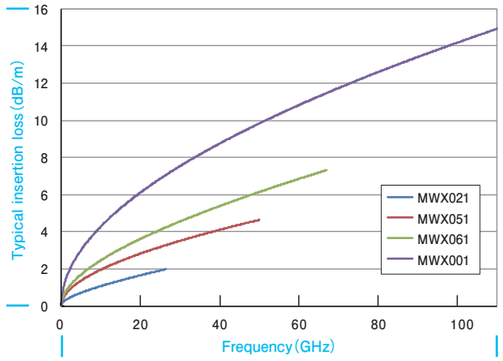
MWX0 SERIES

Cable assemblies with high phase stability for measuring instruments

How to select

The MWX0 series cable assemblies offer excellent phase stability against temperature fluctuationsand bending.
They are ideal for connecting to vector network analyzers for precision measurements .
(Continuous operating temperature range : from -30 to +85 ℃)
Cables are offered in wide range of the frequencies of 26.5, 50, 67 and 110 GHz with various connectors.

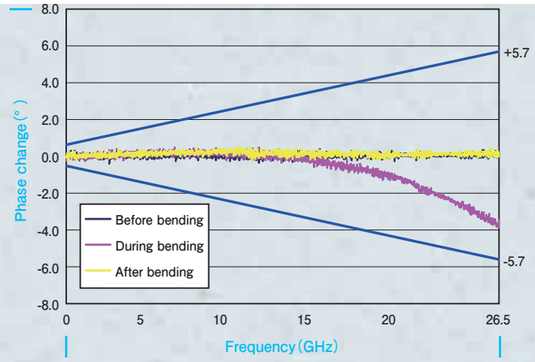
MWX0 Series typical insertion loss

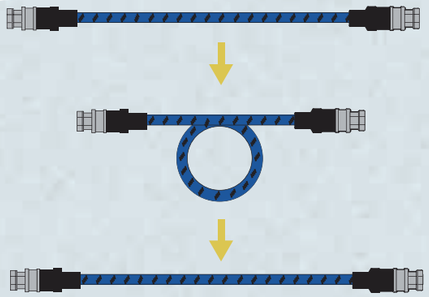


Simple criteria for cable selection

- 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.

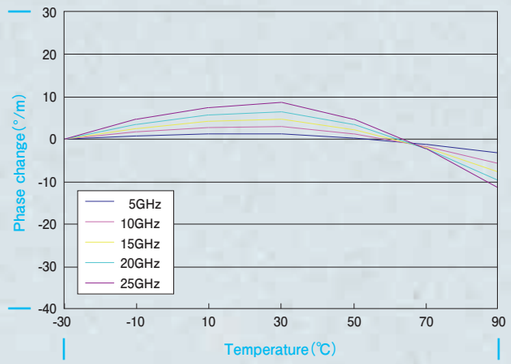
MWX021 Static bending data





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

MWX021 Phase change vs. temperature



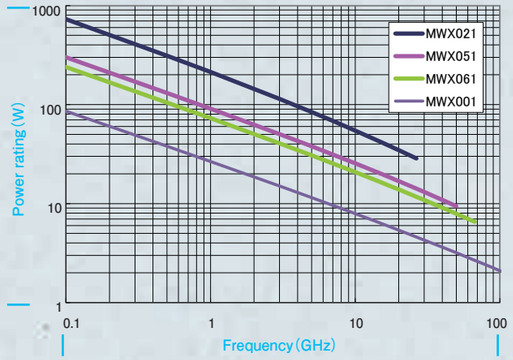
The cable was measured in chamber every 20 ℃ from -30 to 90 ℃, 1 hour after the temperature changed.

Power rating

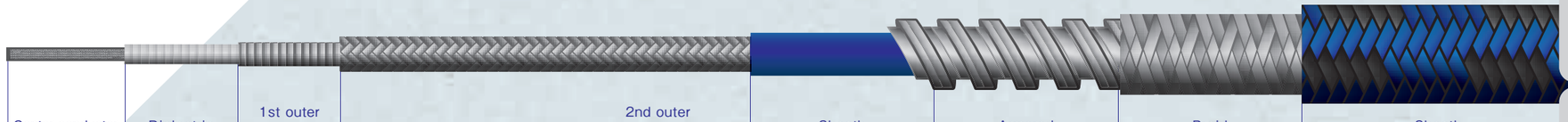
The diagram to the right shows the relationship between frequency and power rating.
The values are calculated at 25 ℃ and at sea level.
The power rating will need to be corrected for different ambient temperatures and altitude.
Power ratings may decrease, depending on the connector selected.

