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☐ Semtech Plano, 1101 Resource Drive, Suite 121, Plano TX 75074

Change Details

Part Number(s) Affected:

µClamp3321ZATFT

Part Number(s) Affected: ☒ N/A

Description, Purpose and Effect of Change:

For the benefit of our customers, Semtech has qualified additional manufacturing capacity for Protection Products. A second assembly facility has been brought on line that duplicates our current wafer and assembly manufacturing processes.

a. Additional Assembly and Test Capacity – Huatian Electronics Co, Ltd, China

Reference POR: Assembly: SCI[USA]; Test: Diodes[Shanghai]

Change Classification	☒ Major ☐ Minor	Impact to Form, Fit, Function	☐ Yes ☒ No
Impact to Data Sheet	☐ Yes ☒ No	New Revision or Date	☒ N/A

Impact to Performance, Characteristics or Reliability:

- NO impact to data sheet content or package dimensions
- NO impact to performance, characteristics; or reliability

Implementation Date	10JAN2019	Work Week	Predicated upon receipt of customer approval
Last Time Ship (LTS) Of unchanged product	N/A Additional Capacity	Affecting Lot No. / Serial No. (SN)	N/A
Sample Availability	Immediate	Reliability Report Availability	Attached

Supporting Documents for Change Validation/Attachments:

- a. Rel Report: - 6278_ **UClamp3321ZA** _RClamp5011ZA_ RClamp3331ZA_ RClamp0521Z_final
b. Char Report: **uClamp3321ZA** RJ6247 2 AER-3571_ Validation R1

Issuing Authority

Semtech Business Unit:	Protection	
Semtech Contact Info:	Les Fang Yuen Sr.Engineering Manager, QA Semtech Corporation 200 Flynn Road Camarillo, CA 93012 lfangyuen@semtech.com Office: (949) 269 4443 Fax: (805) 498-3804	

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NEW ASSEMBLY VENDORS QUAL FOR TEST TAPE AND REEL.

Semtech Job#	6278
Accepted Date	03-20-2017
Part Number	UClamp3321ZA, RClamp5011ZA, RClamp3331ZA, RClamp0521Z
Job Type	New Product on qualified process and qualified package
Business Unit	Protection
Package Type	HTKS
Package Lead	2
Assembly Designator	HuaTian Kunshan
Master Process	Palm Process at TJT
Fab Designator	Tower Texas
Rel Job Status	Rel Testing Complete Passes All Requirements

Completed Tasks

Sub Lot #	Part	Lot	Assembly Lot	Date Code	
1	uClamp3321ZA	DA5809	AER-003896	1701	
Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
1	Data-Prep	None	None		
2	HTRB_Pre_Elect_150°C_RT24	105	Pass on Zero Fails	0	02-10-2017
3	HTRB_150°C_Real Time_0024	105	Pass on Zero Fails	0	02-10-2017
4	HTRB_Pre_Elect	105	Pass on Zero Fails	0	01-13-2017
5	BI_BD_Valid	NA	Meet HTOL Schematics	0	01-13-2017
6	HTRB_150°C_0072	105	Pass on Zero Fails	0	01-13-2017
7	HTRB_150°C_0408	105	Pass on Zero Fails	0	01-16-2017
8	HTS_Pre_Elect	77	Pass on Zero Fails	0	01-13-2017
9	HTS_0168	77	Pass on Zero Fails	0	01-13-2017
10	HTS_0500	77	Pass on Zero Fails	0	01-20-2017
11	HTS_1000	77	Pass on Zero Fails	0	02-03-2017
12	85/85_W/Pre_Pre Elec	20	Pass on Zero Fails	0	04-18-2017
13	85°C/85%RH_BD_Valid	20	Pass on Zero Fails	0	04-18-2017
14	85/85_120hr_On/Off	20	Pass on Zero Fails	0	04-18-2017
15	Pre_Elect_Precond	154	Pass on Zero Fails	0	01-16-2017
16	Precond_Temp_Cyc_5cyc	154	Pass on Zero Fails	0	01-16-2017
17	Precond_HTS_24hr	154	Pass on Zero Fails	0	01-16-2017
18	Precond_85/85_NoElec168hr	154	Pass on Zero Fails	0	01-17-2017
19	Precond_IR_Refl_Char	154	Pass on Zero Fails	0	01-24-2017
20	T/C_Pre_Elect	77	Pass on Zero Fails	0	01-24-2017
21	T/C_wPre_0250	77	Pass on Zero Fails	0	01-24-2017
22	T/C_wPre_0500	77	Pass on Zero Fails	0	02-03-2017

Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
23	T/C_wPre_1000	77	Pass on Zero Fails	0	02-03-2017
24	X_Sect	15	Pass on Zero Fails	0	03-07-2017
25	85°C/85%RH_W/Pre_Pre Elec	77	Pass on Zero Fails	0	01-24-2017
26	85°C/85%RH_BD_Valid	77	Pass on Zero Fails	0	01-24-201
27	85°C/85%RH_Biased_168hrs	77	Pass on Zero Fails	0	01-31-2017
28	85°C/85%RH_Biased_500hrs	77	Pass on Zero Fails	0	02-14-2017
29	85°C/85%RH_Biased_1000hrs	77	Pass on Zero Fails	0	03-07-2017
30	X_Sect	15	Pass on Zero Fails	0	03-07-2017
31	Rider_Card_Wash/Bake	154	Pass on Zero Fails	0	01-13-2017
32	Construct_Package	5 unique packaged devices minimum.	No Major Findings, Q&R to review construction analysis report.	0	03-14-2017
33	Pack_Clos	0	0		

