

<b>ENGINEERING DEPT</b>	<b>PRODUCT SPECIFICATION</b>	<b>SPECNO: GS-BF-EN-66</b>
	<b>FOR TYPE C SERIES CONNECTOR</b>	<b>REV:1 Page 1 of 6</b>

### 1.0 SCOPE

This Product Specification covers the Type C Series connector.

### 2.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

See sales drawings and other sections of this specification for the relevant reference documents. In cases where the specification differs from the drawings, the drawings take precedence.

### 3.0 DESIGN AND CONSTRUCTION

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

### 4.0 MATERIALS

See attached drawings

### 5.0 RATINGS

Rated voltage: 50 V

Temperature Range

Storage:-20to+60

operating:-40 °C TO +85°C

### 6.0 TEST CONDITION

All tests shall be performed as bellow conditions unless otherwise specified

6.1temperature range: 15 °C TO +35°C

6.2humidity range: 25% TO +85%

Atmospheric pressure:86kpa to 1.6kpa(860 to 1060 mber)

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## 7. ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITIN	REQUIREMENT
7.1	Contact Resistance	Mate connectors with dry circuit(20mV,100mA Max) <b>Spec: EIA-364-23B</b>	1).initial: <b>40</b> mΩ max 1).after test: <b>10</b> mΩ change max
7.2	Insulation Resistance	When applied DC 500V between adjacent terminal or ground <b>Spec: EIA-364-21</b>	More than <b>100</b> MΩ min
7.3	Dielectric strength	When applied AC 100V 1 minute between adjacent terminal <b>Spec: EIA-364-20</b>	1).no flashover or insulation breakdown 2).leakage current:0.5mA max
7.4	Contact current rating	When measured at an ambient temperature of 25°C When the currents are applied to the contaces the temperature rise shall not exceed +Δ30°C at any point on the usb type c mated plug and receptacle under test <b>Spec:EIA364-70 method2</b>	5A for shall be applied collectively to vbus pins(A4/A9/B4/B9) 1.25A for Vconn pin(B5)with the return path through the corresponding GND pin(A1/A12A/B1/B12) 0.25A for other contacts
7.5	Differential impedance <b>(USB3.1 type only)</b>	The differential impedance of a mated connector should be within $85\Omega \pm 9\Omega$ as seen from 40ps(20%~80%)Rise tiem	Maximun:94Ω Mimimun:76Ω
7.6	Differential impedance Loss(DDIL) <b>(USB3.1 type only)</b>	The differential insertion loss Measures the differential signal energy transmitted through the mated connector	$\cong -0.25$ Bb for 100MHZ $\cong -0.35$ Bb for 12.5GHZ $\cong -0.45$ Bb for 5GHZ $\cong -0.75$ Bb for 10GHZ $\cong -1.85$ Bb for 15GHZ
7.7	Differential Return Loss(DDRRL) <b>(USB3.1 type only)</b>	The differential Return loss Measures the differential signal reflection the mated connector	$\cong -20$ Bb for 100MHZ $\cong -20$ Bb for 5GHZ $\cong -13$ Bb for 10GHZ $\cong -6$ Bb for 15GHZ

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7.8	Differential Near end&Far end Crosstalk Between superspeed Pairs <b>(USB3.1 type only)</b>	The differential crosstalk measures the unwanted coupling between differential pairs. Both near end and far end crosstalk for mated connector.	$\leq -40\text{Bb}$ for 100MHZ $\leq -40\text{Bb}$ for 5GHZ $\leq -36\text{Bb}$ for 10GHZ $\leq -30\text{Bb}$ for 15GHZ
7.9	Differential Near end&Far end Crosstalk Between D+/D-and superspeed Pairs <b>(USB3.1 type only)</b>	The differential near end and far end crosstalk between the D+/D-pairs and superspeed Pairs in mated connector	$\leq -40\text{Bb}$ for 100MHZ $\leq -40\text{Bb}$ for 5GHZ $\leq -36\text{Bb}$ for 7.5GHZ
7.10	Differential to Common Mode <b>(USB3.1 type only)</b>	Common mode noise is related to EMC performance	$\leq -30\text{Bb}$ for 100MHZ $\leq -30\text{Bb}$ for 6GHZ $\leq -25\text{Bb}$ for 10GHZ

## 8.MECHANICAL REQUIREMENT

ITEM	DESCRIPTION	TEST CONDITIN	REQUIREMENT
8.1	Vibration	Subject mated connectors to 3.10G'S rms.fiteen minutes in each of three mutually perpensicular planes. <b>Spec : EIA-364-28 Test condition VII Test Letter D</b>	1).No discontinuities of 1 $\mu$ sec or longer duration 2).Shall meet visual requirement show no physical damage.
8.2	Physical Shock	Subject mated connectors to 30G'S Half-sine shock pulses of 11ms Duration.three shocks in each Direction applied along three mutually Perpendicular planes,18total shock. <b>Spec: EIA-364-27B</b>	1).No discontinuities of 1 $\mu$ sec or longer duration 2).Shall meet visual requirement show no physical damage.
8.3	Insertion force	Measures force necessary to mate connector assemblies at a rate of <b>12.5mm/Min</b> <b>Spec: EIA-364-13B</b>	Rang:5N to 20N
8.4	Extraction force	Measures force necessary to mate connector assemblies at a rate of <b>12.5mm/Min</b> <b>Spec: EIA-364-13B</b>	Rang: 1~1000 Cycles 6N to 20N 1001~10000 Cycles 6N to 20N
8.5	Soldering strength	Direction: 6 surface test	25N Min.

