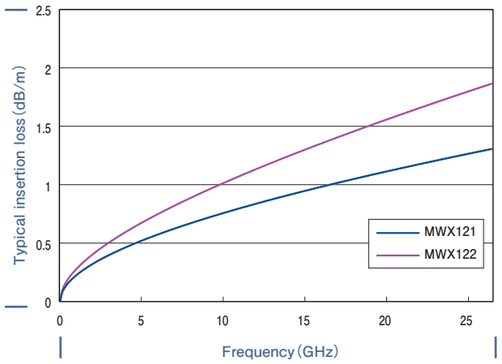
MWX1 SERIES

Cable assemblies with wide temperature & high durability for measuring instruments

How to select

We lineup MWX121 of the heat-resistant type that can be used under a wide range of temperatures (-65 - +125℃) in the microwave measurement.
And MWX122 of the high-durability type (that can be used under the temperature range from -35℃ to +85℃) of which the mechanical life is drastically extended by applying a cabling structure that we developed in the robot cable.

MWX1 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.

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.

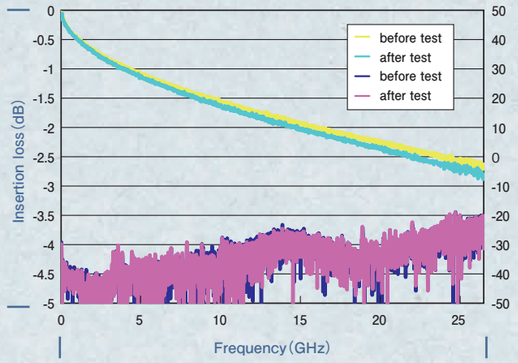
Connector compatibility

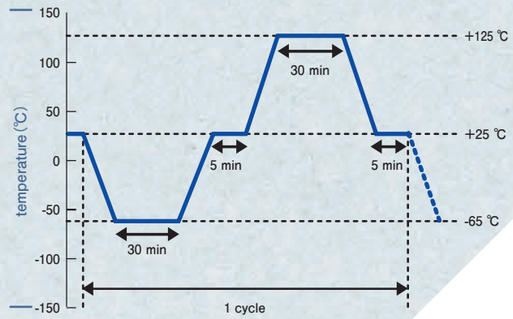
Cable type	Cable maximum operating frequency (GHz)	Compatible connector			
		18.0 GHz	18.5 GHz	26.5 GHz	
		N(m)	SMA(m)	3.5mm(m)	3.5mm(f)
MWX121	26.5 GHz	●	●	●	●
MWX122		●	●	●	●

*For MWX122, you can select the "torque canceller type" that does not affect the twist of cable when connecting.

Heat cycle test for MWX121

MWX121-02000DMSDMS





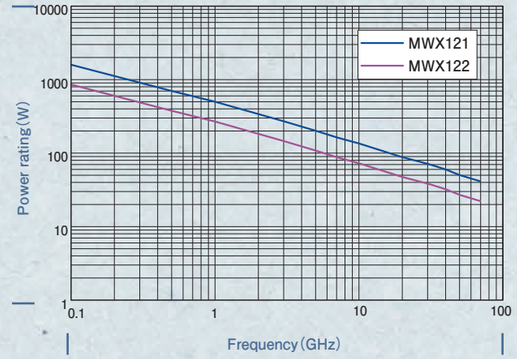
The cycle indicated above chart was repeated 30 times.
We measured the insertion and return loss of the specimen that was taken out from the tester after the 30 cycles.

Power rating

The diagram to the right shows the relationship between frequency and power rating.
The values are calculated at 25 ℃ 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.

