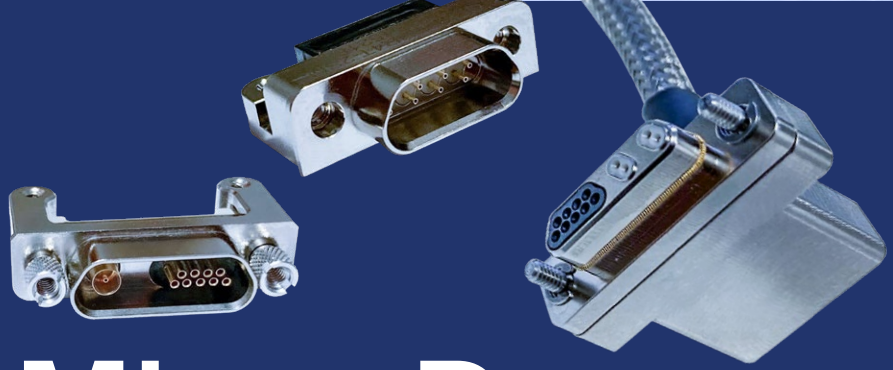
MISSION-CRITICAL
INTERCONNECT
SOLUTIONS

Glenair®



GMMD

Modular Micro-D

Innovative Modular Micro-D Connectors and Cables for RF, Signal, and High-Speed Data Links

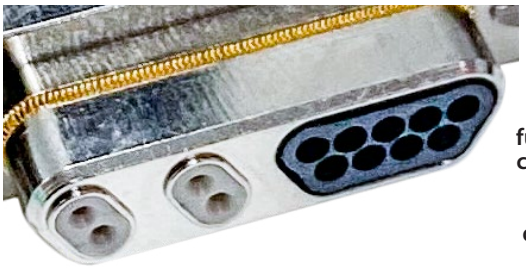
JANUARY 2023

GLENAIR MODULAR HIGH-SPEED

MICRO-D (GMMD)

GMMD: The modular Micro-D differential twinax or RF coax high-speed solution. Combo design accommodates both high data-rate, RF, and standard low-speed signal requirements in a single connector package.

The Series GMMD is an innovative modular Micro-D connector for RF coax and high-speed differential datalink applications. The unique micro miniature design of the GMMD also accommodates standard analog signal and power contacts, making it the most versatile Micro-D rectangular in the industry. GMMD leverages Glenair Signature Micro-D and Nano TwistPin contact inserts, as well as ultra small form-factor differential twinax modules delivering 18 Gb/second per pair and RF to 20 GHz. GMMD is supplied as factory-terminated pigtails, point-to-point jumpers, and SMT receptacles for easy PCB mounting.



Glenair Signature Twinax contact modules (left) are fully shielded for outstanding cross-talk isolation and signal integrity. Standard Micro-D TwistPin contact modules deliver reliable performance IAW MIL-PRF-83513

RoHS MATERIALS

- **Low crosstalk, high bandwidth twinax modules** for 18Gb/s per pair and RF up to 20GHz
- **Cable and 90° PCB configurations** for matched 100 Ohm differential impedance performance from I/O to board
- **SMT receptacles** for easy PCB mounting
- **Combo layouts** include twinax, 50 and 75Ω coax, mixed signal and power
- **TwistPin contacts** for low resistance and high shock and vibe performance
- **Standard Micro-D** shell sizes and hardware

GMMD

Modular High-Speed Micro-D Connectors

Product Selection Guide

PRODUCT SELECTION GUIDE

PERFORMANCE SPECIFICATIONS

Electrical, Mechanical, and Environmental Performance

HORIZONTAL PCB-MOUNT TWINAX AND COMBO TWINAX RECEPTACLES

-HR	Horizontal PCB-mount receptacle
-HRE	Horizontal edge-launched receptacle
-HRP	Horizontal panel-sealed receptacle
-HRPE	Horizontal panel-sealed edge-launched receptacle

VERTICAL PCB-MOUNT TWINAX AND COMBO TWINAX PLUG AND RECEPTACLES

-VP	Vertical PCB-mount plug
-VR	Vertical PCB-mount receptacle
-VRI	Vertical PCB-mount receptacle with integrated hardware

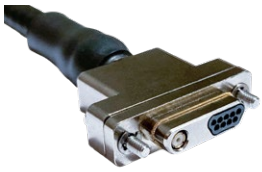
TWINAX AND COMBO TWINAX JUMPERS AND PIGTAILS

-FP	Cable plug connectors
-FPE	Cable plug environmental connectors
-FR	Cable receptacle connectors
-FRP	Rear panel-mount cable receptacle connectors

HORIZONTAL PCB-MOUNT COAX AND COMBO COAX RECEPTACLES

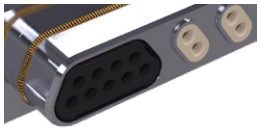
-HRE	Horizontal edge-launched receptacle
-HRPE	Horizontal panel-sealed edge launched receptacle

COAX AND COMBO COAX JUMPERS AND PIGTAILS



-FP	Cable plug connectors
-FPE	Cable plug environmental connectors
-FR	Cable receptacle connectors
-FRP	Rear panel-mount cable receptacle connectors

MOD CODES



-474	Keying option
-428	High-temperature epoxy
-429	Space-grade
-497	Ground springs

Performance specifications

2 **ORDER OF PRECEDENCE**

2.1 **Order of precedence.** In the event of a conflict between the requirements of this specification and the references cited herein, this document takes precedence. The requirements set forth in customer specifications and Glenair detail drawings shall take precedence over this document.

3 **REQUIREMENTS**

3.1 ***Electrical Performance Requirements.***

3.1.1 **Insulation resistance.** 5,000 megohms minimum between any pair of contacts and any contact and the shell when tested in accordance with EIA-364 Procedure 21, which specifies 500 volts DC.

3.1.2 **Dielectric withstanding voltage.**

3.1.2.1 **Dielectric withstanding voltage (sea level).** 600 volts ac, rms 60 Hz. Connectors shall show no evidence of breakdown or flashover when subjected to the DWV test of EIA-364 Procedure 20.

3.1.2.2 **Dielectric withstanding voltage (70,000 feet).** 150 volts ac, rms 60 Hz. Connectors shall show no evidence of breakdown or flashover when subjected to the DWV test of EIA-364 Procedure 20 when interfacial seal is used on #24 contacts.

3.1.3 **Contact resistance**

3.1.3.1 **#24 Contact resistance (M83513 Group C qualification).** The voltage drop of a mated pair of contacts attached to wires shall not exceed the values shown when tested in accordance with MIL-DTL-83513F Paragraph 4.5.8, using 2.5 amps test current.

WIRE	VOLTAGE DROP (MV)
M22759/11-26	65 Maximum
M22759/33-26	75 Maximum
A-A-59551 25 gage	60 Maximum

3.1.3.2 **#24 Contact resistance (lot acceptance testing).** The voltage drop across a mated pair of contacts shall not exceed 8 millivolts when tested in accordance with EIA-364-06, using a test current of one ampere ± 2%. If the connector under test is wired, the calculated resistance across the contacts shall not exceed 8 milliohms when the maximum specified wire resistance per foot is subtracted from the total resistance.

3.1.3.3 **#30 Contact resistance (lot acceptance testing).** The voltage drop across a mated pair of contacts shall not exceed 71 millivolt drop maximum using a 1 ampere test current, when tested in accordance with EAI-364-06, using M22759/33-30 wire.

3.1.3.4 **#30 Low signal level contact resistance.** When tested with a micro-ohmmeter using a test current of 100 milliamperes maximum, the resistance of a mated pair of contacts shall be 71 milliohms maximum using M22759-33-30 wire. Test procedure shall be in accordance with EIA-364-23.

3.1.4 **#24 Low signal level contact resistance.** When tested with a micro-ohmmeter using a test current of 100 milliamperes maximum and 20 millivolts open circuit maximum, the resistance of a mated pair of contacts shall be 32 milliohms maximum. Test procedure shall be in accordance with EIA-364-23.

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Dimensions are subject to change without notice.

Performance specifications

3.1.5 **#24 Contact current capability.** Contacts shall be capable of carrying 3.0 amperes in continuous duty operation from -55° C. to +150° C. when tested in accordance with EIA-364-70.

3.1.5.2 **#30 Contact current capability.** Contacts shall be capable of carrying 1.0 amperes in continuous duty operation from -55° C. to +125° C. when tested in accordance with EIA-364-70.

3.1.6 **Shell-to-shell conductivity.** A mated pair of nickel-plated metal shell GMMD connectors fitted with an optional grounding spring on the plug shell mating face, shall not exceed 10 millivolts maximum voltage drop when tested in accordance with EIA-364-83.

3.1.7 **Shielding effectiveness.** A mated pair of metal shell GMMD connectors fitted with an optional grounding spring on the plug shell mating face shall meet a requirement of 65 dB minimum attenuation when tested in accordance with EIA-364-66.

3.1.8 **Magnetic permeability.** Magnetic permeability, when tested in accordance with EIA-364-54, shall not exceed 2 mu. Non-magnetic options are available.

3.2 ***Mechanical Requirements***

3.2.1 **Contact engaging and separation force.** Maximum engaging force shall be 6.0 ounces when tested in accordance with EIA-364-37, except with a .0221 ± .0001 diameter sleeve with a 6-10 microfinish. Minimum separation force shall be 0.5 ounces when tested in accordance with EIA-364-37, except with a .0230 ± .0001 diameter sleeve with a 6-10 microfinish.

3.2.2 **Connector mating and unmating force.** The maximum mating and unmating force shall not exceed a value equal to 10 ounces times the number of contacts, when tested per EIA-364-13. Mate connectors three times before initial measurements are taken.

3.2.3 **Contact retention.** Contacts, when tested in accordance with EIA-364-29, shall withstand a 5 pound axial load for a minimum of 5 seconds, with a maximum allowable displacement of .005 inch.

3.2.5 **Insert retention.** Inserts shall not be dislodged or moved from their original position when subjected to an axial load of 50 pounds per square inch when tested in accordance with EIA-364-35

3.2.6 **Resistance to soldering heat.** Connectors with solder cup contacts shall not be damaged following soldering with a 360° C. solder iron for at least 4 seconds in accordance with EIA-364-56 Procedure 1. Connectors with printed circuit board terminations shall withstand immersion in a solder bath for 9-11 seconds at 260° C. when tested in accordance with EIA-364-56 Procedure 3 Test Condition B. Connectors, after cooling, shall not exhibit damage or warpage when examined at 10X magnification. .

3.2.7 **Solderability.** Solder cup and printed circuit terminals shall meet the solderability requirements of MIL-STD-202 Method 208.

3.2.8 **Durability.** GMMD connectors shall be capable of 500 cycles of mating with no damage or degradation to electrical performance. Engaging and separation force and mating forces shall not exceed the requirements of 3.2.1 and 3.2.2.

Performance specifications

3.3 ***Environmental Requirements***

3.3.1 **Salt spray (corrosion).** Connectors shall show no exposure of base metal due to corrosion when subjected to the salt spray test of EIA-364-26. In addition, connectors shall meet contact resistance, lw circuit level contact resistance and mating force requirements.

Shell material, finish (code)	EIA-364-26 test condition	Duration (hours)
Aluminum, electroless nickel plating (**-2**)	B	48
Aluminum, alochromate (**-6**)	B	48
Aluminum, gold (**-5**)	B	48
Stainless steel, passivated (**-3**)	D	1000 (48 for M83513)
Aluminum, nickel-PTFE (**-7**)	T	500 (48 for M83513)
Aluminum, zinc-nickel, black (**-8**)	T	500 (48 for M83513)

3.3.2 **Fluid immersion.** Connectors shall meet mating force requirements following 20 hours immersion in synthetic lubricating oil and 1 hour immersion in Coolanol 25, when tested in accordance with MIL-DTL-83513F paragraph 4.5.18.

3.3.3 **Thermal vacuum outgassing.** The assembled connector mass excluding metallic parts shall not exceed 1.0% total mass loss (TML) or 0.1% total volatile condensible materials (CVCM) when tested in accordance with ASTM E595.

3.3.4 **Thermal shock.** Unmated connectors shall withstand 5 cycles of thermal shock with a minimum temperature of -65° C. and a maximum temperature of 150° C. when tested in accordance with EIA-364-32, Condition IV. Connectors shall not exhibit any detrimental damage or degradation of electrical performance.

3.3.6 **Vibration (sine).** Connectors, when mated, wired in series and fixtured in accordance with MIL-DTL-83513F, shall not exhibit any discontinuity longer than 1 microsecond when tested in accordance with EIA-364-28 Test Condition IV, which specifies 12 hour duration, 10 Hz to 2000 Hz, and amplitude of 20 g_n peak. Connectors shall not be damaged and no loosening of parts shall occur.

3.3.7 **Shock.** Connectors, when mated, wired in series and fixtured in accordance with MIL-DTL-83513F, shall not exhibit any discontinuity longer than 1 microsecond when tested in accordance with EIA-364-27, Test Condition E, which specifies an amplitude of 50 g peak. Connectors shall not be damaged and no loosening of parts shall occur.

GMMD MODULAR HIGH-SPEED MICRO-D STANDARD MATERIALS AND FINISHES	
Connector Shell, Metal	Aluminum Alloy 6061 IAW SAE AMS-QQ-A-250/11: Plating code 2: electroless nickel IAW ASTM B733 / Plating code 5: gold plated IAW ASTM B488 over electroless nickel IAW ASTM B733-90. / Plating code 6: chem film IAW MIL-C-5541 Class 3 Stainless Steel, 300 Series: Plating Code 3: Passivated IAW SAE AMS 2700
#24 Insulator and organizer tray	High-grade, high-temperature thermoplastic
Interfacial Seal (where applicable)	Fluorosilicone rubber IAW MIL-R-25988
Conductive Potting	Silver-loaded epoxy
EMI Spring	Gold-plated stainless steel
#24 Pin Contact (TwistPin)	Beryllium copper, gold plated IAW ASTM B 488 Type II Class 1.27 (50 Min minimum) Code C, over nickel underplate IAW SAE AMS-QQ-N-290, class 2, (50-150 µin).
#24 Socket Contact	Phos bronze IAW ASTM 139 gold plated IAW ASTM B 488 Type II Class 1.27 (50 Min minimum) Code C, over nickel underplate IAW SAE-AMS-QQ-N-290, Class 2, (50-150 µin).
Twinax #30 pin contacts	Spring Temper Gold alloy, unplated, per ASTM B477 and ASTM B541
Twinax #30 socket contacts	Gold alloy, unplated, per ASTM B477 and ASTM B541
Twinax Insert	High-grade thermoplastic
Encapsulant	High-temperature potting
Jackscrews, Jackposts, Float Mounts	Stainless steel, 300 series, passivated IAW SAE AMS 2700
Twinax wire	AWG 28 or 30 twisted pair, PTFE dielectric, silver plated copper conductors, SPC braid, fluoropolymer jacket

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Twinax and Combo Twinax contact arrangements, material / finish details, panel cutouts

GMMD TWINAX AND COMBO TWINAX CONTACT ARRANGEMENTS

Contact Arrangement	**2T**	**4T**	**2T9**	**2T15**	**4T9**
Shell Size	9	15	21	25	31
No. / type of contacts	2 Twinax	4 Twinax	2 Twinax, 9 #24	2 Twinax, 15 #24	4 Twinax, 9#24
Example applications	SpFi	10GbE, 2xSATA, SpW, 2xSpFi	USB 3.1, SATA + power		HDMI, DP, DVI, 10GbE + power

Contact Arrangement	**5T9**	**8T**	**4T15**	**8T15**	**4T31**	**12T**
Shell Size	31	31	37	51-2	51-2	51-2
No. / type of contacts	5 Twinax, 9 #24	8 Twinax	4 Twinax, 15 #24	8 Twinax, 15 #24	4 Twinax, 31 #24	12 Twinax
Example applications	DP incl. Aux channels	2x10GbE		DP or HDMI + USB 3.1, dual DVI		

Contact Arrangement	**12T15**	**6T37**	**8T31**	**16T**
Shell Size	67	67	67	67
No. / type of contacts	12 Twinax, 15 #24	6 Twinax, 37 #24	8 Twinax, 31 #24	16 Twinax
Example applications				4x10GbE

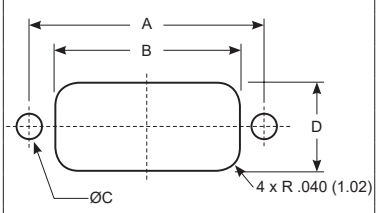
COMPLETE LIST OF CONTACT ARRANGEMENTS

100Ω Twinax		100Ω Twinax		100Ω Twinax	
Arrangement	**Shell Size**	**Arrangement**	**Shell Size**	**Arrangement**	**Shell Size**
2T	9	5T9	31	1T25	31
4T	15	6T9	37	2T25	37
5T	21	10T9	51	6T25	51
6T	25	14T9	67	10T25	67
8T	31	1T15	21	1T31	37
9T	37	2T15	25	4T31	51
10T	51	5T15	37	8T31	67
13T	51	8T15	51	3T37	51
16T	67	12T15	67	7T37	67
1T9	15	2T21	31	3T51	67
2T9	21	3T21	37		
3T9	25	7T21	51		
4T9	31	11T21	67		

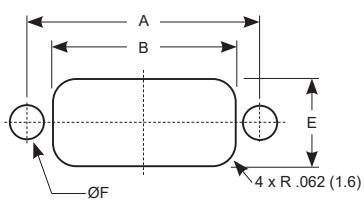
RECOMMENDED PANEL CUTOUT

Layout Diagram

Front Panel Mount



Rear Panel Mount



Layout	A mm. ± 0.08	B mm. ± 0.05	C mm. ± 0.05	D mm. ± 0.05	E mm. + 0.13, - 0.00	F mm. ± 0.05
9	14.35	10.41	2.31	7.04	6.50	3.20
15	18.16	14.22	2.31	7.04	6.50	3.20
21	21.97	18.03	2.31	7.04	6.50	3.20
25	24.51	20.57	2.31	7.04	6.50	3.20
31	28.32	24.38	2.31	7.04	6.50	3.20
37	32.13	28.19	2.31	7.04	6.50	3.20
51-2	41.02	37.08	2.31	7.04	6.50	3.20
67	51.18	47.19	2.31	7.04	6.50	3.20

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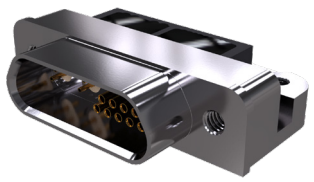
Horizontal PCB-mount twinax and combo twinax receptacles
Surface-mount termination



