EN IEC 62680-1-3 Test Report

24B01N000452-001-COM

For

Type-C Receptacle Connector

Company Name： SHENZHEN ZDT TECHNOLOGY CO.,LTD

Product Name： USB TYPE C FEMALE 16PIN SMT SINK 0.80

Model Name： CF172-16SLB15R-68

Hardware Version： A

Issued Date： 2024-04-01

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

Test Laboratory:

SAICT, Shenzhen Academy of Information and Communications Technology

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
24B01N000452-001-COM	V1	First release	2024-04-01

CONTENTS

1. Test Laboratory

1.1. Testing Location

Location：SAICT

Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000

1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	25-85%RH
Atmospheric pressure	86-106kPa

1.3. Project Data

Testing Start Date: 2020-03-05 Testing End Date: 2024-03-28

1.4. Signature

Su Kun	Wang Yang	Wei Ming
Prepared this test report	**Reviewed this test report**	**Approved this test report**

2. Client Information

2.1. Applicant Information

Company Name：	SHENZHEN ZDT TECHNOLOGY CO.,LTD
Address ：	The No. 3 Industrial Road, Eighth industrial zone, Xitou, Songgang, Baoan district, Shenzhen City
City：	Shenzhen
Country：	China
Telephone：	0755-29420399

2.2. Manufacturer Information

Company Name：	SHENZHEN ZDT TECHNOLOGY CO.,LTD
Address：	The No. 3 Industrial Road, Eighth industrial zone, Xitou, Songgang, Baoan district, Shenzhen City
City:	Shenzhen
Country：	China
Telephone：	0755-29420399

3. Unit Under Test (UUT) Information

3.1. About UUT

Description：	USB2.0 Type-C Receptacle Connector
Brand Name：	SHENZHEN ZDT TECHNOLOGY CO.,LTD
Marking Name：	USB TYPE C FEMALE 16PIN SMT SINK 0.80
Model Name：	CF172-16SLB15R-68
Hardware Version：	A

3.2. Statements

The [USB TYPE C FEMALE 16PIN SMT SINK 0.80], [CF172-16SLB15R-68], manufactured by [SHENZHEN ZDT TECHNOLOGY CO.,LTD] is only for conformance test.
The original report number is [ZDT-DG-12231901] (Test by GRL test Lab)

3.3. Sample Coding

Test Group	Number of Plug/Receptacle	Qty of Specimen
Group A-1	UT01aa to UT10aa	10 pcs
Group A-2	UT11aa to UT20aa	10 pcs
Group A-3	UT21aa to UT30aa	10 pcs
Group A-4	UT31aa to UT50aa	20 pcs
Group A-7	UT51aa to UT60aa	10 pcs
Group B-5	UT61aa to UT63aa	3 pcs

4. Reference Documents

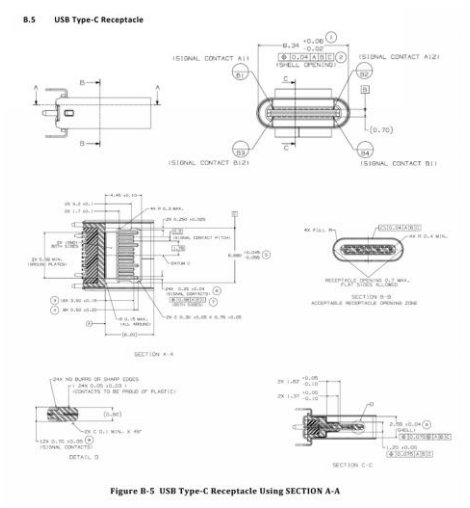
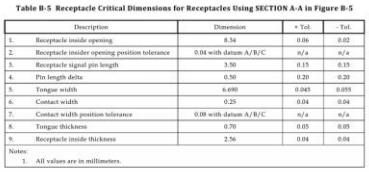
1. EN IEC 62680-1-3:2022, Universal serial bus interfaces for data and power-Part 1-3: Common components – USB Type-C Cable and Connector Specification
2. Universal Serial Bus Type-C Connectors and Cable Assemblies Compliance Document Revision 2.1b:2021

5. USB Type-C Compliance Requirements

5.1. DC Electrical

Clause	Test Item	Test Procedure	Requirement
3.7.8.1	Low Level Contact Resistance (LLCR)	EIA 364-23 The low level contact resistance (LLCR) measurement is made across the plug and receptacle mated contacts and does not include any internal paddle cards or substrates of the plug or receptacle. The test boards shall be provided with the connectors to be tested. • Measure at 20 mV (max) open, circuit at 100 mA.	The following requirements apply to the power and signal contacts: • 40 mΩ (max) initial for VBUS, GND and all other contacts. • 50 mΩ maximum after initial easurement.

5.2. Mechanical

Clause	Test Item	Test Procedure	Requirement
3.2.1	Critical Dimensions		
3.8.1.1	Insertion force	EIA 364-13 The insertion force test shall be done at a maximum speed of 12.5 mm (0.492") per minute.	Within the range from 5 N to 20 N. This requirement does not apply to the plugs that are used for direct docking without a cable.
3.8.1.2	Extraction force	EIA 364-13 The extraction force test shall be done at a maximum speed of 12.5 mm (0.492") per minute.	Within the range of 8 N to 20 N, measured after a preconditioning of five insertion/extraction cycles (i.e., the sixth extraction). After an additional twenty-five insertion/extraction cycles, the extraction force shall be measured again (i.e., the thirty□second extraction) and the extraction force shall be within: a) 33 % of the initial reading, and b) within the range of 8 N to 20 N. The extraction force shall be within the range of 6 N to 20 N after 10,000 insertion/extraction cycles. This requirement does not apply to the plugs that are used for direct docking without a cable.

6. Test Procedure

For the DC electrical, Mechanical and Environmental compliance requirements of Type-C connector, refer to the grouping and test methods in the EIA364.1000.01 standard to implement the test.

Group A-1	
No.	**Test Item**
A-1-1	Low level contact resistance
Group A-2	
No.	**Test Item**
A-2-1	Low level contact resistance
Group A-3	
No.	**Test Item**
A-3-1	Low level contact resistance
Group A-4	
No.	**Test Item**
A-4-1	Low level contact resistance
Group A-7	
No.	**Test Item**
A-7-2	Low level contact resistance
A-7-4	Insertion force
A-7-5	Extraction force
Group B-5	
No.	**Test Item**
B-5-1	Critical Dimensions

7. Test Result Summary

Test Item	Clause	Result
Construction	3.2.1 (6)	Pass
Critical Dimensions	3.2.1 (8)	Pass
Low level contact resistance	3.7.8.1	Pass
Insertion force	3.8.1.1	Pass
Extraction force	3.8.1.2	Pass

8. Test Detail

8.1. Clause 3.2.1 (6) Construction

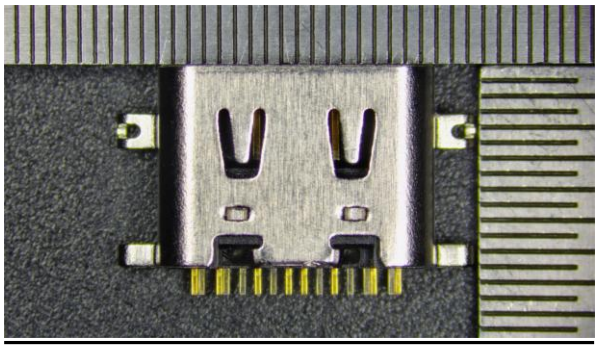
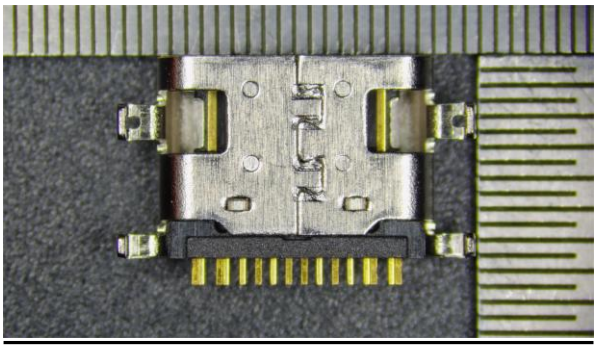
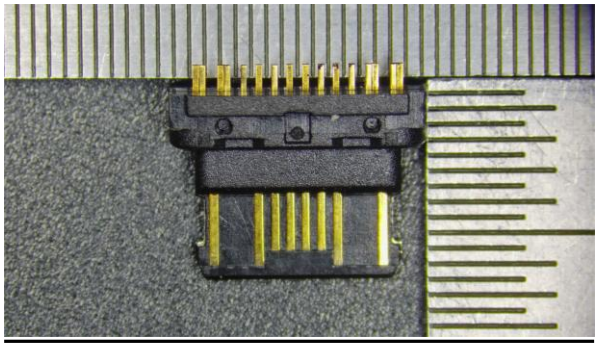
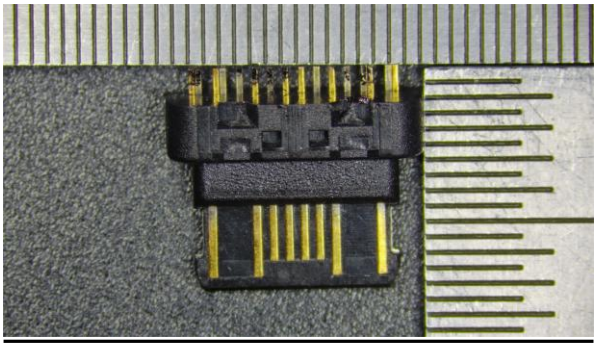
Construction			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/08	Temp. 21.8 ℃ / 56.9 %RH	Huang Siwei	**Pass**

EMC ground return path			
Description	Sample Coding		
	UT69aa	UT70aa	UT71aa
1.EMC spring	Y	Y	Y
2.EMC pad	N	N	N
3.Solid bumps	Y	Y	Y
4.Distance between the bumps	N/A	N/A	N/A
Result	Pass	Pass	Pass
Note: Receptacle configurations with a conductive shell. The requirements apply to the receptacle contact dimensions shown in ALTERNATE SECTION A-A Figure B-5. Receptacle configuration with respect to mounting surface: Right angle.			

