Amphenol Commercial Products

HARSH ENVIRONMENT CONNECTORS

Product Catalogue

Amphenol

Now You're Connected!

Amphenol Commercial Products

The Company

Amphenol Commercial Products are dedicated to the design, development and manufacturing of connector products which are used in Commercial, Industrial, Communications, Military and Aerospace applications worldwide. Our expertise in understanding and supporting our customers' interconnect needs has earned Amphenol a reputation of quality and excellence among the world's leading users of electronic components.

Harsh Environment Connectors

A Rugged Connector is the ideal solution for data transfers in harsh or demanding environments. These connectors offer environmental sealing on the widely used connector standards for RJs, USBs, D-Subs and HDMIs all within standard package sizes.

These Harsh Connectors are designed to provide outstanding corrosion resistance and rugged performance. They can be used in a wide range of applications like in factory automation, outdoor communications, portable vehicle-mounted instrumentation or navigation system and security/surveillance equipment.

All Rugged Connectors provide excellent strength and durability in the most demanding applications with a high-temperature-resistant plastic housing and contacts made of a copper alloy with gold and nickel plating.

Generation 1:

- Epoxy seal
- Provides sealing requirements per IP67

Generation 2:

- Epoxy free
- Utilizes gaskets and seals internal to the connector
- Provides sealing requirements per IP68
- Improved thermal cycling performance

Mission Statement

To Our Customers: We will provide services and quality products on time at the lowest cost, engineered with maximum innovation.

To Our Employees We will provide a safe working environment in which to work, opportunities for training and advancement and equitable compensation for their efforts.

To Our Suppliers: We will provide opportunities to participate in our business successes and will work with them on our goal of continuous improvement.

CONTENTS

Rugged RJ11/RJ45

Rugged USB

Rugged D-Sub

Rugged HDMI

Locking USB

Rugged Bulkhead Adaptor

Additional Products

MRJR SERIES GENERATION 2 RUGGED RJ11/RJ45

Specifications

Connectors are designed to conform to the requirements of TIA-1096-A and IEC 60603-7.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Nickel Plated
Front Insert:	Clear Polycarbonate, UL94V-0
Rear Inserts:	High Temperature Resistant Nylon, Glass Reinforced, UL94-0, Black
Contacts:	Phosphor Bronze Alloy Plated with 1.27µm (50µ") min Gold over 1.27µm (50µ") min Nickel on the Mating Area and 2.54µm (100µ") min Matte Tin over Nickel on the Contact Tails
Panel Gasket:	Conductive Silicone Rubber, Black
Mating Area Ground Tab:	Nickel Plated Copper Alloy
LED's:	Epoxy Lens, Tin Plated Steel Tails
Rear Screws:	Nickel Plated Steel
Internal O-rings:	Silicone Rubber, Beige
PCB:	FR4 Fibreglass, Lead Free
Addiontal Connector:	UL Recognized Component
Ferrite:	Nickel Zinc Soft Ferrite Ceramic

Electrical

Current Rating:	1.5A max per Contact (ΔT ≤ 30°C)
Contact Resistance:	20 mΩ max
Insulation Resistance:	500 MΩ min
DWV:	1000 VAC rms (between adjacent contacts),1500 VAC rms (contacts to ground)
LED Characteristics:	Forward DC Current 25mA max, Forward Voltage 2.5V max @2mA
Ferrite Characteristics:	38 Ω at 25 MHz min Impedance, Common Mode Rejection -30dB min up to 250 MHz

Mechanical, Environmental, Regulatory

UL Recognition:	Level DUXR2, File Number E135615
Water & Dust Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-55°C to +105°C
Durability:	Per EIA 364-09, 2500 Mating Cycles
Vibration:	Per EIA 364-28 Condition II (10g, 10-500Hz, 6 hours), No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition A (11ms, 50g, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/ Load:	Per EIA-364-17, 1.5 A, 70°C, 500 Hours
Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -55°C to +105°C, 25 Cycles
Humidity:	Per EIA-364-31, 21 Cycles, 504 Hrs, 25°C to 65°C, 90-95%RH, with -10°C Cold Shock
Humidity:	Per EIA-364-31, Steady State, 21 Days, 50°C, 90-95%RH
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S, & SO_2), 14 Day Exposure
Salt Spray:	Per EIA 364-26, 250 Hours, 5% Salt, 35°C
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
LED Luminous Intensity:	0.5mCd min at 2mA Forward Current
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging
Insertion & Withdrawal Force:	Per EIA-364-13, 20N (4.5lb_f) max (Latch Disengaged)
Effectiveness of Plug Latch (Coupling Device):	Per EIA-364-13, 50N (11.2lb_f) min

Application Recommendations

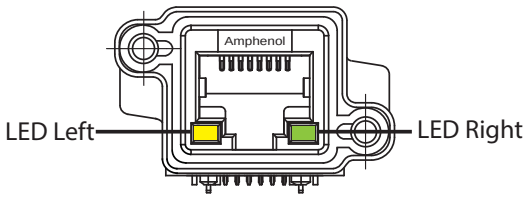
Recommended Mounting Screw Torque:	0.45 to 0.65 N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement
Recommended Soldering Methods:	Manual or wave soldering (solder temperature 260°C max, time 10s max, preheat 100-140°C)

Customer cleaning processes to be polycarbonate compatible to avoid front insertion degredation.

LED Options for MRJR Series

Example Part Number: MRJR-538(X)-01 (X) = LED designation code

For all MRJR Connectors:



LED Code	LED Left	LED Right
0	No LED	No LED
1	Green	Yellow
4	Yellow	Green
5	Green	Green
A	Bi - color Green & Yellow	Bi - color Green & Yellow

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MRJR SERIES

MRJR - X X X X X - X X

Rugged RJ Series, Generation 2

Modular Jack Type
3 - RJ11, 6 Position[1]
4 - RJ11, 6 Position with EMI Ferrite Filtering[2]
5 - RJ45, 8 or 10 Position[3]
6 - RJ45, 8 or 10 Position with EMI Ferrite Filtering[2]
7 - RJ45, 8 or 10 Position with Transient Voltage Suppression[4]
8 - RJ45, 8 Position with Cat5e Performance Level[4]

Termination Style
3 - Right Angle
4 - Vertical
5 - Right Angle on PCB with Right Angle Cable Header[5]
7 - Right Angle on PCB with Right Angle RJ45 Modular Jack[6]
8 - Right Angle on PCB with Vertical RJ45 Modular Jack[7]
9 - Right Angle on PCB with Terminal Blocks
A - Right Angle on PCB with Holes for Wiring (Style 5 PCB)[8]
B - Right Angle on PCB with Vertical Cable Header[9]
C - Right Angle on PCB with Holes for Wiring (Style 7 PCB)[8]
D - Right Angle on PCB with Vertical Cable Header[9]

Number of Contacts
4 - 4 Contacts
6 - 6 Contacts
8 - 8 Contacts
A - 10 Contacts

LED Options
0 - No LEDs
1 - Green Left, Yellow Right
4 - Yellow Left, Green Right
5 - Green Left, Green Right
A - Bi-colour Green/Yellow Left & Right

Tail Length & Thread Options
0 - 2.54mm [.100"] Tail Length, #4-40 UNC Thread
B - 3.81mm [.150"] Tail Length, #4-40 UNC Thread
M - 2.54mm [.100"] Tail Length, M3 x 0.5 Thread
P - 3.81mm [.150"] Tail Length, M3 x 0.5 Thread

Other Options[10]
1 - Single Port, Right Angle with Threaded Holes
F - Single Port, Vertical with Threaded Holes (Use this code with termination style 4 above)

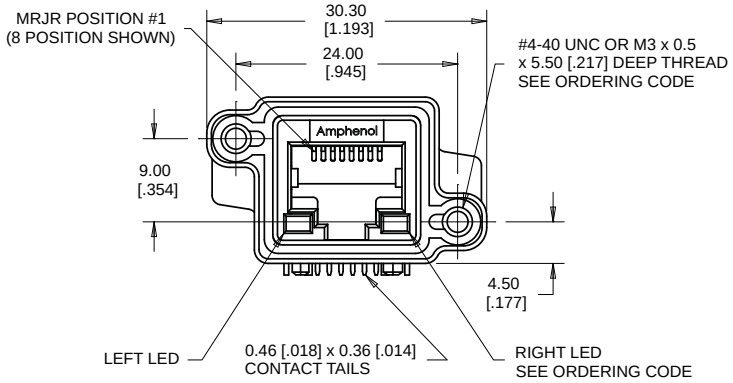
Unique Special Code
No Digit - Part Defined by Previous Digits of Part Number
1 to 9 - Identifies Unique Special Feature
Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details.

Notes:
1) Term RJ11 refers to jack for 6P2C, 6P4C or 6P6C (RJ11, RJ12, RJ13, RJ14, RJ18 or RJ25).
2) Ferrite option currently available for right angle connectors only.
3) Term RJ45 refers to non-keyed jack for 8P8C or 10P10C (RJ31, RJ38, RJ48C, RJ49, RJ50, RJ61).
4) Transient voltage suppression and Cat5e performance level for connectors on a PCB only. Consult with Amphenol for availability.
5) Termination style 5 suitable for both RJ11 and RJ45 jacks. Consult with Amphenol regarding applications where a smaller 14 pin cable header would be preferred.
6) Termination style 7 currently available for RJ11 (6P4C & 6P6C) and RJ45 (8P8C) only.
7) Termination style 8 currently available for RJ45 (8P8C) only.
8) Termination style A uses the PCB from termination style 5. Termination style C uses the PCB from termination style 7.
9) Termination styles B & D currently available for RJ11 (6P4C & 6P6C) without LEDs and RJ45 (8P8C) without LEDs only.
10) Consult with Amphenol for additional termination styles, solder cup contacts, LED colours, contact tail lengths, mounting styles, conductive gaskets or other requirements of interest. See catalogue Accessories pages for dust cover and plug boot options.

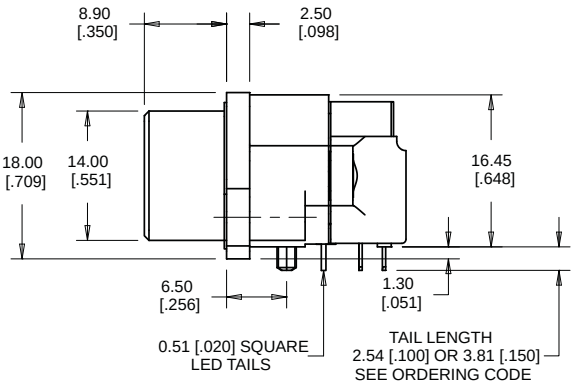
MRJR SERIES GENERATION 2 RUGGED RJ11/RJ45

MRJR-33XX-X1 MRJR-53XX-X1

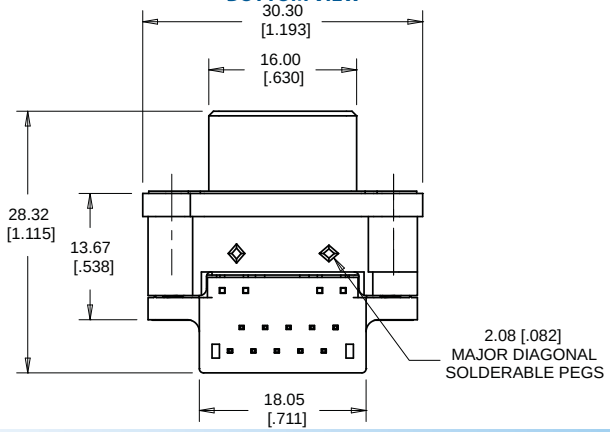
FRONT VIEW



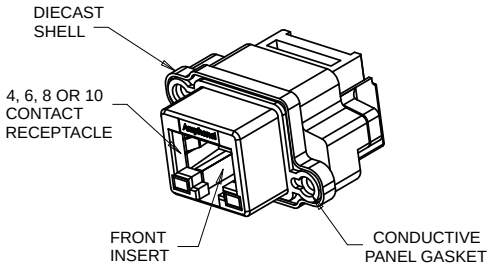
SIDE VIEW



BOTTOM VIEW



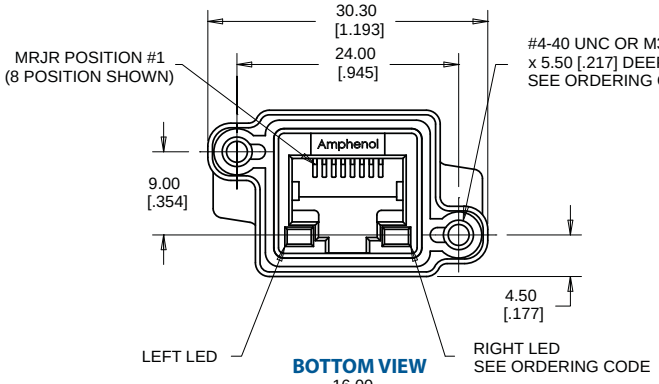
ISOMETRIC VIEW



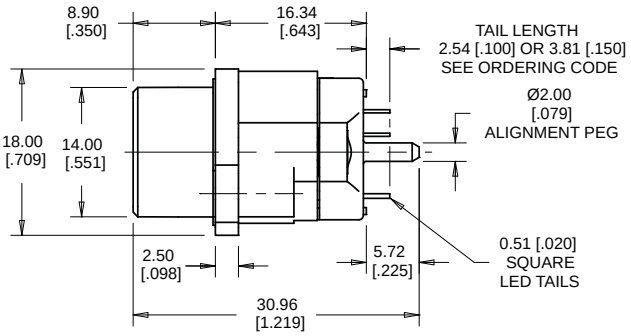
For recommended panel cutout & PCB layout see catalogue page 9

MRJR-34XX-X1 MRJR-54XX-X1

FRONT VIEW



SIDE VIEW



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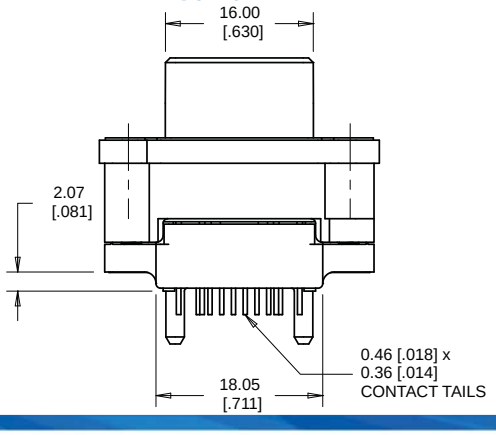

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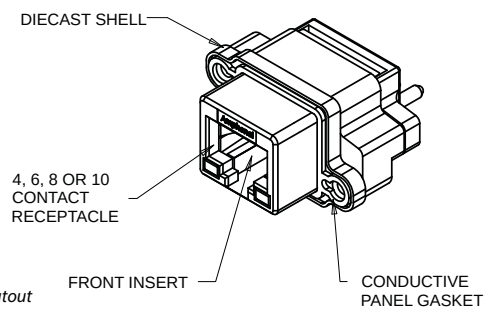

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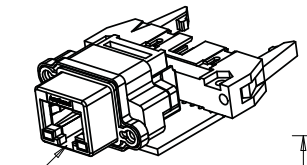
MRJR-35XX-X1 MRJR-55XX-X1

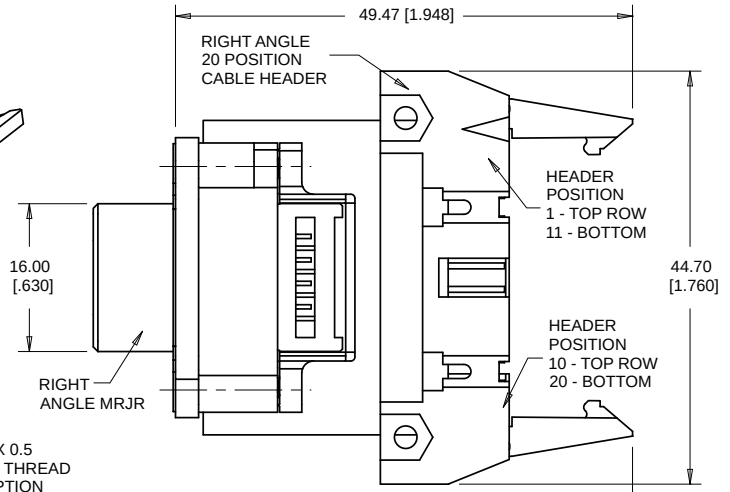
CONNECTIONS CHART

MRJR Connector Type			Cable Header Position
6 Position	8 Position	10 Position	
-	-	1	2
-	1	2	12
1	2	3	3
2	3	4	3
3	4	5	4
4	5	6	14
5	6	7	5
6	7	8	15
-	8	9	6
-	-	10	16
Shell/GND	Shell/GND	Shell/GND	10
LED 1	LED 1	LED 1	1
LED 2	LED 2	LED 2	11
LED 3	LED 3	LED 3	7
LED 4	LED 4	LED 4	17

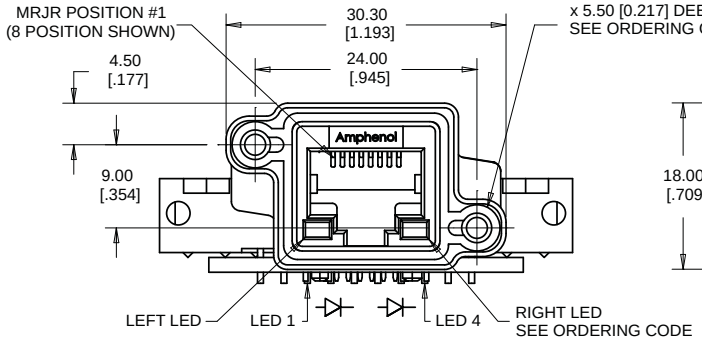
ISOMETRIC VIEW



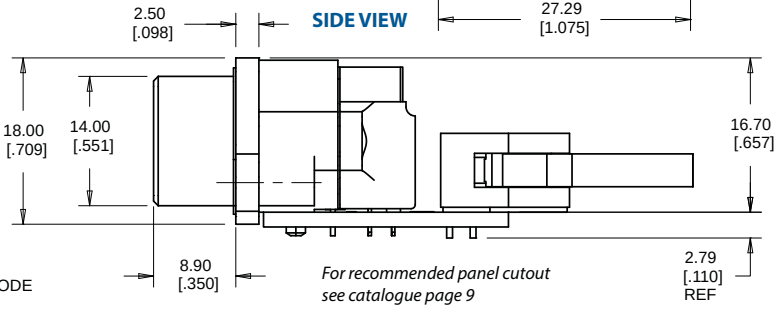
TOP VIEW



FRONT VIEW



SIDE VIEW



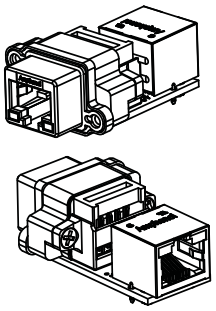
For recommended panel cutout
see catalogue page 9

MRJR-37XX-X1 MRJR-578X-X1

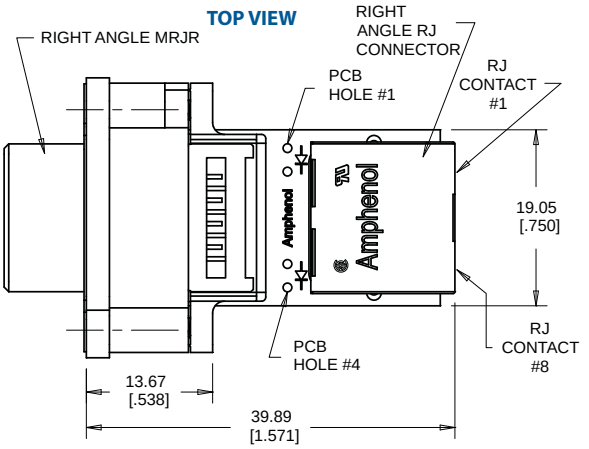
CONNECTIONS CHART

MRJR Connector Type			
MRJR 6 Position	RJ 6 Position	MRJR 8 Position	RJ 8 Position
-	-	1	1
1	1	2	2
2	2	3	3
3	3	4	4
4	4	5	5
5	5	6	6
6	6	7	7
-	-	8	8
Shell/GND	Shell/GND	Shell/GND	Shell/GND
LED 1	LED 1	LED 1	LED 1
LED 2	LED 2	LED 2	LED 2
LED 3	LED 3	LED 3	LED 3
LED 4	LED 4	LED 4	LED 4

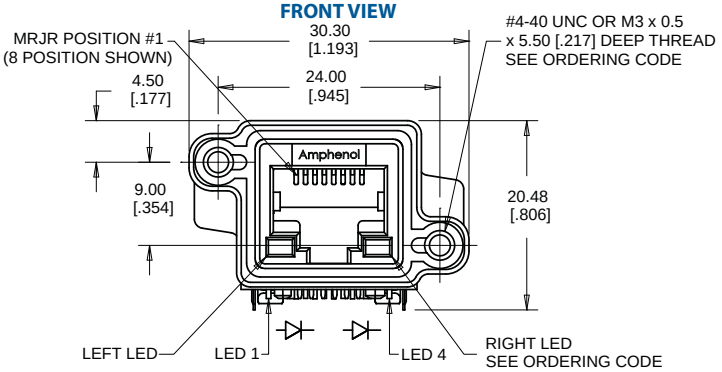
ISOMETRIC VIEWS



TOP VIEW



FRONT VIEW



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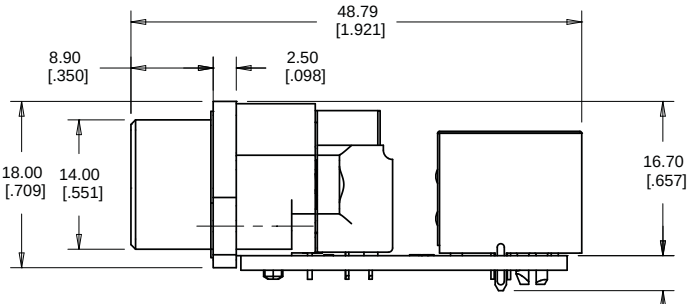


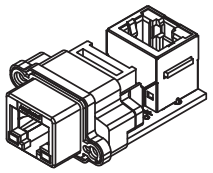
For recommended panel cutout
see catalogue page 9

MRJR-588X-X1

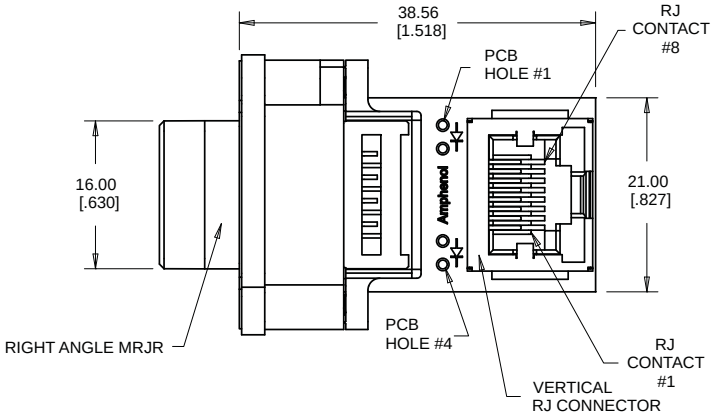
CONNECTIONS CHART

MRJ Contact	RJ Contact
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
Shell/GND	Shield/GND
MRJ LED	PCB Holes
LED 1	1
LED 2	2
LED 3	3
LED 4	4

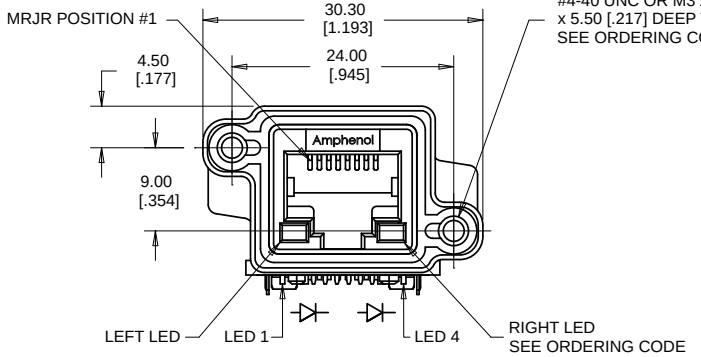
ISOMETRIC VIEW



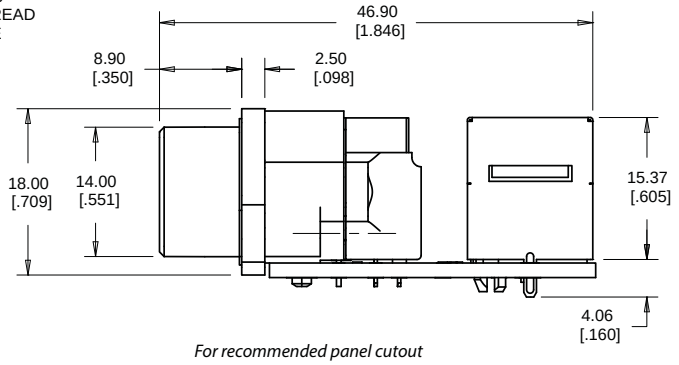
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 9

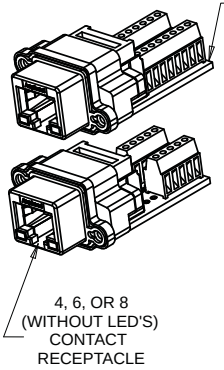
MRJR-39XX-X1 MRJR-59XX-X1

CONNECTIONS CHART

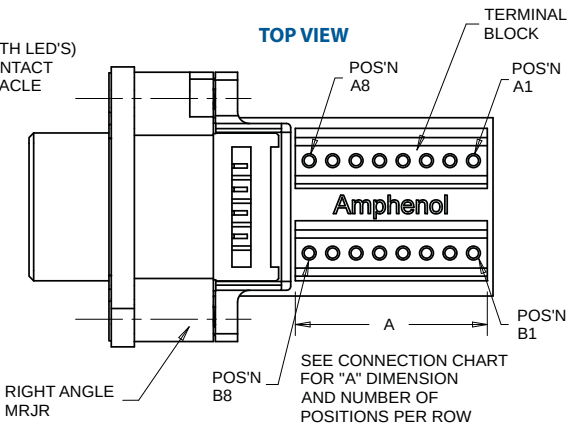
MRJR Connector Type				Terminal Block Position
6 Position	8 Position No LEDs	8 Position with LEDs	10 Position	
Shell/GND	Shell/GND	Shell/GND	Shell/GND	A1 & B1
3	4	4	5	A2
2	3	3	4	A3
1	2	2	3	A4
-	1	1	2	A5
-	-	-	1	A6
-	-	LED 1	LED 1	A7
-	-	LED 2	LED 2	A8
4	5	5	6	B2
5	6	6	7	B3
6	4	4	8	B4
-	8	8	9	B6
-	-	-	10	B6
-	-	LED 4	LED 4	B7
-	-	LED 3	LED 3	B8
5/Row	5/Row	8/Row	8/Row	Position
13.16 [.518]	13.16 [.518]	20.87 [.818]	20.87 [.818]	A' Dim'n

For 6 position with LEDs, the terminal block will be 20.78 [.818] with 8 positions per row.

ISOMETRIC VIEWS



TOP VIEW



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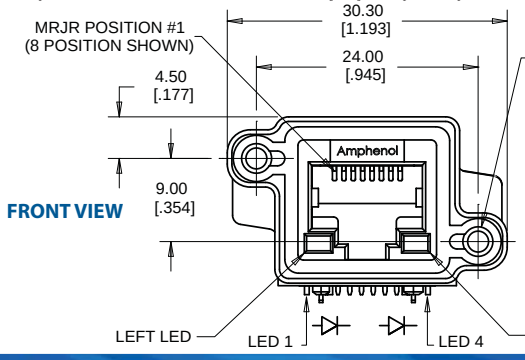
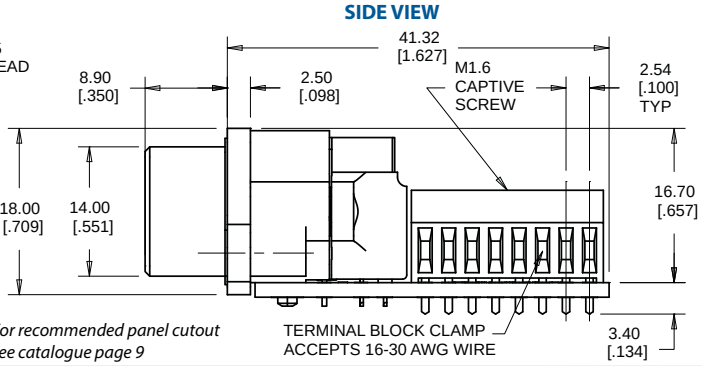


SIDE VIEW



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TERMINAL BLOCK CLAMP ACCEPTS 16-30 AWG WIRE

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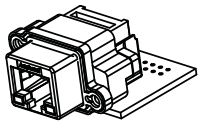
MRJR-3AXX-X1 MRJR-5AXX-X1

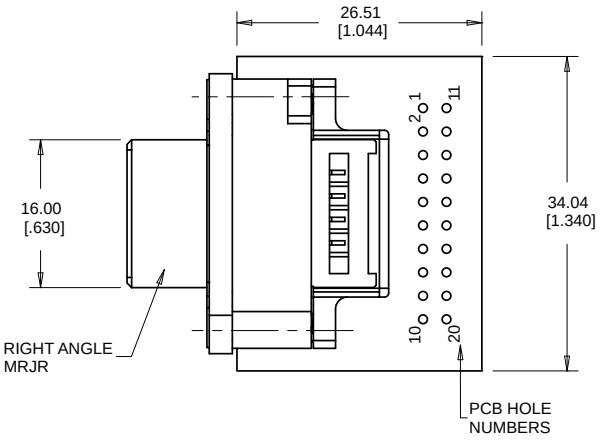
CONNECTIONS CHART

MRJR Connector Type			PCB Hole Numbers
6 Position	8 Position	10 Position	
-	-	1	2
-	1	2	12
1	2	3	3
2	3	4	13
3	4	5	4
4	5	6	14
5	6	7	5
6	7	8	15
-	8	9	6
-	-	10	16
Shell/GND	Shell/GND	Shell/GND	10
LED 1	LED 1	LED 1	1
LED 2	LED 2	LED 2	11
LED 3	LED 3	LED 3	7
LED 4	LED 4	LED 4	17

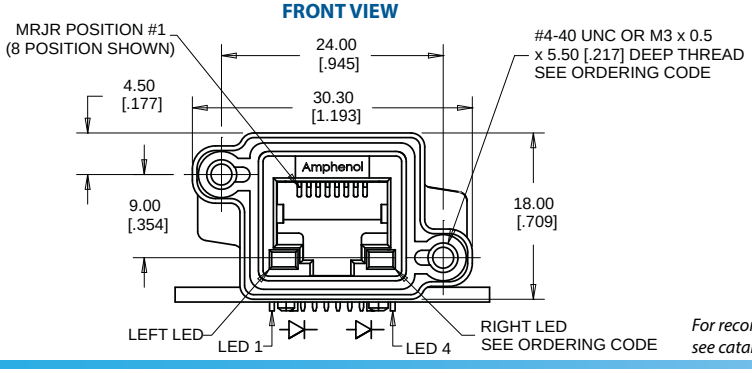
ISOMETRIC VIEW



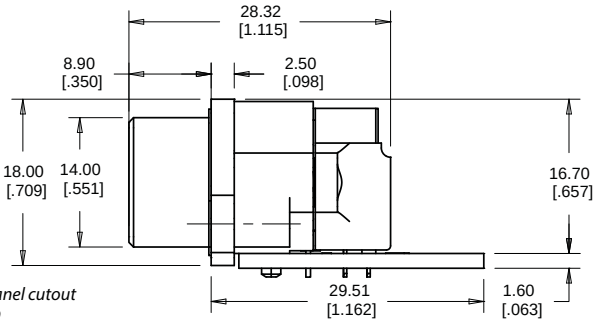
TOP VIEW



FRONT VIEW



SIDE VIEW



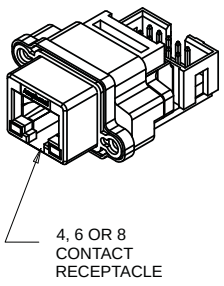
For recommended panel cutout see catalogue page 9

MRJR-3BXX-X1 MRJR-5BXX-X1

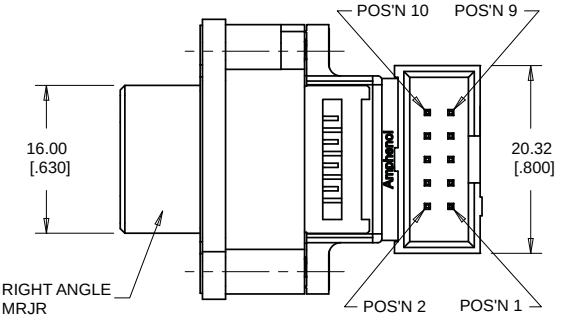
CONNECTIONS CHART

MRJR Connector Type		Cable Header
6 Position	8 Position	
Shell/GND	Shell/GND	2 & 9
-	1	10
1	2	7
2	3	8
3	4	5
4	5	6
5	6	3
6	7	4
-	8	1

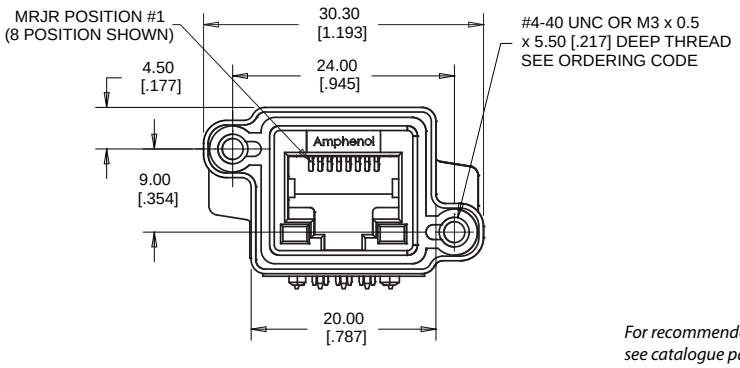
ISOMETRIC VIEW



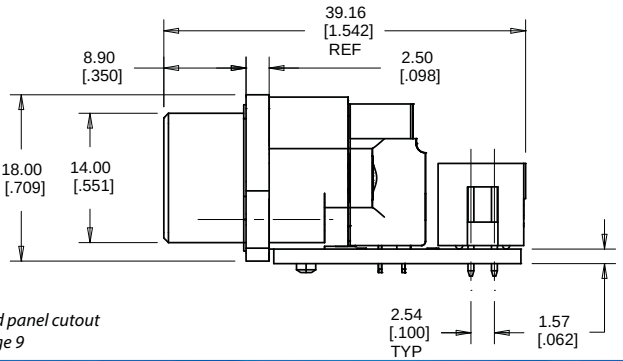
TOP VIEW



FRONT VIEW



SIDE VIEW



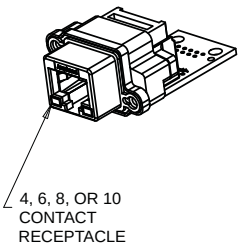
For recommended panel cutout see catalogue page 9

MRJR-3CXX-X1 MRJR-5CXX-X1

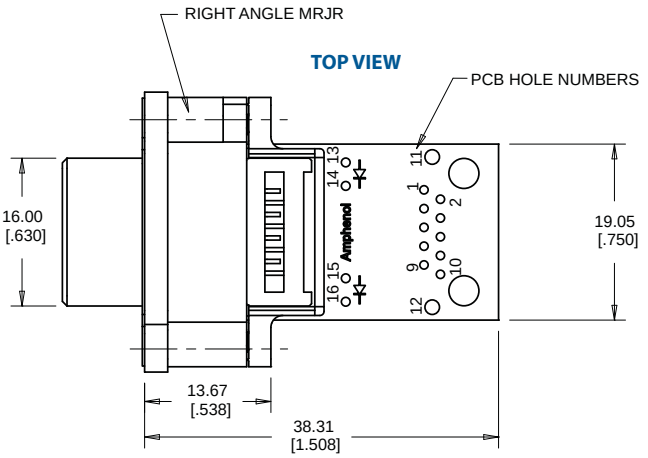
CONNECTIONS CHART

MRJR Connector Type			PCB Hole Numbers
6 Position	8 Position	10 Position	
-	-	1	11 & 12
-	1	2	2
1	2	3	3
2	3	4	4
3	4	5	5
4	5	6	6
5	6	7	7
6	7	8	8
-	8	9	9
-	-	10	10
Shell/GND	Shell/GND	Shell/GND	12
LED 1	LED 1	LED 1	13
LED 2	LED 2	LED 2	14
LED 3	LED 3	LED 3	15
LED 4	LED 4	LED 4	16

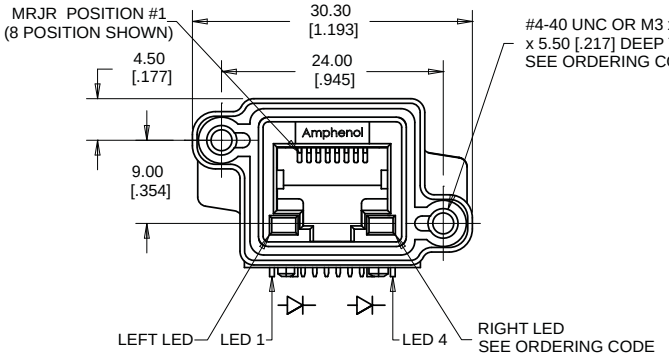
ISOMETRIC VIEW



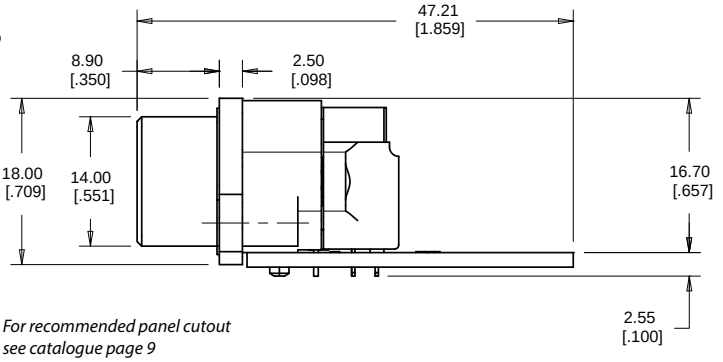
TOP VIEW



FRONT VIEW



SIDE VIEW



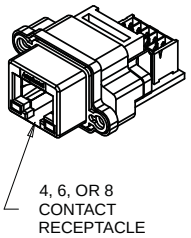
For recommended panel cutout
see catalogue page 9

MRJR-3DX0-X1 MRJR-5D8X-X1

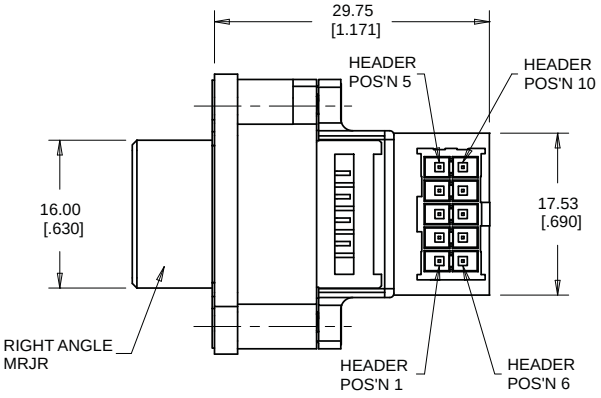
CONNECTIONS CHART

MRJR Connector Type		Header Position
6 Position	8 Position	
Shell/GND	Shell/GND	1 & 10
-	1	5
1	2	9
2	3	4
3	4	8
4	5	3
5	6	7
6	7	2
-	8	6

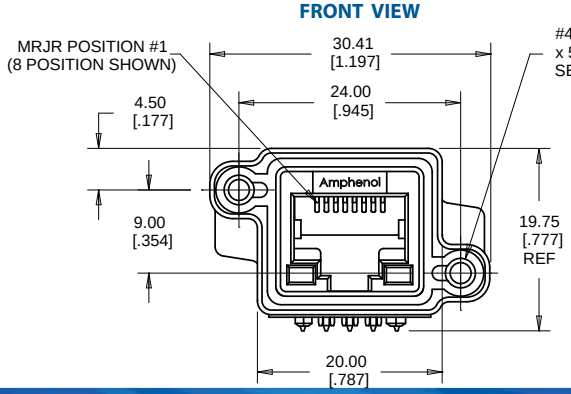
ISOMETRIC VIEW



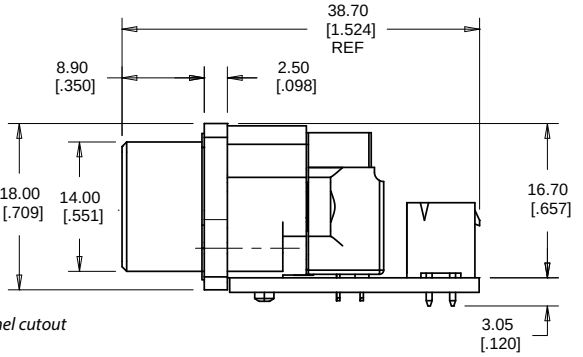
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout
see catalogue page 9

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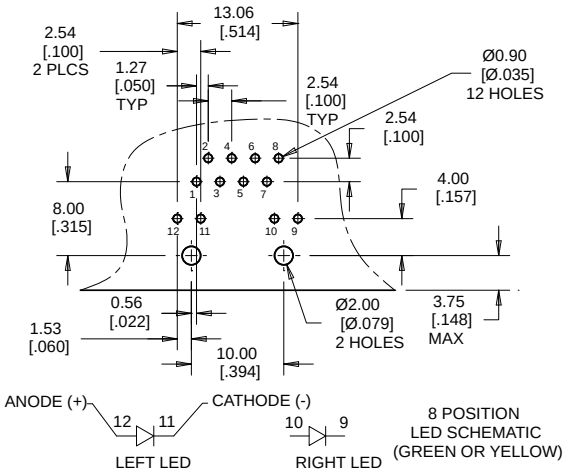
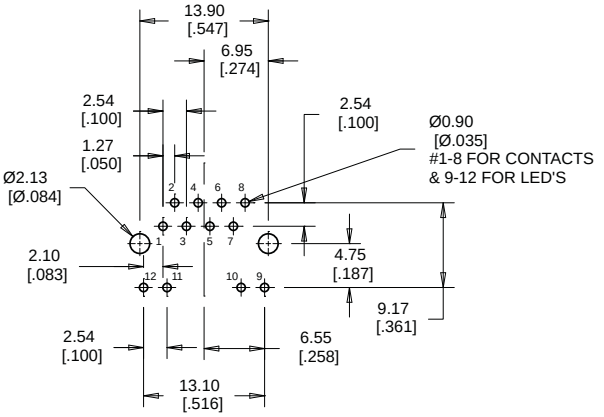
Recommended PCB & Panel Layout

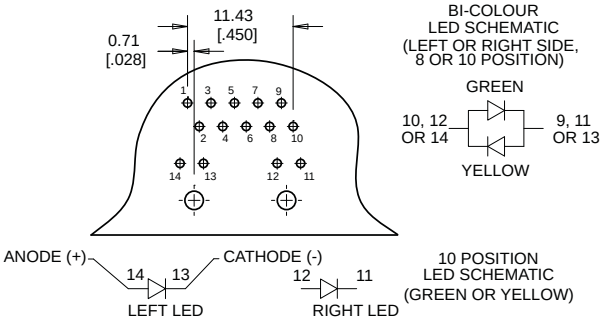
8 Position PCB Layout



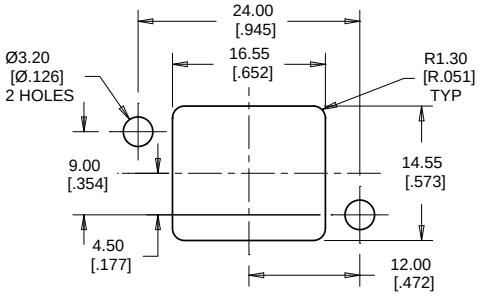
MRJR-54XX PCB Layout



10 Position PCB Layout



Panel Cutout

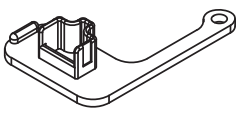


MRJ & MRJR Accessories

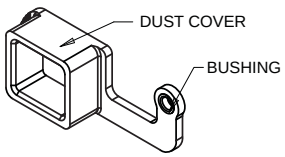
Dust Covers

Material: Silicone Rubber

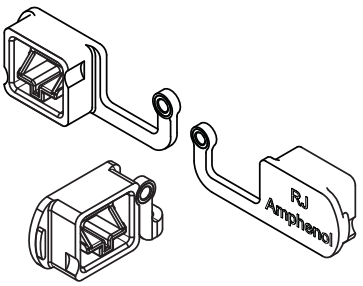
MRJ-2586-10BP (Grey)
MRJ-2586-20BP (Black)



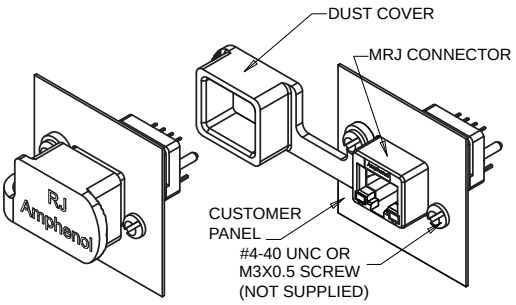
MRJ-2586-01BP (Grey)
MRJ-2586-02BP (Black)



MRJ-2586-12BP (Grey)
MRJ-2586-22BP (Black)
MRJ-2586-42BP (Black, Conductive)

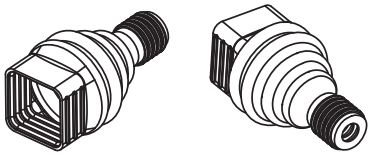


Dust Covers Application Views



Boot[1, 2]

MRJ-258E-11BP (Transparent)
MRJ-258E-12BP (Black)



Notes:
1) Boot to be assembled over RJ cable prior to termination of RJ plug. Slide boot towards cable end to cover plug and mating interface.
2) Square end of boot fits over mating end of Amphenol MRJ or MRJR series modular jacks.