GMMD-HR horizontal PCB-mount receptacle (combo 2T9 layout shown)

CONNECTOR FEATURES

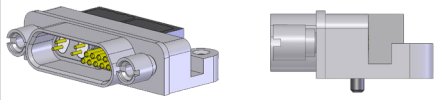
- HRE edge-launched and HRPE panel-sealed receptacles feature 0.635mm PCB pad spacing; HR horizontal and HRP panel-sealed receptacles spaced at 1.27mm
- An alignment pip is integral to the connector housing for accurate PCB registration. The connector shell mounting legs provide a ground path.
- Designed for use with SMT reflow soldering processes, using RoHS-compliant contact tin dipping. Glenair recommends connector be screwed to PCB before soldering

HOW TO ORDER

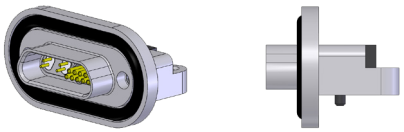
Sample Part Number	GMMD	-HRP	2T9	-2	P	M	-1

Series	**GMMD** = Glenair Modular High-Speed Micro-D
Connector Format	**-HR** = Horizontal PCB-mount receptacle **-HRE** = Horizontal edge-launched receptacle **-HRP** = Horizontal panel-sealed receptacle **-HRPE** = Horiz. panel-sealed edge-launched receptacle
Contact Arrangement	See Table. Consult factory for additional arrangements.
Shell Material / Finish	**-2** = Aluminum / Electroless Nickel **-5** = Aluminum / Gold **-3** = Stainless Steel / Passivated **-6** = Aluminum / Alochromate **-7** = Aluminum / Nickel-PTFE **-8** = Aluminum / Zinc-Nickel, Black
Jackpost Options	Specify per Jackpost / Hardware Options in table below
Board-Mount Options	Specify per Board-Mount Thread Options in table below
Sealing Options for HRP and HRPE (omit for HR and HRE)	**-0** = No O-ring **-1** = Fluorosilicone **-2** = Passivated silver-plated aluminum-filled fluorosilicone **-3** = Nickel-plated aluminum-filled fluorosilicone

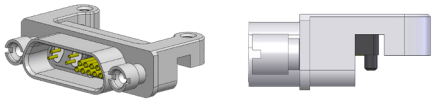
CONNECTOR FORMAT



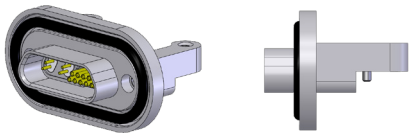
GMMD-HR
Horizontal PCB-Mount Receptacle



GMMD-HRP
Horizontal PCB-Mount Panel-Sealed Receptacle



GMMD-HRE
Horizontal PCB-Mount Edge-Launched Receptacle



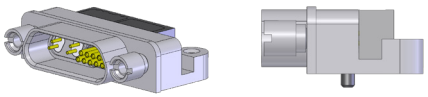
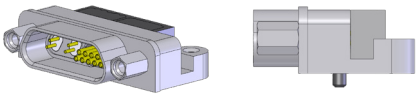
GMMD-HRPE
Horizontal PCB-Mount Panel-Sealed Edge-Launched Receptacle

GMMD TWINAX AND COMBO TWINAX CONTACT ARRANGEMENTS

Code	Shell Size	Twinax Contacts	#24 Contacts
2T	9	2	
4T	15	4	
2T9	21	2	9
2T15	25	2	15
4T9	31	4	9
5T9	31	5	9
8T	31	8	
4T15	37	4	15
8T15	51-2	8	15
4T31	51-2	4	31
12T	51-2	12	
12T15	67	12	15
6T37	67	6	37
8T31	67	8	31
16T	67	16	

JACKPOST / HARDWARE OPTIONS and BOARD-MOUNT THREAD OPTIONS

For **Rear panel mount jackpost**, specify Jackpost option code **T**, **U**, **V**, **W**, **X**, or **Y** per required panel thickness, and board-mount thread option.
For **Factory installed jackpost**, specify code **S** and board-mount thread option.

		Jackpost option		Board-Mount Thread Option	
		Code	Panel Thickness		
Rear panel mount jackpost		T	2.4mm	M	M2 metric
		U	2.0mm		
		V	1.6mm		
		W	1.2mm	U	#2-56 UNC
		X	0.8mm		
		Y	0.6mm		
Factory installed jackpost		S		M	M2 metric
				U	#2-56 UNC

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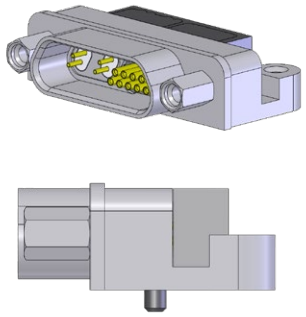
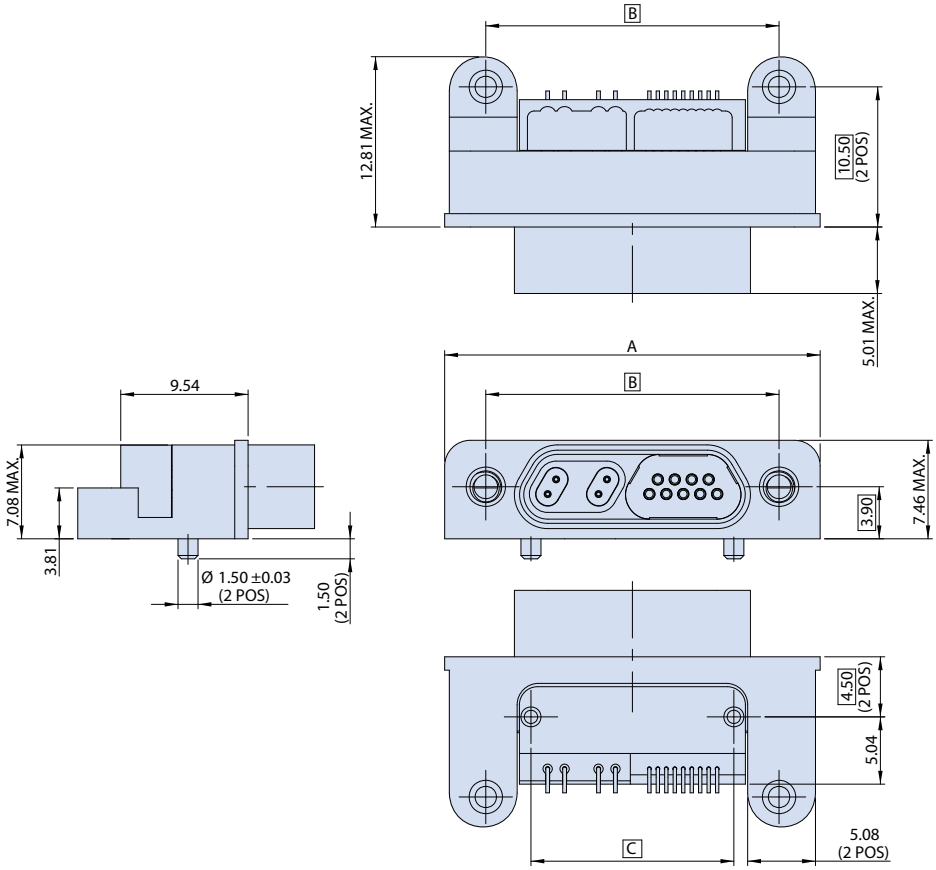
Horizontal PCB-mount twinax and combo twinax receptacles
Surface-mount termination

GMMD-HR HORIZONTAL PCB-MOUNT CONNECTOR DIMENSIONS



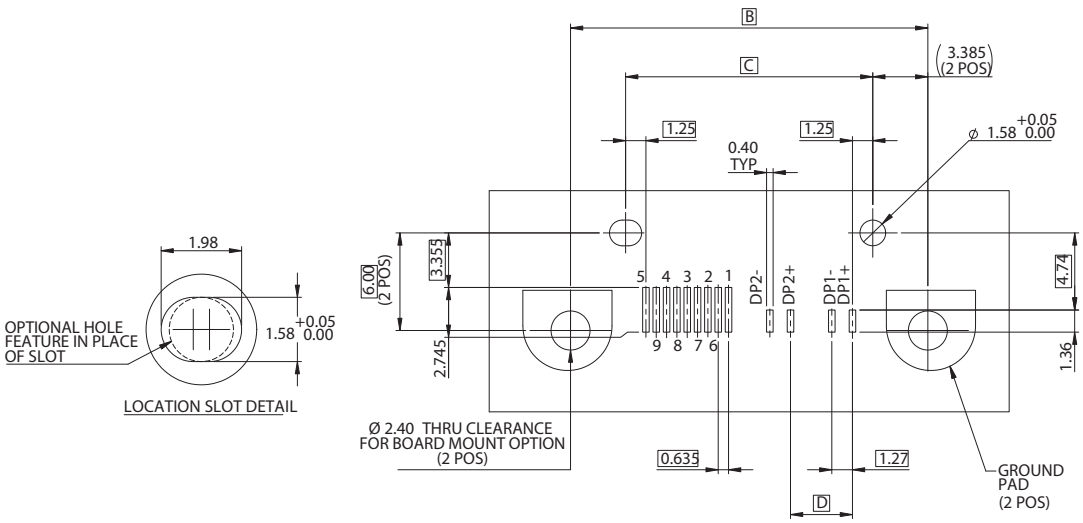
GMMD-HR
Horizontal PCB-Mount Receptacle

Shell size	A (mm)	B (mm)	C (mm)
9	20.56	14.35	7.58
15	24.37	18.16	11.39
21	28.18	21.97	15.20
25	30.72	24.51	17.74
31	34.53	28.32	21.55
37	38.34	32.13	25.36
51-2	47.23	41.02	34.25
67	57.39	51.18	44.41



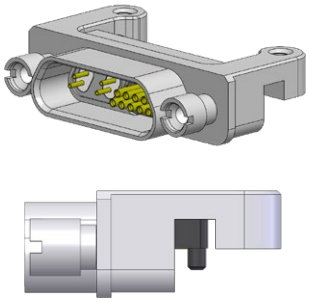
PCB MOUNTING PATTERN FOR GMMD-HR HORIZONTAL PCB-MOUNT (SMT MOUNT - COMPONENT SIDE)

Twinax Contact Pitch		
Shell size	Contact Arrangement	D mm
9	2T9	3.810
15	4T	2.540
21	2T9	3.810
31	4T9	3.175
31	5T9	2.540
31	8T	2.540
37	4T15	3.175
51	8T15	2.540
51	4T31	2.858
51	12T	2.540
67	12T15	2.540
67	6T37	2.858
67	8T31	2.540
67	16T	2.540



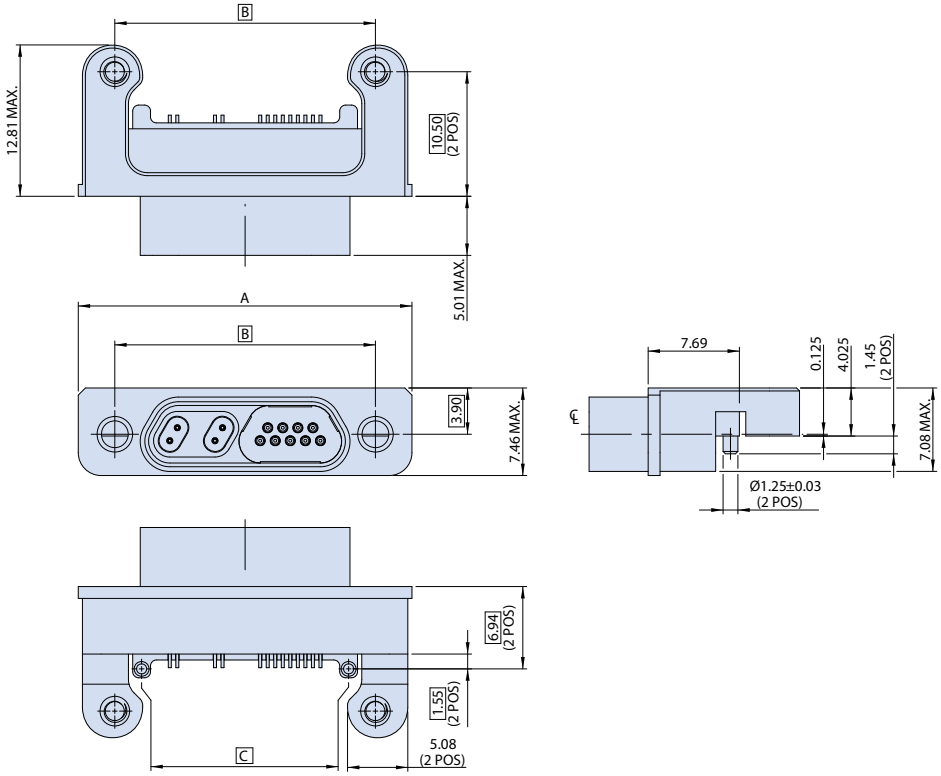
Horizontal PCB-mount twinax and combo twinax receptacles
Surface-mount termination • edge-launched

GMMD-HRE HORIZONTAL EDGE-LAUNCHED PCB-MOUNT CONNECTOR DIMENSIONS



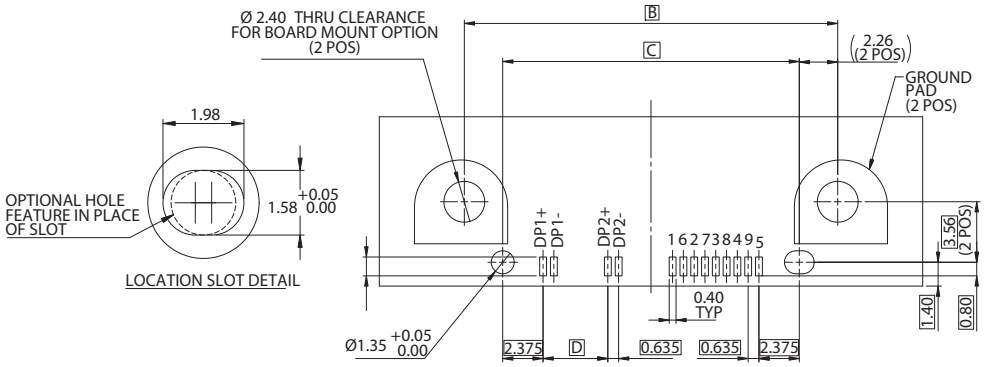
GMMD-HRE
Horizontal PCB-Mount Edge-Launched Receptacle

Shell size	A (mm)	B (mm)	C (mm)
9	20.56	14.35	9.83
15	24.37	18.16	13.64
21	28.18	21.97	17.45
25	30.72	24.51	19.99
31	34.53	28.32	23.80
37	38.34	32.13	27.61
51-2	47.23	41.02	36.50
67	57.39	51.18	46.66



PCB MOUNTING PATTERN FOR GMMD-HRE EDGE-LAUNCHED PCB-MOUNT (SMT MOUNT - COMPONENT SIDE)

Twinax Contact Pitch		
Shell size	Contact Arrangement	D mm
9	2T9	3.810
15	4T	2.540
21	2T9	3.810
31	4T9	3.175
31	5T9	2.540
31	8T	2.540
37	4T15	3.175
51	8T15	2.540
51	4T31	2.858
51	12T	2.540
67	12T15	2.540
67	6T37	2.858
67	8T31	2.540
67	16T	2.540



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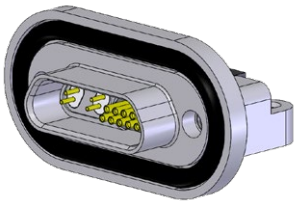
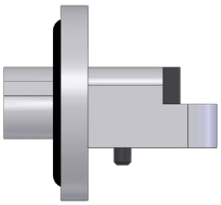
Dimensions are subject to change without notice.

