

# CABLINE®-UY Connector

Part No. Plug: 20857-0\*\*T-01 Receptacle: 20854-0\*\*E-02

## Product Specification

Qualification Test Report No. TR-19084

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2	S22036	January 27, 2022	S.Yamagchi	T.Tanigawa	H.Ikari
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Rev.	ECN	Date	Prepared by	Checked by	Approved by

## 1. Scope

This Product Specification defines the test conditions and the performances of the CABLINE-UY Connector, a wire-to-board connector of 0.35mm contact pitch.

## 2. Product Name and Parts No.

### 2.1 Product Name

CABLINE-UY Connector

### 2.2 Parts No.

Plug: 20857-0\*\*T-01

PLUG HOUSING ASS'Y: 20907-0\*\*E-01

PLUG SHELL A: 3568-0\*\*1

Receptacle: 20854-0\*\*E-02

## 3. Rating

### 3.1 Applicable Cable

Micro-coaxial cable...AWG# 42

Discrete wire...AWG# 36

### 3.2 Operating Conditions

Amperage : 0.35A AC/DC [AWG#42] (per contact pin)

0.50A AC/DC [AWG#36] (per contact pin)

※Testing by a real machine is recommended because temperature rise may be affected by actual situation.

Voltage: AC 60Vr.m.s (per contact pin)

Operating temperature: 233~358K(-40°C~+85°C)

(Containing temperature rise by current)

Operating humidity: 85% max

### 3.3 Storage Conditions

Storage temperature: 248~333K(-25°C~60°C)

Storage humidity: 85% max. (Non-condensing)

## 4. Test and Performance

### Test Condition

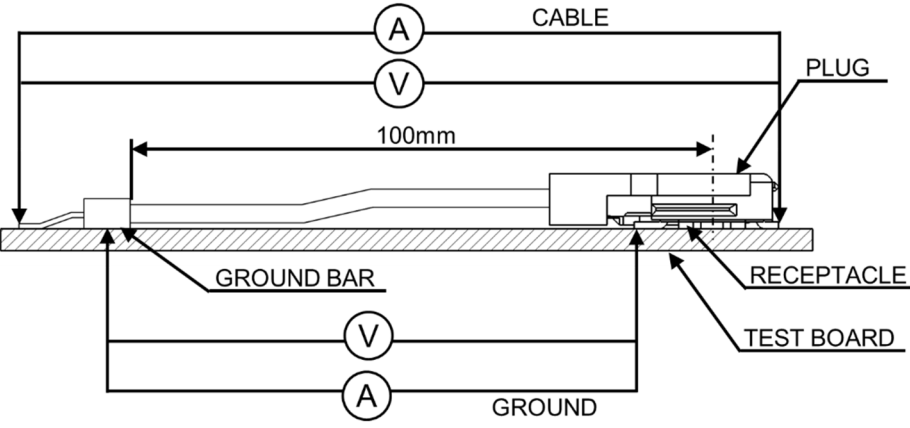
This initial test is equal to it's at shipping condition and unless otherwise specified, all tests and measurements shall be performed under the following conditions in accordance with MIL-STD-202.

Temperature... 288K~308K (15°C~35°C)

Pressure... 866hPa~1066hPa (650mmHg~800mmHg)

Relative humidity... 45~75%R.H.

4.1.Electrical Performance

1. Contact resistance	
Reference standard:	MIL-STD-202G, Method 307
Test conditions:	Solder the receptacle connector to the test board and mate the plug connector together, then measure the contact resistance as shown in Fig.1 by the four terminal methods. Apply the low level condition of 20mV MAX. DC for the open circuit voltage and 10mA MAX. DC for the closed circuit current.
<div></div> <p>Fig.1</p>	
Pass criteria:	Contact Initial: 275 mΩMAX.(AWG#42) 700 mΩMAX.(AWG#42) After testing: ≤40 mΩ MAX. Initial contains the following conductor resistance of a cable 100 mm. 195 mΩ(AWG#36) 620 mΩ(AWG#42) Ground shell Initial: 60 mΩ MAX. After testing: ≤40 mΩ MAX.

2. Insulation resistance	
Reference standard:	MIL-STD-202 G, Method 302
Test conditions:	Mate the plug and receptacle connector together, and then apply DC 100 V between the inner contact and the SHELL A.
Pass criteria:	Initial: 500 MΩ MIN. After testing: 100 MΩ MIN.

**4.1. Electrical Performance**

3. Dielectric withstanding voltage	
Reference standard:	MIL-STD-202 G, Method 301
Test conditions:	Mate the receptacle and plug connector together, then apply AC 200V(rms) between the neighboring contacts for a minute.
Pass criteria:	No abnormalities such as creeping discharge, flashover, insulator breakdown occur.

4. Temperature rising	
Reference standard:	-
Test conditions:	Mate the plug and receptacle connector together and then apply rating current per contact pin.
Pass criteria:	Over ambient $\Delta T 30^{\circ}\text{C}$ MAX.

