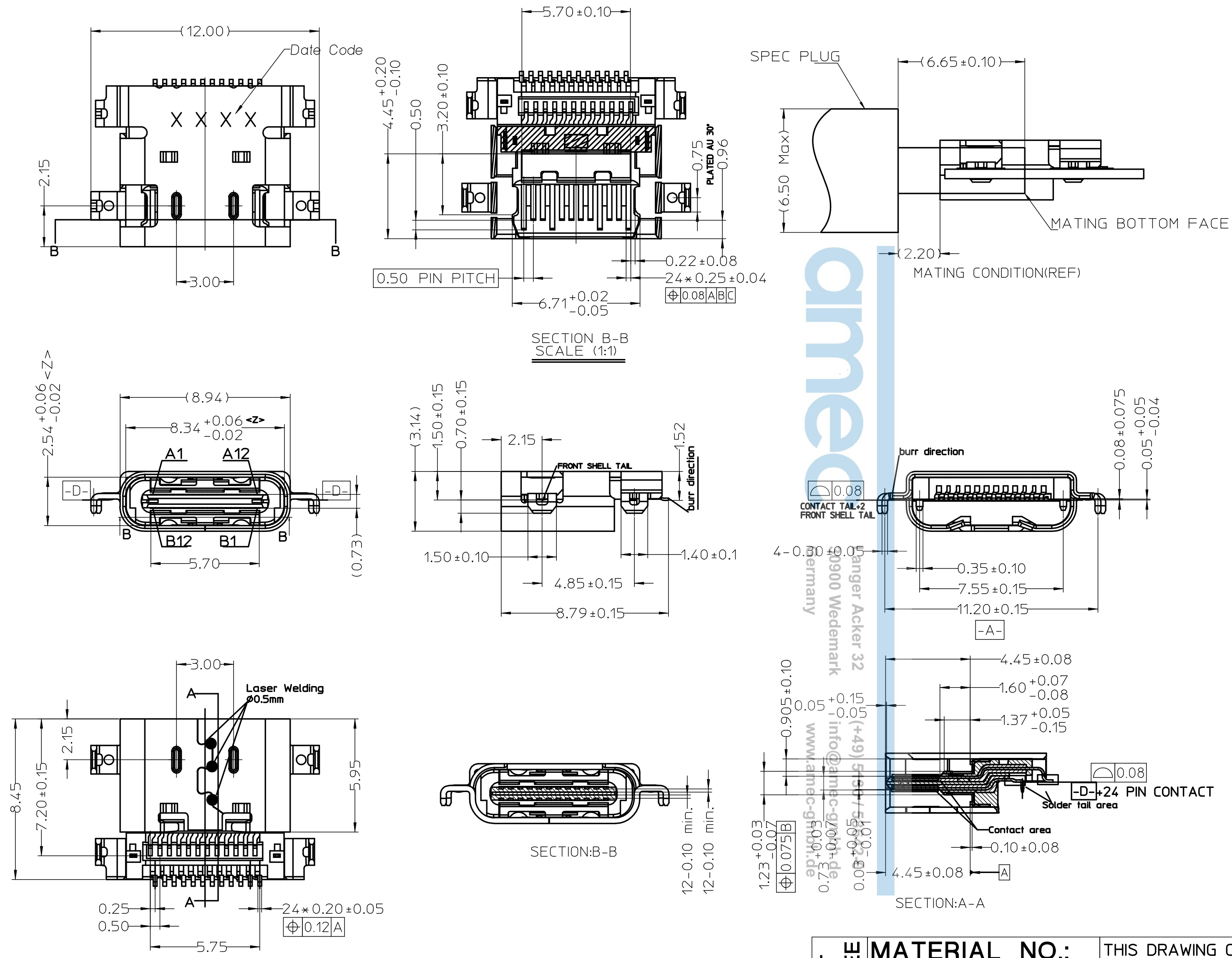
REV	ECN No.	DATE	REMARK



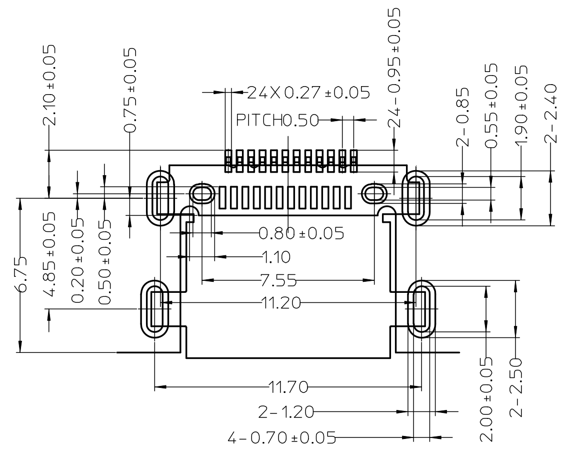
(12.00)
Date Code
2.15
3.00
B
5.70±0.10
4.45 +0.20 -0.10
0.50
3.20±0.10
0.75
PLATED AU 30"
0.96
0.22±0.08
24*0.25±0.04
0.50 PIN PITCH
6.71 +0.02 -0.05
0.08 A B C
SECTION B-B
SCALE (1:1)
SPEC PLUG
(6.65±0.10)
(6.50 Max)
MATING BOTTOM FACE
(2.20)
MATING CONDITION(REF)
2.54 +0.06 -0.02 <Z>
(8.94)
8.34 +0.06 -0.02 <Z>
A1
A12
B12
B1
-D-
5.70
(0.73)
(3.14)
1.50±0.15
0.70±0.15
2.15
FRONT SHELL TAIL
1.52
burr direction
1.50±0.10
1.40±0.1
4.85±0.15
8.79±0.15
0.08
CONTACT TAIL*2
FRONT SHELL TAIL
4-0.30±0.05
0.35±0.10
7.55±0.15
11.20±0.15
-A-
0.08±0.075
0.05 +0.05 -0.04
4.45±0.08
1.60 +0.07 -0.08
1.37 +0.05 -0.15
0.905±0.10
0.05 +0.15 -0.05
-D- 24 PIN CONTACT
Solder tail area
Contact area
0.10±0.08
4.45±0.08
A
SECTION:A-A
1.23 +0.03 -0.07
0.075 B
0.73 +0.03 -0.07
Laser Welding
ø0.5mm
A
8.45
7.20±0.15
5.95
0.25
0.50
5.75
24*0.20±0.05
0.12 A
SECTION:B-B
12-0.10 min.
12-0.10 min.

NOTE:

1. See chart for materials and plating requirements
2. PERFORMANCE:
1.1. Applied AC 100V for 1 minute 1mA
2.2. CONTACT RESISTANCE: Initial: 40mOHM Max,
Initial: 40mOHM Max,
After Test: 10mmOHM Max;
2.3. Current Rating: 5 A
2.4. INSULATION RESISTANCE: 500MOHM Min.
2.5. MATING AND UNMATING FORCE:
MATING FORCE 25N Max,UNMATING FORCE 8N Min.
