

MWX0 SERIES

Cable assemblies with high phase stability for measuring instruments

How to select

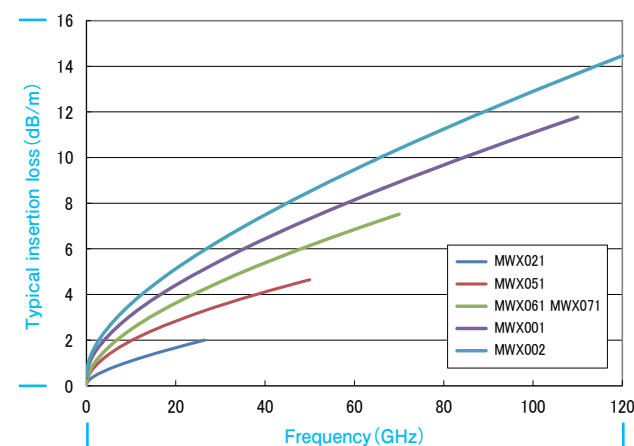
The MWX0 series cable assemblies offer excellent phase stability against temperature fluctuations and bending.

They are ideal for connecting to vector network analyzers for precision measurements.

(Continuous operating temperature range : from -30 to +85 °C)

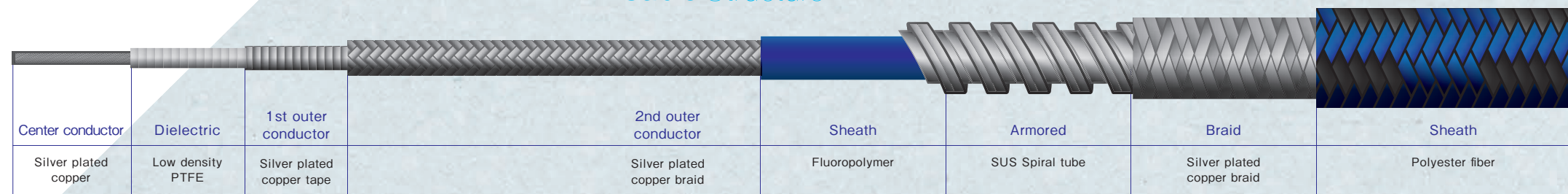
Cables are offered in wide range of the frequencies of 26.5, 50, 67, 70, 110 and 120 GHz with various connectors.

MWX0 Series typical insertion loss



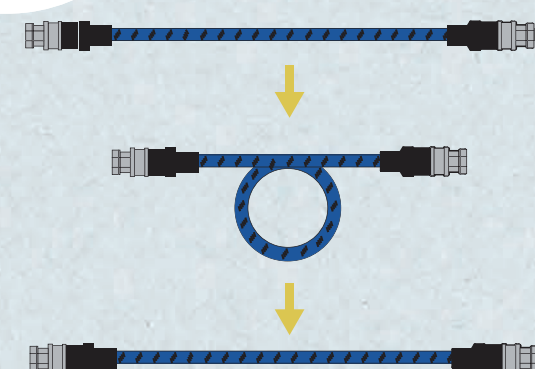
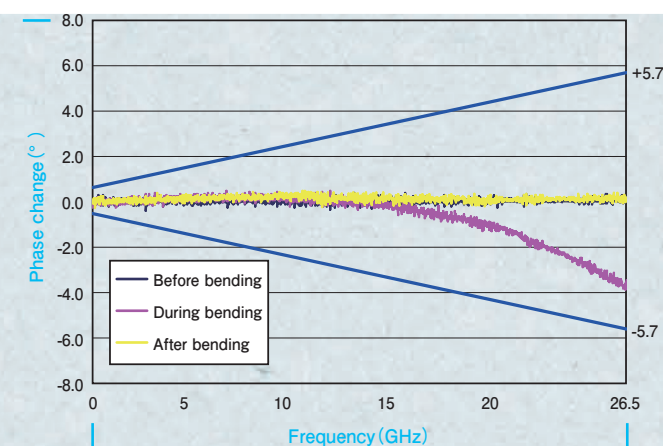
Simple criteria for cable selection

- Insertion loss: The larger the cable outer diameter, the lower the insertion loss.
- Frequency range: The smaller the cable, the higher 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.



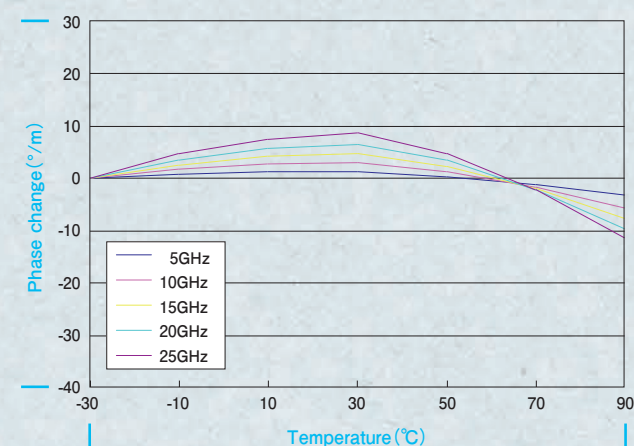
Cable Structure

MWX021 Static bending data



The cable was wrapped 360° around $\phi 60\text{mm}$ mandrel.
*Guaranteed value within $\pm 5.7^\circ$ at 26.5GHz (In shipping value)