Sub Lot #	Part	Lot	Assembly Lot	Date Code
2	RClamp5011ZA	T602940.5	AER-003882	1701

Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
1	Data-Prep	None	None		
2	HTRB_Pre_Elect_150°C_RT24	210	Pass on Zero Fails	0	01-13-2017
3	HTRB_150°C_Real Time_0024	210	Pass on Zero Fails	0	01-19-2017
4	HTRB_Pre_Elect	105	Pass on Zero Fails	0	01-12-2017
5	BI_BD_Valid	NA	Meet HTOL Schematics	0	01-12-2017
6	HTRB_150°C_0072	105	Pass on Zero Fails	0	01-13-2017
7	HTRB_150°C_0408	105	Pass on Zero Fails	0	01-16-2017
8	HTS_Pre_Elect	77	Pass on Zero Fails	0	01-12-2017
9	HTS_0168	77	Pass on Zero Fails	0	01-12-2017
10	HTS_0500	77	Pass on Zero Fails	0	01-19-2017
11	HTS_1000	77	Pass on Zero Fails	0	02-02-2017
12	85/85_W/Pre_Pre Elec	20	Pass on Zero Fails	0	01-13-2017
13	85°C/85%RH_BD_Valid	20	Pass on Zero Fails	0	01-17-2017

Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
14	85/85_120hr_On/Off	20	Pass on Zero Fails	0	01-17-2017
15	Pre_Elect_Precond	154	Pass on Zero Fails	0	01-13-2017
16	Precond_Temp_Cyc_5cyc	154	Pass on Zero Fails	0	01-13-2017
17	Precond_HTS_24hr	154	Pass on Zero Fails	0	01-13-2017
18	Precond_85/85_NoElec168hr	154	Pass on Zero Fails	0	01-16-2017
19	Precond_IR_Refl_Char	154	Pass on Zero Fails	0	01-23-2017
20	T/C_Pre_Elect	77	Pass on Zero Fails	0	01-23-2017
21	T/C_wPre_0250	77	Pass on Zero Fails	0	01-23-2017
22	T/C_wPre_0500	77	Pass on Zero Fails	0	01-30-2017
23	T/C_wPre_1000	77	Pass on Zero Fails	0	02-03-2017
24	X_Sect	15	Pass on Zero Fails	0	02-03-2017
25	85°C/85%RH_W/Pre_Pre Elec	77	Pass on Zero Fails	0	01-23-2017
26	85°C/85%RH_BD_Valid	77	Pass on Zero Fails	0	01-24-2017
27	85°C/85%RH_Biased_168hrs	77	Pass on Zero Fails	0	01-31-2017
28	85°C/85%RH_Biased_500hrs	77	Pass on Zero Fails	0	02-14-2017
29	85°C/85%RH_Biased_1000hrs	77	Pass on Zero Fails	0	03-07-2017
30	X_Sect	15	Pass on Zero Fails	0	02-14-2017
31	Rider_Card_Wash/Bake	154	Pass on Zero Fails	0	01-12-2017
32	Construct_Package	5 unique packaged devices minimum.	No Major Findings, Q&R to review construction analysis report.	0	03-14-2017
33	Pack_Clos	0	0		

Sub Lot #	Part	Lot	Assembly Lot	Date Code	
3	RClamp3331ZA	T620217.1	AER-003888	1701	
Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
1	Data-Prep	None	None		
2	HTRB_Pre_Elect_150°C_RT24	105	Pass on Zero Fails	0	01-13-2017
3	HTRB_150°C_Real Time_0024	210	Pass on Zero Fails	0	01-23-2017
4	HTRB_Pre_Elect	105	Pass on Zero Fails	0	01-12-2017

Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
5	BI_BD_Valid	NA	Meet HTOL Schematics	0	01-12-2017
6	HTRB_150°C_0072	105	Pass on Zero Fails	0	01-13-2017
7	HTRB_150°C_0408	105	Pass on Zero Fails	0	01-16-2017
8	HTS_Pre_Elect	77	Pass on Zero Fails	0	01-12-2017
9	HTS_0168	77	Pass on Zero Fails	0	01-12-2017
10	HTS_0500	77	Pass on Zero Fails	0	01-19-2017
11	HTS_1000	77	Pass on Zero Fails	0	02-02-2017
12	85/85_W/Pre_Pre Elec	20	Pass on Zero Fails	0	01-13-2017
13	85°C/85%RH_BD_Valid	20	Pass on Zero Fails	0	01-17-2017
14	85/85_120hr_On/Off	20	Pass on Zero Fails	0	01-17-2017
15	Pre_Elect_Precond	154	Pass on Zero Fails	0	01-13-2017
16	Precond_Temp_Cyc_5cyc	154	Pass on Zero Fails	0	01-13-2017
17	Precond_HTS_24hr	154	Pass on Zero Fails	0	01-13-2017
18	Precond_85/85_NoElec168hr	154	Pass on Zero Fails	0	01-16-2017
19	Precond_IR_Refl_Char	154	Pass on Zero Fails	0	01-23-2017
20	T/C_Pre_Elect	77	Pass on Zero Fails	0	01-23-2017
21	T/C_wPre_0250	77	Pass on Zero Fails	0	01-23-2017
22	T/C_wPre_0500	77	Pass on Zero Fails	0	01-30-2017
23	T/C_wPre_1000	77	Pass on Zero Fails	0	02-03-2017
24	X_Sect	15	Pass on Zero Fails	0	03-07-2017
25	85°C/85%RH_W/Pre_Pre Elec	77	Pass on Zero Fails	0	01-23-2017
26	85°C/85%RH_BD_Valid	77	Pass on Zero Fails	0	01-24-2017
27	85°C/85%RH_Biased_168hrs	77	Pass on Zero Fails	0	01-31-2017
28	85°C/85%RH_Biased_500hrs	77	Pass on Zero Fails	0	02-14-2017
29	85°C/85%RH_Biased_1000hrs	77	Pass on Zero Fails	0	03-07-2017
30	X_Sect	15	Pass on Zero Fails	0	03-07-2017
31	Rider_Card_Wash/Bake	154	Pass on Zero Fails	0	01-12-2017
32	Construct_Package	5 unique packaged devices minimum.	No Major Findings, Q&R to review construction analysis report.	0	03-14-2017
33	Pack_Clos	0	0		

Sub Lot #	Part	Lot	Assembly Lot	Date Code	
4	RClamp0521Z	EP4691	AER-003884	1701	
Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
1	Data-Prep	None	None		
2	HTRB_Pre_Elect_150°C_RT24	105	Pass on Zero Fails	0	01-23-2017
3	HTRB_150°C_Real Time_0024	210	Pass on Zero Fails	0	01-24-2017
4	HTRB_Pre_Elect	105	Pass on Zero Fails	0	01-13-2017
5	BI_BD_Valid	NA	Meet HTOL Schematics	0	01-13-2017
6	HTRB_150°C_0072	105	Pass on Zero Fails	0	01-13-2017
7	HTRB_150°C_0408	105	Pass on Zero Fails	0	01-30-2017
8	HTS_Pre_Elect	77	Pass on Zero Fails	0	01-13-2017
9	HTS_0168	77	Pass on Zero Fails	0	01-13-2017
10	HTS_0500	77	Pass on Zero Fails	0	01-20-2017
11	HTS_1000	77	Pass on Zero Fails	0	02-03-2017
12	85/85_W/Pre_Pre Elec	20	Pass on Zero Fails	0	01-17-2017
13	85°C/85%RH_BD_Valid	20	Pass on Zero Fails	0	01-17-2017
14	85/85_120hr_On/Off	20	Pass on Zero Fails	0	01-17-2017
15	Pre_Elect_Precond	154	Pass on Zero Fails	0	01-16-2017
16	Precond_Temp_Cyc_5cyc	154	Pass on Zero Fails	0	01-16-2017
17	Precond_HTS_24hr	154	Pass on Zero Fails	0	01-16-2017
18	Precond_85/85_NoElec168hr	154	Pass on Zero Fails	0	01-17-2017
19	Precond_IR_Refl_Char	154	Pass on Zero Fails	0	01-24-2017
20	T/C_Pre_Elect	77	Pass on Zero Fails	0	01-24-2017
21	T/C_wPre_0250	77	Pass on Zero Fails	0	01-24-2017
22	T/C_wPre_0500	77	Pass on Zero Fails	0	02-03-2017
23	T/C_wPre_1000	77	Pass on Zero Fails	0	02-13-2017
24	X_Sect	15	Pass on Zero Fails	0	03-07-2017
25	85°C/85%RH_W/Pre_Pre Elec	77	Pass on Zero Fails	0	01-24-2017
26	85°C/85%RH_BD_Valid	77	Pass on Zero Fails	0	01-24-2017
27	85°C/85%RH_Biased_168hrs	77	Pass on Zero Fails	0	01-31-2017
28	85°C/85%RH_Biased_500hrs	77	Pass on Zero Fails	0	02-14-2017

Task#	Task Code	Sample Size	Criteria	Failures	Task On Actual
29	85°C/85%RH_Biased_1000hrs	77	Pass on Zero Fails	0	02-14-2017
30	X_Sect	15	Pass on Zero Fails	0	03-07-2017
31	Rider_Card_Wash/Bake	154	Pass on Zero Fails	0	01-13-2017
32	Construct_Package	5 unique packaged devices minimum.	No Major Findings, Q&R to review construction analysis report.	0	03-14-2017
33	Pack_Clos	0	0		



