



THE DATASHEET OF FCC17E09SM290

Amphenol Commercial Products

HARSH ENVIRONMENT CONNECTORS



Product Catalogue

Amphenol
Now You're Connected!

OVERVIEW

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 RJ's, USB's, D-Subs and HDMI's 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

MRJR Generation 2 Specifications	2
MRJR Generation 2 Ordering Code	3
MRJR Generation 2 Series	4-9
MRJ Generation 1 Specifications	10
MRJ Generation 1 Ordering Code	11
MRJ Generation 1 Series	12-17

Rugged USB

MUSBR Generation 2 Specifications	18
MUSBR Generation 2 Ordering Code	19
MUSBR Generation 2 Series	20-27
MUSB Generation 1 Specifications	28
MUSB Generation 1 Ordering Code	29
MUSB Generation 1 Series	30-45

Rugged D-Sub

MDBR Generation 2 Specifications	46
MDBR Generation 2 Ordering Code	47
MDBR Generation 2 Series	48-53
MDB Generation 1 Specifications & Panel Cutouts	54
MDB Generation 1 Ordering Code & PCB Layouts	55
MDB Generation 1 Series	56-60

Rugged HDMI

MHDR Specifications	61
MHDR Ordering Code, Panel & PCB Layouts	62
MHDR Series	63

Locking USB

LUSB Specifications	64
LUSB Ordering Code	65
LUSB 2.0 Series	66
LUSB 3.0 Series	67

Rugged Bulkhead Adaptor

ID Specifications	68
ID Ordering Code	69
ID Series	70

Additional Products

Additional Products	71-72
Notes	73



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
Additional Connector:	UL Recognized Component
Ferrite:	Nickel Zinc Soft Ferrite Ceramic

Electrical

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

Application Recommendations

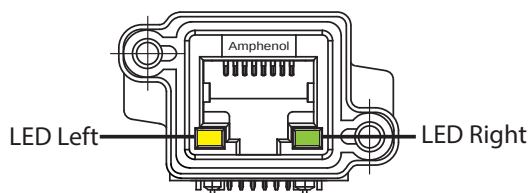
Recommended Mounting Screw Torque:	0.45 to 0.65 N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement
Recommended Soldering Methods:	Manual or wave soldering (solder temperature 260°C max, time 10s max, preheat 100-140°C)

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

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

MRJR - X X X X X - X X

Rugged RJ Series, Generation 2

Modular Jack Type

- 3 - RJ11, 6 Position¹
- 4 - RJ11, 6 Position with EMI Ferrite Filtering²
- 5 - RJ45, 8 or 10 Position³
- 6 - RJ45, 8 or 10 Position with EMI Ferrite Filtering²
- 7 - RJ45, 8 or 10 Position with Transient Voltage Suppression⁴
- 8 - RJ45, 8 Position with Cat5e Performance Level⁴

Termination Style

- 3 - Right Angle
- 4 - Vertical
- 5 - Right Angle on PCB with Right Angle Cable Header⁵
- 7 - Right Angle on PCB with Right Angle RJ45 Modular Jack⁶
- 8 - Right Angle on PCB with Vertical RJ45 Modular Jack⁷
- 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 Header⁹
- C - Right Angle on PCB with Holes for Wiring (Style 7 PCB)⁸
- D - Right Angle on PCB with Vertical Cable Header⁹

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 Options¹⁰

- 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.

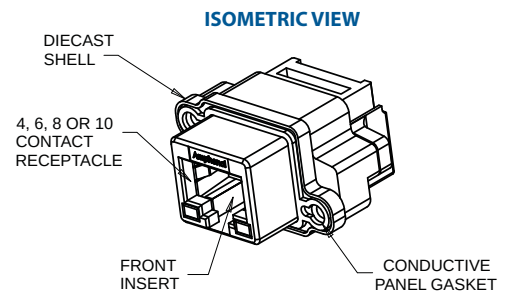
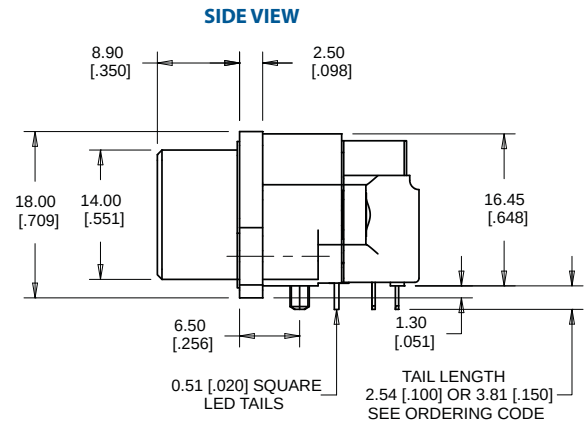
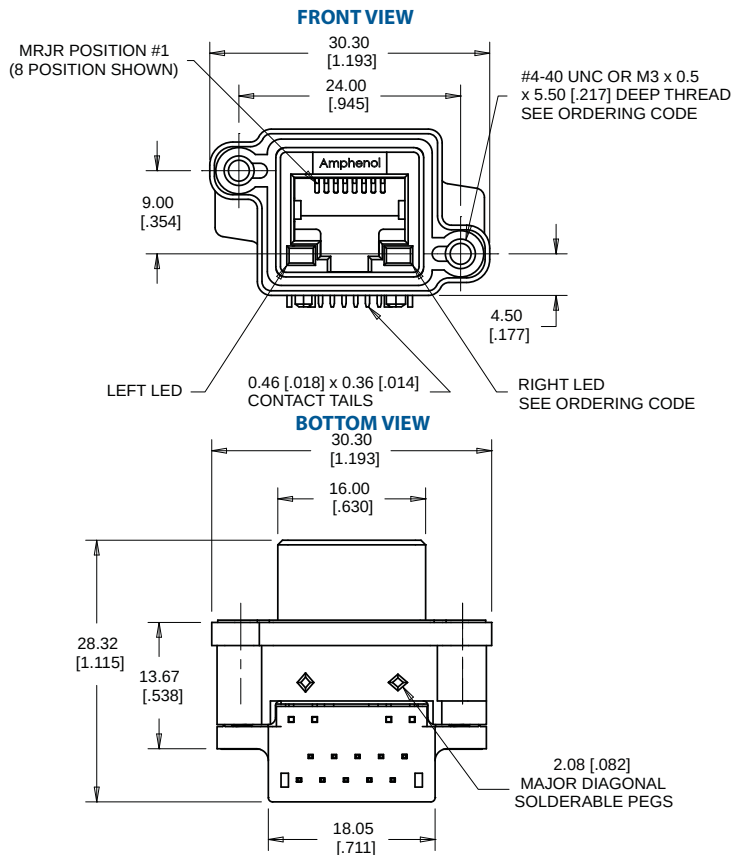
- 7) Termination style 8 currently available for RJ45 (8P8C) only.
- 8) Termination style A uses the PCB from termination style 5. Termination style C uses the PCB from termination style 7.
- 9) Termination styles B & D currently available for RJ11 (6P4C & 6P6C) without LEDs and RJ45 (8P8C) without LEDs 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

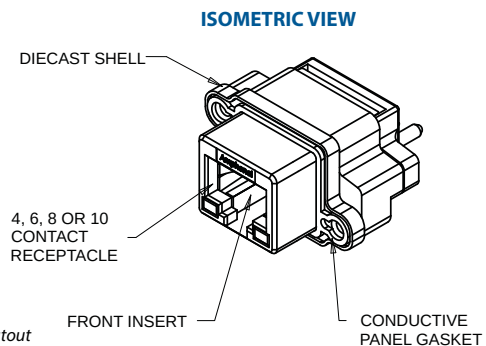
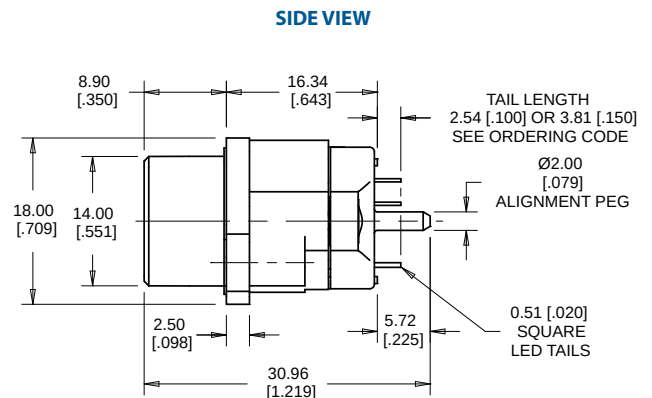
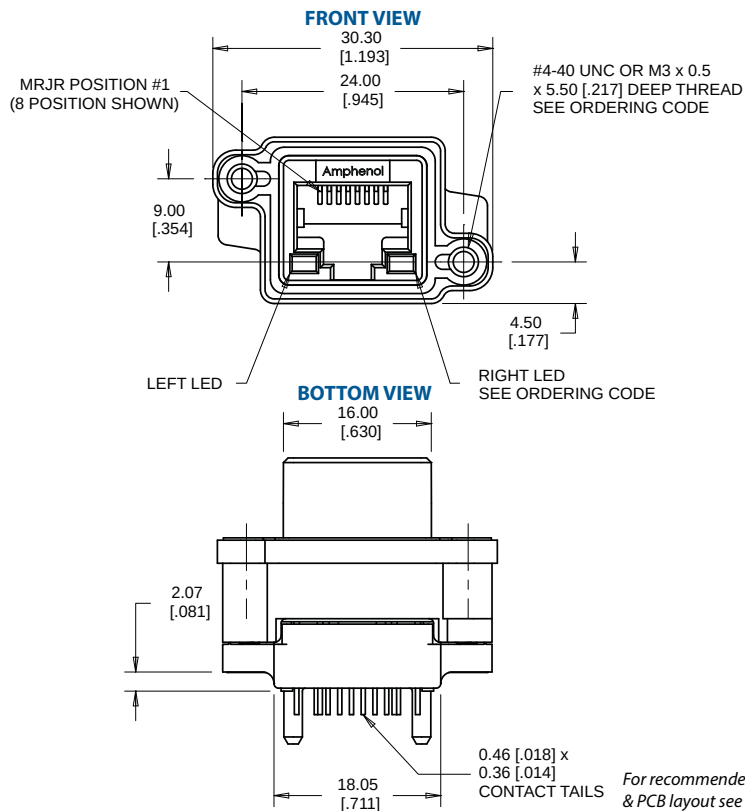
MRJR-53XX-X1



For recommended panel cutout
& PCB layout see catalogue page 9

MRJR-34XX-X1

MRJR-54XX-X1

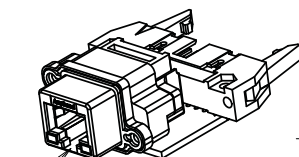


For recommended panel cutout
& PCB layout see catalogue page 9

CONNECTIONS CHART

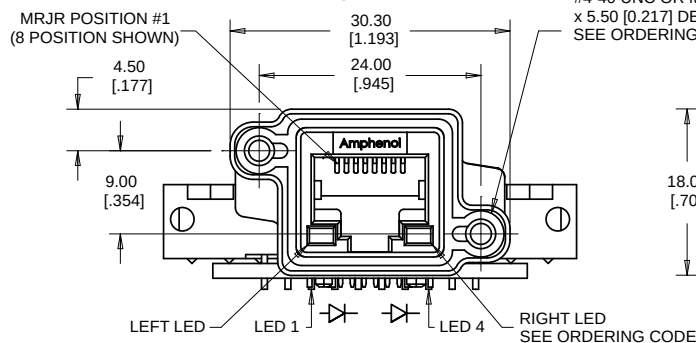
MRJR Connector Type			Cable Header Position
6 Position	8 Position	10 Position	
-	-	1	2
-	1	2	12
1	2	3	3
2	3	4	3
3	4	5	4
4	5	6	14
5	6	7	5
6	7	8	15
-	8	9	6
-	-	10	16
Shell/GND	Shell/GND	Shell/GND	10
LED 1	LED 1	LED 1	1
LED 2	LED 2	LED 2	11
LED 3	LED 3	LED 3	7
LED 4	LED 4	LED 4	17

ISOMETRIC VIEW



4, 6, 8 OR 10
CONTACT
RECEPTACLE

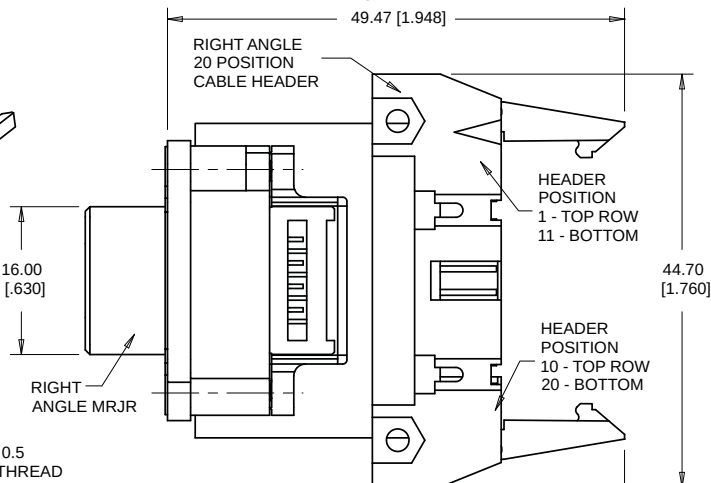
FRONT VIEW



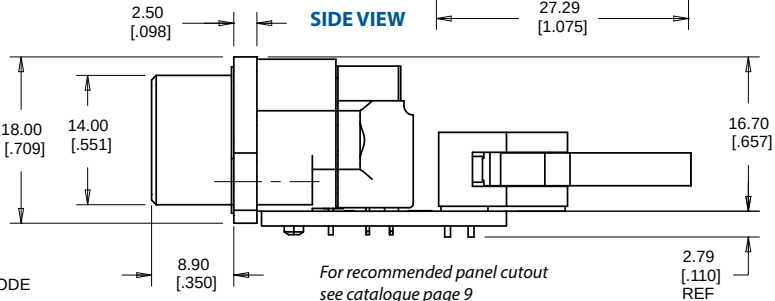
MRJR-35XX-X1

MRJR-55XX-X1

TOP VIEW



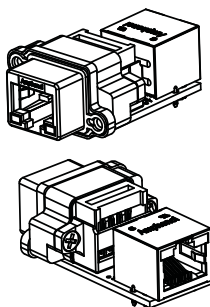
SIDE VIEW



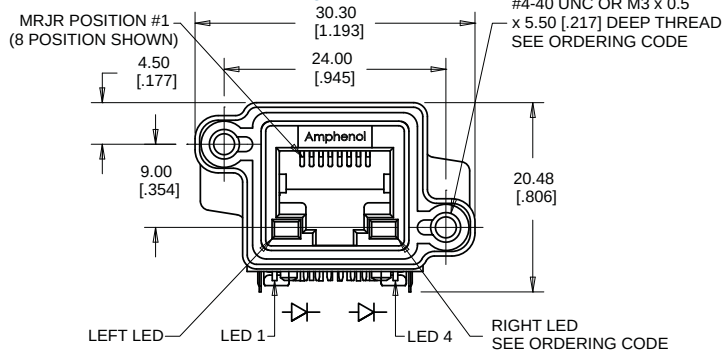
CONNECTIONS CHART

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



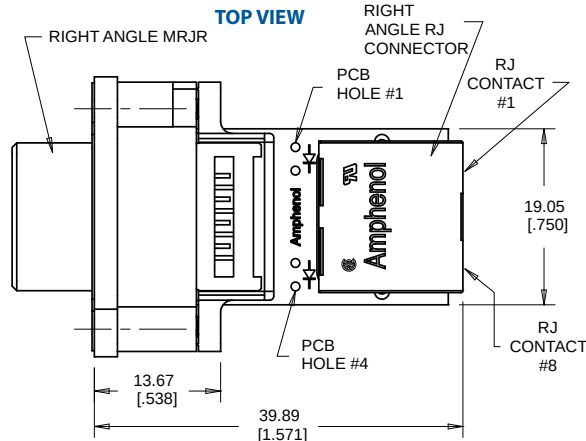
FRONT VIEW



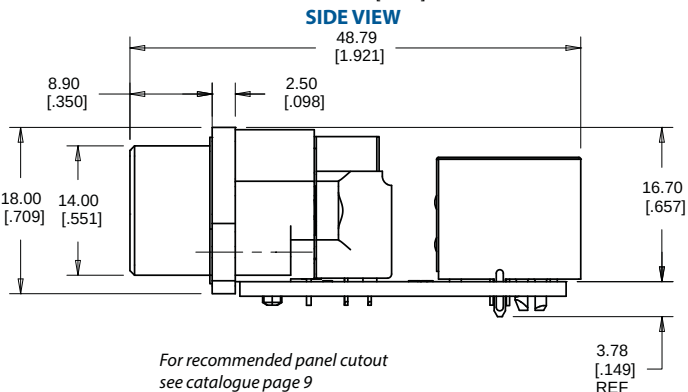
MRJR-37XX-X1

MRJR-578X-X1

TOP VIEW



SIDE VIEW



MRJR SERIES

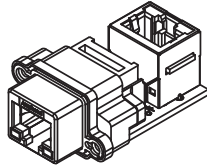
GENERATION 2 RUGGED RJ11/RJ45

MRJR-588X-X1

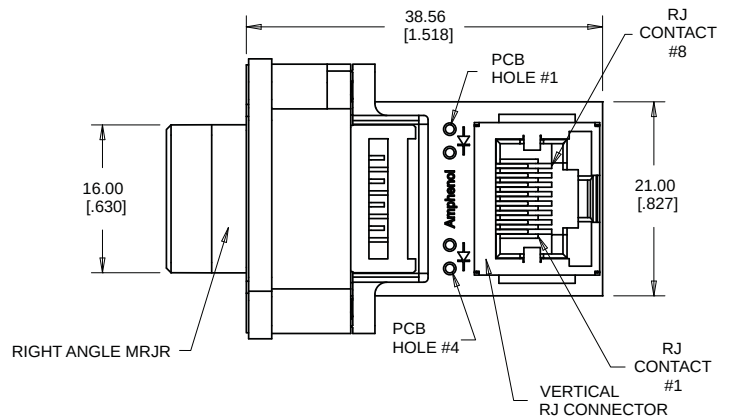
CONNECTIONS CHART

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

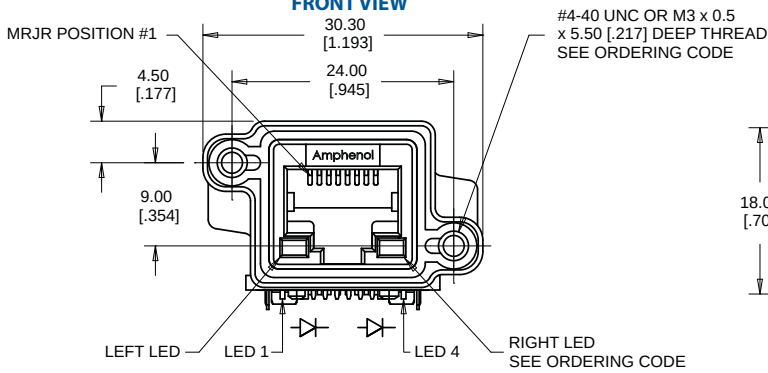
ISOMETRIC VIEW



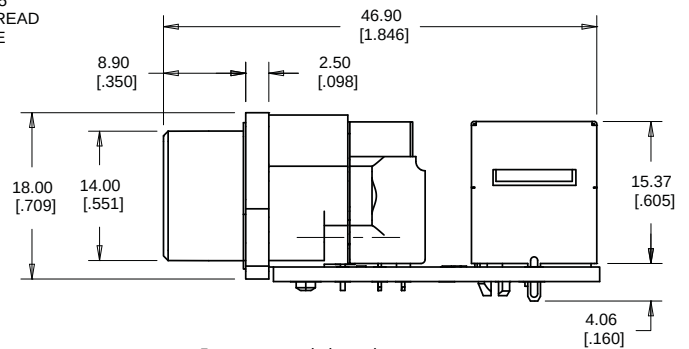
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout
see catalogue page 9

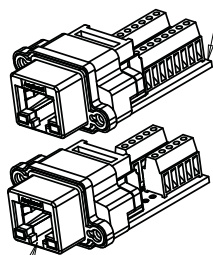
MRJR-39XX-X1 MRJR-59XX-X1

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

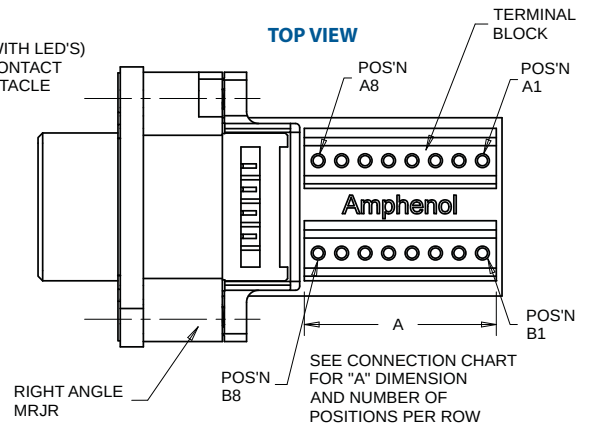
For 6 position with LEDs, the terminal block will be 20.78 [.818] with 8 positions per row.

ISOMETRIC VIEWS

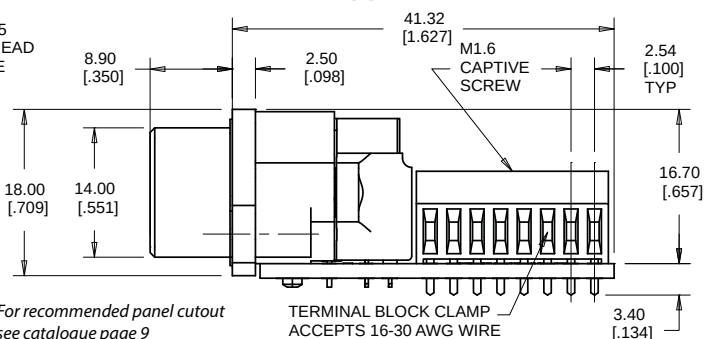


4, 6, OR 8 (WITHOUT LED'S) CONTACT RECEPTACLE

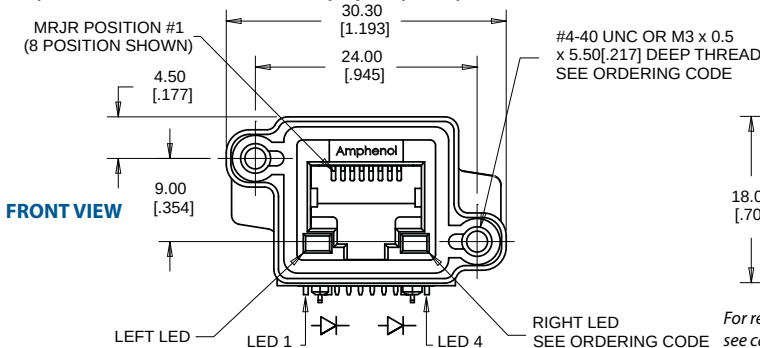
TOP VIEW



SIDE VIEW



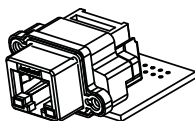
FRONT VIEW



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

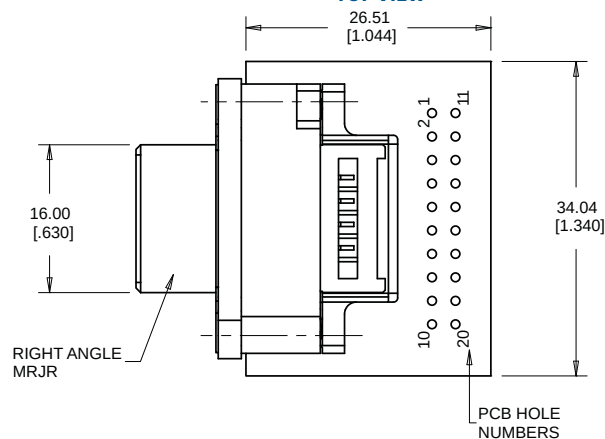
ISOMETRIC VIEW



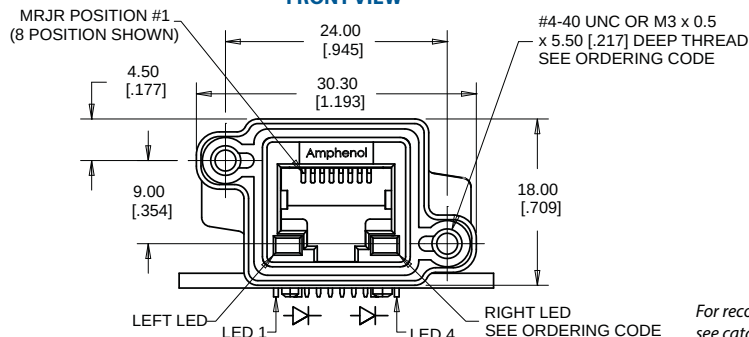
MRJR-3AXX-X1

MRJR-5AXX-X1

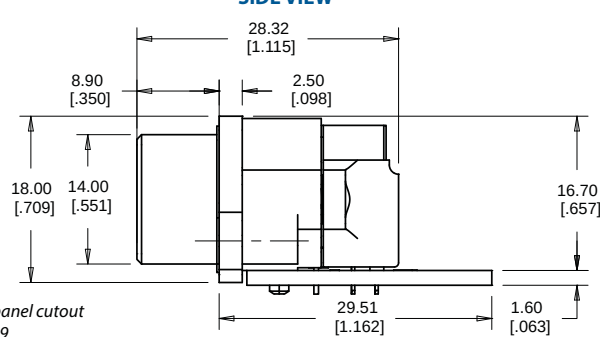
TOP VIEW



FRONT VIEW



SIDE VIEW

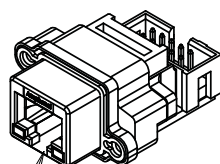


For recommended panel cutout see catalogue page 9

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

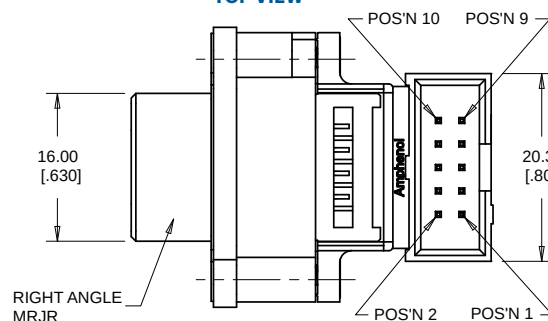


4, 6 OR 8 CONTACT RECEPTACLE

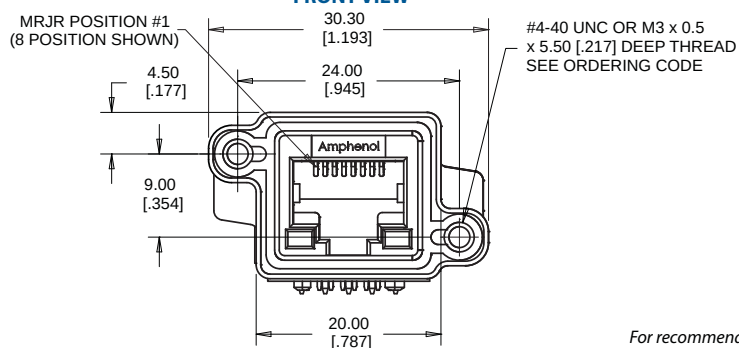
MRJR-3BXX-X1

MRJR-5BXX-X1

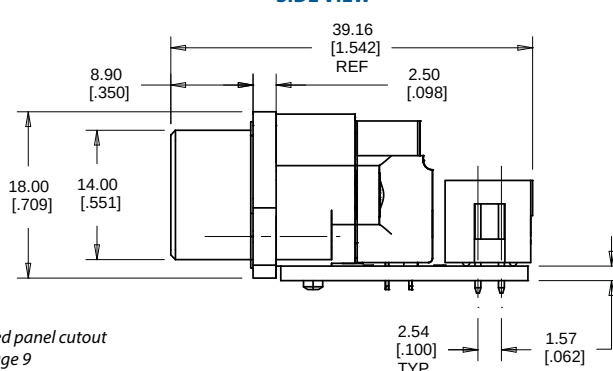
TOP VIEW



FRONT VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 9

MRJR SERIES

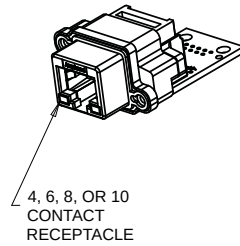
GENERATION 2 RUGGED RJ11/RJ45

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

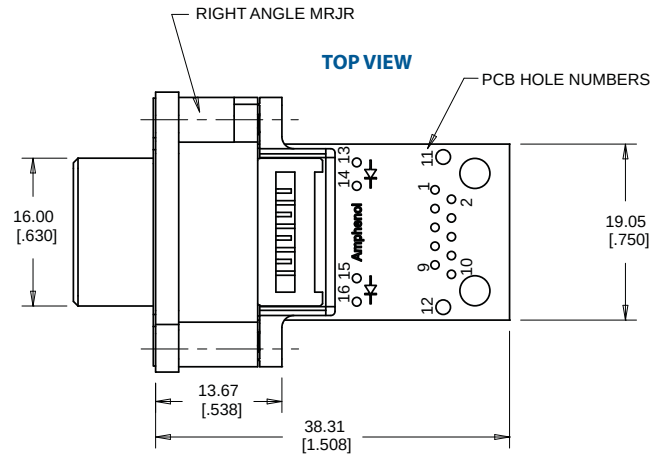
CONNECTIONS CHART

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

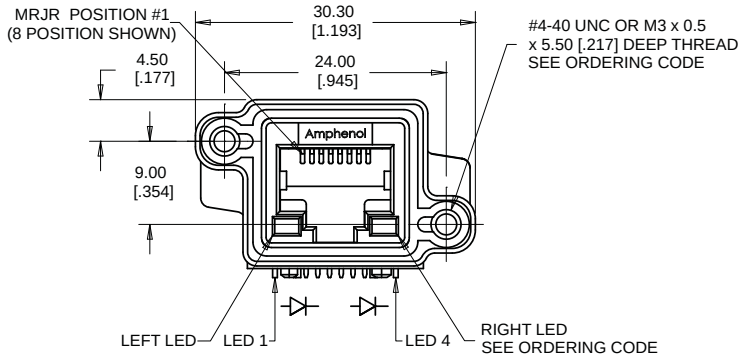
ISOMETRIC VIEW



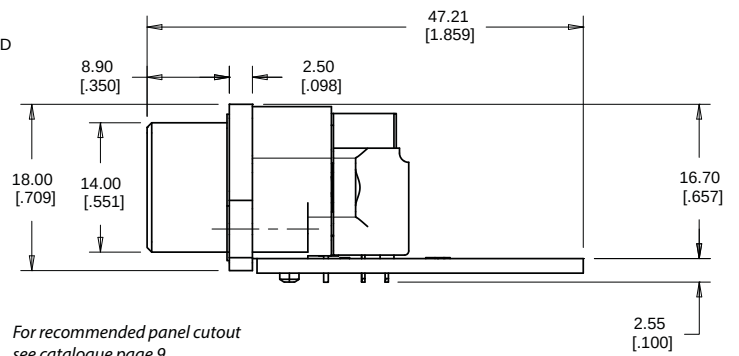
TOP VIEW



FRONT VIEW



SIDE VIEW

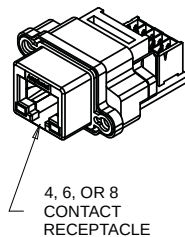


MRJR-3DX0-X1 MRJR-5D8X-X1

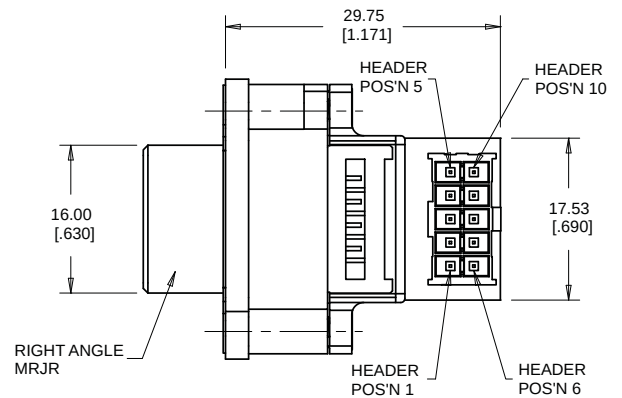
CONNECTIONS CHART

MRJR Connector Type		Header Position
6 Position	8 Position	1 & 10
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

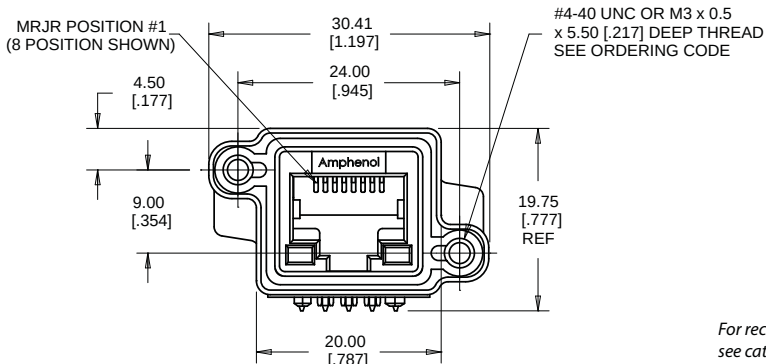
ISOMETRIC VIEW



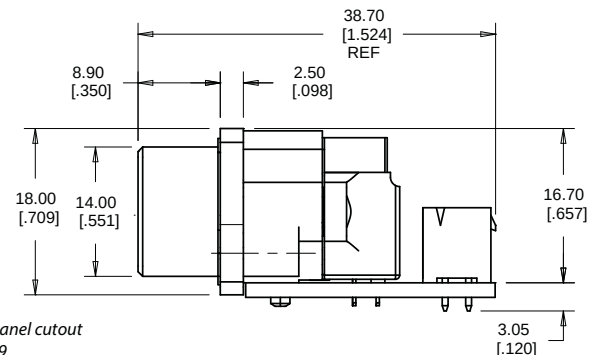
TOP VIEW



FRONT VIEW

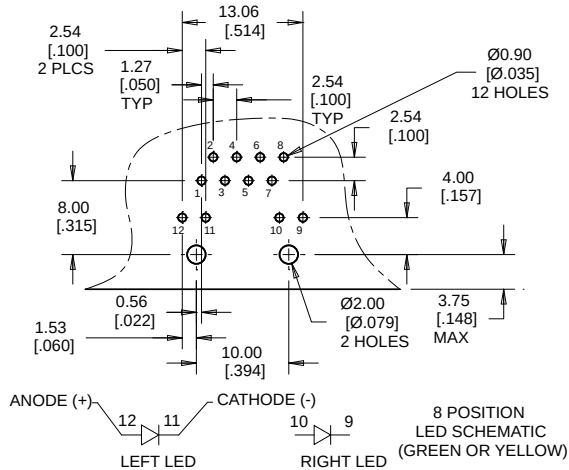


SIDE VIEW

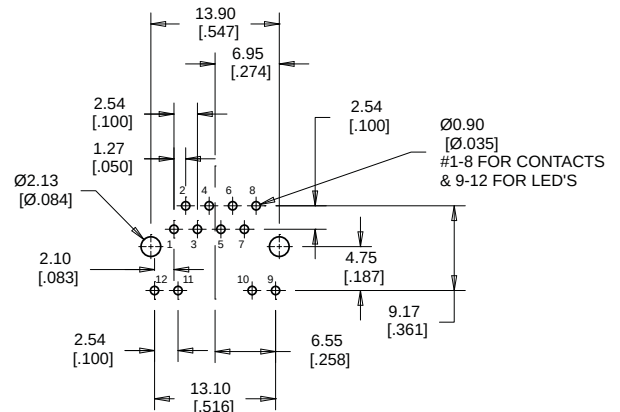


Recommended PCB & Panel Layout

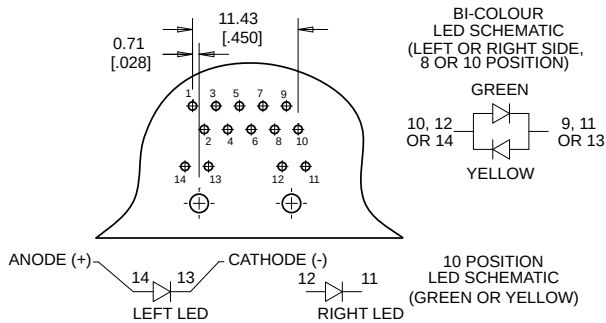
8 Position PCB Layout



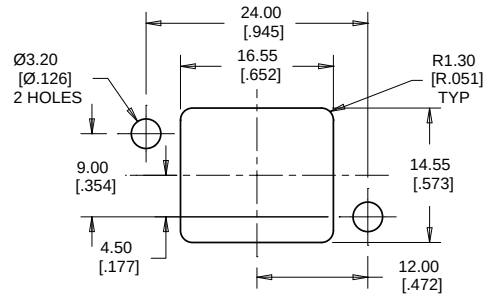
MRJR-54XX PCB Layout



10 Position PCB Layout



Panel Cutout



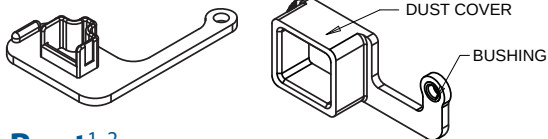
MRJ & MRJR Accessories

Dust Covers

Material: Silicone Rubber

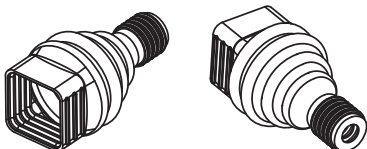
MRJ-2586-10BP (Grey)
MRJ-2586-20BP (Black)

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

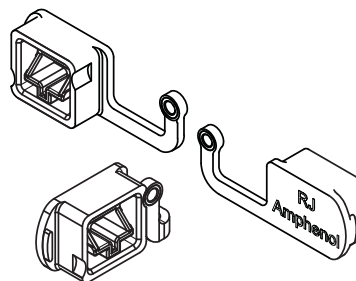


Boot^{1, 2}

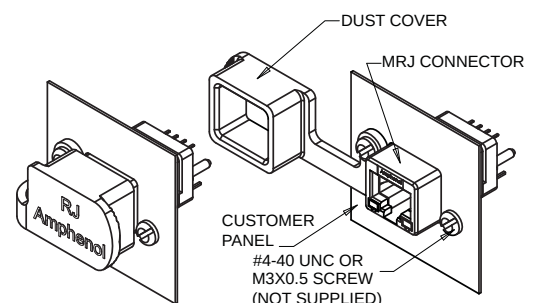
MRJ-258E-11BP (Transparent)
MRJ-258E-12BP (Black)



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



Dust Covers Application Views



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
Additional Connector:	UL Recognized Component
Ferrite:	Nickel Zinc Soft Ferrite Ceramic

Electrical

Current Rating:	1.5A max per Contact ($\Delta T \leq 30^{\circ}\text{C}$)
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 $\geq 1\mu\text{s}$
Shock:	Per EIA 364-27 Test Condition H (11ms, 30g, ½ Sine), No Discontinuity $\geq 1\mu\text{s}$
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

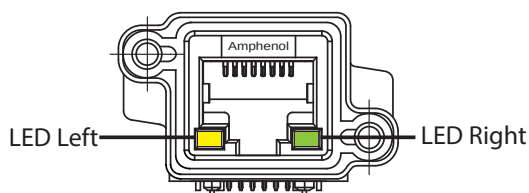
Recommended Mounting Screw Torque:	0.45 to 0.65 N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement
Recommended Soldering Methods:	Manual or wave soldering (solder temperature 260°C max, time 10s max, preheat 100-140°C)

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

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

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 Filtering⁵
- 7 - RJ45, 8 or 10 Position with Transient Voltage Suppression⁶

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 Jack⁷
- 8 - Right Angle on PCB with Vertical RJ45 Modular Jack⁷
- 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 Header⁹
- C - Right Angle on PCB with Holes for Wiring (Style 7 PCB)⁸
- D - Right Angle on PCB with Vertical Cable Header⁹

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 Options¹⁰

- 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.