MWX021 Phase change vs. temperature



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

Simple criteria for connector selection

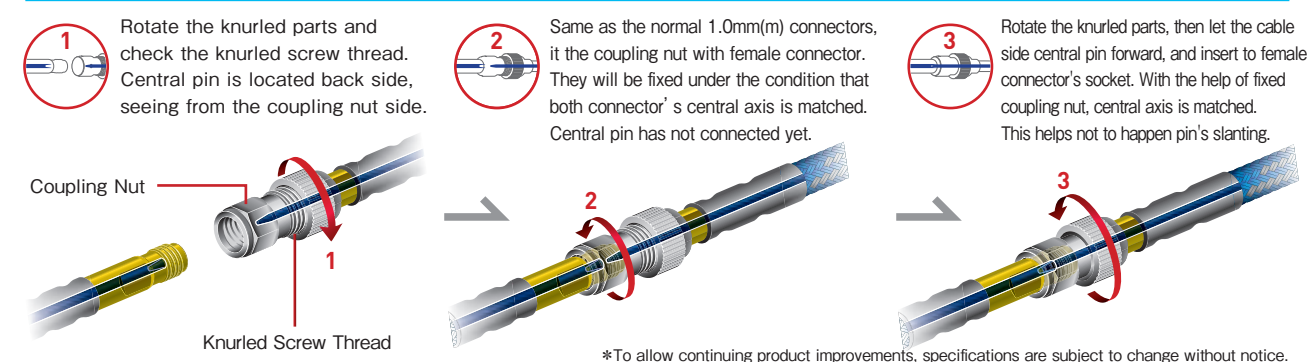
- Choose a suitable connector for your measuring instrument.
- The smaller the connector, the higher the maximum operating frequency.
- The larger the connector, the higher the power rating.

Connector compatibility

Cable type	Cable maximum operating frequency(GHz)	Compatible connector																
		18.0 GHz	18.5 GHz		26.5 GHz		40.0 GHz		50.0 GHz		67.0 GHz		70.0 GHz		110.0 GHz		120.0 GHz	
		N(m)	SMA(m)	SMA(f)	3.5mm(m)	3.5mm(f)	2.92mm(m)	2.92mm(f)	2.4mm(m)	2.4mm(f)	1.85mm(m)	1.85mm(f)	1.85mm(m)	1.85mm(f)	1.0mm(m)	1.0mm(f)	1.0mm(m)	1.0mm(f)
MWX021	26.5 GHz	●	●	●	●	●												
MWX051	50.0 GHz						●	●	●	●								
MWX061	67.0 GHz										●	●						
MWX071	70.0 GHz												●	●				
MWX001	110.0 GHz														●	●		
MWX002	120.0 GHz														●	●	●	●

*MWX002 is a under developing product. Please contact us.

How to use "safety lock mechanism" of 1.0mm(m) connector



*To allow continuing product improvements, specifications are subject to change without notice.

MWX0 SERIES MWX 021



Property

Electrical properties

Maximum operating frequency	26.5 GHz
Characteristic impedance	50±1 Ω
Capacitance (typ.)	85 pF/m
Propagation delay (typ.)	4.21 ns/m
Wavelength reduction rate (typ.)	79 %
Higher mode frequency (typ.)	28 GHz
VSWR (per connector/ both ends of assy.)	1.153/1.33
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 (typ.)	122 g/m
Continuous operating temperature range	-30~+85 °C
Armored side pressure	196N/cm
Assembly length	700~1,500 mm

Order form example

Please provide the following information when placing an order.

* See P.25 "Connector combination codes"

Example MWX021

Assembly length : 1000 mm
Connector I : 3.5 mm (f) straight
Connector II : 3.5 mm (m) straight