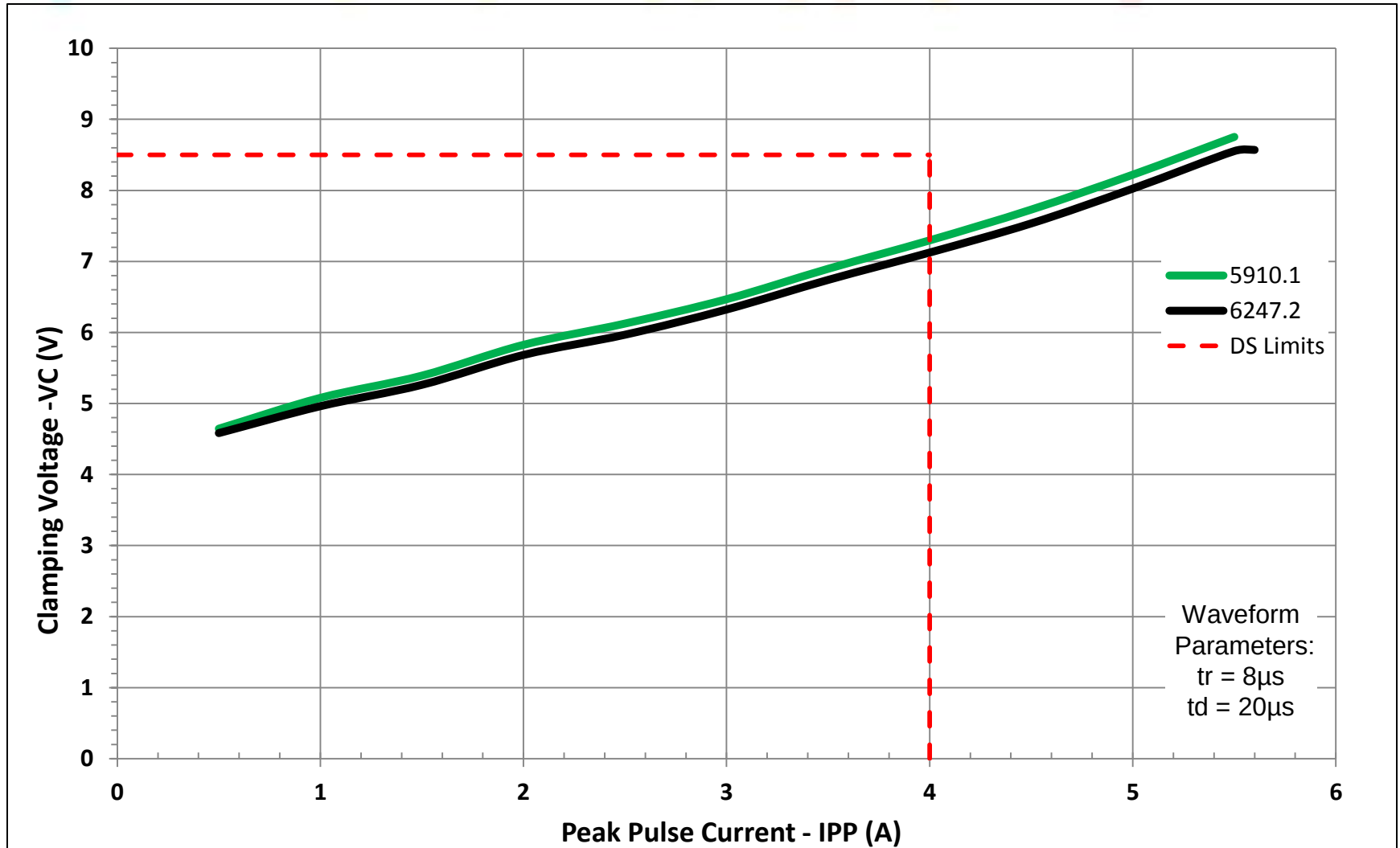
uClamp3321ZA RJ6247.2 (HTKS) Validation Report

