



1. INTRODUCTION

1.1 Purpose

Testing was performed on Single Beam Card Edge Power Connector with 2.54mm pitch power contact design to determine its conformance to requirements of product specification 108-128113, Revision A.

1.2 Scope

This report covers the electrical, mechanical, and environmental performance of the Single Beam Card Edge Power Connector with 2.54mm pitch power contact design. Testing was performed at TE Shanghai Testing Laboratory between 10-APR-2019 and 16-JUN-2020.

1.3 Conclusion

Single Beam Card Edge Power Connector with 2.54mm pitch power contact design (part number 2358256-1 for representative) conformed to the electrical, mechanical, and environmental performance requirements of product specification 108-128113, Revision A.

1.4 Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
#1, #2, #4	15 pcs (5 ea.)	2358256-1	Single Beam Card Edge Power Connector
	15 pcs (5 ea.)	2367417-1	Mating side test PCB, 6layers, 2oZ copper on each layer.
	15 pcs (5 ea.)	2367274-1	Mounting side test PCB, 6layers, 2oZ copper on each layer.
#3	5 pcs	2358256-1	Single Beam Card Edge Power Connector
#5	3 pcs	2358256-1	Single Beam Card Edge Power Connector
	3 pcs	2367417-1	Mating side test PCB, 6layers, 2oZ copper on each layer.
	3 pcs	2367274-1	Mounting side test PCB, 6layers, 2oZ copper on each layer.
#6,7	3 pcs	2358256-1	Single Beam Card Edge Power Connector

1.5 Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing: Temperature: 15°C to 35°C Relative Humidity 25% to 75%

1.6 Qualification Test Sequence

Test Description	Test group						
	1	2	3	4	5	6	7
	Test sequence (a)						
Initial examination of product	1	1	1	1	1	1	1
Low level contact resistance	3,7	2,6		2,5	2,5		
Contact resistance (power contact)		3,7		3,6			
Insulation resistance			2,6				
Dielectric Withstanding Voltage			3,7				
Temperature rise vs current		4					
Vibration, sinusoidal	5						
Mechanical shock	6						
Mating force	2						
Un-mating force	8						
Durability	4						
Contact retention force						2	
Solderability							2
Thermal shock			4		3		
Humidity/temperature cycling.			5		4		
Temperature life				4(b)			
Mixed flowing gas		5(b)					
Final examination	9	8	8	6	6	3	3

Note

- (a) Numbers indicate sequence in which tests are performed.
- (b) Precondition specimens with 10 durability cycles

2. SUMMARY OF TESTING

2.1 Initial examination– All Test Groups

All specimens submitted for testing were representative of normal production lots. A Certificate of Conformance was issued by Product Assurance. Where specified, specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2 Low Level Contact Resistance- Test Group 1, 2, 4, 5.

Test Group	Test Condition	LLCR (mΩ)		Spec	Jud.
		AVG	MAX		
#1	Initial	1.64	2.49	4 mΩ max.	OK
	Final	1.76	2.57		OK
#2	Initial	1.57	1.99		OK
	Final	1.55	1.93		OK
#4	Initial	1.53	2.10		OK
	Final	2.12	3.51		OK
#5	Initial	1.61	2.26		OK
	Final	1.87	2.75		OK

2.3 Contact resistance (power contact only) - Test Group 2, 4,

Test Group	Test Condition	CR(mΩ)		Spec	Jud.	
		AVG	MAX			
#2	Power	Initial	1.60	2.23	4 mΩ max..	OK
		Final	1.57	2.17		OK
#4	Power	Initial	1.66	2.36		OK
		Final	2.09	3.49		OK

2.4 Insulation resistance– Test Group 3

All insulation resistance measurements between power conductors were greater than 5000 megohms,

2.5 Dielectric Withstanding Voltage – Test Group 3

No dielectric breakdown or flashover occurred.

2.6 Temperature rise vs current – Test Group 2

All specimens were soldered on TE mounting test PCB 2367274-1 and mated with TE mating side PCB 2367417-1. The temp rise results are within the requirement of Δ t max = 30°C,

Test Group	Test Condition	T-rise(°C)		Spec	Jud.
		AVG	MAX		
#2	9.3A @50 contacts (25 Pair)	20.5	23.5	30.0°C Max	OK

2.7 Vibration, sinusoidal – Test Group 1

No discontinuity greater than 1microsecond were detected; No physical damage.

