TEST REPORT

Test Report No.	NC72116472.1	Date of issue:	23 August 2016
Company Name	Linear Technologies Corp		
Company Address	1630 McCarthy Boulevard Milpitas CA 95035 USA		
Equipment Description (EUT)	Surge Stopper IC's		
Model No(s) Tested	ISO 16750 Rev A2		
Serial No(s) Tested	A (May & July tests) and B (August test)		
Date(s) Tested	09-11 & 25 May, 25 July, and 10 August 2016		
Issuing Laboratory	TÜV SÜD America Inc 1775 Old Highway 8 NW, Suite 104 New Brighton MN 55112-1891 USA Phone: 651 631 2487 / Fax: 651 638 0285		

Test Result according to the requirements of:	**RESULT:**
ISO 7637-2: 2011	**Compliant**
ISO 16750-2: 2012	**Compliant**
Clause 4.2 - Direct Current Supply Voltage	**Compliant**
Clause 4.3 - Overvoltage	**Compliant**
Clause 4.4 - Superimposed Alternating Voltage - Severity 1	**Compliant**
Clause 4.5 - Slow Decrease and Increase of Supply Voltage	**Compliant**
Clause 4.6 - Discontinuities in Supply Voltage	
Clause 4.6.1 - Momentary Drop in Supply Voltage	**Compliant**
Clause 4.6.2 - Reset Behaviour at Voltage Drop	**Compliant**
Clause 4.6.3 - Starting Profile	**Compliant**
Clause 4.6.4.2 - Load Dump - Test A and Test B	**Compliant**
Clause 4.7.2.3 - Reversed Voltage - Case 2	**Compliant**
Clause 4.9 - Open Circuit Tests	
Clause 4.9.1 - Single Line Interruption	**Compliant**
Clause 4.9.2 - Multiple Line Interruption	**Compliant**
Clause 4.10.2 - Short Circuit Protection - Signal Circuits	**Compliant**

The information presented in this report outlines the testing performed, and is, to the best of our knowledge, true and correct in all respects.

TÜV SÜD AMERICA INC

Tested by:

Eugen P Lifteniuc
EMC Technician

Approved by:

David T Schaefer
EMC Chief Technical Advisor

TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval.

TÜV SÜD America's New Brighton and Taylors Falls Labs maintain A2LA accreditation to ISO/IEC 17025 for the specific tests listed in A2LA Certificate #2955.11 as Electrical Testing Laboratories.

REVISION RECORD

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	102	23 August 2016	Initial Release

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LAB ACCREDITATION:

TÜV SÜD America's New Brighton and Taylors Falls Labs maintain A2LA accreditation to ISO/IEC 17025 for the specific tests listed in A2LA Certificate #2955.11 as Electrical Testing Laboratories located at the following addresses:

Physical Location: 1775 Old Highway 8 NW, Suite 104
New Brighton MN 55112-1891 USA
Satellite Location: 19333 Wild Mountain Road
Taylors Falls MN 55084 USA

SIGN EXPLANATIONS

☐ - not applicable to this report
■ - applicable to this report

Test Regulations:

The tests were performed according to the following regulations:

- ■ - ISO 7637-2: 2011
- ■ - ISO 16750-2: 2012
  - ■ - Clause 4.2 - Direct Current Supply Voltage
  - ■ - Clause 4.3 - Overvoltage
    - ■ - Clause 4.3.1 Systems with 12 V Nominal Voltage
    - ☐ - Clause 4.3.2 Systems with 24 V Nominal Voltage
  - ■ - Clause 4.4 - Superimposed Alternating Voltage
  - ■ - Clause 4.5 - Slow Decrease and Increase of Supply Voltage
  - ■ - Clause 4.6 - Discontinuities in Supply Voltage
    - ■ - Clause 4.6.1 - Momentary Drop in Supply Voltage
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    - ■ - Clause 4.6.3 - Starting Profile
    - ■ - Clause 4.6.4 - Load Dump
      - ■ - Clause 4.6.4.2.2 - Test A
      - ■ - Clause 4.6.4.2.3 - Test B
  - ■ - Clause 4.7 - Reversed Voltage
    - ☐ - Clause 4.7.2.2 - Case 1
    - ■ - Clause 4.7.2.3 - Case 2
  - ☐ - Clause 4.8 - Ground Reference and Supply Offset - ***Test not performed under this report***
  - ■ - Clause 4.9 - Open Circuit Tests
    - ■ - Clause 4.9.1 - Single Line Interruption
    - ■ - Clause 4.9.2 - Multiple Line Interruption
  - ■ - Clause 4.10 - Short Circuit Protection
    - ■ - Clause 4.10.2 - Signal Circuits
    - ☐ - Clause 4.10.3 - Load Circuits
  - ☐ - Clause 4.11 - Withstand Voltage - ***Test not performed under this report***
  - ☐ - Clause 4.12 - Insulation Resistance - ***Test not performed under this report***
  - ☐ - Clause 4.13 - Electromagnetic Compatibility - ***Not included in the scope of ISO 16750***

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature	22.6 - 24.2 °C
Relative Humidity	30.0 - 52.0 %
Atmospheric pressure	97.8 - 98.4 kPa

POWER SUPPLY UTILIZED

Power supply system	12 VDC

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are accurate. The reader is cautioned that there is some measurement variability due to the tolerances of the test equipment that can contribute to a nominal product measurement uncertainty. Furthermore, component differences and manufacturing process variability of production units similar to that tested may result in additional product uncertainty. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests.

TEST EQUIPMENT

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated to meet test method standard requirements and/or manufacturer's specifications.

Test Condition: ISO 7637-2 ELECTRICAL TRANSIENT CONDUCTION ALONG SUPPLY LINES

The *ELECTRICAL TRANSIENT CONDUCTION ALONG SUPPLY LINES* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	SW 5250	Elgar	Power Supply	238	Code Y
■ -	EFT 200	EM Test	Switching Transient Simulator	0597-07	Code Y
■ -	MPG 200	EM Test	Ind Load Disconnect Transient	0497-06	Code Y
■ -	54615B	Hewlett Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	XHR40-25-MGA	Sorensen	Power Supply	1333A01187	Code Y
■ -	P5100	Tektronix	Scope Probe	1-181496	22 Sep 16
■ -	P5100	Tektronix	Scope Probe	184514	22 May 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

Test Pulse	Level IV Requirements: Vehicles w/12 V Systems	Level IV Requirements: Vehicles w/24 V Systems	Level Passed	# of Pulses / Duration	Classification of Functional Status: No Deviation	Deviation within Specification	Does Not Comply	Not Performed
1	-150 V	-600 V	-150 V	500 pulses	■ Class A	☐ Class _	☐	☐
2a	+112 V	+112 V	+112 V	500 pulses	■ Class A	☐ Class _	☐	☐
2b	+10 V	+20 V	+10 V	10 pulses	■ Class A	☐ Class _	☐	☐
3a	-220 V	-300 V	-220 V	1 hour	■ Class A	☐ Class _	☐	☐
3b	+150 V	+300 V	+150 V	1 hour	■ Class A	☐ Class _	☐	☐

Classification of Functional Status:

Class A: All functions performed as designed during and after exposure to disturbance.

Class B: All functions performed as designed during exposure with one or more allowed to go beyond the specified tolerance. All functions returned automatically to within normal limits after exposure was removed. Memory functions remained Class A.

Class C: One or more functions did not perform as designed during exposure but returned automatically to within normal limits after exposure was removed.

Class D: One or more functions did not perform as designed during exposure and did not return to normal operation until after exposure was removed and the EUT was manually reset.

Class E: One or more functions did not perform as designed during and after exposure and did not return to proper operation without repairing or replacing the EUT.

Remarks: As designed, the Conducted Transient Disturbance testing for Test Pulses 1 and 2b caused the EUT to shut down during exposure, but returned to normal operation without user intervention. The EUT is designed to recover after power loss, and, per the standard, meets Class A for Test Pulses 1 and 2b. Refer to the test data sheets in Appendix A for test details.

Test Condition: ISO 16750-2: 2012 CLAUSE 4.2 - DIRECT CURRENT SUPPLY VOLTAGE

The *DIRECT CURRENT SUPPLY VOLTAGE* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144.10	Solar Electronics	Precision Resistor	1	Code B
■ -	XHR40-25-MGA	Sorensen	Power Supply	1333A01187	Code Y
■ -	P5100	Tektronix	Scope Probe	184514	22 May 16
■ -	P5100	Tektronix	Scope Probe	184514	19 May 17

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

	Level II Requirements 12 V Systems		Level Passed			Classification of Functional Status		
Code	Min	Max	Min	Max	Duration	No Deviation	Does Not Comply	Not Performed
A	+6 V	+16 V	+6 V	+16 V	N/A	■ Class A	☐ Class _	☐
B	+8 V	+16 V	+8 V	+16 V	N/A	■ Class A	☐ Class _	☐
C	+9 V	+16 V	+9 V	+16 V	N/A	■ Class A	☐ Class _	☐
D	+10.5 V	+16 V	+10.5 V	+16 V	N/A	■ Class A	☐ Class _	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: _____

Test Condition: ISO 16750-2: 2012 CLAUSE 4.3 - OVERVOLTAGE

The *OVERVOLTAGE* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	SH27	Envirotronics	27 Cu Ft Temp/Humidity Chamber	09963482-S	26 Jan 17
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	XHR40-25-MGA	Sorensen	Power Supply	1333A01187	Code Y
■ -	P5100	Tektronix	Scope Probe	184514	22 May 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

	Requirement		Level Met			Classification of Functional Status			
Temperature	12 V System	24 V System	12 V System	24 V System	Duration	No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
T_{max} -20° C	+18 V	+36 V	+18 V	N/A	60 min	■ Class A	☐ Class _	☐ Class _	☐
Room Temp	+24 V	N/A	+24 V	N/A	1 min	■ Class A	☐ Class _	☐ Class _	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: _____

Test Condition: ISO 16750-2: 2012 CLAUSE 4.4 - SUPERIMPOSED ALTERNATING VOLTAGE

The *SUPERIMPOSED ALTERNATING VOLTAGE* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Transient Lab - Grounded copper bench (1.2m x 3m) or (4' x 10') on 25 Jul 2016

Test equipment used on 25 July 2106:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	54615B	Agilent Technologies	500 MHz 2-CH Oscilloscope	US35420368	17 May 17
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	None	EM Test	Transient Rack AutoWave/VDS200Q	10981	Code B
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	P5100	Tektronix	Scope Probe	184513	17 Jun 17
■ -	P5100A	Tektronix	Scope Probe	C005799	22 Sep 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

Frequency Range: 50 Hz to 25 kHz							Classification of Functional Status		
	Requirement		Level Passed						
Severity Level	12 V Systems	24 V Systems	12 V System	24 V System	Duration	Number of Sweeps	No Deviation	Does Not Comply	Not Performed
1	1 V	1 V	1 V	N/A	120 Sec	5	■ Class A	☐ Class _	☐
2	4 V	4 V	4 V	N/A	120 Sec	5	☐ Class A	☐ Class _	■
3	N/A	10 V	N/A	N/A	120 Sec	5	☐ Class A	☐ Class _	■
4	2 V	N/A	2 V	N/A	120 Sec	5	☐ Class A	■ Class C	☐
Remark:	Duration = 240 Sec (50 Hz to 25 kHz in 120 Sec, then 25 kHz to 50 Hz in 120 Sec)								

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: Testing at Severity 2 caused the EUT to shut off, but the EUT would self-recover 5 minutes later, meeting Class C. No anomalies were noted at Severity 1 testing.

Test Condition: ISO 16750-2: 2012 CLAUSE 4.5 - SLOW DECREASE AND INCREASE OF SUPPLY VOLTAGE

The *SLOW DECREASE AND INCREASE OF SUPPLY VOLTAGE* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Transient Lab - Grounded copper bench (1.2m x 3m) or (4' x 10')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	54615B	Agilent Technologies	500 MHz 2-CH Oscilloscope	US35420368	17 May 17
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	None	EM Test	Transient Rack AutoWave/VDS200Q	None	Code Y
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	P5100	Tektronix	Scope Probe	184513	17 Jun 17
■ -	P5100A	Tektronix	Scope Probe	C005799	22 Sep 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

Test Level (U_{Smin})	Change in Voltage	Ending Voltage	Repetitions	Remark	Classification of Functional Status			
					No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
+10.5 V	-0.5 V/min	0 V	1	EUT Shut down at 2.9 V	■ Class A	☐ Class _	☐ Class _	☐
0 V	-0.5 V/min	+10.5 V	1	EUT turned on at 6 V	■ Class A	☐ Class _	☐ Class _	☐
Remark:		Supply voltage decreased from 10.5 V to 0 V, then increased from 0 V to 10.5 V at a rate of 0.5 V/min.						

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: During the Slow Decrease testing, the EUT shut down at 2.9 V, as designed, meeting Class A.

Test Condition: ISO 16750-2: 2012 CLAUSE 4.6.1 - MOMENTARY DROP IN SUPPLY VOLTAGE

The *MOMENTARY DROP IN SUPPLY VOLTAGE* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	SW 5250	Elgar	Power Supply	238	Code Y
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	P5100	Tektronix	Scope Probe	1-181496	22 Sep 16
■ -	P5100	Tektronix	Scope Probe	184514	22 May 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

Test Level (U_{Smin})	Reduction	Duration	Repetitions	Remark	Classification of Functional Status			
					No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
+ 8	-3.5 V	100 mSec	10	None	■ Class A	☐ Class _	☐ Class _	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: _____

Test Condition: ISO 16750-2: 2012 CLAUSE 4.6.2 - RESET BEHAVIOUR AT VOLTAGE DROP

The *RESET BEHAVIOR AT VOLTAGE DROP* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	SH27	Envirotronics	27 Cu Ft Temp/Humidity Chamber	09963482-S	26 Jan 17
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	XHR40-25-MGA	Sorensen	Power Supply	1333A01187	Code Y
■ -	P5100	Tektronix	Scope Probe	184514	22 May 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

Test Level (V_{nom})	Reduction	Duration	Repetitions	Classification of Functional Status			
				No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
+ 8 V	5%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	10%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	15%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	20%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	25%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	30%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	35%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	40%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	45%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	50%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	55%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	60%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	65%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	70%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	75%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	80%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	85%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	90%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	95%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
+ 8 V	100%	5 Sec	1	☐ Class A	■ Class C	☐ Class _	☐
Remark:	Between each voltage reduction, the voltage was returned to 8 VDC for 10 Sec.						

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: During the Reset Behavior at Voltage Drop testing at the 5% to 100% reduction, the EUT voltage dropped, but operation continued without user intervention, meeting Criteria B.

Test Condition: ISO 16750-2: 2012 CLAUSE 4.6.3 - STARTING PROFILE

The *STARTING PROFILE* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	SW 5250	Elgar	Power Supply	238	Code Y
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	P5100	Tektronix	HV Probe	1-181496	22 Sep 16
■ -	P5100	Tektronix	Scope Probe	184514	19 May 17

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification:

Level IV Requirements(12V)		Level Passed		# of Pulses / Duration	Classification of Functional Status			
Us6	Us	12 V System	24 V System		No Deviation	Deviation within Specification	Does Not Comply	Not Performed
+6 V	+6.5 V	+6 V	+6.5 V	10 pulses	■ Class A	☐ Class _	☐	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: _____

Test Condition: ISO 16750-2: 2012 CLAUSE 4.6.4 - LOAD DUMP

The *LOAD DUMP* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Transient Lab - Grounded copper bench (1.2m x 3m) or (4' x 10')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	Autowave	EM Test	Battery Voltage Variation Arb Gen	P1551169051	25 Apr 17
■ -	None	EM Test	Transient Rack AutoWave/VDS200Q	None	Code Y
■ -	VDS 200Q100	EM Test	Voltage Drop Simulator	P1607181941	25 Apr 17
■ -	54615B	Hewlett Packard	500 MHz 2-CH Oscilloscope	US35420841	25 Jan 17
■ -	P5100	Tektronix	Scope Probe	184514	19 May 17
■ -	P5100A	Tektronix	Scope Probe	C005799	22 Sep 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification - Clause 4.6.4.2.2 - Test A:

Test	Level Requirements		Level Passed	Source Impedance (ohms)	Repetition Rate (Sec)	Transient Duration (mSec)	Repetitions	Classification of Functional Status			
	Vehicles w/12 V Systems	Vehicles w/24 V Systems						No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
A	+79 V / +101 V	+151 V / +202 V	+100 V	0.5	300	400	10	■ Class A	☐ Class _	☐ Class _	☐
B	+79 V / +101 V	+151 V / +202 V	+100 V	0.5	60	400	10	■ Class A	☐ Class _	☐ Class _	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: The EUT recovery time for Test A (unclipped) was 5 minutes.

Test Condition: ISO 16750-2: 2012 CLAUSE 4.7 - REVERSED VOLTAGE

The *REVERSED VOLTAGE* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	XHR40-25-MGA	Sorensen	Power Supply	1333A01187	Code Y
■ -	P5100	Tektronix	Scope Probe	184514	22 May 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification - Section 4.7.2.3 - Case 2:

Level Requirements				Classification of Functional Status			
Vehicles w/12 V Systems	Vehicles w/24 V Systems	Level Passed	Duration	No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
-14 V	-28 V	-14 V	1 minute	■ Class A	☐ Class _	☐	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: The EUT was functional after the test.

Test Condition: ISO 16750-2: 2012 CLAUSE 4.9 - OPEN CIRCUIT TESTS

The *OPEN CIRCUIT TESTS* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	XHR40-25-MGA	Sorensen	Power Supply	1333A01187	Code Y
■ -	P5100	Tektronix	Scope Probe	184514	22 May 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification - Section 4.9.1 - Single Line Interruption:

				Classification of Functional Status			
Test Level	Line	Duration	Remark	No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
+13.5 V	Output High	10 Sec	None	■ Class A	☐ Class _	☐ Class D	☐
+13.5 V	Output Return	10 Sec	None	■ Class A	☐ Class _	☐ Class D	☐

Test specification - Section 4.9.2 - Multiple Line Interruption:

				Classification of Functional Status			
Test Level	Line	Duration	Remark	No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
+13.5 V	Output High / Output Return	10 Sec	None	■ Class A	☐ Class _	☐ Class D	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: The EUT was functional after all tests.

Test Condition: ISO 16750-2: 2012 CLAUSE 4.10 - SHORT CIRCUIT PROTECTION

The *SHORT CIRCUIT PROTECTION* measurements were performed in the following TÜV SÜD America Inc test location(s):

■ - New Brighton Test area 5 - Shielded room (4.9m x 3.7m x 2.7m) or (16' x 12' x 9')

Test equipment used:

	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ -	NH2502R000FE01	Dale	Non-Inductive 2 Ohm Resistor	10981	Code B
■ -	54615B	Hewlett-Packard	500 MHz 2-CH Oscilloscope	US35421312	26 Jan 17
■ -	7144-1.0	Solar Electronics	Precision Resistor	1	Code B
■ -	XHR33-33-MGA	Sorensen	Power Supply	1215A01757	Code Y
■ -	XHR40-25-MGA	Sorensen	Power Supply	1333A01187	Code Y
■ -	P5100	Tektronix	HV Probe	1-181496	22 Sep 16

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test specification - Section 4.10.2 - Signal Circuits:

				Classification of Functional Status			
Test Level	Line*	Duration	Remark	No Deviation	Deviation within Specification	Does Not Comply	Not Applicable
+16 V GND	DC Power input	60 Sec	EUT unpowered. Functional after test	■ Class A	☐ Class _	☐ Class _	☐
+16 V GND	DC Power input	60 Sec	EUT Powered at 13.5V. EUT Functional during & after test	■ Class A	☐ Class _	☐ Class _	☐
+16 V GND	Output High	60 Sec	EUT unpowered. Functional after test	■ Class A	☐ Class _	☐ Class _	☐
+16 V GND	Output High	60 Sec	EUT Powered at 13.5V. EUT Functional during & after test	■ Class A	☐ Class _	☐ Class _	☐

Classification of Functional Status:

Class A: All functions of the device/system performed as designed during and after the test.

Class B: All functions of the device/system performed as designed during the test, with one or more went beyond the specified tolerance. All functions returned automatically to within normal limits after the test, and memory functions remained Class A.

Class C: One or more functions of the device/system did not perform as designed during the test, but returned automatically to normal operation after the test.

Class D: One or more functions of the device/system did not perform as designed during the test and did not return to normal operation after the test until the device/system was reset by simple "operator/use" action.

Class E: One or more functions of the device/system did not perform as designed during and after the test and did not return to proper operation without repairing or replacing the device/system.

Remarks: _____

Equipment Under Test (EUT) Test Operation Mode - Immunity tests:

The device under test was operated under the following conditions during immunity testing and monitored per the manufacturer's instruction:

☐ - Standby
☐ - Test program (H - Pattern)
☐ - Test program (color bar)
☐ - Test program (customer specific)
☐ - Practice operation
■ - Normal operating mode

GENERAL REMARKS:

As designed, the ISO 7637-2 Conducted Transient Disturbance testing for Test Pulses 1 and 2b caused the EUT to shut down during each exposure, and return to normal operation with user intervention, meeting Class A. Refer to the test data sheets in Appendix A for test details.

ISO 16750-2 Section 4.4 Superimposed Alternating Voltage testing at Severity 2 and Severity 4 caused the EUT to shut off, but the EUT would self-recover 5 minutes later, meeting Class C. No anomalies were noted at Severity 1 testing. Severity 3 is not applicable for 12 V units.

During the Slow Decrease testing, the EUT shut down at 2.9 V, as designed, meeting Class A.

During the Reset Behavior at Voltage Drop testing at the 5% to 100% reduction, the EUT voltage dropped, but operation continued without user intervention, meeting Criteria B.