Horizontal PCB-mount twinax and combo twinax receptacles
Surface-mount termination • panel-sealed

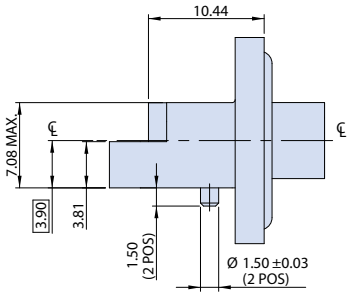
GMMD-HRP HORIZONTAL PCB-MOUNT PANEL-SEALED CONNECTOR DIMENSIONS

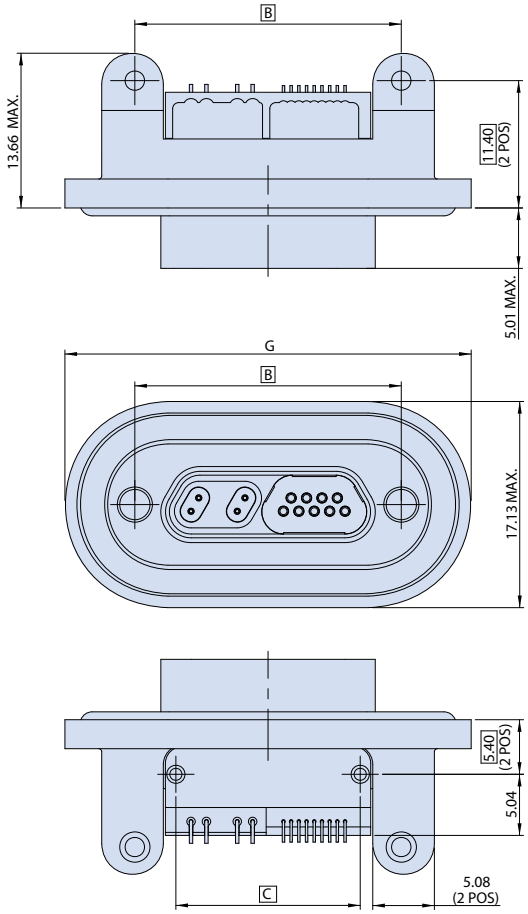




GMMD-HRP
Horizontal PCB-Mount
Panel-Sealed Receptacle

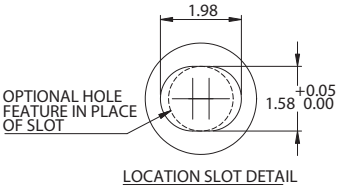
Shell size	B (mm)	C (mm)	G (mm)
9	14.35	7.58	25.88
15	18.16	11.39	29.69
21	21.97	15.20	33.50
25	24.51	17.74	36.04
31	28.32	21.55	39.85
37	32.13	25.36	43.66
51-2	41.02	34.25	52.55
67	51.18	44.41	62.71

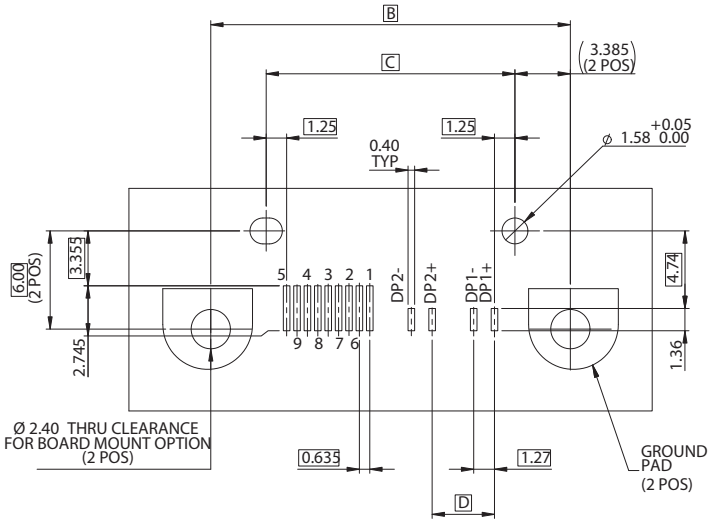




PCB MOUNTING PATTERN FOR GMMD-HRP HORIZONTAL PCB-MOUNT PANEL-SEALED (SMT MOUNT - COMPONENT SIDE)

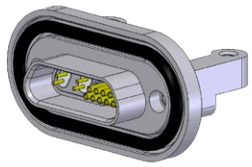
Twinax Contact Pitch		
Shell size	Contact Arrangement	D mm
9	2T9	3.810
15	4T	2.540
21	2T9	3.810
31	4T9	3.175
31	5T9	2.540
31	8T	2.540
37	4T15	3.175
51	8T15	2.540
51	4T31	2.858
51	12T	2.540
67	12T15	2.540
67	6T37	2.858
67	8T31	2.540
67	16T	2.540

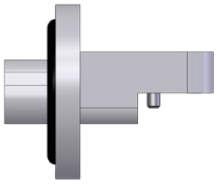




Horizontal PCB-mount twinax and combo twinax receptacles
Surface-mount termination • panel-sealed edge-launched

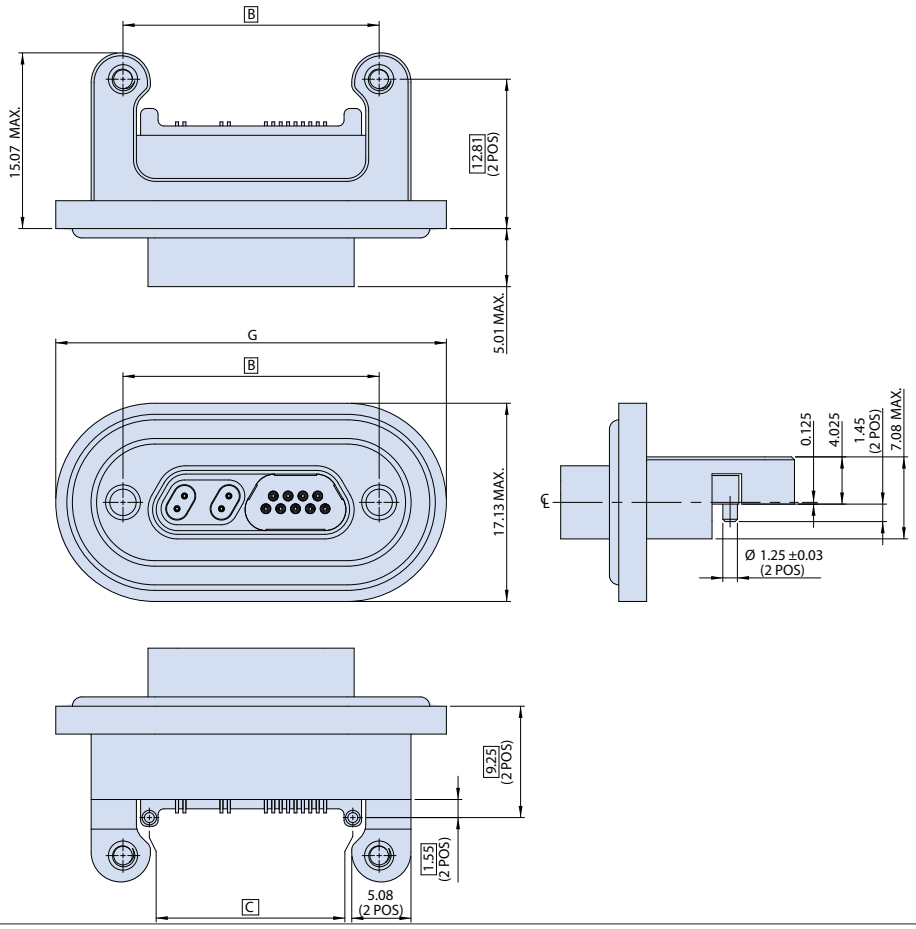
GMMD-HRPE HORIZONTAL PANEL-SEALED EDGE-LAUNCHED PCB-MOUNT CONNECTOR DIMENSIONS





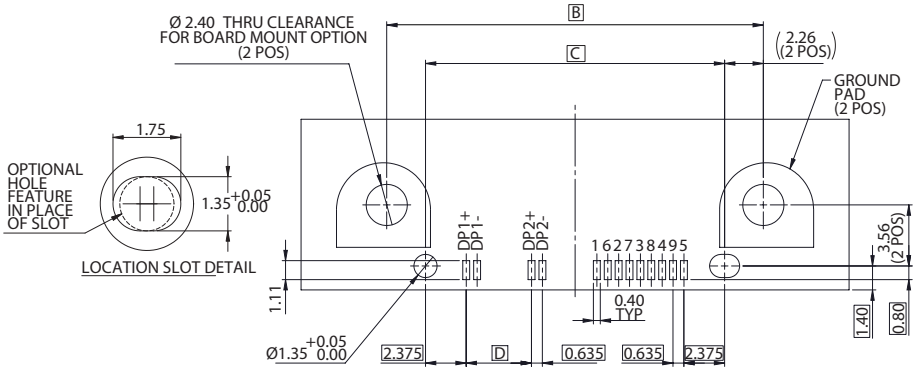
GMMD-HRPE
Horizontal PCB-Mount Panel-Sealed Edge-Launched Receptacle

Shell size	B (mm)	C (mm)	G (mm)
9	14.35	9.83	25.88
15	18.16	13.64	29.69
21	21.97	17.45	33.50
25	24.51	19.99	36.04
31	28.32	23.80	39.85
37	32.13	27.61	43.66
51-2	41.02	36.50	52.55
67	51.18	46.66	62.71



PCB MOUNTING PATTERN FOR GMMD-HRPE HORIZONTAL PCB-MOUNT PANEL-SEALED EDGE-MOUNT (SMT MOUNT - COMPONENT SIDE)

Twinax Contact Pitch		
Shell size	Contact Arrangement	D mm
9	2T9	3.810
15	4T	2.540
21	2T9	3.810
31	4T9	3.175
31	5T9	2.540
31	8T	2.540
37	4T15	3.175
51	8T15	2.540
51	4T31	2.858
51	12T	2.540
67	12T15	2.540
67	6T37	2.858
67	8T31	2.540
67	16T	2.540



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Vertical PCB-mount twinax and combo twinax plug and receptacles
Surface-mount termination

GMMD-VRI vertical PCB-mount receptacle (combo 4T9 layout shown)

CONNECTOR FEATURES

- Vertical connectors use 0.635mm PCB spacing but can have the pins on either side or both sides of the connector to increase pad-pad distance and reduce crosstalk on high-speed lines. Contact Glenair for options. "VRI" option includes integrated hardware and O-ring option for panel-to-receptacle sealing.
- An alignment pip is integral to the connector housing for accurate registration. The connector shell mounting legs provide a ground path.
- Designed for use with SMT reflow soldering processes, using RoHS-compliant contact tin dipping. Glenair recommends connector be screwed to PCB before soldering

GMMD TWINAX AND COMBO TWINAX CONTACT ARRANGEMENTS

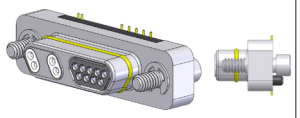
Code	Shell Size	Twinax Contacts	#24 Contacts
2T	9	2	
4T	15	4	
2T9	21	2	9
2T15	25	2	15
4T9	31	4	9
5T9	31	5	9
8T	31	8	
4T15	37	4	15
8T15	51-2	8	15
4T31	51-2	4	31
12T	51-2	12	
12T15	67	12	15
6T37	67	6	37
8T31	67	8	31
16T	67	16	

HOW TO ORDER

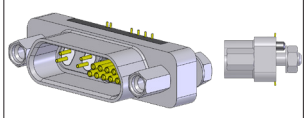
Sample Part Number	GMMD	-VR	2T9	-2	P	M	-1

Series	**GMMD** = Glenair Modular High-Speed Micro-D
Connector Format	**-VR** = Vertical receptacle, PCB-mount **-VRI** = Vertical receptacle, integrated hardware, PCB-mount **-VP** = Vertical PCB-mount plug
Contact Arrangement	See Table. Consult factory for additional arrangements.
Shell Material / Finish	**-2** = Aluminum / Electroless Nickel **-5** = Aluminum / Gold **-3** = Stainless Steel / Passivated **-6** = Aluminum / Alochromate **-7** = Aluminum / Nickel-PTFE **-8** = Aluminum / Zinc-Nickel, Black
Jackpost Options	Specify per Jackpost / Hardware Options in table below
Board-Mount Options	Specify per Board-Mount Thread Options and PCB Thickness in table below
Sealing Options for VRI (omit for VR/VP)	**-0** = No O-ring **-1** = Fluorosilicone **-2** = Passivated silver-plated aluminum-filled fluorosilicone **-3** = Nickel-plated aluminum-filled fluorosilicone

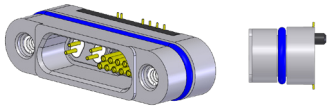
VERTICAL TWINAX CONNECTOR FORMAT GUIDE



GMMD-VP
Vertical PCB-mount Plug

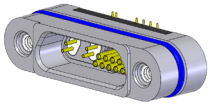
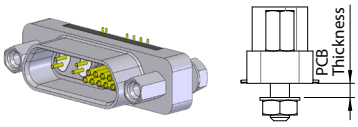
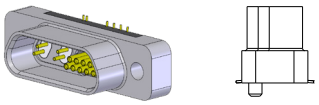
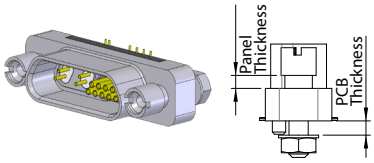
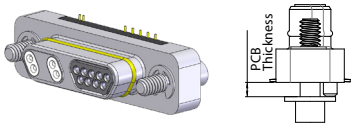


GMMD-VR
Vertical PCB-Mount Receptacle



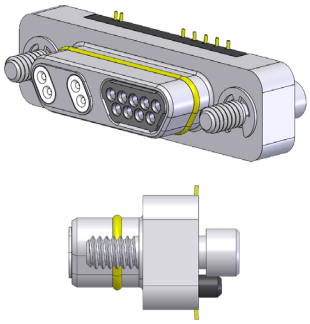
GMMD-VRI Vertical PCB-Mount Receptacle with Integrated Hardware

JACKPOST / HARDWARE OPTIONS

Specify Hardware option code, Board-Mount Thread Option code, and PCB Thickness code where applicable.		Hardware Options		Board-Mount Thread Option		PCB Thickness	
Integrated threaded inserts and jackpost thread		U		M	M2 metric		
				U	#2-56 UNC		
Jackpost Kit		S		M	M2 metric	P	1.6mm
				U	#2-56 UNC	Q	3.2mm
						R	5.0mm
No Jackpost, No Insert		N		N	Through Hole, No Thread		
Rear Panel Mount Jackpost Kit			Panel Thickness	M	M2 metric	P	1.6mm
		T	2.4mm	U	#2-56 UNC	Q	3.2mm
		U	2.0mm			R	5.0mm
		V	1.6mm				
		W	1.2mm				
		X	0.8mm				
		Y	0.6mm				
Jackscrew Kit for Vertical Plugs		M	Socket head jackscrew	N		H	0 – 0.5mm
		N	No hardware			J	0.5 – 1.0mm
						K	1.0 – 1.5mm
						L	1.5 – 2.0mm
						Omit = no hardware	

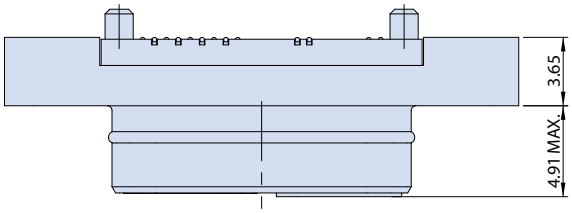
Vertical PCB-mount twinax and combo twinax plug
Surface-mount termination

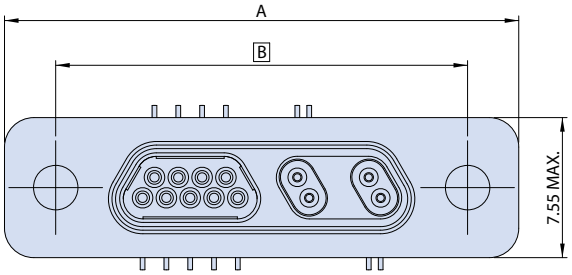
GMMD-VP VERTICAL PCB-MOUNT PLUG DIMENSIONS

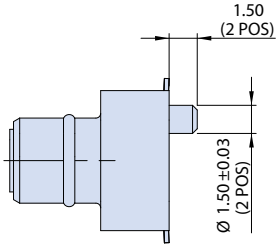


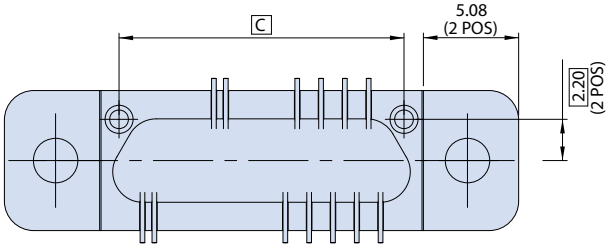
GMMD-VP
Vertical PCB-mount Plug

Shell size	A (mm)	B (mm)	C (mm)
9	19.86	14.35	7.58
15	23.67	18.16	11.39
21	27.48	21.97	15.20
25	30.02	24.51	17.74
31	33.83	28.32	21.55
37	37.64	32.13	25.36
51-2	46.53	41.02	34.25
67	56.69	51.18	44.41



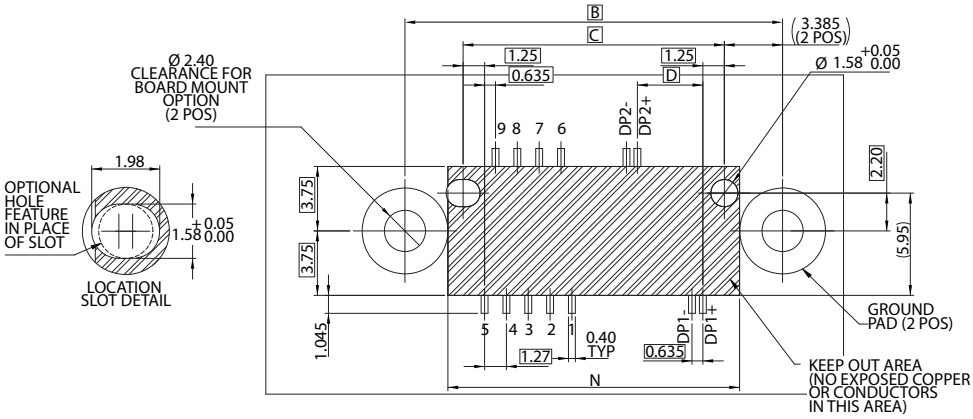






PCB MOUNTING PATTERN FOR GMMD-VP VERTICAL PCB-MOUNT PLUG (SMT MOUNT - COMPONENT SIDE)

Twinax Contact Pitch			
Shell size	Contact Arrangement	D mm	N mm
9	2T	3.810	9.35
15	4T	2.540	13.16
21	2T9	3.810	16.97
31	4T9	3.175	23.32
31	5T9	2.540	
31	8T	2.540	
37	4T15	3.175	27.13
51	8T15	2.540	36.02
51	4T31	2.858	
51	12T	2.540	
67	12T15	2.540	46.18
67	6T37	2.858	
67	8T31	2.540	
67	16T	2.540	



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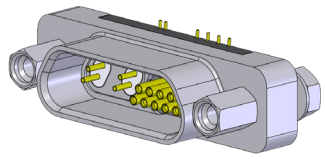
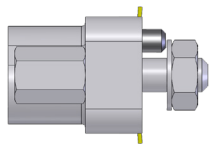
Dimensions are subject to change without notice.

