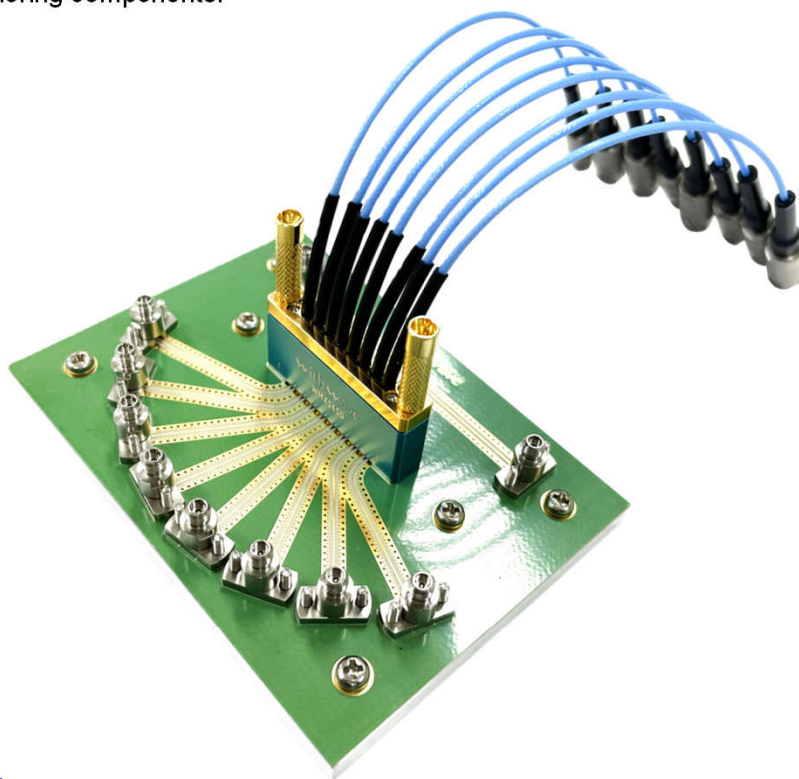


WithWave's High Speed & High-density Multicoax Cable Assemblies (WMX Series) provides a wide range of multiple coax connectors and flexible cable assemblies with a choice of 20, 40, 50, 67, 110 and 145 GHz configurations based on precision array design and superior high frequency cabling solutions.

WMX Series are excellent signal integrity solutions for bench-top testing and automated test equipment to meet increasing demands of semiconductor test equipment and optical testing industries.

These products consist of high-performance flexible assemblies which can be bundled in housings (4, 8 and 16 channels) and the interface to board is compression type which provides lower total cost of testing by avoiding costly soldering components.



■ Features

- Frequency Range : DC to 20, 40, 50, 67, 110 & 145 GHz
- Excellent Insertion and Return loss performance
- Vertical, Right-Angle & Board-Edge type
- No. of Channel : 1x4, 1x8, 2x8 Channel
- Pitch : 2.54 mm

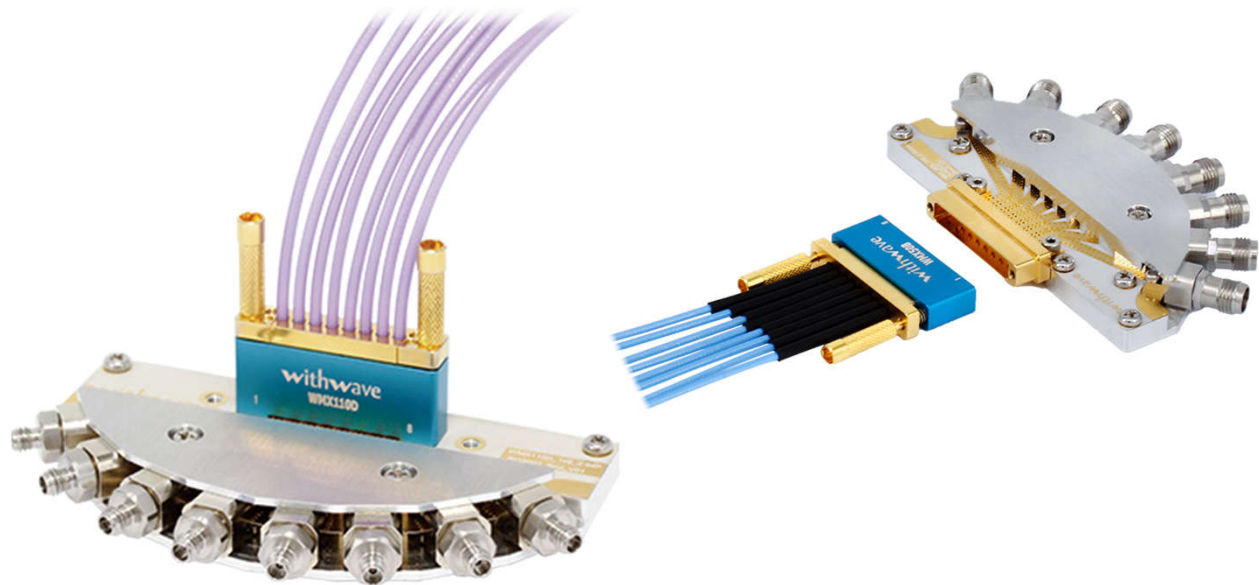
■ Applications

- Semiconductor & Optical test equipment
- High speed testing module
- Super Computing
- 5G Communication systems



■ Specification

Specification		WMX20	WMX40	WMX50	WMX67	WMX110	WMX145
SERDES		PAM4	PAM4	PAM4	PAM4	PAM4	PAM4
Characterization		28 Gbps	56 Gbps	56 Gbps	112 Gbps	224 Gbps	480 Gbps
Freq. Range (Max)		20GHz	40GHz	50GHz	67GHz	110GHz	145GHz
Connector type		SMA	2.92mm	2.4mm	1.85mm	1.0mm	0.8mm
PCB Mount type	Vertical	O	O	O	O	O	O
	Right-Angle	O	O	O	O	O	O
	Board-Edge	O	O	O	O	-	-
No. of Positions	Vertical	4 (1x4), 8 (1x8), 16 (2x8)					
	Right-Angle	8 (1x8), 16 (2x8)					
	Board-Edge	8 (1x8)				-	
Pitch		2.54mm					
Return Loss (VSWR)		-14dB (1.5 : 1)		-13dB (1.6 : 1)		-10dB (2.0 : 1)	
Cable Length (Min)		100 mm					
		(*Contact us for other lengths)					
Temperature		-55 ~ +125°C					



■ Selection Guide

| WMX Series

WMX40VS-8A1-KM1-300-2-02-H

Max. Frequency	PCB Transition	Pitch	Cable Length	Connector Holder
20 : 20 GHz (WMX20)	M : Microstrip	1 : 2.54mm	(Unit : mm)	N : None (Shrink tube)
40 : 40 GHz (WMX40)	S : Stripline			H : Conn. Holder
50 : 50 GHz (WMX50)				
67 : 67 GHz (WMX67)				
110 : 110 GHz (WMX110)				
145 : 145 GHz (WMX145)				
No. of Channel	Connector Type	No. of Phase Matched Cable	Phase Matching	
4A : 1x4 CH	SM1 : SMA Male (WMX20)	00 : None	N : No Phase Matching	
8A : 1x8 CH	SF1 : SMA Female (WMX20)	02 : 2 Cables / pair	1 : 1ps	
16A : 2x8 CH	KM1 : 2.92mm Male (WMX40)	04 : 4 Cables / pair	2 : 2ps	
	KF1 : 2.92mm Female (WMX40)	08 : 8 Cables / pair	5 : 5ps	
	PF1 : SMPM Female (WMX40)			
	2M1 : 2.4mm Male (WMX50)			
	2F1 : 2.4mm Female (WMX50)			
	VM1 : 1.85mm Male (WMX67)			
	VF1 : 1.85mm Female (WMX67)			
	PF2 : SMPM Female (WMX67)			
	WM1 : 1.0mm Male (WMX110)			
	WF1 : 1.0mm Female (WMX110)			
	DM1 : 0.8mm Male (WMX145)			
	DF1 : 0.8mm Female (WMX145)			
PCB Mounting Type				
V : Vertical				
R : Right-Angle				
B : Board Edge				

■ Selection Guide

| Socket, Stiffener and Bending JIG

WMX-8A-01-B

No. of Channel	Pitch	Mounting type
4A : 1x4 CH	1 : 2.54mm	B : Socket (Board Edge)
8A : 1x8 CH		S1 : Stiffener-01 (Vertical, Right-Angle)
16A : 2x8 CH		S2 : Stiffener-02 (Vertical, Right-Angle)
		J1 : JIG-01 (Cable bending)



WMX-8A-01-B

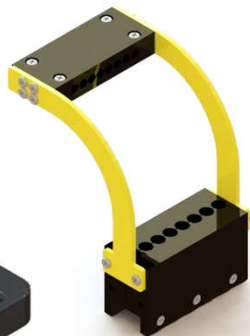
(Solderless)



WMX-8A-01-S1



WMX-8A-01-S2

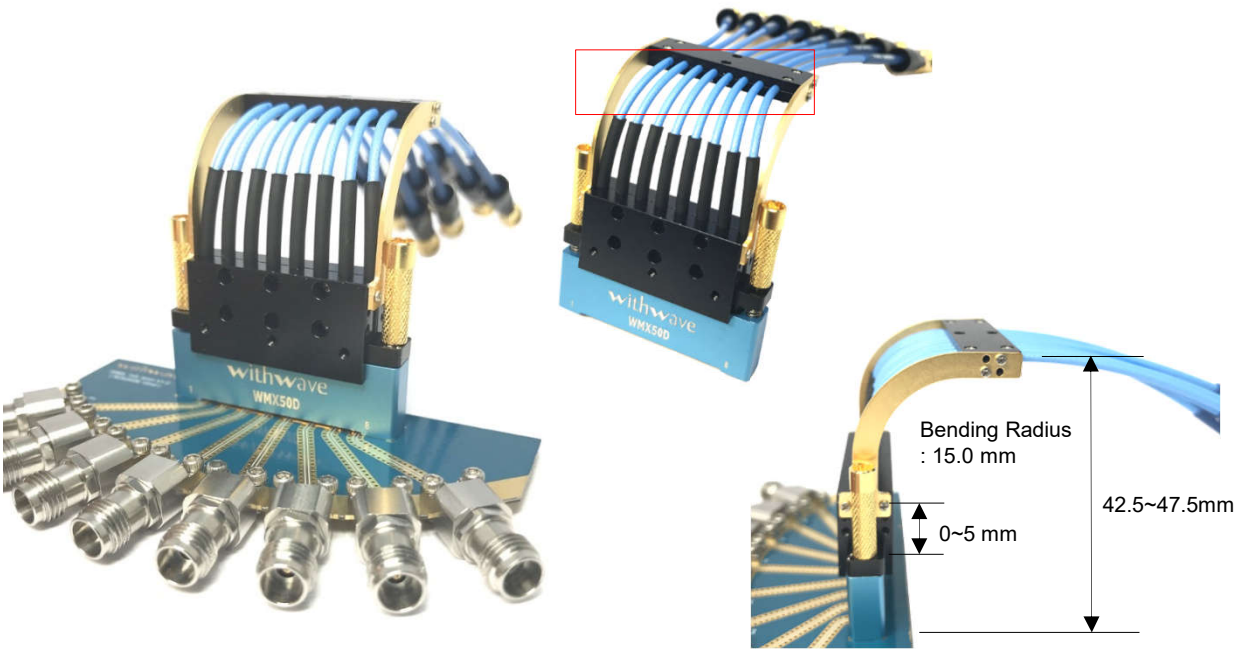


WMX-8A-01-J1

■ Selection Guide | Cable Holder

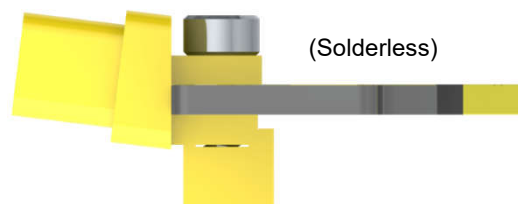
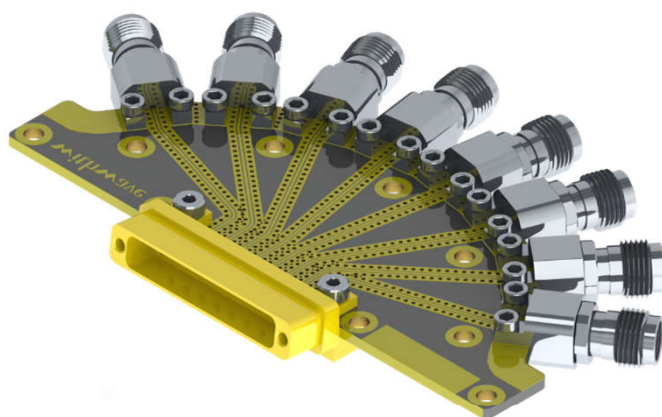
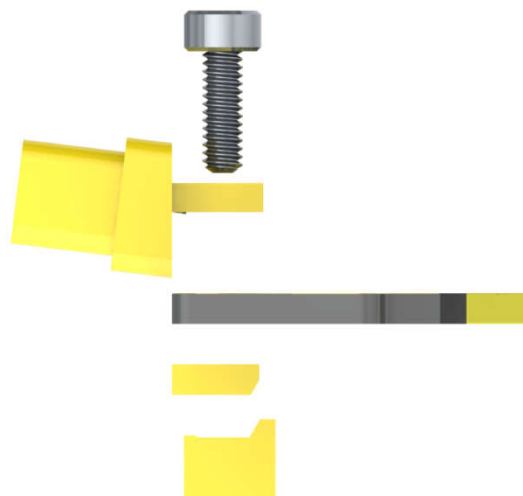
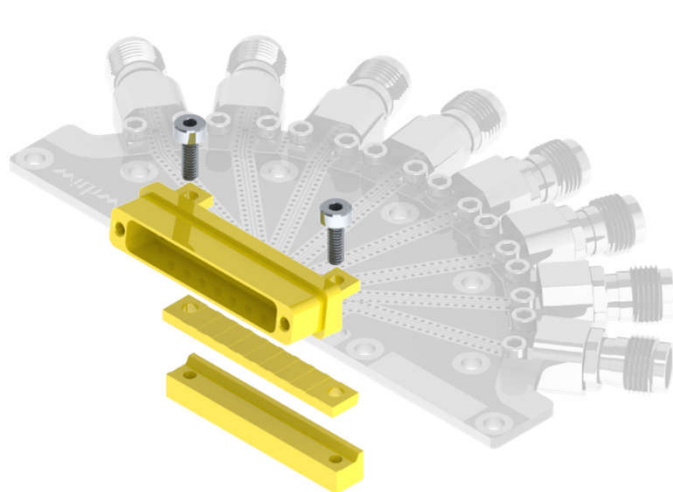


■ Selection Guide | Bending JIG for 90 degrees cable bending

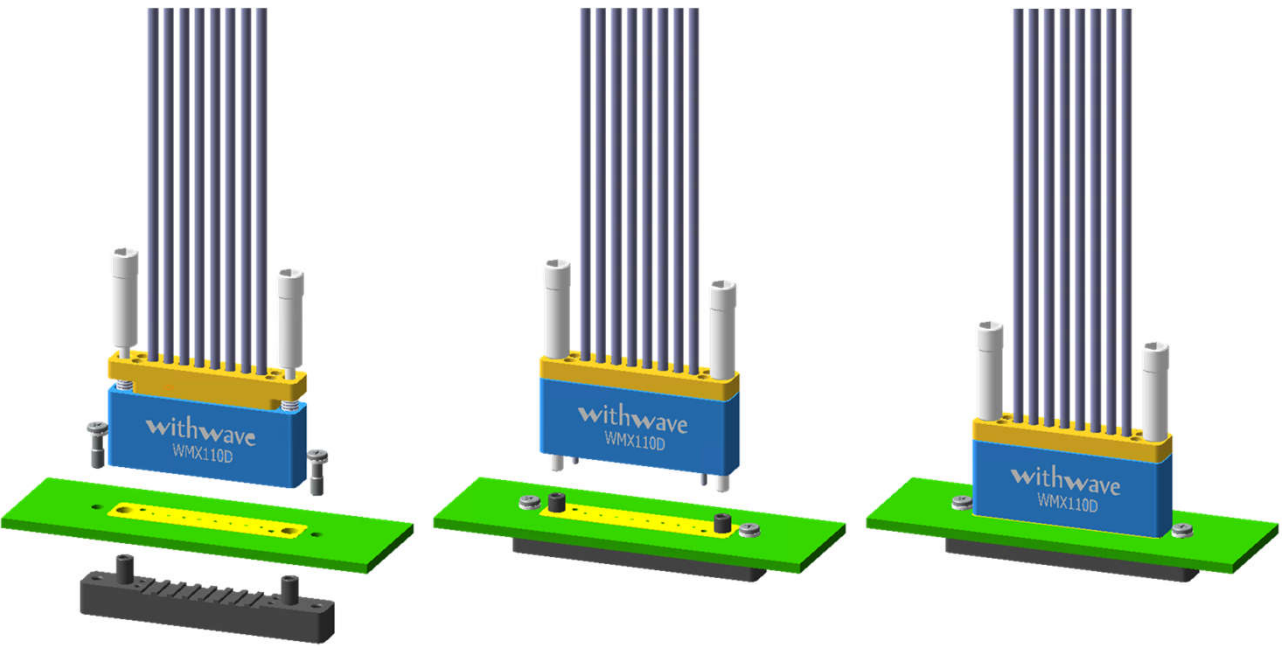


■ Selection Guide

| Board Edge Socket (WMX-8A-01-B, Top mounting)

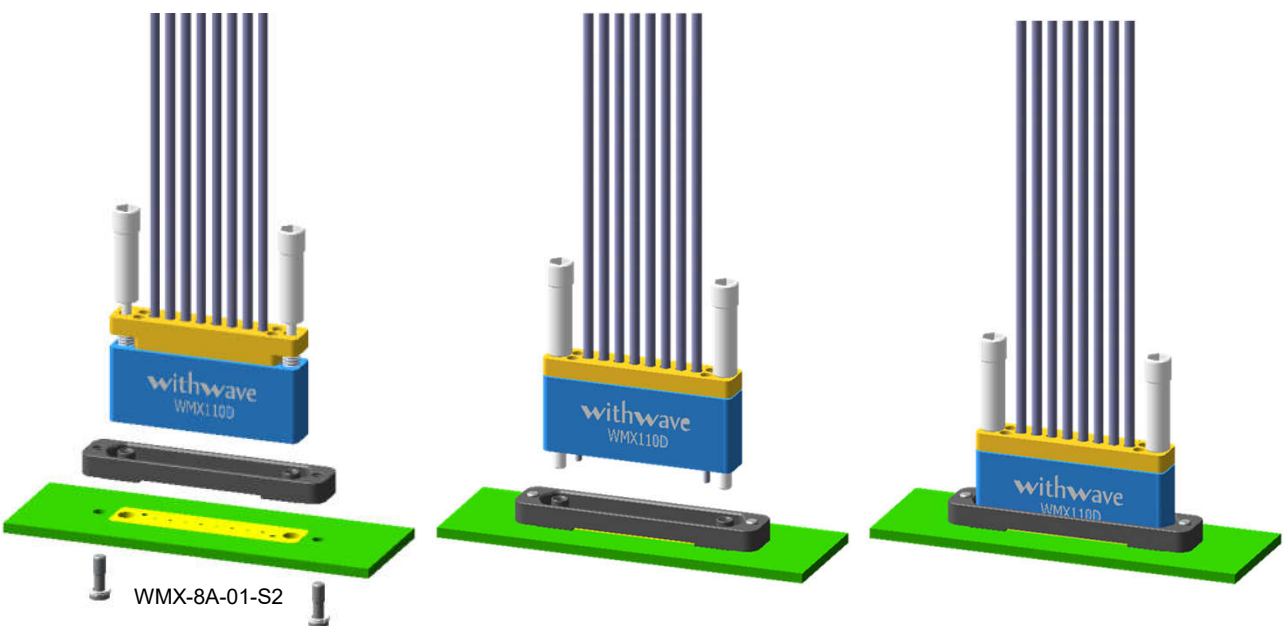


■ Selection Guide | Stiffener-01 (WMX-8A-01-S1, Bottom installation)



WMX-8A-01-S1

■ Selection Guide | Stiffener-02 (WMX-8A-01-S2, Top installation)



WMX-8A-01-S2

* If there is PCB warpage, a separate bracket is required.

■ Selection Guide | Phase matching and No. of phase matched cable

WMX40VS-8A1-KM1-300-2-02-H

Max. Frequency		
20	: 20 GHz	(WMX20)
40	: 40 GHz	(WMX40)
50	: 50 GHz	(WMX50)
67	: 67 GHz	(WMX67)
110	: 110 GHz	(WMX110)
145	: 145 GHz	(WMX145)

PCB Transition	
M	: Microstrip
S	: Stripline

Pitch	
1	: 2.54mm

Cable Length	
(Unit : mm)	

Connector Holder	
N	: None (Shrink tube)
H	: Conn. Holder

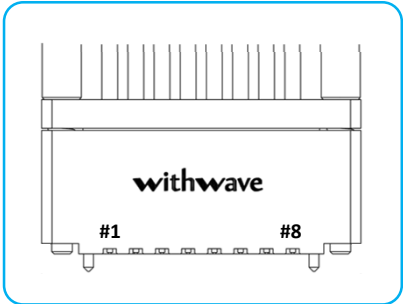
No. of Channel	
4A	: 1x4 CH
8A	: 1x8 CH
8B	: 2x4 CH
16A	: 2x8 CH

Connector Type		
SM1	: SMA Male	(WMX20)
SF1	: SMA Female	(WMX20)
KM1	: 2.92mm Male	(WMX40)
KF1	: 2.92mm Female	(WMX40)
PF1	: SMPM Female	(WMX40)
2M1	: 2.4mm Male	(WMX50)
2F1	: 2.4mm Female	(WMX50)
VM1	: 1.85mm Male	(WMX67)
VF1	: 1.85mm Female	(WMX67)
PF2	: SMPM Female	(WMX67)
WM1	: 1.0mm Male	(WMX110)
WF1	: 1.0mm Female	(WMX110)
DM1	: 0.8mm Male	(WMX145)
DF1	: 0.8mm Female	(WMX145)

No. of Phase Matched Cable	
00	: None
02	: 2 Cables / pair
04	: 4 Cables / pair
08	: 8 Cables / pair
16	: 16 Cables / pair

Phase Matching	
N	: No Phase Matching
1	: 1ps
2	: 2ps
5	: 5ps

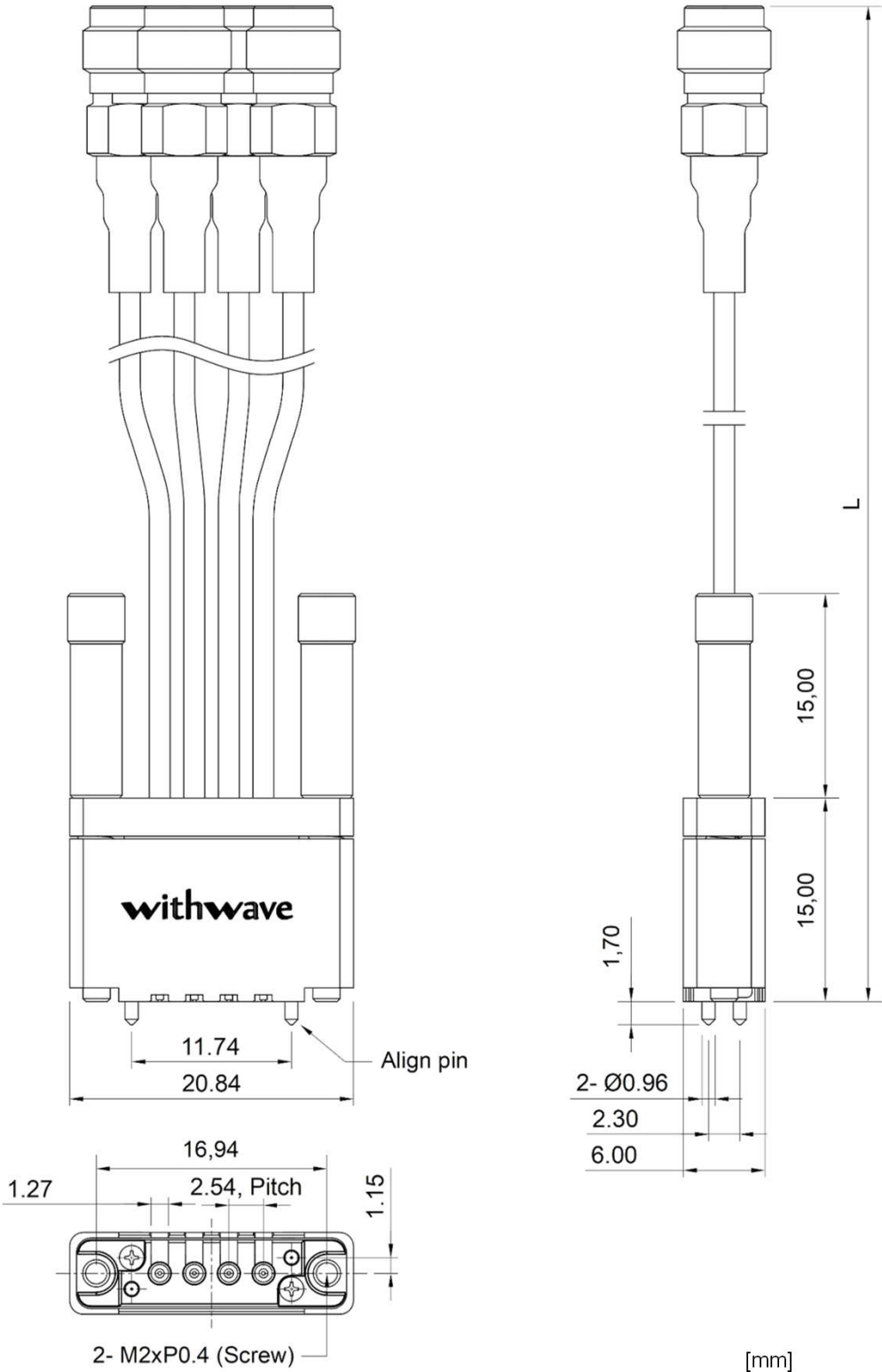
PCB Mounting Type	
V	: Vertical
R	: Right-Angle
B	: Board Edge



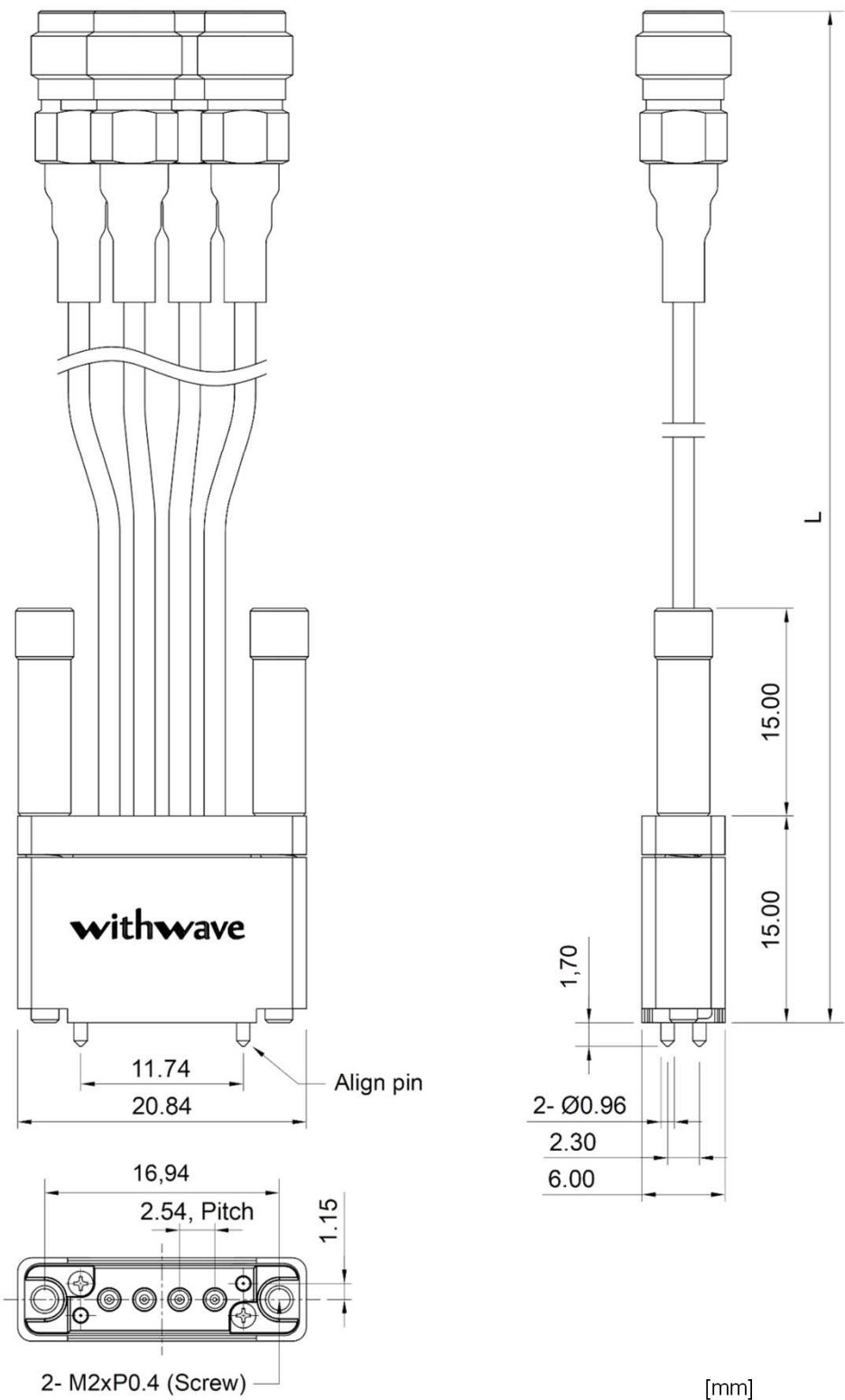
-N-00-	N : No phase matching 00 : None	
-1-02-	1 : 1ps phase matching 02 : 2 Cables /pair	
-2-04-	2 : 2ps phase matching 04 : 4 Cables /pair	
-5-08-	5 : 5ps phase matching 08 : 8 Cables /pair	

Drawing (WMX Series)

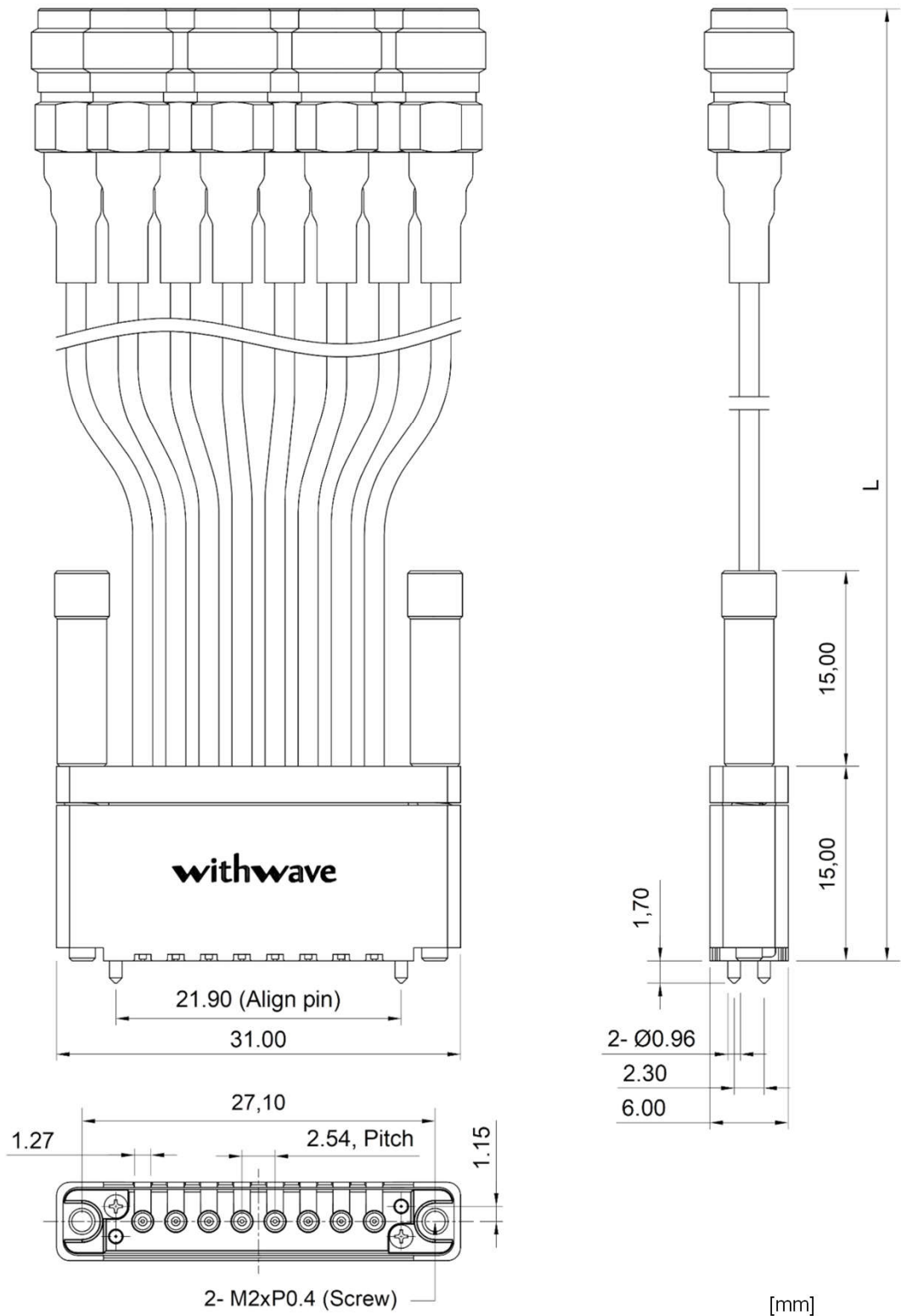
| Vertical, Microstrip, 1x4 Channel (WMX_{xx}VM-4A1)



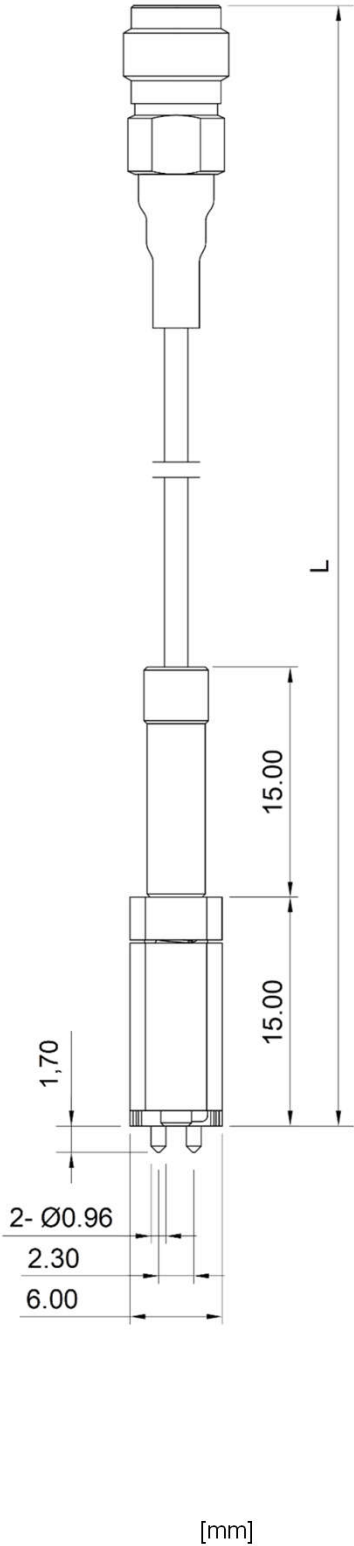
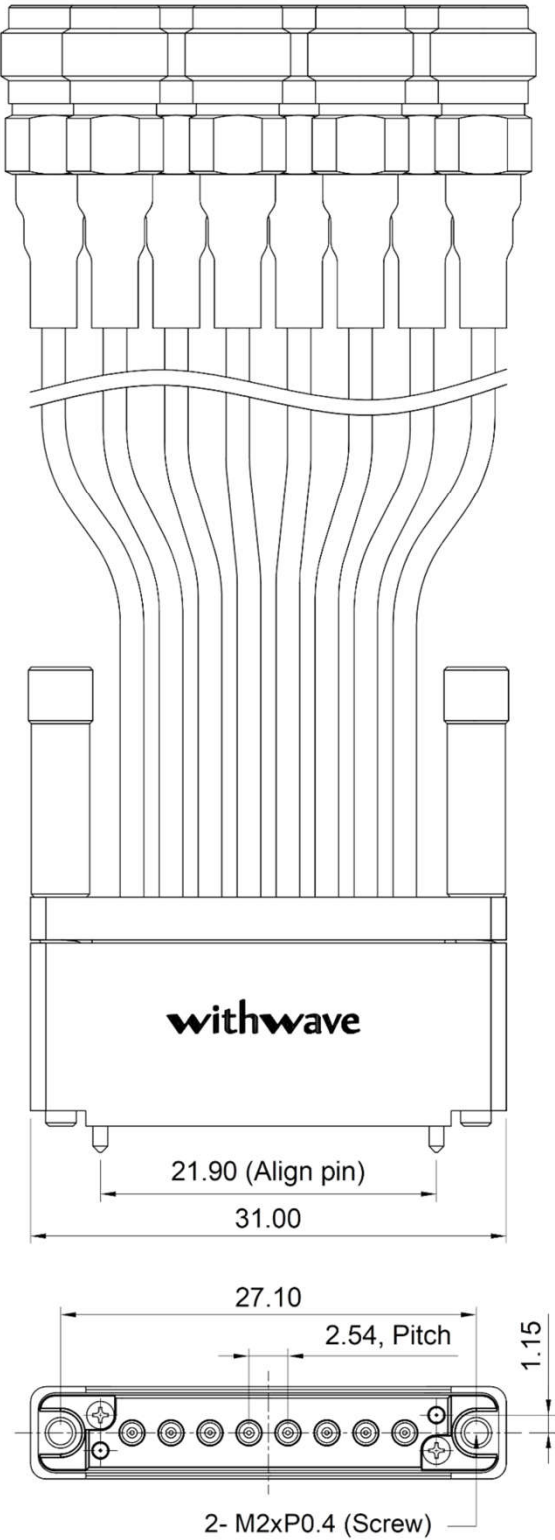
■ Drawing (WMX Series) | Vertical, Stripline, 1x4 Channel (WMXxxVS-4A1)



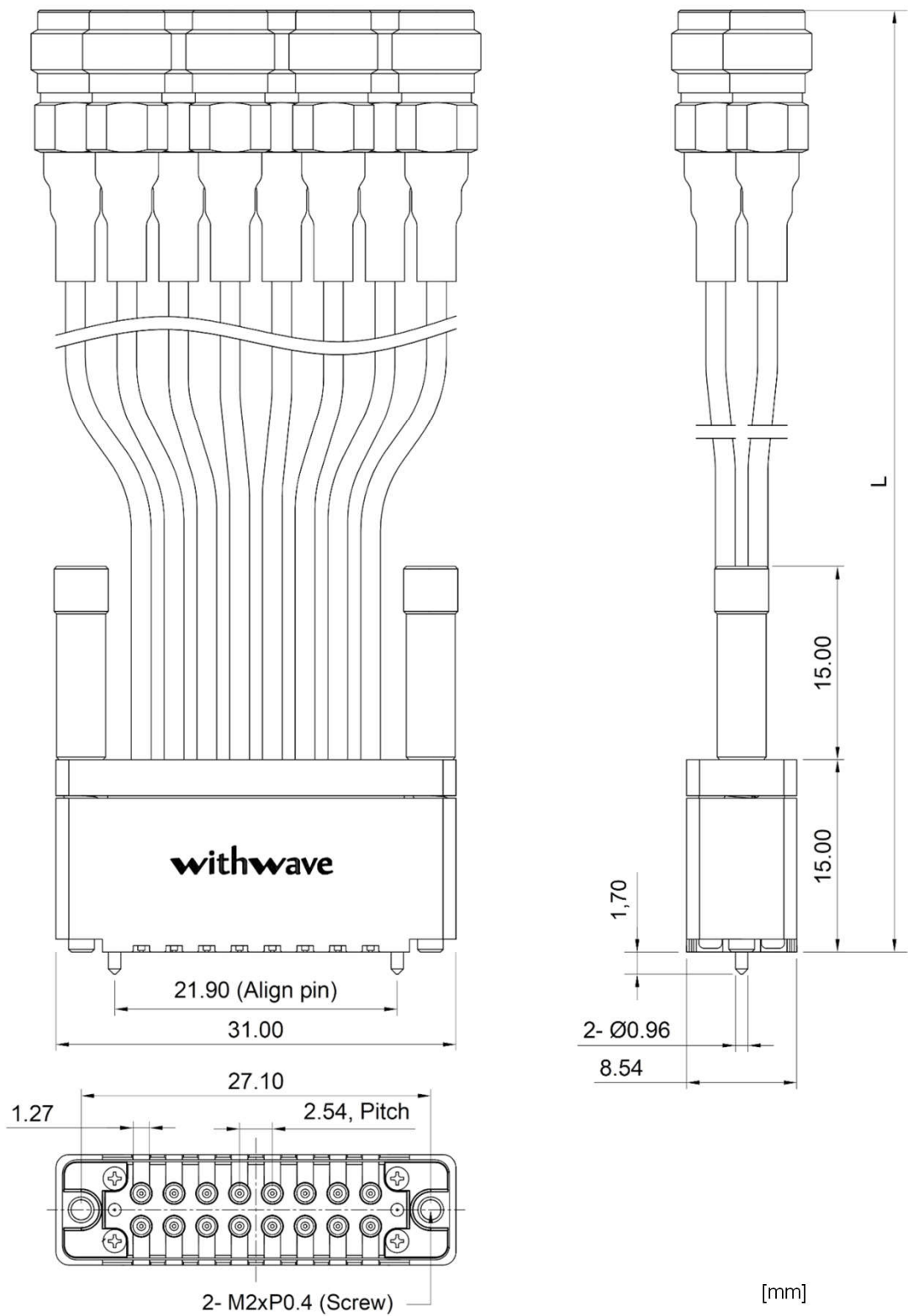
■ Drawing (WMX Series) | Vertical, Microstrip, 1x8 Channel (WMX_{xx}VM-8A1)



■ Drawing (WMX Series) | Vertical, Stripline, 1x8 Channel (WMX_{xx}VS-8A1)

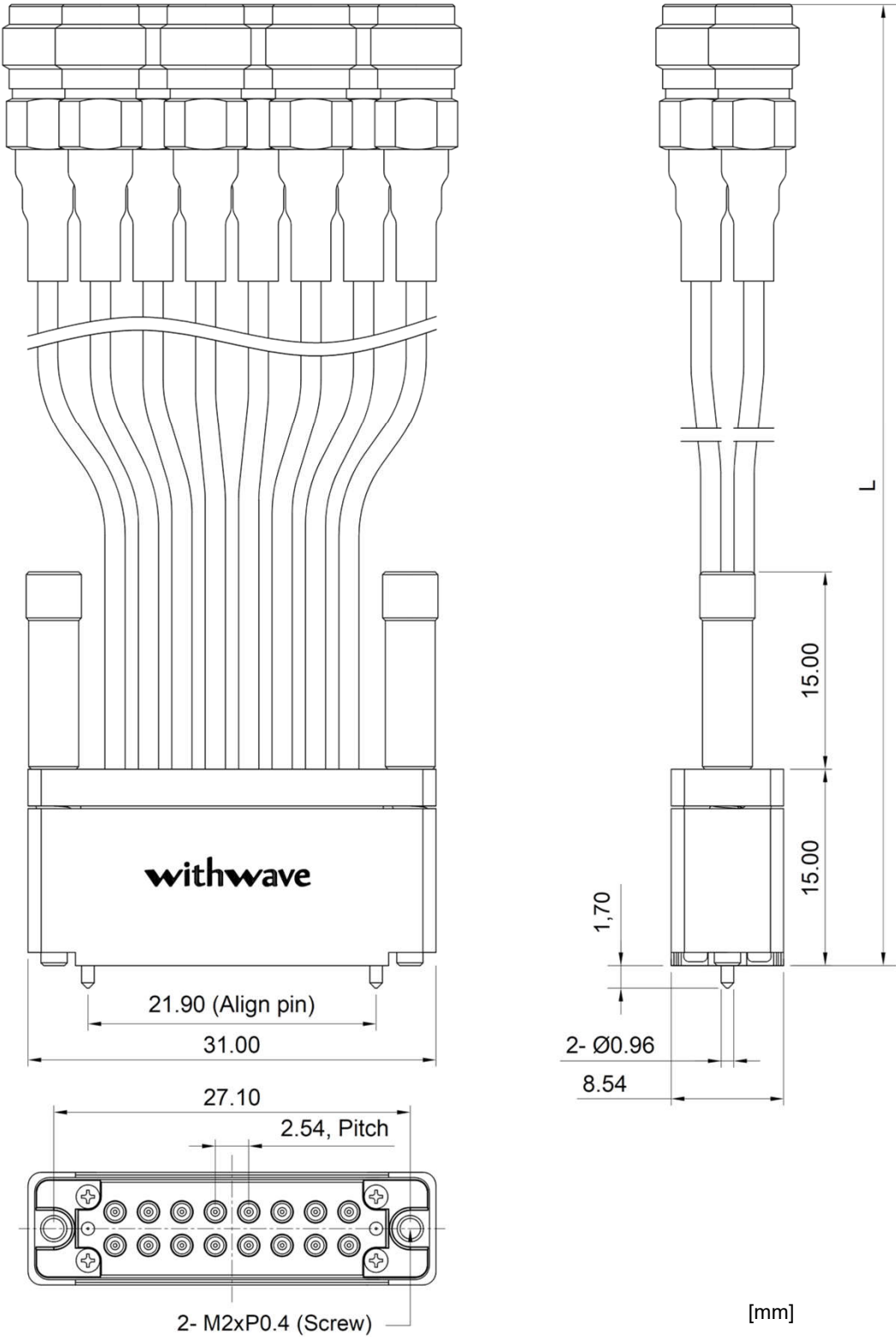


■ Drawing (WMX Series) | Vertical, Microstrip, 2x8 Channel (WMX_{xx}VM-16A1)



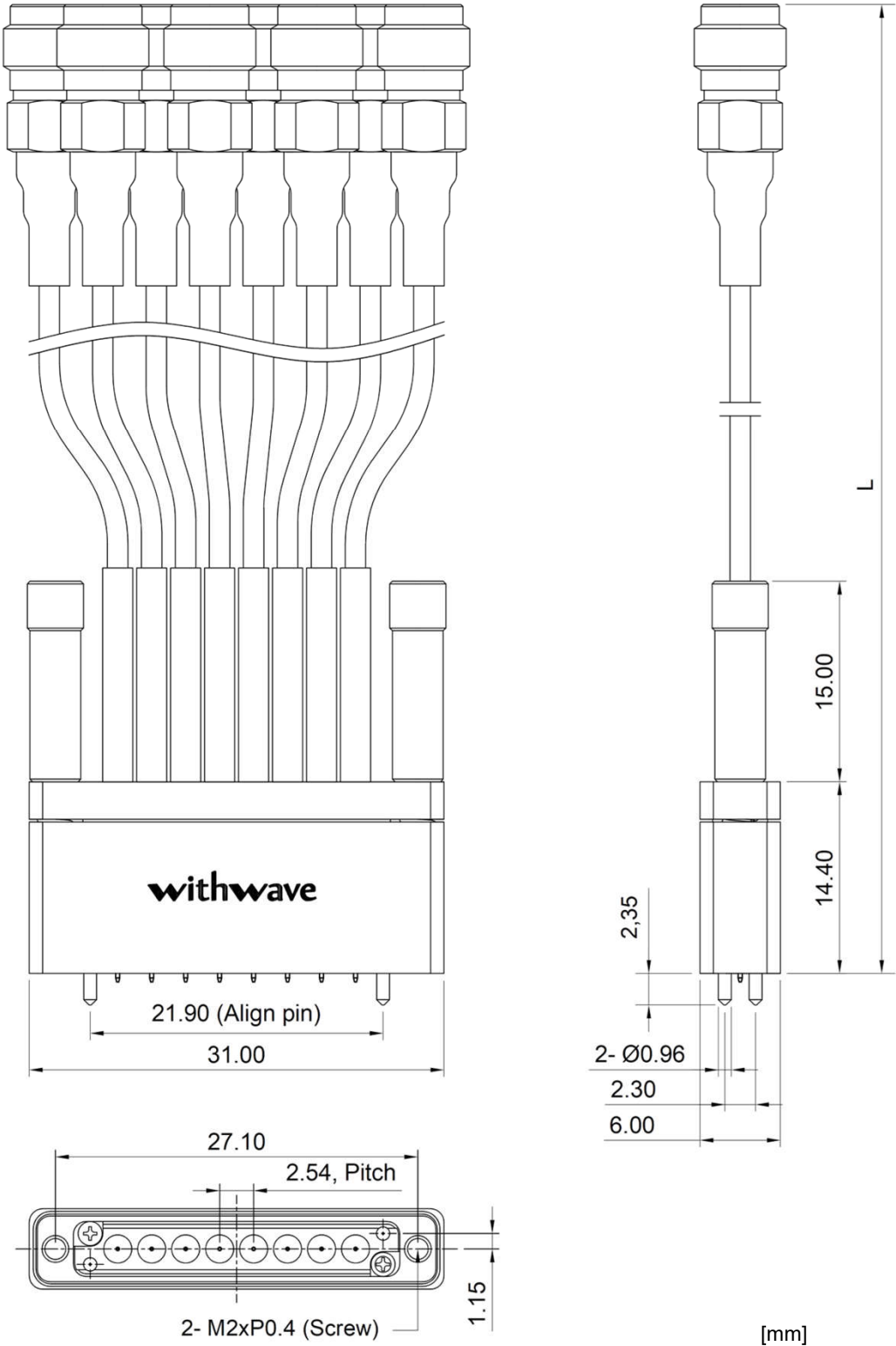
■ Drawing (WMX Series)

| Vertical, Stripline, 2x8 Channel (WMX_{xx}VS-16A1)

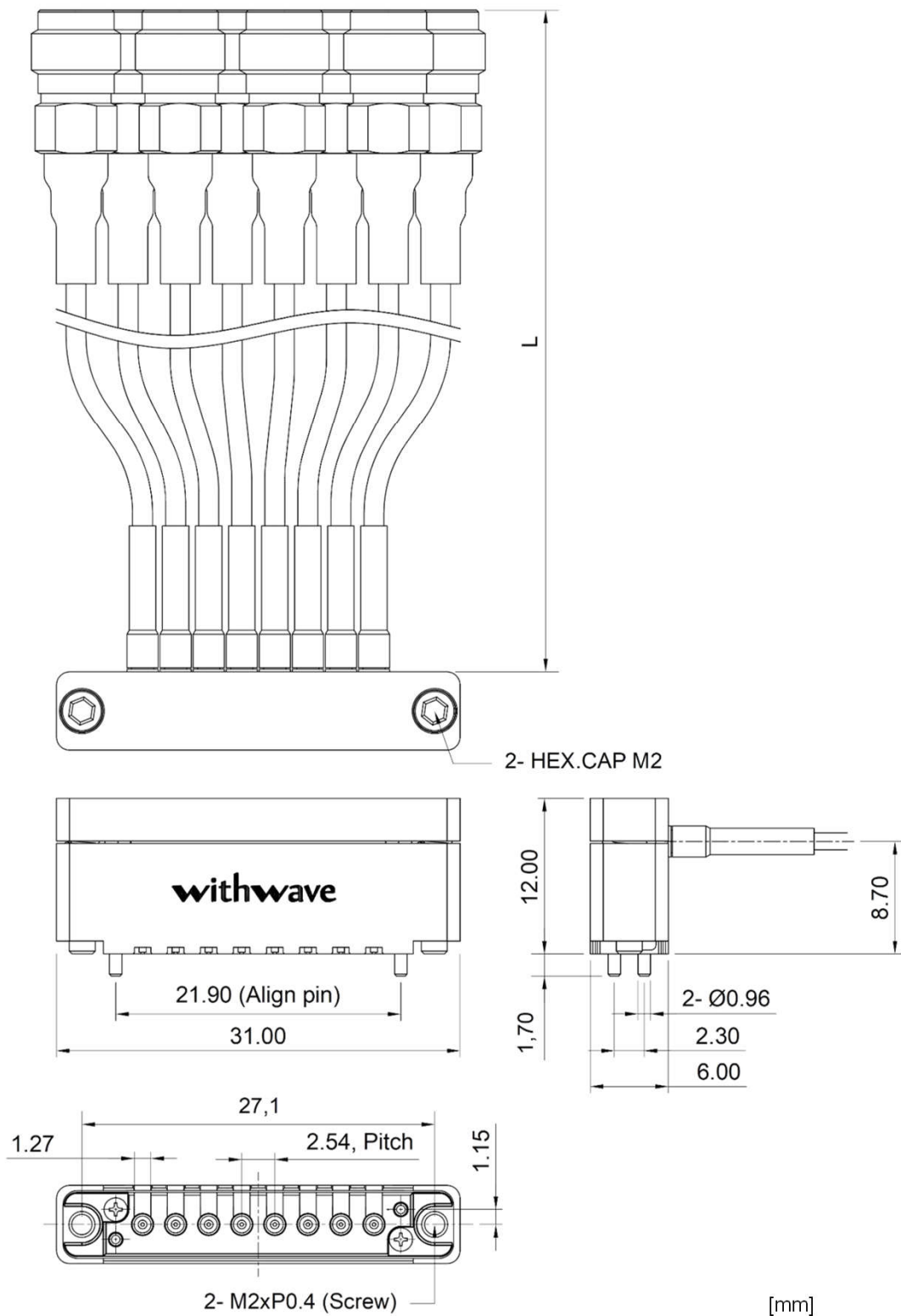


■ Drawing (WMX Series)

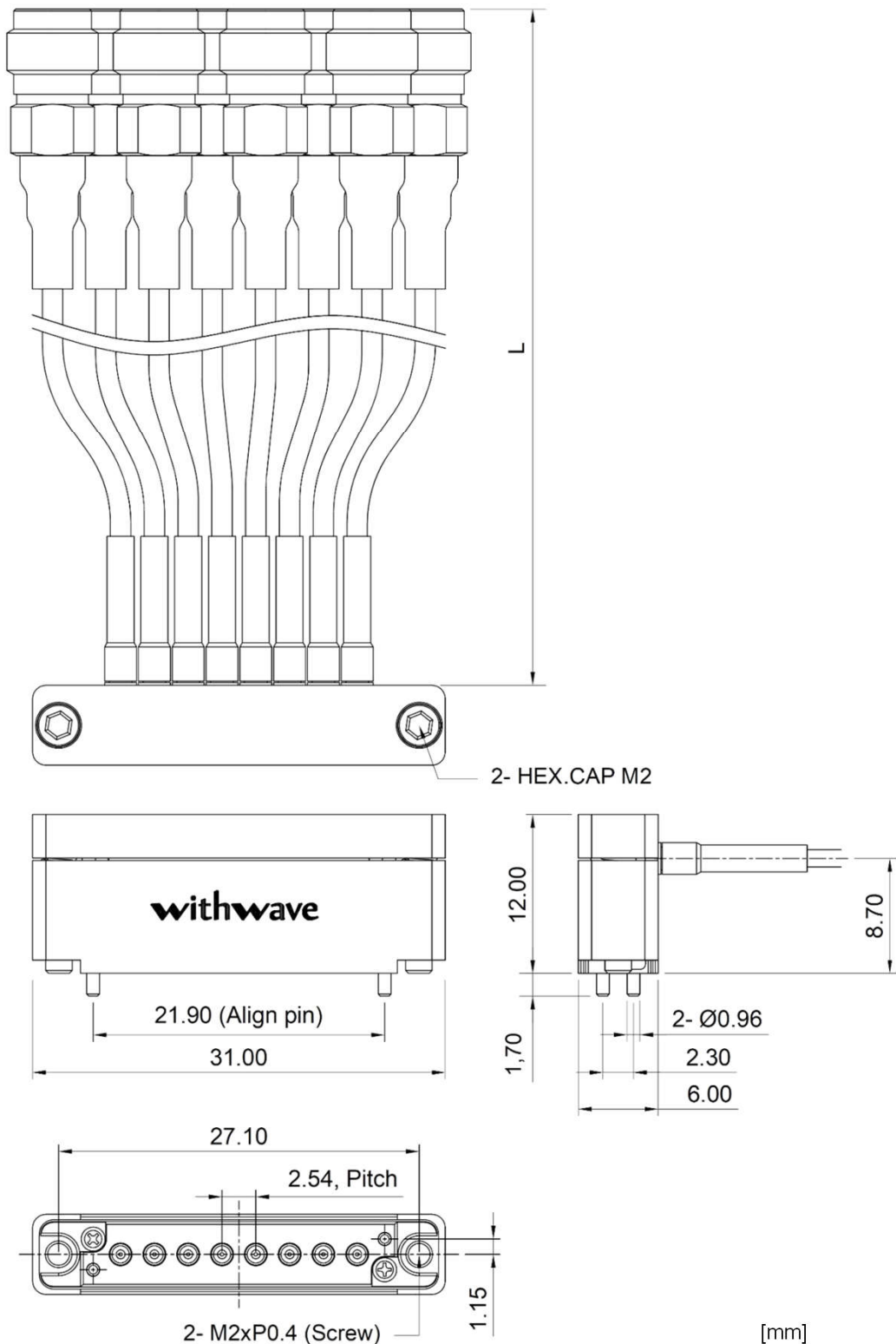
| Board Edge, Microstrip, 1x8 Channel (WMXxxBM-8A1)



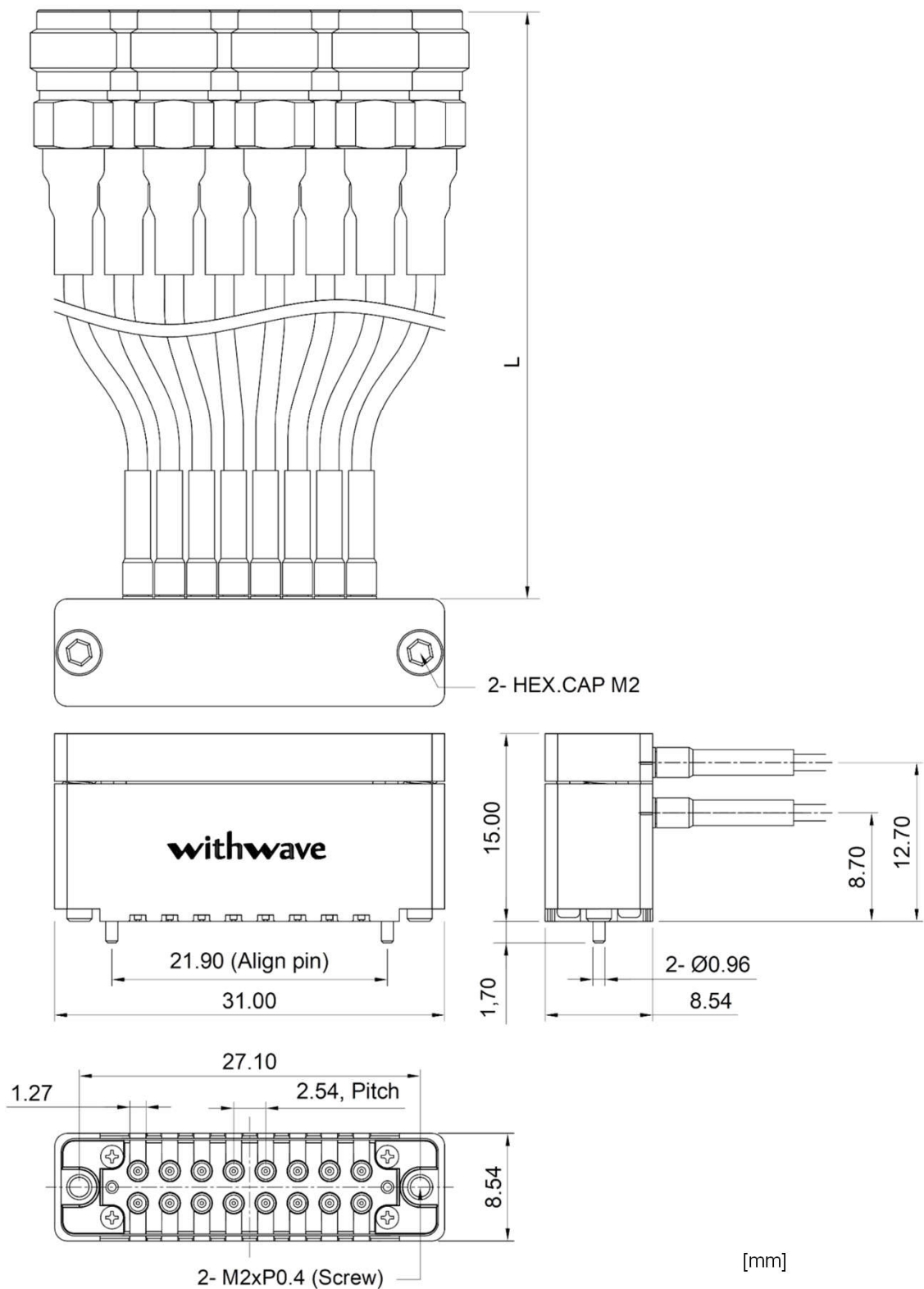
■ Drawing (WMX Series) | Right-Angle, Microstrip, 1x8 Channel (WMX_{xx}RM-8A1)



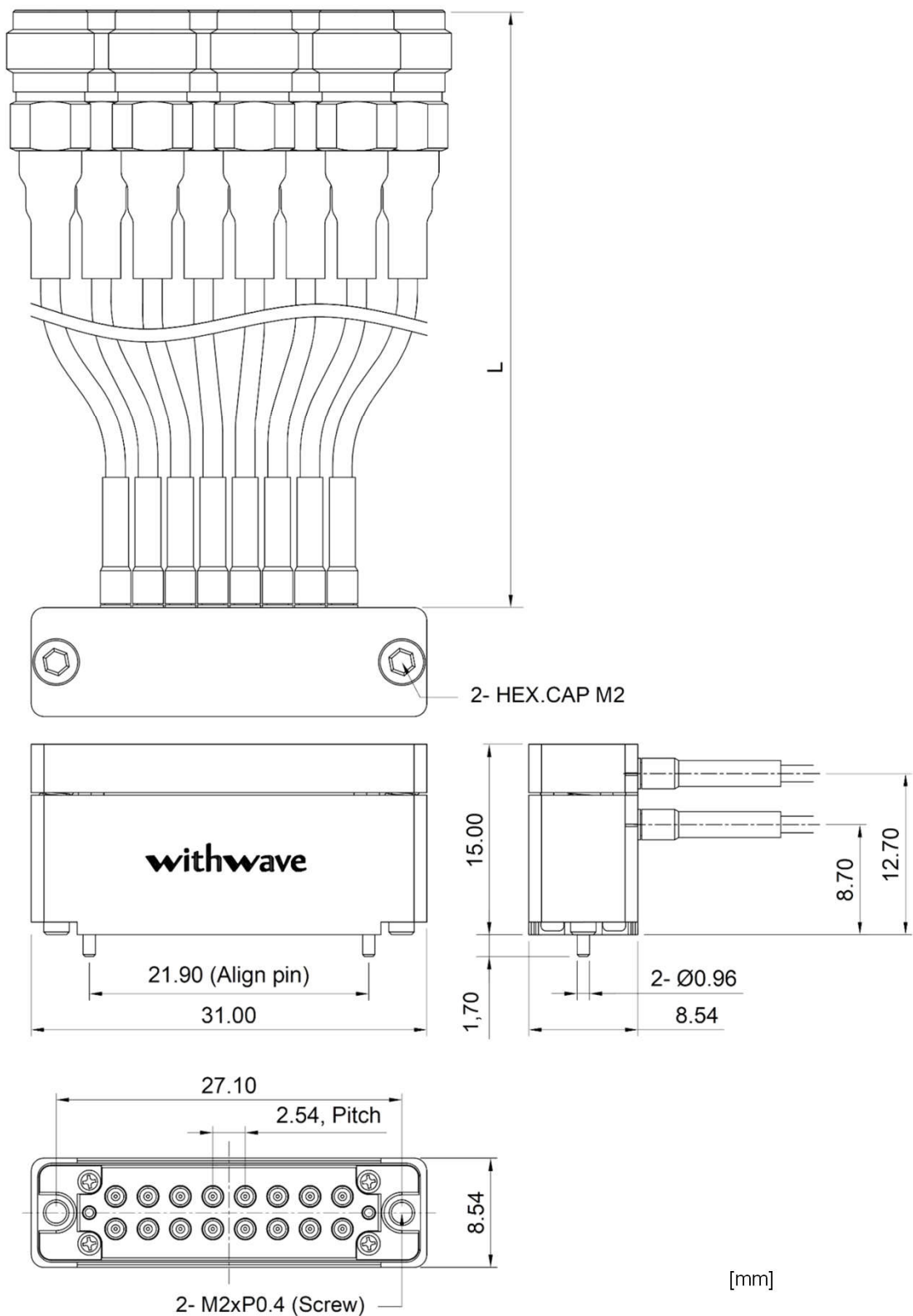
■ Drawing (WMX Series) | Right-Angle, Stripline, 1x8 Channel (WMXxxRS-8A1)



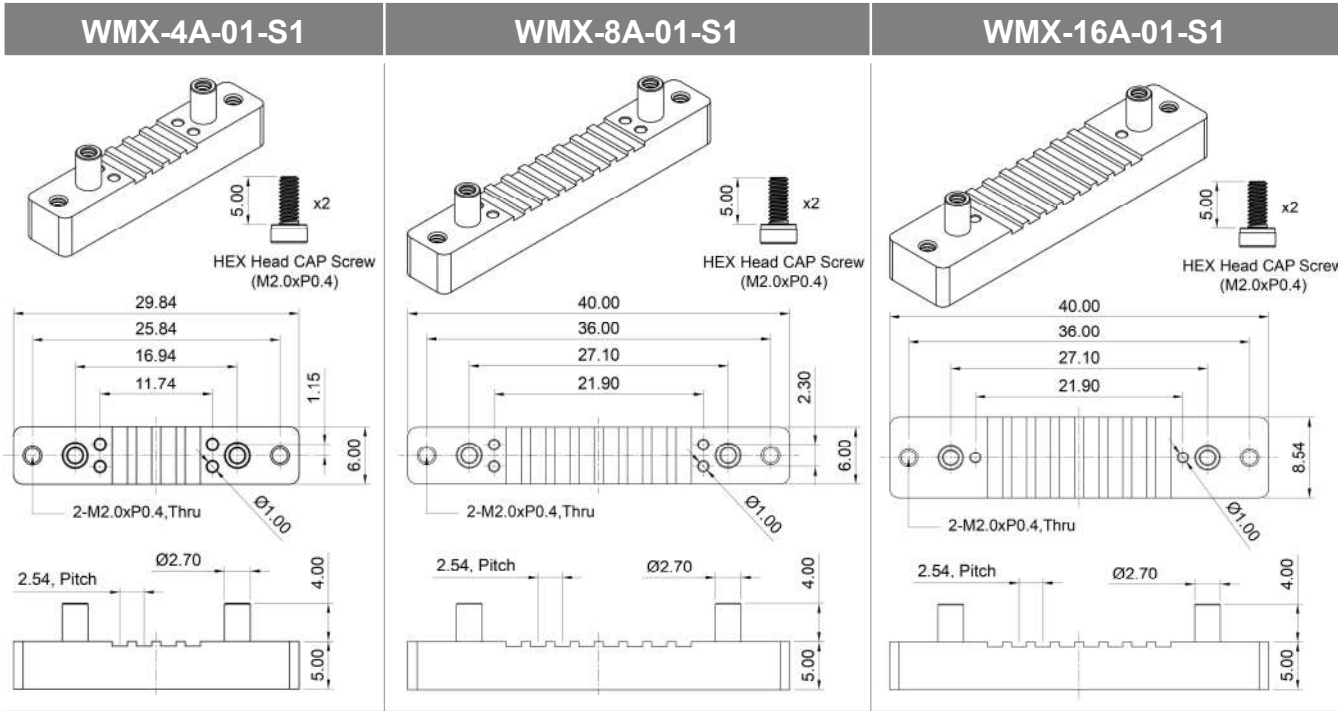
■ Drawing (WMX Series) | Right-Angle, Microstrip, 2x8 Channel (WMXxxRM-16A1)



■ Drawing (WMX Series) | Right-Angle, Stripline, 2x8 Channel (WMXxxRS-16A1)

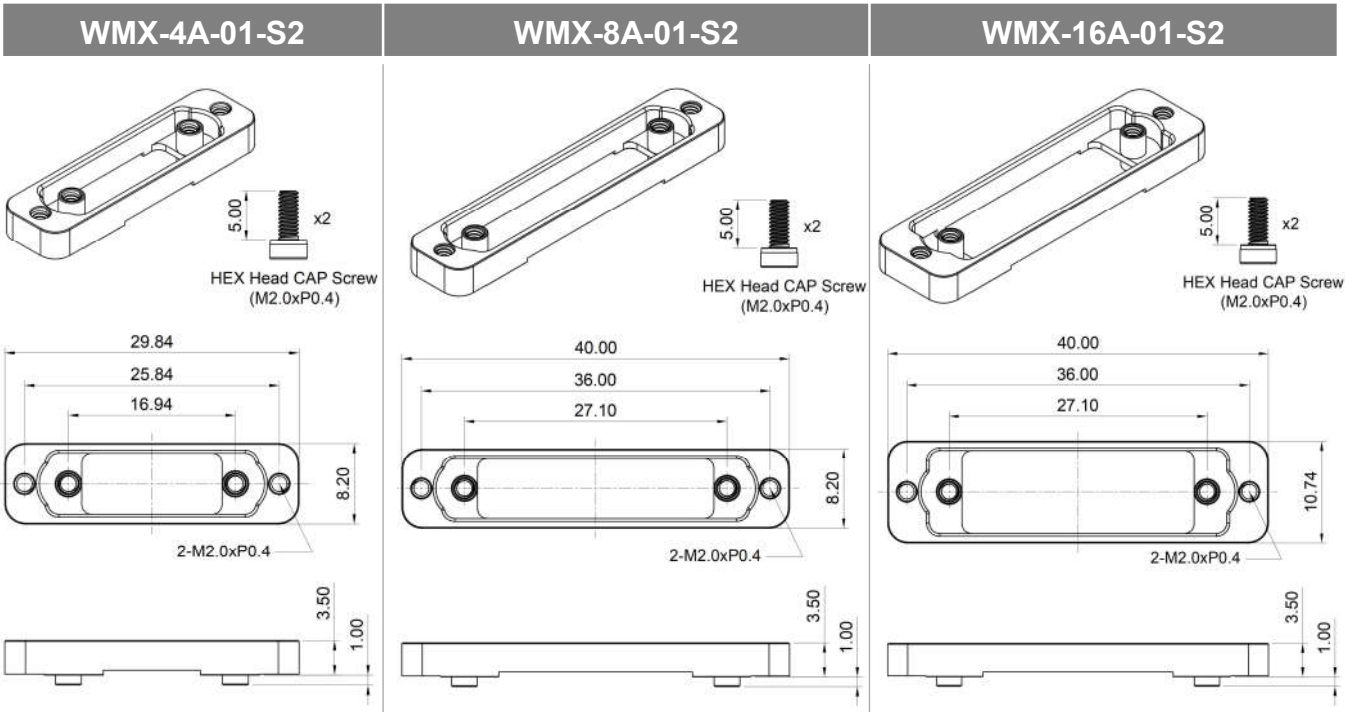


Drawing | Stiffener-01 (WMX Vertical, Right-Angle mounting type)



[mm]

Drawing | Stiffener-02 (WMX Vertical, Right-Angle mounting type)

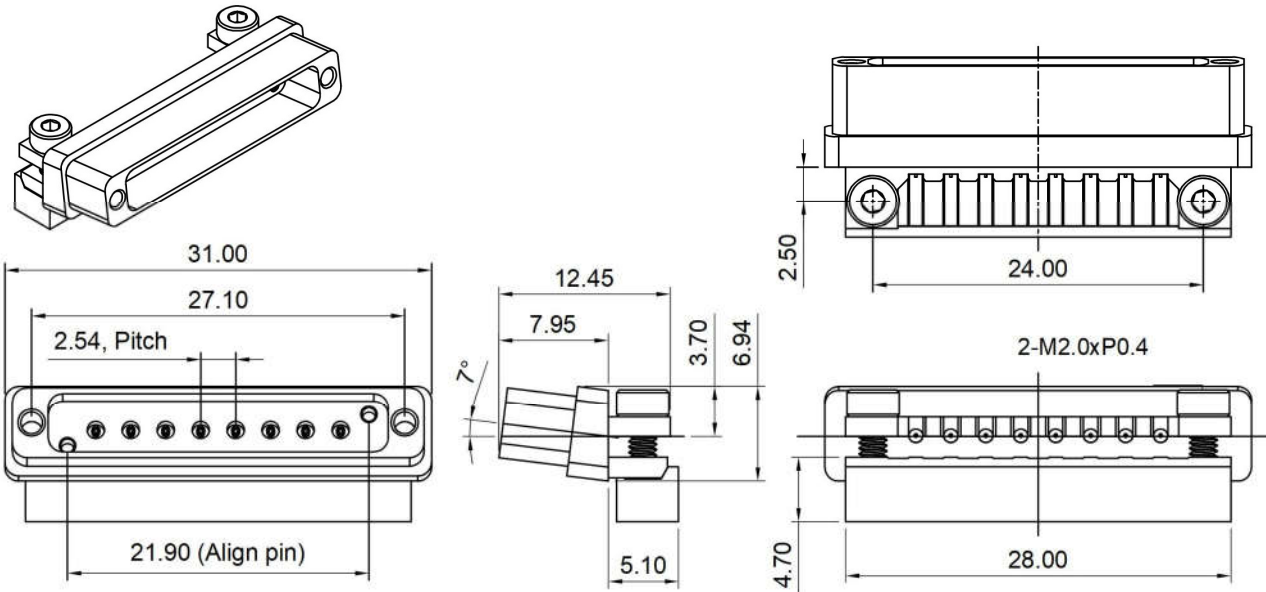


[mm]

■ Drawing

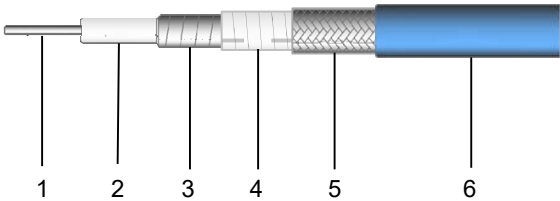
| Socket (WMX Board edge mounting type)

WMX-8A-01-B



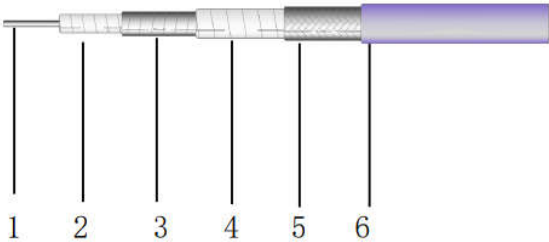
[mm]

■ Cable Specification (FX047P)



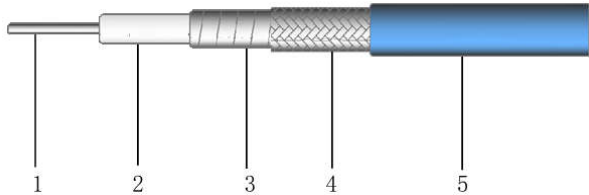
Scope	FX047P		Specification
Electrical Properties	• Operating Frequency Range (GHz)	67	
	• Impedance (Ohm)	50 ± 2	
	• Velocity of Propagation (%)	70	
	• Shielding effectiveness (dB)	>90	
	• Voltage Withstand(V, DC)	450	
Material & Construction	Structure		Material
	1. Center Conductor	Solid Bare Copper	
	2. Dielectric	Solid PTFE	
	3. 1 st Outer Shield	Flat Silver-Plated Copper	
	4. Interlayer	PTFE	
	5. 2 nd Outer Shield	Silver-Plated Copper Alloy	
	6. Jacket	FEP (Color : Sky-blue)	
Mechanical and Environmental Performance	• Weight (g/m)	7.2	
	• Operating Temperature Range (°C)	-55~+125	
	• Bend Radius : Installation (mm)	8.0	
	• Bend Radius : Repeated (mm)	15.0	
Attenuation values	Freq (MHz)	dB /m	Average power (kW)
	300	0.67	0.046
	500	0.87	0.036
	1000	1.24	0.025
	3000	2.16	0.014
	6000	3.08	0.010
	10000	4.01	0.008
	12400	4.48	0.007
	16000	5.12	0.006
	18000	5.44	0.006
	26500	6.66	0.005
	40000	8.29	0.004
	• Calculate Attenuation = 3.8791180*√F(MHz) + 0.0013340*F(MHz)		
	• Attenuation : Typical, 25°C, VSWR =1.0		
	• Power : Sea Level, 40°C, VSWR=1.0		

■ Cable Specification (W601)



Scope	W601	Specification	
Electrical Properties	• Operating Frequency Range (GHz)	110	
	• Impedance (Ohm)	50 ± 2	
	• Velocity of Propagation (%)	76	
	• Shielding effectiveness (dB)	>90	
	• Voltage Withstand(V, DC)	200	
Material & Construction	Structure	Material	
	1. Center Conductor	Silver Plated Copper	
	2. Dielectric	LD PTFE	
	3. 1 st Outer Shield	Flat Silver-Plated Copper	
	4. Inner Tape	LD PTFE	
	5. 2 nd Outer Shield	Silver-Plated Copper Alloy	
	6. Jacket	Violet FEP	
Mechanical and Environmental Performance	• Weight (g/m)	8	
	• Operating Temperature Range (°C)	-55~+125	
	• Bend Radius : Installation (mm)	7	
	• Bend Radius : Repeated (mm)	18	
Attenuation values	Freq (MHz)	dB /m	Average power (kW)
	300	0.70	0.061
	1000	1.29	0.033
	4000	2.59	0.017
	8000	3.68	0.012
	10000	4.12	0.010
	12000	4.52	0.010
	16000	5.22	0.008
	26500	6.76	0.006
	40000	8.35	0.005
	50000	9.37	0.005
	• Calculate Attenuation = 4.0594000*√F(MHz) + 0.0005755*F(MHz)		
	• Attenuation : Typical@25°C, VSWR =1.0		
	• Power : Sea Level@40°C, VSWR=1.0		

■ Cable Specification (W602)



Scope	W602		Specification
Electrical Properties	• Operating Frequency Range (GHz)		145
	• Impedance (Ohm)		50 ± 2
	• Velocity of Propagation (%)		70
	• Shielding effectiveness (dB)		>90
	• Voltage Withstand(V, DC)		350
Material & Construction	Structure		Material
	1. Center Conductor		Silver Plated Copper
	2. Dielectric		Solid PTFE
	3. 1 st Outer Shield		Flat Silver-Plated Copper
	4. 2 nd Outer Shield		Silver Plated Copper Alloy
	5. Jacket		FEP (Color : Sky-blue)
Mechanical and Environmental Performance	• Weight (g/m)		7
	• Operating Temperature Range (°C)		-55~+125
	• Bend Radius : Installation (mm)		7.0
	• Bend Radius : Repeated (mm)		13.0
Attenuation values	Freq (MHz)	dB /m	Average power (kW)
	300	0.87	0.0120
	1000	1.60	0.0065
	3000	2.81	0.0037
	6000	4.04	0.0026
	10000	7.25	0.0014
	26500	8.96	0.0012
	40000	11.26	0.0009
	50000	12.77	0.0008
	60000	14.17	0.0007
	67000	15.10	0.0007
	• Calculate Attenuation = 4.9470180*√F(MHz) + 0.0034250*F(MHz)		
	• Attenuation : Typical, 25°C, VSWR =1.0		
	• Power : Sea Level, 40°C, VSWR=1.0		

■ Revision History

Revision	Date	Changes
Ver 1.0	2019-06-24	Released WMX Series
Ver 1.1	2020-01-22	Released WMX Series
Ver 1.2	2020-03-01	Add Socket type and Bending Jig
Ver 1.3	2020-05-19	Add Fixing Nuts
Ver 1.4	2020-09-10	Revised selection guide
Ver 1.5	2021-09-29	Updated drawings
Ver 2.0	2021-11-29	Add spec.
Ver 3.0	2025-07-01	Revised WMX Series Updated drawings, spec, measurement data