Number of pins: 16

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
√	N/A	N/A	√	√	√	√	√	√	N/A	N/A	√
B12	**B11**	**B10**	**B9**	**B8**	**B7**	**B6**	**B5**	**B4**	**B3**	**B2**	**B1**
√	N/A	N/A	√	√	√	√	√	√	N/A	N/A	√

Tongue photograph

	
A Side	**B Side**
	
A Side	**B Side**

8.2. Clause 3.2.1 (8) Critical Dimensions

B-5-1 Critical Dimensions			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/08-2024/03/08	Temp. 21.8 ℃ / 56.9 %RH	Huang Siwei	**Pass**

Test data: (Unit:mm)			
B-5-1 Critical Dimensions – Receptacle			
Description	Sample Coding		
	UT61aa	UT62aa	UT63aa
1.Receptacle inside opening (8.32～8.40)	8.362	8.367	8.373
2.Receptacle insider opening position tolerance (0.04 with datum A/B/C)	0.005	0.007	0.005
3.Receptacle signal pin length （3.35～3.65）	3.454	3.457	3.443
4.Pin length delta (0.30～0.70)	0.518	0.514	0.516
5.Tongue width (6.635～6.735)	6.6816	6.6677	6.6865
6.Contact width (0.21～0.29)	0.286	0.275	0.282
7.Contact width position tolerance (0.08 with datum A/B/C)	0.075	0.075	0.079
8. Tongue thickness （0.65～0.75）	0.746	0.733	0.742
9.Receptacle inside thickness (2.52～2.60)	2.599	2.599	2.597

8.3. Clause 3.7.8.1 Low level contact resistance

A-1-1 Low level contact resistance			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/28-2024/03/28	Temp. 21.2 ℃ / 67.9 %RH	Zhan Weilong	**Pass**
Test condition	Mated；Maximum open circuit voltage 20 mV；Test current 100 mA.		
Criteria	≤40 mΩ（Initial）		

A-1-1 Low Level Contact Resistance (mΩ)												
Sample Coding	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
UT01aa	22.0	N/A	N/A	26.2	23.2	22.7	22.8	22.7	5.3	N/A	N/A	19.5
UT02aa	26.8	N/A	N/A	25.8	22.5	22.2	22.6	22.5	4.8	N/A	N/A	18.6
UT03aa	23.6	N/A	N/A	25.7	22.8	22.8	23.1	23.1	4.8	N/A	N/A	17.7
UT04aa	25.7	N/A	N/A	26.9	23.0	23.3	23.3	23.2	5.1	N/A	N/A	18.3
UT05aa	28.1	N/A	N/A	26.0	23.1	23.2	23.3	23.1	5.1	N/A	N/A	18.5
UT06aa	23.8	N/A	N/A	25.9	22.6	22.5	23.3	24.3	4.9	N/A	N/A	18.3
UT07aa	22.9	N/A	N/A	27.3	23.7	24.0	24.6	23.6	5.3	N/A	N/A	18.6
UT08aa	28.1	N/A	N/A	26.7	23.3	22.7	23.8	22.8	4.9	N/A	N/A	18.6
UT09aa	21.9	N/A	N/A	25.9	22.5	22.3	23.0	22.6	5.2	N/A	N/A	18.4
UT10aa	23.6	N/A	N/A	27.2	23.3	23.4	24.9	23.7	5.3	N/A	N/A	18.5
Sample Coding	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
UT01aa	23.9	N/A	N/A	22.1	21.9	23.7	22.3	22.8	22.0	N/A	N/A	19.5
UT02aa	22.9	N/A	N/A	21.5	22.2	24.3	25.6	23.0	22.2	N/A	N/A	19.1
UT03aa	23.2	N/A	N/A	21.5	21.5	21.8	22.0	22.1	21.2	N/A	N/A	19.0
UT04aa	26.6	N/A	N/A	22.5	22.4	26.5	22.4	22.3	21.9	N/A	N/A	19.6
UT05aa	24.4	N/A	N/A	21.8	22.2	24.2	22.6	22.8	22.1	N/A	N/A	19.7
UT06aa	24.7	N/A	N/A	22.4	22.6	22.8	26.5	23.0	22.8	N/A	N/A	18.8
UT07aa	24.4	N/A	N/A	22.8	22.9	23.6	22.6	22.6	21.9	N/A	N/A	20.0
UT08aa	26.1	N/A	N/A	21.9	22.2	22.8	23.0	22.9	22.3	N/A	N/A	19.6
UT09aa	25.1	N/A	N/A	21.4	22.5	23.4	24.8	26.8	23.4	N/A	N/A	20.3
UT10aa	24.1	N/A	N/A	22.8	22.8	22.9	22.5	22.3	22.2	N/A	N/A	19.7

A-2-1 Low level contact resistance			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/28-2024/03/28	Temp. 21.2 ℃ / 67.9 %RH	Zhan Weilong	**Pass**
Test condition	Mated；Maximum open circuit voltage 20 mV；Test current 100 mA.		
Criteria	≤40 mΩ（Initial）		

A-2-1 Low Level Contact Resistance (mΩ)												
Sample Coding	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
UT11aa	27.8	N/A	N/A	26.7	23.1	23.2	23.4	23.0	5.3	N/A	N/A	18.5
UT12aa	29.1	N/A	N/A	25.2	21.9	22.1	22.6	22.5	4.9	N/A	N/A	19.0
UT13aa	27.9	N/A	N/A	26.2	23.1	23.1	23.3	23.3	5.3	N/A	N/A	18.6
UT14aa	25.9	N/A	N/A	26.0	23.4	23.2	23.4	23.4	5.1	N/A	N/A	19.0
UT15aa	21.7	N/A	N/A	26.0	22.7	22.5	22.6	22.9	5.2	N/A	N/A	18.5
UT16aa	23.7	N/A	N/A	25.7	22.2	22.6	22.9	22.6	5.2	N/A	N/A	19.0
UT17aa	28.2	N/A	N/A	25.8	22.5	22.6	22.7	23.0	5.4	N/A	N/A	18.1
UT18aa	25.3	N/A	N/A	26.3	23.1	22.9	22.9	22.6	5.2	N/A	N/A	19.4
UT19aa	28.0	N/A	N/A	26.0	22.2	22.7	22.5	22.8	5.2	N/A	N/A	18.2
UT20aa	27.3	N/A	N/A	25.5	22.3	22.5	22.9	22.4	5.4	N/A	N/A	18.9
Sample Coding	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
UT11aa	23.9	N/A	N/A	21.7	23.0	23.8	22.4	22.4	21.7	N/A	N/A	19.5
UT12aa	24.7	N/A	N/A	21.4	22.4	23.3	38.4	36.9	26.1	N/A	N/A	20.1
UT13aa	24.2	N/A	N/A	22.4	22.2	22.6	22.3	22.7	22.0	N/A	N/A	20.0
UT14aa	25.5	N/A	N/A	22.3	22.6	24.1	24.1	21.8	23.3	N/A	N/A	21.0
UT15aa	23.4	N/A	N/A	21.9	22.1	22.8	22.6	22.4	22.5	N/A	N/A	19.7
UT16aa	25.4	N/A	N/A	22.0	22.7	23.7	25.5	20.7	21.4	N/A	N/A	21.3
UT17aa	23.8	N/A	N/A	22.3	22.2	22.4	22.4	22.5	22.0	N/A	N/A	19.6
UT18aa	24.0	N/A	N/A	21.8	22.9	24.8	21.6	22.0	23.3	N/A	N/A	21.6
UT19aa	23.5	N/A	N/A	22.4	22.0	22.4	22.3	22.6	22.2	N/A	N/A	19.6
UT20aa	24.6	N/A	N/A	21.8	22.8	23.6	24.1	23.4	21.7	N/A	N/A	22.4

A-3-1 Low level contact resistance			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/28-2024/03/28	Temp. 21.2 ℃ / 67.9 %RH	Zhan Weilong	**Pass**
Test condition	Mated；Maximum open circuit voltage 20 mV；Test current 100 mA.		
Criteria	≤40 mΩ（Initial）		

A-3-1 Low Level Contact Resistance (mΩ)												
Sample Coding	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
UT21aa	21.3	N/A	N/A	26.0	22.8	23.4	23.1	23.3	5.5	N/A	N/A	18.6
UT22aa	27.9	N/A	N/A	27.1	23.1	23.2	23.2	23.6	5.4	N/A	N/A	18.6
UT23aa	28.0	N/A	N/A	26.5	22.8	23.5	22.6	22.9	5.5	N/A	N/A	18.5
UT24aa	28.5	N/A	N/A	26.6	23.0	22.8	23.1	23.2	5.2	N/A	N/A	18.4
UT25aa	25.9	N/A	N/A	25.7	22.3	22.5	22.4	22.5	5.2	N/A	N/A	18.4
UT26aa	22.7	N/A	N/A	26.1	23.2	23.4	24.1	23.9	5.1	N/A	N/A	18.5
UT27aa	26.7	N/A	N/A	28.0	22.8	24.9	24.5	24.7	5.2	N/A	N/A	19.0
UT28aa	28.9	N/A	N/A	27.1	23.2	23.5	23.6	23.4	5.1	N/A	N/A	19.4
UT29aa	26.2	N/A	N/A	26.4	23.2	23.1	22.8	23.3	5.4	N/A	N/A	19.4
UT30aa	28.7	N/A	N/A	25.9	23.2	22.7	22.8	22.9	5.6	N/A	N/A	18.7
Sample Coding	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
UT21aa	24.3	N/A	N/A	22.3	22.7	23.0	24.5	22.8	21.8	N/A	N/A	19.9
UT22aa	25.1	N/A	N/A	22.0	22.4	22.6	22.9	22.5	21.8	N/A	N/A	19.6
UT23aa	24.7	N/A	N/A	22.2	22.4	22.4	22.0	22.6	22.2	N/A	N/A	19.5
UT24aa	24.1	N/A	N/A	22.0	22.4	22.6	22.4	22.5	21.9	N/A	N/A	19.7
UT25aa	23.6	N/A	N/A	22.2	22.4	22.4	22.3	22.4	21.9	N/A	N/A	19.5
UT26aa	24.2	N/A	N/A	22.9	22.6	22.6	22.9	23.0	22.4	N/A	N/A	19.9
UT27aa	25.9	N/A	N/A	23.2	22.9	23.5	23.7	23.1	22.4	N/A	N/A	20.1
UT28aa	26.0	N/A	N/A	22.4	28.8	23.0	22.5	23.2	22.1	N/A	N/A	19.7
UT29aa	23.9	N/A	N/A	22.5	22.8	23.2	22.6	23.3	21.6	N/A	N/A	19.7
UT30aa	24.2	N/A	N/A	21.9	22.0	22.5	22.4	23.2	21.7	N/A	N/A	19.6

A-4-1 Low level contact resistance			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/28-2024/03/28	Temp. 21.2 ℃ / 67.9 %RH	Zhan Weilong	**Pass**
Test condition	Mated；Maximum open circuit voltage 20 mV；Test current 100 mA.		
Criteria	≤40 mΩ（Initial）		

