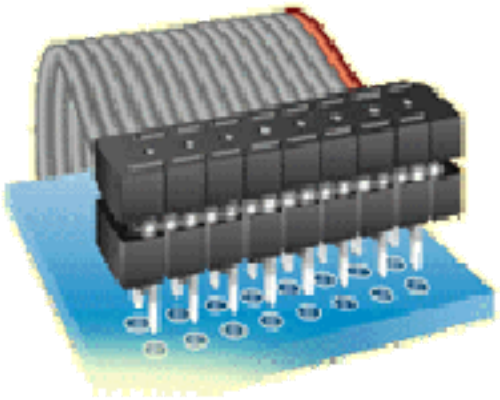
Project Number: Design Verification Test Report	Tracking Code: TC1023—3443_Report_Rev_1		
Requested by: Mark Shireman	Date: 1/25/2011	Product Rev: 0	
Part #: IDMD-32-D-05.00-A	Lot #: na	Tech: Aaron McKim Tony Wagoner	Eng: Eric Mings
Part description: IDMD			Qty to test: 30
Test Start: 07/16/2009	Test Completed: 8/19/2010		



DESIGN VERIFICATION TEST REPORT

IDMD

IDMD-32-D-05.00-A

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

SCOPE

To perform the following tests: Design verification test. See test plan.

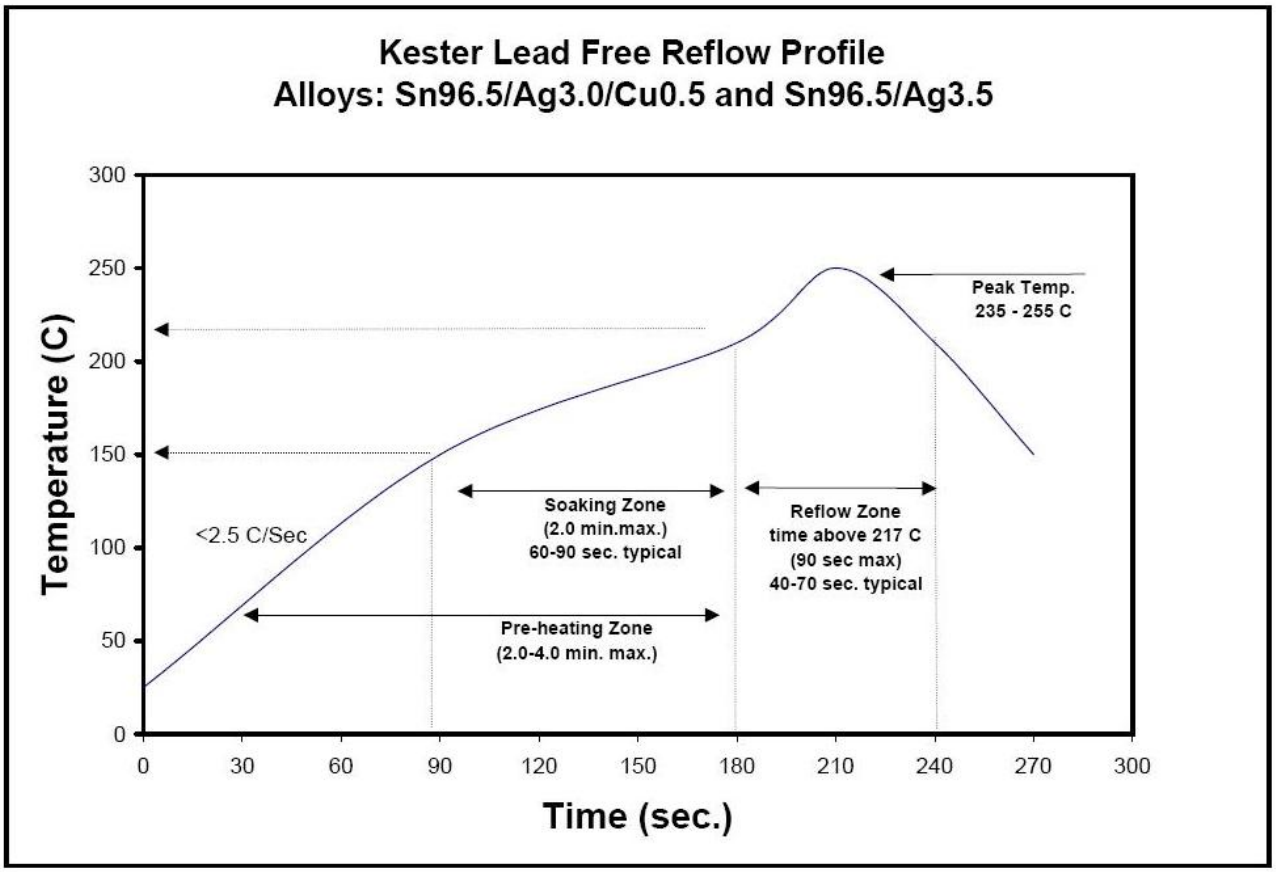
APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

