

JANUARY 21, 2015

TEST REPORT #214575  
REVISION 1.2

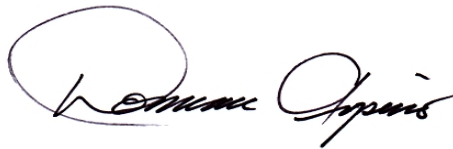
MFG TESTING

EDGE RATE HIGH SPEED EDGE CARD CONNECTOR, VERTICAL

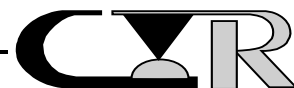
PART NUMBER

HSEC8-150-01-S-DV-A

SAMTEC



APPROVED BY: DOMINIC ARPINO  
PROJECT ENGINEERING MANAGER  
CONTECH RESEARCH, INC.  
RUMFORD, RI

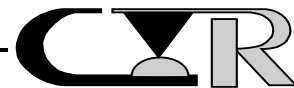


**Contech Research**

An Independent Test and Research Laboratory

REVISION HISTORY

DATE	REV. NO.	DESCRIPTION	ENG.
1/21/2015	1.0	Initial Issue	DA
1/23/2015	1.1	Editorial changes on page 7	DA
1/23/2015	1.2	On page 7, corrected the number of durability cycles to 20.	DA

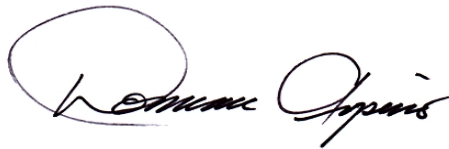


## CERTIFICATION

This is to certify that the evaluation described herein was designed and executed by personnel of Contech Research, Inc. It was performed with the concurrence of Samtec, of New Albany, IN who was the test sponsor.

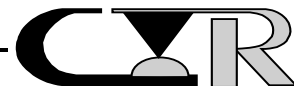
All equipment and measuring instruments used during testing were calibrated and traceable to NIST according to ISO 10012-1 and ANSI/NCSL Z540-1 and MIL-STD-45662 as applicable.

All data, raw and summarized, analysis and conclusions presented herein are the property of the test sponsor. No copy of this report, except in full, shall be forwarded to any agency, customer, etc., without the written approval of the test sponsor and Contech Research.



APPROVED BY: DOMINIC ARPINO  
PROJECT ENGINEERING MANAGER  
CONTECH RESEARCH, INC.  
RUMFORD, RI

DA:cf



## SCOPE

To perform Mixed Flowing Gas testing on HSEC8 connectors as manufactured and submitted by the test sponsor Samtec.

## APPLICABLE DOCUMENTS

1. Unless otherwise specified, the following documents of issue in effect at the time of testing performed form a part of this report to the extent as specified herein. The requirements of sub-tier specifications and/or standards apply only when specifically referenced in this report.
2. Standard: EIA Publication 364

## TEST SAMPLES AND PREPARATION

1. The following test samples were submitted by the test sponsor, Samtec, for the evaluation to be performed by Contech Research, Inc.

### Description

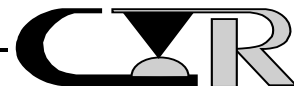
EDGE RATE HIGH SPEED EDGE CARD CONNECTOR, VERTICAL

### Part Number

HSEC8-150-01-S-DV-A

2. The test samples as submitted were supplied by the manufacturer as being fabricated and assembled utilizing normal production techniques common for this type of product and inspected in accordance with the quality criteria as established for the product involved.
3. Test samples were supplied assembled and terminated to test boards by the test sponsor.
4. Test boards for mounting test samples were supplied by the test sponsor.
5. Applicable qualified mating PCB's were supplied by the test sponsor.

-continued on next page.



TEST SAMPLES AND PREPARATION -continued

6. All test samples were coded and identified by the test sponsor to maintain continuity throughout the test sequences. Upon initiating testing, mated test samples remained with each other throughout the test sequences for which they were designated.
7. All equipment and measuring instruments used during testing were calibrated and traceable to NIST according to ISO 10012-1 and ANSI/NCCL Z540-1, as applicable.
8. Unless otherwise specified in the test procedures used, no further preparation was used.

TEST SELECTION

1. See Test Plan Flow Diagram, Figure #1, for test sequences used.
2. Test set ups and/or procedures which are standard or common are not detailed or documented herein provided they are certified as being performed in accordance with the applicable (industry or military) test methods, standards and/or drawings as specified in the detail specification.

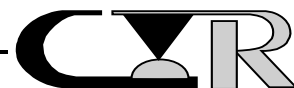
SAMPLE CODING

1. All samples were coded. Mated test samples remained with each other throughout the test group/sequences for which they were designated. Coding was performed in a manner which remained legible for the test duration.
2. The test samples were coded in the following manner:

Group 5 - No Lube

Sample ID #41 through #48

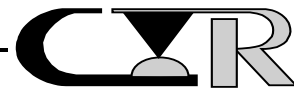
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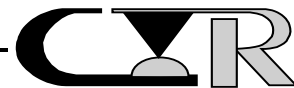
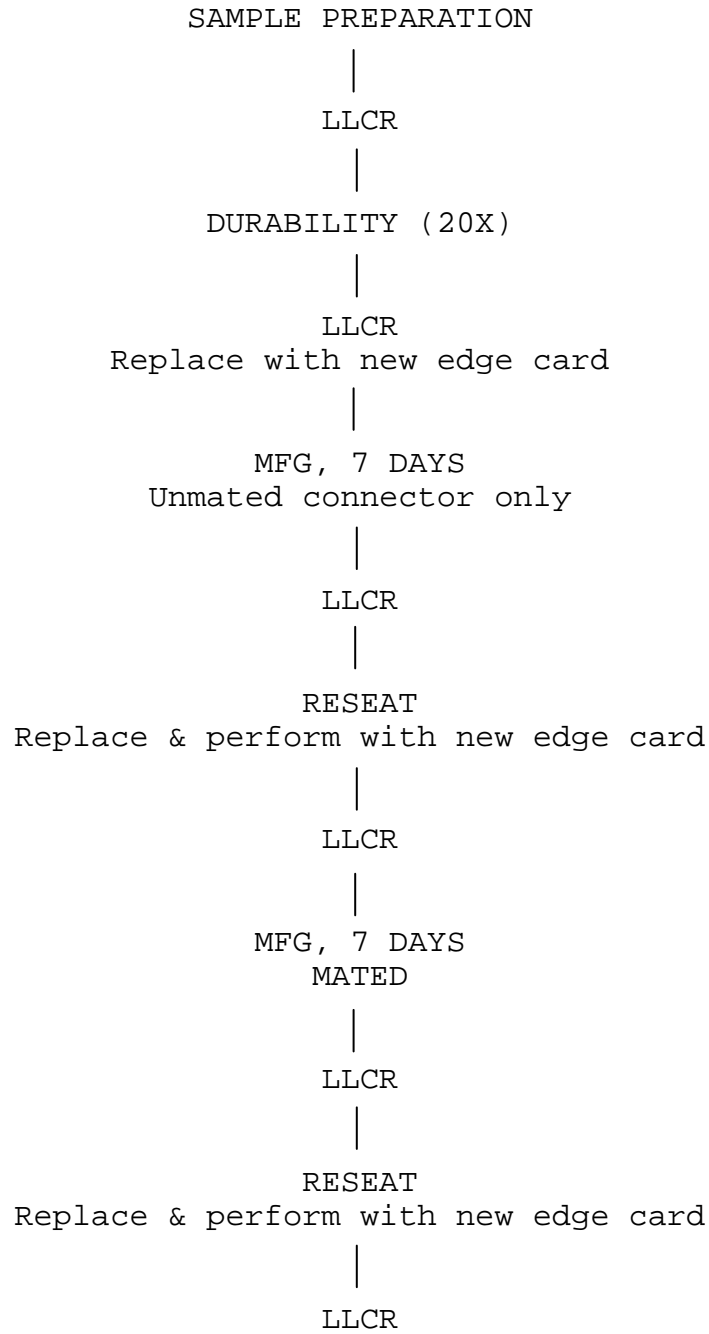
SAMPLE CODING -continued

3. The data files were coded in the following manner:

<u>Sample #</u>	<u>File ID#'s</u>
41	21457541
42	21457542
43	21457543
44	21457544
45	21457545
46	21457546
47	21457547
48	21457548



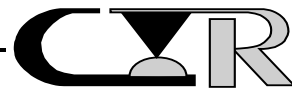
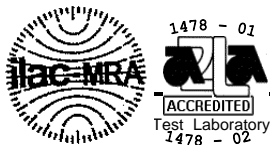
**FIGURE #2**



**DATA SUMMARY**

<b><u>TEST</u></b>	<b><u>REQUIREMENT</u></b>	<b><u>RESULTS</u></b>
LLCR		
-ID #41	RECORD	4.6 mΩ MAX.
-ID #42	RECORD	4.7 mΩ MAX.
-ID #43	RECORD	5.2 mΩ MAX.
-ID #44	RECORD	4.8 mΩ MAX.
-ID #45	RECORD	6.4 mΩ MAX.
-ID #46	RECORD	5.4 mΩ MAX.
-ID #47	RECORD	5.1 mΩ MAX.
-ID #48	RECORD	5.0 mΩ MAX.
DURABILITY		
-ID #41	NO DAMAGE	PASSED
-ID #42	NO DAMAGE	PASSED
-ID #43	NO DAMAGE	PASSED
-ID #44	NO DAMAGE	PASSED
-ID #45	NO DAMAGE	PASSED
-ID #46	NO DAMAGE	PASSED
-ID #47	NO DAMAGE	PASSED
-ID #48	NO DAMAGE	PASSED
LLCR		
-ID #41	+10.0 mΩ MAX.CHG.	+0.3 mΩ MAX.CHG.
-ID #42	+10.0 mΩ MAX.CHG.	+0.4 mΩ MAX.CHG.
-ID #43	+10.0 mΩ MAX.CHG.	+0.4 mΩ MAX.CHG.
-ID #44	+10.0 mΩ MAX.CHG.	+0.4 mΩ MAX.CHG.
-ID #45	+10.0 mΩ MAX.CHG.	+0.2 mΩ MAX.CHG.
-ID #46	+10.0 mΩ MAX.CHG.	+0.7 mΩ MAX.CHG.
-ID #47	+10.0 mΩ MAX.CHG.	+0.5 mΩ MAX.CHG.
-ID #48	+10.0 mΩ MAX.CHG.	+0.4 mΩ MAX.CHG.
MFG (DAY 1 TO 7, UNMATED)		
-ID #41 THRU #48	NO CORROSION	PASSED
LLCR		
-ID #41	+10.0 mΩ MAX.CHG.	+0.3 mΩ MAX.CHG.
-ID #42	+10.0 mΩ MAX.CHG.	+0.7 mΩ MAX.CHG.
-ID #43	+10.0 mΩ MAX.CHG.	+1.0 mΩ MAX.CHG.
-ID #44	+10.0 mΩ MAX.CHG.	+1.1 mΩ MAX.CHG.
-ID #45	+10.0 mΩ MAX.CHG.	+1.0 mΩ MAX.CHG.
-ID #46	+10.0 mΩ MAX.CHG.	+1.4 mΩ MAX.CHG.
-ID #47	+10.0 mΩ MAX.CHG.	+1.0 mΩ MAX.CHG.
-ID #48	+10.0 mΩ MAX.CHG.	+0.5 mΩ MAX.CHG.

