BBi RANGE

HARWiN

COMPONENT SPECIFICATION

C05801

USB Type-C® Connectors

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1. DESCRIPTION OF CONNECTORS

The USB Type-C range covers USB4®, USB 3.2 Gen 2 and USB 2.0 Type-C™, with six female receptacles and one male plug. All parts are supplied on tape and reel for surface-mount or hybrid-solder assembly and share the standard Type-C current allocation.

Products complying to each USB specification differ by mounting style. Two of the USB 3.2 receptacles also include waterproofing. Each product is offered with two contact area finishes: gold flash (with part numbers ending 42R or 44R) or 0.76µm (30µ") gold (ending with 43R or 45R).

The following variants are available with USB-IF certification:

- USB-C4R24AZ42R = TID 11684
- USB-C3R24AZ42R = TID 9570

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2. RATINGS

NOTE:

- The pins referred to in the current rating and data rate are shown in Appendix 1.

2.1. Material & Finish

Housing Materials:
- Insulator ..... LCP, UL94V-0
- Outer Shell and internal plates ..... Stainless Steel, Nickel finish or unplated - see individual drawings
- Waterproof seal (where applicable) ..... Silicone

Contact Material ..... Copper-Nickel-Cobalt-Silicon

Contact Finish - underplate:
- USB4 ..... 2µm (80µ") min nickel
- USB 3.2 Gen 2 ..... 1.27µm (50µ") min nickel
- USB 2.0 ..... 0.76µm (30µ") min nickel

Contact Finish - contact area:
- Gold flash (part numbers ending 42R or 44R) ..... 0.025µm (1µ") min gold
- Gold (part numbers ending 43R or 45R) ..... 0.76µm (30µ") gold

Contact Finish - terminations:
- Tin (part numbers ending 42R or 43R) ..... 2.5µm (100µ") min tin
- Gold (part numbers ending 44R or 45R) ..... 0.025µm (1µ") min gold

2.2. Electrical Characteristics

Current Rating (EIA-364-70) - also see Appendix 1:
- VBUS (pins A4, A9, B4, B9) ..... 5A max
- GND (pins A1, A12, B1, B12) ..... 6.25A max
- VCONN (pin B5) ..... 1.25A max
- Other contacts ..... 0.25A min

Data Rate (TX/RX pairs) - also see Appendix 1:
- USB4 ..... 40 Gbps
- USB 3.2 Gen 2 ..... 10 Gbps
- USB 2.0 ..... 480 Mbps

Power Rating:
- USB4 ..... 240W max
- USB 3.2 Gen 2, USB 2.0 ..... 150W max

Dielectric Withstanding Voltage (EIA-364-20 Method B) 100VAC

Working Voltage:
- USB4 ..... 48V DC/AC max
- USB 3.2 Gen 2, USB 2.0 ..... 30V DC/AC max

Contact Resistance (EIA-364-23):
- Initial ..... 40mΩ max
- After test ..... 50mΩ max

Insulation Resistance (EIA-364-21) ..... 100MΩ min

2.3. Environmental Characteristics

Operating Temperature Range: ..... -40°C to +85°C
Humidity Life (EIA-364-31B): ..... 40±2°C, 90–95% RH, 96 hours
Cyclic Temperature and Humidity (EIA-364-31B): ..... 25±3°C / 80±3% RH, 65±3°C / 50±3% RH
Thermal Shock (EIA-364-32 Condition I) ..... –40°C to +85°C, 10 cycles
Temperature Life (EIA-364-17 Method A) ..... 105°C, 120 hours
Vibration (EIA-364-28): ..... 20~500 Hz (Condition VII, Letter D)
Salt Spray (EIA-364-26B) ..... 48 hours
Sealing / Ingress Protection (IEC 60529) ..... IPX7 (1.0m for 30 minutes)
Applicable products only

2.4. Mechanical Characteristics

Durability (EIA-364-09) ..... 10,000 mating cycles min
Insertion Force (EIA-364-13) ..... 5N min, 20N max
Withdrawal Force (EIA-364-13):
- Initial ..... 8N min, 20N max
- After test ..... 6N min, 20N max

2.5. Soldering Data

Solderability (EIA-364-52) ..... 245°C for 5 seconds
Resistance to Soldering Heat ..... 245°C for 30 seconds max

APPENDIX 1 - CONTACT ALLOCATION AND TEST PINS

Type-C receptacle – mating-face view (24-position)



16-position variants omit the high-speed pairs (TX/RX)

Current rating test (EIA-364-70): red / navy / amber pins **Data rate test: green and blue pins**

- VBUS – 5 A max
- GND – 6.25 A max
- VCONN – 1.25 A max
- CC / SBU – other contacts 0.25 A min
- D+ / D− – USB 2.0 data (480 Mbps)
- TX / RX – 10 Gbps (USB 3.2), 40 Gbps (USB4)

Contacts used in the rated tests:

Test	Contacts	Applies to
Current rating (EIA-364-70)	VBUS: A4, A9, B4, B9 – 5A max GND: A1, A12, B1, B12 – 6.25A max VCONN: B5 – 1.25A max All other contacts – 0.25A min	All products
Data rate – high speed 10 Gbps (USB 3.2 Gen 2) 40 Gbps (USB4)	TX1+/−: A2, A3 TX2+/−: B2, B3 RX1+/−: B10, B11 RX2+/−: A10, A11	24-position products only (USB4 and USB 3.2 Gen 2)
Data rate – USB 2.0 480 Mbps	D+ / D−: A6, A7, B6, B7	USB4, USB 3.2 Gen 2 and USB 2.0 products (24- and 16-position)