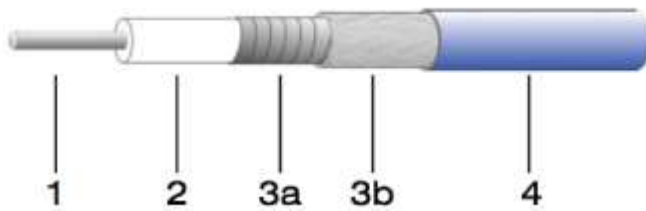


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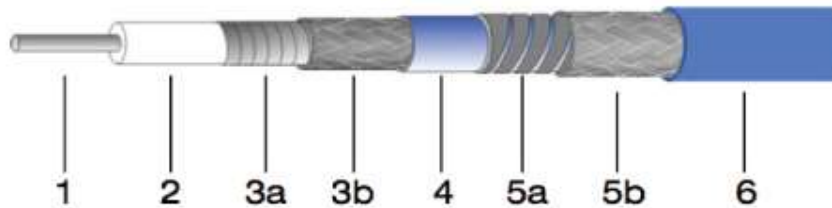
## TOTOKU TCF Series ( all products lineup ) THE FLEXIBLE MICROWAVE CABLE ASSEMBLIES

### Cable Structure

Normal Type



Soft Armor Type (-HS)



<b>1: Inner Conductor</b>	Solid silver plated copper (Solid or Stranded)
<b>2: Insulation</b>	Porous PTEE
<b>3: Outer Conductor</b>	a. Silver plated copper tape b. Silver plated copper braid
<b>4: Jacket(Inner Sheath)</b>	FEP (blue)、ETFE(TCF280SHS)
<b>5: Armor Jacket</b>	a.Stainless steel coil (flat wire) b.Stainless steel wire braid
<b>6: Outer Sheath</b>	PVC(blue)

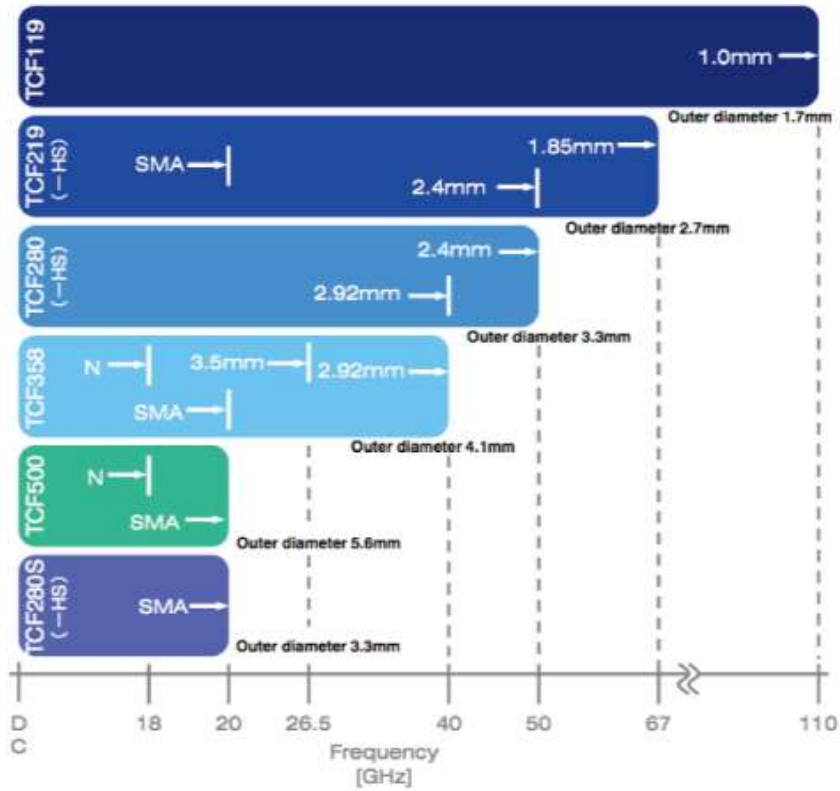
### Features & Benefits

- Highly Flexible
- The World First 110GHz Application
- Mating Flexibility
- Lower Attenuation
- Lower Reflective Characteristic
- Solid Phase Stability over Temperature and Bending

( The TCF series cables can also be used for ultra high-speed digital signal transmission. )

