RJ45 Magnetic Modjack

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) RJ45 Connector with 10/100, 1G/2.5G/5G/10G Base-T Transformer(Based on TE part#, see Table1) to determine its conformance to the requirements of Product Specification 108-161443 Revision .

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of RJ45 Connector with 10/100, 1G/2.5G/5G/10G Base-T Transformer(Based on TE part #, see Table1).

1.3. Conclusion

All part numbers listed in paragraph 1.5 conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-161443 Revision.

1.4. Product Description

The RJ45 Connector with 10/100, 1G/2.5G/5G/10G Base-T Transformer(Based on TE part #, see Table1) are mainly used in Wi-Fi 6, network communication devices and servers, etc. The product complies with FCC and IEEE specifications.

1.5. Test Specimens

The test specimens were representative of normal production lots, and the following part numbers were used for testing (see Table1).

Test Group	Quantity	TE Part#	Description	Data Rate	T. Rise Rated Current	POE / non POE
1-11	55	2489048-X	10G Base-T, AutoMDIX	10G BASE-T	0.1A	Non POE
1-11	55	2489079-X	10G Base-T, AutoMDIX	10G BASE-T	0.1A	Non POE
1-11	55	2489084-X	10G Base-T, AutoMDIX	10G BASE-T	0.1A	Non POE
1-11	55	2489085-X	2.5G Base-T, AutoMDIX	2.5G BASE-T	0.1A	Non POE
1-11	55	2489102-X	2.5G Base-T, AutoMDIX	2.5G BASE-T	0.1A	Non POE
1-11	55	2489103-X	5G Base-T, AutoMDIX, Power over Ethernet (PoE)	5G BASE-T	0.72A	60W
1-11	55	2489107-X	2.5G Base-T, AutoMDIX, Power over Ethernet (PoE)	2.5G BASE-T	0.72A	60W
1-11	55	2489108-X	5G Base-T, AutoMDIX, Power over Ethernet (PoE)	5G BASE-T	1.0A	100W
1-11	55	2489115-X	10/100/1000 Base-T, AutoMDIX	1G BASE-T	0.1A	Non POE
1-11	55	2489116-X	10/100/1000 Base-T, AutoMDIX	1G BASE-T	0.1A	Non POE
1-11	55	2489117-X	10/100/1000 Base-T, AutoMDIX	1G BASE-T	0.1A	Non POE
1-11	55	2489120-X	10/100/1000 Base-T, AutoMDIX	1G BASE-T	0.1A	Non POE
1-11	55	2488942-X	10/100/1000 Base-T, AutoMDIX	1G BASE-T	0.1A	Non POE
1-11	55	2488953-X	10/100 Base-T, AutoMDIX	10/100 BASE-T	0.1A	Non POE
1-11	55	2488960-X	10/100 Base-TX, AutoMDIX	10/100 BASE-T	0.1A	Non POE
1-11	55	2488965-X	10/100 Base-TX, AutoMDIX	10/100 BASE-T	0.1A	Non POE
1-11	55	2488983-X	10/100 Base-T, AutoMDIX	10/100 BASE-T	0.1A	Non POE
1-11	55	2489011-X	10/100 Base-T, AutoMDIX, Power over Ethernet+ (PoE+)	10/100 BASE-T	0.72A	60W

Table 1: TE Part # list and Description

TRANSMISSION PERFORMANCE

Items	Performance Requirement
LCR	**Part# 2489085-X** OCL:180uH MIN@100KHZ/0.1v 8mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP：1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.0 Ω max CABLE: 0.8Ωmax **Part# 2489102-X** OCL:180uH MIN@100KHZ/0.1v 8mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP：1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.2 Ω max CABLE: 1.0Ωmax
Insertion Loss	-1.0dB MAX@1MHz-50MHz -1.5dB MAX@50MHz-125MHz
Return Loss	-18dB MIN@1MHz-40MHz; -18+15LOG (f/40MHz)dB MIN@40MHz-250MHz
Near-End Cross-Talk (NEXT)	-35dB MIN@1MHz-40MHz; -35+15LOG (f/40MHz)dB MIN@40MHz-125MHz
Common Mode Rejection Radio	-30dB MIN@1 MHz-200 MHz
Commonmode to Differential Mode Attenuation	-35dB MIN@1 MHz-125 MHz