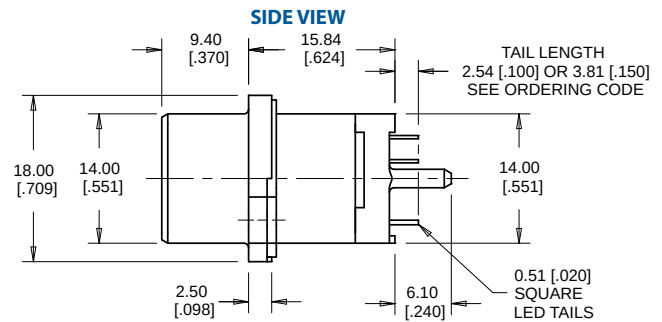
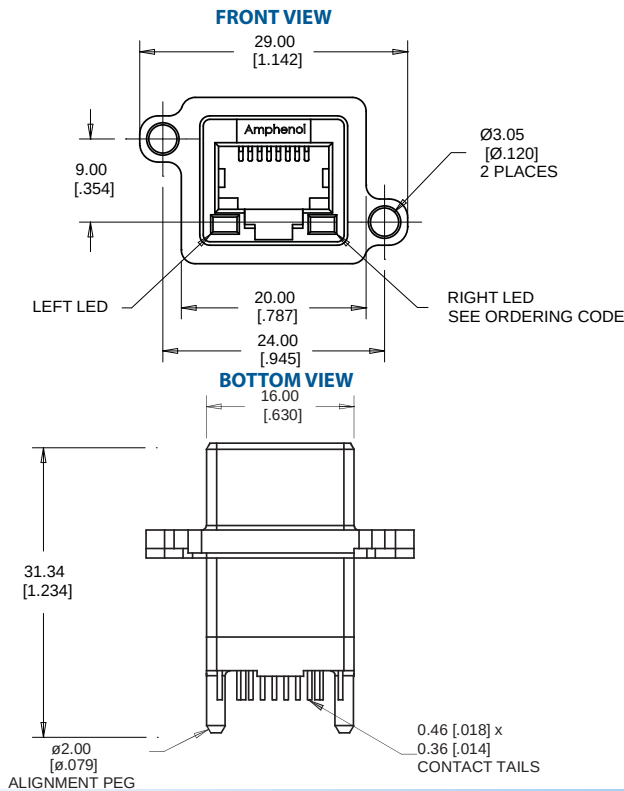
- 7) Termination styles 7 & 8 currently available for RJ45 (8P8C) only.
- 8) Termination style A uses the PCB from termination style 5. Termination style C uses the PCB from termination style 7.
- 9) Termination styles B & D currently available for RJ45 (8P8C) without LEDs only.
- 10) Consult with Amphenol 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 SERIES

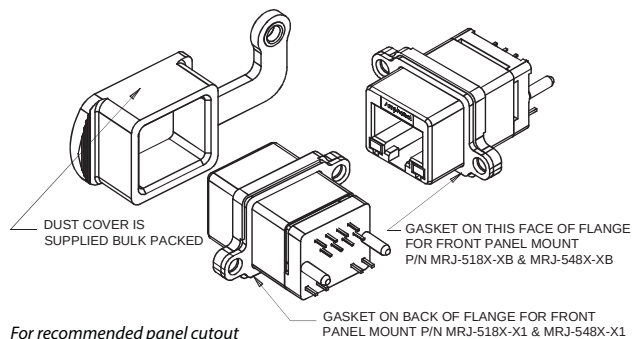
GENERATION 1 RUGGED RJ45

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

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



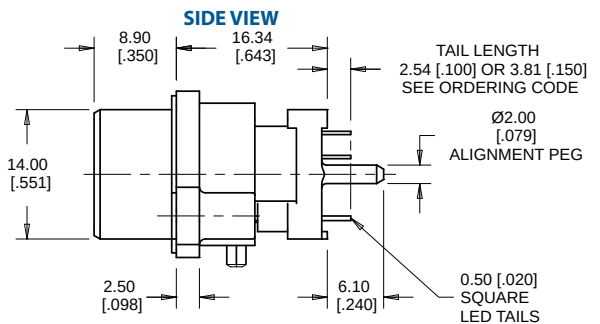
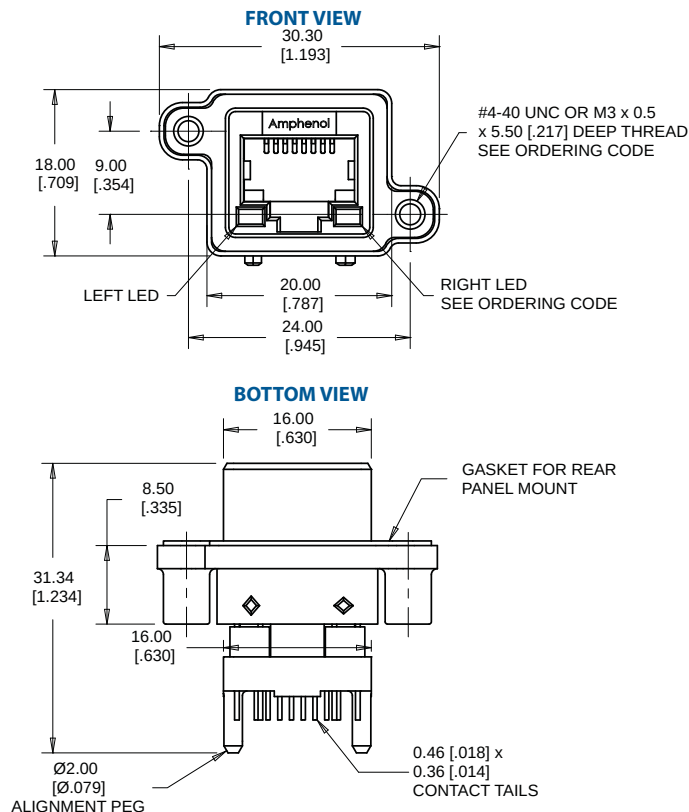
ISOMETRIC VIEWS



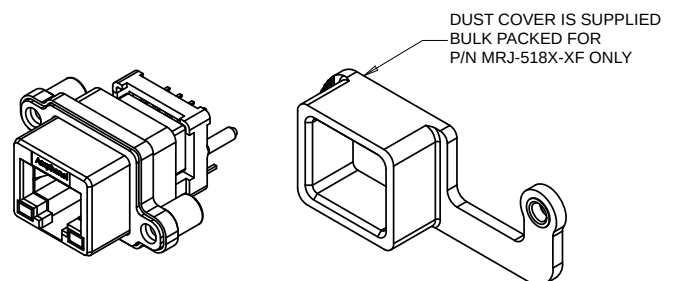
For recommended panel cutout & PCB layout see catalogue page 17

MRJ-518X-XF

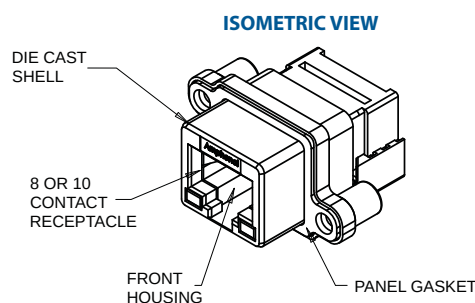
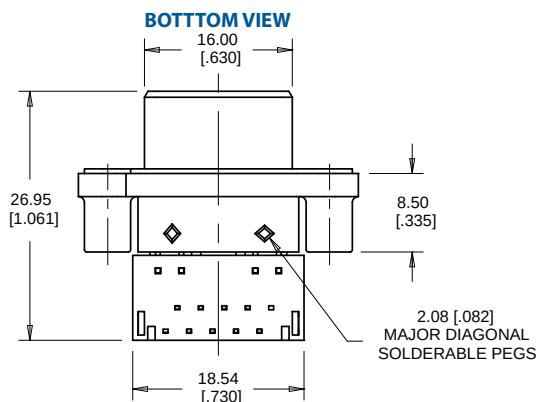
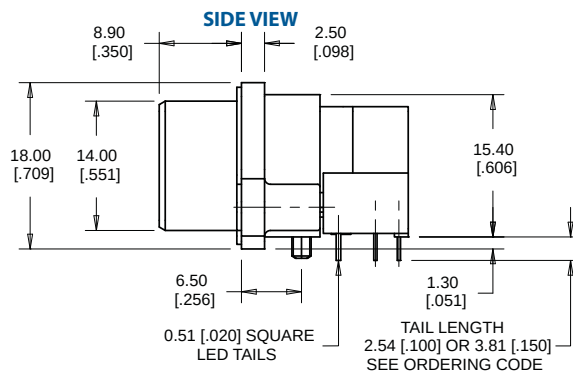
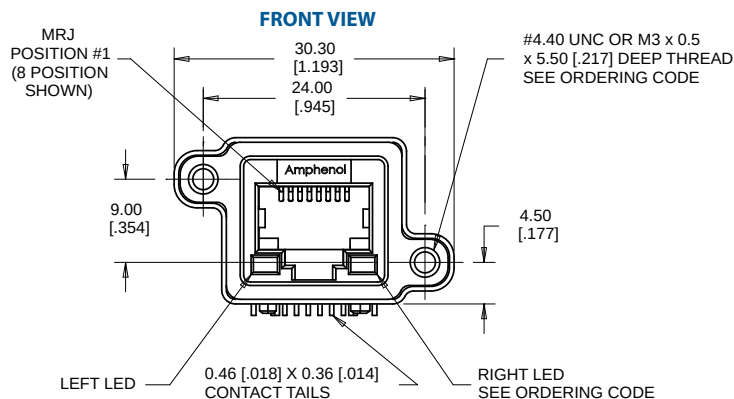
MRJ-548X-XF



ISOMETRIC VIEWS



For recommended panel cutout & PCB layout see catalogue page 17

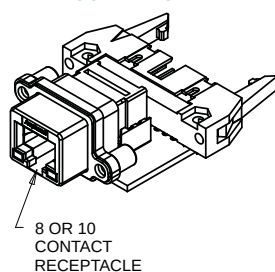


For recommended panel cutout & PCB layout see catalogue page 17

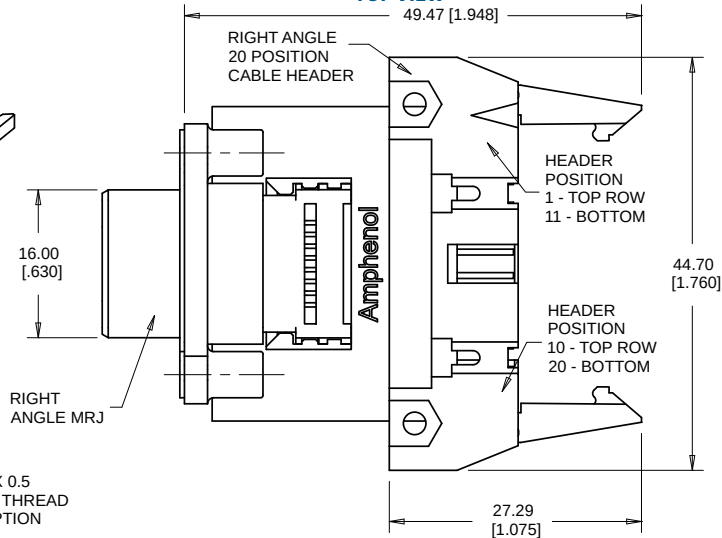
CONNECTIONS CHART

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

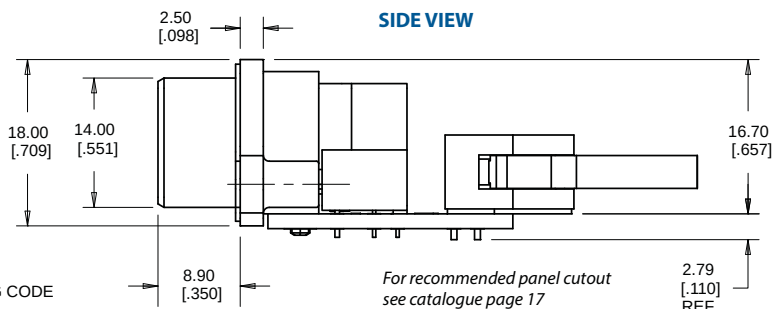
ISOMETRIC VIEW



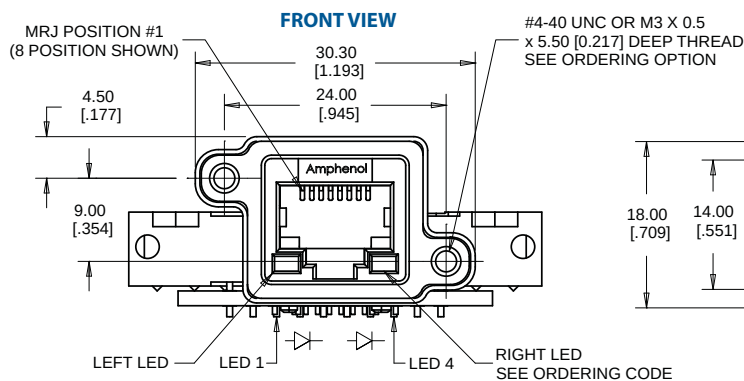
TOP VIEW



SIDE VIEW



For recommended panel cutout see catalogue page 17

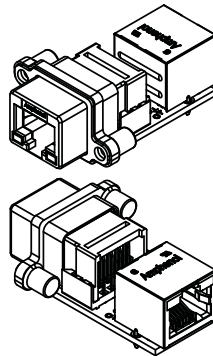


MRJ-578X-X1

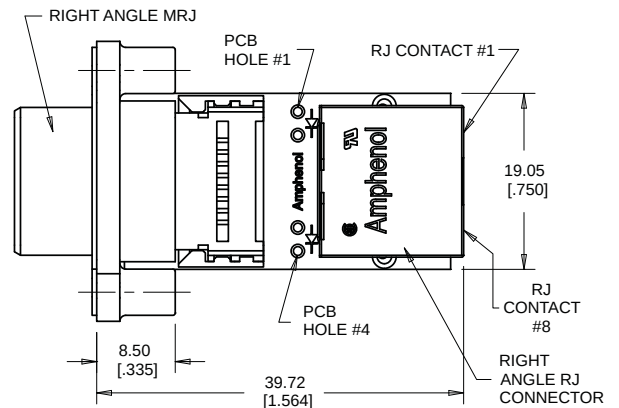
CONNECTIONS CHART

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

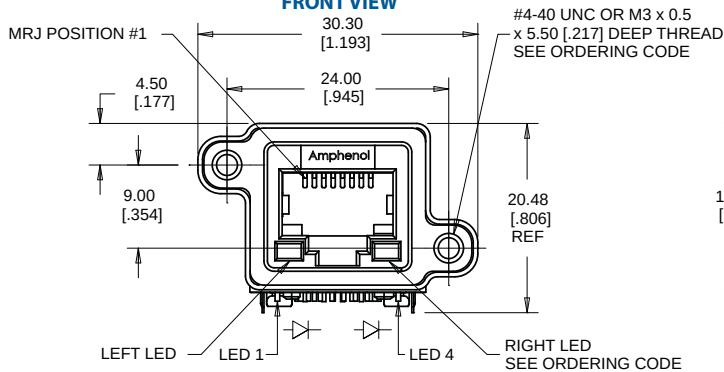
ISOMETRIC VIEWS



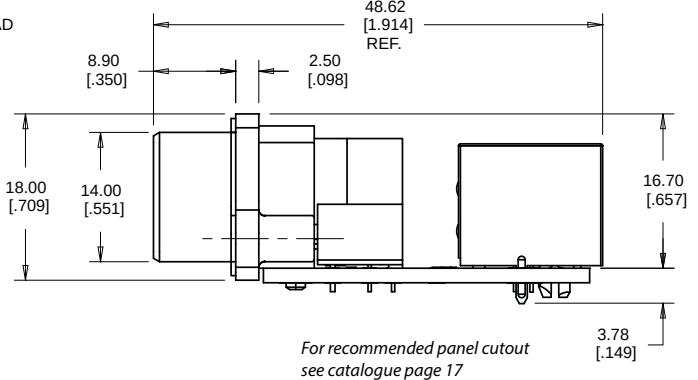
TOP VIEW



FRONT VIEW



SIDE VIEW

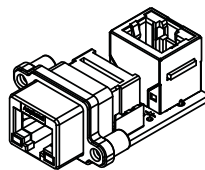


MRJ-588X-X1

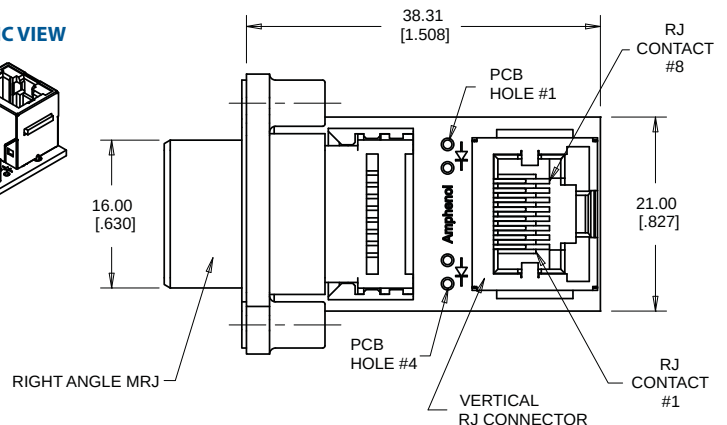
CONNECTIONS CHART

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

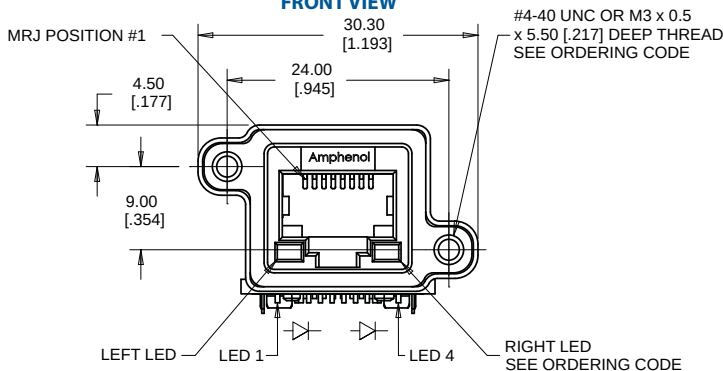
ISOMETRIC VIEW



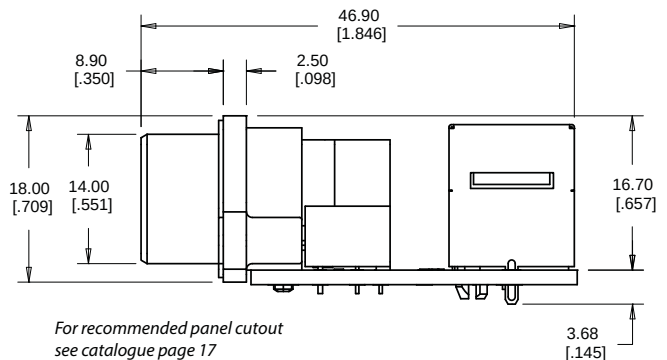
TOP VIEW



FRONT VIEW



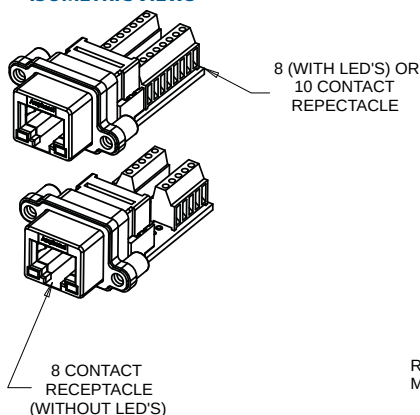
SIDE VIEW



CONNECTIONS CHART

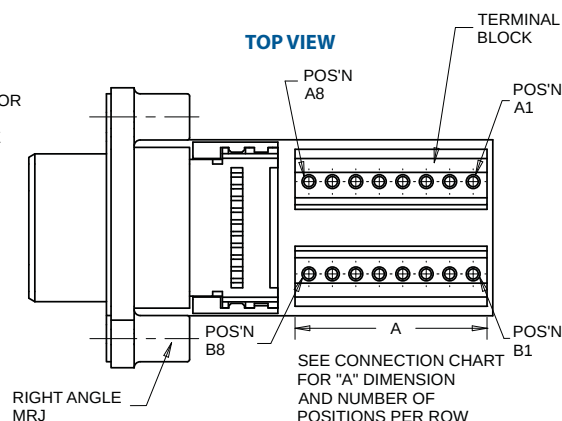
MRJ Connector Type			Terminal Block Position
8 Position No LEDs	8 Position with LEDs	10 Position	
Shell/GND	Shell/GND	Shell/GND	A1 & B1
4	4	5	A2
3	3	4	A3
2	2	3	A4
1	1	2	A5
-	-	1	A6
-	LED 1	LED 1	A7
-	LED 2	LED 2	A8
5	5	6	B2
6	6	7	B3
4	4	8	B4
8	8	9	B5
-	-	10	B6
-	LED 4	LED 4	B7
-	LED 3	LED 3	B8
5/Row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

ISOMETRIC VIEWS

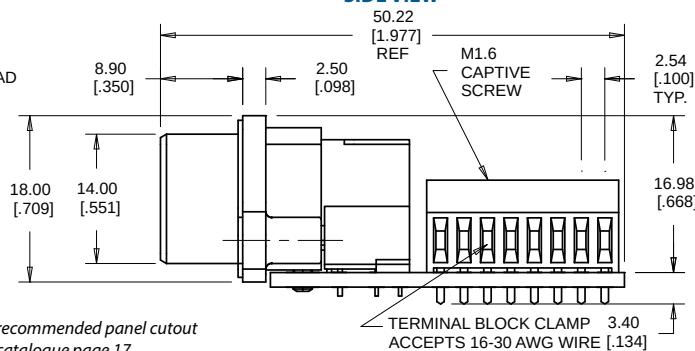


MRJ-59XX-X1

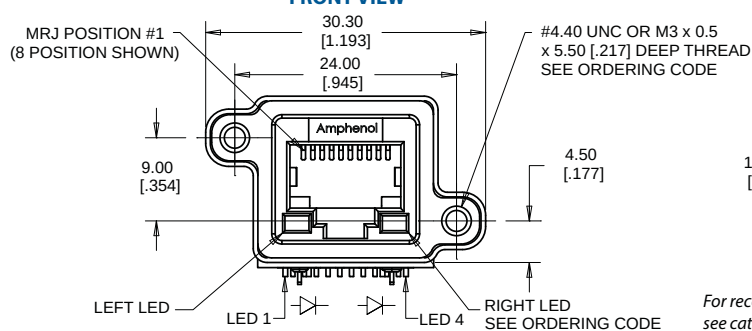
TOP VIEW



SIDE VIEW



FRONT VIEW

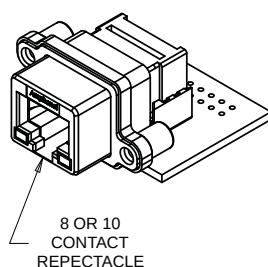


For recommended panel cutout see catalogue page 17

CONNECTIONS CHART

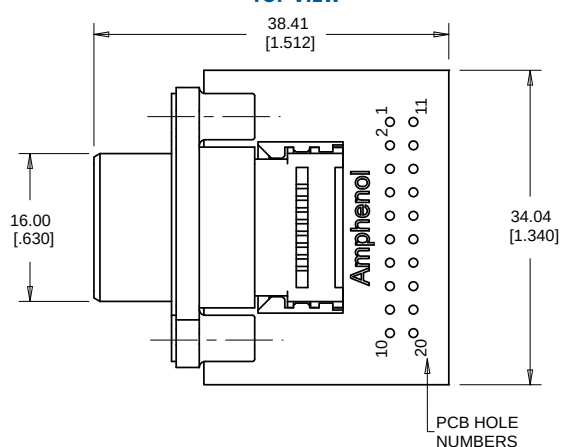
MRJ Connector Type		PCB Hole Number
8 Position	10 Position	
Shell/GND	Shell/GND	10
-	1	2
1	2	12
2	3	3
3	4	13
4	5	4
5	6	14
6	7	5
7	8	15
8	9	6
-	10	16
LED 1	LED 1	1
LED 2	LED 2	11
LED 3	LED 3	7
LED 4	LED 4	17

ISOMETRIC VIEW

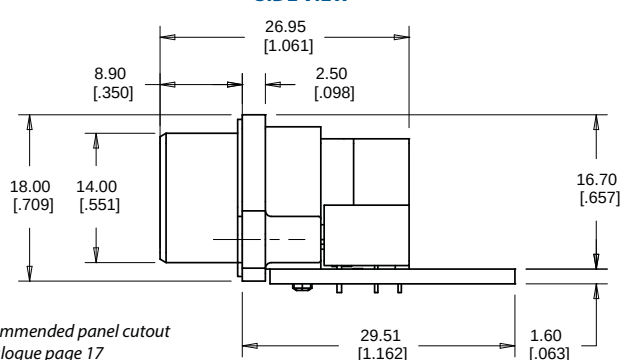


MRJ-5AXX-X1

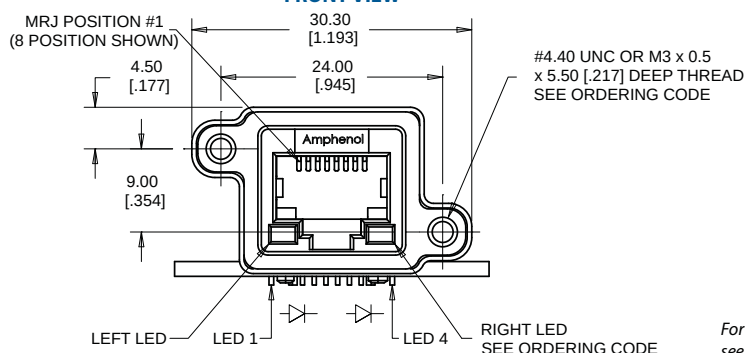
TOP VIEW



SIDE VIEW



FRONT VIEW



For recommended panel cutout see catalogue page 17

MRJ SERIES

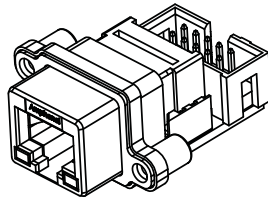
GENERATION 1 RUGGED RJ45

MRJ-5B80-X1

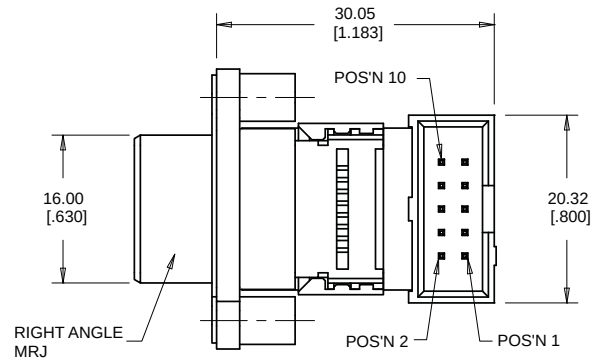
CONNECTIONS CHART

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

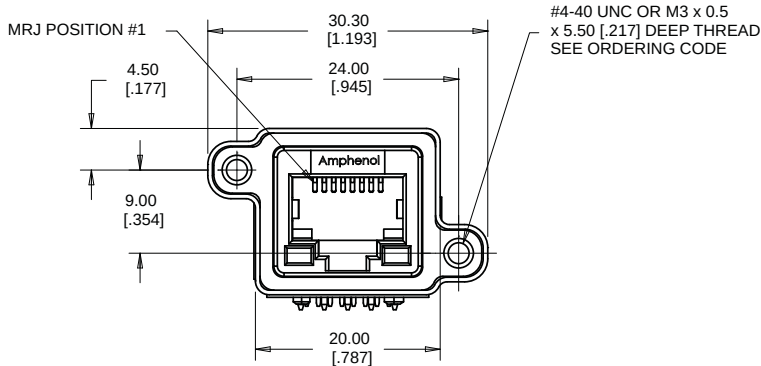
ISOMETRIC VIEW



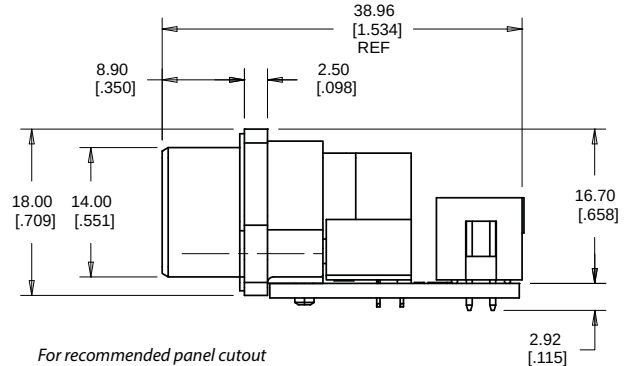
TOP VIEW



FRONT VIEW



SIDE VIEW



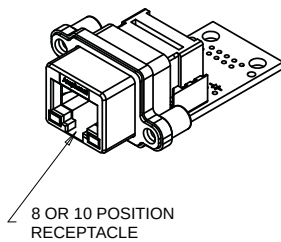
For recommended panel cutout see catalogue page 17

MRJ-5CXX-X1

CONNECTIONS CHART

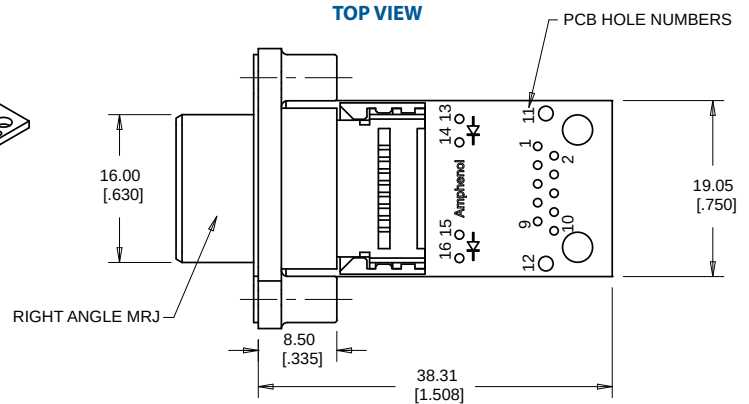
MRJ Connector Type	8 Position	10 Position	PCB Hole Number
Shell/GND	Shell/GND	Shell/GND	11 & 12
-	1	1	1
1	2	2	2
2	3	3	3
3	4	4	4
4	5	5	5
5	6	6	6
6	7	7	7
7	8	8	8
8	9	9	9
-	10	10	10
LED 1	LED 1	LED 1	13
LED 2	LED 2	LED 2	14
LED 3	LED 3	LED 3	15
LED 4	LED 4	LED 4	16

ISOMETRIC VIEW

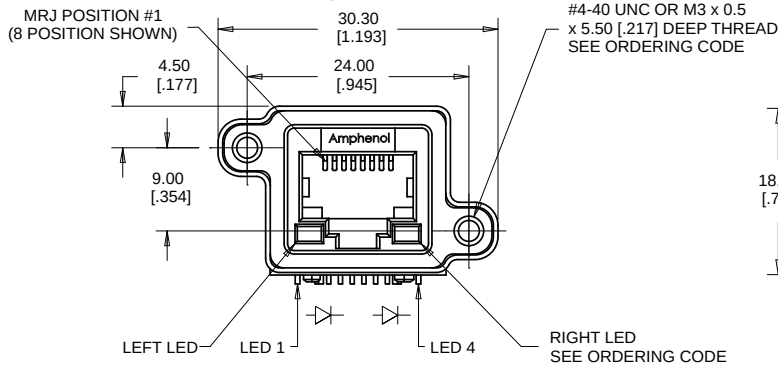


8 OR 10 POSITION RECEPTACLE

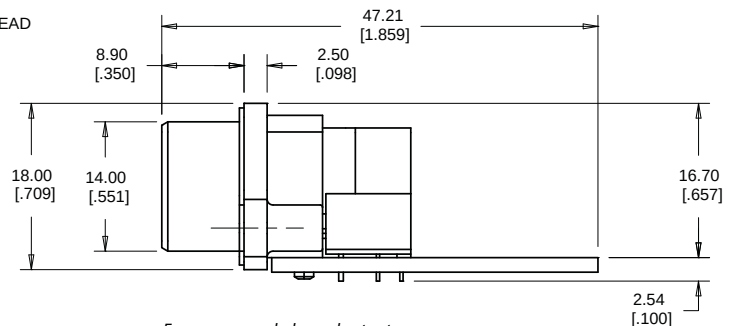
TOP VIEW



FRONT VIEW



SIDE VIEW



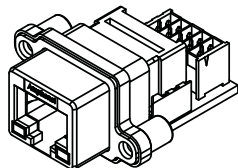
For recommended panel cutout see catalogue page 17

MRJ-5D8X-X1

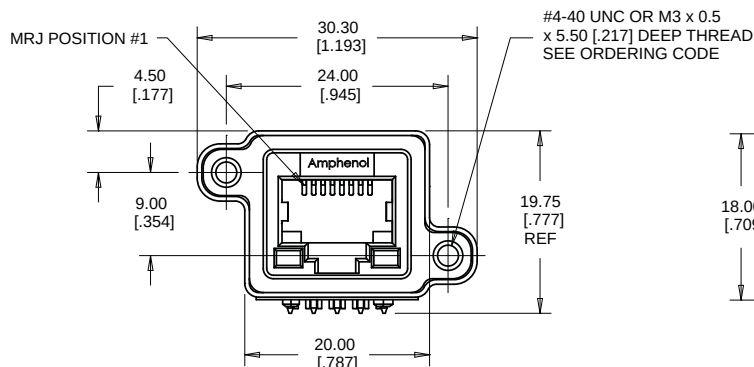
CONNECTIONS CHART

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

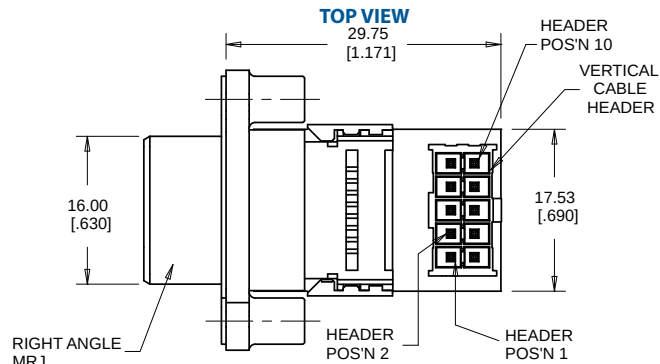
ISOMETRIC VIEW



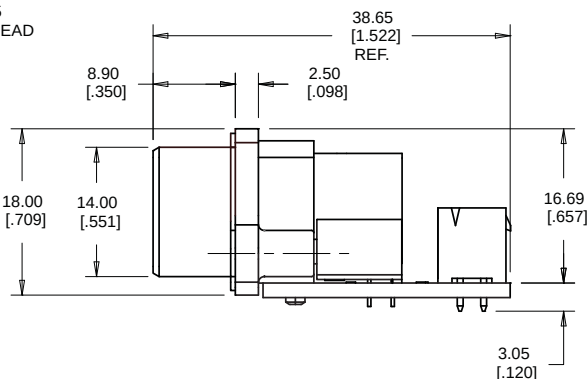
FRONT VIEW



TOP VIEW

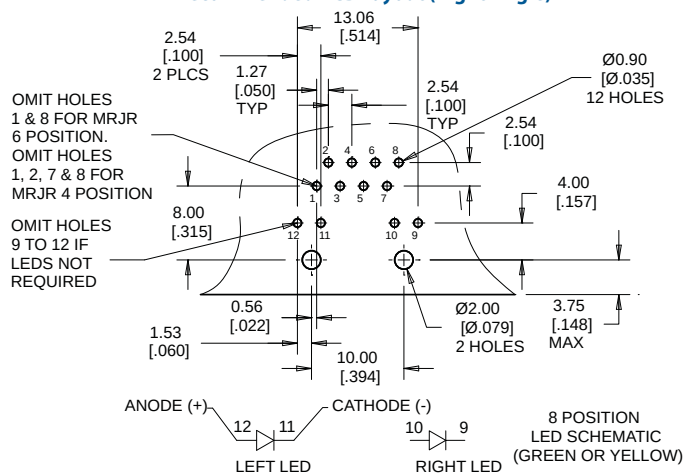


SIDE VIEW

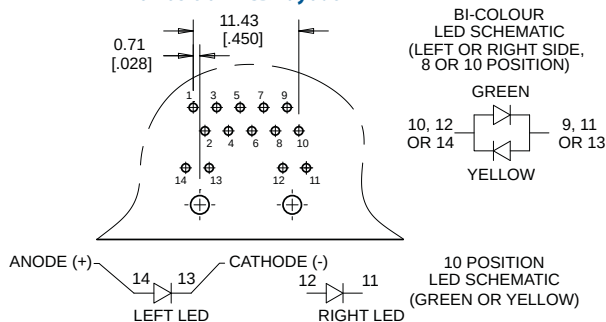


For recommended panel cutout see below

Recommended PCB Layout (Right Angle)

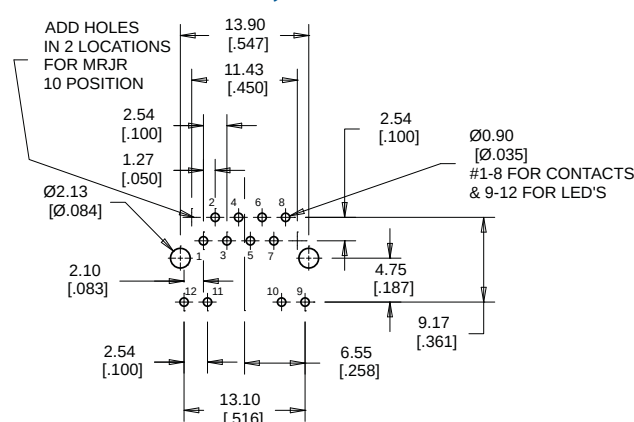


10 Position PCB Layout

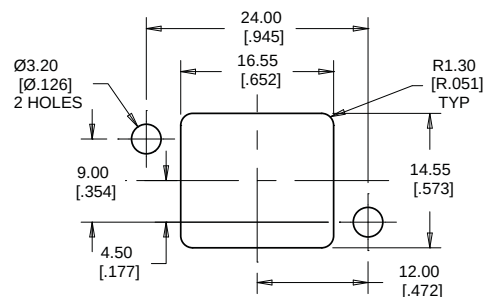


Recommended PCB & Panel Layouts

Recommended PCB Layout (Vertical)



Panel Cutout





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:	<i>Standard A</i> - 30 mA max per Contact ($\Delta T \leq 30^{\circ}\text{C}$) <i>Mini</i> - 1A max per Contact ($\Delta T \leq 30^{\circ}\text{C}$)
Contact Resistance:	<i>Standard A</i> - 30 mΩ max <i>Mini</i> - 50 mΩ max
Insulation Resistance:	<i>Standard A</i> - 1000 MΩ min <i>Mini</i> - 100 MΩ min
DWV:	<i>Standard A</i> - 500 VAC rms <i>Mini</i> - 100 VAC rms

Mechanical, Environmental, Regulatory

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

Application Recommendations

Recommended Mounting Screw Torque:	<i>Standard A</i> - 0.45 to 0.65N-m (4 to 5.75 In-lbs) for steel screws with 3mm (.118") thread engagement, <i>Micro</i> - 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)

MUSBR - X X X 1 - X X X

Rugged USB Receptacle Series, Generation 2

Receptacle Type Per USB 2.0¹

- 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 - Vertical²
- 8 - Right Angle on PCB with Vertical Cable Header²
- A - Right Angle on PCB with Holes for Wiring (Style 3 PCB)³
- B - Right Angle on PCB with Vertical Single Row Isolated Header²
- E - Right Angle on PCB with Vertical Matching USB Type Connector²

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 Options⁶

- 0 - With No Dust Cover
- 1 - With Grey Dust Cover
- 5 - With Black Dust Cover

Unique Special Code⁷

- 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.