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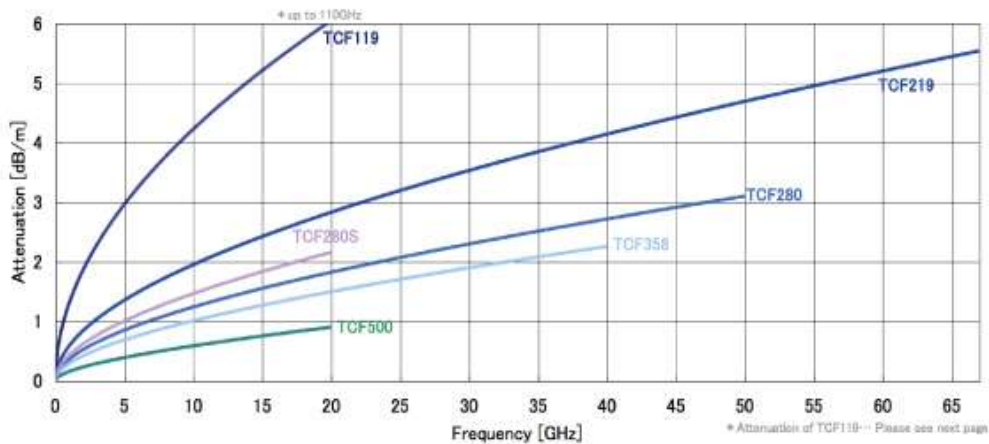
## Cable Lineup (and connector lineup)



-HS (Soft Armor Type)

## Details & Information

### Attenuation of TCF Series (at 25°C)



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## Cable Specification: Structure details

	Inner conductor	Dielectric	Outer conductor
	Material	Material	Material
TCF119	Silver plated copper	Porous PTFE	Silver plated copper tape and braid
TCF219 (HS)	Silver plated copper	Porous PTFE	Silver plated copper tape and braid
TCF280 (HS)	Silver plated copper	Porous PTFE	Silver plated copper tape and braid
TCF280S (HS)	Silver plated copper	Porous PTFE	Silver plated copper tape and braid
TCF358	Silver plated copper	Porous PTFE	Silver plated copper tape and braid
TCF500	Silver plated copper	Porous PTFE	Silver plated copper tape and braid

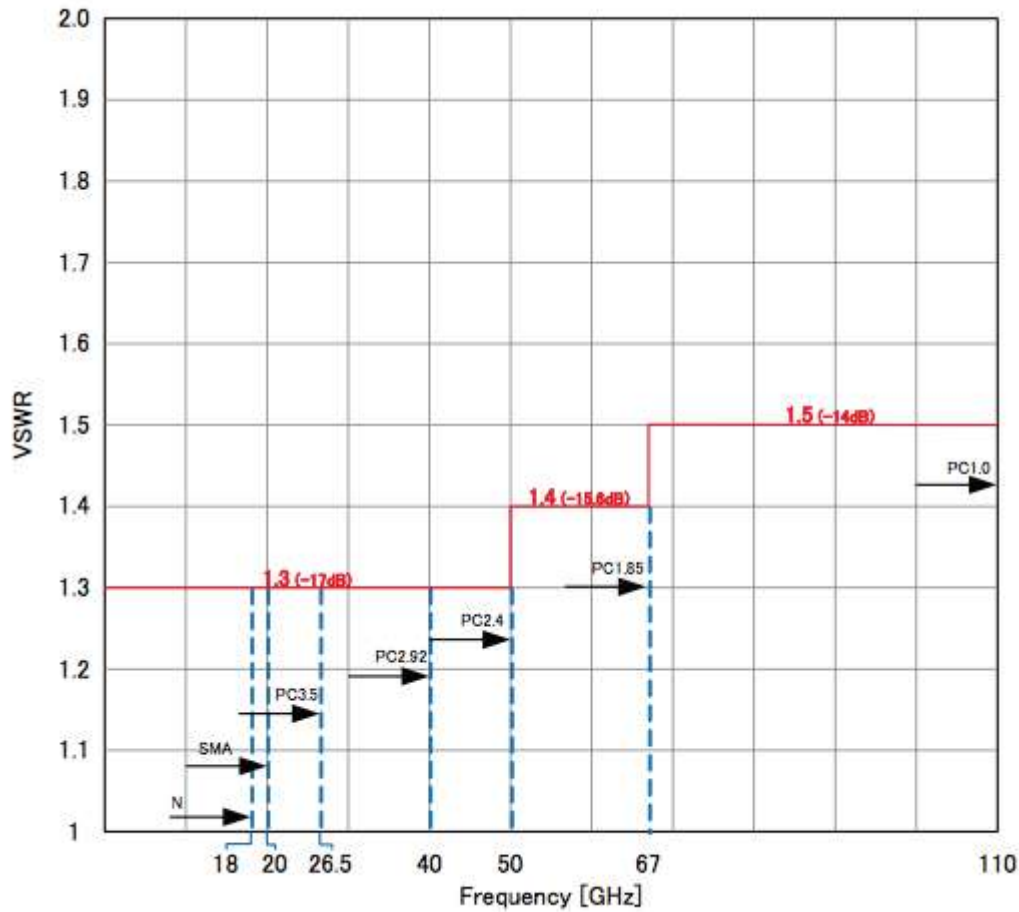
	(Inner) Sheath		"HS" Armor Outer sheath	
	Material	O.D. [mm]	Material	O.D. [mm]
TCF119	FEP(Blue)	1.7	-	
TCF219 (HS)	FEP(Blue)	2.7	PVC	7.1
TCF280 (HS)	FEP(Blue)	3.3	PVC	7.1
TCF280S (HS)	ETFE(Gray)	3.3	PVC	7.1
TCF358	ETFE(Gray)	4.1	-	
TCF500	ETFE(Gray)	5.6	-	