A-4-1 Low Level Contact Resistance (mΩ)												
Sample Coding	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
UT31aa	20.1	N/A	N/A	26.1	23.3	23.2	23.5	23.2	5.3	N/A	N/A	18.4
UT32aa	20.0	N/A	N/A	26.4	22.6	22.8	22.9	22.9	5.2	N/A	N/A	18.4
UT33aa	28.1	N/A	N/A	26.5	23.3	23.3	23.2	23.5	5.3	N/A	N/A	18.3
UT34aa	22.1	N/A	N/A	27.2	25.1	27.1	22.5	22.8	5.6	N/A	N/A	18.7
UT35aa	21.8	N/A	N/A	26.0	23.3	23.1	23.2	23.1	5.4	N/A	N/A	18.9
UT36aa	20.0	N/A	N/A	26.0	23.7	23.2	22.9	23.1	5.9	N/A	N/A	18.5
UT37aa	24.0	N/A	N/A	26.0	23.1	23.6	24.1	23.8	5.5	N/A	N/A	18.5
UT38aa	20.4	N/A	N/A	26.2	23.5	23.0	22.5	22.8	5.3	N/A	N/A	18.5
UT39aa	28.7	N/A	N/A	26.4	24.6	23.9	23.6	23.1	5.5	N/A	N/A	18.5
UT40aa	20.8	N/A	N/A	28.4	23.8	23.9	23.3	23.8	5.3	N/A	N/A	18.9
UT41aa	22.5	N/A	N/A	26.0	23.3	23.0	22.8	23.6	5.1	N/A	N/A	18.5
UT42aa	23.5	N/A	N/A	26.4	23.5	23.0	23.1	23.1	5.2	N/A	N/A	18.3
UT43aa	25.3	N/A	N/A	26.4	23.1	23.6	22.8	22.9	5.3	N/A	N/A	18.4
UT44aa	29.5	N/A	N/A	26.6	23.4	22.9	23.0	23.1	5.2	N/A	N/A	18.0
UT45aa	21.2	N/A	N/A	26.8	23.2	23.4	22.9	23.0	5.5	N/A	N/A	18.5
UT46aa	23.3	N/A	N/A	27.7	24.6	24.0	23.6	23.6	5.3	N/A	N/A	18.8
UT47aa	21.3	N/A	N/A	27.8	23.7	22.1	23.4	23.5	5.0	N/A	N/A	18.3
UT48aa	25.9	N/A	N/A	27.3	23.3	23.2	22.4	22.8	5.1	N/A	N/A	18.1
UT49aa	24.0	N/A	N/A	26.2	23.1	23.2	23.1	23.8	5.2	N/A	N/A	18.0
UT50aa	20.1	N/A	N/A	26.5	23.2	23.2	22.8	23.2	5.1	N/A	N/A	18.7

A-4-1 Low Level Contact Resistance (mΩ)												
Sample Coding	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
UT31aa	24.3	N/A	N/A	22.0	22.0	22.3	22.4	22.3	21.5	N/A	N/A	19.5
UT32aa	24.0	N/A	N/A	22.0	22.1	22.5	22.5	22.4	21.6	N/A	N/A	19.6
UT33aa	24.3	N/A	N/A	22.2	22.0	22.7	27.6	22.4	21.7	N/A	N/A	19.7
UT34aa	24.6	N/A	N/A	22.4	22.0	23.2	23.5	23.0	22.0	N/A	N/A	19.9
UT35aa	24.4	N/A	N/A	22.0	22.7	22.9	23.2	23.1	22.4	N/A	N/A	19.8
UT36aa	24.0	N/A	N/A	22.4	22.0	22.9	23.4	22.5	21.7	N/A	N/A	20.0
UT37aa	25.5	N/A	N/A	22.3	22.6	23.4	28.6	22.7	21.8	N/A	N/A	19.5
UT38aa	23.7	N/A	N/A	21.8	22.1	22.8	22.2	22.5	21.8	N/A	N/A	19.4
UT39aa	24.6	N/A	N/A	22.2	22.2	22.8	22.6	22.6	21.5	N/A	N/A	19.5
UT40aa	24.5	N/A	N/A	22.5	22.2	23.3	22.8	22.8	22.1	N/A	N/A	20.8
UT41aa	23.7	N/A	N/A	22.1	21.9	22.5	22.4	22.2	21.6	N/A	N/A	20.0
UT42aa	24.0	N/A	N/A	21.8	22.3	23.0	23.1	22.4	21.6	N/A	N/A	19.4
UT43aa	24.2	N/A	N/A	22.2	22.6	23.2	23.1	22.8	22.0	N/A	N/A	19.6
UT44aa	24.7	N/A	N/A	21.7	22.1	22.5	22.9	22.8	21.4	N/A	N/A	19.5
UT45aa	23.8	N/A	N/A	22.6	22.7	23.0	23.5	23.2	22.2	N/A	N/A	19.9
UT46aa	24.9	N/A	N/A	22.3	22.5	23.4	23.1	22.6	21.5	N/A	N/A	19.7
UT47aa	23.9	N/A	N/A	22.7	22.5	23.0	22.5	22.2	22.0	N/A	N/A	19.5
UT48aa	26.8	N/A	N/A	22.6	21.9	22.5	22.4	22.3	21.6	N/A	N/A	19.4
UT49aa	24.1	N/A	N/A	21.9	22.3	24.0	23.5	24.3	21.4	N/A	N/A	19.5
UT50aa	24.1	N/A	N/A	21.6	22.0	23.0	22.6	22.8	22.2	N/A	N/A	22.7

A-7-2 Low level contact resistance			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/28-2024/03/28	Temp. 21.6 ℃ / 66.4 %RH	Zhan Weilong	**Pass**
Test condition	Mated；Maximum open circuit voltage 20 mV；Test current 100 mA.		
Criteria	≤40 mΩ（Initial）		

Test data:

A-7-2 Low Level Contact Resistance (mΩ)

Sample Coding	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
UT51aa	22.4	N/A	N/A	25.3	23.1	22.2	22.7	22.2	5.7	N/A	N/A	19.4
UT52aa	26.3	N/A	N/A	26.6	23.6	22.9	22.2	23.1	5.6	N/A	N/A	18.1
UT53aa	23.8	N/A	N/A	25.2	23.0	23.7	22.8	23.1	5.6	N/A	N/A	18.3
UT54aa	25.2	N/A	N/A	26.2	22.8	23.8	22.5	22.7	5.3	N/A	N/A	19.8
UT55aa	28.7	N/A	N/A	26.1	22.4	22.8	23.9	23.4	5.4	N/A	N/A	18.5
UT56aa	23.3	N/A	N/A	26.7	22.2	23.2	24.0	22.3	5.9	N/A	N/A	18.3
UT57aa	22.1	N/A	N/A	25.7	23.1	23.3	23.6	22.4	4.4	N/A	N/A	20.0
UT58aa	28.8	N/A	N/A	25.4	23.9	22.8	22.5	22.5	5.9	N/A	N/A	18.9
UT59aa	21.3	N/A	N/A	25.8	22.1	23.7	23.3	23.2	5.6	N/A	N/A	18.4
UT60aa	23.5	N/A	N/A	25.7	24.0	22.8	23.8	23.2	4.3	N/A	N/A	19.8
Sample Coding	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12
UT51aa	22.1	N/A	N/A	21.8	21.1	22.4	23.9	22.5	23.3	N/A	N/A	20.3
UT52aa	23.9	N/A	N/A	22.3	22.2	24.8	22.5	23.3	22.4	N/A	N/A	19.7
UT53aa	23.2	N/A	N/A	21.9	21.4	23.8	22.2	22.5	22.6	N/A	N/A	20.9
UT54aa	23.0	N/A	N/A	21.5	21.9	23.0	23.0	23.9	23.1	N/A	N/A	19.9
UT55aa	25.2	N/A	N/A	22.7	21.3	21.4	23.1	23.9	21.6	N/A	N/A	19.7
UT56aa	25.8	N/A	N/A	21.8	21.4	22.7	22.2	22.7	23.6	N/A	N/A	20.4
UT57aa	22.4	N/A	N/A	21.1	21.5	22.8	23.2	22.5	23.0	N/A	N/A	20.8
UT58aa	22.8	N/A	N/A	21.4	21.2	24.6	23.5	23.9	22.2	N/A	N/A	20.2
UT59aa	22.6	N/A	N/A	23.0	21.5	21.2	23.1	22.8	22.6	N/A	N/A	20.7
UT60aa	25.1	N/A	N/A	22.4	22.8	22.9	23.3	23.8	23.1	N/A	N/A	20.3

8.4. Clause 3.8.1.1 Insertion force

A-7-4 Insertion Force			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/28-2024/03/28	Temp. 21.6 ℃ / 66.4 %RH	Zhan Weilong	**Pass**
Test condition	Speed：12.5mm/min；Insertion depth：4.8mm.		
Criteria	Insertion force:5N～20N		

Test data:					
A-7-4 Insertion Force					
Sample Coding	UT51aa	UT52aa	UT53aa	UT54aa	UT55aa
Insertion force (N)	14.3	16.9	8.9	9.7	19.3
Sample Coding	UT56aa	UT57aa	UT58aa	UT59aa	UT60aa
Insertion force (N)	10.3	16.1	9.9	17.1	10.8

8.5. Clause 3.8.1.1 Extraction force

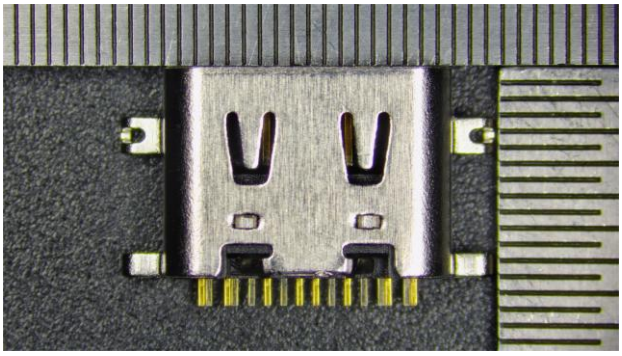
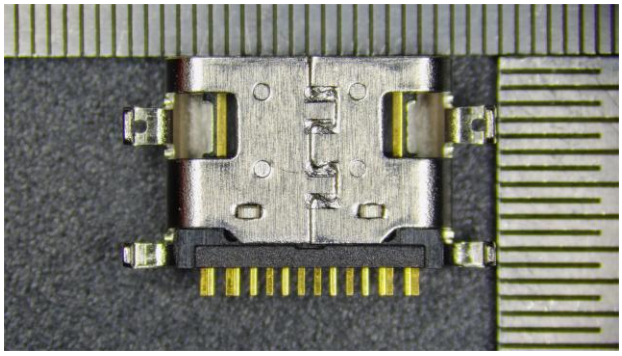
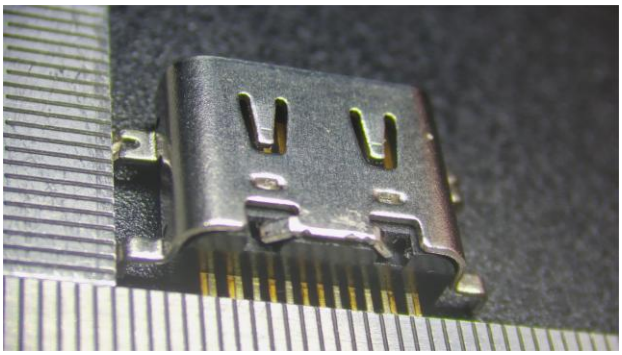
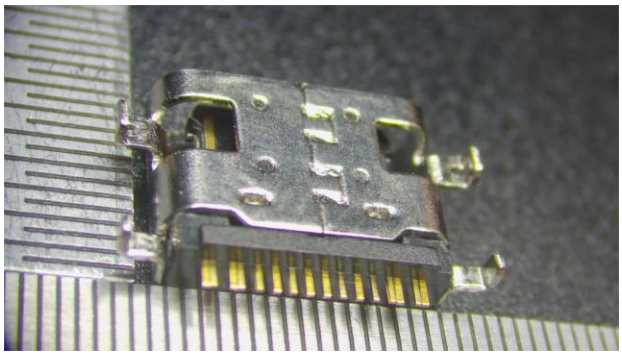
A-7-5 Extraction Force			
Testing Period	**Measure environment**	**Test Engineer**	**Test Result**
2024/03/28-2024/03/28	Temp. 21.6 ℃ / 66.4 %RH	Zhan Weilong	**Pass**
Test condition	Speed：12.5mm/min；Extraction depth：4.8mm.		
Criteria	Extraction force：8N～20N(Initial reading)		