2.8 Mechanical shock – Test Group 1

No discontinuity greater than 1microsecond were detected; No physical damage.

2.9 Mating force and Unmating force – Test Group 1

All specimens were soldered on mounting PCB when tested.

Test Group	Mating force(N)		Spec	Un-Mating (N)		Spec	Jud.
	AVG	MAX		AVG	MIN		
#1	40.3	49.3	75N max	20.7	16.2	7.5N min	OK

2.10 Durability – Test Group 1

No physical damage occurred to the specimens as a result of mating and un-mating the specimens 200 times.

2.11 Contact retention force – Test Group 6

All retention force measurements for contact were more than 5N per contact with 19.8N min.

2.12 Solderability – Test Group 7

All of test specimens get more than 95% coverage.

2.13 Thermal shock – Test Group 3, 6

No evidence of physical damage was visible as a result of exposure to thermal shock.

2.14 Humidity-temperature cycling – Test Group 3, 5

No evidence of physical damage was visible as a result of exposure to Humidity-temperature cycling

2.15 Temperature life– Test Group 4

No evidence of physical damage was visible as a result of exposure to 250hours at 105°C temperature life.

2.16 Mixed flowing gas– Test Group 2

No evidence of physical damage was visible as a result of the Class IIA MFG exposure for 14days.

2.17 Final examination of product – All Test Groups

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

3. TEST REQUIREMENTS AND PROCEDURES SUMMARY

Test Description	Requirement	Procedure
Initial examination of product	Meets requirements of product drawing.	EIA-364-18 Visual and dimensional (C of C) inspection per product drawing.

ELECTRICAL		
Low Level Contact Resistance	4 mΩ max per contact.	EIA-364-23 Subject specimens to 100 mA maximum and 20 mV maximum open circuit voltage
Contact resistance (power contact only)	At 9.3A for power, 4 mΩ Max	EIA-364-06
Insulation Resistance	5000 MΩ minimum	EIA-364-21 500+/-10% VDC, 2 minutes hold. Test between adjacent contacts
Dielectric Withstanding Voltage	One-minute hold with no breakdown or flashover	EIA-364-20, Condition I. 1200 V for adjacent contacts of unmated connector assemblies.
Temperature rise vs current	Temperature rise: 30°C max. over ambient temperature	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5-minute intervals are within 1°C See table 2

MECHANICAL		
Vibration, sinusoidal	No discontinuities of 1 microsecond or longer duration. See Note	EIA-364-28, Test condition I, Subject mated specimens to 10-55-10 Hz Traversed in 1 minutes at 1.52mm amplitude 2 hours each of 3 mutually perpendicular planes;
Mechanical shock	No discontinuities of 1 microsecond or longer duration. See Note	EIA-364-27, Test Condition A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks
Mating force	3N max—per contact pair	EIA-364-13, Method A. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute
Un-mating force	0.3N min— per contact pair	EIA-364-13, Method A. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute

Durability	200 cycles See Note	EIA-364-9, Mate and un-mate specimens for 200 cycles at a maximum rate of 500 cycles per hour
Contact retention force	5N min. per contact	EIA-364-29 Measure force necessary to remove individual contact from the housing at a maximum rate of 12.7mm per minute
Solderability	Solderable area shall have a minimum of 95% solder coverage. See Note.	TE Spec. 109-11-11, Test Method A.

ENVIRONMENTAL		
Thermal shock	See Note	EIA-364-32, Method A, Test condition I, Subject specimens to 5cycles between -55 and 105°C with 30 minute dwells at temperature extremes and 1 minute maximum transition between temperatures
Temperature life	See Note	EIA-364-17, Method A, Test condition 4, Test condition C. Subject mated specimens to 105°C for 250 hours
Humidity/temperature cycling.	See Note	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 90 to 95% RH
Mixed flowing gas	See Note	EIA-364-65, Class IIA (4 gas). Subject mated specimens to environmental Class IIA for 14 days--(7 days unmated, LLCR, followed by 7 days mated)

i **NOTE**
Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in section 1.6