2.6. DURABILITY : 10000 CYCLES
2.7. Temperature rise:Temperature rise:30K Max.
2.8. Salt Spray; Duration: 48H
3. Safety and Environment:
Compliance with environmental hazards control requirements ROHS and H.F.
4. Pin Distribution

Pin No

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
GND	TX1+	TX1-	Vbus	CC1	D+	D-	SBU1	Vbus	RX2-	RX2+	GND
GND	TX1+	TX1-	Vbus	CC1	D+	D-	SBU1	Vbus	RX2-	RX2+	GND
B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12



RECOMMENDED PCB LAYOUT
TOP VIEW (TOLRANCE:±0.05)

ITEM	DESCRIPTION	MATERIAL	Q'TY	REMARKS
6	SHELL	STAINLESS STEEL. SUS301 1/2H OR EQUIVALENT, 80u" MIN NICKEL UNDERPLATING	1	
5	GND PLATE	STAINLESS STEEL. SUS304 1/2H OR EQUIVALENT, 80u" MIN NICKEL UNDERPLATING	2	
4	SUPPORT PLATE	STAINLESS STEEL. SUS301 H OR EQUIVALENT, 80u" MIN NICKEL UNDERPLATING	1	
3	INSERT MOLD	THERMOPLASTIC,PA10T R630 OR EQUIVALENT, UL94V-0,COLOR:BLACK,	1	
2	CONTACT B	UNDERPLATING:80 u" MIN CONTACT AREA: Pd-Ni30 u" Min+2 u" Au Min SOLDER TAIL PLATING:2u" Au	12	
1	CONTACT A		12	

ROHS COMPLIANT
LEAD&HALOGEN FREE

MATERIAL NO.:

80397–1025

REVIEW TABLE FOR DETAILS

QUALITY SYMBOL
0 = (J) 0 = ▲

GENERAL TOLERANCES (UNLESS SPECIFIED)	
X.XXXX	± ---
X.XXX	± ---
X.XX	± 0.20
X.X	± 0.25
ANGULAR	±--°

TITLE
USB TYPE C CONNECTOR
0.50MM PITCH, 24 CIRCUITS
DUAL SMT

Bellwether Electronic Corp.