Specifications

Connectors are designed to conform to the requirements of TIA-1096-A and IEC 60603-7.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Nickel Plated
Front Insert:	Clear Polycarbonate, UL94V-0
Rear Inserts:	High Temperature Resistant Nylon, Glass Reinforced, UL94-0, Black
Contacts:	Phosphor Bronze Alloy Plated with 1.7µm (50µ") min Gold over 1.27µm (50µ") min Nickel on the Mating Area and 2.54µm (100µ") min Matte Tin over Nickel on the Contact Tails
Panel Gasket:	Conductive Silicone Rubber, Black
Mating Area Ground Tab:	Nickel Plated Copper Alloy
LED's:	Epoxy Lens, Tin Plated Steel Tails
Rear Screws:	Nickel Plated Steel
Internal O-rings:	Silicone Rubber, Beige
PCB:	FR4 Fibreglass, Lead Free
Addiontal Connector:	UL Recognized Component
Ferrite:	Nickel Zinc Soft Ferrite Ceramic

Electrical

Current Rating:	1.5A max per Contact (ΔT ≤ 30°C)
Contact Resistance:	20 mΩ max
Insulation Resistance:	500 MΩ min
DWV:	1000 VAC rms (between adjacent contacts),1500 VAC rms (contacts to ground)
LED Characteristics:	Forward DC Current 25mA max, Forward Voltage 2.5V max @2mA
Ferrite Characteristics:	38 Ω at 25 MHz min Impedance, Common Mode Rejection -30dB min up to 250 MHz

Mechanical, Environmental, Regulatory

UL Recognition:	Level DUXR2, File Number E135615
Water & Dust Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-55°C to +105°C
Durability:	Per EIA 364-09, 2500 Mating Cycles
Vibration:	Per EIA 364-28 Condition II (10g, 10-500 Hz, 6 hours), No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition H (11ms, 30g, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/ Load:	Per EIA-364-17, 1.5 A, 70°C, 500 Hours Per EIA-364-17, 105°C, 1000 Hours
Temperature Life w/o Load:	Per EIA-364-32, -55°C to +105°C, 25 Cycles
Thermal Shock:	Per EIA-364-31, 21 Cycles, 504 Hrs, 25°C to 65°C,
Humidity:	90-95%RH, with -10°C Cold Shock
Humidity:	Per EIA-364-31, Steady State, 21 Days, 50°C, 90-95%RH
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S, & SO_2), 14 Day Exposure
Salt Spray:	Per EIA 364-26, 250 Hours, 5% Salt, 35°C
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
LED Luminous Intensity:	0.5mCd min at 2mA Forward Current
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging
Insertion & Withdrawal Force:	Per EIA-364-13, 20N (4.5lb_f) max (Latch Disengaged)
Effectiveness of Plug Latch (Coupling Device):	Per EIA-364-13, 50N (11.2lb_f) min

Application Recommendations

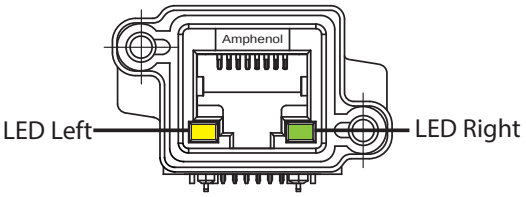
Recommended Mounting Screw Torque:	0.45 to 0.65 N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement
Recommended Soldering Methods:	Manual or wave soldering (solder temperature 260°C max, time 10s max, preheat 100-140°C)

Customer cleaning processes to be polycarbonate compatible to avoid front insertion degredation.

LED Options for MRJ Series

Example Part Number: MRJ-538(X)-01 (X) = LED designation code

For all MRJ Connectors:



LED Code	LED Left	LED Right
0	No LED	No LED
1	Green	Yellow
4	Yellow	Green
5	Green	Green
A	Bi - color Green & Yellow	Bi - color Green & Yellow

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MRJ SERIES

MRJ - X X X X - X X X

Rugged RJ Series, Generation 1

Modular Jack Type
3 - RJ11, 6 Position[1, 2]
5 - RJ45, 8 or 10 Position[3, 4]
6 - RJ45, 8 or 10 Position with EMI Ferrite Filtering[5]
7 - RJ45, 8 or 10 Position with Transient Voltage Suppression[6]

Termination Style
1 - Vertical, supplied with dust cover
3 - Right Angle
4 - Vertical
5 - Right Angle on PCB with Right Angle Cable Header
7 - Right Angle on PCB with Right Angle RJ45 Modular Jack[7]
8 - Right Angle on PCB with Vertical RJ45 Modular Jack[7]
9 - Right Angle on PCB with Terminal Blocks
A - Right Angle on PCB with Holes for Wiring (Style 5 PCB)[8]
B - Right Angle on PCB with Vertical Cable Header[9]
C - Right Angle on PCB with Holes for Wiring (Style 7 PCB)[8]
D - Right Angle on PCB with Vertical Cable Header[9]

Number of Contacts
8 - 8 Contacts
A - 10 Contacts

LED Options
0 - No LEDs
1 - Green Left, Yellow Right
4 - Yellow Left, Green Right
5 - Green Left, Green Right
A - Bi-colour Green/Yellow Left & Right

Tail Length & Thread Options
0 - 2.54mm [.100"] Tail Length, #4-40 UNC (or Through Hole for Vertical with Other Option 1 or B)
B - 3.81mm [.150"] Tail Length, #4-40 UNC (or Through Hole for Vertical with Other Option 1 or B)
M - 2.54mm [.100"] Tail Length, M3 x 0.5 Thread
P - 3.81mm [.150"] Tail Length, M3 x 0.5 Thread

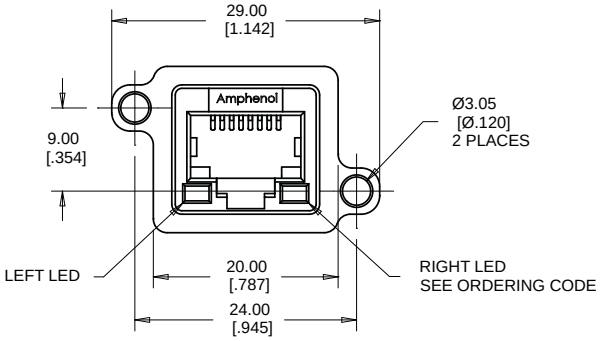
Other Options[10]
1 - Single Port, Right Angle with Threaded Holes or Vertical with Through Hole & Gasket on Back of Flange
B - Single Port, Vertical with Through Hole & Gasket on Front of Flange
F - Single Port, Vertical with Threaded Holes

Unique Special Code
No Digit - Part Defined by Previous Digits of Part Number
1 to 9 - Identifies Unique Special Feature
Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details.

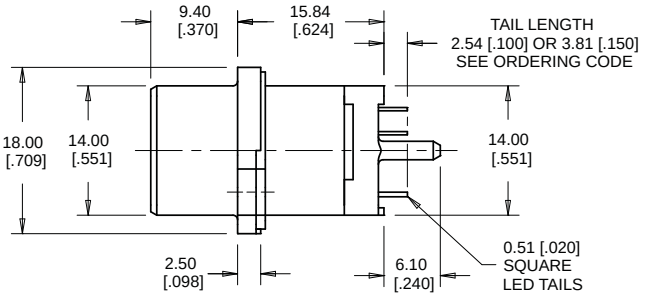
Notes:
1) Term RJ11 refers to jack for 6P2C, 6P4C or 6P6C (RJ11, RJ12, RJ13, RJ14, RJ18 or RJ25).
2) RJ11 jacks currently available in MRJR series only. See MRJR catalogue pages.
3) Term RJ45 refers to non-keyed jack for 8P8C or 10P10C (RJ31, RJ38, RJ48C, RJ49, RJ50, RJ61).
4) 10 position jack currently available for right angle connectors only.
5) Ferrite option currently available for right angle connectors only.
6) Transient voltage suppression for connectors on a PCB only. Consult with Amphenol for availability.
7) Termination styles 7 & 8 currently available for RJ45 (8P8C) only.
8) Termination style A uses the PCB from termination style 5. Termination style C uses the PCB from termination style 7.
9) Termination styles B & D currently available for RJ45 (8P8C) without LEDs only.
10) Consult with Amphenol for additional termination styles, solder cup contacts, LED colours, contact tail lengths, mounting styles, conductive gaskets or other requirements of interest. See catalogue Accessories pages for dust cover and plug boot options.

MRJ-518X-X1 MRJ-548X-X1
MRJ-518X-XB MRJ-548X-XB

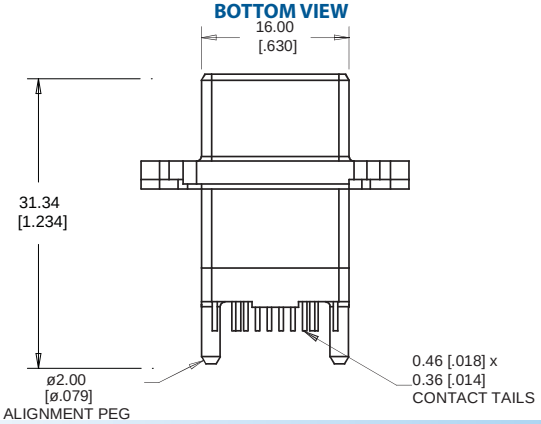
FRONT VIEW



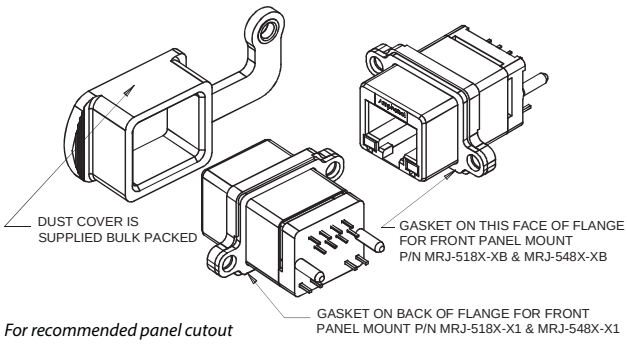
SIDE VIEW



BOTTOM VIEW



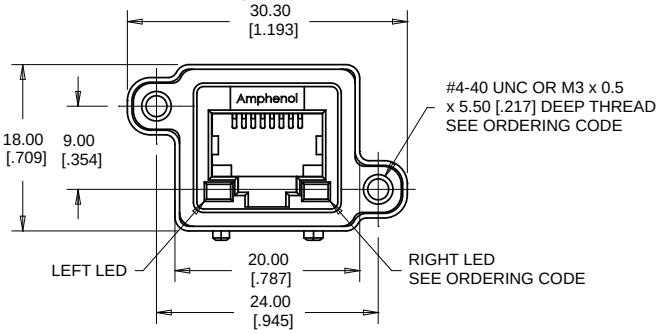
ISOMETRIC VIEWS



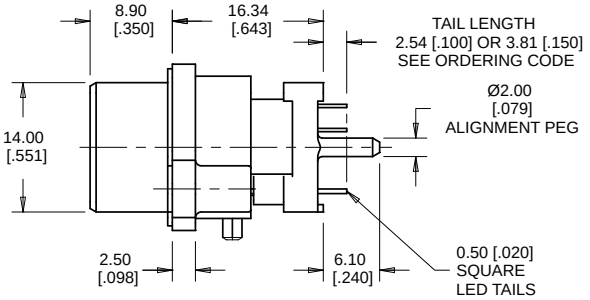
For recommended panel cutout & PCB layout see catalogue page 17

MRJ-518X-XF MRJ-548X-XF

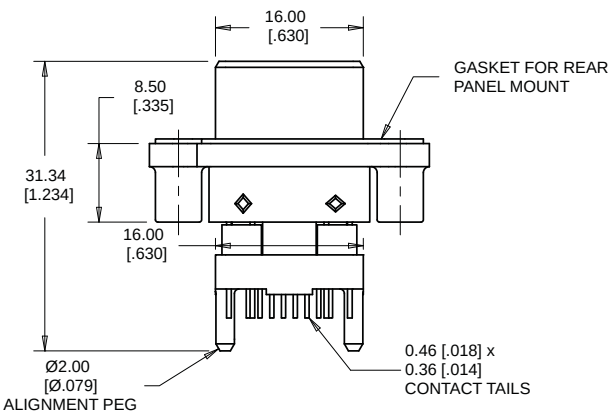
FRONT VIEW



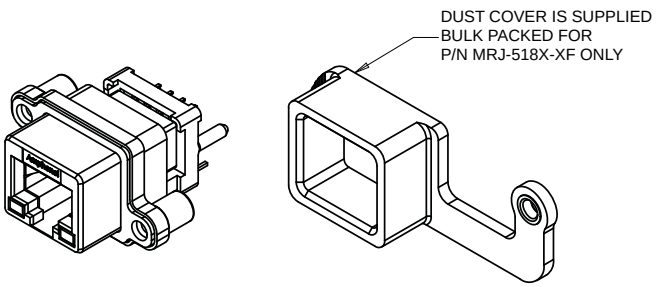
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEWS



For recommended panel cutout & PCB layout see catalogue page 17

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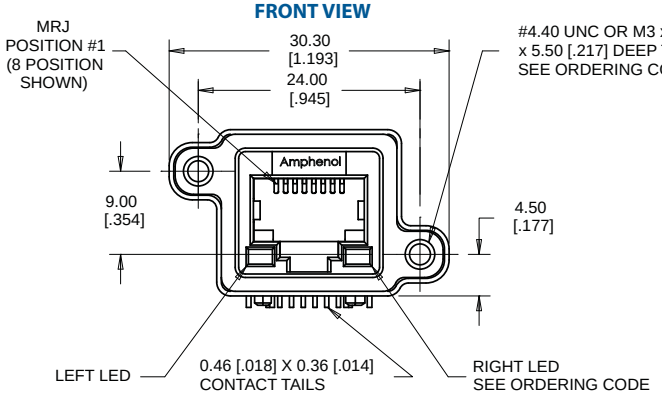
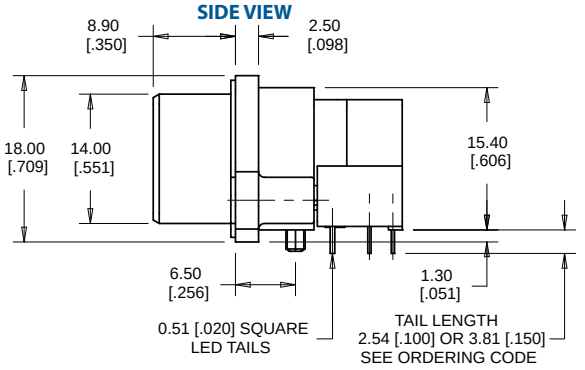
MRJ-53XX-X1

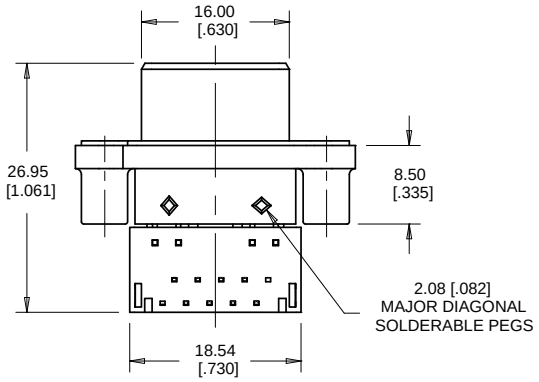
FRONT VIEW



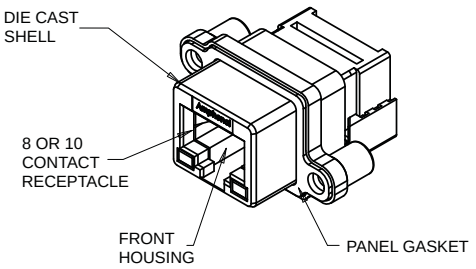
SIDE VIEW



BOTTTOM VIEW



ISOMETRIC VIEW



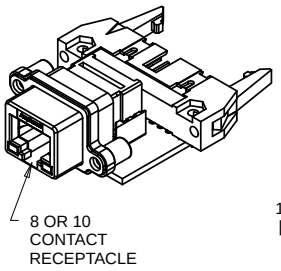
For recommended panel cutout
& PCB layout see catalogue page 17

CONNECTIONS CHART

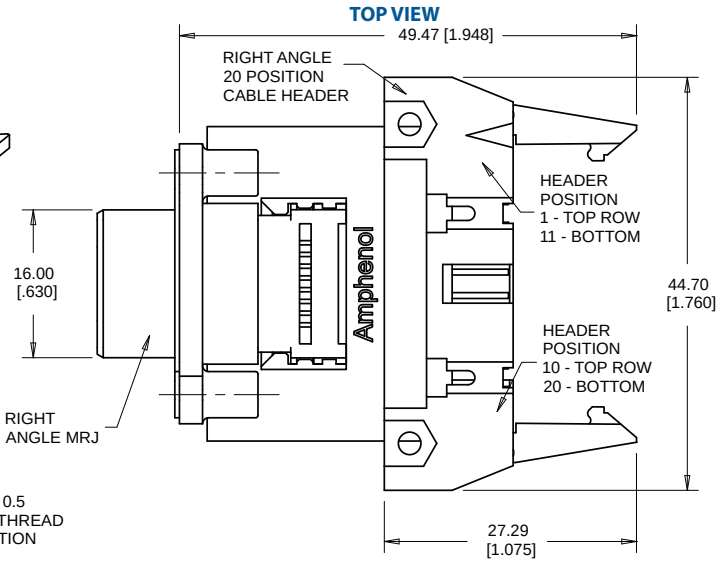
MRJ Connector Type		PCB Hole Number
8 Position	10 Position	
Shell/GND	Shell/GND	10
-	1	2
1	2	12
2	3	3
3	4	13
4	5	4
5	6	14
6	7	5
7	8	15
8	9	6
-	10	16
LED 1	LED 1	1
LED 2	LED 2	11
LED 3	LED 3	7
LED 4	LED 4	17

MRJ-55XX-X1

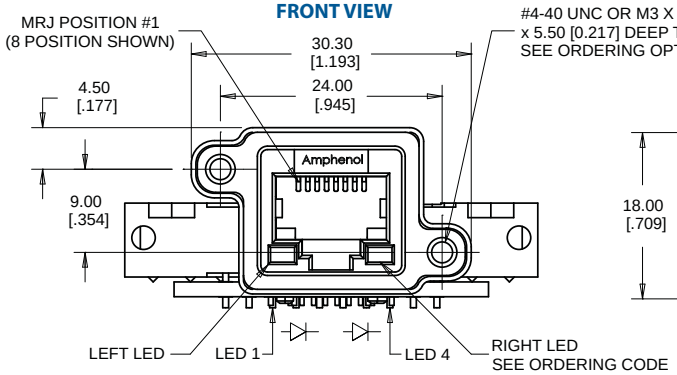
ISOMETRIC VIEW



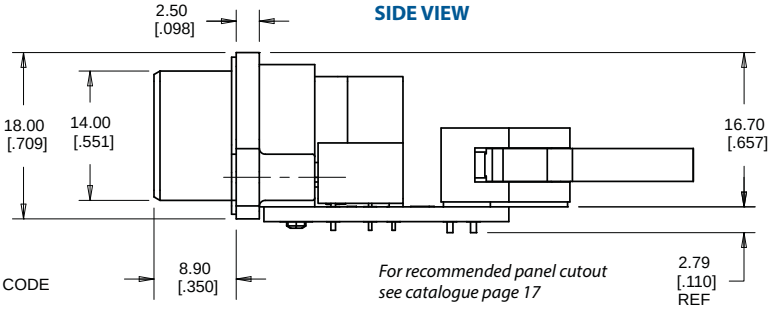
TOP VIEW



FRONT VIEW



SIDE VIEW



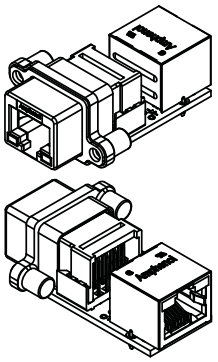
For recommended panel cutout
see catalogue page 17

MRJ-578X-X1

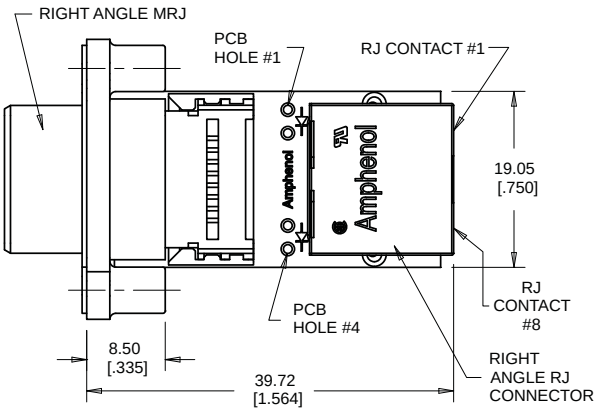
CONNECTIONS CHART

MRJ Contact	RJ Contact
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
Shell/GND	Shield/GND
MRJ LED	PCB Holes
LED 1	1
LED 2	2
LED 3	3
LED 4	4

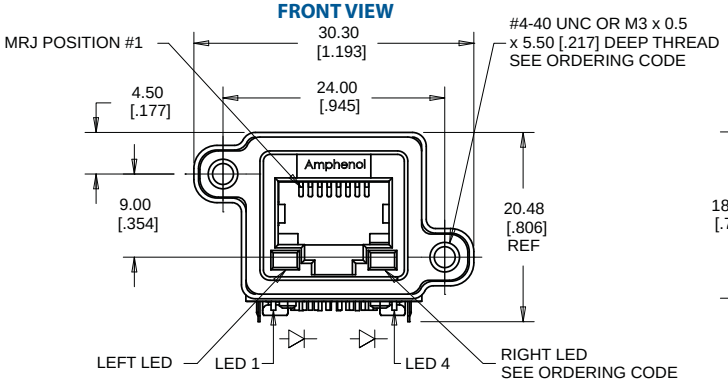
ISOMETRIC VIEWS



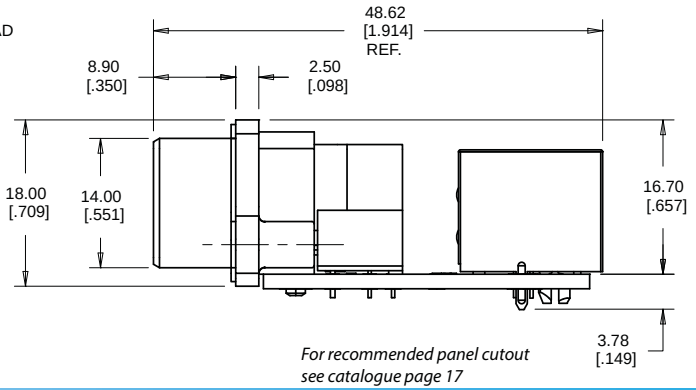
TOP VIEW



FRONT VIEW



SIDE VIEW



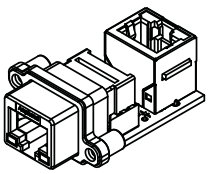
For recommended panel cutout see catalogue page 17

MRJ-588X-X1

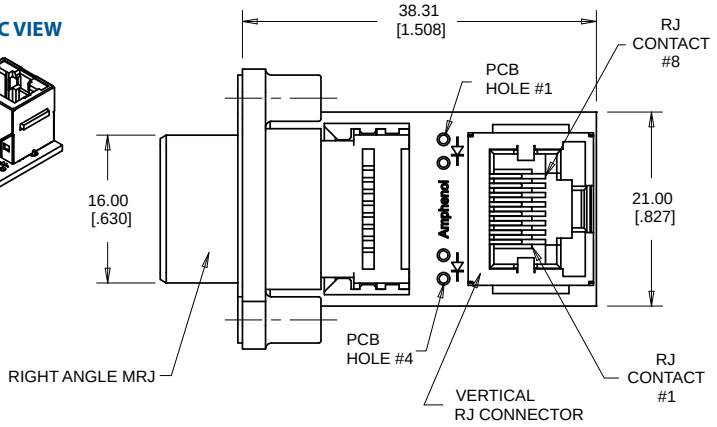
CONNECTIONS CHART

MRJ Contact	RJ Contact
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
Shell/GND	Shield/GND
MRJ LED	PCB Holes
LED 1	1
LED 2	2
LED 3	3
LED 4	4

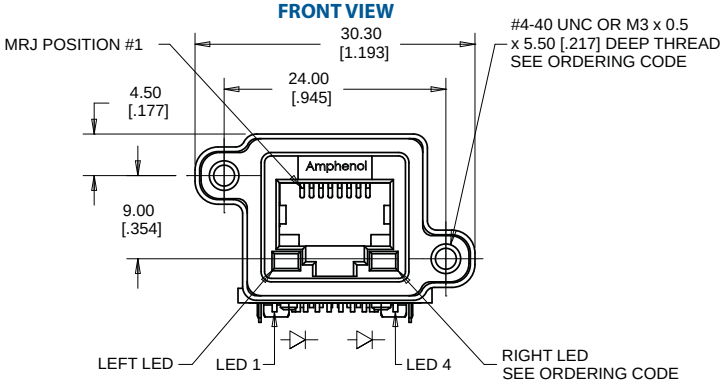
ISOMETRIC VIEW



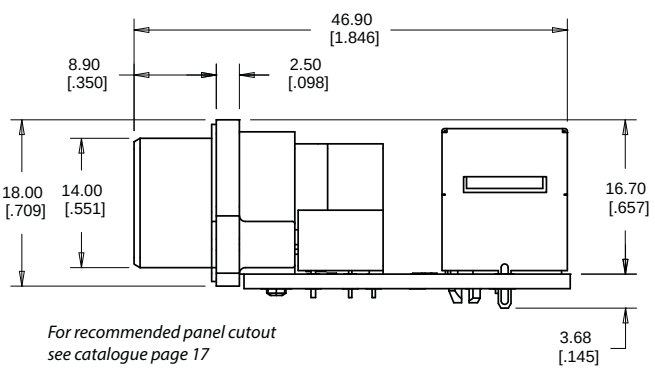
TOP VIEW



FRONT VIEW



SIDE VIEW



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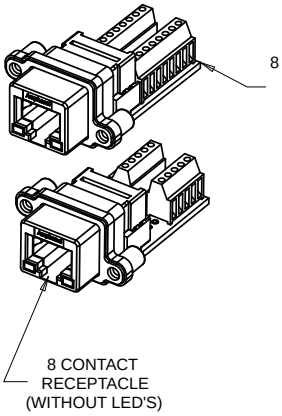
MRJ-59XX-X1

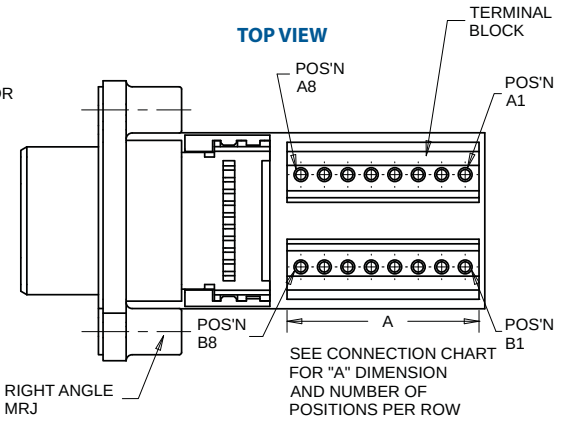
CONNECTIONS CHART

MRJ Connector Type			Terminal Block Position
8 Position No LEDs	8 Position with LEDs	10 Position	
Shell/GND	Shell/GND	Shell/GND	A1 & B1
4	4	5	A2
3	3	4	A3
2	2	3	A4
1	1	2	A5
-	-	1	A6
-	LED 1	LED 1	A7
-	LED 2	LED 2	A8
5	5	6	B2
6	6	7	B3
4	4	8	B4
8	8	9	B5
-	-	10	B6
-	LED 4	LED 4	B7
-	LED 3	LED 3	B8
5/Row	8/Row	8/Row	Position
13.16 [.518]	20.87 [.818]	20.87 [.818]	A' Dim'n

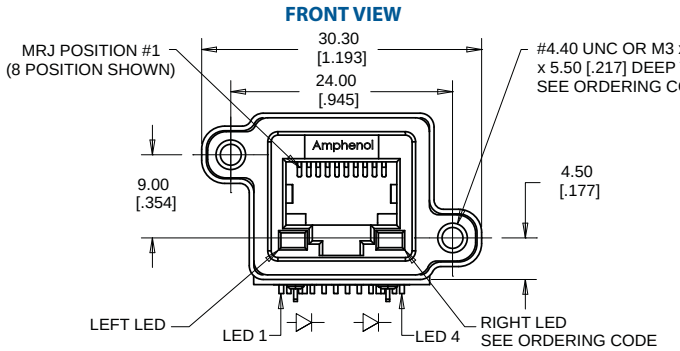
ISOMETRIC VIEWS



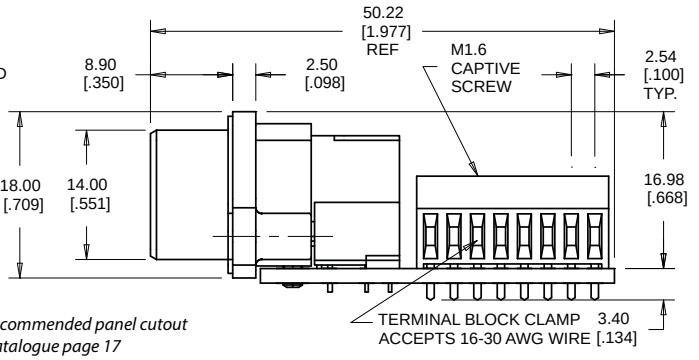
TOP VIEW



FRONT VIEW



SIDE VIEW



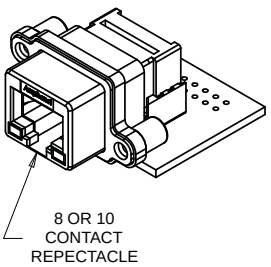
For recommended panel cutout
see catalogue page 17

MRJ-5AXX-X1

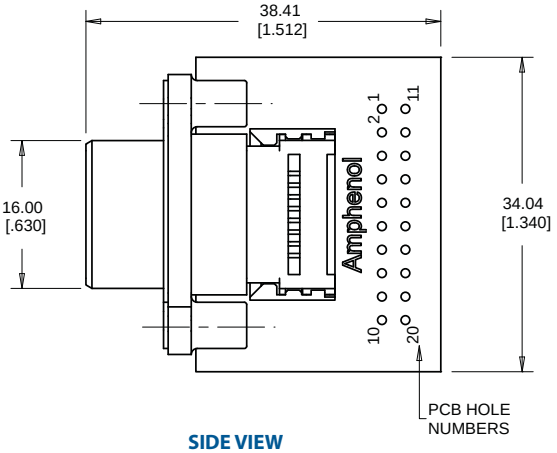
CONNECTIONS CHART

MRJ Connector Type		PCB Hole Number
8 Position	10 Position	
Shell/GND	Shell/GND	10
-	1	2
1	2	12
2	3	3
3	4	13
4	5	4
5	6	14
6	7	5
7	8	15
8	9	6
-	10	16
LED 1	LED 1	1
LED 2	LED 2	11
LED 3	LED 3	7
LED 4	LED 4	17

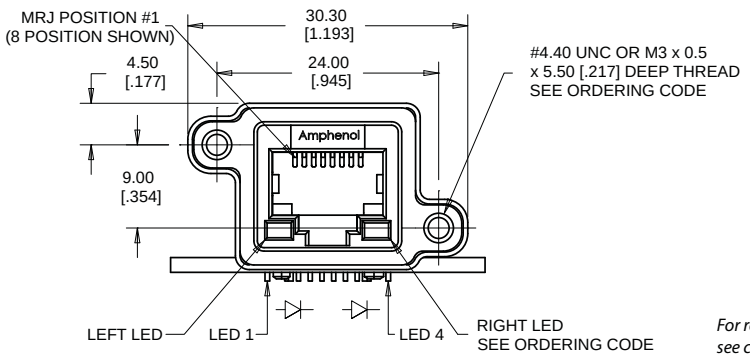
ISOMETRIC VIEW



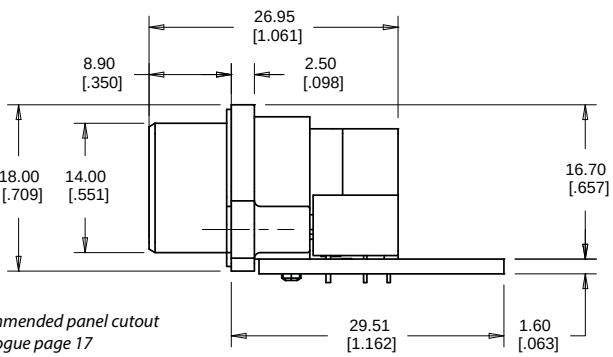
TOP VIEW



FRONT VIEW



SIDE VIEW



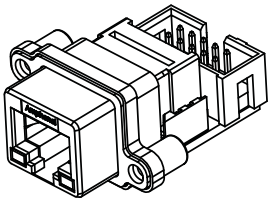
For recommended panel cutout
see catalogue page 17

MRJ-5B80-X1

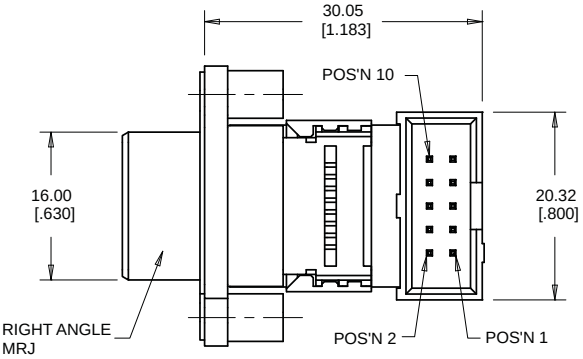
CONNECTIONS CHART

MRJ 8 Position	Header Position
Shell/GND	2 & 9
1	10
2	7
3	8
4	5
5	6
6	3
7	4
8	1

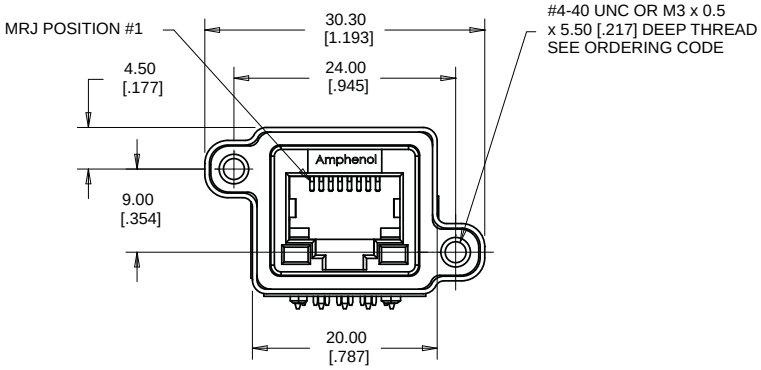
ISOMETRIC VIEW



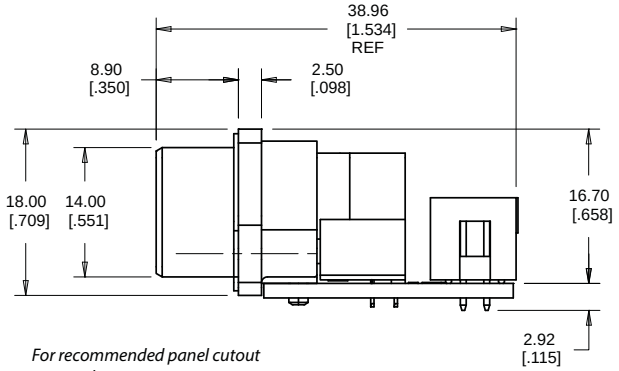
TOP VIEW



FRONT VIEW



SIDE VIEW



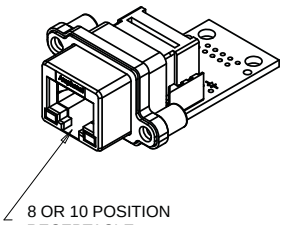
For recommended panel cutout see catalogue page 17

MRJ-5CXX-X1

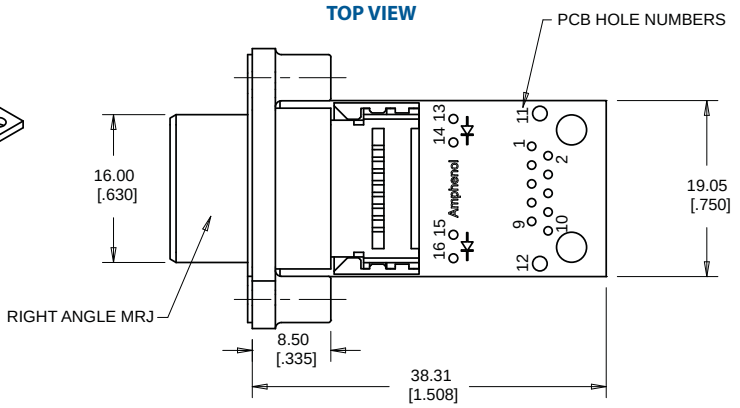
CONNECTIONS CHART

MRJ Connector Type		PCB Hole Number
8 Position	10 Position	
Shell/GND	Shell/GND	11 & 12
-	1	1
1	2	2
2	3	3
3	4	4
4	5	5
5	6	6
6	7	7
7	8	8
8	9	9
-	10	10
LED 1	LED 1	13
LED 2	LED 2	14
LED 3	LED 3	15
LED 4	LED 4	16

