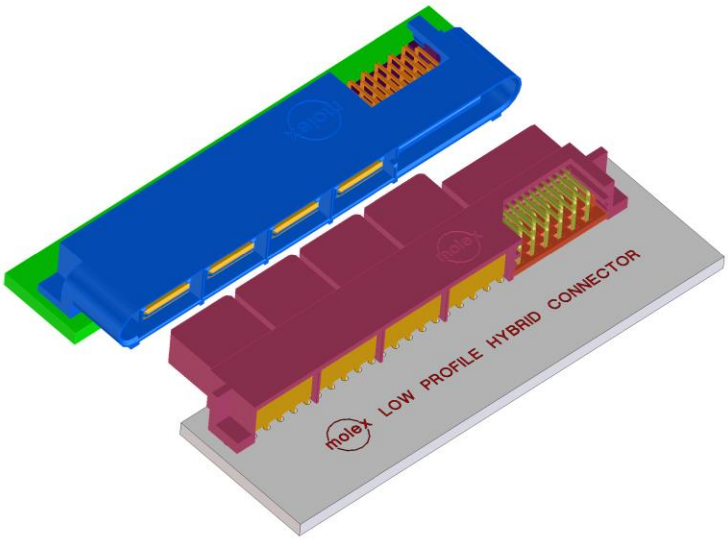
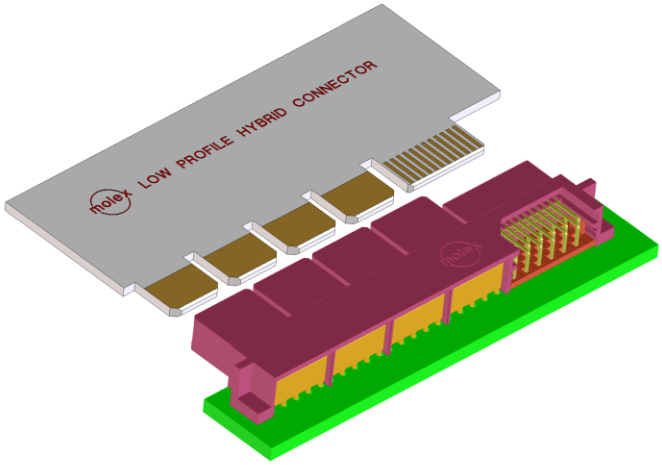
PRODUCT SPECIFICATION

PRODUCT SPECIFICATION FOR LOW PROFILE HYBRID (LPH)® ™ INTERCONNECT SYSTEM





REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
G	EC No: 177250 DATE: 2018/5/25	PRODUCT SPECIFICATION FOR LOW PROFILE HYBRID (LPH) INTERCONNECT SYSTEMS	1 of 14

DOCUMENT NUMBER:	CREATED / REVISED BY:	CHECKED BY:	APPROVED BY:
PS-45984-001	ALIN06	JZENG	KHLIM

1.0 SCOPE

This specification covers the performance requirements and test methods for the following products listed by series numbers:

45984-****	LPH Receptacle Assembly
45985-****	LPH Plug Assembly

1. The Low Profile Header (LPH) interconnect system consists of a right angle plug and a right angle receptacle header. Each can be configured with 4 to 10 power contacts and 12 to 40 signal contacts. Additional options include guides and board mounting pegs. Receptacle can also mate to 1.57±0.15 mm / .062"±.006" thick card edge. Both plug and receptacle connectors are through-hole solder into printed circuit boards and provide co-planer mate-ability. For wave soldering, it is recommended to use interference peg design (Diameter is 3.30mm) or use fixture to hold the part down during soldering.
When mounting the connector into PCB by manual operation, it is required to press two side of the connector with even force on the connector to insure the connector can be inserted into PCB smoothly.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAMES

LPH Right Angle Receptacle Header Assembly	Series 45984
LPH Right Angle Plug Header Assembly	Series 45985

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

Dimensions: See individual sales drawings.
Material: RoHs compliant materials (LCP for housings, copper alloy for terminals).
Plating: Gold on mating surfaces and tin the PC tail with nickel under-plating overall.

2.3 SAFETY AGENCY APPROVALS

UL File Number: E29179
CSA File Number: LR19980

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Refer to the appropriate sales drawings and other sections of this specification for the necessary referenced documents and specifications.

