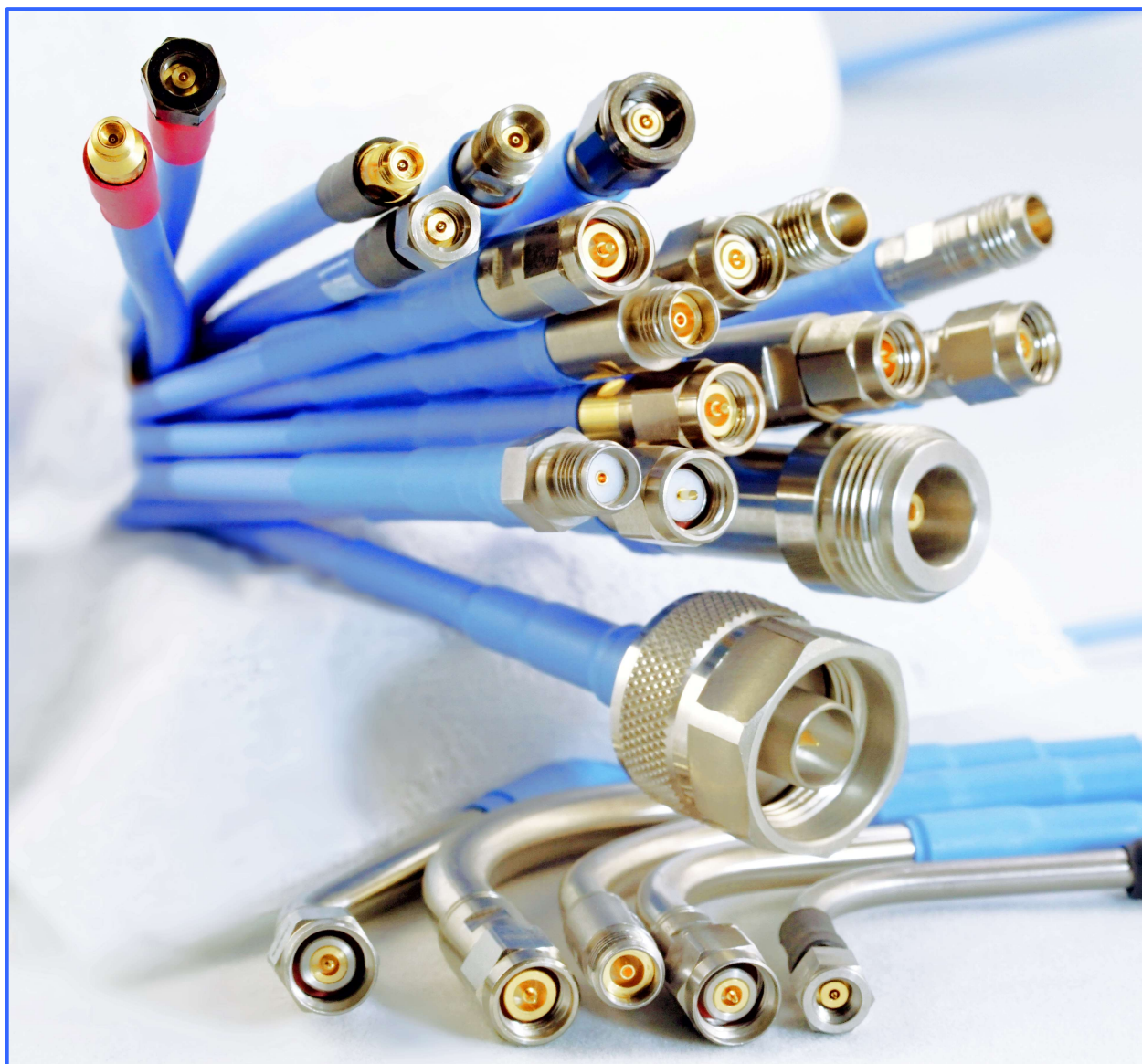


FLEXIBLE COAXIAL CABLE ASSEMBLIES

for microwave

マイクロウェーブ用同軸ケーブルアセンブリ



- Wavemolle is a very flexible cable assembly
- Uses a cable with excellent damping characteristics
- Excellent reflection characteristics because it uses a precision connector designed exclusively for each cable.
- Excellent phase and loss stability against temperature changes and bending
- Because it is compatible with various standard coaxial connectors
 - Plug-jack conversion
 - Connector type conversion
 - Plug-jack conversion with different types of connectors can be realized with a cable assembly.
- Phase-adjusted assembly enables ultra-high-speed digital signal transmission, which requires low Skew, and ideal signal transmission even for evaluation equipment.

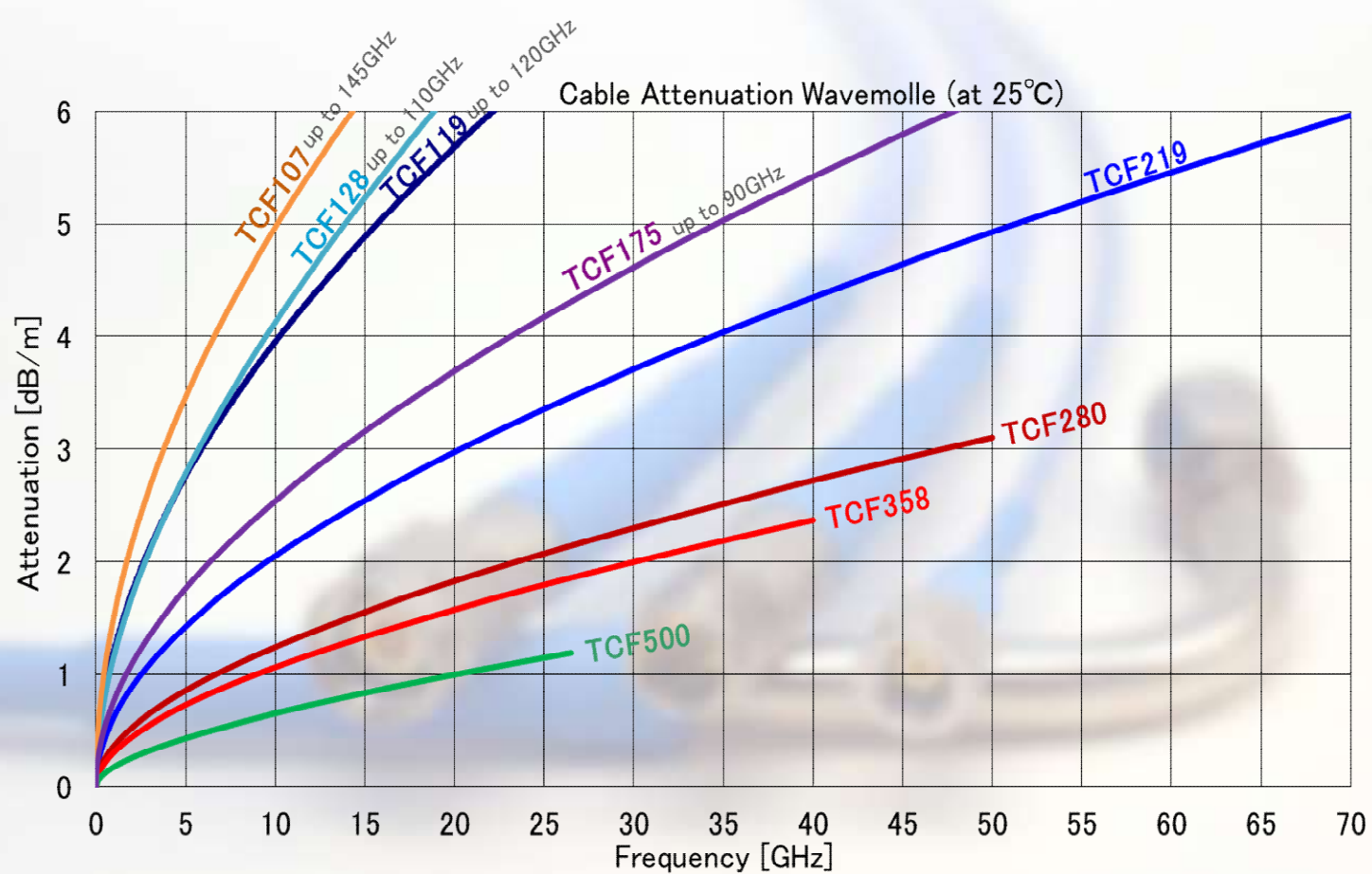
【Relative phase adjustment】

- Phase adjustment is possible between two or more cables.
It can be used without being aware of the cable combination as long as it is within the same purchase lot.

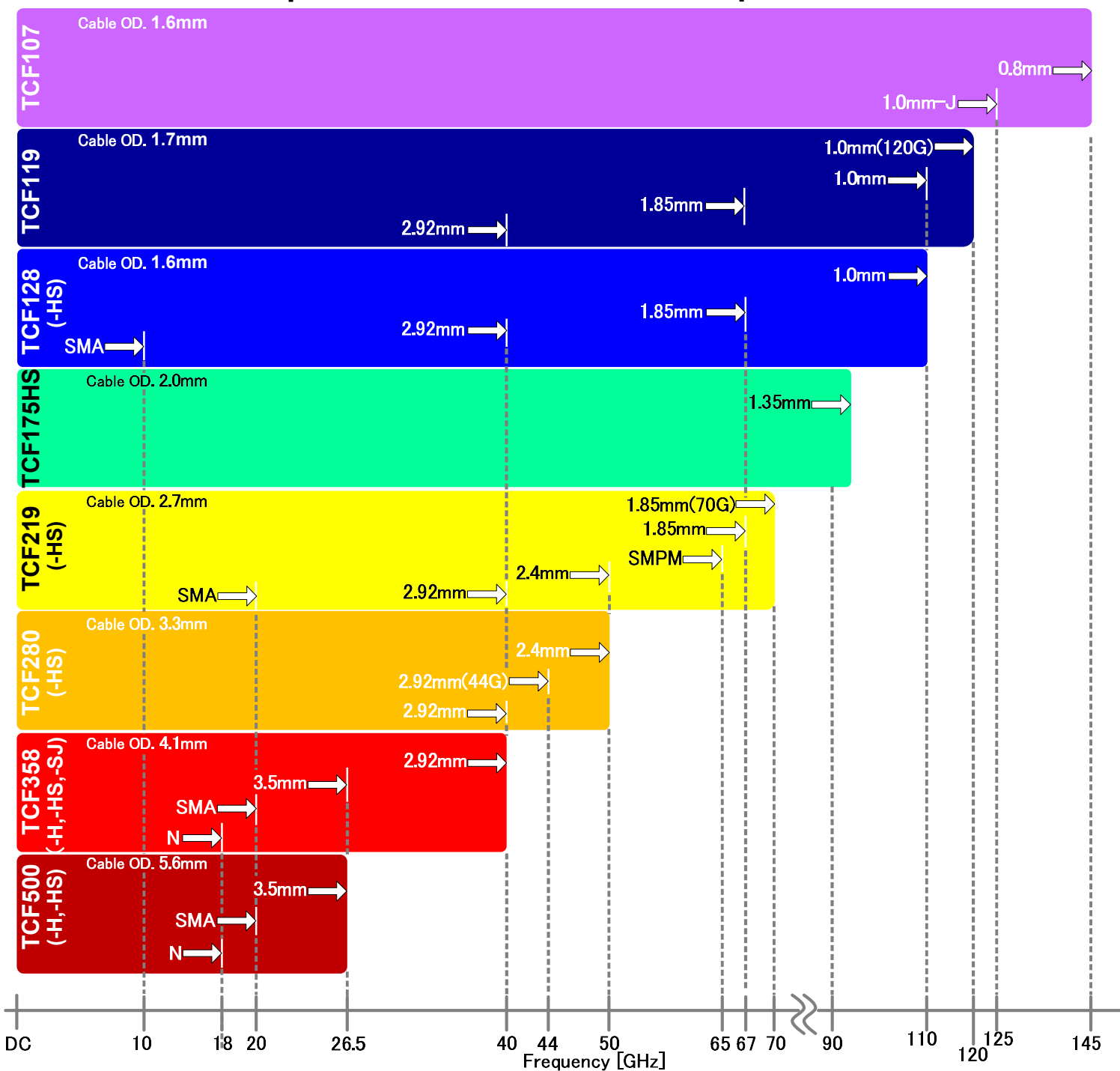
【Absolute phase adjustment】

- It is possible to adjust to the specified delay time.
It can be used without being aware of the purchase lot, and the cost can be reduced by purchasing only the failed cable.

■ Attenuation of cable

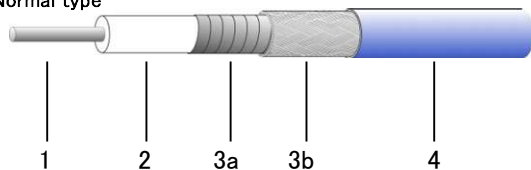


Cable Lineup (and connector lineup)



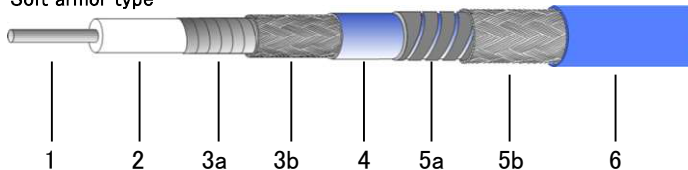
Cable Structure

Normal type



- 1: Inner conductor - Solid silver plated copper
- 2: Insulation - PTFE or Porous PTFE
- 3: Outer conductor - a. Silver plated copper tape
b. Silver plated copper braid
- 4: Jacket (Inner sheath) - FEP (blue)

Soft armor type



- 5: Armor jacket - a. Stainless steel coil (flat wire)
b. Stainless steel wire braid
- 6: Outer sheath - PVC (blue) or Olefin

■ Cable specification

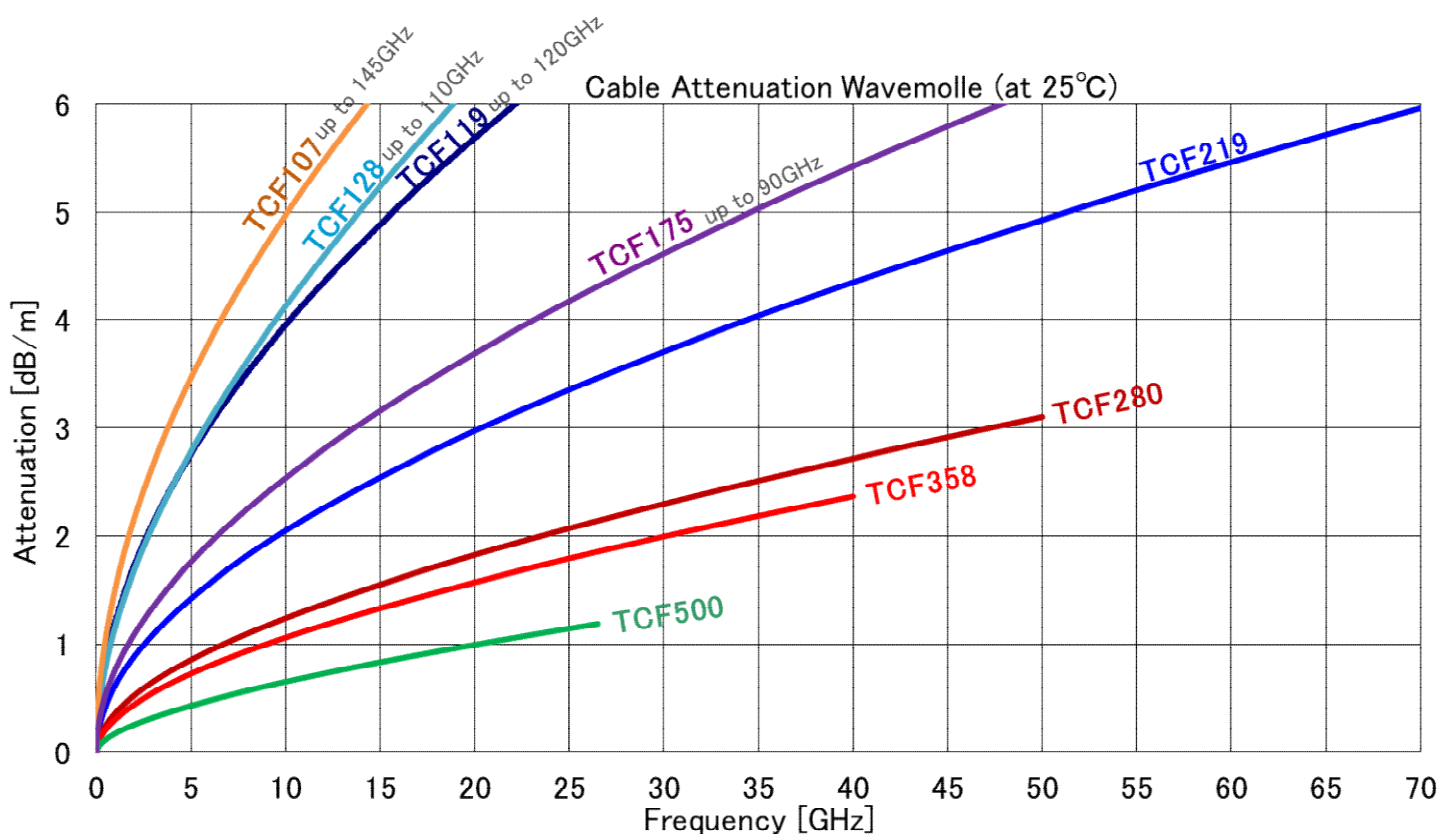
Structure details

Cable part number	Center Conductor	Dielectric	Outer Conductor	(Inner) Sheath		H Armor Outer Sheath		HS Armor Outer Sheath		TCFF type (Formable Armor)	
	Material	Material	Material	Material	O.D.[mm]	Material	O.D.[mm]	Material	O.D.[mm]	Material	O.D.[mm]
TCF107	Solid SPC	Porous PTFE	Silver-plated annealed copper special double shield	FEP (blue)	—	—		Olefin	4.3	Olefin	5.2
TCF119	Solid SPC			FEP (blue)	—	—		Olefin	4.3	Olefin	5.2
TCF128(HS)	Solid SPC	PTFE		FEP (blue)	1.6	—		Olefin	4.3	Olefin	5.2
TCF175HS	Solid SPC	Porous PTFE		FEP (blue)	—	—		PVC	5.8		
TCF219(H,HS)	Solid SPC			FEP (blue)	2.7	Olefin	7.6	PVC	7.1	SJ type (soft jacket)	
TCF280(H,HS)	Solid SPC			FEP (blue)	3.3	Olefin	7.6	PVC	7.1	Material	O.D.[mm]
TCF358(H,HS,SJ)	Solid SPC			FEP (blue)	4.1	Olefin	8.6	PVC	7.7	Olefin	(5.2)
TCF500(H,HS,SJ)	Solid SPC			FEP (blue)	5.6	Olefin	10.2	PVC	9.2		

Electrical, Mechanical characteristics

Cable part number	Characteristic impedance	Capacitance	Time Delay	Transmission rate	Moding frequency	Min. Bending radius(static)	Temp range			
	[ohm]	[pF/m]	[ns/m]	[% of c]	[GHz]	[mm]	without armor	with "H" armor	with "HS" armor	TCFF type (Formable Armor)
TCF107	50	85	4.3	78	157	10	—	—	-55~+125	-55~+125
TCF119	50	85	4.3	78	134	10	—	—	-55~+125	-55~+125
TCF128(HS)	50	85	4.8	70	110	10	-65 ~ +125	—	-55~+125	-55~+125
TCF175HS	50	85	4.3	78	92	15	—	—	-55~+105	
TCF219(H,HS)	50	85	4.3	78	75	15	-65 ~ +125	-30 ~ +85	-30 ~ +105	SJ type (Soft Jacket)
TCF280(H,HS)	50	85	4.3	78	52	20	-65 ~ +125	-30 ~ +85	-30 ~ +105	[°C]
TCF358(H,HS,SJ)	50	85	4.3	78	41	20	-65 ~ +125	-30 ~ +85	-30 ~ +105	-55~+125
TCF500(H,HS,SJ)	50	85	4.3	78	27	25	-65 ~ +125	-30 ~ +85	-30 ~ +105	

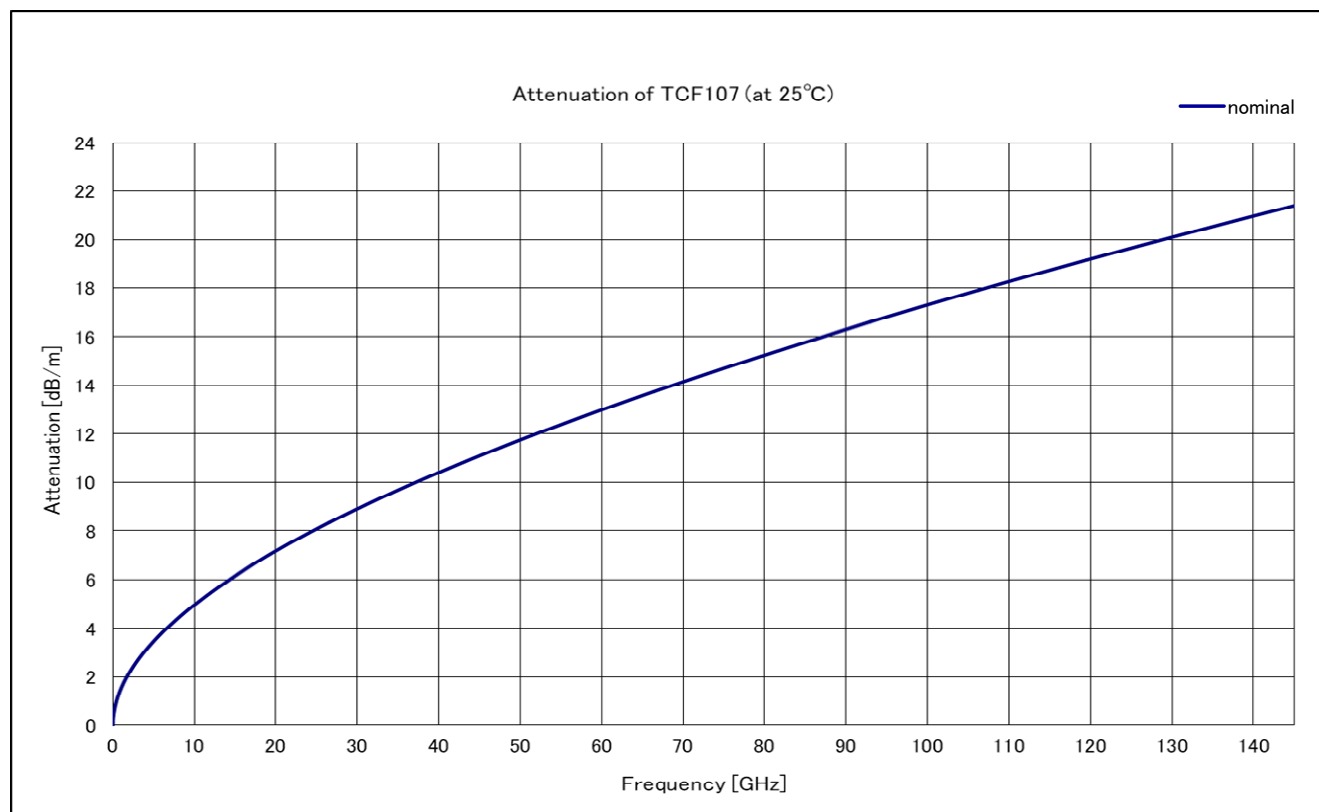
■ Cable attenuation (Nominal)



