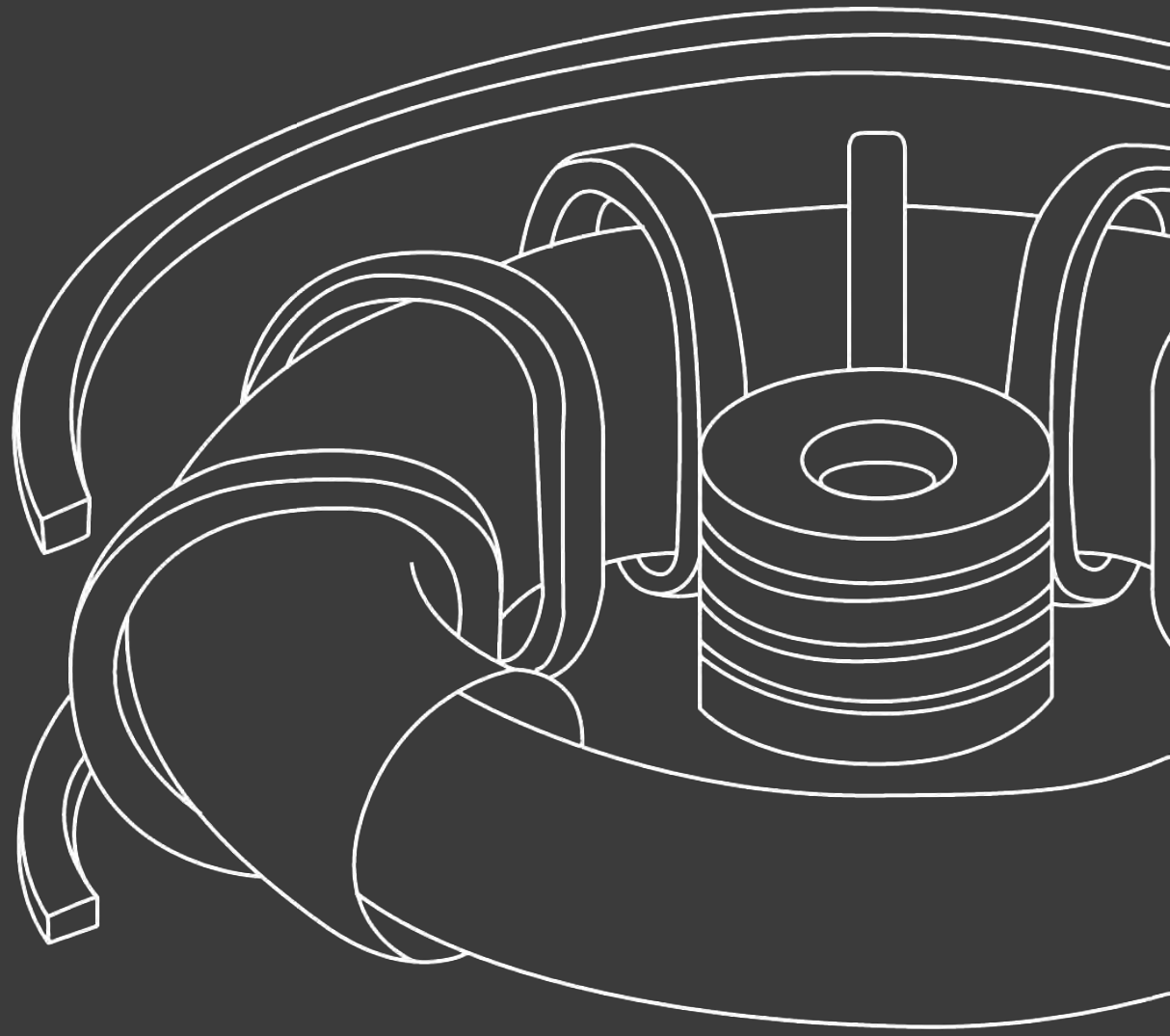
ERAVANT

NEXT GENERATION MILLIMETERWAVE COMPONENTS

PRODUCTS FOR INDUSTRIAL AND SCIENTIFIC SYSTEM APPLICATIONS



TACTRON ELEKTRONIK

ERAVANT is supported by TACTRON ELEKTRONIK GmbH & Co. KG

CONTENTS

INTRODUCTION

Eravant designs and manufactures total solutions for microwave and millimeterwave applications covering 10 MHz to 220 GHz.

- **This presentation introduces Eravant's standard product offering for industrial and scientific system applications.**
- **In fact, most Eravant products are ready to be used for many industrial and science system applications without modifications or customizations.**
- Our full product offering, including Limited Run Models, are listed on our website at www.eravant.com.

Additional products and presentations are available at customer's request:

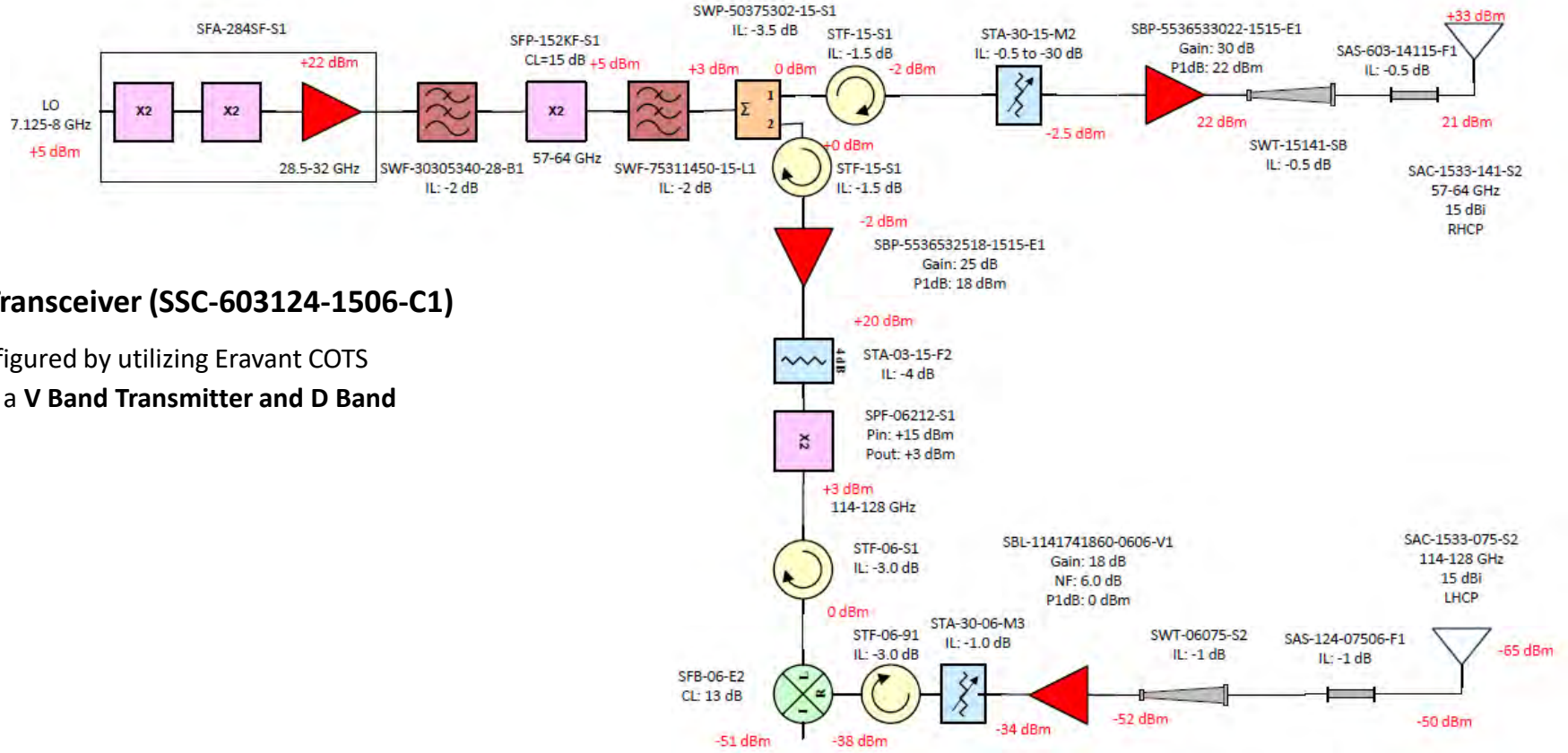
- Custom models for components and subassemblies can be configured to customers' specifications.
- Presentations for specific applications like Instrumentations, 5G and IoT, Radars, Communications and Space/Thermal Vac are listed online.
- Presentations about Ka, Q, U, V, E, W, F and D-Bands are also available.

INDUSTRIAL & SCIENTIFIC APPLICATION SUMMARY

- Many system approaches are based on Radar and Communication principles with some unique considerations. The intention of this presentation is to display how Eravant products are implemented in some industrial and scientific custom designed systems and some focused applications. The list below are some selected block diagrams.
  - **Dual Band Transceiver**
  - **Frequency Transponder**
  - **Radiometry and Remote Sensing**
  - **Radio Astronomy**
  - **Fabric and Nonconductive Material Sheet Thickness Measurement**
  - **Industrial Process Control**
  - **Plasma Diagnostics and Material Characterization**
  - **Medical applications such as biological imaging or thermography**

- The presentation starts with some generic block diagrams Eravant has developed by utilizing its COTS (Commercial of the Shelf) family products.
- In addition, the presentation includes some sample modeled block diagrams Eravant developed in some frequency bands with its specific model numbers by using its standard components for some custom applications. However, the idea of these block diagrams are readily applicable for other frequency bands with or without any modifications by selecting proper COTS models from ERAVANT web offerings.
- The presentation mentions many high performance or unique COTS components and sub-assemblies for introduction purpose, although the most Eravant products are readily to be used for many industry and scientific apparatus applications.
- The custom designed components and modules are available upon request by contacting support@eravant.com.