3.1 See sales drawings and the other sections of this specifications for the necessary referenced documents and specification.

3.2 Assembly Drawings: SD-45984-***, SD-45985-***

4.0 RATINGS

4.1 VOLTAGE

250 Volts AC (RMS)/DC (Power)
30 Volts DC (Signal)

Connector Rating per UL-1977
Connector voltage rating meets the connector approval level defined by UL 1977, Sect. 11 for spacing per table 11.1. Example: 1.2 mm for ≥ 250 volt; 3.2 mm for ≤ 250 volt.

Exception taken for spacing less than those specified are permitted, if the device complies with the requirements in the dielectric voltage withstanding test per Sect. 17.

Application Voltage Guideline
For application voltage requirements please refer to UL-60950 or other applicable standards, the creepage & clearance also needs to be determined based upon pads/traces on the PCB.

4.2 CURRENT **

When tested in accordance with EIA-364-TP70:
(Tested to 30deg.C max. rise above ambient)

Ckt. Size	4	6	8	10
Current	30 Amperes	27 Amperes	23 Amperes	20 Amperes

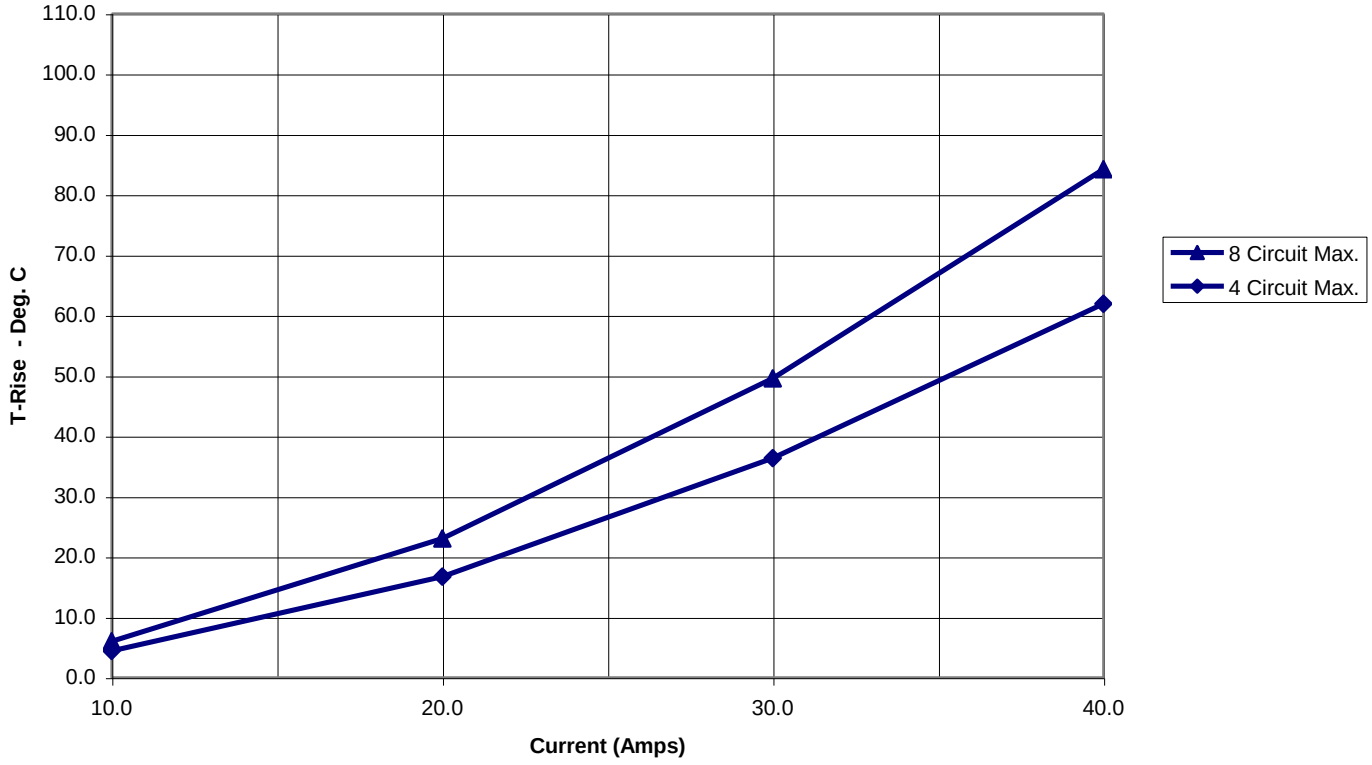
Signal Contact: 1 Ampere per contact

*** Current rating is application dependent. Above rating is for reference only. Appropriate de-rating is required per ambient conditions, copper weight of PCB needed to achieve thermal balance, gross heating from adjacent components, and other factors that influence connector performance.*

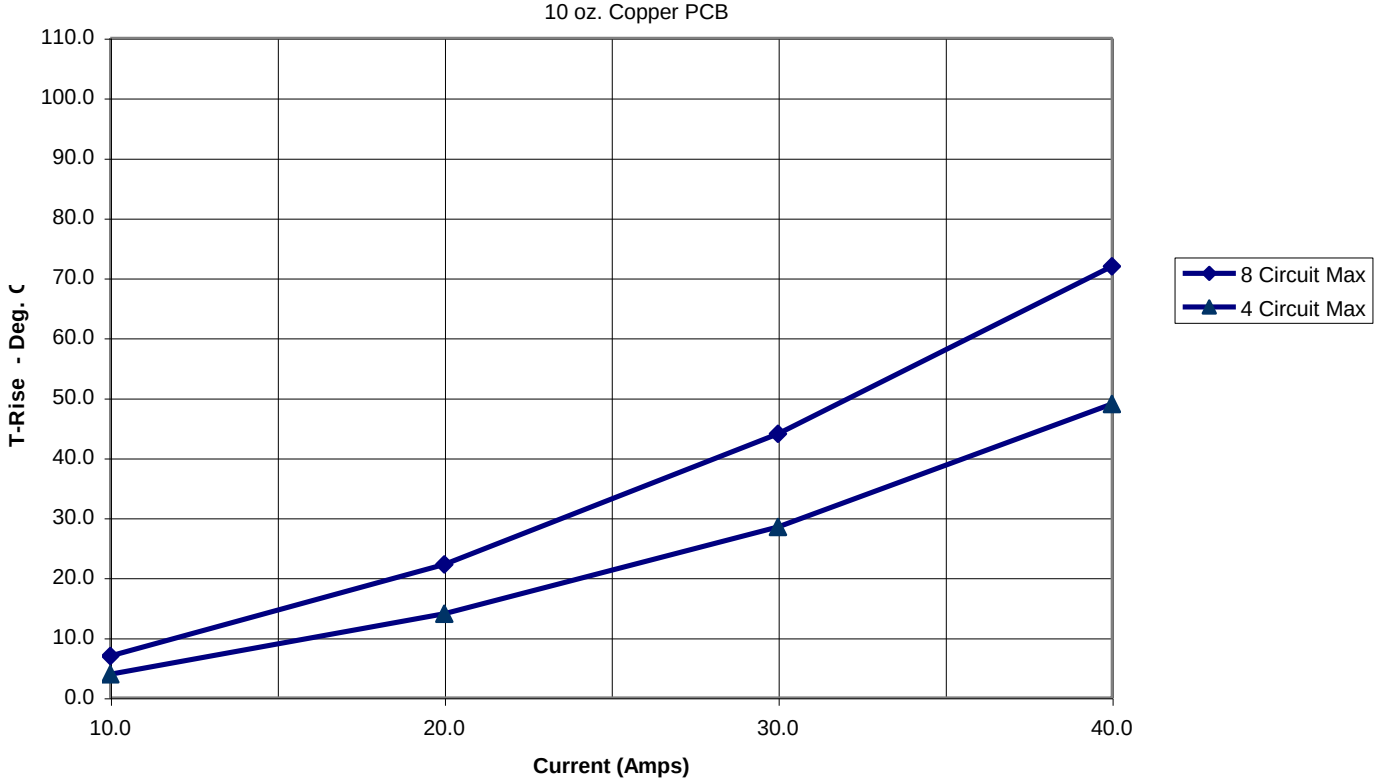
4.2.1 CURRENT INTERRUPTION

30 Amps @ 48 Vdc – Power
1.0 Amp @ 30 Vdc - Signal

Low Profile Hybrid
Temperature Rise vs. Current
8 Circuit & 4 Circuit Max.
4 oz. Copper PCB