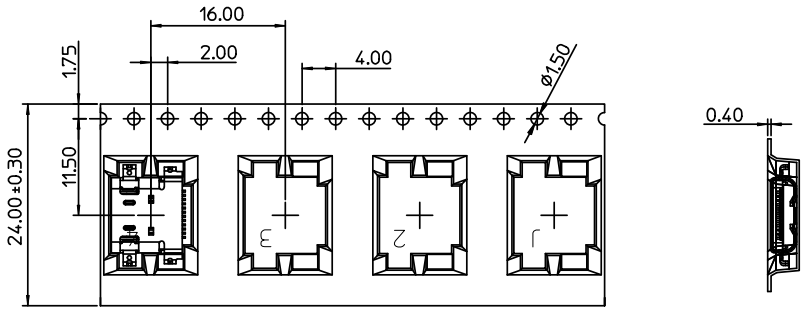
ECN DESCRIPTION	
PROPOSAL	
DRAWN BY: Eric Bai	DATE: 20160928
CHECKED BY: Rainy Zhu	DATE: 20160928
APPROVED BY: Rainy Zhu	DATE: 20160928

DOCUMENT NO.	SHEET NO.
SD-80397-001	1 OF 1

DIMENSION STYLE	DESIGN UNITS	SCALE	
MM ONLY	METRIC	1:1	THIRD ANGLE PROJECTION

frame size: A4
QR-QP025-06 REV.:A

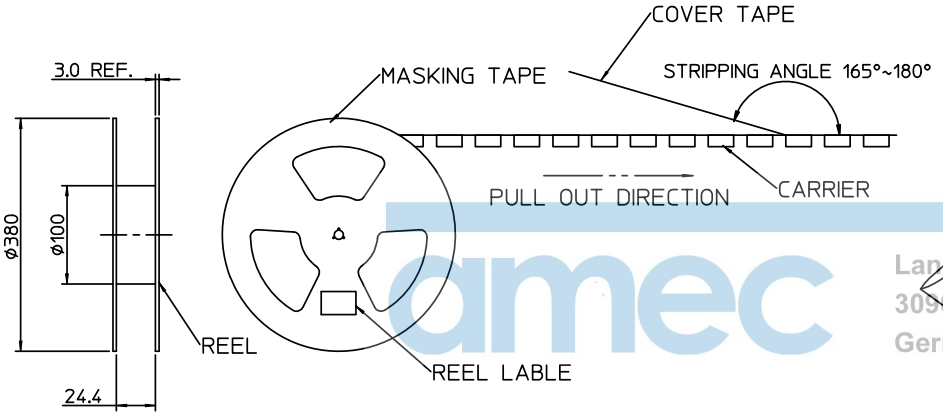
REV	ECN No.	DATE	REMARK

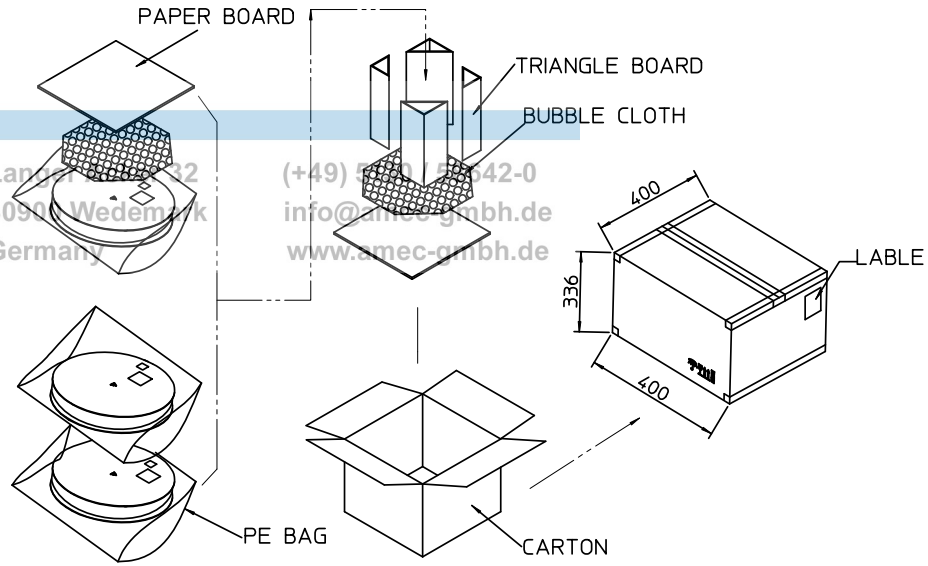


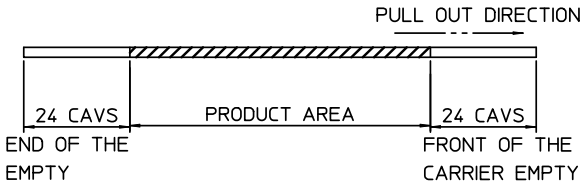
NOTES:

1. STAPLES SHOULD ONLY BE USED TO SET UP CARTON.
   ALL CARTON CLOSURES MUST BE DONE WITH TAPE.
2. FILL PACKAGING TAPE REEL WITH THE QUANTITIES
   AS INDICATED IN THE CHART.

PART NO.	Q'TY/REEL	REEL/CARTON	Q'TY/CARTON
80397-1025	1500 PCS	8 REELS	12000 PCS







ROHS COMPLIANT
LEAD&HALOGEN FREE

MATERIAL NO.: 80397-1025

REVIEW TABLE FOR DETAILS

QUALITY SYMBOL ▽ = 0 ▶ = 0

GENERAL TOLERANCES (UNLESS SPECIFIED)	
X.XXXX	± ---
X.XXX	± ---
X.XX	± 0.20
X.X	± 0.25
ANGULAR	±--°

TITLE: USB TYPE C CONNECTOR
0.50MM PITCH, 24 CIRCUITS
DUAL SMT

Bellwether Electronic Corp.

ECN DESCRIPTION: PROPOSAL

DRAWN BY: Eric Bai DATE: 20170514

CHECKED BY: DATE:

APPROVED BY: DATE:

DOCUMENT NO.: PK-80397-001

SHEET NO.: 1 OF 1

DIMENSION STYLE	DESIGN UNITS	SCALE
MM ONLY	METRIC	1:1

THIRD ANGLE PROJECTION

BellWether **PRODUCT SPECIFICATION**

PRODUCT DESCRIPTION:

UNIVERSAL SERIAL BUS
TYPE-C RECEPTACLE SERIES

PRODUCT NUMBER:

80397 Series(PROPOSAL)

1.0 SCOPE

This product specification defines the product performance and the test methods to ensure the performance of the USB TYPE C , which is designed and manufactured by Bellwether Electronic corp. Applicable material No：80397 series