MODELED BLOCK DIAGRAMS



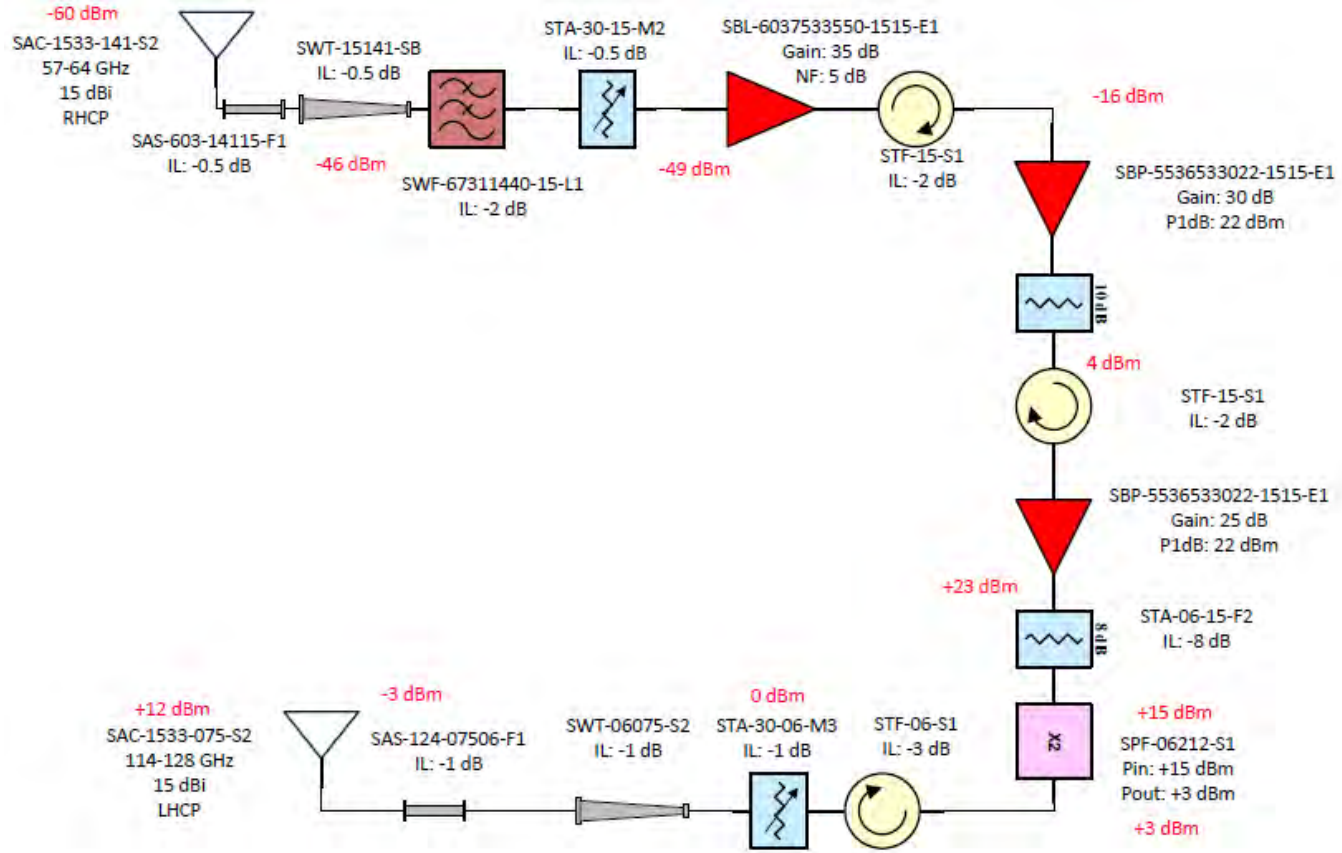
- **Frequency Dual Band Transceiver (SSC-603124-1506-C1)**

  This block diagram is configured by utilizing Eravant COTS components to complete a **V Band Transmitter and D Band Receiver Sub-assembly.**

MODELED BLOCK DIAGRAMS

- **Frequency Transponder (SSE-603124-1506-C1)**

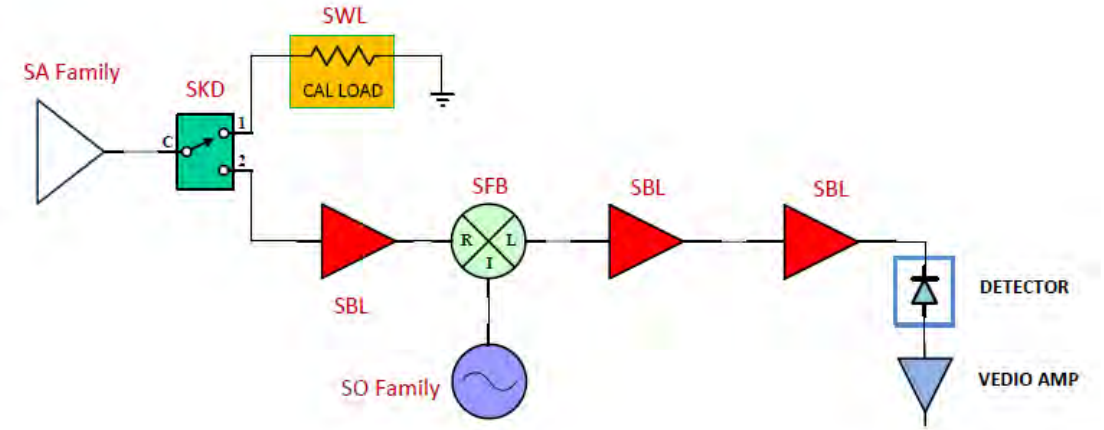
  This block diagram is configured by utilizing Eravant COTS components to complete a **V Band to D Band Transponder Sub-assembly**.



GENERIC BLOCK DIAGRAMS

- **Total Power Heterodyne Radiometer**

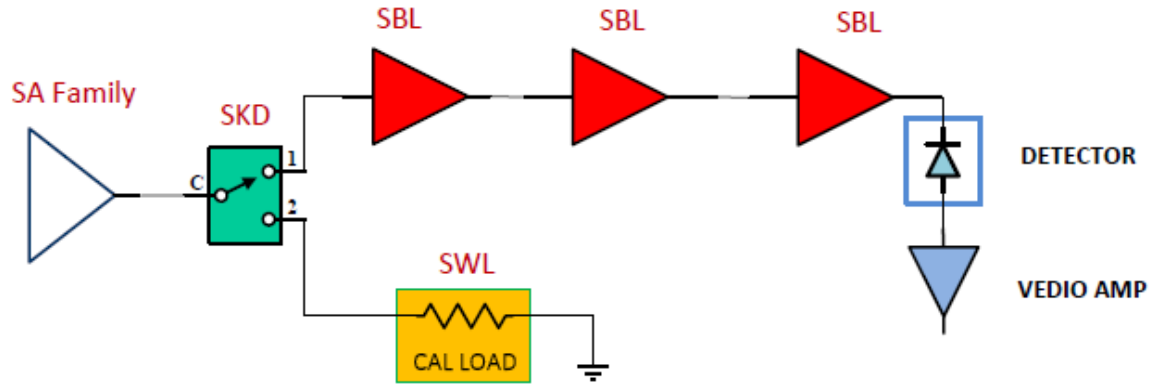
  The microwave radiometers are widely used for remote sensing for atmospheric and environmental observations. There are mainly two types of radiometer schemes, total power heterodyne and “Dicke” direct detection.



GENERIC BLOCK DIAGRAMS

- **“Dicke” Direct Detection Radiometer**

  The microwave radiometers are widely used for remote sensing for atmospheric and environmental observations. There are mainly two types of radiometer schemes, total power heterodyne and “Dicke” direct detection.