Test data:					
A-7-5 Extraction Force					
Sample Coding	UT51aa	UT52aa	UT53aa	UT54aa	UT55aa
Extraction force (N)	18.7	19.5	12.3	12.5	19.2
Sample Coding	UT56aa	UT57aa	UT58aa	UT59aa	UT60aa
Extraction force (N)	11.1	19.5	12.7	18.4	13.5

9. Test Equipments Utilized

Name	Model	Serial number	Calibration Date	Expire Date
4-axis Tester	YH-8812WEXT	17068812429	2023.11.27	2024.11.26
4-axis Tester	YH-8812WEXT	17068812430	2023.11.27	2024.11.26
Microscope	MM-400/L	3413948	2023.11.27	2024.11.26
Micro-ohmmeter	RM3545	170938239	2023.11.27	2024.11.26

ANNEX A: UUT photograph

	
Top	Buttom
	
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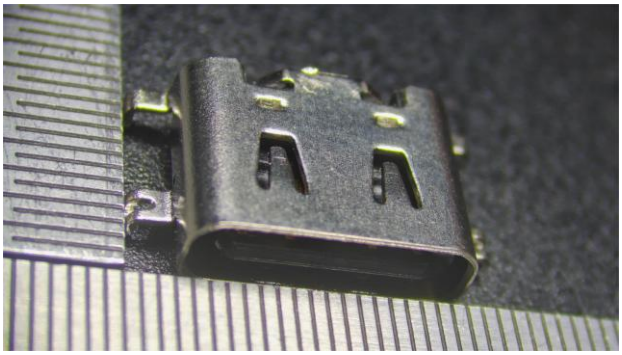
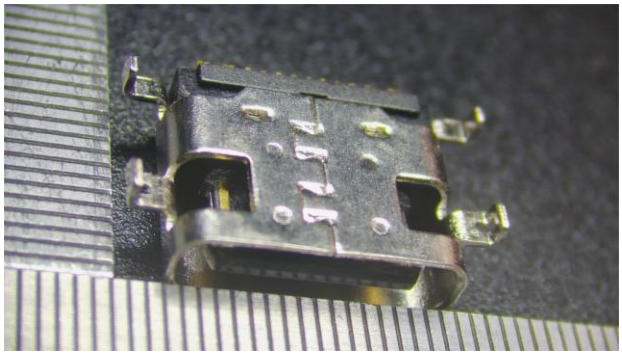
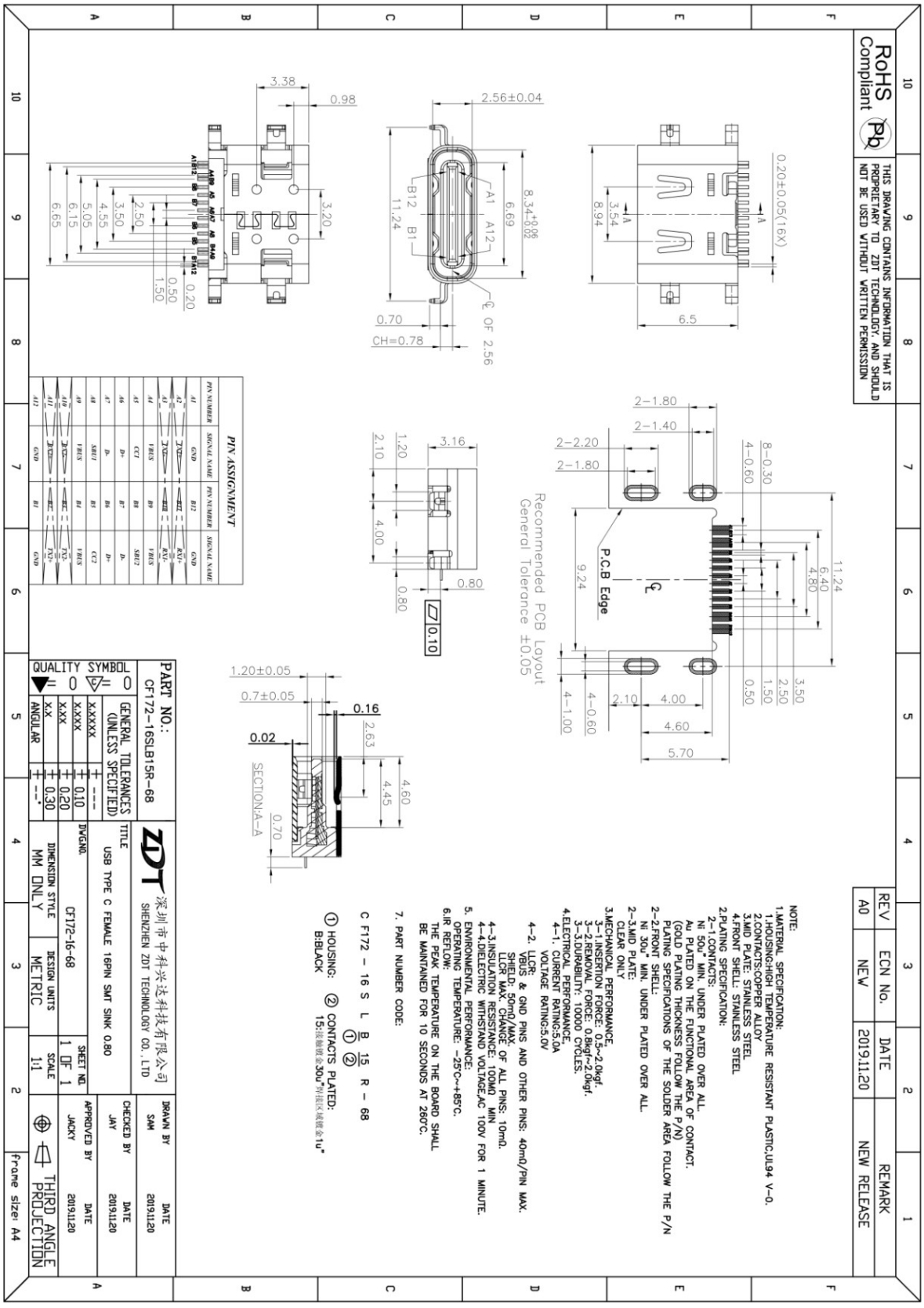
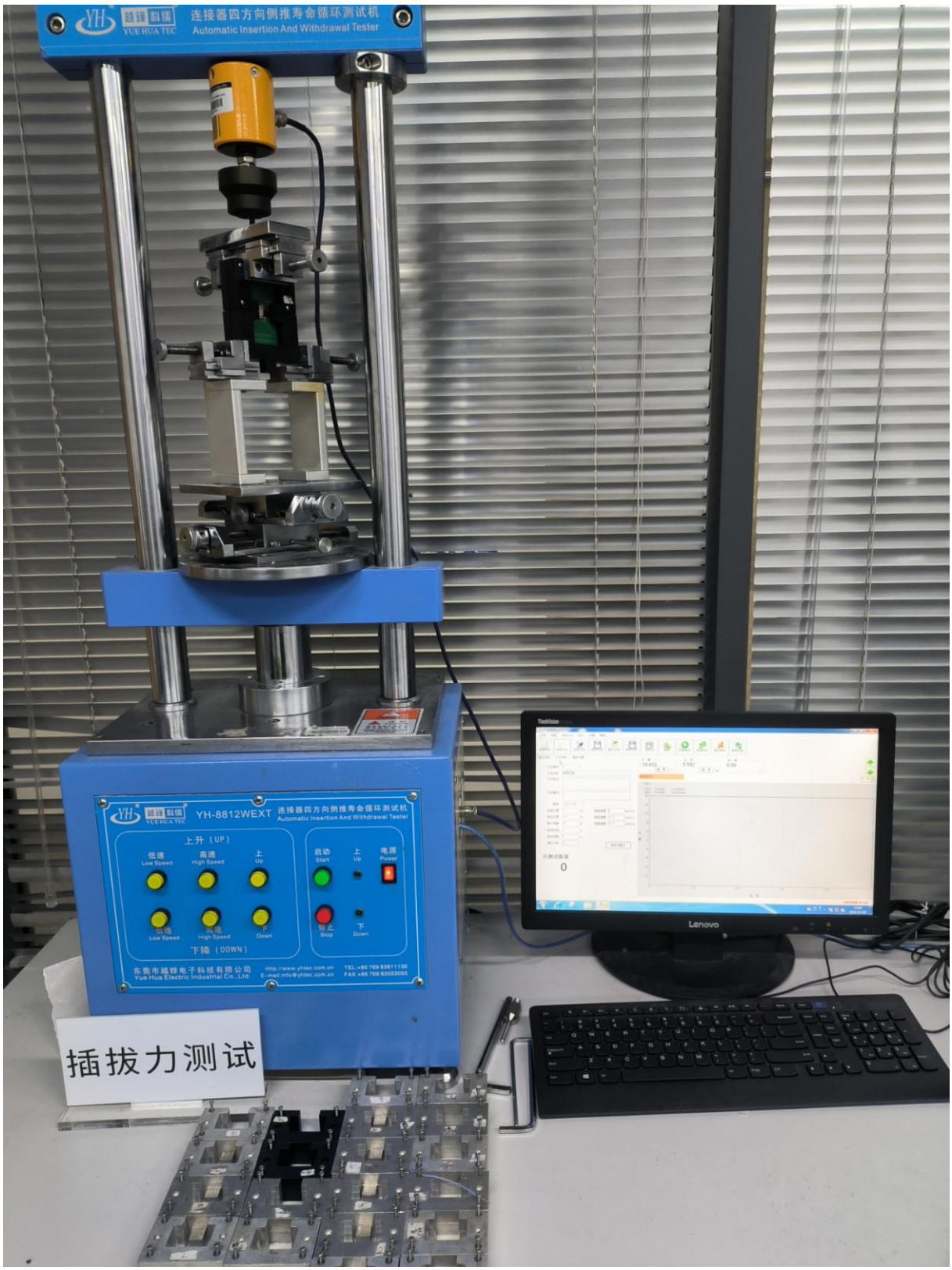
	
Receptacle	Receptacle

ANNEX B: Drawing



ANNEX C: Insertion Force & Extraction Force Test Layout



ANNEX D: The original test report [ZDT-DG-12231901]

GRL
GRANITE RIVER LABS

USB Type-C Connector
Compliance Test Report

Mar.05,2020

Customer ID	SHEN ZHEN ZDT TECHNOLOGY CO.,LTD
GRL Project Number	ZDT-DG-12231901
Customer Contact	Address: No43B, NO2 industrial estate, Xitian, Gongming Town, Guangming District, Shenzhen Tel：0755-29420399 Email: liuqingsheng@zdtconn.com
Product Marketing Name	USB TYPE C FEMALE 16PIN SMT SINK 0.80
Product Model Name	CF172-16SLB15R-68
Product TID	**2754**
Product Type	☒USB Type-C Receptacle ☐USB Type-C Plug
Scope of Testing	USB Type-C Connector Compliance Test
Test Results	**PASS**
GRL Test Engineer	Jack Tan
GRL Reviewer	Jesson Li

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Room 501, Level 5, Building 1, No. 5 Keji 2nd Rd., Songshan Lake, Dongguan City, China 523808 || info_dg@graniteriverlabs.com

1. Project Summary

This USB Type-C Connector Compliance Test Report performs the DC electrical, Mechanical and Environmental Compliance tests.