Vertical PCB-mount twinax and combo twinax receptacles
Surface-mount termination

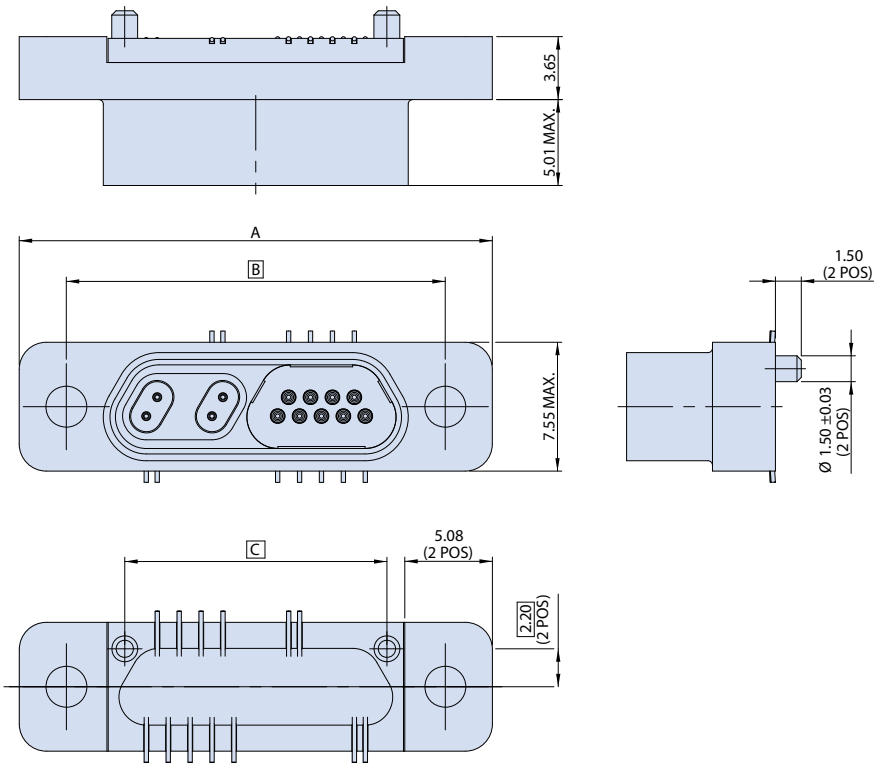
GMMD-VR VERTICAL PCB-MOUNT RECEPTACLE DIMENSIONS





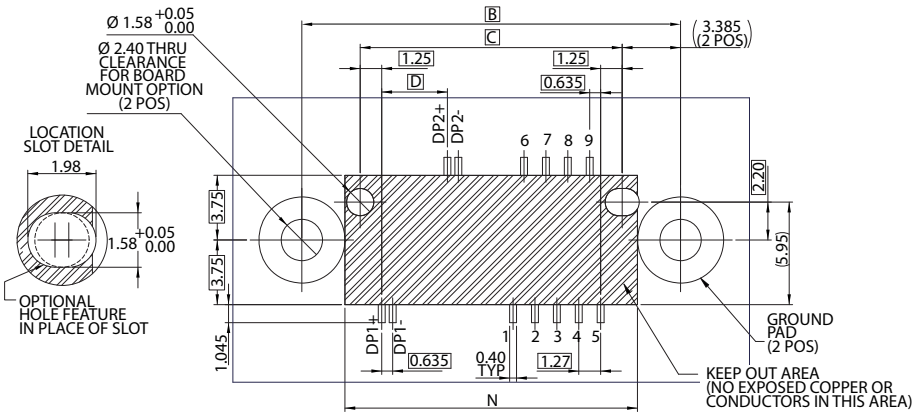
GMMD-VR
Vertical PCB-Mount Receptacle

Shell size	A (mm)	B (mm)	C (mm)
9	19.86	14.35	7.58
15	23.67	18.16	11.39
21	27.48	21.97	15.20
25	30.02	24.51	17.74
31	33.83	28.32	21.55
37	37.64	32.13	25.36
51-2	46.53	41.02	34.25
67	56.69	51.18	44.41



PCB MOUNTING PATTERN FOR GMMD-VR VERTICAL PCB-MOUNT (SMT MOUNT - COMPONENT SIDE)

Twinax Contact Pitch			
Shell size	Contact Arrangement	D mm	N mm
9	2T	3.810	9.35
15	4T	2.540	13.16
21	2T9	3.810	16.97
31	4T9	3.175	23.32
31	5T9	2.540	
31	8T	2.540	
37	4T15	3.175	27.13
51	8T15	2.540	36.02
51	4T31	2.858	
51	12T	2.540	
67	12T15	2.540	46.18
67	6T37	2.858	
67	8T31	2.540	
67	16T	2.540	



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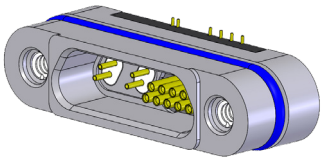
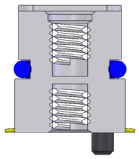
Vertical PCB-mount twinax and combo twinax receptacles
Surface-mount termination • integrated hardware

GMMD-VRI VERTICAL PCB-MOUNT RECEPTACLE WITH INTEGRATED HARDWARE - DIMENSIONS

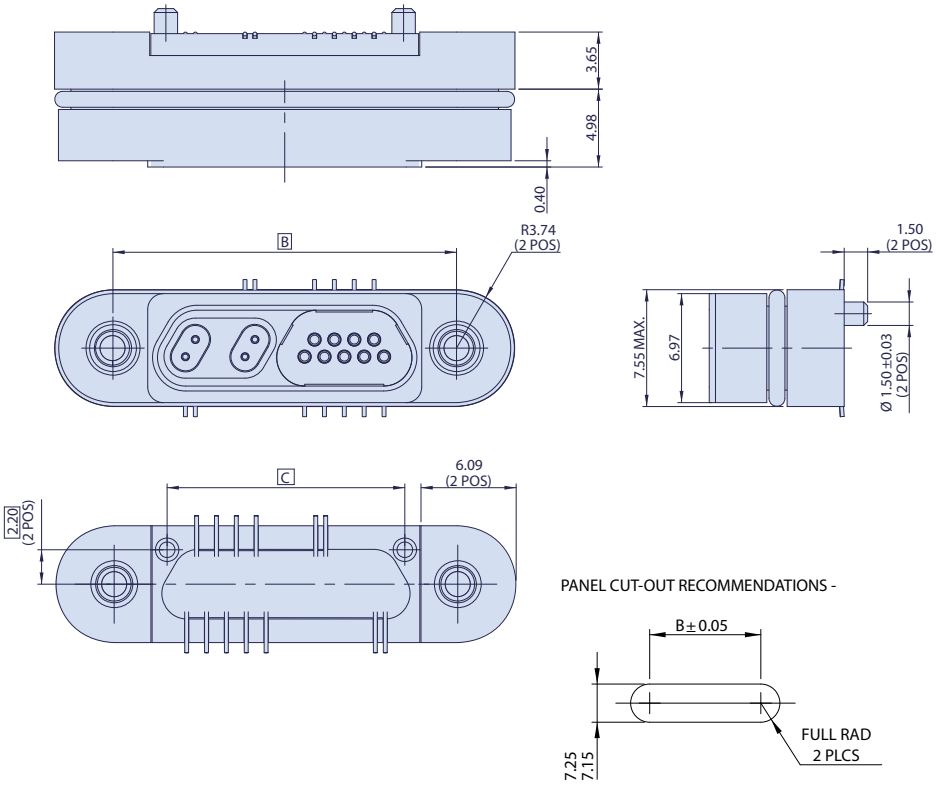




GMMD-VRI Vertical PCB-Mount Receptacle with Integrated Hardware

Shell size	B (mm)	C (mm)
9	14.35	7.58
15	18.16	11.39
21	21.97	15.20
25	24.51	17.74
31	28.32	21.55
37	32.13	25.36
51-2	41.02	34.25
67	51.18	44.41

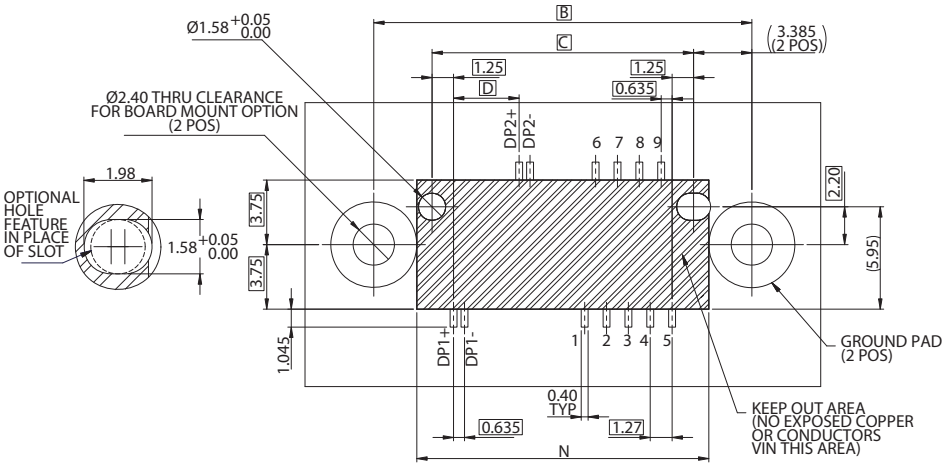
- Same footprint as for standard vertical PCB mount
- O-ring supplied for sealing against panel



IT IS RECOMMENDED THAT ALL SHARP EDGES ARE REMOVED TO AVOID DAMAGE TO THE RUBBER SEAL DURING CONNECTOR FIT

PCB MOUNTING PATTERN FOR GMMD-VRI VERTICAL PCB-MOUNT WITH INTEGRATED HARDWARE (SMT MOUNT - COMPONENT SIDE)

Twinax Contact Pitch			
Shell size	Contact Arrangement	D mm	N mm
9	2T	3.810	9.35
15	4T	2.540	13.16
21	2T9	3.810	16.97
31	4T9	3.175	23.32
31	5T9	2.540	
31	8T	2.540	
37	4T15	3.175	27.13
51	8T15	2.540	36.02
51	4T31	2.858	
51	12T	2.540	
67	12T15	2.540	46.18
67	6T37	2.858	
67	8T31	2.540	
67	16T	2.540	



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Rev. 10.01.24
Dimensions are subject to change without notice.

Twinax and combo twinax jumper assemblies
Plug-to-plug • plug-to-receptacle • receptacle-to-receptacle

Back-to-back Twinax cable assemblies provide a turnkey solution for easy on-site installation. Assemblies are supplied with GMMD plug or receptacle on each end in a choice of any Twinax or combo contact arrangement. Environmental seal options are available for plug connectors. Twinax cable may be ordered in 28 or 30 AWG, standard M22759/33 signal cable in 24 – 30 AWG. EMI shielded with five optional braid materials, including Glenair Signature weight-saving composite microfilament AmberStrand or microfilament stainless steel ArmorLite. Outer jacket options available for environmental and abrasion protection. Integral backshells, hardware, and wire exit direction all fully customizable. Consult factory for space-flight specific applications.

HOW TO ORDER

Sample Part Number	GMMD	-FPE	2T15	-B	M	A	N	R	S	4	-FPE	T	S	3	2	-800	-3

Series	**GMMD** = Glenair Modular High-Speed Micro-D
Connector 1 Type	**FP** = Flying-Lead Plug **FPE** = Flying-Lead Plug, Environmentally-Sealed **FR** = Flying-Lead Receptacle **FRP** = Flying-Lead Receptacle, Rear Panel Mount
Contact Arrangement	See Table. Consult factory for additional arrangements.
Twinax Cable	**-A** = 28AWG 100Ω Shielded Twinax **-B** = 30AWG 100Ω Shielded Twinax
Signal Cables*	**L** = 24AWG M22759/33 wire **N** = 28AWG M22759/33 wire **M** = 26AWG M22759/33 wire **O** = 30AWG M22759/33 wire
Shield Options	**A** = SnCu braid (100-001A) **B** = 100% AmberStrand (103-026) **C** = 100% ArmorLite (103-051) **E** = AgCu braid (100-002A) **F** = NiCu braid (100-003A) **N** = no braid
Jacket Options	**D** = Thin-Wall Heatshrink (VG 95343 part 5 type D) **G** = Monofilament PEEK braid (102-051) **H** = Nomex® Braid (103-013) **J** = LSZH Heatshrink (30°C to +105°C; VG 95343 part 5 type L) **N** = No Jacket
Backshell 1 Type	**T** = Straight Backshell **R** = 90° Backshell **F** = 45° Backshell **0** = no backshell
Wire Exit Direction	**L** = in direction of long row of D-form **S** = in direction of short row of D-form (for straight or no backshell, **L** is the default)
Hardware Options 1	See Hardware Options Table
Connector 2 Type	**FP** = Plug **FPE** = Plug Environmental **FR** = Receptacle **FRP** = Rear Panel Mount Receptacle
Backshell 2 Type	**T** = Straight Backshell **R** = 90° Backshell **F** = 45° Backshell **0** = no backshell
Wire Exit Direction	**L** = in direction of long row of D-form **S** = in direction of short row of D-form
Hardware Options 2	See Hardware Options Table
Shell Material / Finish	**-2** = Aluminum / Electroless Nickel **-3** = Stainless Steel / Passivated **-5** = Aluminum / Gold **-6** = Aluminum / Alochromate **-7** = Aluminum / Nickel-PTFE **-8** = Aluminum / Zinc-Nickel, Black
Overall Length	mm (metric)
Gasket Material for FPE and FRP	**-0** = No seal **-1** = Fluorosilicone **-2** = Passivated silver-plated aluminum-filled fluorosilicone **-3** = Nickel-plated aluminum-filled fluorosilicone

* Omit if not used

Twinax and combo twinax single-ended flying lead assemblies
Shielded and unshielded • plug or receptacle

Flying lead Twinax cable assemblies provide a flexible solution for easy on-site installation. Assemblies are supplied with GMMD plug or receptacle on one end in a choice of any Twinax or combo contact arrangement. Environmental seal options are available for plug connectors. Twinax cable may be ordered in 28 or 30 AWG, standard M22759/33 signal cable in 24 – 30 AWG. EMI shielded with five optional braid materials, including Glenair Signature weight-saving composite microfilament AmberStrand or microfilament stainless steel ArmorLite. Outer jacket options available for environmental and abrasion protection. Integral backshell, hardware, and wire exit direction all fully customizable. Consult factory for space-flight specific applications.

HOW TO ORDER

Sample Part Number	GMMD	-FRP	4T15	-A	N	B	D	T	S	4	-0	7	-500	-2
Series	**GMMD** = Glenair Modular High-Speed Micro-D													
Connector Type	**FP** = Flying-Lead Plug **FPE** = Flying-Lead Plug, Environmentally-Sealed **FR** = Flying Lead Receptacle **FRP** = Flying Lead Receptacle, Rear Panel Mount													
Contact Arrangement	See Table. Consult factory for additional arrangements.													
Twinax Cable	**-A** = 28AWG 100Ω Shielded Twinax **-B** = 30AWG 100Ω Shielded Twinax													
Signal Cables*	**L** = 24AWG M22759/33 wire **N** = 28AWG M22759/33 wire **M** = 26AWG M22759/33 wire **O** = 30AWG M22759/33 wire													
Shield Options	**A** = SnCu braid (100-001A) **B** = 100% AmberStrand (103-026) **C** = 100% ArmorLite (103-051) **E** = AgCu braid (100-002A) **F** = NiCu braid (100-003A) **N** = no braid													
Jacket Options	**D** = Thin-Wall Heatshrink (VG 95343 part 5 type D) **G** = Monofilament PEEK braid (102-051) **H** = Nomex® Braid (103-013) **J** = LSZH Heatshrink (30°C to +105°C; VG 95343 part 5 type L) **N** = No Jacket													
Backshell Type	**T** = Straight Backshell **R** = 90° Backshell **F** = 45° Backshell **0** = no backshell													
Wire Exit Direction	**L** = in direction of long row of D-form **S** = in direction of short row of D-form (for straight or no backshell, **L** is the default)													
Hardware Options	See Hardware Options Table													
[no second connector]	**0**													
Shell Material / Finish	**-2** = Aluminum / Electroless Nickel **-3** = Stainless Steel / Passivated **-5** = Aluminum / Gold **-6** = Aluminum / Alochromate **-7** = Aluminum / Nickel-PTFE **-8** = Aluminum / Zinc-Nickel, Black													
Overall Length	mm (metric)													
Gasket Material for FPE and FRP	**-0** = No seal **-1** = Fluorosilicone **-2** = Passivated silver-plated aluminum-filled fluorosilicone **-3** = Nickel-plated aluminum-filled fluorosilicone													

* - Omit if not used

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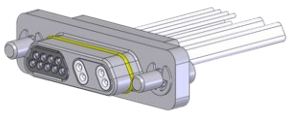
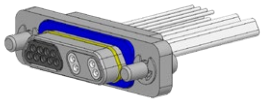
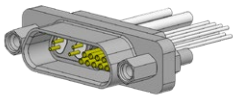
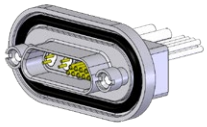
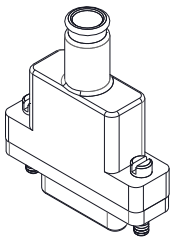
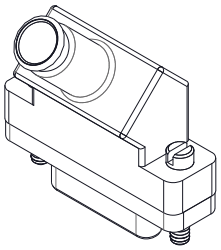
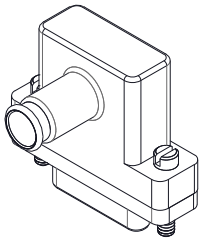
Twinax and combo twinax jumpers and pigtails
Selection guide • plug backshell options • hardware

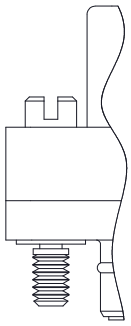
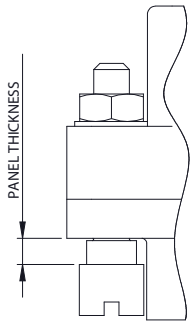
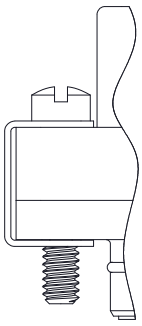
TWINAX AND COMBO TWINAX CABLE ASSEMBLY CONNECTOR SELECTION GUIDE

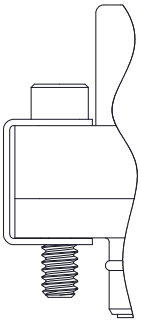
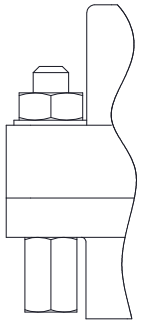
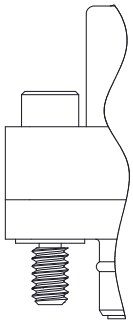
			
GMMD-FP Cable Plug	**GMMD-FPE** Cable Plug, Environmental	**GMMD-FR** Cable Receptacle	**GMMD-FRP** Rear Panel Mount Cable Receptacle