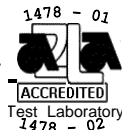
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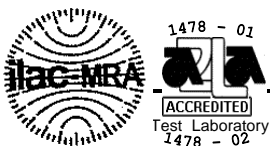
DATA SUMMARY -continued

<u>TEST</u>	<u>REQUIREMENT</u>	<u>RESULTS</u>
RESEAT WITH NEW EDGE CARD		
-ID #41 THRU #48	NO DAMAGE	PASSED
LLCR		
-ID #41	+10.0 mΩ MAX.CHG.	+0.5 mΩ MAX.CHG.
-ID #42	+10.0 mΩ MAX.CHG.	+0.7 mΩ MAX.CHG.
-ID #43	+10.0 mΩ MAX.CHG.	+0.9 mΩ MAX.CHG.
-ID #44	+10.0 mΩ MAX.CHG.	+0.5 mΩ MAX.CHG.
-ID #45	+10.0 mΩ MAX.CHG.	+0.5 mΩ MAX.CHG.
-ID #46	+10.0 mΩ MAX.CHG.	+0.5 mΩ MAX.CHG.
-ID #47	+10.0 mΩ MAX.CHG.	+0.6 mΩ MAX.CHG.
-ID #48	+10.0 mΩ MAX.CHG.	+0.9 mΩ MAX.CHG.
MFG (DAY 8 TO 14, MATED)		
-ID #41 THRU #48	NO CORROSION	PASSED
LLCR		
-ID #41	+10.0 mΩ MAX.CHG.	+0.7 mΩ MAX.CHG.
-ID #42	+10.0 mΩ MAX.CHG.	+1.5 mΩ MAX.CHG.
-ID #43	+10.0 mΩ MAX.CHG.	+0.6 mΩ MAX.CHG.
-ID #44	+10.0 mΩ MAX.CHG.	+1.1 mΩ MAX.CHG.
-ID #45	+10.0 mΩ MAX.CHG.	+0.9 mΩ MAX.CHG.
-ID #46	+10.0 mΩ MAX.CHG.	+1.0 mΩ MAX.CHG.
-ID #47	+10.0 mΩ MAX.CHG.	+1.4 mΩ MAX.CHG.
-ID #48	+10.0 mΩ MAX.CHG.	+1.5 mΩ MAX.CHG.
RESEAT WITH NEW EDGE CARD		
-ID #41 THRU #48	NO DAMAGE	PASSED
LLCR		
-ID #41	+10.0 mΩ MAX.CHG.	+0.6 mΩ MAX.CHG.
-ID #42	+10.0 mΩ MAX.CHG.	+0.8 mΩ MAX.CHG.
-ID #43	+10.0 mΩ MAX.CHG.	+0.6 mΩ MAX.CHG.
-ID #44	+10.0 mΩ MAX.CHG.	+1.0 mΩ MAX.CHG.
-ID #45	+10.0 mΩ MAX.CHG.	+0.5 mΩ MAX.CHG.
-ID #46	+10.0 mΩ MAX.CHG.	+1.0 mΩ MAX.CHG.
-ID #47	+10.0 mΩ MAX.CHG.	+0.7 mΩ MAX.CHG.
-ID #48	+10.0 mΩ MAX.CHG.	+0.6 mΩ MAX.CHG.

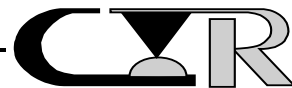
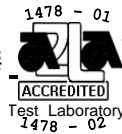


## EQUIPMENT LIST

ID#	Next Cal	Last Cal	Equipment Name	Manufacturer	Model #	Serial #	Accuracy	Freq. Cal
280	4/10/2015	4/10/2014	Micro-Ohm Meter	Keithley Instr.	580	477845	See Cal Cert	12 mon
436	N/A	N/A	Gas Regulator	Liquid Carbonic Co.	702-S-3	392838	N/A	N/A
443	N/A	N/A	Gas Regulator Valve	Liquid Carbonic Co.	DRK-2-48	40197	See Manual	N/A
510	N/A	N/A	Regulator	Liquid Carbonic	SGS 160C	M2 42366	N/A	N/A
525	N/A	N/A	Gas Regulator	Superior Co.	5113A	350218	See Owners Manual	N/A
543	12/29/2015	12/29/2014	Analytical Balance	Ohaus Co.	AP250D	MO9198	± .4mg	12 mon
650	3/21/2015	3/21/2014	Digital Multimeter	Hewlett Packard	34401A	US36032126	See Cal Cert	12 mon
1043	N/A	N/A	MFG Flow System	Contech Research	N/A	N/A	N/A	N/A
1113	N/A	N/A	Elect.Liquid Level Control	Cole Parmer	2225	030237	N/A	N/A
1380	N/A	N/A	Scanner Main Frame	Keithley	7011	0672970	See Manual	Ea Test
1381	N/A	N/A	Air Dryer	Balston	75-20	A03391	See Manual	N/A
1500	10/31/2015	10/31/2014	Temp Humid Trans	Vaisala	HMT333	CO650008	See Cal Cert	12 mon
1571	N/A	N/A	Chlorine Analyzer	IMS CO.	Air Sentury	1265AN	See Cal Cert	EA Test
1589	N/A	N/A	Computer	IBM	MFG Lab	MFG-01	N/A	N/A
1595	N/A	N/A	H2S Analyzer	Teledyne Analyzer	101-E	1231	N/A	N/A
1599	N/A	N/A	NO2 Analyzer	Teledyne Analyzer	200E	289	N/A	N/A
1793	N/A	N/A	Computer	Dell	Optiplex	CKWCPC1	N/A	N/A



# TEST RESULTS



PROJECT NO.: 214575

SPECIFICATION: EIA-364 TP 23

PART NO.: See page 4

PART DESCRIPTION: See page 4

SAMPLE SIZE: 8 PCB's

TECHNICIAN: BE

START DATE: 12/15/14

COMPLETE DATE: 12/15/14

ROOM AMBIENT: 20°C

RELATIVE HUMIDITY: 36%

EQUIPMENT ID#: 280, 1793

LOW LEVEL CIRCUIT RESISTANCE (LLCR)

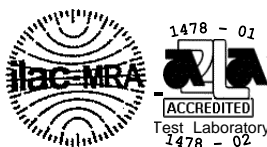
PURPOSE:

1. To evaluate contact resistance characteristics of the contact systems under conditions where applied voltages and currents do not alter the physical contact interface and will detect oxides and films which degrade electrical stability. It is also sensitive to and may detect the presence of fretting corrosion induced by mechanical or thermal environments as well as any significant loss of contact pressure.
2. This attribute was monitored after each preconditioning and/or test exposure in order to determine said stability of the contact systems as they progress through the applicable test sequences.
3. The electrical stability of the system is determined by comparing the initial resistance value to that observed after a given test exposure. The difference is the change in resistance occurring whose magnitude establishes the stability of the interface being evaluated.

PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 23 with the following conditions.

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PROCEDURE: -continued

2. Test Conditions:

- a) Test Current : 100 milliamps maximum
- b) Open Circuit Voltage : 20 millivolts
- c) No. of Positions Tested : 24 per test sample

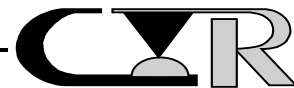
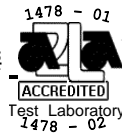
3. Per the test sponsors request the edge card was replaced with a new edge card during the test sequence, see Figure #2, test sequence flow chart.

-----  
REQUIREMENTS:

Low level circuit resistance shall be measured and recorded.

-----  
RESULTS:

See data files 21457541 through 214475486 for individual data points.



PROJECT NO.: 214575	SPECIFICATION: EIA-364 TP 09
-----	
PART NO.: See Page 4	PART DESCRIPTION: See page 4
-----	
SAMPLE SIZE: 8 PCB's	TECHNICIAN: BE
-----	
START DATE: 12/17/14	COMPLETE DATE: 12/17/14
-----	
ROOM AMBIENT: 20°C	RELATIVE HUMIDITY: 39%
-----	
EQUIPMENT ID#: Manual	
-----	

DURABILITY

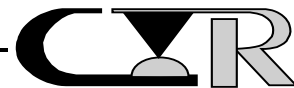
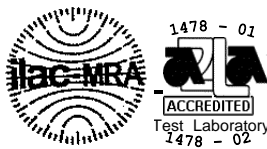
PURPOSE:

1. This is a conditioning sequence which is used to induce the type of wear on the contacting surfaces which may occur under normal service conditions. The connectors are mated and unmated a predetermined number of cycles. Upon completion, the units being evaluated are exposed to the environments as specified to assess any impact on electrical stability resulting from wear or other wear dependent phenomenon.
  
2. This type of conditioning sequence is also used to mechanically stress the connector system as would normally occur in actual service. This sequence in conjunction with other tests is used to determine if a significant loss of contact pressure occurs from said stresses which in turn, may result in an unstable electrical condition to exist.

-----  
PROCEDURE:

1. The test was performed in accordance with EIA 364, Test Procedure 09.
  
2. Test Conditions:
  - a) No. of Cycles : 20
  
3. The durability cycling was performed manually.

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PROCEDURE: -continued

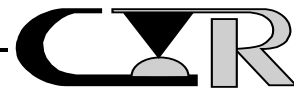
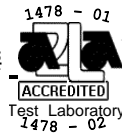
4. All subsequent variable testing was performed in accordance with the procedures previously indicated.

-----  
REQUIREMENTS:

1. There shall be no evidence of physical damage to the test samples so tested.
2. The change in low level circuit resistance shall not exceed +10.0 milliohms.

-----  
RESULTS:

1. There was no evidence of physical damage to the test samples as tested.
2. See data files 214575411 through 21457548 for individual data points.



PROJECT NO.: 214575

SPECIFICATION: EIA-364-65B

PART NO.: See page 4

PART DESCRIPTION: See page 4

SAMPLE SIZE: 8 PCB's

TECHNICIAN: AJP

START DATE: 12/22/14

COMPLETE DATE: 1/12/15

ROOM AMBIENT: 21°C

RELATIVE HUMIDITY: 48%

EQUIPMENT ID#: 436, 443, 510, 525, 543, 650, 1043, 1113, 1380,  
1381, 1500, 1571, 1589, 1595, 1599

MIXED FLOWING GAS

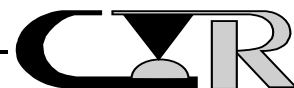
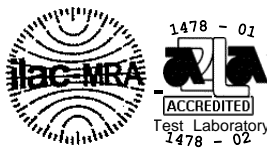
PURPOSE:

1. To determine the impact on electrical stability of contact interfaces when the test samples are exposed to a mixed flowing gas environment. Said environment is based on field data simulating typical, severe, non-benign environments. Said exposure is indicative of expected behavior in the field.
3. Mixed flowing gas tests (MFG) are environmental test procedures whose primary purpose is to evaluate product performance under simulated storage or operating (field) conditions. For parts involving plated contact surfaces, such tests are also used to measure the effect of plating degradation (due to the environment) on the electrical and durability properties of a contact or connector system. The specific test conditions are usually chosen so as to simulate, in the test laboratory, the effects of certain representative field environments or environmental severity levels on standard metallic surfaces.

PROCEDURE:

1. The test environment was performed in accordance with EIA 364, Test Procedure 65 with the following conditions.

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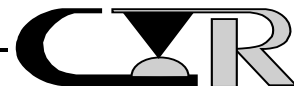
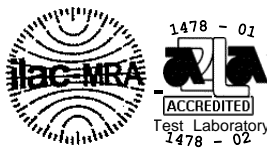
PROCEDURE: -continued

2. Environmental Conditions:

- a) Temperature : 30°C ± 1°C
- b) Relative Humidity : 70% ± 2%
- c) Cl<sub>2</sub> : 10 ± 3 ppb
- d) NO<sub>2</sub> : 200 ± 50 ppb
- e) H<sub>2</sub>S : 10 ± 5 ppb
- f) SO<sub>2</sub> : 100 ± 20 ppb
- g) Exposure Time : 14 days
- h) Mating Conditions : Day 1 to 7, Unmated (the mating PCB was not exposed)  
Day 8 to 14, Mated
- i) Mounting Conditions : Mounted

- 3. The test chamber was allowed to stabilize at the specified conditions indicated.
- 4. After stabilization, the test samples and control coupons were placed in the chamber such that they were no closer than 2.0" from each other and/or the chamber walls.
- 5. The test samples were handled in a manner so as not to disturb the contact interface.
- 6. After placement of the test samples in the chamber, it was allowed to re-stabilize and adjusted as required to maintain the specified concentrations and conditions.
- 7. The test chamber was monitored periodically during the exposure period to assure the environmental conditions as specified were maintained.
- 8. The samples were suspended in the chamber as shown in Figure #3.
- 9. During the exposure, resistance measurements were taken at specific intervals and in the following sequence.
  - a) Place the test samples in the test chamber.
  - b) At each designated measurement period, remove the test units from the test chamber. The test samples were exposed to room ambient for two hours prior to making measurements.