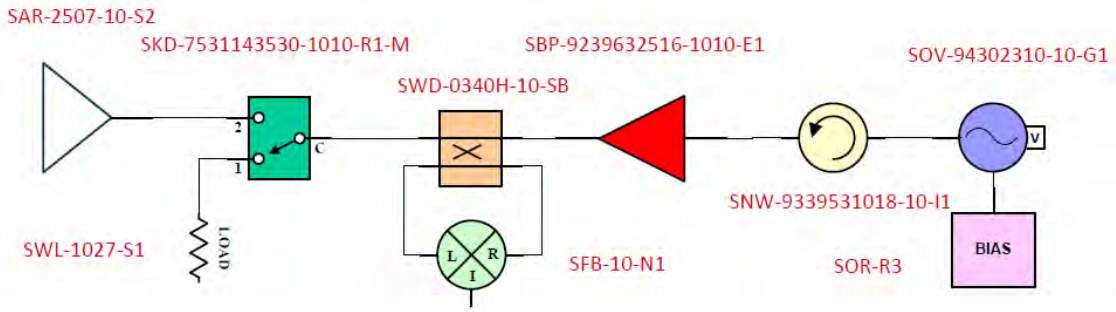


MODELED BLOCK DIAGRAMS

- **W Band Reflectometer Based Sensor (SSD-94310-25R-S1)**

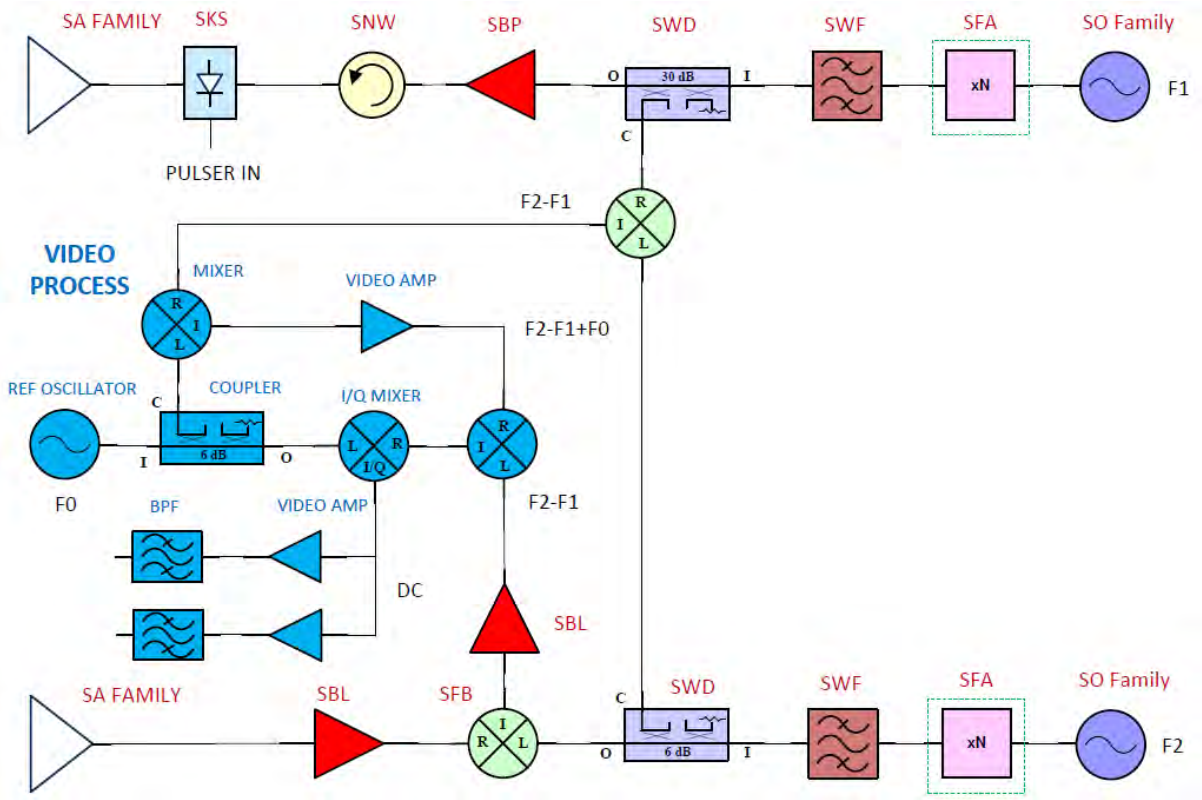
  This block diagram is configured by utilizing Eravant COTS components to complete a W band reflectometer sensor for material property characterization measurement system.

  This sub-assembly can be also used as a distance sensor to measure the object small displacement is a production convey environment.



GENERIC BLOCK DIAGRAMS

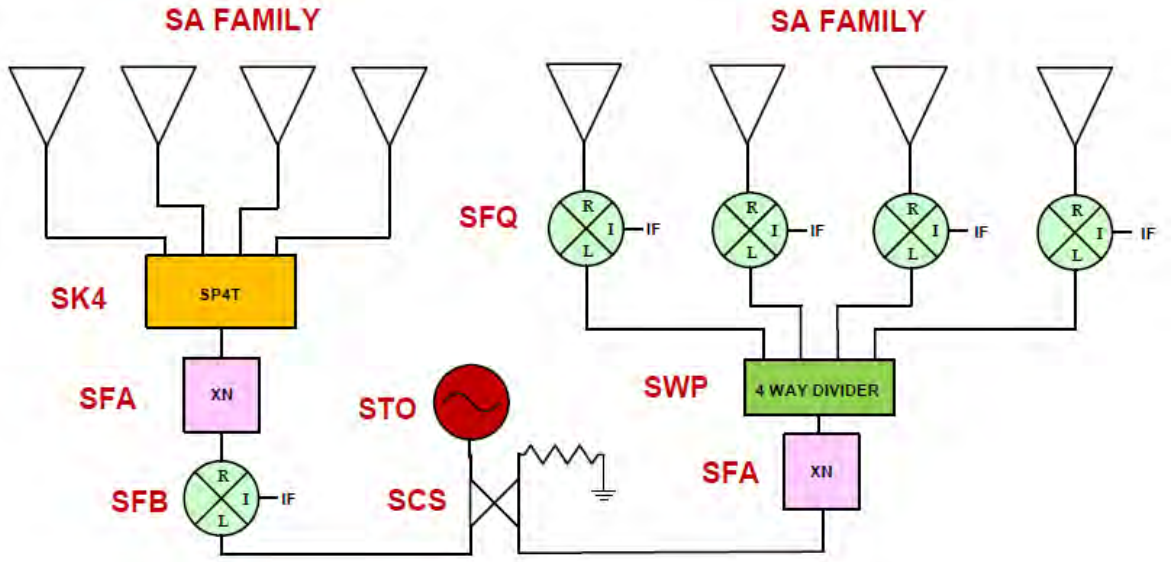
- **Plasma and Material Characterization System**
  This block diagram is configured by utilizing Eravant standard components to complete a system for plasma diagnostics and material property characterizations. The blue colored components are commodity goods belonging to the RF frequency spectrum.



MODELED BLOCK DIAGRAMS

- **E Band Body Scanner Sensor Head (SSC-7337331202-1212-B1)**

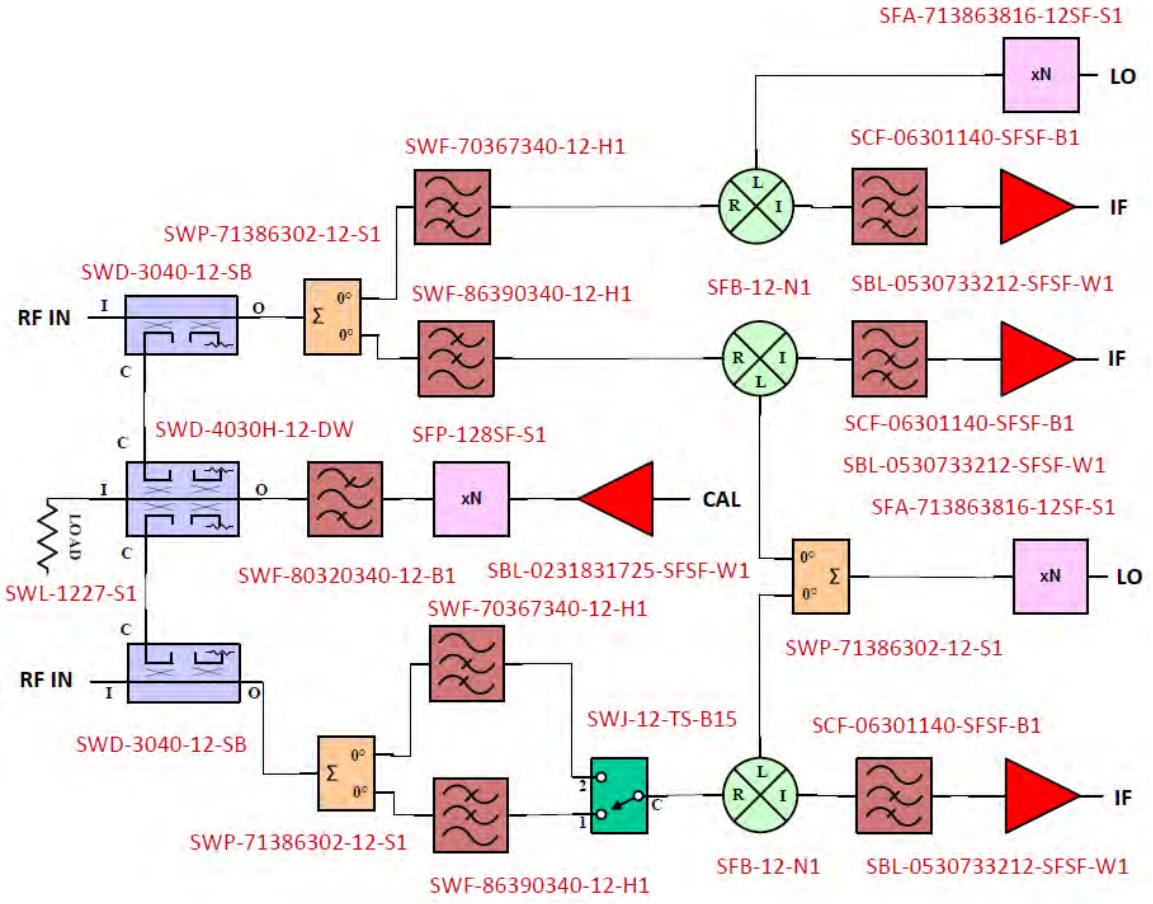
  This sub-assembly is constructed by utilizing Eravant COTS components to complete an **E Band Body Scanning Sub-assembly**. It is based on FMCW Radar principle. The swept frequency range is from 70 to 75 GHz.



MODELED BLOCK DIAGRAMS

- **E Band Receiver (SSK-SR723843-12-C1)**

  This sub-assembly is constructed by utilizing Eravant COTS components to complete an **E Band Receiver Sub-assembly** for weak signal listening.