PLUG BACKSHELL OPTIONS

		
GMMD-*-T** Top Entry	**GMMD-***-F** 45° Entry	**GMMD-***-R** 90° Side Entry

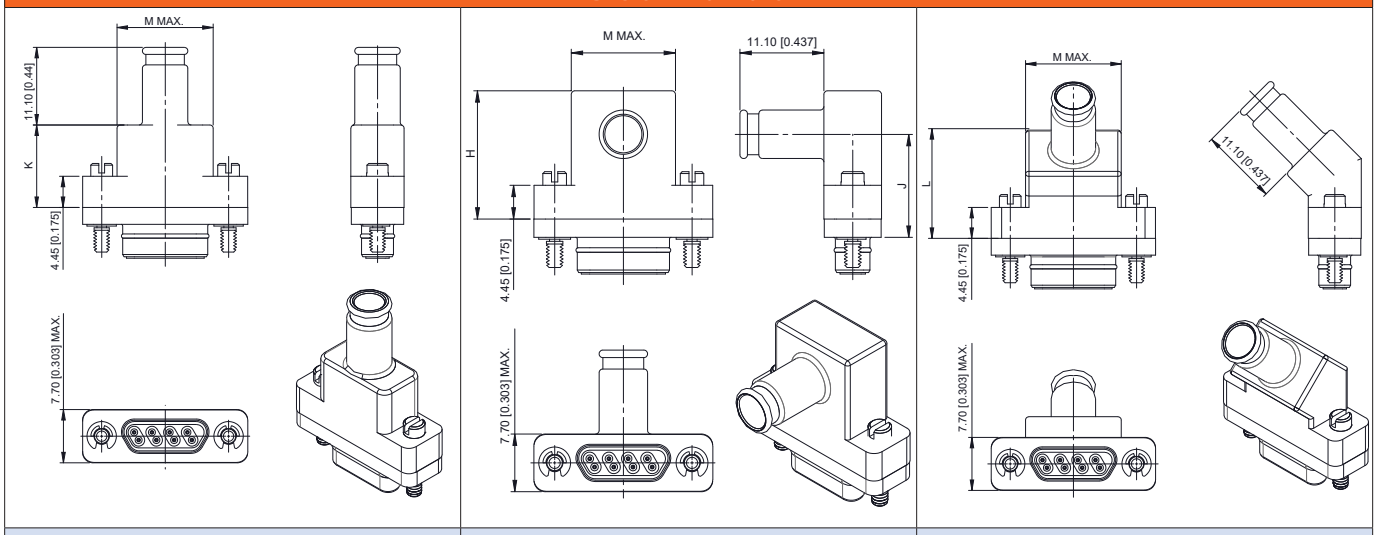
HARDWARE OPTIONS (BACKSHELLS SHOWN FOR REFERENCE ONLY)

		
1 - Circlip-Retained Jackscrew	Rear Panel Mount Jackpost Nut (specify letter for panel thickness) **T**=2.4 **U**=2.0 **V**=1.6 **W**=1.2 **X**=0.8 **Y**=0.6	**3** - Clip-Retained Fillister Head Jackscrew

			
4 - Clip-Retained Socket Head Jackscrew	**5** - Clip-Retained Extended Jackscrew	**S** - Hexagonal Jackpost, Nut and Spring Washer	**7** - Circlip-retained socket head jackscrew

Twinax and combo twinax jumpers and pigtails
Backshell dimensional details

BACKSHELL OPTIONS



Type T - Straight | **Type R** - Right Angle | **Type F** -45° Angle

PLUG AND BACKSHELL DIMENSIONS					
Shell size	H (mm)	J (mm)	K (mm)	L (mm)	M (mm)
9	16.20	11.10	8.90	15.01	10.16
15	17.10	11.20	11.95	16.01	13.97
21	18.00	11.70	15.00	16.76	17.78
25	19.00	12.30	16.50	16.81	20.32
31	19.20	12.10	18.00	16.84	27.94
37	19.70	12.10	19.00	17.24	36.83
51-2	21.80	13.90	19.80	17.24	47.18
67	21.80	13.90	19.80	18.86	57.34

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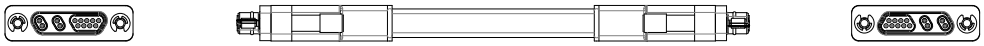
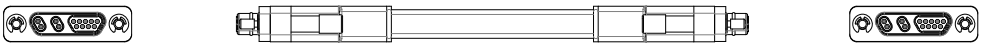
Twinax and combo twinax jumpers and pigtails
Cable configurations

Straight-to-Straight

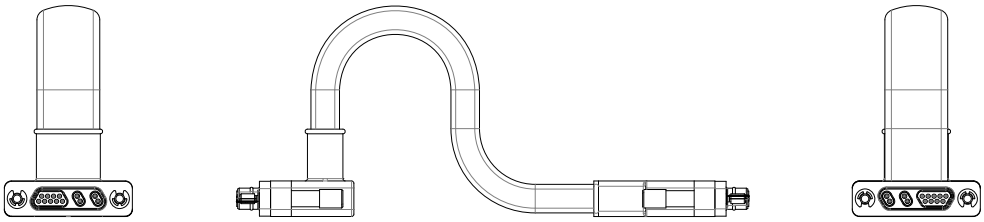


TL-TS

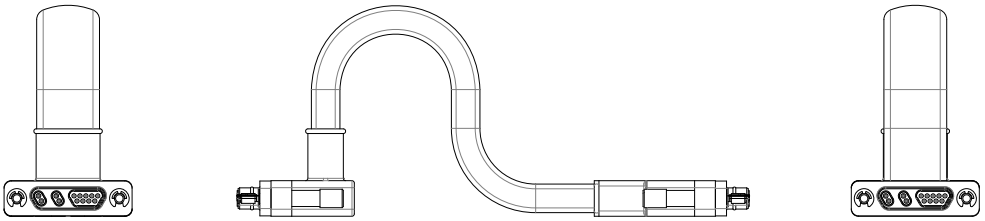


TL-TL

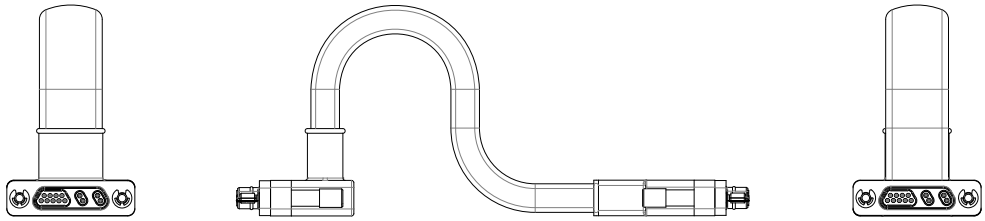
Right Angle-to-Straight



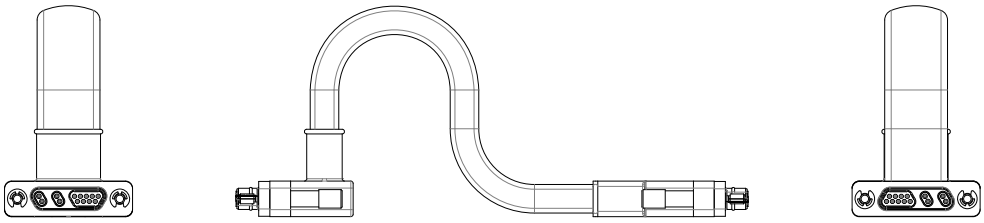
RS-TL



RL-TL



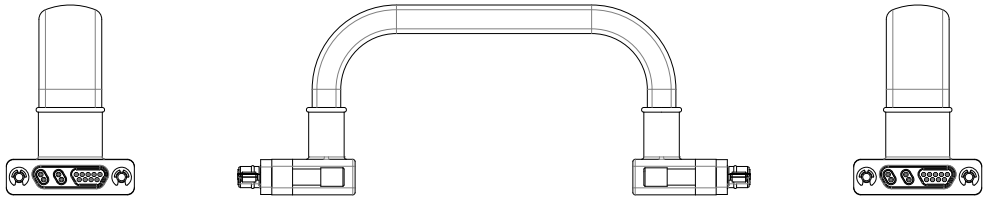
RS-TS



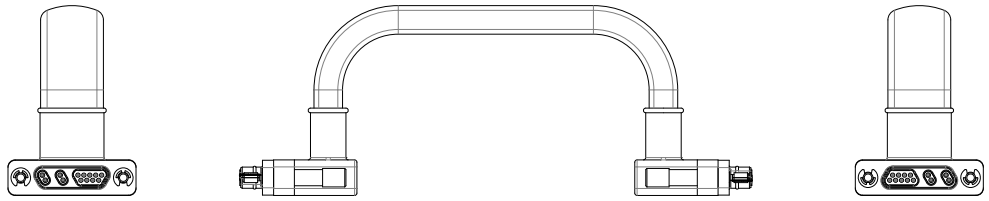
RL-TS

Twinax and combo twinax jumpers and pigtails
Cable configurations

Right Angle-to-Right Angle



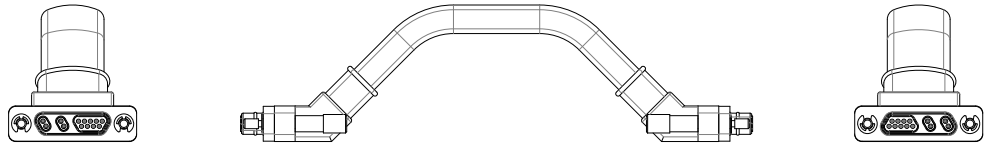
RL-RL



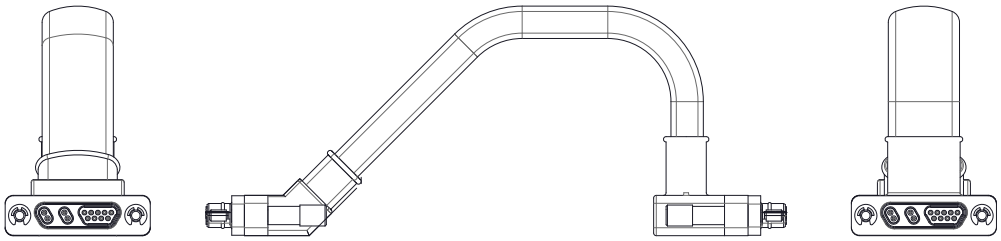
RL-RS

RS-RS

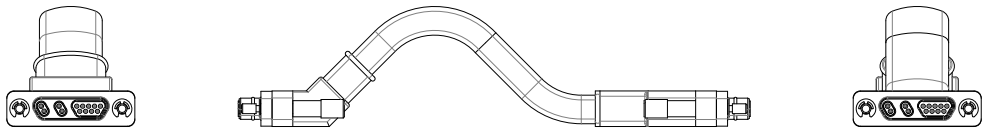
45°-to-Right Angle and Straight



FL-FS



FL-RL



FL-TL

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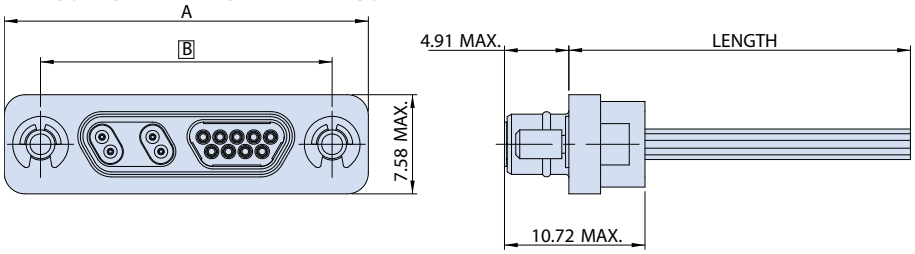
Twinax and combo twinax jumpers and pigtails
Plug-to-plug • plug-to-receptacle • receptacle-to-receptacle

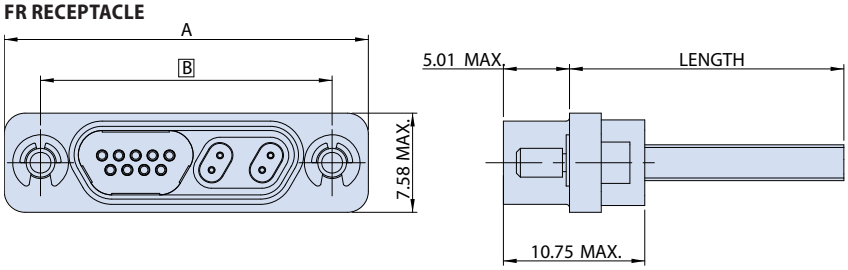
GMMD POINT-TO-POINT AND FLYING LEAD CABLE ASSEMBLY CONNECTOR DIMENSIONS

Shell size	A (mm)	B (mm)
9	19.84	14.35
15	23.65	18.16
21	27.46	21.97
25	30.00	24.51
31	33.81	28.32
37	37.62	32.13
51-2	46.51	41.02
67	56.67	51.18

FP PLUG AND FPE ENVIRONMENTAL PLUG

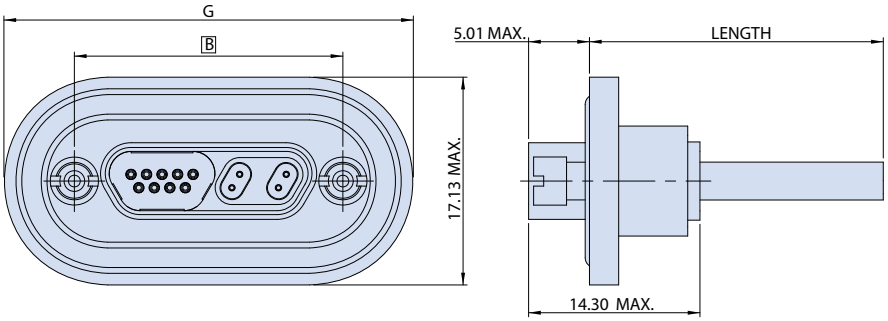


FR RECEPTACLE



FRP REAR PANEL MOUNT RECEPTACLE

Shell size	B (mm)	G (mm)
9	14.35	25.88
15	18.16	29.69
21	21.97	33.50
25	24.51	36.04
31	28.32	39.85
37	32.13	43.66
51-2	41.02	52.55
67	51.18	62.71



GMMD MODULAR HIGH-SPEED MICRO-D CONTACT ARRANGEMENTS (additional arrangements are available, consult factory)

Contact Arrangement	**2T**	**4T**	**2T9**	**2T15**	**4T9**
Shell Size	9	15	21	25	31
No. / type of contacts	2 Twinax	4 Twinax	2 Twinax, 9 #24	2 Twinax, 15 #24	4 Twinax, 9#24
Example applications	SpFi	10GbE, 2xSATA, SpW, 2xSpFi	USB 3.1, SATA + power		HDMI, DP, DVI, 10GbE + power

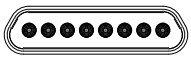
Contact Arrangement	**5T9**	**8T**	**4T15**	**8T15**	**4T31**	**12T**
Shell Size	31	31	37	51-2	51-2	51-2
No. / type of contacts	5 Twinax, 9 #24	8 Twinax	4 Twinax, 15 #24	8 Twinax, 15 #24	4 Twinax, 31 #24	12 Twinax
Example applications	DP incl. Aux channels	2x10GbE		DP or HDMI + USB 3.1, dual DVI		

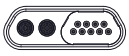
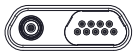
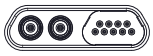
Contact Arrangement	**12T15**	**6T37**	**8T31**	**16T**
Shell Size	67	67	67	67
No. / type of contacts	12 Twinax, 15 #24	6 Twinax, 37 #24	8 Twinax, 31 #24	16 Twinax
Example applications				4x10GbE

Coax and Combo Coax contact arrangements materials and finishes • panel cutouts

GMMD COAX AND COMBO COAX CONTACT ARRANGEMENTS

Contact Arrangement	**2C**	**4C**	**6C**
Shell Size	9	21	25
No. / type of contacts	2 X 50Ω Coax	4X 50Ω Coax	6X 50Ω Coax

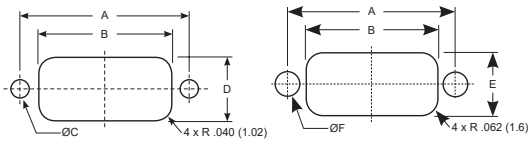
		
Contact Arrangement	**8C**	**16C**
Shell Size	37	67
No. / type of contacts	8 X 50Ω Coax	16X 50Ω Coax

				
Contact Arrangement	**2C9**	**1V9**	**2V9**	**4V**
Shell Size	21	21	31	21
No. / type of contacts	2X 50Ω Coax, 9 X #24	1 X 75Ω Coax, 9 X #24	2 X 75Ω Coax, 9 X #24	4 X 75Ω Coax

GMMD MODULAR HIGH-SPEED MICRO-D STANDARD MATERIALS AND FINISHES

Connector Shell, Metal	Aluminum Alloy 6061 IAW SAE AMS-QQ-A-250/11: Plating code 2: electroless nickel IAW ASTM B733 / Plating code 5: gold plated IAW ASTM B488 over electroless nickel IAW ASTM B733-90. / Plating code 6: chem film IAW MIL-C-5541 Class 3 Stainless Steel, 300 Series: Plating Code 3: Passivated IAW SAE AMS 2700
#24 Insulator and organizer tray	High-grade, high-temperature thermoplastic
Interfacial Seal (where applicable)	Fluorosilicone rubber IAW MIL-R-25988
#24 Pin Contact (TwistPin)	Beryllium copper, gold plated IAW ASTM B 488 Type II Class 1.27 (50 Min minimum) Code C, over nickel underplate IAW SAE AMS-QQ-N-290, class 2, (50-150 µin).
#24 Socket Contact	Phos bronze IAW ASTM 139 gold plated IAW ASTM B 488 Type II Class 1.27 (50 Min minimum) Code C, over nickel underplate IAW SAE-AMS-QQ-N-290, Class 2, (50-150 µin).
Twinax #30 pin contacts	Spring Temper Gold alloy, unplated, per ASTM B477 and ASTM B541
Twinax #30 socket contacts	Gold alloy, unplated, per ASTM B477 and ASTM B541
Coax isolating bush	High-grade thermoplastic
Encapsulant	High-temperature potting
Jackscrews, Jackposts, Float Mounts	Stainless steel, 300 series, passivated IAW SAE AMS 2700

RECOMMENDED PANEL CUTOUT



Front Panel Mount Rear Panel Mount

Layout	A	B	C	D	E	F
	mm. ± 0.08	mm. ± 0.05	mm. ± 0.05	mm. ± 0.05	mm. + 0.13, - 0.00	mm. ± 0.05
9	14.35	10.41	2.31	7.04	6.50	3.20
15	18.16	14.22	2.31	7.04	6.50	3.20
21	21.97	18.03	2.31	7.04	6.50	3.20
25	24.51	20.57	2.31	7.04	6.50	3.20
31	28.32	24.38	2.31	7.04	6.50	3.20
37	32.13	28.19	2.31	7.04	6.50	3.20
51-2	41.02	37.08	2.31	7.04	6.50	3.20
67	51.18	47.19	2.31	7.04	6.50	3.20