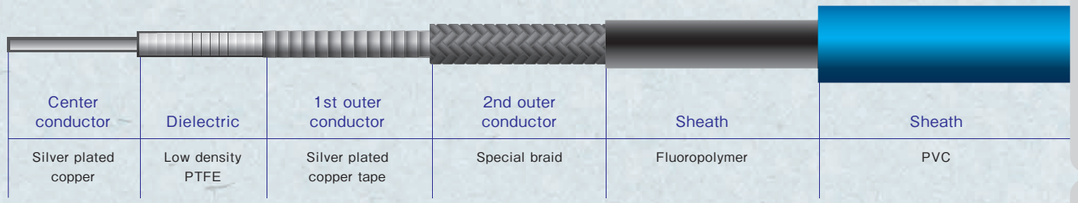
Power rating of MWX1 series at sea level



Cable Structure : MWX121

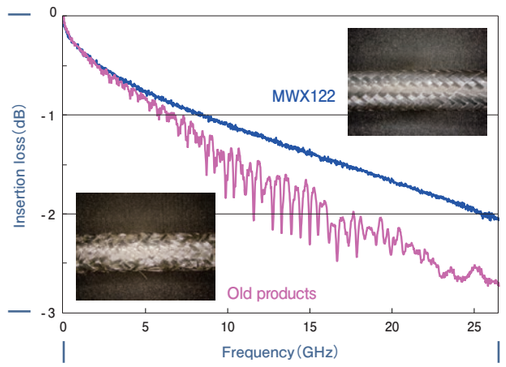
Center conductor	Dielectric	1st outer conductor	2nd outer conductor	Sheath	Sheath
Silver plated copper	Low density PTFE	Silver plated copper tape	Silver plated copper braid	Fluoropolymer	Aramid fiber

Cable Structure : MWX122

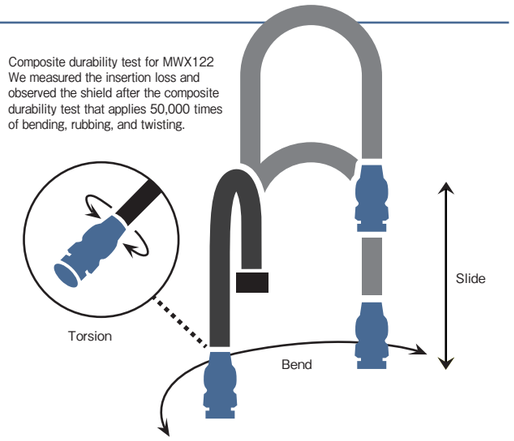


Center conductor	Dielectric	1st outer conductor	2nd outer conductor	Sheath	Sheath
Silver plated copper	Low density PTFE	Silver plated copper tape	Special braid	Fluoropolymer	PVC

Composite durability test for MWX122



Composite durability test for MWX122
We measured the insertion loss and observed the shield after the composite durability test that applies 50,000 times of bending, rubbing, and twisting.



MWX1 SERIES

MWX 121

Static bending | Temperature change | Frequency 26.5 GHz | Temperature range -65~+125℃ | Minimum bending radius 30 mm | RoHS compliant | Measurement | Delivery time 5 days | Listed in the catalogue; manufactured to order | Custom support

Property

Electrical properties

Maximum operating frequency	26.5 GHz
Characteristic impedance	50±1 Ω
Capacitance (typ.)	88 pF/m
Propagation delay (typ.)	4.28 ns/m
Wavelength reduction rate (typ.)	78 %
Higher mode frequency (typ.)	27.0 GHz
VSWR (per connector/ both ends of assy.)	1.153/1.33
Maximum frequency insertion loss(26.5 GHz)	1.3 dB/m

Mechanical properties

Cable outer diameter	6.6 mm
Minimum bending radius (inner side)	30 mm
Cable mass (typ.)	80 g/m
Continuous operating temperature range	−65~+125 ℃
Assembly length	200~5,000 mm

Order form example

Please provide the following information when placing an order.

＊ See P.33"Connector combination codes"

Example MWX121

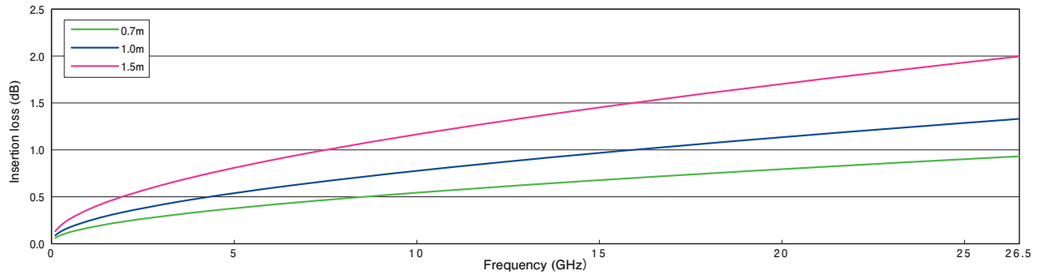
Assembly length：1000mm
Connector Ⅰ：3.5 mm(f) straight
Connector Ⅱ：3.5 mm(m) straight

Catalog No.
MWX121-01000DFSDMS
a b c

a:Cable
b:Assembly length
c:Connector

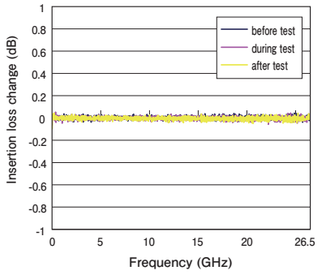
Technical Data

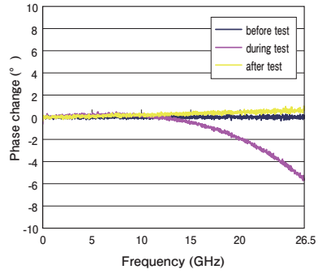
Cable typical insertion loss



● Typical insertion loss (0.0077×f(GHz)+0.215×√f(GHz)+0.02)×L(m) ● Maximum insertion loss (0.0077×f(GHz)+0.215×√f(GHz)+0.02)×1.12×L(m)

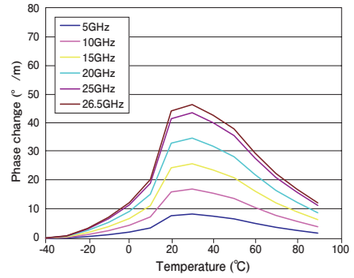
Static bending data (insertion loss, phase) Bending radius: 30 mm





＊The cable was wrapped 360° around φ60mm mandrel.

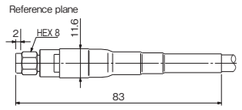
MWX121 Phase change vs. temperature



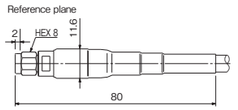
＊The cable was measured in chamber every 20 ℃ from -40 to 90 ℃, 1 hour after the temperature changed.

Connector

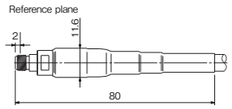
SMA(m) straight (Code:AMS)
Maximum operating frequency:18.5 GHz／Mass:14g



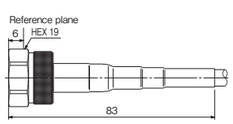
3.5mm(m) straight (Code:DMS)
Maximum operating frequency:26.5 GHz／Mass:13g



3.5mm(f) straight (Code:DFS)
Maximum operating frequency:26.5 GHz／Mass:12g



N(m) straight (Code:NMS)
Maximum operating frequency:18.0 GHz／Mass:36g



＊The above figures are measured values for reference only.

MWX1 SERIES

MWX 122

Static bending | Flexibility | Frequency 26.5 GHz | Temperature range -30~+85℃ | Minimum bending radius 30 mm | RoHS compliant | Measurement | Torque canceller | Delivery time 5 days | Listed in the catalogue; manufactured to order | Custom support

Property

Electrical properties

Maximum operating frequency	26.5 GHz
Characteristic impedance	50±1 Ω
Capacitance (typ.)	89 pF/m
Propagation delay (typ.)	4.39 ns/m
Wavelength reduction rate (typ.)	76 %
Higher mode frequency (typ.)	27.0 GHz
VSWR (per connector/ both ends of assy.)	1.153/1.33
Maximum frequency insertion loss(26.5 GHz)	1.9 dB/m

Mechanical properties

Cable outer diameter	6.5 mm
Minimum bending radius (inner side)	30 mm
Cable mass (typ.)	79 g/m
Continuous operating temperature range	−30~+85 ℃
Assembly length	300~3,000 mm

Order form example

Please provide the following information when placing an order.

＊See P.33"Connector combination codes"

Example MWX122

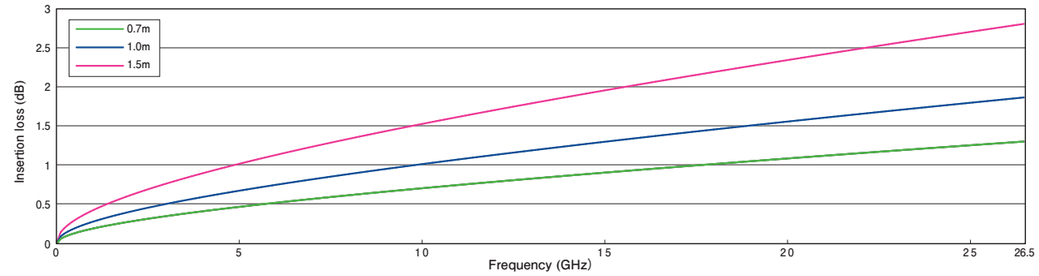
Assembly length：1000 mm
Connector Ⅰ：3.5 mm(f) straight torque canceller
Connector Ⅱ：3.5 mm(m) straight torque canceller

Catalog No.
MWX122-01000DFCDMC
a b c

a:Cable
b:Assembly length
c:Connector

Technical Data

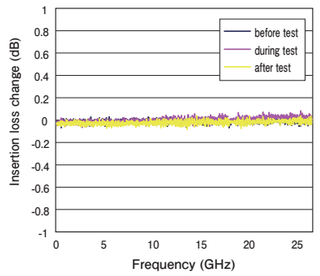
Cable typical insertion loss

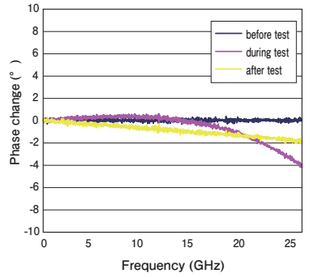


● ypical insertion loss (0.022f (GHz) +0.25√f (GHz) +0.025) ×L (m) ● Maximum insertion loss (0.022f (GHz) +0.25√f (GHz) +0.025) ×1.12×L (m)

Static bending data (insertion loss, phase)

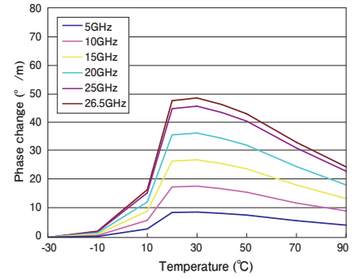
Bending radius: 30 mm





＊The cable was wrapped 360° around φ60mm mandrel.

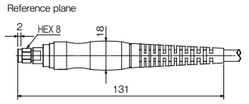
MWX122 Phase change vs. temperature



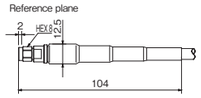
＊The cable was measured in chamber every 20 ℃ from -30 to 90 ℃, 1 hour after the temperature changed.

Connector

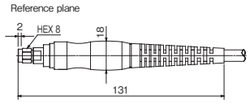
SMA(m) Torque canceller(Code:AMC)
Maximum operating frequency:18.5 GHz／Mass:41g



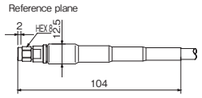
SMA(m) straight (Code:AMS)
Maximum operating frequency:18.5 GHz／Mass:15g



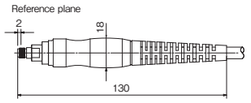
3.5mm(m) Torque canceller(Code:DMC)
Maximum operating frequency:26.5 GHz／Mass:41g



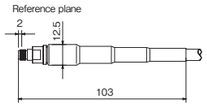
3.5mm(m) straight (Code:DMS)
Maximum operating frequency:26.5 GHz／Mass:15g



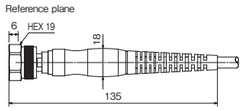
3.5mm(f) Torque canceller(Code:DFC)
Maximum operating frequency:26.5 GHz／Mass:40g



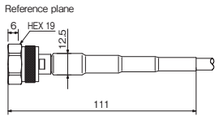
3.5mm(f) straight (Code:DFS)
Maximum operating frequency:26.5 GHz／Mass:14g



N(m) Torque canceller(Code:NMC)
Maximum operating frequency:18.0 GHz／Mass:67g



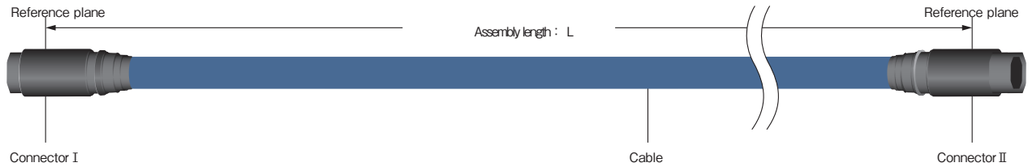
N(m) straight (Code:NMS)
Maximum operating frequency:18.0 GHz／Mass:41g



＊The above figures are measured values for reference only.

MWX1 SERIES

Placing orders



Catalog number

MWX121-02000 DMS DMS

ex.1
- Cable : MWX121
- Assembly length : 2000 mm
- Connector Ⅰ : 3.5 mm(m)straight
- Connector Ⅱ : 3.5 mm(m)straight

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.

Catalog number

MWX122-01000 DFC DMC

ex.2
- Cable : MW122
- Assembly length : 1000 mm
- Connector Ⅰ : 3.5 mm(f)straight torque canceller
- Connector Ⅱ : 3.5 mm(m)straight torque canceller

Connector combination codes

Connector Ⅰ / Connector Ⅱ			SMA	SMA Torque canceller	3.5mm	3.5mm Torque canceller	3.5mm	3.5mm Torque canceller	N	N Torque canceller
			m	m	m	m	f	f	m	m
			AMS	AMC	DMS	DMC	DFS	DFC	NMS	NMC
SMA	m	AMS	AMSAMS	AMCAMS	AMSDMS	AMSDMC	AMSDFS	AMSDFC	AMSNMS	AMSNMC
SMA Torque canceller	m	AMC	-	AMCAMC	AMCDMS	AMCDMC	AMCDFS	AMCDFC	AMCNMS	AMCNMC
3.5mm	m	DMS	-	-	DMSDMS	DMCDMS	DFSDMS	DFCDMS	DMSNMS	DMSNMC
3.5mm Torque canceller	m	DMC	-	-	-	DMCDMC	DFSDMC	DFCDMC	DMCNMS	DMCNMC
3.5mm	f	DFS	-	-	-	-	DFSDFS	DFCDFS	DFSNMS	DFSNMC
3.5mm Torque canceller	f	DFC	-	-	-	-	-	DFCDFC	DFCNMS	DFCNMC
N	m	NMS	-	-	-	-	-	-	NMSNMS	NMCNMS
N Torque canceller	m	NMC	-	-	-	-	-	-	-	NMCNMC

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

Please provide a catalog number when placing an order.

Delivery time

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

Junkosha

Creating Unsurpassed Value

Phase Stability & Slim Cable

Up to 67 GHz

Junkosha MWX161

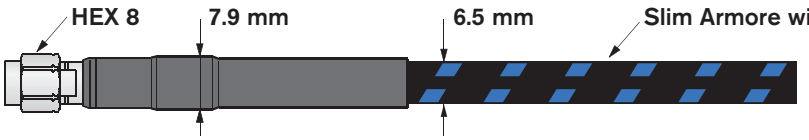
- Cable assemblies with small diameter at neck part and the most suitable for multi-port VNA.
- Torque Driver is available to mount on narrow pitch connector arrangement board.
- Cable assemblies with excellent phase stability against bending and temperature.
- Cable assemblies with excellent mechanical characteristics using SUS flexible tubing for protection.
- Wide range of connectors: 3.5 mm, 2.92 mm, 2.4 mm and 1.85 mm

Property

Maximum operating frequency	67.0 GHz
Characteristic impedance	50±1 Ω
Capacitance (typ.)	90 pF/m
Propagation delay (typ.)	4.35 ns/m
Velocity of propagation (typ.)	77 %
Higher mode frequency (typ.)	70 GHz
VSWR (typ.)	1.30
Maximum frequency insertion loss (67.0 GHz)	7.3 dB/m

Maximum outer diameter	7.9 mm (0.311″)
Cable outer diameter	6.5 mm (0.256″)
Minimum bending radius (inner side)	30 mm
Cable mass (typ.)	79 g/m
Continuous operating temperature range	−65～+125 °C
Armored side pressure	196 N/cm
Assembly length	600～1,500 mm (24～60″)

Image courtesy of Keysight Technologies Inc.

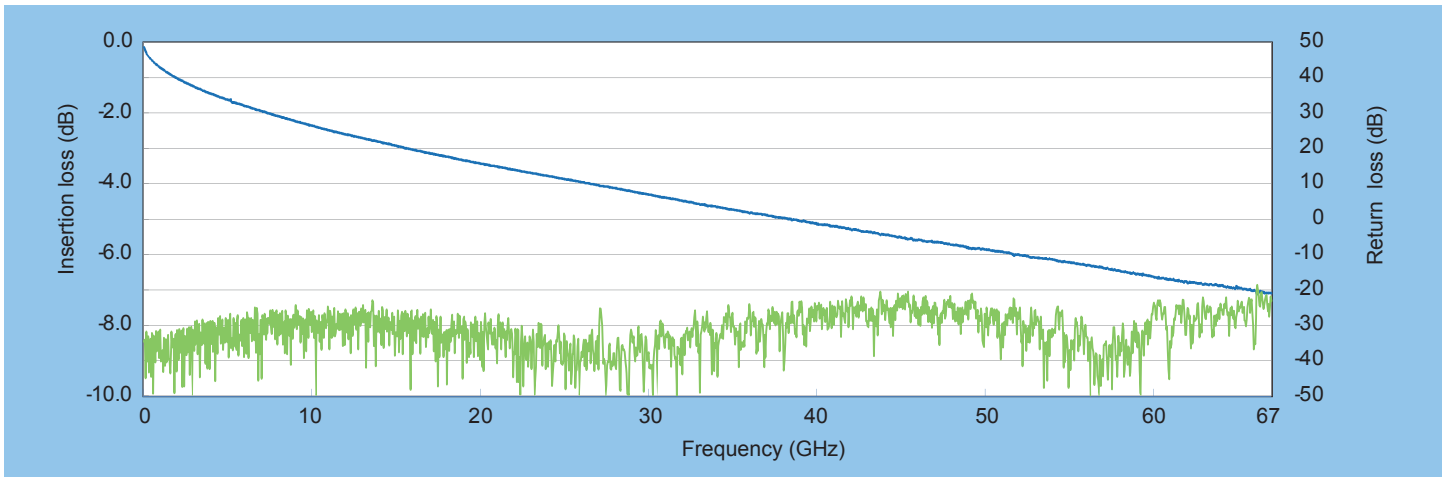


Maximum Frequency: 67 GHz

Temperature Range: -65 ~ +125 degree C

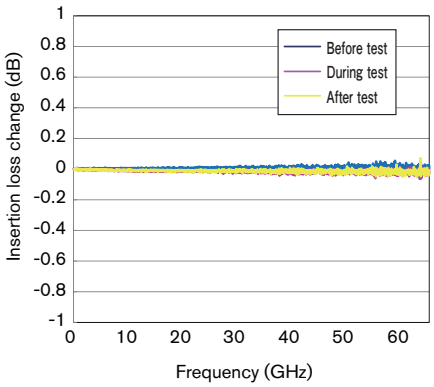
Phase Performance that Endures

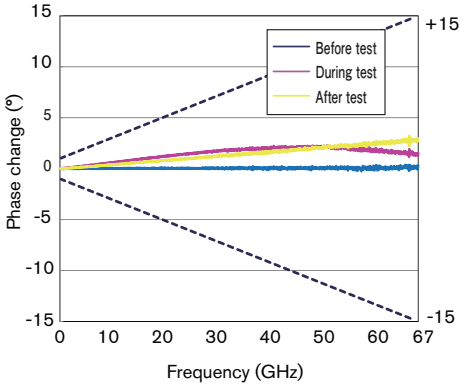
Insertion loss and Return loss [Assembly length 1000mm, Connector: Both side 1.85 mm (m)]



Technical Data

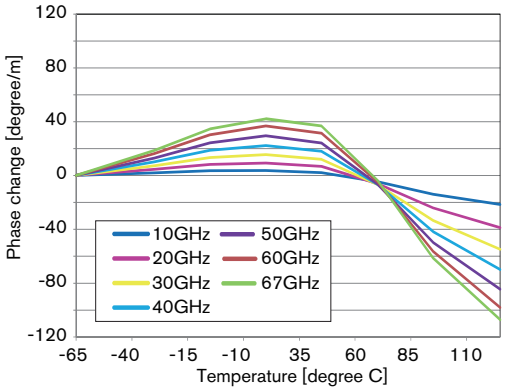
Static bending data (insertion loss, phase) **Bending radius: 30 mm**





＊The above figures are measured values for reference only.
＊The cable was wrapped 360 degree around φ60 mm mandrel.

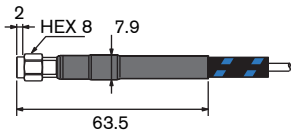
Phase change vs. temperature



The cable was measured in chamber every 20 ~ 30 degree C from -65 to 125 degree C, 30 minutes after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

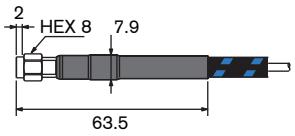
Connector Type

●3.5 mm (m) [Code：DMS]



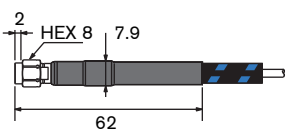
Maximum frequency: 26.5 GHz

●2.92 mm (m) [Code：KMS]



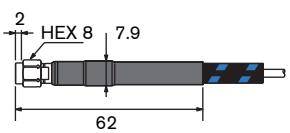
Maximum frequency: 40.0 GHz

●2.4 mm (m) [Code：LMS]



Maximum frequency: 50.0 GHz

●1.85 mm (m) [Code：VMS]



Maximum frequency: 67.0 GHz

Order form example

Please provide the following information when placing an order.

a : Cable	**b：Assembly length**
c：Connector Ⅰ	**d : Connector Ⅱ**
e : Armore	

Example 1

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

Catalog No.
MWX161-01000 DMS DMS /B
a b c d e

Example 2

Assembly length：610mm
Connector Ⅰ：2.4mm（m）
Connector Ⅱ：1.85mm（m）

Catalog No.
MWX161-00610 LMS VMS /B
a b c d e

*To allow continuing product improvements, specifications are subject to change without notice.
*The data are measured, not guaranteed values. *MWX is a registered trademark of Junkosha Inc.

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