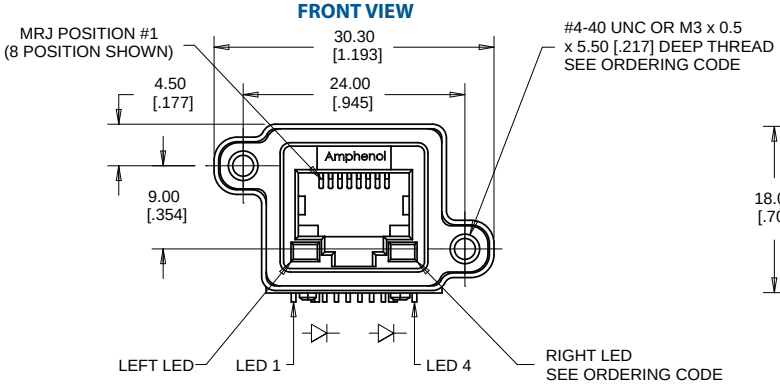
ISOMETRIC VIEW



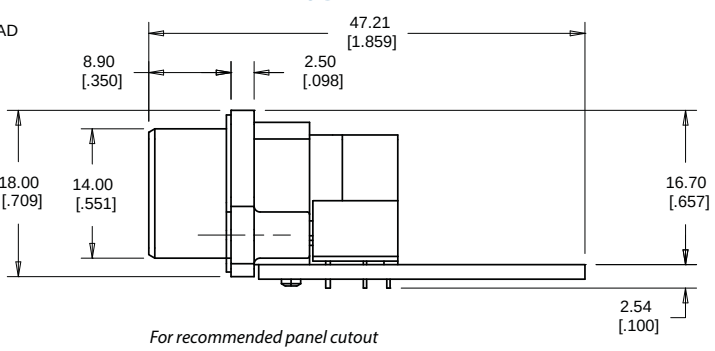
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 17

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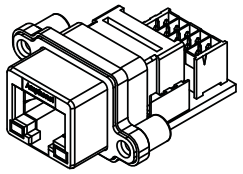
MRJ-5D8X-X1

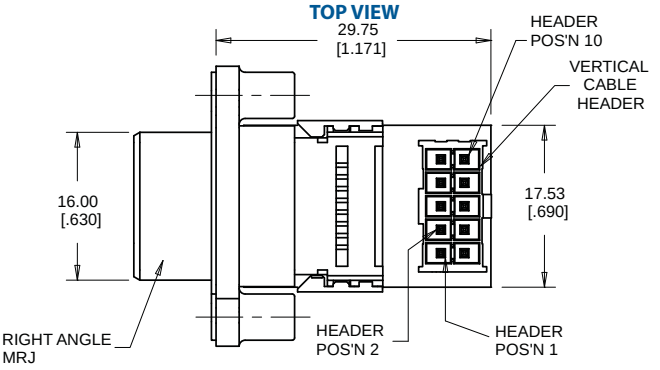
CONNECTIONS CHART

MRJ 8 Position	Header Position
Shell/GND	1 & 10
1	5
2	9
3	4
4	8
5	3
6	7
7	2
8	6

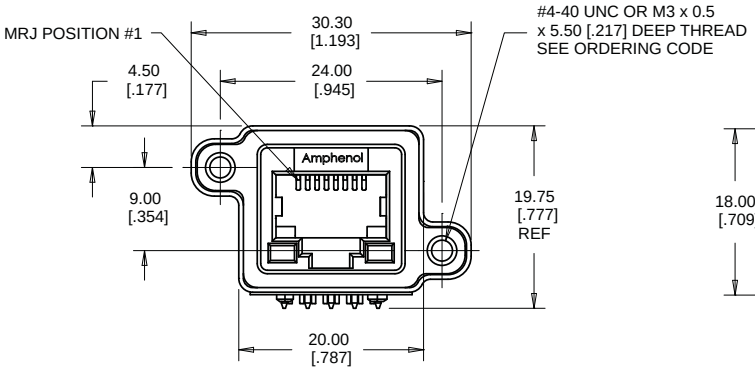
ISOMETRIC VIEW



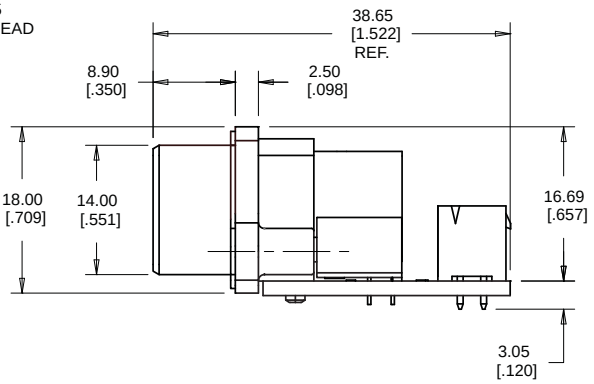
TOP VIEW



FRONT VIEW

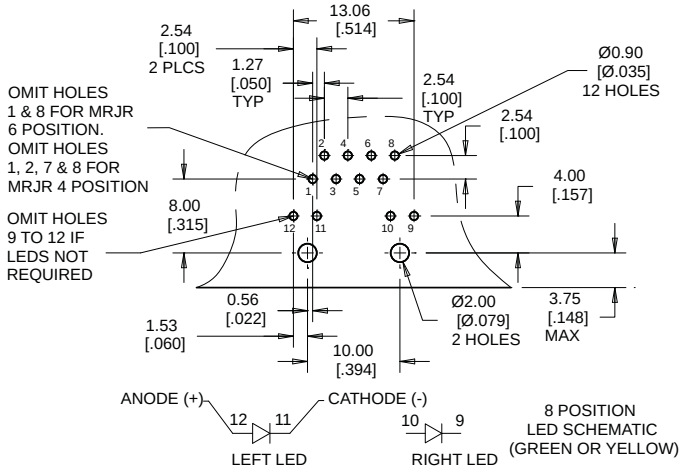


SIDE VIEW

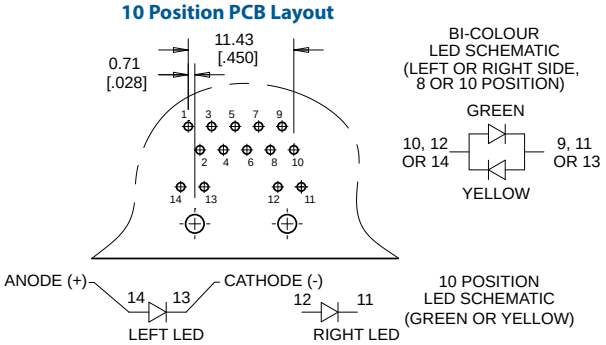


For recommended panel cutout see below

Recommended PCB Layout (Right Angle)

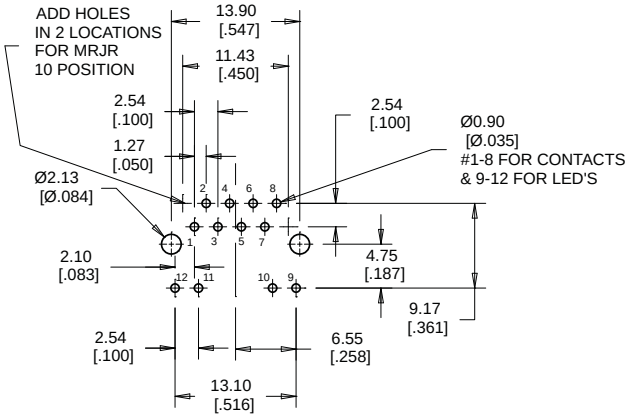


10 Position PCB Layout

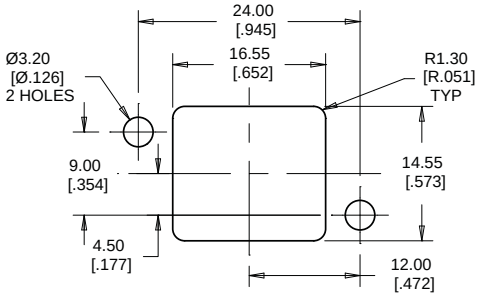


Recommended PCB & Panel Layouts

Recommended PCB Layout (Vertical)



Panel Cutout



MUSBR SERIES GENERATION 2 RUGGED USB

Specifications

Connectors are designed to conform to the requirements of the USB 2.0 specification.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Nickel Plated
Insulator Housing:	High Temperature Resistant Engineering Thermoplastic, Glass Reinforced, UL94V-0, Black
Contacts:	Phosphor Bronze, Plated with 0.76µm (30µ") min Gold over 1.27µm (50µ") min Nickel on the Mating Area and 2.54µm (100µ") min Matte Tin over Nickel on the Contact Tails
Internal Shield & Rear Shield:	Stainless Steel, Passivated
Panel Gasket:	Conductive Silicone Rubber, Black
Internal O-ring:	Silicone Rubber, Beige
PCB:	FR4 Fibreglass, Lead Free
Additional Connector:	UL Recognized Component

Electrical

Current Rating:	*Standard A* - 30 mA max per Contact ($\Delta T \leq 30°C$) *Mini* - 1A max per Contact ($\Delta T \leq 30°C$)
Contact Resistance:	*Standard A* - 30 mΩ max *Mini* - 50 mΩ max
Insulation Resistance:	*Standard A* - 1000 MΩ min *Mini* - 100 MΩ min
DWV:	*Standard A* - 500 VAC rms *Mini* - 100 VAC rms

Mechanical, Environmental, Regulatory

UL Recognition:	Level DUXR2, File Number E135615, see Listing
Water & Dust Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-40°C to +105°C
Insertion Force:	Per EIA-364-13, 35N (7.9lb_f) max
Extraction Force:	Per EIA-364-13, *Standard A* - 10N (2.2lb_f) min *Mini* - 7N (1.6lb_f) min Initial, 3N (0.7lb_f) min after Durability
Durability:	Per EIA 364-09, *Standard A* - 1500 Mating Cycles *Mini* - 5000 Mating Cycles
Vibration:	Per EIA 364-28 Random Condition V, Letter A No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition H (11 ms, 30, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -40°C to +125°C, 5 Cycles
Humidity:	Per EIA 364-31, 10 Cycles, 240 Hrs, 25°C to 65°C 90-95%RH, with -10C Cold Shock
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S & SO_2), 14 Day Exposure
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging

Application Recommendations

Recommended Mounting Screw Torque:	*Standard A* - 0.45 to 0.65N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement, *Micro* – 0.23 to 0.34N-m (2 to 3 In-lbs) for steel screws with 2.5mm (.098") thread engagement
Recommended Soldering Methods:	Manual or wave (solder temperature 260°C max, time 10s max, preheat 100-140°C)

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ORDERING CODE

MUSBR SERIES

MUSBR - X X X 1 - X X X

Rugged USB Receptacle Series, Generation 2

Receptacle Type Per USB 2.0[1]
A - Standard A Series
B - Mini B Series
E - Mini AB Series

Termination Style
1 - Right Angle
2 - Right Angle on PCB with Right Angle Cable Header
3 - Right Angle on PCB with Right Angle Matching USB Type Connector
4 - Right Angle on PCB with Terminal Blocks
5 - Vertical[2]
8 - Right Angle on PCB with Vertical Cable Header[2]
A - Right Angle on PCB with Holes for Wiring (Style 3 PCB)[3]
B - Right Angle on PCB with Vertical Single Row Isolated Header[2]
E - Right Angle on PCB with Vertical Matching USB Type Connector[2]

Number of Contacts
1 - Standard 4 Contacts per Port for Types A
5 - Standard 5 Contacts per Port for Types B & E

Insulator Housing Colour
1 - Black for Types A, B & E

Shell & Thread Options[4, 5]
3 - Standard Shell, Unified Thread
4 - Low Profile Shell for Type A, Unified Thread
5 - Rear Flange Shell for Types B & E, Unified Thread
M - Standard Shell, Metric Thread
R - Low Profile Shell for Type A, Metric Thread
T - Rear Flange Shell for Types B & E, Metric Thread

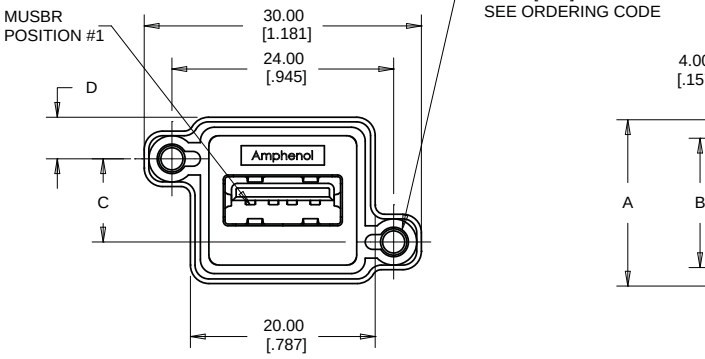
Dust Cover Options[6]
0 - With No Dust Cover
1 - With Grey Dust Cover
5 - With Black Dust Cover

Unique Special Code[7]
No Digit - Part Defined by Previous Digits of Part Number
1 to 9 - Identifies Unique Special Features
Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details.

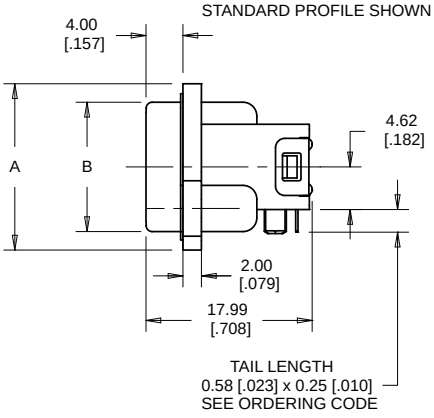
Notes:
1) For a Micro AB receptacle with epoxy free design, refer to MUSB series receptacle type K.
2) Termination styles 8, B & E are currently available for receptacle type A only.
3) Termination style A uses the PCB from termination style 3.
4) For receptacle type A (Standard A Series), the term standard shell relates to the shell profile. For receptacle types B & E (Mini B & Mini AB), the term standard shell relates to the position of the flange. It is not an indication of connector availability.
5) For receptacle type A (Standard A Series), the unified thread is #4-40UNC and the metric thread is M3 x 0.5. For receptacle types B & E (Mini B & Mini AB), the unified thread is #2-56UNC and the metric thread is M2.5 x 0.45.
6) When dust covers are supplied with the connector, they are not installed. They are supplied in bulk inside each package of connectors.
7) Consult with Amphenol for additional termination styles, solder cup contacts, contact tail lengths, mounting styles, non-conductive gaskets or other requirements of interest. See catalogue Accessories page for dust cover options.

MUSBR-A111-XX

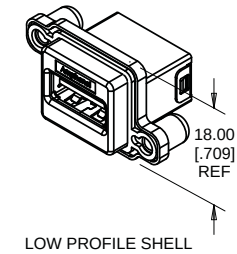
FRONT VIEW
STANDARD PROFILE SHOWN



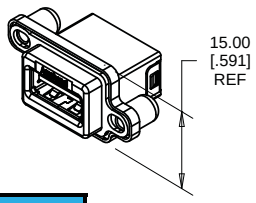
SIDE VIEW
STANDARD PROFILE SHOWN



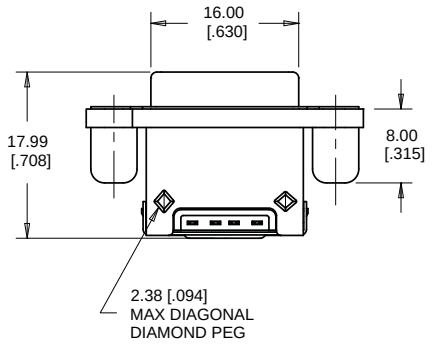
ISOMETRIC VIEWS
STANDARD PROFILE SHELL



LOW PROFILE SHELL



BOTTOM VIEW



CONNECTIONS CHART

Dimensions	Standard Profile	Low Profile
A	18.00	15.00
B	14.00	11.00
C	9.00	6.35
D	4.50	3.00

For recommended panel cutout & PCB layout see catalogue page 26

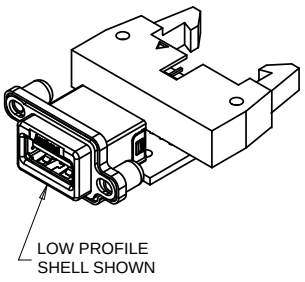
MUSBR-A211-XX

CONNECTIONS CHART

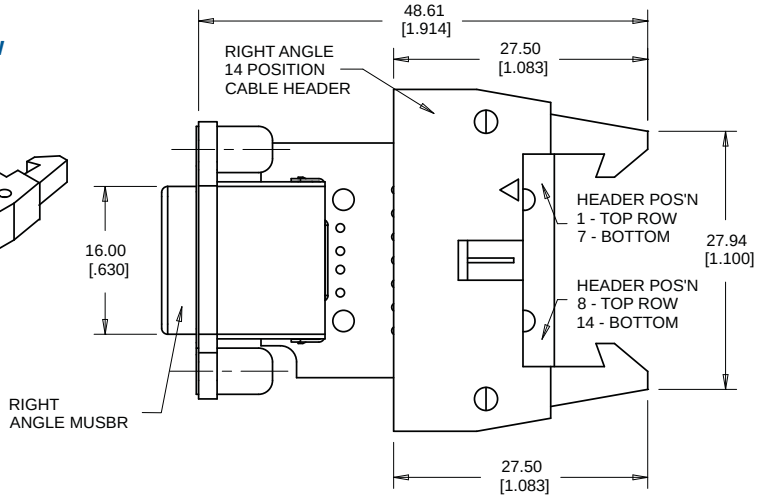
Rugged USB Receptacle	Cable Header
Shell/GND	1
1	14
2	13
3	12
4	11

Dimensions	Standard Profile	Low Profile
A	18.00	15.00
B	14.00	11.00
C	9.00	6.35
D	4.50	3.00
E	13.62	12.12

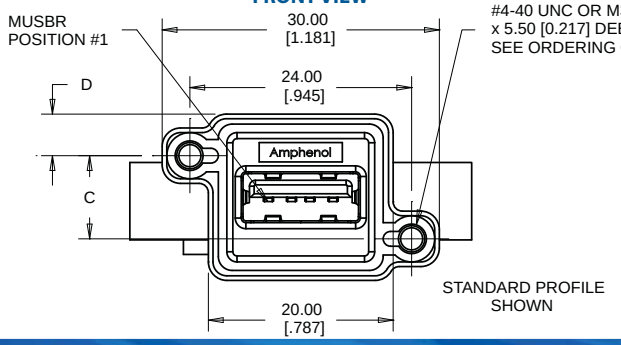
ISOMETRIC VIEW



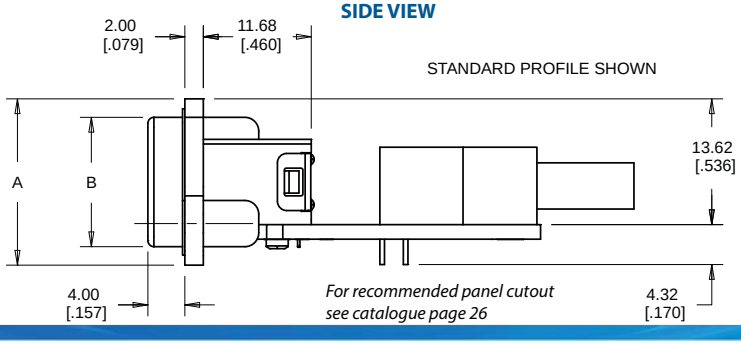
TOP VIEW



FRONT VIEW



SIDE VIEW
STANDARD PROFILE SHOWN



For recommended panel cutout see catalogue page 26

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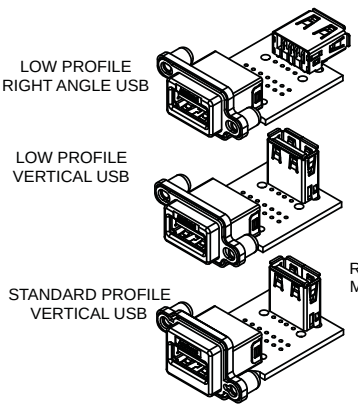
MUSBR-A311-XX MUSBR-AE11-XX

CONNECTIONS CHART

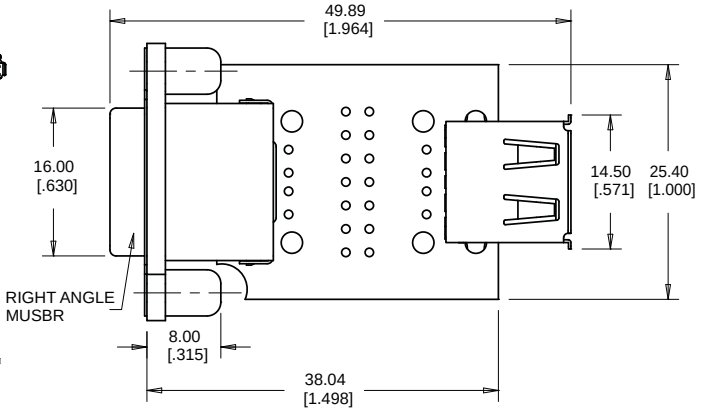
MUSB Contact	USB Position
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4

Dimension	Standard Profile	Low Profile
A	18.00	15.00
B	14.00	11.00
C	9.00	6.35
D	4.50	3.00
E	13.62	12.12

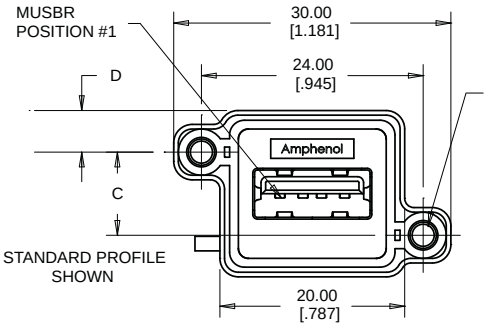
ISOMETRIC VIEWS



TOP VIEW

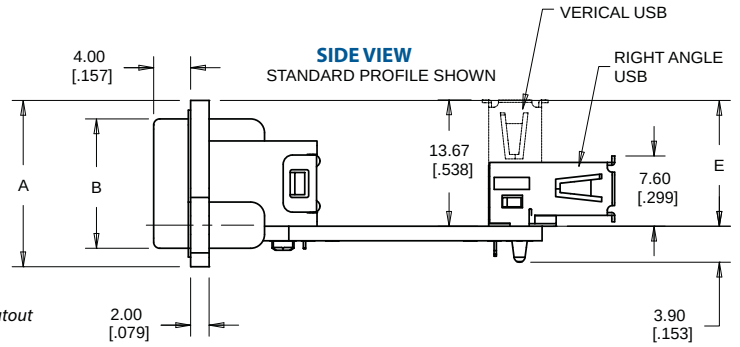


FRONT VIEW



SIDE VIEW

STANDARD PROFILE SHOWN



For recommended panel cutout see catalogue page 26

MUSBR-A411-XX

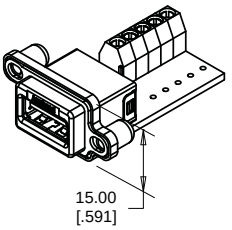
CONNECTIONS CHART

MUSBR Position	Terminal Position
Shell/GND	5
1	1
2	2
3	3
4	4

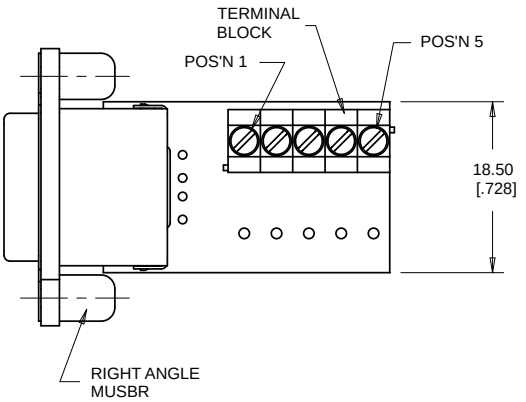
Dimension	Standard Profile	Low Profile
A	18.00	15.00
B	14.00	11.00
C	9.00	6.35
D	4.50	3.00
E	13.62	12.12

ISOMETRIC VIEW

LOW PROFILE

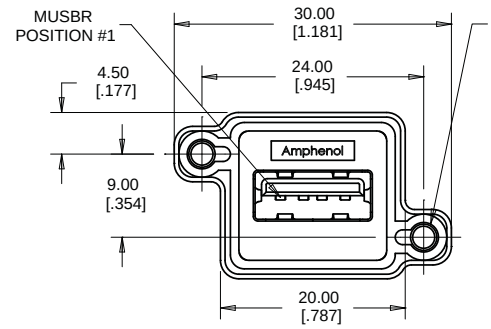


TOP VIEW



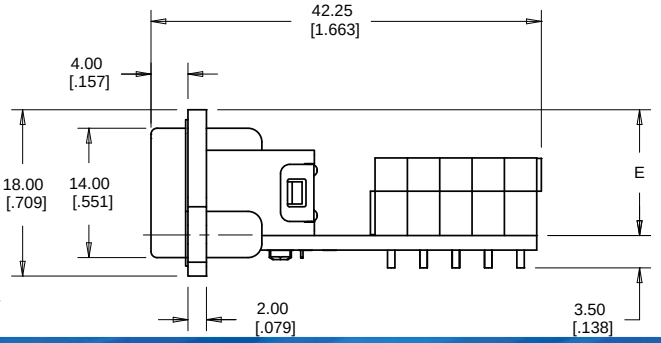
FRONT VIEW

STANDARD PROFILE SHOWN



SIDE VIEW

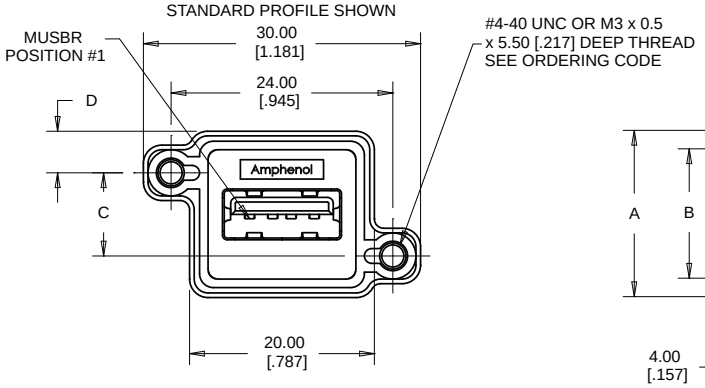
STANDARD PROFILE SHOWN



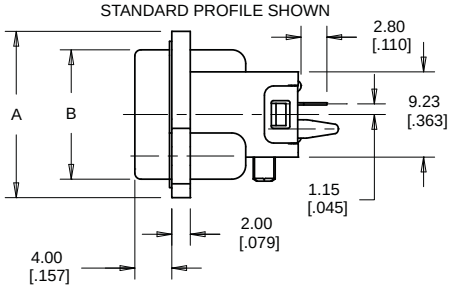
For recommended panel cutout see catalogue page 26

MUSBR-A511-XX

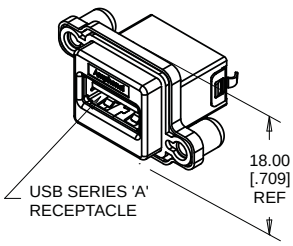
FRONT VIEW
STANDARD PROFILE SHOWN



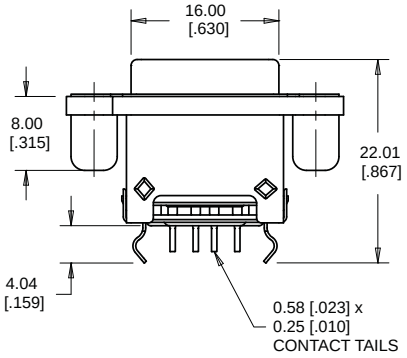
SIDE VIEW
STANDARD PROFILE SHOWN



ISOMETRIC VIEWS
STANDARD PROFILE SHELL



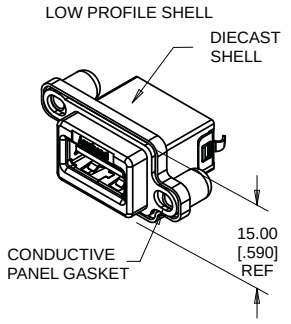
BOTTOM VIEW



CONNECTIONS CHART

Dimension	Standard Profile	Low Profile
A	18.00	15.00
B	14.00	11.00
C	9.00	6.35
D	4.50	3.00

LOW PROFILE SHELL



For recommended panel cutout & PCB layout see catalogue page 26

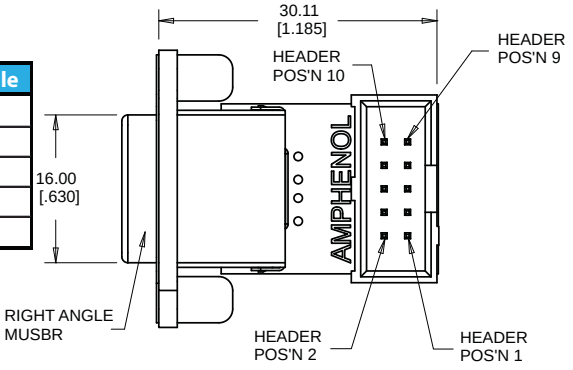
MUSBR-A811-XX

CONNECTIONS CHART

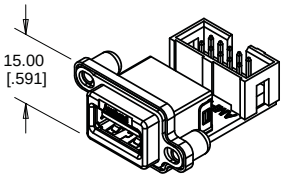
Rugged USB Receptacle	Cable Header
Shell/GND	2 & 9
1	10
2	8
3	6
4	4

Dimension	Standard Profile	Low Profile
A	18.00	15.00
B	14.00	11.00
C	9.00	6.35
D	4.50	3.00
E	13.62	12.12

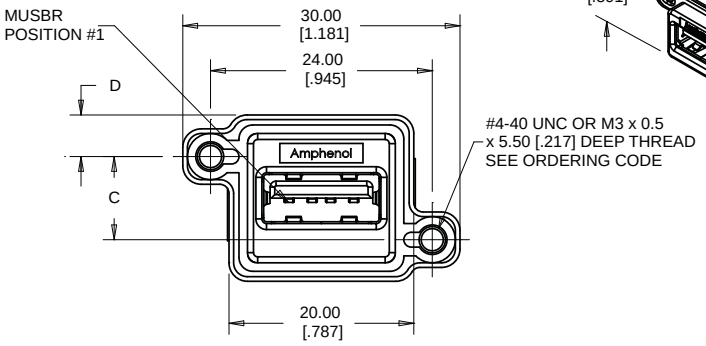
TOP VIEW



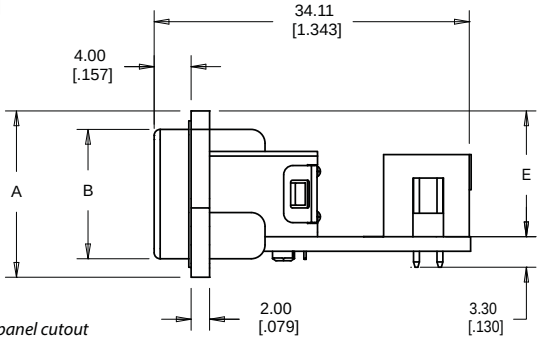
ISOMETRIC VIEW
LOW PROFILE SHELL



FRONT VIEW
STANDARD PROFILE SHOWN



SIDE VIEW
STANDARD PROFILE SHOWN



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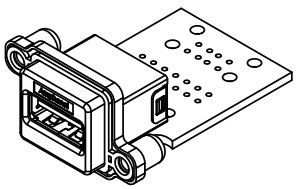
MUSBR-AA11-XX

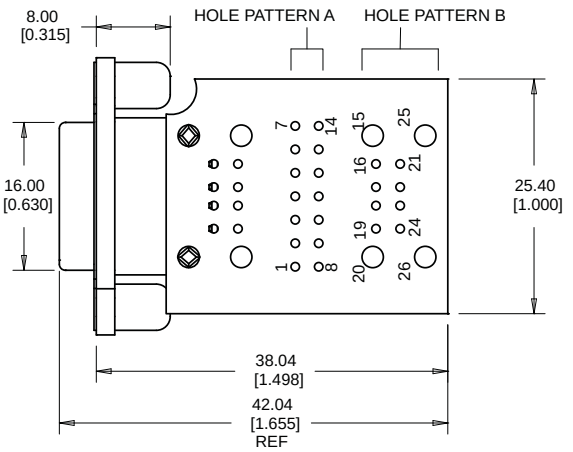
CONNECTIONS CHART

Rugged USB Receptacle	Cable Header
Shell/GND	2 & 9
1	10
2	8
3	6
4	4

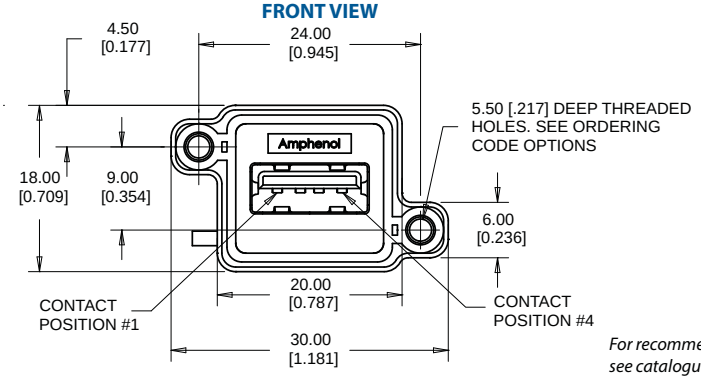
ISOMETRIC VIEW



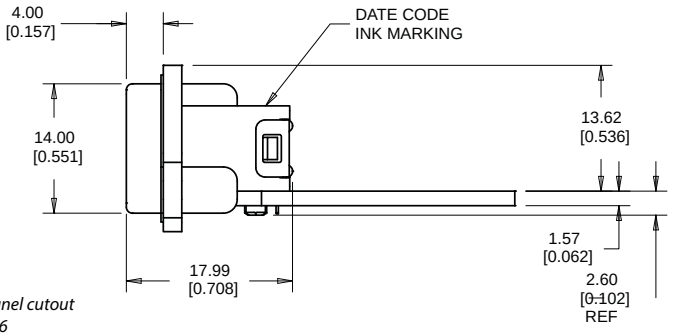
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



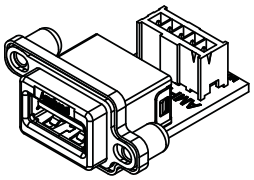
For recommended panel cutout
see catalogue page 26

MUSBR-AB11-XX

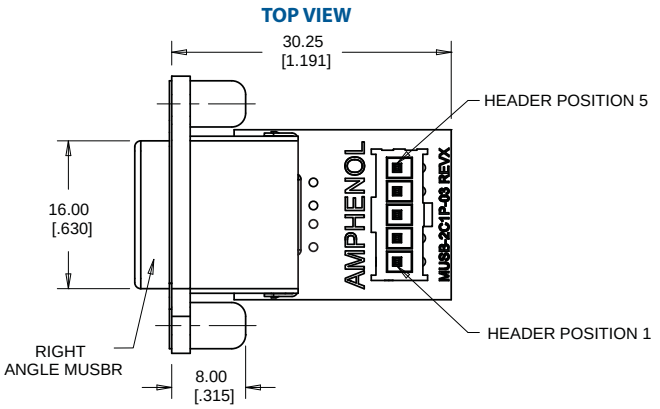
CONNECTIONS CHART

Rugged USB Receptacle	Header Position
Shell/GND	1
1	5
2	4
3	3
4	2

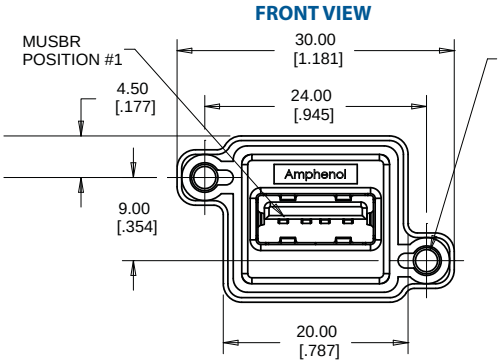
ISOMETRIC VIEW



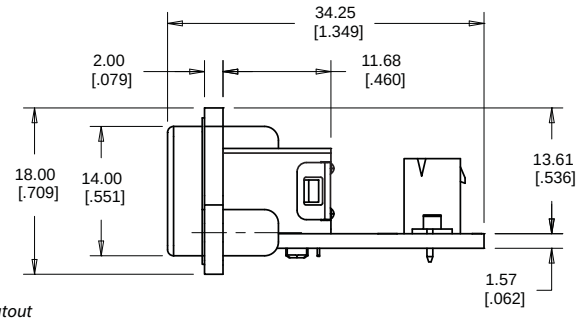
TOP VIEW



FRONT VIEW



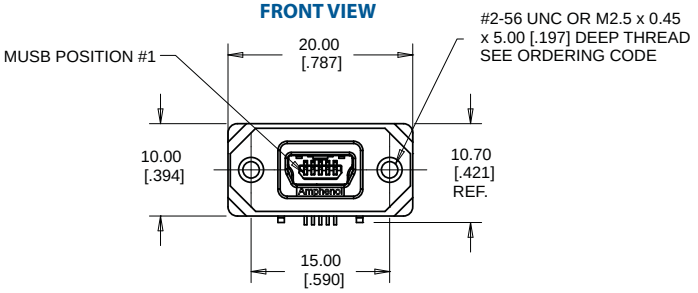
SIDE VIEW



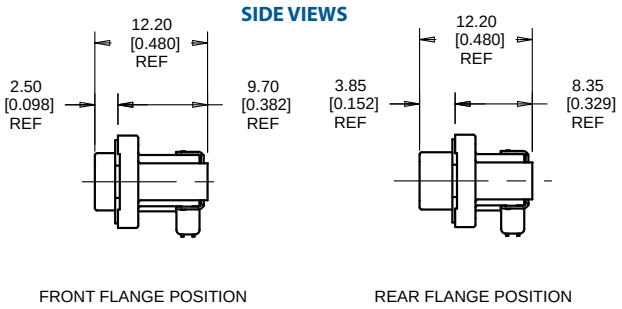
For recommended panel cutout
see catalogue page 26

MUSBR-B151-XX MUSBR-E151-XX

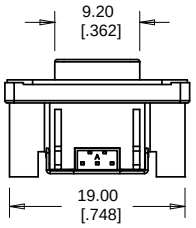
FRONT VIEW



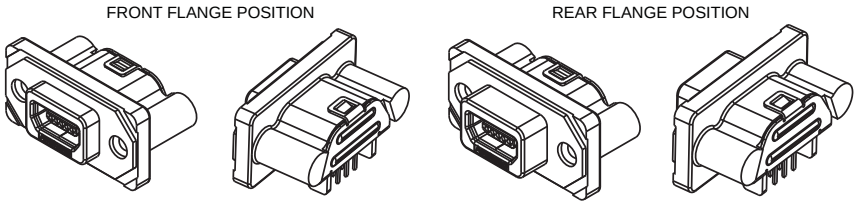
SIDE VIEWS



BOTTOM VIEW



ISOMETRIC VIEWS



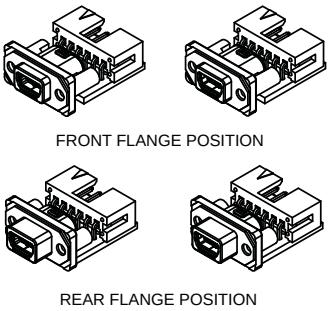
For recommended panel cutout & PCB layout see catalogue page 26

MUSBR-B251-XX MUSBR-E251-XX

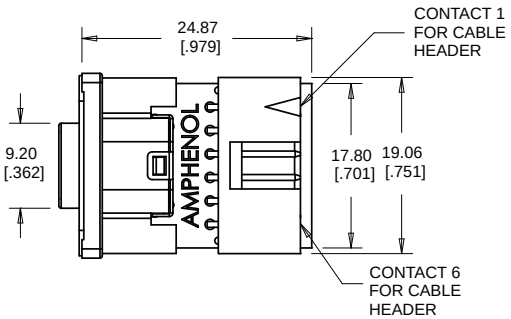
CONNECTIONS CHART

Mini-B USB Receptacle	Cable Header
Shell/GND	6
1	1
2	2
3	3
4	4
5	5

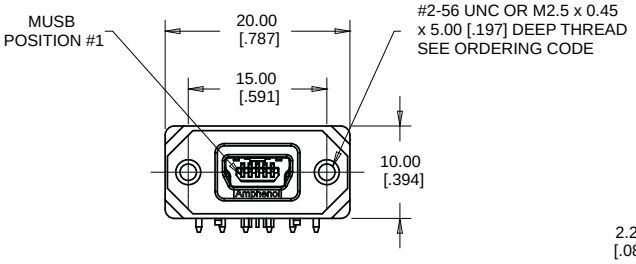
ISOMETRIC VIEWS



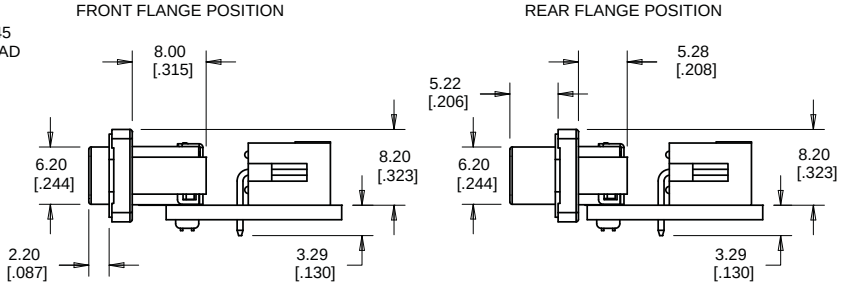
TOP VIEW



FRONT VIEW



SIDE VIEWS



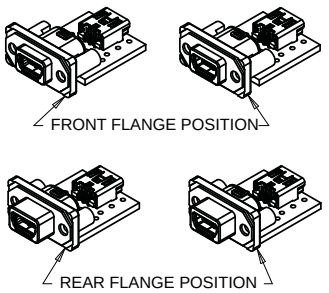
For recommended panel cutout see catalogue page 26

MUSBR-B351-XX MUSBR-E351-XX

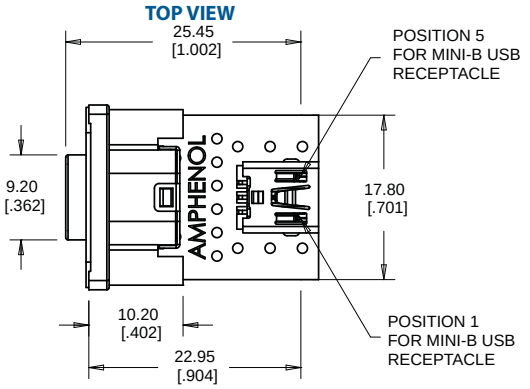
CONNECTIONS CHART

Mini-B USB Receptacle	Terminal Position
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4
5	5

