Power over Ethernet Consortium
Clause 33 PD Conformance Test Suite v 1.5 Report

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Linear Technology   Report Rev. 1.0
1630 McCarthy Blvd
Milpitas, CA 95035

Enclosed are the results from the Clause 33 PD Conformance testing performed on:

Device Under Test (DUT):	Linear Technology LTC4267EDHC
Hardware Version:	Not Available
Firmware Version:	Not Available
Software Version:	Not Available
DUT PD Chip:	Linear LTC4267
DUT Magnetics:	Pulsejack JK0-0044
Miscellaneous:	Demo Circuit 804A

The test suite referenced in this report is available at the UNH-IOL website:

ftp://ftp.iol.unh.edu/pub/ethernet/test_suites/CL33_PD/PD_Test_Suite_v1.5.pdf

No issues were uncovered during Clause 33 PD conformance testing.

Testing Completed 09/12/2005   Review Completed 09/27/2005

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Result Key

The following table contains possible results and their meanings:

Result	Interpretation
PASS	The Device Under Test (DUT) was observed to exhibit conformant behavior.
PASS with Comments	The DUT was observed to exhibit conformant behavior however an additional explanation of the situation is included, such as due to time limitations only a portion of the testing was performed.
FAIL	The DUT was observed to exhibit non-conformant behavior.
Warning	The DUT was observed to exhibit behavior that is not recommended.
Informative	Results are for informative purposes only and are not judged on a pass of fail basis.
Refer to Comments	From the observations, a valid pass or fail could not be determined. An additional explanation of the situation is included.
Not Applicable	The DUT does not support the technology required to perform these tests.
Not Available	Due to testing station or time limitations, the tests could not be performed.
Borderline	The observed values of the specified parameters are valid at one extreme, and invalid at the other.
Not Tested	Not tested due to the time constraints of the test period.

Test Setup

Testing Equipment	
Testing Software	UNH-IOL PDGUI_v2.2
Real-time DSO	TEKTRONIX, TDS 3014
Current Probe and Amplifier	TEKTRONIX, TPS305 and TPSA300
Digital Multimeter	HEWLETT-PACKARD, 34401A
Digital Power Supply	AGILENT TECHNOLOGIES, E3641A

Testing Configuration A
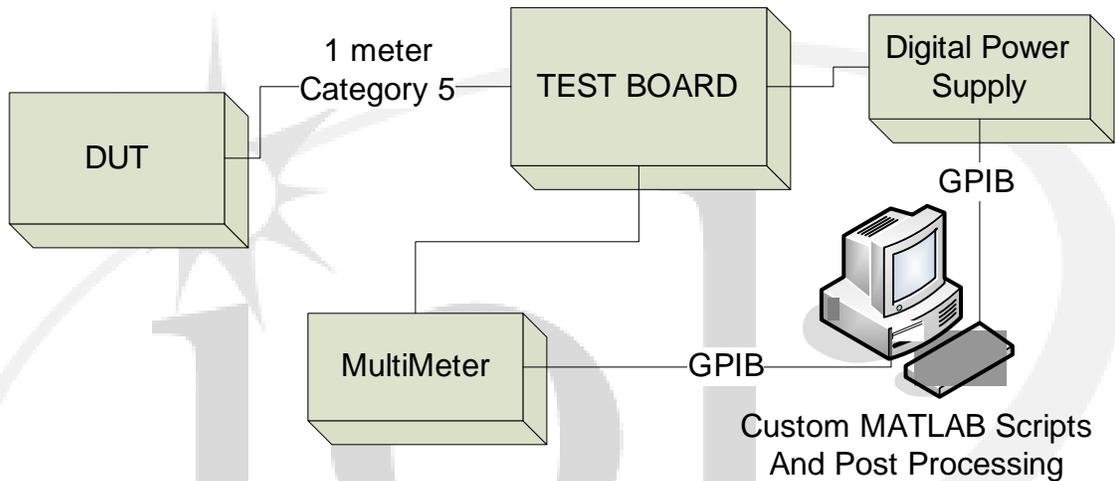
Testing Configuration B
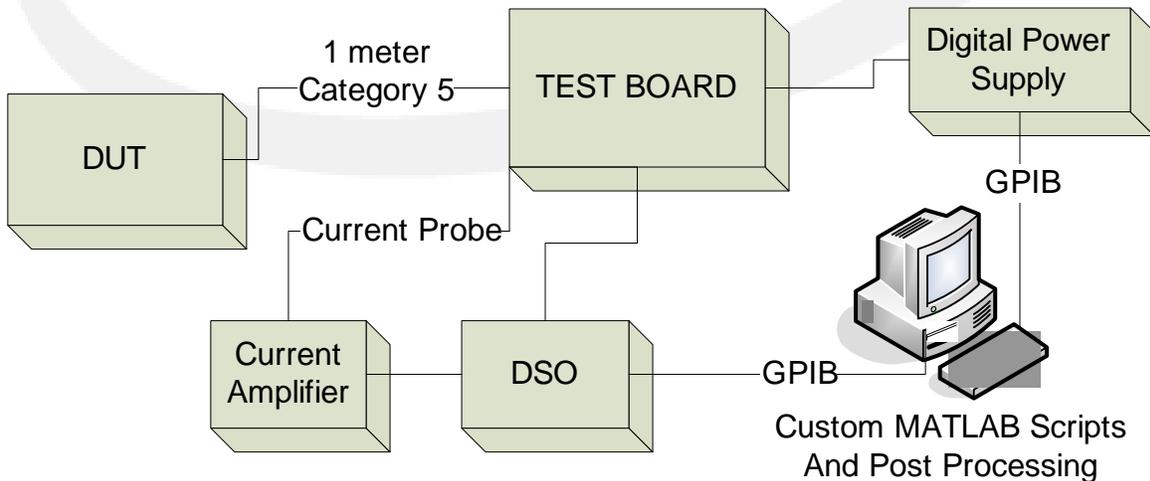
GROUP 1: PARAMETRIC TESTING