**4.2. Mechanical Performance**

1. Mating force and Unmating force	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on push-on/pull-off machine, measure of initial and mating/unmating 30 cycles at a speed $25\pm 3\text{mm/min}$ . along the mating axis.
Pass criteria:	Mating force 5 P Initial: 30 N MAX.    30cycles: 30 N MAX. 10 P Initial: 30 N MAX.    30cycles: 30 N MAX. Unmating force 5 P Initial: 5 N MIN.        30cycles: 3 N MIN. 10 P Initial: 5 N MIN.        30cycles: 3 N MIN.

2. Durability	
Reference standard:	-
Test conditions:	Solder the receptacle connector to the test board, then place the board and plug on the push-on/pull-off machine, and repeat mating and unmating 30cycles at a speed $25\pm 3\text{mm/min}$ . along the mating axis.
Pass criteria:	Contact resistance: Shall meet 4.1.1

3. Cable retention force	
Reference standard:	-
Test conditions:	Place the plug connector on the push-on/pull-off machine and then apply force on the cable along the direction at a speed $25\pm 3\text{mm/min}$ . Measure the force when the cable dislodges the plug connector.
Pass criteria:	5P: 2.45 N MIN.    10P: 4.9 N MIN.

4. Vibration	
Reference standard:	MIL-STD-202 G, Method 201
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and place them on the vibrator. Then apply the following vibration. During the testing, run 100mA DC to check electrical discontinuity. Frequency: $10\text{Hz} \rightarrow 55\text{Hz} \rightarrow 10\text{Hz}$ /approx. 1min. Directions: 3 mutually perpendicular direction. Total Amplitude: 1.52mm Sweep duration: 2 hours for each direction, a total of 6 hours.
Pass criteria:	Contact resistance: Shall meet 4.1.1. Electrical discontinuity: No electrical discontinuity greater than $1\mu\text{s}$ shall occur. Appearance: No abnormality adversely affecting the performance shall occur.

**4.2. Mechanical Performance**

5. Shock	
Reference standard:	MIL-STD-202 G, Method 213, Condition A.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and place them on the shock machine. Then apply the following shock. During the testing, run 100mA DC to check electrical discontinuity. MAX.G: 50G Duration: 11msec Wave Form: Half Sinusoidal Directions: 6 mutually perpendicular direction Cycle: 3 cycles about each direction
Pass criteria:	Contact resistance: Shall meet 4.1.1. Electrical discontinuity: No electrical discontinuity greater than 1 $\mu$ s shall occur. Appearance: No abnormality adversely affecting the performance shall occur.

**4.3. Environmental Performance**

1. Thermal shock	
Reference standard:	MIL-STD-202 G, Method 107, Condition A.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 218K(-55°C),30min.→358K(85°C),30min. Transition time: 5min. MAX. No. of cycles: 5 cycles
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

2. High temperature life	
Reference standard:	MIL-STD-202 G, Method 108, Condition A.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 358 $\pm$ 2K (85 $\pm$ 2°C) Duration: 96 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Appearance: No abnormality adversely affecting the performance shall occur.

3. Humidity(Steady state)	
Reference standard:	MIL-STD-202 G, Method 103, Condition B.
Test conditions:	Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: 313 $\pm$ 2K (40 $\pm$ 2°C) Humidity: 90~95%RH Duration: 96 hours
Pass criteria:	Contact resistance: Shall meet 4.1.1. Insulation resistance: Shall meet 4.1.2. Dielectric withstanding voltage: Shall meet 4.1.3. Appearance: No abnormality adversely affecting the performance shall occur.

## 4.3. Environmental Performance

## 4. Humidity(Cycling)

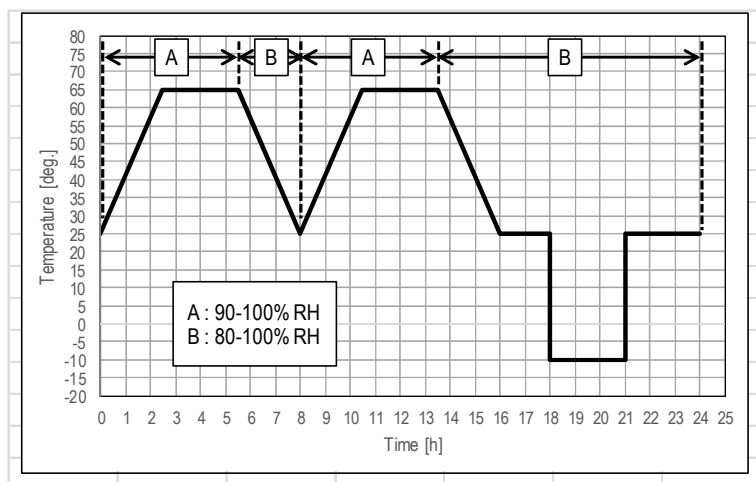
Reference standard: MIL-STD-202 G, Method 106.

Test conditions: Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment.

Temperature: 298[263]~338K (25[-10]~65°C)

Humidity: 90~98%RH

Duration: 10cycles (240hours)



Pass criteria:

- Contact resistance: Shall meet 4.1.1.
- Insulation resistance: Shall meet 4.1.2.
- Dielectric withstanding voltage: Shall meet 4.1.3.
- Appearance: No abnormality adversely affecting the performance shall occur.

