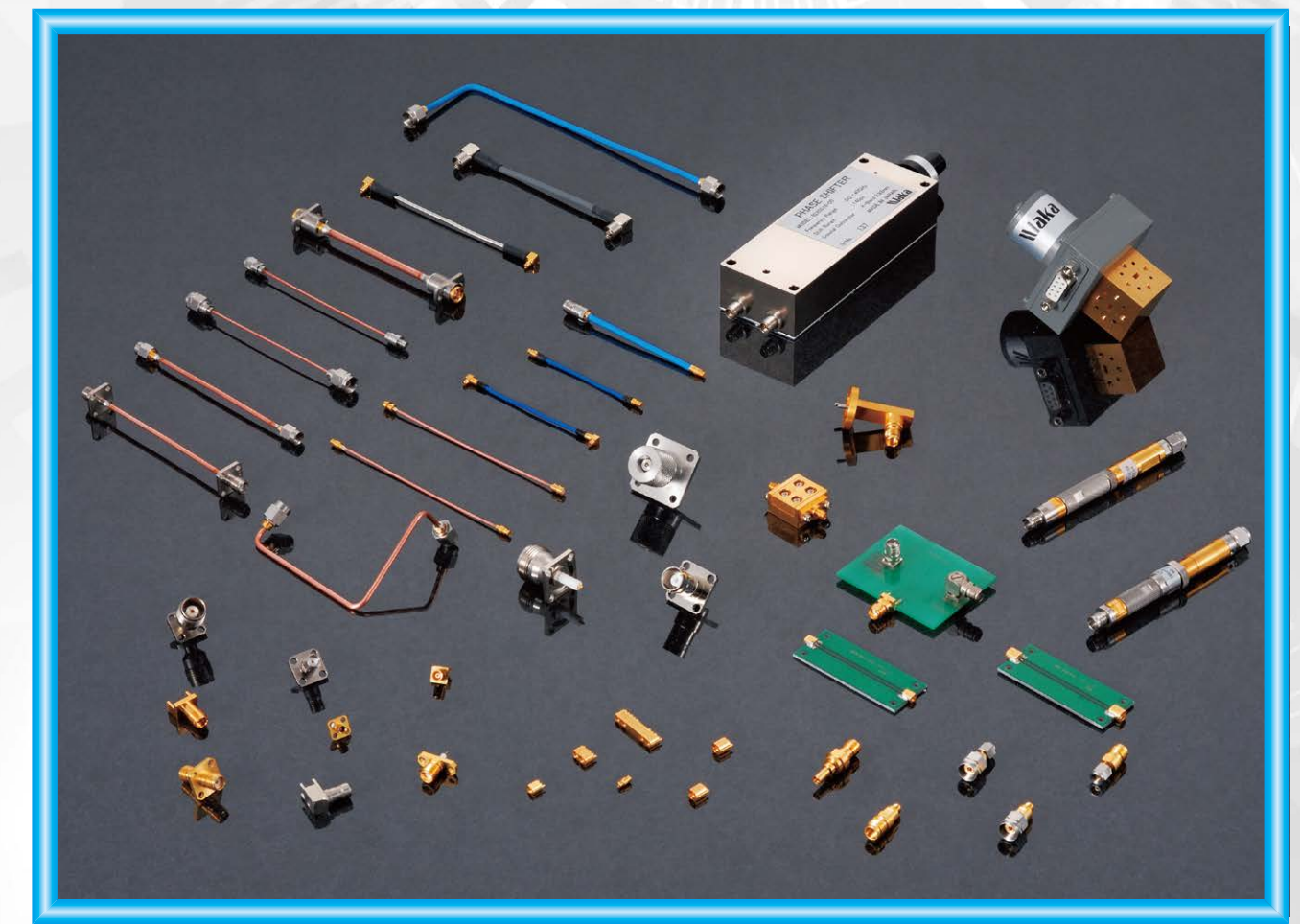
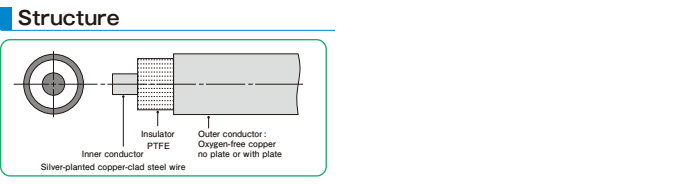


Micro wave Coaxial Components Introduction



Waka
WAKA MANUFACTURING Co.,Ltd.