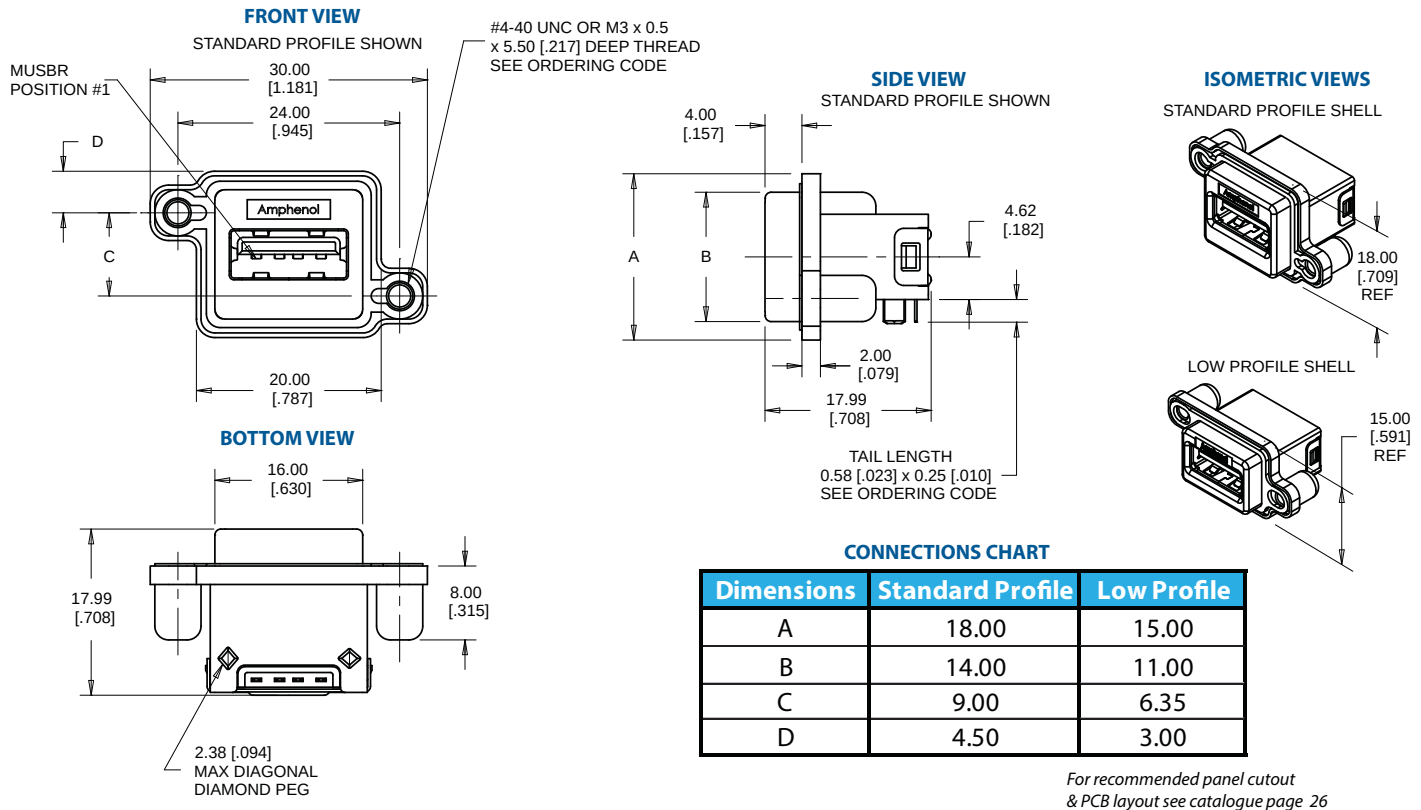
Notes:

- 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.

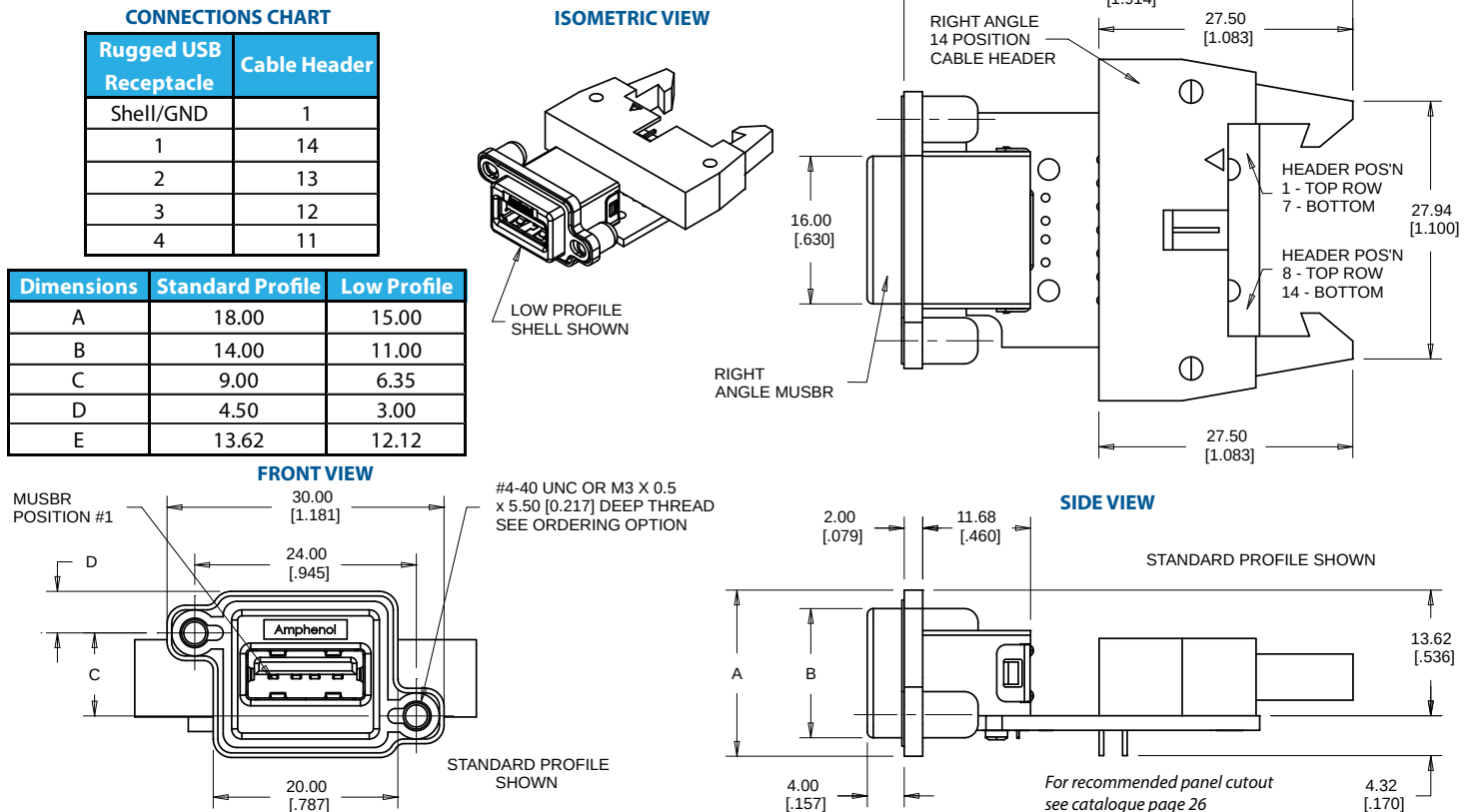
MUSBR SERIES

GENERATION 2 RUGGED USB

MUSBR-A111-XX



MUSBR-A211-XX

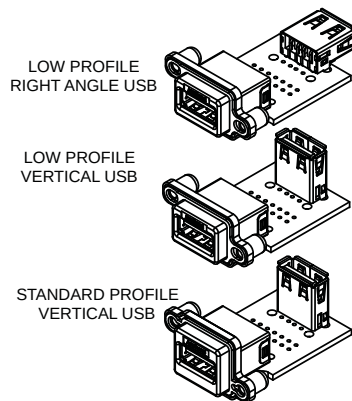


CONNECTIONS CHART

MUSBR 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

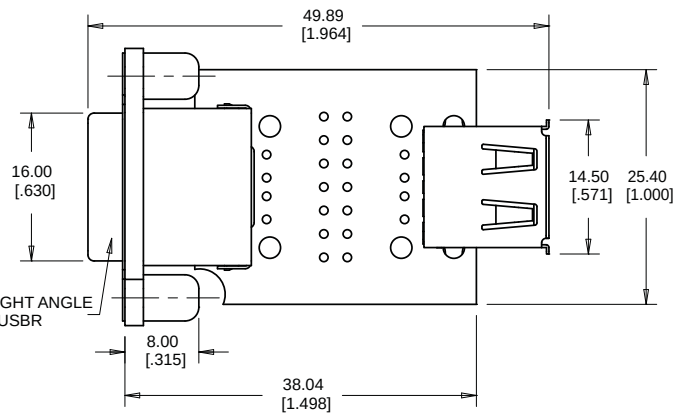
ISOMETRIC VIEWS



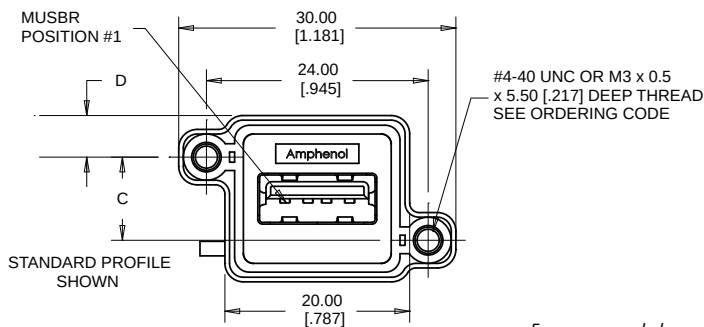
MUSBR-A311-XX

MUSBR-AE11-XX

TOP VIEW

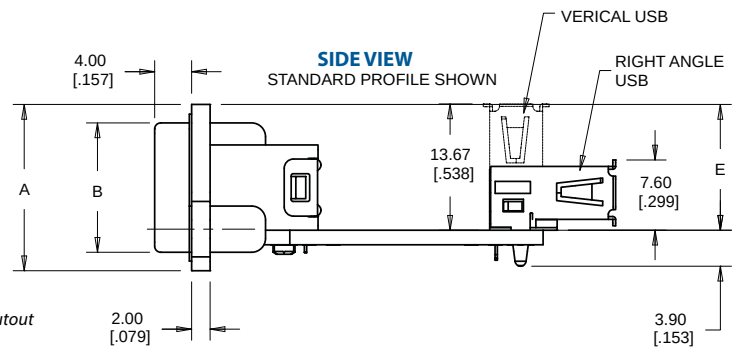


FRONT VIEW



For recommended panel cutout see catalogue page 26

SIDE VIEW



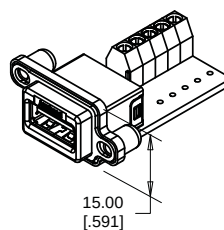
CONNECTIONS CHART

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

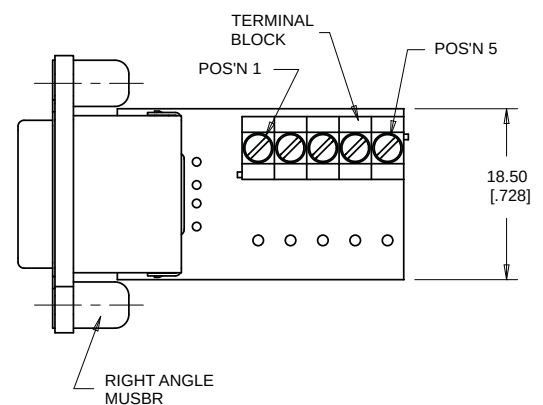
Dimension	Standard Profile	Low Profile
A	18.00	15.00
B	14.00	11.00
C	9.00	6.35
D	4.50	3.00
E	13.62	12.12

ISOMETRIC VIEW

LOW PROFILE

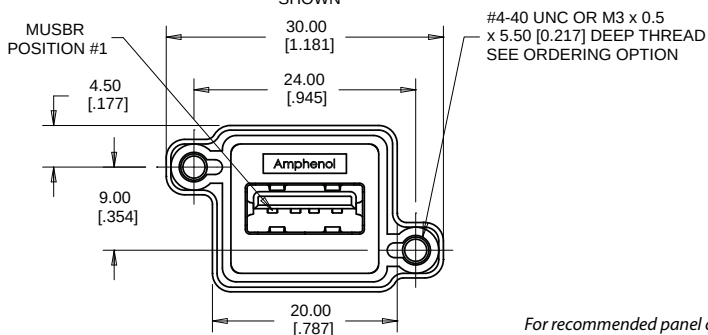


TOP VIEW



FRONT VIEW

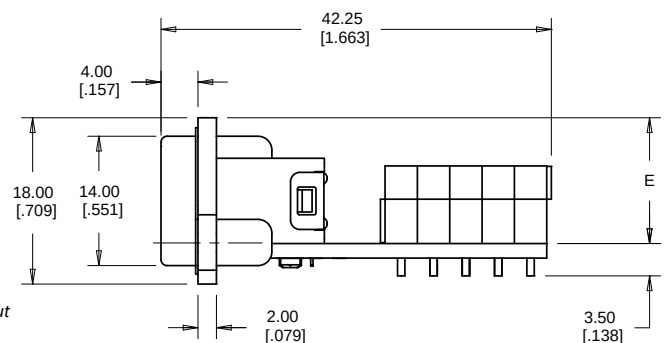
STANDARD PROFILE SHOWN



For recommended panel cutout see catalogue page 26

SIDE VIEW

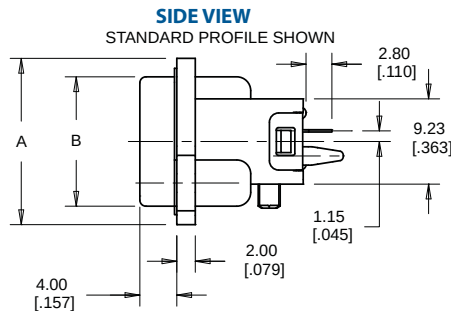
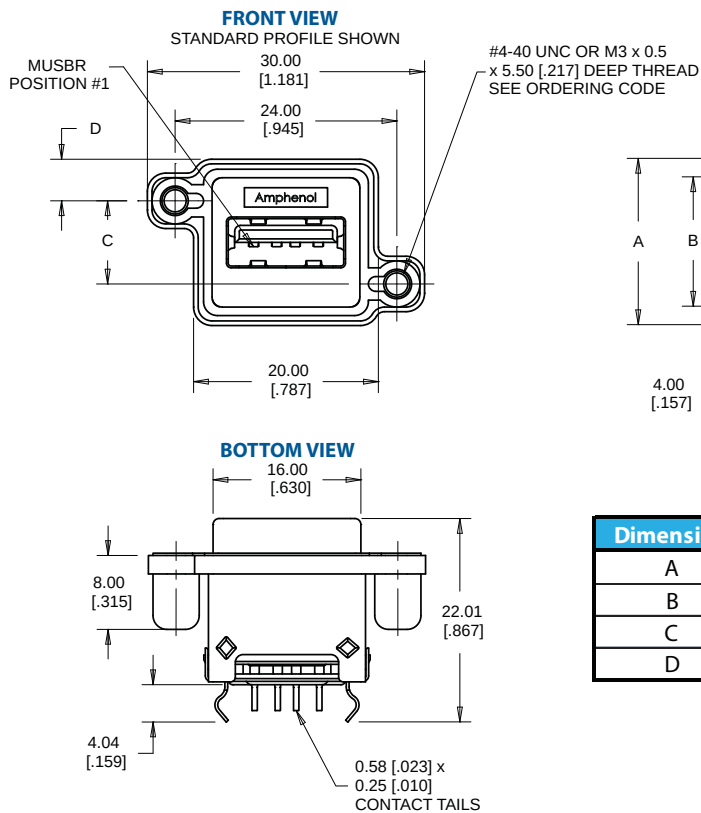
STANDARD PROFILE SHOWN



MUSBR SERIES

GENERATION 2 RUGGED USB

MUSBR-A511-XX



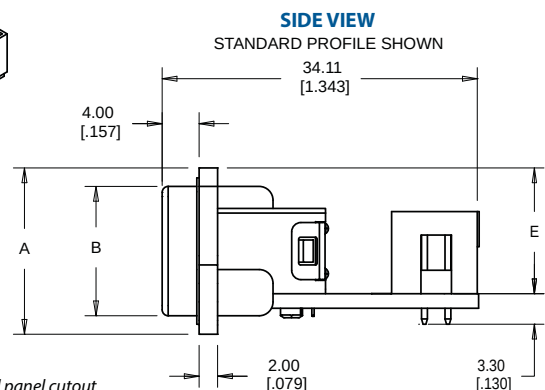
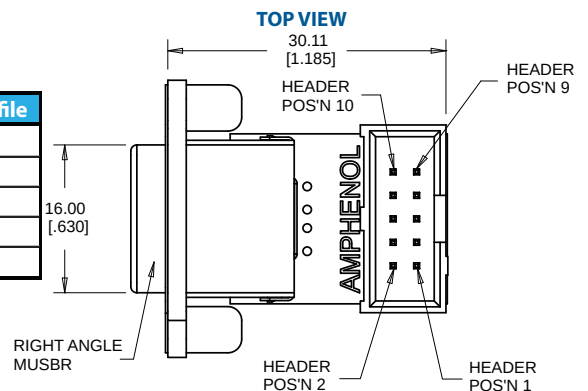
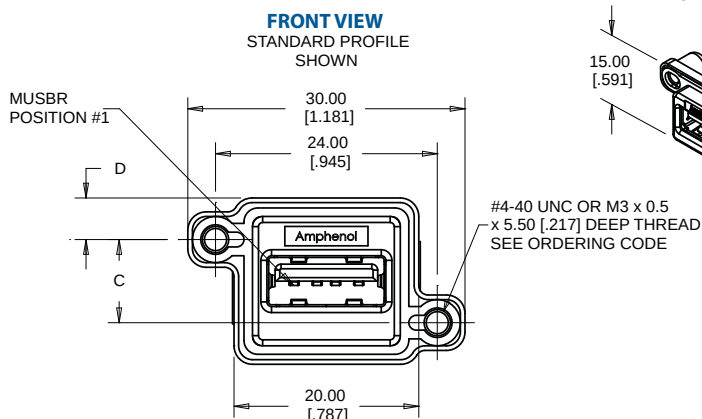
CONNECTIONS CHART

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

For recommended panel cutout
& PCB layout see catalogue page 26

MUSBR-A811-XX

Rugged USB Receptacle	Cable Header	Dimension	Standard Profile	Low Profile
Shell/GND	2 & 9	A	18.00	15.00
1	10	B	14.00	11.00
2	8	C	9.00	6.35
3	6	D	4.50	3.00
4	4	E	13.62	12.12

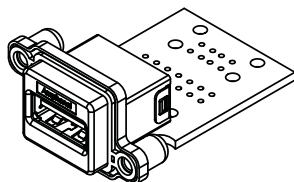


For recommended panel cutout
see catalogue page 26

CONNECTIONS CHART

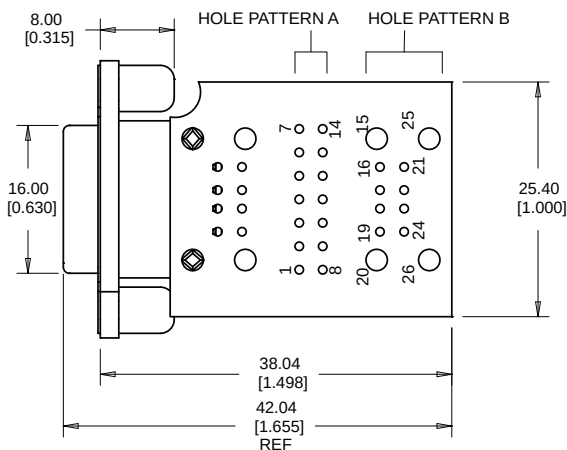
Rugged USB Receptacle	Cable Header
Shell/GND	2 & 9
1	10
2	8
3	6
4	4

ISOMETRIC VIEW

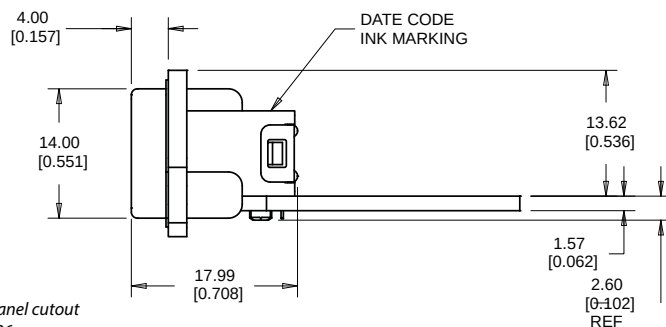


MUSBR-AA11-XX

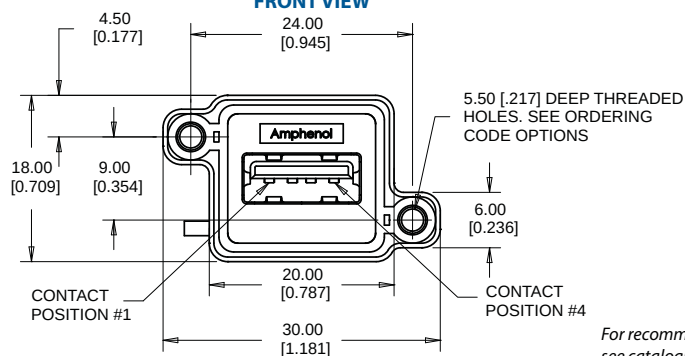
BOTTOM VIEW



SIDE VIEW



FRONT VIEW



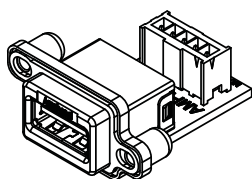
For recommended panel cutout see catalogue page 26

MUSBR-AB11-XX

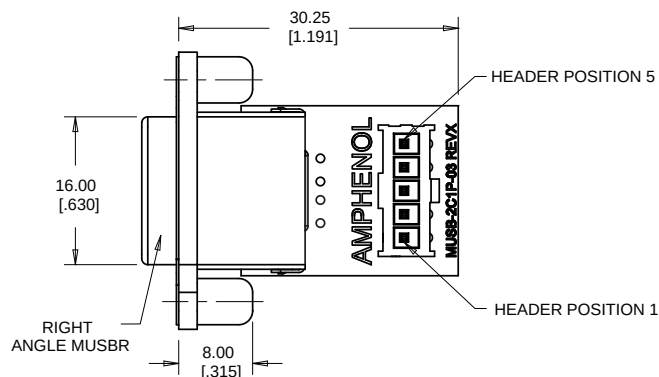
CONNECTIONS CHART

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

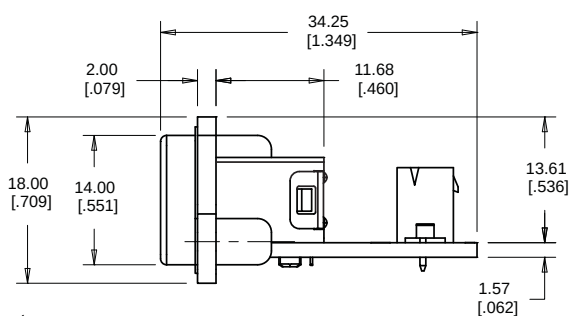
ISOMETRIC VIEW



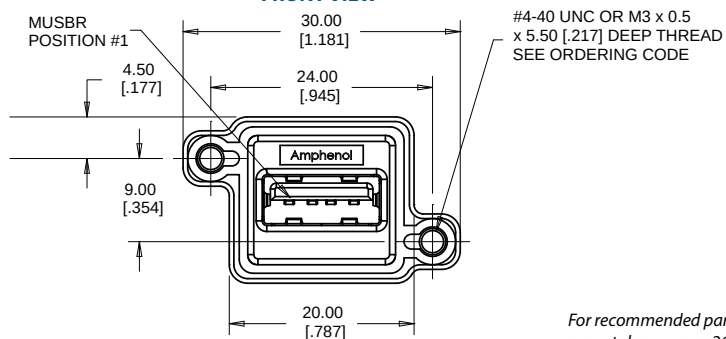
TOP VIEW



SIDE VIEW



FRONT VIEW



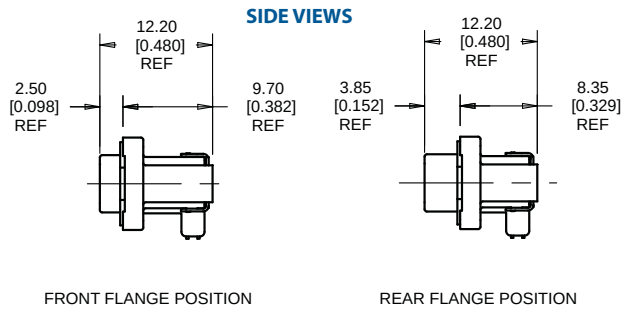
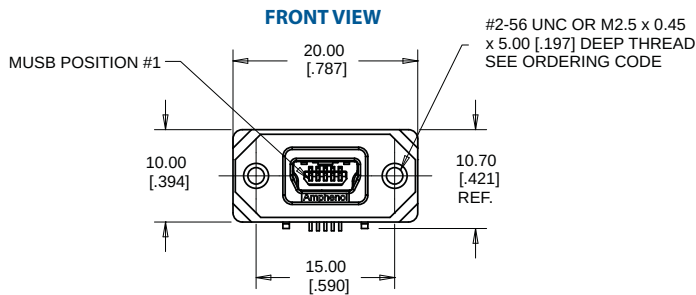
For recommended panel cutout see catalogue page 26

MUSBR SERIES

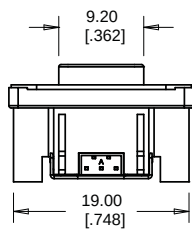
GENERATION 2 RUGGED USB

MUSBR-B151-XX

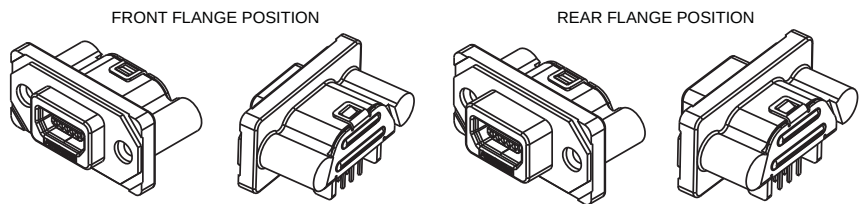
MUSBR-E151-XX



BOTTOM VIEW



ISOMETRIC VIEWS



For recommended panel cutout
& PCB layout see catalogue page 26

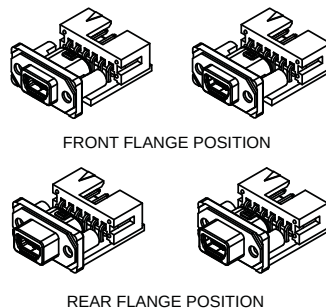
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MUSBR-E251-XX

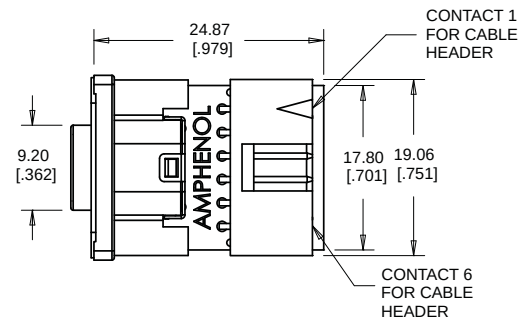
CONNECTIONS CHART

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

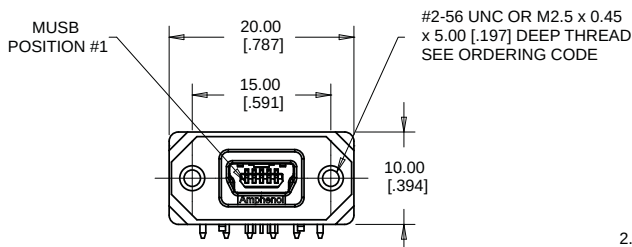
ISOMETRIC VIEWS



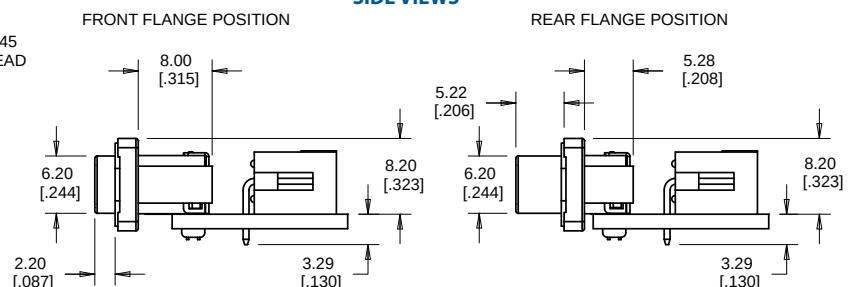
TOP VIEW



FRONT VIEW



SIDE VIEWS



For recommended panel cutout
see catalogue page 26

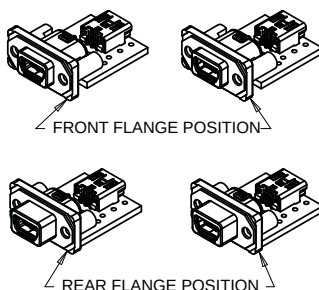
MUSBR-B351-XX

MUSBR-E351-XX

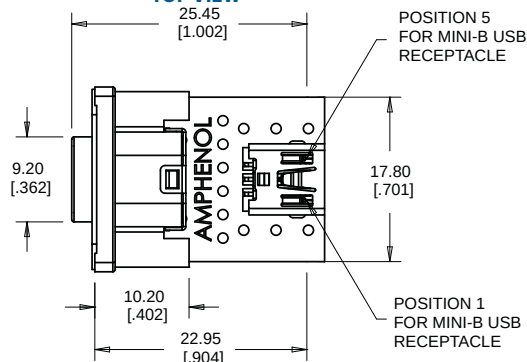
CONNECTIONS CHART

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

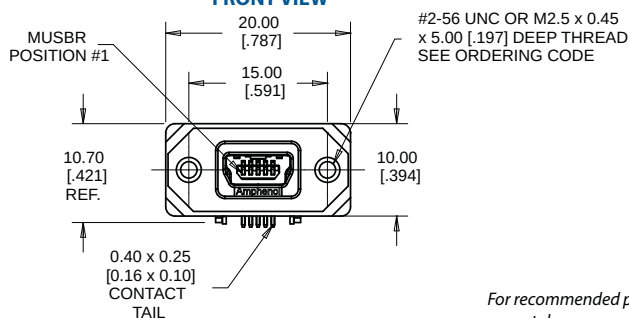
ISOMETRIC VIEWS



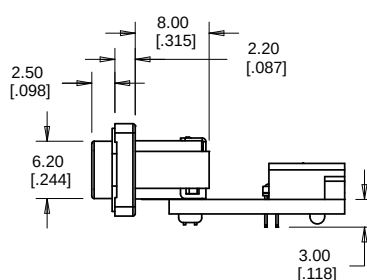
TOP VIEW



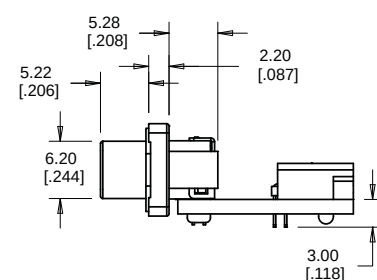
FRONT VIEW



FRONT FLANGE POSITION



REAR FLANGE POSITION



For recommended panel cutout see catalogue page 26

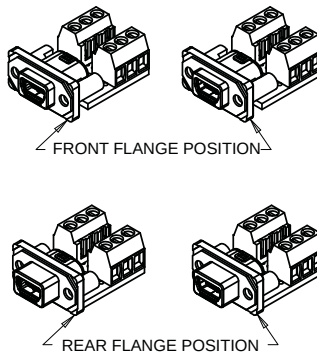
MUSBR-B451-XX

MUSBR-E451-XX

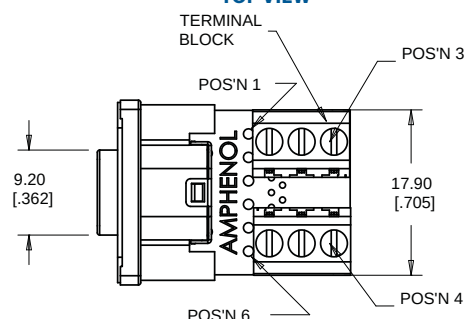
CONNECTIONS CHART

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

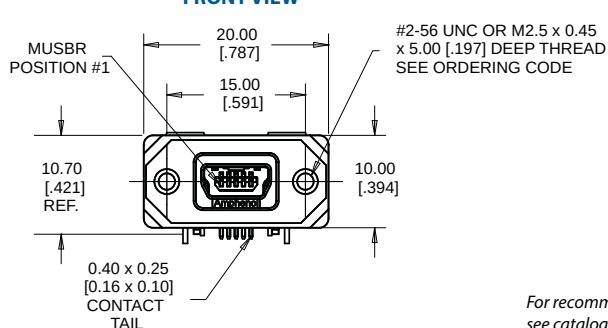
ISOMETRIC VIEWS



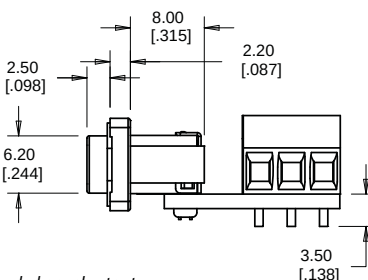
TOP VIEW



FRONT VIEW

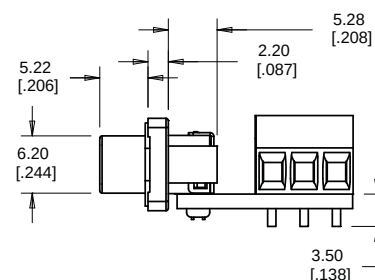


FRONT FLANGE POSITION



SIDE VIEWS

REAR FLANGE POSITION

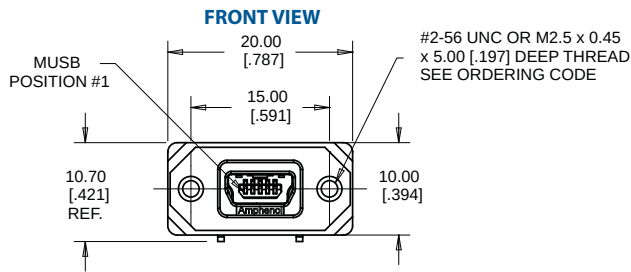


For recommended panel cutout see catalogue page 26

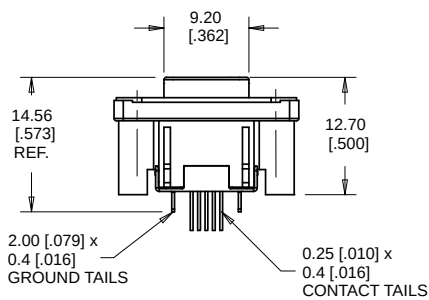
MUSBR SERIES

GENERATION 2 RUGGED USB

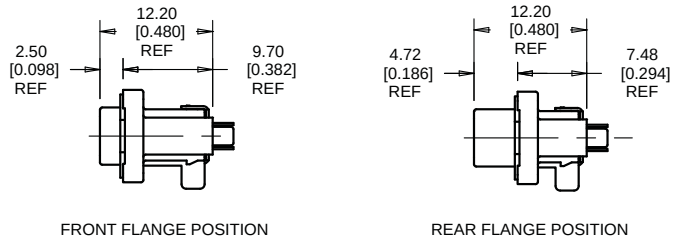
MUSBR-B511-XX MUSBR-E511-XX



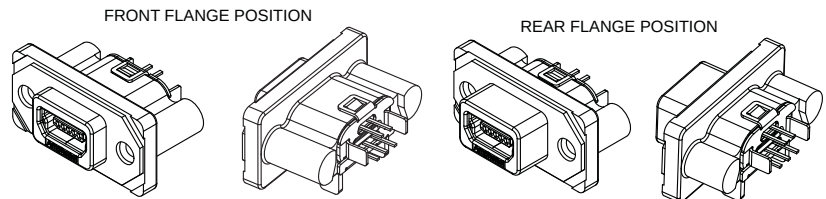
BOTTOM VIEW



SIDE VIEWS



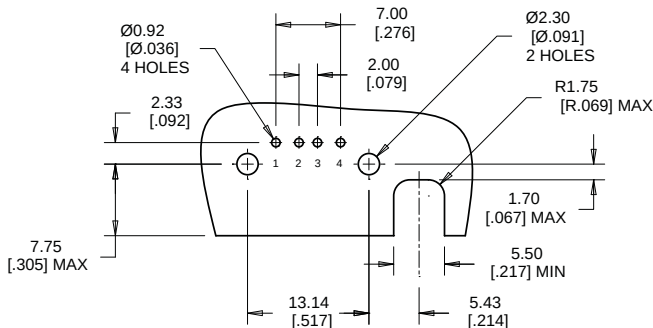
ISOMETRIC VIEWS



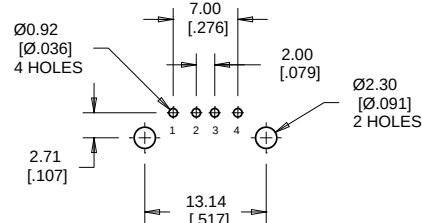
For recommended panel cutout & PCB layout see below

Recommended PCB & Panel Layouts

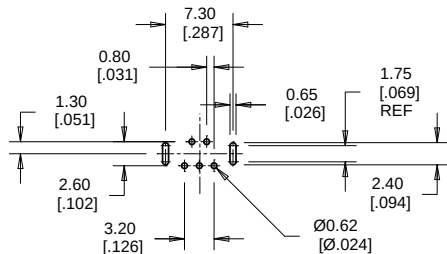
MUSBR-A111-XX



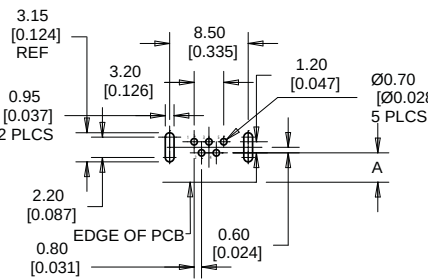
MUSBR-A511-XX



MUSBR-B551-XX

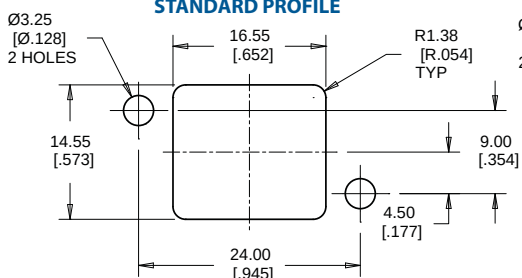


MUSBR-B151-XX

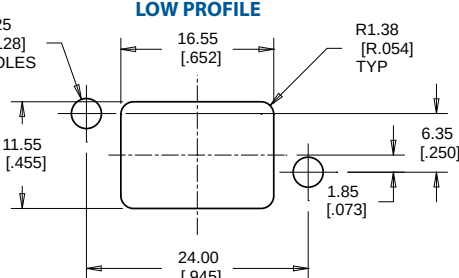


Part No.	Dimension "A"
MUSBR-B151-3X	4.53 [0.178] max
MUSBR-B151-5X	3.18 [0.125] max

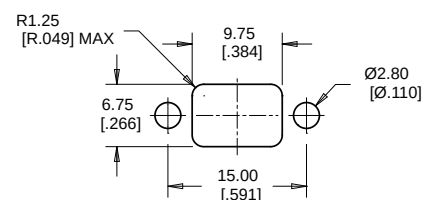
STANDARD PROFILE



LOW PROFILE

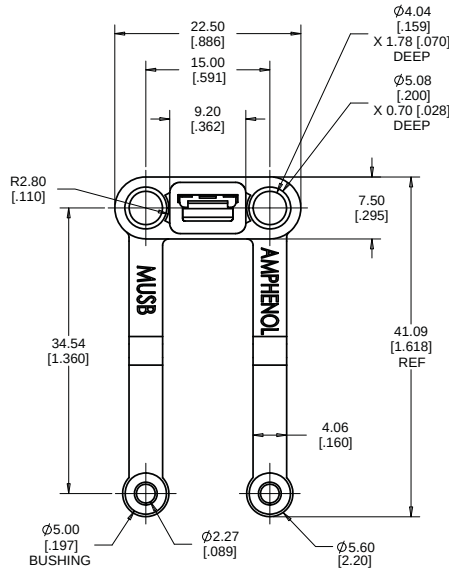
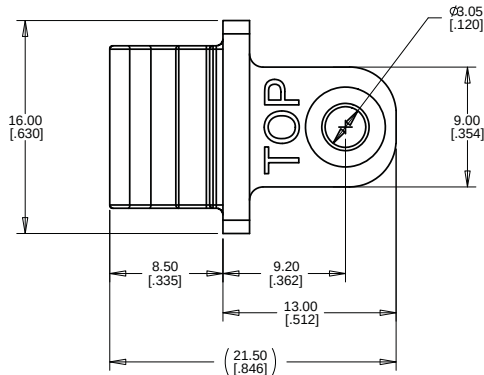


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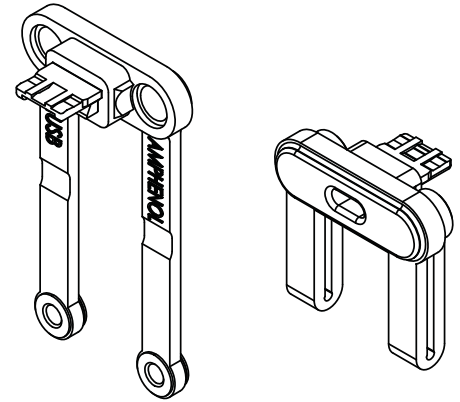


