



Instrument RF product selection

Maxwellon

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Maxwellon

Maxwellon Electronic Instruments Co.,LTD.



CATALOG

FSH

High performance flexible interconnection assemblies



Product Type
FSH-250
FSH-250-L
FSH-260-L
FSH-360

Application Instruments:
Spectrum Analyzer
Matrix Switch
RF Signal Source
Vector Network Analyzer

01

FSD

Low loss semi-rigid cable assemblies



Product Type
FSD-047-TP/TM
FSD-086-TP/TM
FSD-120-TP/TM
FSD-141-TP/TM

Application Instruments:
Spectrum Analyzer
Matrix Switch
RF Signal Source
Vector Network Analyzer

03

Network analyzer port adapters



Product Type
3.5 mm Series
2.92 mm Series
2.4 mm Series
1.85 mm Series

Application instruments:
Vector Network Analyzer
Electric terminal load
Electronic calibration kit

05

VNA

VNA Microwave/RF Test Cable Assemblies for network analyzer



Product Type
V18 V50
V26 V67
V40 V110

Application instruments:
Vector Network Analyzer

06



CATALOG

Torque Wrench



Product Type
8 in-lbs 6.2in-lbs
12in-lbs 7.1in-lbs
5.3in-lbs

09

Precision Adapter



09



Assembly Selection Information

Product Features

Length
Add 0 if the length code
is less than 4 digits
For example, 8=08.00

FSHXXXXXX - XXXX

Cable Type
FSH-250 = 25
FSH-250-L = 25L
FSH-260-L = 26
FSH-360 = 36

Connector type,
independent on both sides
Refer to connector selection table for code

IN:Inch
M:Meter
F:Foot

- Excellent bending phase, amplitude stability
- Stainless steel outer shield, high tensile strength
- Triple shielding structure, good insulation
- Bending at random and maintaining shape stability
- Stainless steel soldering-free connector

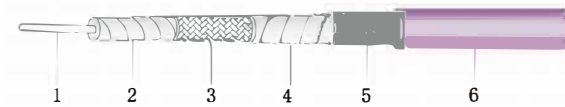
For example: FSH2629M29M-300

Optional Connectors

Connector Code	Connection Type	Operating Frequency (GHz)	FSH-250	FSH-250-L	FSH-260-L	FSH-360	Typical VSWR	Max VSWR
24M	2.4mm Male	50GHz			●		1.30	1.35
24F	2.4mm Female	50GHz			○		1.30	1.35
29M	2.92mm Male	40GHz	●	●	●		1.25	1.30
29MR	2.92mm Male Right Angle	40GHz	○	○		○	1.30	1.35
SM	SMA Male	26.5GHz	●	●	●		1.25	1.30
SFBH	SMA Female Bulkhead	18GHz	●	●		●	1.25	1.30
NM	N Male	18GHz			○		1.25	1.30
NFFL	N Female 4-hole Flange	18GHz	○				1.25	1.30
SMPFR	SMP Female Right Angle	18GHz	○	○			1.30	1.35

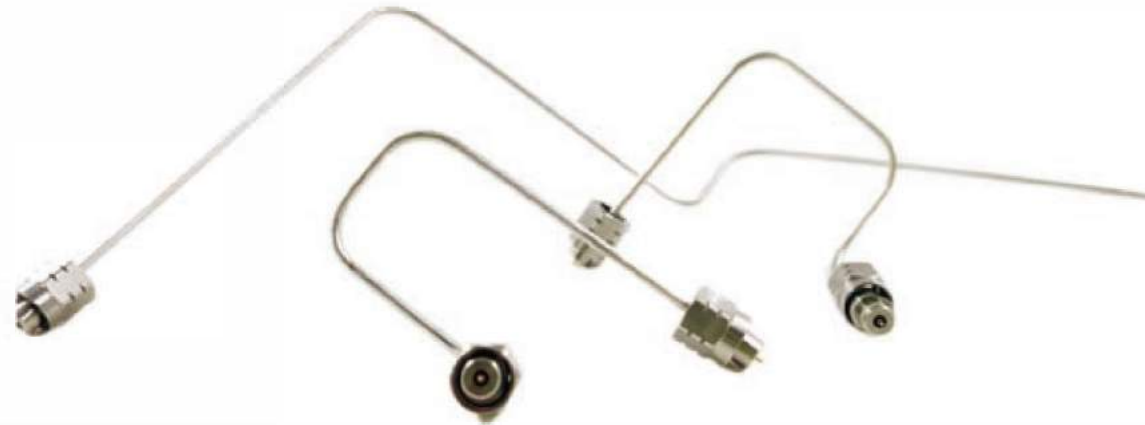
Note:
● = stocked and ○ = designed but not stocked.

FSH Specification



1 Center Conductor	SPC	4 Interlayer	Aluminum Foil
2 Dielectric	PTFE	5 Outer Shield	Stainless Steel Wire
3 Outer Conductor	SPC Tape	6 Jacket	FEP

	FSH-250			FSH-250-L			FSH-260-L			FSH-360		
Physical & Mechanical Specifications												
Dimensions	mm	Inch		mm	Inch		mm	Inch		mm	Inch	
Jacket	2.50	0.098		2.50	0.098		2.64	0.104		3.61	0.142	
Bend Radius: Installation	10.00	0.394		10.00	0.394		10.60	0.417		8.40	0.331	
Bend Radius: Repeated	25.00	0.984		25.00	0.984		26.00	1.024		36.00	1.417	
Weight	18 g/m	0.012 lbs/ft		16 g/m	0.011 lbs/ft		17 g/m	0.011 lbs/ft		31 g/m	0.021 lbs/ft	
Temperature Range	-55~+125°C (-67~+257°F)			-55~+165°C (-67~+329°F)								
Electrical Specifications												
Operating Frequency	40 GHz			40.0 GHz			50.0 GHz			26.5 GHz		
Max Phase Stability(±°)	±8			±8			±8			±8		
MaxAmplitudeStability(±dB)	±0.15			±0.15			±0.15			±0.15		
Impedance	50Ω											
Shielding Effectiveness	> 90 dB											
Velocity of Propagation	70%			74%			76%			76%		
Attenuation & Power Handling	Attenuation (+25°C Ambient) & Power Handling(+40°C Ambient; Sea Level; VSWR1:1)											
Frequency (MHz)	dB/ m	dB/ Ft	kW	dB/ m	dB/ Ft	kW	dB/ m	dB/ Ft	kW	dB/ m	dB/ Ft	kW
1000	0.829	0.253	0.103	0.721	0.220	0.103	0.601	0.183	0.103	0.398	0.121	0.346
2000	1.180	0.360	0.073	1.029	0.314	0.072	0.858	0.262	0.072	0.567	0.173	0.243
4000	1.684	0.513	0.051	1.474	0.449	0.050	1.228	0.375	0.050	0.809	0.247	0.170
8000	2.412	0.735	0.036	2.121	0.647	0.035	1.768	0.539	0.035	1.159	0.353	0.119
10000	2.711	0.826	0.032	2.388	0.728	0.031	1.990	0.607	0.031	1.303	0.397	0.106
18000	3.697	1.127	0.023	3.275	0.999	0.023	2.729	0.832	0.023	1.778	0.542	0.078
26500	4.546	1.386	0.019	4.047	1.234	0.018	3.372	1.028	0.018	2.188	0.667	0.063
40000	5.682	1.732	0.015	5.088	1.551	0.015	4.240	1.293	0.015			
50000							4.809	1.466	0.013			
Attenuation at Frequency	dB/m= $\frac{K1*\sqrt{FMHz}+K2*FMHz}{100}$											
K1	2.5808091			2.2320000			1.8600000			1.2380700		
K2	0.0013000			0.0015600			0.0013000			0.0006499		



Assembly Selection Information

Length
Add 0 if the length code is less than 4 digits
For example: 8=08.00

FSDXXXXXX-XXXXXXXXXX-XX.XXXX

Cable Type
086TP/TM
120TP/TM
141TP/TM
047TP/TM

Connector type
independent on both sides
Refer to connector selection table for code

