

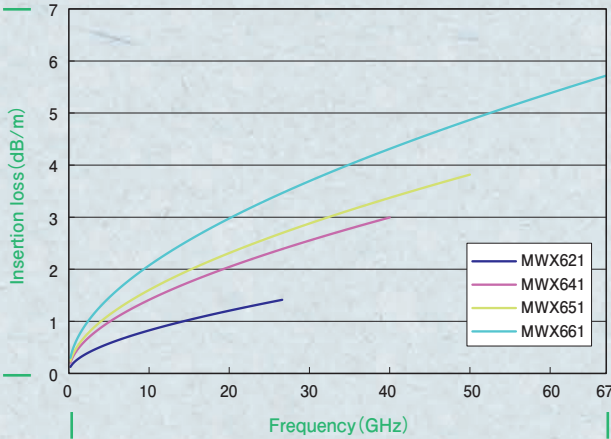
# MWX6 SERIES

Highly precise skew match type

Highly precise skew match cable assembly with less than 1psec skew between the two for measurement of digital transmission. (Continuous operating temperature range : -30 to +85 °C)  
Low insertion loss, suitable for measurement of the high-precision differential transmission signal.  
4 type cables are a vailable depends on maximum frequency (26.5GHz, 40GHz, 50GHz a nd 67GHz).

How to select

## MWX6 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.

MWX621	● Typical insertion loss $(0.0077 \times f(\text{GHz}) + 0.2304 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$	● Maximum insertion loss $(0.0077 \times f(\text{GHz}) + 0.2304 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$
MWX641	● Typical insertion loss $(0.0095 \times f(\text{GHz}) + 0.41 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$	● Maximum insertion loss $(0.0095 \times f(\text{GHz}) + 0.41 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$
MWX651	● Typical insertion loss $(0.0095 \times f(\text{GHz}) + 0.47 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$	● Maximum insertion loss $(0.0095 \times f(\text{GHz}) + 0.47 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$
MWX661	● Typical insertion loss $(0.0095 \times f(\text{GHz}) + 0.6148 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$	● Maximum insertion loss $(0.0095 \times f(\text{GHz}) + 0.6148 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$

	MWX621	MWX641	MWX651	MWX661
18.5GHz	1.2dB/m	1.8dB/m	2.1dB/m	2.9dB/m
Maximum frequency	1.4dB/m	3.0dB/m	3.8dB/m	5.6dB/m

## 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.

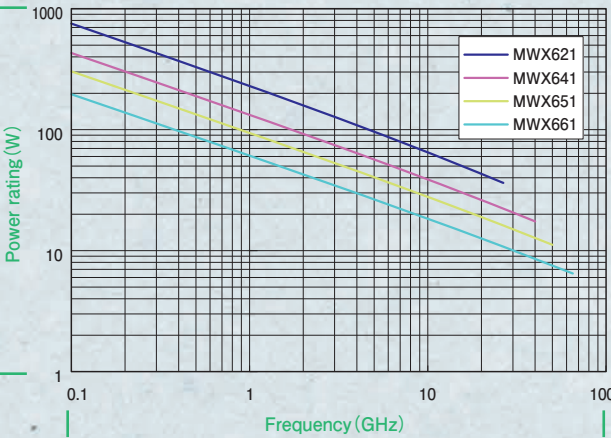
## Connector compatibility

Cable type	Cable Maximum Frequency (GHz)	Applicable connector									
		18.5 GHz	26.5 GHz	40.0 GHz	50.0 GHz	67.0 GHz					
		SMA(m)	3.5mm (m)	3.5mm(f)	2.92mm(m)	2.92mm(f)	2.4mm(m)	2.4mm(f)	1.85mm(m)	1.85mm(f)	
MWX621	26.5 GHz	●	●	●							
MWX641	40.0 GHz				●	●					
MWX651	50.0 GHz				●	●	●	●			
MWX661	67.0 GHz								●	●	