Semi-Rigid cable

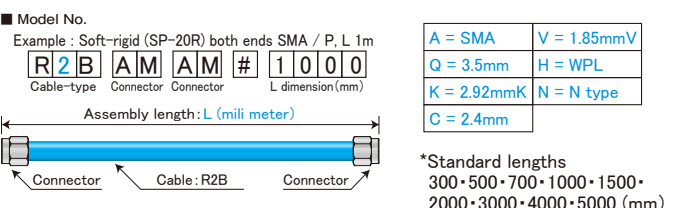
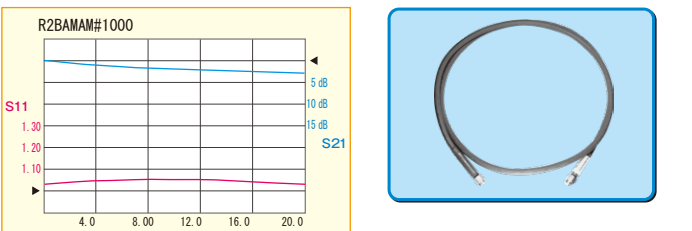


Typical specification

	SX-36 (0.141")	SX-22 (0.085")	SX-12 (0.047")	SX-09 (0.034")
Impedance (Ω)	50±0.5	50±1.0	50±2.0	50±2.5
Outer conductor diameter (mm)	3.581±0.025	2.197±0.025	1.194±0.025	0.864±0.025
Inner conductor diameter (mm)	0.919±0.017	0.511±0.013	0.287±0.012	0.203±0.012
Insulator diameter (mm)	2.985±0.051	1.676±0.051	0.940±0.025	0.660±0.025
Capacitance (pF/m)	95	95	95	95
Insulation dielectric strength (VRMS)	5000	2500	2000	2000
Corona generating voltage (VRMS)	2000	1500	1000	750
Higher order mode (GHz)	33	62	117	157
Wave length shortening (%)	70	70	70	70
The minimum bending radius (mm)	6.5	3.0	3.2	3.2
Weight (g/m)	46.0	20.0	6.7	3.9
The highest temperature (°C)	125	125	125	125

Attenuation/ Electric Power Capacity (dB/m)/(W) (20°C, sea level)	Frequency (GHz)	Attenuation (dB/m)			
		0.5	1.0	5.0	10.0
0.24/600	0.5	0.24/600	0.42/180	0.70/45	1.05/14
	1.0	0.34/450	0.60/130	1.05/32	1.50/10
	5.0	0.84/180	1.41/54	2.40/13	3.40/4.5
	10.0	1.25/120	2.06/36	3.50/9	4.90/3.2
	20.0	1.90/70	3.04/20	5.00/6.5	7.00/2
	30.0	2.45	3.85	6.35	8.70
	40.0		4.57	7.45	10.20
	50.0		5.25	8.45	11.55
	60.0		5.85	9.40	12.80

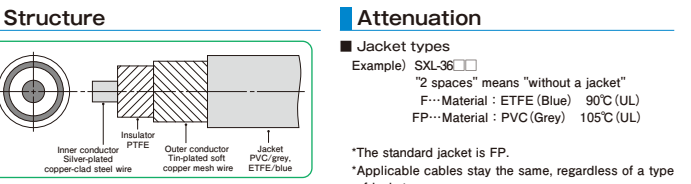
Soft Rigid cable (Our original cable for measurement use) DC~65GHz



Typical specification

Model No.	R2B AM AM # 1000	R2B AM AL # 1000	R2B KM KM # 1000	R2B VM VM # 1000
Applicable cable	R2B (SP-20R)			
Impedance	50Ω			
Standard Insertion loss at 10GHz	1.8dB	1.8dB	1.8dB	1.8dB
Standard Insertion loss at 18GHz	3.0dB	3.0dB	3.0dB	3.0dB
Standard Insertion loss at 40GHz	-	-	3.9dB	3.9dB
Standard Insertion loss at 65GHz	-	-	-	4.9dB
V.S.W.R.	1.2 (at 18GHz)		1.35 (at 65GHz)	
Outer conductor	Oxygen-free seamless copper pipe			
Inner conductor	Silver-plated copper-clad steel wire			
Insulator	Low loss PTFE			
Outer sheath	polyolefin			
Operating temperature range	-55~+105°C			
Outer sheath diameter	φ6.3mm			
Outer sheath color	Blue			
Connectors	SMA/P	SMA/LP	2.92mmK/P	1.85mmV/P
Minimum bending radius	40mm			