The compliance test is based on the following documents:

- *Universal Serial Bus Type-C Cable and Connector Specification Release 2.0 August 2019*
- *Universal Serial Bus Type-C Connectors and Cable Assemblies Compliance Document, Revision 1.2, August 22, 2017.*
- *EIA Standard EIA-364*

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2. Test Summary

Group A-1		
Test Title	**Common Requirement**	**Result**
A-1-1 : Low Level Contact Resistance	40mΩ max.	PASS
A-1-2 : Durability (preconditioning)	50 Plug/Unplug Cycles with no evidence of physical damage	PASS
A-1-3 : Temperature Life	105°C without applied voltage for 120 Hours	PASS
A-1-4 : Low Level Contact Resistance	50mΩ max.	PASS
A-1-5 : Reseating	3 Unplug/Plug Cycles manually without evidence of physical damage	PASS
A-1-6 : Low Level Contact Resistance	50mΩ max.	PASS
Group A-2		
A-2-1 : Low Level Contact Resistance	40mΩ max.	PASS
A-2-2 : Durability (preconditioning)	50 unplug/plug cycles with no evidence of physical damage	PASS
A-2-3 : Thermal shock	EIA-364-32, test condition I ,10 cycles	PASS
A-2-4 : Low Level Contact Resistance	50mΩ max.	PASS
A-2-5 : Cyclic temperature and humidity	No evidence of physical damage. Cycle between 25°C ±3°C at 80%±3%RH and 65°C ±3°C at 50% ±3%RH for 24 cycles.	PASS
A-2-6 : Low Level Contact Resistance	50mΩ max.	PASS
A-2-7 : Reseating	3 Unplug/Plug Cycles manually without evidence of physical damage	PASS
A-2-8 : Low Level Contact Resistance	50mΩ max.	PASS

Group A-3		
Test Title	**Common Requirement**	**Result**
A-3-1 : Low Level Contact Resistance	40mΩ max.	PASS
A-3-2 : Durability (preconditioning)	50 Plug/Unplug Cycles with no evidence of physical damage	PASS
A-3-3 : Temperature life (preconditioning)	105°C without applied voltage for 72 Hours	PASS
A-3-4 : Low Level Contact Resistance	50mΩ max.	PASS
A-3-5 : Vibration	No evidence of physical damage. 15 minutes vibration for each X, Y, and Z direction. No discontinuities of 1us or longer duration	PASS
A-3-6 : Low Level Contact Resistance	50mΩ max.	PASS
Group A-4		
A-4-1 : Low Level Contact Resistance	40mΩ max.	PASS
A-4-2 : Durability (preconditioning)	50 Plug/Unplug Cycles with no evidence of physical damage	PASS
A-4-3 : Temperature life (preconditioning)	105°C without applied voltage for 72 Hours	PASS
A-4-4 : Low Level Contact Resistance	50mΩ max.	PASS
A-4-5 : Mixed flowing gas	Low level contact resistance meets spec before and after the mixed flowing gas test. Temperature : 30°C, Relative Humidity : 70% H_2S : 10ppb ; NO_2 : 200ppb Cl_2 : 10ppb ; SO_2 : 100ppb Class IIA for 7 days Mated	PASS
A-4-6 : Low Level Contact Resistance	50mΩ max.	PASS
A-4-7 : Thermal disturbance	Cycle between 15°C ±3°C and 85°C ±3°C in control environment	PASS

A-4-8 : Low Level Contact Resistance	50mΩ max.	PASS
A-4-9 : Reseating	3 Unplug/Plug Cycles manually without evidence of physical damage.	PASS
A-4-10 : Low Level Contact Resistance	50mΩ max.	PASS
Group A-7		
Test Title	**Common Requirement**	**Result**
A-7-1 : Dielectric withstanding voltage	Withstands 100VAC (RMS) disruptive discharge	PASS
A-7-2 : Low level contact resistance	40mΩ max.	PASS
A-7-2 : Durability (preconditioning)	4 Unplug/Plug Cycles, followed by an Unplug with no evidence of physical damage	PASS
A-7-3 : Insertion force	Within 5 N to 20 N.	PASS
A-7-4 : Extraction force	Within 8 N to 20 N.	PASS
A-7-5 : Durability	No evidence of physical damage. 25Plug/Unplug Cycles	PASS
A-7-6 : Extraction force	Within: a) 33% of the initial reading, and b) 8 N to 20 N.	PASS
A-7-7 : Durability	No evidence of physical damage. 10,000 plug/unplug cycles, flipping every 2,500 cycles.	PASS
A-7-8 : Extraction force	Within 6 N to 20 N.	PASS
A-7-9 : Low level contact resistance	50mΩ max.	PASS
A-7-10 : Dielectric withstanding voltage	Withstands 100VAC (RMS). No disruptive discharge	PASS
A-7-11 : Insulation Resistance	100MΩ min. Between adjacent contacts of unmated and mated connectors.	PASS

Group B-1		
B-1-3：4-Axis Continuity	No discontinuities greater than 1 microsecond duration in any of the four orientations tested.	PASS
Group B-5		
B-5-1：Critical Dimension	Meet all critical dimension requirements defined in Compliance Document	PASS
B-5-2：EMC Shielding Spring Inspection	No EMC shielding spring finger tip of the USB Full-Featured Type-C plug or USB 2.0 Type-C plug shall be exposed in the plug housing opening of the unmated Type-C plug.	PASS
Group B-6		
B-6-1：Contact Current Rating	When current is applied to the contacts, the temperature rise shall not exceed 30℃ at the outside surface of the shell. This requirement applies to the USB Type-C connector mated pair only.	PASS

3. Test Equipment

Mechanical Equipment			
Equipment Name	**Model No**	**Calibration Date**	**Due Date**
Durability Tester	CBSM-L5	2019-04-01	2020-03-31
Mating/Un-mating Tester	ZL-2809	2019-07-18	2020-07-17
Vibration Machine	YVM-300	2019-07-18	2020-07-17
Discontinuity Tester	TS-713	2019-06-21	2020-06-20
Image measuring instrument	3020	2019-04-01	2020-03-31

Environment Equipment			
Equipment Name	**Model No.**	**Calibration Date**	**Due Date**
Temp.&Humidity Chamber	ZL-6004	2019-07-18	2020-07-17
Hot Air Chamber	ZL-6014	2019-07-18	2020-07-17
Mixed-flow gas chamber	JL-QF-64P	2019-07-18	2020-07-17
Analytical Balance	ShimadzuAP-135W	2019-04-08	2020-04-07

Electrical Equipment			
Equipment Name	**Model No.**	**Calibration Date**	**Due Date**
Precision LCR Meter	HIOKI IM3533	2019-05-14	2020-05-13
Insulation withstand voltage tester	Chroma 19052	2019-04-01	2020-03-31
Intelligent DC Low Resistance Tester	TH2512	2019-04-01	2020-03-31
DC Power	Keysight E3634A	2019-04-01	2020-03-31
DC Electronic load	Keithley 2380-120-60	2019-04-01	2020-03-31
Thermometer	RDXL4SD	2019-04-01	2020-03-31

4. Primary Qualification Approval Testing

Test Group	Number of Specimens(pcs)	Sample No.
Group A-1	5	a1_1 ~a1_5
Group A-2	5	a2_1 ~a2_5
Group A-3	5	a3_1 ~a3_5
Group A-4	10	a4_1 ~a4_10
Group A-7	5	a7_1 ~a7_5
Group B-1	8	b1_1 ~b1_8
Group B-5	3	b5_1 ~b5_3
Group B-6	3	b6_1 ~b6_3

5. Test Result

5.1. Test Group A-1

Group A-1		
A-1-1：Low Level Contact Resistance	40mΩ max. (Results in following table)	PASS
A-1-2：Durability (preconditioning)	No evidence of physical damage	PASS
A-1-3：Temperature Life	105°C without applied voltage for 120 Hours	PASS
A-1-4：Low Level Contact Resistance	50mΩ max. (Results in following table)	PASS
A-1-5：Reseating	No evidence of physical damage	PASS
A-1-6：Low Level Contact Resistance	50mΩ max. (Results in following table)	PASS

5.1.1. Group A-1-1: LLCR Results

A-1-1: Low Level Contact Resistance Requirement：≤ 40mΩ (Unit: mΩ)					
Pin\Samples No.	a1_1	a1_2	a1_3	a1_4	a1_5
A1	22.6	22.3	22.1	23.5	25.1
A4	22.7	22.5	21.6	22.5	27.1
A5	23.4	23.5	22.8	23.5	23.0
A6	22.5	22.5	22.2	22.7	22.2
A7	23.6	23.4	23.1	25.8	23.8
A8	22.9	22.7	22.4	22.1	22.5
A9	24.1	24.1	22.9	23.3	23.7
A12	26.1	26.1	20.4	26.8	20.5
B1	26.3	27.1	19.8	23.6	19.8
B4	23.5	23.4	22.8	22.9	22.6
B5	25.6	26.0	23.9	24.7	23.8
B6	23.8	23.7	23.8	24.3	23.6
B7	23.6	23.6	21.5	21.4	21.5
B8	22.7	22.8	22.7	22.6	22.8
B9	21.3	21.3	20.8	21.3	21.4
B12	19.9	19.8	19.6	20.4	20.2

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5.1.2. Group A-1-4 LLCR Results

A-1-4 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin \Samples No.	a1_1	a1_2	a1_3	a1_4	a1_5
A1	22.4	22.9	22.6	23.5	23.0
A4	24.6	23.1	21.7	22.6	23.7
A5	23.8	23.3	22.8	22.6	24.2
A6	23.1	22.8	22.7	23.8	23.4
A7	22.7	23.6	22.6	23.2	24.4
A8	22.9	23.0	23.0	22.6	23.9
A9	23.4	24.9	22.3	24.1	24.1
A12	24.0	23.3	21.6	20.8	21.4
B1	25.6	23.8	20.5	21.0	22.3
B4	21.5	23.2	23.6	23.4	23.1
B5	24.2	22.9	24.6	22.7	24.7
B6	22.6	22.6	24.2	23.0	24.2
B7	23.2	25.3	22.7	22.4	22.7
B8	23.1	22.5	23.0	22.6	24.4
B9	21.7	21.7	21.0	21.6	22.5
B12	21.8	19.6	20.8	19.4	20.7

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5.1.3. Group A-1-6 LLCR Results

A-1-6 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin\Samples No.	a1_1	a1_2	a1_3	a1_4	a1_5
A1	22.7	22.6	22.9	22.8	22.7
A4	22.5	22.5	22.3	23.0	23.0
A5	23.8	23.3	23.3	22.3	23.7
A6	23.3	22.8	23.2	22.7	23.2
A7	23.6	23.5	24.3	23.5	23.4
A8	23.8	22.6	23.0	22.5	22.4
A9	23.5	23.0	23.0	23.4	23.6
A12	22.8	22.7	21.3	22.8	21.4
B1	23.4	23.5	19.7	23.4	21.0
B4	22.0	22.8	23.8	23.2	23.3
B5	22.6	23.6	24.4	23.5	23.1
B6	23.2	22.3	23.8	23.3	23.4
B7	22.2	23.1	22.6	23.1	23.2
B8	23.1	22.9	23.4	22.9	23.3
B9	21.5	21.6	21.5	21.9	21.0
B12	20.5	20.4	20.2	20.8	20.4

