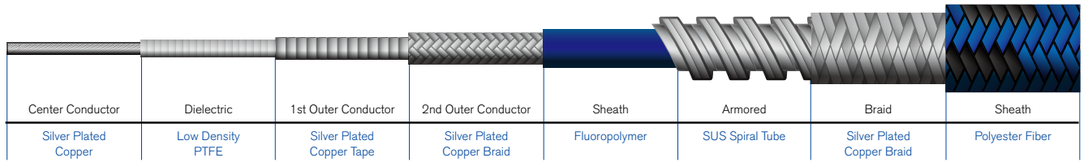
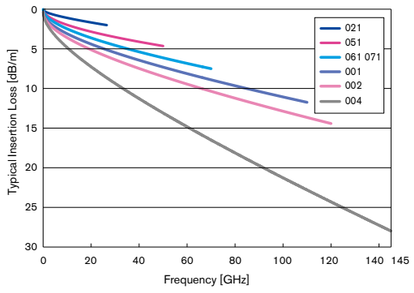
0 Series

Cable Assemblies with High Phase Stability for Measuring Instruments

The 0 series cable assemblies offer excellent phase stability against temperature fluctuation sand bending.
They are ideal for connecting to vector network analyzers for precision measurement.
(Continuous operating temperature range : from -30 to +85 °C)
Cables are offered in wide range of the frequencies of 26.5, 50, 67, 70, 110, 120 and 145 GHz with various connectors.



0 Series Typical Insertion Loss



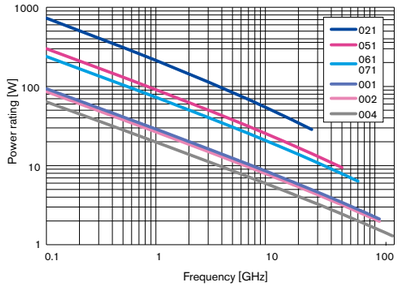
Simple Criteria for Cable Selection	
Insertion Loss	The larger the cable outer diameter, the lower the insertion loss.
Frequency Range	The smaller the cable, the higher mode frequency.
Power Rating	The larger the cable outer diameter, the higher the power rating.
Flexibility	The smaller the cable, the better the flexibility.
Mass	The smaller the cable, the lighter the cable.

Power Rating

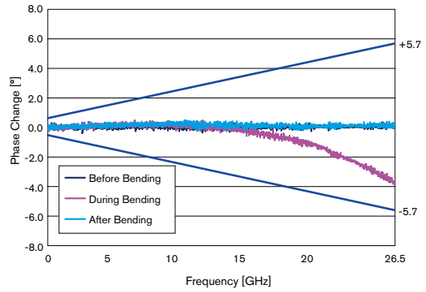
The diagram to the right shows the relationship between frequency and power rating.
The values are calculated at 25 °C and at sea level.
The power rating will need to be corrected for different ambient temperatures and altitude.
Power ratings may decrease, depending on the connector selected .

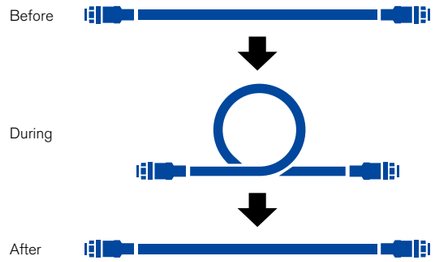
* The above figures are measured values for reference only.

Power Rating of 0 Series at Sea Level



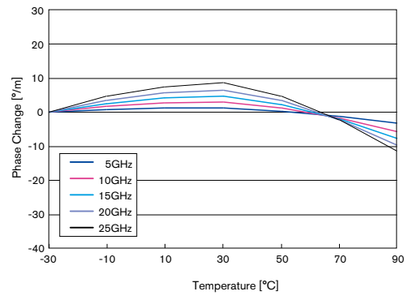
021 Static Bending Data





The cable was wrapped 360° around ϕ60mm mandrel.
* Guaranteed value within ±5.7° at 26.5GHz (In shipping value)

021 Phase Change vs. Temperature

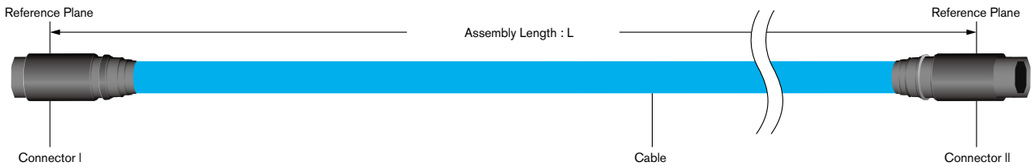


The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed.

* The above figures are measured values for reference only.

0 Series

Placing orders



Catalog No.

MWX021 - 01000 DFS DMS /B

Example.1

Cable : MWX021

Assembly Length : 1000 mm

Connector I : 3.5 mm (f) Straight

Connector II : 3.5 mm (m) Straight

Armored : Armored-Type

Armored-Type cables will have a " /B" appended to the connector combination code.
No appended to the connector combination code when cables are not armored type.

The unit of Assembly Length is mm.
Shown as a five-digit number.
If the number consists of fewer than five digits, remember to add zero (s) to the left of the first digit to make it five digits.
The Assembly Length is measured based on the reference planes, not on the connector ends, shown at the figure to the left.

- The order of Connector I and Connector II is determined by the alphabetical order of the first letter of the Connector Code.
  In the case of DMS (3.5mm(m) and AMS (SMA(m), Connector I : AMS, Connector II : DMS
- The order of Connector I and Connector II when the first letter of the Connector Code is the same depends on the alphabetical order of the second and subsequent letters.
  In the case of DMS (3.5mm(m) and DFS (3.5mm(f), Connector I : DFS, Connector II : DMS

Delivery time

0 series will be shipped within 11 business days after received order.

* Leadtime may be effected by larger order volume.

Connector Codes

Connector		0 Series							
		021/B	051/B	051	061/B	061	071/B	001/B	002/B	004/B
Type	Maximum Operating Frequency	26.5 GHz	50.0 GHz		67.0 GHz		70.0 GHz	110.0 GHz	120.0 GHz	145.0 GHz
N (m) Straight	18.0 GHz	NMS								
SMA (m) Straight	18.5 GHz	AMS								
SMA (f) Straight	18.5 GHz	AFS								
3.5 mm (m) Straight	26.5 GHz	DMS		DMS						
3.5 mm (m) Multi-Lock	26.5 GHz	DMP								
3.5 mm (m) Swept	26.5 GHz			DMW						
3.5 mm (f) Straight	26.5 GHz	DFS								
2.92 mm (m) Straight	40.0 GHz		KMS	KMS						
2.92 mm (m) Swept	40.0 GHz			KMW						
2.92 mm (f) Straight	40.0 GHz		KFS	KFS						
2.4 mm (m) Straight	50.0 GHz		LMS	LMS						
2.4 mm (m) Swept	50.0 GHz			LMW						
2.4 mm (f) Straight	50.0 GHz		LFS	LFS						
2.4 mm (f) NMD	50.0 GHz		LFD							
1.85 mm (m) Straight	67.0 GHz				VMS	VMS				
1.85 mm (m) Swept	67.0 GHz					VMW				
1.85 mm (f) Straight	67.0 GHz				VFS	VFS				
1.85 mm (f) NMD	67.0 GHz				VFD					
1.85 mm (m) Straight	70.0 GHz						VMS			
1.85 mm (f) Straight	70.0 GHz						VFD			
1.0 mm (m) Safety-Lock	110.0 GHz							WMT		
1.0 mm (f) Straight	110.0 GHz							WFS		
1.0 mm (m) Straight	110.0 GHz								WMS1	
1.0 mm (f) Straight	110.0 GHz								WFS1	
1.0 mm (m) Safety-Lock	120.0 GHz								WMT	
1.0 mm (m) Straight	120.0 GHz								WMS	
1.0 mm (f) Straight	120.0 GHz								WFS	
1.0 mm (m) Safety-Lock	130.0 GHz									WMT
1.0 mm (f) Straight	130.0 GHz									WFS
0.8 mm (m) Safety-Lock	145.0 GHz									MMT
0.8 mm (f) Straight	145.0 GHz									MFS

