

ENGINEERING	RELIABILITY TEST REPORT	SPEC.NO.:	SPCU023C
DEPT.	CU33 TYPE C/F 16PIN H10.30mm VERTICAL TYPE	PAGE:	1/18

TEST ITEM :
 1.ELECTRICAL
 2.MECHANICAL
 3.ENVIRONMENTAL

TEST EQUIPMENT :
 1.INSERTION & REMOVAL APPARATUS
 2.ELECTRONIC MEASURING APPARATUS
 3.ENVIRONMENTAL APPARATUS

SERIES NO. : P/N: CU3316S2SBLR003-NH

DATE OF TESTING : 2021/5/31

TEST DEPART : DD100

LOT Number:

CONTAIN : ATTACHED

TEST RESULT: Accept Reject



APPROVE BY: Keny

CHECKED By: Kevin

TESTER BY: Annie

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1. TEST ITEMS AND SEQUECE

Test Group (a)	Sample Groups										
	A	B	C	D	E	F	G	H	I	J	
Test Description											
Examination of product	1,8	1,9	1,8	1,12	1,13	1,5	1,3	1,4	1,4	1,3	
Contact Resistance	2,5,7	2,4,6,8	2,5,7	2,5,8,11	3,10	2,4					
Insulation Resistance					2,11						
Dielectric Strength					12						
Temperature Rising									2		
Differential Impedance							2				
Mating force					5,8						
Unmating force					6,9						
Durability 3 cycles	6	7		10	4						
Durability 50 cycles	3		3	3							
Durability 10000 cycles					7						
4-Axis continuity test								3			
Vibration			6								
Thermal Shock		3									
Cyclic Humidity		5		9							
Temperature Life	4										
Temperature Life (Preconditioning)			4	4							
Mixed flowing gas				7							
Solderability										2	
Salt Spray						3					
Thermal Cycling				6							
Resistance to Soldering Heat								2	3		
IPX7 Waterproofing test											
Number of Test Samples (Min.)	5	5	5	5	5	5	5	5	5	5	

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2. Test Result
2-1 Group-A

	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	
2-1-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-1-2	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 40mΩ (Initial)	Sample	Initial
				1	23.26mΩ
				2	23.50mΩ
				3	23.09mΩ
				4	23.51mΩ
				5	20.72mΩ
2-1-3	Durability	The durability rating shall be 50 cycles.Test reference standard:EIA-364-09	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-1-4	Temperature Life	105° C without applied voltage for 120 hours Test reference standard:EIA-364-17C test condition A	No evidence of damage.	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-1-5	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	20.73mΩ
				2	20.26mΩ
				3	21.28mΩ
				4	20.62mΩ
				5	20.86mΩ

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-1-6	Reseating	Manually unplug/plug the connector or socket.Perform 3 such cycles.	No evidence of physical damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-1-7	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	20.47mΩ
				2	20.22mΩ
				3	20.46mΩ
				4	20.40mΩ
2-1-8	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

2-2 Group-B

	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-2-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-2-2	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 40mΩ (Initial)	Sample	Initial
				1	19.80mΩ
				2	22.43mΩ
				3	21.98mΩ
				4	22.81mΩ
				5	23.41mΩ

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	
2-2-3	Thermal shock	Temperature range from -55°C to +85°C .Start from -55°C. After 30 min. change to +85° C, change time is no more than 5 minutes. Total 5 cycles. Test reference standard: EIA-364-32 test condition I	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-2-4	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	17.69mΩ
				2	18.79mΩ
				3	19.51mΩ
				4	18.54mΩ
				5	18.79mΩ
2-2-5	Cyclic temperature and humidity	Test condition :25 °C ±3 °C at 80 % ±3% Relative Humidity and 65 °C ± 3 °C at 50 % ±3% Relative Humidity . Ramp times should be 0.5 hour and dwell times should be 1.0 hour . Duration : 72Hours, Circulate test: 24 Cycles.	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-2-6	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	20.78mΩ
				2	23.30mΩ
				3	21.63mΩ
				4	23.36mΩ
				5	20.23mΩ
2-2-7	Reseating	Manually unplug/plug the connector or socket Perform 3 such cycles.	No evidence of physical damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	Final
2-2-8	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	1	19.24mΩ
				2	23.83mΩ
				3	22.39mΩ
				4	23.75mΩ
				5	23.46mΩ
2-2-9	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