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5.2. Test Group A-2

Group A-2		
A-2-1 : Low Level Contact Resistance	40mΩ max.	PASS
A-2-2 : Durability (preconditioning)	50 unplug/plug cycles with no evidence of physical damage	PASS
A-2-3 : Thermal shock	EIA-364-32, test condition I ,10 cycles	PASS
A-2-4 : Low Level Contact Resistance	50mΩ max.	PASS
A-2-5 : Cyclic temperature and humidity	No evidence of physical damage. Cycle between 25°C ±3°C at 80%±3%RH and 65°C ±3°C at 50% ±3%RH for 24 cycles.	PASS
A-2-6 : Low Level Contact Resistance	50mΩ max.	PASS
A-2-7 : Reseating	No evidence of physical damage. Manually unplug/plug the connector or socket. Perform 3 such cycles.	PASS
A-2-8 : Low Level Contact Resistance	50mΩ max.	PASS

5.2.1. Group A-2-1 LLCR Result:

A-2-1 : Low Level Contact Resistance Requirement：≤ 40mΩ (Unit :mΩ)					
Pin\Samples No.	a2_1	a2_2	a2_3	a2_4	a2_5
A1	21.8	22.6	21.4	21.6	21.8
A4	21.4	22.1	21.3	21.1	22.1
A5	22.8	23.4	22.5	22.4	23.1
A6	22.6	22.8	23.1	22.9	22.2
A7	22.9	25.7	23.8	22.8	22.5
A8	23.5	28.5	22.5	21.7	22.4
A9	22.6	23.5	22.4	22.1	25.1
A12	20.8	20.7	20.8	28.4	22.0
B1	20.1	19.9	19.8	19.7	22.9
B4	22.7	23.3	22.7	22.3	28.9
B5	25.2	24.3	24.1	23.4	23.4
B6	24.1	24.2	23.7	23.7	23.2
B7	21.0	22.1	21.6	21.3	25.5
B8	23.1	23.5	23.1	22.4	26.6
B9	21.3	22.4	24.4	20.9	21.4
B12	19.7	20.5	19.9	19.8	19.8

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5.2.2. Group A-2-4 LLCR Result:

A-2-4 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin\Samples No.	a2_1	a2_2	a2_3	a2_4	a2_5
A1	22.2	23.6	22.2	21.9	22.4
A4	20.9	22.0	21.2	20.7	21.5
A5	21.9	22.4	22.3	21.8	21.9
A6	22.0	23.0	22.6	23.6	22.5
A7	22.4	22.6	22.4	22.6	21.9
A8	22.2	23.5	23.0	22.3	23.0
A9	23.0	24.0	21.8	21.7	23.8
A12	21.9	21.2	21.5	20.4	23.9
B1	20.7	20.7	20.8	19.3	20.3
B4	20.8	23.7	22.6	22.4	22.9
B5	22.6	24.0	24.5	24.1	25.1
B6	22.5	23.4	23.7	24.2	24.6
B7	24.4	23.6	21.6	21.4	22.6
B8	22.6	22.3	23.2	22.1	23.5
B9	22.5	22.0	21.0	20.4	21.3
B12	20.7	20.0	19.6	19.2	19.5

5.2.3. Group A-2-6 LLCR Result:

A-2-6 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin\Samples No.	a2_1	a2_2	a2_3	a2_4	a2_5
A1	22.5	23.4	22.7	22.1	22.6
A4	21.3	22.3	21.4	21.0	21.7
A5	22.5	22.6	22.4	22.0	22.6
A6	23.0	22.6	23.0	23.8	24.9
A7	22.4	23.3	22.5	22.9	22.6
A8	22.8	23.0	23.3	22.5	23.3
A9	22.1	23.1	22.3	22.0	22.2
A12	22.1	21.1	21.6	22.0	22.9
B1	21.2	21.0	20.8	22.1	21.8
B4	22.9	23.6	20.8	22.5	22.6
B5	23.6	24.9	24.9	24.4	23.5
B6	23.8	23.0	23.9	24.5	22.0
B7	22.4	24.6	22.5	21.6	21.4
B8	22.6	23.0	22.4	22.4	22.5
B9	21.0	21.5	21.0	20.8	21.4
B12	19.5	20.3	20.0	19.3	19.7

5.2.4. Group A-2-8 LLCR Result:

A-2-8 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin\Samples No.	a2_1	a2_2	a2_3	a2_4	a2_5
A1	22.4	23.3	22.6	22.2	22.4
A4	21.9	22.7	22.0	21.0	21.7
A5	23.4	22.8	22.4	22.0	22.4
A6	24.4	22.4	23.5	23.8	24.3
A7	23.4	23.1	22.4	23.0	25.3
A8	22.3	22.6	22.7	22.4	25.7
A9	23.9	22.9	22.2	22.0	21.2
A12	22.7	21.3	21.3	21.8	20.9
B1	21.5	21.0	20.9	20.4	20.9
B4	23.0	23.6	23.0	22.4	21.3
B5	23.2	25.2	24.8	24.2	22.8
B6	23.9	22.0	23.9	24.7	25.3
B7	22.6	24.8	22.0	21.8	22.4
B8	22.4	23.4	22.4	22.8	22.8
B9	21.2	21.6	21.1	20.7	21.4
B12	19.4	20.2	19.7	19.5	19.4

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5.3. Test Group A-3

Group A-3		
Test Title	**Common Requirement**	**Result**
A-3-1 : Low Level Contact Resistance	40mΩ max.	PASS
A-3-2 : Durability (preconditioning)	50 Plug/Unplug Cycles with no evidence of physical damage	PASS
A-3-3 : Temperature life (preconditioning)	105°C without applied voltage for 72 Hours	PASS
A-3-4 : Low Level Contact Resistance	50mΩ max.	PASS
A-3-5 : Vibration	No evidence of physical damage. 15 minutes vibration for each X, Y, and Z direction. No discontinuities of 1us or longer	PASS
A-3-6 : Low Level Contact Resistance	50mΩ max.	PASS

5.3.1. Group A-3-1 LLCR Result:

A-3-1 : Low Level Contact Resistance Requirement : ≤ 40mΩ (Unit :mΩ)					
Pin\Samples No.	a3_1	a3_2	a3_3	a3_4	a3_5
A1	22.4	22.3	22.1	21.7	23.2
A4	21.6	21.4	21.3	21.5	22.1
A5	22.7	22.3	22.4	22.8	23.3
A6	22.2	21.9	21.7	22.2	23.1
A7	23.0	28.7	22.7	22.5	23.6
A8	22.2	28.2	21.7	23.2	22.7
A9	22.7	28.1	22.8	22.5	23.5
A12	21.6	20.7	24.3	20.3	30.1
B1	19.9	30.1	23.4	19.3	22.3
B4	22.6	28.2	22.8	23.1	23.4
B5	23.6	24.9	23.4	30.1	24.7
B6	23.5	24.3	23.2	23.6	27.8
B7	21.6	22.2	21.5	21.6	23.6
B8	22.5	23.2	23.1	22.6	24.2
B9	21.2	21.7	21.2	21.4	21.7
B12	19.8	20.2	21.3	19.8	20.1

5.3.2. Group A-3-4 LLCR Result:

A-3-4 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin\Samples No.	a3_1	a3_2	a3_3	a3_4	a3_5
A1	22.8	22.2	21.8	21.8	23.4
A4	22.2	21.8	21.8	22.3	22.4
A5	23.3	23.0	22.7	23.0	24.2
A6	22.2	22.5	21.9	22.3	23.8
A7	23.1	23.2	22.9	23.5	23.7
A8	22.4	22.6	22.0	22.9	23.6
A9	22.9	23.3	23.0	23.1	23.6
A12	23.4	23.7	21.2	21.3	22.6
B1	20.0	21.5	22.1	19.7	23.3
B4	22.9	23.5	22.4	23.1	23.7
B5	23.7	23.7	23.2	21.4	23.4
B6	21.6	24.1	23.2	24.1	23.0
B7	22.8	22.1	21.3	21.7	22.5
B8	21.2	23.1	22.7	22.9	23.4
B9	22.0	21.0	21.2	21.6	21.6
B12	20.1	19.7	20.0	20.0	20.3

5.3.3. Group A-3-6 LLCR Result:

A-3-6 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin\Samples No.	a3_1	a3_2	a3_3	a3_4	a3_5
A1	22.5	22.0	22.0	21.9	23.2
A4	22.3	21.4	21.6	22.0	22.2
A5	23.3	22.9	22.7	22.8	22.9
A6	22.1	22.3	22.1	22.4	23.7
A7	23.0	23.0	23.0	22.7	24.3
A8	22.4	22.7	22.0	22.4	22.7
A9	23.0	23.4	23.2	22.7	23.5
A12	23.2	23.3	21.6	20.5	23.4
B1	20.0	21.2	22.8	19.6	22.1
B4	22.9	23.7	23.5	22.9	23.6
B5	23.7	21.6	23.4	22.2	23.4
B6	23.5	24.1	21.3	23.8	23.0
B7	21.7	22.0	23.0	21.8	22.7
B8	22.7	23.1	21.1	22.7	23.0
B9	21.4	20.9	21.0	21.3	21.9
B12	20.0	19.8	20.1	19.9	20.4

5.4. Test Group A-4

Group A-4		
A-4-1：Low Level Contact Resistance	40mΩ max.	PASS
A-4-2：Durability (preconditioning)	50 Plug/Unplug Cycles with no evidence of physical damage	PASS
A-4-3：Temperature life (preconditioning)	105°C without applied voltage for 72 Hours	PASS
A-4-4：Low Level Contact Resistance	50mΩ max.	PASS
A-4-5：Mixed flowing gas	Low level contact resistance meets spec before and after the mixed flowing gas test. Temperature：30°C, Relative Humidity：70% H2S：10ppb ; NO2：200ppb Cl2：10ppb ; SO2：100ppb Class IIA for 7 days Mated	PASS
A-4-6：Low Level Contact Resistance	50mΩ max.	PASS
A-4-7：Thermal disturbance	Cycle between 15°C ±3°C and 85°C ±3°C in control environment	PASS
A-4-8：Low Level Contact Resistance	50mΩ max.	PASS
A-4-9：Reseating	3 Unplug/Plug Cycles manually without evidence of physical damage.	PASS
A-4-10：Low Level Contact Resistance	50mΩ max.	PASS

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5.4.1. Group A-4-1LLCR Result:

A-4-1 : Low Level Contact Resistance Requirement：≤ 40mΩ (Unit :mΩ)										
Pin\Samples	a4_1	a4_2	a4_3	a4_4	a4_5	a4_6	a4_7	a4_8	a4_9	a4_10
A1	22.5	22.3	21.6	22.5	22.7	22.2	22.1	21.9	23.5	22.4
A4	22.1	22.4	21.1	21.7	22.5	22.8	22.0	21.7	23.1	22.0
A5	22.8	23.1	22.8	23.0	23.0	23.5	23.0	23.1	23.7	23.2
A6	22.4	22.7	22.7	22.6	23.1	23.1	22.2	22.4	22.8	22.6
A7	23.4	23.7	22.5	23.5	24.6	24.0	22.8	22.9	23.3	23.0
A8	22.6	23.5	22.2	22.5	23.4	24.4	22.2	22.6	23.6	22.7
A9	23.7	23.2	22.7	22.6	23.5	24.3	23.0	22.6	22.5	23.1
A12	21.3	21.1	20.8	20.6	24.6	21.9	25.0	20.8	21.1	22.7
B1	22.3	19.9	19.7	19.6	25.0	24.1	19.9	20.1	19.4	20.7
B4	23.8	23.1	22.8	23.3	25.9	25.4	23.3	22.8	22.3	23.4
B5	24.4	24.3	23.6	24.0	25.9	26.4	26.3	24.0	23.6	24.3
B6	24.2	23.7	25.3	24.1	24.7	23.5	23.9	24.0	23.6	23.9
B7	22.3	21.8	21.6	22.1	22.2	22.2	22.0	21.7	21.8	21.9
B8	23.4	22.8	22.9	22.9	24.1	23.3	23.1	22.6	22.5	22.9
B9	21.7	21.5	20.7	21.6	22.3	21.3	21.7	21.5	21.8	21.6
B12	19.8	19.7	19.8	20.2	21.7	19.9	20.5	19.9	20.5	20.2

5.4.2. Group A-4-4 LLCR Result:

A-4-4 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)										
Pin\Samples	a4_1	a4_2	a4_3	a4_4	a4_5	a4_6	a4_7	a4_8	a4_9	a4_10
A1	22.5	22.1	21.8	23.2	23.0	22.1	22.5	22.2	21.4	22.8
A4	22.3	22.3	21.5	21.8	23.5	22.6	21.9	22.3	21.3	22.1
A5	23.3	22.8	21.8	23.5	23.7	24.4	22.8	23.4	23.0	23.0
A6	22.6	22.6	22.1	23.2	23.6	22.1	22.5	23.2	22.6	23.0
A7	23.1	23.3	23.2	23.8	24.4	23.6	22.7	23.4	23.2	23.4
A8	23.0	22.7	21.9	22.7	21.8	22.9	22.1	22.7	23.8	22.7
A9	23.4	23.0	22.5	22.5	22.6	21.6	22.9	22.8	22.6	23.2
A12	21.4	21.0	20.4	20.2	19.8	20.2	20.0	20.8	20.7	20.0
B1	20.5	20.0	19.9	19.9	21.9	20.0	21.1	20.1	19.5	21.2
B4	23.8	23.4	22.6	22.9	22.6	20.5	23.8	22.7	22.5	23.0
B5	24.4	24.5	23.6	22.8	22.5	23.6	22.7	24.4	23.9	24.0
B6	24.3	24.3	22.7	22.3	22.9	23.6	23.8	24.1	24.2	24.2
B7	22.2	22.1	21.6	21.0	22.0	23.0	21.8	21.7	21.0	22.3
B8	23.3	23.0	23.0	23.0	23.2	23.1	23.1	22.9	23.0	23.4
B9	21.5	21.5	20.7	21.5	21.4	21.2	21.6	21.3	22.3	21.5
B12	19.7	19.8	20.0	20.3	21.3	20.0	20.4	20.0	20.7	20.2

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5.4.3. Group A-4-6 LLCR Result:

A-4-6 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)										
Pin\Samples	a4_1	a4_2	a4_3	a4_4	a4_5	a4_6	a4_7	a4_8	a4_9	a4_10
A1	22.8	22.5	22.0	22.8	24.0	22.2	22.4	22.5	22.7	22.7
A4	21.9	21.7	21.2	23.7	23.2	21.3	21.2	21.1	23.0	21.8
A5	22.9	22.6	23.4	24.3	23.9	23.6	22.4	22.4	24.1	22.6
A6	23.5	23.1	23.8	23.0	25.2	23.0	22.7	23.0	22.9	23.0
A7	22.3	22.6	22.9	23.8	24.0	23.2	22.0	22.5	22.3	22.6
A8	24.4	23.2	23.6	23.5	23.4	23.0	22.7	22.7	24.2	23.4
A9	24.3	23.3	22.7	22.4	23.1	22.6	22.7	22.5	23.5	23.0
A12	23.1	21.4	21.2	21.0	21.7	22.8	21.8	21.1	21.0	21.0
B1	22.4	21.0	20.8	21.3	20.0	21.7	21.0	21.0	20.2	22.0
B4	23.9	23.7	23.2	23.1	21.4	21.5	22.8	23.5	22.6	23.4
B5	25.1	24.9	24.3	24.4	23.0	22.5	22.3	24.6	24.1	24.3
B6	24.0	23.7	22.7	22.3	23.4	22.7	23.4	23.6	23.6	23.5
B7	22.3	22.0	21.8	22.1	21.9	21.4	22.2	21.7	22.0	22.1
B8	23.0	22.1	22.7	22.8	22.5	22.4	22.1	21.9	22.4	22.6
B9	21.5	21.4	20.6	21.7	23.0	21.0	21.4	21.0	22.8	21.4
B12	19.5	19.3	19.0	20.3	20.0	21.1	19.8	19.8	21.0	20.0

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5.4.4. Group A-4-8 LLCR Result:

A-4-8 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)										
Pin\Samples	a4_1	a4_2	a4_3	a4_4	a4_5	a4_6	a4_7	a4_8	a4_9	a4_10
A1	22.8	22.8	22.0	22.7	21.7	22.4	22.7	22.6	22.7	22.9
A4	22.0	21.6	21.0	23.2	23.0	21.5	21.5	21.4	22.3	21.8
A5	22.6	22.8	21.6	23.3	24.2	23.6	22.3	22.3	24.3	22.7
A6	23.0	23.0	23.1	24.4	25.0	23.7	22.8	22.7	23.0	23.2
A7	22.4	22.8	24.8	23.8	24.6	23.7	22.3	22.6	22.5	23.0
A8	23.4	23.7	24.6	26.0	23.6	23.8	22.7	22.4	24.3	23.5
A9	23.4	23.4	22.5	22.5	21.8	22.4	22.6	22.8	22.8	23.3
A12	23.2	21.4	21.2	21.0	21.0	21.6	23.6	21.4	21.0	22.6
B1	22.0	21.0	20.8	20.4	20.6	20.5	20.6	21.0	20.4	21.2
B4	23.8	23.4	23.0	23.0	21.6	21.4	23.9	23.5	22.7	23.6
B5	24.6	24.8	24.0	24.5	23.0	23.3	22.1	24.8	24.1	24.8
B6	23.7	23.6	23.2	22.3	22.8	22.9	23.4	23.6	23.7	23.7
B7	22.3	21.9	23.6	21.6	21.4	22.0	22.1	21.8	21.7	22.4
B8	23.1	22.2	22.8	22.0	22.3	23.2	22.6	22.1	22.8	22.6
B9	21.6	21.5	21.0	22.3	24.4	22.0	21.4	21.1	22.6	21.4
B12	19.1	19.1	19.1	19.7	20.5	19.3	19.6	19.4	21.2	19.3

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5.4.5. Group A-4-10 LLCR Result:

A-4-10 : Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)										
Pin\Samples	a4_1	a4_2	a4_3	a4_4	a4_5	a4_6	a4_7	a4_8	a4_9	a4_10
A1	22.7	22.7	22.3	24.2	23.8	22.4	22.5	22.5	23.0	22.8
A4	21.7	22.0	21.0	23.7	23.6	21.6	21.5	21.4	22.4	22.8
A5	22.9	23.0	22.7	22.3	24.0	24.0	22.6	22.0	23.7	23.4
A6	23.2	23.1	25.0	22.1	23.4	23.4	22.9	23.3	23.1	23.5
A7	22.9	23.0	25.1	22.3	25.3	22.8	22.3	22.7	22.6	23.2
A8	24.5	24.1	24.3	23.8	24.0	23.1	23.8	23.1	24.7	23.4
A9	23.1	23.3	24.3	22.5	22.6	24.3	22.6	22.6	22.7	23.2
A12	23.6	21.7	23.8	20.8	23.6	23.1	23.1	21.4	21.1	22.7
B1	22.1	21.0	23.7	20.5	23.8	21.8	20.6	21.0	21.0	21.4
B4	22.6	23.6	23.3	23.0	21.0	22.4	24.0	23.1	22.6	23.4
B5	26.0	24.6	23.8	24.4	22.2	23.0	21.8	24.6	24.0	24.7
B6	24.4	24.5	22.8	21.4	21.9	22.3	23.6	23.4	23.9	23.6
B7	24.5	22.1	24.0	21.3	21.7	21.4	22.1	21.7	23.1	22.2
B8	22.3	22.4	23.8	22.3	21.9	22.6	22.3	22.3	22.5	22.5
B9	23.4	21.4	21.0	22.5	24.2	21.4	21.5	21.1	23.2	21.7
B12	19.2	19.1	19.0	21.0	20.7	19.4	19.7	19.2	21.7	19.3

5.5. Test Group A-7

Group A-7		
Test Title	**Common Requirement**	**Result**
A-7-1：Dielectric withstanding voltage	Withstands 100VAC (RMS).No disruptive discharge	PASS
A-7-2：Low level contact resistance	40mΩ max.	PASS
A-7-2：Durability (preconditioning)	4 Unplug/Plug Cycles, followed by an Unplug ,with no evidence of physical damage	PASS
A-7-3：Insertion force	Within 5 N to 20 N.	PASS
A-7-4：Extraction force	Within 8 N to 20 N.	PASS
A-7-5：Durability	No evidence of physical damage. 25 Plug/Unplug Cycles	PASS
A-7-6：Extraction force	Within: a) 33% of the initial reading, and b) 8 N to 20 N.	PASS
A-7-7：Durability	No evidence of physical damage. 10,000 plug/unplug cycles, flipping every 2,500 cycles.	PASS
A-7-8：Extraction force	Within 6 N to 20 N.	PASS
A-7-9：Low level contact resistance	50mΩ max.	PASS
A-7-10：Dielectric withstanding voltage	Withstands 100VAC (RMS) . No disruptive discharge	PASS
A-7-11：Insulation Resistance	100MΩ min. Between adjacent contacts of unmated and mated connectors.	PASS

5.5.1. Group A-7-2 LLCR Result:

A-7-2 :Low Level Contact Resistance Requirement：≤40mΩ (Unit :mΩ)					
Pin\Samples No	a7_1	a7_2	a7_3	a7_4	a7_5
A1	21.9	23.9	22.3	23.3	21.8
A4	21.6	25.3	21.5	22.3	21.4
A5	23.4	23.2	23.2	23.4	22.5
A6	22.7	22.3	22.2	23.0	22.0
A7	23.4	23.1	22.8	23.1	23.5
A8	22.9	22.2	22.3	23.5	21.8
A9	23.1	25.6	23.1	23.8	23.1
A12	24.6	24.4	20.5	22.9	21.7
B1	23.3	25.0	19.9	20.9	23.2
B4	23.4	24.5	23.6	24.4	23.3
B5	23.9	25.2	24.3	22.7	23.6
B6	23.9	26.0	24.0	22.8	23.2
B7	21.9	24.2	21.9	22.4	21.5
B8	23.1	23.3	22.5	23.2	22.7
B9	21.6	23.4	21.8	21.5	21.3
B12	19.8	23.0	20.1	20.6	19.8