Low Profile Hybrid
Temperature Rise vs. Current
8 Circuit & 4 Circuit Max.
10 oz. Copper PCB

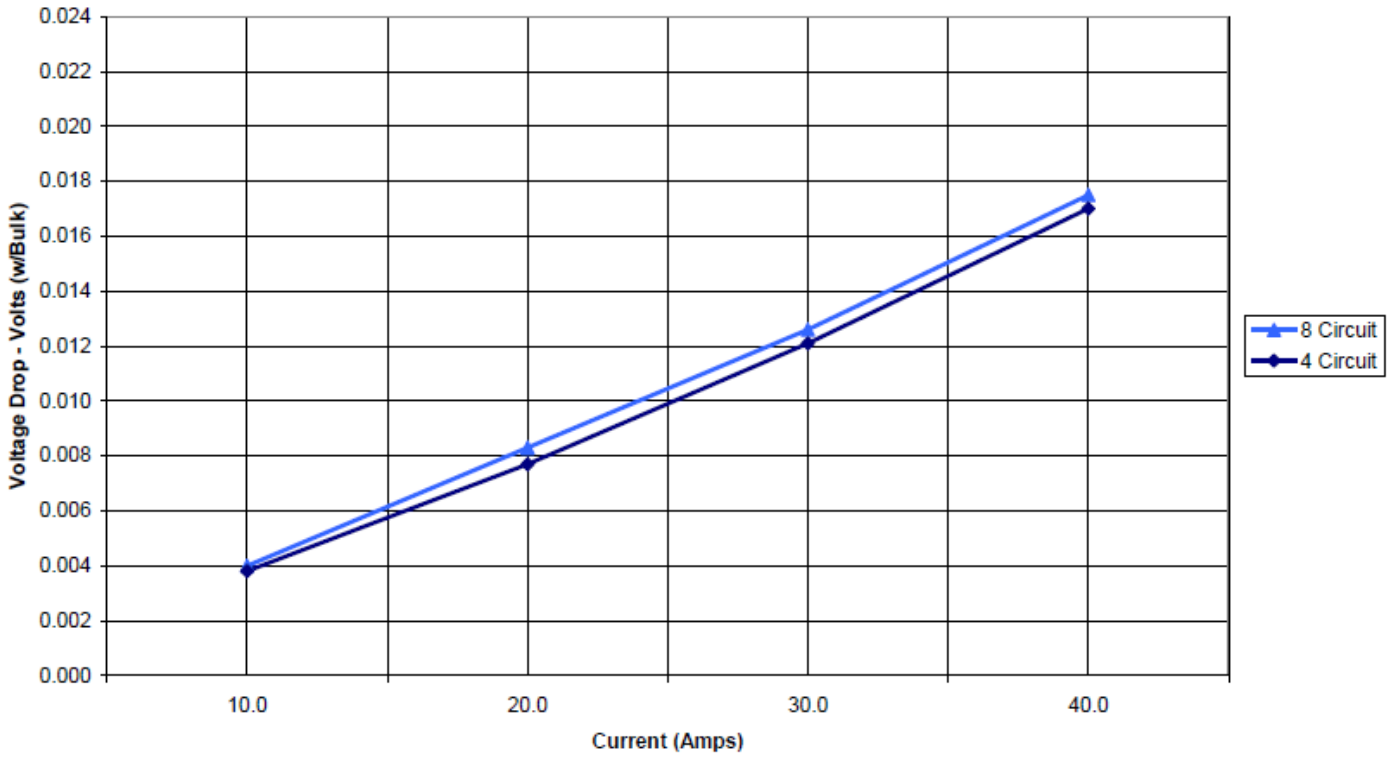


Low Profile Hybrid

Voltage Drop Vs. Current

8 Circuit & 4 circuit

4 oz. Copper PCB