COMPLETE LIST OF CONTACT ARRANGEMENTS

50Ω Coax		75Ω Coax	
Arrangement	**Shell Size**	**Arrangement**	**Shell Size**
2C	9	1V	9
3C	15	2V	15
4C	21	3V	21
5C	21	4V	25
6C	25	5V	31
7C	31	6V	37
8C	37	8V	51
9C	37	10V	67
12C	51	1V9	21
16C	67	2V9	25
2C9	21	3V9	31
4C9	31	4V9	37
8C9	51	6V9	51
11C9	67	8V9	67
1C15	25	1V15	25
2C15	31	2V15	31
4C15	37	3V15	37
6C15	51	5V15	51
10C15	67	7V15	67
1C21	31	2V21	37
2C21	37	4V21	51
5C21	51	6V21	67
8C21	67	1V25	37
2C25	37	3V25	51
4C25	51	6V25	67
8C25	67	2V31	51
3C31	51	5V31	67
6C31	67	2V37	51
2C37	51	4V37	67
5C37	67	2V51	67
2C51	67		

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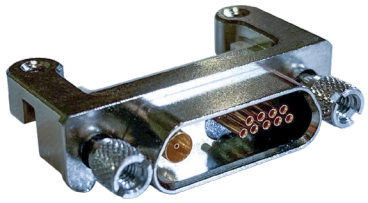
Horizontal PCB-mount coax and combo coax receptacles
Surface-mount termination • edge-launched



GMMD-HRE horizontal PCB-mount receptacle (combo 1V9 layout shown)

HOW TO ORDER

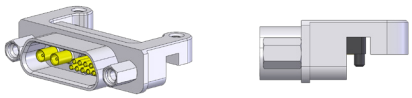
Sample Part Number	GMMD	-HRE	2C9	-2	P	M	-1

Series	**GMMD** = Glenair Modular High-Speed Micro-D
Connector Format	**-HRE** = Horizontal edge-launched receptacle **-HRPE** = Horizontal panel-sealed edge launched recept.
Contact Arrangement	See Table. Consult factory for additional arrangements.
Shell Material / Finish	**-2** = Aluminum / Electroless Nickel **-5** = Aluminum / Gold **-3** = Stainless Steel / Passivated **-6** = Aluminum / Alochromate **-7** = Aluminum / Nickel-PTFE **-8** = Aluminum / Zinc-Nickel, Black
Jackpost Options	Specify per Jackpost / Hardware Options in table below
Board-Mount Options	Specify per Board-Mount Thread Options in table below
Sealing Options for HRPE (omit for HRE)	**-0** = No O-ring **-1** = Fluorosilicone **-2** = Passivated silver-plated aluminum-filled fluorosilicone **-3** = Nickel-plated aluminum-filled fluorosilicone

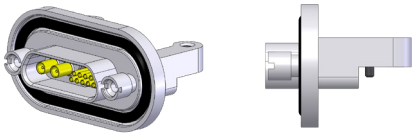
CONNECTOR FEATURES

- One of the smallest rugged multiway RF coax connectors available
- 50Ω on 3.18mm pitch for combo arrangements
- 50Ω on 2.54 pitch for coax-only arrangements
- Shield isolated from connector shell
- PCB edge-launched for optimized 20GHz high-bandwidth performance
- Compatible with RG-178, semi-rigid and flexible 047 cables for 50Ω / RG-179 and semi-rigid cables for 75Ω

CONNECTOR FORMAT



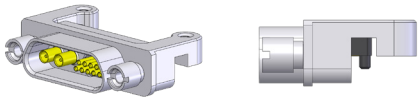
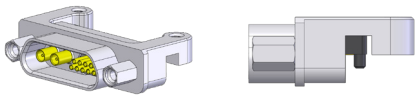
GMMD-HRE
Horizontal PCB-Mount Edge-Launched Receptacle



GMMD-HRPE
Horizontal PCB-Mount Panel-Sealed Edge-Launched Receptacle

JACKPOST / HARDWARE OPTIONS and BOARD-MOUNT THREAD OPTIONS

For **Rear panel mount jackpost**, specify Jackpost option code **T**, **U**, **V**, **W**, **X**, or **Y** per required panel thickness, and board-mount thread option.
For **Factory installed jackpost**, specify code **S** and board-mount thread option.

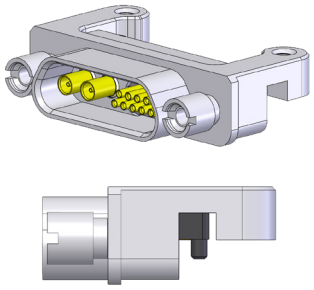
		Jackpost option		Board-Mount Thread Option	
		Code	Panel Thickness		
Rear panel mount jackpost		T	2.4mm	M	M2 metric
		U	2.0mm		
		V	1.6mm		
		W	1.2mm	U	#2-56 UNC
		X	0.8mm		
		Y	0.6mm		
Factory installed jackpost		S		M	M2 metric
				U	#2-56 UNC

GMMD COAX AND COMBO COAX CONTACT ARRANGEMENTS

Code	Shell Size	Coax Contacts	#24 Contacts
2C	9	2x50Ω	
4C	21	4x50Ω	
6C	25	6x50Ω	
8C	37	8x50Ω	
16C	67	16x50Ω	
1C9	15	1x50Ω	9
2C9	21	2x50Ω	9
1V9	21	1x75Ω	9
2V9	31	2x75Ω	9
4V	21	4x75Ω	

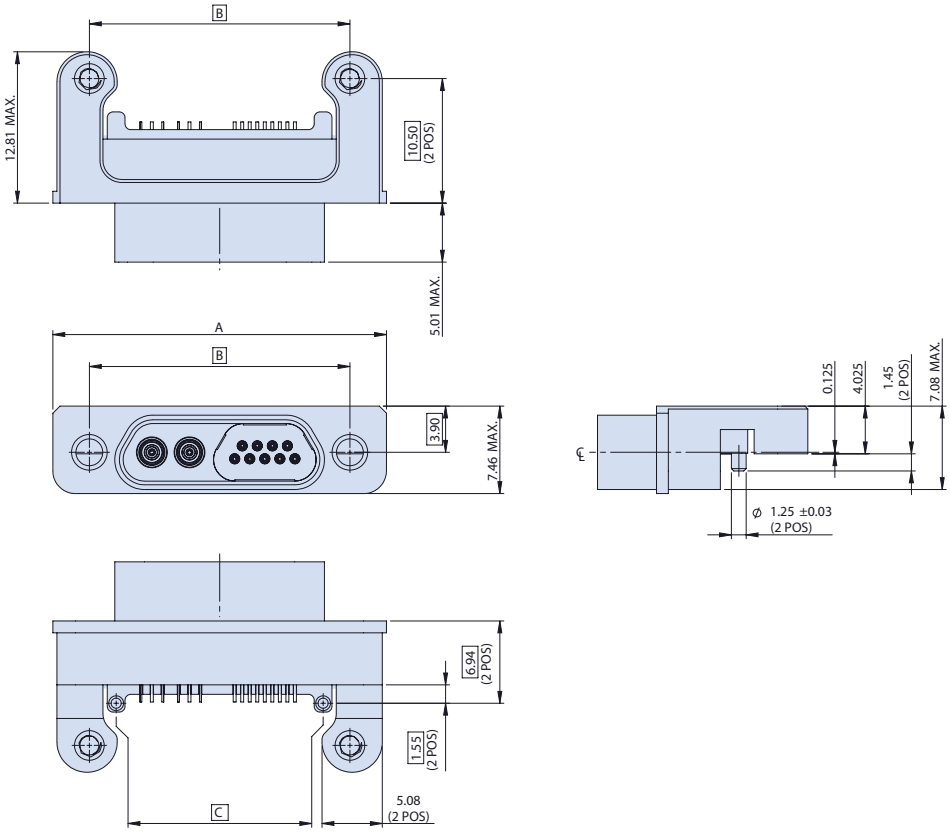
Horizontal PCB-mount coax and combo coax receptacles
Surface-mount termination • edge-launched

GMMD-HRE HORIZONTAL EDGE-LAUNCHED PCB-MOUNT CONNECTOR DIMENSIONS



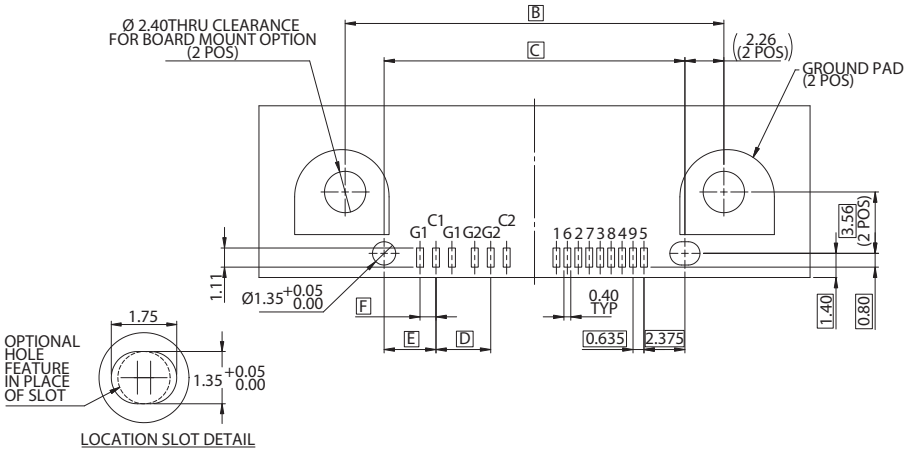
GMMD-HRE
Horizontal PCB-Mount Edge-Launched Receptacle

Shell size	A (mm)	B (mm)	C (mm)
9	20.56	14.35	9.83
15	24.37	18.16	13.64
21	28.18	21.97	17.45
25	30.72	24.51	19.99
31	34.53	28.32	23.80
67	57.39	51.18	46.66



PCB MOUNTING PATTERN FOR GMMD-HRE HORIZONTAL EDGE-LAUNCHED PCB-MOUNT CONNECTOR (SMT MOUNT - COMPONENT SIDE)

			D	E	F
50ohm hybrid			3.175	3.01	0.925
75ohm hybrid			4.15	3.53	1.325
	Shell size	Arrangement			
50ohm only	9	2C	2.54	3.645	0.925
	21	4C	2.54	4.915	0.925
	25	6C	2.54	3.645	0.925
	37	8C	2.54	3.01	0.925
	51-2	12C	2.54	4.28	0.925
	67	16C	2.54	4.28	0.925
75ohm only	9	2V	3.5	3.165	1.325
	15	3V	3.5	3.32	1.325
	21	4V	3.5	3.475	1.325



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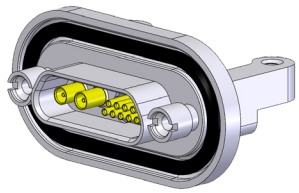
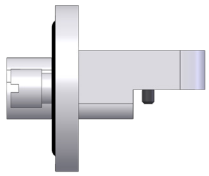
Rev. 06.08.26
Dimensions are subject to change without notice.

Horizontal PCB-mount coax and combo coax receptacles
Surface-mount termination • panel-sealed edge-launched

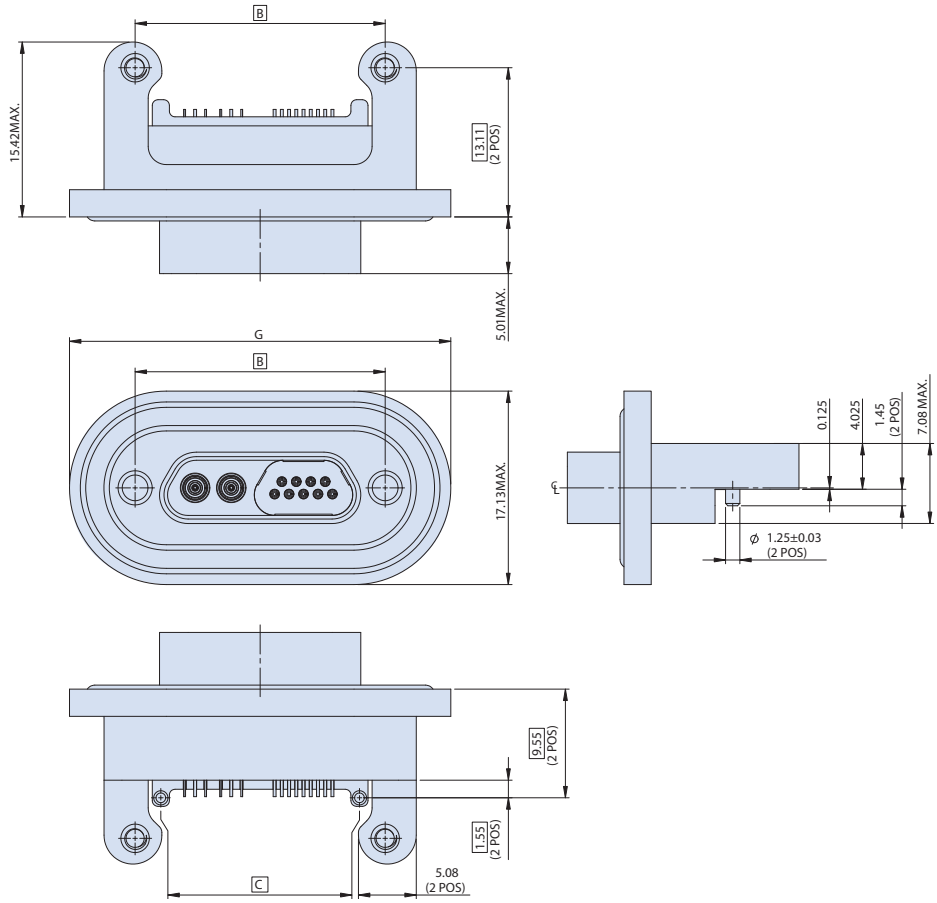
GMMD-HRPE HORIZONTAL PANEL-SEALED EDGE-LAUNCHED PCB-MOUNT CONNECTOR DIMENSIONS





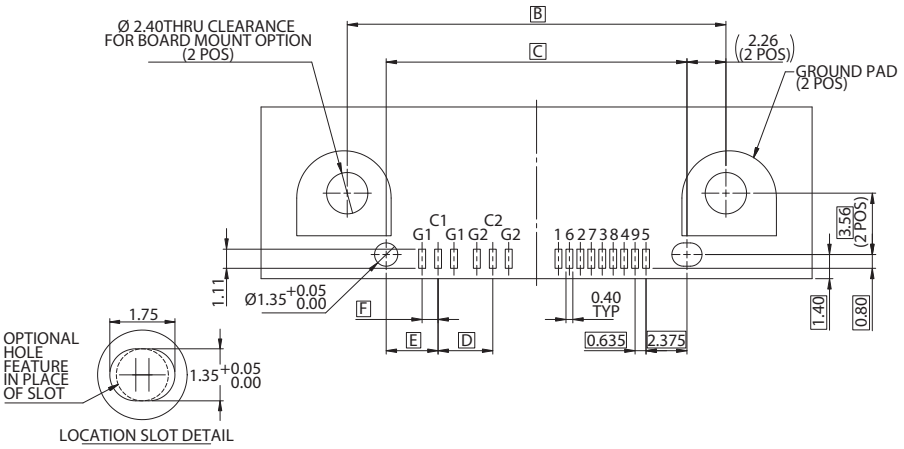
GMMD-HRPE
Horizontal PCB-Mount Panel-Sealed Edge-Launched Receptacle

Shell size	B (mm)	C (mm)	G (mm)
9	9.83	25.88	25.88
15	13.64	29.69	26.69
21	17.45	33.50	33.50
25	19.99	36.04	36.04
31	23.80	39.85	39.85
67	46.66	62.71	62.71



PCB MOUNTING PATTERN FOR GMMD-HRPE HORIZONTAL PANEL-SEALED EDGE-LAUNCHED PCB-MOUNT (SMT MOUNT - COMPONENT SIDE)

			D	E	F
50ohm hybrid			3.175	3.01	0.925
75ohm hybrid			4.15	3.53	1.325
	Shell size	Arrangement			
50ohm only	9	2C	2.54	3.645	0.925
	21	4C	2.54	4.915	0.925
	25	6C	2.54	3.645	0.925
	37	8C	2.54	3.01	0.925
	51-2	12C	2.54	4.28	0.925
	67	16C	2.54	4.28	0.925
75ohm only	9	2V	3.5	3.165	1.325
	15	3V	3.5	3.32	1.325
	21	4V	3.5	3.475	1.325



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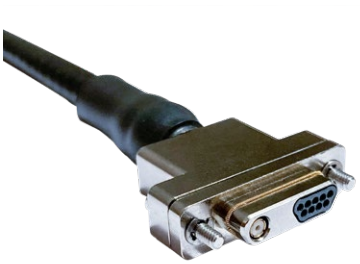
Dimensions are subject to change without notice.

Coax and combo coax jumper assemblies
Plug-to-plug • plug-to-receptacle • receptacle-to-receptacle



Back-to-back Coax cable assemblies provide a turnkey solution for easy on-site installation. Assemblies are supplied with GMMD plug or receptacle on each end in a choice of any coax or combo contact arrangement. Environmental seal options are available for plug connectors. 50Ω and 75Ω Coax cable may be ordered in flexible or semi-rigid configurations, standard M22759/33 signal cable in 24 – 30 AWG. EMI shielded with five optional braid materials, including Glenair Signature weight-saving composite microfilament AmberStrand or microfilament stainless steel ArmorLite. Outer jacket options available for environmental and abrasion protection. Integral backshells, hardware, and wire exit direction all fully customizable.