Tests and inspection shall be performed in accordance with the requirements, tests and methods contained herein. A re-qualification test shall be conducted immediately following all major process changes.

2.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

EIA-364.

The following documents are part of this specification between the requirements of this specified herewith. In the event of conflict between the requirements of this specification and the product drawings, the product drawings shall take precedence. In the event of conflict between the requirements of this specification and reference documents, this specification shall take precedence.

3.0 REQUIREMENTS

3.1 DESIGN AND CONSTRUCTION

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 MATERIALS

Materials used in the construction of product shall be as specified on the applicable product drawing.

4.0 RATINGS

Voltage ：20V AC Per Contact

Current： A current of 5 A shall be applied collectively to VBUS pins (i.e., pins A4, A9, B4, and B9) and 1.25 A shall be applied to the VCONN pin (i.e., B5 of the plug connector) with the return path through the corresponding GND pins (i.e., pins A1, A12, B1, and B12). A minimum current of 0.25 A shall also be applied individually to all the other contacts.

Operating temperature range：- 55℃ + 85℃

Storage temperature range: - 55℃ + 85℃

Humidity: 95% max. non condensing

5.0 PERFORMANCE AND TEST DESCRIPTION

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

5.1 APPEARANCE REQUIREMENTS

ITEM	TEST DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Visual and dimensional inspections**	Visual, dimensional and functional per applicable quality inspection plan. **Per EIA 364-18**	Meets requirements of product drawing. No physical damage.