MUSB/MUSBR Accessories

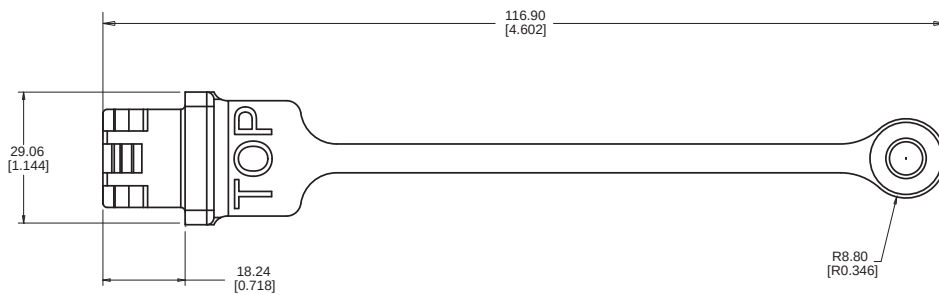
MUSB-2A111-027BP (Black)



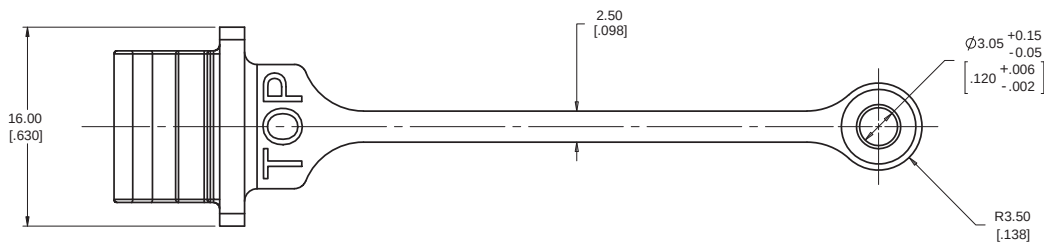
MUSB-2E151-006BP (Grey)
MUSB-2E151-016BP (Black)



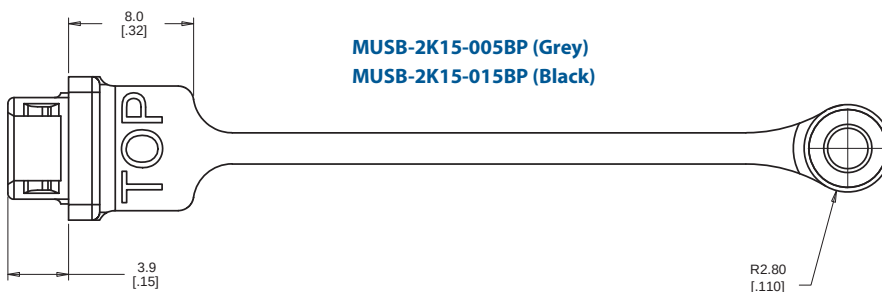
MUSB-2E151-005BP (Grey)
MUSB-2E151-015BP (Black)



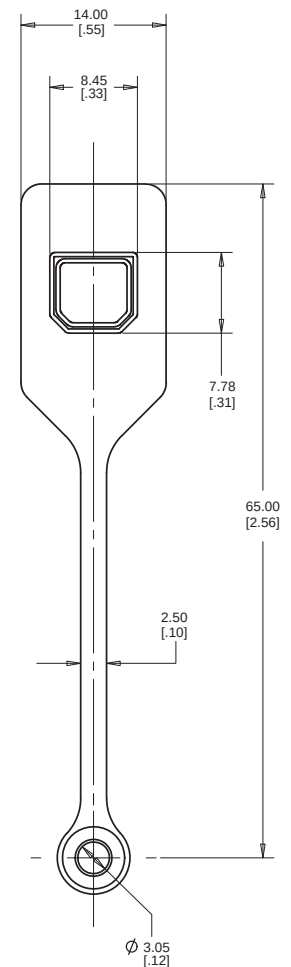
MUSB-2A111-014BP (Grey)
MUSB-2A111-024BP (Black)



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



MUSB-2D11-004BP (Grey)
MUSB-2D11-014BP (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 Tin over Nickel on the Contact Tails
Internal Shield & Rear Shield:	Copper or Steel Alloy, Nickel Plated or Stainless Steel, Passivated
Panel Gasket:	<i>Standard A & B</i> - Silicone Rubber, Black <i>Mini & Micro</i> - Cellular Arethane Foam, Black
Internal O-ring:	<i>Micro</i> - Silicone Rubber, Beige
PCB:	FR4 Fibreglass, Lead Free
Additional Connector:	UL Recognized Component

Electrical

Standard A & B

Current Rating:	1.5A max. per contact ($\Delta T \leq 30^{\circ}\text{C}$)
Contact Resistance:	30 mΩ max.
Insulation Resistance:	1000 MΩ min.
DWV:	500V AC rms

Mini

Current Rating:	1.0A max. per contact ($\Delta T \leq 30^{\circ}\text{C}$)
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 ($\Delta T \leq 30^{\circ}\text{C}$)
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	Shock:	Per EIA 364-27 Test Condition H (11 ms, 30, ½ Sine), No Discontinuity $\geq 1\mu\text{s}$
Water & Dust Protection Level:	Code IP67 per IEC 60529	Temperature Life w/o Load:	Per EIA-364-17, 105°C, 1000 Hours
Operating Temperature:	-40°C to +105°C	Thermal Shock:	Per EIA-364-32, -40°C to +125°C, 5 Cycles
Insertion Force:	Per EIA-364-13, 35N (7.9lb _f) max	Humidity:	Per EIA 364-31, 10 Cycles, 240 Hrs, 25°C to 65°C 90-95%RH, with -10C Cold Shock
Extraction Force:	Per EIA-364-13: <i>Standard A & B</i> - 10N (2.2lb _f) min <i>Mini</i> - 7N (1.6lb _f) min Initial, 3N (0.7lb _f) min after Durability <i>Micro</i> - 8N (1.8lb _f) min after Durability	Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl ₂ , NO ₂ , H ₂ S & SO ₂), 14 Day Exposure
Durability:	Per EIA 364-09: <i>Standard A & B</i> - 1500 Mating Cycles <i>Mini</i> - 5000 Mating Cycles <i>Micro</i> - 10 000 Mating Cycles	Salt Spray:	Per EIA 364-26, 250 Hours, 5% Salt, 35°C Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Vibration:	Per EIA 364-28 Random Condition V, Letter A No Discontinuity $\geq 1\mu\text{s}$	Solvent Resistance:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging
		Solderability:	

Application Recommendations

Recommended Mounting Screw Torque:	<i>Standard A & B</i> - 0.45 to 0.65N-m (4 to 7.5In-lbs) for steel crews with 3mm (.118") thread engagement, <i>Mini & Micro</i> - 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 - 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 Series¹

Termination Style

- 1 - Right Angle
- 2 - Right Angle on PCB with Right Angle Cable Header²
- 3 - Right Angle on PCB with Right Angle Matching USB Type Connector²
- 4 - Right Angle on PCB with Terminal Blocks²
- 5 - Vertical²
- 8 - Right Angle on PCB with Vertical Cable Header³
- A - Right Angle on PCB with Holes for Wiring (Style 3 PCB)^{2,4}
- B - Right Angle on PCB with Vertical Single Row Isolated Header⁵
- D - Right Angle on PCB with Vertical Dual Row Isolated Header⁶
- E - Right Angle on PCB with Vertical Matching USB Type Connector⁷

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 Options¹⁰

- 0 - With No Dust Cover¹¹
- 1 - With Grey Dust Cover
- 5 - With Black Dust Cover

Unique Special Code¹²

- 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.

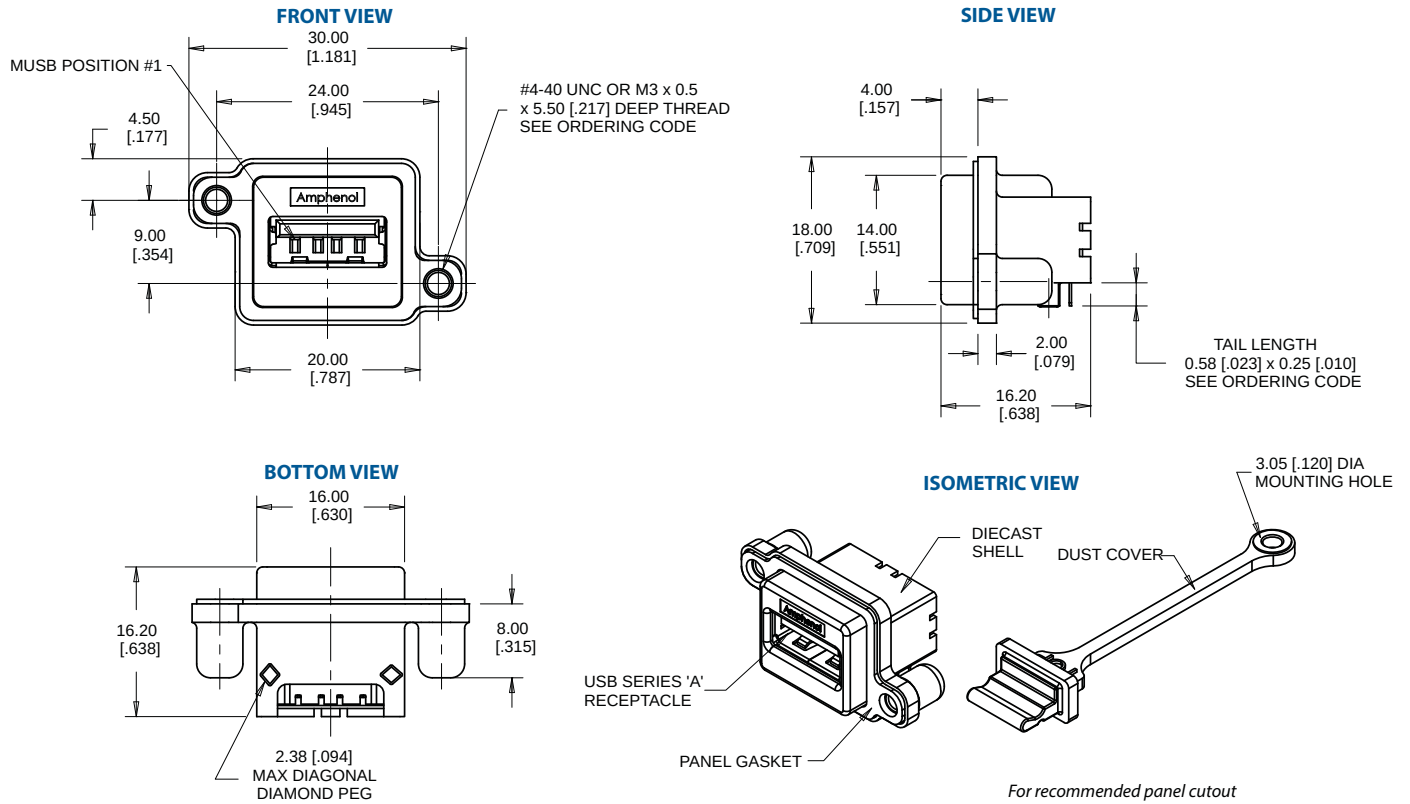
- 9) For receptacle types A, C & D (Standard A & B Series), the unified thread is #4-40UNC and the metric thread is M3x0.5. For receptacle types B, E & K (Mini B, Mini AB & Micro AB), the unified thread is #2-56UNC and the metric thread is M2.5x0.45.
- 10) When dust covers are supplied with the connector, 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 SERIES

GENERATION 1 RUGGED USB

MUSB-A111-XX



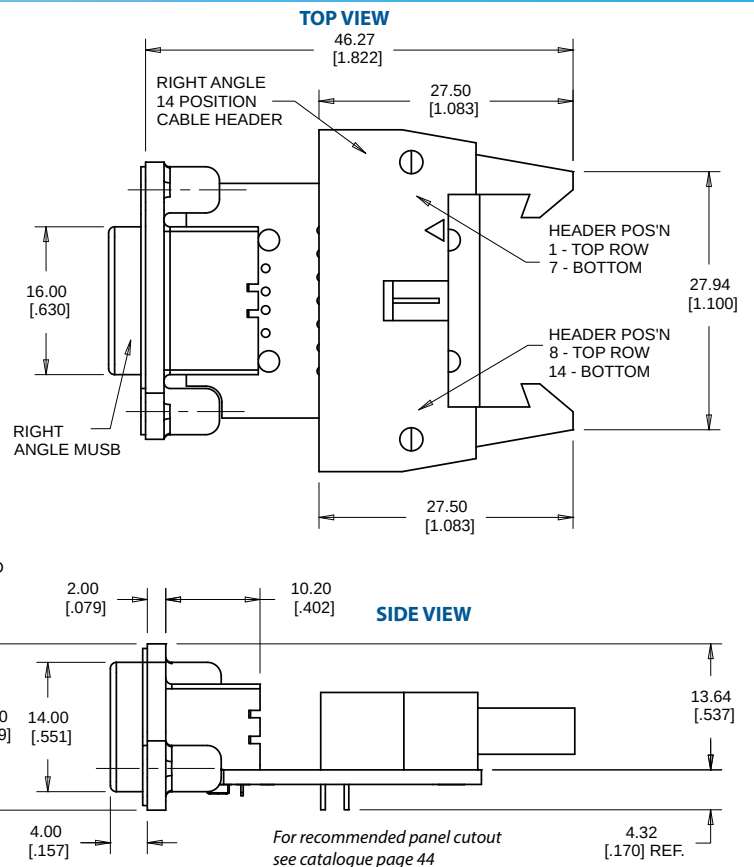
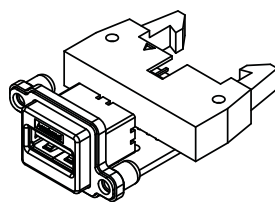
For recommended panel cutout & PCB layout see catalogue page 44-45

MUSB-A211-XX

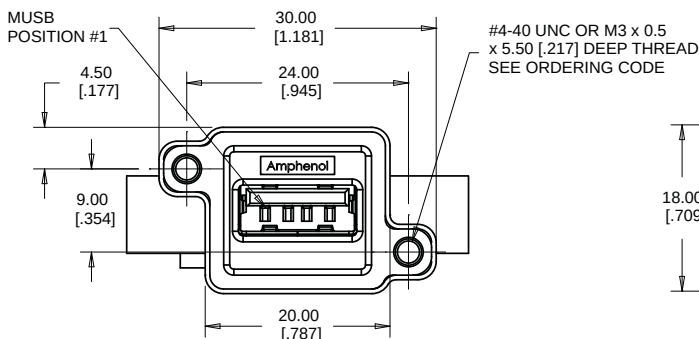
CONNECTIONS CHART

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

ISOMETRIC VIEW



FRONT VIEW



MUSB-A311-XX

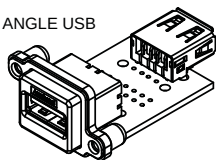
MUSB-AE11-XX

CONNECTIONS CHART

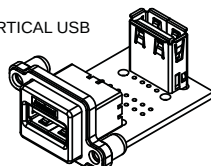
MUSB Contact	USB Contact
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4

ISOMETRIC VIEWS

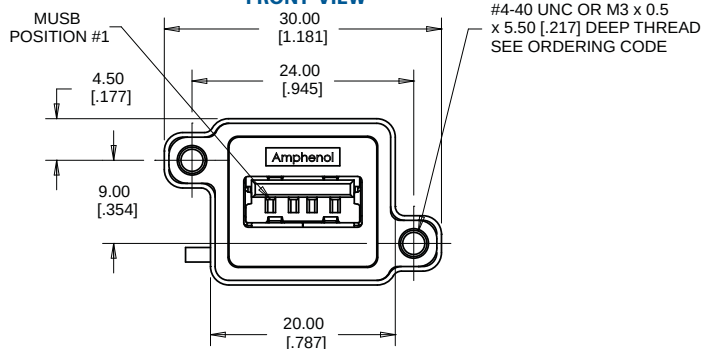
RIGHT ANGLE USB



VERTICAL USB

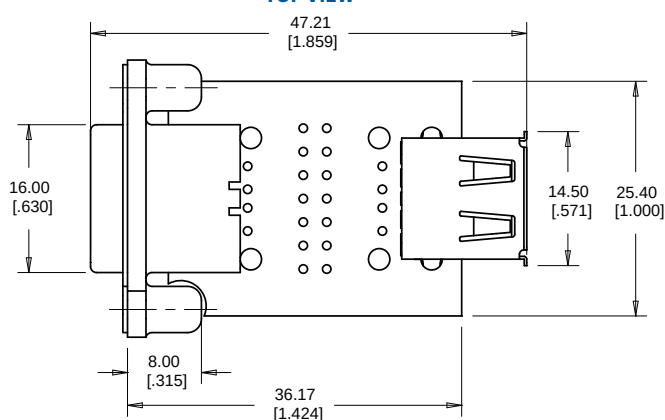


FRONT VIEW

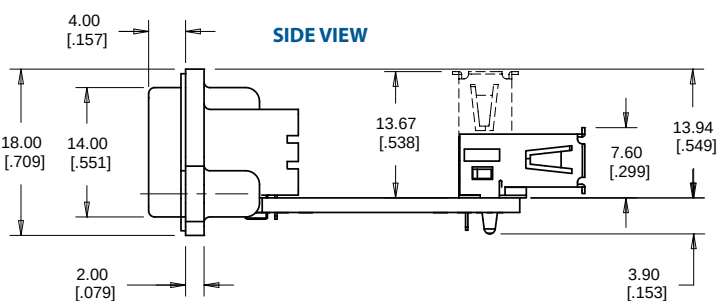


For recommended panel cutout see catalogue page 44

TOP VIEW



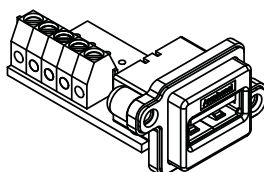
SIDE VIEW



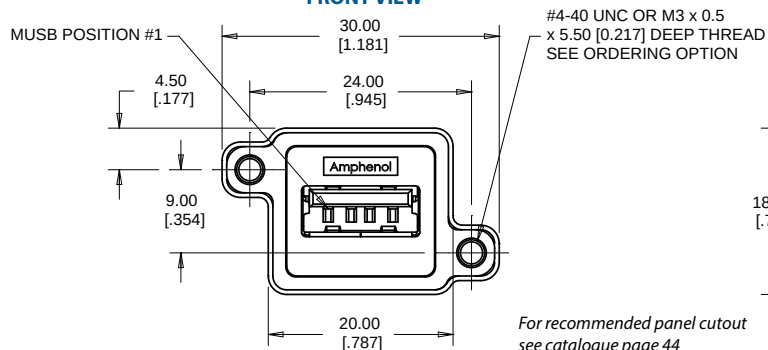
CONNECTIONS CHART

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

ISOMETRIC VIEW

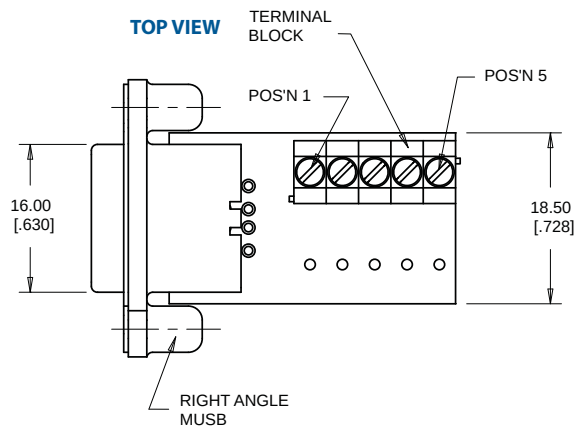


FRONT VIEW

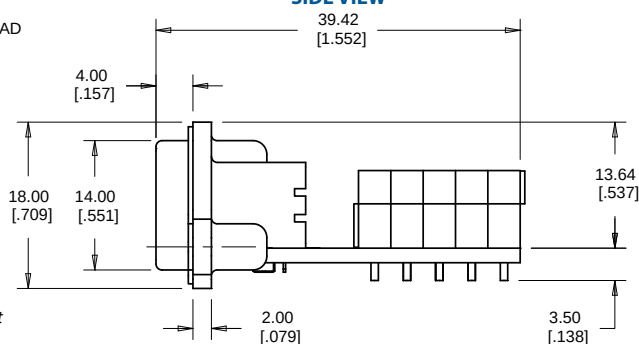


For recommended panel cutout see catalogue page 44

TOP VIEW



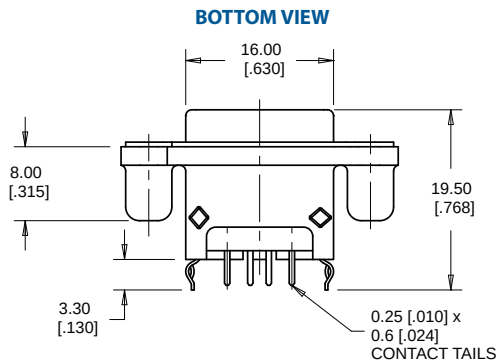
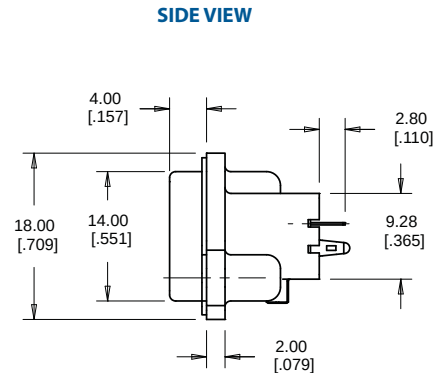
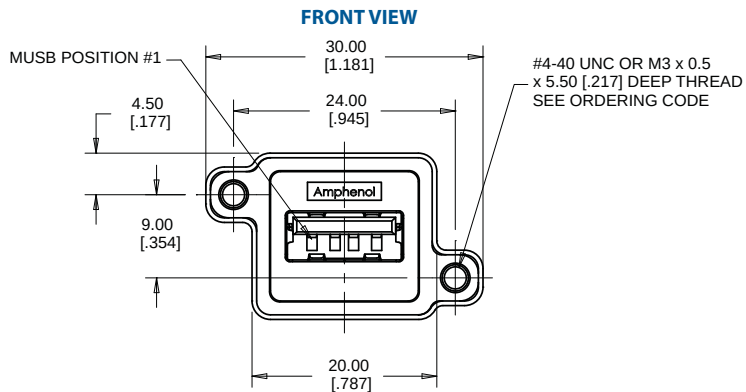
SIDE VIEW



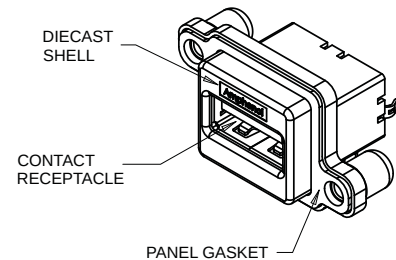
MUSB SERIES

GENERATION 1 RUGGED USB

MUSB-A511-XX



ISOMETRIC VIEW



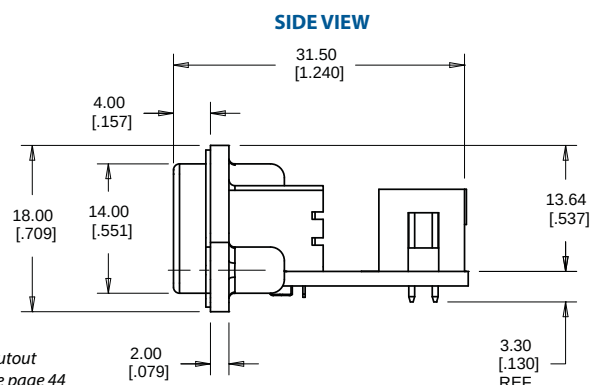
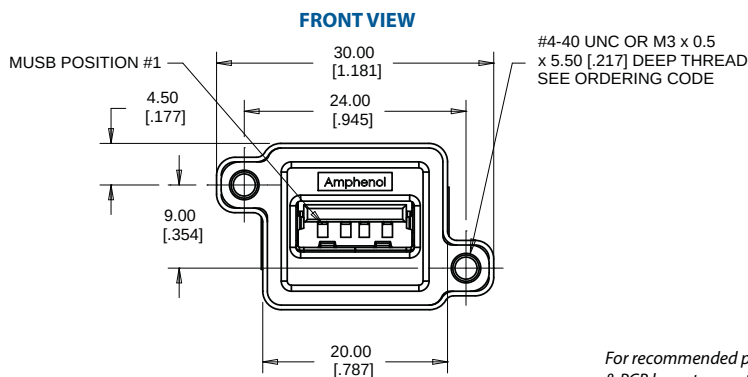
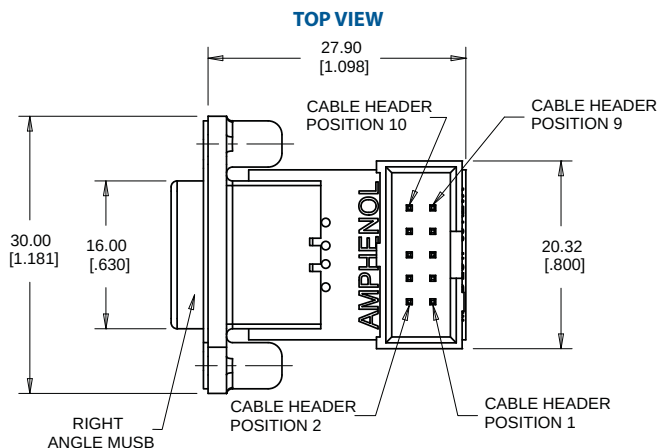
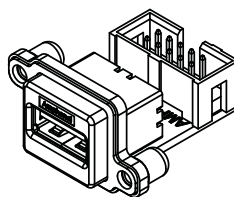
For recommended panel cutout
& PCB layout see catalogue page 44-45

MUSB-A811-XX

CONNECTIONS CHART

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

ISOMETRIC VIEW



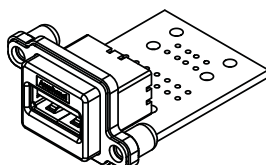
For recommended panel cutout
& PCB layout see catalogue page 44

MUSB-AA11-XX

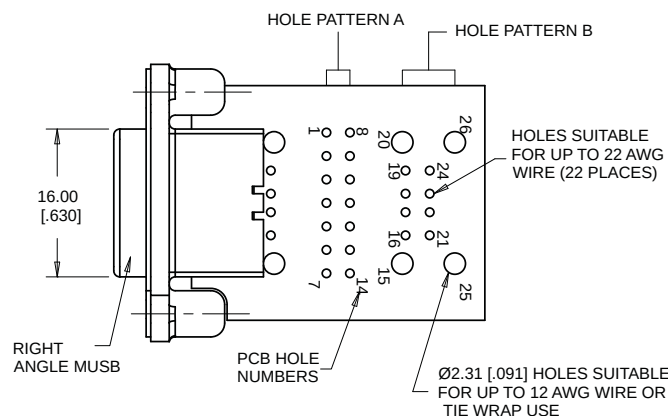
CONNECTIONS CHART

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

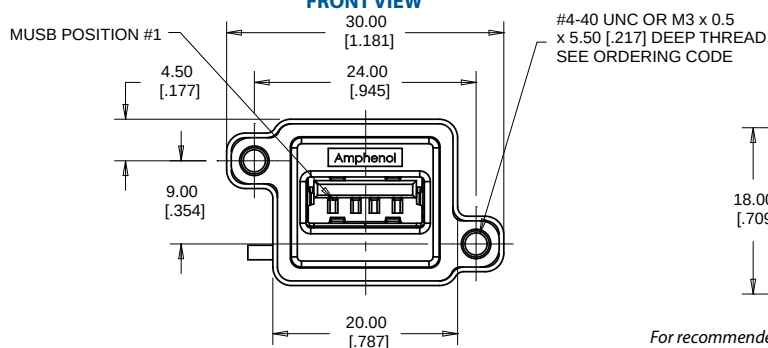
ISOMETRIC VIEW



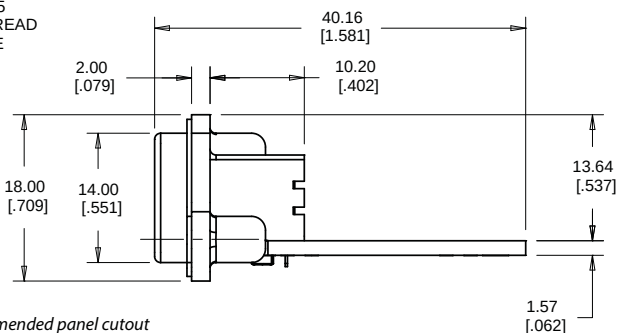
TOP VIEW



FRONT VIEW



SIDE VIEW

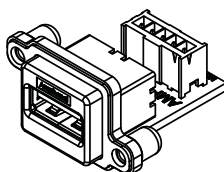


MUSB-AB11-XX

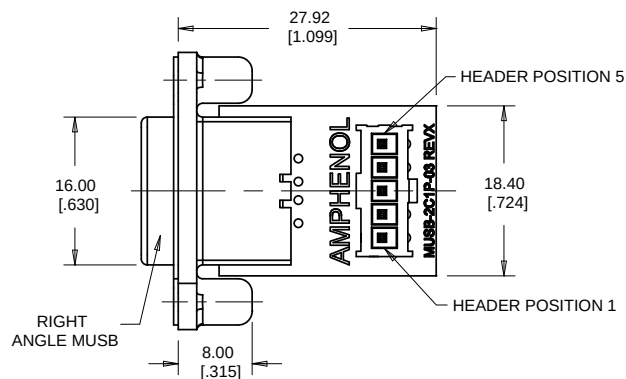
CONNECTIONS CHART

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

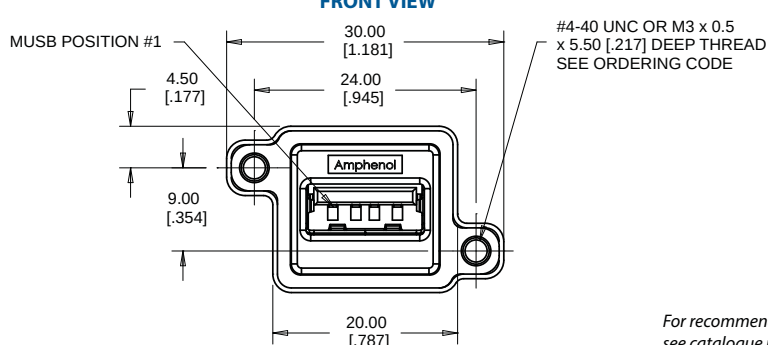
ISOMETRIC VIEW



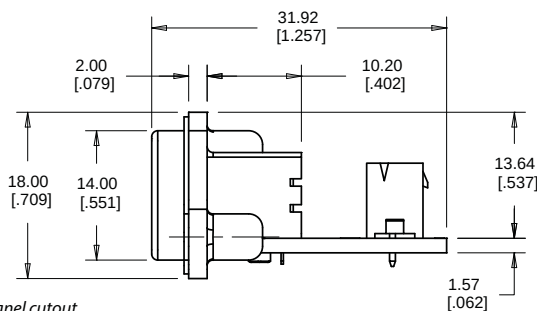
TOP VIEW



FRONT VIEW



SIDE VIEW

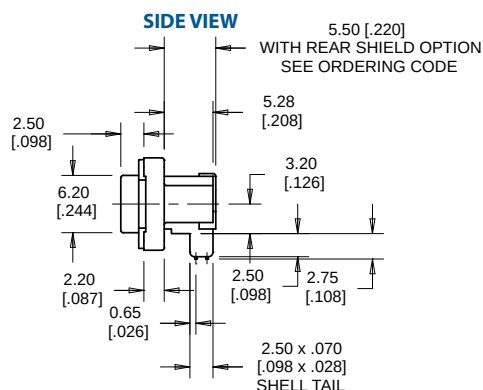
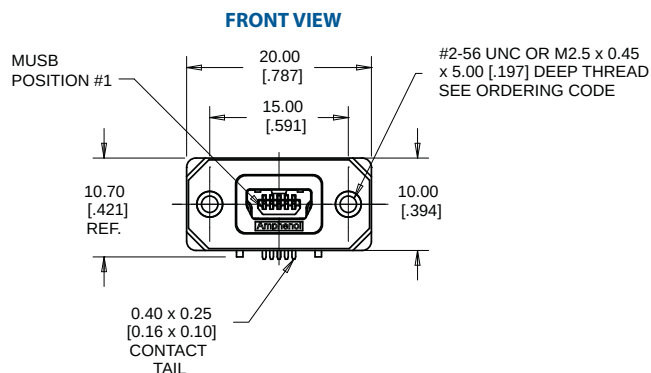


MUSB SERIES

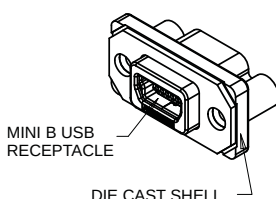
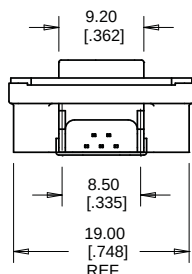
GENERATION 1 RUGGED USB

MUSB-B151-XX

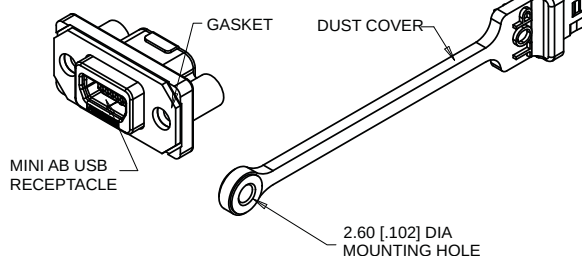
MUSB-E151-XX



BOTTOM VIEW



ISOMETRIC VIEWS



For recommended panel cutout see catalogue page 44

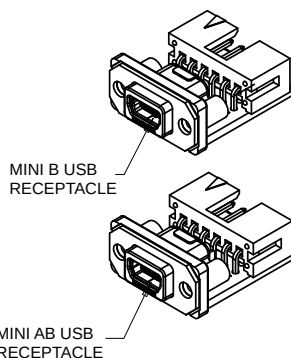
MUSB-B251-XX

MUSB-E251-XX

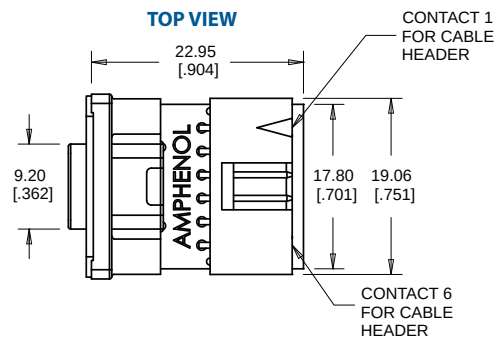
CONNECTIONS CHART

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

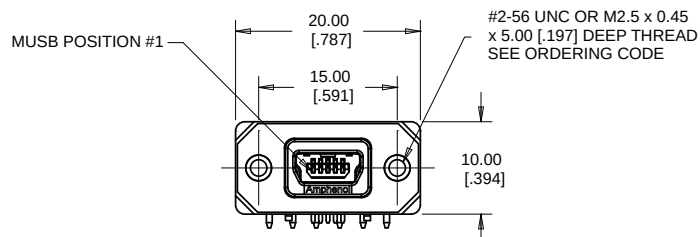
ISOMETRIC VIEWS



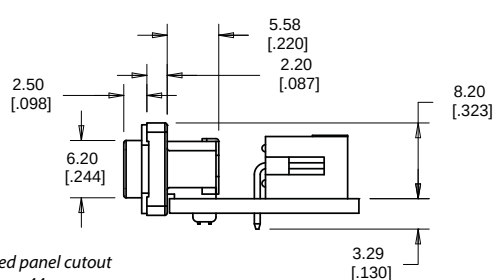
TOP VIEW



FRONT VIEW



SIDE VIEW



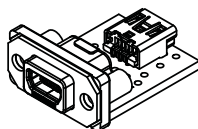
For recommended panel cutout see catalogue page 44

CONNECTIONS CHART

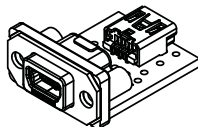
Mini-B USB Receptacle	Terminal Position
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4
5	5

ISOMETRIC VIEWS

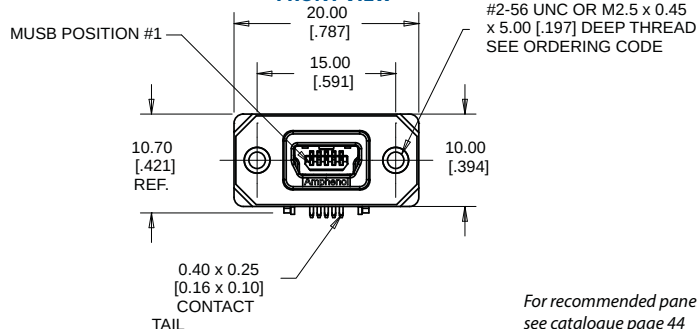
RIGHT ANGLE MINI-B USB



RIGHT ANGLE MINI-AB USB



FRONT VIEW

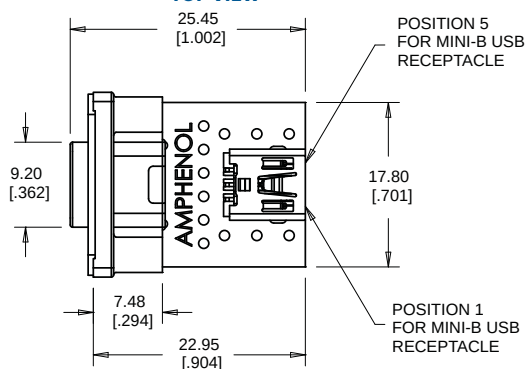


For recommended panel cutout see catalogue page 44

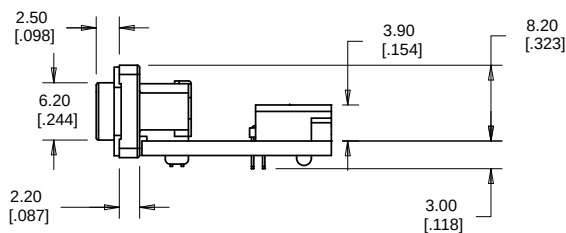
MUSB-B351-XX

MUSB-E351-XX

TOP VIEW



SIDE VIEW

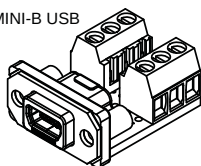


CONNECTIONS CHART

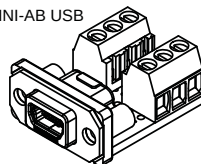
Mini-B USB Receptacle	Terminal Position
Shell/GND	6
1	1
2	2
3	3
4	4
5	5