Cable attenuation

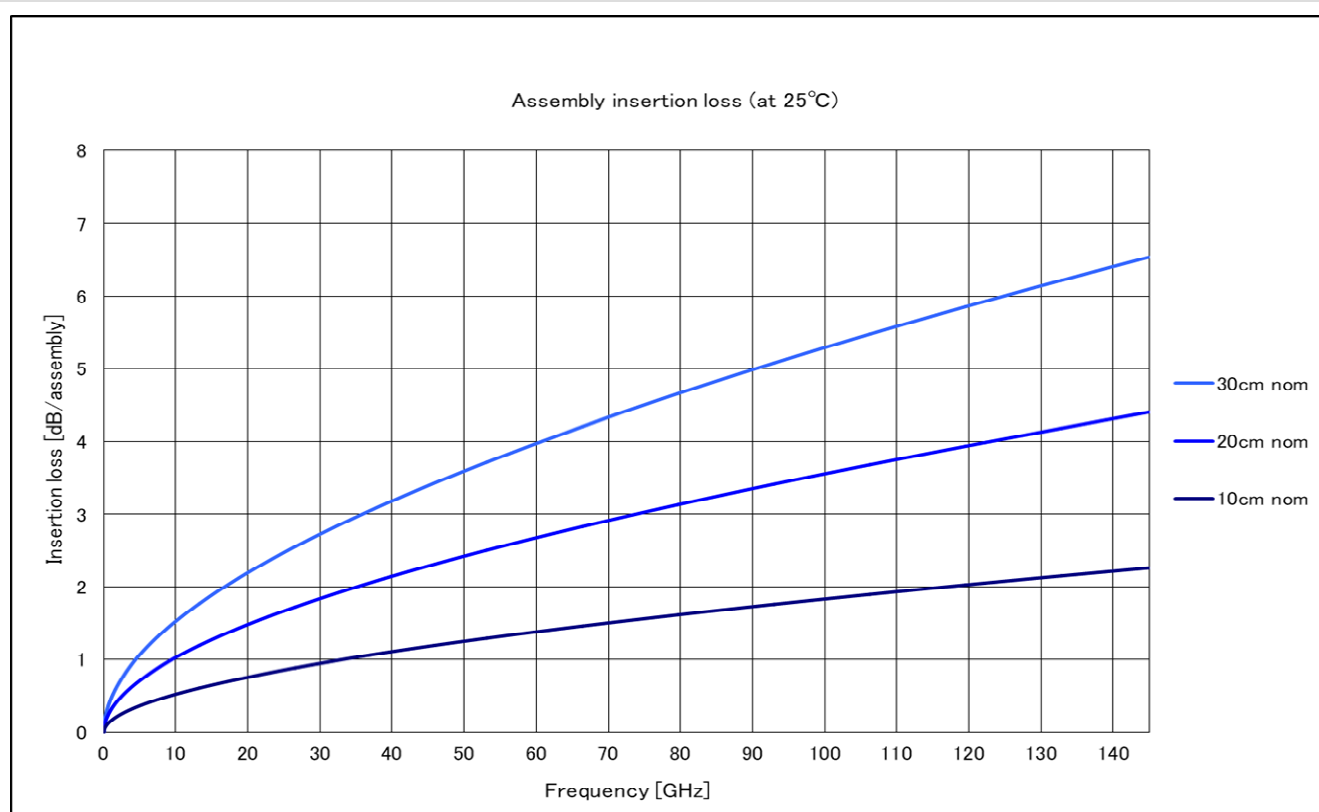
$$\text{Cable attenuation (25°C) [dB/m]} = \text{Conductor loss coefficient} \times \sqrt{f} \text{ [GHz]} + \text{Dielectric loss coefficient} \times f \text{ [GHz]}$$

$$1.500 \text{ (typical)} \times \sqrt{f} \text{ [GHz]} + 0.0230 \text{ (typical)} \times f \text{ [GHz]}$$



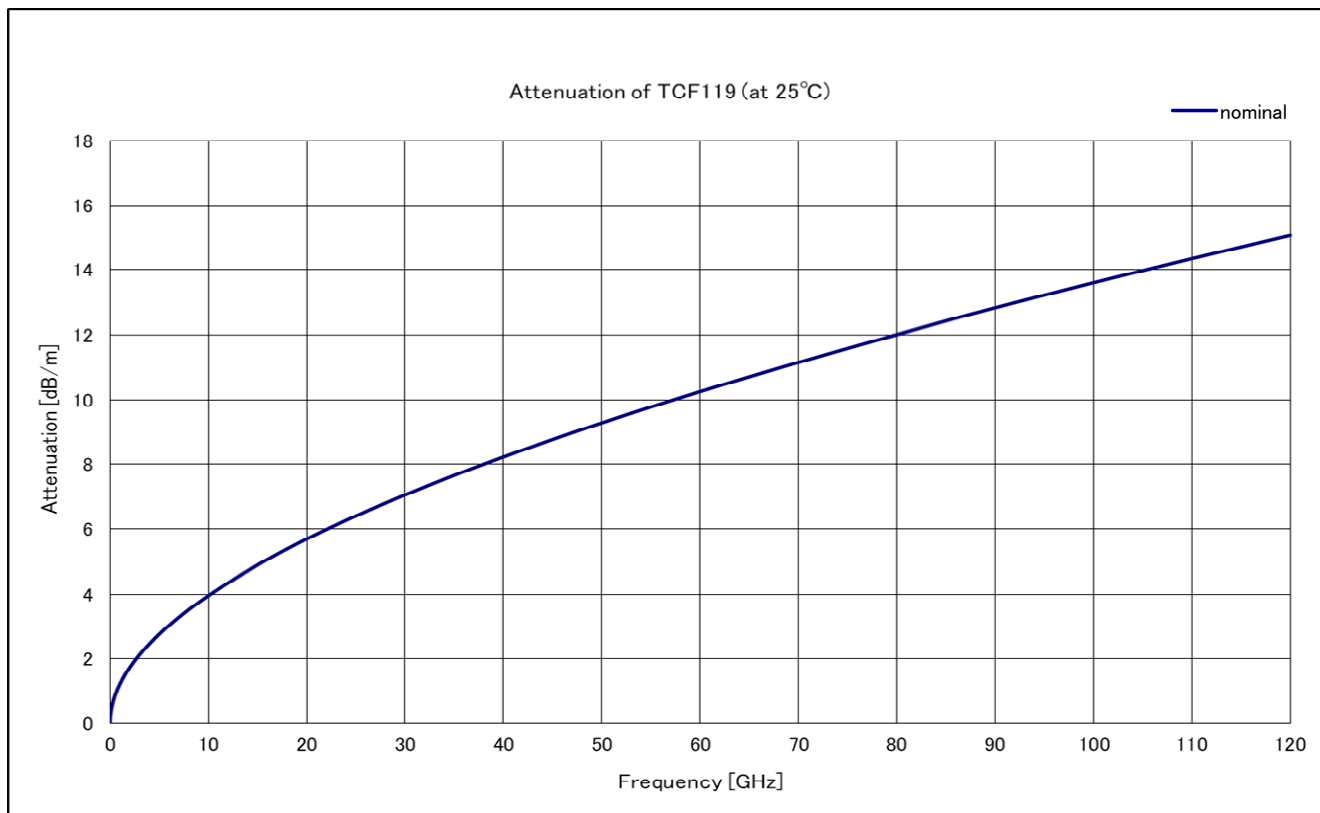
Assembly insertion loss

$$\text{Assembly insertion loss (25°C)} = \text{Cable attenuation (25°C)} \times \text{assembly length} + 0.01 \times \sqrt{f} \text{ [GHz]}$$



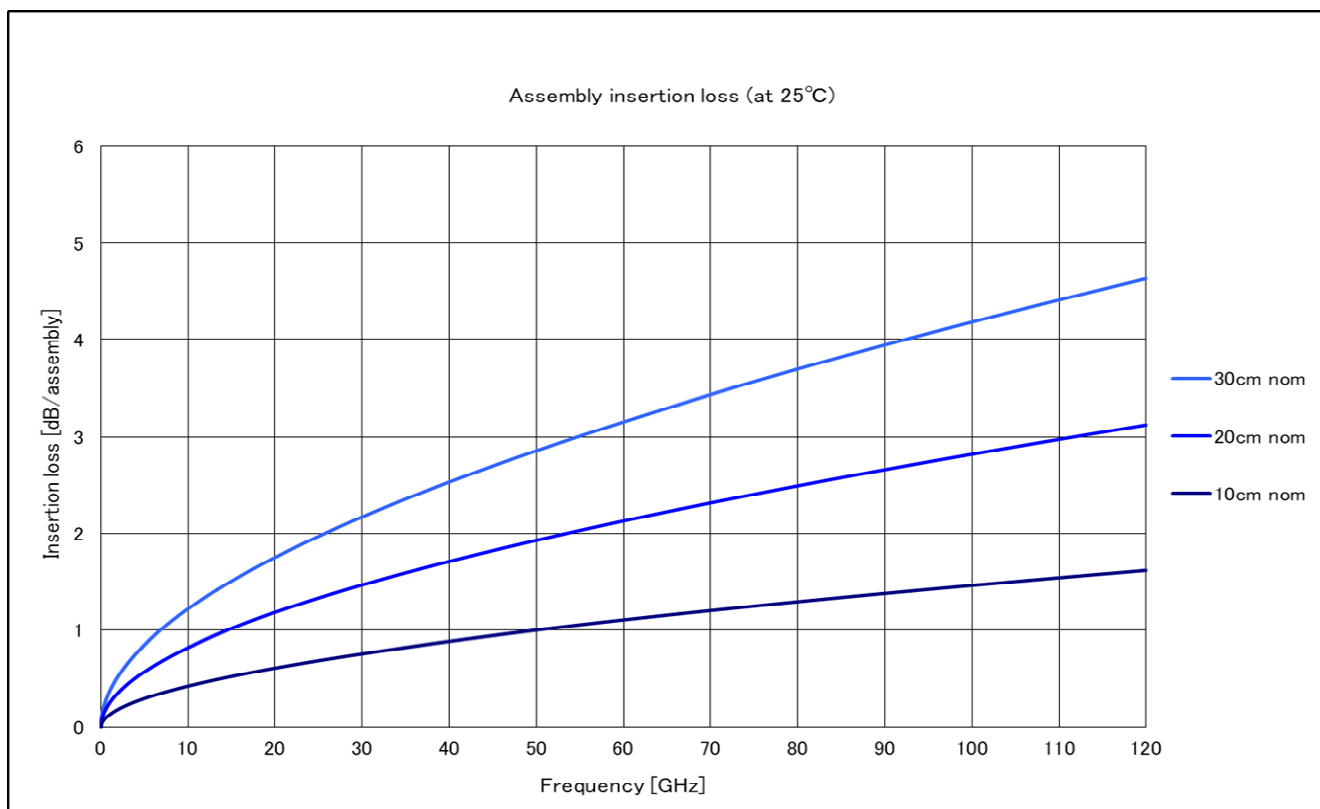
Cable attenuation

$$\text{Cable attenuation (25°C) [dB/m]} = \text{Conductor loss coefficient} \times \sqrt{f \text{ [GHz]}} + \text{Dielectric loss coefficient} \times f \text{ [GHz]} \\ 1.200 \text{ (typical)} \times \sqrt{f \text{ [GHz]}} + 0.0160 \text{ (typical)} \times f \text{ [GHz]}$$



Assembly insertion loss

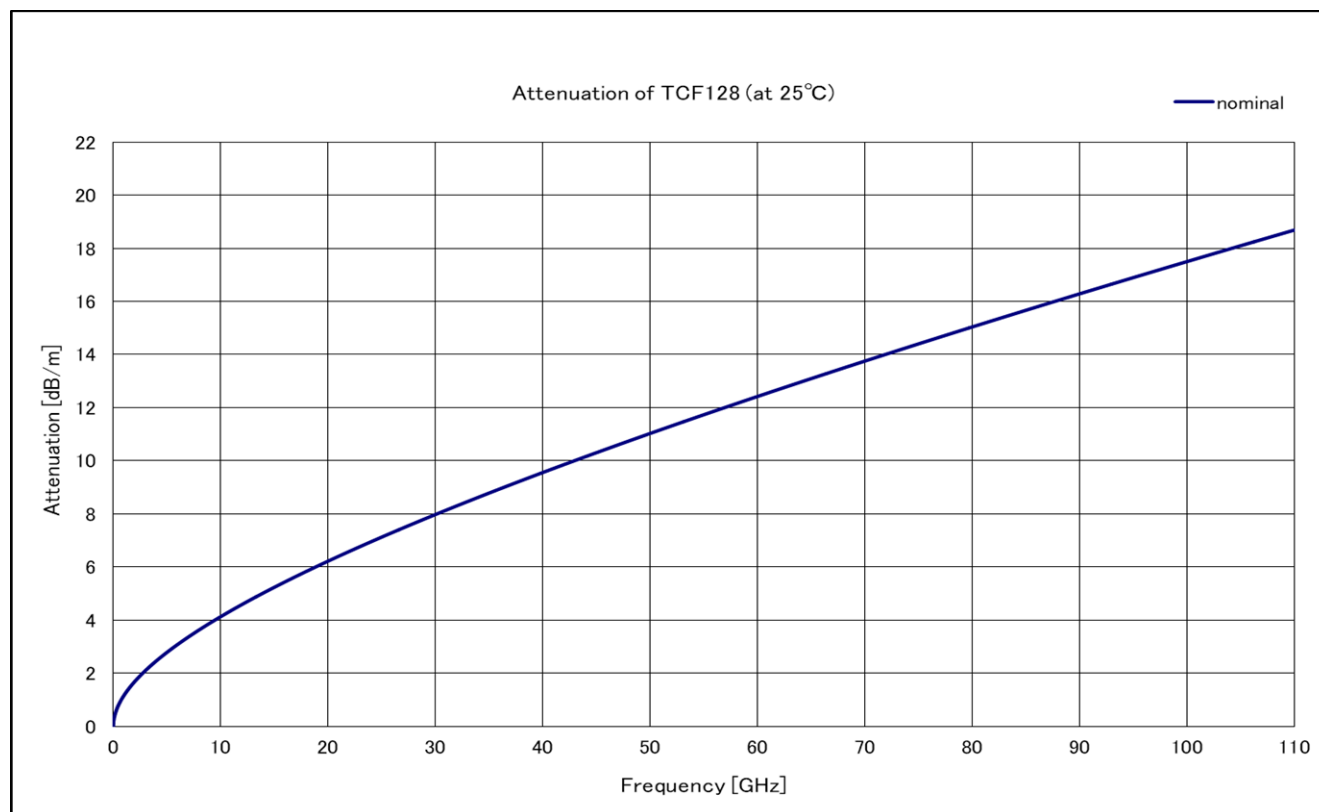
$$\text{Assembly insertion loss (25°C)} = \text{Cable attenuation (25°C)} \times \text{assembly length} + 0.01 \times \sqrt{f \text{ [GHz]}}$$



■ Cable attenuation

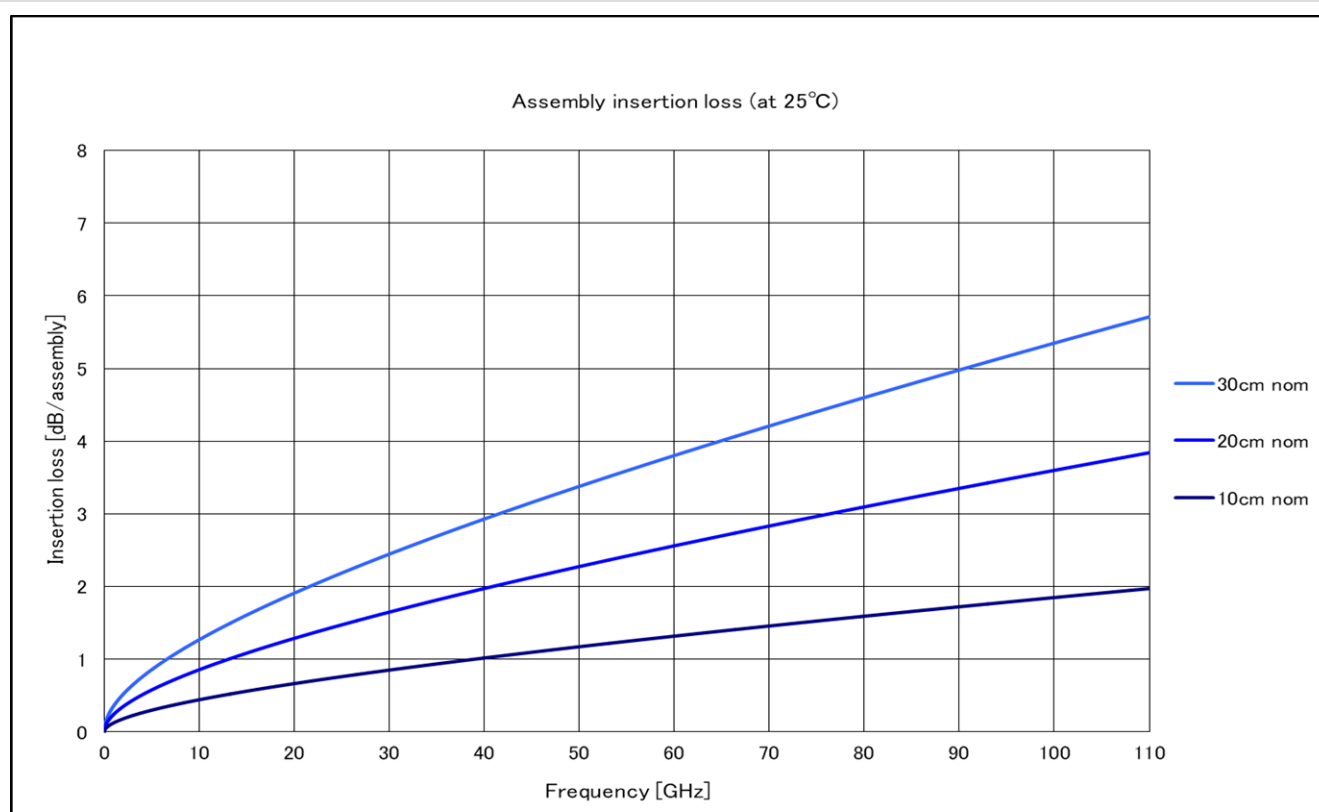
Cable attenuation (25°C) [dB/m] = Conductor loss coefficient * \sqrt{f} [GHz] + Dielectric loss coefficient * f [GHz]

$$1.100 \text{ (typical)} \times \sqrt{f} \text{ [GHz]} + 0.0650 \text{ (typical)} \times f \text{ [GHz]}$$



■ Assembly insertion loss

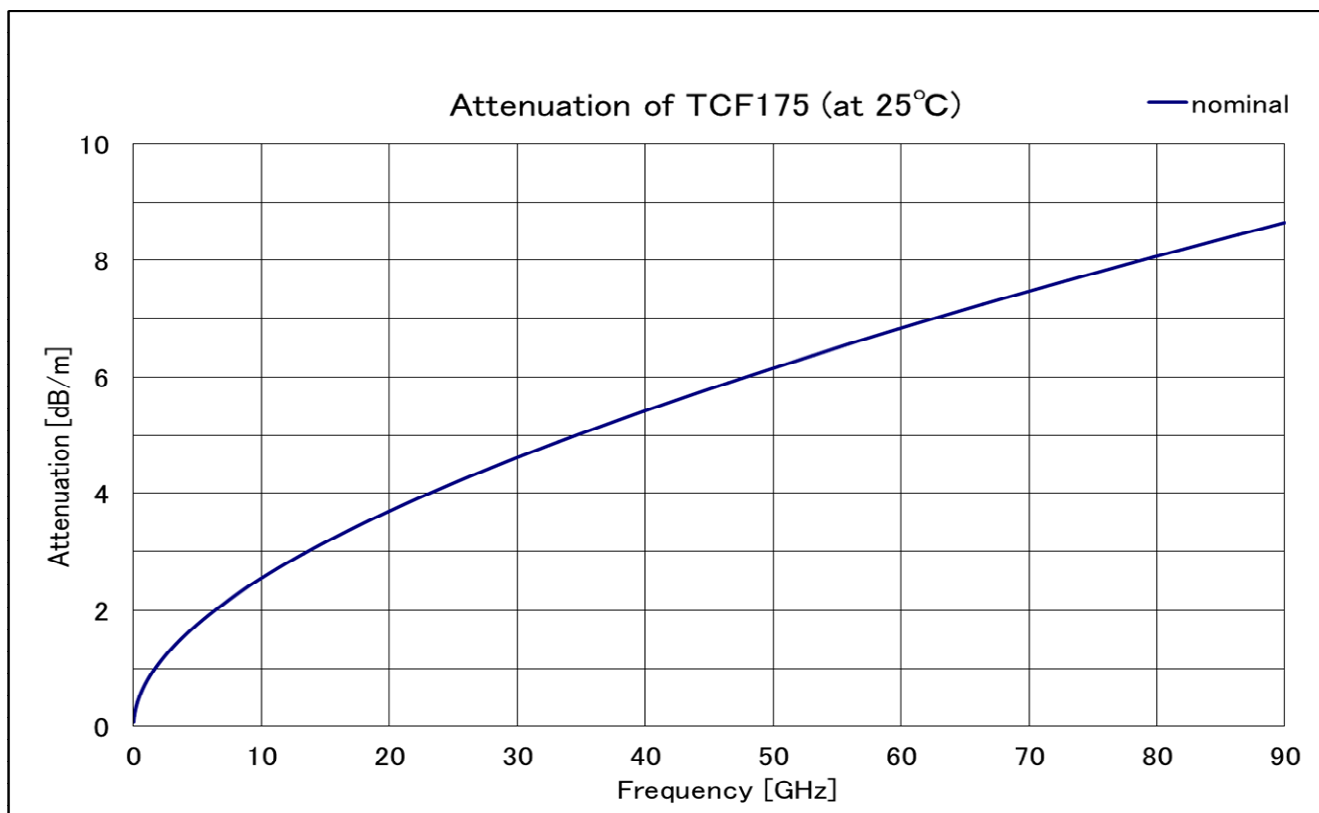
Assembly insertion loss (25°C) = Cable attenuation (25°C) * assembly length + $0.01 \times \sqrt{f}$ [GHz]