2/1/2017

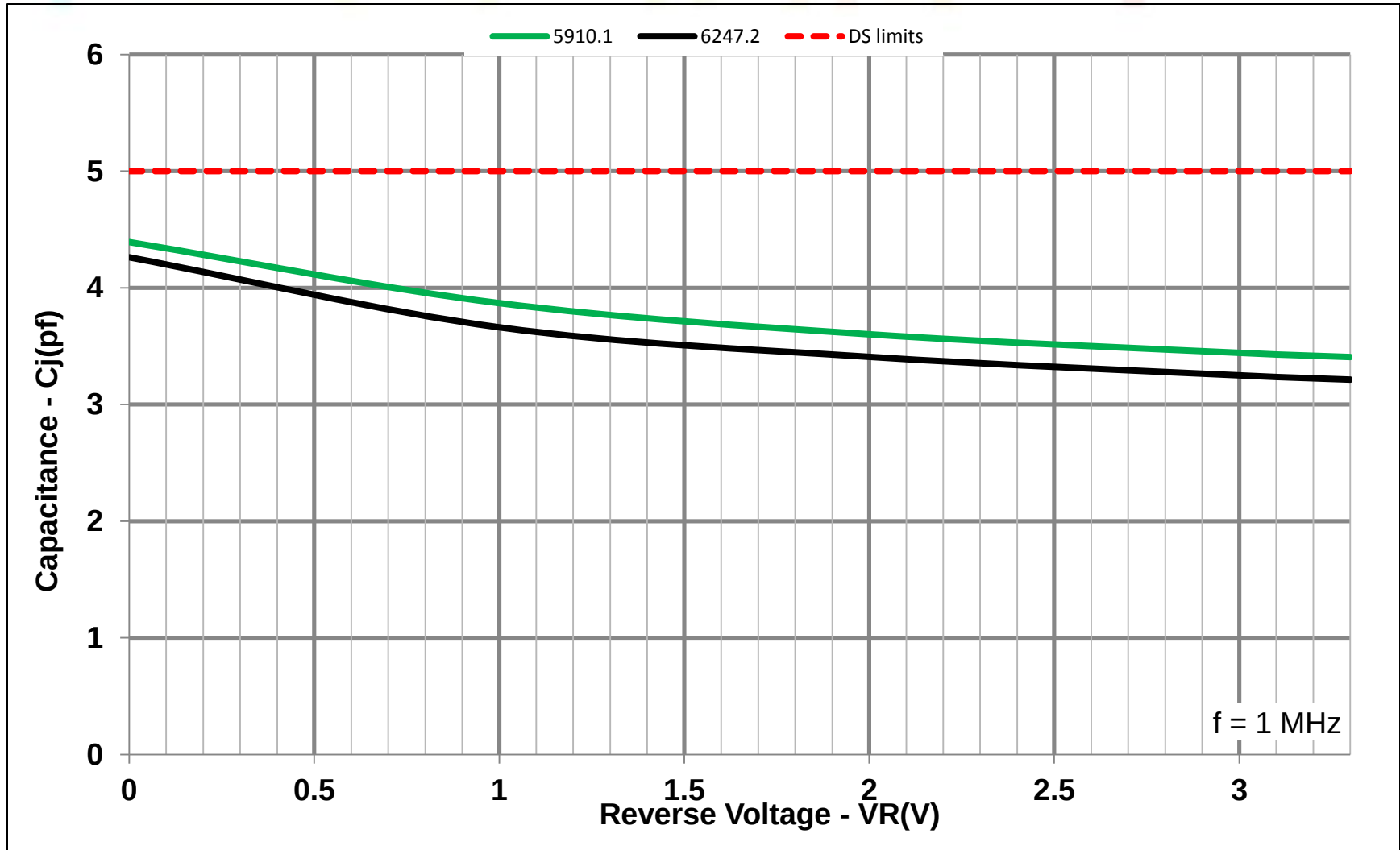
Build History

Date Completed	11/1/2016	12/9/2014
Part Number:	UClamp3321ZA	UClamp3321ZA
AER:	AER-003571	AER-002203/2204
Build Number:		GEP378900
Lot Number:	DA5801	GEP378900
Wafer #:	9	5
Device:	SPZ14021R2FCN	SPZ14021R1FCN
Date Code:	1636	1448
Rel #:	6247.2	5910.1
Owner:	Sam Jiang	Maykel Ghorbanzadeh
Notes:	Wafer fabrication - ASMC (China), Assembly – Huatian Kunshan (China)	Wafer fabrication - ASMC (China), Assembly - ICI (US), tape and reel - Diodes (China)