Semi-Flexible cable

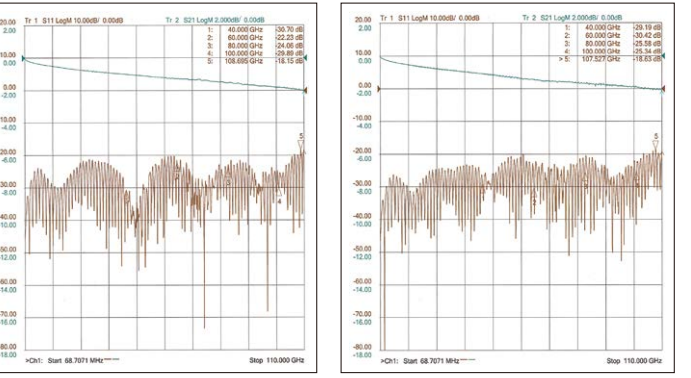
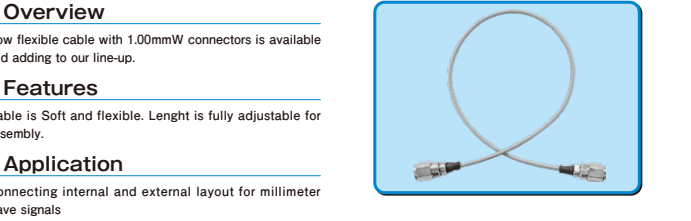


Typical specification

	Normal type		
	SXL-36, 36F, 36FP	SXL-22, 22F, 22FP	SXL-12F
Impedance (Ω)	50±1.0	50±1.0	50±2
Outer conductor diameter (mm)	3.50±0.1	2.1±0.1	1.15±0.1
Inner conductor diameter (mm)	0.930±0.010	0.511 ±0.010	0.287 ±0.010
Insulator diameter (mm)	2.90 ±0.05	1.58 ±0.05	0.9 ±0.05
Capacitance (pF/m)	98	98	98
Insulation dielectric strength (VRMS)	3000	3000	3000
Corona generating voltage (VRMS)	2000	1500	1000
Higher order mode (GHz)	35	62	113
Wave length shortening (%)	70	70	70
The minimum bending radius (mm)	8.0	5.0	3.0
Weight (g/m)	44.4	17	5.5

Attenuation (20°C, sea level)	Frequency (GHz)	Attenuation (dB/m)			
		0.5	1.0	5.0	10.0
0.5	0.5	0.2	0.4	0.90	1.27
	1.0	0.45	0.79	1.27	2.92
	5.0	1.11	1.83	2.71	4.30
	10.0	1.74	2.71	4.30	
	20.0	2.44(18GHz)	3.85(18GHz)	6.00(18GHz)	

Flexible Cable Assy DC~110GHz



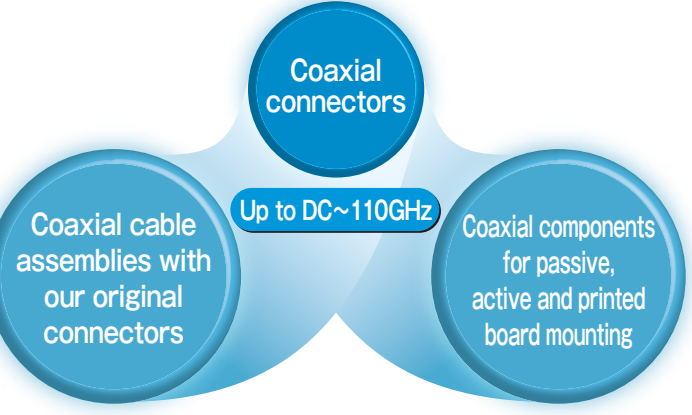
Typical specification

Model name	02W2641#	02W2613#	02W2647#	02W2647#
Cable model NO.	SWF-12			
Characteristic impedance	50±1Ω			
Applicable frequency (GHz)	DC ~ 65		DC ~ 110	
V.S.W.R.	1.25 (20GHz), 1.4 (40GHz), 1.6 (60GHz)		1.3 (40GHz), 1.4 (70GHz), 1.6 (110GHz)	
Outer sheath	FEP (Blue)			
Outer conductor II	Silver plated braided copper			
Outer conductor I	Flat wire (silver plated copper)			
Insulator	FEP (Natural color)			
Inner conductor	silver plated copper-clad steel wire			
Outer sheath diameter (mm)	1.47+0.2-0.1			
Operating (conservation) temperature range	-55 ~ 125°C			
Connector used	1.85mmV/P-P	1.85mmV/P-J	1.0mmW/P-P	1.0mmW/P-J
Minimum flexing radius	5.1mm			