## 5. Salt water spray

Reference standard: -

Test conditions: Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment.

Temperature: 308±2K (35±2°C)

Salt water density: 5±1% [by weight]

Duration: 48 hours

Pass criteria:

- Contact resistance: Shall meet 4.1.1.
- Appearance: No abnormality adversely affecting the performance shall occur.

6. H<sub>2</sub>S gas

Reference standard: -

Test conditions: Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment.

Temperature: 313±2K (40±2°C)

Relative humidity: 80±5%RH

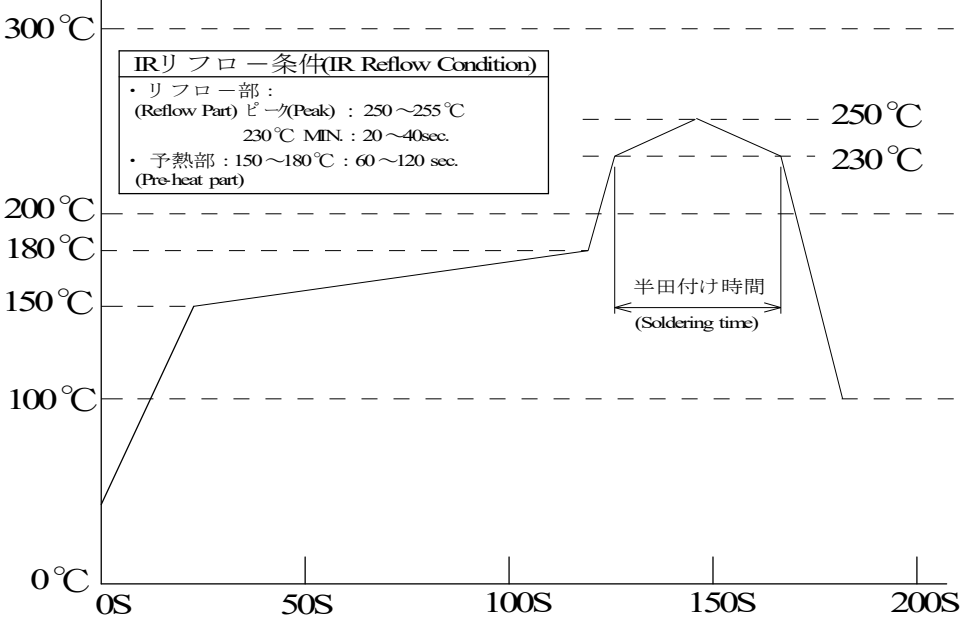
Gas: H<sub>2</sub>S 3±1ppm

Duration: 48 hours

Pass criteria:

- Contact resistance: Shall meet 4.1.1.
- Appearance: No abnormality adversely affecting the performance shall occur.

1. Solder ability	
Reference standard:	-
Test conditions:	Dip the solder tine of the contact in the solder bath at 518±5K （245±5℃） for 5±0.5seconds after immersing the tine in the flux of RMA or R type for 5 to 10 seconds.
Pass criteria:	More than 95% of the dipped surface shall be evenly wet.

2. Soldering heat resistance	
Reference standard:	-
Test conditions:	<p>Reflow temperature as shown in Fig.2.</p> <p>The number of times of Reflow is within 2. Nitrogen reflow cannot correspond.</p> <div><p>IRリフロー条件(IR Reflow Condition)</p><ul style="list-style-type: none"><li>リフロー部 : (Reflow Part) ピーク(Peak) : 250~255℃ 230℃ MIN: 20~40sec.</li><li>予熱部 : 150~180℃ : 60~120 sec. (Pre-heat part)</li></ul><p>半田付け時間 (Soldering time)</p></div>
Pass criteria:	No deformation nor defect adversely affecting the performance occur.

## 4.5 Test Sequence and Specimen Quantity

Table 1 Test Sequence and Sample Quantity

Test Item	Group										
	A	B	C	D	E	F	G	H	J	K	L
Contact Resistance	2,6	1,3,5	1,5	1,3	1,3	1,5	1,3	1,3			
Insulation Resistance			2,6		2,6	2,6					
D. W. Voltage			3,7		3,7	3,7					
Temperature rising											1
Mating Force	1,5										
Un-mating Force	3,7										
Durability	4										
Cable Retention Force	8										
Vibration		2									
Shock		4									
Thermal Shock			4								
High Temperature Life				2							
Humidity (Steady State)					4						
Humidity (Cycling)						4					
Salt Water Spray							2				
H2S Gas								2			
Solder ability									1		
Soldering Heat Resistance										1	
Specimen Quantity.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	5 pcs.	10 pcs.	10 pcs.	5 Pcs.

※Numbers indicate sequence in which tests are performed.

## 5. Recommended Metal Mask

Recommended thickness of METAL MASK :  $t=0.08$

Refer to drawing for the recommended metal mask thickness and opening dimension.

## 6. Precautions for Handling Cable Connectors

Refer to instruction manual:HIM-18037 for the handling of CABLINE-UY.