- The smallest frequency among the maximum operating frequencies of the connectors and cables to be used is the maximum operating frequency of the assembly.
- Please inquire separately for products with connector symbols in gray, as they require a longer delivery time.

- The lowest frequency among the maximum operating frequencies of the connectors and cables to be used is the maximum operating frequency of the assembly.
- For products with Connector Code in gray, please inquire separately as it takes time for delivery.

0 Series Cable Assemblies with High Phase Stability for Measuring Instruments

021

Features

- Phase Stability: Static Bending
- Phase Stability: Temperature Change
- Maximum Operating Frequency: 26.5 GHz
- Temperature Range: -30 to 85°C
- Days to Ship: 11 Business Days
- RoHS Compliant

Property

Electrical Properties

Maximum Operating Frequency	26.5 GHz
Characteristic Impedance	50±1 Ω
Capacitance (Typical)	85 pF/m
Propagation Delay (Typical)	4.21 ns/m
Velocity of Propagation (Typical)	79 %
Higher Mode Frequency (Typical)	28 GHz
VSWR (Typical)	1.33
Maximum Frequency Insertion Loss (26.5 Ghz)	2.0 dB/m

Mechanical Properties

Cable Outer Diameter	8.5 mm
Minimum Bending Radius (Inner Side)	30 mm
Cable Mass (Typical)	122 g/m
Continuous Operating Temperature Range	-30~+85 °C
Armored Side Pressure	196 N/cm
Assembly Length	700~1,500 mm

Order Form Example

Please provide the following information when placing an order.

Example MWX021

* See P. 0-4 "Connector Codes"

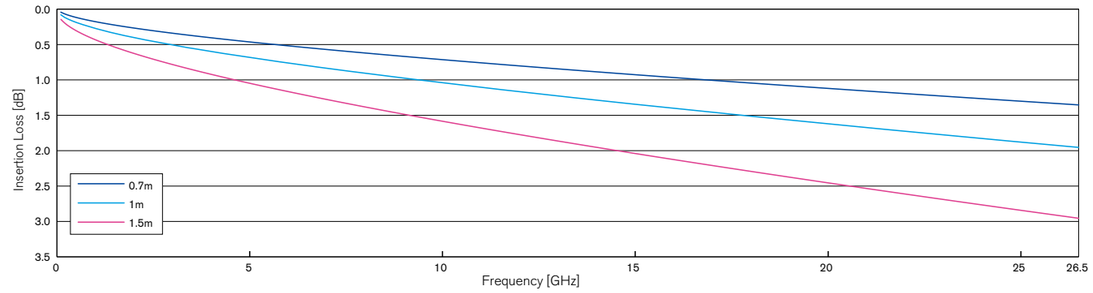
Assembly Length : 1000mm
Connector Ⅰ : 3.5 mm (f) Straight
Connector Ⅱ : 3.5 mm (m) Straight

Catalog No.
MWX021-01000DFSDMS/B
a b c d

a. Cable Type
b. Assembly Length
c. Connector
d. Armored

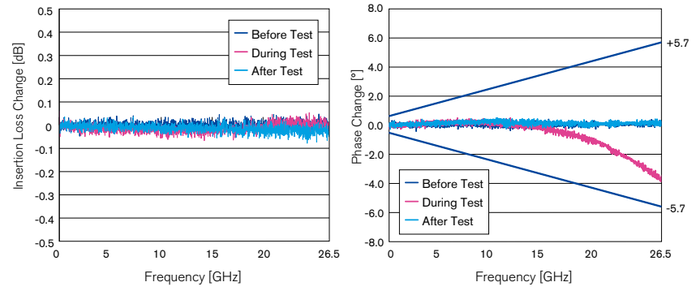
Technical Data

Cable Typical Insertion Loss



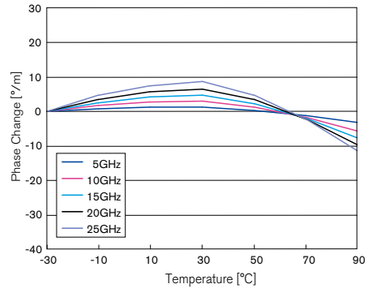
Typical Insertion Loss $(0.67\times(0.038\times f\,[GHz]+0.371\times\sqrt{f\,[GHz]})+0.07)\times L\,[m]$ **Maximum Insertion Loss** $(0.67\times(0.038\times f\,[GHz]+0.371\times\sqrt{f\,[GHz]})+0.07)\times 1.12\times L\,[m]$

Static Bending Data (Insertion Loss, Phase) Bending Radius : 30 mm



* Guaranteed value within ±5.7° at 26.5 GHz (In shipping value)
* The cable was wrapped 360° around ø60mm mandrel.

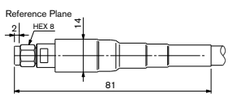
021 Phase Change vs. Temperature



The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

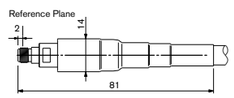
Connector

SMA (m) Straight (Code : AMS)



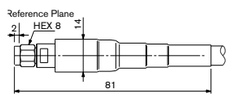
Maximum Operating Frequency : 18.5 GHz / Mass : 18g

SMA (f) Straight (Code : AFS)



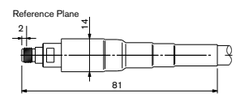
Maximum Operating Frequency : 18.5 GHz / Mass : 17g

3.5mm (m) Straight (Code : DMS)



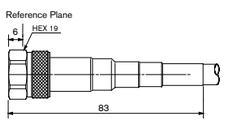
Maximum Operating Frequency : 26.5 GHz / Mass : 18g

3.5mm (f) Straight (Code : DFS)



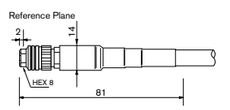
Maximum Operating Frequency : 26.5 GHz / Mass : 17g

N (m) Straight (Code : NMS)



Maximum Operating Frequency : 18.0 GHz / Mass : 43g

3.5mm (m) Multi-Lock Type (Code : DMP)



Maximum Operating Frequency : 26.5 GHz / Mass : 24g

*Refer to P0-4 Connector Code Table for othrer applicable connectors.

* The above figures are measured values for reference only.