STANDARD COMPONENTS

STANDARD COMPONENTS FOR RADAR SYSTEMS

- Per the block diagram presented above, the following components are the key building blocks for any industrial and scientific apparatus systems. This presentation selects some components as introduction or illustration purpose.
  - **SA:** Antennas
  - **SAT:** Orthomode Transducers
  - **SAS:** Polarizers
  - **SB:** Amplifiers
  - **SF:** Mixers
  - **SFA:** Multipliers
  - **SO:** Oscillators
  - **SN:** Circulators and Isolators
  - **SK:** Switches and Attenuators
  - **SWP & SCS:** Power Dividers
  - **SWM:** Magic Tees
  - **SWD & SCD:** Directional Couplers
  - **SCF & SWF:** Filters

SCALAR FEED HORN

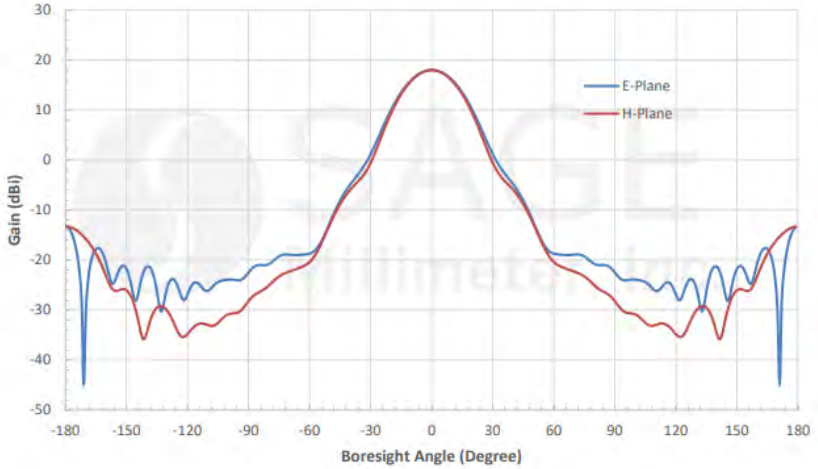
FAMILY: SAF
Ka BAND

SAF-2434231725-328-S1

Features:

- 24 to 42 GHz
- Low Sidelobe Level
- Linear and Circular Polarization
- High Return Loss
- Full Ka Band Bandwidth Operation

Parameter	Minimum	Typical	Maximum
Frequency	24 GHz	33 GHz	42 GHz
Gain		17 dBi	
3 dB Beamwidth, E-plane		25°	
3 dB Beamwidth, H-plane		25°	
Sidelobes, E-plane		-25 dB	
Sidelobes, H-plane		-25 dB	
Return Loss		15 dB	
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



GAUSSIAN OPTICS

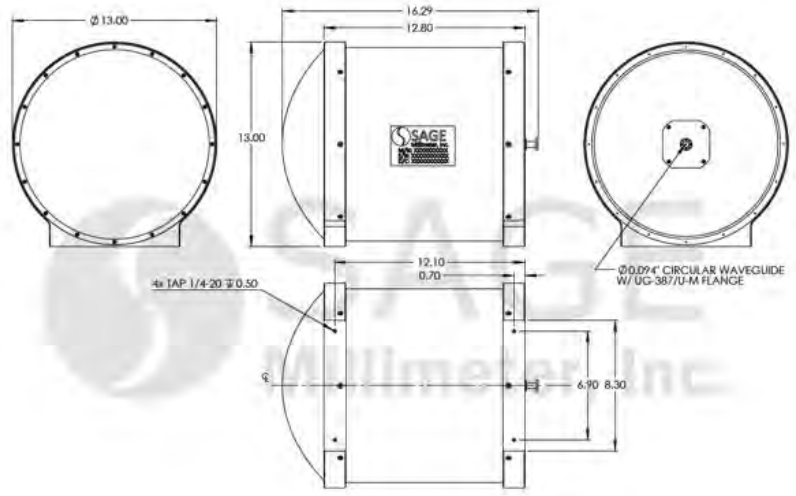
FAMILY: SAG
W BAND

SAG-8831044801-094-S1

Features:

- 88 to 100 GHz
- High Gain: 48 dB
- 3 dB Beamwidth: 0.8 Degrees
- Low Sidelobe Level
- Linear and Circular Polarization
- High Return Loss

Parameter	Minimum	Typical	Maximum
Frequency	88 GHz	94 GHz	100 GHz
Gain		48 dBi	
3 dB Beamwidth		0.8°	
Sidelobes		-25 dB	
Polarization	Linear and Circular		
Return Loss		25 dB	
Specification Temperature		+25 °C	
Operating Temperature	-40°C		+85 °C



LENS CORRECTED ANTENNA

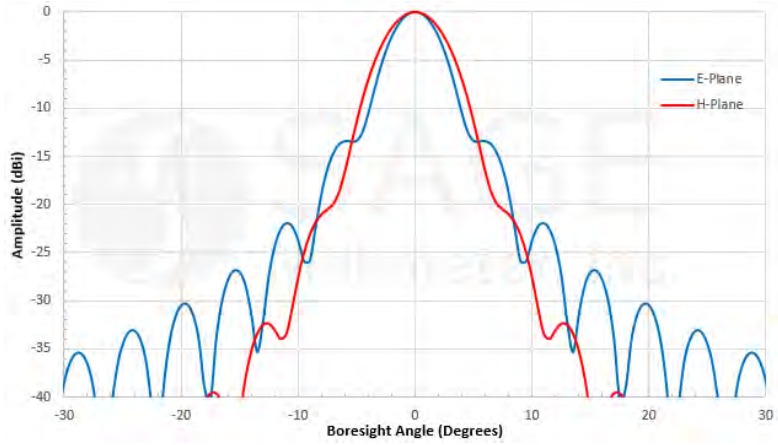
FAMILY: SAL
E BAND

SAL-7138633004-125-S1

Features:

- 71 to 86 GHz
- High Gain: 30 dB
- 3 dB Beamwidth: 5 Degrees
- Low Sidelobe Level
- Linear and Circular Polarization
- High Return Loss

Parameter	Minimum	Typical	Maximum
Frequency	71 GHz	78.5 GHz	86 GHz
Gain		30 dBi	
3 dB Beamwidth, E-Plane		4.3˚	
3 dB Beamwidth, H-Plane		5.3˚	
Sidelobes, E-Plane		-13 dB	
Sidelobes, H-Plane		-22 dB	
Return Loss		25 dB	
Polarization	Linear and Circular		
Specification Temperature		+25 ˚C	
Operation Temperature	-40 ˚C		+85 ˚C



SPOT-FOCUSING LENS ANTENNA

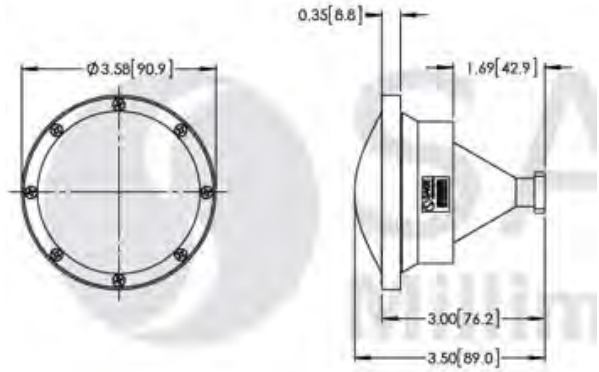
FAMILY: SAQ
Ka BAND

SAQ-353039-250-S1

Features:

- 34 to 36 GHz
- Ridged Mechanical Configurations
- High Efficiency and Low loss

Parameter		Minimum	Typical	Maximum
Frequency		34.0 GHz	35.0 GHz	36.0 GHz
Frequency Bandwidth			±500 MHz	
Focal Length			3.94"	
Peak to First Null	Spot Size		3.39"	
	Power Captured		83.8%	
10 dB Below Peak	Spot Size		1.96"	
	Power Captured		78.9%	
3 dB Below Peak	Spot Size		1.16"	
	Power Captured		47.4%	
Polarization		Linear and Circular		
VSWR			1.2:1	
Specification Temperature			+25˚C	
Operating Temperature		-40˚C		+85˚C



MONOPULSE CASSEGRAIN ANTENNA

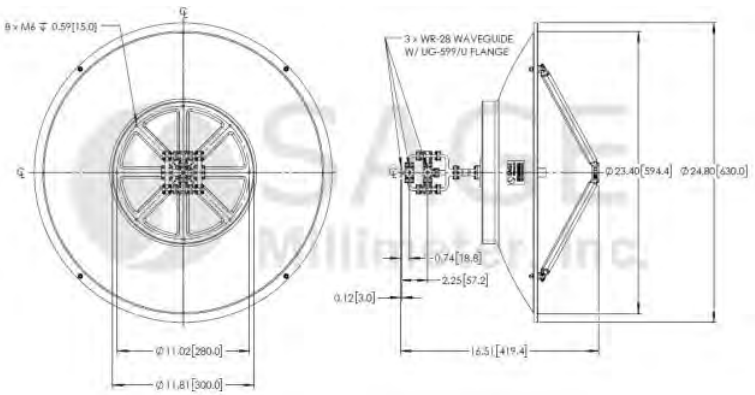
FAMILY: SAY
35 GHz

SAY-3433632750-28-U5-MP

Features:

- 34 to 36 GHz
- 43 dBi Gain
- Low Profile

Parameter	Minimum	Typical	Maximum
Frequency	34 GHz	35 GHz	36 GHz
Gain, Sum Port		38 dBi	
Sum 3 dB Beamwidth		2.0°	
Gain, Difference V-Port		34 dBi	
Gain, Difference H-Port		34 dBi	
Null Depth		30 dB	
Polarization	Linear		
Sidelobes, E-Plane		-16 dB	
Sidelobes, H-Plane		-16 dB	
Port VSWR		1.6:1	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