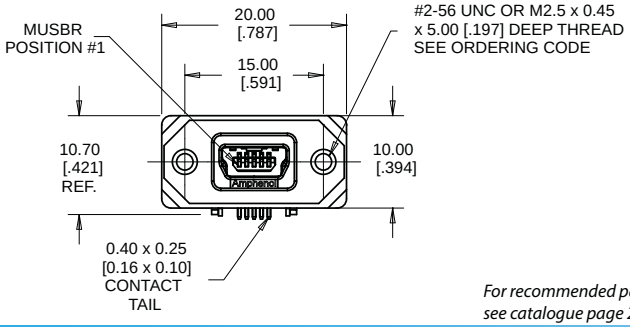
ISOMETRIC VIEWS



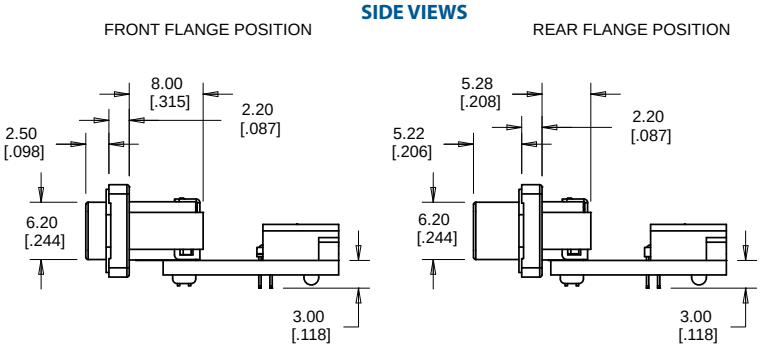
TOP VIEW



FRONT VIEW



SIDE VIEWS



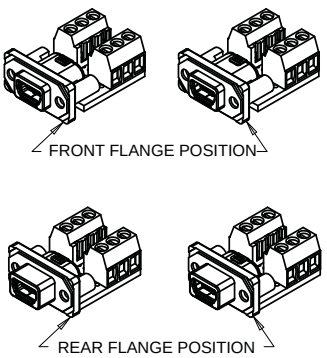
For recommended panel cutout
see catalogue page 26

MUSBR-B451-XX MUSBR-E451-XX

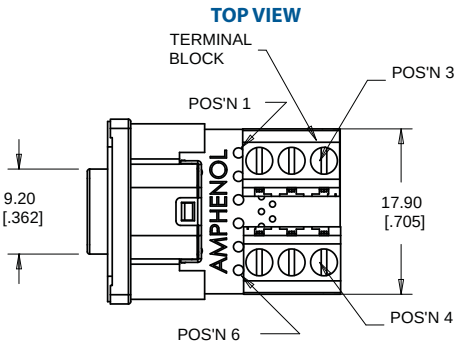
CONNECTIONS CHART

Mini-B USB Receptacle	Terminal Position
Shell/GND	6
1	1
2	2
3	3
4	4
5	5

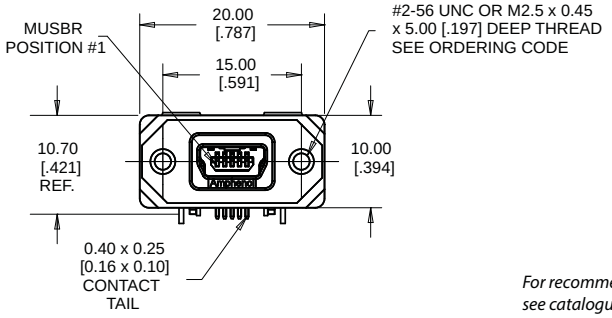
ISOMETRIC VIEWS



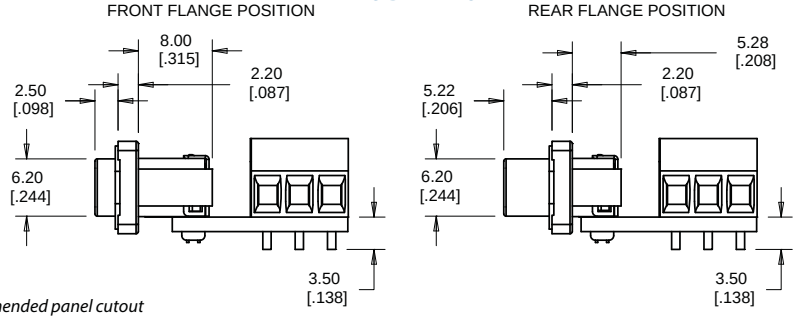
TOP VIEW



FRONT VIEW



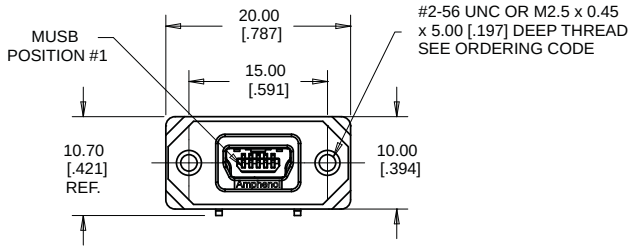
SIDE VIEWS



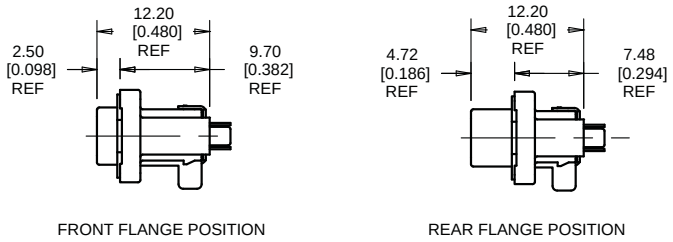
For recommended panel cutout
see catalogue page 26

MUSBR-B511-XX MUSBR-E511-XX

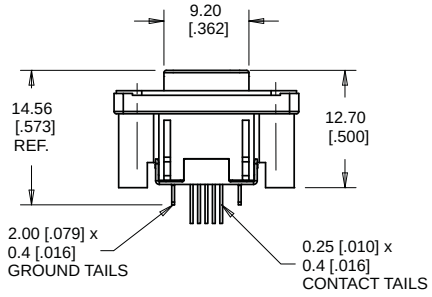
FRONT VIEW



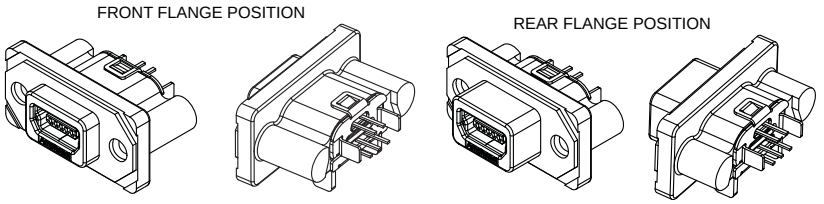
SIDE VIEWS



BOTTOM VIEW



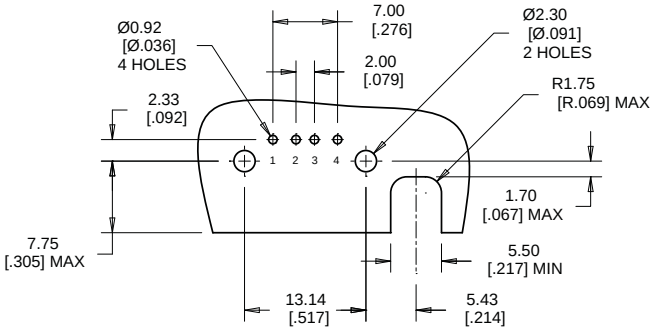
ISOMETRIC VIEWS



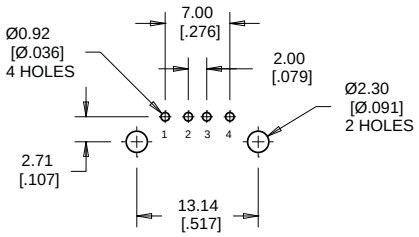
For recommended panel cutout & PCB layout see below

Recommended PCB & Panel Layouts

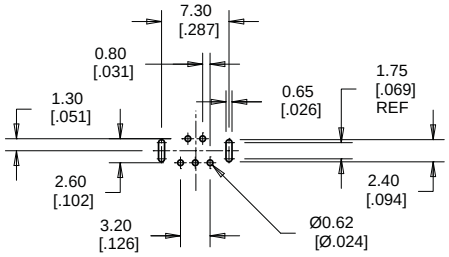
MUSBR-A111-XX



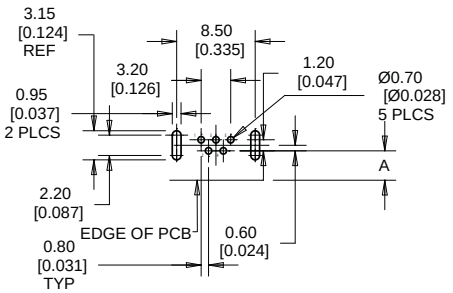
MUSBR-A511-XX



MUSBR-B551-XX

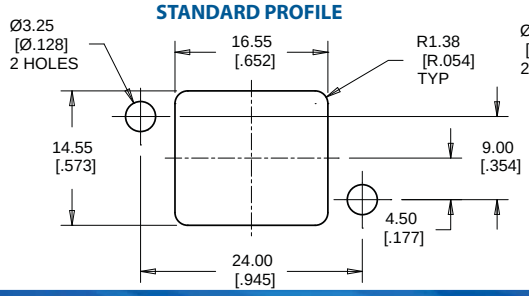


MUSBR-B151-XX

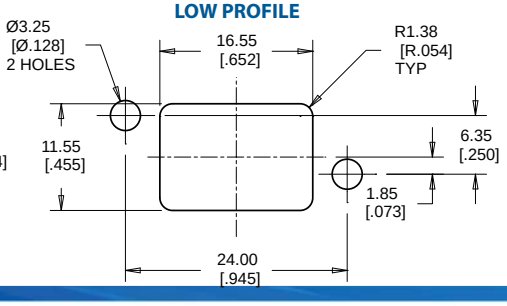


Part No.	Dimension "A"
MUSBR-B151-3X	4.53 [.178] max
MUSBR-B151-5X	3.18 [.125] max

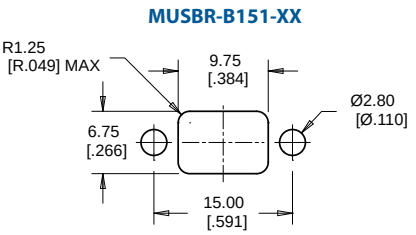
STANDARD PROFILE



LOW PROFILE



MUSBR-B151-XX



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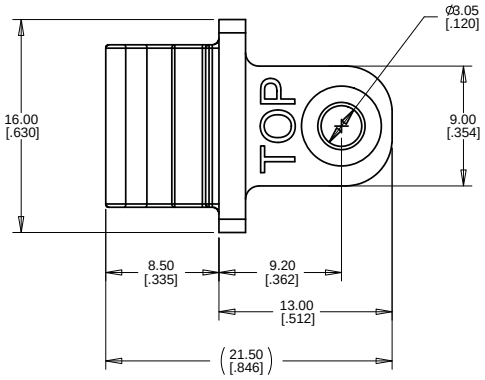
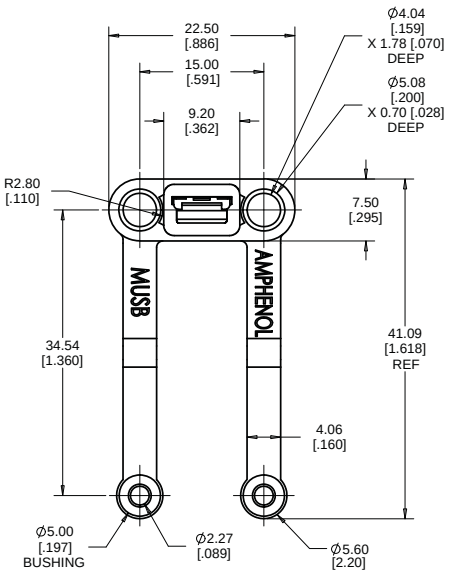
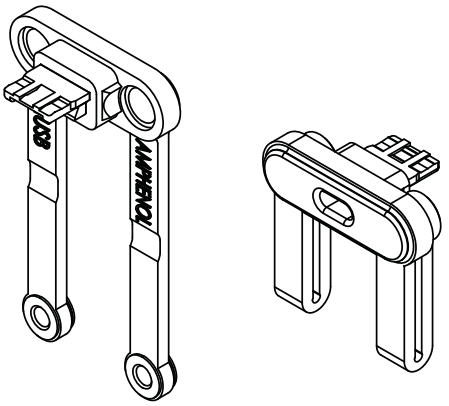
MUSB/MUSBR Accessories

MUSB-2A111-027BP (Black)

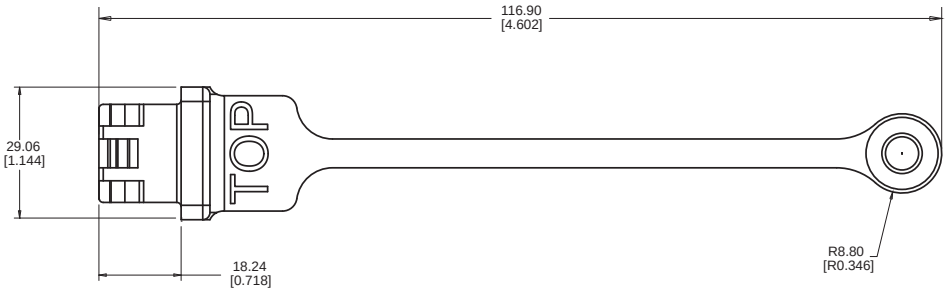




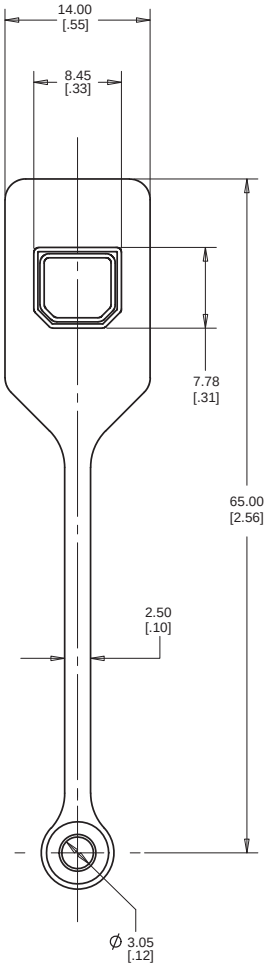
MUSB-2E151-006BP (Grey)
MUSB-2E151-016BP (Black)



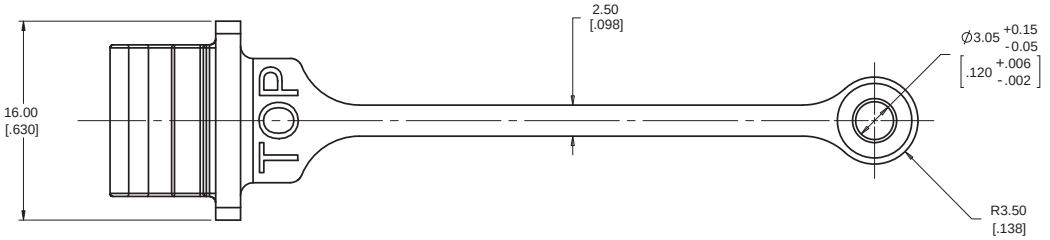
MUSB-2E151-005BP (Grey)
MUSB-2E151-015B (Black)



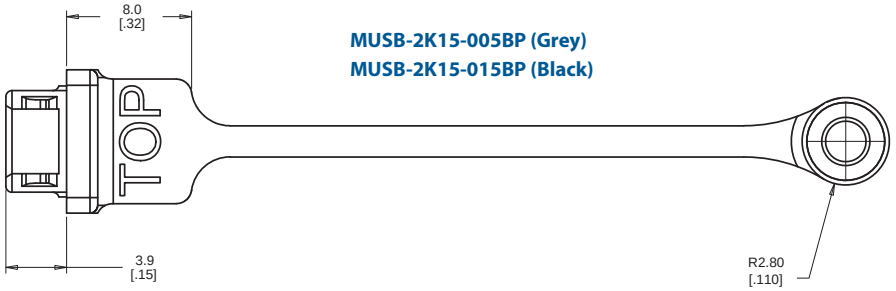
MUSB-2D11-004BP (Grey)
MUSB-2D11-014BP (Black)



MUSB-2A111-014BP (Grey)
MUSB-2A111-024BP (Black)



MUSB-2K15-005BP (Grey)
MUSB-2K15-015BP (Black)



Note: All dust covers are made from silicone rubber with mickel plated brass mounting bushings

Specifications

Connectors are designed to conform to the requirements of the USB 2.0 specification.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Nickel Plated
Insulator Housing:	High Temperature Resistant Engineering Thermoplastic, Glass Reinforced, UL94V-0, See Ordering Code for Colour
Contacts:	Phosphor Bronze or Bronze Alloy Plated with 0.76µm (30µ") min Gold over 1.27µm (50µ") min Nickel on the Mating Area and 2.54µm (100µ") min Matte Tine over Nickel on the Contact Tails
Internal Shield & Rear Shield:	Copper or Steel Alloy, Nickel Plated or Stainless Steel, Passivated
Panel Gasket:	*Standard A & B* - Silicone Rubber, Black *Mini & Micro* - Cellular Arethane Foam, Black
Internal O-ring:	*Micro* - Silicone Rubber, Beige
PCB:	FR4 Fibreglass, Lead Free
Additional Connector:	UL Recognized Component

Electrical

Standard A & B	
Current Rating:	1.5A max. per contact (ΔT ≤ 30°C)
Contact Resistance:	30 mΩ max.
Insulation Resistance:	1000 MΩ min.
DWV:	500V AC rms
Mini	
Current Rating:	1.0A max. per contact (ΔT ≤ 30°C)
Contact Resistance:	50 mΩ max.
Insulation Resistance:	100 MΩ min.
DWV:	100V AC rms
Micro	
Current Rating:	1.5A max for signal contacts 2, 3 & 4 or 1.8A max. for power contacts 1 & 5 with 0.5A max. for signal contacts 2, 3 & 4 (ΔT ≤ 30°C)
Contact Resistance:	30 mΩ max.
Insulation Resistance:	100 MΩ min.
DWV:	100V AC rms

Mechanical, Environmental, Regulatory

UL Recognition:	Level DUXR2, File Number E135615, see Listing
Water & Dust Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-40°C to +105°C
Insertion Force:	Per EIA-364-13, 35N (7.9lb_f) max
Extraction Force:	Per EIA-364-13: *Standard A & B* - 10N (2.2lb_f) min *Mini* - 7N (1.6lb_f) min Initial, 3N (0.7lb_f) min after Durability *Micro* - 8N (1.8lb_f) min after Durability
Durability:	Per EIA 364-09: *Standard A & B* - 1500 Mating Cycles *Mini* - 5000 Mating Cycles *Micro* - 10 000 Mating Cycles
Vibration:	Per EIA 364-28 Random Condition V, Letter A No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition H (11 ms, 30, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -40°C to +125°C, 5 Cycles
Humidity:	Per EIA 364-31, 10 Cycles, 240 Hrs, 25°C to 65°C 90-95%RH, with -10C Cold Shock
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S & SO_2), 14 Day Exposure
Salt Spray:	Per EIA 364-26, 250 Hours, 5% Salt, 35°C
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging

Application Recommendations

Recommended Mounting Screw Torque:	*Standard A & B* - 0.45 to 0.65N-m (4 to 7.5In-lbs) for steel crews with 3mm (.118") thread engagement, *Mini & Micro* - 0.23 to 0.34N-m (2 to 3In-lbs) for steel screws with 2.5mm (.098") thread engagement
Recommended Soldering Methods:	Manual or wave (solder temperature 260°C max, time 10s max, preheat 100-140°C)

MUSB SERIES

MUSB - X X X X - X X X

Rugged USB Receptacle Series, Generation 1

Receptacle Type Per USB 2.0
A - Standard A Series
B - Mini B Series
C - Standard A Series Stacked
D - Standard B Series
E - Mini AB Series
K - Micro AB Series[1]

Termination Style
1 - Right Angle
2 - Right Angle on PCB with Right Angle Cable Header[2]
3 - Right Angle on PCB with Right Angle Matching USB Type Connector[2]
4 - Right Angle on PCB with Terminal Blocks[2]
5 - Vertical[2]
8 - Right Angle on PCB with Vertical Cable Header[3]
A - Right Angle on PCB with Holes for Wiring (Style 3 PCB)[2, 4]
B - Right Angle on PCB with Vertical Single Row Isolated Header[5]
D - Right Angle on PCB with Vertical Dual Row Isolated Header[6]
E - Right Angle on PCB with Vertical Matching USB Type Connector[7]

Number of Contacts
1 - Standard 4 Contacts per Port for Types A, C & D
5 - Standard 5 Contacts per Port for Types B, E & K

Insulator Housing Colour
1 - Black for Types A, B, C & E, White for Type D
2 - Grey for Type K

Rear Shield and Thread Options[8, 9]
0 - No Rear Shield, Unified Thread
3 - With Rear Shield, Unified Thread
M - With Rear Shield, Metric Thread
N - No Rear Shield, Metric Thread

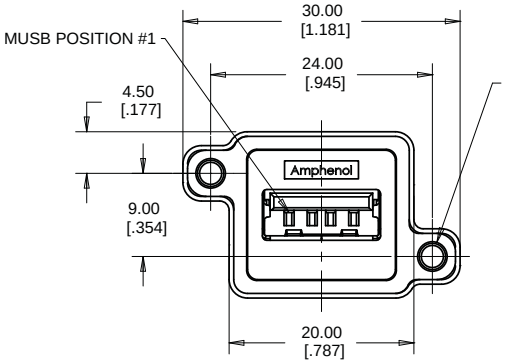
Dust Cover Options[10]
0 - With No Dust Cover[11]
1 - With Grey Dust Cover
5 - With Black Dust Cover

Unique Special Code[12]
No Digit - Part Defined by Previous Digits of Part Number
1 to 9 - Identifies Unique Special Features
Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details.

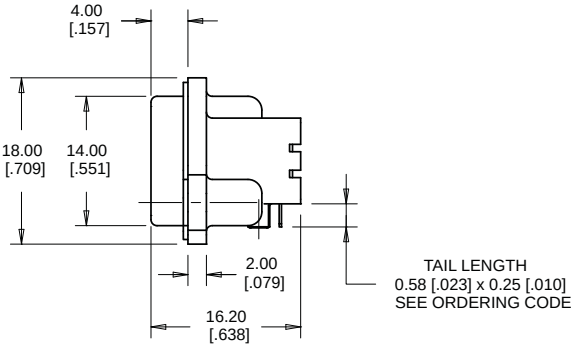
Notes:
1) Receptacle type K (Micro AB) is a generation 2 epoxy free design. It is currently available in right angle only. Consult with Amphenol for the availability of the vertical version.
2) Termination styles 2, 3, 4, 5 & A are currently available for receptacle types A, B, C, D & E only.
3) Termination style 8 is currently available for receptacle types A, C & D only.
4) Termination style A uses the PCB from termination style 3.
5) Termination style B is currently available for receptacle types A & D only.
6) Termination style D is currently available for receptacle type C only.
7) Termination style E is currently available for receptacle types A & C only.
8) Rear shields are optional for receptacle types B & E (Mini B & Mini AB) with right angle termination style. Rear shields are required for all other types with right angle terminations. Rear shields are not available for vertical termination style.
9) For receptacle types A, C & D (Standard A & B Series), the unified thread is #4-40UNC and the metric thread is M3x0.5. For receptacle types B, E & K (Mini B, Mini AB & Micro AB), the unified thread is #2-56UNC and the metric thread is M2.5x0.45.
10) When dust covers are supplied with the connector, they are not installed. They are supplied in bulk inside each package of connectors. For receptacle type C (Standard A Series Stacked), two dust covers are supplied per connector.
11) For receptacle types B & E (Mini B & Mini AB), dust cover code 4 is frequently used. Code 4 connectors are identical to code 0. For example, part number MUSB-B151-34 is identical to MUSB-B151-30.
12) Consult with Amphenol for additional termination styles, solder cup contacts, mounting styles, conductive gaskets or other requirements of interest. See catalogue Accessories pages for dust cover options.

MUSB-A111-XX

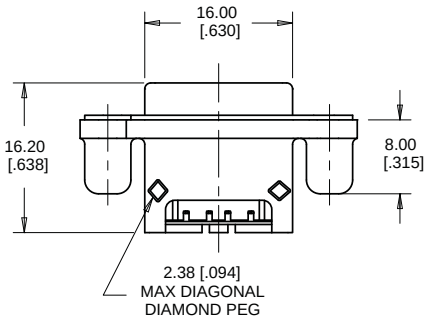
FRONT VIEW



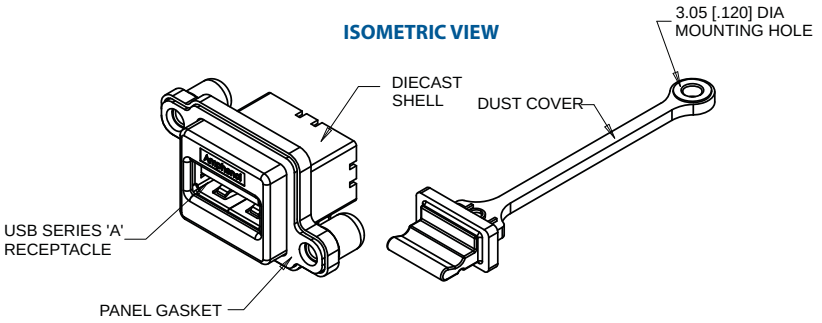
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEW



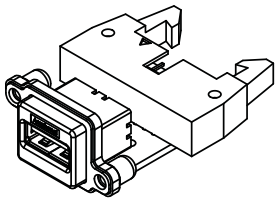
For recommended panel cutout
& PCB layout see catalogue page 44-45

MUSB-A211-XX

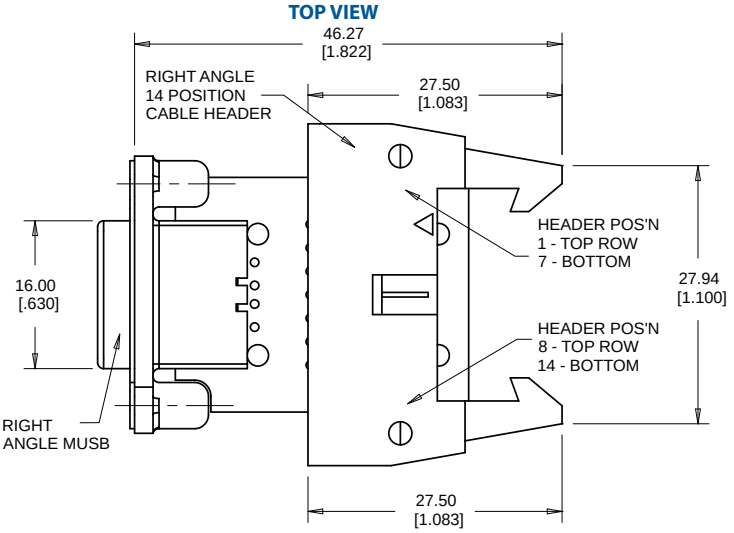
CONNECTIONS CHART

Rugged USB Receptacle	Cable Header
Shell/GND	1
1	14
2	13
3	12
4	11

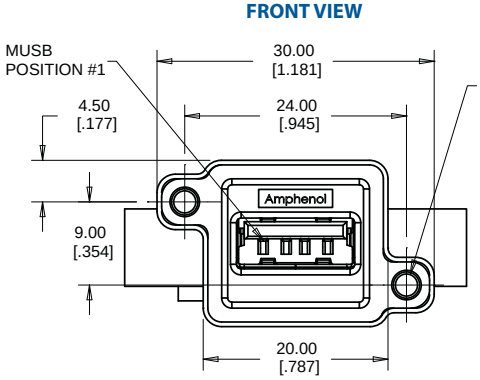
ISOMETRIC VIEW



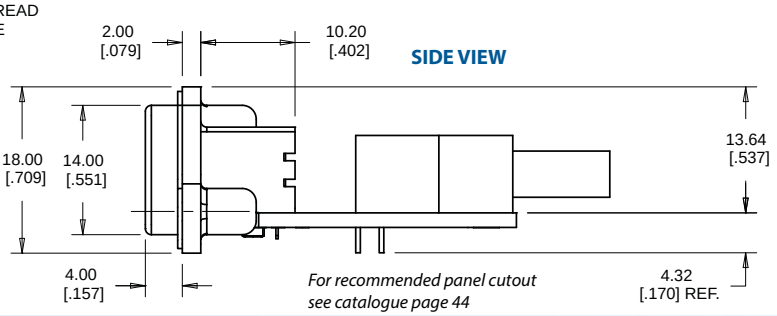
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout
see catalogue page 44

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MUSB SERIES

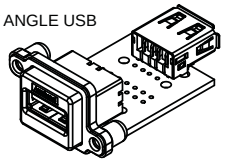
MUSB-A311-XX MUSB-AE11-XX

CONNECTIONS CHART

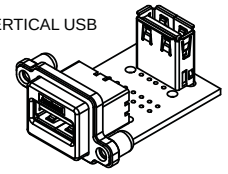
MUSB Contact	USB Contact
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4

ISOMETRIC VIEWS

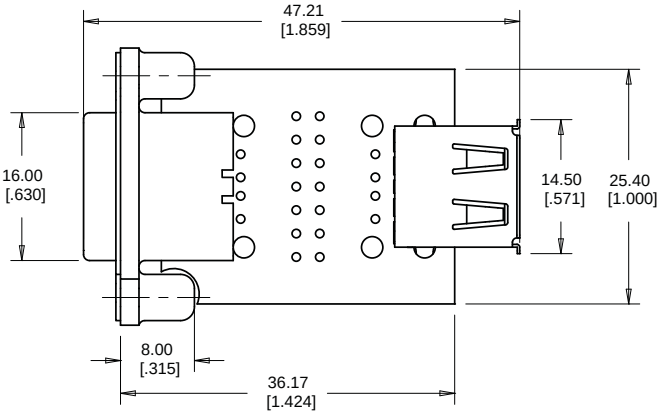
RIGHT ANGLE USB



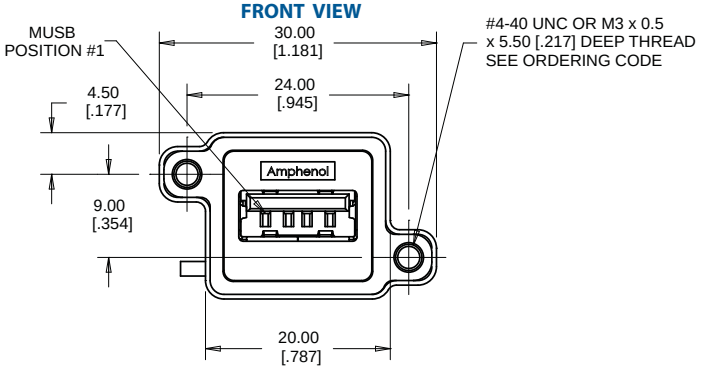
VERTICAL USB



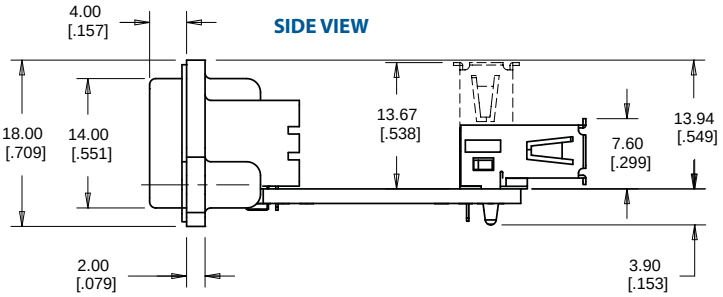
TOP VIEW



FRONT VIEW



SIDE VIEW



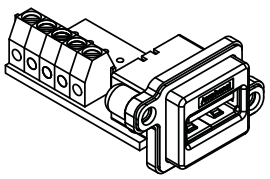
For recommended panel cutout see catalogue page 44

MUSB-A411-XX

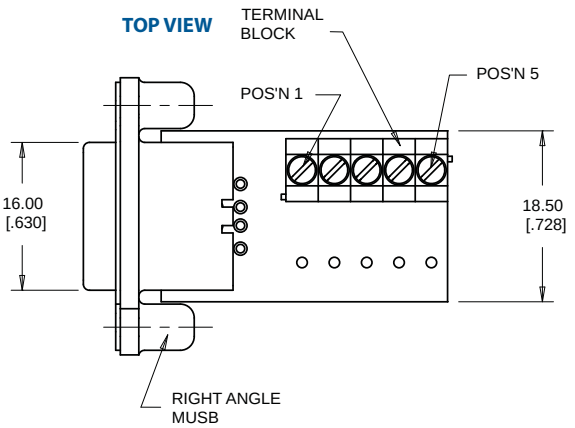
CONNECTIONS CHART

MUSB Position	Terminal Position
Shell/GND	5
1	1
2	2
3	3
4	4

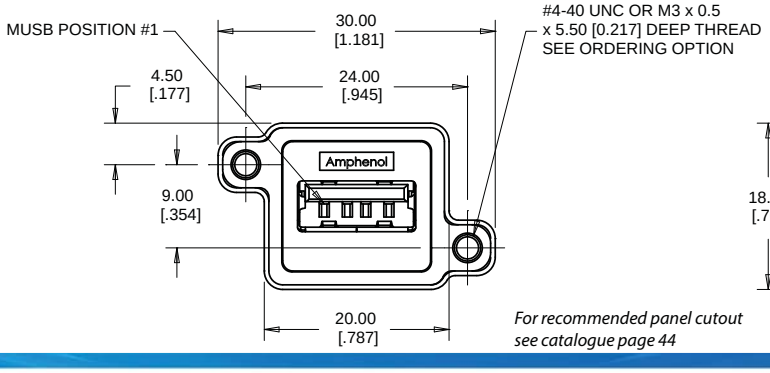
ISOMETRIC VIEW



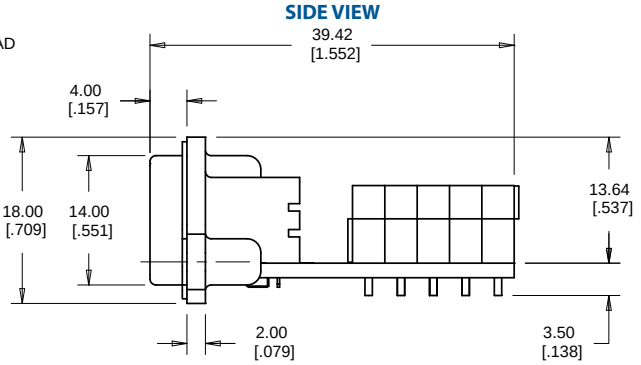
TOP VIEW



FRONT VIEW



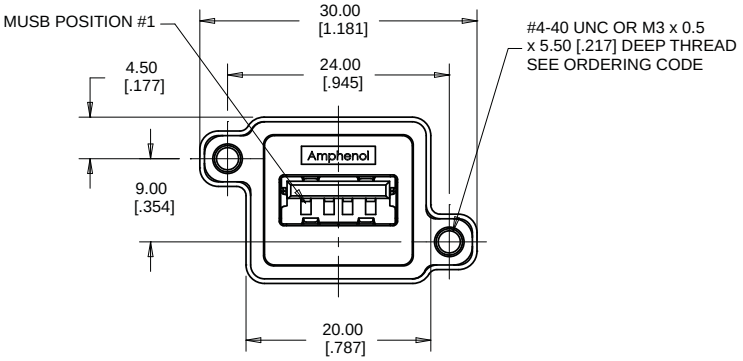
SIDE VIEW



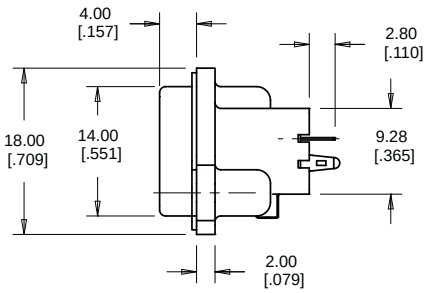
For recommended panel cutout see catalogue page 44

MUSB-A511-XX

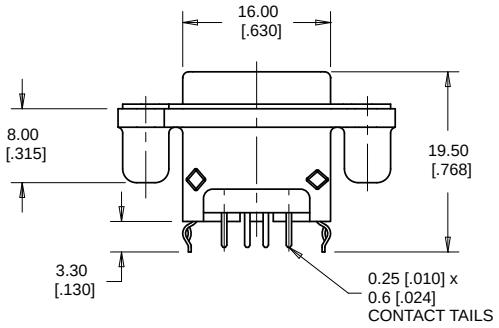
FRONT VIEW



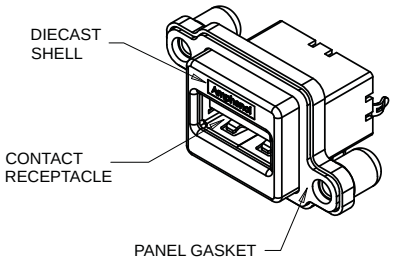
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEW



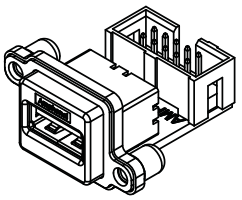
For recommended panel cutout & PCB layout see catalogue page 44-45

MUSB-A811-XX

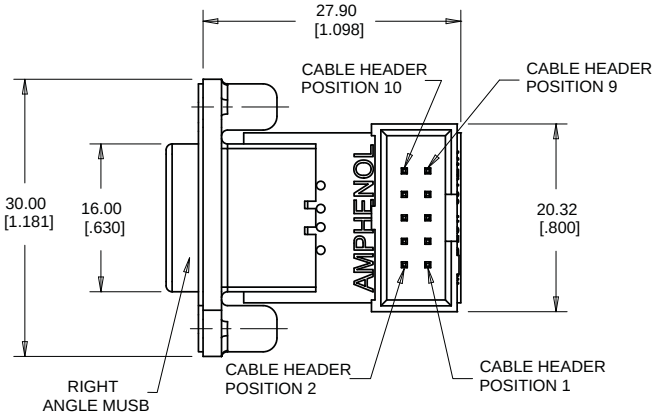
CONNECTIONS CHART

MUSB Position	Terminal Position
Shell/GND	2 & 9
1	10
2	8
3	6
4	4

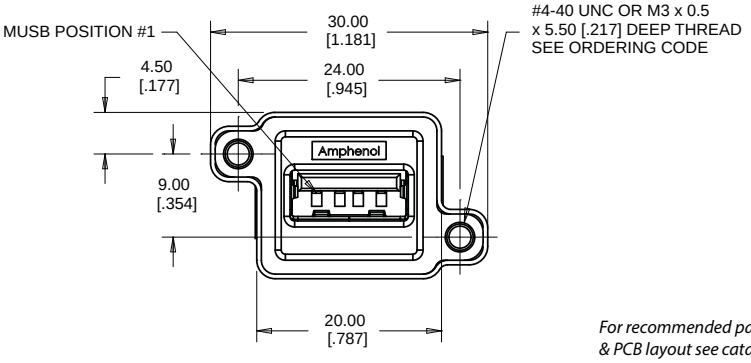
ISOMETRIC VIEW



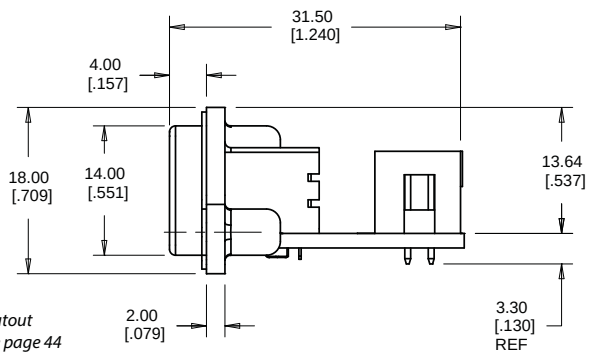
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout & PCB layout see catalogue page 44

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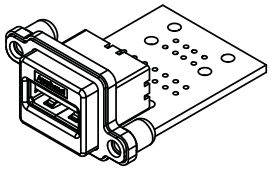
MUSB-AA11-XX

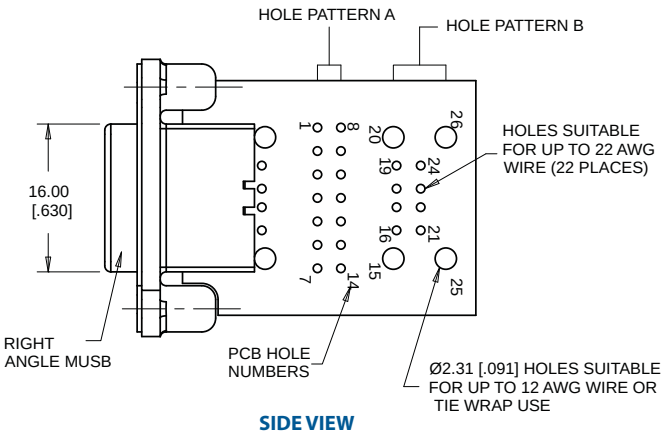
CONNECTIONS CHART

Rugged USB Receptable	PCB Hole Pattern A	PCB Hole Pattern B
Shell/GND	1	15, 20, 25 or 26
1	14	21
2	13	22
3	12	23
4	11	24

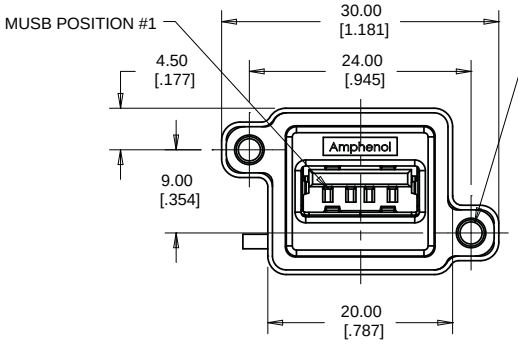
ISOMETRIC VIEW



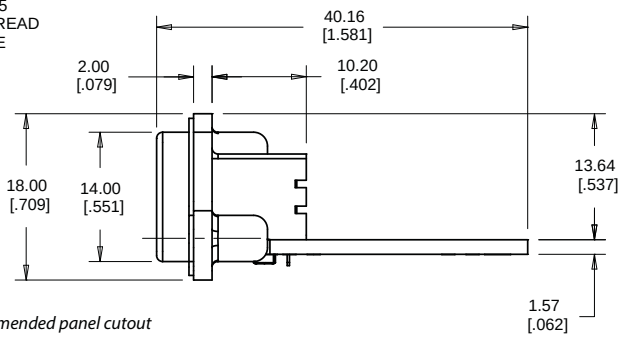
TOP VIEW



FRONT VIEW



SIDE VIEW



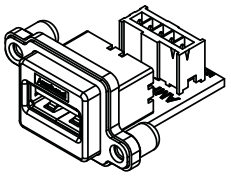
For recommended panel cutout see catalogue page 44