## Cable Specification : Electrical and Mechanical Characteristics

	Characteristic Impedance	Capacitance	Time delay	Transmission rate
	[ohm]	[pF/m]	[ns/m]	[% of c]
TCF119	50	85	4.3	78
TCF219(HS)	50	85	4.3	78
TCF280(HS)	50	85	4.3	78
TCF280S(HS)	50	85	4.3	78
TCF358	50	85	4.3	78
TCF500	50	85	4.3	78
	Moding frequency	min. bending radius static	Temp. range	"HS" type temp. range
	[Ghz]	[mm]	[°C]	[°C]
TCF119	134	10	-65...+125	—
TCF219(HS)	134	10	-65...+125	—
TCF280(HS)	134	10	-65...+125	—
TCF280S(HS)	134	10	-65...+125	—
TCF358	134	10	-65...+125	—
TCF500	134	10	-65...+125	—

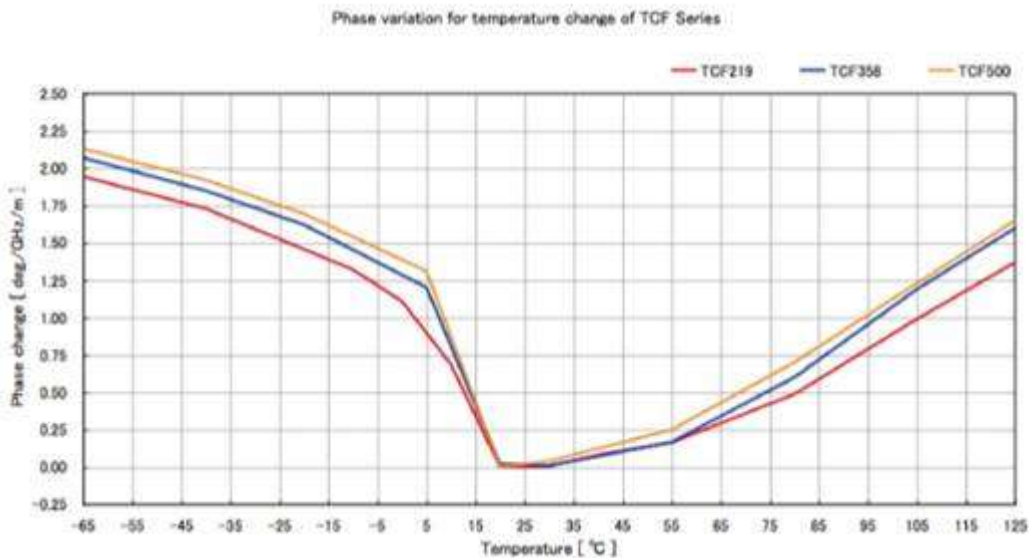
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## VSWR Specification