Modifications required to pass:

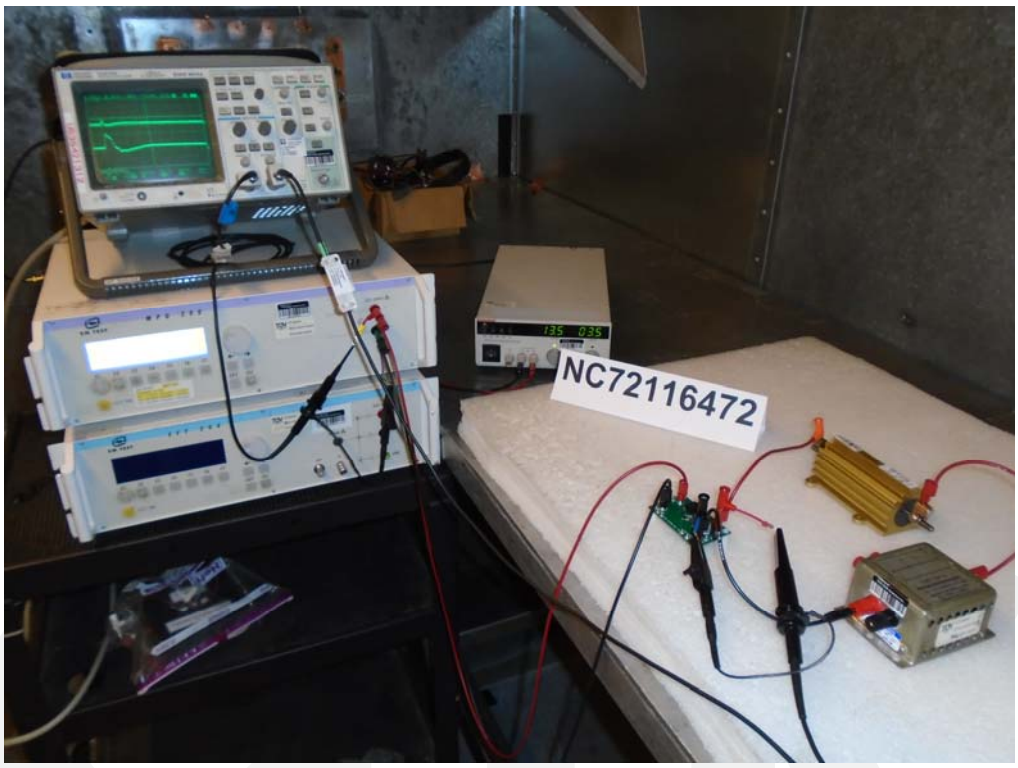
- None

Test Specification Deviations: Additions to or Exclusions from:

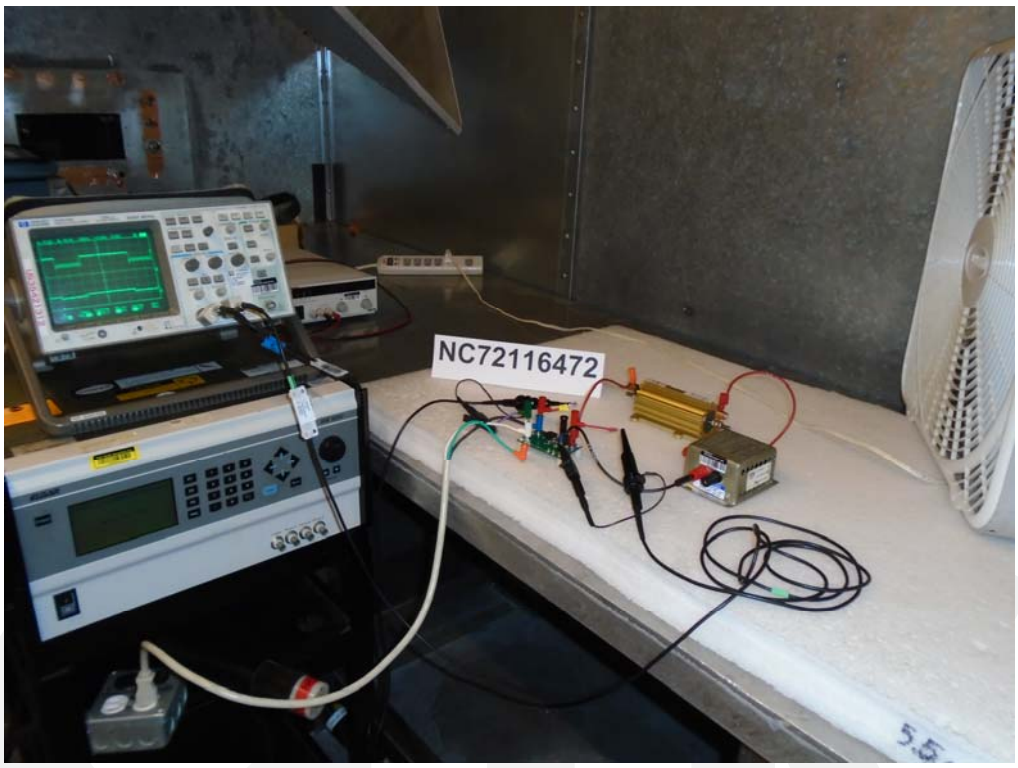
- None

EUT Received Date:	09 May 2016
Condition of EUT:	Normal
Testing Start Date:	09 May 2016
Testing End Date:	10 August 2016

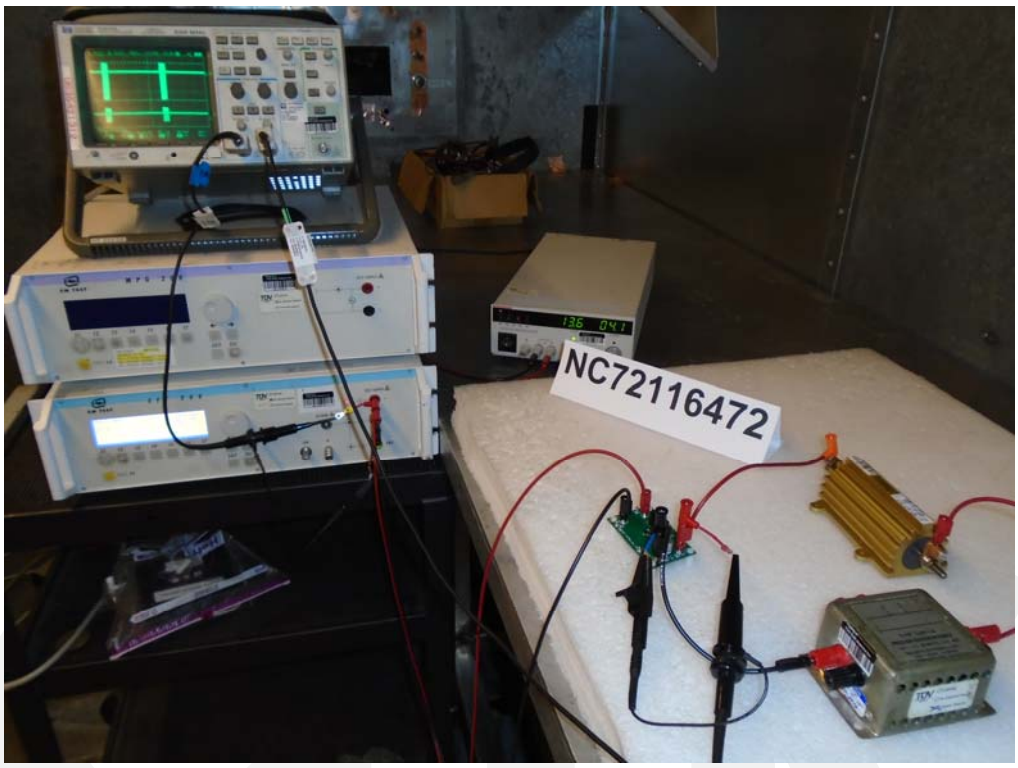
Test-setup photo(s):
ISO 7637-2: 2011 - Electrical Transient Conduction Along Supply Lines
Test Pulses 1 and 2a



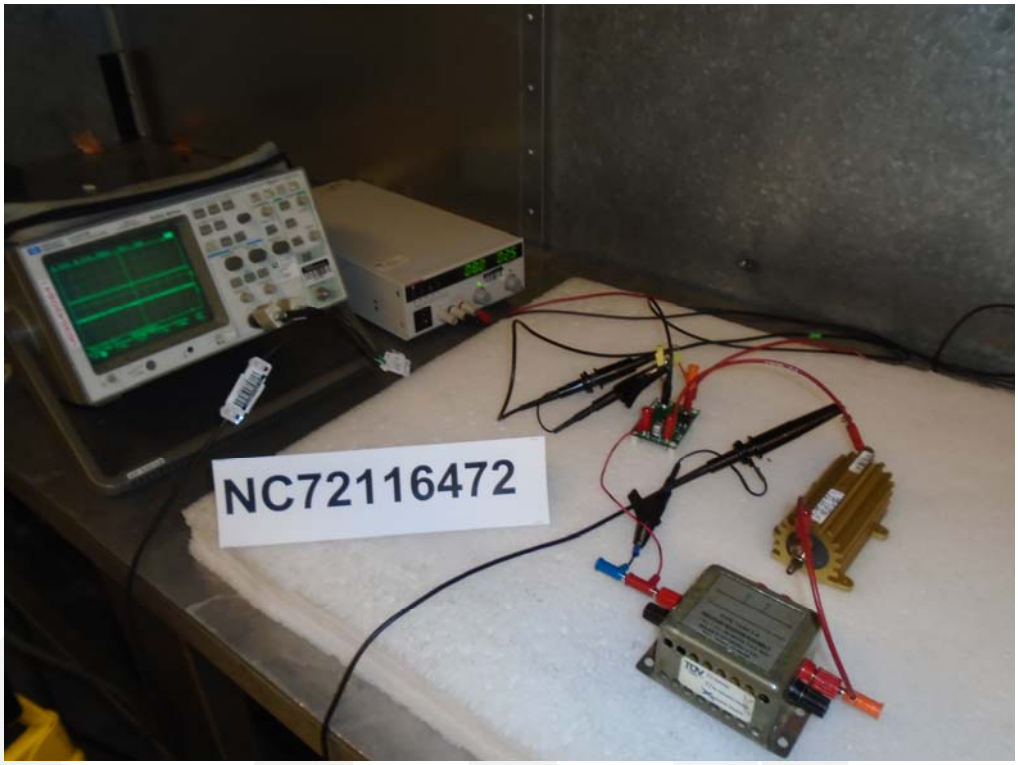
Test-setup photo(s):
ISO 7637-2: 2011 - Electrical Transient Conduction Along Supply Lines
Test Pulse 2b



Test-setup photo(s):
ISO 7637-2: 2011 - Electrical Transient Conduction Along Supply Lines
Test Pulses 3a and 3b



Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.2 - Direct Current Supply Voltage



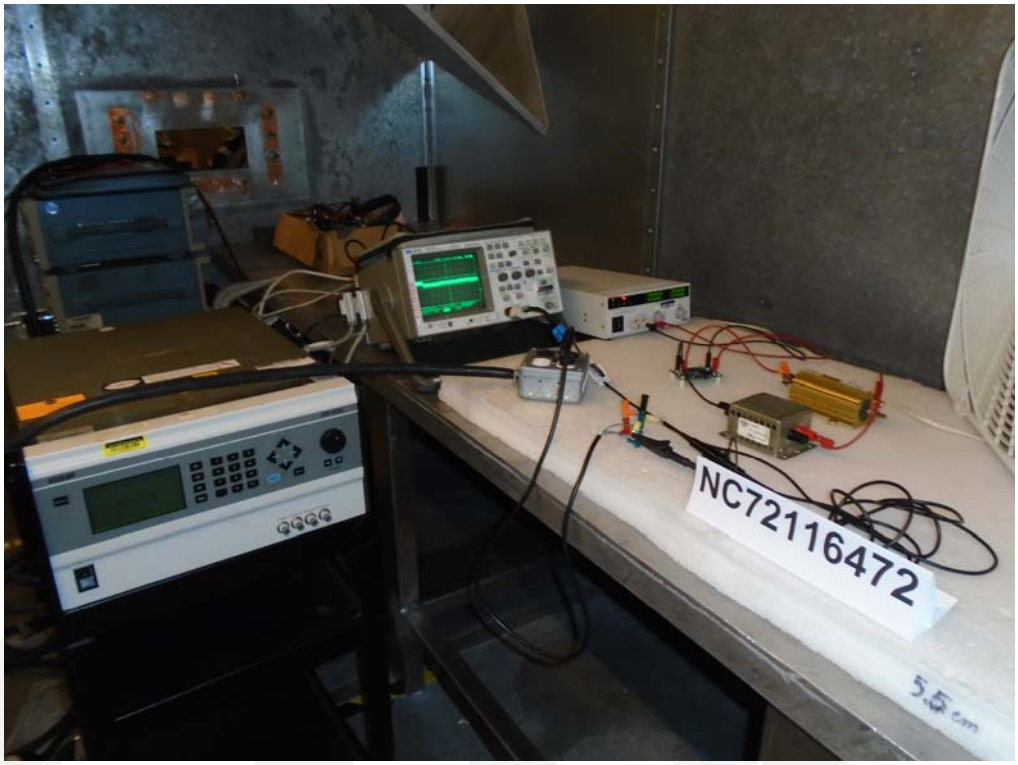
Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.3 - Overvoltage

Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.3 - Overvoltage

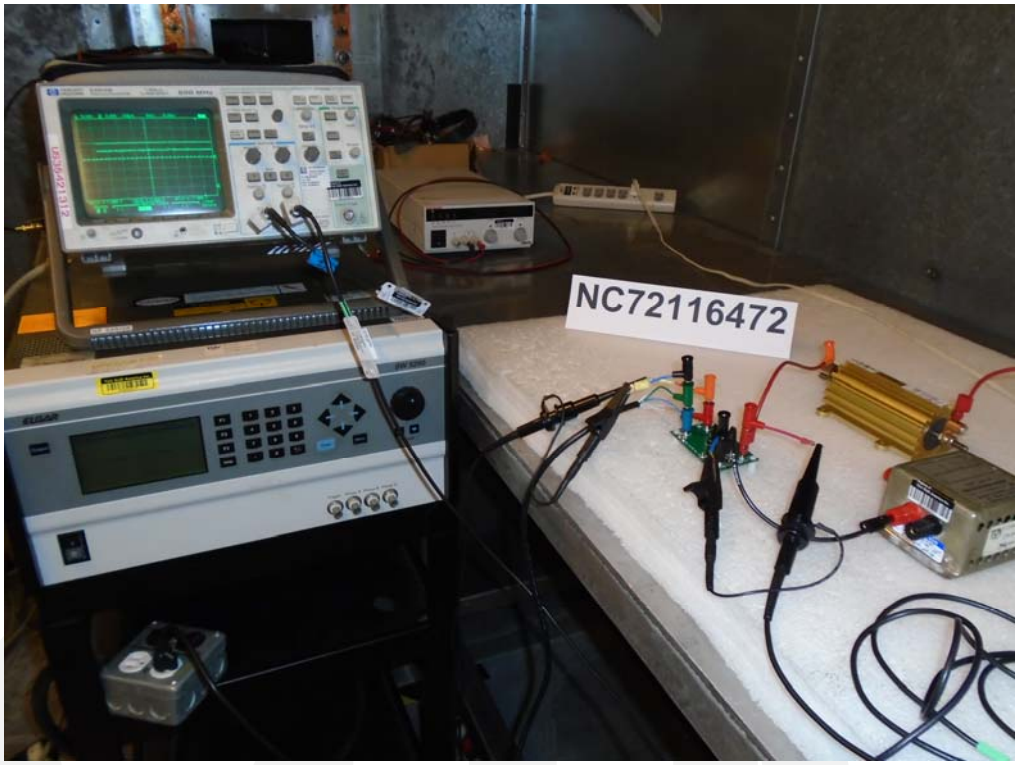
Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.4 - Superimposed Alternating Voltage

Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.5 - Slow Decrease and Increase of Supply Voltage

Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.6.1 - Momentary Drop in Supply Voltage

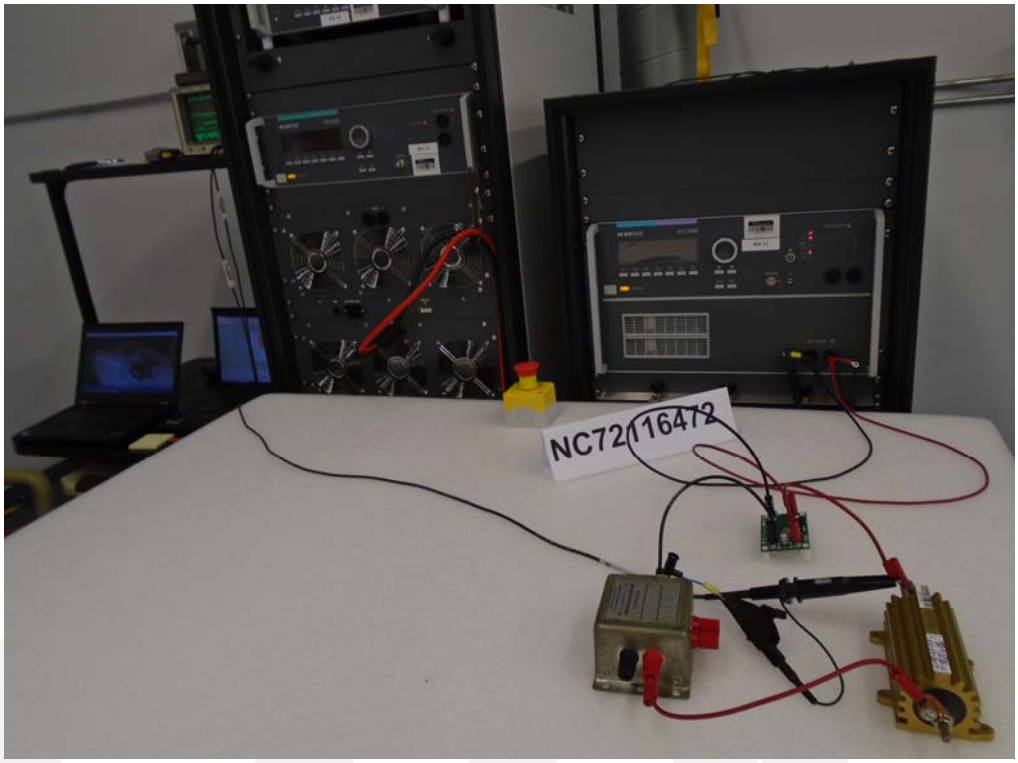


Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.6.2 - Reset Behaviour at Voltage Drop



Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.6.3 - Starting Profile

Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.6.4.2 - Load Dump - Test A and Test B



Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.7.2.3 - Reversed Voltage - Case 2

Test-setup photo(s):

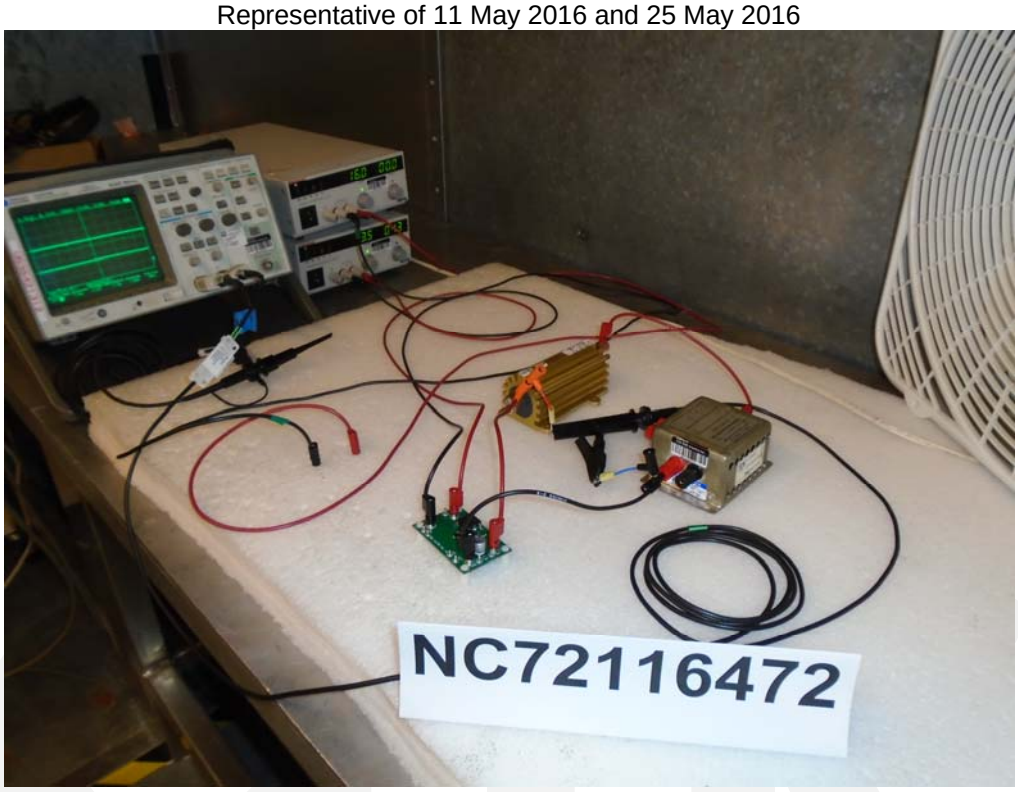
ISO 16750-2: 2012 - Clause 4.9 - Open Circuit Tests

Clause 4.9.1 - Single Line Interruption

Clause 4.9.2 - Multiple Line Interruption

Test-setup photo(s):
ISO 16750-2: 2012 - Clause 4.10.2 - Short Circuit Protection - Signal Circuits

Representative of 11 May 2016 and 25 May 2016



Appendix A

Test Data Sheets

TRANSIENT IMMUNITY - PULSE 1

Test Report #: NC72116472 Test Area: 5

EUT Part #: ISO 16750 Rev A2 Date: May 9, 2016

ESN #: A EUT Power: 12 VDC Temperature: 24.1 °C

Test Method: ISO 7637-2: 2011 Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 30.0 %

EUT Description: Surge Stopper IC's Page: 1 of 6

Notes: Channel 1 on scope capture is the pulse generator, channel 2 is the EUT

Test Voltage (Volts)	test Level (Volts)	Pulse Width (mSec)	Pulse Period (Sec)	Source Impedance (Ohms)	repetitions	Criteria Met (Class)	Complies Yes	Complies No	Remarks
									Lead Description - DC Input Power
13.5	-150	1	0.5	10	500	A	✓		
									DC power dropped out during transient
									And recovered afterwards, as designed

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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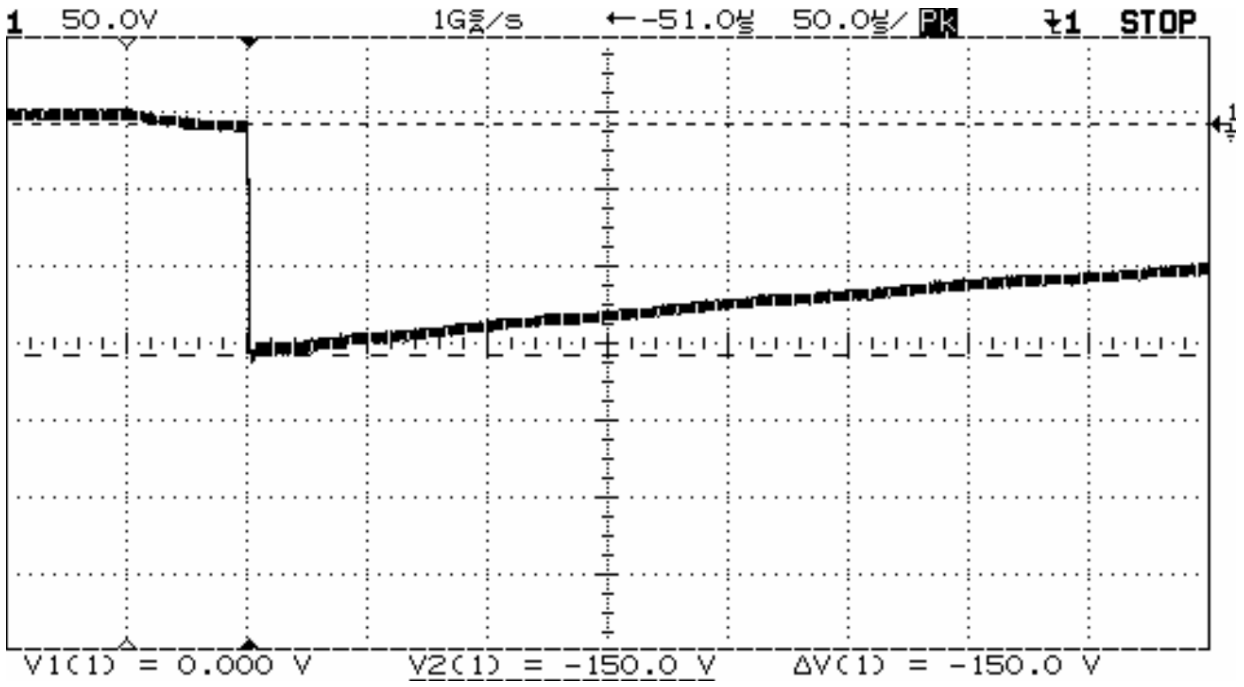
TRANSIENT IMMUNITY - PULSE 1

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	2 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 1 – Tr, T3, & Us - Open Circuit



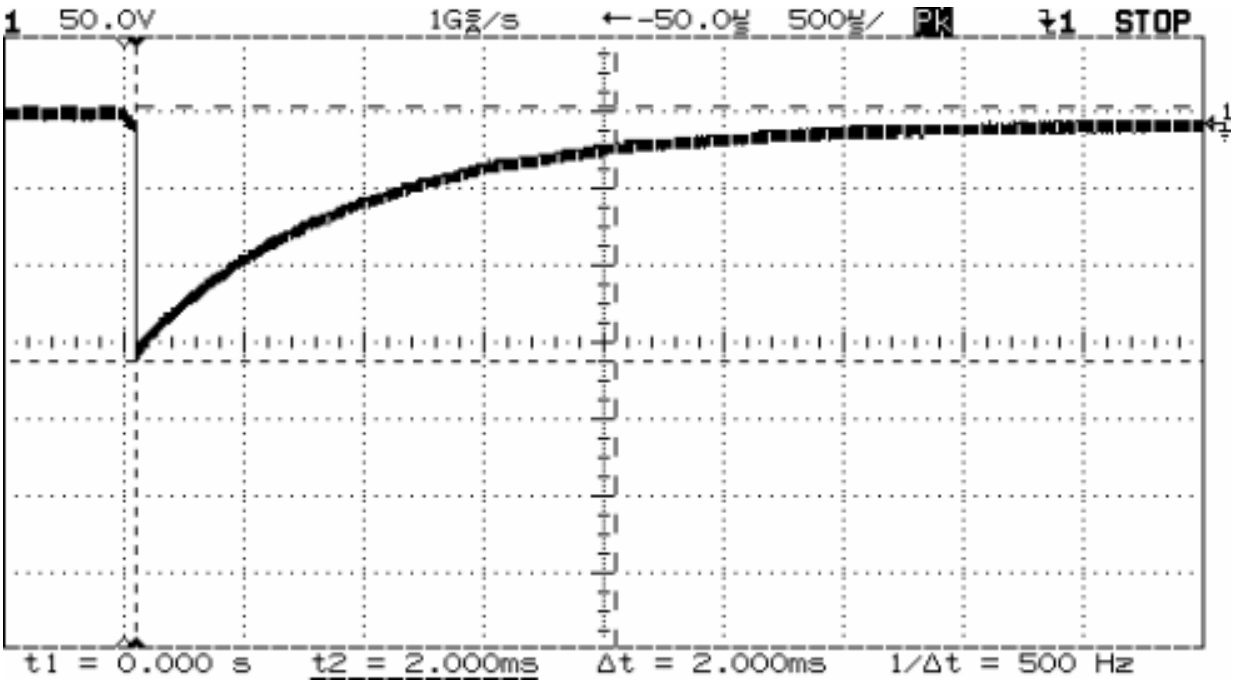
Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T. Schaefer (Printed) _____ (Signature)