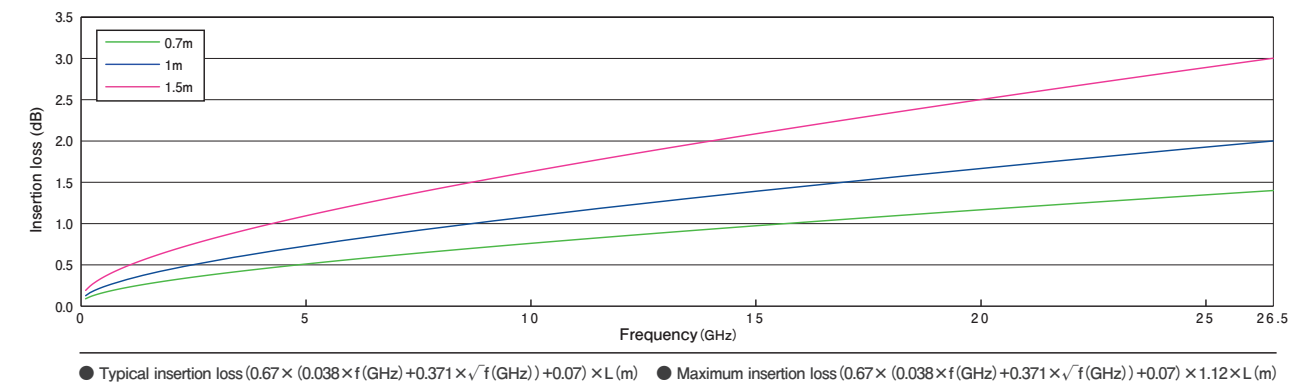
Catalog No.:
MWX021-01000DFSDMS/B

a b c d

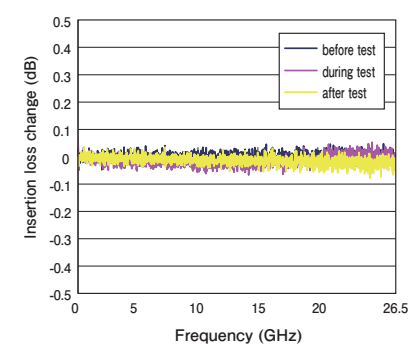
a:Cable
b:Assembly length
c:Connector
d:Armored

Technical Data

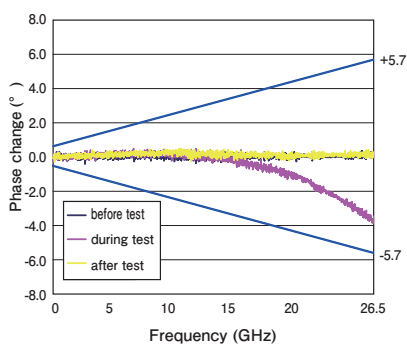
Cable typical insertion loss



Static bending data (insertion loss, phase)

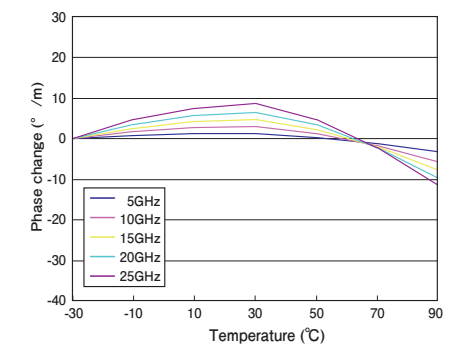


Bending radius: 30 mm



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

MWX021 Phase change vs. temperature

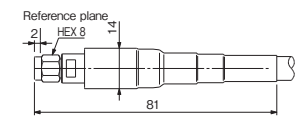


The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed.
Figure shows the excellent phase stability over the temperature changes.

Connector

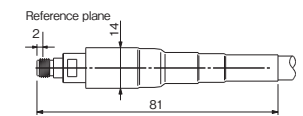
SMA(m) straight (Code:AMS)

Maximum operating frequency:18.5 GHz / Mass:18g



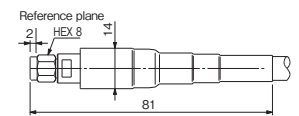
SMA(f) straight (Code:AFS)

Maximum operating frequency:18.5 GHz / Mass:17g



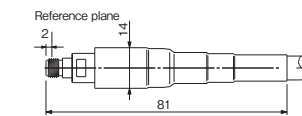
3.5mm(m) straight (Code:DMS)

Maximum operating frequency:26.5 GHz / Mass:18g



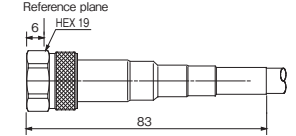
3.5mm(f) straight (Code:DFS)

Maximum operating frequency:26.5 GHz / Mass:17g



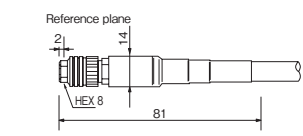
N(m) straight (Code:NMS)

Maximum operating frequency:18.0 GHz / Mass:43g



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

Maximum operating frequency:26.5 GHz / Mass:24g



*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.

MWX0 SERIES MWX 051



Property

Electrical properties

Maximum operating frequency	50.0 GHz
Characteristic impedance	50±1 Ω
Capacitance (typ.)	85 pF/m
Propagation delay (typ.)	4.19 ns/m
Wavelength reduction rate (typ.)	79 %
Higher mode frequency (typ.)	61 GHz
VSWR (per connector/ both ends of assy.)	1.21 / 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 (typ.)	76 g/m
Continuous operating temperature range	-30~+85 °C
Armored side pressure	196 N/cm
Assembly length	700~1,500 mm

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

a:Cable
b:Assembly length
c:Connector
d:Armored

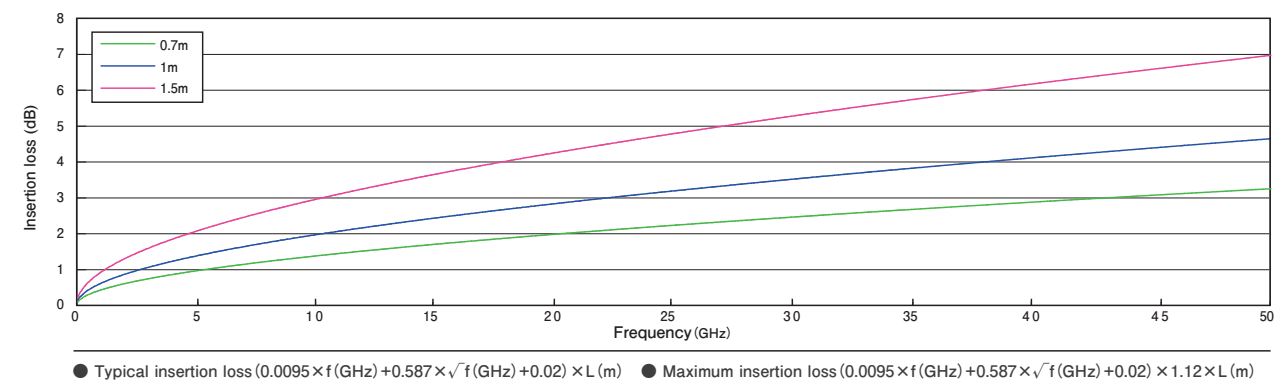
Order form example

Please provide the following information when placing an order.