3.5mm Connector "Multi-Lock Type" 3 Ways for Coupling

Snap-On Coupling

Coupling without screwing.
Insert the cable connector and slide the coupling nut forward.
It helps to reduce workload for users who have repeating insertion and extraction, such as production and testing line.

Hand Screw Coupling

After snap-on coupling, becomes stable.
screw the coupling nut, then the connection
This connector made the work-load 1/3 compared to the conventional ones.

Torque Wrench Coupling

Torque wrench management for more accurate measureis available at the HEX part with standard tightening, ment, such as calibration.

0 Series Cable Assemblies with High Phase Stability for Measuring Instruments

051

Features

- Phase Stability: Static Bending
- Phase Stability: Temperature Change
- Maximum Operating Frequency: 50.0 GHz
- Temperature Range: -30 to 85°C
- Days to Ship: 11 Business Days
- RoHS Compliant

Property

Electrical Properties

Maximum Operating Frequency	50.0 GHz
Characteristic Impedance	50±1 Ω
Capacitance (Typical)	85 pF/m
Propagation Delay (Typical)	4.19 ns/m
Velocity of Propagation (Typical)	79 %
Higher Mode Frequency (Typical)	61 GHz
VSWR (Typical)	1.46
Maximum Frequency Insertion Loss (50.0 GHz)	4.6 dB/m

Mechanical Properties

Cable Outer Diameter	6.6 mm
Minimum Bending Radius (Inner Side)	30 mm
Cable Mass (Typical)	76 g/m
Continuous Operating Temperature Range	-30~+85 °C
Armored Side Pressure	196 N/cm
Assembly Length	700~1,500 mm

Order Form Example

Please provide the following information when placing an order.

Example MWX051

Assembly Length: 1000mm
Connector Ⅰ : 2.4 mm (f) Straight
Connector Ⅱ : 2.4 mm (m) Straight

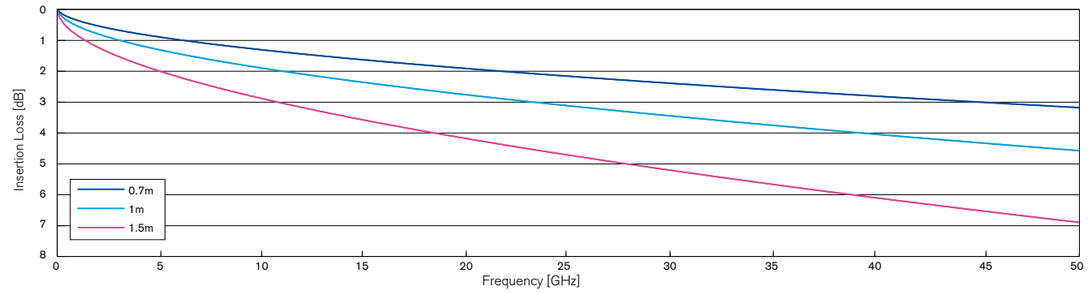
Catalog No.
MWX051-01000LFSLMS/B
a b c d

* See P. 0-4 "Connector Codes"

a. Cable
b. Assembly Length
c. Connector
d. Armored

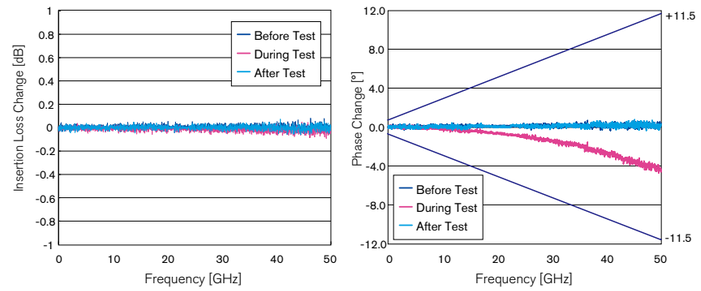
Technical Data

Cable Typical Insertion Loss



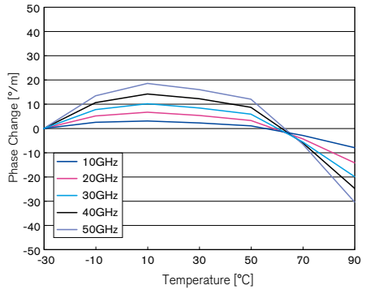
Typical Insertion Loss $(0.0095\times f[GHz]+0.587\times\sqrt{f[GHz]+0.02})\times L[m]$ **Maximum Insertion Loss** $(0.0095\times f[GHz]+0.587\times\sqrt{f[GHz]+0.02})\times 1.12\times L[m]$

Static Bending Data (Insertion Loss, Phase) Bending Radius : 30 mm



* Guaranteed value within ±11.5° at 50 GHz (In shipping value).
* The cable was wrapped 360° around ø60mm mandrel.

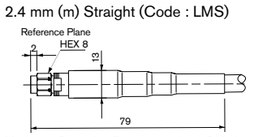
051 Phase Change vs. Temperature



The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

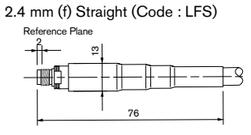
Connector

2.4 mm (m) Straight (Code : LMS)



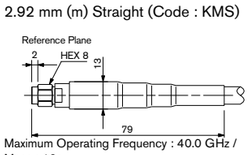
Maximum Operating Frequency : 50.0 GHz / Mass : 11g

2.4 mm (f) Straight (Code : LFS)



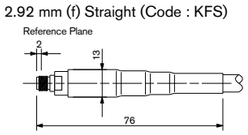
Maximum Operating Frequency : 50.0 GHz / Mass : 14g

2.92 mm (m) Straight (Code : KMS)



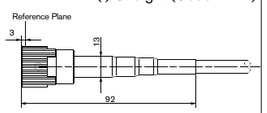
Maximum Operating Frequency : 40.0 GHz / Mass : 12g

2.92 mm (f) Straight (Code : KFS)



Maximum Operating Frequency : 40.0 GHz / Mass : 14g

NMD 2.4 mm (f) Straight (Code : LFD)



Maximum Operating Frequency : 50.0 GHz / Mass : 60g

*Refer to P0-4 Connector Code Table for othrer applicable connectors.

Option

Non-armored type (2.4 mm and 2.92 mm connector) can be used for 051.
Please contact us.

0 Series Cable Assemblies with High Phase Stability for Measuring Instruments

061

Features

- Phase Stability: Static Bending
- Phase Stability: Temperature Change
- Maximum Operating Frequency: 67.0 GHz
- Temperature Range: -30 to 85°C
- Days to Ship: 11 Business Days
- RoHS Compliant

Property

Electrical Properties

Maximum Operating Frequency	67.0 GHz
Characteristic Impedance (Typical)	50±1 Ω
Capacitance (Typical)	90 pF/m
Propagation Delay (Typical)	4.35 ns/m
Velocity of Propagation (Typical)	77 %
Higher Mode Frequency (Typical)	70 GHz
VSWR (Typical)	1.46
Maximum Frequency Insertion Loss (67.0 GHz)	7.3 dB/m

Mechanical Properties

Cable Outer Diameter	6.6 mm
Minimum Bending Radius (Inner Side)	30 mm
Cable Mass (Typical)	73 g/m
Continuous Operating Temperature Range	-30~+85 °C
Armored Side Pressure	196 N/cm
Assembly Length	700~1,500 mm

Order Form Example

Please provide the following information when placing an order.