MUSB-AB11-XX

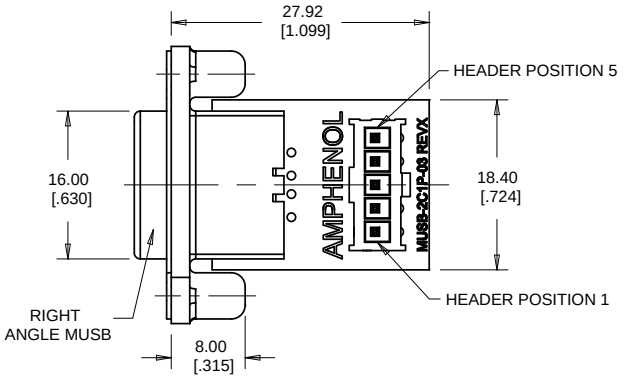
CONNECTIONS CHART

MUSB Contact	Header Position
Shell/GND	1
1	5
2	4
3	3
4	2

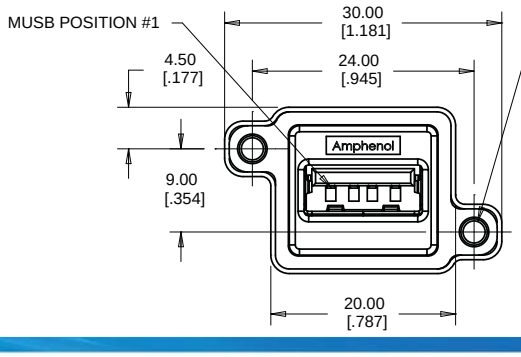
ISOMETRIC VIEW



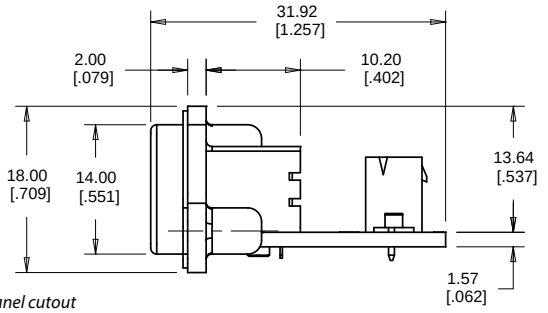
TOP VIEW



FRONT VIEW



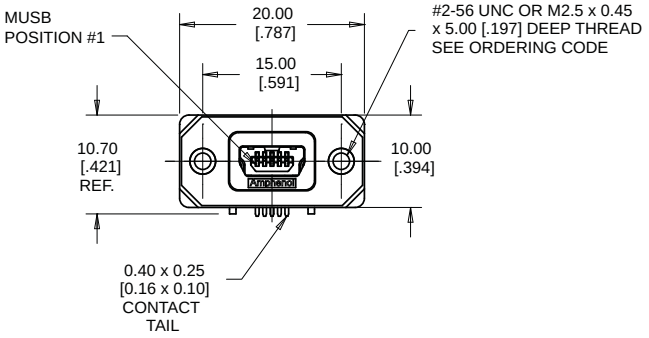
SIDE VIEW



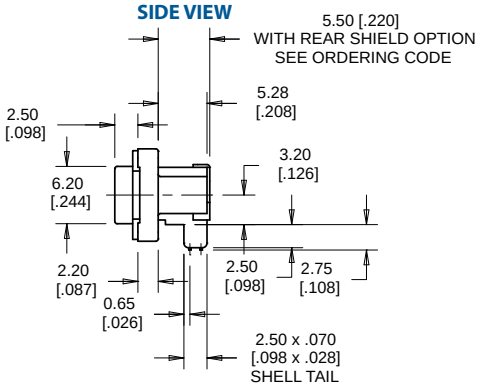
For recommended panel cutout see catalogue page 44

MUSB-B151-XX MUSB-E151-XX

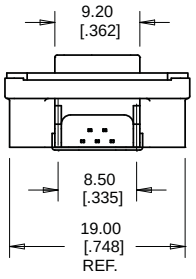
FRONT VIEW



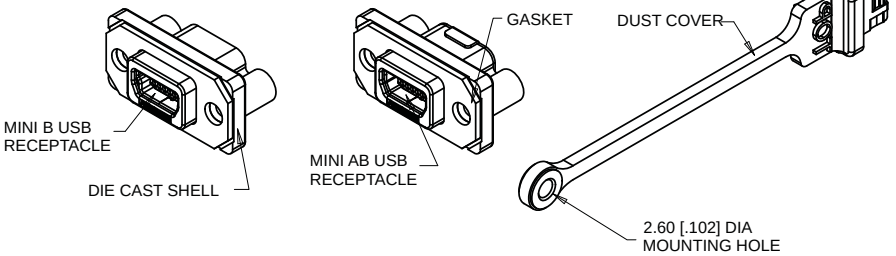
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEWS



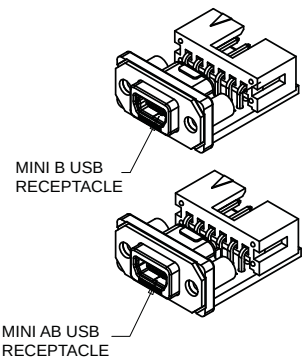
For recommended panel cutout see catalogue page 44

MUSB-B251-XX MUSB-E251-XX

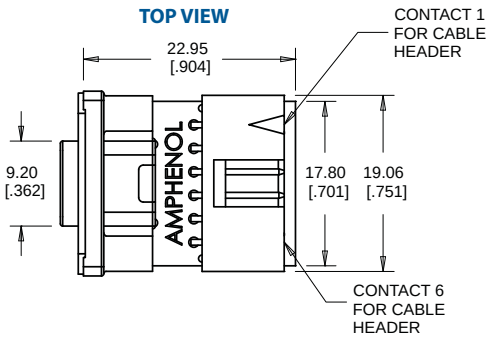
CONNECTIONS CHART

Mini-B USB Receptable	Cable Header
Shell/GND	6
1	1
2	2
3	3
4	4
5	5

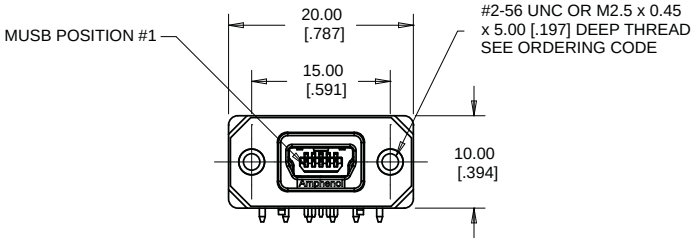
ISOMETRIC VIEWS



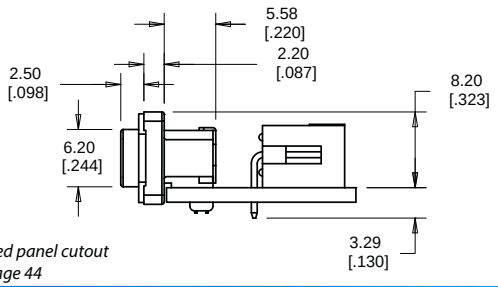
TOP VIEW



FRONT VIEW



SIDE VIEW



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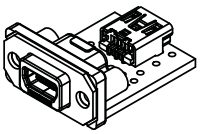
MUSB-B351-XX MUSB-E351-XX

CONNECTIONS CHART

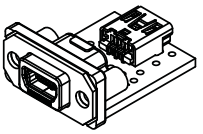
Mini-B USB Receptacle	Terminal Position
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4
5	5

ISOMETRIC VIEWS

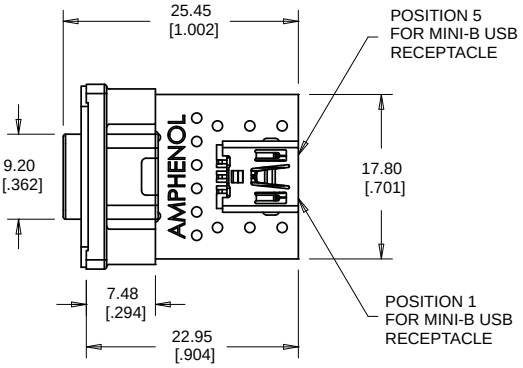
RIGHT ANGLE MINI-B USB



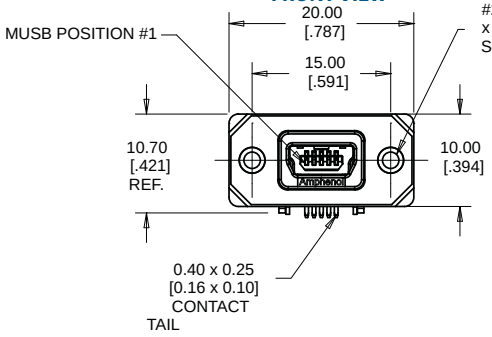
RIGHT ANGLE MINI-AB USB



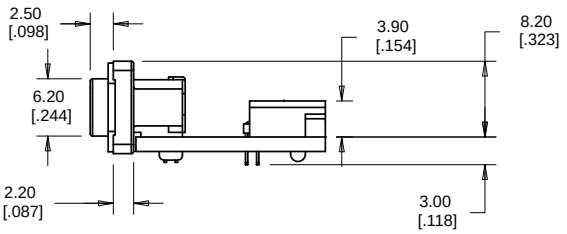
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 44

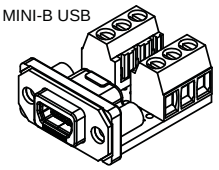
MUSB-B451-XX MUSB-E451-XX

CONNECTIONS CHART

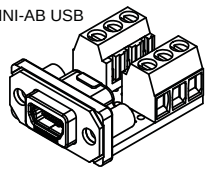
Mini-B USB Receptacle	Terminal Position
Shell/GND	6
1	1
2	2
3	3
4	4
5	5

ISOMETRIC VIEWS

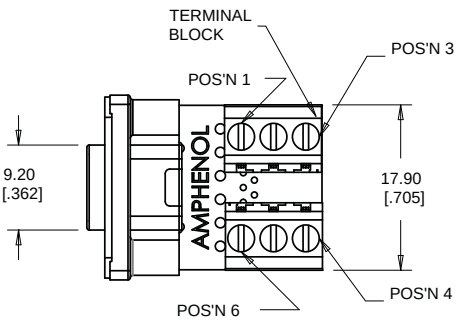
RIGHT ANGLE MINI-B USB



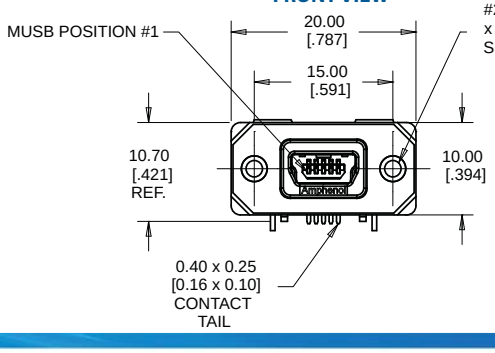
RIGHT ANGLE MINI-AB USB



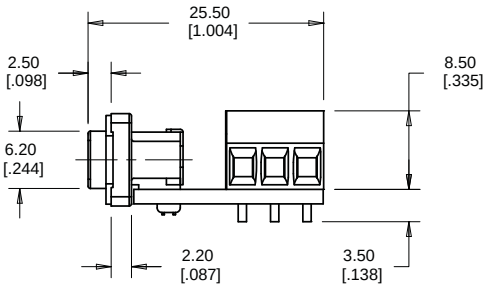
TOP VIEW



FRONT VIEW



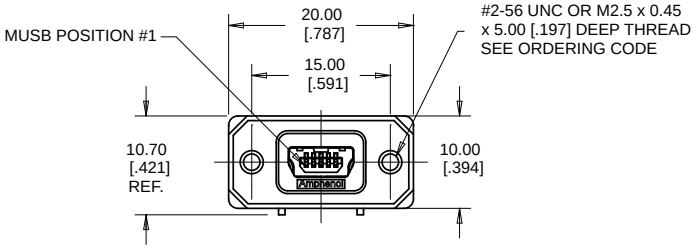
SIDE VIEW



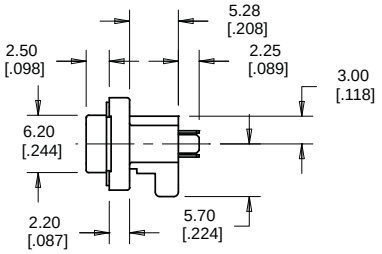
For recommended panel cutout see catalogue page 44

MUSB-B551-XX MUSB-E551-XX

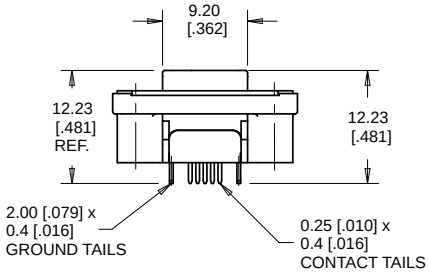
FRONT VIEW



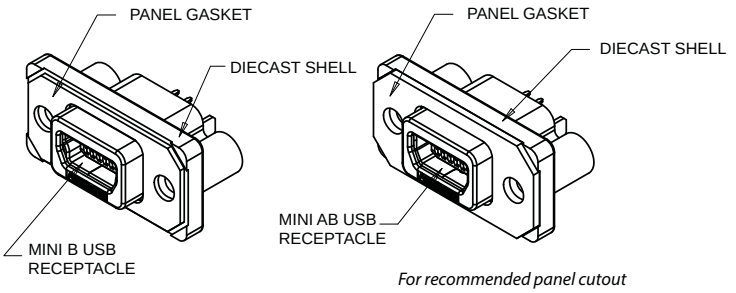
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEWS



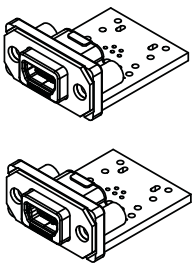
For recommended panel cutout & PCB layout see catalogue page 44-45

MUSB-BA51-XX MUSB-EA51-XX

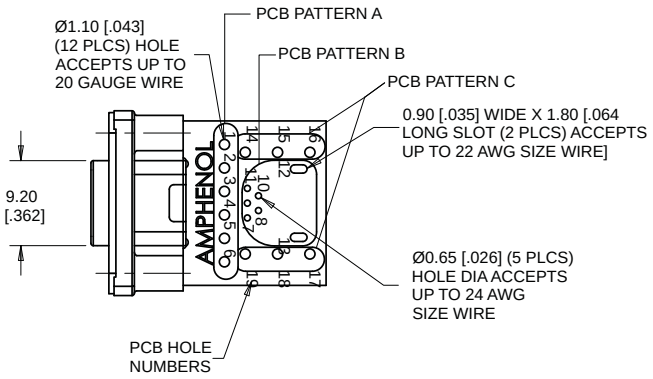
CONNECTIONS CHART

Rugged USB Receptable	PCB Hole Pattern A	PCB Hole Pattern B	PCB Hole Pattern C
Shell/GND	6	12 or 13	19
1	1	7	14
2	2	8	15
3	3	9	16
4	4	10	17
5	5	11	18

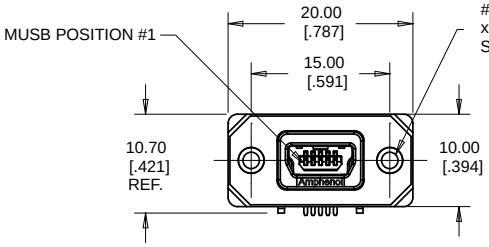
ISOMETRIC VIEWS



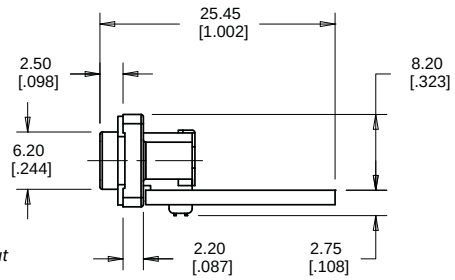
TOP VIEW



FRONT VIEW



SIDE VIEW



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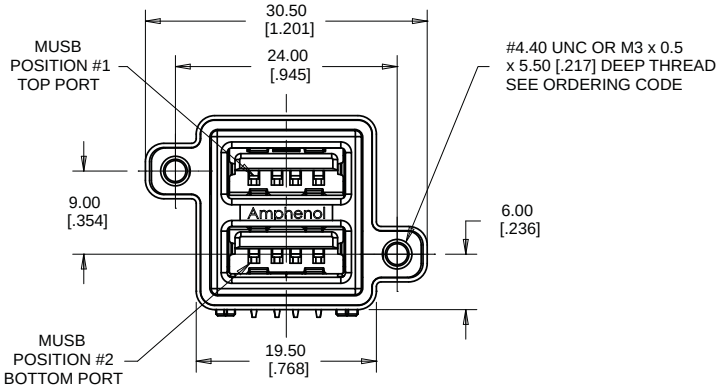
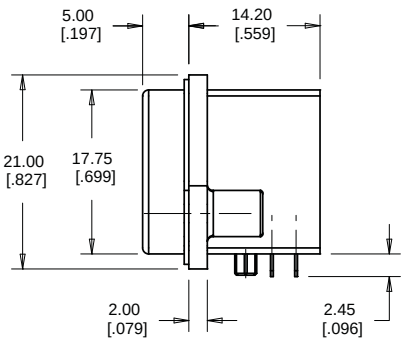
MUSB-C111-XX

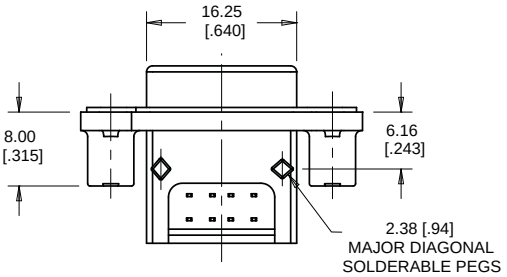
FRONT VIEW



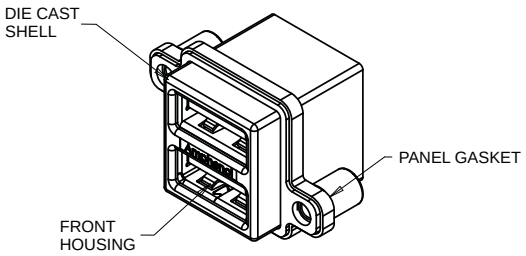
SIDE VIEW



BOTTTOM VIEW



ISOMETRIC VIEW



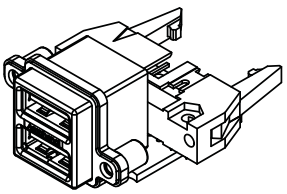
For recommended panel cutout
& PCB layout see catalogue page 44-45

CONNECTIONS CHART

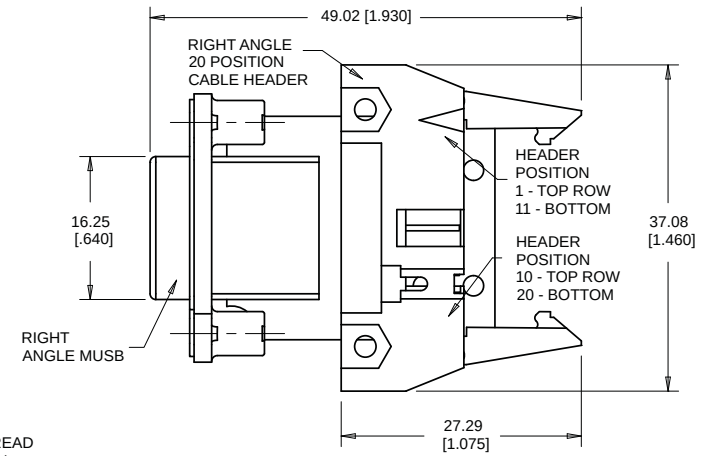
Rugged USB Receptacle	Cable Header
Shell/GND	1
1	14
2	13
3	12
4	11
5	7
6	6
7	5
8	4

MUSB-C211-XX

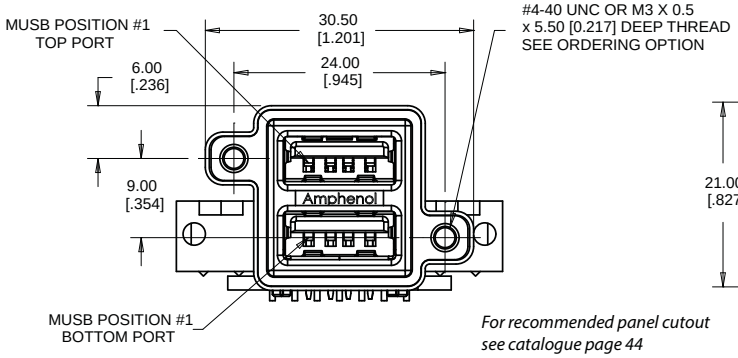
ISOMETRIC VIEW



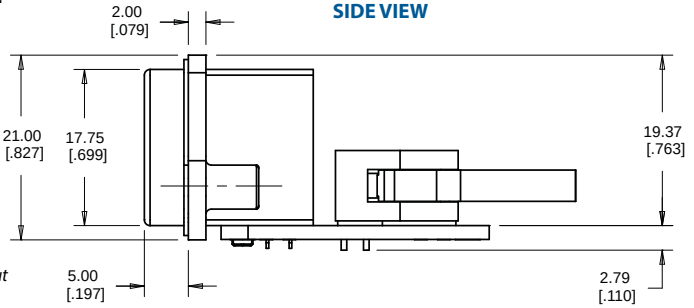
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout
see catalogue page 44

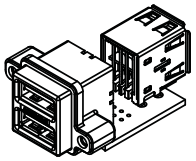
MUSB-C311-XX MUSB-CE11-XX

CONNECTIONS CHART

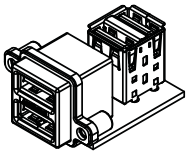
MUSB Contact	USB Contact
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

ISOMETRIC VIEWS

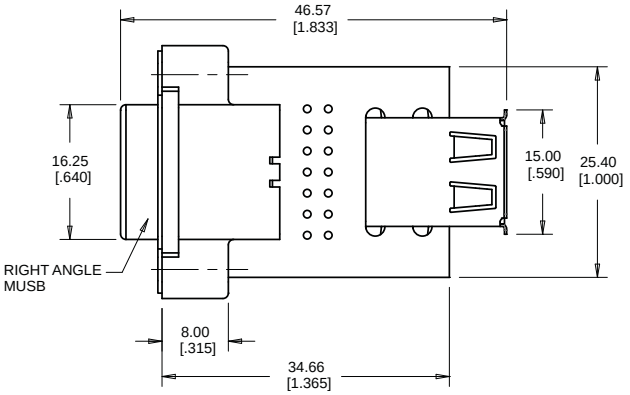
MUSB-C311-XX
RIGHT ANGLE USB



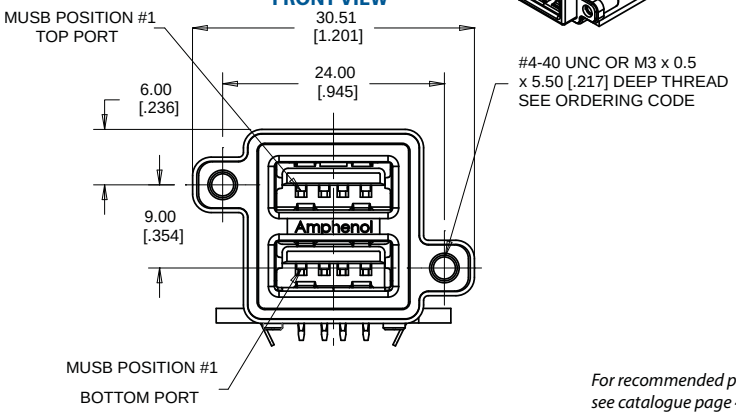
MUSB-CE11-XX
VERTICAL USB



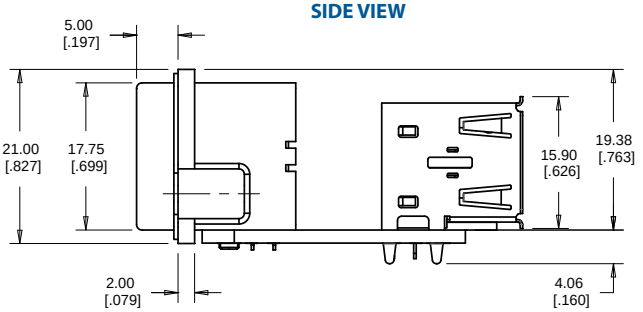
TOP VIEW



FRONT VIEW



SIDE VIEW



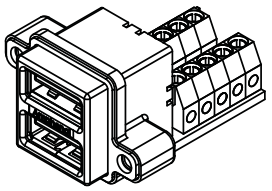
For recommended panel cutout see catalogue page 44

MUSB-C411-XX

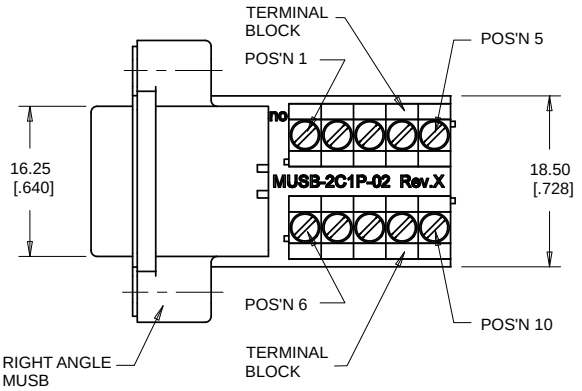
CONNECTIONS CHART

MUSB Position	Terminal Position
Shell/GND	5, 10
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

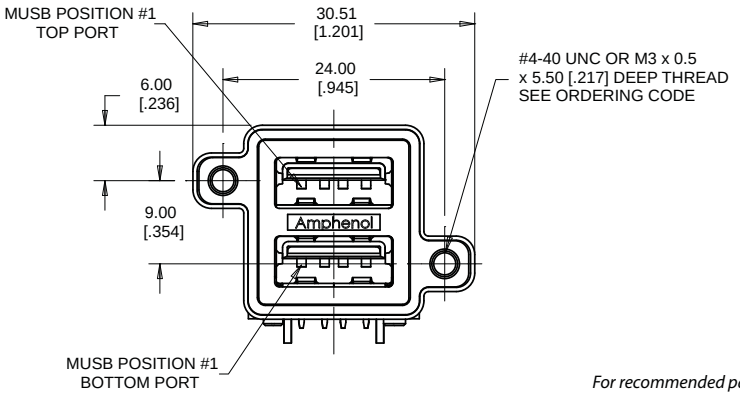
ISOMETRIC VIEW



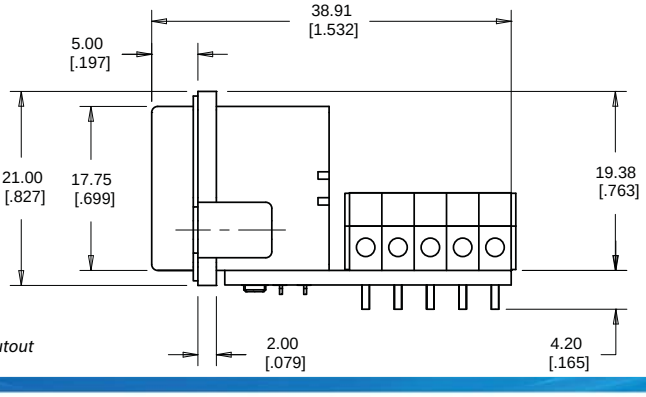
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 44

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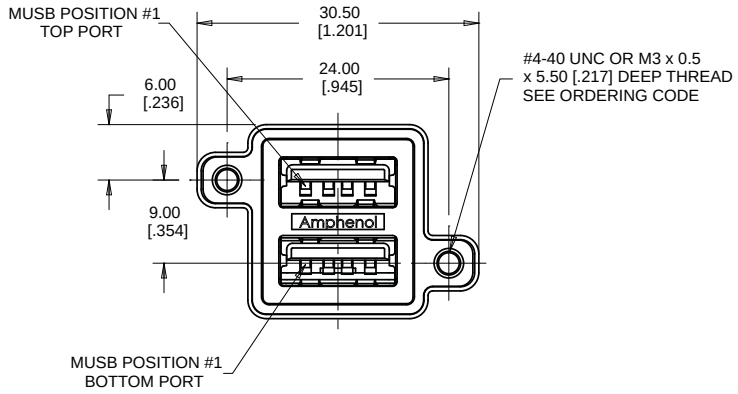
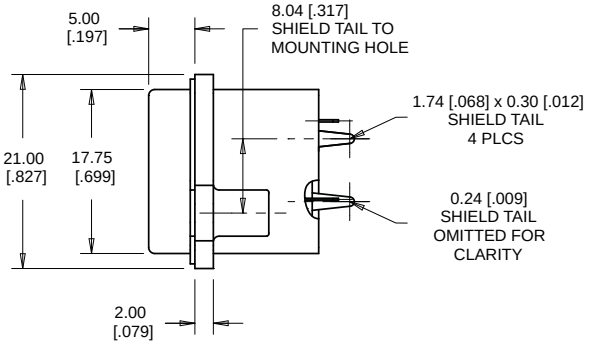
MUSB SERIES

MUSB-C511-XX

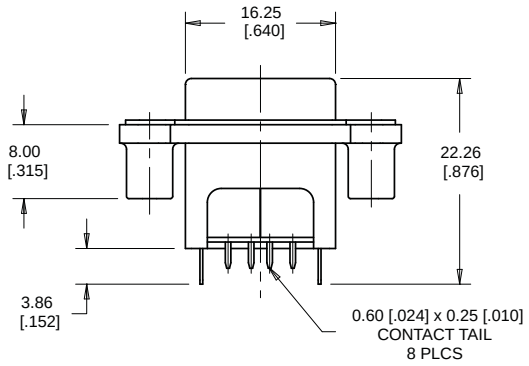
FRONT VIEW



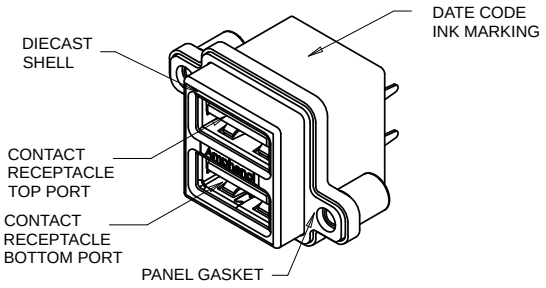
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEW

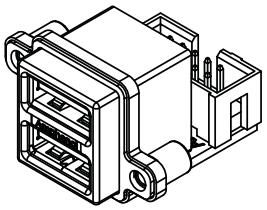


For recommended panel cutout
& PCB layout see catalogue page 44-45

CONNECTIONS CHART

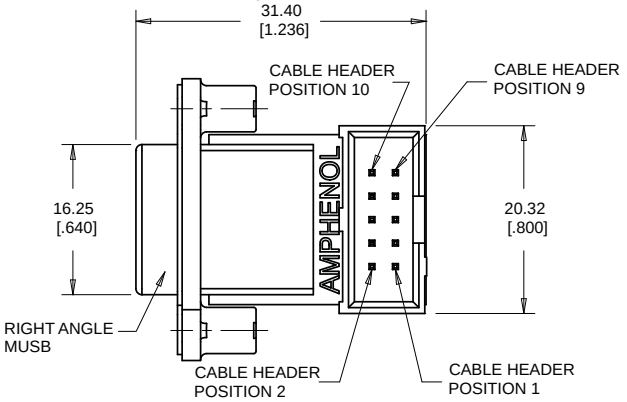
MUSB Position	Terminal Position
Shell/GND	2 & 9
1	10
2	8
3	3
4	4
5	7
6	5
7	3
8	1

ISOMETRIC VIEW

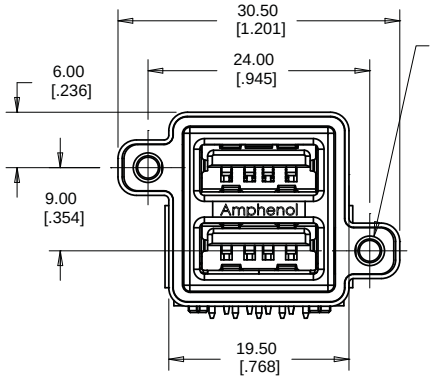


MUSB-C811-XX

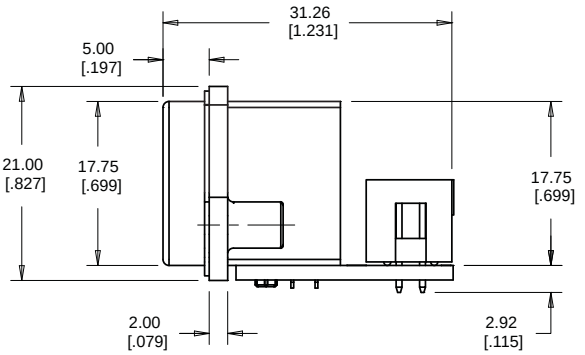
TOP VIEW



FRONT VIEW



SIDE VIEW



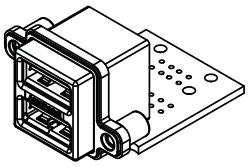
For recommended panel cutout
see catalogue page 44

MUSB-CA11-XX

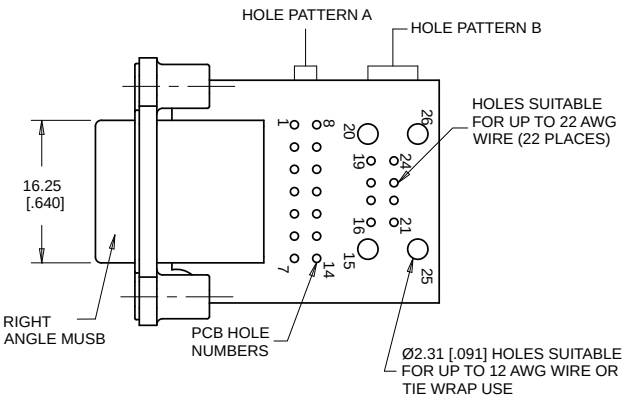
CONNECTIONS CHART

Rugged USB Receptable	PCB Hole Pattern A	PCB Hole Pattern B
Shell/GND	1	15, 20, 25 or 26
1	14	21
2	13	22
3	12	23
4	11	24
5	7	16
6	6	17
7	5	18
8	4	19

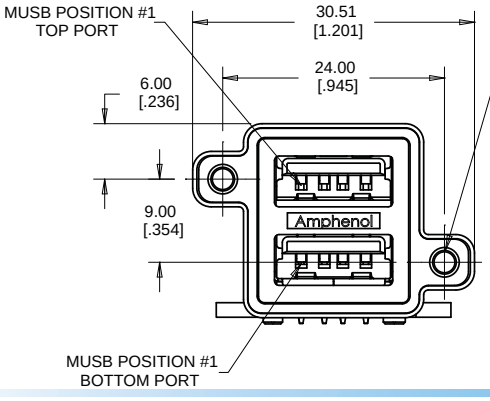
ISOMETRIC VIEW



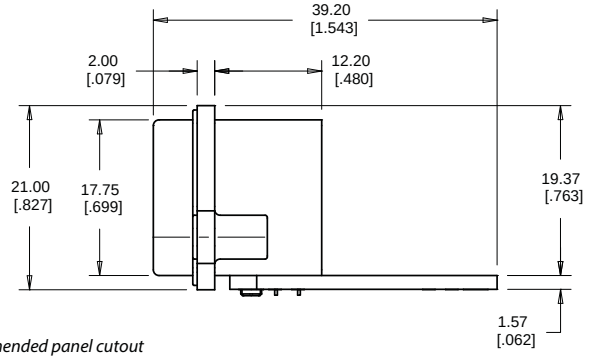
TOP VIEW



FRONT VIEW



SIDE VIEW



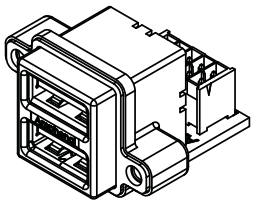
For recommended panel cutout see catalogue page 44

MUSB-CD11-XX

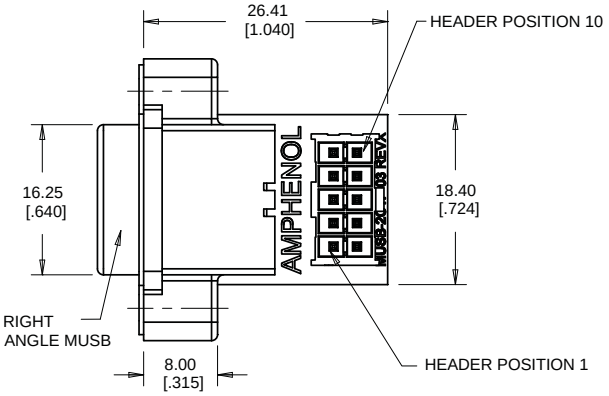
CONNECTIONS CHART

MUSB Contact	Header Position
Shell/GND	1 & 10
Top 1	9
Top 2	8
Top 3	7
Top 4	6
Bottom 1	5
Bottom 2	4
Bottom 3	3
Bottom 4	2

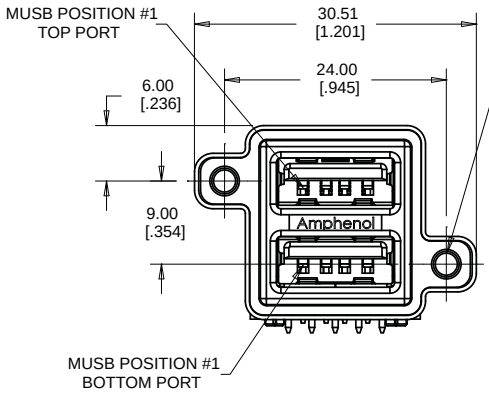
ISOMETRIC VIEW



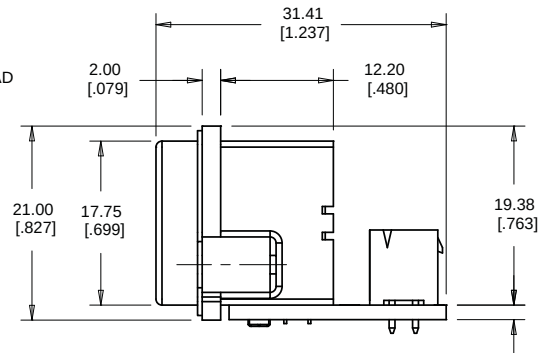
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 44

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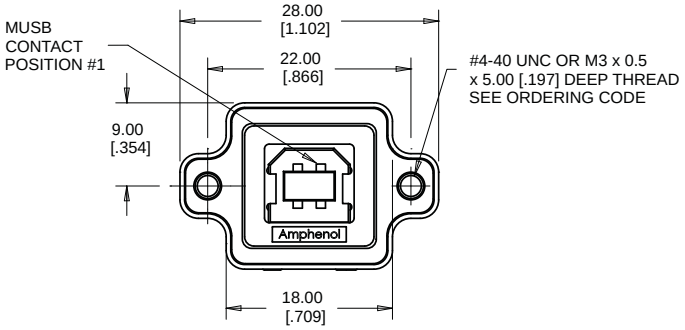
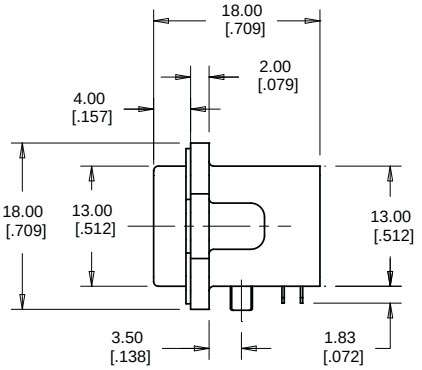
MUSB-D111-XX

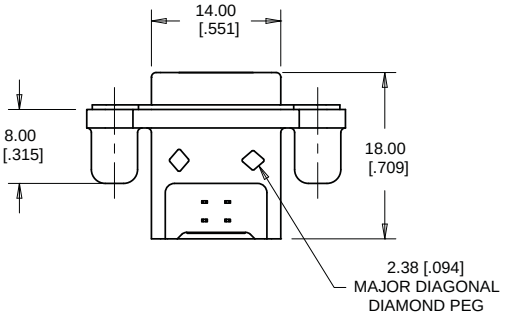
FRONT VIEW



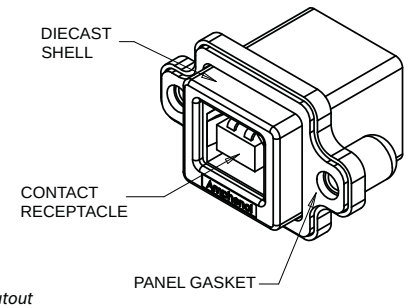
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEW



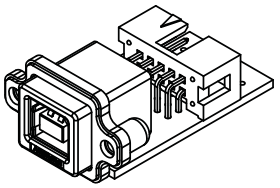
For recommended panel cutout & PCB layout see catalogue page 44-45