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PROCEDURE: -continued

- c) Measure and record low level circuit resistance measurements.
  - d) Upon completion of the measurements, place the test units back into the test chamber until the next measurement interval or until completion of the test duration.
10. Following completion of each 7 day MFG test exposure, the samples were subjected to the tests indicated below:
- a) LLCR
  - b) Reseat
  - c) LLCR
11. All subsequent variable testing was performed in accordance with the procedures previously indicated.

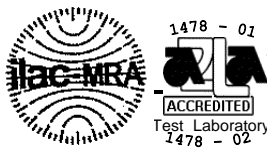
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REQUIREMENTS:

- 1. There shall be no evidence of damage or corrosion to the test samples as exposed which will cause mechanical or electrical malfunction of the said samples.
- 2. The change in low level circuit resistance shall not exceed +10.0 milliohms.

-----  
RESULTS:

- 1. There was no evidence of physical damage or corrosion
- 2. See data files 21547541 through 214547548 for individual data points.

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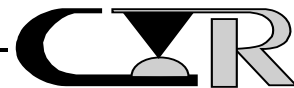
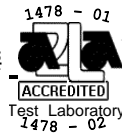


RESULTS: -continued

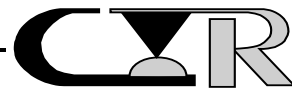
3. Five copper coupons were placed in the chamber for each of the seven days of exposure. Upon removal said coupons were evaluated via weight gain technique with the following results:

<u>Coupon No.</u>	<u>WEIGHT GAIN (<math>\mu\text{gm}/\text{cm}^2/\text{Day}</math>)</u>	
	<u>Set 1</u>	<u>Set 2</u>
1	12	16
2	12+	15
3	12+	16
4	13	15+
5	12+	14+

Requirement: 12 to 16  $\mu\text{gm}/\text{cm}^2/\text{Day}$



**FIGURE #3**



LLCR DATA FILES

Group 5 - No Lubed

21457541

21457542

21457543

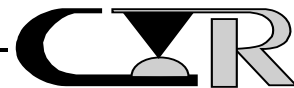
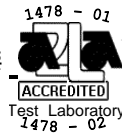
21457544

21457545

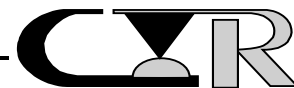
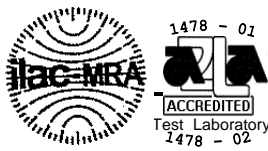
21457546

21457547

21457548



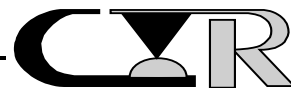
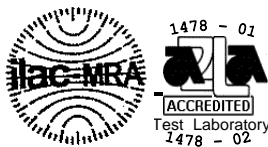
Low Level Contact Resistance - Delta Values						
Project:	214575				Spec:EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A				File No.:	21457541
Description:	PN UCC8-010-01-H-S-1-A				Tech:	
Open Circuit Voltage:	20mV				Current:	100mA
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
41-1	4.2	0.3	0.3	0.3	0.7	0.5
41-2	4.5	-0.2	0.0	0.2	-0.1	-0.1
41-3	4.6	-0.2	-0.1	0.1	-0.1	-0.1
41-4	4.3	0.0	0.1	0.1	0.1	0.0
41-5	4.3	0.0	-0.1	0.3	0.4	0.2
41-6	4.3	-0.1	-0.1	0.0	-0.1	0.6
41-7	4.5	-0.1	0.0	0.0	0.2	-0.1
41-8	4.1	0.1	0.3	0.2	0.3	0.2
41-9	4.2	0.1	0.1	0.4	0.2	0.3
41-10	4.3	0.0	0.0	0.0	0.1	0.0
41-11	4.1	0.2	0.2	0.2	0.2	0.2
41-12	4.2	0.1	0.0	0.3	0.3	0.2
41-13	4.2	0.0	0.1	0.2	0.2	0.4
41-14	4.3	-0.2	-0.2	0.2	0.1	0.0
41-15	4.1	0.1	0.3	0.3	0.3	0.3
41-16	4.1	0.1	0.3	0.4	0.2	0.2
41-17	4.1	0.1	0.2	0.3	0.1	0.4
41-18	4.3	0.0	0.3	0.1	0.0	0.2
41-19	4.3	-0.1	0.1	0.0	-0.1	0.0
41-20	4.3	0.0	0.0	0.5	0.2	0.1
41-21	4.4	-0.1	0.1	0.5	0.2	0.1
41-22	4.6	-0.2	0.0	0.2	0.3	0.0
41-23	4.4	-0.2	0.1	0.3	0.7	0.2
41-24	4.5	-0.1	-0.1	0.0	0.0	-0.1
MAX	4.6	0.3	0.3	0.5	0.7	0.6
MIN	4.1	-0.2	-0.2	0.0	-0.1	-0.1
AVG	4.3	0.0	0.1	0.2	0.2	0.1
STD	0.2	0.1	0.2	0.2	0.2	0.2
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	280.0	280	280	280	280	280
	1793.0	1793	1793	1793	1793	1793