ISOMETRIC VIEWS

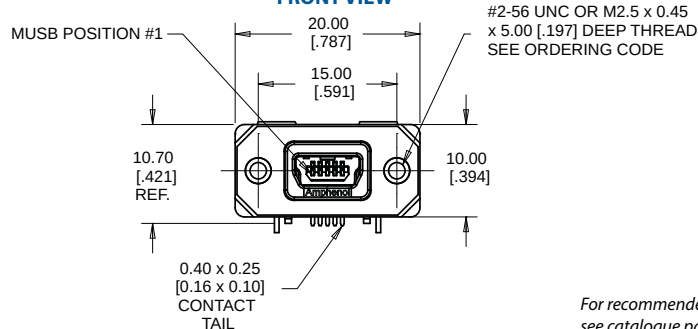
RIGHT ANGLE MINI-B USB



RIGHT ANGLE MINI-AB USB

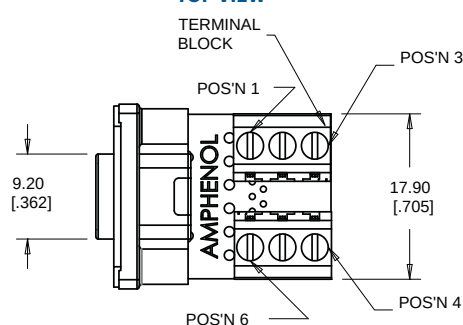


FRONT VIEW

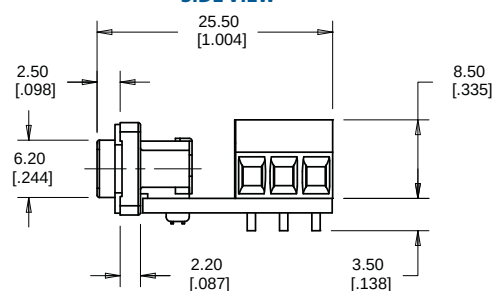


For recommended panel cutout see catalogue page 44

TOP VIEW



SIDE VIEW

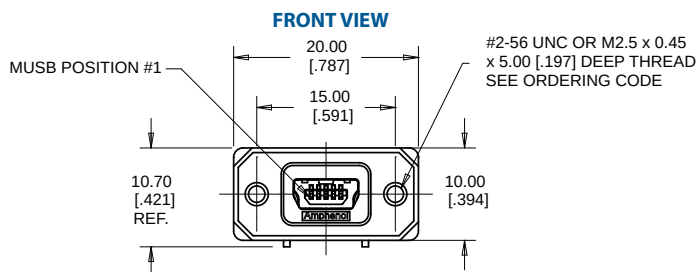


MUSB SERIES

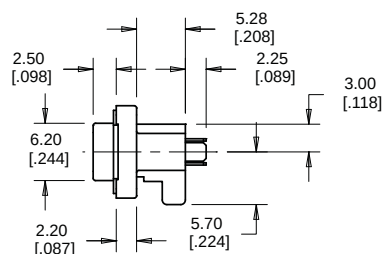
GENERATION 1 RUGGED USB

MUSB-B551-XX

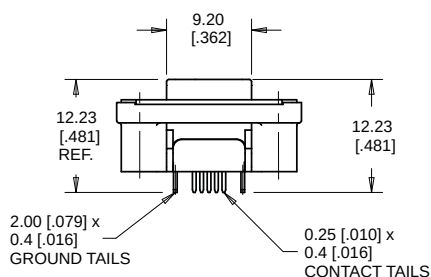
MUSB-E551-XX



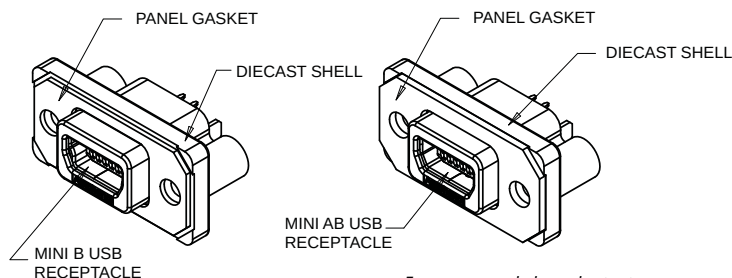
SIDE VIEW



BOTTOM VIEW



ISOMETRIC VIEWS



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

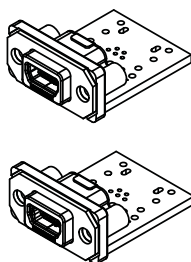
MUSB-BA51-XX

MUSB-EA51-XX

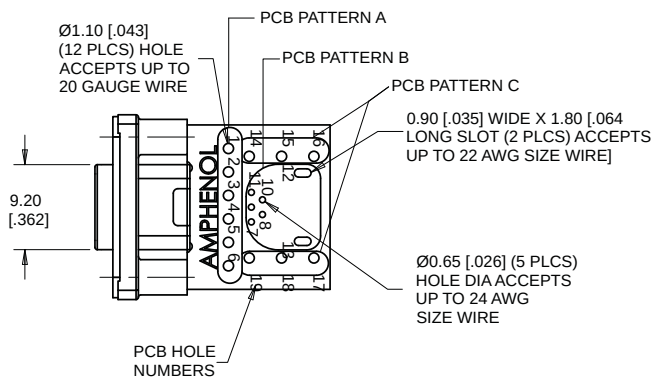
CONNECTIONS CHART

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

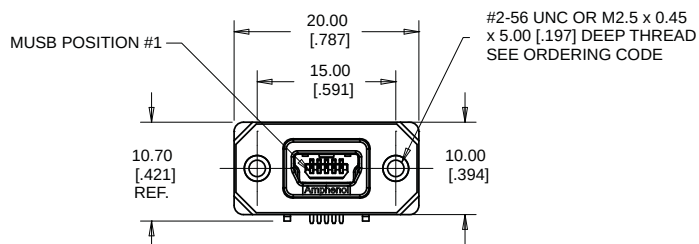
ISOMETRIC VIEWS



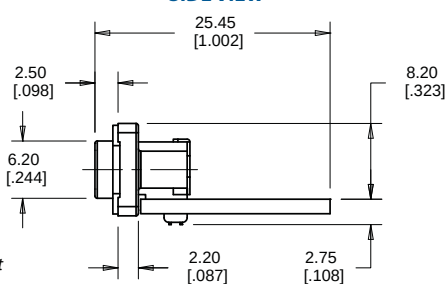
TOP VIEW



FRONT VIEW

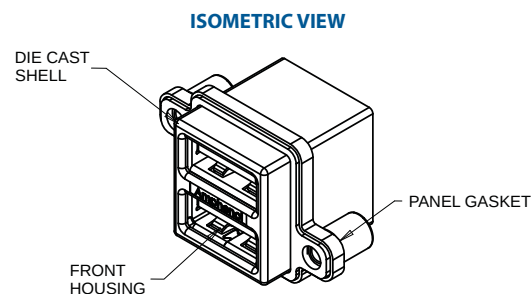
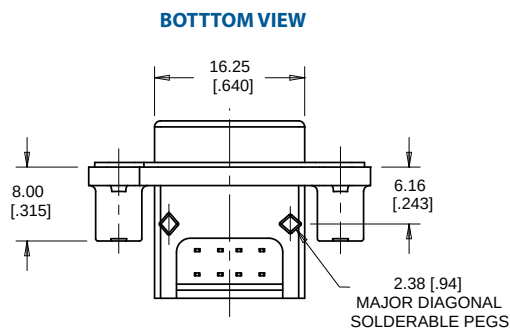
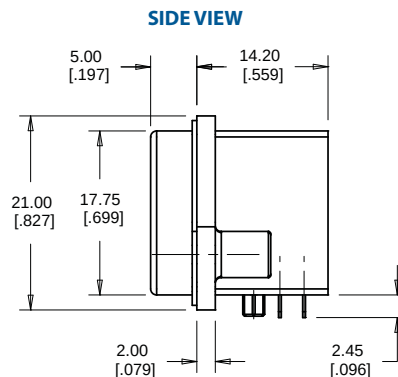
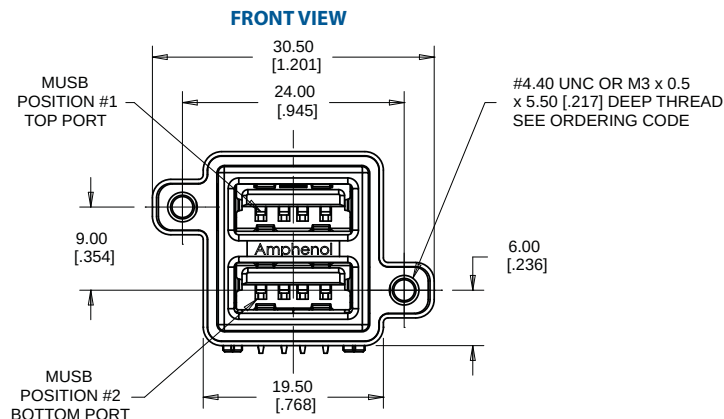


SIDE VIEW



For recommended panel cutout see catalogue page 44

MUSB-C111-XX

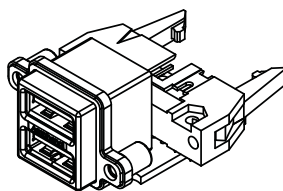


For recommended panel cutout
& PCB layout see catalogue page 44-45

CONNECTIONS CHART

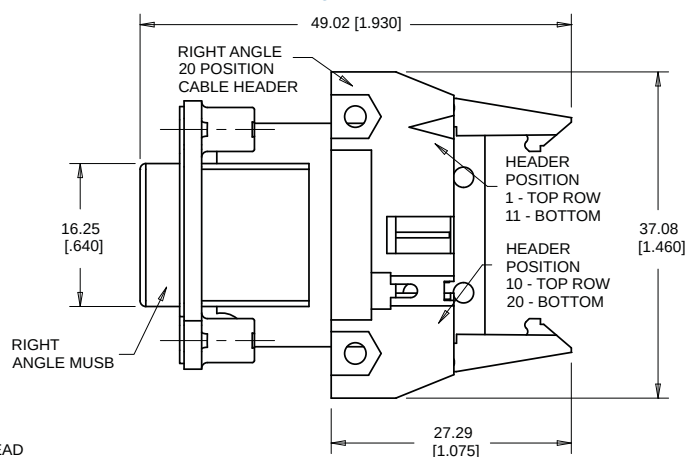
Rugged USB Receptacle	Cable Header
Shell/GND	1
1	14
2	13
3	12
4	11
5	7
6	6
7	5
8	4

ISOMETRIC VIEW

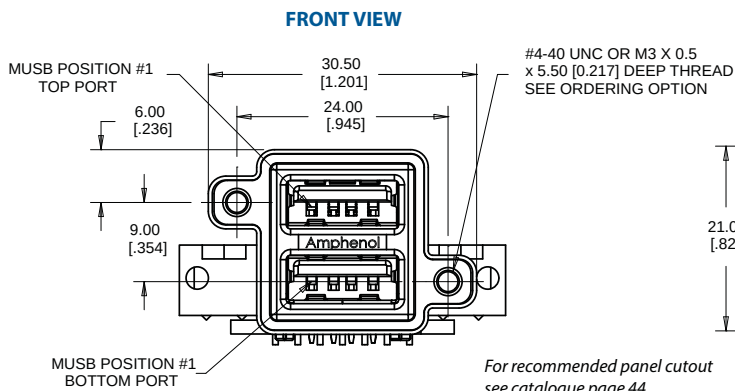
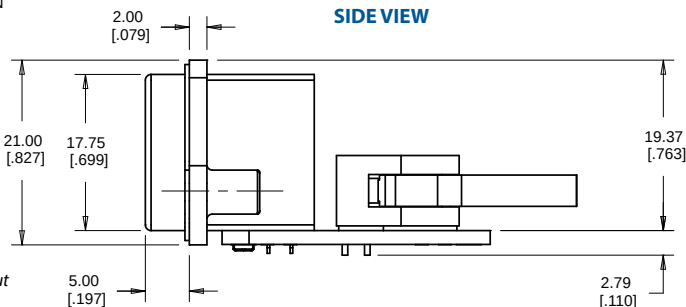


MUSB-C211-XX

TOP VIEW



SIDE VIEW



For recommended panel cutout
see catalogue page 44

MUSB SERIES

GENERATION 1 RUGGED USB

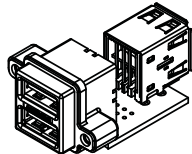
MUSB-C311-XX MUSB-CE11-XX

CONNECTIONS CHART

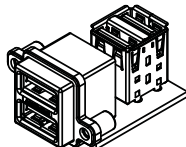
MUSB Contact	USB Contact
Shell/GND	Shell/GND
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

ISOMETRIC VIEWS

MUSB-C311-XX
RIGHT ANGLE USB

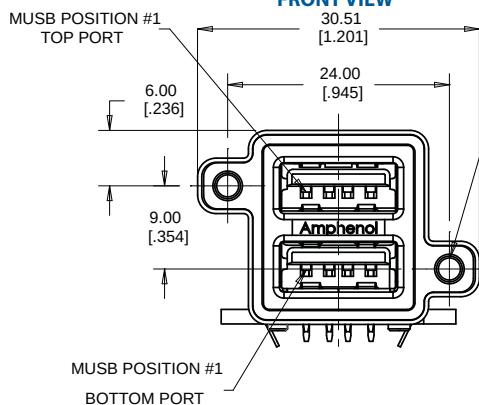


MUSB-CE11-XX
VERTICAL USB

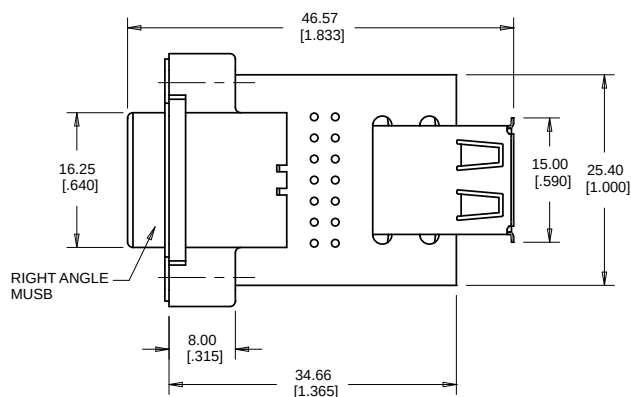


#4-40 UNC OR M3 x 0.5
x 5.50 [.217] DEEP THREAD
SEE ORDERING CODE

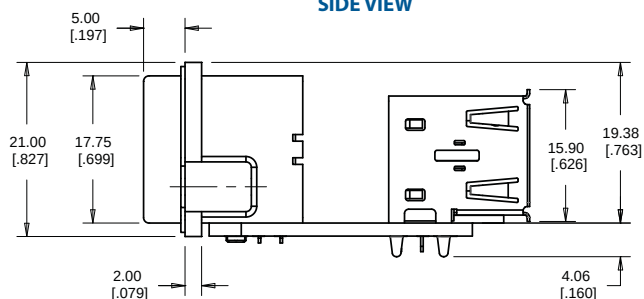
FRONT VIEW



TOP VIEW



SIDE VIEW



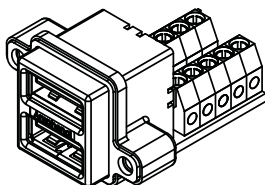
For recommended panel cutout
see catalogue page 44

MUSB-C411-XX

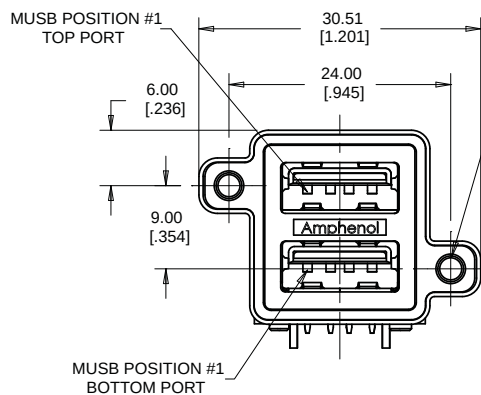
CONNECTIONS CHART

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

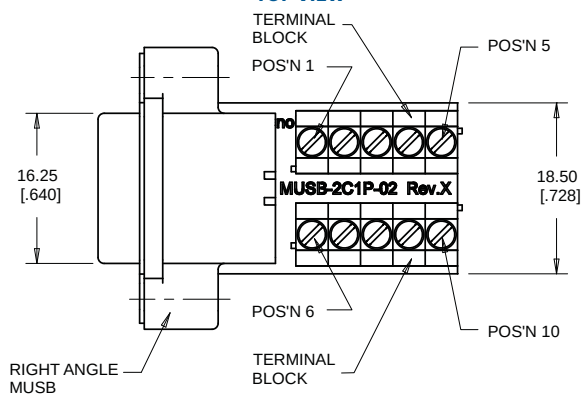


FRONT VIEW

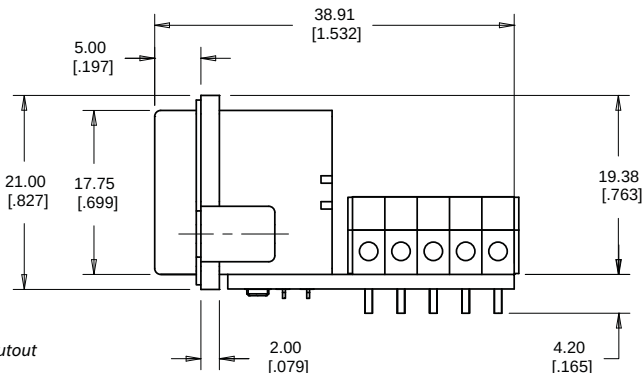


#4-40 UNC OR M3 x 0.5
x 5.50 [.217] DEEP THREAD
SEE ORDERING CODE

TOP VIEW

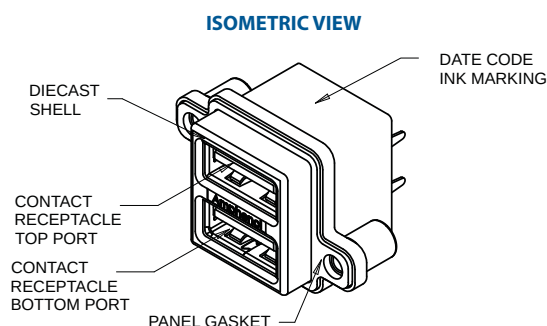
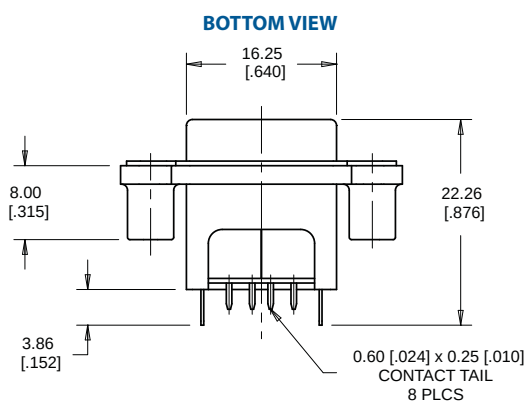
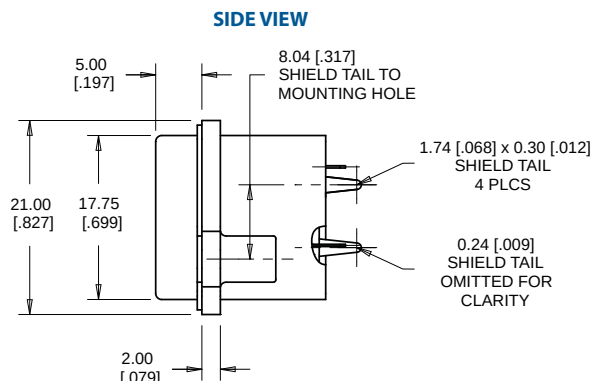
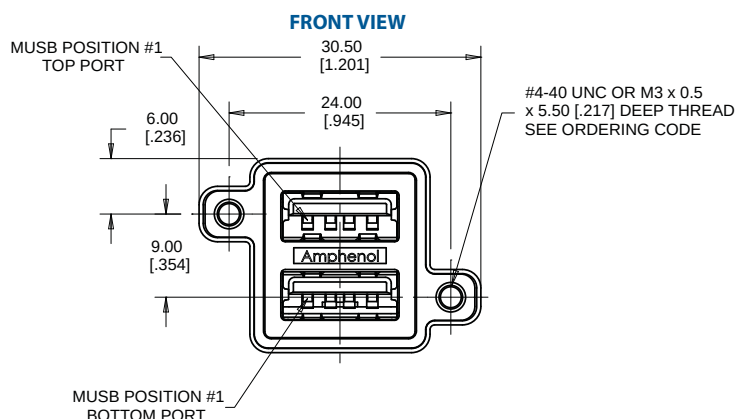


SIDE VIEW



For recommended panel cutout
see catalogue page 44

MUSB-C511-XX

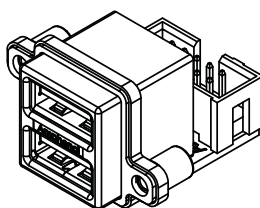


For recommended panel cutout & PCB layout see catalogue page 44-45

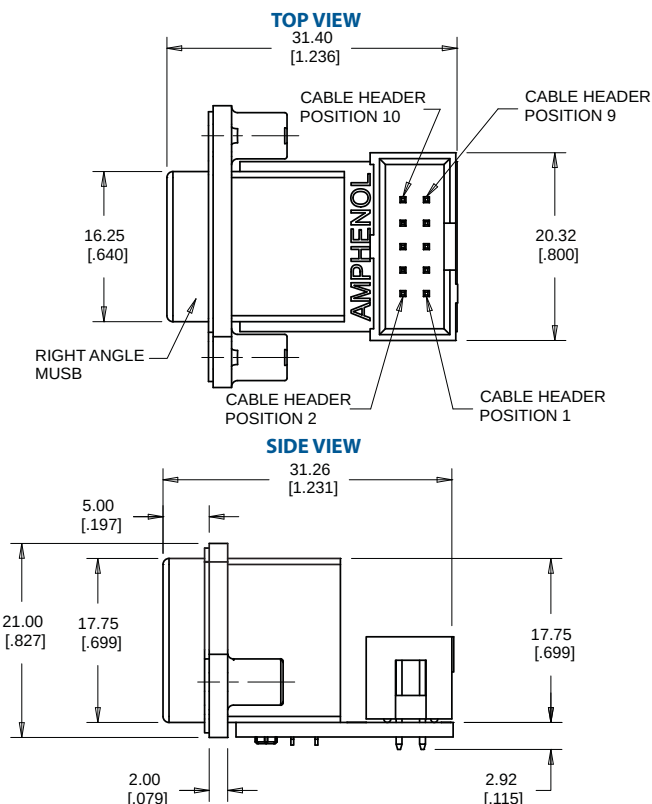
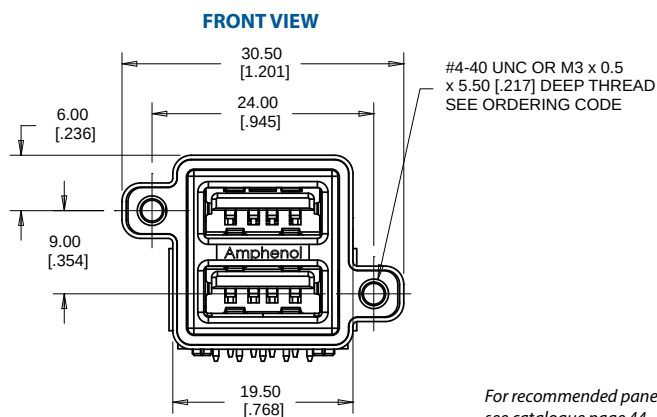
CONNECTIONS CHART

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



For recommended panel cutout see catalogue page 44

MUSB SERIES

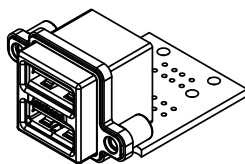
GENERATION 1 RUGGED USB

MUSB-CA11-XX

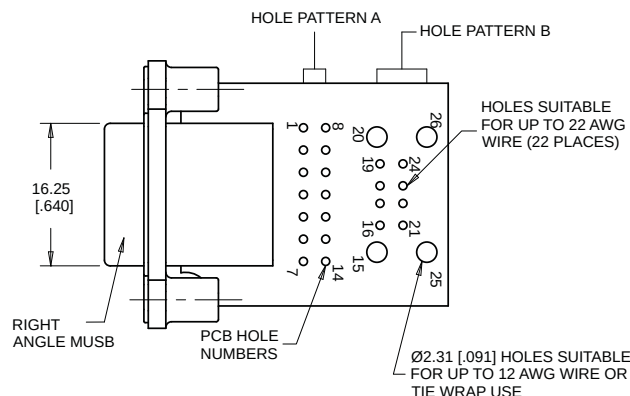
CONNECTIONS CHART

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

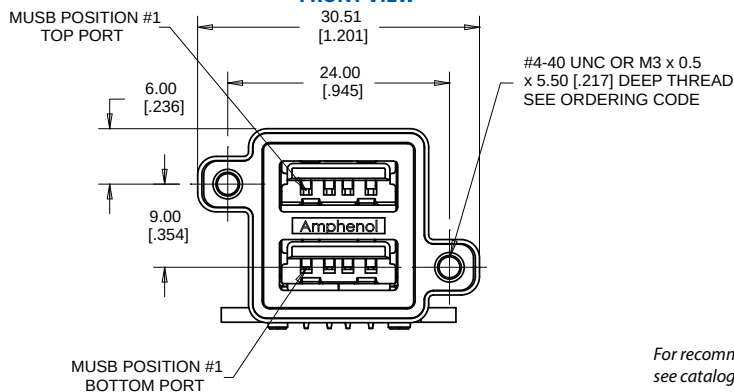
ISOMETRIC VIEW



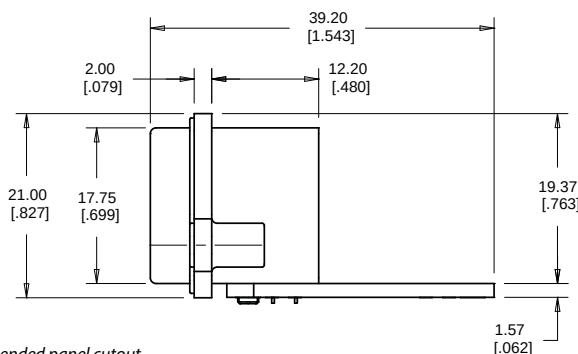
TOP VIEW



FRONT VIEW



SIDE VIEW



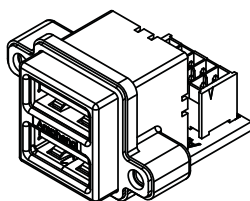
For recommended panel cutout see catalogue page 44

MUSB-CD11-XX

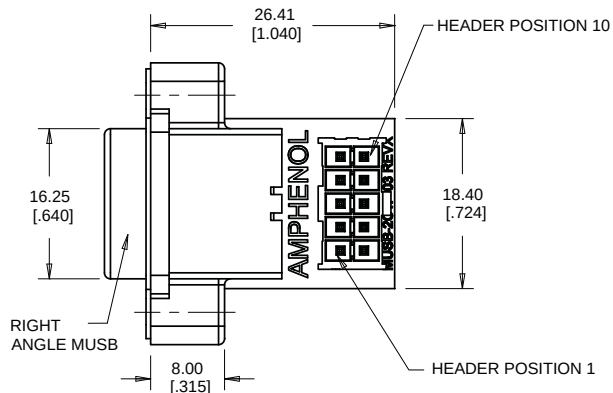
CONNECTIONS CHART

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

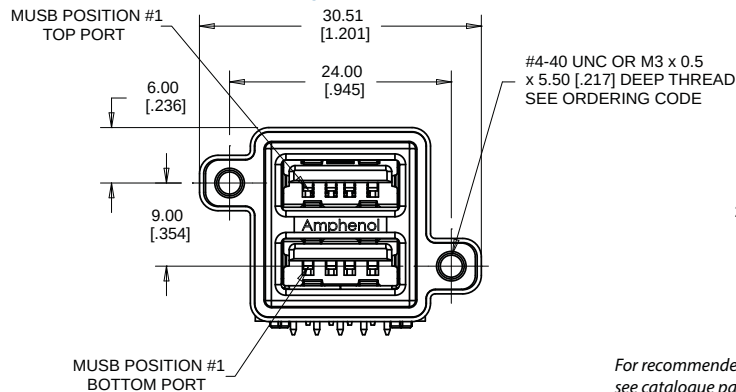
ISOMETRIC VIEW



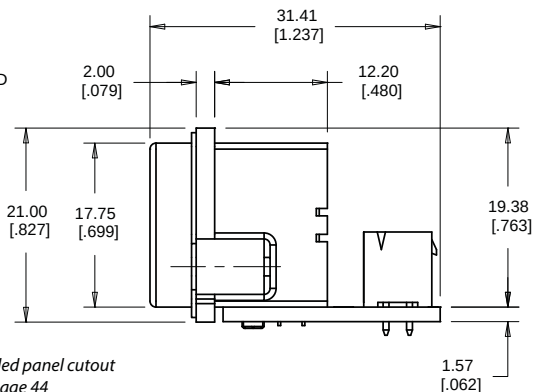
TOP VIEW



FRONT VIEW

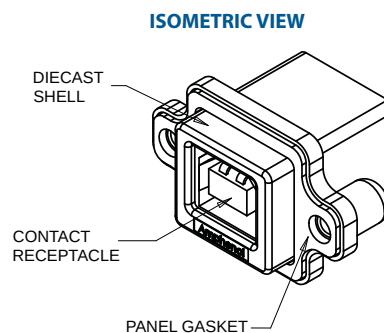
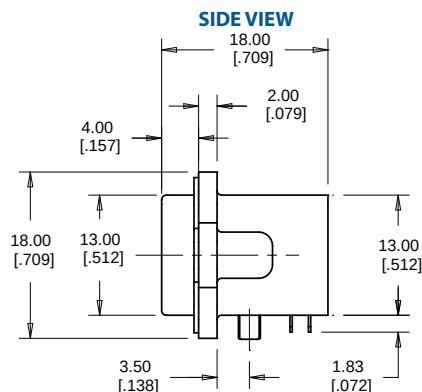
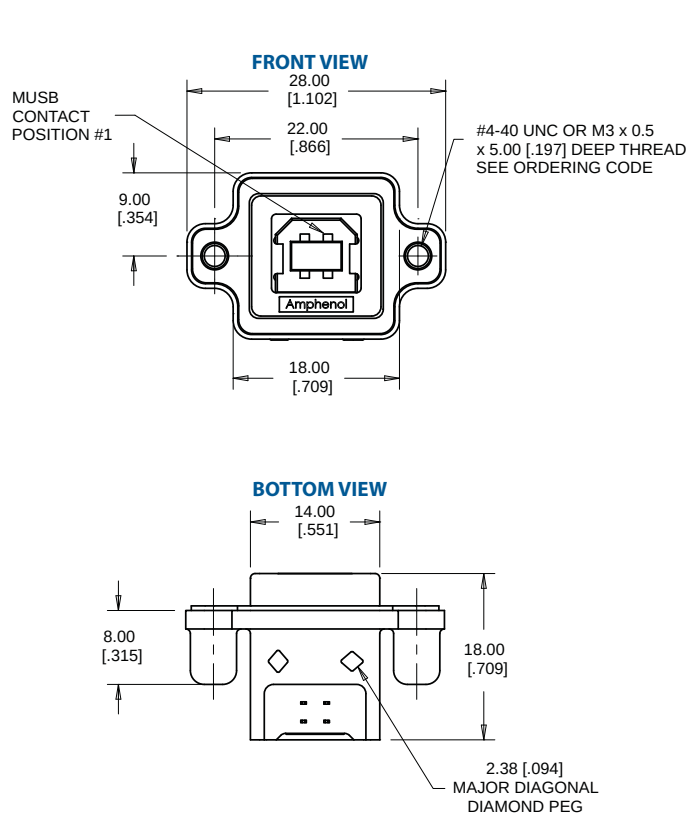


SIDE VIEW



For recommended panel cutout see catalogue page 44

MUSB-D111-XX



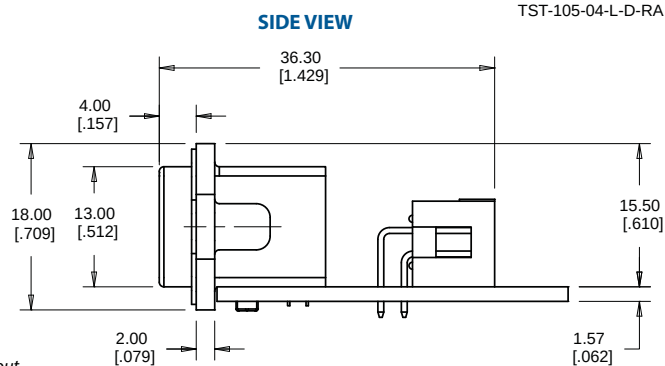
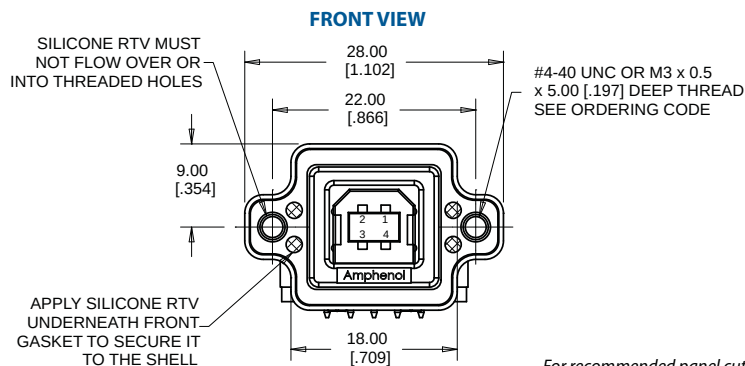
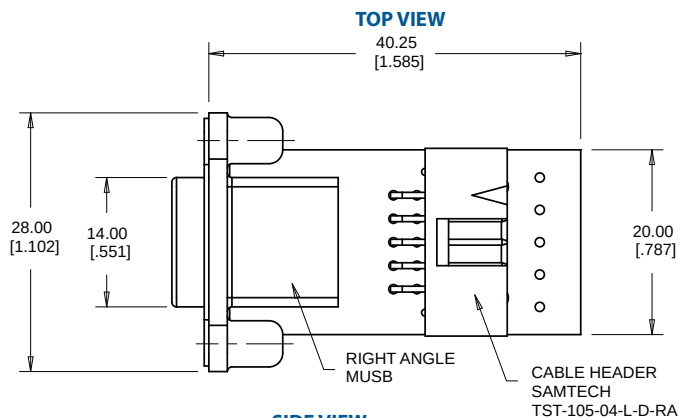
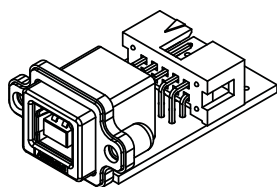
For recommended panel cutout & PCB layout see catalogue page 44-45

MUSB-D211-XX

CONNECTIONS CHART

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

ISOMETRIC VIEW



For recommended panel cutout see catalogue page 44

MUSB SERIES

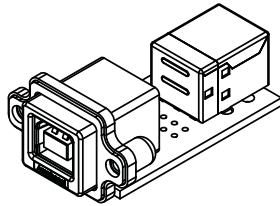
GENERATION 1 RUGGED USB

MUSB-D311-XX

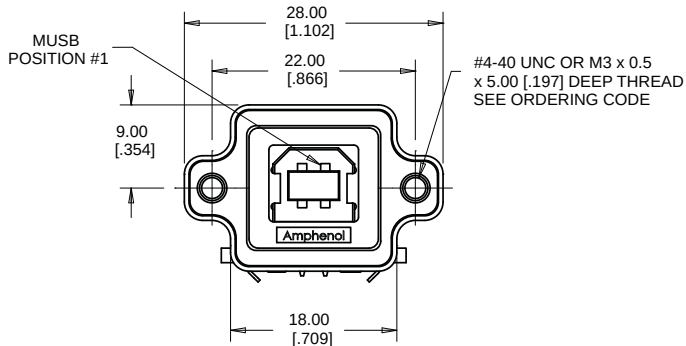
CONNECTIONS CHART

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

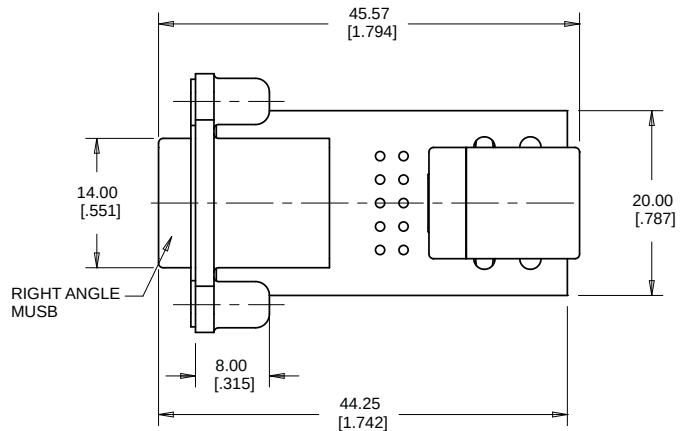
ISOMETRIC VIEW



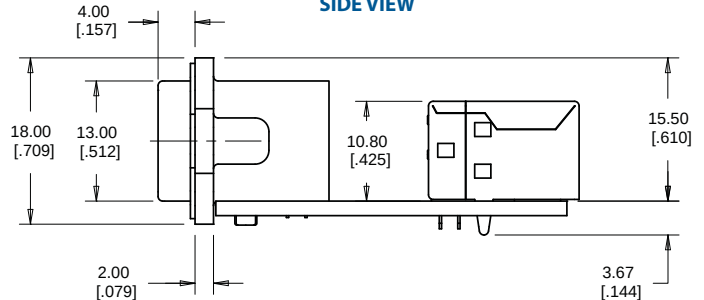
FRONT VIEW



TOP VIEW



SIDE VIEW



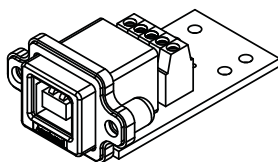
For recommended panel cutout see catalogue page 44

MUSB-D411-XX

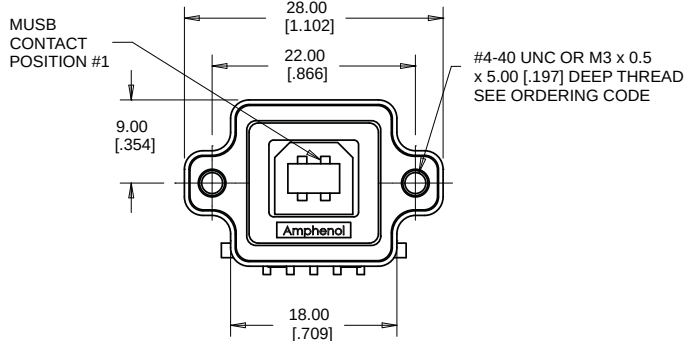
CONNECTIONS CHART

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

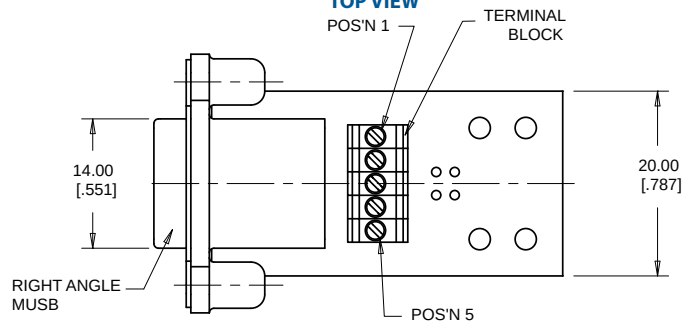
ISOMETRIC VIEW



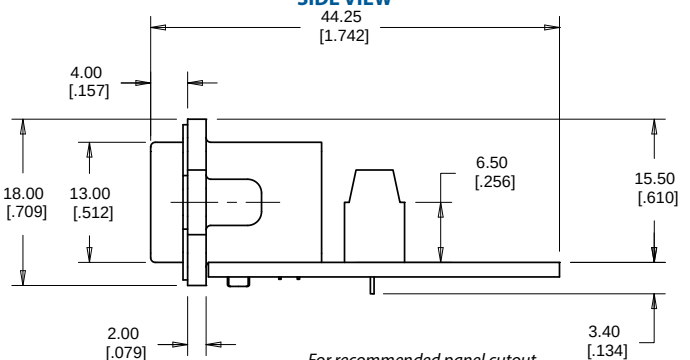
FRONT VIEW



TOP VIEW

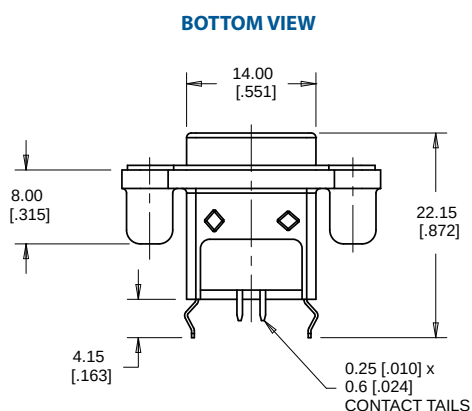
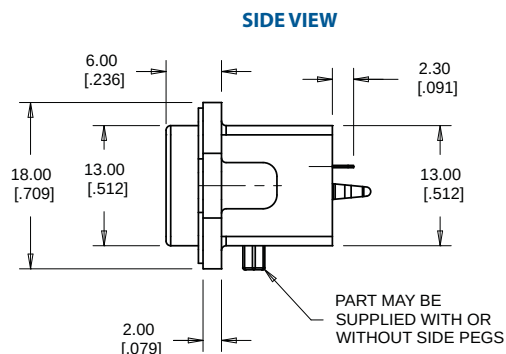
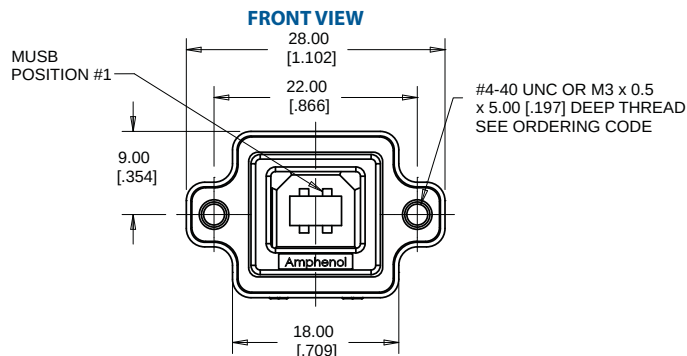


SIDE VIEW

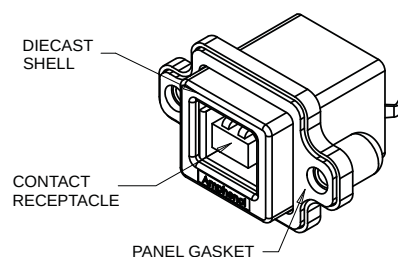


For recommended panel cutout see catalogue page 44

MUSB-D511-XX



ISOMETRIC VIEW



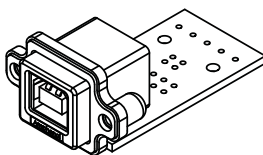
For recommended panel cutout & PCB layout see catalogue page 44-45