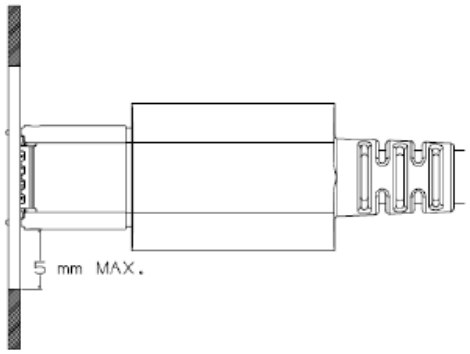
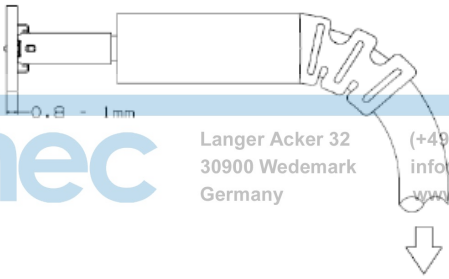
5.2 ELECTRICAL REQUIREMENTS

ITEM	TEST DESCRIPTION	TEST CONDITION	REQUIREMENT

2	**Contact Resistance (Low Level)**	Mate connectors: apply a maximum voltage of **20** mV and a current of **100** mA. Measurement is made from the solder tail of the receptacle to the soldering point of the plug (including any internal paddle cards, contacts and substrates of the plug and receptacle). **Per EIA-364-23B**	**40** milliohms ,[initial] MAX. PER CONTACT **10** milliohms MAX. (change from initial)
3	**Dielectric Withstanding Voltage**	Unmated & mated connectors: apply a voltage of **100** VAC (RMS) for **1** minute between adjacent contacts. **Per EIA-364-20**	No Breakdown
4	**Insulation Resistance**	Unmated & mated connectors: apply a voltage of **500** VDC between adjacent contacts. **Per EIA-364-21**	**100** Megohms MIN.
5	**Temperature Rise**	Mate connectors: Apply 5.0 A to VBUS pins and 1.25A to VCONN pins with the return path through the corresponding GND pins. A minimum current of 0.25A shall also be applied individually to all the other contacts. The temperature rise above shall not exceed 30℃ at any point on the mated plug and receptacle under test. The ambient condition is still air at 25℃ **Per EIA-364-70, Method 2**	Temperature rise: **+30**℃ MAX.

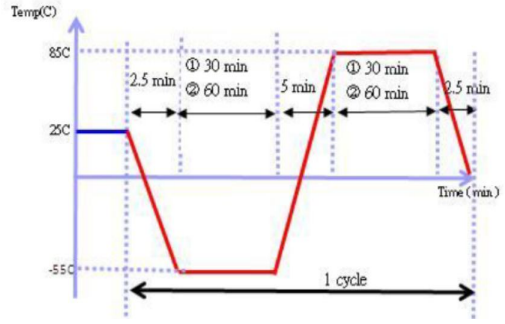
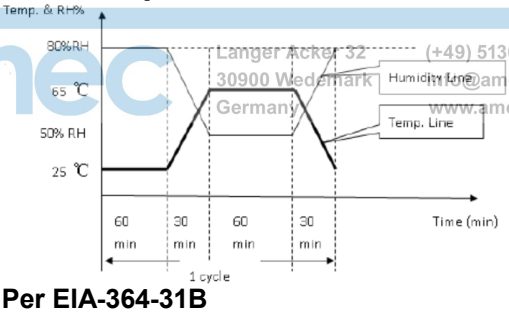
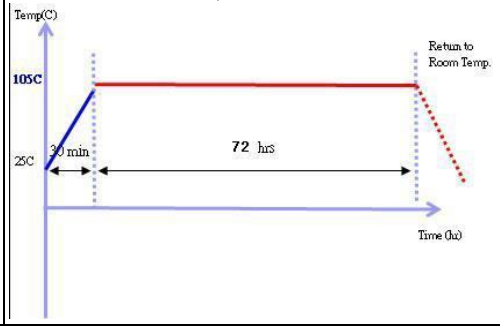
5.3 MECHANICAL REQUIREMENTS