■ Cable attenuation

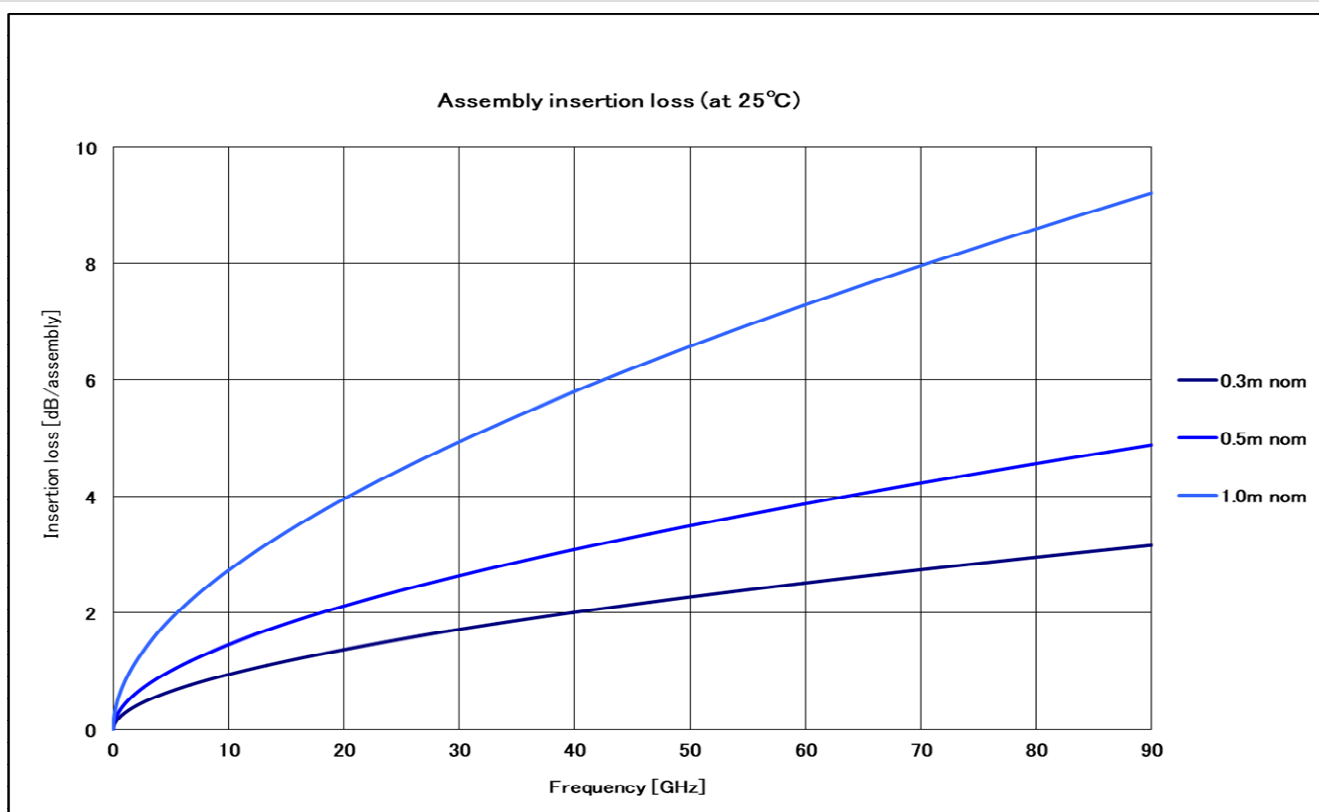
$$\text{Cable attenuation (25°C) [dB/m]} = \text{Conductor loss coefficient} \times \sqrt{f} \text{ [GHz]} + \text{Dielectric loss coefficient} \times f \text{ [GHz]}$$

$$0.75 \text{ (typical)} \times \sqrt{f} \text{ [GHz]} + 0.075 \text{ (typical)} \times f \text{ [GHz]}$$



■ Assembly insertion loss

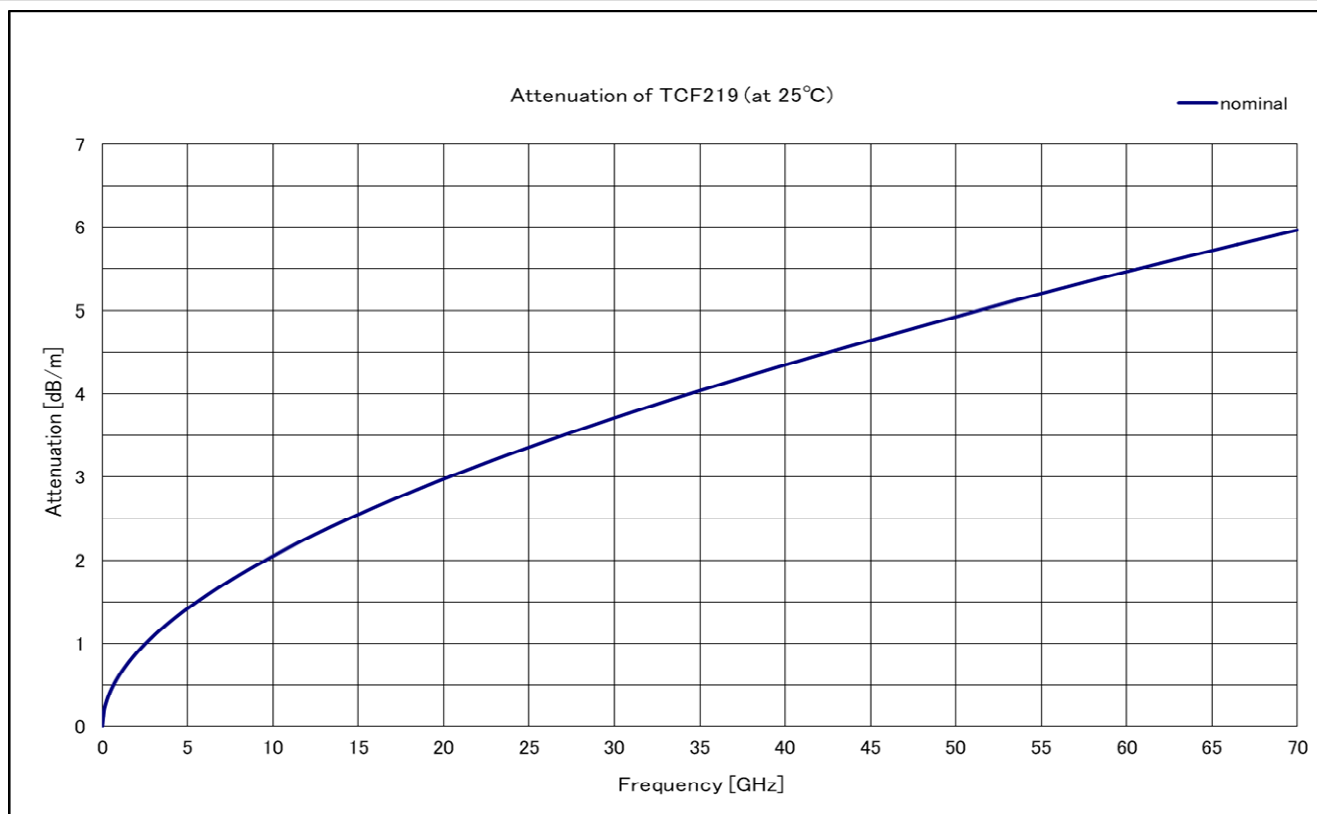
$$\text{Assembly insertion loss (25°C)} = \text{Cable attenuation (25°C)} \times \text{assembly length} + 0.06 \times \sqrt{f} \text{ [GHz]}$$



Cable attenuation

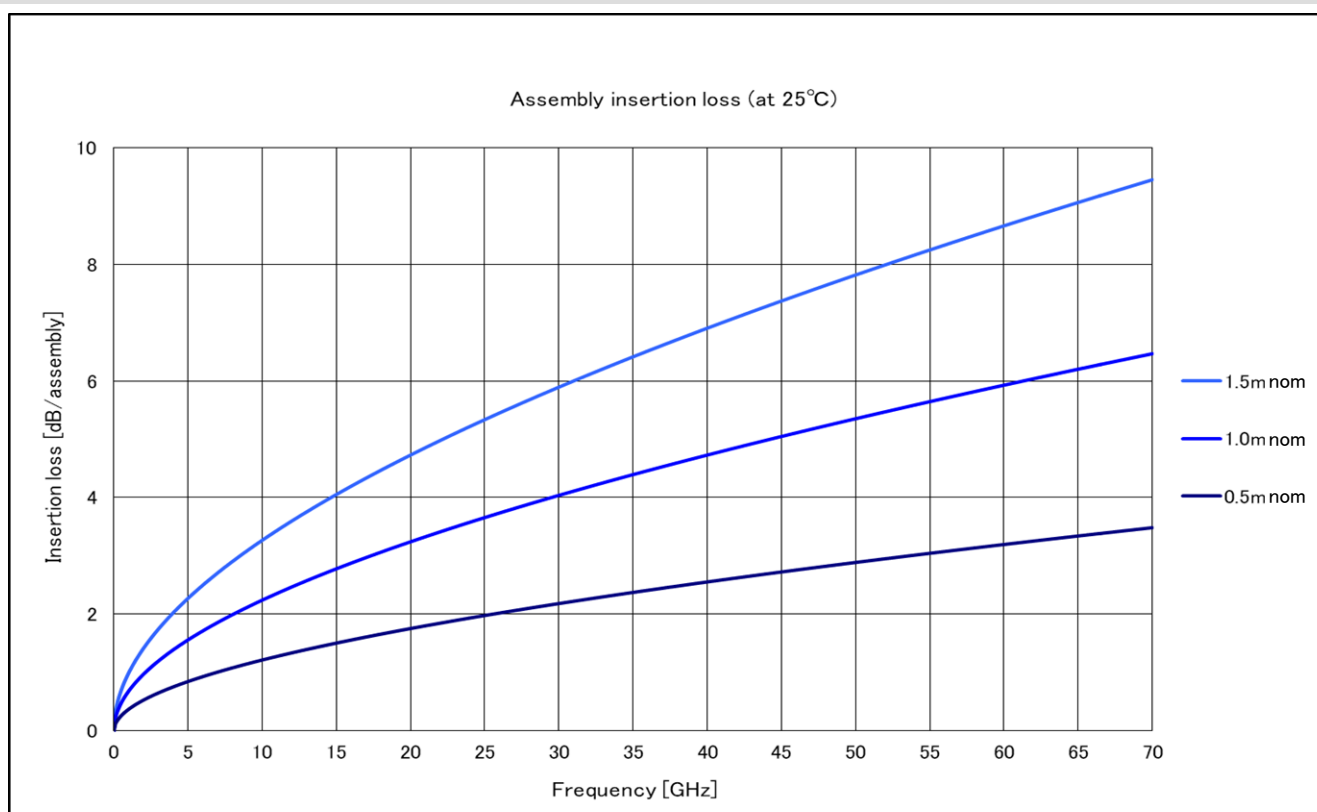
Cable attenuation (25°C) [dB/m] = Conductor loss coefficient * \sqrt{f} [GHz] + Dielectric loss coefficient * f [GHz]

$$0.610 \text{ (typical)} \times \sqrt{f} \text{ [GHz]} + 0.0123 \text{ (typical)} \times f \text{ [GHz]}$$



Assembly insertion loss

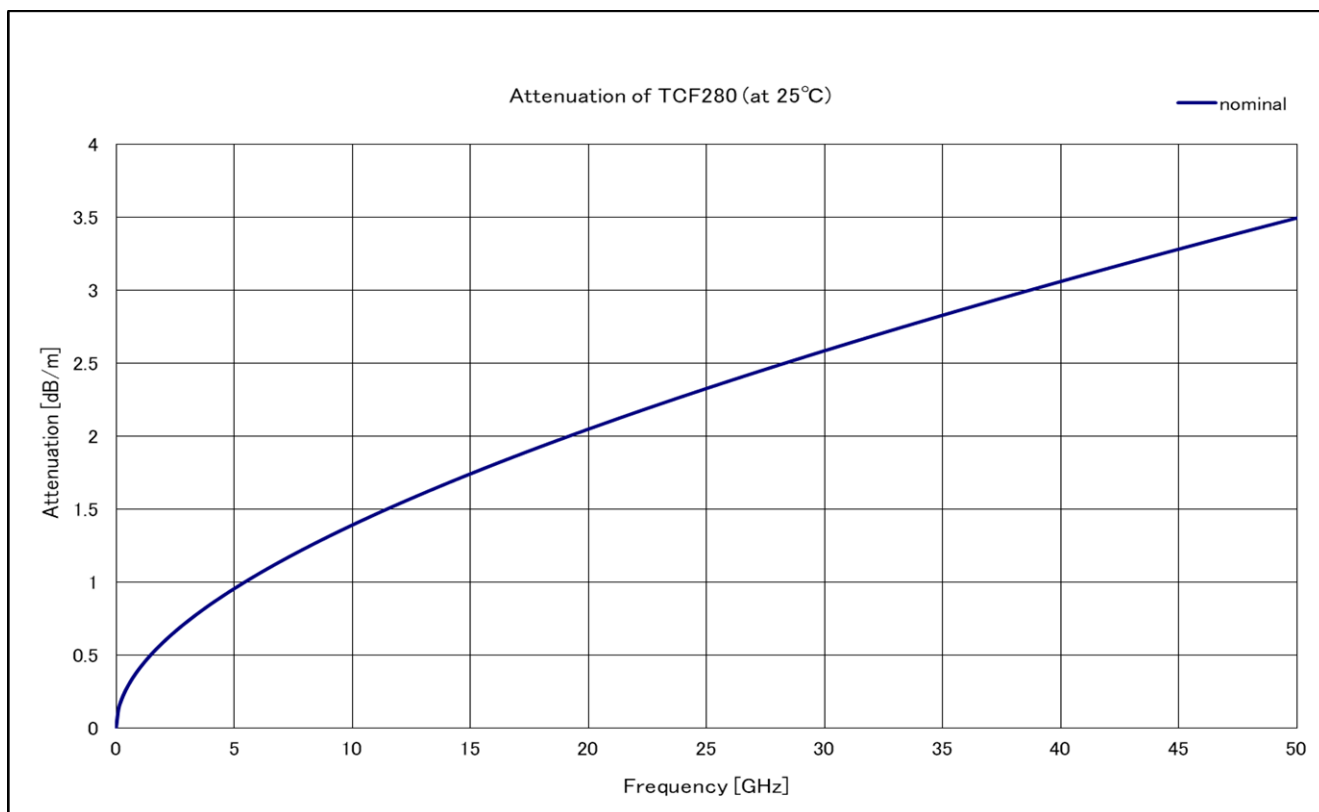
Assembly insertion loss (25°C) = Cable attenuation (25°C) * assembly length + $0.06 \times \sqrt{f}$ [GHz]



■ Cable attenuation

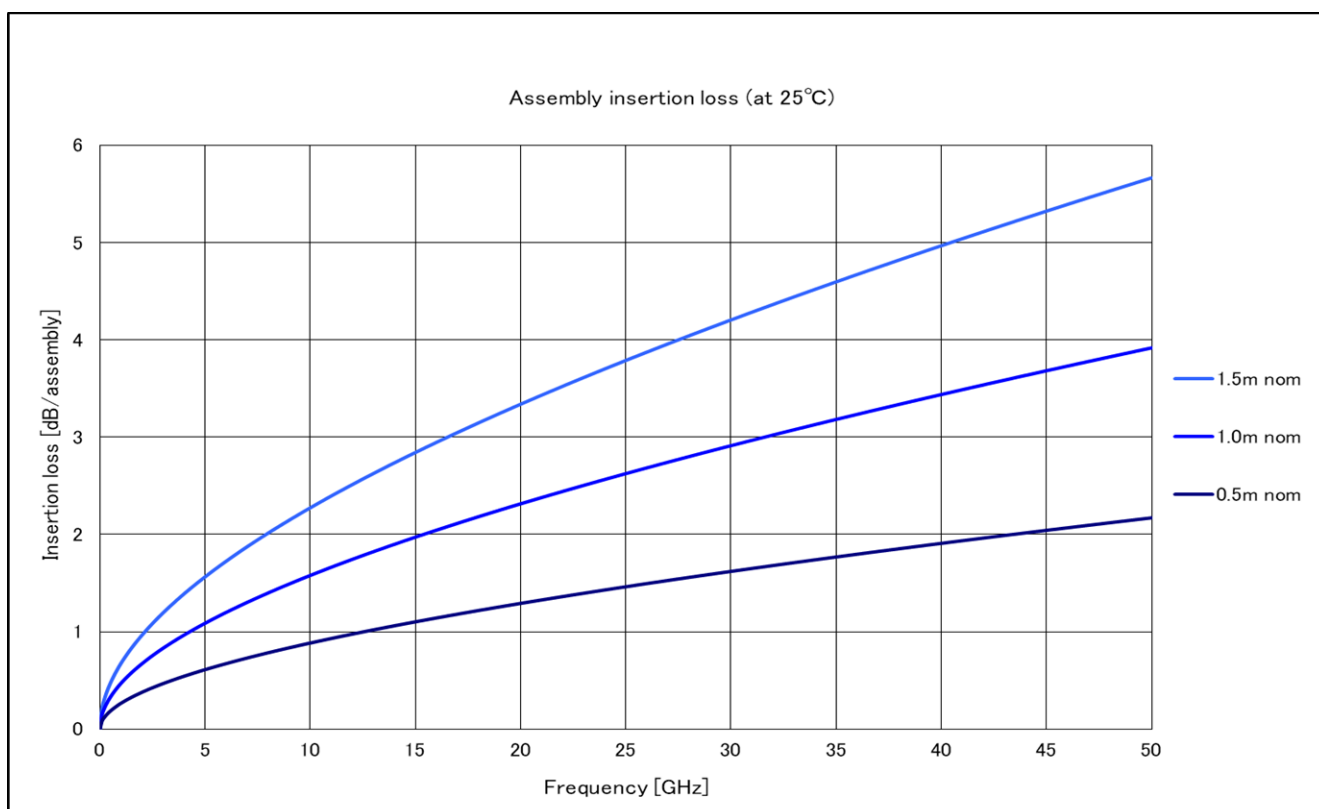
Cable attenuation (25°C) [dB/m] = Conductor loss coefficient * \sqrt{f} [GHz] + Dielectric loss coefficient * f [GHz]

$$0.395 \text{ (typical)} \times \sqrt{f} \text{ [GHz]} + 0.0140 \text{ (typical)} \times f \text{ [GHz]}$$



■ Assembly insertion loss

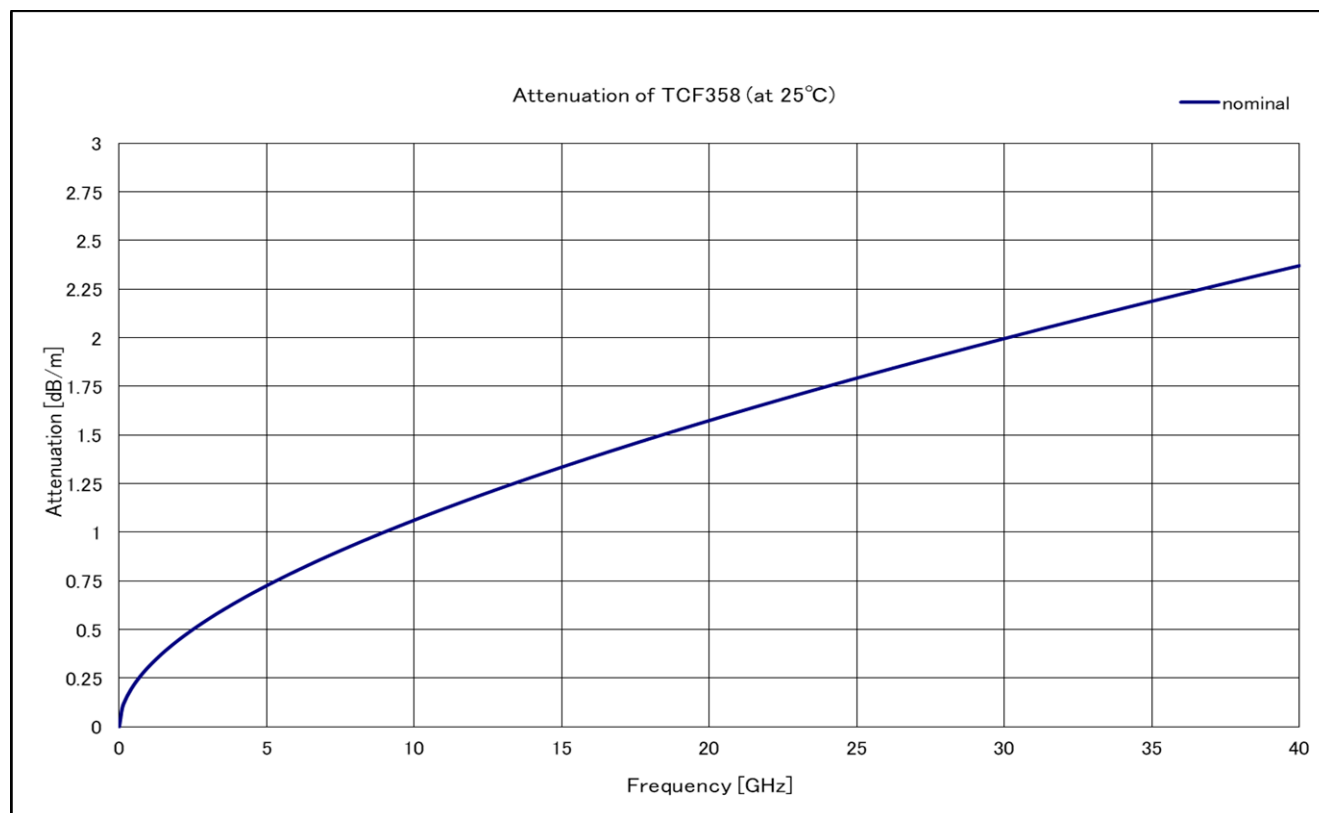
Assembly insertion loss (25°C) = Cable attenuation (25°C) * assembly length + $0.06 * \sqrt{f}$ [GHz]