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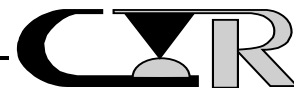
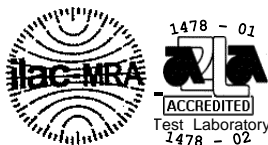
Low Level Contact Resistance - Delta Values						
Project:	214575				Spec: EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A			File No.:	21457542	
Description:	PN UCC8-010-01-H-S-1-A			Tech:		
Open Circuit Voltage:	20mV			Current:	100mA	
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
42-1	4.4	0.1	0.4	0.3	1.0	0.3
42-2	4.6	-0.1	0.1	-0.1	0.3	-0.2
42-3	4.5	0.2	0.7	0.2	0.9	0.0
42-4	4.7	-0.2	0.3	0.1	0.3	0.2
42-5	4.4	-0.1	0.2	0.3	0.5	0.4
42-6	4.4	-0.2	0.0	0.2	0.2	0.2
42-7	4.4	0.0	0.3	0.5	0.7	0.4
42-8	4.5	0.1	0.2	0.0	0.2	0.1
42-9	4.2	0.3	0.2	0.4	0.6	0.4
42-10	4.5	0.0	0.1	0.5	0.9	0.8
42-11	4.3	0.4	0.6	0.4	1.1	0.3
42-12	4.2	0.4	0.3	0.4	0.9	0.3
42-13	4.4	0.1	0.2	0.0	0.4	0.2
42-14	4.2	0.2	0.3	0.2	1.2	0.3
42-15	4.3	0.1	0.2	0.2	0.8	0.4
42-16	4.2	0.2	0.2	0.4	0.7	0.5
42-17	4.3	0.0	0.2	0.1	0.8	0.4
42-18	4.5	-0.1	0.0	0.2	1.0	0.1
42-19	4.3	0.1	0.4	0.7	1.1	0.6
42-20	4.3	0.0	0.3	0.6	1.0	0.5
42-21	4.7	-0.2	-0.2	0.0	0.9	-0.7
42-22	4.5	0.1	0.2	0.3	0.5	0.2
42-23	4.5	0.2	0.3	0.1	0.3	0.2
42-24	4.3	0.3	0.4	0.6	1.5	0.7
MAX	4.7	0.4	0.7	0.7	1.5	0.8
MIN	4.2	-0.2	-0.2	-0.1	0.2	-0.7
AVG	4.4	0.1	0.3	0.3	0.7	0.3
STD	0.1	0.2	0.2	0.2	0.3	0.3
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	280	280	280	280	280	280
	1793	1793	1793	1793	1793	1793



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Low Level Contact Resistance - Actual Values						
Project:	214575				Spec: EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A				File No.:	21457543
Description:	PN UCC8-010-01-H-S-1-A				Tech:	
Open Circuit Voltage:	20mV				Current:	100mA
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
43-1	4.6	4.7	4.7	4.7	4.6	4.7
43-2	4.8	4.5	4.6	4.8	4.9	4.8
43-3	5.2	4.8	4.9	4.8	4.9	4.6
43-4	4.9	4.7	4.8	4.7	4.7	5.0
43-5	4.5	4.9	4.9	4.6	4.6	4.8
43-6	4.4	4.3	4.5	4.6	4.5	4.7
43-7	4.7	4.8	4.9	4.7	4.8	5.0
43-8	4.5	4.6	4.6	4.6	4.5	4.8
43-9	4.5	4.8	4.6	4.8	4.6	4.4
43-10	4.4	4.7	4.7	5.0	4.7	4.8
43-11	4.6	4.7	5.0	4.5	4.6	4.6
43-12	4.4	4.5	5.4	5.3	5.0	4.7
43-13	4.6	4.9	4.9	4.8	4.5	4.6
43-14	4.9	4.8	4.9	4.9	5.0	4.7
43-15	4.8	4.9	4.7	4.8	5.0	5.0
43-16	4.6	4.9	4.5	4.5	4.6	4.7
43-17	4.5	4.7	5.2	4.6	4.7	4.5
43-18	4.7	4.9	5.1	4.7	4.6	5.3
43-19	4.7	5.0	4.9	4.6	4.4	4.9
43-20	4.5	4.7	4.7	4.6	4.6	4.8
43-21	4.9	4.9	4.9	4.7	4.7	5.0
43-22	4.7	4.8	4.9	4.8	4.6	5.2
43-23	4.8	4.6	4.6	4.4	4.3	4.8
43-24	4.7	4.8	4.7	4.5	4.5	4.9
MAX	5.2	5.0	5.4	5.3	5.0	5.3
MIN	4.4	4.3	4.5	4.4	4.3	4.4
AVG	4.7	4.7	4.8	4.7	4.7	4.8
STD	0.2	0.2	0.2	0.2	0.2	0.2
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	280	280	280	280	280	280
	1793	1793	1793	1793	1793	1793

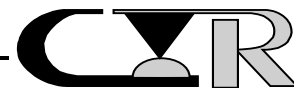
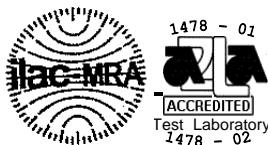


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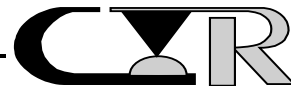
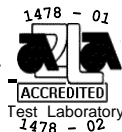
Low Level Contact Resistance - Delta Values						
Project:	214575				Spec: EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A				File No.:	21457544
Description:	PN UCC8-010-01-H-S-1-A				Tech:	
Open Circuit Voltage:	20mV				Current:	100mA
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
44-1	4.2	0.2	0.9	0.5	0.4	0.3
44-2	4.4	0.2	0.1	0.1	0.2	-0.1
44-3	4.6	-0.3	0.5	0.5	0.3	-0.2
44-4	4.5	-0.2	-0.1	0.1	0.0	1.0
44-5	4.4	-0.2	0.1	0.3	0.1	0.1
44-6	4.3	0.1	0.1	0.5	0.5	0.2
44-7	4.7	-0.4	0.0	0.1	-0.2	0.0
44-8	4.4	-0.3	0.4	0.2	0.1	0.8
44-9	4.4	0.4	0.9	0.3	0.5	0.3
44-10	4.8	-0.3	-0.1	-0.1	-0.1	-0.3
44-11	4.5	0.0	0.0	-0.1	0.0	0.2
44-12	4.4	-0.1	0.0	0.2	0.2	0.0
44-13	4.5	0.0	0.0	0.0	0.3	0.2
44-14	4.6	-0.2	0.2	0.1	0.3	0.0
44-15	4.5	-0.4	-0.2	0.1	0.1	0.0
44-16	4.6	-0.2	-0.1	-0.2	0.0	0.3
44-17	4.5	-0.2	0.0	0.0	0.1	0.1
44-18	4.8	-0.5	-0.1	-0.2	0.0	-0.1
44-19	4.8	-0.5	0.0	-0.3	-0.3	-0.4
44-20	4.5	0.0	0.0	0.0	0.0	0.2
44-21	4.7	-0.1	-0.1	-0.2	-0.2	-0.2
44-22	4.4	0.3	1.1	0.2	1.1	0.2
44-23	4.5	0.4	-0.1	0.0	0.3	0.1
44-24	4.4	0.0	0.5	0.0	0.3	-0.1
MAX	4.8	0.4	1.1	0.5	1.1	1.0
MIN	4.2	-0.5	-0.2	-0.3	-0.3	-0.4
AVG	4.5	-0.1	0.2	0.1	0.2	0.1
STD	0.2	0.3	0.4	0.2	0.3	0.3
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	1793	280	280	280	280	280
	280	1793	1793	1793	1793	1793