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8.6	Durability	<p>Mate and unmate connector assemblies for</p> <p>Operation 1 : 25 cycles at maximum rated of <b>200 cycles/ hour.</b></p> <p>Operation 2 : 10000 cycles at maximum rated of <b>200 cycles/ hour.</b></p> <p><b>SPEC: EIA-364-09</b></p>	Shall meet visual requirement, show no physical damage.
8.7	Terminal Retention Force	<p>Axial pullout force on the terminal in the housing at a rate of 25±3mm/Min per minute</p> <p><b>Spec: EIA-364-35</b></p>	<b>5N /PIN Min</b> <b>{500gf/pin. Min}</b>

## 9. ENVIRONMENTAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
9.1	Solder ability	<p>The surfaces to be tested shall be immersed in flux for a minimum of 3~5 seconds. the temperature of the solder bath shall be maintained as measured below the surface on the solder at <b>255°C±5°C</b></p> <p><b>Spec: EIA 364-52</b></p>	No evidence of physical damage, Wet solder coverage: 95%Min
9.2	Humidity Life	<p>The connectors shall be mated and exposed to the condition of <b>60±2°C</b> with 90~95% Humidity for 96 hour; Recovery time 1~2 hours</p> <p><b>Spec: EIA-364-31B</b></p>	<p>No evidence of physical damage</p> <p>Contact Resistance: 50mΩ Max</p> <p>Insulation Resistance: 1000MΩ Min</p> <p>Dielectric strength: 500V DC</p>
9.3	Salt Spray	<p>Subject mated connectors to 35+/-2 °C and 5+/-1% with 95~98% Humidity <b>Ph 6.5~7.2</b> for salt condition for 48 hours. After test, rinse the sample with water and recondition the room temperature for 2 hour</p> <p><b>Spec: EIA-364-26B</b></p>	<p>No detrimental corrosion allowed in contact area.</p> <p>Contact Resistance: 50mΩ Max</p>
9.4	Cold Resistance	<p>Solder connectors on PCB, expose to -40±2°C for 48 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 2 hours, after which the specified measurements shall be performed.</p>	<p>No evidence of physical damage .</p> <p>Contact Resistance: 50mΩ Max</p> <p>Insulation Resistance: 1000MΩ Min</p>

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ITEM	DESCRIPTION	TEST CONDITIN	REQUIREMENT										
9.5	Heat Shock	<p>Samples shall be placed in the test chamber with the test condition for 10 cycles,:</p> <table border="1"> <tr> <td>Temperature(°C)</td> <td>-55</td> <td>+25</td> <td>+85</td> <td>+25</td> </tr> <tr> <td>Time(H)</td> <td>2</td> <td>0.5</td> <td>2</td> <td>0.5</td> </tr> </table> <p>Upon completion of the test, specimen shall be conditional at ambient room conditions for 1~2 hours, after which the specified measurements shall be performed.</p> <p><b>Spec:EIA 364-32 Test condition I</b></p>	Temperature(°C)	-55	+25	+85	+25	Time(H)	2	0.5	2	0.5	<p>No evidence of physical damage</p> <p>Contact Resistance:50mΩ Max</p> <p>Insulation Resistance: 1000MΩ Min</p> <p>Dielectric strength: 500V DC</p>
Temperature(°C)	-55	+25	+85	+25									
Time(H)	2	0.5	2	0.5									
9.6	Temperature Life(Heat Aging)	<p>Mated Connector <b>105±2°C , 120 hours</b></p> <p>Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 2 hours,</p> <p><b>Spec: EIA-364-17 Test condition 4 Method A</b></p>	<p>No evidence of physical damage</p> <p>Contact Resistance:50mΩ Max</p> <p>Insulation Resistance: 1000MΩ Min</p>										
9.7	Thermal Shock	<p>500 cycles of:</p> <p>a) -40±3°C for 2 H</p> <p>b) +85±3°C for 2 H</p> <p>The time of changing temperature shall be less than 5 minutes</p> <p>(ANSI/EIA-364-32C Condition 1)</p>	<p>No evidence of physical damage</p> <p>Contact Resistance:50mΩ Max</p> <p>Insulation Resistance: 1000MΩ Min</p> <p>Dielectric strength: 500V DC</p>										
9.8	Resistance to soldering heat	<p>test condition for reflow soldering, <b>2 cycles</b></p> <p><b>Spec: MIL-STD-202 F, Method 210 A</b></p>	<p>No evidence of physical damage</p>										

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Test Item		Test Group										
		A	B	C	D	E	F	G	H	I	J	L
		Test Sequence										
1	Examination of Product	1,5	1,5	1	1,5	1,9	1,9	1,5	1,5	1,9	1,3	1,3
2	Contact Resistance	2	2,6		2,4	2,6	2,6	2,4	2,4	2,6		
3	Insulation Resistance	3				3,7	3,7			3,7		
4	Withstanding Voltage Test	4				4,8	4,8			4,8		
5	Durability		3									
6	Contact Retention Force		4	2								
7	Cold Resistance				3							
8	Thermal Shock					5						
9	Humidity Life						5					
10	Temperature LifeL							3				
11	Salt Spray								3			
12	Heat Shock									5		
13	Solder ability										2	
14	Resistance to soldering heat											2
15	No. of Test Samples (Min.)	5	5	5	5	5	5	5	5	5	5	5

A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
GND	RX2+	RX2-	VBUS	SBU1	D-	D+	CC	VBUS	TX1-	TX1+	GND
GND	TX2+	TX2-	VBUS	VCONN			SBU2	VBUS	RX1-	RX1+	GND
B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12