Corporate vision

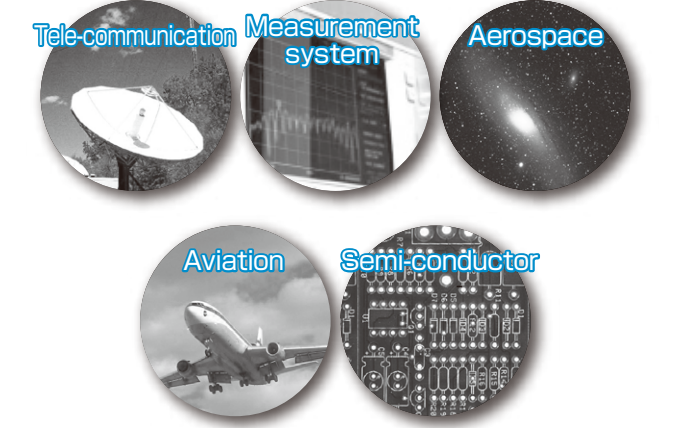
Focus on Micro Wave Business

We are winning our competitive edge in the area of the high frequency wave connectors and are continuing to offer our original components & devices to meet your needs.



Global Business Development

We provide you with the best solution services in the area of Micro wave business with our world-wide vertical production network.



Facilities



Head Office
1-20-3-6F Nishishinjuku Shinjuku-ku, Tokyo 160-0023, JAPAN
Tel: 81-3-6635-5410 Fax: 81-3-6635-5420

Omi Plant
4590-1 Omi-mura higashichikuma-gun, Nagano 399-7701, JAPAN
Tel: 81-263-67-2174 Fax: 81-263-67-2157

Matsumoto Plant
6043-17 Akashina-nanaki Azumino-city, Nagano 399-7104, JAPAN
Tel: 81-263-62-2643 Fax: 81-263-62-4964

Corporate Profile

Name Waka Manufacturing Co., Ltd.
Head office Nishishinjuku-Takagi Bldg. 6F 1-20-3 Nishishinjuku Shinjuku-ku, Tokyo 160-0023, Japan
TEL : 81-3-6635-5410 FAX : 81-3-6635-5420
http://www.waka.co.jp

URL http://www.waka.co.jp
Established April, 1958
Capital ¥23,000,000
Fiscal year end September
C.E.O. Yoshinosuke Wakabayashi
Business domain
● Micro Wave Coaxial Business
● Millimeter wave connector ● Micro wave connector
● Coaxial cable ● Micro wave components
● Digital interface Business
● Connector ● Cable ● Radio frequency components
● Lithium Ion Battery Business
● Machining Business

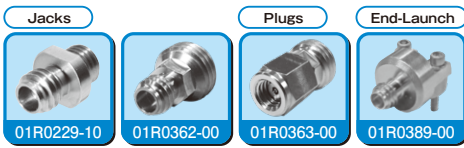
Banks
Sumitomo Mitsui Banking Corporation Hatanodai Branch
The Hachijuni Bank Co., Ltd. Akashina Branch
Mizuho Bank Co., Ltd. Iidabashi Branch

Clientele
ADVANTEST CORPORATION
ALPS ELECTRIC CO., LTD.
ANRITSU CORPORATION
OKI ELECTRIC INDUSTRY CO., LTD.
KEYSIGHT TECHNOLOGIES, INC.
CANON INC.
SUMITOMO ELECTRIC DEVICE INNOVATIONS INC.
SONY CORPORATION
TDK CORPORATION
TOKYO KEIKI INC.
TOSHIBA CORPORATION
NEC CORPORATION
NIPPON TELEGRAPH AND TELEPHONE CORPORATION
JAPAN RADIO CO., LTD.
HITACHI CO., LTD.
HITACHI HEALTHCARE COMPANY
FUJITSU CO., LTD.
PANASONIC CORPORATION
MITSUBISHI ELECTRIC CORPORATION
MURATA MANUFACTURING CO., LTD.
WAVEPARTS

Agencies
SHANGHAI FINTEST TECHNOLOGY DEVELOPMENT CO., LTD
CASTLE MICROWAVE LTD
MILLIMETRIC RF & MICROWAVE COMPONENTS
TACTRON ELEKTRONIK GMBH & CO. KG
Honestco Electric Co. LTD
Merinhawk Asia Pacific Sdn. Bhd.,
Millimetrica RF & Microwave Components Systems S.r.l.
Pro Nova ELEKTRONIK GmbH
YEOIL GLOBAL
OKAMOTO ELECTRONICS CORPORATION.
KAKUTA RADIO ELECTRONIC CO., LTD.
KYORITSU DENGYO CO., LTD.
KONO ELECTRONICS CO., LTD.
SUMIDEN SHOUJI CO., LTD.
SEVENISK INC.
DATRON CO., LTD.
TOA MUSENENKI CO., LTD.
NIHON DENKEI CO., LTD.
HOEI DENKI CO., LTD.
RYODEN TRADING CO., LTD.

