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Test Report PR190112 461G, Rev. 0
MIL-STD-461G Testing of the
Flexboss 21 PN: IV-16000-HYB-AW-FX-00, and SN: 45000E0018
Flexboss 18 PN: IV-13000-HYB-AW-FX-00, and SN: 50301N0067

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Record of Revisions and Alterations		
Revision	**Brief Description of Individual Change**	**Date Incorporated**
0	Initial Issue	06/17/2024

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Signatures

Prepared by: ______________________________

Caleb Zavala, Technical Writer

Approved by: ______________________________

Dieu Vo, EMI/EMC Department Manager

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to present the procedures used and the results obtained during the performance of a MIL-STD-461G test program on the EUT. The test program was conducted to determine the ability of the EUT to successfully satisfy the requirements specified in the references listed in Section 2.0.

Client Information

This EMITR is contracted by EG4 Electronics, Sulphur Springs, TX 75482.

Scope

This EMITR is applicable to the qualification of the Flexboss 21 & Flexboss 18. The Flexboss 21 & Flexboss 18 is required to meet the requirements in MIL-STD-461G.

1.2 Acronyms

EUT: Equipment Under Test

EMI: Electromagnetic Interference

EMITR: Electromagnetic Interference Test Report

LISN: Line Impedance Stabilization Network

OLE: Object Linking and Embedding

RF: Radio Frequency

TPD: Terminal Protection Device

EMC: Electromagnetic Compatibility

EMITP: Electromagnetic Interference Test Procedure

ICS: Instrument Control System

ODBC: Open Database Connectivity

PSA: Performance Spectrum Analyzer

TEM: Transverse Electromagnetic

TILE: Total Integrated Laboratory Environment Software

1.3 Definitions

Decibel (dB) is a logarithmic unit of measurement that expresses the magnitude of a physical quantity (usually power or intensity) relative to a specified or implied reference level.

Metric Units are a system of measures defined by the International System on Units based on the “Le System International d’ Unites (SI)”, of the International Bureau of Weights and Measures. These units are described in ASTM E3380

Non-Developmental Item is a broad, generic term that covers material available from a wide variety of sources both industry and Government with little or no development effort required by the procuring activity.

Octave refers to the interval between one frequency and another with double its frequency.

Semi-Anechoic Chamber refers to a chamber with RF absorber lining on all walls and ceiling, but not the floor.

Safety Critical is a category of subsystems and equipment whose degraded performance could result in loss of life or loss of vehicle platform.

Test Setup Boundary includes all enclosures of the EUT and the 2 m of exposed interconnecting leads (except for leads which are shorter in actual installation) and power leads required by MIL-STD-461G.

2 REFERENCES

The following listed in Tables 2-1 and 2-2 form a part of this document to the extent specified herein.

Table 2-1 Government Specifications, Standards, and Handbooks

No	Specification	Rev	Title
1	MIL-STD-461	G	Department of Defense Interface Standard, Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment, dated December 11, 2015
2	MIL-STD-220	B	Method of Insertion Loss Measurement, dated June 25, 2004, with Change 1
3	DI-EMCS-80201C	C	Data Item Description Electromagnetic Interference Test Procedures (EMITP), dated August 30, 2007
4	S9407-AB-HBK-010	2	Handbook of Shipboard Electromagnetic Shielding Practices, dated September 30, 1989
5	DoDI 6055.11	N/A	Protecting Personnel from Electromagnetic Fields, dated August 19, 2009

Table 2-2 Other Documents, Drawings, and Publications

No	Specification	Title
6	POEG42006	EG4 Electronics LLC Purchase Order, dated 04/07/2025
7	OP0670564 - 0	Element Quotation for EG4 Electronics LLC, dated 02/28/2025
8	ISO/IEC 17025L:2017(E)	General Requirements for the Competence of Testing and Calibration Laboratories
9	Element SOP 110	Standard Operating Procedure – Electrical Safety dated June 4, 2012
10	Element SOP 114	Lock Out/Tag Out Procedure, dated November 2, 2010
11	ANSI C63.4-2003	American National Standard for Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz–40 GHz, 2003

3 EQUIPMENT UNDER TEST

3.1 Description

Table 3.1-1 lists key parametric data for the Flexboss 21 & Flexboss 18

Table 3.1-1 Parametric Data for the Flexboss 21 & Flexboss 18

Length:	34.3 inches	**Weight:**	121.25 pounds
Width:	20.5 inches	**Input Power:**	115VAC/60Hz
Height:	11.2 inches		

3.2 Test Configuration

To be supplied by customer.

3.3 EMI Test Grounding Method

The EUT was connected to the ground plane with a braided copper strap. The connection between the EUT and the ground plane was verified to be in accordance with installation guidelines. The ground braid construction is flat CRES 316 bond strap, 9 x 2 x 0.02”.

3.4 Security Classification

This equipment is considered an unclassified defense article. While unclassified, it should be handled only by authorized personnel. This equipment contains technical data within the definition of the International Traffic in Arms Regulations, and is subject to the export control laws of the USG. Retransfer of this data by any means to any Foreign Person, whether in the United States or abroad, without the written approval of the U. S. Department of State, is prohibited. See CFR 22 Parts 120-130.

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4 TEST REQUIREMENTS

This section provides an overview of the EMI test plan.

4.1 Test Dates and Location

Table 4.1-1 Test Dates and Locations

Section	Test	MIL-STD-461G Section	Dates
5.1	CS115	5.14	04/30/2025-05/05/2025
5.2	CS116	5.15	05/05/2025-05/07/2025
5.3	CS117	5.15	05/12/2025
Note: All testing was performed at Element in Plano, TX.			

The following signatures record the testing that was performed in accordance with test procedures contained herein.

Table 4.1-2 MIL-STD-461G Test Completion Verification

Signature indicates the test was supervised by Element representative.			
Test	**Verified by**	**Signature**	**Date**
CS115	Dieu Vo		04/30/2025-05/05/2025
CS116			05/05/2025-05/07/2025
CS117			05/12/2025

4.2 Test Resources

Lists of the Element provided equipment used during testing are included in each test section. This equipment is calibrated according to ISO/IEC 17025:2017(E) and calibration is traceable to the National Institute of Standards and Technology (NIST). Calibration records are maintained on file at Element.

TILE Software

TILE is an integrated approach to designing, performing, reporting, and archiving complex Electromagnetic Compatibility (EMC) tests. TILE/ICS (Instrument Control System) is the portion of the TILE system that provides simple, direct control of EMC measurement instruments. TILE provides a common user interface for all testing, coupled with tight integration into standard report writing programs (Microsoft Word) and spreadsheets (Microsoft Excel). It provides the ability to perform EMC tests as well as manipulate the data generated during these measurements.

By using the latest software techniques, such as OLE 2.0 and ODBC (Open Database Connectivity), TILE allows for rapid design and testing within the laboratory environment. The use of 32-bit code is of particular significance within the EMC community given the large data sizes inherent in EMC testing.

TILE/ICS uses a flowchart to simplify the user interface. Each step in the process is represented on the flowchart with an icon, which are referred to as actions. The icons are each a unique test, information step or prompt. The flowchart provides a powerful tool for symbolizing communications with the instruments and data manipulation/correction.

Instrument control is based on the General Purpose Instrument Bus (GPIB or IEEE-488-2), Serial Communications (IEEE-232), or other standards. The TILE system is hardware independent within these constraints and the abilities of the hardware used. Most EMC instrumentation is supported by TILE. The emphasis on hardware independence allows for quick introduction of new instrumentation into the laboratory environment. No new code has to be written by the user, only a new instrument driver by subcontractor ETS-Lindgren. These instrument drivers are provided free of charge to registered users.

The TILE automation profiles used in this EMITR (Electromagnetic Interference Test Report) are included in each applicable test section. These Profile snapshots represent the parameters and characteristics used in the automation process, such as bandwidth settings, frequency step rates, and dwell times for the applicable test frequency range.

Since TILE is a widely used software program, its main programs have been validated. Only user information must be verified and is included in the individual test method. The system verifications performed in each emission test verifies the software at the same time as the rest of the measurement system. Verifications performed for susceptibility are included in each test method of the test procedure. TILE software defaults all receiver video bandwidth resolutions to 3 MHz which is the maximum video bandwidth resolution setting for all Element receivers.

The output from TILE software is in the form of graphs or tables. The graphs are used to graphically display the data gathered across the frequency range tested. The tables are used to capture the 4 highest peaks detected during test or any peak which approaches within 6 dB of the test limit. This would include any peaks that exceed the limit. TILE is the data recording device for all testing. The completed TILE profiles are stored on a secure server that is continually backed up on another secure server.

Whether the software is set to logarithmic or linear scale does not impact the final result displayed. All data gathered from the analyzer is gathered with the analyzer in a linear mode and converted to a logarithmic scale by the software.

The receiver settings defined in the Parameters tab of the Measure Range TILE icon are irrelevant as the driver loaded into the software is for a spectrum analyzer. TILE recognizes the driver as a spectrum analyzer and only uses the settings for an analyzer (ignoring all portions marked for receiver).

The TILE profile is reviewed for accuracy before and after a test is performed by the shift supervisor. Additionally, Element' accrediting body requires Element to provide proof of functionality of test profiles. TILE profiles are used.

Element uses internal quality processes to ensure the software meets MIL-STD-461G requirements. A technical justification can be provided for each group of software subsets used to perform testing, but Element considers such to be unsuitable for presentation in a test procedure due to the length and technical detail such justifications would require. Factors are manually entered by the technician performing the test before each test and the use of the correct factor is verified by a pre-test inspection before the technician is allowed to perform the test. Additionally, a post-test inspection is performed to ensure the data gathered is valid. This software has been repeatedly proved and is accurate in all aspects.

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Table 4.2-1 TILE Software

Manufacturer	Model	Rev	Date
ETS Lindgren	TILE 6	6.0.4.633	03/26/2014

Test Personnel

Element provided a test operator and supervisory personnel to perform the test steps for each of the test procedures described in Section 5. The client provided support personnel to monitor the EUT performance and determine susceptibility of the EUT in accordance with criteria and procedures in Sections 3.3 and 4.5. During the performance of RE102 and RS103 these and all personnel were outside the test chamber with the door closed. During the performance of CS115, CS116, and CS117 these personnel may have been located inside the test chamber as required.

Test Equipment

The test chamber contained only necessary equipment to perform the test; anything that does not support the test was removed from the test chamber.

Ambient Electromagnetic Level

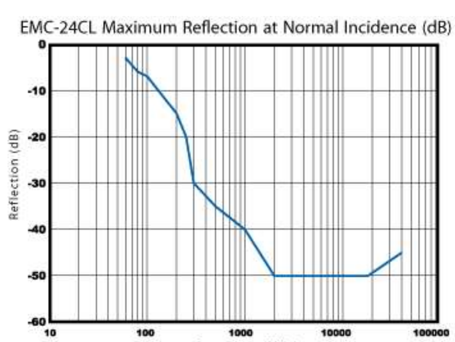
During testing, the ambient electromagnetic level measured with the EUT de-energized and all auxiliary equipment turned on was at least 6 dB below the allowable specified limits when the tests are performed in a shielded enclosure. Ambient conducted levels on power leads were measured with the leads disconnected from the EUT and connected to a resistive load which draws the same rated current as the EUT. When tests are performed in a shielded enclosure and the EUT is in compliance with required limits, the ambient profile need not be recorded in this EMITR. When measurements are made outside of a shielded enclosure the ambient conditions for temperature, humidity and barometric pressure are recorded. The ambient conditions were recorded in this EMITR and they did not compromise the test results.

4.3 General Test Requirements

4.3.1 Test Facility

All testing occurred within a shielded semi anechoic enclosure, located in Plano, TX. The chamber is lined with anechoic Radio Frequency (RF) absorbing cones on the walls and the ceiling. Peripheral equipment was located outside the shielded enclosure. All power leads entering the shielded enclosures were routed via electromagnetic interference filters to provide at least 80 dB of attenuation above 10 kHz when measured in accordance with MIL-STD-220B. Interconnecting cables were routed via feed-through ports mounted on the enclosure. Shielding effectiveness to electric fields and plane waves of this EMI test chamber exceeded 80 dB from 14 kHz–10 GHz, and 60 dB from 10 GHz–40 GHz.

The anechoic RF absorber material shown in Figure 4.3-1 (carbon impregnated foam pyramids) is used when performing electric field radiated emissions or radiated susceptibility testing inside a shielded enclosure. It is intended to reduce reflections of electromagnetic energy and to improve accuracy and repeatability.



MHz	dB
60	– 3
80	– 6
100	–7
200	–15
250	– 20
300	– 30
500	– 35
1,000	– 40
2,000	– 50
3,000	– 50
6,000	– 50
10,000	– 50
18,000	– 50
40,000	– 45

MIL-STD-461D/E Performance Requirement

FREQUENCY	MINIMUM ABSORBTION
80 MHz - 250 MHz	6 dB
250 MHz - 40 GHz	10 dB

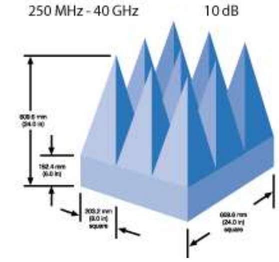


Figure 4.3-1 EMC 24PCL RF Absorber Performance Data

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4.3.2 Ground Plane

The ground plane was a copper plane, measuring 350 cm x 89 cm, placed on a table inside the shielded enclosure. The shielded enclosure measures 20' x 18' x 10'. The EUT was bonded to the ground through a ground strap provided by EG4 Electronics. The ground plane met the requirements of MIL STD-461G.

The EUT was installed on a metallic ground plane as shown in Figure 4.3-2. Equipment orientation in relation to ground plane and antennae was determined after near-field probe of equipment determined the greatest source of emissions. For purposes of test planning, it was assumed that the front face of the EUT was the worst case for emissions and susceptibility as the other faces of the EUT are continuous metal construction with the exception of the bottom face which allows cable penetration. See Figure 4.3-2 for details of the Element provided fixture to simulate shipboard installation.

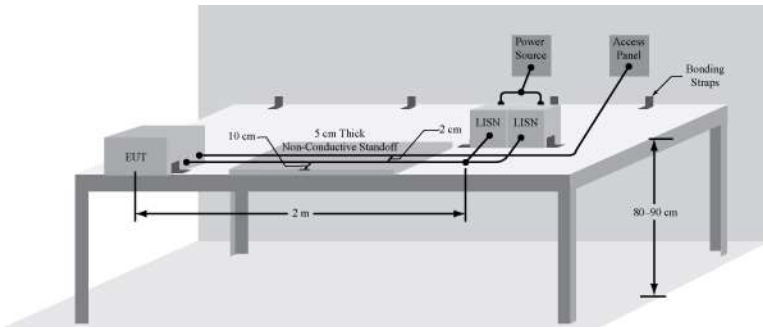

Figure 4.3-2 EUT Bench Top

4.3.3 Power Source Impedance

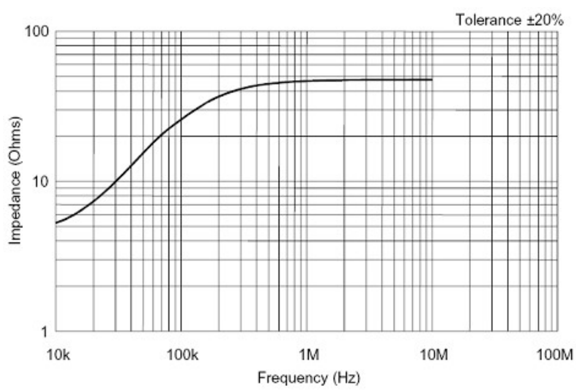

Figure 4.3-3 LISN Impedance Example

The impedance of power sources providing input power to the EUT were controlled by LISNs for all measurement procedures of this document unless otherwise stated in a particular test procedure. LISNs were not used on output power leads. The LISNs were located at the power source end of the 2.5 m exposed length of power leads. The LISN impedance characteristics were in accordance with Figure 4.3-3. The LISN impedance was measured at least annually under the following conditions:

- The impedance was measured between the power output lead on the load side of the LISN and the metal enclosure of the LISN.
- The LISN signal output port had a 50 ohm termination.

The power input terminal on the power source side of the LISN was un-terminated. The impedance measurement results are provided in this EMITR.

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Frequency Accuracy

In order for the EUT to successfully satisfy the requirements specified in the references listed in Section 2.0, the frequency accuracy of the recorded measurements was within ±2%. Verification with a frequency counter or other measuring device was required. Amplitude Accuracy was ±2 dB.

Other Accuracies

- Distance: ±5%
- Amplitude, measurement system (includes measurement receivers, transducers, cables, and so forth): ±3 dB
- Time (waveforms): ±5%
- Resistors: ±5%
- Capacitors: ±20%

4.4 Emissions Testing

Bandwidths

The measurement receiver bandwidths listed in Table 4.4-1, which are derived from MIL-STD-461G, were used for emissions testing. These bandwidths are specified at the 6 dB down points for the overall selectivity curve of the receivers. Video filtering was not used to bandwidth limit the receiver response. A controlled video bandwidth was available on the measurement receivers used; it was set to its greatest value. This value was 3 MHz.

Table 4.4-1 Bandwidth and Measurement Times

Frequency Range	6 dB Band-width	Dwell Time[1]	Min Measurement Time of Analog Measurement Receiver
30 Hz–1 kHz	10 Hz	0.15 sec	0.015 sec/Hz
1 kHz–10 kHz	100 Hz	0.015 sec	0.15 sec/kHz
10 kHz–150 kHz	1 kHz	0.015 sec	0.015 sec/kHz
150 kHz–30 MHz	10 kHz	0.015 sec	1.5 sec/MHz
30 MHz–1 GHz	100 kHz	0.015 sec	0.15 sec/MHz
> 1GHz	1 MHz	0.015 sec	15 sec/GHz
[1]Alternative scanning technique. Multiple faster sweeps with the use of a maximum hold function may be used if the total scanning time is equal to or greater than the Minimum Measurement Time defined above.			

Frequency Scanning

For emission measurements, the entire frequency range for each applicable test was scanned. Minimum measurement time for analog measurement receivers during emission testing was as specified in Table 4.4-1. Synthesized measurement receivers were stepped in ½ bandwidth increments or less, and the measurement dwell time was as specified in Table 4.4-1. For equipment that operated such that potential emissions were produced at only infrequent intervals, times for frequency scanning were increased as necessary to capture any emissions.

Sweep time for analog measurement receivers can be calculated by subtracting the stop frequency from the start frequency to determine the frequency span. The frequency span was then multiplied by the specified minimum measurement time for the analog receiver. Sweep time for synthesized measurement receivers can be calculated by determining the frequency span, then dividing the frequency span by of half the specified measurement bandwidth. This step increment was then multiplied by the specified dwell time.

Element utilized analog measurement receivers. The calculated frequency ranges and sweep times were adjusted to provide more data points than required by MIL-STD-461G. One example is the treatment of the frequency range 120 Hz–1 kHz for RE101. For an analog receiver, 461G requires a 10 Hz resolution bandwidth and a minimum measurement time of 0.015 sec/Hz. This is 880 Hz x 0.015 sec = 13.2 seconds total sweep time. The software was preset for a 50 second sweep, far longer than required by MIL-STD-461G.

Element's measurement receivers employed 1001–8000 data points for each frequency range scanned. In keeping with the previous example of RE101, by the software settings, 1 range was tested from 120 Hz–1 kHz. 880 Hz across 1001 data points translates to a frequency resolution of 0.9 Hz. The standard allows 1% or 2x the resolution bandwidth, whichever is less stringent. Two times the 10 Hz resolution bandwidth for this range is 20 Hz. The tables Element provides for emissions test resolve to 3 decimal places for frequency and 2 decimal places for amplitude.

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4.5 Susceptibility Testing

Frequency Scanning

For susceptibility measurements, the entire frequency range for each applicable test was scanned. For swept frequency susceptibility testing, frequency scan rates and frequency step sizes of signal sources did not exceed the values listed in Table 4.5-1. The rates and step sizes were specified in terms of a multiplier of the tuned frequency (f_o) of the signal source. Analog scans refer to signal sources which are continuously tuned. Stepped scans refer to signal sources which are sequentially tuned to discrete frequencies. Stepped scans dwelled at each tuned frequency for 3 seconds. Scan rates and step sizes were decreased when necessary to permit observation of a response.

Table 4.5-1 Susceptibility Scanning

Frequency Range	Analog Scans Max Scan Rates	Stepped Scans Max Step Size
30 Hz-1 MHz	0.0333f_o/sec	0.05 f_o
1 MHz-30 MHz	0.00667 f_o/sec	0.01 f_o
30 MHz-1 GHz	0.00333 f_o/sec	0.005 f_o
1 GHz-40 GHz	0.00167 f_o/sec	0.0025 f_o

Thresholds of Susceptibility

When susceptibility indications were noticed in EUT operation, a threshold level was determined when possible, and where the susceptible condition was no longer present. Thresholds of susceptibility were determined as follows:

- When a susceptibility condition was detected, the interference signal was reduced until the EUT recovered.
- The interference was reduced by an additional 6 dB.
- The interference signal was gradually increased until the susceptibility condition reoccurred.
- The level, frequency range of occurrence, frequency and level of greatest susceptibility, and other test parameters, as applicable were recorded.

Notice of Deviation

In accordance with Element' quality procedures, when a EUT was observed to exceed an emission limit or display susceptibility to a susceptibility test, a Notice of Deviation document was generated by the technician performing the test. This NOD documents the emission/susceptibility requirement, how the EUT deviated from the requirement, and allows room for resolution of the deviation. This document was signed by the Element program engineer and the Element quality representative. It was then forwarded to the customer contact provided by the client. Once mitigated (or passed over), the steps taken to correct the deviation (or simply instruction from the customer to continue testing) were recorded in the NOD and it was integrated into the body of this EMITR in the appropriate location.

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4.6 General Test Precautions

Excess Personnel and Equipment
The test area was kept free of unnecessary personnel, equipment, cable racks, and desks. Only the equipment essential to the test being performed was in the test area or enclosure. Only personnel actively involved in the test was permitted in the enclosure.

Overload Precautions
Measurement receivers and transducers are subject to overload, especially receivers without pre-selectors and active transducers. Periodic checks were performed to assure that an over-load condition did not exist. Instrumentation changes were implemented to correct any overload condition.

Linear Response of Signal
In accordance with ANSI C63.4-2003 Clause 4.2, the measuring system satisfied the following condition:

- The measuring system shall have a linear response.

If a non-linear response was suspected due to an overload condition, the linearity response of the measurement system was verified. This was accomplished by performing a continuous sweep across the measurement range. A second sweep was performed with external RF attenuation added to the front end of the spectrum analyzer to confirm that the measurement amplitude at the suspect frequencies were reduced corresponding to the amount of attenuation applied.

For example, a linear response would be verified if a 30 dB signal measured through a 10 dB attenuator reads 20 dB, and reads 10 dB through a 20 dB attenuator. A non-linear response would be verified if a 30 dB signal reads a value higher than expected through a given attenuator (non-linear response: 30 dB input – 10 dB attenuator = 27.5 dB)

If a non-linear response was verified, the addition of more external attenuation or internal attenuation with an RF reference level adjustment was required to regain a linear measurement response. Newer models of EMI Receivers such as the Agilent E4446A series indicate where an IF or RF overload exists. In this case, the attenuation of the analyzer's input signal was adjusted until the overload indication was removed.

RF Hazards
Some tests in this report result in electromagnetic fields that were potentially dangerous to personnel. The permissible exposure levels in DoDI 6055.11 did not exceed in areas where personnel are present. Safety procedures and devices were used to prevent accidental exposure of personnel to RF hazards.

Shock Hazard
Some tests require potentially hazardous voltages to be present. Extreme caution was taken by all personnel to assure that all safety precautions were observed.

See the Element Standard Operating Procedure SOP 110 for electrical safety and SOP114 for Lock-Out Tag-Out procedures.

5 TEST DESCRIPTIONS AND RESULTS

Table 5-1 Test Results Summary

Section	Test	Met Criteria?
5.1	MIL-STD-461G CS115	Yes
5.2	MIL-STD-461G CS116	Yes
5.3	MIL-STD-461G CS117	Yes with NOD 1

*The decision rule used to state compliance is in accordance with the test specification used for testing.

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5.1 Conducted Susceptibility: Method CS115 Bulk Cable Injection, Impulse Excitation

5.1.1 CS115 Purpose

This test verifies the ability of the EUT to withstand impulse signals coupled onto its cables.

5.1.2 CS115 Limit

The EUT shall not exhibit any malfunction, degradation of performance, or deviation from specified indications beyond the tolerances indicated in the individual equipment or subsystems specification when subjected to a pre-calibrated signal having rise and fall times, pulse width, and amplitude as specified in Figure CS115-1 at a 30 Hz rate for 1 minute.

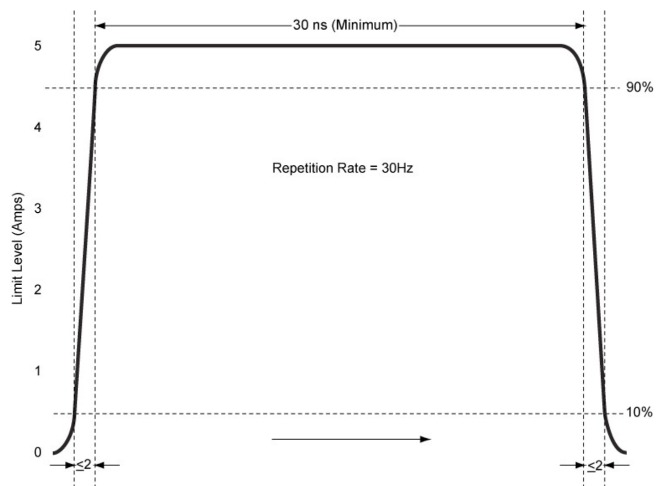

Figure CS115-1 Signal Characteristics for all Applications

5.1.3 CS115 Test Setup

The EUT was set up in accordance with Section 5.13 of MIL-STD-461G.

5.1.4 CS115 Calibration

The test equipment is configured per Figure CS115-2. The injection probe is calibrated as follows:

1. The injection probe is placed around the center conductor of the calibration fixture.
2. One end of the calibration fixture is terminated with a coaxial load. The other end is terminated with an attenuator connected to an oscilloscope with 50ohm input impedance.

Calibration proceeds as follows:

1. The measurement equipment is turned on and sufficient time is allowed for stabilization.
2. The pulse generator source is adjusted for the rise time, pulse width, and pulse repetition rate requirements.
3. The signal applied to the calibration fixture is increased until the oscilloscope indicates that the required current level is flowing in the center conductor of the calibration fixture.
4. It is verified that the rise time, fall time, and pulse width portions of the waveform have the correct durations, and that the correct repetition rate is present. Note that the precise pulse shape cannot be reproduced due to the inductive coupling mechanism.
5. The pulse generator amplitude setting is recorded.

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5.1.5 CS115 Test Procedure

The test equipment is configured per Figure CS115-3, and as follows:
1. The injection and monitor probes are placed around the cable bundle interfacing with a/an EUT connector.
2. The monitor probe is placed 5 cm from the connector. If the connector and backshell's overall length exceeds 5 cm, the monitor probe is positioned as close to the connector's backshell as possible.
3. The injection probe is positioned 5 cm from the monitor probe.

Testing proceeds as follows on all required cables:
1. The EUT is turned on and sufficient time is allowed for stabilization.
2. Susceptibility Evaluation:
   A. The pulse generator is adjusted, as a minimum, for the amplitude setting determined in Step 5 of the previous Calibration Procedure.
   B. The test signal is applied at the pulse repetition rate for the required duration.
   C. The EUT is monitored for degradation of performance.
   D. If susceptibility is noted, the threshold level is determined and it is verified to be above the limit.
   E. The peak current induced on the cable is recorded off the oscilloscope.
   F. Steps A–E are repeated on each cable bundle interfacing with each electrical connector on the EUT.

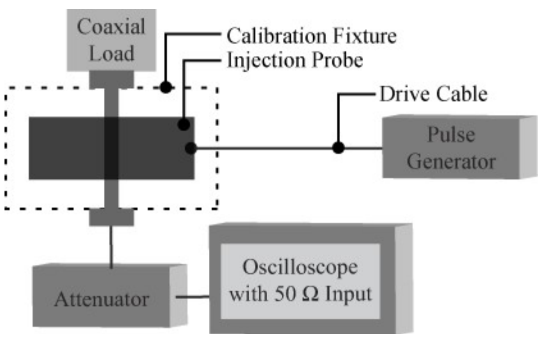

Figure CS115-2 Calibration Setup

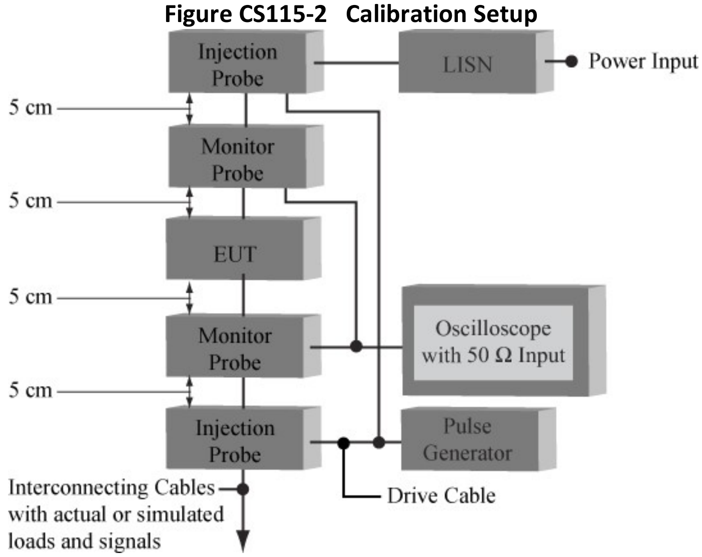

Figure CS115-3 Bulk Cable Injection

5.1.6 CS115 Test Results

The Flexboss 21 PN: IV-16000-HYB-AW-FX-00 and Flexboss 18 PN: IV-13000-HYB-AW-FX-00 **complied** with the requirements in Section 2.0.

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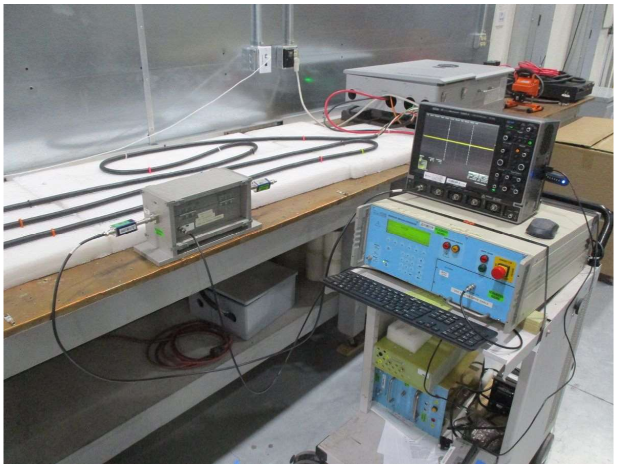
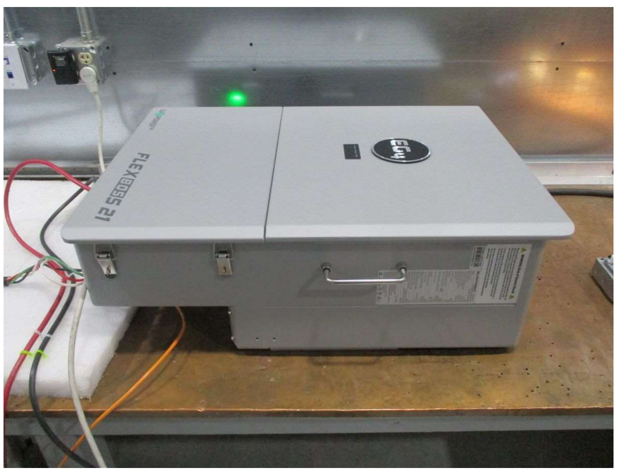
5.1.7 CS115 Test Photographs

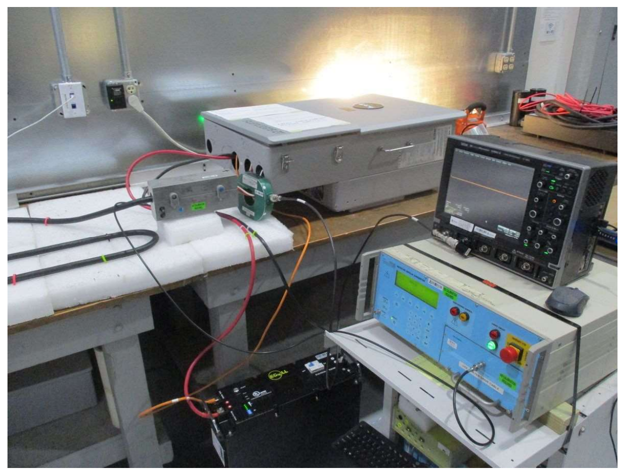


CS115 - Calibration Verification Setup

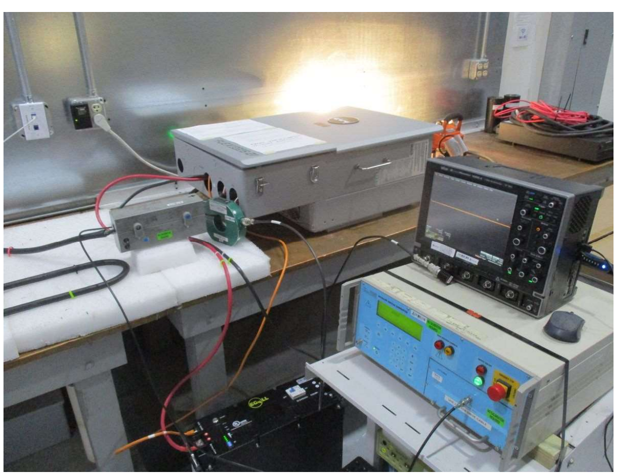
CS115 - EMI01 - EUT Info



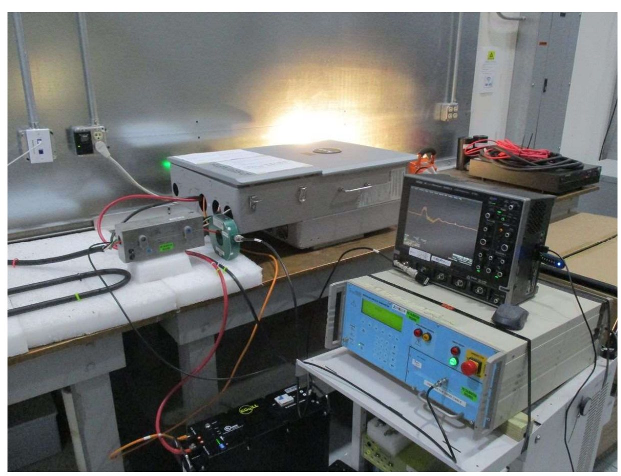
CS115 - EMI01 - EUT Setup



CS115 - EMI01 - Test on AC Full Bundle

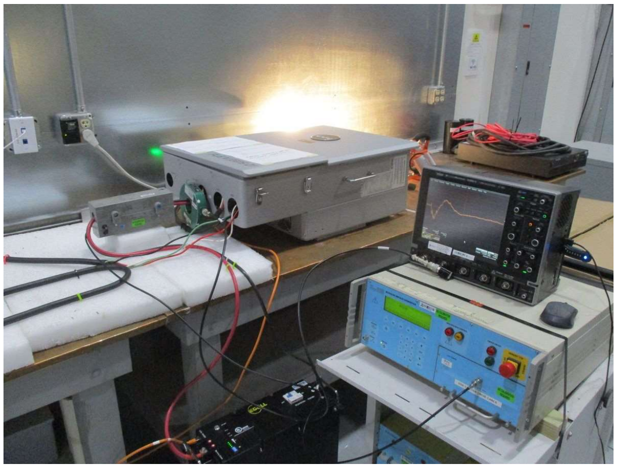


CS115 - EMI01 - Test on AC L1 Only

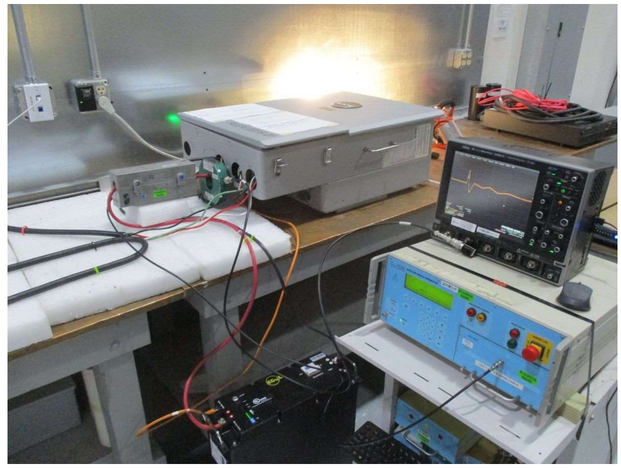


CS115 - EMI01 - Test on AC L2 Only

EAR Controlled Data

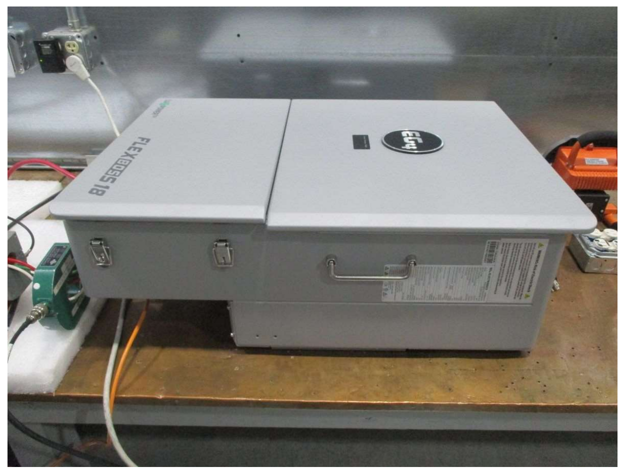


CS115 - EMI01 - Test on DC Full Bundle

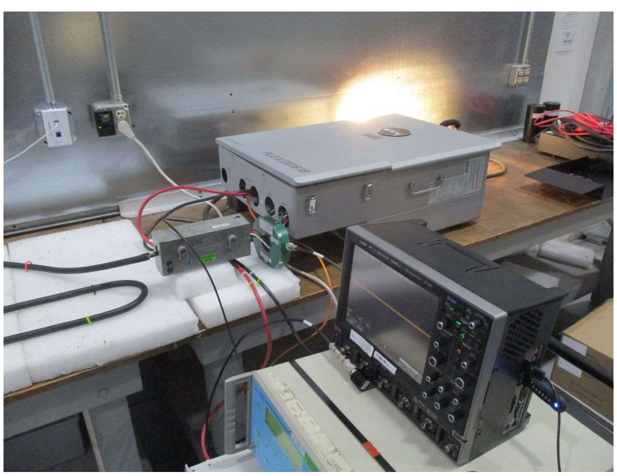


CS115 - EMI01 - Test on DC High Side Only

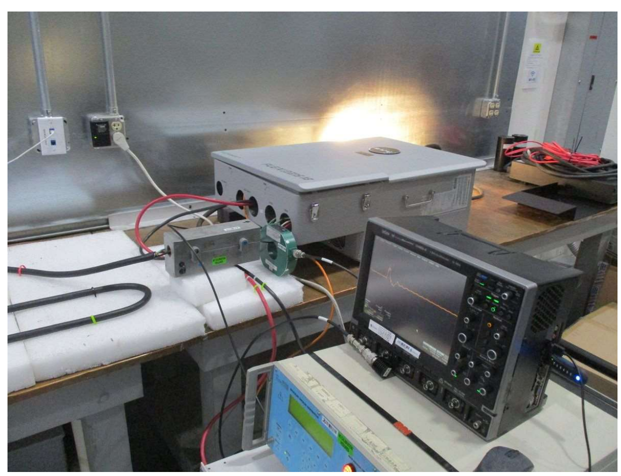
CS115 - EMI02 - EUT Info



CS115 - EMI02 - EUT Setup

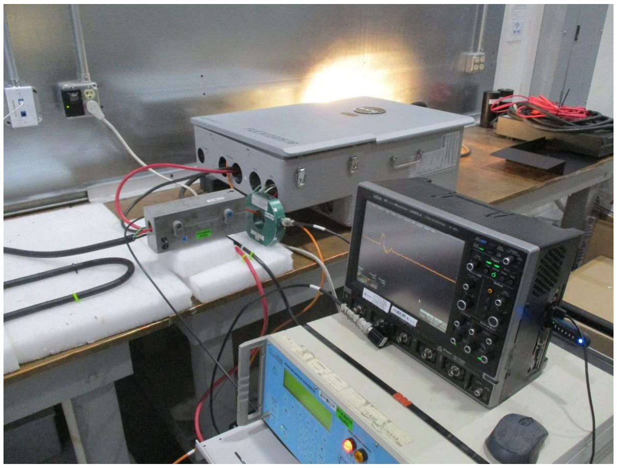


CS115 - EMI02 - Test on AC Full Bundle

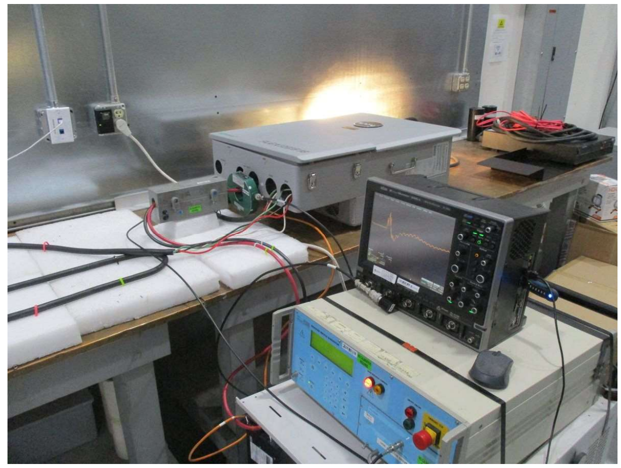


CS115 - EMI02 - Test on AC L1 Only

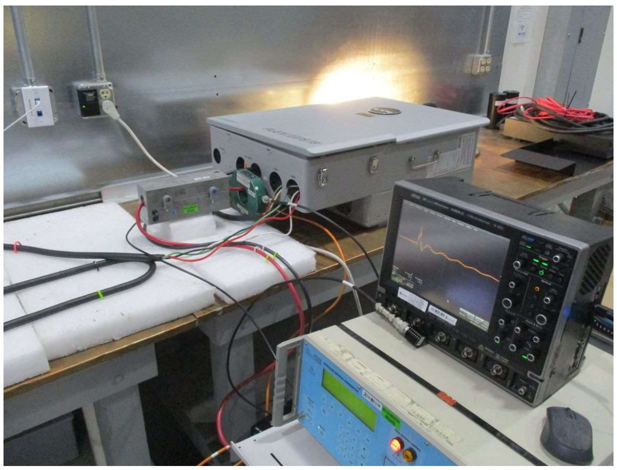
EAR Controlled Data



CS115 - EMI02 - Test on AC L2 Only

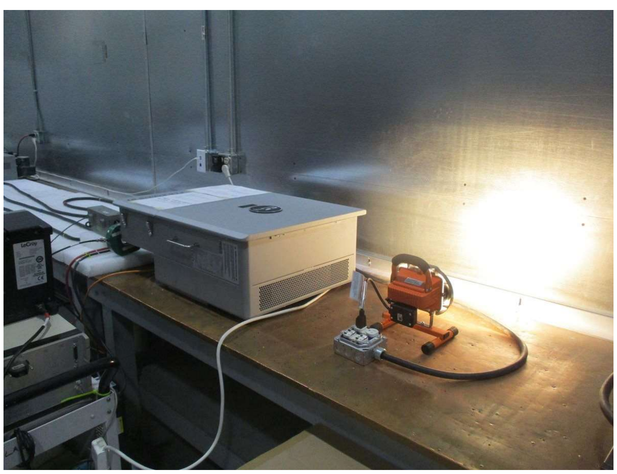


CS115 - EMI02 - Test on DC Full Bundle



CS115 - EMI02 - Test on DC High Side Only

CS115 - General Test Setup

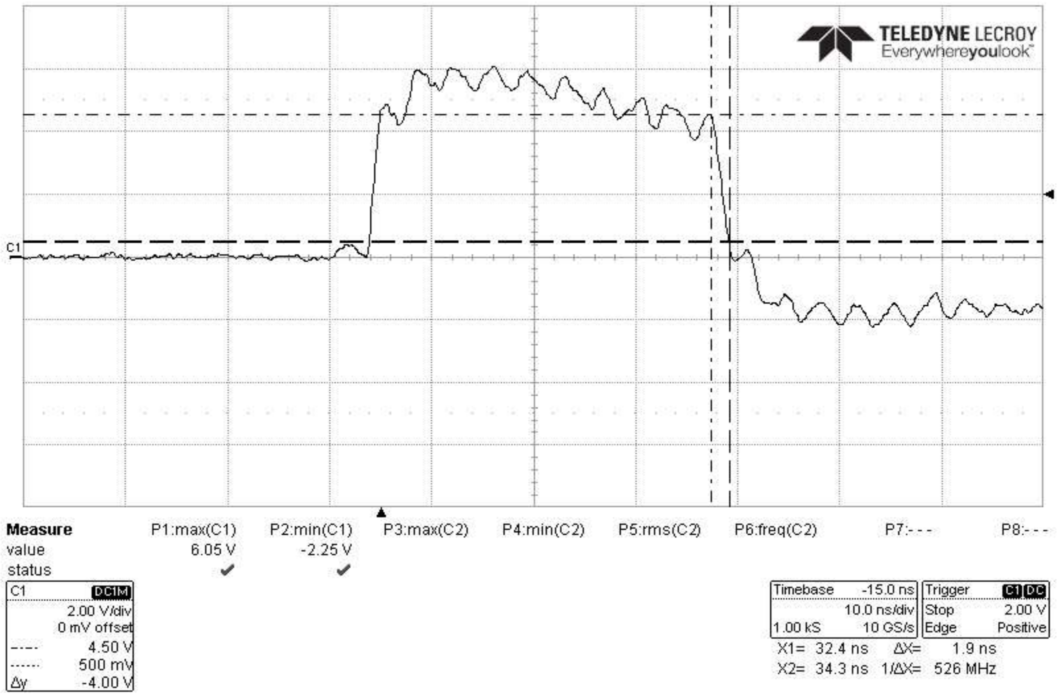


CS115 - Load Setup

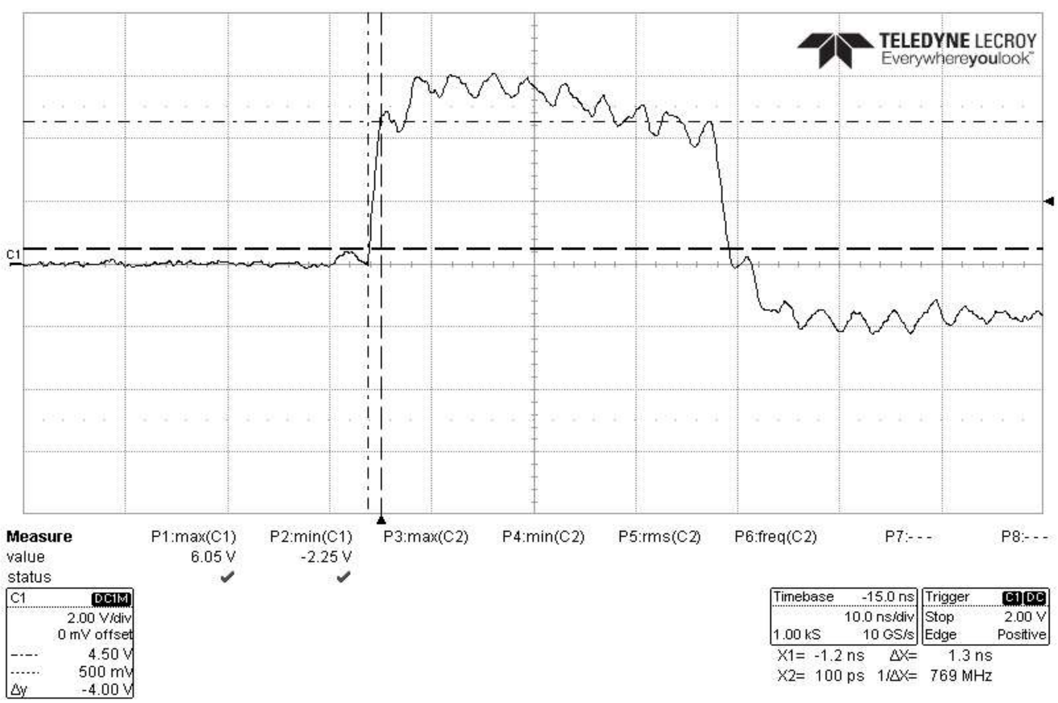
EAR Controlled Data

5.1.8 CS115 Test Data

CS115 Verification Test Data for Impulse Excitation Test

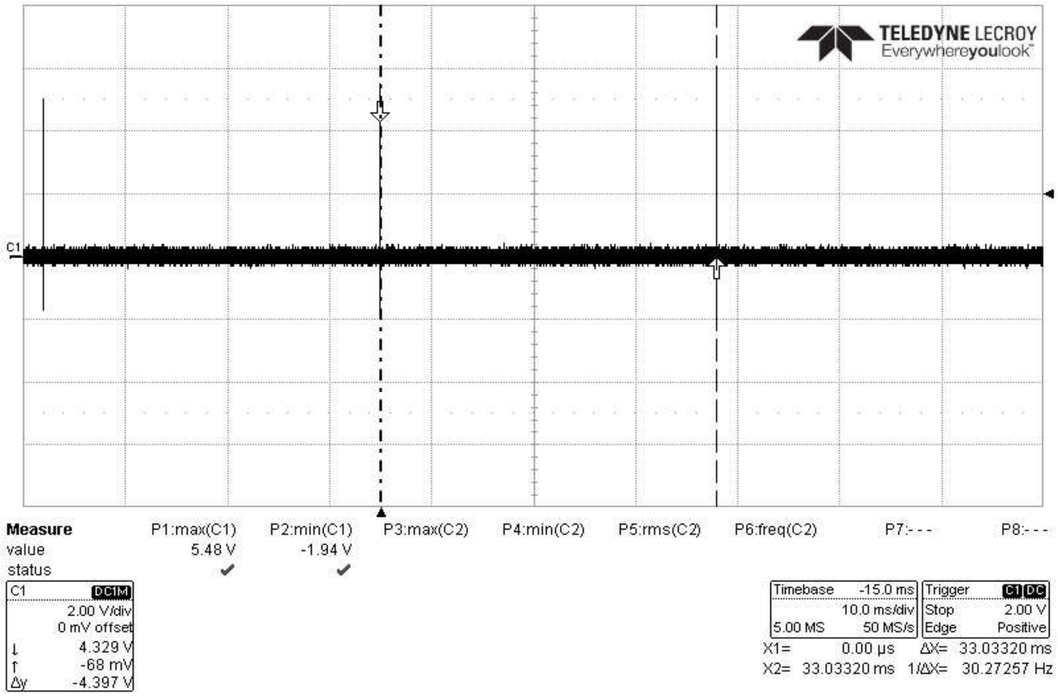


CS115 less 2ns Fall Time Verification

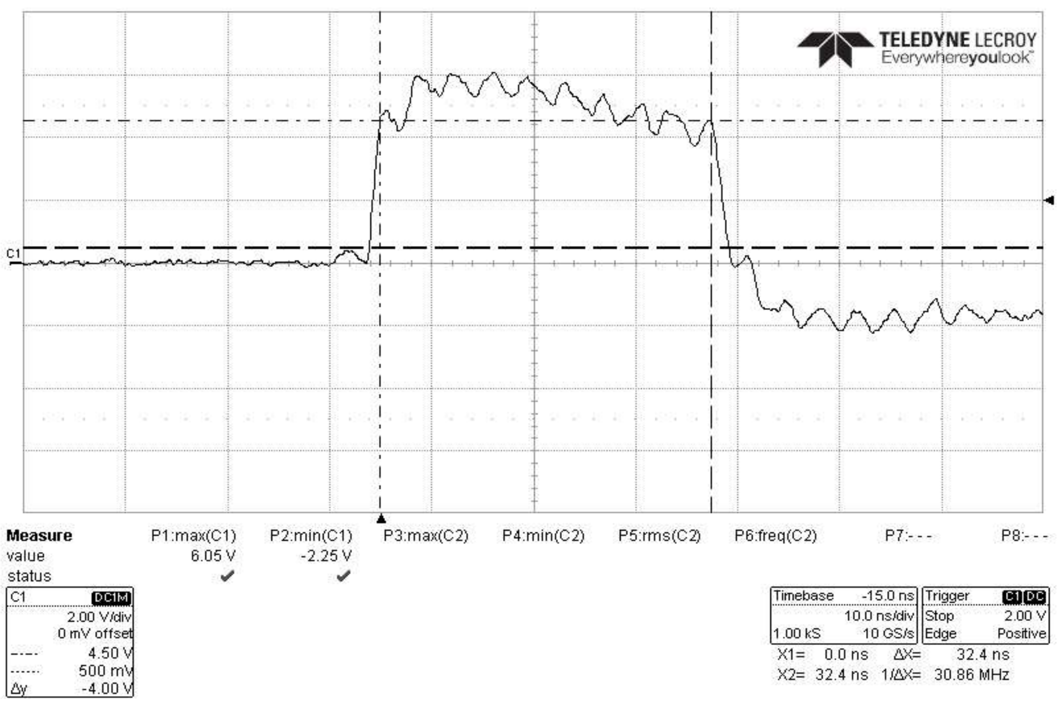


CS115 less 2ns risetime Verification

EAR Controlled Data



CS115 less 30Hz Repetition Rate Verification



CS115 less 30ns duration Verification

EAR Controlled Data

CS115 Actual Test Data for Impulse Excitation Test EMI-01 Flexboss 21

CUSTOMER:	**EG4 Electronics LLC**	**MJO:**	**PR190112**
TEST ITEM:	**Flexboss 21**	**DATE:**	**4/30/2025**
PART NUMBER	**IV-16000-HYB-AW-FX-00**	**UNIT NO:**	**45000E0018**
SPECIFICATION:	**MIL-STD-461G**	**CHAMBER NO:**	**Workbench 1**

EUT Power Input	**208VAC/60Hz and 48VDC**
Limit	**5A**

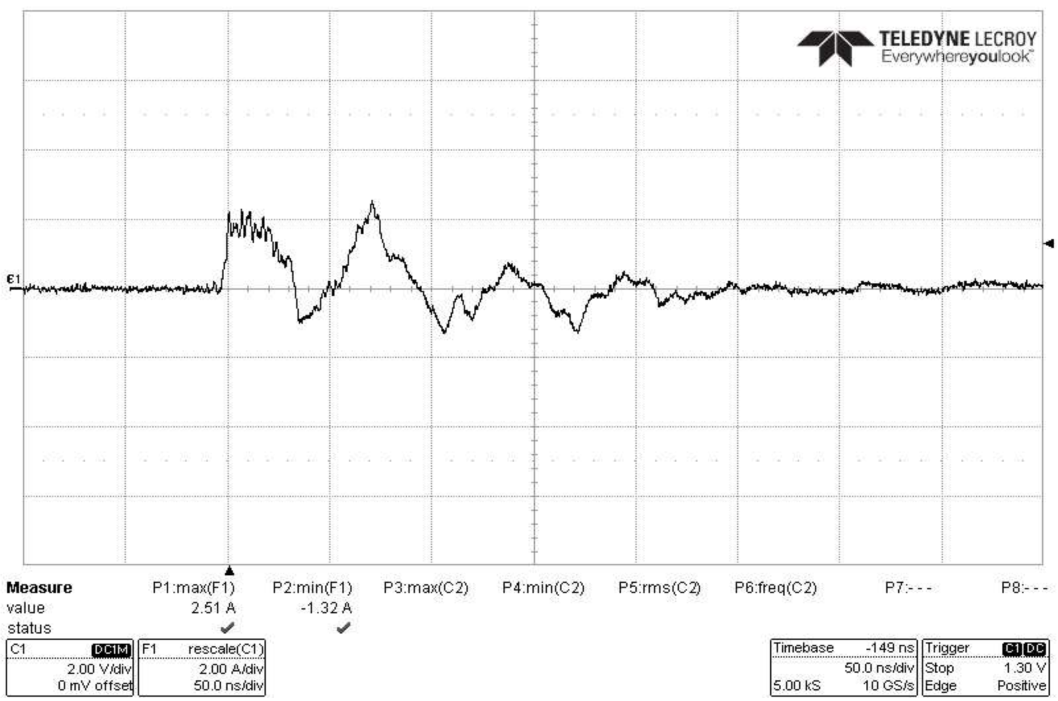
CS115 Conducted Susceptibility, Bulk Cable Injection, Impulse Excitation

Test Level: 30 nanosecond pulse width @ 5 Amps. Pulse rate at 30 Hz per second for **one minute**.

Temperature: 20C | **Humidity: 55% RH** | **Barometric Pressure: 987 mBar**

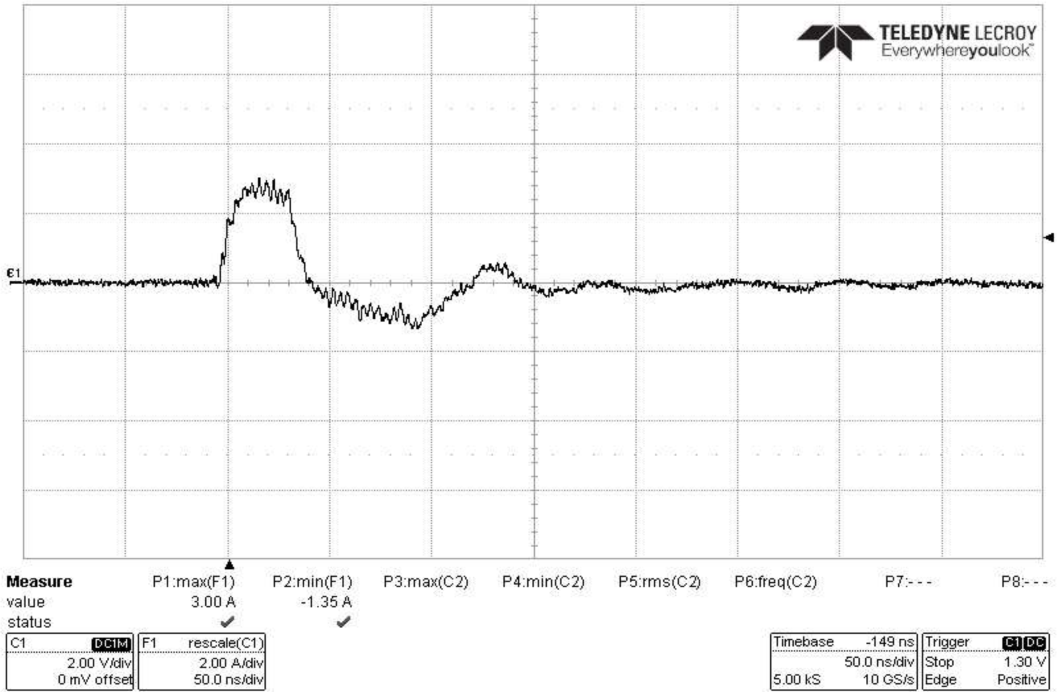
Frequency	Test Level (A)	Actual Test (A)	Test on Cable	Results	Comments
30nS Impulse Excitation	5	2.51	AC Full Bundle	☑ Pass	
30nS Impulse Excitation	5	3	AC L1 LINE	☑ Pass	
30nS Impulse Excitation	5	3.29	AC L2 LINE	☑ Pass	
30nS Impulse Excitation	5	4.54	DC Bundle	☑ Pass	
30nS Impulse Excitation	5	3.93	DC High Side Only	☑ Pass	

TECHNICIAN / ENGINEER:	**Donald Adams**	**DATE:**	**4/30/2025**

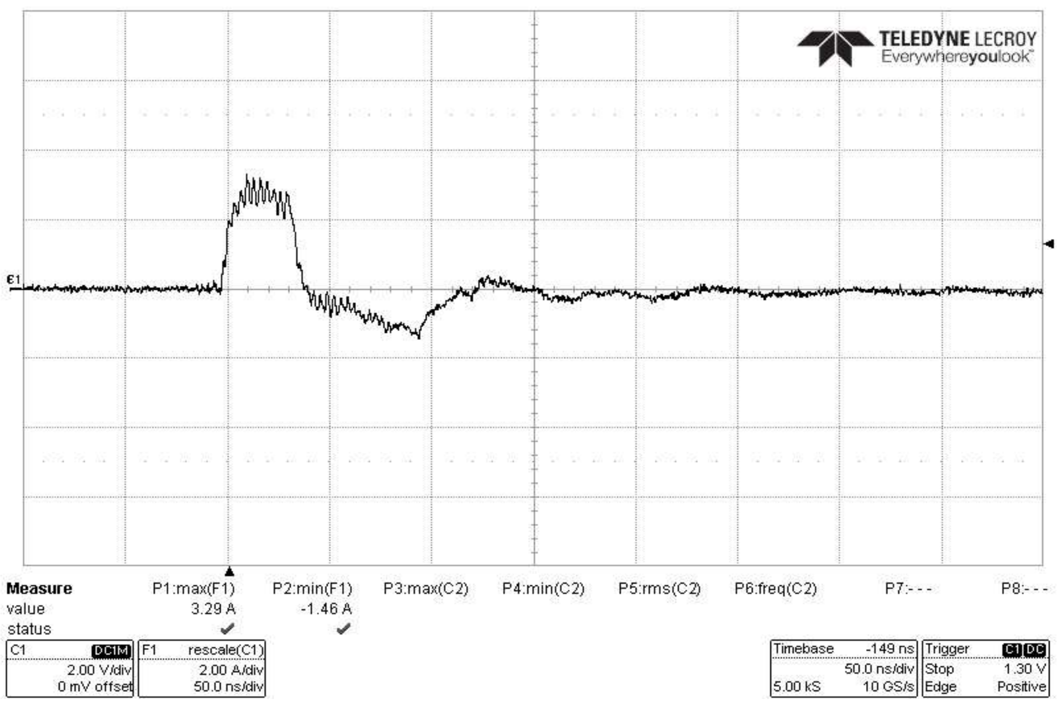


EMI01 - Test on AC Full Bundle - Waveform

EAR Controlled Data

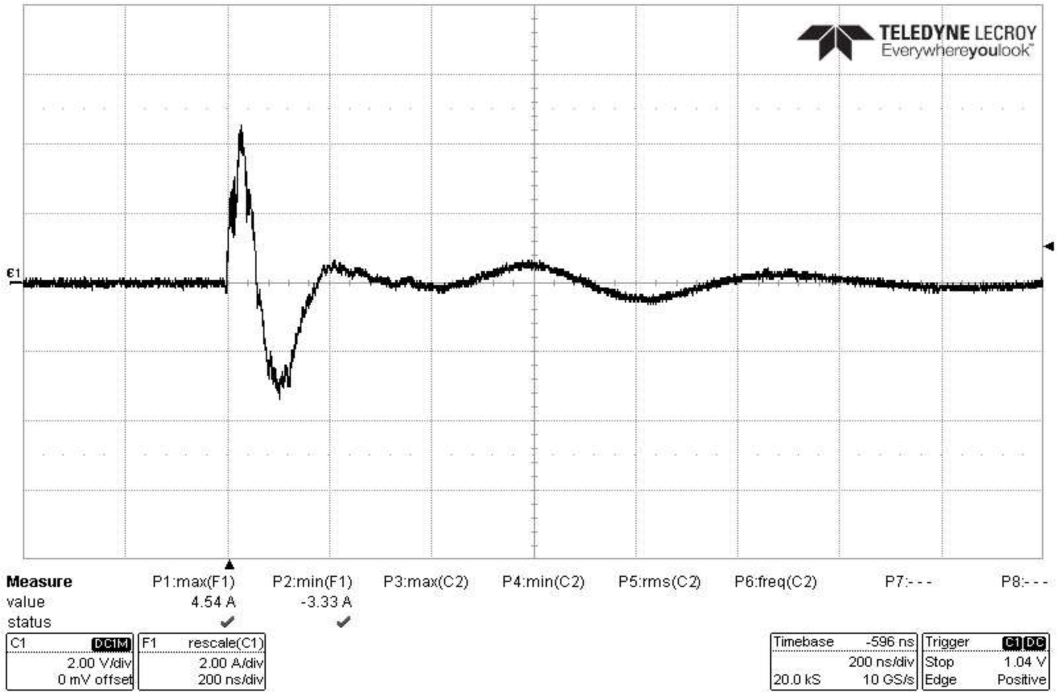


EMI01 - Test on AC L1 Only - Waveform

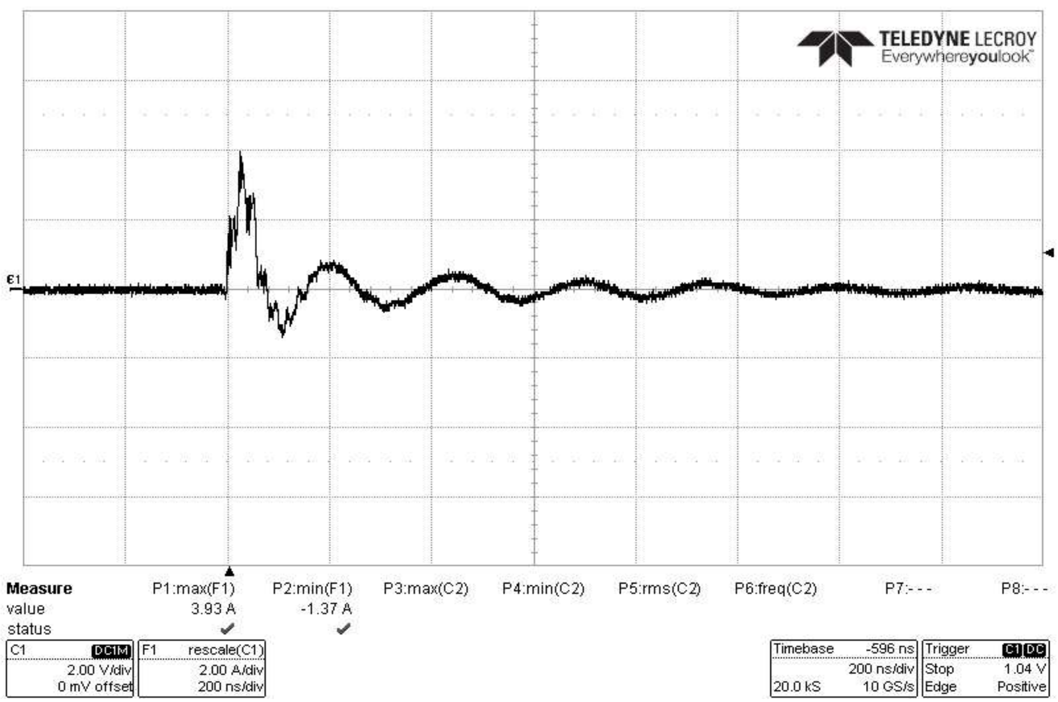


EMI01 - Test on AC L2 Only - Waveform

EAR Controlled Data



EMI01 - Test on DC Full Bundle - Waveform



EMI01 - Test on DC High Side Only - Waveform

EAR Controlled Data

CS115 Actual Test Data for Impulse Excitation Test EMI-02 Flexboss 18

CUSTOMER:	**EG4 Electronics LLC**	**MJO:**	**PR190112**
TEST ITEM:	**Flexboss 18**	**DATE:**	**5/5/2025**
PART NUMBER	**IV-13000-HYB-AW-FX-00**	**UNIT NO:**	**50301N0067**
SPECIFICATION:	**MIL-STD-461G**	**CHAMBER NO:**	**Workbench 1**

EUT Power Input	**208VAC/60Hz and 48VDC**
Limit	**5A**

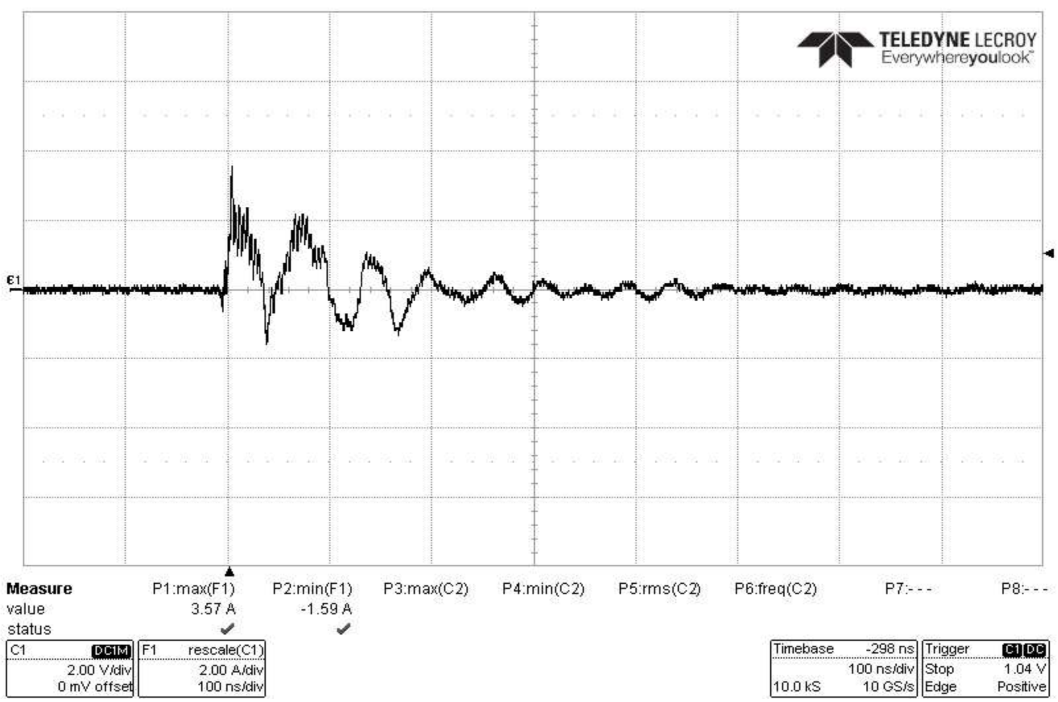
CS115 Conducted Susceptibility, Bulk Cable Injection, Impulse Excitation

Test Level: 30 nanosecond pulse width @ 5 Amps. Pulse rate at 30 Hz per second for **one minute**.

Temperature: 20C | **Humidity: 51% RH** | **Barometric Pressure: 990 mBar**

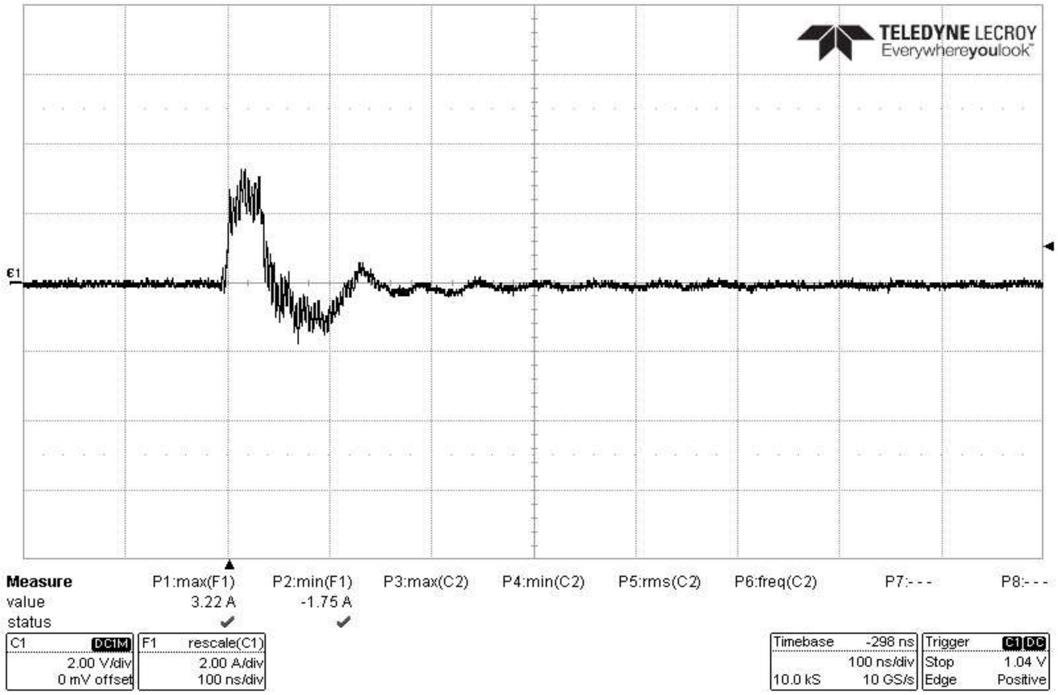
Frequency	Test Level (A)	Actual Test (A)	Test on Cable	Results	Comments
30nS Impulse Excitation	5	3.57	AC Full Bundle	☑ Pass	
30nS Impulse Excitation	5	3.22	AC L1 LINE	☑ Pass	
30nS Impulse Excitation	5	3.29	AC L2 LINE	☑ Pass	
30nS Impulse Excitation	5	4.16	DC Bundle	☑ Pass	
30nS Impulse Excitation	5	4.01	DC High Side Only	☑ Pass	

TECHNICIAN / ENGINEER:	**Donald Adams**	**DATE:**	**5/5/2025**

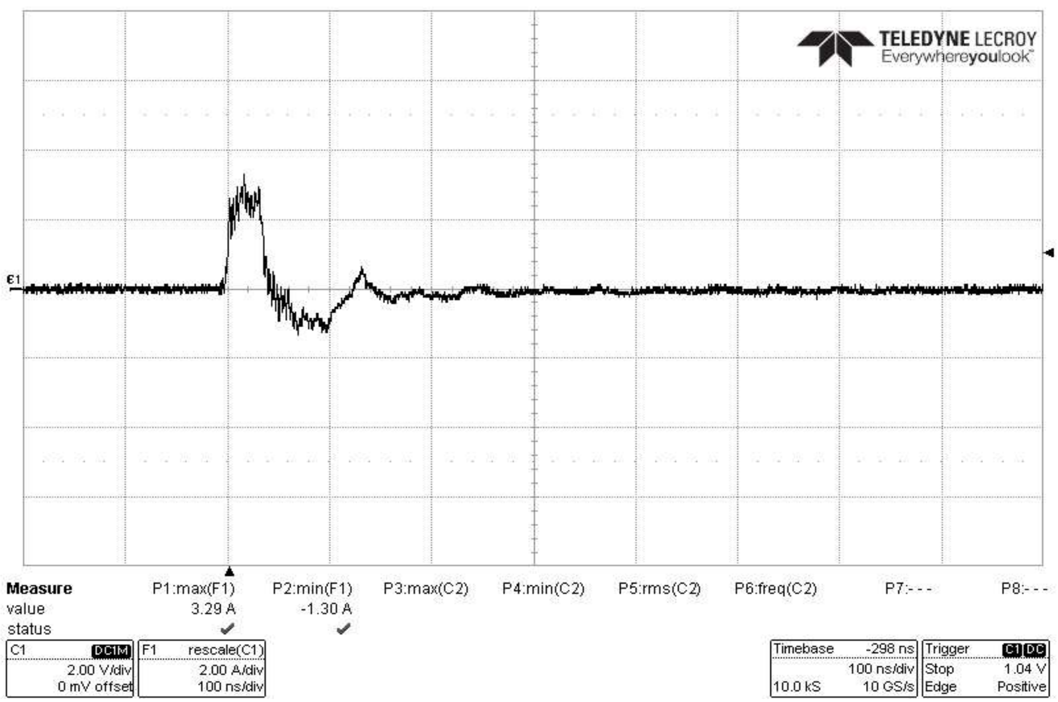


EMI02 - Test on AC Full Bundle - Waveform

EAR Controlled Data

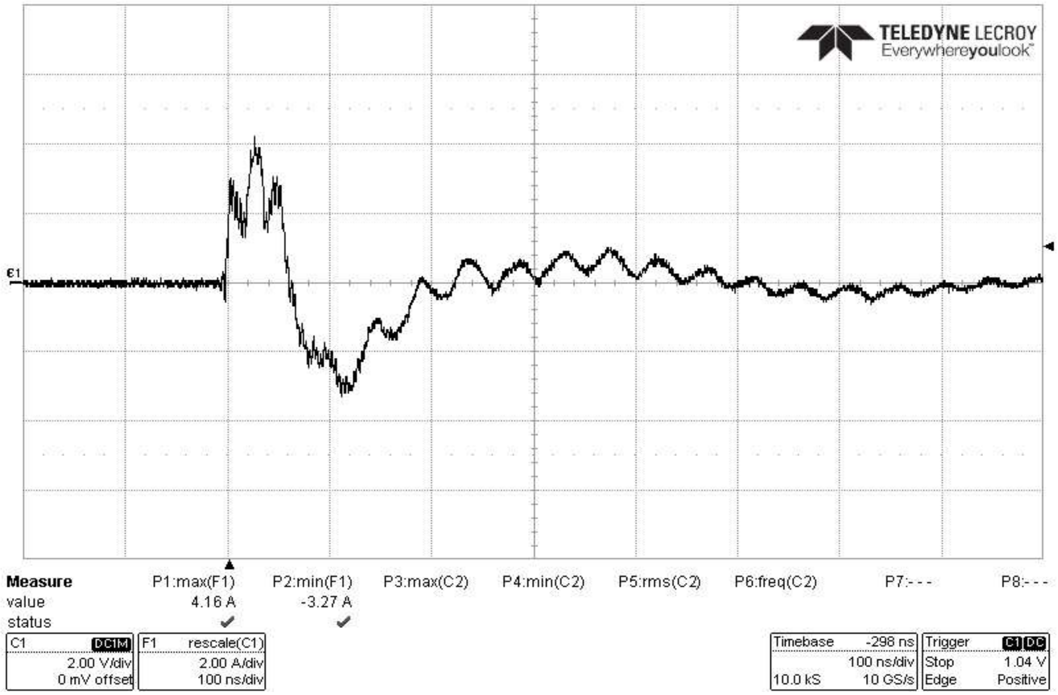


EMI02 - Test on AC L1 Only - Waveform

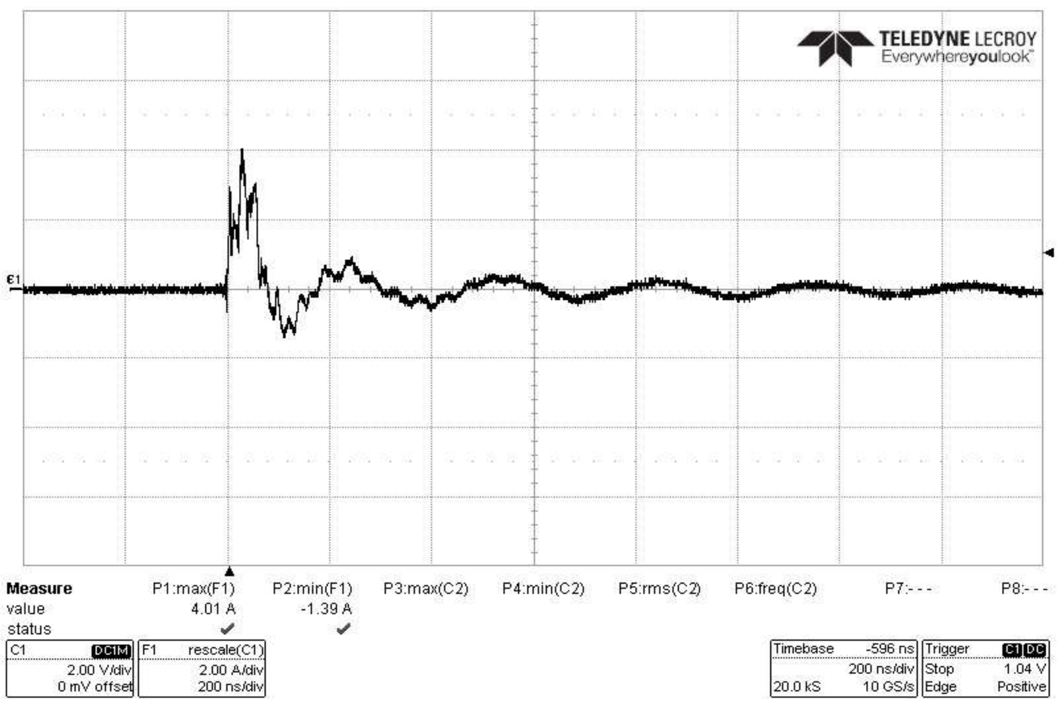


EMI02 - Test on AC L2 Only - Waveform

EAR Controlled Data



EMI02 - Test on DC Full Bundle - Waveform



EMI02 - Test on DC High Side Only - Waveform

EAR Controlled Data

5.1.9 CS115 Test Equipment List

CS115 Impulse Excitation Test Equipment List			
Element ID#	**Manufacturer/ Description**	**Duration**	**Cal Due**
WC021568	Lecroy Model 104MXi-A 1GHz Oscilloscope	12 months	11/4/2025
WC066535	Pearson Model 8705C Current Probe	12 months	8/12/2025
WC021316	Solar LISN, 9331-50-TS-200-N, 10K-50MHz	12 months	9/17/2025
WC021315	Solar LISN, Model 9331-50-TS-200-N, 10K-50MHz, SN# 112577	12 months	6/3/2025
WC021306	Solar LISN, 9331-50-TS-200-N, 10K-50MHz	12 months	6/3/2025
WC021034	EMC Partner, Modular Impulse Generator, Model: MIG2000-6	NCR	NCR
WC021029	EMC Partner, CS115 Injection Module, Model: CS115REC	NCR	NCR
WC021033	EMC Partner, CS115/CS116 (30MHz & 100MHz) Injection Probe, Model: CN-MIG-BT2	NCR	NCR

Calibration Abbreviation
NCR: No Calibration Required

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5.2 Conducted Susceptibility: Method CS116 Damped Sinusoidal Transients, Cables and Power Leads, 10 kHz–100 MHz

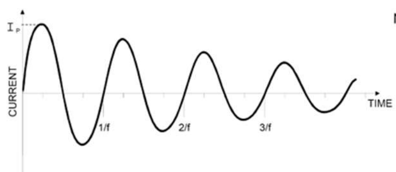
5.2.1 CS116 Purpose

This test verifies the ability of the EUT to withstand damped sinusoidal transients coupled onto its cables and power leads.

5.2.2 CS116 Limits

The EUT did not exhibit any malfunction, degradation of performance, or deviation from specified indications beyond the tolerances indicated in the individual equipment or subsystem specification when subjected to the signal shown in Figure CS116-1 and having a maximum current as specified in Figure CS116-2.

The limit is applicable across the entire specified frequency range. As a minimum, compliance shall be demonstrated at the following frequencies: 0.01, 0.1, 1, 10, 30, and 100MHz. If there are other frequencies known to be critical to the equipment installation, such as platform resonances, compliance shall also be demonstrated at those frequencies. The test signal repetition rate shall be no greater than one pulse per second and no less than one pulse every two seconds. The pulses shall be applied for a period of five minutes.



NOTES:

1. Normalized waveform: $e^{-(\pi f t)/Q}\sin(2\pi f t)$

   Where:
   f = Frequency (Hz)
   t = Time (sec)
   Q = Damping factor, 15 ±5

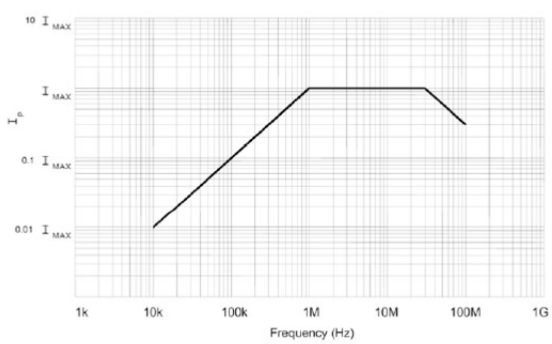
2. Damping factor (Q) shall be determined as follows:

   $$Q = \frac{\pi(N-1)}{\ln(I_P/I_N)}$$

   Where:
   Q = Damping factor
   N = Cycle number (i.e. N = 2, 3, 4, 5,…)
   I_P = Peak current at 1st cycle
   I_N = Peak current at cycle closest to 50% decay
   ln = Natural log

3. I_P as specified in Figure CS116-2

Figure CS116-1 Typical Damped Sinusoidal Waveform



Notes:
For Army and Navy Procedures
I_{MAX} = 10 amp
For Air Force Procedures
I_{MAX} = 5 amp

Figure CS116-2 Limit for all Applications

5.2.3 CS116 Test Setup

The EUT was setup in accordance with Section 5.14 of MIL-STD-461G.

5.2.4 CS116 Measurement System Check

The test equipment was configured per Figure CS116-3.

1. The measurement system check was performed prior to testing specified in Section 5.8.5.
2. The measurement equipment was turned on and sufficient time was allowed for stabilization.
3. The frequency of the damped sine generator was set to one of the test frequencies defined in Section 5.8.2.
4. The signal from the damped sine generator was adjusted to the level specified Figure CS116-2.
5. The damped sine generator settings were recorded.
6. The waveform complied with the requirements.
7. The pulse repetition rate was between 1 to 2 pulses per second. The actual rate was recorded.

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8. Frequency, amplitude, and damping factor were recorded
9. Steps 3–8 were repeated for each frequency specified Section 5.8.2.

5.2.5 CS116 Test Procedure

The test equipment was configured per Figure CS116-4, and as follows:

1. The injection and monitor probes were placed around the cable bundle interfacing with a EUT connector.
2. The monitor probe was placed 5 cm from the connector. If the connector and backshell's overall length exceeded 5 cm, the monitor probe was positioned as close to the connector's backshell as possible.
3. The injection probe was positioned 5 cm from the monitor probe.

Testing proceeded as follows on all required cables and power leads:

1. The EUT and the measurement equipment were turned on and sufficient time was allowed for stabilization.
2. The damped sine generator was set to a test frequency.
3. The test signals were applied to each cable or power lead sequentially.
   A. The damped sine wave generator's output level was slowly increased to provide current without exceeding the pre-calibrated generator output level.
   B. The peak current was recorded.
   C. The EUT was monitored for degradation of performance during the 5 minute pulsing period.
   D. The peak current obtained while being applied to the cable was recorded.
4. Step 3 was repeated for each test frequency, as specified in the requirement.

- If susceptibility was noted, the threshold level was determined, and it was verified to be above the limit in accordance with Section 4.5.

5. Steps 2–4 were repeated in the power-off condition.

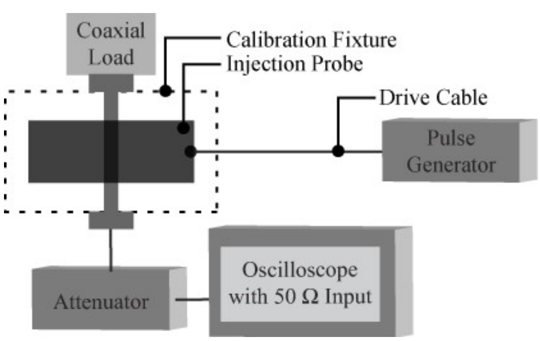


Figure CS116-3 Typical Test Setup for System Measurement Check of Test Waveform

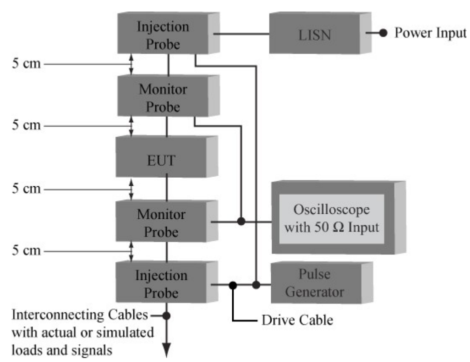
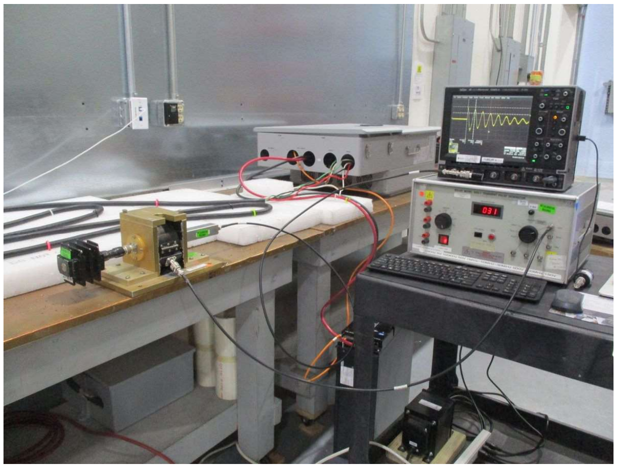


Figure CS116-4 Typical Setup for Bulk Cable Injection of Damped Sinusoidal Transients

5.2.6 CS116 Test Results

The Flexboss 21 PN: IV-16000-HYB-AW-FX-00 and Flexboss 18 PN: IV-13000-HYB-AW-FX-00 **complied** with the requirements in Section 2.0.

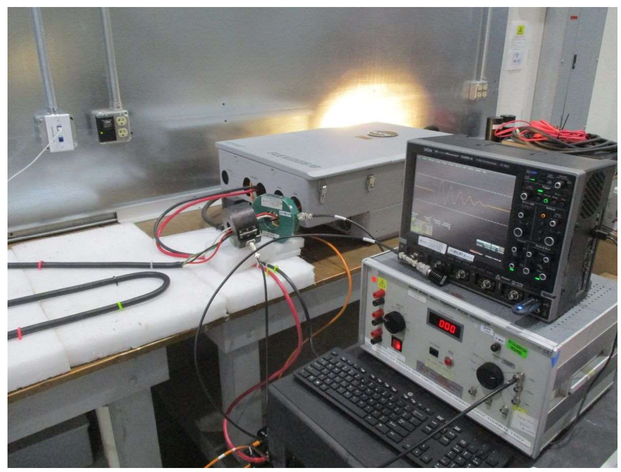
5.2.7 CS116 Test Photographs



CS116 Calibration

CS116 Test Setup

CS116 test on AC Full Bundle EMI#1



CS116 test on AC Full Bundle EMI#2

CS116 test on AC L1 EMI#1

CS116 test on AC L1 EMI#2

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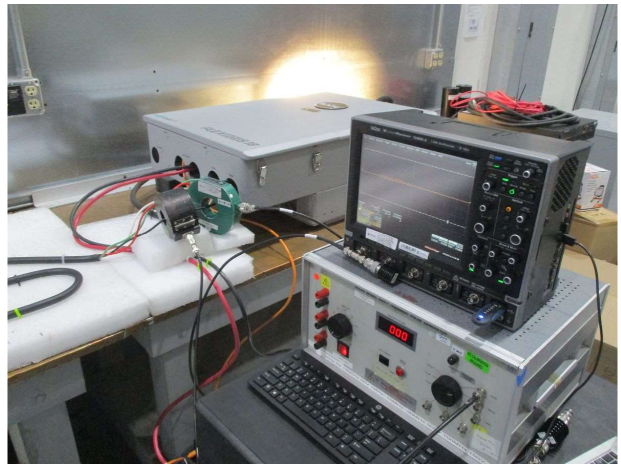
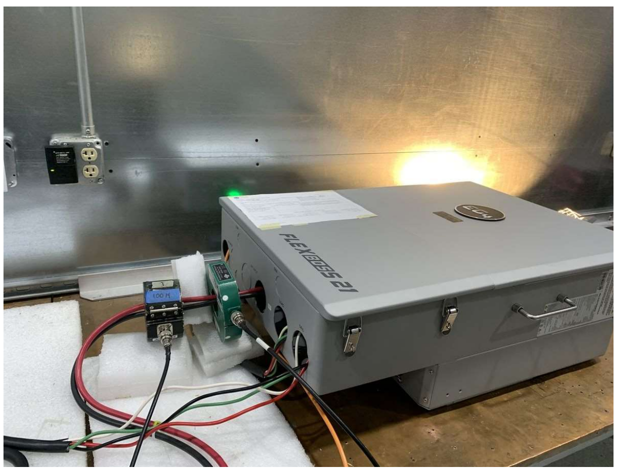
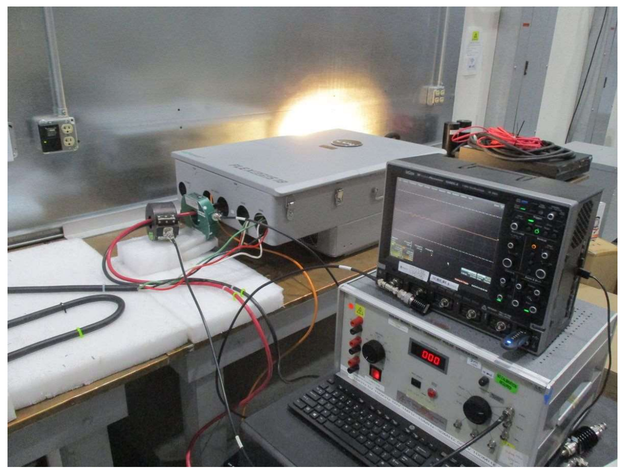
CS116 test on AC L2 EMI#1



CS116 test on AC L2 EMI#2

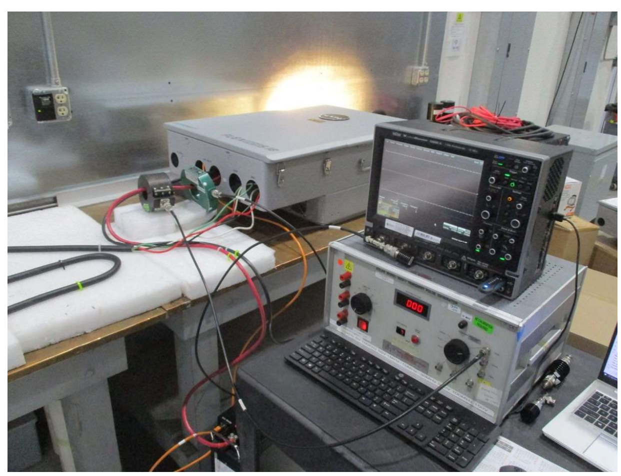


CS116 test on DC Bundle EMI#1



CS116 test on DC Bundle EMI#2

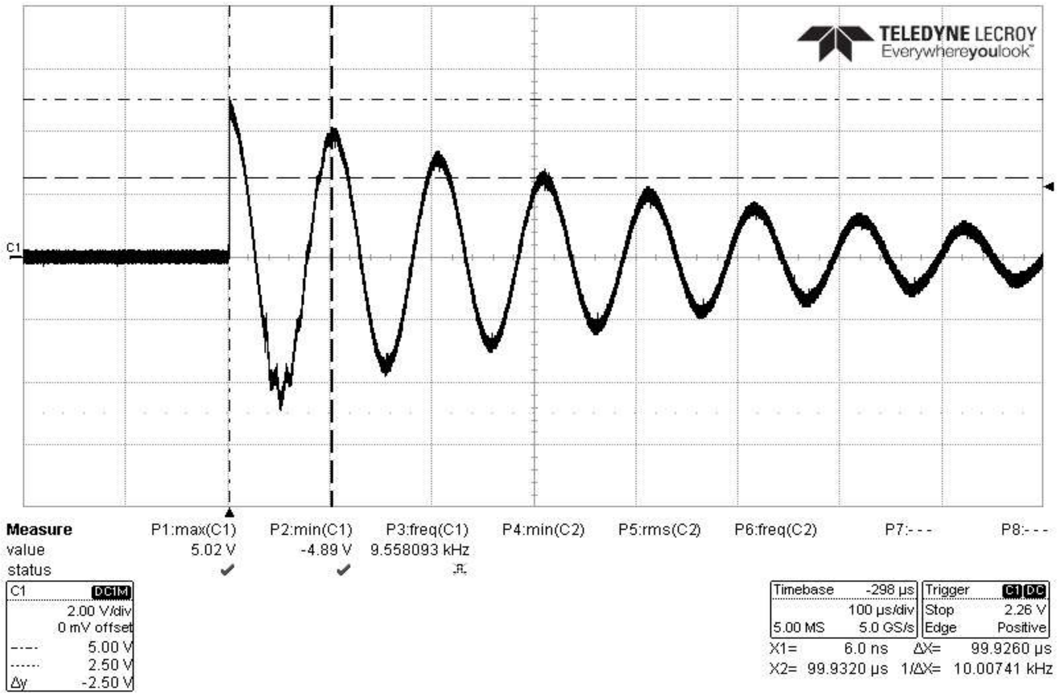
CS116 test on High Side EMI#1



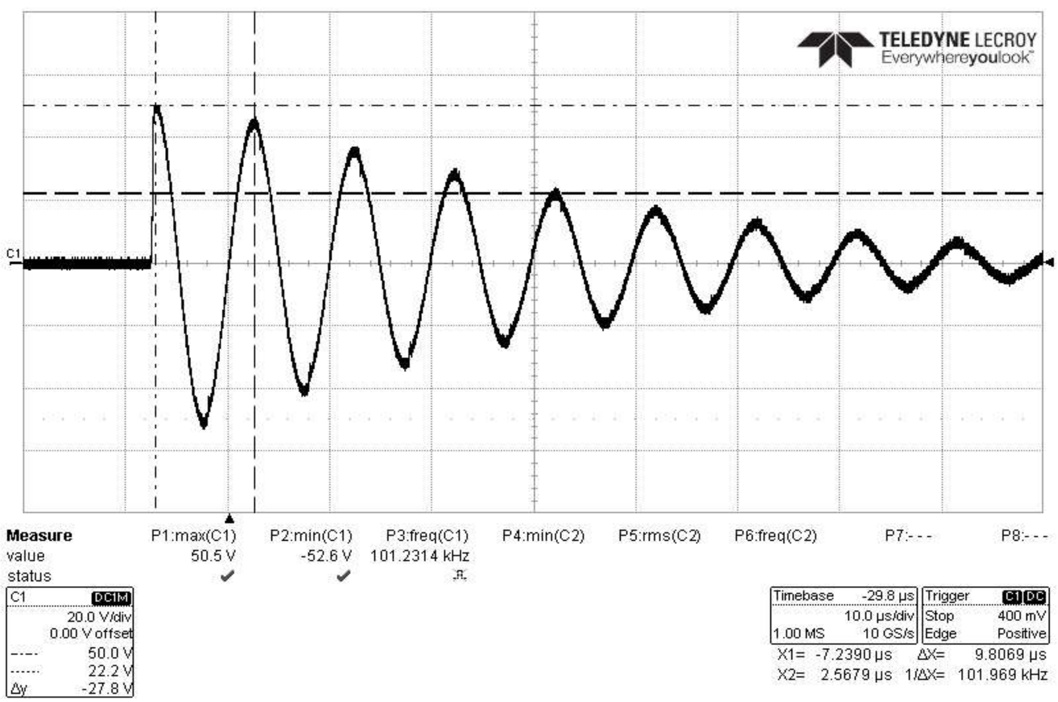
CS116 test on High Side EMI#2

5.2.8 CS116 Test Data

CS116 Verification Test Data from 10 kHz – 100MHz

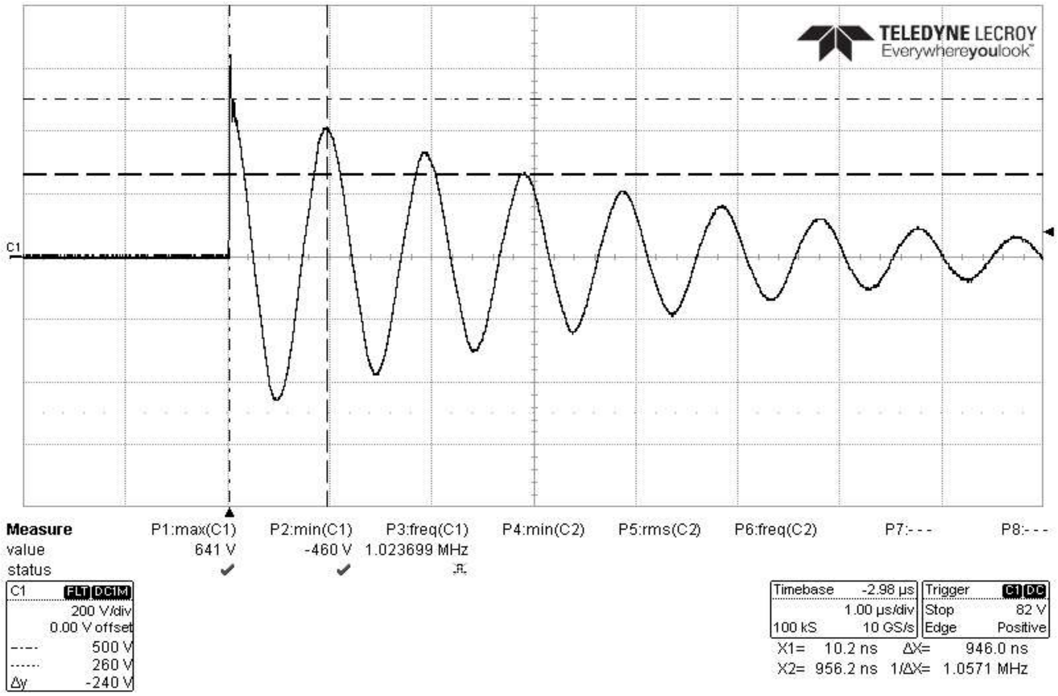


Verification CS116 Damped Sinusoidal Transient Test at 10 kHz

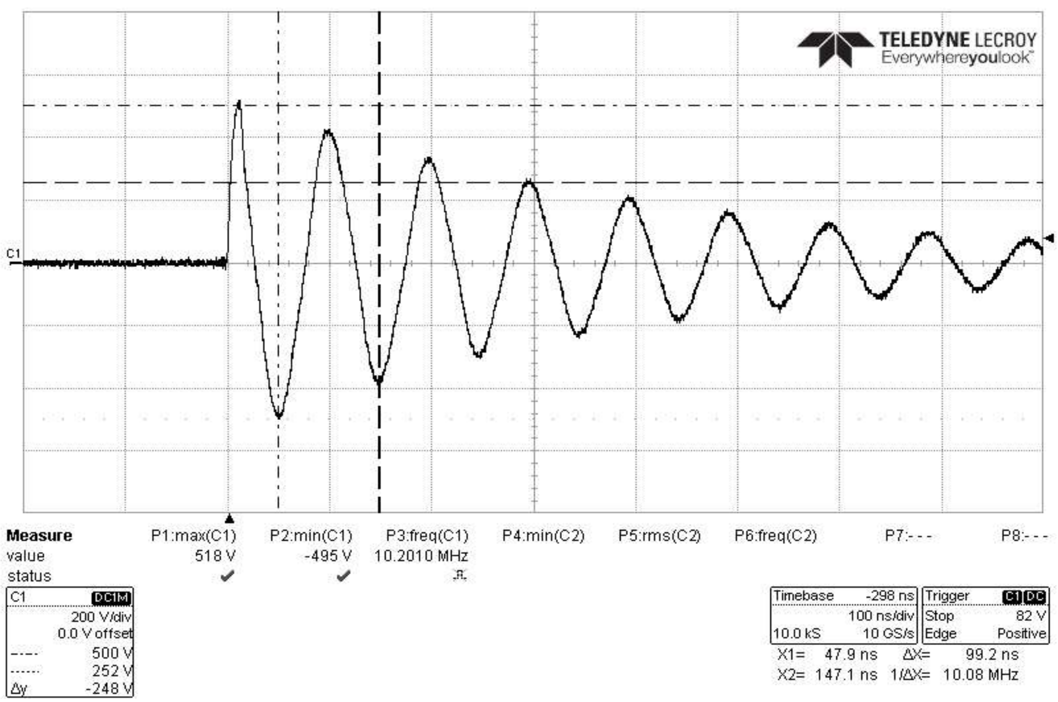


Verification CS116 Damped Sinusoidal Transient Test at 100 kHz

EAR Controlled Data

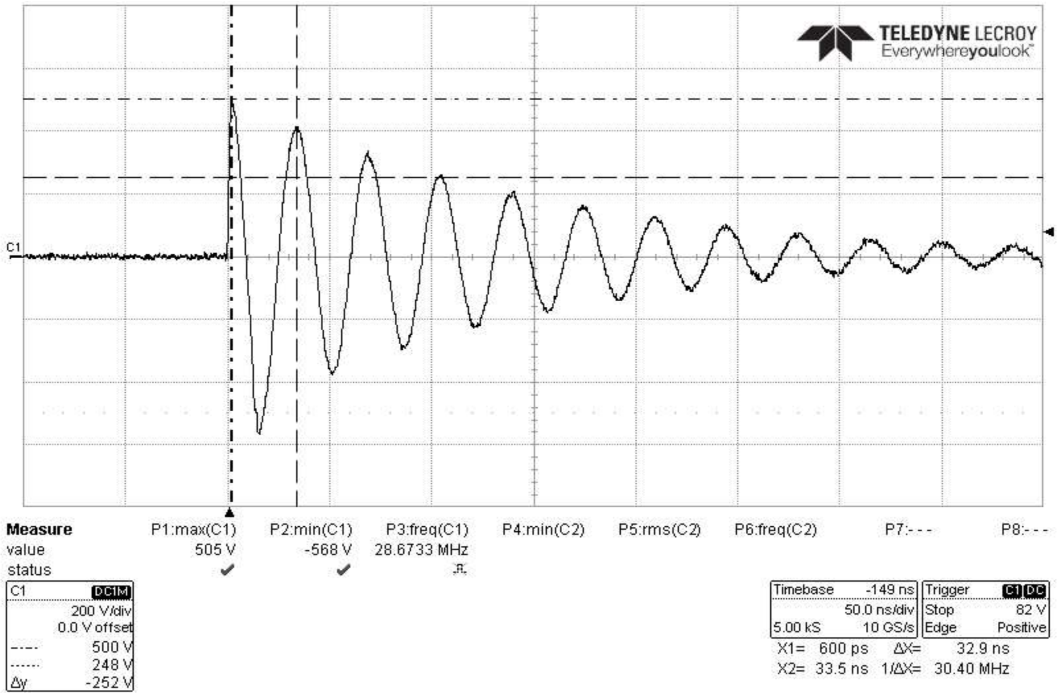


Verification CS116 Damped Sinusoidal Transient Test at 1MHz

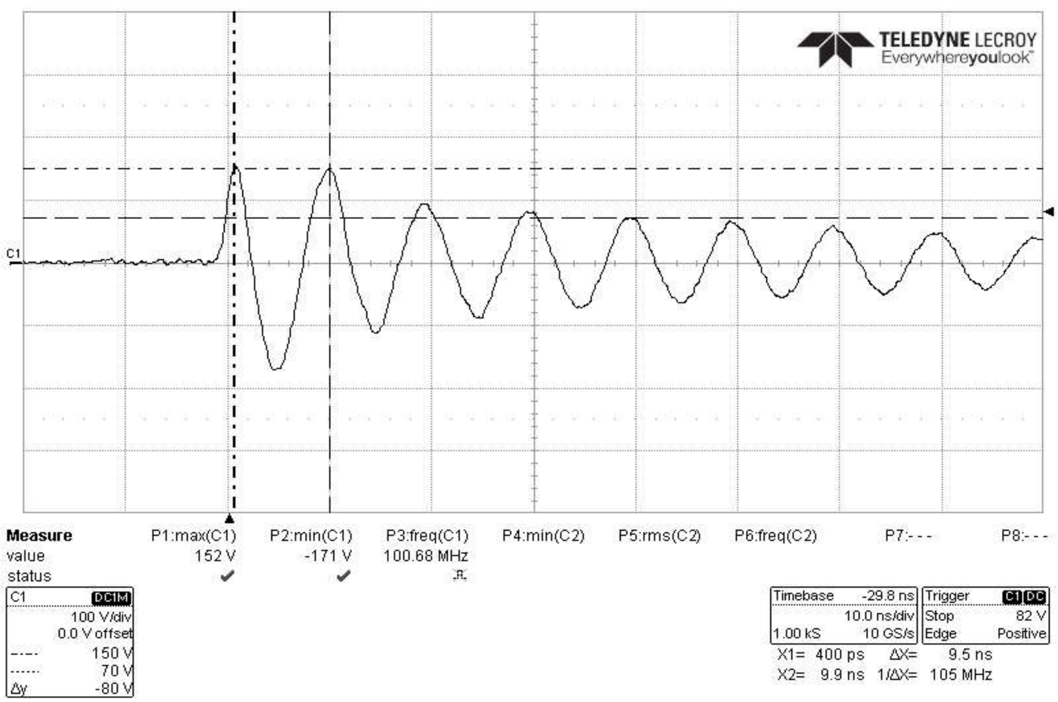


Verification CS116 Damped Sinusoidal Transient Test at 10MHz

EAR Controlled Data



Verification CS116 Damped Sinusoidal Transient Test at 30MHz



Verification CS116 Damped Sinusoidal Transient Test at 100MHz

EAR Controlled Data

CS116 Actual Test Data from 10 kHz – 100MHz Test on EMI-01 Flexboss 21

CUSTOMER:	EG4 Electronics LLC	MJO:	PR190112
TEST ITEM:	Flexboss 21	DATE:	5/7/2025
PART NUMBER	IV-16000-HYB-AW-FX-00	UNIT NO:	45000E0018
SPECIFICATION:	MIL-STD-461G	CHAMBER NO:	Workbench 1

EUT Power Input	208VAC/60Hz and 48VDC

CS116 Conducted Susceptibility, Damped Sinusoidal Transients

Test Level: For Army and Navy procurements, I_{MAX} = 10A

Temperature: 22C	Humidity: 51%	Barometric Pressure: 998 mBar

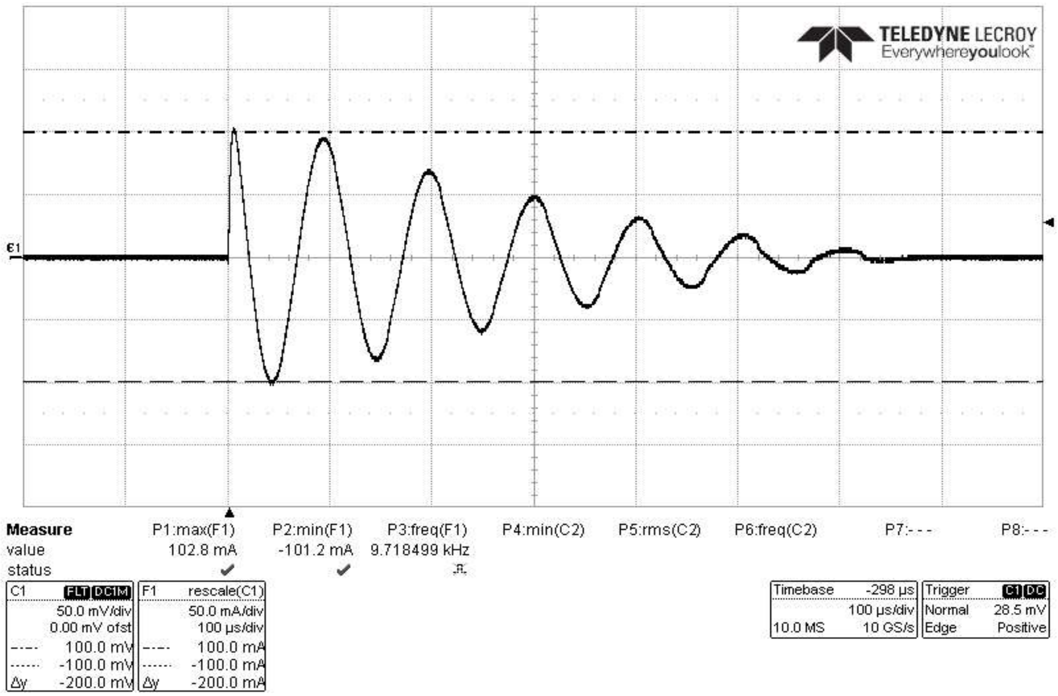
Remarks: The EUT was monitored for susceptibility during the performance of the test. The pulses shall be applied for a period of five minutes per frequency. All Bundle, Power Bundle and Each individual High Side Power Lead.

Frequecy/ Level	0.01MHz	0.1MHz	1MHz	10MHz	30MHz	100MHz	Comments
Cable under test	0.1A/5V	1A/50V	10A/500V	10A/500V	10A/500V	3A/150V	
AC Full Bundle	Pass AR	Pass AR	Pass AR	Pass VR	Pass VR	Pass VR	
AC L1	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	
AC L2	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	
DC Bundle	Pass VR	Pass VR	Pass AR	Pass VR	Pass VR	Pass VR	
High Side	Pass AR	Pass AR	Pass AR	Pass AR	Pass AR	Pass AR	

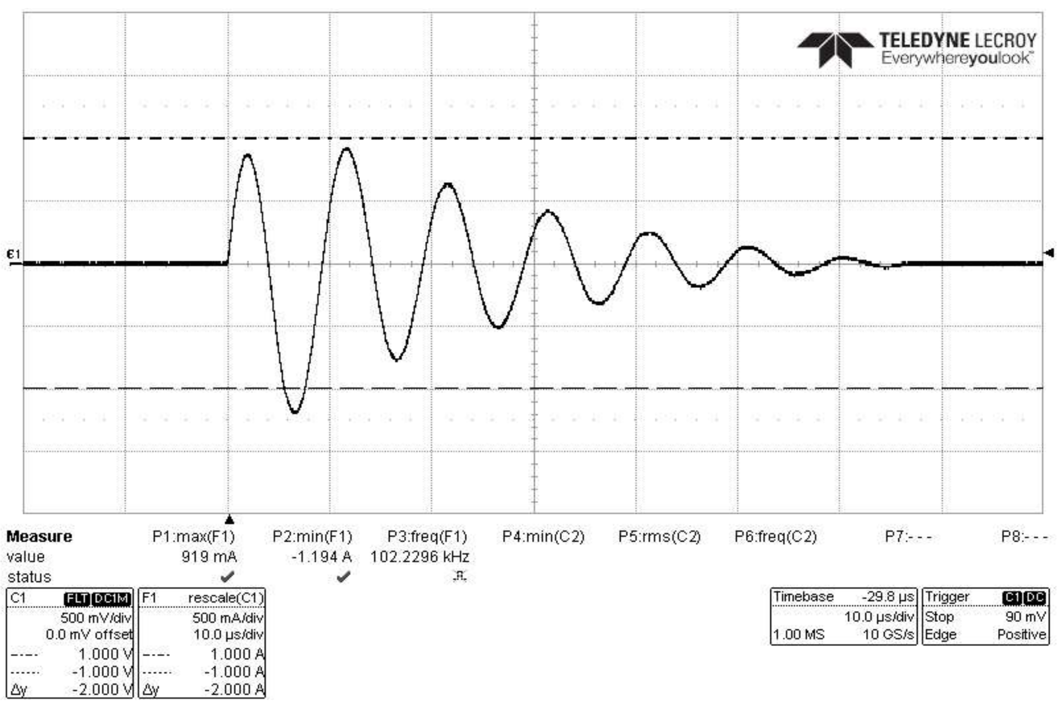
NOTE:	
	Pass AR: Passed with Current Reached
	Pass VR: Passed with Voltage Reached

TECHNICIAN / ENGINEER:	Phuoc Tran	DATE:	5/7/2025

EAR Controlled Data

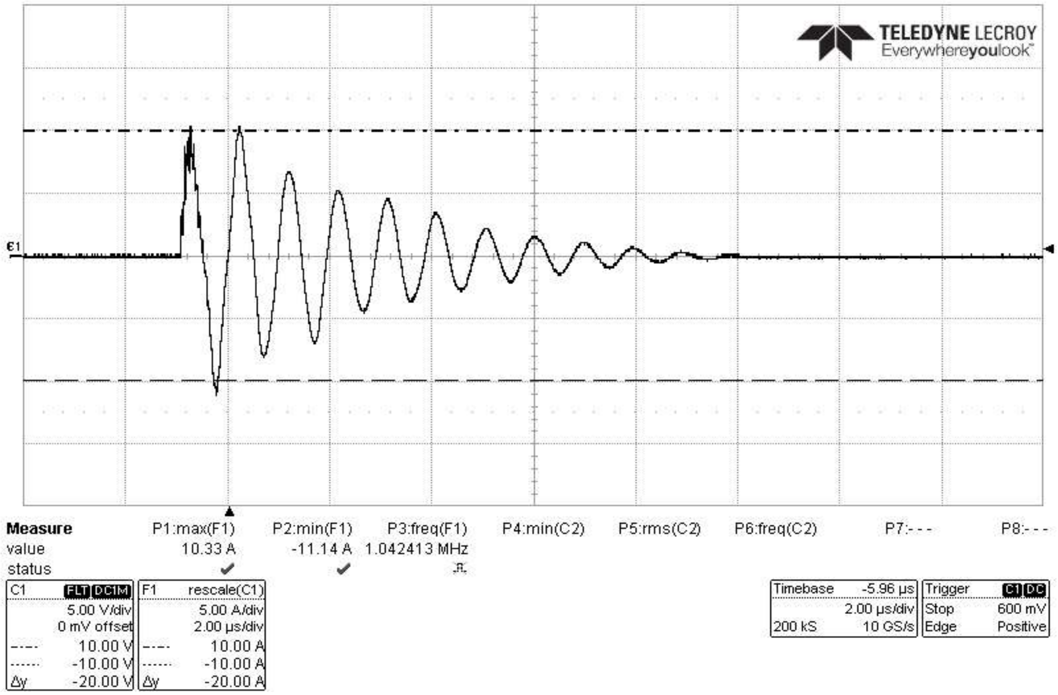


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on AC Full Bundle

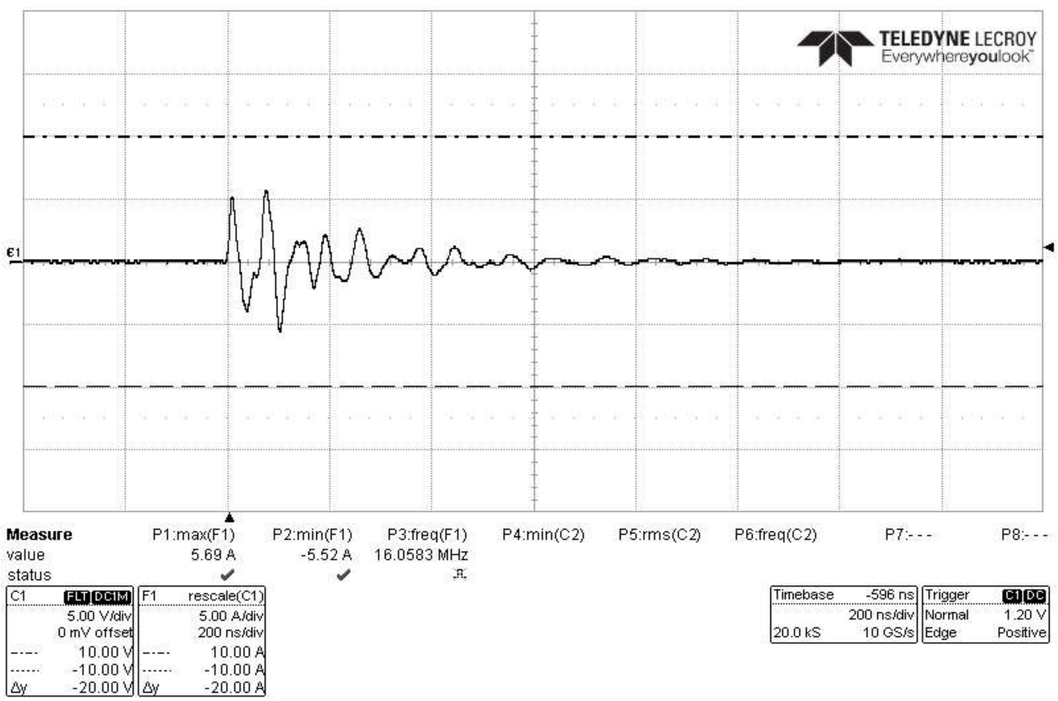


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on AC Full Bundle

EAR Controlled Data

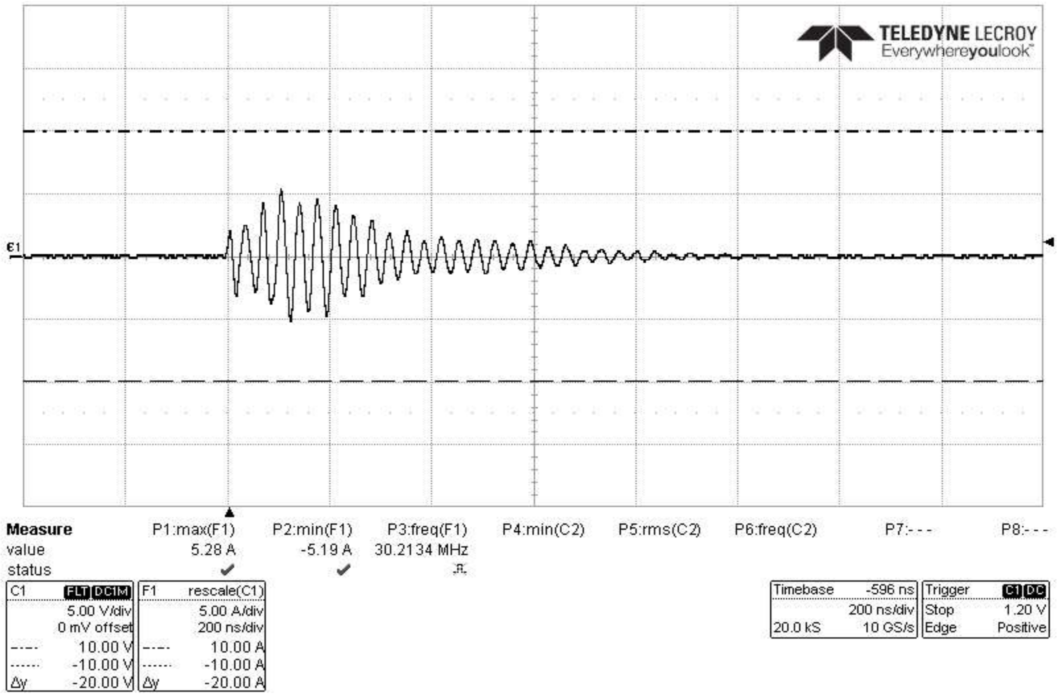


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on AC Full Bundle

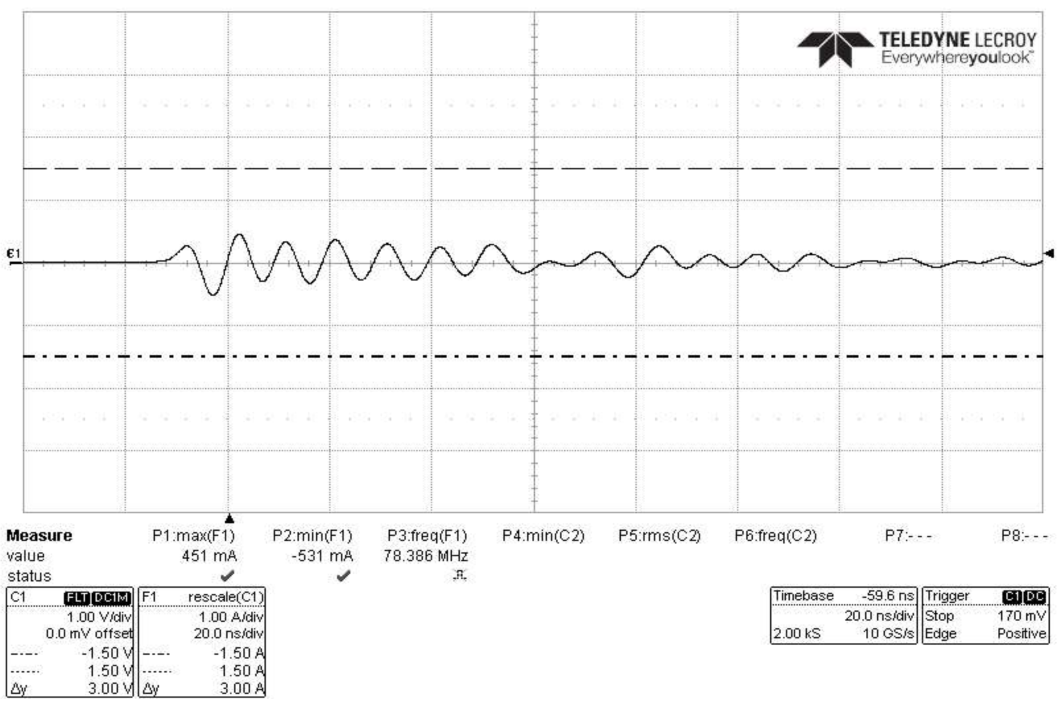


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on AC Full Bundle

EAR Controlled Data

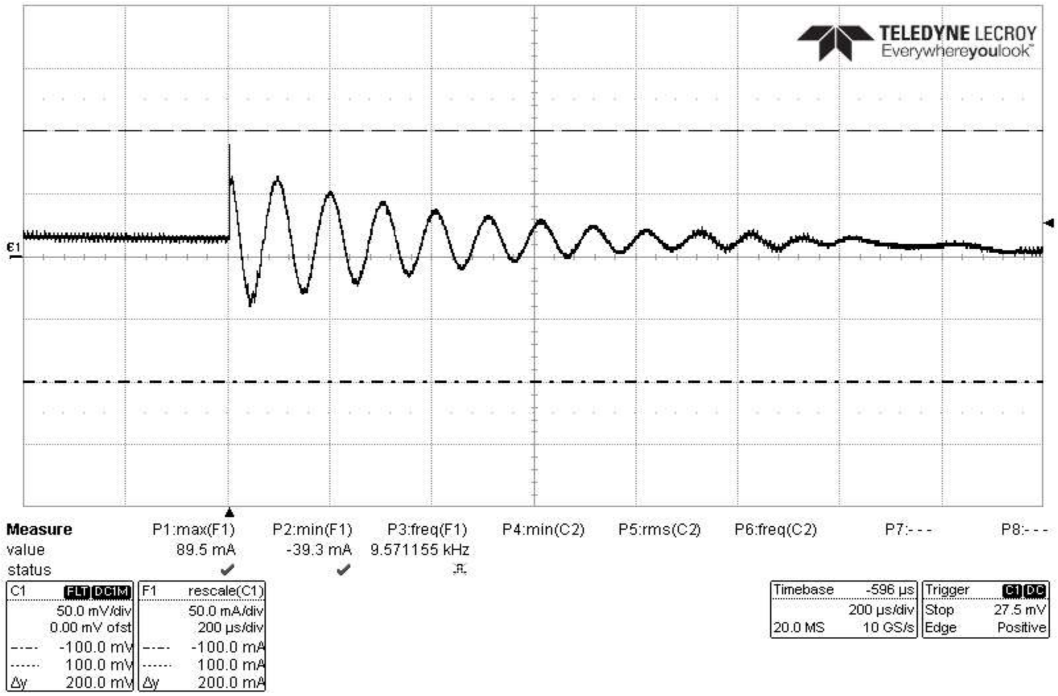


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on AC Full Bundle

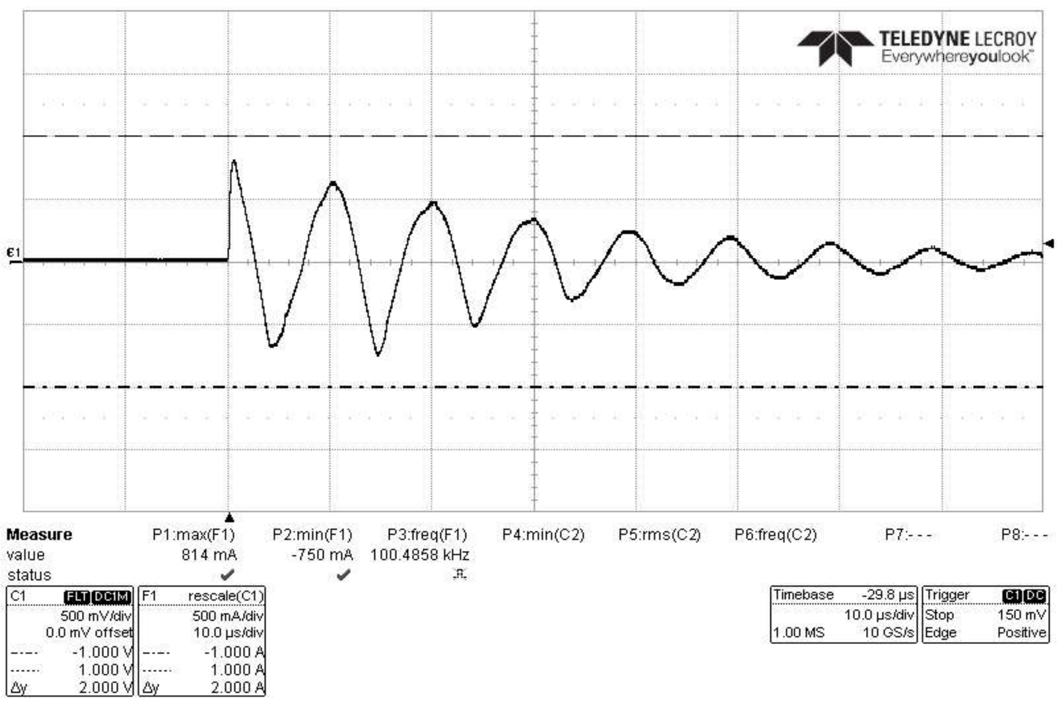


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on AC Full Bundle

EAR Controlled Data

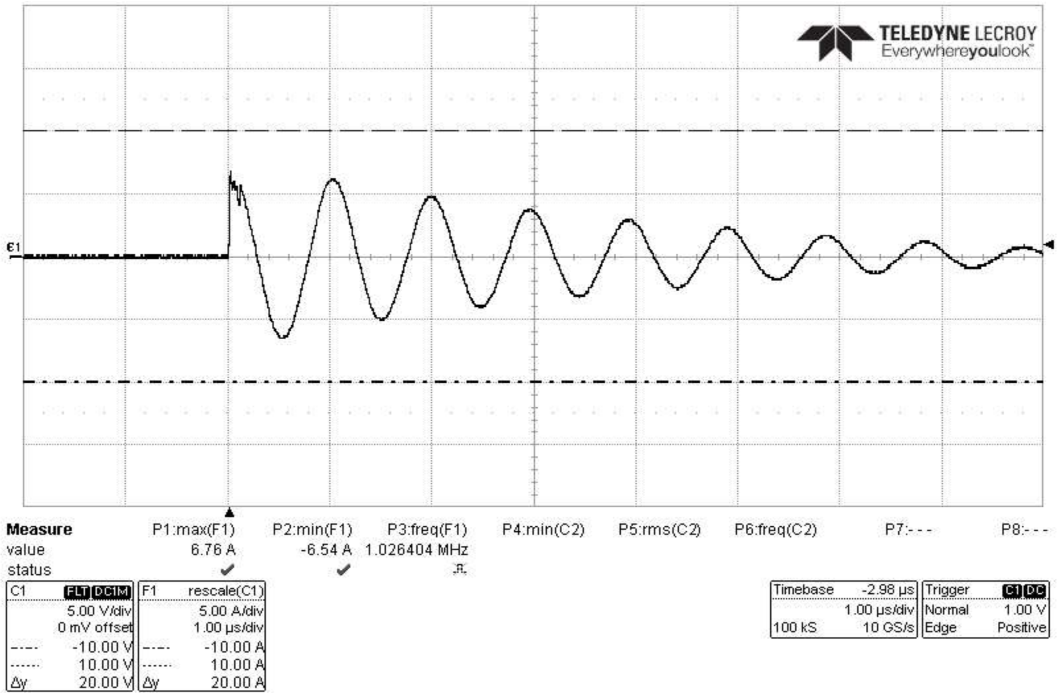


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on AC Line 1

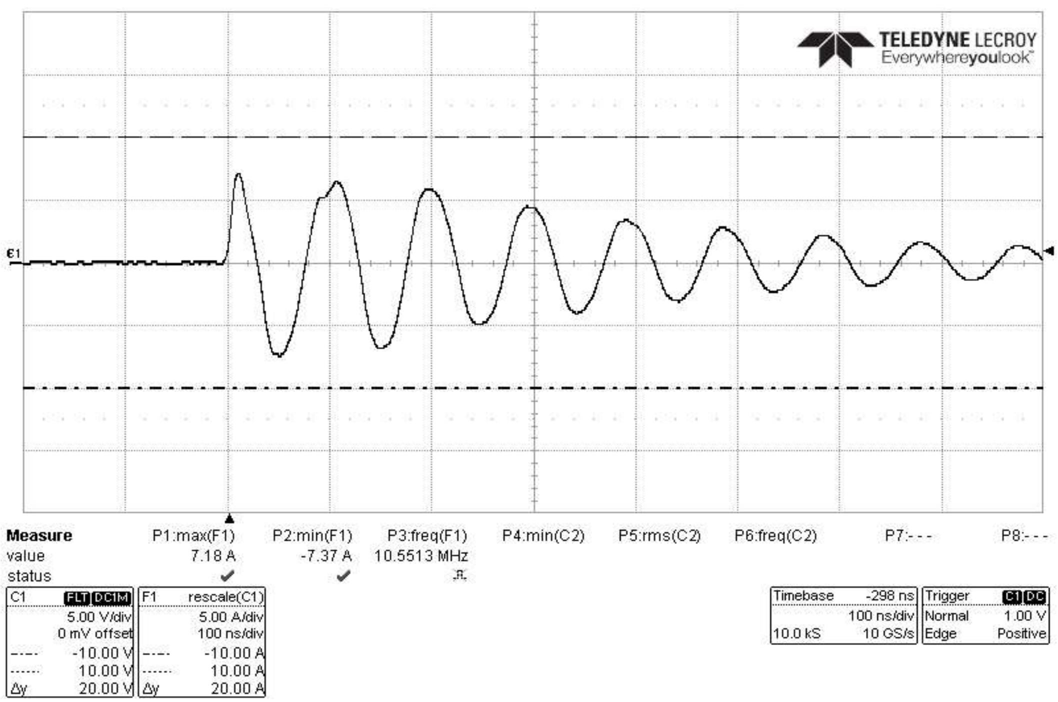


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on AC Line 1

EAR Controlled Data

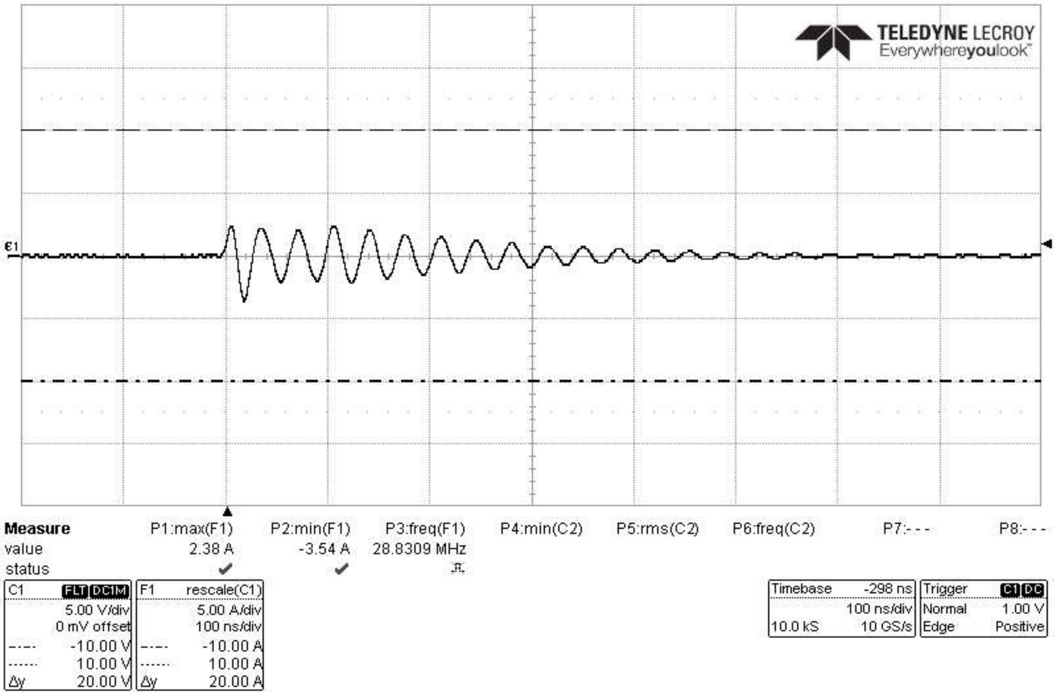


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on AC Line 1

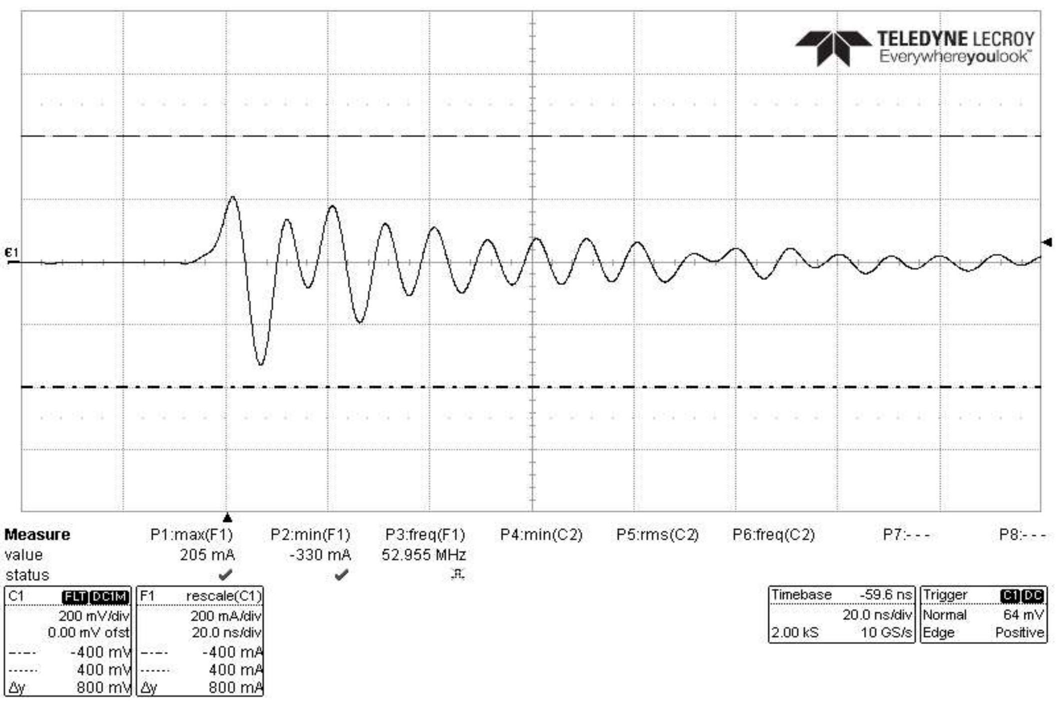


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on AC Line 1

EAR Controlled Data

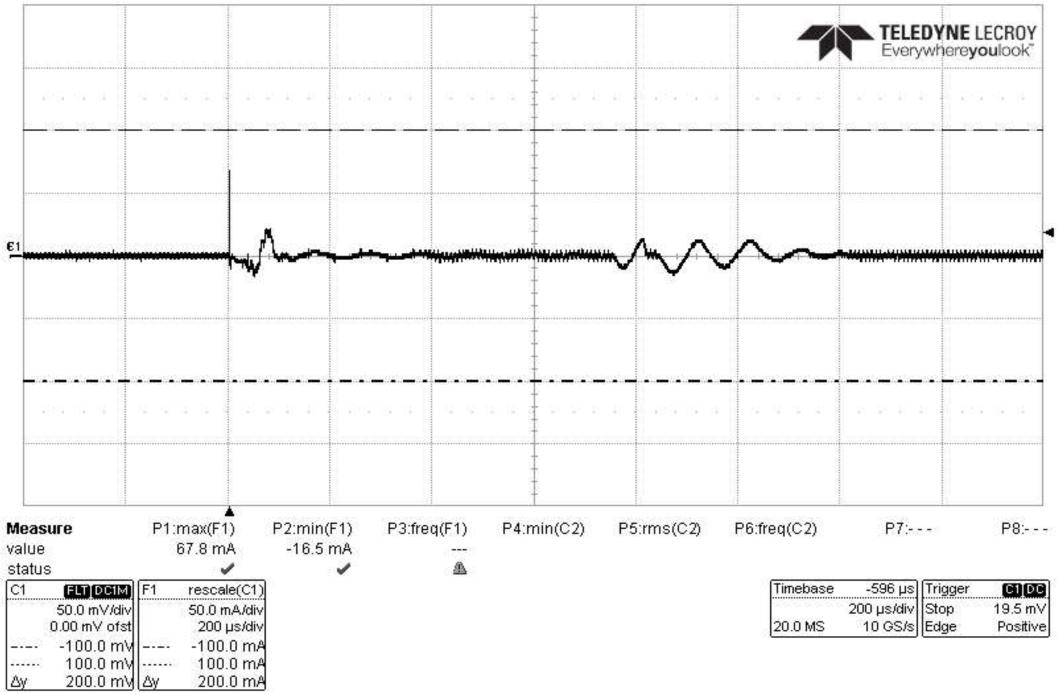


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on AC Line 1

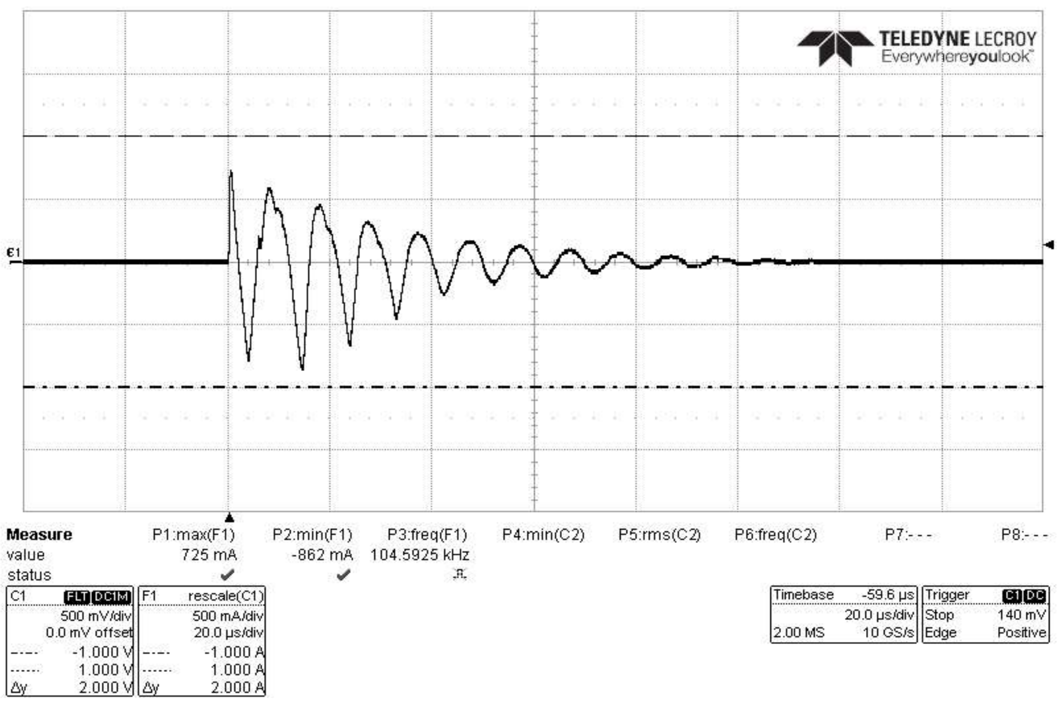


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on AC Line 1

EAR Controlled Data

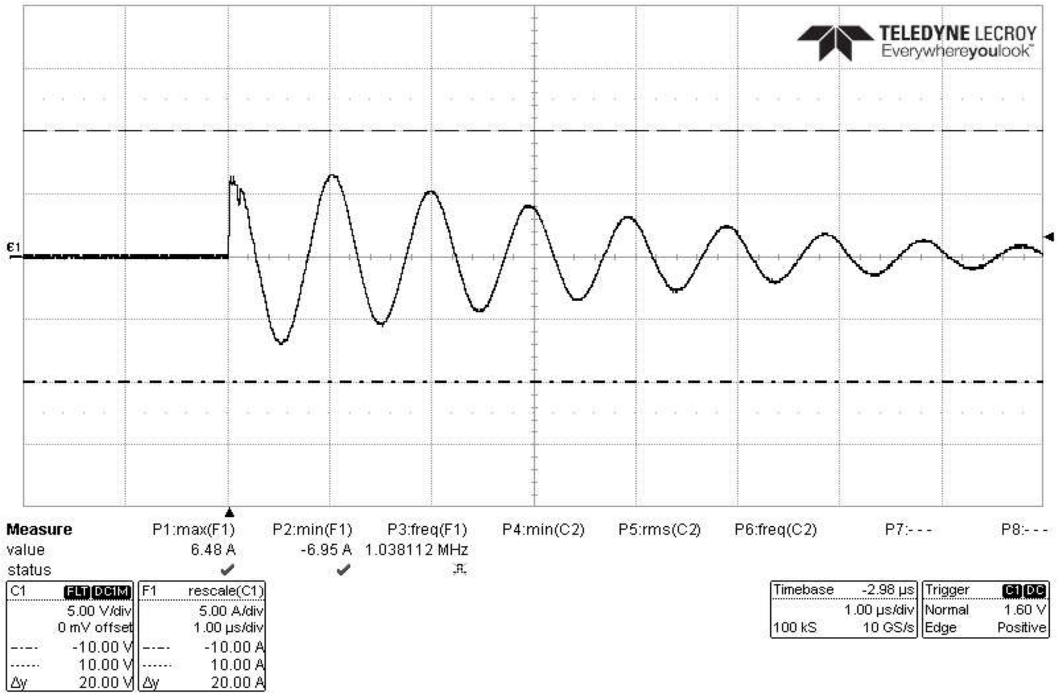


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on AC Line 2

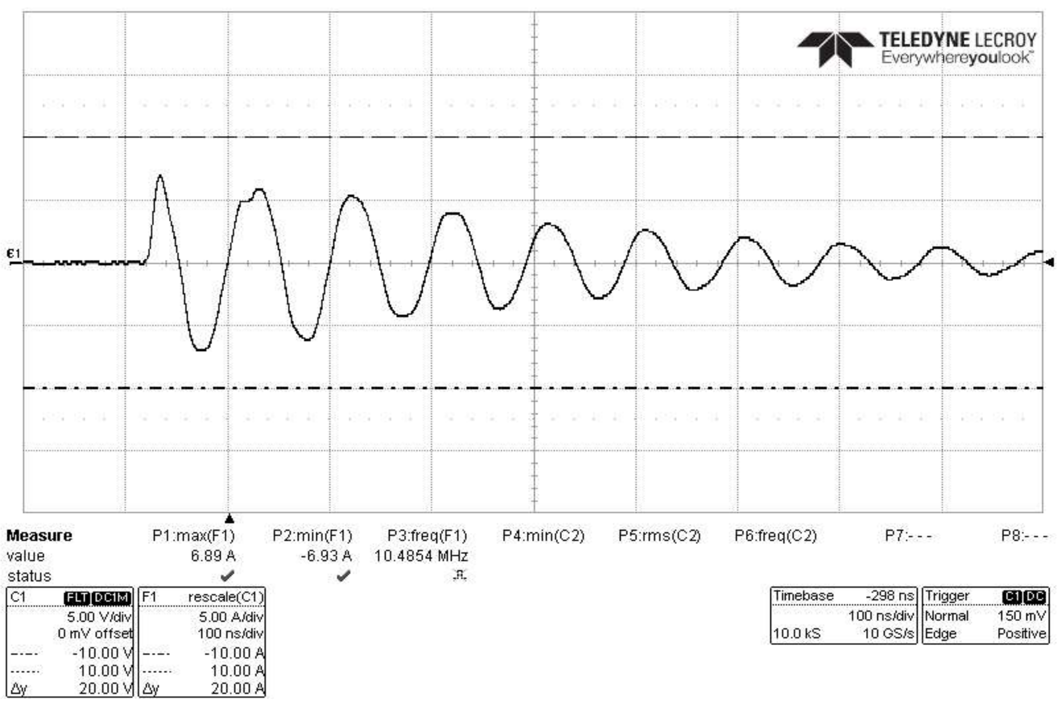


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on AC Line 2

EAR Controlled Data

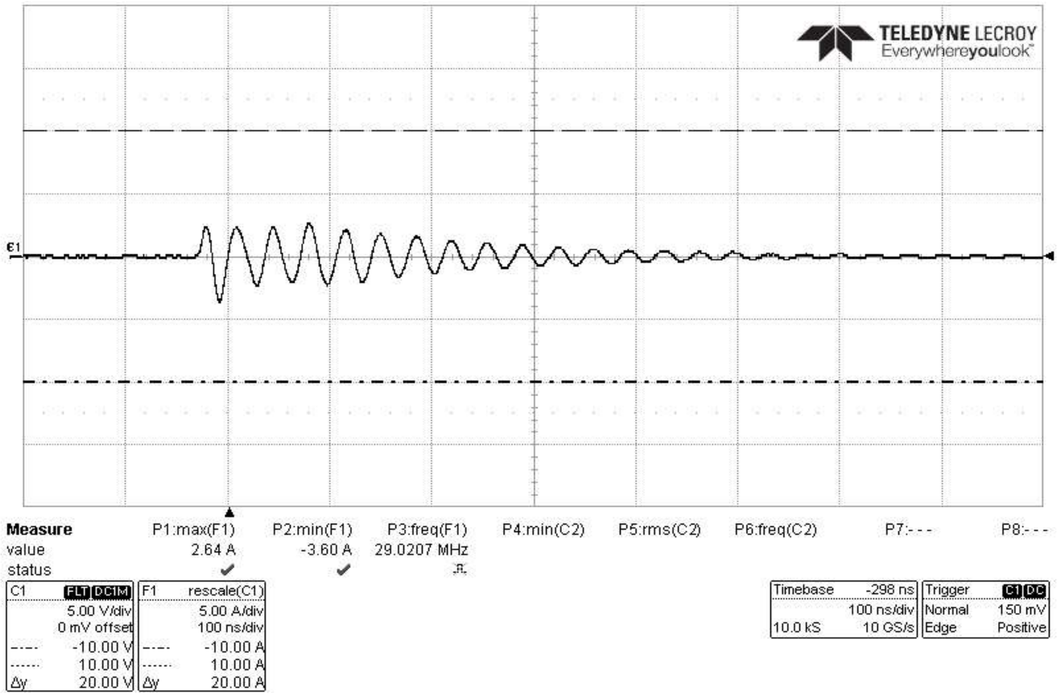


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on AC Line 2

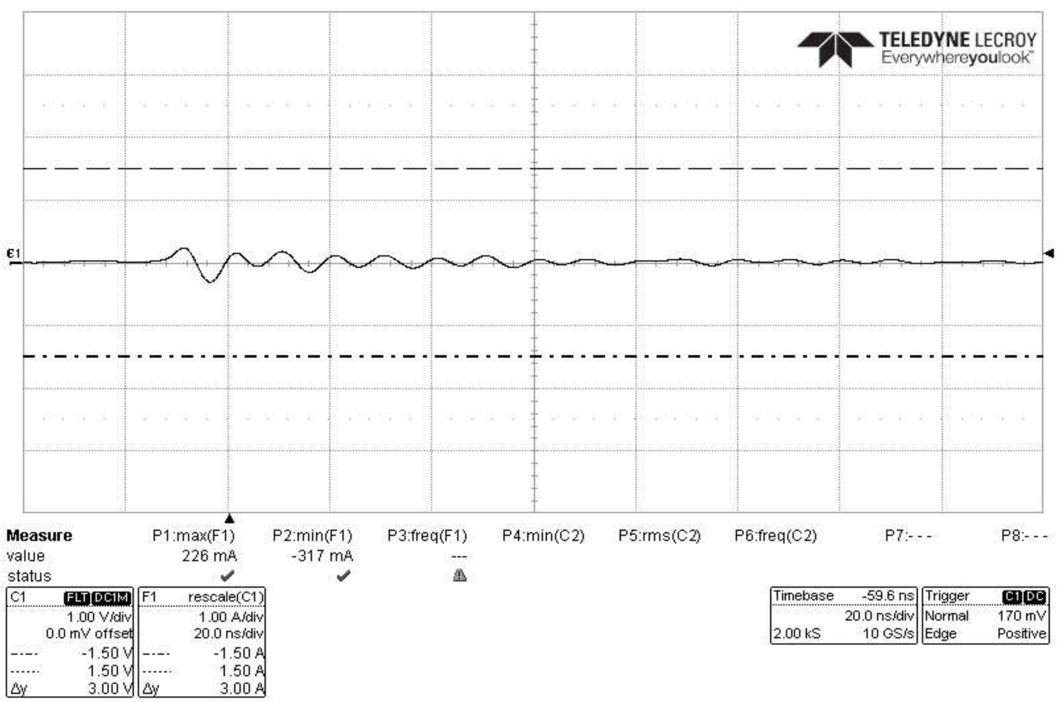


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on AC Line 2

EAR Controlled Data

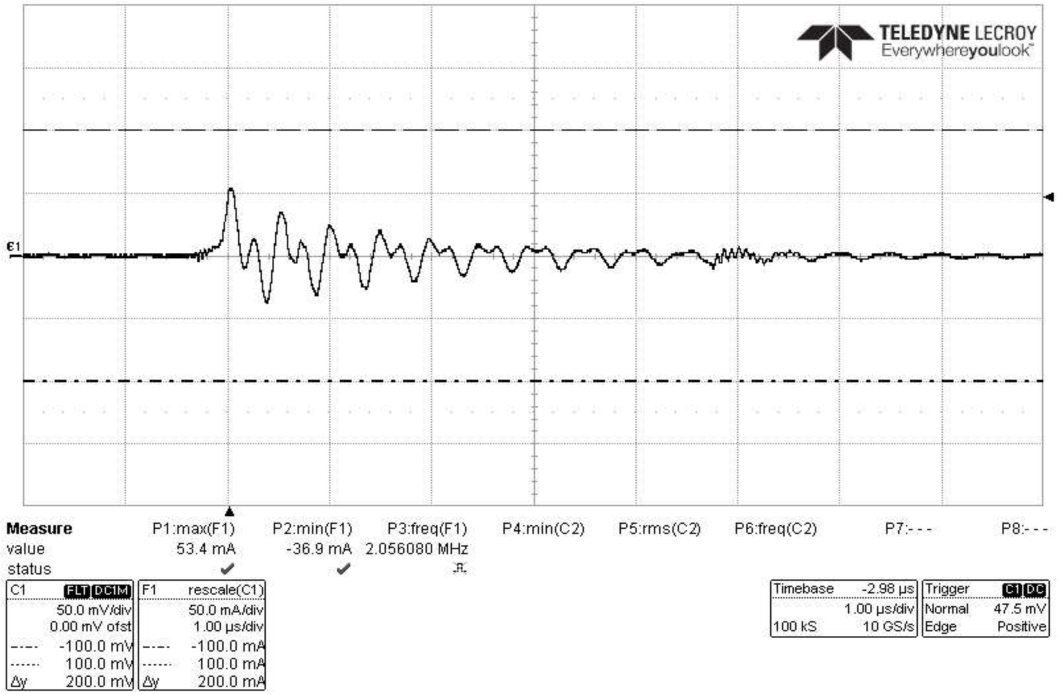


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on AC Line 2

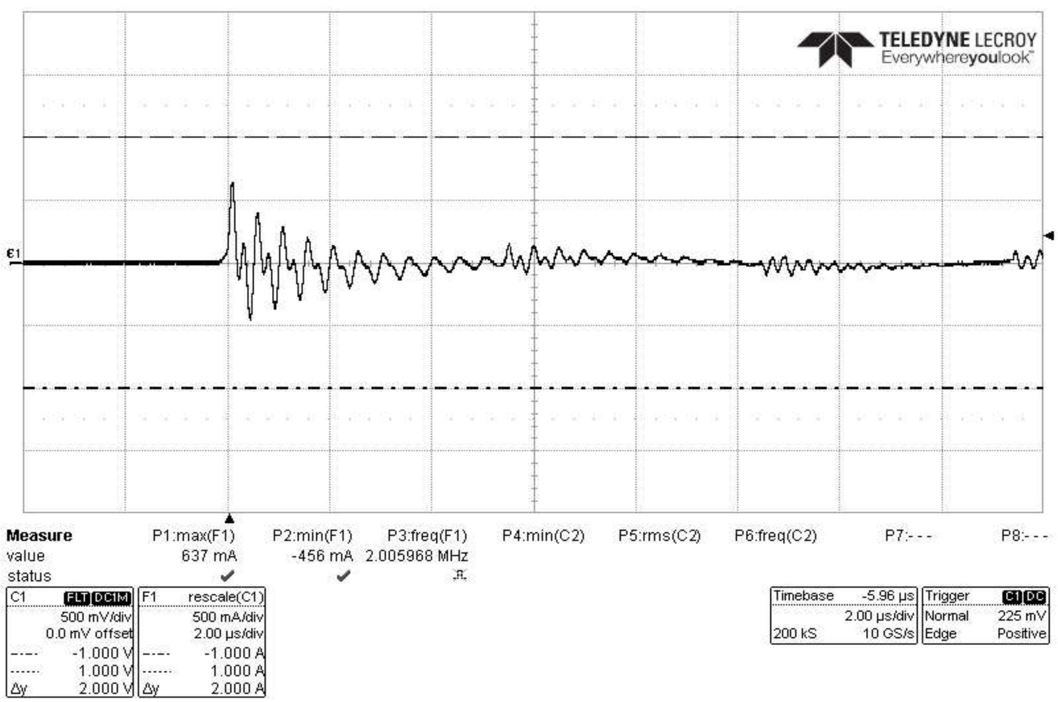


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on AC Line 2

EAR Controlled Data

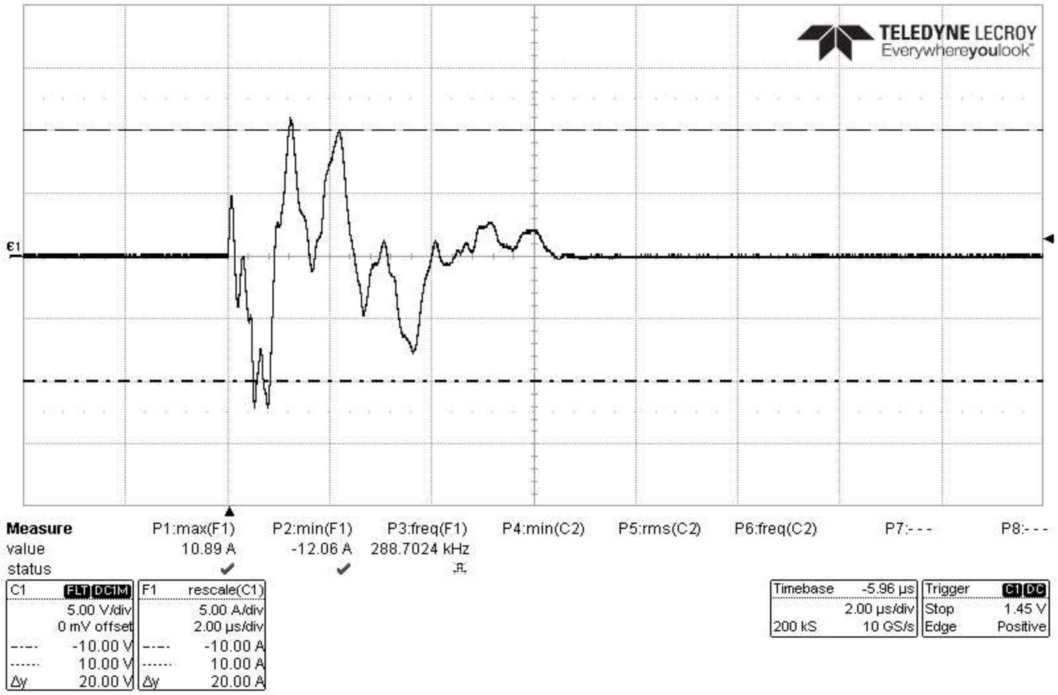


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on DC Bundle

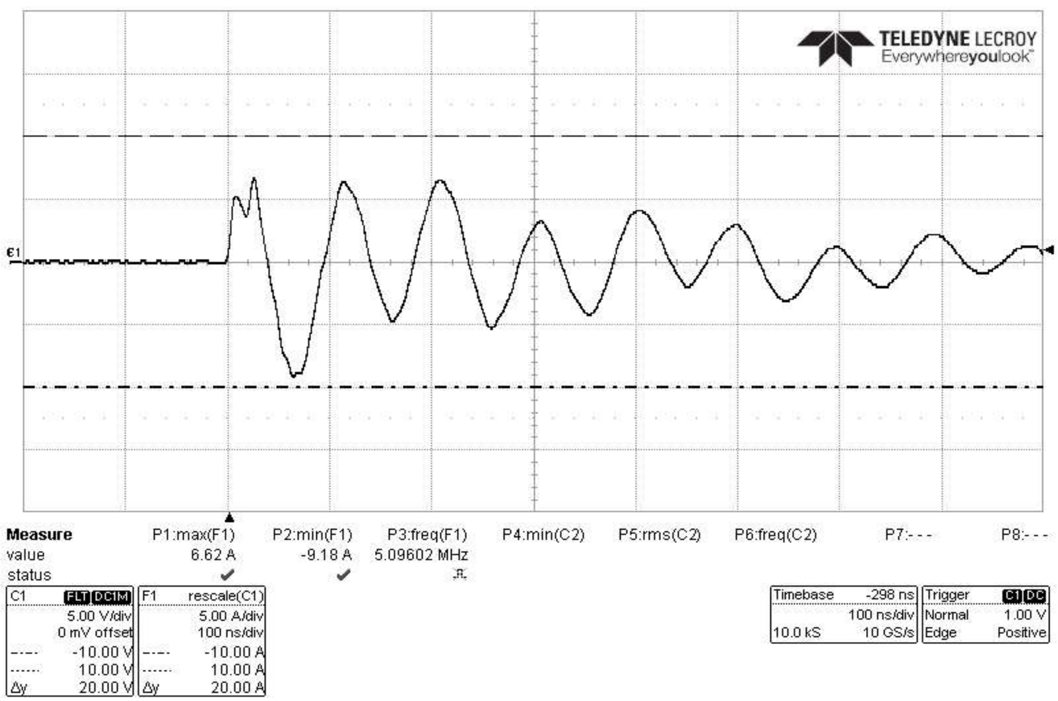


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on DC Bundle

EAR Controlled Data

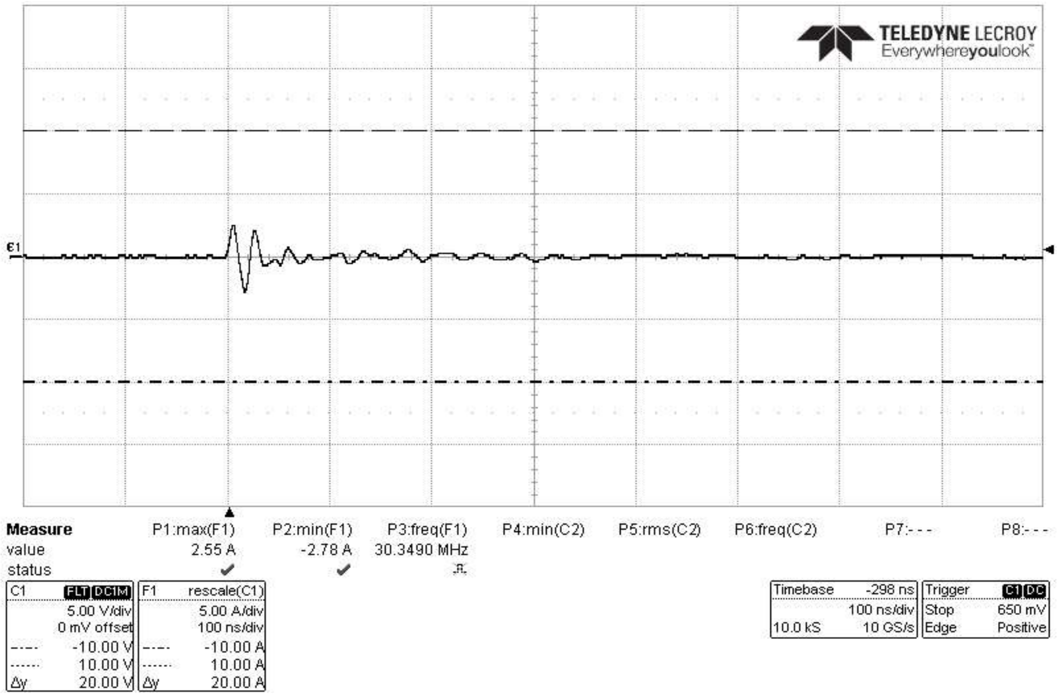


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on DC Bundle

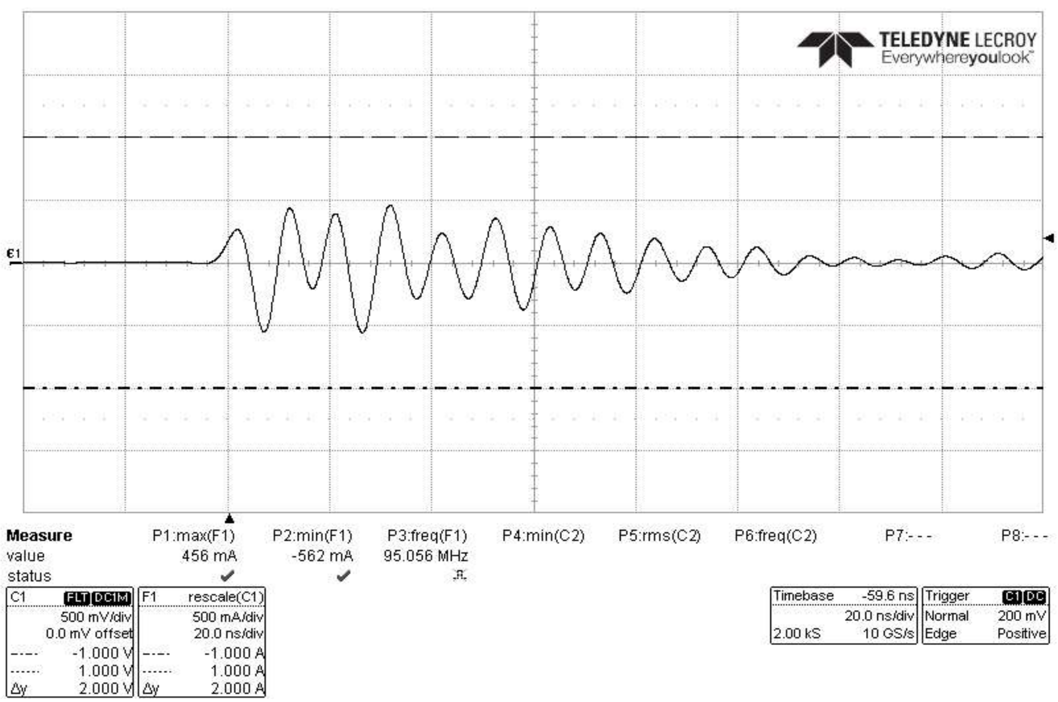


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on DC Bundle

EAR Controlled Data

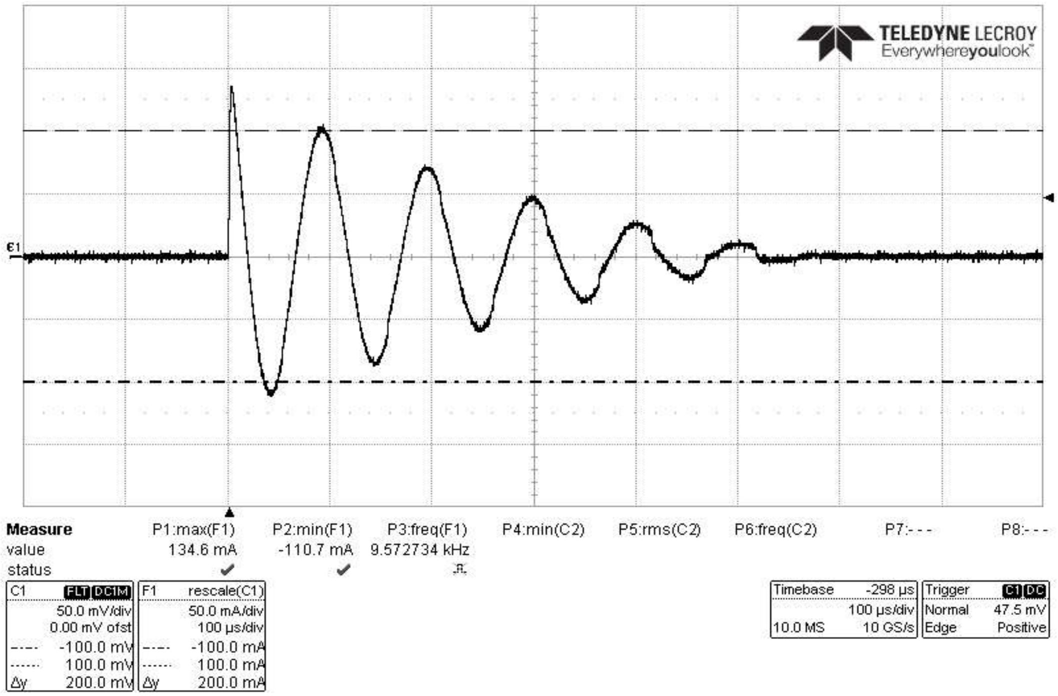


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on DC Bundle

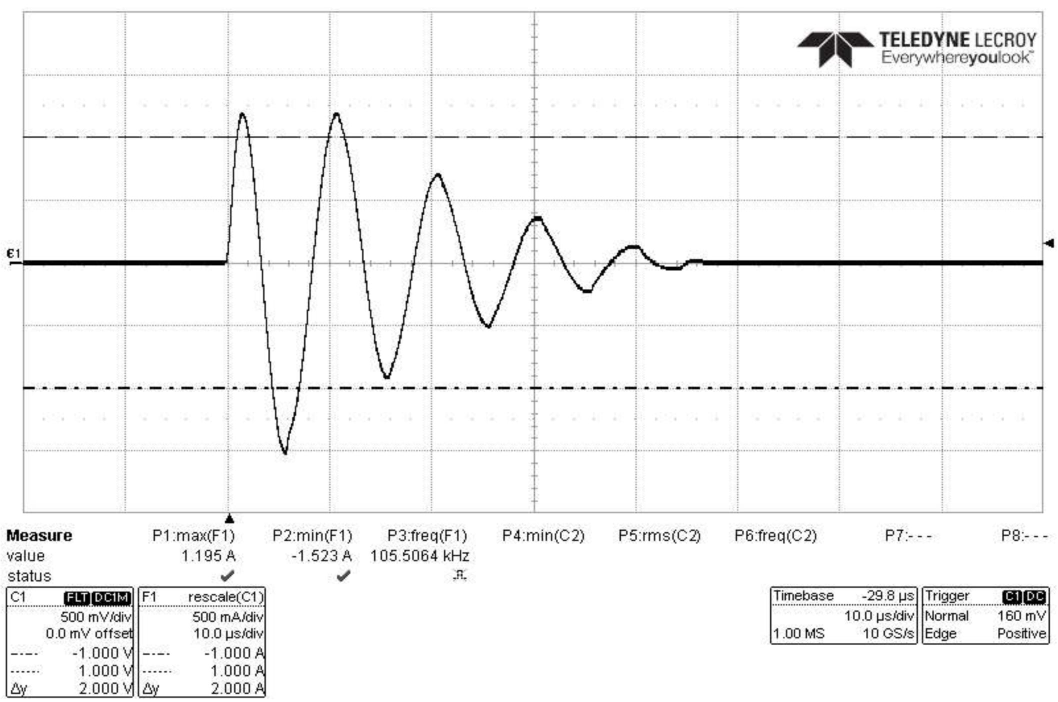


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on DC Bundle

EAR Controlled Data

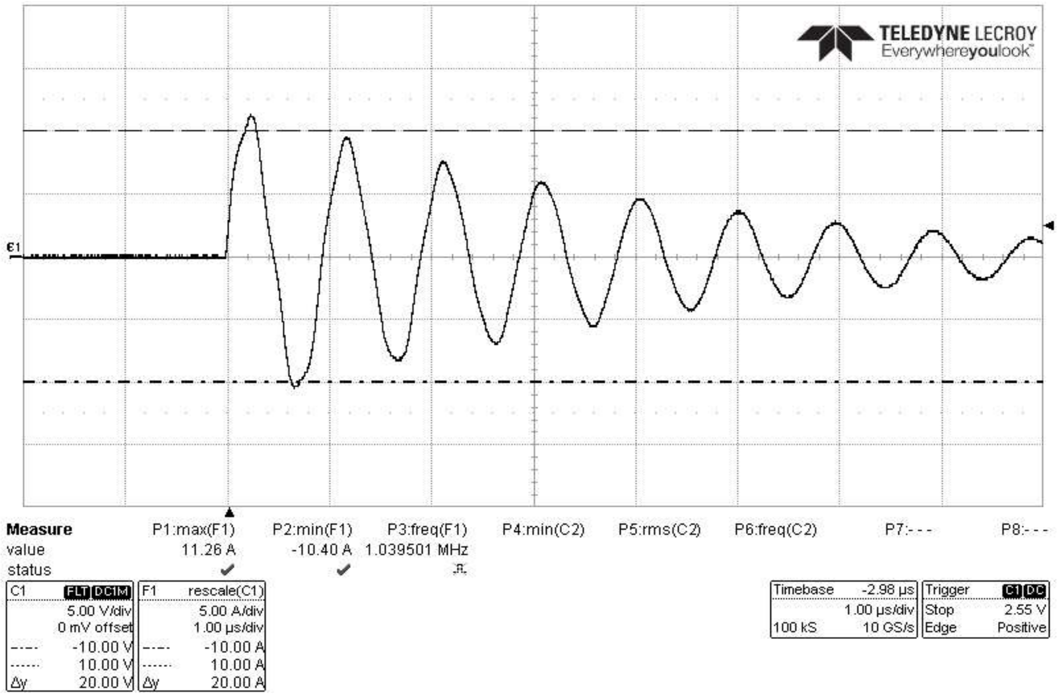


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on DC High Side

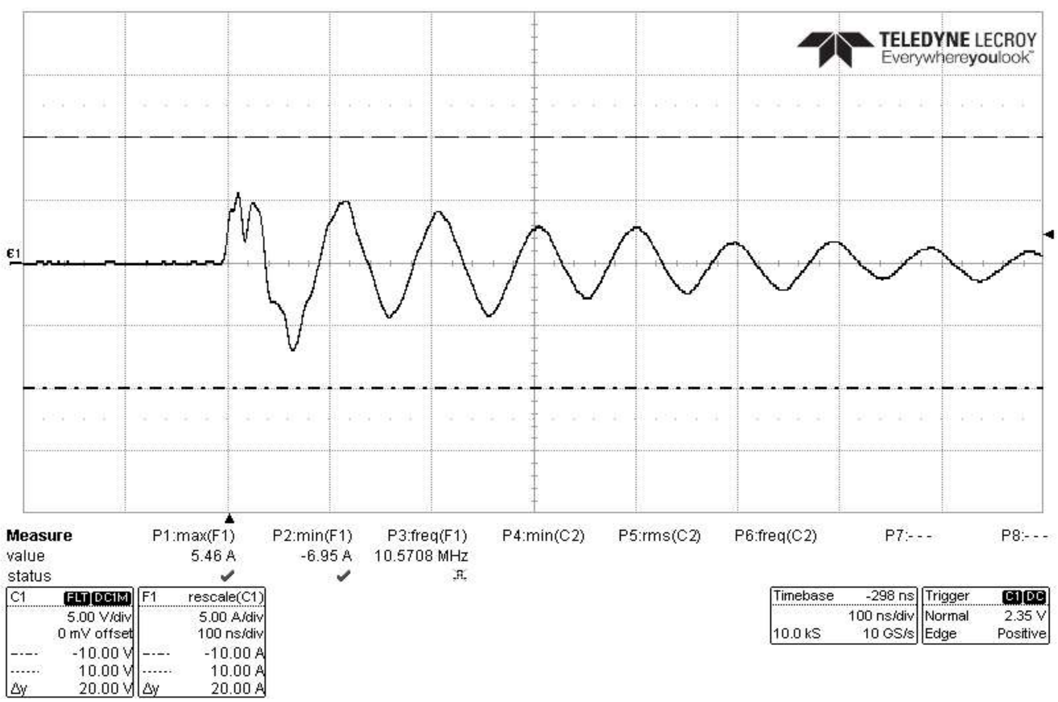


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on DC High Side

EAR Controlled Data

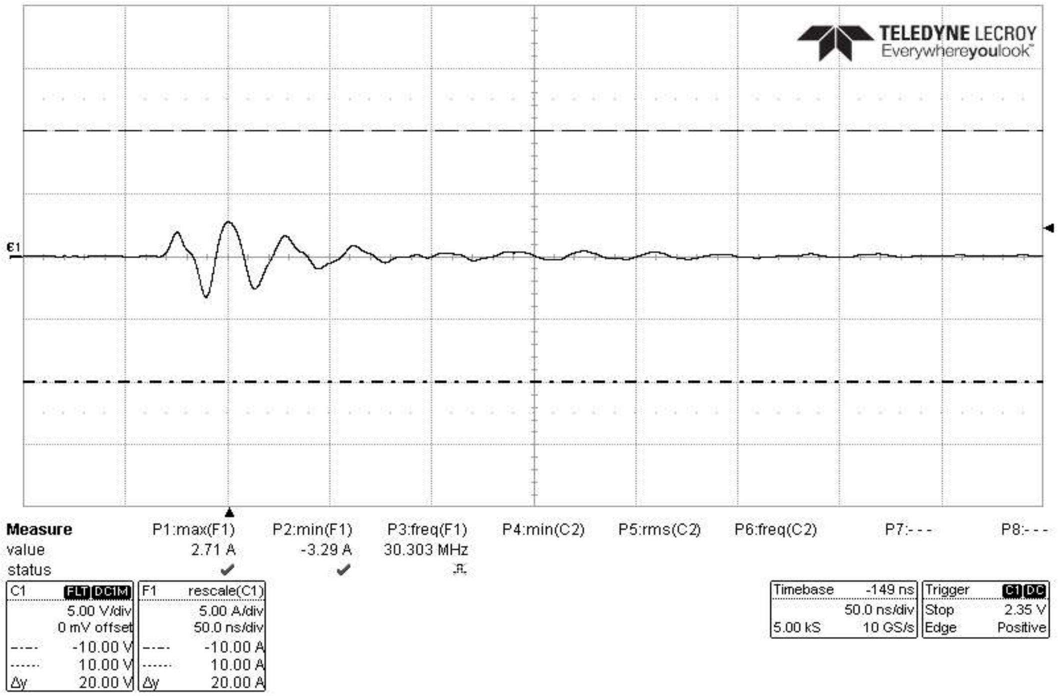


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on DC High Side

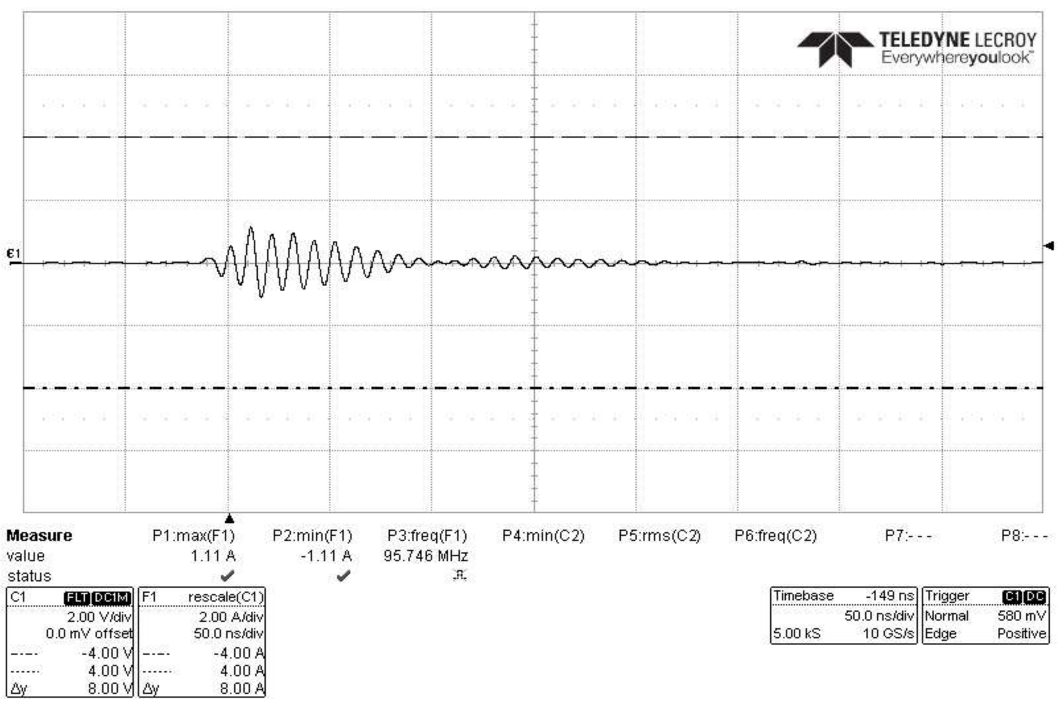


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on DC High Side

EAR Controlled Data



Actual CS116 Damped Sinusoidal Transient Test at 30MHz on DC High Side



Actual CS116 Damped Sinusoidal Transient Test at 100MHz on DC High Side

EAR Controlled Data

CS116 Actual Test Data from 10 kHz – 100MHz Test on EMI-02 Flexboss 18

CUSTOMER:	**EG4 Electronics LLC**	**MJO:**	**PR190112**
TEST ITEM:	**Flexboss 18**	**DATE:**	**5/5/2025**
PART NUMBER	**IV-13000-HYB-AW-FX-00**	**UNIT NO:**	**50301N0067**
SPECIFICATION:	**MIL-STD-461G**	**CHAMBER NO:**	**Workbench 1**

EUT Power Input	**208VAC/60Hz and 48VDC**
CS116 Conducted Susceptibility, Damped Sinusoidal Transients	
Test Level: For Army and Navy procurements, I_{MAX} = 10A	

Temperature: 20C	**Humidity: 51%**	**Barometric Pressure: 990 mBar**

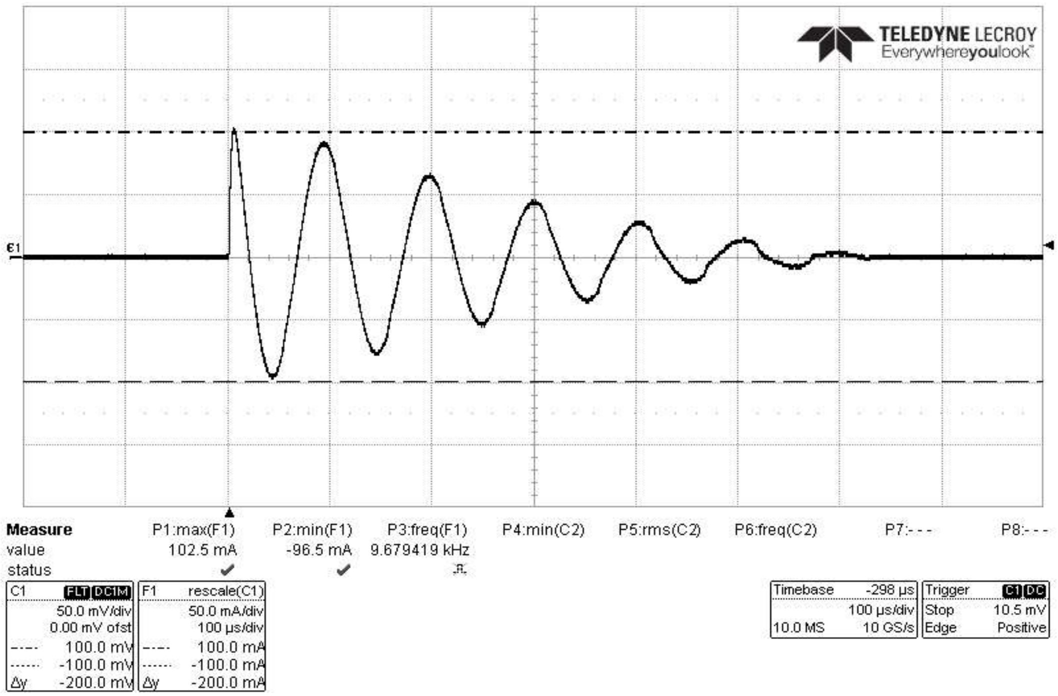
Remarks: The EUT was monitored for susceptibility during the performance of the test. The pulses shall be applied for a period of five minutes per frequency. All Bundle, Power Bundle and Each individual High Side Power Lead.