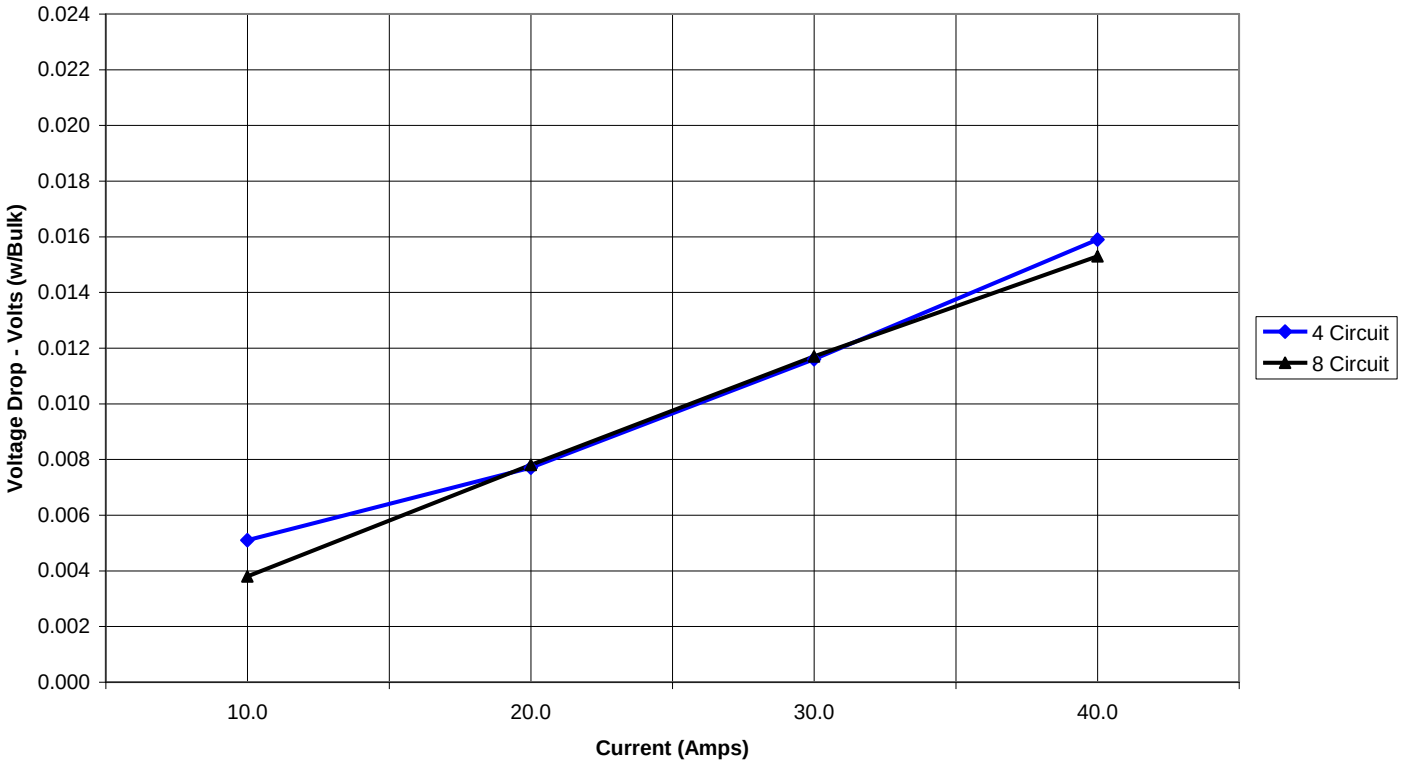


Low Profile Hybrid

Voltage Drop Vs. Current

8 Circuit & 4 Circuit

10 oz. Copper PCB



4.3 TEMPERATURE

Operating: -40°C to +105°C (including T-rise from applied current)
Non-operating: -40°C to +105°C