Example MWX061

* See P. 0-4 "Connector Codes"

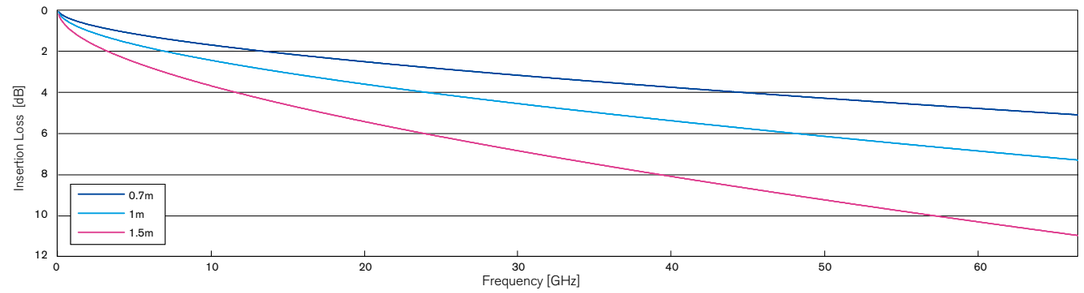
Assembly Length: 700 mm
Connector I : 1.85 mm (f) Straight
Connector II : 1.85 mm (m) Straight

Catalog No.
MWX061-00700VFSVMS/B
a b c d

a. Cable
b. Assembly Length
c. Connector
d. Armored

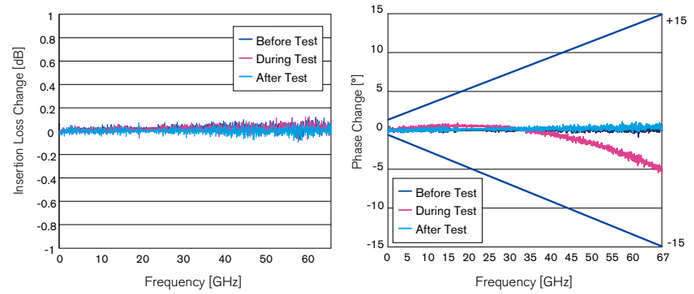
Technical Data

Cable Typical Insertion Loss



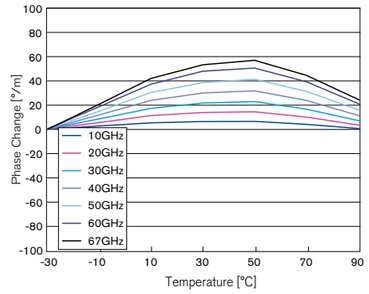
Typical Insertion Loss (0.0232×f [GHz]+0.702×√f [GHz]+0.02)×L [m] **Maximum Insertion Loss** (0.0232×f [GHz]+0.702×√f [GHz]+0.02)×1.12×L [m]

Static Bending Data (Insertion Loss, Phase) Bending Radius : 30 mm



* Guaranteed value within ±15° at 67 GHz (In shipping value).
* The cable was wrapped 360° around ø60mm mandrel.

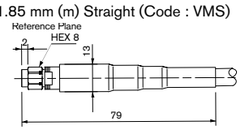
061 Phase Change vs. Temperature



The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

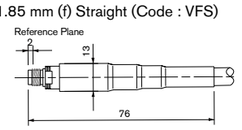
Connector

1.85 mm (m) Straight (Code : VMS)



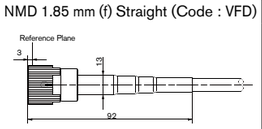
Maximum Operating Frequency : 67.0 GHz / Mass : 11g

1.85 mm (f) Straight (Code : VFS)



Maximum Operating Frequency : 67.0 GHz / Mass : 14g

NMD 1.85 mm (f) Straight (Code : VFD)



Maximum Operating Frequency : 67.0 GHz / Mass : 60g

*Refer to P0-4 Connector Code Table for othrer applicable connectors.

Option

Non-armored type (1.85mm connector) can be used for 061.
Please contact us.

* The above figures are measured values for reference only.

0 Series Cable Assemblies with High Phase Stability for Measuring Instruments

071

Features

- Phase Stability: Static Bending
- Phase Stability: Temperature Change
- Maximum Operating Frequency: 70.0 GHz
- Temperature Range: -30 to 85°C
- Days to Ship: 11 Business Days
- RoHS Compliant

Property

Electrical Properties

Maximum Operating Frequency	70.0 GHz
Characteristic Impedance (Typical)	50±1 Ω
Capacitance (Typical)	90 pF/m
Propagation Delay (Typical)	4.35 ns/m
Velocity of Propagation (Typical)	77 %
Higher Mode Frequency (Typical)	70 GHz
VSWR (Typical)	1.46
Maximum Frequency Insertion Loss (70.0 GHz)	7.5 dB/m

Mechanical Properties

Cable Outer Diameter	6.6 mm
Minimum Bending Radius (Inner Side)	30 mm
Cable Mass (Typical)	73 g/m
Continuous Operating Temperature Range	-30~+85 °C
Armored Side Pressure	196 N/cm
Assembly Length	700~1,500 mm

Order Form Example

Please provide the following information when placing an order.

Example MWX071

* See P. 0-4 "Connector Codes"

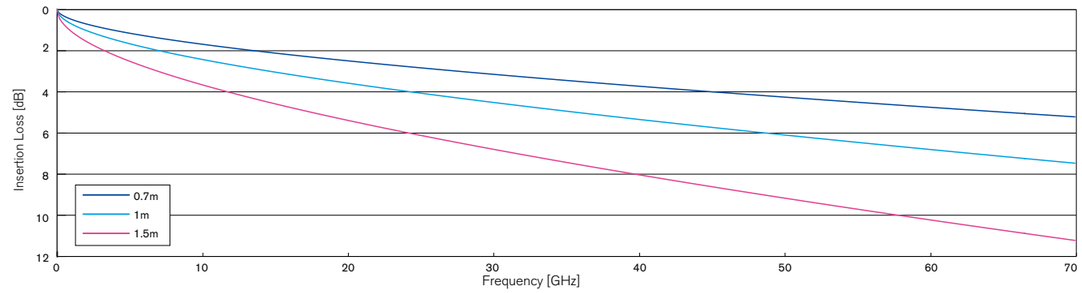
Assembly Length: 700 mm
Connector I : 1.85 mm (f) Straight
Connector II : 1.85 mm (m) Straight