TRANSIENT IMMUNITY - PULSE 1

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	3 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 1 – Td - Open Circuit



Tested by: Eugen Lifteniuc (Printed) — Signature

Reviewed by: David T. Schaefer (Printed) — Signature

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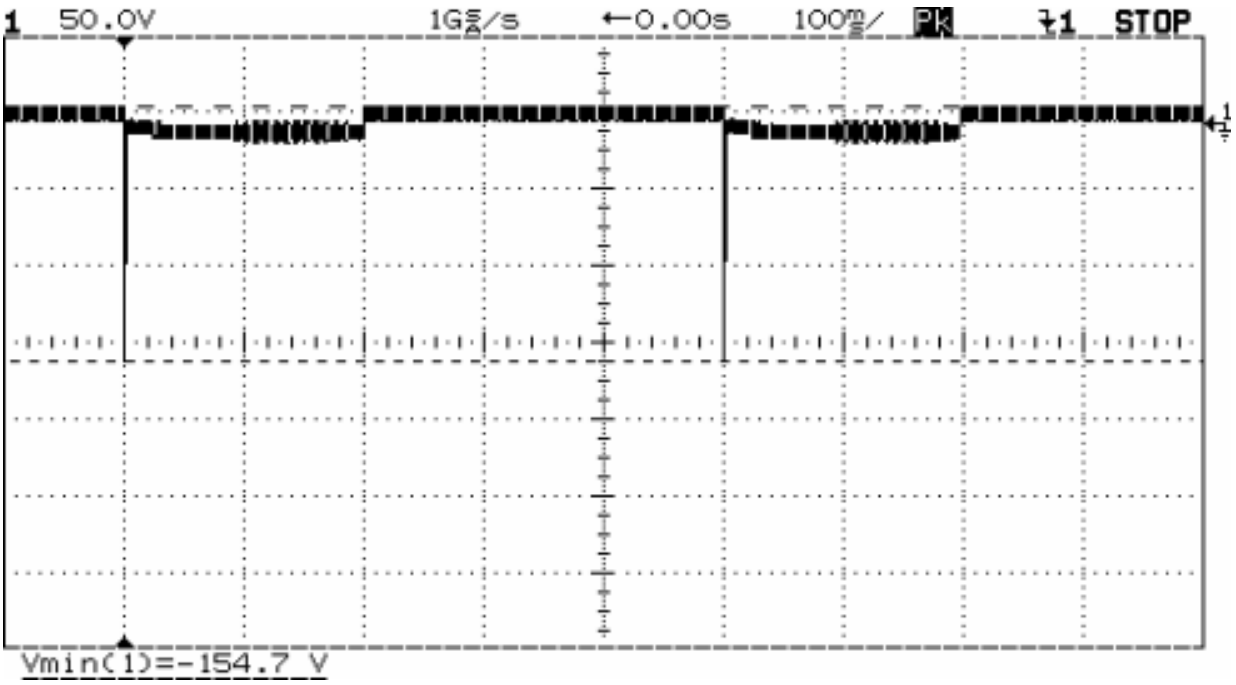
TRANSIENT IMMUNITY - PULSE 1

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	4 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 1 – T1 & T2 - Open Circuit



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Reviewed by: David T. Schaefer (Printed) — Signature

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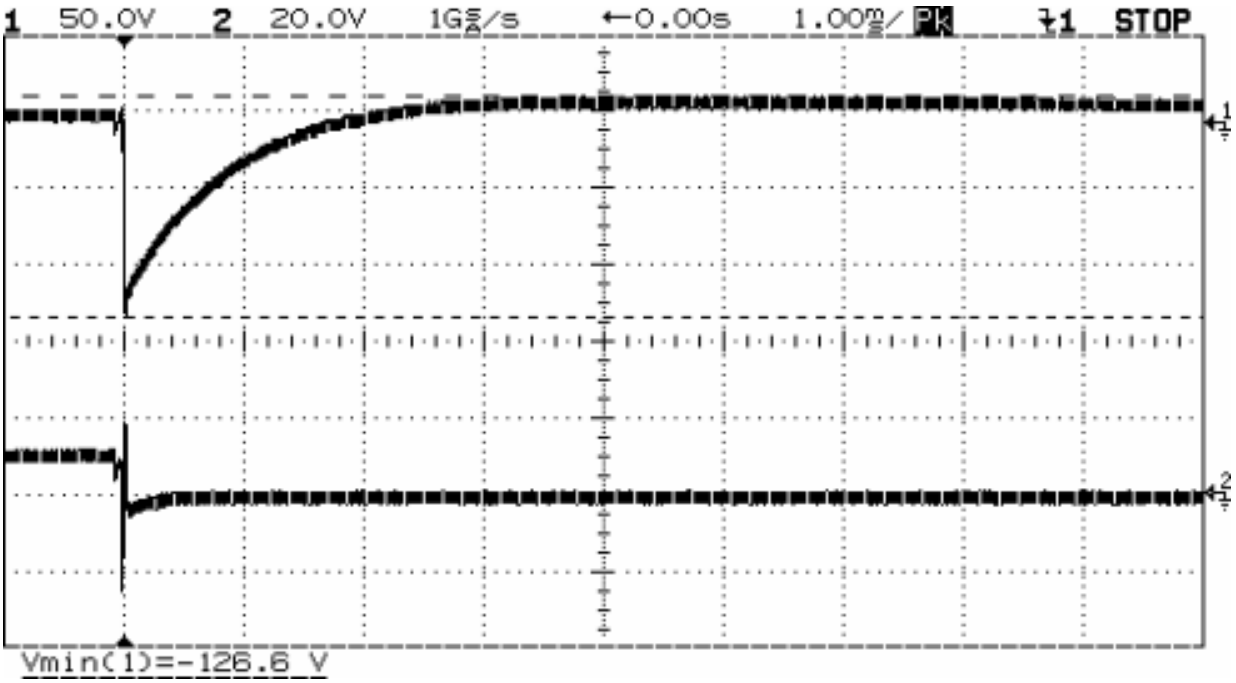
TRANSIENT IMMUNITY - PULSE 1

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	5 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 1 – Tr & Td - EUT Load



Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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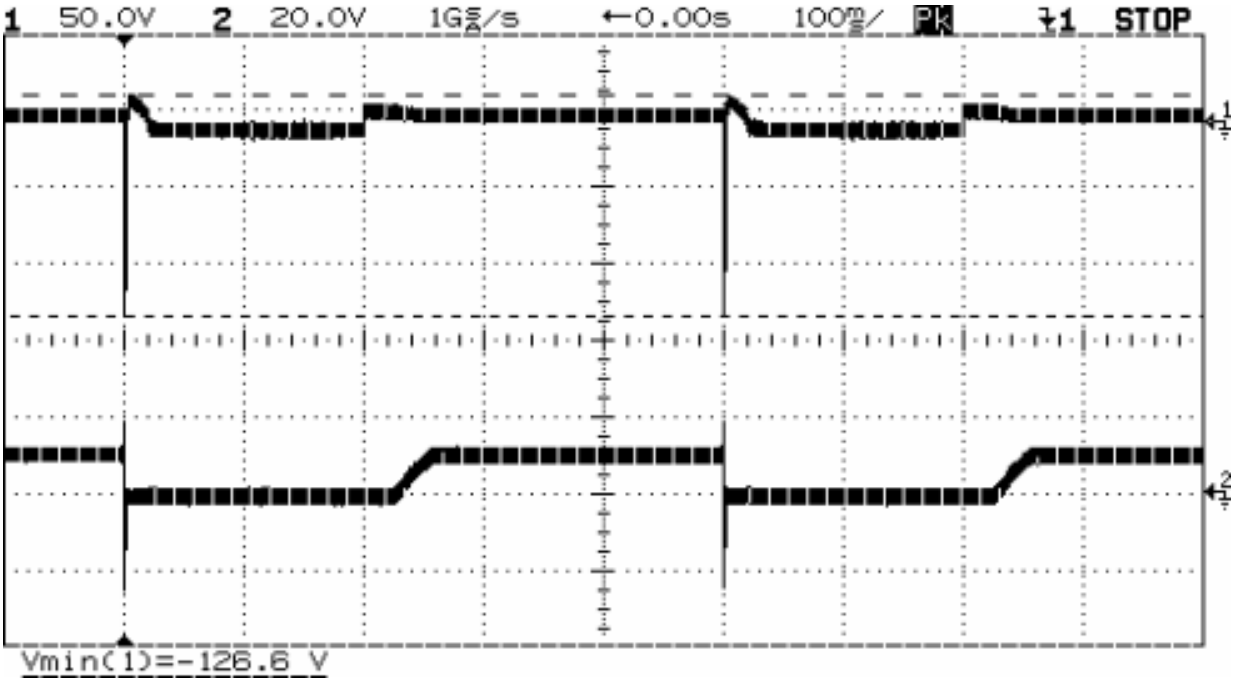
TRANSIENT IMMUNITY - PULSE 1

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	6 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 1 – T1 - EUT Load



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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TRANSIENT IMMUNITY - PULSE 2a

Test Report #: NC72116472 Test Area: 5

EUT Part #: ISO 16750 Rev A2 Date: May 9, 2016

ESN #: A EUT Power: 12 VDC Temperature: 24.1 °C

Test Method: ISO 7637-2: 2011 Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 30.0 %

EUT Description: Surge Stopper IC's Page: 1 of 6

Notes: Channel 1 on scope capture is the pulse generator, channel 2 is the EUT

Test Voltage (Volts)	test Level (Volts)	Pulse Width (mSec)	Pulse Period (Sec)	Source Impedance (Ohms)	repetitions	Criteria Met (Class)	Complies Yes	Complies No	Remarks
									Lead Description - DC Input Power
13.5	+112	0.05	0.5	2	500	A	✓		

Tested by: Eugen Lifteniuc (Printed) (Signature)

Reviewed by: David T. Schaefer (Printed) (Signature)

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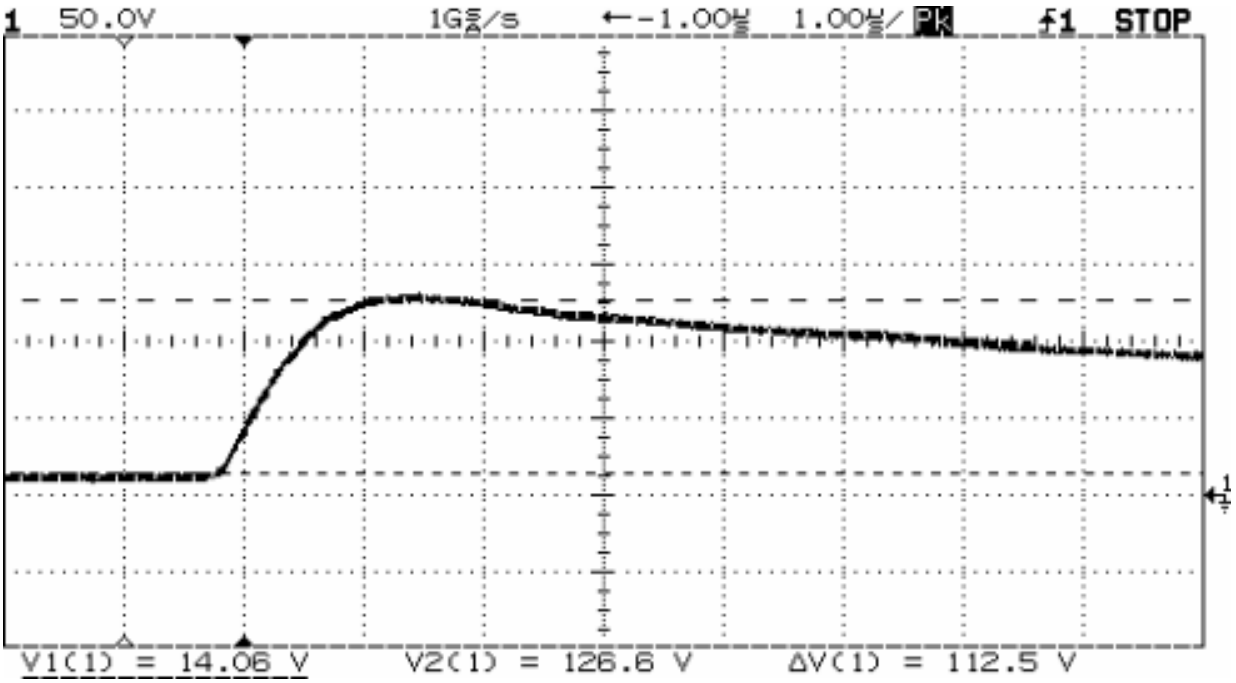
TRANSIENT IMMUNITY - PULSE 2a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	2 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2a – Tr - Open Circuit



Tested by: Eugen Lifteniuc (Printed) — Signature

Reviewed by: David T. Schaefer (Printed) — Signature

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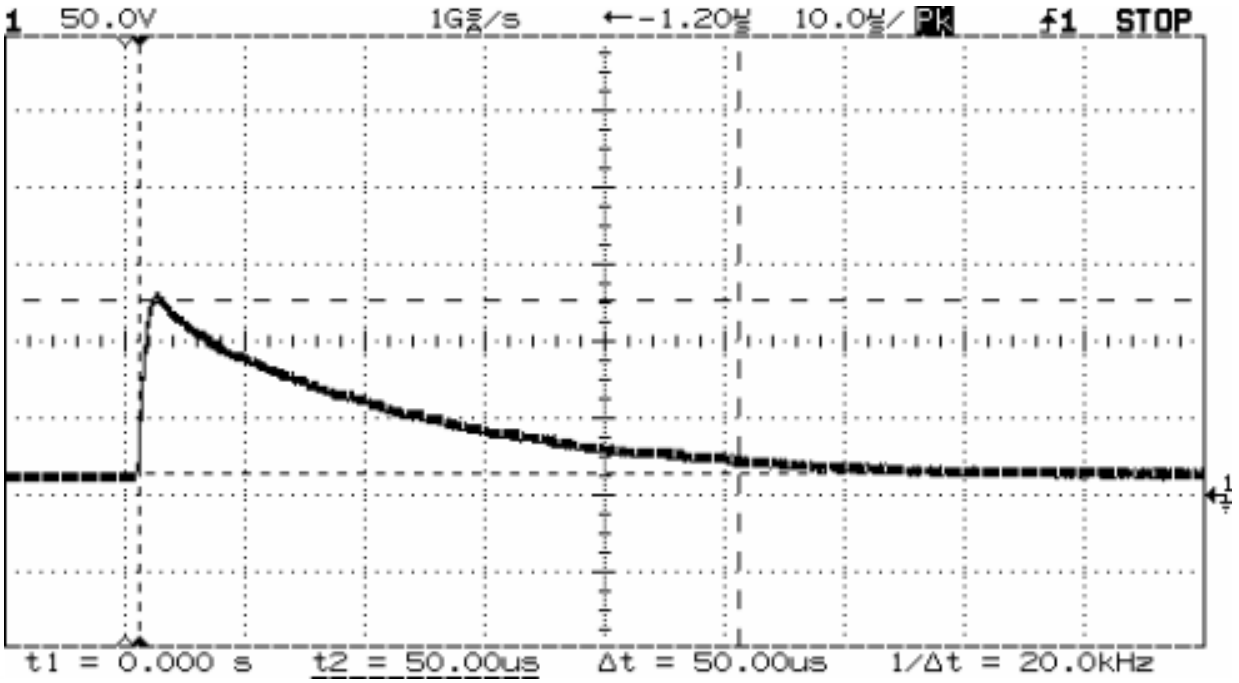
TRANSIENT IMMUNITY - PULSE 2a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	3 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2a – Td - Open Circuit



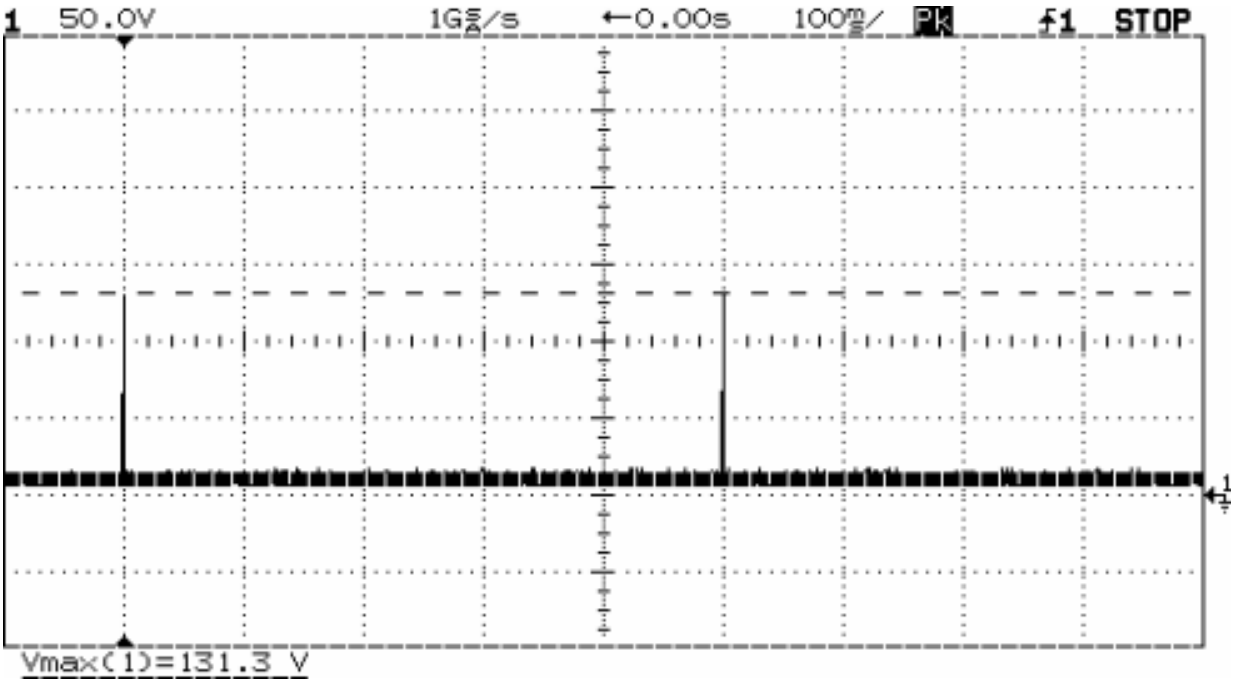
Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T. Schaefer (Printed) _____ (Signature)

TRANSIENT IMMUNITY - PULSE 2a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	4 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2a – T1 - Open Circuit



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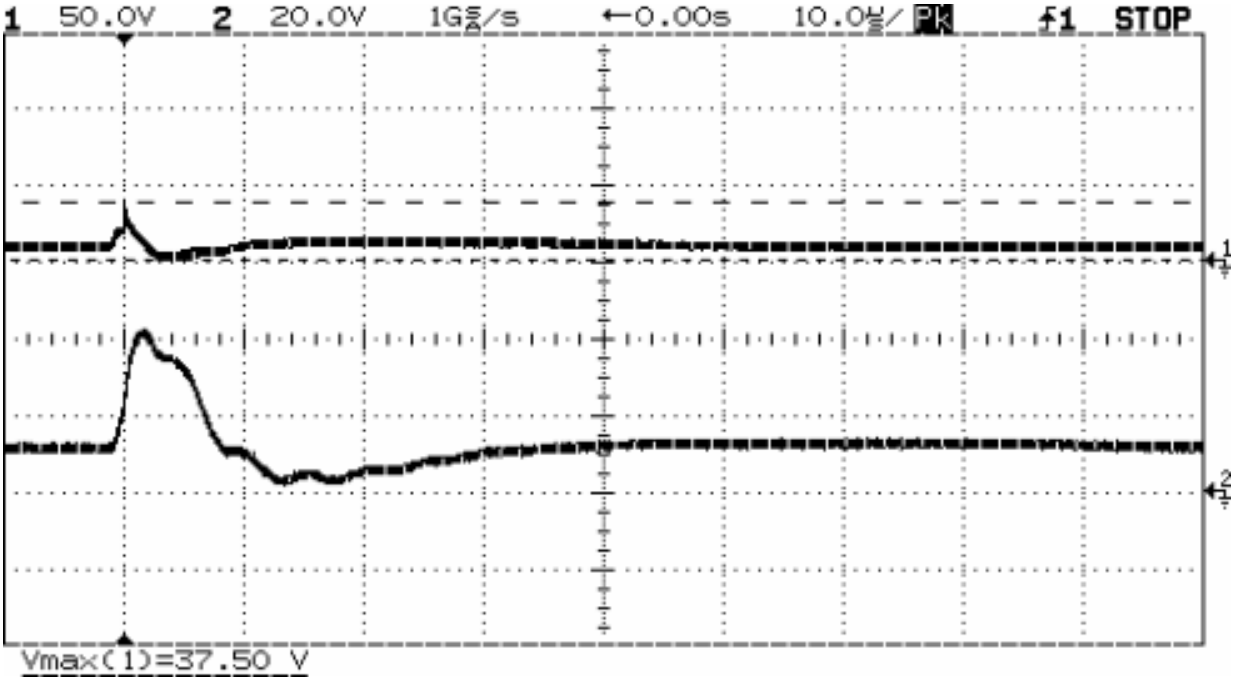
TRANSIENT IMMUNITY - PULSE 2a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	5 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2a – Tr & Td - EUT Load



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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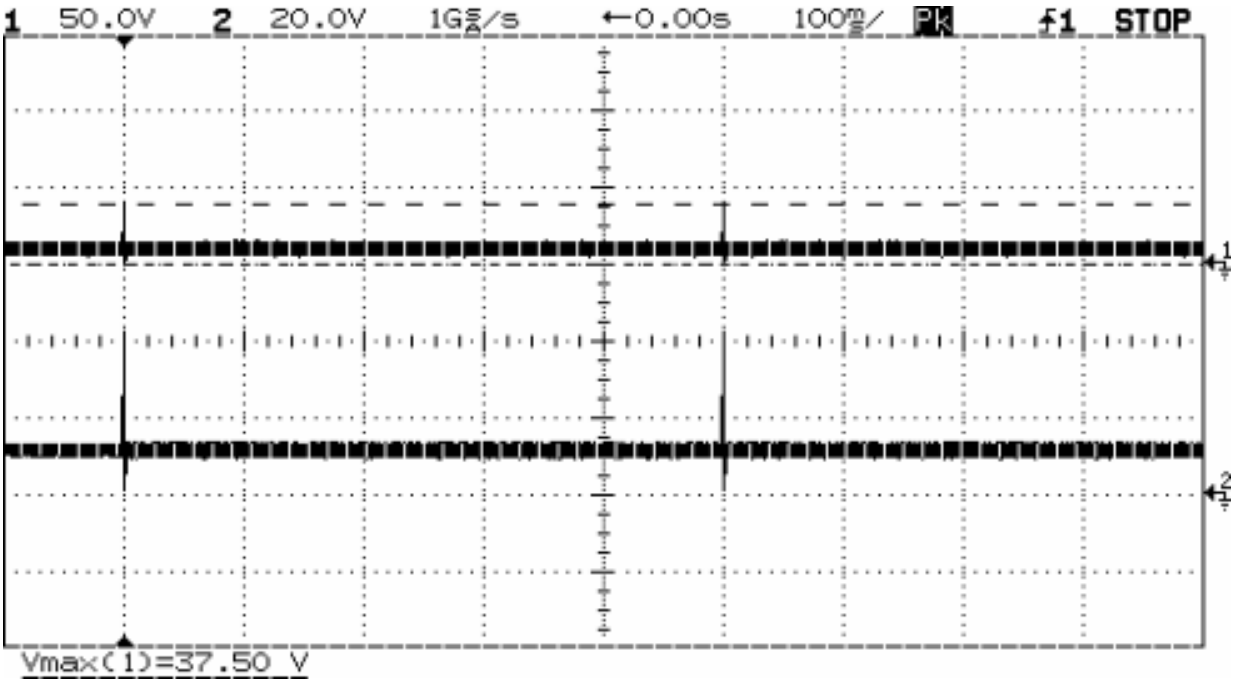
TRANSIENT IMMUNITY - PULSE 2a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	6 of 6
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2a – T1 - EUT Load



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

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TRANSIENT IMMUNITY - PULSE 2b

Test Report #: NC72116472 Test Area: 5

EUT Part #: ISO 16750 Rev A2 Date: May 9, 2016

ESN #: A EUT Power: 12 VDC Temperature: 24.1 °C

Test Method: ISO 7637-2: 2011 Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 30.0 %

EUT Description: Surge Stopper IC's Page: 1 of 4

Notes: Channel 1 on scope capture is the pulse generator, channel 2 is the EUT

Test Voltage (Volts)	test Level (Volts)	Pulse Width (Sec)	Rep Rate (Sec)	Source Impedance (Ohms)	repetitions	Criteria Met (Class)	Complies Yes	Complies No	Remarks
									Lead Description - DC Input Power
13.5	10	2	10	0	10	A	✓		- EUT shuts down with each test pulse as
									designed, returns to normal operation
									with no user intervention