8x20uS Vc



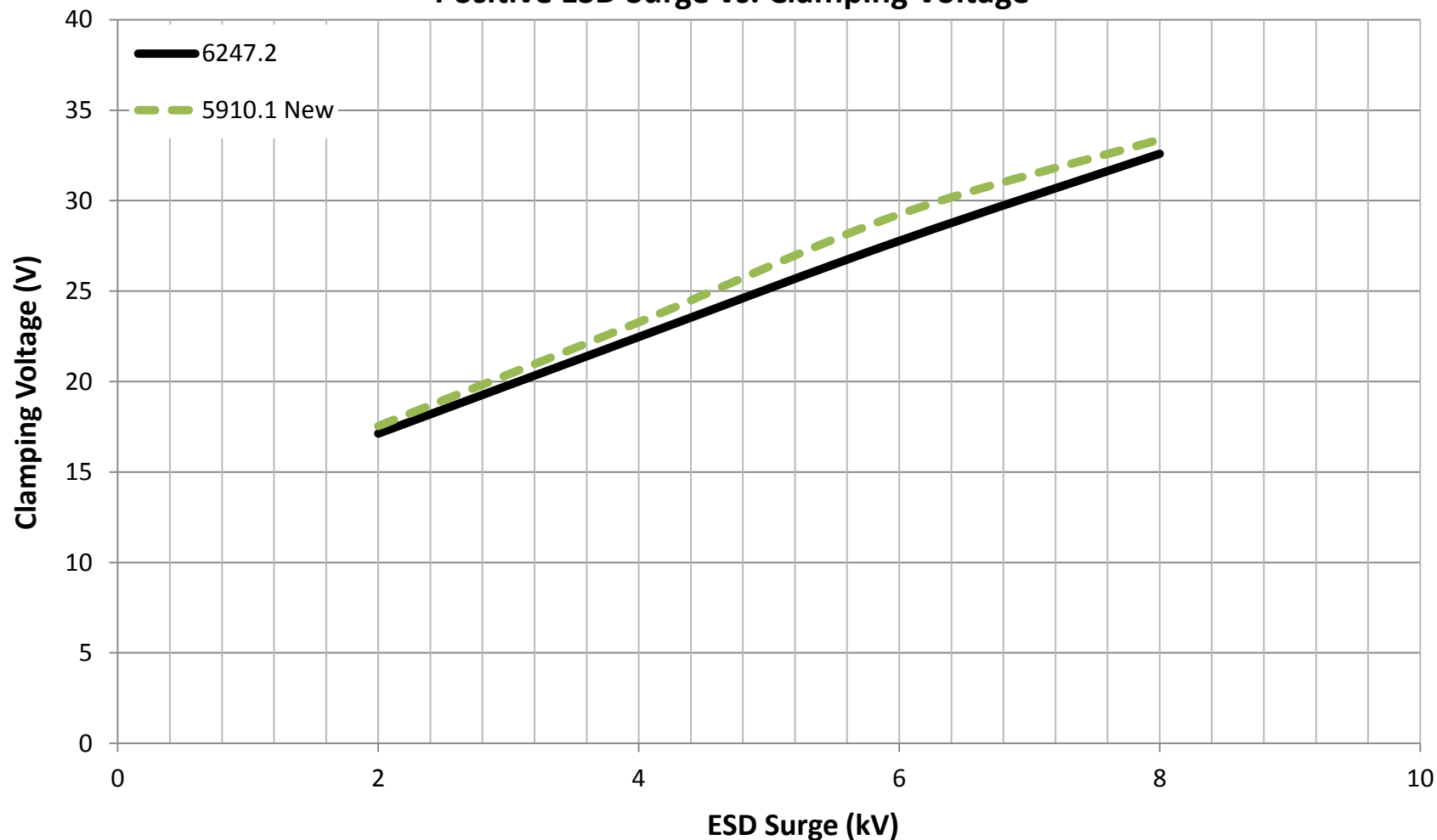
Cap over Bias



Positive ESD

Impedance: 50 Ohm / Attenuator:

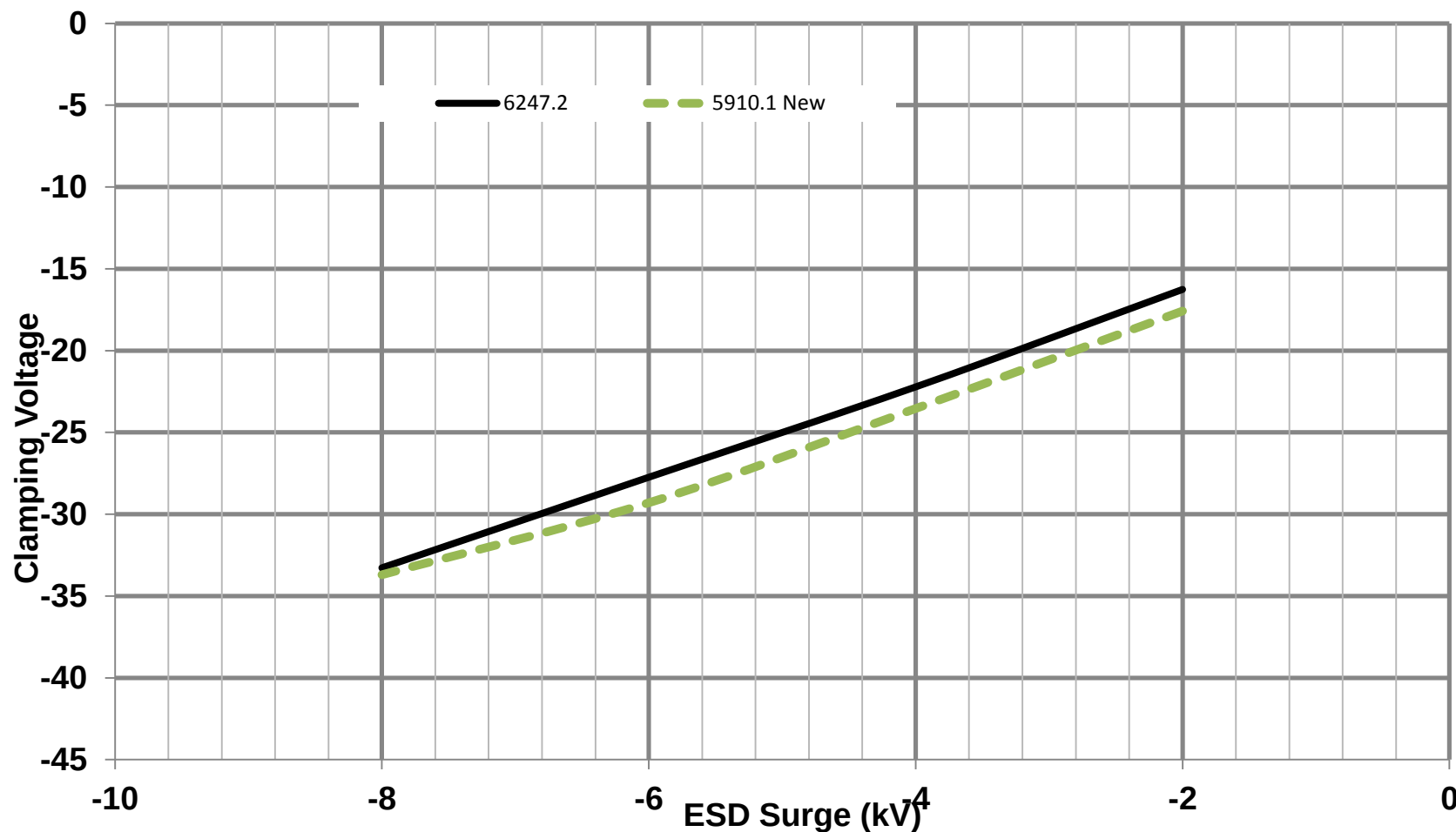
Positive ESD Surge vs. Clamping Voltage



Negative ESD

Impedance: 50 Ohm / Attenuator: 20dB

Negative ESD Surge vs. Clamping Voltage



ESD Reliability



RJ6247.2

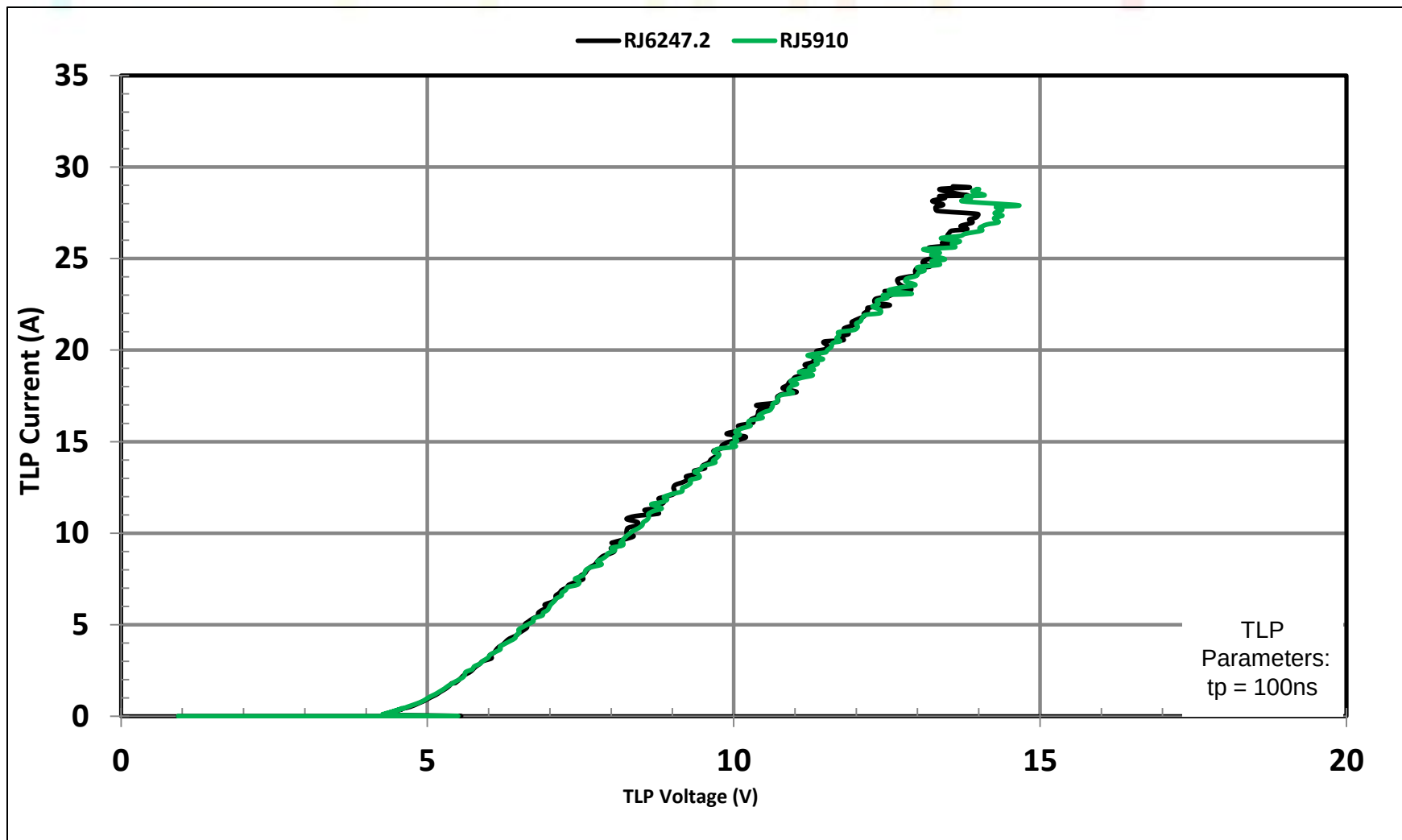
Contact (Line-Line)	Pass	Fail	Fail Type
Device 1: Pin 1-2	± 19kV	± 20kV	<i>vf</i>
Device 2: Pin 1-2	± 20kV	± 21kV	<i>vf</i>
Device 3: Pin 1-2	± 19kV	± 20kV	<i>vf</i>
Device 4: Pin 1-2	± 20kV	± 21kV	<i>short</i>
Device 5: Pin 1-2	± 19kV	± 20kV	<i>vf</i>

Air (Line-Line)	Pass	Fail	Fail Type
Device 1: Pin 1-2	± 23kV	± 24kV	<i>short</i>
Device 2: Pin 1-2	± 23kV	± 24kV	<i>short</i>
Device 3: Pin 1-2	± 23kV	± 24kV	<i>short</i>
Device 4: Pin 1-2	± 22kV	± 23kV	<i>short</i>
Device 5: Pin 1-2	± 23kV	± 24kV	<i>short</i>