1) All materials were manufactured in accordance with the applicable product specification.
2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
3) After soldering, the parts to be used for LLCR and DWV/IR testing were cleaned according to TLWI-0001.
4) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
5) The automated procedure is used with aqueous compatible soldering materials.
6) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
7) Any additional preparation will be noted in the individual test sequences.
8) Solder Information: Lead Free
9) Re-Flow Time/Temp: See accompanying profile.
10) Samtec Test PCBs used:

TYPICAL OVEN PROFILE (Soldering Parts to Test Boards)



FLOWCHARTS

IR & DWV

TEST STEP	GROUP A1 2 Mated Sets Break Down - Pin to Pin	GROUP A2 2 Unmated of Part # Being Tested Break Down - Pin to Pin	GROUP A3 2 Unmated of Mating Part # Break Down - Pin to Pin	GROUP B1 2 Mated Sets Pin to Pin
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Aging (both sets unmated)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (both sets unmated)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

DWV on group B1 to be performed at Test Voltage

DWV test voltage is equal to 75% of the lowest break down voltage from group A1, A2 or A3

Thermal Aging = EIA-364-17, Test Condition 4 (105°C)

Time Condition 'B' (250 Hours)

Humidity = EIA-364-31, Test Condition B (240 Hours)

and Method III (+25°C to +65°C @ 90% RH to 98% RH)

ambient pre-condition and delete steps 7a and 7b

IR = EIA-364-21

DWV = EIA-364-20, Test Condition 1

Additional Groups Below May Be Needed Based Upon Part Options and Geometry

TEST STEP	GROUP C1 2 Mated Sets Break Down - Row to Row	GROUP C2 2 Unmated of Part # Being Tested Break Down - Row to Row	GROUP C3 2 Unmated of Mating Part # Break Down - Row to Row	GROUP D1 2 Mated Sets Row to Row
01	DWV/Break Down Voltage	DWV/Break Down Voltage	DWV/Break Down Voltage	IR & DWV at test voltage (on both mated sets and on each connector unmated)
02				Thermal Aging (both sets unmated)
03				IR & DWV at test voltage (on both mated sets and on each connector unmated)
04				Cyclic Humidity (both sets unmated)
05				IR & DWV at test voltage (on both mated sets and on each connector unmated)

FLOWCHARTS CONTINUED

DOUBLE ROW

Current Carrying Capacity **3 Mated Assemblies Each**

TEST STEP	GROUP B1 3 Mated Assemblies 2 CONTACT POWERED	GROUP B2 3 Mated Assemblies 4 CONTACTS POWERED	GROUP B3 3 Mated Assemblies 6 CONTACTS POWERED	GROUP B4 3 Mated Assemblies 8 CONTACTS POWERED	GROUP B5 3 Mated Assemblies ALL CONTACTS POWERED
01	CCC	CCC	CCC	CCC	CCC

(TIN PLATING) - Tabulate calculated current at RT, 65°C, 75°C and 95°C
after derating 20% and based on 105°C
(GOLD PLATING) - Tabulate calculated current at RT, 85°C, 95°C and 115°C
after derating 20% and based on 125°C
CCC, Temp rise = EIA-364-70

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

THERMAL:

1) EIA-364-17, *Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors.*
2) Test Condition 4 at 105° C.
3) Test Time Condition B for 250 hours.
4) All test samples are pre-conditioned at ambient.
5) All test samples are exposed to environmental stressing in the mated condition.