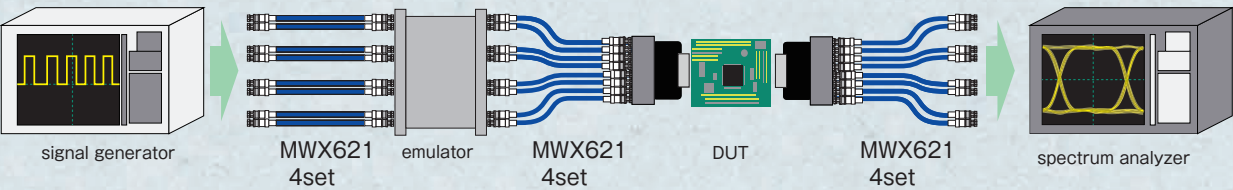
## Power rating

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 MWX6 series at sea level



## Connection example of MWX6 Series



## Major applications

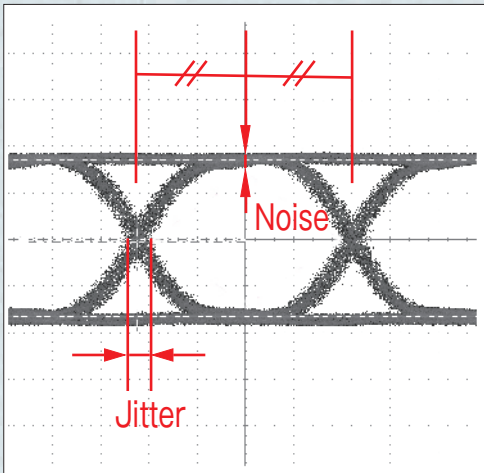
- Measurement and evaluation of the USB, HDMI etc.
- BERT measurement, Jitter measurement.

## (Reference) Eye pattern and Junkosha's method of calculating degree of eye pattern

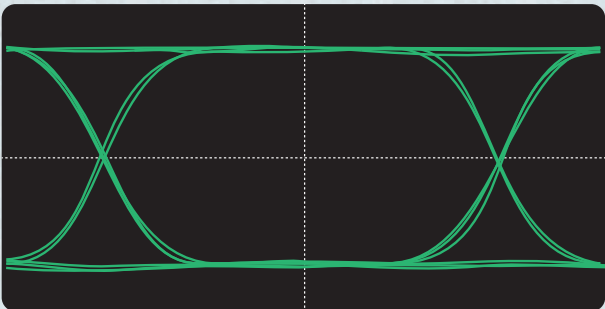
To measure pulse wave transmission characteristics, an experimental tool called "eye pattern" is observed.  
Upon balanced transmission, skew (variability of propagation delay time) between the signal cables will become one of the cause of deterioration of the jitter.  
Taking above into consideration, MWX6 series are designed a nd manufactured.

$$\text{Degree of horizontal eye opening (\%)} = 100 \times \left( \frac{\frac{1}{\text{bit rate}} - \text{jitter}}{\frac{1}{\text{bit rate}}} \right)$$

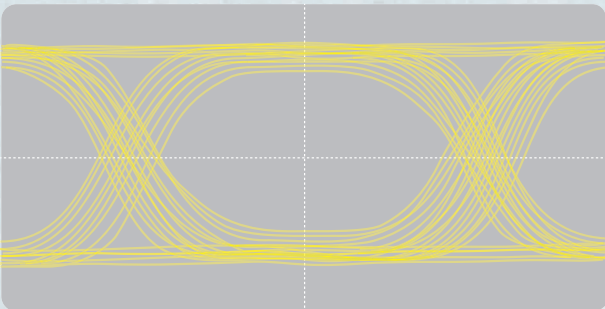
$$\text{Degree of vertical eye opening (\%)} = 100 \times \left( \frac{\text{amplitude of input signals} - 2 \times \text{noise}}{\text{amplitude of input signals}} \right)$$



## MWX6 SERIES



## Conventional product





## MWX 6 SERIES

## MWX 6

Frequency  
26.5 GHzFrequency  
40.0 GHzFrequency  
50.0 GHzFrequency  
67.0 GHzTemperature  
range  
-30~+85°C

RoHS compliant



Skew match

Delivery time  
5 daysListed in  
the catalogue  
manufactured  
to orderCustom  
support