*The above figures are measured values for reference only.

Power rating of MWX0 series at sea level



Cable Structure



Center conductor	Dielectric	1st outer conductor	2nd outer conductor	Sheath	Armored	Braid	Sheath
Silver plated copper	Low density PTFE	Silver plated copper tape	Silver plated copper braid	Fluoropolymer	SUS Spiral tube	Silver plated copper braid	Polyester fiber

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		110.0 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)	1.0mm(m)	1.0mm(f)
MWX021	26.5 GHz	●	●	●	●	●								
MWX051	50.0 GHz						●	●	●	●				
MWX061	67.0 GHz										●	●		
MWX001	110.0 GHz												●	●

*Armored type: Armored with protection sheath to reduce damage caused by mechanical movement.
*MWX061 can be customized up to 70GHz.

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.

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

MWX0 SERIES

MWX 021

Static bending | Temperature change | Frequency 26.5 GHz | Temperature range -30~+85℃ | Minimum bending radius 30 mm | RoHS compliant | Measurement | Armored | Multi-lock | 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.)	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 ℃
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.21 "Connector combination codes"

Example MWX021

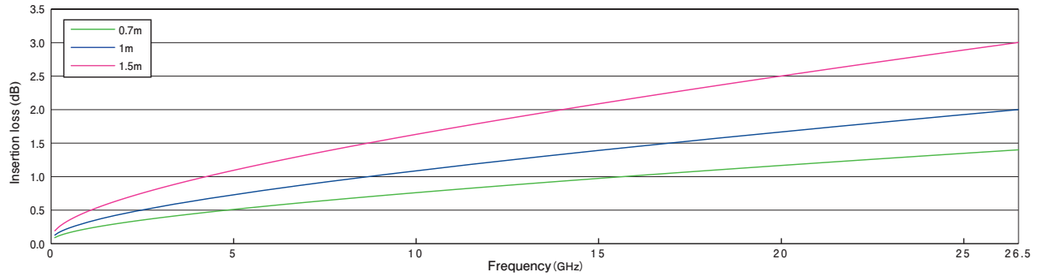
Assembly length : 1000 mm
Connector Ⅰ : 3.5 mm (f) straight
Connector Ⅱ : 3.5 mm (m) straight

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

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

Technical Data

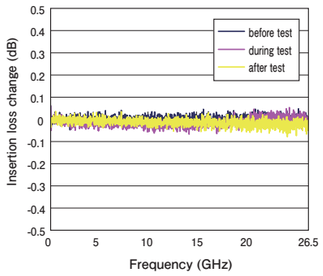
Cable typical insertion loss

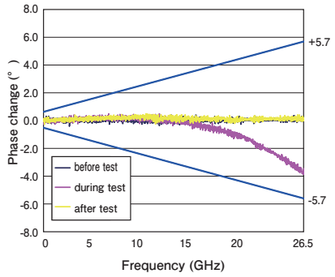


● Typical insertion loss (0.67× (0.038×f (GHz) +0.371×√f (GHz)) +0.07) ×L (m) ● Maximum insertion loss (0.67× (0.038×f (GHz) +0.371×√f (GHz)) +0.07) ×1.12×L (m)

Static bending data (insertion loss, phase)

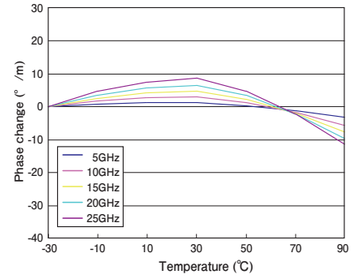
Bending radius: 30 mm





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

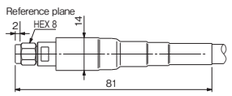
MWX021 Phase change vs. temperature



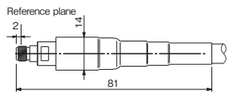
The cable was measured in chamber every 20 ℃ from -30 to 90 ℃, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

Connector

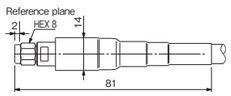
SMA (m) straight (Code:AMS)
Maximum operating frequency:18.5 GHz／Mass:18g



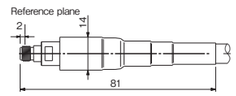
SMA (f) straight (Code:AFS)
Maximum operating frequency:18.5 GHz／Mass:17g



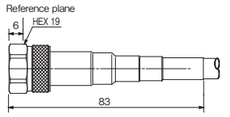
3.5mm (m) straight (Code:DMS)
Maximum operating frequency:26.5 GHz／Mass:18g



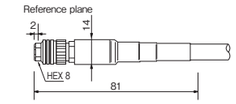
3.5mm (f) straight (Code:DFS)
Maximum operating frequency:26.5 GHz／Mass:17g



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.

MWX0 SERIES

MWX 051

Static bending | Temperature change | Frequency 50.0 GHz | Temperature range -30~+85℃ | 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	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 ℃
Armored side pressure	196 N/cm
Assembly length	700~1,500 mm

Order form example

Please provide the following information when placing an order.

＊See P.21 "Connector combination codes"

Example MWX051

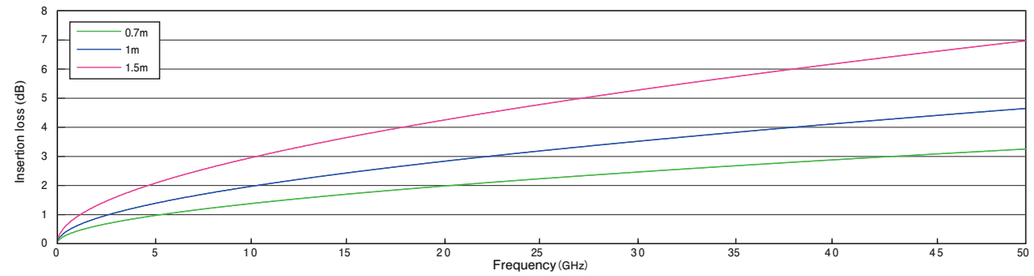
Assembly length : 1000mm
Connector Ⅰ:2.4 mm(f)straight
Connector Ⅱ:2.4 mm(m)straight

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

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

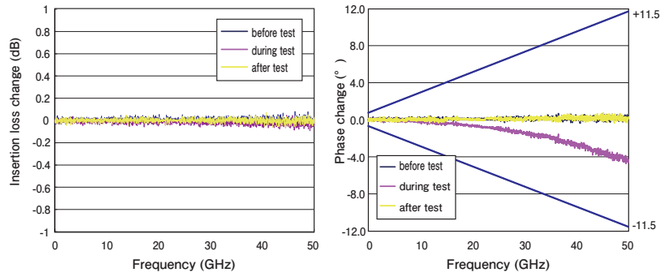
Technical Data

Cable typical insertion loss



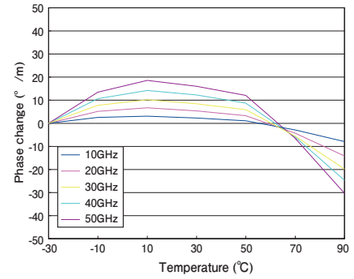
● Typical insertion loss (0.0095×f(GHz)+0.587×√f(GHz)+0.02)×L(m) ● Maximum insertion loss (0.0095×f(GHz)+0.587×√f(GHz)+0.02)×1.12×L(m)

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 φ60mm mandrel.

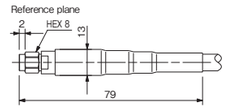
MWX051 Phase change vs. temperature



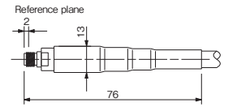
The cable was measured in chamber every 20 ℃ from -30 to 90 ℃, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

Connector

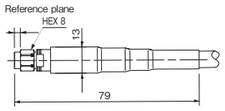
2.92 mm(m) straight (Code:KMS)
Maximum operating frequency:40.0 GHz／Mass:12g



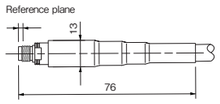
2.92 mm(f) straight (Code:KFS)
Maximum operating frequency:40.0 GHz／Mass:14g



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



＊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℃ | 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 ℃
Armored side pressure	196 N/cm
Assembly length	700~1,500 mm

Order form example

Please provide the following information when placing an order.

＊See P.21 "Connector combination codes"

Example MWX061

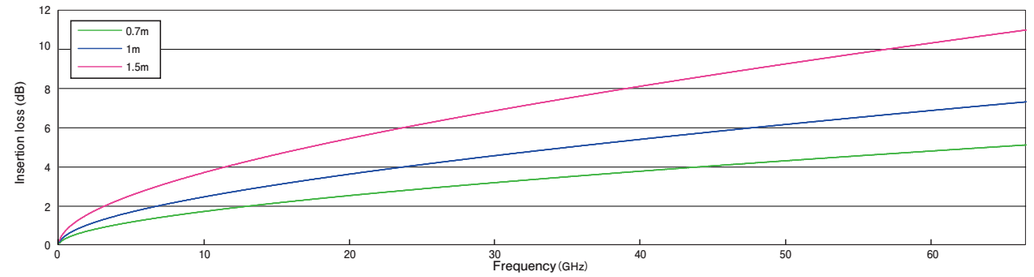
Assembly length：700 mm
Connector Ⅰ：1.85 mm(f)straight
Connector Ⅱ：1.85 mm(m)straight

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

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

Technical Data

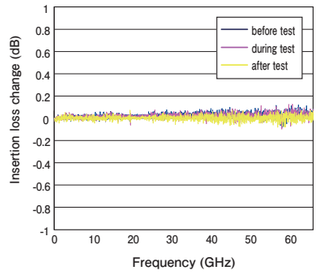
Cable typical insertion loss

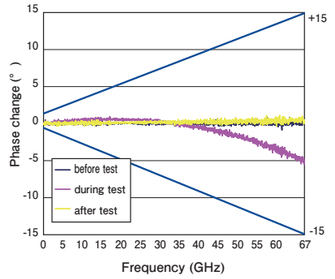


● Typical insertion loss (0.0232×f (GHz) +0.702×√f (GHz) +0.02) ×L (m) ● Maximum insertion loss (0.0232×f (GHz) +0.702×√f (GHz) +0.02) ×1.12×L (m)

Static bending data (insertion loss, phase)

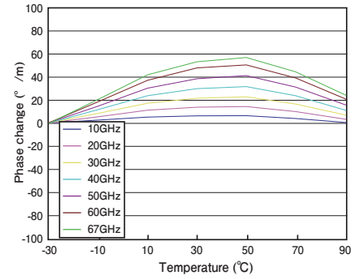
Bending radius: 30 mm





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

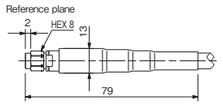
MWX061 Phase change vs. temperature



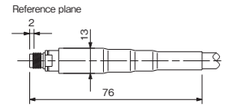
The cable was measured in chamber every 20 ℃ from -30 to 90 ℃, 1 hour after the temperature changed. Figure shows the excellent phase stability over the temperature changes.

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 **MWX061 can be customized up to 70Ghz.**

＊The above figures are measured values for reference only.

MWX0 SERIES

MWX 001

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(67.0 GHz)	13.7dB/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 ℃
Armored side pressure	157 N/cm
Assembly length	100~200 mm

Order form example

Please provide the following information when placing an order.

＊See P.21 "Connector combination codes"

Example MWX001

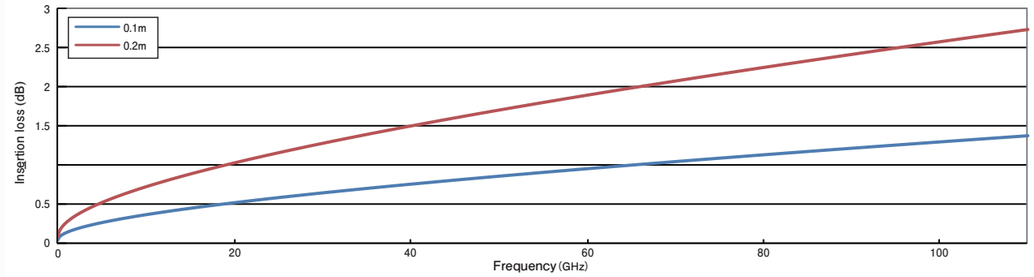
Assembly length: 100 mm
Connector Ⅰ: 1.0 mm(f) straight
Connector Ⅱ: 1.0 mm(m) straight