IN:Inch
M:Meter
F:Foot

For example: FSD086TM-SMSM-00.30M

Product Features

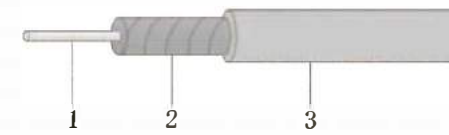
- Wide temperature operating range
- Lessttemperature-relatedphase change
- Lower loss
- Higher power handling
- Lighter weight
- Plenty connector options

Optional Connectors

Connector Code	Connection Type	Operating Frequency (GHz)	FSD-047A-TM/TP	FSD-086-TM/TP	FSD-120-TM/TP	FSD-141-TM/TP	Typical VSWR	Max VSWR
18M	1.85mm Male	67GHz	○				1.35	1.40
18FBH	1.85mm Female Bulkhead	67GHz	○				1.35	1.40
35M	3.5mm Male	26.5GHz				●	1.25	1.30
35FBH	3.5mm Female Bulkhead	26.5GHz				●	1.25	1.30
SM	SMA Male	26.5GHz		●		●	1.25	1.30
		18GHz			●		1.25	1.30

Note:
● =stocked and ○ = designed but not stocked

FSD Specification



- | | | | |
|--------------------|------|-------------------|--------------------------|
| 1 Center Conductor | SPC | 3 Outer Conductor | TM-Ternary Alloy Plating |
| 2 Dielectric | PTFE | | TP-Tin Plating |

	FSD-047A-TM/TP			FSD-086-TM/TP			FSD-120-TM/TP			FSD-141-TM/TP		
Physical & Mechanical Specifications												
Dimensions	mm	Inch		mm	Inch		mm	Inch		mm	Inch	
Jacket	1.19	0.047		2.18	0.086		3.05	0.120		3.58	0.141	
Bend Radius: Installation	5	0.197		7	0.276		10.5	0.413		12.5	0.492	
Weight	6 g/m	0.004 lbs/ft		19 g/m	0.013 lbs/ft		35 g/m	0.024 lbs/ft		43 g/m	0.029 lbs/ft	
Temperature Range	-60~+150°C (-76~302°F)			-60~+250°C (-76~482°F)								
Electrical Specifications												
Operating Frequency	20 GHz			50 GHz			40 GHz			26.5 GHz		
Impedance	50Ω											
Shielding Effectiveness	> 165dB											
Velocity of Propagation	70%			76%			76%			76%		
Attenuation & Power Handling	Attenuation (+25°C Ambient) & Power Handling(+40°C Ambient; Sea Level; VSWR1:1)											
Frequency (MHz)	dB/ m	dB/ Ft	kW	dB/ m	dB/ Ft	kW	dB/ m	dB/ Ft	kW	dB/ m	dB/ Ft	kW
1000	1.204	0.367	0.047	0.550	0.168	0.259	0.340	0.104	0.528	0.310	0.094	0.590
2000	1.728	0.527	0.033	0.782	0.238	0.183	0.484	0.147	0.371	0.442	0.135	0.414
4000	2.494	0.760	0.023	1.113	0.339	0.128	0.691	0.211	0.259	0.631	0.193	0.289
8000	3.628	1.106	0.016	1.587	0.484	0.090	0.991	0.302	0.181	0.907	0.276	0.201
10000	4.102	1.250	0.014	1.781	0.543	0.080	1.114	0.340	0.161	1.020	0.311	0.179
18000	5.700	1.738	0.010	2.417	0.737	0.059	1.522	0.464	0.118	1.396	0.426	0.131
26500				2.960	0.902	0.048	1.874	0.571	0.096	1.721	0.525	0.106
35000				3.428	1.045	0.042	2.180	0.665	0.082			
40000				3.680	1.122	0.039	2.346	0.715	0.076			
50000				4.146	1.264	0.034						
Attenuation at Frequency	dB/m= $\frac{K1*\sqrt{FMHz}+K2*FMHz}{100}$											
K1	3.6716383			1.7220000			1.0550000			0.9610400		
K2	0.0043000			0.0005900			0.0005904			0.0005904		