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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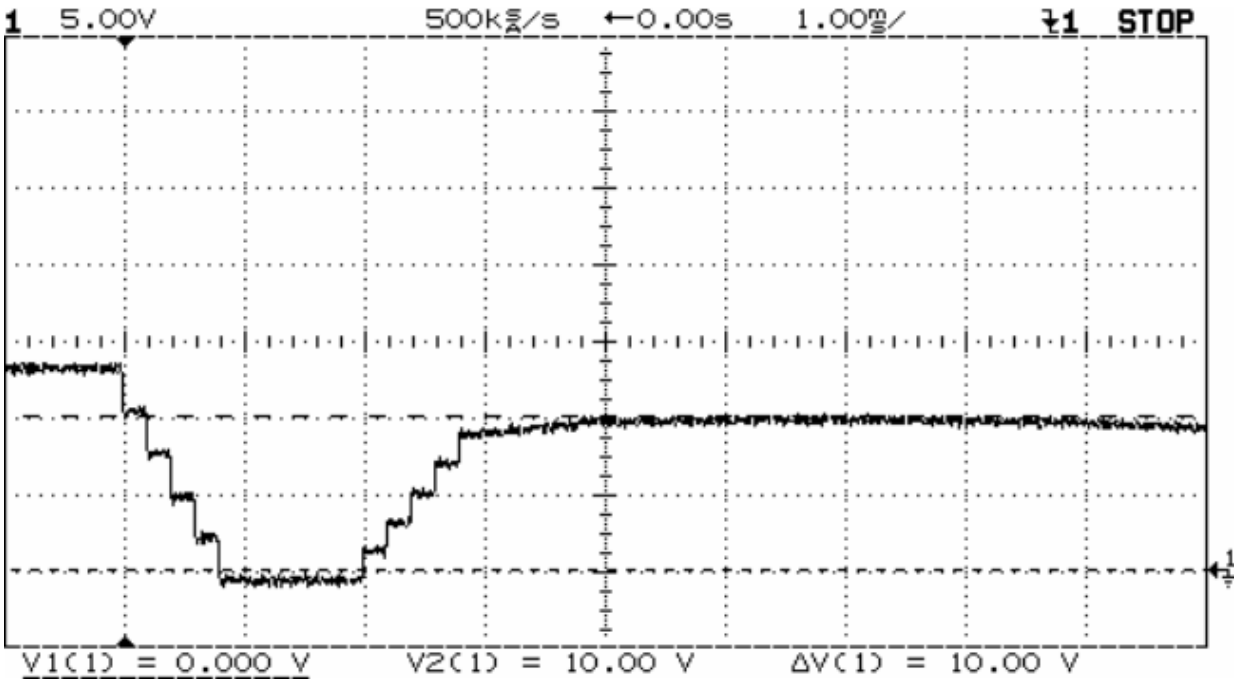
TRANSIENT IMMUNITY - PULSE 2b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	2 of 4
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2b – Tr - Open circuit



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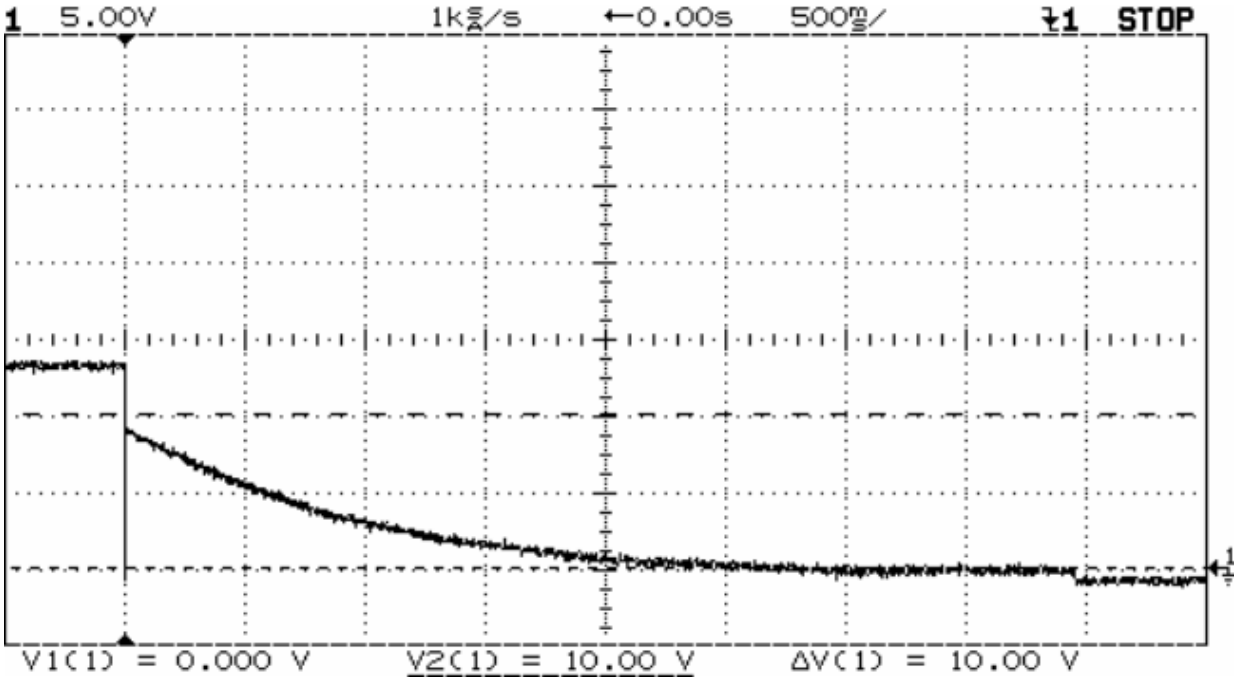
TRANSIENT IMMUNITY - PULSE 2b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	3 of 4
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2b – Td - Open Circuit



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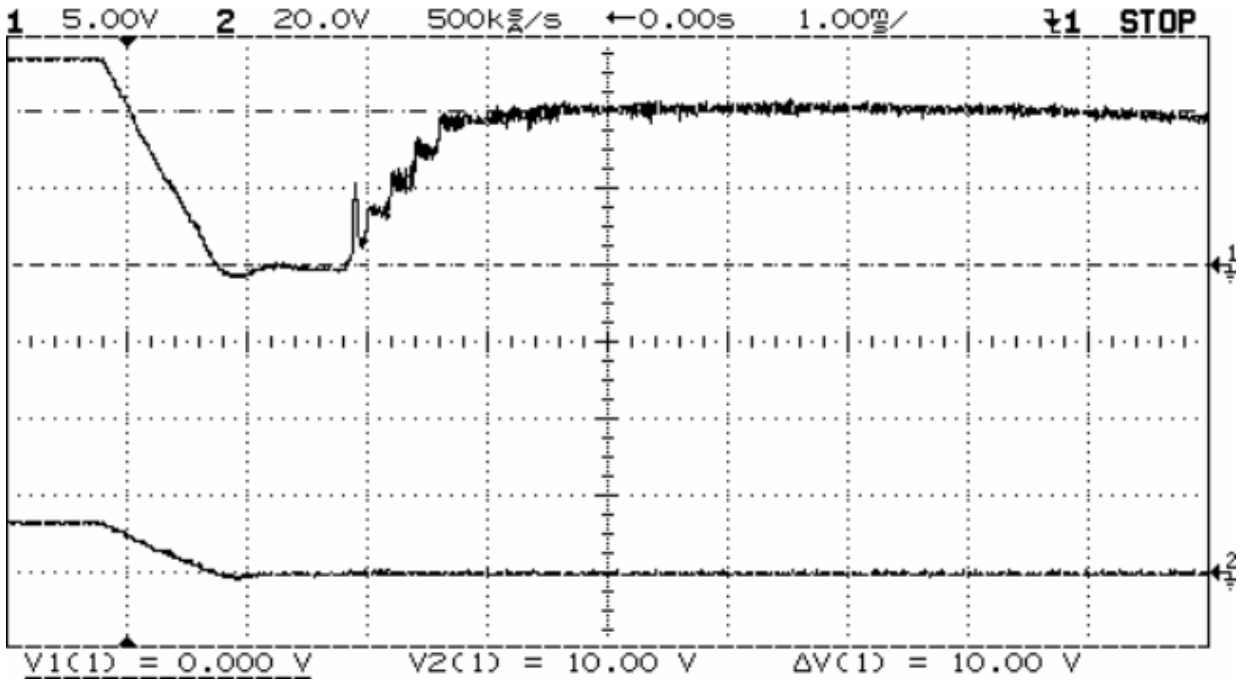
TRANSIENT IMMUNITY - PULSE 2b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	4 of 4
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 2b - Td - EUT Load



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TRANSIENT IMMUNITY - PULSE 3a

Test Report #: NC72116472 Test Area: 5

EUT Part #: ISO 16750 Rev A2 Date: May 9, 2016

ESN #: A EUT Power: 12 VDC Temperature: 24.1 °C

Test Method: ISO 7637-2: 2011 Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 30.0 %

EUT Description: Surge Stopper IC's Page: 1 of 7

Notes: Channel 1 on scope capture is the pulse generator, channel 2 is the EUT

Test Voltage (Volts)	test Level (Volts)	Rep Rate (uSec)	Burst Width (mSec)	Burst Period (mSec)	Source Impedance (Ohms)	Test Time (Min)	Criteria Met (Class)	Complies Yes	Complies No	Remarks
										Lead Description - DC Input Power
13.5	-220	100	10	100	50	60	A	✓		

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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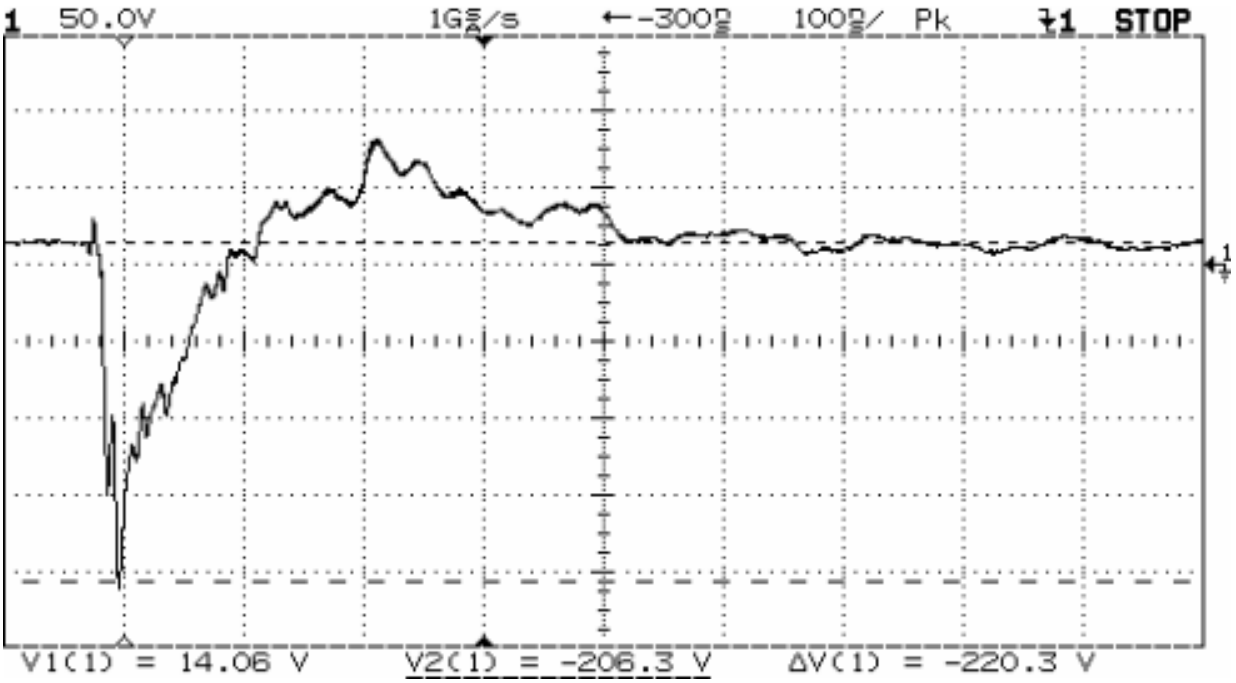
TRANSIENT IMMUNITY - PULSE 3a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	2 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3a – Tr & Td - Open Circuit



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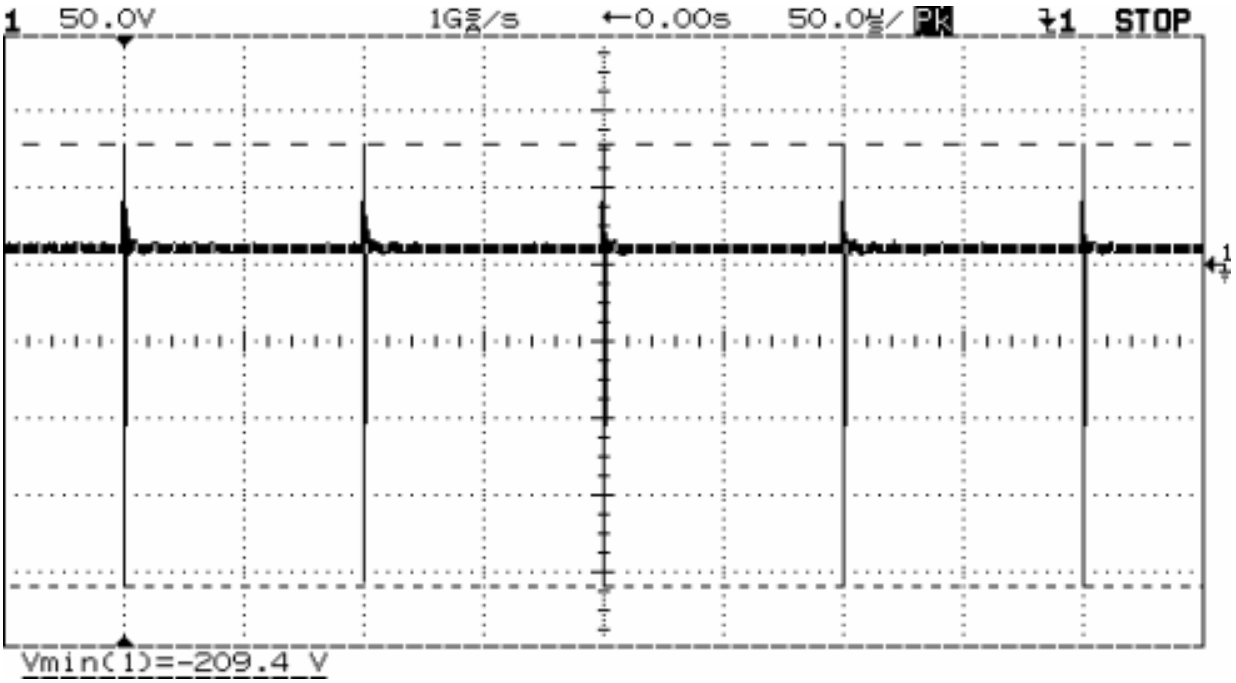
TRANSIENT IMMUNITY - PULSE 3a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	3 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3a – T1 - Open Circuit



Tested by: Eugen Lifteniuc (Printed) — (Signature)

Reviewed by: David T. Schaefer (Printed) — (Signature)

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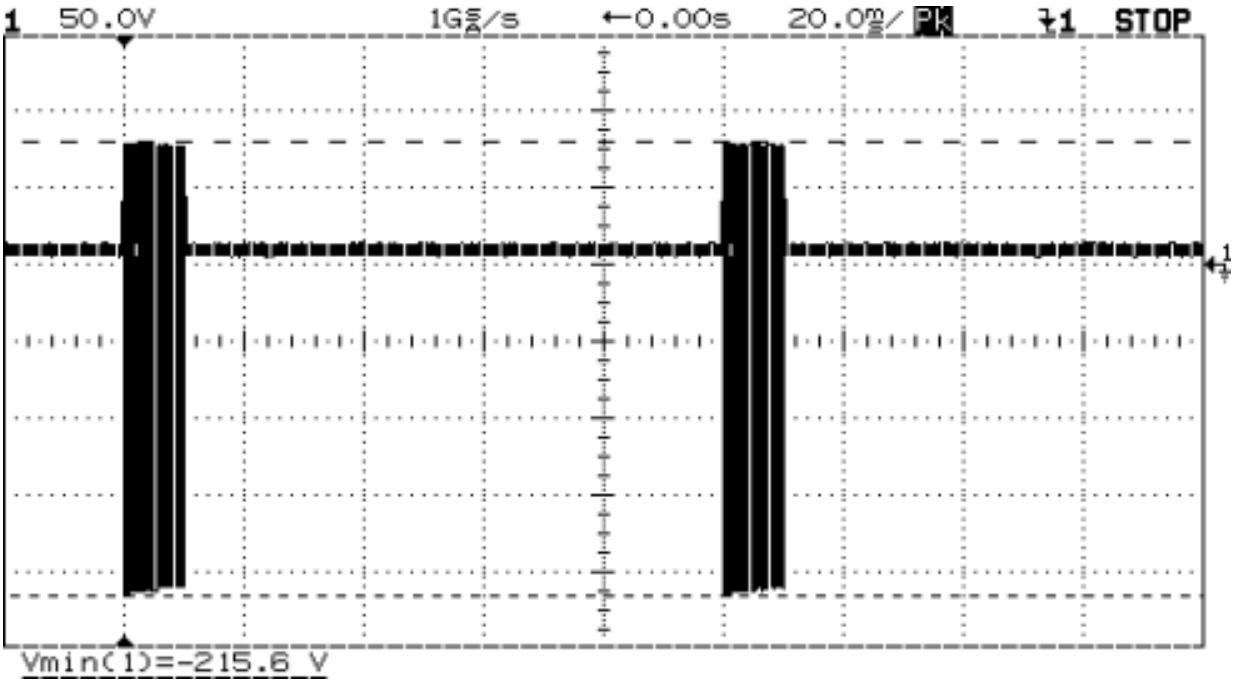
TRANSIENT IMMUNITY - PULSE 3a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	4 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3a – T4 + T5 - Open Circuit



Tested by: Eugen Lifteniuc (Printed) — (Signature)

Reviewed by: David T. Schaefer (Printed) — (Signature)

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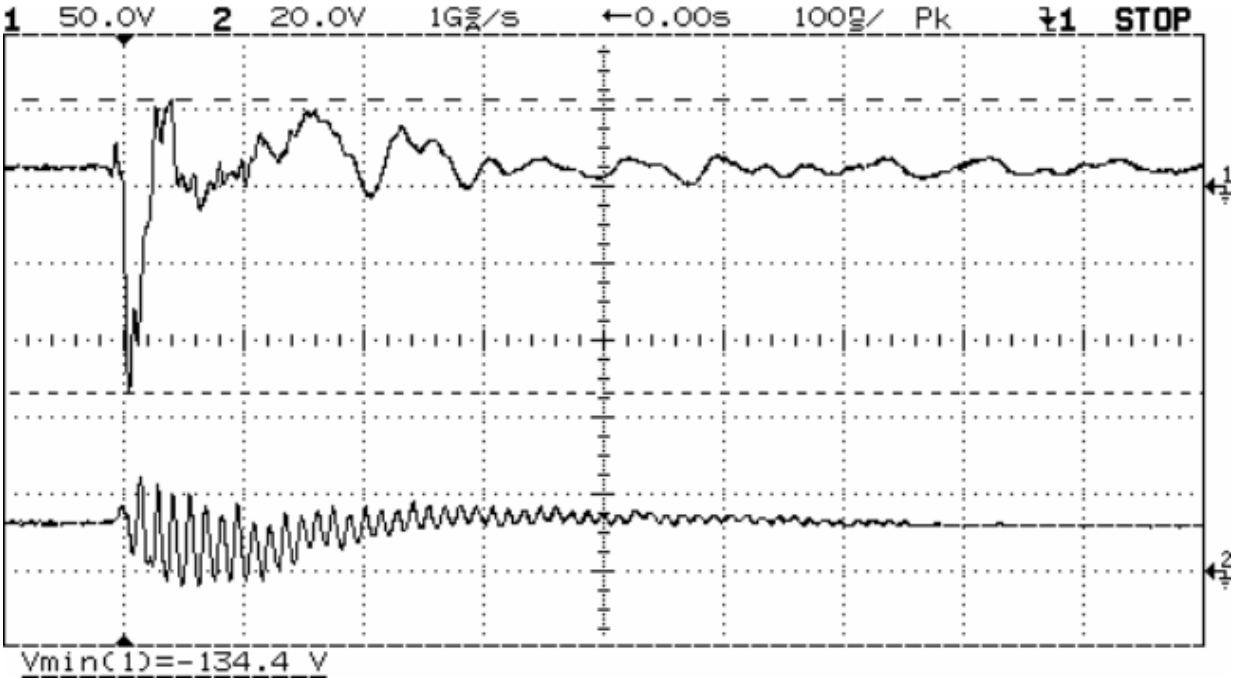
TRANSIENT IMMUNITY - PULSE 3a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	5 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3a – Tr & Td - EUT Load



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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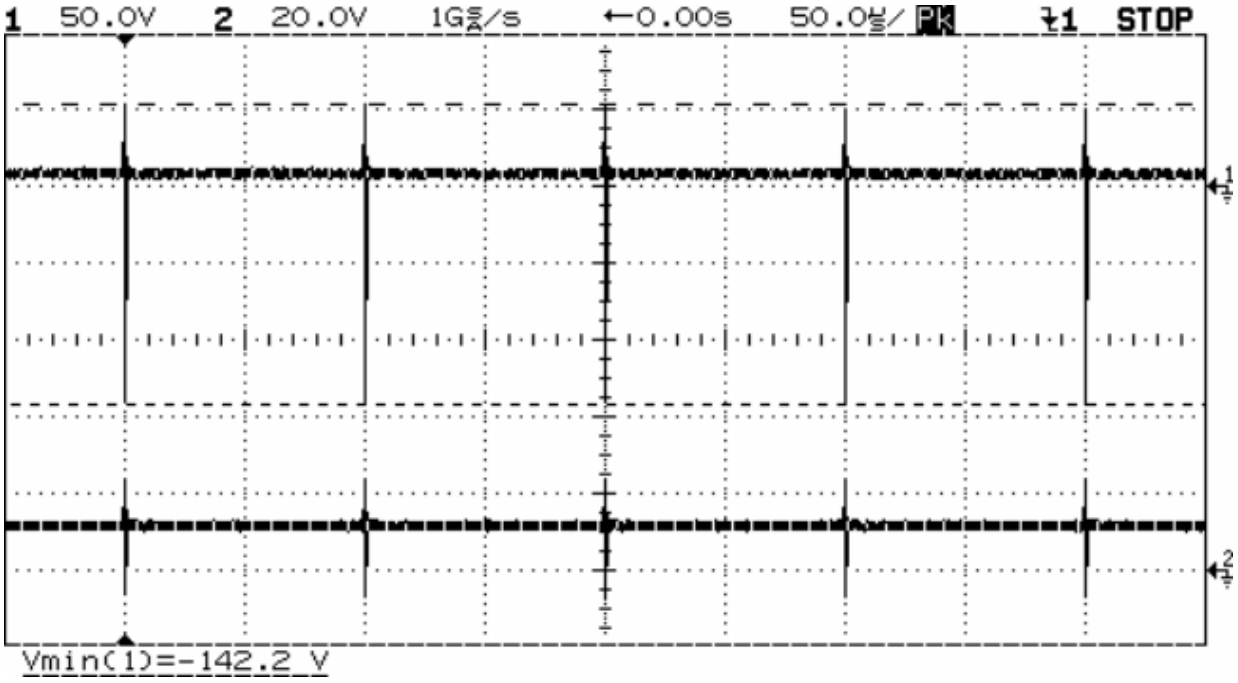
TRANSIENT IMMUNITY - PULSE 3a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	6 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3a – T1 - EUT Load