MONOPULSE CASSEGRAIN ANTENNA

FAMILY: SAY
35 GHz

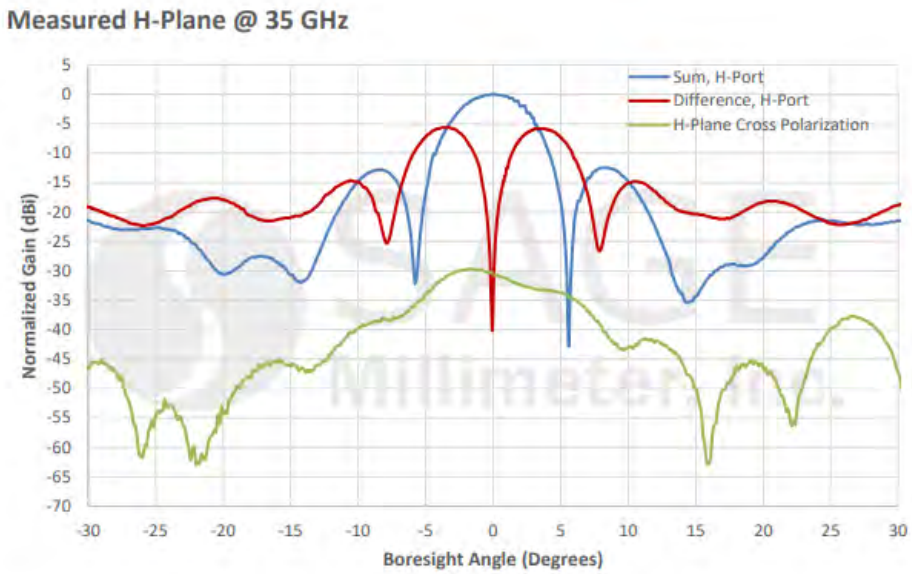
SAY-3433632750-28-U5-MP

Features:

- 34 to 36 GHz
- 27 dBi Gain
- Low Profile

Item	Specification
RF Connectors	WR-28 Waveguide with UG-599/U Compatible Flange
RF Connector Material	Aluminum
RF Connector Finish	Black Painted
Reflector Material	Aluminum
Reflector Finish	Chem Film
Weight	1.56 Oz
Reflector Diameter	4.02"
Outline	AY-RA28-04-MP-BX1

Parameter	Minimum	Typical	Maximum
Frequency	34 GHz		36 GHz
Gain, Sum Port		27 dBi	
Sum 3 dB Beamwidth		5.0°	
Gain, Difference V-Port		21 dBi	
Gain, Difference H-Port		21 dBi	
Null Depth		30 dB	
Polarization		Linear	
Sidelobes, E-Plane		10 dB	
Sidelobes, H-Plane		10 dB	
Return Loss		10 dB	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



QUAD RIDGED, DUAL POLARIZED ANTENNA

FAMILY: SAV
6 to 24.5 GHz

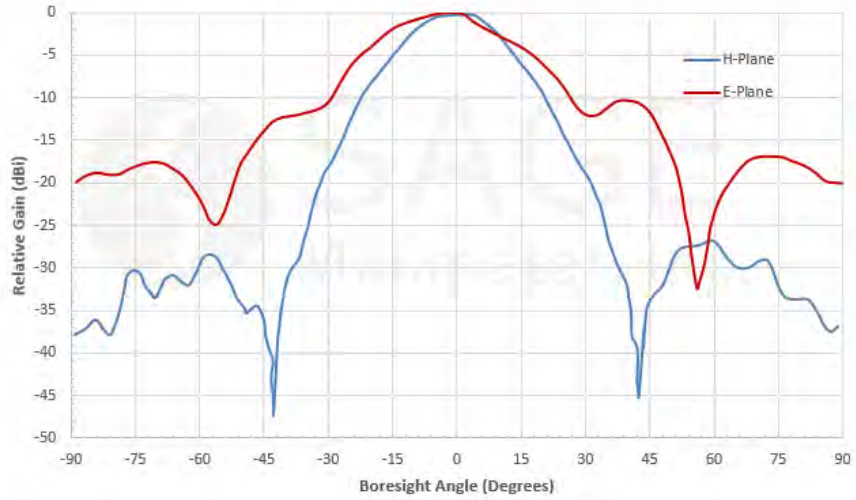
SAV-0632531431-SF-U3-QR

Features:

- 6 to 24.5 GHz
- Dual Polarized
- 3.13” (L) X 1.69” (W) X 1.69” (H)
- 5 Models to Cover up to 50 GHz

Parameter	Minimum	Typical	Maximum
Frequency	6.0 GHz		24.5 GHz
Gain		14 dBi	
Polarization		Circular and Linear	
E-Plane 3 dB Beamwidth		26°	
H-Plane 3 dB Beamwidth		36°	
Port to Port Isolation		35 dB	
E-Plane Sidelobe Levels		-17 dB	
H-Plane Sidelobe Levels		-20 dB	
Return Loss		8 dB	
Cross Polarization		-30 dB	
Power Handling			25 W (CW)
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C

Typical Antenna Pattern @ 24.5 GHz



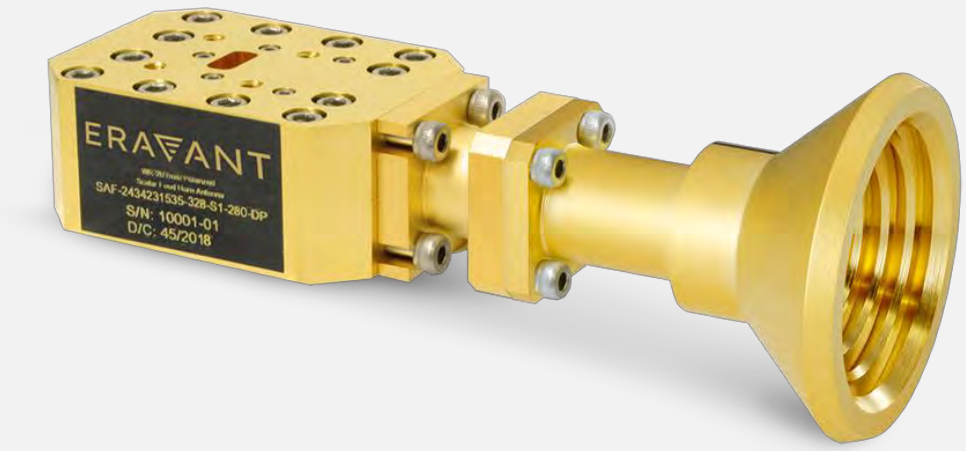
DUAL POLARIZED SCALAR HORN ANTENNA

FAMILY: SAF
24 to 42 GHz

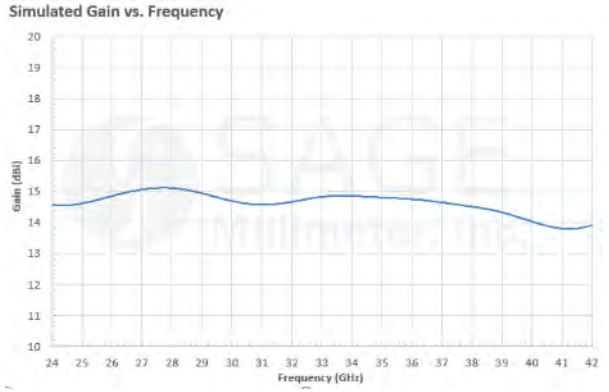
SAF-2434231535-328-S1-280-DP

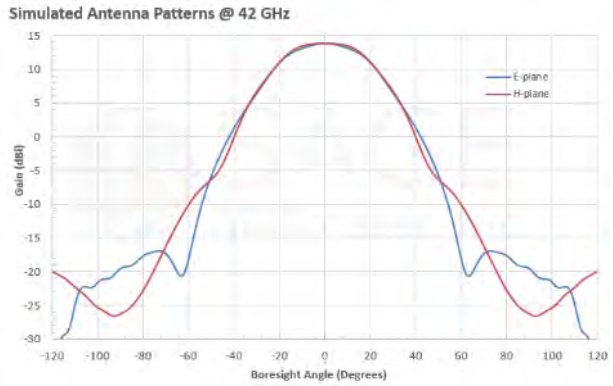
Features:

- 24 to 42 GHz
- Gain 15 dBi
- 3 dB Beamwidth 35°
- Dual Polarized
- 7 Models to Cover up to 110 GHz



Parameter	Minimum	Typical	Maximum
Frequency	24 GHz		42 GHz
Gain		15 dBi	
3 dB Beamwidth, E-plane @ 33 GHz		35°	
3 dB Beamwidth, H-plane @ 33 GHz		35°	
Sidelobe Levels		-25 dB	
V and H Port Isolation		35 dB	
Cross Polarization Rejection		35 dB	
Port Return Loss		15 dB	
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C





SLOTTED WAVEGUIDE ARRAY ANTENNA

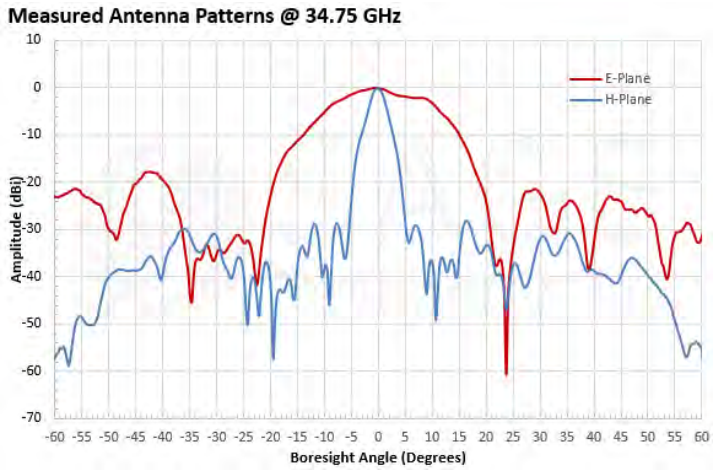
FAMILY: SAW
35 GHz

SAW-3533532716-28-L2-WR

Features:

- 35 GHz
- High Aperture Efficiency
- Flat and Low Profile
- Linear Polarization
- Weather Resistance

Parameter	Minimum	Typical	Maximum
Frequency	34.75 GHz		35.25 GHz
Gain		27 dBi	
Polarization		Linear, Vertical	
3 dB Beamwidth, Vertical		16°	
3 dB Beamwidth, Horizontal		2°	
Side Lobe Level		-15 dB	
Return Loss		13 dB	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