Product Features

- LPC Laboratory metrology grade interface standard
- 100% in-house design/machining/assembly/testing
- Replacement for HUBER+SUHNER
- No MOQ requirement, certified by CEC
- Smooth surface of screw sleeve, no snagging in rotation



Selection Information

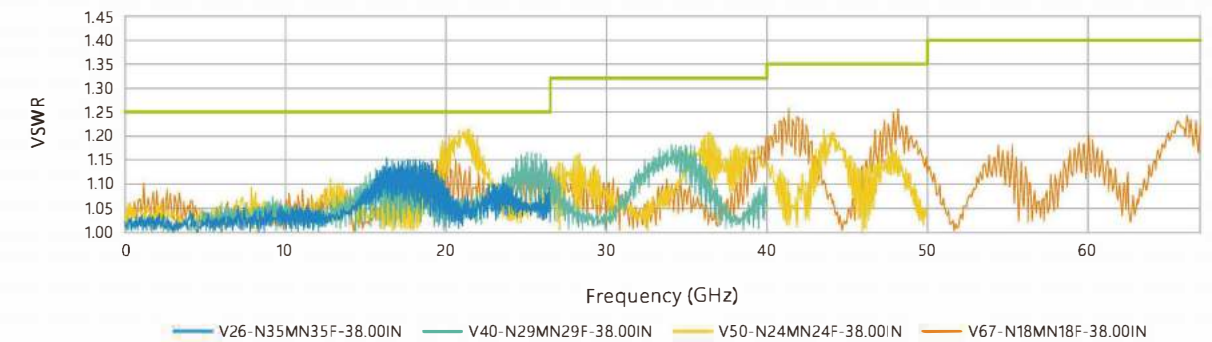
Part Name	Description	Frequency	VSWR	Insertion Loss	Durability
NF-35M-BH001	N Female to 3.5 mm Male Bulkhead Adapter	DC-18GHz	≤1.15	<0.05x√F(GHz) dB	5000
NMD-35M35M-BH001	NMD 3.5 mm Male to 3.5 mm Male Bulkhead Adapter	DC-26.5GHz	≤1.15	<0.05x√F(GHz) dB	5000
N29M-29M-BH001	NMD 2.92 mm Male to 2.92 mm Male Bulkhead Adapter	DC-40GHz	≤1.20	<0.06x√F(GHz) dB	5000
N29M-24M-BH001	NMD 2.92 mm Male to 2.4 mm Male Bulkhead Adapter	DC-40GHz	≤1.20	<0.06x√F(GHz) dB	5000
N24M-24M-BH001	NMD 2.4 mm Male to 2.4 mm Male Bulkhead Adapter	DC-50GHz	≤1.20	<0.07x√F(GHz) dB	5000
N24M-24M-001	NMD 2.4 mm Male to 2.4 mm Male Adapter	DC-50GHz	≤1.20	<0.07x√F(GHz) dB	5000
N18M-18M-001	NMD 1.85 mm Male to 1.85 mm Male Adapter	DC-67GHz	≤1.25	<0.08x√F(GHz) dB	5000
18F-N24M-BH001	1.85 mm Female to NMD 2.4 mm Male Bulkhead Adapter	DC-50GHz	≤1.20	<0.06x√F(GHz) dB	5000
18F-N29M-BH001	1.85 mm Female to NMD 2.92 mm Male Bulkhead Adapter	DC-40GHz	≤1.20	<0.06x√F(GHz) dB	5000
18F-N35M-BH001	1.85 mm Female to NMD 3.5 mm Male Bulkhead Adapter	DC-26.5GHz	≤1.20	<0.05x√F(GHz) dB	5000
18F-A24F-BH001	1.85 mm Female to APC 2.4 mm Female Bulkhead Adapter	DC-50GHz	≤1.20	<0.06x√F(GHz) dB	5000
18F-A29F-BH001	1.85 mm Female to APC 2.92 mm Female Bulkhead Adapter	DC-40GHz	≤1.20	<0.06x√F(GHz) dB	5000
18F-A35F-BH001	1.85 mm Female to APC 3.5 mm Female Bulkhead Adapter	DC-26.5GHz	≤1.20	<0.05x√F(GHz) dB	5000
N24M-24F-BH001	NMD 2.4 mm Male to 2.4 mm Female Bulkhead Adapter	DC-50GHz	≤1.20	<0.07x√F(GHz) dB	5000
N24M-24F-001	NMD 2.4 mm Male to 2.4 mm Female Adapter	DC-50GHz	≤1.20	<0.06x√F(GHz) dB	5000
N24F-24F-001	NMD 2.4 mm Female to 2.4 mm Female Adapter	DC-50GHz	≤1.20	<0.06x√F(GHz) dB	5000