Frequecy/ Level	**0.01MHz**	**0.1MHz**	**1MHz**	**10MHz**	**30MHz**	**100MHz**	**Comments**
Cable under test	**0.1A/5V**	**1A/50V**	**10A/500V**	**10A/500V**	**10A/500V**	**3A/150V**	
AC Full Bundle	Pass AR	Pass AR	Pass AR	Pass VR	Pass VR	Pass VR	
AC L1	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	
AC L2	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	Pass VR	
DC Bundle	Pass AR	Pass AR	Pass AR	Pass AR	Pass AR	Pass AR	
High Side	Pass AR	Pass AR	Pass AR	Pass AR	Pass AR	Pass AR	

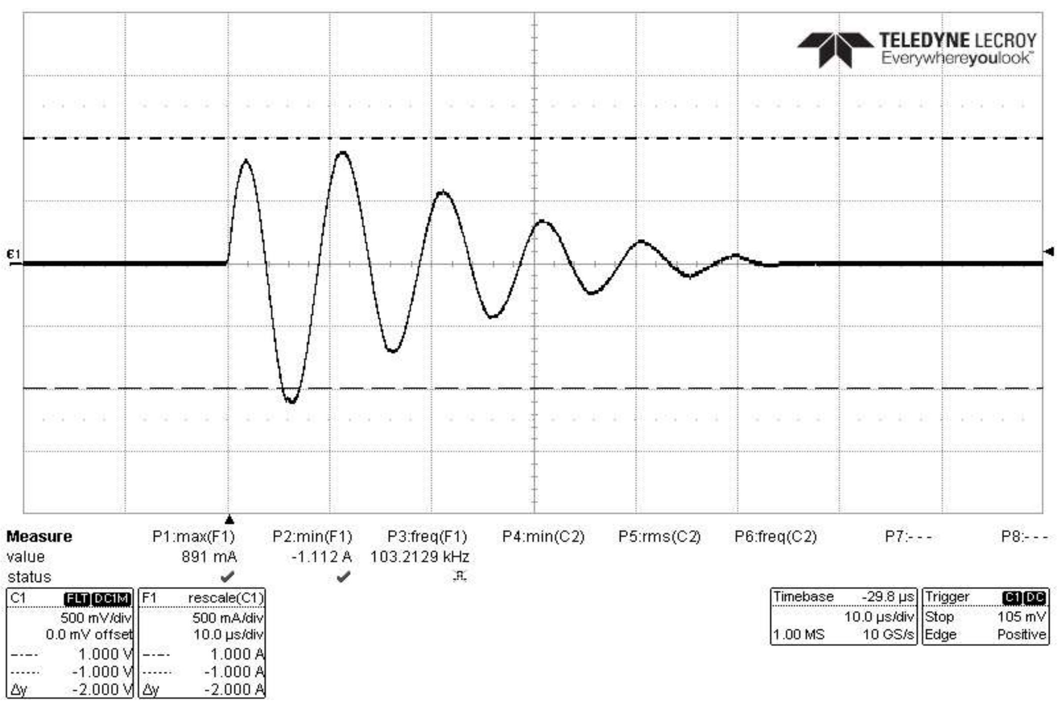
NOTE:	Pass AR: Passed with Current Reached
	Pass VR: Passed with Voltage Reached

TECHNICIAN / ENGINEER:	**Donald Adams**	**DATE:**	**5/5/2025**

EAR Controlled Data

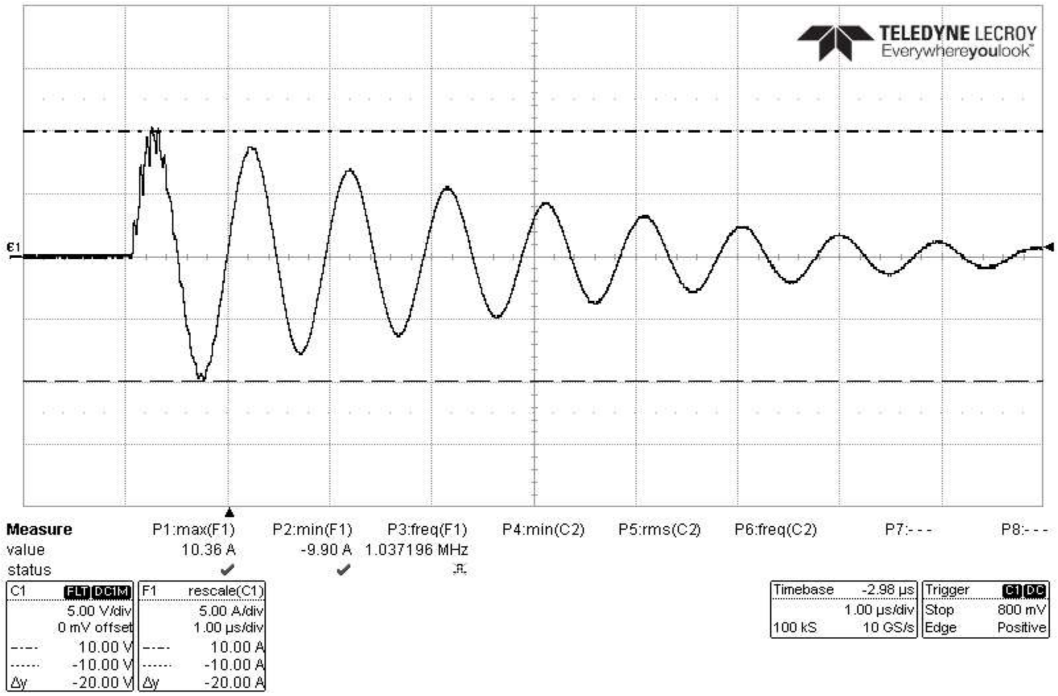


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on AC Full Bundle

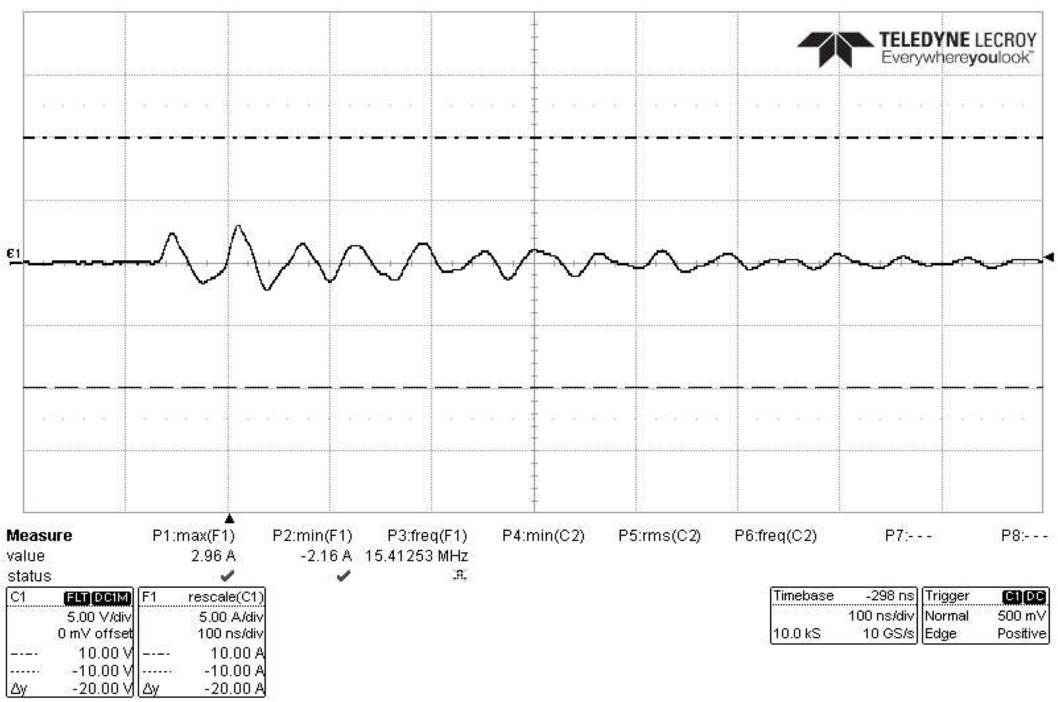


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on AC Full Bundle

EAR Controlled Data

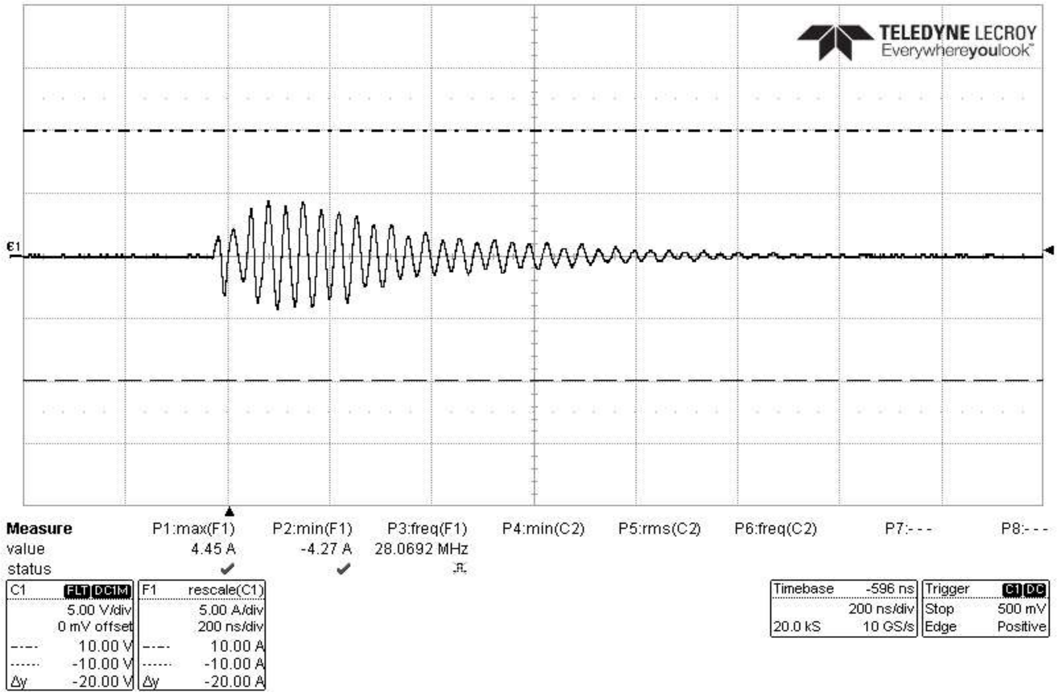


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on AC Full Bundle

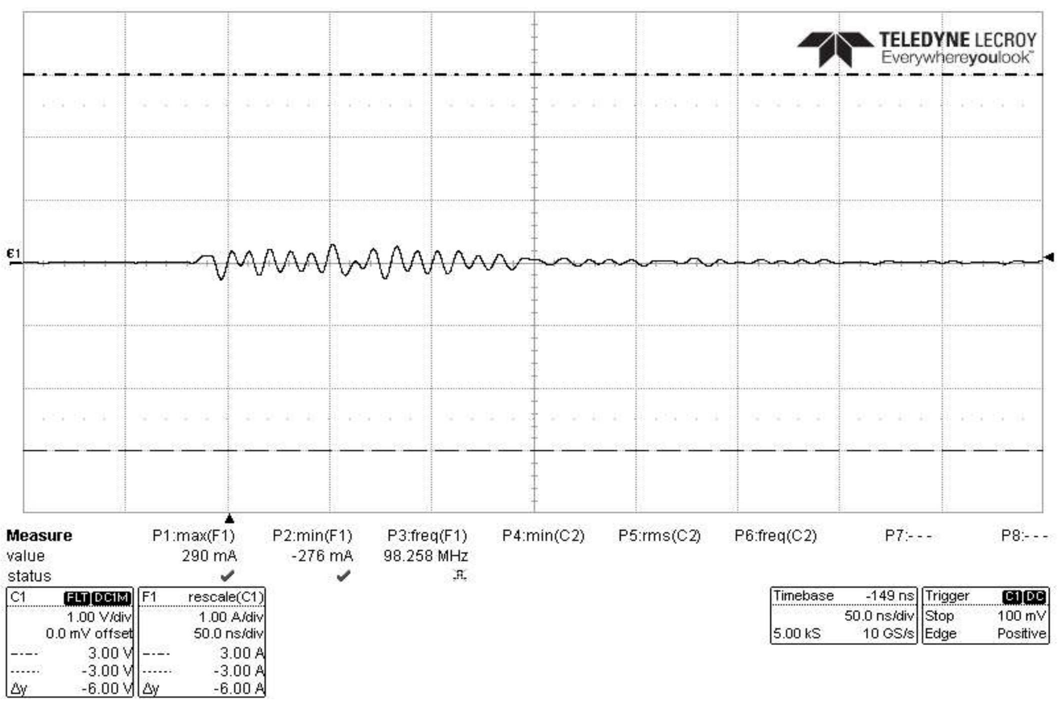


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on AC Full Bundle

EAR Controlled Data

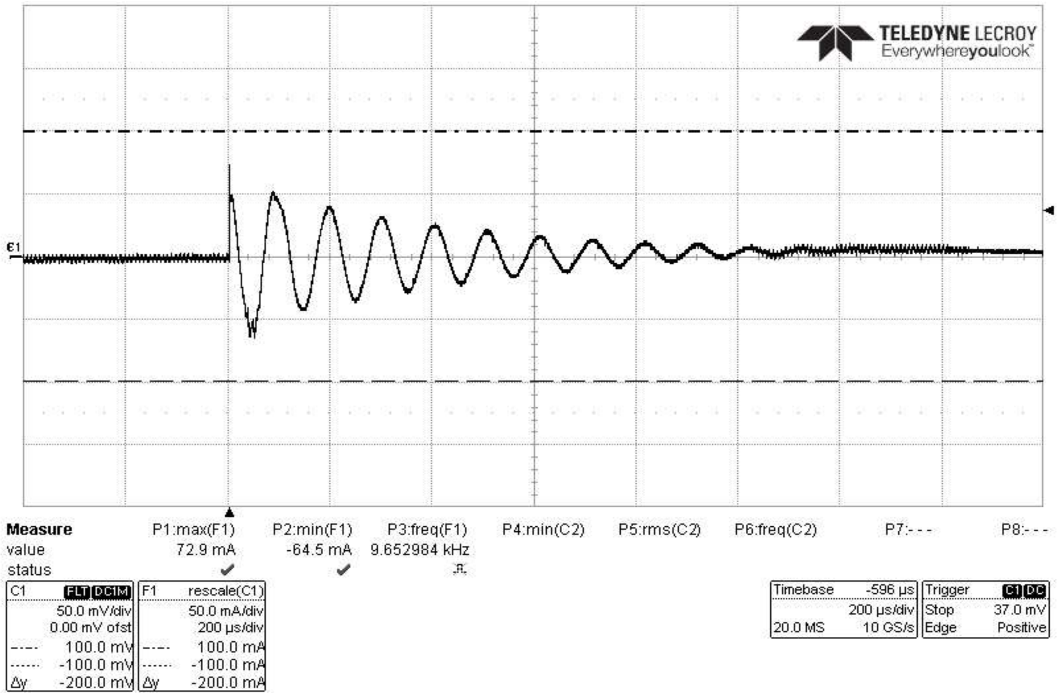


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on AC Full Bundle

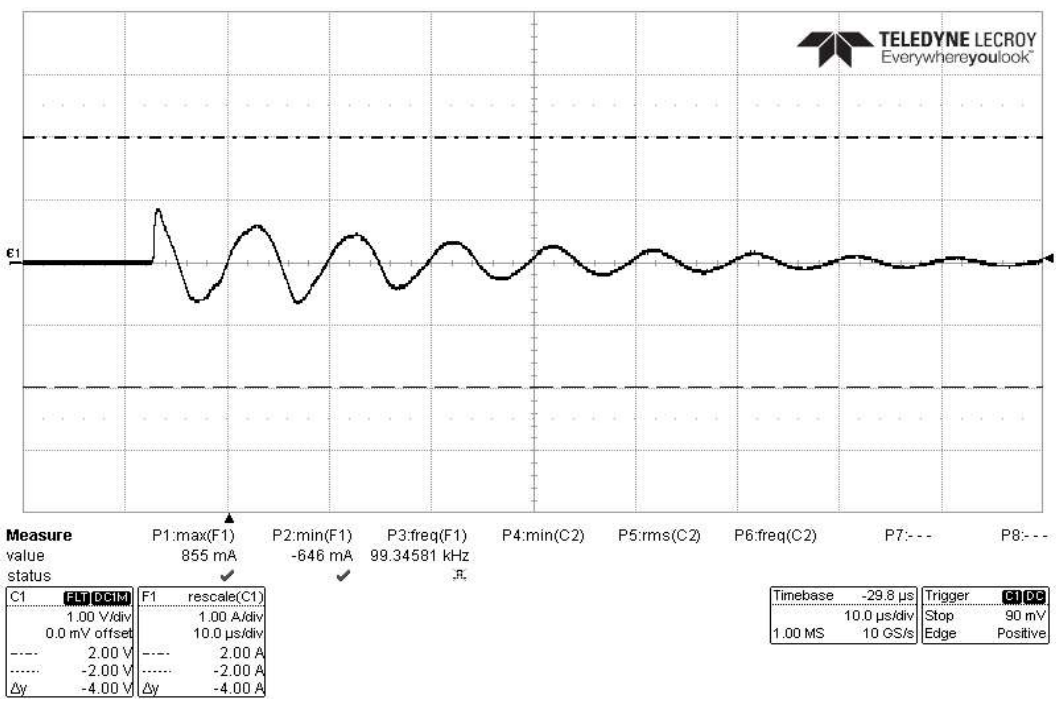


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on AC Full Bundle

EAR Controlled Data

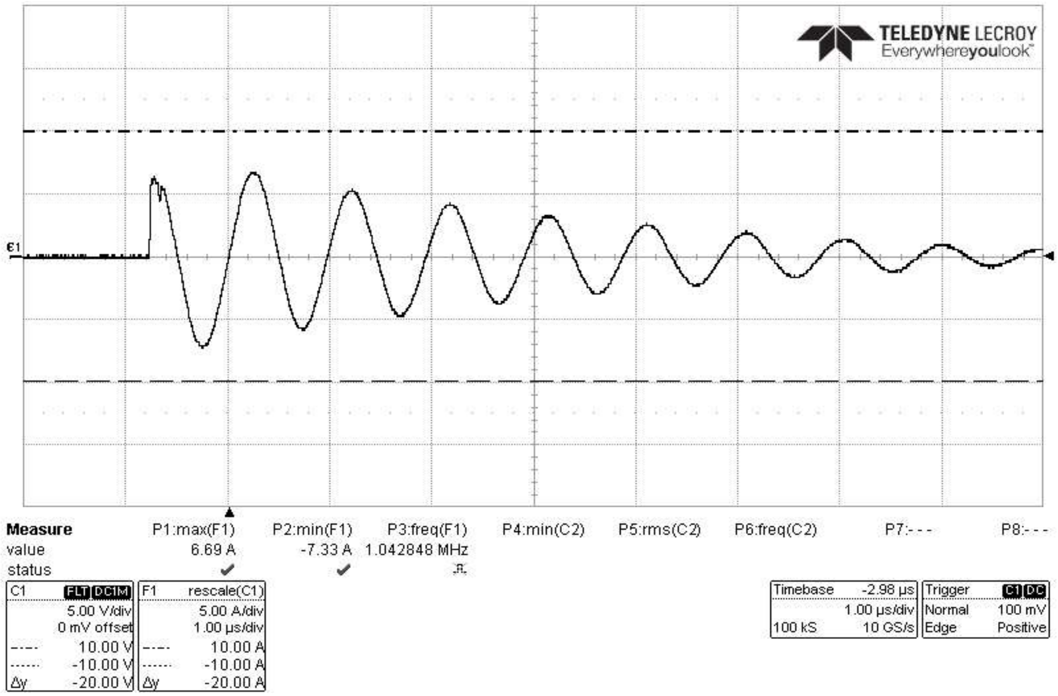


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on AC Line 1

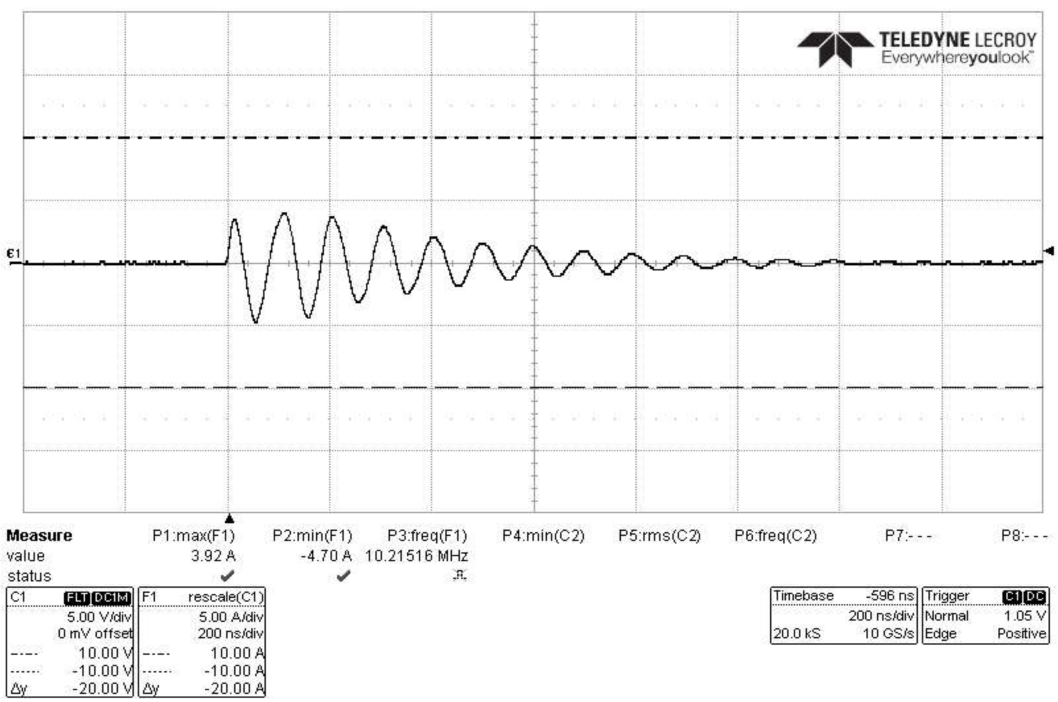


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on AC Line 1

EAR Controlled Data

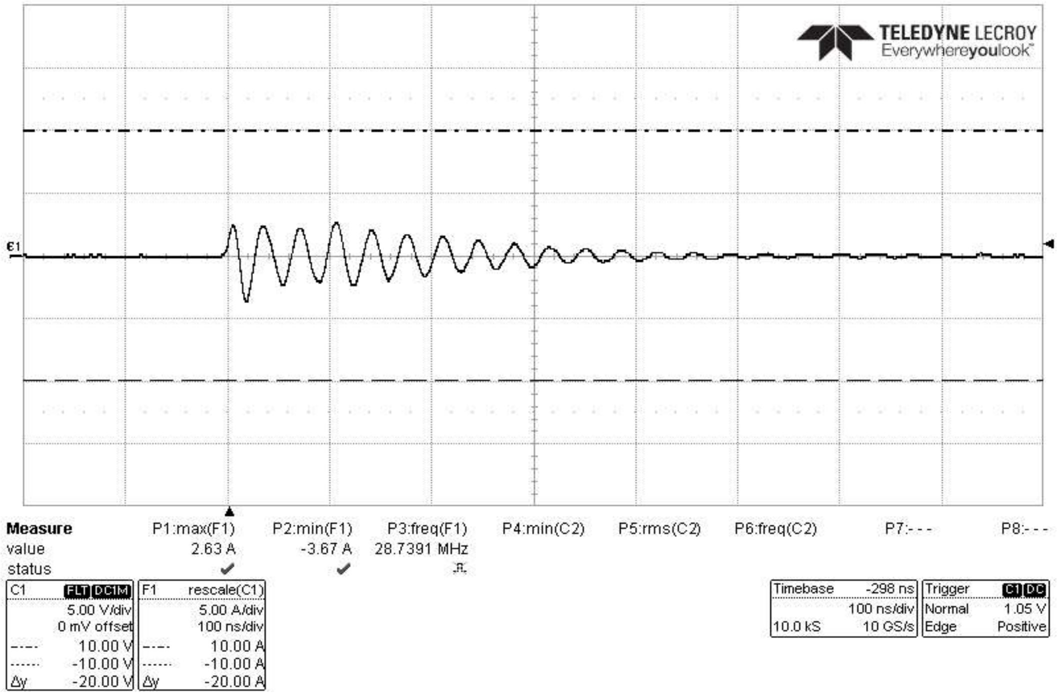


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on AC Line 1

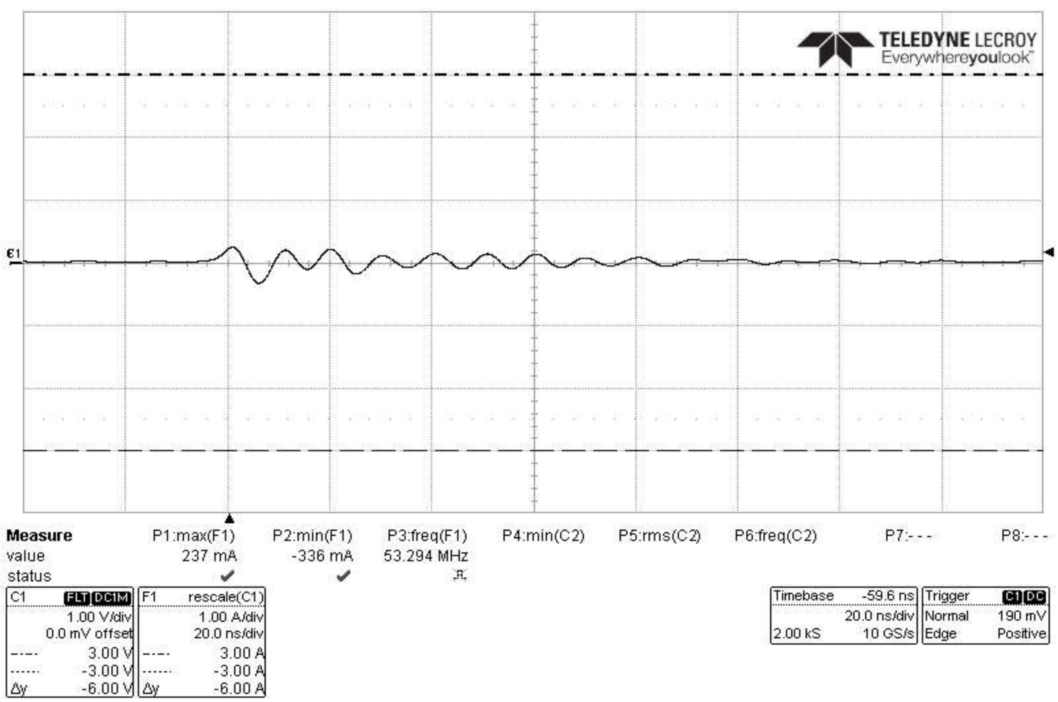


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on AC Line 1

EAR Controlled Data

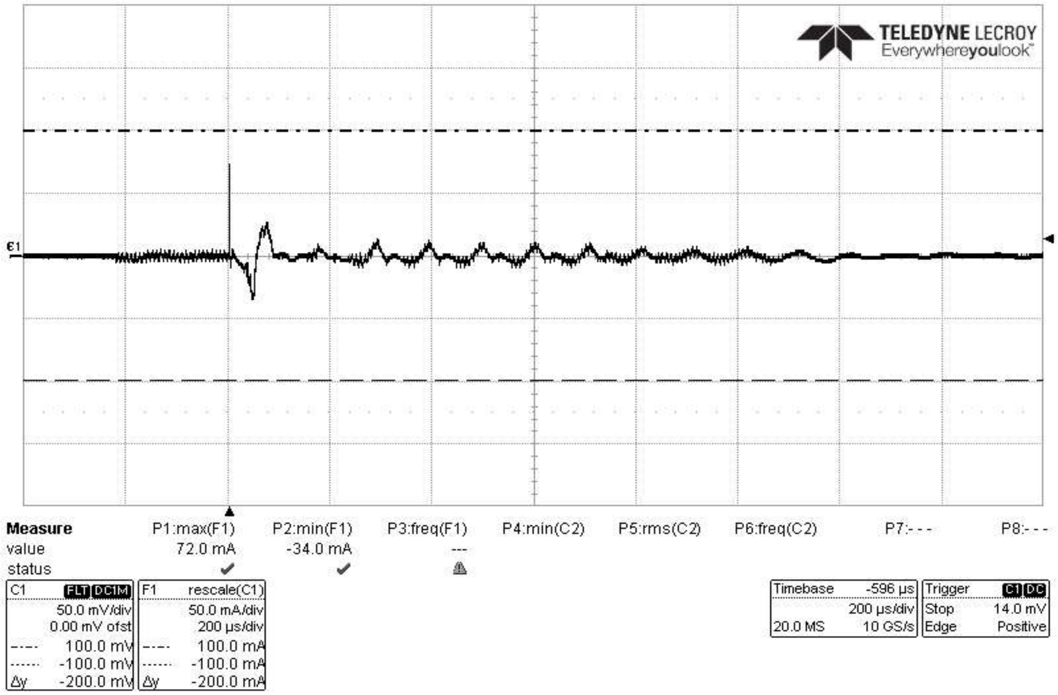


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on AC Line 1

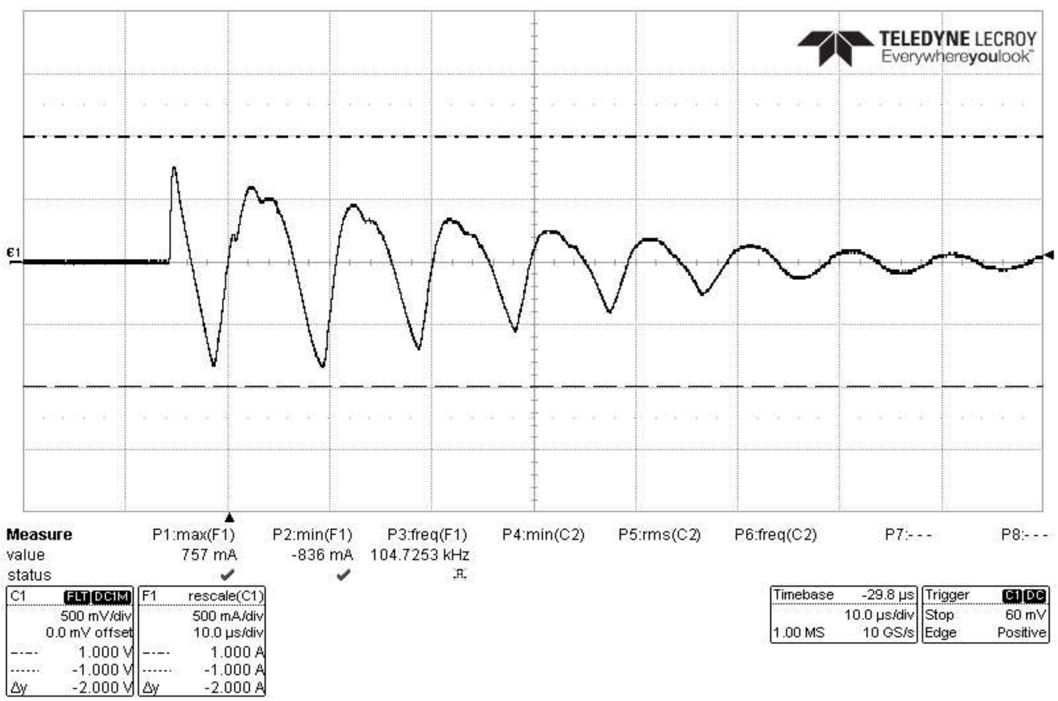


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on AC Line 1

EAR Controlled Data

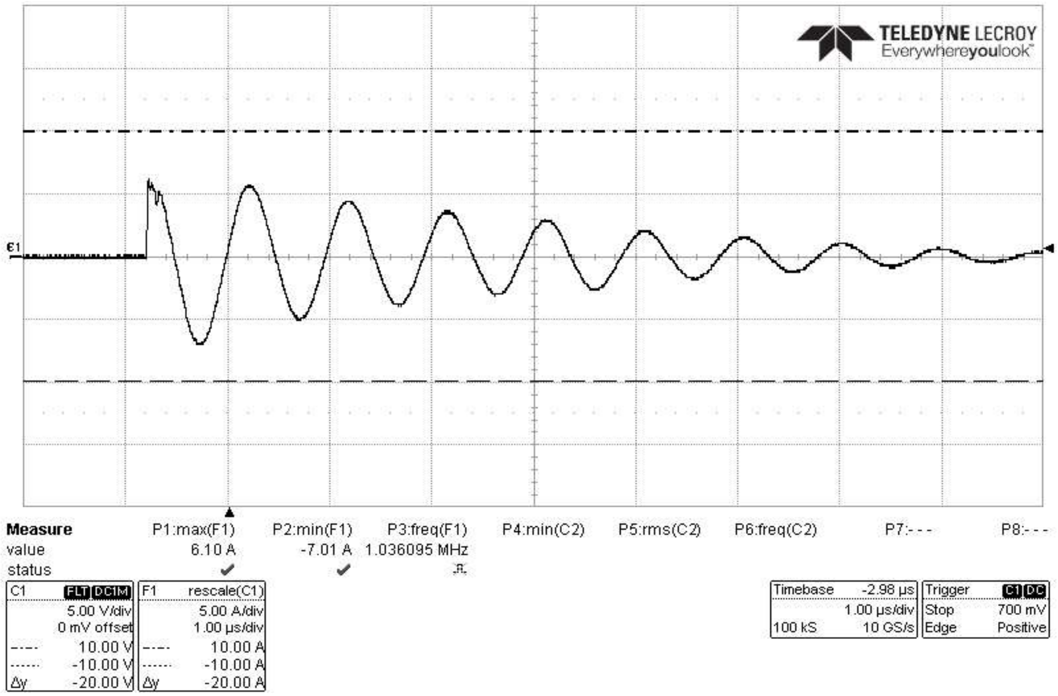


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on AC Line 2

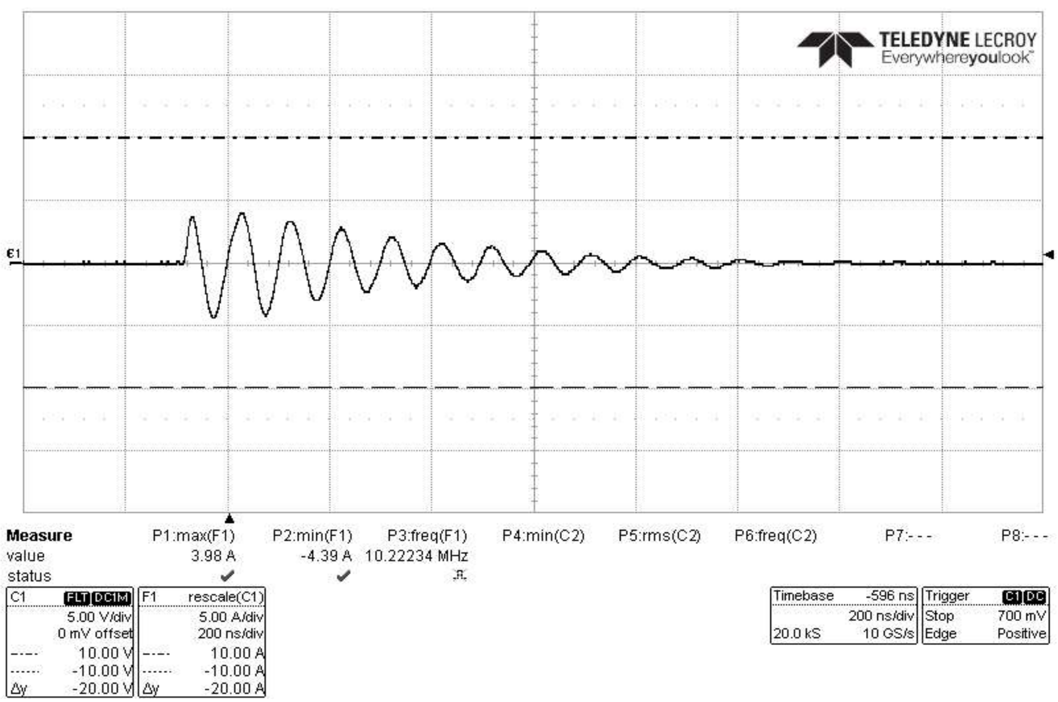


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on AC Line 2

EAR Controlled Data

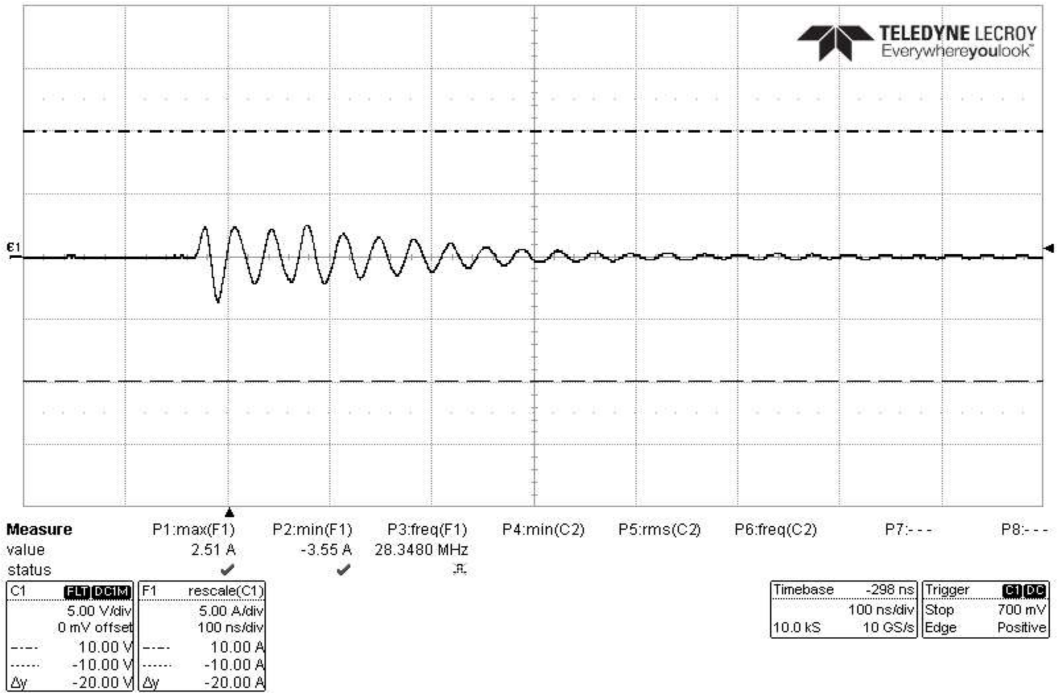


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on AC Line 2

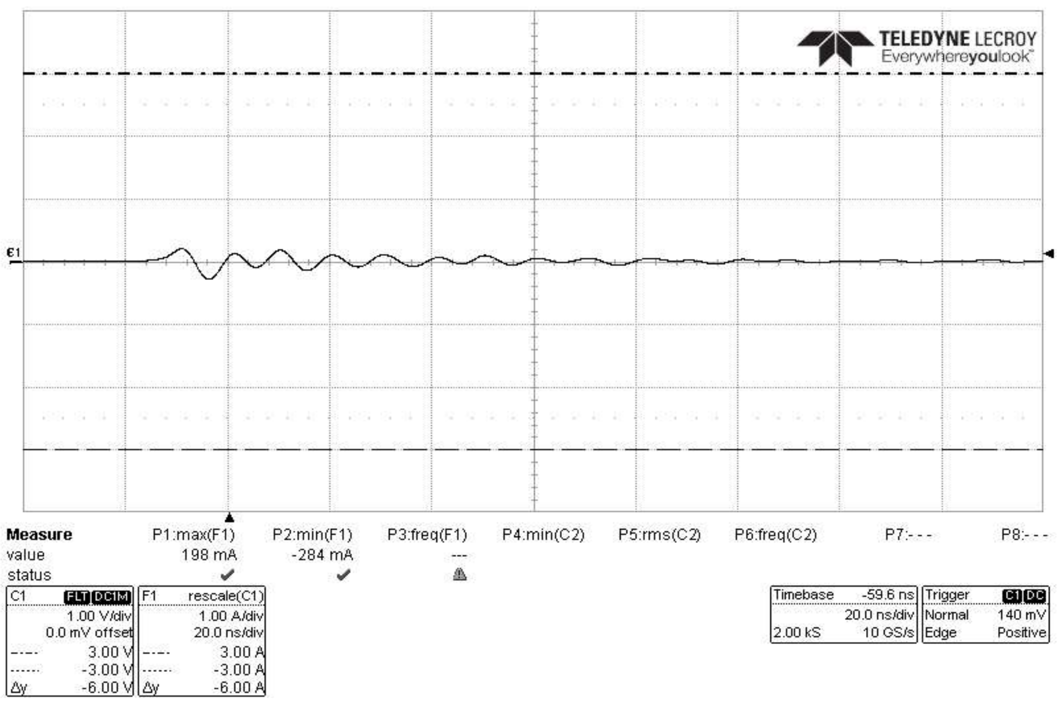


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on AC Line 2

EAR Controlled Data

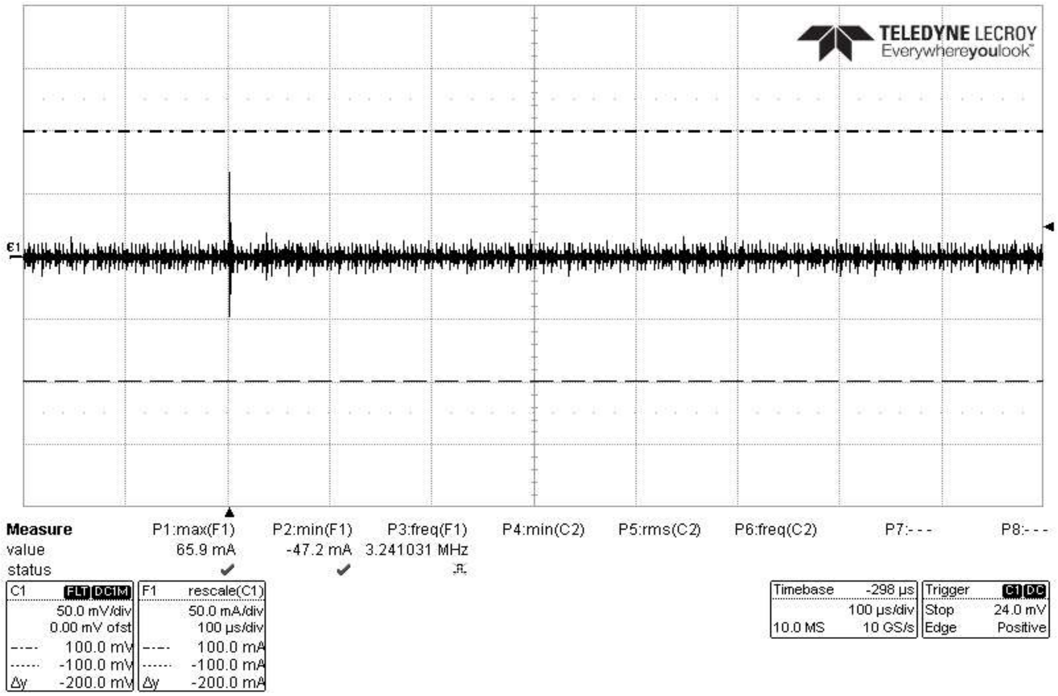


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on AC Line 2

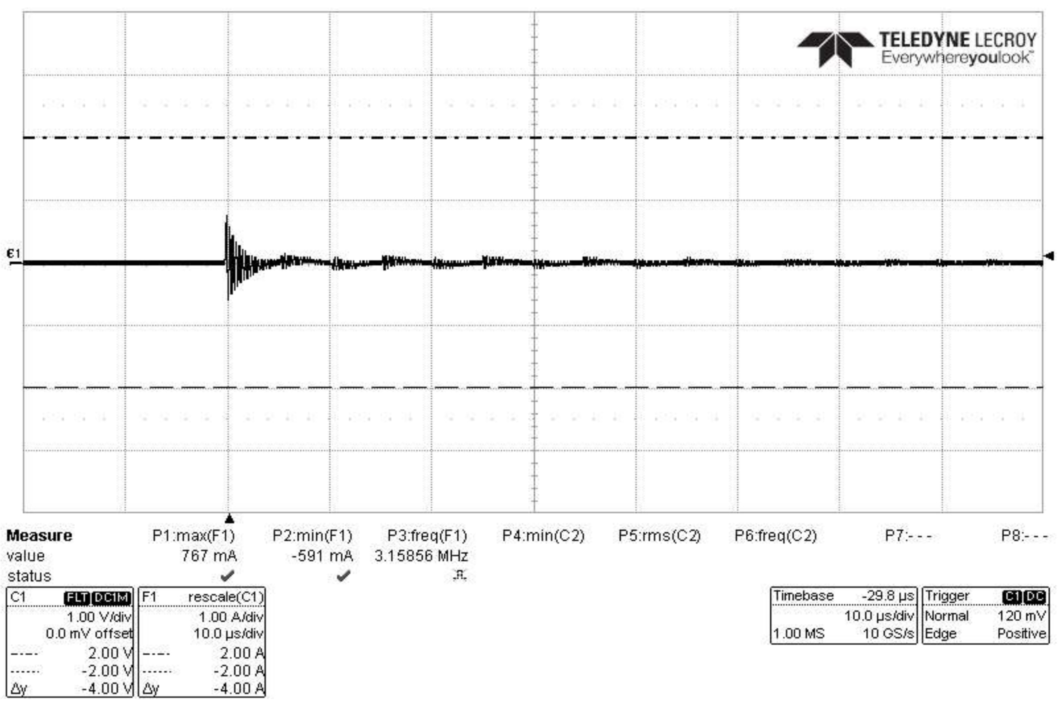


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on AC Line 2

EAR Controlled Data

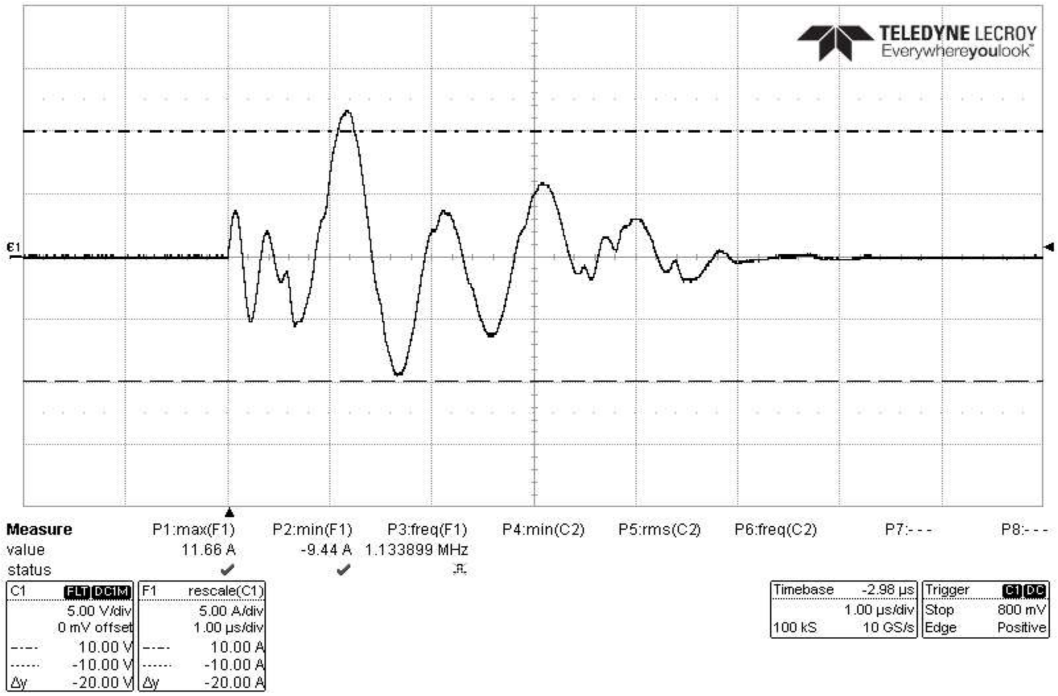


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on DC Bundle

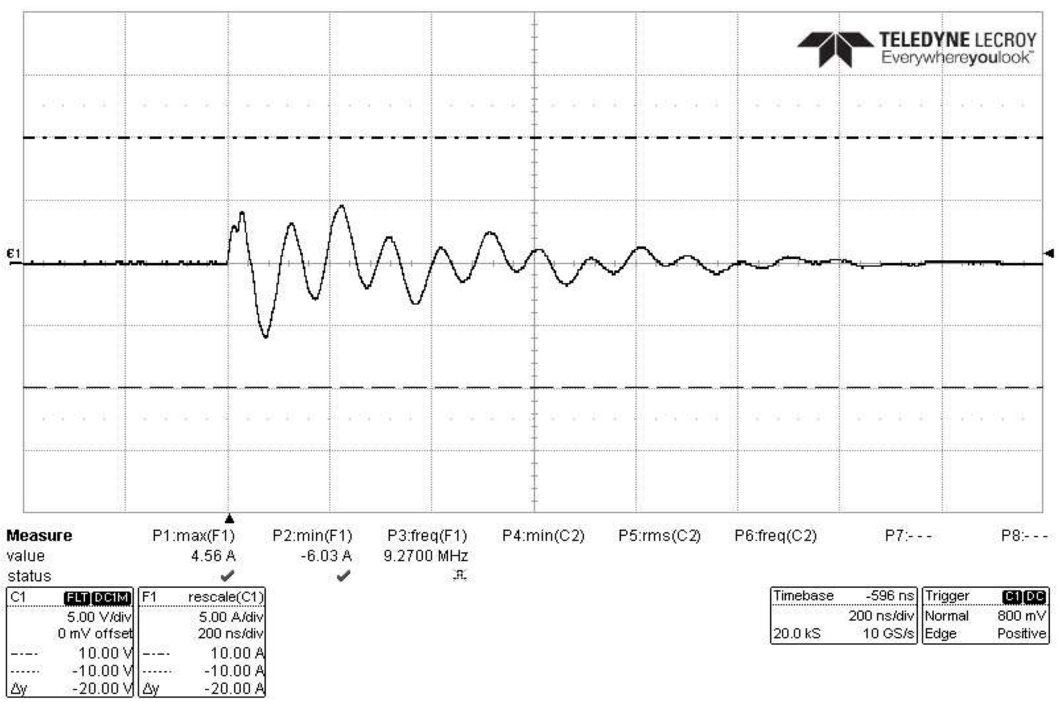


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on DC Bundle

EAR Controlled Data

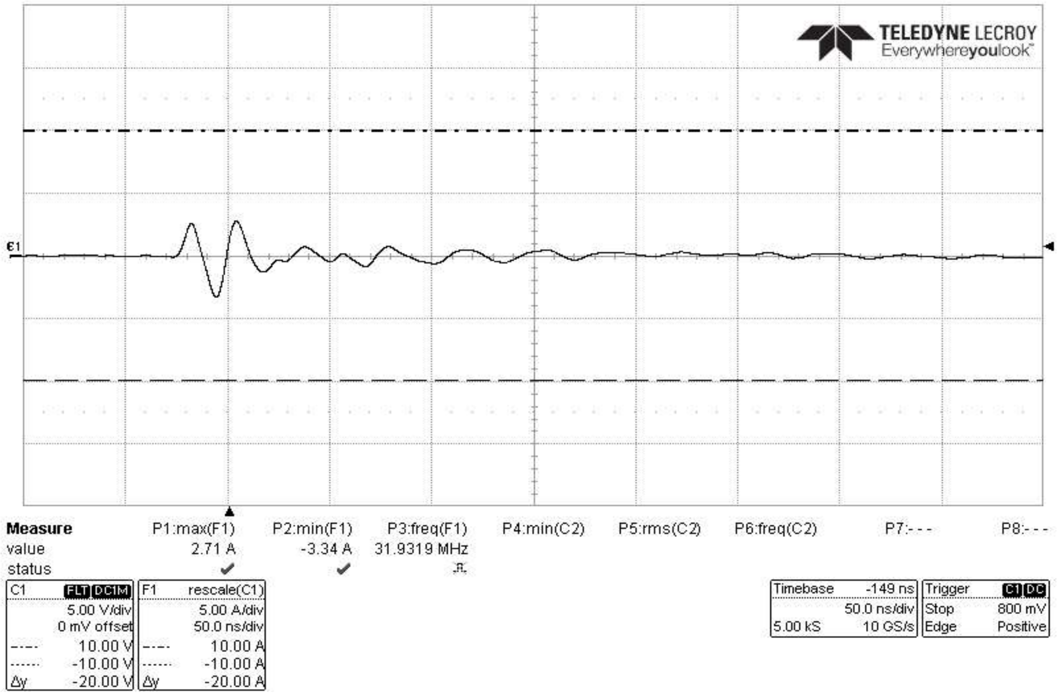


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on DC Bundle

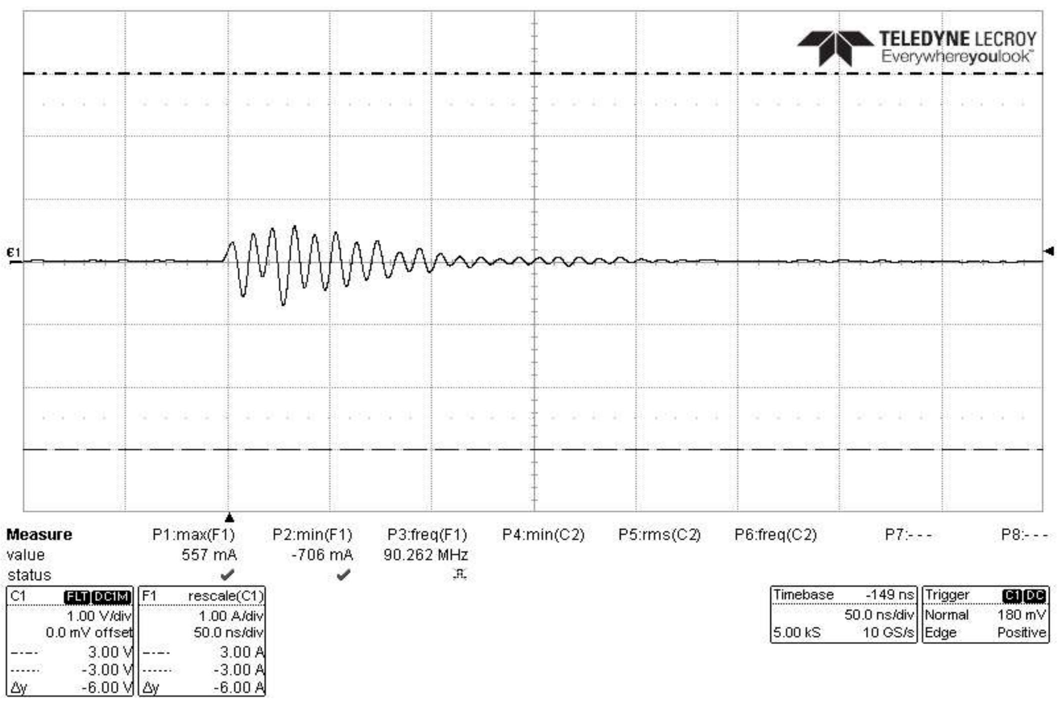


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on DC Bundle

EAR Controlled Data

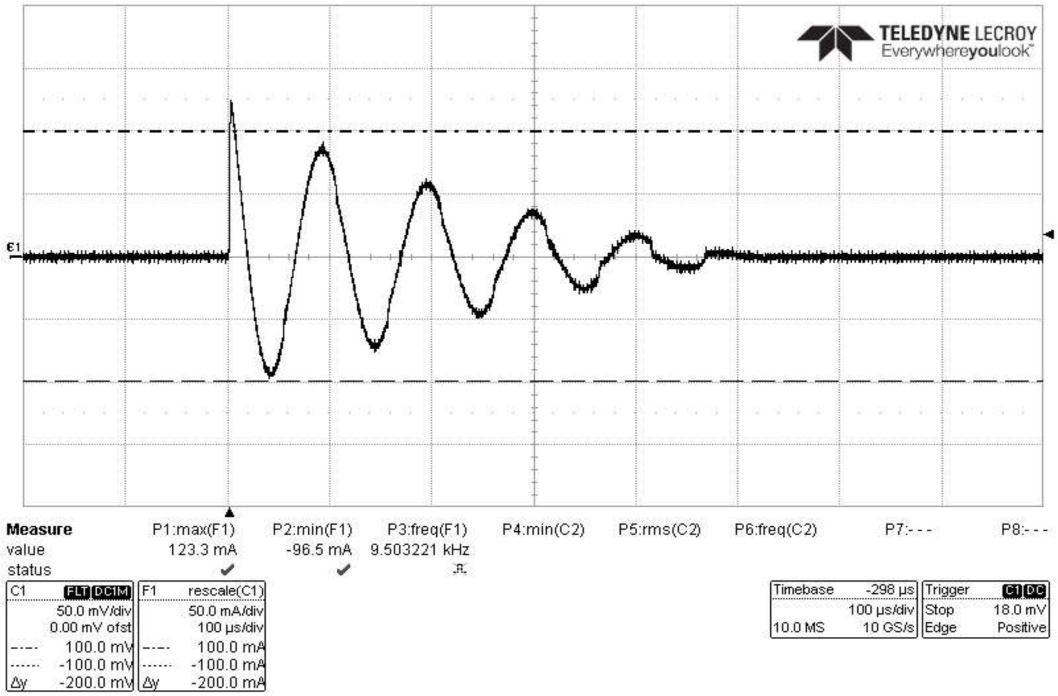


Actual CS116 Damped Sinusoidal Transient Test at 30MHz on DC Bundle

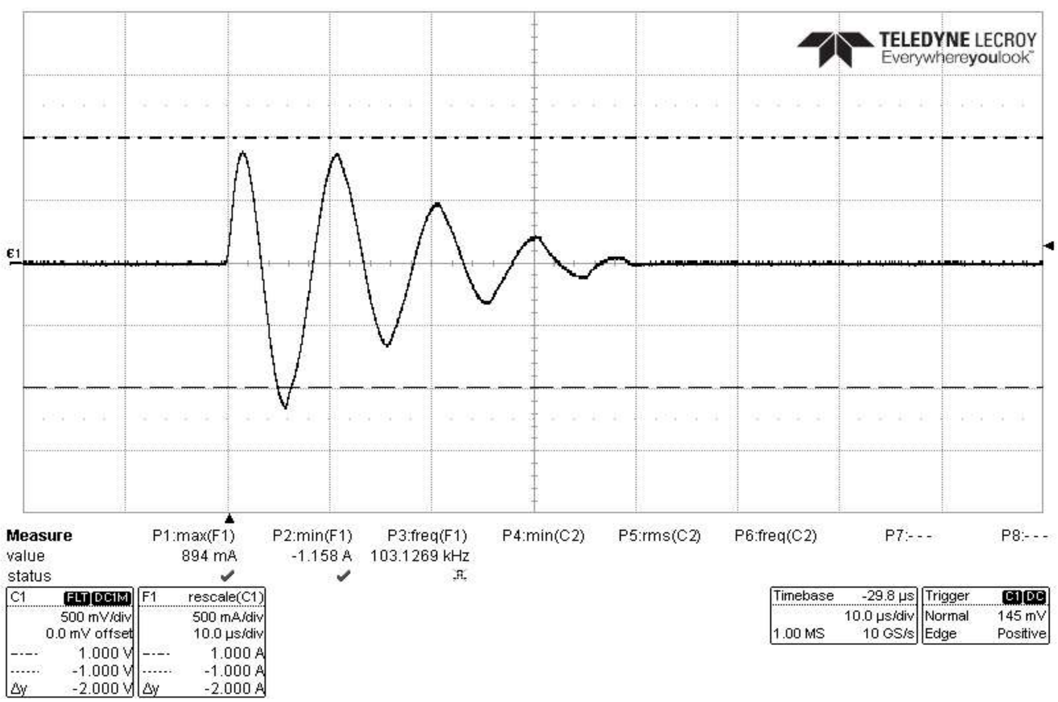


Actual CS116 Damped Sinusoidal Transient Test at 100MHz on DC Bundle

EAR Controlled Data

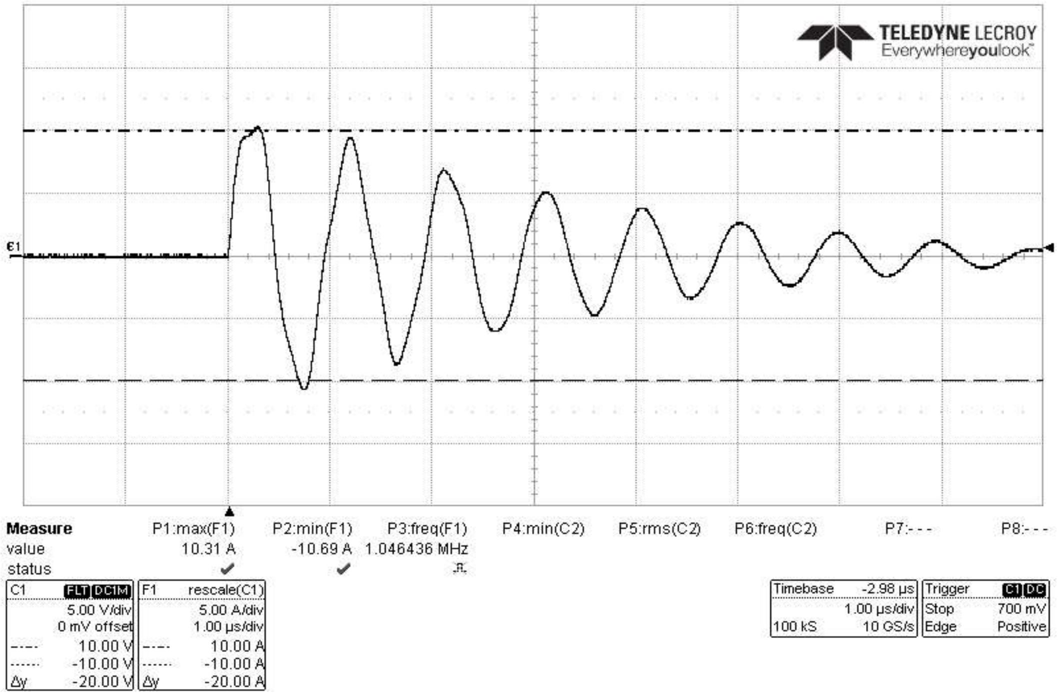


Actual CS116 Damped Sinusoidal Transient Test at 10 kHz on DC High Side

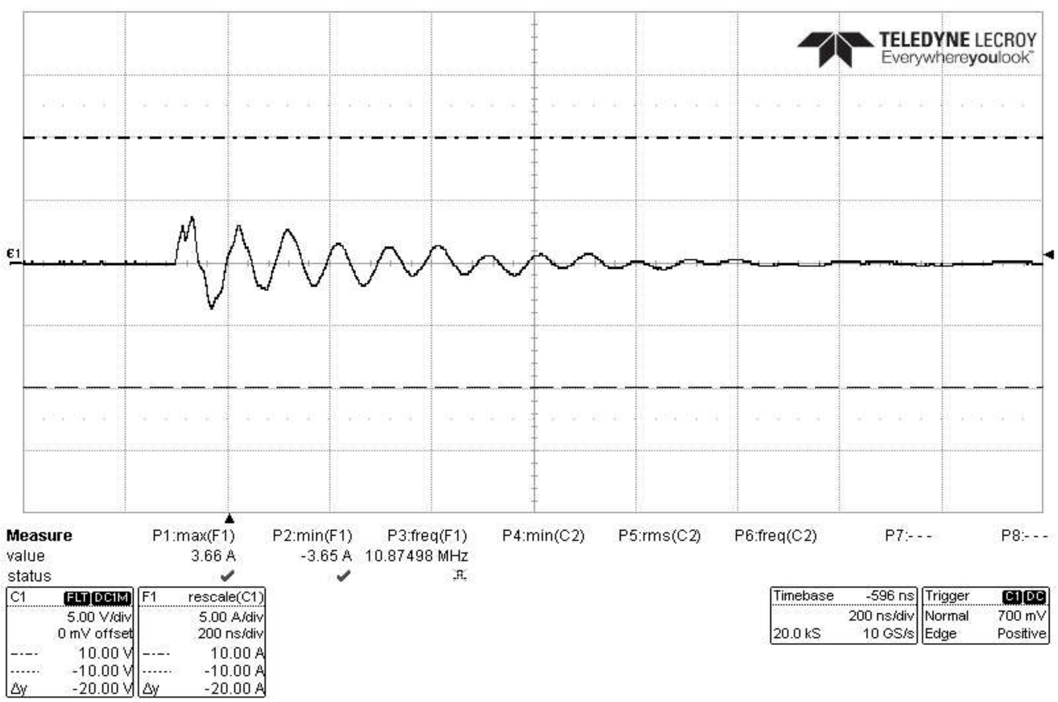


Actual CS116 Damped Sinusoidal Transient Test at 100 kHz on DC High Side

EAR Controlled Data

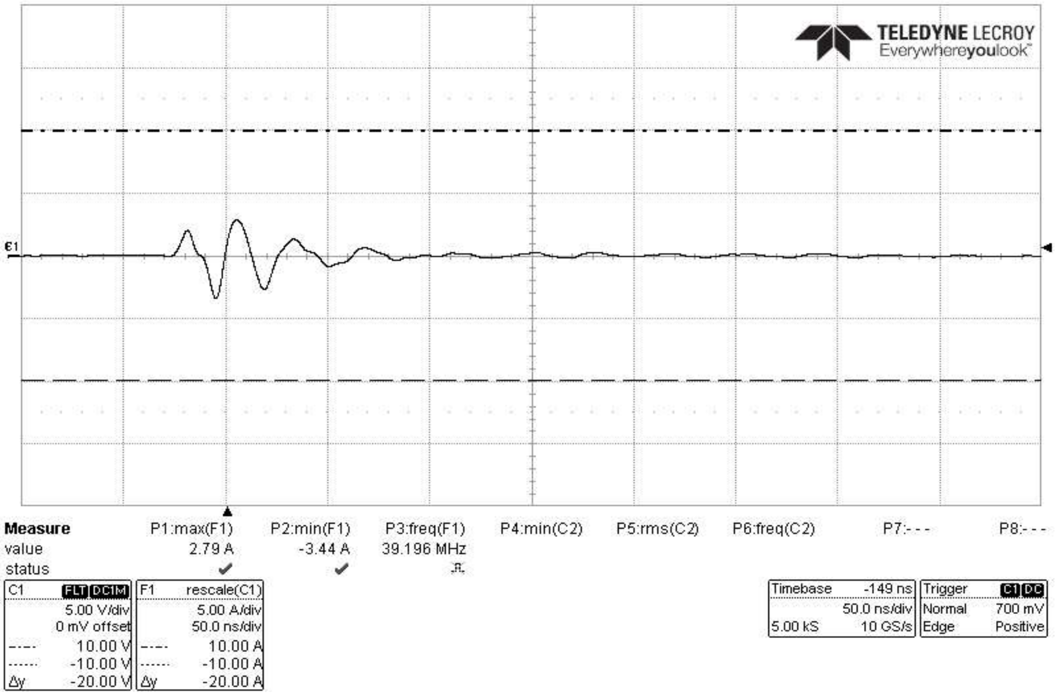


Actual CS116 Damped Sinusoidal Transient Test at 1MHz on DC High Side

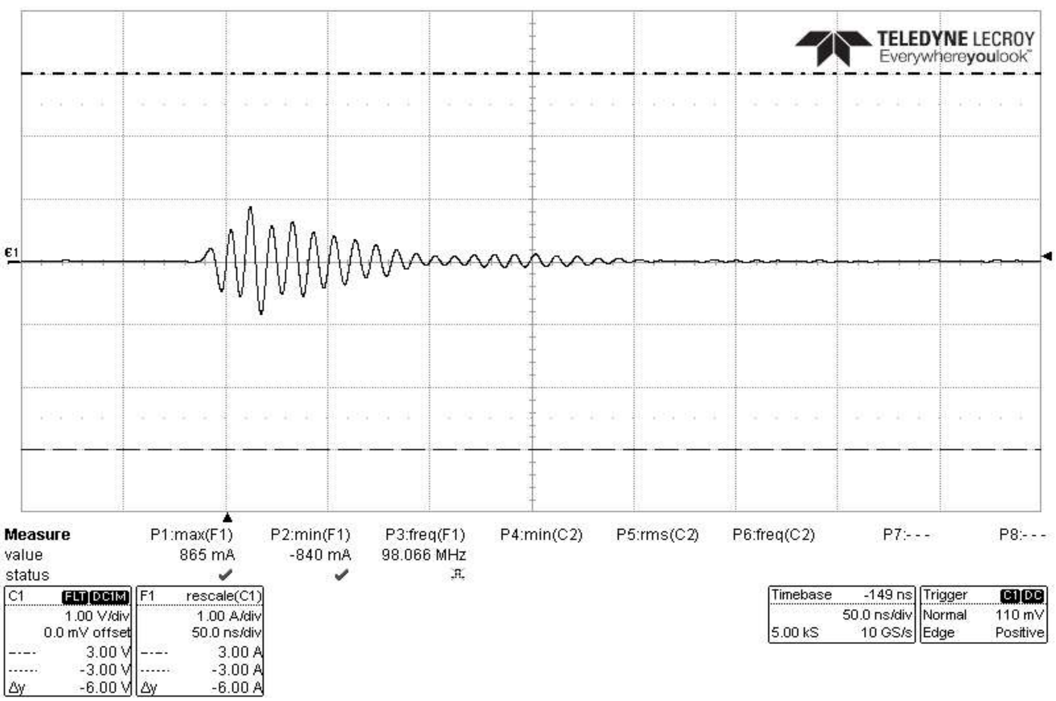


Actual CS116 Damped Sinusoidal Transient Test at 10MHz on DC High Side

EAR Controlled Data



Actual CS116 Damped Sinusoidal Transient Test at 30MHz on DC High Side



Actual CS116 Damped Sinusoidal Transient Test at 100MHz on DC High Side

EAR Controlled Data

5.2.9 CS116 Test Equipment

Element ID#	Manufacturer/ Description	Duration	Cal Due
WC021568	Lecroy Model 104MXi-A 1GHz Oscilloscope	12 months	11/4/2025
WC021715	Solar, Transient Pulse Generator, Model: 9354-1	NCR	NCR
WC021522	Solar Electronics, Calibration Fixture, Type: 9125-1	NCR	NCR
WC021266	Solar Electronics, Current Injection Probe, Type: 9144-1N, 10kHz-100MHz, 100W	NCR	NCR
WC021265	Solar Electronics, Current Injection Probe, Type: 9142-1N, 2MHz-450MHz, 100W	NCR	NCR
WC066513	Solar Electronics, High Voltage Attenuator, Type: 9410-1, 40dB	NCR	NCR
WC066535	Pearson Model 8705C Current Probe	12 months	8/12/2025
WC020791	Aeroflex/Weinschel Model 1440-4 Terminator 50 ohm	NCR	NCR
WC021316	Solar LISN, 9331-50-TS-200-N, 10K-50MHz	12 months	9/17/2025
WC021315	Solar LISN, Model 9331-50-TS-200-N, 10K-50MHz, SN# 112577	12 months	6/3/2025
WC021306	Solar LISN, 9331-50-TS-200-N, 10K-50MHz	12 months	6/3/2025

Calibration Abbreviation
NCR: No Calibration Required

EAR Controlled Data

5.3 Conducted Susceptibility: Method CS117 Lightning Induced Transients, Cables and Power Leads

5.3.1 CS117 Purpose

This test procedure is used to verify the ability of the EUT to withstand lightning transients coupled onto EUT associated cables and power leads.

5.3.2 CS117 Limits

The EUT shall not exhibit any malfunction, degradation of performance, or deviation from specified indications, beyond the tolerances indicated in the individual equipment or subsystem specification, when subjected to the levels and lightning transients specified in Table VII and supplemented by the waveform and timing definitions shown on Figures CS117-1 through CS117-8. The applicable transients of Table VII are considered default values and waveforms based upon previous experience and shall be used for the defined equipment functionality when the host platform lightning transient data does not exist. In the event that there is platform lightning transient data available, this data may be used to tailor the requirements with different selected levels or waveforms, pending approval by the procuring activity. Note that the power lines are tested separately as well as within the bundle as defined in the test procedures section and are tested at the levels defined in Table VII.

5.3.3 CS117 Test Equipment

The test equipment shall be as follows:
a. Lightning transient generator

b. Injection Transformers

c. Oscilloscope

d. Current monitor probes

e. Attenuators, 50 ohm, as needed on current monitor probes

f. Voltage monitor probes, high impedance

g. Monitor loop, low impedance wire loop

h. Calibration loop, low impedance wire loop

i. Capacitors, ≥ 28,000 µF for DC power inputs and 10 µF for AC power inputs

j. LISNs

5.3.4 CS117 Test Setup

The test setup shall be as follows:
a. Maintain a basic test setup for the EUT as shown and described on Figures 2 through 5 and section 4.3.8 of the MIL-STD-461G. The power input side of the LISN shall have a ≥ 28,000 µF capacitor between the high and return for DC power and a 10 µF capacitor from high and return to ground plane for AC power.

b. Calibration. Configure the test equipment in accordance with Figure CS117-9 for verification of the waveform, both short circuit current and open circuit voltage.

c. EUT testing:

(1) Configure the test equipment as shown on Figure CS117-10, Figure CS117-11 or Figure CS117-12.

(2) Place the injection transformer and current monitor probe(s) around a cable bundle interfacing an EUT connector.

(3) Locate the current monitor probe 5-15 cm from the connector. If the overall length of the connector and backshell exceeds 15 cm, position the current monitor probe as close to the connector's backshell as possible.

(4) Position the injection transformer 5-50 cm from the current monitor probe.

(5) Place a monitor loop in the injection transformer and connect a voltage monitor probe.

5.3.5 CS117 Test Procedure

The test procedures shall be as follows:

a. Turn on the measurement equipment and allow sufficient time for stabilization.

b. Calibration. Perform the following procedures using the calibration setup for waveform verification.

(1) Connect the transient generator to the primary input of the injection transformer.

(2) For each waveform, at the designated test level (VT or IT), record the voltage waveform with the calibration loop open or the current waveform with the calibration loop shorted, as applicable. Verify that each waveform complies with the relevant waveshape parameters shown on Figure CS117-1 through Figure CS117-6. It is not necessary for the transient generator to produce the associated voltage or current limit level (VL or IL) and waveshape. However, if the transient generator is capable of reaching the designated limit level (VL or IL), record and verify the limit waveform at that generator setting.

(3) For the Multiple Stroke and Multiple Burst tests, also verify the applicable pulse patterns and timing identified on Figure CS117-7 and Figure CS117-8.

(4) Reverse the transient generator polarity and repeat 5.9.5b(2) through 5.9.5b(3).

c. EUT testing.

(1) Turn on the EUT and measurement equipment to allow sufficient time for stabilization.

(2) While applying transients, increase the generator setting until the designated test level (VT or IT) or the limit level (VL or IL) is reached. Adjustments shall be made in the generator settings and/or injection transformer configuration as necessary to enable the required test level (VT or IT) to be achieved in the tested cable unless the corresponding limit level (VL or IL) is reached first. Calibration shall then be repeated if changes are made to the injection transformer configuration. Record the waveforms and amplitude levels obtained. If the limit level (VL or IL) is reached before the test level (VT or IT), the test shall be reevaluated to determine if the test is acceptable as follows:

(a) If the transient generator produced a compliant limit waveform (amplitude and waveshape) during calibration, the test is acceptable.

(b) If the specified limit waveform is achieved during the test and is within the waveshape tolerances shown on Figure CS117-1 through Figure CS117-6, the test is acceptable.

(c) If one of the above criteria is not met, then the test shall be repeated for that cable bundle using another transient generator that can meet the limit waveform requirements. In this case, the associated limit level (VL or IL) now becomes the test level (VT or IT) and the test level now becomes the limit level. Calibration shall be repeated using the substitute transient generator.

When measuring voltage or current waveform levels, short duration spikes or high frequency noise due to instrument noise, switching transients, or loading effects shall be ignored.

(3) For the Multiple Stroke test, at the generator setting established in 5.9.5c(2), apply a minimum of ten multiple stroke applications while monitoring the operation of the EUT. The maximum time between application of each Multiple Stroke transient shall be no greater than 5 minutes.

(4) For the Multiple Burst test, at the generator setting established in 5.9.5c(2), apply a multiple burst application every 3 seconds (3 seconds between the start of each set of three bursts) continuously for a minimum of 5 minutes.

(5) Reverse the transient generator polarity and repeat 5.9.5c(2) through 5.9.5c(4).

(6) Repeat 5.9.5c(2) through 5.9.5c(5) on each cable bundle interfacing with each electrical connector on the EUT. For power cables, perform 5.9.5c(2) through 5.9.5c(5) on complete power cables (high sides and returns) and on the power cables with the power returns and chassis grounds (green wires) excluded from the cable bundle. For connectors which include both interconnecting leads and power, perform 5.9.5c(2) through 5.9.5c(5) on the entire bundle, on the power leads (including returns and grounds) grouped separately, and on the power leads grouped with the returns and grounds removed.

EAR Controlled Data

TABLE VII. CS117 Test and limit levels for multiple stroke and multiple burst lightning tests.

Multiple Stroke			
Applicability	**Test Description**	**Internal Equipment Levels****	**External Equipment Levels****
All equipment installations	Waveform 2 (WF2)/ Waveform 1 (WF1)	First Stroke V_L = 300 V (WF2) I_T = 600 A (WF1) I_T = 60 A* Subsequent Strokes V_L = 150 V (WF2) I_T = 150 A (WF1) I_T = 30 A*	First Stroke V_L = 750 V (WF2) I_T = 1500 A (WF1) I_T = 150 A* Subsequent Strokes V_L = 375 V (WF2) I_T = 375 A (WF1) I_T = 75 A*
All equipment installations	Waveform 3 (WF3) – 1 MHz and 10 MHz	First Stroke V_T = 600 V (WF3) I_L = 120 A (WF3) I_L = 24 A* Subsequent Strokes V_T = 300 V (WF3) I_L = 60 A (WF3) I_L = 12 A*	First Stroke V_T = 1500 V (WF3) I_L = 300 A (WF3) I_L = 60 A* Subsequent Strokes V_T = 750 V (WF3) I_L = 150 A (WF3) I_L = 30 A*
Equipment installations routed in areas with composite skin/structure.	Waveform 4 (WF4)/ Waveform 5A (WF5A)	First Stroke V_L = 300 V (WF4) I_T = 1000 A (WF5A) I_T = 300 A* Subsequent Strokes V_L = 75 V (WF4) I_T = 200 A (WF5A) I_T = 150 A*	First Stroke V_L = 750 V (WF4) I_T = 2000 A (WF5A) I_T = 750 A* Subsequent Strokes V_L = 187.5 V (WF4) I_T = 400 A (WF5A) I_T = 375 A*
Multiple Burst			
Applicability	**Test Description**	**Internal Equipment Levels****	**External Equipment Levels****
All equipment installations	Waveform 3 (WF3) – 1 MHz and 10 MHz	V_T = 360 V (WF3) I_L = 6 A (WF3)	V_T = 900 V (WF3) I_L = 15 A (WF3)
Equipment installations that utilize short, low impedance cable bundle installations.	Waveform 6 (WF6)	V_L = 600 V (WF6) I_T = 30 A (WF6)	V_L = 1500 V (WF6) I_T = 75 A (WF6)

Notes:
*These current levels are intended for individual power leads or low count wire bundles. When multiple leads are tested together, this current shall be increased to the full bundle level or to the number of leads multiplied by the appropriate individual current test or limit level, whichever is less.
**Amplitude Tolerance is +20%,-0% for all waveforms, except the tolerance is relaxed to +50%,-0% for the Subsequent Strokes. V_T represents the test voltage level in volts and I_T represents the test current level in amperes. V_L (volts) and I_L (amperes) represent limits intended to prevent over-stressing the EUT beyond the requirements.

EAR Controlled Data

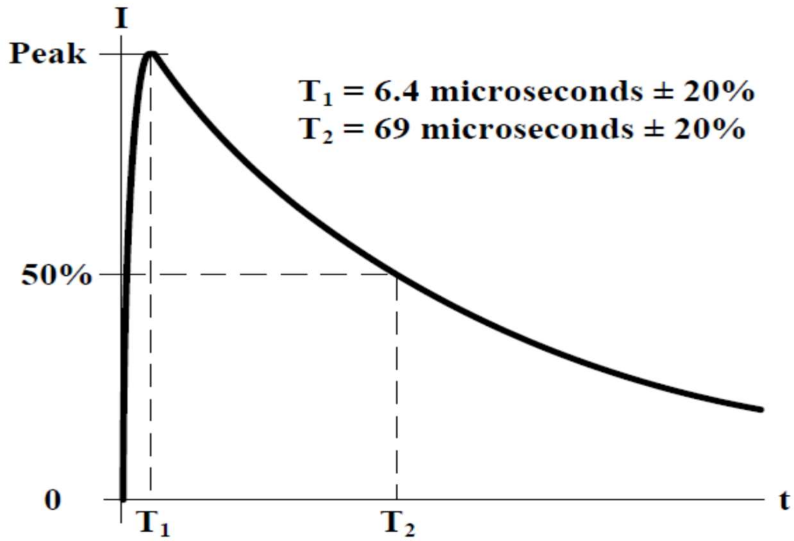


Figure CS117-1 Current Waveform 1

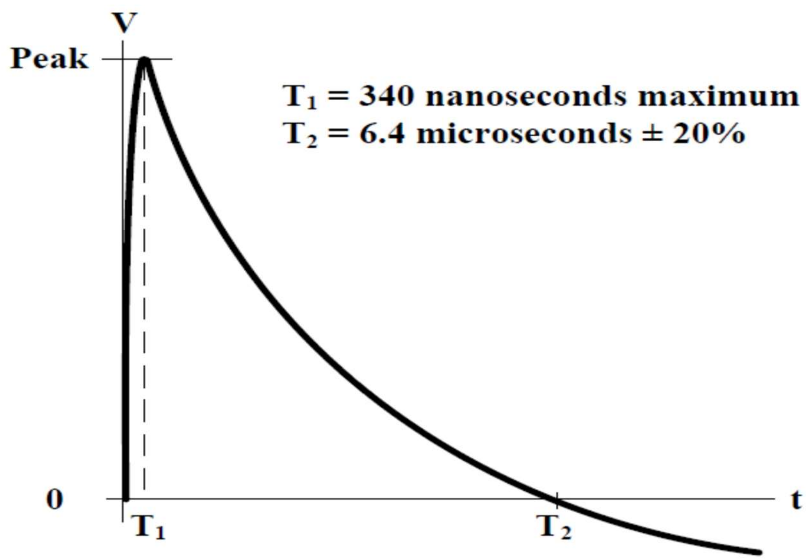


Figure CS117-2 Voltage Waveform 2

EAR Controlled Data

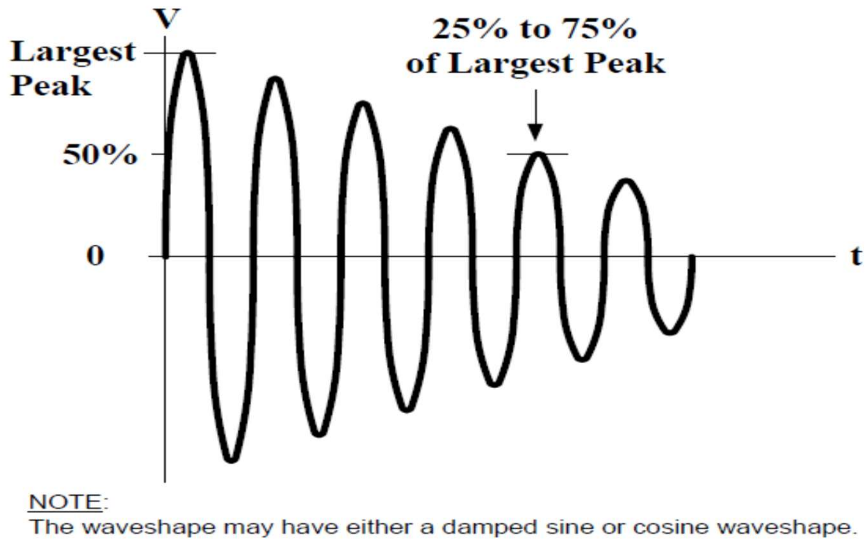


Figure CS117-3 Voltage Waveform 3

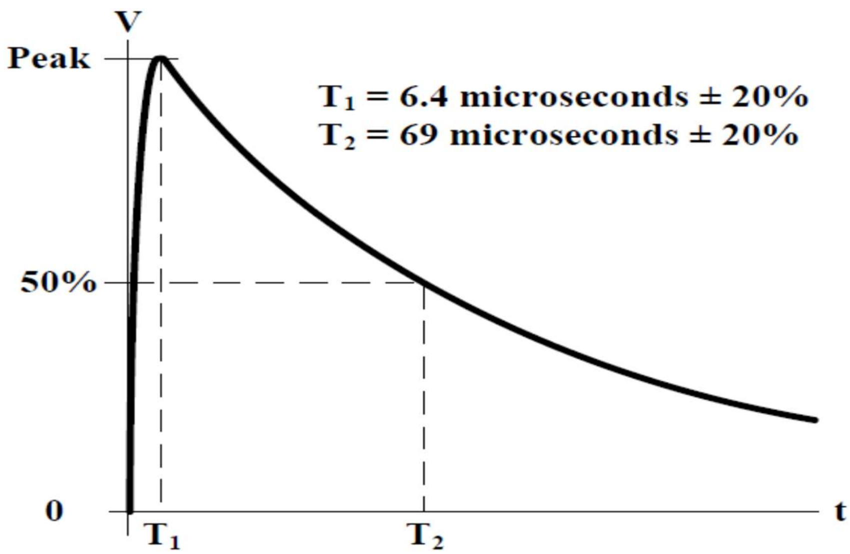


Figure CS117-4 Voltage Waveform 4

EAR Controlled Data

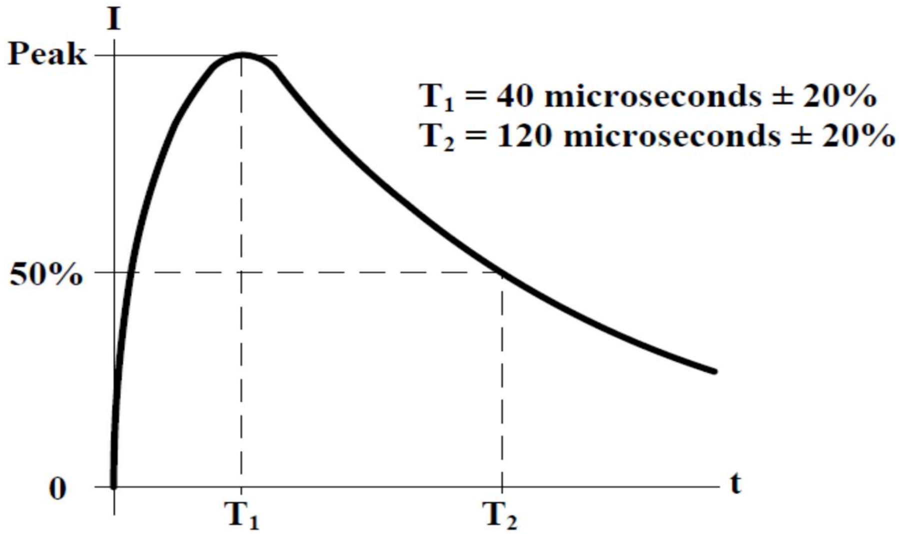


Figure CS117-5 Current Waveform 5A

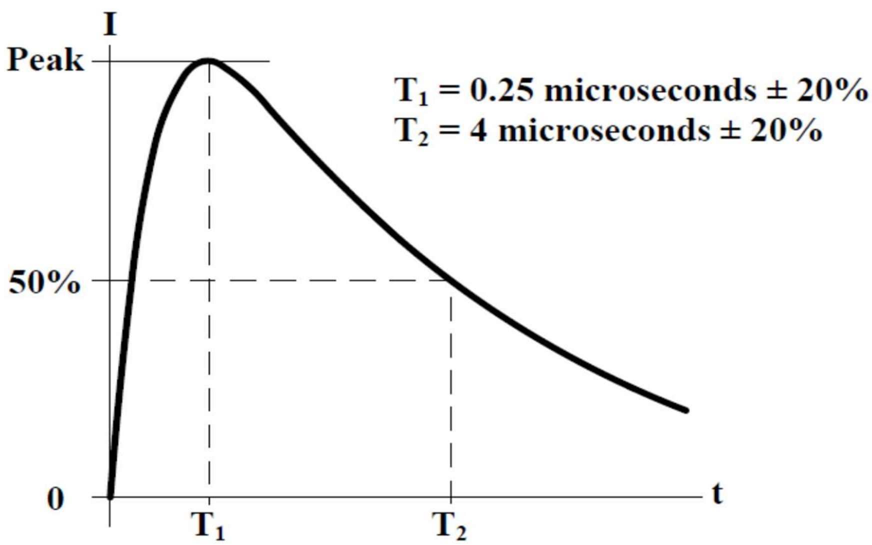


Figure CS117-6 Current Waveform 6

EAR Controlled Data

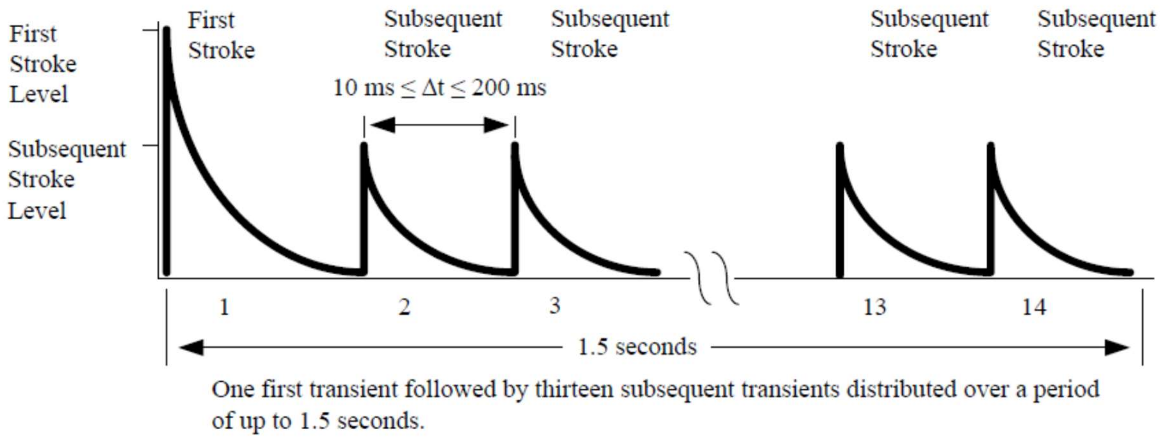


Figure CS117-7 Multiple Stroke Application

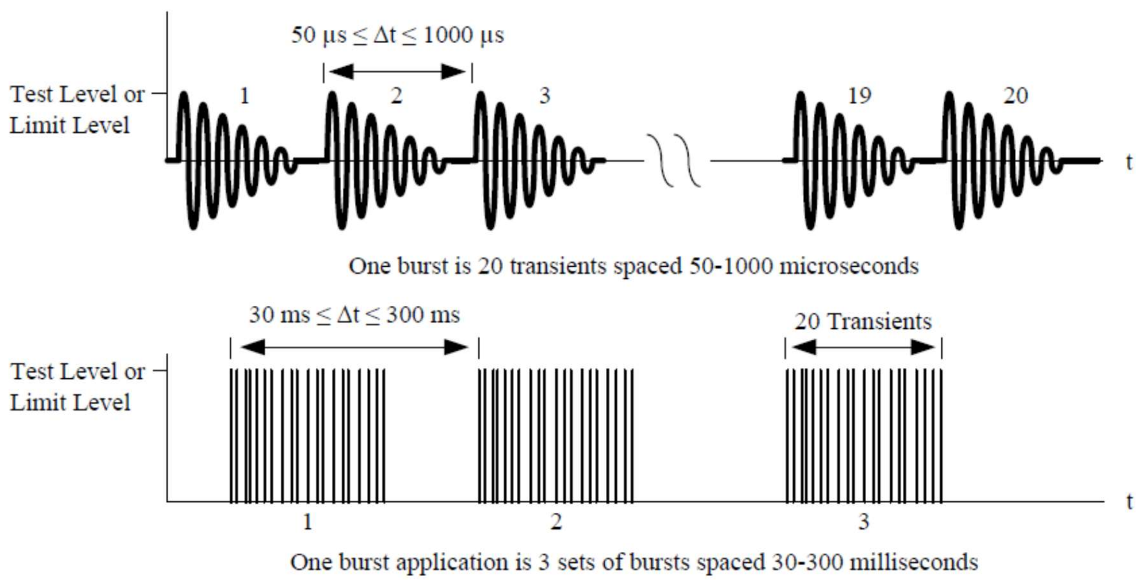


Figure CS117-8 Multiple Burst Application

EAR Controlled Data

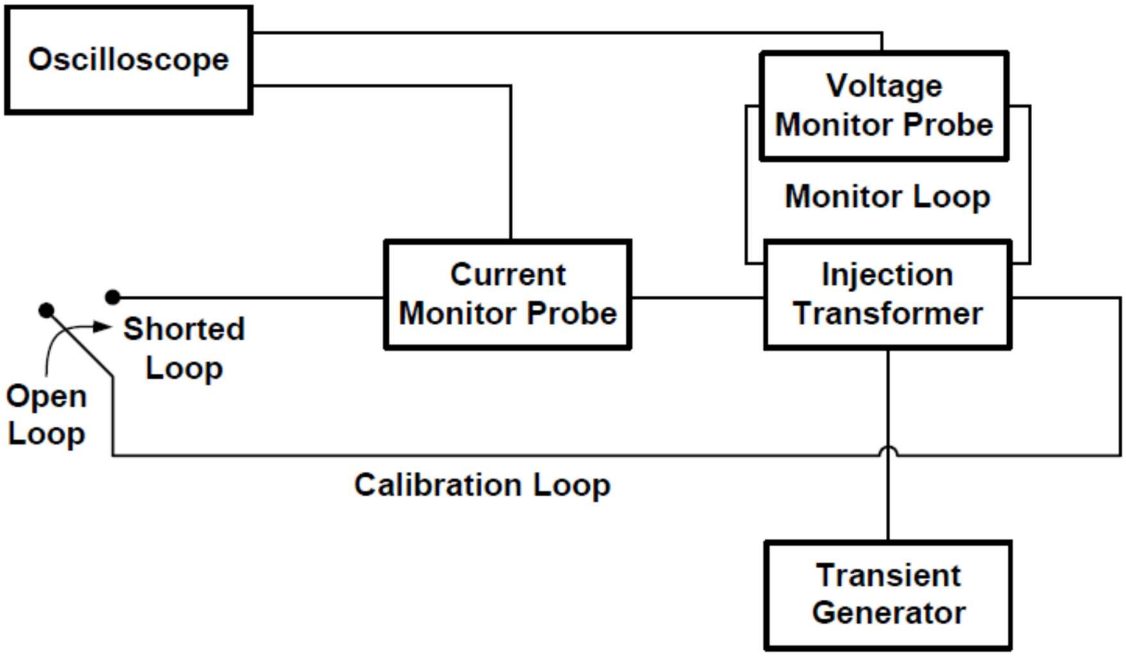


Figure CS117-9 Typical test setup for calibration of lightning waveforms

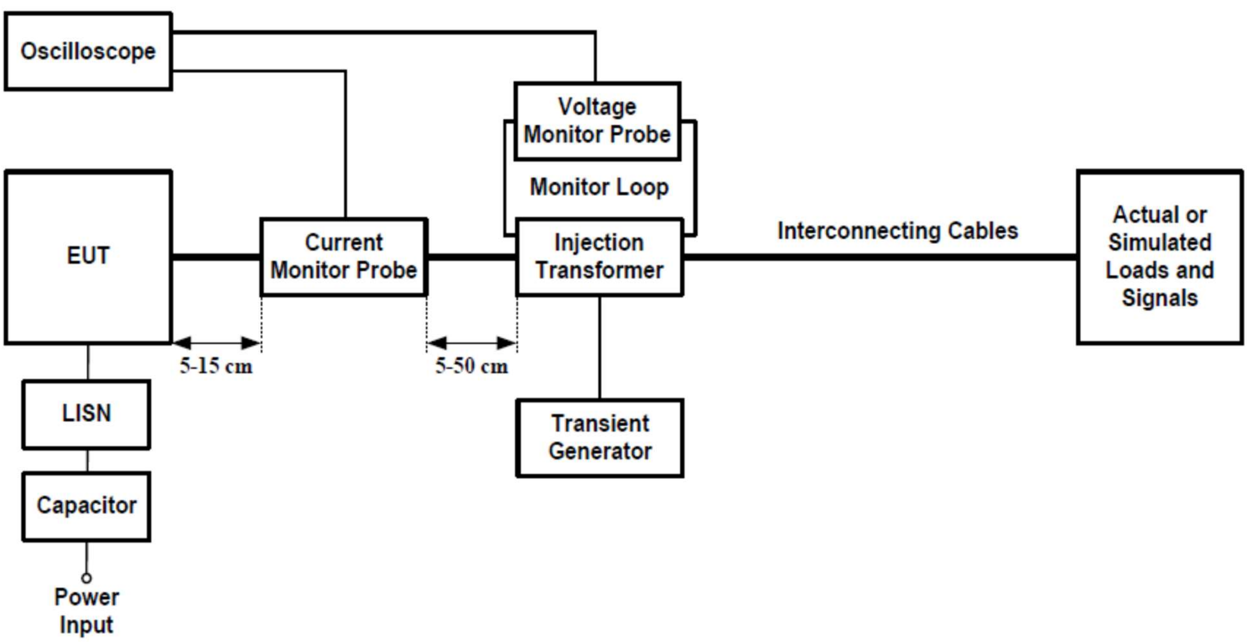


Figure CS117-10 Typical setup for bulk cable injection of lightning transients on complete interconnecting cable bundles

EAR Controlled Data

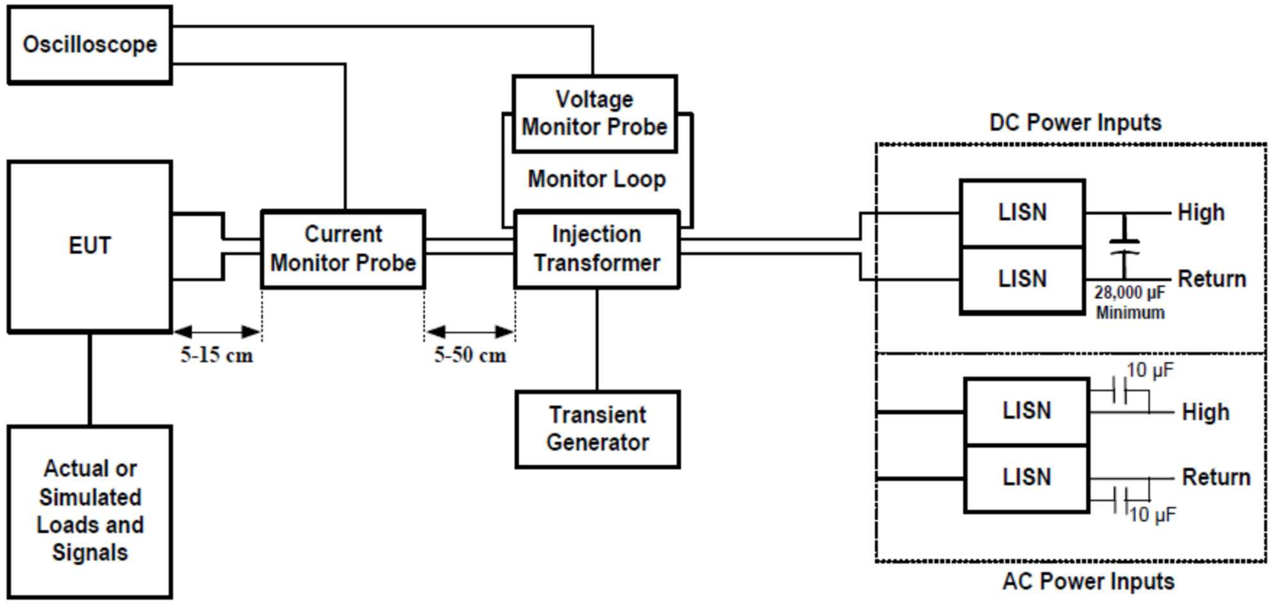


Figure CS117-11 Typical setup for bulk cable injection of lightning transients on complete power cables (high sides and returns)

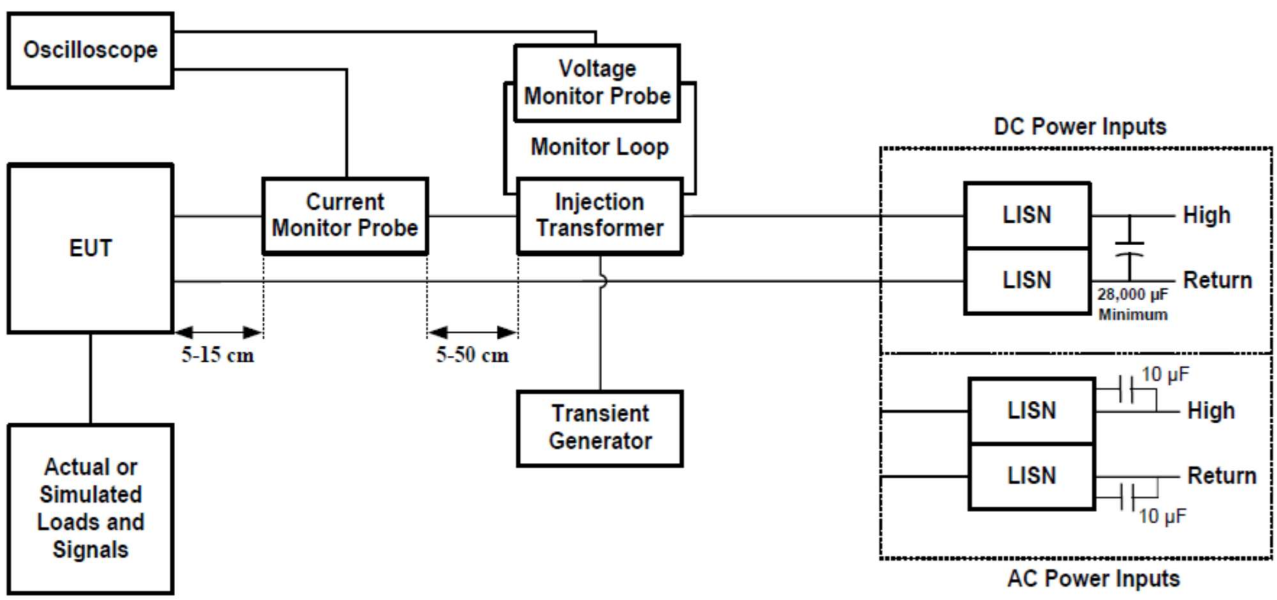


Figure CS117-12 Typical setup for bulk cable injection of lightning transients on power cables with power returns and chassis grounds excluded from the cable bundle

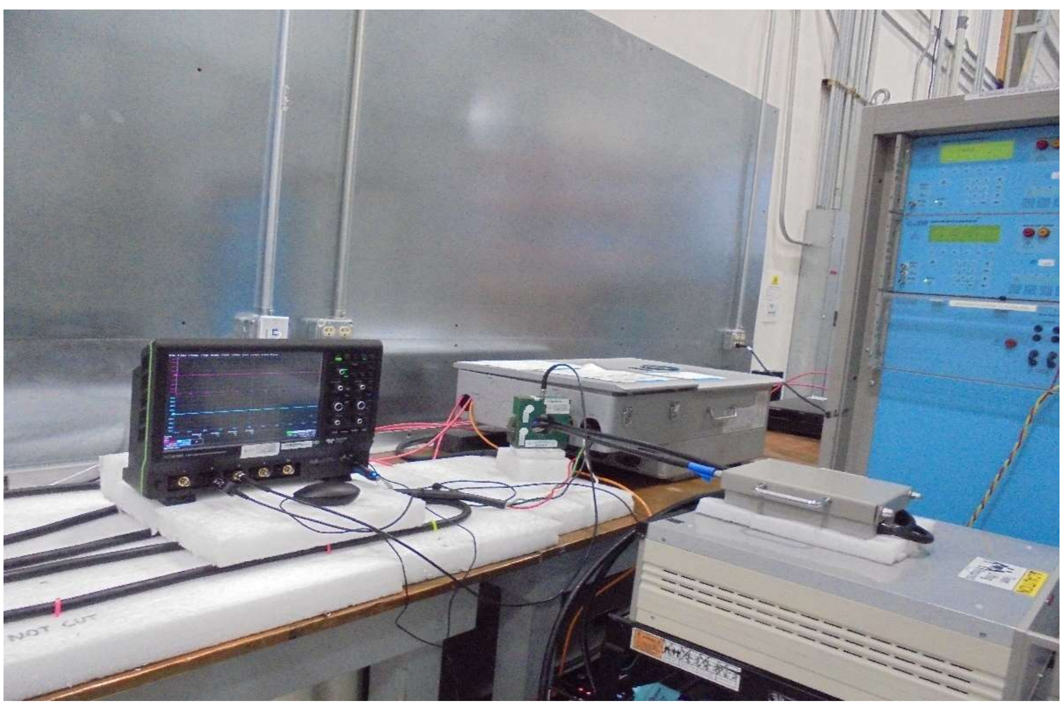
5.3.6 CS117 Test Results

The Flexboss 21 PN: IV-16000-HYB-AW-FX-00 and Flexboss 18 PN: IV-13000-HYB-AW-FX-00 **did not comply** with the requirements, please see NOD #1.

EAR Controlled Data

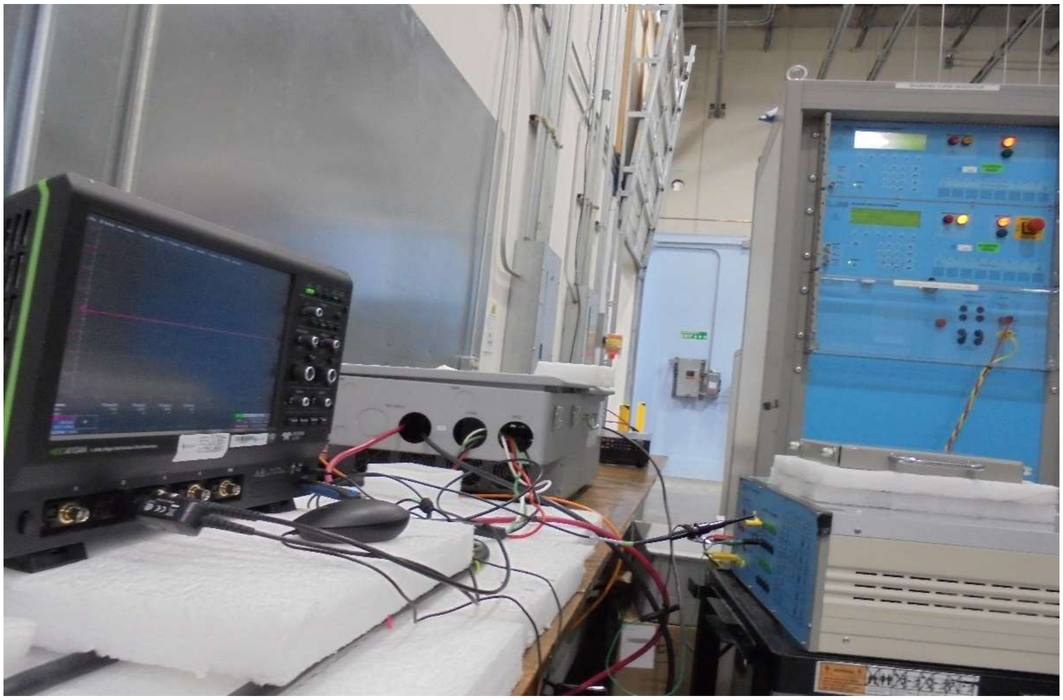
5.3.7 CS117 Test Photographs

General Test Setup for CS117, General Test Setup Waveform #1

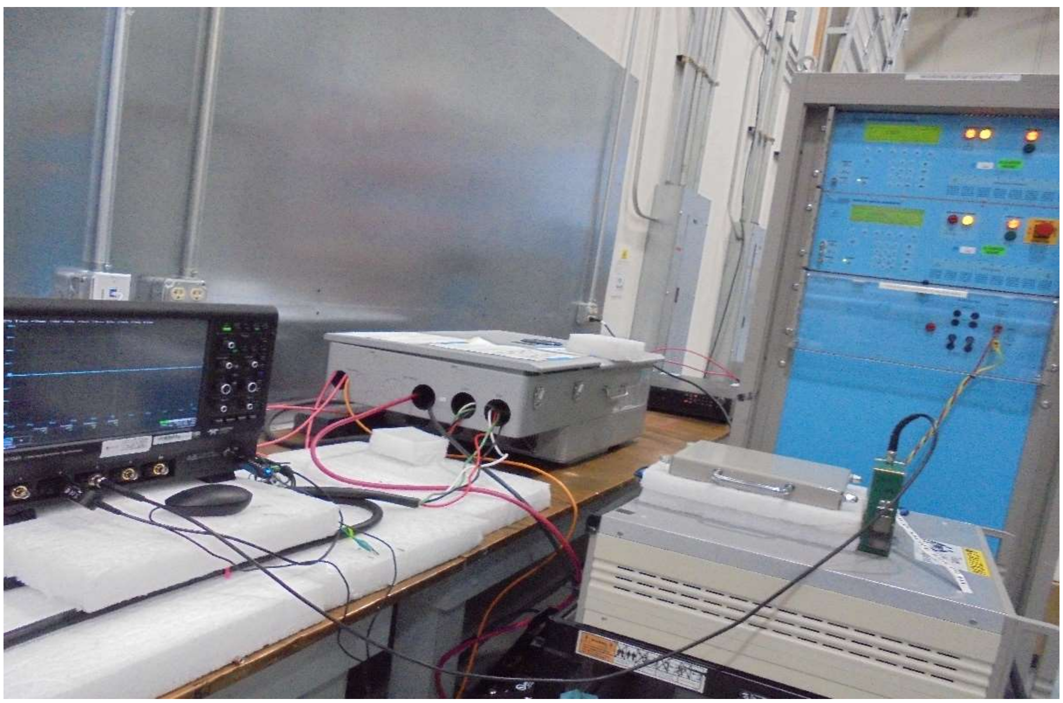


General Test Setup for CS117, General Test Setup Waveform #1

EAR Controlled Data

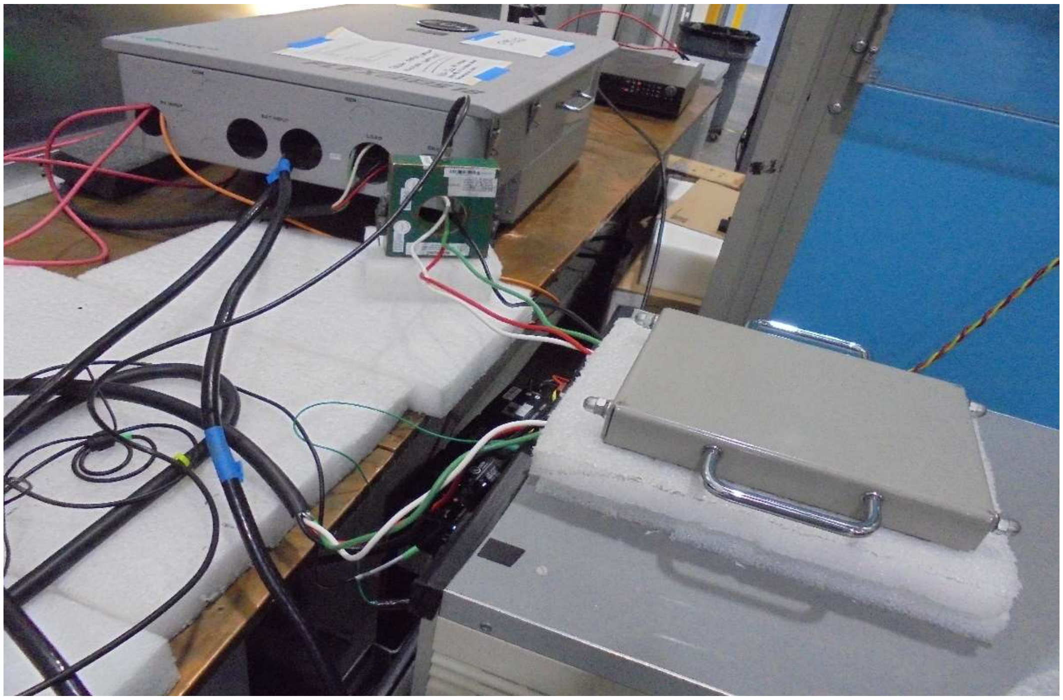


General Test Setup for CS117, Test Setup Waveform #1 – Voltage Verification

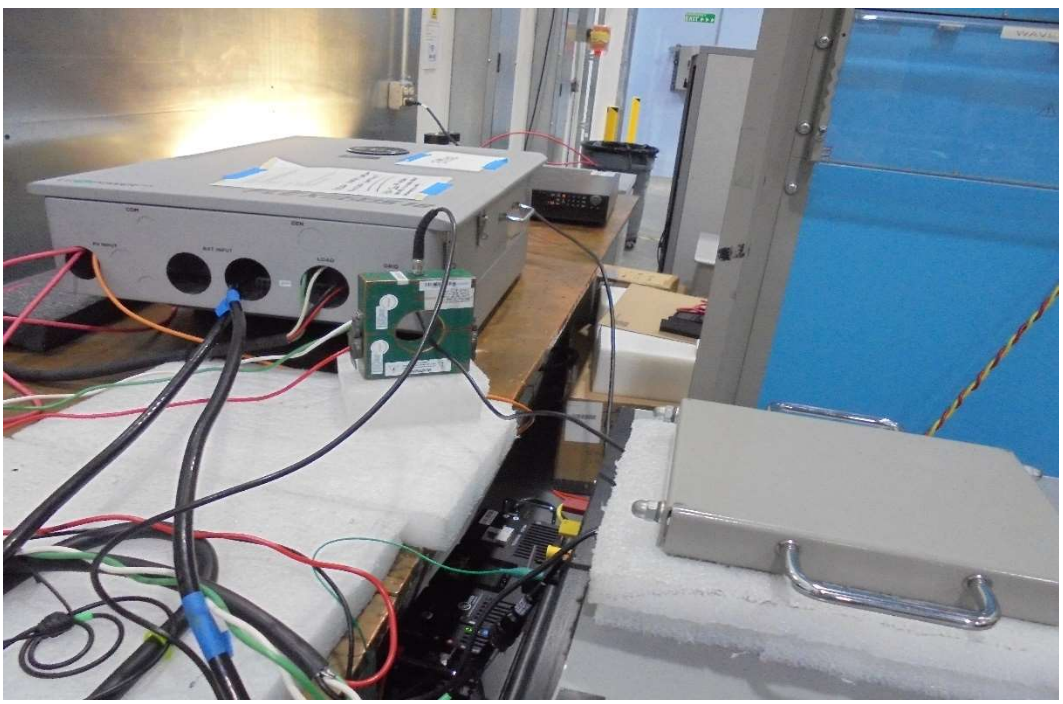


General Test Setup for CS117, Test Setup Waveform #1 – Current Verification

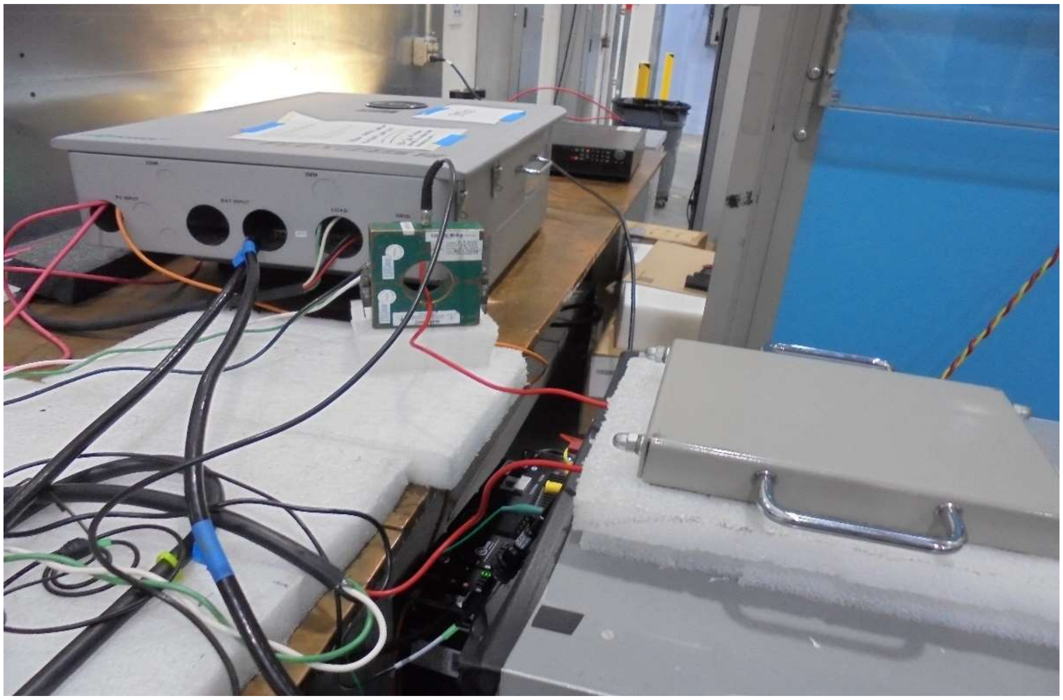
EAR Controlled Data



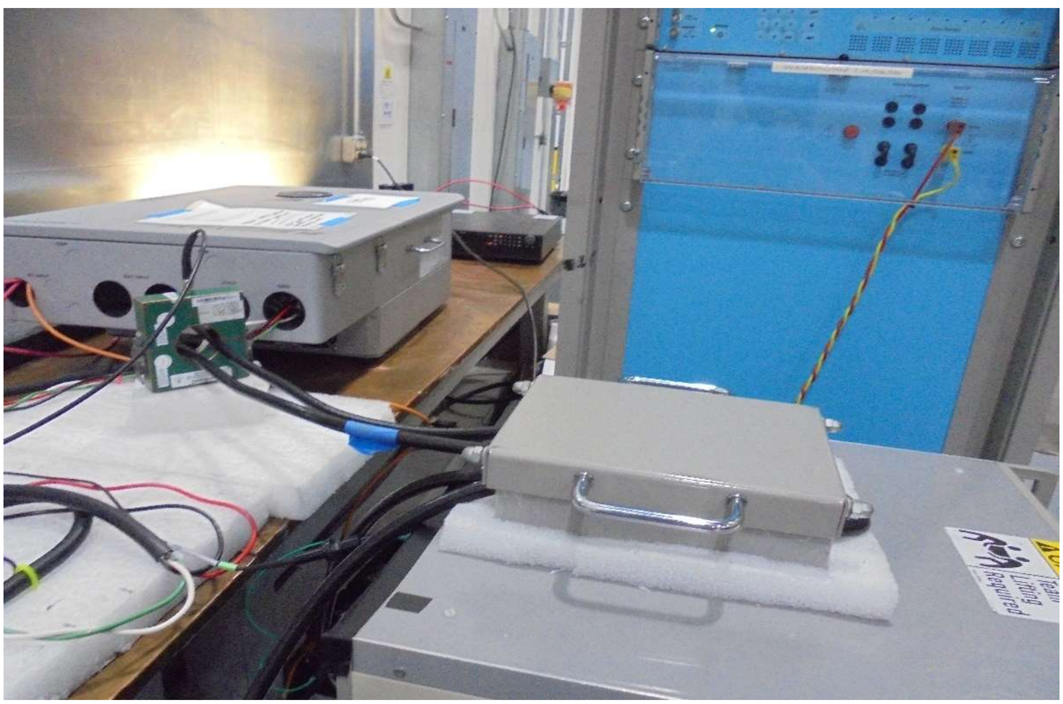
General Test Setup for CS117, Test Setup Waveform #1 – Actual Test on Full AC Bundle



General Test Setup for CS117, Test Setup Waveform #1 – Actual Test on Line 1 AC Power

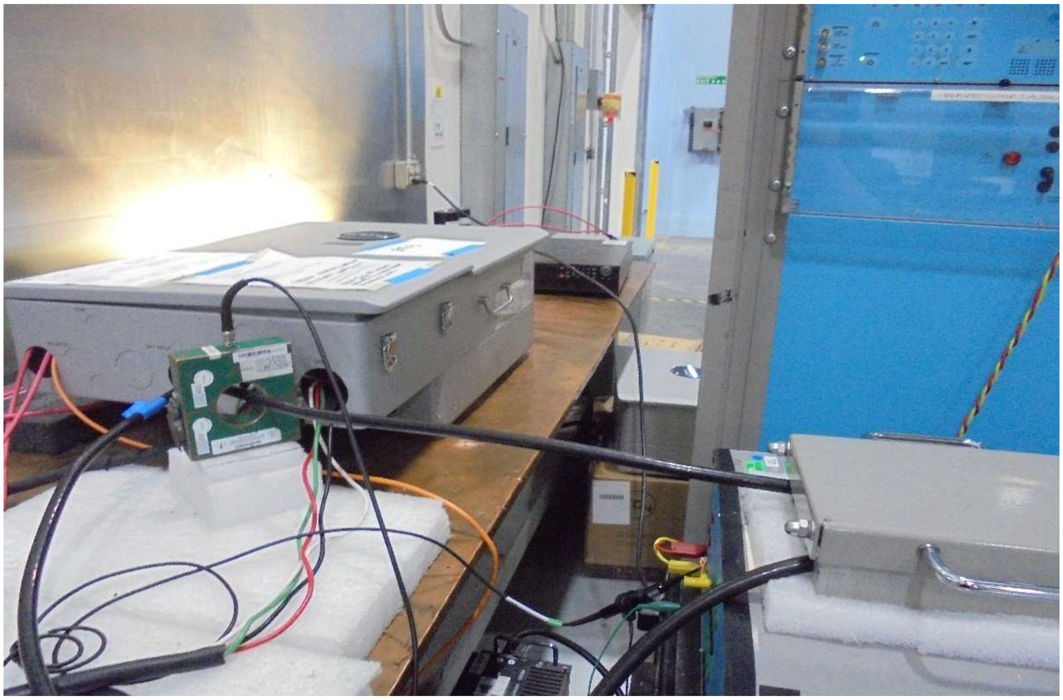


General Test Setup for CS117, Test Setup Waveform #1 – Actual Test on Line 2 AC Power



General Test Setup for CS117, Test Setup Waveform #1 – Actual Test on DC Power Bundle

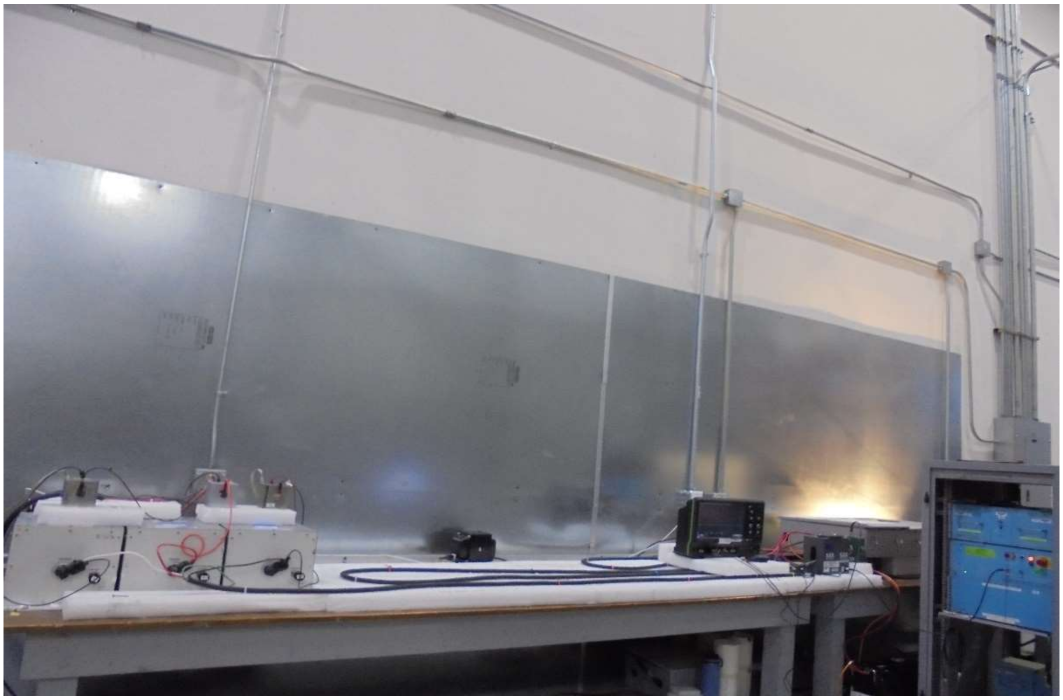
EAR Controlled Data



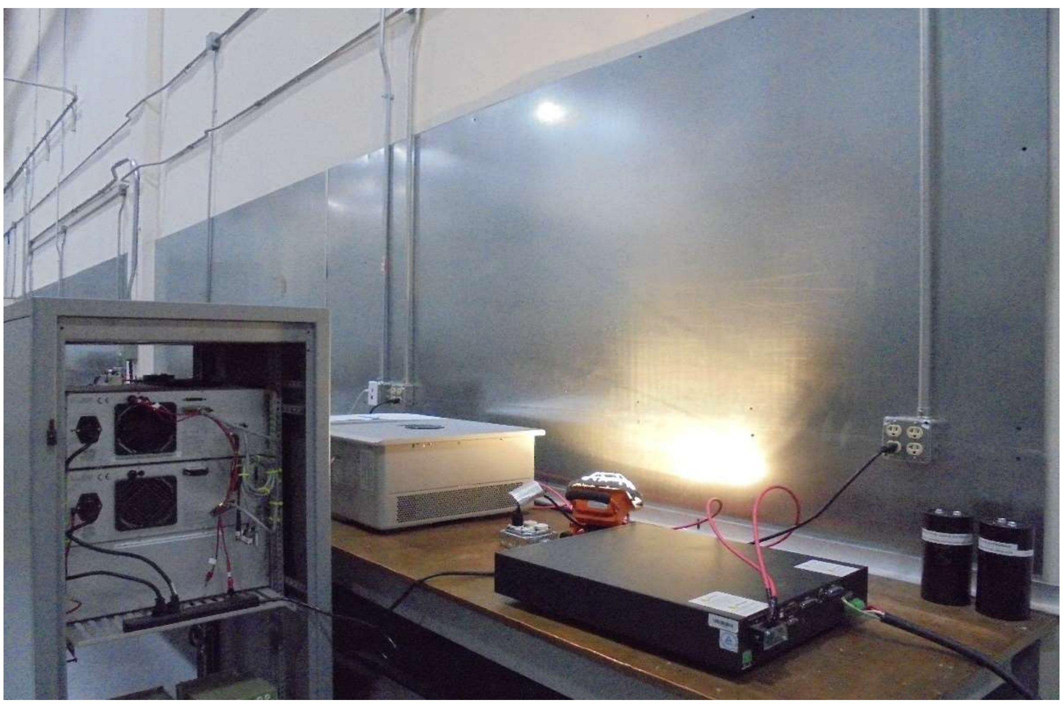
General Test Setup for CS117, Test Setup Waveform #1 – Actual Test on DC High

General Test Setup for CS117, Test Setup Waveform #1 – Actual Test on DC Return

EAR Controlled Data

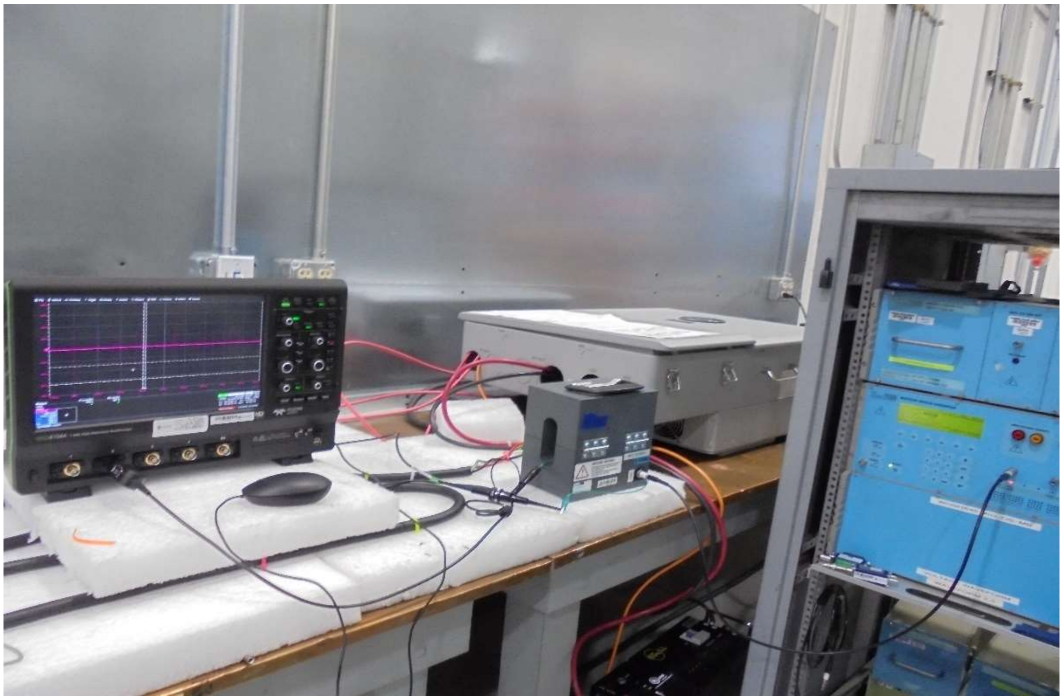


General Test Setup for CS117, General Test Setup Waveform #2 & #3

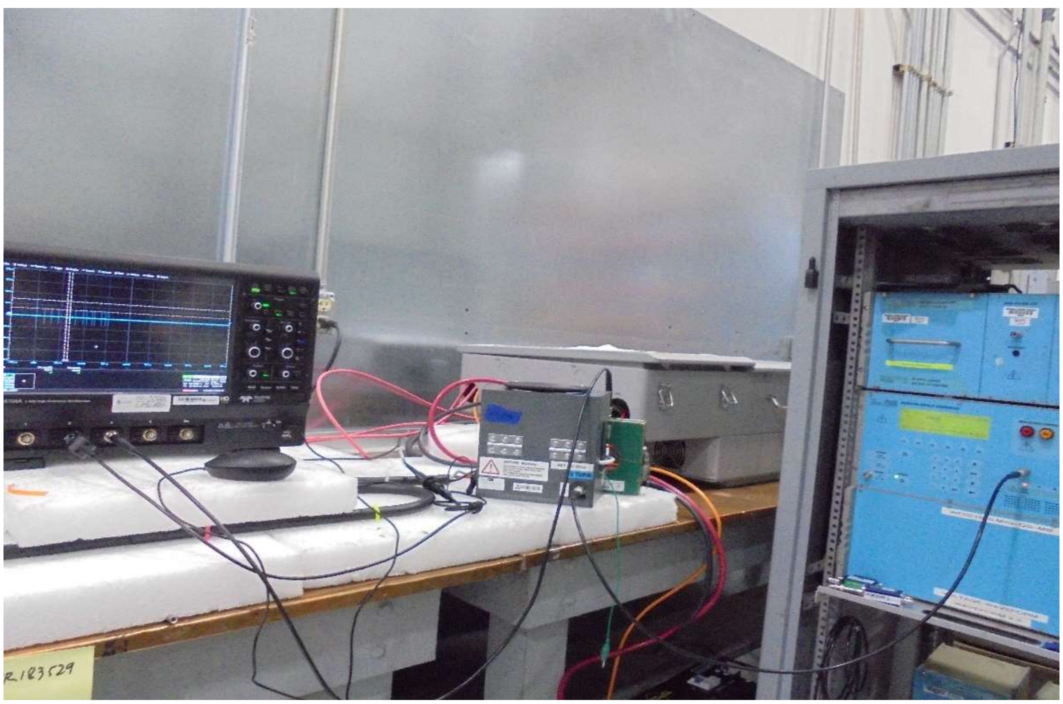


General Test Setup for CS117, General Test Setup Waveform #2 & #3

EAR Controlled Data

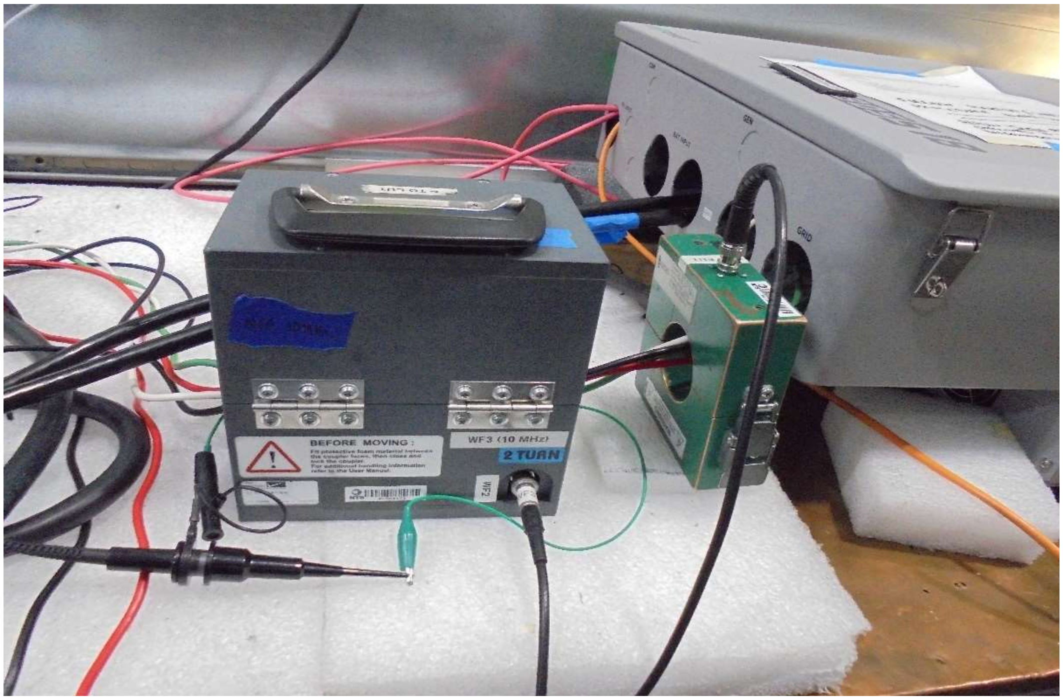


General Test Setup for CS117, Test Setup Waveform #2 & #3 – Voltage Verification

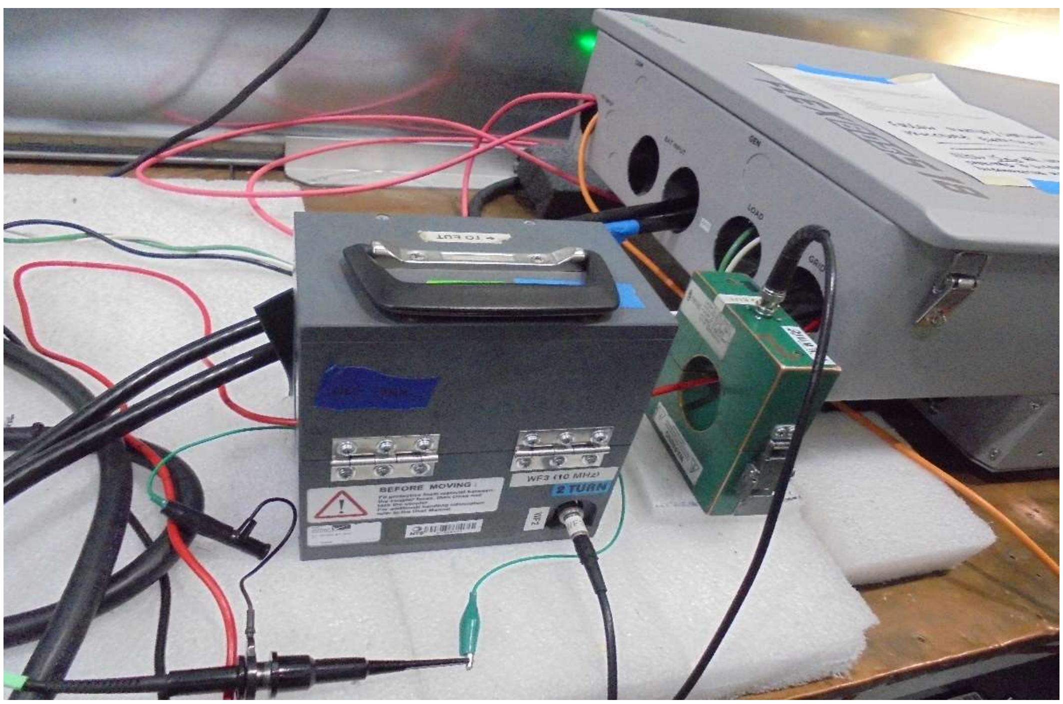


General Test Setup for CS117, Test Setup Waveform #2 & #3 – Current Verification

EAR Controlled Data

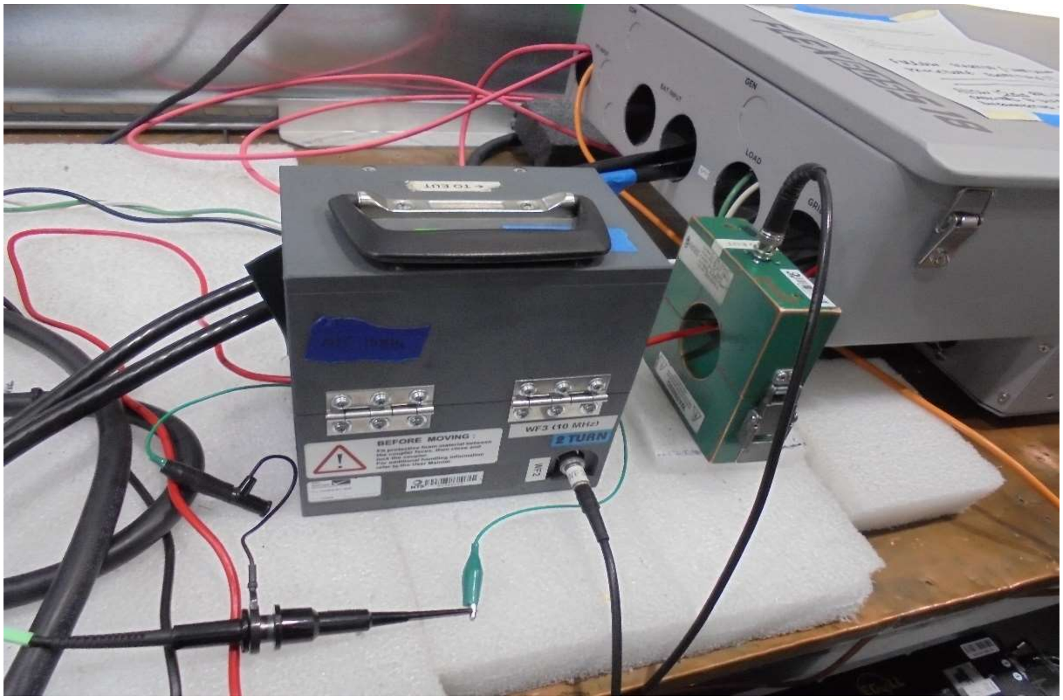


General Test Setup for CS117, Test Setup Waveform #2 & #3 – Actual Test on Full AC Bundle

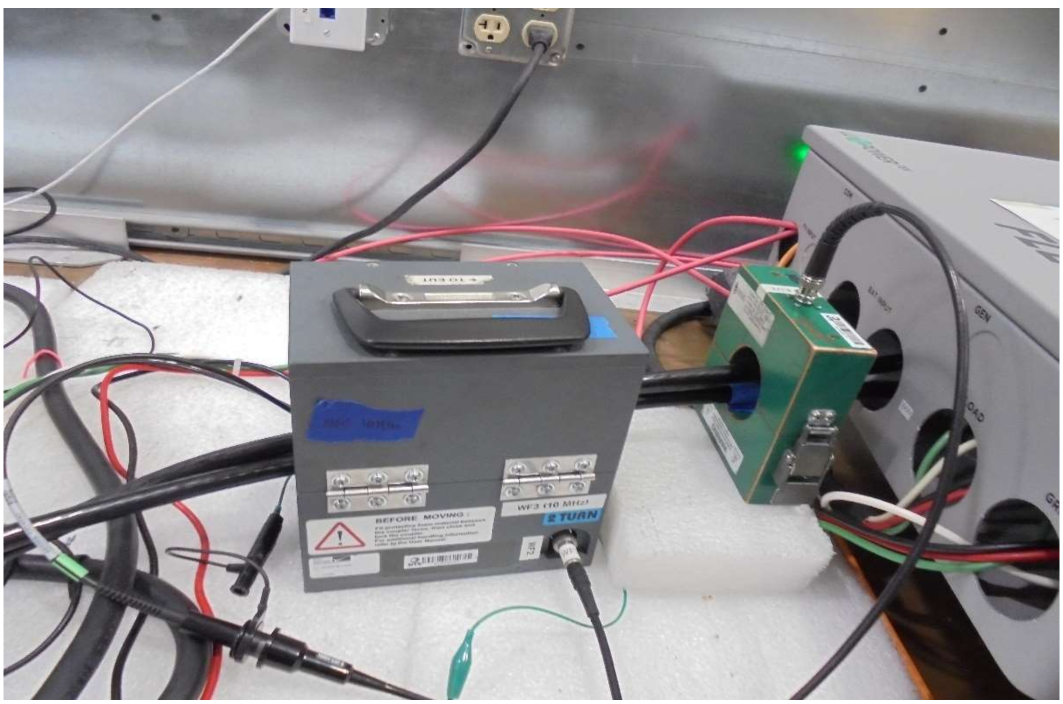


General Test Setup for CS117, Test Setup Waveform #2 & #3 – Actual Test on Line 1 AC Power

EAR Controlled Data

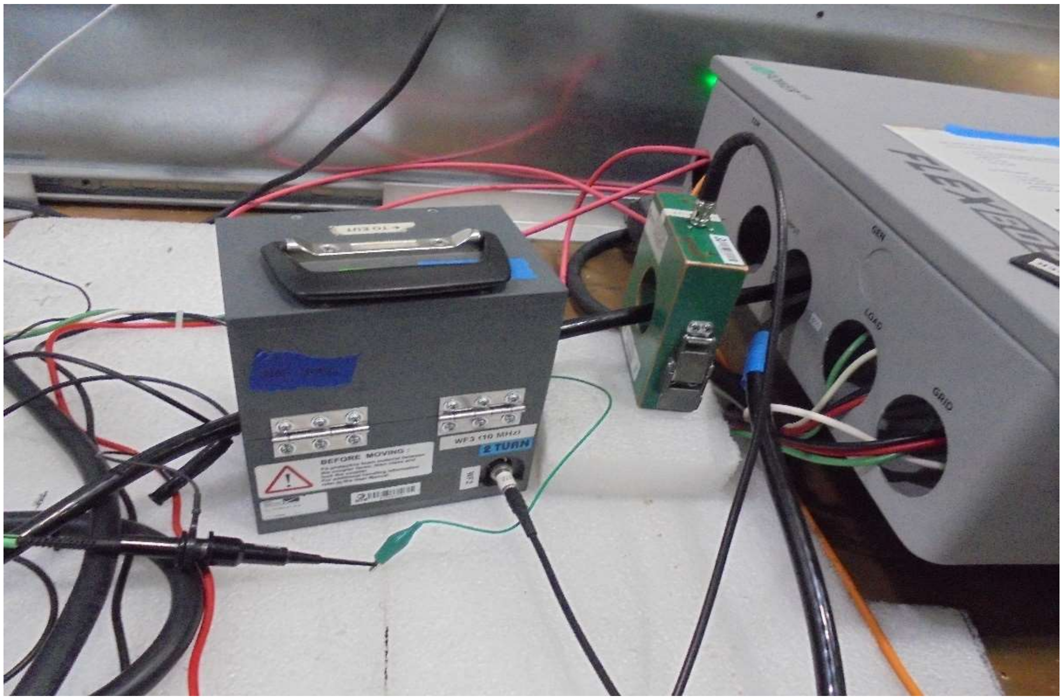


General Test Setup for CS117, Test Setup Waveform #2 & #3 – Actual Test on Line 2 AC Power

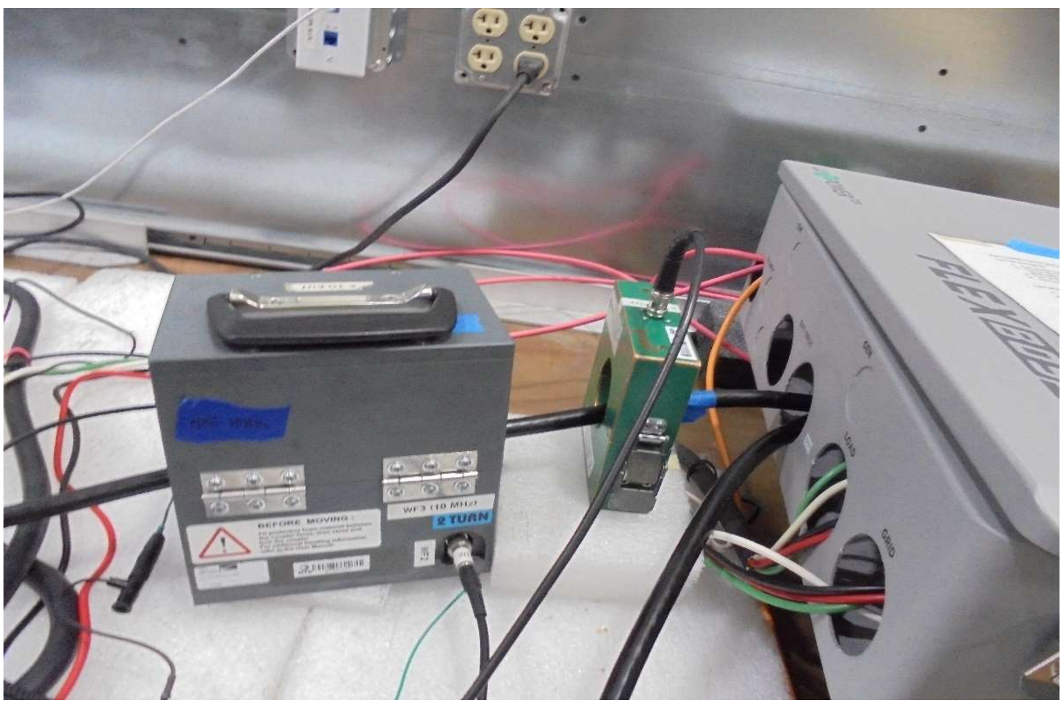


General Test Setup for CS117, Test Setup Waveform #2 & #3 – Actual Test on DC Power Bundle

EAR Controlled Data



General Test Setup for CS117, Test Setup Waveform #2 & #3 – Actual Test on DC High



General Test Setup for CS117, Test Setup Waveform #2 & #3 – Actual Test on DC Return

5.3.8 CS117 Test Data

element

NOTICE OF DEVIATION

Customer:	EG4 Electronic	Job #:	PR1901121	NOD #:	1
P. O. #:	POEG42006	Date of Deviation:	5/13/2025	CAR #:	
Notification Made To: *(Customer Contact)*	Ashwanth Prabakar	Notification Made By:	Johnny Vu		
If notification was not made, provide justification:					
Date:	5/13/2025	Via:	Email		
Test:	CS117	Test Item:	Flexboss 21&Flexboss 18		
Specification:	MIL-STD 461G	Model or P/N:	IV-16000-HYB-AW-FX-00 and IV-13000-HYB-AW-FX-00		
Revision/Date:	Dec 2015	Serial Number:	45000E0018 and 50301N0067		

REQUIREMENTS: *(Reference paragraph or section of specification)*

The EUT shall not exhibit any malfunction, degradation of performance, or deviation from specified indications, beyond the tolerances indicated in the individual equipment or subsystem specification, when subjected to the levels and lightning transients specified in Table VII and supplemented by the waveform and timing definitions shown on Figures CS117-1 through CS117-8

DESCRIPTION OF DEVIATION

Throughout the test, the normal light with the green LED indicator was turned on and off. The warning light was also turned on. The EUT was operating as intended during the test.

DISPOSITIONS/COMMENTS/RECOMMENDATIONS:

Continue test.

		[signature]	5/15/2025
Customer Disposition Authorization	Date	Element Quality Representative	Date
[signature]	5/15/2025		
Element Project Manager	Date	Government QAR (if applicable)	Date

NOTE: IT IS THE CUSTOMER'S RESPONSIBILITY TO ANALYZE AND DISPOSITION DEVIATIONS ON CUSTOMER TEST PROGRAMS.