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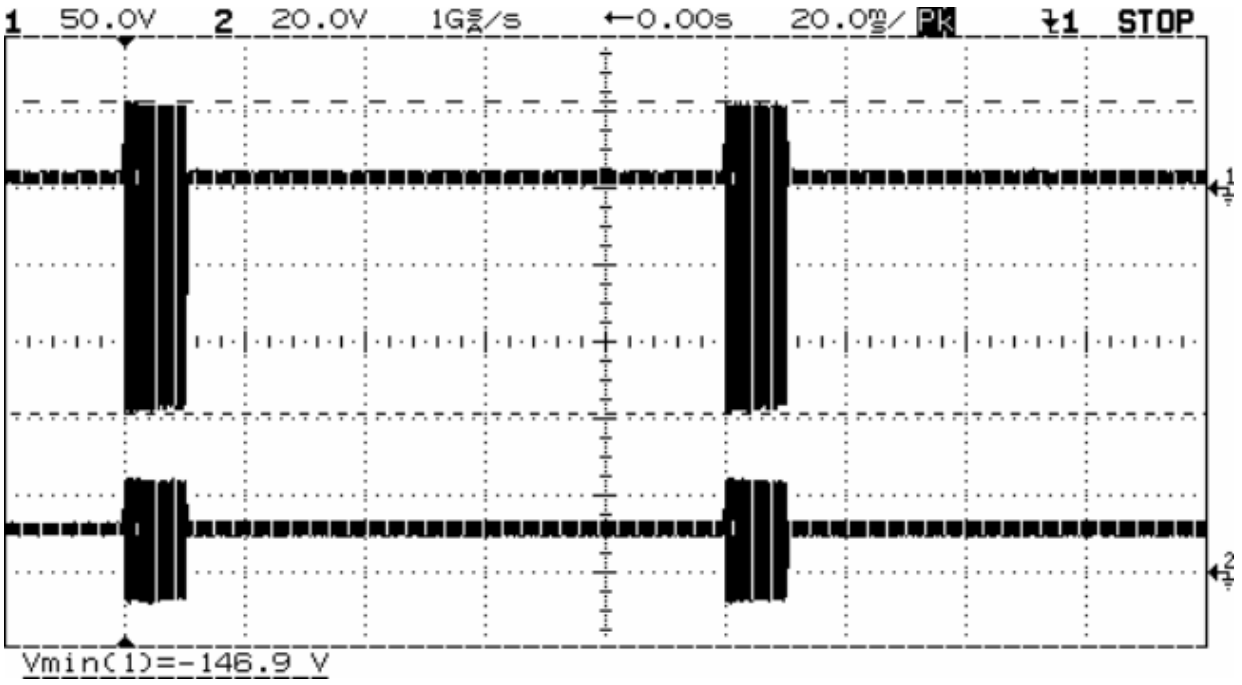
TRANSIENT IMMUNITY - PULSE 3a

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	7 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3a – T4 + T5 - EUT Load



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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TRANSIENT IMMUNITY - PULSE 3b

Test Report #: NC72116472 Test Area: 5

EUT Part #: ISO 16750 Rev A2 Date: May 9, 2016

ESN #: A EUT Power: 12 VDC Temperature: 24.1 °C

Test Method: ISO 7637-2: 2011 Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 30.0 %

EUT Description: Surge Stopper IC's Page: 1 of 7

Notes: Channel 1 on scope capture is the pulse generator, channel 2 is the EUT

Test Voltage (Volts)	test Level (Volts)	Rep Rate (uSec)	Burst Width (mSec)	Burst Period (mSec)	Source Impedance (Ohms)	Test Time (Min)	Criteria Met (Class)	Complies Yes	Complies No	Remarks
										Lead Description - DC Input Power
13.5	+150	100	10	100	50	60	A	✓		

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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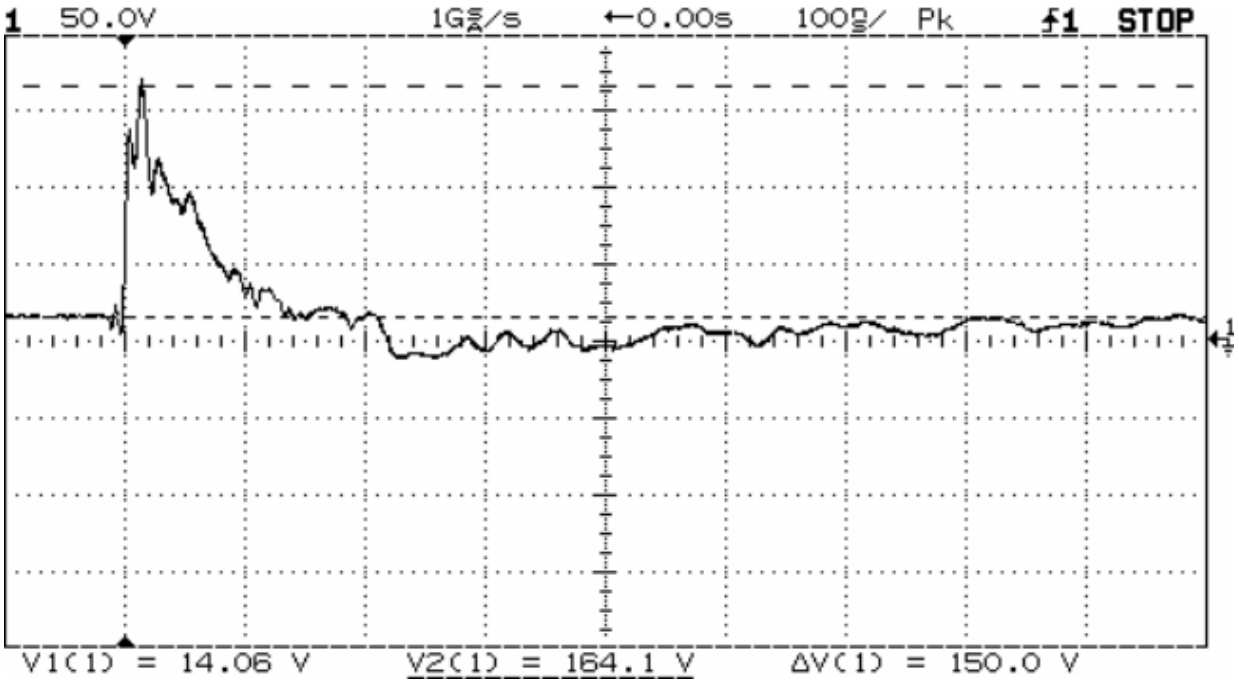
TRANSIENT IMMUNITY - PULSE 3b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	2 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3b – Tr & Td - Open Circuit



Tested by: Eugen Lifteniuc (Printed) — (Signature)

Reviewed by: David T. Schaefer (Printed) — (Signature)

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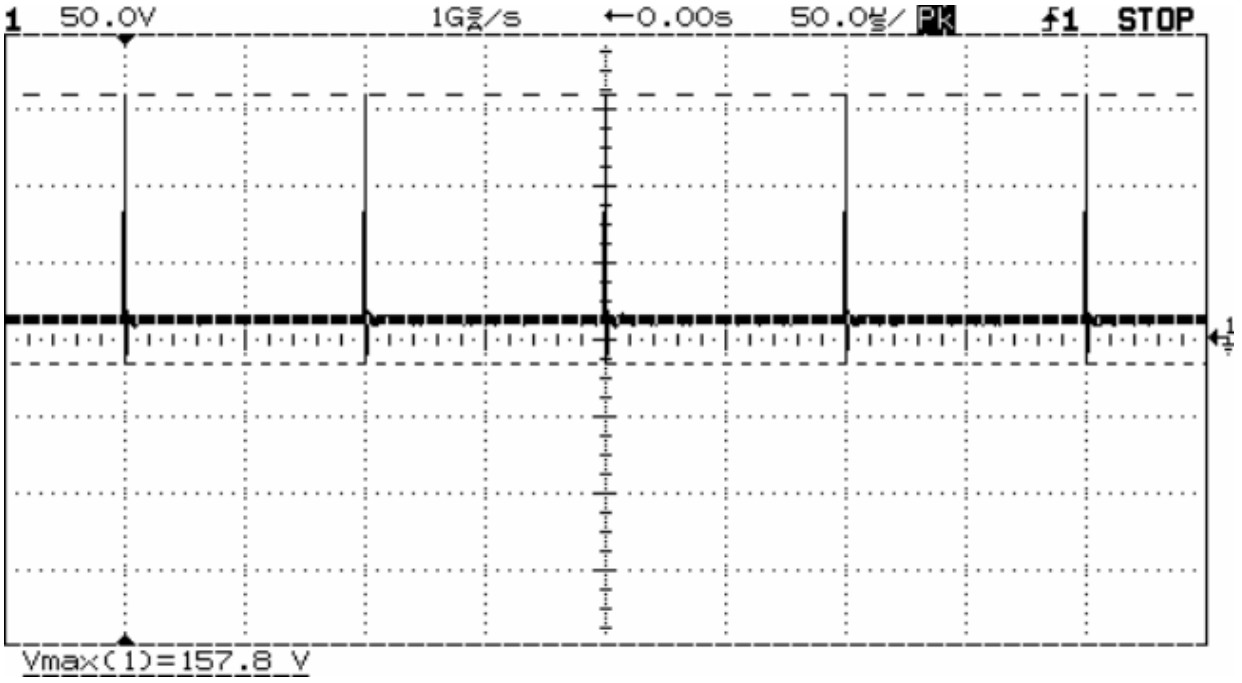
TRANSIENT IMMUNITY - PULSE 3b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	3 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3b – T1 - Open Circuit



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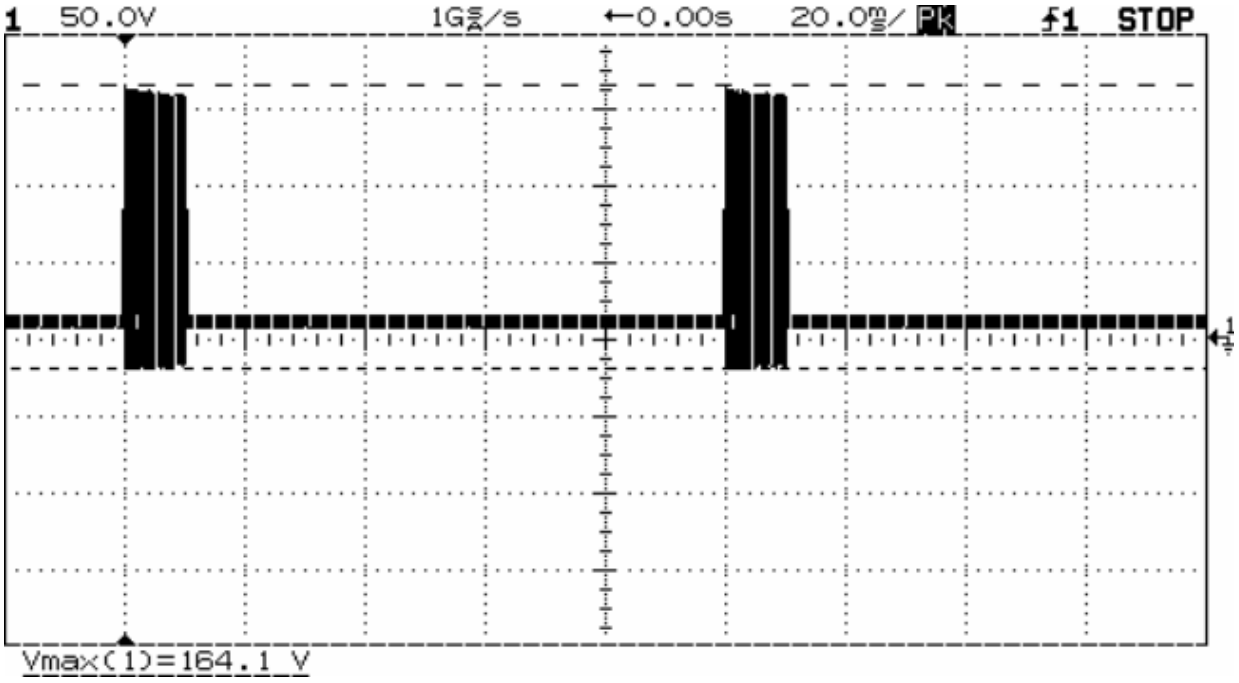
TRANSIENT IMMUNITY - PULSE 3b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	4 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3b – T4 + T5 - Open Circuit



Tested by: Eugen Lifteniuc (Printed) — Signature

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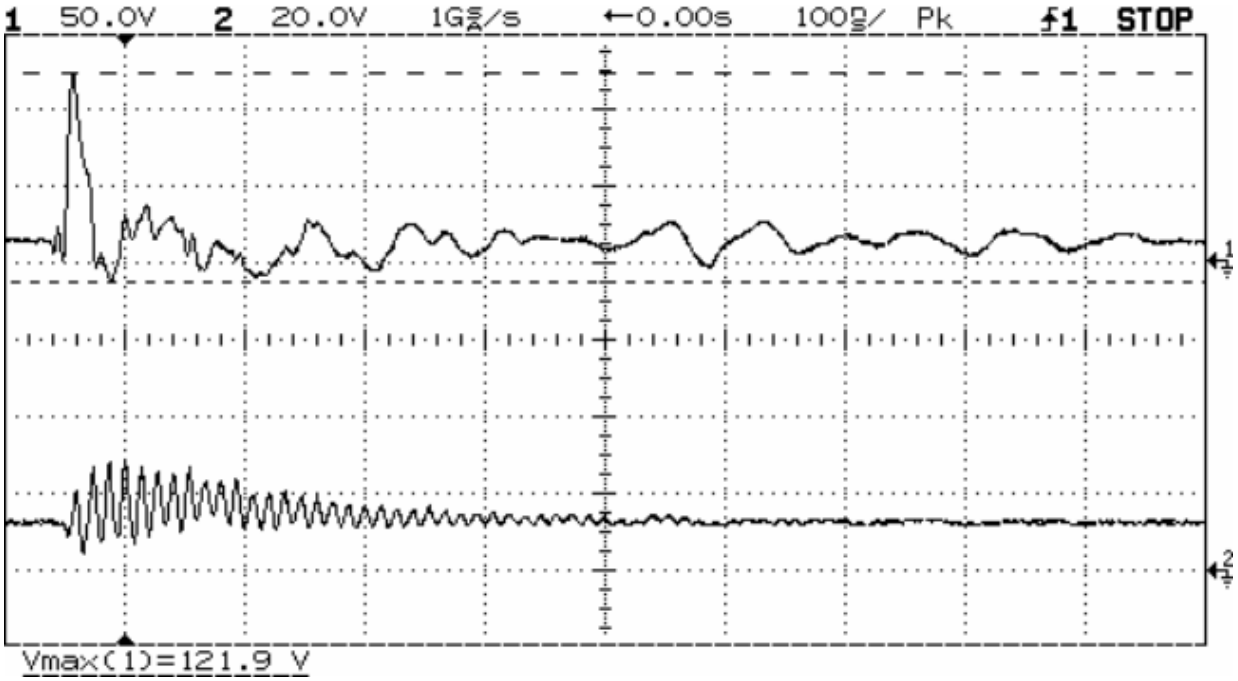
TRANSIENT IMMUNITY - PULSE 3b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	5 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3b – Tr & Td - EUT Load



Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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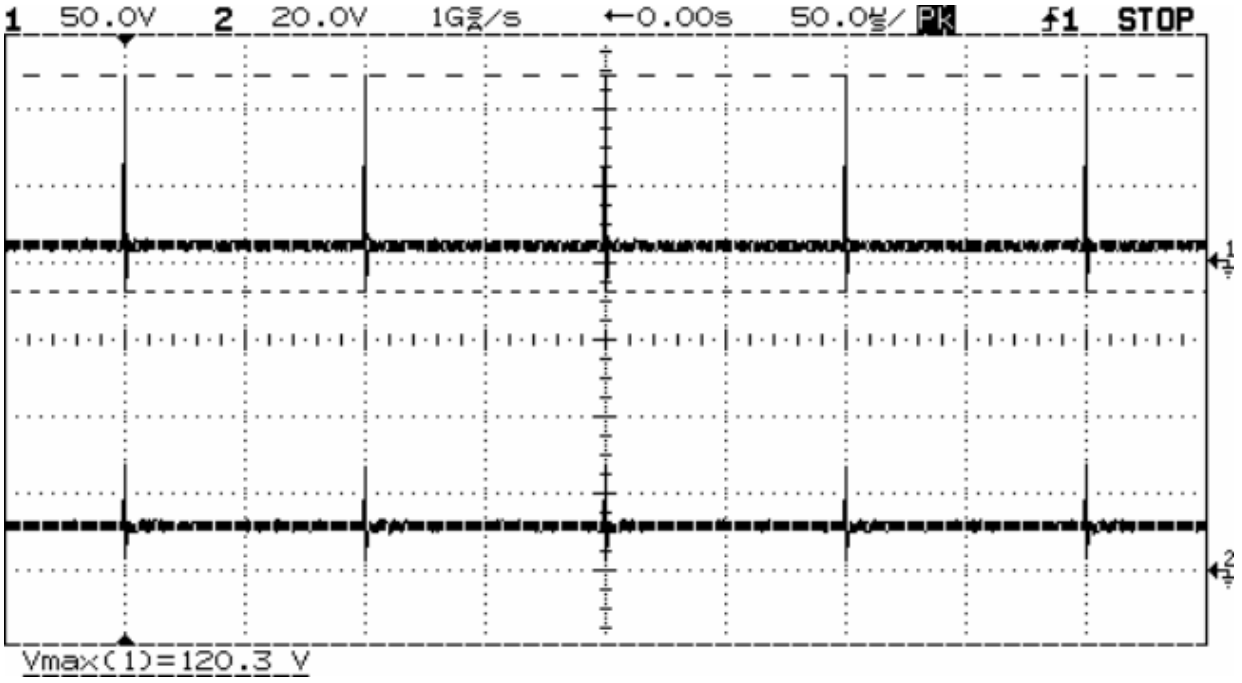
TRANSIENT IMMUNITY - PULSE 3b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	6 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3b – T1 - EUT Load



Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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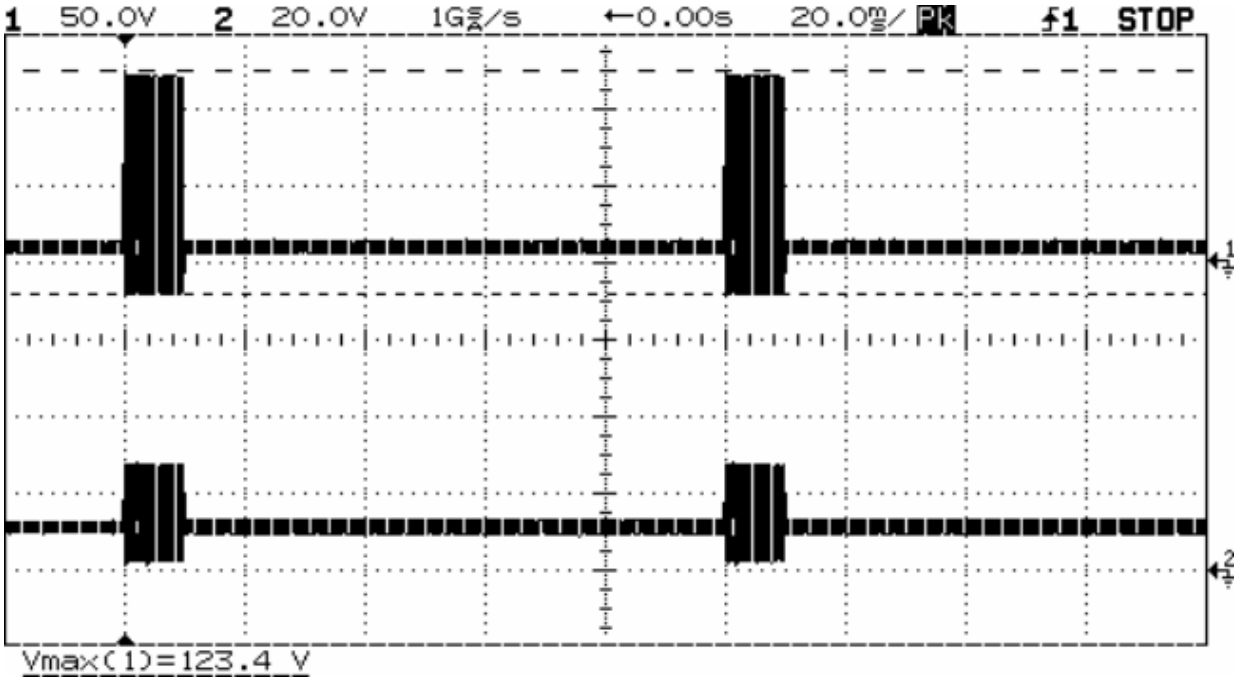
TRANSIENT IMMUNITY - PULSE 3b

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 9, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 7637-2: 2011			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	7 of 7
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 3b – T4 + T5 - EUT Load



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Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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DIRECT CURRENT SUPPLY VOLTAGE

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 25, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 24.2 °C

Test Method: ISO 16750-2: 2012, Section 4.2, Direct Current Supply Voltage Air Pressure: 97.9 kPa

Customer: Linear Technology Corp Relative Humidity: 42.8 %

EUT Description: Surge Stopper IC's Page: 1 of 6

Notes: V1 is Input, V2 is Output

Test Level (V)	Duration (min)	Complies Yes	Complies No	Criteria Met	Remarks
16	n/a	✓		A	Code A from Table 1 of Section 4.2 in ISO 16750-2:2012
6	n/a	✓		A	Code A
8	n/a	✓		A	Code B
9	n/a	✓		A	Code C
10.5	n/a	✓		A	Code D

Tested by: Eugen Lifteniuc (Printed)  (Signature)

Reviewed by: David T. Schaefer (Printed)  (Signature)

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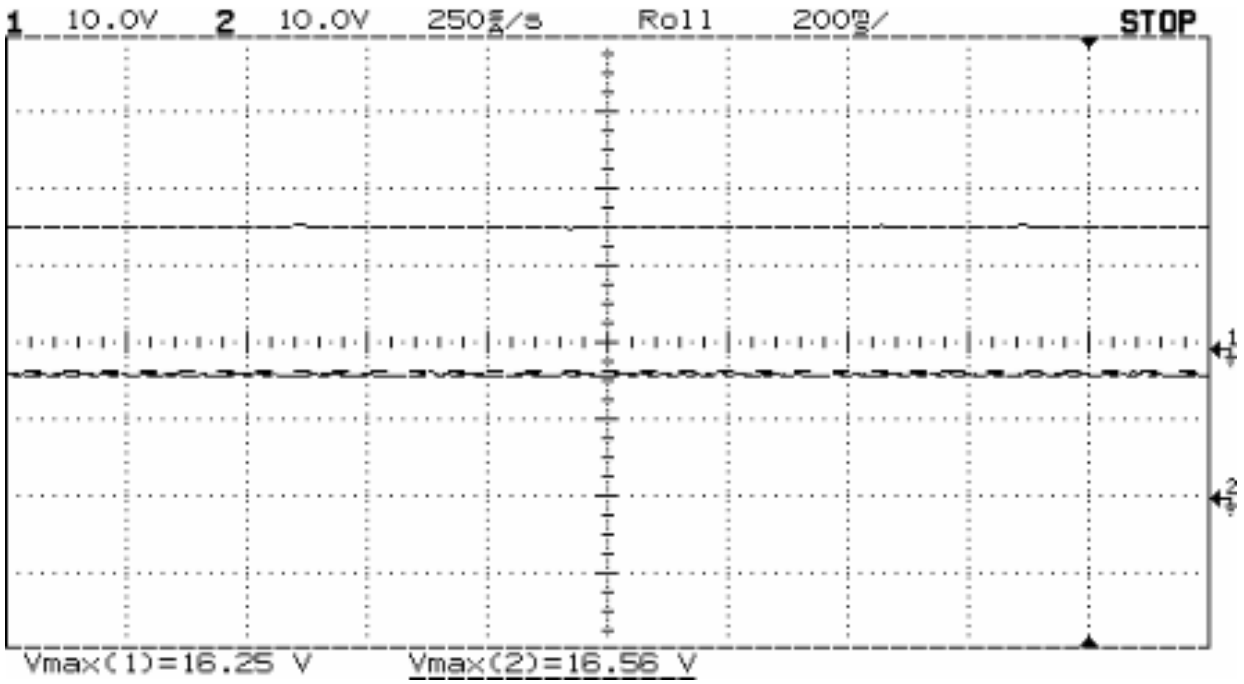
DIRECT CURRENT SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 25, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.2, Direct Current Supply Voltage			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	42.8 %
EUT Description:	Surge Stopper IC's			Page:	2 of 6
Notes:	V1 is Input, V2 is Output				