Table 2: Part # 2489085-X / 2489102-X TRANSMISSION PERFORMANCE

Items	Performance Requirement
LCR	OCL:120uH MIN@100KHZ/0.1v 19mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP：1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.0 Ω max CABLE: 0.8Ωmax
Insertion Loss	-1.0dB MAX@1MHz-125MHz -2.0dB MAX@125MHz-200MHz -2.5dB MAX@200MHz-250MHz
Return Loss	-20dB MIN@1MHz-40MHz; -20+15LOG (f/40MHz)dB MIN@40MHz-250MHz
Near-End Cross-Talk (NEXT)	-25dB MIN@1MHz-125MHz; -20dB MIN@125MHz-250MHz
Common Mode Rejection Radio	-23dB MIN@1MHz-250MHz

Table 3: Part # 2489103-X / 2489108-X TRANSMISSION PERFORMANCE

Items	Performance Requirement
	OCL: 120uH MIN@100KHz/100mV With 19mA DC Bias For(CHANNEL1,2,3,4) TR: 1:1±2% @ 100kHZ/0.1V CP： 1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.0Ω max CABLE: 0.8Ωmax
Insertion Loss	-1.0 dB Max from 1MHz to 100 MHz -1.0 dB Max from 100MHz to 125 MHz
Return Loss	-20dB MIN from 1 MHz to 40 MHz -20+15LOG(f/40MHz)dB MIN from 40 MHz to 200 MHz
Near-End Cross-Talk (NEXT)	-35dB MIN from 1 MHz to 40 MHz -35+15LOG (f/40MHz)dB MIN from 40 MHz to 125 MHz
Common Mode Rejection Radio	-30dB MIN from 1 MHz to 200 MHz

Table 4: Part # 2489107-X TRANSMISSION PERFORMANCE

Items	Performance Requirement
LCR	**Part# 2488942-X / 2488965-X** OCL: 350uH MIN@100KHZ/0.1v 8mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP: 1000PF @ 1kHZ/1V OPEN/SHORT DCR: PHY: 1.0 Ω max CABLE: 1.2Ωmax **Part# 2488953-X / 2488983-X** OCL: 350uH MIN@100KHZ/0.1v 8mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP: 1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.5Ω max CABLE: 1.0Ωmax **Part# 2489115-X / 2489116-X / 2489117-X / 2489120-X** OCL: 350uH MIN@100KHZ/0.1v 8mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP: 1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.0Ω max CABLE: 0.8Ωmax
Insertion Loss	-1.0 dB MAX from 0.3 MHz to 100 MHz
Return Loss	-18dB MIN from 1 MHz to 30 MHz -16dB MIN from 30 MHz to 60 MHz -12dB MIN from 60 MHz to 80 MHz -10dB MIN from 80 MHz to 100 MHz
Near-End Cross-Talk (NEXT)	-30dB MIN from 1 MHz to 100 MHz
Common- to- Common Mode Attenuation	-30dB MIN from 1 MHz to 100 MHz

Table 5: Part # 2488942-X / 2488953-X / 2488965-X / 2488983-X / 2489115-X / 2489116-X / 2489117-X / 2489120-X TRANSMISSION PERFORMANCE

Items	Performance Requirement
LCR	OCL: 350uH MIN@100KHZ/0.1v 8mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP: 1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.5Ω max CABLE: 1.0Ωmax
Insertion Loss	-1.0dB MAX from 0.3 MHz to 100 MHz
Return Loss	-18dB MIN from 1 MHz to 30 MHz -16dB MIN from 30 MHz to 60 MHz -12dB MIN from 60 MHz to 80 MHz -10dB MIN from 80 MHz to 100 MHz
Near-End Cross-Talk (NEXT)	-35dB MIN from 1 MHz to 100 MHz
Common- to- Common Mode Attenuation	-35dB MIN from 1 MHz to 100 MHz

Table 6: Part# 2488960-X TRANSMISSION PERFORMANCE

Items	Performance Requirement
LCR	OCL: 220uH MIN@100KHz/100mV With 15mA DC Bias For(CHANNEL1,2) 350uH MIN@100KHz/100mV With 8mA DC Bias For(CHANNEL1,2) TR: 1:1±2% @ 100kHZ/0.1V C: 1000PF @ 1kHZ/1V OPEN/SHORT DCR:PHY:1.0 Ω max CABLE: 0.8Ωmax
Insertion Loss	-1.2dB MAX from 0.3 MHz to 100 MHz
Return Loss	-18dB MIN from 1 MHz to 30 MHz -16dB MIN from 30 MHz to 60 MHz -12dB MIN from 60 MHz to 80 MHz -10dB MIN from 80 MHz to 100 MHz
Near-End Cross-Talk (NEXT)	-30dB MIN from 1 MHz to 100 MHz
Common- to- Common Mode Attenuation	-30dB MIN from 1 MHz to 100 MHz