Test # and Label	Part(s)	Result(s)
33.1.1 – PD Source Power	**a**	**PASS**
Expected Results and Procedural Comments		

Using Testing Configuration A, verify that the DUT does not source power on its PI for either mode A and B.

a.   The DUT should not source power on its PI at any time.

Comments on Test Results

a.   The DUT was observed to not source power on either of its two sets of PI conductors.

Test # and Label	Part(s)	Result(s)
33.1.2 – PD Pinout	**a**	**PASS**
Expected Results and Procedural Comments		

Using Testing Configuration A, verify that the DUT is insensitive to the polarity of the power supply and is able to operate in either Mode A or Mode B.

a.   In all cases the DUT should accept the applied power and become operational once the requested power has been supplied.

Comments on Test Results

a.   The DUT became operational when power was applied to Mode A (MDI and MDI-X), or Mode B (MDI and MDI-X).

Test # and Label	Part(s)	Result(s)
33.1.3 Valid PD Detection Signature	**a**	**PASS**
	b	**PASS**

Expected Results and Procedural Comments

Purpose: To verify that the DUT presents a valid detection signature while it is requesting power on the PI.

a. The observed signature resistance should between 23.75 and 26.25 kΩ (inclusive).
b. The DUT should have either a voltage offset less than or equal to 1.9 V, or a current offset less than or equal to 10 µA.

Comments on Test Results

Part a.	Mode A	Mode B	Units
V-I Slope Minimum	24.676	24.628	KΩ
V-I Slope Average	25.063	25.050	KΩ
V-I Slope Maximum	25.781	25.761	KΩ
Part b.			
Voltage Offset	1.013	1.029	V
Current Offset	Not Applicable	Not Applicable	µA

NOTE: Failures indicated in red, enclosed by parenthesis

Test # and Label	Part(s)	Result(s)
33.1.4 – Non Valid PD Detection Signature	**a**	**PASS**

Expected Results and Procedural Comments

Purpose: To verify that the DUT presents a non-valid detection signature while it is not requesting power, or once powered, at the PI of the non-powered pairs.

a. The PD should have a non-valid input resistance less than 12 kΩ or greater than 45 kΩ..

Comments on Test Results

Part a.	Mode A	Mode B	Units
V-I Slope Minimum	6134.2	5088.2	KΩ
V-I Slope Average	37095.8	61304.7	KΩ

NOTE: Failures indicated in red, enclosed by parenthesis

Test # and Label	Part(s)	Result(s)
33.1.5 – PD Classification Signature	a	PASS

Expected Results and Procedural Comments

Using Testing Configuration A, verify that the DUT provides proper classification signature current draw.

a.   The current drawn by the DUT should fall within the range (inclusive) specified for each supported class.

Comments on Test Results

Part a.		Mode A	Mode B	Units
Class 0	Avg. Signature Current	0.460	0.461	mA
Class 1	Avg. Signature Current	10.419	10.417	mA
Class 2	Avg. Signature Current	18.514	18.505	mA
Class 3	Avg. Signature Current	27.647	27.644	mA
Class 4	Avg. Signature Current	40.581	40.576	mA

NOTE: Failures indicated in red, enclosed by parenthesis

Test # and Label	Part(s)	Result(s)
33.1.6 – Input Average Power	a	PASS

Expected Results and Procedural Comments

Using Testing Configuration B, verify that the DUT provides proper information about its maximum power requirements, and that those requirements fall within the acceptable range.

a.   The power drawn by the DUT should fall within the range (inclusive) specified for each supported class.

Comments on Test Results

Part a.		Mode A	Mode B	Units
Class 0	Power Draw at 44 V	0.235	0.238	W
	Power Draw at 57 V	0.305	0.309	W
Class 1	Power Draw at 44 V	0.241	0.239	W
	Power Draw at 57 V	0.311	0.310	W
Class 2	Power Draw at 44 V	0.240	0.240	W
	Power Draw at 57 V	0.300	0.310	W
Class 3	Power Draw at 44 V	0.232	0.240	W
	Power Draw at 57 V	0.285	0.311	W
Class 4	Power Draw at 44 V	0.241	0.241	W
	Power Draw at 57 V	0.313	0.311	W

NOTE: Failures indicated in red, enclosed by parenthesis

Test # and Label	Part(s)	Result(s)
33.1.7 – Backfeed Voltage	a	PASS

Expected Results and Procedural Comments

Using Testing Configuration A, verify that when the DUT is powered, the voltage on the opposite mode, across a 100kΩ resistor is less than V_{bfd}, or 2.8V.

a.   The voltage across the 100kΩ should be less than 2.8V

Comments on Test Results

a.   The voltage across the 100kΩ resistor was observed to be 0.0 V.