■ Cable attenuation

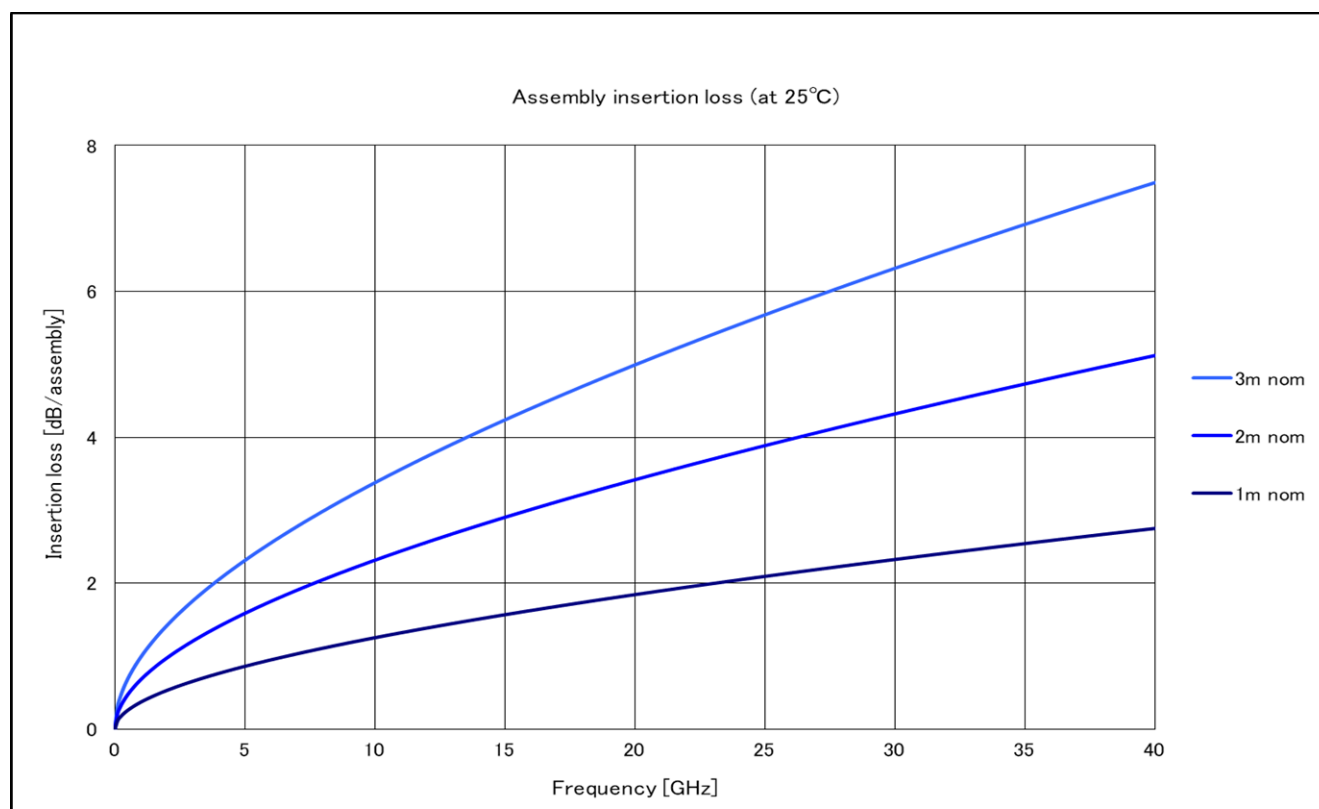
Cable attenuation (25°C) [dB/m] = Conductor loss coefficient * \sqrt{f} [GHz] + Dielectric loss coefficient * f [GHz]

$$0.297 \text{ (typical)} \times \sqrt{f} \text{ [GHz]} + 0.0123 \text{ (typical)} \times f \text{ [GHz]}$$



■ Assembly insertion loss

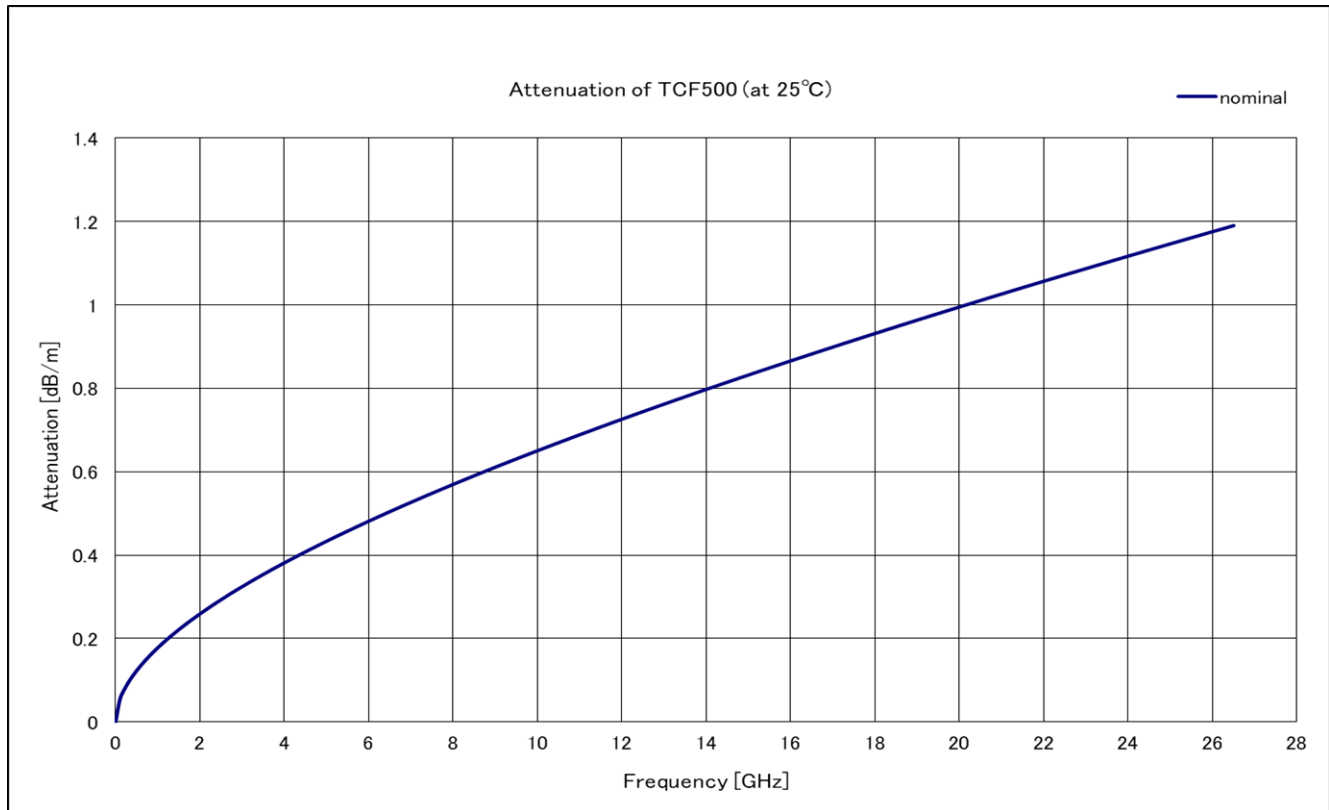
Assembly insertion loss (25°C) = Cable attenuation (25°C) * assembly length + $0.06 \times \sqrt{f}$ [GHz]



■ Cable attenuation

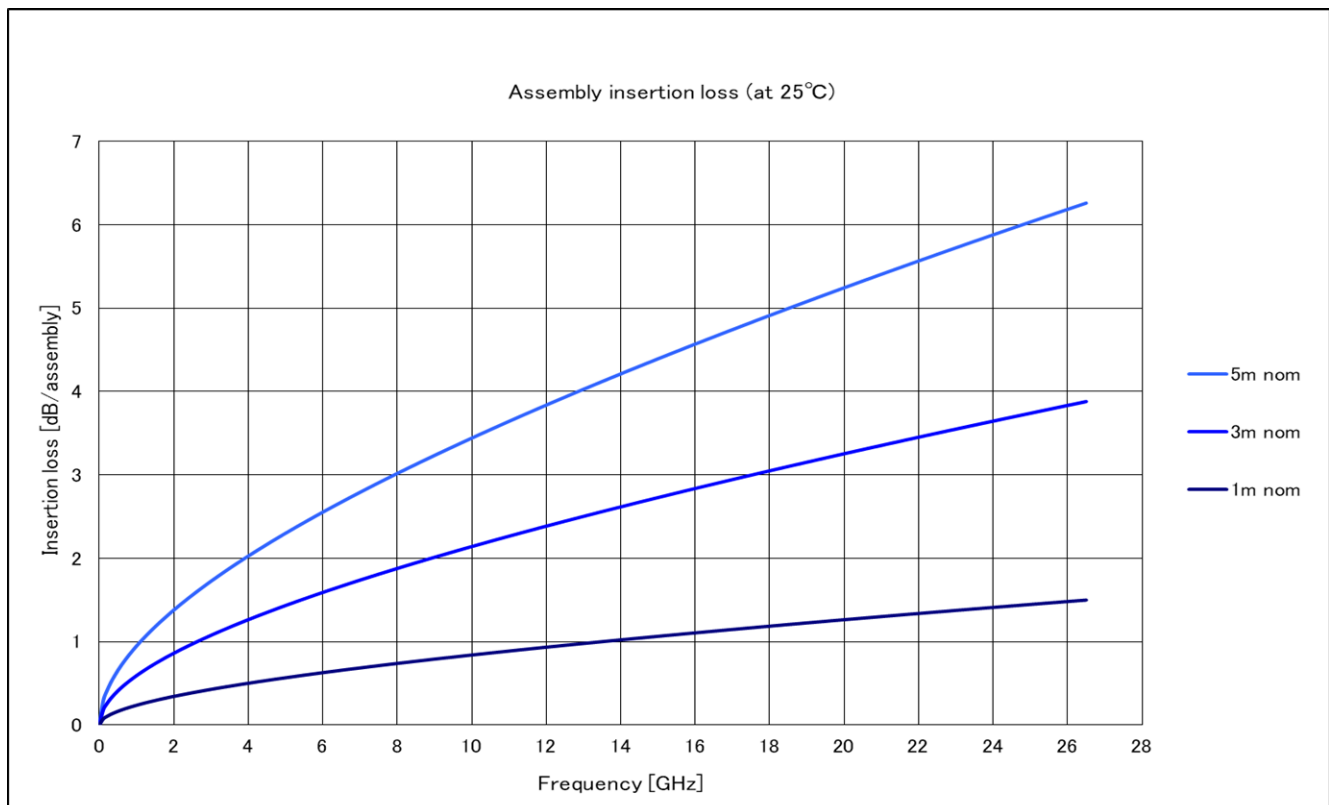
$$\text{Cable attenuation (25°C) [dB/m]} = \text{Conductor loss coefficient} \times \sqrt{f \text{ [GHz]}} + \text{Dielectric loss coefficient} \times f \text{ [GHz]}$$

$$0.165 \text{ (typical)} \times \sqrt{f \text{ [GHz]}} + 0.0129 \text{ (typical)} \times f \text{ [GHz]}$$



■ Assembly insertion loss

$$\text{Assembly insertion loss (25°C)} = \text{Cable attenuation (25°C)} \times \text{assembly length} + 0.06 \times \sqrt{f \text{ [GHz]}}$$



■ Non-Magnetic type assembly

Non-Magnetic type 2.92mm plug connector for TCF280 is available.

Model number

Regular part number: TCF280TT???? For ???, please write the total length in mm, aligned to the left.

Option symbol at the end of the model number: NM

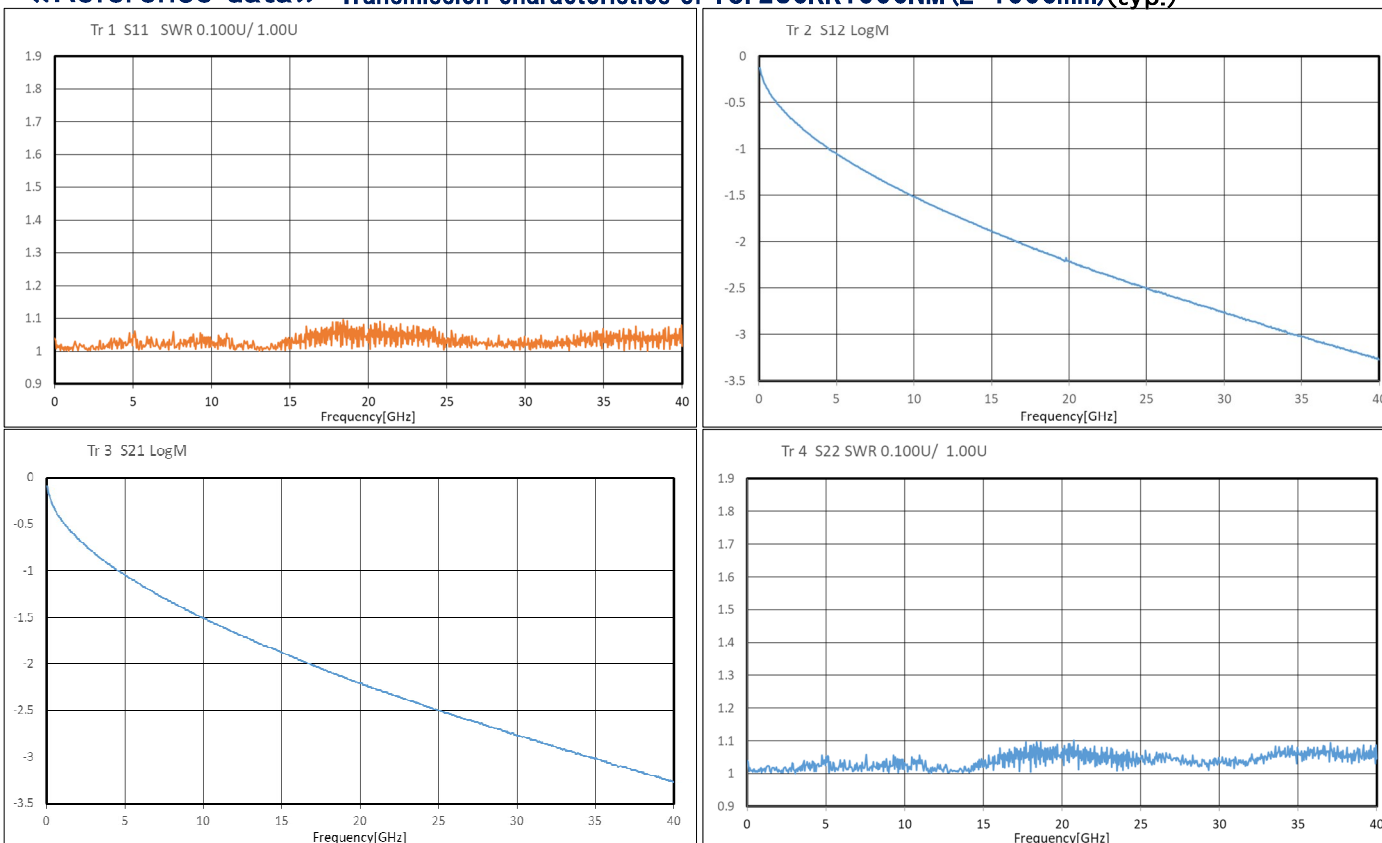
Note: Because the armor is magnetic, there are no armor reinforcements in this assembly.

✕ Example of model designation for 0.5m cable assembly
with non-magnetic 2.92mm plugs on both ends
TCF280TT500NM

✕ Example of model designation for 0.5m cable assembly
with non-magnetic 2.92mm plugs on both ends
TCF280TT1000NM



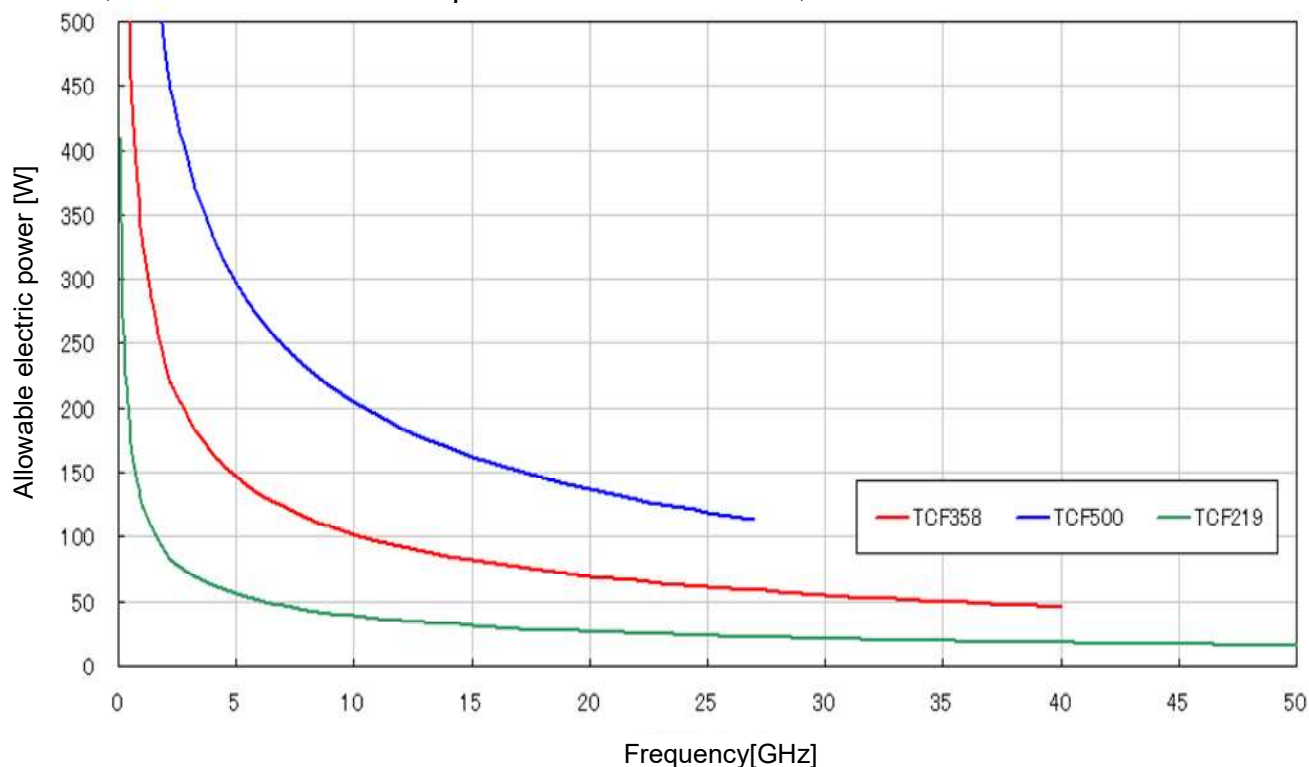
《Reference data》 Transmission characteristics of TCF280KK1000NM (L=1000mm)(typ.)



本データは実測値であり、保証値ではありません。

Maximum C.W. power of cables

(at +25°C ambient temperature and sea level)



Lateral pressure performance

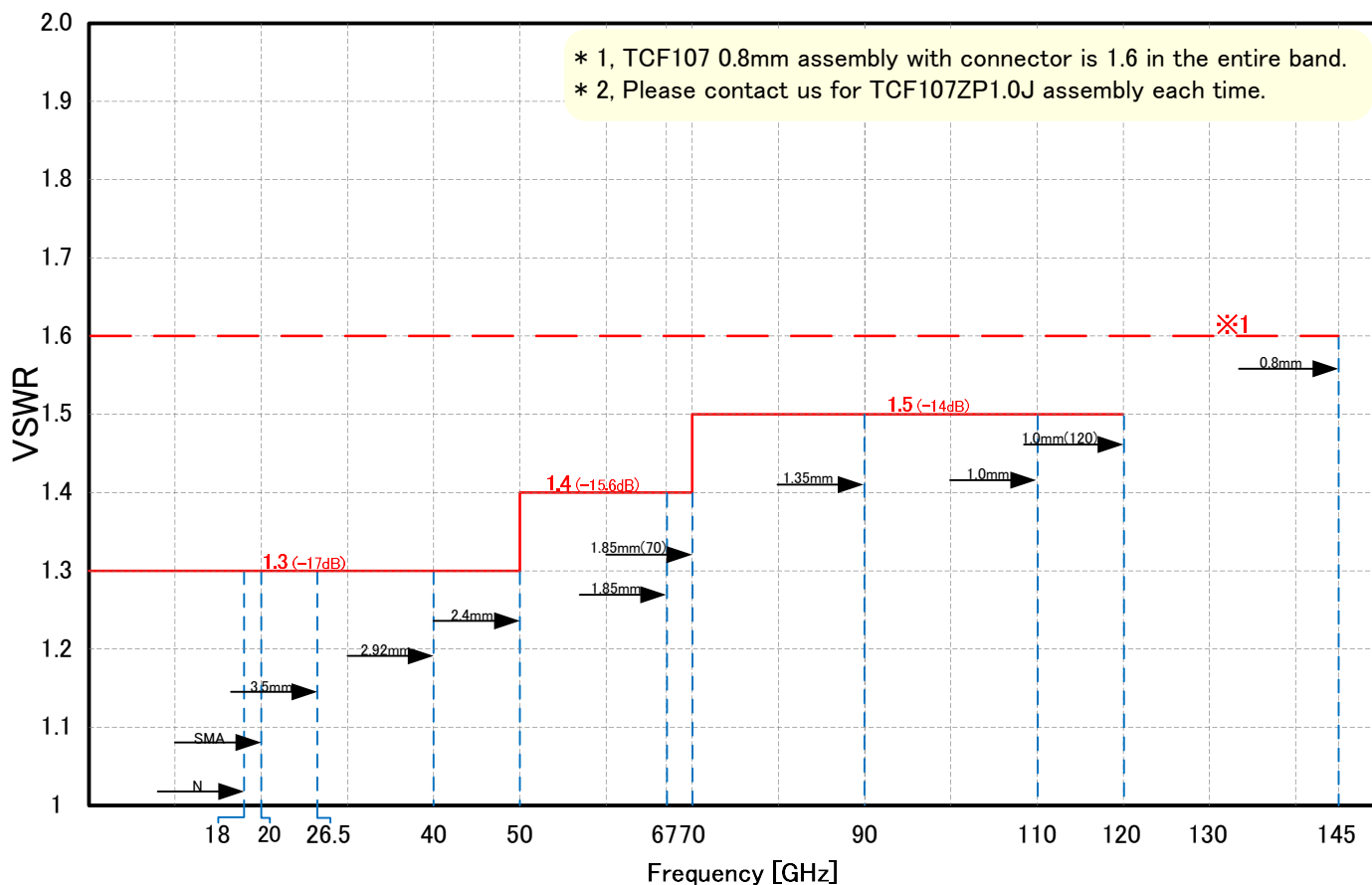
TOTOKU cable type	Armor type	Lateral pressure performance typical(N/cm) *1,2
TCF358	Normal	47
TCF500	Normal	65
TCF280	Normal	36
TCF219	Normal	29
TCF358H	Standard armor	770
TCF500H	Standard armor	690
TCF358HS	Soft armor	500
TCF500HS	Soft armor	370
TCF280HS	Soft armor	400
TCF219HS	Soft armor	430
TCF119	Soft armor	330
TCF107	Soft armor	330
TCFF128	Formable armor	730
TCFF119	Formable armor	730
TCFF107	Formable armor	730

*1 Data shows typical values, not guaranteed values.