HUMIDITY:

1) Reference document: EIA-364-31, *Humidity Test Procedure for Electrical Connectors.*
2) Test Condition B, 240 Hours.
3) Method III, +25° C to + 65° C, 90% to 98% Relative Humidity excluding sub-cycles 7a and 7b.
4) All samples are pre-conditioned at ambient.
5) All test samples are exposed to environmental stressing in the mated condition.

TEMPERATURE RISE (Current Carrying Capacity, CCC):

1) EIA-364-70, *Temperature Rise versus Current Test Procedure for Electrical Connectors and Sockets*.
2) When current passes through a contact, the temperature of the contact increases as a result of I^2R (resistive) heating.
3) The number of contacts being investigated plays a significant part in power dissipation and therefore temperature rise.
4) The size of the temperature probe can affect the measured temperature.
5) Copper traces on PC boards will contribute to temperature rise:
    a. Self heating (resistive)
    b. Reduction in heat sink capacity affecting the heated contacts
6) A de-rating curve, usually 20%, is calculated.
7) Calculated de-rated currents at three temperature points are reported:
    a. Ambient
    b. 80^{o} C
    c. 95^{o} C
    d. 115^{o} C
8) Typically, neighboring contacts (in close proximity to maximize heat build up) are energized.
9) The thermocouple (or temperature measuring probe) will be positioned at a location to sense the maximum temperature in the vicinity of the heat generation area.
10) A computer program, *TR 803.exe*, ensures accurate stability for data acquisition.
11) Hook-up wire cross section is larger than the cross section of any connector leads/PC board traces, jumpers, etc.
12) Hook-up wire length is longer than the minimum specified in the referencing standard.

INSULATION RESISTANCE (IR):

To determine the resistance of insulation materials to leakage of current through or on the surface of these materials when a DC potential is applied.

1) PROCEDURE:
    a. Reference document: EIA-364-21, *Insulation Resistance Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Electrification Time 2.0 minutes
        iii. Test Voltage (500 VDC) corresponds to calibration settings for measuring resistances.
2) MEASUREMENTS:
3) When the specified test voltage is applied (VDC), the insulation resistance shall not be less than 5000 megohms.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

To determine if the sockets can operate at its rated voltage and withstand momentary over potentials due to switching, surges, and other similar phenomenon. Separate samples are used to evaluate the effect of environmental stresses so not to influence the readings from arcing that occurs during the measurement process.

1) PROCEDURE:
    a. Reference document: EIA-364-20, *Withstanding Voltage Test Procedure for Electrical Connectors*.
    b. Test Conditions:
        i. Between Adjacent Contacts or Signal-to-Ground
        ii. Barometric Test Condition 1
        iii. Rate of Application 500 V/Sec
        iv. Test Voltage (VAC) until breakdown occurs
2) MEASUREMENTS/CALCULATIONS
    a. The breakdown voltage shall be measured and recorded.
    b. The dielectric withstanding voltage shall be recorded as 75% of the minimum breakdown voltage.
    c. The working voltage shall be recorded as one-third (1/3) of the dielectric withstanding voltage (one-fourth of the breakdown voltage).