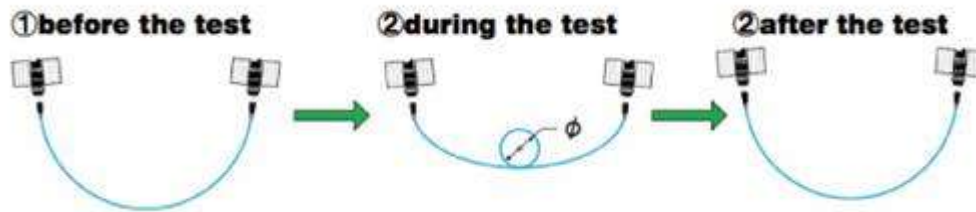


Phase Characteristics

Phase variation for temperature change



## Phase change after bending

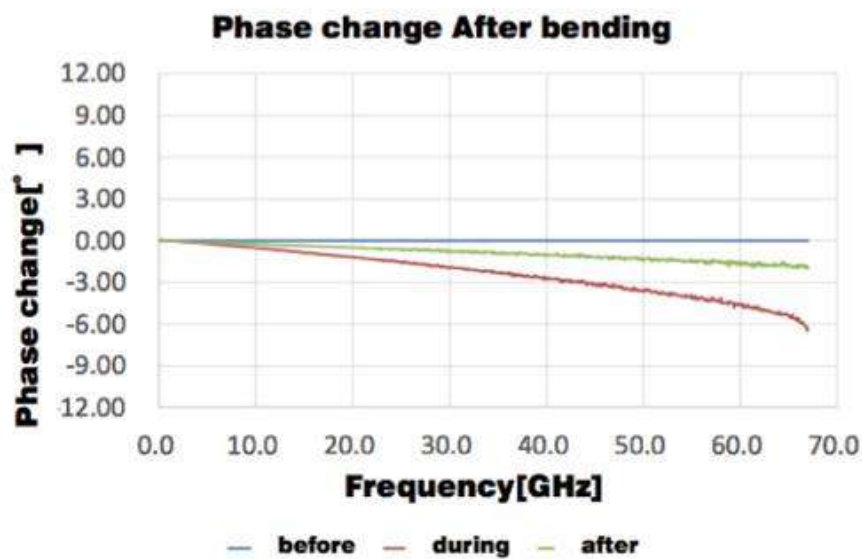


- ① before the test
- ② during the test( $\phi 100$  360°bending)
- ③ after the test
- ② during the test( $\Phi 60$  360°bending)
- ③ after the test
- ② during the test( $\phi 40$  or  $\phi 30$  360°bending)
- ③ after the test

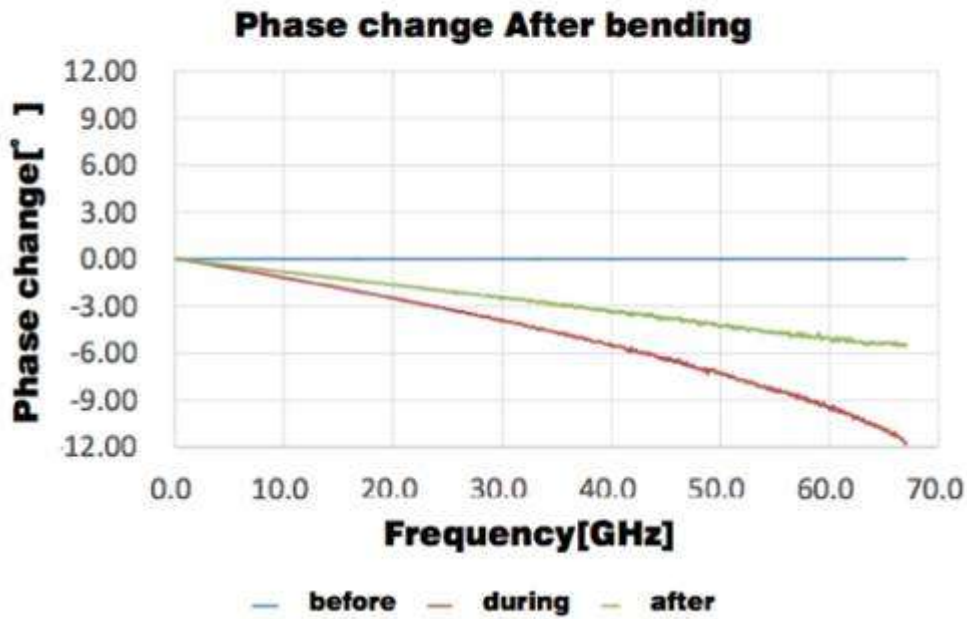
Measured each phase change

## Phase Characteristics [ TCF219 ]

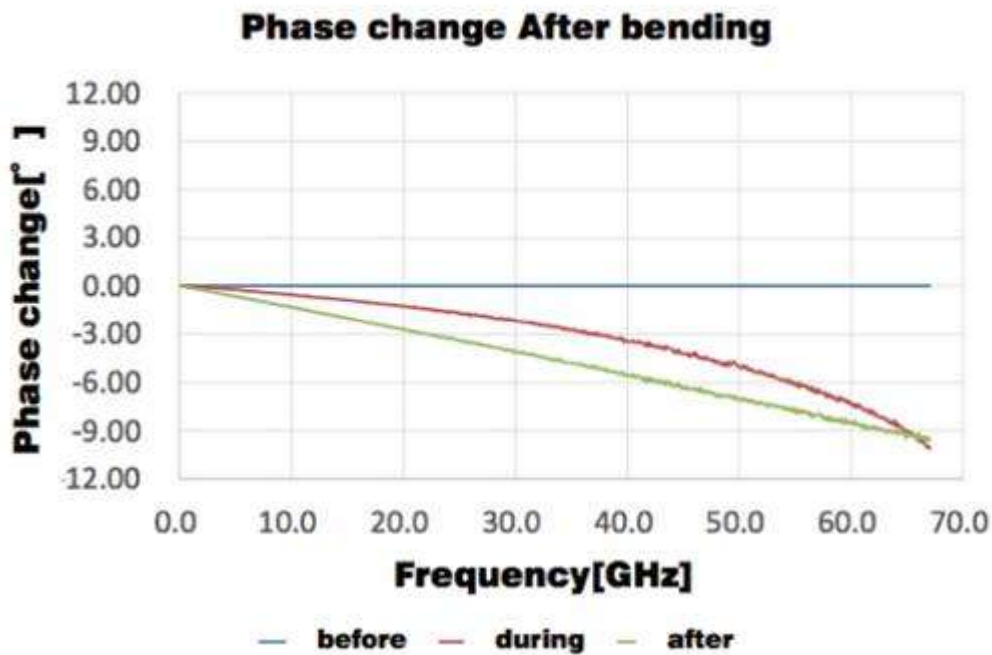
$\Phi 100$



Φ60



Φ30

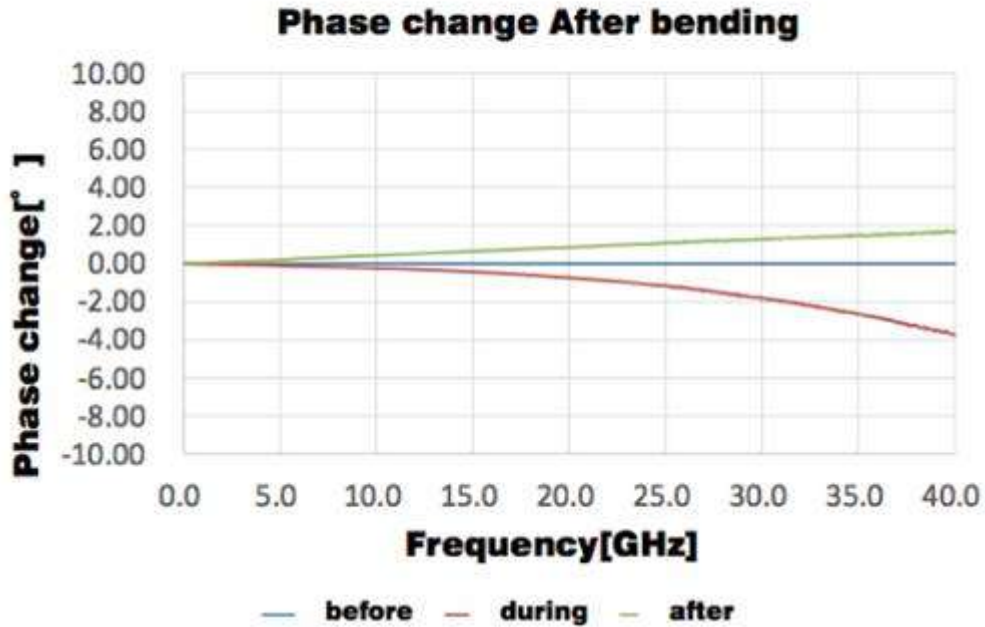


※ Reference date for Phase change is measured values, not guarantee values.

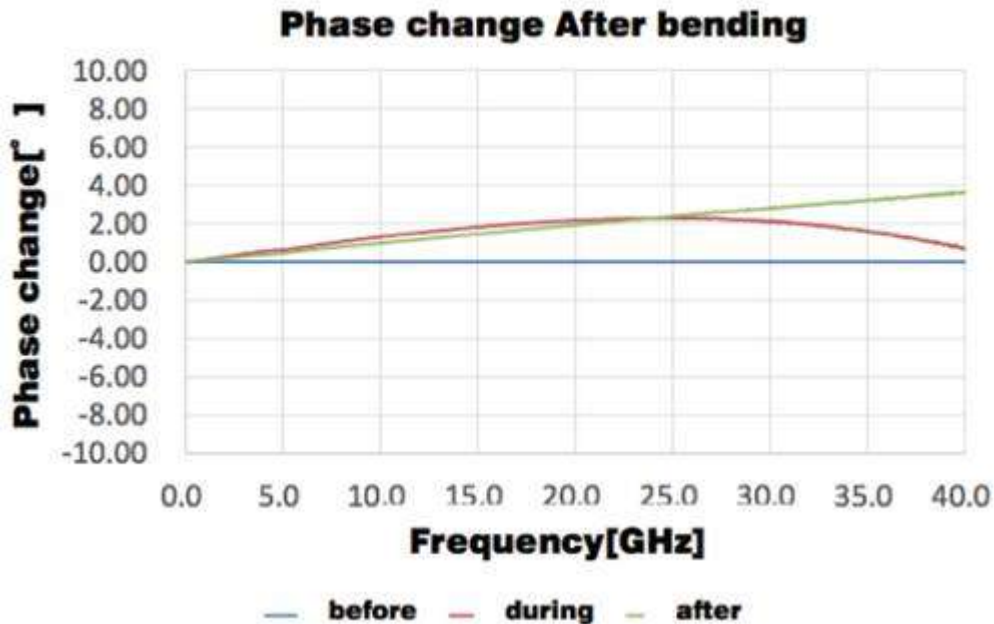
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## Phase Characteristics [ TCF358 ]

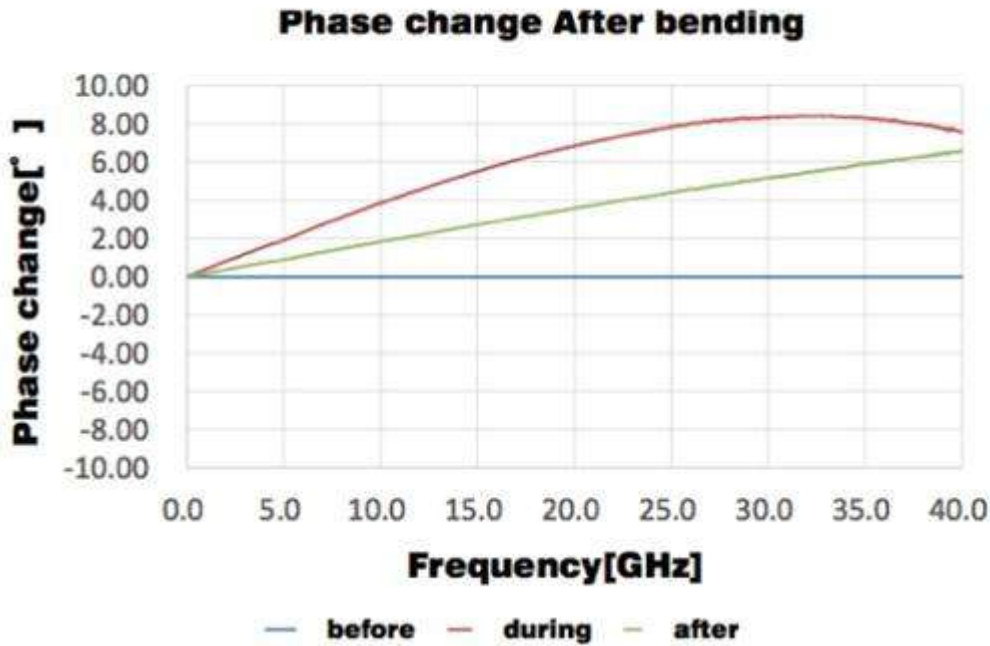
Φ 100



Φ 60



Φ 40

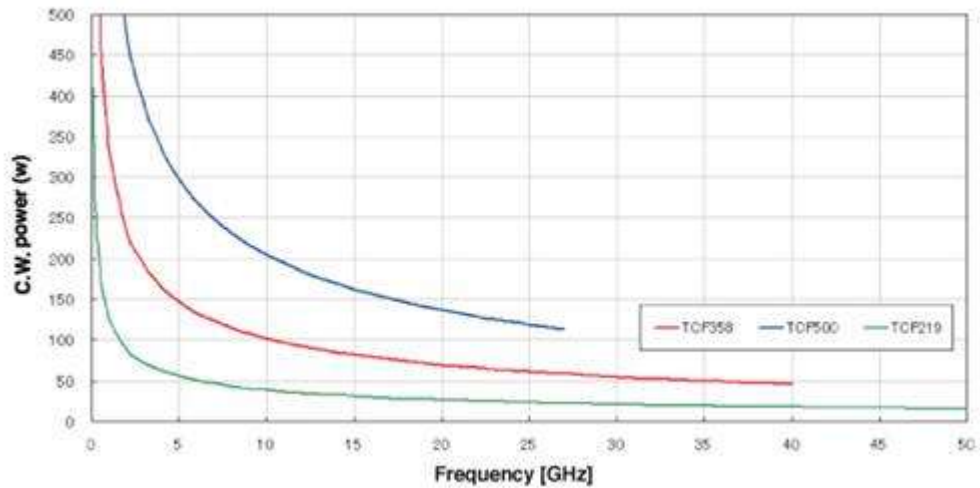


※ Reference date for Phase change is measured values, not guarantee values.

[Power handling capability Lateral pressure performance](#)

Maximum C.W. power of cables

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





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## Lateral pressure performance

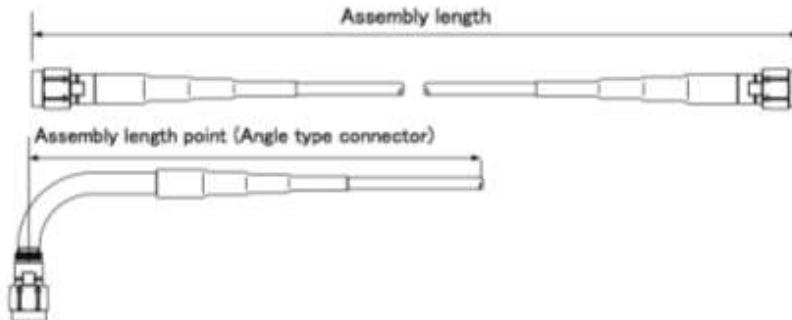
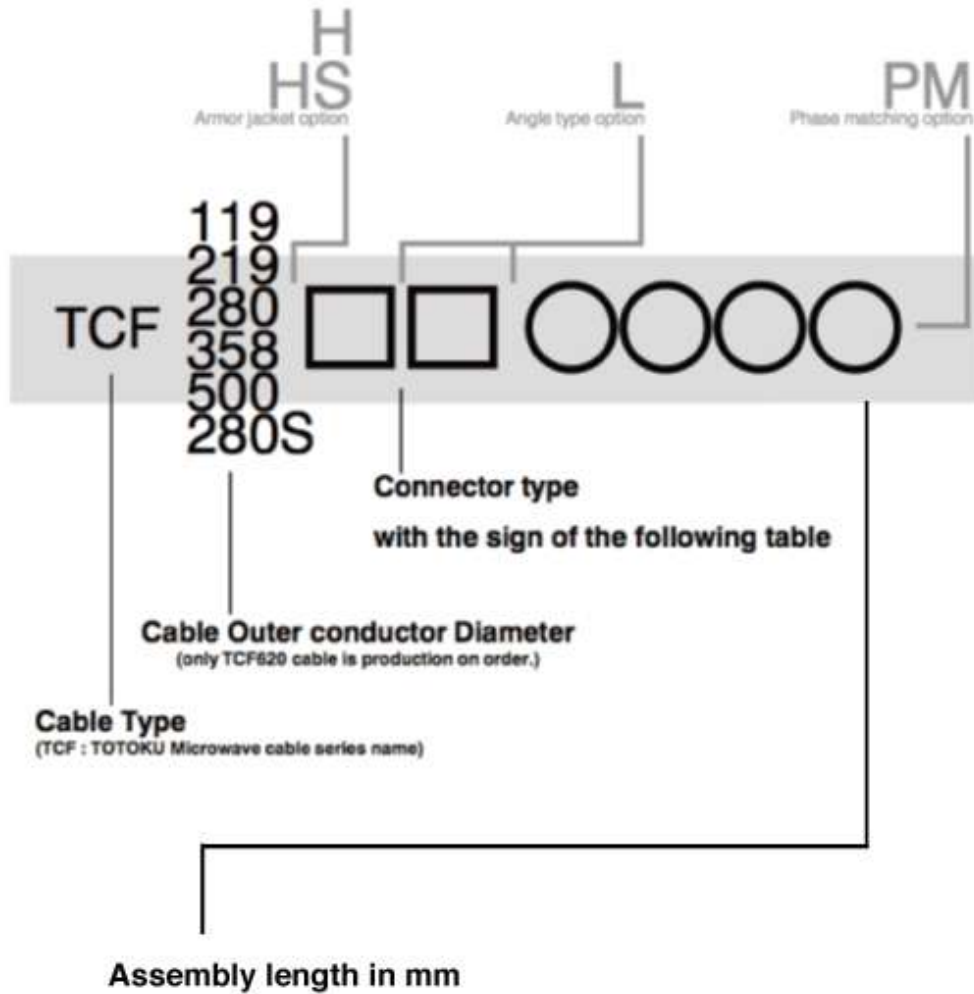
TOTOKU Cable Type	Armor Type	Lateral pressure performance typical(N/cm) *1,2
TCF358	Normal	47
TCF500	Normal	65
TCF280	Normal	36
TCF219	Normal	29
TCF358H	Standard armor	770
TCF500H	Standard armor	690
TCF280HS	Soft armor	400
TCF219HS	Soft armor	430
TCF119	Soft armor	330

\*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.