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

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

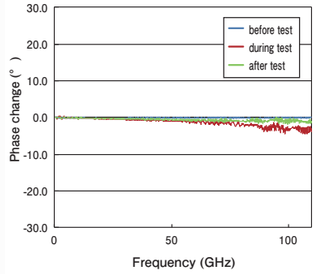
Technical Data

Cable typical insertion loss



● Typical insertion loss (0.9×√f(GHz)+0.035×f(GHz)+0.4)×L(m) ● Maximum insertion loss (0.9×√f(GHz)+0.035×f(GHz)+0.4)×1.12×L(m)

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

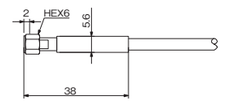


＊The cable was wrapped 90° around φ30mm mandrel.

Connector

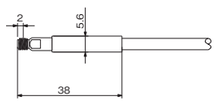
1.0 mm(m) straight (Code:WMS)
Maximum operating frequency:110.0GHz／Mass:3g

Reference plane



1.0 mm(f) straight (Code:WFS)
Maximum operating frequency:110.0GHz／Mass:2g

Reference plane



＊The above figures are measured values for reference only.

MWX0 SERIES

Placing orders

Catalog number

MWX021-01000 DMS DMS /B

ex.1
Cable : MWX021
Assembly length : 1000 mm
Connector Ⅰ : 3.5 mm(m)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.

Connector combination codes

Connector Ⅰ / Connector Ⅱ			SMA m	SMA f	N m	3.5mm m	3.5mm Multi-Lock m	3.5mm f	2.92mm m	2.92mm f	2.4mm m	2.4mm f	1.85mm m	1.85mm f	1.0mm m	1.0mm f
			AMS	AFS	NMS	DMS	DMP	DFS	KMS	KFS	LMS	LFS	VMS	VFS	WMS	WFS
SMA	m	AMS	AMSAMS	AFSAMS	AMSNMS	AMSDMS	AMSDMP	AMSDFS	-	-	-	-	-	-	-	-
SMA	f	AFS	-	AFSAFS	AFSNMS	AFSDMS	AFSDMP	AFSDFS	-	-	-	-	-	-	-	-
N	m	NMS	-	-	NMSNMS	DMSNMS	DMPNMS	DFSNMS	-	-	-	-	-	-	-	-
3.5mm	m	DMS	-	-	-	DMSDMS	DMPDMS	DFSDMS	-	-	-	-	-	-	-	-
3.5mm Multi-Lock	m	DMP	-	-	-	-	DMPDMP	DFSDMP	-	-	-	-	-	-	-	-
3.5mm	f	DFS	-	-	-	-	-	DFSDFS	-	-	-	-	-	-	-	-
2.92mm	m	KMS	-	-	-	-	-	-	KMSKMS	KFSKMS	KMSLMS	KMSLFS	-	-	-	-
2.92mm	f	KFS	-	-	-	-	-	-	-	KFSKFS	KFSLMS	KFSLFS	-	-	-	-
2.4mm	m	LMS	-	-	-	-	-	-	-	-	LMSLMS	LFSLMS	-	-	-	-
2.4mm	f	LFS	-	-	-	-	-	-	-	-	-	LFSLFS	-	-	-	-
1.85mm	m	VMS	-	-	-	-	-	-	-	-	-	-	VMSVMS	VFSVMS	-	-
1.85mm	f	VFS	-	-	-	-	-	-	-	-	-	-	-	VFSVFS	-	
1.0mm	m	WMS	-	-	-	-	-	-	-	-	-	-	-	-	WMSWMS	WFSWMS
1.0mm	f	WFS	-	-	-	-	-	-	-	-	-	-	-	-	-	WFSWFS

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.