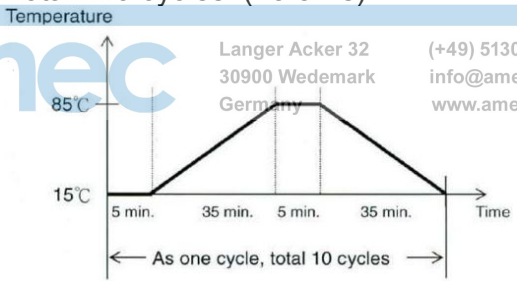
TEM	TEST DESCRIPTION	TEST CONDITION	REQUIREMENT
6	Mating Force	Operation Speed：[12.5] mm/min. Measure the force required to mate connector. **Per EIA-364-13**	5N to 20N
7	Unmating Force	Operation Speed：[12.5] mm/min. Measure the force required to unmate connector **Per EIA-364-13**	8N to 20N from 1 to 1000 cycles 6N to 20N from 1000 to10000 cycles
8	Durability	Operation Speed：200cycle per hour. Durability Cycles：10000 Cycles **(EIA-364-09)**	No evidence of physical damage
9	Durability (Preconditioning)	Perform 50 unplug/plug cycles (EIA-364-09)	No evidence of physical damage

10	Vibration	Waveform:Sine wave Frequency:10-55-10 Hz in 1 minute Amp:1.52mm Direction: X.Y.Z.(3 directions) Duration:2 hours per each direction Discontinuities:<0.1μs. (EIA-364-28 Condition VII, Test letter D)	Appearance: no damage. Discontinuity: 1 microsecond Max
11	**4-Axis Continuity Test**	The connector family shall be tested for continuity under stress using the test configurations shown in following figure.   Apply an 8N tensile force to the cable in a direction of perpendicular to the axis of insertion for 10 seconds at least. Measure the continuity across each contact and conform that each non-ground contact shall not short to the shell during the stresses. Repeat the test for 90 degree, 180 degree and 270 degree rotations.	Discontinuity1 μs MAX. & Non-ground contact not any shorting to the shell
12	**Wrenching Strength**	First time: A moment of 0.75 Nm (for example: 50 N at 15 mm). Fig.4.1 Second time: A new Plug is required for each of the four test directions. A moment of 2.0 Nm is applied to the plug in the up and down directions and 3.5 Nm is applied to the plug in the right and left directions.Refer to Fig.4.2	First time ： No Discontinuity or shorts allowed. Dielectric withstanding Voltage ： No disruptive discharge for 100VAC Second time : 0.75Nm MIN. Refer to Fig.4
13	Reseating	Manually unplug/plug the connector or socket, perform 3 such cycles.	Appearance: No abnormality Function : OK

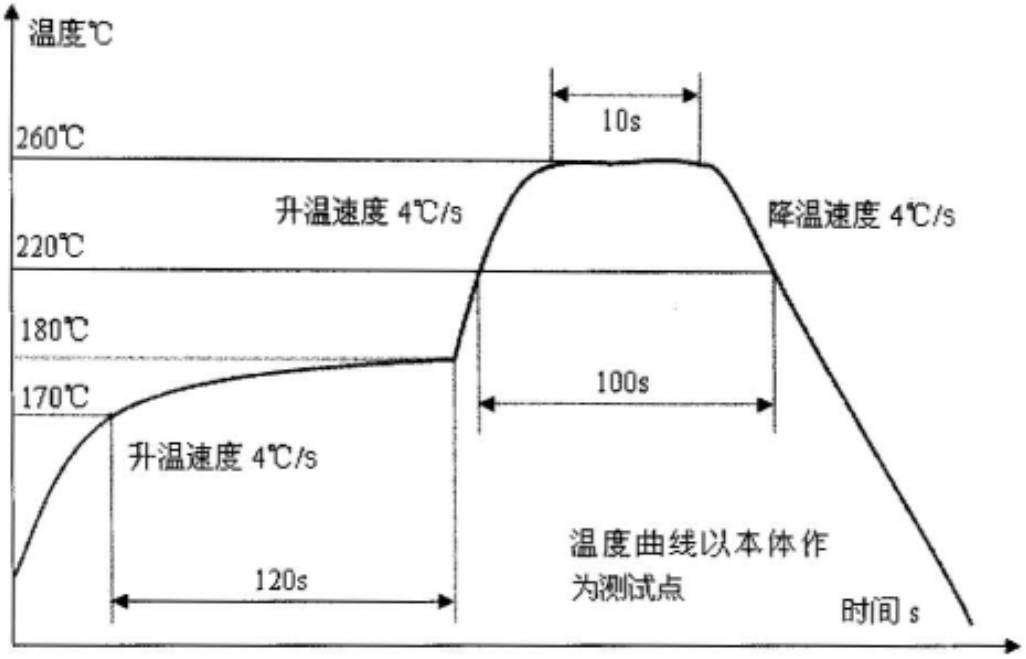
14	Drop	76cm Height one carton 6-sydes random dropping.	Appearance: No abnormality Function : OK