Table 7: Part# 2489048-X / 2489079-X / 2489084-X TRANSMISSION PERFORMANCE

Items	Performance Requirement
	OCL:120uH MIN@100KHZ/0.1v 8mA DC bias TR: 1:1±2% @ 100kHZ/0.1V CP: 1000PF @ 1kHZ/1V

	OPEN/SHORT DCR:PHY:1.0 Ω max CABLE: 0.8Ωmax
Insertion Loss	-3.0dB Max from 1MHz to 500 MHz
Return Loss	-22dB MIN@1MHz-100MHz; -22+20.75LOG(f/100)dB MIN@100MHz-500MHz
Near-End Cross-Talk (NEXT)	-28 dB MIN from 1 MHz to 100 MHz -19 dB MIN from 100 MHz to 500 MHz
Common- to- Common Mode Attenuation	-30dB MIN from 1 MHz to 100 MHz -20dB MIN from 100 MHz to 500 MHz

Table 8: Part # 2489011-X TRANSMISSION PERFORMANCE

1.6. Qualification Test Sequence

Test Items	**Test Groups (a)**										
	A	B	C	D	E	F	G	H	I	J	K
	Test Sequence (b)										
Examination of product	1,5	1,5	1,5	1,6	1,7	1,6	1,4	1,5	1,4	1,3	1,10
Dielectric withstanding Voltage											2
Insulation Resistance											3
Contact Resistance						2,5		2,4			
LCR	2,4	2,4	2,4	2,5	2,6						4
IL											5
RL											6
NEXT											7
CMR											8
CM to DM											9
Temperature Rise					5						
Mechanical Vibration				3							
Mechanical shock				4							
Ring test					4						
Durability						4					
ConnectorMating,Unmatig Force						3					
Normal force										2	
Plug Retention Force							2				
Jack Retention to PCB							3				

Plug Typs					3						
Thermal shock			3								
Salt Spray								3			
Humidity/temperature cycling	3										
Temperature life		3									
Solderability									2		
Resistance to soldering heat									3		
Sample Quantity(pcs)	Single port Connector 5pcs/Test Group；Multi port connector 3pcs/Test Group										

Table 9: Test Items&Groups

NOTE
(a) See Paragraph 0.
(b) Numbers indicate sequence which tests were performed.

1.7. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

Temperature: 15°C to 35°C

Relative Humidity: 20% to 80%

2. SUMMARY OF TESTING

2.1. TEST RESULTS:

Group A									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
A.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS
A.03	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
A.04	Humidity-Temperature Cycle	--	No damage	OK	OK	OK	OK	OK	PASS
A.05	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
A.06	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group B									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
B.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS

B.03	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
B.04	Temperature life	--	No damage	OK	OK	OK	OK	OK	PASS
B.05	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
B.06	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group C									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
A.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS
A.03	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
A.04	Thermal shock	--	No damage	OK	OK	OK	OK	OK	PASS
A.05	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
A.06	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group D									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
D.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS
D.03	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
D.04	Mechanical Vibration	--	Discontinuity less than 1 μs; No damage	OK	OK	OK	OK	OK	PASS
D.05	Mechanical shock		Discontinuity less than 1 μs; No damage	OK	OK	OK	OK	OK	PASS
D.06	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
D.07	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group E									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
E.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS

E.03	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
E.04	Plug Typs		No damage	OK	OK	OK	OK	OK	PASS
E.05	Ring test	--	Discontinuity less than 1 μs; No damage	OK	OK	OK	OK	OK	PASS
E.06	Temperature Rise	℃	30℃ Max	NA					
E.07	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
E.08	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group F									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
F.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS
F.03	Contact Resistance	mΩ	20 mΩ Max	11.84	10.72	12.33	10.94	11.86	PASS
F.04	Mating force	N	30N Max	3.12	3.60	3.72	3.54	3.42	PASS
	Unmating force			1.14	1.20	1.28	1.16	1.21	PASS
F.05	Durability	--	No damage	OK	OK	OK	OK	OK	PASS
F.06	Contact Resistance	mΩ	40 mΩ Max	12.36	11.84	12.79	11.35	12.48	PASS
F.07	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group G									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
G.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS
G.03	Plug Retention Force	--	5kgf Min	OK	OK	OK	OK	OK	PASS
G.04	Jack Retention to PCB	--	5kgf Min	OK	OK	OK	OK	OK	PASS
G.05	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group H									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
H.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS

H.03	Contact Resistance	mΩ	20 mΩ Max	11.63	10.94	12.53	11.75	12.16	PASS
H.04	Salt spray	--	No damage	OK	OK	OK	OK	OK	PASS
H.05	Examination of Product	--	Meet the drawing requirements	Normal					PASS
H.06	Contact Resistance	mΩ	40 mΩ Max	12.84	13.55	12.97	13.26	12.94	PASS