MUSB-D211-XX

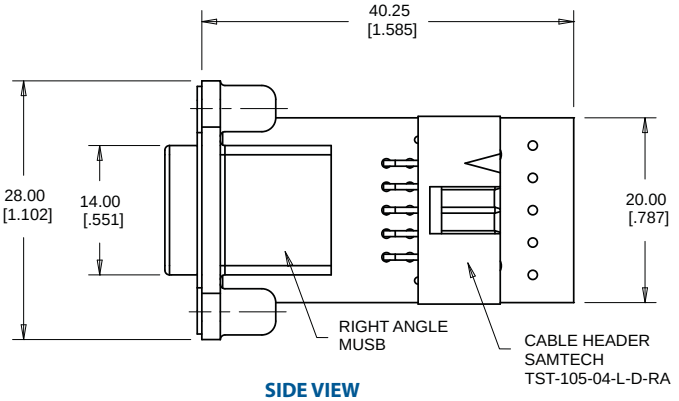
CONNECTIONS CHART

MUSB Position	Terminal Position
Shell/GND	5
1	2
2	1
3	3
4	4

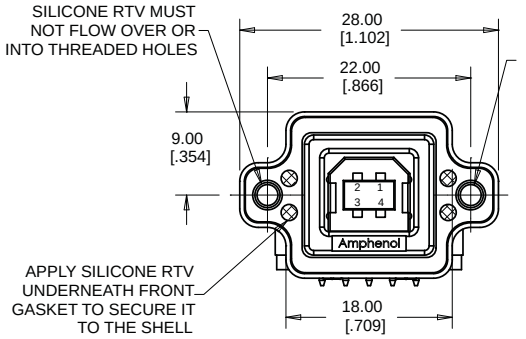
ISOMETRIC VIEW



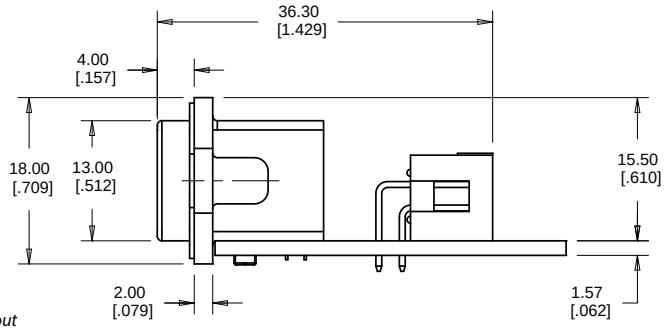
TOP VIEW



FRONT VIEW



SIDE VIEW



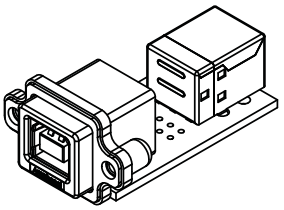
For recommended panel cutout see catalogue page 44

MUSB-D311-XX

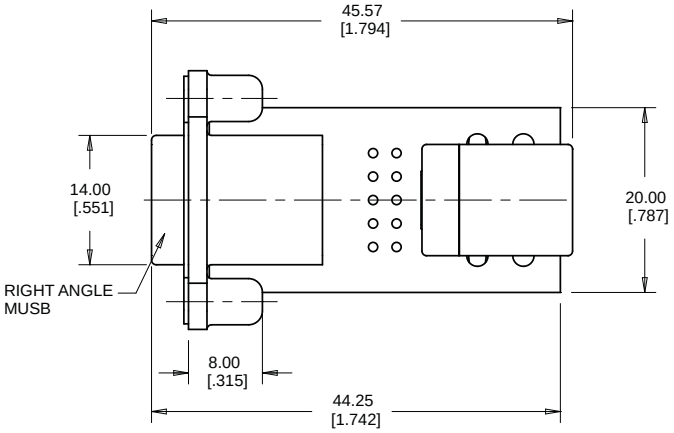
CONNECTIONS CHART

MUSB Contact	USB Contact
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4

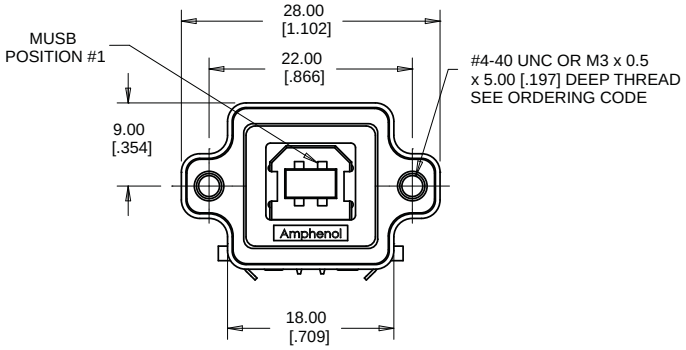
ISOMETRIC VIEW



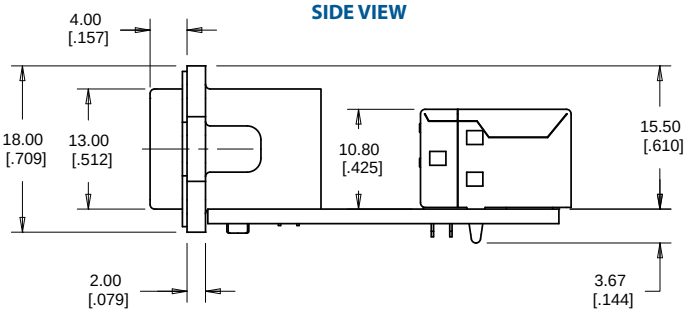
TOP VIEW



FRONT VIEW



SIDE VIEW



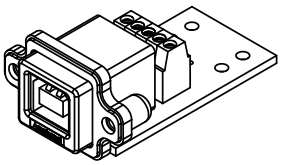
For recommended panel cutout see catalogue page 44

MUSB-D411-XX

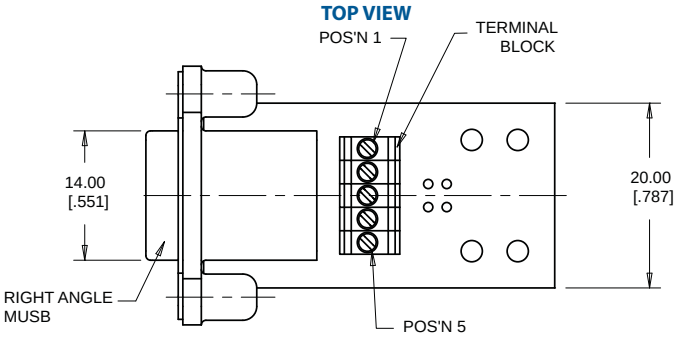
CONNECTIONS CHART

MUSB Position	Terminal Position
Shell/GND	5
1	2
2	1
3	3
4	4

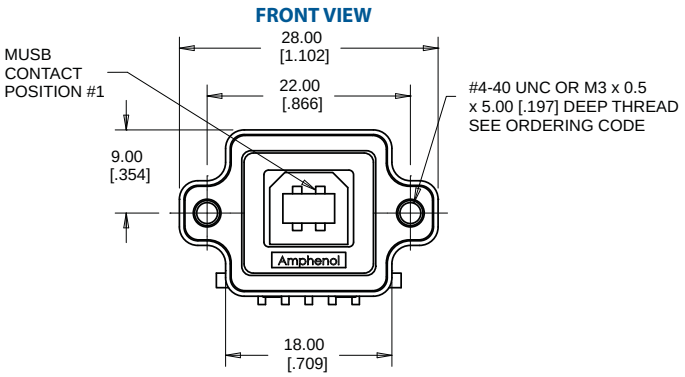
ISOMETRIC VIEW



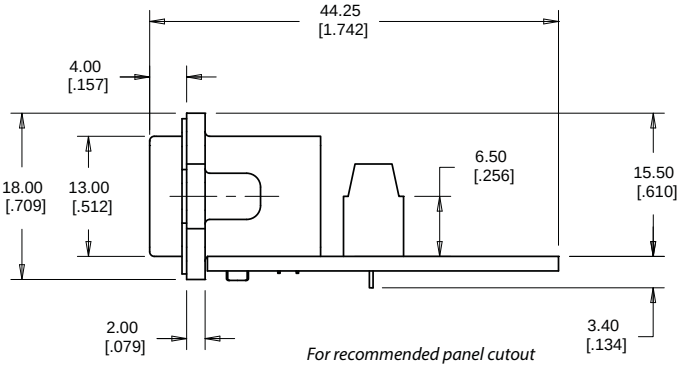
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 44

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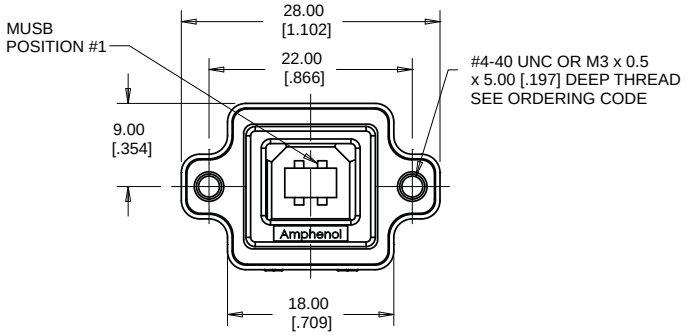
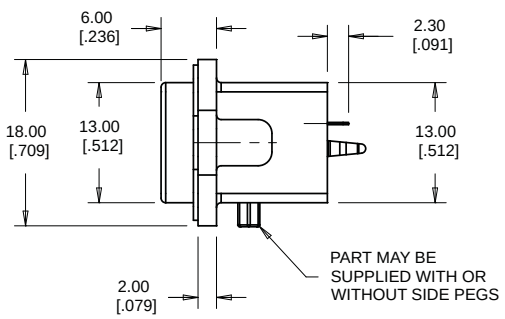
MUSB-D511-XX

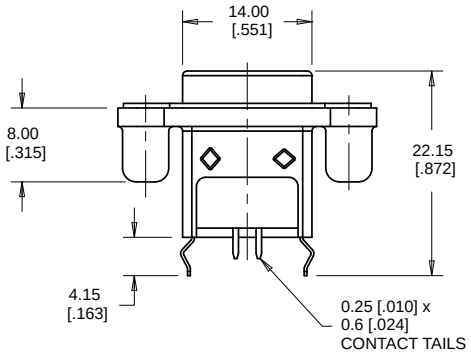
FRONT VIEW



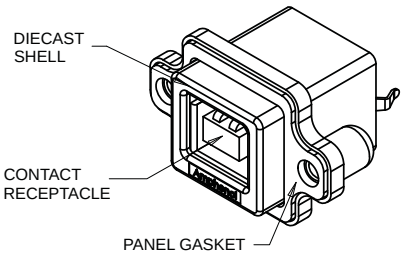
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEW



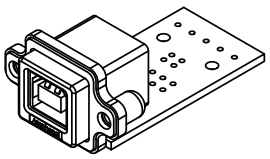
For recommended panel cutout & PCB layout see catalogue page 44-45

MUSB-DA11-XX

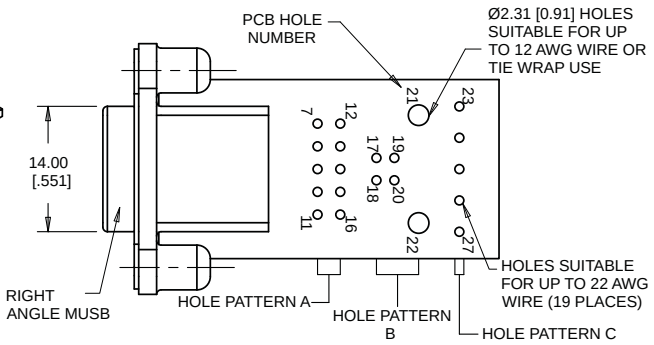
CONNECTIONS CHART

Rugged USB Receptable	PCB Hole Pattern A	PCB Hole Pattern B	PCB Hole Pattern C
Shell/GND	11	22 or 21	27
1	8	17	23
2	7	18	24
3	9	19	25
4	10	20	26

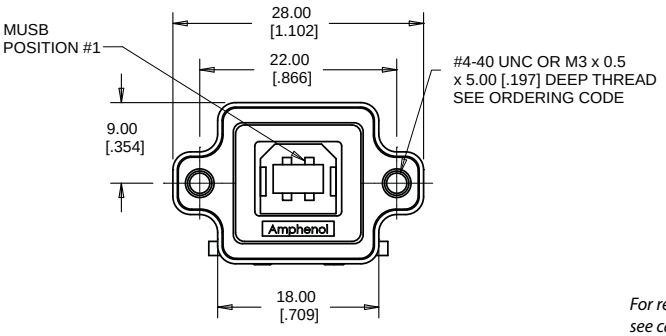
ISOMETRIC VIEW



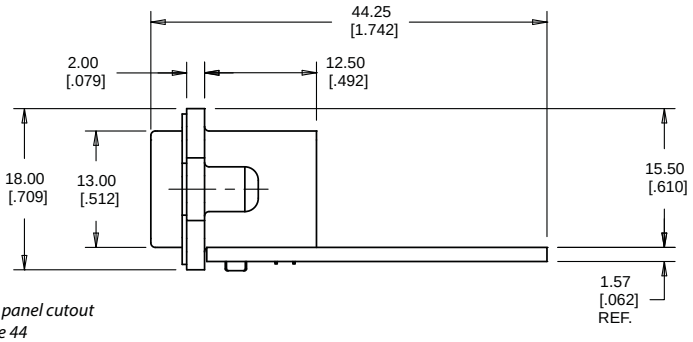
TOP VIEW



FRONT VIEW



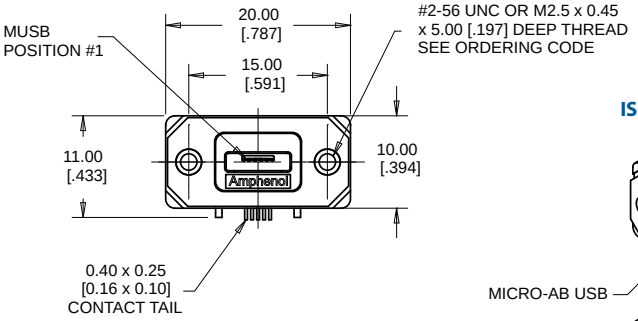
SIDE VIEW



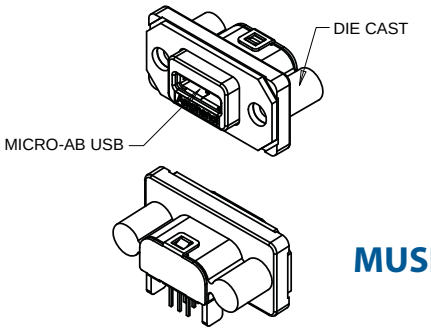
For recommended panel cutout see catalogue page 44

MUSB-K152-XX

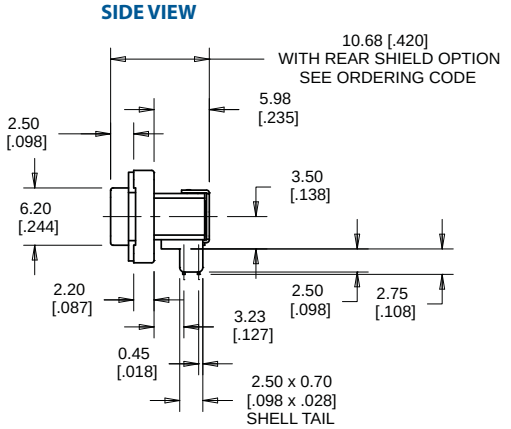
FRONT VIEW



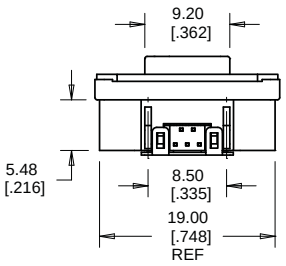
ISOMETRIC VIEWS



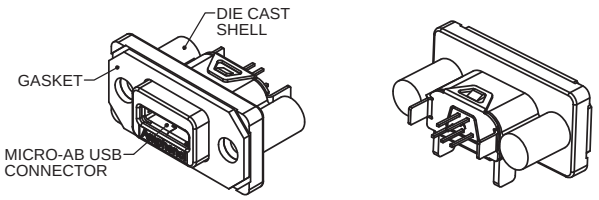
SIDE VIEW



BOTTOM VIEW



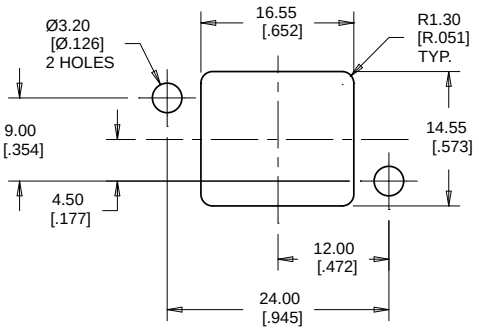
MUSB-K552-XX



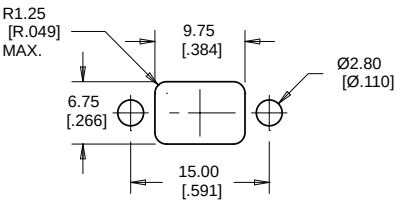
For recommended panel cutout
see below & for PCB layout see catalogue page 45

Recommended Panel Cutouts

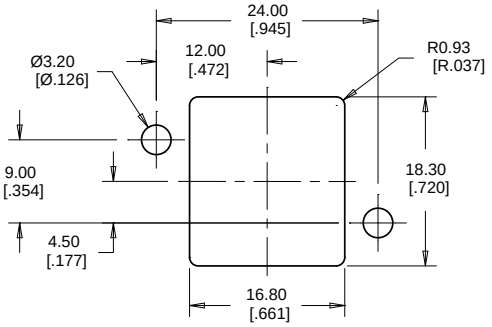
MUSB-A511-XX



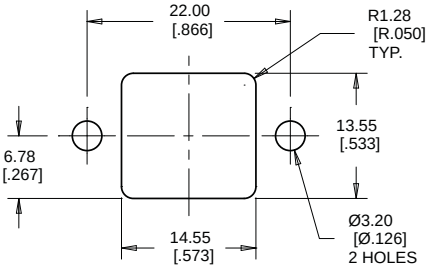
MUSB-B151-XX



MUSB-C511-XX



MUSB-D111-XX



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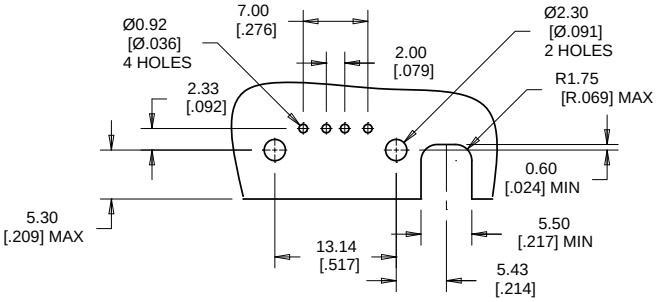
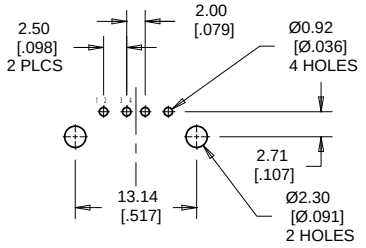
Recommended PCB Layouts

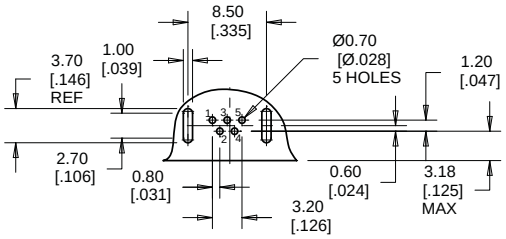
MUSB-A111-XX



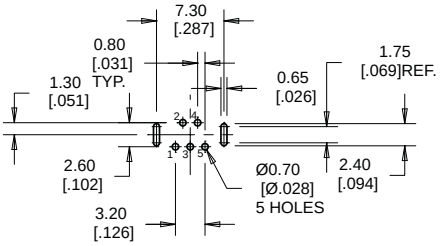
MUSB-A511-XX



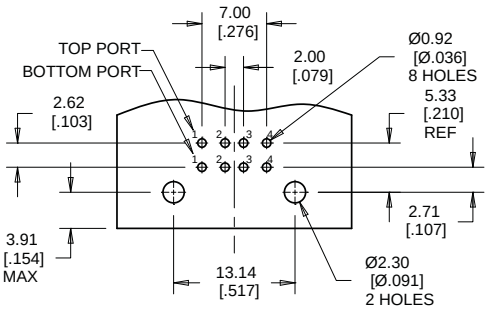
MUSB-B151-XX
MUSB-E151-XX



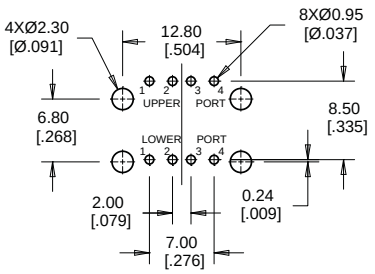
MUSB-B551-XX
MUSB-E551-XX



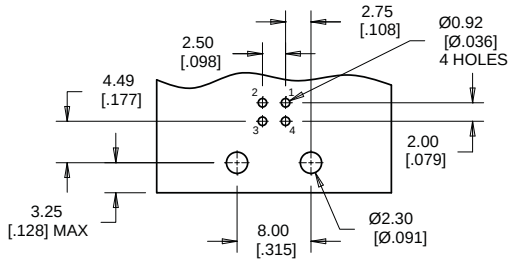
MUSB-C111-XX



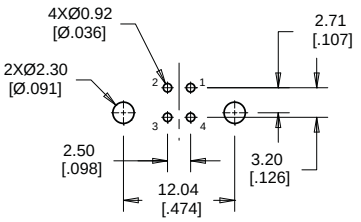
MUSB-C511-XX



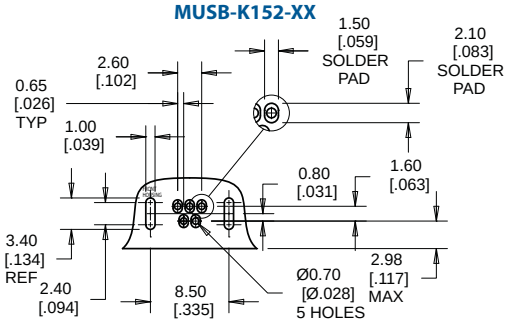
MUSB-D111-XX



MUSB-D511-XX



MUSB-K152-XX



NOTES:

1) GENERAL TOLERANCE FOR HOLE AND SLOT SIZES ± 0.05 [.002].

2) LOCATION DIMENSIONS ARE BASIC. LOCATE FEATURE WITHIN 0.13 [.005] DIAMETER OF TRUE POSITION.

Specifications

The D-Subminiature connectors are designed to conform to the requirements of MIL-DTL-24308 specification. Part numbers MDBR-E09XX-XN0 have size 20 contacts for standard density. All other part numbers have size 22D contacts for high density configurations.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Nickel Plated
Insulator Housing:	High Temperature Resistant Nylon, Glass Reinforced, UL94V-0, Black
Contacts:	Machined Phosphor Bronze or Brass Alloy Plated with 0.76µm (30µ") min Gold over 1.27µm (50µ") min Nickel
Gaskets & O-rings:	Silicone Rubber, Black or Red

Electrical

Current Rating:	*Standard Density* - 5A max *High Density* - 3A max
Contact Resistance:	20 mΩ max
Insulation Resistance:	5000 MΩ min
DWV:	*Standard Density* - 1500 VDC *High Density* - 1200 VDC

Mechanical, Environmental, Regulatory

Water & Dust Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-44°C to +105°C
Contact Insertion Force:	*Standard Density* - 5.0N (18oz$_f$) max, 3.3N (12oz$_f$) max Average Initial *High Density* - 5.0N (18oz$_f$) max, 2.6N (9.5oz$_f$) max Average Initial
Durability:	Per EIA 364-09, 500 Mating Cycles
Vibration:	Per EIA 364-28 Condition V, Letter D, 4.5 Hrs, No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition A (11ms, 50g, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -55°C to +105°C, 25 Cycles
Humidity:	Per EIA-364-31, 10 Cycles, 240 Hrs, 25°C to 65°C, 90-95%RH, with -10°C Cold Shock
Thermal Cycling:	Per EIA-364-110, 500 Cycles, 15°C to 85°C
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S, & SO_2), 14 Day Exposure
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging

Application Recommendations

Recommended Mounting Screw Torque:	0.45 to 0.65N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement
Recommended Soldering Methods:	Manual or wave (solder temperature 260°C max, time 10s max, preheat 100-140°C)

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MDBR SERIES

MDBR - XXX X X - XX X

Rugged D-Sub, Generation 2

Shell Size & Number of Contacts
E09 - E Size Shell, 9 Contacts, Size 20, Standard Density
E15 - E Size Shell, 15 Contacts, Size 22, High Density
A26 - A Size Shell, 26 Contacts, Size 22, High Density[1]

Gender Type
P - Pin
S - Socket

Termination Style
E - Vertical PCB Tail
M - Solder Cup Tail

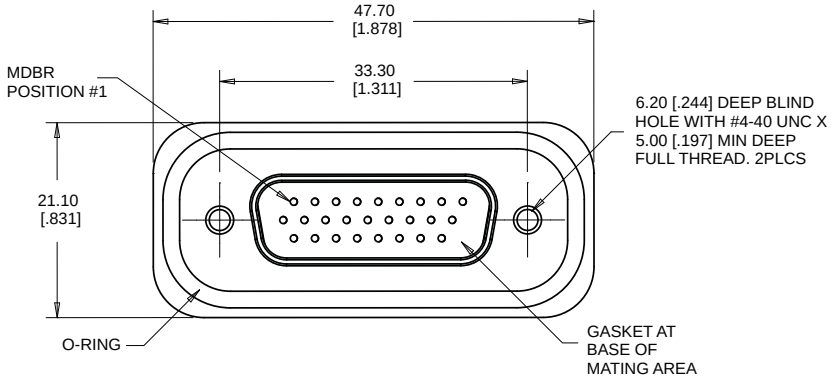
Mounting Hole Thread Options
AN - #4-40 UNC Unified Thread
JN - M3 x 0.5 Metric Thread

Options and Unique Special Code[2]
0 - Standard Part
1 to 9 - Identifies Unique Special Features
Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details

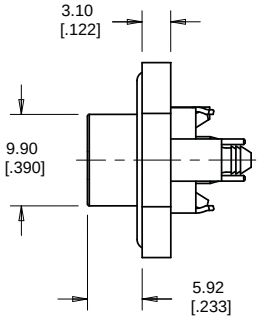
Notes:
1) The MDBR series with 26 contacts is currently available in the pin contact version only.
2) Consult with Amphenol for additional terminations, contact tail lengths, mounting styles or other special requirements

MDBR-A26PE-XN0

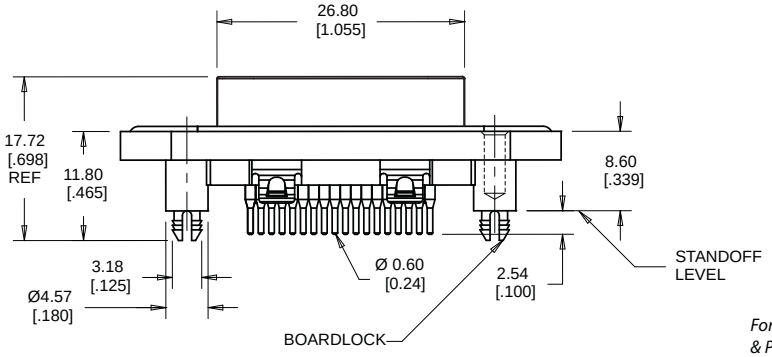
FRONT VIEW



SIDE VIEW



BOTTOM VIEW



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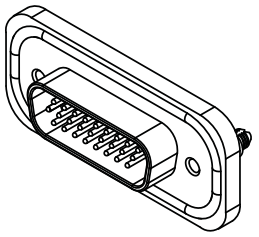
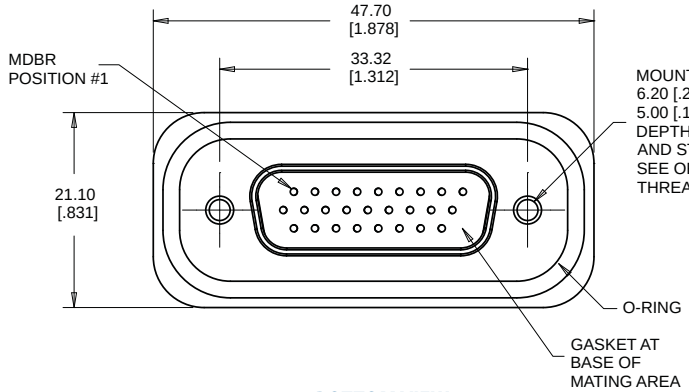


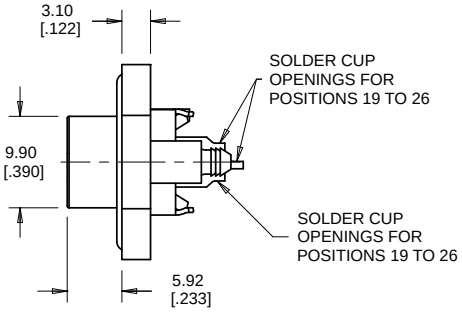
For recommended panel cutout
& PCB layout see catalogue page 53

MDBR-A26PM-XN0

FRONT VIEW



SIDE VIEW



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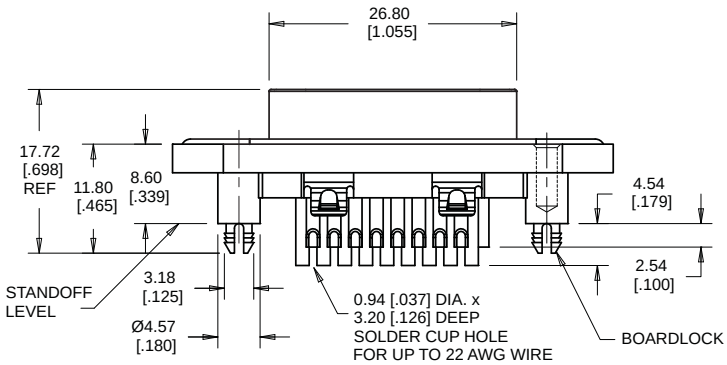

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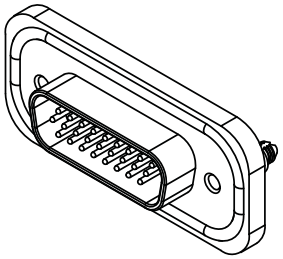

For recommended panel cutout
see catalogue page 53

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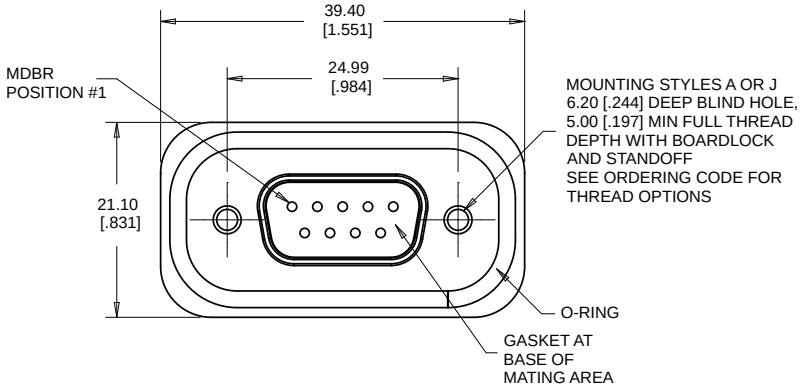
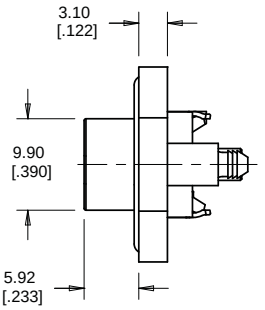
MDBR-E09PE-XN0

FRONT VIEW



SIDE VIEW



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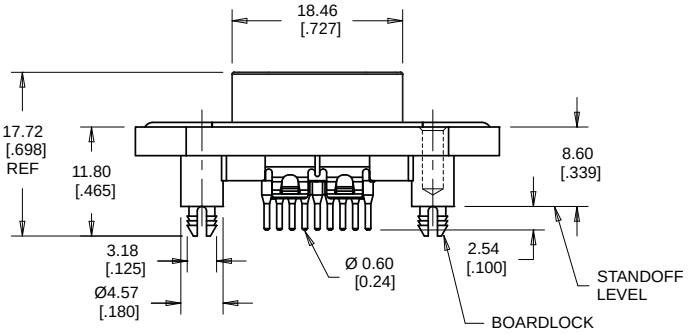

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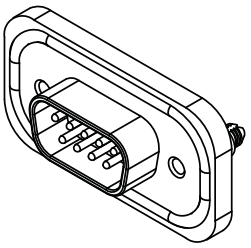
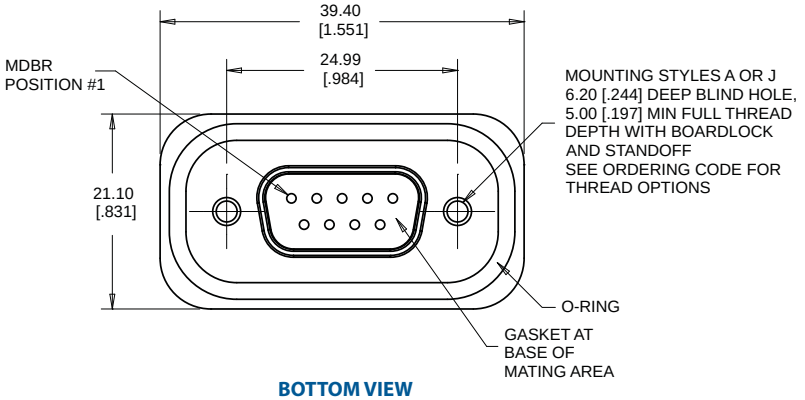


For recommended panel cutout
& PCB layout see catalogue page 53

MDBR-E09PM-XN0

FRONT VIEW



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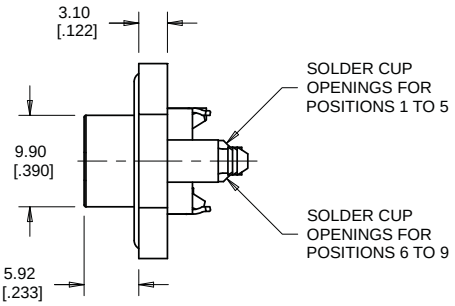

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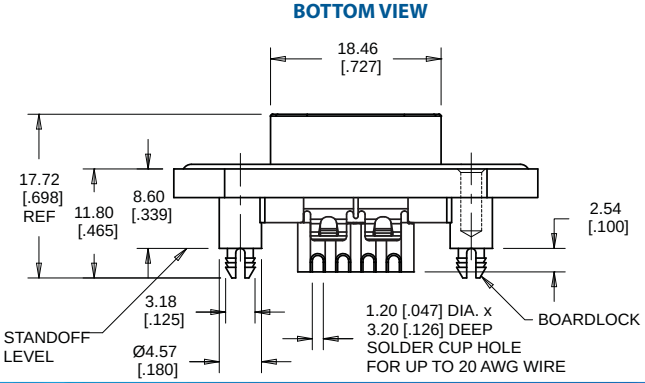

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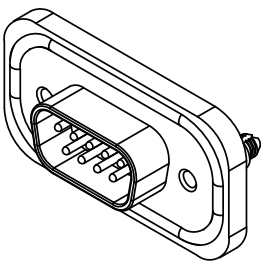
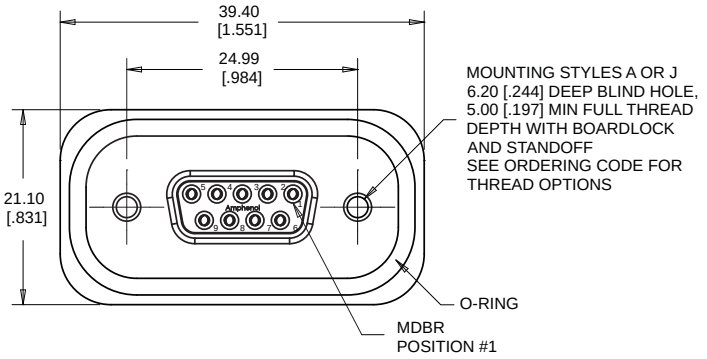


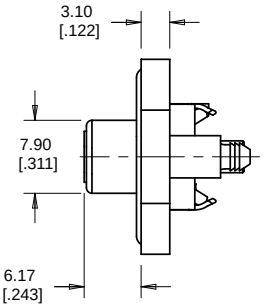
For recommended panel cutout
see catalogue page 53

MDBR-E09SE-XN0

FRONT VIEW



SIDE VIEW



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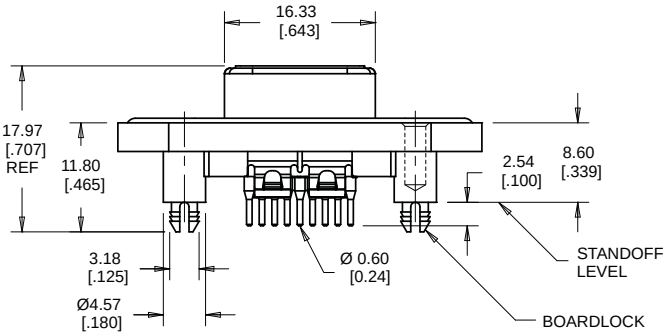

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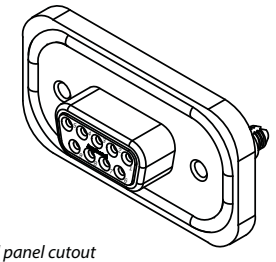
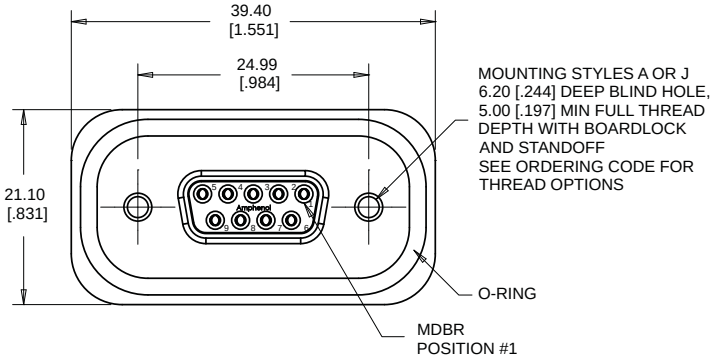


For recommended panel cutout
& PCB layout see catalogue page 53

MDBR-E09SM-XN0

FRONT VIEW



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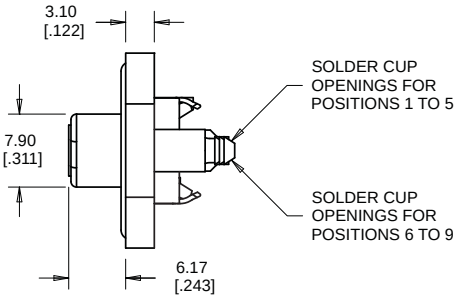

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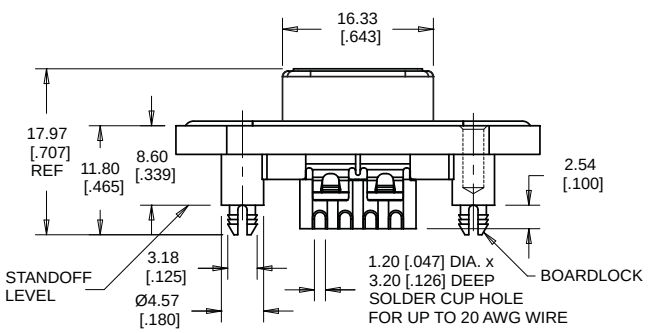

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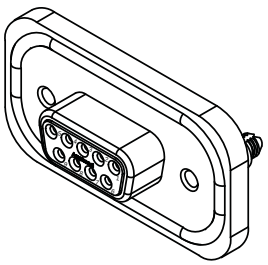

For recommended panel cutout
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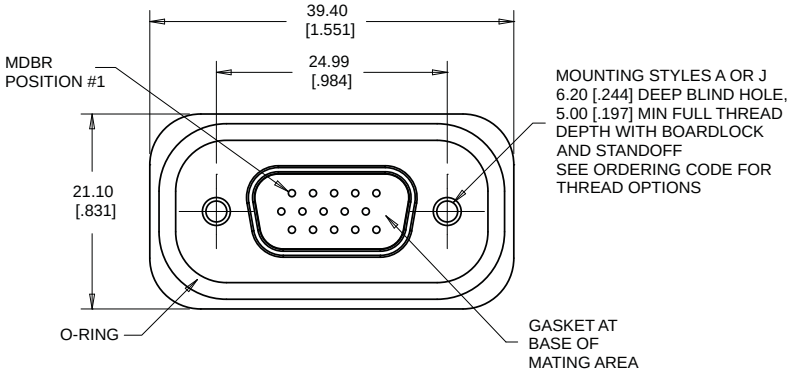
MDBR-E15PE-XN0

FRONT VIEW



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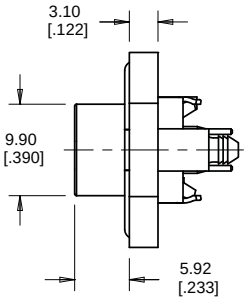

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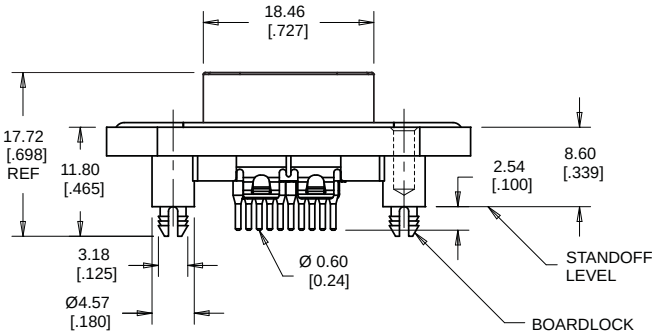

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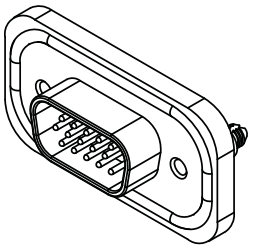
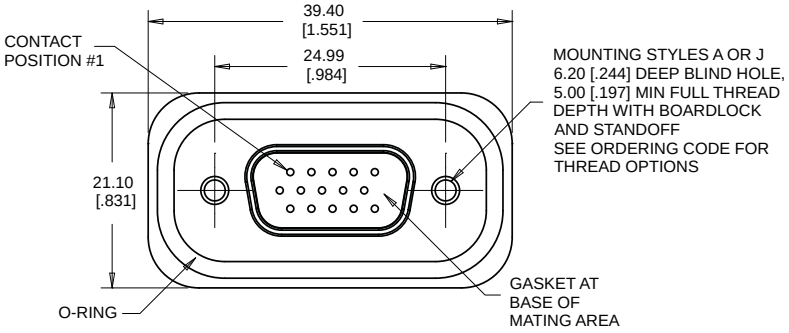