## Property

	MWX621	MWX641	MWX651	MWX661
Maximum operating frequency	26.5GHz	40.0GHz	50.0GHz	67.0GHz
Characteristics impedance (typ.)	50±1Ω	50±1Ω	50±1Ω	50±1Ω
Propagation delay (typ.)	4.4ns/m	4.35ns/m	4.36ns/m	4.38ns/m
VSWR (one end / both ends)	1.153/1.33	1.197/1.43	1.197/1.43	1.197/1.43
Typical insertion loss	1.4dB/m (26.5GHz)	3.0dB/m (40.0GHz)	3.8dB/m (50.0GHz)	5.6dB/m (67.0GHz)
Skew (between pair cables)	1ps	1ps	1ps	1ps
Phase deviation (between pair cables : @1GHz)	0.3°	0.3°	0.3°	0.3°
Cable outer diameter	6.0mm	4.1mm	3.7mm	2.6mm
Cable mass (typ.)	64g/m	35g/m	29g/m	17g/m
Continuous operating temperature range	-30~+85°C	-30~+85°C	-30~+85°C	-30~+85°C
Applicable connector	SMA(m) 3.5mm(m), 3.5mm(f)	2.92mm(m), 2.92mm(f)	2.4mm(m), 2.4mm(f) 2.92mm(m), 2.92mm(f)	1.85mm(m), 1.85mm(f)
Assembly length	200~1,500mm	200~1,500mm	200~1,500mm	200~1,500mm

## Order form example

Please provide the following information when placing an order.

\* We supply MWX6 series one pair of two cables.  
\* See P.81 "Connector combination codes"

## Example MWX621

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

Catalog No.

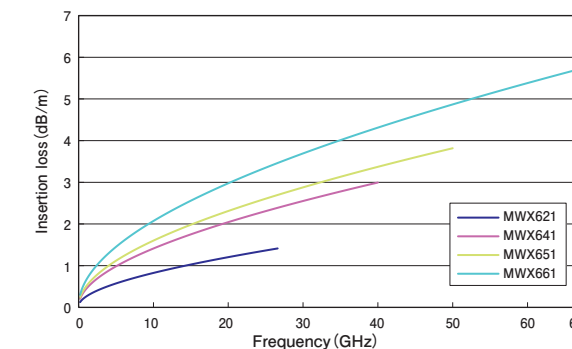
MWX621-01000DFSDMS/PAIR

a b c d

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

## Technical Data

## MWX6 Series Typical insertion loss



	MWX621	MWX641	MWX651	MWX661
18.5GHz	1.2dB/m	1.8dB/m	2.1dB/m	2.9dB/m
Maximum frequency	1.4dB/m	3.0dB/m	3.8dB/m	5.6dB/m

MWX621 ● Typical insertion loss  $(0.0077 \times f(\text{GHz}) + 0.2304 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$  ● Maximum insertion loss  $(0.0077 \times f(\text{GHz}) + 0.2304 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$

MWX641 ● Typical insertion loss  $(0.0095 \times f(\text{GHz}) + 0.41 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$  ● Maximum insertion loss  $(0.0095 \times f(\text{GHz}) + 0.41 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$

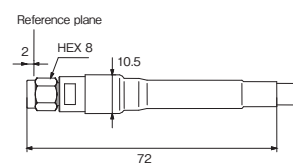
MWX651 ● Typical insertion loss  $(0.0095 \times f(\text{GHz}) + 0.47 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$  ● Maximum insertion loss  $(0.0095 \times f(\text{GHz}) + 0.47 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$

MWX661 ● Typical insertion loss  $(0.0095 \times f(\text{GHz}) + 0.6148 \times \sqrt{f(\text{GHz})} + 0.02) \times L(\text{m})$  ● Maximum insertion loss  $(0.0095 \times f(\text{GHz}) + 0.6148 \times \sqrt{f(\text{GHz})} + 0.02) \times 1.12 \times L(\text{m})$

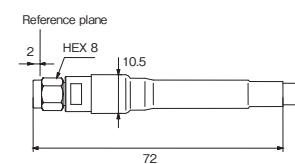
## Connector

## MWX621

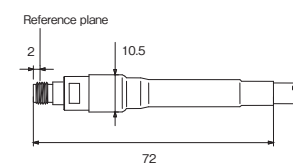
SMA (m) straight (Code:AMS)  
Maximum operating frequency: 18.5 GHz / Mass: 11g



3.5mm (m) straight (Code:DMS)  
Maximum operating frequency: 26.5 GHz / Mass: 11g

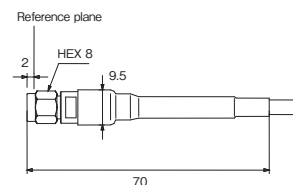


3.5mm (f) straight (Code:DFS)  
Maximum operating frequency: 26.5 GHz / Mass: 10g