*2 It is the force that the electrical characteristic can secure.

It is in a condition that the cable or armor was crushed a little.

■ VSWR Spec (※1,※2)



■ Phase matching assemblies technology

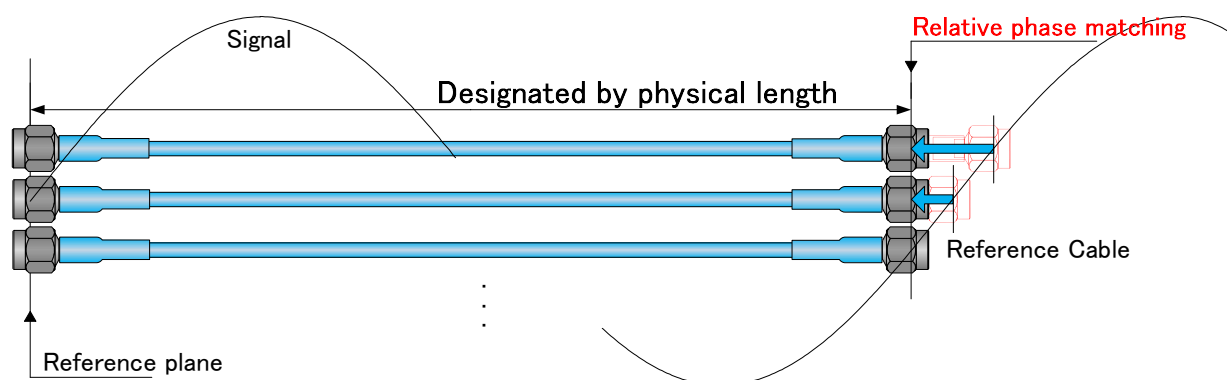
One of the excellent features of this product is the technology to accurately match the phase (electrical length) of the cable assembly.

This is made possible by TOTOKU's proprietary connector, high-performance cable, and special connection processing technology.

This makes it possible to obtain superior performance and provide cable assemblies at a lower cost than the method of adding an expensive adapter with phase adjustment function or the method of selecting from multiple assemblies.

Relative phase matching (Option symbol "PM" refer to P.23)

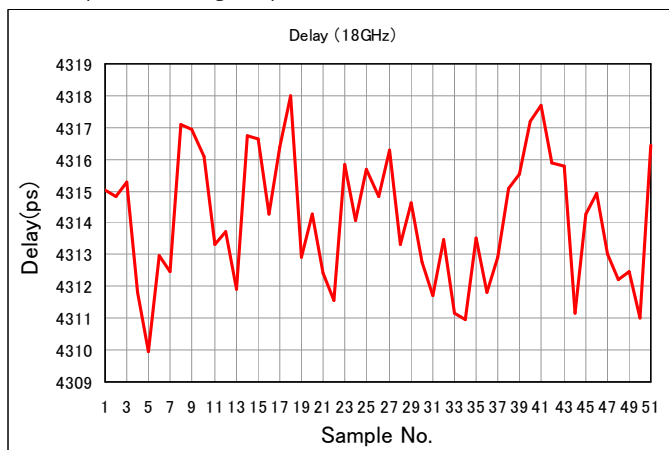
Phase matching in two or more cable assemblies



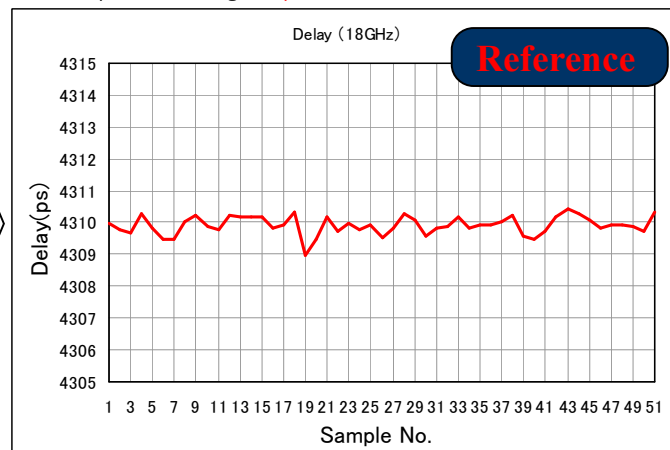
Phase (Electrical length) matching of 51 assemblies is enumerated as an example.

51 assemblies Assembly length: 1m Measure frequency: 18GHz

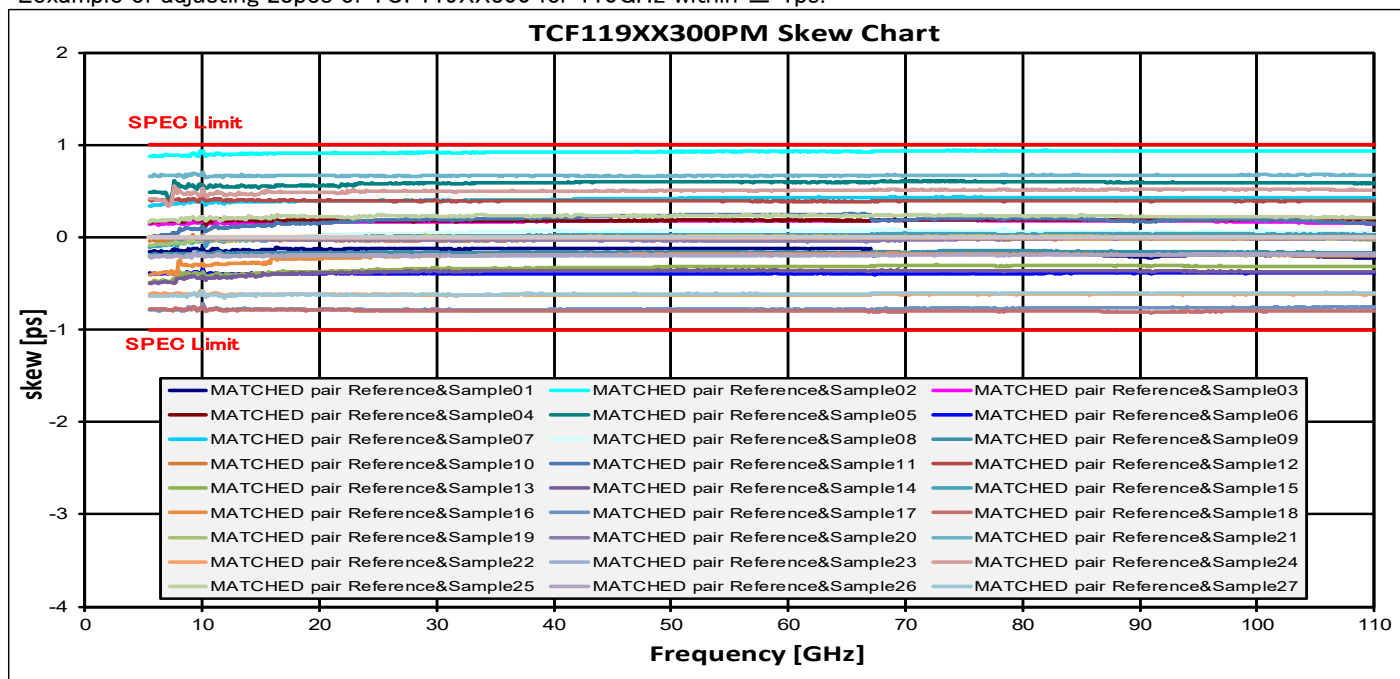
BEFORE phase matching $\pm 5\text{ps} / 51\text{assemblies}$



AFTER phase matching $\pm 1\text{ps} / 51\text{assemblies}$

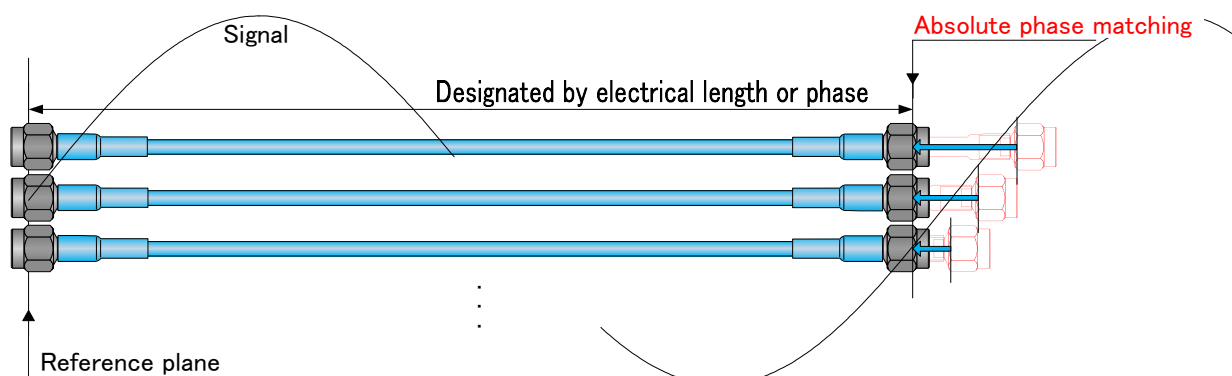


Example of adjusting 28pcs of TCF119XX300 for 110GHz within $\pm 1\text{ps}$.



Absolute phase matching (Option symbol "APM" refer to P.23)

Manufacture to have the specified electrical length.



Please specify the electric length

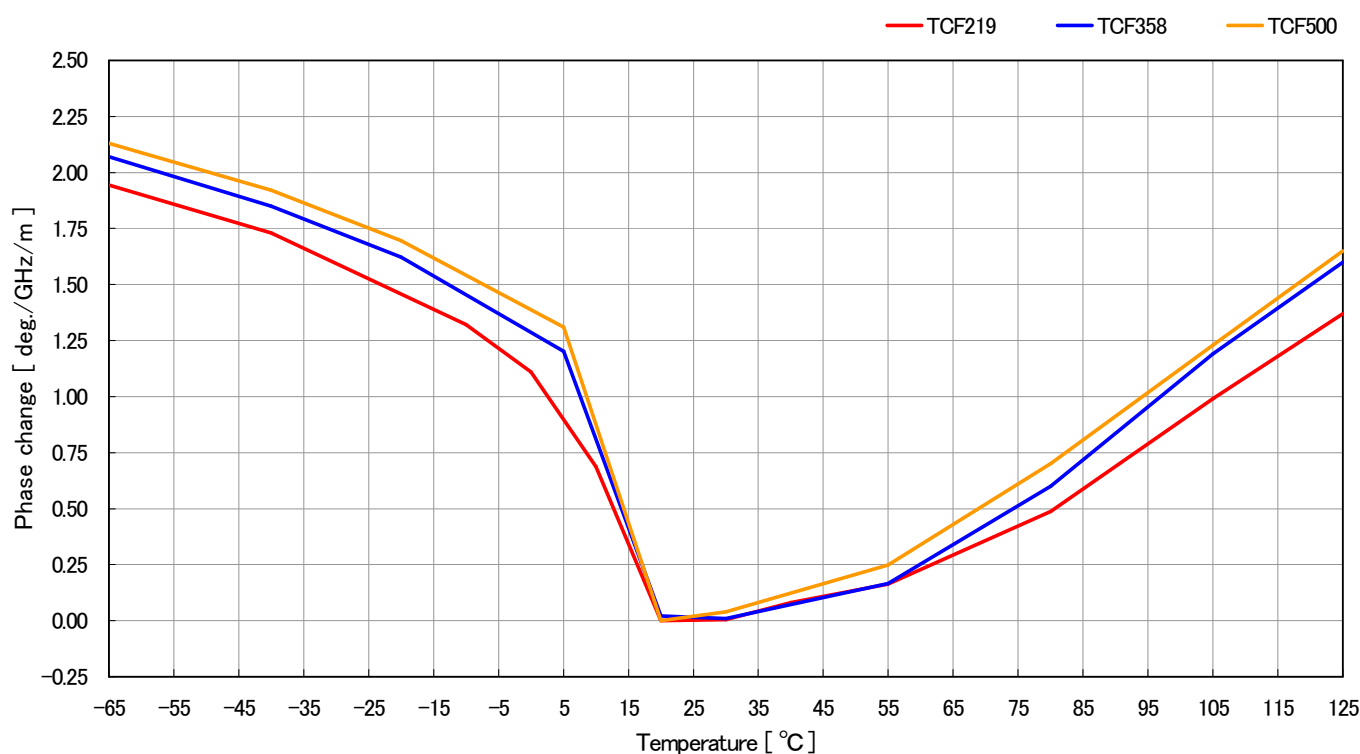
* It is also possible to match it with the assembly purchased in the past.

We will make adjustments based on the data stored by us (data at the time of shipment).

Please let us know the product number and serial number.

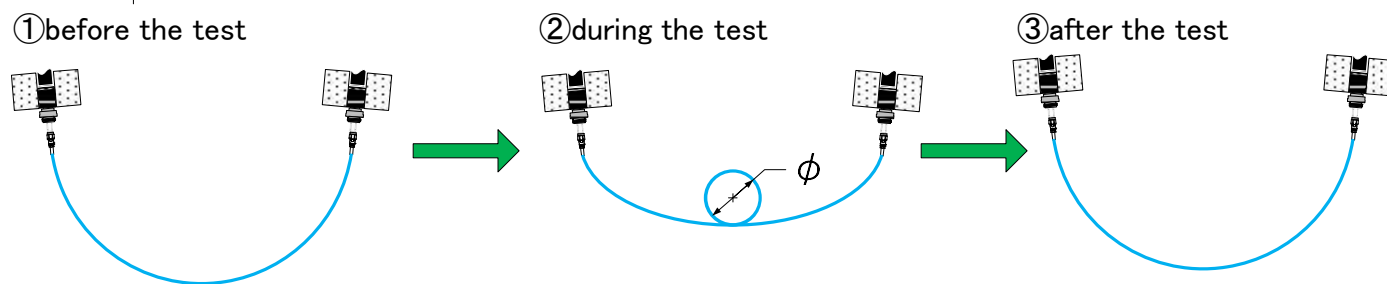
Phase variation for temperature change

Phase variation for temperature change of Wavemolle (TCF Cable Assembly)



Phase change After bending

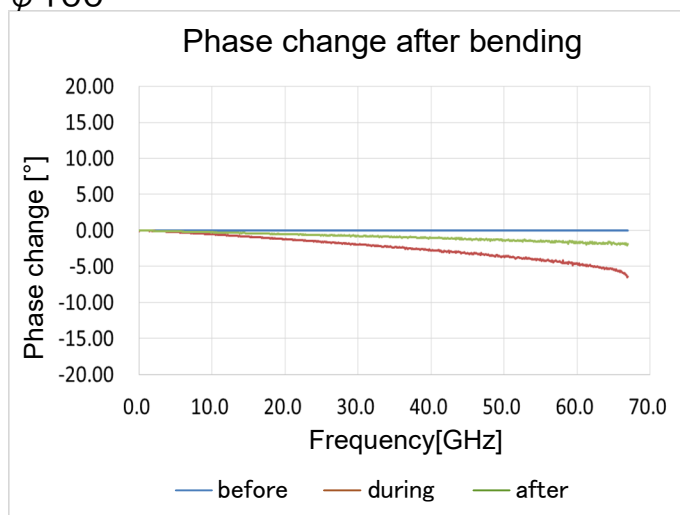
【Test method】



- ① before the test
 - ② during the test (ϕ 100 360° bending)
 - ③ after the test
 - ② during the test (ϕ 60 360° bending)
 - ③ after the test
 - ② during the test (ϕ 40 or ϕ 30 360° bending)
 - ③ after the test
- Measured each phase change.

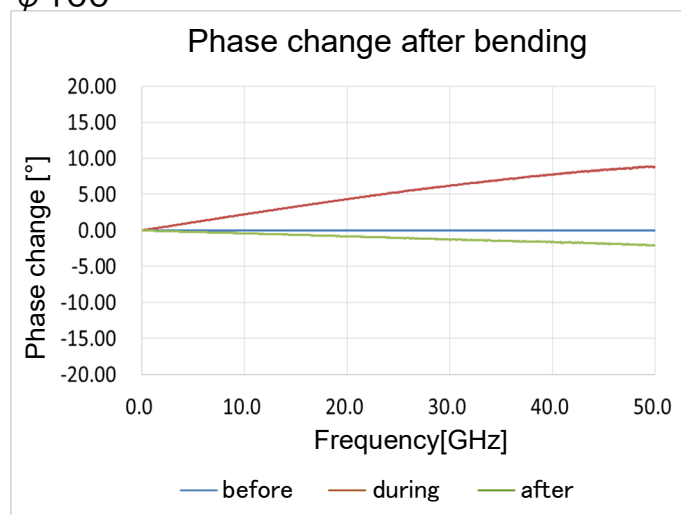
【TCF219】

φ 100

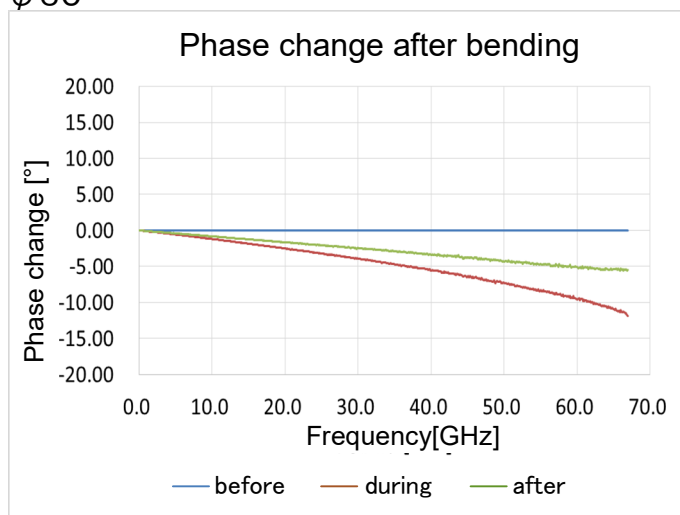


【TCF280】

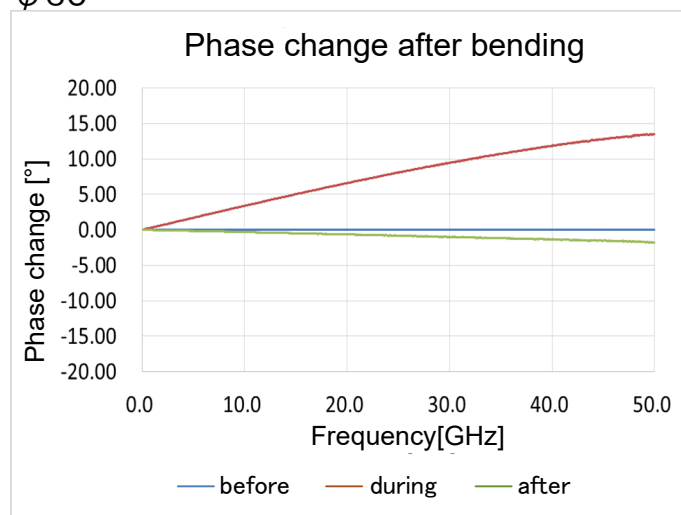
φ 100



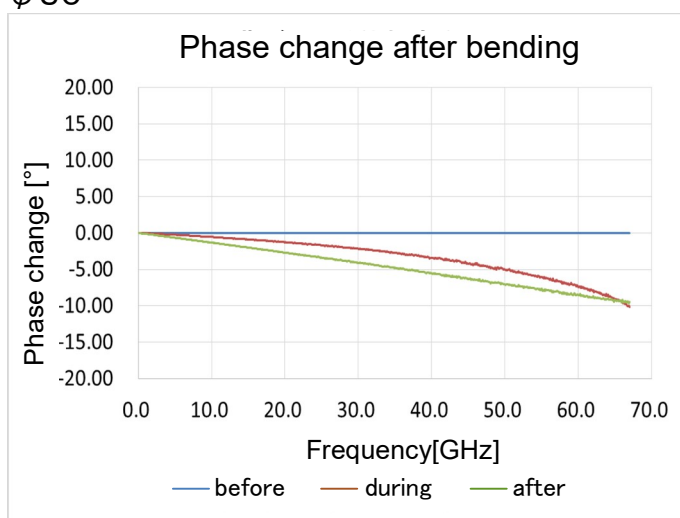
φ 60



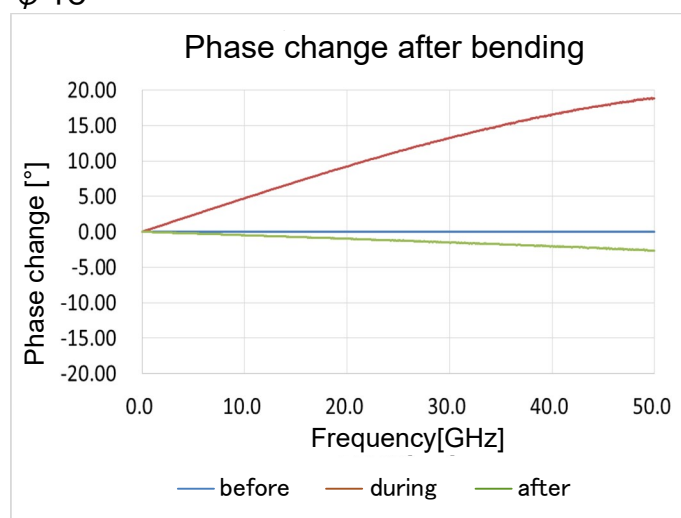
φ 60



φ 30



φ 40

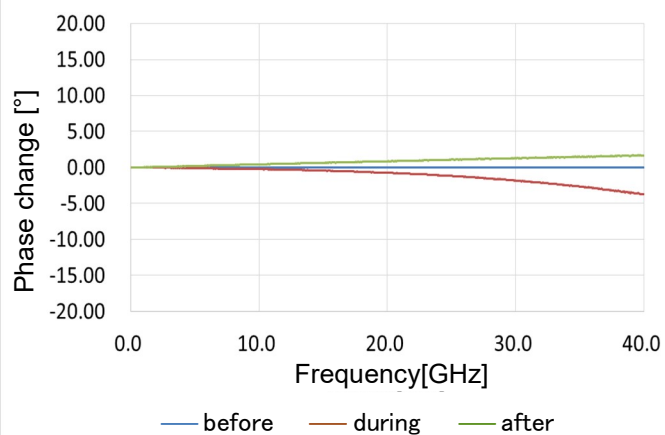


※ Reference date for Phase change is measured values, not guarantee values.