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5.5.2. Group A-7-3 Insertion Force:

A-7-3 Insertion Force Requirement：5N -20N (Unit :N)						
Pin\Samples No	a7_1	a7_2	a7_3	a7_4	a7_5	Pass/Fail
Insertion Force	11.09	13.32	11.33	14.37	10.28	Pass

5.5.3. Group A-7-4 Extraction Force:

A-7-4 Extraction Force Requirement：8N -20N (Unit :N)						
Pin\Samples No	a7_1	a7_2	a7_3	a7_4	a7_5	Pass/Fail
Extraction Force	14.50	17.22	15.33	17.62	15.01	Pass

5.5.4. Group A-7-6 Extraction Force:

A-7-6 Extraction Force Requirement：8N -20N (Unit :N)						
Pin\Samples No	a7_1	a7_2	a7_3	a7_4	a7_5	Pass/Fail
Extraction Force	17.06	16.90	15.17	17.35	15.91	Pass

5.5.5. Group A-7-8 Extraction Force:

A-7-8 Extraction Force Requirement：6N -20N (Unit :N)						
Pin\Samples No	a7_1	a7_2	a7_3	a7_4	a7_5	Pass/Fail
Extraction Force	10.80	9.83	10.34	11.13	11.45	Pass

5.5.6. Group A-7-9 LLCR Result:

A-7-9 :Low Level Contact Resistance Requirement：≤ 50mΩ (Unit :mΩ)					
Pin\Samples No	a7_1	a7_2	a7_3	a7_4	a7_5
A1	22.9	24.3	22.3	23.9	22.0
A4	23.8	26.6	23.8	22.6	21.6
A5	25.7	23.8	24.2	23.2	23.4
A6	24.8	24.5	24.6	24.3	23.5
A7	26.0	24.2	23.5	24.4	24.3
A8	23.2	23.7	23.7	22.0	23.6
A9	25.2	23.3	23.8	23.8	22.7
A12	24.5	21.7	20.7	21.2	21.8
B1	23.9	19.8	21.1	24.1	21.2
B4	24.3	21.9	24.1	23.3	21.9
B5	24.6	22.4	21.9	21.9	23.5
B6	23.0	23.1	25.7	22.6	23.1
B7	26.5	21.4	22.1	21.7	21.0
B8	23.8	23.7	22.5	23.2	22.7
B9	24.4	24.4	23.7	22.9	21.7
B12	20.8	23.2	21.1	20.8	20.8

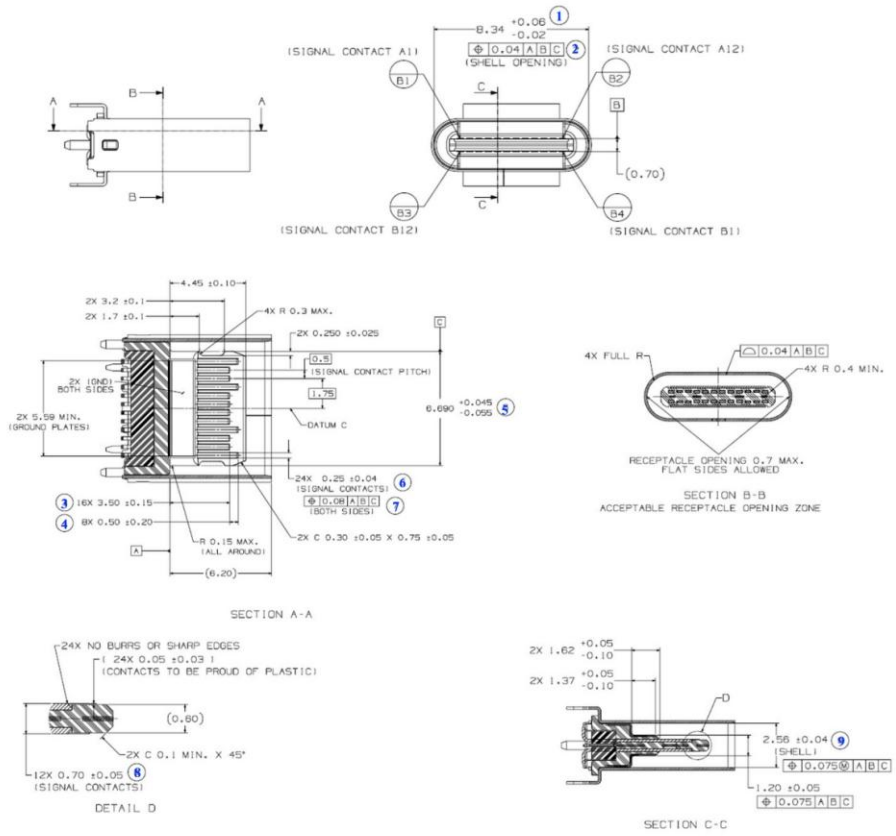
5.6. Test Group B-1

Group B-1		
B-1-3：4-Axis Continuity	No discontinuities greater than 1 microsecond duration in any of the four orientations tested.	PASS

5.7. Test Group B-5

Group B-5		
B-5-1 : Critical Dimension	Meet all critical dimension requirements defined in Compliance Document	PASS
B-5-2 : EMC Shielding Spring Inspection	Visually inspect EMC shielding spring finger tip that No exposed in the receptacle housing opening.	PASS

Figure B-1 USB Type-C receptacle



5.7.1. B-5-1 Critical Dimensions

B-5-1 Critical Dimensions (Unit: mm)							
Description\ Samples No	**b5_1**	**b5_2**	**b5_3**	DIMENSION	+TOL	-TOL	P/F
1. Receptacle inside opening	8.344	8.345	8.337	8.34	0.06	0.02	Pass
2. Receptacle insider opening position tolerance	0.02	0.02	0.01	0.04 with datum A/B/C	n/a	n/a	Pass
3. Receptacle signal pin length	3.514	3.496	3.538	3.50	0.15	0.15	Pass
4. Pin length delta	0.510	0.501	0.505	0.50	0.20	0.20	Pass
5. Tongue width	6.725	6.681	6.691	6.690	0.045	0.055	Pass
6. Contact width	0.278	0.270	0.282	0.25	0.04	0.04	Pass
7. Contact width position tolerance	0.01	0.02	0.02	0.08 with datum A/B/C	n/a	n/a	Pass
8. Tongue thickness	0.692	0.689	0.685	0.70	0.05	0.05	Pass
9. Receptacle inside thickness	2.564	2.582	2.555	2.56	0.04	0.04	Pass
Notes： 1. All dimensions are in millimeters.							

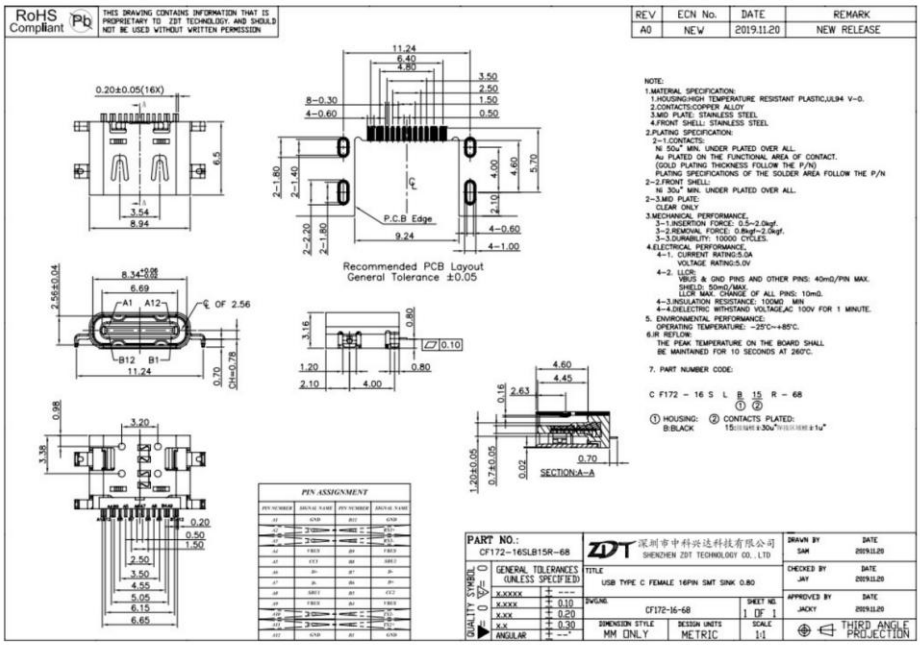
5.8. Test Group B-6

Group B-6		
B-6-1：Contact Current Rating	When current is applied to the contacts, the temperature rise shall not exceed 30°C at the outside surface of the shell. This requirement applies to the USB Type-C connector mated pair only.	PASS

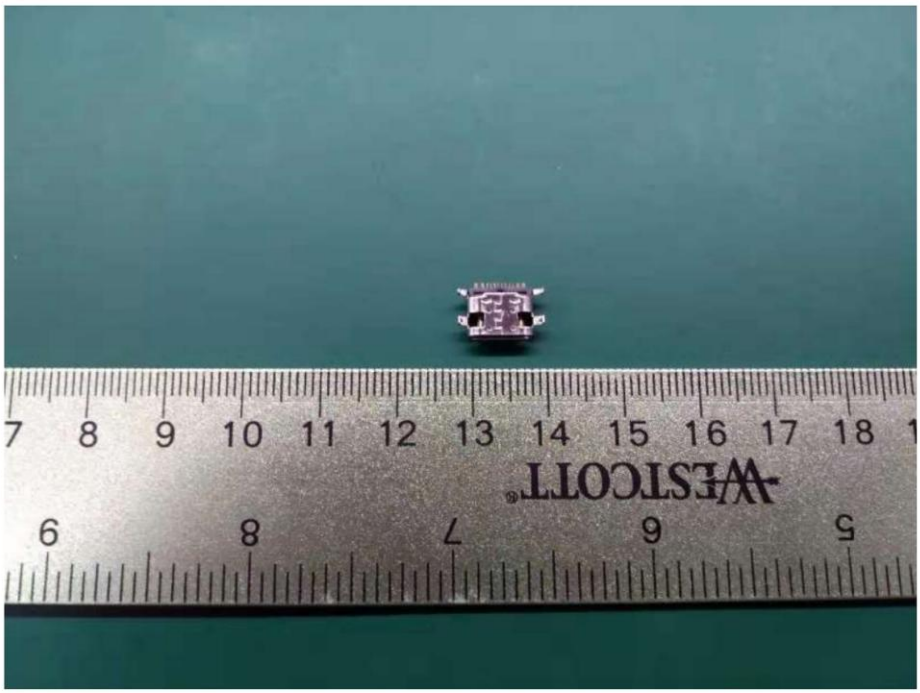
5.8.1. Contact Current Rating Result:

	Temperature Difference (Room temperature 25°C) Requirement：≤ 30°C (Unit: °C)			
Point \ Samples No	b6_1	b6_2	b6_3	Pass/Fail
Point 1	12.6	17.3	15.1	Pass
Point 2	11.7	15.4	13.8	Pass
Point 3	7.7	8.7	8.5	Pass

Appendix A：Drawing



Appendix B： Product Photo



--End of Report--

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*****END OF REPORT*****