Test # and Label	Part(s)	Result(s)
33.1.8 – PD Power Supply Turn On / Off	a	PASS
	b	PASS
	c	PASS

Expected Results and Procedural Comments

Using Testing Configuration A, verify that the DUT will turn on its power supply once power has been applied to the PI, will remain on over the entire port voltage range, and turn off its power supply once power is removed.

a.   The DUT should turn on its power supply at a port voltage less than 42 V.
b.   Once turned on, the DUTs power supply should remain on for port voltages over the range of 44 V to 57V.
c.   The DUT should turn off its power supply at a port voltage greater than 30V and less than 36 V.

Comments on Test Results

a.   Mode A - The DUTs power supply was observed to properly turn on at a port voltage less than 42 V.
     Mode B - The DUTs power supply was observed to properly turn on at a port voltage less than 42 V.
b.   The DUT remained operational throughout the entire range of port voltages.
c.   Mode A - The DUTs power supply was observed to turn off at a port voltage of 31 V.
     Mode B - The DUTs power supply was observed to turn off at a port voltage of 31 V.

Annex A: Figures

Attached are plots of the data taken for signature resistance and classification current draws. These data points were obtained using digital multimeter and a digital power supply. The data was downloaded and post processed using custom Matlab scripts.

Figure 1: Mode A Detection Signature Characteristics
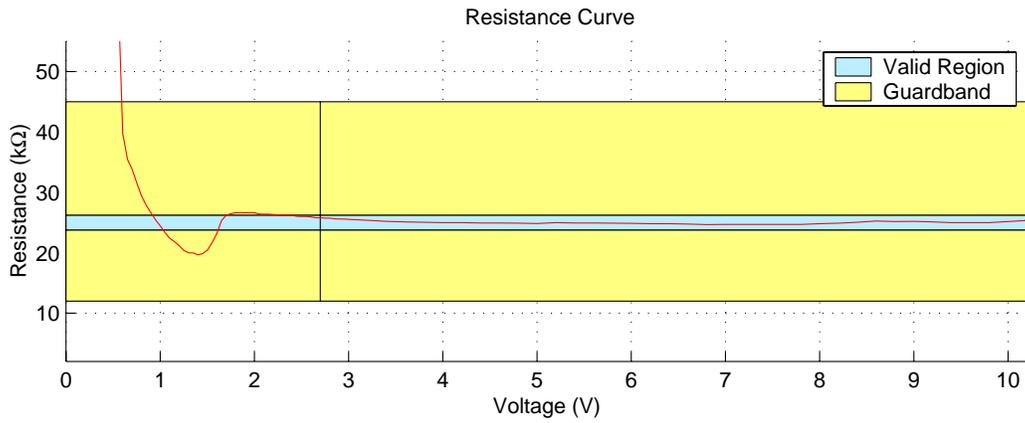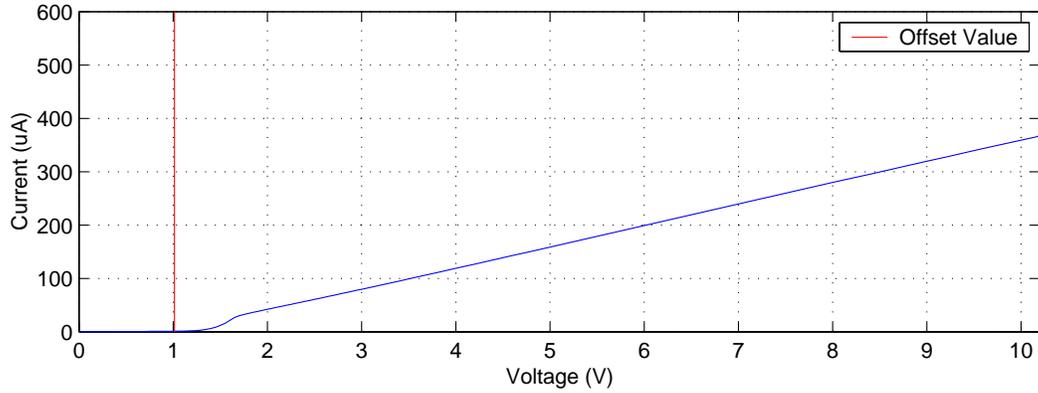
Figure 2: Mode B Detection Signature Characteristics
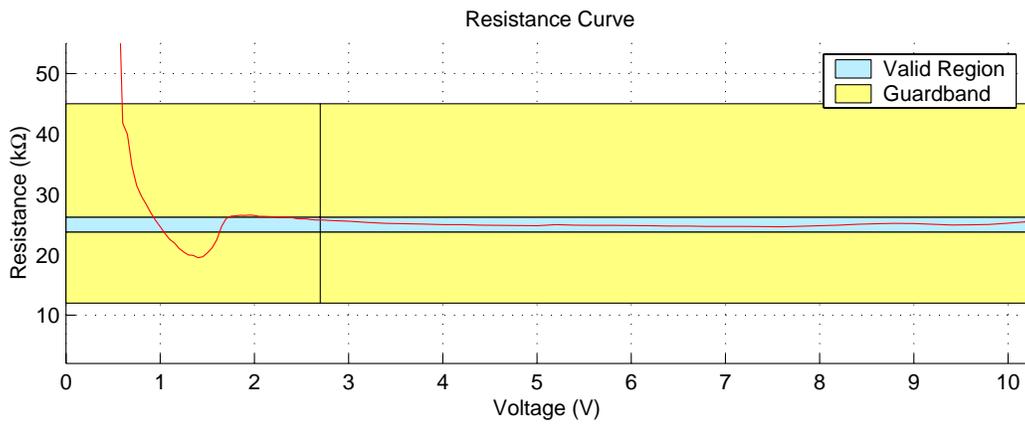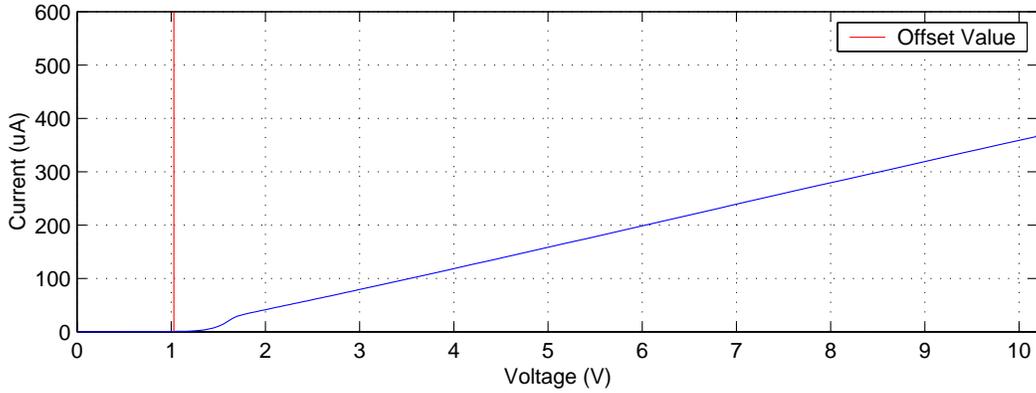
Figure 3: Mode A Classification Signature Characteristics – Class 0
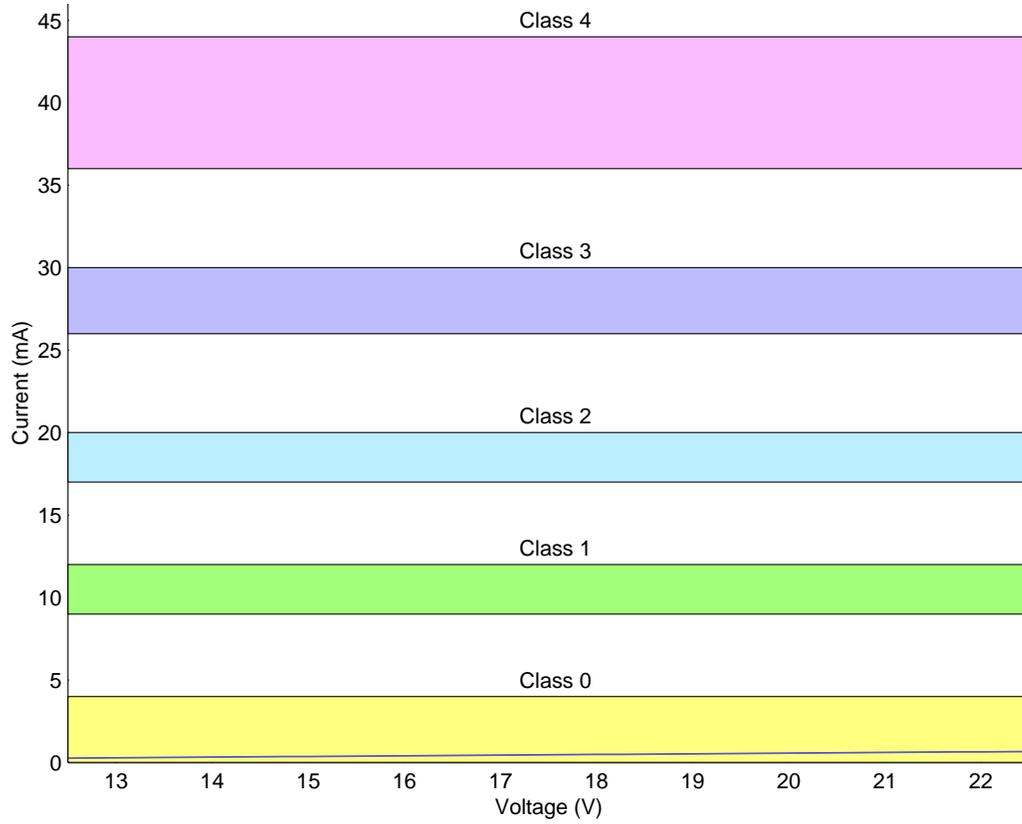