FOR Element QA USE:	*Tracking Code:*	5
	Risk Level:	Low

Tracking Codes:

1. Employee Error - Training	*2. Employee Error - Process*	*3. Test Equipment Problem*	*4. Equipment Limitations*	*5. Customer Item Problem*	*6. Other*

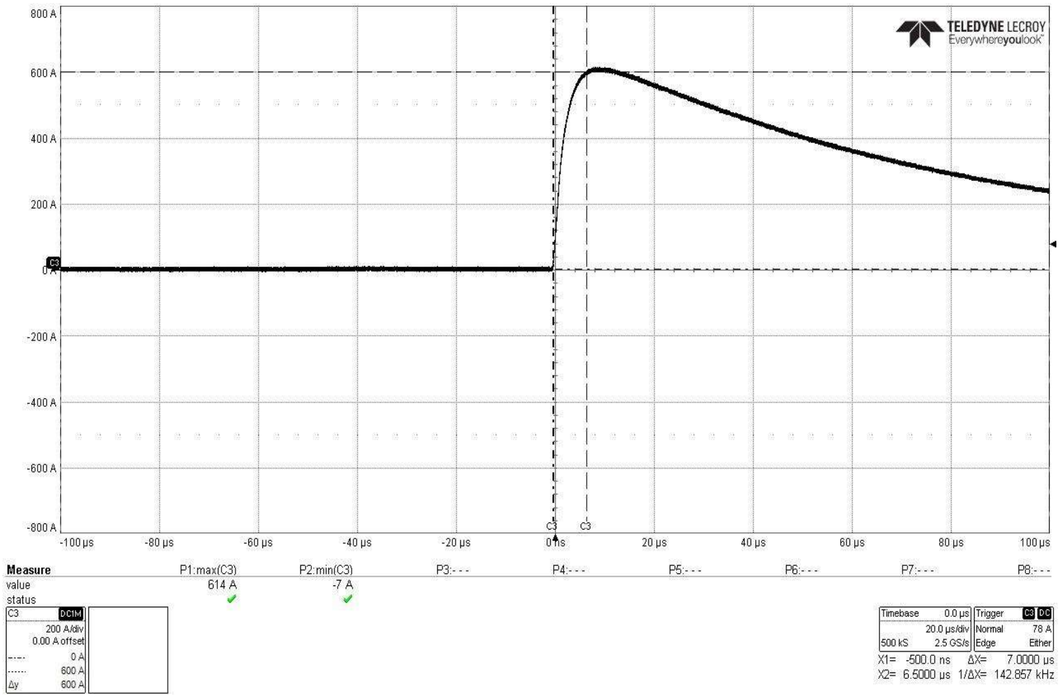
Risk Levels:

Low	*Medium*	*High*

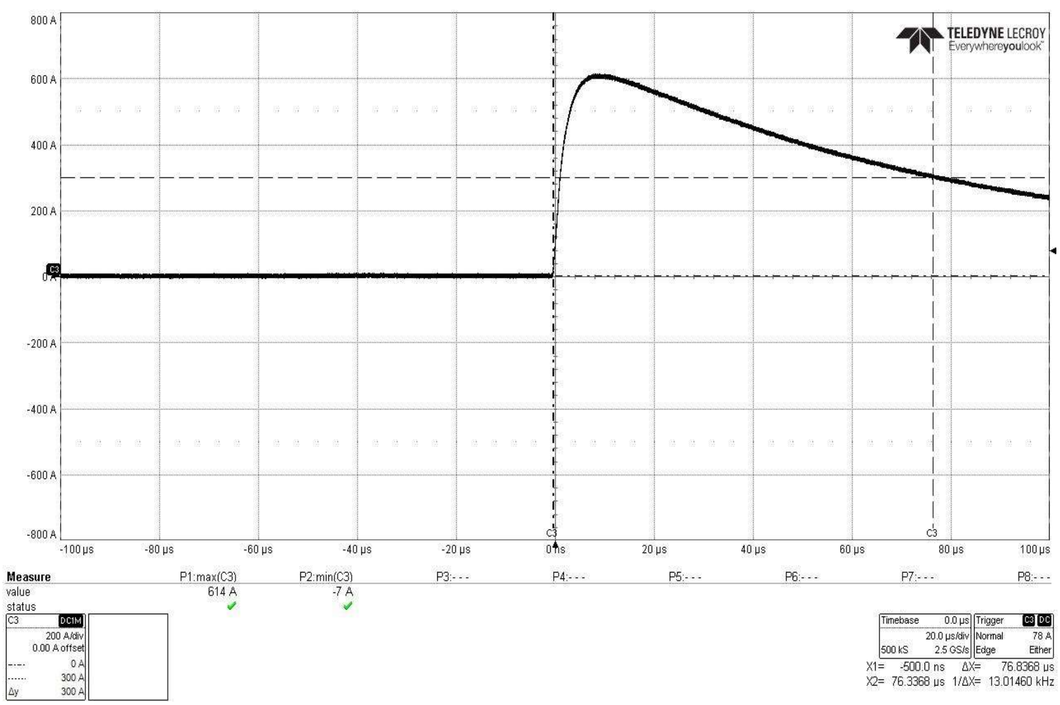
COR 16.0, REV. 8

EAR Controlled Data

CS117 Current Verification Multiple Stroke Waveform #1 at 600A

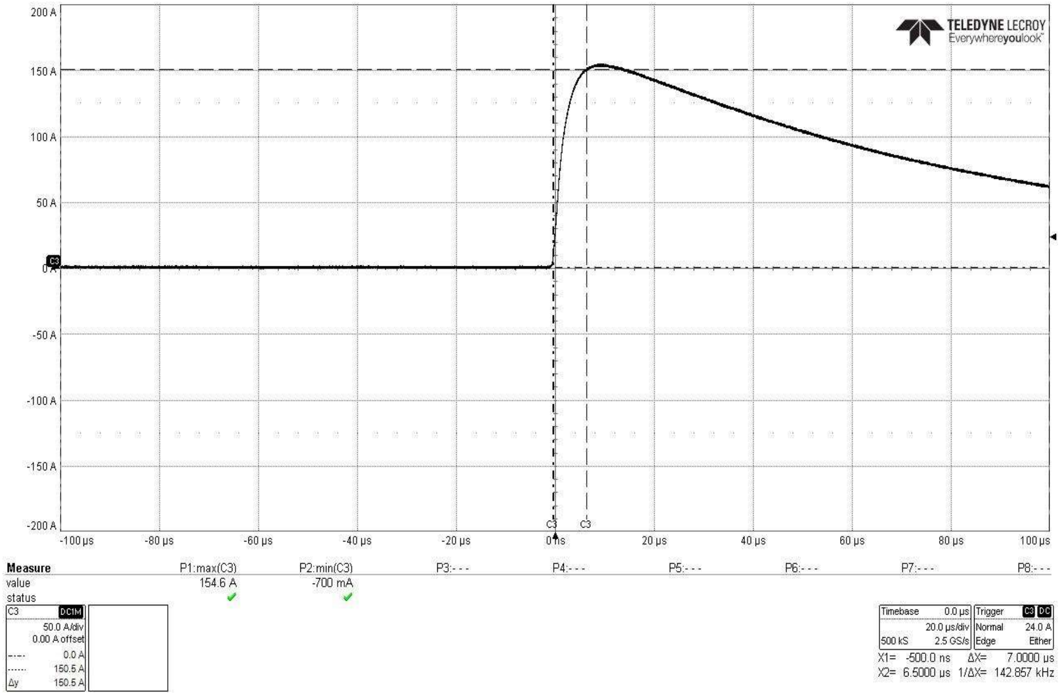


CS117 Current Verification Waveform #1, First Transient +600A, T1

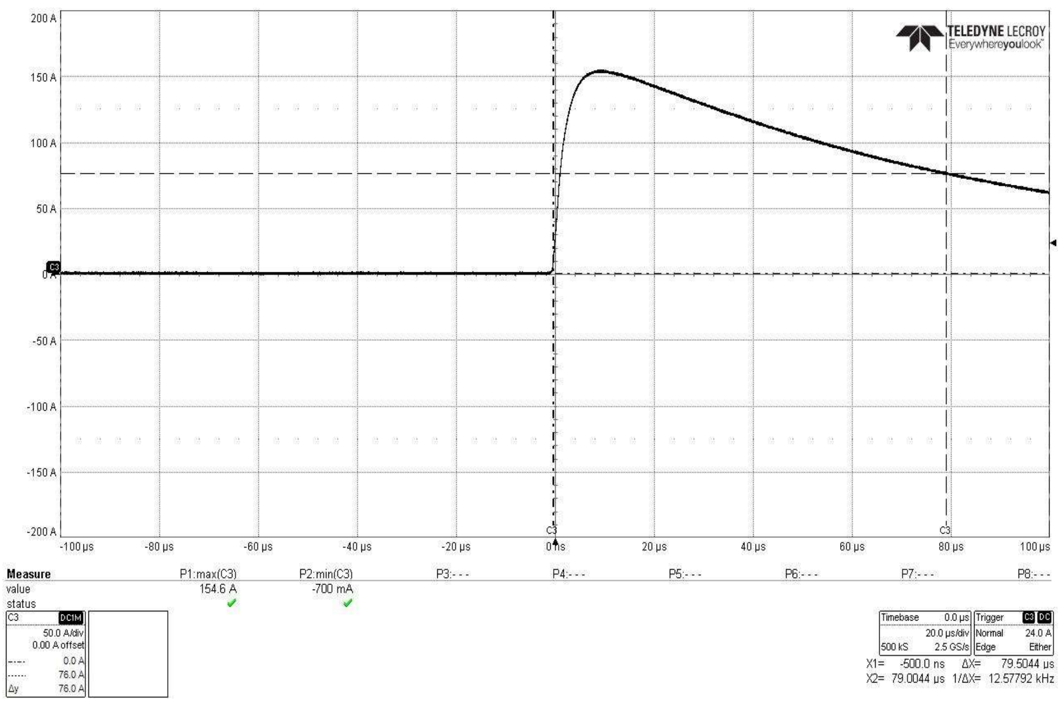


CS117 Current Verification Waveform #1, First Transient +600A, T2

EAR Controlled Data

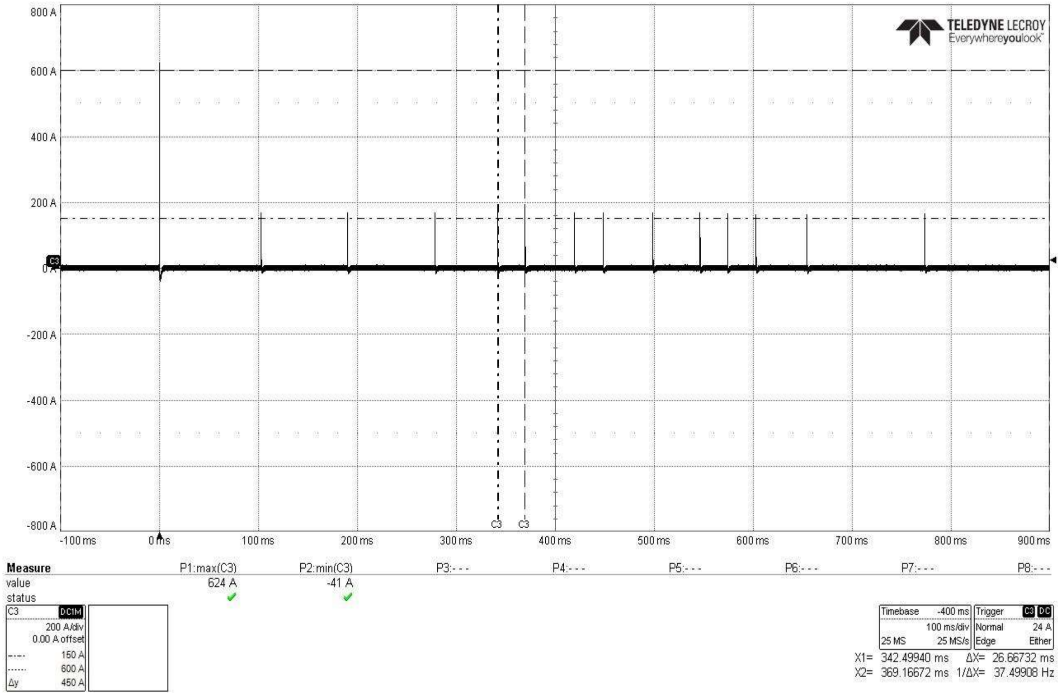


CS117 Current Verification Waveform #1, Subsequent Transient +150A, T1

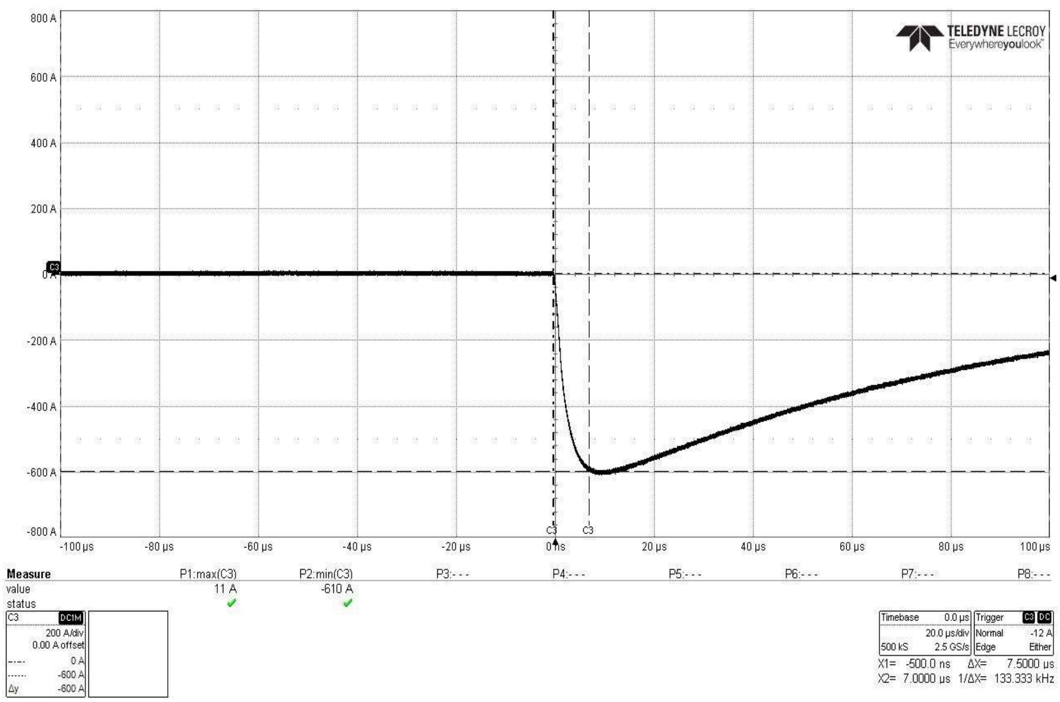


CS117 Current Verification Waveform #1, Subsequent Transient +150A, T2

EAR Controlled Data

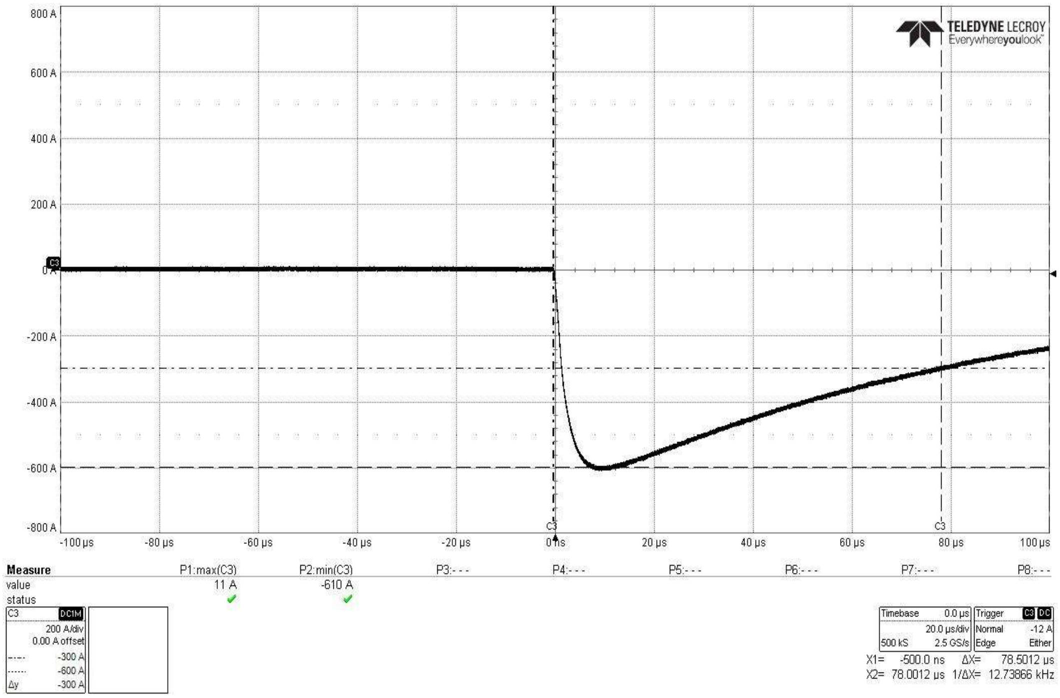


CS117 Current Verification Waveform #1, 14 Transients +600A/150A

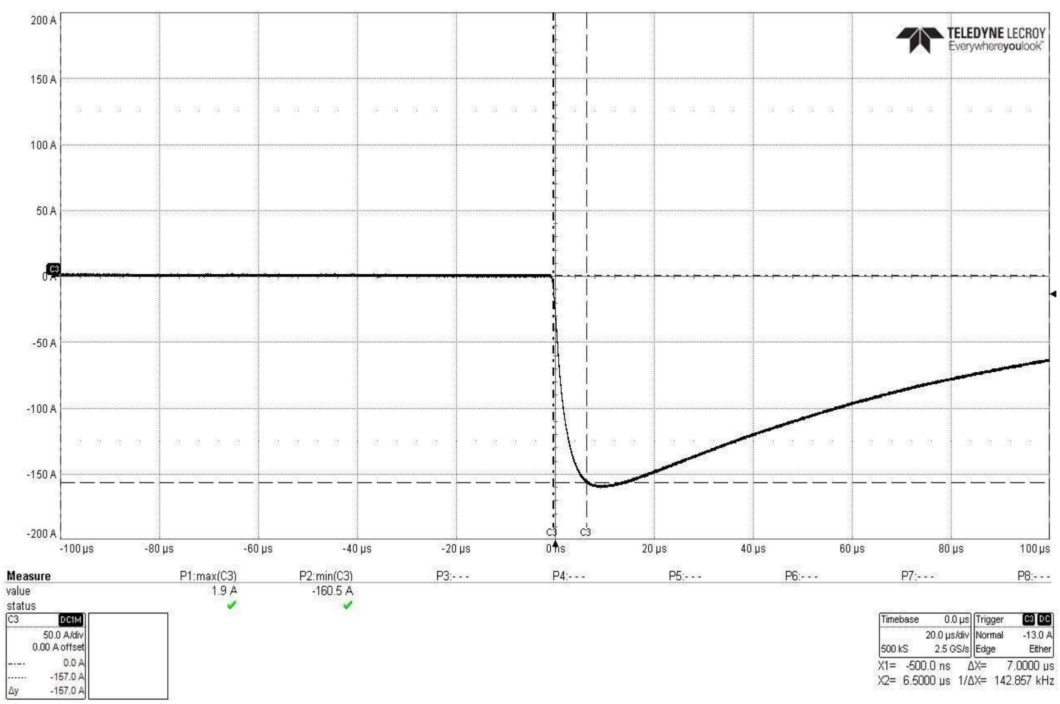


CS117 Current Verification Waveform #1, First Transient -600A, T1

EAR Controlled Data

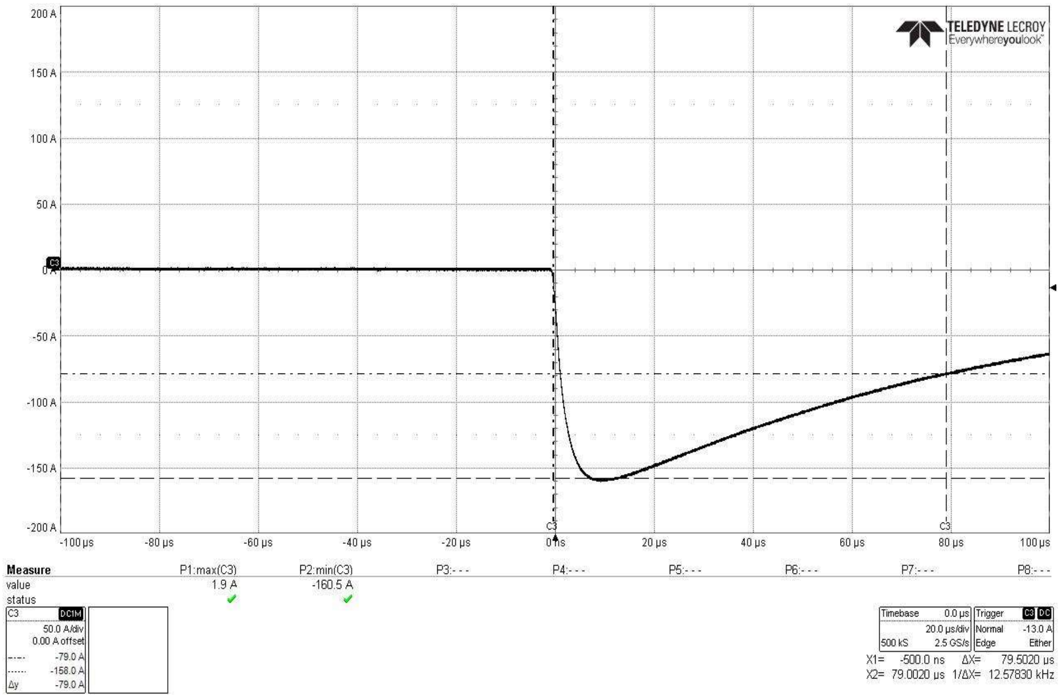


CS117 Current Verification Waveform #1, First Transient -600A, T2

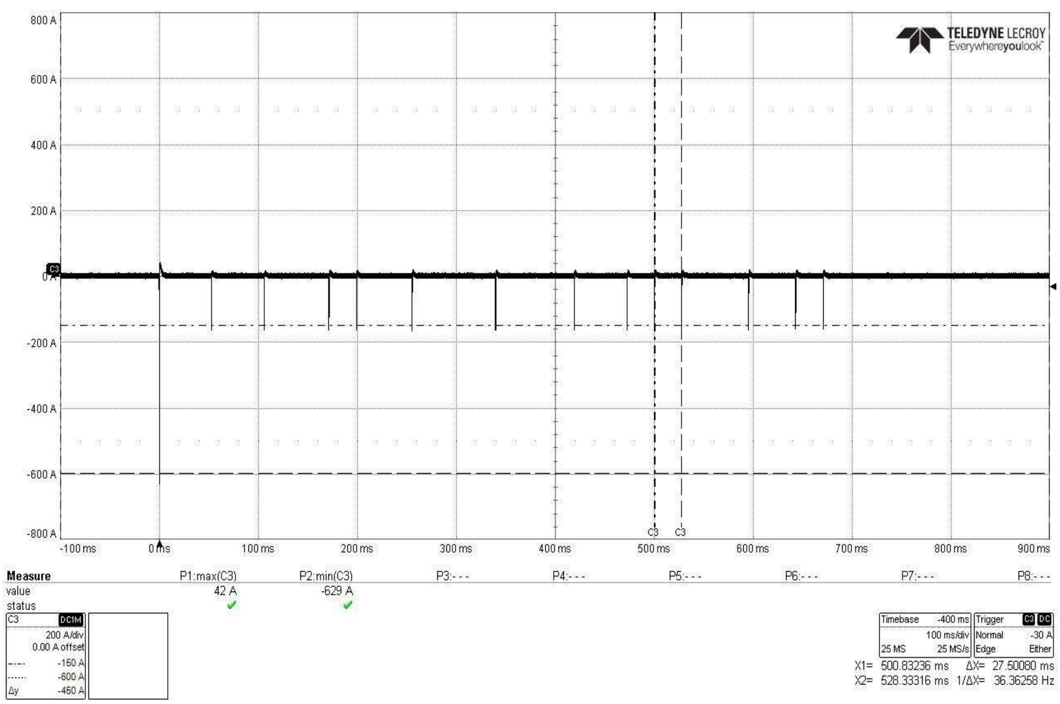


CS117 Current Verification Waveform #1, Subsequent Transient -150A, T1

EAR Controlled Data

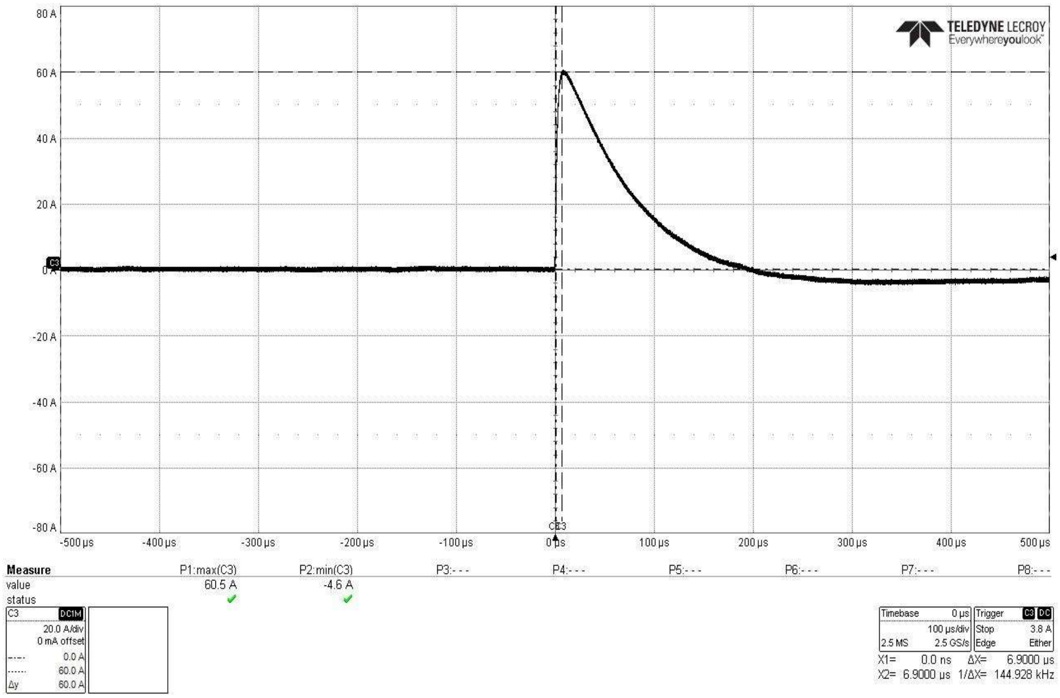


CS117 Current Verification Waveform #1, Subsequent Transient -150A, T2

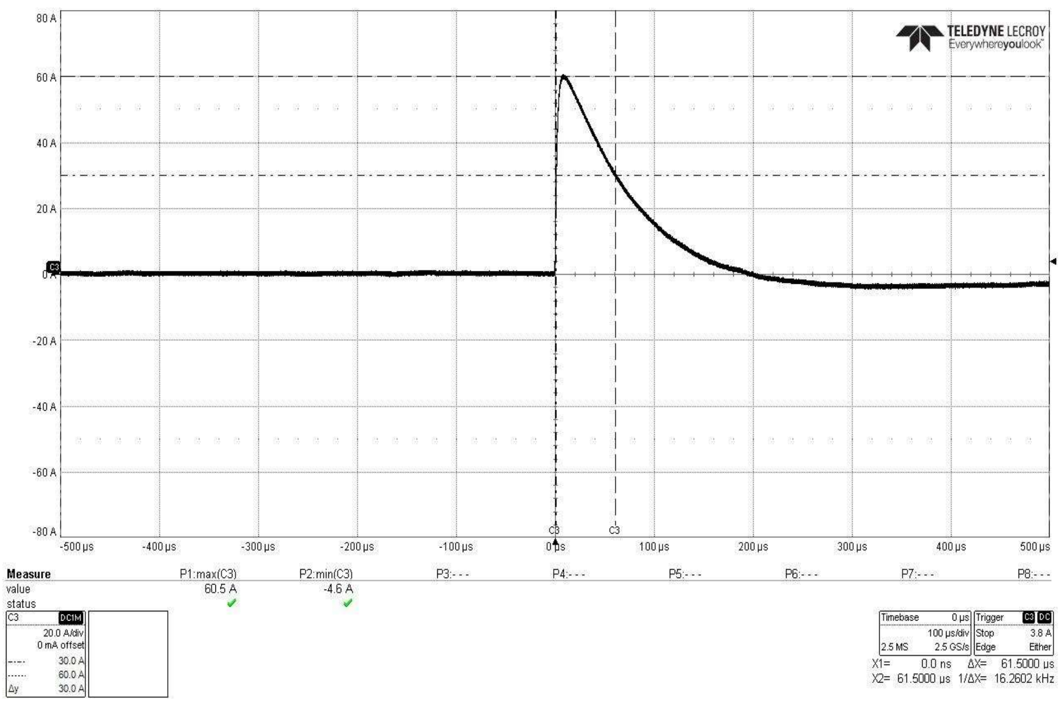


CS117 Current Verification Waveform #1, 14 Transients -600A/150A

EAR Controlled Data

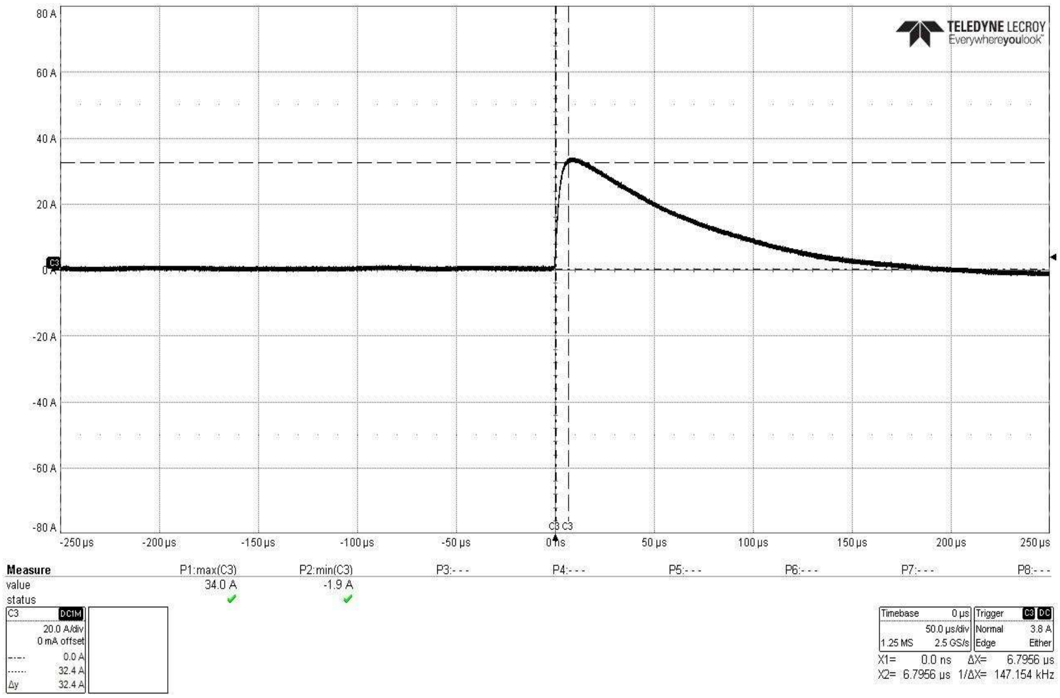


CS117 Current Verification Waveform #1, First Transient +60A, T1

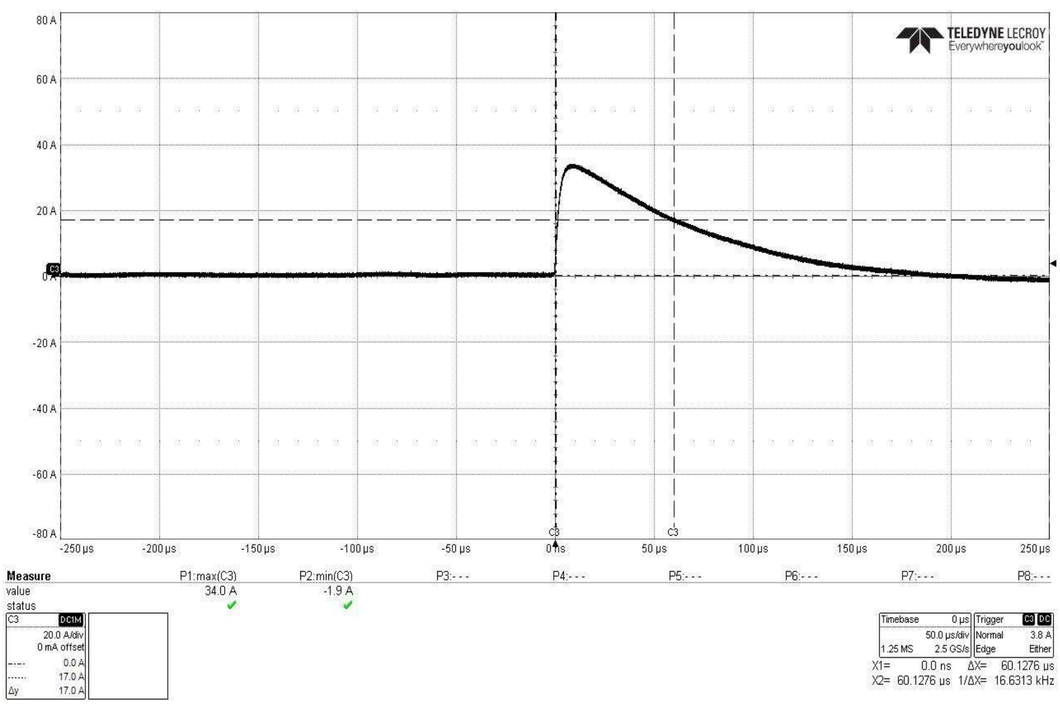


CS117 Current Verification Waveform #1, First Transient +60A, T2

EAR Controlled Data

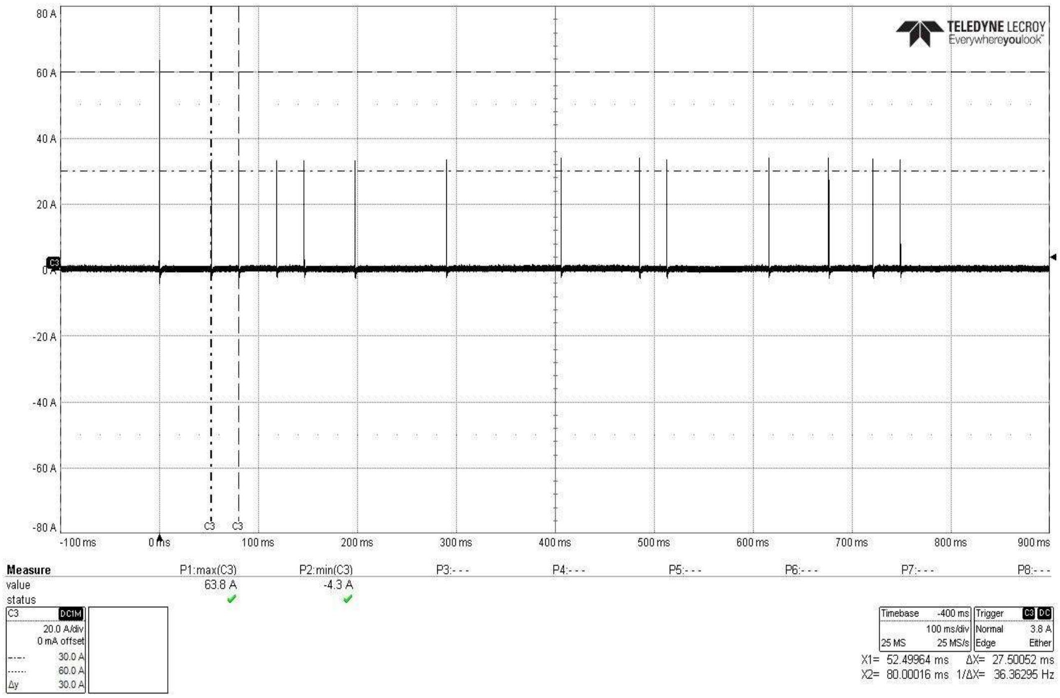


CS117 Current Verification Waveform #1, Subsequent Transient +30A, T1

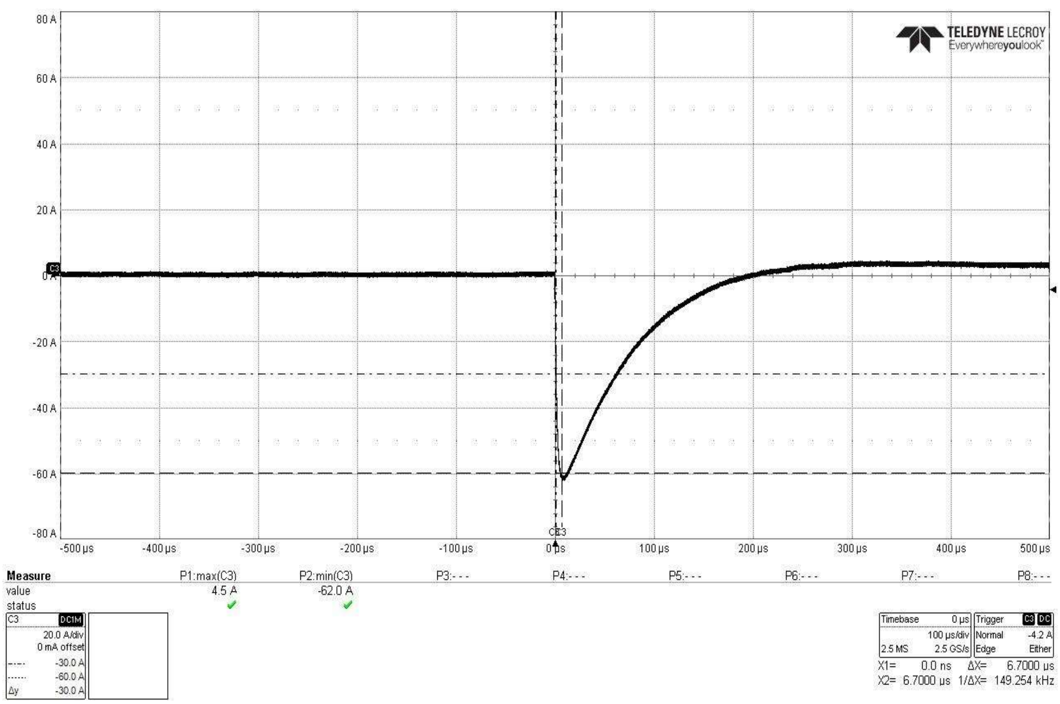


CS117 Current Verification Waveform #1, Subsequent Transient +30A, T2

EAR Controlled Data

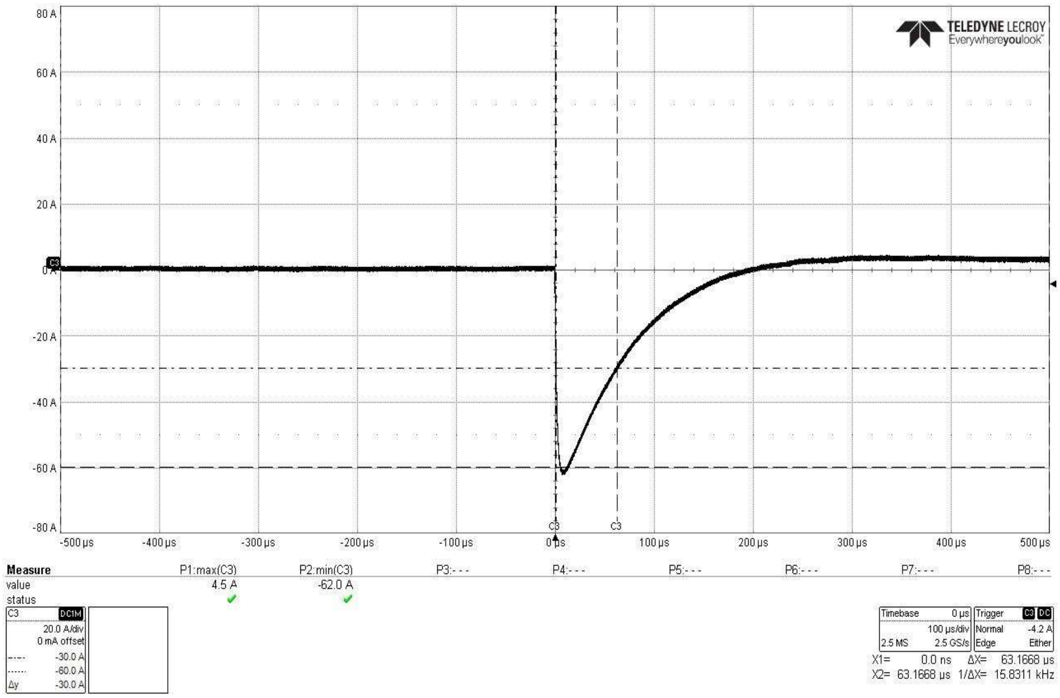


CS117 Current Verification Waveform #1, 14 Transients +60A/30A

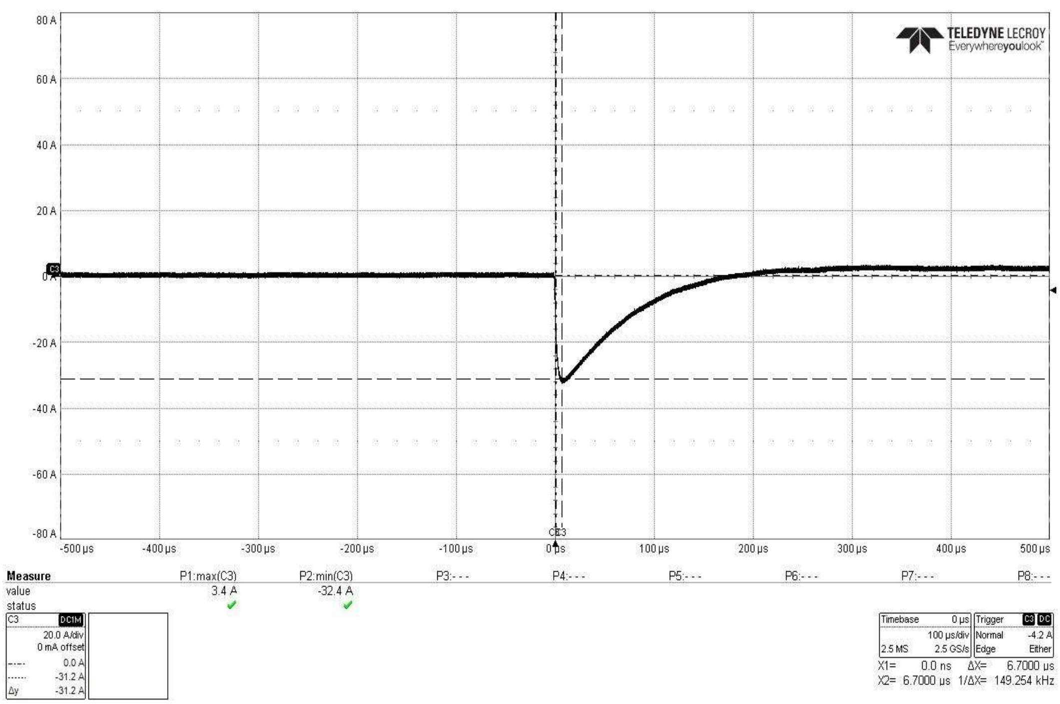


CS117 Current Verification Waveform #1, First Transient -60A, T1

EAR Controlled Data

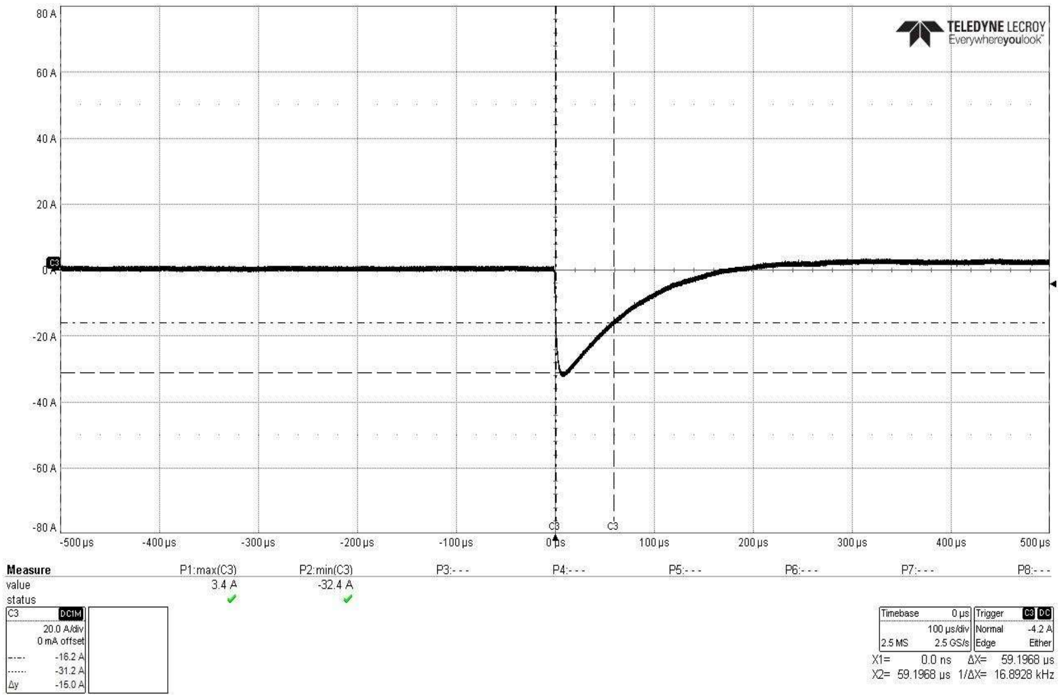


CS117 Current Verification Waveform #1, First Transient -60A, T2

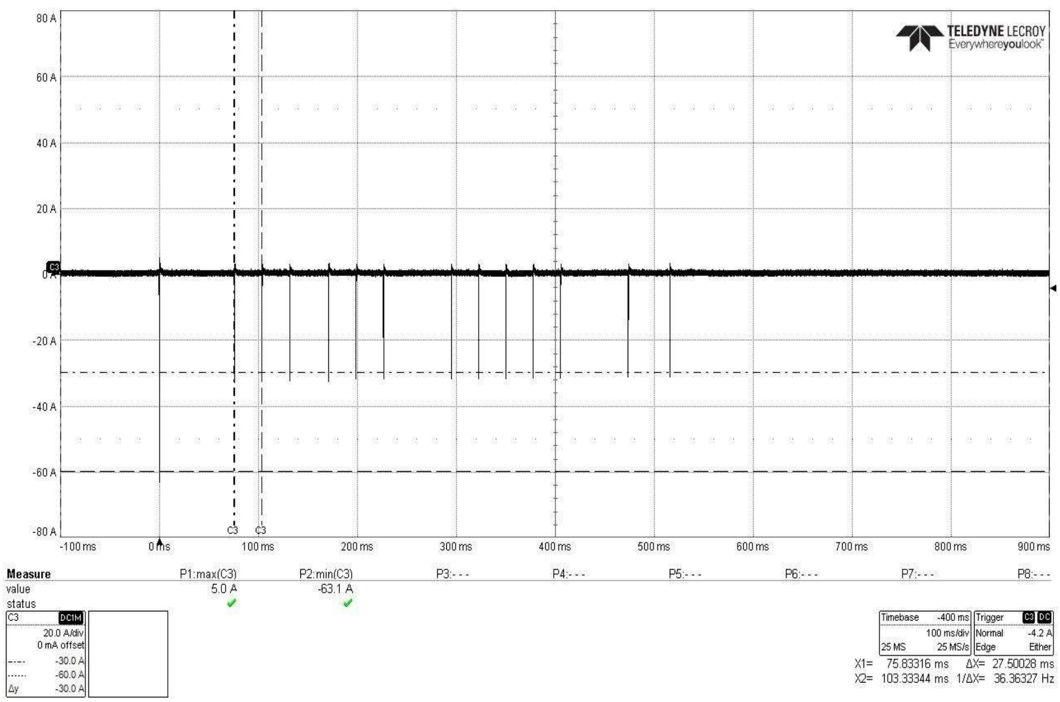


CS117 Current Verification Waveform #1, Subsequent Transient -30A, T1

EAR Controlled Data



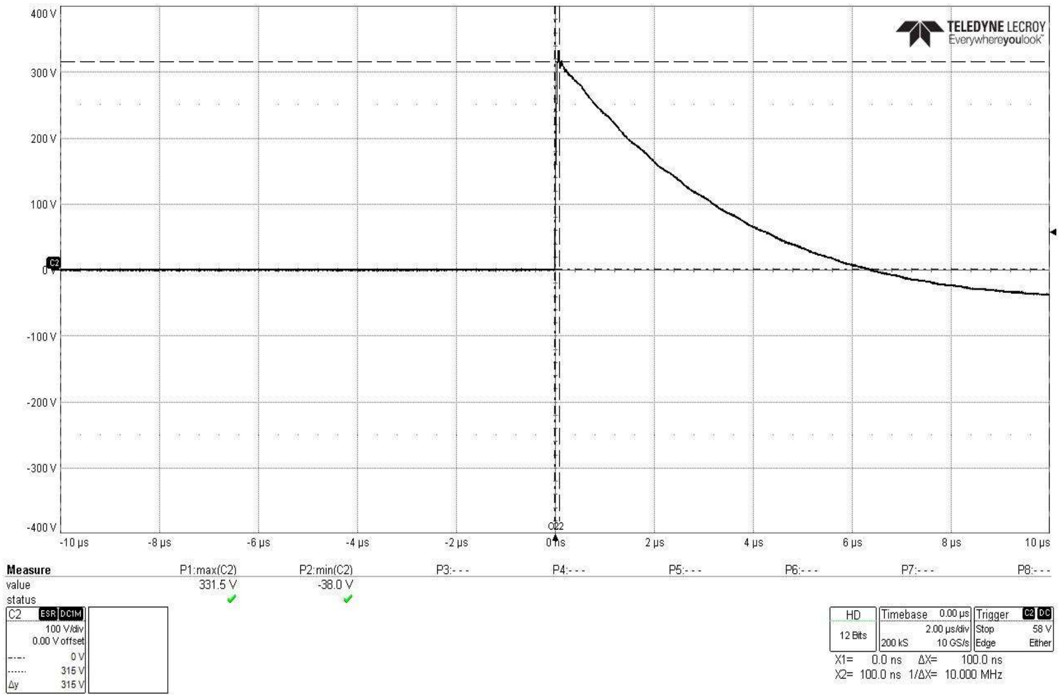
CS117 Current Verification Waveform #1, Subsequent Transient -30A, T2



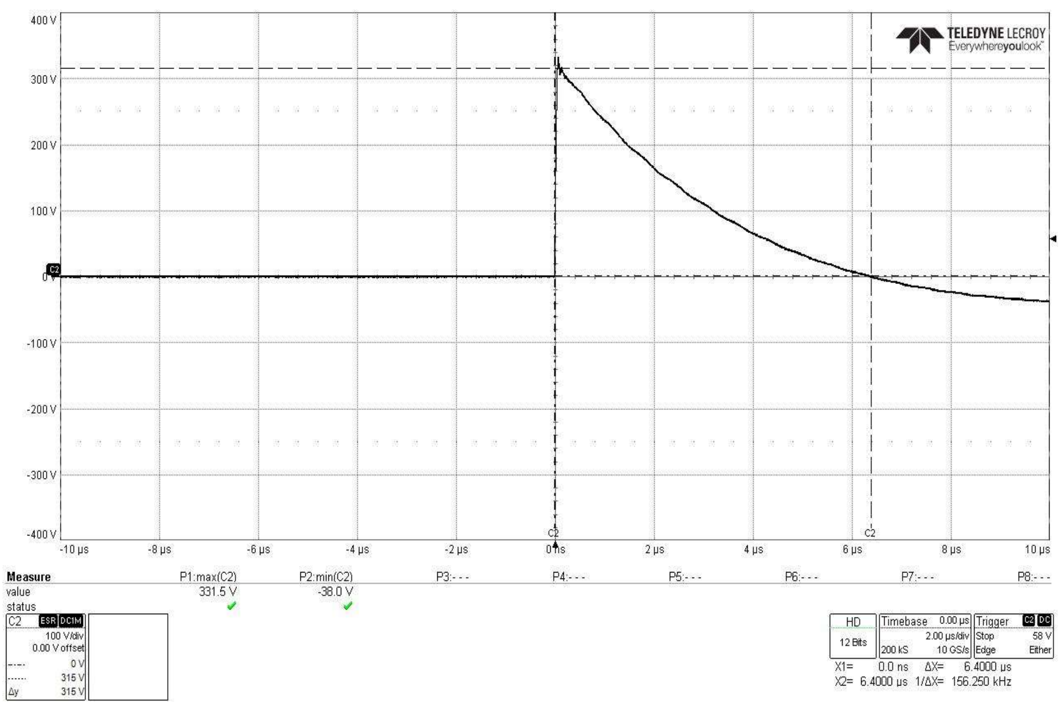
CS117 Current Verification Waveform #1, 14 Transients -60A/30A

EAR Controlled Data

CS117 Voltage Verification Multiple Stroke Waveform #2 at 300V

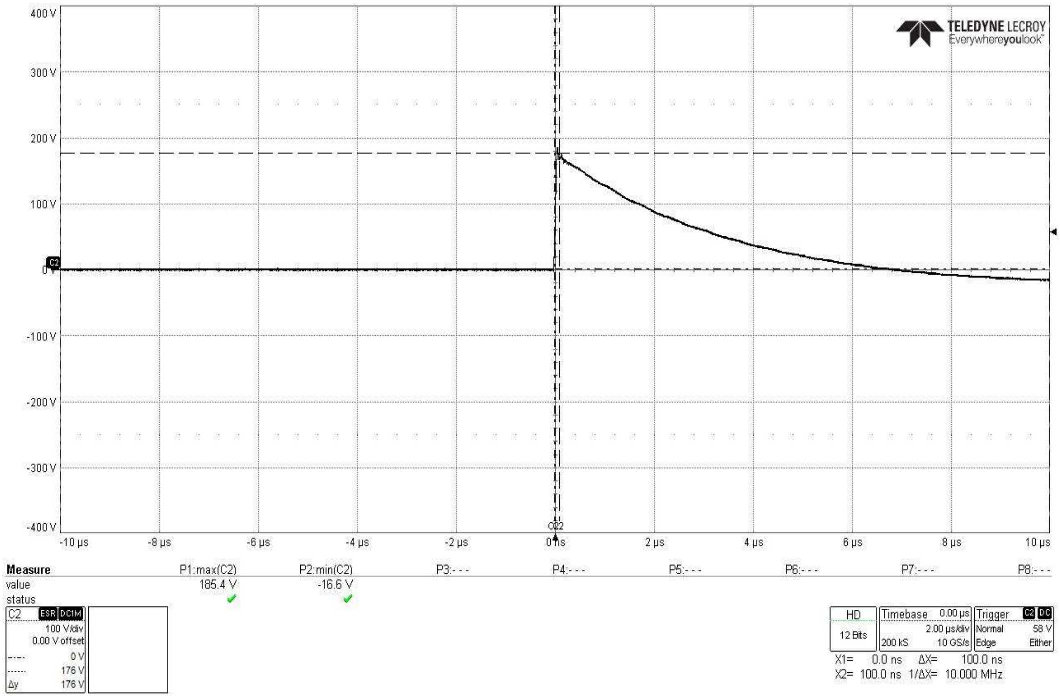


CS117 Voltage Verification Waveform #2, First Transient +300V, T1

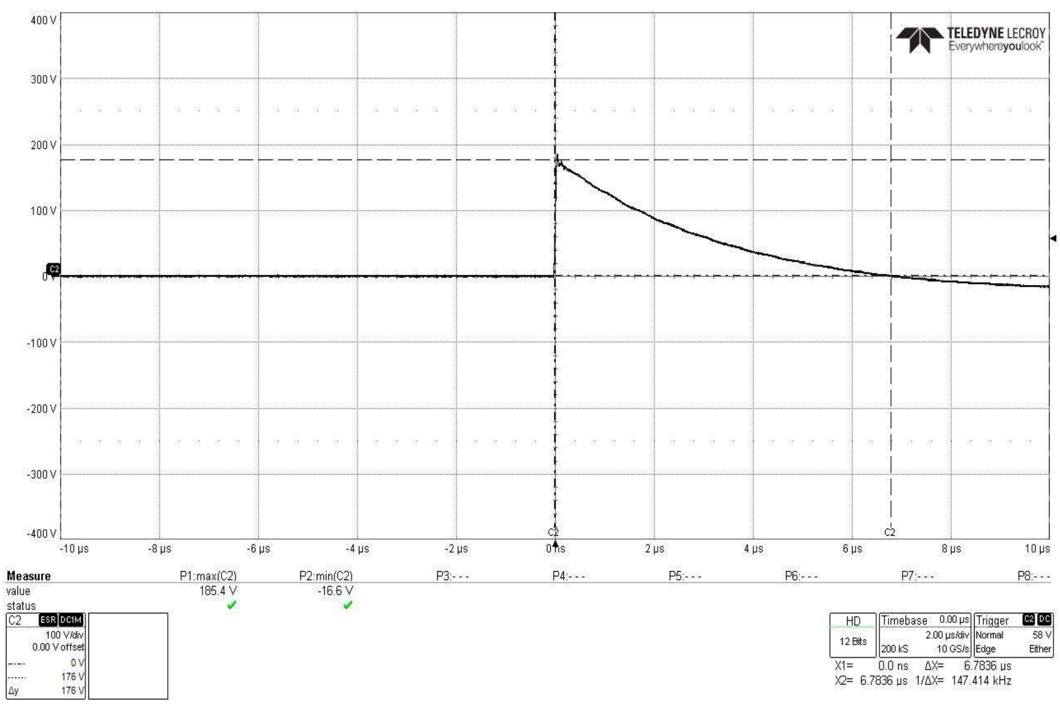


CS117 Voltage Verification Waveform #2, First Transient +300V, T2

EAR Controlled Data

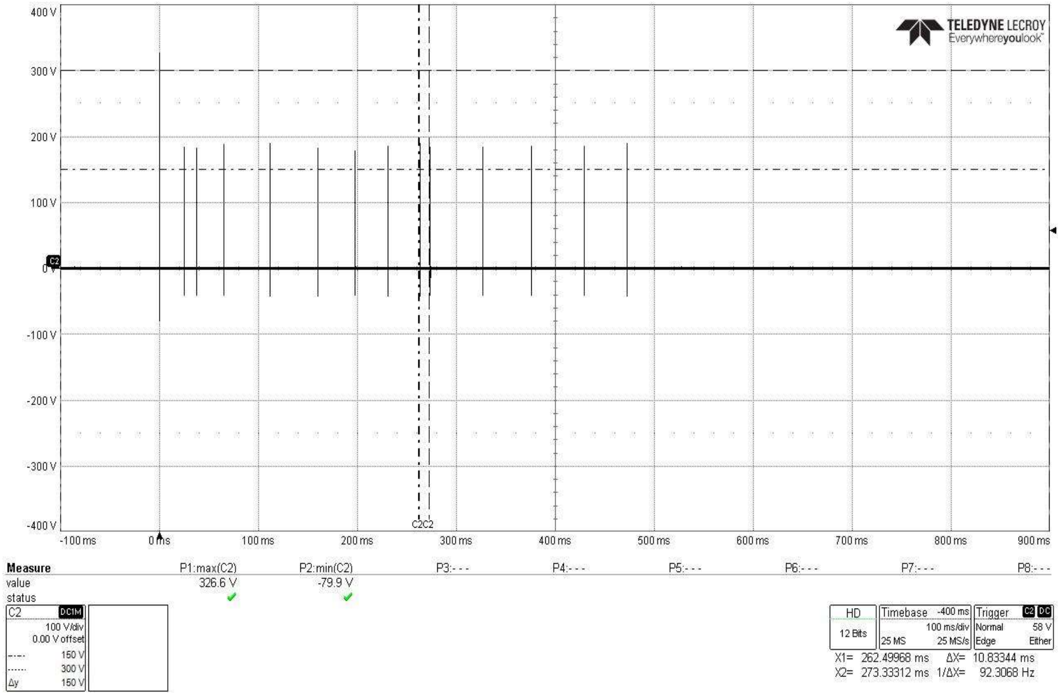


CS117 Voltage Verification Waveform #2, Subsequent Transient +150V, T1

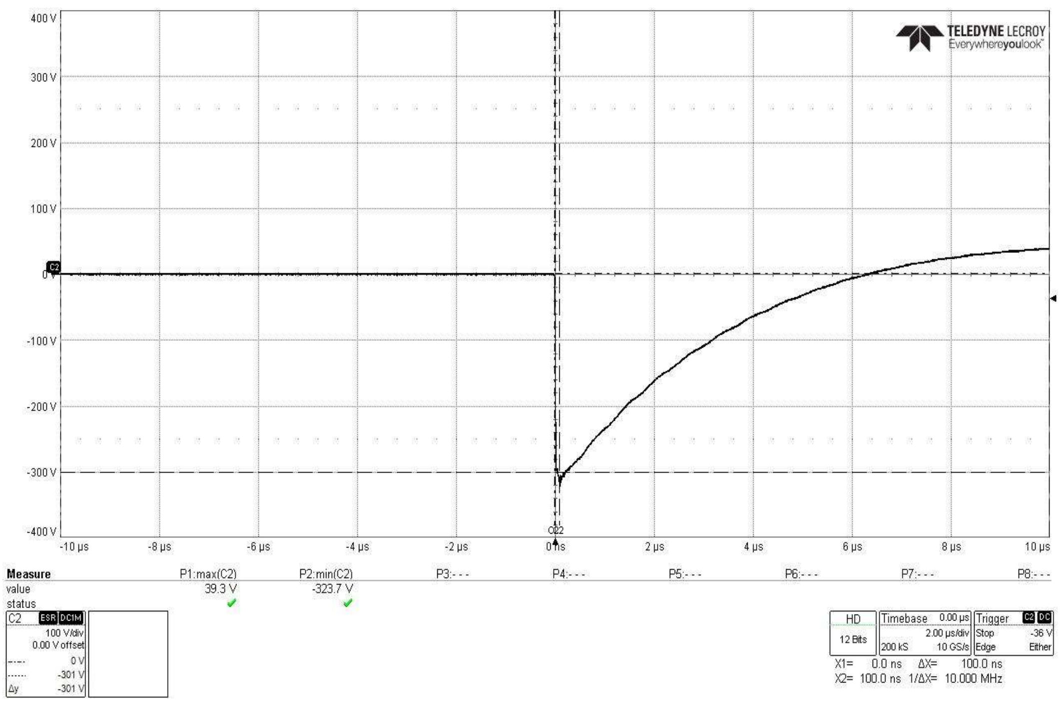


CS117 Voltage Verification Waveform #2, Subsequent Transient +150V, T2

EAR Controlled Data

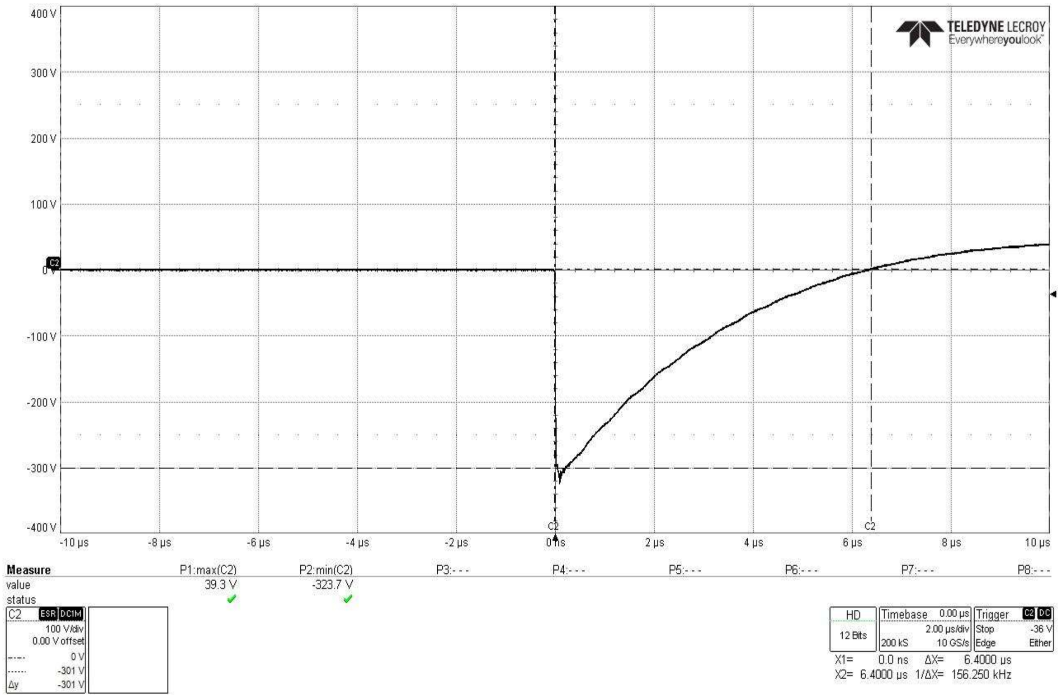


CS117 Voltage Verification Waveform #2, 14 Transients +300V/150VA

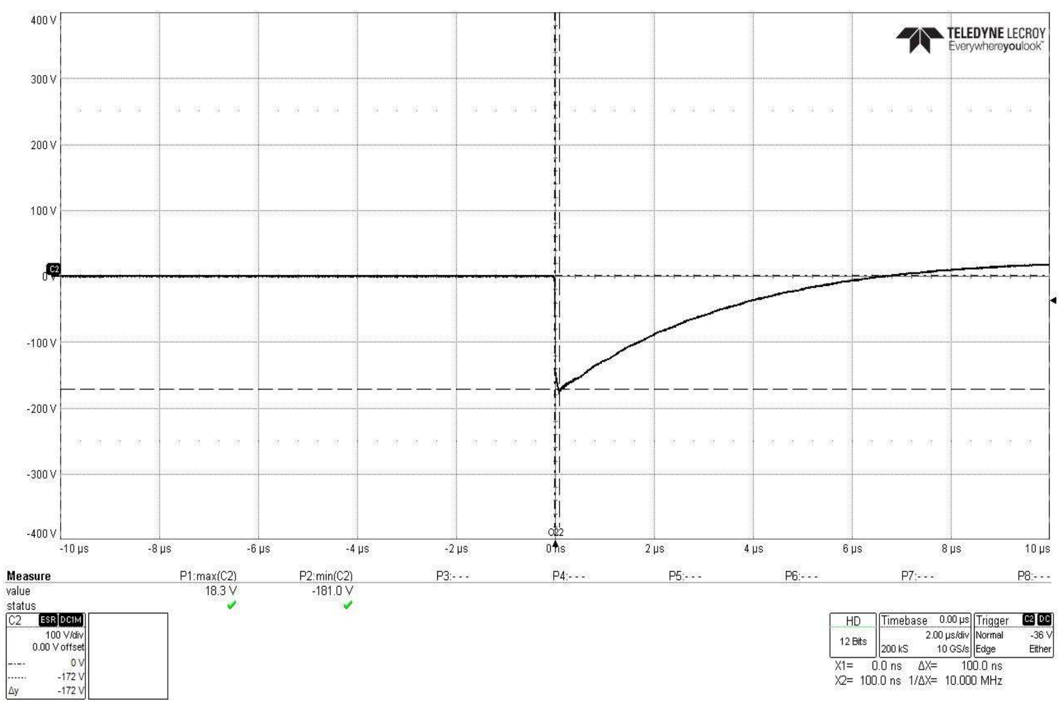


CS117 Voltage Verification Waveform #2, First Transient -300V, T1

EAR Controlled Data

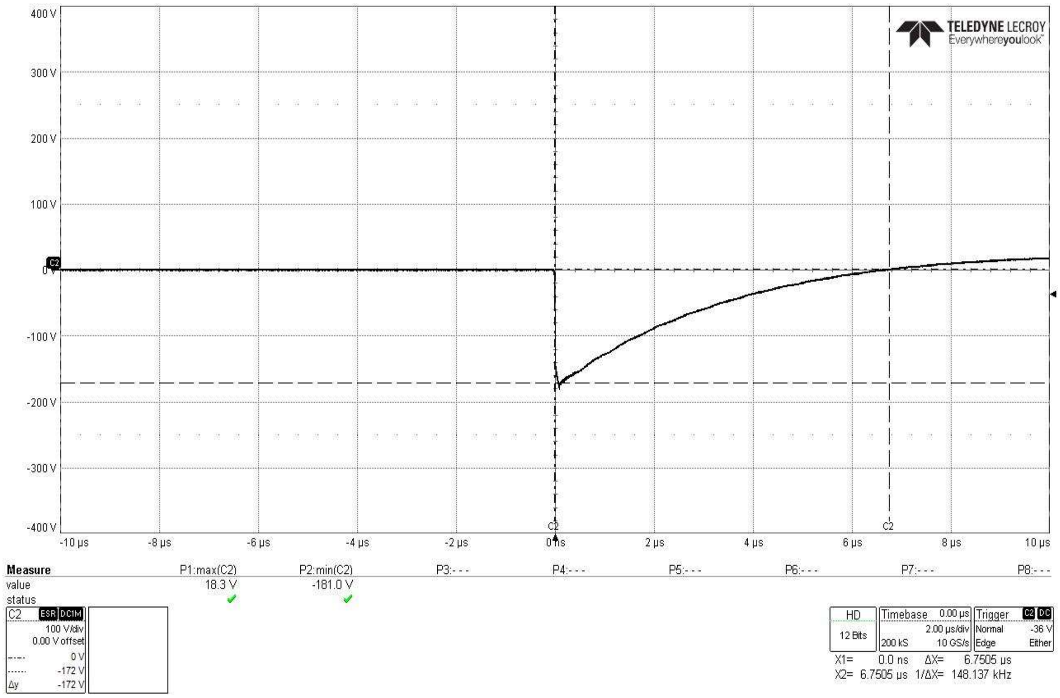


CS117 Voltage Verification Waveform #2, First Transient -300V, T2

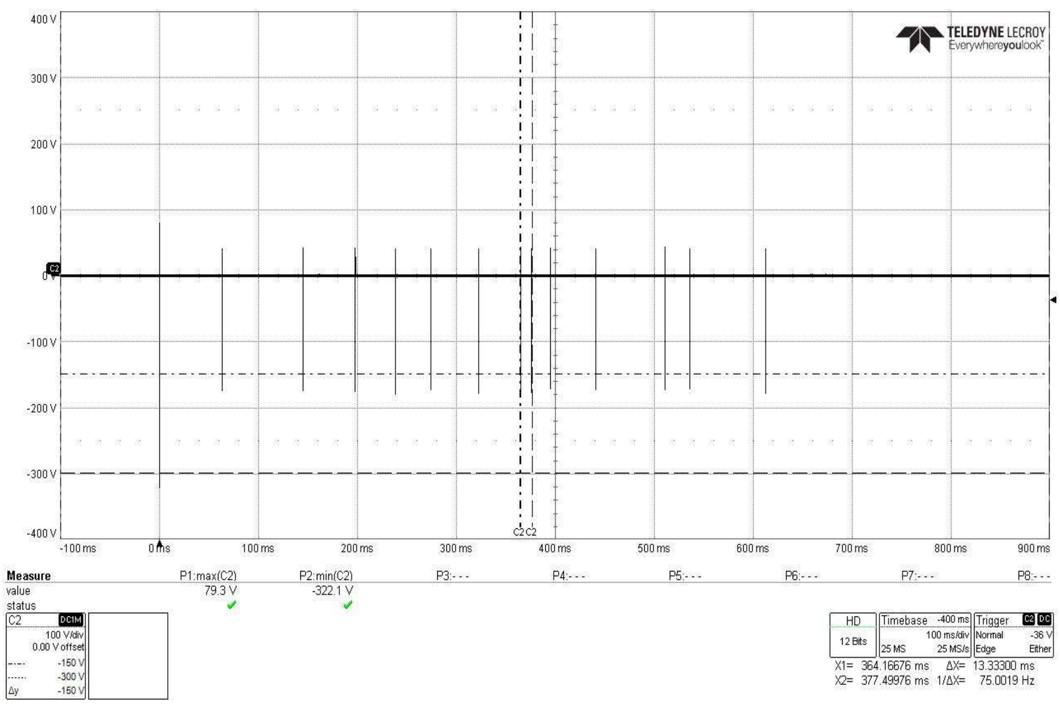


CS117 Voltage Verification Waveform #2, Subsequent Transient -150V, T1

EAR Controlled Data



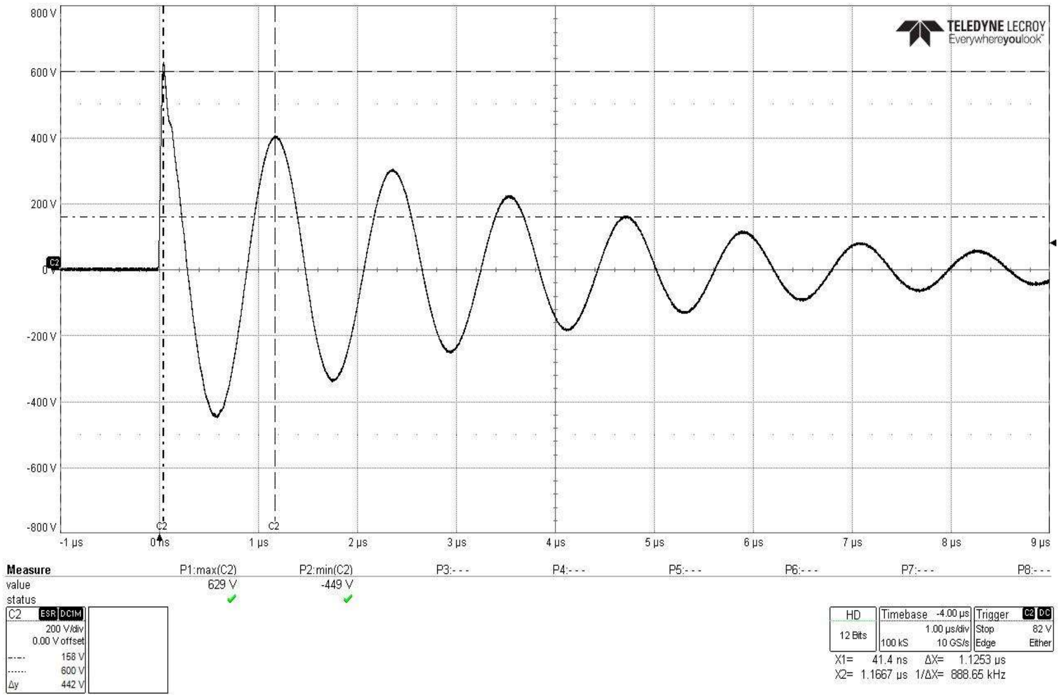
CS117 Voltage Verification Waveform #2, Subsequent Transient -150V, T2



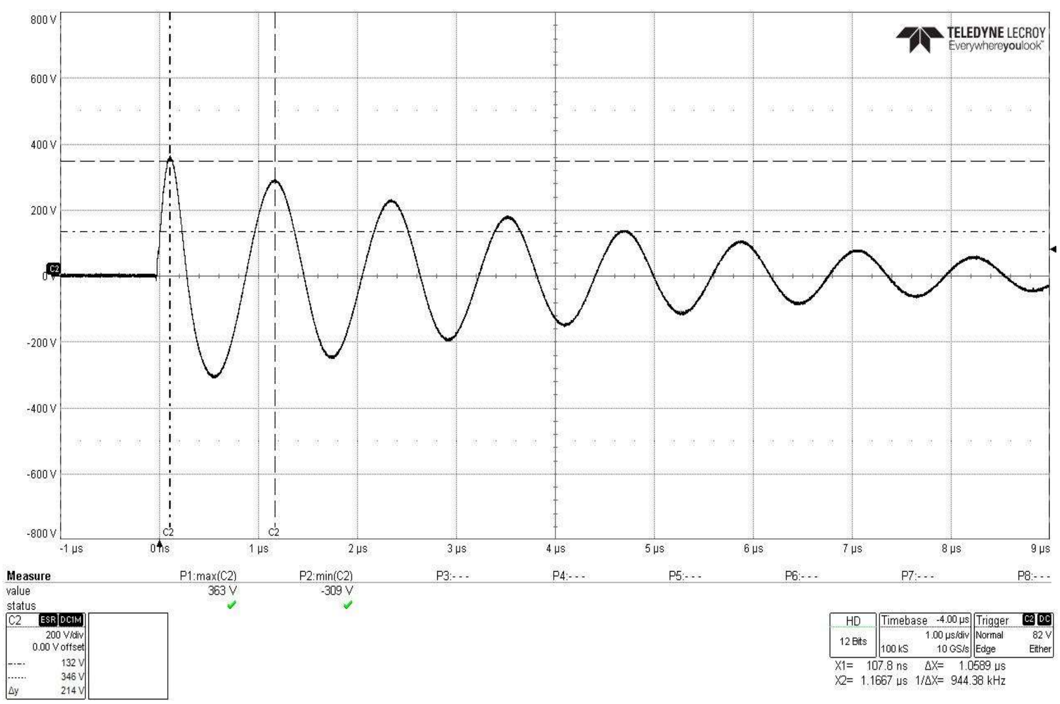
CS117 Voltage Verification Waveform #2, 14 Transients -300V/150VA

EAR Controlled Data

CS117 Voltage Verification Multiple Stroke Waveform #3 at 1MHz with 600V

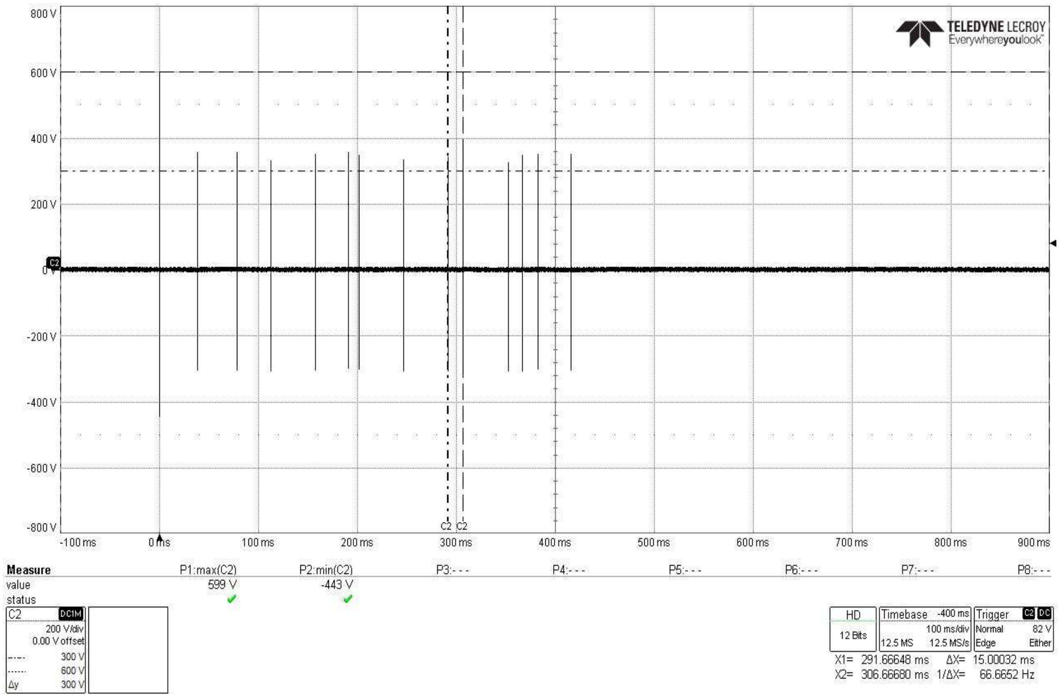


CS117 Voltage Verification Waveform #3 at 1MHz, First Transient +600V

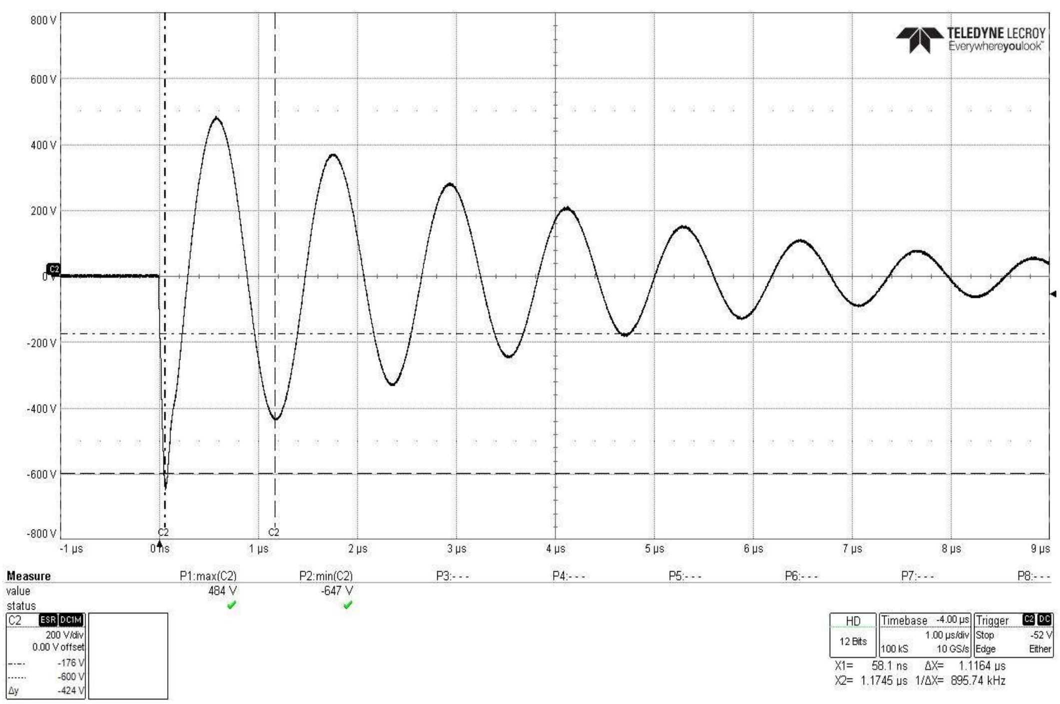


CS117 Voltage Verification Waveform #3 at 1MHz, Subsequent Transient +300V

EAR Controlled Data

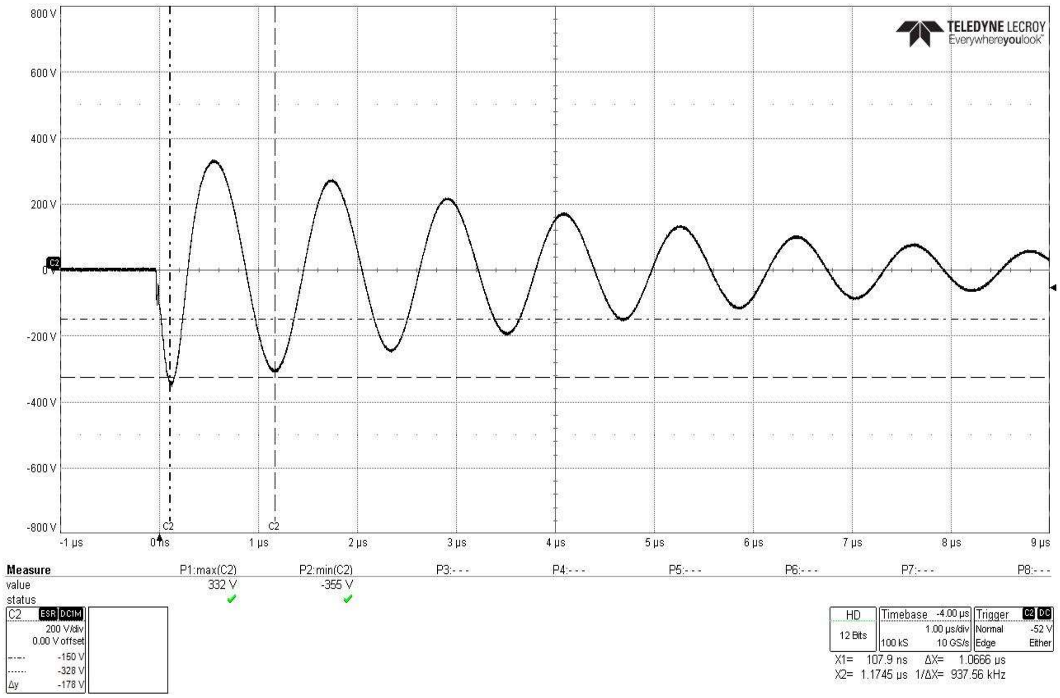


CS117 Voltage Verification Waveform #3 at 1MHz, 14 Transients +600V/300V

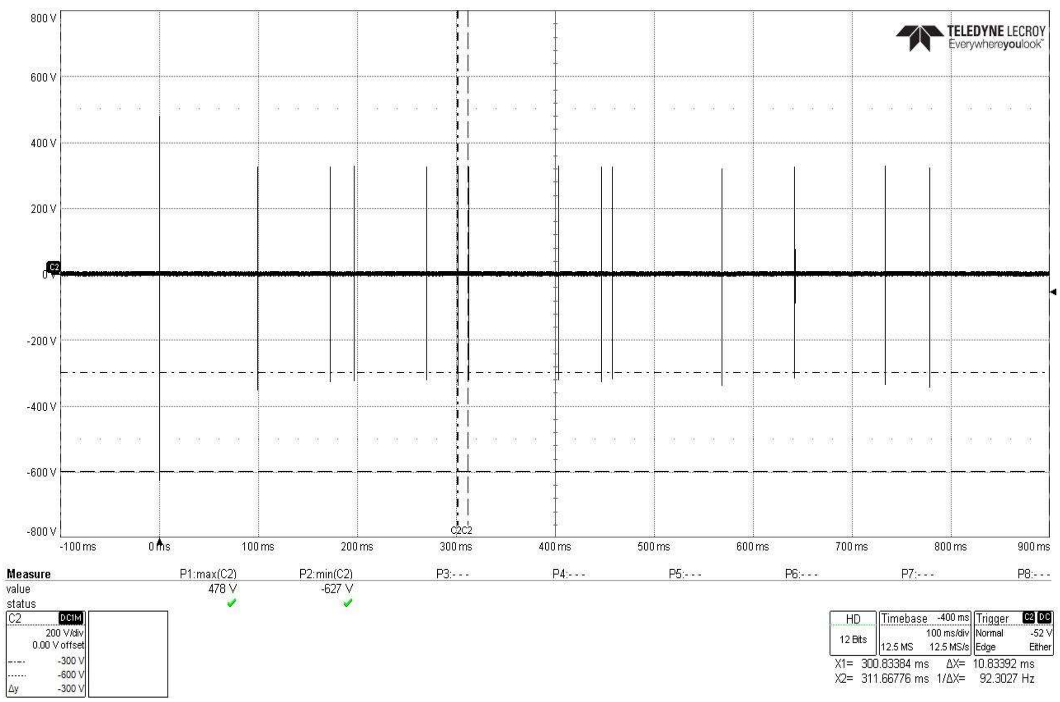


CS117 Voltage Verification Waveform #3 at 1MHz, First Transient -600V

EAR Controlled Data



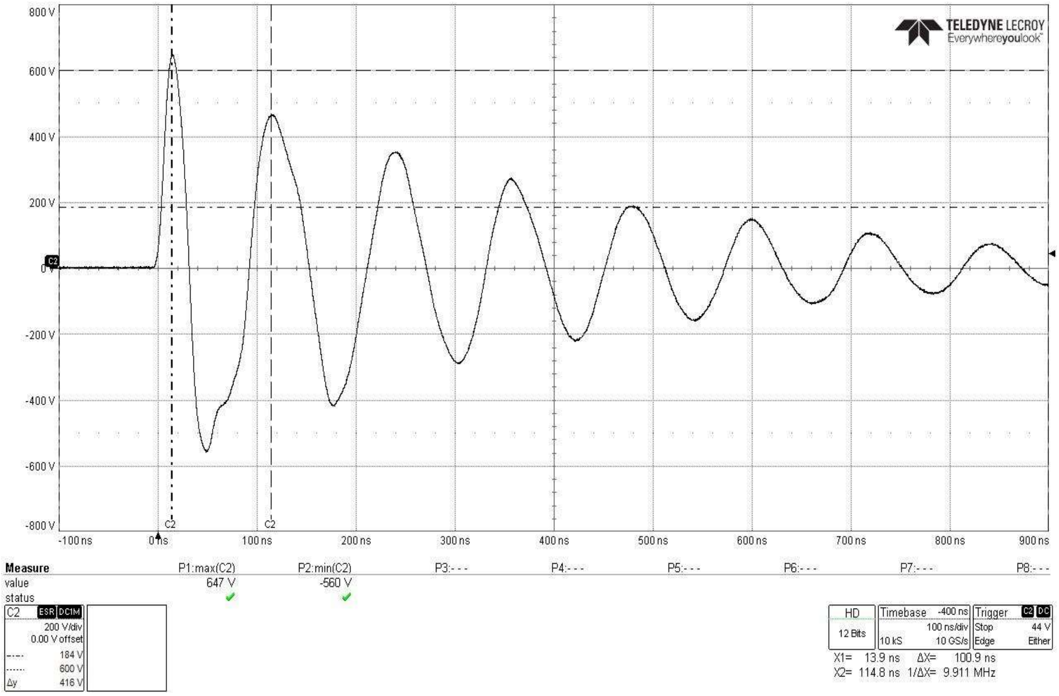
CS117 Voltage Verification Waveform #3 at 1MHz, Subsequent Transient -300V



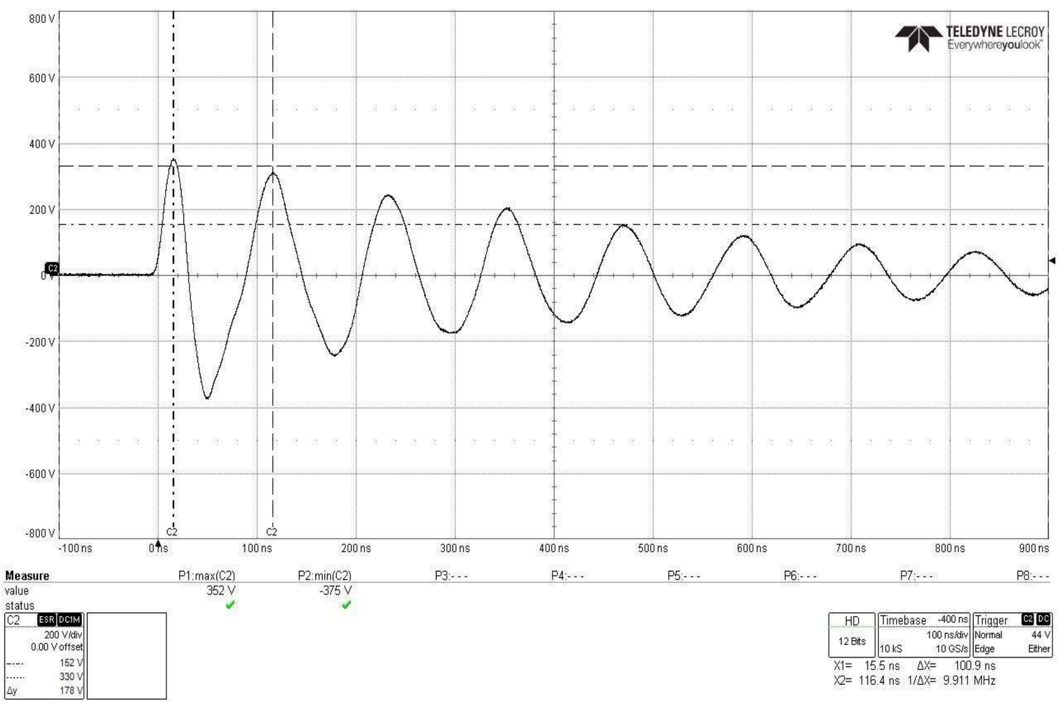
CS117 Voltage Verification Waveform #3 at 1MHz, 14 Transients -600V/300V

EAR Controlled Data

CS117 Voltage Verification Multiple Stroke Waveform #3 at 10MHz with 600V

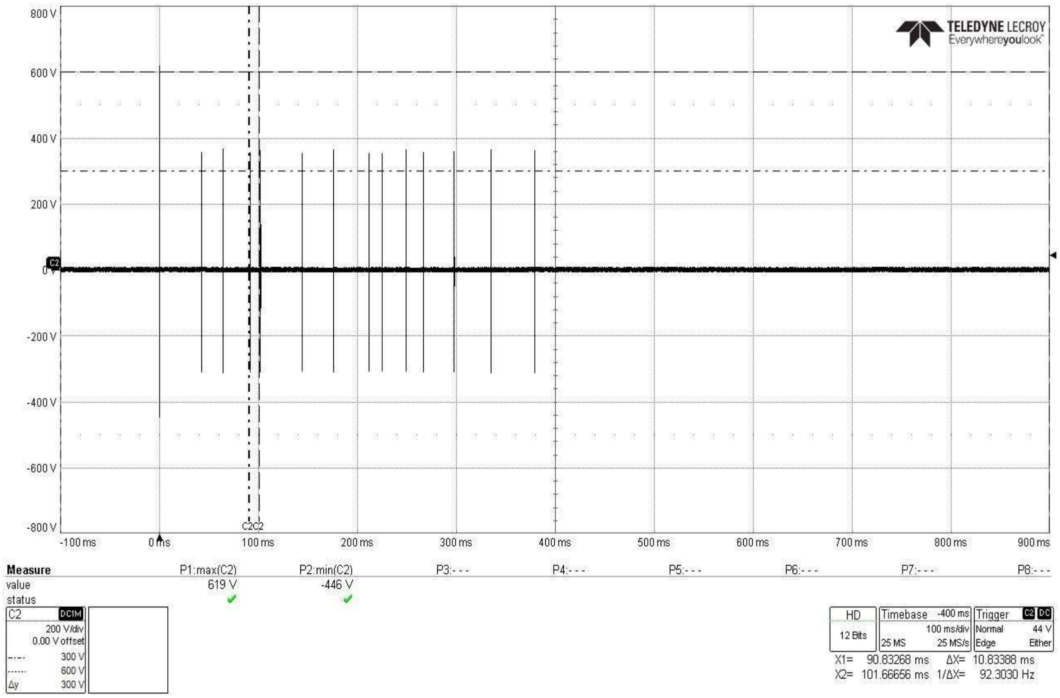


CS117 Voltage Verification Waveform #3 at 1MHz, First Transient +600V

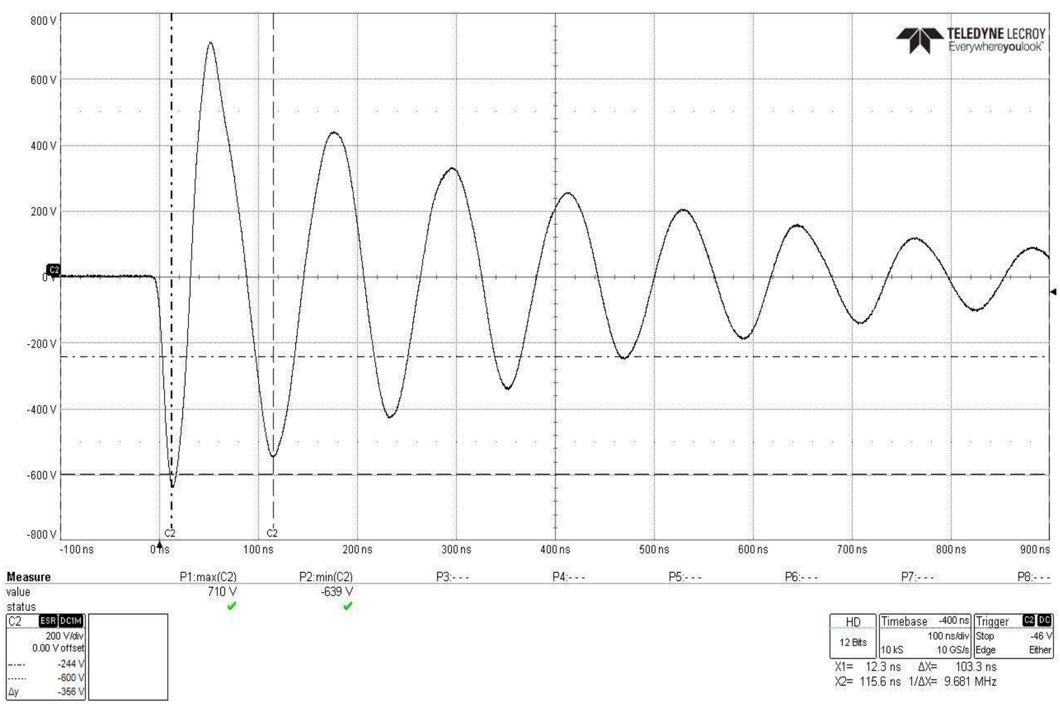


CS117 Voltage Verification Waveform #3 at 10MHz, Subsequent Transient +300V

EAR Controlled Data

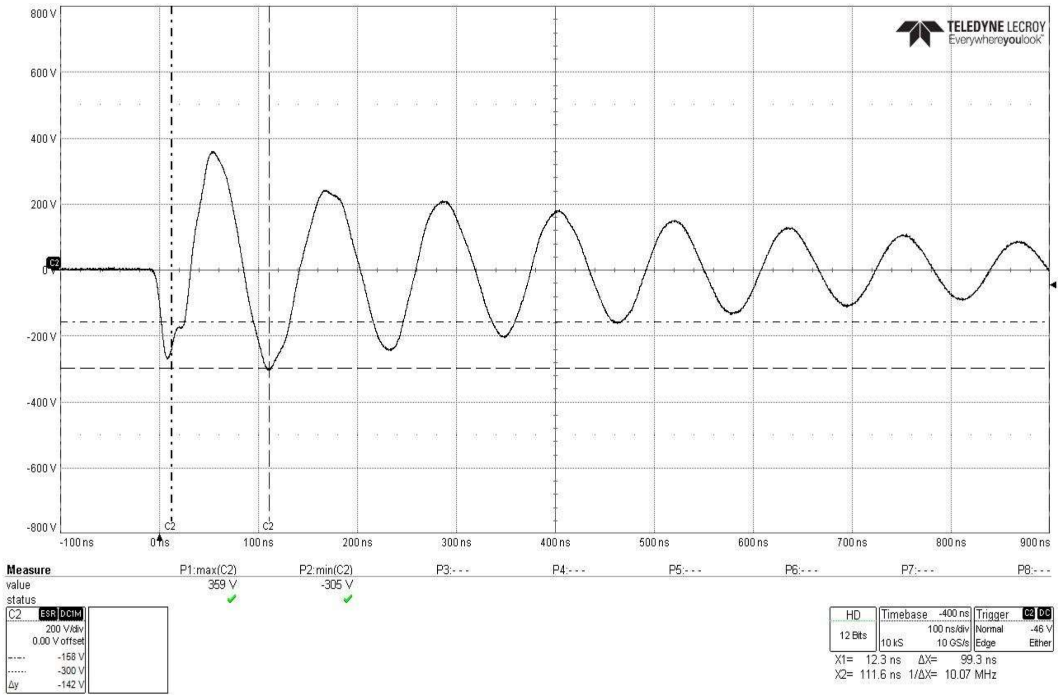


CS117 Voltage Verification Waveform #3 at 10MHz, 14 Transients +600V/300V

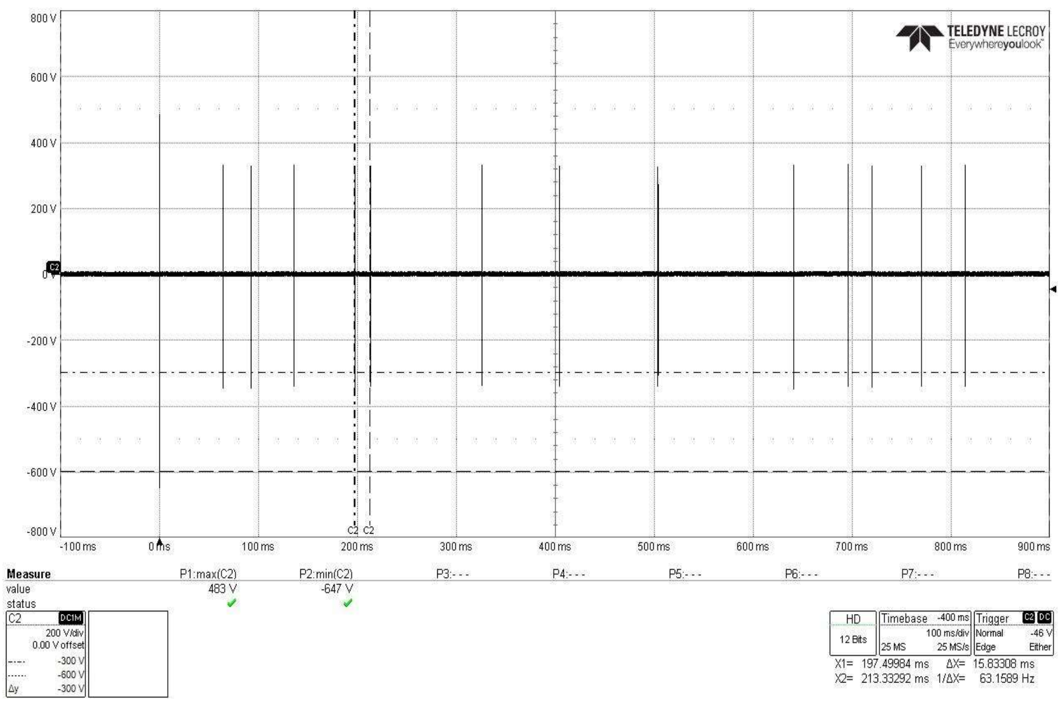


CS117 Voltage Verification Waveform #3 at 10MHz, First Transient -600V

EAR Controlled Data



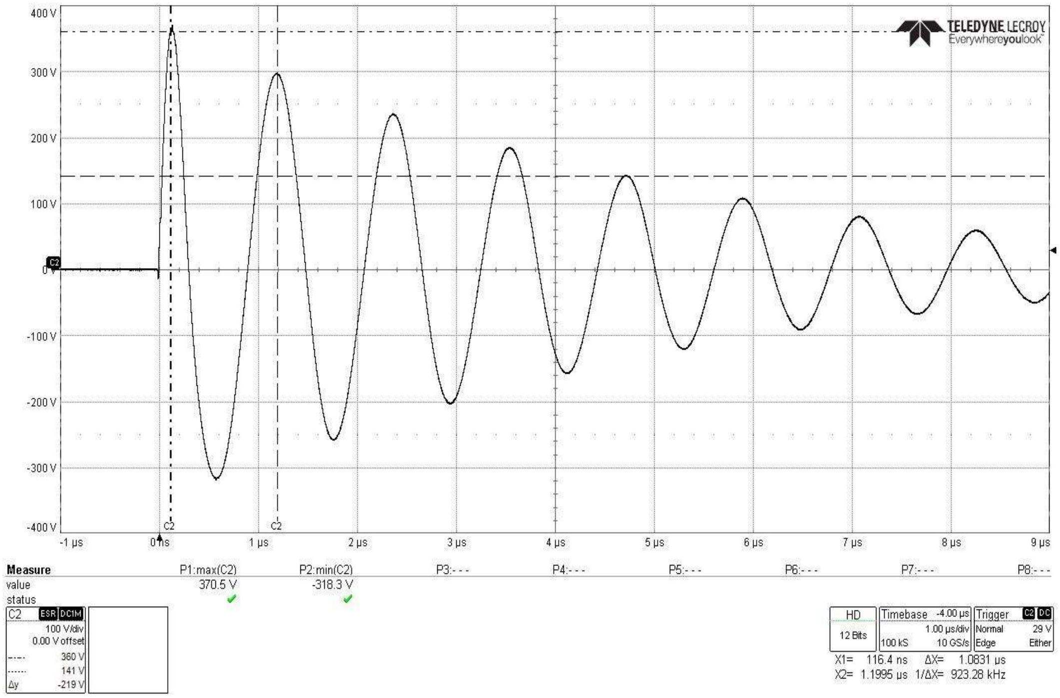
CS117 Voltage Verification Waveform #3 at 10MHz, Subsequent Transient -300V



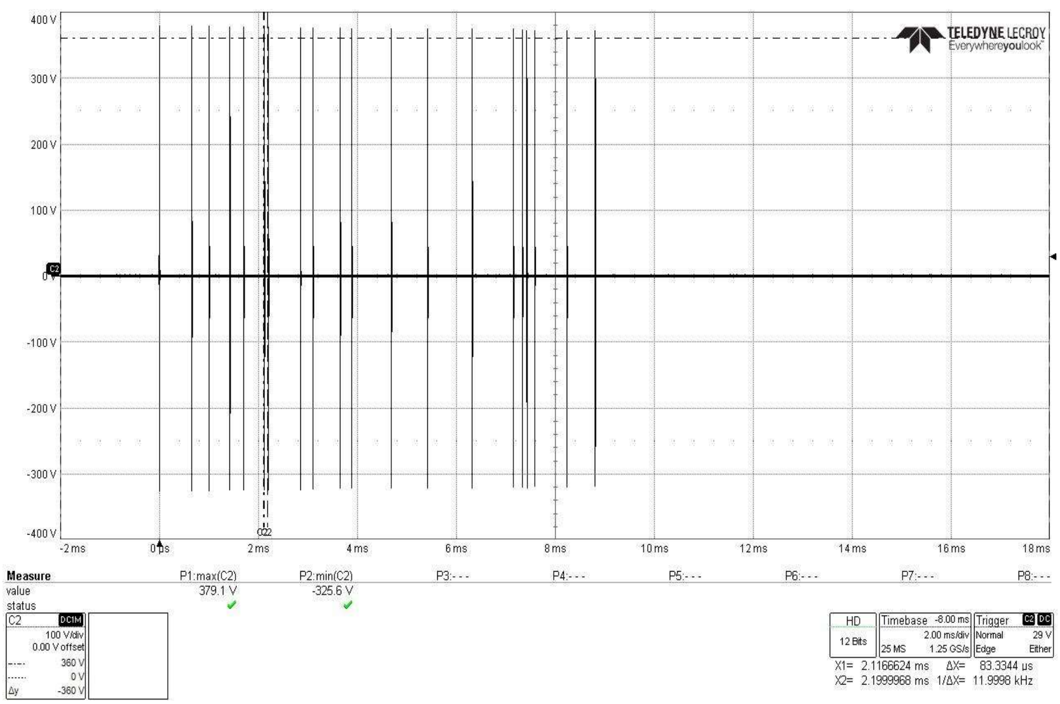
CS117 Voltage Verification Waveform #3 at 10MHz, 14 Transients -600V/300V

EAR Controlled Data

CS117 Voltage and Current Verification Multiple Burst (MB) Waveform #3 at 1MHz with 360V/6A

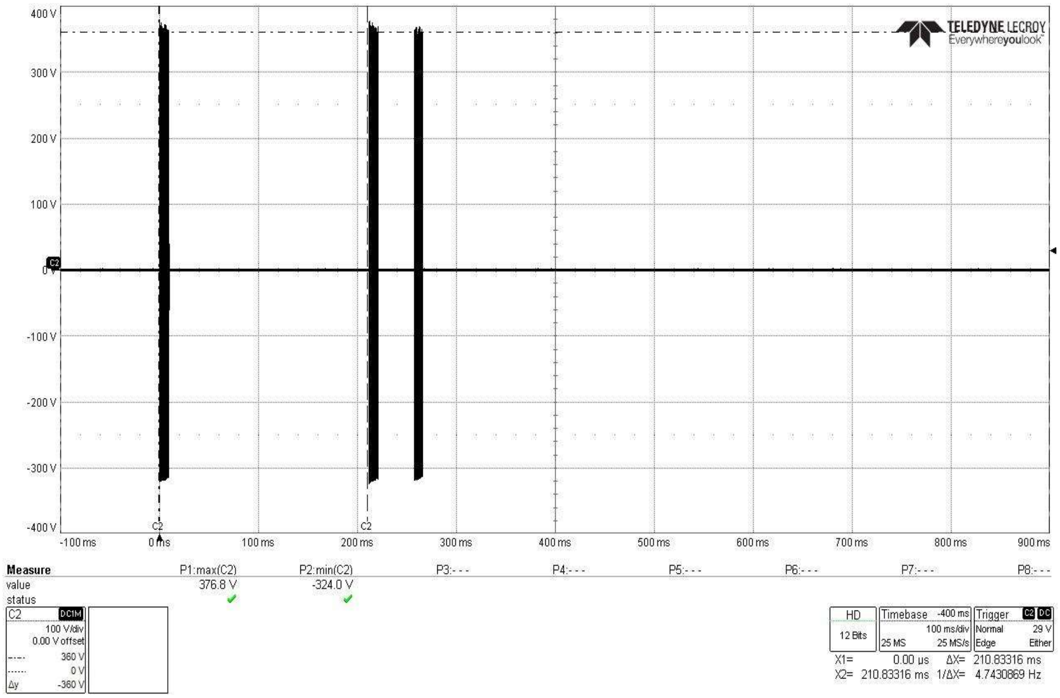


CS117 Voltage Verification MB Waveform #3 at 1MHz, First Transient at +360V

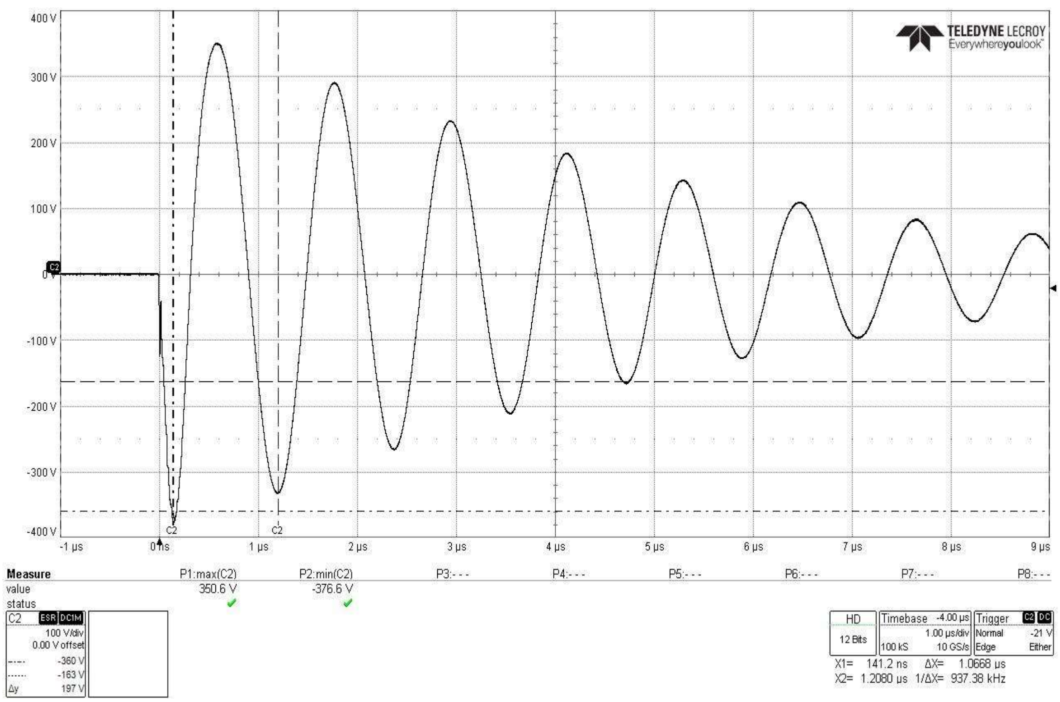


CS117 Voltage Verification MB Waveform #3 at 1MHz, 20 Transients at +360V

EAR Controlled Data

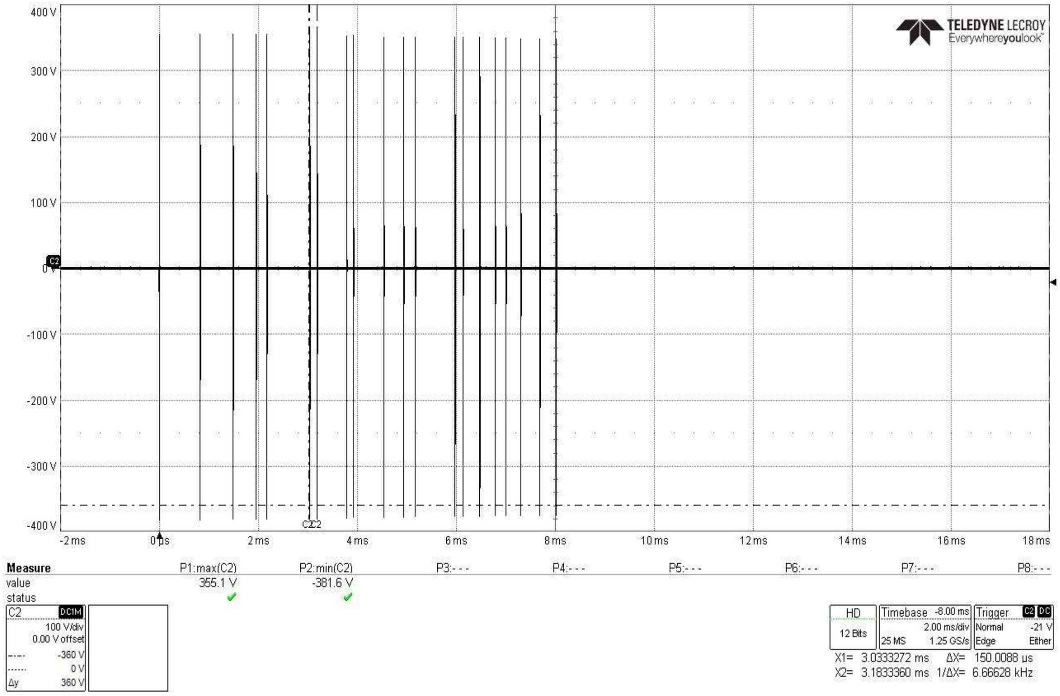


CS117 Voltage Verification MB Waveform #3 at 1MHz, 3 Bursts at +360V

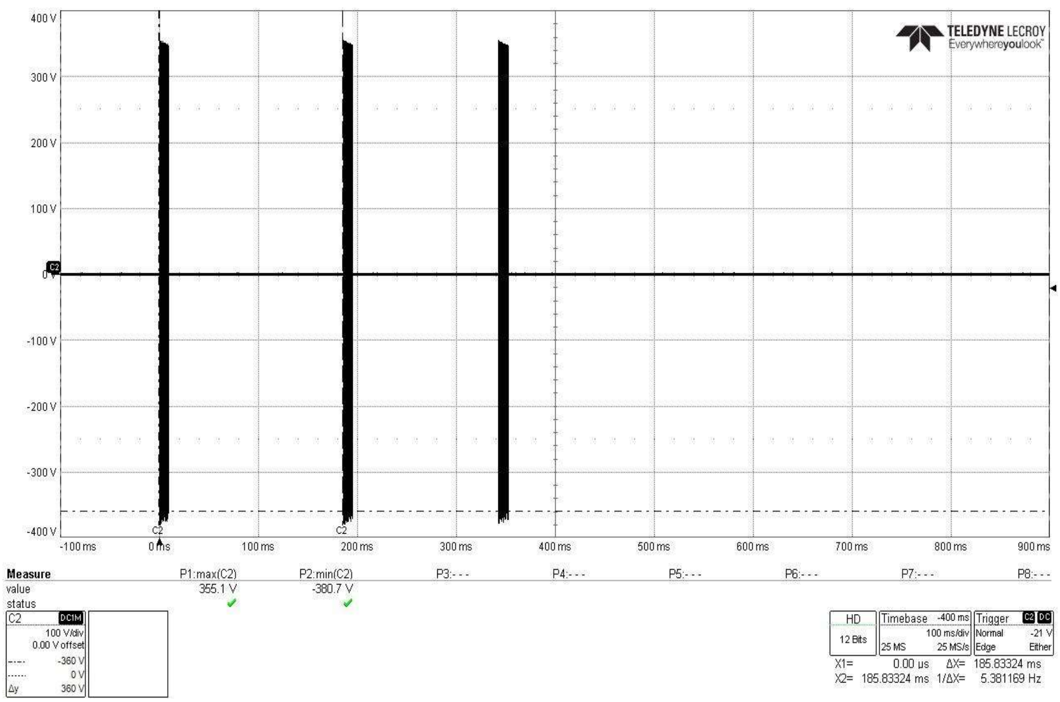


CS117 Voltage Verification Waveform #3 at 1MHz, First Transient at -360V

EAR Controlled Data

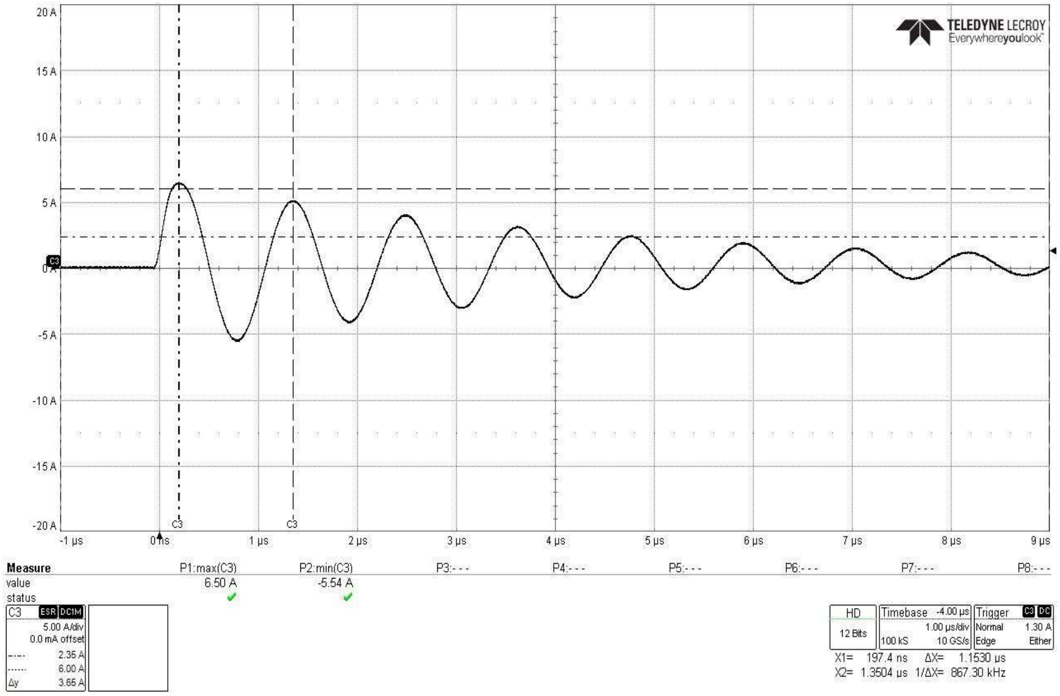


CS117 Voltage Verification MB Waveform #3 at 1MHz, 20 Transients at -360V

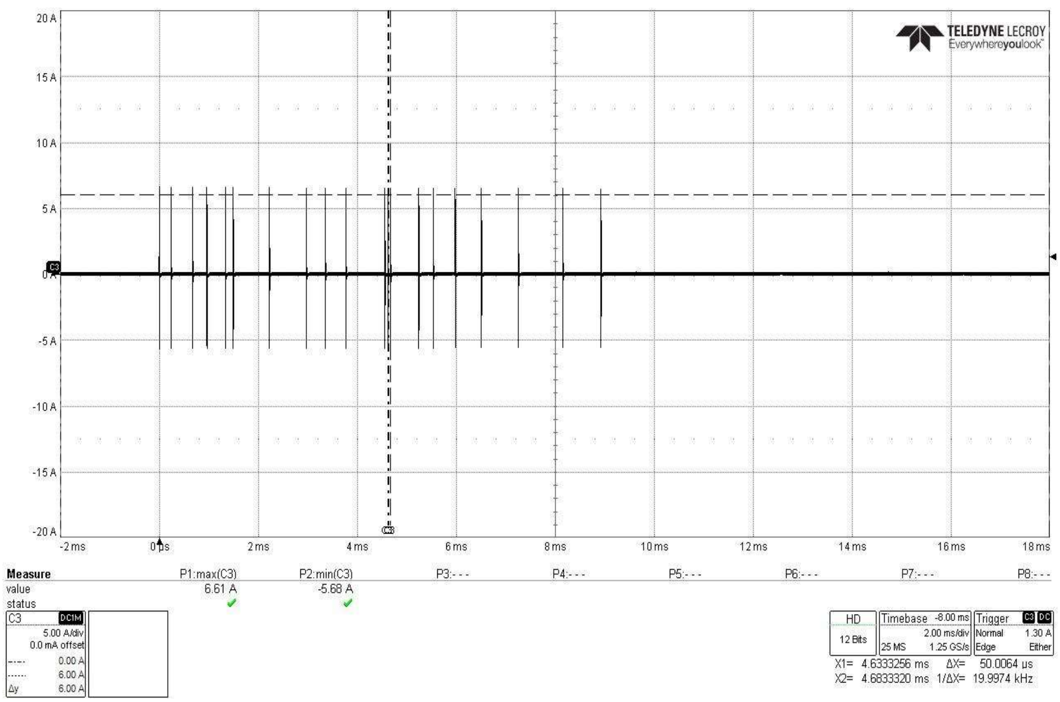


CS117 Voltage Verification MB Waveform #3 at 1MHz, 3 Bursts at -360V

EAR Controlled Data

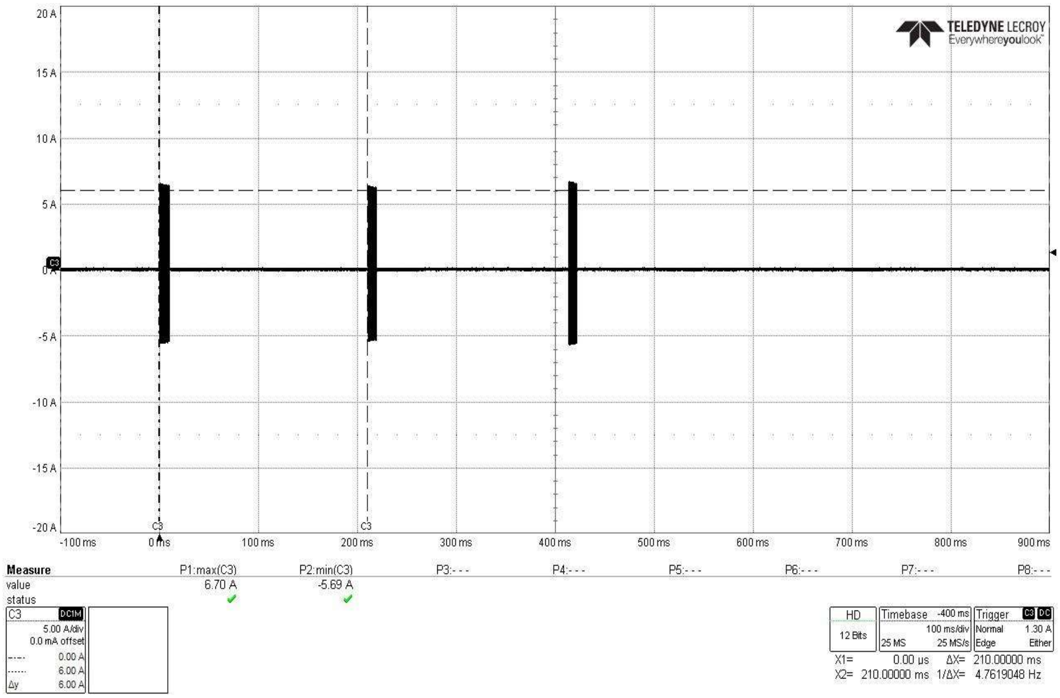


CS117 Current Verification MB Waveform #3 at 1MHz, First Transient at +6A

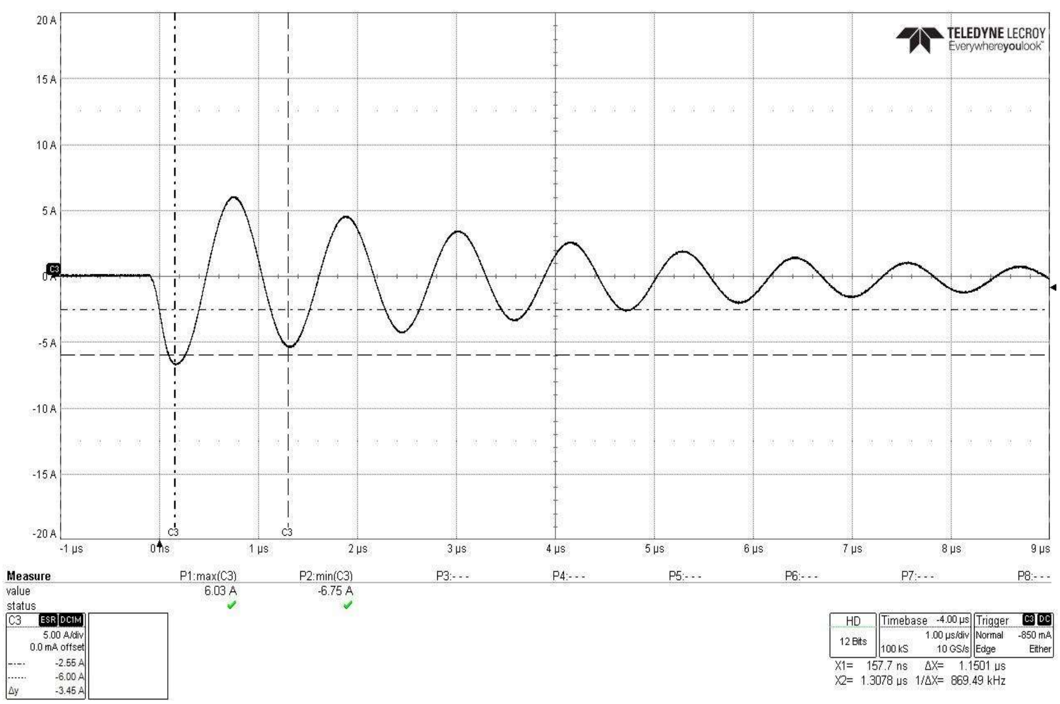


CS117 Current Verification MB Waveform #3 at 1MHz, 20 Transients at +6A

EAR Controlled Data

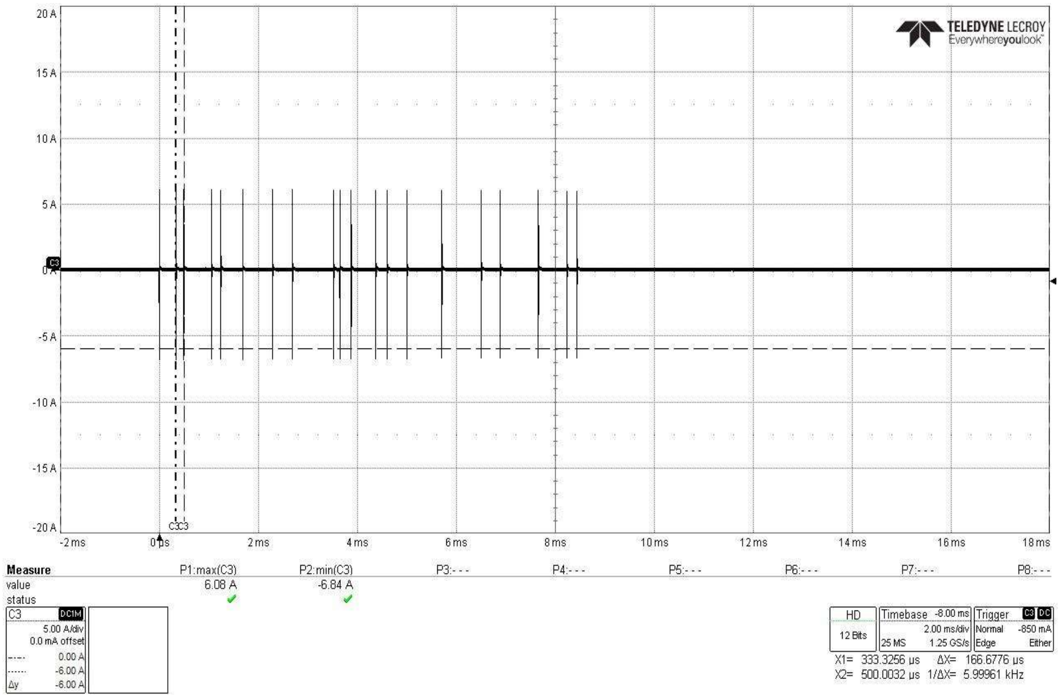


CS117 Current Verification MB Waveform #3 at 1MHz, 3 Bursts at +6A

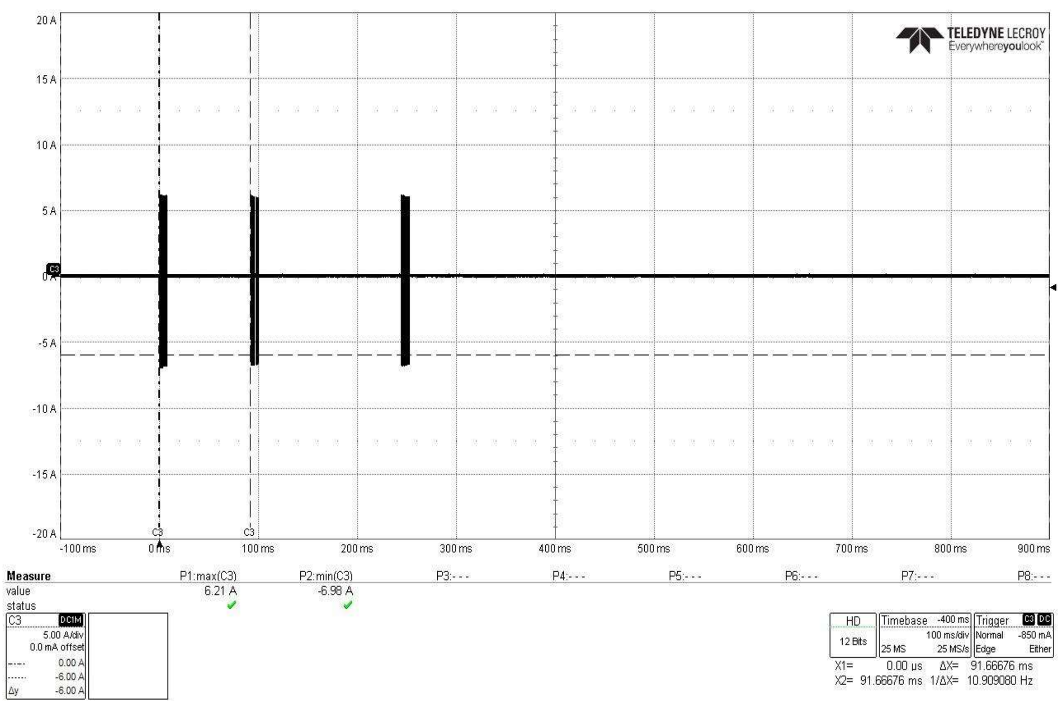


CS117 Current Verification MB Waveform #3 at 1MHz, First Transient at -6A

EAR Controlled Data



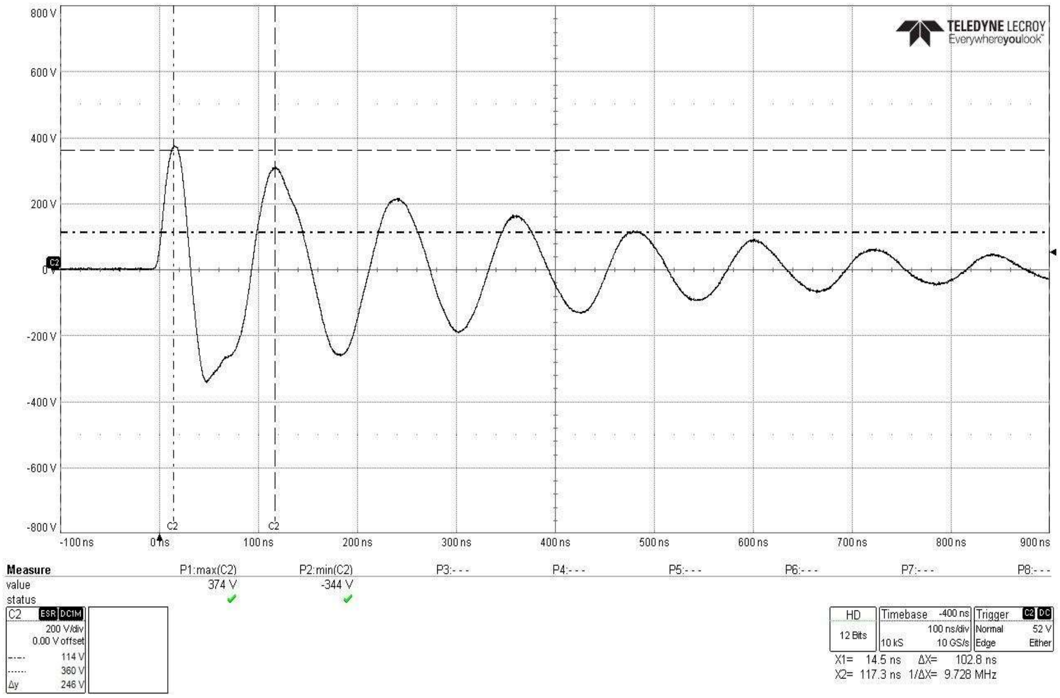
CS117 Current Verification MB Waveform #3 at 1MHz, 20 Transients at -6A



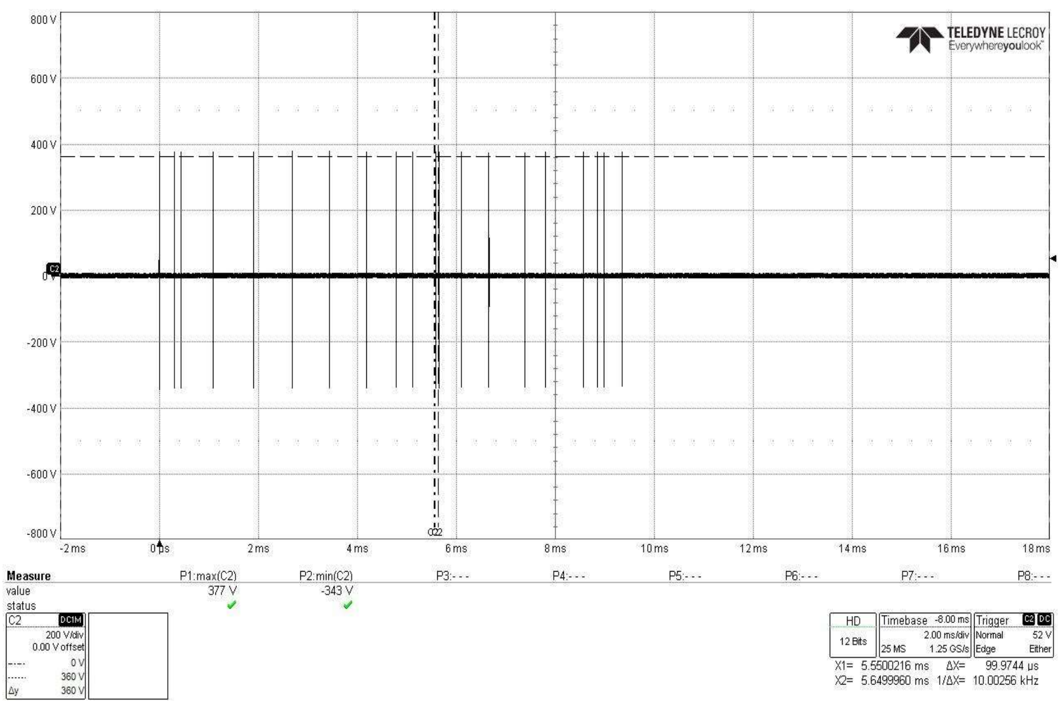
CS117 Current Verification MB Waveform #3 at 1MHz, 3 Bursts at -6A

EAR Controlled Data

CS117 Voltage and Current Verification Multiple Burst (MB) Waveform #3 at 10MHz with 360V/6A

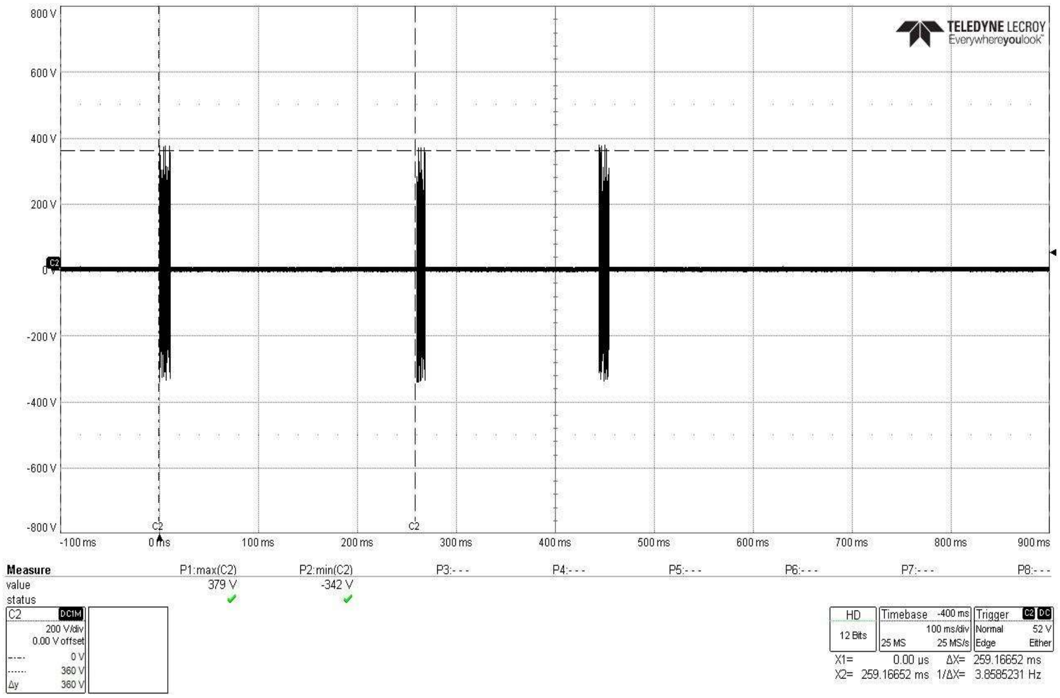


CS117 Voltage Verification MB Waveform #3 at 10MHz, First Transient at +360V

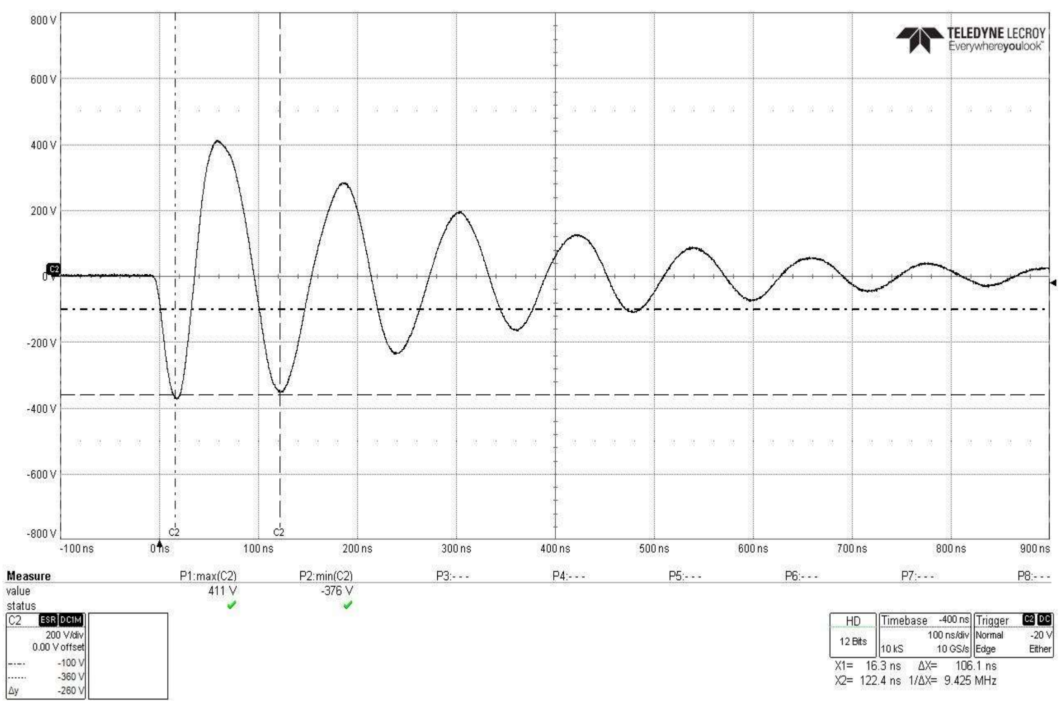


CS117 Voltage Verification MB Waveform #3 at 10MHz, 20 Transients at +360V

EAR Controlled Data

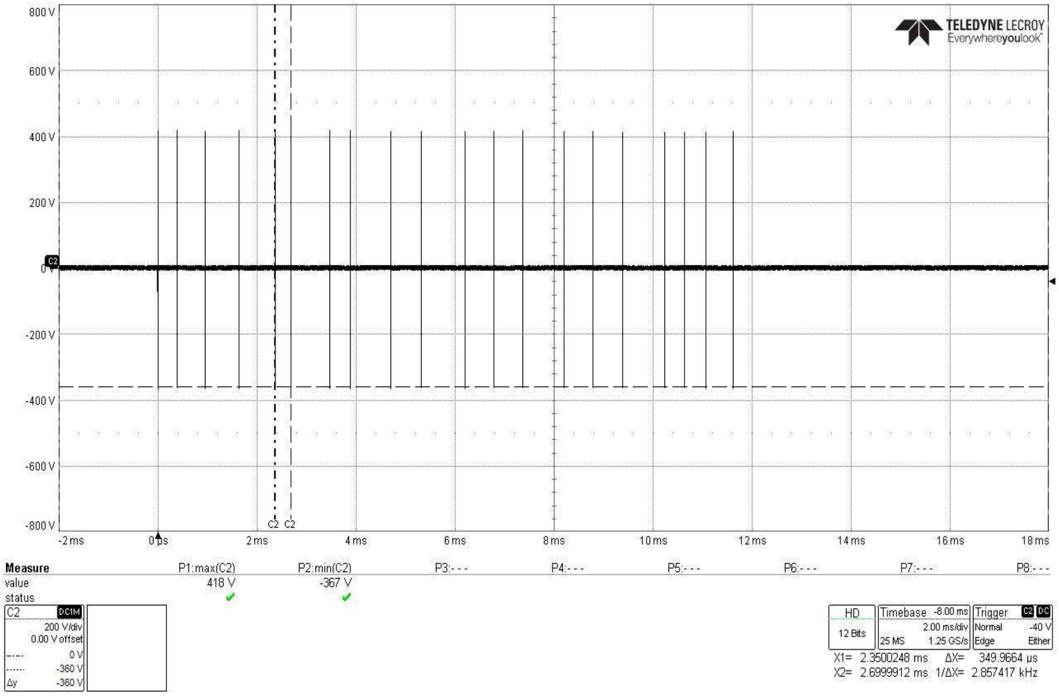


CS117 Voltage Verification MB Waveform #3 at 10MHz, 3 Bursts at +360V

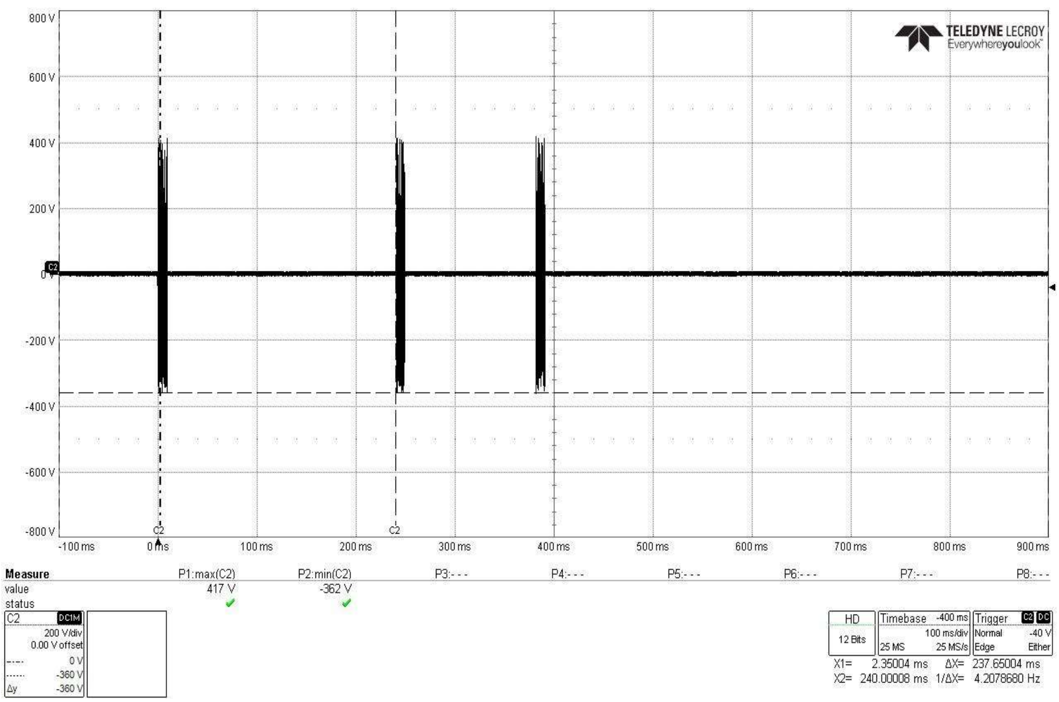


CS117 Voltage Verification MB Waveform #3 at 10MHz, First Transient at -360V

EAR Controlled Data

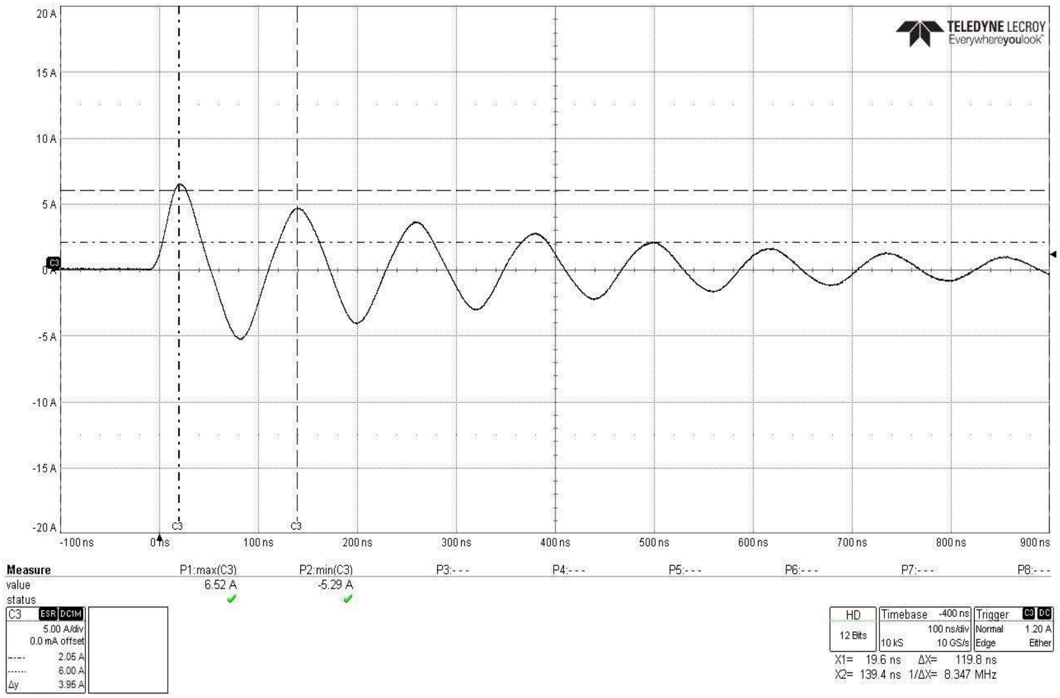


CS117 Voltage Verification MB Waveform #3 at 10MHz, 20 Transients at -360V

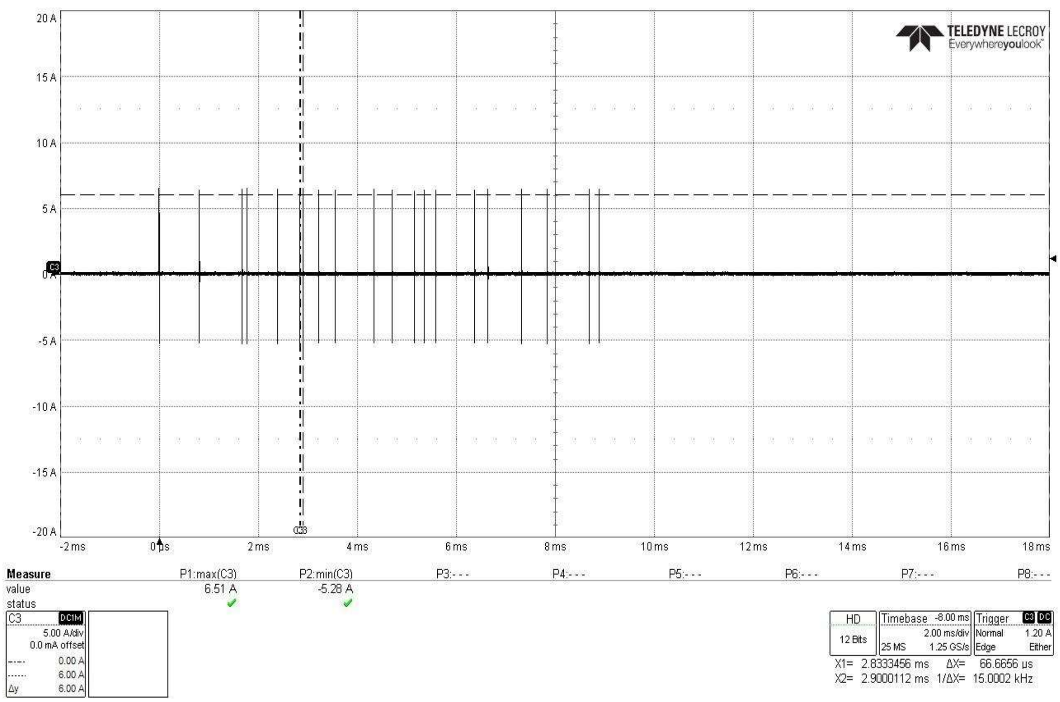


CS117 Voltage Verification MB Waveform #3 at 10MHz, 3 Bursts at -360V

EAR Controlled Data

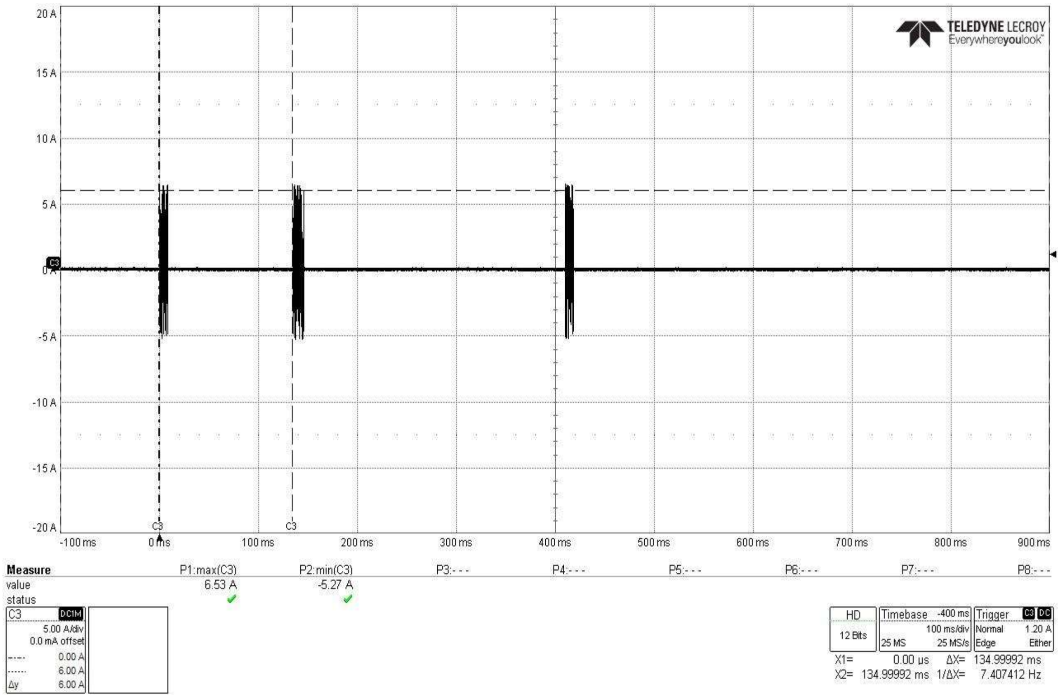


CS117 Current Verification MB Waveform #3 at 10MHz, First Transient at +6A

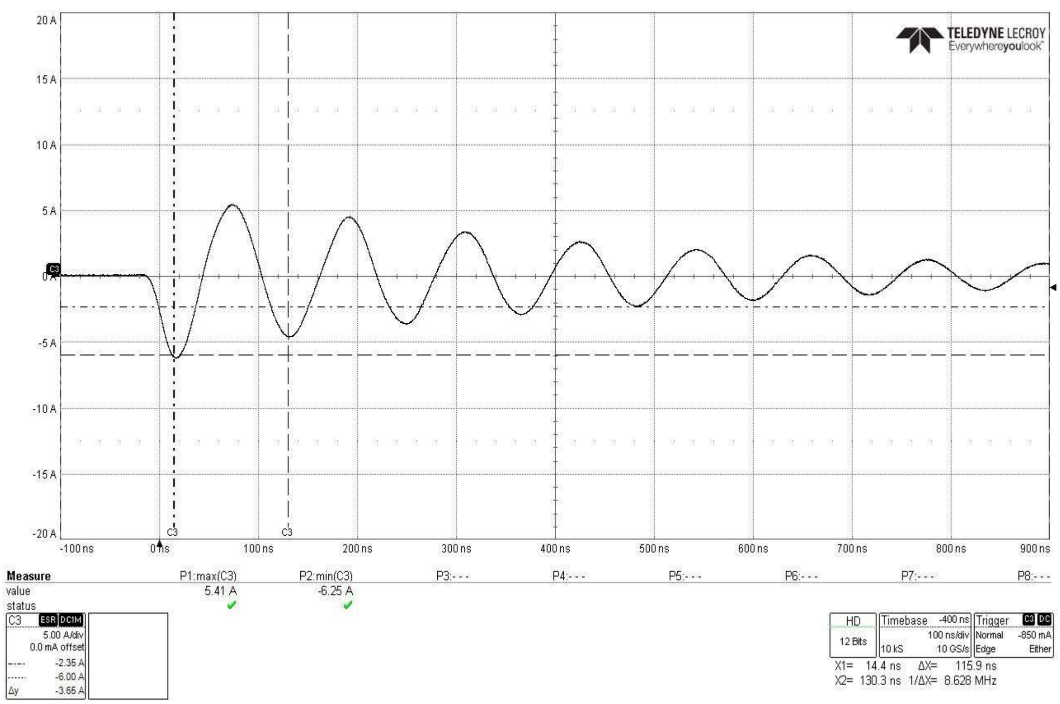


CS117 Current Verification MB Waveform #3 at 10MHz, 20 Transients at +6A

EAR Controlled Data

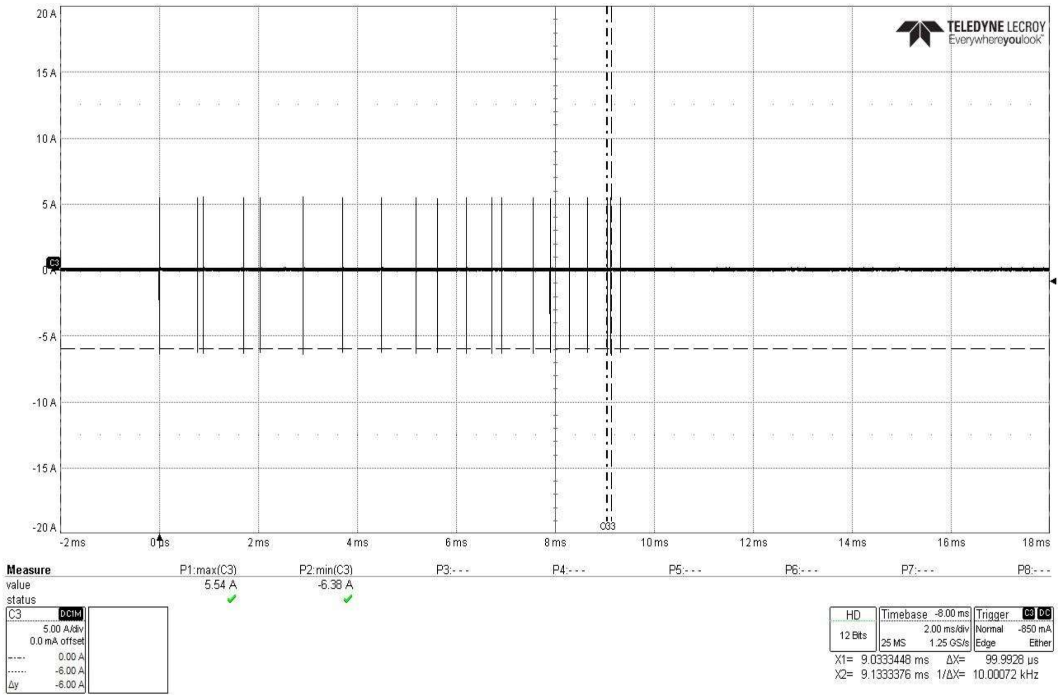


CS117 Current Verification MB Waveform #3 at 10MHz, 3 Bursts at +6A

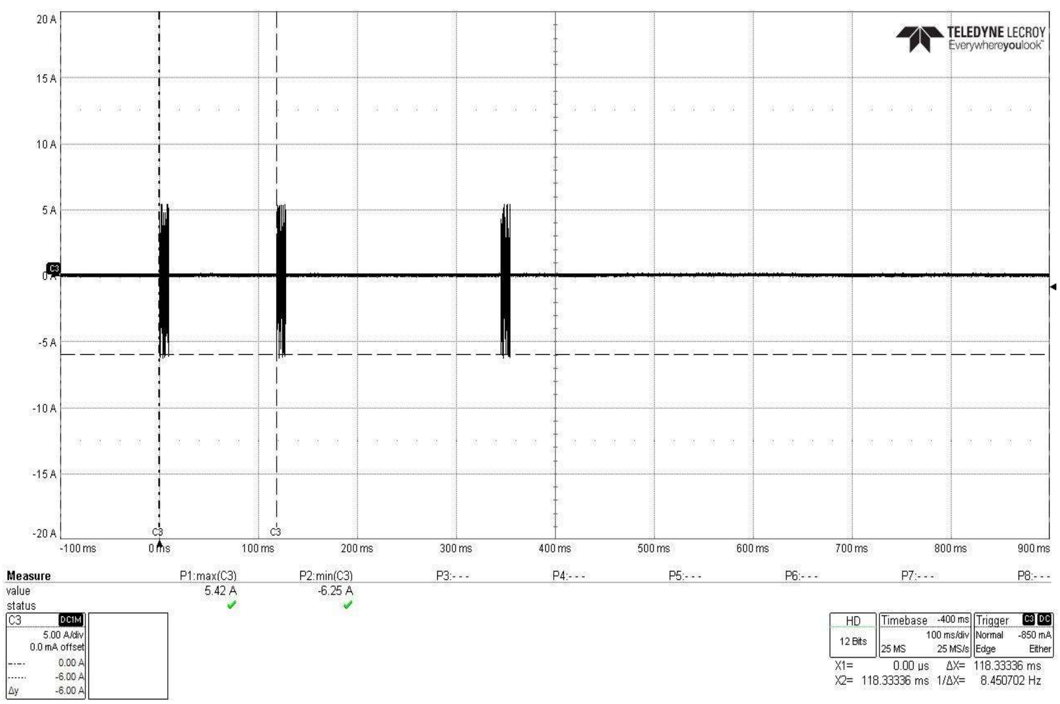


CS117 Current Verification MB Waveform #3 at 10MHz, First Transient at -6A

EAR Controlled Data



CS117 Current Verification MB Waveform #3 at 10MHz, 20 Transients at -6A



CS117 Current Verification MB Waveform #3 at 10MHz, 3 Bursts at -6A

EAR Controlled Data

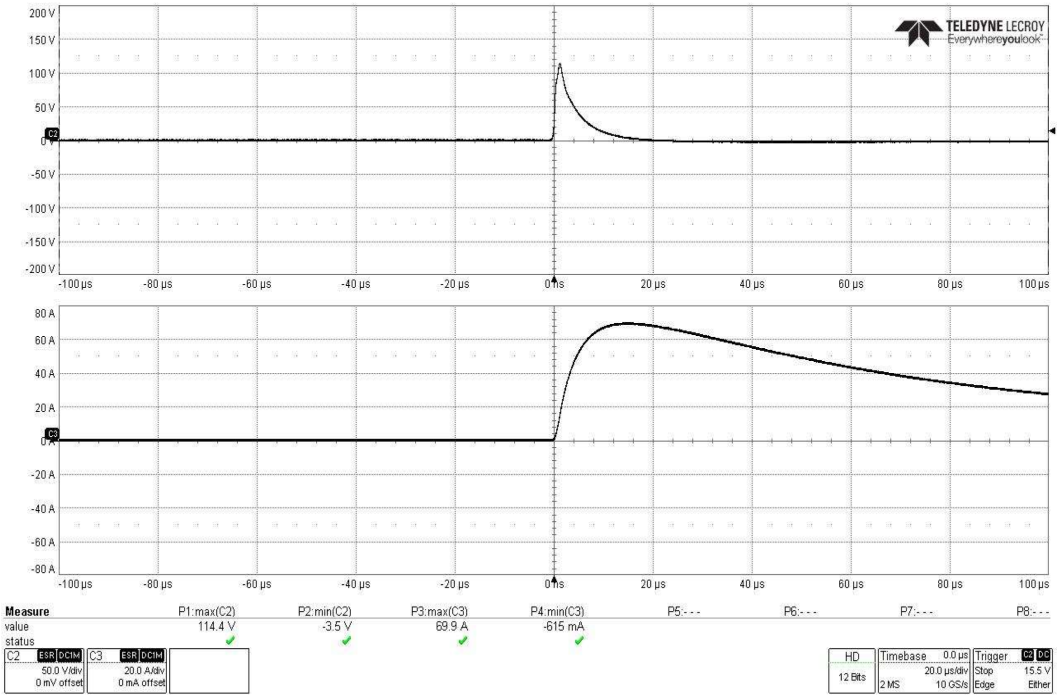
CUSTOMER:	EG4 Electronics LLC	MJO:	PR190112
TEST ITEM:	Flexboss 21	DATE:	5/12/25
PART NUMBER:	IV-16000-HYB-AW-FX-00	UNIT NO:	45000E0018
SPECIFICATION:	MIL-STD-461G	CHAMBER NO:	Work Bench 2

EUT Power Input:	AC 115V/60Hz and DC (Battery Only)				
MIL-STD-461G CS117 Lightning Induced Transient Susceptibility					
Temperature: 85F	Humidity: 42% RH	Barometric Pressure: 981 mBar			
Internal Equipment Levels	**Test Level**	**Test On**	**Results**		**Comments**
Waveform #1 MS	300VL_60At/150VL_30At	AC Pwr LINE 1	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_60At/150VL_30At	AC Pwr LINE 2	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_600At/150VL_150At	Full AC Power Bundle	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_60At/150VL_30At	DC bundle	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_60At/150VL_30At	DC Return Side	☑ Pass	☐ Fail	
Waveform #1 MS	300VL_60At/150VL_30At	DC High Side	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_60AL/150Vt_30AL	AC Pwr LINE 1	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_60AL/150Vt_30AL	AC Pwr LINE 2	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_600AL/150Vt_150AL	Full AC Power Bundle	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_600AL/150Vt_150AL	DC bundle	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	AC Pwr LINE 1	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	AC Pwr LINE 2	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_120A/300V_60AL	Full AC Power Bundle	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_120A/300V_60AL	DC bundle	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	DC Return Side	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	DC High Side	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	AC Pwr LINE 1	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	AC Pwr LINE 2	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	Full AC Power Bundle	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	DC bundle	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	DC Return Side	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	DC High Side	☑ Pass	☐ Fail	

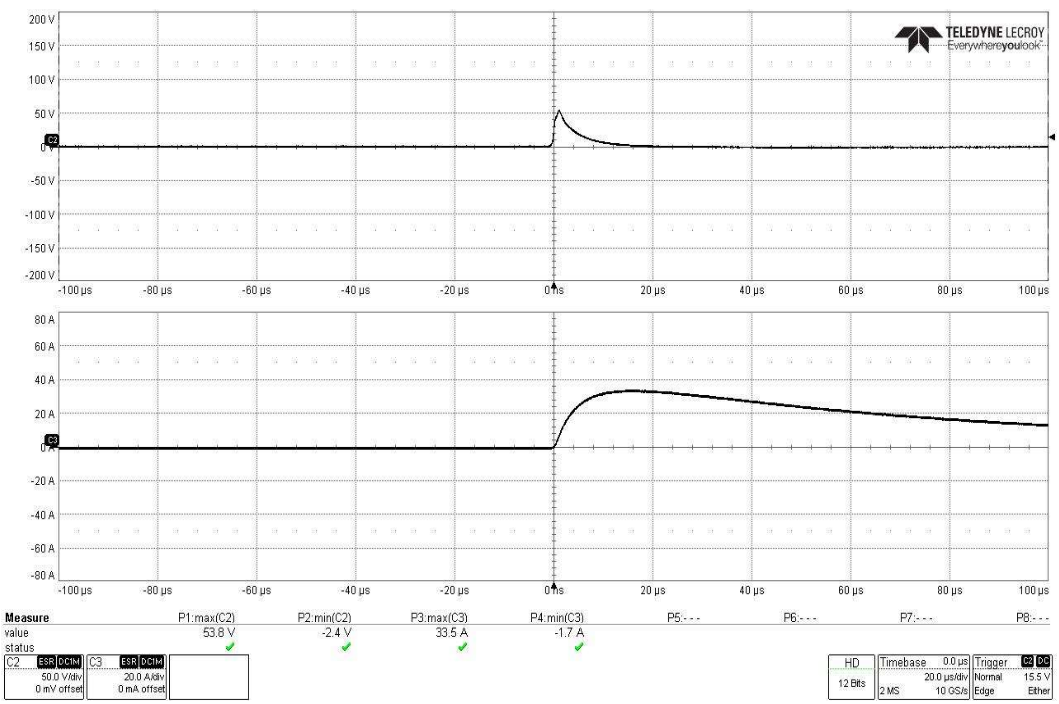
TECHNICIAN / ENGINEER:	Johnny Vu	DATE:	5/12/2025