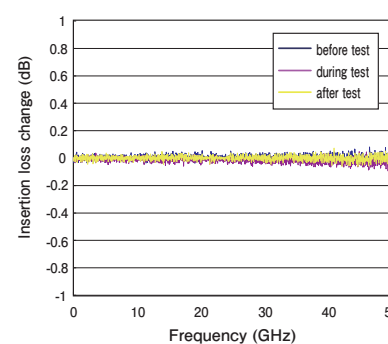
* See P.25 "Connector combination codes"

Technical Data

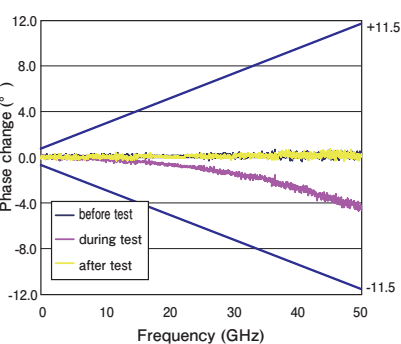
Cable typical insertion loss



Static bending data (insertion loss, phase)

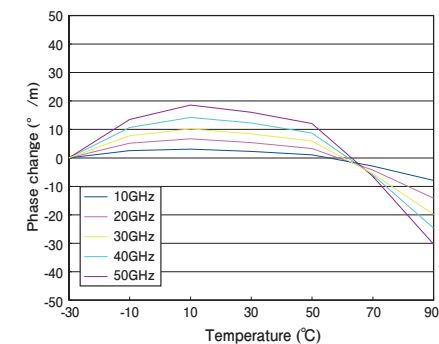


Bending radius: 30 mm



*Guaranteed value within ±11.5° at 50 GHz (In shipping value).
*The cable was wrapped 360° around φ60mm mandrel.

MWX051 Phase change vs. temperature

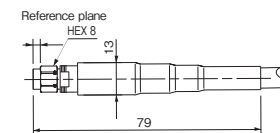


The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed.
Figure shows the excellent phase stability over the temperature changes.

Connector

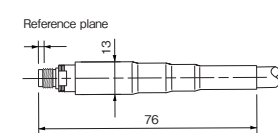
2.4 mm (m) straight (Code:LMS)

Maximum operating frequency:50.0 GHz / Mass:11g



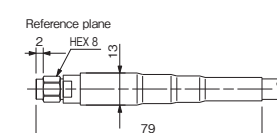
2.4 mm (f) straight (Code:LFS)

Maximum operating frequency:50.0 GHz / Mass:14g



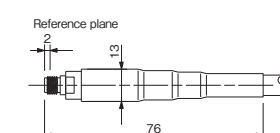
2.92 mm (m) straight (Code:KMS)

Maximum operating frequency:40.0 GHz / Mass:12g



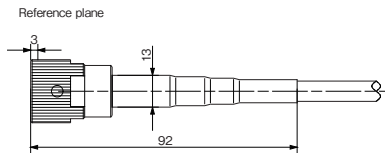
2.92 mm (f) straight (Code:KFS)

Maximum operating frequency:40.0 GHz / Mass:14g



NMD 2.4mm(f) straight (Custom-made)

Maximum operating frequency:50.0 GHz / Mass:60g



Option

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



*The above figures are measured values for reference only.

MWX0 SERIES

MWX 061

Static bending

Temperature change

Frequency 67.0 GHz

Temperature range -30~+85°C

Minimum bending radius 30 mm

RoHS compliant

Measurement

Armored

Delivery time 5 days

Listed in the catalogue; manufactured to order

Custom support



Property

Electrical properties

Maximum operating frequency	67.0 GHz
Characteristic impedance	50±1 Ω
Capacitance (typ.)	90 pF/m
Propagation delay (typ.)	4.35 ns/m
Wavelength reduction rate (typ.)	77 %
Higher mode frequency (typ.)	70 GHz
VSWR (per connector/ both ends of assy.)	1.21 / 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 (typ.)	73 g/m
Continuous operating temperature range	-30~+85 °C
Armored side pressure	196 N/cm
Assembly length	700~1,500 mm