Figure 4: Mode A Classification Signature Characteristics – Class 1
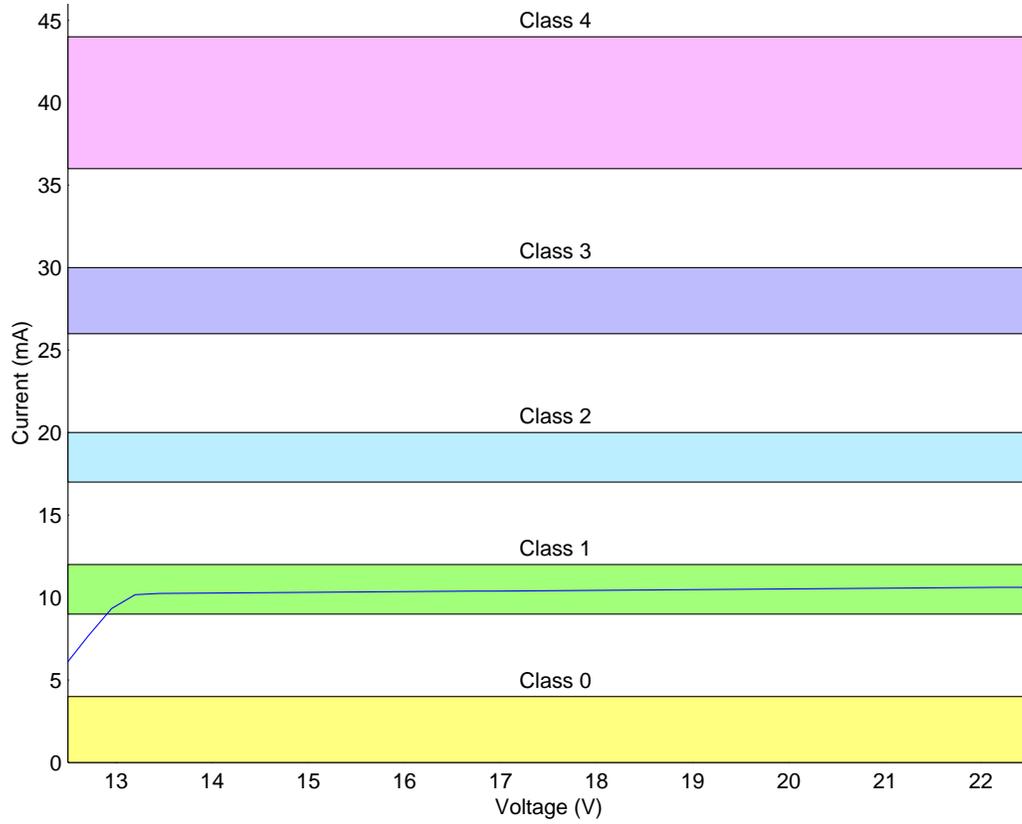
Figure 5: Mode A Classification Signature Characteristics – Class 2
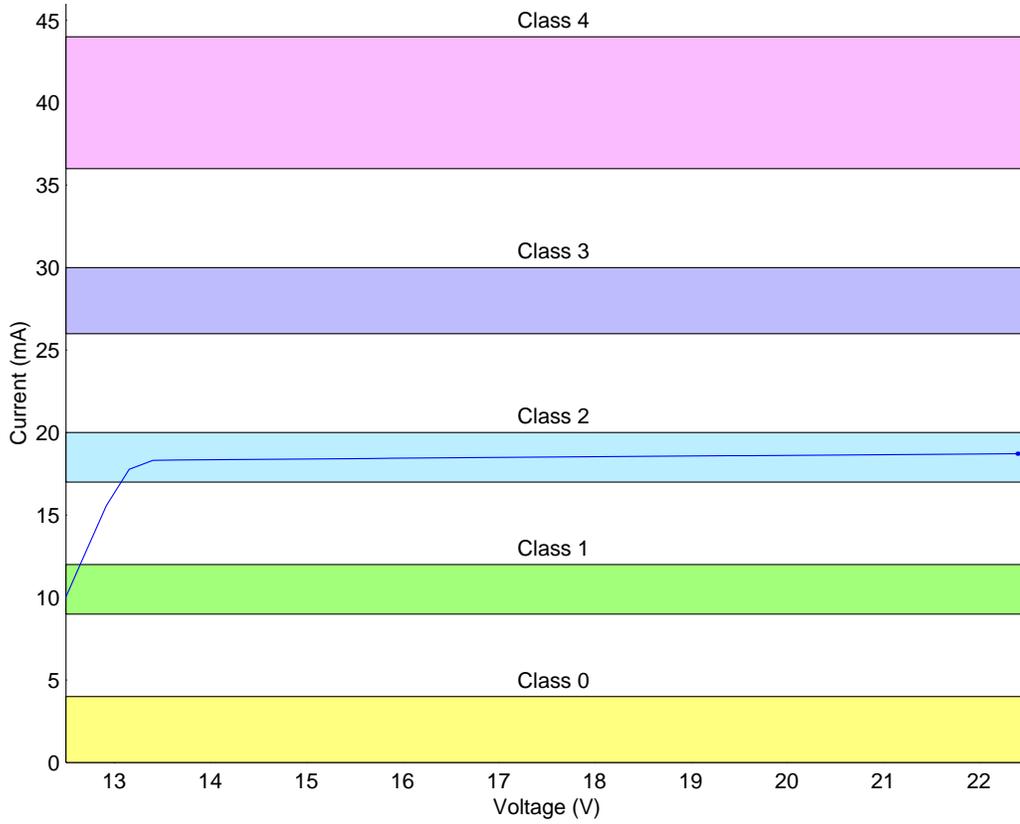
Figure 6: Mode A Classification Signature Characteristics – Class 3
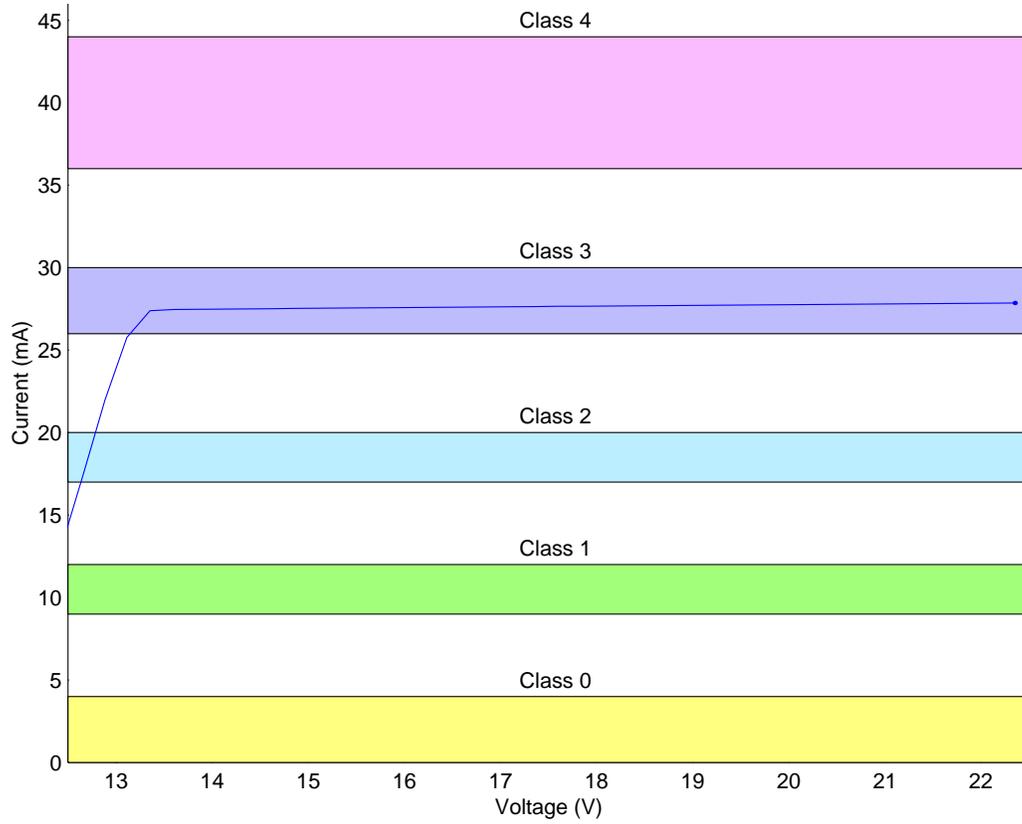
Figure 7: Mode A Classification Signature Characteristics – Class 4
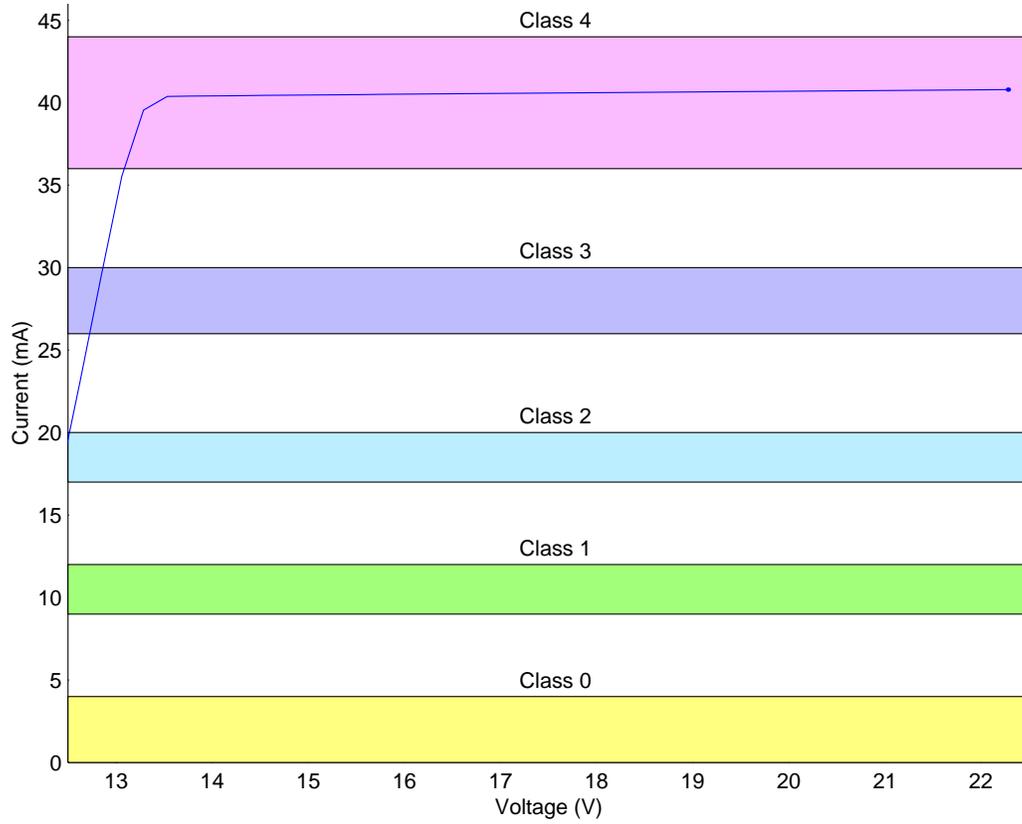
Figure 8: Mode B Classification Signature Characteristics – Class 0