HOW TO ORDER

Sample Part Number	GMMD	-FPE	2C15	-C	M	A	N	R	L	5	-FPE	T	S	3	2	-800	-2

Series	**GMMD** = Glenair Modular High-Speed Micro-D
Connector 1 Type	**FP** = Plug **FPE** = Plug Environmental **FR** = Receptacle **FRP** = Rear Panel Mount Receptacle
Contact Arrangement	**2C9** = 2 X 50Ω Coax + 9 X #24 discretes **4V15** = 4 X 75Ω Coax + 15 X #24 discretes **8C** = 8 X 50Ω Coax
Coax Cable	**-C** = 50Ω RG178 **-V** = 75Ω RG179 **-D** = 50Ω 047 Semi-Rigid **-W** = 75Ω Semi-Rigid **-E** = 50Ω 047 Flexible
Signal Cables*	**L** = 24AWG M22759/33 wire **N** = 28AWG M22759/33 wire **M** = 26AWG M22759/33 wire **O** = 30AWG M22759/33 wire
Shield Options	**A** = SnCu braid (100-001A) **B** = 100% AmberStrand (103-026) **C** = 100% ArmorLite (103-051) **E** = AgCu braid (100-002A) **F** = NiCu braid (100-003A) **N** = no braid
Jacket Options	**D** = Thin-Wall Heatshrink (VG 95343 part 5 type D) **G** = Monofilament PEEK braid (102-051) **H** = Nomex® Braid (103-013) **J** = LSZH Heatshrink (-30°C to +105°C; VG 95343 part 5 type L) **N** = No Jacket
Backshell 1 Type	**T** = Straight Backshell **R** = 90° Backshell **F** = 45° Backshell **0** = no backshell
Wire Exit Direction	**L** = in direction of long row of D-form **S** = in direction of short row of D-form (for straight or no backshell, **L** is the default)
Hardware Options 1	See Hardware Options Table
Connector 2 Type	**FP** = Plug **FPE** = Plug Environmental **FR** = Receptacle **FRP** = Rear Panel Mount Receptacle
Backshell 2 Type*	**T** = Straight Backshell **R** = 90° Backshell **F** = 45° Backshell **0** = no backshell
Wire Exit Direction*	**L** = in direction of long row of D-form **S** = in direction of short row of D-form
Hardware Options 2*	See Hardware Options Table
Shell Material / Finish	**-2** = Aluminum / Electroless Nickel **-3** = Stainless Steel / Passivated **-5** = Aluminum / Gold **-6** = Aluminum / Alochromate **-7** = Aluminum / Nickel-PTFE **-8** = Aluminum / Zinc-Nickel, Black
Overall Length	mm (metric)
Gasket Material for FPE and FRP*	**-1** = Fluorosilicone **-2** = Passivated silver-plated aluminum-filled fluorosilicone **-3** = Nickel-plated aluminum-filled fluorosilicone

* - Omit if not used

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Coax and combo coax single-ended flying lead pigtail assemblies
Shielded and unshielded • plug or receptacle

Flying lead Coax cable assemblies provide a flexible solution for easy on-site installation. Assemblies are supplied with GMMD plug or receptacle on one end in a choice of any Coax or combo contact arrangement. Environmental seal options are available for plug connectors. 50Ω and 75Ω Coax cable may be ordered in flexible or semi-rigid configurations. Signal cable available in 24 – 30 AWG. EMI shielded with five optional braid materials, including Glenair Signature weight-saving composite microfilament AmberStrand or microfilament stainless steel ArmorLite. Outer jacket options available for environmental and abrasion protection. Integral backshell, hardware, and wire exit direction all fully customizable. Consult factory for space-flight specific applications.

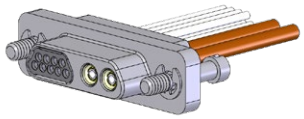
HOW TO ORDER

Sample Part Number	**GMMD**	**-FPE**	**2C9**	**-A**	**M**	**A**	**N**	**R**	**L**	**5**	**0**	**2**	**-800**
Series	**GMMD** = Glenair Modular High-Speed Micro-D												
Connector 1 Type	**FP** = Plug **FPE** = Plug Environmental **FR** = Flying Lead Receptacle **FRP** = Rear Panel Mount Flying Lead Receptacle												
Contact Arrangement	See Table. Consult factory for additional arrangements.												
Coax Cable	**-C** = 50Ω RG178 **-V** = 75Ω RG179 **-D** = 50Ω 047 Semi-Rigid **-W** = 75Ω Semi-Rigid **-E** = 50Ω 047 Flexible												
Signal Cables*	**L** = 24AWG M22759/33 wire **N** = 28AWG M22759/33 wire **M** = 26AWG M22759/33 wire **O** = 30AWG M22759/33 wire												
Shield Options	**A** = SnCu braid (100-001A) **B** = 100% AmberStrand (103-026) **C** = 100% ArmorLite (103-051) **E** = AgCu braid (100-002A) **F** = NiCu braid (100-003A) **N** = no braid												
Jacket Options	**D** = Thin-Wall Heatshrink (VG 95343 part 5 type D) **G** = Monofilament PEEK braid (102-051) **H** = Nomex® Braid (103-013) **J** = LSZH Heatshrink (-30°C to +105°C; VG 95343 part 5 type L) **N** = No Jacket												
Backshell Type	**T** = Straight Backshell **R** = 90° Backshell **F** = 45° Backshell **0** = no backshell												
Wire Exit Direction	**L** = in direction of long row of D-form **S** = in direction of short row of D-form (for straight or no backshell, **L** is the default)												
Hardware Options	See Hardware Options Table												
[no second connector]	**0**												
Shell Material / Finish	**-2** = Aluminum / Electroless Nickel **-3** = Stainless Steel / Passivated **-5** = Aluminum / Gold **-6** = Aluminum / Alochromate **-7** = Aluminum / Nickel-PTFE **-8** = Aluminum / Zinc-Nickel, Black												
Overall Length	mm (metric)												
Gasket Material for FPE and FRP*	**-1** = Fluorosilicone **-2** = Passivated silver-plated aluminum-filled fluorosilicone **-3** = Nickel-plated aluminum-filled fluorosilicone												

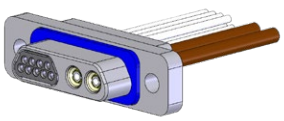
* - Omit if not used

Coax and combo coax jumpers and pigtails
Selection guide • plug backshell options • hardware

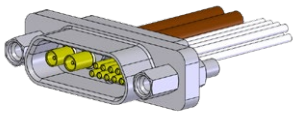
COAX AND COMBO COAX CABLE ASSEMBLY CONNECTOR SELECTION GUIDE



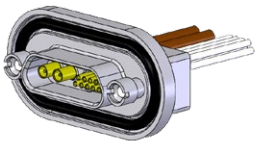
GMMD-FP
Cable Plug



GMMD-FPE
Cable Plug, Environmental

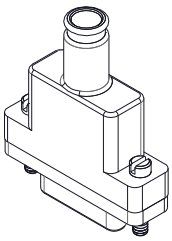


GMMD-FR
Cable Receptacle

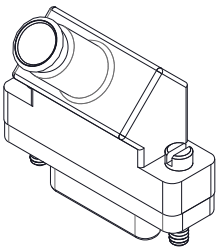


GMMD-FRP
Rear Panel Mount Cable Receptacle

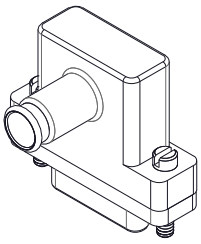
PLUG BACKSHELL OPTIONS



GMMD-*-T**
Top Entry

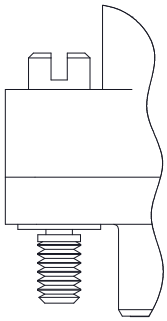


GMMD-*-F**
45° Entry

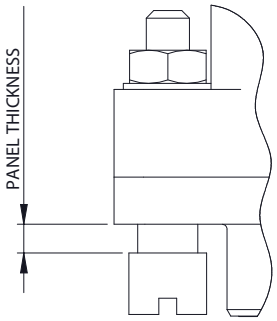


GMMD-*-R**
90° Side Entry

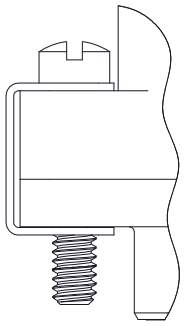
HARDWARE OPTIONS (BACKSHELLS SHOWN FOR REFERENCE ONLY)



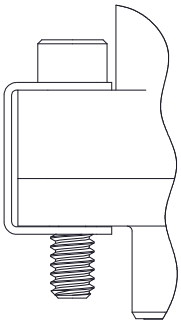
1 - Circlip-Retained Jackscrew



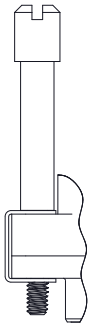
Rear Panel Mount Jackpost Nut
(specify letter for panel thickness)
T=2.4 **U**=2.0 **V**=1.6 **W**=1.2 **X**=0.8 **Y**=0.6



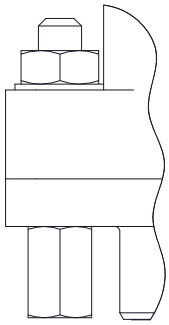
3 - Clip-Retained Fillister Head Jackscrew



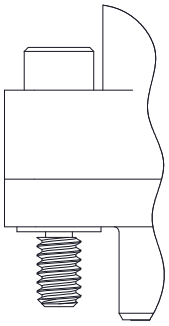
4 - Clip-Retained Socket Head Jackscrew



5 - Clip-Retained Extended Jackscrew



S - Hexagonal Jackpost, Nut and Spring Washer



7 - Circlip-retained socket head jackscrew

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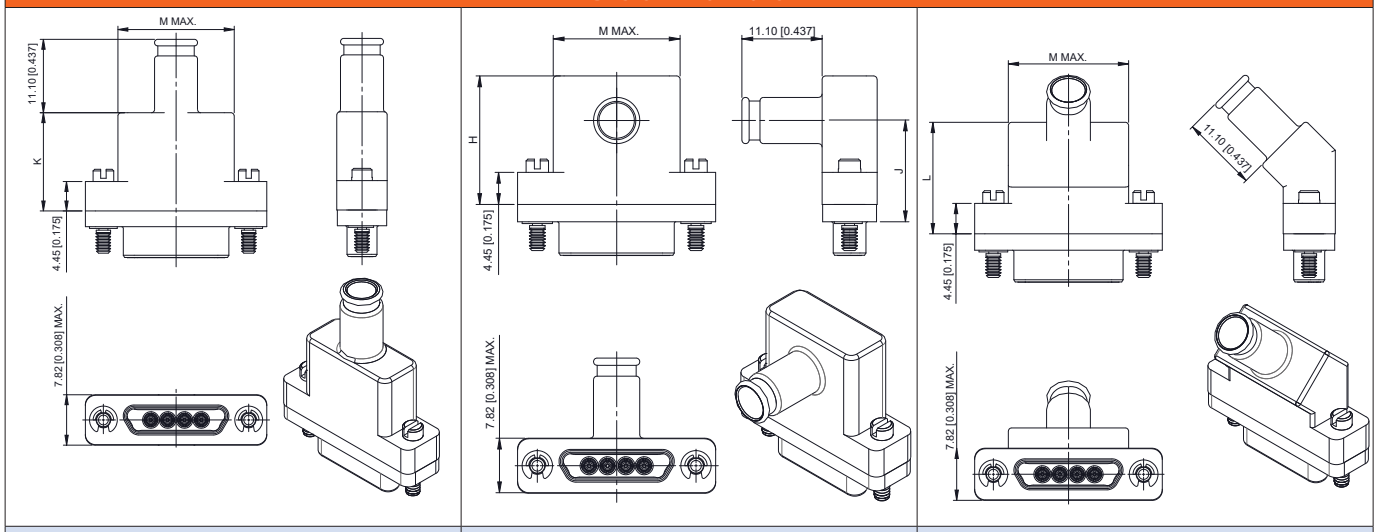
Dimensions are subject to change without notice.

Coax and combo coax jumpers and pigtails
Backshell dimensional details

BACKSHELL OPTIONS

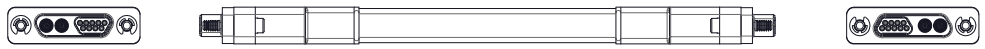


Type T - Straight	**Type R** - Right Angle	**Type F** -45° Angle

PLUG AND BACKSHELL DIMENSIONS					
Shell size	**H** (mm)	**J** (mm)	**K** (mm)	**L** (mm)	**M** (mm)
9	16.20	11.10	8.90	15.01	10.16
15	17.10	11.20	11.95	16.01	13.97
21	18.00	11.70	15.00	16.76	17.78
25	19.00	12.30	16.50	16.81	20.32
31	19.20	12.10	18.00	16.84	27.94
37	19.70	12.10	19.00	17.24	36.83
51-2	21.80	13.90	19.80	17.24	47.18
67	21.80	13.90	19.80	18.86	57.34

Coax and combo coax jumpers and pigtails
Cable configurations

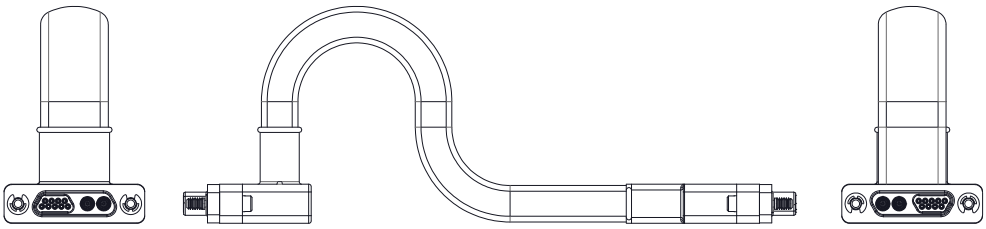
Straight-to-Straight



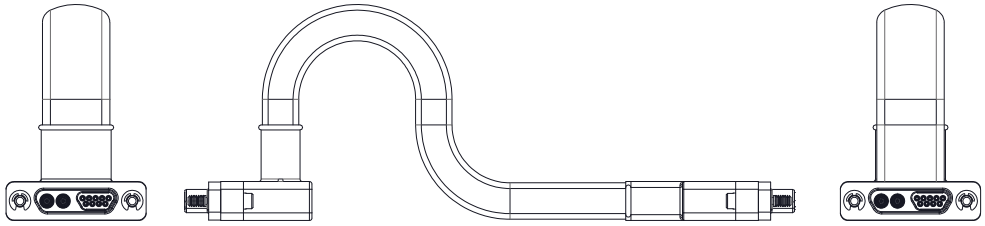
TL-TS

TL-TL

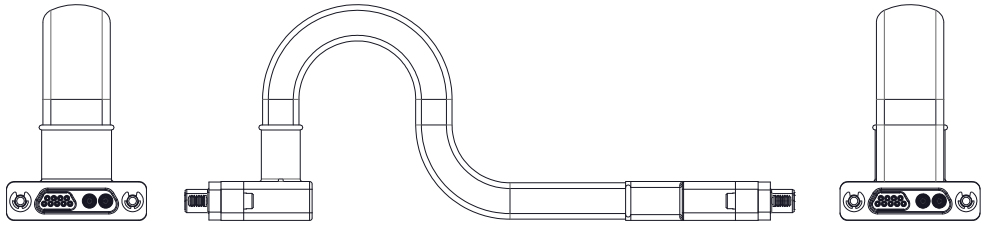
Right Angle-to-Straight



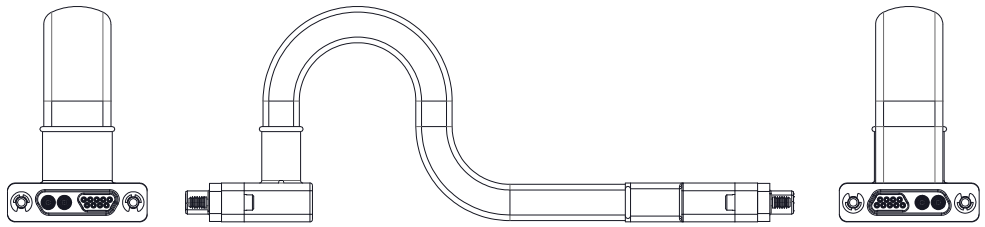
RS-TL



RL-TL



RS-TS



RL-TS

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Coax and combo coax jumpers and pigtails
Cable configurations

Right Angle-to-Right Angle

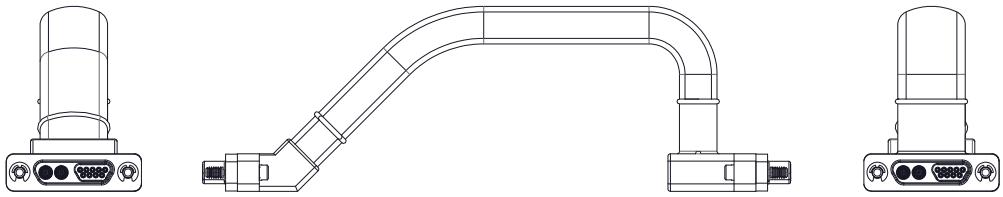
RL-RL

RL-RS

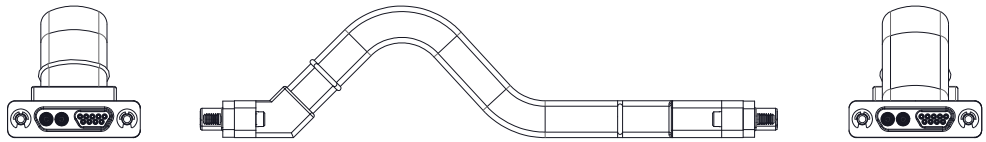
RS-RS

45°-to-Right Angle and Straight

FL-FS



FL-RL



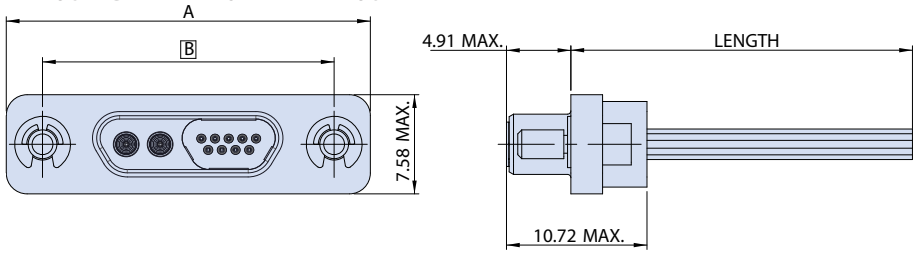
FL-TL

Coax and combo coax jumpers and pigtails
Plug-to-plug • plug-to-receptacle • receptacle-to-receptacle

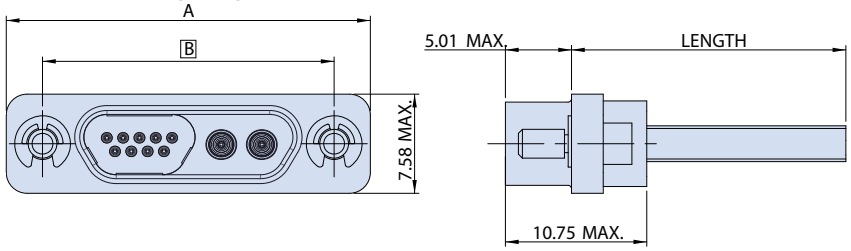
GMMD FLYING LEAD CABLE ASSEMBLY CONNECTOR DIMENSIONS

Shell size	A (mm)	B (mm)
9	19.84	14.35
15	23.65	18.16
21	27.46	21.97
25	30.00	24.51
31	33.81	28.32
37	37.62	32.13
51-2	46.51	41.02
67	56.67	51.18