For recommended panel cutout & PCB layout see catalogue page 53

MDBR-E15PM-XN0

FRONT VIEW



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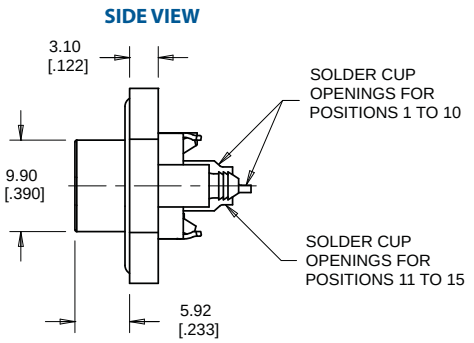

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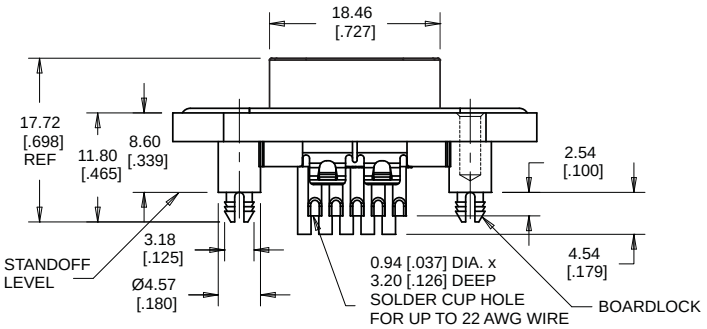

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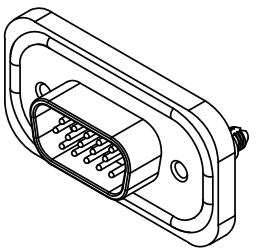
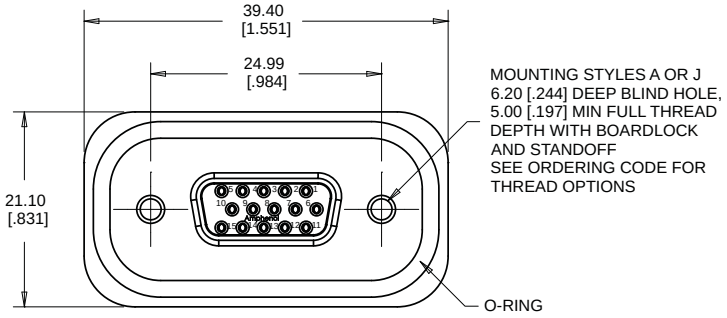


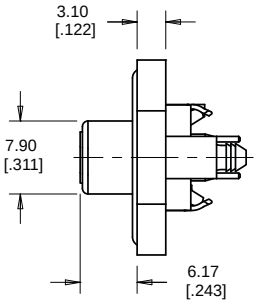
For recommended panel cutout see catalogue page 53

MDBR-E15SE-XN0

FRONT VIEW



SIDE VIEW



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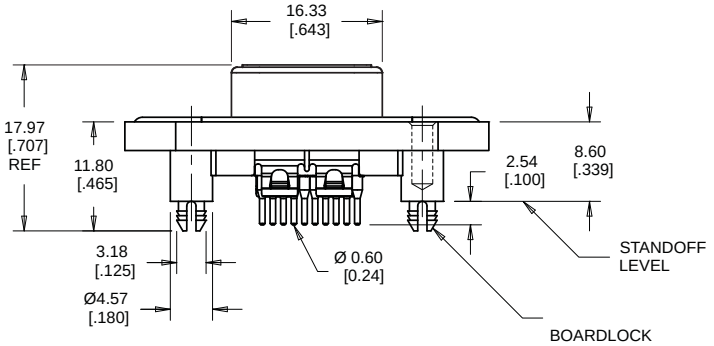

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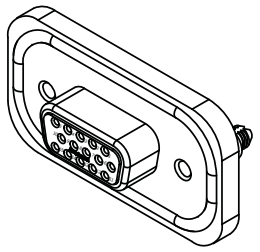
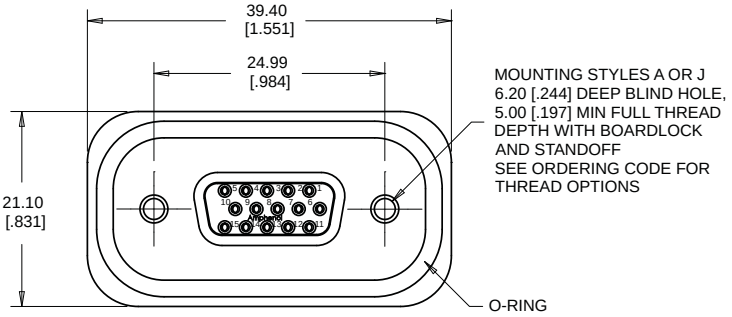


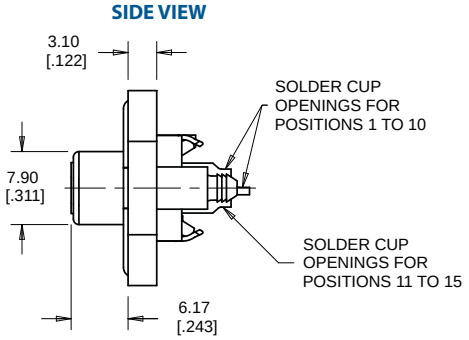
For recommended panel cutout
& PCB layout see catalogue page 53

MDBR-E15SM-XN0

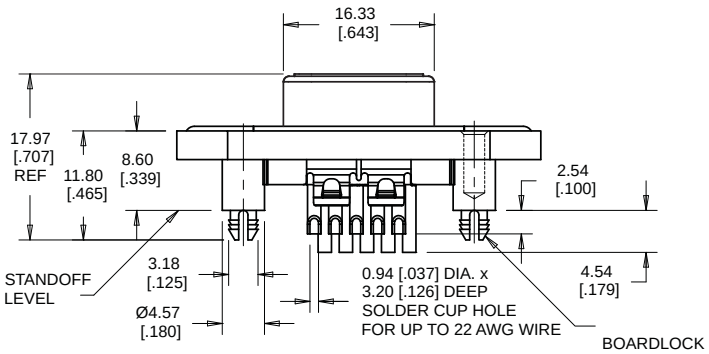
FRONT VIEW



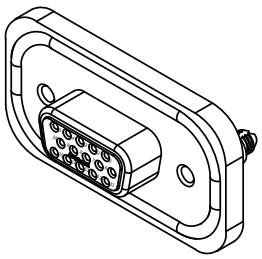
SIDE VIEW



BOTTOM VIEW

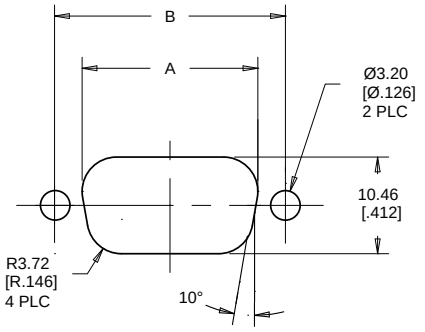


ISOMETRIC VIEW



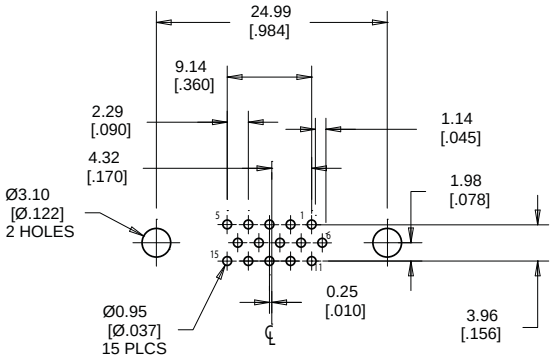
For recommended panel cutout
see catalogue page 53

Recommended Panel Cutout

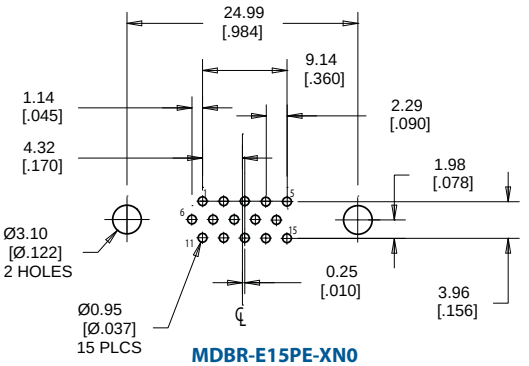


Dimension	Shell Size/Contacts	
	E09/E15	A26
A	19.05 [.750]	27.36 [1.077]
B	24.99 [.984]	33.32 [1.312]

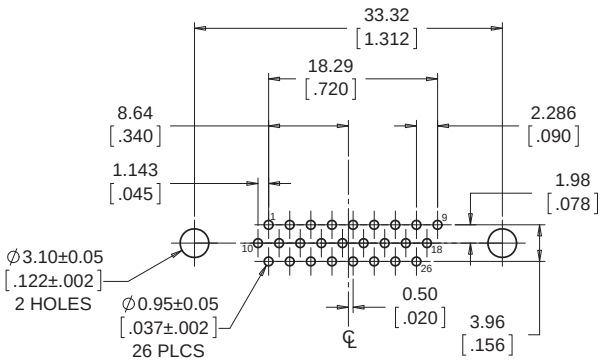
Recommended PCB Layouts



MDBR-E15SE-XN0



MDBR-E15PE-XN0



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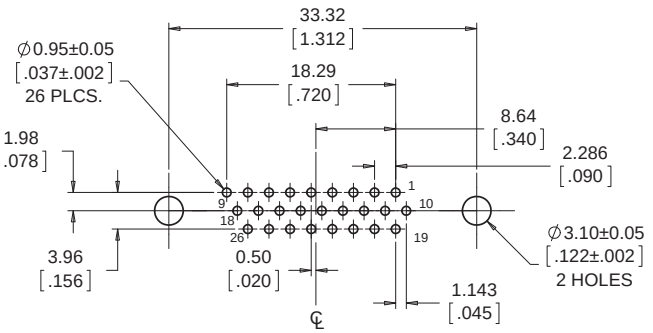

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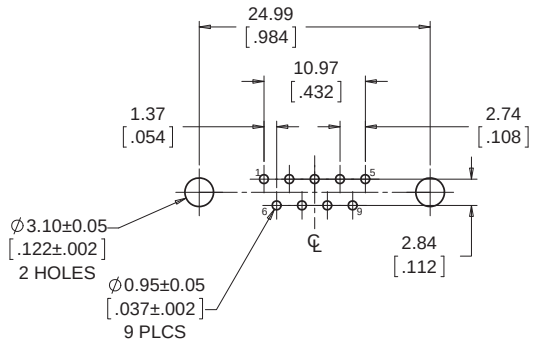

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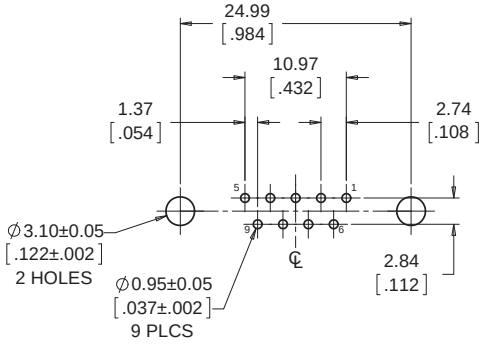


MDBR-E09SE-XN0

MDB SERIES

GENERATION 1 RUGGED D-SUB

D-Subminiature connectors are designed to conform to the requirements of MIL-DTL-24308 specification. Part numbers MDB-A26PE-860 & MDB-E15PE-766 have size 22D contacts for high density configurations. All other part numbers have size 20 contacts for standard density configurations.

Specifications

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Nickel Plated[1]
Insulator Housing:	High Temperature Resistant Nylon, Glass Reinforced, UL94V-0, Black
Contacts:	Machined Phosphor Bronze or Brass Alloy Plated with 0.76µm (30µ") min Gold over 1.27µm (50µ") min Nickel[2]
Gaskets & O-rings:	Silicone Rubber, Black or Red
Jack Sockets:	Stainless Steel[3]
Dust Covers	Silicone Rubber, Grey, with Nickel Plated Brass Bushing
Threaded Inserts[4]:	Nickel Plated Steel

Electrical

Current Rating:	*Standard Density* - 5A max *High Density* - 3A max
Contact Resistance:	20 mΩ max
Insulation Resistance:	5000 MΩ min
DWV:	1000 VDC

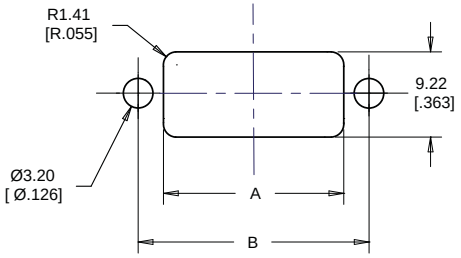
Mechanical, Environmental, Regulatory

Water & Dust Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-44°C to +105°C
Contact Insertion Force:	*Standard Density* - 5.0N (18oz$_f$) max, 3.3N (12oz$_f$) max Average Initial *High Density* - 5.0N (18oz$_f$) max, 2.6N (9.5oz$_f$) max Average Initial
Durability:	Per EIA 364-09, 500 Mating Cycles
Vibration:	Per EIA 364-28 Condition V, Letter D, 4.5 Hrs, No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition A (11ms, 50g, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -55°C to +105°C, 25 Cycles
Humidity:	Per EIA-364-31, 10 Cycles, 240 Hrs, 25°C to 65°C, 90-95%RH, with -10°C Cold Shock
Thermal Cycling:	Per EIA-364-110, 500 Cycles, 15°C to 85°C
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S, & SO_2), 14 Day Exposure
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging

Application Recommendations

Recommended Mounting Screw Torque:	0.45 to 0.65N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement
Recommended Soldering Methods:	Manual or wave (solder temperature 260°C max, time 10s max, preheat 100-140°C)

Recommended Front Mount Panel Cutout



MDB-E09SE/E09PE/E15PE/B25SE -760/765/766

Dimensions	Shell Size/Contacts	
	E09/E15	B25
A	19.15 [.754]	42.02 [1.624]
B	24.99 [.984]	47.04 [1.852]

For rear mount panel cutout see page 53

Notes:
1) Not Applicable for MDB-E09SA-700
2) For MDB-E09SA-700, 0.51µm (20µ") min Gold over Nickel
3) For MDB-E09SA-700, Nickel Plated
4) For MDB-E09SA-700

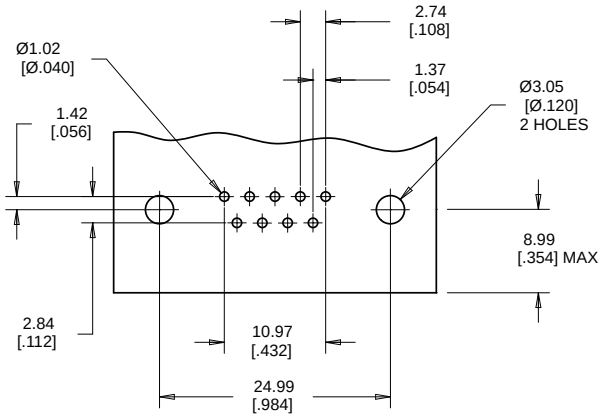
Available Standard Part Numbers	
MDB-E09SA-700	9 size standard density, socket, right angle tails, all plastic shell, rear mount with jack sockets installed
MDB-E09PE-760	9 size standard density, pin, vertical PCB tails, high profile die cast shell, front mount with jacket sockets & dust cover
MDB-E09PE-765	9 size standard density, pin, vertical PCB tails, high profile die cast shell, front mount
MDB-E09SE-760	9 size standard density, socket, vertical PCB tails, high profile die cast shell, front mount with jack sockets & dust cover
MDB-E09SE-765	9 size standard density, socket, vertial PCB tails, high profile die cast shell, front mount
MDB-B25SE-765	25 size standard density, socket, vertical PCB tails, high profile die cast shell, front mount
MDB-E15PE-766	15 size high density, pin, vertical PCB tails, high profile die cast
MDB-E09PE-860	9 size standard density, pin, vertical PCB tails, low profile die cast shell, rear mount
MDB-E09SE-860	9 size standard density, socket, vertical PCB tails, low profile die cast shell, rear mount
MDB-A26PE-860	26 size high density, pin, vertical PCB tails, low profile die cast shell, rear mount

MDB - XXX X X - XXX

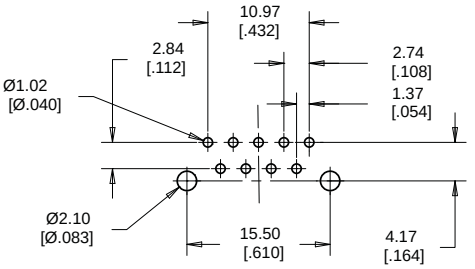
- MDB: Rugged D-Sub, Generation 1
- XXX: Shell Size & Number of Contacts
- X: Gender Type - Pin or Socket
- X: Termination Style - Right Angle or Vertical
- XXX: Options Code

See Available Standard Part Numbers List on Page 54

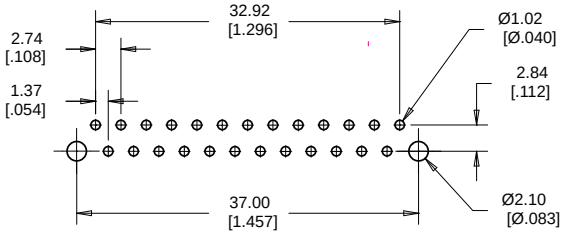
Recommended PCB Layouts



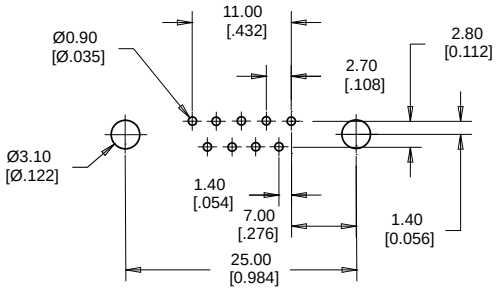
MDB-E09SA-700



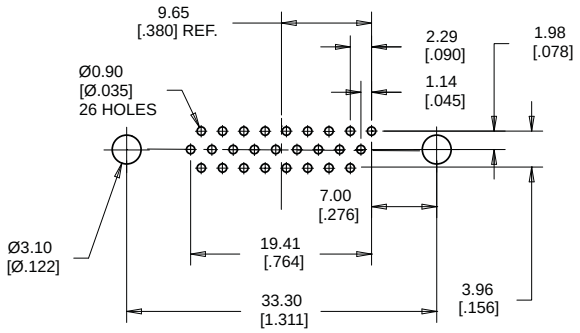
MDB-E09SE/E09PE-760/765



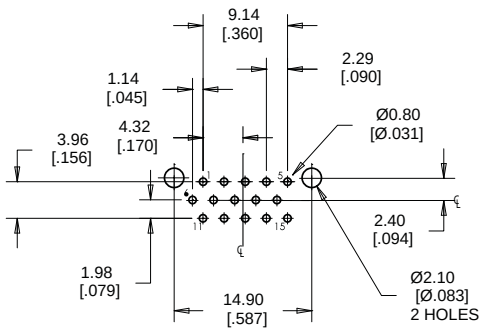
MDB-B25SE-76X



MDB-E09PE/E09SE-860



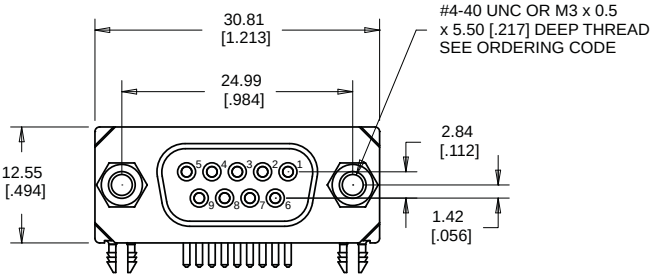
MDB-A26PE-860



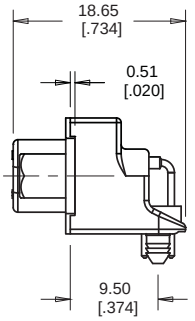
MDB-E15PE-766

MDB-E09SA-700

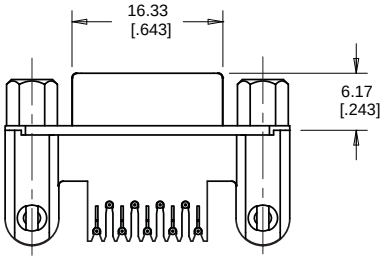
FRONT VIEW



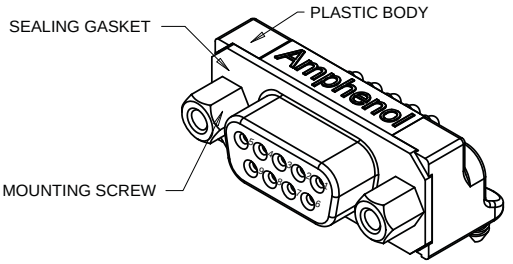
SIDE VIEW



BOTTOM VIEW



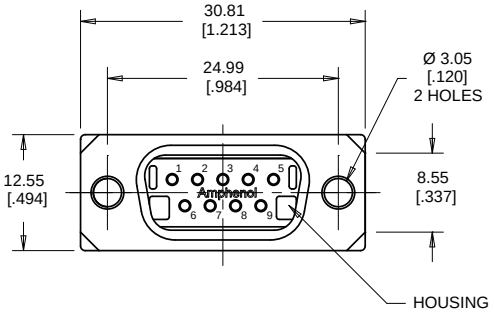
ISOMETRIC VIEW



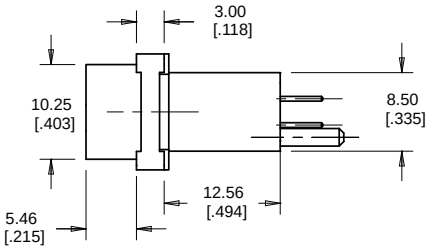
For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

MDB-E09PE-760* MDB-E09PE-765

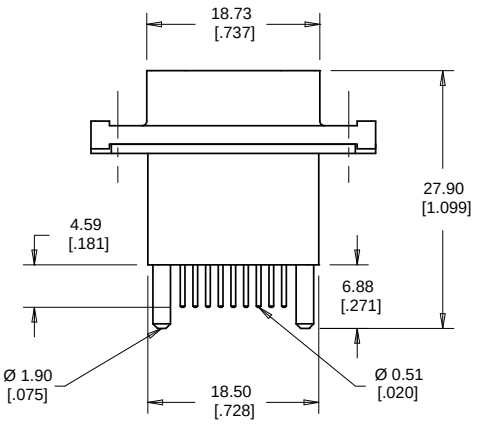
FRONT VIEW



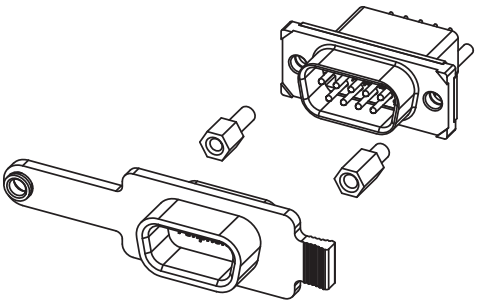
SIDE VIEW

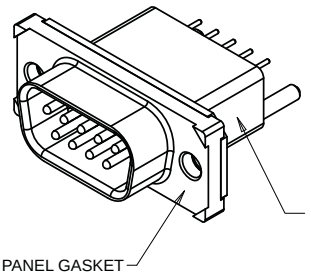


BOTTOM VIEW



ISOMETRIC VIEWS





For recommended panel cutout & PCB layout see catalogue page 54-55

*MDB-E09PE-760 comes with jack sockets and dust cover

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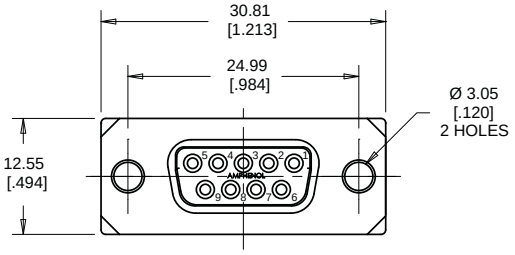
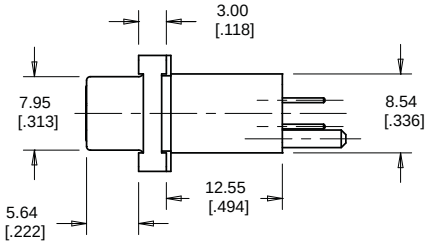
MDB-E09SE-760* MDB-E09SE-765

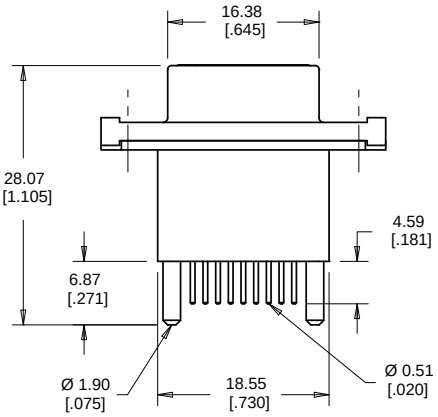
FRONT VIEW



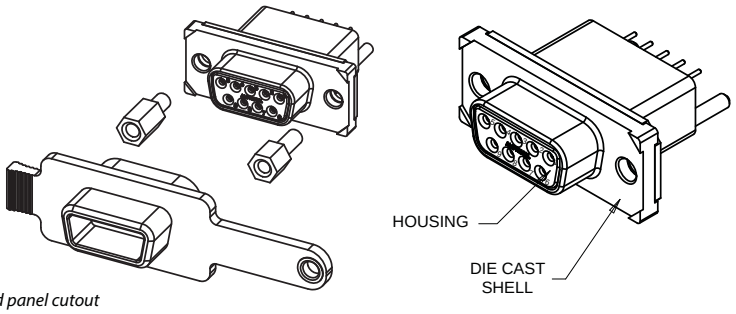
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEWS

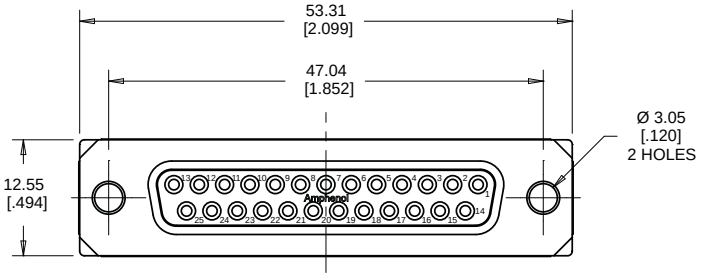


For recommended panel cutout & PCB layout see catalogue page 54-55

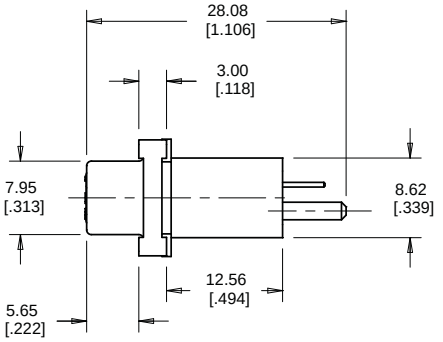
*MDB-E09SE-760 comes with jack sockets and dust cover

MDB-B25SE-765

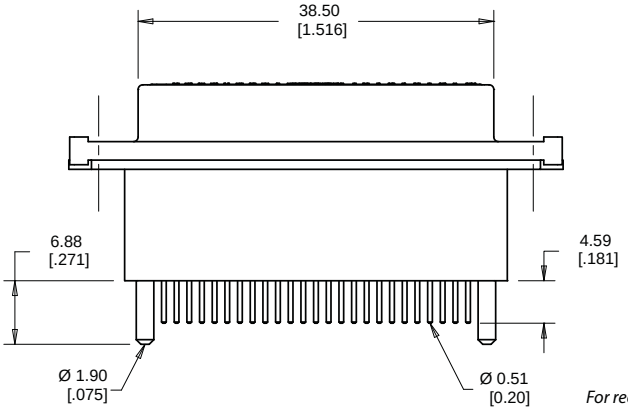
FRONT VIEW



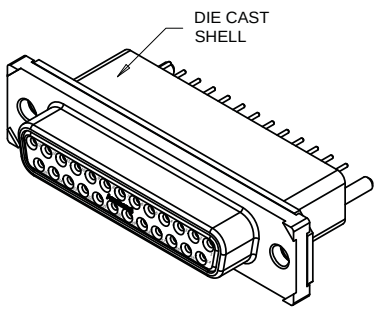
SIDE VIEW



BOTTOM VIEW



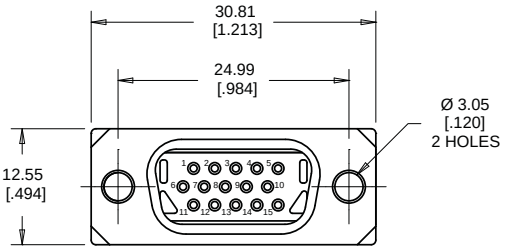
ISOMETRIC VIEW



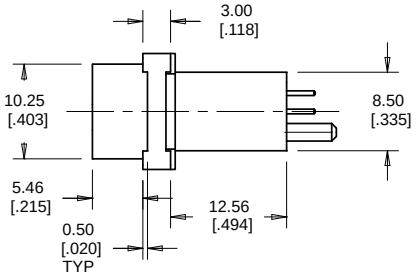
For recommended panel cutout & PCB layout see catalogue page 54-55

MDB-E15PE-766

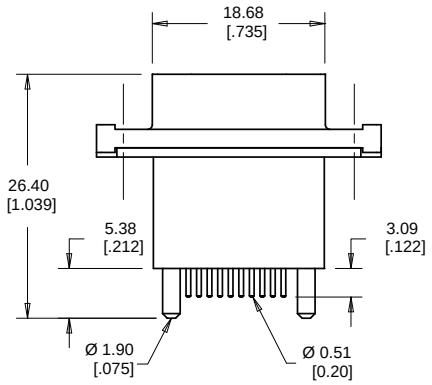
FRONT VIEW



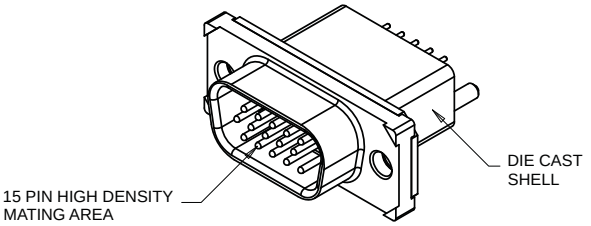
SIDE VIEW



BOTTOM VIEW



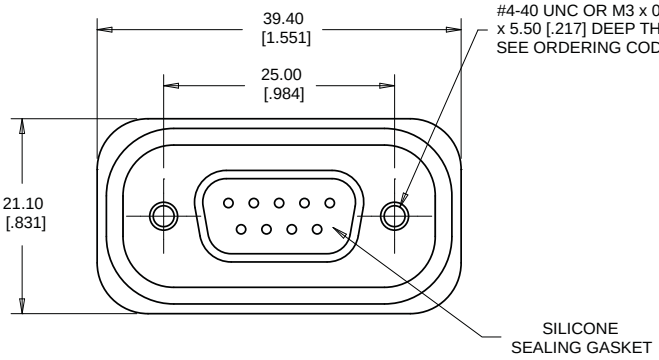
ISOMETRIC VIEW



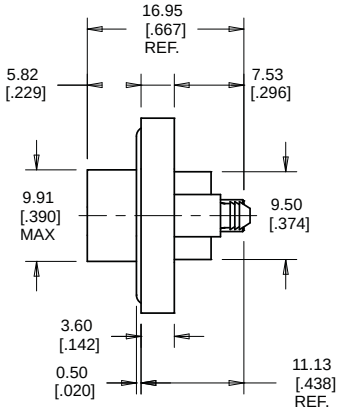
For recommended panel cutout & PCB layout see catalogue page 54- 55

MDB-E09PE-860

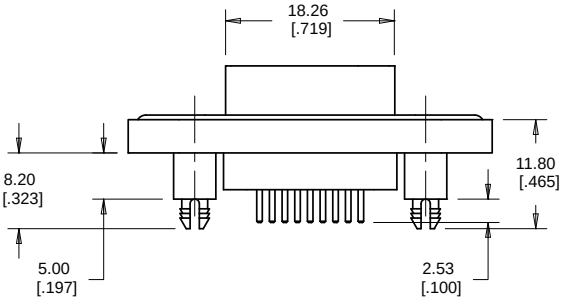
FRONT VIEW



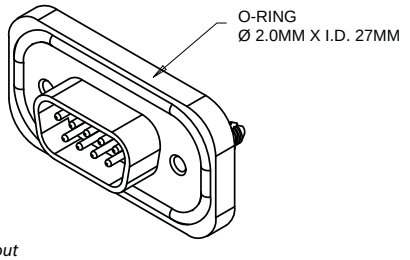
SIDE VIEW



BOTTOM VIEW



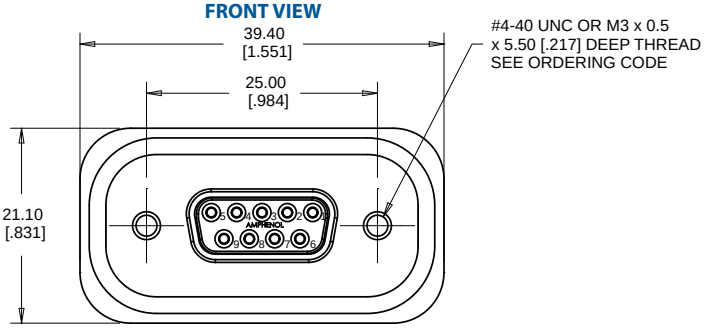
ISOMETRIC VIEW



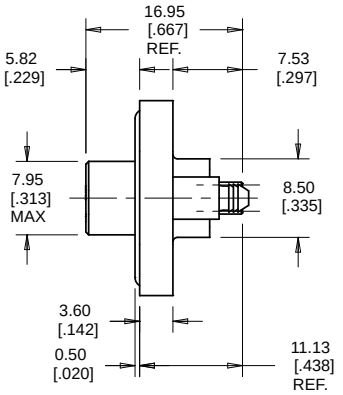
For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

MDB-E09SE-860

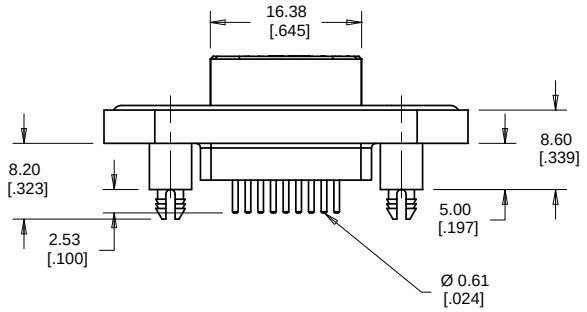
FRONT VIEW



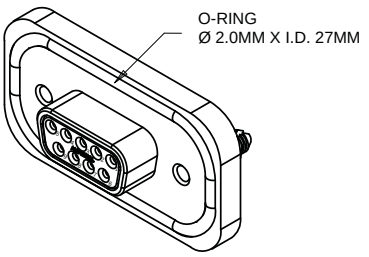
SIDE VIEW



BOTTOM VIEW



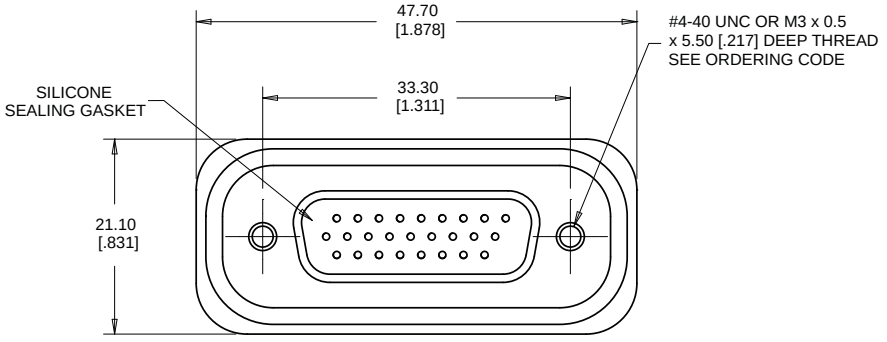
ISOMETRIC VIEW



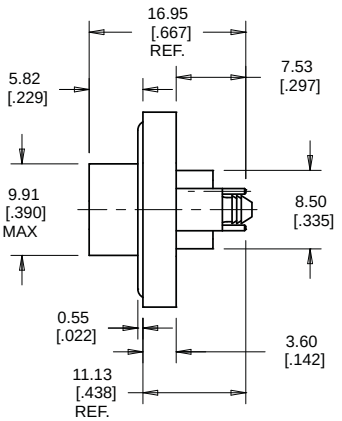
For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

MDB-A26PE-860

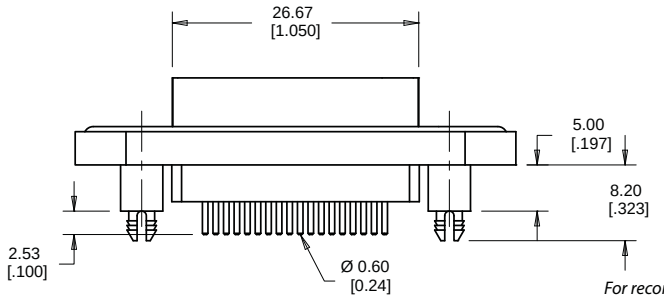
FRONT VIEW



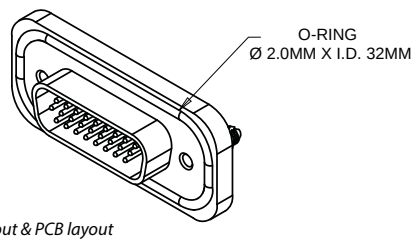
SIDE VIEW



BOTTOM VIEW



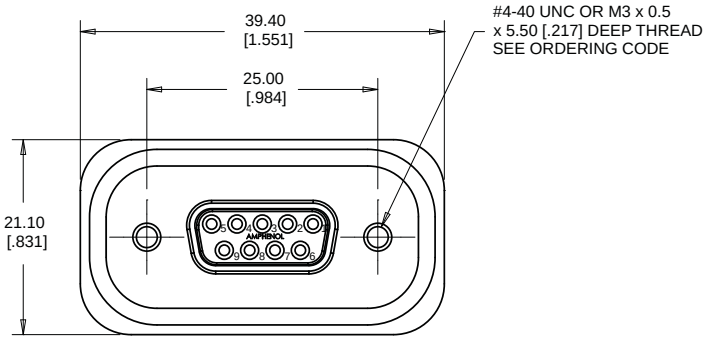
ISOMETRIC VIEW



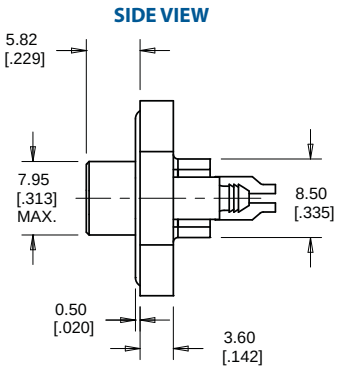
For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

MDB-E09SM-860

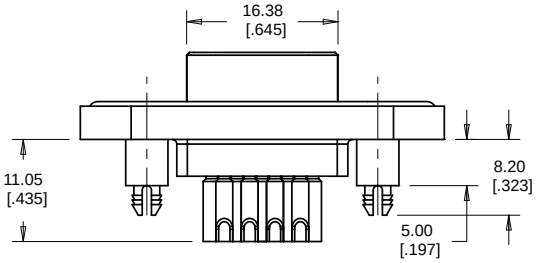
FRONT VIEW



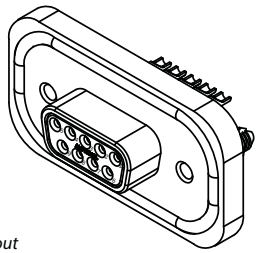
SIDE VIEW



BOTTOM VIEW



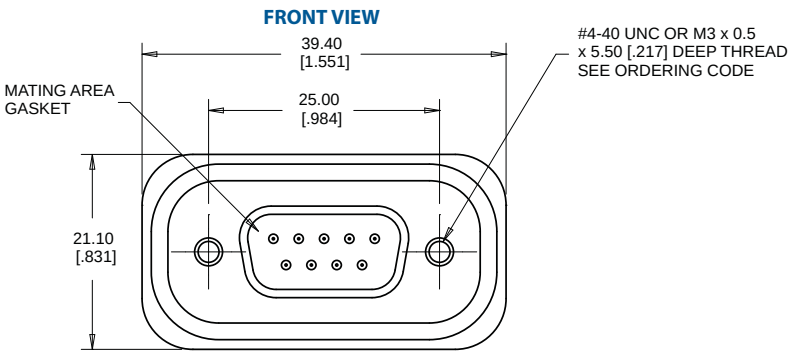
ISOMETRIC VIEW



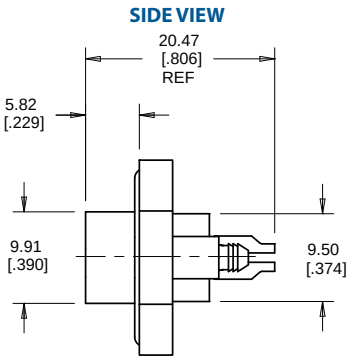
For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

MDB-E09PM-860

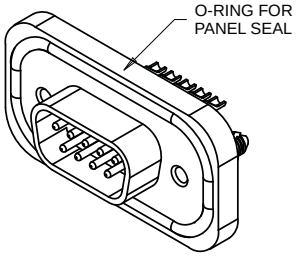
FRONT VIEW



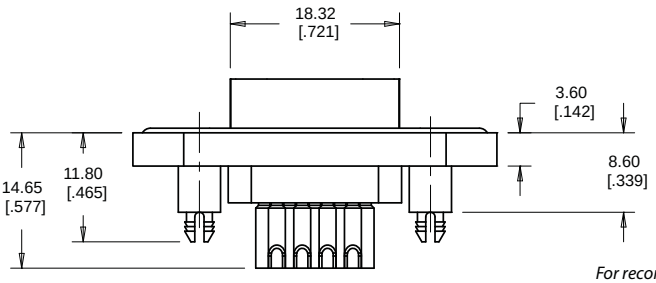
SIDE VIEW



ISOMETRIC VIEW



BOTTOM VIEW



For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

Amphenol Commercial Products - Amphenol Canada Corp. Telephone: (416) 291- 4401 Fax: (416) 292 - 0647 Email: sales@amphenolcanada.com

Specifications

Connectors are designed to conform to the requirements of High-Definition Multimedia Interface (HDMI) specification, Rev 1.4.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Matte Tin over Nickel Plated
Housing Inserts:	High Temperature Resistant LCP, Glass Reinforced, UL94V-0, Black
Contacts:	Copper Alloy Plated with 0.76µm (30µ") min Gold over 1.27µm (50µ") min Nickel on the Mating Area and 2.54µm (100µ") min Matte Tin over Nickel on the Contact Tails
Internal Shields & Rear Shields:	Stainless Steel, Passivated
Panel Gasket:	Conductive Silicone Rubber, Black
Internal O-rings:	Silicone Rubber, Beige

Electrical

Current Rating:	0.5A max per Contact (ΔT ≤ 30°C)
Contact Resistance:	10 mΩ max, Initial
Insulation Resistance:	1000 MΩ min
DWV:	500 VAC rms (between adjacent contacts or contacts to ground)
Differential Impedance:	100 Ω ± 15%

Mechanical, Environmental, Regulatory

Water & Dust Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-55°C to +105°C
Insertion Force:	Per EIA-364-13, 44.1N (4.5 kg_f, 9.1lb_f) max
Withdrawal Force:	Per EIA-364-13, 9.8N (1.0 kg_f, 2.2lb_f) to 39.2N (4.0 kg_f, 8.8lb_f)
Durability	Per EIA 364-09, 10 000 Mating Cycles
Vibration:	Per EIA 364-28 Condition III (15g, 10-2000Hz, 12 Hrs), No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition A (11ms, 50g, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -55°C to +125°C, 10 Cycles
Humidity:	Per EIA 364-31, 10 Cycles, 240 Hrs, 25°C to 65°C, 90-95%RH, with -10 Cold Shock
Mixed Flowing Gas	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S, & SO_2), 14 Day Exposure
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging

Application Recommendations

Recommended Mounting Screw Torque:	0.45 to 0.65N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement
Recommended Soldering Methods:	Manual or wave (solder temperature 260°C max, time 10s max, preheat 100-140°C)

MHDR SERIES

ORDERING CODE

MHDR - A X 1 1 - X 0 X

Rugged HDMI Receptacle Series

Receptacle Type
A - Standard A Series

Termination Style
1 - Right Angle
5 - Vertical

Number of Contacts
1 - Standard 19 Contacts

Insulator Housing Colour
1 - Black

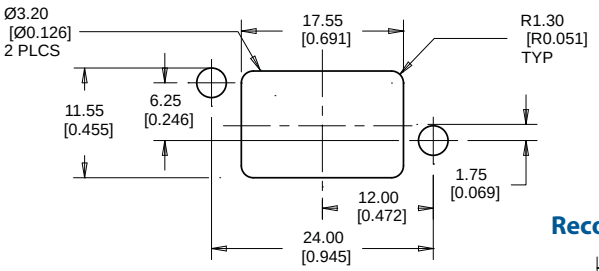
Mounting Thread Options
3 - #4-40 UNC Unified Thread
M - M3 x 0.5 Metric Thread

Other Options
0 - Standard

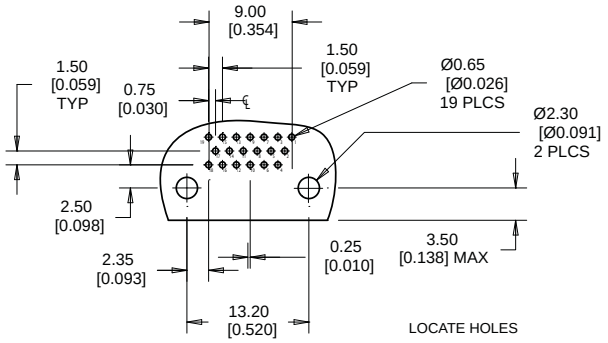
Unique Special Code[1]
No Digit - Part Defined by Previous Digits of Part Number
1 to 9 - Identifies Unique Special Features
Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details

Notes:
1) Consult with Amphenol for additional termination styles, contact tail lengths, mounting styles, non-conductive gaskets or other special requirements.