4.4 DURABILITY

250 Cycles

5.0 QUALIFICATION

Laboratory conditions and sample selection are in accordance with EIA-364-1000

6.0 PERFORMANCE

6.1 ELECTRICAL PERFORMANCE

DESCRIPTION	TEST CONDITION	REQUIREMENT
CONTACT RESISTANCE (LOW LEVEL) (EIA-364-23)	Mate connectors, apply maximum voltage of 20mV and a current of 100 mA	Maximum Change: Signal Contact: 15 milliohm Power Contact: 0.75 milliohm
CONTACT RESISTANCE (@ RATED CURRENT)	Mate connectors, apply maximum voltage of 20mV at the rated current.	Maximum Change: Signal Contact: 15 milliohm Power Contact: 0.75 milliohm
INSULATION RESISTANCE (EIA-364-21)	Apply 500 VDC between adjacent terminals or ground.	5,000 megaohms minimum
DIELECTRIC WITHSTANDING VOLTAGE (EIA-364-20)	Apply 1500 VDC for 1 minute between adjacent terminals or ground.	No breakdown
TEMPERATURE RISE	Mate connectors Measure T-Rise @ Rated Current After 96 Hours.	30 C T-Rise

6.2 MECHANICAL PERFORMANCE

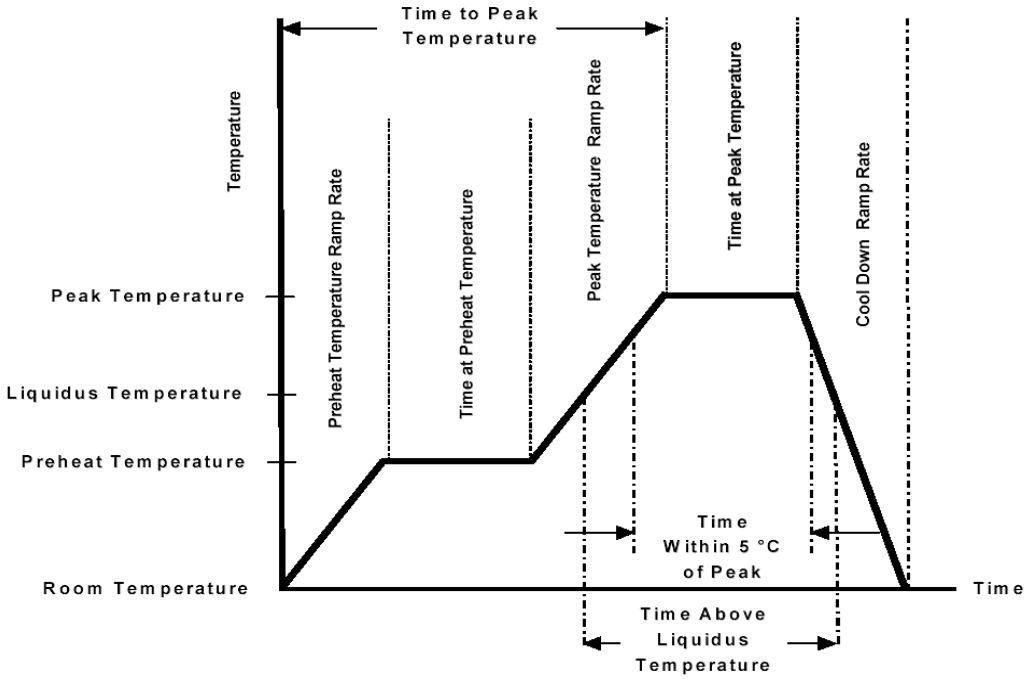
ITEM	TEST CONDITION	REQUIREMENT
MATING FORCE, SINGLE CIRCUIT (EIA-364-37)	Mate connectors at a rate of 25 +/- 6 mm per minute.	110 g per signal pin 700 g per Power Contact (Maximum Values)
UNMATING FORCE, SINGLE CIRCUIT (EIA-364-37)	Unmate connectors at a rate of 25 +/- 6 mm per minute.	15 g per signal pin 150 g per Power Contact (Minimum Values)
DURABILITY W/O ENVIRONMENT (EIA-364-09)	Mate connectors 250 cycles at a maximum rate of 10 cycles per minute.	Maximum Change: Signal Contact: 15 milliohm Power Contact: 0.75 milliohm
NORMAL FORCE	Apply perpendicular force to terminal at rate of 25 +/- 6mm per minute	90 g per signal pin 300 g per Power Contact (Nominal Values)
Maximum connector(with pegs) mounting force into PCB	Mounting connectors at a rate of 25 +/- 6 mm per minute. Both pegs should be inserted into PCB at the same time with even force instead of slanted or one sided insertion	Interference peg: 11000 g. (Maximum Values)