1.0mmW Connector DC~110GHz

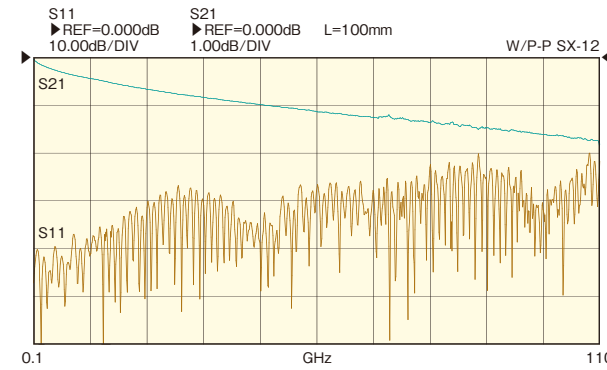
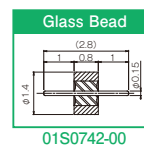
Receptacle (Jack)



Cable assemblies

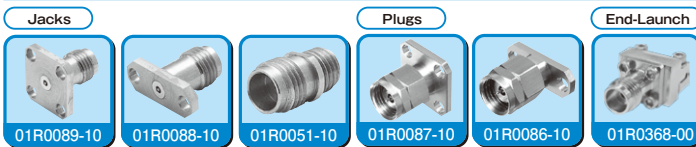


Related parts

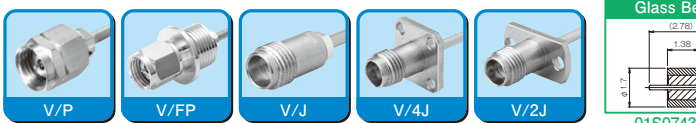


1.85mmV Connector DC~65GHz

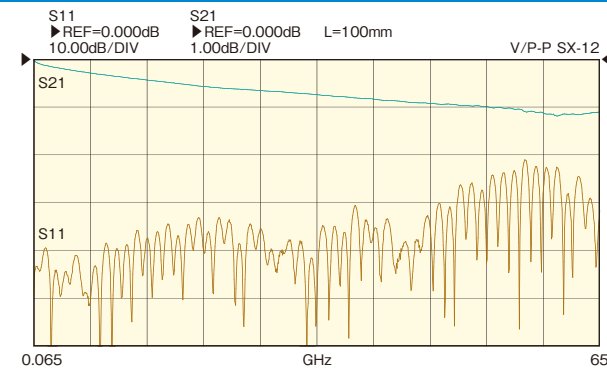
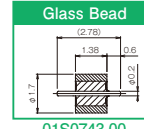
Receptacles



Cable assemblies

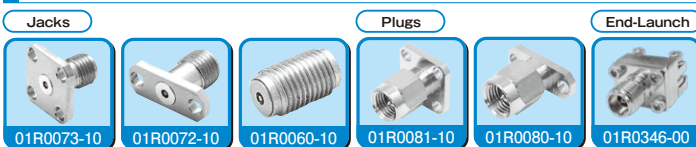


Related parts

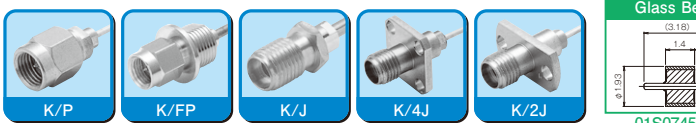


2.92mmK Connector DC~45GHz

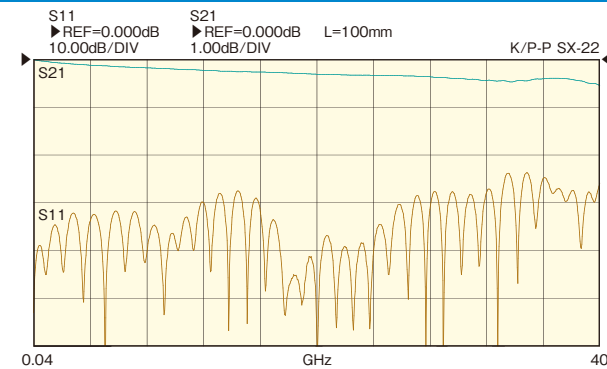
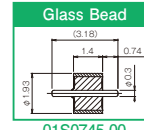
Receptacles