MUSB-DA11-XX

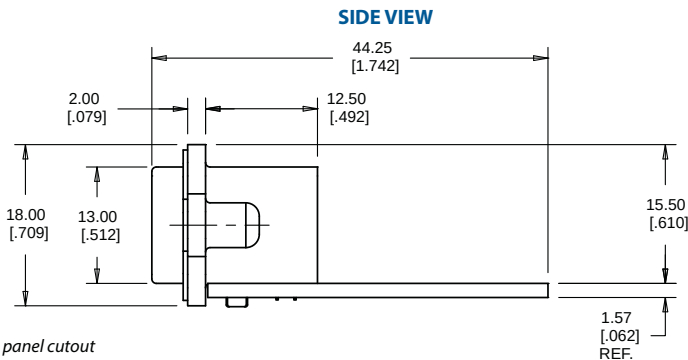
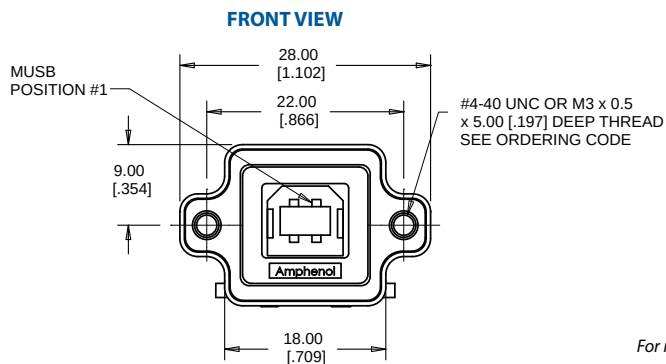
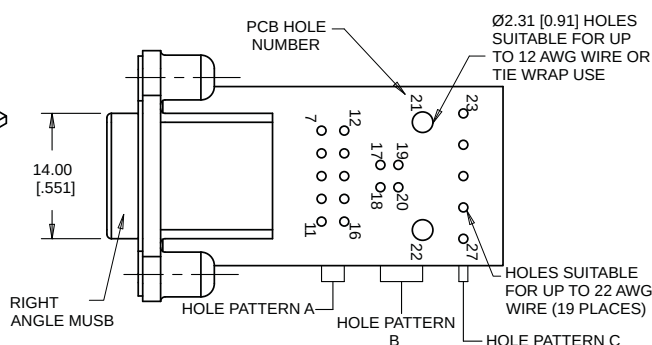
CONNECTIONS CHART

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

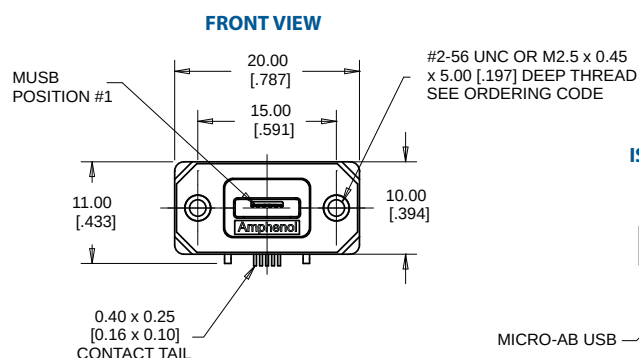


TOP VIEW

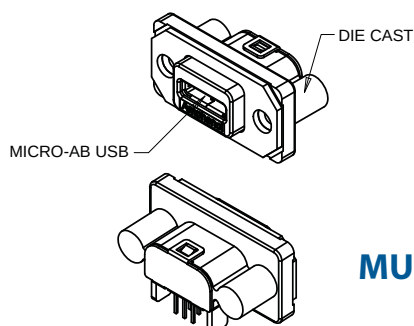


For recommended panel cutout see catalogue page 44

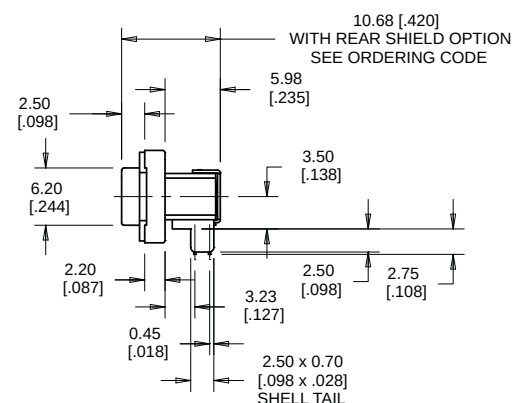
MUSB-K152-XX



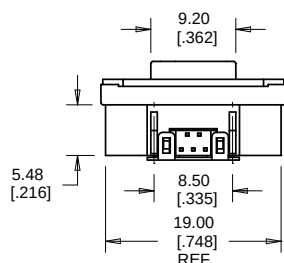
ISOMETRIC VIEWS



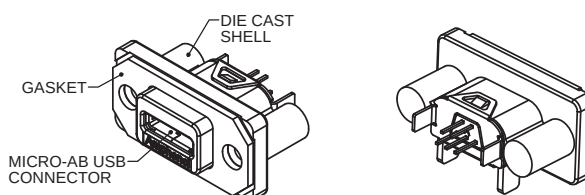
SIDE VIEW



BOTTOM VIEW



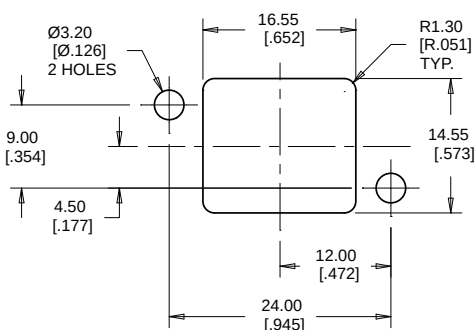
MUSB-K552-XX



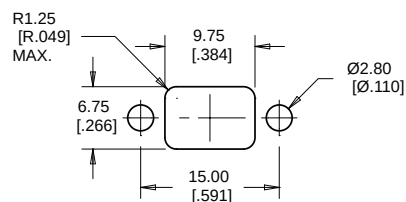
For recommended panel cutout see below & for PCB layout see catalogue page 45

Recommended Panel Cutouts

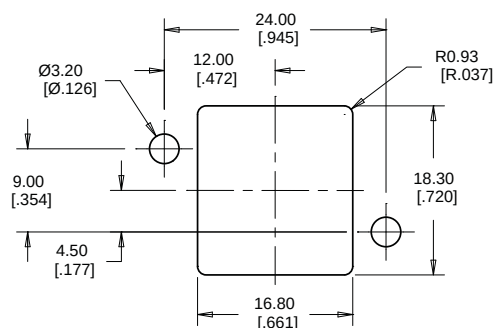
MUSB-A511-XX



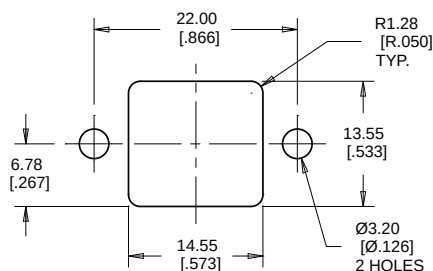
MUSB-B151-XX



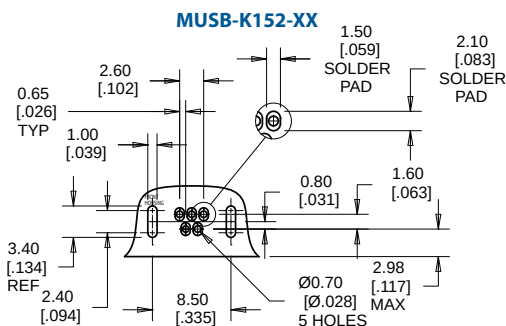
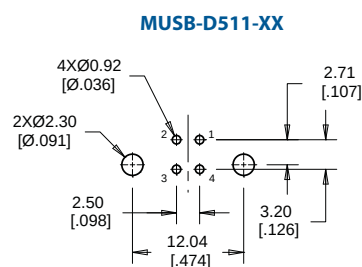
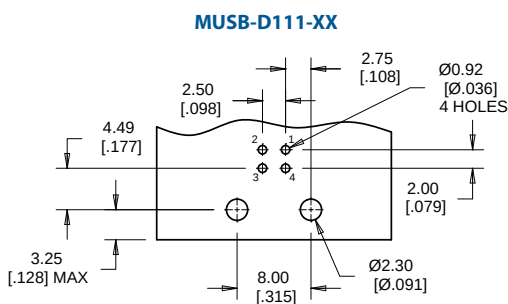
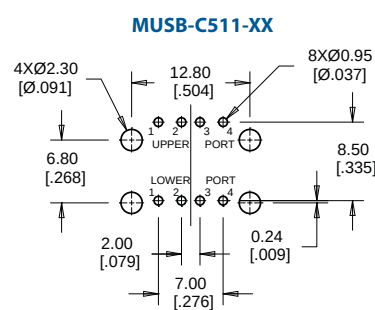
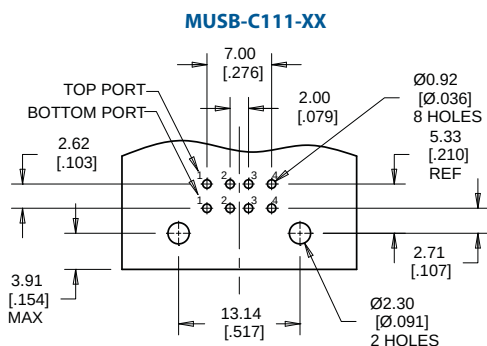
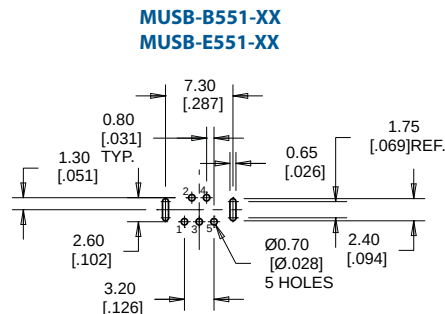
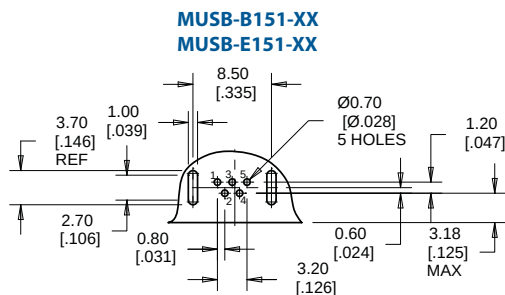
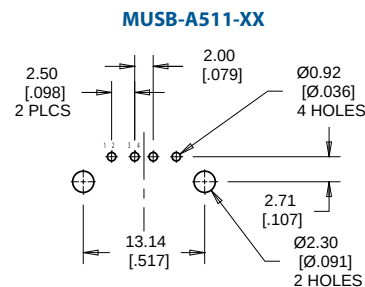
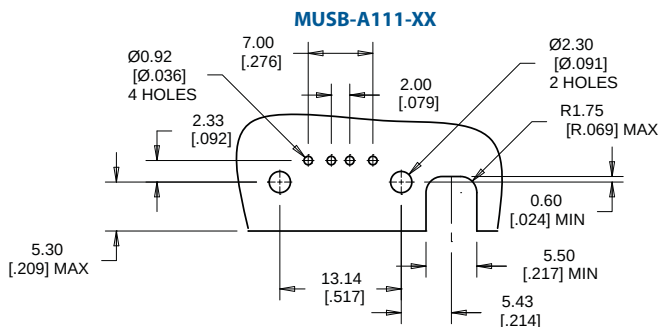
MUSB-C511-XX



MUSB-D111-XX



Recommended PCB Layouts



NOTES:

1) GENERAL TOLERANCE FOR HOLE AND SLOT SIZES ± 0.05 [0.002].

2) LOCATION DIMENSIONS ARE BASIC. LOCATE FEATURE WITHIN 0.13 [0.005] 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

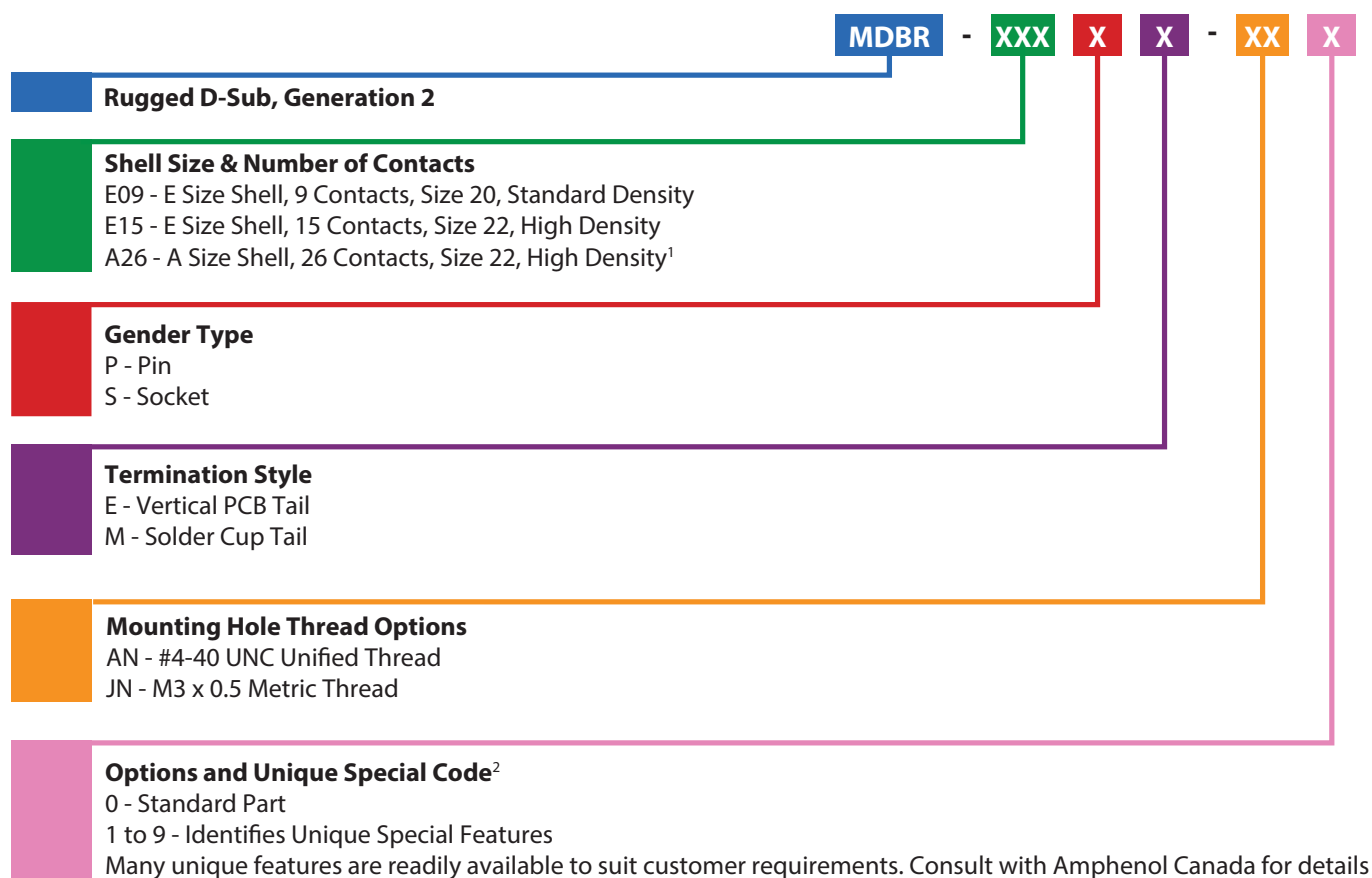
Current Rating:	<i>Standard Density</i> - 5A max <i>High Density</i> - 3A max
Contact Resistance:	20 mΩ max
Insulation Resistance:	5000 MΩ min
DWV:	<i>Standard Density</i> - 1500 VDC <i>High Density</i> - 1200 VDC

Mechanical, Environmental, Regulatory

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

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)

**Notes:**

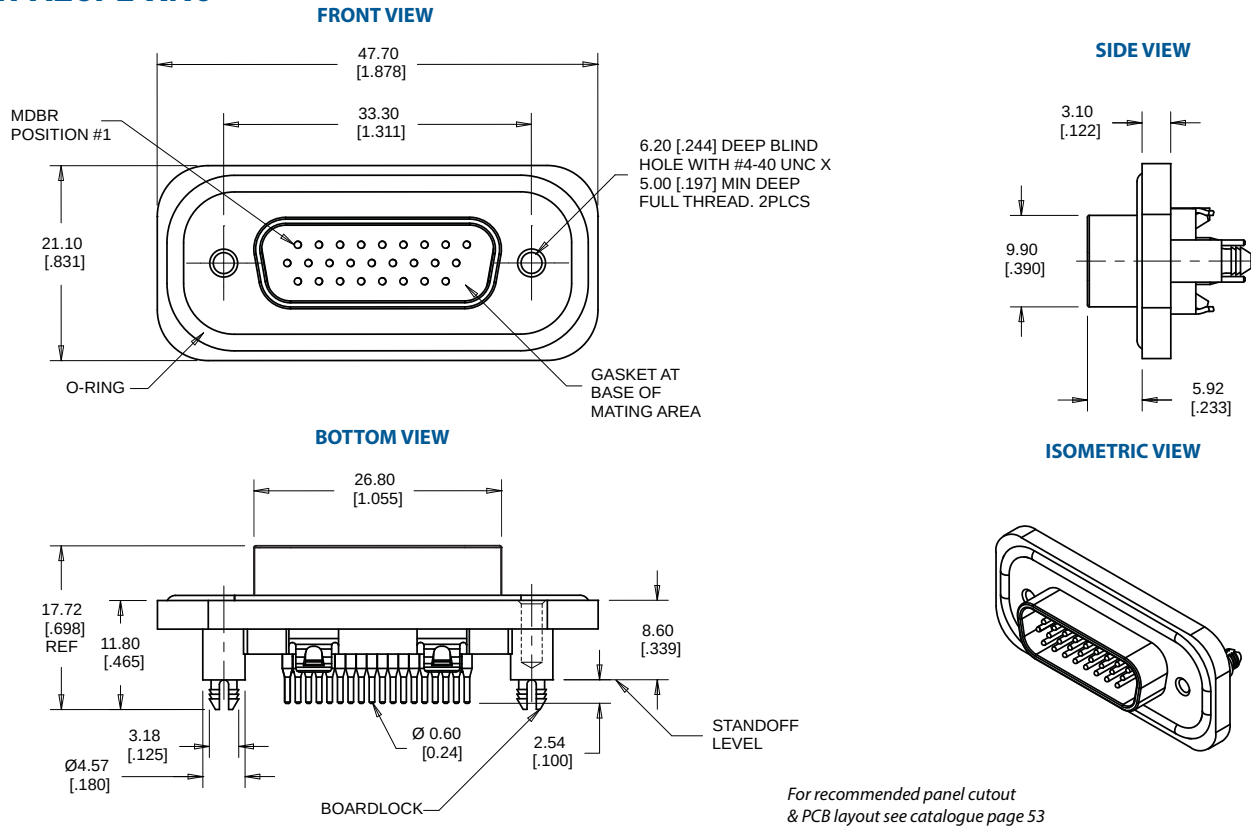
1) The MDBR series with 26 contacts is currently available in the pin contact version only.

2) Consult with Amphenol for additional terminations, contact tail lengths, mounting styles or other special requirements

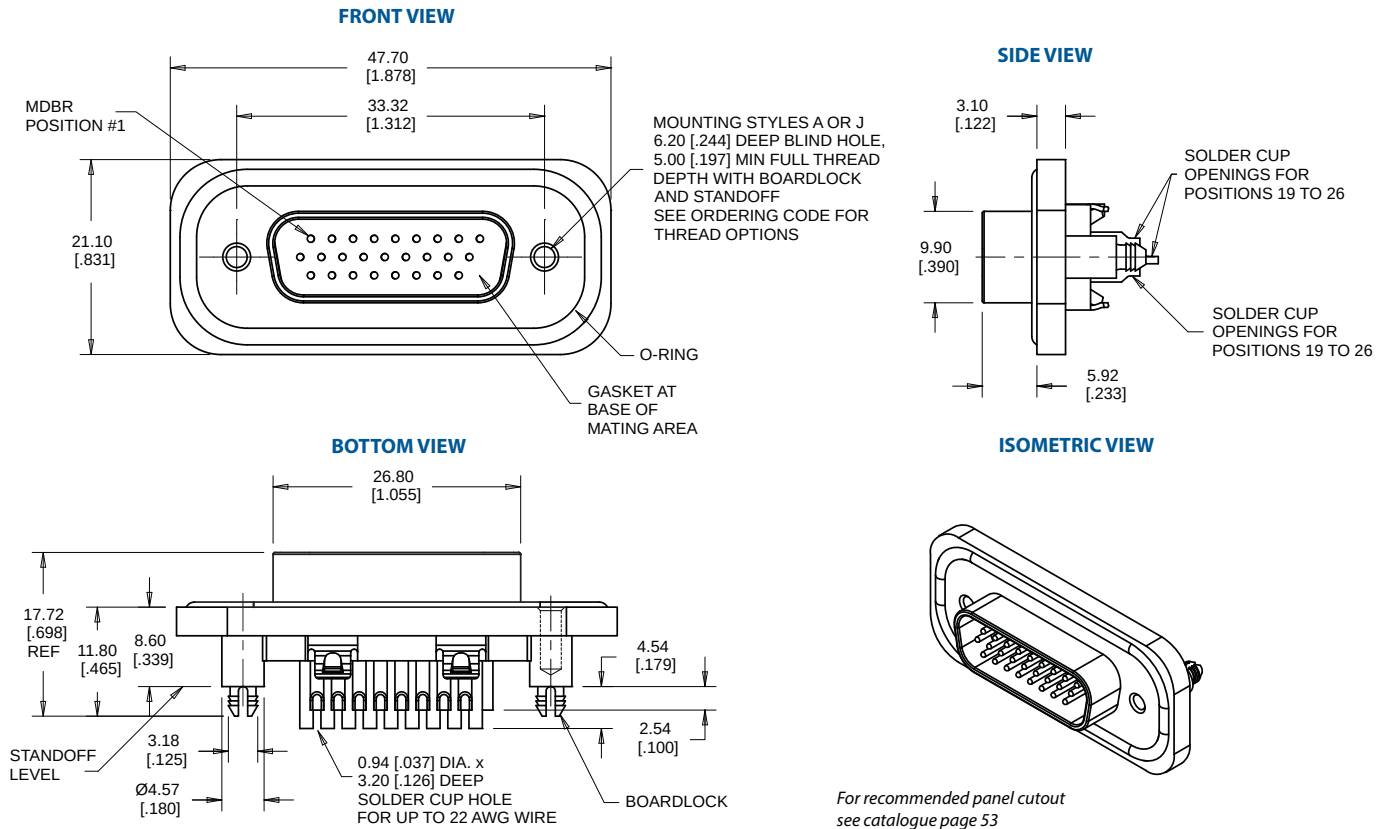
MDBR SERIES

GENERATION 2 RUGGED D-SUB

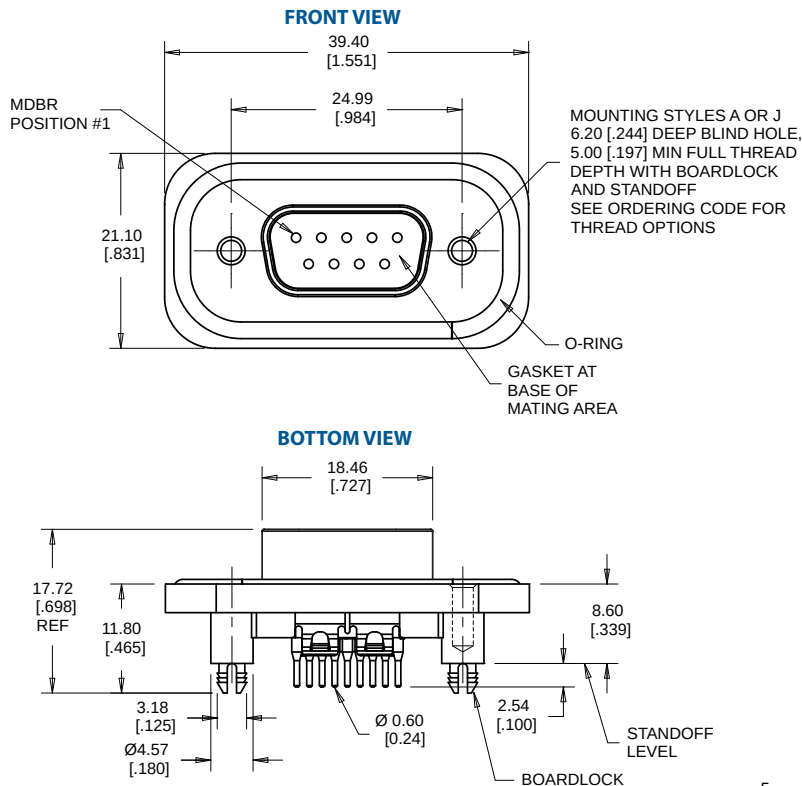
MDBR-A26PE-XN0



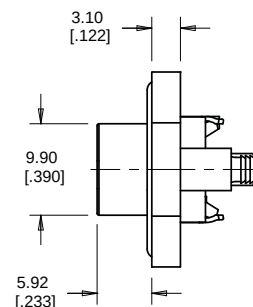
MDBR-A26PM-XN0



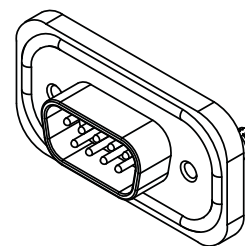
MDBR-E09PE-XN0



SIDE VIEW

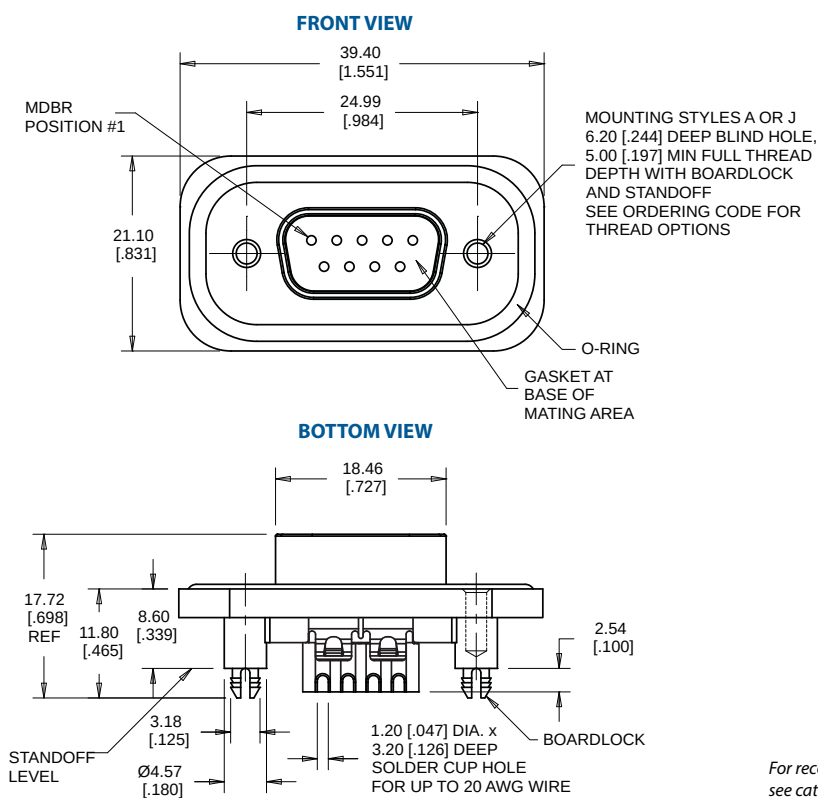


ISOMETRIC VIEW

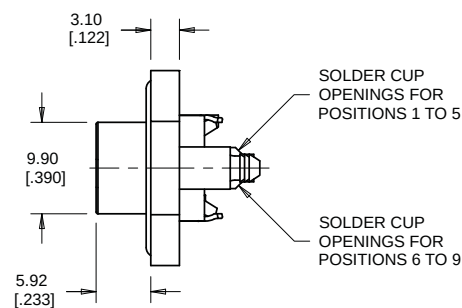


For recommended panel cutout
& PCB layout see catalogue page 53

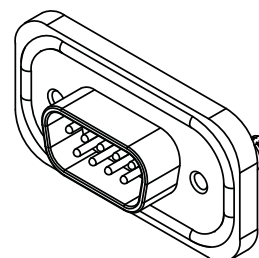
MDBR-E09PM-XN0



SIDE VIEW



ISOMETRIC VIEW

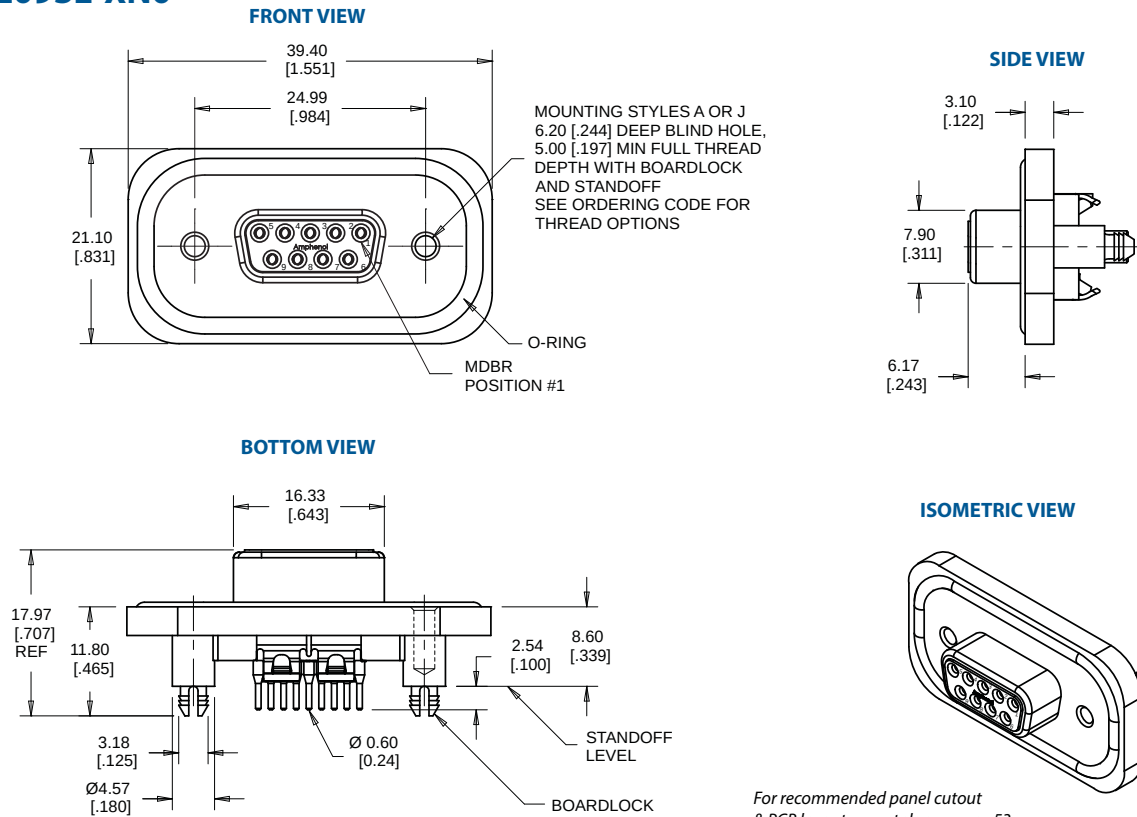


For recommended panel cutout
see catalogue page 53

MDBR SERIES

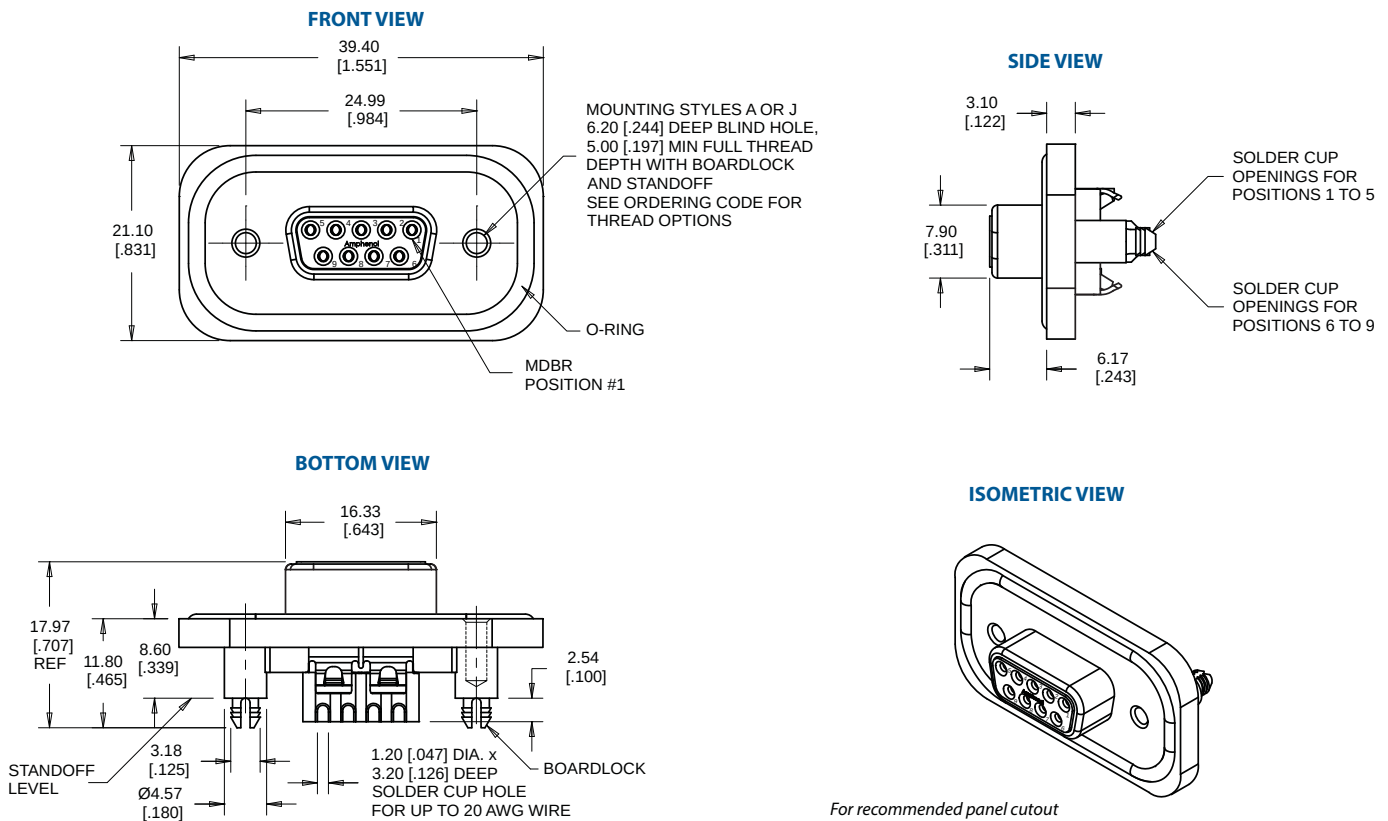
GENERATION 2 RUGGED D-SUB

MDBR-E09SE-XN0



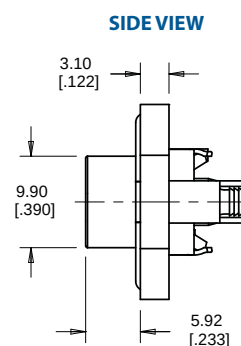
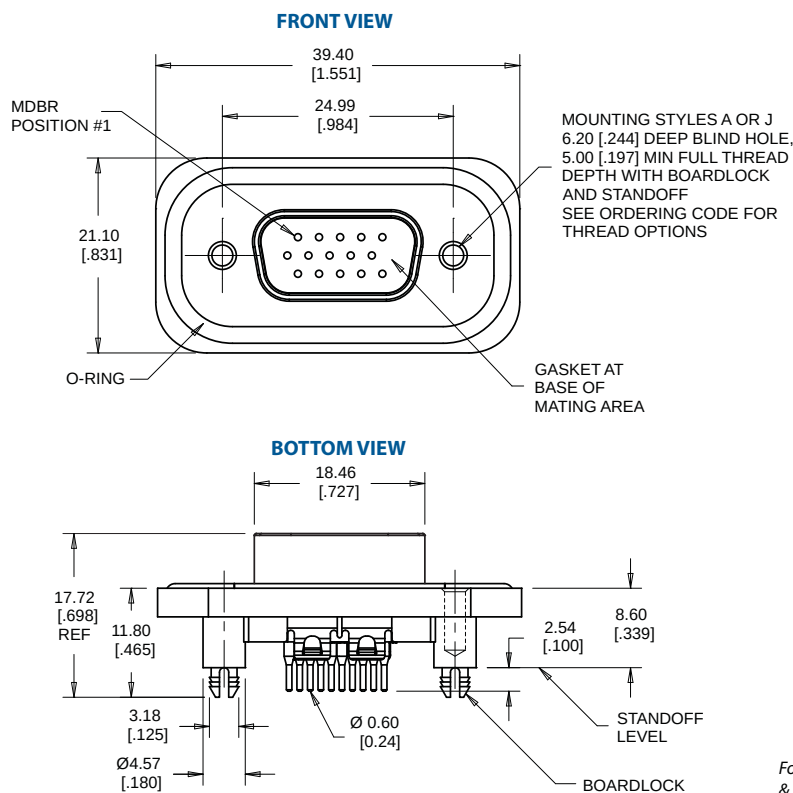
For recommended panel cutout
& PCB layout see catalogue page 53

MDBR-E09SM-XN0

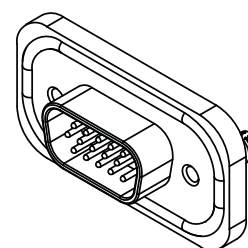


For recommended panel cutout
see catalogue page 53

MDBR-E15PE-XN0

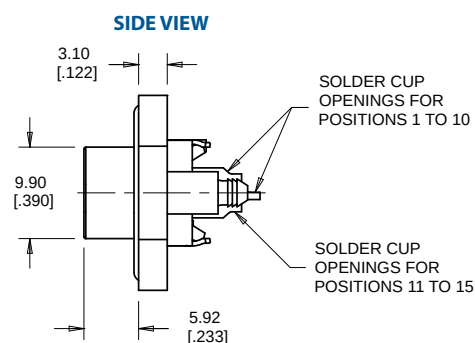
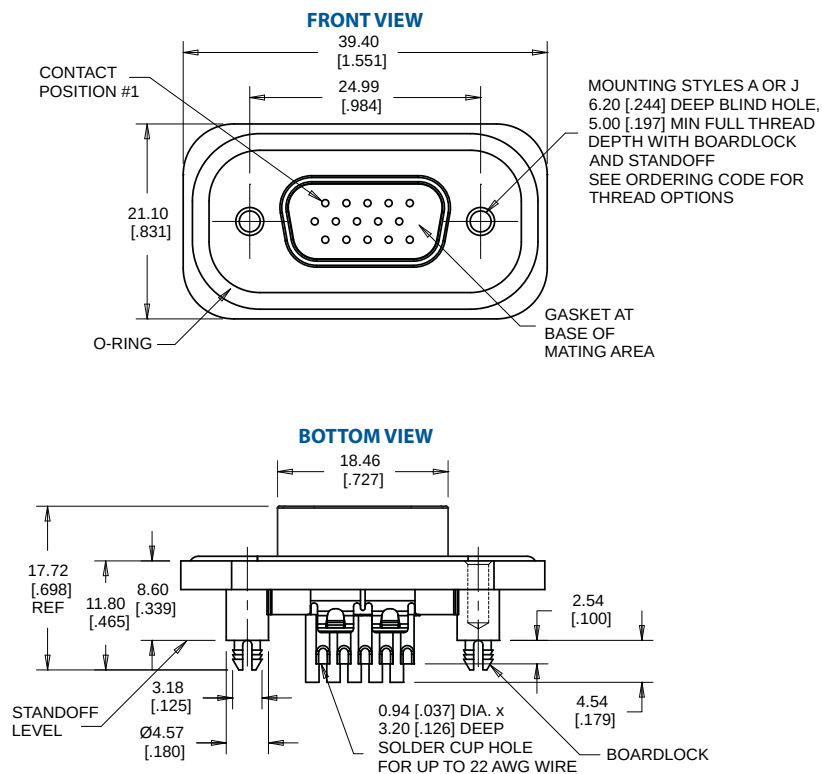


ISOMETRIC VIEW

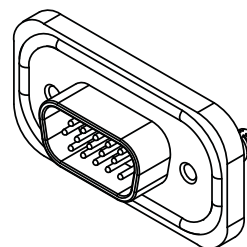


For recommended panel cutout
& PCB layout see catalogue page 53

MDBR-E15PM-XN0



ISOMETRIC VIEW

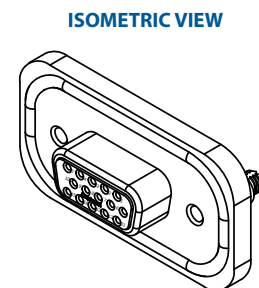
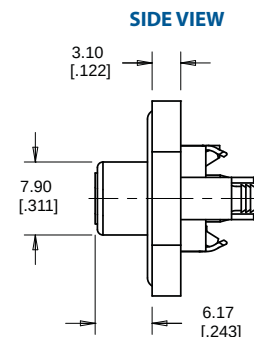
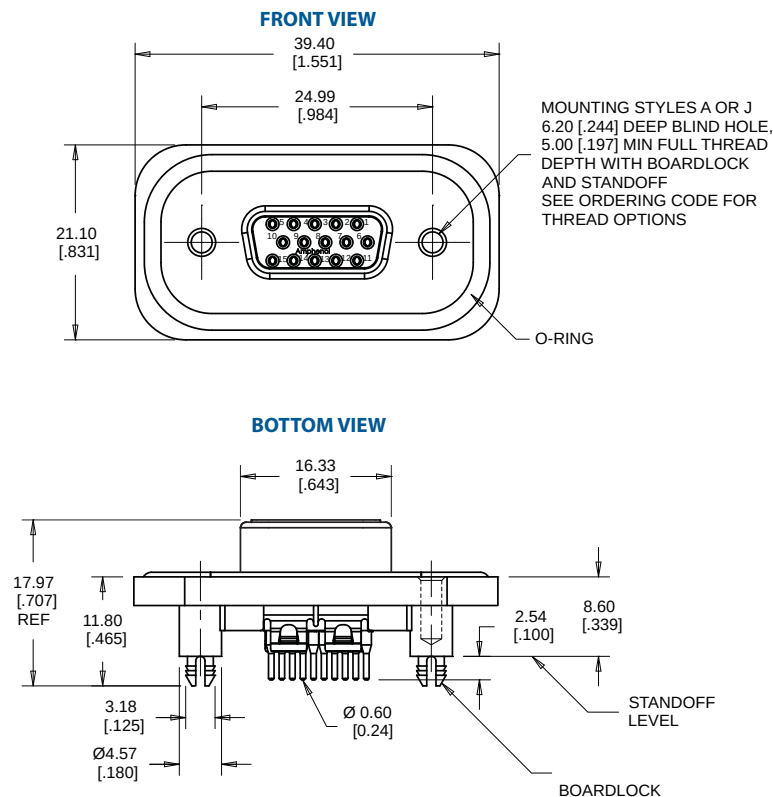


For recommended panel cutout
see catalogue page 53

MDBR SERIES

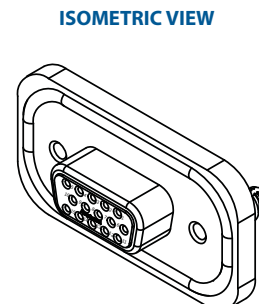
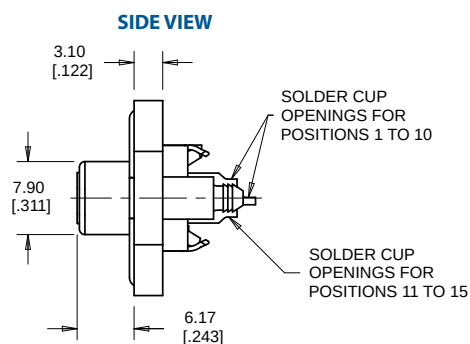
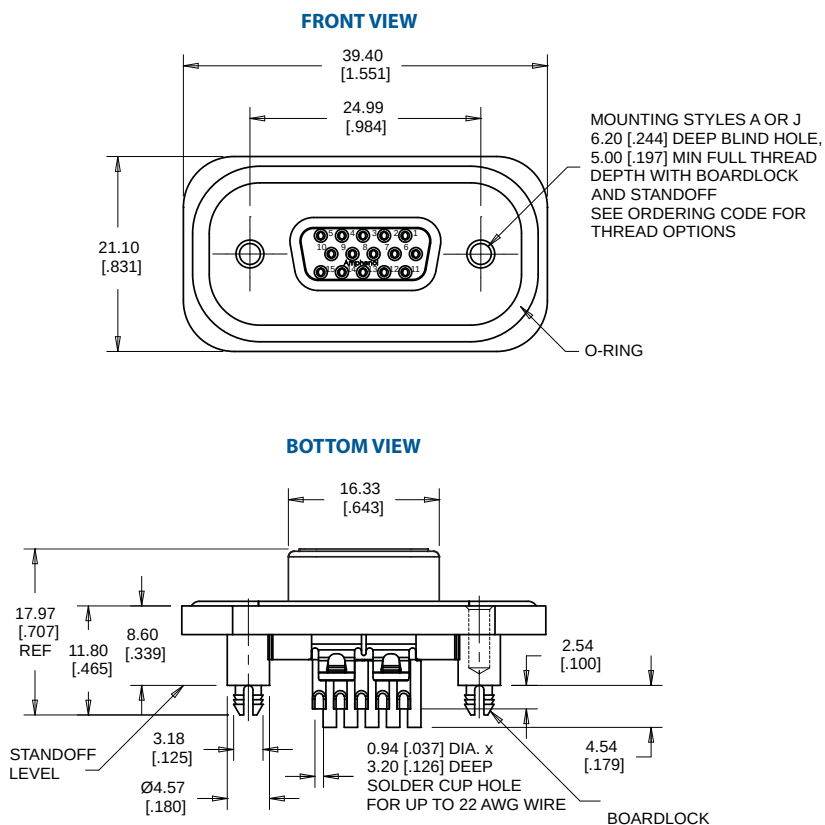
GENERATION 2 RUGGED D-SUB

MDBR-E15SE-XN0



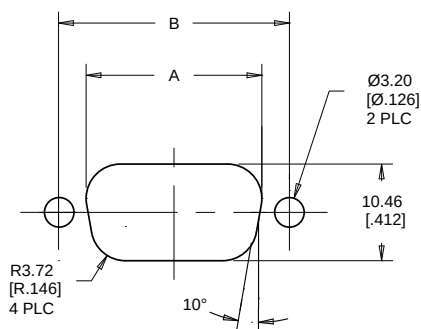
For recommended panel cutout
& PCB layout see catalogue page 53

MDBR-E15SM-XN0



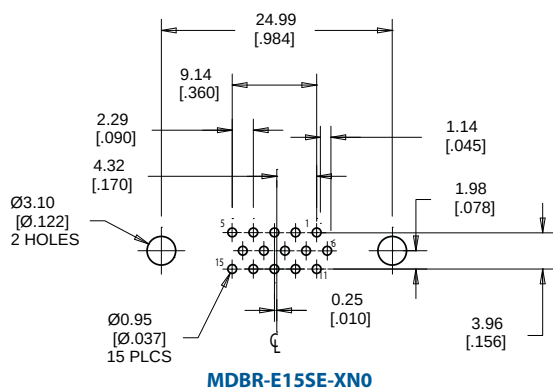
For recommended panel cutout
see catalogue page 53

Recommended Panel Cutout

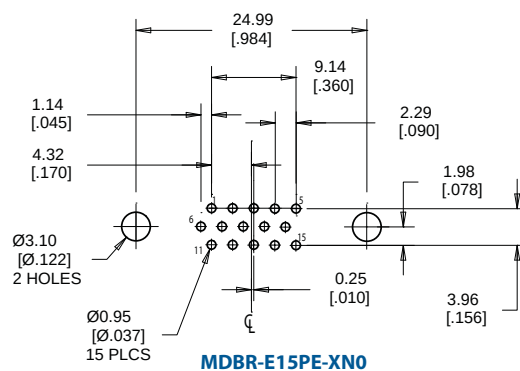


Dimension	Shell Size/Contacts	
	E09/E15	A26
A	19.05 [.750]	27.36 [1.077]
B	24.99 [.984]	33.32 [1.312]

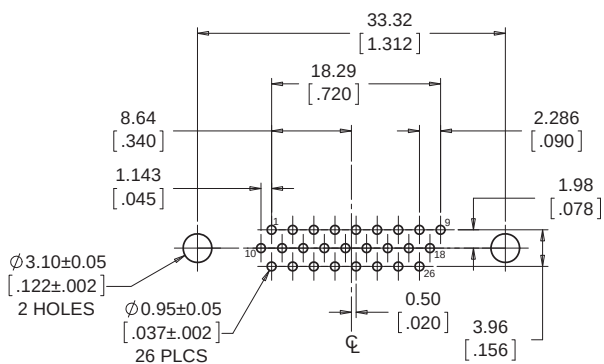
Recommended PCB Layouts



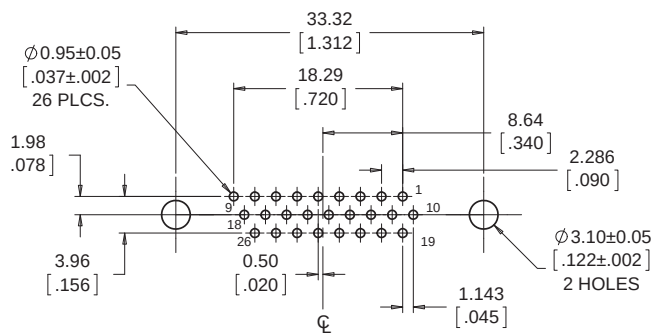
MDBR-E15SE-XN0



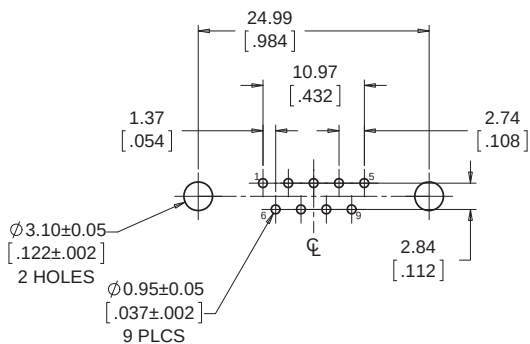
MDBR-E15PE-XN0



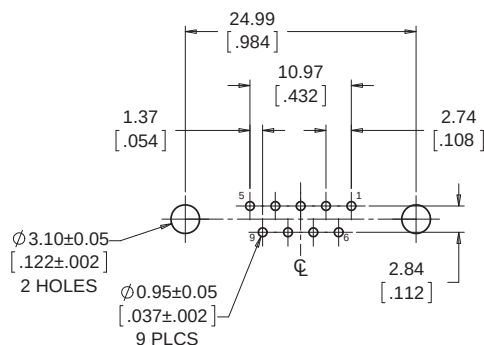
MDBR-A26PE-XN0



MDBR-A26SE-XN0



MDBR-E09PE-XN0



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 Inserts⁴:	Nickel Plated Steel

Mechanical, Environmental, Regulatory

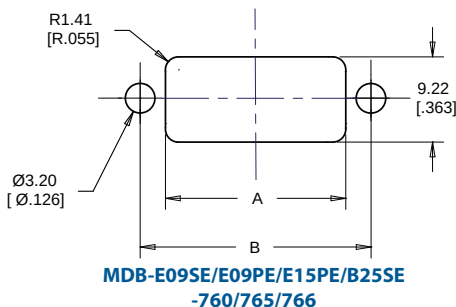
Water & Dust

Protection Level:	Code IP67 per IEC 60529
Operating Temperature:	-44°C to +105°C
Contact Insertion Force:	<i>Standard Density</i> - 5.0N (18oz _f) max, 3.3N (12oz _f) max Average Initial <i>High Density</i> - 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

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



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

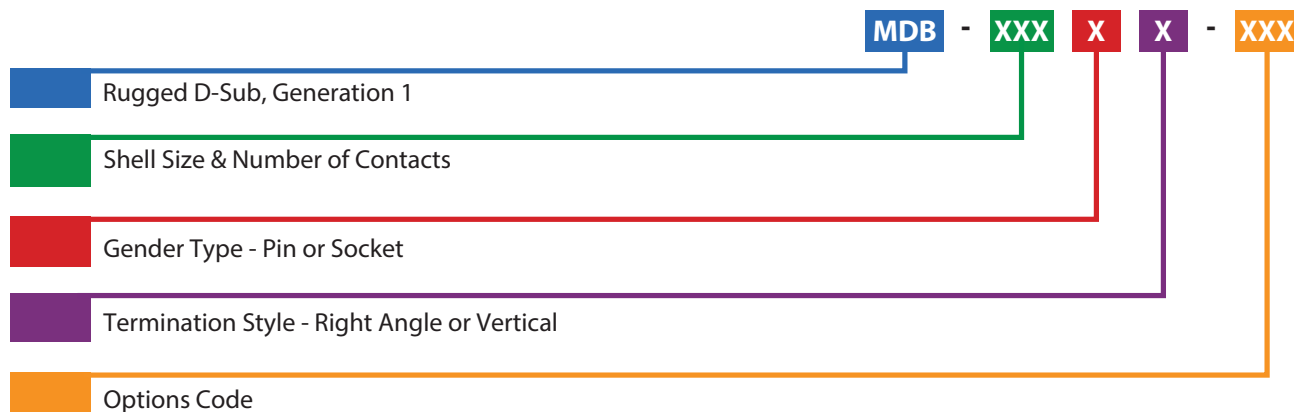


Electrical

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

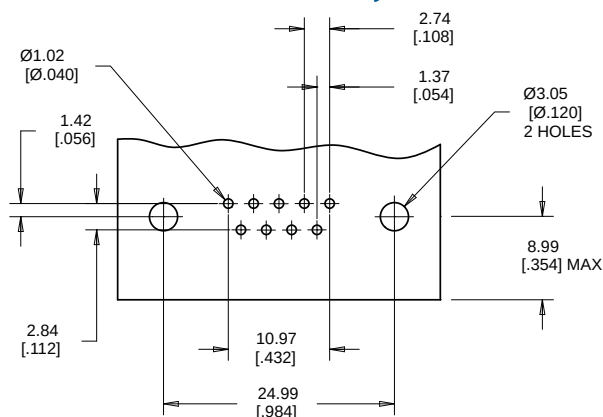
Thermal Shock:	Per EIA-364-32, -55°C to +105°C, 25 Cycles
Humidity:	Per EIA-364-31, 10 Cycles, 240 Hrs, 25°C to 65°C, 90-95%RH, with -10°C Cold Shock
Thermal Cycling:	Per EIA-364-110, 500 Cycles, 15°C to 85°C
Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl ₂ , NO ₂ , H ₂ S, & SO ₂), 14 Day Exposure
Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging

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, vertical 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

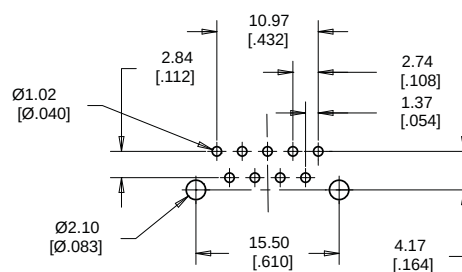


See Available Standard Part Numbers List on Page 54

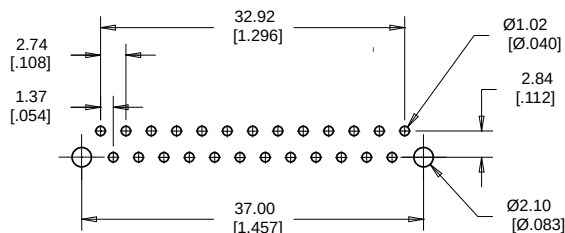
Recommended PCB Layouts



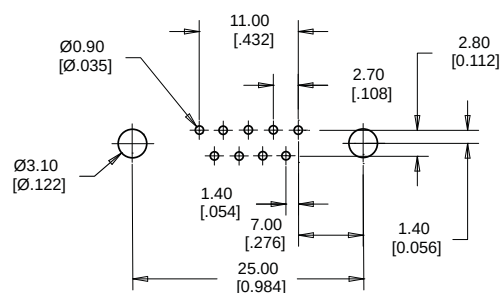
MDB-E09SA-700



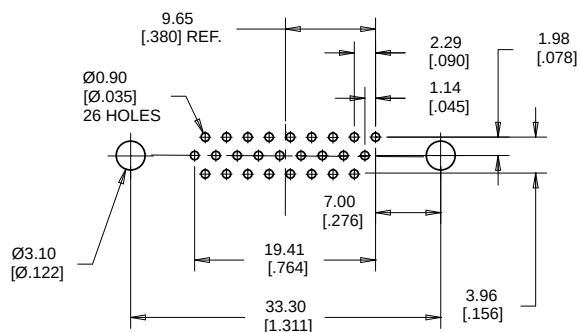
MDB-E09SE/E09PE-760/765



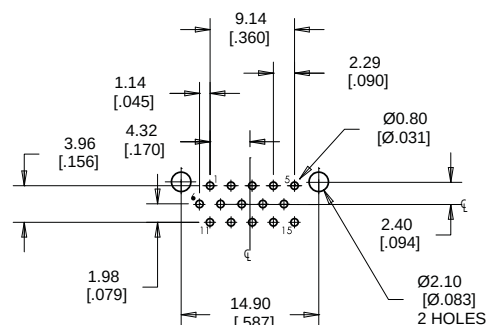
MDB-B25SE-76X



MDB-E09PE/E09SE-860



MDB-A26PE-860

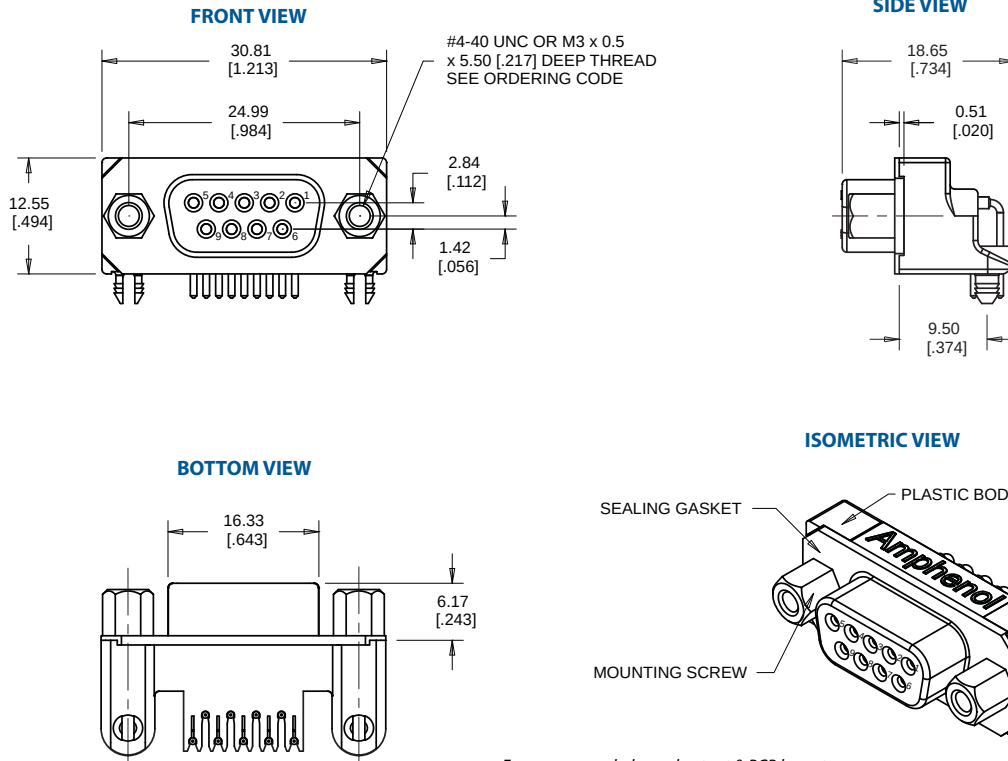


MDB-E15PE-766

MDB SERIES

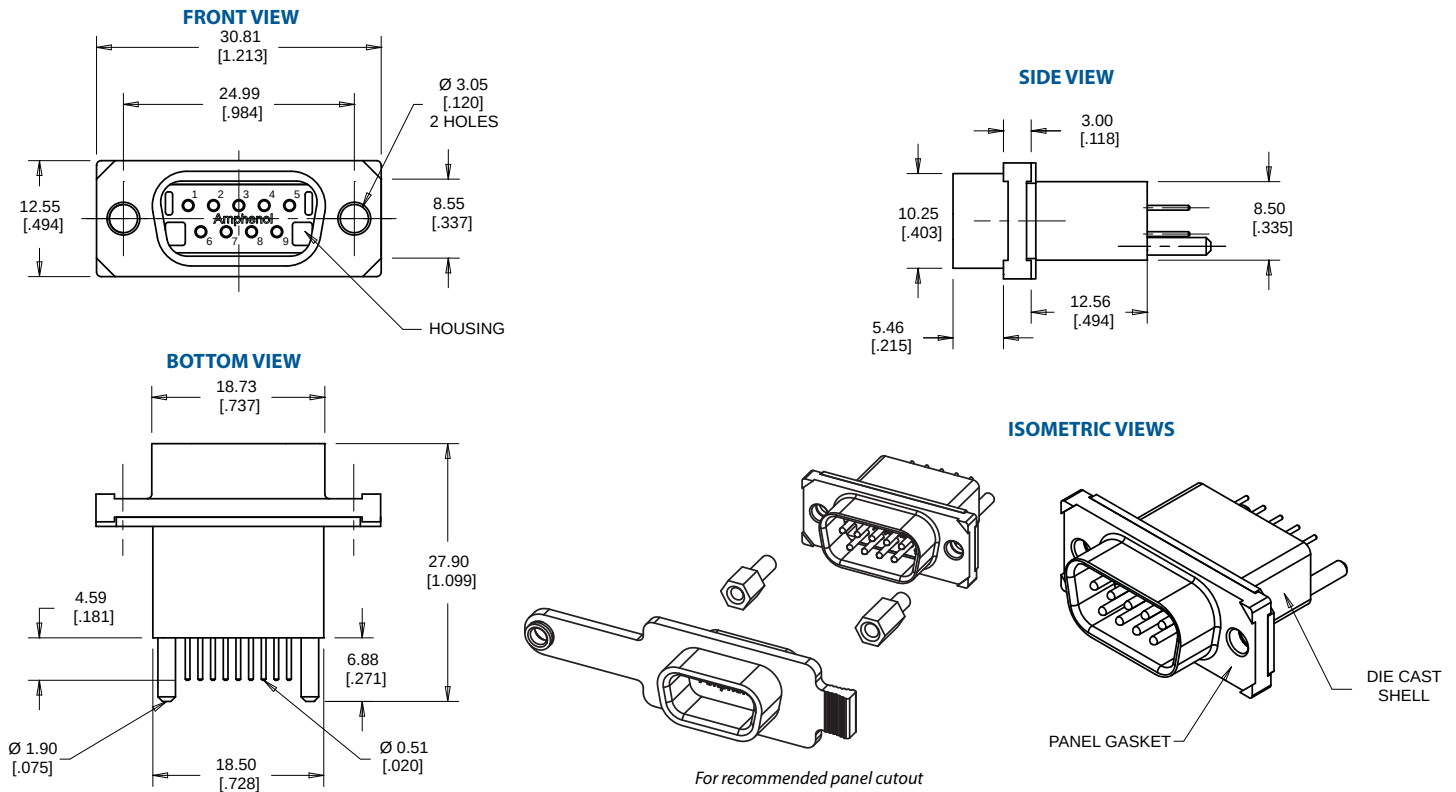
GENERATION 1 RUGGED D-SUB

MDB-E09SA-700



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

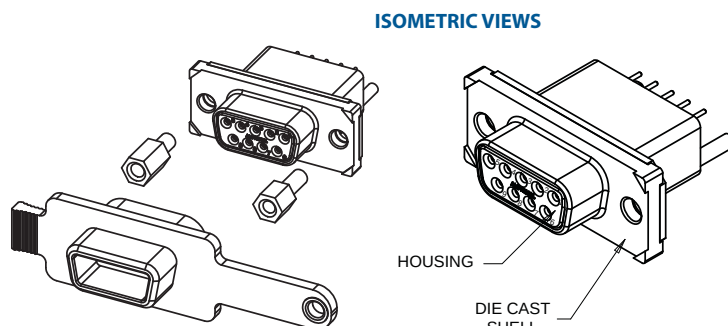
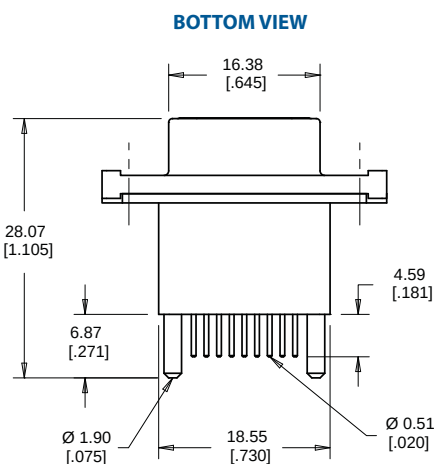
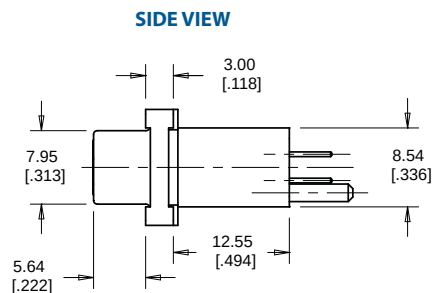
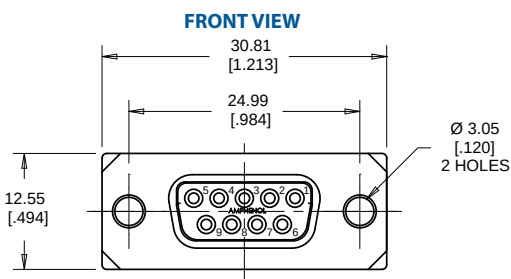
MDB-E09PE-760* MDB-E09PE-765



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

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

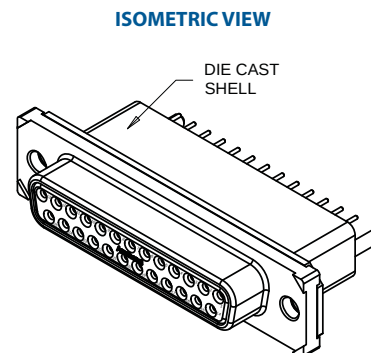
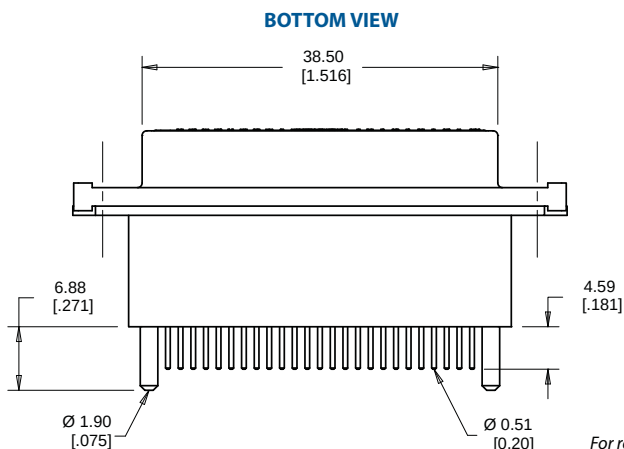
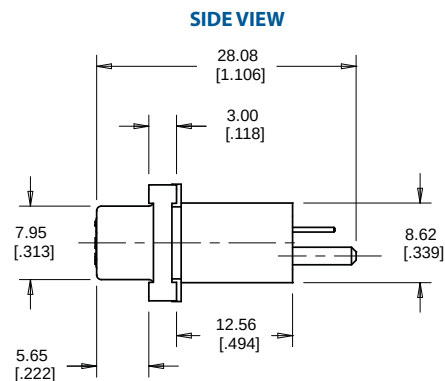
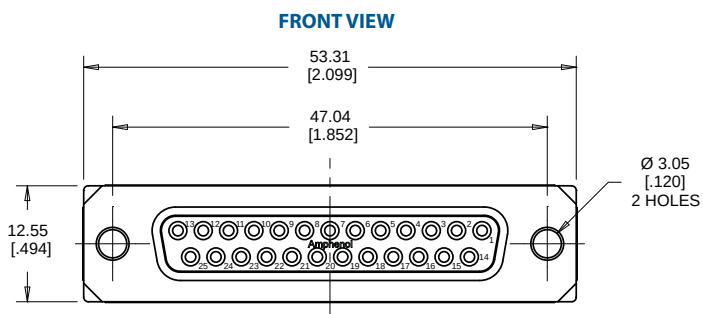
MDB-E09SE-760* MDB-E09SE-765



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

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

MDB-B25SE-765

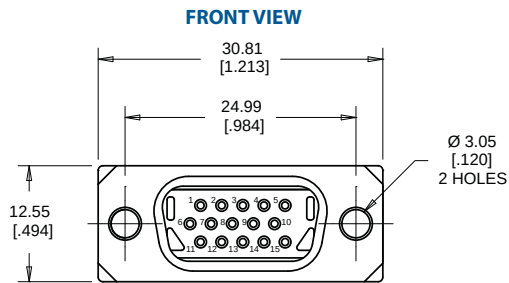


For recommended panel cutout
& PCB layout see catalogue page 54-55

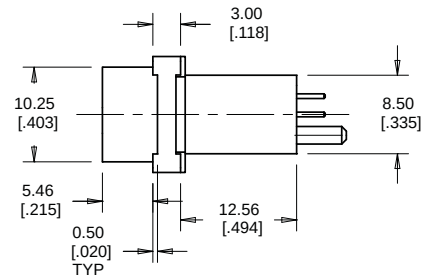
MDB SERIES

GENERATION 1 RUGGED D-SUB

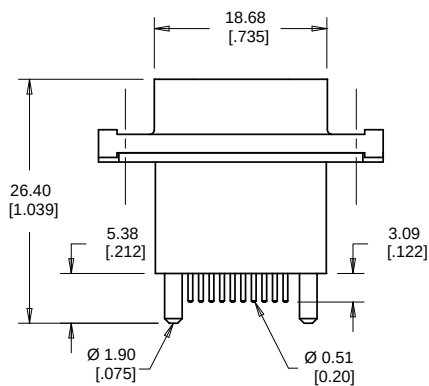
MDB-E15PE-766



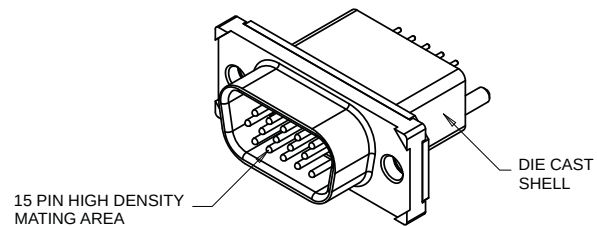
SIDE VIEW



BOTTOM VIEW



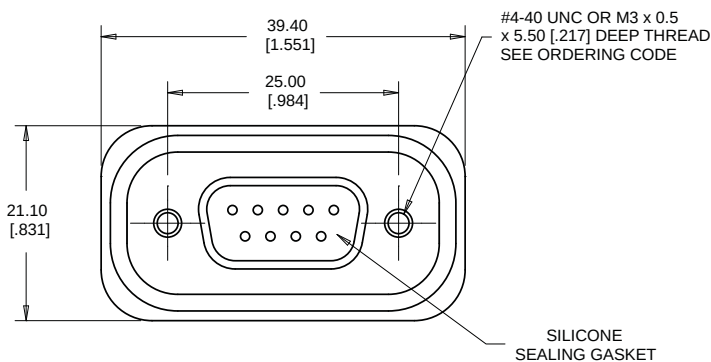
ISOMETRIC VIEW



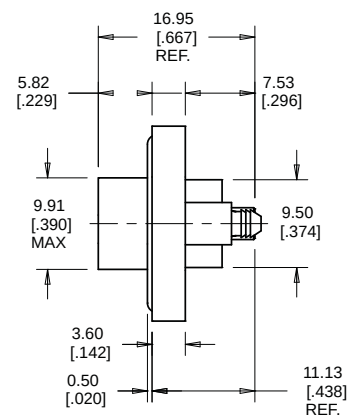
For recommended panel cutout
& PCB layout see catalogue page 54- 55

MDB-E09PE-860

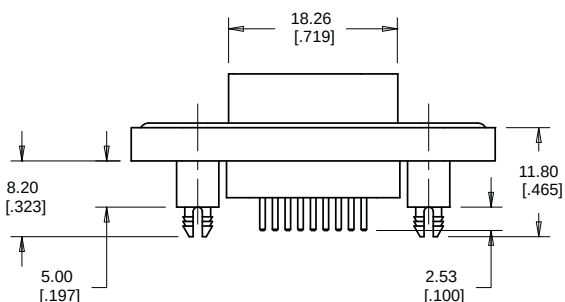
FRONT VIEW



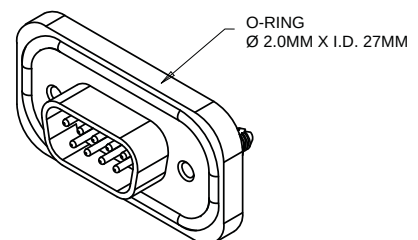
SIDE VIEW



BOTTOM VIEW

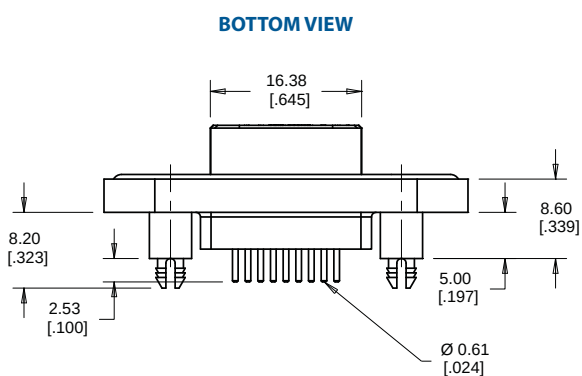
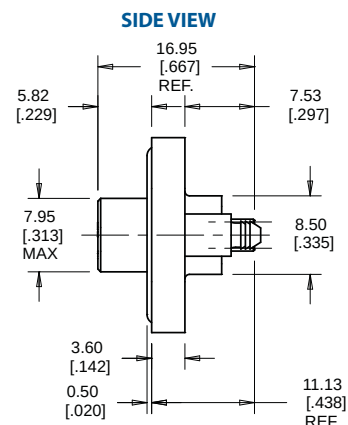
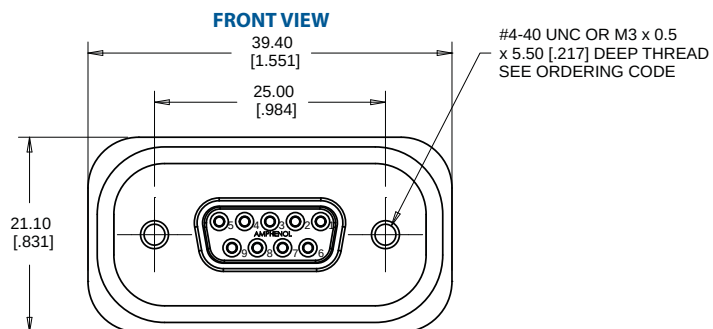


ISOMETRIC VIEW

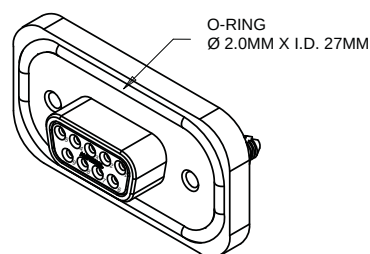


For recommended panel cutout & PCB layout
see catalogue page 53 & 55 respectively

MDB-E09SE-860

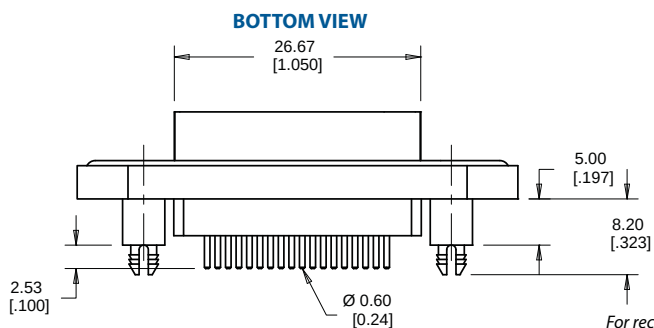
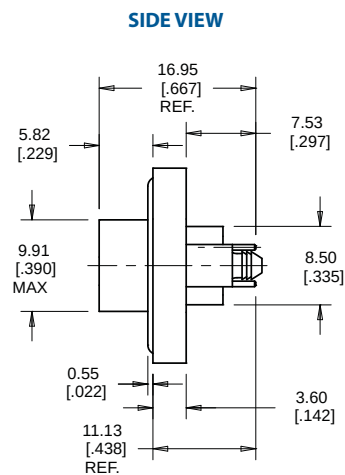
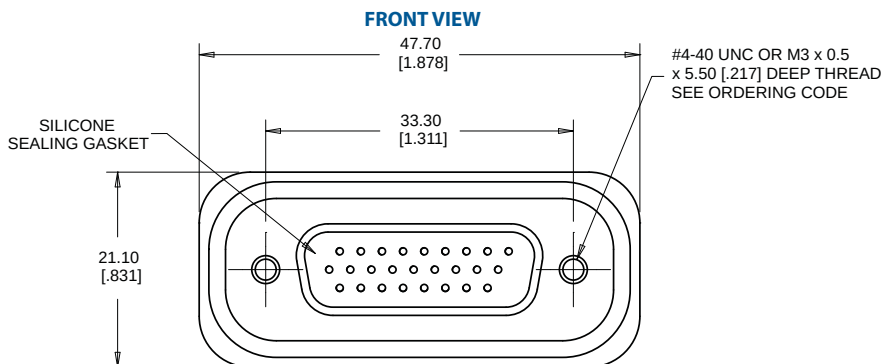


ISOMETRIC VIEW

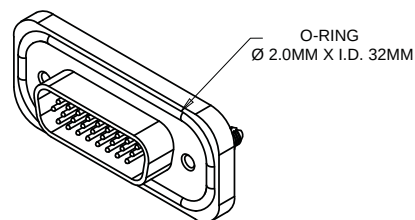


For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

MDB-A26PE-860



ISOMETRIC VIEW

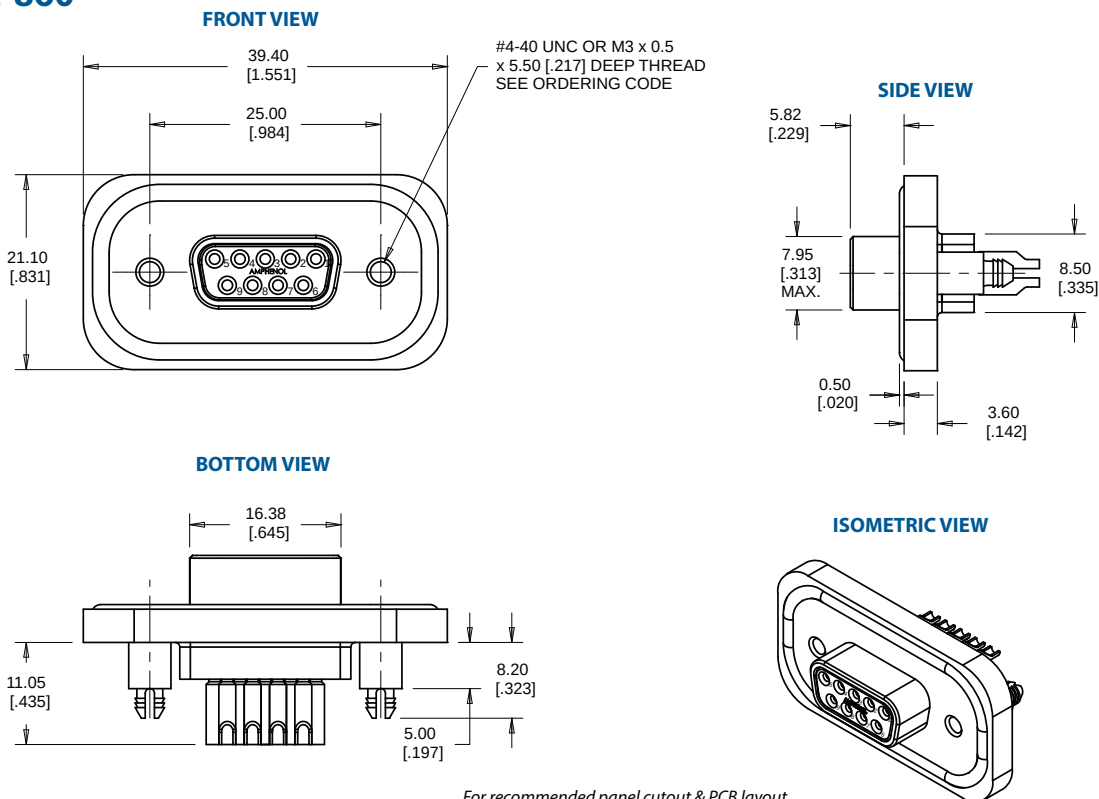


For recommended panel cutout & PCB layout see catalogue page 53 & 55 respectively