Example MWX061

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

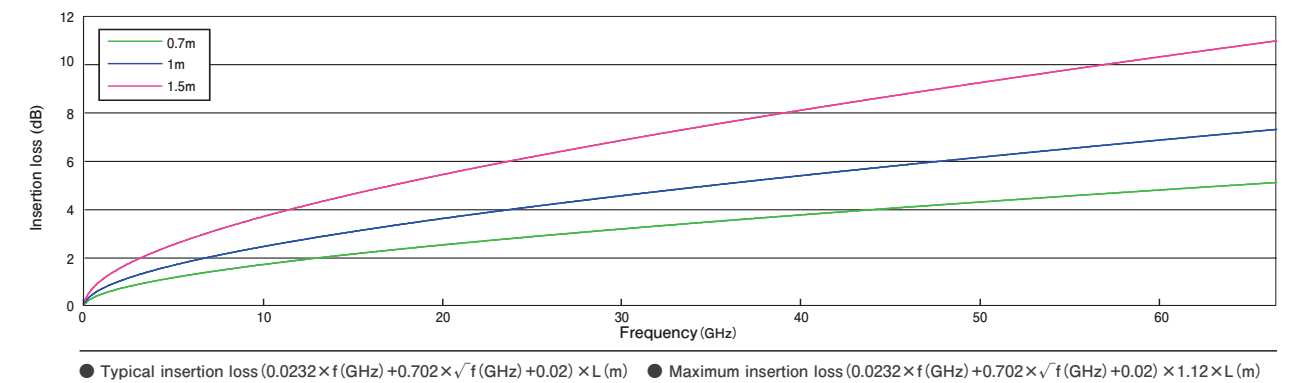
Order form example

Please provide the following information when placing an order.

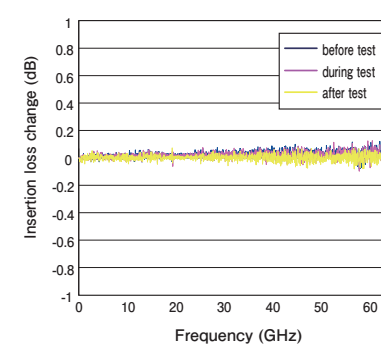
* See P.25 "Connector combination codes"

Technical Data

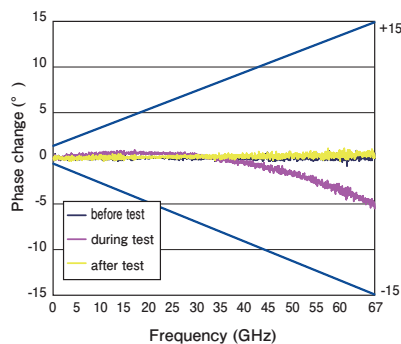
Cable typical insertion loss



Static bending data (insertion loss, phase)

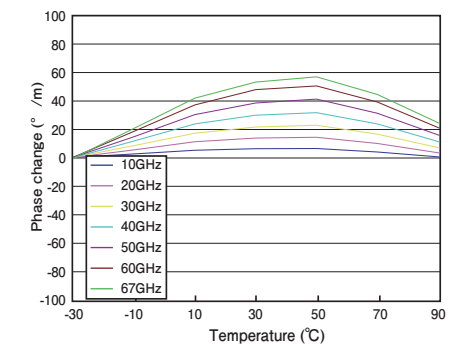


Bending radius: 30 mm



*Guaranteed value within ±15° at 67 GHz (In shipping value).
*The cable was wrapped 360° around φ60mm mandrel.

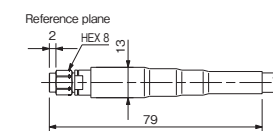
MWX061 Phase change vs. temperature



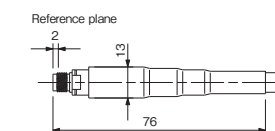
The cable was measured in chamber every 20 °C from -30 to 90 °C, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

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



Option

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



*The above figures are measured values for reference only.

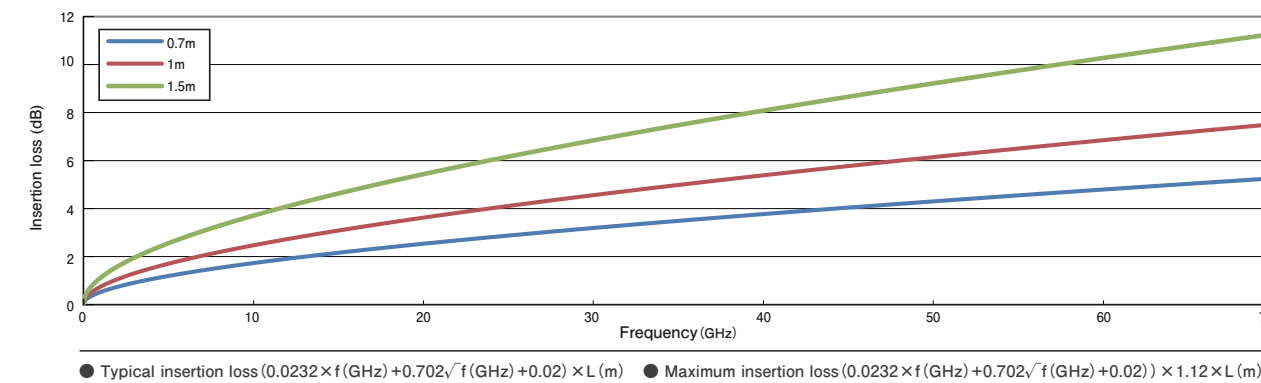
M W X 0 S E R I E S

MWX 071

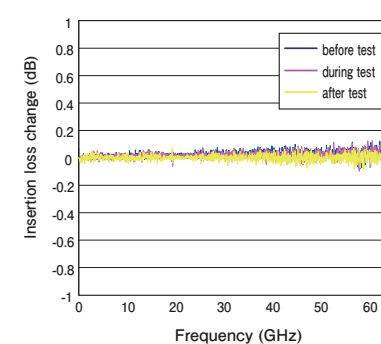


Technical Data

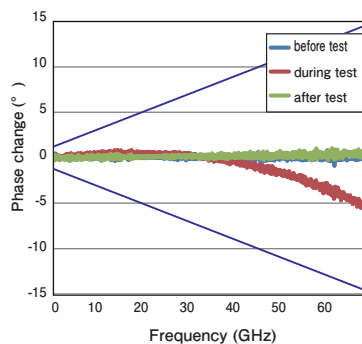
Cable typical insertion loss



Static bending data (insertion loss, phase)