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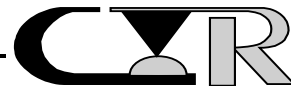
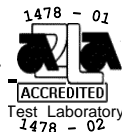
Low Level Contact Resistance - Delta Values						
Project:	214575				Spec: EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A				File No.:	21457545
Description:	PN UCC8-010-01-H-S-1-A				Tech:	
Open Circuit Voltage:	20mV				Current:	100mA
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
45-1	6.4	-2.0	-1.3	-1.6	-1.6	-2.0
45-2	4.8	-0.5	0.2	-0.3	0.5	-0.5
45-3	4.8	-0.3	-0.2	-0.1	0.3	-0.3
45-4	4.6	-0.3	-0.2	-0.1	0.1	0.1
45-5	4.8	-0.5	-0.1	-0.1	0.6	-0.3
45-6	4.4	-0.2	-0.1	0.0	0.1	0.2
45-7	4.6	-0.2	-0.1	0.0	0.2	-0.2
45-8	4.5	-0.3	-0.1	-0.2	-0.1	-0.1
45-9	4.4	-0.2	0.4	0.0	0.5	-0.1
45-10	4.8	-0.4	-0.4	0.0	0.3	-0.4
45-11	4.4	-0.2	-0.1	0.0	0.1	0.0
45-12	4.5	-0.2	-0.1	0.1	0.3	-0.1
45-13	4.8	-0.2	-0.4	-0.3	-0.3	-0.5
45-14	4.5	0.1	0.1	0.0	0.5	0.0
45-15	4.8	-0.4	0.1	-0.3	0.1	-0.2
45-16	4.3	0.2	0.4	0.3	0.4	0.0
45-17	4.4	0.0	0.1	-0.1	0.2	0.0
45-18	4.6	0.0	0.2	0.2	0.1	-0.2
45-19	4.4	-0.1	0.4	0.4	0.9	-0.1
45-20	4.5	0.0	0.0	0.2	0.5	-0.1
45-21	4.5	0.2	0.2	0.2	0.3	-0.1
45-22	4.5	0.1	0.8	0.5	0.5	0.5
45-23	4.4	0.0	0.8	0.0	0.2	-0.1
45-24	4.7	-0.2	1.0	0.0	0.1	-0.3
MAX	6.4	0.2	1.0	0.5	0.9	0.5
MIN	4.3	-2.0	-1.3	-1.6	-1.6	-2.0
AVG	4.6	-0.2	0.1	0.0	0.2	-0.2
STD	0.4	0.4	0.5	0.4	0.5	0.4
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	280	280	280	280	280	280
	1793	1793	1793	1793	1793	1793



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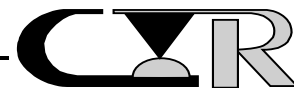
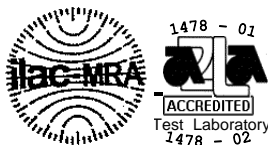
Low Level Contact Resistance - Delta Values						
Project:	214575				Spec: EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A				File No.:	21457546
Description:	PN UCC8-010-01-H-S-1-A				Tech:	
Open Circuit Voltage:	20mV				Current:	100mA
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
46-1	4.7	0.1	0.1	0.0	0.3	0.0
46-2	4.4	0.4	1.2	0.1	0.2	0.0
46-3	4.5	0.7	0.3	0.4	0.5	0.4
46-4	4.9	-0.1	0.3	-0.2	0.2	-0.2
46-5	4.4	0.1	0.1	0.5	1.0	0.6
46-6	4.3	0.2	0.5	0.0	0.4	0.3
46-7	4.6	0.0	0.7	-0.1	0.4	0.3
46-8	4.4	0.3	0.3	0.0	0.7	0.1
46-9	4.2	0.5	0.9	0.2	0.8	0.0
46-10	4.7	0.1	0.2	0.0	0.5	-0.1
46-11	4.6	0.0	0.2	0.0	0.4	-0.1
46-12	4.1	0.4	0.6	0.2	0.5	0.1
46-13	4.4	0.4	1.4	0.2	0.5	-0.1
46-14	4.3	0.4	0.8	0.3	0.7	0.2
46-15	4.4	0.4	0.7	0.3	0.9	0.0
46-16	4.3	0.3	0.5	0.1	0.5	1.0
46-17	4.2	0.5	0.9	0.1	0.4	0.0
46-18	4.4	0.5	0.2	0.0	0.4	0.1
46-19	4.5	0.2	0.3	-0.3	0.0	-0.2
46-20	4.6	0.2	0.7	-0.2	0.2	-0.4
46-21	5.4	-0.6	-0.7	-0.7	-0.6	-0.9
46-22	4.7	0.1	0.2	-0.2	0.2	-0.3
46-23	4.4	0.2	0.5	0.0	0.3	-0.1
46-24	4.6	0.2	1.0	-0.1	0.7	0.5
MAX	5.4	0.7	1.4	0.5	1.0	1.0
MIN	4.1	-0.6	-0.7	-0.7	-0.6	-0.9
AVG	4.5	0.2	0.5	0.0	0.4	0.0
STD	0.3	0.3	0.4	0.3	0.3	0.4
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	280	280	280	280	280	280
	1793	1793	1793	1793	1793	1793