5.4 ENVIRONMENTAL REQUIREMENTS

ITEM	TEST DESCRIPTION	TEST CONDITION	REQUIREMENT
15	**Thermal Shock**	est Condition I **10 CYCLES –55℃ AND +85℃** 	No physical damage & 10 milliohms MAX. (change from initial)
16	**Cyclic temperature and Humidity**	25 °C /80 %RH for 1hr. Upper-Ramp for 0.5hr 65 °C /50 %RH for 1 hr. Down-Ramp for0.5hr, Total 24 Cycles, 72hrs  **Per EIA-364-31B**	No physical damage & 10 milliohms MAX. (change from initial)
17	**Temperature life**	Mate connectors to expose to 105 **± 2** ℃ for **120** hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. **Per EIA-364-17B, Test condition A** 	No physical damage & 10 milliohms MAX. (change from initial)

18	Mixed Flowing Gas	Subject mated connectors into the chamber, the connector shall be mounted on appropriate LLCR boards and exposed to: a) Relative Humidity: 70%+/-2% b) Temperature: 30℃+/-1℃ c) Duration: 7 days. d) Invironmental Class: IIA (EIA-364-65.)	No physical damage. Contact Resistanc： 50 mΩ Max.
19	**Salt Spray**	The mated connectors shall be exposed to the following salt mist conditions. At the completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed. NaCl solution concentration: 5±1%, Spray time: 48 hours, Temperature:35±2℃. **PER EIA-364-26B CONDITION B**	No physical damage &10 milliohms MAX. (change from initial)
20	Thermal Disturbance	5 °C for 5 min Upper-Ramp: 35 min (2°C/min) 85 °C for 5 min Down-Ramp:35min (2°C/min) Humidity: Not be controlled. Total : 10 cycles. (13.3hrs)  	No physical damage. Contact Resistanc： 50 mΩ Max.
21	Solderability	EIA364-52 Soldering Time:3 +/-0.5sec Soldering Temperature:245+3/-3℃ Immersion in the soldering bath at 0.5mm From terminal tip	NO damage. Minimum: 95 % of immersed area.
22	Soldering Heat	Reflow soldering method Refer to below Graph **Soldering iron method** Soldering time:10+/-0.5sec. Soldering Temperature : 260+0/-2℃ 0.5mm from terminal tip and fitting nail(mounted ear) tip	No physical damage or discoloration of connector materials.

IR REFLOW:



1：Shall meet visual requirements, show no physical damage, and meet requirement of additional tests as specified in the test sequence in Figures 2

2：Resistance to soldering process is indicated on notes of customer drawing. Select the appropriate test type which drawing notes are matched with.

6.0 TESTING SEQUENCE

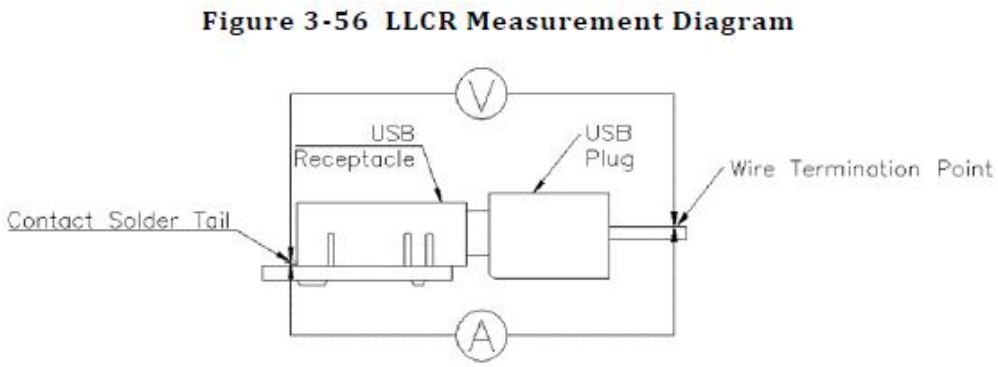
Test or Examination	Test Group											
	A	B	C	D	E	F	G	H	I	J	K	L
	Test Sequence（a）											
Examination of Product	1,8	1,10	1,8	1,11	1,15	1,3	1,3	1,3	1,3	1,3	1,3	1,5
Low level Contact resistance	2,5,7	2,5,7,9	2,5,7	2,5,7, 9,10	3,12							2,4
Dielectric thstanding Voltage					2,13							
Insulation Resistance					14							
Temperature Rising						2						
Mating Force					4，8，11							
Unmating Force					5,7,10							
Durability					6(1000cycles) 9(10000cycle)							
Durability (Preconditioning)	3	3	3	3								
Vibration			6									
4-Axes Continuity							2					
Wrenching Strength								2				
Reseating	6	8		10								
Drop									2			
Thermal Shock		4										
Cyclic Temp. and Humidity		6		7								
Temp. Life	4		4	4								
Thermal Disturbance				8								
Mixed Flowing Gas				6								
Salt spray												3
Solderabil-ity										2		
Soldering Heat											2	
Sample QTY	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**	**5PCS**