6.3 ENVIRONMENTAL PERFORMANCE

ITEM	TEST CONDITION	REQUIREMENT
VIBRATION (EIA-364-28)	Mate connectors and vibrate per EIA-364-28, test condition D, 15 minutes each axis	Maximum Change: Signal Contact: 15 milliohm Power Contact: 0.75 milliohm
THERMAL SHOCK (EIA-364-32)	Mate connectors, expose to 5 cycles from –55 deg. C to 85 deg. C per EIA-364-TP-32	Maximum Change: Signal Contact: 15 milliohm Power Contact: 0.75 milliohm
TEMPERATURE LIFE (EIA-364-17)	Mate Connectors, expose to 180 hours at 105 °C Per EIA-364-17 Method A	Maximum Change: Signal Contact: 15 milliohm Power contact: 0.75 milliohm
CYCLIC TEMPERATURE & HUMIDITY (EIA-364-31)	Mate connectors: expose to 24 cycles from 25 °C / 80% RH to 65 °C / 50% RH	Maximum Change: Signal Contact: 15 milliohm Power Contact: 0.75 milliohm
MIXED FLOWING GAS	168 hours unmated, 72 hours mated, per EIA-364-65 Class IIA	Maximum Change: Signal Contact: 15 milliohm Power Contact: 0.75 milliohm
SOLDER RESISTENCE (Wave)	Submerge terminal tails in solder. Dwell: 2.0 +/- 0.5 sec. Solder Temp: 260° C Max.	Visual: No damage to insulator material

6.4 SOLDERING PROFILE

(This profile is per JEDEC J-STD-020D.1 and it is for guide line only; please see notes for additional information)



Description	Requirement
Average Ramp Rate	3°C/sec Max
Preheat Temperature	150°C Min to 200°C Max
Preheat Time	60 to 180 sec
Ramp to Peak	3°C/sec Max
Time over Liquids (217°C)	60 to 150 sec
Peak Temperature	260 +0/-5°C
Time within 5°C of Peak	20 to 40 sec
Ramp - Cool Down	6°C/sec Max
Time 25°C to Peak	8 min Max

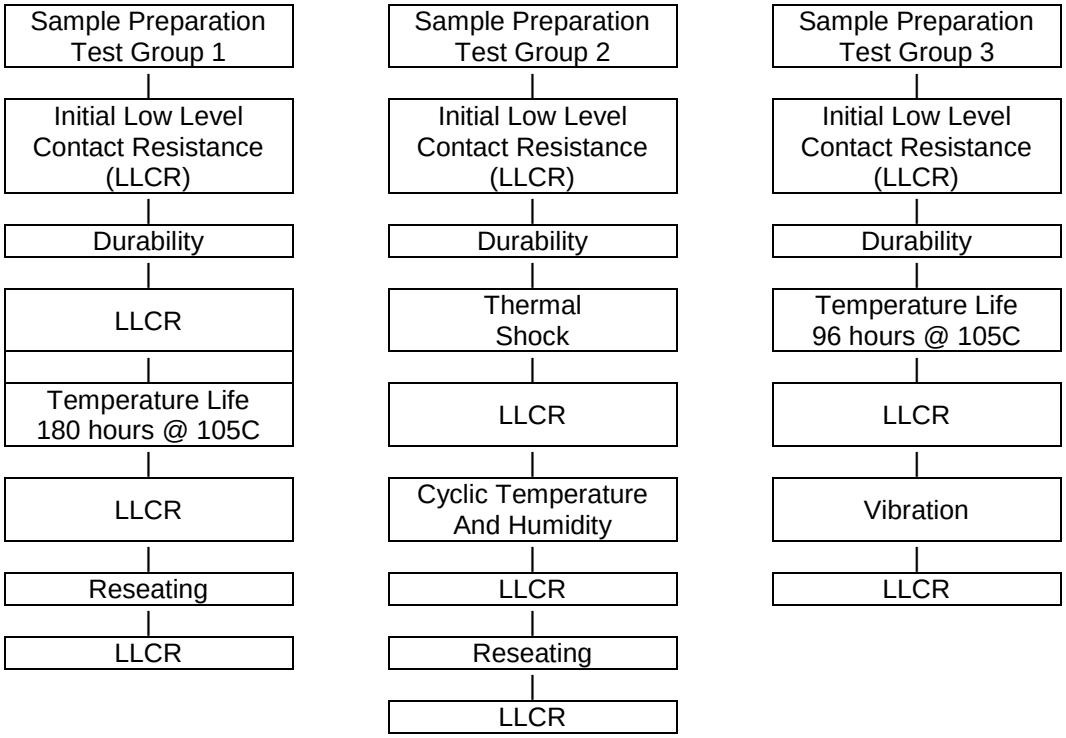
Notes:

1. Temperature indicated refers to the PCB surface temperature at solder tail area.
2. Connector can withstand up to 3 reflow cycles with a cool-down to room temperature in-between.

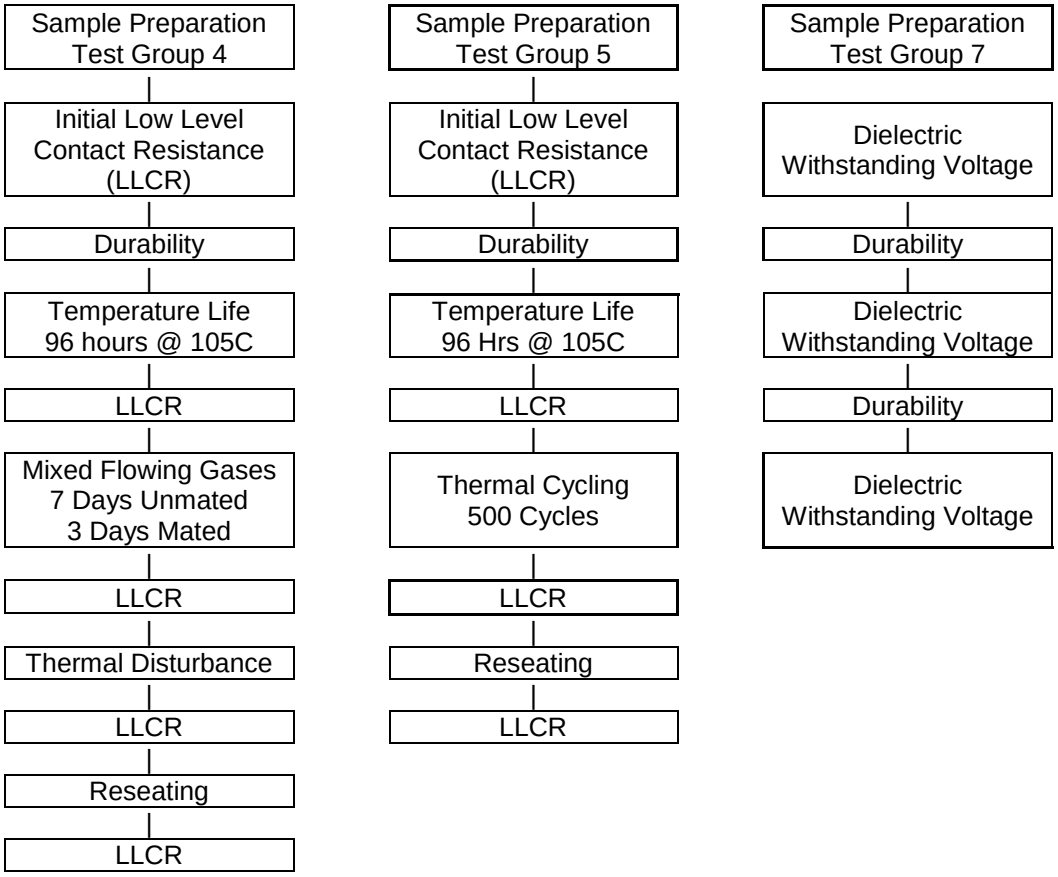
3. Actual reflow profile also depends on equipment, solder paste, PCB thickness, and other components on the board. Please consult your solder paste & reflow equipment manufacturer for their recommendations to adopt a suitable process.

7.0 TEST SEQUENCE

7.1 Reliability Test Sequences (per EIA-364-1000 Test Groups 1, 2, and 3):



7.1 Reliability Test Sequences (per EIA-364-1000 Test Groups 4, 5, and 7)



7.2 Electrical Performance Test Sequence: