

Quality&Precise



MAXWELLON FABTest

FABTest Microwave & Milli meter
Wave Solution Union
2023



Maxwellon

Millimeter wave technology is widely applied in fields such as communication, radar, remote sensing, radio astronomy, clinical medicine and spectroscopy. Regarding communication, with the business developing towards high capacity, high speed and low time delay, the communication bands are shifting to higher frequency. The basic structure of 5G mobile communication is to utilize a combined communication mode of "low frequency + millimeter wave". At the same time, the high-speed satellite internet construction is speeding up in many countries. In the coming communication era, an integrated "air-space-ground" information network will be built based on millimeter wave technology. Maxwellon Electronics is committed to provide high quality products and service for customers in millimeter wave applications. Our FABTest series flexible millimeter wave cable assembly solution is providing precise, efficient and reliable signal transmission from DC to 67GHz.

■ Feature & Advantage

High Precision

Rigorous quality control assures the transmission precision

Reliable

High reliable cables guarantee the consistency and reliability of signal transmission

Low Loss

Unique structure endows the FABTest series ultra-low loss

Delivery

Standard product
Off-the-shelf
Fast delivery

Flexible

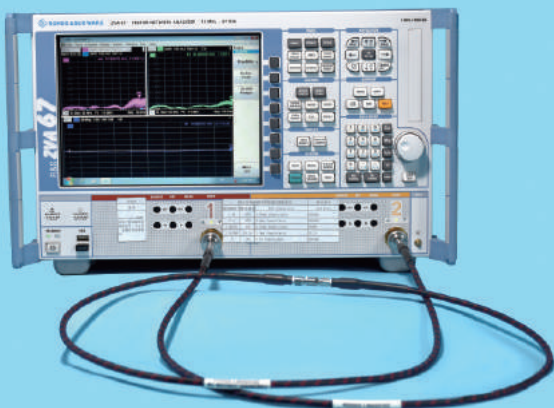
Flexible cable and armor make installation convenient

Environmentally Friendly

RoHS 2.0 Compliance

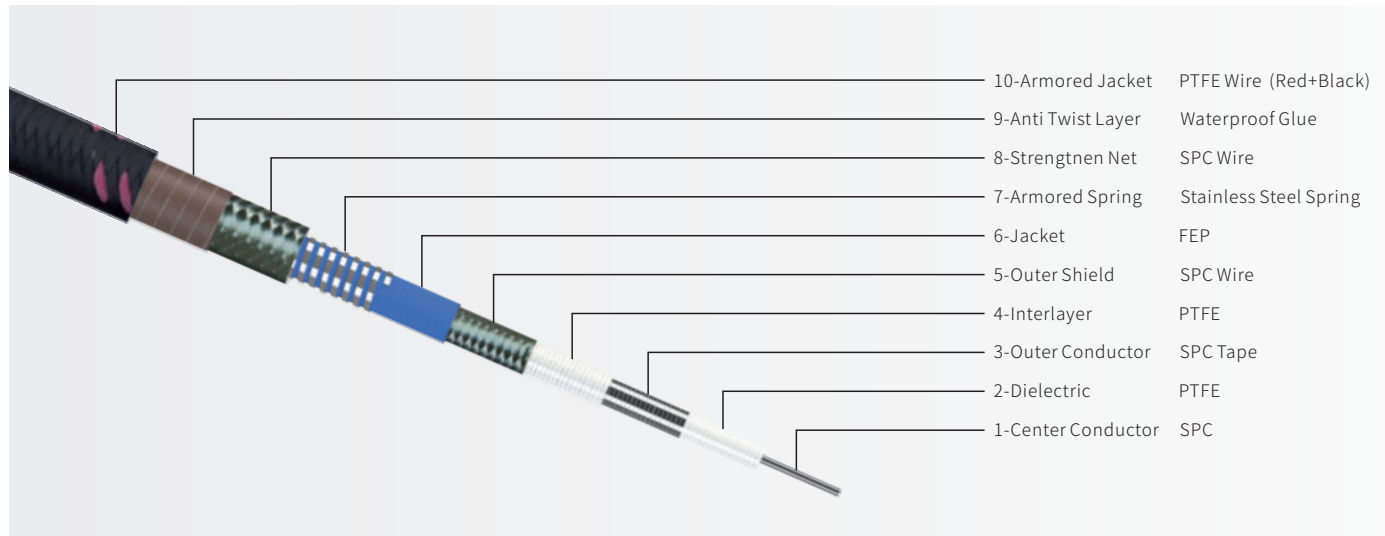


■ Typical Application



- 5G Communication
- EMC
- Antenna test
- Semiconductor R&D, fabrication
- Millimeter wave system interconnection
- High speed module R&D and manufacturing
- Optical module R&D and manufacturing

FABTest Cable Construction



FABTest Cable Specifications

Electrical Specifications

FABTest Cable Type		FTT/FTTA	FTP/FTP A	FTN/FTNA	FTS/FTSA
Operating Frequency (GHz)		26.5	40	50	67
Typical VSWR		1.20	1.20	1.25	1.28
Maximum VSWR		1.30	1.30	1.30	1.38
Jacket		Gray FEP	Gray FEP	Blue FEP	Blue FEP
Impedance (Ω)		50			
Insertion Loss (dB/m)	DC-18GHz	1.02	1.43	1.92	2.88
	DC-26.5GHz	1.25	1.76	2.35	3.56
	DC-40GHz		2.21	2.92	4.48
	DC-50GHz			3.29	5.09
	DC-67GHz				6.02
Typical Mechanical Phase ($^{\circ}$)	DC-18GHz	± 4	± 4	± 4	± 4
	DC-26.5GHz	± 5	± 5	± 5	± 5
	DC-40GHz		± 6	± 6	± 6
	DC-50GHz			± 7	± 7
	DC-67GHz				± 9
Typical Mechanical Amplitude (dB)	DC-18GHz	± 0.03	± 0.03	± 0.03	± 0.03
	DC-26.5GHz	± 0.04	± 0.04	± 0.04	± 0.04
	DC-40GHz		± 0.05	± 0.05	± 0.05
	DC-50GHz			± 0.06	± 0.06
	DC-67GHz				± 0.10
Shielding Effectiveness (dB)		>90			
Velocity of Propagation		83%	82%	74%	74%

Enviromental Specifications

Temperature Range ($^{\circ}\text{C}$)	-40~+85
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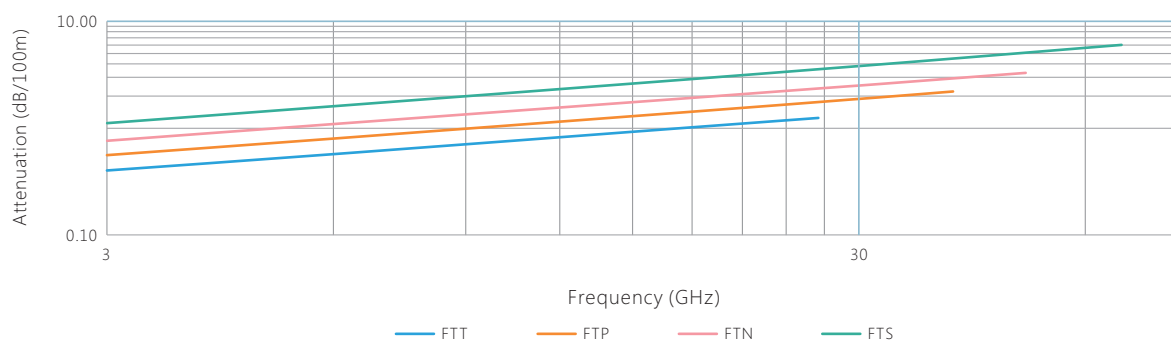
Non-armored Mechanical Specifications

	FTT	FTP	FTN	FTS
Outside Diameter of Cable (mm)	5.30	3.80	3.60	2.60
Minimum Bending Radius:Installation (mm)	27	18	14	11
Minimum Bending Radius:Repeated (mm)	53	36	36	28
Weight (g/m)	63	32	34	20

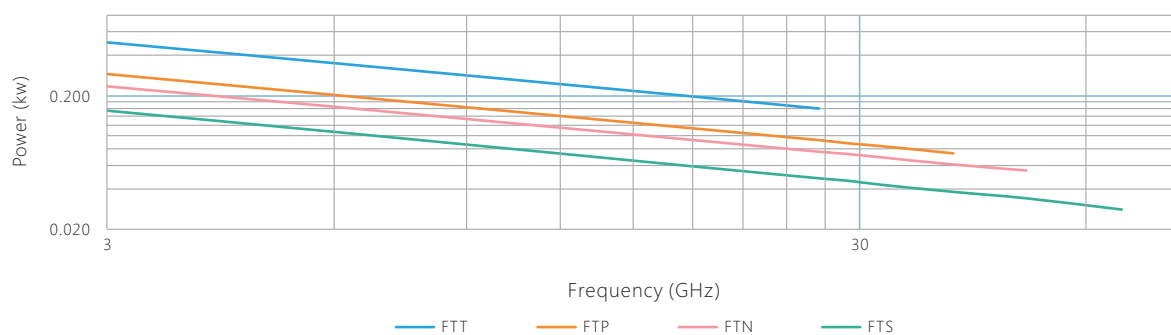
Armored Mechanical Specifications

	FTTA	FTP A	FTNA	FTSA
Outside Diameter of Armored Cable (mm)	7.95	6.50	6.00	4.65
Armored Minimum Bending Radius:Installation (mm)	40	32.5	30	23
Armored Minimum Bending Radius:Repeated (mm)	80	65	60	47
Armored Weight (g/m)	147	97	92	60

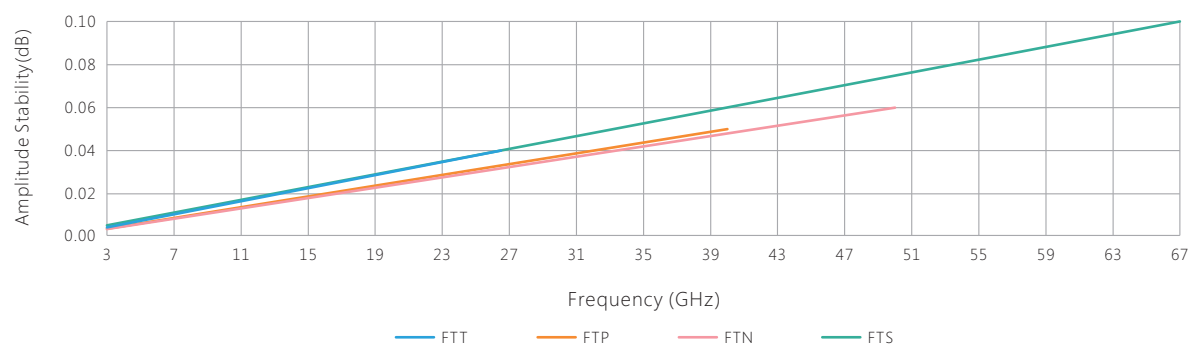
Frequency & Attenuation



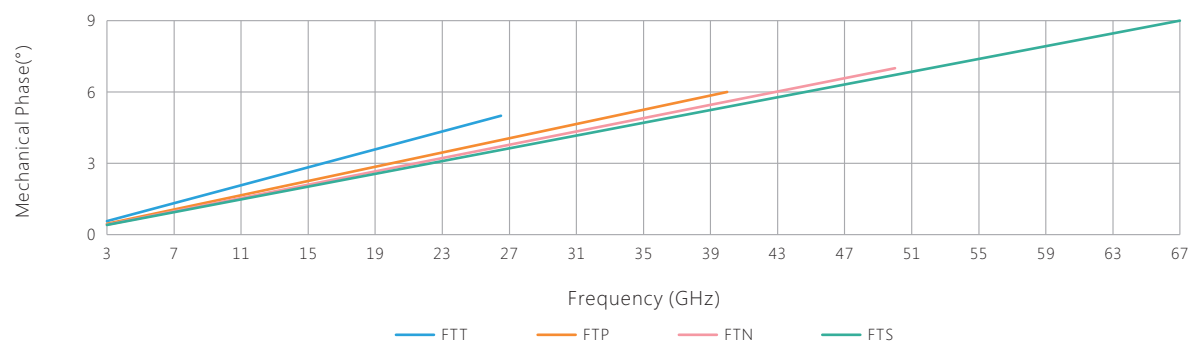
Frequency & Power



Typical Value of Mechanical Amplitude Stability



Typical Value of Mechanical Phase Stability



■ Component Selection Information

1	2	3	4	-	5	6	7	8	9	10	11	12	-	13	14	.	15	16	17	18	-	19
Cable Type		Armour				Left Connector			Right Connector			Customized Length			Unit		Phase/Time Delay					

Digit 1-3: Cable type: FTT/FTP/FTS/FTN

Digit 4: A-Armored; non-Armored,without digit

Digit 5-8: Left connector,code as follows,four digits maximum, less than four digits are indented according to the actual code

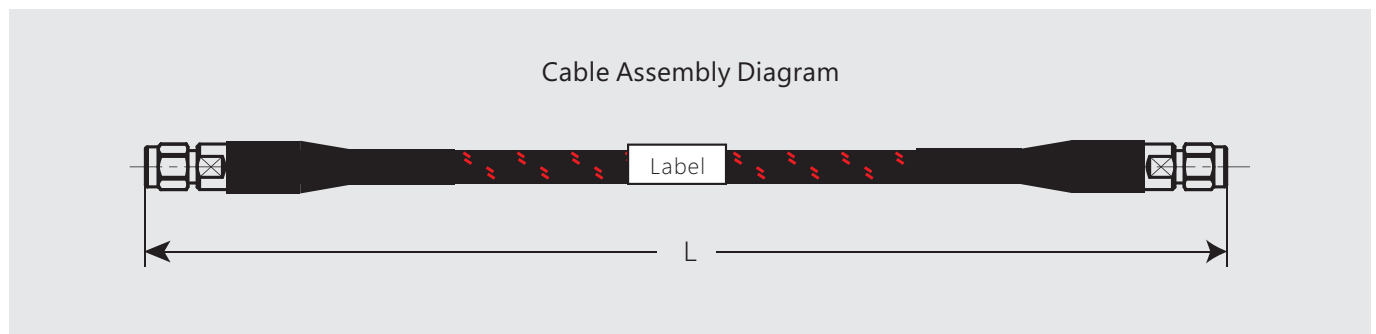
Digit 9-12: Right connector,code as follows, four digits maximum, less than four digits are indented according to the actual code.

Digit 13-16: Customized length. e.g.: 1-"01.00"

Digit 17-18: Unit: M-meter/IN-inch/F-feet, if less than two digits, indent by one

Digit 19: Phase matching/time delay: "p"; Omit this digit if no phase/time delay requirement;

For example: FTP-29M29M-01.00M/FTPA-29M29M-01.00M-P



■ Connector Selection

FABTest			FTT	FTTA	FTP	FTPA	FTN	FTNA	FTS	FTSA
Connector Code	Connector Type	Diameter Operating Frequency	5.30mm	7.95mm	3.80mm	6.50mm	3.60mm	6.00mm	2.60mm	4.65mm
18F	1.85mm Female	67.0GHz							●	
18M	1.85mm Male	67.0GHz							●	
24F	2.4mm Female	50.0GHz			●		●		●	
24M	2.4mm Male	50.0GHz			●		●		●	
29F	2.92mm Female	40.0GHz					●			
29M	2.92mm Male	40.0GHz			●		●		●	
29MR	2.92mm Male Right Angle	40.0GHz					●			
35F	3.5mm Female	26.5GHz					●			
35M	3.5mm Male	26.5GHz	●		●		●		●	
SM	SMA Male	18.0GHz	●		●		●		●	
NM	N Male	18.0GHz	●				●			

Note: For other connectors, please consult the manufacturer

■ FTT Series Cable Assemblies, Fast Delivery of Standard Products

Product Code	Products Designation	Connector A	Connector B	Length	Frequency	VSWR	Insertion Loss
T-CA21-10071	FTT-SMSM-01.00M	SMA Male	SMA Male	1.0m	18GHz	1.30	1.44dB
T-CA21-10072	FTTA-SMSM-01.00M						
T-CA21-10073	FTT-SMSM-01.50M	SMA Male	SMA Male	1.5m	18GHz	1.30	1.95dB
T-CA21-10074	FTTA-SMSM-01.50M						
T-CA21-10075	FTT-SMNM-01.00M	SMA Male	N Male	1.0m	18GHz	1.30	1.44dB
T-CA21-10076	FTTA-SMNM-01.00M						
T-CA21-10077	FTT-SMNM-01.50M	SMA Male	N Male	1.5m	18GHz	1.30	1.95dB
T-CA21-10078	FTTA-SMNM-01.50M						
T-CA21-10079	FTT-NMNM-01.00M	N Male	N Male	1.0m	18GHz	1.30	1.44dB
T-CA21-10080	FTTA-NMNM-01.00M						
T-CA21-10081	FTT-NMNM-01.50M	N Male	N Male	1.5m	18GHz	1.30	1.95dB
T-CA21-10082	FTTA-NMNM-01.50M						

Note: For time delay matching and phase matching

Calculation formula of insertion loss: Insertion loss (dB) = $\frac{K1 \cdot \sqrt{1000F} + K2 \cdot 1000F}{100} \cdot L + 0.1 \cdot \sqrt{F}$, K1=0.7156867, K2=0.000328. The unit of "F" is GHz. The unit of "L" is meter.

■ FTP Series Cable Assemblies, Fast Delivery of Standard Products

Product Code	Products Designation	Connector A	Connector B	Length	Frequency	VSWR	Insertion Loss
T-CA21-10083	FTP-24M24M-01.00M	2.4mm Male	2.4mm Male	1.0m	40GHz	1.30	2.84dB
T-CA21-10084	FTP-24M24M-01.00M						
T-CA21-10085	FTP-24M24M-01.50M	2.4mm Male	2.4mm Male	1.5m	40GHz	1.30	3.94dB
T-CA21-10086	FTP-24M24M-01.50M						
T-CA21-10087	FTP-24M24F-01.00M	2.4mm Male	2.4mm Female	1.0m	40GHz	1.30	2.84dB
T-CA21-10088	FTP-24M24F-01.00M						
T-CA21-10089	FTP-24M24F-01.50M	2.4mm Male	2.4mm Female	1.5m	40GHz	1.30	3.94dB
T-CA21-10090	FTP-24M24F-01.50M						
T-CA21-10091	FTP-29M29M-01.00M	2.92mm Male	2.92mm Male	1.0m	40GHz	1.30	2.84dB
T-CA21-10092	FTP-29M29M-01.00M						
T-CA21-10093	FTP-29M29M-01.50M	2.92mm Male	2.92mm Male	1.5m	40GHz	1.30	3.94dB
T-CA21-10094	FTP-29M29M-01.50M						
T-CA21-10095	FTP-SMSM-01.00M	SMA Male	SMA Male	1.0m	18GHz	1.30	1.85dB
T-CA21-10096	FTP-SMSM-01.00M						
T-CA21-10097	FTP-SMSM-01.50M	SMA Male	SMA Male	1.5m	18GHz	1.30	2.57dB
T-CA21-10098	FTP-SMSM-01.50M						

Note: For time delay matching and phase matching

Calculation formula of insertion loss: Insertion loss (dB) = $\frac{K1 \cdot \sqrt{1000F + K2 \cdot 1000F}}{100} \cdot L + 0.1 \cdot \sqrt{F}$, K1=0.9915499, K2=0.0005549. The unit of "F" is GHz. The unit of "L" is meter.

■ FTN Series Cable Assemblies, Fast Delivery of Standard Products

Product Code	Products Designation	Connector A	Connector B	Length	Frequency	VSWR	Insertion Loss
T-CA21-10099	FTN-24M24M-01.00M	2.4mm Male	2.4mm Male	1.0m	50GHz	1.30	3.99dB
T-CA21-10100	FTNA-24M24M-01.00M						
T-CA21-10101	FTN-24M24M-01.50M	2.4mm Male	2.4mm Male	1.5m	50GHz	1.30	5.63dB
T-CA21-10102	FTNA-24M24M-01.50M						
T-CA21-10103	FTN-24M24F-01.00M	2.4mm Male	2.4mm Female	1.0m	50GHz	1.30	3.99dB
T-CA21-10104	FTNA-24M24F-01.00M						
T-CA21-10105	FTN-24M24F-01.50M	2.4mm Male	2.4mm Female	1.5m	50GHz	1.30	5.63dB
T-CA21-10106	FTNA-24M24F-01.50M						
T-CA21-10107	FTN-29M29M-01.00M	2.92mm Male	2.92mm Male	1.0m	40GHz	1.30	3.55dB
T-CA21-10108	FTNA-29M29M-01.00M						
T-CA21-10109	FTN-29M29M-01.50M	2.92mm Male	2.92mm Male	1.5m	40GHz	1.30	5.01dB
T-CA21-10110	FTNA-29M29M-01.50M						
T-CA21-10111	FTN-29M29F-01.00M	2.92mm Male	2.92mm Female	1.0m	40GHz	1.30	3.55dB
T-CA21-10112	FTNA-29M29F-01.00M						
T-CA21-10113	FTN-29M29F-01.50M	2.92mm Male	2.92mm Female	1.5m	40GHz	1.30	5.01dB
T-CA21-10114	FTNA-29M29F-01.50M						
T-CA21-10115	FTN-35M35M-01.00M	3.5mm Male	3.5mm Male	1.0m	26.5GHz	1.30	2.86dB
T-CA21-10116	FTNA-35M35M-01.00M						
T-CA21-10117	FTN-35M35M-01.50M	3.5mm Male	3.5mm Male	1.5m	26.5GHz	1.30	4.04dB
T-CA21-10118	FTNA-35M35M-01.50M						
T-CA21-10119	FTN-35M35F-01.00M	3.5mm Male	3.5mm Female	1.0m	26.5GHz	1.30	2.86dB
T-CA21-10120	FTNA-35M35F-01.00M						
T-CA21-10121	FTN-35M35F-01.50M	3.5mm Male	3.5mm Female	1.5m	26.5GHz	1.30	4.04dB
T-CA21-10122	FTNA-35M35F-01.50M						
T-CA21-10123	FTN-SMSM-01.00M	SMA Male	SMA Male	1.0m	18GHz	1.30	2.34dB
T-CA21-10124	FTNA-SMSM-01.00M						
T-CA21-10125	FTN-SMSM-01.50M	SMA Male	SMA Male	1.5m	18GHz	1.30	3.30dB
T-CA21-10126	FTNA-SMSM-01.50M						