OMNI-DIRECTIONAL ANTENNA

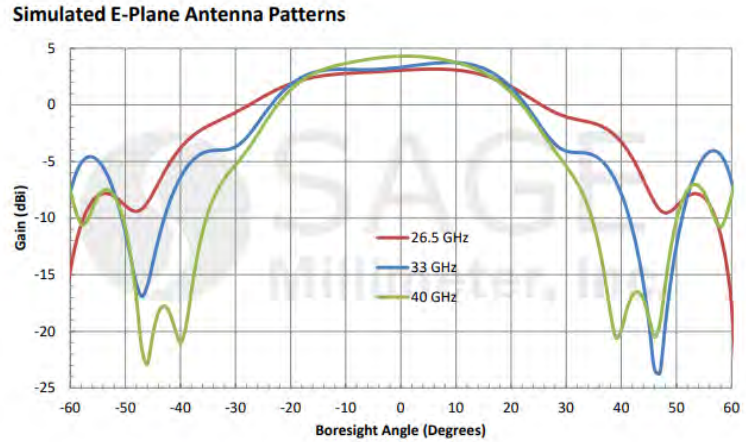
FAMILY: SAO
Ka BAND

SAO-2734030345-28-S1

Features:

- 26.5 to 40 GHz
- 360° Azimuth Coverage
- 45° Vertical 3 dB Bandwidth
- Vertically Polarized
- Full Ka Band Bandwidth Operation

Parameter	Minimum	Typical	Maximum
Frequency Range	26.5 GHz		40.0 GHz
Gain		3 dBi	
Azimuth Gain Variation		±1 dB	
Azimuth Beamwidth		360˚	
3 dB Vertical Beamwidth		45˚	
Return Loss		10 dB	
Power Handling		150 W (CW)	200 W (CW)
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



OMNI-DIRECTIONAL ANTENNA

FAMILY: SAO
Ka BAND

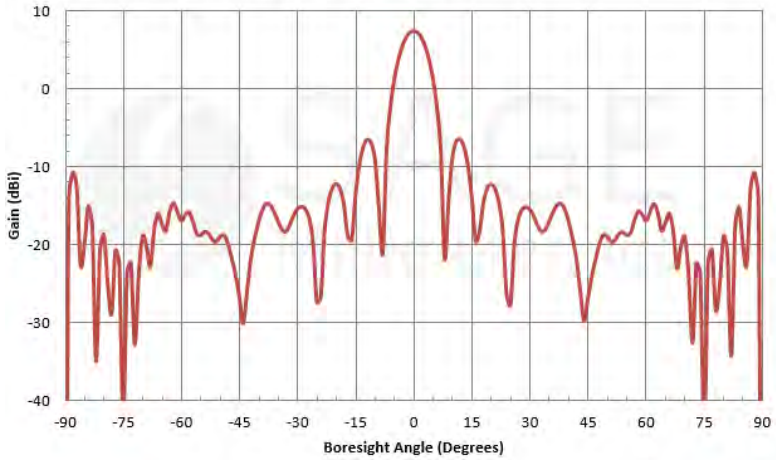
SAO-2734030810-28-S1

Features:

- 26.5 to 40 GHz
- 360° Azimuth Coverage
- 10° Vertical 3 dB Bandwidth
- Vertically Polarized
- Full Ka Band Bandwidth Operation

Parameter	Minimum	Typical	Maximum
Frequency Range	24 GHz		40 GHz
Gain		7.5 dBi	
Azimuth Gain Variation		±1 dB	
Azimuth Beamwidth		360˚	
3 dB Vertical Beamwidth		10˚	
Return Loss		9 dB	
Power Handling		150 Watts	200 Watts
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C

Typical E-Plane Antenna Pattern @ 33.25 GHz



ORTHOMODE TRANSDUCER

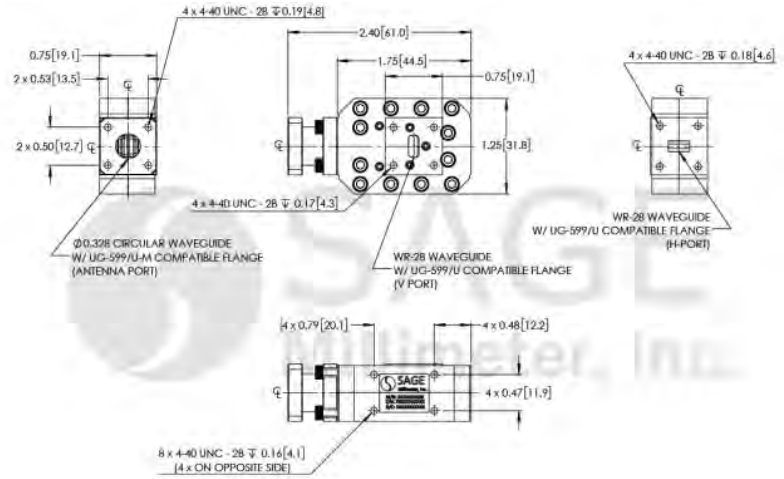
FAMILY: SAT
18 to 110 GHz

SAT-333-32828-C1

Features:

- Full Waveguide Band Operation
- High Port Isolation
- High Crosspol Rejection
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency Range	24 GHz		42 GHz
Insertion Loss (H to A Port)		0.5 dB	
Insertion Loss (V to A Port)		0.5 dB	
Isolation (H to V Port)		40 dB	
Cross Polarization (H to A Port)		35 dB	
Cross Polarization (V to A Port)		35 dB	
Return Loss (H Port)		15 dB	
Return Loss (V Port)		15 dB	
Return Loss (A Port, Vertical)		15 dB	
Return Loss (A Port, Horizontal)		15 dB	
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



ORTHOMODE POLARIZER

FAMILY: SAS
18 to 110 GHz

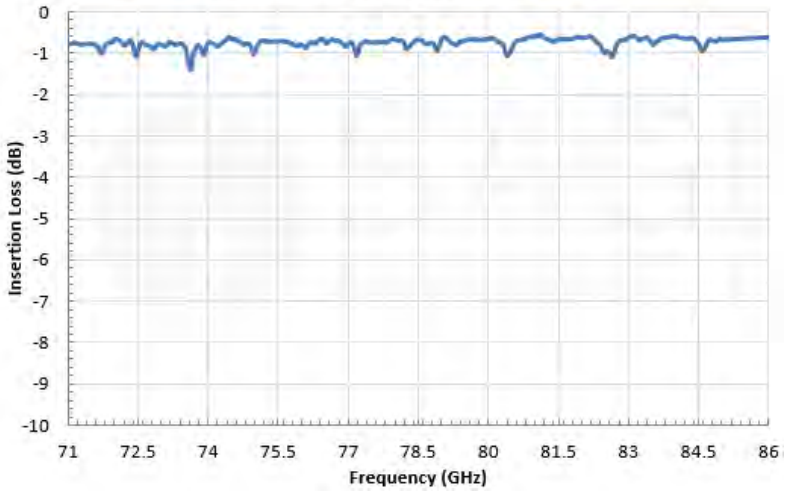
SAS-793-11012-F1

Features:

- Circular Waveguide Interface
- Low Insertion Loss
- Good Axial Ratio
- LHCP or RHCP
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency Range	71 GHz		86 GHz
Insertion Loss		0.5 dB	
Axial Ratio		1.1	1.2
Return Loss		20 dB	
Specification Temperature		+25 ˚C	
Operation Temperature	-40 ˚C		+85 ˚C

Typical Insertion Loss vs. Frequency (Back to Back)



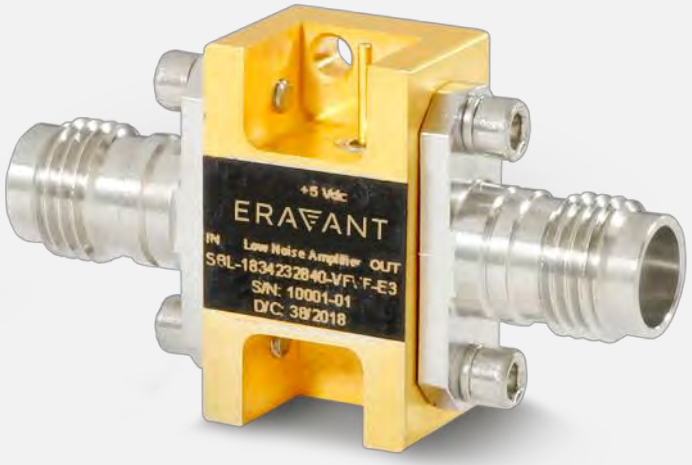
BROADBAND AMPLIFIER

FAMILY: SBB
18 to 42 GHz

SBB-1834232815-KFKF-E3

Features:

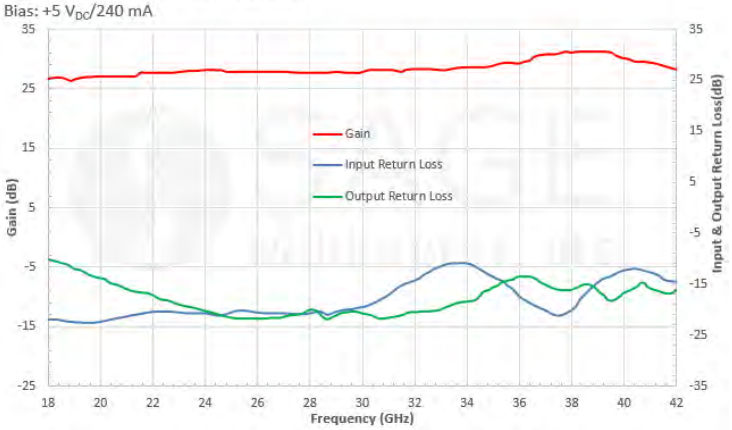
- 18 to 42 GHz
- 5G Band
- Gain 28 dBi
- SBB Family Has More than 50 Models