Group I									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
I.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS
I.02	Solderability	--	95% of immersed area must show no voids, pin holes	OK	OK	OK	OK	OK	PASS
I.03	Resistance to Soldering heat	--	No damage	OK	OK	OK	OK	OK	PASS
I.04	Examination of Product	--	Meet the drawing requirements	OK	OK	OK	OK	OK	PASS

Group J									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
J.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS
J.03	Normal force	g	50gf/pin minimum	58.42	62.08	61.43	56.82	63.79	PASS
J.04	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Group K									
Sep.	TEST ITEM	Unit	REQUIREMENTS	Sample#1	Sample#2	Sample#3	Sample#4	Sample#5	RESULTS
J.01	Examination of Product	--	Meet the drawing requirements	Normal					PASS

J.03	Dielectric withstanding Voltage	--	No discharge or breakdown	OK	OK	OK	OK	OK	PASS
J.04	Insulation Resistance	--	500MΩ min	OK	OK	OK	OK	OK	PASS
J.05	LCR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
J.06	IL	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
J.07	RL	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
J.08	NEXT	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
J.09	CMR	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
J.10	CM to DM	--	Meet specification requirements	OK	OK	OK	OK	OK	PASS
J.11	Examination of Product	--	Meet the drawing requirements	Normal					PASS

Table 10: Test Result

3. TEST METHODS

3.1 Examination of Product
Per EIA-364-18，Visual inspection of samples
Test condition: Meet requirements of product drawing.

3.2 Dielectric withstanding Voltage
Specimens were subjected to Dielectric withstanding Voltage test in accordance with EIA-364-20.
Test condition: Apply a voltage between transformer primary and secondary. Voltage: 2250 VDC, Duration: 1 minute; between shield and contacts. Voltage: 2250 VDC, Duration: 1 minute.
Requirement: No discharge or breakdown.

3.3 Insulation Resistance
Specimens were subjected to Insulation Resistance test in accordance with EIA-364-21.
Test condition: Apply a voltage between transformer primary and secondary. Voltage: 500 VDC, Duration: 2 minutes; between shield and contacts. Voltage: 500 VDC, Duration: 2 minutes.
Requirement: 500MΩ min

3.4 Contact Resistance
Specimens were subjected to Contact Resistance test in accordance with EIA-364-23.
Test condition: 20mV Maximum, 100mA apply to measure contact resistance by dry circuit.
Requirement: Initial is 20 milliohm Max. After test is 40 milliohm Max

3.5 LCR comprehensive performance test
Test condition: Test with the LCR tester TH2819XB
Performance Requirement: See Table 2 to Table 8

3.6 Insertion Loss
Specimens were subjected to Insertion Loss test in accordance with EIA-568-A
Test condition: Use a four port E5071C network analyzer to test the IL parameters of each channel
Performance Requirement: See Table 2 to Table 8

3.7 Return Loss
Specimens were subjected to Return Loss test in accordance with EIA-568-A
Test condition: Use a four port E5071C network analyzer to test the RL parameters of each channel
Performance Requirement: See Table 2 to Table 8

3.8 Cross Talk
Specimens were subjected to Cross Talk test in accordance with EIA-568-A
Test condition: Use a four port E5071C network analyzer to test the NEXT CTK between channels 1 and 2, 2 and 3, and 3 and 4, as well as the CTK of each adjacent 2 port channel
Performance Requirement: See Table 2 to Table 8

3.9 Common Mode Rejection Radio
Specimens were subjected to Common Mode Rejection Radio test in accordance with EIA-568-A
Test condition: Use a four port E5071C network analyzer to test the CMRR parameters of each channel
Performance Requirement: See Table 2 to Table 8

3.10 Commonmode to Differential Mode Attenuation
Specimens were subjected to Commonmode to Differential Mode Attenuation test in accordance with EIA-568-A
Test condition: Use a four port E5071C network analyzer to test the CM to DM parameters of each channel
Performance Requirement: See Table 2 to Table 8

3.11 Temperature Rise
Specimens were subjected to Temperature Rise test in accordance with EIA-364-70 Method Ⅰ
Test condition：Ambient Conditions Still air at 25℃.Stabilize at a single current level until 3readings at 5 minute intervals are within1℃；4pairs of differential lines connected in series with a rated current (current value refer to Table 1) for internal temperature rise testing
Requirement:：30℃ maximum temperature rise.