RESULTS

Temperature Rise, CCC at a 20% de-rating

- **CCC for a 30°C Temperature Rise----------3.0A per contact with 2 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------2.4A per contact with 4 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------2.1A per contact with 6 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------2.0A per contact with 8 adjacent contacts powered**
- **CCC for a 30°C Temperature Rise----------1.5A per contact with all adjacent contacts powered**

Insulation Resistance minimums, IR

Pin to Pin

- **Initial**
  - **Mated----------100,000 Meg Ω ---------- Pass**
- **Thermal**
  - **Mated----------100,000 Meg Ω ---------- Pass**
- **Humidity**
  - **Mated----------100,000 Meg Ω ---------- Pass**

Row to Row

- **Initial**
  - **Mated----------100,000 Meg Ω ---------- Pass**
- **Thermal**
  - **Mated---------- 50,000 Meg Ω ---------- Pass**
- **Humidity**
  - **Mated----------100,000 Meg Ω ---------- Pass**

Dielectric Withstanding Voltage minimums, DWV

- **Minimums**
  - **Breakdown Voltage---------- 1500 VAC**
  - **Test Voltage ---------- 1125 VAC**
  - **Working Voltage ----------375 VAC**

Pin to Pin

- **Initial DWV ----------Passed**
- **Thermal DWV----------Passed**
- **Humidity DWV----------Passed**

Row to Row

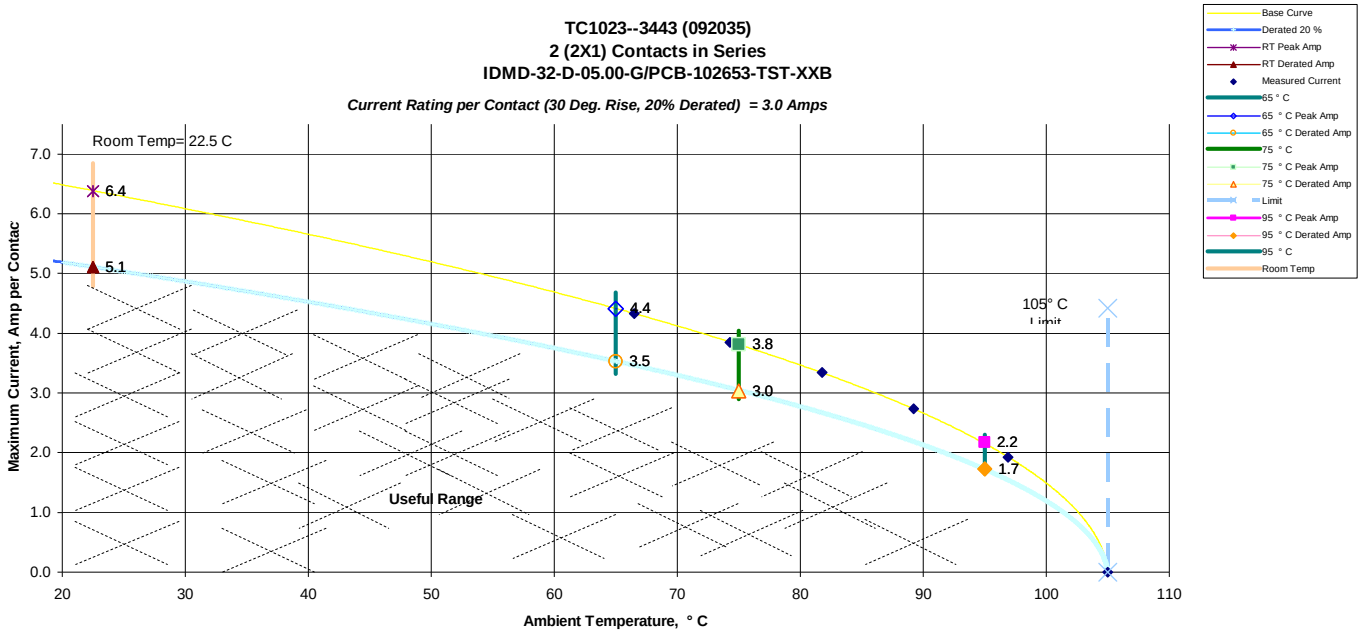
- **Initial DWV ----------Passed**
- **Thermal DWV----------Passed**
- **Humidity DWV----------Passed**