EAR Controlled Data

CS117 Actual Test Multiple Stroke Waveform #1 with A$_T$ = 600A on Flexboss 21

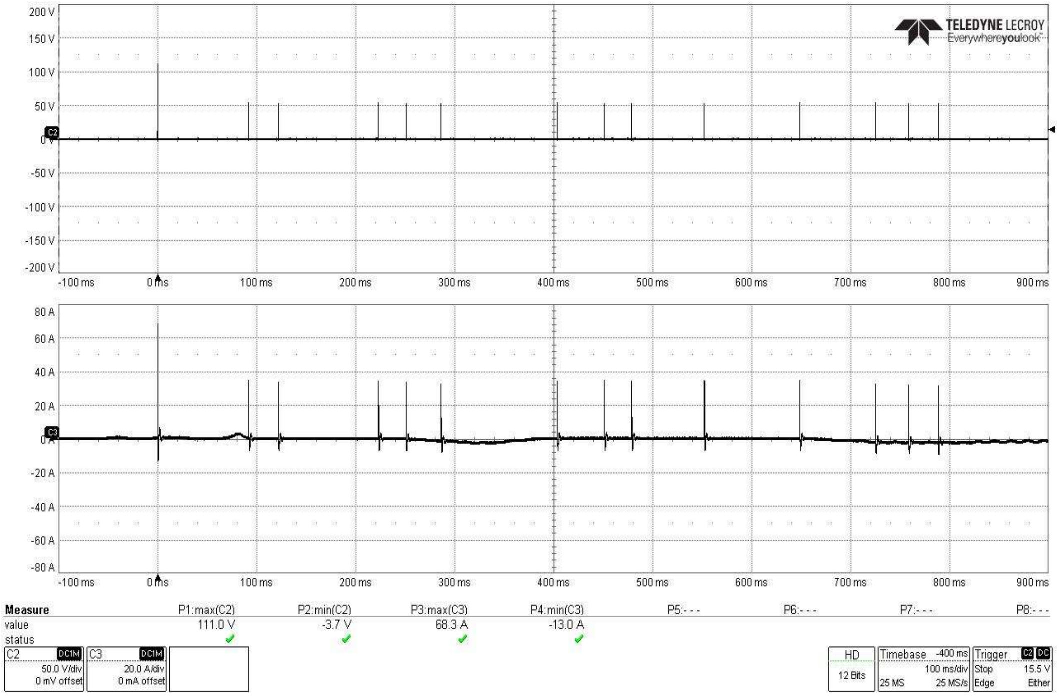


Actual Test CS117 Waveform #1, First Transient +600A, on DC High Side

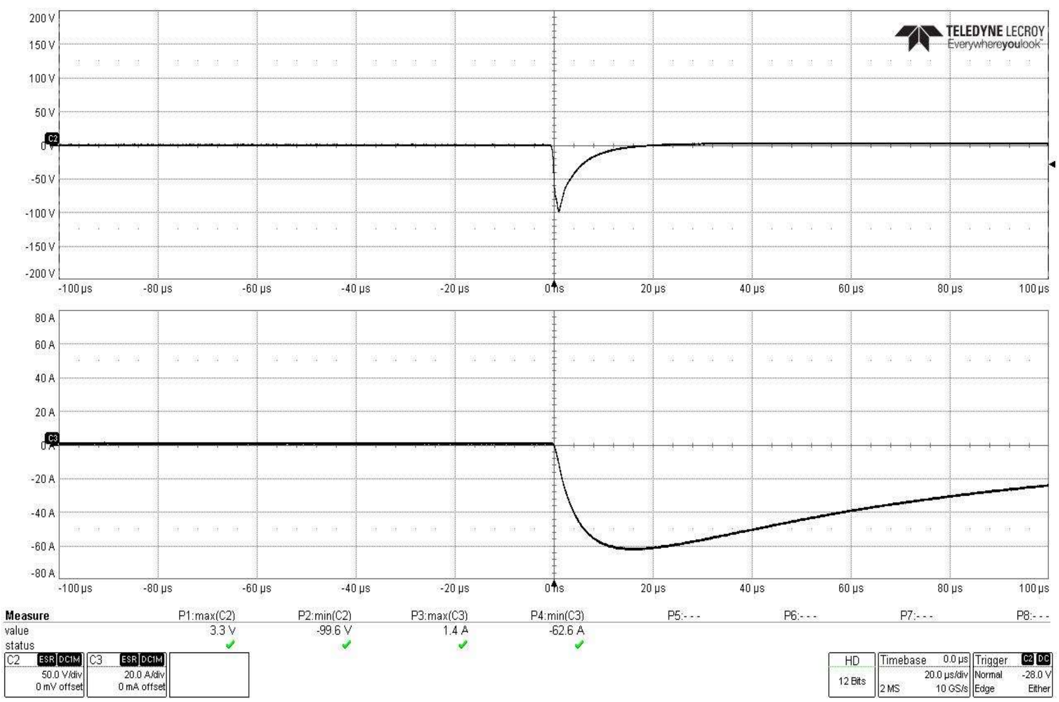


Actual Test CS117 Waveform #1, Subsequent Transient +150A, on DC High Side

EAR Controlled Data

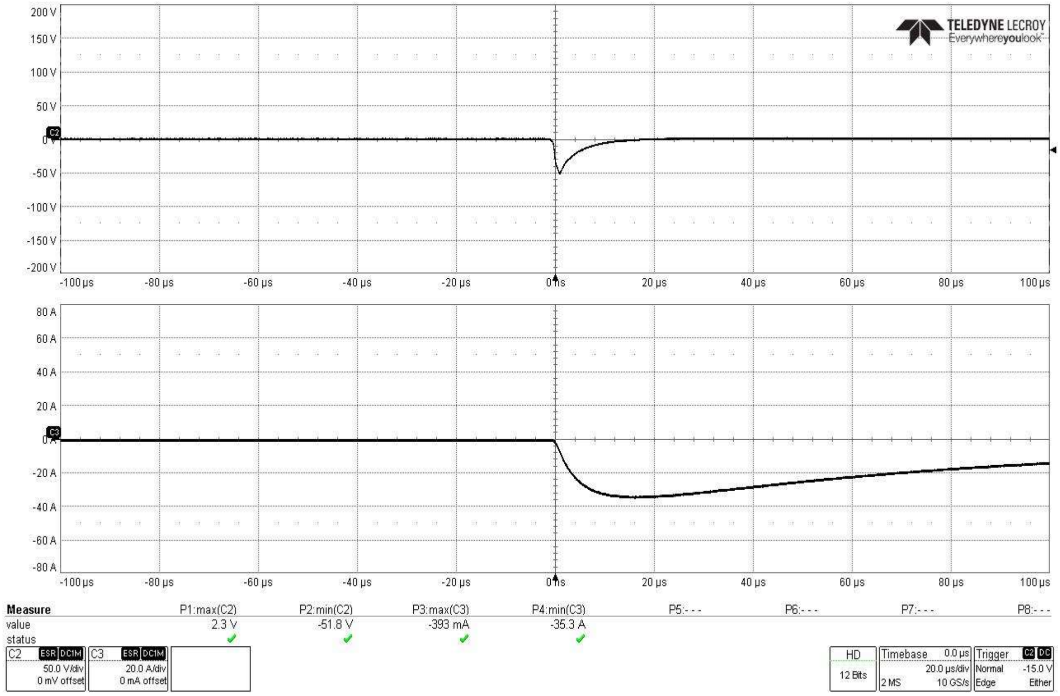


Actual Test CS117 Waveform #1, 14 Transients +600/+150A, on DC High Side

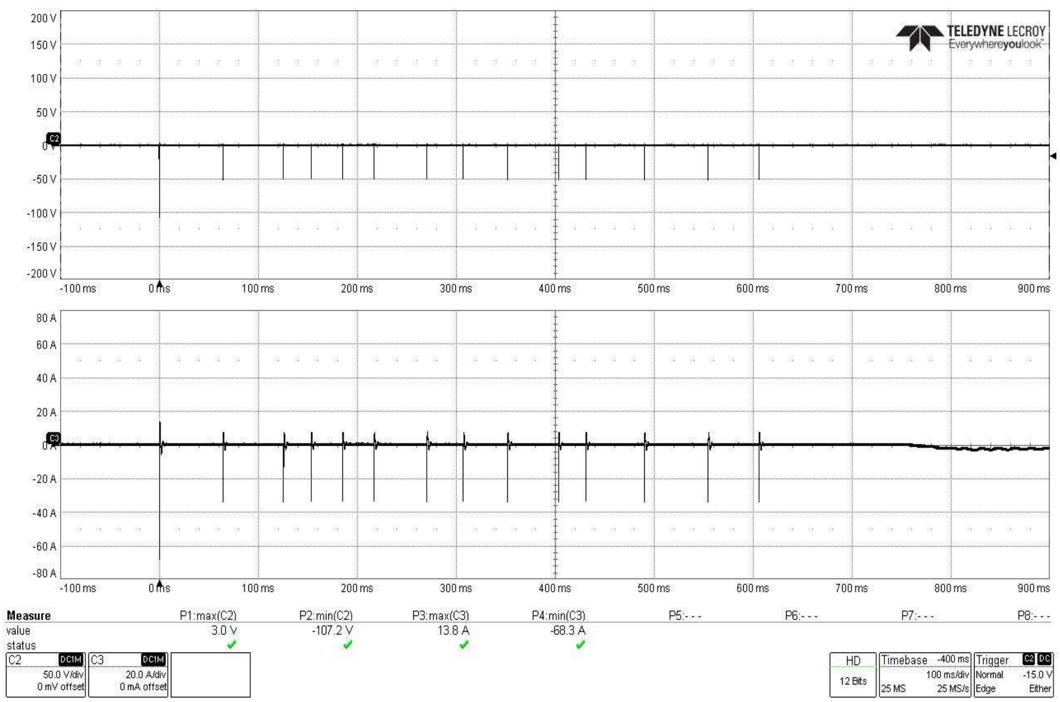


Actual Test CS117 Waveform #1, First Transient -600A, on DC High Side

EAR Controlled Data

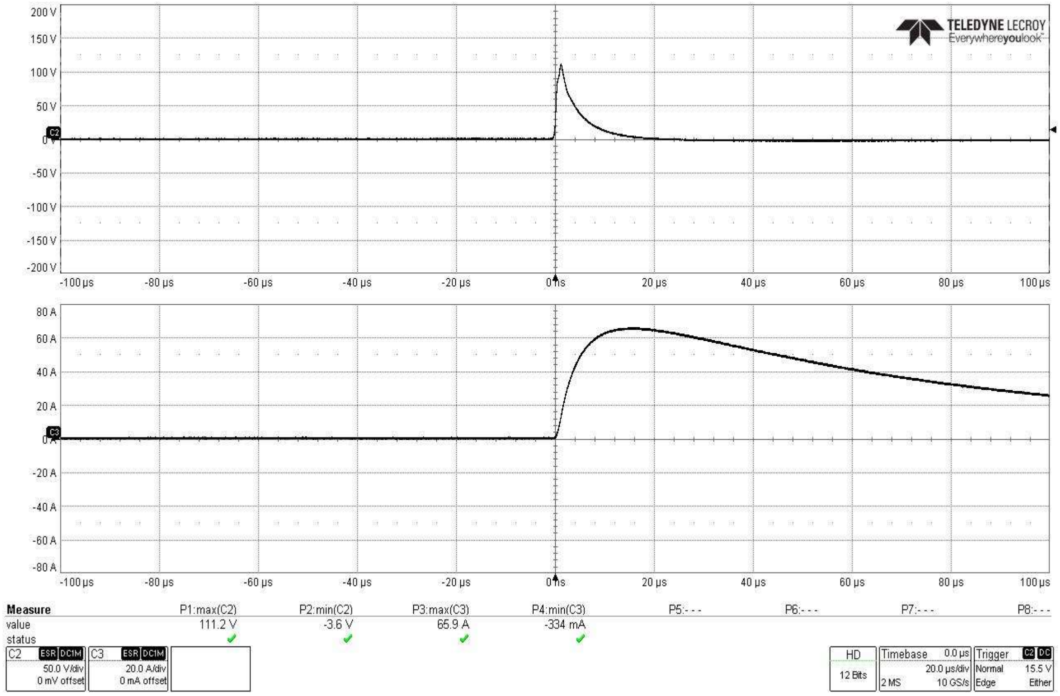


Actual Test CS117 Waveform #1, Subsequent Transient -150A, on DC High Side

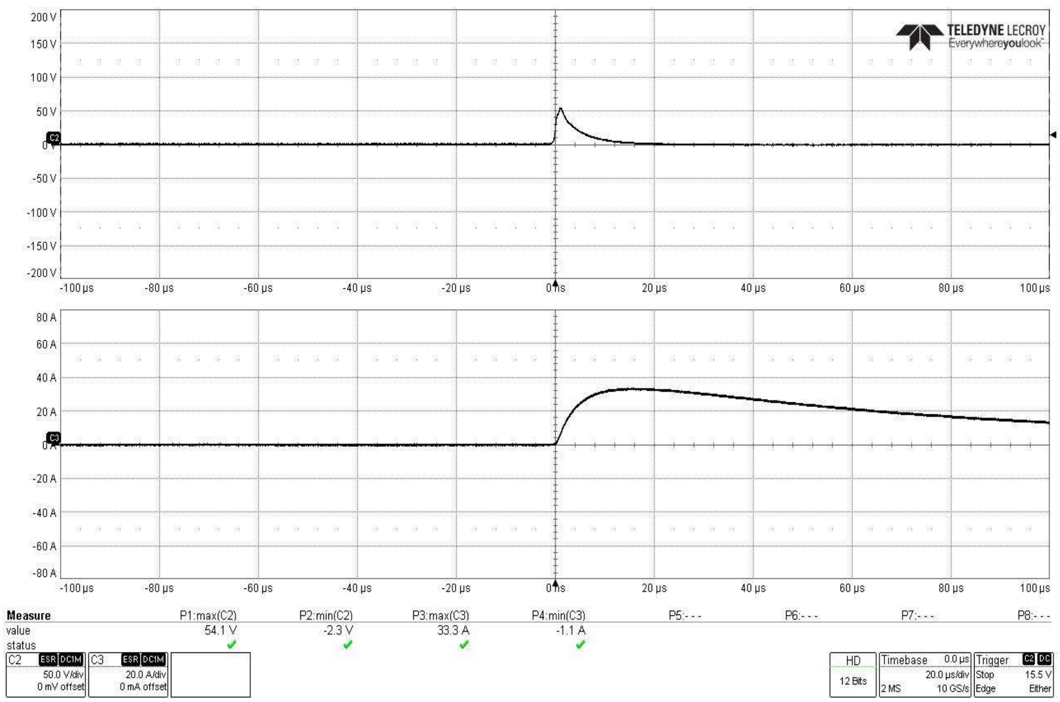


Actual Test CS117 Waveform #1, 14 Transients -600/-150A, on DC High Side

EAR Controlled Data

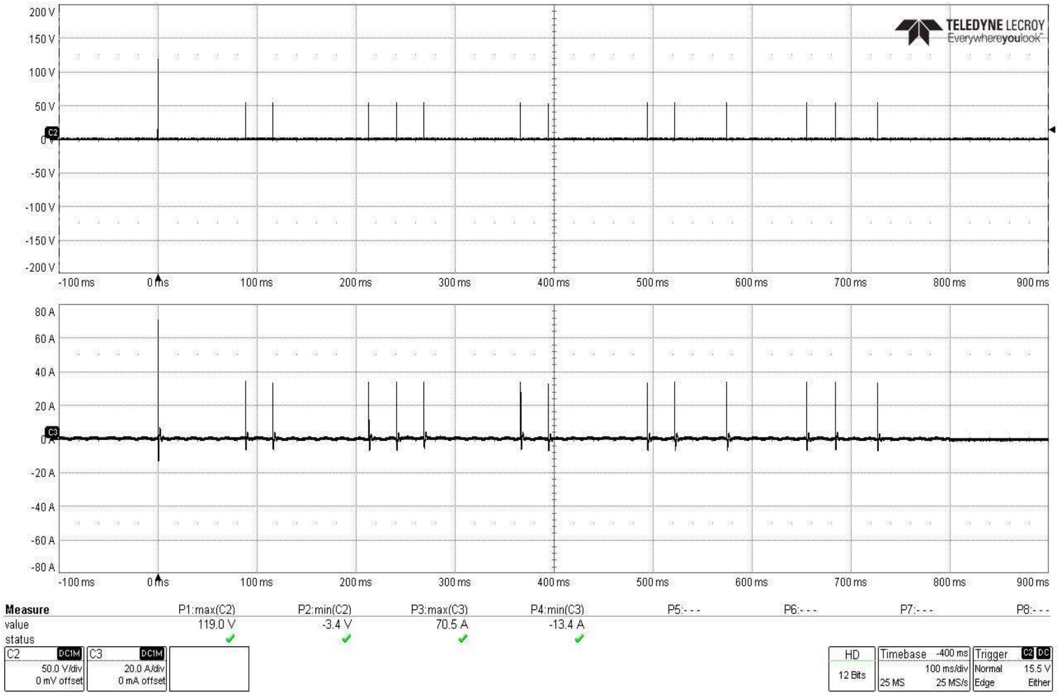


Actual Test CS117 Waveform #1, First Transient +600A, on DC Return Side

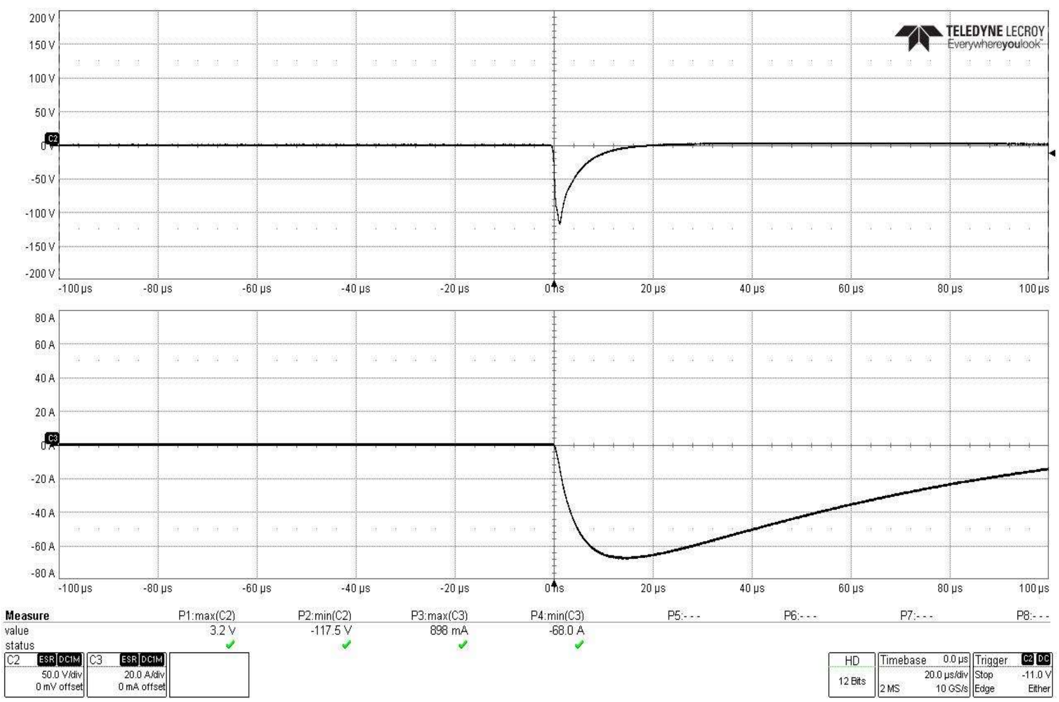


Actual Test CS117 Waveform #1, Subsequent Transient +150A, on DC Return Side

EAR Controlled Data

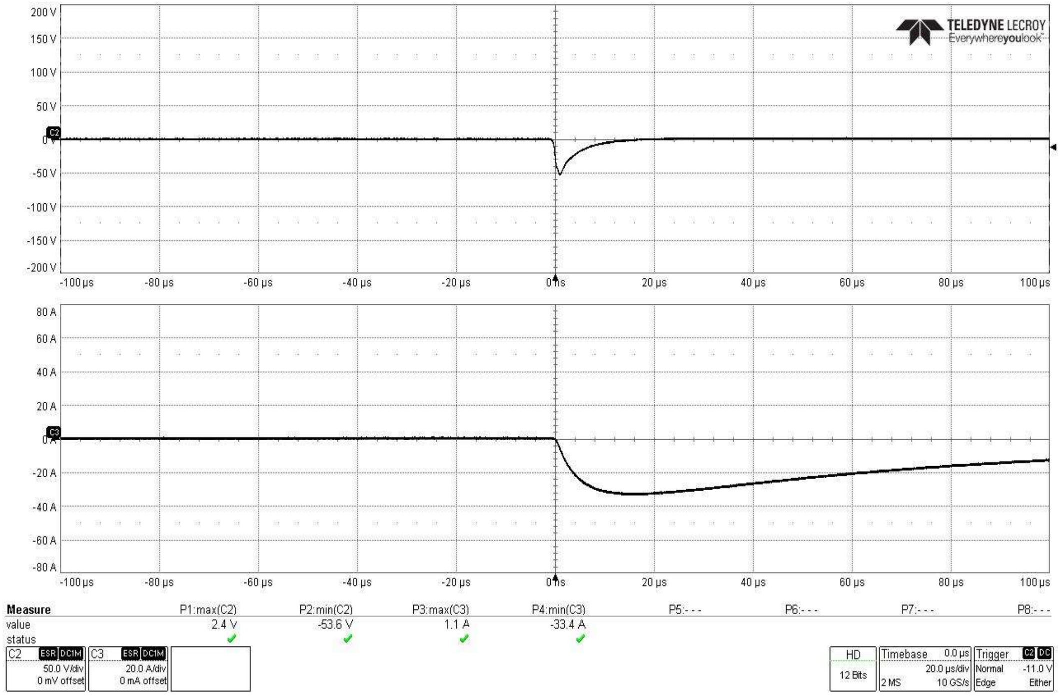


Actual Test CS117 Waveform #1, 14 Transients +600/+150A, on DC Return Side

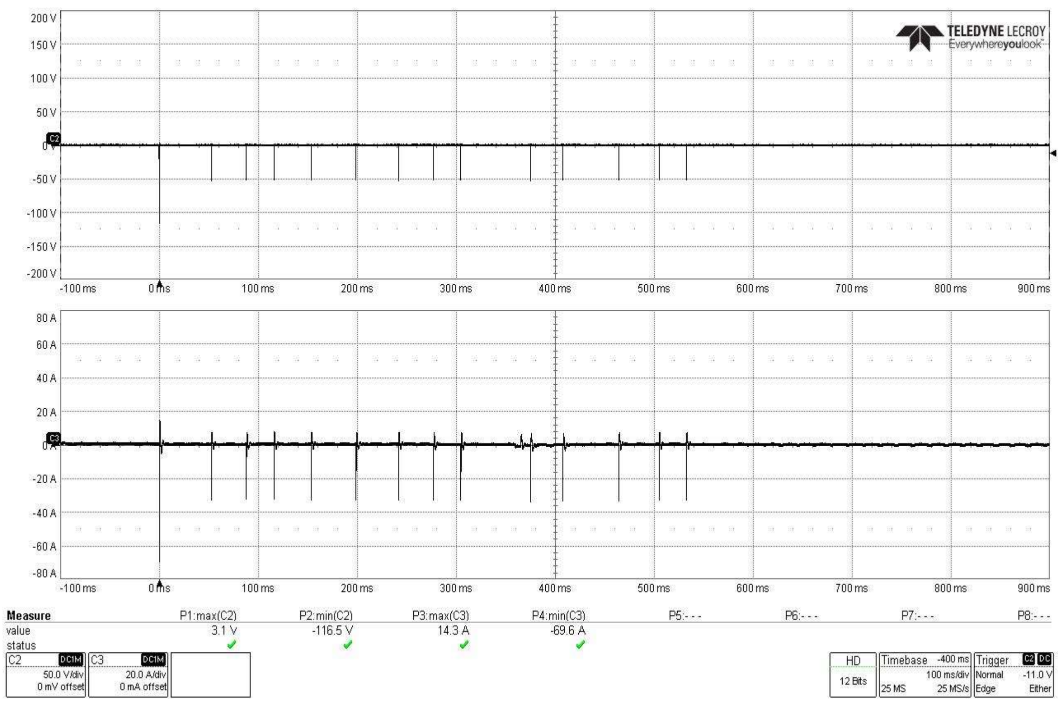


Actual Test CS117 Waveform #1, First Transient -600A, on DC Return Side

EAR Controlled Data



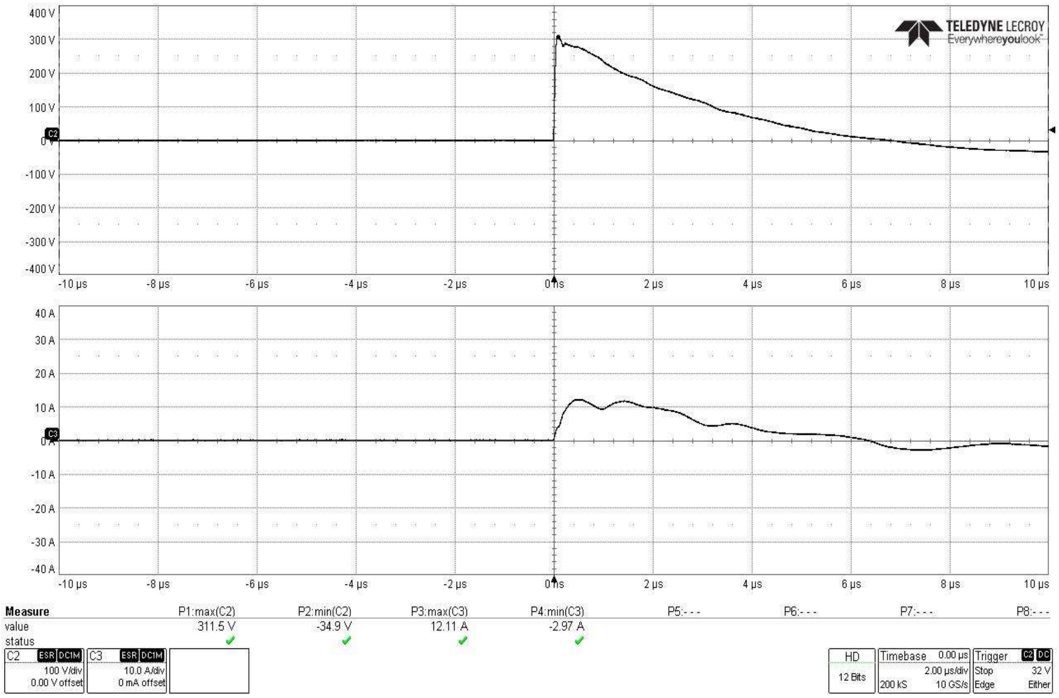
Actual Test CS117 Waveform #1, Subsequent Transient -150A, on DC Return Side



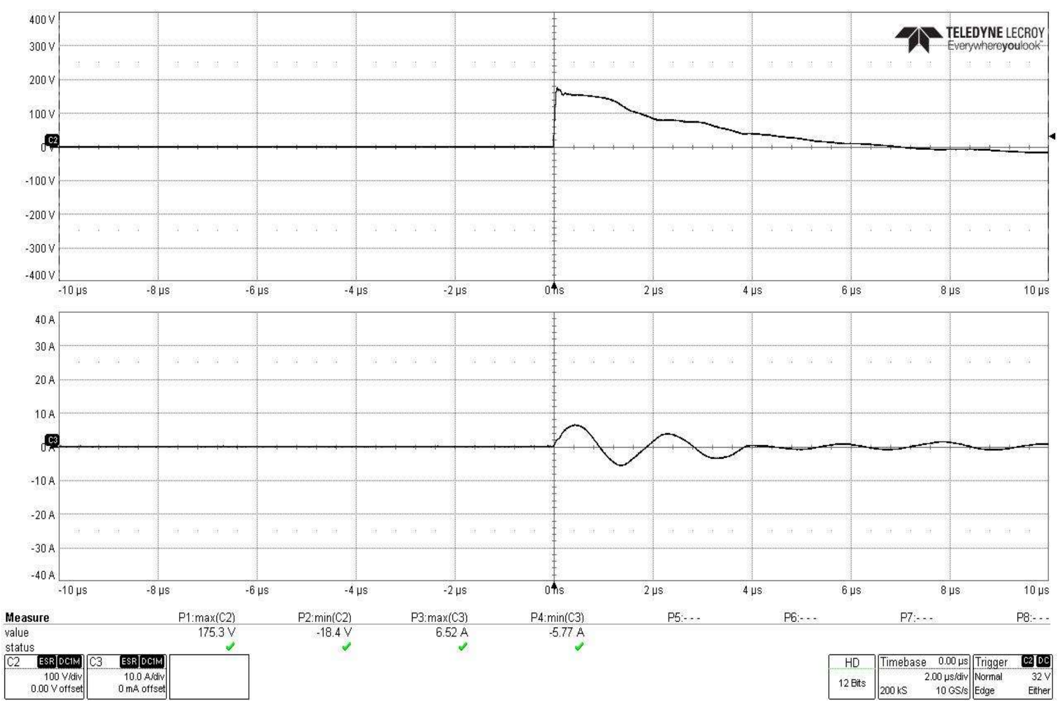
Actual Test CS117 Waveform #1, 14 Transients -600/-150A, on DC Return Side

EAR Controlled Data

CS117 Actual Test Multiple Stroke Waveform #2 with V_T = 300V on Flexboss 21

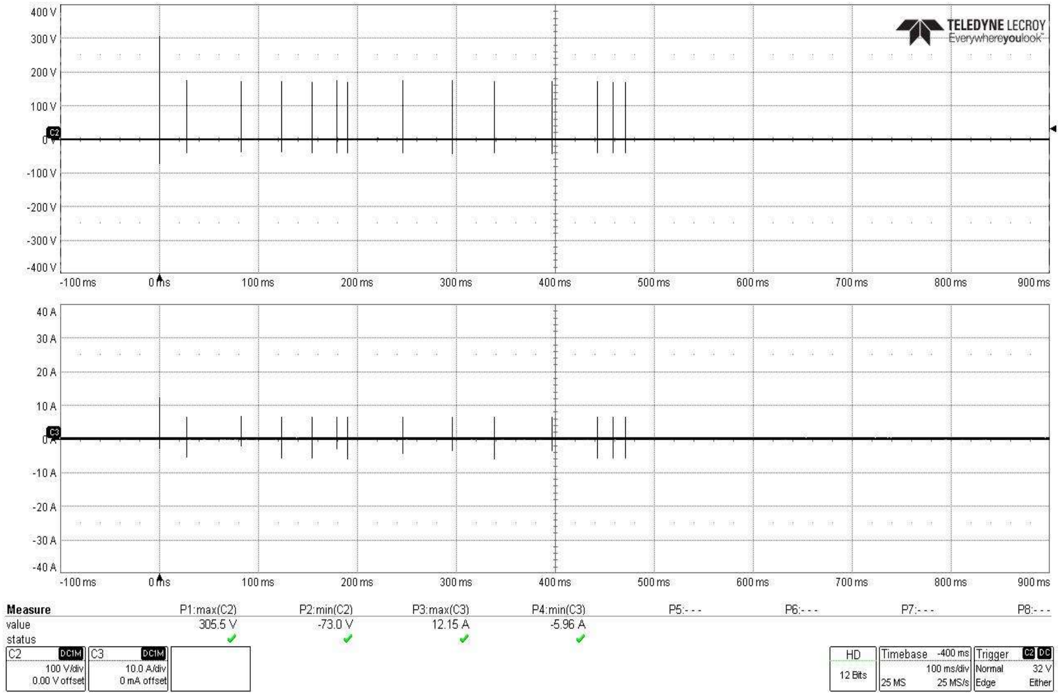


Actual Test CS117 Waveform #2, First Transient +300V/600A on AC Power Line 1

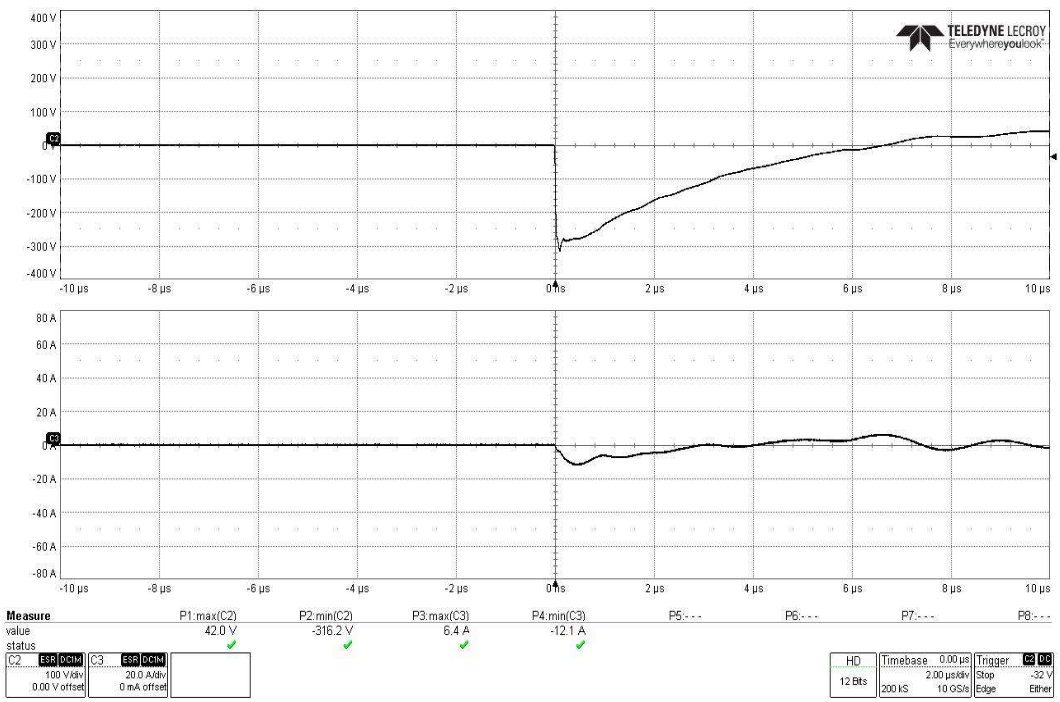


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on AC Power Line 1

EAR Controlled Data

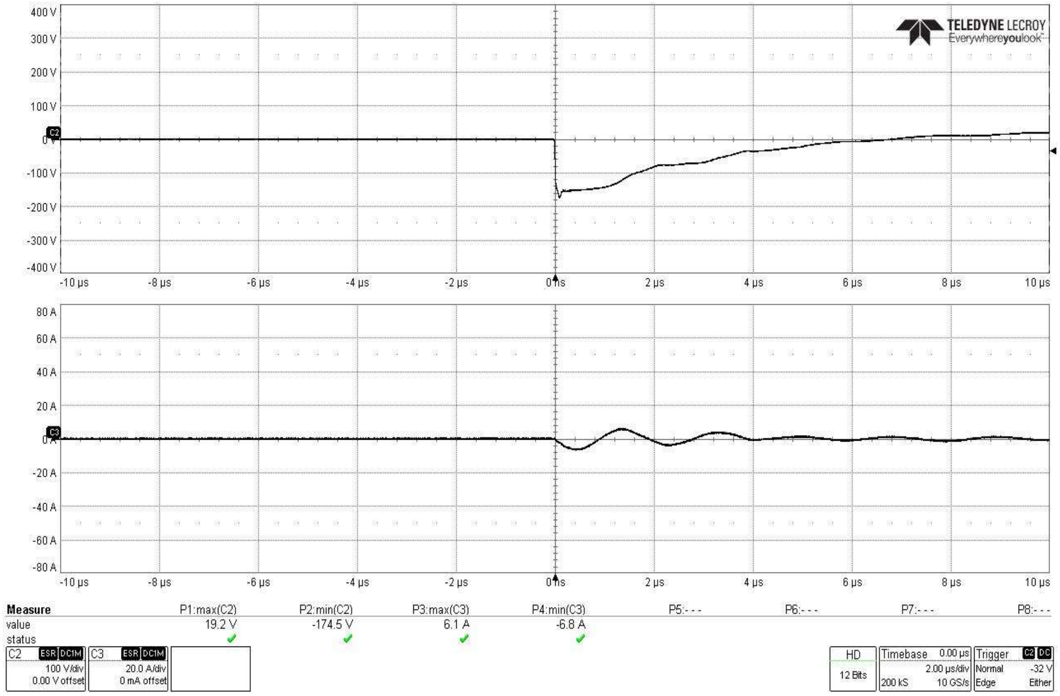


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on AC Power Line 1

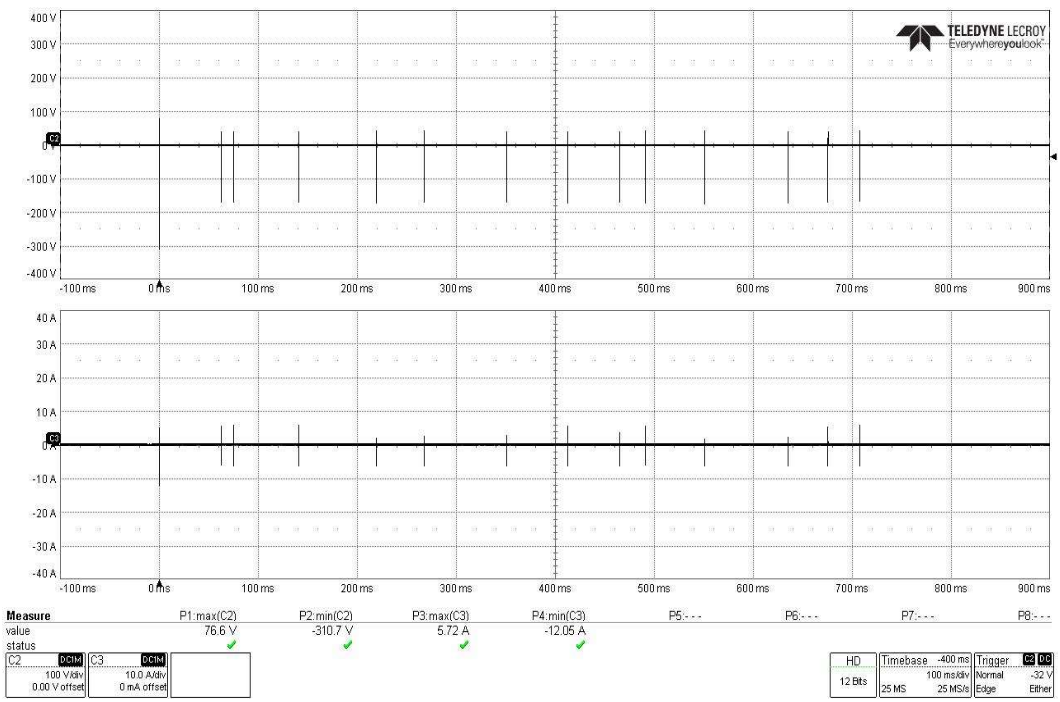


Actual Test CS117 Waveform #2, First Transient -300V/600A on AC Power Line 1

EAR Controlled Data

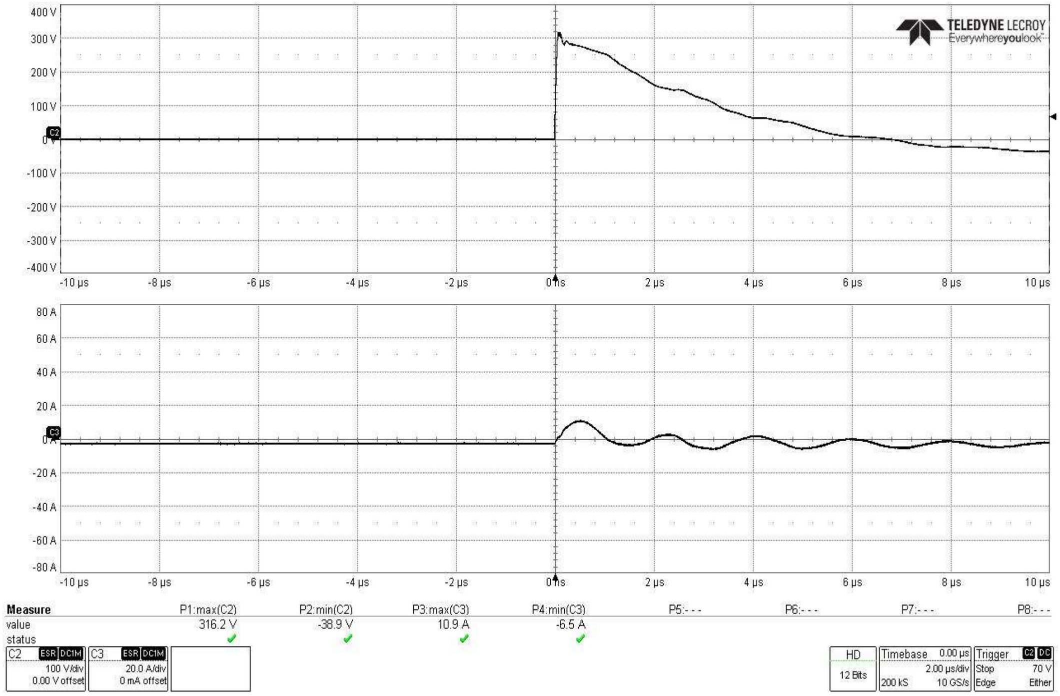


Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on AC Power Line 1

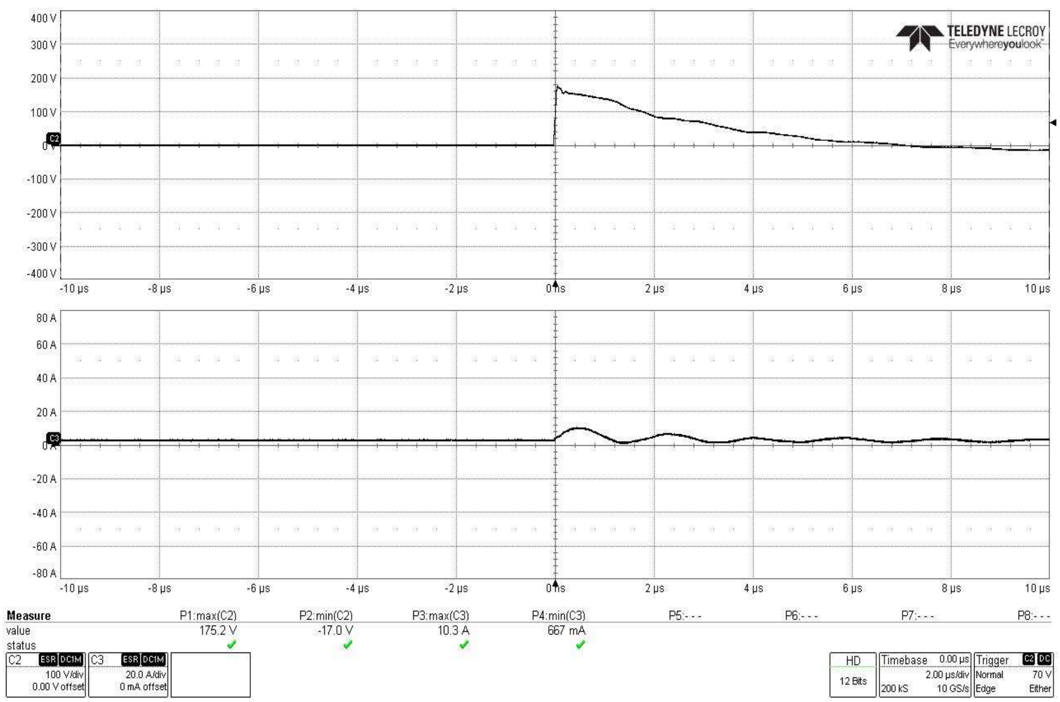


Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on AC Power Line 1

EAR Controlled Data

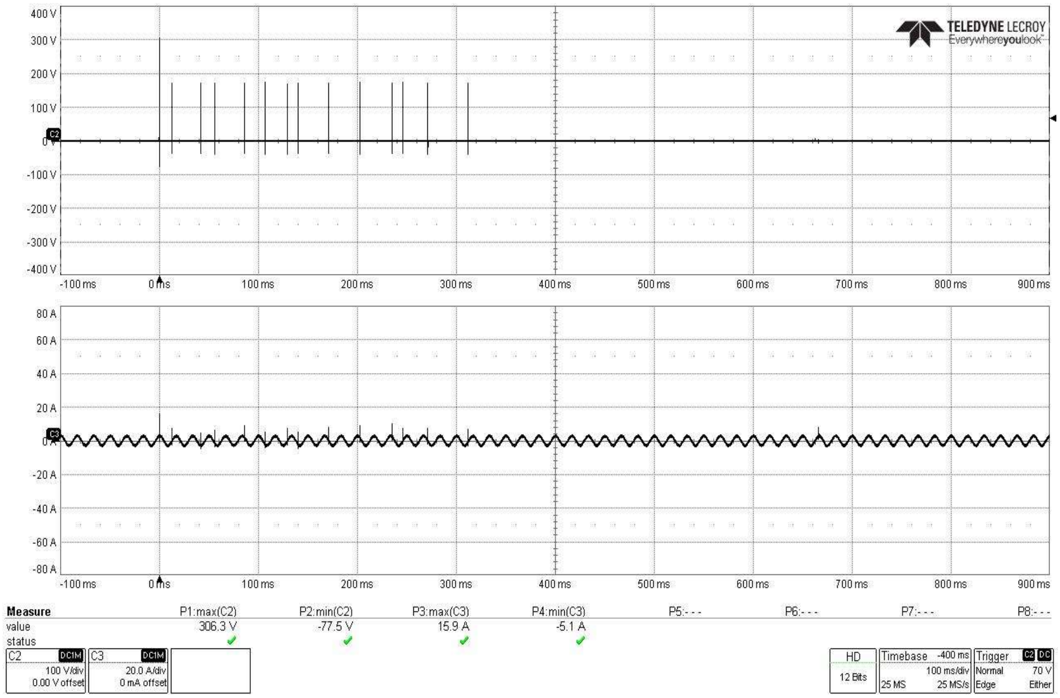


Actual Test CS117 Waveform #2, First Transient +300V/600A on AC Power Line 2

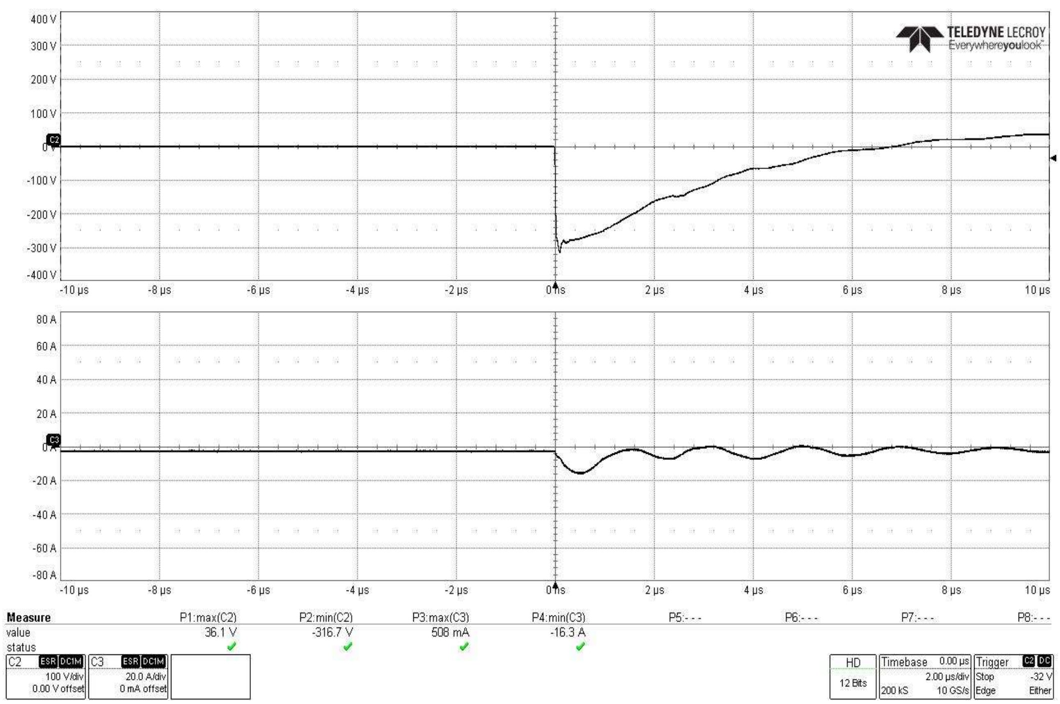


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on AC Power Line 2

EAR Controlled Data

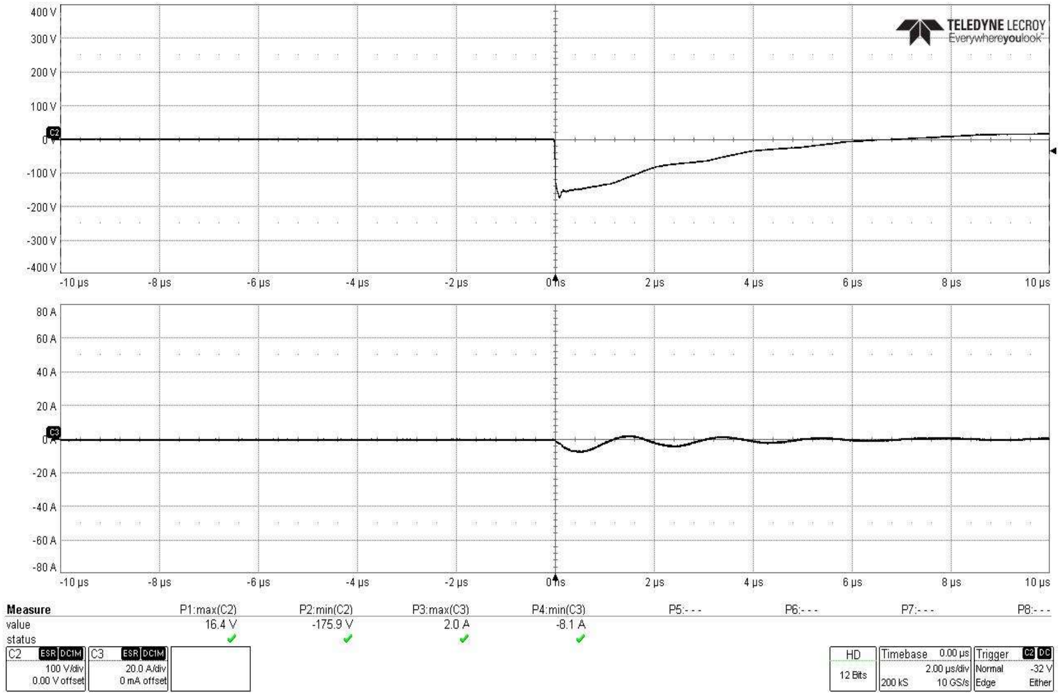


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on AC Power Line 2

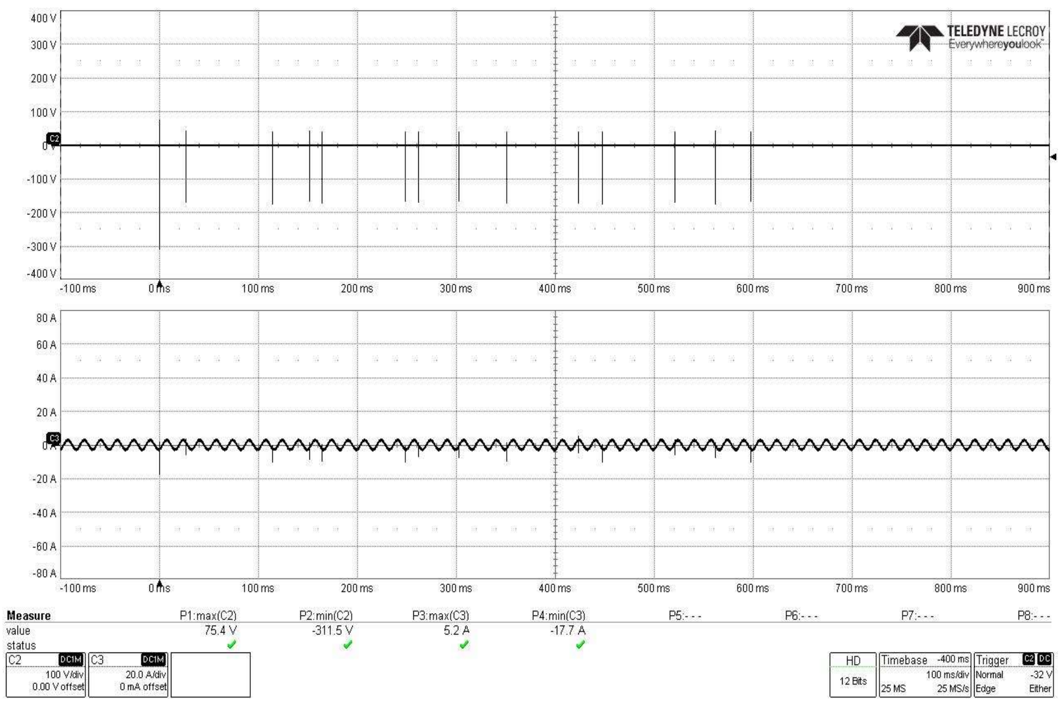


Actual Test CS117 Waveform #2, First Transient -300V/600A on AC Power Line 2

EAR Controlled Data

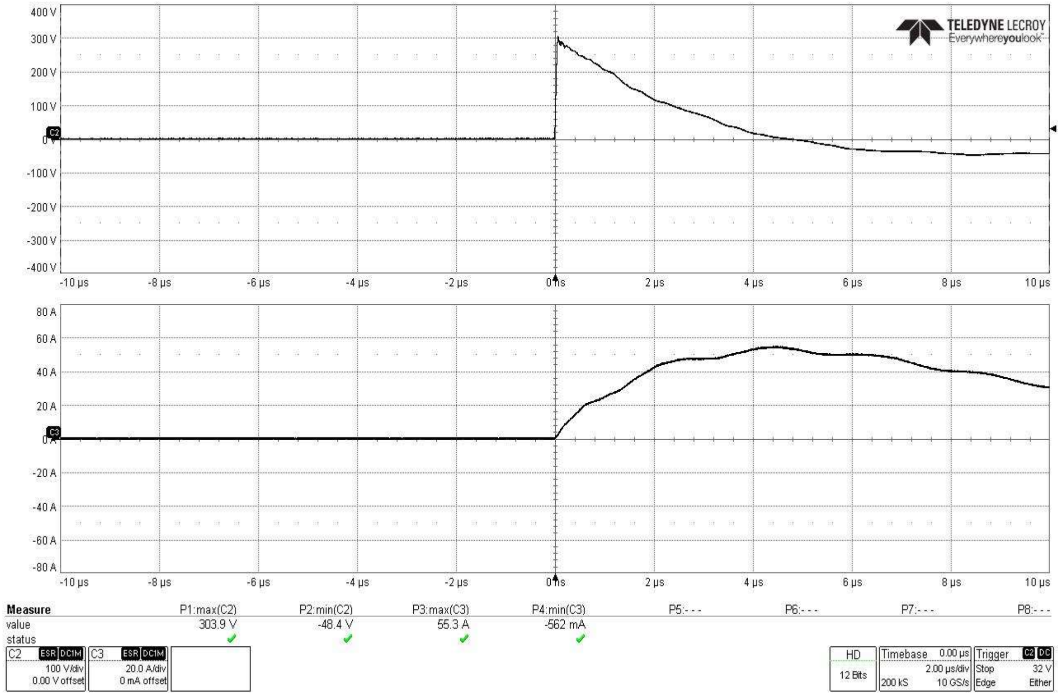


Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on AC Power Line 2

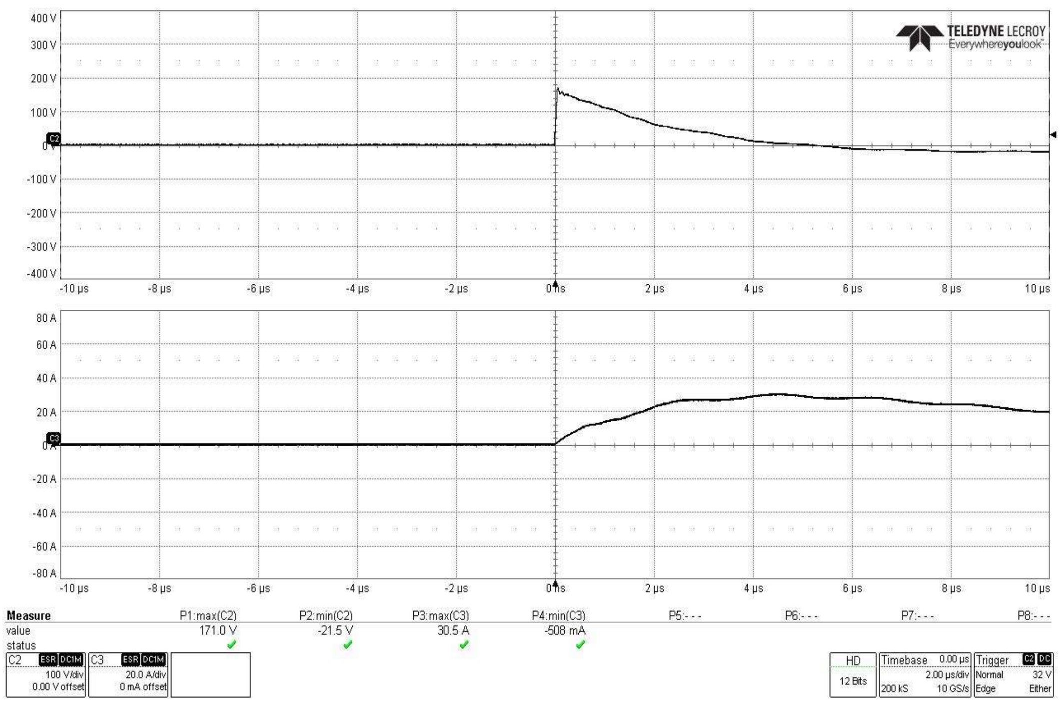


Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on AC Power Line 2

EAR Controlled Data

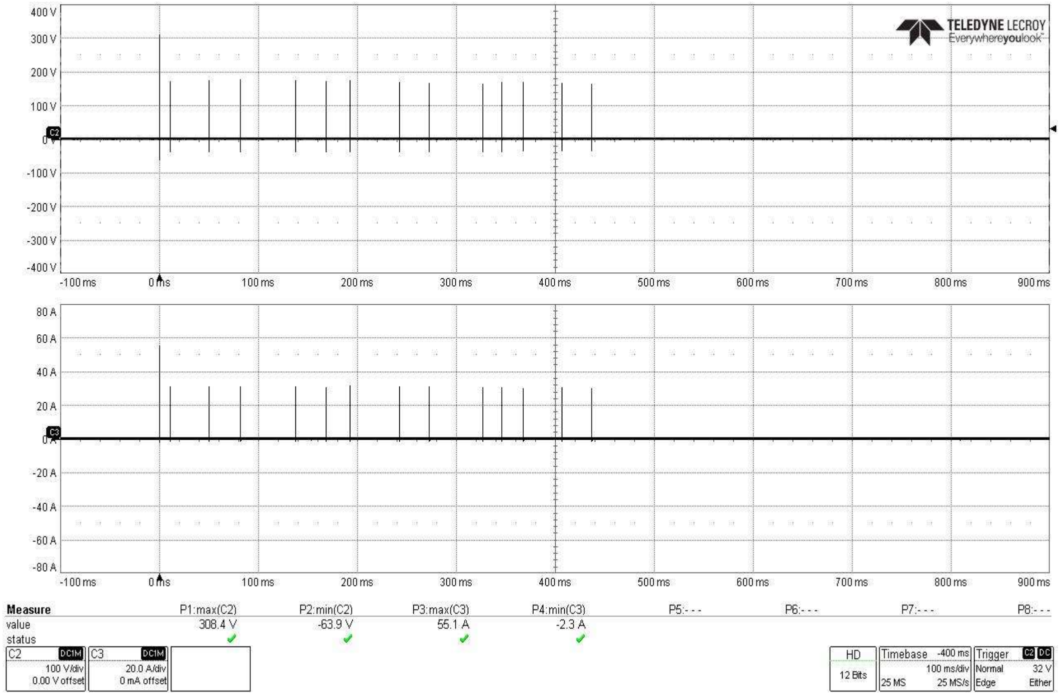


Actual Test CS117 Waveform #2, First Transient +300V/600A on Full AC Power Bundle

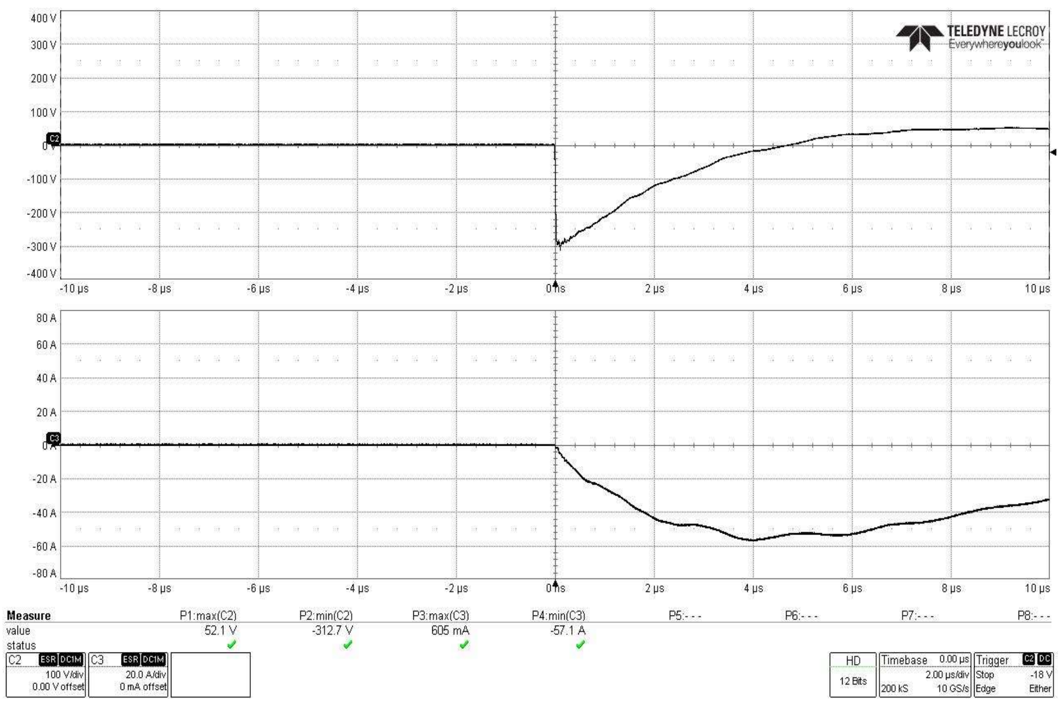


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on Full AC Power Bundle

EAR Controlled Data

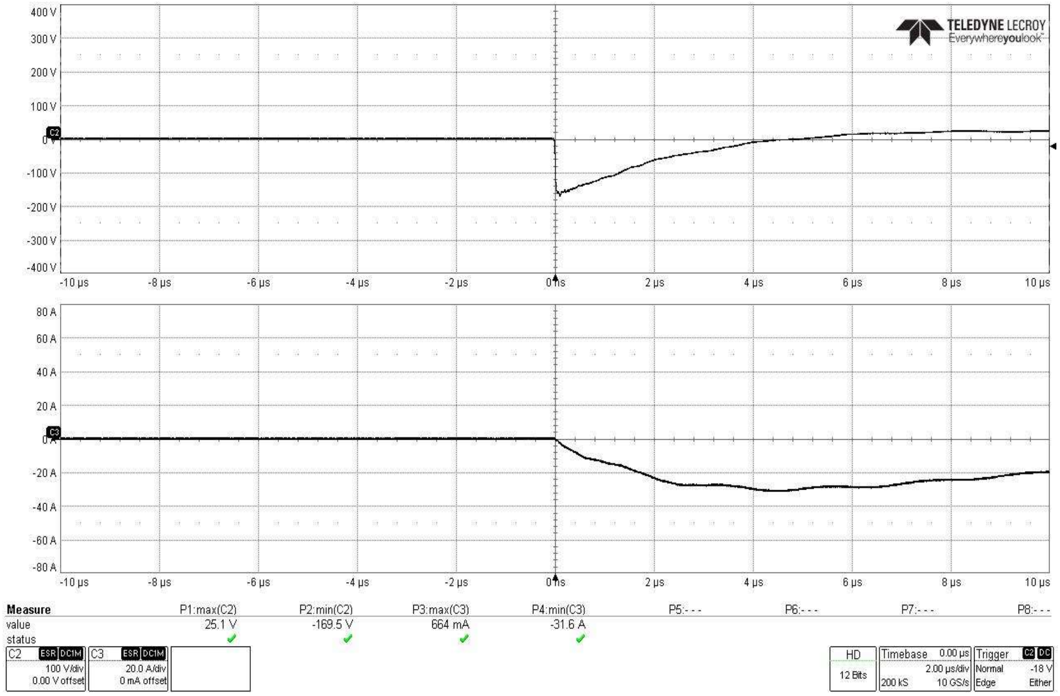


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on Full AC Power Bundle

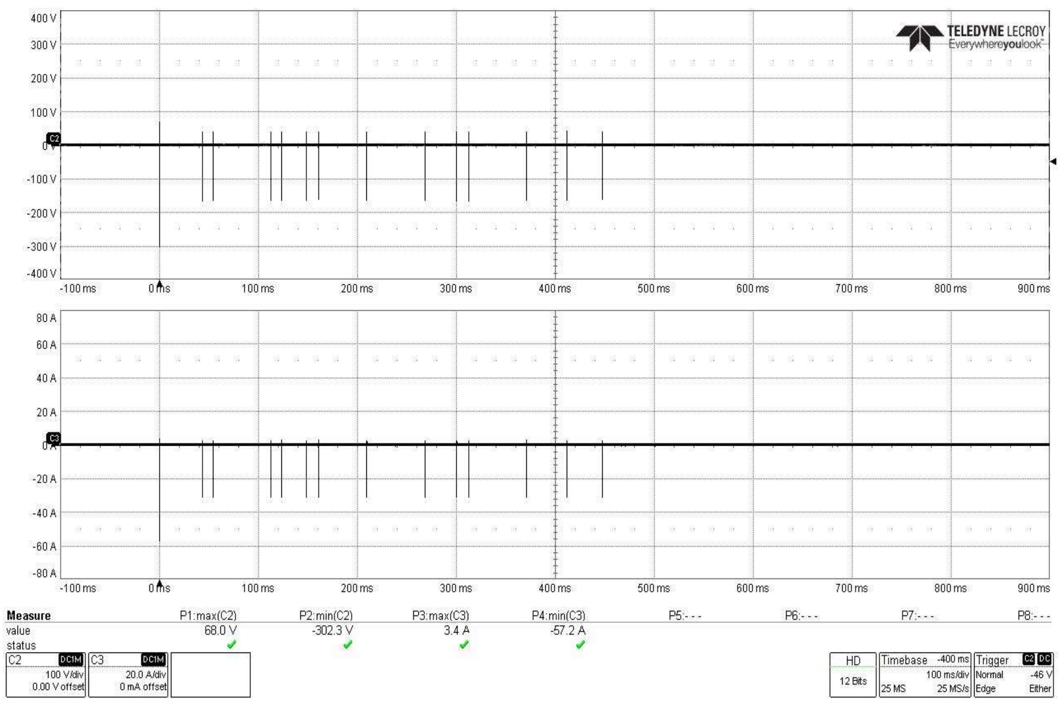


Actual Test CS117 Waveform #2, First Transient -300V/600A on Full AC Power Bundle

EAR Controlled Data

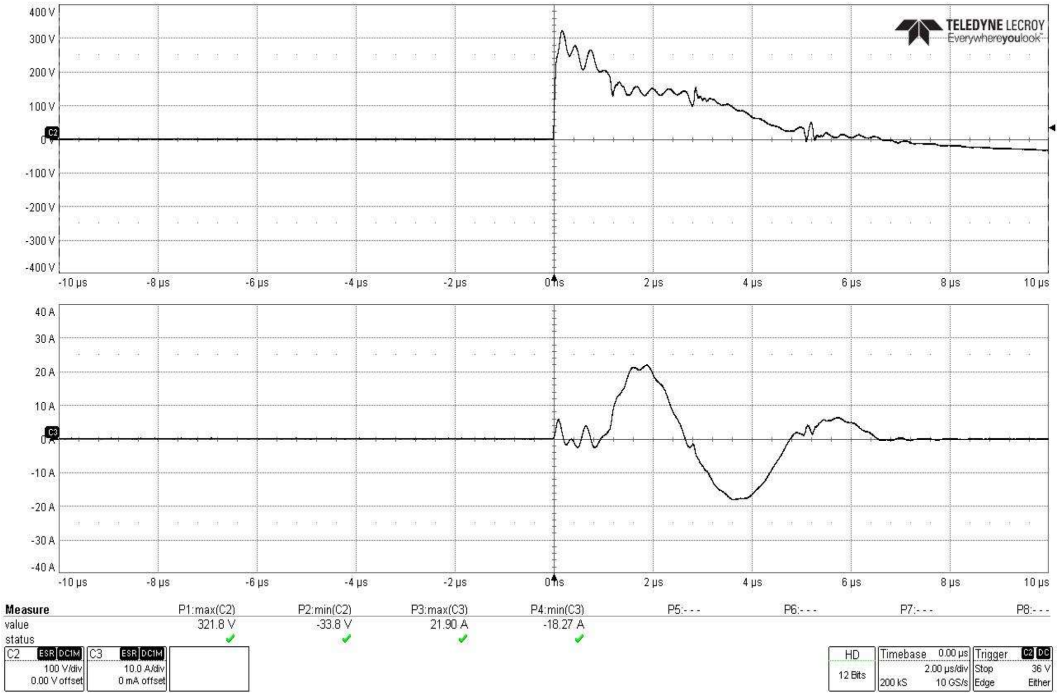


Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on Full AC Power Bundle

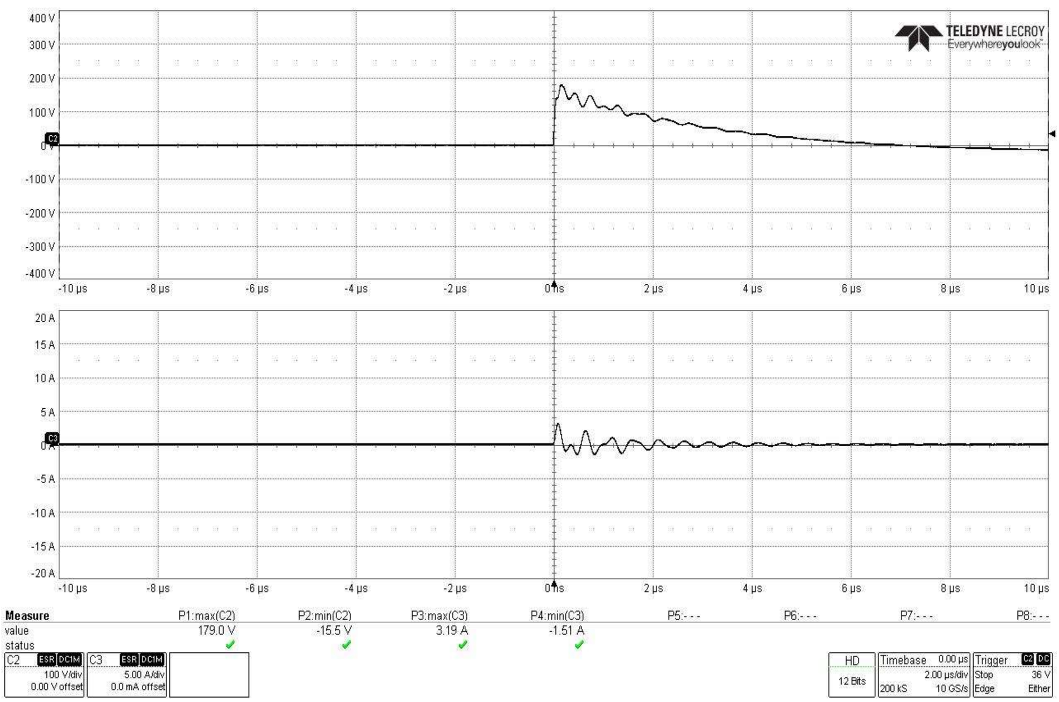


Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on DC Power Bundle

EAR Controlled Data

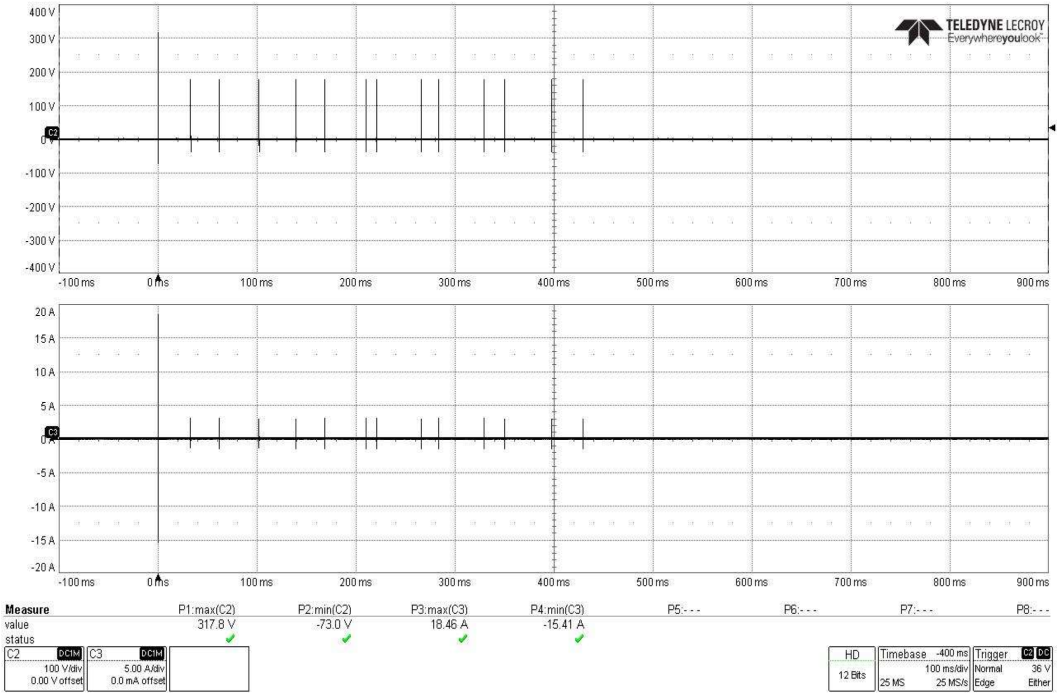


Actual Test CS117 Waveform #2, First Transient +300V/600A on DC Power Bundle

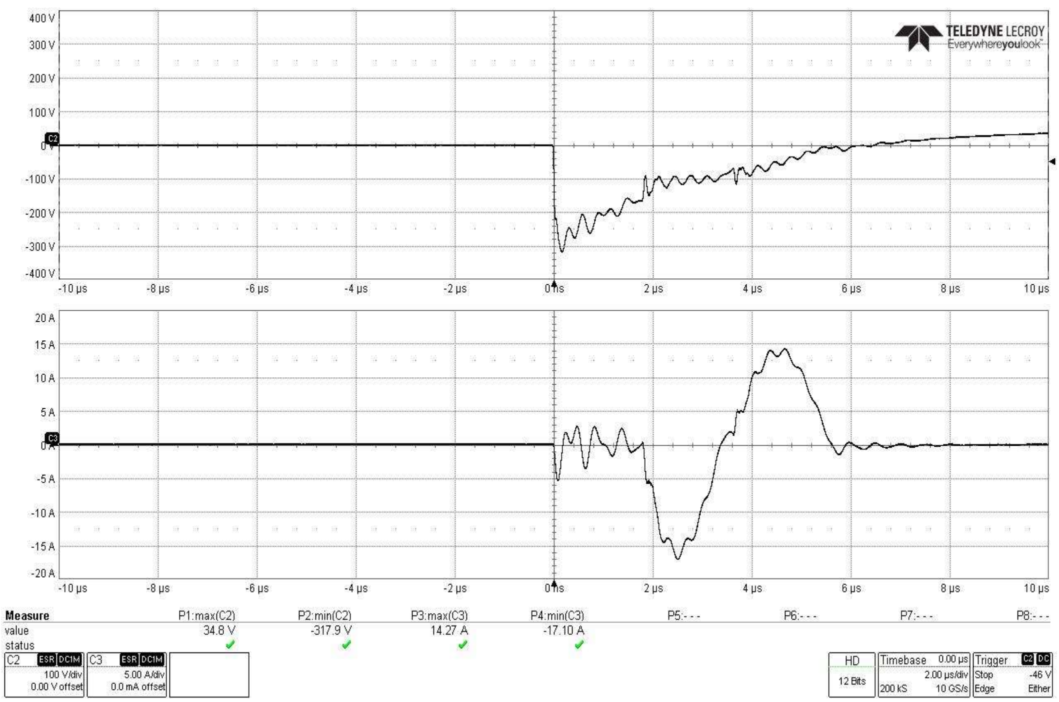


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on DC Power Bundle

EAR Controlled Data

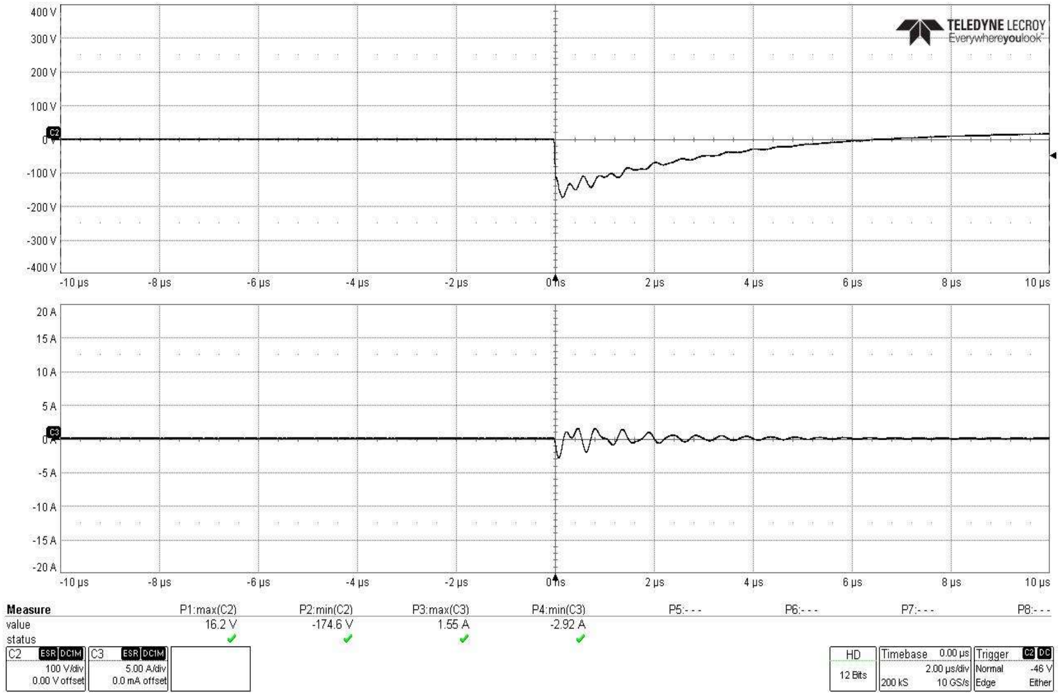


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on DC Power Bundle

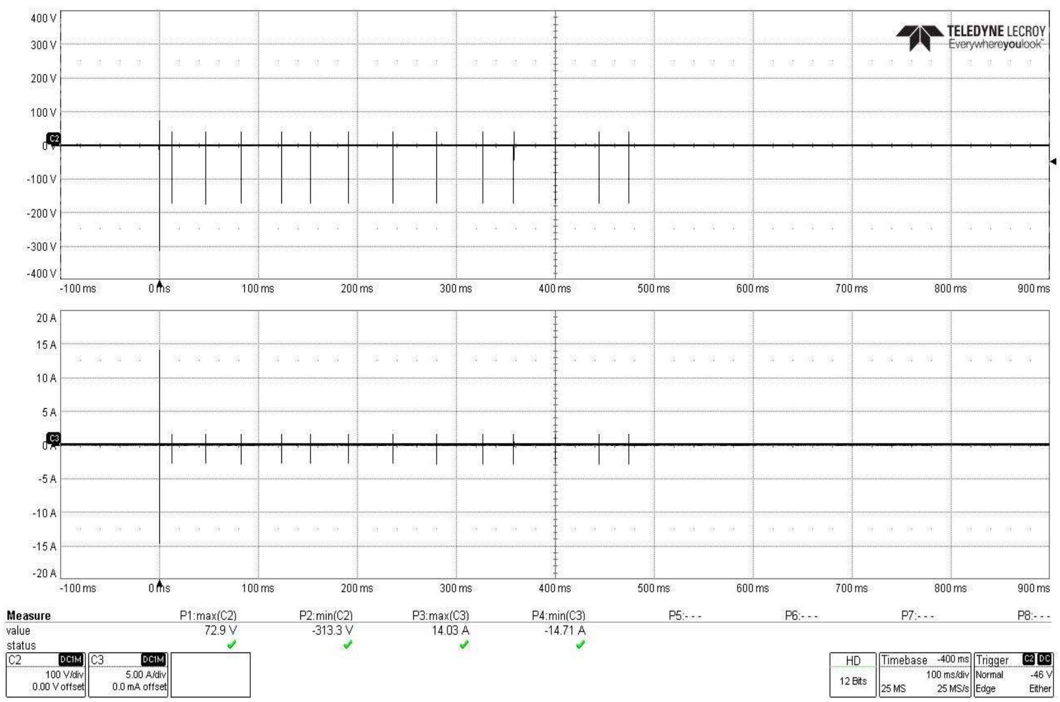


Actual Test CS117 Waveform #2, First Transient -300V/600A on DC Power Bundle

EAR Controlled Data



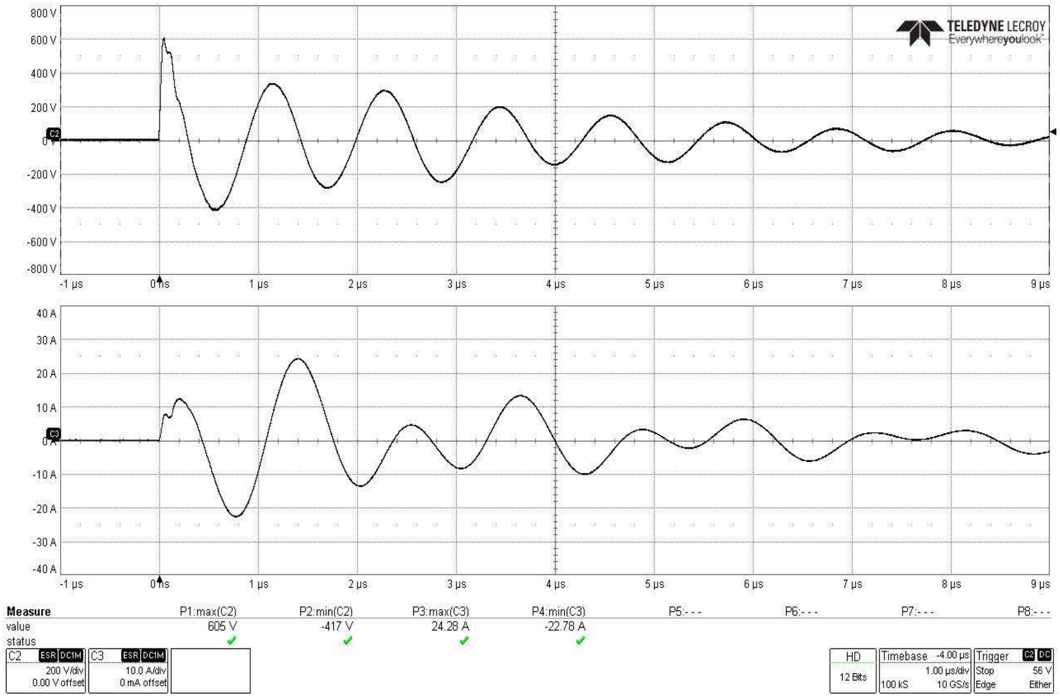
Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on DC Power Bundle



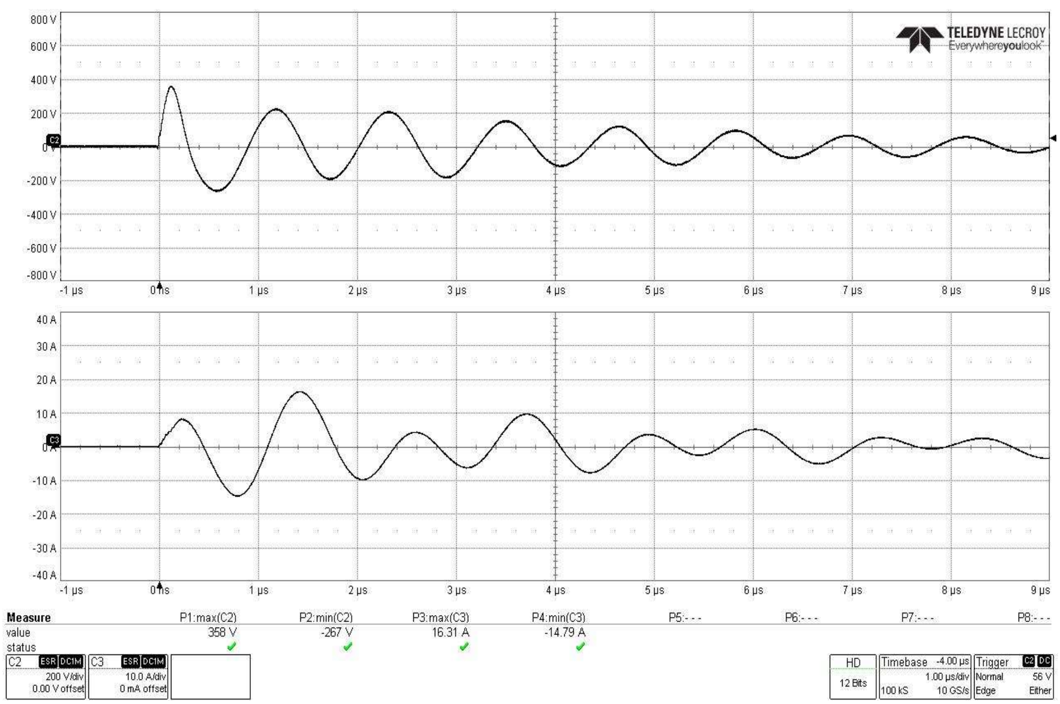
Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on DC Power Bundle

EAR Controlled Data

CS117 Actual Test Waveform #3 at 1MHz with V_T = 600V on Flexboss 21

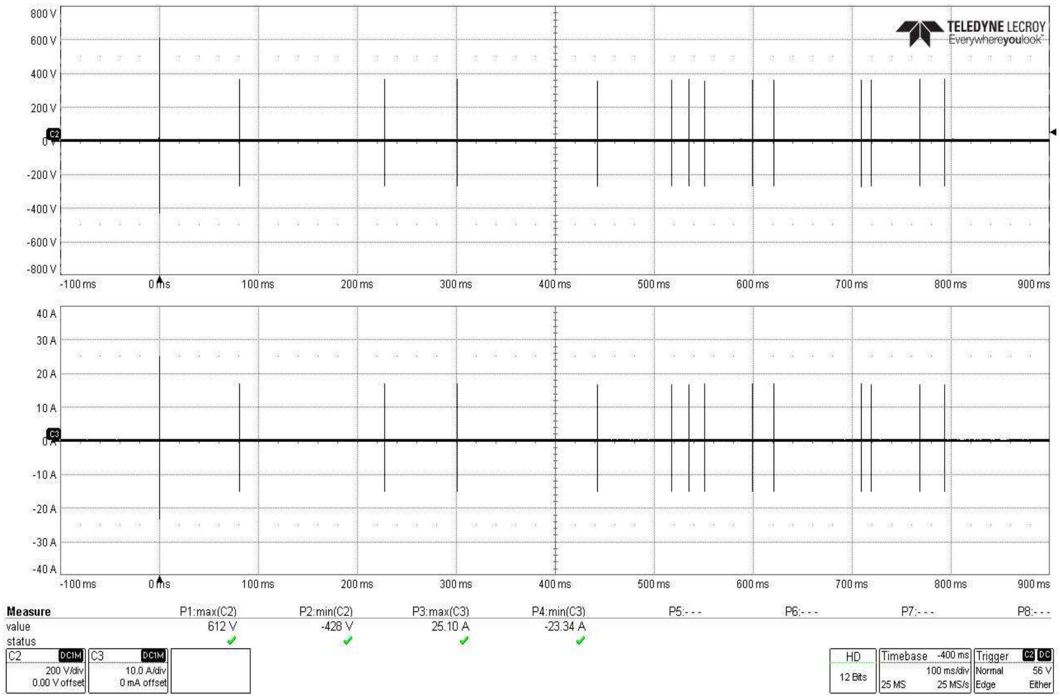


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on AC Power Line 1

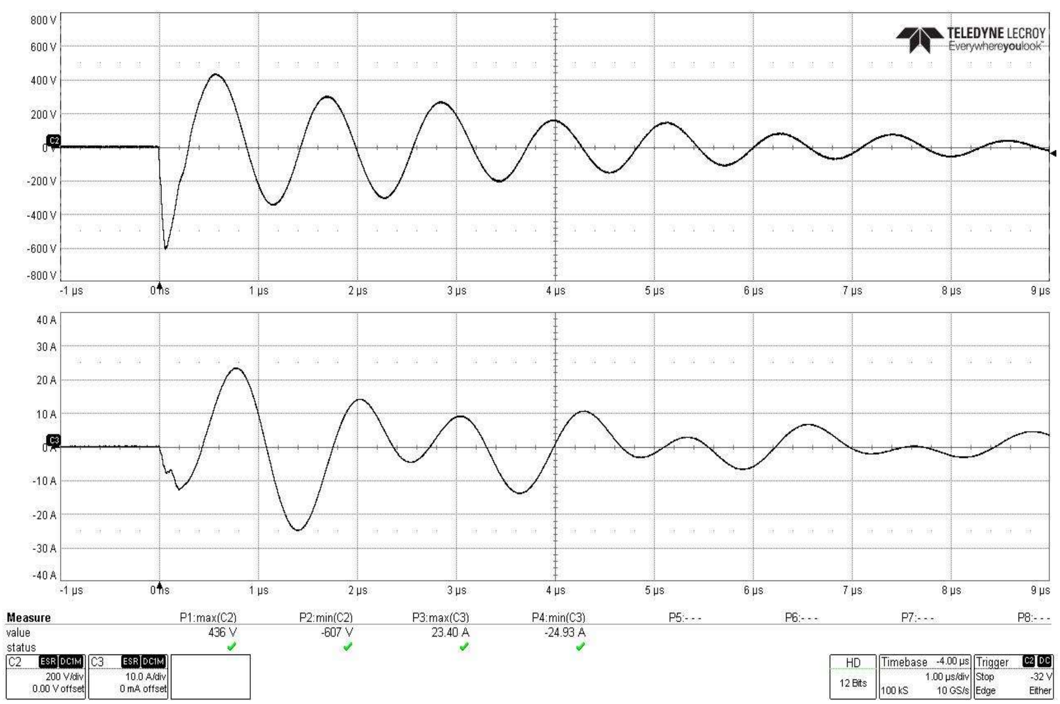


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on AC Power Line 1

EAR Controlled Data

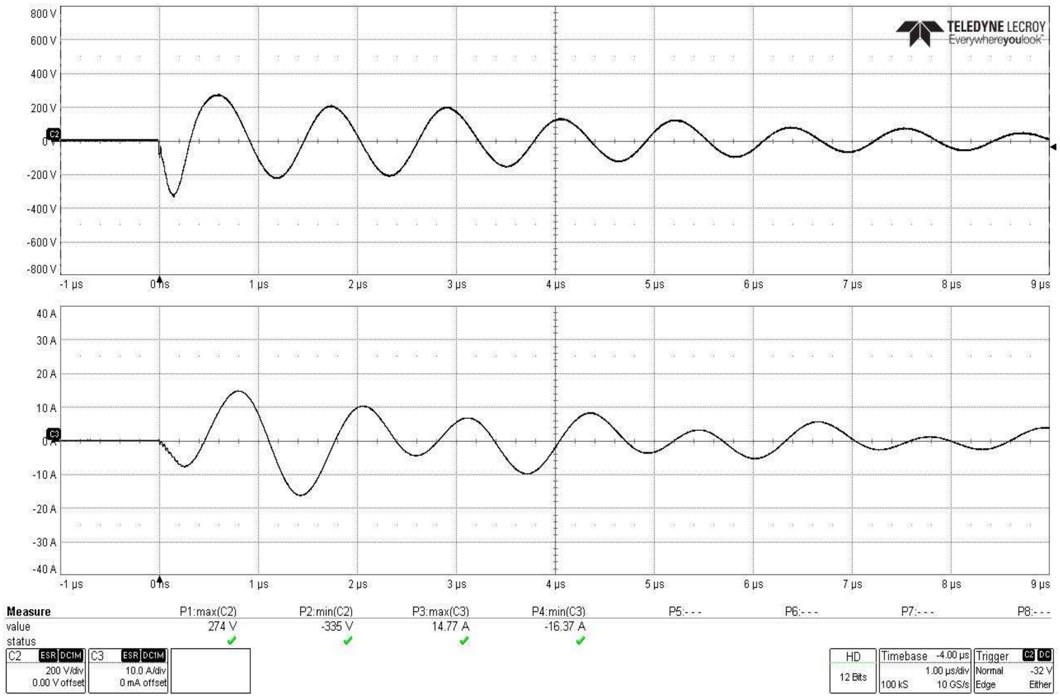


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on AC Power Line 1

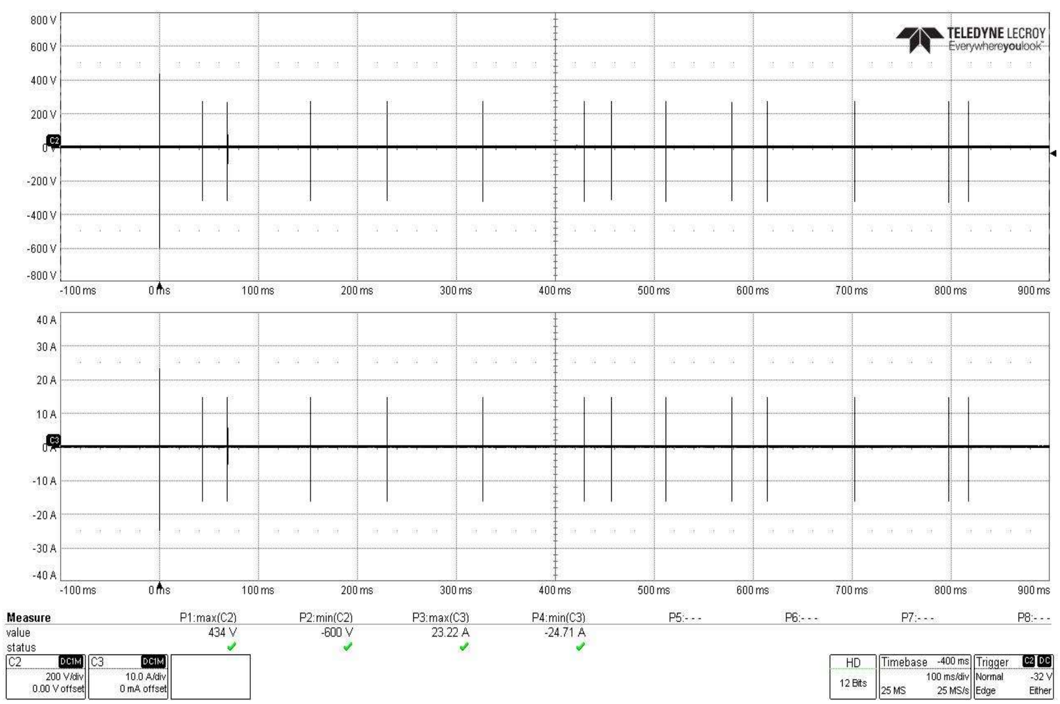


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on AC Power Line 1

EAR Controlled Data

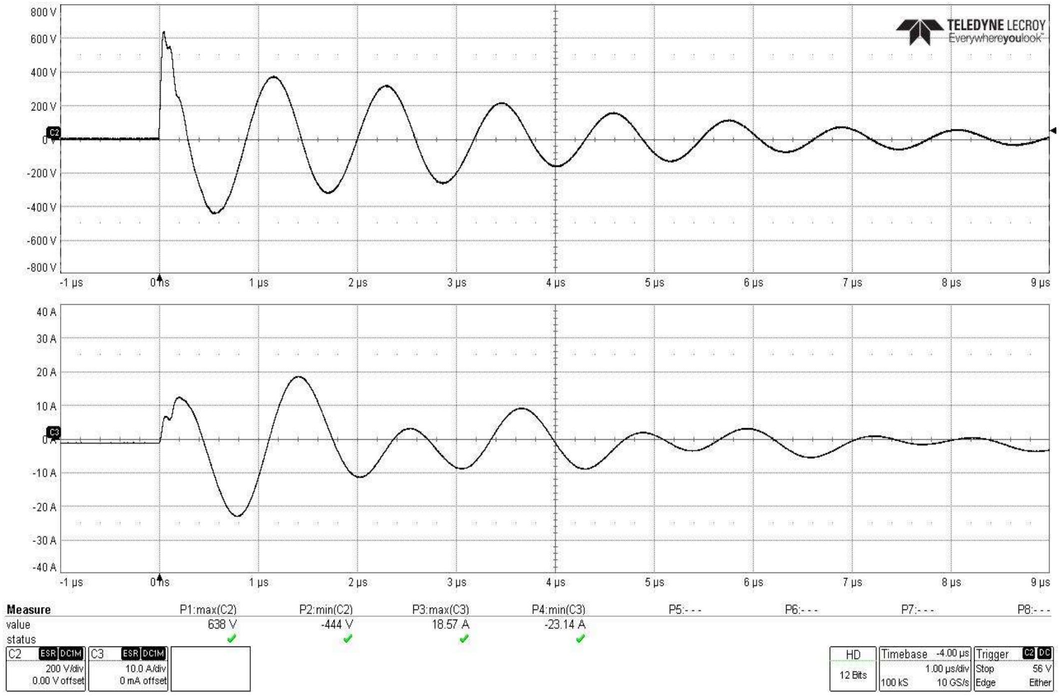


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on AC Power Line 1

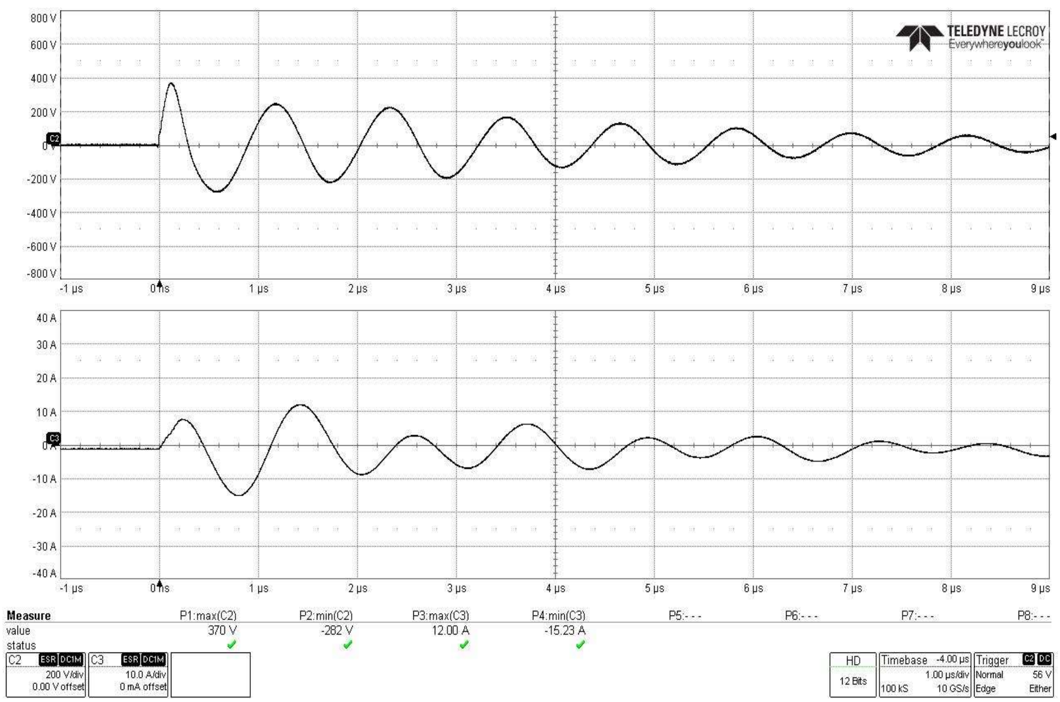


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on AC Power Line 1

EAR Controlled Data

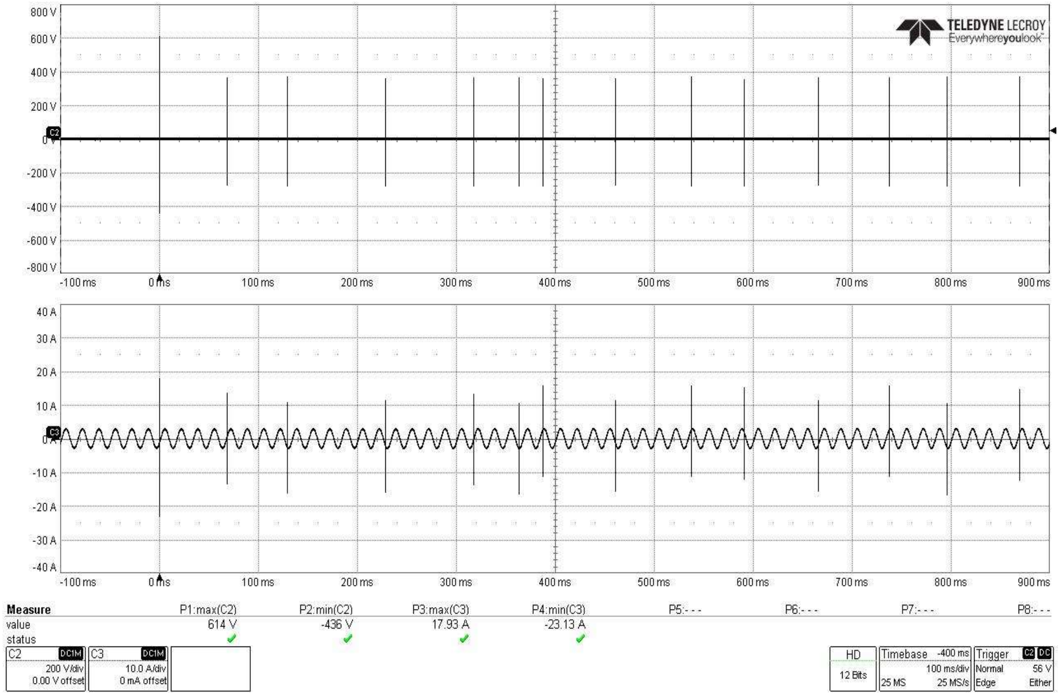


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on AC Power Line 2

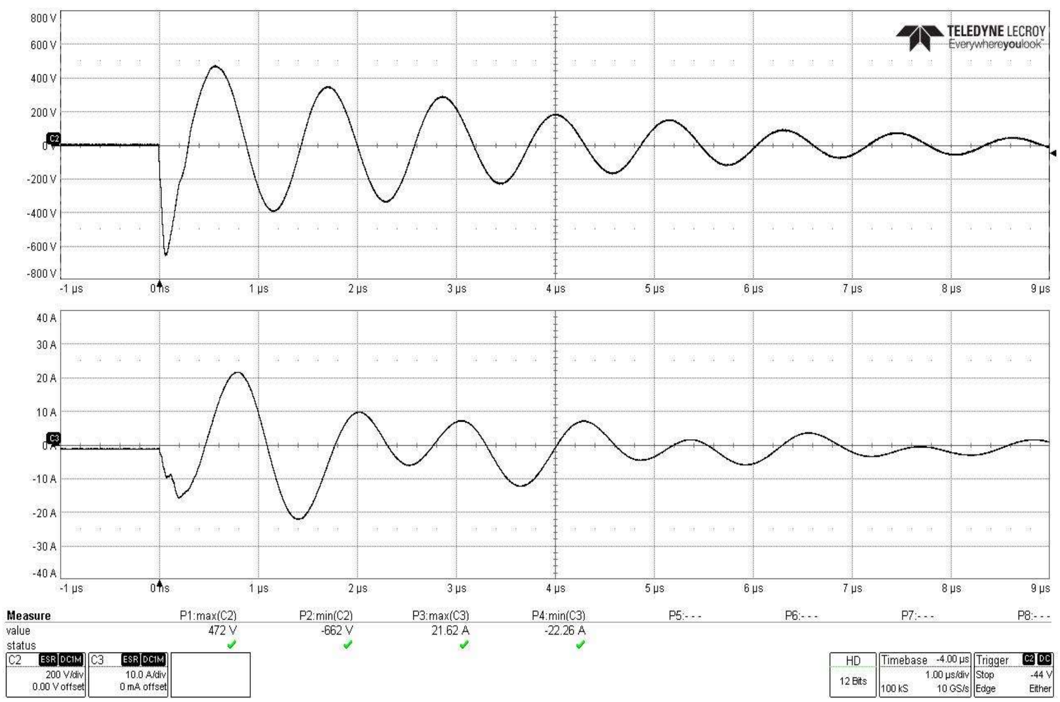


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on AC Power Line 2

EAR Controlled Data

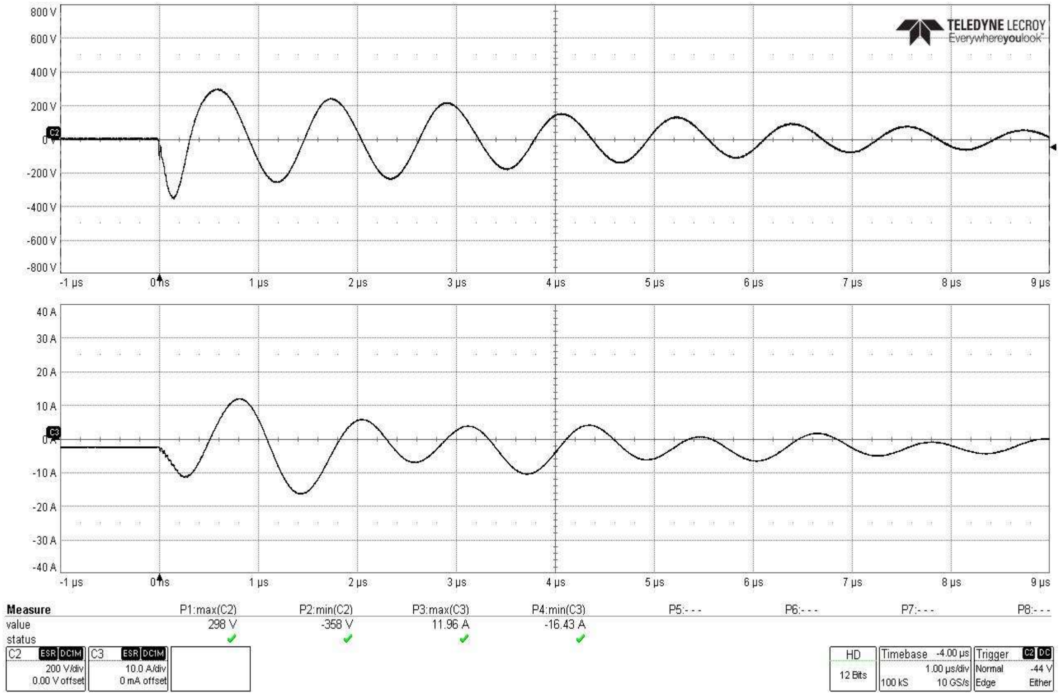


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on AC Power Line 2

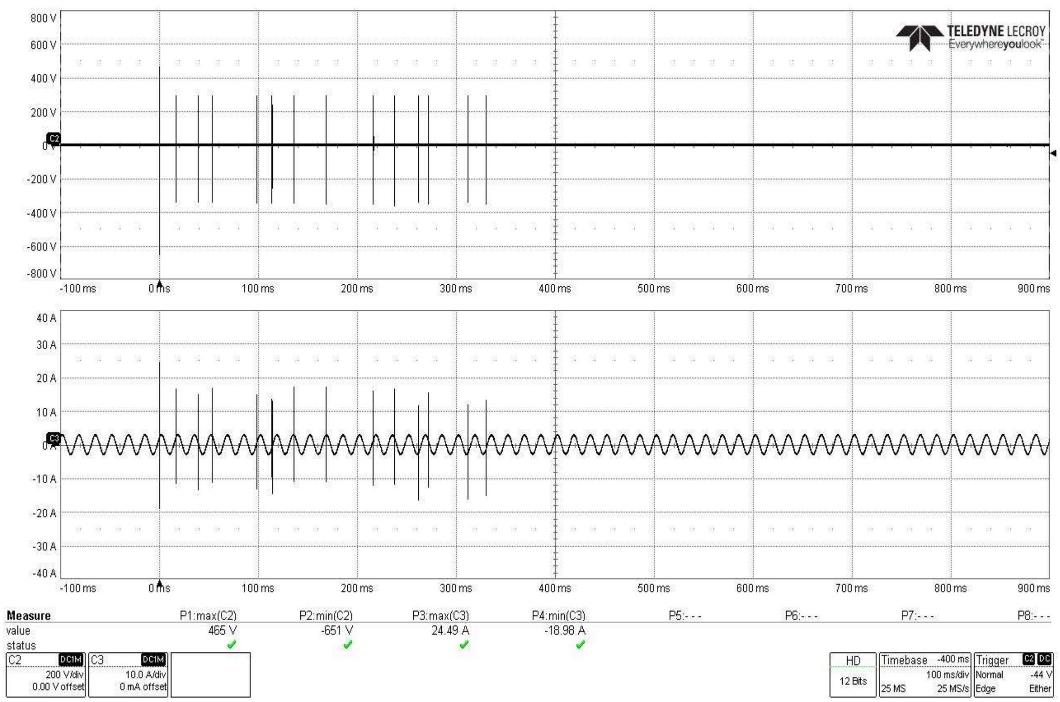


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on AC Power Line 2

EAR Controlled Data

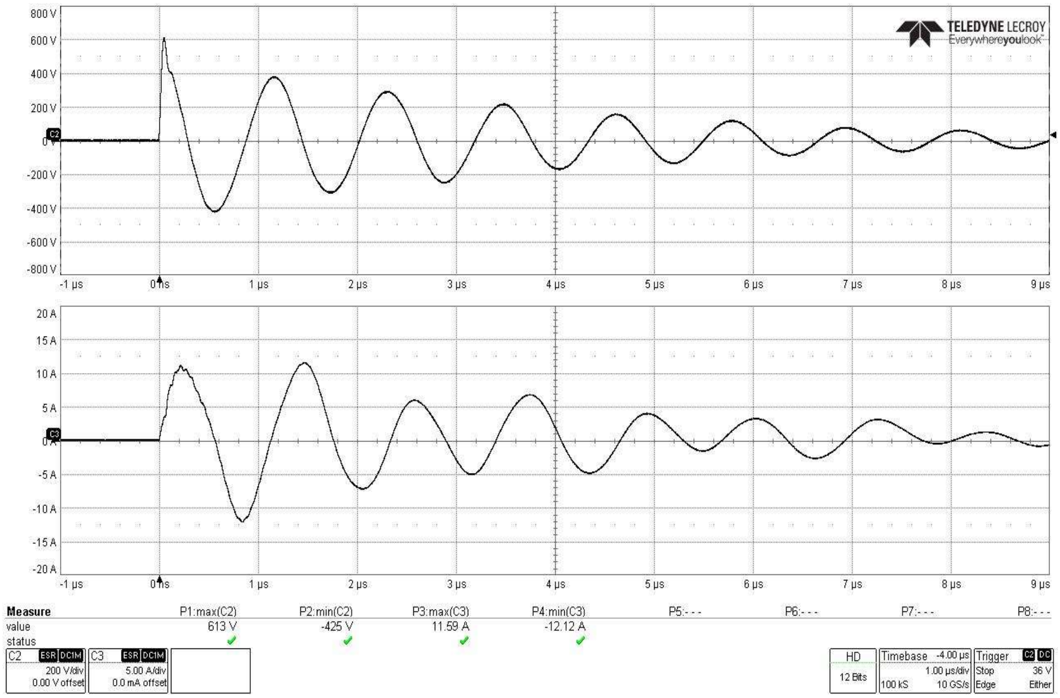


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on AC Power Line 2

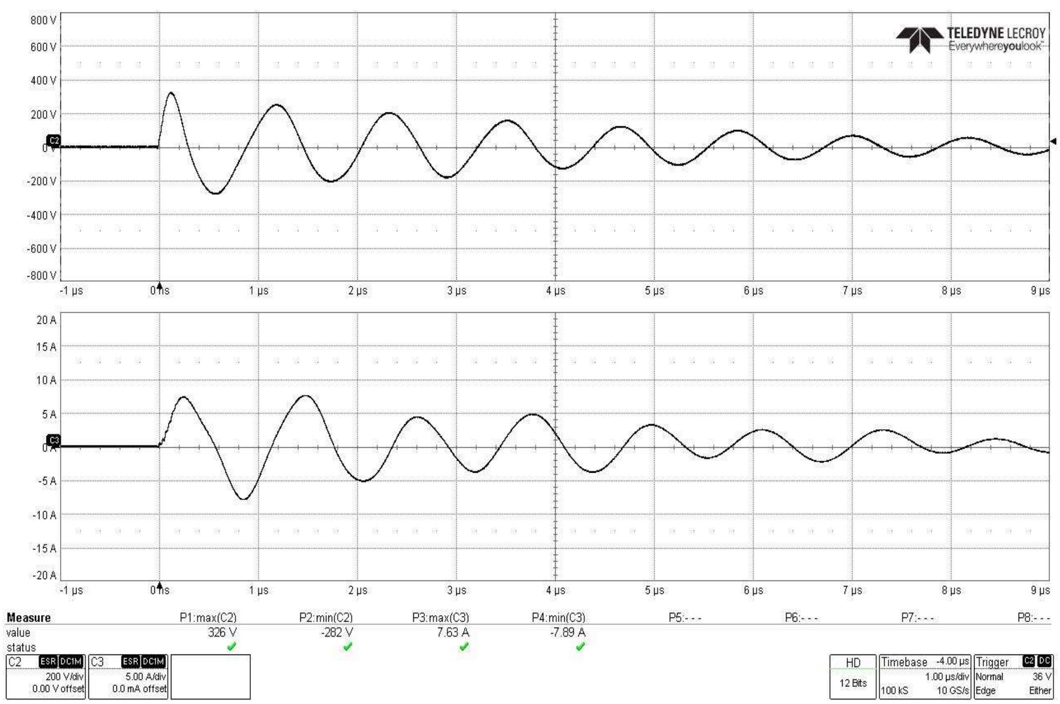


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on AC Power Line 2

EAR Controlled Data

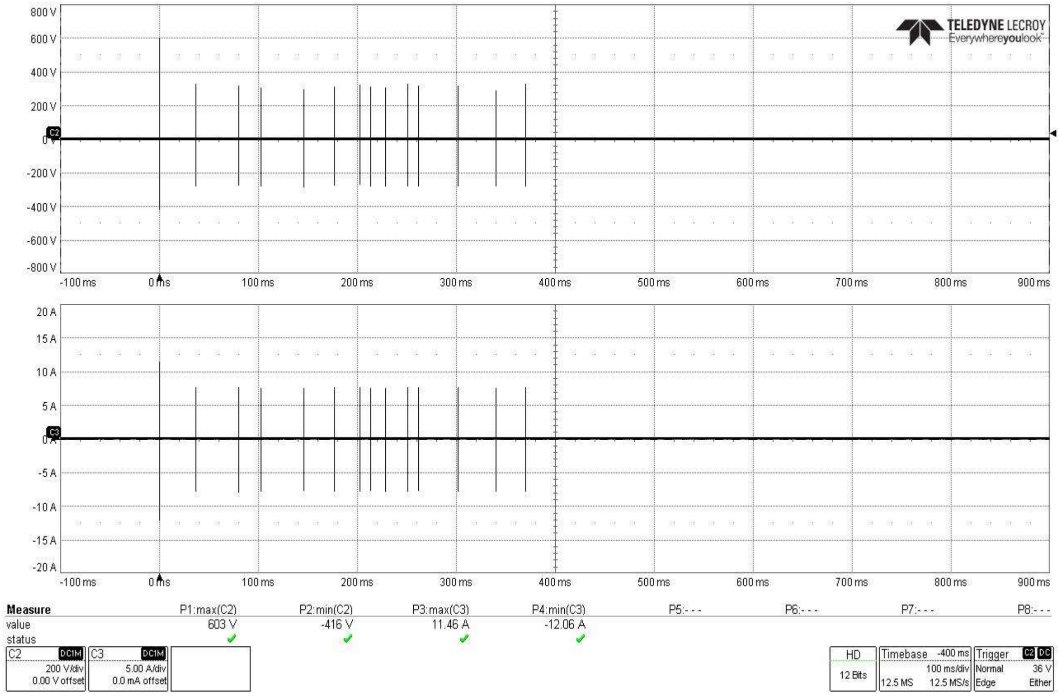


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on Full AC Power Bundle

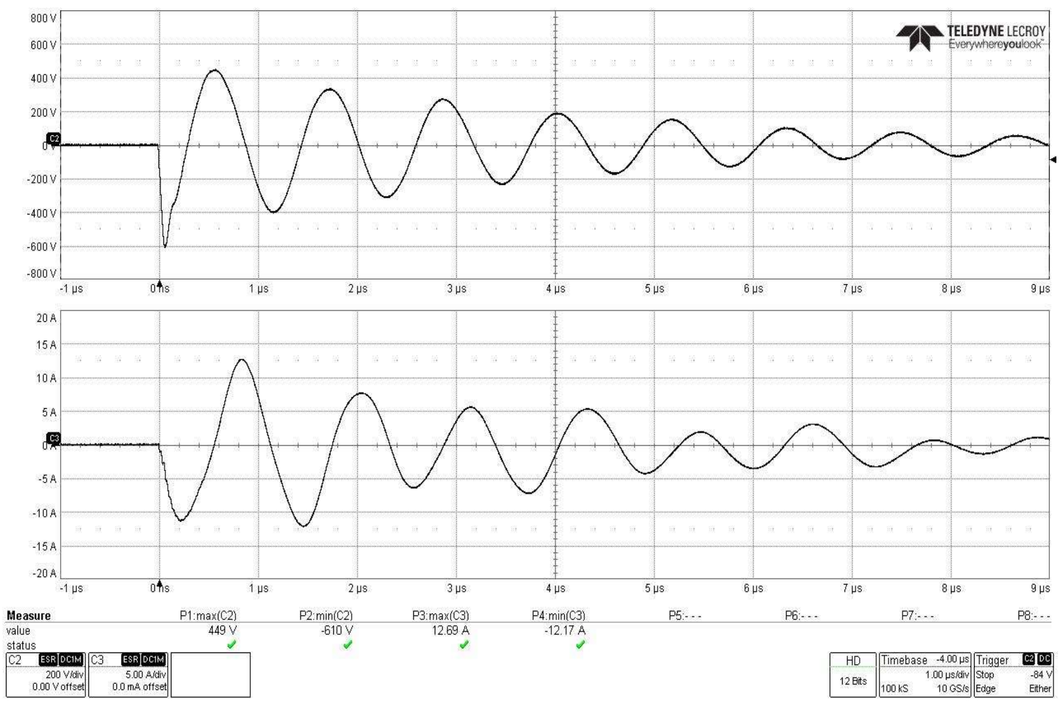


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on Full AC Power Bundle

EAR Controlled Data

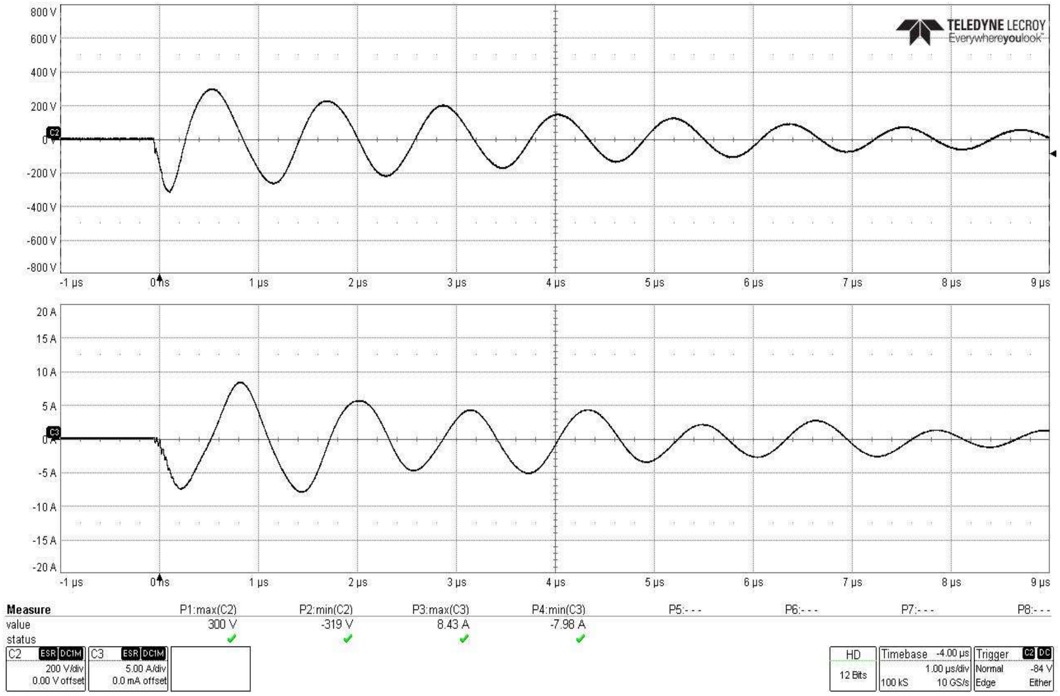


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on Full AC Power Bundle

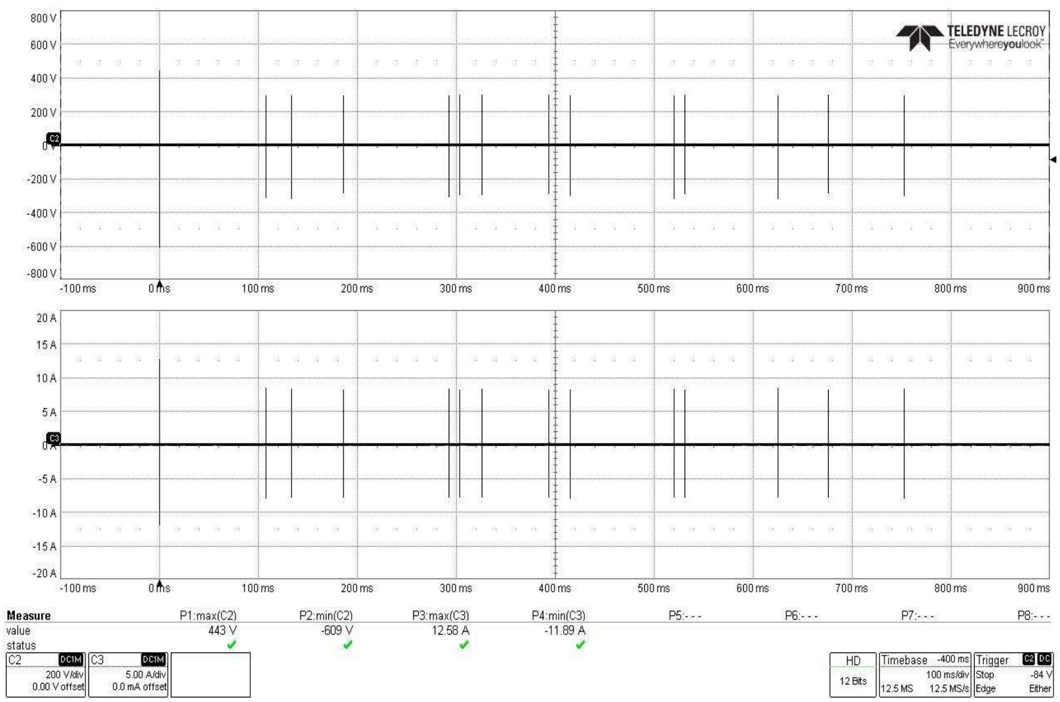


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on Full AC Power Bundle

EAR Controlled Data

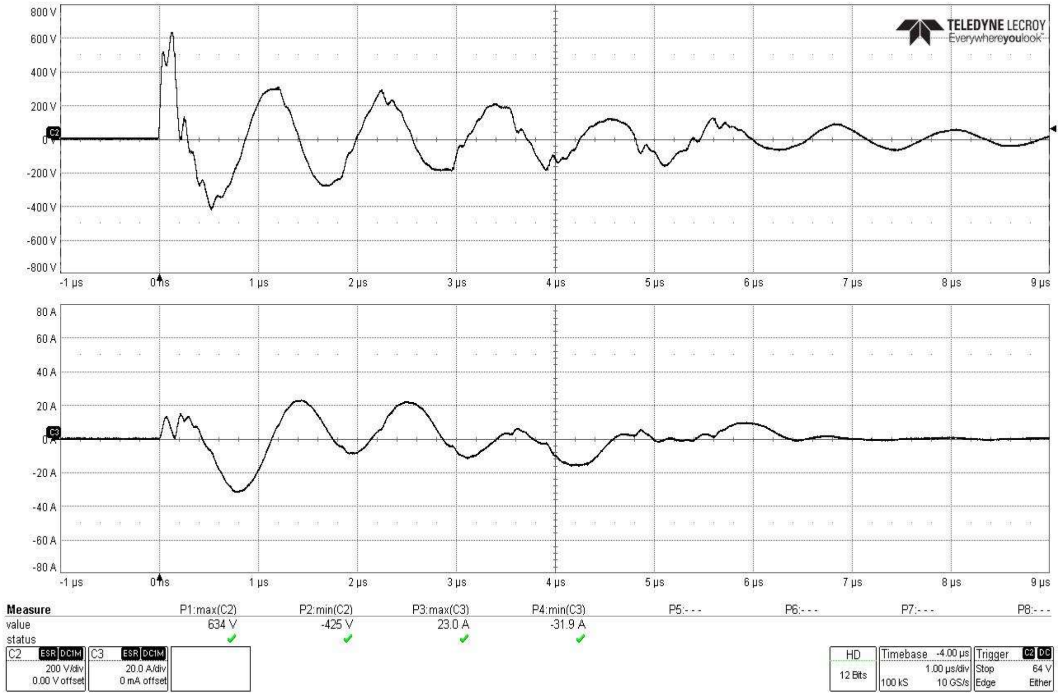


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on Full AC Power Bundle

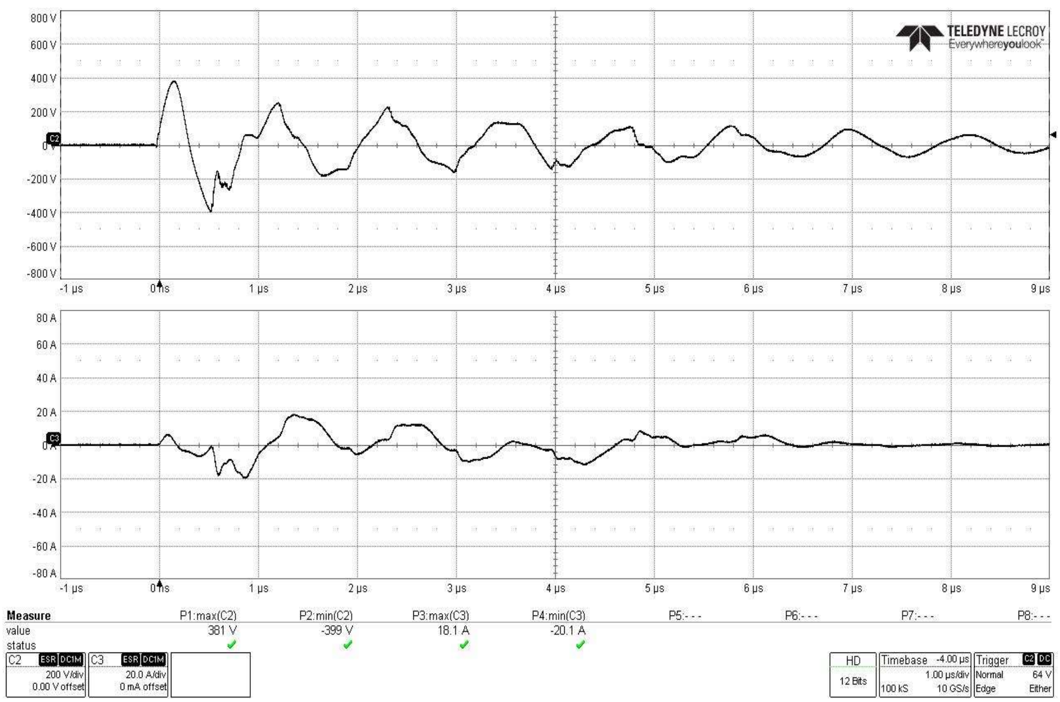


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on Full AC Power Bundle

EAR Controlled Data

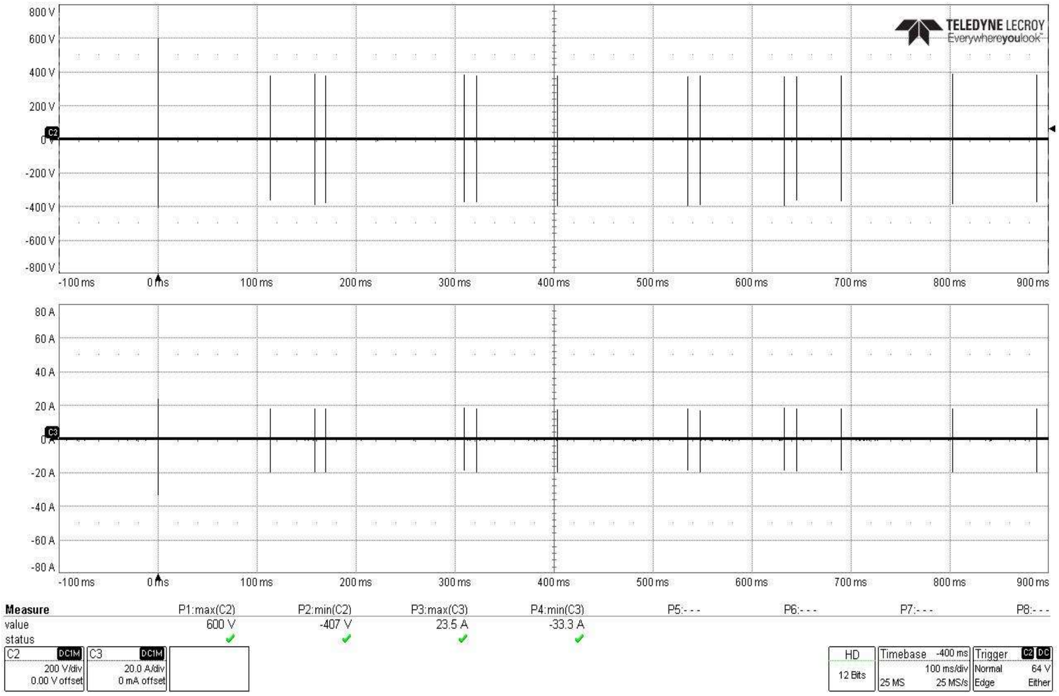


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on DC Power Bundle

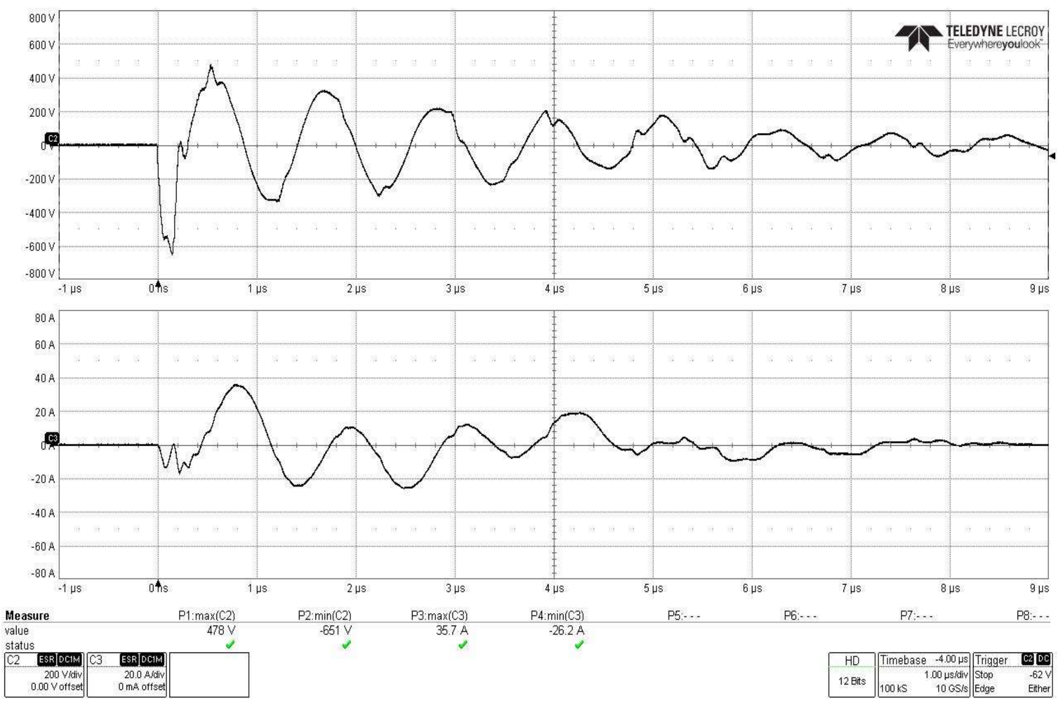


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on DC Power Bundle

EAR Controlled Data

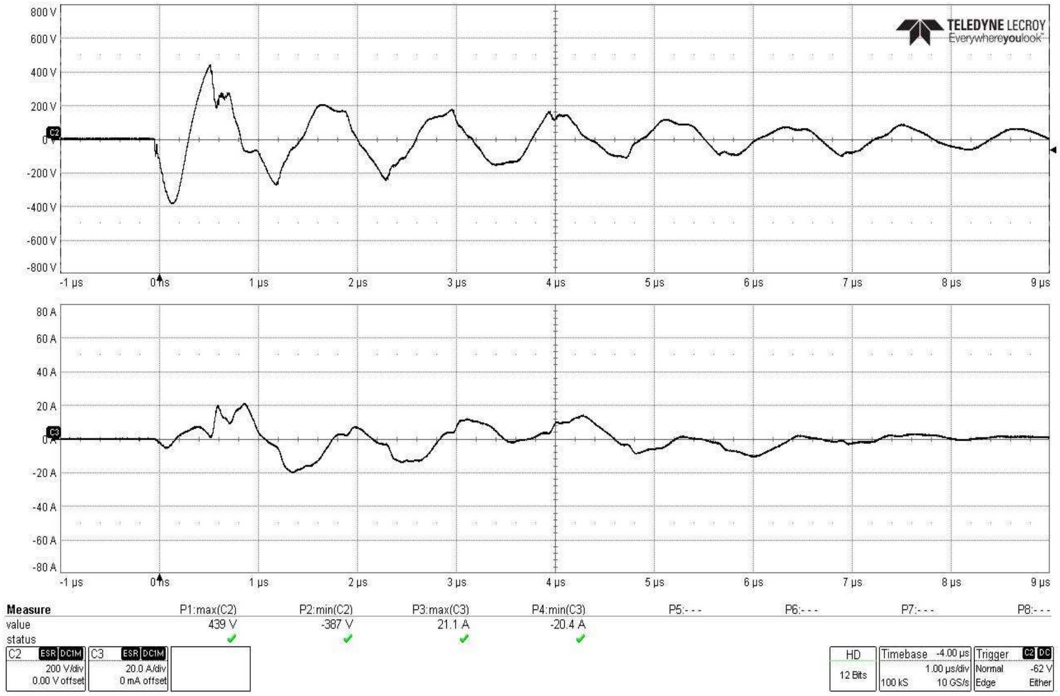


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on DC Power Bundle

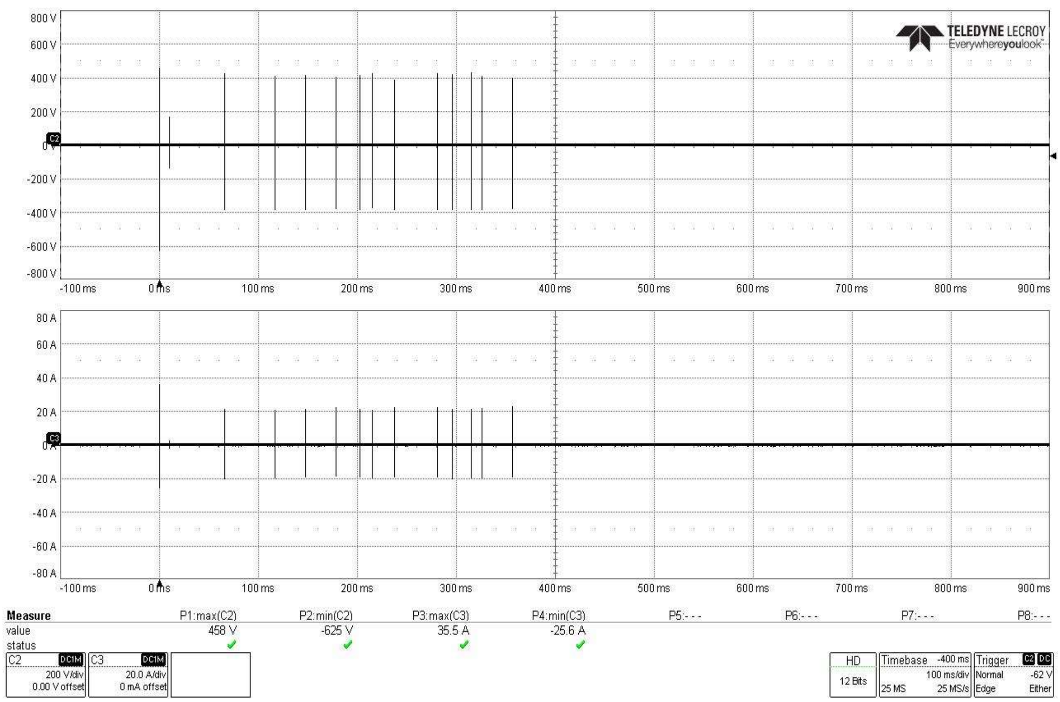


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on DC Power Bundle

EAR Controlled Data

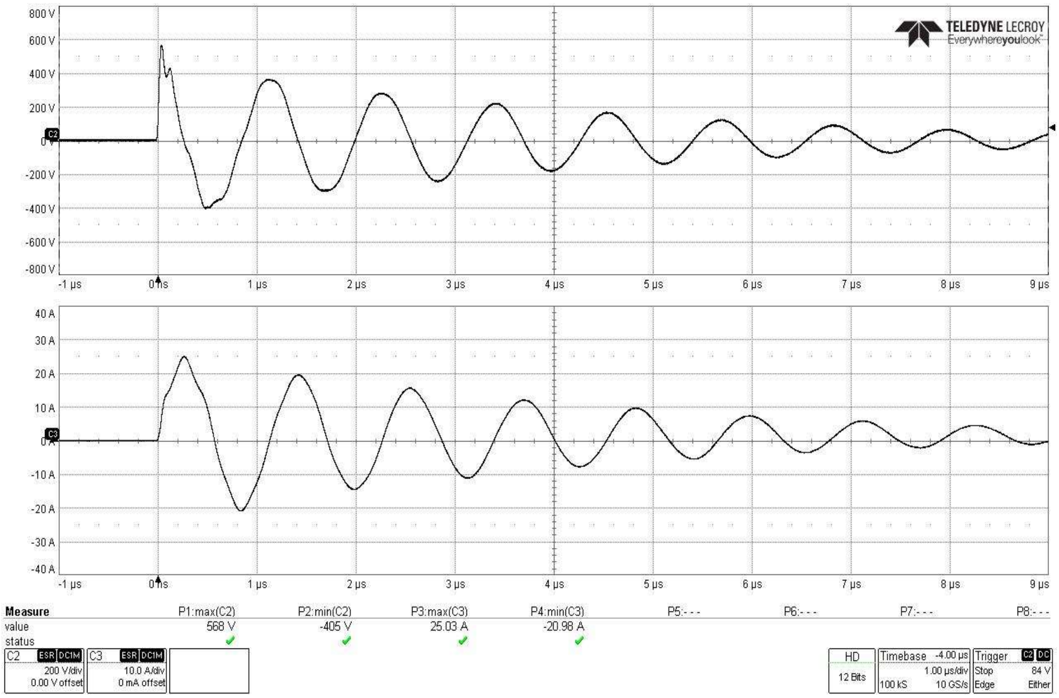


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on DC Power Bundle

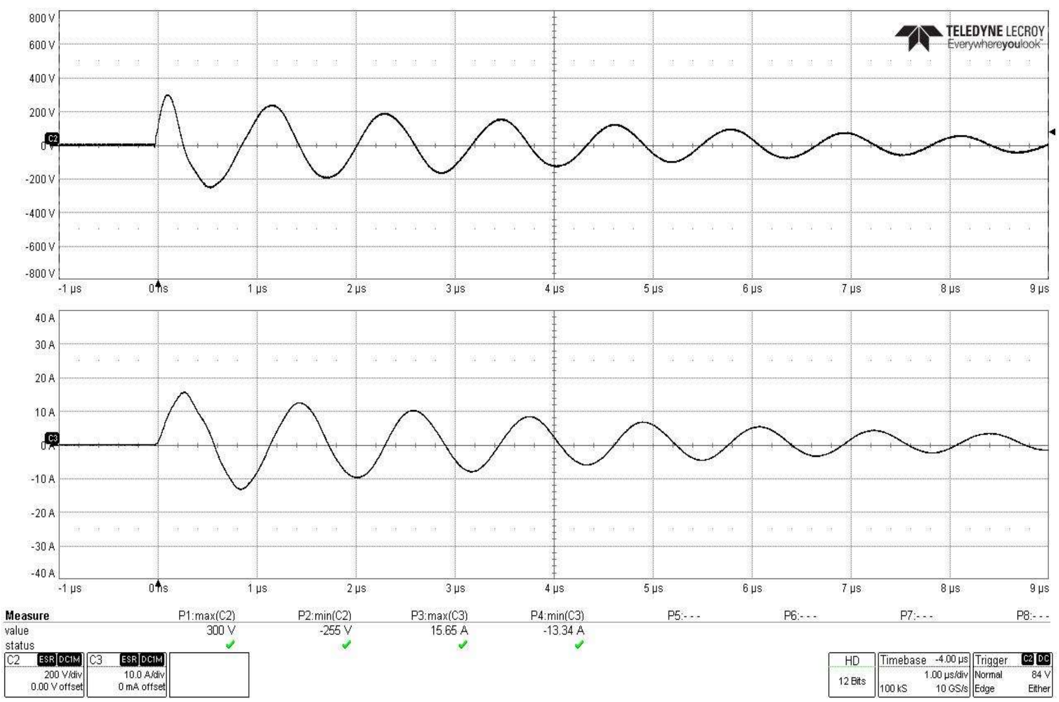


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on DC Power Bundle

EAR Controlled Data

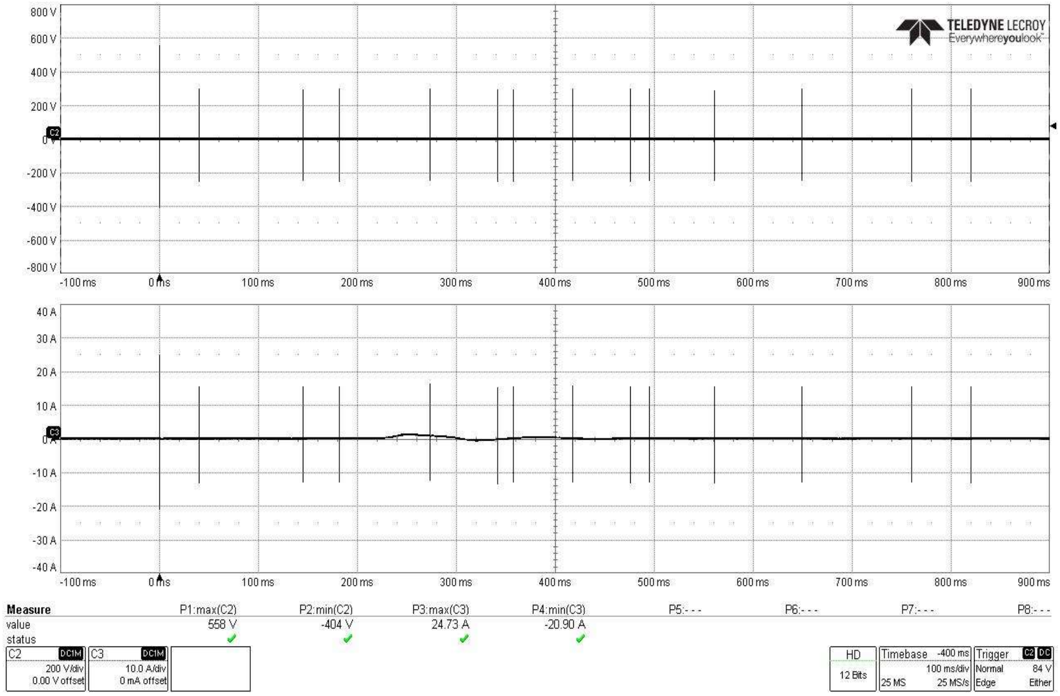


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on DC High Side

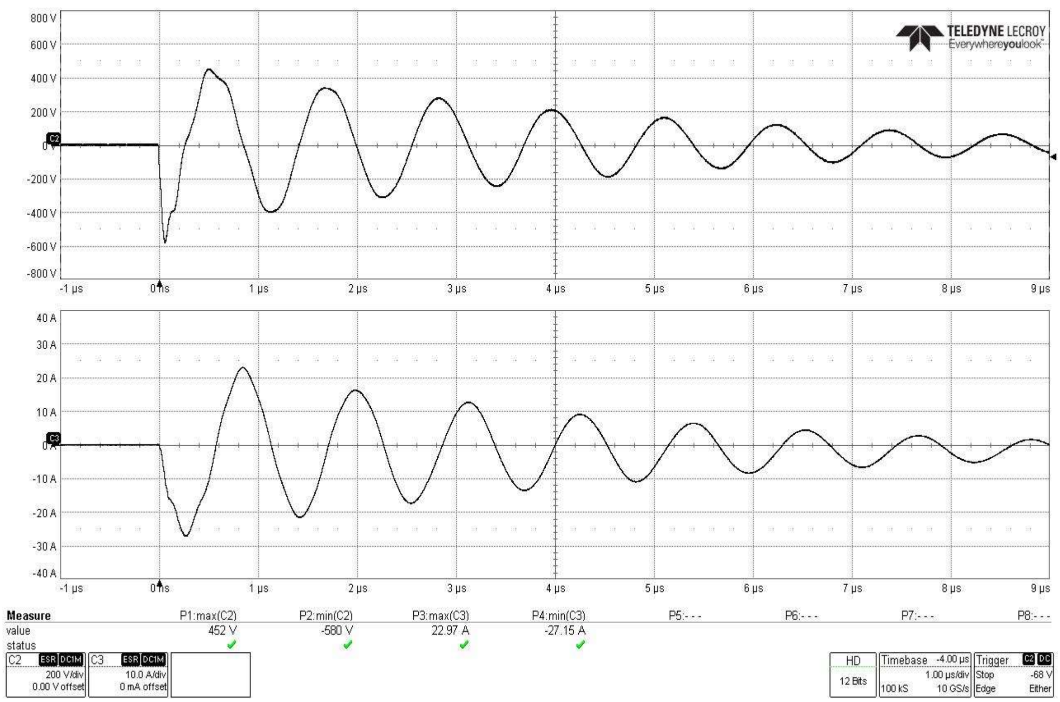


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on DC High Side

EAR Controlled Data

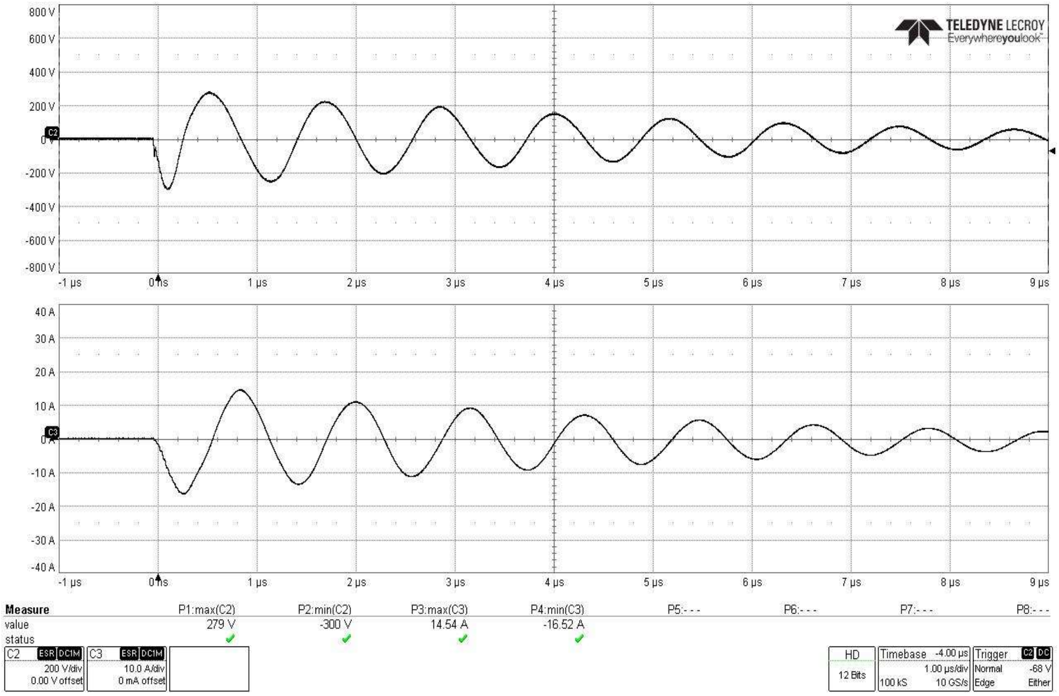


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on DC High Side

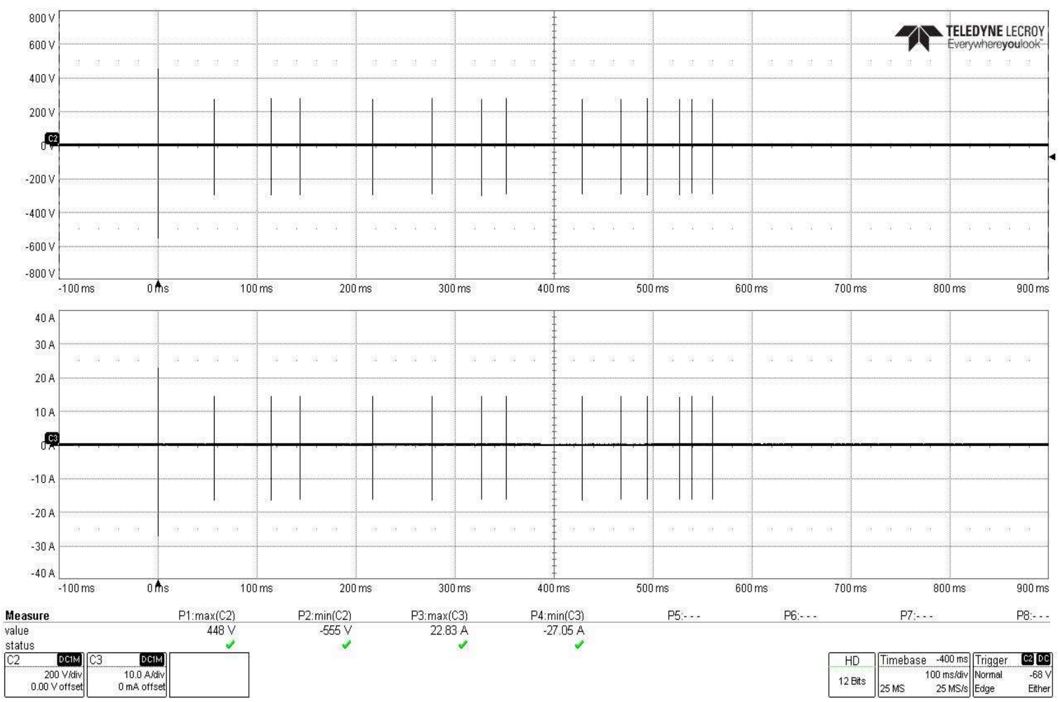


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on DC High Side

EAR Controlled Data

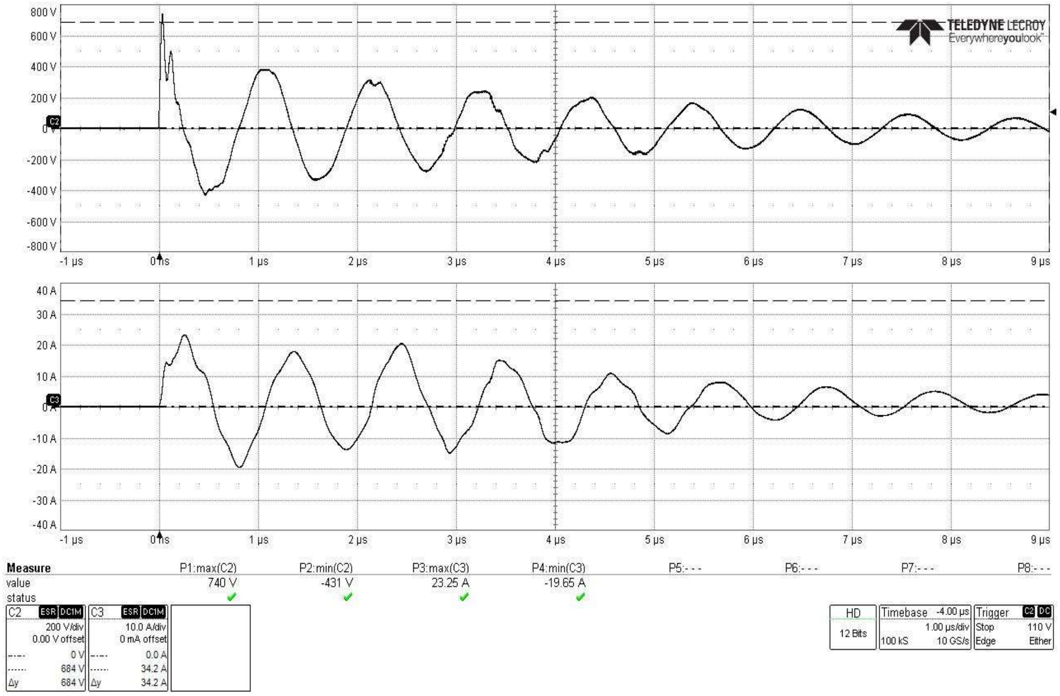


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on DC High Side

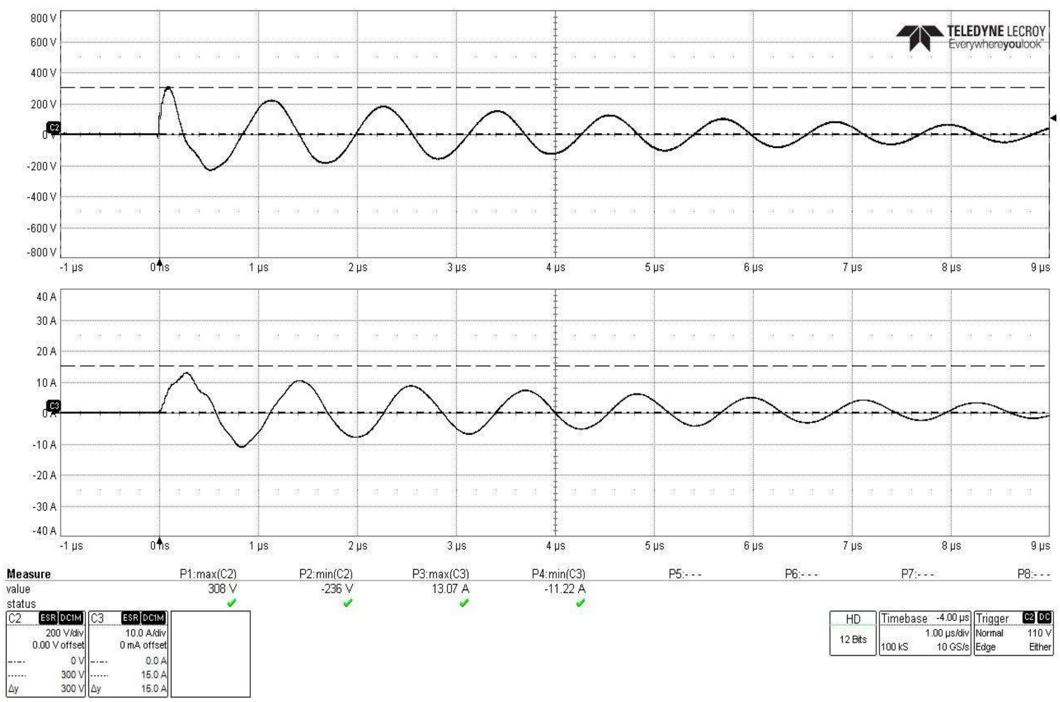


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on DC High Side

EAR Controlled Data

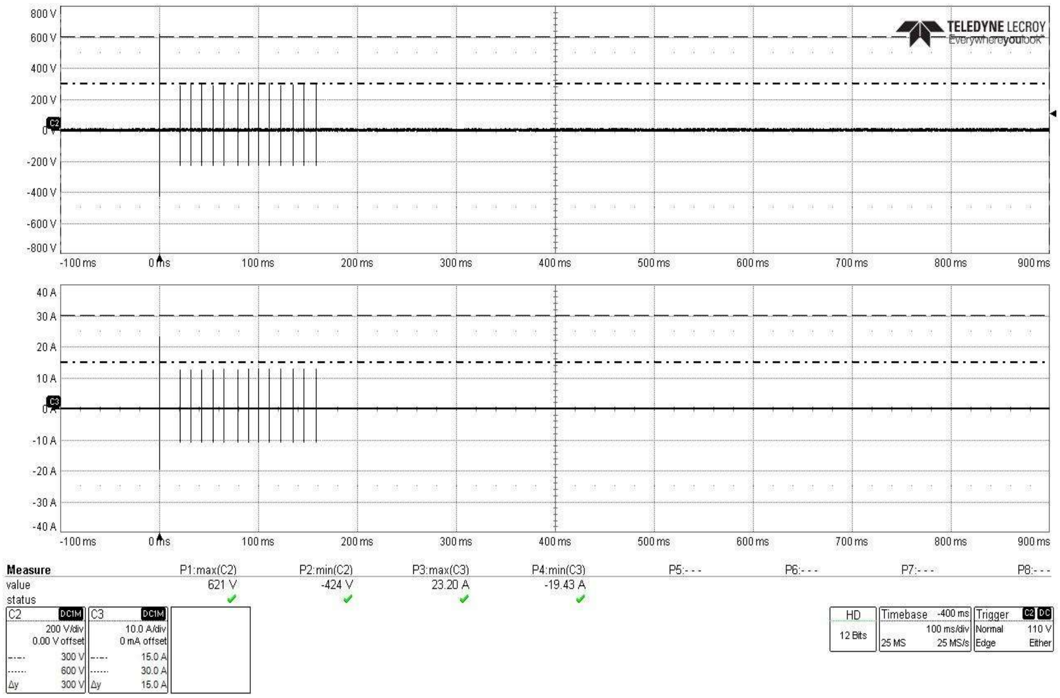


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on DC Return Side

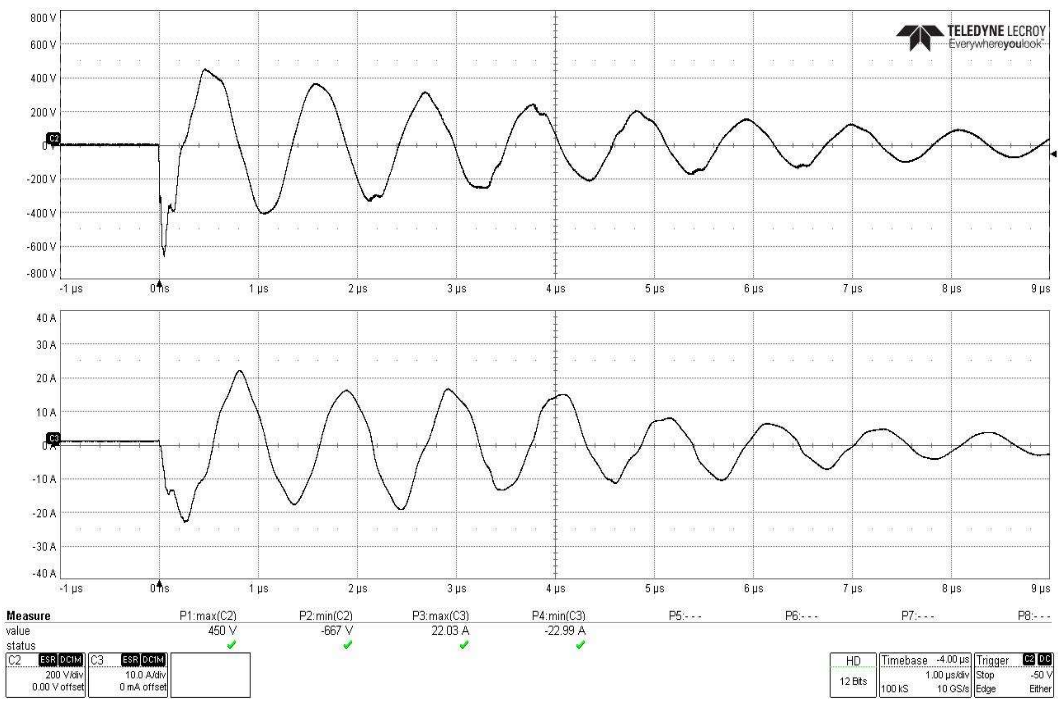


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on DC Return Side

EAR Controlled Data

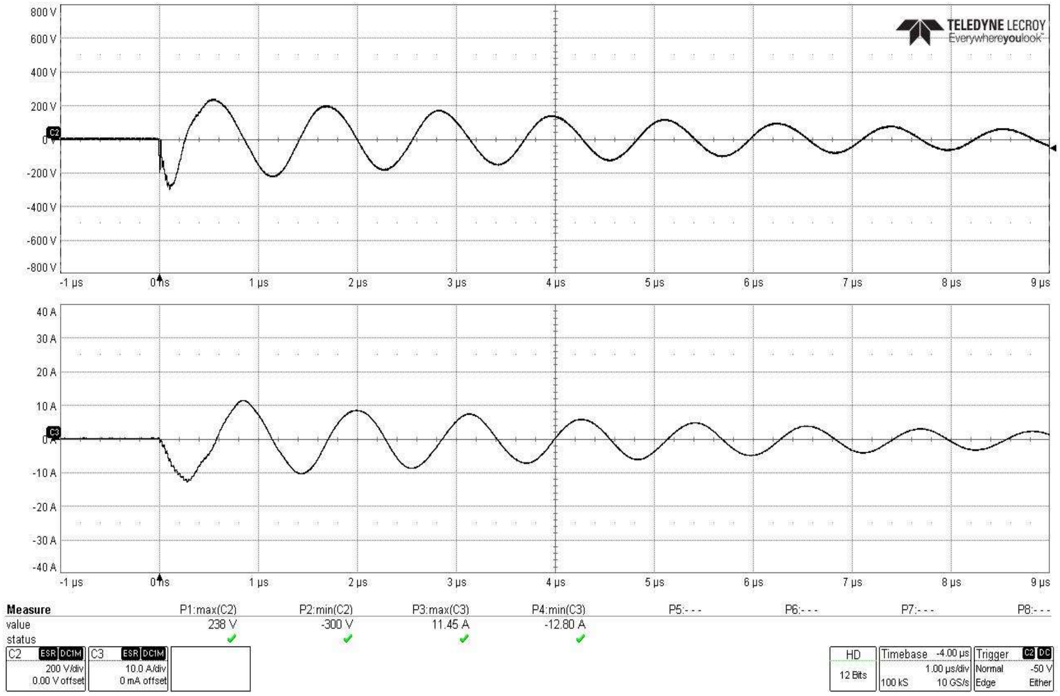


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on DC Return Side

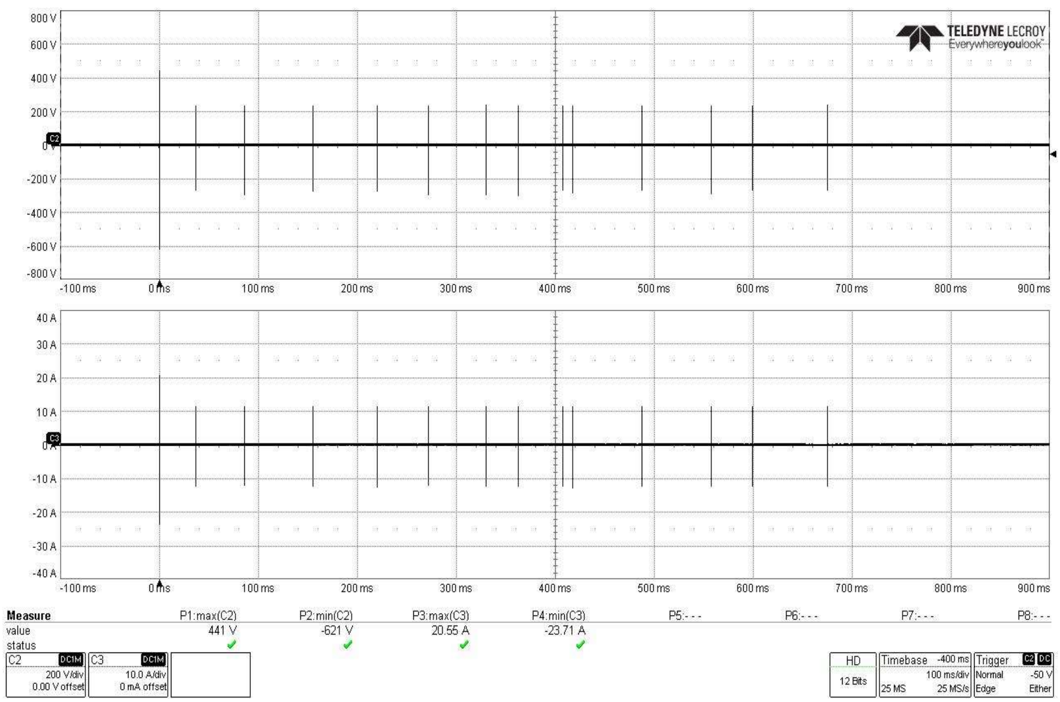


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on DC Return Side

EAR Controlled Data



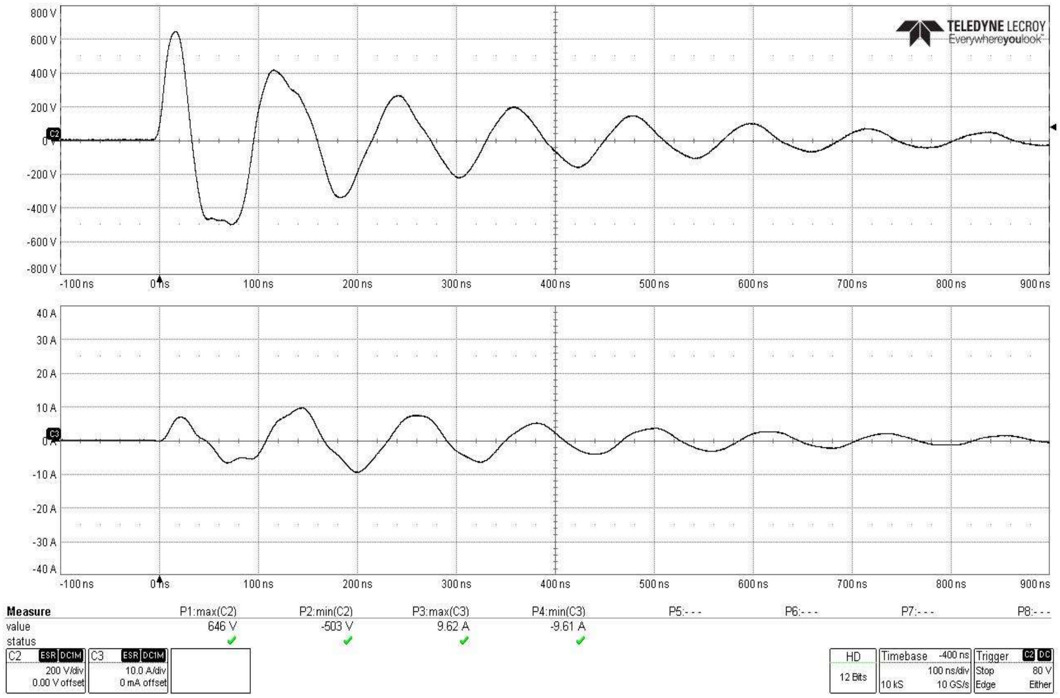
Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on DC Return Side



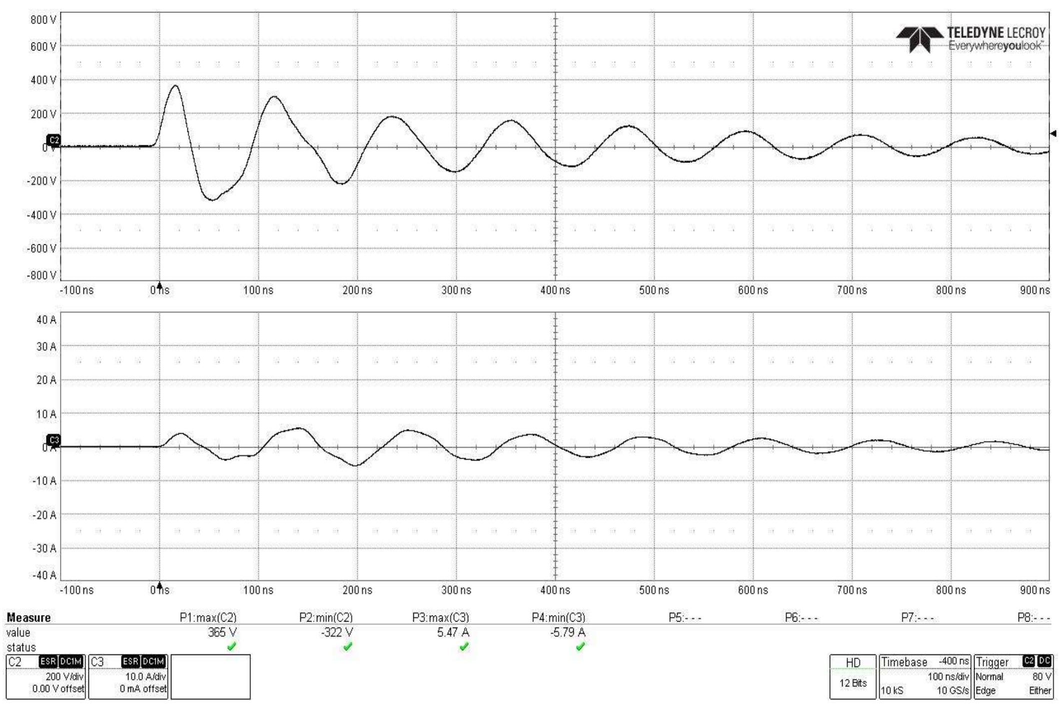
Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on DC Return Side