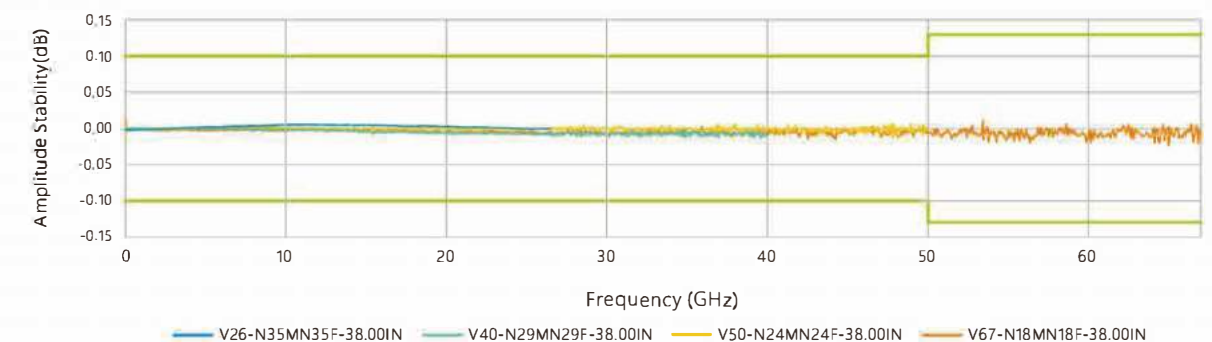
Product Features

- Extremely accurate measurement with stable electrical performance up to 67GHz
- Same excellent phase & amplitude stability even at flexure
- Super robust cable, equipped with NMD connector, can withstand repeated mating, extrusion, twisting and bending, extraordinary reliability
- Extend the validity of utilization after calibration, reduce the repeated calibrations