2-3 Group-C

	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-3-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-3-2	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 40mΩ (Initial)	Sample	Initial
				1	23.02mΩ
				2	23.26mΩ
				3	22.85mΩ
				4	23.27mΩ
2-3-3	Durability (preconditioning)	The durability rating shall be 50 cycles.Test reference standard:EIA-364-09	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-3-4	Temperature Life (Preconditioning)	105° C without applied voltage for 72 hours Test reference standard:EIA-364-17C test condition A	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-3-5	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	18.31mΩ
				2	20.49mΩ
				3	20.27mΩ
				4	20.36mΩ
2-3-6	Vibration	No evidence of physical damage. No discontinuities of 1 uS or longer duration when mated connector during test. Test reference standard : EIA-364-28, test condition VII	The connector must be mated test. Test condition: Duration: 15 minutes in each (Total of 45minutes) X, Y, Z axis. Amplitude : 1.52mm P-P or 147m/s2 {15G} Sweep time: 50-500-50Hz in 15 minutes.	Sample	No damage
				1	NA
				2	NA
				3	NA
				4	NA
2-3-7	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	NA
				2	NA
				3	NA
				4	NA
2-3-8	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

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2-4 Group-D					
	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
2-4-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-4-2	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 40mΩ (Initial)	Sample	Initial
				1	23.02mΩ
				2	23.26mΩ
				3	22.85mΩ
				4	20.36mΩ
				5	18.95mΩ
2-4-3	Durability (preconditioning)	The durability rating shall be 50 cycles.Test reference standard:EIA-364-09	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-4-4	Temperature Life (Preconditioning)	105° C without applied voltage for 72 hours Test reference standard:EIA-364-17C test condition A	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-4-5	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	21.47mΩ
				2	21.14mΩ
				3	19.94mΩ
				4	20.06mΩ
				5	18.87mΩ

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-4-6	Thermal Cycling	10 cycle consists of Temperature High: +85°C ± 3°C Temperature High: +15°C ± 3°C Ramp Rate: 2°C/min Dwell Time: 5 minutes at High and Low temperatures	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-4-7	Mixed flowing gas	The connector must be mated test. Test condition : 1. Gas concentration test condition: CL2 (10±3) ppb; NO2(200±50) ppb; H2S (10±3) ppb; SO2(200±50)ppb; 2. Test the Temperature must be control 30 ±1 °C, Relative Humidity must be control 70 ± 1%. 3. Test duration is 7 days(168 hours) 4. Test reference standard: EIA-364-65 Class II A	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-4-8	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max. Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	21.47mΩ
				2	21.14mΩ
				3	19.94mΩ
				4	20.06mΩ
				5	18.87mΩ
2-4-9	Cyclic temperature and humidity	Test condition : 25 °C ±3 °C at 80 % ±3% Relative Humidity and 65 °C ±3 °C at 50 % ±3% Relative Humidity . Ramp times should be 0.5 hour and dwell times should be 1.0 hour . Duration : 72Hours, Circulate test: 24 Cycles.	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-4-10	Reseating	Manually unplug/plug the connector or socket. Perform 3 such cycles.	No evidence of physical damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-4-11	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	21.88mΩ
				2	22.63mΩ
				3	23.15mΩ
				4	21.43mΩ
2-4-12	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-5 Group-E					
	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-5-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-5-2	Insulation resistance	EIA 364 – 21E Insulation between adjacent terminals in an environment of 23 + 2 C and relative humidity less than 85%. Testing conditions: 500V DC , 1 minutes Plug in test	100 M Ω Min.	Sample	Mating
				1	∞
				2	∞
				3	∞
				4	∞
				5	∞

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	Initial
2-5-3	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 40mΩ (Initial)		
				1	23.26mΩ
				2	23.50mΩ
				3	23.09mΩ
				4	23.51mΩ
				5	20.72mΩ
2-5-4	Reseating	Manually unplug/plug the connector or socket. Perform 3 such cycles.	No evidence of physical damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-5-5	Insertion/extraction Cycles	EIA 364 – 13 Measure force necessary to mate connector assemblies at maximum rate of 12.5mm/min.	Mating force: 5N~20N	Sample	Mating
				1	7.06 N
				2	6.08 N
				3	6.08 N
				4	5.98 N
				5	5.98 N
2-5-6	Insertion/extraction Cycles	EIA 364 – 13 Measure force necessary to mate connector assemblies at maximum rate of 12.5mm/min.	Un-mating Force: 8 N to 20 N	Sample	Un-mating
				1	10.00 N
				2	9.70 N
				3	9.60 N
				4	9.70 N
				5	10.00 N

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	Mating
2-5-7	Durability	The durability rating shall be 10,000 cycles minimum for the USB Type-C connector family. The durability test shall be done at a rate of 500 ± 50 cycles per hour . Each insertion/extraction of 2500 cycles rotating sockets or plugs 180 °. Test reference standard:EIA-364-09	Mating force: 5N~20N	Sample	Mating
				1	7.94 N
				2	10.29 N
				3	9.60 N
				4	10.19 N
			5	9.70 N	
			Un-mating Force: 6 N to 20 N(1001-10000cycles)	Sample	Un-mating
				1	7.45 N
				2	7.45 N
				3	7.45 N
4	7.45 N				
5	7.45 N				
2-5-8	Insertion/extraction Cycles	EIA 364 – 13 Measure force necessary to mate connector assemblies at maximum rate of 12.5mm/min.	Mating force: 5N~20N	Sample	Un-mating
				1	10.49 N
				2	10.29 N
				3	9.60 N
				4	10.19 N
5	9.70 N				
2-5-9	Insertion/extraction Cycles	EIA 364 – 13 Measure force necessary to mate connector assemblies at maximum rate of 12.5mm/min.	Un-mating Force: 6 N to 20 N(1001-10000cycles)	Sample	Un-mating
				1	16.86 N
				2	17.44 N
				3	19.40 N
				4	18.62 N
5	19.50 N				
2-5-10	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	20.15mΩ
				2	27.70mΩ
				3	22.81mΩ
				4	24.31mΩ
5	23.15mΩ				