Cable assemblies

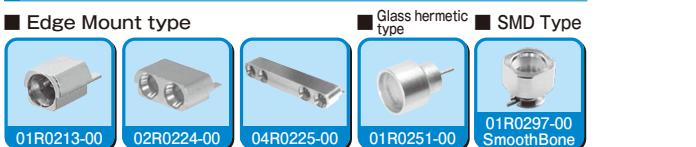


Related parts

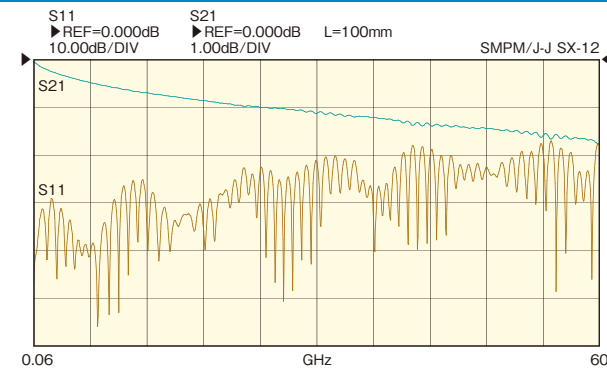
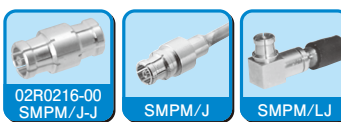


SMPM Connector DC~65GHz

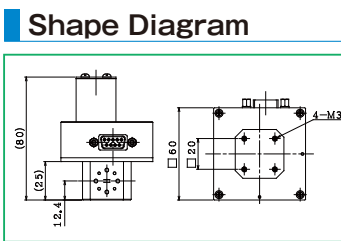
Receptacles



Adapter



V Band Waveguide Transfer Switch

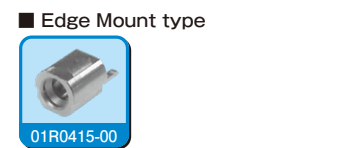


Products Specification

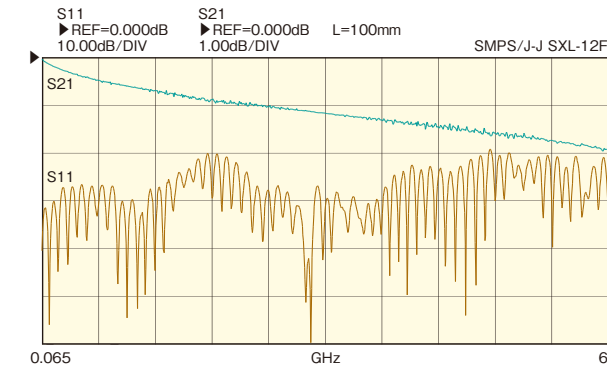
Electrical		Mechanical	
Requirement	Specification	Requirement	Specification
Frequency	55 ~ 65 GHz	Flange	UG-385/U equivalent
V.S.W.R.	1.2 max	Waveguide	WR-15
Insertion Loss	0.6dB max	Control	D-SUB9P(Plug)
Isolation	50dB	Transfer speed	100msec or less
Rated Voltage	DC 12V	Life	1million or more
Rated electric current	2A	Temperature	5°C ~ 40°C

SMPS Connector DC~60GHz

Receptacles

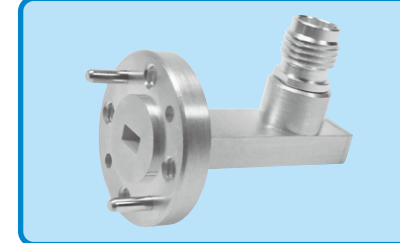


Cable assemblies



Coaxial Waveguide Adapter DC~110GHz

Side-Launcher (01X0543-00) V Band



End-Launcher (01X0591-00) V Band

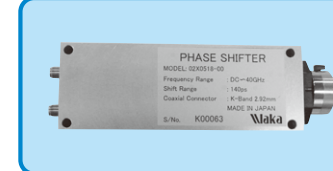


Typical specification

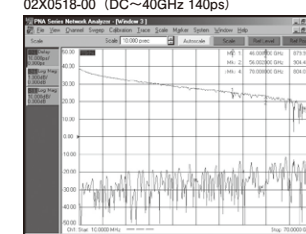
Band	Model No	Type	Frequency	Waveguide	Flange	Connector	V.S.W.R	Insertion Loss	Length
V	01X0589-00	Side-launcher	50~65GHz	WR-15	UG-385/U	1.85mmV/J	under 1.5	under 0.6dB	29mm
V	01X0590-00	Side-launcher	50~65GHz	WR-15	UG-385/U	1.85mmV/P	under 1.6	under 0.7dB	29mm
V	01X0561-00	End-launcher	50~65GHz	WR-15	UG-385/U	1.85mmV/J	under 1.4	under 0.3dB	16.7mm
V	01X0571-00	End-launcher	50~65GHz	WR-15	UG-385/U	1.85mmV/P	under 1.4	under 0.4dB	20.2mm
V	01X0591-00	End-launcher	50~75GHz	WR-15	UG-385/U	1.0mmW/J	under 1.5	under 0.4dB	12.5mm
E	01X0562-00	End-launcher	60~92GHz	WR-12	UG-387/U	1.00mmW/J	under 1.5	under 0.4dB	12.6mm
E	01X0572-00	End-launcher	60~92GHz	WR-12	UG-387/U	1.00mmW/P	under 1.5	under 0.5dB	15.6mm
W	01X0563-00	End-launcher	74~110GHz	WR-10	UG-387/U-M	1.00mmW/J	under 1.5	under 0.5dB	11.3mm
W	01X0573-00	End-launcher	74~110GHz	WR-10	UG-387/U-M	1.00mmW/P	under 1.5	under 0.5dB	14.5mm

Phase Shifter DC~60GHz

Dial type shifter [02X0518-00]



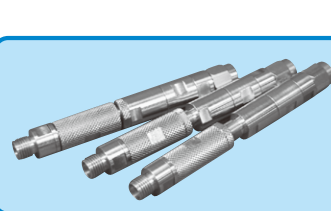
Sample Data



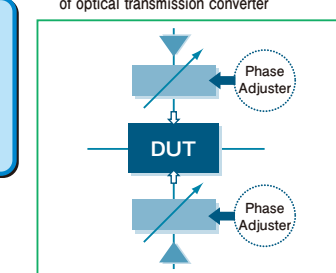
Typical specification

Phase shifter	
Model No.	02X0518-00
Terminal	2.92mmK/J
Drive mechanism	Control shift φ3mm Varrier Dial
Adjustable delay time (ps)	140
Frequency (GHz)	DC~40
Adjustable phase shift (deg/GHz)	50.4
Delay time repeatability	±0.1ps
*V.S.W.R. (DC~20GHz)	1.15
*V.S.W.R. (20~40GHz)	1.3
*V.S.W.R. (40~60GHz)	1.4
*Insertion Loss (DC~20GHz)	1.0dB
*Insertion Loss (20~40GHz)	1.3dB
*Insertion Loss (40~60GHz)	1.5dB

Phase Adjuster DC~60GHz



Sample application : Phase adjustment of optical transmission converter



Typical specification

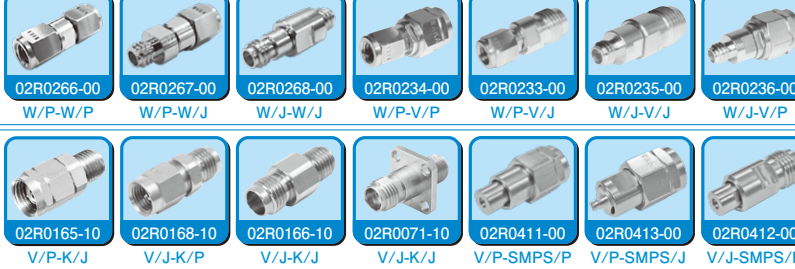
Model No.	A18S	A45K	A45V	A60V
Terminal	SMA/P-J	2.92mmK/P-J	1.85mmV/P-J	
Length (mm)	(86~104)	(89~108)		
Drive mechanism	Trapezoid screw			
Delay time adjustable (ps)	60			
Frequency range (GHz)	DC~18	DC~40	DC~60	
Phase shift adjustable (ps/1 cycles)	1.666/1 cycles			
Impedance (Ω)	50			
V.S.W.R.	1.3(at 18GHz)	1.4(at 40GHz)	1.5(at 60GHz)	
*Insertion Loss (DC~18GHz)	0.7 dB		1.0 dB	
*Insertion Loss (18~40GHz)			1.0 dB	1.3 dB
*Insertion Loss (40~60GHz)				1.5 dB

*When the adjustable delay time is at the maximum.

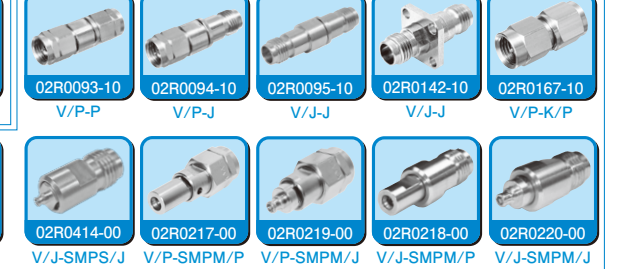
Super Accurate Milli-meter wave adapter

*For details, pls look up on web site or call our sales representative.

1.0mmWアダプタ



1.85mmVアダプタ



2.4mmアダプタ



2.92mmKアダプタ



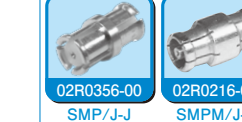
3.5mmアダプタ



L字アダプタシリーズ



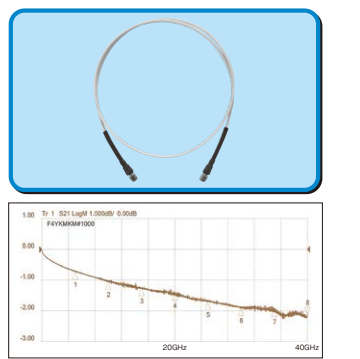
SMP SMPM



Low-Loss Micro and Millimeter Wave Cable Assy

Typical specification

Model name	F4YKMMK	F5YAMMM
Characteristic impedance	50±2Ω	50±2Ω
Applicable frequency (GHz)	DC ~ 40	DC ~ 18
Insertion loss(L=1000mm)	1.3dB (10GHz z), 1.8dB (20GHz z), 2.3dB (30GHz), 3dB (40GHz)	0.7dB (5GHz z), 1.0dB (10GHz z), 1.3dB (18GHz)
V.S.W.R.	1.2 (at 20GHz z), 1.3 (at 40GHz z)	1.2 (at 10GHz z), 1.3 (at 18GHz z)
Outer sheath	FEP (Yellow)	FEP (Yellow)
Outer conductor II	Braid Silver plated copper	Braid Silver plated copper
Outer conductor I	Foil Silver plated copper	Foil Silver plated copper
Insulator	low loss PTFE	low loss PTFE
Inner conductor	Silver plated copper-clad steel wire	Silver plated copper-clad steel wire
Outer sheath diameter(mm)	3.98	5.7
Operating (conservation) temperature range	-55 ~ 125°C	-55 ~ 125°C
Connector used	2.92mmK/P-P	SMA/P-P
Minimum flexing radius	12.7mm	19mm

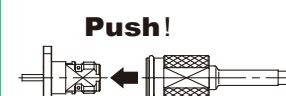


WPL Connector DC~18GHz

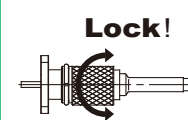
Waka Patent approved

The unique way of engagement

Easy engagement
Step 1: Push the receptacle-H cut part into the plug coupling Rorret Cut Part



Step 2: Revolve the coupling by 90° to lock. (either clockwise or counterclockwise)

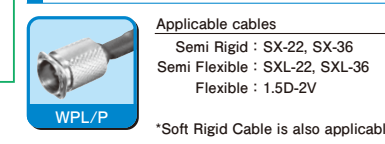


Typical specification

capability	
Impedance	50Ω
Frequency Range	DC~18GHz*
V.S.W.R.	≤1.2 at 18GHz (Rec)
Insertion Loss	≤0.15dB at 18GHz (Rec)
Insulation Resistance	DC500V Min 500MΩ (Rec)
Dielectric Withstanding Voltage	AC1000V rms at Sea Level
Contact Resistance	ACS0mA : Max3mΩ
Coupling nut Retention	Min50N
Resistable engagement times	500
Operating temperature range	-55~125°C
Applicable cables	Semi Rigid, Semi Flexible*

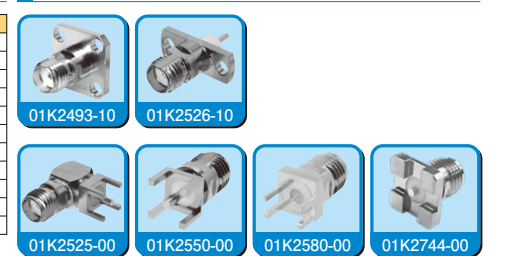
*Semi flexible cables : applicable frequency range

Cable assemblies



*Soft Rigid Cable is also applicable

Receptacles



Convertible adapters (for SMA)