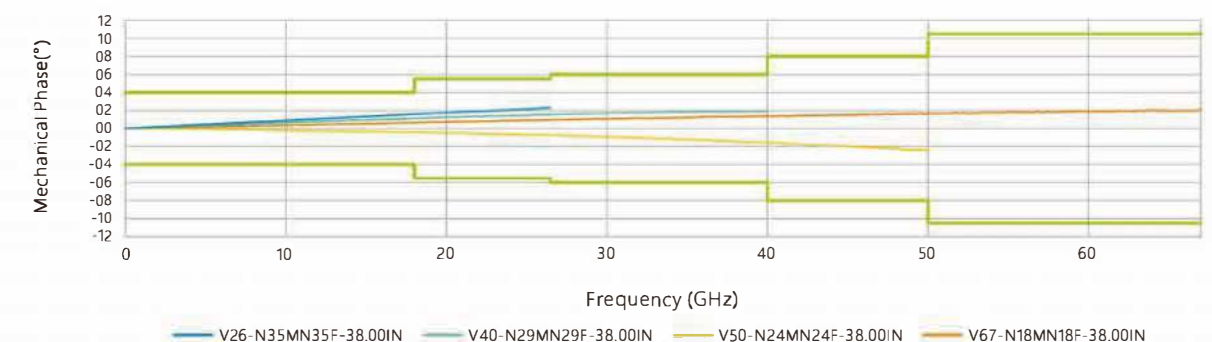
VSWR



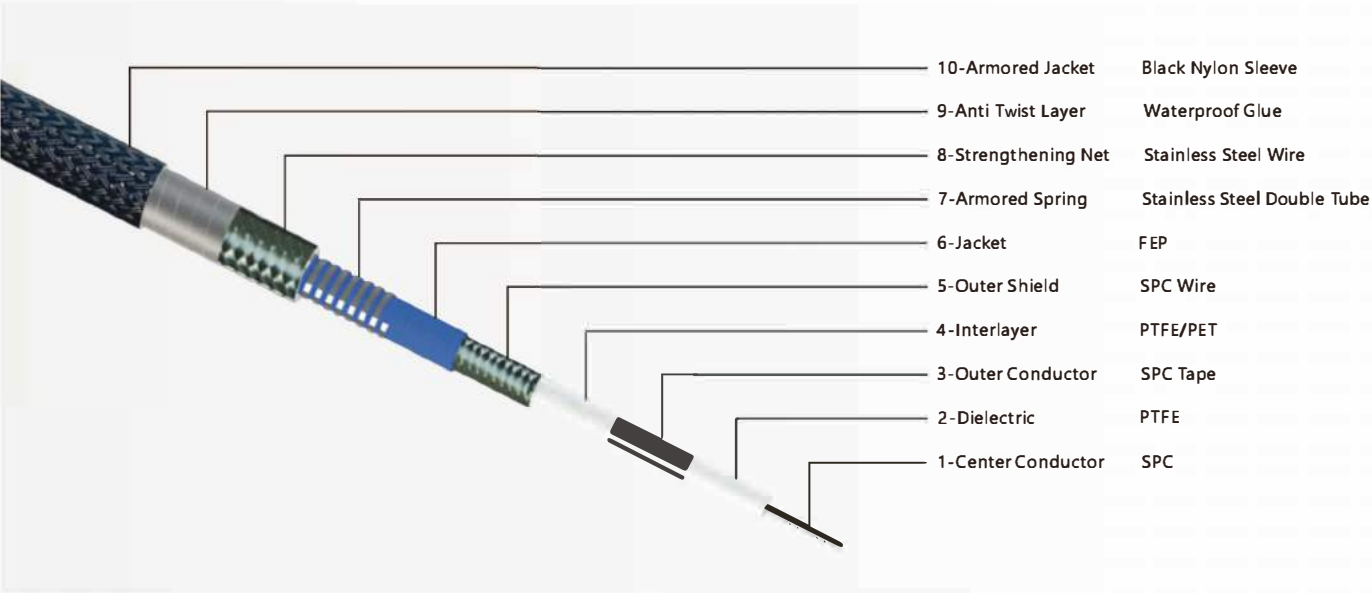
Typical Value of Mechanical Amplitude Stability



Typical Value of Mechanical Phase Stability



VNA Cable Construction



VNA Cable Assembly Specifications

Electrical Specifications

VNA Cable Type	V18			V26			V40			V50			V67		
Operating Frequency (GHz)	18			26.5			40			50			67		
Cable Assembly Length (Inch)	25	38	48	25	38	48	25	38	48	25	38	48	25	38	48
Typical VSWR	1.18			1.18			1.25			1.25			1.35		
Maximum VSWR	1.25			1.25			1.32			1.35			1.40		
Typical Insertion Loss (dB)	1.42	2.05	2.54	1.75	2.53	3.12	2.17	3.13	3.88	2.45	3.53	4.36	4.27	6.21	7.70
Maximum Insertion Loss (dB)	1.77	2.41	2.90	2.16	2.93	3.53	2.66	3.62	4.37	2.98	4.07	4.90	4.59	6.54	8.03
Typical Mechanical Phase (°)	2.0	2.0	3.0	2.0	2.0	3.0	1.5	3.0	3.0	1.5	4.0	4.0	4.0	5.0	7.0
Maximum Mechanical Phase (°)	2.5	4.0	4.0	2.7	5.5	5.5	3.0	6.0	6.0	3.5	8.0	8.0	8.5	10.5	10.5
Typical Mechanical Amplitude (dB)	0.02	0.02	0.03	0.01	0.02	0.03	0.02	0.02	0.03	0.01	0.03	0.03	0.02	0.02	0.04
Maximum Mechanical Amplitude (dB)	0.08	0.10	0.10	0.08	0.10	0.10	0.08	0.10	0.10	0.08	0.10	0.13	0.10	0.13	0.20
Impedance (Ω)	50														
Shielding Effectiveness (dB)	> 100														
Velocity of Propagation	74%														
Time Delay (ns/cm)	4.5														