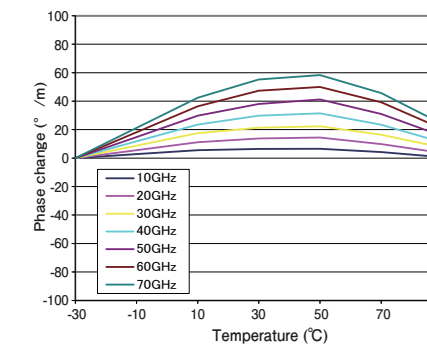


Bending radius: 30 mm



*Guaranteed value within $\pm 15^\circ$ at 70 GHz (In shipping value).
*The cable was wrapped 360° around $\phi 60\text{mm}$ mandrel.

MWX071 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.

Property

Electrical properties

Maximum operating frequency	70.0 GHz
Characteristic impedance	$50 \pm 1 \Omega$
Capacitance (typ.)	90 pF/m
Propagation delay (typ.)	4.35 ns/m
Wavelength reduction rate (typ.)	77 %
Higher mode frequency (typ.)	70 GHz
VSWR (per connector/ both ends of assy.)	1.21 / 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 (typ.)	73 g/m
Continuous operating temperature range	-30~+85 °C
Armored side pressure	196 N/cm
Assembly length	700~1,500 mm

Example MWX071

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

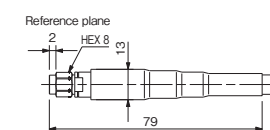
Order form example

Please provide the following information when placing an order.

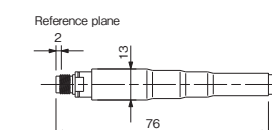
* See P.25 "Connector combination codes"

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




*The above figures are measured values for reference only.


MWX0 SERIES
MWX 001




Static bending




Temperature change




Frequency 110.0 GHz




Temperature range -30~+85°C




Minimum bending radius 15 mm




RoHS compliant




Measurement




Armored



Delivery time 5 days



Listed in the catalogue; manufactured to order



Custom support



Property

Electrical properties

Maximum operating frequency	110.0 GHz
Characteristic impedance	standard 50 Ω
Capacitance (typ.)	88 pF/m
Propagation delay (typ.)	4.2 ns/m
Wavelength reduction rate (typ.)	79 %
Higher mode frequency (typ.)	110 GHz
VSWR (per connector/ both ends of assy.)	1.197/1.43
Maximum frequency insertion loss(110.0 GHz)	11.8dB/m

Mechanical properties

Cable outer diameter	4.0 mm
Minimum bending radius (inner side)	15 mm
Cable mass (typ.)	50 g/m
Continuous operating temperature range	-30~+85 °C
Armored side pressure	157 N/cm
Assembly length	100~200 mm

Example MWX001

Assembly length: 100 mm
Connector I : 1.0 mm(f)straight
Connector II : 1.0 mm(m)straight

Catalog No.:
MWX001-00100WFSWMT/B

- a:Cable
b:Assembly length
c:Connector
d:Armored

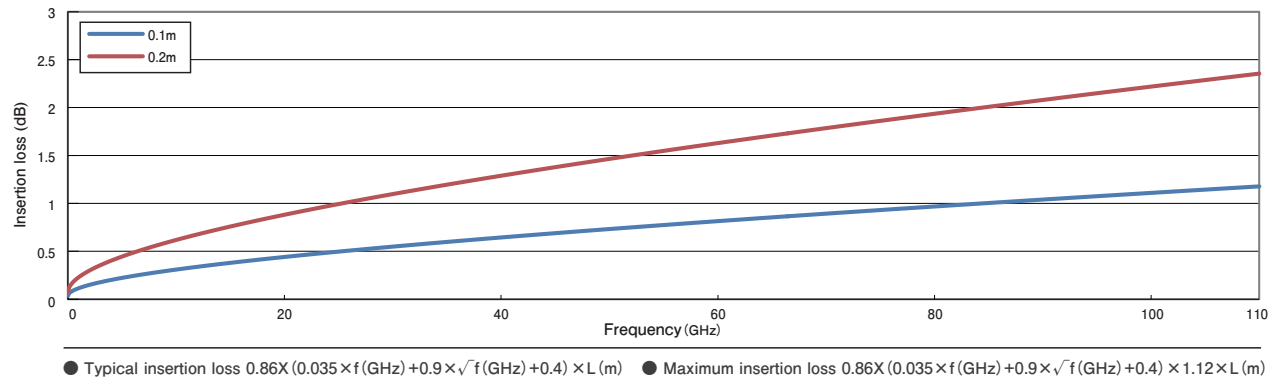
Order form example

Please provide the following information when placing an order.