EAR Controlled Data

CS117 Actual Test Waveform #3 at 10MHz with V_T = 600V on Flexboss 21

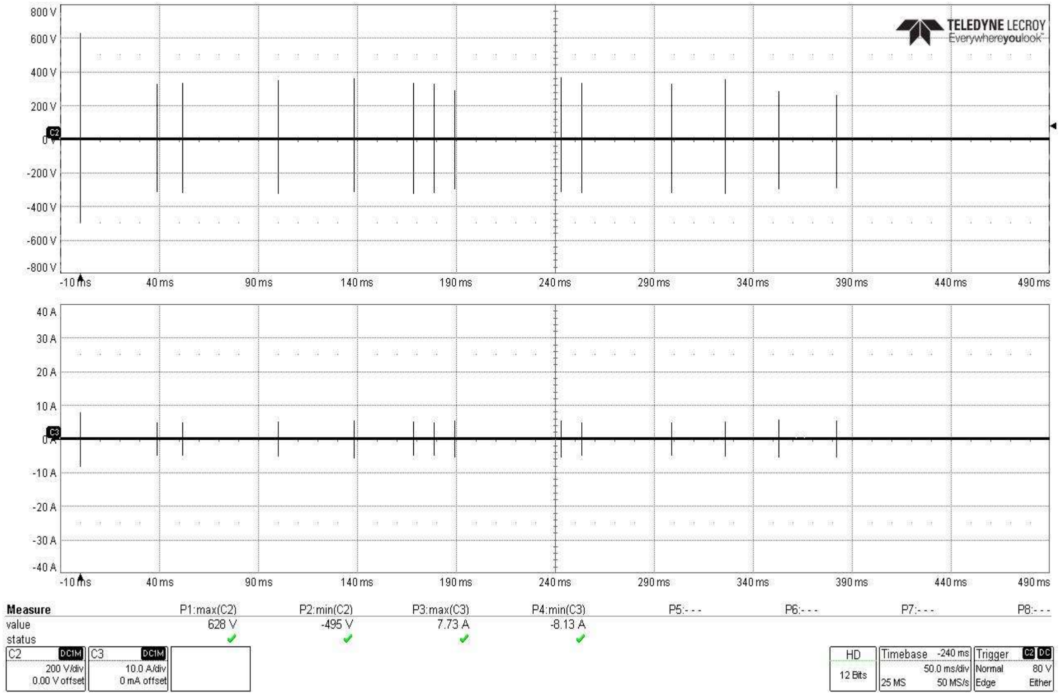


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on AC Power Line 1

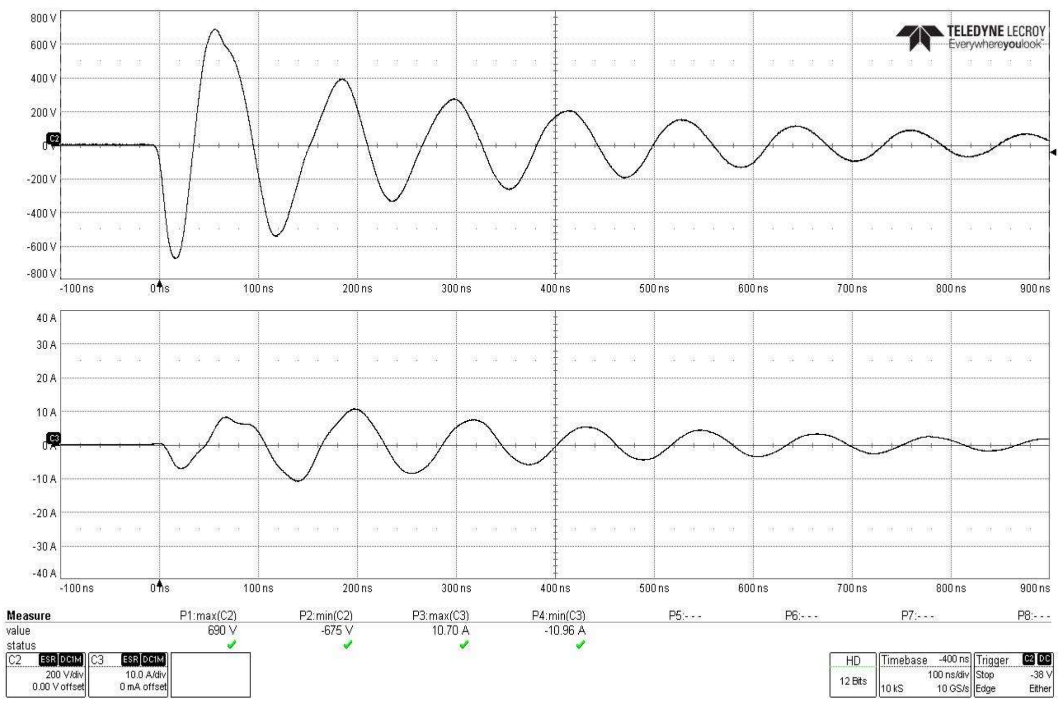


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on AC Power Line 1

EAR Controlled Data

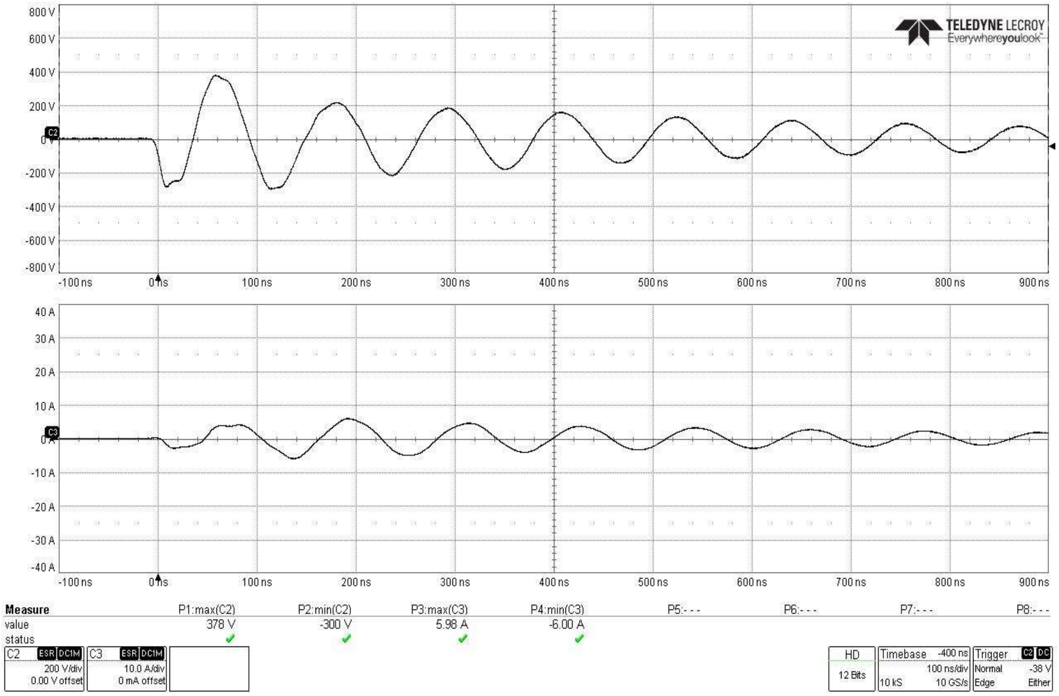


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on AC Power Line 1

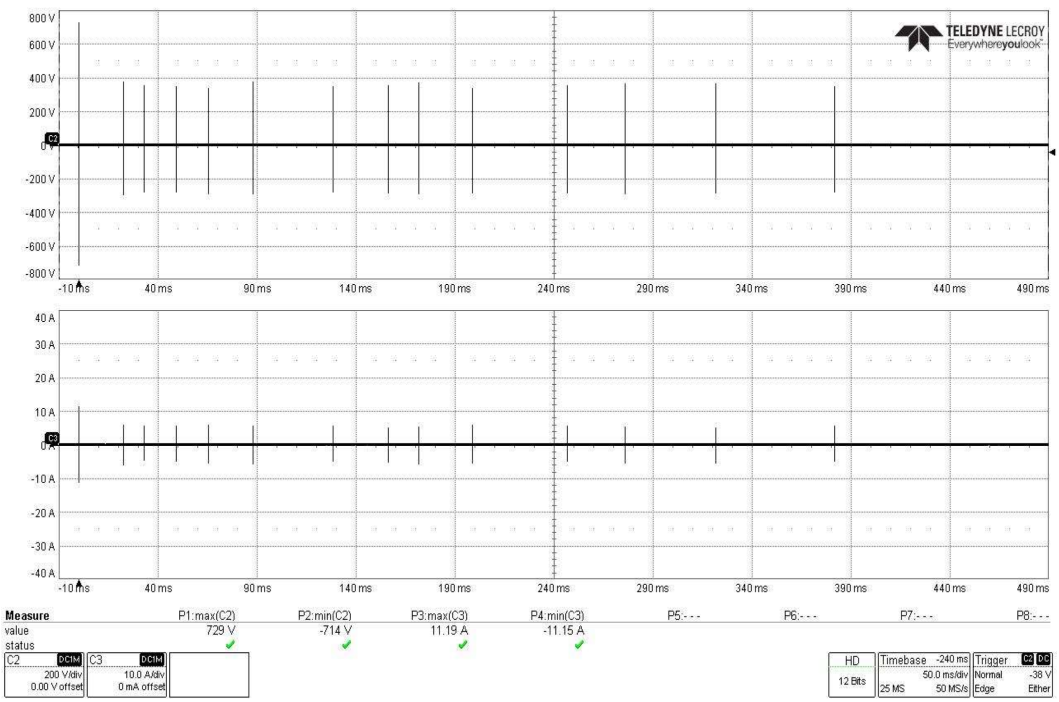


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on AC Power Line 1

EAR Controlled Data

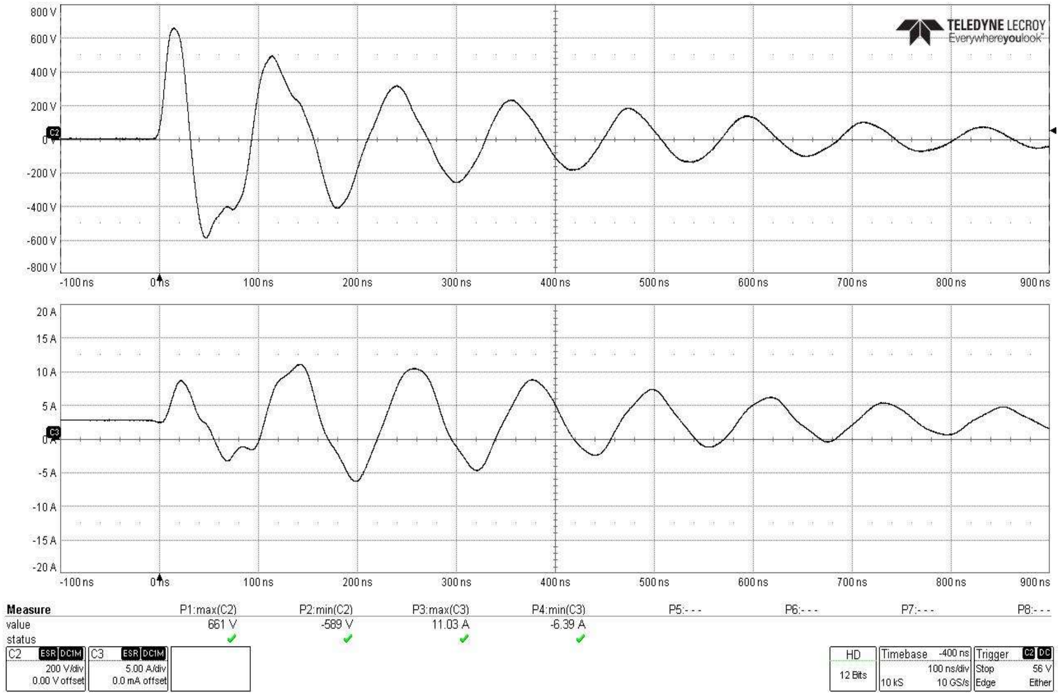


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on AC Power Line 1

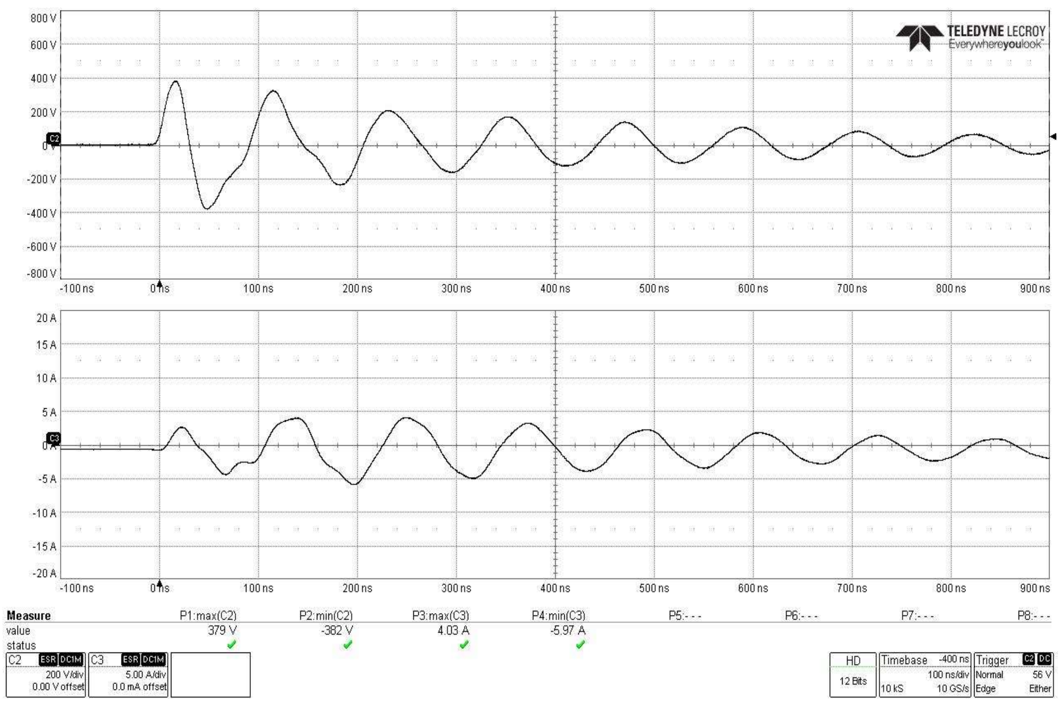


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on AC Power Line 1

EAR Controlled Data

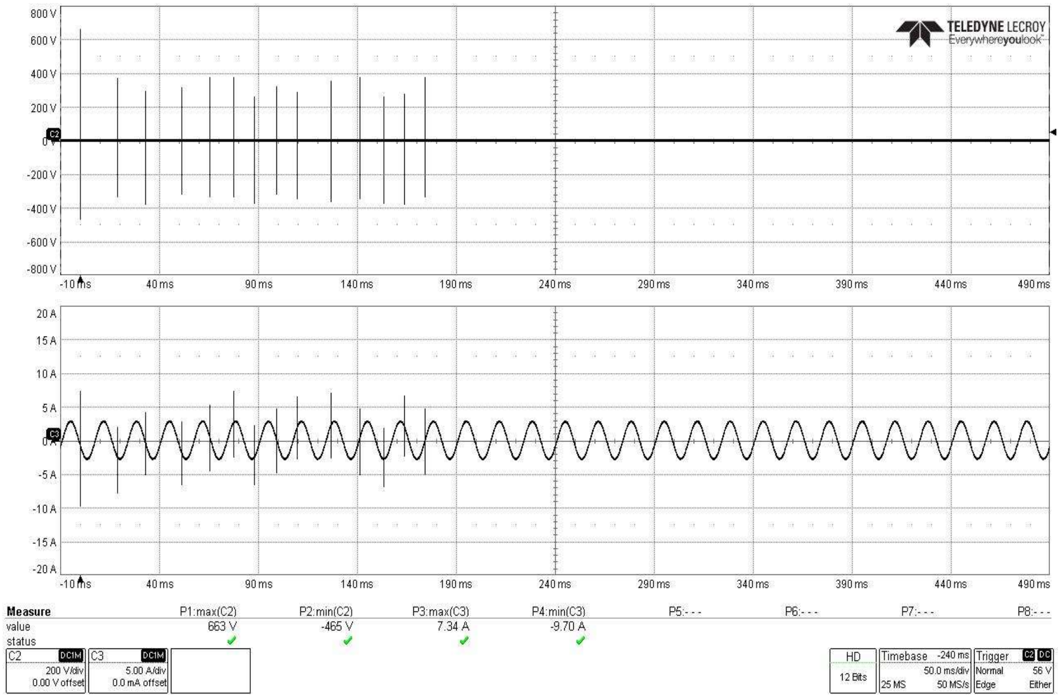


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on AC Power Line 2

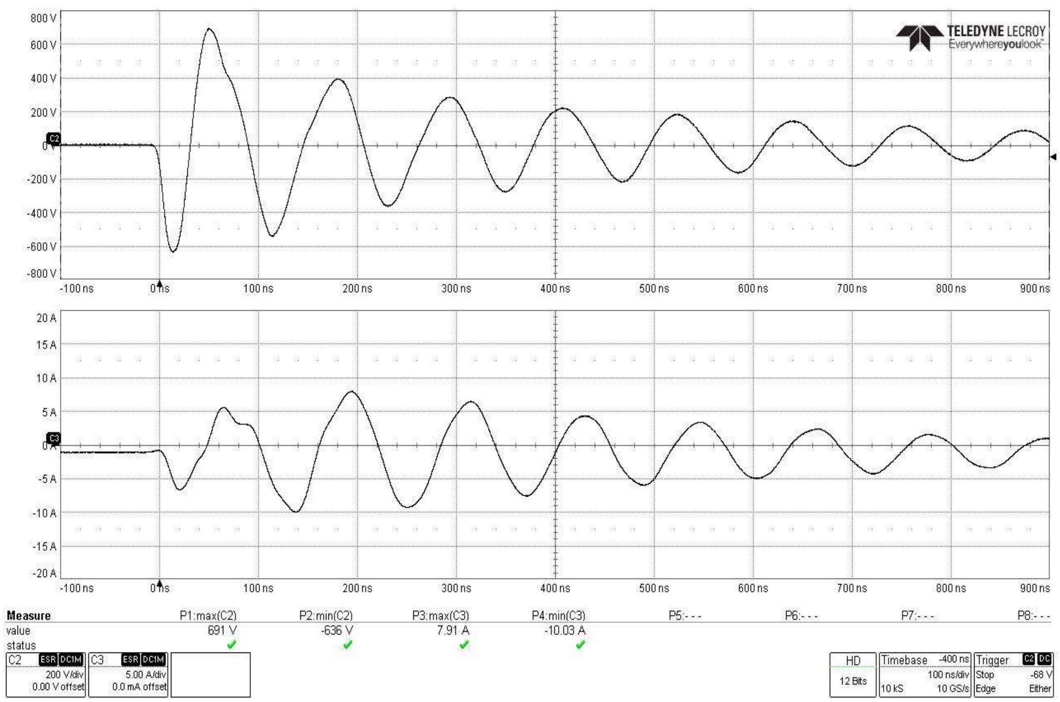


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on AC Power Line 2

EAR Controlled Data

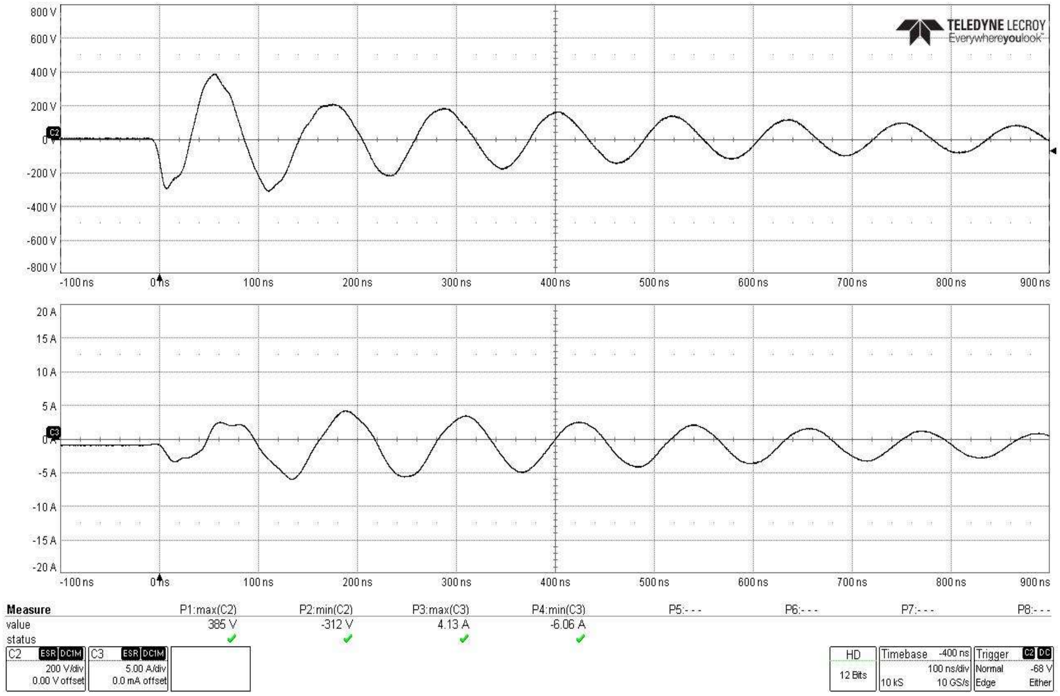


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on AC Power Line 2

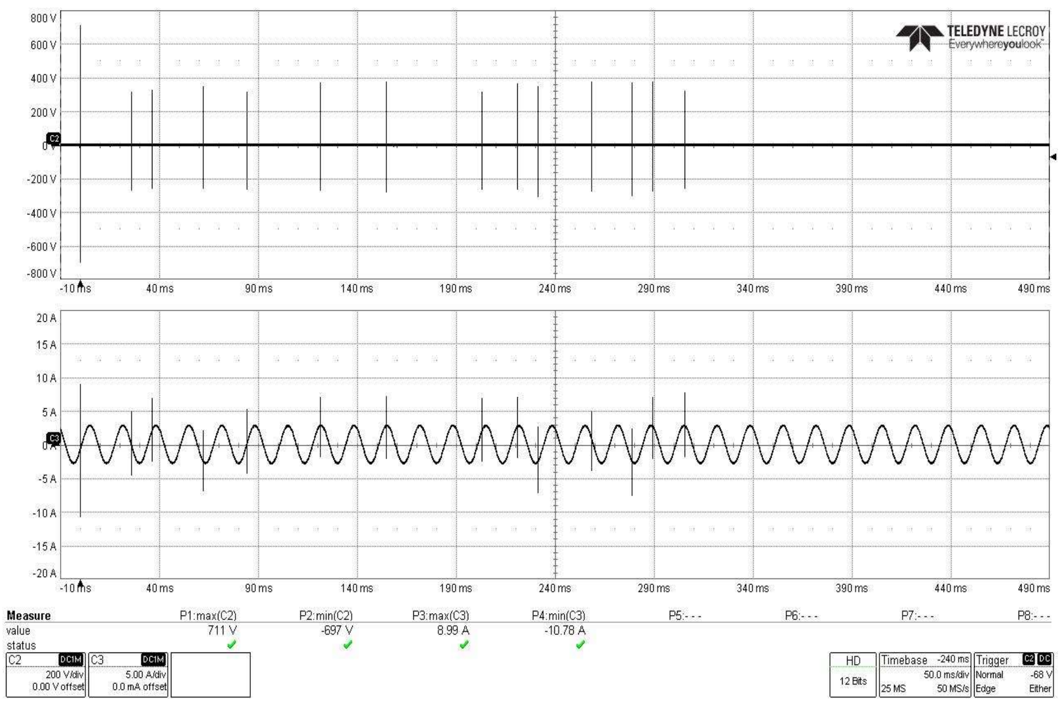


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on AC Power Line 2

EAR Controlled Data

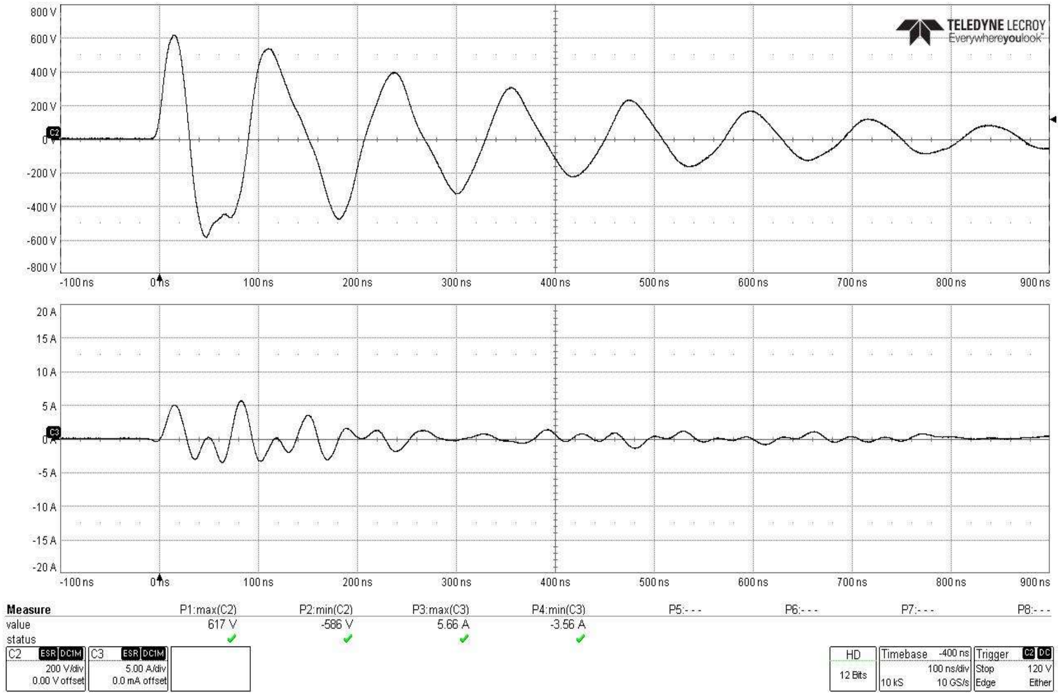


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on AC Power Line 2

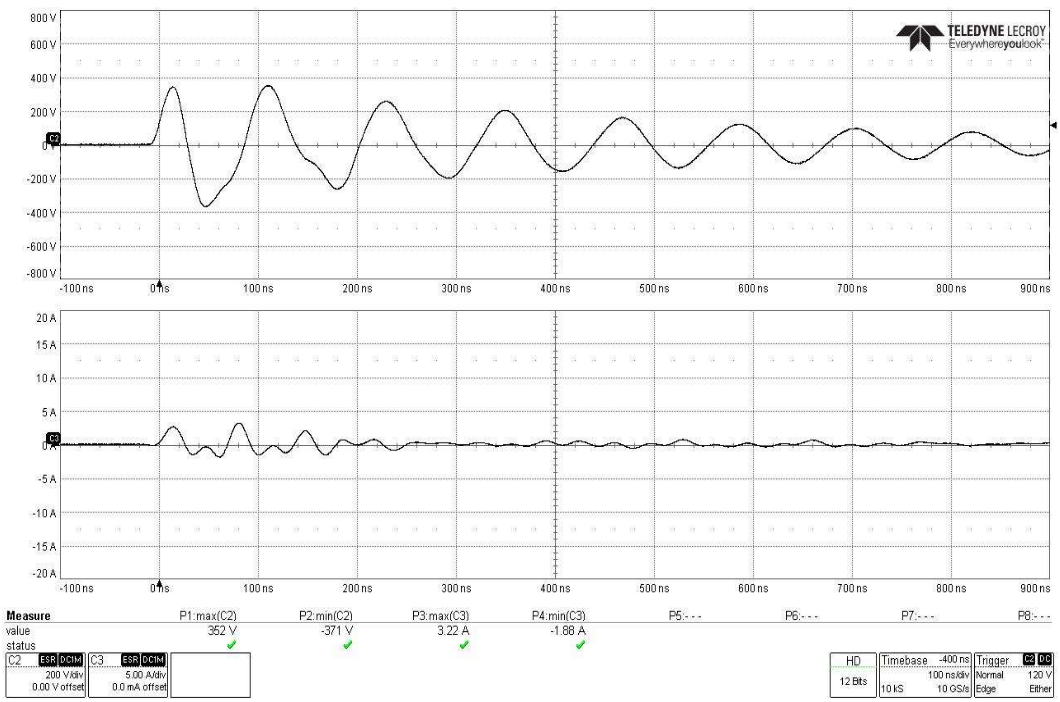


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on AC Power Line 2

EAR Controlled Data

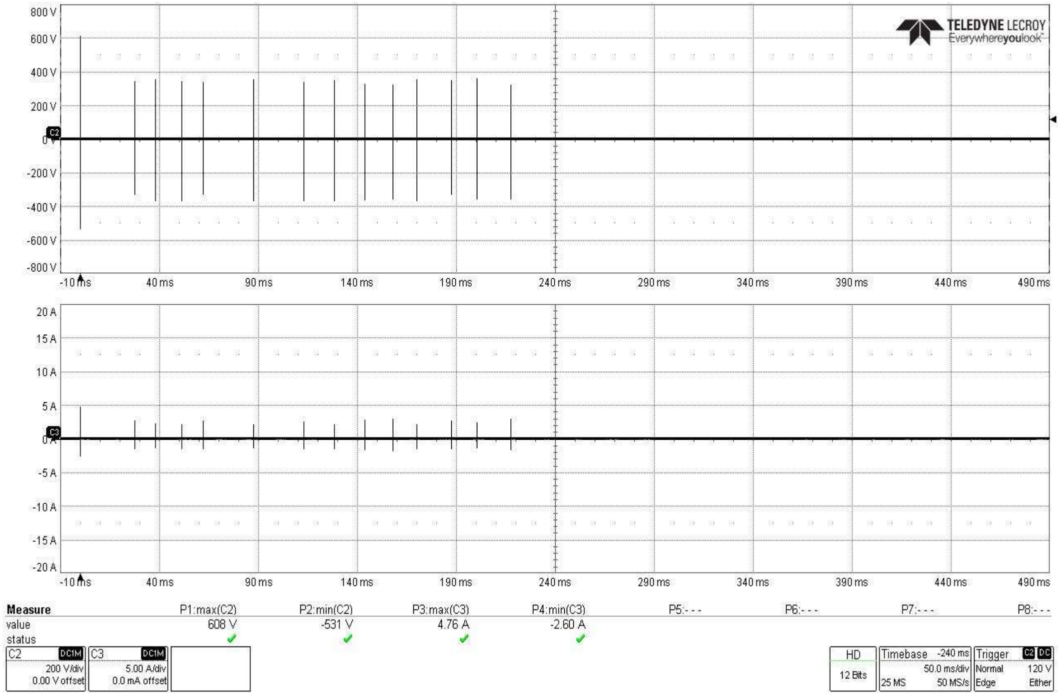


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on Full AC Power Bundle

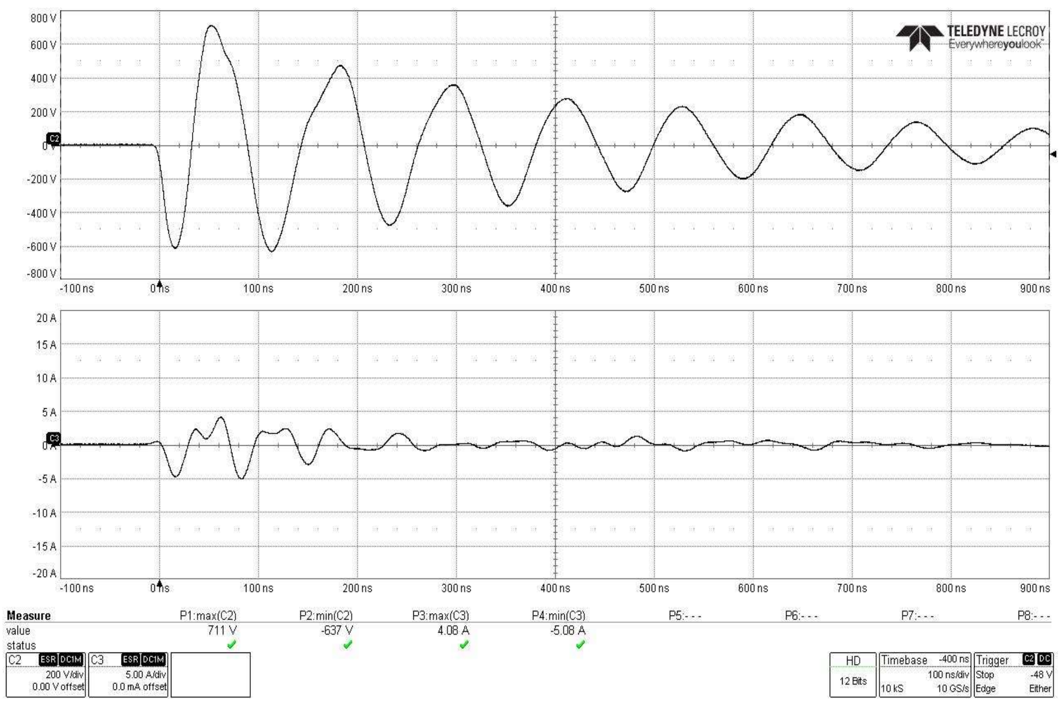


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on Full AC Power Bundle

EAR Controlled Data

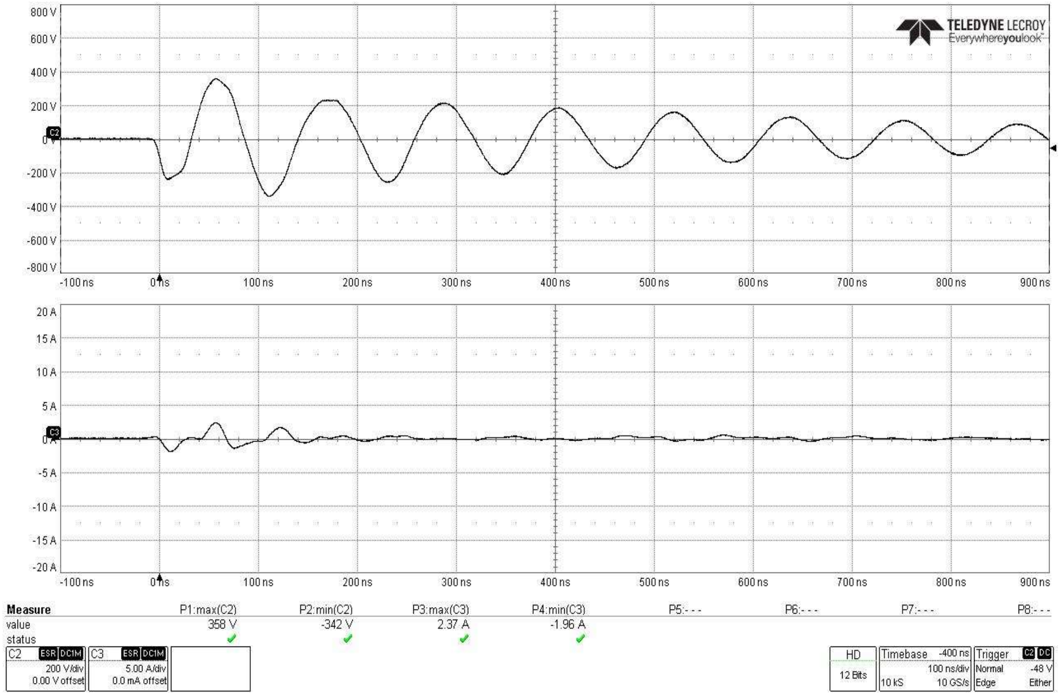


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on Full AC Power Bundle

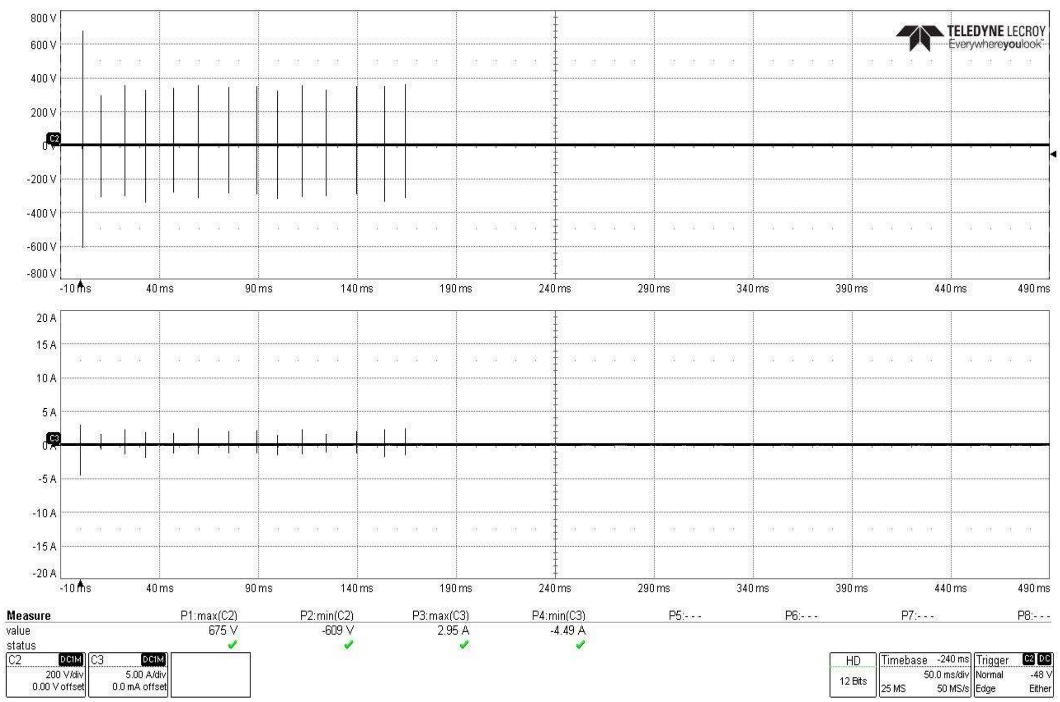


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on Full AC Power Bundle

EAR Controlled Data

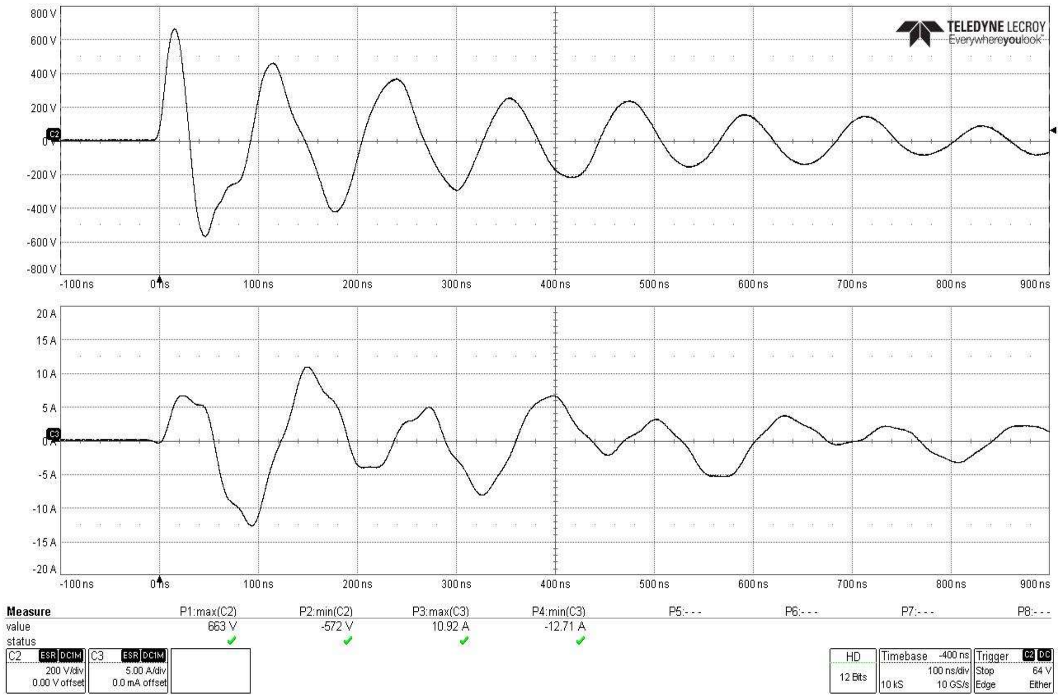


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on Full AC Power Bundle

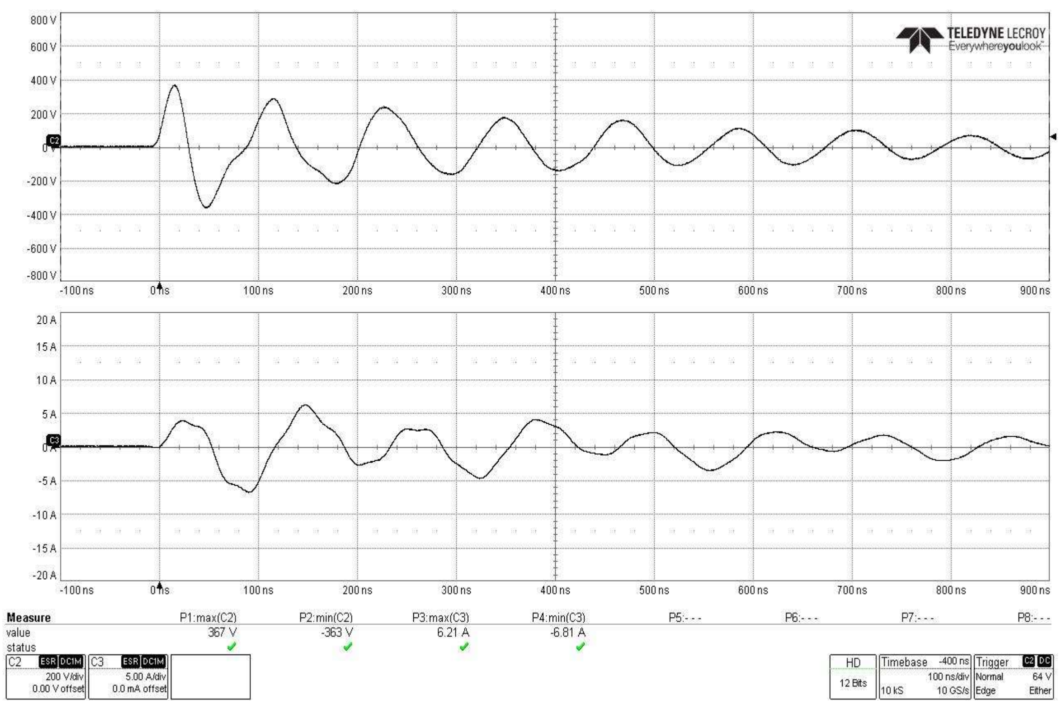


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on Full AC Power Bundle

EAR Controlled Data

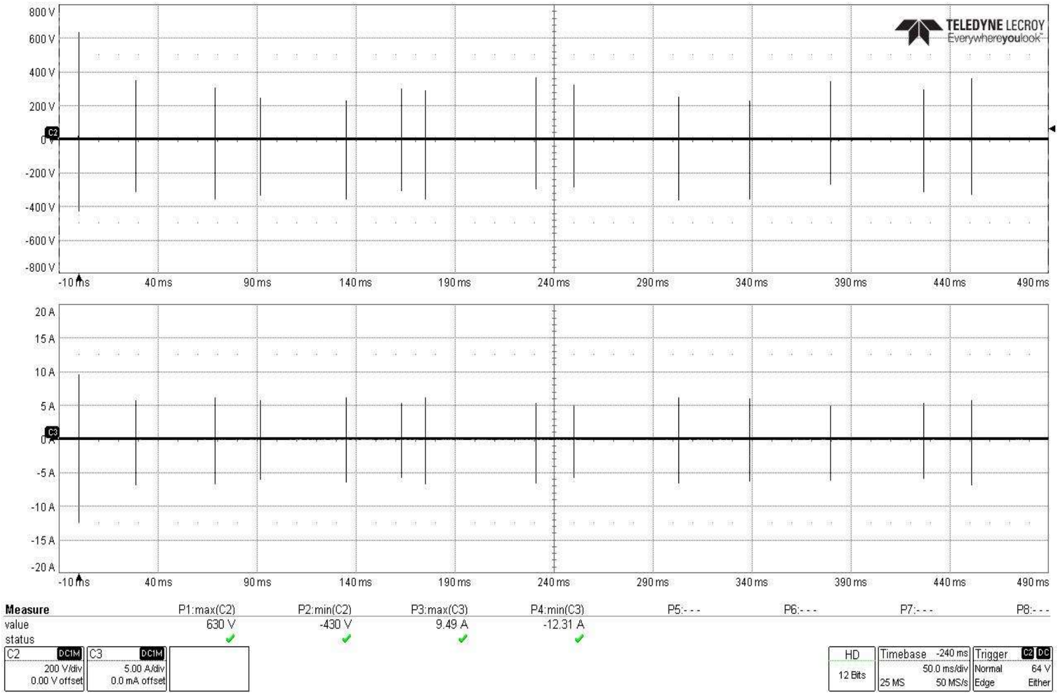


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on DC Power Bundle

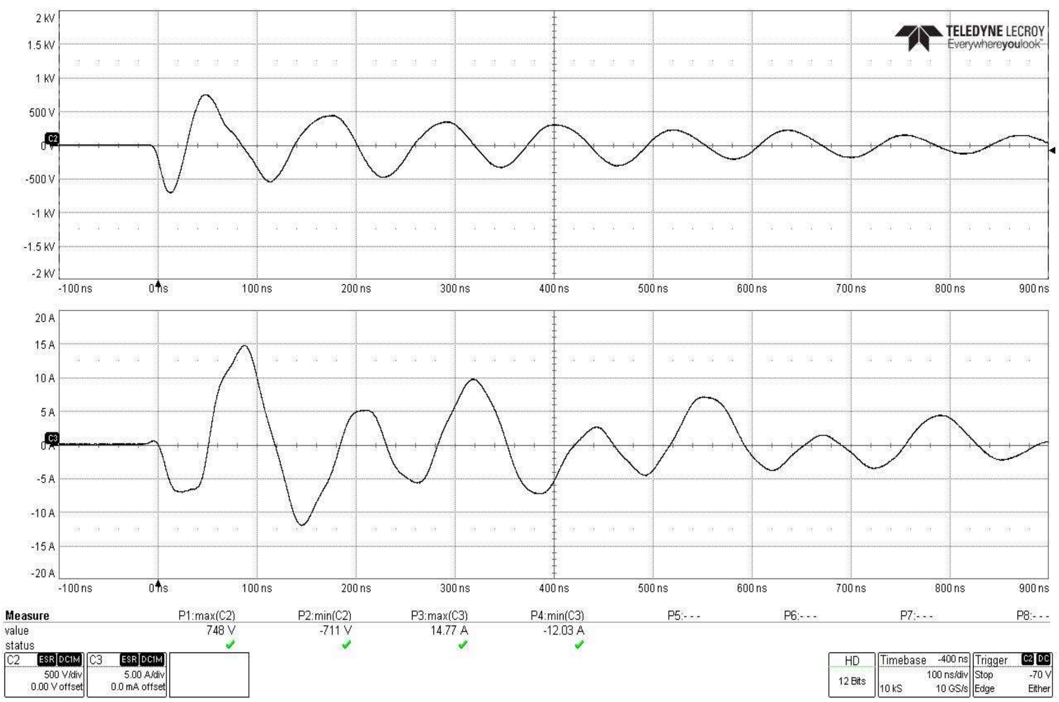


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on DC Power Bundle

EAR Controlled Data

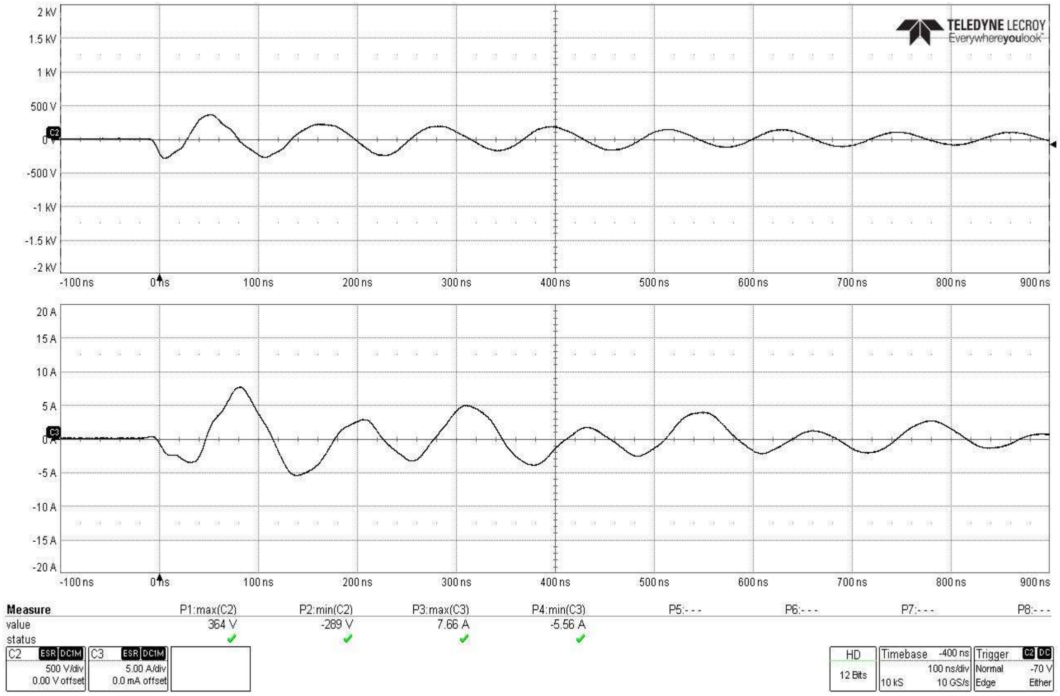


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on DC Power Bundle

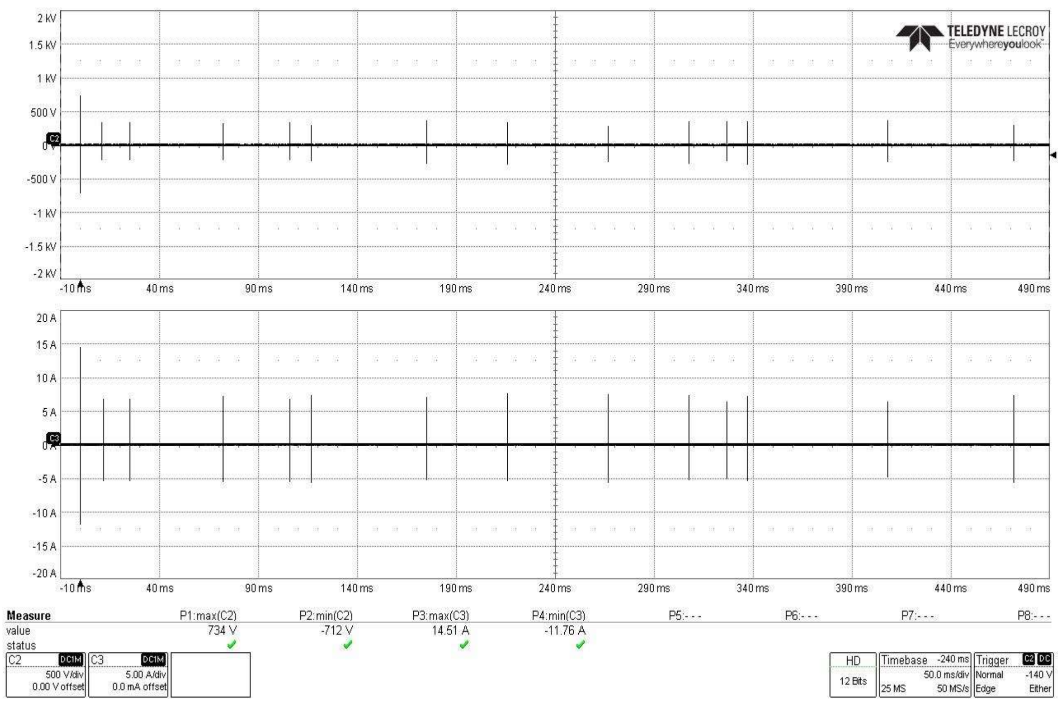


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on DC Power Bundle

EAR Controlled Data

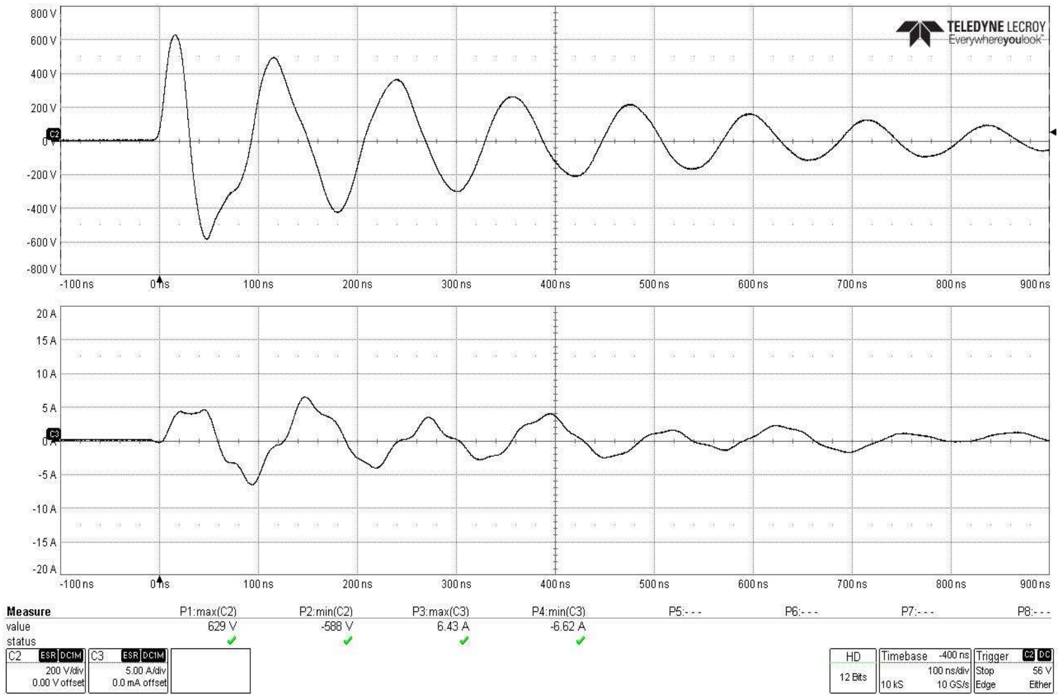


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on DC Power Bundle

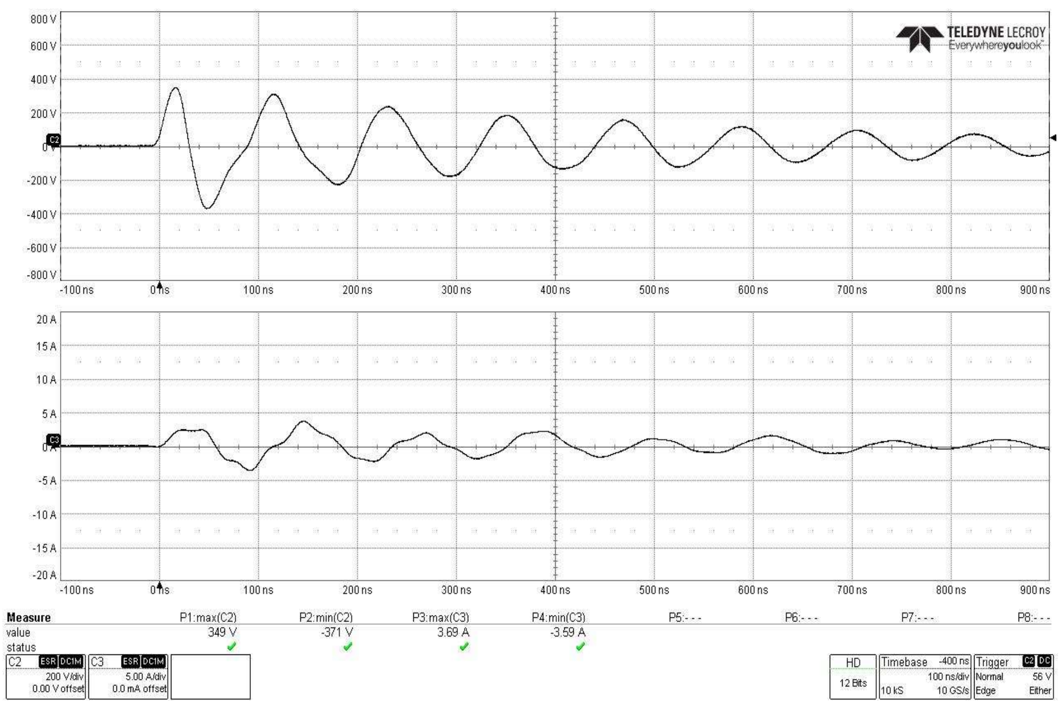


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on DC Power Bundle

EAR Controlled Data

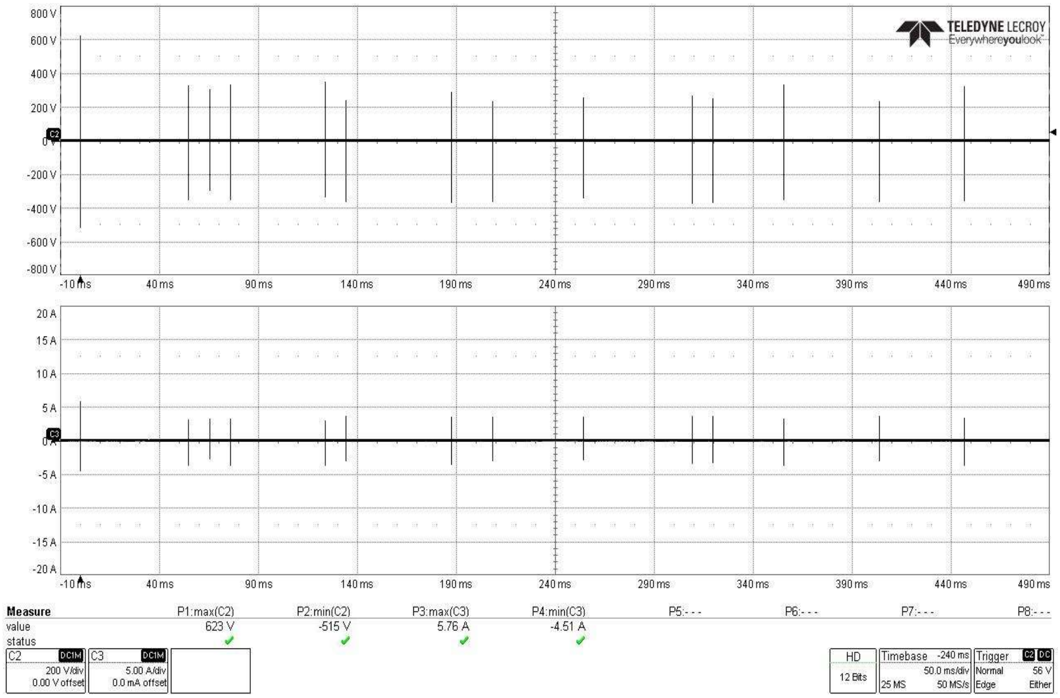


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on DC High Side

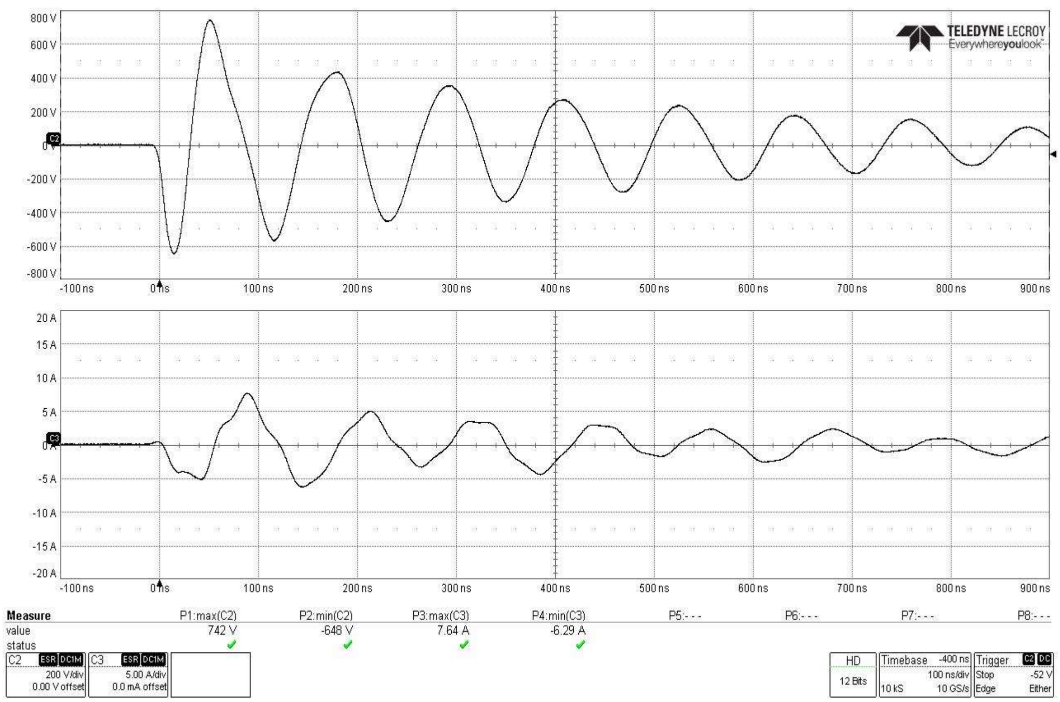


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on DC High Side

EAR Controlled Data

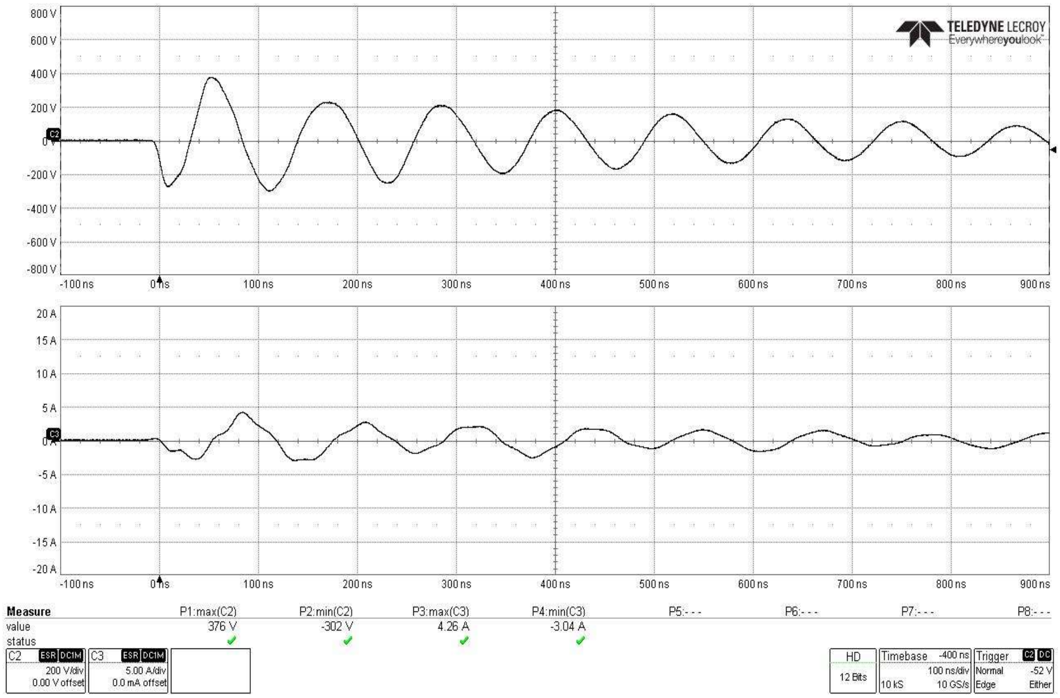


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on DC High Side

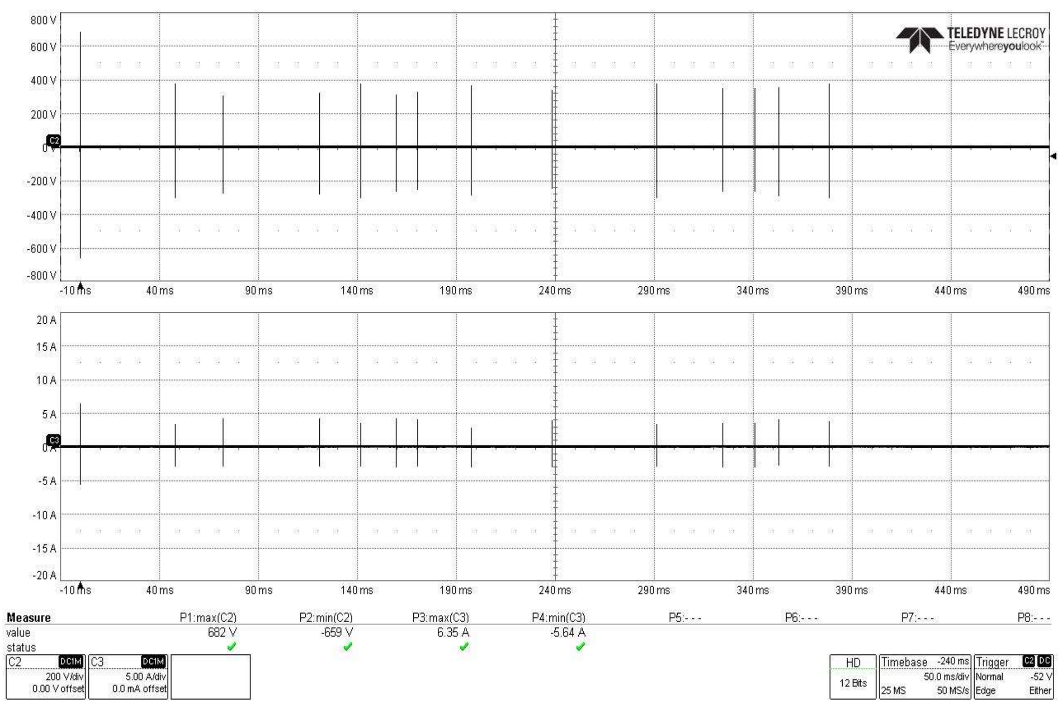


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on DC High Side

EAR Controlled Data

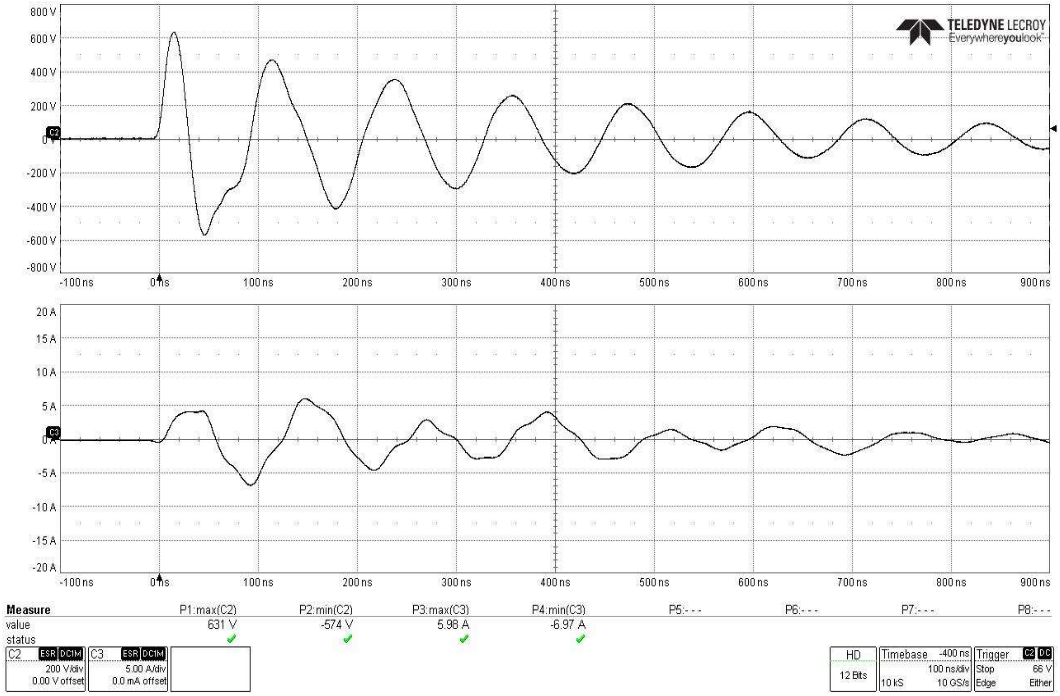


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on DC High Side

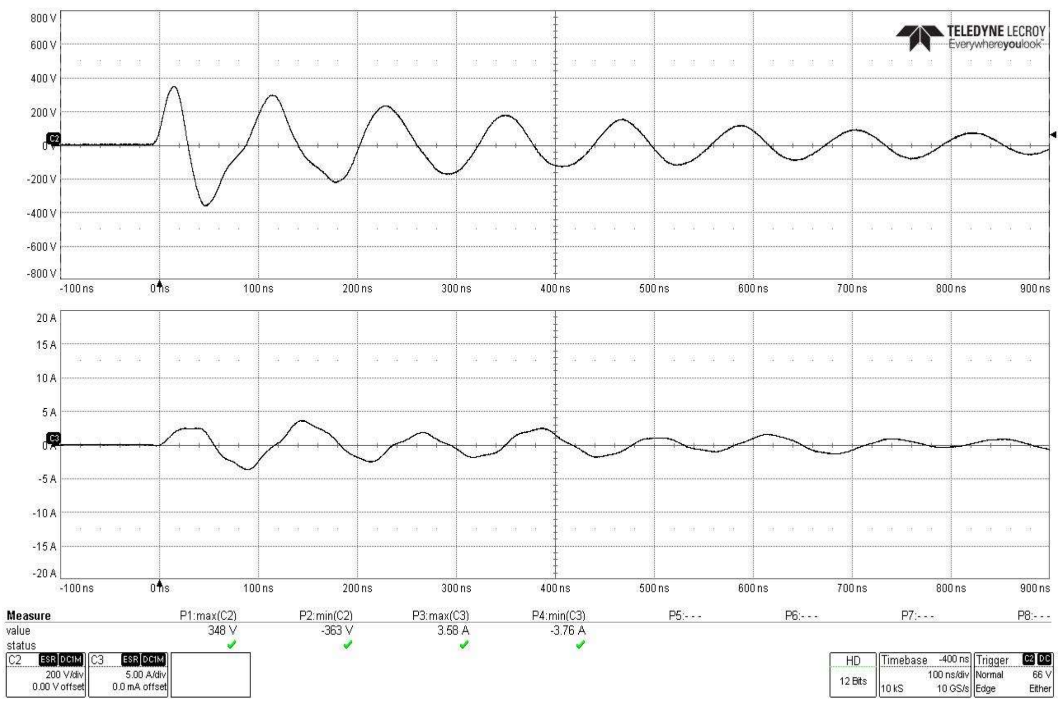


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on DC High Side

EAR Controlled Data

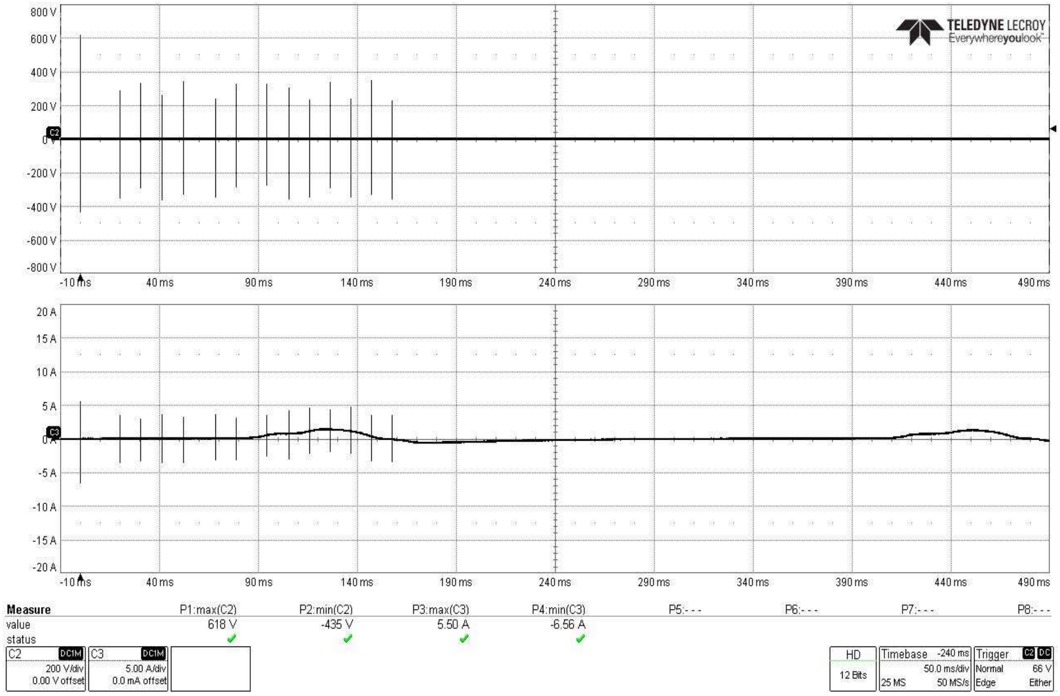


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on DC Return Side

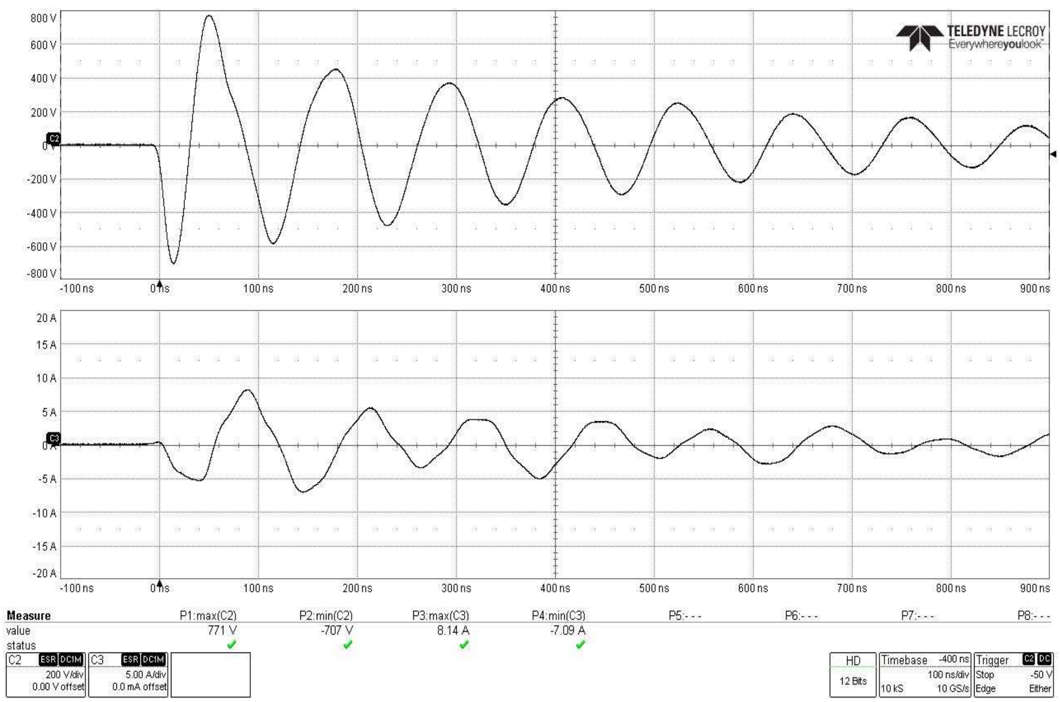


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on DC Return Side

EAR Controlled Data

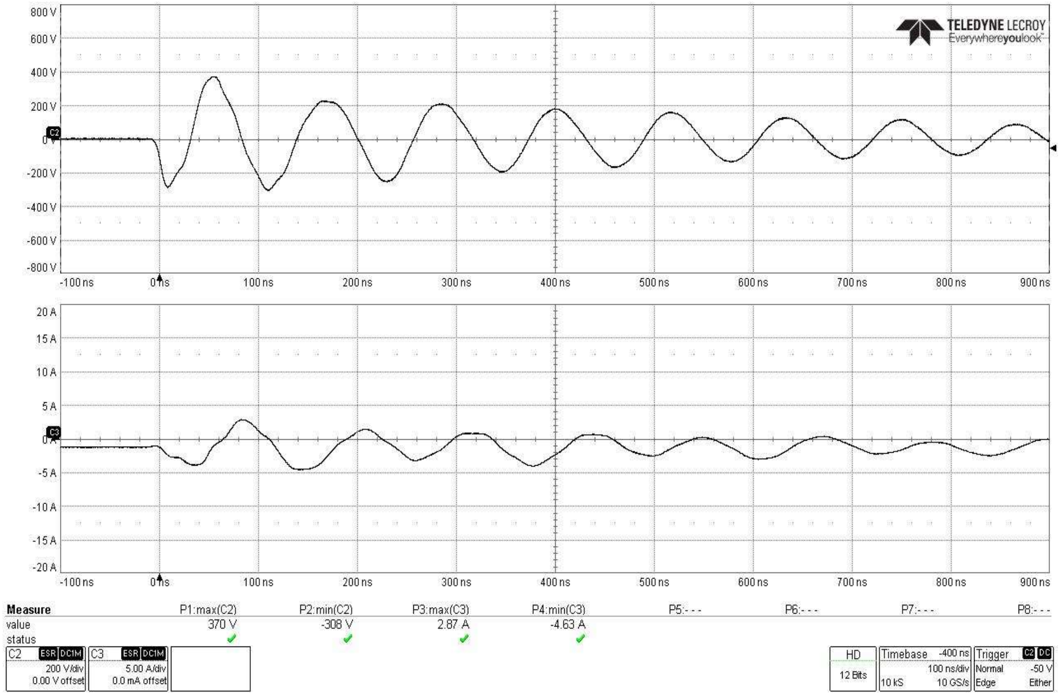


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on DC Return Side

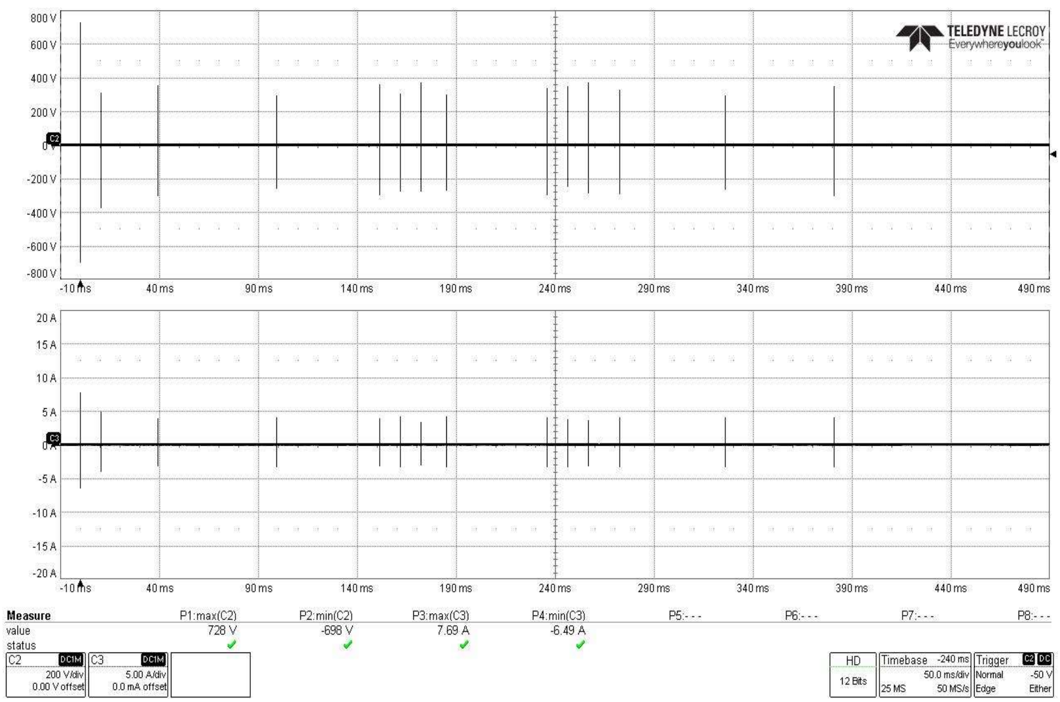


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on DC Return Side

EAR Controlled Data



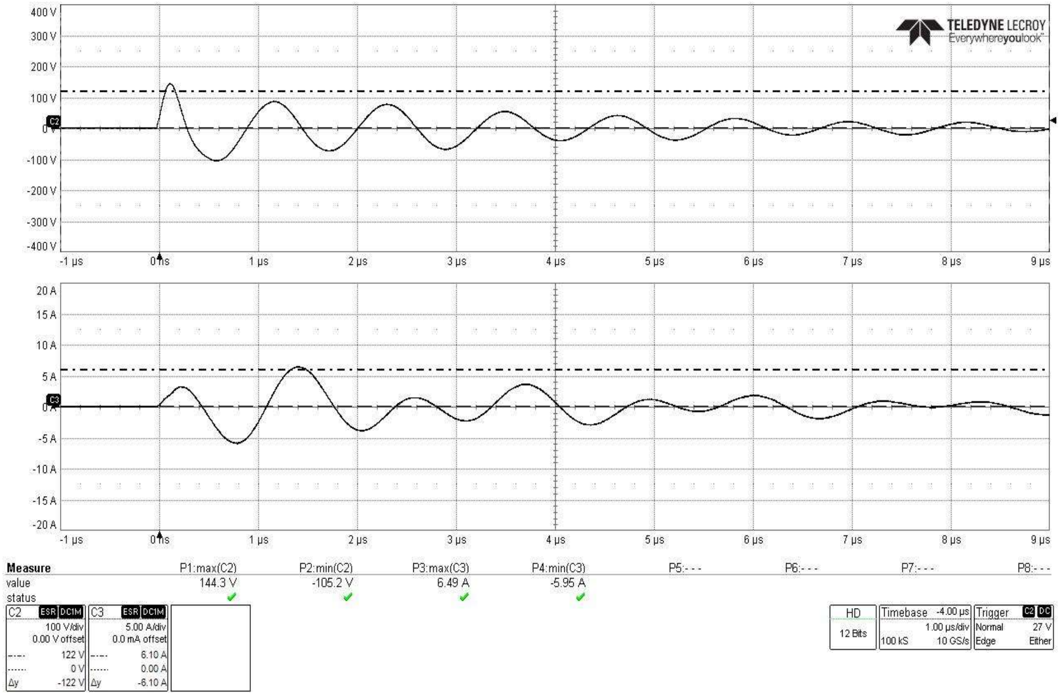
Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on DC Return Side



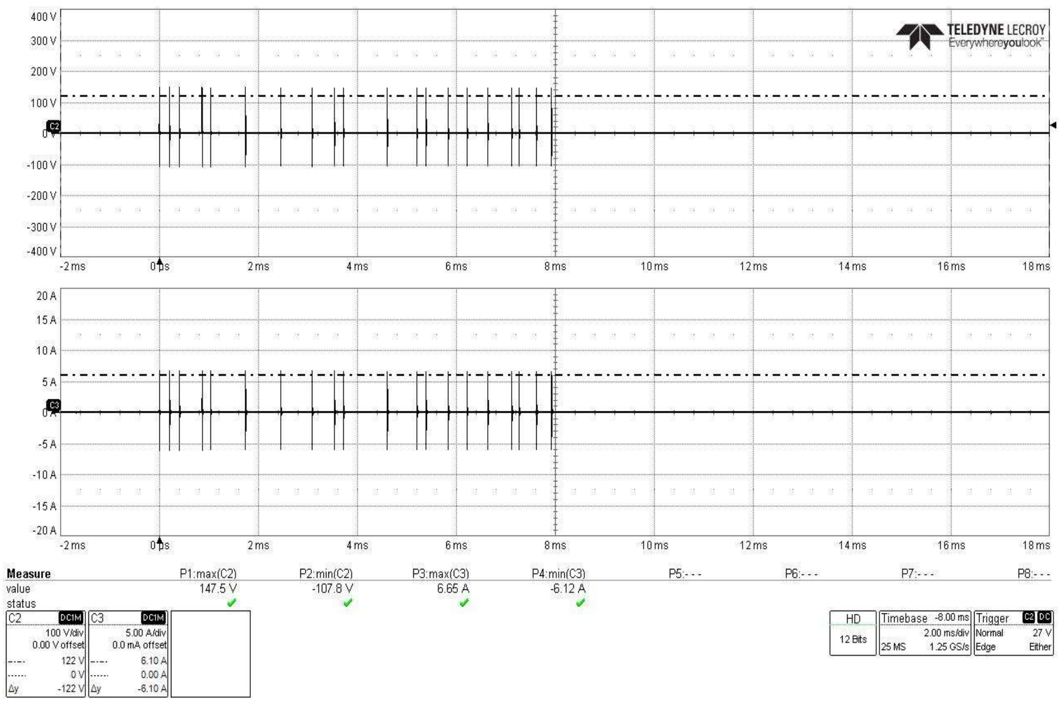
Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on DC Return Side

EAR Controlled Data

CS117 Actual Test Multiple Burst (MB) Waveform #3 at 1MHz with V_T = 360V on Flexboss 21

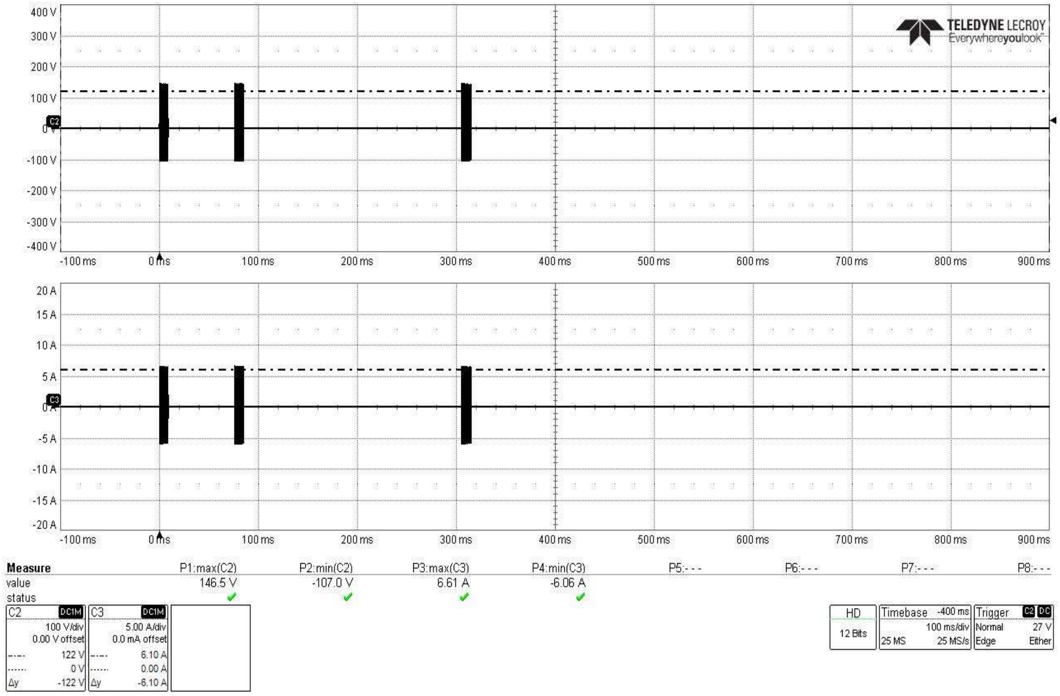


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on AC Power Line 1

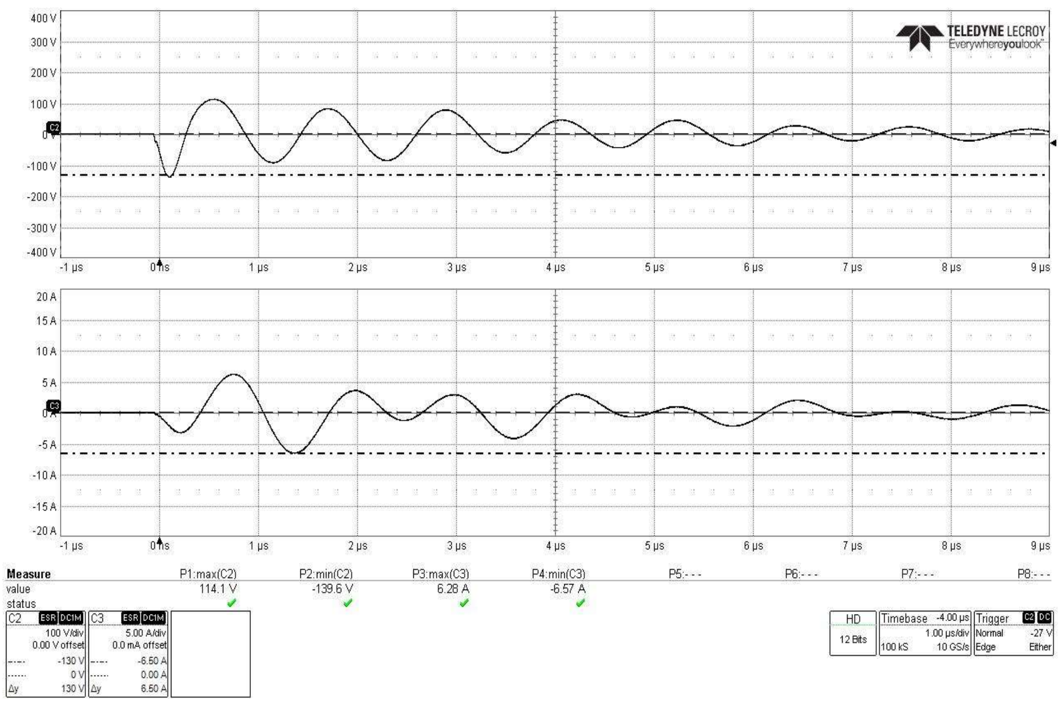


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on AC Power Line 1

EAR Controlled Data

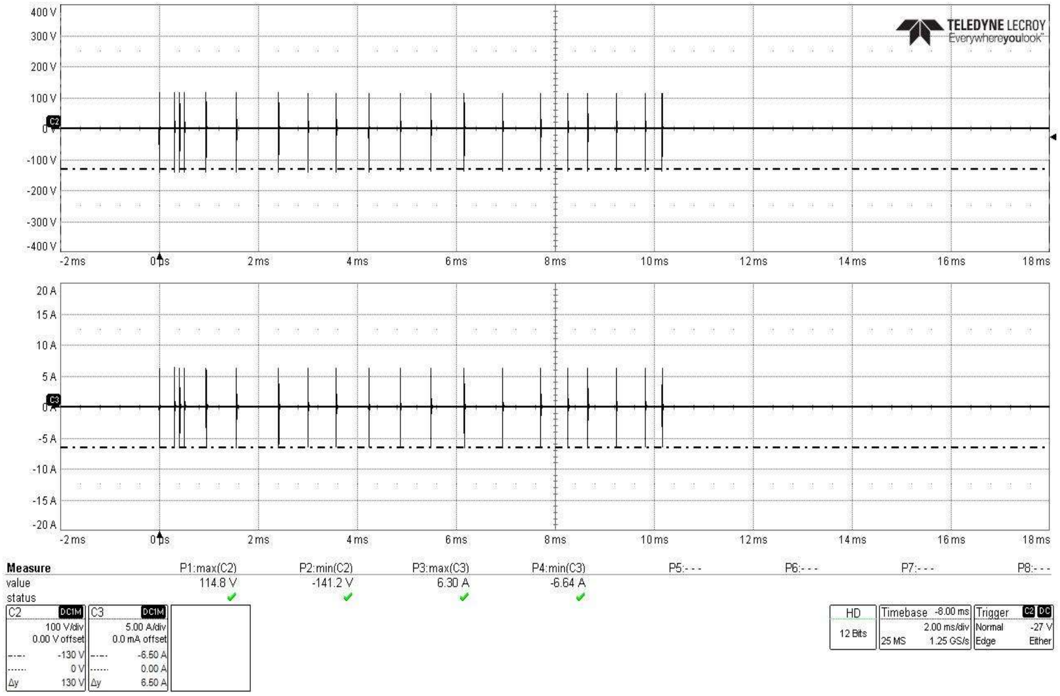


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on AC Power Line 1

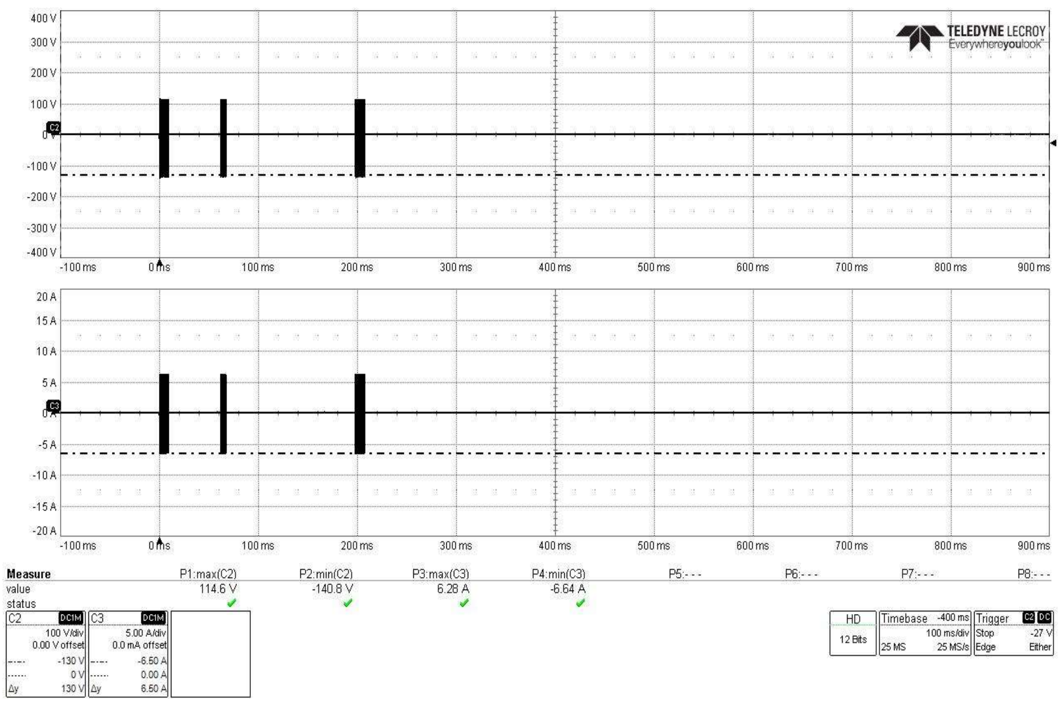


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on AC Power Line 1

EAR Controlled Data

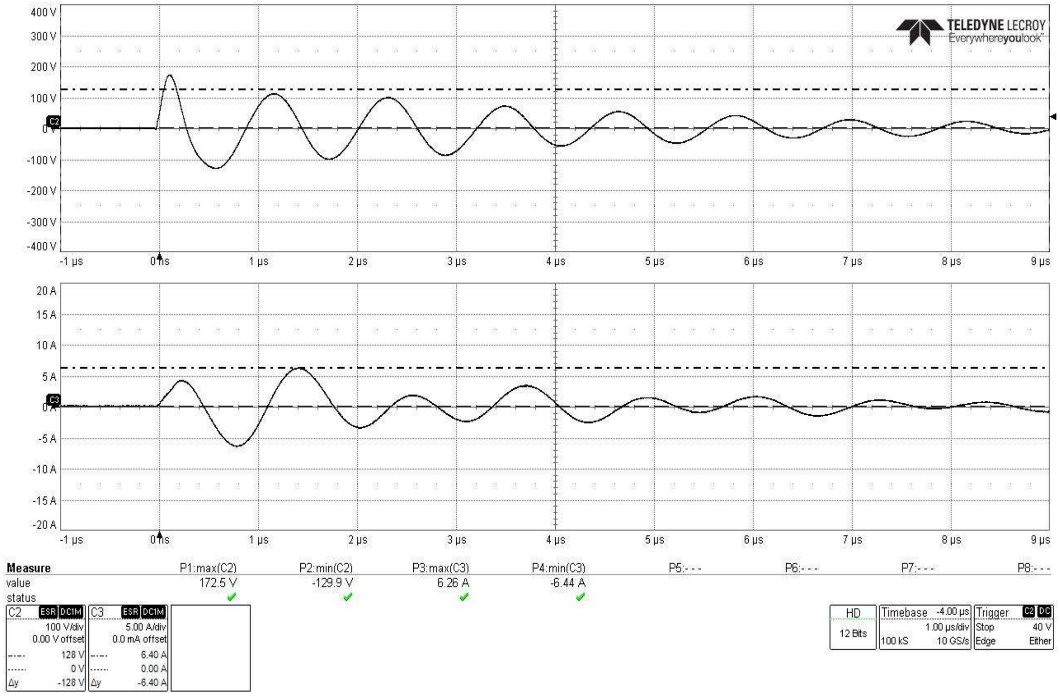


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on AC Power Line 1

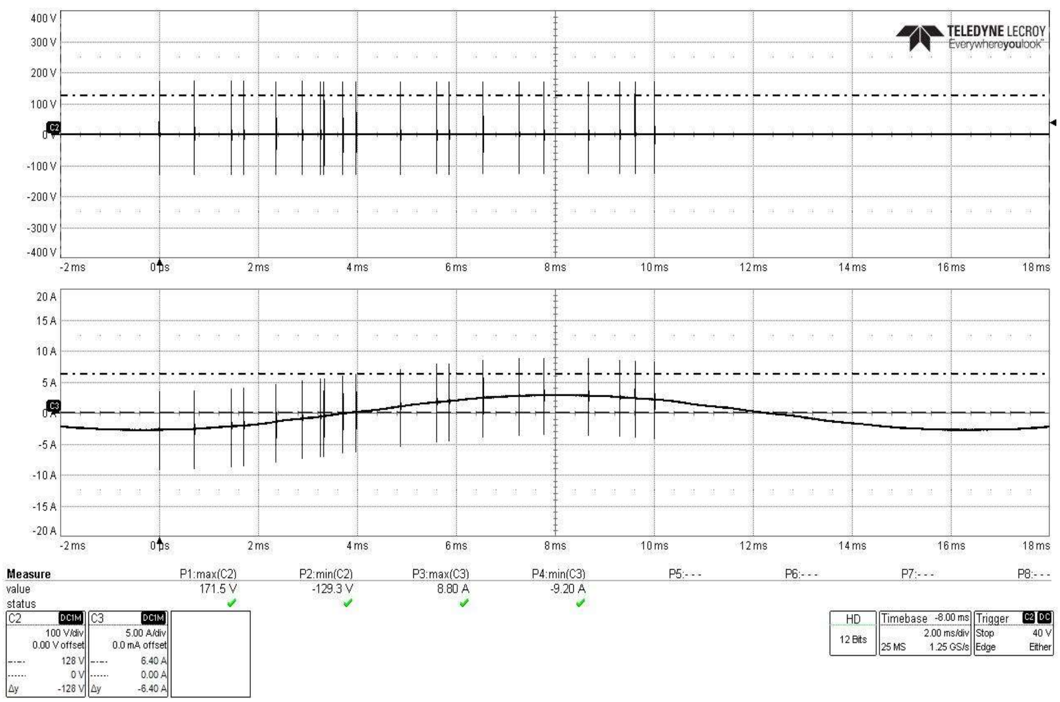


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on AC Power Line 1

EAR Controlled Data

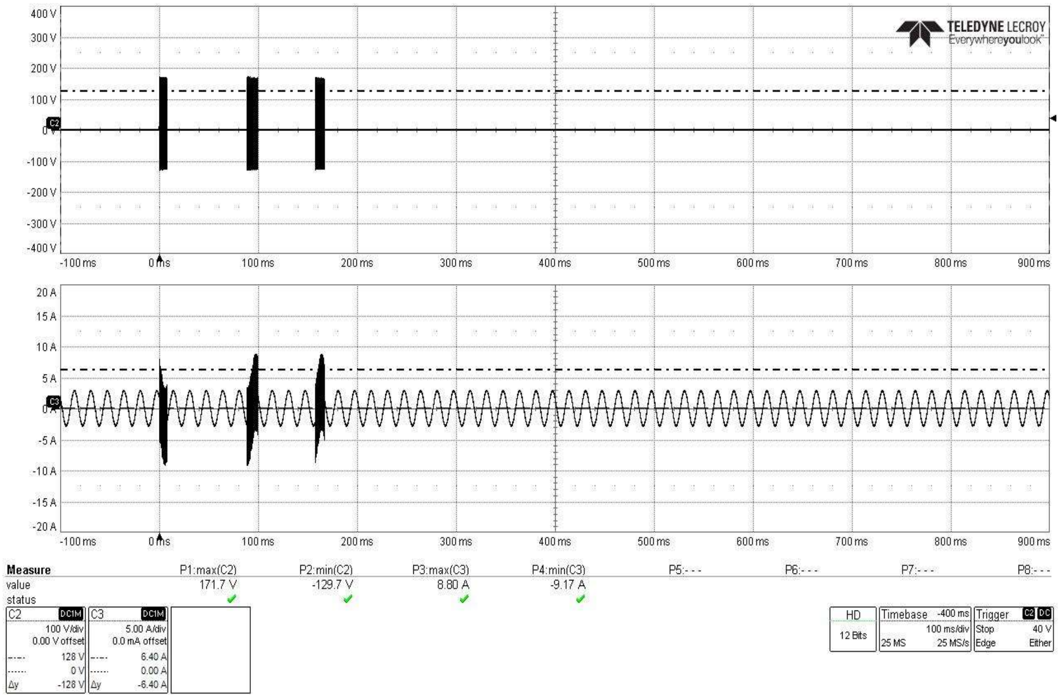


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on AC Power Line 2

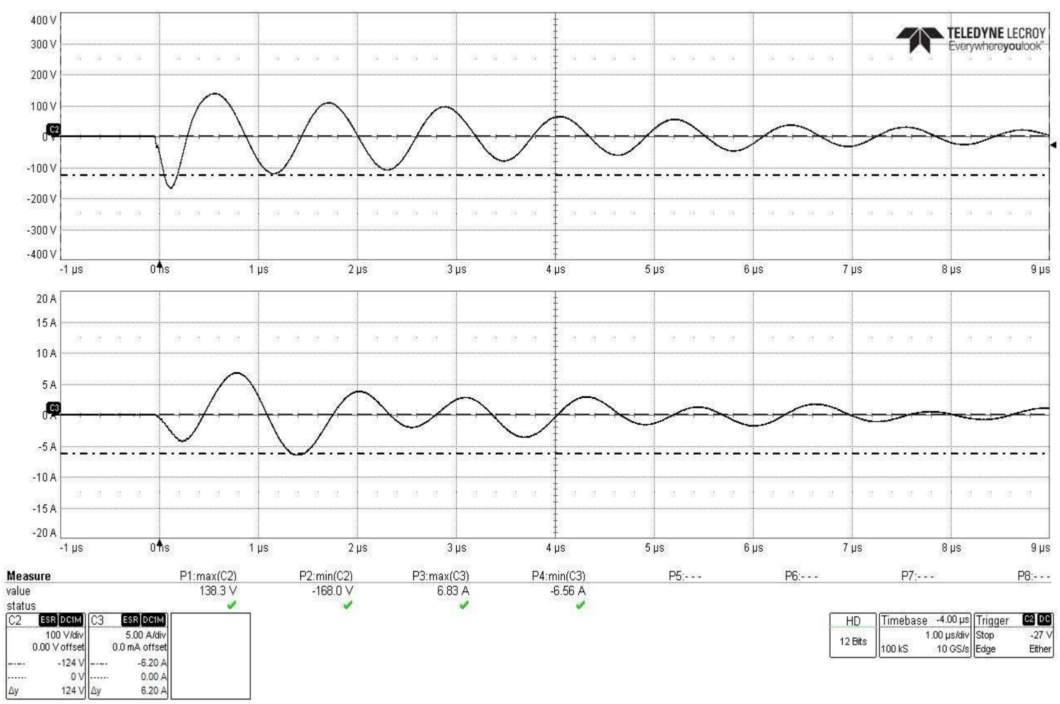


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on AC Power Line 2

EAR Controlled Data

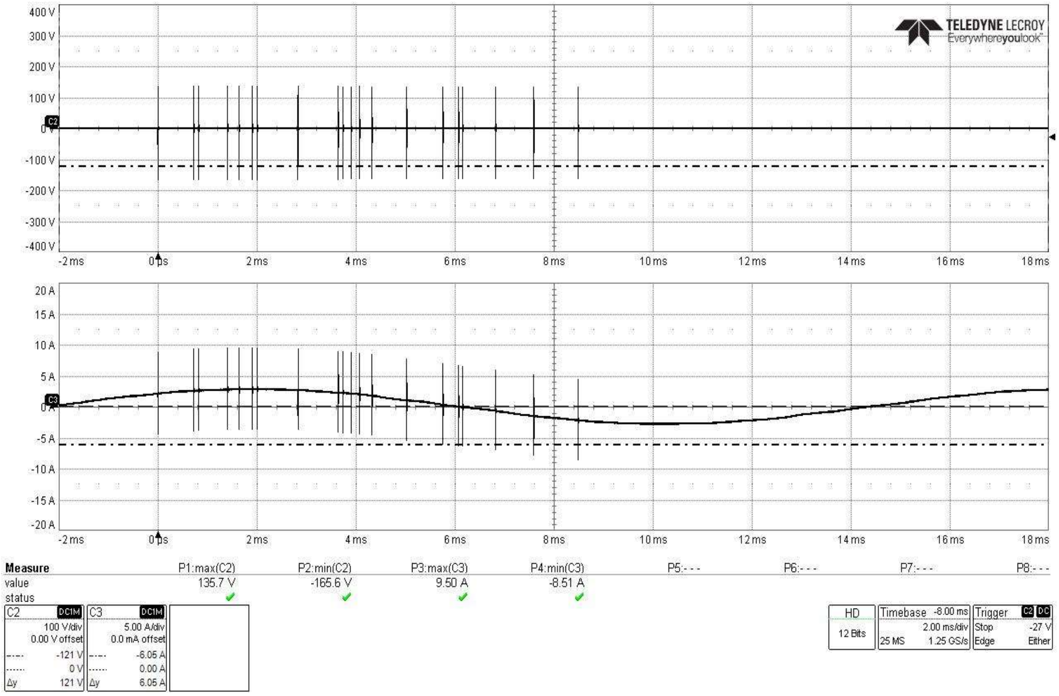


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on AC Power Line 2

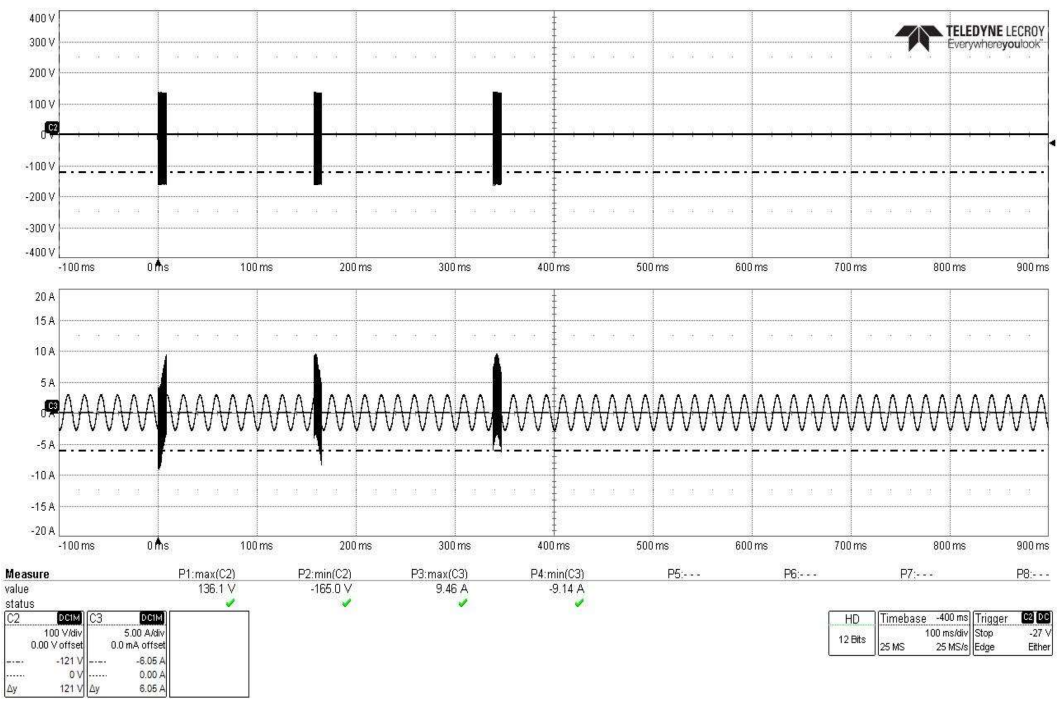


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on AC Power Line 2

EAR Controlled Data

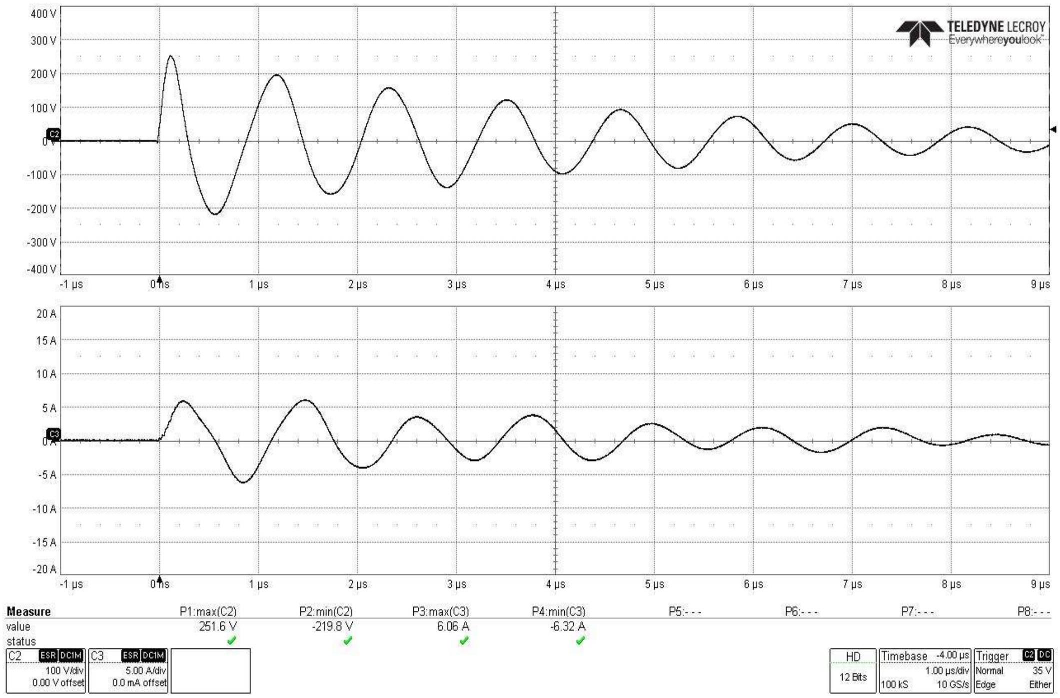


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on AC Power Line 2

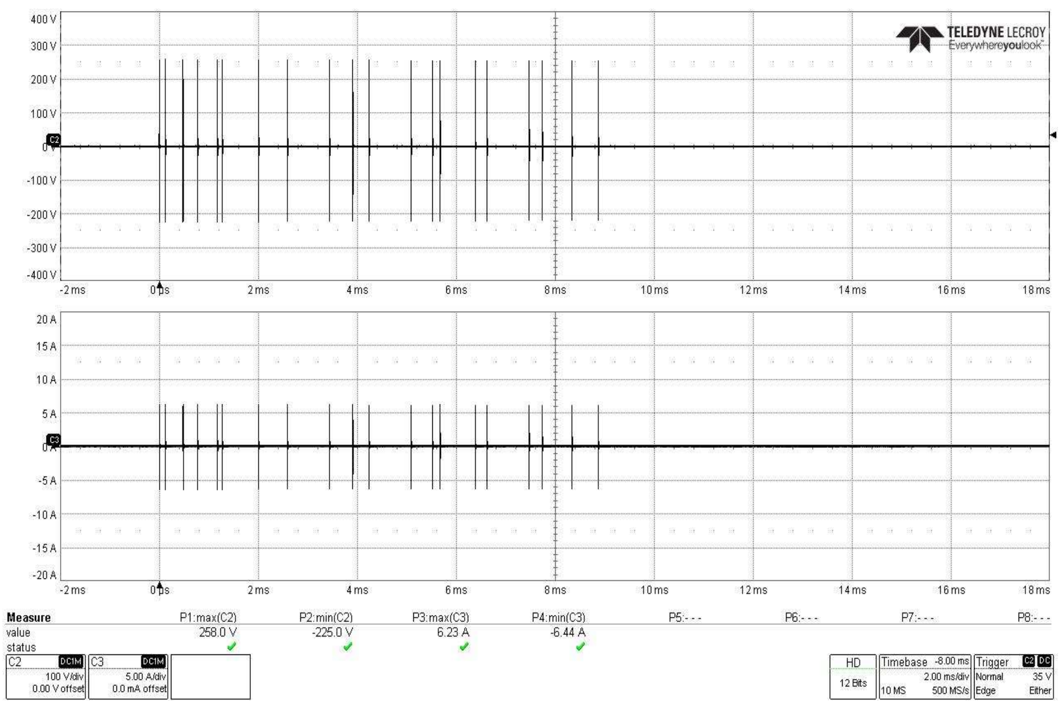


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on AC Power Line 2

EAR Controlled Data

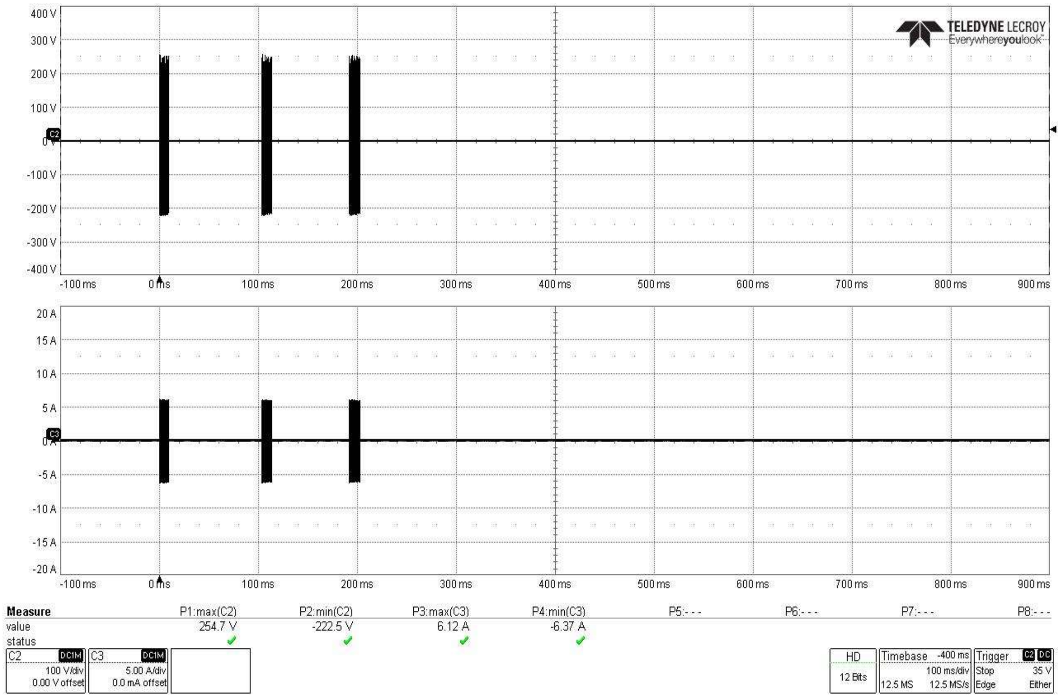


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on Full AC Power Bundle

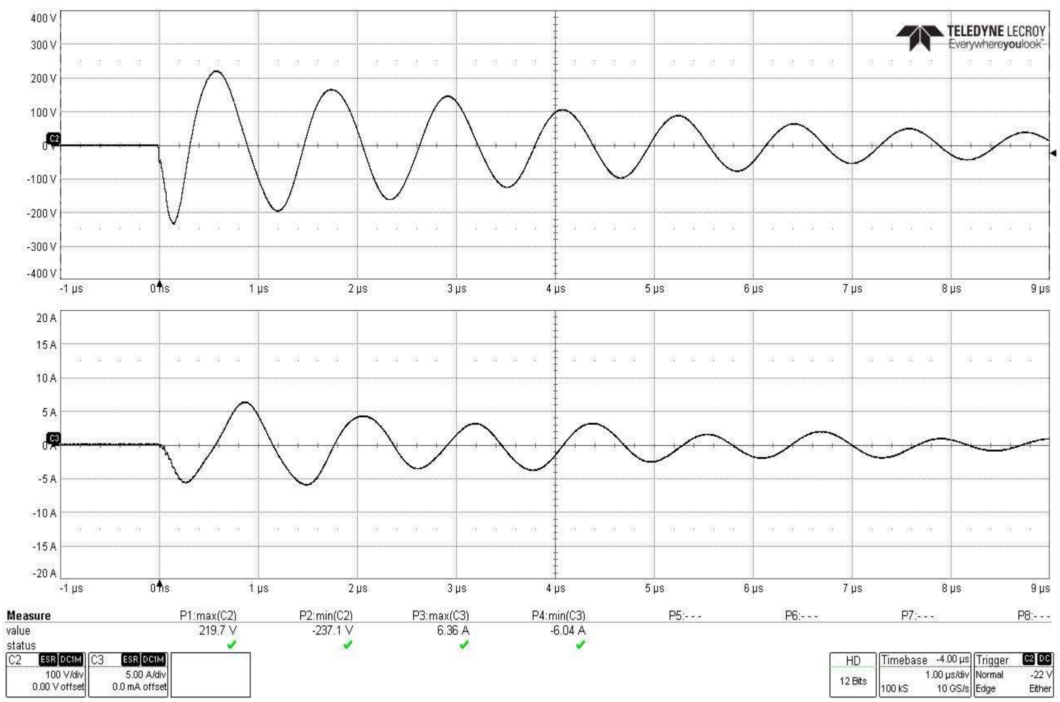


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on Full AC Power Bundle

EAR Controlled Data

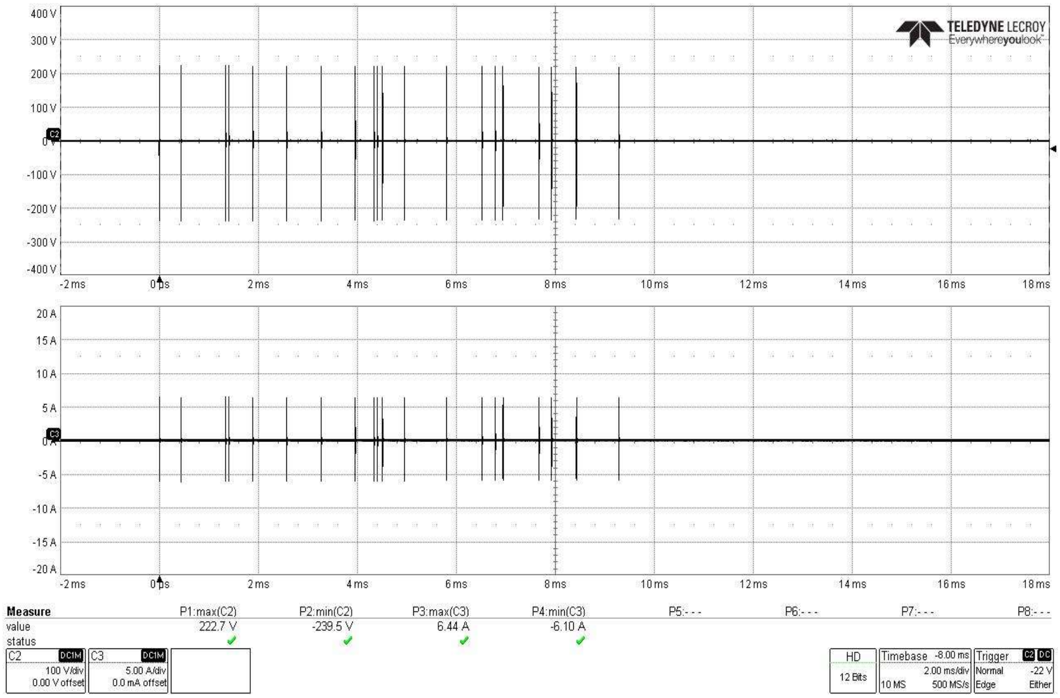


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on Full AC Power Bundle

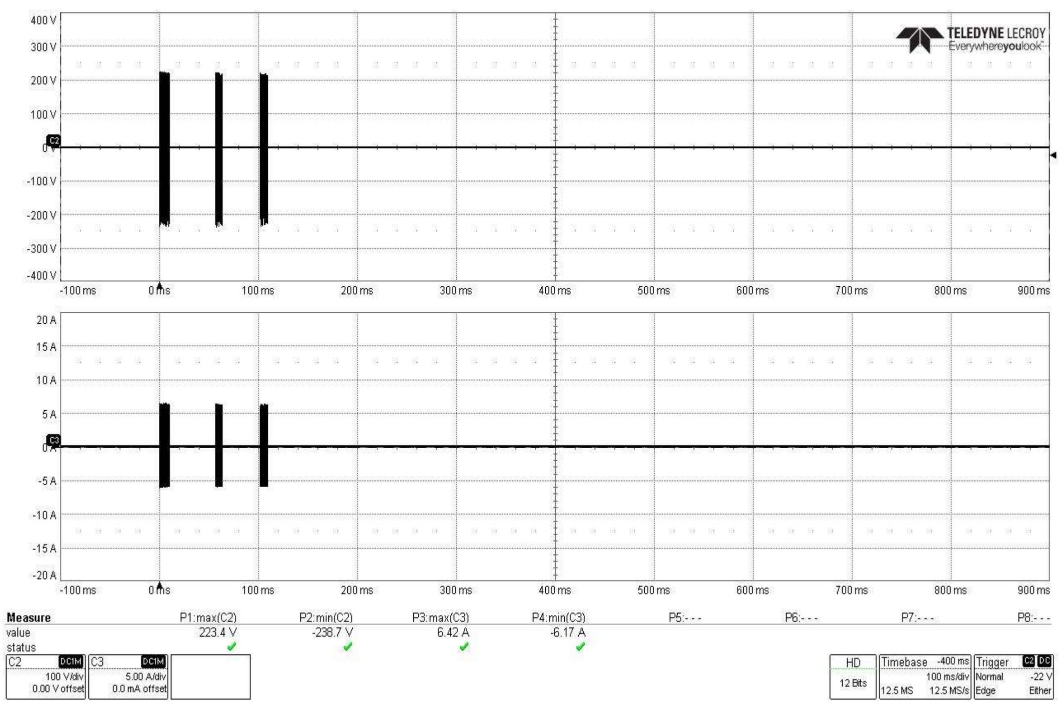


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on Full AC Power Bundle

EAR Controlled Data

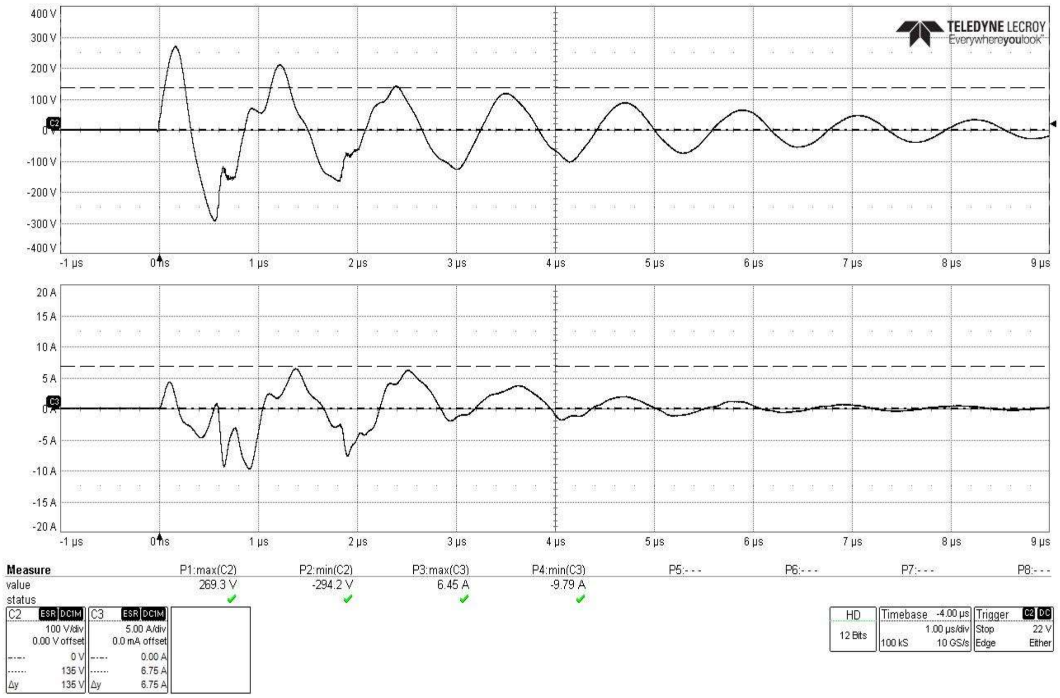


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on Full AC Power Bundle

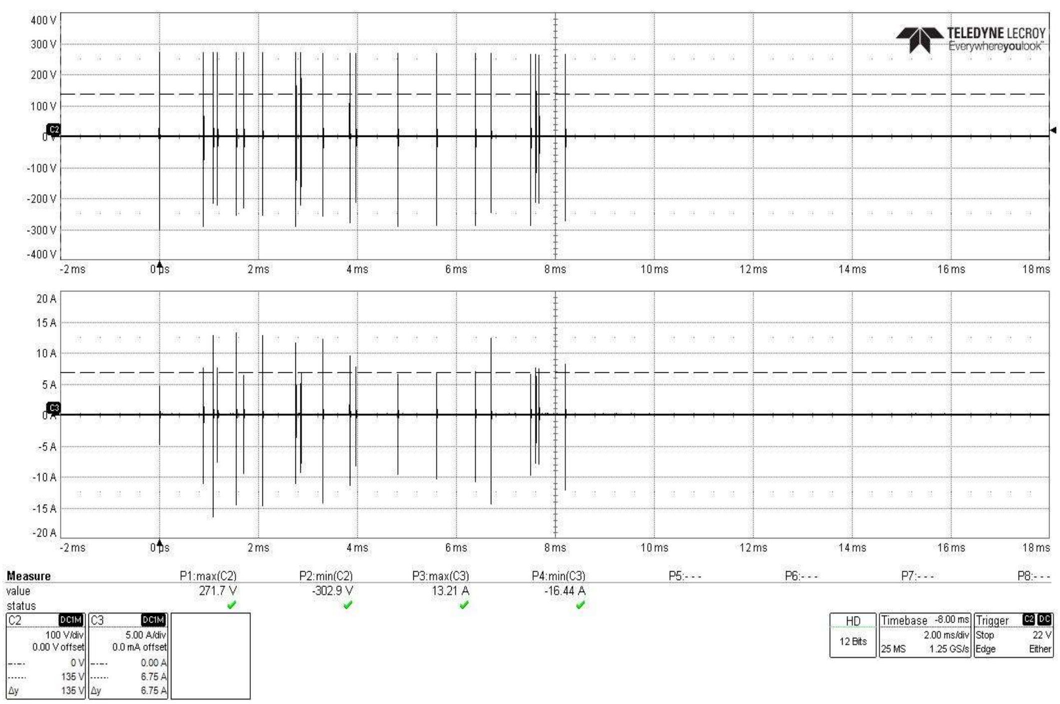


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on Full AC Power Bundle

EAR Controlled Data

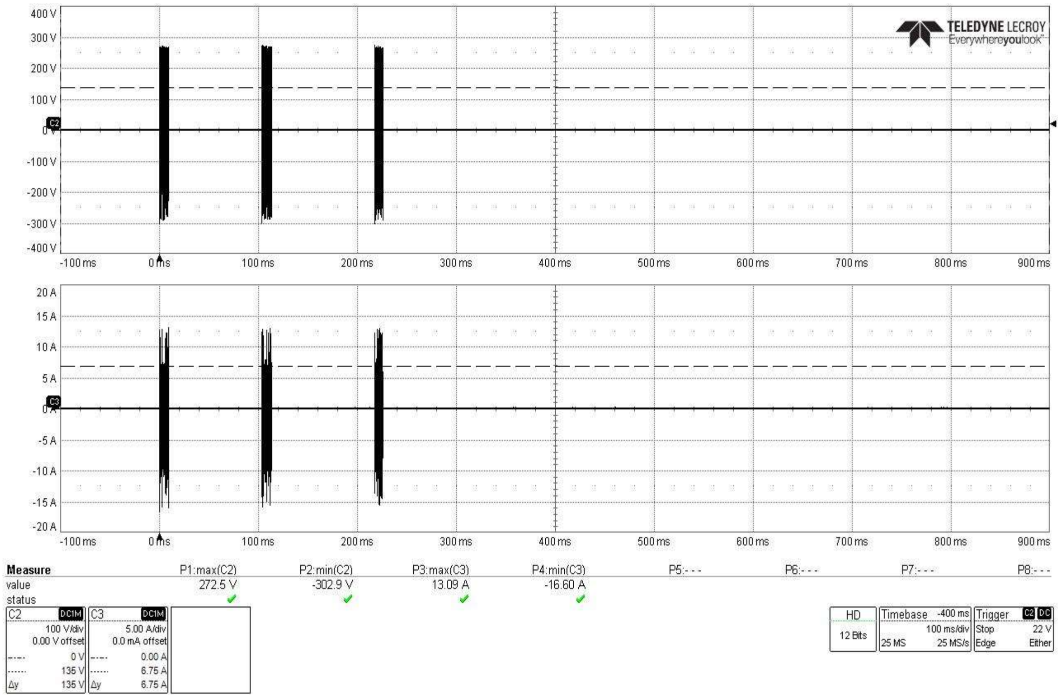


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on DC Power Bundle

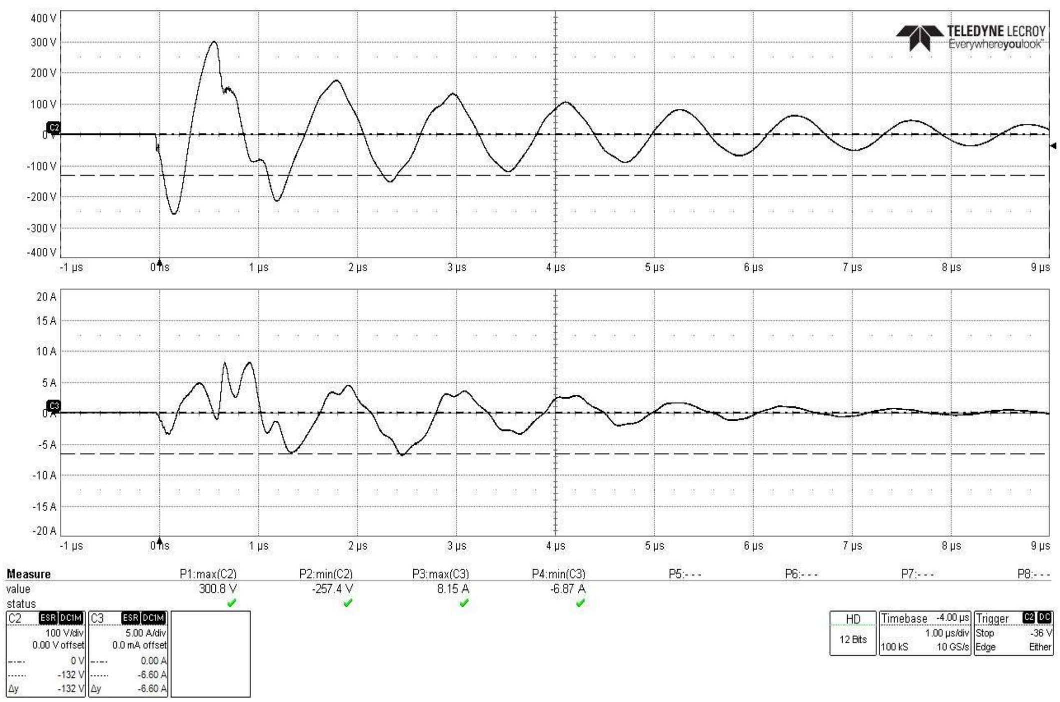


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on DC Power Bundle

EAR Controlled Data

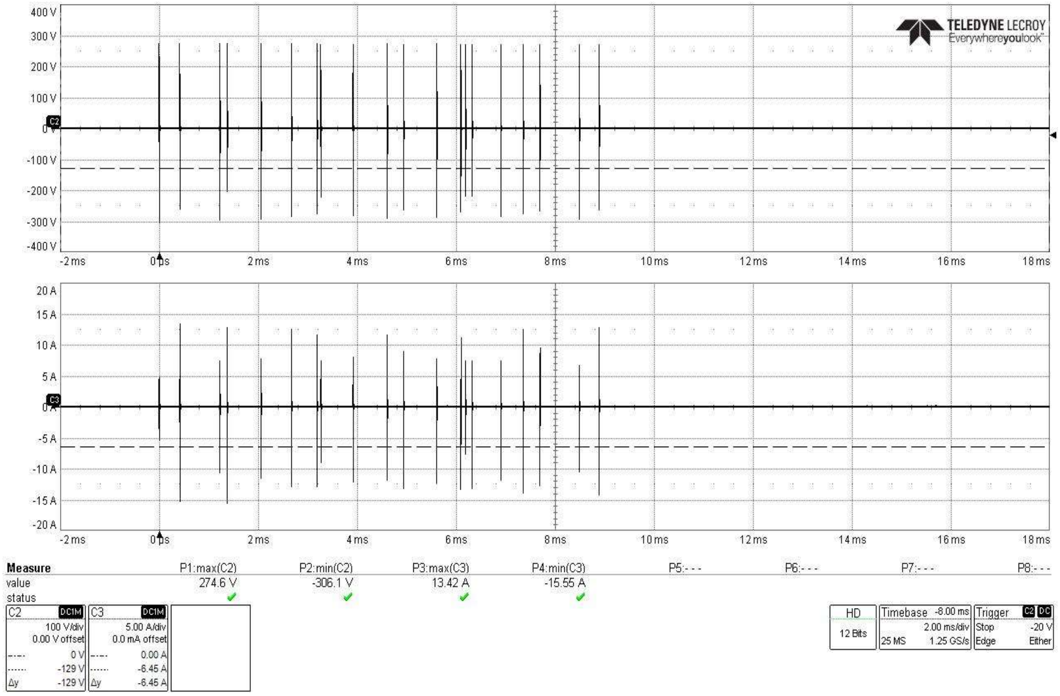


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on DC Power Bundle

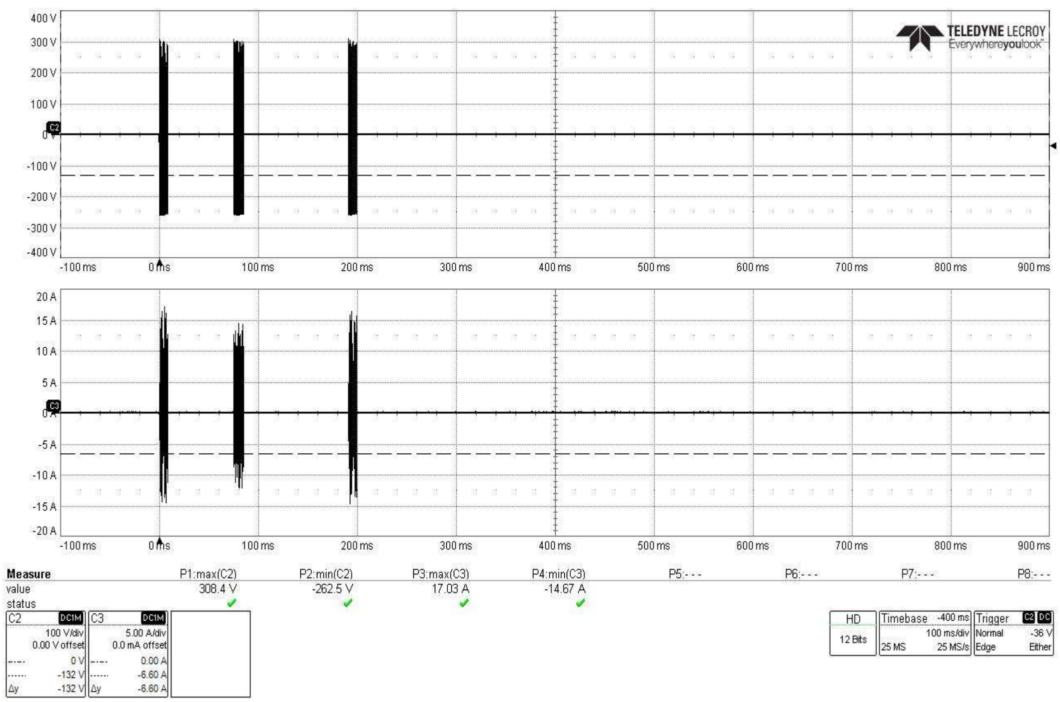


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on DC Power Bundle

EAR Controlled Data

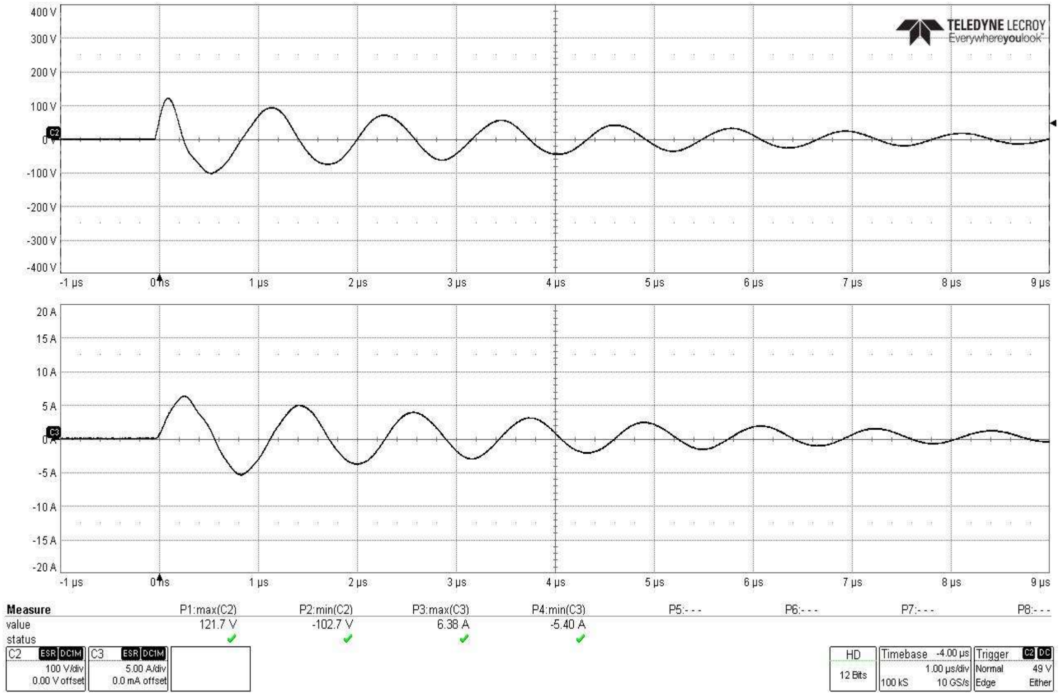


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on DC Power Bundle

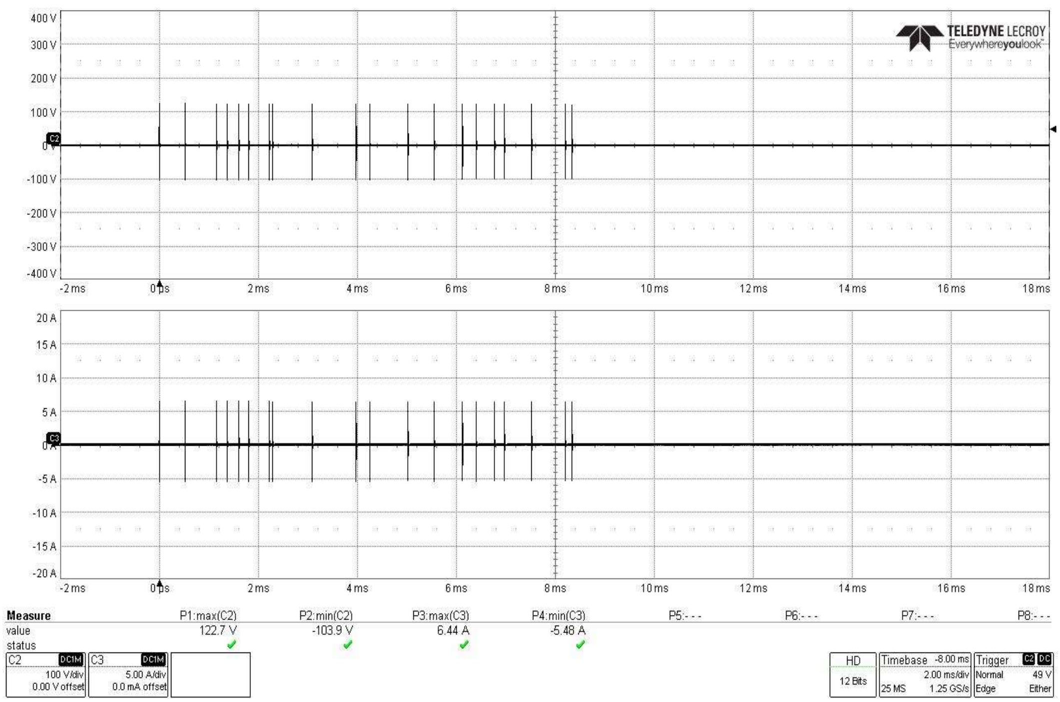


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on DC Power Bundle

EAR Controlled Data

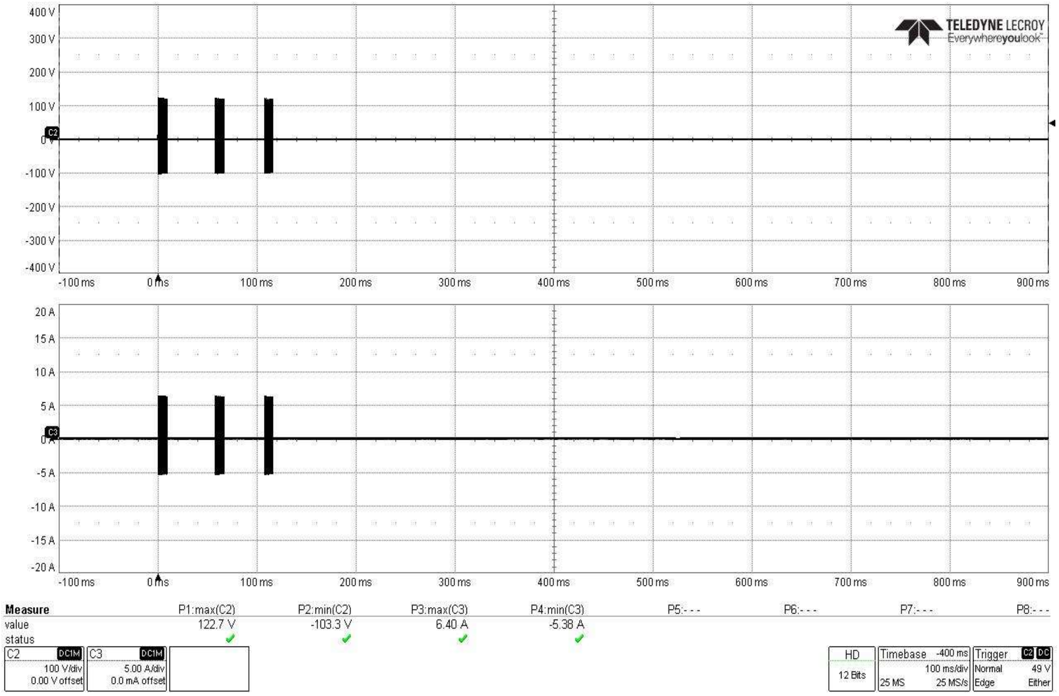


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on DC Power High Side

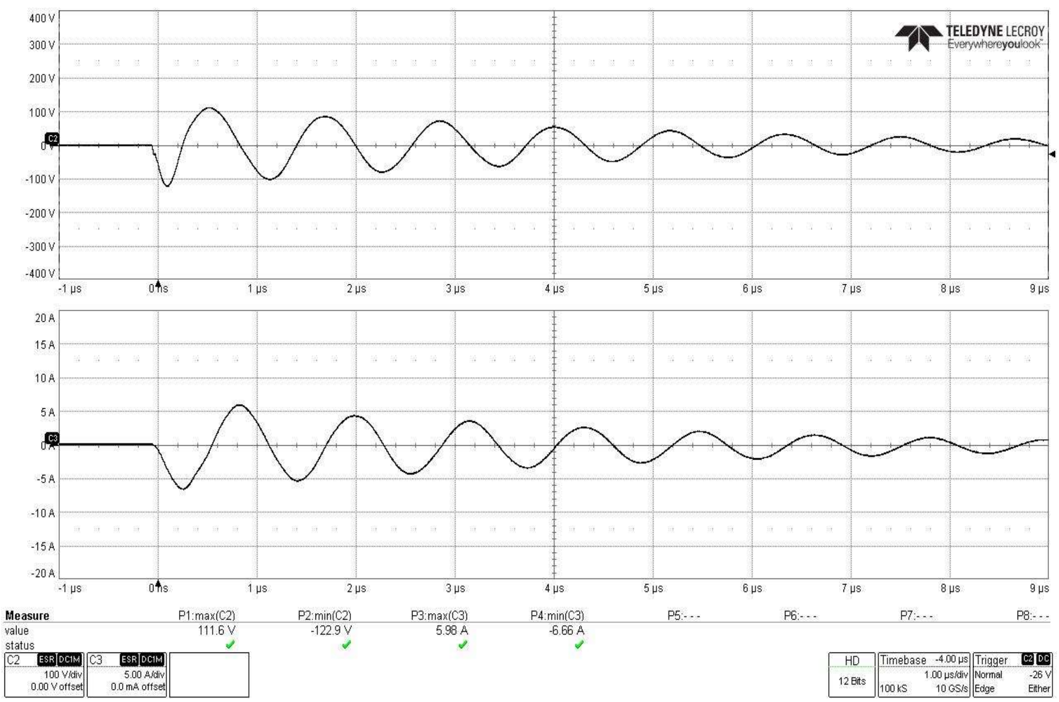


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on DC Power High Side

EAR Controlled Data

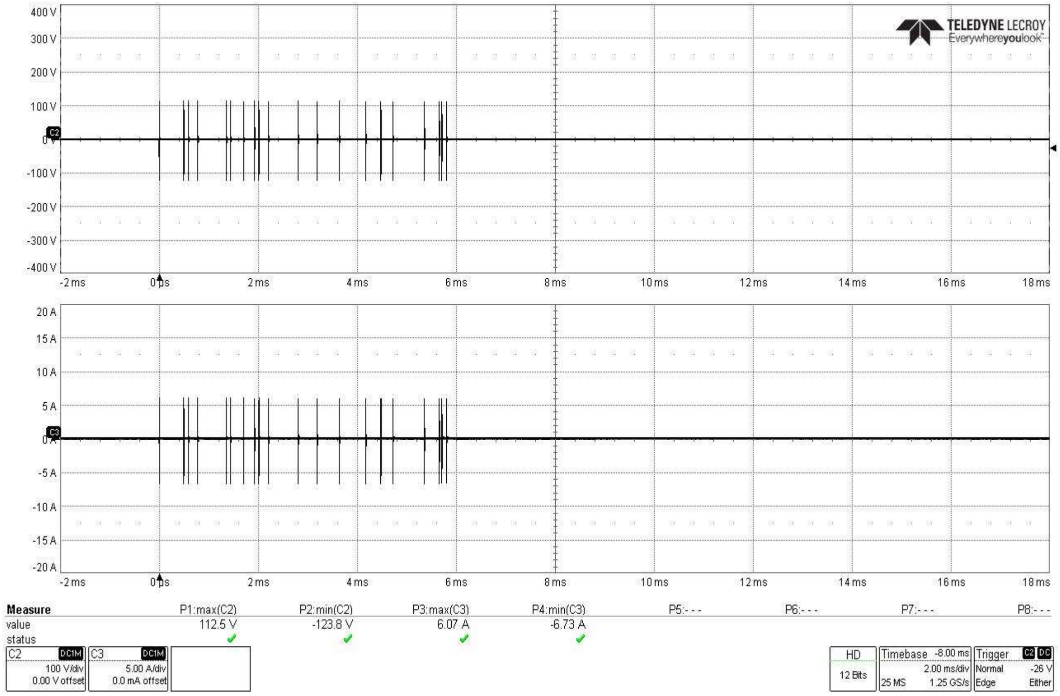


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on DC Power High Side

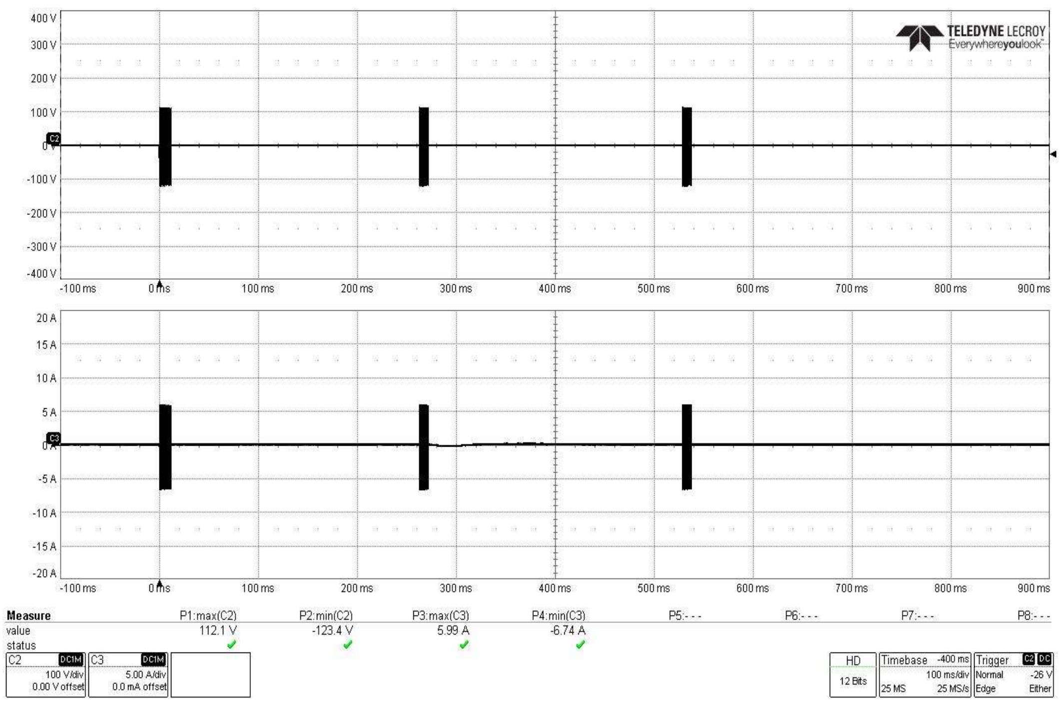


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on DC Power High Side

EAR Controlled Data

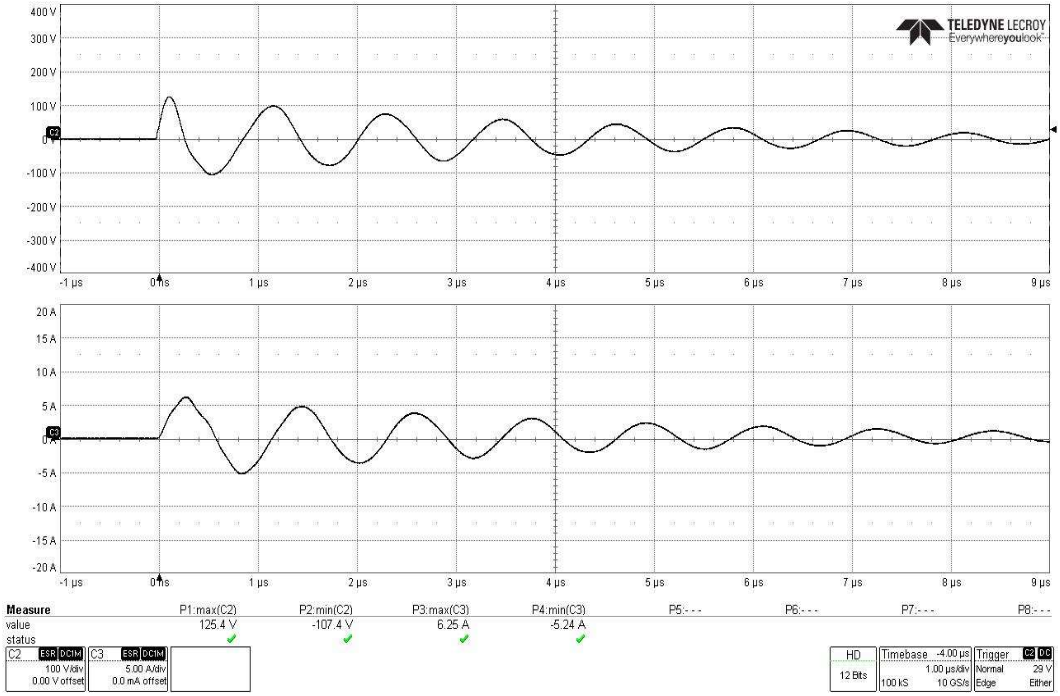


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on DC Power High Side

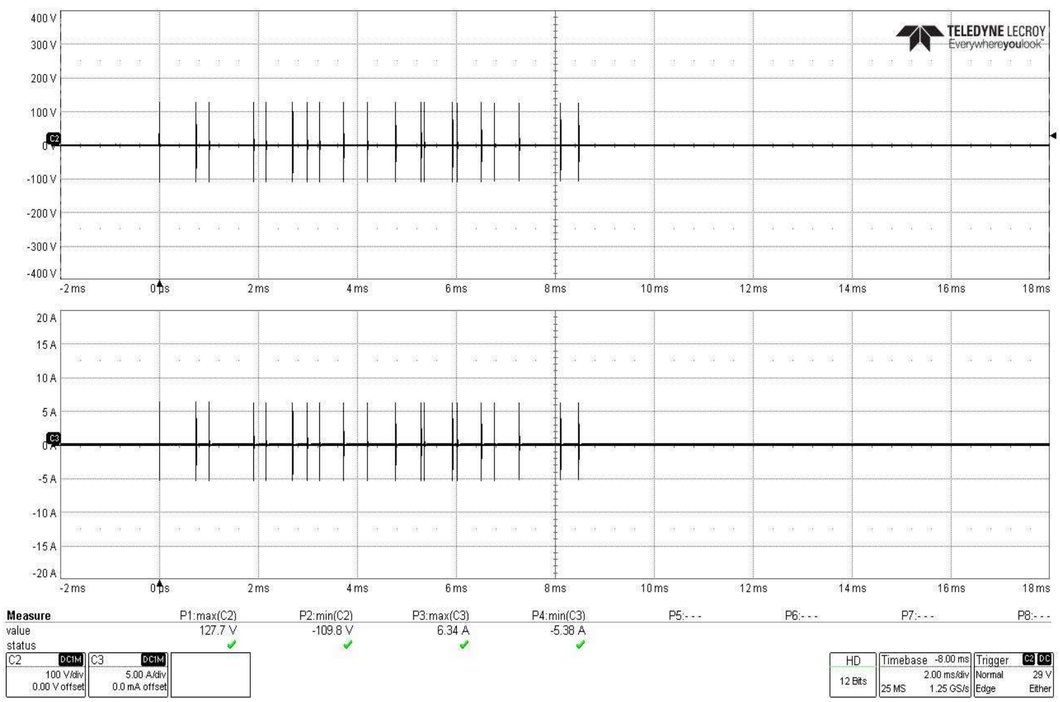


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on DC Power High Side

EAR Controlled Data

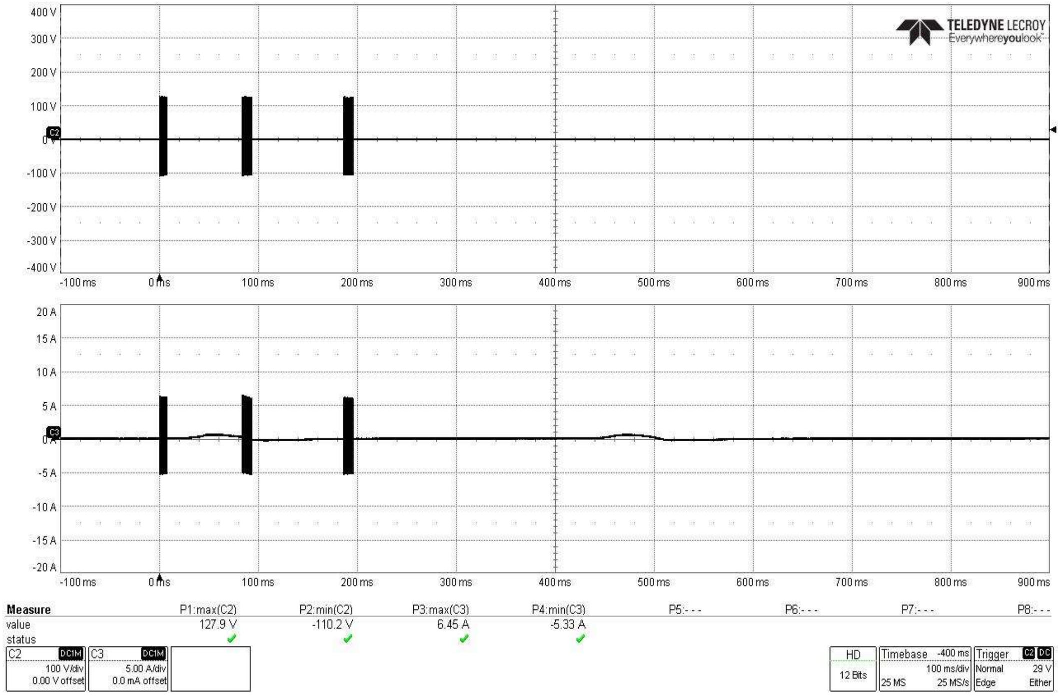


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on DC Power Return Side

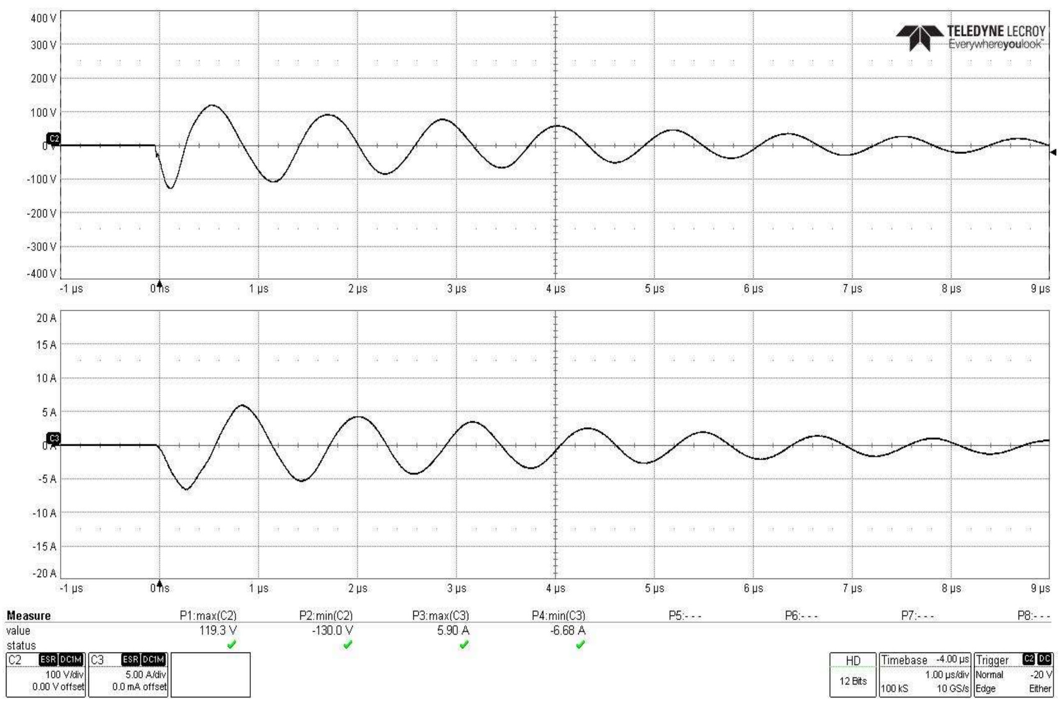


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on DC Power Return Side

EAR Controlled Data

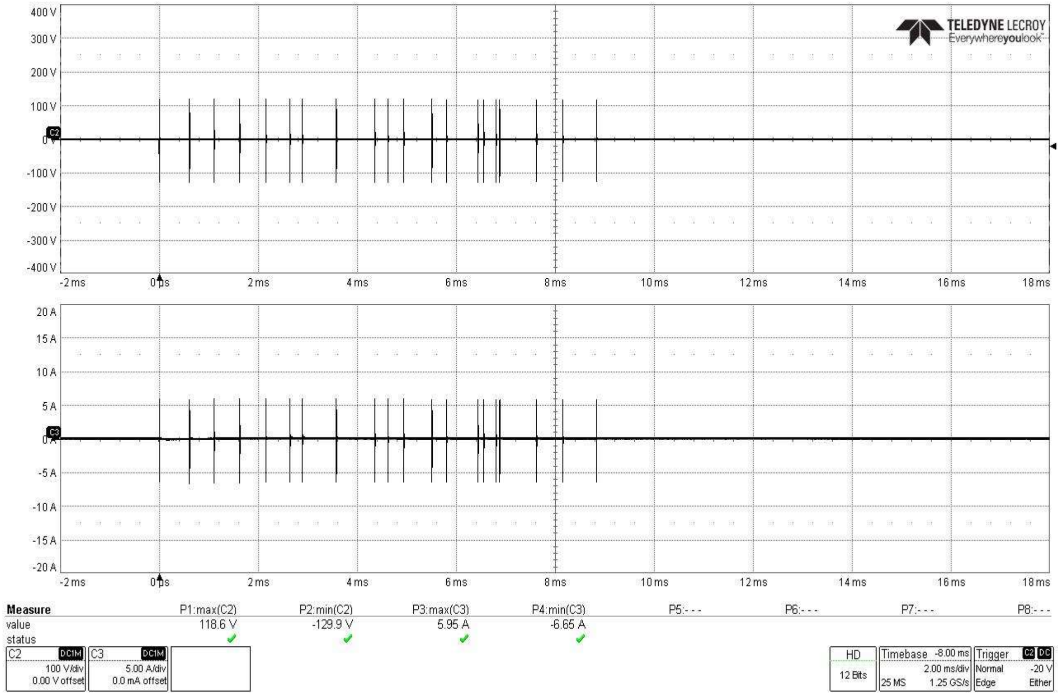


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on AC DC Power Return Side

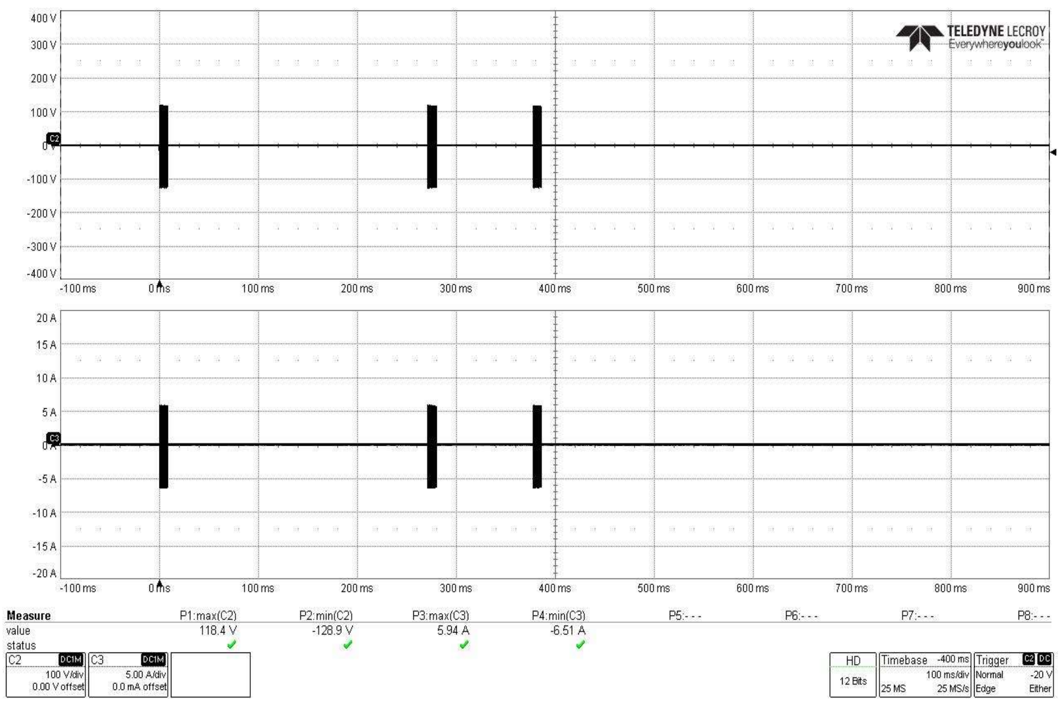


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on DC Power Return Side

EAR Controlled Data



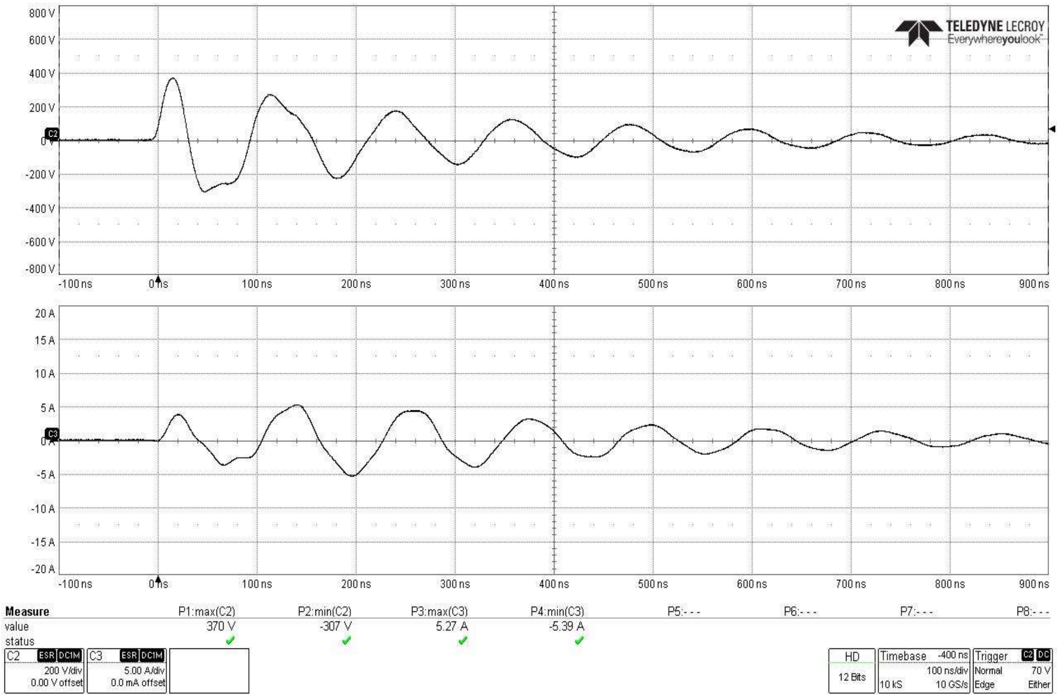
Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on DC Power Return Side



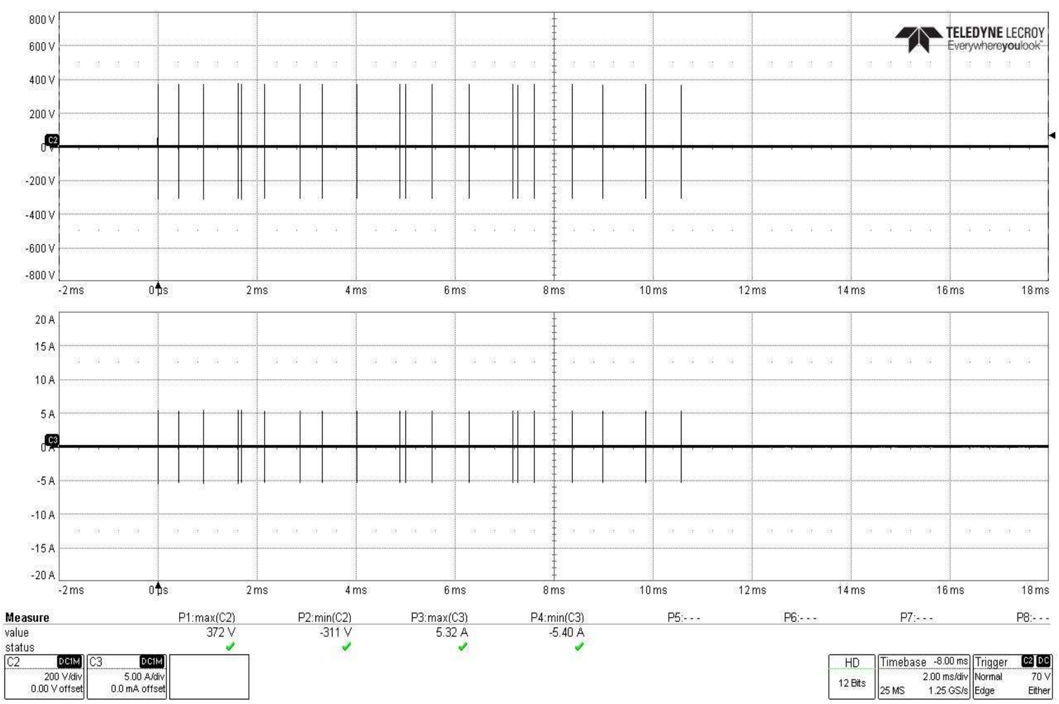
Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on DC Power Return Side

EAR Controlled Data

CS117 Actual Test Multiple Burst (MB) Waveform #3 at 10MHz with V_T = 360V on Flexboss 21