【TCF358】

φ 100

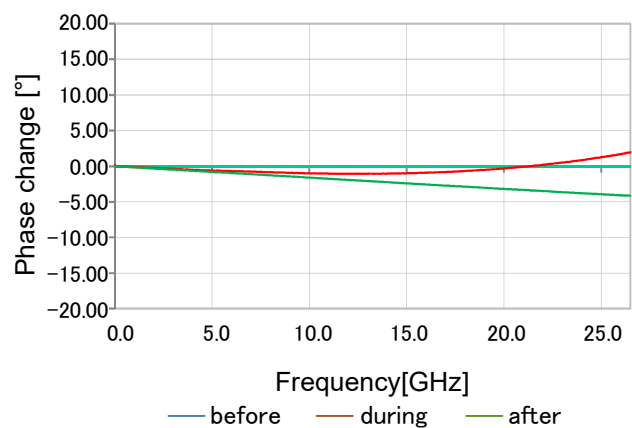
Phase change after bending



【TCF500】

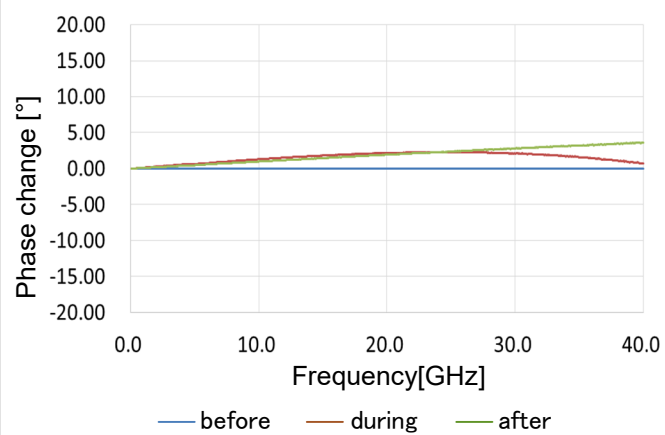
φ 100

Phase change after bending



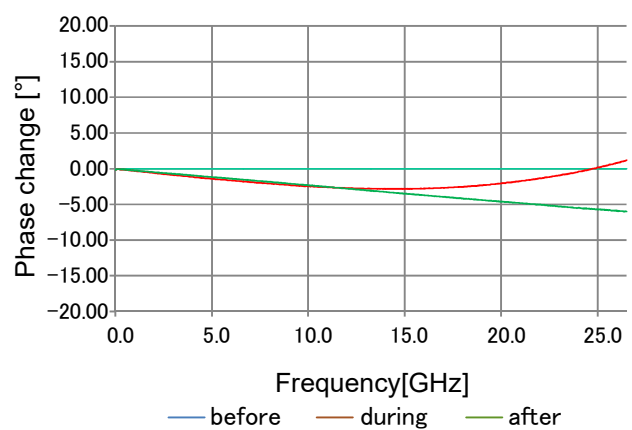
φ 60

Phase change after bending



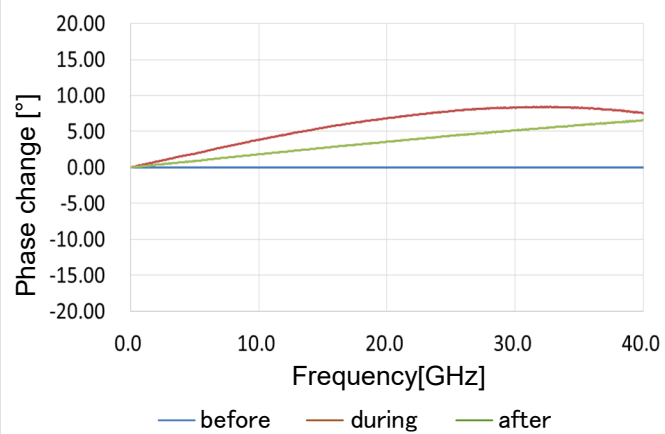
φ 60

Phase change after bending



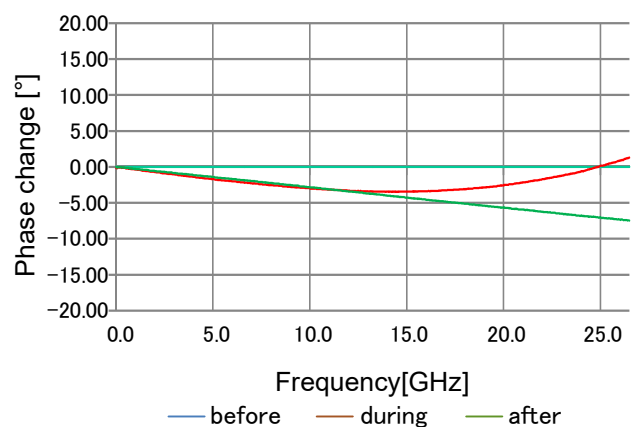
φ 40

Phase change after bending



φ 50

Phase change after bending

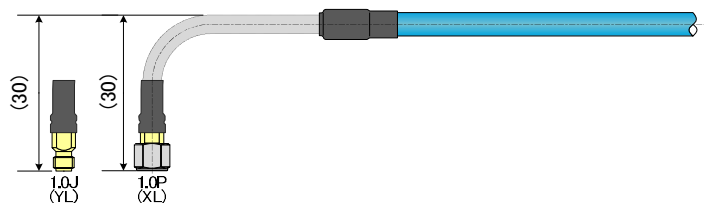


※ Reference date for Phase change is measured values, not guarantee values.

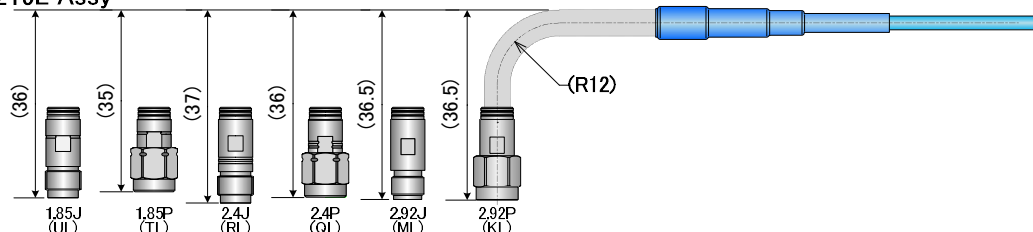
■ Supports angle of terminal part

(Name at the bottom of connector diagram indicates connector name and plug jack, and numbers in parentheses indicate symbol when our product number is specified).

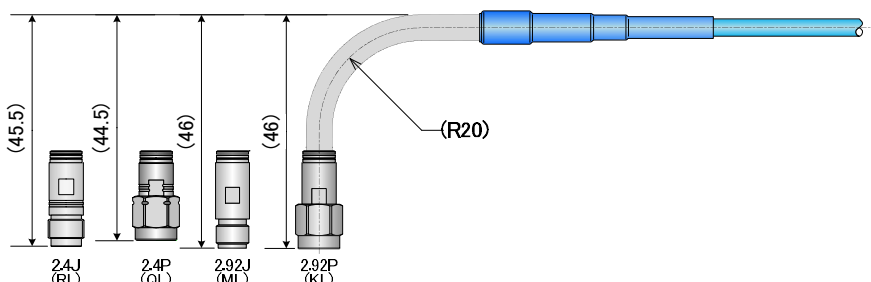
TCF119L Assy



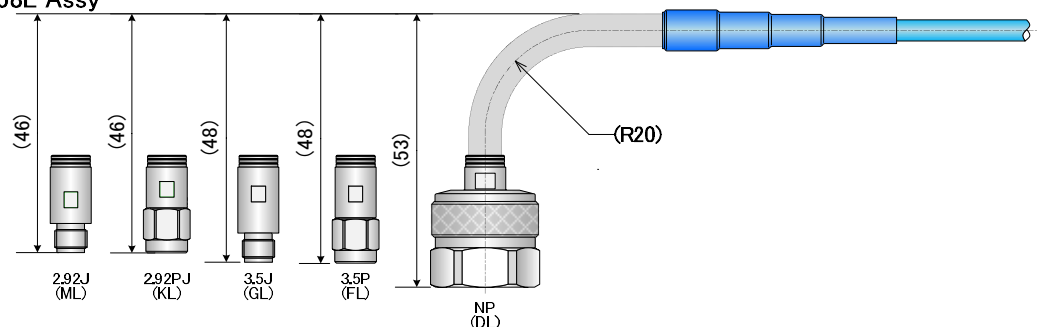
TCF219L Assy



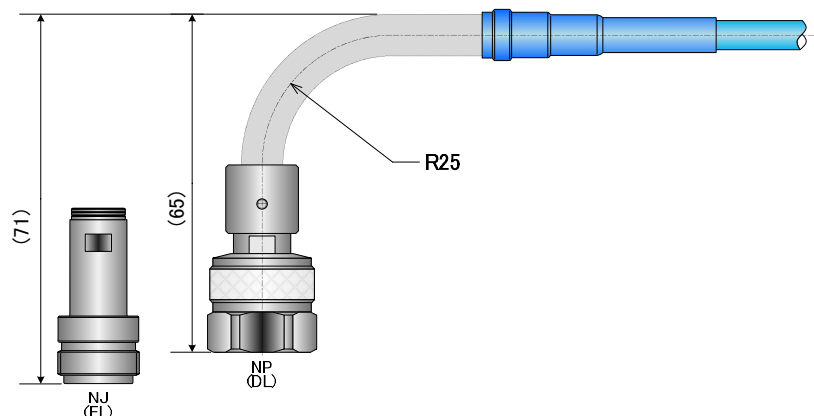
TCF280L Assy



TCF358L Assy



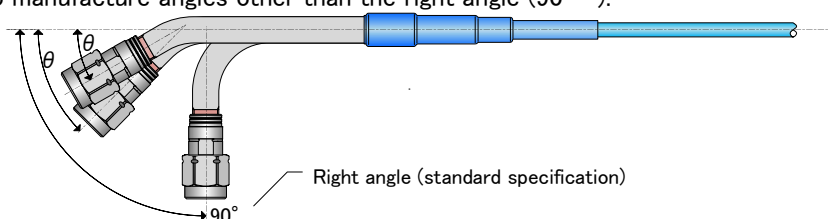
TCF500L Assy



■ Special terminal shape correspondence

(It is necessary to determine the specifications each time)

We also manufacture angles other than the right angle (90 °).



Please feel free to contact our sales department.

コネクタタイプ / Connector type		ケーブルタイプ / Cable type																					
		非補強タイプ / Normal					SJタイプ / soft jacket	標準アーマー補強タイプ / Standard armor				柔軟アーマー補強タイプ / Soft armor								TCFFフォーマブルアーマー / TCFF formable armor			
		単線 Solid					単線 Solid	単線 Solid				単線 Solid								単線 Solid			
中心導体: Inner conductor:																							
コネクタ記号		500	358	280	219	128	358SJ	500H	358H	280H	219H	500HS	358HS	280HS	219HS	175HS	128HS	119	107	128	119	107	
コネクタタイプ / Connector type	18GHz	N-P	D	○	○			○	○	○			○	○									
		N-J	E	○					○				○										
		N-LP	DL	○	○			○	○	○			○	○									
		N-LJ	EL	○					○				○										
	20GHz	SMA-P	A	○	○		※○ ~10GHz	○	○	○		○	○	○		○							
		SMA-J	B		○		※○ ~10GHz	○		○				○									
		3.5-P	F	○	○			○	○	○			○	○									
		3.5-J	G		○			○		○				○									
	26.5GHz	3.5-LP	FL		○			○		○				○									
		3.5-LJ	GL		○			○		○				○									
		2.92-P	K	○	○	○	○	○		○	○	○		○	○	○		○	○				
		2.92-J	M	○	○	○	○	○		○	○	○		○	○	○		○	○				
	40GHz	2.92-LP	KL		○	○	○	○		○	○	○		○	○	○							
		2.92-LJ	ML		○	○	○	○		○	○	○		○	○	○							
		2.92-P	※1 K44G		○										○								
		2.92-J	※1 M44G		○										○								
	44GHz	2.92-LP	※1 KL44G		○										○								
		2.92-LJ	※1 ML44G		○										○								
		2.4-P	Q		○	○					○	○			○	○							
		2.4-J	R		○	○					○	○			○	○							
	50GHz	2.4-LP	QL		○	○					○	○			○	○							
		2.4-LJ	RL		○	○					○	○			○	○							
		SMPM-J	SMPM			○																	
		1.85-P	T			○	○					○			○		○	○					
	67GHz	1.85-J	U			○	○					○			○		○	○					
		1.85-LP	TL			○						○			○								
		1.85-LJ	UL			○						○			○								
		1.85-P	※2 T70G			○						○			○								
	70GHz	1.85-J	※2 U70G			○						○			○								
		1.85-LP	※2 TL70G			○						○			○								
1.85-LJ		※2 UL70G			○						○			○									
1.35-P		135P													○								
90GHz	1.35-J	135J													○								
	1.0-P	X				○											○	○		○	○		
	1.0-J	Y				○											○	○		○	○		
	1.0-LP	XL				○											○	○					
110GHz	1.0-LJ	YL				○											○	○					
	1.0-P	※3 X120G																	○		○		
	1.0-J	※3 Y120G																	○		○		
	1.0-LP	※3 XL120G																	○				
120GHz	1.0-LJ	※3 YL120G																	○				
	1.0-J	※4 1.0J																		△		△	
	0.8-P	ZP																	○			△	
	0.8-J	ZJ																	○			△	
ケーブル適用可能最大長 (m) Assembly maximum length (m)		50	21	16	9	0.7	3	50	21	16	9	10	10	10	9	1	0.7	0.7	0.3	0.7	0.7	0.3	
ケーブル標準最大長 (m) Standard maximum length (m)		20	21	5	2	0.3	3	20	21	5	2	10	10	5	2	1	0.3	0.3	0.3	0.3	0.3	0.3	

ケーブル標準最大長 (m) を超える長さのアセンブリについては都度弊社営業までご相談ください。

When you need an assembly of length more than cable standard maximum length, please inquire to our sales department at each time.

△は開発中の物です、弊社営業までご相談ください。△ is in development, please inquire to our sales department.

※1 44G、※2 70G、※3 120G: 以降のページの“品番”の項をご確認ください。 ※1 44G、※2 70G、※3 120G: Please confirm an item of “model number” of following page.

※4 TCF107ZP1.0JアセンブリについてはP.29を確認ください。 ※4 See page 29 for the TCF107ZP1.0J assembly.

Part Number Designation

Cable Type

(TCF : TOTOKU Microwave cable Part number)

H, HS Armor jacket option

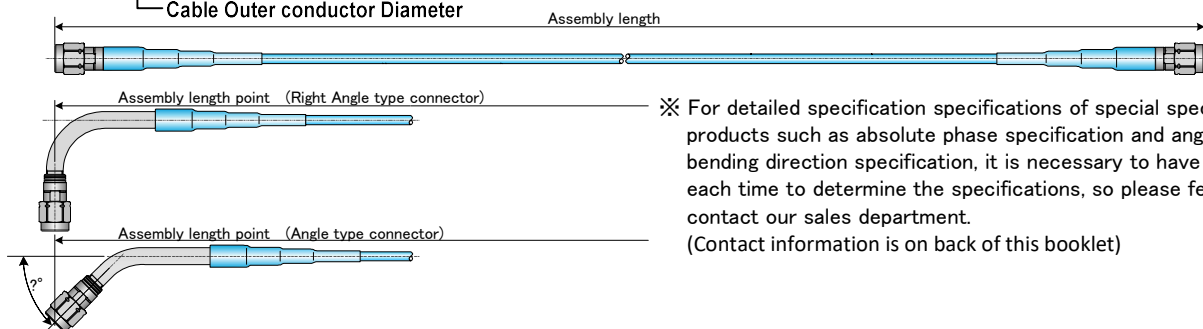
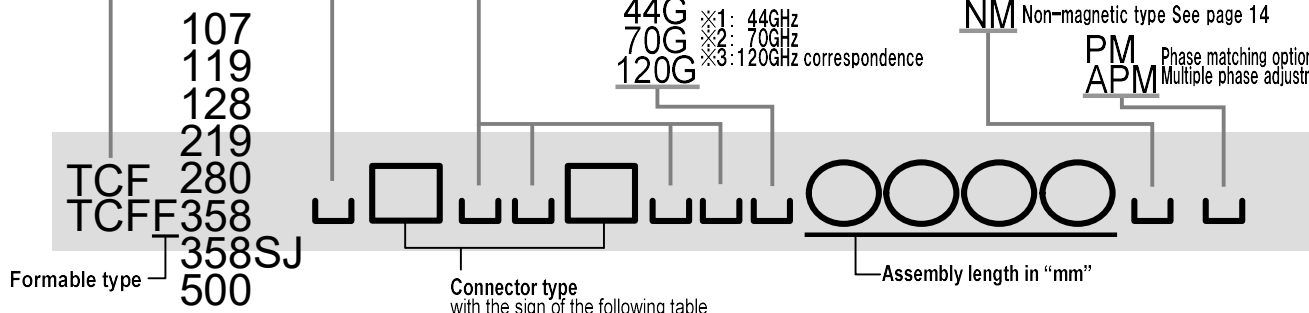
TCF107 and 119 is not necessary to describe because it is a standard specification with HS armor.

L Connector angle type option

※5: For angles other than 90°, specify the specified angle with parentheses after "L" Example: L (45)

44G ※1: 44GHz
70G ※2: 70GHz
120G ※3: 120GHz correspondence

NM Non-magnetic type See page 14

PM Phase matching option
APM Multiple phase adjustment options

Connector type with the sign table

A	B	SMPM			
SMA - Plug	SMA - Jack	SMPM - Jack			
D	E	F	G		
N - Plug	N - Jack	3.5mm - Plug	3.5mm - Jack		
K	M	K44G	M44G	Q	R
2.92mm - Plug	2.92mm - Jack	2.92mm - Plug	2.92mm - Jack	2.4mm - Plug	2.4mm - Jack
T	U	T70G ※1	U70G ※1	135P	135J
1.85mm - Plug	1.85mm - Jack	1.85mm - Plug	1.85mm - Jack	1.35mm - Plug	1.35mm - Jack
X	Y	X120G ※2	Y120G ※2	1.0J ※3	
1.0mm - Plug	1.0mm - Jack	1.0mm - Plug	1.0mm - Jack	1.0mm - Jack	

"2.92mm connector" is also called "K connector"
"1.85mm connector" is also called "V connector"

Note 1 Cable part reinforcement specifications are available. Please specify by adding the "H, HS, SJ" symbol after the cable size notation. (Refer to P.5)

Note 2 Connector products with terminal angles are available. For a right angle (standard support), specify by adding an "L" symbol after connector type symbol. For other angles, add (??) (?? is degree) after "L" symbol and specify with "L (??)". (Refer to P.21) Example: TL (45) 1.85 mm male 45 degree type
In case of terminal connector part angle type, it is necessary to determine the angle of each terminal in advance, and in case of both ends angle type, it is necessary to determine direction etc. in advance, please contact us for details.

Note 3 Phase adjustment option that aligns multiple electrical lengths is available for applications where Skew is a problem in digital transmission, etc.
Please specify by adding "PM" or "APM" symbol after the assembly length notation. (See pages 16 and 17)

Note 4 Different types of connectors and males and female can be combined as long as they are applicable to each cable size.

(Example: TCF280 cable with 2.92 mm male connector on one end, 2.4 mm female connector on one end, etc., please check connector combination table on left)

If you have any other questions, please feel free to contact us. (Contact information is listed on the back of this booklet)

Part number of assembly (Examples)

TCF280RK700 ⇒ TCF280 cable 700mm length ASSY. 2.4mm straight female connector(Hereafter "CN") and 2.92mm straight male CN.

TCF119XY300 ⇒ TCF119 cable 305mm length ASSY. 1.0mm straight male CN and 1.0mm straight female CN.

TCF119XY300PM ⇒ Part number to which the in-lot relative phase matching option is applied to the above assembly

TCF107ZPJ100 ⇒ TCF107 cable 1000mm length ASSY. 0.8mm straight male CN and 0.8mm straight female CN.

TCF358FF300PM ⇒ TCF358 cable 300mm length ASSY. PC3.5mm straight male CN both side, added phase matching option.

※1. ~44GHz ※2. ~70GHz ※3. ~120GHz correspondence Assembly part number

TCF280KM44G1000 ⇒ TCF280 cable 1000mm length ASSY. 2.92mm straight male CN and 2.92mm straight female CN.(DC~44GHz)

TCF219HSTU70G1000 ⇒ TCF219 cable 1000mm length ASSY reinforced by HS armor. 1.85mm straight male CN and 1.85mm straight female CN.(DC~70GHz)

TCF119XY120G100 ⇒ TCF119 cable 100mm length ASSY. 1.0mm straight male CN and 1.0mm straight female CN.(DC~120GHz)

※4. 120GHz correspondence assembly (TCF107 cable 0.8mm male CN And 1.0mm female CN) part number

TCF107ZP1.0J130 ⇒ TCF107 cable 130mm length ASSY. 0.8mm straight male CN and 1.0mm straight female CN.(DC~125GHz)

Please contact our sales office for this assembly each time.

※5. Assembly part number with angle type connector

TCF219 TLU 1200 ⇒ TCF219 cable 1200mm length ASSY. 1.85mm right angle type male CN and 1.85mm straight female CN.

TCF219TL(45)U500 ⇒ TCF219 cable 500mm length ASSY. 1.85mm 45° angle male CN and 1.85mm straight female CN.

Coaxial cable assembly with 2.92mm connector for use **up to 44GHz****NEW PRODUCT!!**

■ Feature

- Connection possible with a 2.92mm connector (SMA physical compatibility) up to 43.5GHz, which is the dividing frequency of 5G communication
- Compatible with standard specification, H, HS armor specification
- Compatible with specified assembly length
- Coaxial connector provides excellent connection reproducibility
- ※ A transmission characteristic chart calibrated with a Cal kit that supports up to 44GHz is attached.

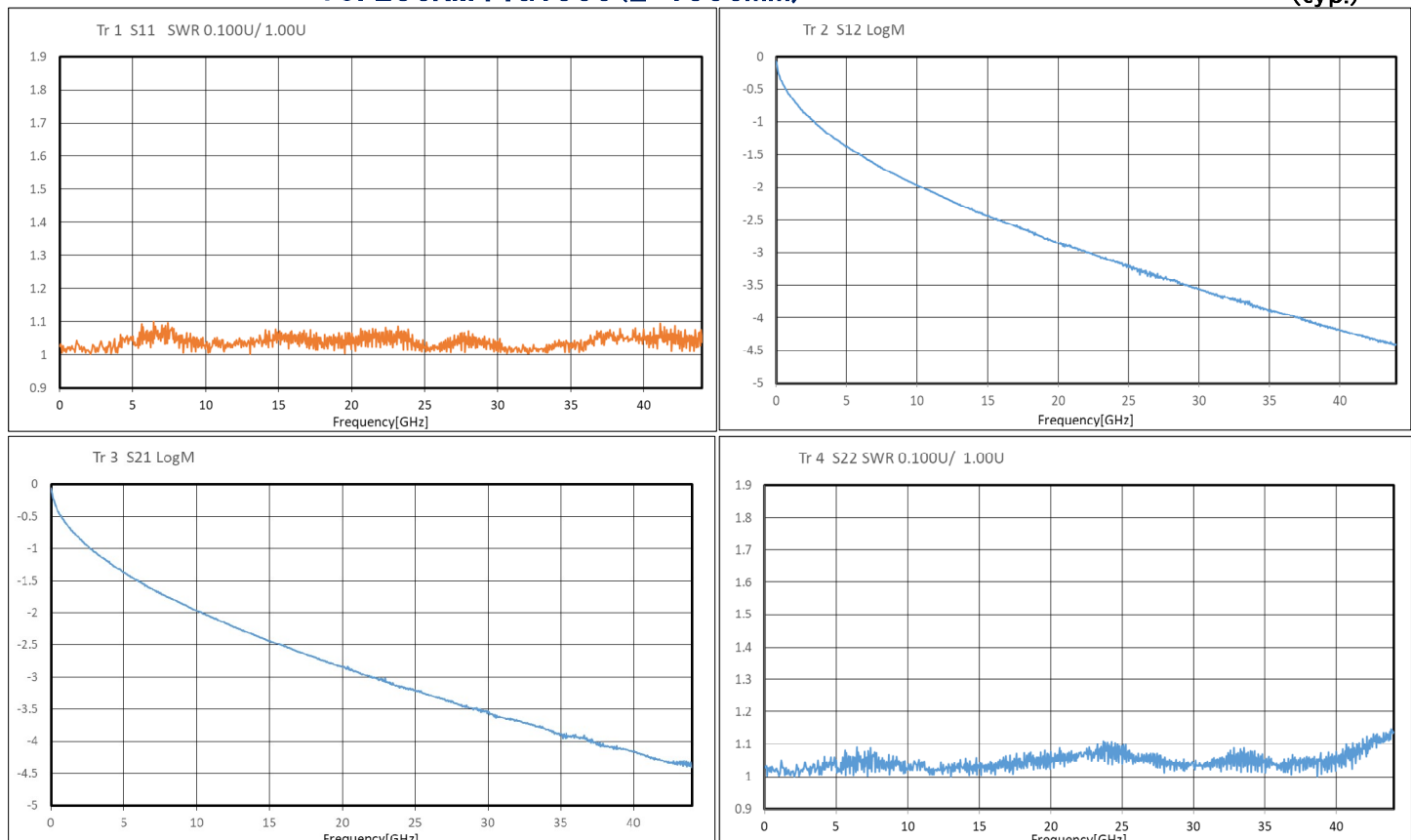
■ Application

- 5G communication
 - Measurement of noise, etc.
 - High frequency equipment internal and external wiring
 - Lead wire for measuring equipment
 - Optical device related
 - Semiconductor tester
 - Information and communication equipment including optical communication
- You can use it for etc.



《Reference data》 TCF280KM44G1300(L=1300mm)

(typ.)



This transmission characteristic data is an actual value, not a guaranteed value.

TCF128 flexible coaxial cable assembly for 110GHz with 1.0mm connector

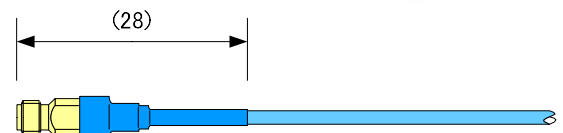
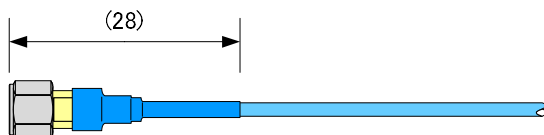
Feature

- World largest broadband area:DC~110GHz
- Easy handling ,easy fixing by without armor
- Low-reflection and Low-attenuation realized by means of dedicated connector and unique fixing
- Corresponding to arbitrary length
- Excellent mating reproducibility

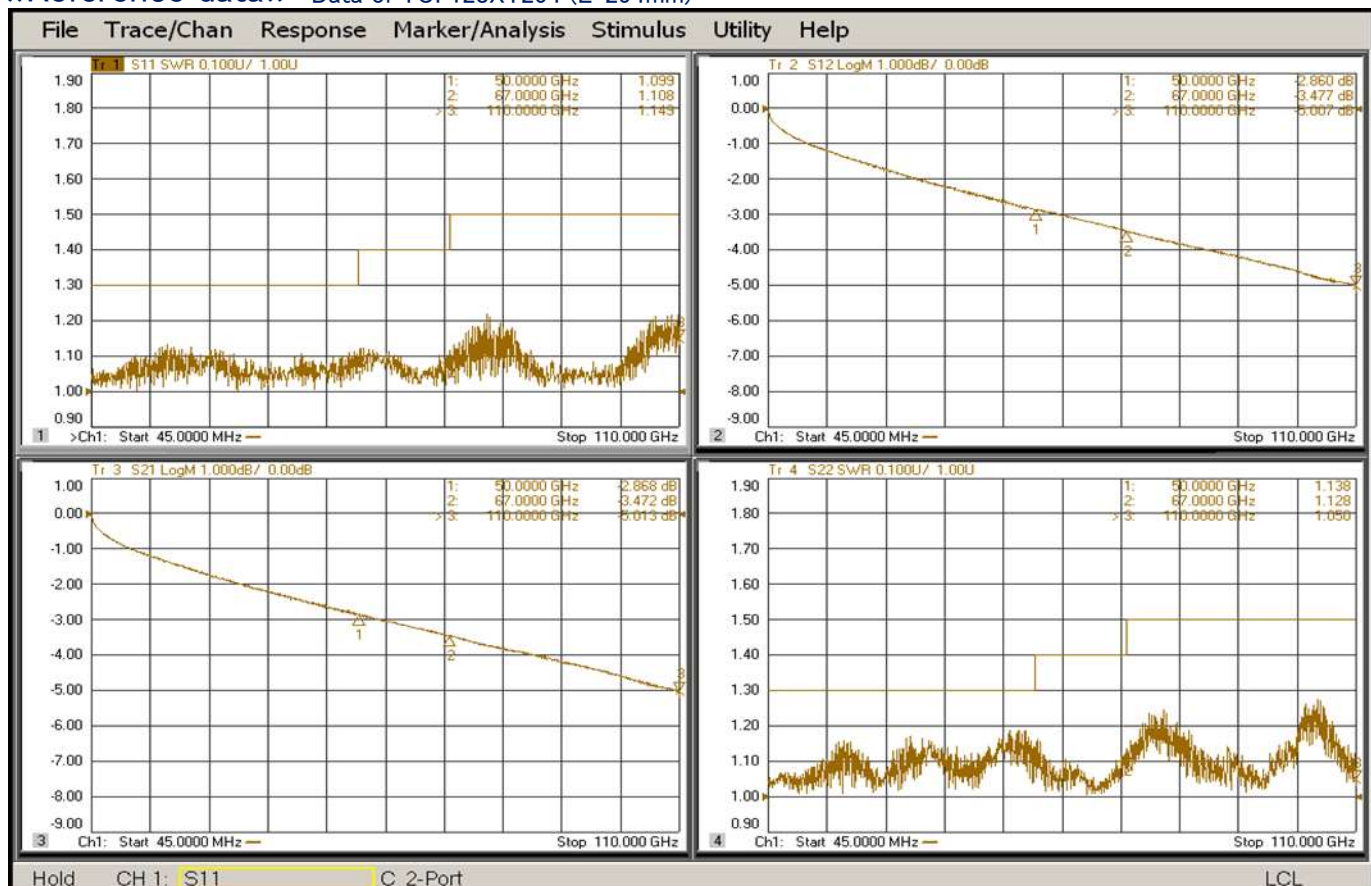
Application

- Millimetric wave radar
- High-frequency device wiring material
- Measuring instruments lead wire
- Optical device
- Semiconductor tester
- Metal and optical Info-communications device

Terminal structure



《Reference data》 Data of TCF128XY254 (L=254mm)



This transmission characteristic data is an actual value, not a guaranteed value.

Coaxial cable assembly with 1.35mm connector that can be used up to 90GHz

NEW PRODUCT!!

■ Feature

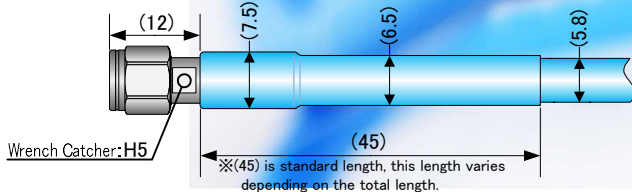
- Assembly usable from DC to 90GHz using newly standardized 1.35mm connector
- Appearance is similar to 1.85mm and easier to handle than 1.0mm connector
- Achieves low attenuation and low reflection characteristics with unique processing method and dedicated connector
- Armor reinforcement is standard and has excellent lateral pressure resistance.
- Compatible with specified assembly length
- Coaxial connector provides excellent connection reproducibility

■ Application

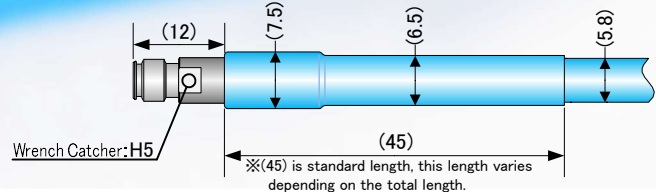
- Millimeter wave radar
 - Wiring inside high frequency equipment
 - Lead wire for measuring equipment
 - Optical device related
 - Semiconductor tester
 - Information and communication equipment including optical communication
- You can use it for etc.

■ Structure of cable terminal part

Plug connector part (our connector symbol: 135P)

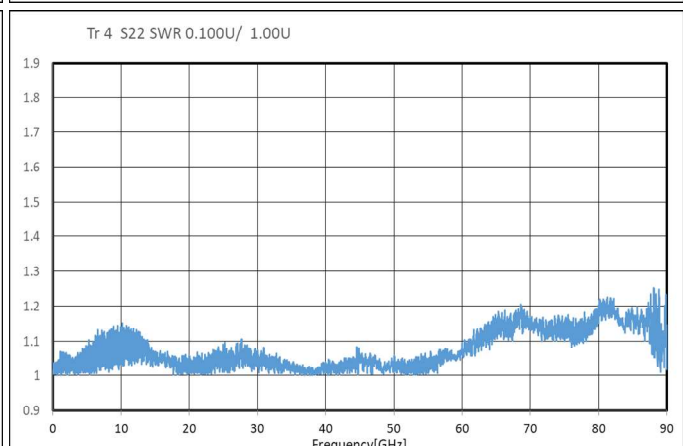
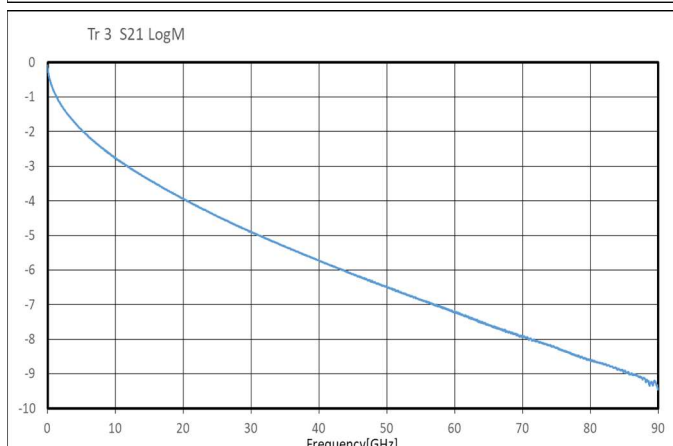
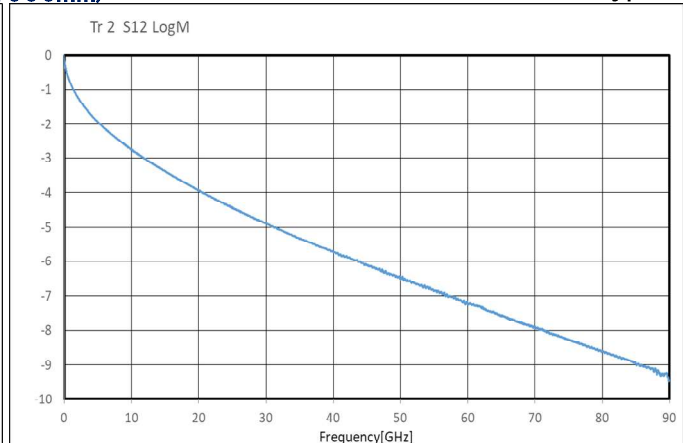
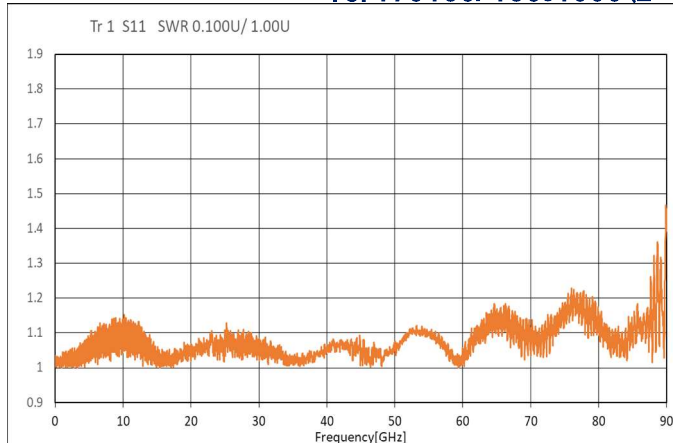


Jack connector part (our connector symbol: 135J)



《Reference data》 TCF175135P135J1000 (L=1000mm)

(typ.)



This transmission characteristic data is an actual value, not a guaranteed value.

「Wavemolle」TCF119 flexible coaxial cable assy up to 120GHz with 1.0mm connector

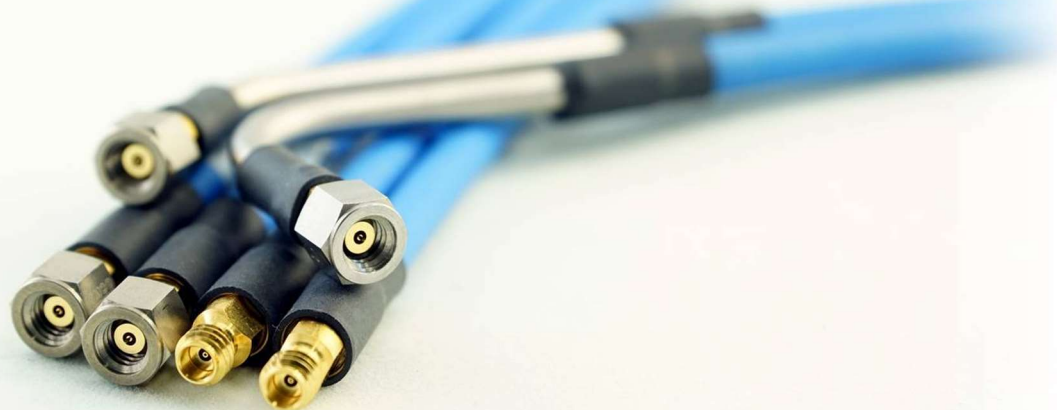
■ Feature

○ Cable

The external conductor structure has been improved and the frequency band has been expanded from DC to 120 GHz.

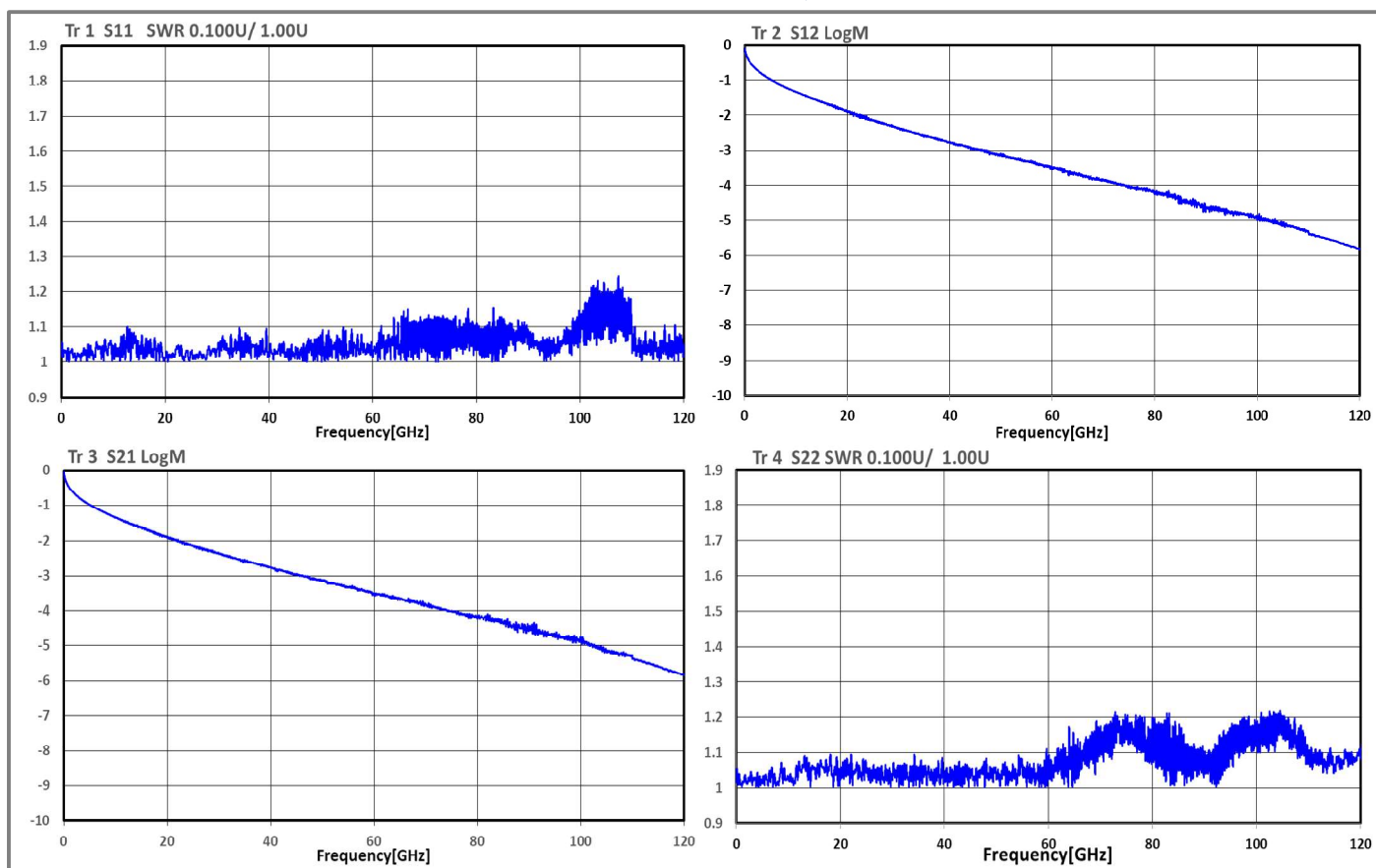
○ Precision connector

The internal structure has been improved and the frequency band has been expanded to the DC to 120 GHz band.



Standard type is reinforced with flexible armor.
Angle connector is also available.

《Reference data》 Data of TCF119XY120G300(L=300mm)



Note) Values within the performance charts are typical values, not guaranteed values.