FP PLUG AND FPE ENVIRONMENTAL PLUG

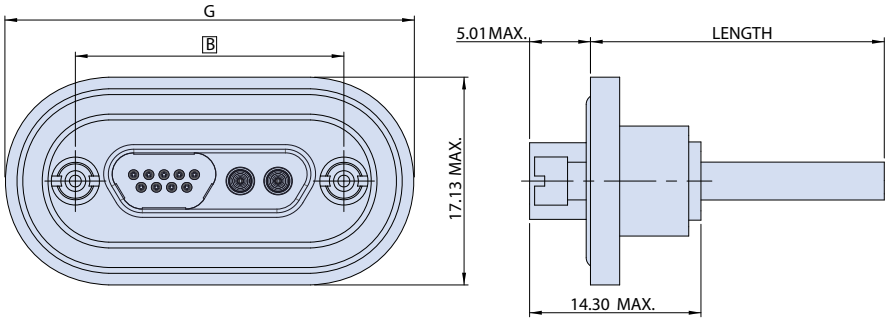


FR RECEPTACLE



Shell size	B (mm)	G (mm)
9	14.35	25.88
15	18.16	29.69
21	21.97	33.50
25	24.51	36.04
31	28.32	39.85
37	32.13	43.66
51-2	41.02	52.55
67	51.18	62.71

FRP REAR PANEL MOUNT RECEPTACLE



GMMD COAX AND COMBO COAX CONTACT ARRANGEMENTS (additional arrangements are available, consult factory)

Contact Arrangement	2C	4C	6C
Shell Size	9	21	25
No. / type of contacts	2 X 50Ω Coax	4X 50Ω Coax	6X 50Ω Coax

Contact Arrangement	8C	16C
Shell Size	37	67
No. / type of contacts	8 X 50Ω Coax	16X 50Ω Coax

Contact Arrangement	1C9	2C9	1V9	2V9	4V
Shell Size	15	21	21	31	21
No. / type of contacts	1 X 50Ω Coax 9 X #24	2X 50Ω Coax, 9 X #24	1 X 75Ω Coax, 9 X #24	2 X 75Ω Coax, 9 X #24	4 X 75Ω Coax

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Rev. 06.08.26
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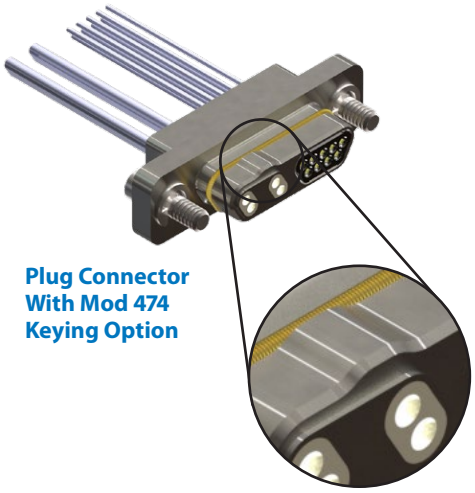
Mod Code 474 Keying Option



Plug Connector With Mod 474 Keying Option

Prevent Mis-Mating with Mod Code 474 Keying Option

Keyed GMMD connectors for "fail-safe" circuits feature specially modified shells to prevent mis-mating. The plug shell has a raised key, and the receptacle shell has a keyway.

The shell size nine connector accommodates three key positions. All other sizes have five positions available. The letter code following Mod Code 474 specifies the key position. "474A" plugs mate to "474A" receptacles.

Keyed plugs will not mate to unkeyed receptacles, but keyed receptacles will plug into standard unkeyed plugs.

HOW TO ORDER GMMD CONNECTORS WITH MOD 474	
Step 1: Find a Standard GMMD Part Number Mod 474 keying is available on all standard metal shell GMMD connectors, including solder cup, pre-wired and printed circuit board versions. This feature is not available on plastic GMMD or M83513 connectors.	**Example:** GMMD-HR4T9-2PM
Step 2: Pick a Keying Position A letter code identifies the key position. The table on the following page shows the keying options for each shell size. Mod Code 474A mates to 474**A** receptacles, and so on.	**Example:** 474**B**
Step 3: Add the Mod Code to the Part Number A letter code identifies the key position. The table on the following page shows the keying options for each shell size. Mod 474A plugs mate to 474A receptacles, and so on.	**Example:** GMMD-HR4T9-2PM-**474B**

GMMD KEY POSITIONS: MODIFICATION CODE 474

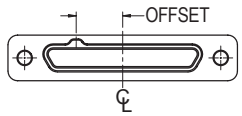


Fig. 1

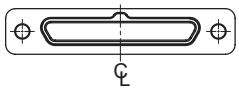


Fig. 2

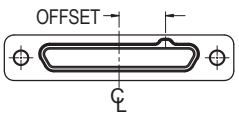


Fig. 3

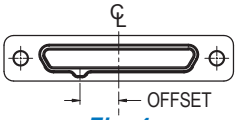


Fig. 4

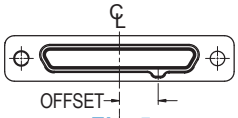


Fig. 5

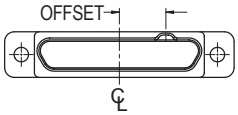


Fig. 6

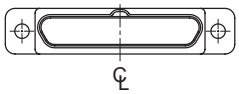


Fig. 7

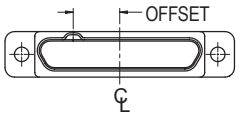


Fig. 8

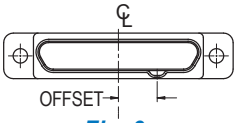


Fig. 9

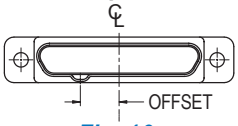


Fig. 10

Figure 1 plug connector mates to Figure 6 receptacle, figure 2 mates to figure 7, and so on. Figure 11 mates to figure 12.

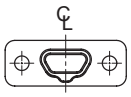


Fig. 11

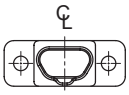


Fig. 12

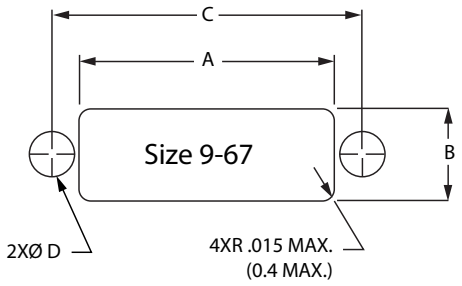
Mating face of connector shown.

Mod Code 474 Keying Option

KEY POSITION OFFSETS

Layout	Key Position A			Key Position B			Key Position C			Key Position D			Key Position E		
		Offset			Offset			Offset			Offset			Offset	
	Figure	In.	mm.	Figure	In.	mm.	Figure	In.	mm.	Figure	In.	mm.	Figure	In.	mm.
9P	1	.025	0.64	3	.025	0.64	11	.000	0.00	NA	—	—	NA	—	—
9S	6	.025	0.64	8	.025	0.64	12	.000	0.00	NA	—	—	NA	—	—
15P	1	.090	2.29	2	.000	0.00	3	.090	2.29	4	.050	1.25	5	.050	1.25
15S	6	.090	2.29	7	.000	0.00	8	.090	2.29	9	.050	1.27	10	.050	1.27
21P	1	.130	3.30	2	.000	0.00	3	.130	3.30	4	.100	2.54	5	.100	2.54
21S	6	.130	3.30	7	.000	0.00	8	.130	3.30	9	.100	2.54	10	.100	2.54
25P	1	.180	4.57	2	.000	0.00	3	.180	4.57	4	.125	3.18	5	.125	3.18
25S	6	.180	4.57	7	.000	0.00	8	.180	4.57	9	.125	3.18	10	.125	3.18
31P	1	.200	5.08	2	.000	0.00	3	.200	5.08	4	.150	3.81	5	.150	3.81
31S	6	.200	5.08	7	.000	0.00	8	.200	5.08	9	.150	3.81	10	.150	3.81
37P	1	.300	7.62	2	.000	0.00	3	.300	7.62	4	.250	6.35	5	.250	6.35
37S	6	.300	7.62	7	.000	0.00	8	.300	7.62	9	.250	6.35	10	.250	6.35
51-2P	1	.400	10.16	2	.000	0.00	3	.400	10.16	4	.350	8.89	5	.350	8.89
51-2S	6	.400	10.16	7	.000	0.00	8	.400	10.16	9	.350	8.89	10	.350	8.89
67P	1	.600	15.24	2	.000	0.00	3	.600	15.24	4	.500	12.70	5	.500	12.70
67S	6	.600	15.24	7	.000	0.00	8	.600	15.24	9	.500	12.70	10	.500	12.70

MOD CODE 474 REAR PANEL MOUNT PANEL CUTOUTS



Layout	A +.004 (0.10) -.000		B +.004 (0.10) -.000		C +.003 (0.076) -.003 (0.076)		ØD +.002 (0.051) -.000	
	In	mm	In	mm	In	mm	In	mm
9	0.408	10.36	0.301	7.65	0.565	14.35	0.126	3.20
15	0.558	14.17	0.301	7.65	0.715	18.16	0.126	3.20
21	0.708	17.98	0.301	7.65	0.865	21.97	0.126	3.20
25	0.808	20.52	0.301	7.65	0.965	24.51	0.126	3.20
31	0.958	24.33	0.301	7.65	1.115	28.32	0.126	3.20
37	1.108	28.14	0.301	7.65	1.265	32.13	0.126	3.20
51-2	1.458	37.03	0.301	7.65	1.615	41.02	0.126	3.20
67	4.858	123.39	0.301	7.65	2.015	51.18	0.126	3.20

© 2023 Glenair, Inc • 1211 Air Way, Glendale, CA 91201 • 818-247-6000 • www.glenair.com • U.S. CAGE code 06324 • GMMD Modular High-Speed Micro-D
Dimensions are subject to change without notice.

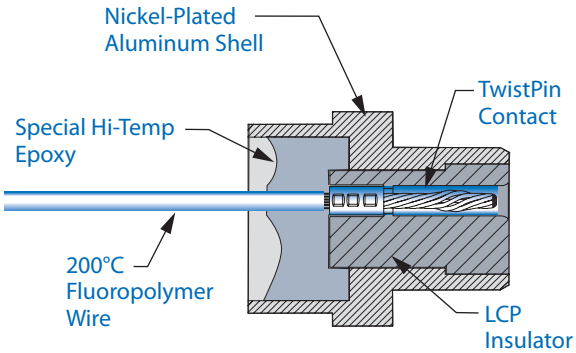
Mod Code 428 High-Temperature Epoxy

Potting a Micro-D with Epoxy-Filled Syringe

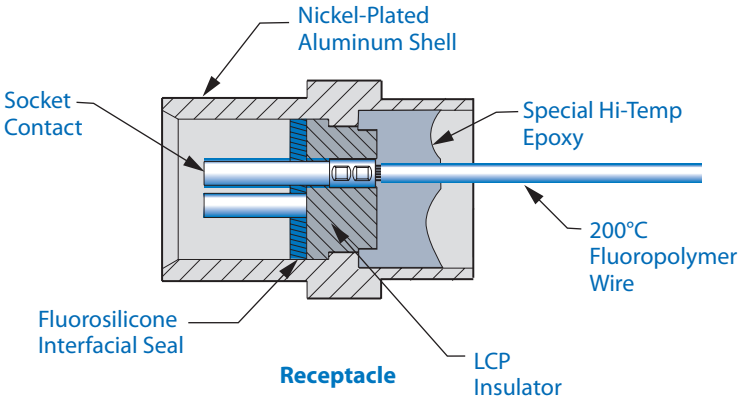
Upgrade to 200° Celsius with Mod Code 428 High-Temperature Epoxy

The search for oil and gas has led to deeper reservoirs where extreme temperatures and pressures test the limits of electronics design. Oil well logging instruments must be able to withstand temperatures beyond the limits of standard connectors.

Micro-D connectors are made from temperature-resistant materials. The Liquid Crystal Polymer (LCP) glass-filled thermoplastic insulators easily withstand 400° F. The Fluorosilicone seals, TwistPin contacts and aluminum shells also are rated for continuous exposure to 400° F. The epoxy potting compound is the only component not rated for high temperature. Mod Code 428 upgrades the standard epoxy with a special 600° F. epoxy.



Plug



Receptacle

HOW TO ORDER MICRO-D CONNECTORS WITH MOD 428 HI TEMP

Step 1: Find a Standard Micro-D part Number
Mod 428 is available on all standard metal shell Micro-D connectors, including solder cup, pre-wired and printed circuit board versions. Not available on plastic Micro-D or M83513 connectors.

Example: GMMD-HR4T9-2SM
1. Metal shell only
2. Nickel-plated aluminum or stainless steel shells only.

Step 2: Add the Mod Code to the Part Number

Example: GMMD-HR4T9-2SM-**428**

APPLICATION NOTES

1. Shell Material & Finish:	Electroless nickel plated aluminum is commonly used for high temperature connectors. Cadmium plated aluminum is not recommended for temperatures exceeding 175° C. because of discoloration and breakdown of the chromate seal applied to the cadmium. Stainless steel shells provide the best resistance to temperature and corrosive environments, but at the expense of weight and cost.
2. Potting Compound:	200° C Rated Epoxy

Mod Code 429 for Space-Grade Applications

Detail of the Atmospheric Infrared Sounder Instrument (AIRS) with Glenair Micro-D Cables and Connectors
Photo courtesy JPL

Save Time and Cost with Modification Codes for Space Grade GMMD connectors

GMMD connectors are a good choice for all types of orbital and deep space projects. Glenair Modification Codes provide special processing for GMMDs to meet NASA requirements without the need for a customer 'Statement of Work' or 'Specification Control Drawing'. This section explains Glenair Modification Code ordering, and provides valuable information on outgassing and other space flight topics.

HOW TO ORDER SPACE GRADE GMMD CONNECTORS

Step 1: Find a Standard GMMD Part Number
Electroless nickel plated shells and Tefzel® wire are preferred for space flight. Cadmium plating is prohibited.

Step 2: Select a NASA Screening Level
The term "Screening Level" refers to the final inspection procedure and does not include outgassing.
Level 1 for mission-critical highest reliability
Level 2 for high reliability
Level 3 for standard reliability

Step 3: Outgassing Processing
Specify bakeout or thermal vacuum outgassing. Both bakeout and thermal vacuum outgas processes incur additional cost.

Step 4: Select Appropriate Modification Code.
Match the desired level of screening, outgassing or a combination of both. Select from the table below to choose the right modification code. Add the modification code to the connector part number. Example: GMMD-HR2T9-2SM-**429C**

NASA EEE-INST-02, Table 2A Screening Levels

Inspection	Level 1	Level 2	Level 3
Visual	100%	100%	100%
Mechanical	2(0)	2(0)	
Dielectric Withstanding Voltage	2(0)	2(0)	
Insulation Resistance	2(0)	2(0)	
Contact Engagement & Separation Force	2(0)		
Hermeticity (Sealed Receptacles Only)	100%	100%	
Coupling Force	2(0)		

Required inspection quantity shown. Number in parenthesis indicates acceptance of failures allowed for all quantities inspected.

Screening Level and Available Outgassing Modification Codes

NASA Screening Level	Special Screening Only	Special Screening Plus Outgassing Processing	
		48 Hour Oven Bake 175° C.	Thermal Vacuum Outgassing 24 hrs. 125° C.
Level 1 Highest Reliability	Mod Code 429F	Mod Code 429J	Mod Code 429C
Level 2 High Reliability	Mod Code 429D	Mod Code 429K	Mod Code 429A
Level 3 Standard Reliability	Mod Code 432	Mod Code 186	Mod Code 186M

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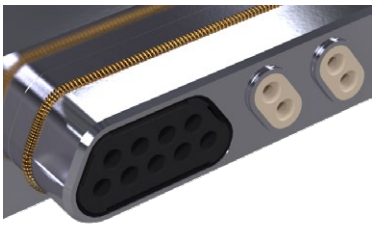
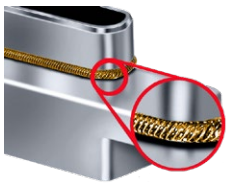
Mod Code 497 Ground Springs for Plugs



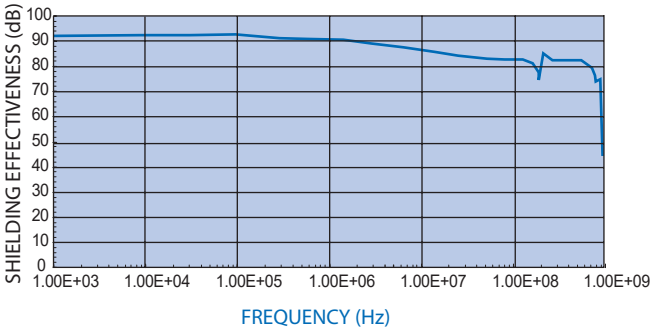
Improve EMI Performance with Mod Code 497 Ground Springs

GMMD Twinax connectors are all equipped as standard with a ground spring to ensure excellent shell to shell conductivity and low EMI.
GMMD Coax connectors do not have this as standard but for those plugs that contain solely coax contacts the Mod Code 497 can be added.
For combo coax connectors (those with coax and #24 discrete contacts) the Mod Code 497 can not be used.
For such an arrangement, if improved EMI is needed use the GMMD-FPE plug style which includes a gasket seal, opting for one of the two conductive gasket materials.

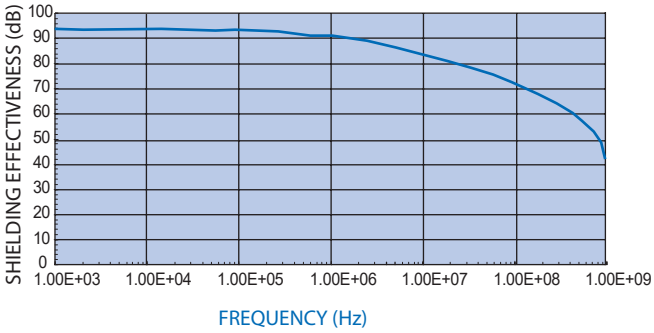
Ground Spring and EMI Shielding Effectiveness – A gold-plated stainless steel ground spring on the pin connector mating face offers substantial improvement in EMI protection. The graphs compare identical connectors tested with and without ground springs.



EMI Performance with Ground Spring



EMI Performance without Ground Spring



HOW TO ORDER GMMD CONNECTORS WITH MOD 497 SPRINGS

Step 1: Find a Standard GMMD Part Number
Ground springs are available on all standard GMMD plug connectors.

Example: GMMD-FP4C-CNN0L105-100
1. Plugs only (pin connectors)
2. Nickel and gold plated aluminum shells only

Step 2: Add the Mod Code to the Part Number

Example: GMMD-FP4C-CNN0L105-100-497

MISSION-CRITICAL

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