MDB SERIES

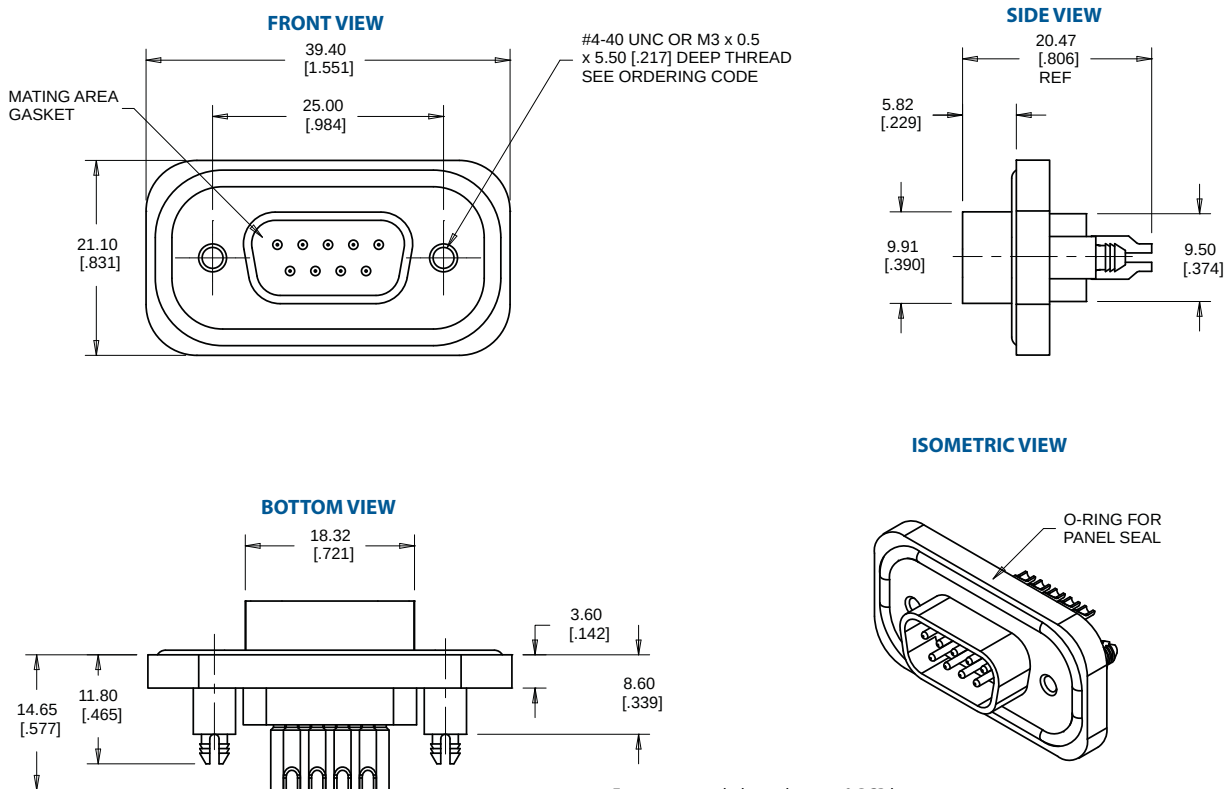
GENERATION 1 RUGGED D-SUB

MDB-E09SM-860



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

MDB-E09PM-860



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



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

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

Electrical

Current Rating:	0.5A max per Contact ($\Delta T \leq 30^\circ\text{C}$)
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%

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 ₂ S, & 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 Code¹

No Digit - Part Defined by Previous Digits of Part Number
1 to 9 - Identifies Unique Special Features

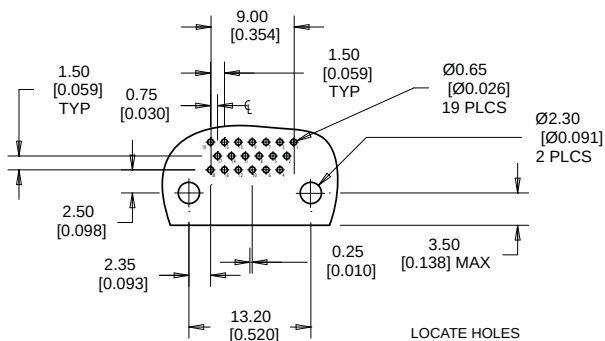
Many unique features are readily available to suit customer requirements. Consult with Amphenol Canada for details

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



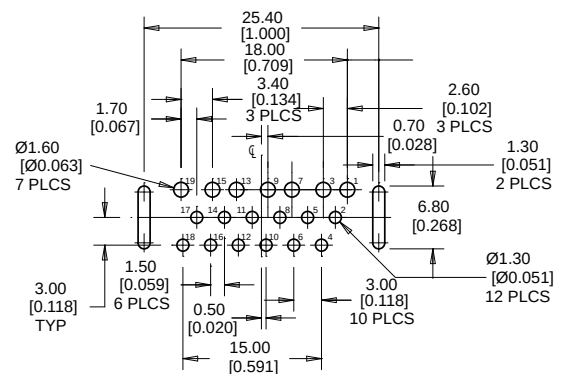
COMPONENT SIDE OF BOARD

LOCATE HOLES

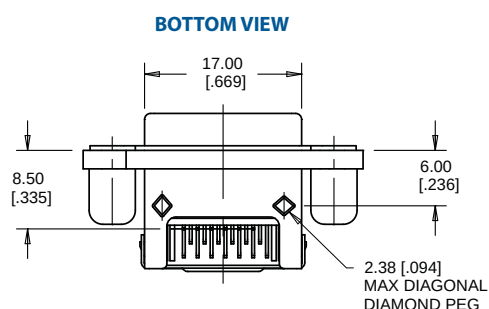
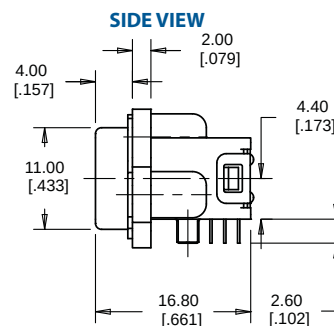
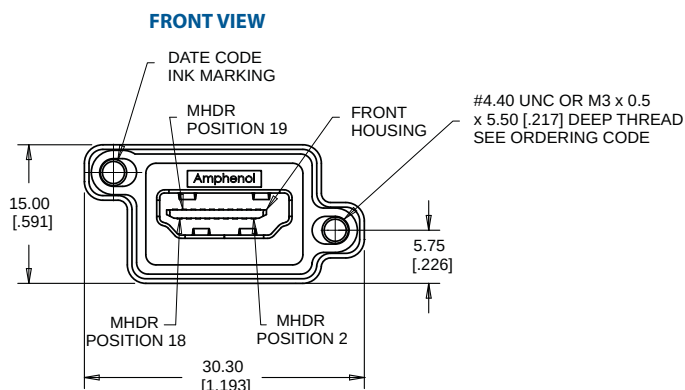
0.13 [0.005] DIA

POSITION DIMENSIONS ARE BASIC

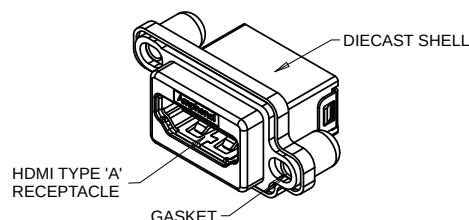
MHDR-A511-X0 Recommended PCB Layout



MHDR-A111-X0

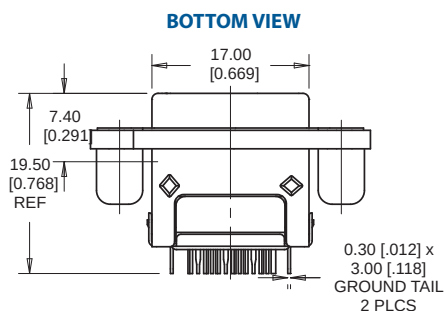
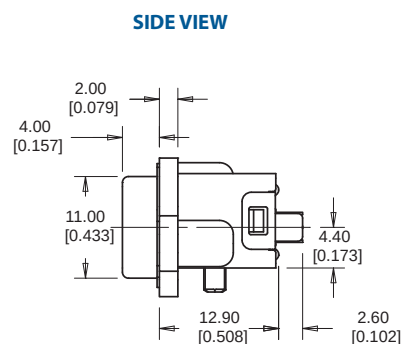
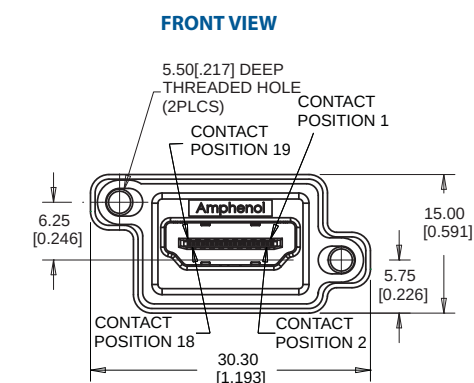


ISOMETRIC VIEW

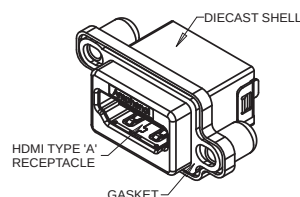


For recommended panel cutout
& PCB layout see catalogue page 62

MHDR-A511-X0



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

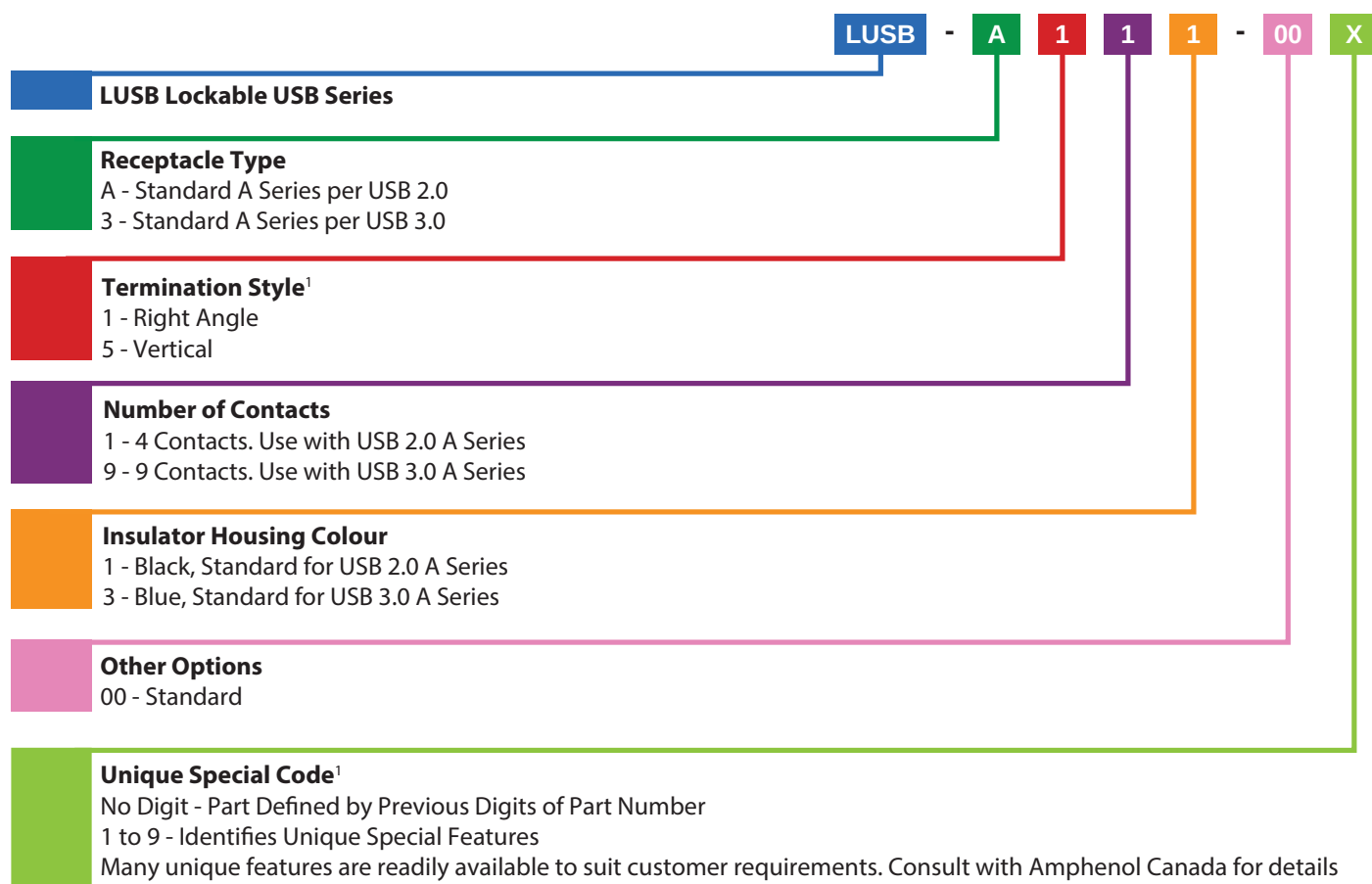
Current Rating:	<i>Standard A USB 2.0</i> - 1.5A max Contact ($\Delta T \leq 30^{\circ}\text{C}$) <i>Standard A USB 3.0</i> - 1.8A max for positions 1 & 4 with 0.25A max per Contact for Remaining Positions ($\Delta T \leq 30^{\circ}\text{C}$)
Contact Resistance:	30 mΩ max
Insulation Resistance:	1000 MΩ min
DWV:	500 VAC rms
Differential Impedance:	90 ± 15 Ω

Mechanical, Environmental, Regulatory

Operating Temperature:	-45°C to +105°C	Humidity:	Per EIA-364-31, 10 Cycles, 240 Hrs, 25°C to 65°C, 90-95%RH, with -10°C Cold Shock
Insertion Force:	Per EIA-364-13, 35N (7.9lb _f) max	Mixed Flowing Gas:	Per EIA 364-65 Class IIA (Cl ₂ , NO ₂ , H ₂ S, & SO ₂), 14 Day Exposure
Extraction Force:	Per EIA-364-13, 8N (1.8lb _f) min with Latch Disengaged	Solvent Resistance:	Isopropyl Alcohol & 5% Sodium Hydroxide Solution, 24 Hrs Each
Plug Retention Force:	50N (11.2 lb _f) min with Latch Engaged	Solderability:	Per EIA-364-52, 95% Coverage after Category 2 Steam Aging
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		

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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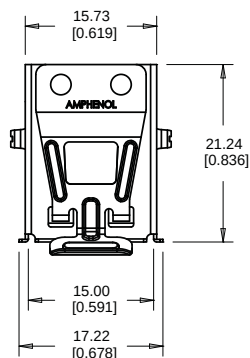


Notes:

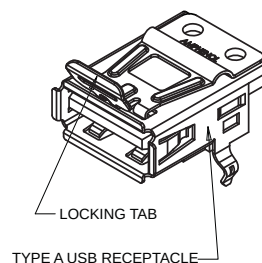
1) Consult with Amphenol for additional connectors such as vertical or upright (flag) termination styles, contact tail lengths, latch styles or other special requirements.

LUSB-A111-00

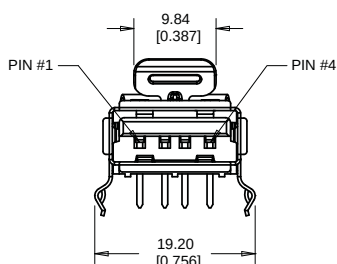
TOP VIEW



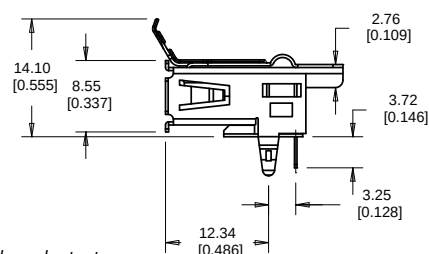
ISOMETRIC VIEW



FRONT VIEW



SIDE VIEW

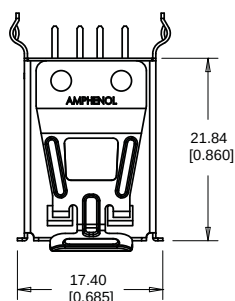


For recommended panel cutout
& PCB layout see catalogue page 67

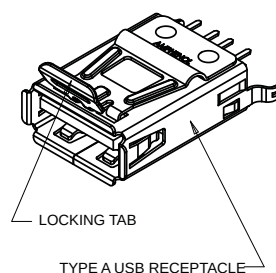
LUSB-A511-00

CONSULT FACTORY

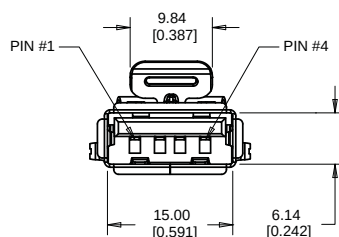
TOP VIEW



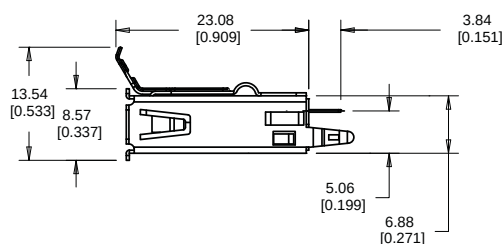
ISOMETRIC VIEW



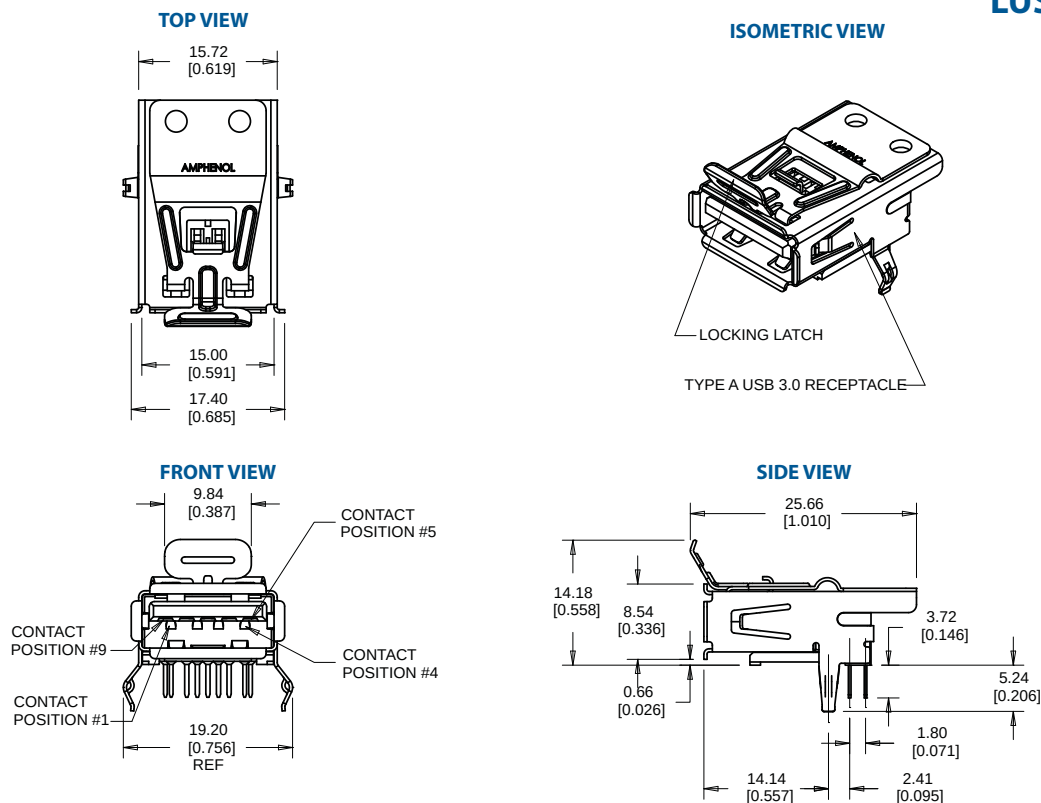
FRONT VIEW



SIDE VIEW

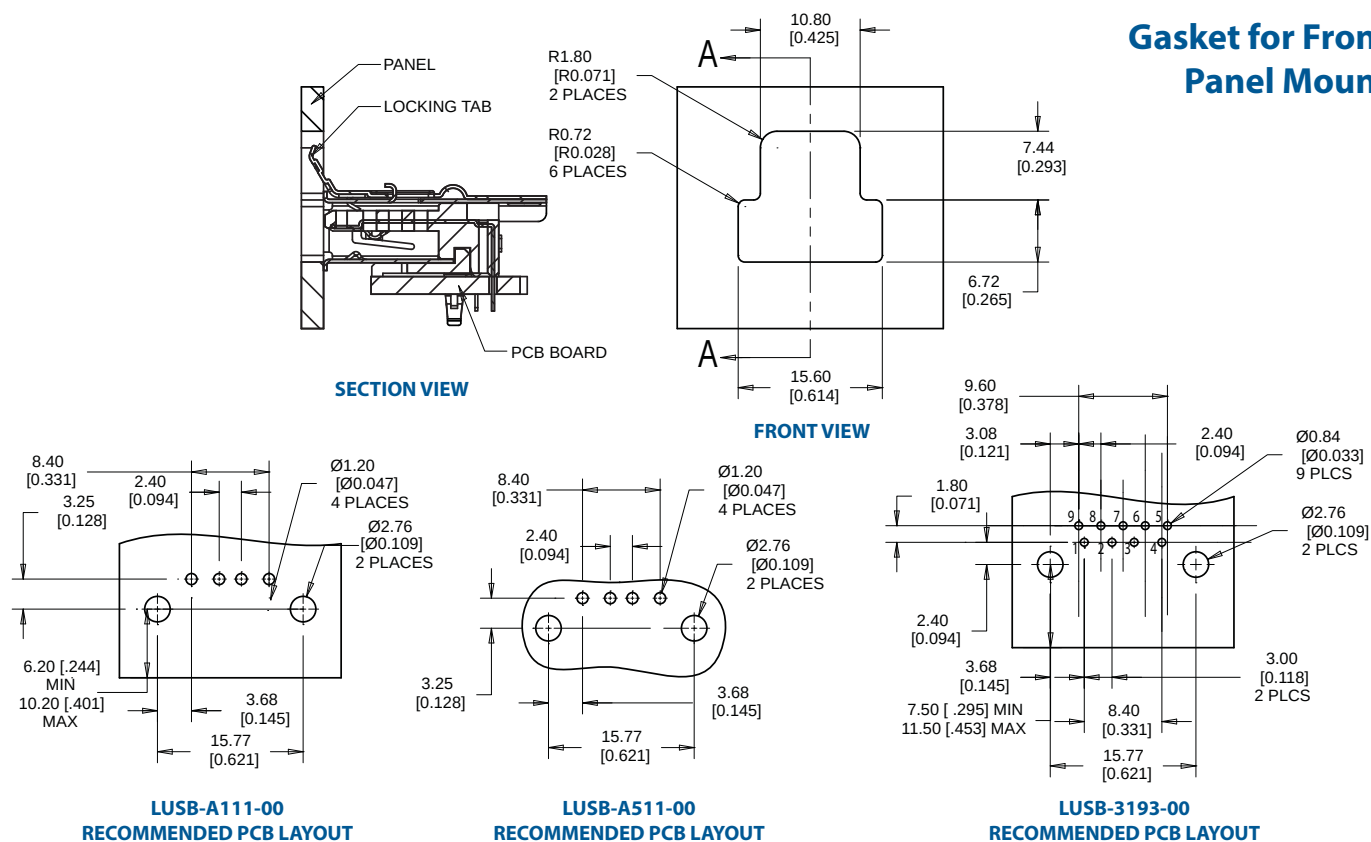


For recommended panel cutout
& PCB layout see catalogue page 67



For recommended panel cutout
& PCB layout see below

Gasket for Front Panel Mount





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 ($\Delta T \leq 30^{\circ}\text{C}$)
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 $\geq 1\mu\text{s}$
Shock:	Per EIA 364-27 Test Condition A (11ms, 50g, ½ Sine), No Discontinuity $\geq 1\mu\text{s}$
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
---	--

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 Style¹

- 50 - RJ45 Modular Jack 8P8C
- 51 - USB 2.0, A Series

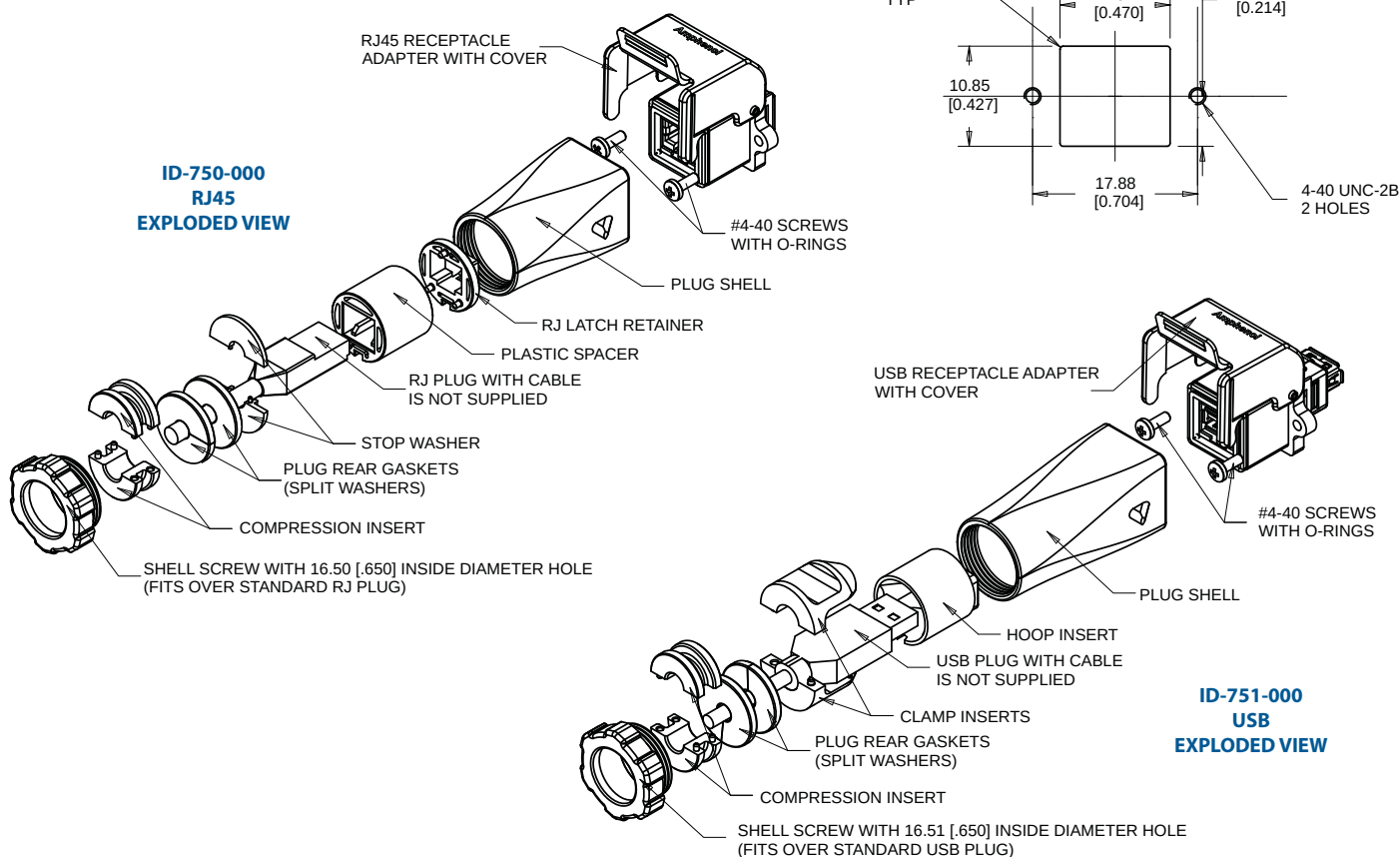
Options and Unique Special Code¹

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

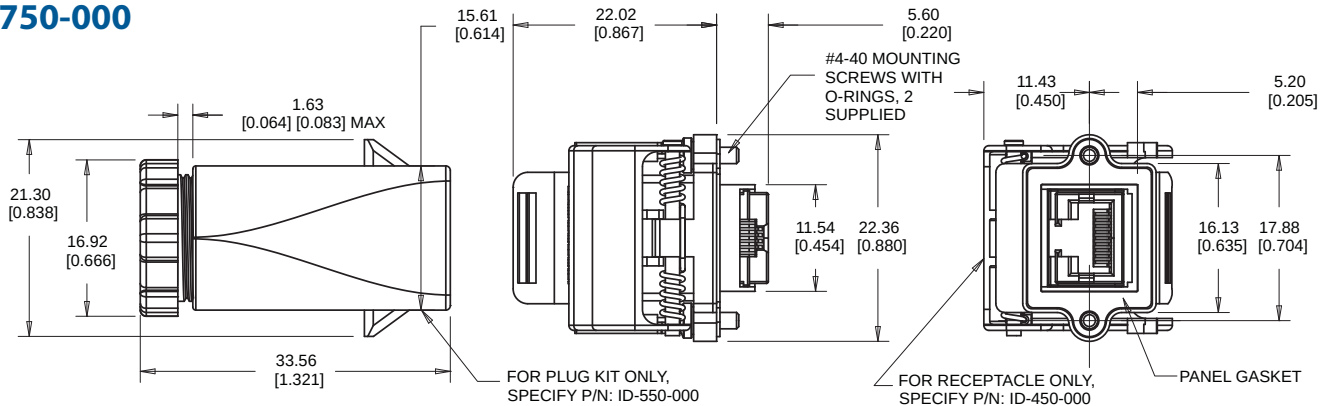
Notes:

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

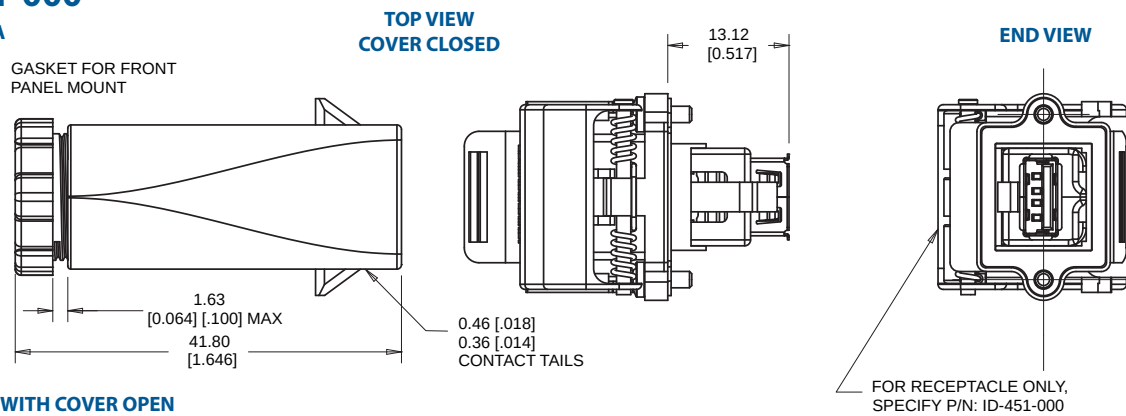
Recommended Panel Cutout



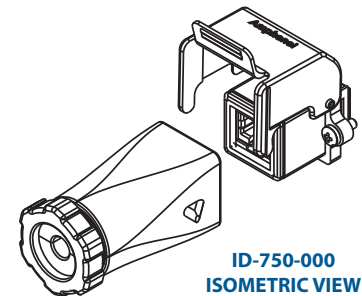
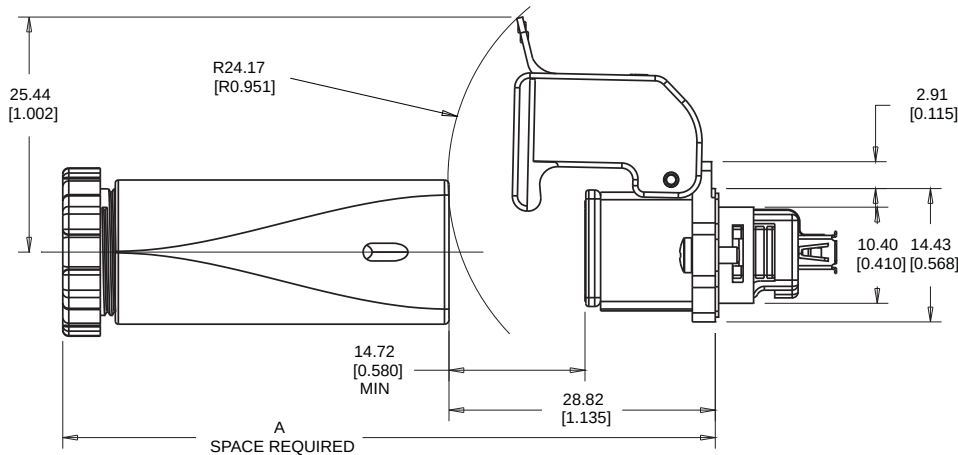
ID-750-000 RJ45



ID-751-000 USB Type A

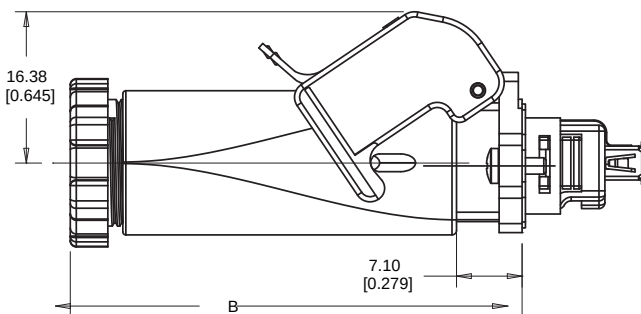


SIDE VIEW WITH COVER OPEN

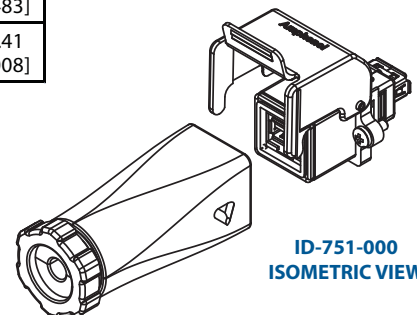


ID-750-000
ISOMETRIC VIEW

SIDE VIEW, MATED & COVER LOCKED

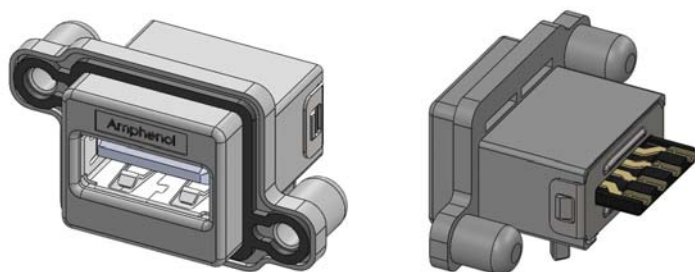
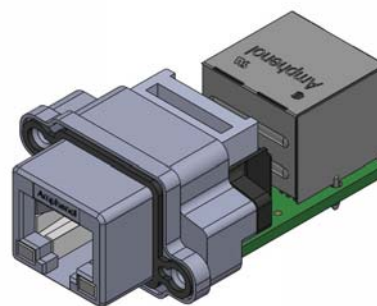
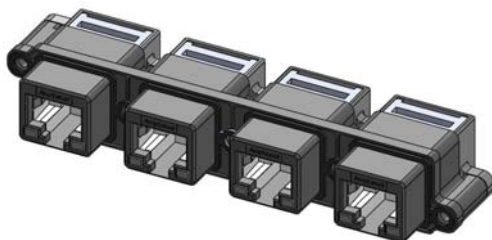
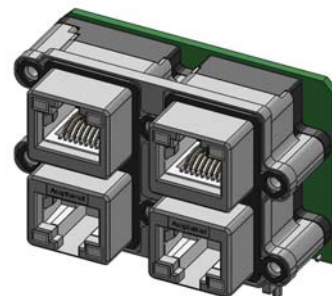
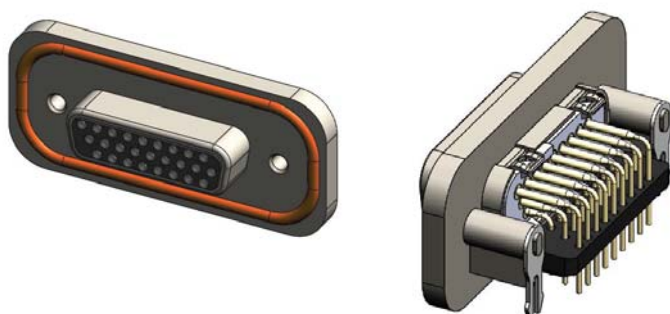
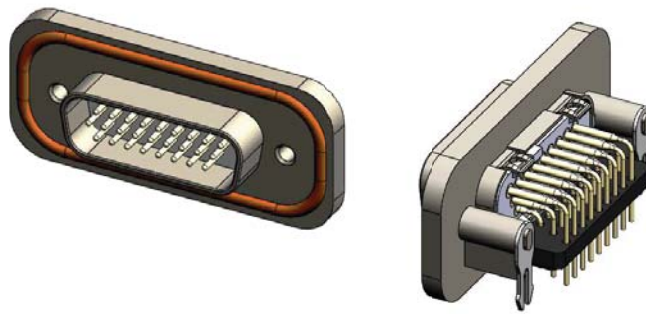


Part No.	A	B
ID 750-000	97.03 [3.820]	63.08 [2.483]
ID 751-000	110.36 [4.345]	76.41 [3.008]



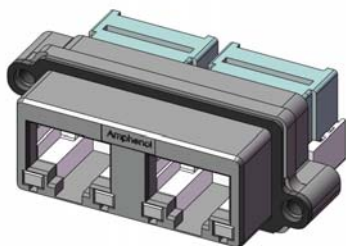
ID-751-000
ISOMETRIC VIEW

For recommended panel cutout
see catalogue page 69

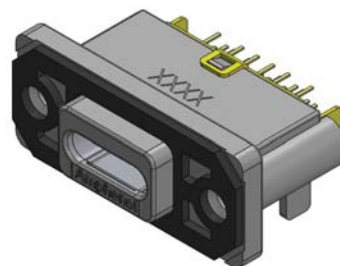
MUSBR Vertical Solder Cup**MRJR Cat 5e Right Angle****MRJR Right Angle 4 Port****MRJR 2x2 Stacked****MDBR Right Angle 26 Pin****MDBR Right Angle 26 Socket**

ADDITIONAL PRODUCTS

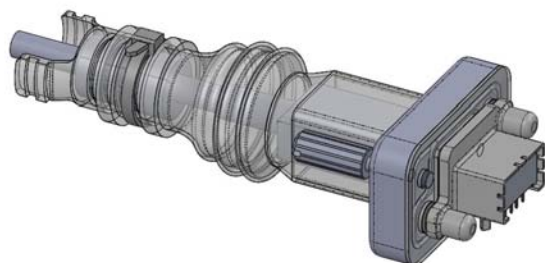
MRJ Right Angle 2 Port



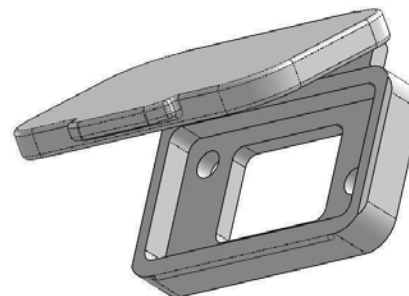
MUSBR Type C



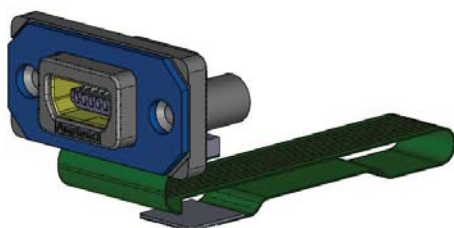
MUSBR Plug Boot



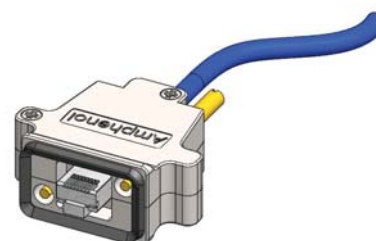
MUSBR Latching Dust Cover



Rugged Connector on Flex



MRJR Plug Hood



Amphenol Commercial Products



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Fax: (416) 754-8668
www.amphenolcanada.com
Email: sales@amphenolcanada.com

CATALOGUE NBR: ADT 0002/06-15 REV A

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