2.92, 1.85mm Connector to 1.0mm Connector Conversion Coaxial Cable Assembly

NEW PRODUCT!!

■Features

- 1.0mm measurement system can be used for device measurement in low frequency band.
TCF119XY cable is often used for 1.0mm measurement probe applications, this assembly replaces the probe head side connector with a 2.92mm and 1.85mm connector. Devices can be measured in low frequency bands without hassle and risk of system switching.

Product name example

TCF119TY??? Assembly with 1.0mm jack--1.85mm plug

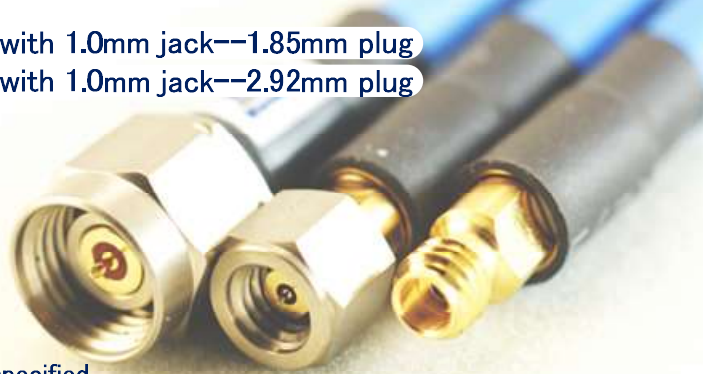
TCF119KY??? Assembly with 1.0mm jack--2.92mm plug

Other terminal connectors

- 1.0 mm plug, jack
- 1.85mm plug, jack
- 2.92mm plug, jack

can be freely combined and specified.

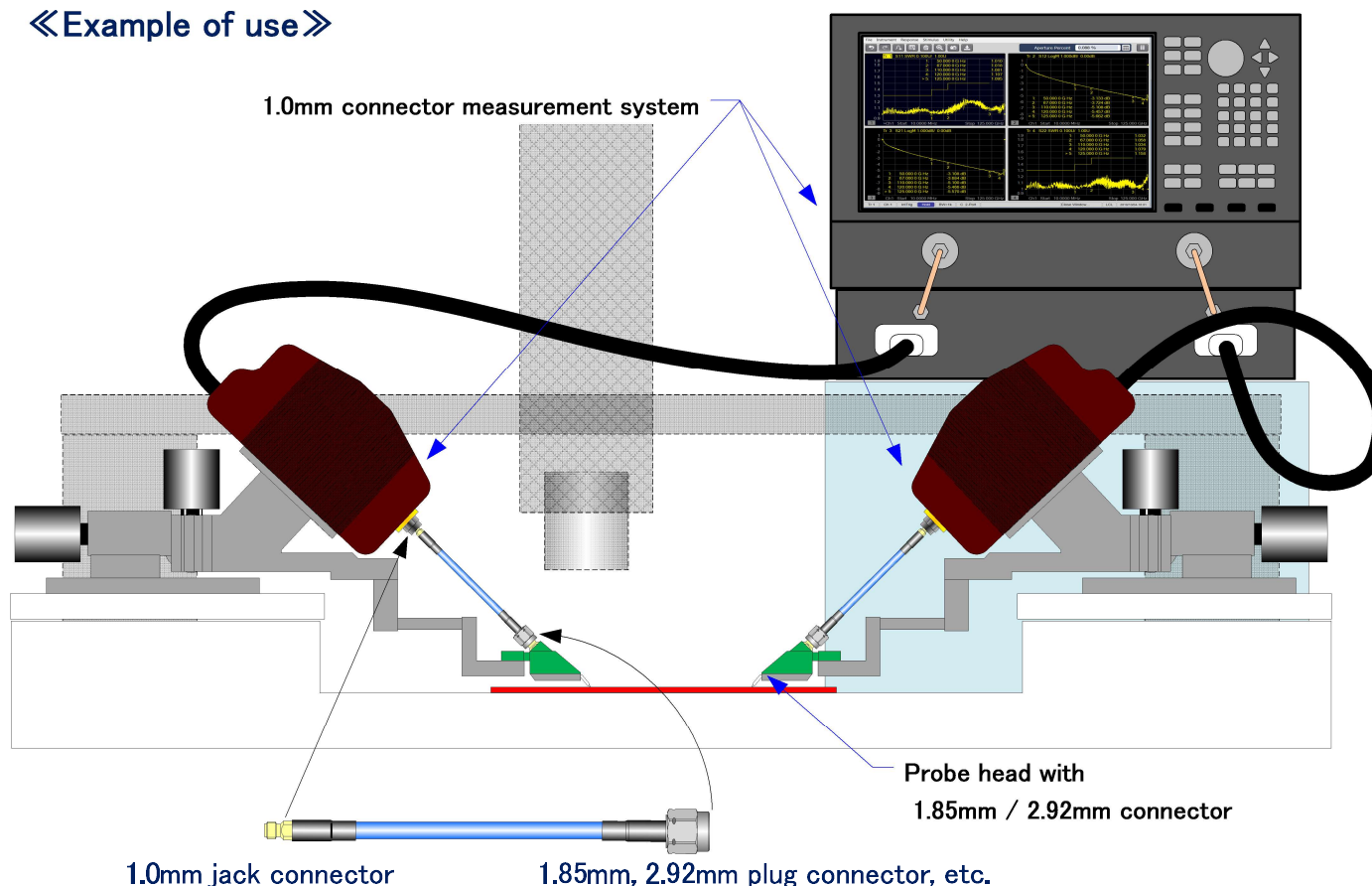
As shown in table on right, it is compatible with many different types of connectors.



Connector variations and mating connector compatibility

	Measuring instrument side connector	Opposite side connector	Connectable Connector					
			1.0mm	1.85mm	2.4mm	2.92mm	3.5mm	SMA
TCF119 2.92/1.85mm Connector to 1.0mm Connector Conversion Cable Assembly	1.0mm Plug or Jack	1.0mm Plug or Jack	Existing product	-	-	-	-	
		1.85mm Plug or Jack	-	NEW product	-	-	-	
		2.92mm Plug or Jack	-	-	NEW product	-	-	-

《Example of use》



TCF107 flexible coaxial cable assy up to 125GHz with 0.8-1.0mm connector

NEW PRODUCT!!

■ Feature

○ Precision connector

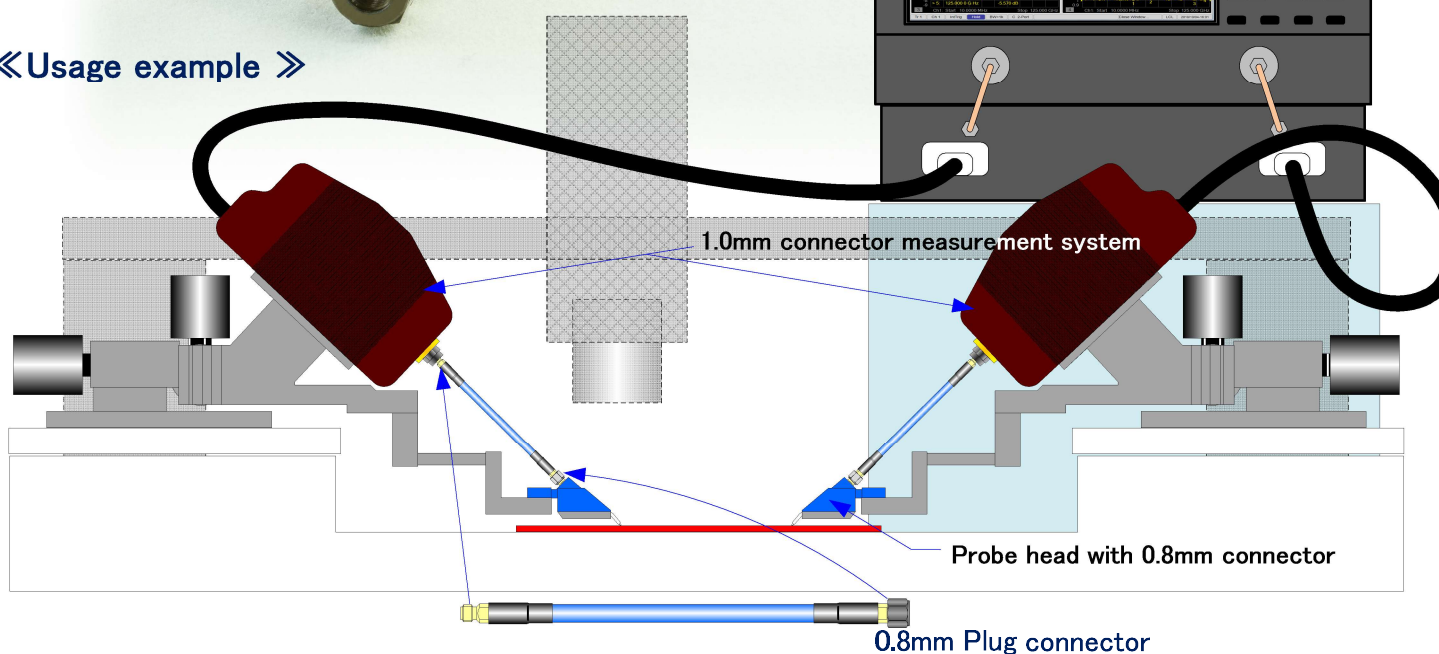
Improved structure of connector to make it mode-free up to 130GHz.

Use for measuring up to the maximum frequency (125 or 130 GHz) with 1.0 mm measurement system using a probe head with a 0.8 mm connector.

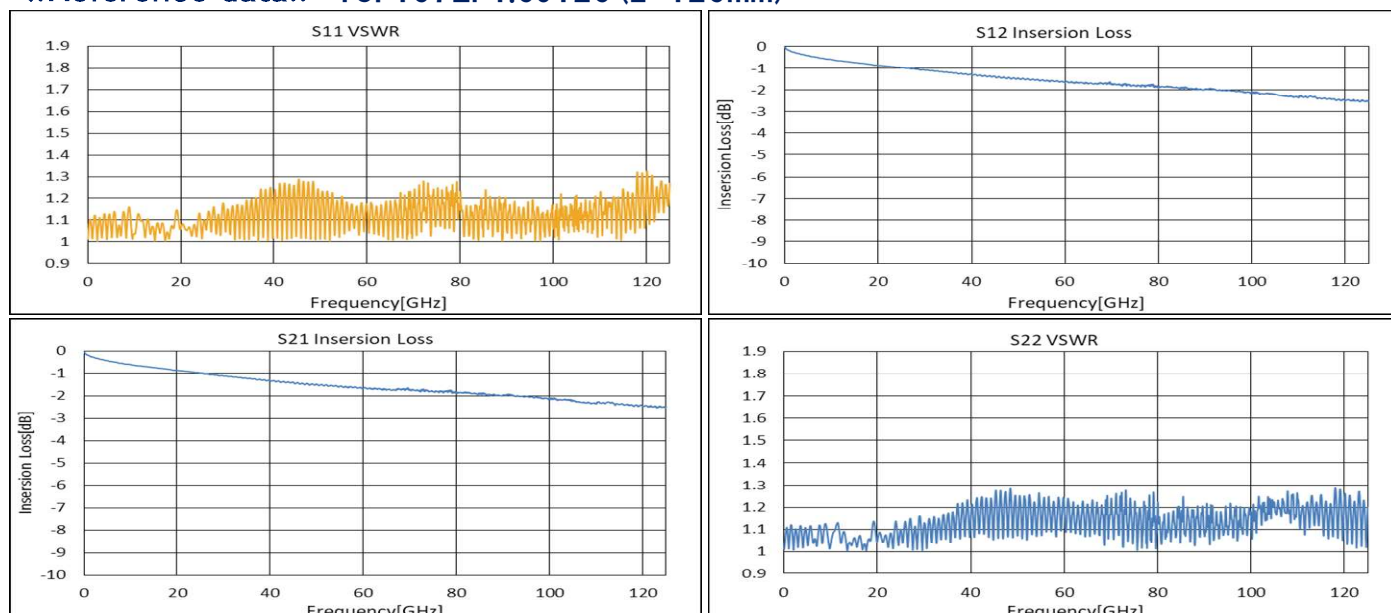
1.0mm Jack
connector

0.8mm Plug
connector

《Usage example》



《Reference data》 TCF107ZP1.0J120 (L=120mm)



This transmission characteristic data is an actual value, not a guaranteed value.

「Wavemolle」TCF107 flexible coaxial cable assy up to 145GHz with 0.8mm connector

NEW PRODUCT!!

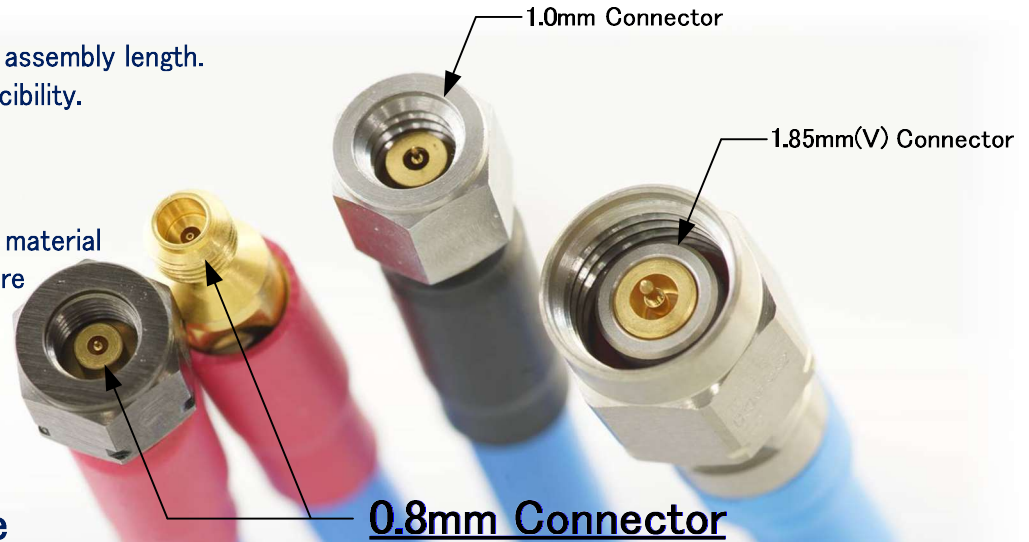
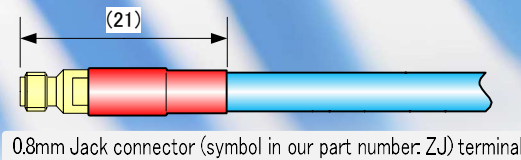
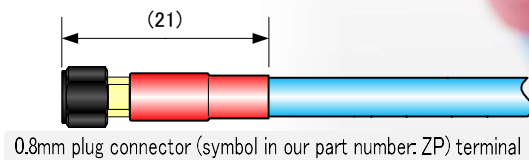
Feature

- Covers a higher frequency band than the TCF119 series, DC to 145GHz.
- High flexibility
- Achieves low attenuation with a unique processing method and a dedicated connector.
- Corresponds to the specified assembly length.
- Excellent connection reproducibility.

Application

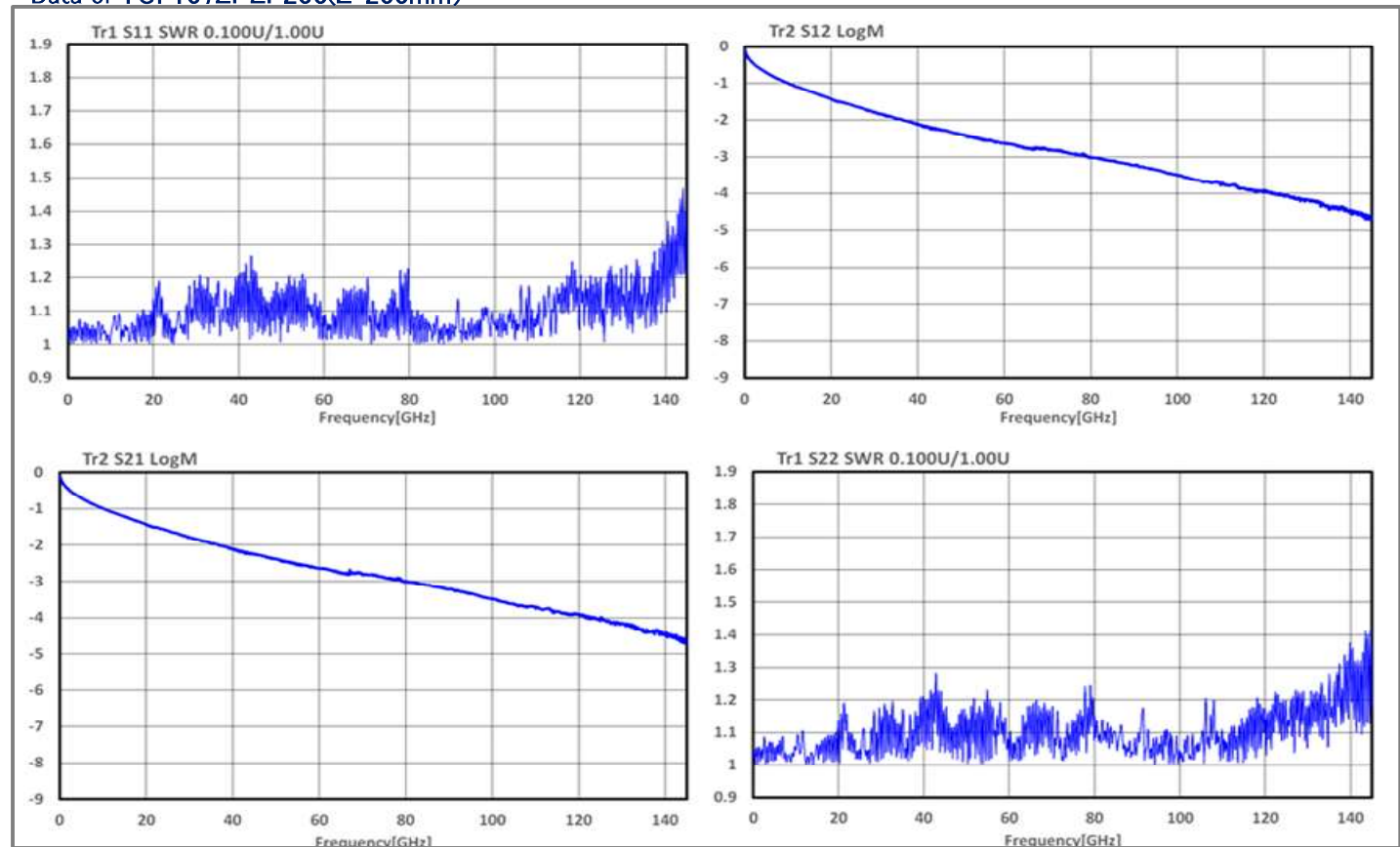
- Millimetric wave radar
- High-frequency device wiring material
- Measuring instruments lead wire
- Optical device
- Semiconductor tester
- Metal and optical Info-communications device

Terminal structure



«Reference data»

Data of TCF107ZPZP200(L=200mm)



Note) Values within the performance charts are typical values, not guaranteed values.

TCF128, 119, 107 Formable coaxial cable assembly

Features

NEW PRODUCT!!

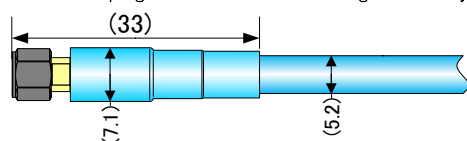
- Shape retention
- Low attenuation achieved with unique processing method and dedicated connector
- Supports specified assembly length
- Excellent connection reproducibility
- Measurement accuracy can be improved because measurement can be performed using the same shape as during calibration.
- There is a risk that the device under test (DUT) may be deformed or repelled due to the return nature of the cable, making accurate measurement impossible or damaging the DUT, but this risk can be reduced.
- Three-dimensional connection is possible, and measurement efficiency can be increased because the calibration ends are in the same position.
- Since there is no repulsion even in narrow spaces, it is possible to control the cable position.

Application

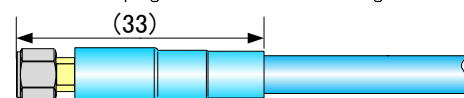
- Millimeter wave radar
- Wiring inside high frequency equipment
- Lead wire for measuring instruments
- Optical device related
- Semiconductor tester

Structure of cable terminal part

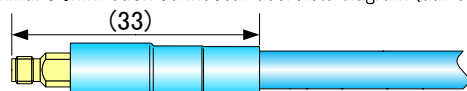
Terminal 0.8mm plug connector overview diagram (our symbol: ZP)



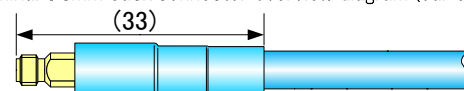
Terminal 1.0mm plug connector overview diagram (our symbol: X)



Terminal 0.8mm Jack connector overview diagram (our symbol: ZJ)



Terminal 1.0mm Jack connector overview diagram (our symbol: Y)



Lineup and model number

Connector	Our connector symbol	Cable			Upper limit frequency	NOTE
		TCF128	TCF119	TCF107		
1.0mm Plug	X	○	○		110GHz	
1.0mm Jack	Y	○	○		110GHz	
1.0mm Plug	X120G		○		120GHz	
1.0mm Jack	Y120G		○		120GHz	
1.0mm Jack	1.0J			○	125GHz	(130GHz mode free type)
0.8mm Plug	ZP			○	145GHz	
0.8mm Jack	ZJ			○	145GHz	

By adding "F" after the first "TCF" in the regular part number to make it "TCFF", it becomes a model number that represents a formable product.

Example

Example of model number specification①: **TCFF119XY120G300**

Cable:TCF119, Left end:1.0mm plug, Right end:1.0mm jack, Total length:300mm, Upper frequency limit:120GHz, Formable assembly

Example of model number specification②: **TCFF107ZP1.0J300**

Cable:TCF107, Left end:0.8mm plug, Right end:1.0mm jack, Total length:300mm, Upper frequency limit: 130GHz, Formable assembly (However, our transmission characteristics measurement range is up to 125GHz)

Example of model number specification③: **TCFF107ZPJ300**

Cable:TCF107, Left end:0.8mm plug, Right end:0.8mm jack, Total length:300mm, Upper frequency limit:145GHz, Formable assembly



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