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	Mating
2-5-11	Insulation resistance	EIA 364 – 21E Insulation between adjacent terminals in an environment of 23 + 2 C and relative humidity less than 85%. Testing conditions: 500V DC · 1 minutes Plug in test	100 M Ω Min.	Sample	Mating
				1	∞
				2	∞
				3	∞
				4	∞
2-5-12	Dielectric strength	EIA 364 – 20E Test between adjacent contacts of mated and unmated connector assemblies Testing conditions: 100V AC · 1 minutes	Leakage current: 5mA Max. No flashover & spark over & excess leakage & breakdown	Sample	No breakdown
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-5-13	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-6 Group-F					
	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-6-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-6-2	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 40m Ω (Initial)	Sample	Initial
				1	23.26m Ω
				2	23.50m Ω
				3	23.09m Ω
				4	23.51m Ω
5	20.72m Ω				

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-6-3	Salt spray	EIA 364 - 26 Concentration: 5±1% Spray time: 48±4hours Ambient temperature: 35±2°C	Shall meet visual requirements, No detrimental corrosion allowed in contact area and base metal exposed.	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-6-4	Contact resistance	Dry circuit of DC 20 mV max. , 100 mA max.Per EIA-364-23	Less than 50mΩ (After test:)	Sample	Final
				1	21.72mΩ
				2	25.64mΩ
				3	22.81mΩ
				4	27.34mΩ
2-6-5	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

2-7 Group-G

	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
				Sample	No damage
2-7-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	NA
				2	NA
				3	NA
				4	NA
2-7-2	Mated Connector (Impedance)	The mated connector impedance requirement is needed to maintain signal integrity. The differential impedance of a mated connector shall be within 85Ω +/-9Ω	85 Ω ± 9 Ω	Sample	Mating
				1	NA
				2	NA
				3	NA
				4	NA
				5	NA

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
2-7-3	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	NA
				2	NA
				3	NA
				4	NA
				5	NA

2-8 Group-H

	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
2-8-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-8-2	Resistance to Soldering Heat	Lead-Free wave flow process: Pre-heat: 80°C/60Sec. Soldering time: 10 ± 1.0 second Soldering pot: 260 ± 5°C	Appearance: No Damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-8-3	4-Axis continuity test	The receptacle shall be mounted on the PCB board , and receptacle PCB shall initially be placed in a horizontal plane, at a distance of 15mm form the mating edge of the receptacle shell, fixed a circular probe perpendicular to The male head and downward pressure	Products in the case of 20N force to bear the same time , receptacle and plug contact discontinuity less than 10s and no physical damage of the four orientations.	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
2-8-4	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

2-9 Group-I

	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
2-9-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
2-9-2	Temperature Rising	1.A current of 5.0 A shall be applied collectively to VBUS pins (pins A4, A9, B4, and B9) 2.1.25 A applied to the VCONN pin (B5 of the plug connector) with the return path through the corresponding GND pins (pins A1, A12, B1, and B12). 3. A minimum current of 0.25 A shall also be applied individually to all the other contacts.	the temperature rise shall not exceed 30 °C	Sample	temperature
				1	29 °C
				2	27 °C
				3	28 °C
				4	28 °C
2-9-3	Resistance to Soldering Heat	Lead-Free wave flow process: Pre-heat: 80°C/60Sec. Soldering time: 10 ± 1.0 second Soldering pot: 260 ± 5°C	Appearance: No Damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

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	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
2-9-4	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

2-10 Group-J

	ITEM	TEST CONDITION	REQUIREMENT	TEST RESULT	
2-10-1	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-10-2	Solderability	Solder pot temperature: 250±5°C Soldering time: 3 to 5 Seconds Test reference standard: EIA 364-52	The inspected area of each lead must have 95% solder coverage Minimum.	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass
2-10-3	Examination of product	Visual inspection. EIA-364-18	Appearance: No damage	Sample	No damage
				1	Pass
				2	Pass
				3	Pass
				4	Pass
				5	Pass

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3. OPERATING TEMPERATURE RANGE: -40°C to+80°C

4. Recommended IR Reflow Temperature Profile(Lead-Free):