DATA SUMMARIES

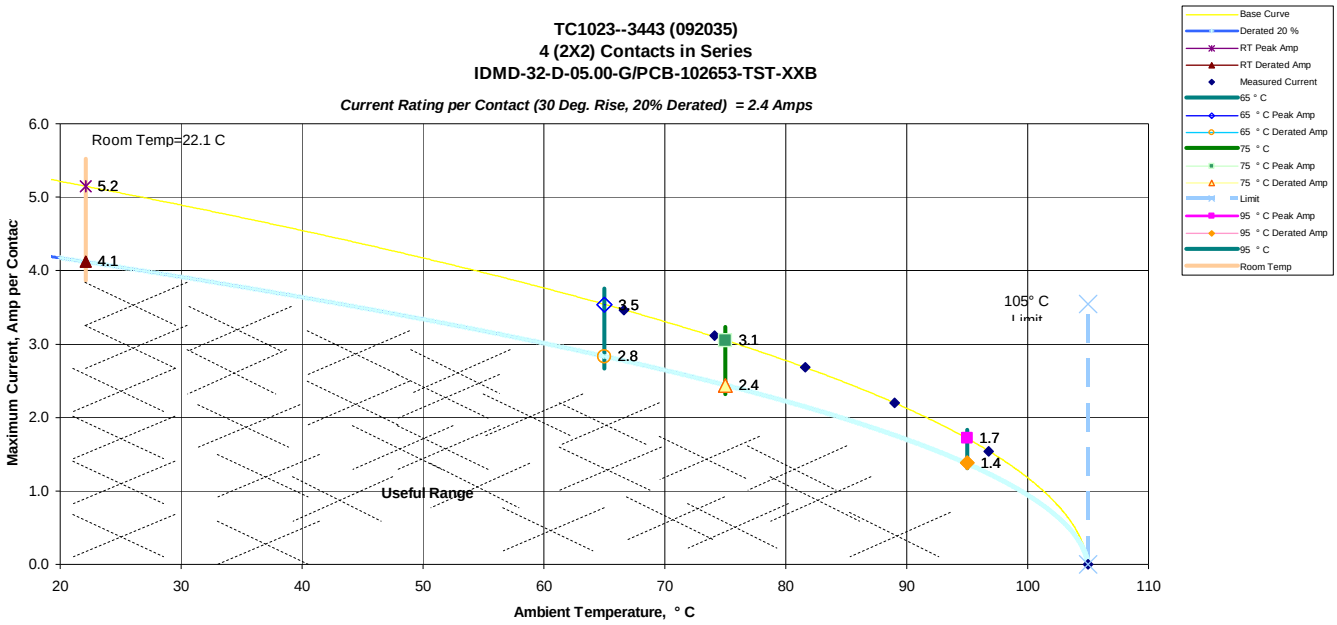
TEMPERATURE RISE - (Current Carrying Capacity, CCC):

1) High quality thermocouples whose temperature slopes track one another were used for temperature monitoring.
2) The thermocouples were placed at a location to sense the maximum temperature generated during testing.
3) Temperature readings recorded are those for which three successive readings, 15 minutes apart, differ less than 1° C (computer controlled data acquisition).
4) Adjacent contacts were powered:

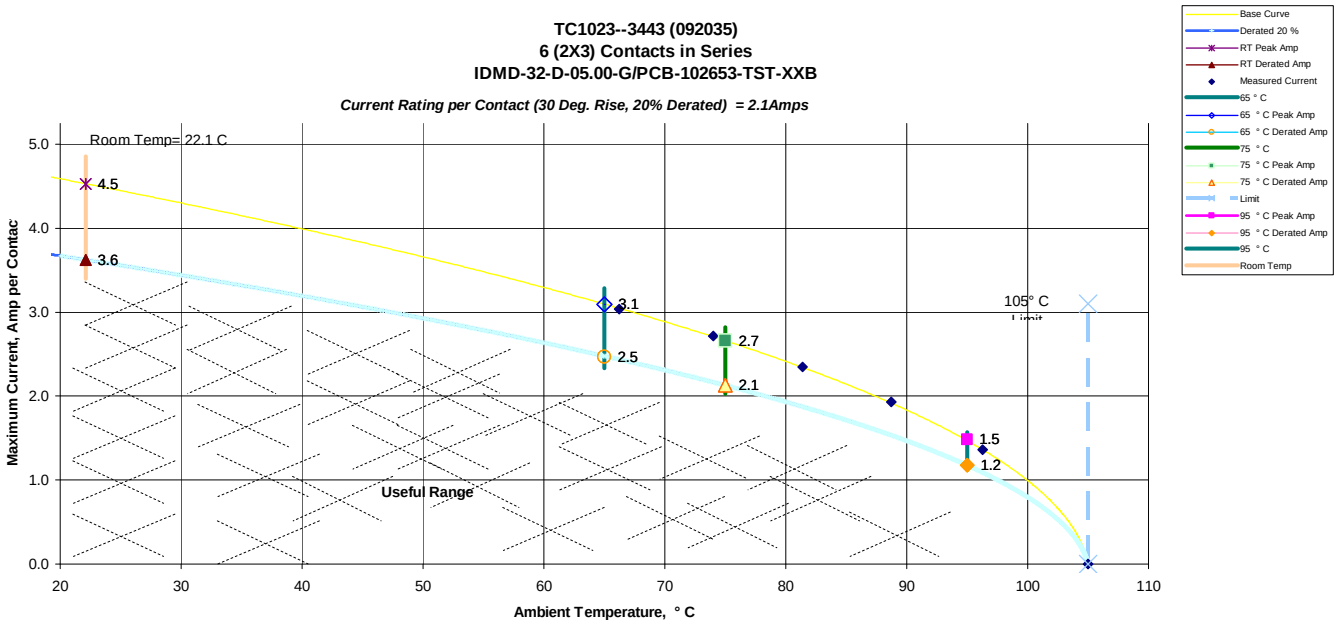
    a. Linear configuration with 2 adjacent conductors/contacts powered



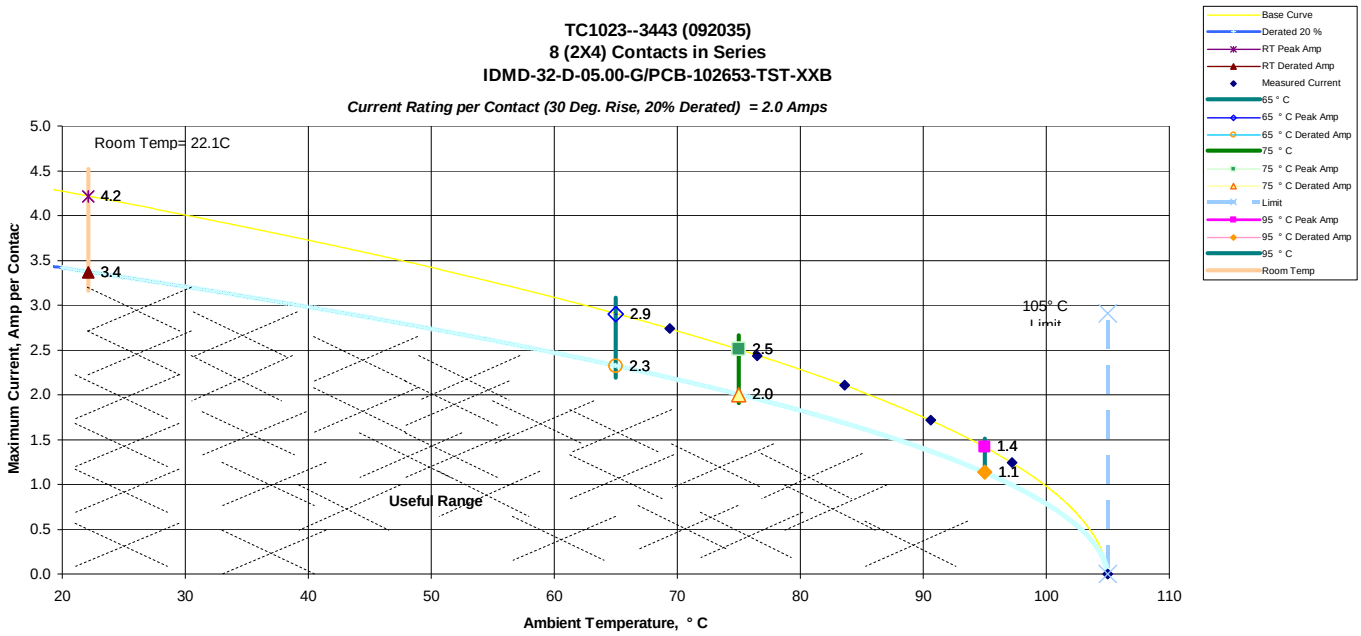
b. Linear configuration with 4 adjacent conductors/contacts powered