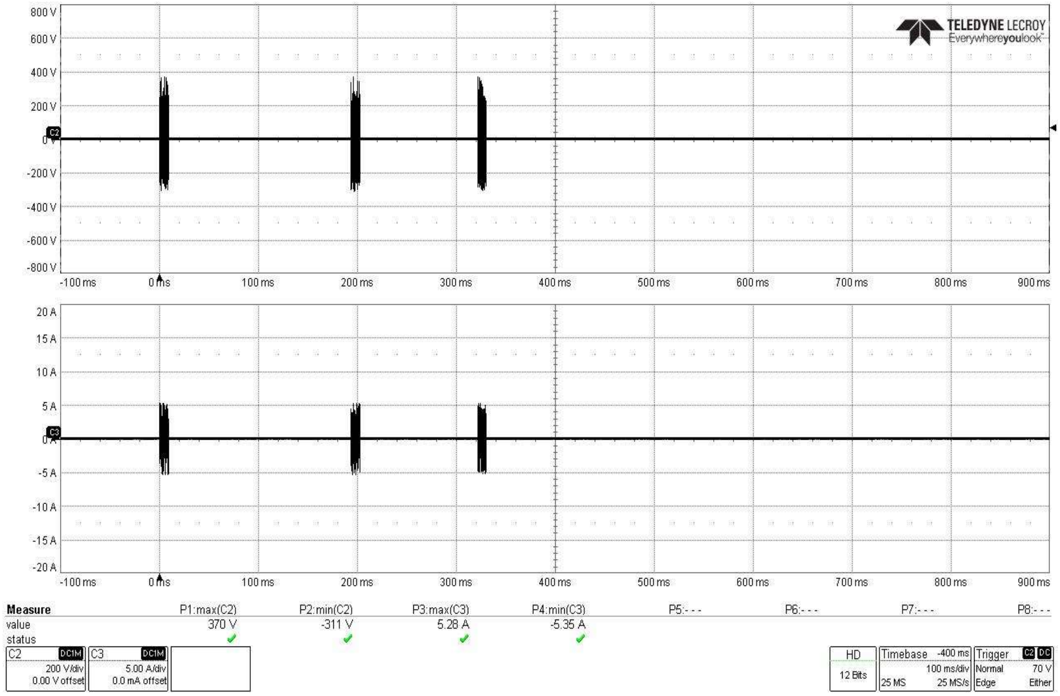


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on AC Power Line 1

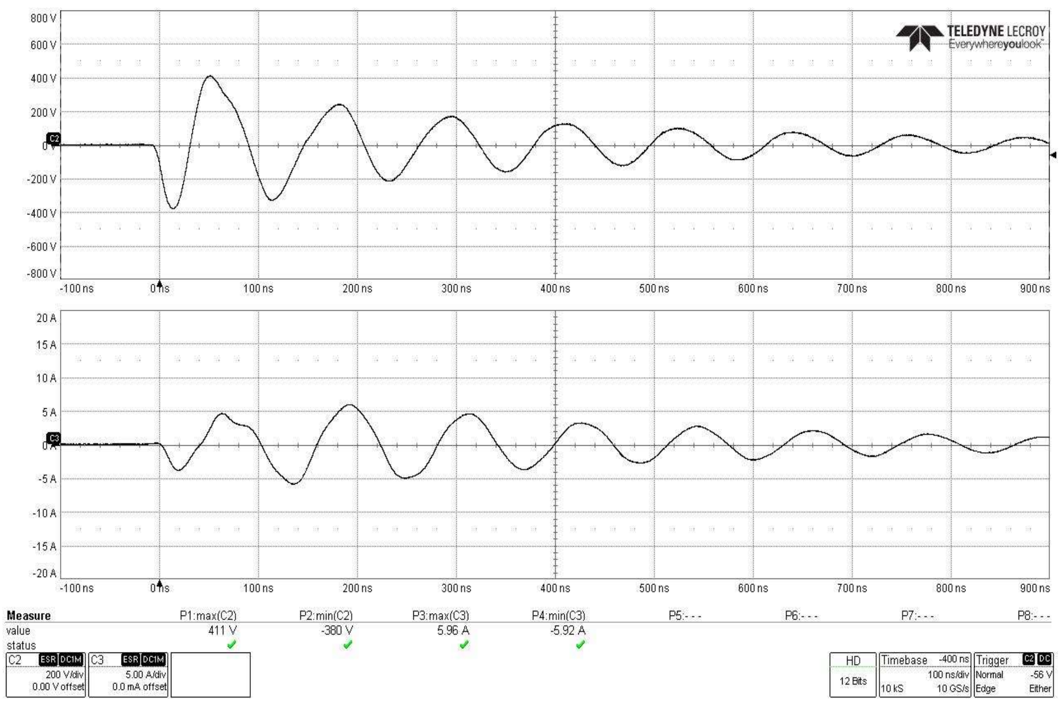


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on AC Power Line 1

EAR Controlled Data

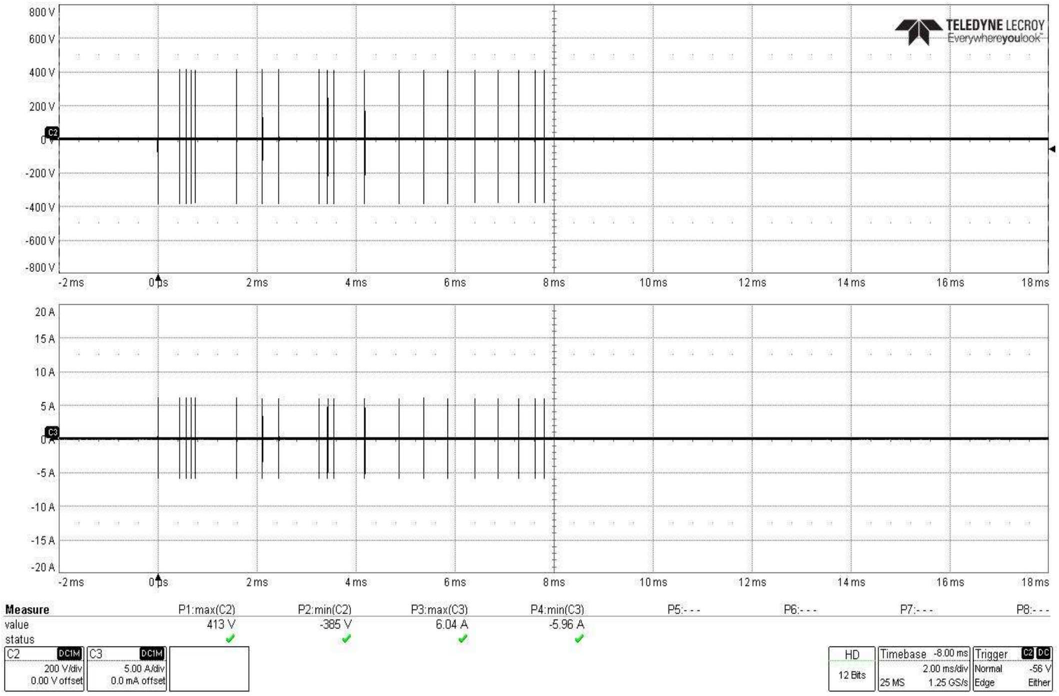


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on AC Power Line 1

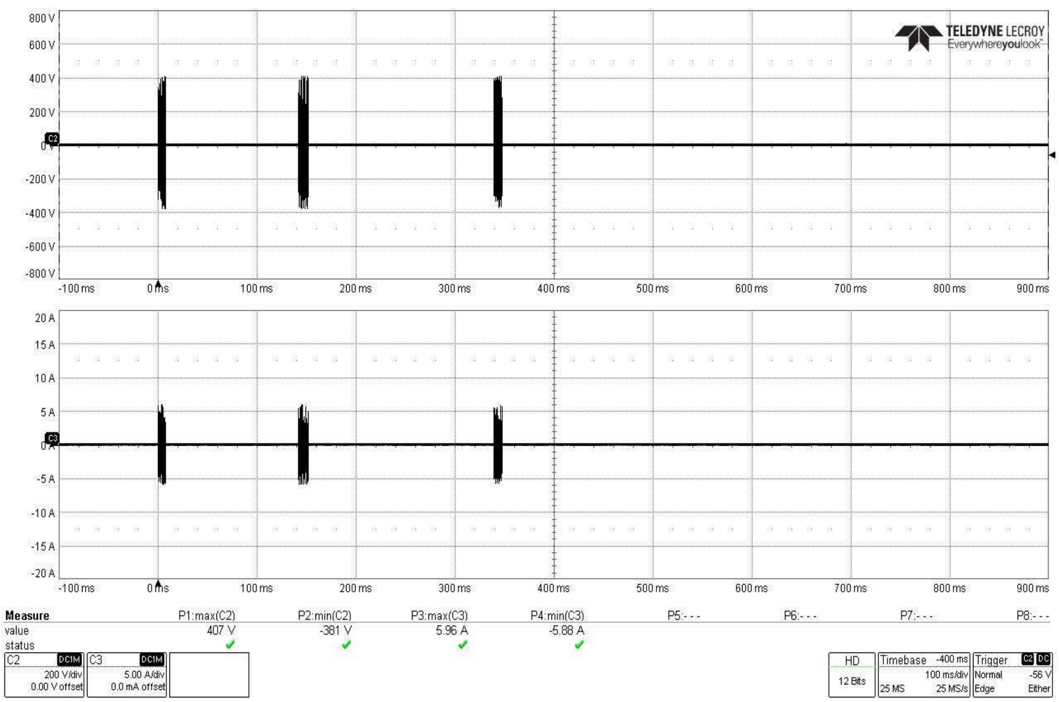


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on AC Power Line 1

EAR Controlled Data

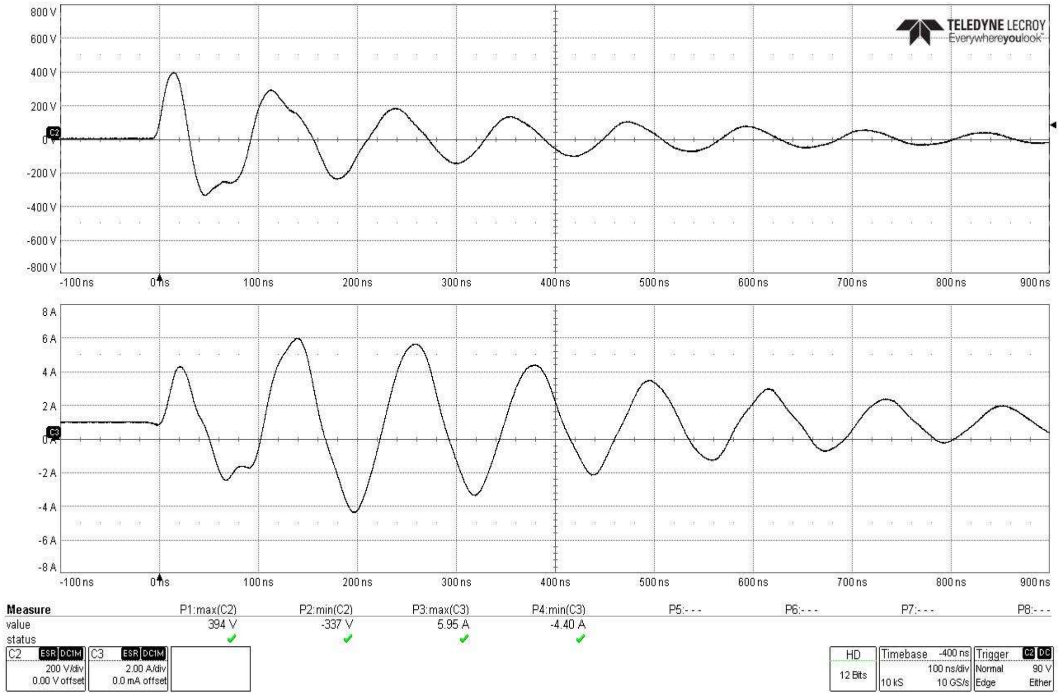


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on AC Power Line 1

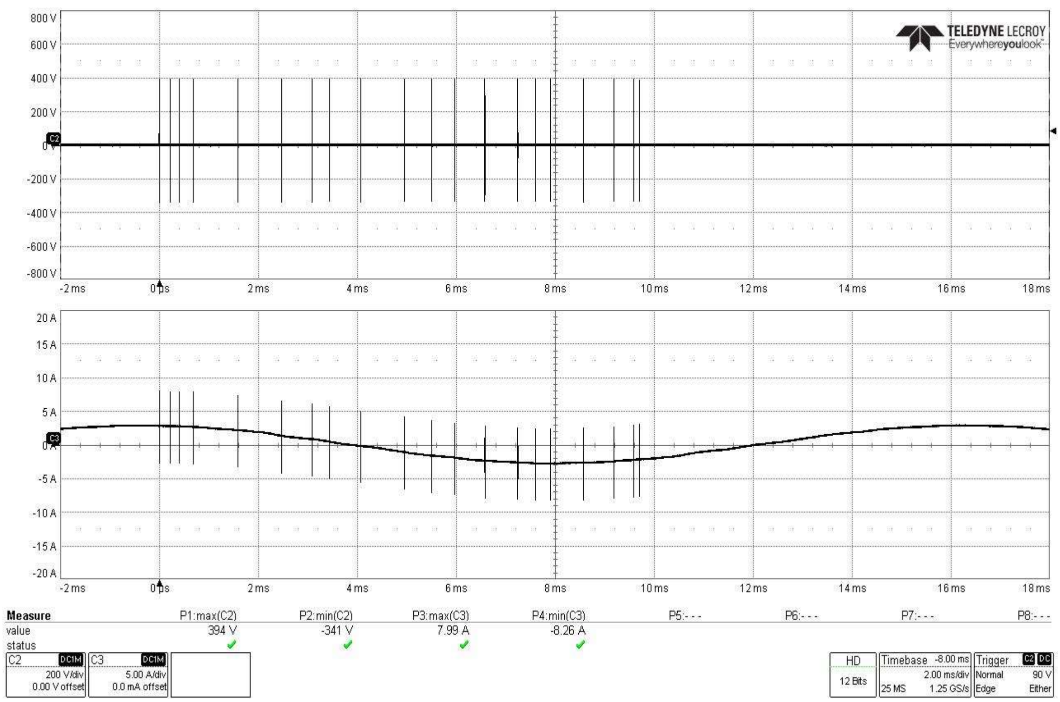


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on AC Power Line 1

EAR Controlled Data

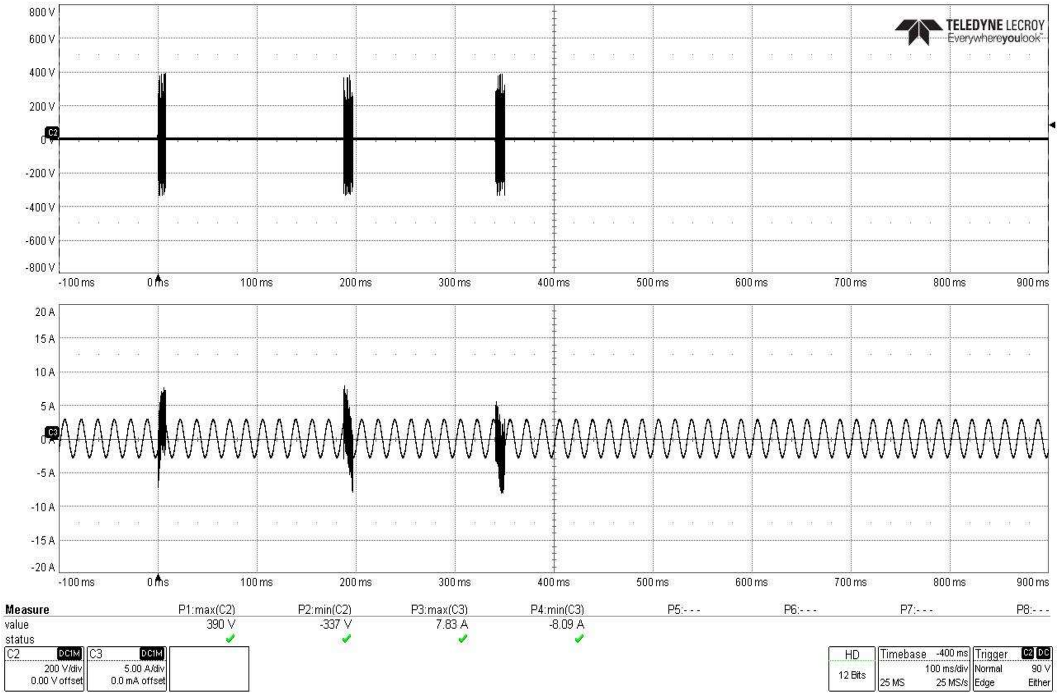


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on AC Power Line 2

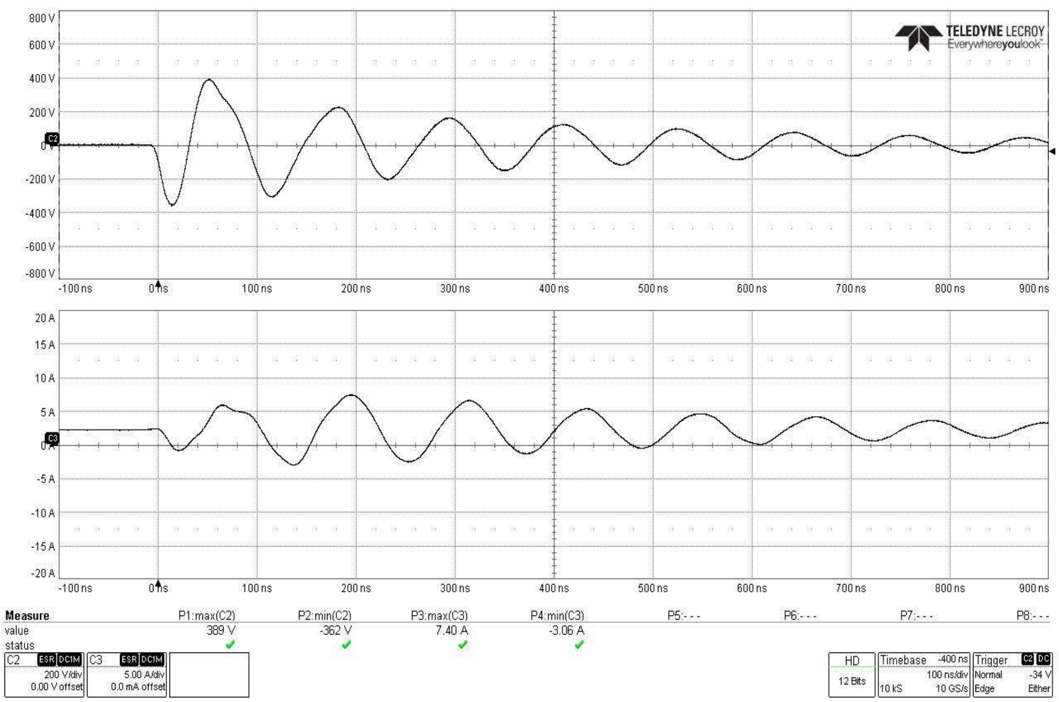


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on AC Power Line 2

EAR Controlled Data

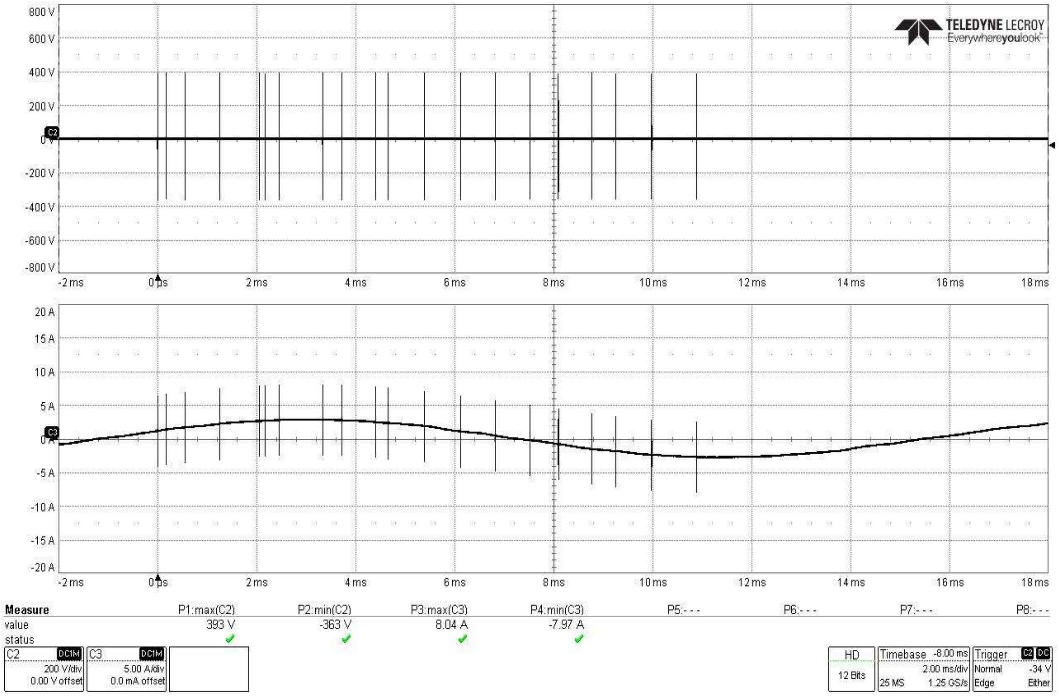


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on AC Power Line 2

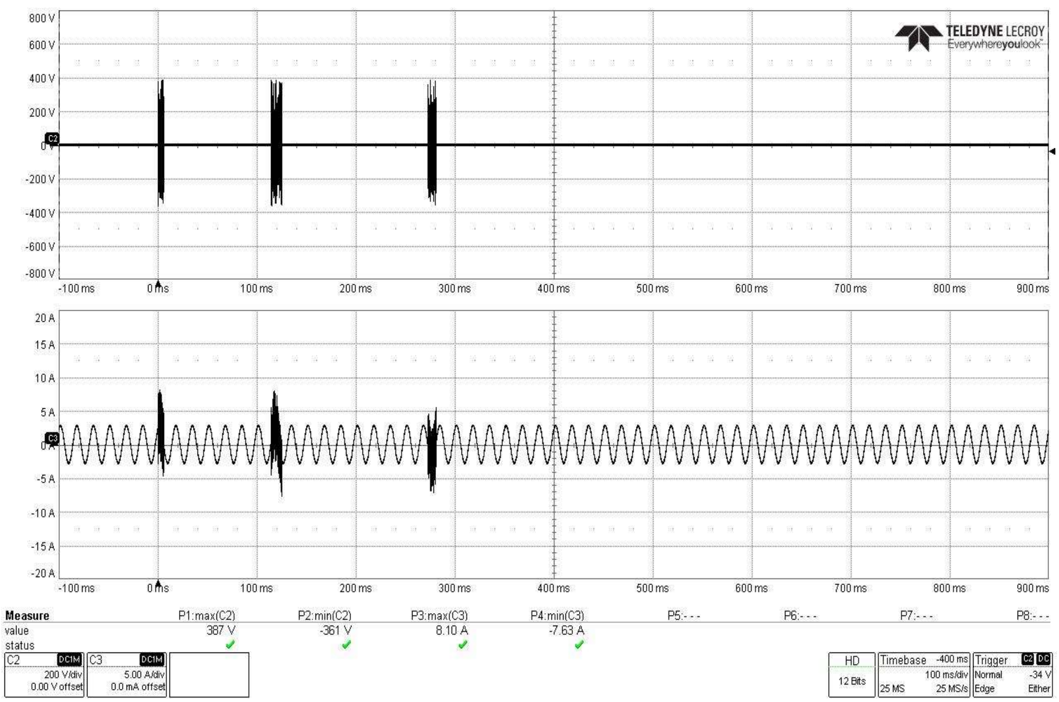


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on AC Power Line 2

EAR Controlled Data

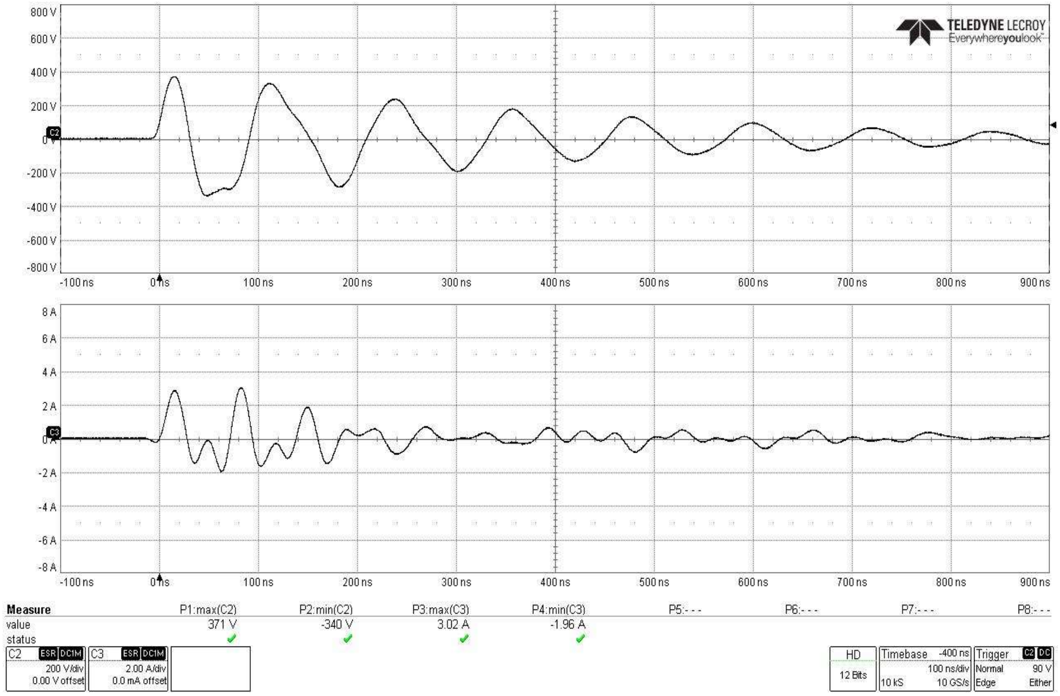


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on AC Power Line 2

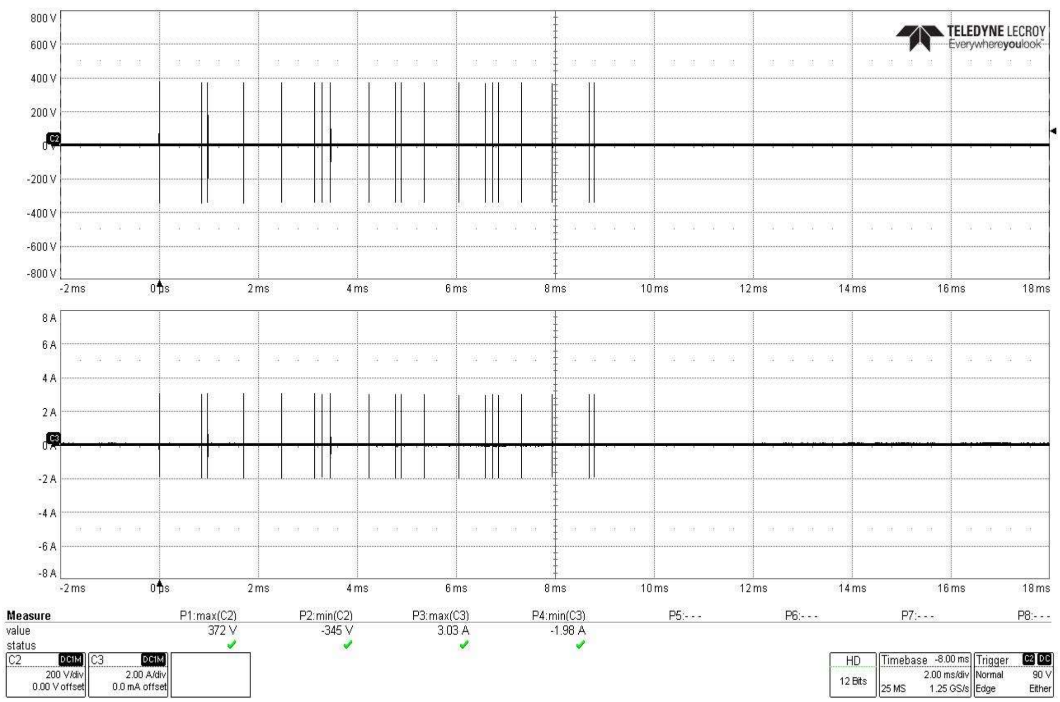


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on AC Power Line 2

EAR Controlled Data

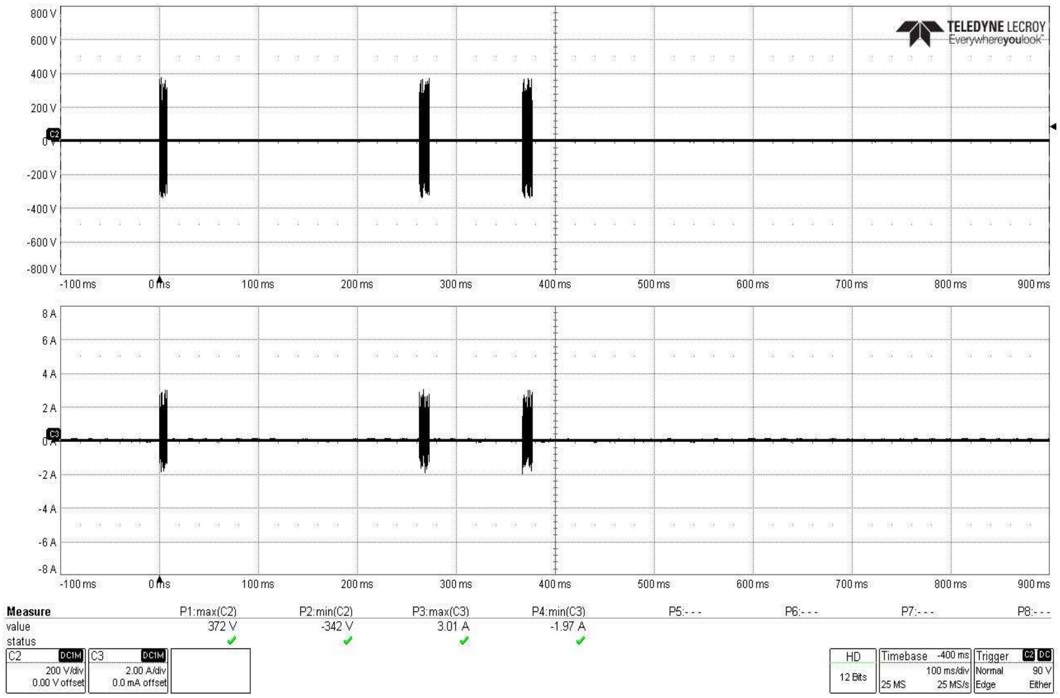


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on Full AC Power Bundle

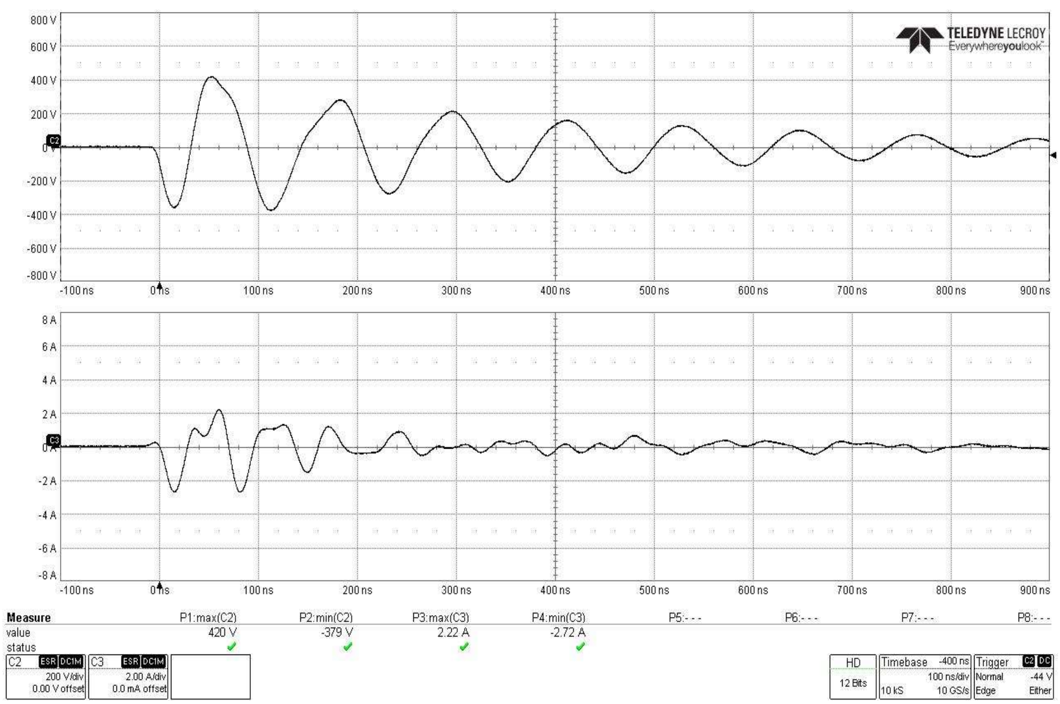


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on Full AC Power Bundle

EAR Controlled Data

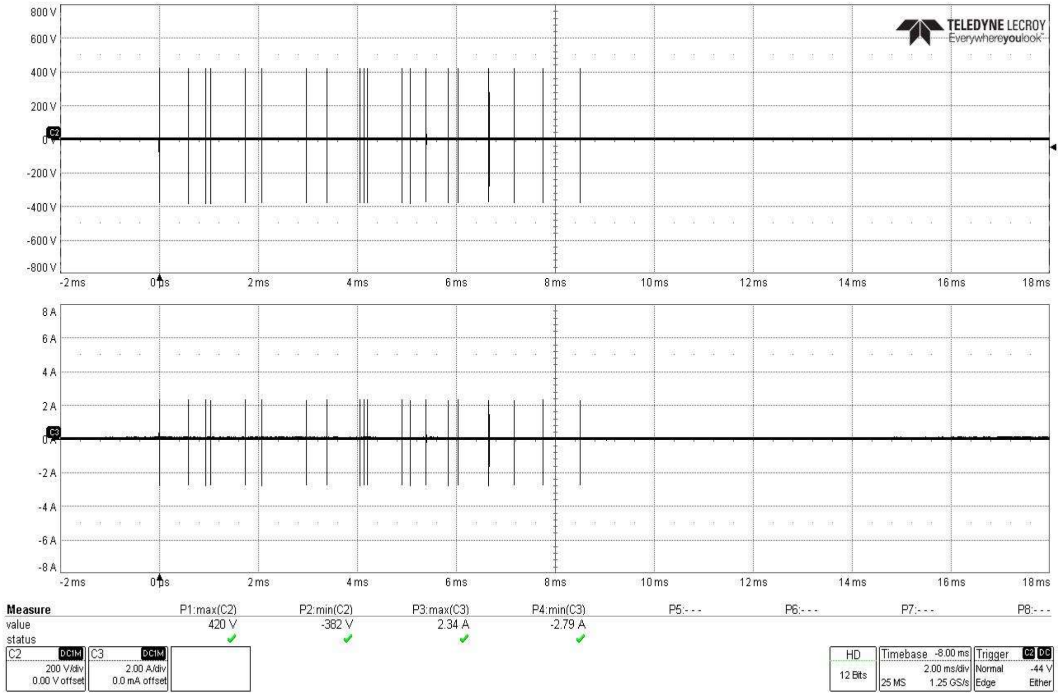


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on Full AC Power Bundle

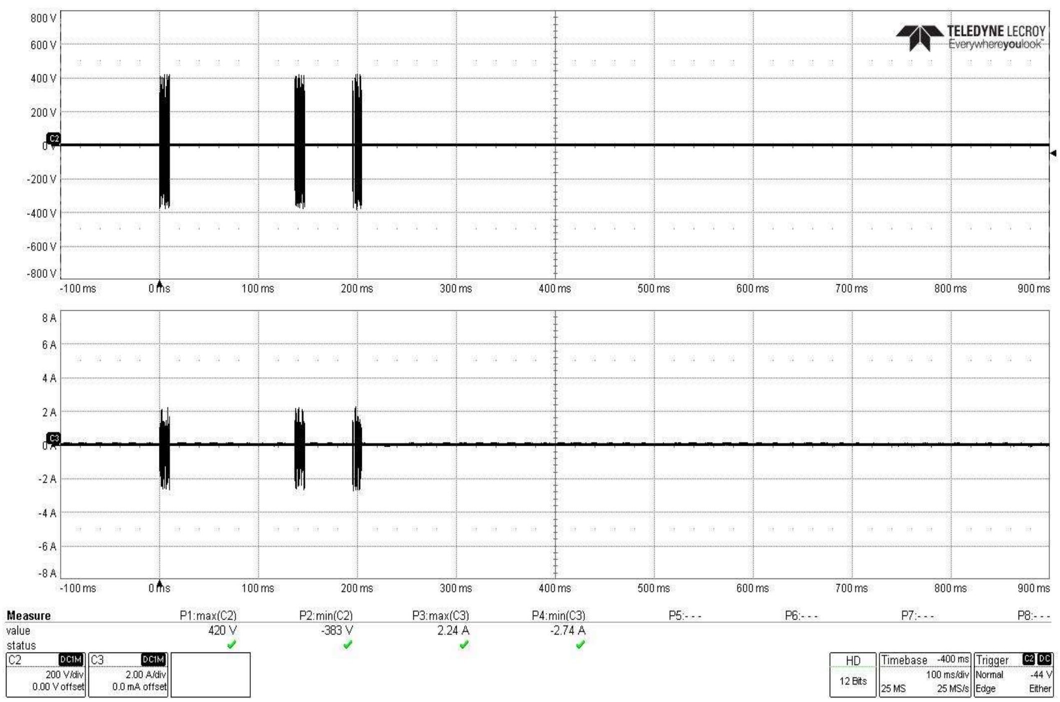


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on Full AC Power Bundle

EAR Controlled Data

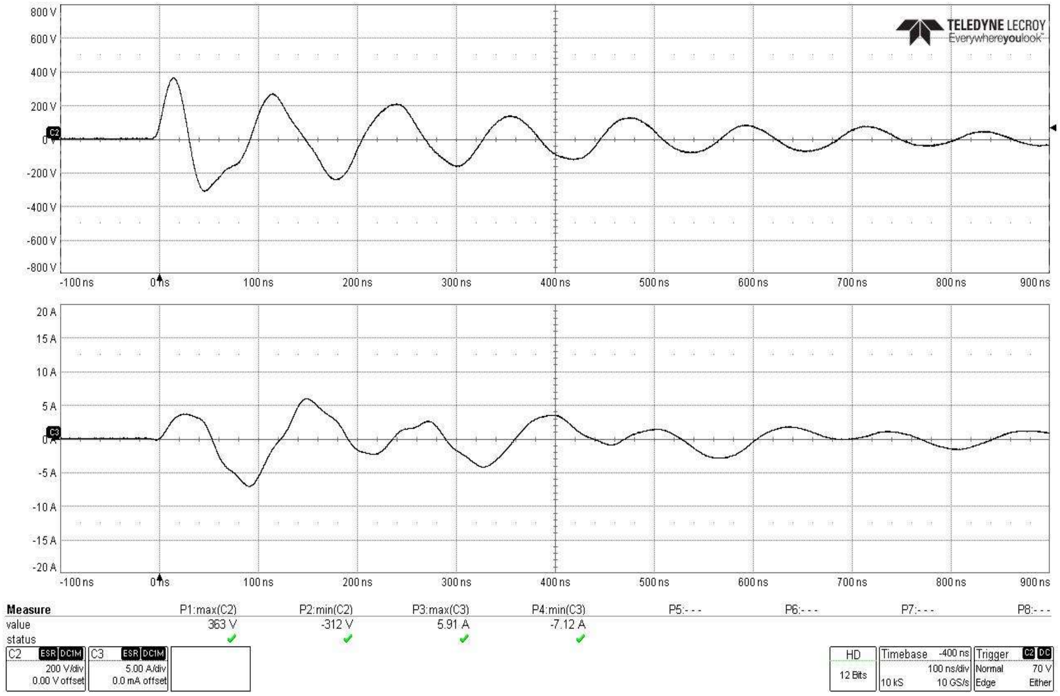


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on Full AC Power Bundle

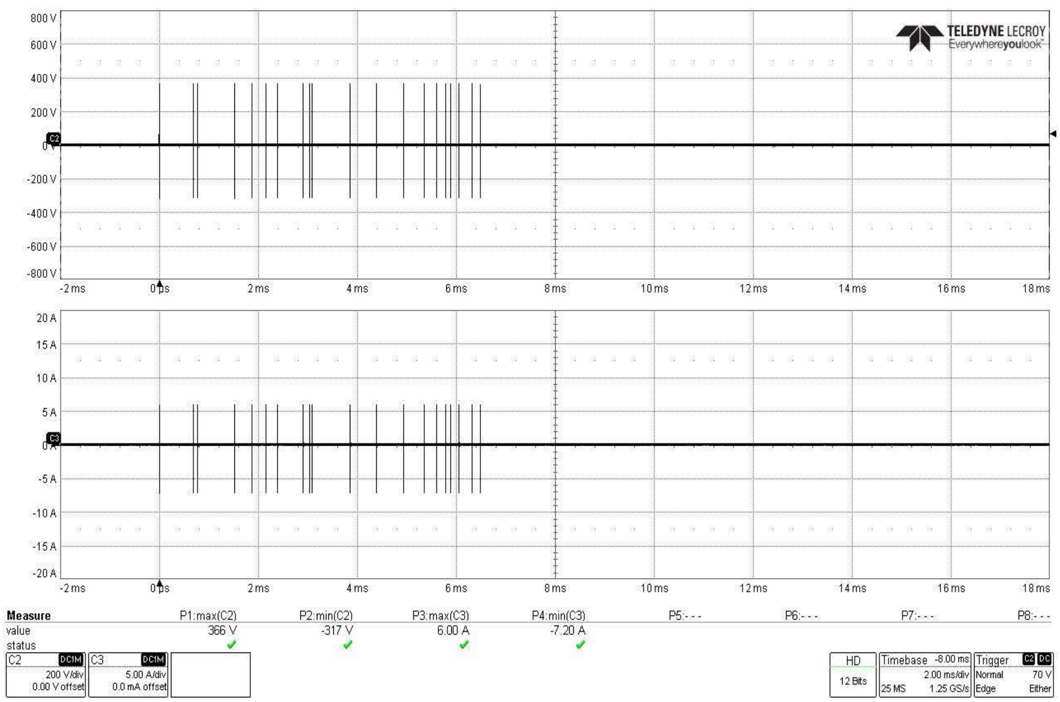


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on Full AC Power Bundle

EAR Controlled Data

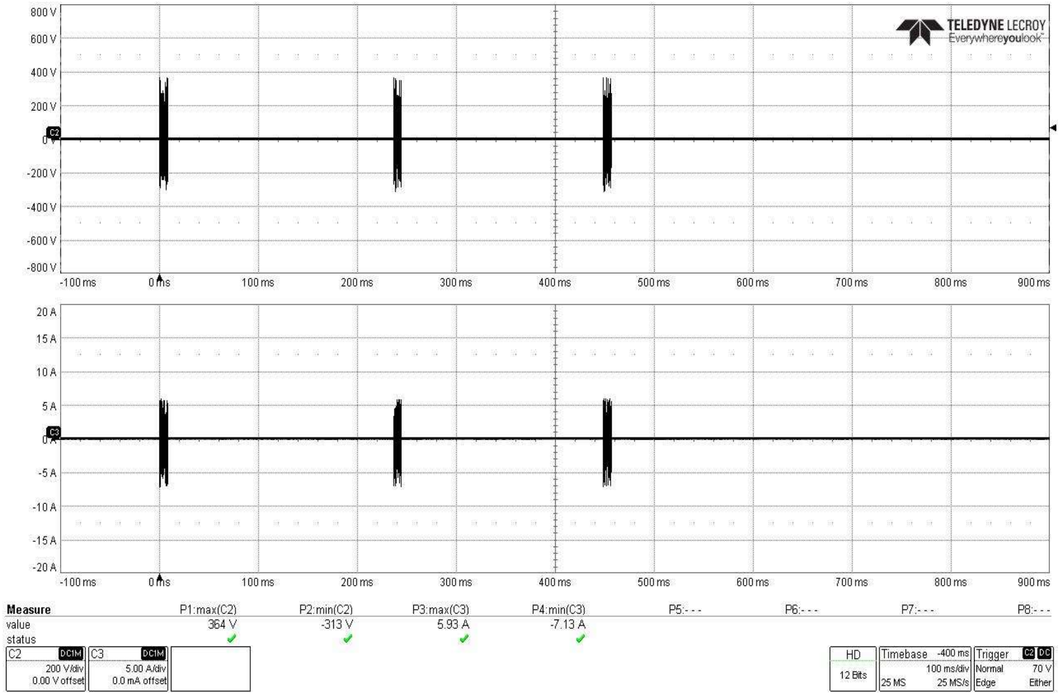


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on DC Power Bundle

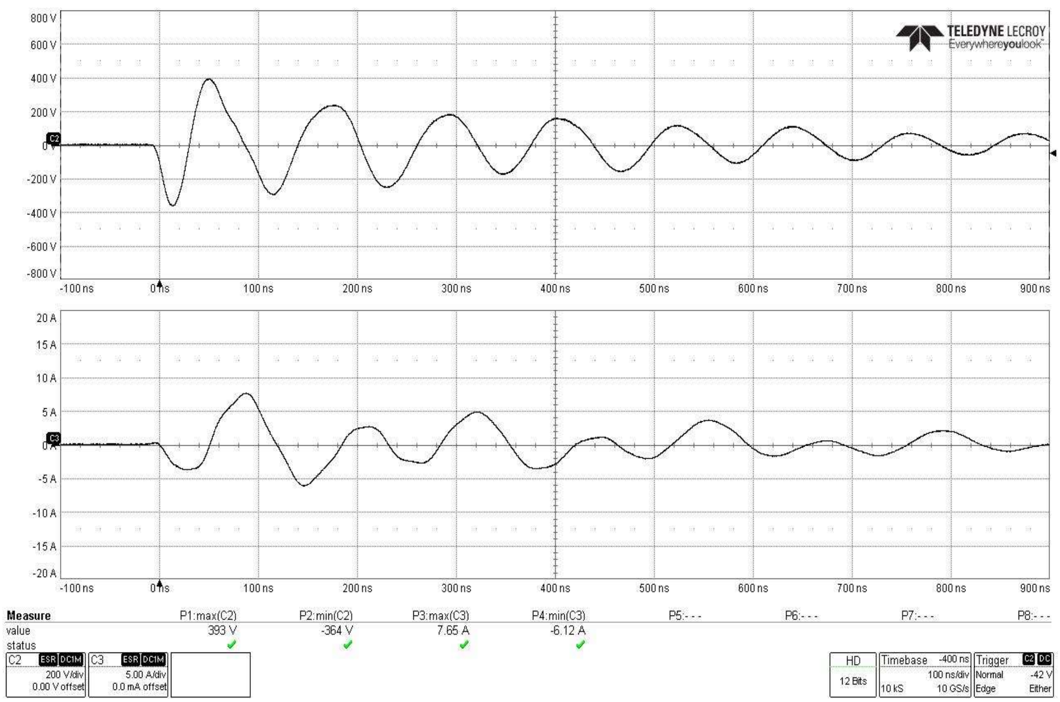


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on DC Power Bundle

EAR Controlled Data

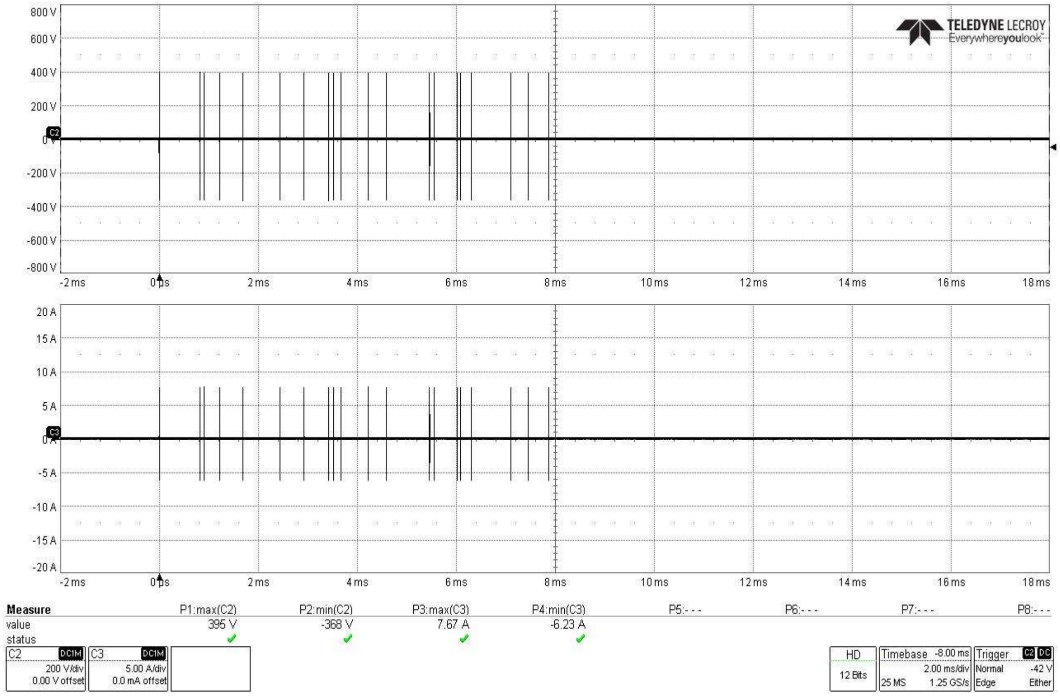


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on DC Power Bundle

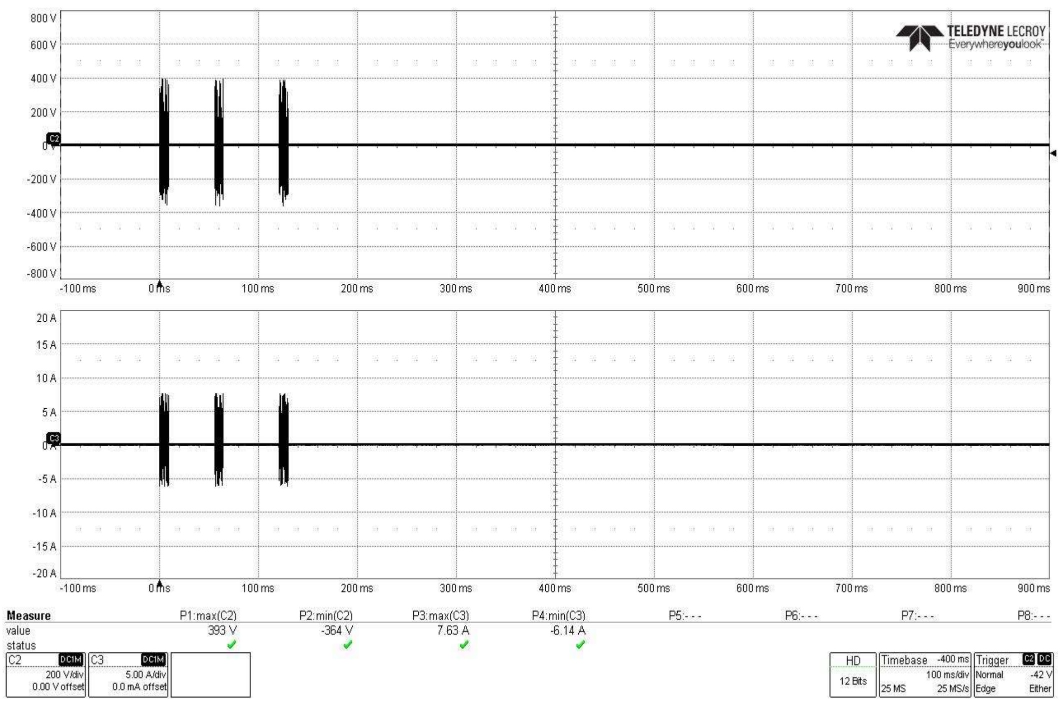


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on DC Power Bundle

EAR Controlled Data

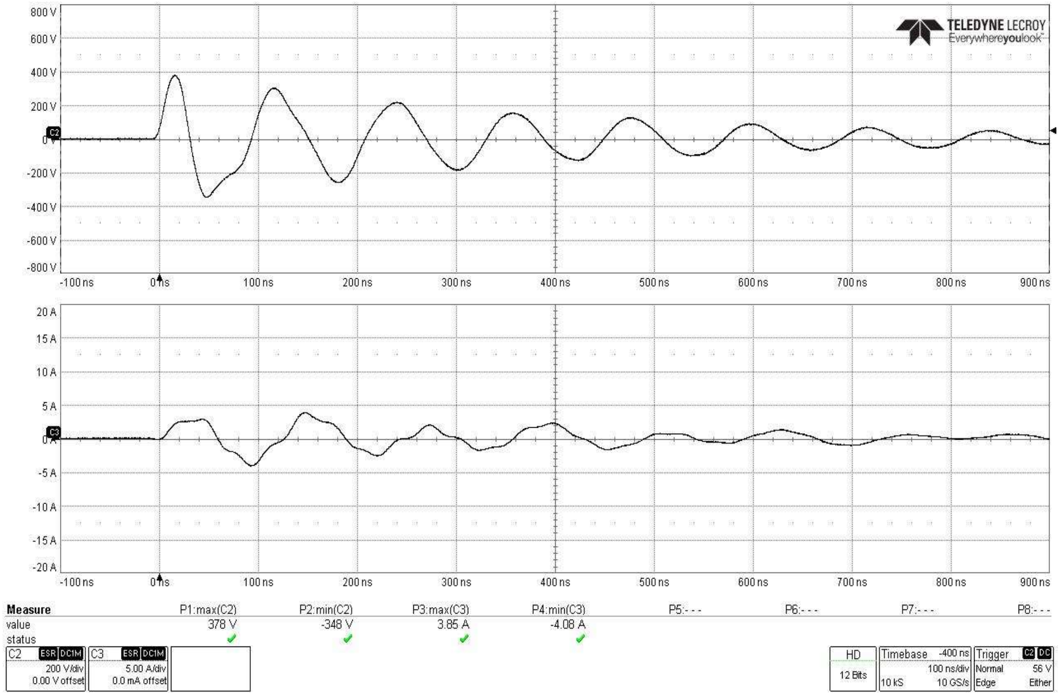


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on DC Power Bundle

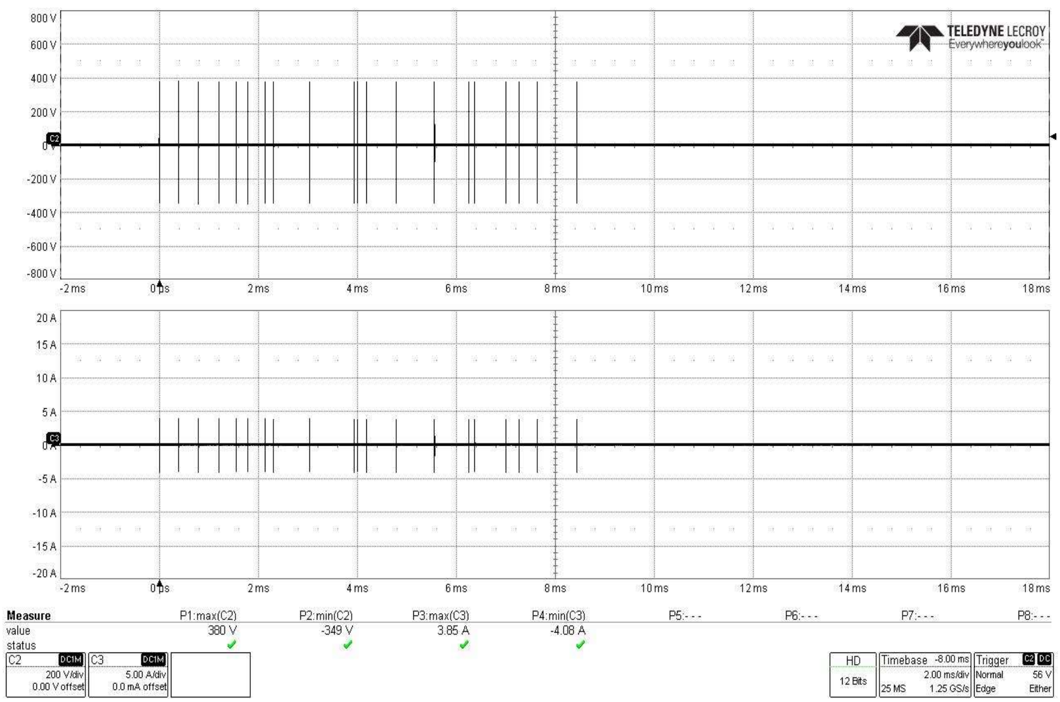


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on DC Power Bundle

EAR Controlled Data

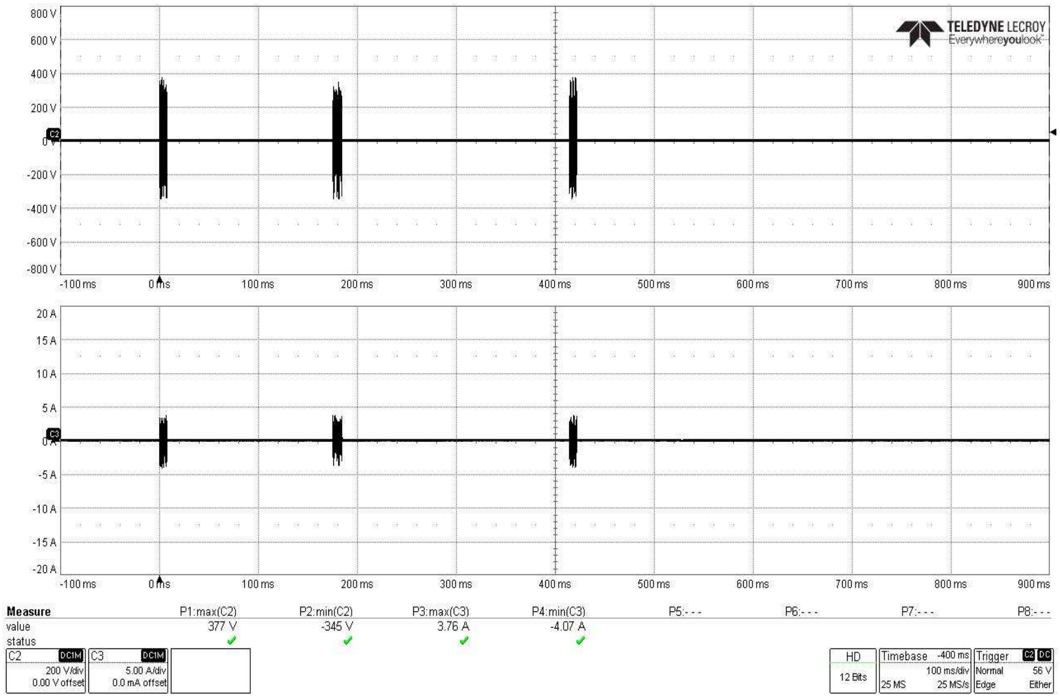


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on DC Power High Side

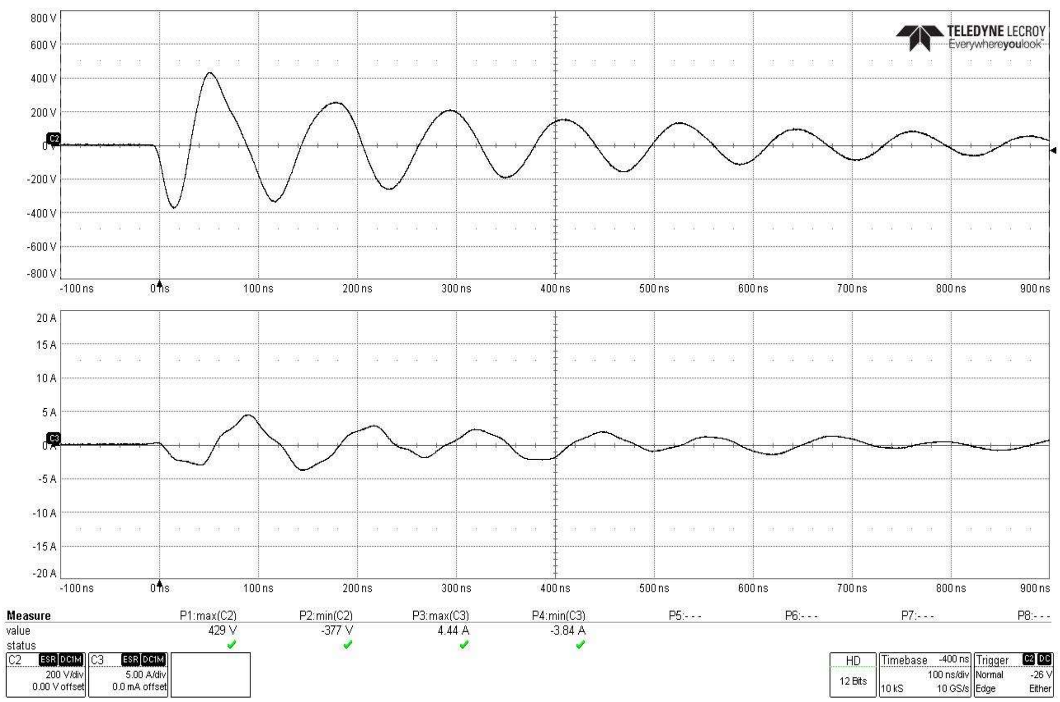


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on DC Power High Side

EAR Controlled Data

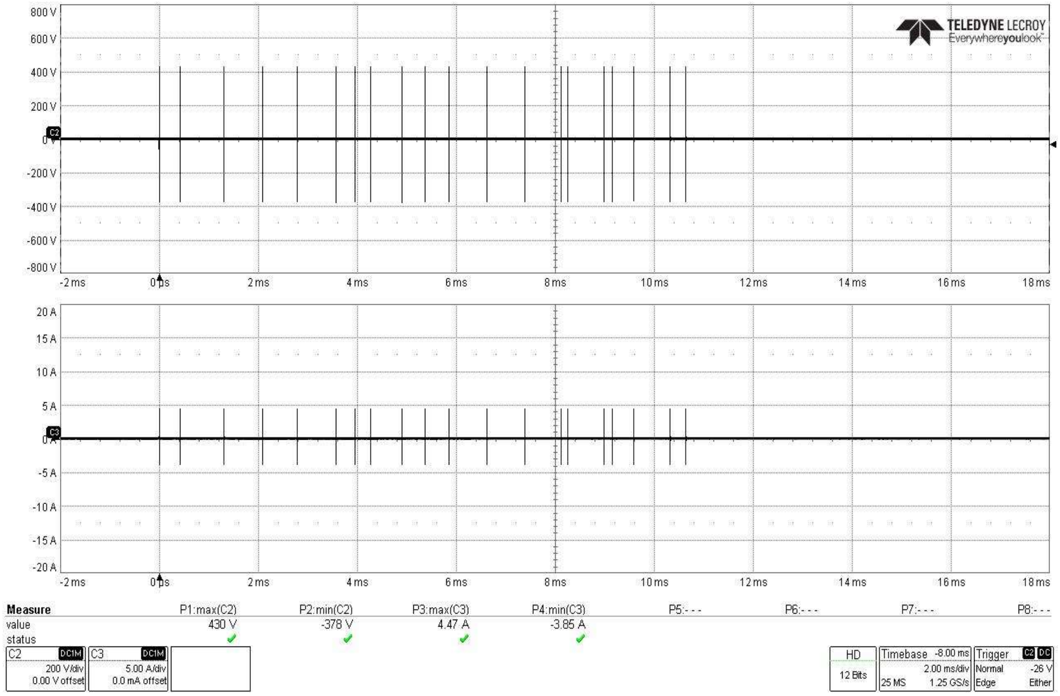


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on DC Power High Side

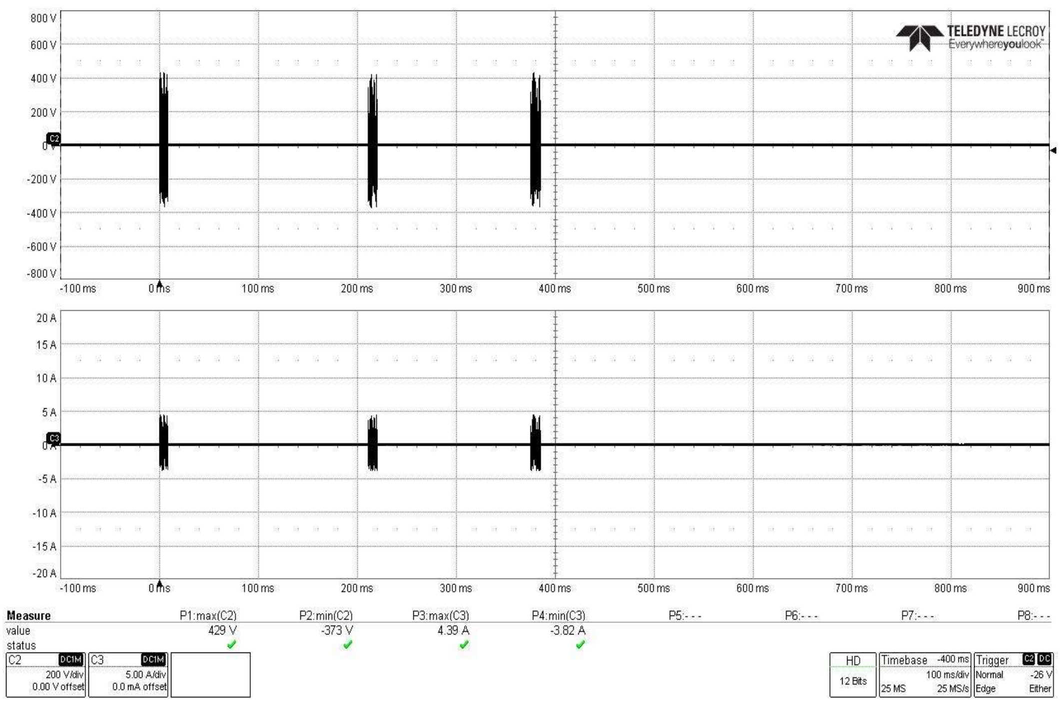


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on DC Power High Side

EAR Controlled Data

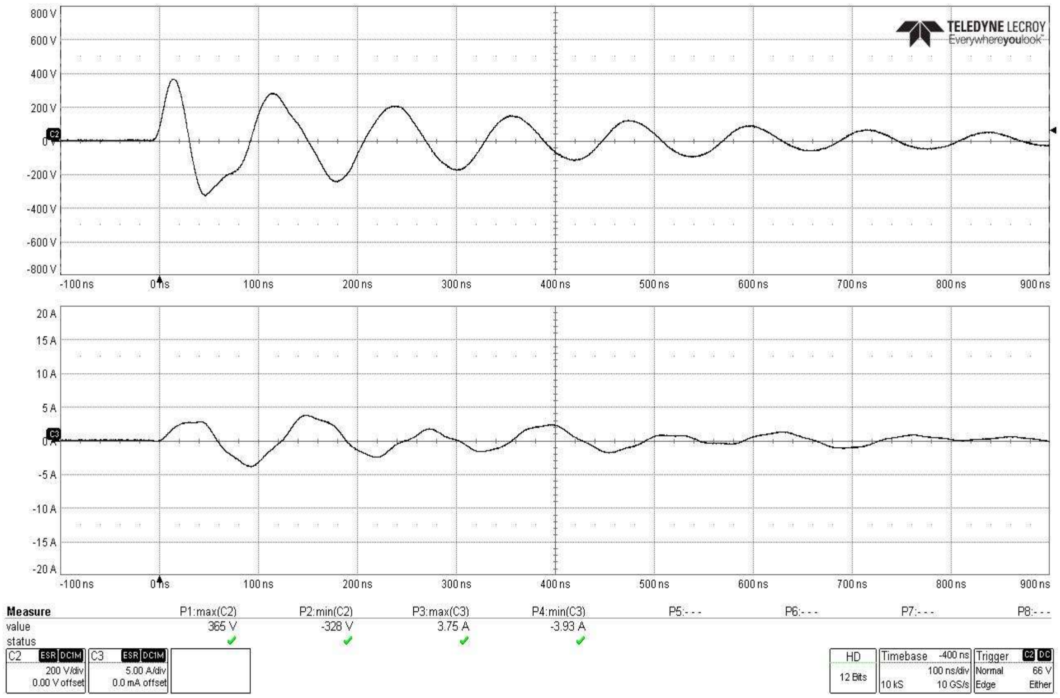


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on DC Power High Side

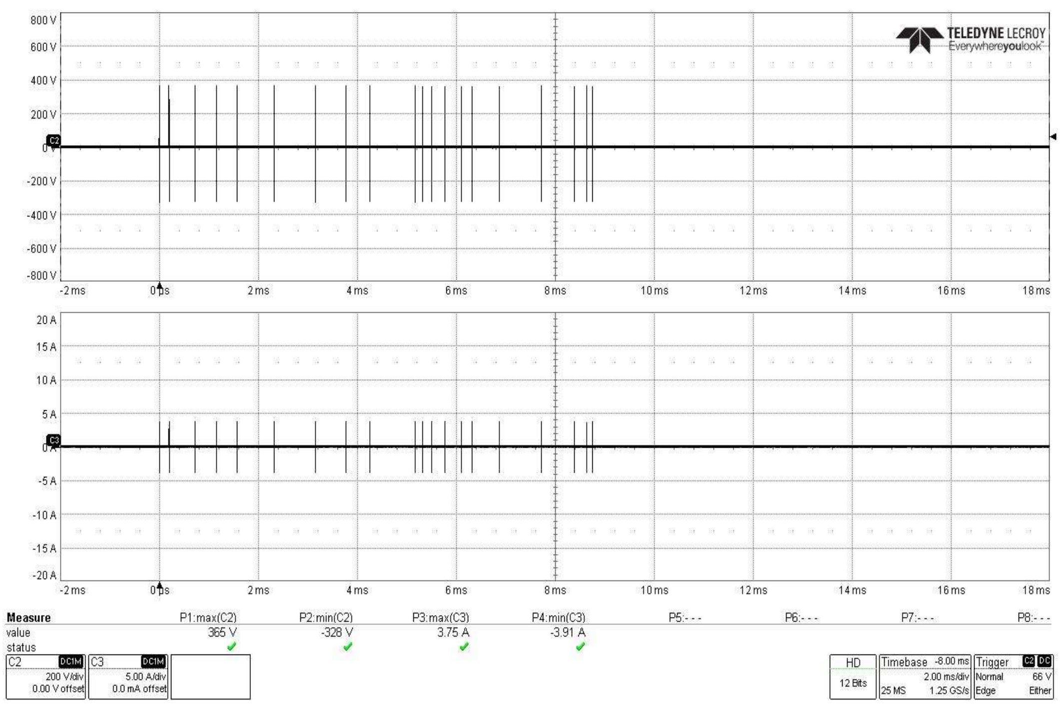


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on DC Power High Side

EAR Controlled Data

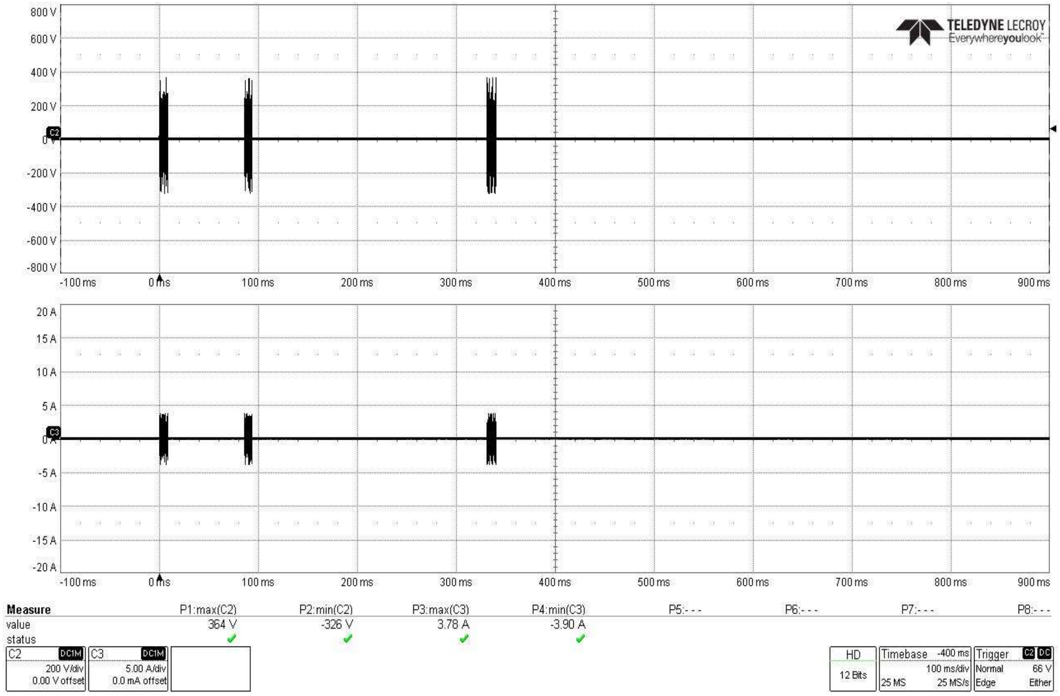


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on DC Power Return Side

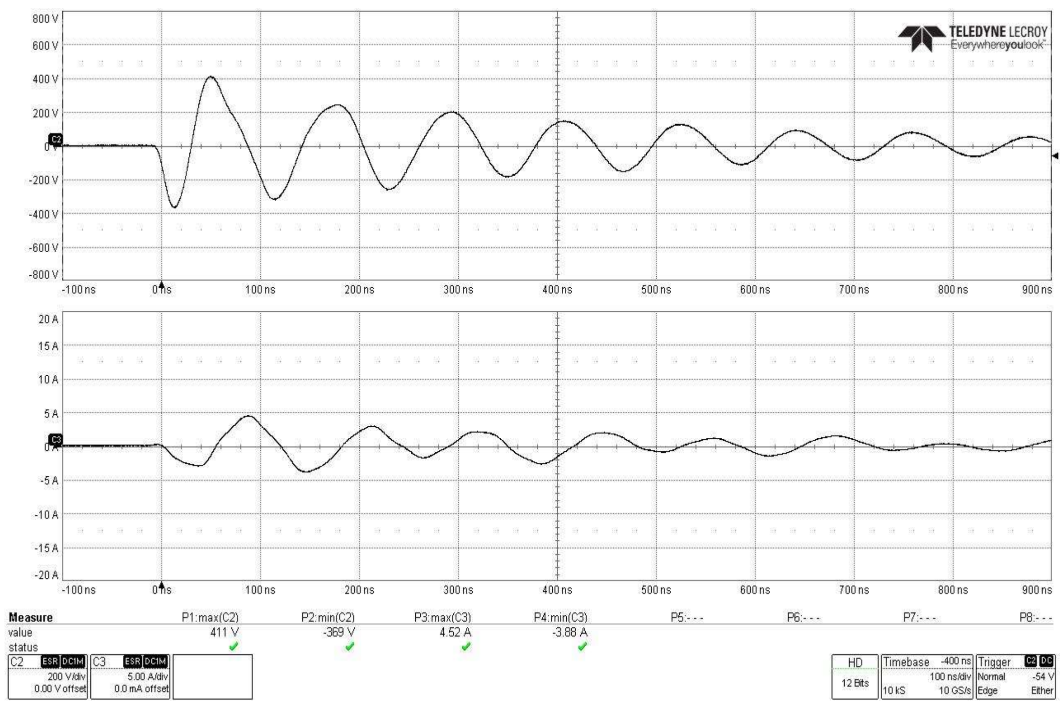


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on DC Power Return Side

EAR Controlled Data

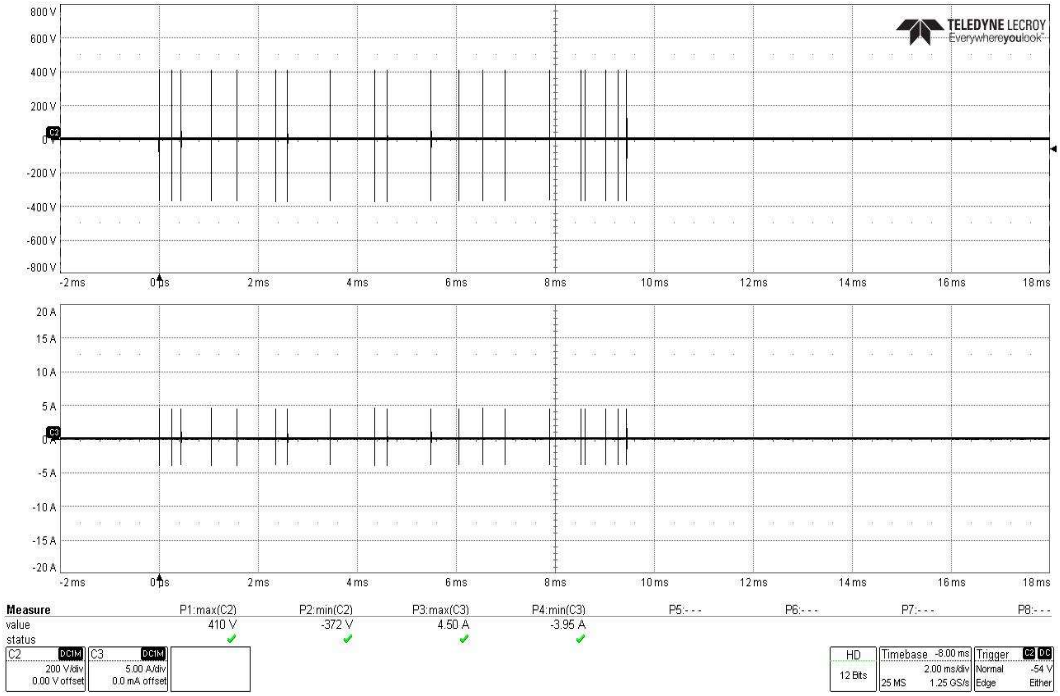


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on AC DC Power Return Side

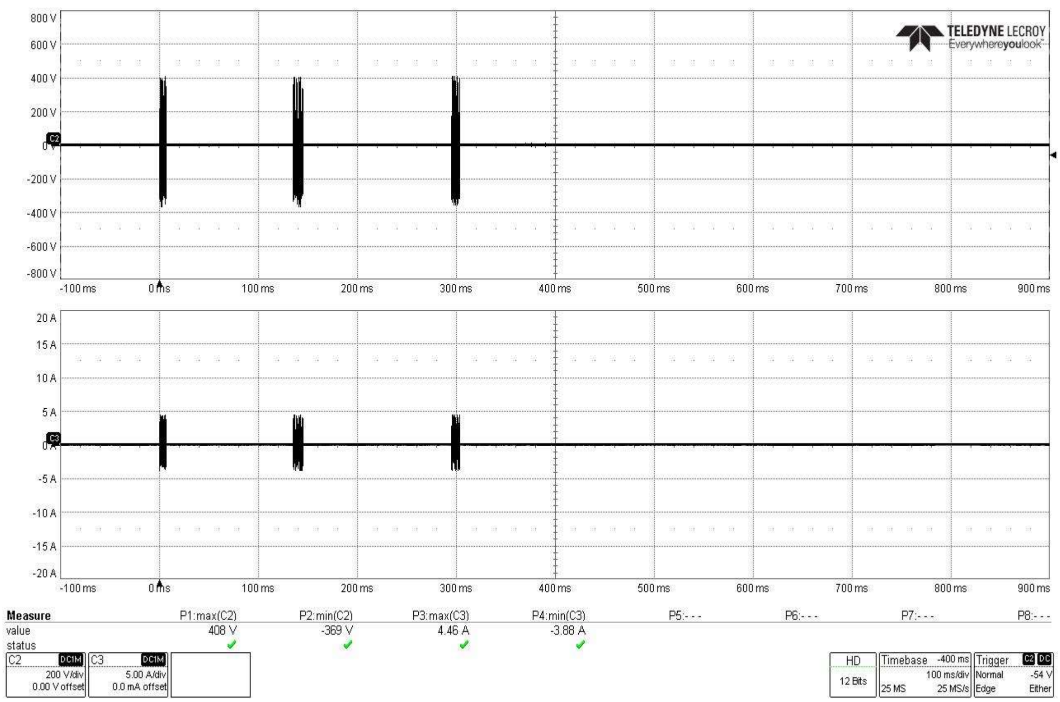


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on DC Power Return Side

EAR Controlled Data



Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on DC Power Return Side



Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on DC Power Return Side

EAR Controlled Data

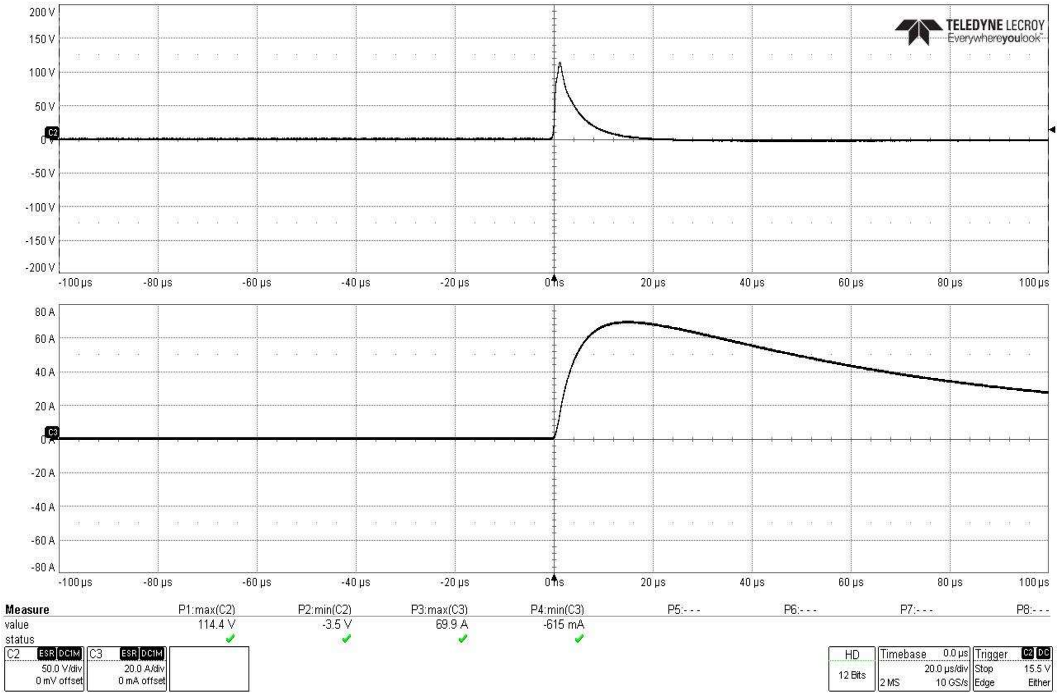
CUSTOMER:	EG4 Electronics LLC	MJO:	PR190112
TEST ITEM:	Flexboss 18	DATE:	5/12/25
PART NUMBER:	IV-13000-HYB-AW-FX-00	UNIT NO:	50301N0067
SPECIFICATION:	MIL-STD-461G	CHAMBER NO:	Work Bench 2

EUT Power Input:	AC 115V/60Hz and DC (Battery Only)				
MIL-STD-461G CS117 Lightning Induced Transient Susceptibility					
Temperature: 85F	Humidity: 42% RH	Barometric Pressure: 981 mBar			
Internal Equipment Levels	Test Level	Test On	Results		Comments
Waveform #1 MS	300VL_60At/150VL_30At	AC Pwr LINE 1	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_60At/150VL_30At	AC Pwr LINE 2	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_600At/150VL_150At	Full AC Power Bundle	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_60At/150VL_30At	DC bundle	☐ Pass	☐ Fail	VL reached 1st - WF2 Required
Waveform #1 MS	300VL_60At/150VL_30At	DC Return Side	☑ Pass	☐ Fail	
Waveform #1 MS	300VL_60At/150VL_30At	DC High Side	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_60AL/150Vt_30AL	AC Pwr LINE 1	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_60AL/150Vt_30AL	AC Pwr LINE 2	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_600AL/150Vt_150AL	Full AC Power Bundle	☑ Pass	☐ Fail	
Waveform #2 MS	300Vt_600AL/150Vt_150AL	DC bundle	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	AC Pwr LINE 1	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	AC Pwr LINE 2	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_120A/300V_60AL	Full AC Power Bundle	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_120A/300V_60AL	DC bundle	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	DC Return Side	☑ Pass	☐ Fail	
Waveform #3 MS at 1MHz & 10MHz	600V_24A/300V_12AL	DC High Side	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	AC Pwr LINE 1	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	AC Pwr LINE 2	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	Full AC Power Bundle	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	DC bundle	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	DC Return Side	☑ Pass	☐ Fail	
Waveform #3 MB at 1MHz & 10MHz	360Vt_6AL	DC High Side	☑ Pass	☐ Fail	

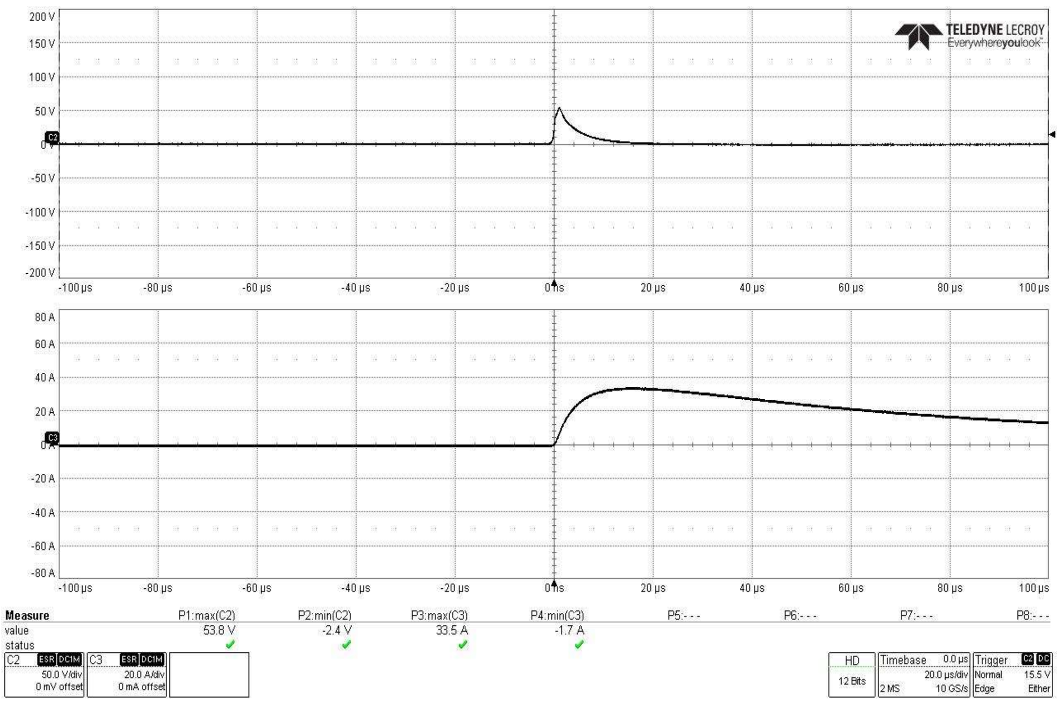
TECHNICIAN / ENGINEER:	Johnny Vu	DATE:	5/12/2025

EAR Controlled Data

CS117 Actual Test Multiple Stroke Waveform #1 with AT = 600A on Flexboss 18

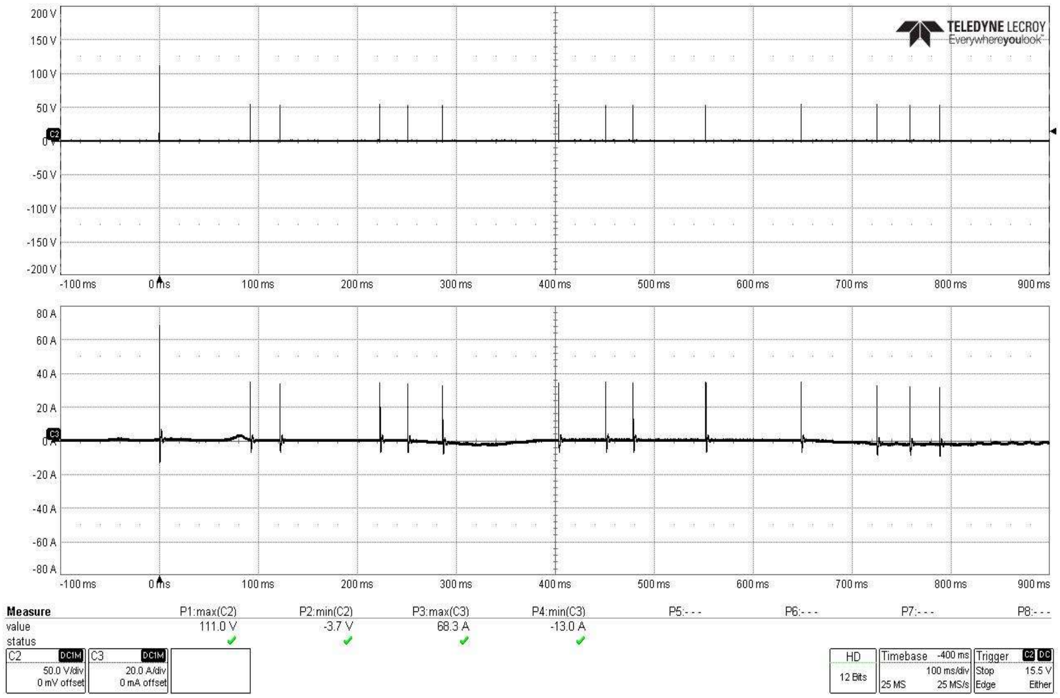


Actual Test CS117 Waveform #1, First Transient +600A, on DC High Side

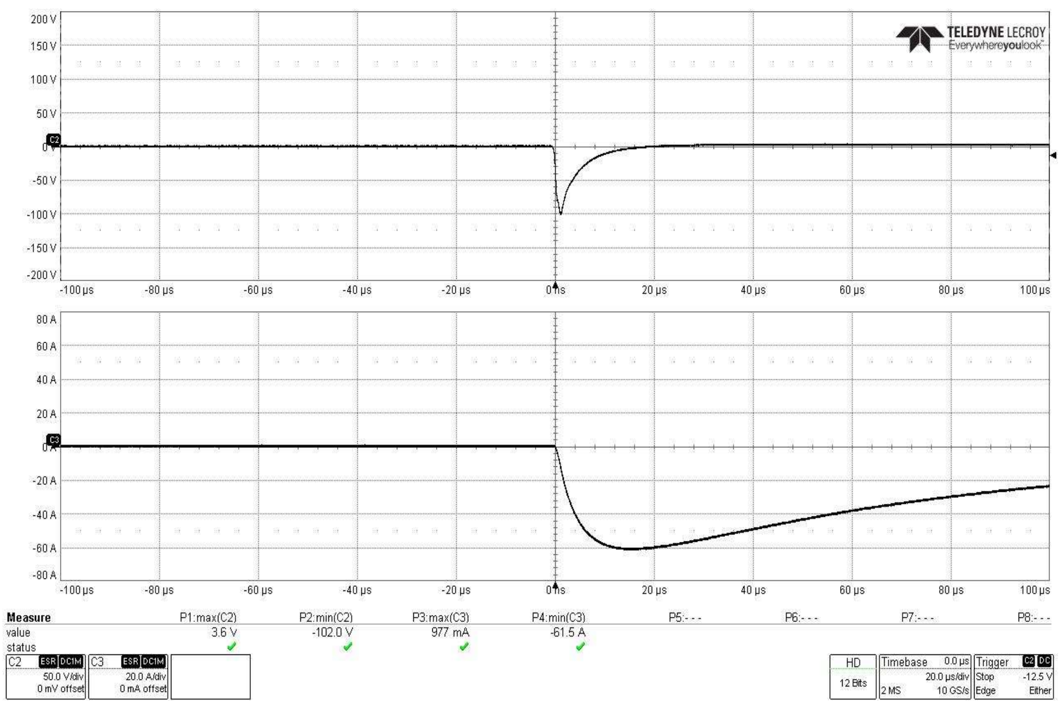


Actual Test CS117 Waveform #1, Subsequent Transient +150A, on DC High Side

EAR Controlled Data

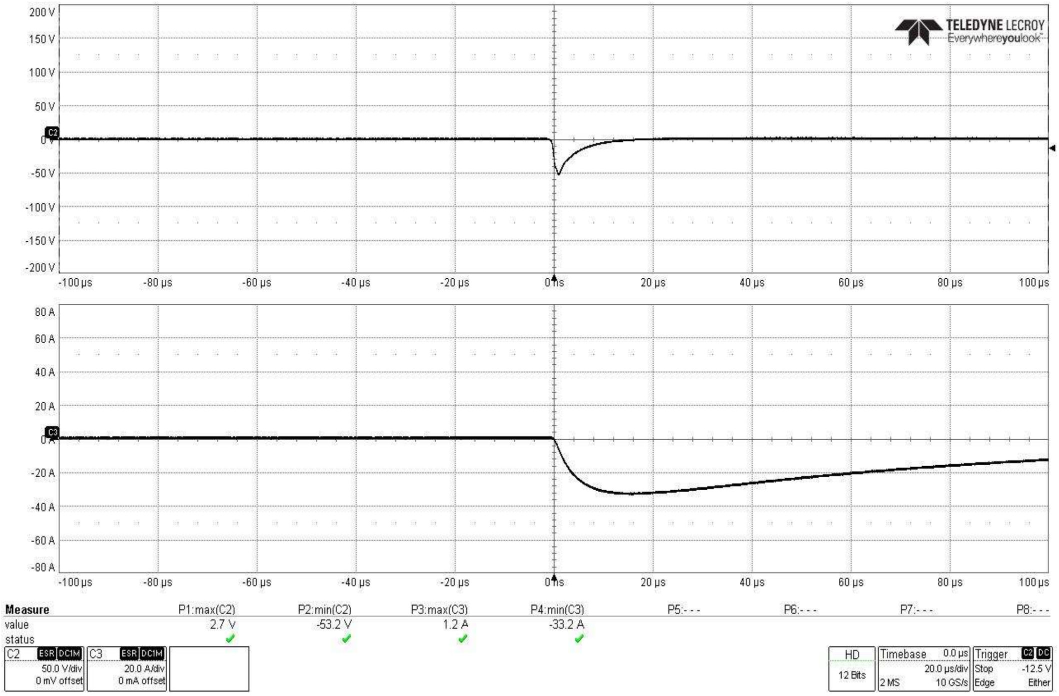


Actual Test CS117 Waveform #1, 14 Transients +600/+150A, on DC High Side

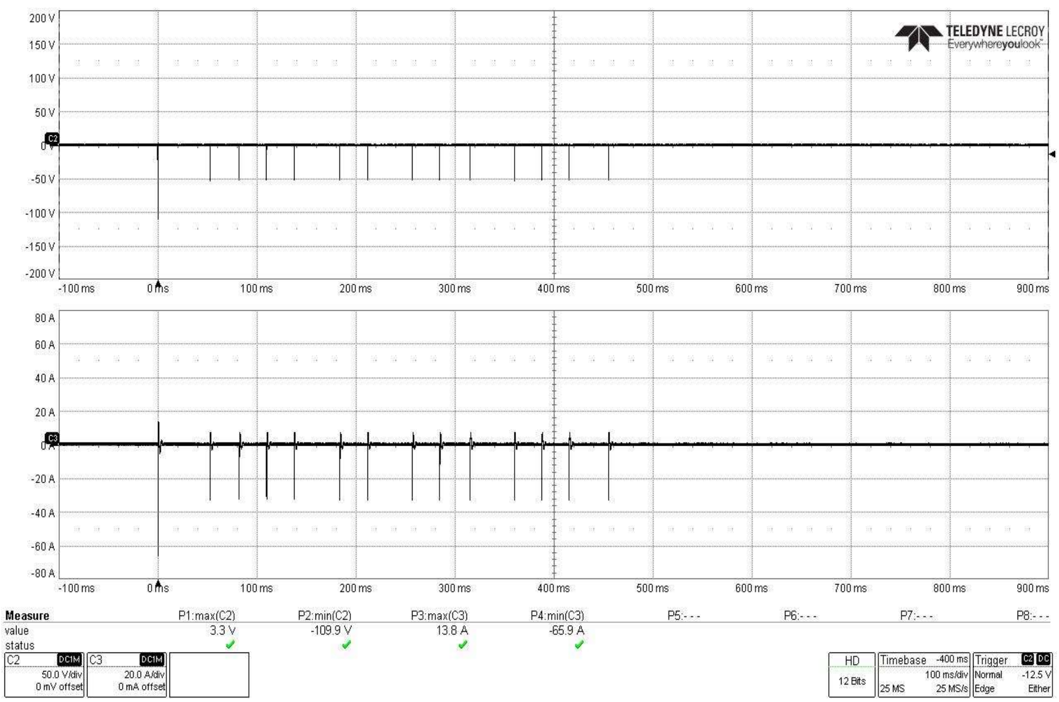


Actual Test CS117 Waveform #1, First Transient -600A, on DC High Side

EAR Controlled Data

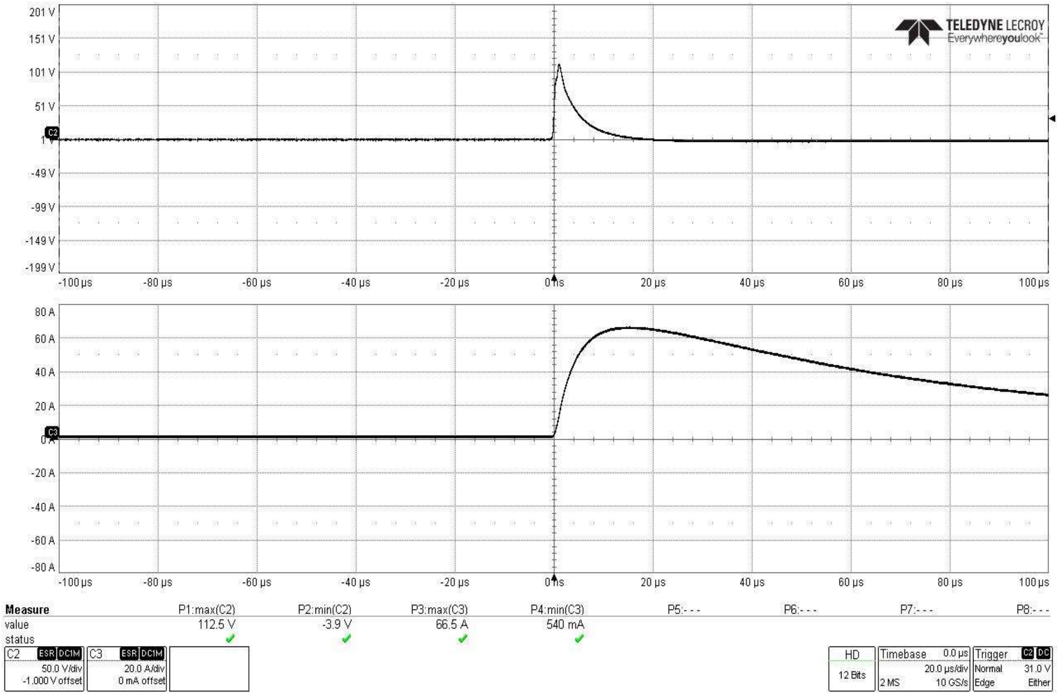


Actual Test CS117 Waveform #1, Subsequent Transient -150A, on DC High Side

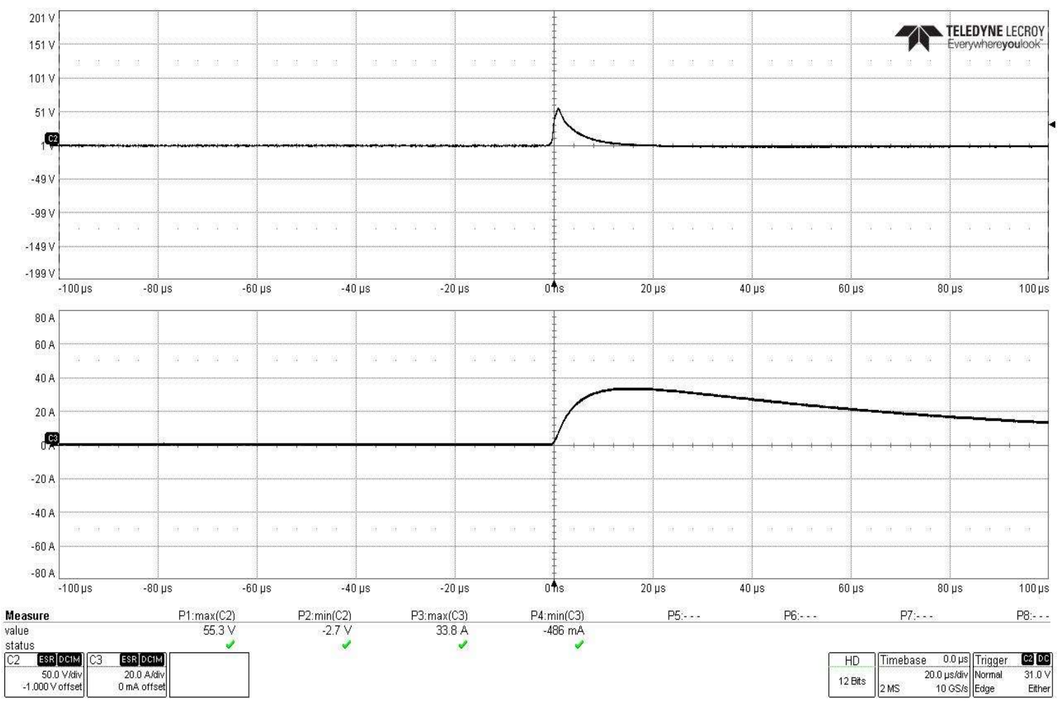


Actual Test CS117 Waveform #1, 14 Transients -600/-150A, on DC High Side

EAR Controlled Data

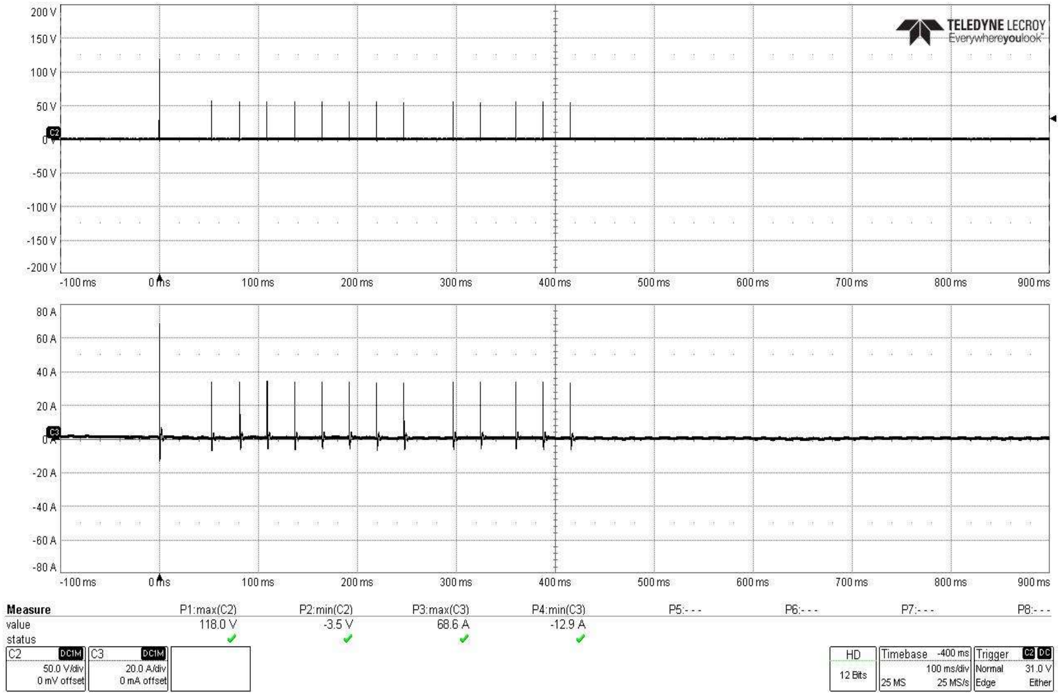


Actual Test CS117 Waveform #1, First Transient +600A, on DC Return Side

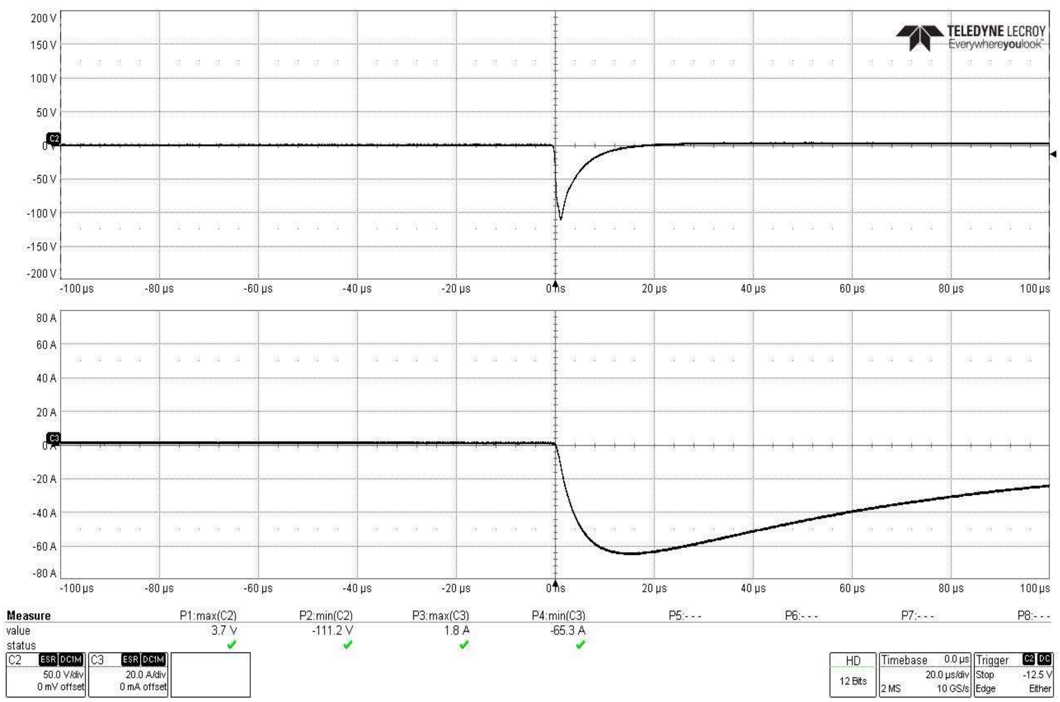


Actual Test CS117 Waveform #1, Subsequent Transient +150A, on DC Return Side

EAR Controlled Data

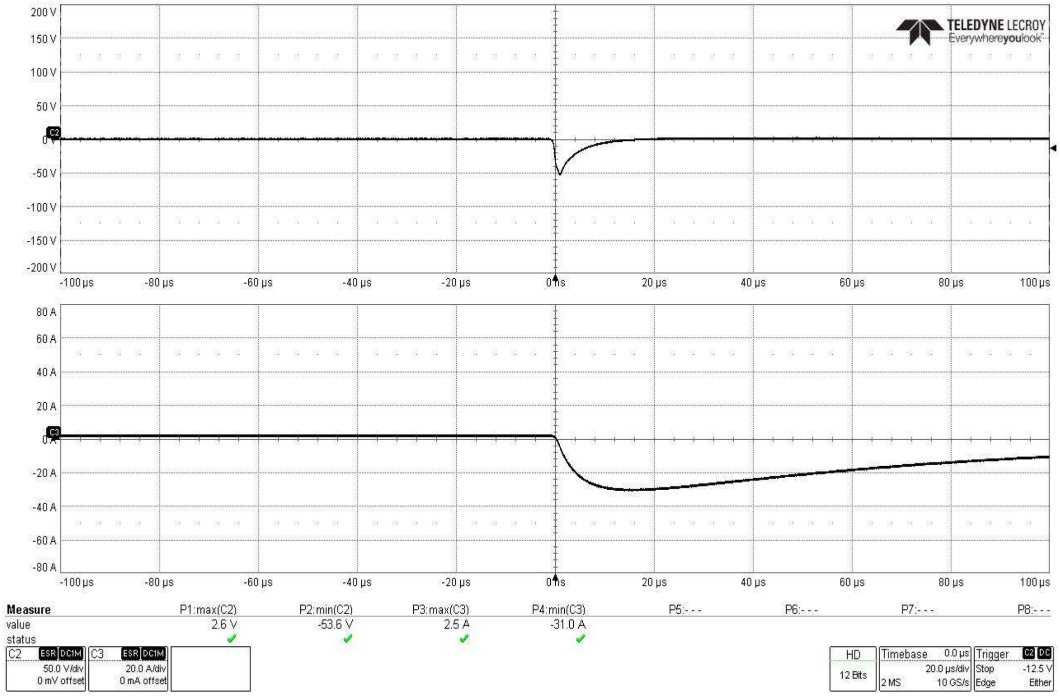


Actual Test CS117 Waveform #1, 14 Transients +600/+150A, on DC Return Side

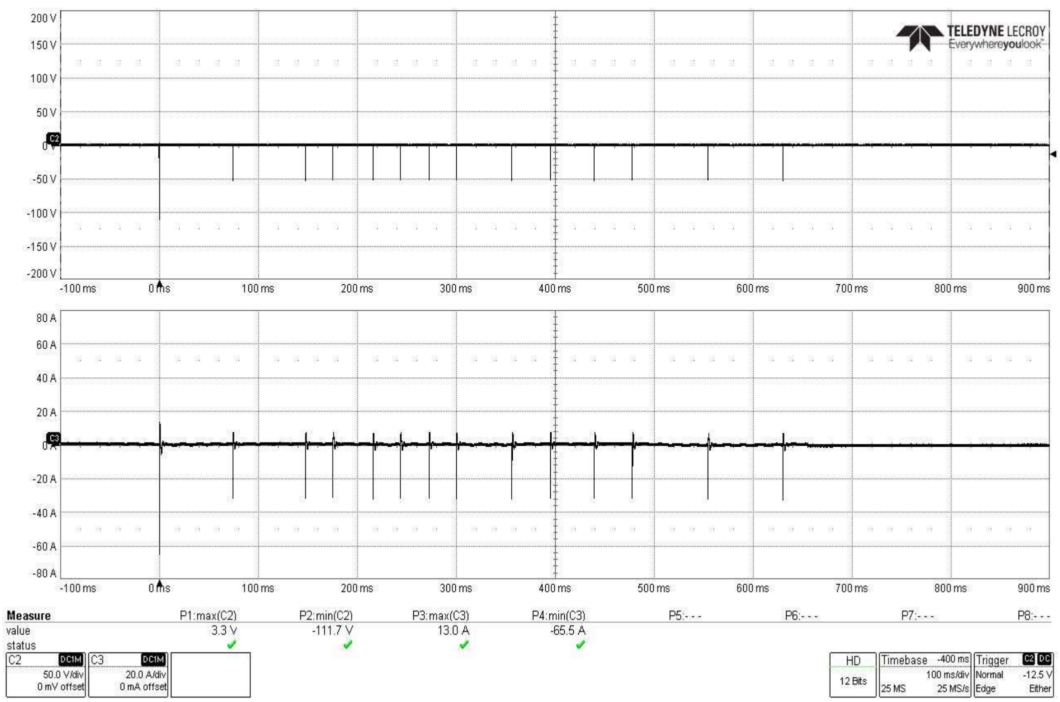


Actual Test CS117 Waveform #1, First Transient -600A, on DC Return Side

EAR Controlled Data



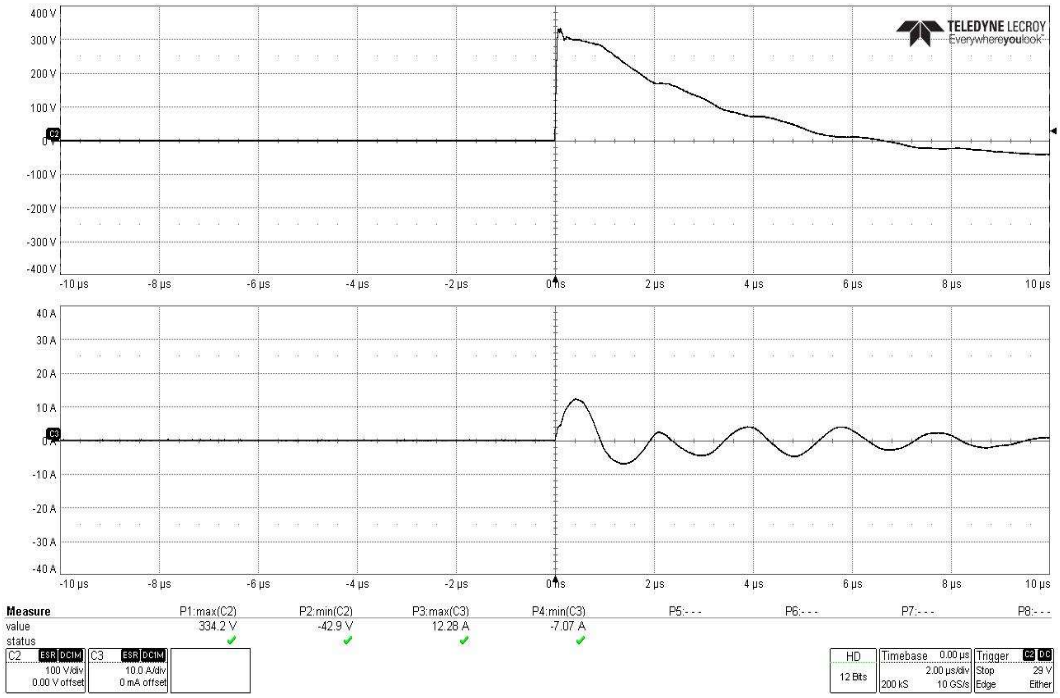
Actual Test CS117 Waveform #1, Subsequent Transient -150A, on DC Return Side



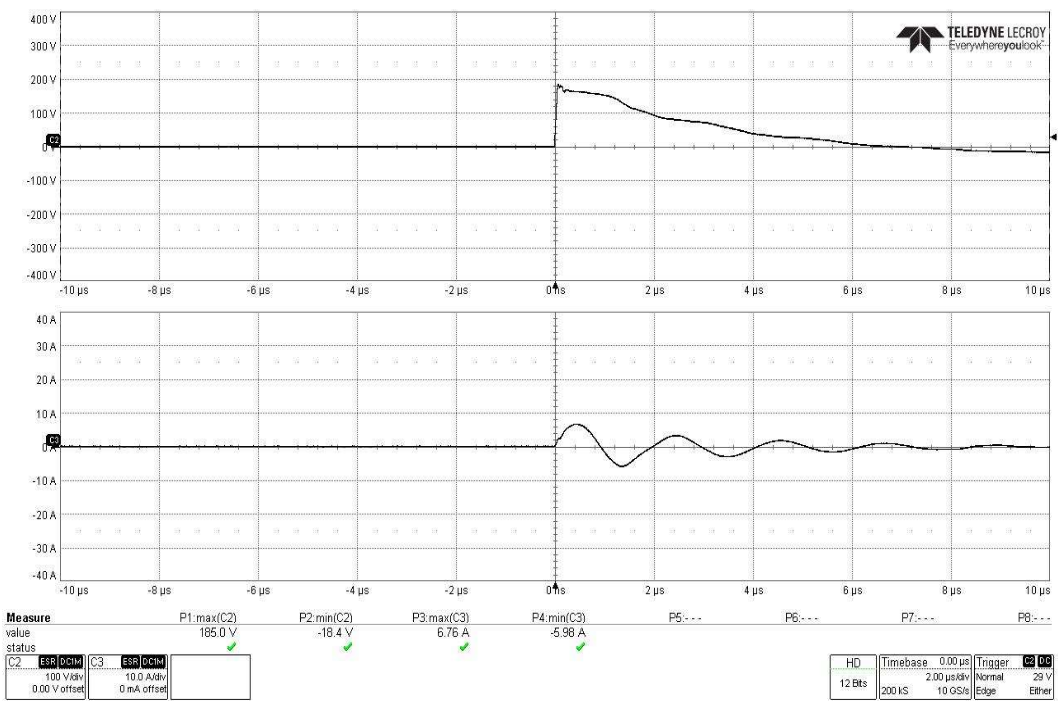
Actual Test CS117 Waveform #1, 14 Transients -600/-150A, on DC Return Side

EAR Controlled Data

CS117 Actual Test Multiple Stroke Waveform #2 with V_T = 300V on Flexboss 18

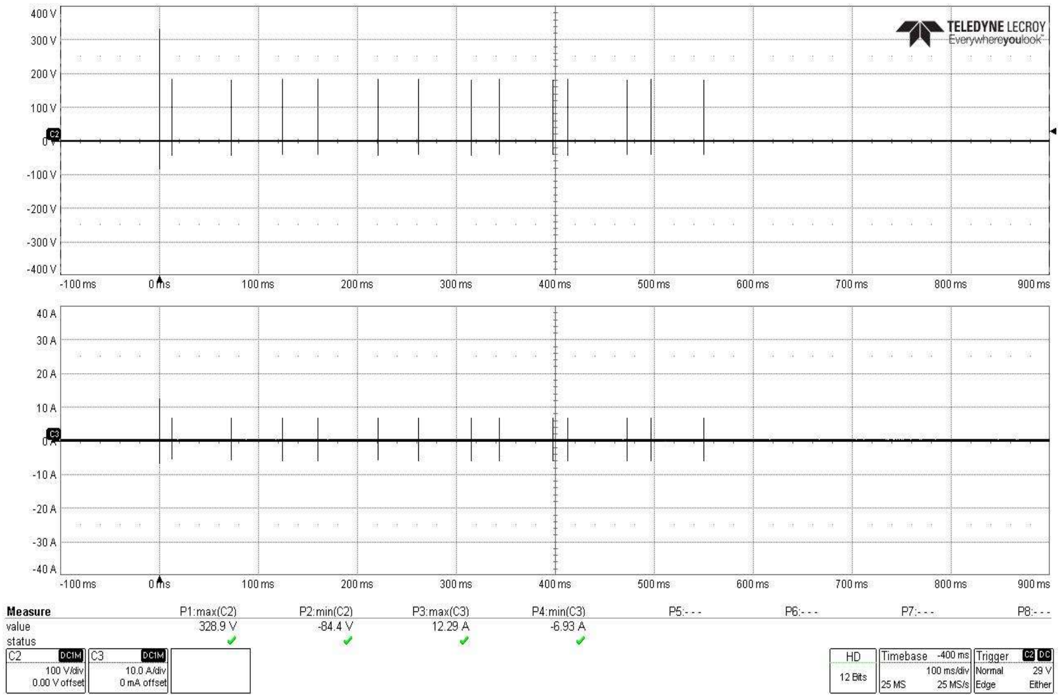


Actual Test CS117 Waveform #2, First Transient +300V/600A on AC Power Line 1

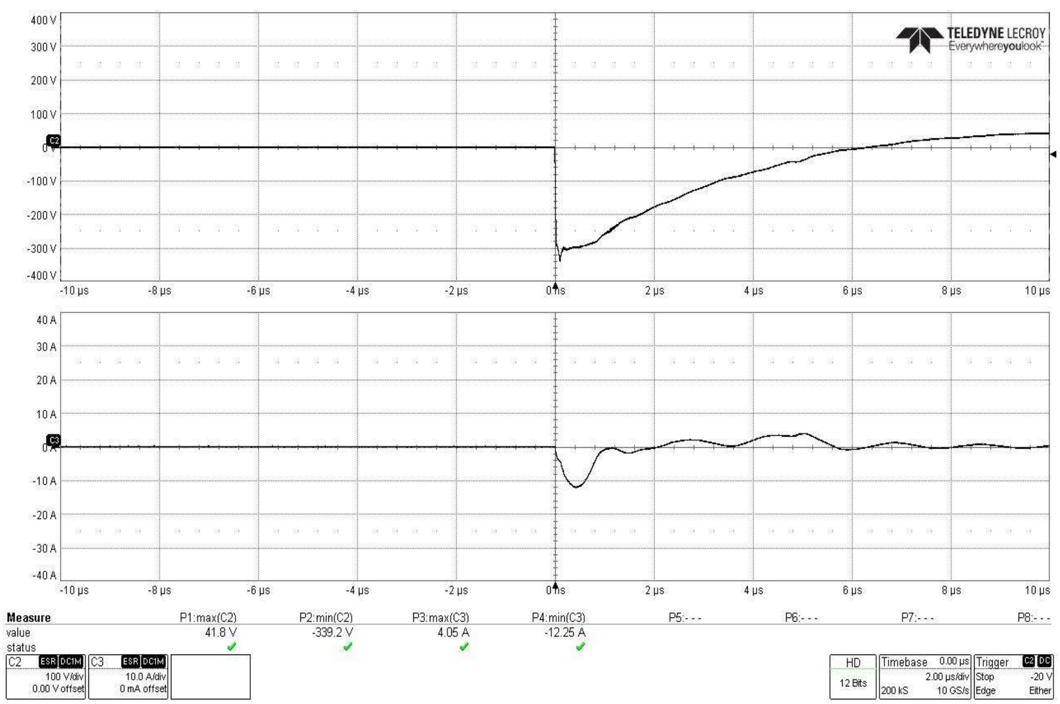


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on AC Power Line 1

EAR Controlled Data

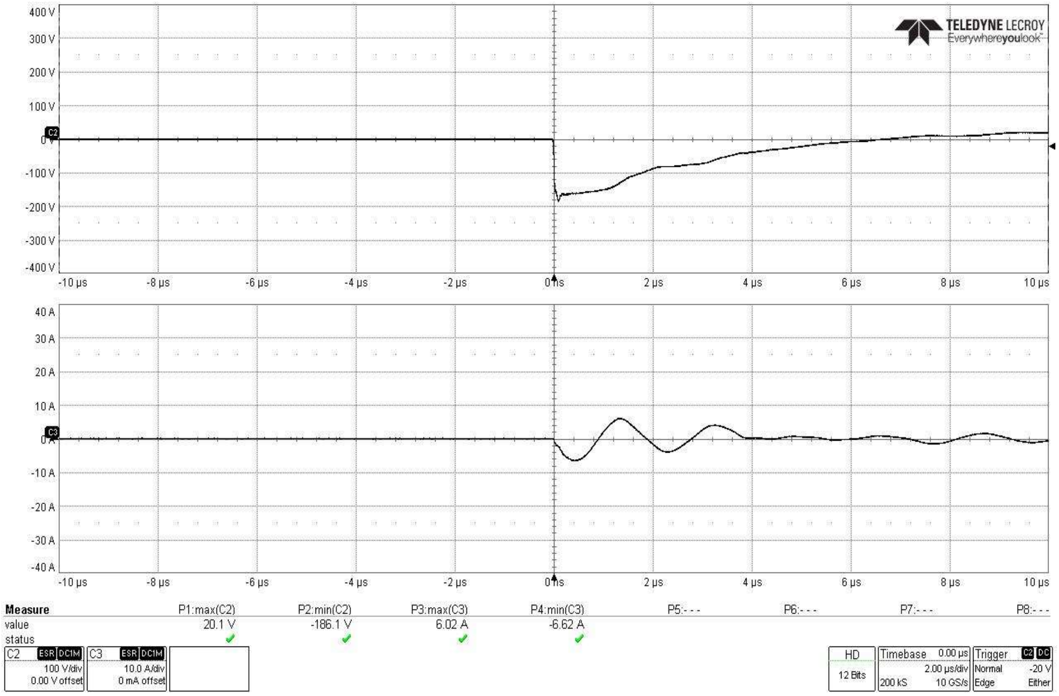


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on AC Power Line 1

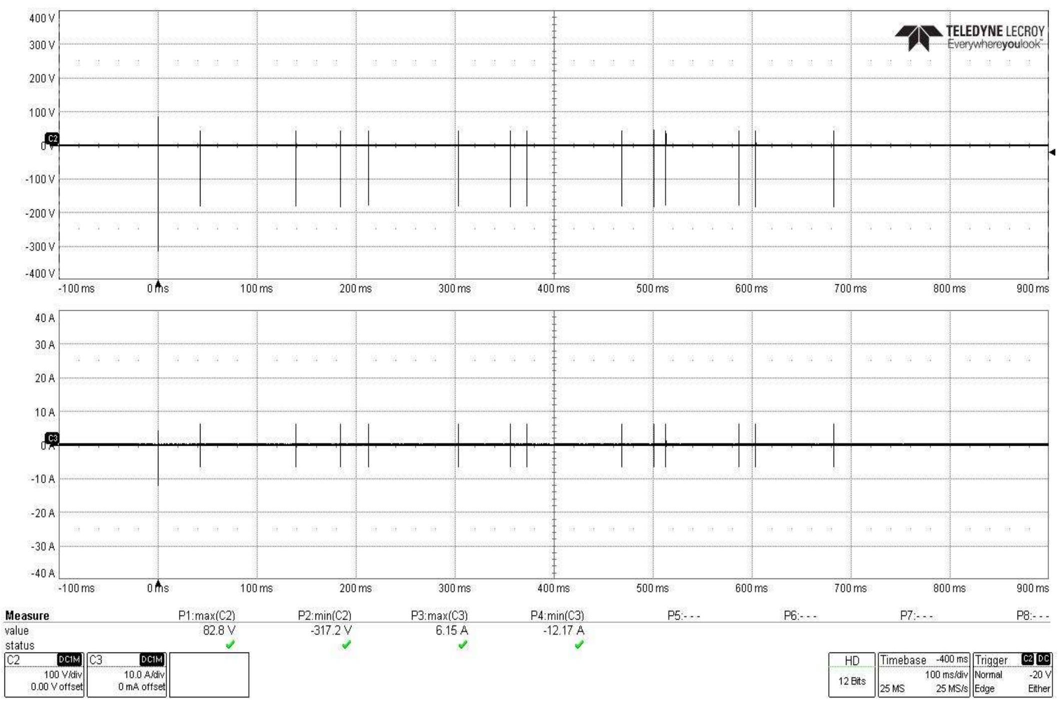


Actual Test CS117 Waveform #2, First Transient -300V/600A on AC Power Line 1

EAR Controlled Data

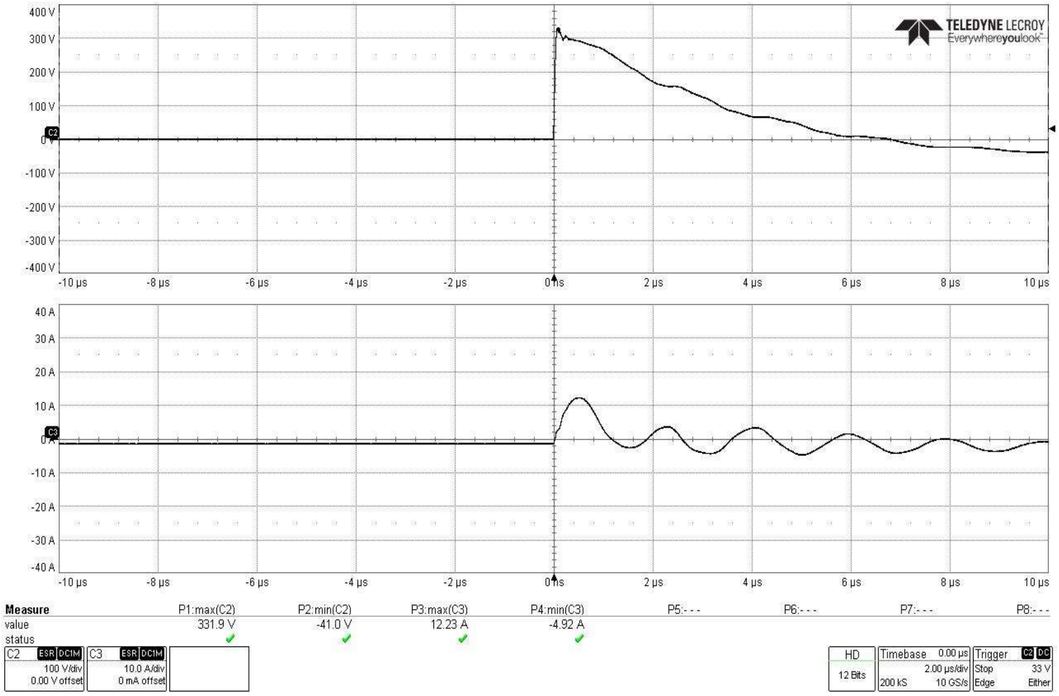


Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on AC Power Line 1

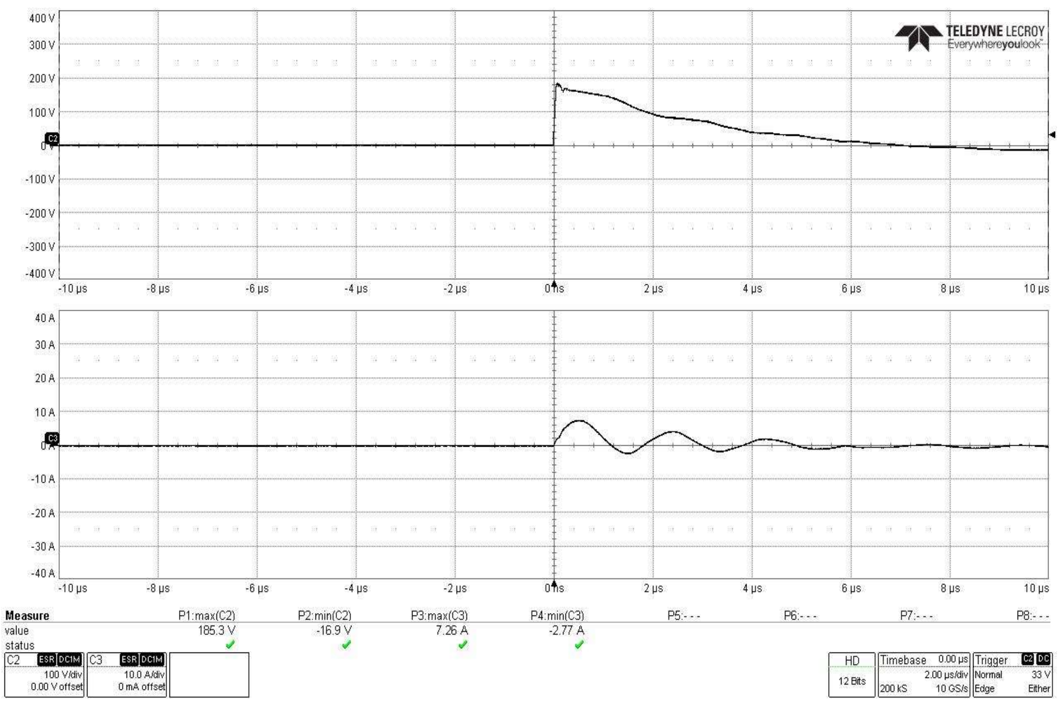


Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on AC Power Line 1

EAR Controlled Data

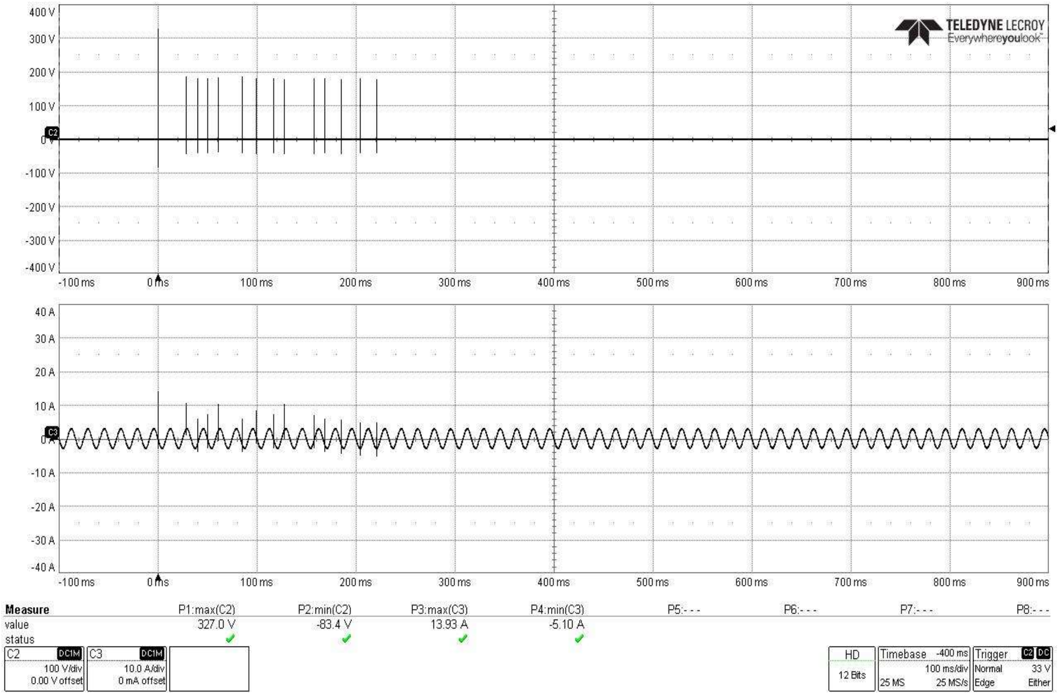


Actual Test CS117 Waveform #2, First Transient +300V/600A on AC Power Line 2

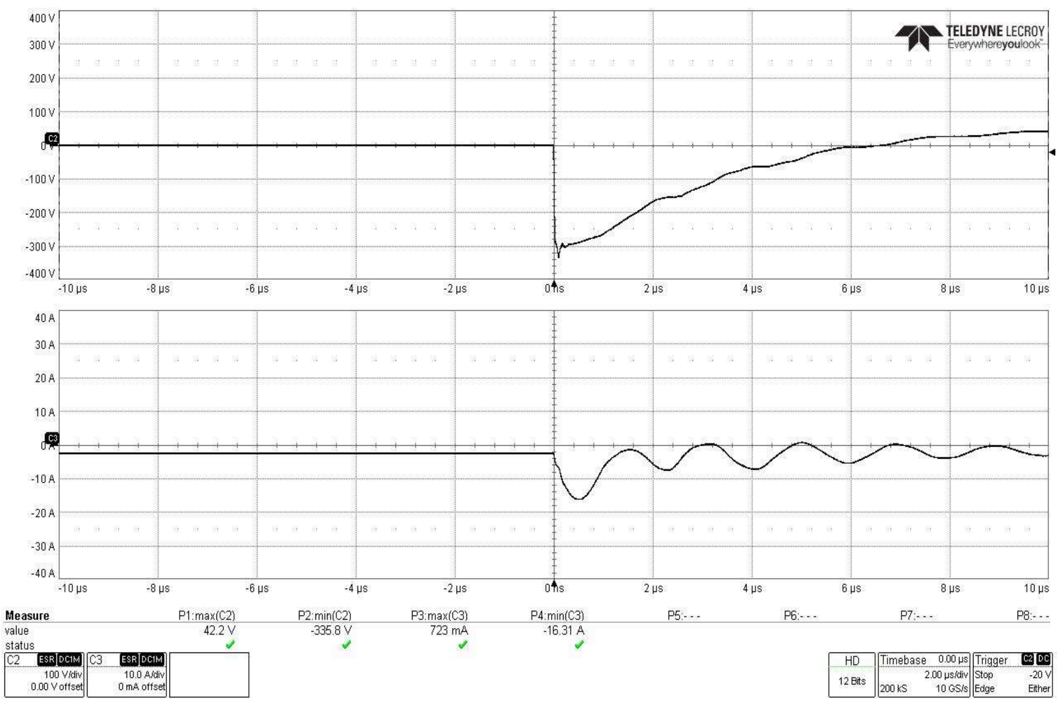


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on AC Power Line 2

EAR Controlled Data

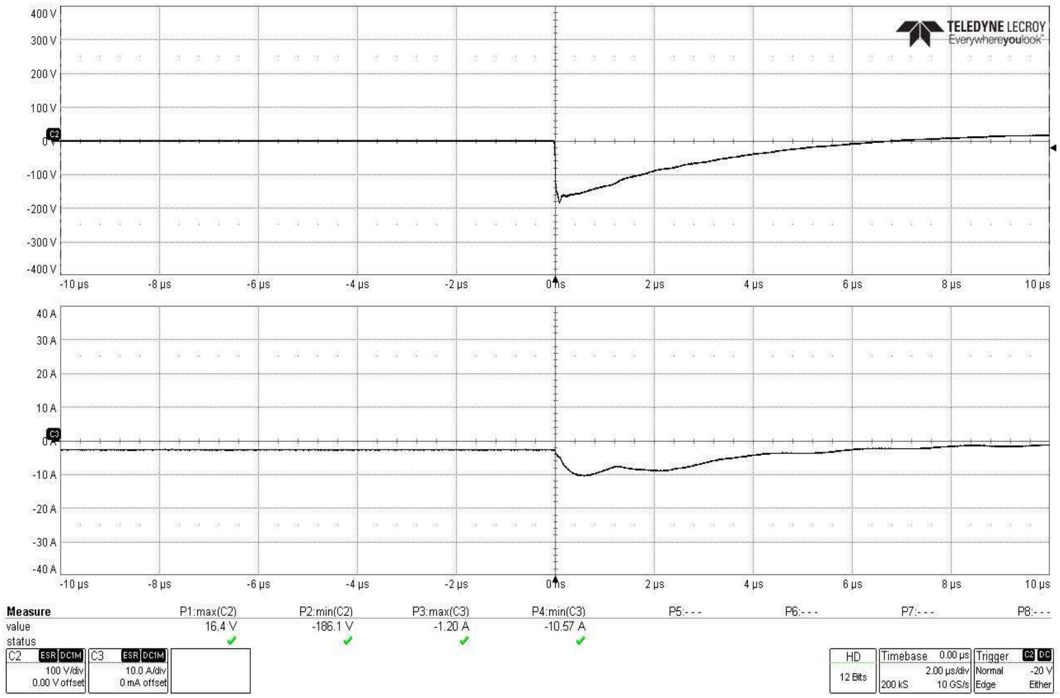


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on AC Power Line 2

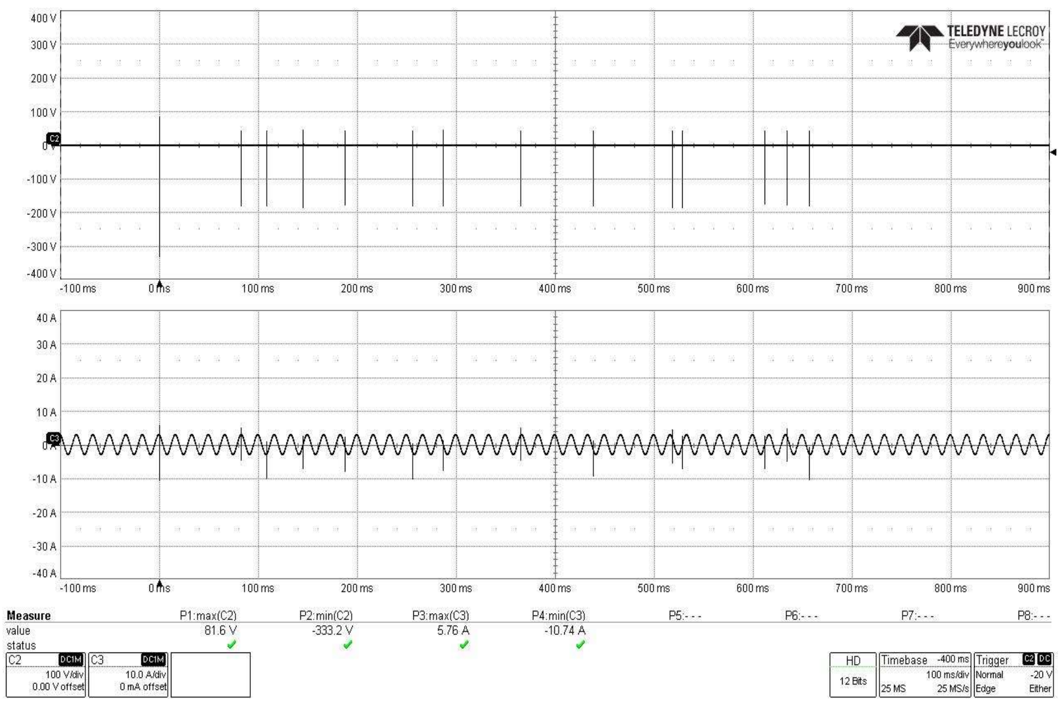


Actual Test CS117 Waveform #2, First Transient -300V/600A on AC Power Line 2

EAR Controlled Data

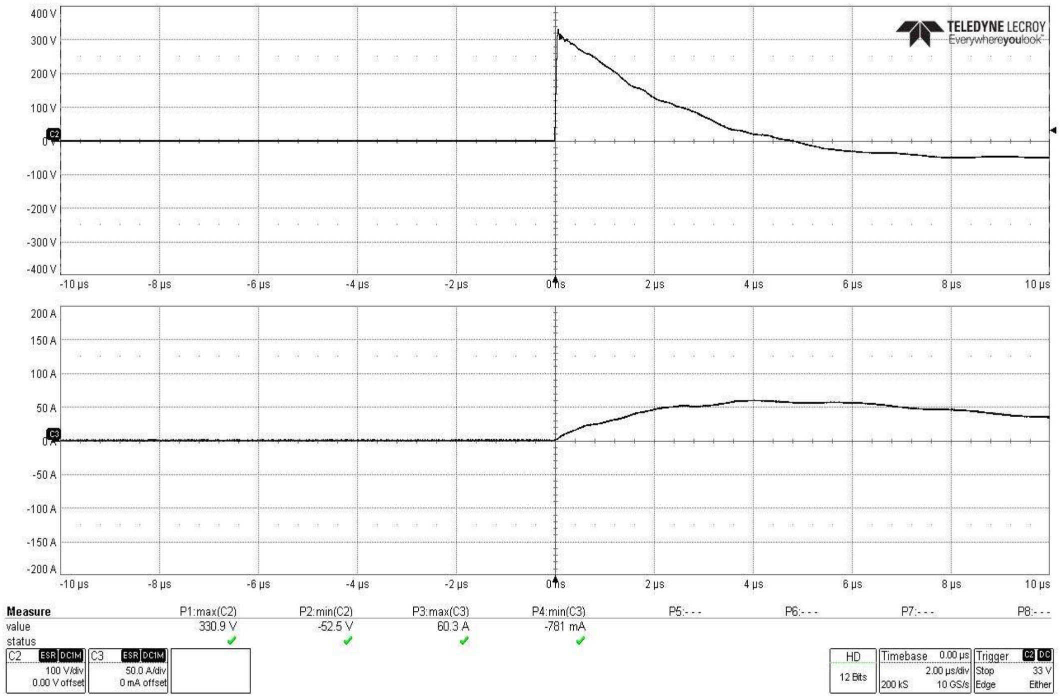


Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on AC Power Line 2

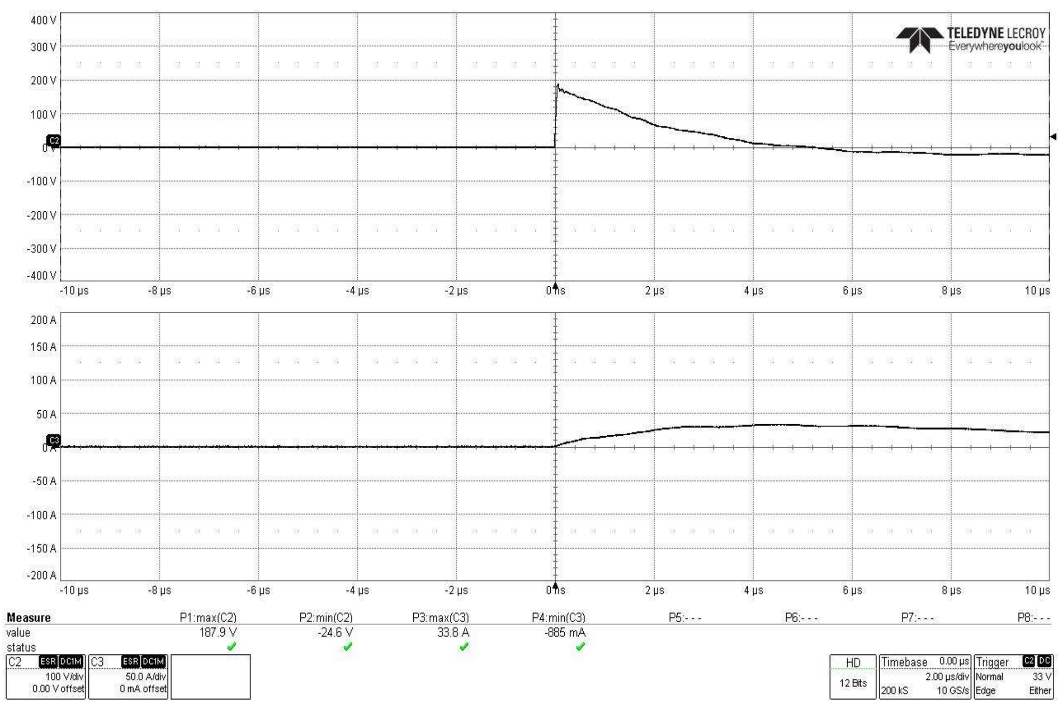


Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on AC Power Line 2

EAR Controlled Data

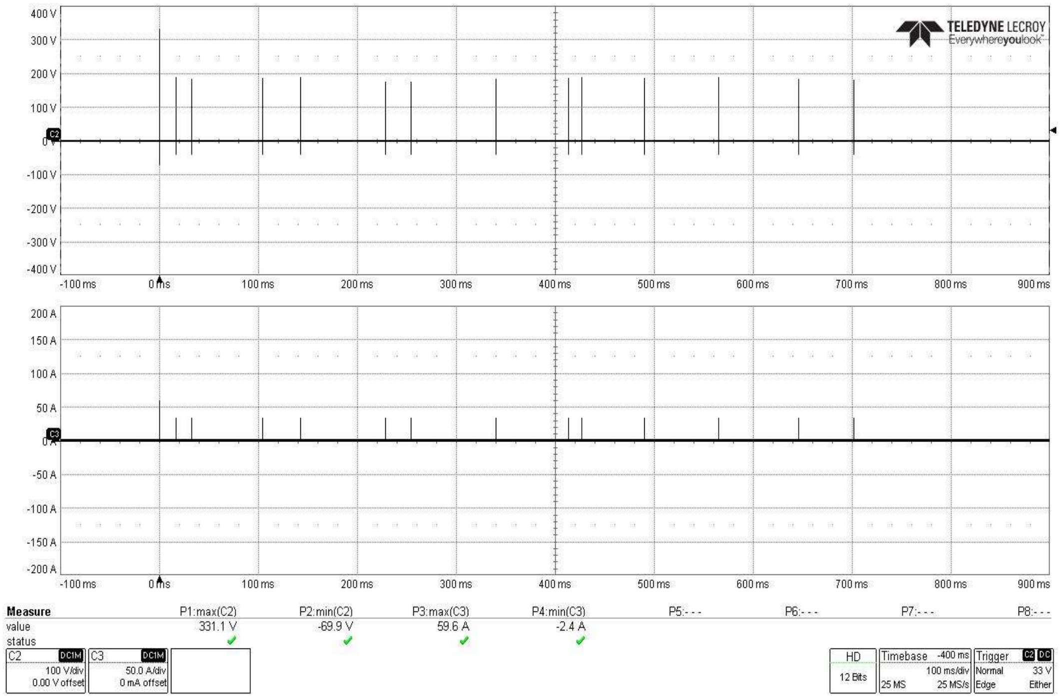


Actual Test CS117 Waveform #2, First Transient +300V/600A on Full AC Power Bundle

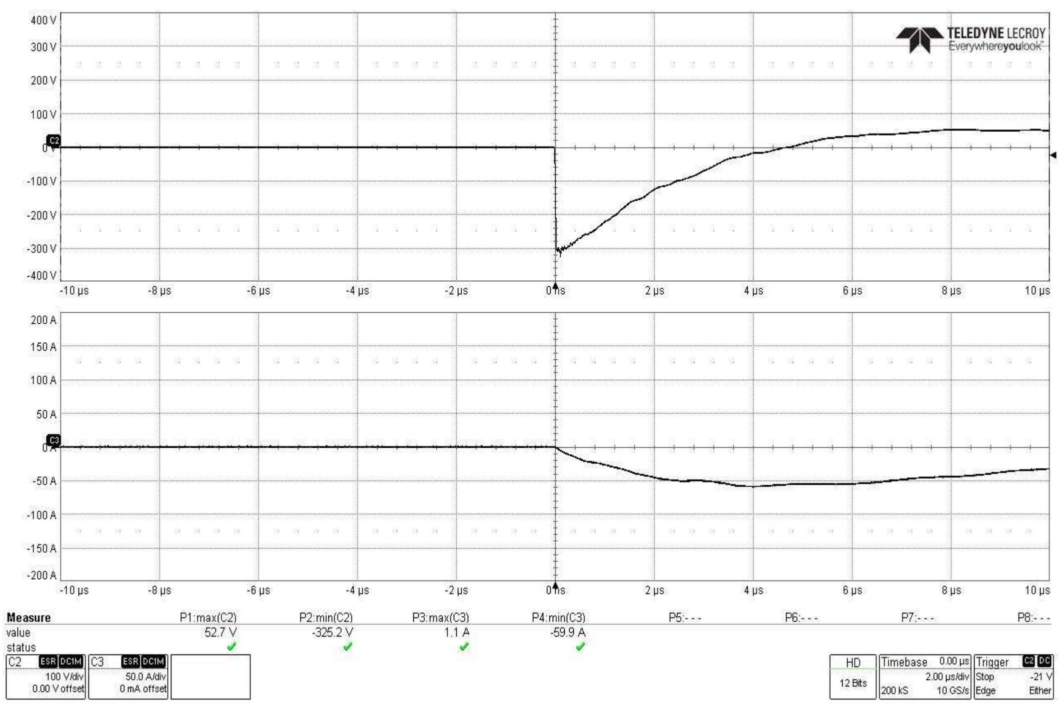


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on Full AC Power Bundle

EAR Controlled Data

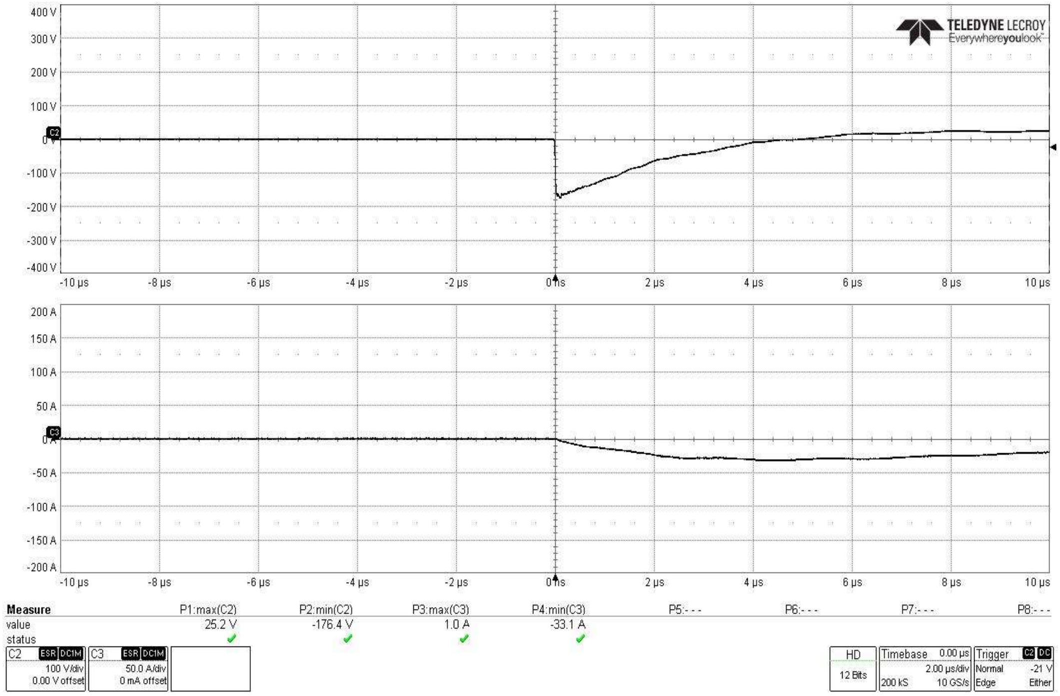


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on Full AC Power Bundle

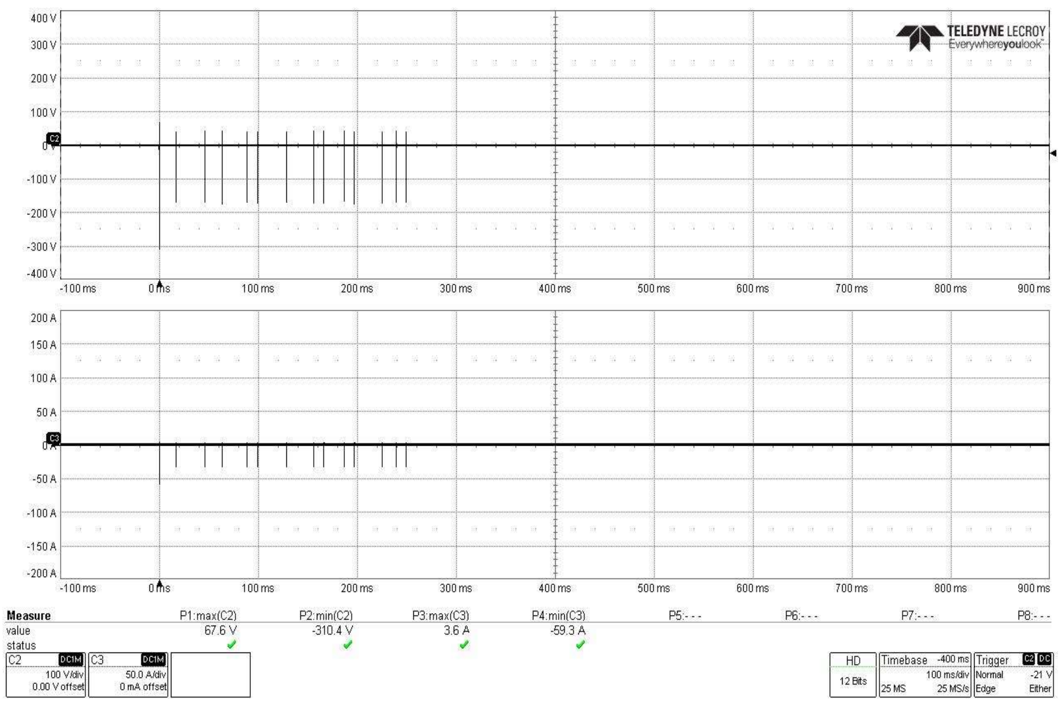


Actual Test CS117 Waveform #2, First Transient -300V/600A on Full AC Power Bundle

EAR Controlled Data

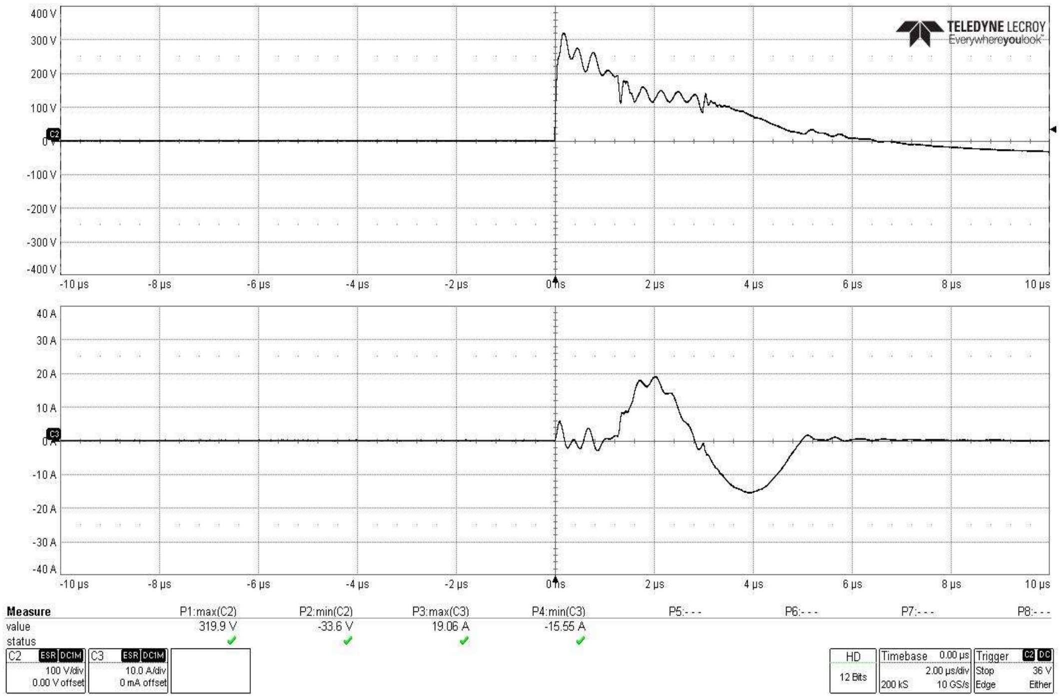


Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on Full AC Power Bundle

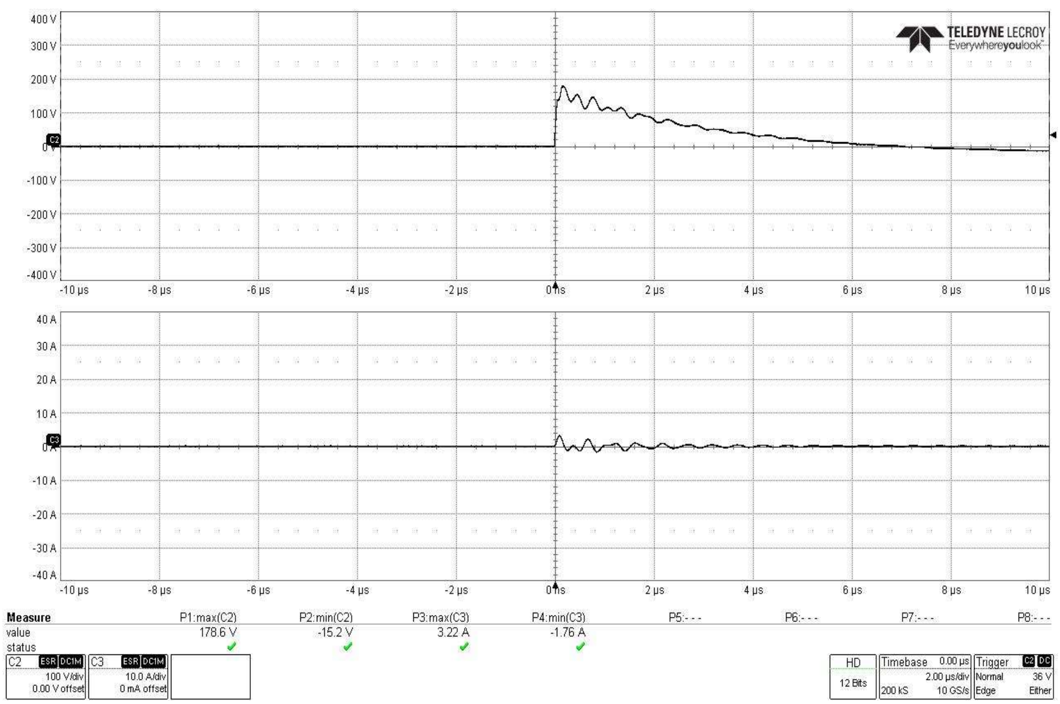


Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on DC Power Bundle

EAR Controlled Data

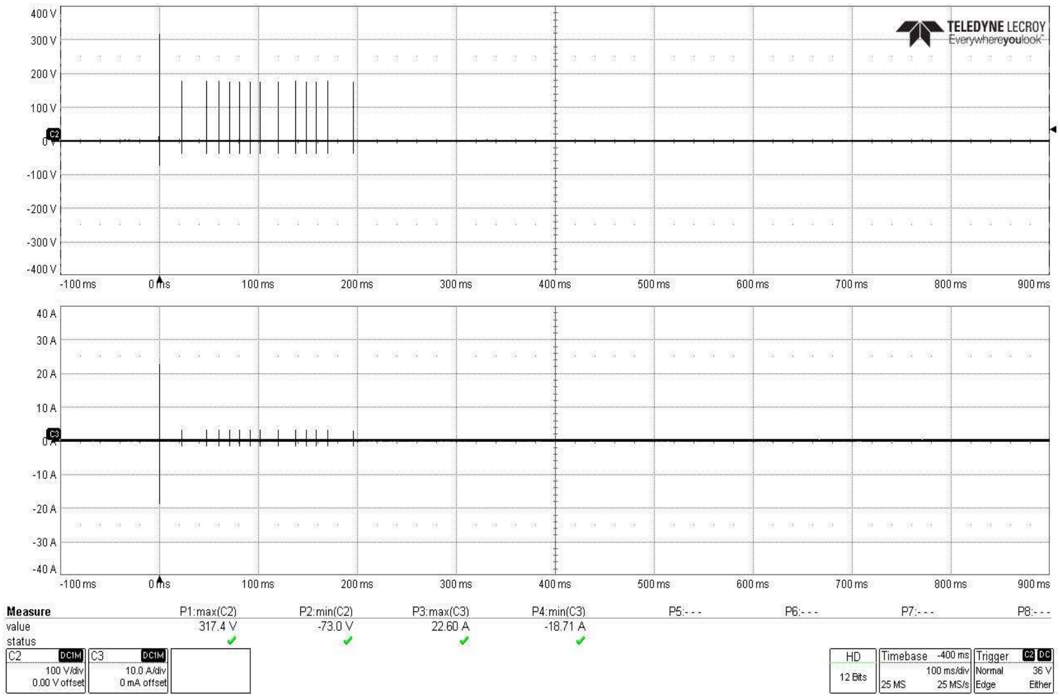


Actual Test CS117 Waveform #2, First Transient +300V/600A on DC Power Bundle

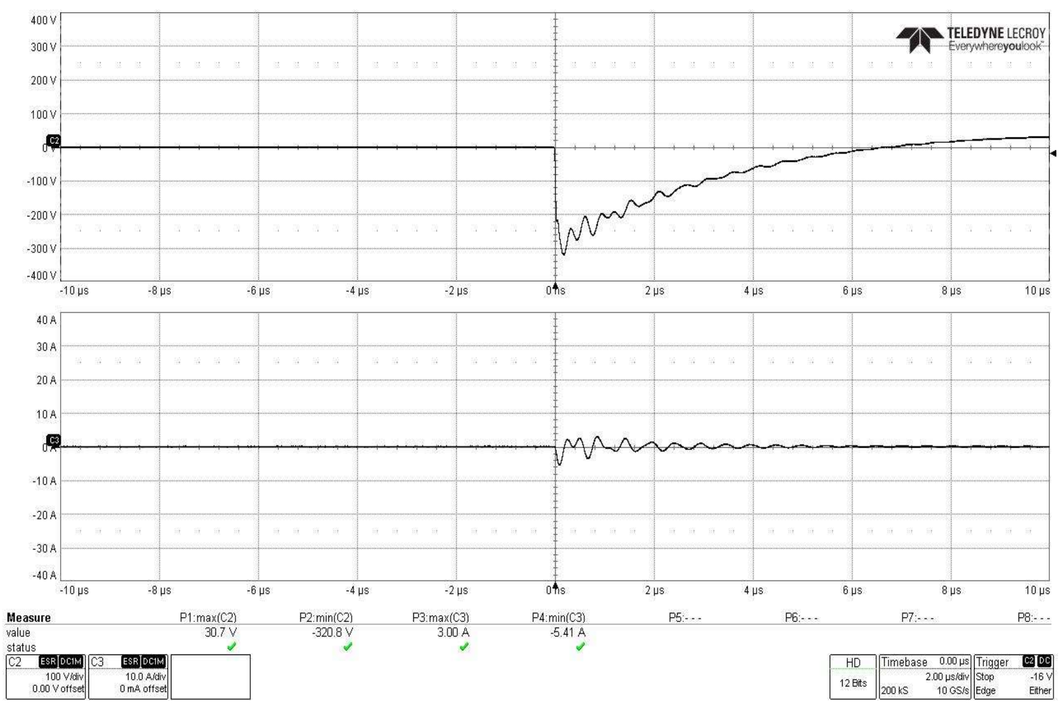


Actual Test CS117 Waveform #2, Subsequent Transient +150V/150A on DC Power Bundle

EAR Controlled Data

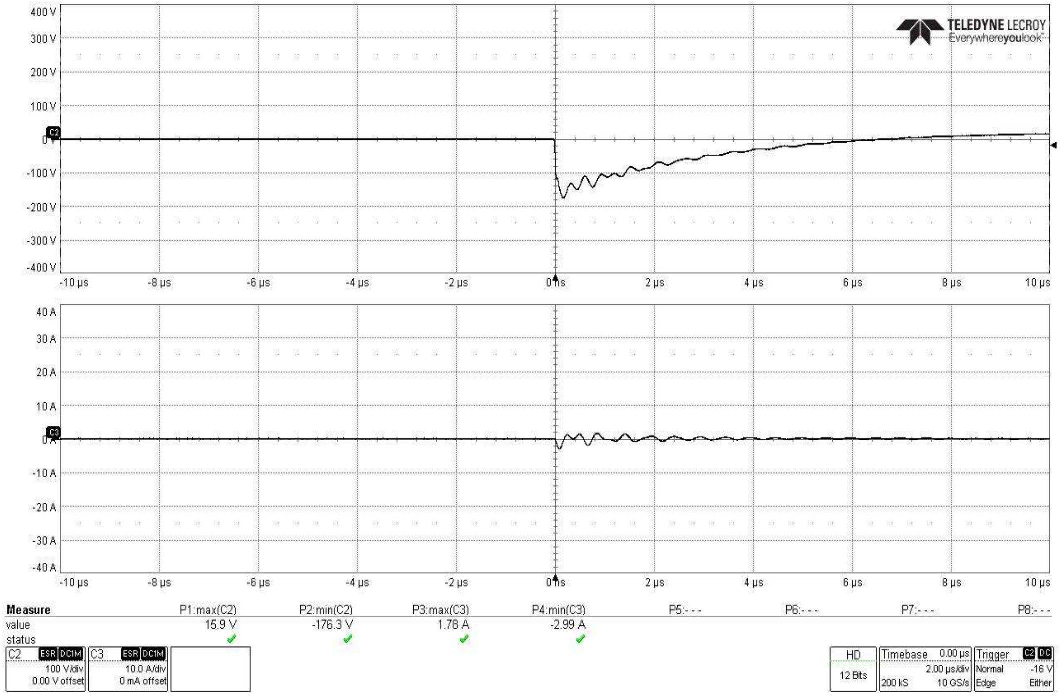


Actual Test CS117 Waveform #2, 14 Transients +300/600A & +150V/150A on DC Power Bundle

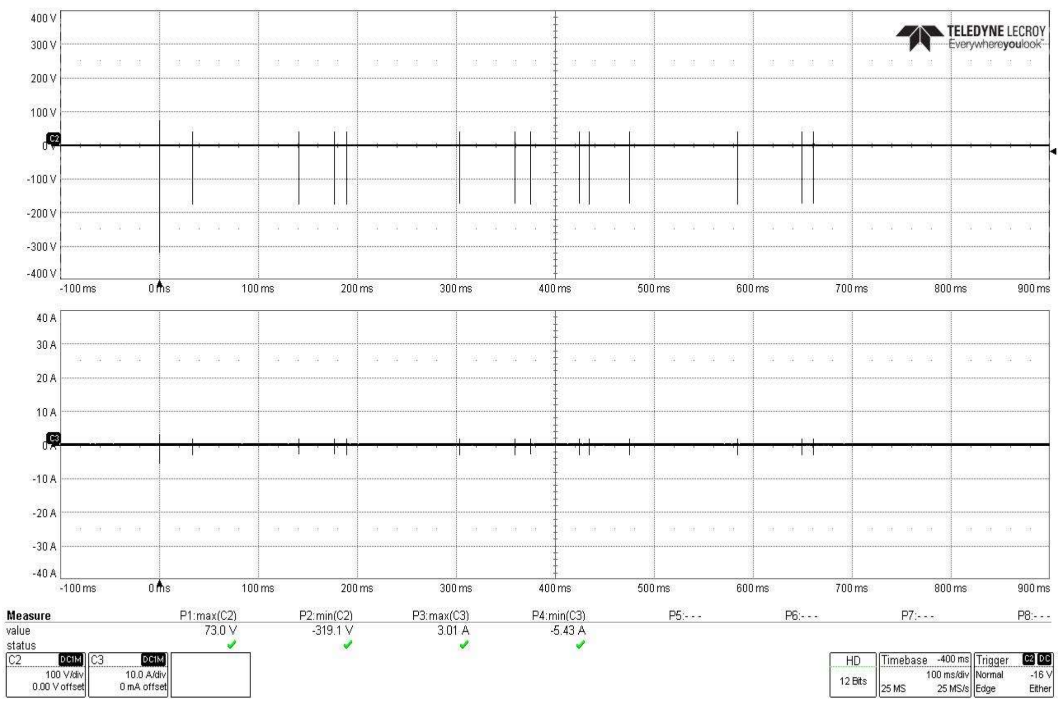


Actual Test CS117 Waveform #2, First Transient -300V/600A on DC Power Bundle

EAR Controlled Data



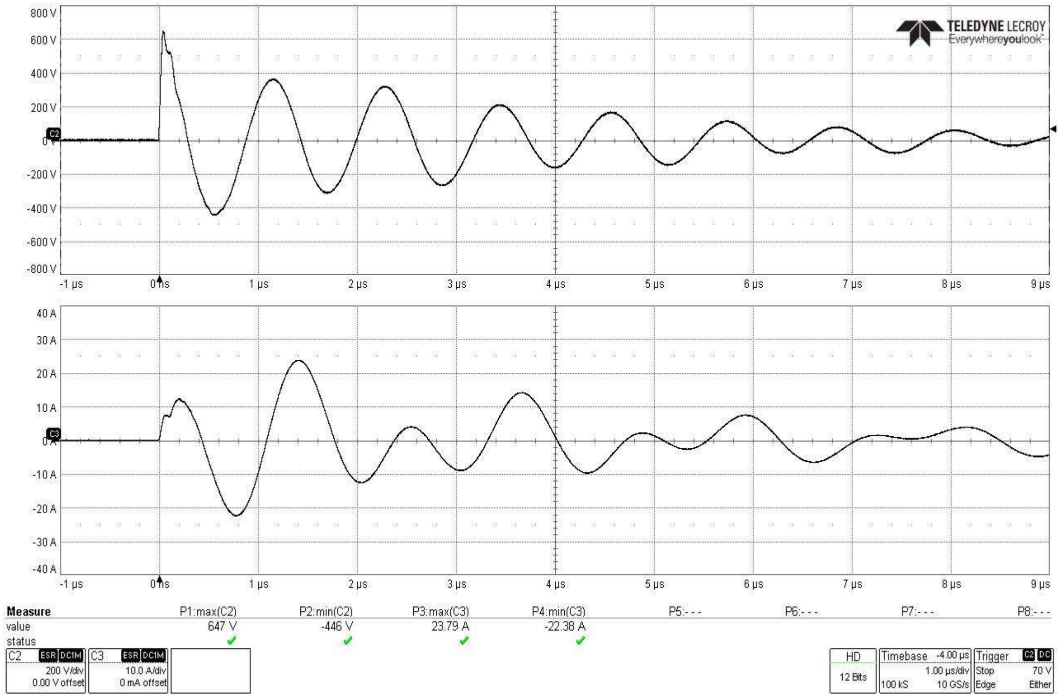
Actual Test CS117 Waveform #2, Subsequent Transient -150V/150A on DC Power Bundle



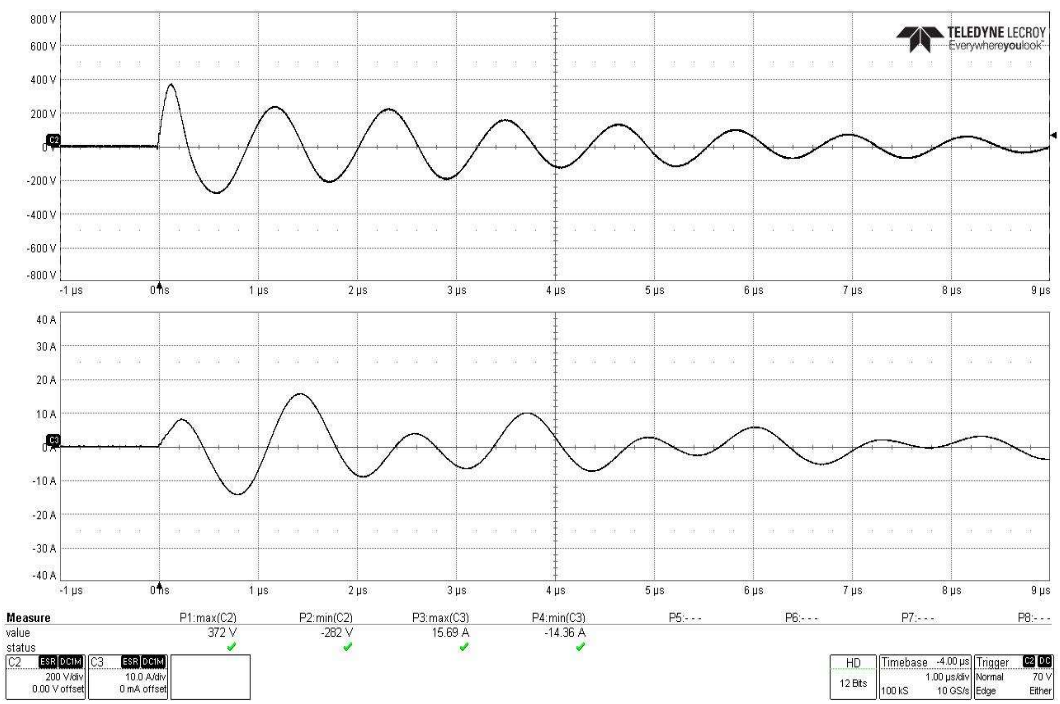
Actual Test CS117 Waveform #2, 14 Transients -300/600A & -150V/150A on DC Power Bundle