Note: For time delay matching and phase matching

Calculation formula of insertion loss: $\text{Insertion loss (dB)} = \frac{K1 \cdot \sqrt{1000F} + K2 \cdot 1000F}{100} \cdot L + 0.1 \cdot \sqrt{F}$, K1=1.3707349, K2=0.00044. The unit of "F" is GHz. The unit of "L" is meter.

■ FTS Series Cable Assemblies, Fast Delivery of Standard Products

Product Code	Products Designation	Connector A	Connector B	Length	Frequency	VSWR	Insertion Loss
T-CA21-10127	FTS-18M18M-01.00M	1.85mm Male	1.85mm Male	1.0m	67GHz	1.30	6.84dB
T-CA21-10128	FTSA-18M18M-01.00M						
T-CA21-10129	FTS-18M18M-01.50M	1.85mm Male	1.85mm Male	1.5m	67GHz	1.30	9.85dB
T-CA21-10130	FTSA-18M18M-01.50M						
T-CA21-10131	FTS-18M18F-01.00M	1.85mm Male	1.85mm Female	1.0m	67GHz	1.30	6.84dB
T-CA21-10132	FTSA-18M18F-01.00M						
T-CA21-10133	FTS-18M18F-01.50M	1.85mm Male	1.85mm Female	1.5m	67GHz	1.30	9.85dB
T-CA21-10134	FTSA-18M18F-01.50M						
T-CA21-10135	FTS-24M24M-01.00M	2.4mm Male	2.4mm Male	1.0m	50GHz	1.30	5.79dB
T-CA21-10136	FTSA-24M24M-01.00M						
T-CA21-10137	FTS-24M24M-01.50M	2.4mm Male	2.4mm Male	1.5m	50GHz	1.30	8.34dB
T-CA21-10138	FTSA-24M24M-01.50M						
T-CA21-10139	FTS-24M24F-01.00M	2.4mm Male	2.4mm Female	1.0m	50GHz	1.30	5.79dB
T-CA21-10140	FTSA-24M24F-01.00M						
T-CA21-10141	FTS-24M24F-01.50M	2.4mm Male	2.4mm Female	1.5m	50GHz	1.30	8.34dB
T-CA21-10142	FTSA-24M24F-01.50M						
T-CA21-10143	FTS-29M29M-01.00M	2.92mm Male	2.92mm Male	1.0m	40GHz	1.30	5.11dB
T-CA21-10144	FTSA-29M29M-01.00M						
T-CA21-10145	FTS-29M29M-01.50M	2.92mm Male	2.92mm Male	1.5m	40GHz	1.30	7.35dB
T-CA21-10146	FTSA-29M29M-01.50M						
T-CA21-10147	FTS-35M35M-01.00M	3.5mm Male	3.5mm Male	1.0m	26.5GHz	1.30	4.07dB
T-CA21-10148	FTSA-35M35M-01.00M						
T-CA21-10149	FTS-35M35M-01.50M	3.5mm Male	3.5mm Male	1.5m	26.5GHz	1.30	5.85dB
T-CA21-10150	FTSA-35M35M-01.50M						

Note: For time delay matching and phase matching

Calculation formula of insertion loss: $\text{Insertion loss (dB)} = \frac{K1 \cdot \sqrt{1000F + K2 \cdot 1000F}}{100} \cdot L + 0.1 \cdot \sqrt{F}$; $K1=1.95$, $K2=0.00145$. The unit of "F" is GHz. The unit of "L" is meter.



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