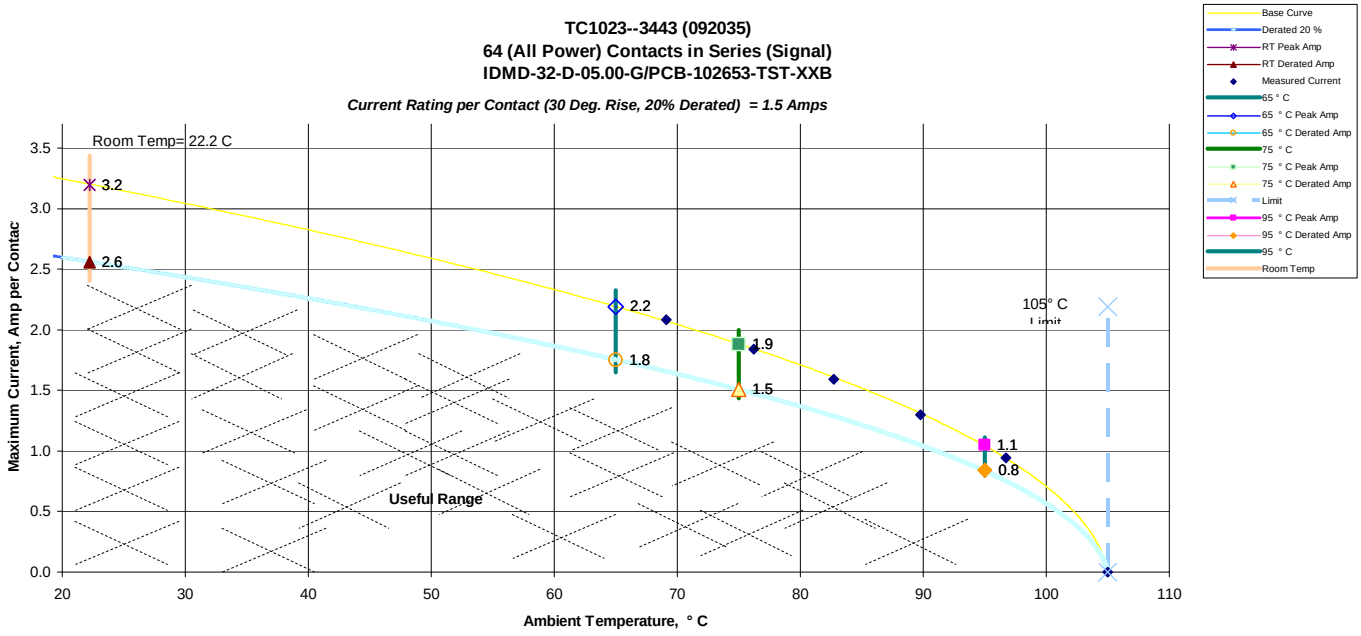
c. Linear configuration with 6 adjacent conductors/contacts powered



d. Linear configuration with 8 adjacent conductors/contacts powered



e. Linear configuration with all adjacent conductors/contacts powered



DATA SUMMARIES CONTINUED

INSULATION RESISTANCE (IR):