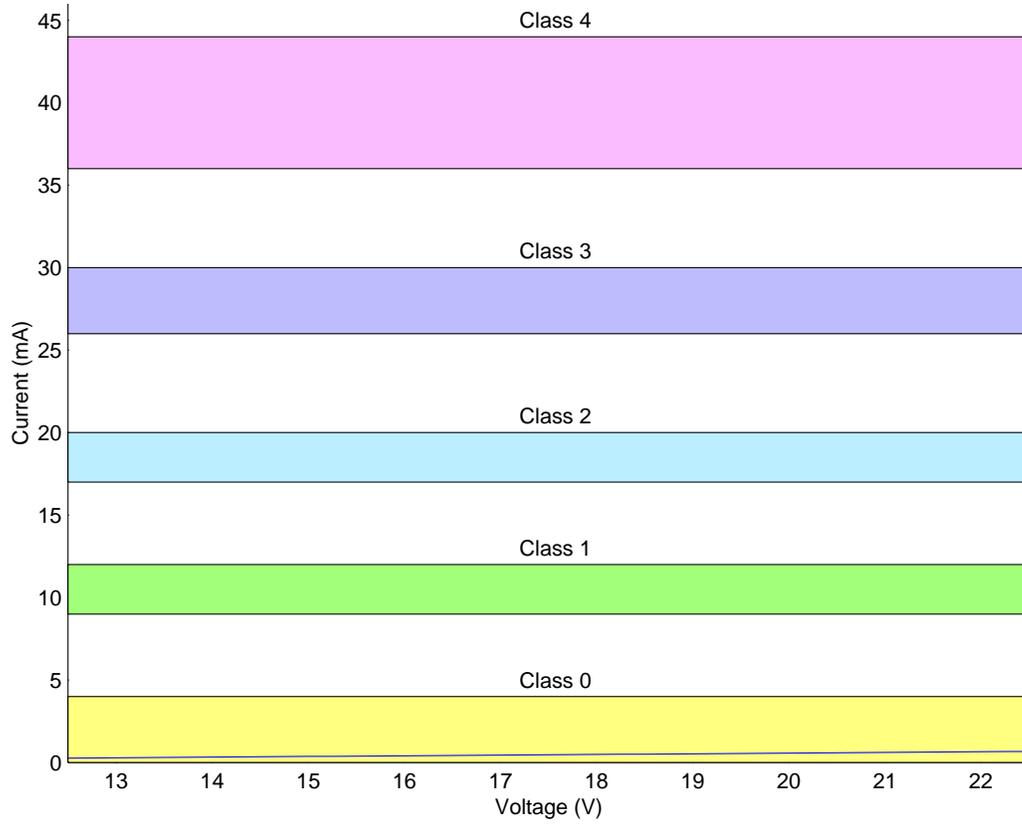
Figure 9: Mode B Classification Signature Characteristics – Class 1
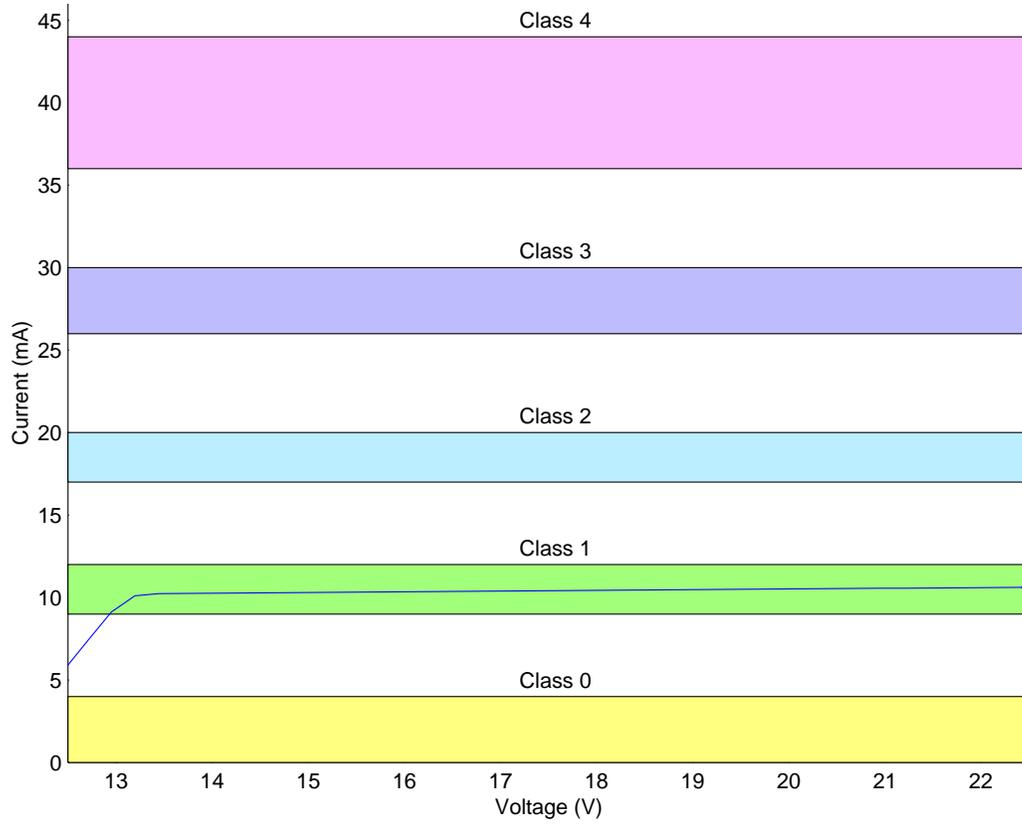
Figure 10: Mode B Classification Signature Characteristics – Class 2
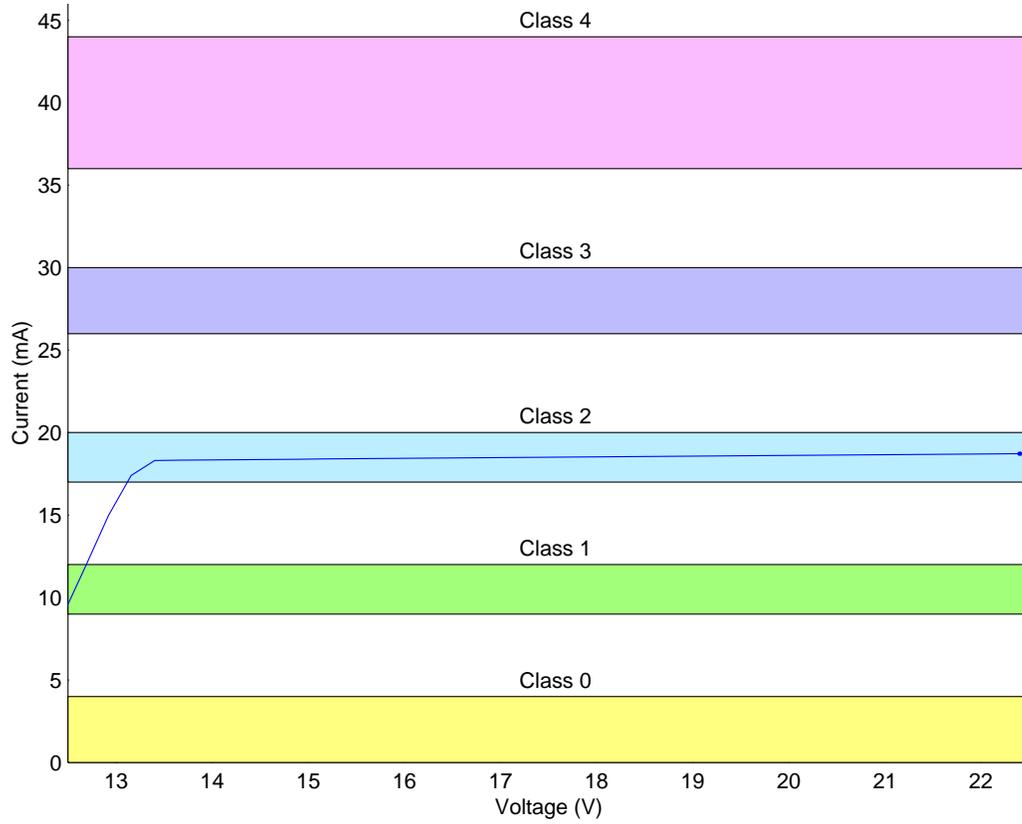
Figure 11: Mode B Classification Signature Characteristics – Class 3
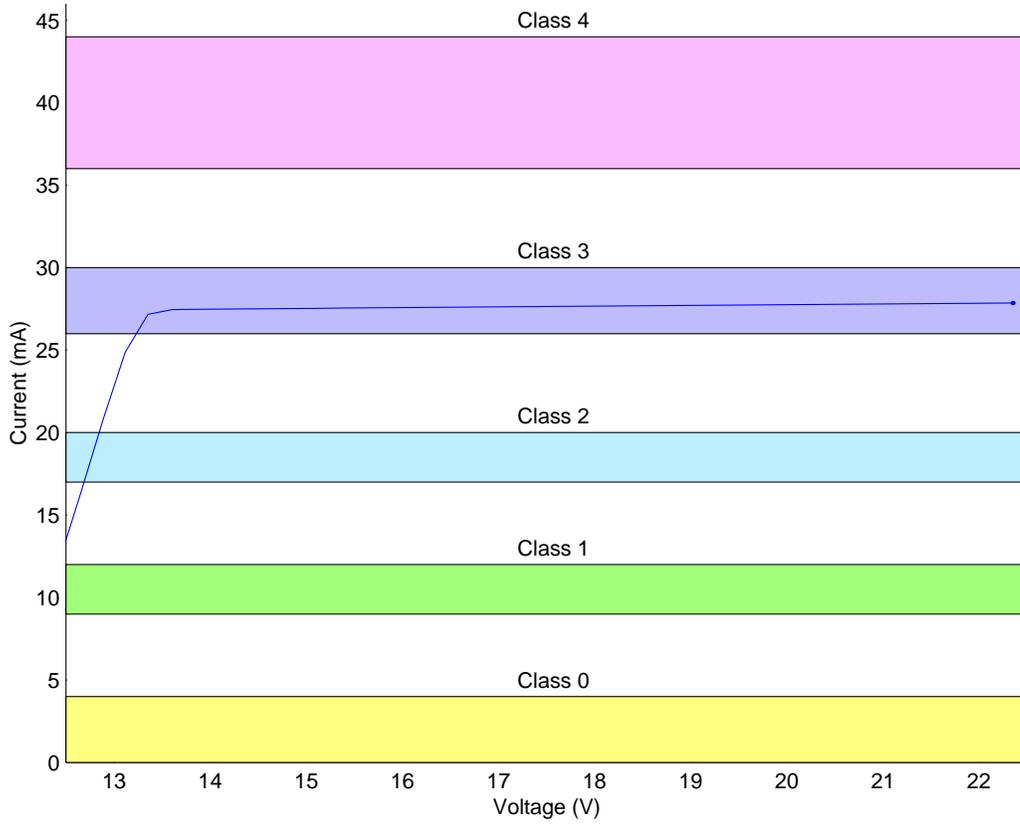
Figure 12: Mode B Classification Signature Characteristics – Class 4