Catalog No.
MWX071-00700VFSVMS/B
a b c d

a. Cable
b. Assembly Length
c. Connector
d. Armored

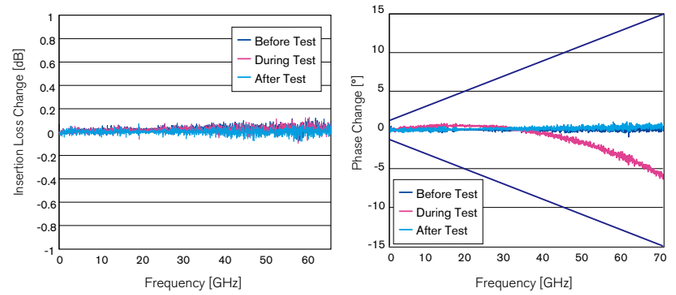
Technical Data

Cable Typical Insertion Loss



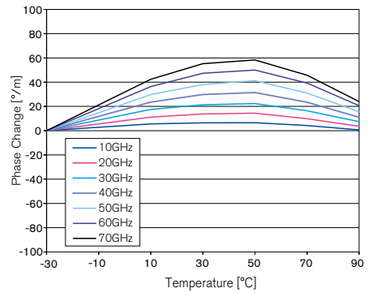
Typical iInsertion Loss $(0.0232\times f[GHz]+0.702\sqrt{f[GHz]}+0.02)\times L[m]$ **Maximum Insertion Loss** $(0.0232\times f[GHz]+0.702\sqrt{f[GHz]}+0.02))\times 1.12\times L[m]$

Static Bending Data (Insertion Loss, Phase) Bending Radius : 30 mm



* Guaranteed value within ±15° at 70 GHz (In shipping value).
* The cable was wrapped 360° around ø60mm mandrel.

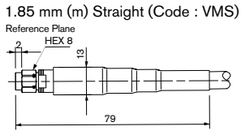
071 Phase Change vs. Temperature



The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

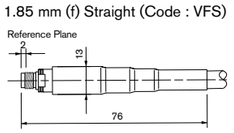
Connector

1.85 mm (m) Straight (Code : VMS)



Maximum Operating Frequency : 70.0 GHz /
Mass : 11g

1.85 mm (f) Straight (Code : VFS)



Maximum Operating Frequency : 70.0 GHz /
Mass : 14g

*Refer to P0-4 Connector Code Table for othrer applicable connectors.

* The above figures are measured values for reference only.

0 Series Cable Assemblies with High Phase Stability for Measuring Instruments

001

Features

- Phase Stability: Static Bending
- Phase Stability: Temperature Change
- Maximum Operating Frequency: 110.0 GHz
- Temperature Range: -30 to 85°C
- Days to Ship: 15 Business Days
- RoHS Compliant

Property

Electrical Properties

Maximum Operating Frequency	110.0 GHz
Characteristic Impedance	50 Ω
Capacitance (Typical)	88 pF/m
Propagation Delay (Typical)	4.2 ns/m
Velocity of Propagation (Typical)	79 %
Higher Mode Frequency (Typical)	110 GHz
VSWR (Typical)	1.43
Maximum Frequency Insertion Loss (110.0 GHz)	11.8 dB/m

Mechanical Properties

Cable Outer Diameter	4.0 mm
Minimum Bending Radius (Inner Side)	15 mm
Cable Mass (Typical)	50 g/m
Continuous Operating Temperature Range	-30~+85 °C
Armored Side Pressure	157 N/cm
Assembly Length	100~200 mm

Order Form Example

Please provide the following information when placing an order.

Example MWX001

* See P. 0-4 "Connector Codes"

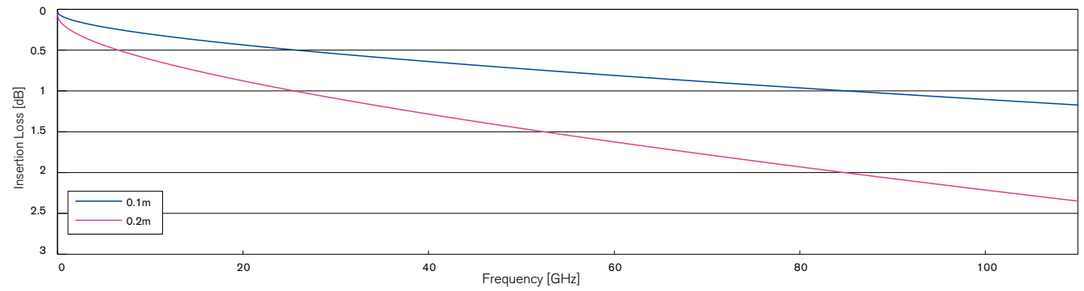
Assembly Length: 100 mm
Connector Ⅰ : 1.0 mm (f) Straight
Connector Ⅱ : 1.0 mm (m) Straight

Catalog No.
MWX001-00100WFSWMT/B
a b c d

a. Cable
b. Assembly Length
c. Connector
d. Armored

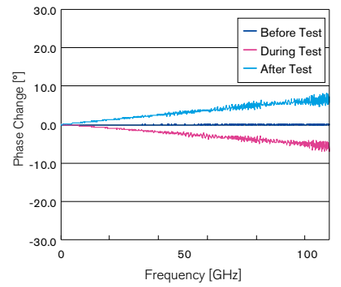
Technical Data

Cable Typical Insertion Loss



Typical Insertion Loss 0.86X(0.035×f[GHz]+0.9×√f[GHz]+0.4)×L[m] **Maximum Insertion Loss** 0.86X(0.035×f[GHz]+0.9×√f[GHz]+0.4)×1.12×L[m]

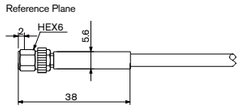
Static Bending Data (Insertion Loss, Phase) Bending Radius : 15 mm



* The cable was wrapped 90° around ø30mm mandrel.

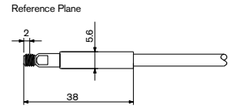
Connector

1.0 mm (m) Safty Lock (Code : WMT)



Maximum Operating Frequency : 110.0 GHz / Mass: 4g

1.0 mm (f) Straight (Code : WFS)



Maximum Operating Frequency : 110.0GHz / Mass : 2g

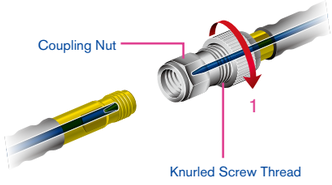
*Refer to P0-4 Connector Code Table for othrer applicable connectors.

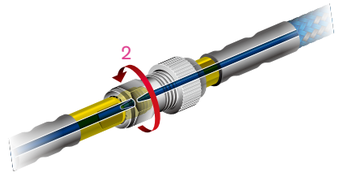
How to Use "Safety Lock Mechanism" of 1.0mm (m) Connector

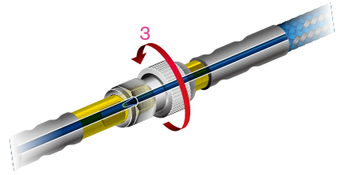
1 Rotate the knurled parts and check the knurled screw thread. Central pin is located back side, seeing from the coupling nut side.

2 Same as the normal 1.0mm(m) connectors, it the coupling nut with female connector. They will be fixed under the condition that both connector' s central axis is matched. Central pin has not connected yet.

3 Rotate the knurled parts, then let the cable side central pin forward, and insert to female connector's socket. With the help of fixed coupling nut, central axis is matched. This helps not to happen pin's slanting.







* The above figures are measured values for reference only.