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※It is necessary to decide specifications about the special specifications such as absolute phase designation, the angle except terminal 90 °each time. Please feel free to contact our sales department.

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Connector type with the sign table

A	B	D
SMA-m	SMA-f	N-m
E	F	G
N-f	3.5mm-m	3.5mm-f
K	M	Q
2.92mm-m	2.92mm-f	2.4mm-m
R	T	U
2.4mm-f	1.85mm-m	1.85mm-f
X	Y	
1.0mm-m	1.0mm-f	

“2.92mm connector” is also called “K connector”.

“1.85mm connector” is also called “V connector”.

note 1	"-m" after a connector type shows a straight male connector (also called "PLUG") and "-f" shows a straight female (also called "JACK") connector.
note 2	TCF cable assemblies are available with armoring. In this case, sign "H" is added after the Cable Outer Diameter. Please ask an applicable type.
note 3	TCF cable assemblies are available with bending by connector area. In this case, sign "L" is added after the sign of connector type. Please ask an applicable type
note 4	TCF cable assemblies are available with Phase matching, in this case, sign "PM" is added after the assembly length. Please ask an applicable type.
note 5	For TCF cable, many variations in mating connectors are available. (e.g. TCF280 series: 2.92mm connector to one end and 2.4mm connector to the other end)

## Name of assembly (Examples)

TCF219 TLU 1200	TCF219 cable assembly with 1.85mm angle type male connector and 1.85mm straight female connector, 1200mm of assembly
TCF358 AB	TCF358 cable assembly with SMA straight male connector and SMA straight female

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 E-mail: Pradeep@rfconnectorhouse.com, Website: <http://www.rfconnector.info/>

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500	connector, 500mm of assembly length.							
TCF280 RK 700	TCF280 cable assembly with PC2.4mm straight female connector and 2.92mm straight male connector, 700mm of assembly length.							
TCF358 FF 300 PM	TCF358 cable assembly with PC3.5mm straight male connector both side, 300mm of assembly length, added phase matching option.							
Cable type								
normal								
				Inner conductor Solid			Inner conductor Stranded	
				500	358	280	219	280S
Connector type	18GHz	Connector sign						
		N-P	D	o	o			
		N-J	E	o	o			
		N-LP	DL		o			
	20GHz	SMA-P	A	o	o		o	o
		SMA-J	B	o	o			
	26.5GHz	3.5-P	F		o			
		3.5-J	G		o			
		3.5-LP	FL		o			
		3.5-LJ	GL		o			
	40GHz	2.92-K	K		o	o	o	
		2.92-J	M		o	o	o	
		2.92-LP	KL		o	o	o	
		2.92-LJ	ML		o	o	o	
	50GHz	2.4-P	Q			o	o	
		2.4-J	R			o	o	
		2.4-LP	QL			o	o	
		2.4-LJ	RL			o	o	
	67GHz	1.85-P	T				o	
		1.85-J	U				o	
1.85-LP		TL				o		
1.85-LJ		UL				o		
110GHz	1.0-P	X						
	1.0-J	Y						
Assembly maximum length (m)				50	21	16	9	25
Cable standard maximum length (m)				20	21	5	2	2

Cable type							
Standard armor							
				Inner conductor Solid			
Connector				500	358	280	219

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		sign					
Connector type	18GHz	N-P	D	o	o		
		N-J	E	o	o		
		N-LP	DL				
		N-LJ	EL				
	20GHz	SMA-P	A	o	o		o
		SMA-J	B	o	o		
	26.5GHz	3.5-P	F		o		
		3.5-J	G		o		
		3.5-LP	FL				
		3.5-LJ	GL				
	40GHz	2.92-K	K		o	o	o
		2.92-J	M		o	o	o
		2.92-LP	KL			o	o
		2.92-LJ	ML			o	o
	50GHz	2.4-P	Q			o	o
		2.4-J	R			o	o
		2.4-LP	QL			o	o
		2.4-LJ	RL			o	o
	67GHz	1.85-P	T				o
		1.85-J	U				o
		1.85-LP	TL				o
		1.85-LJ	UL				o
	110GHz	1.0-P	X				
		1.0-J	Y				
Assembly maximum length (m)				50	21	16	9
Cable standard maximum length (m)				20	21	5	2