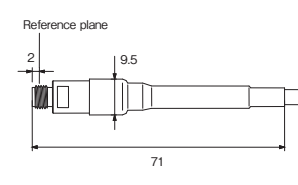


## MWX641

2.92mm (m) straight (Code:KMS)  
Maximum operating frequency: 40.0 GHz / Mass: 8g

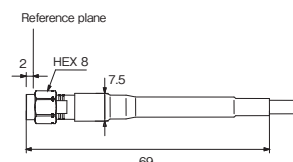


2.92mm (f) straight (Code:KFS)  
Maximum operating frequency: 40.0 GHz / Mass: 8g

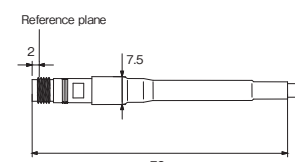


## MWX651

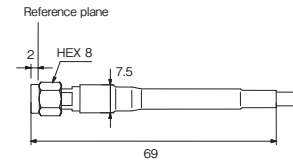
2.4mm (m) straight (Code:LMS)  
Maximum operating frequency: 50.0 GHz / Mass: 5g



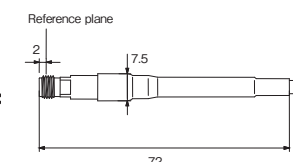
2.4mm (f) straight (Code:LFS)  
Maximum operating frequency: 50.0 GHz / Mass: 5g



2.92mm (m) straight (Code:KMS)  
Maximum operating frequency: 40.0 GHz / Mass: 5g

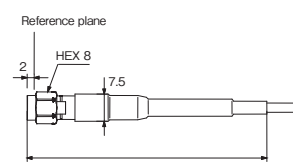


2.92mm (m) straight (Code:KFS)  
Maximum operating frequency: 40.0 GHz / Mass: 5g

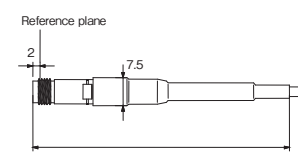


## MWX661

1.85mm (m) straight (Code:VMS)  
Maximum operating frequency: 67.0 GHz / Mass: 6g

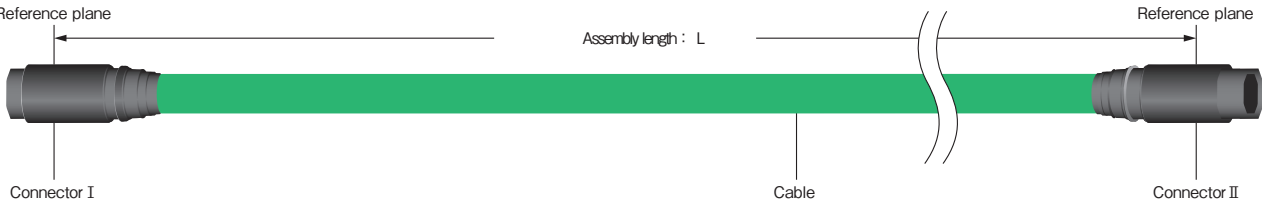


1.85mm (f) straight (Code:VFS)  
Maximum operating frequency: 67.0 GHz / Mass: 6g



# MWX6 SERIES

## Placing orders



ex.1

Catalog number

MWX621-01000 DFS DMS /PAIR

Cable : MWX621

Assembly length : 1000 mm

Connector I : 3.5 mm(f)straight

Connector II : 3.5 mm(m)straight

Pair product

Note 1 ) 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.  
Note 2 ) We supply MWX6 series one pair of two cables.  
Upon ordering, you are requested to inform us the catalogue number and set quantity.

## Delivery time

MWX6 Series will be shipped within 7 business days after receiving your order.  
\*L/T might be changed on your order Qty.

**Option**  
In the event that you would like to change quantity of one set, please feel free to contact us.

**Remarks**  
Skew of MWX6 series between the two cables is standardized less than 1 psec upon shipment.  
Please be careful upon handling them with great care.

Connector combination codes

Connector I \ Connector II			SMA	3.5mm	3.5mm	2.92mm	2.92mm	2.4mm	2.4mm	1.85mm	1.85mm
			m	m	f	m	f	m	f	m	f
			AMS	DMS	DFS	KMS	KFS	LMS	LFS	VMS	VFS
SMA	m	AMS	AMSAMS	AMSDMS	AMSDFS	-	-	-	-	-	-
3.5mm	m	DMS	-	DMSDMS	DFSDMS	-	-	-	-	-	-
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

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

Please provide a catalog number when placing an order.