0 Series Cable Assemblies with High Phase Stability for Measuring Instruments

002

Features

- Phase Stability: Static Bending
- Phase Stability: Temperature Change
- Maximum Operating Frequency: 120.0 GHz
- Temperature Range: -30 to 85°C
- Days to Ship: 15 Business Days
- RoHS Compliant

Property

Electrical Properties

Maximum Operating Frequency	120.0 GHz
Characteristic Impedance	50 Ω
Capacitance (Typical)	88 pF/m
Propagation Delay (Typical)	4.2 ns/m
Velocity of Propagation (Typical)	79 %
Higher Mode Frequency (Typical)	120 GHz
VSWR (Typical)	1.43
Maximum Frequency Insertion Loss (67.0 GHz) 120.0 GHz)	14.5 dB/m

Mechanical Properties

Cable Outer Diameter	4.0 mm
Minimum Bending Radius (Inner Side)	15 mm
Cable Mass (Typical)	50 g/m
Continuous Operating Temperature Range	-30~+85 °C
Armored Side Pressure	157 N/cm
Assembly Length	100~200 mm

Order Form Example

Please provide the following information when placing an order.

Example MWX002

* See P. 0-4 "Connector Codes"

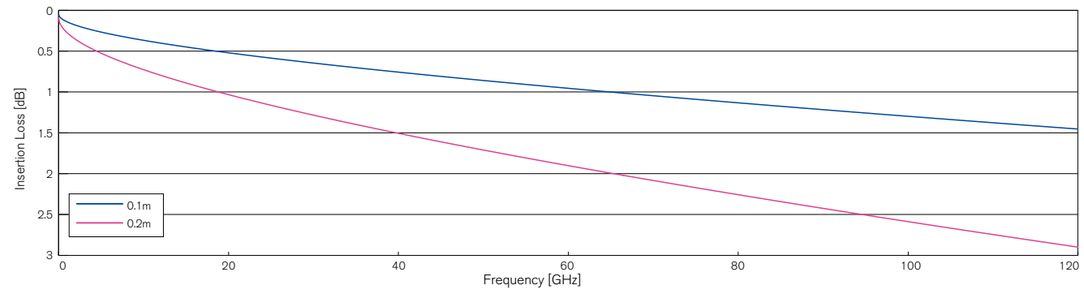
Assembly Length: 100 mm
Connector Ⅰ : 1.0 mm (f) Straight
Connector Ⅱ : 1.0 mm (m) Straight

Catalog No.
MWX002-00100WFSWMT/B
a b c d

a. Cable
b. Assembly Length
c. Connector
d. Armored

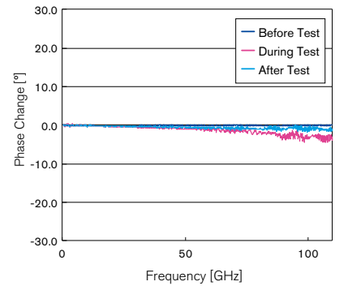
Technical Data

Cable Typical Insertion Loss



Typical Insertion Loss $(0.035\times f[GHz]+0.9\times\sqrt{f[GHz]}+0.4)\times L[m]$ **Maximum Insertion Loss** $(0.035\times f[GHz]+0.9\times\sqrt{f[GHz]}+0.4)\times 1.12\times L[m]$

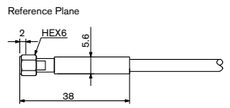
Static Bending Data (Insertion Loss, Phase) Bending Radius



* The cable was wrapped 90° around ø30mm mandrel.

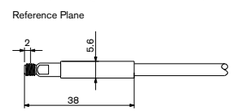
Connector

1.0mm (m) Straight (Code : WMS)



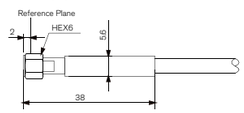
Maximum Operating Frequency : 120.0GHz / Mass : 3g

1.0mm (f) Straight (Code : WFS)



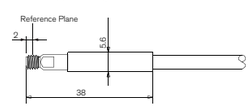
Maximum Operating Frequency : 120.0GHz / Mass : 2g

1.0 mm (m) Straigh (Code : WMS1)



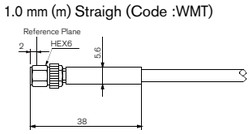
Maximum Operating Frequency : 110GHz / Mass : 3g

1.0 mm (f) Straigh (Code :WFS1)



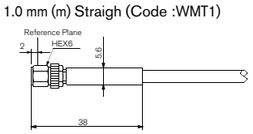
Maximum Operating Frequency : 110GHz / Mass : 2g

1.0 mm (m) Straigh (Code :WMT)



Maximum Operating Frequency : 120GHz / Mass : 4g

1.0 mm (m) Straigh (Code :WMT1)



Maximum Operating Frequency : 110GHz / Mass : 4g

*Refer to P0-4 Connector Code Table for othrer applicable connectors.

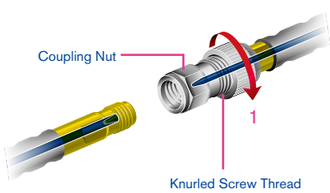
* The above figures are measured values for reference only.

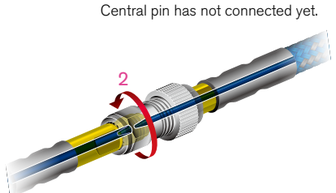
How to Use "Safety Lock Mechanism" of 1.0mm (m) Connector

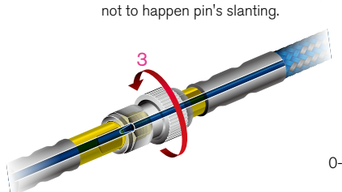
Rotate the knurled parts and check the knurled screw thread. Central pin is located back side, seeing from the coupling nut side.

Same as the normal 1.0mm(m) connectors, it the coupling nut with female connector. They will be fixed under the condition that both connector' s central axis is matched. Central pin has not connected yet.

Rotate the knurled parts, then let the cable side central pin forward, and insert to female connector's socket. With the help of fixed coupling nut, central axis is matched. This helps not to happen pin's slanting.







0 Series Cable Assemblies with High Phase Stability for Measuring Instruments

004

Features

- Phase Stability: Static Bending
- Phase Stability: Temperature Change
- Maximum Operating Frequency: 145.0 GHz
- Temperature Range: -30 to 85°C
- Days to Ship: 15 Business Days
- RoHS Compliant

Property

Electrical Properties

Maximum Operating Frequency	145.0 GHz
Characteristic Impedance (Typical)	50 Ω
Capacitance (Typical)	90 pF/m
Propagation Delay (Typical)	4.5 ns/m
Velocity of Propagation (Typical)	74 %
Higher Mode Frequency (Typical)	145 GHz
VSWR (Typical)	1.5
Maximum Frequency Insertion Loss (145.0 GHz)	28.1 dB/m

Mechanical Properties

Cable Outer Diameter	4.0 mm
Minimum Bending Radius (Inner Side)	20 mm
Cable Mass (Typical)	50 g/m
Continuous Operating Temperature Range	-30~+85 °C
Armored Side Pressure	157 N/cm
Assembly Length	100~200 mm

Order Form Example

Please provide the following information when placing an order.