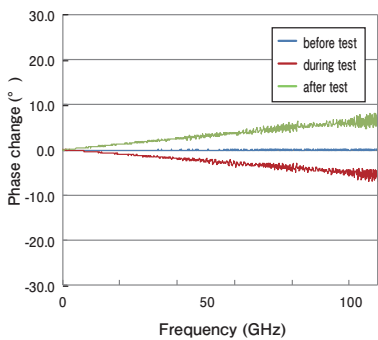
* See P.25 "Connector combination codes"

Technical Data

Cable typical insertion loss



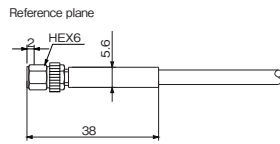
Static bending data (insertion loss, phase) Bending radius: 15 mm



Connector

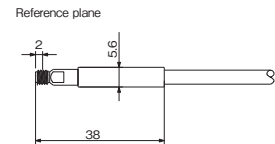
1.0mm(m) Safty Lock (Code:WMT)

Maximum operating frequency:110.0GHz / Mass:4g

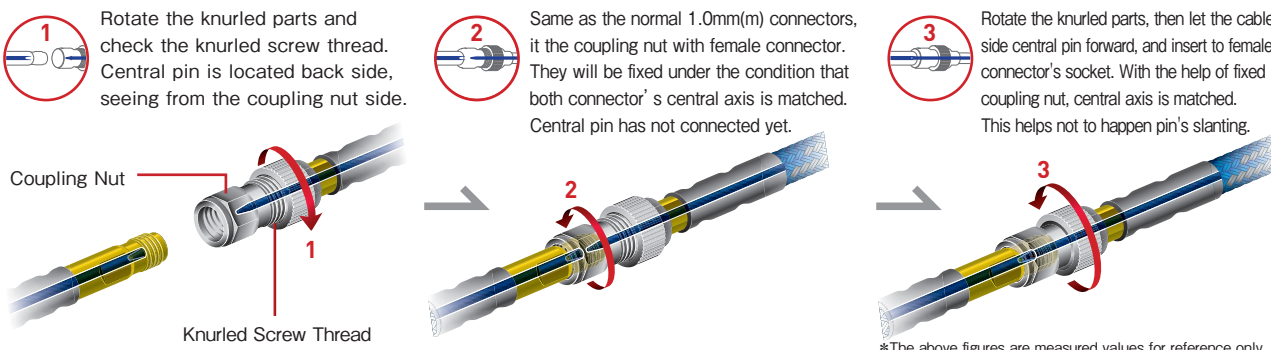


1.0mm(f)straight (Code:WFS)

Maximum operating frequency:110.0GHz / Mass:2g



How to use "safety lock mechanism" of 1.0mm(m) connector





Property

Electrical properties

Maximum operating frequency	120.0 GHz
Characteristic impedance	50 Ω
Capacitance (typ.)	88 pF/m
Propagation delay (typ.)	4.2 ns/m
Wavelength reduction rate (typ.)	79 %
Higher mode frequency (typ.)	120 GHz
VSWR (per connector/ both ends of assy.)	1.197/1.43
Maximum frequency insertion loss(120.0 GHz)	14.5 dB/m

Mechanical properties

Cable outer diameter	4.0 mm
Minimum bending radius (inner side)	15 mm
Cable mass (typ.)	50 g/m
Continuous operating temperature range	-30~+85 °C
Armored side pressure	157 N/cm
Assembly length	100~200 mm

Order form example

- MWX002 for up to 120GHz is a under developing product. Please contact us.
- MWX002 for up to 110GHz is a already released product. Please order it as below.

Up to 110 GHz (Already Released)

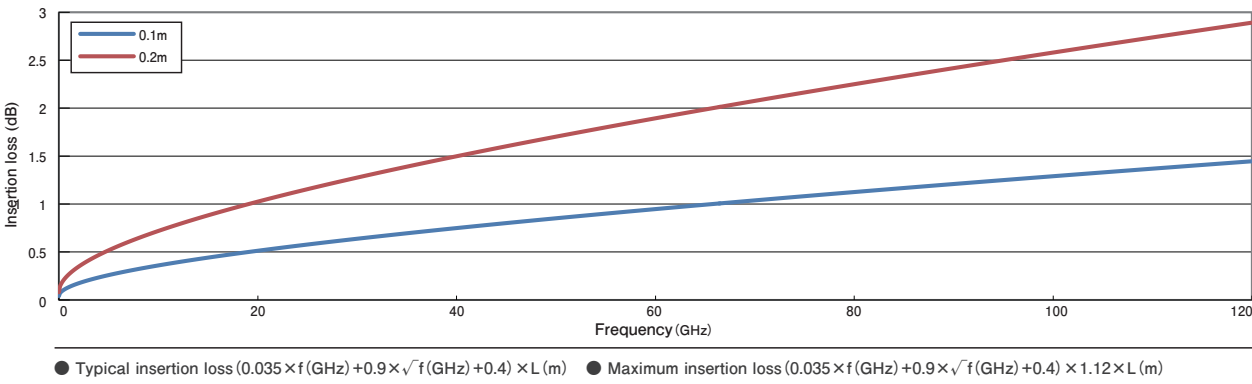
Assembly length: 150 mm
Connector I : 1.0 mm(f) straight
Connector II : 1.0 mm(m) straight