Recommended Panel Cutout



MHDR-A111-X0
Recommended PCB Layout

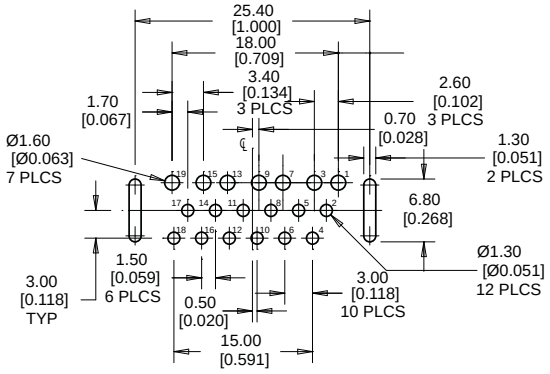


LOCATE HOLES

⌖	0.13 [.005] DIA

POSITION DIMENSIONS ARE BASIC

MHDR-A511-X0
Recommended PCB Layout



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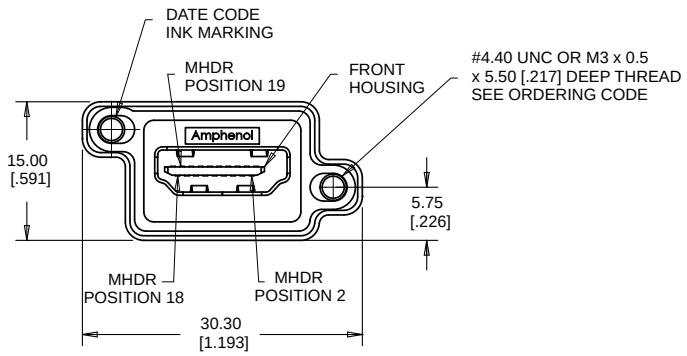
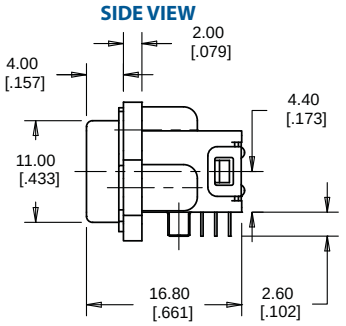
MHDR-A111-X0

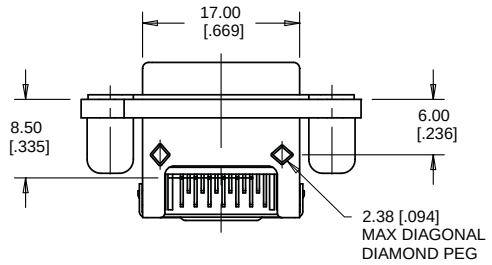
FRONT VIEW



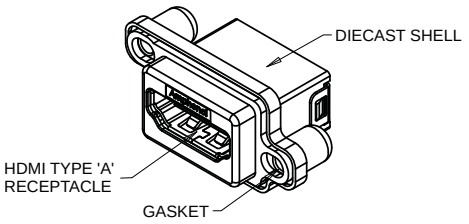
SIDE VIEW



BOTTOM VIEW



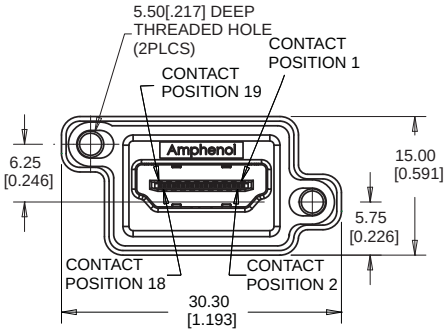
ISOMETRIC VIEW



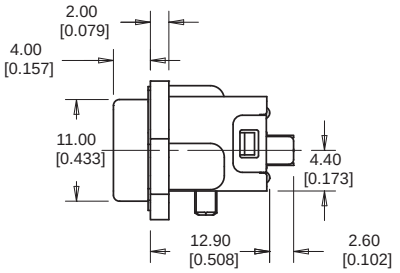
For recommended panel cutout
& PCB layout see catalogue page 62

MHDR-A511-X0

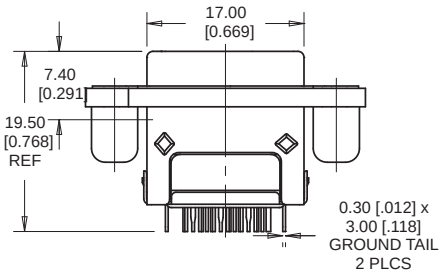
FRONT VIEW



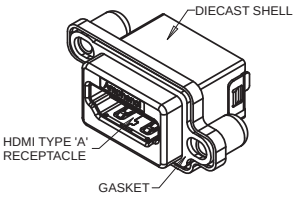
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEW



For recommended panel cutout
& PCB layout see catalogue page 62

Specifications

Connectors are designed to conform to the requirements of the USB 2.0 or 3.0 specifications as applicable.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

Insulator Housing:	High Temperature Resistant Engineering Thermoplastic, Glass Reinforced, UL94V-0 Flammability Rating, Halogen Free, Colour per Ordering Code
Contacts:	Phosphor Bronze, Plated with 0.76µm (30µ") min Gold over 1.27µm (50µ") min Nickel on the Mating Area and 2.54µm (100µ") min Matte Tin over Nickel on the Contact Tails
Shield:	Copper Alloy, Solderable Nickel Plated
Latch:	Stainless Steel

Electrical

Current Rating:	*Standard A USB 2.0* - 1.5A max Contact (ΔT ≤ 30°C) *Standard A USB 3.0* - 1.8A max for positions 1 & 4 with 0.25A max per Contact for Remaining Positions (ΔT ≤ 30°C)
Contact Resistance:	30 mΩ max
Insulation Resistance:	1000 MΩ min
DWV:	500 VAC rms
Differential Impendance:	90 ± 15 Ω

Mechanical, Environmental, Regulatory

Operating Temperature:	-45°C to +105°C
Insertion Force:	Per EIA-364-13, 35N (7.9lb_f) max
Extraction Force:	Per EIA-364-13, 8N (1.8lb_f) min with Latch Disengaged
Plug Retention Force:	50N (11.2 lb_f) min with Latch Engaged
Durability:	Per EIA 364-09, 1500 Mating Cycles (with Latch Activation for each Cycle)
Vibration:	Per EIA 364-28 Random Condition V, Letter A, No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition H (11ms, 30g, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -65°C to +105°C, 10 Cycles
Humidity:	Per EIA-364-31, 10 Cycles, 240 Hrs, 25°C to 65°C, 90-95%RH, with -10°C Cold Shock
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl_2, NO_2, H_2S, & SO_2), 14 Day Exposure
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging

Application Recommendations

Recommended Soldering Methods: Manual, wave (solder temperature 260°C max, time 10s max, preheat 100-140°C) or pin-in-paste reflow (260°C peak per IPC/JEDEC J-STD-020D)

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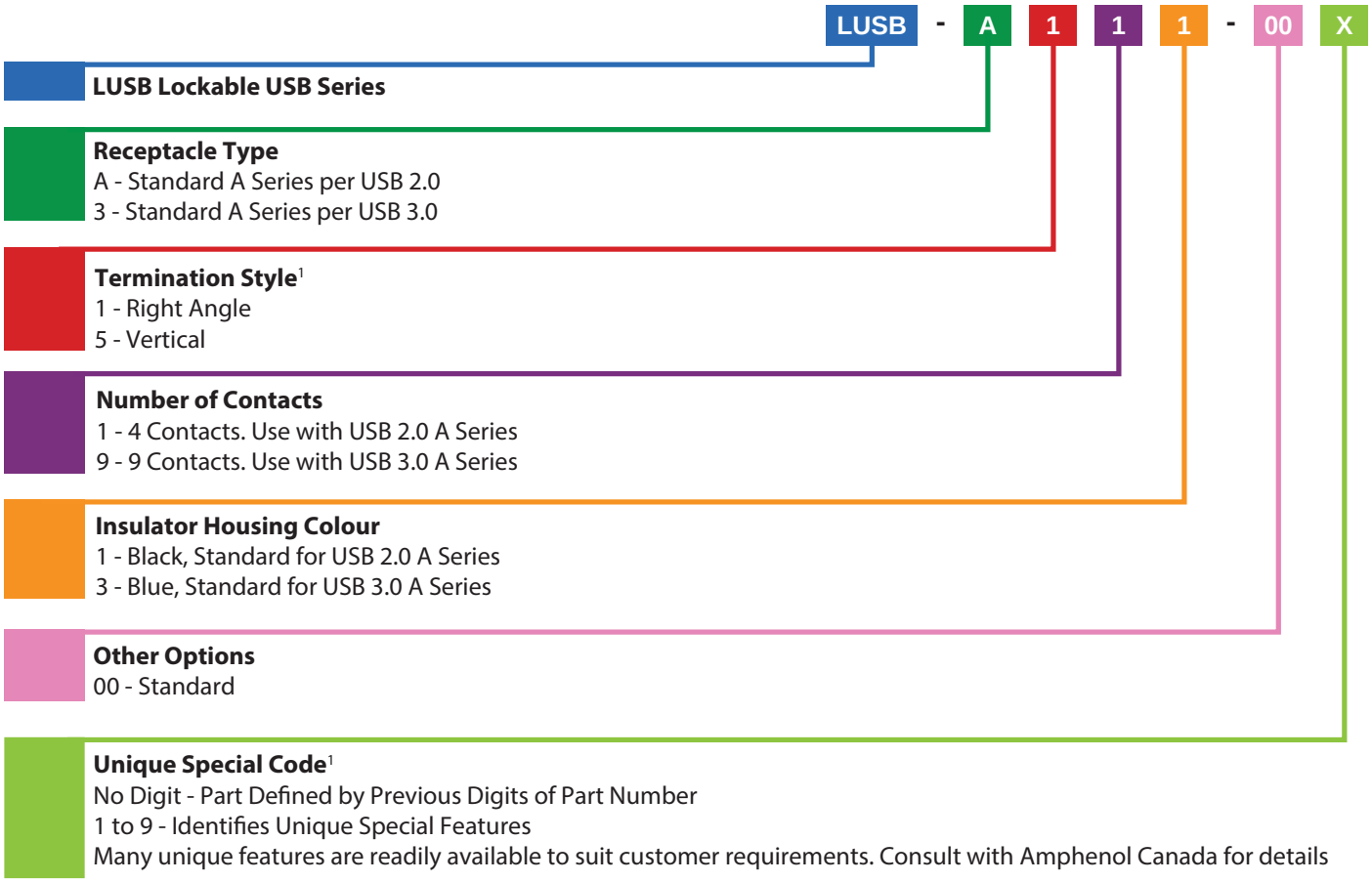
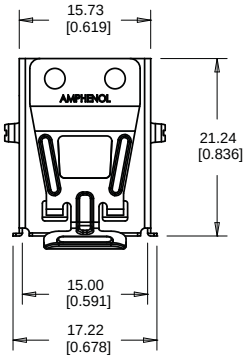
LUSB SERIES



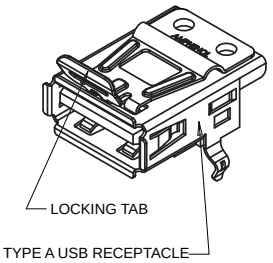
Notes:
1) Consult with Amphenol for additional connectors such as vertical or upright (flag) termination styles, contact tail lengths, latch styles or other special requirements.

LUSB-A111-00

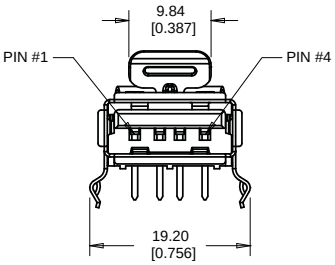
TOP VIEW



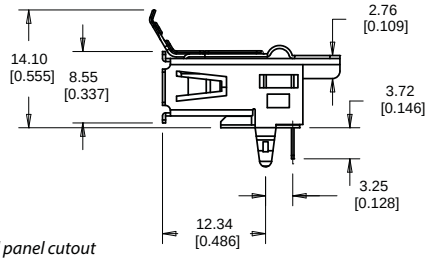
ISOMETRIC VIEW



FRONT VIEW



SIDE VIEW

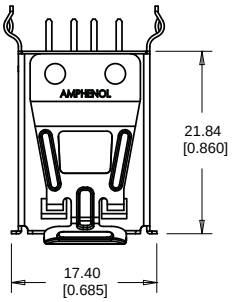


For recommended panel cutout & PCB layout see catalogue page 67

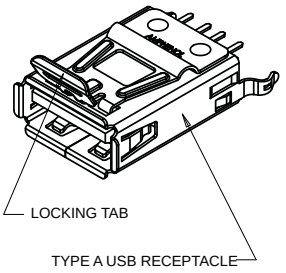
LUSB-A511-00

CONSULT FACTORY

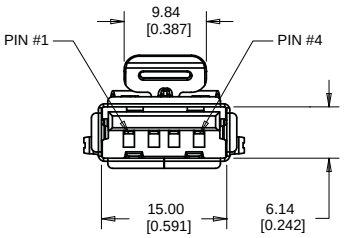
TOP VIEW`



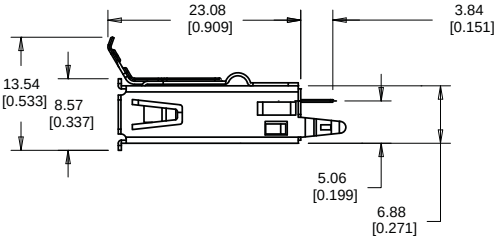
ISOMETRIC VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout & PCB layout see catalogue page 67

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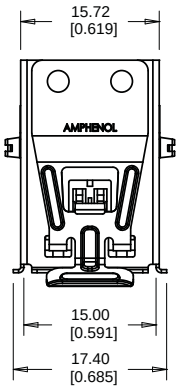
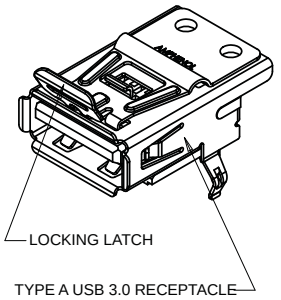
LUSB-3193-00

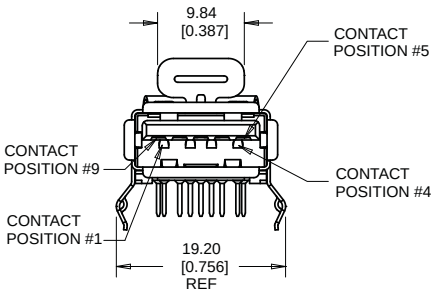
TOP VIEW



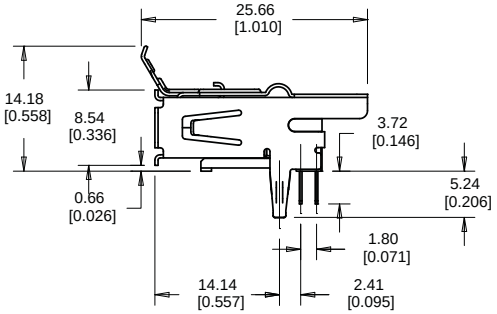
ISOMETRIC VIEW



FRONT VIEW

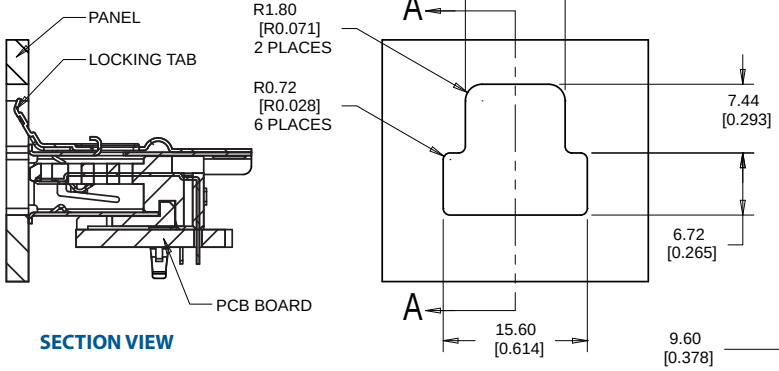


SIDE VIEW



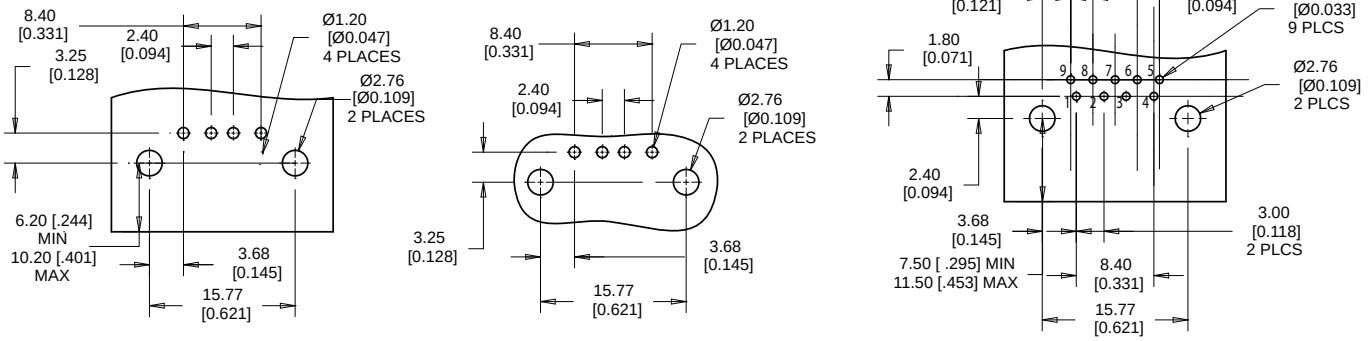
For recommended panel cutout & PCB layout see below

Gasket for Front Panel Mount



SECTION VIEW

FRONT VIEW



LUSB-A111-00
RECOMMENDED PCB LAYOUT

LUSB-A511-00
RECOMMENDED PCB LAYOUT

LUSB-3193-00
RECOMMENDED PCB LAYOUT

Specifications

The ID series is designed to provide a sealed adapter at the panel or bulkhead of equipment. The interface is sealed in both the mated and un-mated conditions. The adapter interface is available in modular jack or USB type A in a receptacle to receptacle configuration. The external plug kit can be assembled over most standard plug terminated cables after the cable is complete. The spring loaded external cover of the receptacle provides a positive lock for the mated plug, yet closes the mating area tightly when not in use. This connector system allows for a close 35.4mm (1.394") port to port spacing when multiple adapters are placed side by side.

Material

All Materials are RoHS Compliant per EU Directive 2011/65/EU

External Shell:	Die Cast Zinc, Nickel Plated
Internal Shield:	*Modular Jack* - Stainless Steel *USB Type A* - Copper Alloy, Nickel Plated
Inserts:	Engineering Thermoplastic, Glass Reinforced, UL94V-0, Black
Contacts:	Copper Alloy Plated with 0.76µm (30µ") min Gold over 1.27µm (50µ") min Nickel on the Mating Area
Internal Over-moulding:	*USB Type A Only* - Thermoplastic over UL1007 Wiring
Gaskets, O-rings, Split Washers:	Silicone Rubber
Mounting Screws	Stainless Steel

Electrical

Current Rating:	1.5A max per Contact (ΔT ≤ 30°C)
Contact Resistance:	*Modular Jack* - 20 mΩ max *USB Type A* - 30 mΩ max
Insulation Resistance:	*Modular Jack* - 500 MΩ min *USB Type A* - 1000 MΩ min
DWV:	*Modular Jack* -1000 VAC rms (between adjacent contacts),1500 VAC rms (contacts to ground) *USB Type A* - 500 VAC rms

Mechanical, Environmental, Regulatory

Operating Temperature:	-40°C to +85°C
Insertion Force:	*Modular Jack* - 20N (4.5lb_f) max *USB Type A* - 30N (7.9lb_f) max
Extraction Force:	*Modular Jack* - 20N (4.5lb_f) max with Latch Disengaged *USB Type A* - 10N (2.2lb_f) min
Durability:	Per EIA 364-09, 1500 Cycles
Vibration:	Per EIA 364-28 Condition II (10g, 10-500Hz), No Discontinuity ≥ 1µs
Shock:	Per EIA 364-27 Test Condition A (11ms, 50g, ½ Sine), No Discontinuity ≥ 1µs
Temperature Life:	Per EIA-364-17, Without Load, 85°C, 1000 Hours
Thermal Shock:	Per EIA-364-32, -55°C to +85°C, 10 Cycles
Humidity:	Per EIA-364-31, 10 Cycles, 240 Hrs, 25°C to 65°C, 90-95%RH, with -10°C Cold Shock

Application Recommendations

Recommended Mounting Screw Torque: 0.45 to 0.65N-m (4 to 5.75 in-lbs) for steel screws with 3mm (.118") thread engagement, dependent upon customer panel threaded hole material

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ID - X XX - XXX

Bulkhead Adaptor Series

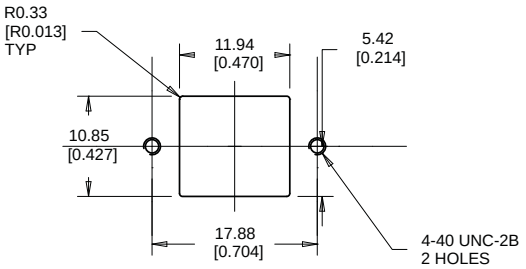
Connector Type
4 - Receptacle Only
5 - Plug Kit for RJ
6 - Plug Kit for USB
7 - Receptacle with Plug Kit

Interface Style[1]
50 - RJ45 Modular Jack 8P8C
51 - USB 2.0, A Series

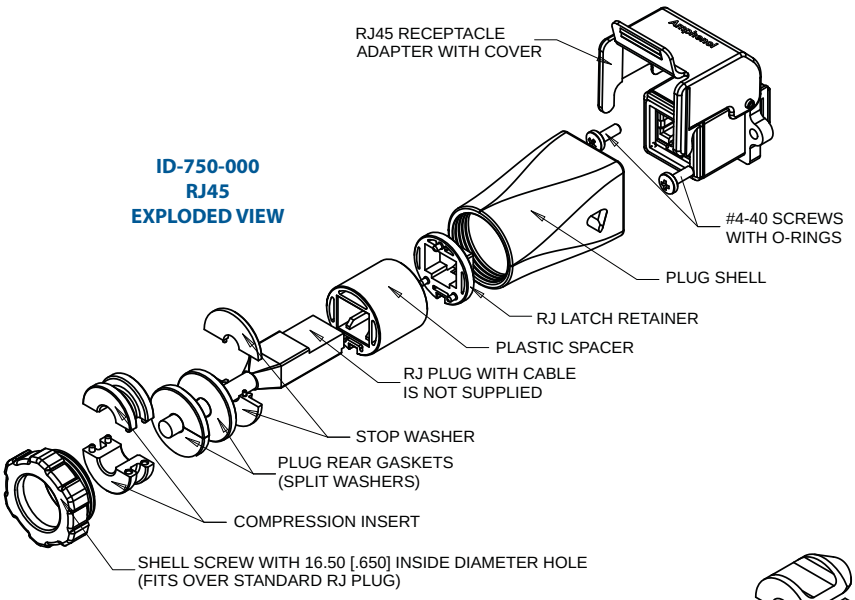
Options and Unique Special Code[1]
000 - Standard Part
9XX - Identifies Unique Special Features. Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details.

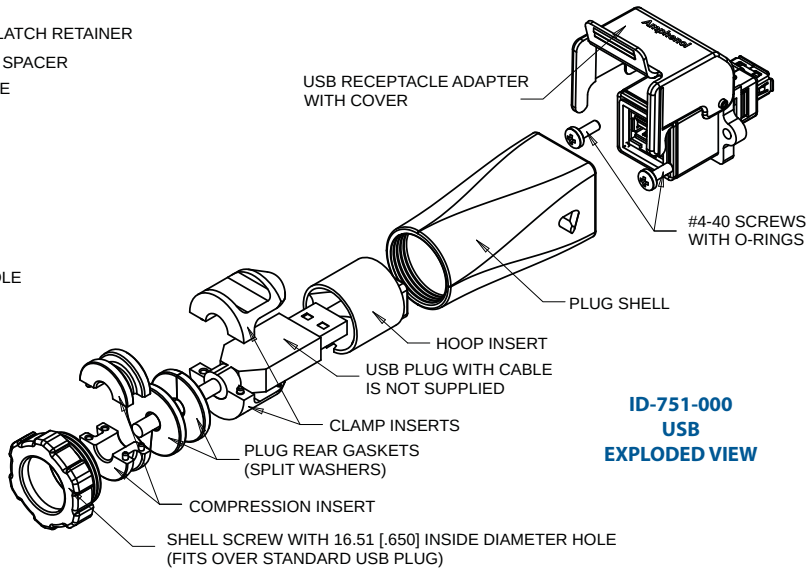
Notes:
1) Consult with Amphenol for additional interfaces styles such as RF, power or fibre optic, mounting styles or other special requirements.

Recommended Panel Cutout



ID-750-000
RJ45
EXPLODED VIEW

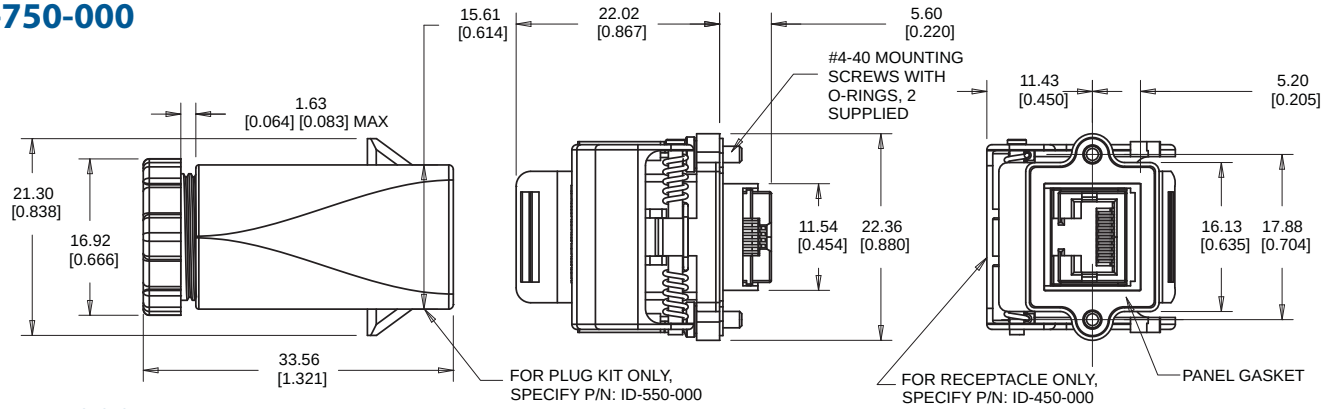




ID-751-000
USB
EXPLODED VIEW

ID-750-000

RJ45

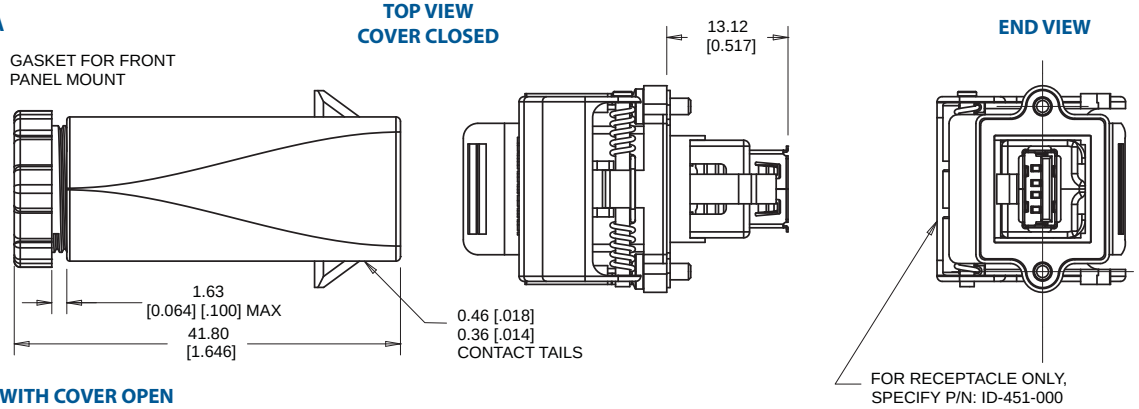


ID-751-000

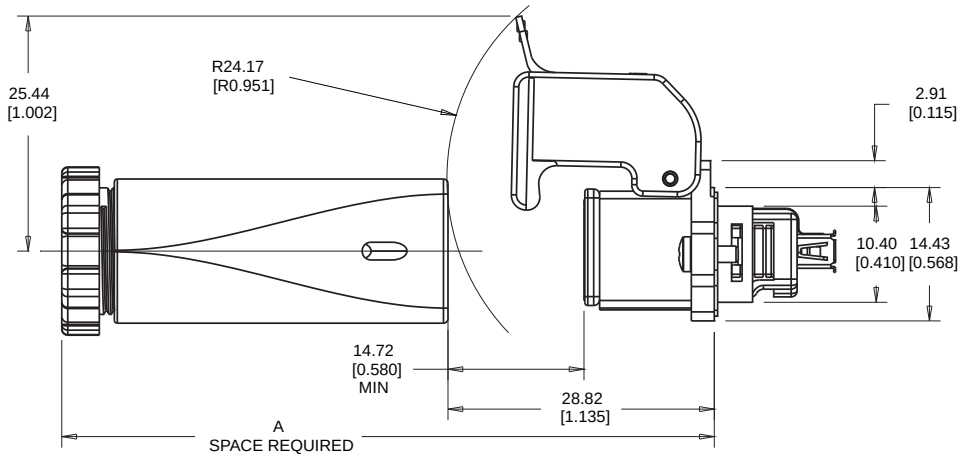
USB Type A

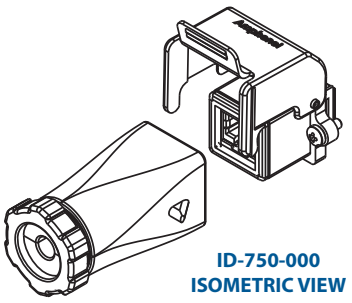
TOP VIEW COVER CLOSED

END VIEW



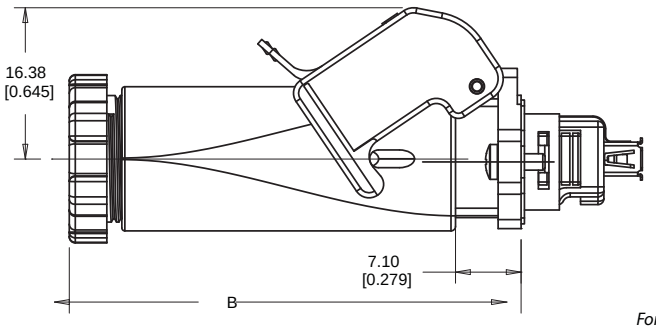
SIDE VIEW WITH COVER OPEN



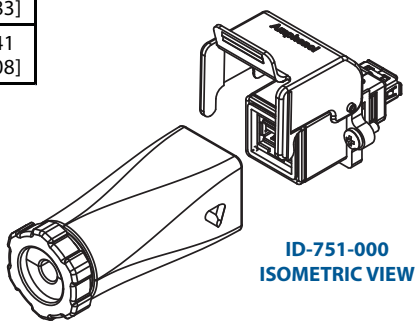


ID-750-000 ISOMETRIC VIEW

SIDE VIEW, MATED & COVER LOCKED



Part No.	A	B
ID 750-000	97.03 [3.820]	63.08 [2.483]
ID 751-000	110.36 [4.345]	76.41 [3.008]



ID-751-000 ISOMETRIC VIEW

For recommended panel cutout see catalogue page 69

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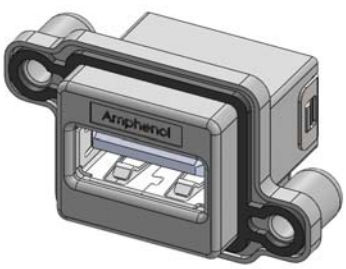
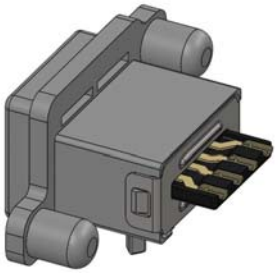
Consult factory

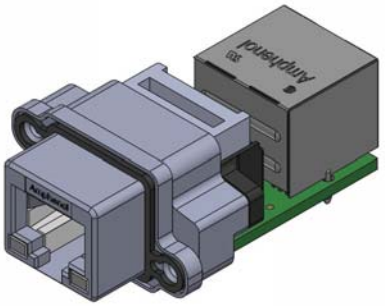
ADDITIONAL PRODUCTS

MUSBR Vertical Solder Cup

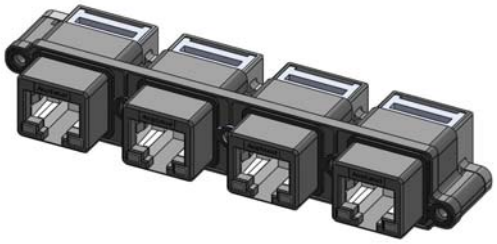




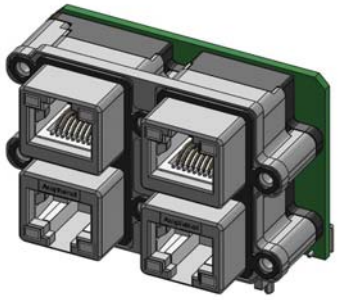
MRJR Cat 5e Right Angle



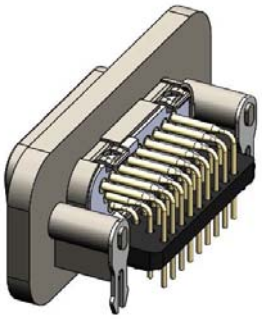
MRJR Right Angle 4 Port



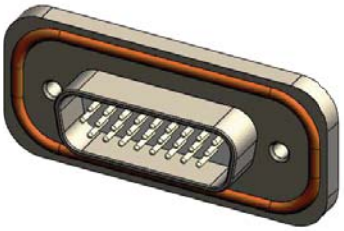
MRJR 2x2 Stacked

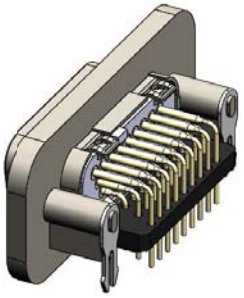


MDBR Right Angle 26 Pin



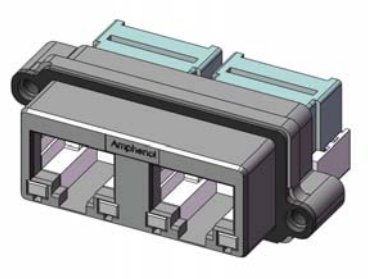
MDBR Right Angle 26 Socket



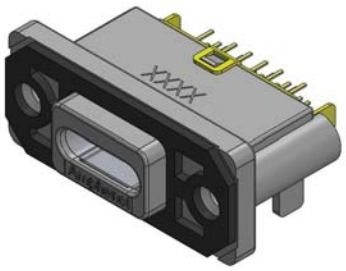


ADDITIONAL PRODUCTS

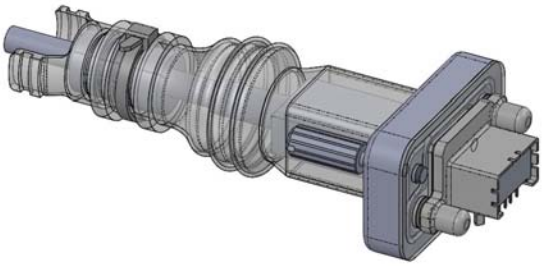
MRJ Right Angle 2 Port



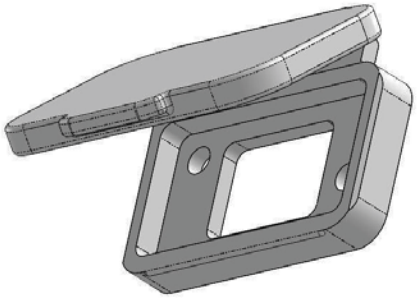
MUSBR Type C



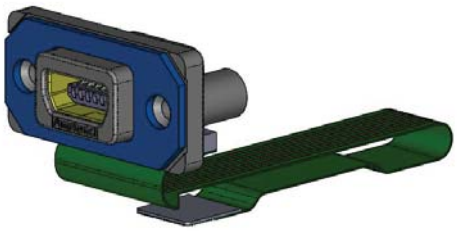
MUSBR Plug Boot



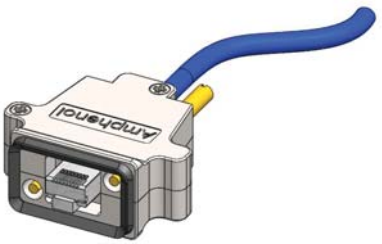
MUSBR Latching Dust Cover



Rugged Connector on Flex



MRJR Plug Hood



Amphenol Commercial Products - Amphenol Canada Corp. Telephone: (416) 291-4401 Fax: (416) 292-0647 Email: sales@amphenolcanada.com

NOTES

Amphenol Commercial Products

605 Milner Avenue
Toronto, Ontario
Canada, M1B 5X6
Telephone: (416) 754-5656
Fax: (416) 754-8668
www.amphenolcanada.com
Email: sales@amphenolcanada.com

CATALOGUE NBR: ADT 0002/06-15 REV A