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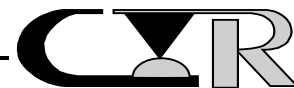
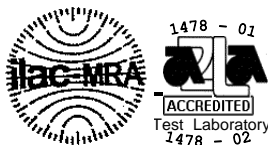
Low Level Contact Resistance - Delta Values						
Project:	214575				Spec: EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A				File No.:	21457547
Description:	PN UCC8-010-01-H-S-1-A				Tech:	
Open Circuit Voltage:	20mV				Current:	100mA
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
47-1	4.4	0.3	0.9	0.0	0.8	0.3
47-2	4.5	0.0	0.9	0.0	0.3	0.2
47-3	4.6	0.0	0.4	-0.1	0.5	0.5
47-4	4.6	0.3	0.4	0.0	0.1	0.2
47-5	4.5	0.0	0.4	0.2	1.1	0.1
47-6	4.7	-0.1	0.3	-0.3	-0.1	0.0
47-7	4.6	0.5	0.6	0.0	-0.1	0.2
47-8	4.6	0.1	0.3	-0.1	0.0	0.0
47-9	4.6	0.2	0.2	-0.2	-0.1	-0.1
47-10	4.7	0.3	0.3	-0.2	0.1	-0.2
47-11	4.6	-0.1	-0.2	-0.1	0.0	0.0
47-12	4.5	0.2	0.2	0.6	0.3	0.3
47-13	5.1	-0.6	-0.5	-0.6	-0.4	-0.6
47-14	4.4	0.5	0.1	0.0	0.3	0.1
47-15	4.6	0.0	-0.1	-0.3	-0.2	-0.2
47-16	4.7	-0.7	-0.1	-0.4	-0.3	-0.1
47-17	4.4	0.5	0.0	-0.1	-0.1	0.5
47-18	4.7	-0.2	-0.1	-0.3	-0.2	0.7
47-19	4.8	-0.3	0.0	-0.4	0.3	-0.2
47-20	5.1	-0.4	-0.4	-0.7	-0.5	-0.2
47-21	4.4	0.3	0.4	0.4	1.1	0.4
47-22	4.5	0.3	1.0	0.1	0.6	0.6
47-23	4.4	0.1	0.9	0.2	1.4	0.2
47-24	4.4	0.1	0.3	0.1	1.4	0.3
MAX	5.1	0.5	1.0	0.6	1.4	0.7
MIN	4.4	-0.7	-0.5	-0.7	-0.5	-0.6
AVG	4.6	0.1	0.3	-0.1	0.3	0.1
STD	0.2	0.3	0.4	0.3	0.6	0.3
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	280	280	280	280	280	1793
	1793	1793	1793	1793	1793	



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Low Level Contact Resistance - Delta Values						
Project:	214575				Spec: EIA 364 TP 23	
Customer:	Samtec			Subgroup: Group 5 No Lube		
Product:	HSEC8-150-01-S-DV-A				File No.:	21457548
Description:	PN UCC8-010-01-H-S-1-A				Tech:	
Open Circuit Voltage:	20mV				Current:	100mA
Units:	milliohms					
Temp °C	20°C	20°C	20°C	20°C	22°C	20°C
R.H. %	35%	35%	30%	35%	29%	31%
Date:	16-Dec-2014	16-Dec-2014	31-Dec-2014	5-Jan-2015	12-Jan-2015	13-Jan-2015
Pos. ID	Initial	20X	MFG 7d	1X New Card	MFG 7d	1X New Card
			Unmated		Mated	
48-1	4.7	-0.3	0.3	0.2	0.5	-0.2
48-2	4.6	-0.3	-0.1	0.0	0.3	-0.2
48-3	5.0	-0.6	-0.4	-0.3	-0.1	-0.3
48-4	4.5	0.0	0.0	0.2	0.5	0.4
48-5	4.5	-0.1	0.0	0.0	0.2	0.6
48-6	4.5	-0.1	0.0	0.2	0.5	0.6
48-7	4.5	0.1	-0.1	0.3	0.5	0.2
48-8	4.4	0.1	-0.1	0.2	0.8	0.3
48-9	4.6	0.0	0.0	0.0	0.2	0.3
48-10	4.6	0.1	-0.1	0.0	0.3	0.2
48-11	4.6	0.3	0.5	0.8	0.9	0.5
48-12	4.4	0.3	0.0	0.6	0.4	0.2
48-13	4.4	0.2	0.1	0.2	0.4	0.2
48-14	4.5	0.2	0.1	0.1	0.7	0.1
48-15	4.4	0.1	0.2	0.2	0.2	0.4
48-16	4.3	0.4	0.1	0.2	0.5	0.4
48-17	4.4	0.2	0.1	0.3	0.2	0.5
48-18	4.7	0.0	0.0	0.2	0.4	0.2
48-19	4.2	0.2	0.2	0.4	1.5	0.5
48-20	4.6	0.1	0.2	0.2	0.7	0.5
48-21	4.4	0.4	0.3	0.2	1.2	0.4
48-22	4.6	0.0	0.1	0.6	1.1	0.2
48-23	4.5	0.1	0.2	0.9	0.4	0.4
48-24	4.7	-0.3	0.1	0.6	0.1	-0.2
MAX	5.0	0.4	0.5	0.9	1.5	0.6
MIN	4.2	-0.6	-0.4	-0.3	-0.1	-0.3
AVG	4.5	0.0	0.1	0.3	0.5	0.3
STD	0.2	0.2	0.2	0.3	0.4	0.3
Open	0	0	0	0	0	0
Tech:	BE	BE	BE	BE	BE	BE
EQUIP. ID	280	280	280	280	280	280
	1793	1793	1793	1793	1793	1793



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