NOTE：

(a) Numbers indicate sequence in which tests are performed.

(b) Sampling Quantity: 5 pcs for each test group.

FIGURE 2. CONTACT RESISTANCE



Example of 4-Axes Continuity Test

FIGURE 4-1 **Wrenching Strength**

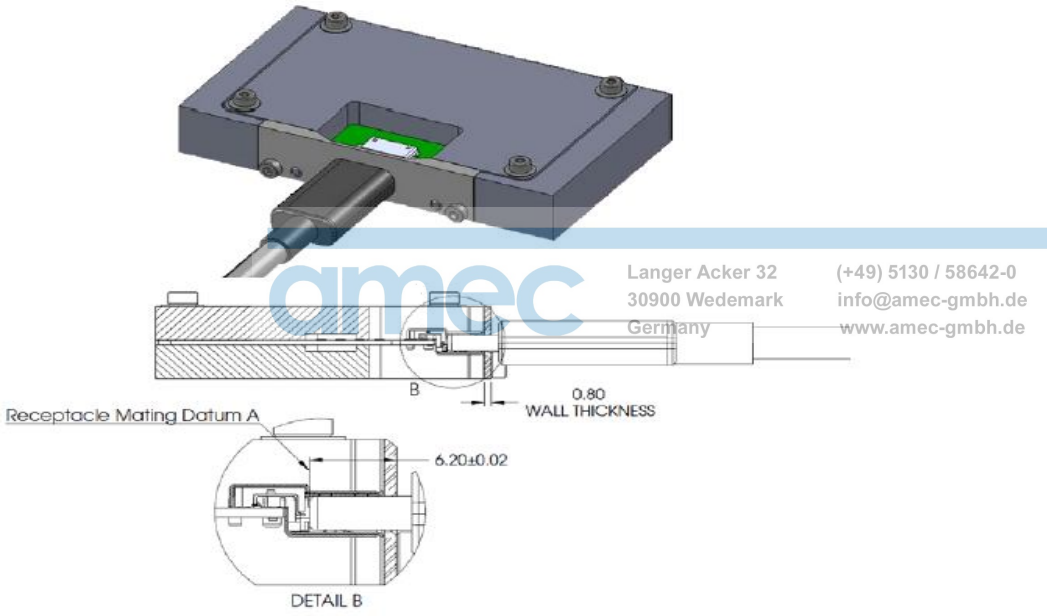
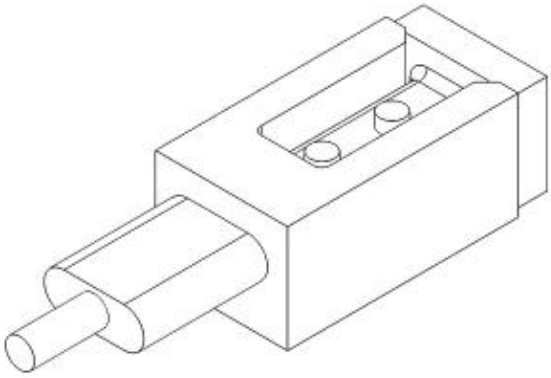


FIGURE 4-2 **Wrenching Strength**



Example of Wrenching Strength Test Mechanical Failure Point