Example MWX004

* See P. 0-4 "Connector Codes"

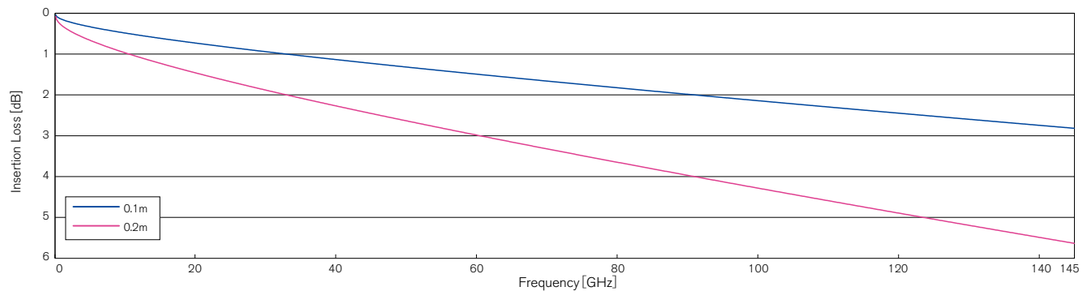
Assembly Length: 100 mm
Connector I : 1.0 mm (f) Straight
Connector II : 1.0 mm (m) Straight

Catalog No.
MWX004-00100MFSMMT/B
a b c d

a. Cable
b. Assembly Length
c. Connector
d. Armored

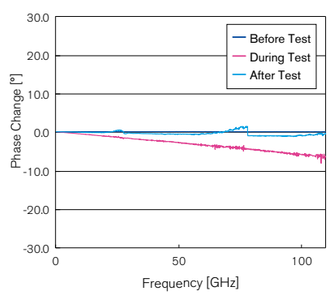
Technical Data

Cable Typical Insertion Loss



Typical Insertion Loss $(0.1\times f[GHz]+1.1\times\sqrt{f[GHz]}+0.4)\times L[m]$ **Maximum Insertion Loss** $(0.1\times f[GHz]+1.1\times\sqrt{f[GHz]}+0.4)\times 1.12\times L[m]$

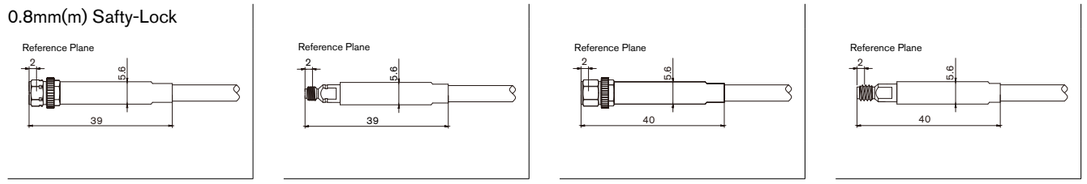
Static Bending Data (Insertion Loss, Phase) Bending Radius: 15mm



* The cable was wrapped 90° around ø30mm mandrel.

Connector

0.8mm(m) Safty-Lock

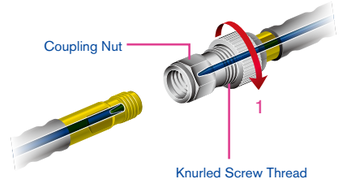


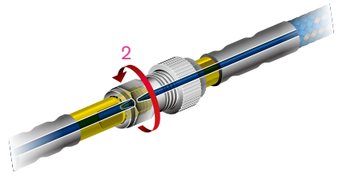
How to Use "Safety Lock Mechanism" of 1.0mm / 0.8mm (m) Connector

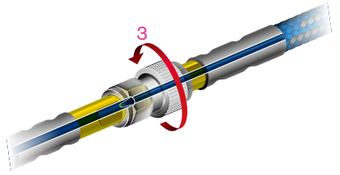
1 Rotate the knurled parts and check the knurled screw thread. Central pin is located back side, seeing from the coupling nut side.

2 Same as the normal 1.0 / 0.8mm(m) connectors, it the coupling nut with female connector. They will be fixed under the condition that both connector' s central axis is matched. Central pin has not connected yet.

3 Rotate the knurled parts, then let the cable side central pin forward, and insert to female connector's socket. With the help of fixed coupling nut, central axis is matched. This helps not to happen pin's slanting.







* The above figures are measured values for reference only.

Series Common Properties

Connector Insertion Loss [dB/connector]

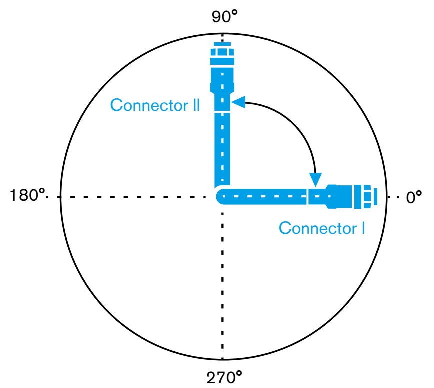
Connector Type	Connector Insertion Loss	Frequency [GHz] 1.0 GHz	10.0 GHz	18.5 GHz	26.5 GHz	40.0 GHz	50.0 GHz	67.0 GHz
SSMA (m) Straight	0.03√f	0.03	0.09	0.13	-	-	-	-
SMA (m) Straight	0.03√f	0.03	0.09	0.13	0.15	0.19	-	-
SMA (f) Straight	0.03√f	0.03	0.09	0.13	-	-	-	-
SMA (m) Right Angle	0.07√f	0.07	0.22	0.3	-	-	-	-
SMA (m) Swept	0.04√f	0.04	0.13	0.17	-	-	-	-
TNC (m) Straight	0.07√f	0.07	0.22	0.3	-	-	-	-
N (m) Straight	0.05√f	0.05	0.16	0.22	-	-	-	-
N (f) Straight	0.05√f	0.05	0.16	0.22	-	-	-	-
N (m) Swept	0.06√f	0.06	0.19	0.26	-	-	-	-
SMP (f) Straight	0.12√f	0.12	0.38	0.52	-	-	-	-
SMPM (f) Straight	0.12√f	0.12	0.38	0.52	0.62	0.76	0.85	0.98
3.5mm (m) Straight	0.03√f	0.03	0.09	0.13	0.15	-	-	-
3.5mm (f) Straight	0.03√f	0.03	0.09	0.13	0.15	-	-	-
3.5mm (m) Swept	0.04√f	0.04	0.13	0.17	0.21	-	-	-
2.92mm (m) Straight	0.03√f	0.03	0.09	0.13	0.15	0.19	-	-
2.92mm (f) Straight	0.03√f	0.03	0.09	0.13	0.15	0.19	-	-
2.92mm (m) Swept	0.04√f	0.04	0.13	0.17	0.21	0.25	-	-
2.4mm (m) Straight	0.042√f	0.04	0.13	0.18	0.22	0.27	0.3	-
2.4mm (f) Straight	0.042√f	0.04	0.13	0.18	0.22	0.27	0.3	-
1.85mm (m) Straight	0.065√f	0.065	0.206	0.28	0.33	0.41	0.46	0.53
1.85mm (f) Straight	0.065√f	0.065	0.206	0.28	0.33	0.41	0.46	0.53
1.0mm (m) Straight	0.065√f	0.065	0.206	0.28	0.33	0.41	0.46	0.53
1.0mm (f) Straight	0.065√f	0.065	0.206	0.28	0.33	0.41	0.46	0.53

Tolerances for Assembly Length

Tolerance values of 0, 1, 2 and 3 series are shown below.
Please contact us if your tolerance requirements for phase matching are more stringent.