Mechanical Specifications

Outside Diameter of Armored Cable (mm)	14.8														
Minimum Bending Radius:Installation (mm)	74														
Minimum Bending Radius:Repeated (mm)	148														
Weight (g/m)	315	385	455	315	385	455	315	385	455	315	385	455	315	385	455
Flexible Life (cycle)	> 50000														
Crush Resistance (kgf/cm)	> 150														

Enviromental Specification

Temperature Range (°C)	-40~+85														
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Component Selection Information

1	2	3	-	4	5	6	7	8	9	10	11	-	12	13	14	15	16	17
Cable Type				Connector									Customized Length				Unit	

Digit 1-3: Cable type: V67/V50/V40/V26/V18

Digit 4-7: Left connector, e.g.: N18M

Digit 8-11: Right connector, e.g.: A35F

Digit 12-15: Customized length. e.g.: 1-"01.00"

Digit 16-17: Unit: IN-inch

For example: V67-N18FA18F-25.00IN

Connector Type



NMD FEMALE



NMD MALE



APC FEMALE



NMD 7M

Connector Selection

VNA Cable Type			V67	V50	V40	V26	V18
Connector Code	Connector Type	Operating Frequency	14.8mm				
N18F	NMD 1.85mm Female	67GHz	●				
A18F	APC 1.85mm Female	67GHz	●				
N18M	NMD 1.85mm Male	67GHz	●				
N24F	NMD 2.4mm Female	50GHz		●			
A24F	APC 2.4mm Female	50GHz		●			
N24M	NMD 2.4mm Male	50GHz		●			
N29F	NMD 2.92mm Female	40GHz			●		
A29F	APC 2.92mm Female	40GHz			●		
N29M	NMD 2.92mm Male	40GHz			●		
N35F	NMD 3.5mm Female	26.5GHz				●	
A35F	APC 3.5mm Female	26.5GHz				●	
N35M	NMD 3.5mm Male	26.5GHz				●	
7M	NMD 7mm	18GHz					●

maxwellon

Torque Wrench
Precision Adapter

Available Product

PN	For Use With Connector	Wrench Size		Thread Size	Pre-set Torque	
		(mm)	(inch)		(N/m)	(lb/in)
FT0017SS	SMA/3.5mm/2.92mm male	8.0	5/16	1/4-36UNS-2B	0.9	8.0
	2.4mm/1.85mm male			M7x0.75-6H		
FT0018SS	N male	19.0	3/4	5/8-24UNEF-2B	1.4	12.0
FT0019SS	NMD 3.5mm/2.92mm male	20.0	25/32	11/16-24UNEF-2A	1.4	12.0
	NMD 24mm/1.85mm male			5/8-24UNEF-2A		
FT0020SS	/	5.5	0.216	/	0.6	5.3
FT0021SS	1.0mm male	6.0	15/64	M4x0.7-6H	0.7	6.2
FT0022SS	/	7.0	0.276	/	0.8	7.1
FT0023SS	NMD 1.0mm male	13.0	0.512	7/16-28UNEF-2A	1.4	12.0
FT0024SS	TNC male	14.0	0.551	7/16-28UNEF-2B	1.4	12.0



90° break over status



Optional Connectors

Code Series	1.0mm	1.85mm	2.4mm	2.92mm	3.5mm	SMA
Code	10	18	24	29	35	S
1.0mm	●	●				
1.85mm	●	●	●	●		
2.4mm		●	●	●	●	
2.92mm		●	●	●	●	
3.5mm		●	●	●	●	
SMA						●

Note:
● =stocked and ○ = designed but not stocked.