	Pin to Pin		
	Mated	Unmated	Unmated
Minimum	**IDMD/PCB**	**IDMD**	**PCB**
Initial	100000	Not Tested	Not Tested
Thermal	100000	Not Tested	Not Tested
Humidity	100000	Not Tested	Not Tested

	Row to Row		
	Mated	Unmated	Unmated
Minimum	**IDMD/PCB**	**IDMD**	**PCB**
Initial	100000	Not Tested	Not Tested
Thermal	50000	Not Tested	Not Tested
Humidity	100000	Not Tested	Not Tested

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Voltage Rating Summary	
Minimum	**IDMD/PCB**
Break Down Voltage	1500
Test Voltage	1125
Working Voltage	375

Pin to Pin	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

Row to Row	
Initial Test Voltage	Passed
After Thermal Test Voltage	Passed
After Humidity Test Voltage	Passed

DATA

INSULATION RESISTANCE (IR):

Initial Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X		
Sample#	IDMD/PCB	IDMD	PCB
092035-003	100000		
092035-004	100000		
	Row to Row		
	Mated	Unmated	
	X		
Sample#	IDMD/PCB	IDMD	PCB
092035-003	100000		
092035-004	100000		

Thermal Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	x		
Sample#	IDMD/PCB	IDMD	PCB
092035-003	100000		
092035-004	100000		
	Row to Row		
	Mated	Unmated	
	x		
Sample#	IDMD/PCB	IDMD	PCB
092035-003	50000		
092035-004	50000		

Humidity Insulation Resistance
Measured In Meg Ohms

	Pin to Pin		
	Mated	Unmated	
	X		
Sample#	IDMD/PCB	IDMD	PCB
092035-003	100000		
092035-004	100000		

	Row to Row		
	Mated	Unmated	
	X		
Sample#	IDMD/PCB	IDMD	PCB
092035-003	100000		
092035-004	100000		

DIELECTRIC WITHSTANDING VOLTAGE (DWV):

Initial DWV
Test Voltage= 1125

	Pin to Pin		
	Mated	Unmated	
Sample#	IDMD/PCB	IDMD	PCB
092035-003	1125		
092035-004	1125		
	Row to Row		
	Mated	Unmated	
Sample#	IDMD/PCB	IDMD	PCB
092035-003	1125		
092035-004	1125		

Thermal Test Voltage
Test Voltage= 1125

	Pin to Pin		
	Mated	Unmated	
Sample#	IDMD/PCB	IDMD	PCB
092035-003	1125		
092035-004	1125		
	Row to Row		
	Mated	Unmated	
Sample#	IDMD/PCB	IDMD	PCB
092035-003	1125		
092035-004	1125		

DATA CONTINUED

Humidity Test Voltage
Test Voltage= 1125

	Pin to Pin		
	Mated	Unmated	
Sample#	IDMD/PCB	IDMD	PCB
092035-003	1125		
092035-004	1125		
	Row to Row		
	Mated	Unmated	
Sample#	IDMD/PCB	IDMD	PCB
092035-003	1125		
092035-004	1125		

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: MO-03
Description: Multimeter /Data Acquisition System
Manufacturer: Keithley
Model: 2700
Serial #: 0791975
Accuracy: See Manual
… Last Cal: 06/16/09, Next Cal: 06/16/2010

Equipment #: OV-03
Description: Cascade Tek Forced Air Oven
Manufacturer: Cascade Tek
Model: TFO-5
Serial #: 0500100
Accuracy: Temp. Stability: +/-.1C/C change in ambient
… Last Cal: 06/16/2009, Next Cal: 06/16/2010

Equipment #: THC-01
Description: Temperature/Humidity Chamber
Manufacturer: Thermotron
Model: SM-8-7800
Serial #: 30676
Accuracy: See Manual
… Last Cal: 02/16/2010, Next Cal: 08/16/2010

Equipment #: HPM-01
Description: Hipot Megommeter
Manufacturer: Hipotronics
Model: H306B-A
Serial #: M9905004
Accuracy: 2 % Full Scale Accuracy
… Last Cal: 11/30/2009, Next Cal: 11/30/2010