Catalog No.:
MWX002-00150WFS1WMS1/B

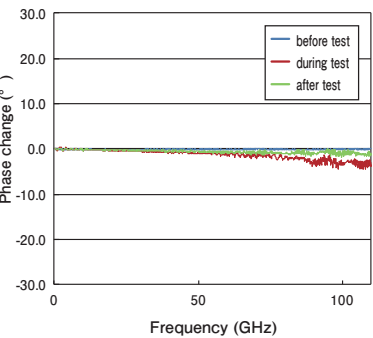
a:Cable
b:Assembly length
c:Connector
d:Armored

Technical Data

Cable typical insertion loss



Static bending data (insertion loss, phase) Bending radius: 15 mm

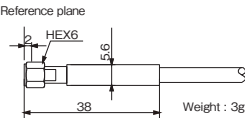


* The cable was wrapped 90° around φ30mm mandrel.

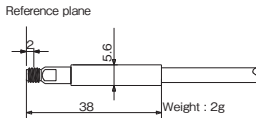
Connector

Up to 120 GHz: Enhanced 1.0mm Connector (Please contact us.)

1.0 mm (m) straight (Code:WMS)
Maximum operating frequency:120.0GHz / Mass:3g

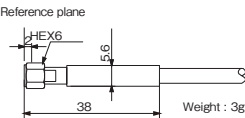


1.0 mm (f) straight (Code:WFS)
Maximum operating frequency:120.0GHz / Mass:2g

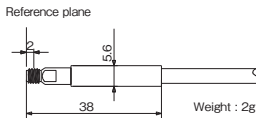


Up to 110 GHz: Standard 1.0mm Connector (Already released)

1.0mm(m) straight (Code : WMS1)
Maximum operating frequency:120.0GHz / Mass:3g



1.0mm(f) straight (Code : WFS1)
Maximum operating frequency:120.0GHz / Mass:2g



*The above figures are measured values for reference only.

MWX0 SERIES

Placing orders



ex.1
Cable : MWX021
Assembly length : 1000 mm
Connector I : 3.5 mm(f)straight
Connector II : 3.5 mm(m)straight
Armored : Armored-type

Catalog number
MWX021-01000 DFS DMS /B

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.

Delivery time

MWX0 series will be shipped within 5 business days after received order.
*Leadtime may be effected by larger order volume.

Connector combination codes for MWX021, MWX051, MWX061 and MWX071

Connector I \ Connector II			SMA	SMA	N	3.5mm	3.5mm Multi-Lock	3.5mm	2.92mm	2.92mm	2.4mm	2.4mm	1.85mm	1.85mm
			m	f	m	m	m	f	m	f	m	f	m	f
			AMS	AFS	NMS	DMS	DMP	DFS	KMS	KFS	LMS	LFS	VMS	VFS
SMA	m	AMS	AMSAMS	AFSAMS	AMS NMS	AMS DMS	AMS DMP	AMS DFS	-	-	-	-	-	-
SMA	f	AFS	-	AFSAFS	AFS NMS	AFS DMS	AFS DMP	AFS DFS	-	-	-	-	-	-
N	m	NMS	-	-	NMS NMS	DMS NMS	DMP NMS	DFS NMS	-	-	-	-	-	-
3.5mm	m	DMS	-	-	-	DMS DMS	DMP DMS	DFS DMS	-	-	-	-	-	-
3.5mm Multi-Lock	m	DMP	-	-	-	-	DMP DMP	DFS DMP	-	-	-	-	-	-
3.5mm	f	DFS	-	-	-	-	-	DFS DFS	-	-	-	-	-	-
2.92mm	m	KMS	-	-	-	-	-	-	KMS KMS	KFS KMS	KMS LMS	KMS LFS	-	-
2.92mm	f	KFS	-	-	-	-	-	-	-	KFS KFS	KFS LMS	KFS LFS	-	-
2.4mm	m	LMS	-	-	-	-	-	-	-	-	LMS LMS	LFS LMS	-	-
2.4mm	f	LFS	-	-	-	-	-	-	-	-	-	LFS LFS	-	-
1.85mm	m	VMS	-	-	-	-	-	-	-	-	-	-	VMS VMS	VFS VMS
1.85mm	f	VFS	-	-	-	-	-	-	-	-	-	-	-	VFS VFS

m : male (plug)
f : female (jack)

Please provide a catalog number when placing an order.

Connector combination codes for MWX001

Connector I \ Connector II			1.0mm Safty-Lock	1.0mm
			m	f
			WMT	WFS
1.0mm Safty-Lock	m	WMT	WMTWMT	WFSWMT
SMA	f	WFS	-	WFSWFS

m : male (plug)
f : female (jack)

Connector combination codes for MWX002 Standard 1.0mm connector (up to 110GHz)

Connector I \ Connector II			1.0mm	1.0mm
			m	f
			WMT1	WFS1
1.0mm	m	WMT1	WMT1WMT1	WFS1WMT1
1.0mm	f	WFS1	-	WFS1WFS1

※Please contact us if you need enhanced 1.0mm connectors for 120GHz.