Assembly Length [mm]	Tolerance [mm]
L≦1000	±10
1000<L≦2000	±20
2000<L≦5000	±50
5000<L	±100

About Customer-Specified Swept and Right-Angle Connectors



The angle of Connector Ⅱ relative to Connector Ⅰ when Connector Ⅰ is assumed to be at 0° (as viewed from the direction of Connector Ⅰ) is indicated by three digits following the catalog number.
(The indication is omitted if the angle is 0°.)
Example : If Connector Ⅱ is at an angle of 90° when viewed from the direction of Connector Ⅰ : MWX312-01000AMRAMR-090

Technical Data

Return Loss – VSWR Conversion Table

Return Loss dB	Voltage Standing Wave Ratio VSWR	Reflection Coefficient
60	1.002	0.001
50	1.006	0.003
40	1.020	0.010
35	1.036	0.018
30	1.065	0.032
29	1.074	0.035
28	1.083	0.040
27	1.094	0.045
26	1.106	0.050
25	1.119	0.056
24	1.135	0.063
23	1.152	0.071
22	1.173	0.079
21	1.196	0.089
20	1.222	0.100
19	1.253	0.112
18	1.288	0.126
17	1.329	0.141
16	1.377	0.158
15	1.433	0.178
14	1.499	0.200
13	1.577	0.224
12	1.671	0.251
11	1.785	0.282
10	1.925	0.316

VSWR – Return Loss Conversion Table

Voltage Standing Wave Ratio VSWR	Return Loss dB	Reflection Coefficient	Propagation Loss dB
1.01	46.1	0.005	0.0001
1.02	40.1	0.010	0.0004
1.03	36.6	0.015	0.0010
1.04	34.2	0.020	0.0017
1.05	32.3	0.024	0.0025
1.06	30.7	0.029	0.0037
1.07	29.4	0.034	0.0050
1.08	28.3	0.038	0.0063
1.09	27.3	0.043	0.0080
1.10	26.4	0.048	0.0100
1.15	23.1	0.070	0.0213
1.20	20.8	0.091	0.0361
1.25	19.1	0.111	0.0538
1.30	17.7	0.130	0.0740
1.35	16.5	0.149	0.0975
1.40	15.6	0.167	0.1228
1.45	14.7	0.184	0.1496
1.50	14.0	0.200	0.1773
1.60	12.7	0.231	0.2382
1.70	11.7	0.259	0.3016
1.80	10.9	0.286	0.3706
1.90	10.2	0.310	0.4388
2.00	9.5	0.333	0.5104
3.00	6.0	0.500	1.2494
4.00	4.4	0.600	1.9382

db Table

Power Ratio P2/P1	dB Dp	Current Ratio/ Voltage Ratio $I_2/I_1 \cdot V_2/V_1$	dB Di·Dv
×0.01	-20dB	×0.01	-40dB
×0.1	-10dB	×0.1	-20dB
×1	0dB	×1	0dB
×2	3.0dB	×2	6.0dB
×3	4.8dB	×3	9.5dB
×4	6.0dB	×4	12.0dB
×5	7.0dB	×5	14.0dB
×6	7.8dB	×6	15.6dB
×7	8.5dB	×7	16.9dB
×8	9.0dB	×8	18.1dB
×9	9.5dB	×9	19.1dB
×10	10dB	×10	20dB
×100	20dB	×100	40dB
×1000	30dB	×1000	60dB

Power : $D_p = 10\log_{10}\frac{P_2}{P_1}$ [dB]

Current : $D_i = 20\log_{10}\frac{I_2}{I_1}$ [dB]

Voltage : $D_v = 20\log_{10}\frac{V_2}{V_1}$ [dB]

- Power level "dBm" represents the absolute value with respect to the standard 0[dBm] for 1[m/W]. P[mW] is given by 10log10P[dBm].

1. VSWR $= \frac{1+\rho}{1-\rho} = \frac{1+10^{-\frac{RL}{20}}}{1-10^{-\frac{RL}{20}}}$

2. Return Loss RL (dB) $= -20\log\rho$ $= -20\log\frac{VSWR-1}{VSWR+1}$

3. Reflection Coefficient $\rho = (VSWR-1) / (VSWR+1) = 10^{-\frac{RL}{20}}$

4. Propagation Loss α (dB) $= -10\log(1-\rho^2)$ $= -10\log\left(1-\left(\frac{VSWR-1}{VSWR+1}\right)^2\right)$

Relationship between frequency and wavelength
$f = \frac{c}{\lambda}$ where $c = 2.998\times10^8$ [m/s]

Relationship between phase change θ[°],
frequency f [GHz],
cable length L[mm]and
propagation delay τ[nsec]

$L = 0.8328\times\theta\div\sqrt{\varepsilon_r}\div f$

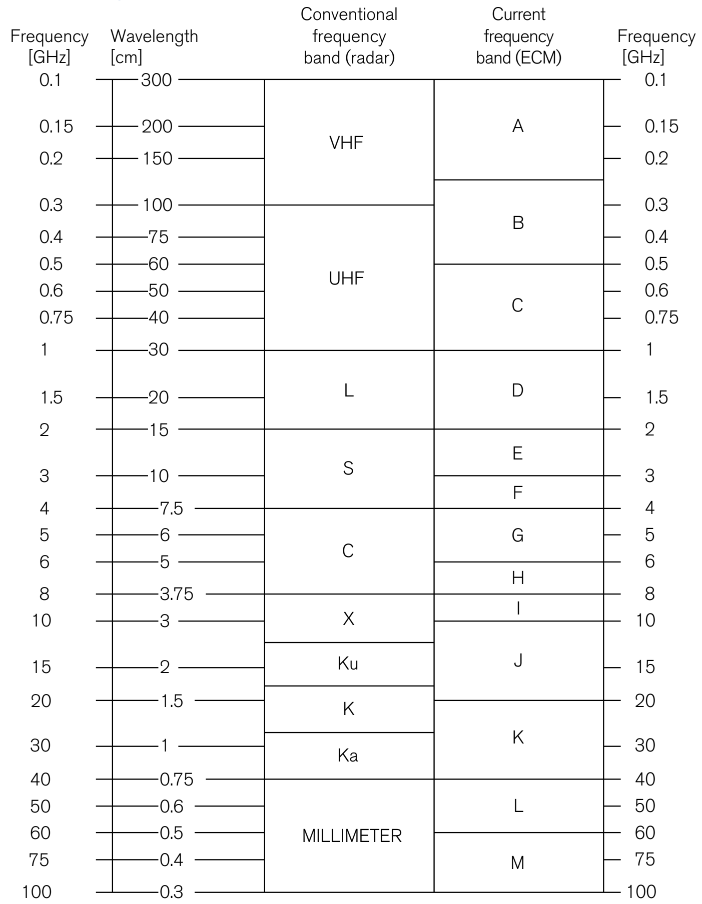
$\theta = 1.201\times L\times\sqrt{\varepsilon_r}\times f$

$\theta = 360\times f\times\tau$

where εr is the specific dielectric constant of the cable insulator.

Air : εr=1, Dense PTFE : εr≒2.1

Frequency Band Name and Code



* The above figures are measured values for reference only.