3.12 Mechanical Vibration
Specimens were subjected to Vibration test in accordance with EIA-364-28.
Test condition：Solder each of plug and receptacle connector to the P.C. Board, then mate them together. Place the mated connector firmly on the vibrator and apply the following condition shall be done，passing DC 100mA current during the test.
Frequency: Change 20Hz – 500Hz within one minute
Amplitude: 1.52mm
Acceleration:3.10G’S
Direction: along three perpendicular directions
Time: 15 minutes in each direction，45minutes in total
Requirement: Discontinuity less than 1 μs, No damage.

3.13 Mechanical Shock
Specimens were subjected to Mechanical Shock test in accordance with EIA-364-28.
Test condition：Accelerate Velocity：490m/s2 （50G）; Waveform：Half-sine shock plus
Pulse width: 11milli-second.
Number of impacts: 3 drops each to normal and reversed directions of X,Y and Z axes, totally 18 drops
Requirement: Discontinuity less than 1 μs, No damage.

3.14 Ring Test
Rotating instantaneous breaking test on the sample according to the figure
Test condition：Mating connectors at weight: 2lbs.
cable and vertical centerline angle:45°
Plug height:6.02mm.

Rotate counterclockwise and clockwise 3 cycles/direction
Speed:4 RPM
Requirement: Discontinuity less than 1 μs, No damage.

3.15 Durability
Specimens were subjected to Durability test in accordance with EIA-364-9.
Test condition: cycle rate: 10-20cycles per minute, Testing cycles: 750cycles.
Requirement: No damage after testing,

3.16 Connector mating unmating Force
Specimens were subjected to Connector mating unmating Force test in accordance with EIA-364-13
Test condition: at a maximum rate of 25±3mm per minute, Mating & Unmating force
Requirement:30N Max

3.17 Normal force
Specimens were subjected to Normal force test in accordance with EIA-364-04
Test condition： Terminal at maximum rate 25±3mm Per minute and measure the normal force.
Requirement: 50gf/pin minimum

3.18 Plug Retention Force
Specimens were subjected to Plug Retention Force test in accordance with EIA-364-98.
Test condition: Put the connector and plug in a vertical position, hang a 5Kgf object at the bottom of the plug for 60s±5s
Requirement: The samples were not damaged after testing.

3.19 Jack Retention to PCB
Specimens were subjected to Jack Retention to PCB test in accordance with EIA-364-29
Test condition: Put the connector and plug in a vertical e position, hang a 5kgf object at the bottom of the plug for 60s±5s
Requirement:5kg Min, Connector shall not Come apart from PCB

3.20 Plug Types
Specimens were subjected to Plug types test in accordance with product specification.
Test condition: use 1 types of plug
Requirement: Meet Standard RJ45 Jack Height:5.89-6.15mm

3.21 Thermal Shock
Specimens were subjected to Thermal Shock test in accordance with EIA-364-32
Test condition: Duration: 10 cycles. Temperature: -40℃(30 min.), +85℃(30 min.).
Test other items when placed at room temperature for 1-2h after the test.
Requirement: No physical damage.

3.22 Humidity-Temperature Cycle
Specimens were subjected to Humidity-Temperature Cycle test in accordance with EIA-364-31B, Method Ⅳ.
Test condition: Per EIA-364-31, Subject samples to 10 cycles (10 days) between 25 ℃ and 65 ℃ with 90% to 95% RH.
Test other items when placed at room temperature for 1-2h after the test.
Requirement: No physical damage.

3.23 Salt Spray
Specimens were subjected to Salt Spray test in accordance with EIA-364-26B
Test condition: Temperature 35±2℃, Salt–solution（5±1）%, Humidity（95~98）%(R.H.), PH value: 6.5-7.2.
Duration: 48H.

Requirement: 24 hour salt spray test, no corrosion found on the welding feet
48 hour salt spray test, no corrosion found in the thick gold area of the gold needle terminal

3.24 Temperature life
Specimens were subjected to Temperature life test in accordance with EIA-364-17
Test condition：Subject mated samples to 85℃ for 250 hours.
Test other items when placed at room temperature for 1-2h after the test
Requirement: Meet visual requirements, No evidence physical damage;

3.25 Solderability
Specimens were subjected to Solderability test in accordance with EIA-364-52
Test condition: Test temperature: 245℃ ± 5℃.
Test time: 5±0.5 seconds.
Requirement: 95% of immersed area must show no voids or pin holes.

3.26 Resistance to Soldering heat
Specimens were subjected to Resistance to Soldering heat test in accordance with EIA-364-56
Test condition: PIP: 260℃ 30S number of time: 2 times

4. APPENDIX

4.1. Table List