16V, Usmax



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Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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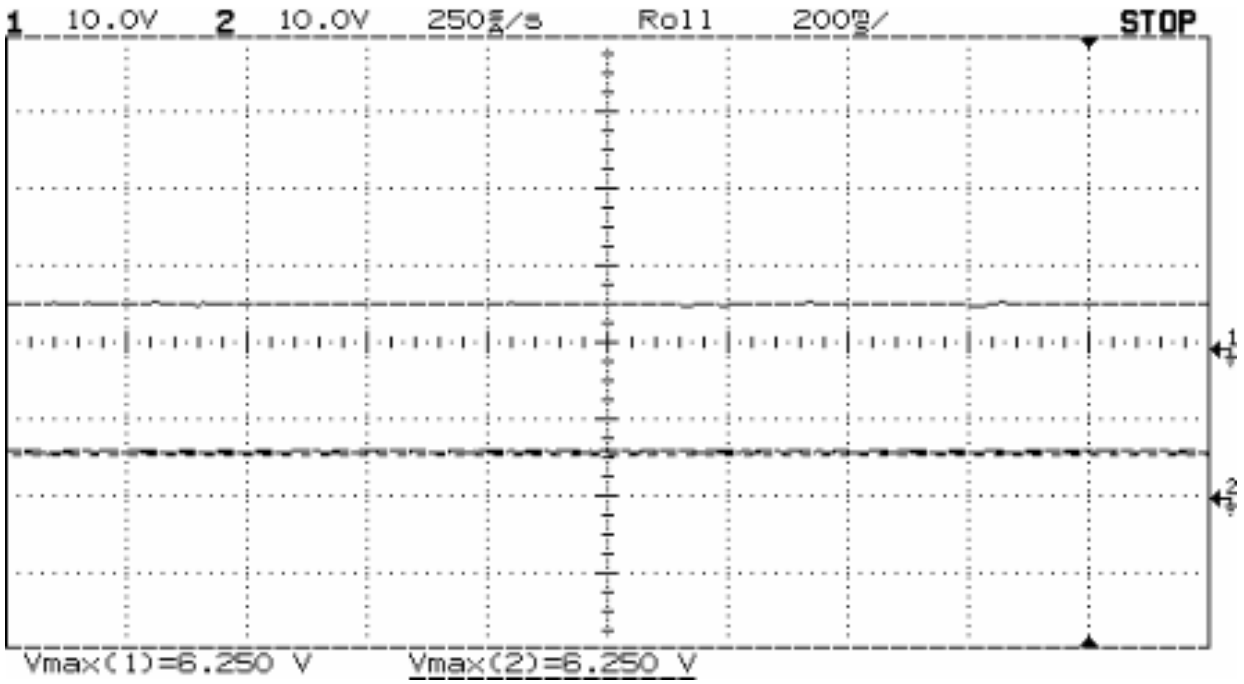
DIRECT CURRENT SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 25, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.2, Direct Current Supply Voltage			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	42.8 %
EUT Description:	Surge Stopper IC's			Page:	3 of 6
Notes:	V1 is Input, V2 is Output				

6V, Usmin



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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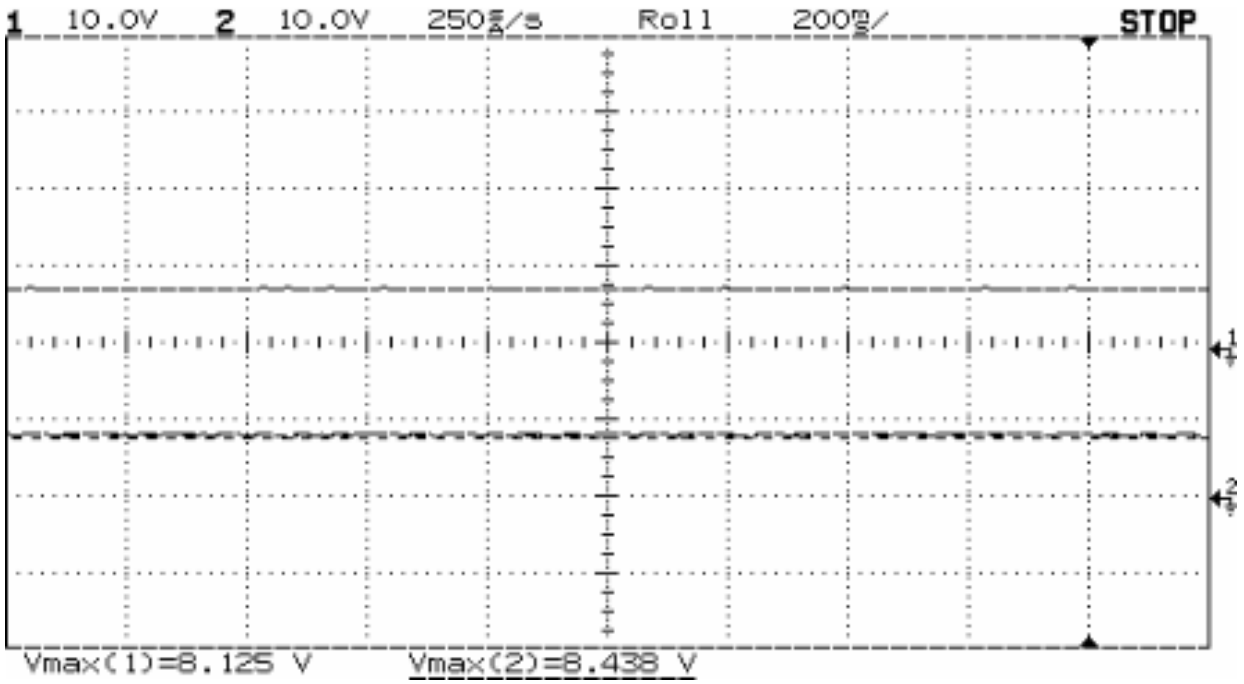
DIRECT CURRENT SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 25, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.2, Direct Current Supply Voltage			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	42.8 %
EUT Description:	Surge Stopper IC's			Page:	4 of 6
Notes:	V1 is Input, V2 is Output				

8V, Usmin



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Reviewed by: David T. Schaefer (Printed) Signature

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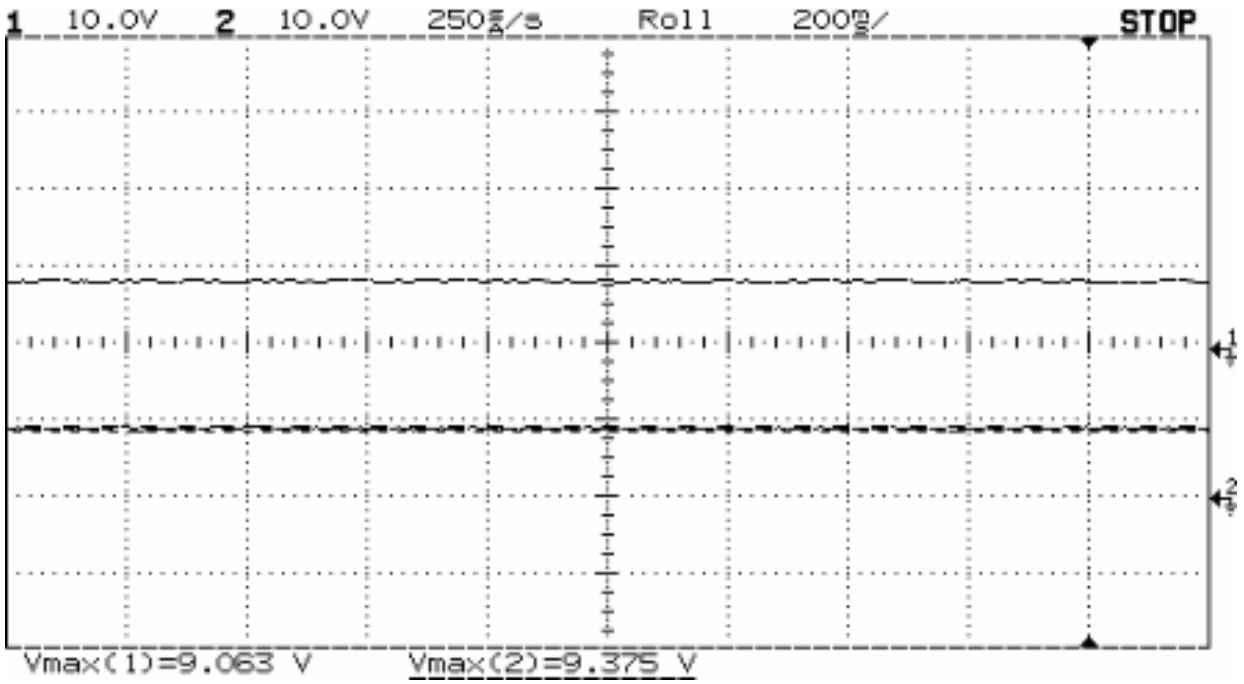
DIRECT CURRENT SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 25, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.2, Direct Current Supply Voltage			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	42.8 %
EUT Description:	Surge Stopper IC's			Page:	5 of 6
Notes:	V1 is Input, V2 is Output				

9V, Usmin



Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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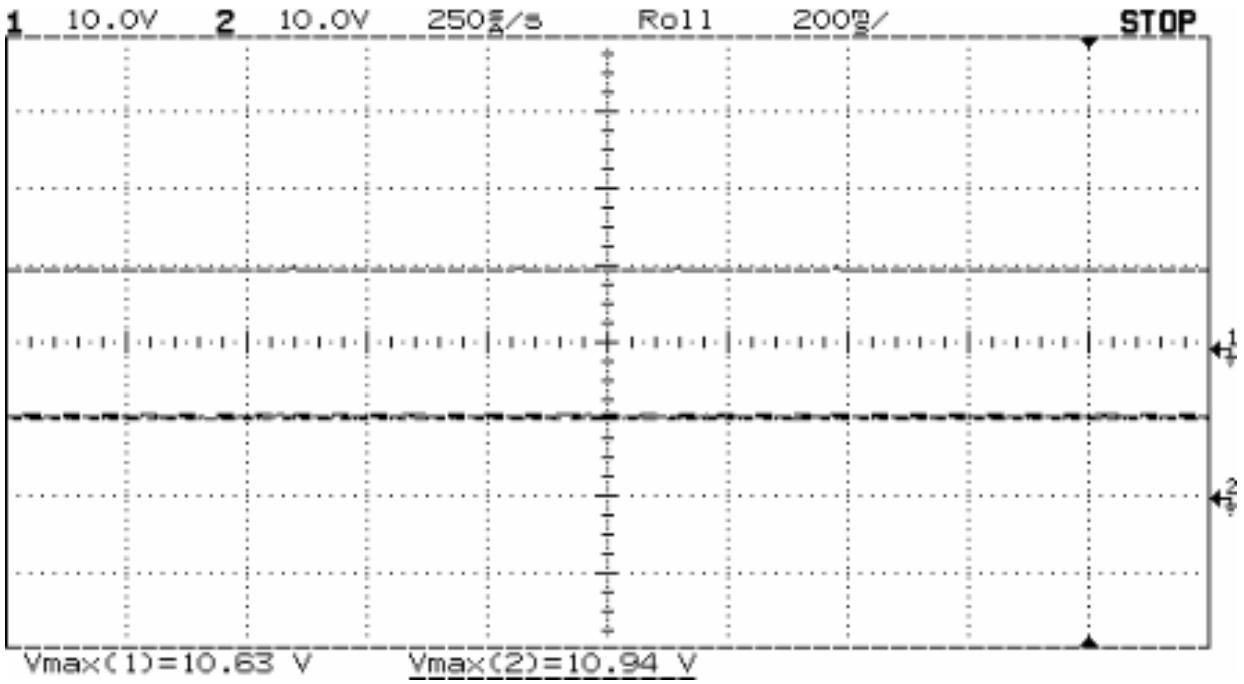
DIRECT CURRENT SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 25, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.2, Direct Current Supply Voltage			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	42.8 %
EUT Description:	Surge Stopper IC's			Page:	6 of 6
Notes:	V1 is Input, V2 is Output				

10.5V, Usmin



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Reviewed by: David T. Schaefer (Printed) Signature

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OVERVOLTAGE

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 9, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 24.1 °C

Test Method: ISO 16750-2: 2012, Section 4.3.1.1, Overvoltage Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 30.0 %

EUT Description: Surge Stopper IC's Page: 1 of 1

Notes:

Test Level (V)	Temperature (°C)	Duration (min)	Complies Yes	Complies No	Criteria Met	Remarks
18	65	60	✓		A	

Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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OVERVOLTAGE

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 10, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 23.6 °C

Test Method: ISO 16750-2: 2012, Section 4.3.1.2, Overvoltage at room temperature Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 37.5 %

EUT Description: Surge Stopper IC's Page: 1 of 2

Notes:

Test Level (V)	Temperature (°C)	Duration (min)	Complies		Criteria Met	Remarks
			Yes	No		
24	23.6	1	✓		A	

Tested by: Eugen Lifteniuc (Printed) (Signature)

Reviewed by: David T. Schaefer (Printed) (Signature)

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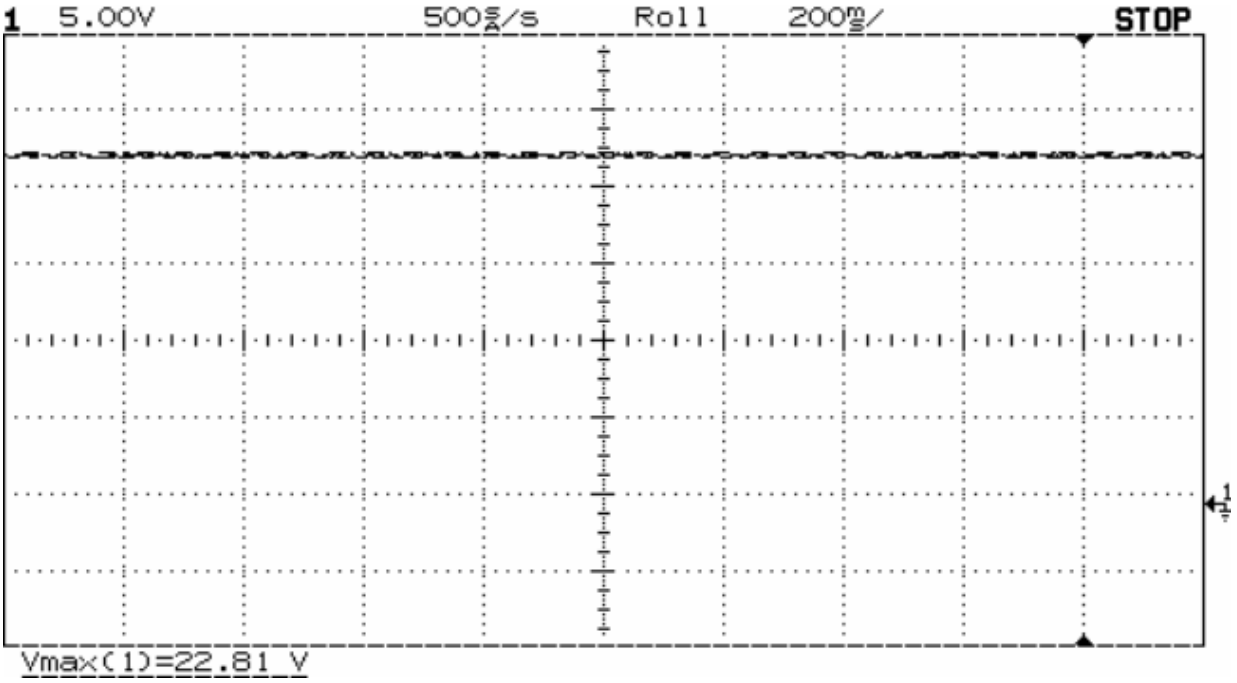
OVERVOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 10, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	23.6 °C
Test Method:	ISO 16750-2: 2012, Section 4.3.1.2, Overvoltage at room temperature			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	37.5 %
EUT Description:	Surge Stopper IC's			Page:	2 of 2
Notes:					



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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SUPERIMPOSED ALTERNATING VOLTAGE

Test Report #: NC72116472 Test Area: Env. Lab

EUT Model #: ISO 16750 Rev A2 Date: 25 July, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 24.2 °C

Test Method: ISO 16750-2: 2012, Section 4.4, Superimposed Alternating Voltage Air Pressure: 98.4 kPa

Customer: Linear Technology Corp Relative Humidity: 52.0 %

EUT Description: Surge Stopper IC's Page: 1 of 1

Notes: Frequency swept from 50Hz to 25kHz in 120s, then from 25kHz to 50Hz in 120s.

Sweep ran 5 times.

FREQUENCY (Hz)	TEST VOLTAGE (V_{pp})	DURATION (s)	Number Sweeps	COMPLIES YES	COMPLIES NO	CRITERIA MET	REMARKS
							Swept 5 times – Severity 2
50	2	120	1	✓		A	
↓	↓	↓	↓	↓		↓	
16000	↓	↓	↓		✓	C	EUT shuts off
↓	↓	↓	↓		↓	↓	
25000	↓	↓	↓		↓	↓	
↓	↓	↓	↓		↓	↓	
50	↓	↓	↓		↓	↓	
							Swept 5 times – Severity 1
50	1	120	1	✓		A	
↓	↓	↓	↓	↓		↓	
25000	↓	↓	↓	↓		↓	
↓	↓	↓	↓	↓		↓	
50	↓	↓	↓	↓		↓	

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David Schaefer (Signature)

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SLOW DECREASE / INCREASE OF SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	Env. Lab		
EUT Model #:	ISO 16750 Rev A2	Date:	25 July, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.5, Slow Decrease / Increase of Supply Voltage			Air Pressure:	98.4 kPa
Customer:	Linear Technology Corp			Relative Humidity:	52.0 %
EUT Description:	Surge Stopper IC's			Page:	1 of 1

Notes: Supply voltage decreased from 10.5V to 0V, then increased from 0V to 10.5V at a rate of 0.5V/min.

TEST LEVEL (U_{SMIN})	CHANGE IN VOLTAGE (V)	REPETITIONS	DURATION	COMPLIES		CRITERIA MET	REMARKS
				YES	NO		
10.5	0.5/min	1	N/A	✓		A	0.5 V/min decrease
↓	↓	↓	↓	✓		A	
2.9	↓	↓	↓	✓		A	EUT shut down as designed
↓	↓	↓	↓	✓		A	
0	↓	↓	↓	✓		A	EUT still off
0	0.5/min	1	N/A	✓		A	
↓	↓	↓	↓	✓		A	
3.5	↓	↓	↓	✓		C	EUT turned ON, then back OFF 5 sec later
↓	↓	↓	↓	✓		A	
5.5	↓	↓	↓	✓		C	Pause test for 3 min to let EUT recover.
							EUT recovered, re-sweep 0-10.5V
0	0.5/min	1	N/A	✓		A	0.5 V/min increase
↓	↓	↓	↓	✓		A	
6	↓	↓	↓	✓		A	EUT turned ON
↓	↓	↓	↓	✓		A	
10.5	↓	↓	↓	✓		A	

Tested by: Eugen Lifteniuc (Printed)  (Signature)

Reviewed by: David T. Schaefer (Printed)  (Signature)

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MOMENTARY DROP IN SUPPLY VOLTAGE

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 10, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 23.6 °C

Test Method: ISO 16750-2: 2012, Section 4.6.1, Momentary Drop in Supply Voltage Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 37.5 %

EUT Description: Surge Stopper IC's Page: 1 of 3

Notes:

TEST LEVEL (U_{SMIN})	REDUCTION (V)	REPETITIONS	DURATION (ms)	COMPLIES YES	COMPLIES NO	CRITERIA MET	REMARKS
8	3.5	10	100	✓		A	

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David Schaefer (Signature)

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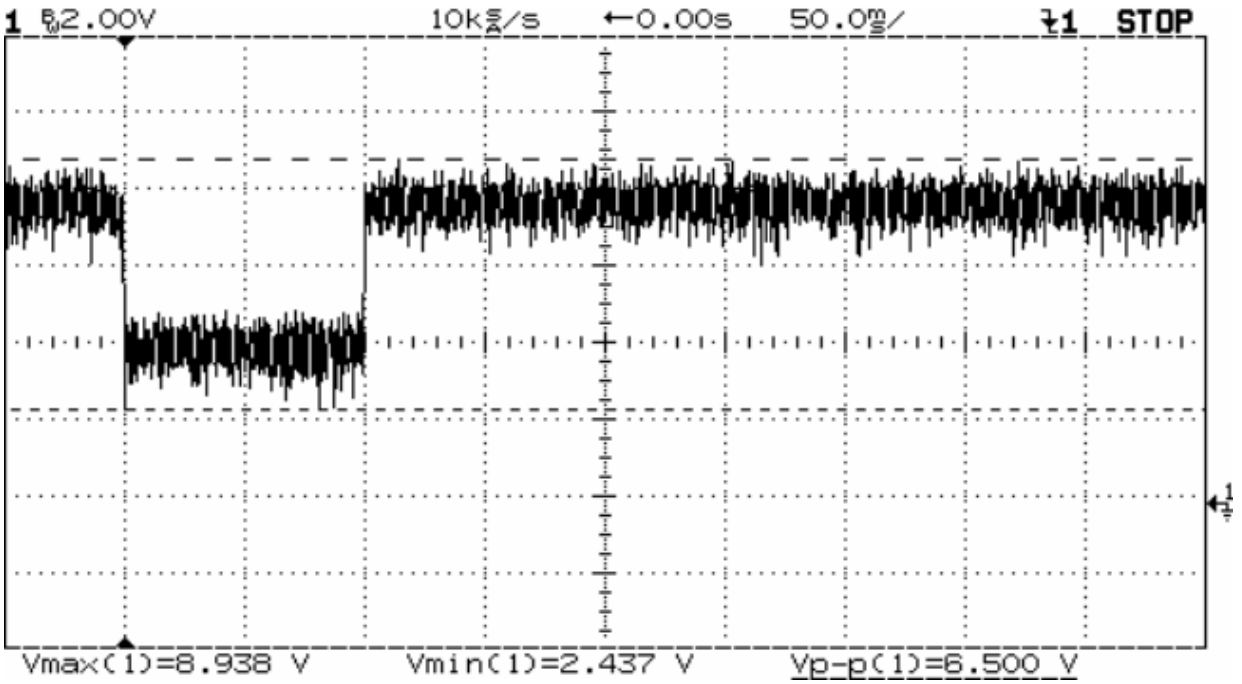
MOMENTARY DROP IN SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 10, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	23.6 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.1, Momentary Drop in Supply Voltage			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	37.5 %
EUT Description:	Surge Stopper IC's			Page:	2 of 3
Notes:					

Short Voltage Drop – Open Circuit



Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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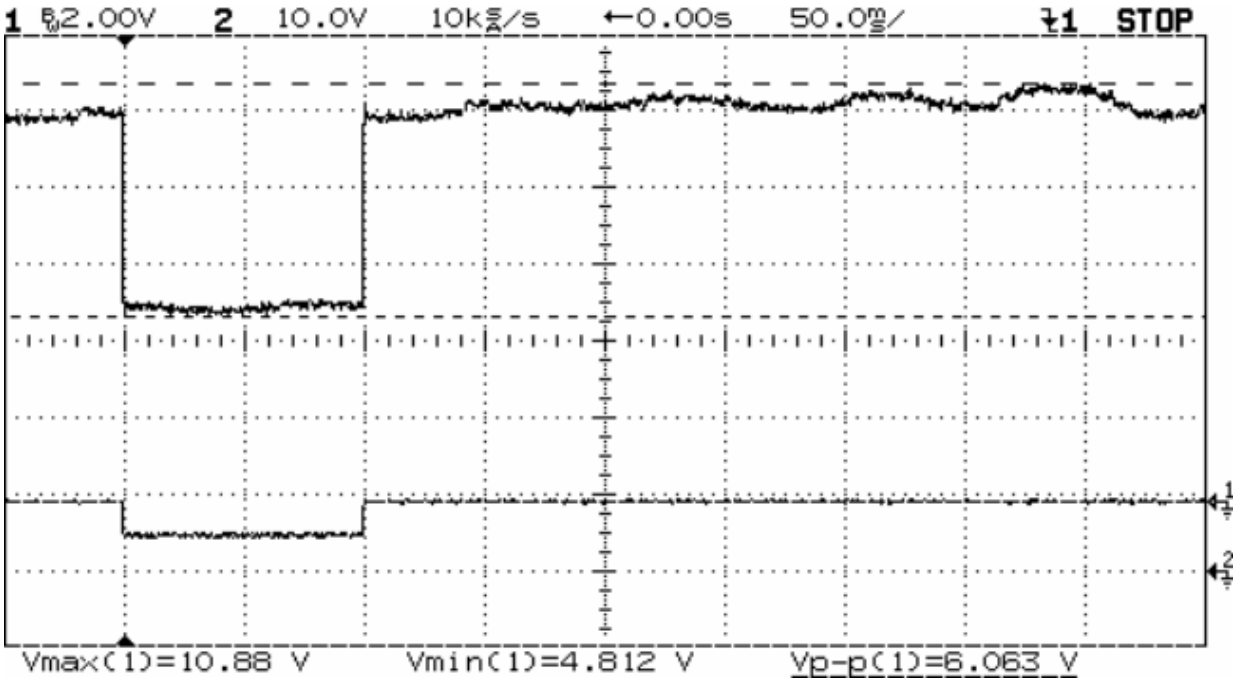
MOMENTARY DROP IN SUPPLY VOLTAGE

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 10, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	23.6 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.1, Momentary Drop in Supply Voltage			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	37.5 %
EUT Description:	Surge Stopper IC's			Page:	3 of 3
Notes:					

Short Voltage Drop – EUT Load



Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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RESET BEHAVIOUR AT VOLTAGE DROP

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 9, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 24.1 °C

Test Method: ISO 16750-2: 2012, Section 4.6.2, Reset Behavior at Voltage Drop Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 30.0 %

EUT Description: Surge Stopper IC's Page: 1 of 2

Notes: Channel 1 on scope capture is the pulse generator, channel 2 is the EUT

Test Level (Nominal Voltage)	% Reduction	Repetitions	Duration (s)	Complies Yes	Complies No	Criteria Met	Remarks
8	5	1	5	✓		C	
8	10	1	5	✓		C	
8	15	1	5	✓		C	
8	20	1	5	✓		C	
8	25	1	5	✓		C	
8	30	1	5	✓		C	
8	35	1	5	✓		C	
8	40	1	5	✓		C	
8	45	1	5	✓		C	
8	50	1	5	✓		C	
8	55	1	5	✓		C	
8	60	1	5	✓		C	
8	65	1	5	✓		C	
8	70	1	5	✓		C	
8	75	1	5	✓		C	
8	80	1	5	✓		C	
8	85	1	5	✓		C	
8	90	1	5	✓		C	
8	95	1	5	✓		C	
8	100	1	5	✓		C	
							C = EUT voltage dropped, operation continued
							with no user intervention.