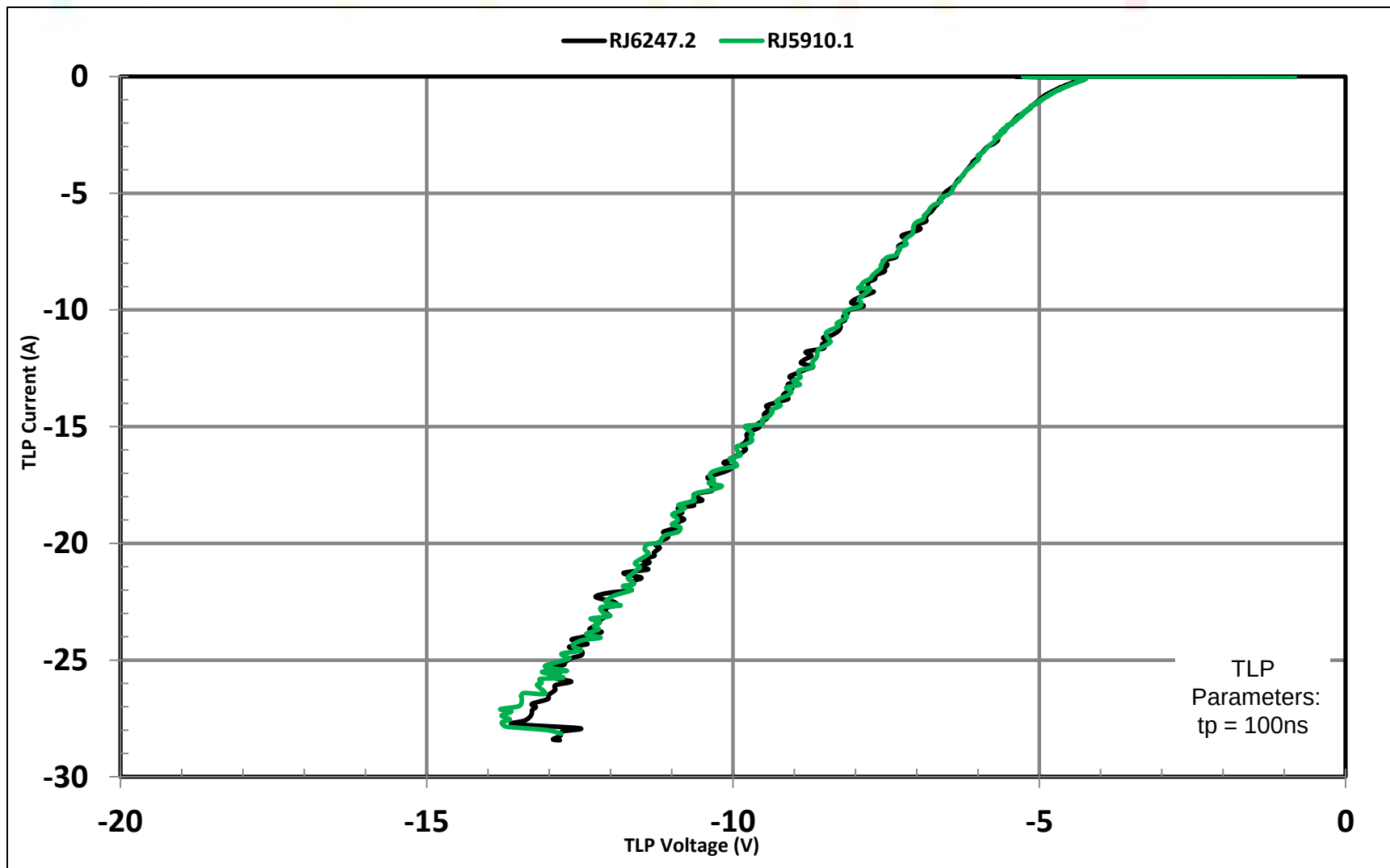
5910.1 New				Data 11-30-2016				
Contact (Line-Line)	Pass	Fail	Fail Type		Air (Line-Line)	Pass	Fail	Fail Type
Device 1: Pin 1-2	± 19kV	± 20kV	<i>Lost VF</i>		Device 1: Pin 1-2	± 22kV	± 23kV	<i>Short</i>
Device 2: Pin 1-2	± 19kV	± 20kV	<i>Lost VF</i>		Device 2: Pin 1-2	± 21kV	± 22kV	<i>Short</i>
Device 3: Pin 1-2	± 20kV	± 21kV	<i>Lost VF</i>		Device 3: Pin 1-2	± 21kV	± 22kV	<i>Short</i>
Device 4: Pin 1-2	± 20kV	± 21kV	<i>Lost VF</i>		Device 4: Pin 1-2	± 22kV	± 23kV	<i>Short</i>
Device 5: Pin 1-2	± 19kV	± 20kV	<i>Lost VF</i>		Device 5: Pin 1-2	± 21kV	± 22kV	<i>Short</i>

Datasheet	
Air	±17KV
Contact	±15KV

Positive TLP



Negative TLP





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