EAR Controlled Data

CS117 Actual Test Waveform #3 at 1MHz with V_T = 600V on Flexboss 18

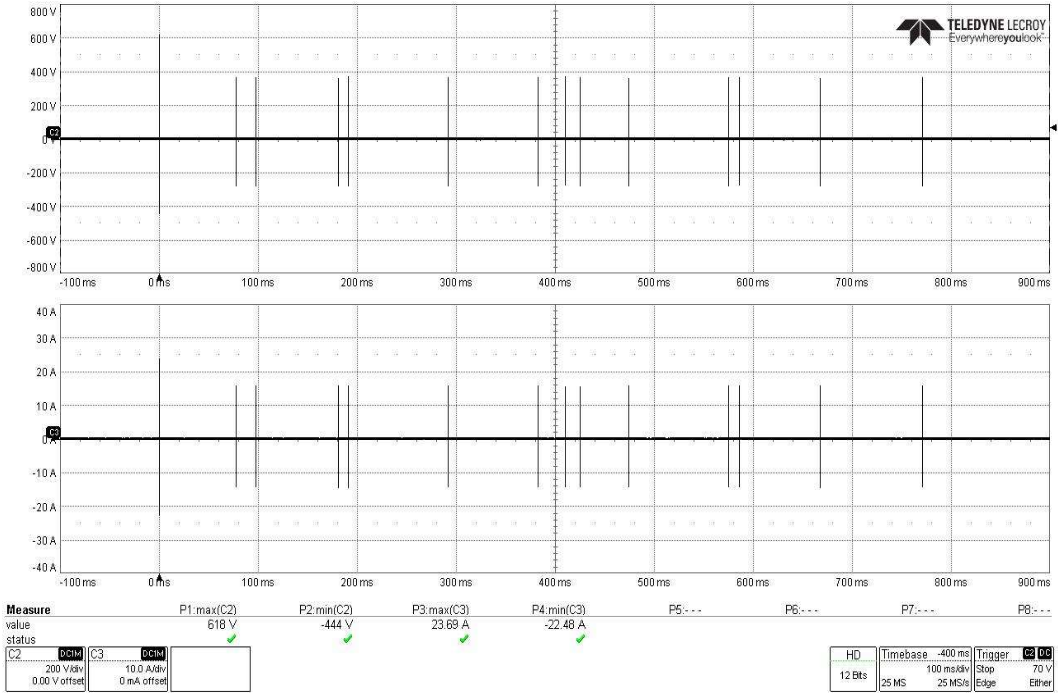


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on AC Power Line 1

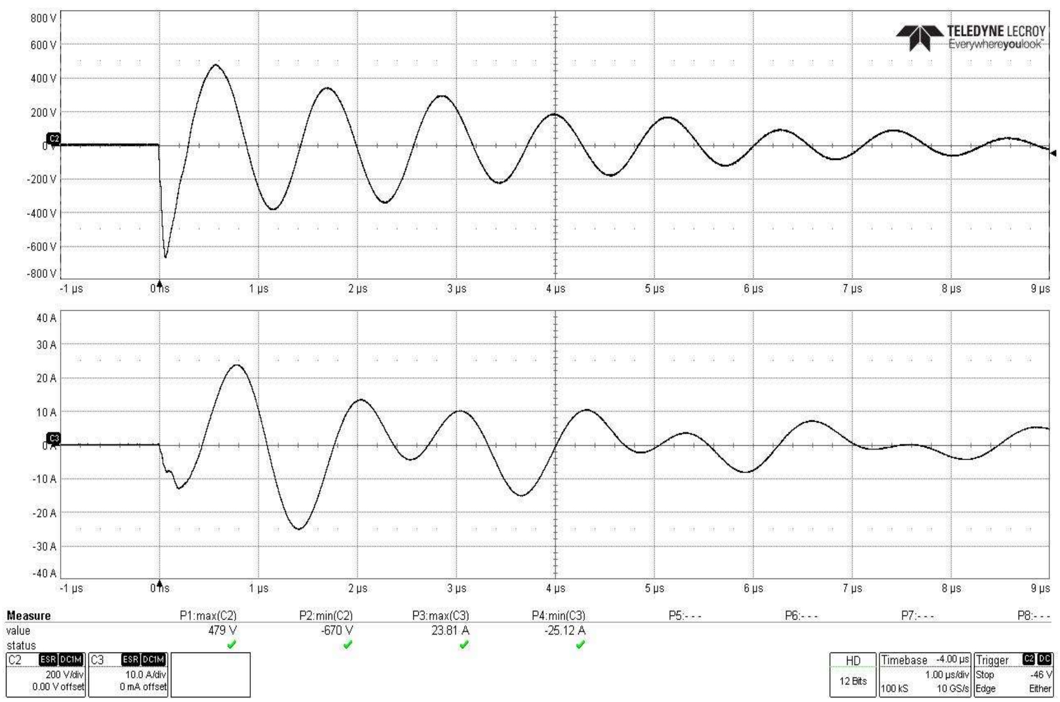


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on AC Power Line 1

EAR Controlled Data

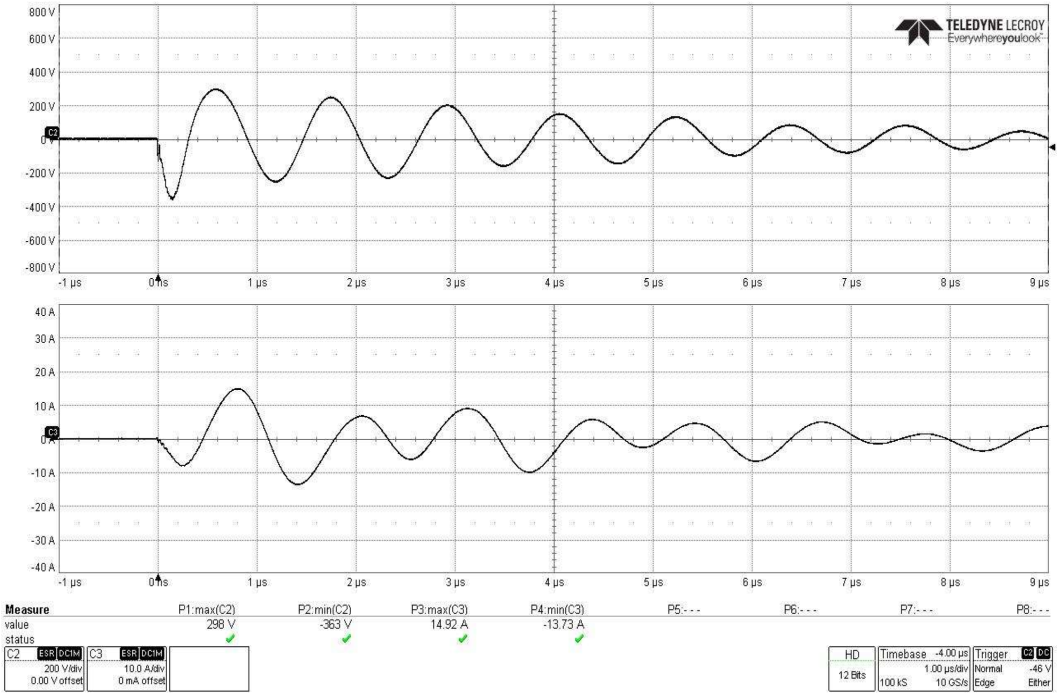


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on AC Power Line 1

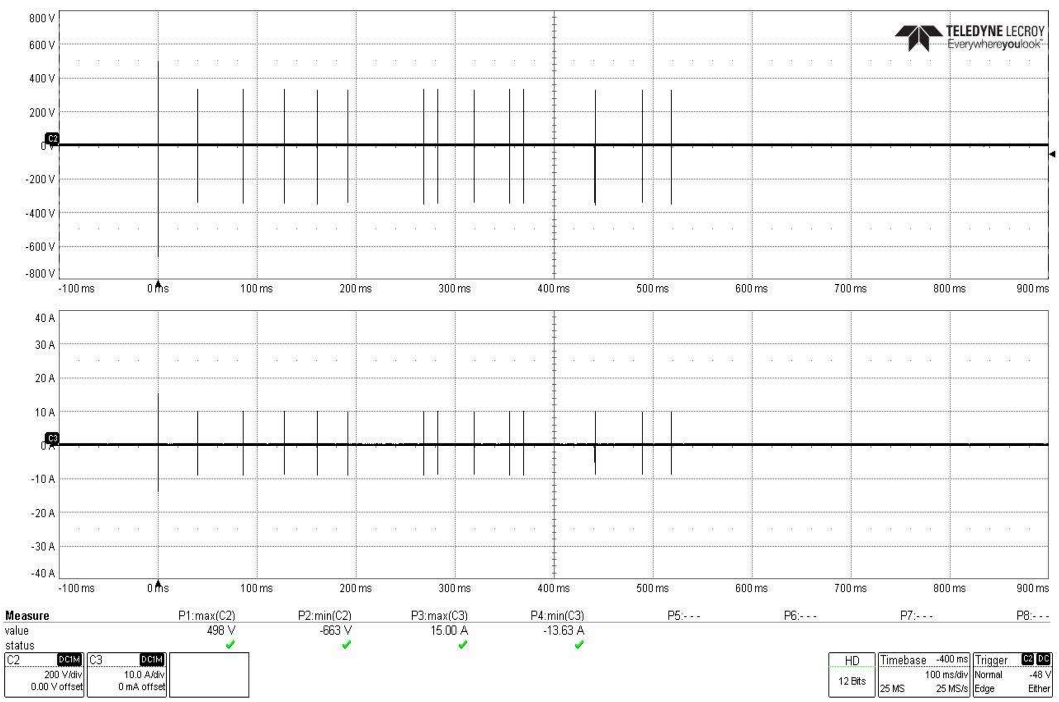


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on AC Power Line 1

EAR Controlled Data

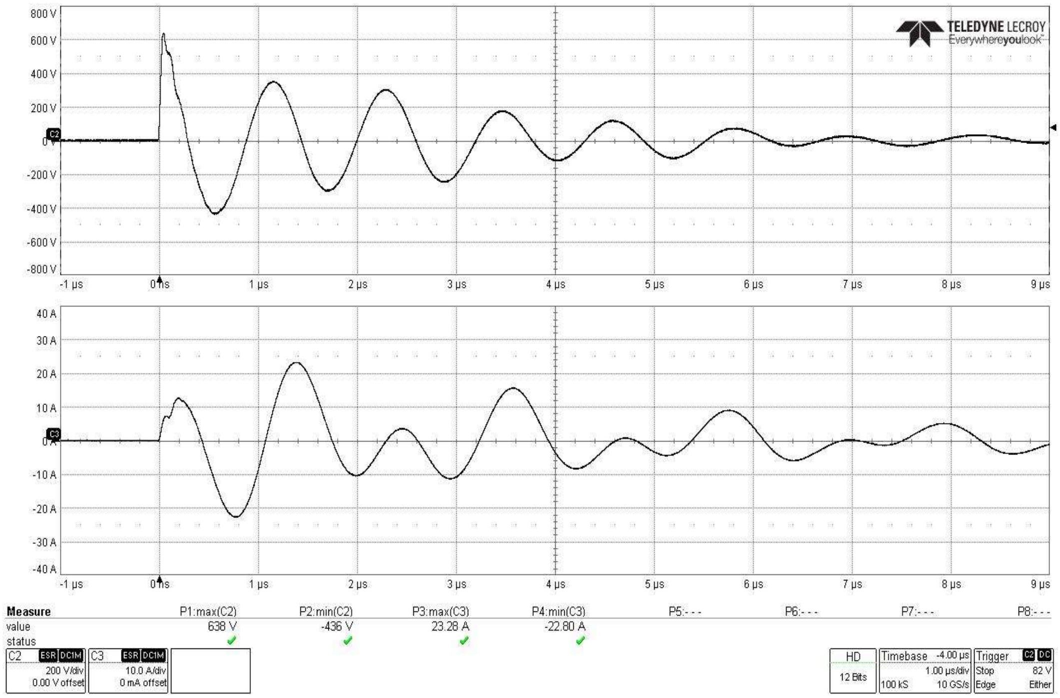


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on AC Power Line 1

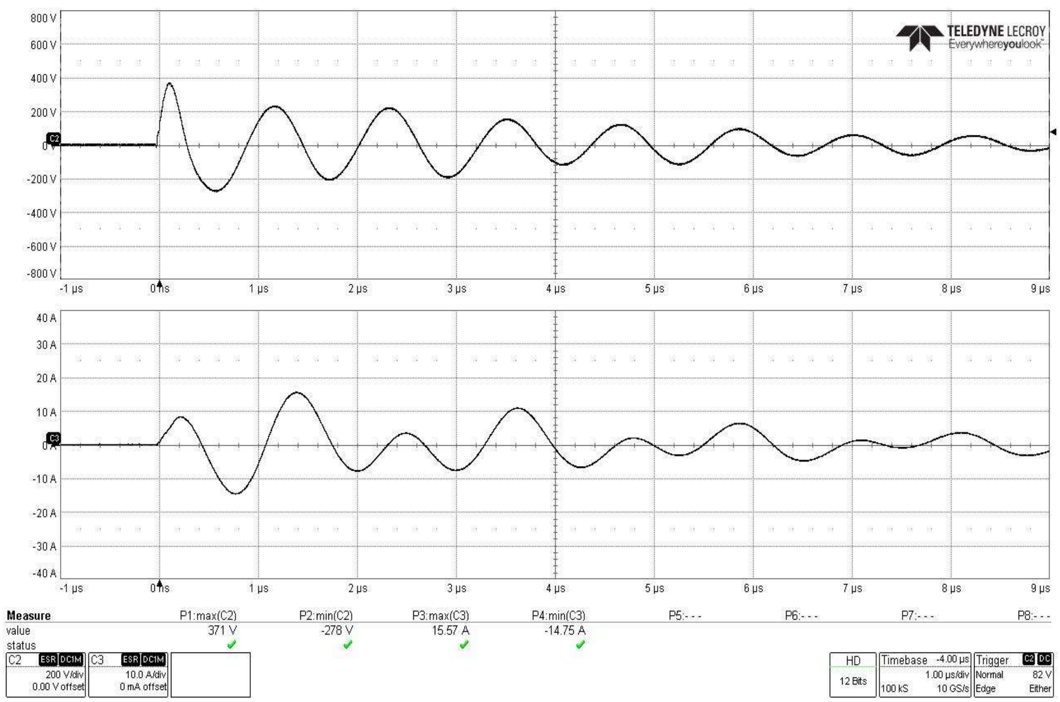


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on AC Power Line 1

EAR Controlled Data

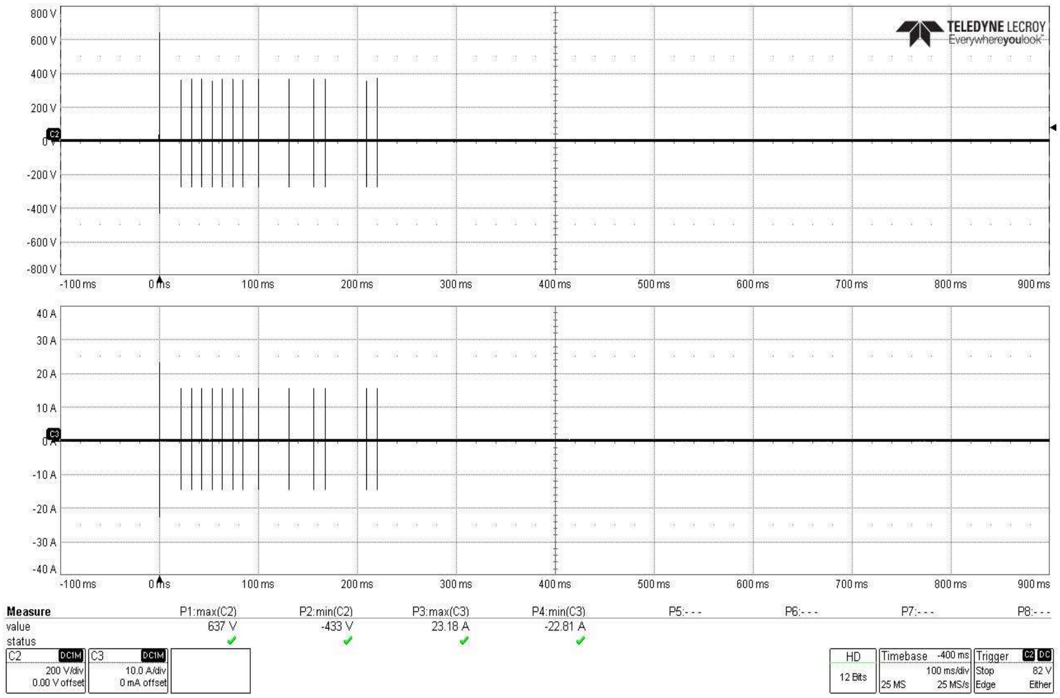


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on AC Power Line 2

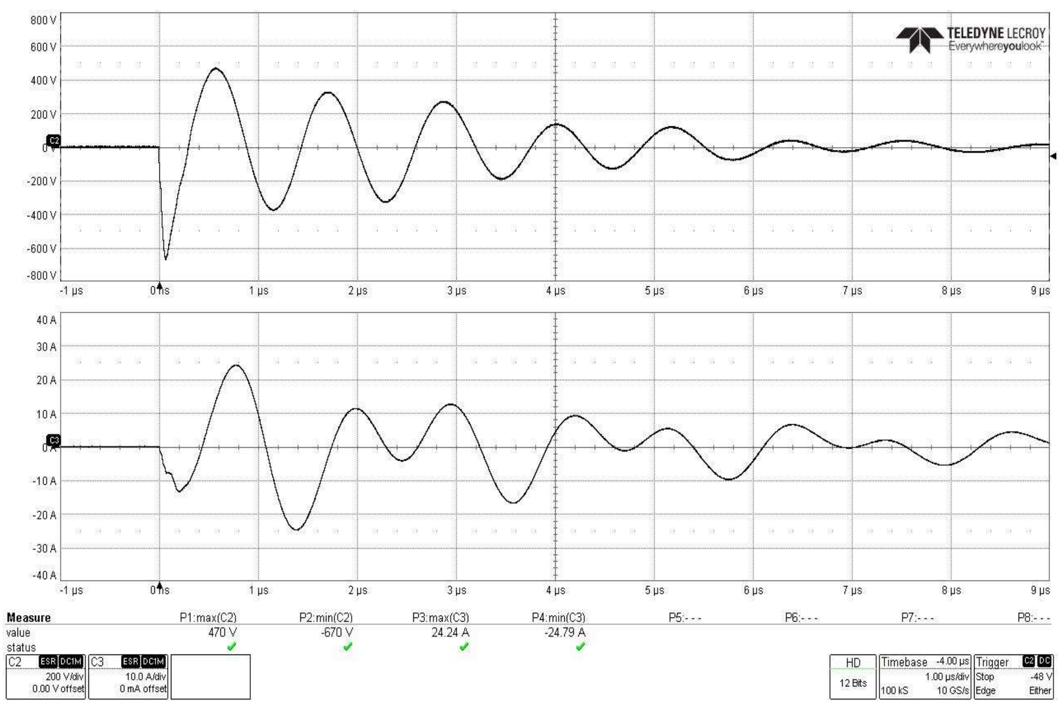


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on AC Power Line 2

EAR Controlled Data

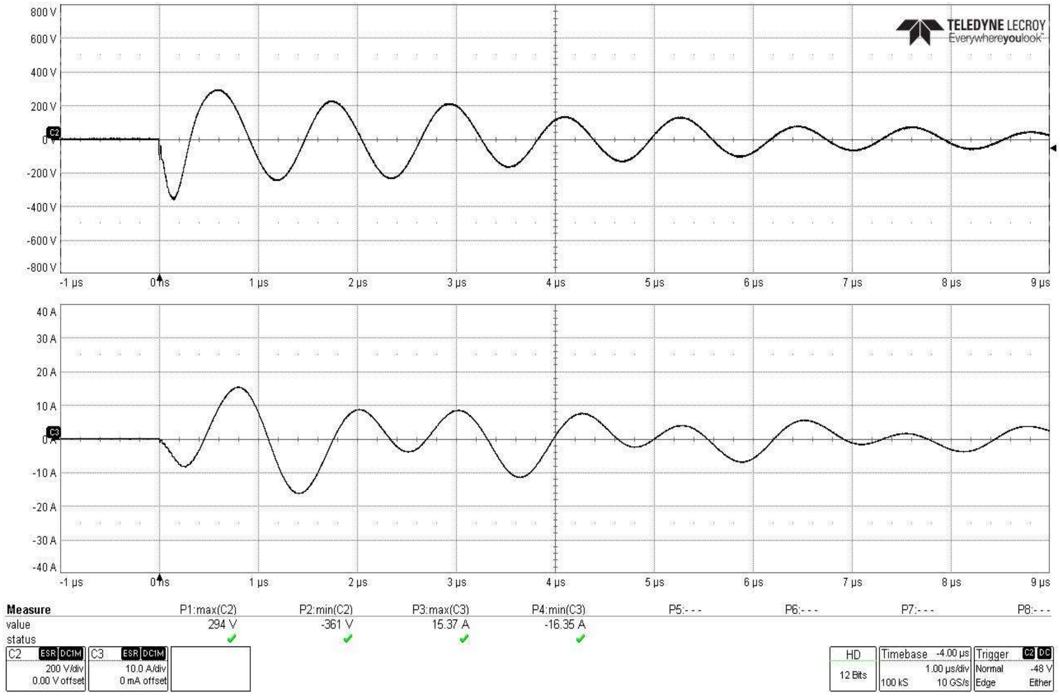


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on AC Power Line 2

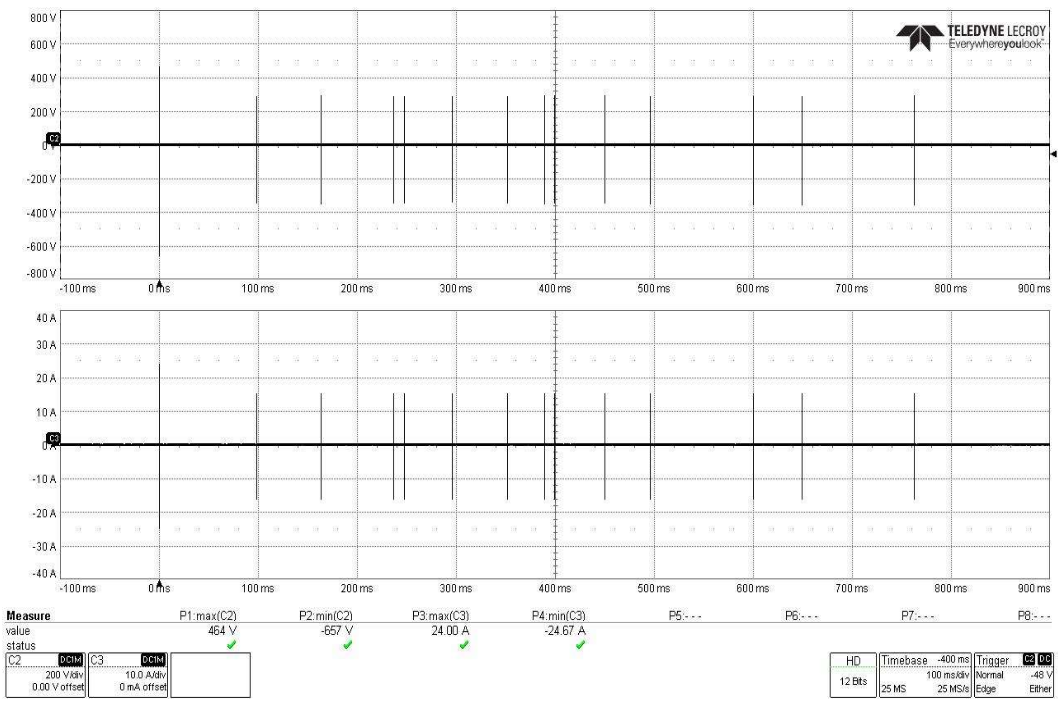


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on AC Power Line 2

EAR Controlled Data

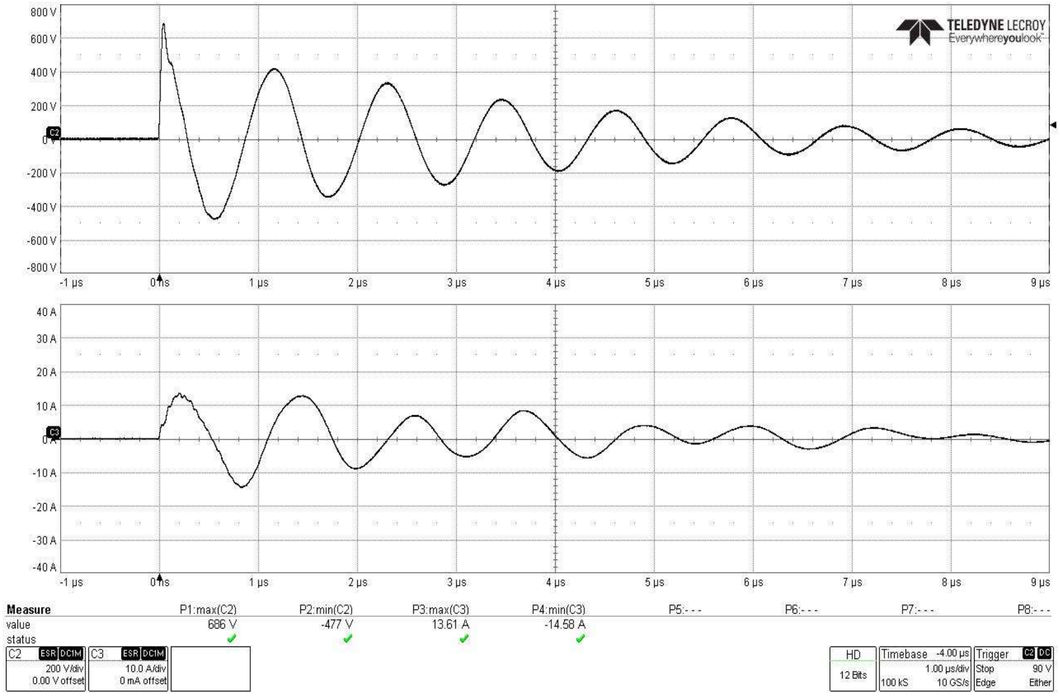


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on AC Power Line 2

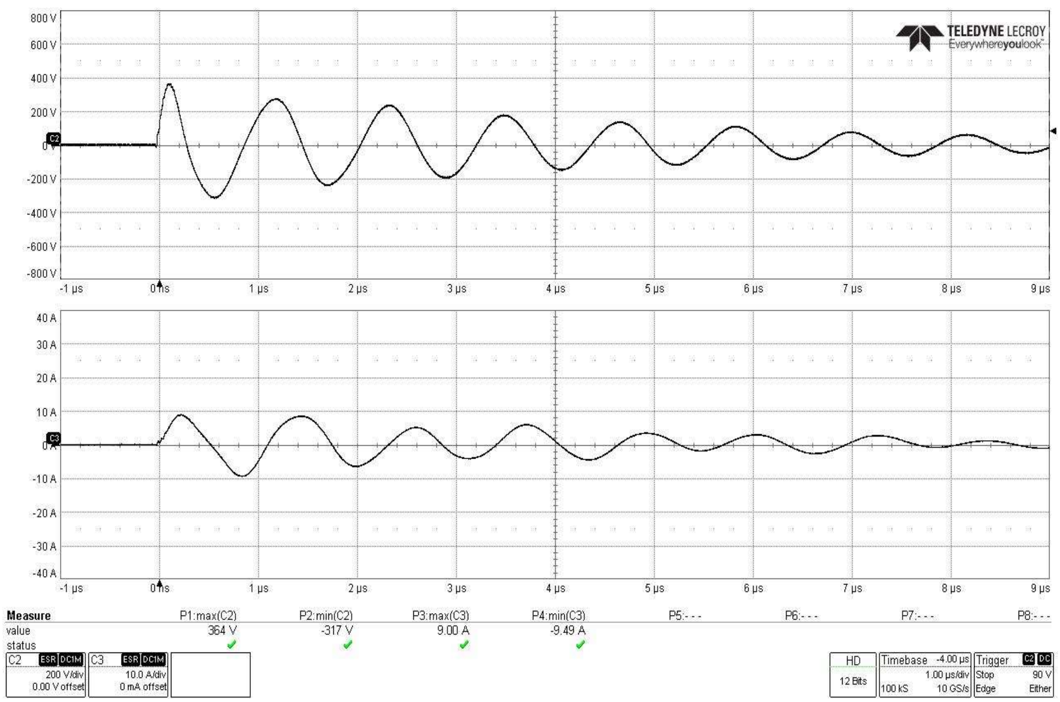


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on AC Power Line 2

EAR Controlled Data

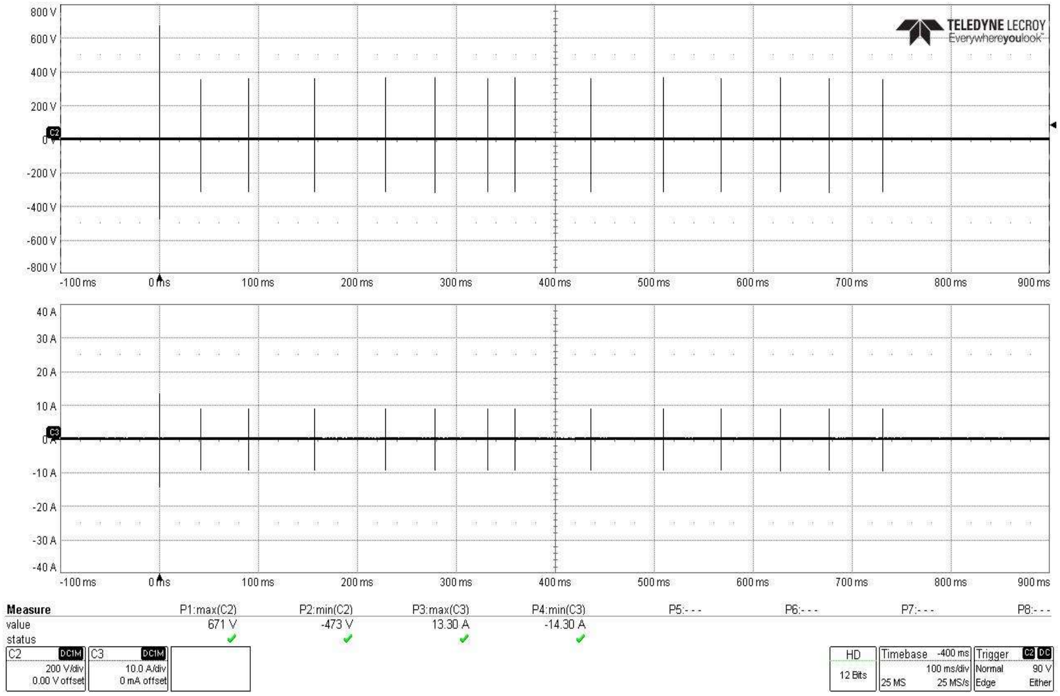


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on Full AC Power Bundle

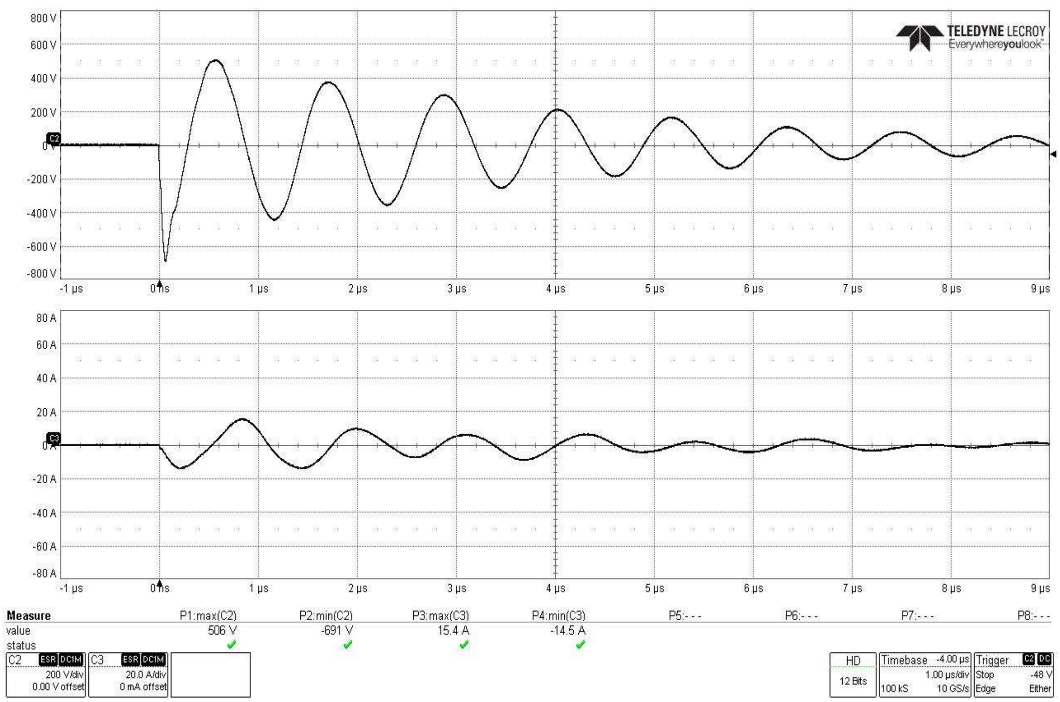


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on Full AC Power Bundle

EAR Controlled Data

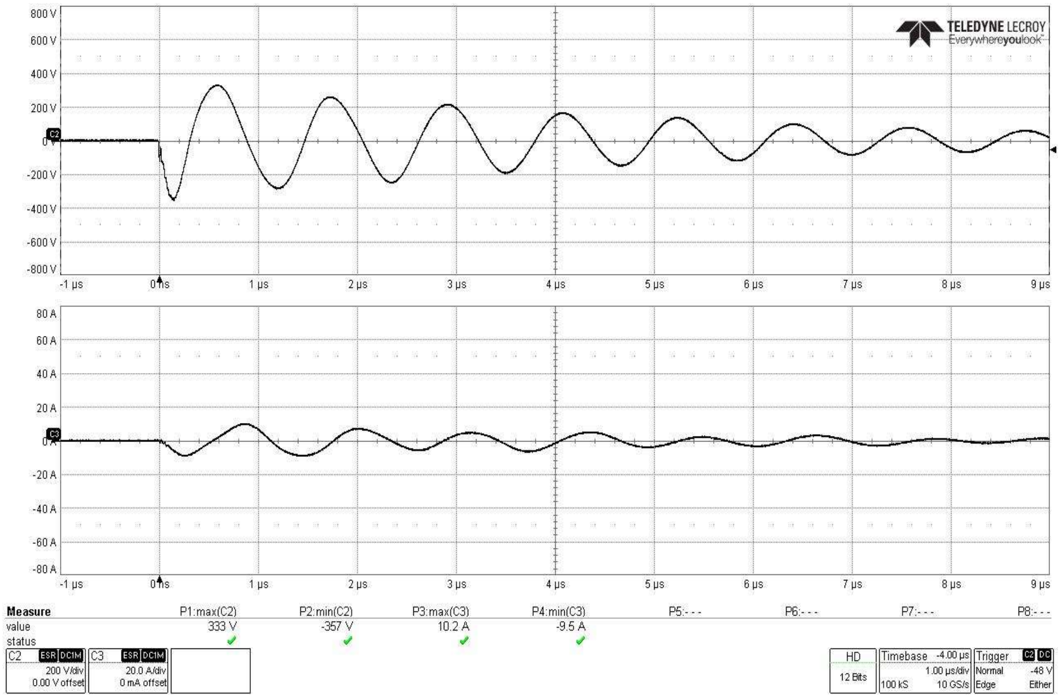


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on Full AC Power Bundle

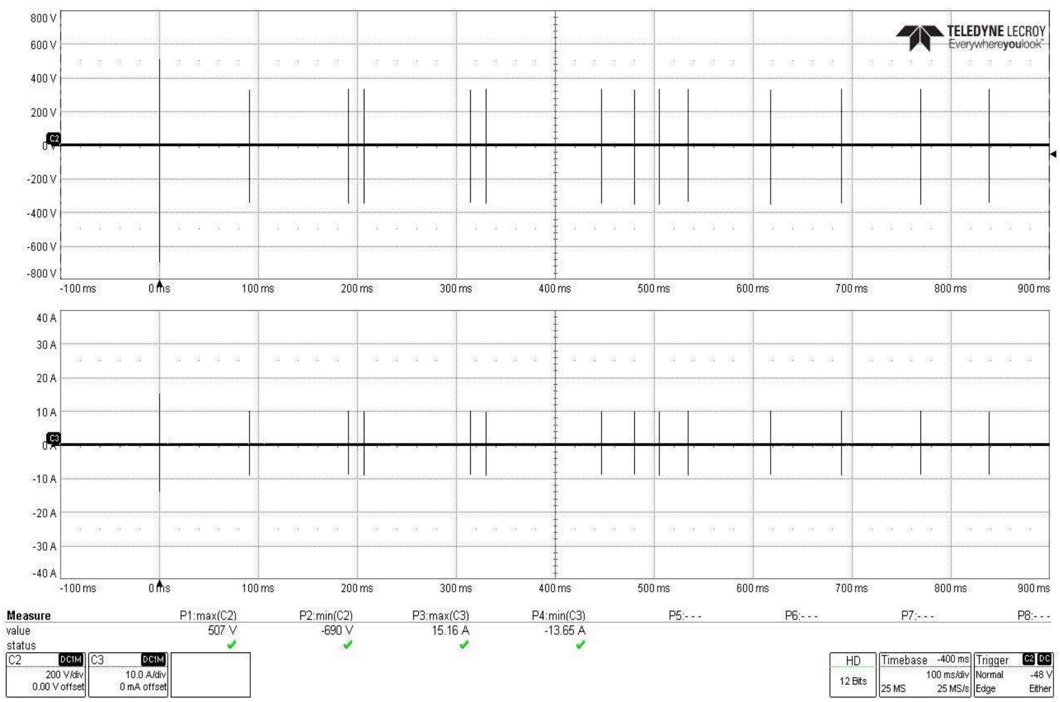


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on Full AC Power Bundle

EAR Controlled Data

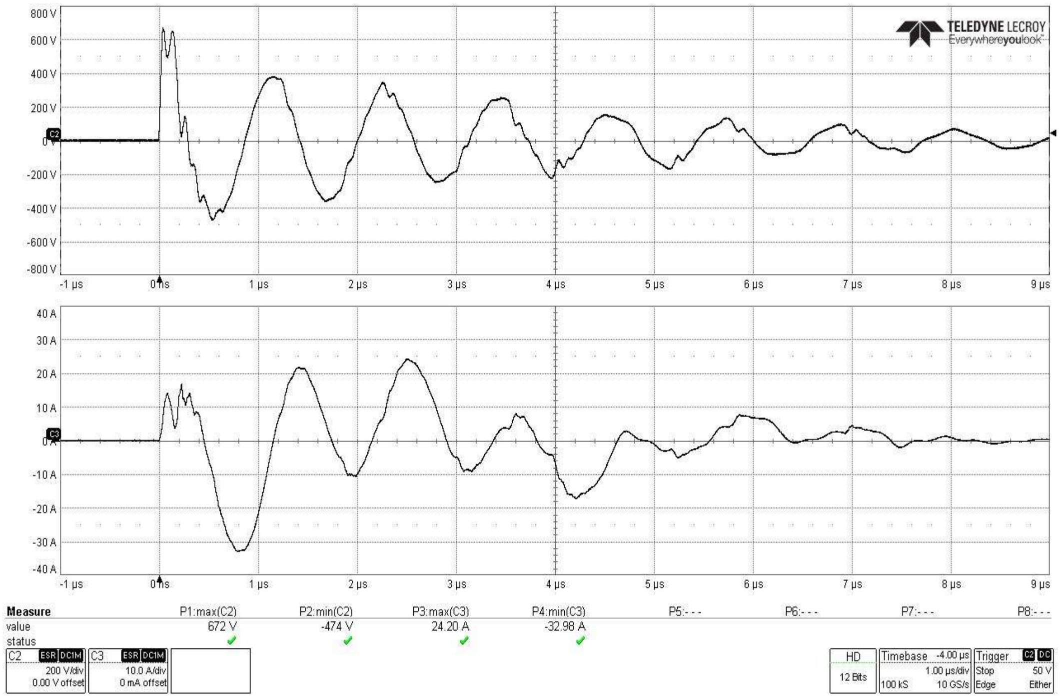


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on Full AC Power Bundle

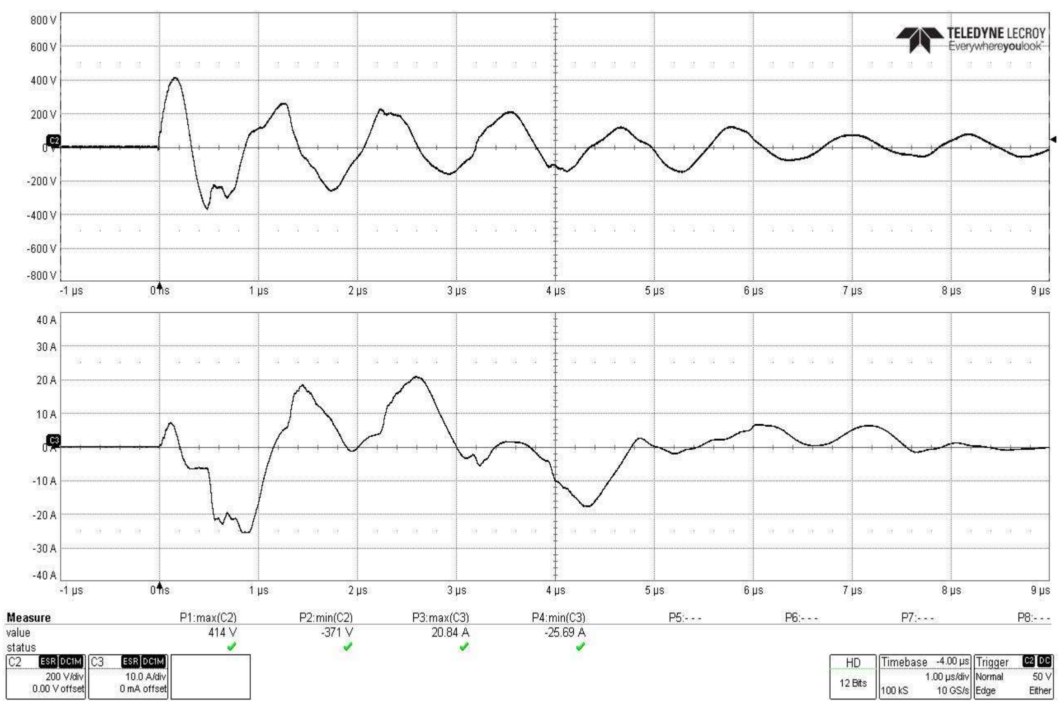


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on Full AC Power Bundle

EAR Controlled Data

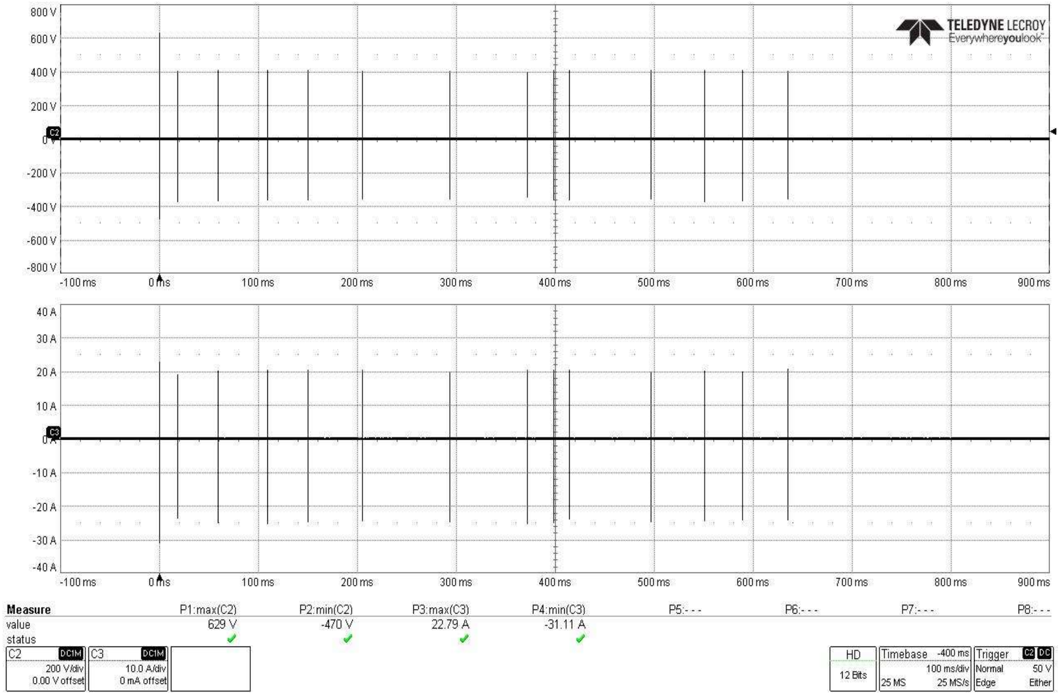


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on DC Power Bundle

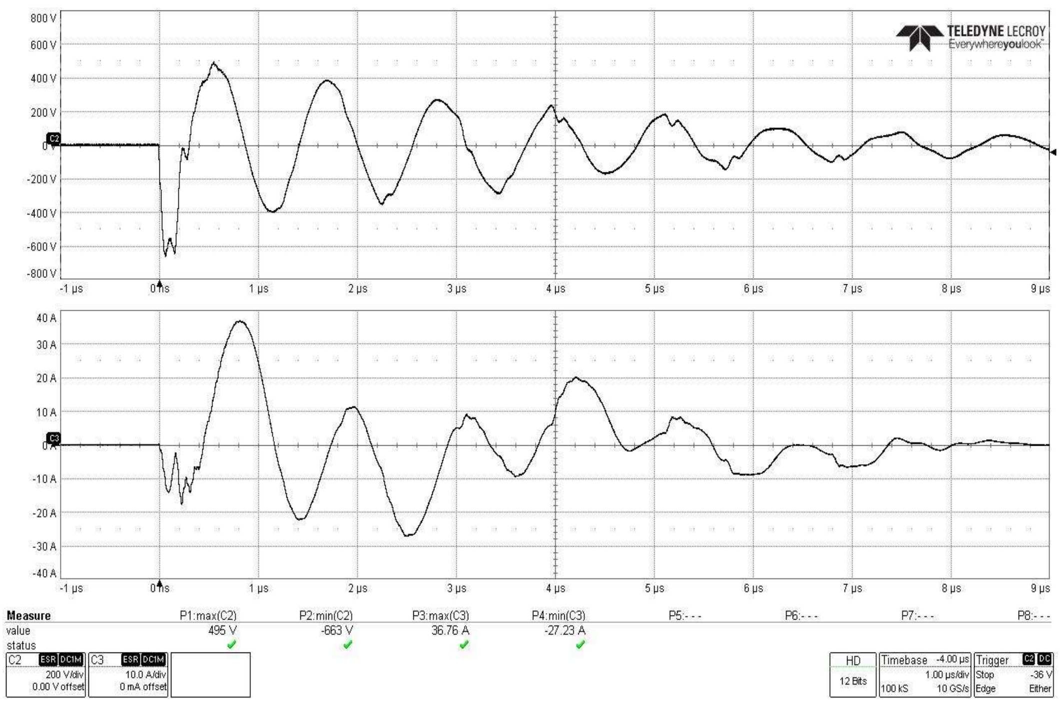


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on DC Power Bundle

EAR Controlled Data

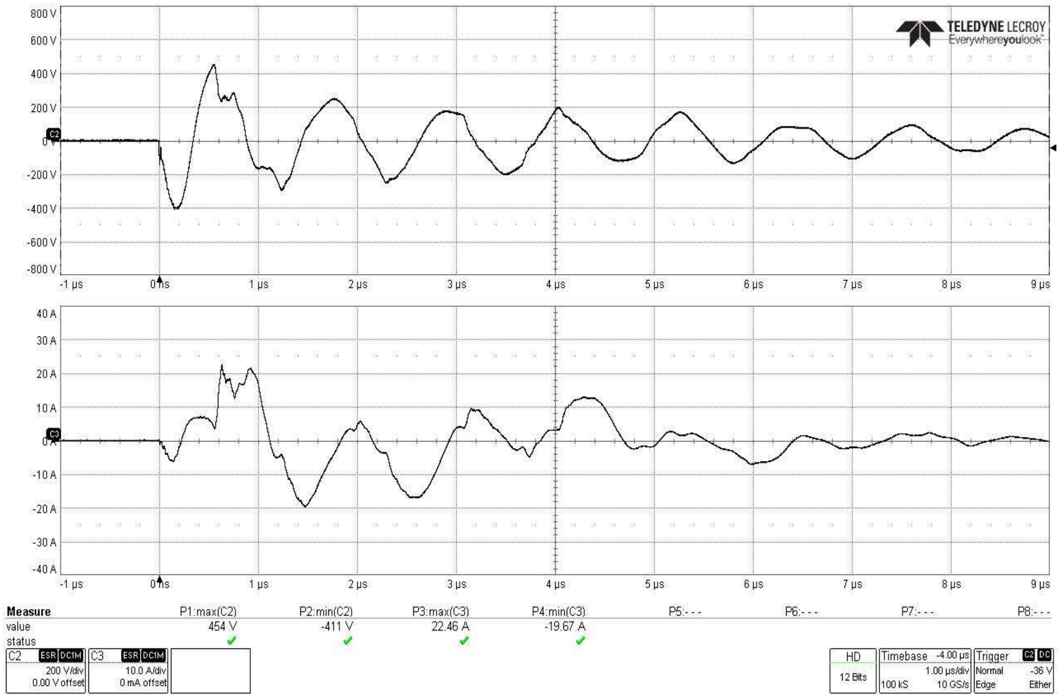


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on DC Power Bundle

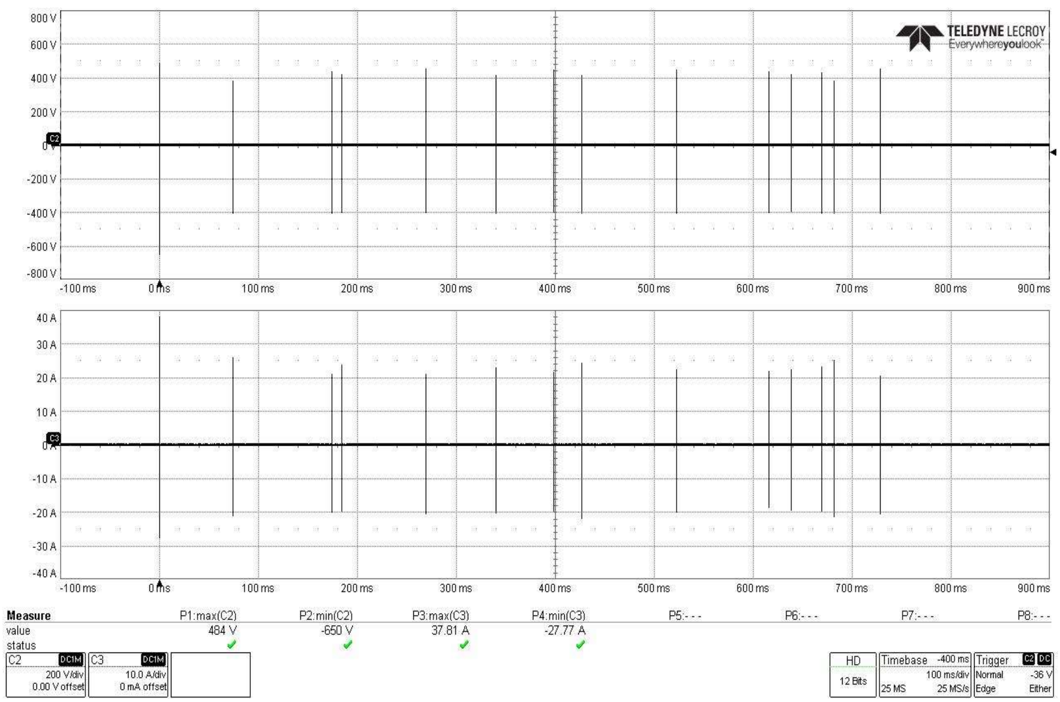


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on DC Power Bundle

EAR Controlled Data

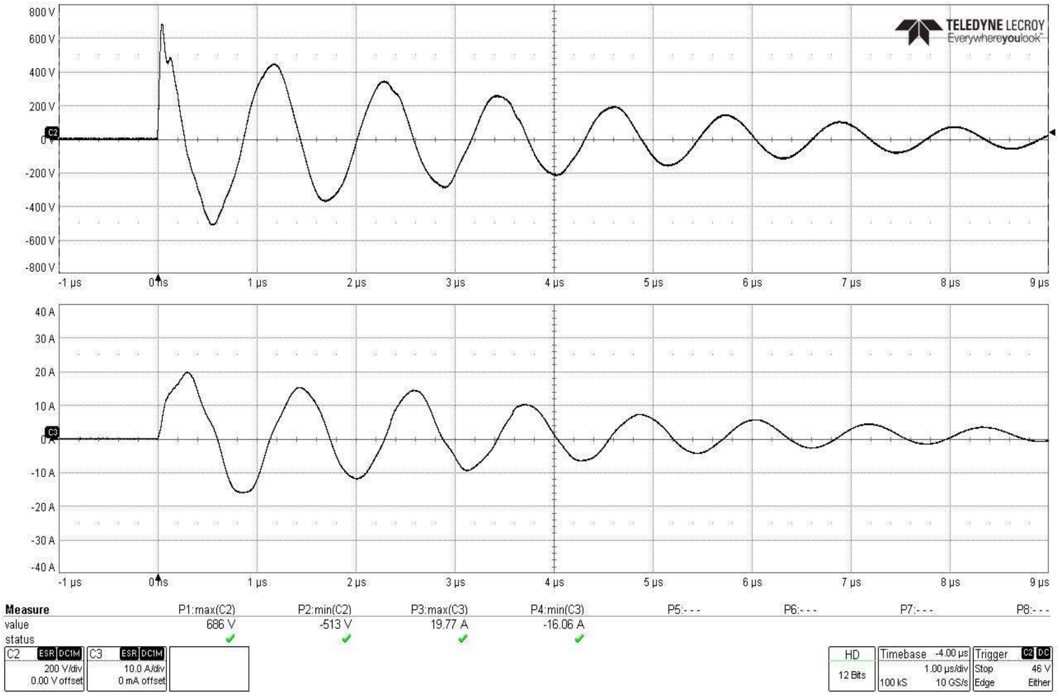


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on DC Power Bundle

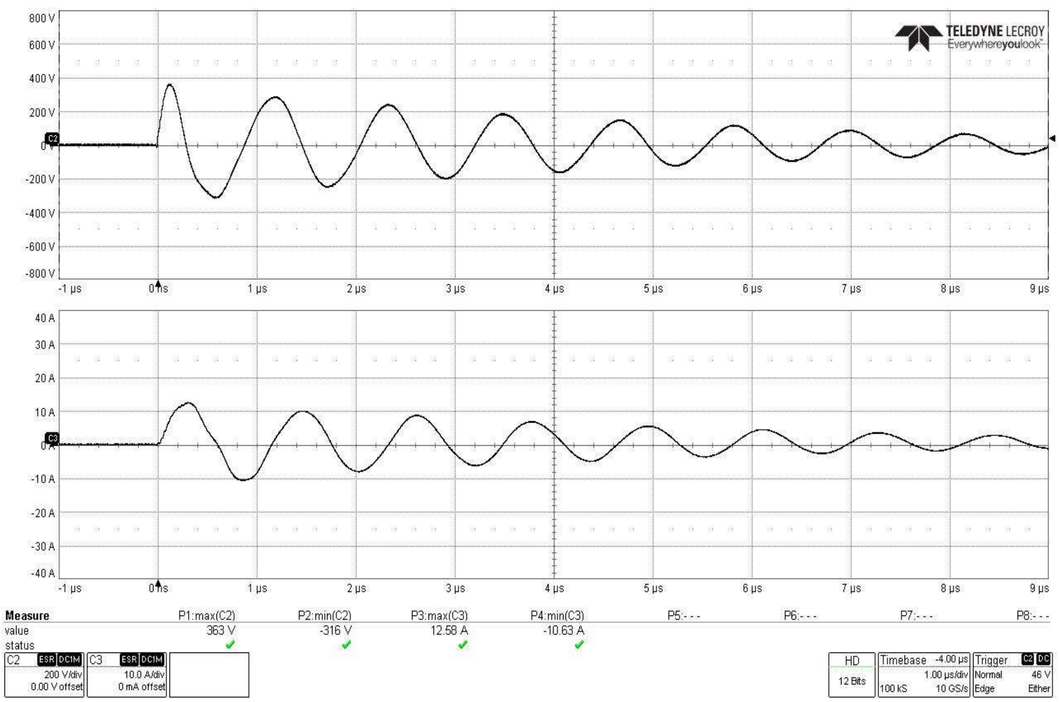


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on DC Power Bundle

EAR Controlled Data

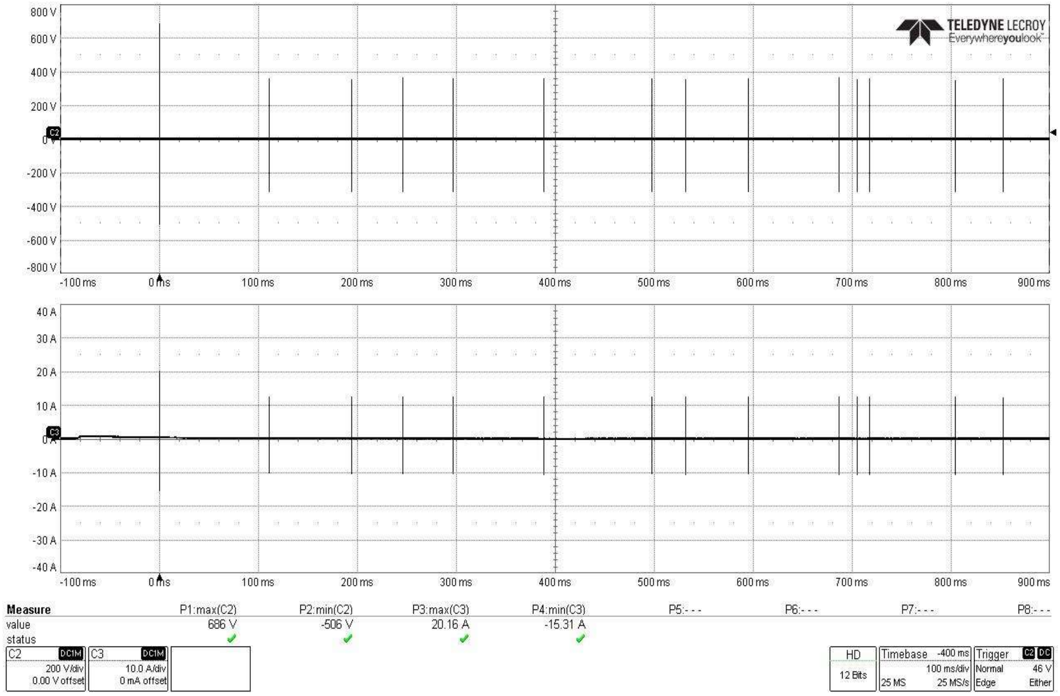


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on DC High Side

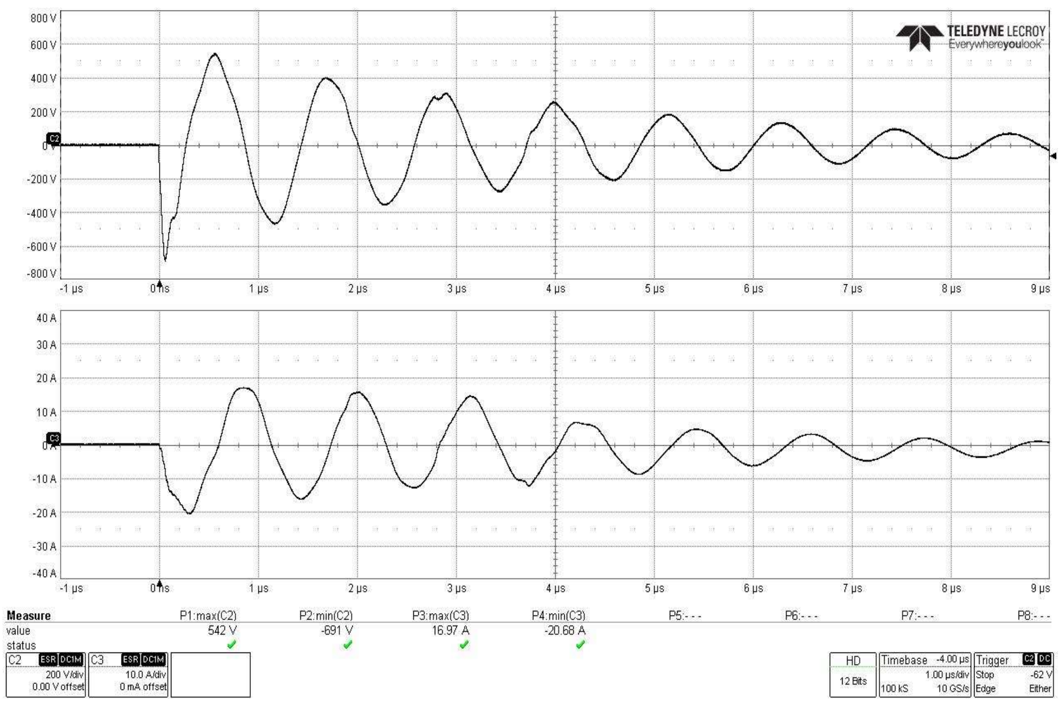


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on DC High Side

EAR Controlled Data

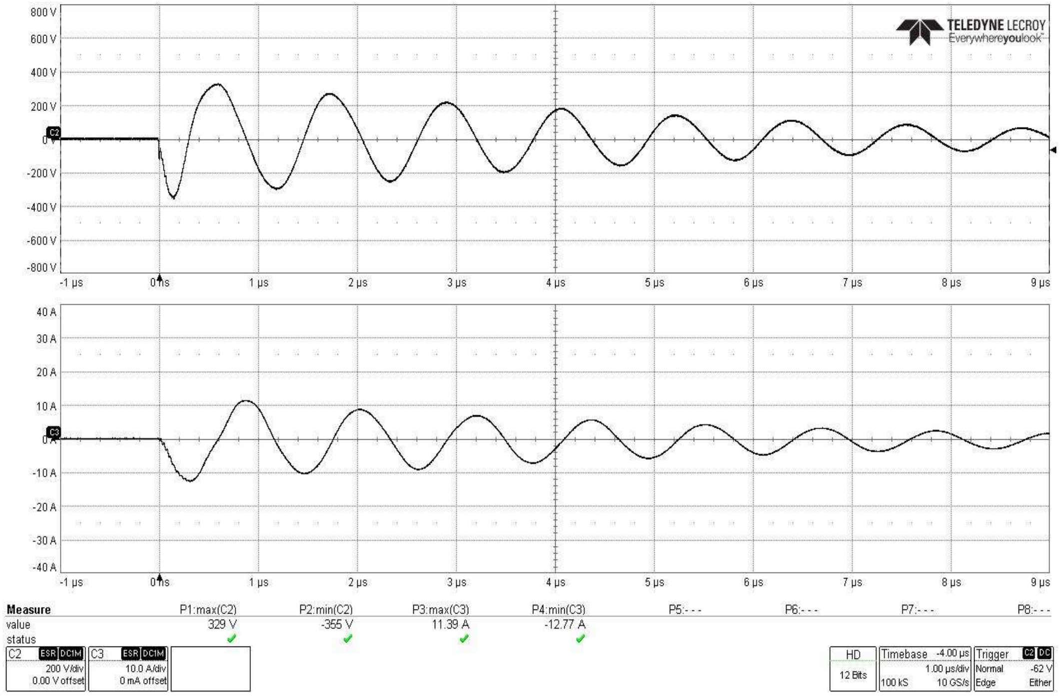


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on DC High Side

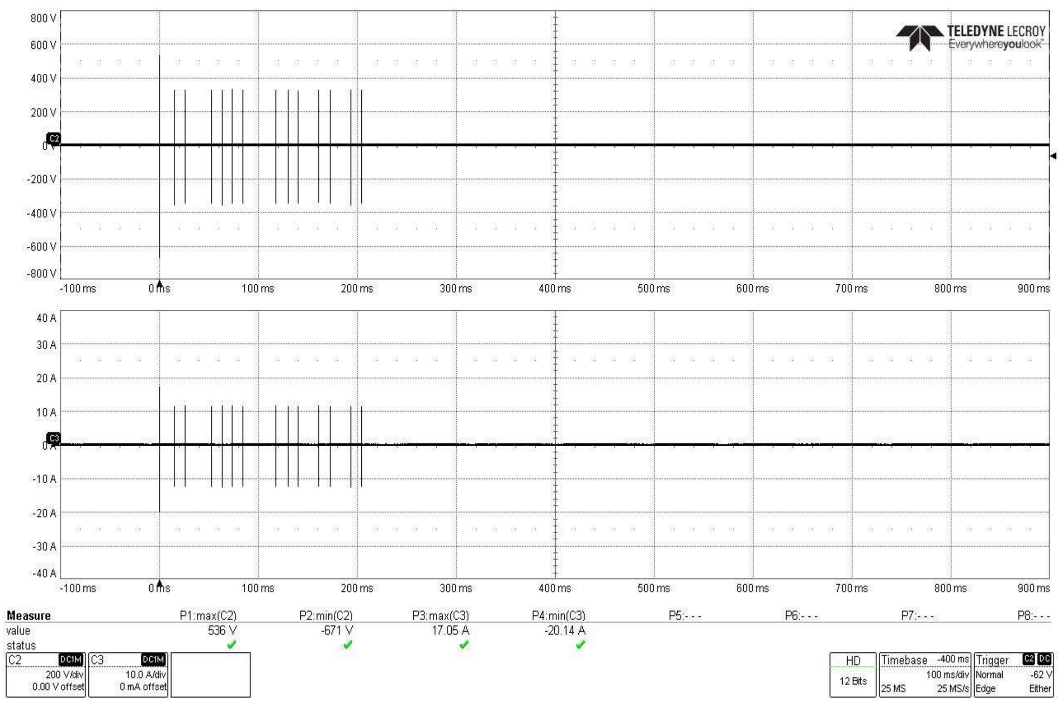


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on DC High Side

EAR Controlled Data

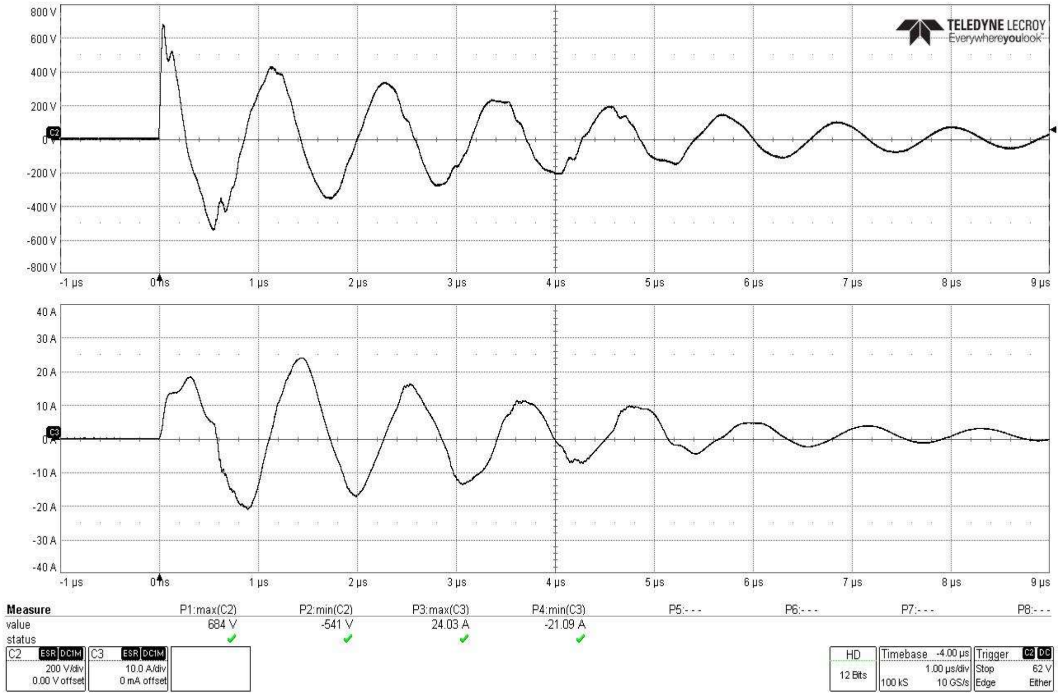


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on DC High Side

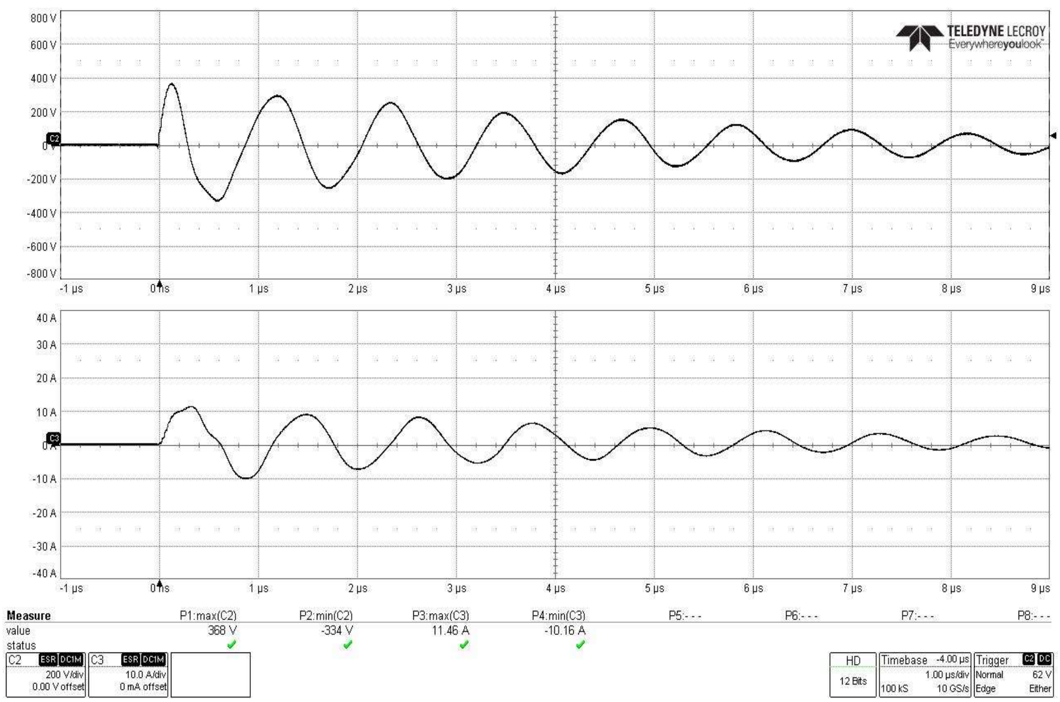


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on DC High Side

EAR Controlled Data

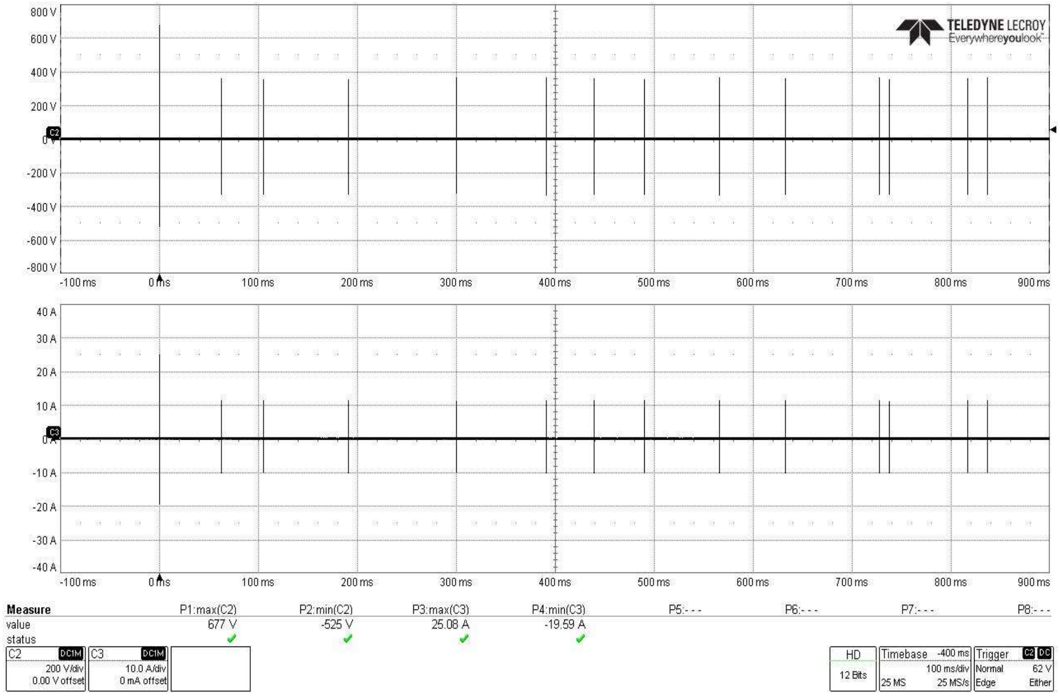


Actual Test CS117 Waveform #3 at 1MHz, First Transient +600V, on DC Return Side

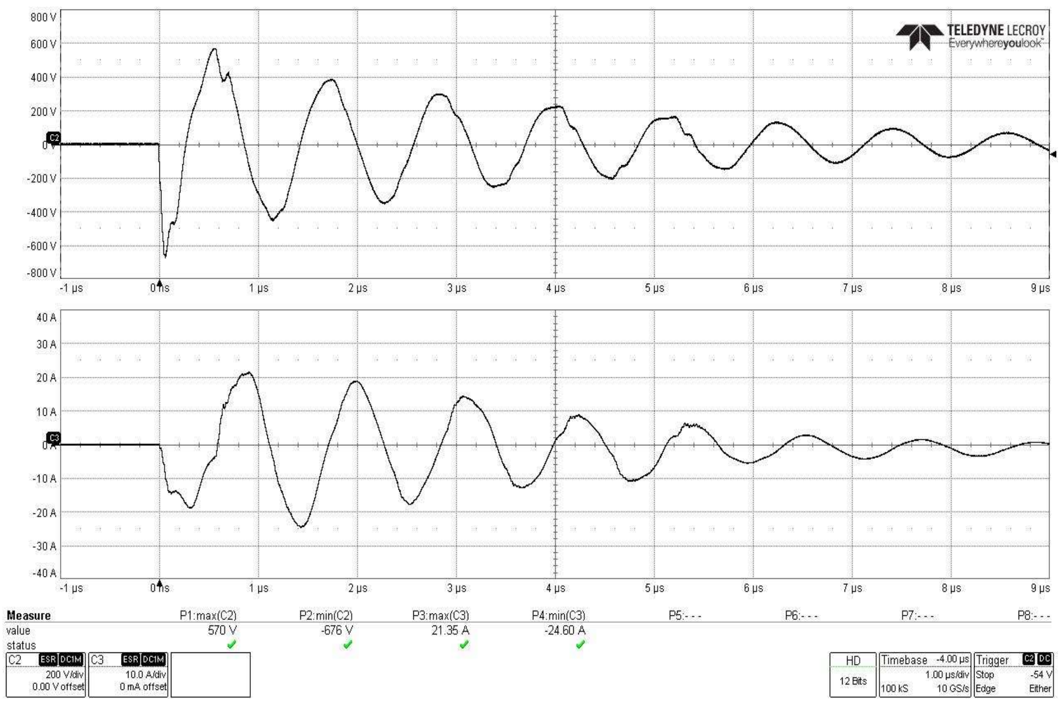


Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient +300V, on DC Return Side

EAR Controlled Data

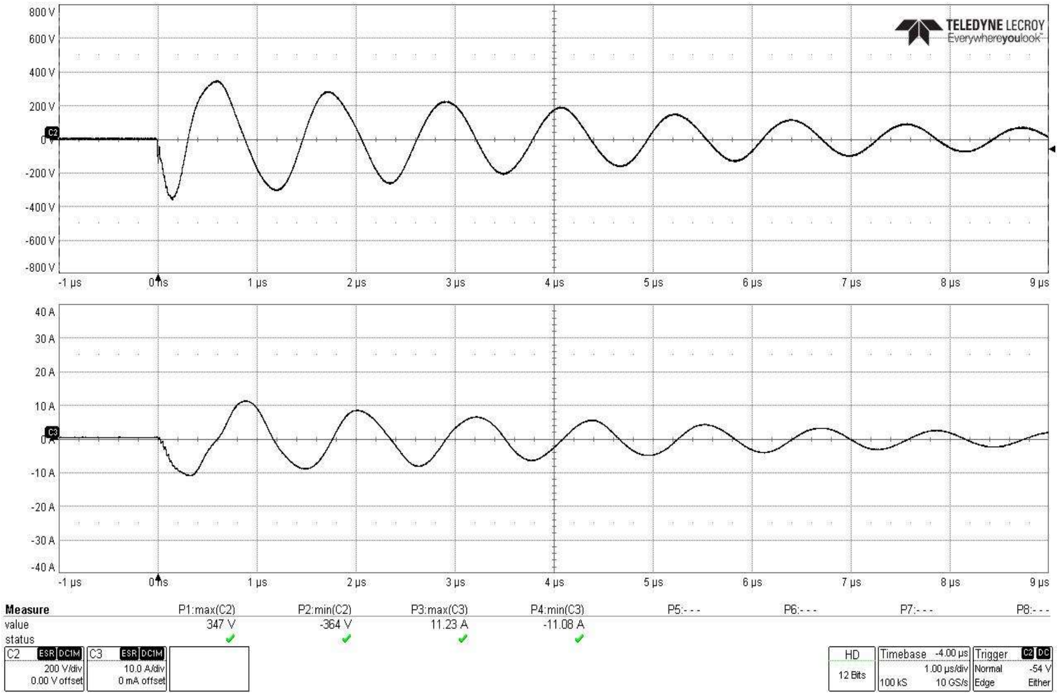


Actual Test CS117 Waveform #3 at 1MHz, 14 Transients +600/+300V, on DC Return Side

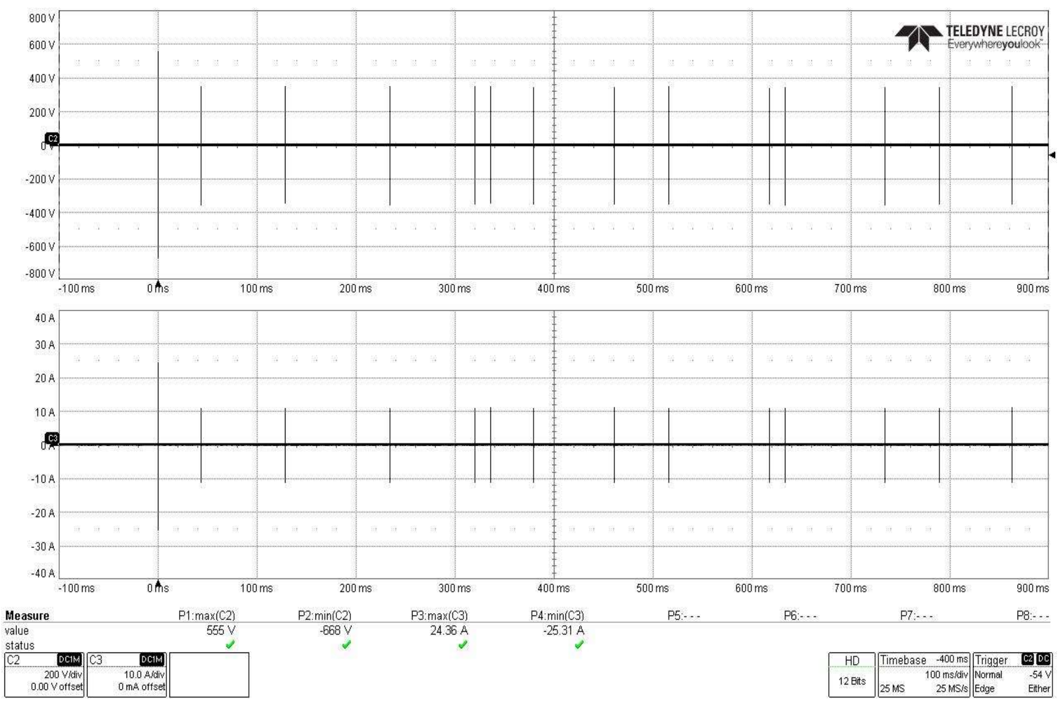


Actual Test CS117 Waveform #3 at 1MHz, First Transient -600V, on DC Return Side

EAR Controlled Data



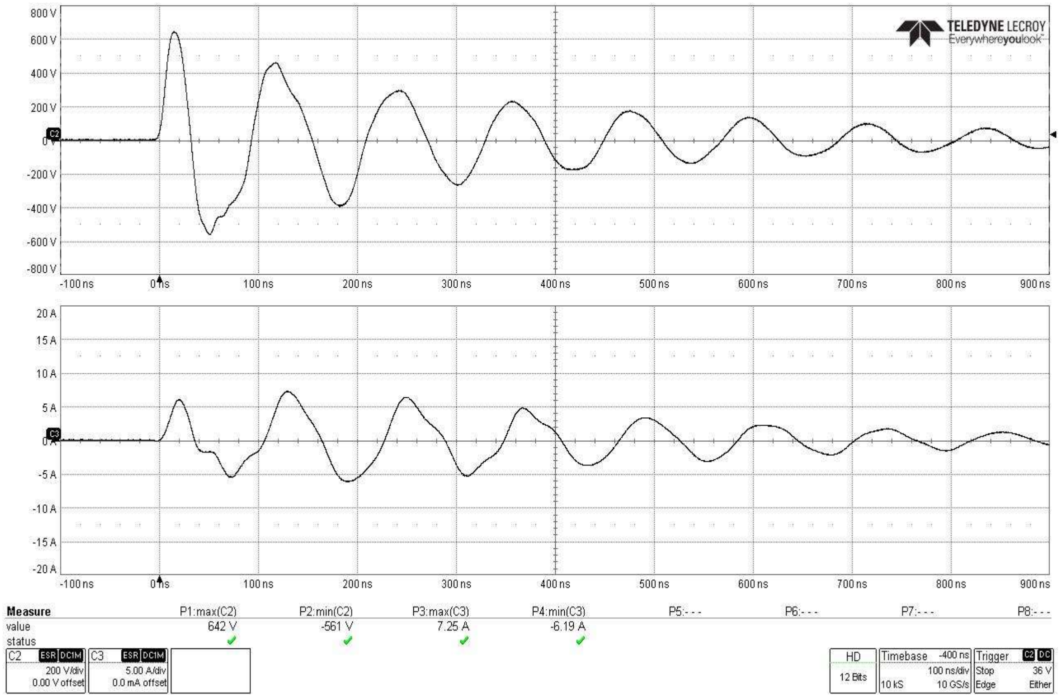
Actual Test CS117 Waveform #3 at 1MHz, Subsequent Transient -300V, on DC Return Side



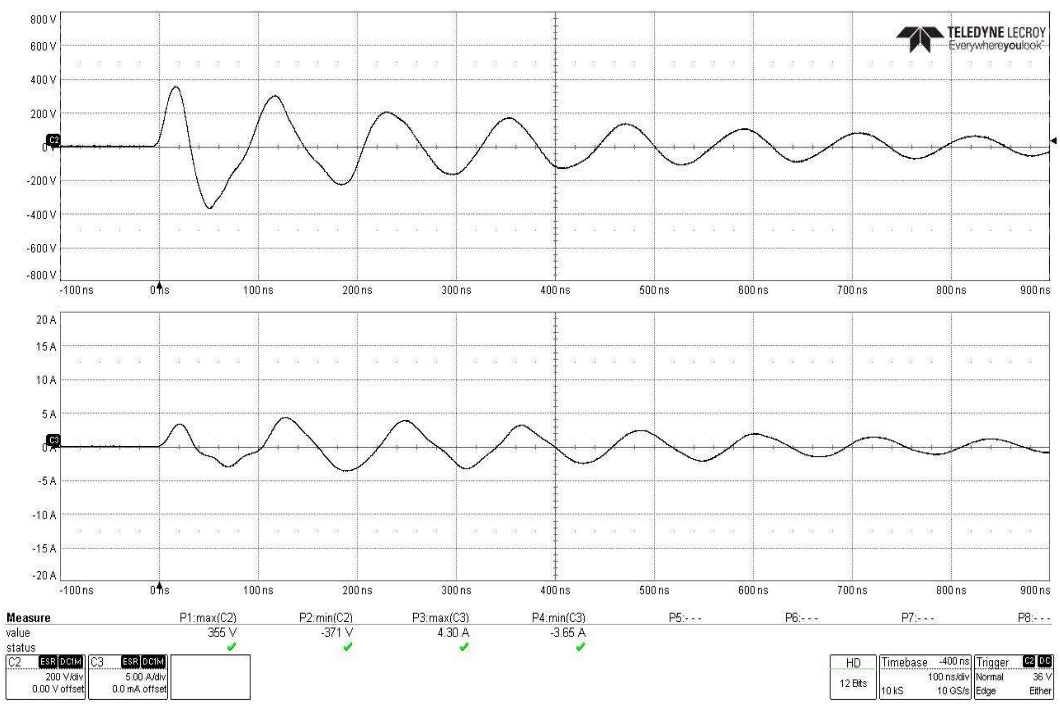
Actual Test CS117 Waveform #3 at 1MHz, 14 Transients -600/-300V, on DC Return Side

EAR Controlled Data

CS117 Actual Test Waveform #3 at 10MHz with VT = 600V on Flexboss 18

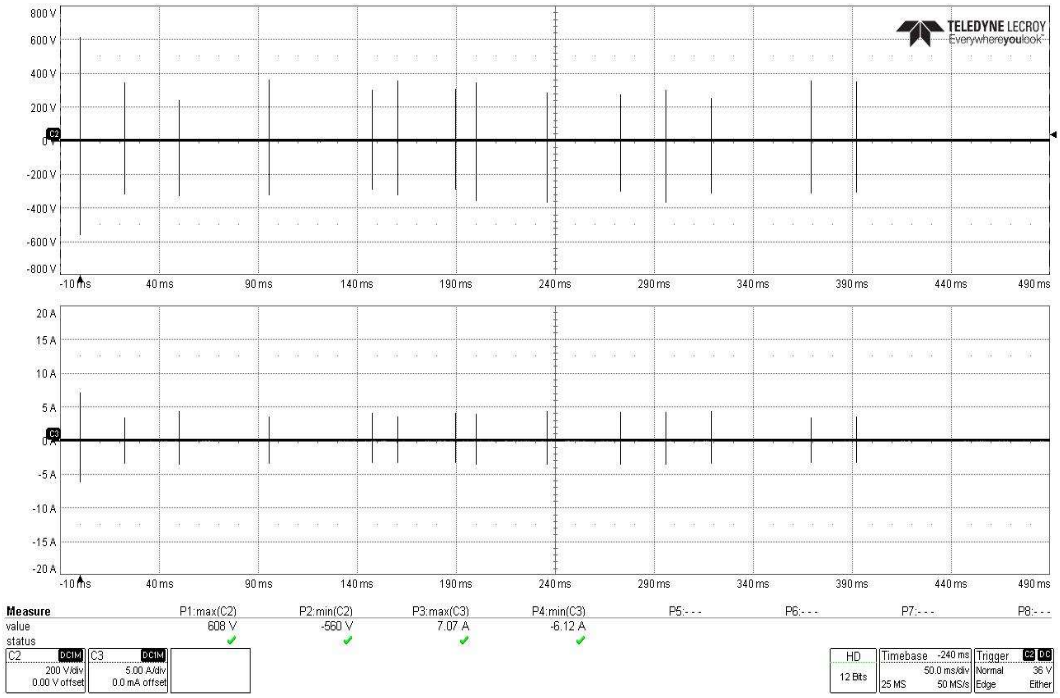


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on AC Power Line 1

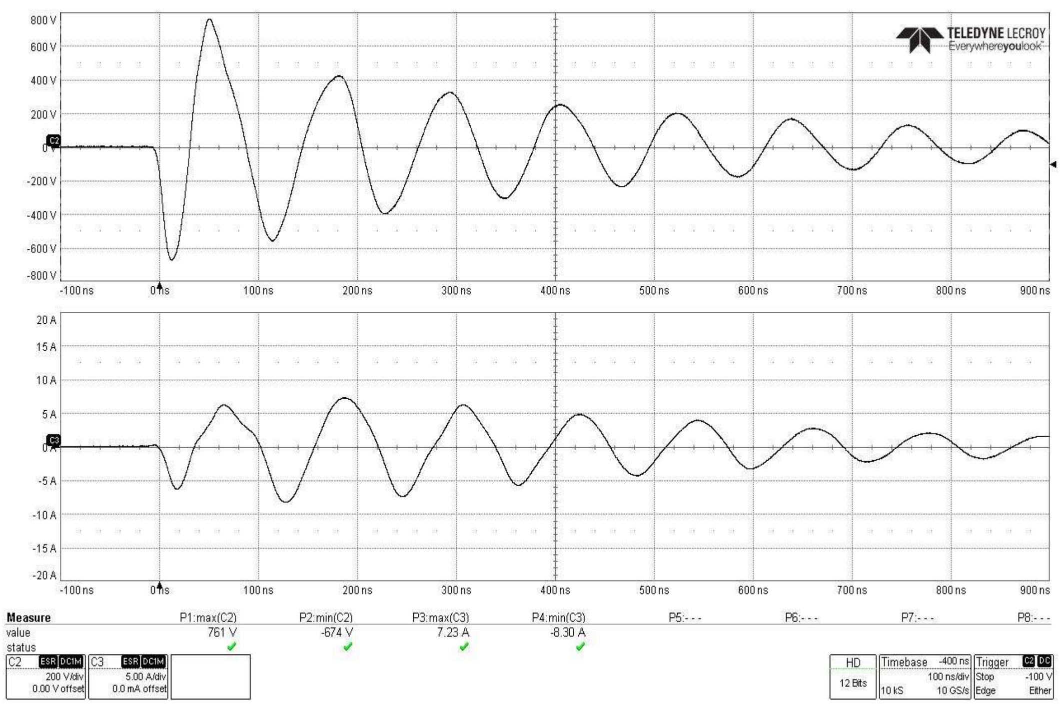


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on AC Power Line 1

EAR Controlled Data

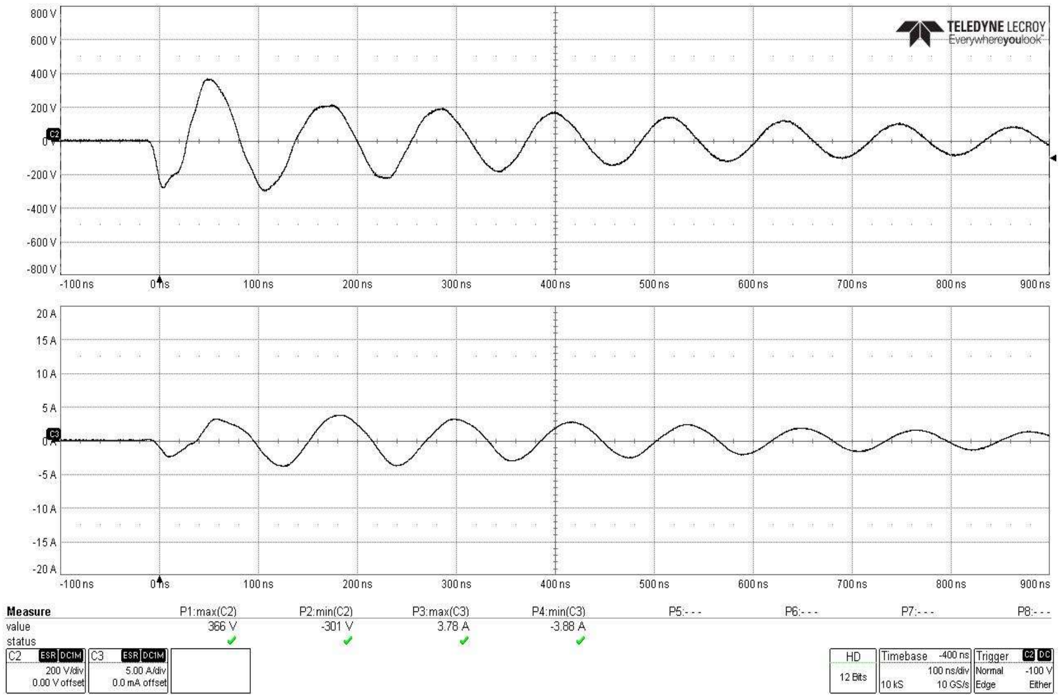


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on AC Power Line 1

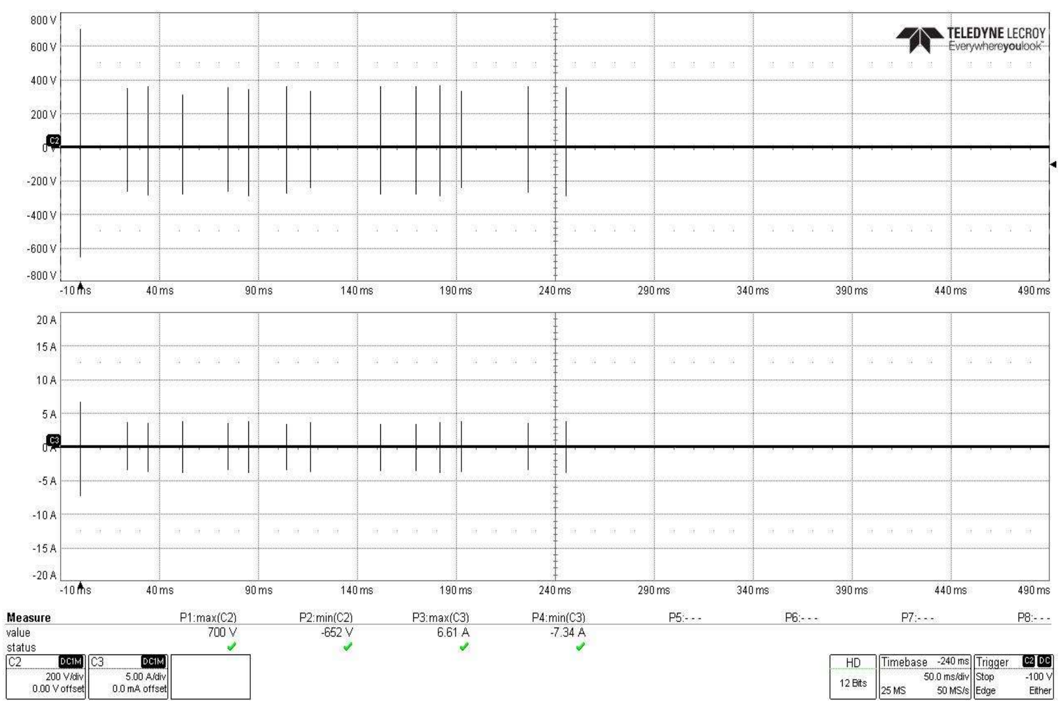


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on AC Power Line 1

EAR Controlled Data

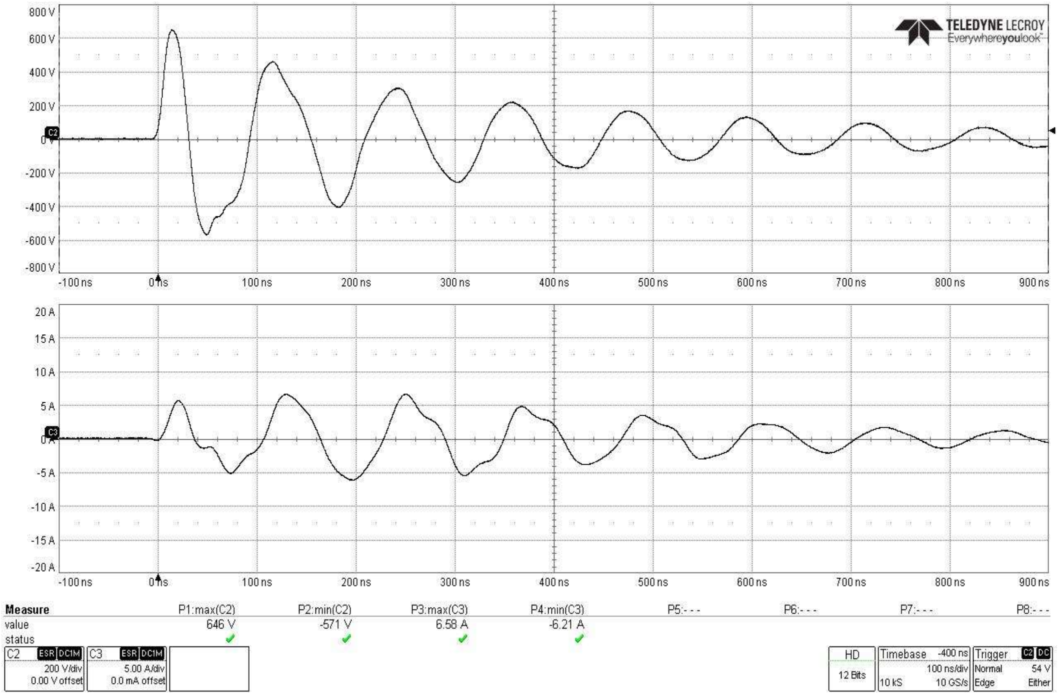


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on AC Power Line 1

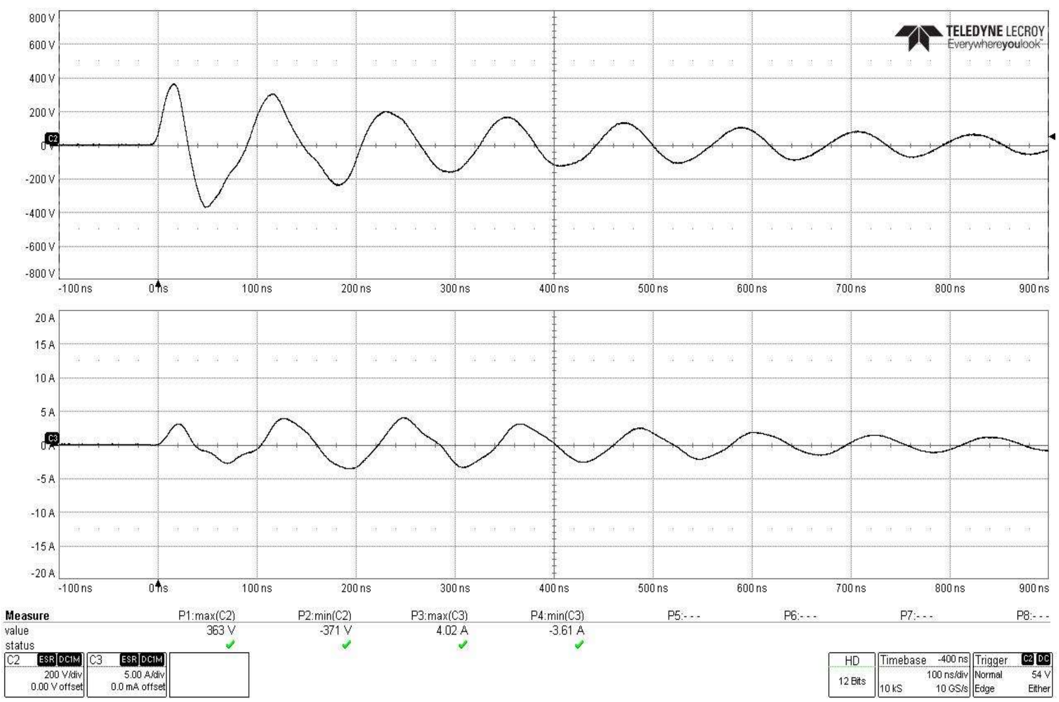


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on AC Power Line 1

EAR Controlled Data

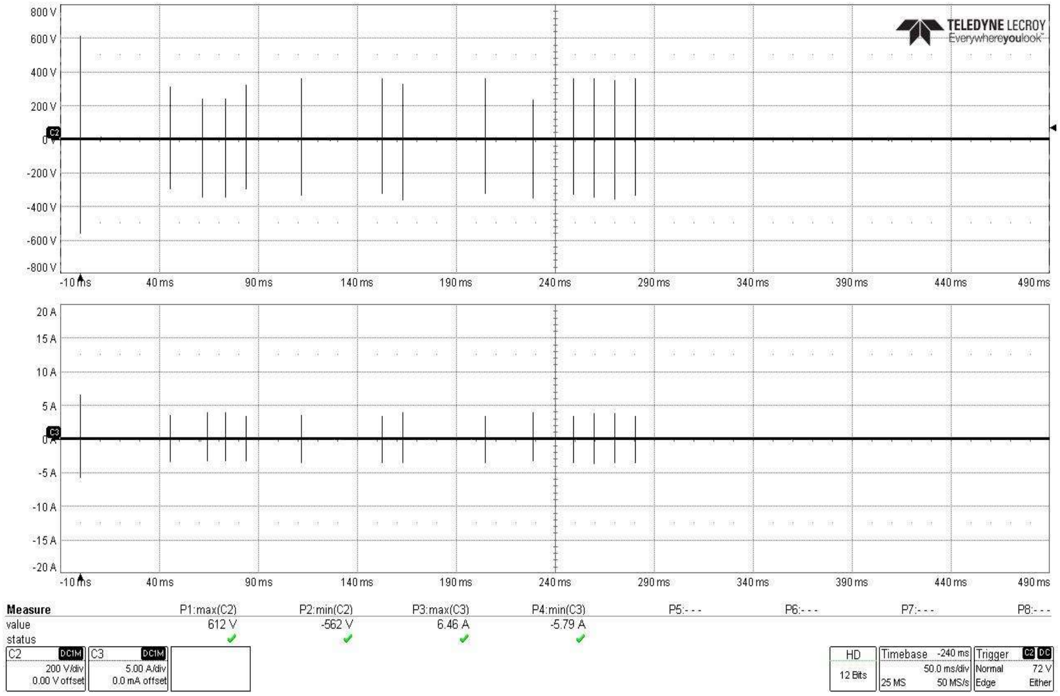


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on AC Power Line 2

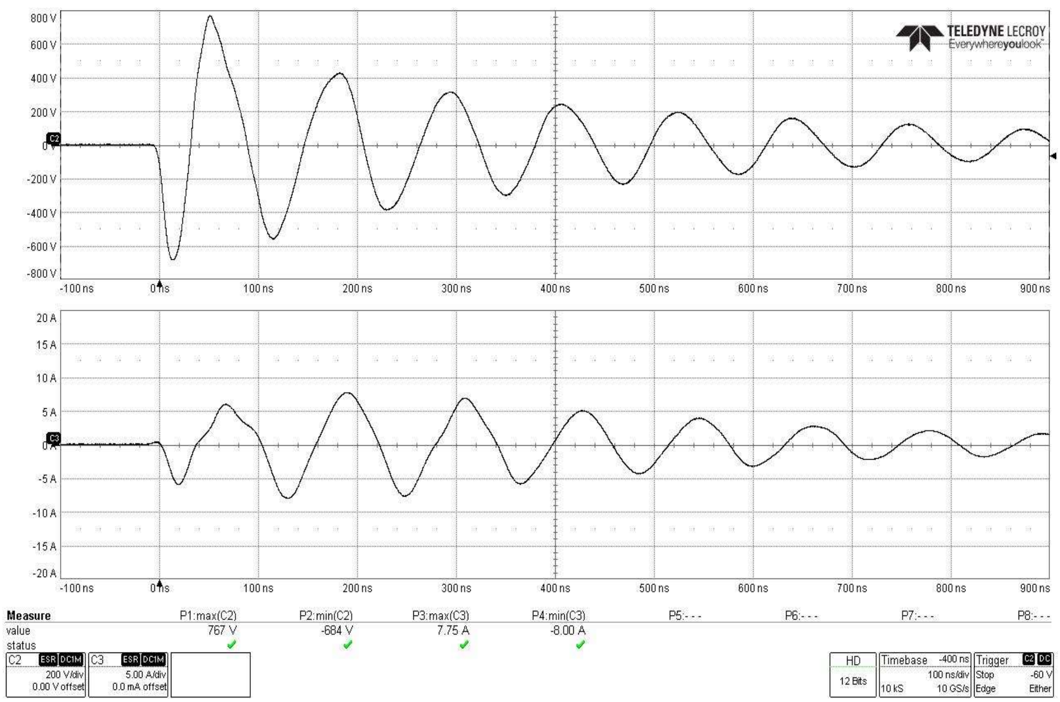


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on AC Power Line 2

EAR Controlled Data

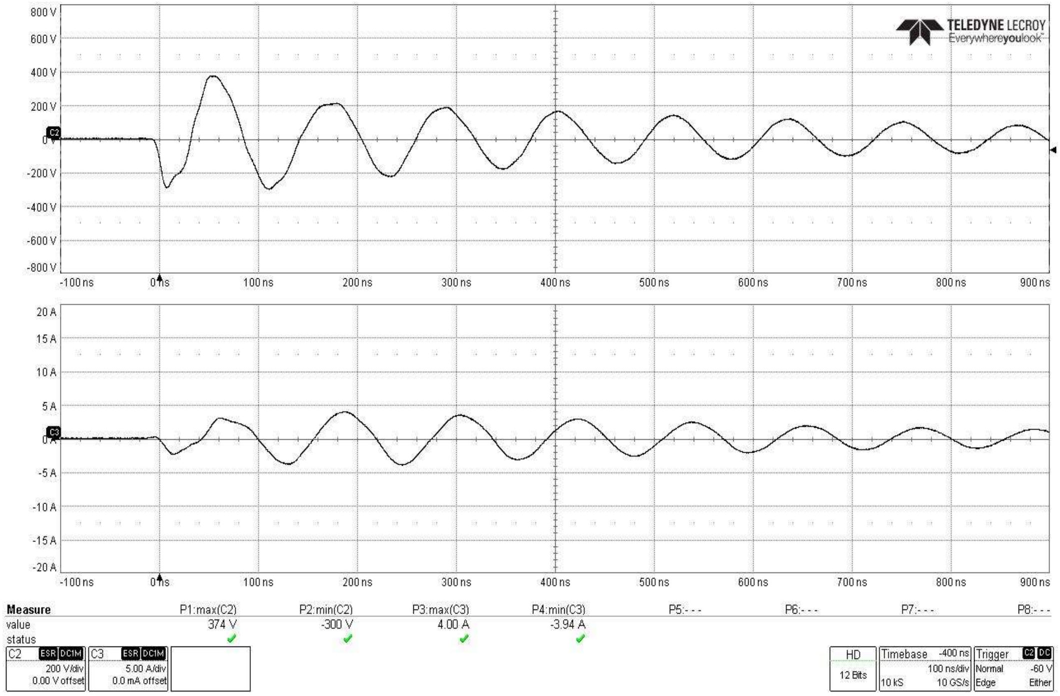


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on AC Power Line 2

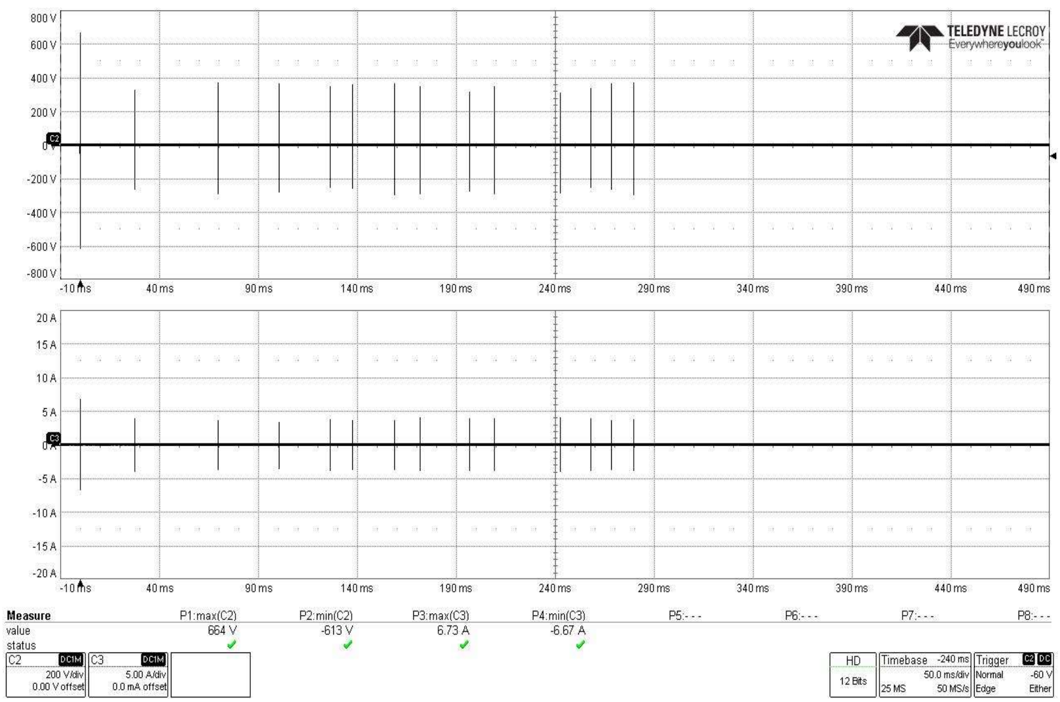


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on AC Power Line 2

EAR Controlled Data

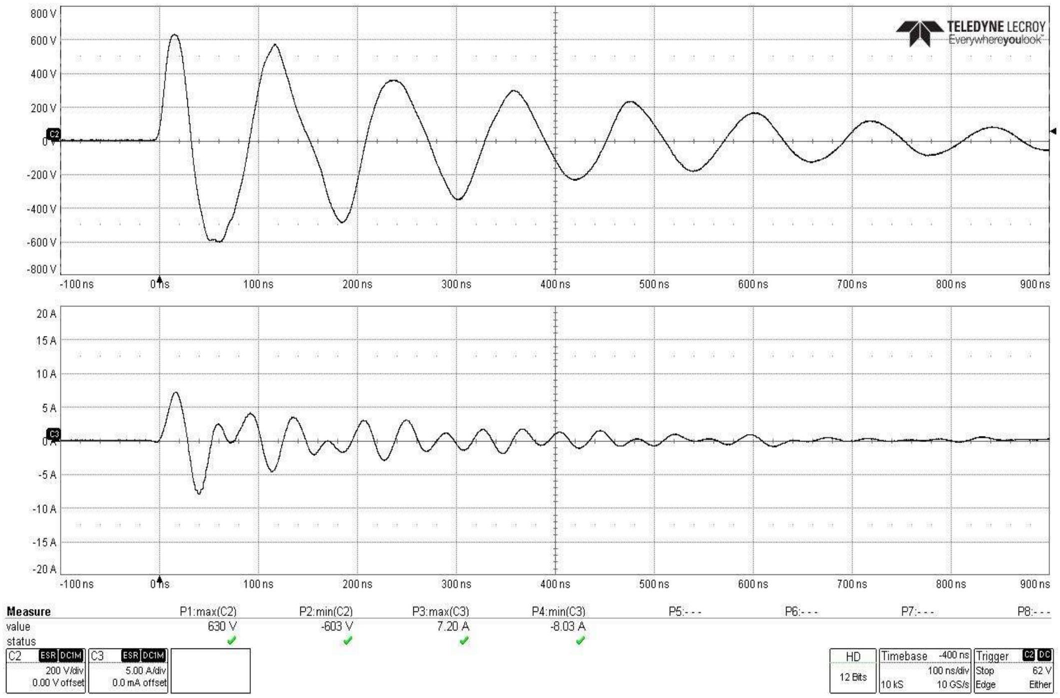


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on AC Power Line 2

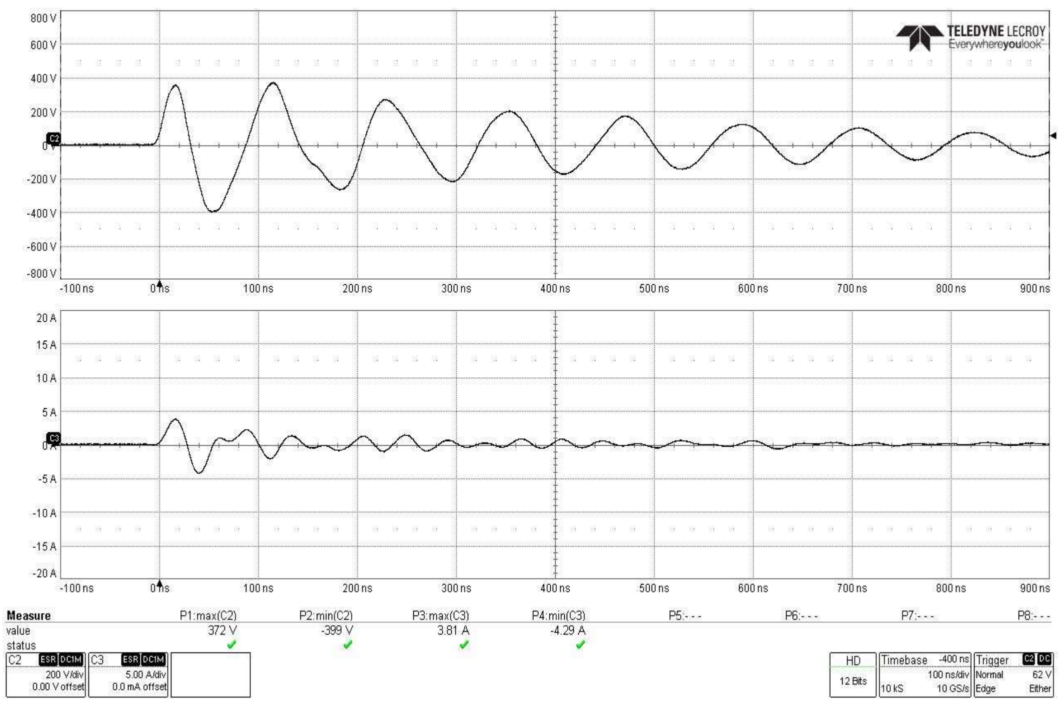


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on AC Power Line 2

EAR Controlled Data

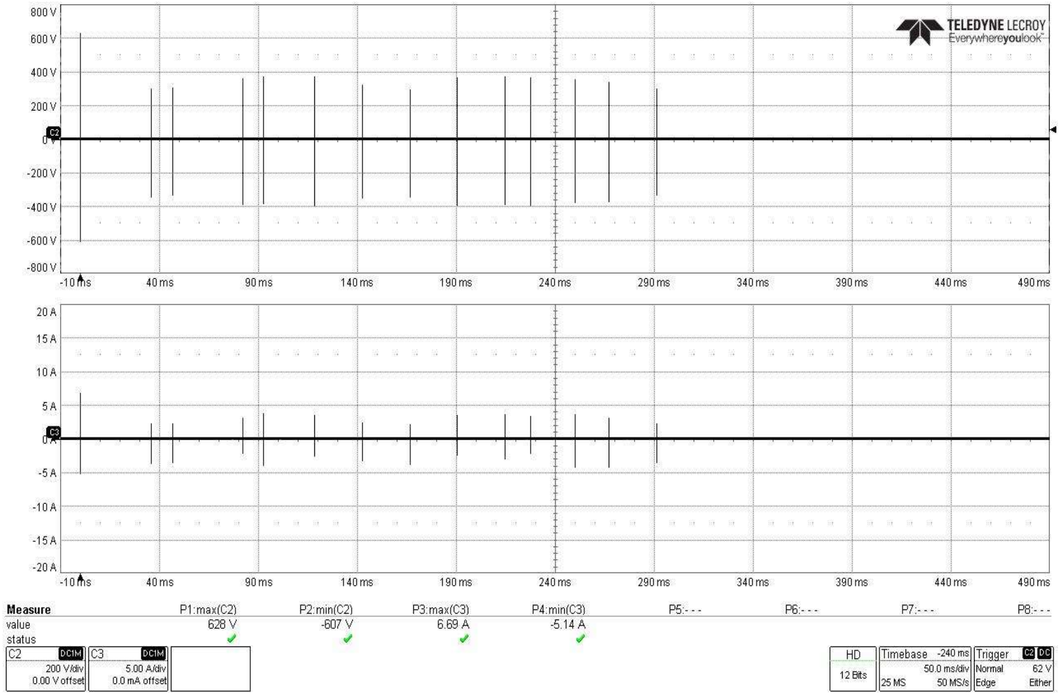


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on Full AC Power Bundle

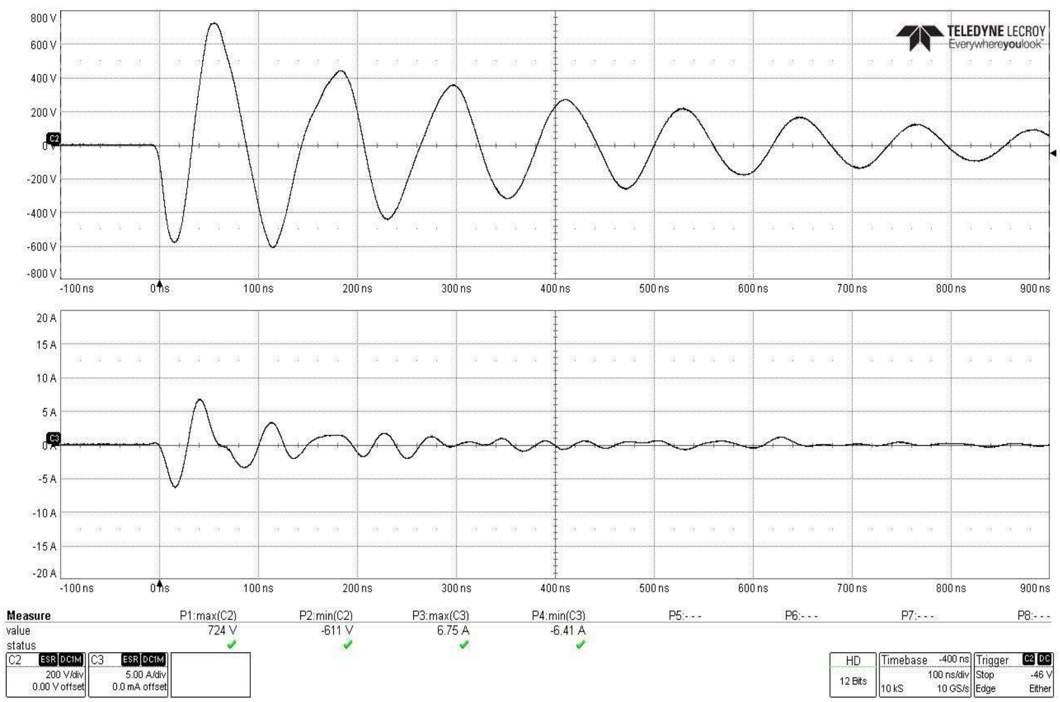


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on Full AC Power Bundle

EAR Controlled Data

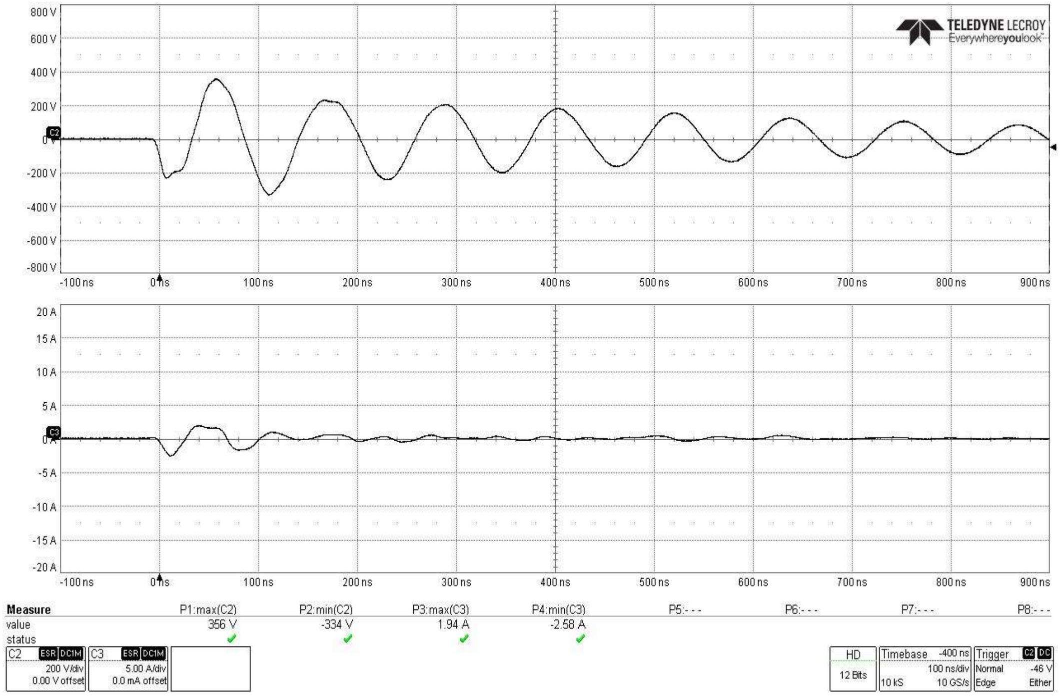


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on Full AC Power Bundle

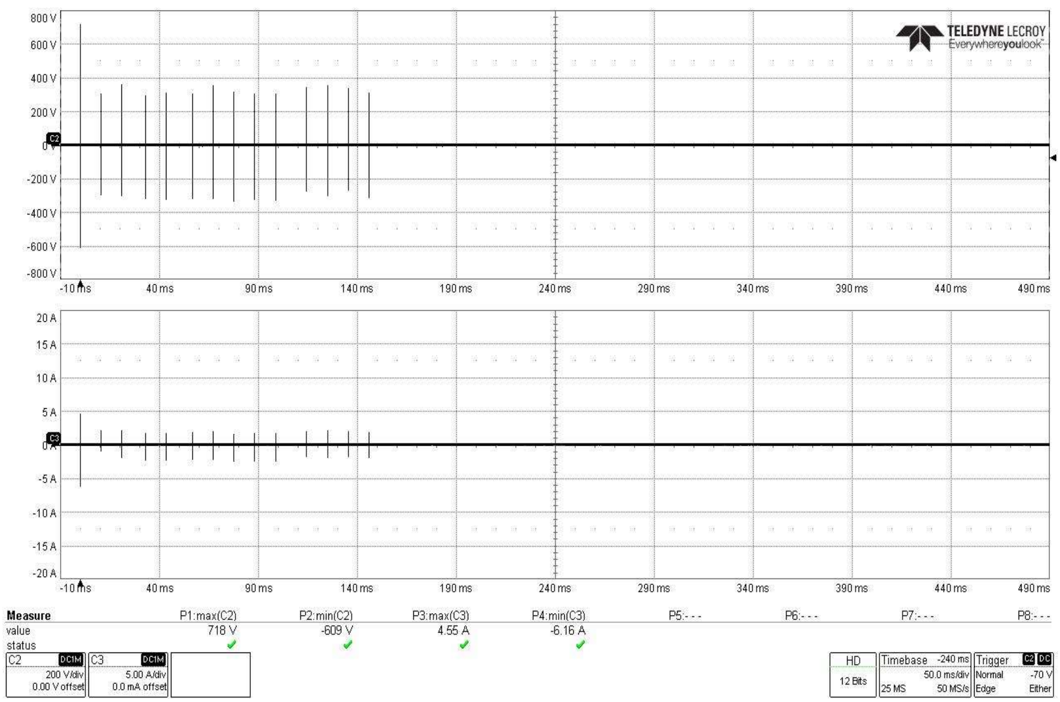


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on Full AC Power Bundle

EAR Controlled Data

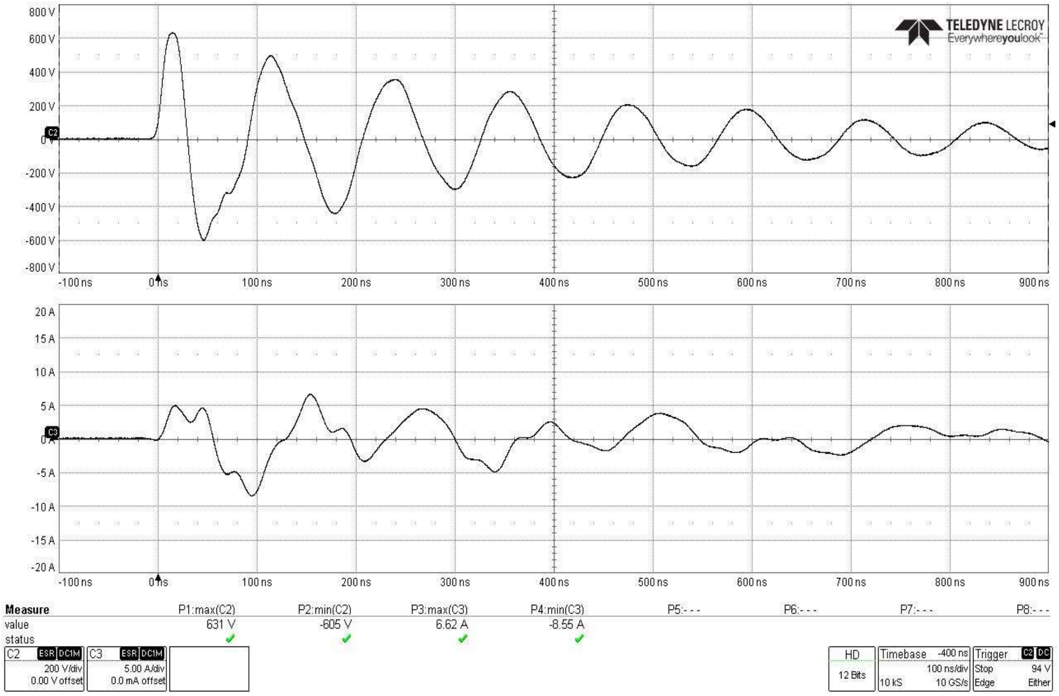


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on Full AC Power Bundle

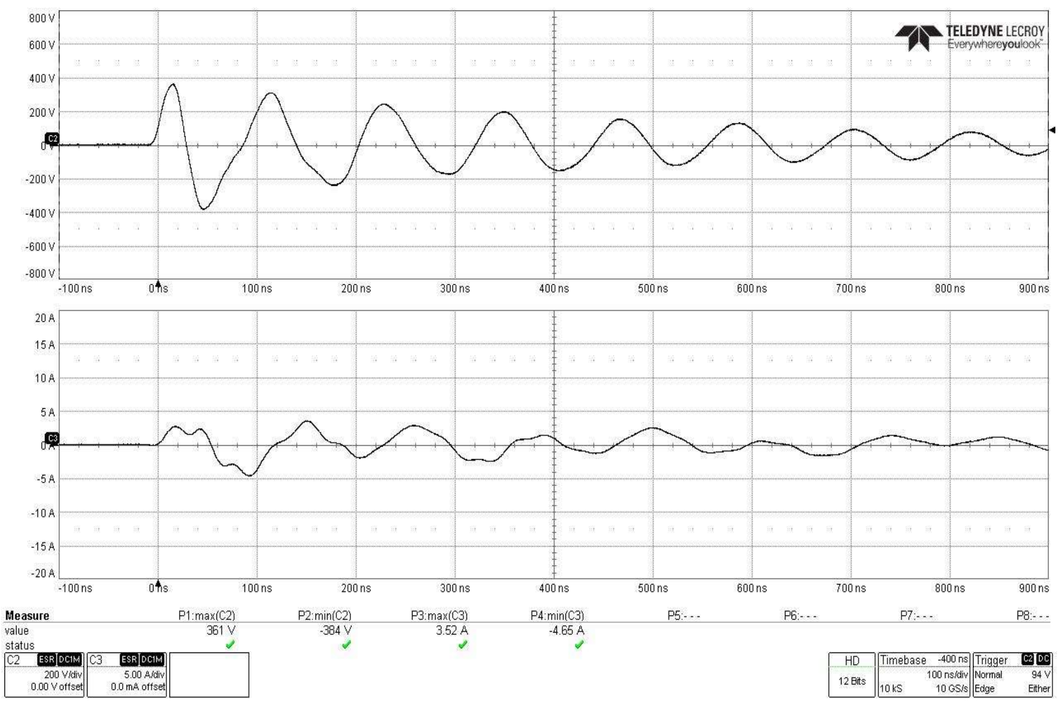


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on Full AC Power Bundle

EAR Controlled Data

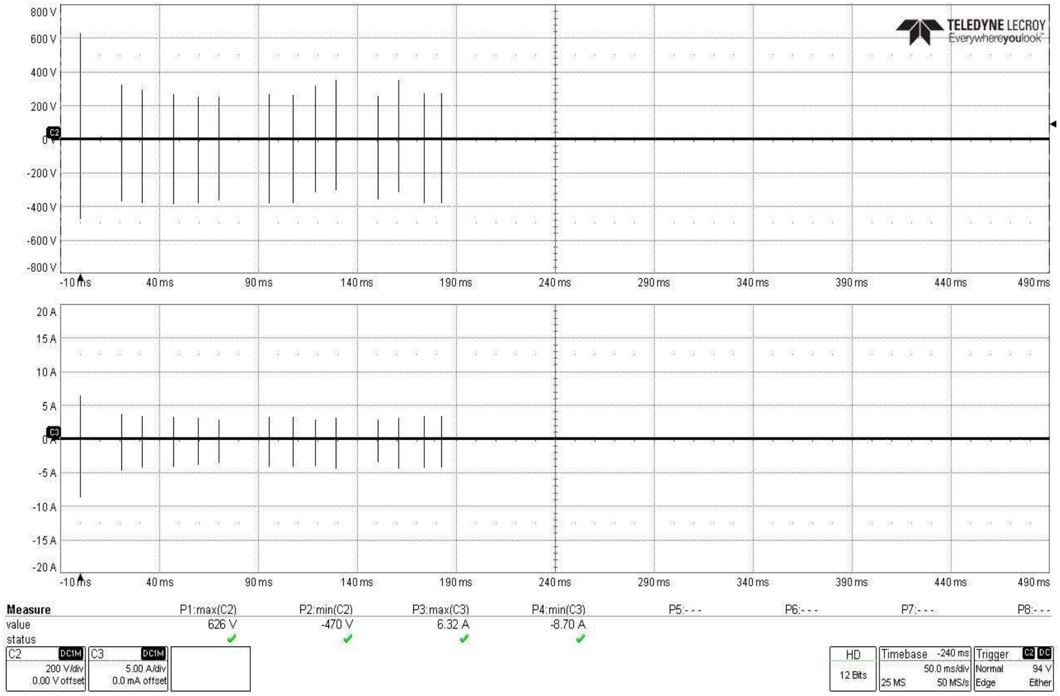


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on DC Power Bundle

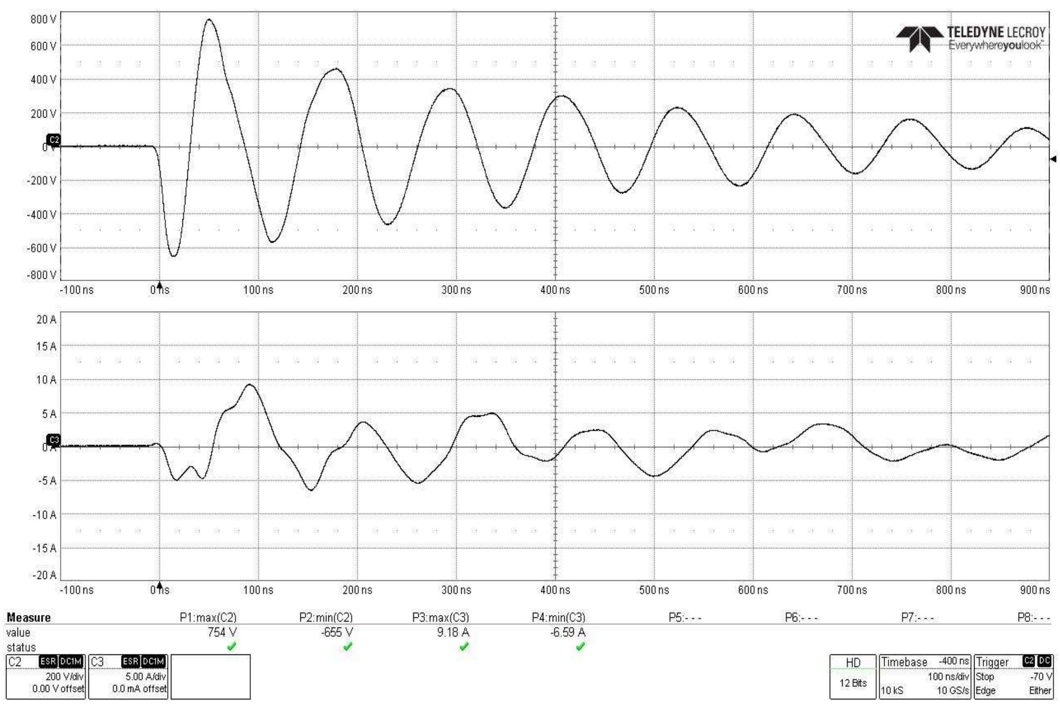


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on DC Power Bundle

EAR Controlled Data

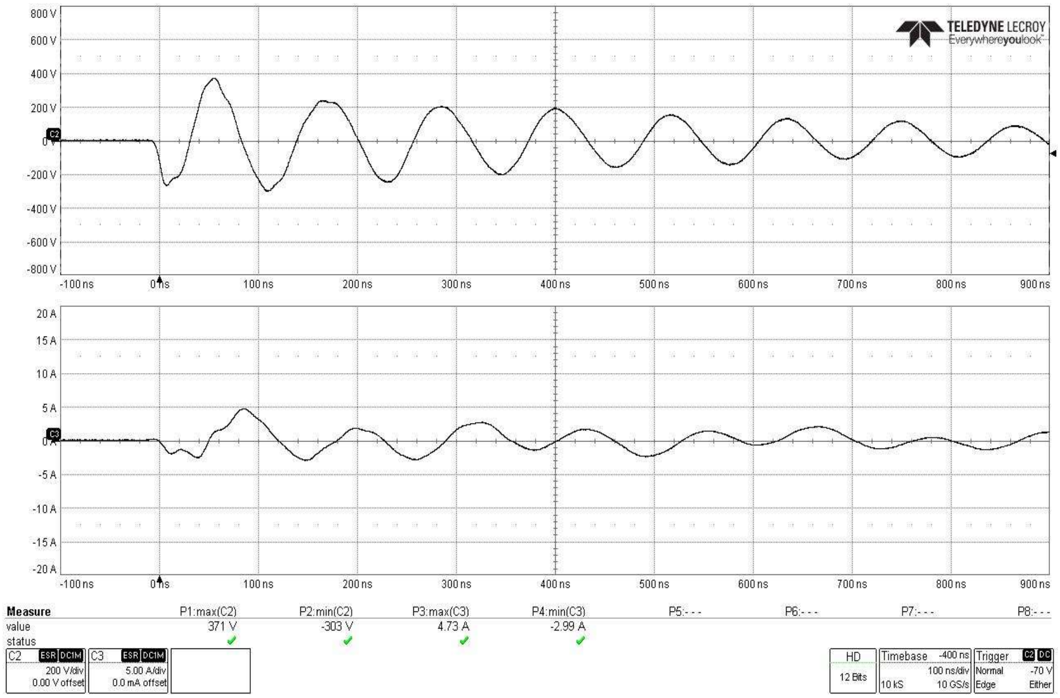


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on DC Power Bundle

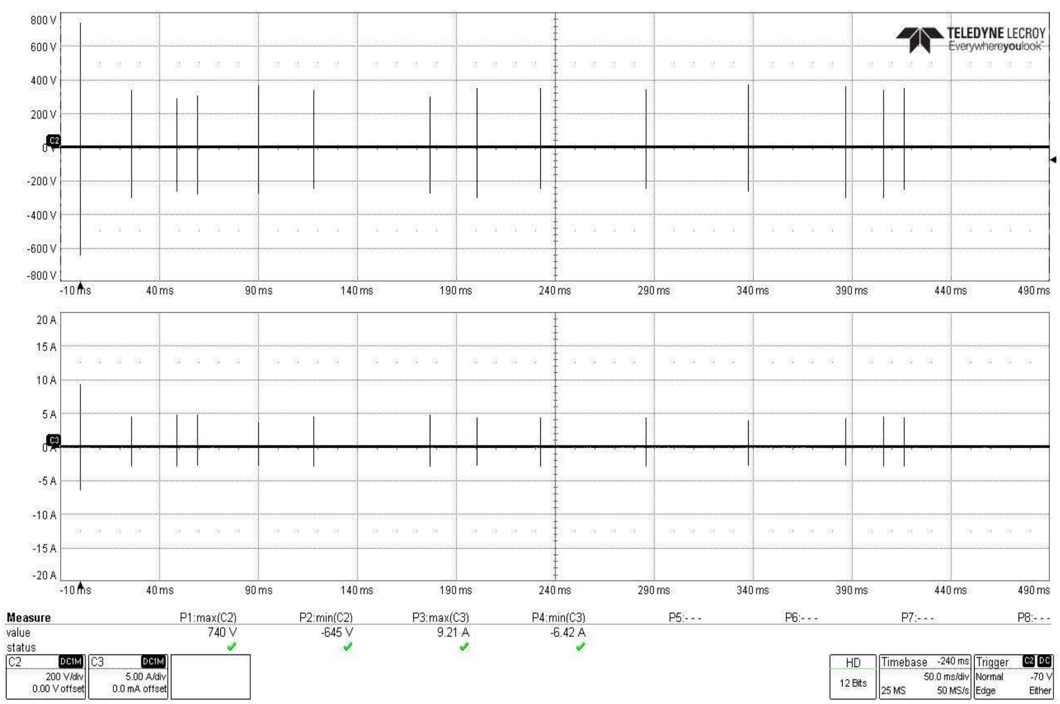


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on DC Power Bundle

EAR Controlled Data

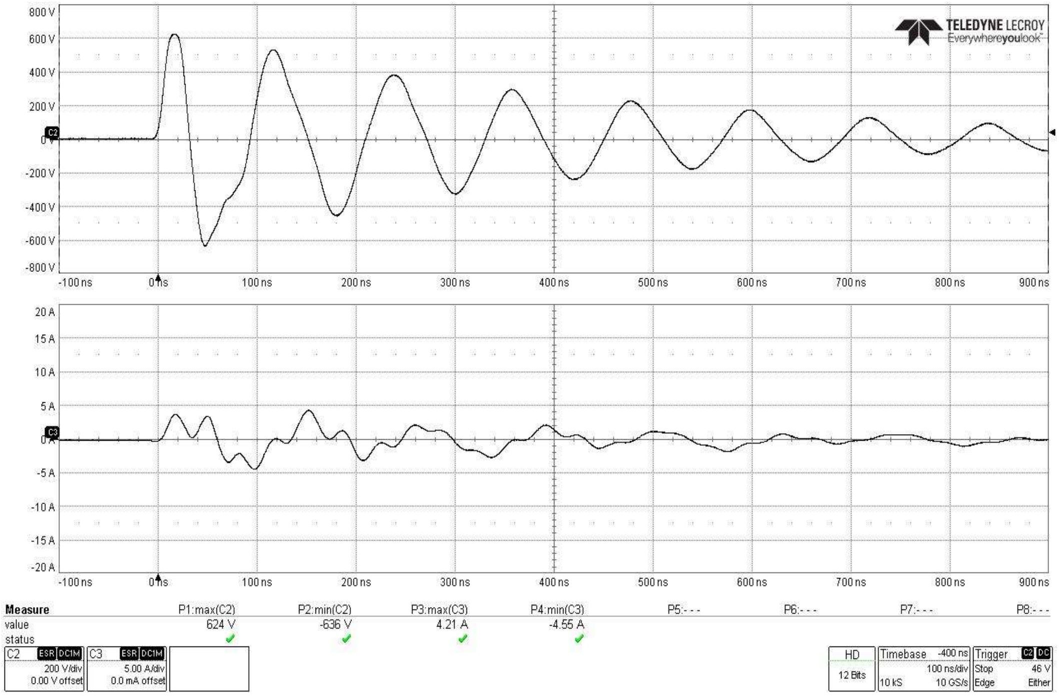


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on DC Power Bundle

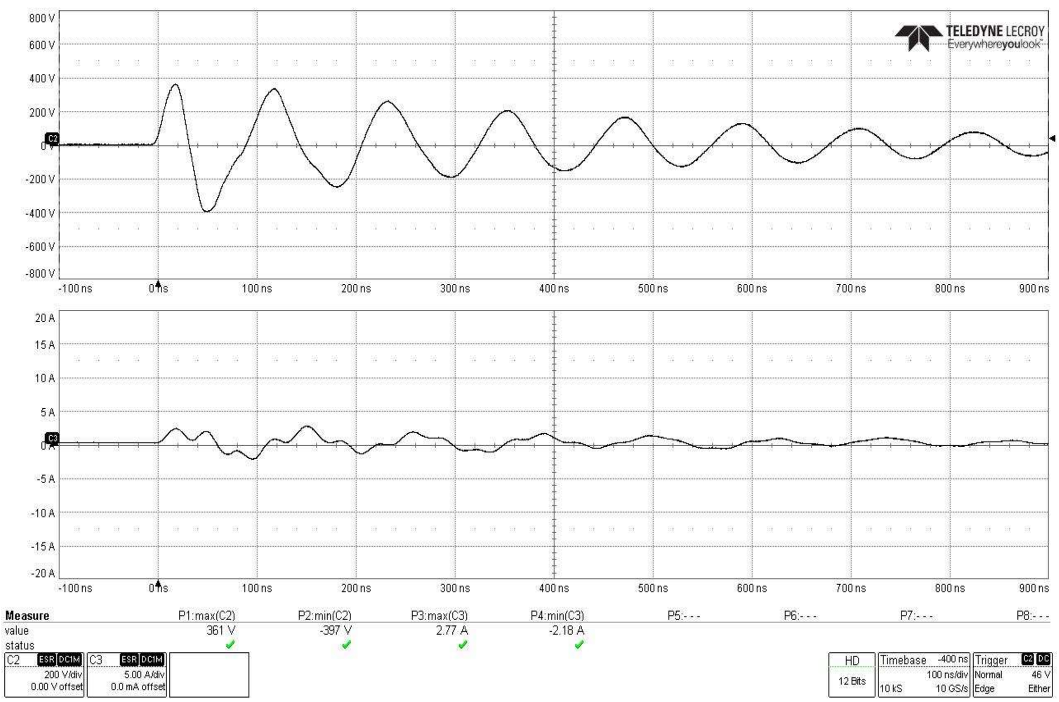


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on DC Power Bundle

EAR Controlled Data

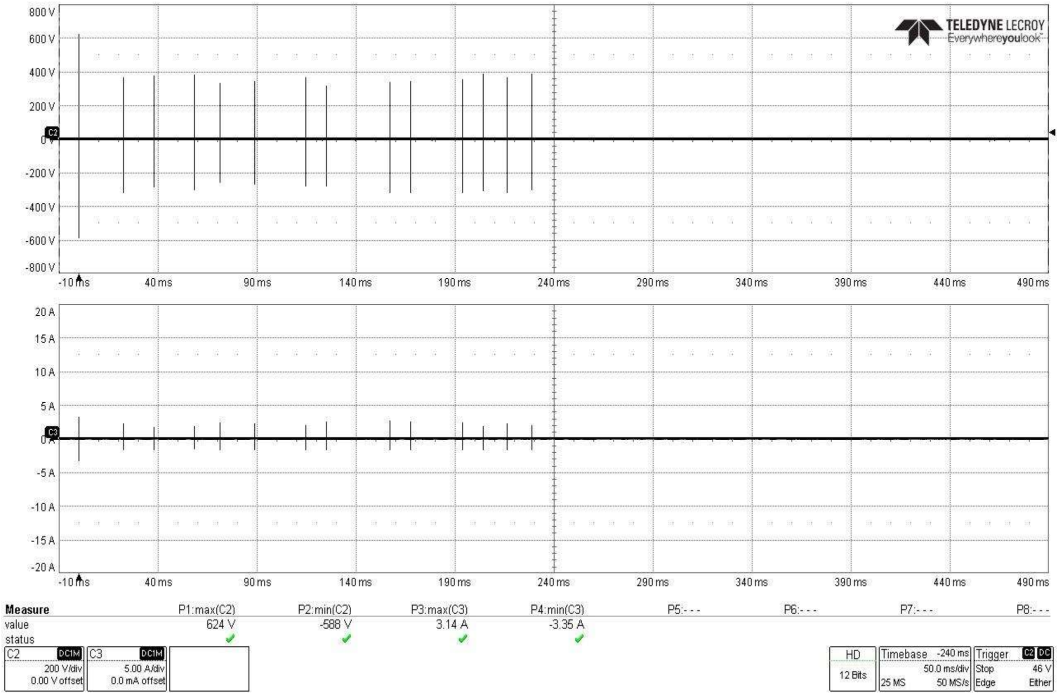


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on DC High Side

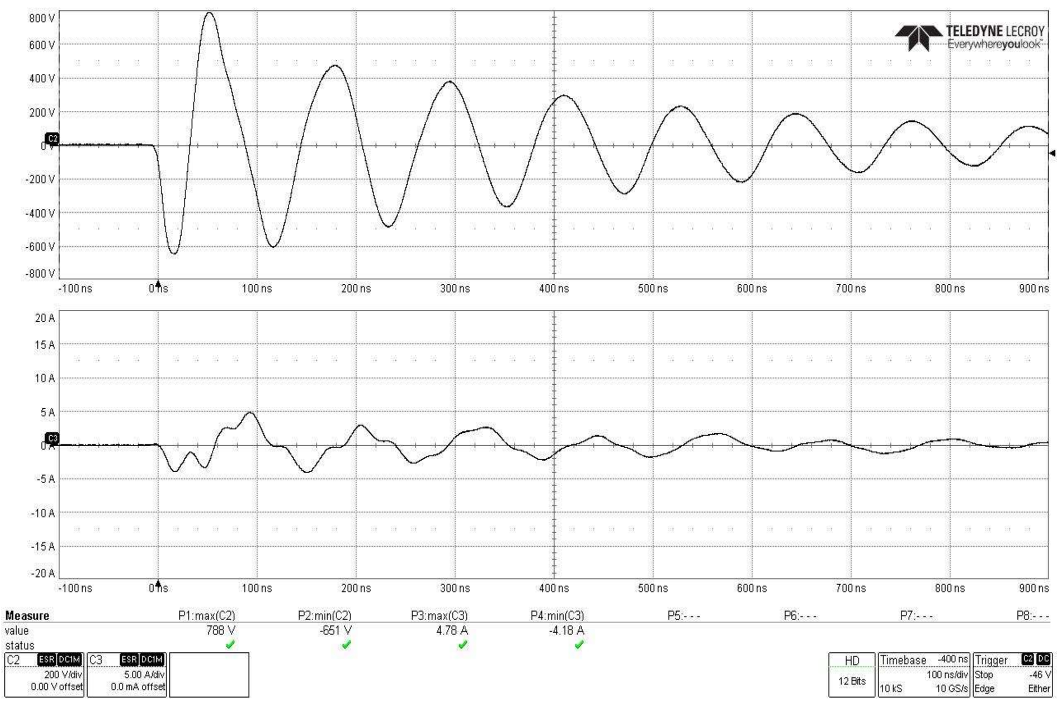


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on DC High Side

EAR Controlled Data

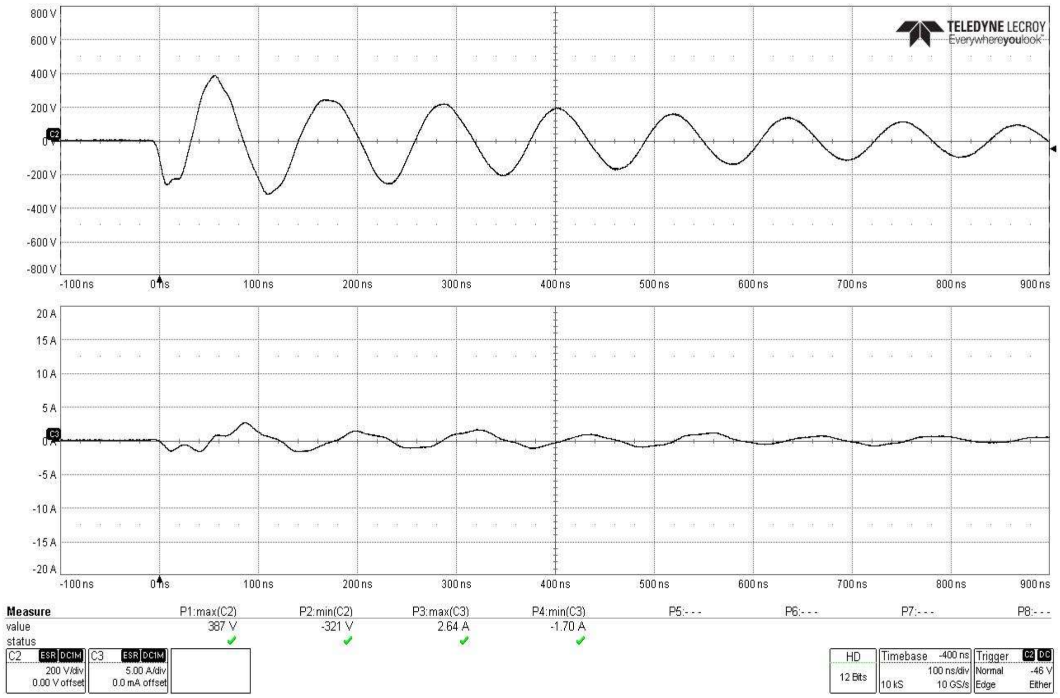


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on DC High Side

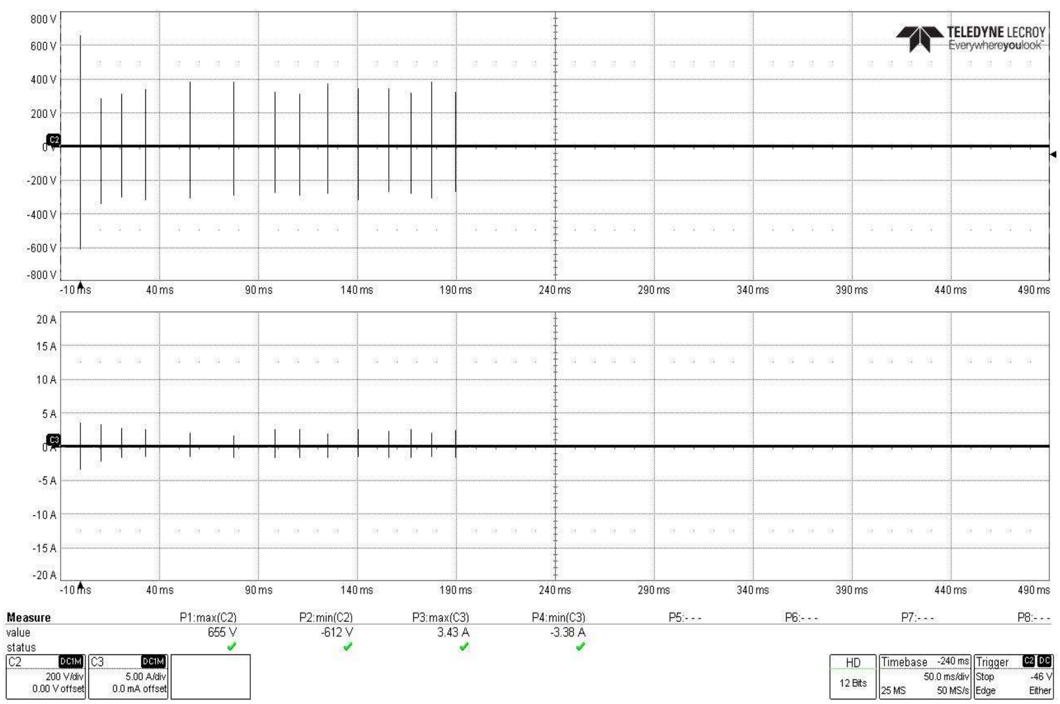


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on DC High Side

EAR Controlled Data

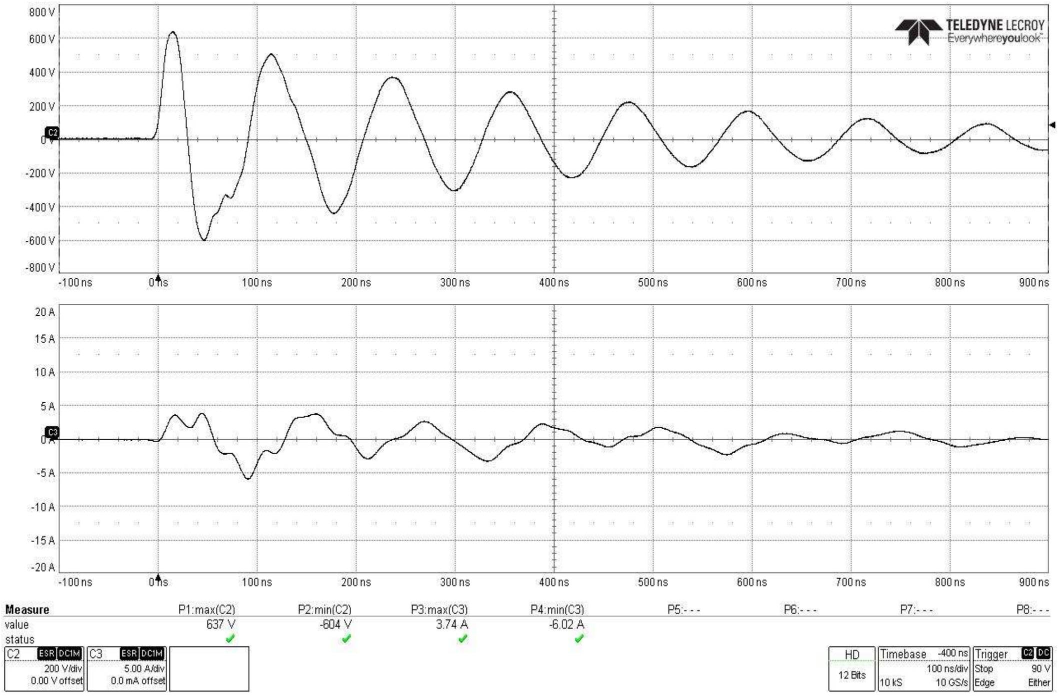


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on DC High Side

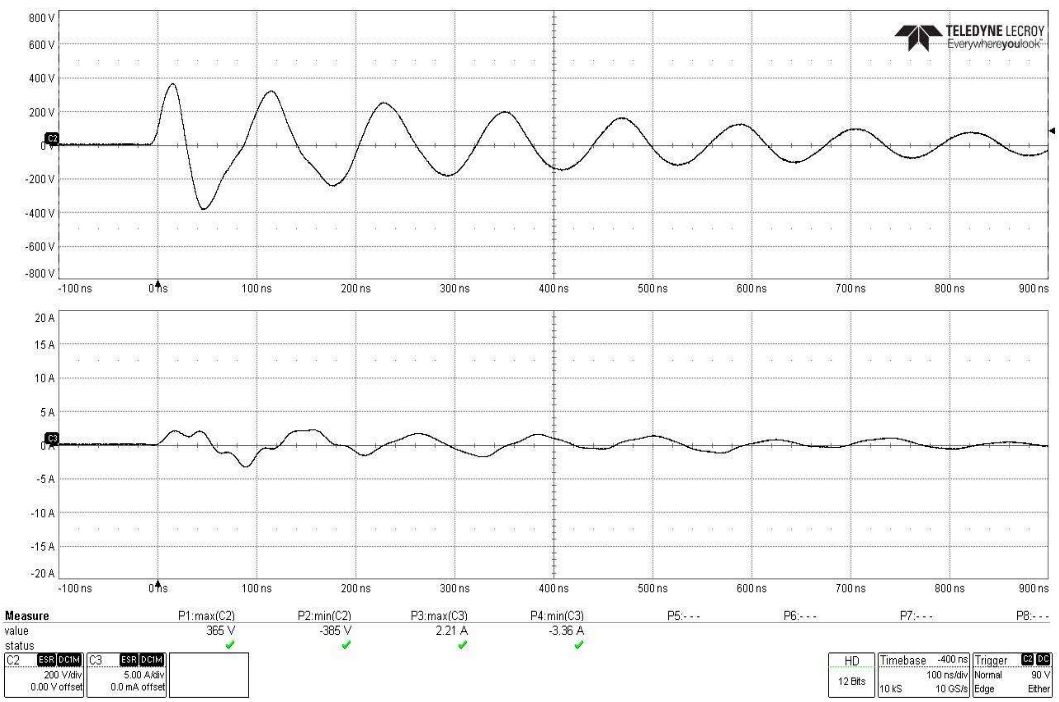


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on DC High Side

EAR Controlled Data

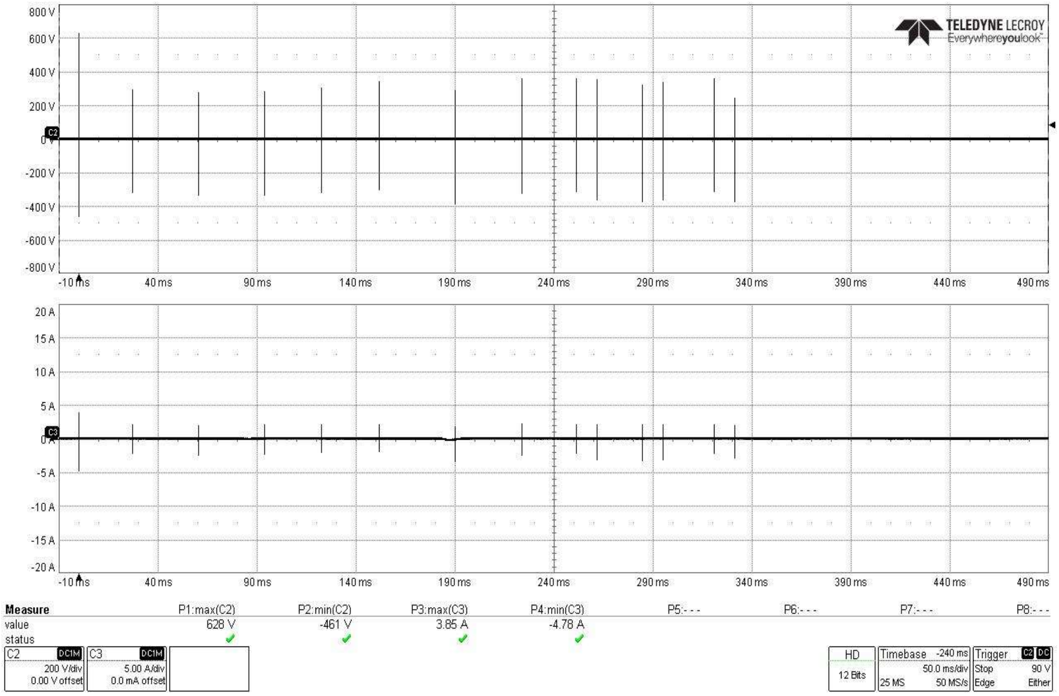


Actual Test CS117 Waveform #3 at 10MHz, First Transient +600V, on DC Return Side

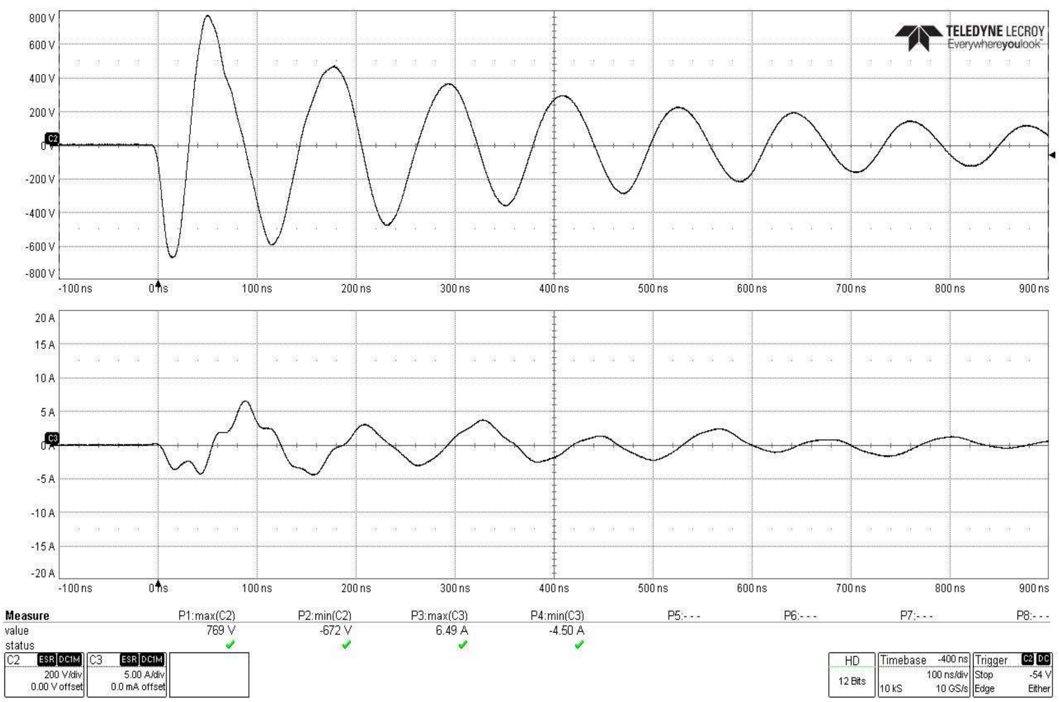


Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient +300V, on DC Return Side

EAR Controlled Data

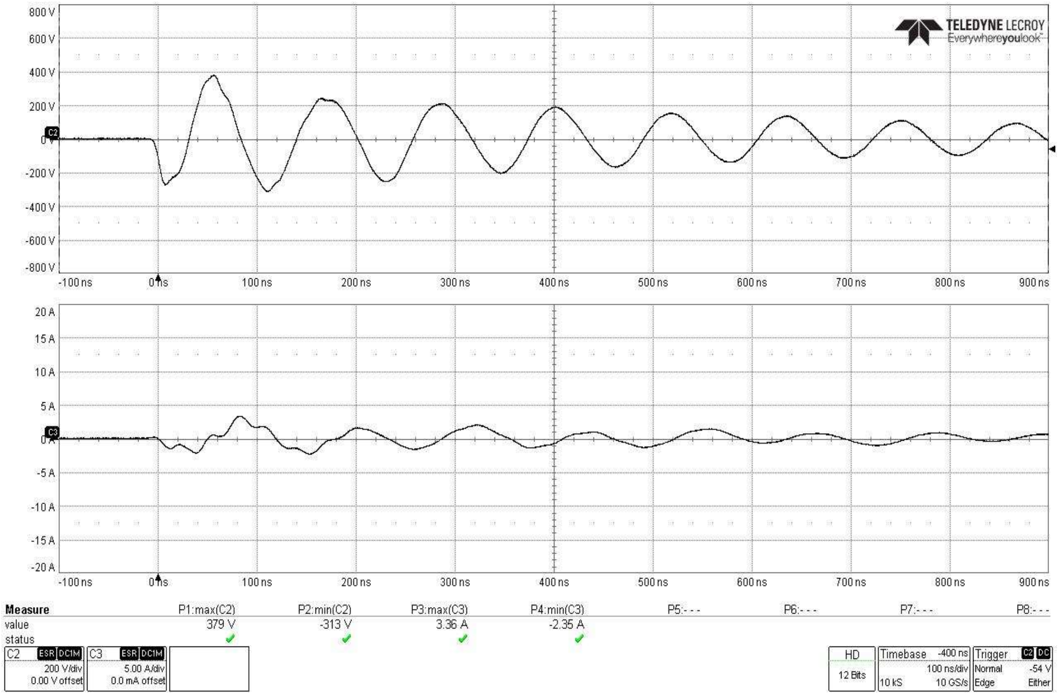


Actual Test CS117 Waveform #3 at 10MHz, 14 Transients +600/+300V, on DC Return Side

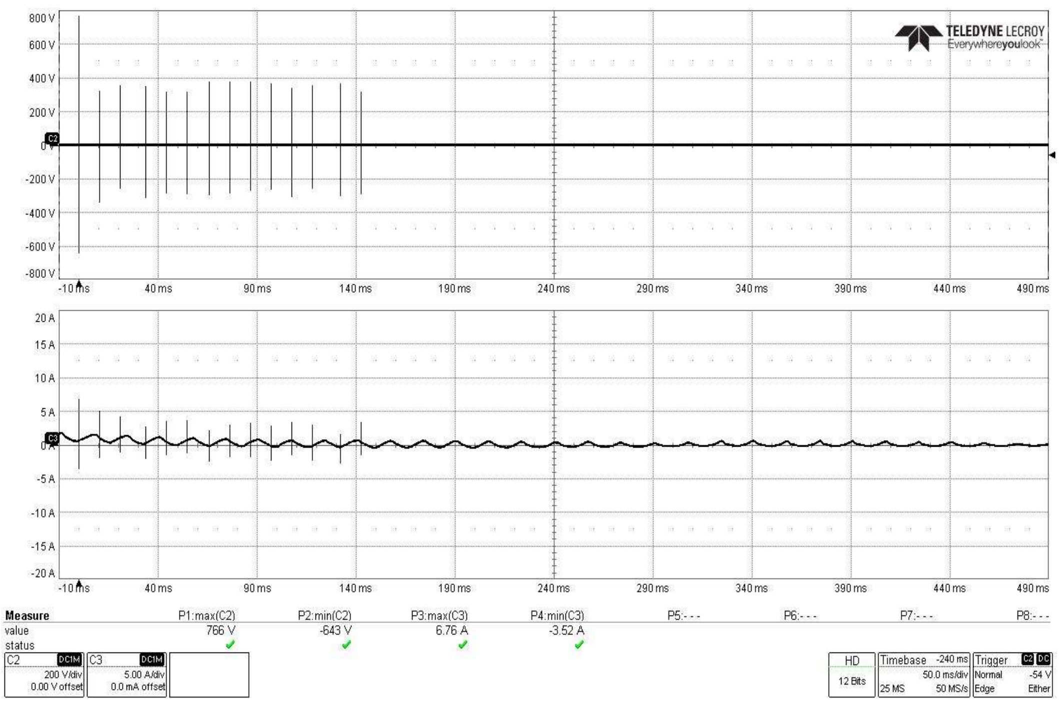


Actual Test CS117 Waveform #3 at 10MHz, First Transient -600V, on DC Return Side

EAR Controlled Data



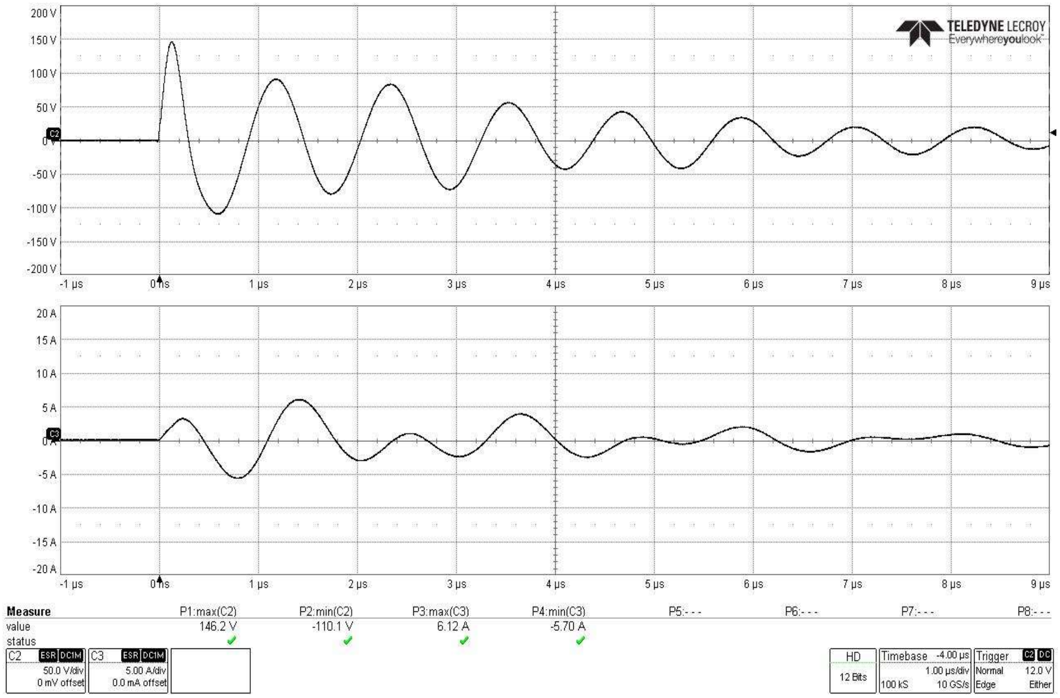
Actual Test CS117 Waveform #3 at 10MHz, Subsequent Transient -300V, on DC Return Side