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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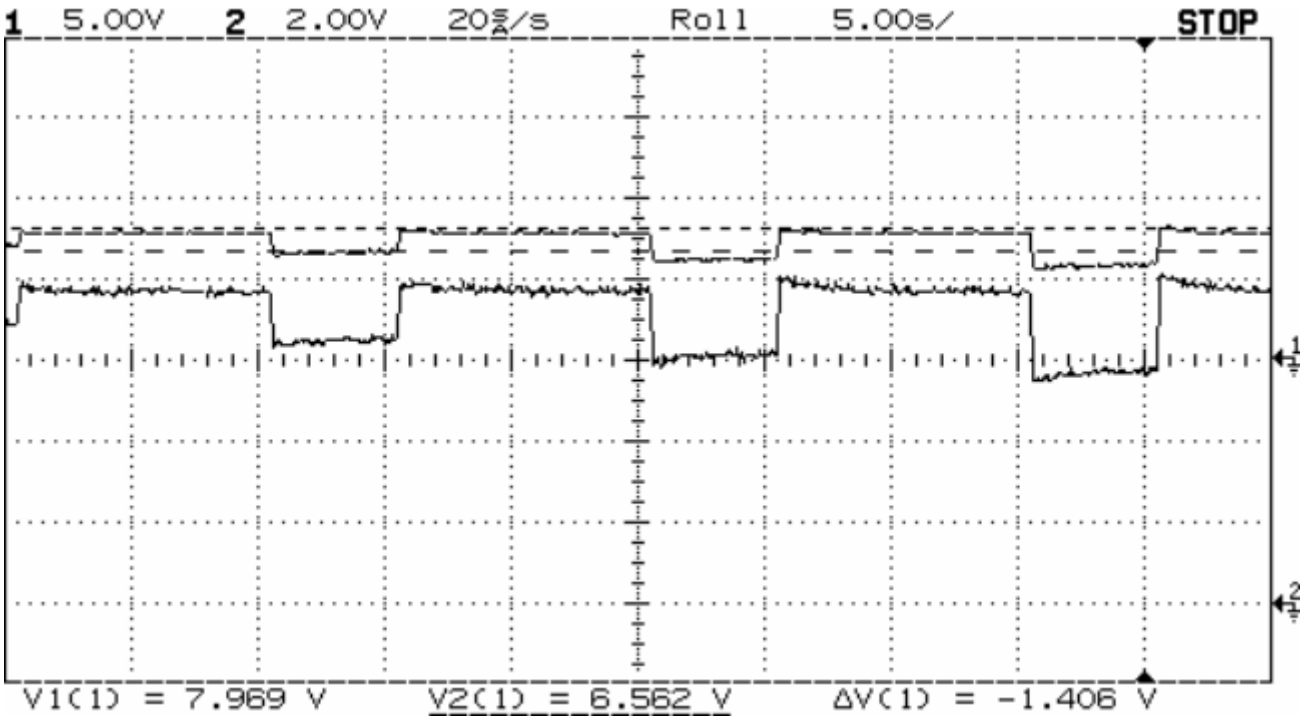
RESET BEHAVIOUR AT VOLTAGE DROP

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 9, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.1 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.2, Reset Behavior at Voltage Drop			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	30.0 %
EUT Description:	Surge Stopper IC's			Page:	2 of 2
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Supply Voltage Profile



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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STARTING PROFILE

TRANSIENT IMMUNITY - PULSE 4

Test Report #: NC72116472 Test Area: 5

EUT Part #: ISO 16750 Rev A2 Date: May 25, 2016

ESN #: A EUT Power: 12 VDC Temperature: 24.2 °C

Test Method: ISO 16750-2: 2012, Section 4.6.3, Starting profile Air Pressure: 97.9 kPa

Customer: Linear Technology Corp Relative Humidity: 342.8 %

EUT Description: Surge Stopper IC's Page: 1 of 5

Notes: Channel 1 on scope capture is the pulse generator, channel 2 is the EUT

TEST VOLTAGE (VOLTS)	TEST LEVEL (VOLTS) US	TRANSIENT TIME - T8 (Sec)	TEST LEVEL (VOLTS) UA	TRANSIENT TIME - TF SEC	SOURCE Impedance (Ohms)	REPETITIONS	CRITERIA Met (Class)	COMPLIES YES	COMPLIES NO	REMARKS
										Lead Description - DC Input Power
13.5	-6.5	10	-6	0.005	0	10	A	✓		
										Tf=5
										Tr=100
										T6 =15
										T7 =50
										T8 =10

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David Schaefer (Signature)

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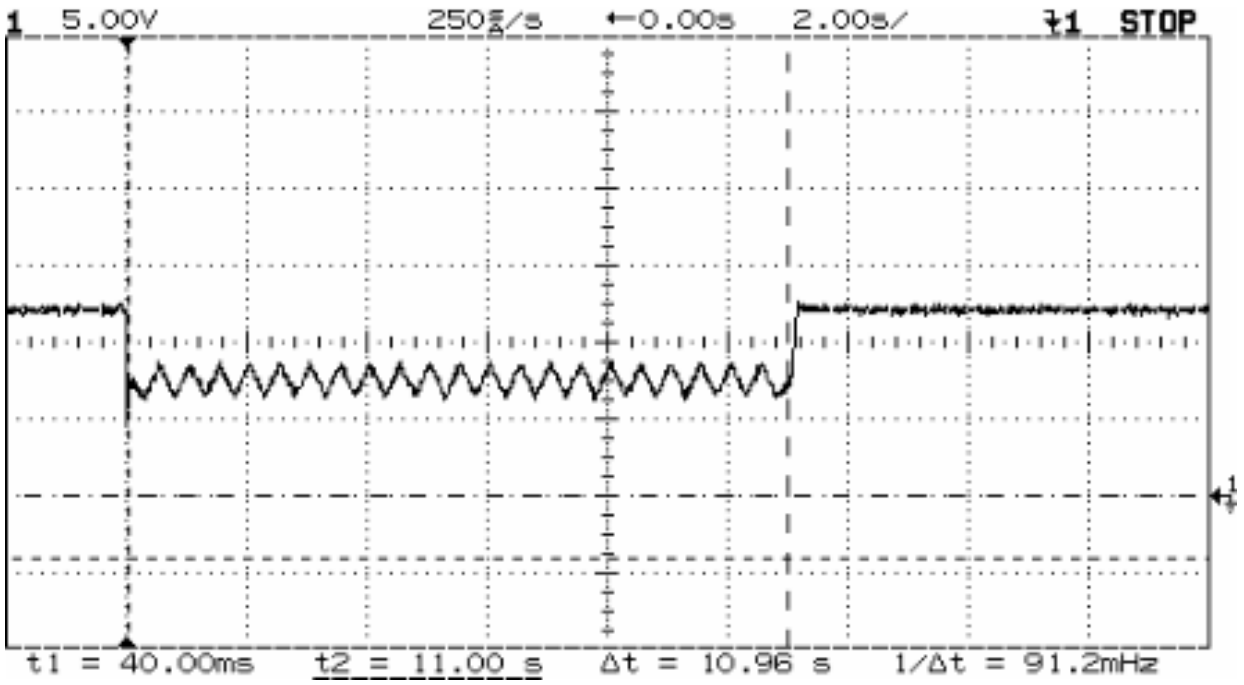
STARTING PROFILE

TRANSIENT IMMUNITY - PULSE 4

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 25, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.3, Starting profile			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	342.8 %
EUT Description:	Surge Stopper IC's			Page:	2 of 5
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 4 - Open Circuit (EUT disconnected) – 12v



Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

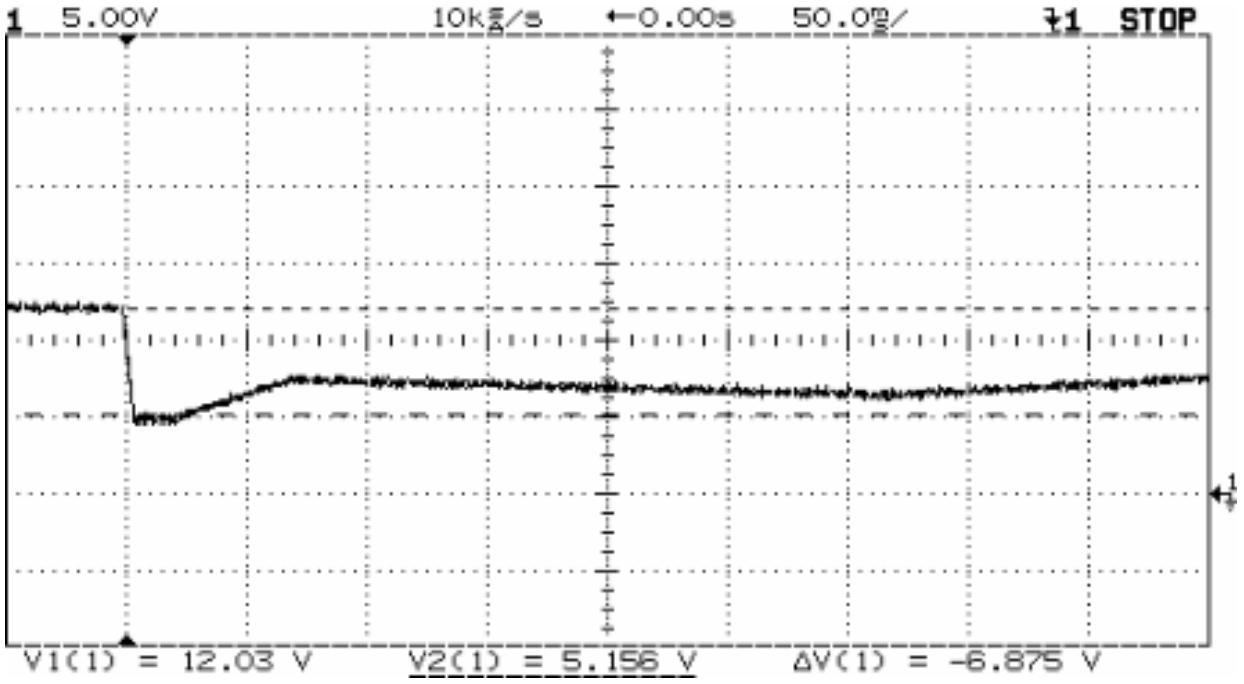
T:\L\Linear Technology Corp\Surge Stopper IC's\72116472\Rpt_Docs\IM\16472 [4.6.3] Stating profile_epl DTS [25 May retest].doc

STARTING PROFILE

TRANSIENT IMMUNITY - PULSE 4

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 25, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.3, Starting profile			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	342.8 %
EUT Description:	Surge Stopper IC's			Page:	3 of 5
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 4 - Open Circuit (EUT disconnected) – 12V



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Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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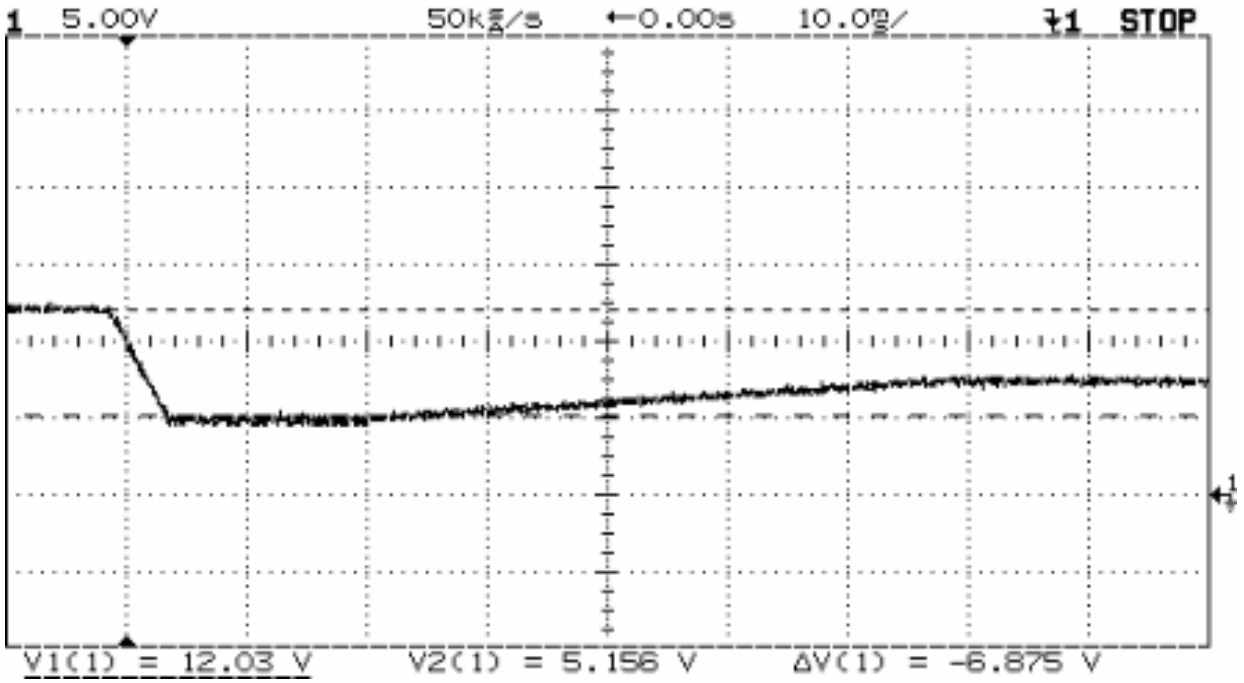
STARTING PROFILE

TRANSIENT IMMUNITY - PULSE 4

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 25, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.3, Starting profile			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	342.8 %
EUT Description:	Surge Stopper IC's			Page:	4 of 5
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 4 - Open Circuit (EUT disconnected) – 12V



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Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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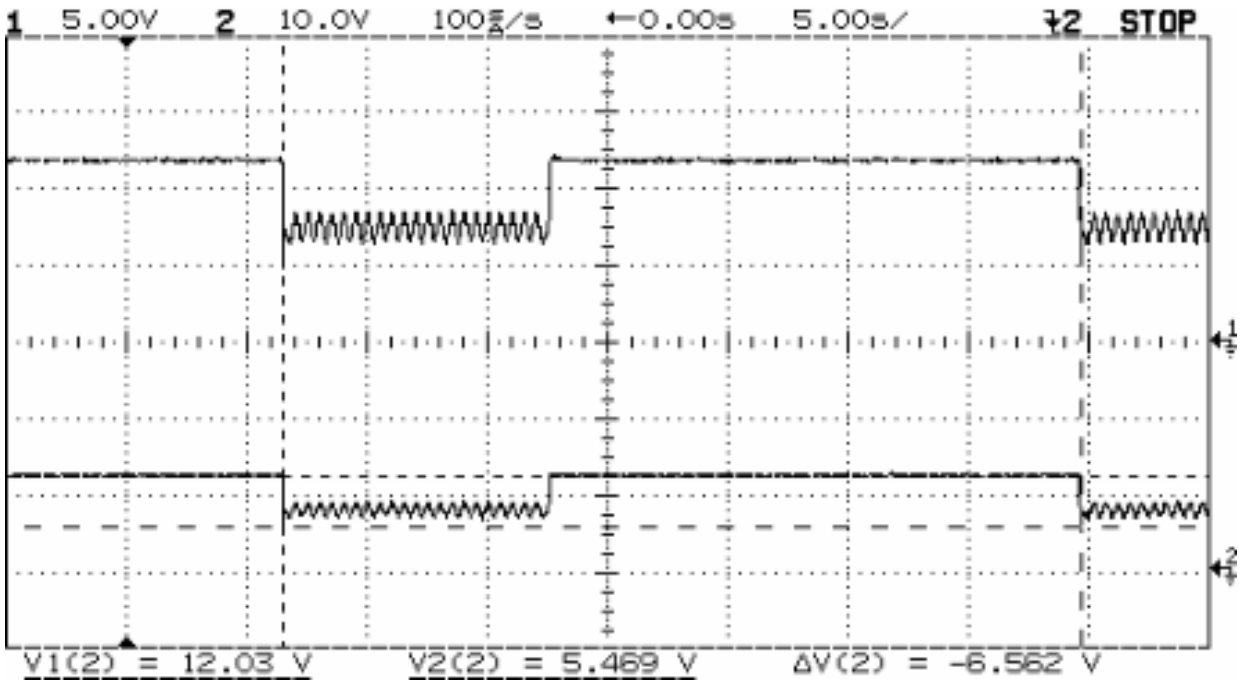
STARTING PROFILE

TRANSIENT IMMUNITY - PULSE 4

Test Report #:	NC72116472	Test Area:	5		
EUT Part #:	ISO 16750 Rev A2	Date:	May 25, 2016		
ESN #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.3, Starting profile			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	342.8 %
EUT Description:	Surge Stopper IC's			Page:	5 of 5
Notes:	Channel 1 on scope capture is the pulse generator, channel 2 is the EUT				

Pulse 4 - EUT Load – 12V



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Reviewed by: David T. Schaefer (Printed) _____ (Signature)

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Load Dump
Test A and Test B

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	August 10, 2016		
EUT Serial #:	B	EUT Power:	12 VDC	Temperature:	23.8 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.4, Load dump (including both Test A and Test B)			Air Pressure:	98.3 kPa
Customer:	Linear Technology Corp			Relative Humidity:	50.3 %
EUT Description:	Surge Stopper IC's			Page:	1 of 7
Notes:					

EST VOLTAGE (VOLTS)	TEST LEVEL (VOLTS)	SOURCE Impedance (Ohms)	REP RATE (Sec)	TRANSIENT DURATION (mSec)	REPETITIONS	COMPLIES YES	COMPLIES NO	REMARKS
								Lead Description - DC Input Power
								Test B – clipped at 35V
13.5	100	0.5	60	400	10	✓		Meets Class A.
								Test A – EUT recovery time: 5min
13.5	100	0.5	300	400	10	✓		EUT shuts off with each test pulse, returns
								To normal operation with no user intervention.
								Meets Class A.

Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T Schaefer (Printed) _____ (Signature)

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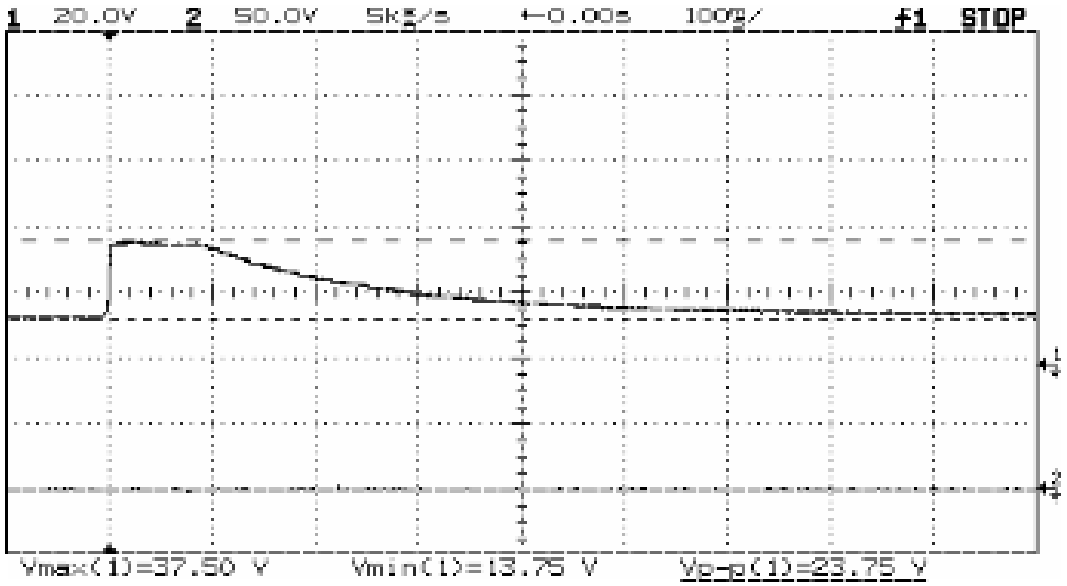
Load Dump
Test A and Test B

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	August 10, 2016		
EUT Serial #:	B	EUT Power:	12 VDC	Temperature:	23.8 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.4, Load dump (including both Test A and Test B)			Air Pressure:	98.3 kPa
Customer:	Linear Technology Corp			Relative Humidity:	50.3 %
EUT Description:	Surge Stopper IC's			Page:	2 of 7
Notes:					

Load Dump, Test B - Open Circuit



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T Schaefer (Printed) _____ (Signature)

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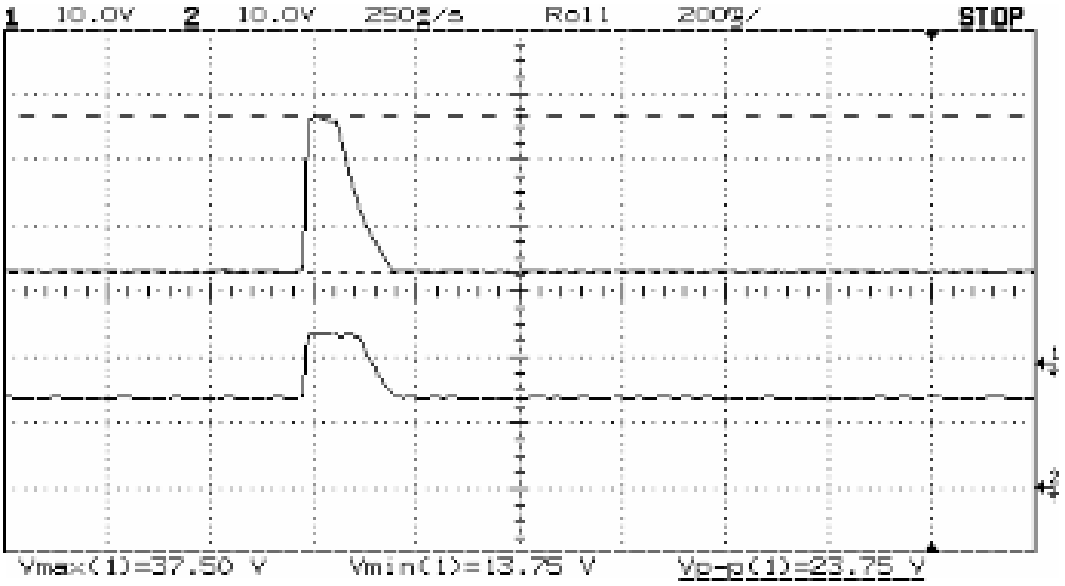
Load Dump
Test A and Test B

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	August 10, 2016		
EUT Serial #:	B	EUT Power:	12 VDC	Temperature:	23.8 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.4, Load dump (including both Test A and Test B)			Air Pressure:	98.3 kPa
Customer:	Linear Technology Corp			Relative Humidity:	50.3 %
EUT Description:	Surge Stopper IC's			Page:	3 of 7
Notes:					

Load Dump, Test B with EUT



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Reviewed by: David T Schaefer (Printed) _____ (Signature)

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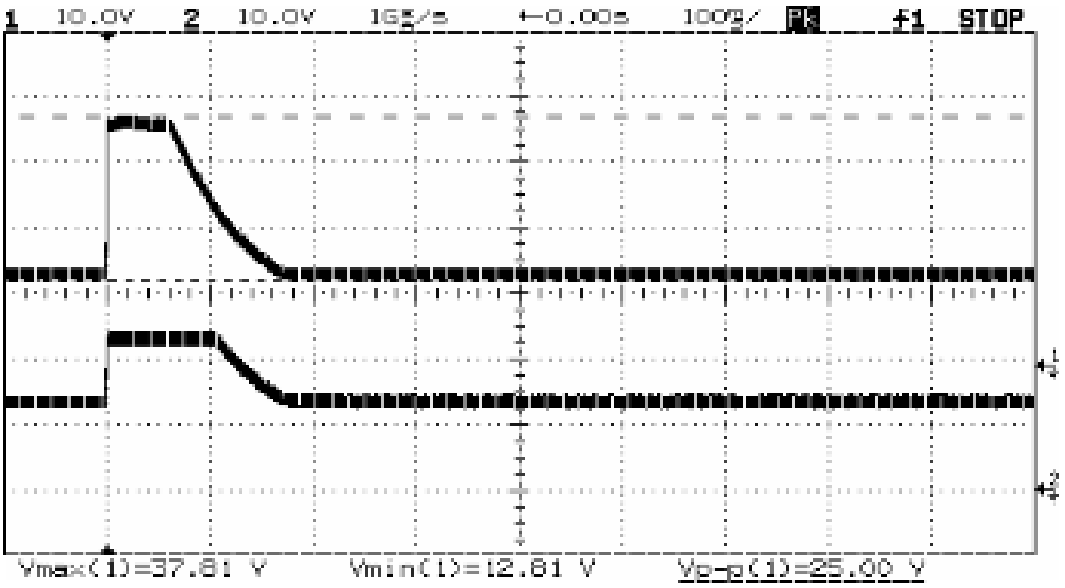
Load Dump
Test A and Test B

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	August 10, 2016		
EUT Serial #:	B	EUT Power:	12 VDC	Temperature:	23.8 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.4, Load dump (including both Test A and Test B)			Air Pressure:	98.3 kPa
Customer:	Linear Technology Corp			Relative Humidity:	50.3 %
EUT Description:	Surge Stopper IC's			Page:	4 of 7
Notes:					

Load Dump, Test B with EUT



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T Schaefer (Printed) _____ (Signature)

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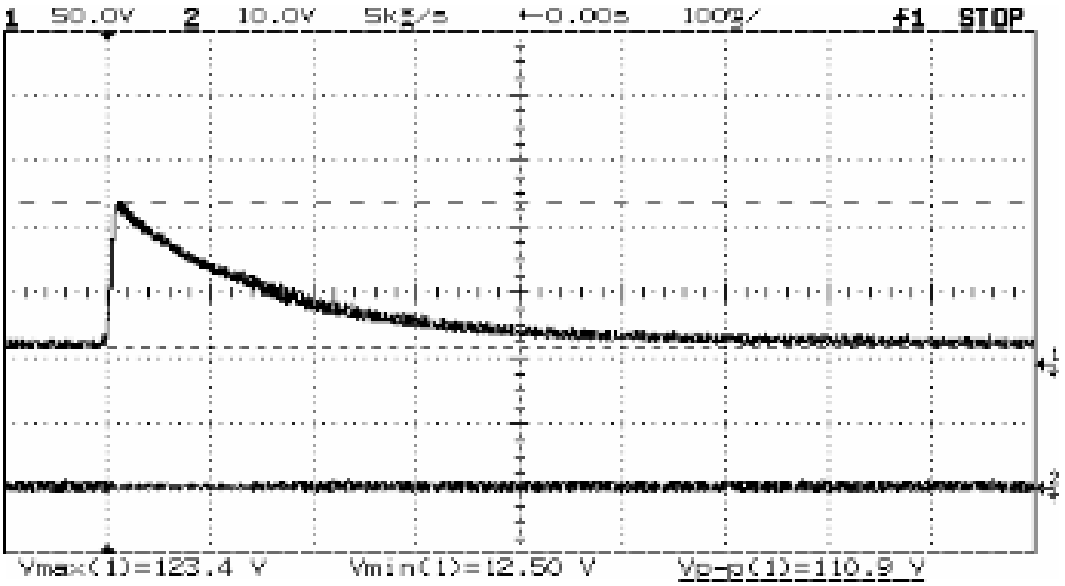
Load Dump
Test A and Test B

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	August 10, 2016		
EUT Serial #:	B	EUT Power:	12 VDC	Temperature:	23.8 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.4, Load dump (including both Test A and Test B)			Air Pressure:	98.3 kPa
Customer:	Linear Technology Corp			Relative Humidity:	50.3 %
EUT Description:	Surge Stopper IC's			Page:	5 of 7
Notes:					

Load Dump, Test A - Open Circuit



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T Schaefer (Printed) _____ (Signature)

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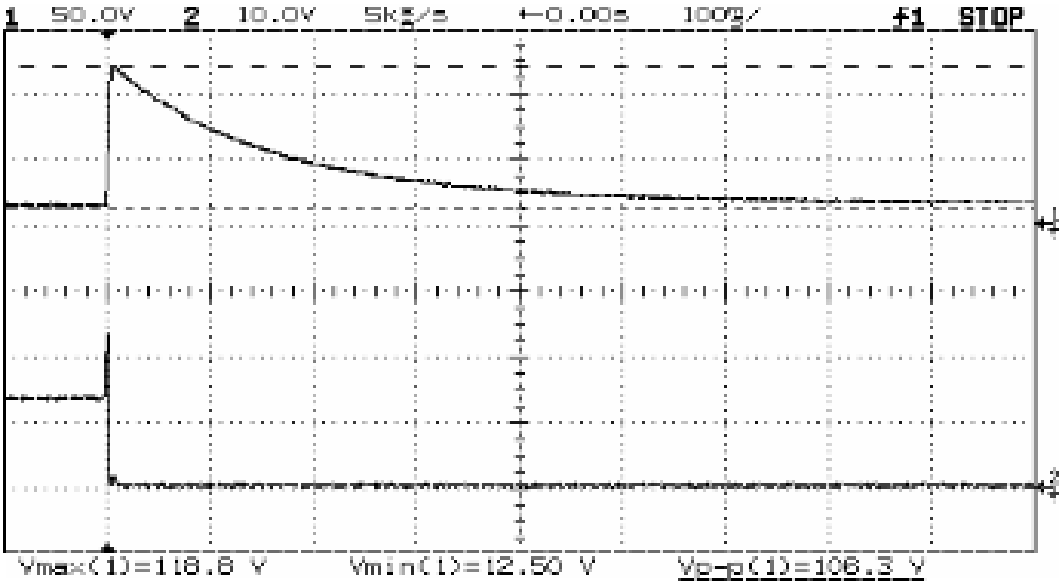
Load Dump
Test A and Test B

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	August 10, 2016		
EUT Serial #:	B	EUT Power:	12 VDC	Temperature:	23.8 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.4, Load dump (including both Test A and Test B)			Air Pressure:	98.3 kPa
Customer:	Linear Technology Corp			Relative Humidity:	50.3 %
EUT Description:	Surge Stopper IC's			Page:	6 of 7
Notes:					

Load Dump, Test A with EUT



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T Schaefer (Printed) _____ (Signature)

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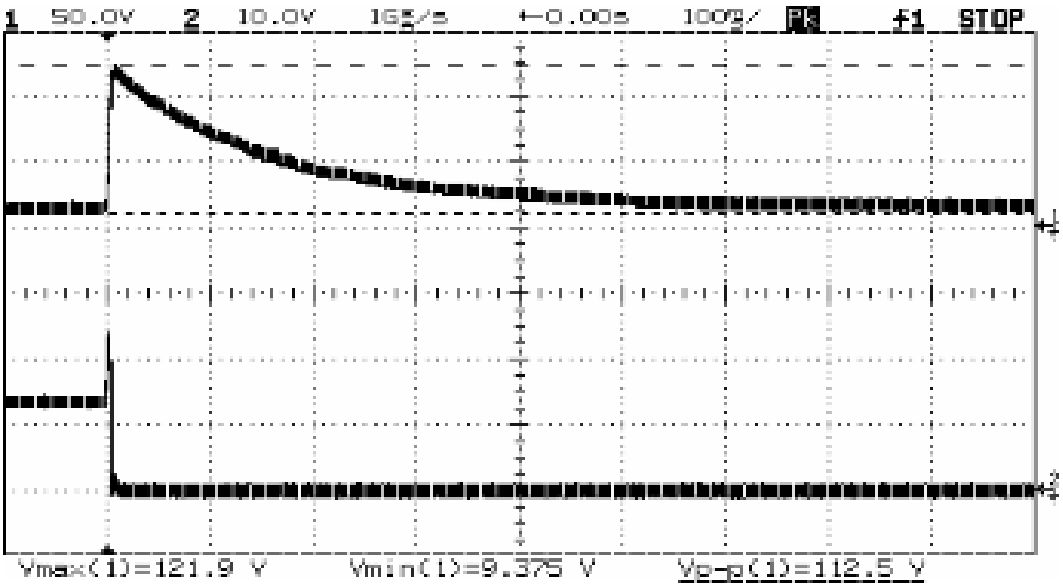
Load Dump
Test A and Test B

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	August 10, 2016		
EUT Serial #:	B	EUT Power:	12 VDC	Temperature:	23.8 °C
Test Method:	ISO 16750-2: 2012, Section 4.6.4, Load dump (including both Test A and Test B)			Air Pressure:	98.3 kPa
Customer:	Linear Technology Corp			Relative Humidity:	50.3 %
EUT Description:	Surge Stopper IC's			Page:	7 of 7
Notes:					

Load Dump, Test A with EUT



Tested by: Eugen Lifteniuc (Printed) _____ (Signature)

Reviewed by: David T Schaefer (Printed) _____ (Signature)

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REVERSED VOLTAGE

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 10, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 23.6 °C

Test Method: ISO 16750-2: 2012, Section 4.7.2.3, Reversed Voltage Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 37.5 %

EUT Description: Surge Stopper IC's Page: 1 of 1

Notes:

Test Level (V)	Duration (min)	Complies Yes	Complies No	Criteria Met	Remarks
-14	1	✓		A	- EUT functional after test

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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OPEN CIRCUIT TESTS

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 10, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 23.6 °C

Test Method: ISO 16750-2: 2012, Section 4.9, Open Circuit Tests Air Pressure: 97.8 kPa

Customer: Linear Technology Corp Relative Humidity: 37.5 %

EUT Description: Surge Stopper IC's Page: 1 of 4

Notes:

Test Level (V)	Line Interrupted	Duration (s)	Complies		Criteria Met	Remarks
			Yes	No		
13.5	Output high	10	✓		A	
13.5	Output return	10	✓		A	
13.5	Both	10	✓		A	Disconnect Output high and Output return simultaneously.

Tested by: Eugen Lifteniuc (Printed) Signature

Reviewed by: David T. Schaefer (Printed) Signature

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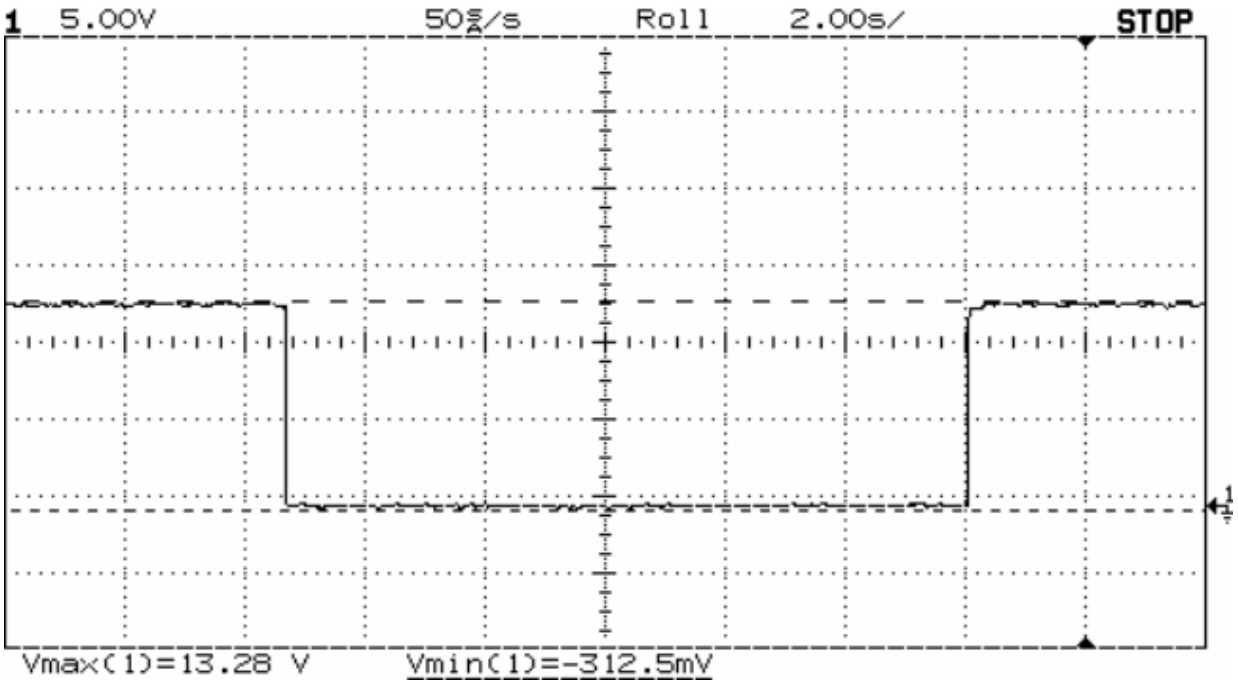
OPEN CIRCUIT TESTS

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 10, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	23.6 °C
Test Method:	ISO 16750-2: 2012, Section 4.9, Open Circuit Tests			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	37.5 %
EUT Description:	Surge Stopper IC's			Page:	2 of 4
Notes:					

Output High



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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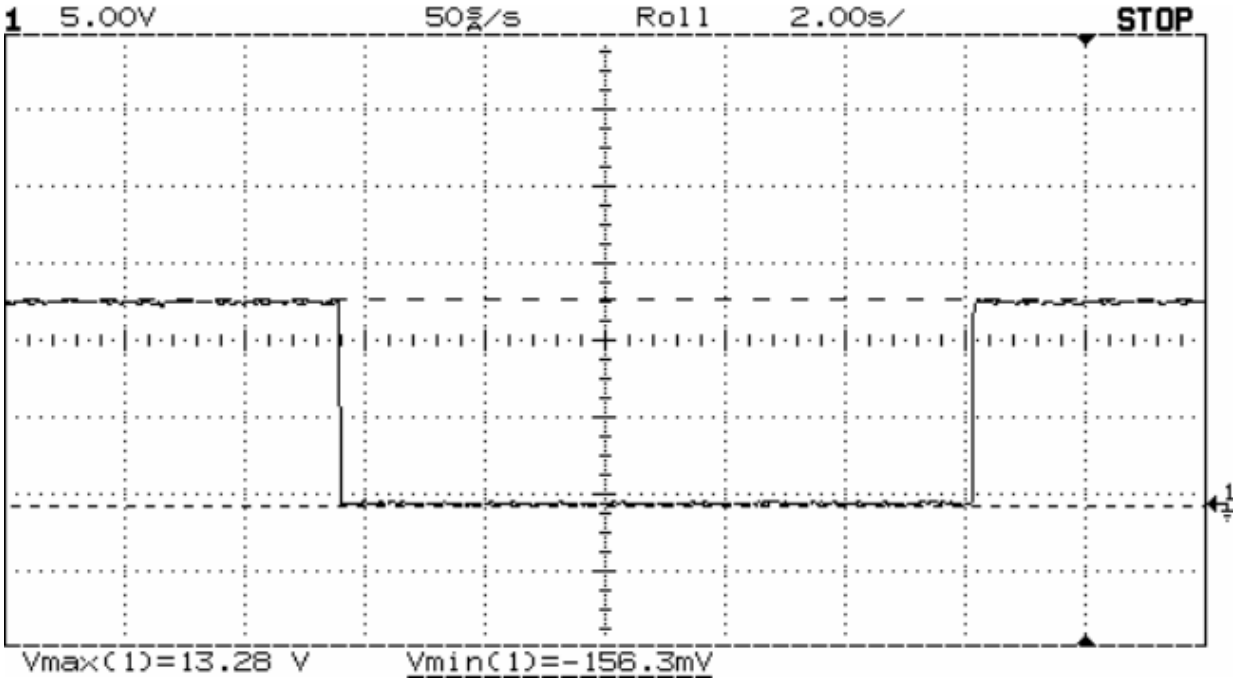
OPEN CIRCUIT TESTS

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 10, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	23.6 °C
Test Method:	ISO 16750-2: 2012, Section 4.9, Open Circuit Tests			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	37.5 %
EUT Description:	Surge Stopper IC's			Page:	3 of 4
Notes:					

Output Return



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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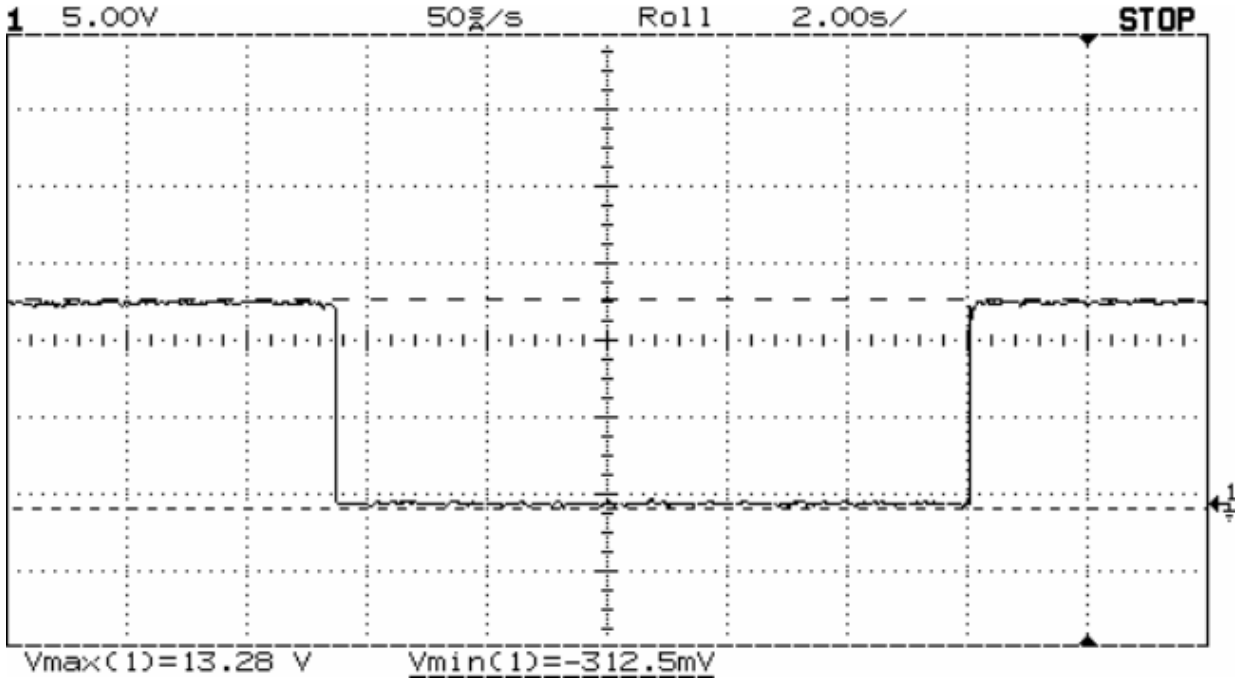
OPEN CIRCUIT TESTS

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 10, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	23.6 °C
Test Method:	ISO 16750-2: 2012, Section 4.9, Open Circuit Tests			Air Pressure:	97.8 kPa
Customer:	Linear Technology Corp			Relative Humidity:	37.5 %
EUT Description:	Surge Stopper IC's			Page:	4 of 4
Notes:					

Output High & Output Return



Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David T. Schaefer (Signature)

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SHORT CIRCUIT PROTECTION

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 11, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 22.6 °C

Test Method: ISO 16750-2: 2012, Section 4.10.2, Short Circuit Protection - Signal Circuits Air Pressure: 98.3 kPa

Customer: Linear Technology Corp Relative Humidity: 41.2 %

EUT Description: Surge Stopper IC's Page: 1 of 1

Notes:

LINE TESTED	LINE SHORTED TO	DURATION (s)	COMPLIES YES	COMPLIES NO	CRITERIA MET	REMARKS
						EUT unpowered
DC power input	16 VDC	60	✓		A	EUT functional after test (4min 30sec recovery time)
DC power input	GND	60	✓		A	
						EUT powered: 13.5V
DC power input	16 VDC	60	✓		A	EUT functional during and after test
DC power input	GND	60	✓		A	EUT output dropped to zero. Recovered 5 min after test
						designed

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David Schaefer (Signature)

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SHORT CIRCUIT PROTECTION

Test Report #: NC72116472 Test Area: 5

EUT Model #: ISO 16750 Rev A2 Date: May 25, 2016

EUT Serial #: A EUT Power: 12 VDC Temperature: 24.2 °C

Test Method: ISO 16750-2: 2012, Section 4.10.2, Short Circuit Protection - Signal Circuits Air Pressure: 97.9 kPa

Customer: Linear Technology Corp Relative Humidity: 42.8 %

EUT Description: Surge Stopper IC's Page: 1 of 2

Notes:

LINE TESTED	LINE SHORTED TO	DURATION (s)	COMPLIES YES	COMPLIES NO	CRITERIA MET	REMARKS
						EUT unpowered
Output High	16 VDC	60	✓		A	EUT functional after test (4min 30sec recovery time)
Output High	GND	60	✓		A	
						EUT powered: 13.5V
Output High	16 VDC	60	✓		A	EUT functional during and after test
Output High	GND	60	✓		A	EUT output dropped to zero. Recovered 5 min after test
						as designed

Tested by: Eugen Lifteniuc (Printed) Eugen L (Signature)

Reviewed by: David T. Schaefer (Printed) David Schaefer (Signature)

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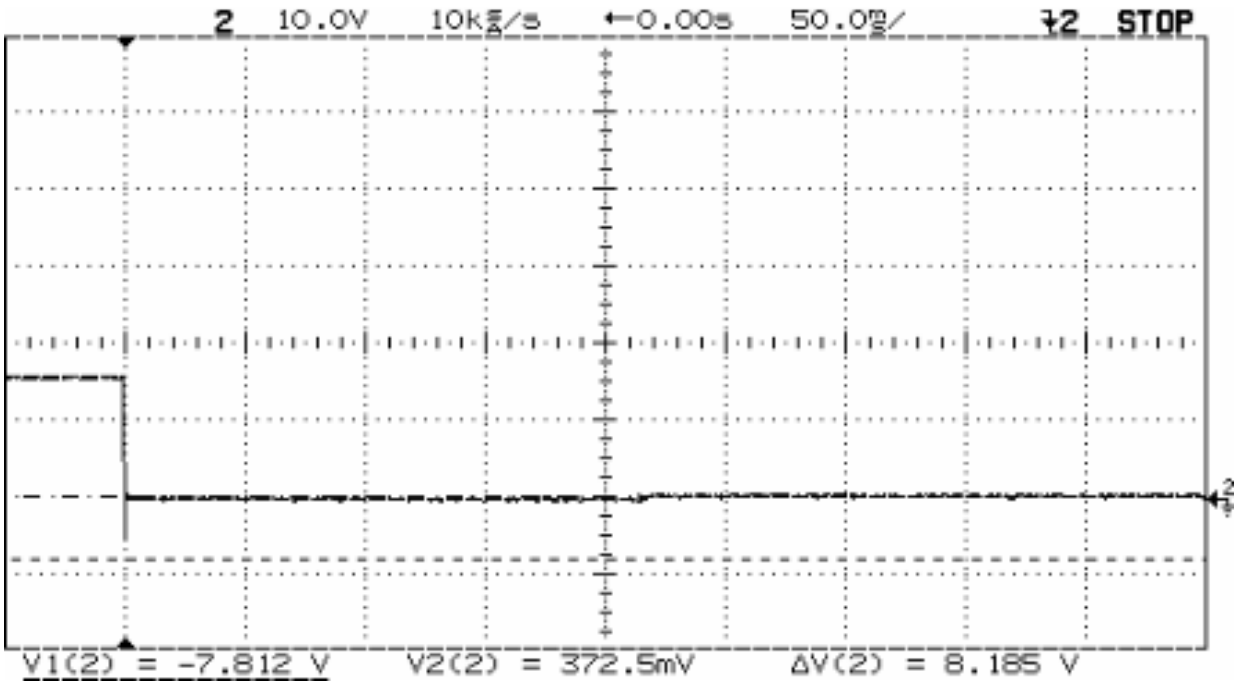
SHORT CIRCUIT PROTECTION

Test Report #:	NC72116472	Test Area:	5		
EUT Model #:	ISO 16750 Rev A2	Date:	May 25, 2016		
EUT Serial #:	A	EUT Power:	12 VDC	Temperature:	24.2 °C
Test Method:	ISO 16750-2: 2012, Section 4.10.2, Short Circuit Protection - Signal Circuits			Air Pressure:	97.9 kPa
Customer:	Linear Technology Corp			Relative Humidity:	42.8 %
EUT Description:	Surge Stopper IC's			Page:	2 of 2

Notes:



Tested by: Eugen Lifteniuc (Printed) — Signature

Reviewed by: David T. Schaefer (Printed) — Signature

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Appendix B

EMC Test Plan and Constructional Data Form

None Provided