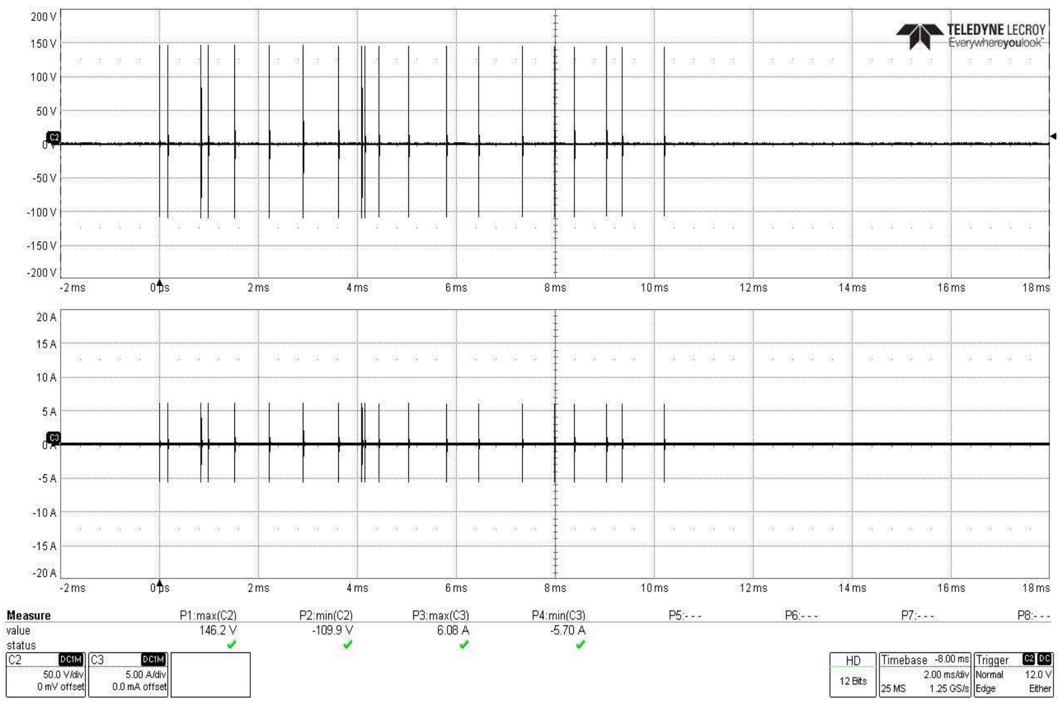
Actual Test CS117 Waveform #3 at 10MHz, 14 Transients -600/-300V, on DC Return Side

EAR Controlled Data

CS117 Actual Test Multiple Burst (MB) Waveform #3 at 1MHz with V_T = 360V on Flexboss 18

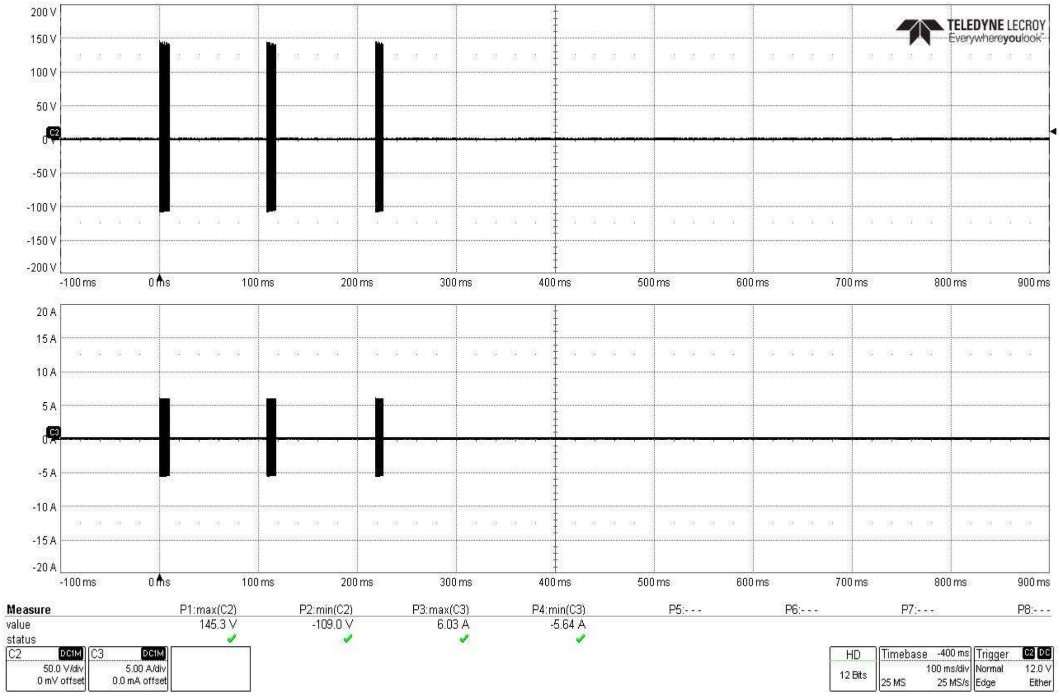


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on AC Power Line 1

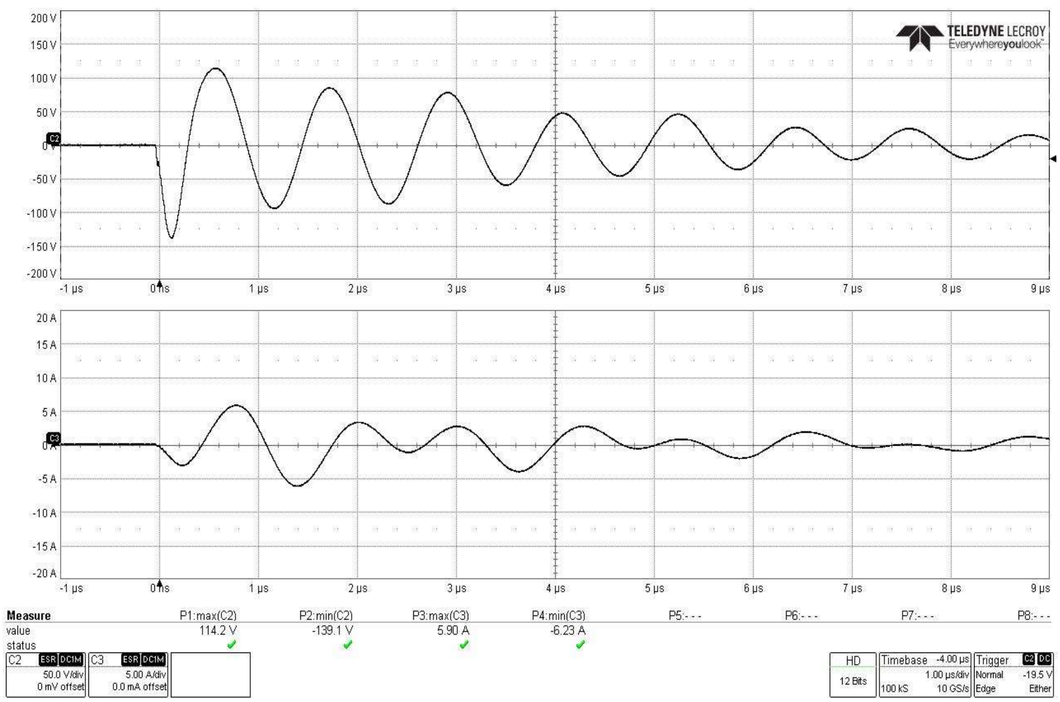


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on AC Power Line 1

EAR Controlled Data

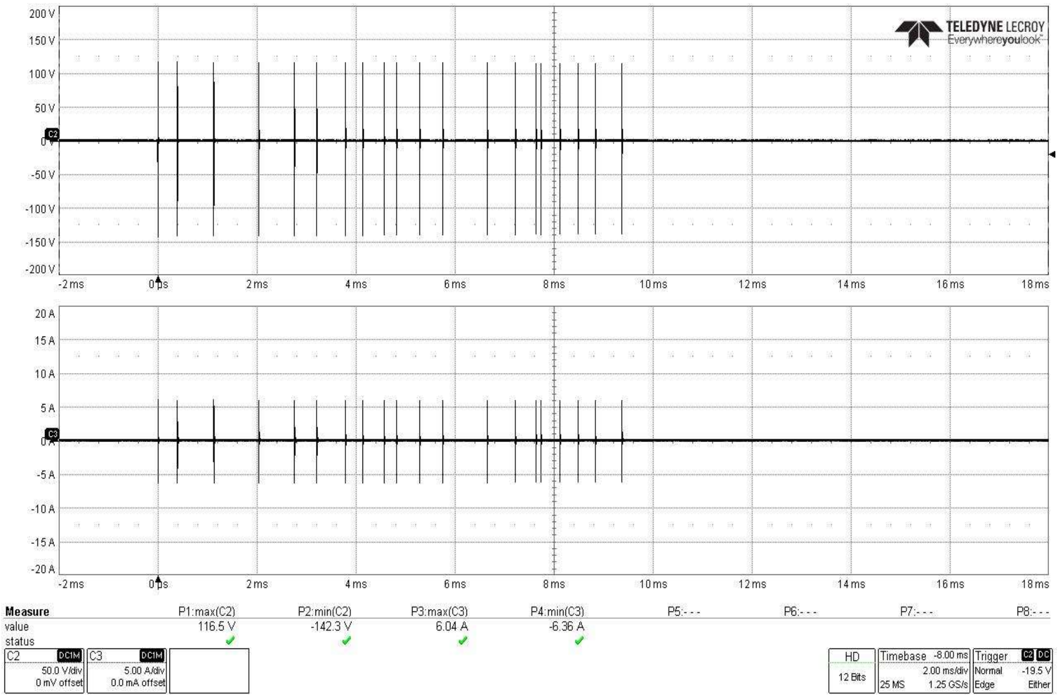


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on AC Power Line 1

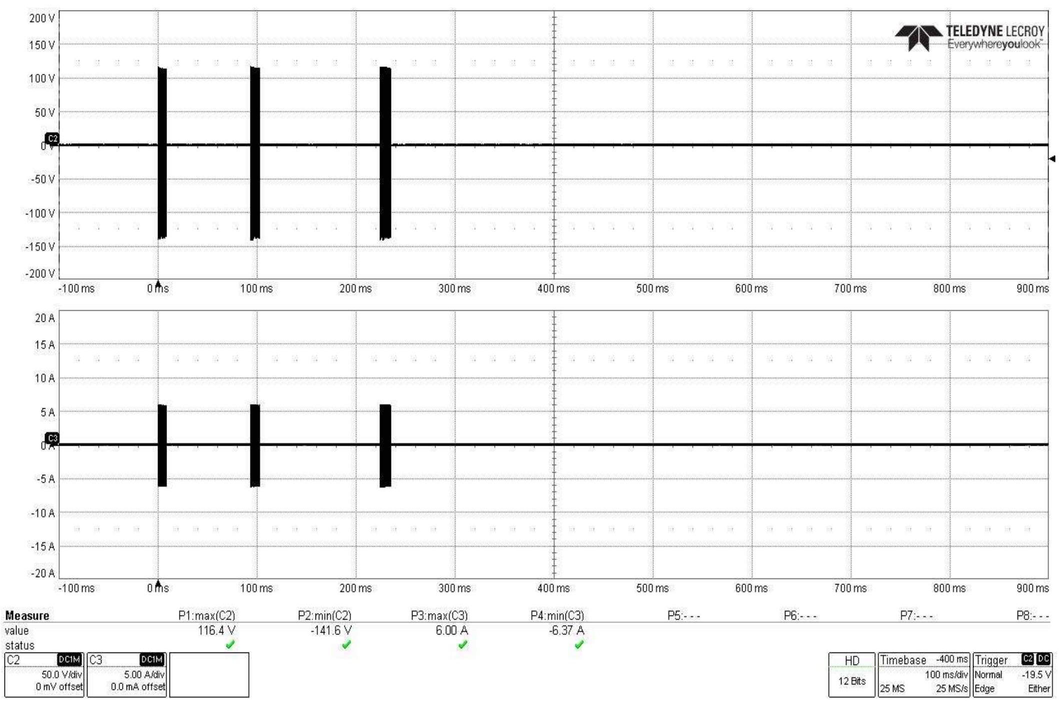


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on AC Power Line 1

EAR Controlled Data

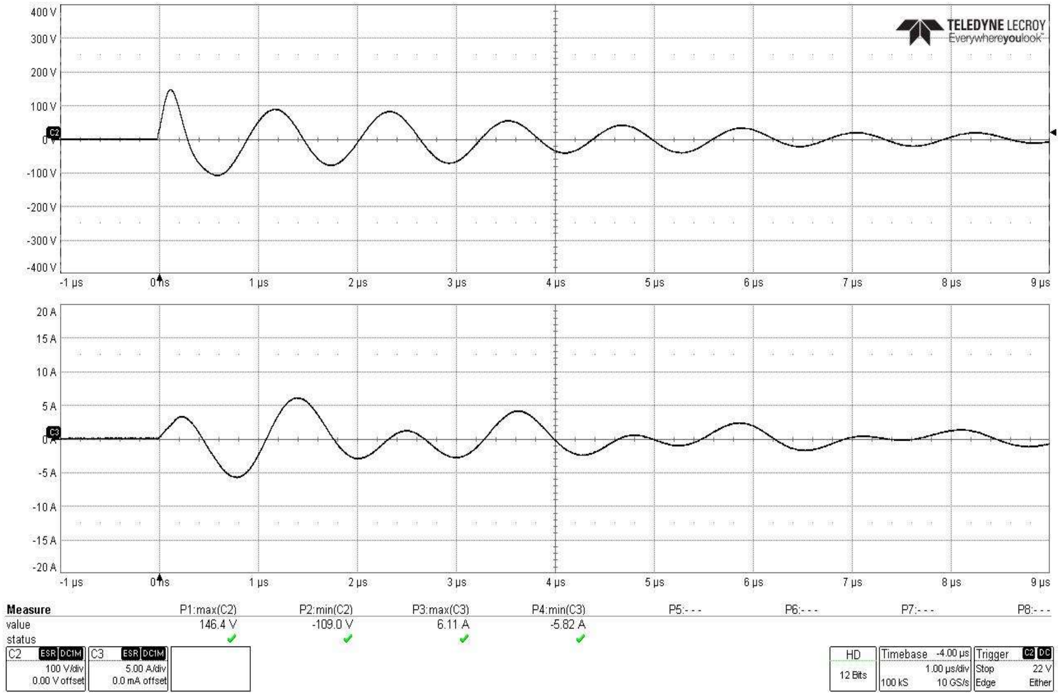


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on AC Power Line 1

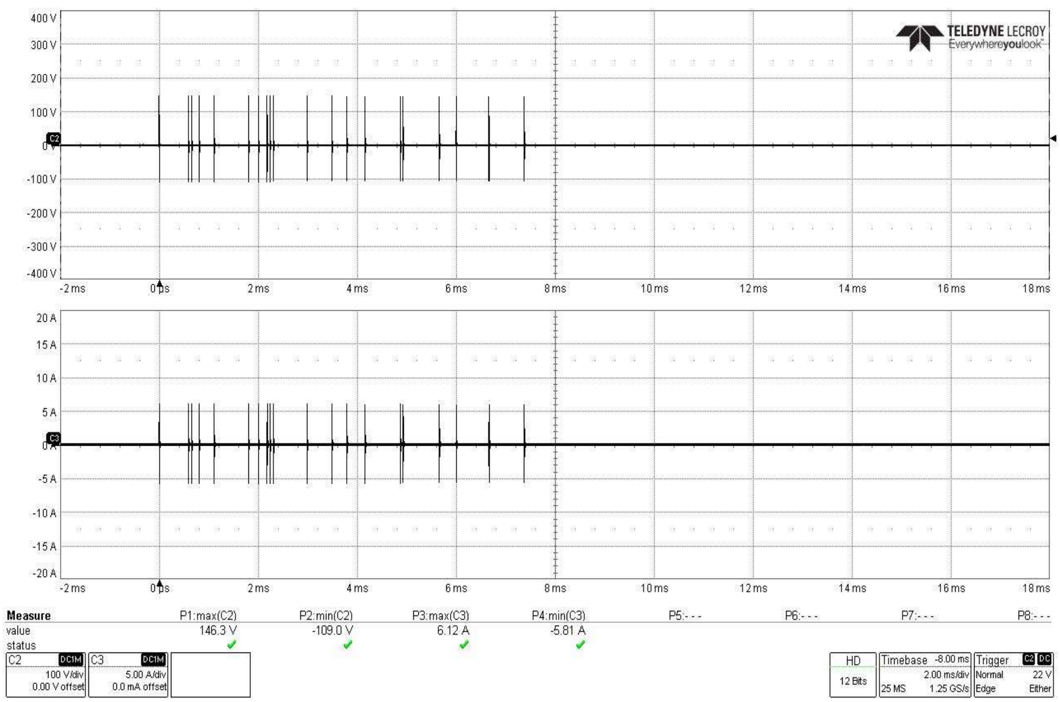


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on AC Power Line 1

EAR Controlled Data

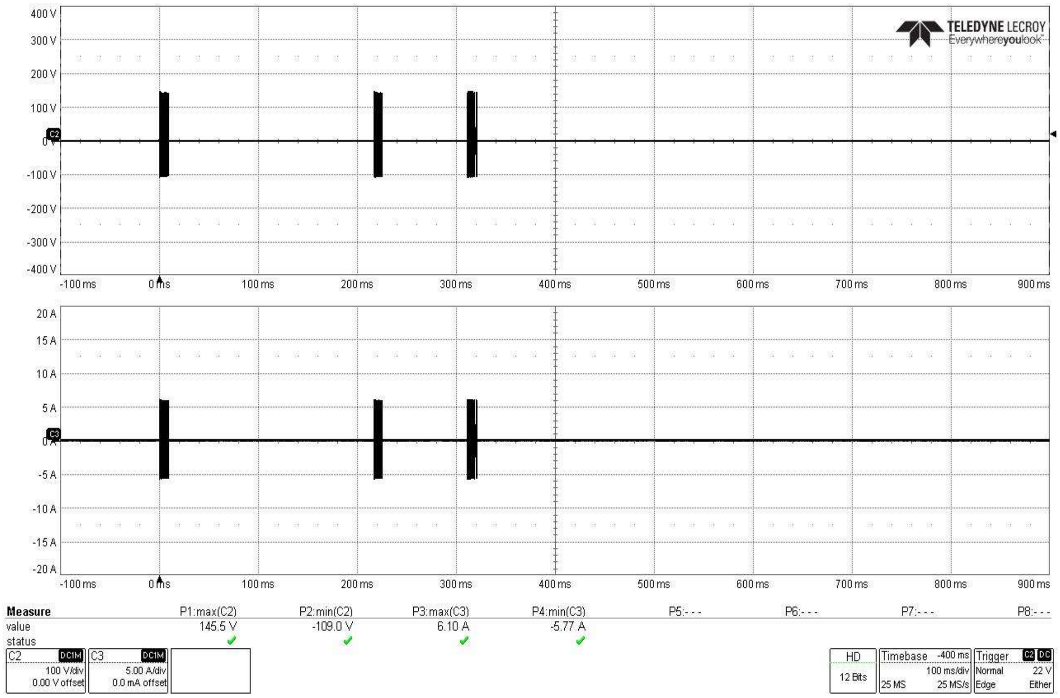


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on AC Power Line 2

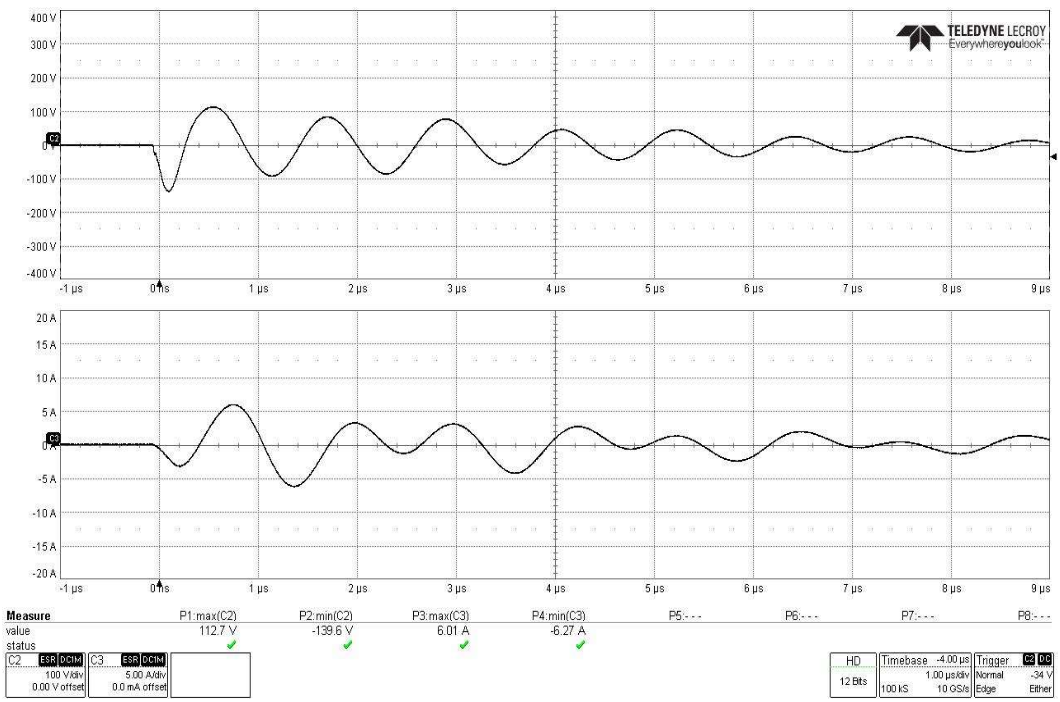


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on AC Power Line 2

EAR Controlled Data

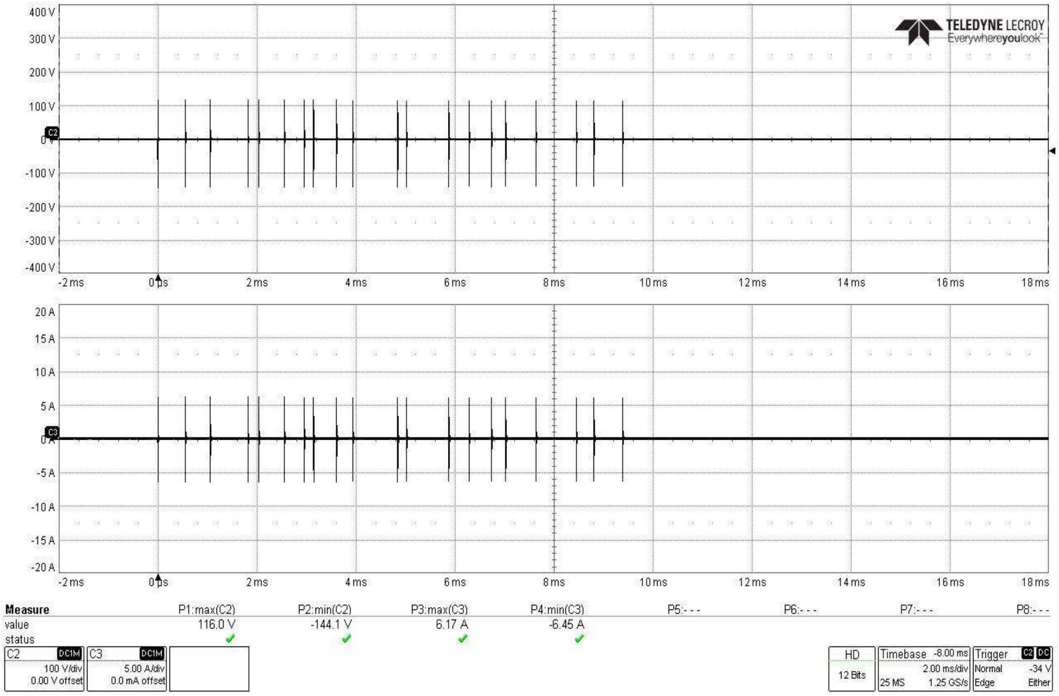


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on AC Power Line 2

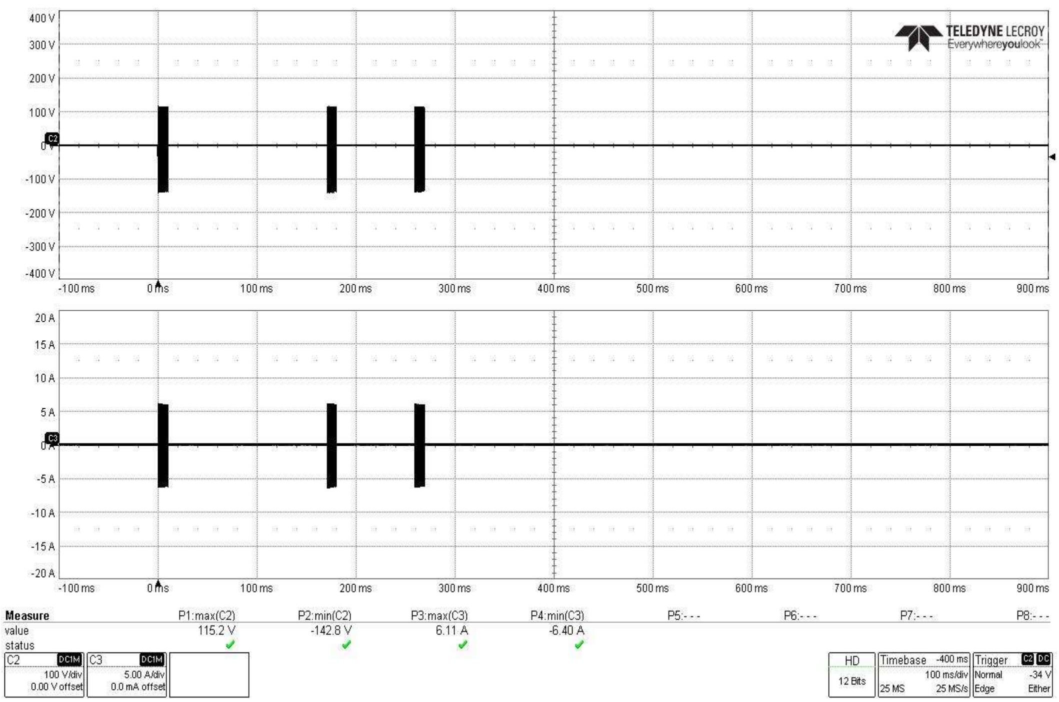


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on AC Power Line 2

EAR Controlled Data

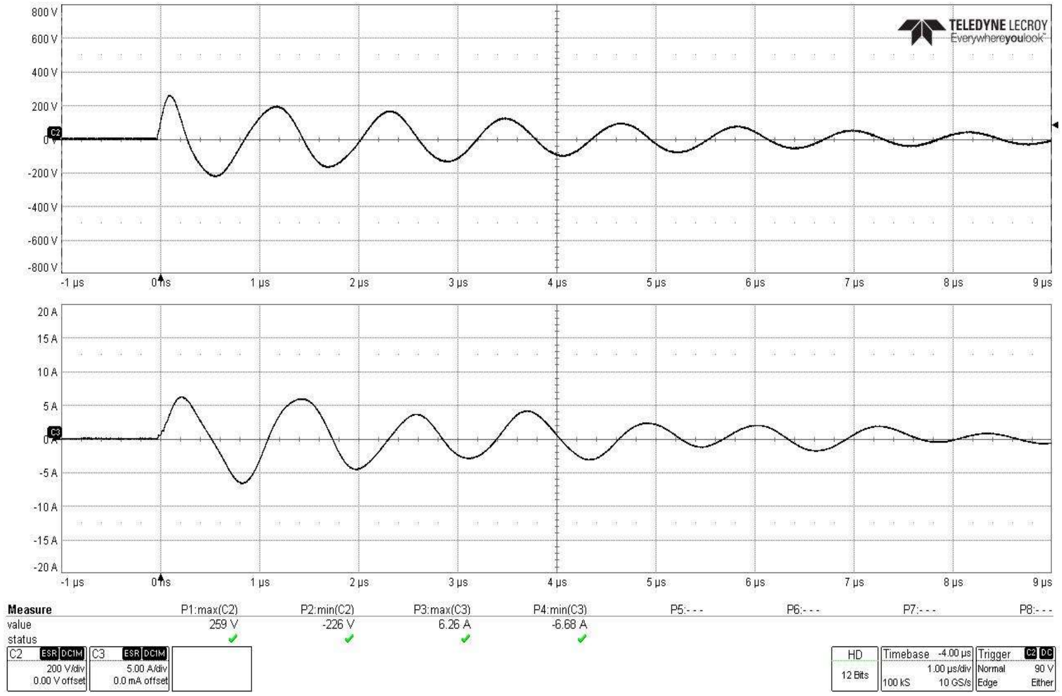


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on AC Power Line 2

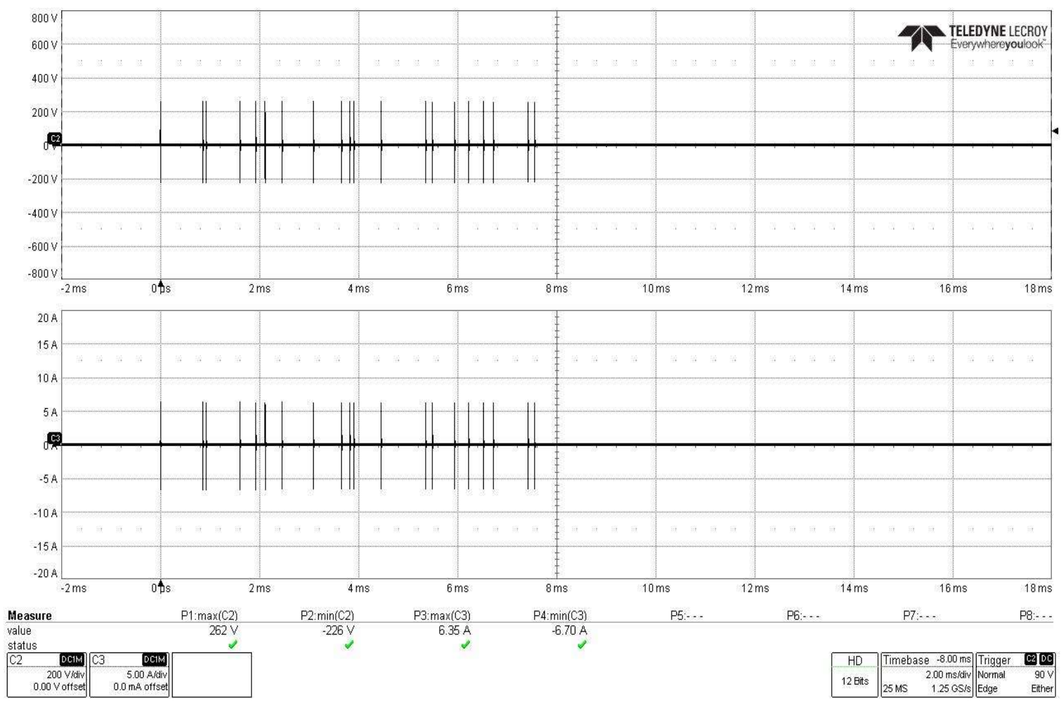


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on AC Power Line 2

EAR Controlled Data

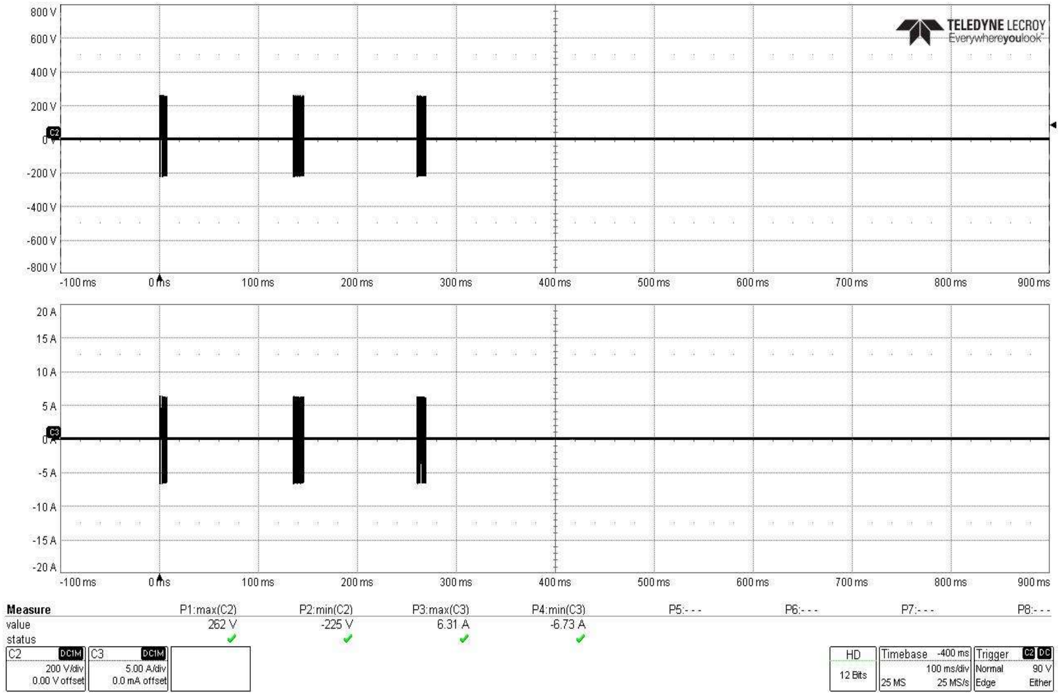


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on Full AC Power Bundle

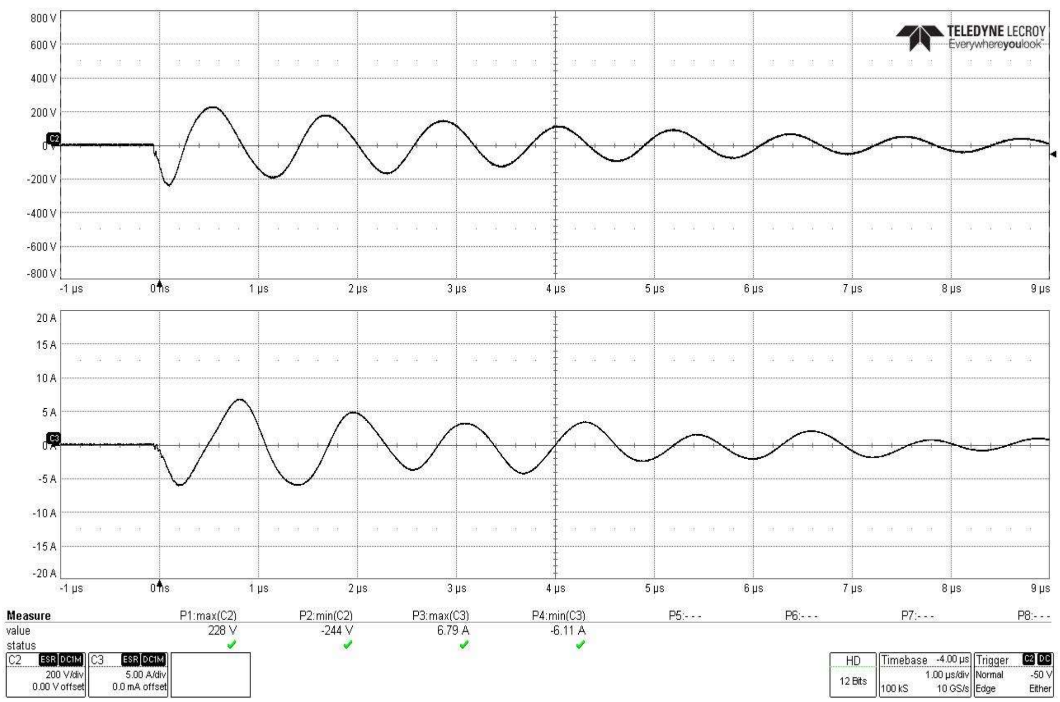


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on Full AC Power Bundle

EAR Controlled Data

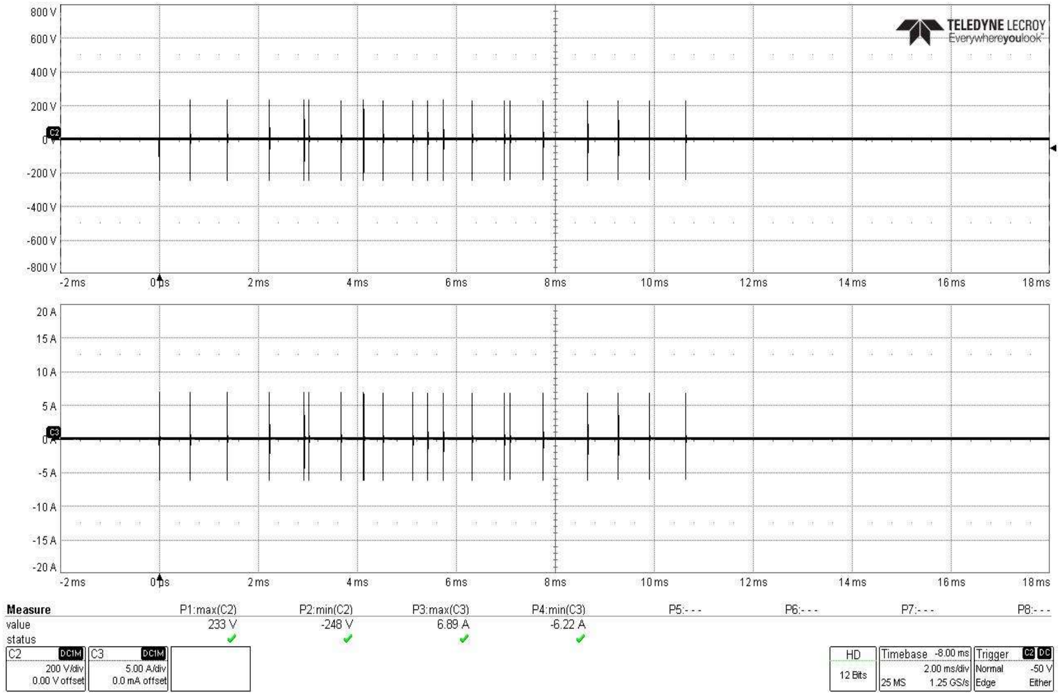


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on Full AC Power Bundle

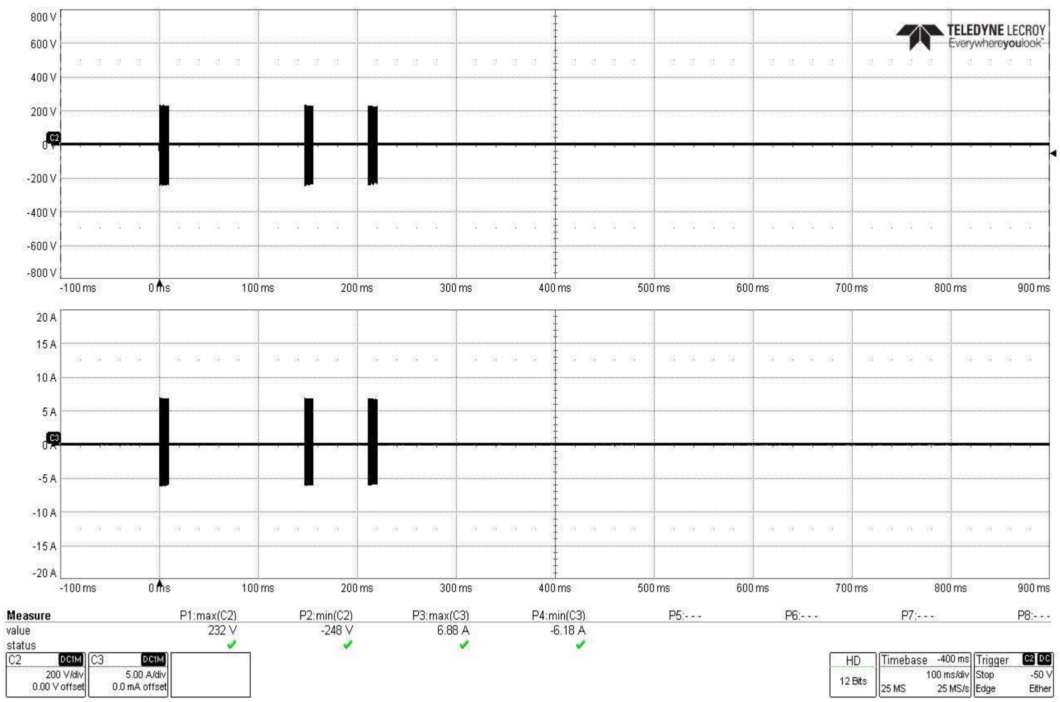


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on Full AC Power Bundle

EAR Controlled Data

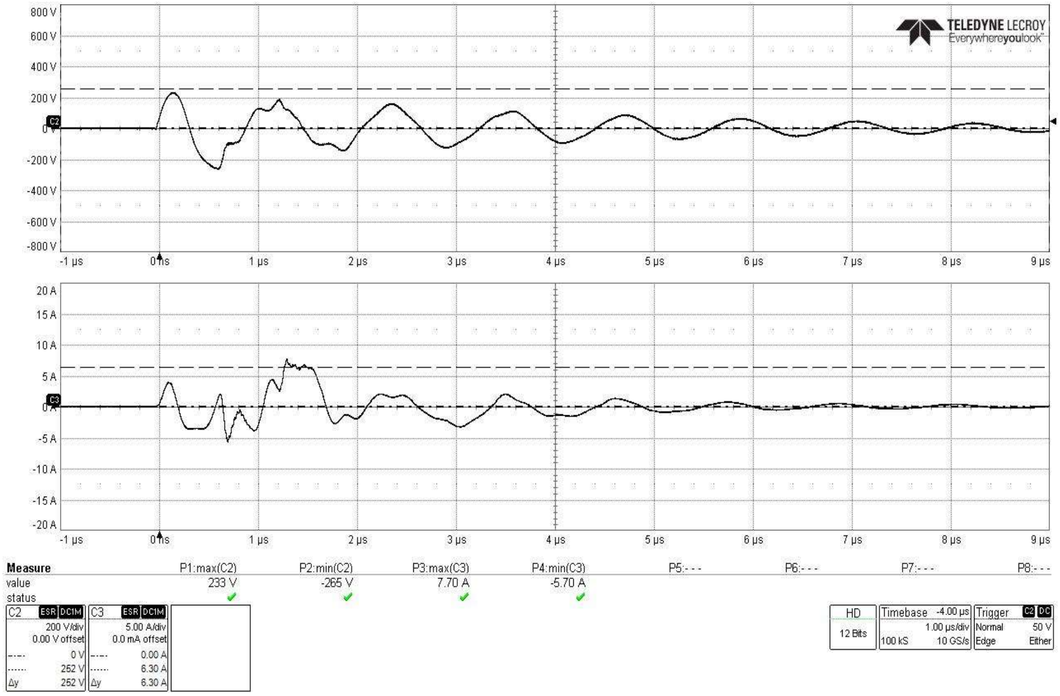


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on Full AC Power Bundle

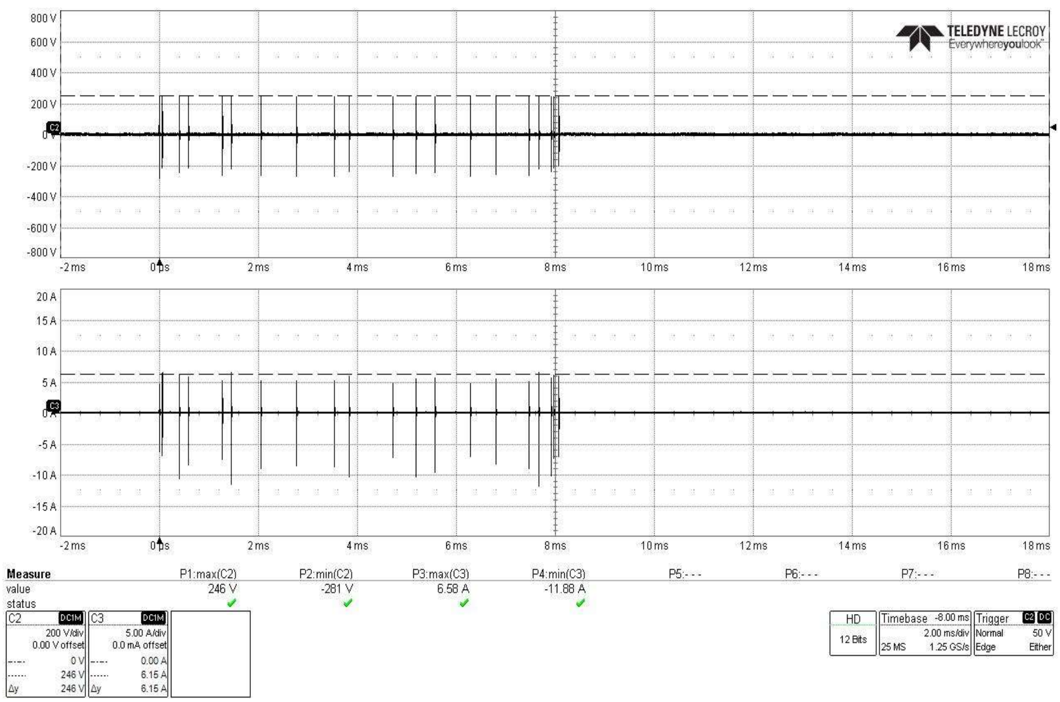


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on Full AC Power Bundle

EAR Controlled Data

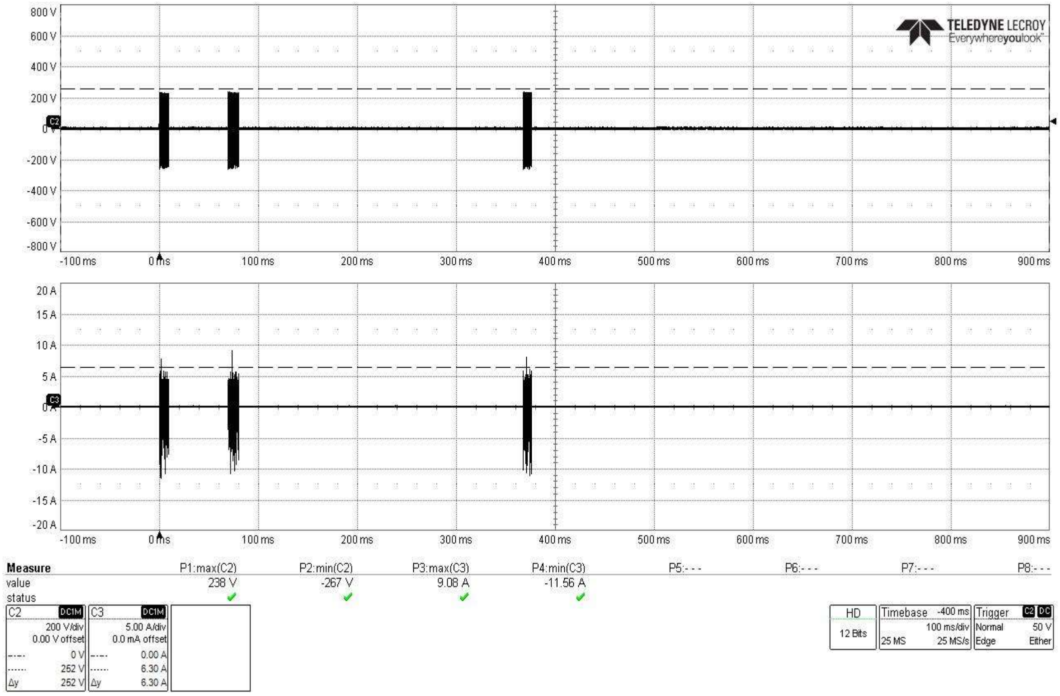


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on DC Power Bundle

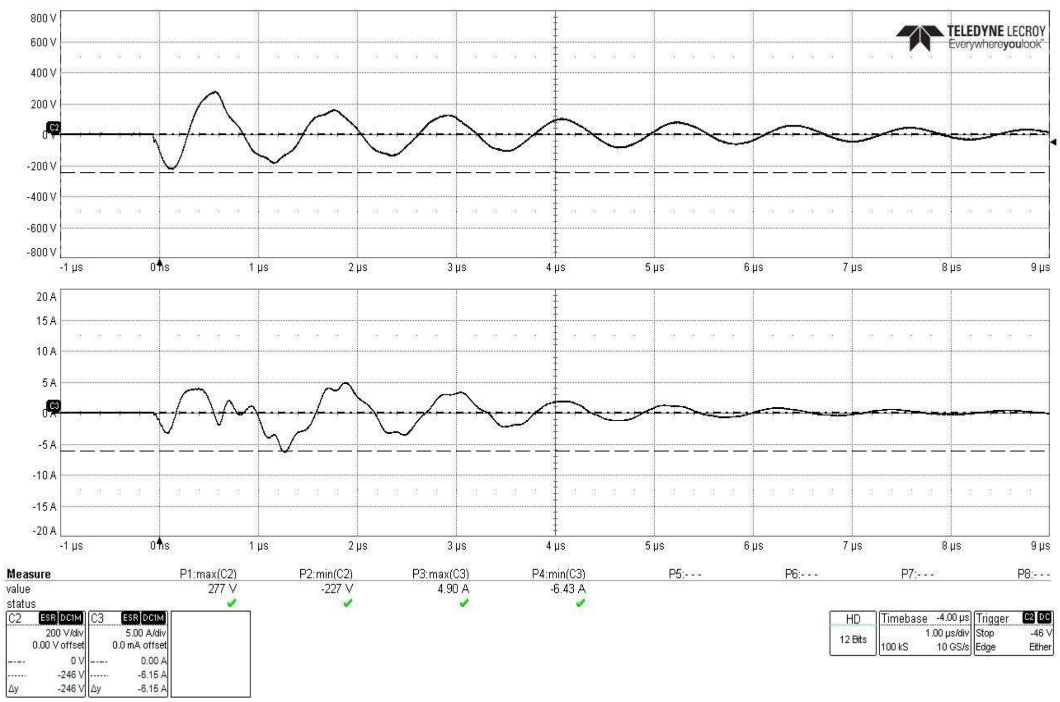


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on DC Power Bundle

EAR Controlled Data

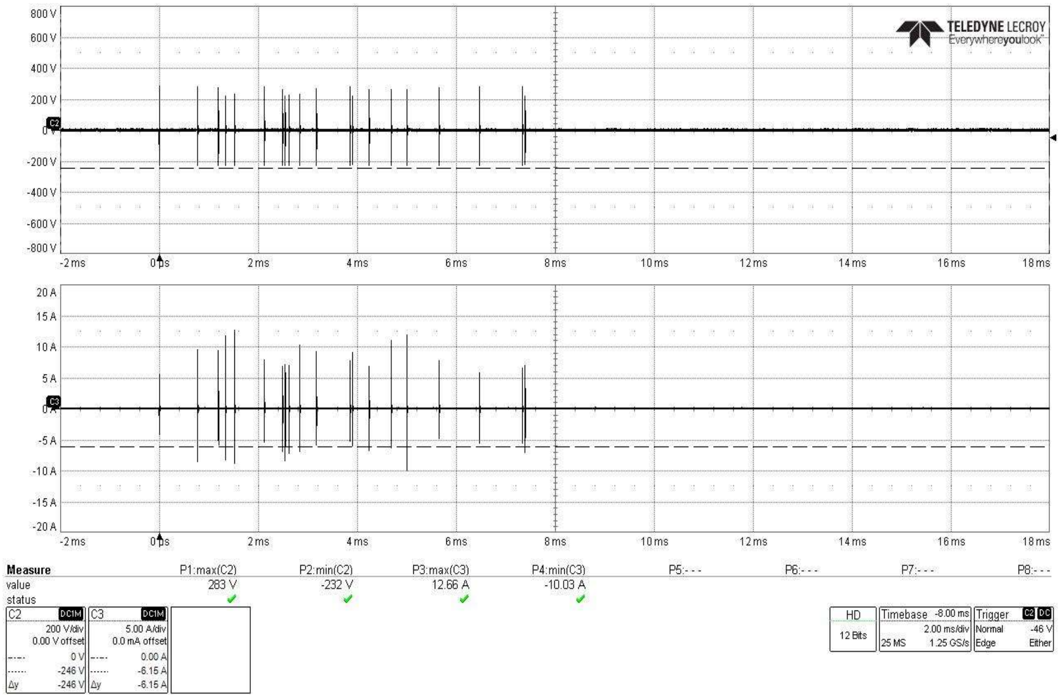


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on DC Power Bundle

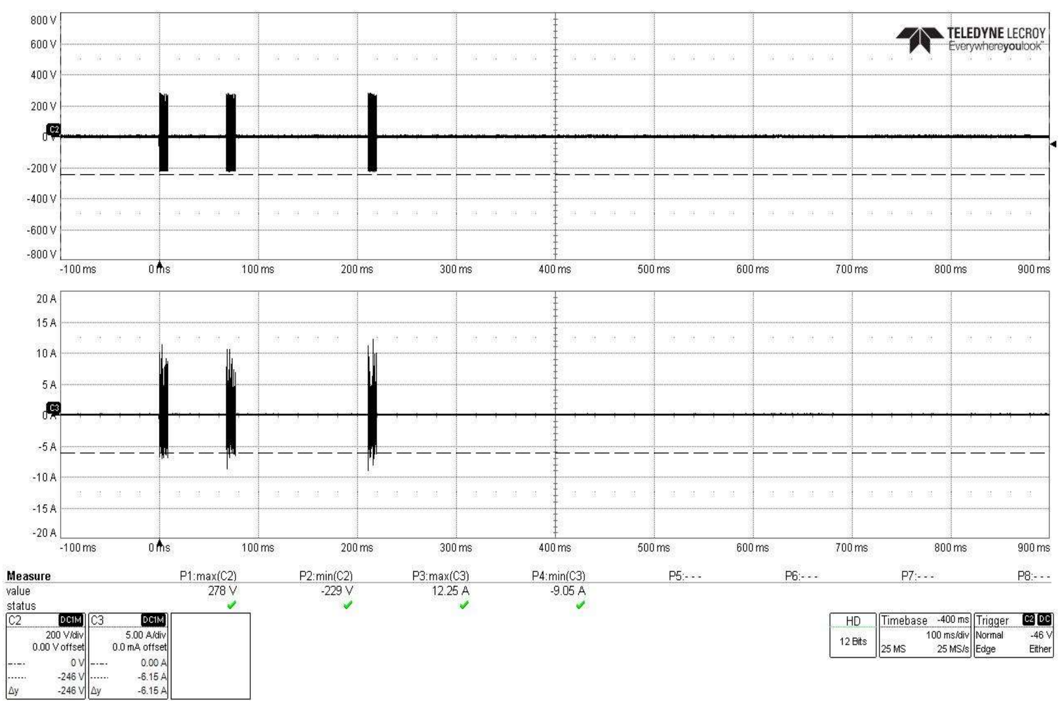


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on DC Power Bundle

EAR Controlled Data

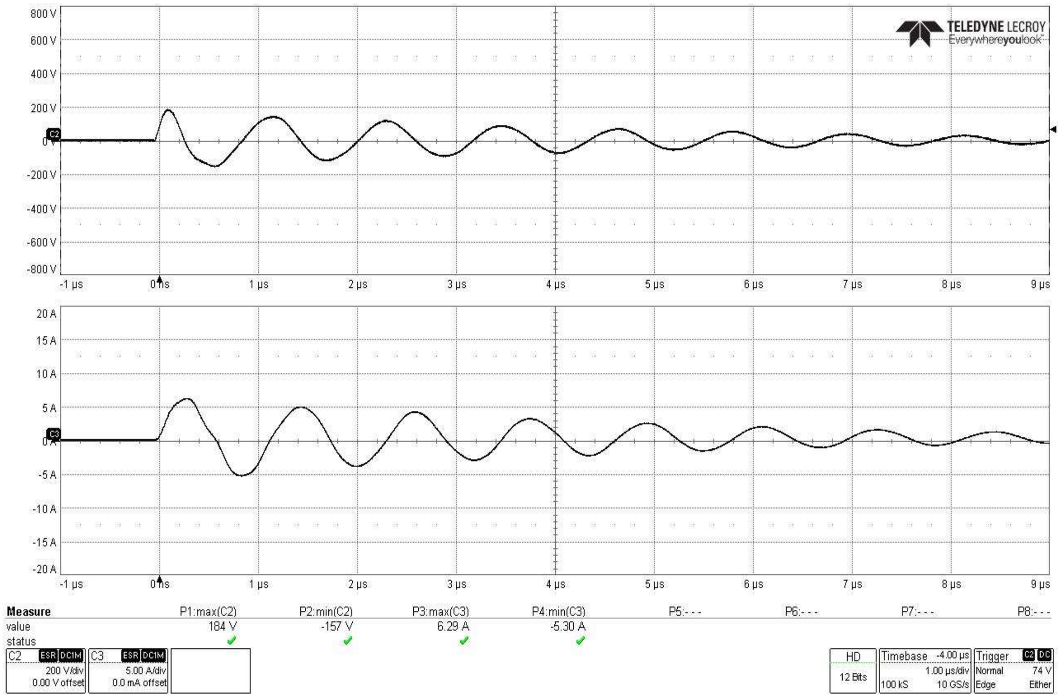


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on DC Power Bundle

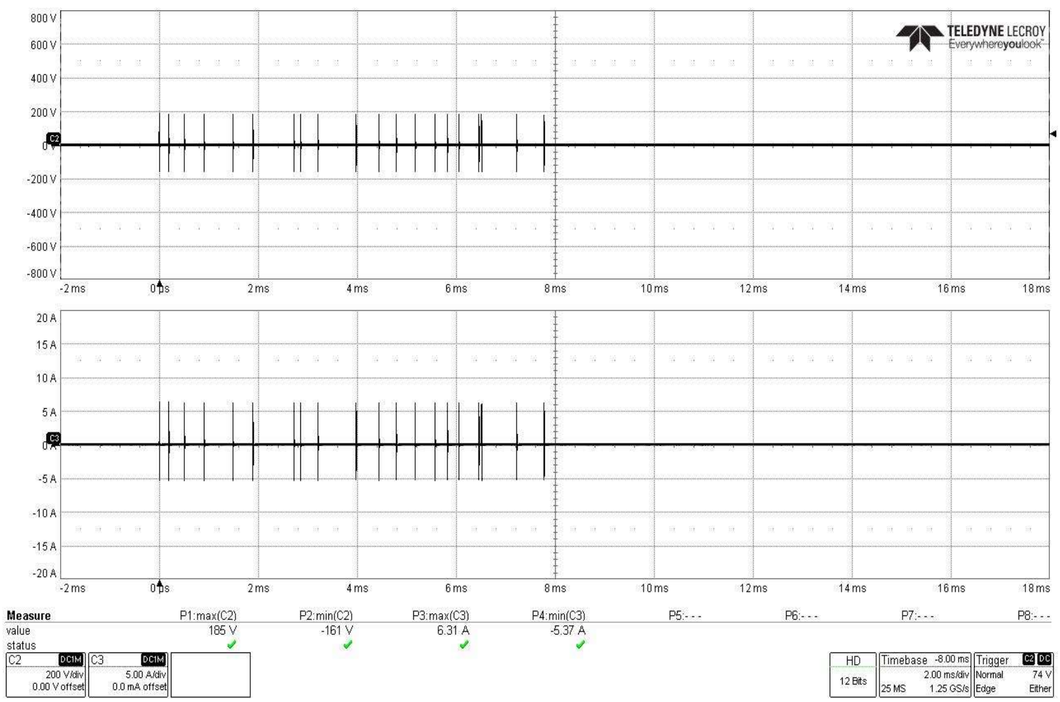


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on DC Power Bundle

EAR Controlled Data

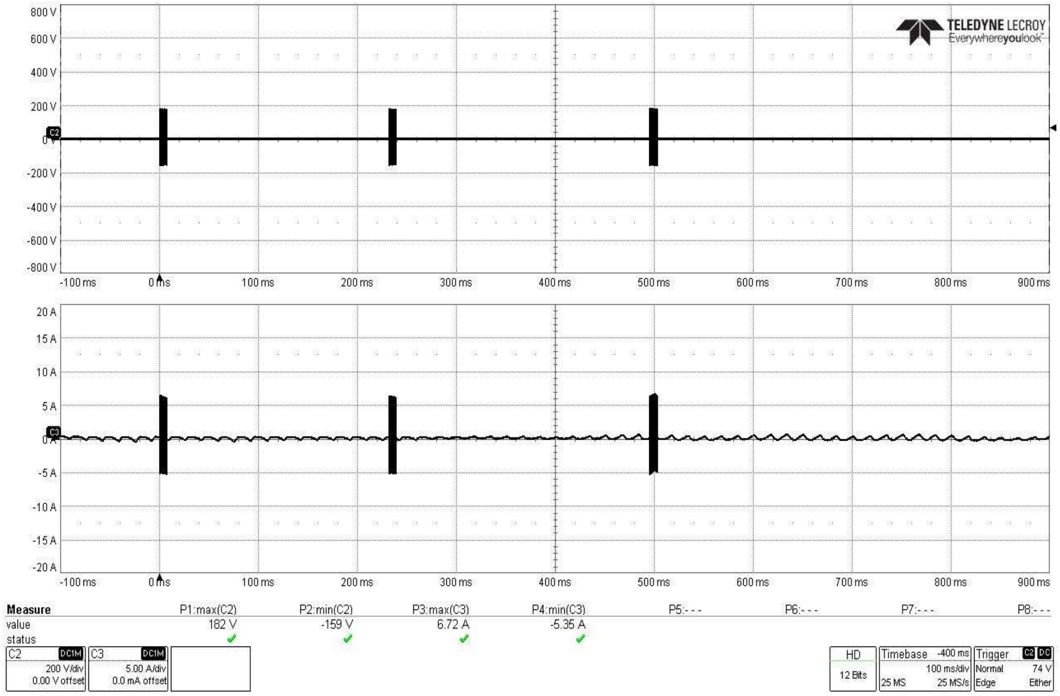


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on DC Power High Side

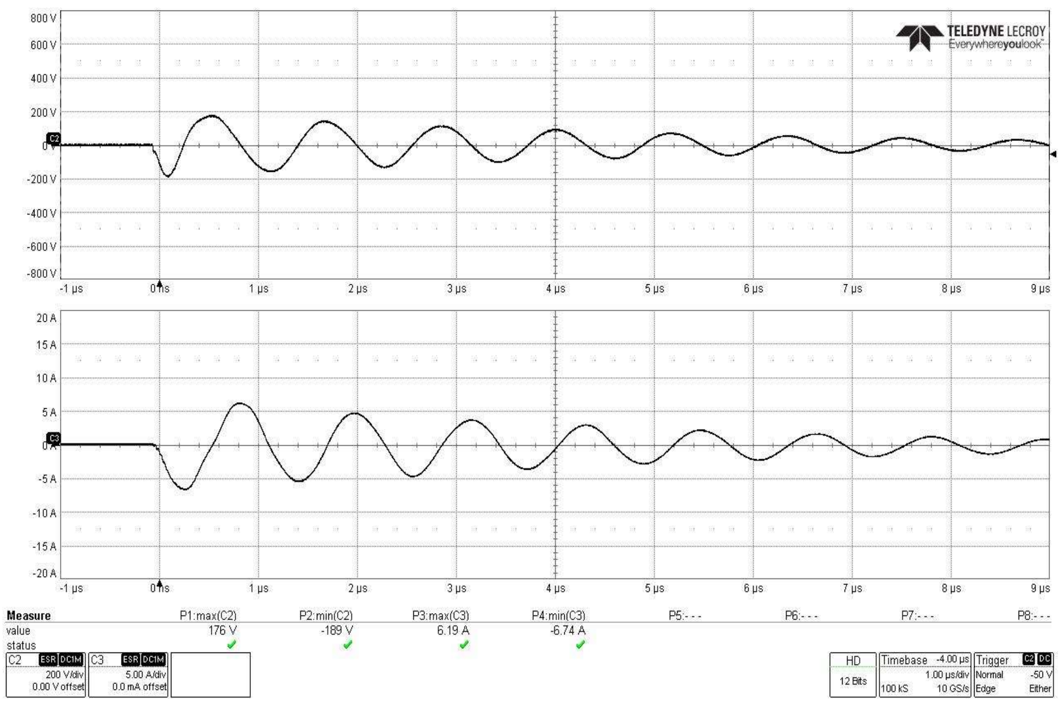


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on DC Power High Side

EAR Controlled Data

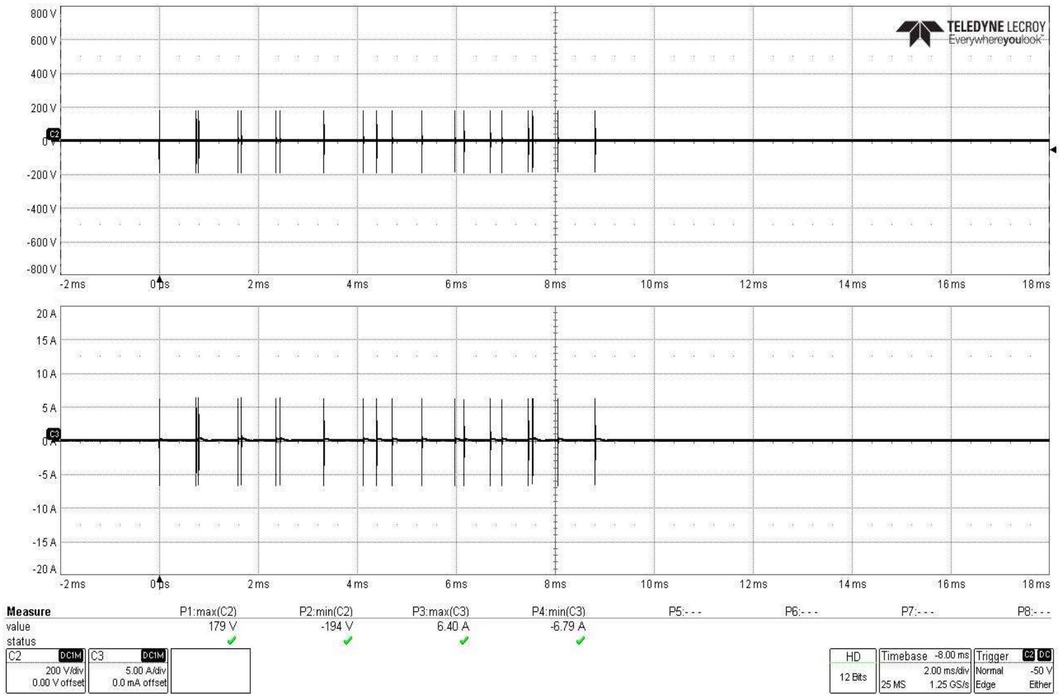


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on DC Power High Side

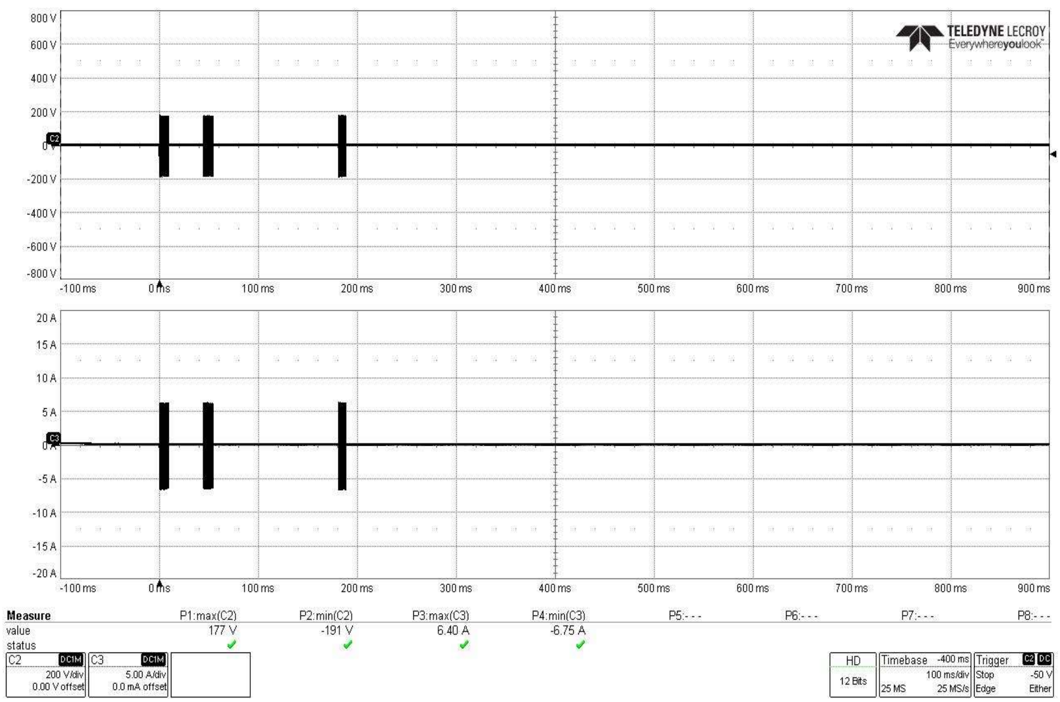


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on DC Power High Side

EAR Controlled Data

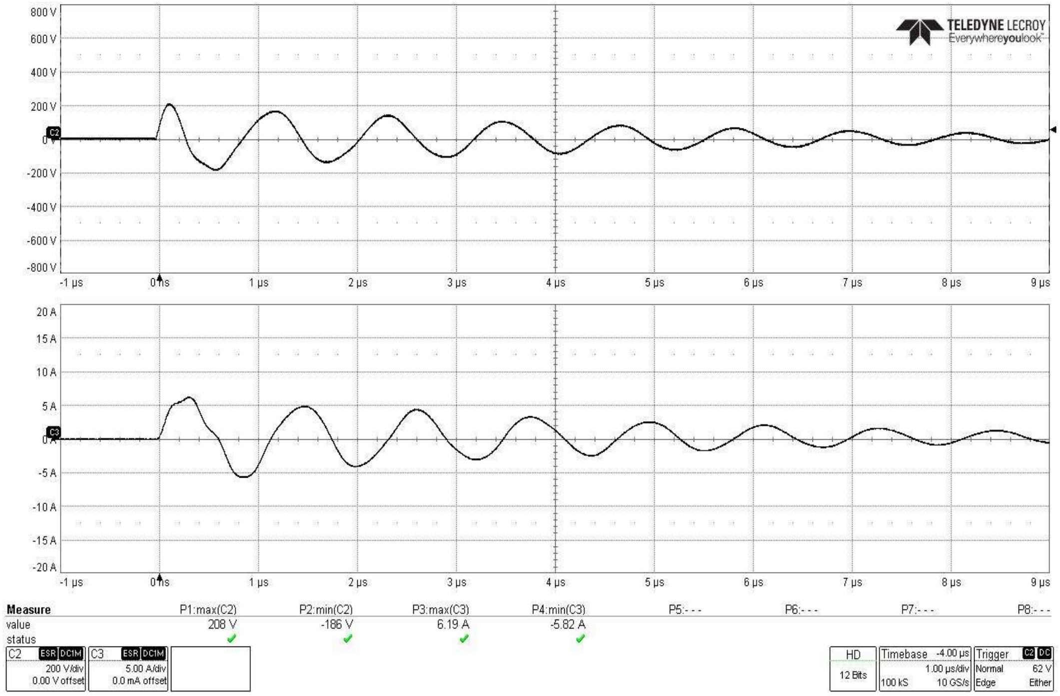


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on DC Power High Side

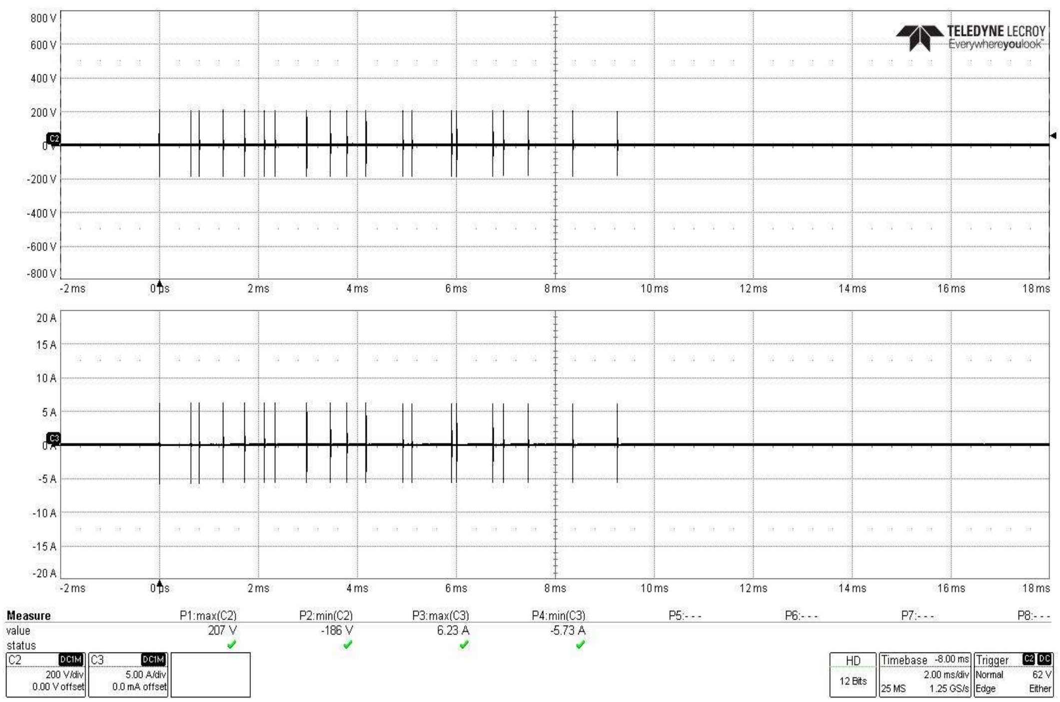


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on DC Power High Side

EAR Controlled Data

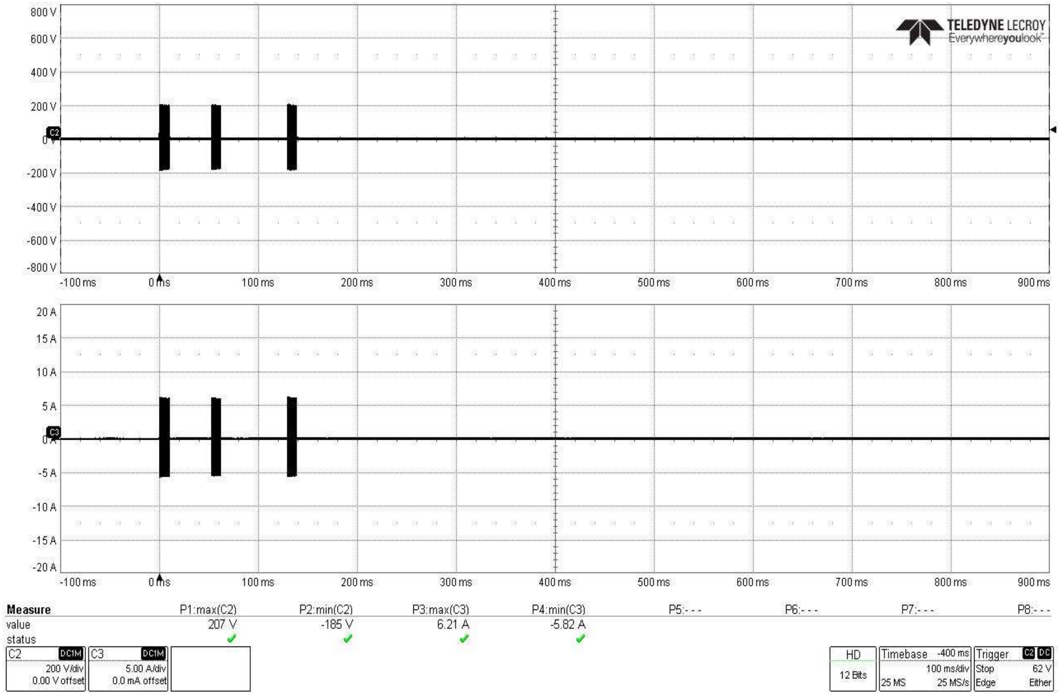


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient +360V/6A, on DC Power Return Side

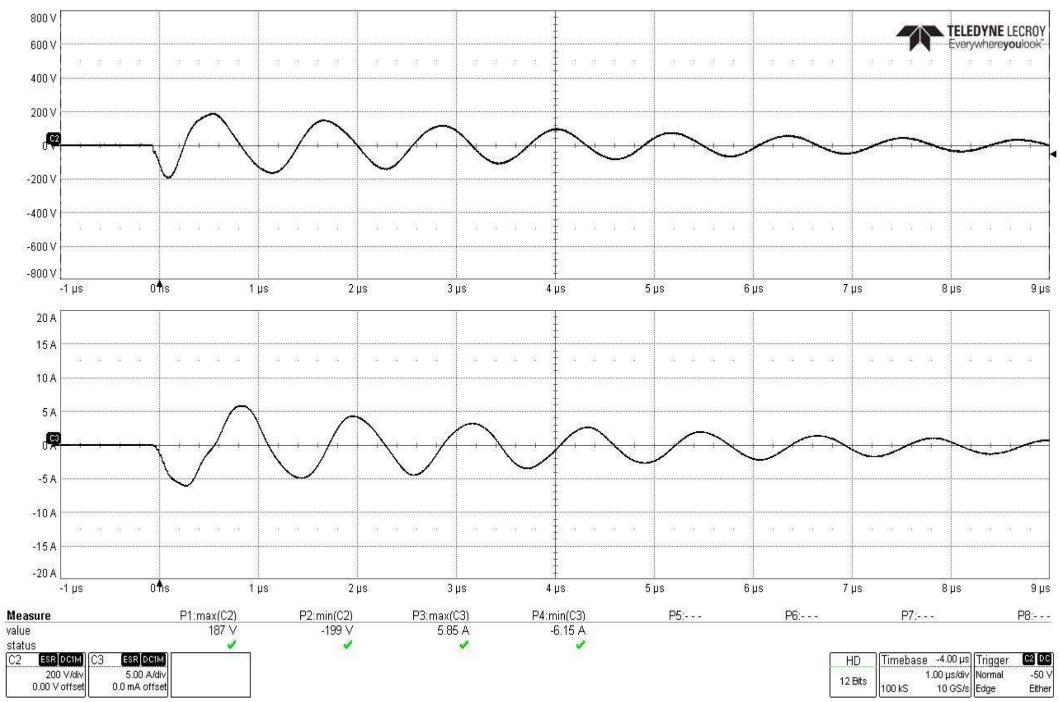


Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients +360V/6A, on DC Power Return Side

EAR Controlled Data

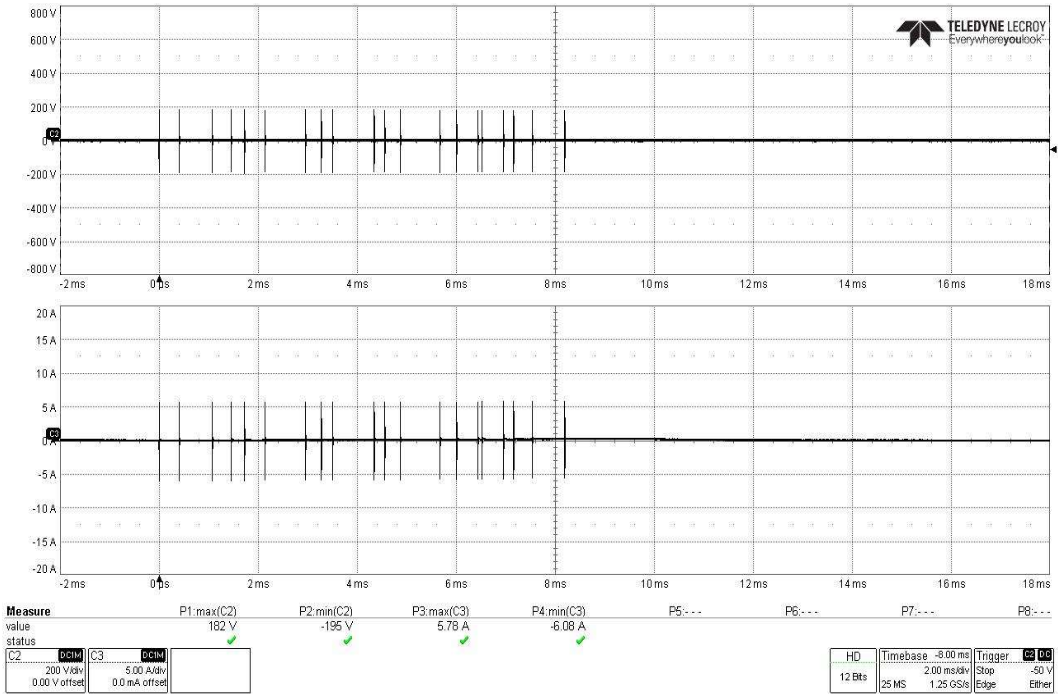


Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts +360V/6A, on AC DC Power Return Side

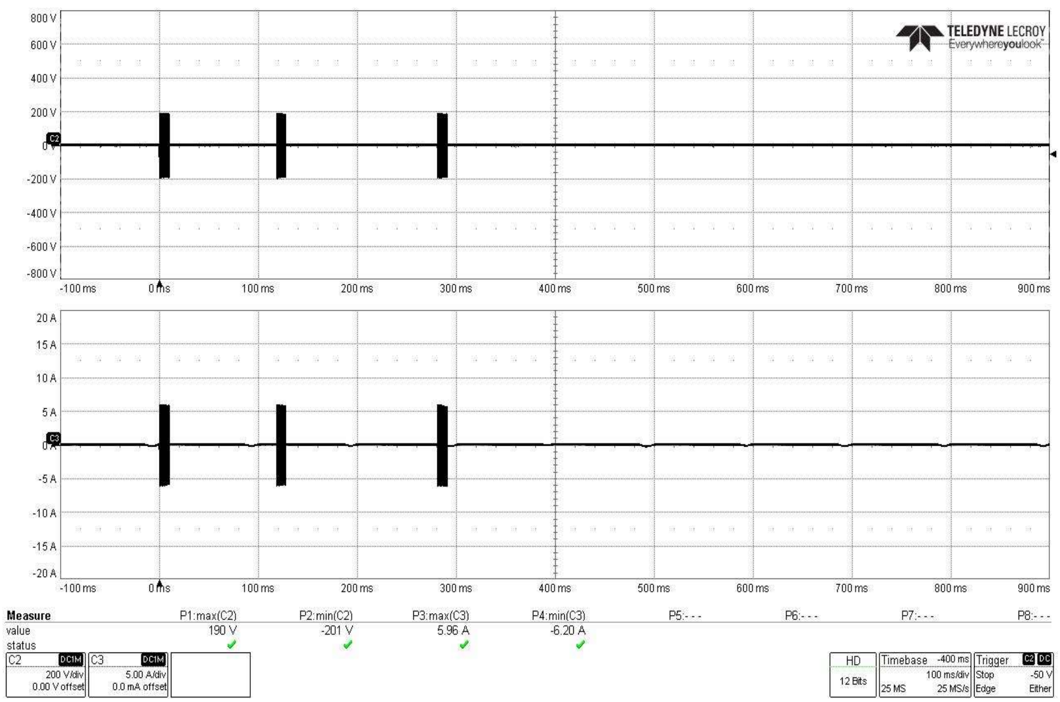


Actual Test CS117 MB Waveform #3 at 1MHz, First Transient -360V/6A, on DC Power Return Side

EAR Controlled Data



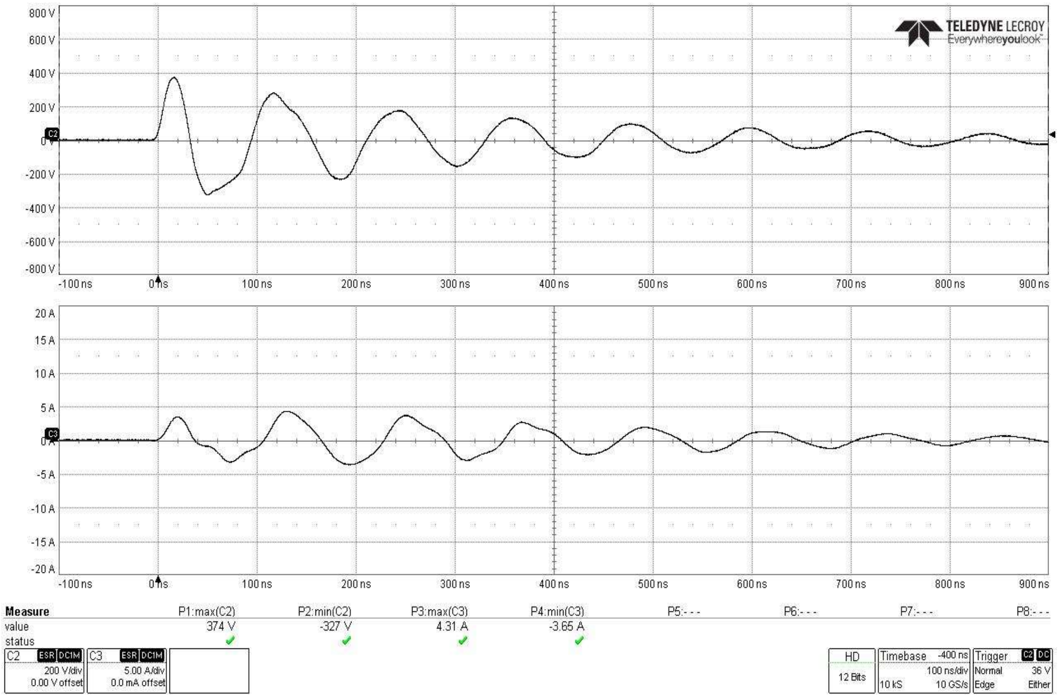
Actual Test CS117 MB Waveform #3 at 1MHz, 20 Transients -360V/6A, on DC Power Return Side



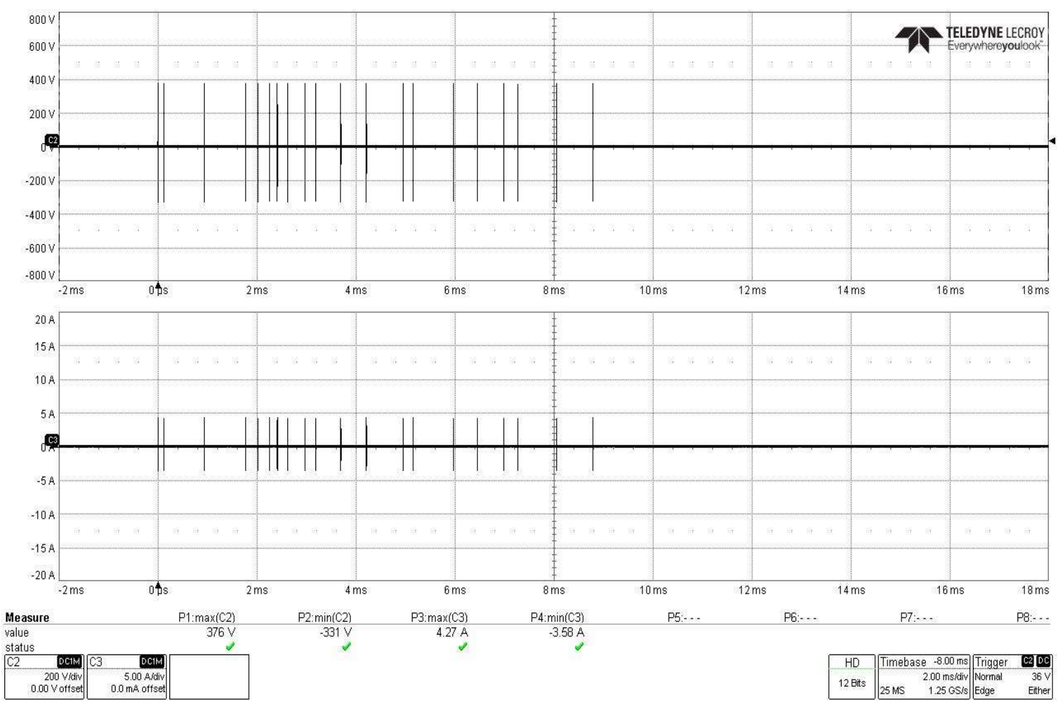
Actual Test CS117 MB Waveform #3 at 1MHz, 3 Bursts -360V/6A, on DC Power Return Side

EAR Controlled Data

CS117 Actual Test Multiple Burst (MB) Waveform #3 at 10MHz with V_T = 360V on Flexboss 18

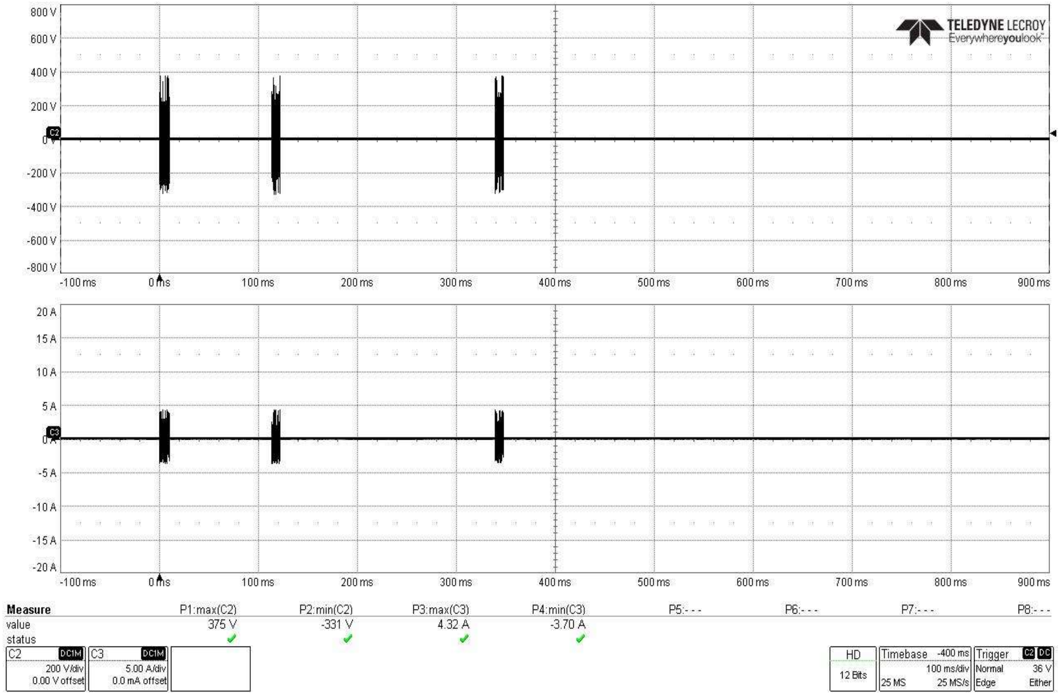


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on AC Power Line 1

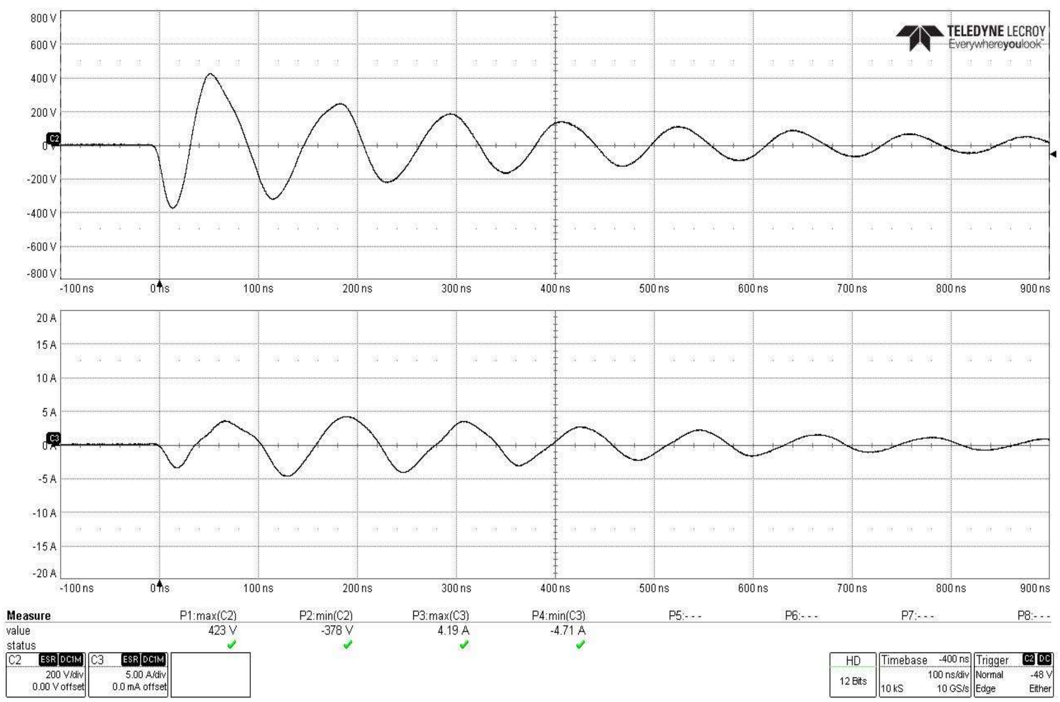


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on AC Power Line 1

EAR Controlled Data

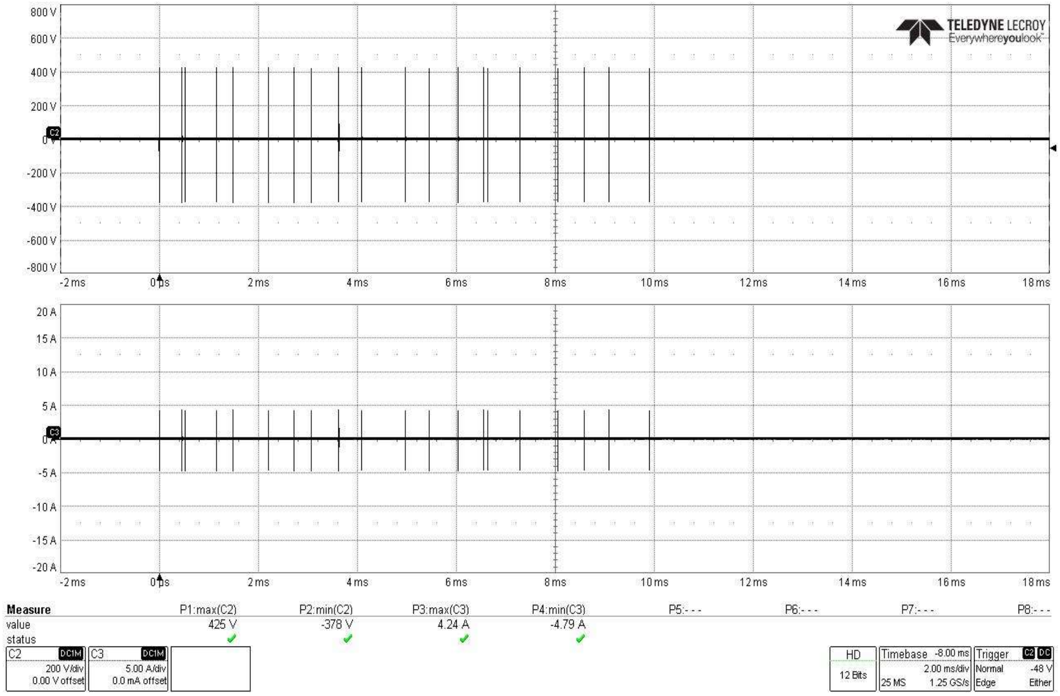


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on AC Power Line 1

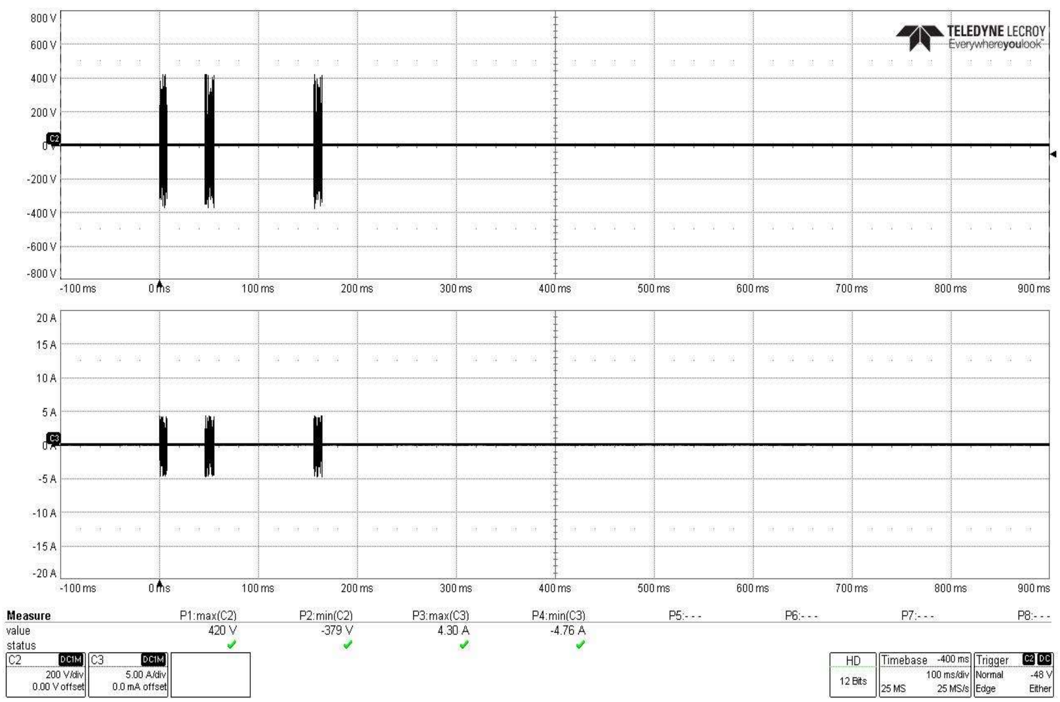


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on AC Power Line 1

EAR Controlled Data

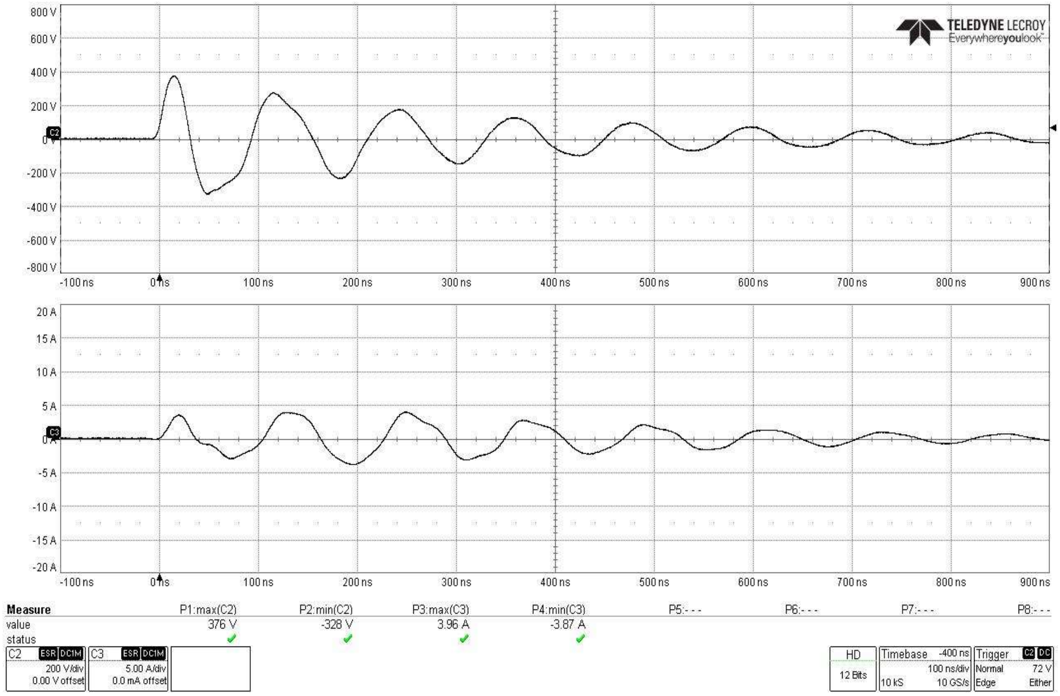


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on AC Power Line 1

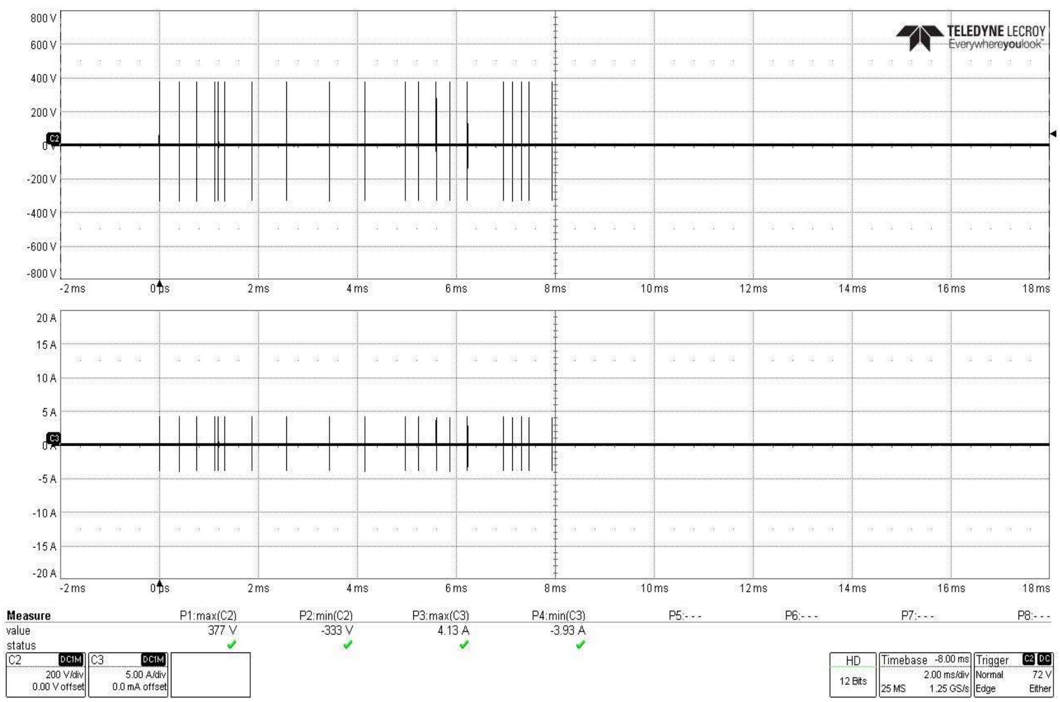


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on AC Power Line 1

EAR Controlled Data

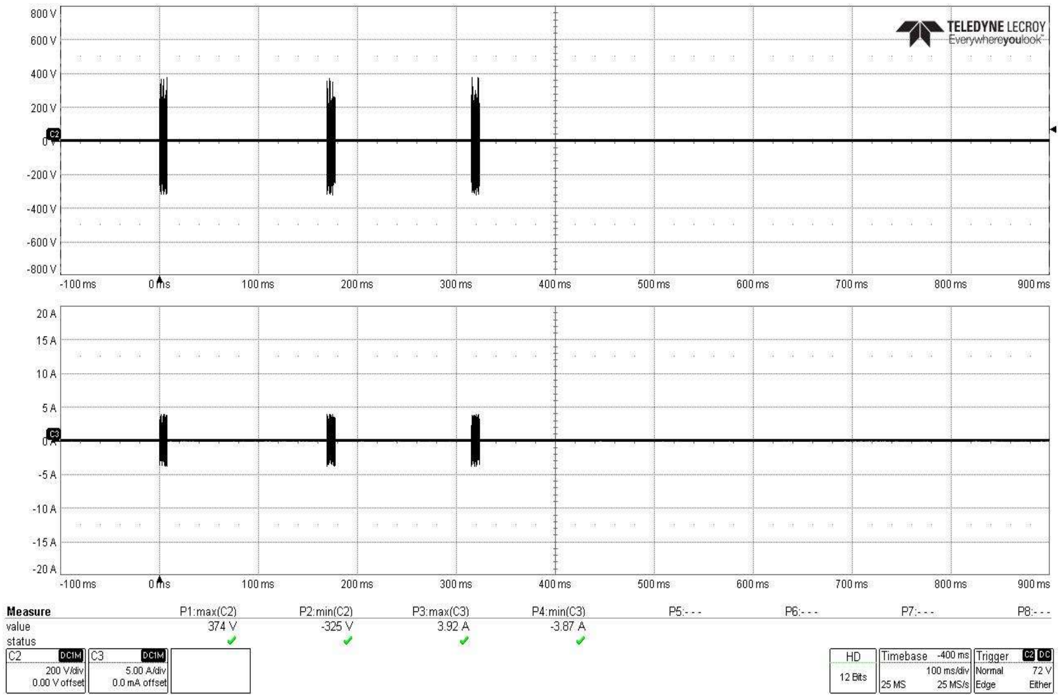


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on AC Power Line 2

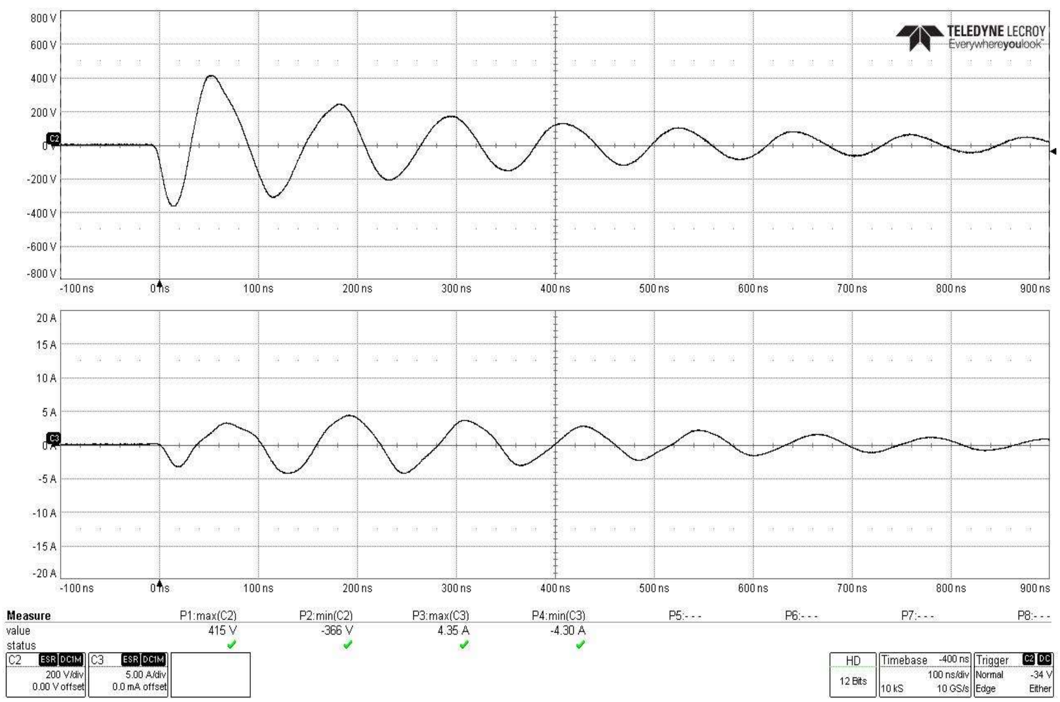


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on AC Power Line 2

EAR Controlled Data

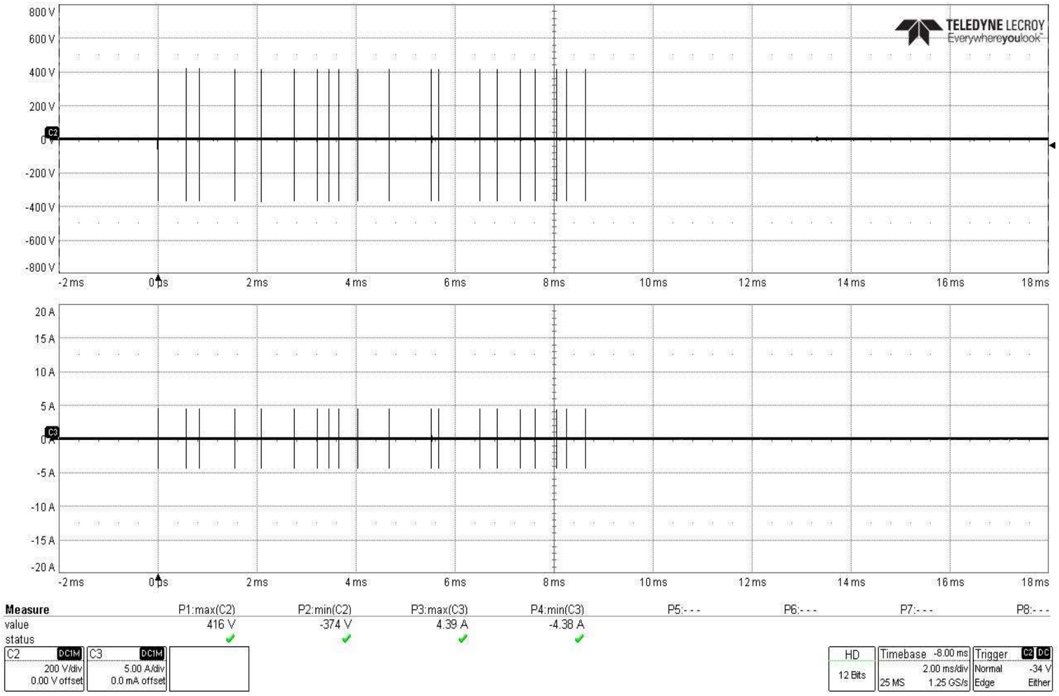


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on AC Power Line 2

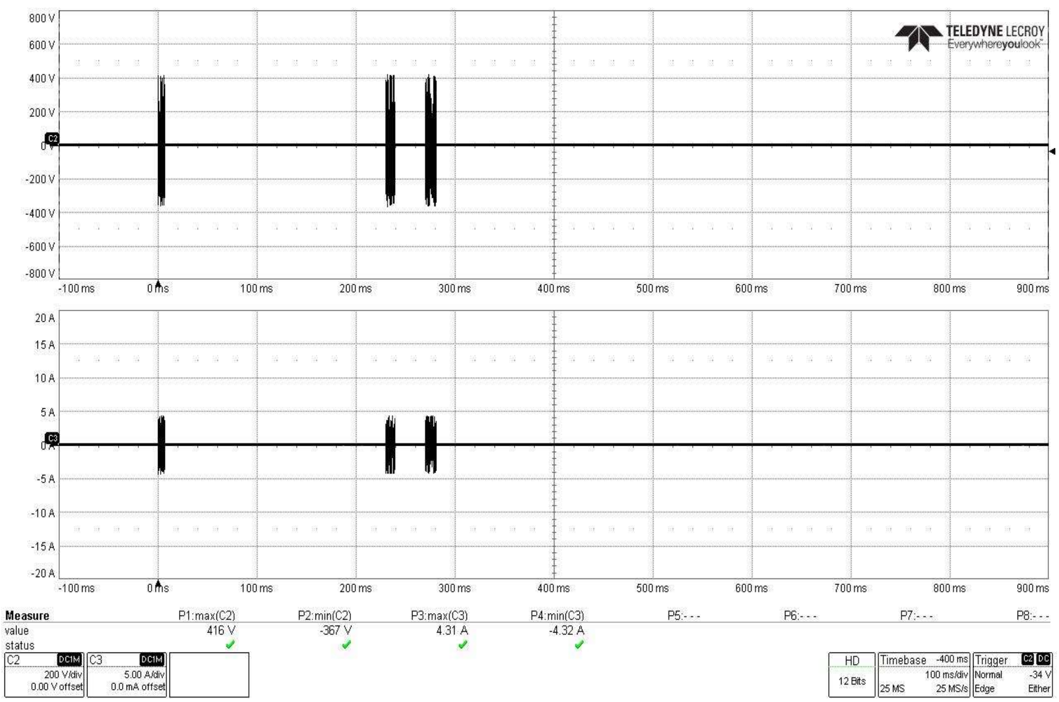


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on AC Power Line 2

EAR Controlled Data

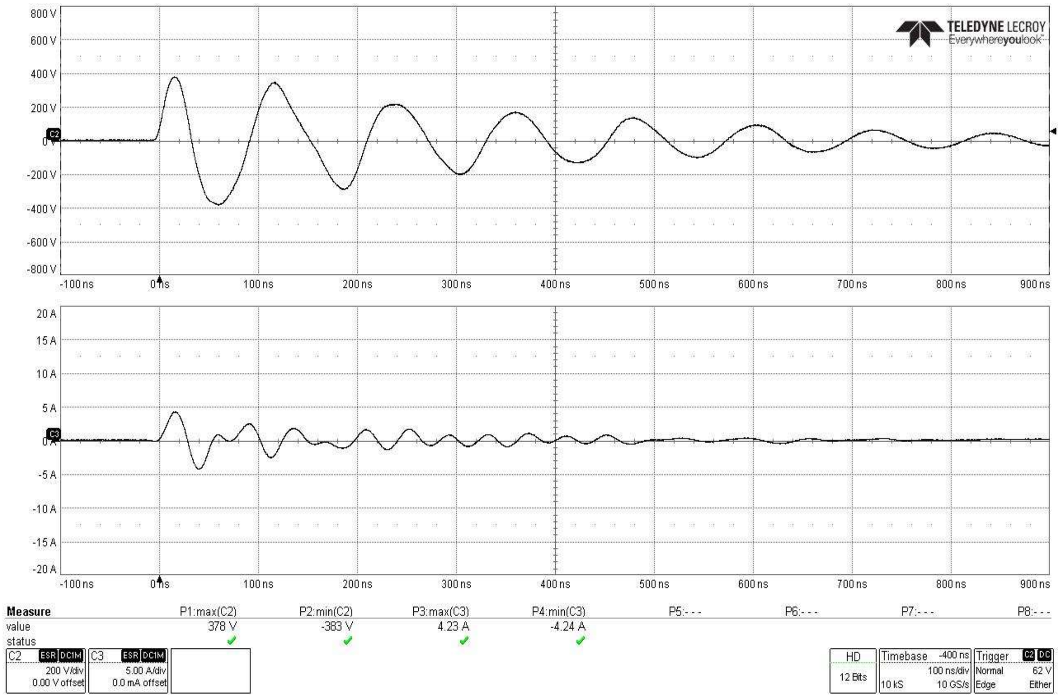


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on AC Power Line 2

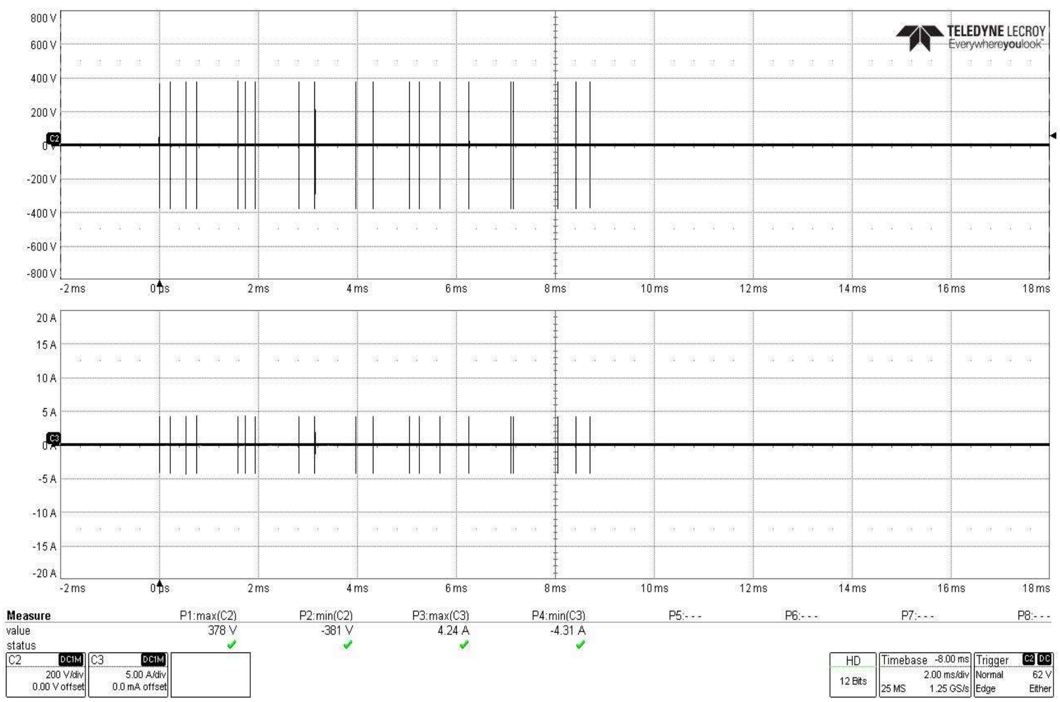


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on AC Power Line 2

EAR Controlled Data

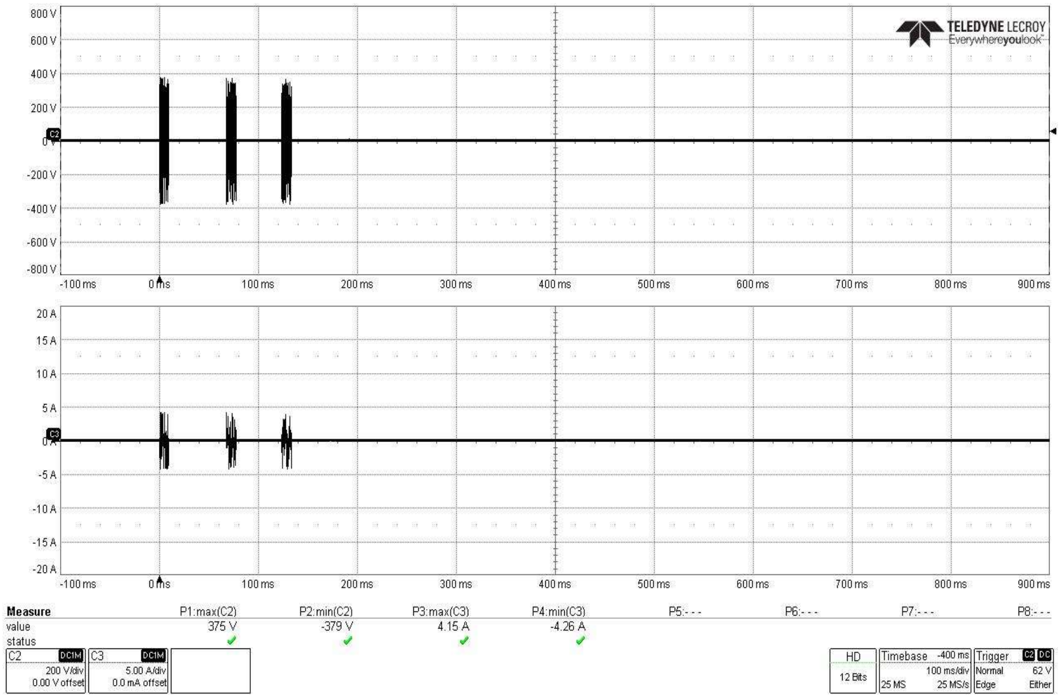


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on Full AC Power Bundle

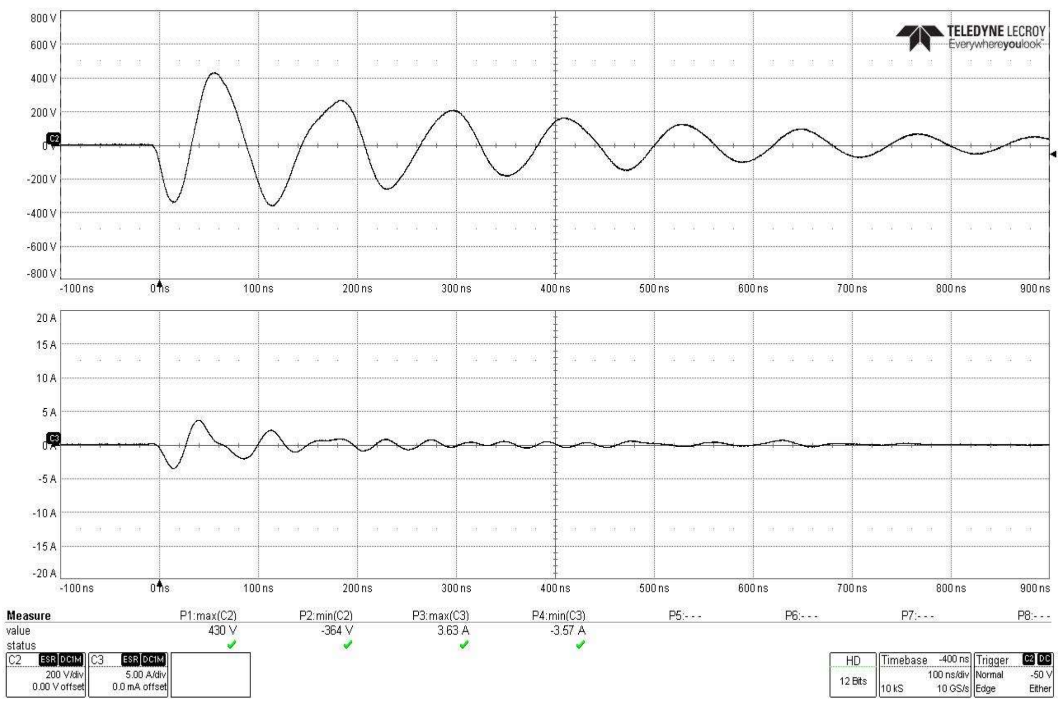


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on Full AC Power Bundle

EAR Controlled Data

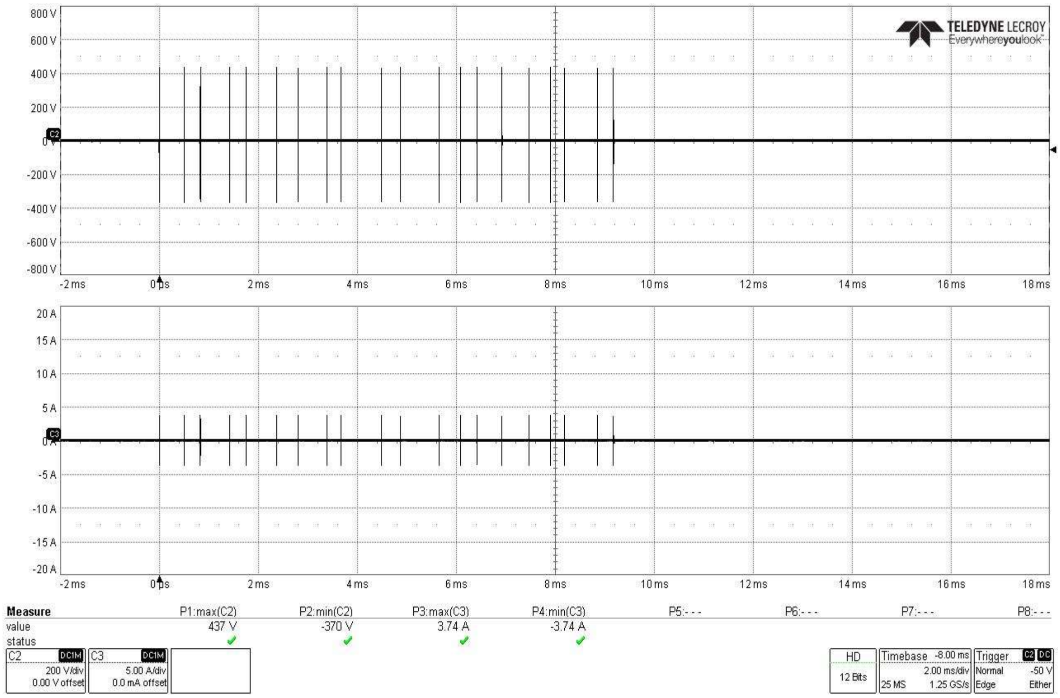


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on Full AC Power Bundle

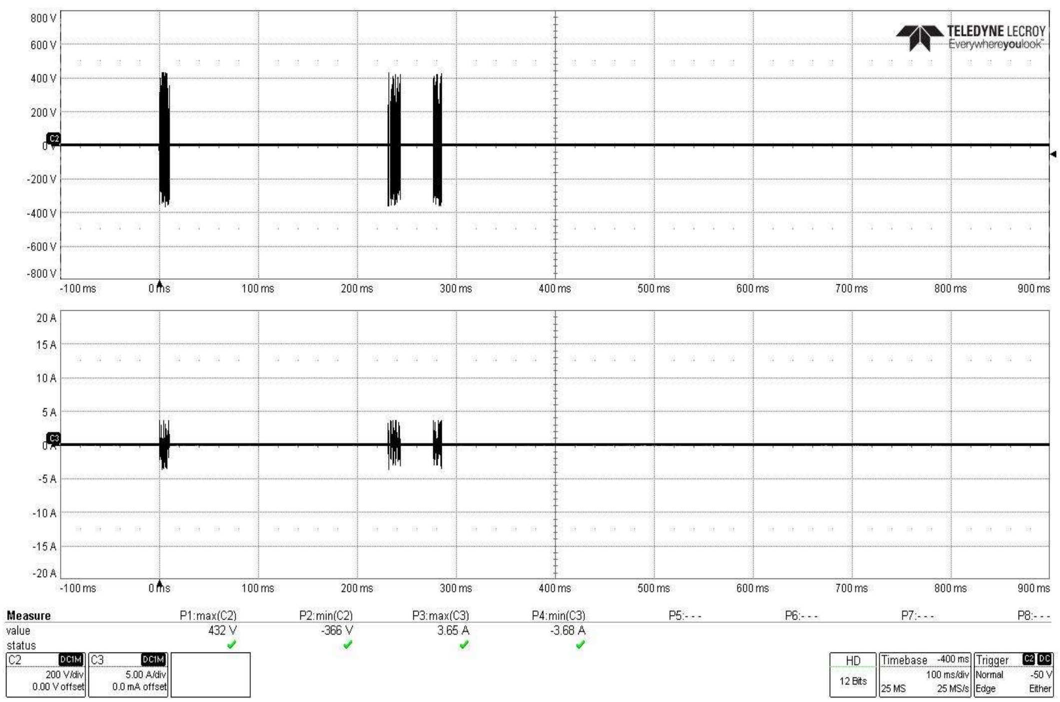


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on Full AC Power Bundle

EAR Controlled Data

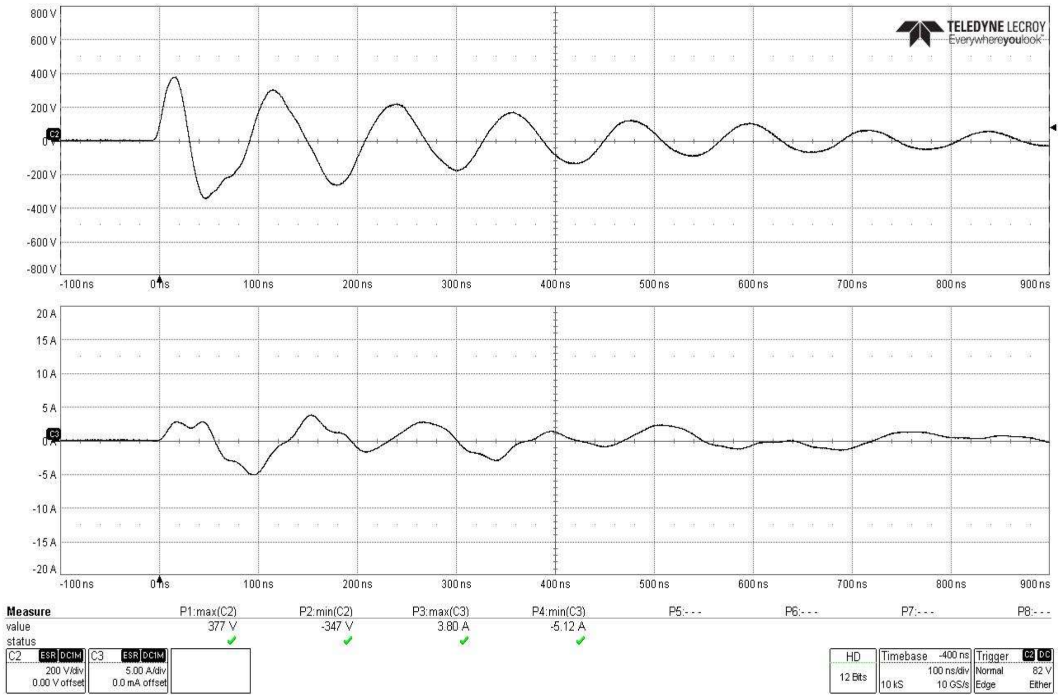


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on Full AC Power Bundle

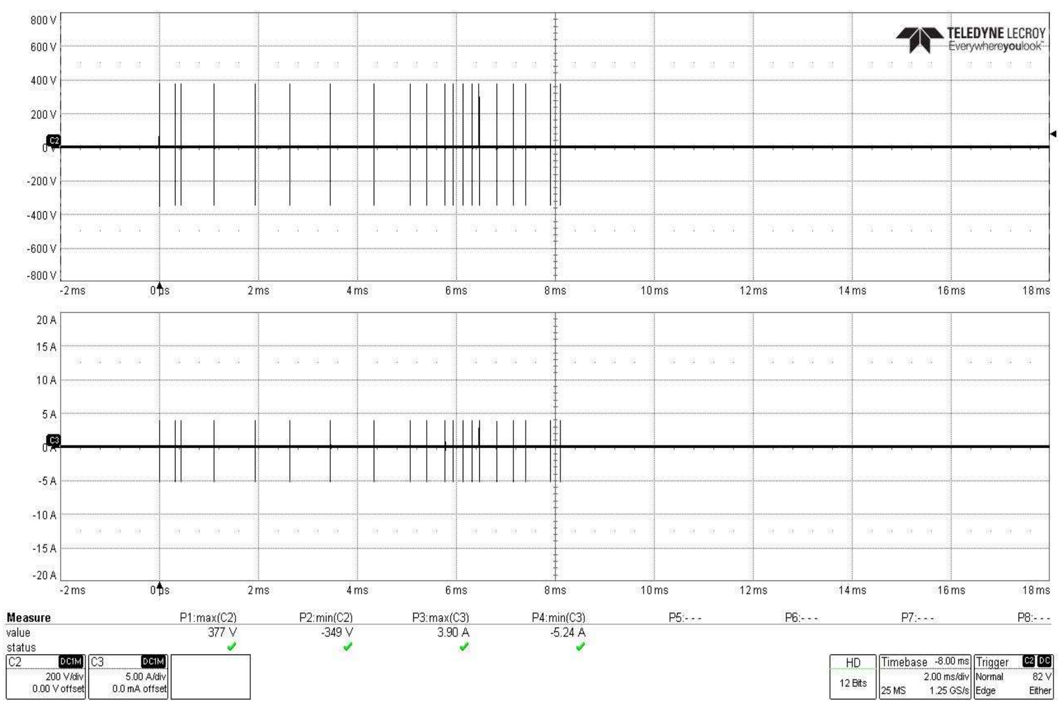


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on Full AC Power Bundle

EAR Controlled Data

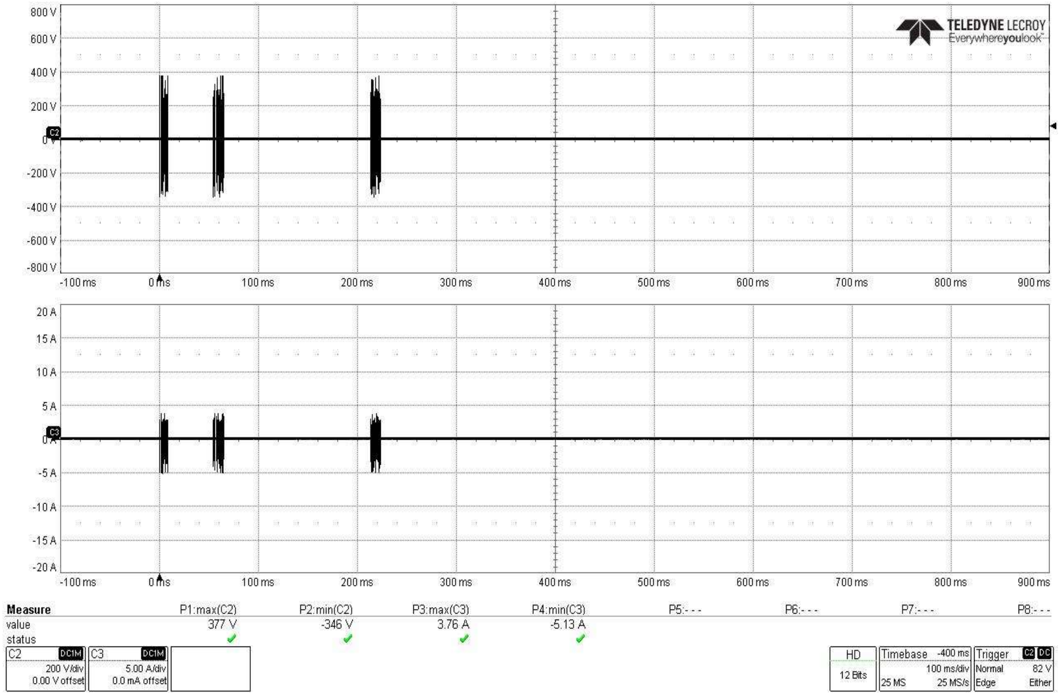


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on DC Power Bundle

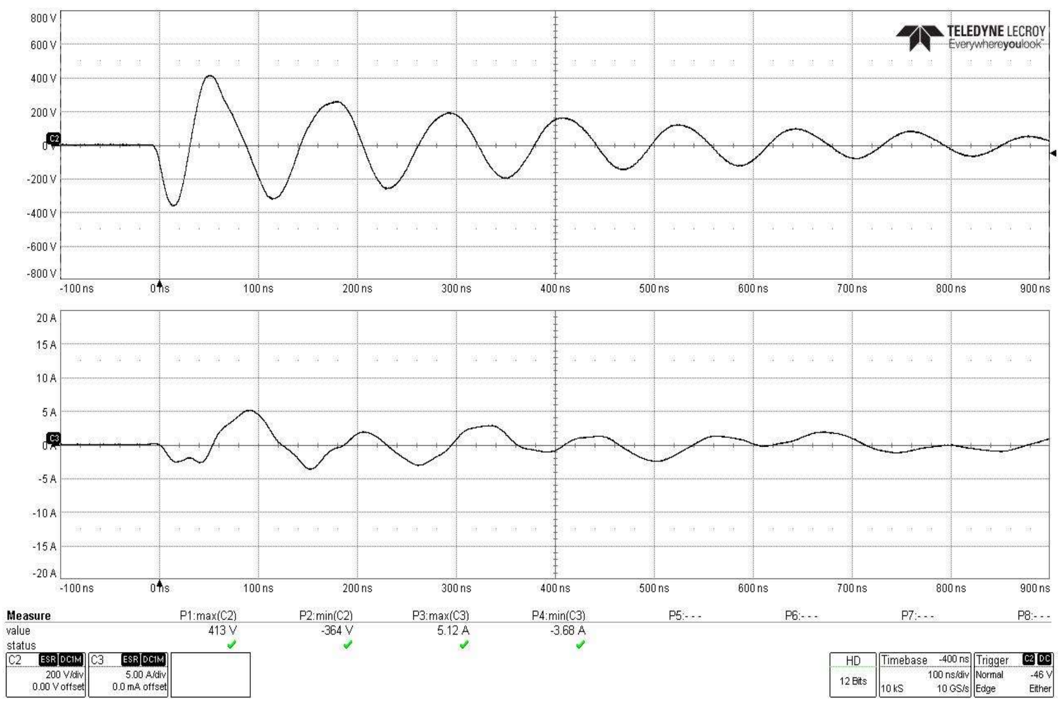


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on DC Power Bundle

EAR Controlled Data

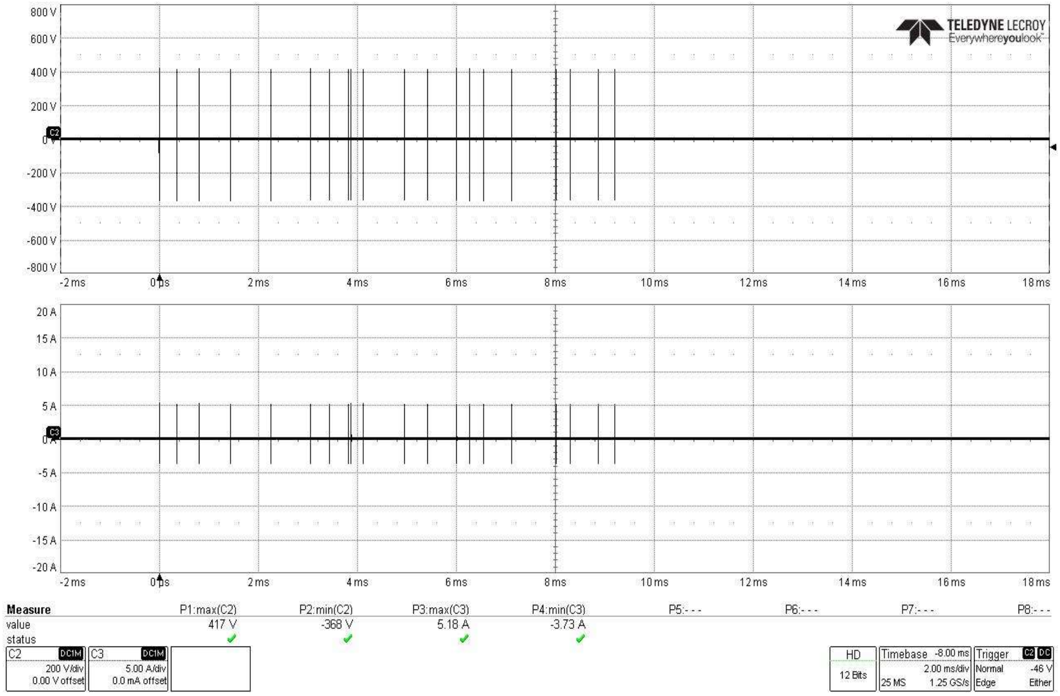


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on DC Power Bundle

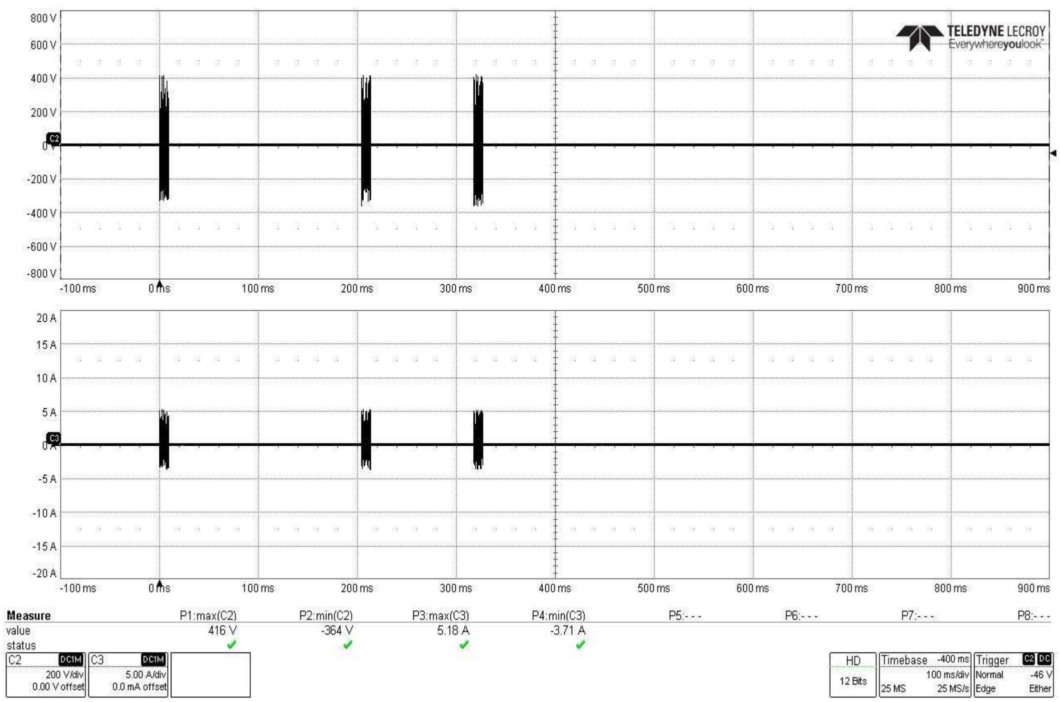


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on DC Power Bundle

EAR Controlled Data

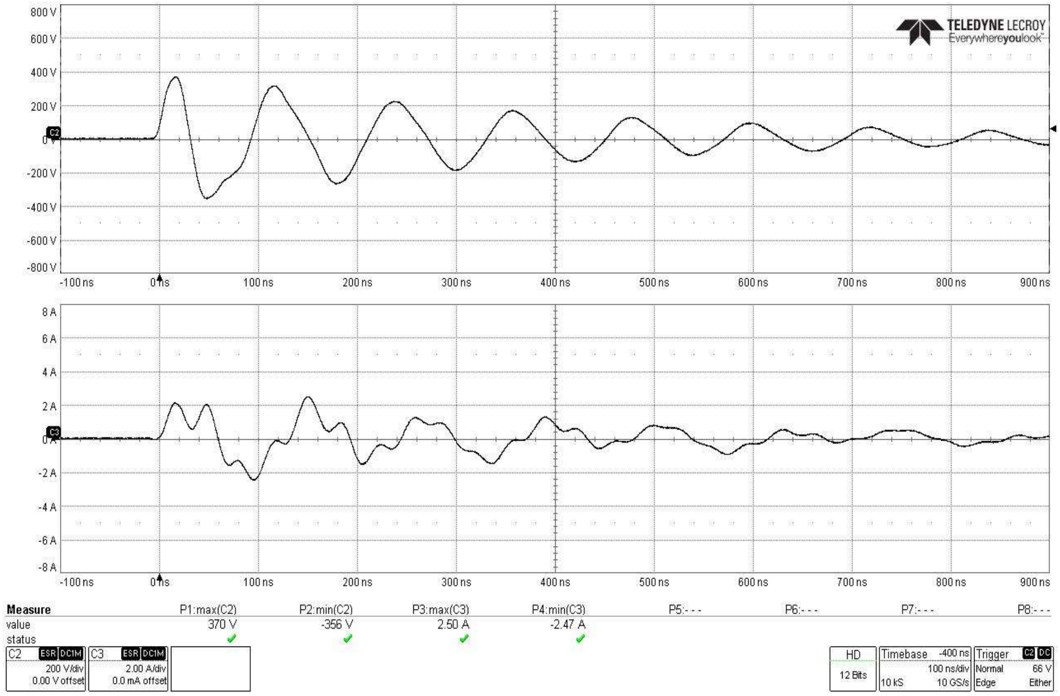


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on DC Power Bundle

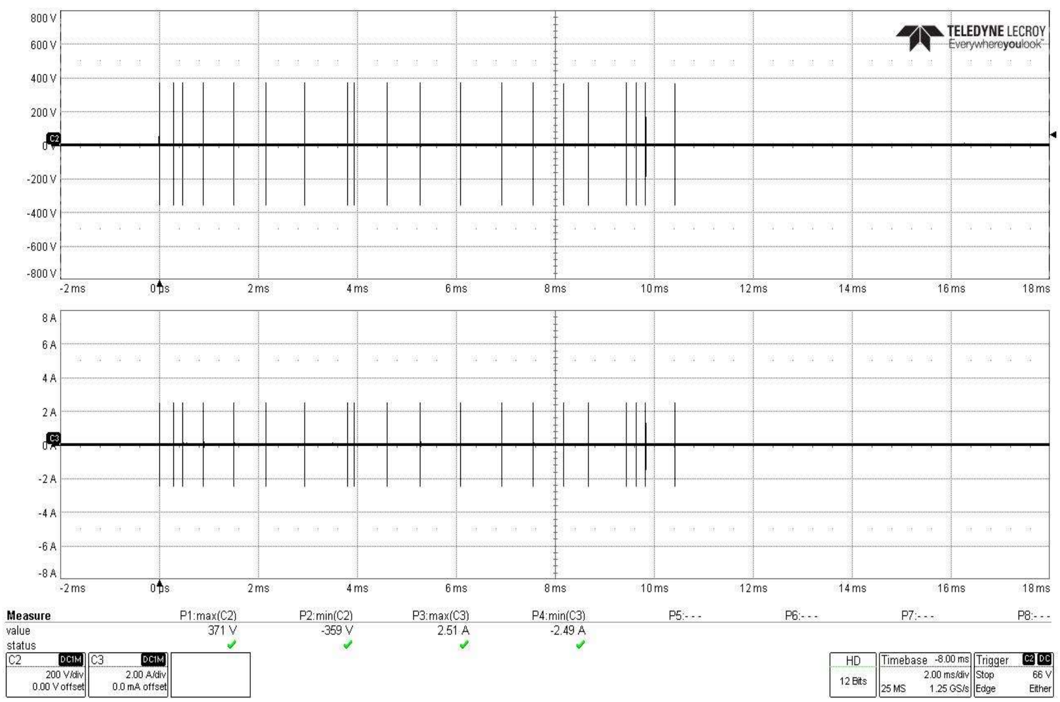


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on DC Power Bundle

EAR Controlled Data

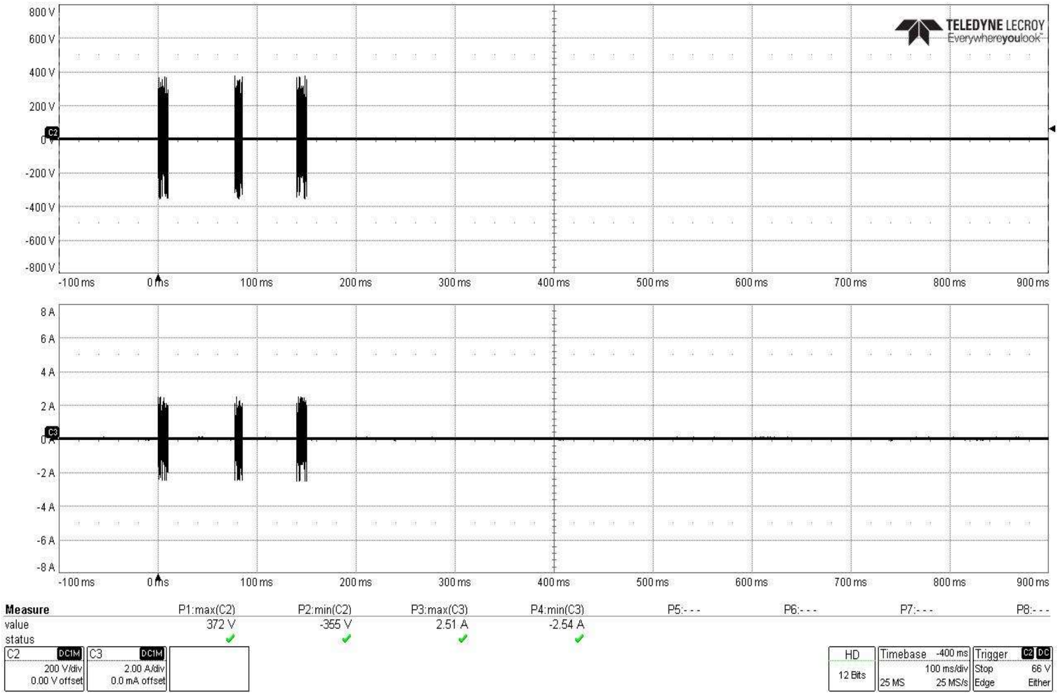


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on DC Power High Side

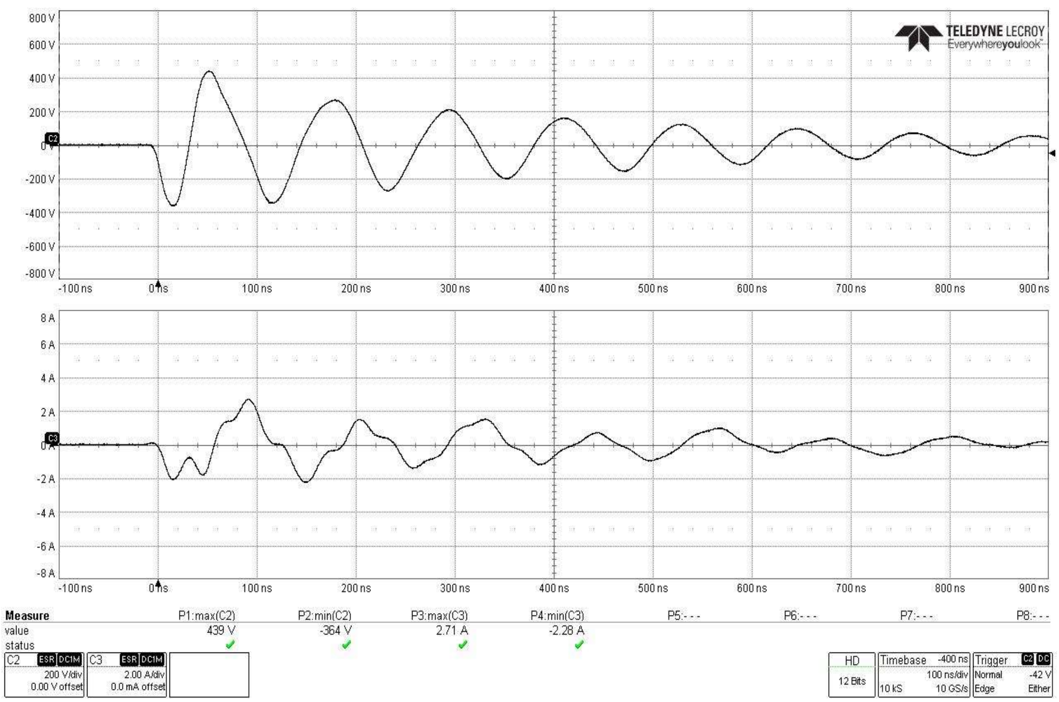


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on DC Power High Side

EAR Controlled Data

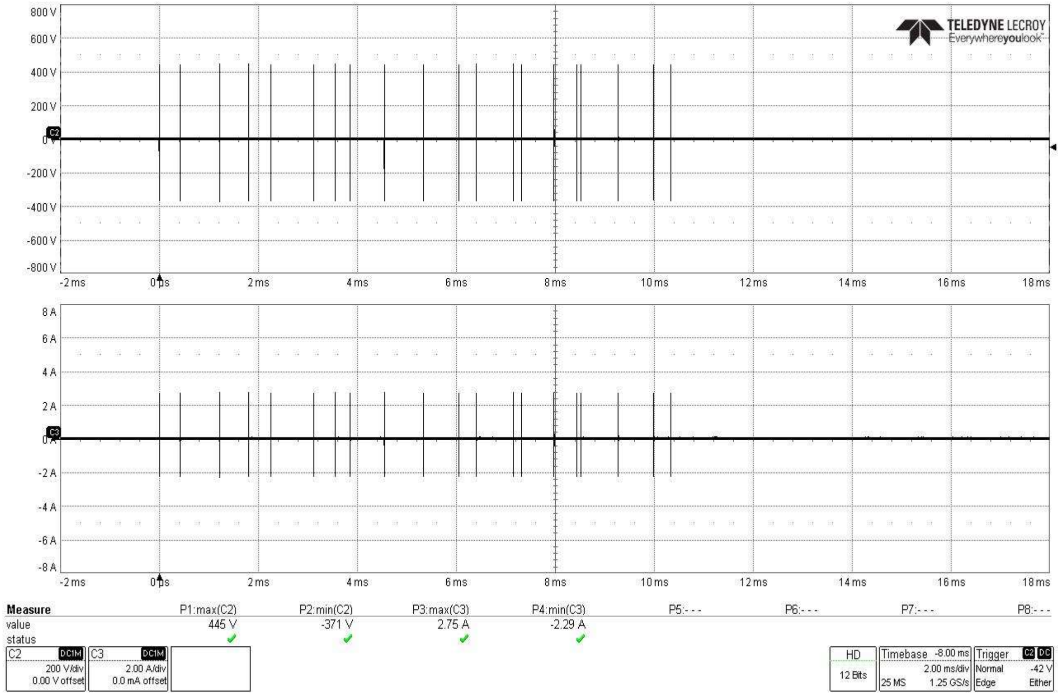


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on DC Power High Side

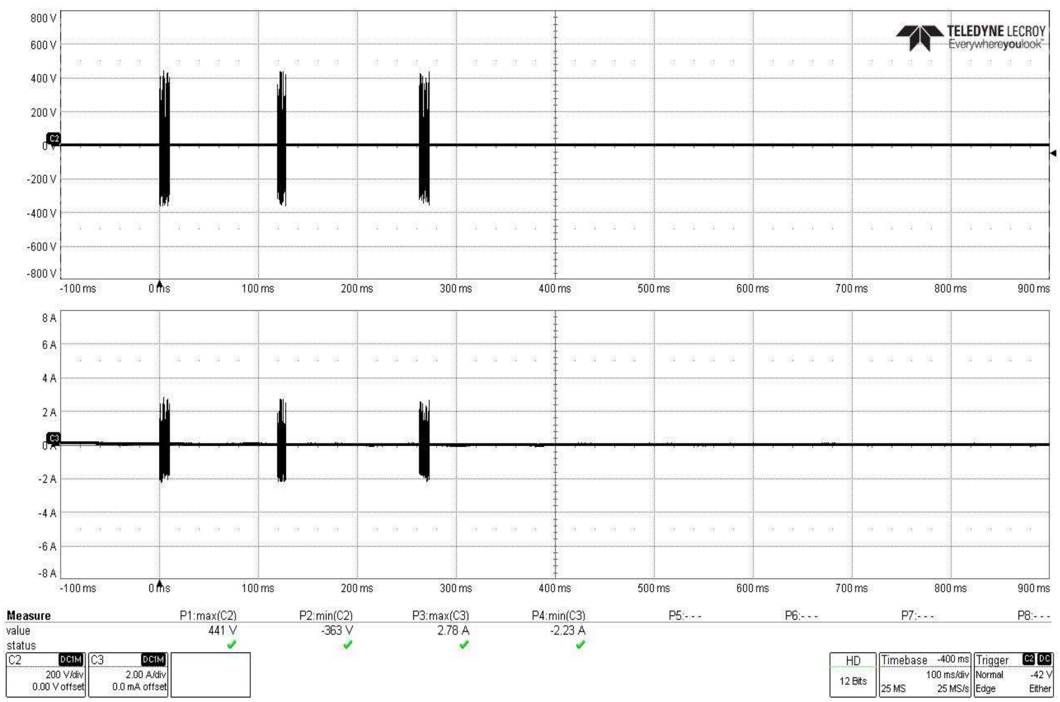


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on DC Power High Side

EAR Controlled Data

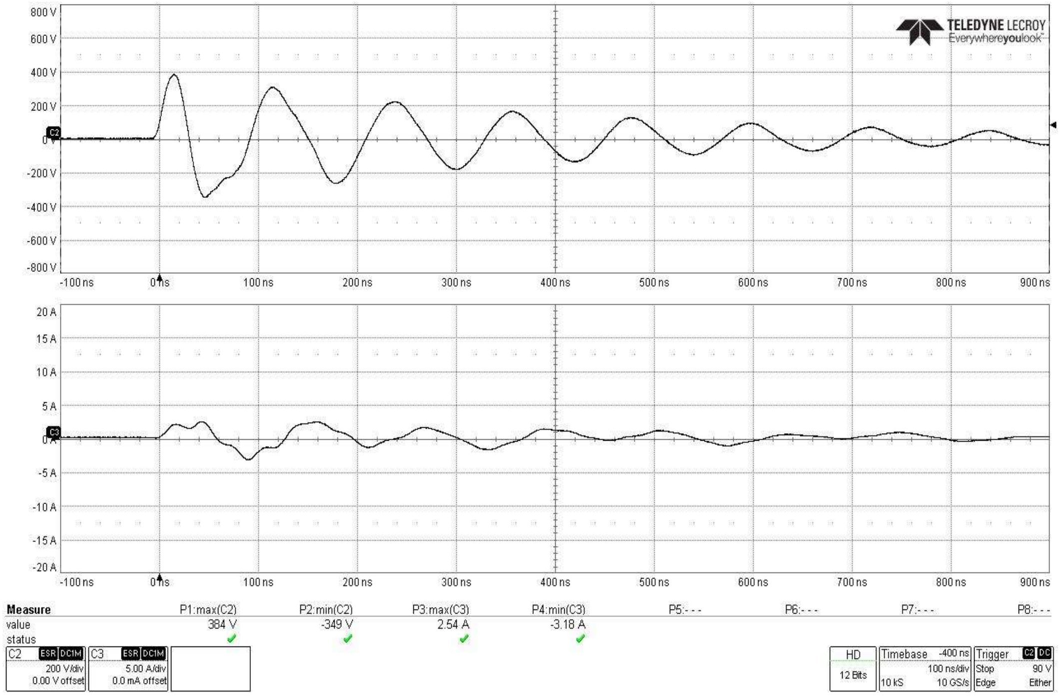


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on DC Power High Side

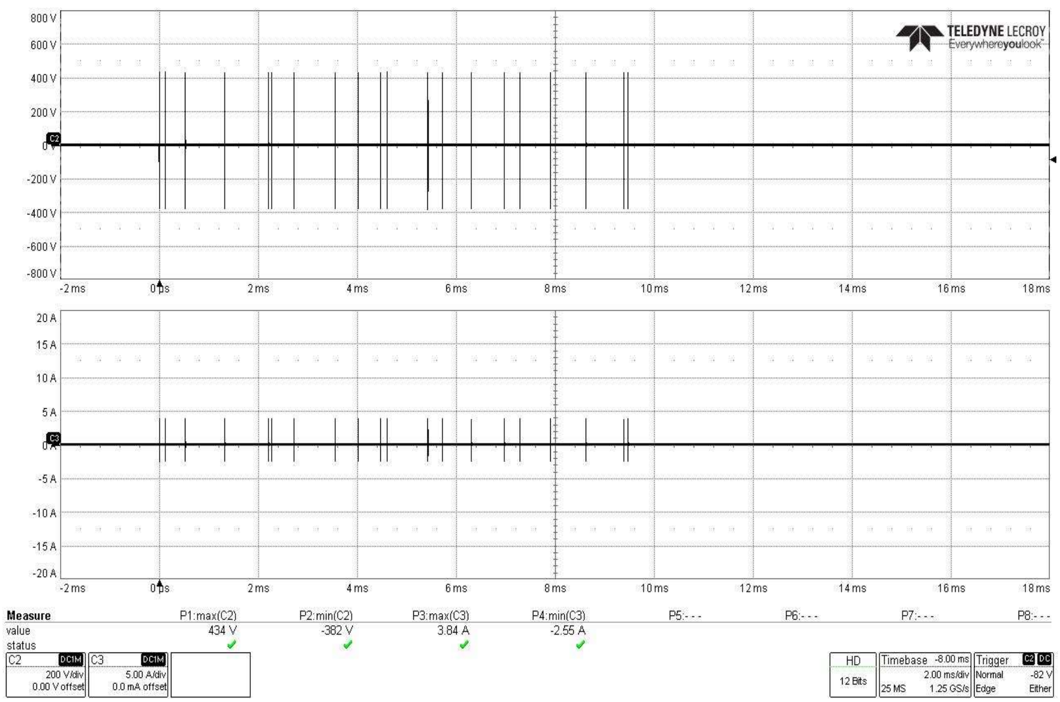


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on DC Power High Side

EAR Controlled Data

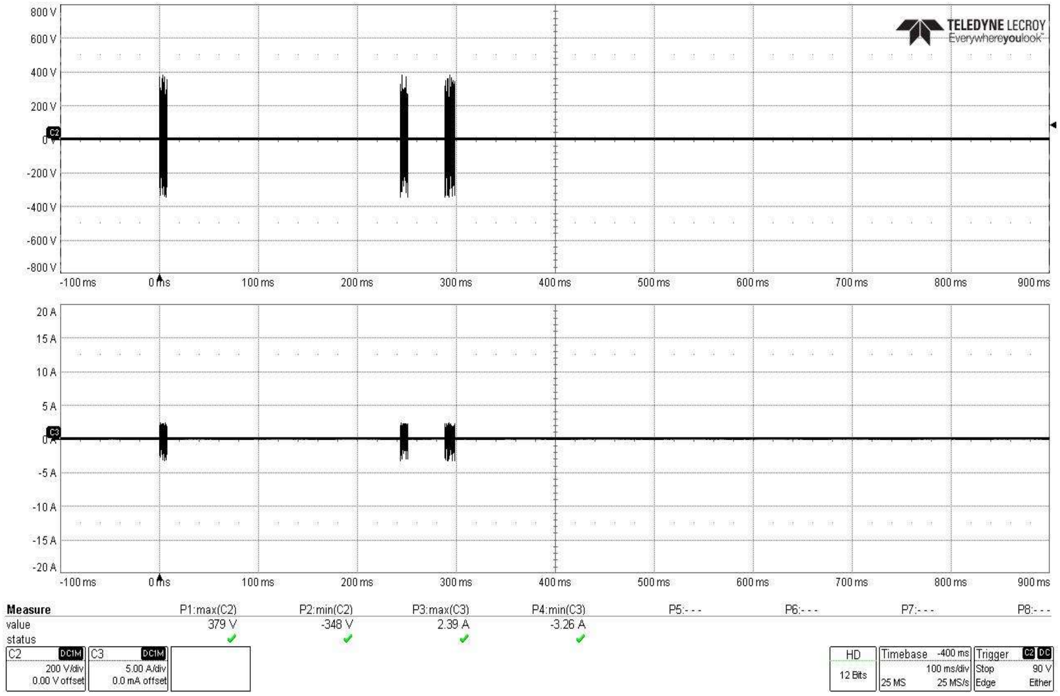


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient +360V/6A, on DC Power Return Side

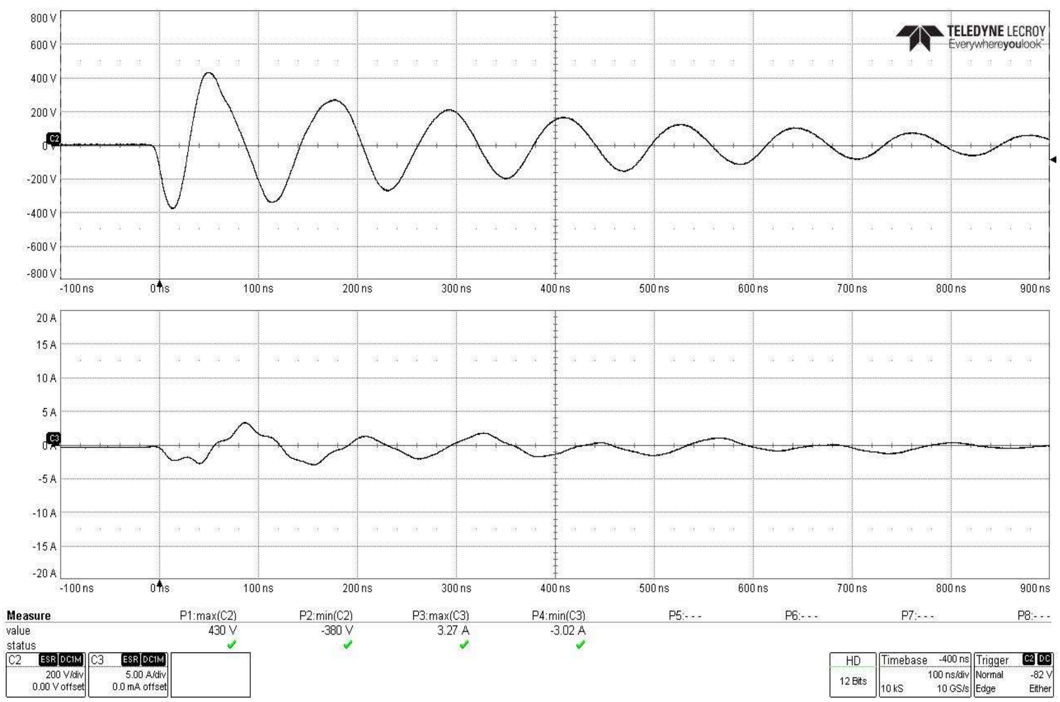


Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients +360V/6A, on DC Power Return Side

EAR Controlled Data

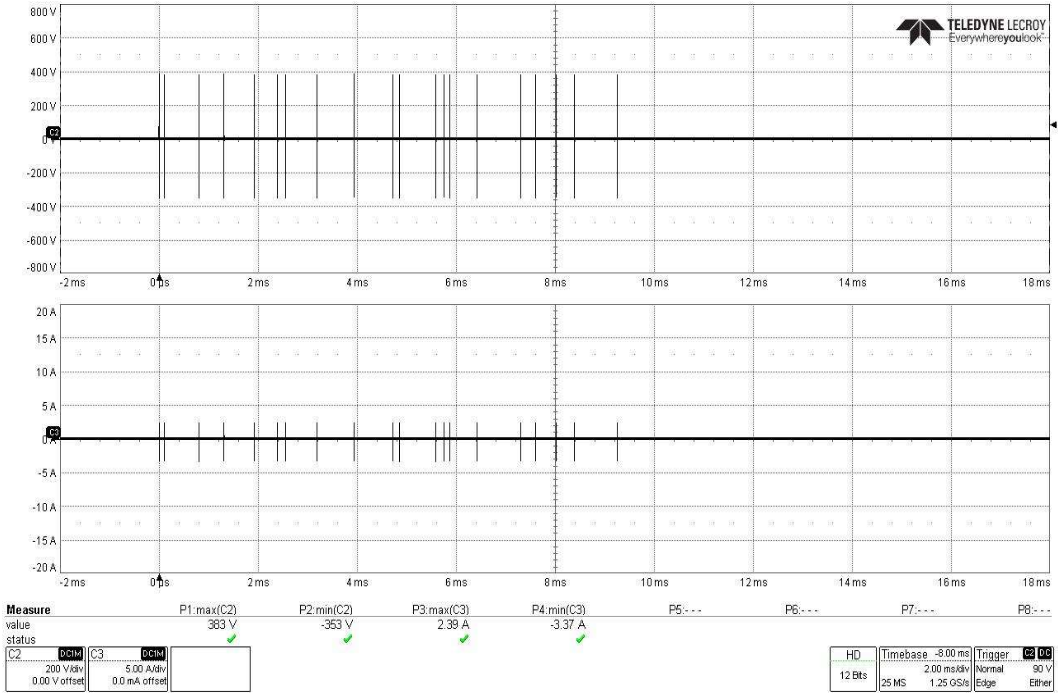


Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts +360V/6A, on AC DC Power Return Side

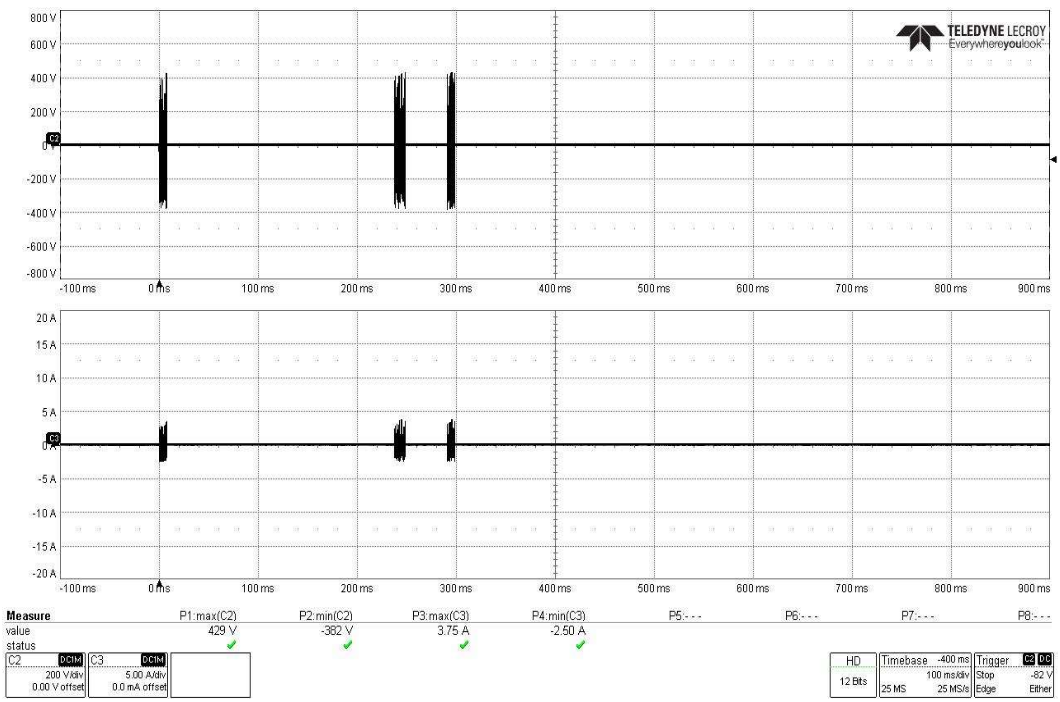


Actual Test CS117 MB Waveform #3 at 10MHz, First Transient -360V/6A, on DC Power Return Side

EAR Controlled Data



Actual Test CS117 MB Waveform #3 at 10MHz, 20 Transients -360V/6A, on DC Power Return Side



Actual Test CS117 MB Waveform #3 at 10MHz, 3 Bursts -360V/6A, on DC Power Return Side

EAR Controlled Data

5.3.9 CS117 Test Equipment

CS117 Test Equipment List			
Element ID#	**Manufacturer/Model**	**Duration**	**Cal Due**
WC083051	Lecroy HDO4104A High Definition Oscilloscope model HD4096	12 months	1/3/2026
WC066411	Pearson, Model 3525, Current Monitor 10X	12 months	6/24/2025
WC021316	Solar LISN, 9331-50-TS-200-N, 10K-50MHz	12 months	6/18/2025
WC021315	Solar LISN, Model 9331-50-TS-200-N, 10K-50MHz, SN# 112577	12 months	6/3/2025
WC021306	Solar LISN, 9331-50-TS-200-N, 10K-50MHz	12 months	6/3/2025
WC021044	Pearson, Current Monitor, Model: 4160, 100x	12 months	7/9/2025
WC066422	EMC-Partner Injection Transformer Model CN-MIG-BT-1540; WF2, 3 & 6	NCR	NCR
WC021645	EMC-Partner Modular Impulse Generator Model MIG-OS-MB; WF2 & 3	NCR	NCR
WC021644	EMC-Partner Modular Impulse Generator Model MIG0600SS; WF1, 4, 5A & 5	NCR	NCR
WC021643	EMC-Partner Modular Impulse Generator Model MIG0600MS; WF1, 4, 5A &	NCR	NCR
WC021025	EMC-Partner Coupling Transformer Model CN-GI-CI; WF1, 5A & 5B	NCR	NCR

Calibration Abbreviation
NCR: No Calibration Required

EAR Controlled Data

End of Report