Parameter	Minimum	Typical	Maximum
Frequency	18 GHz		42 GHz
Gain	22 dB	28 dB	
P_{1dB}	+10 dBm	+15 dBm	
P_{sat}		+16 dBm	
Noise Figure		4.0 dB	6.0 dB
RF Input Power			-5 dBm
Damage RF Input Power			0 dBm
Input Return Loss		10 dB	
Output Return Loss		10 dB	
DC Voltage		+5 V_{DC}	+5.5 V_{DC}
DC Supply Current		240 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C

Typical Performance vs. Frequency

Bias: +5 V_{DC}/240 mA



BROADBAND LOW NOISE AMPLIFIER

FAMILY: SBL
75 to 110 GHz

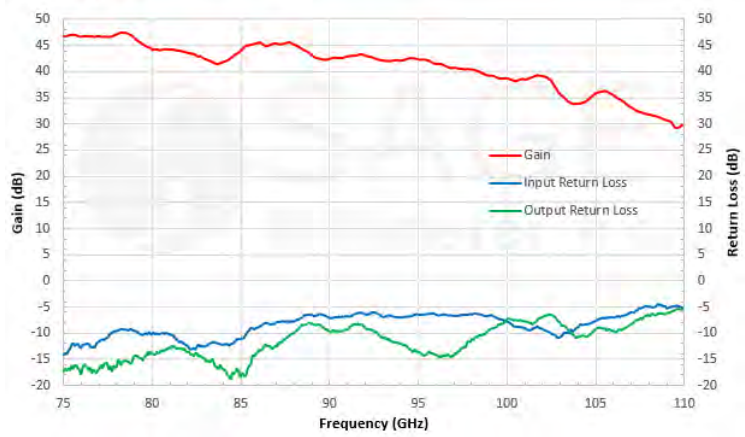
SBL-7531143550-1010-E1

Features:

- 75 to 110 GHz
- 5 dB Noise Figure
- 35 dB Nominal Gain
- SBL Family Cover up to 170 GHz

Parameter	Minimum	Typical	Maximum
Frequency	75 GHz		110 GHz
Gain		35 dB	
Noise Figure		5 dB	
P_{1dB}		-5 dBm	
P_{in}			+15 dBm
Input Return Loss		6 dB	
Output Return Loss		8 dB	
DC Voltage	+6 V_{DC}	+8 V_{DC}	+15 V_{DC}
DC Supply Current		100 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C

Typical Gain and Return Loss vs. Frequency
Bias: +8 V_{DC}/69 mA



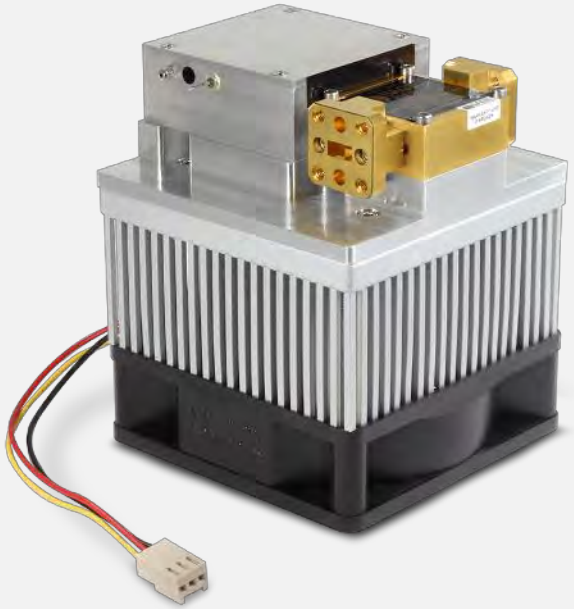
HIGH POWER AMPLIFIER

FAMILY: SBP
31 to 38 GHz

SBP-3133834034-KFKF-C1-2

Features:

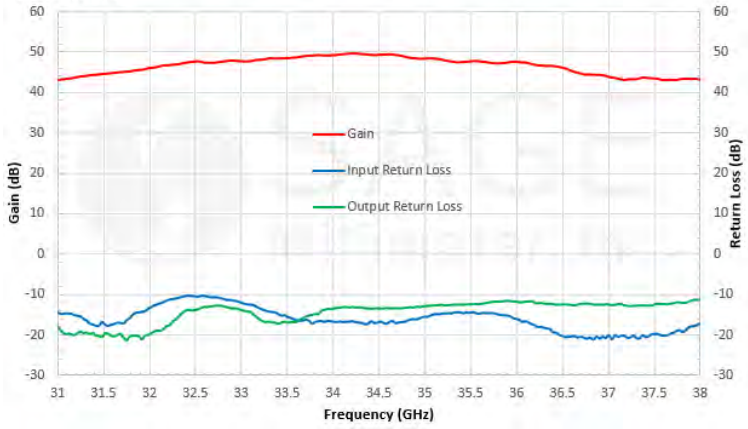
- 31 to 38 GHz
- +35 dBm Psat
- 40 dB Nominal Gain
- SBP Family Covers up to 110 GHz



Parameter	Minimum	Typical	Maximum
Frequency	31 GHz		38 GHz
Gain		40 dB	
P_{1dB}		+34 dBm	
P_{sat}		+35 dBm	
P_{in}			+20 dBm
Input Return Loss		10 dB	
Output Return Loss		10 dB	
DC Voltage		+8 V_{DC}	
DC Supply Current (Under RF Drive)		4 A	
Supply Voltage to Fan		+12 V_{DC}	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C

Typical Gain and Return Loss vs. Frequency

V_{IN}: +8 V_{DC}/2.4 A



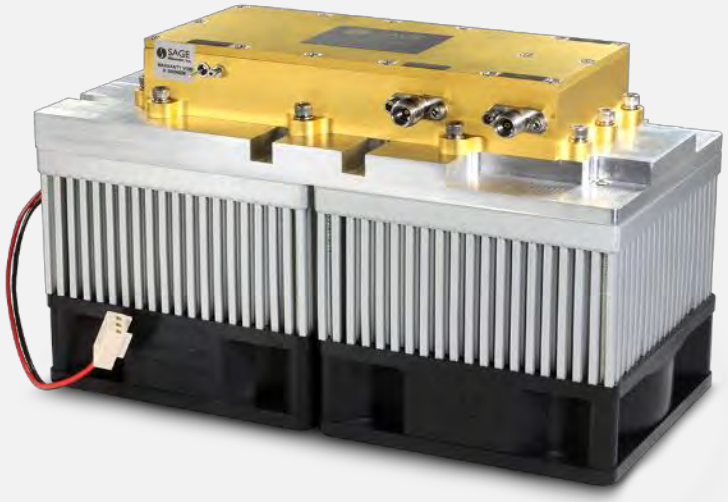
HIGH POWER GaN AMPLIFIER

FAMILY: SBP
32 to 38 GHz

SBP-3233831838-KFKF-E1-HR

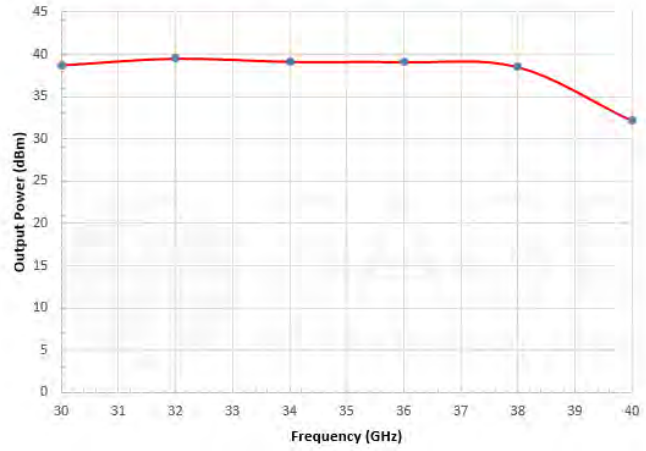
Features:

- 32 to 38 GHz
- +38 dBm Psat
- 18 dB Nominal Gain
- SBP Family Covers up to 110 GHz



Parameter	Minimum	Typical	Maximum
Frequency	32 GHz		38 GHz
Gain		18 dB	
P_{sat}		+38 dBm	
P_{in}			+30 dBm
Input Return Loss		15 dB	
Output Return Loss		10 dB	
DC Voltage		+30 V_{DC}	+48 V_{DC}
DC Supply Current		2 A	
Supply Voltage to Fan		+12 V_{DC}	
Specification Temperature		+25˚C	
Operating Temperature	0˚C		+50˚C

Typical Output Power Psat Vs. Frequency
Bias = +48 V_{DC} / 2 A



HIGH POWER AMPLIFIER

FAMILY: SBP
75 to 110 GHz

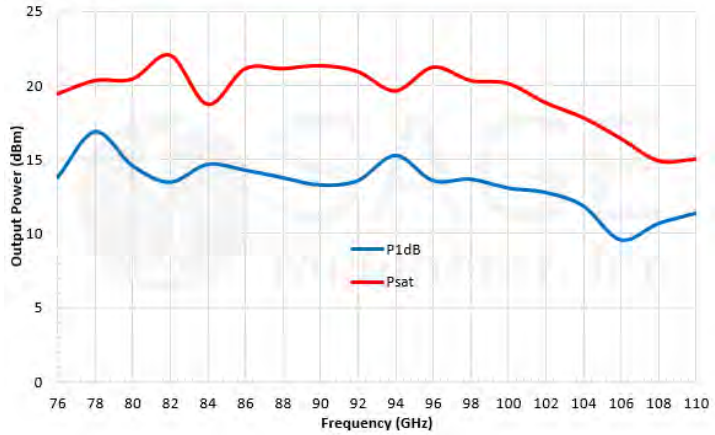
SBP-7531142515-1010-E1

Features:

- 75 to 110 GHz
- +20 dBm Psat
- 25 dB Nominal Gain
- SBP Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	75 GHz		110 GHz
Gain		25 dB	
P_{1dB}		+15 dBm	
P_{sat}		+20 dBm	
P_{in}			0 dBm
Input Return Loss		10 dB	
Output Return Loss		10 dB	
DC Voltage	+13 V_{DC}	+15 V_{DC}	+16 V_{DC}
DC Supply Current		190 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C

Typical Output Power vs. Frequency
Bias: +15 V_{DC}/190 mA



BALANCED MIXER

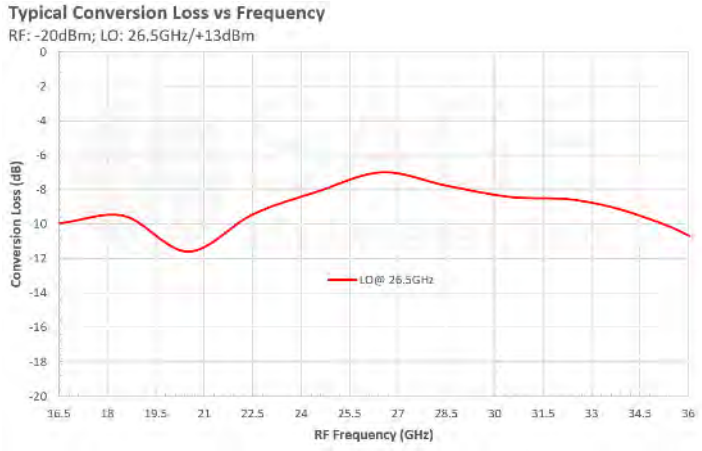
FAMILY: SFB
11 to 40 GHz

SFB-11340312-KFKFSF-N1-M

Features:

- 11 to 40 GHz
- 12 dB Conversion Loss
- Balanced Configuration
- SFB Family Has More than 30 Models

Parameter	Minimum	Typical	Maximum
RF Frequency	11 GHz		40 GHz
LO Frequency	11 GHz		40 GHz
IF Frequency	DC		10 GHz
LO Pumping Power	+13 dBm	+15 dBm	+18 dBm
Conversion Loss		12 dB	
Input P-1dB		+9 dBm	
RF to LO Isolation		30 dB	
LO to IF Isolation		25 dB	
RF to IF Isolation		25 dB	
Combined LO and RF Power			+21 dBm
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



I/Q MIXER

FAMILY: SFQ
30 to 50 GHz

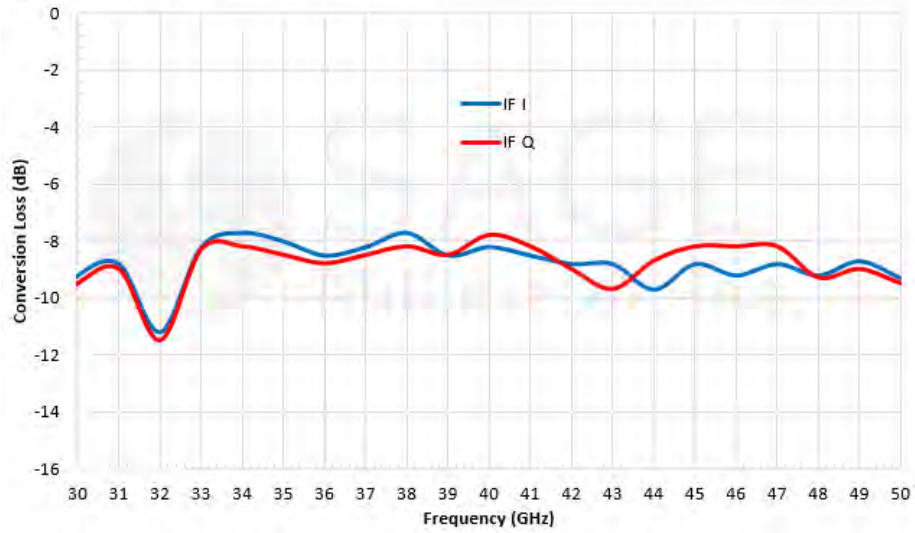
SFQ-30350313-2F2FSF-N1-M

Features:

- 30 to 50 GHz
- 9 dB Conversion Loss
- Balanced Configuration
- SFQ Family Has More than 30 Models

Parameter	Minimum	Typical	Maximum
RF Frequency	30 GHz		50 GHz
LO Frequency	30 GHz		50 GHz
LO Pumping Power	+16 dBm	+17 dBm	+20 dBm
IF Frequency	DC		2.0 GHz
Conversion Loss		13 dB	15 dB
I/Q Phase Unbalance		±15°	
I/Q Amplitude Unbalance		±1.0 dB	
LO to RF Port Isolation	20 dB	30 dB	
LO to IF Port Isolation		15 dB	
RF to IF Port Isolation		20 dB	
IP1dB		+4 dBm	
IP3dB		+13 dBm	
Combined RF & LO Power			+20 dBm

Typical Conversion Loss vs. Frequency
LO Power: +17 dBm



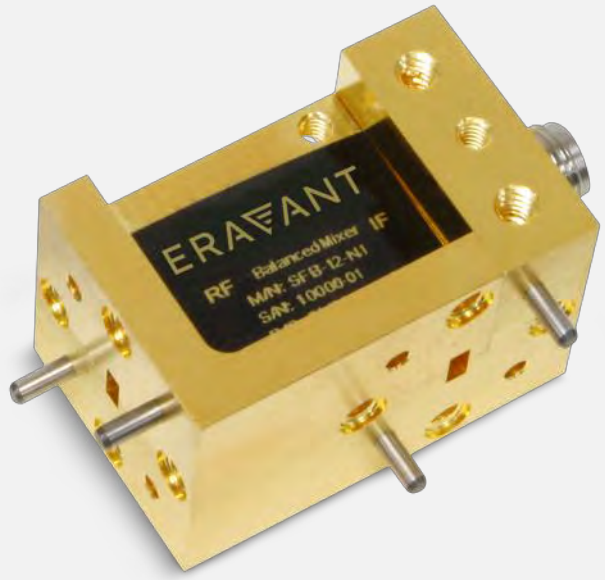
BALANCED MIXER

FAMILY: SFB
60 to 90 GHz

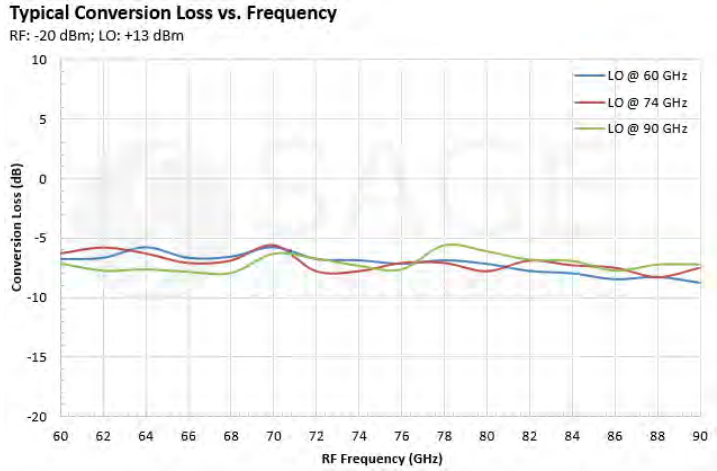
SFB-12-N1

Features:

- 60 to 90 GHz
- 9 dB Conversion Loss
- Balanced Configuration
- SFB Family Has More than 30 Models



Parameter	Minimum	Typical	Maximum
RF Frequency	60 GHz		90 GHz
LO Frequency	60 GHz		90 GHz
IF Frequency	DC		30 GHz
LO Pumping Power	+10 dBm	+13 dBm	+15 dBm
Conversion Loss		9 dB	12 dB
Input P_{1dB}		-3 dBm	
RF to LO Isolation		30 dB	
Combined RF and LO Power			+18 dBm
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



I/Q MIXER

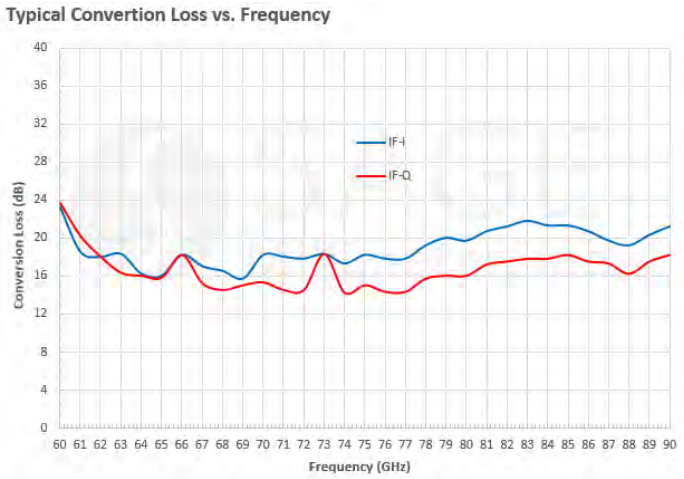
FAMILY: SFQ
60 to 90 GHz

SFQ-60390315-1212SF-E1-M

Features:

- 60 to 90 GHz
- 15 dB Conversion Loss
- Balanced Configuration
- SFQ Family Has More than 30 Models

Parameter	Minimum	Typical	Maximum
RF Frequency Range	60 GHz		90 GHz
RF Input P-1		5 dBm	
LO Frequency Range	60 GHz		90 GHz
LO Pumping Power		+10 dBm	+12 dBm
IF Frequency Range	DC	2 GHz	
Conversion Loss		15 dB	20 dB
I/Q Phase Unbalance		±15°	
I/Q Amplitude Unbalance		±1.5 dB	
LO to RF Port Isolations	20 dB	40 dB	
Operating Temperature	0 °C		+50 °C



ACTIVE MULTIPLIER

FAMILY: SFA
20 to 50 GHz

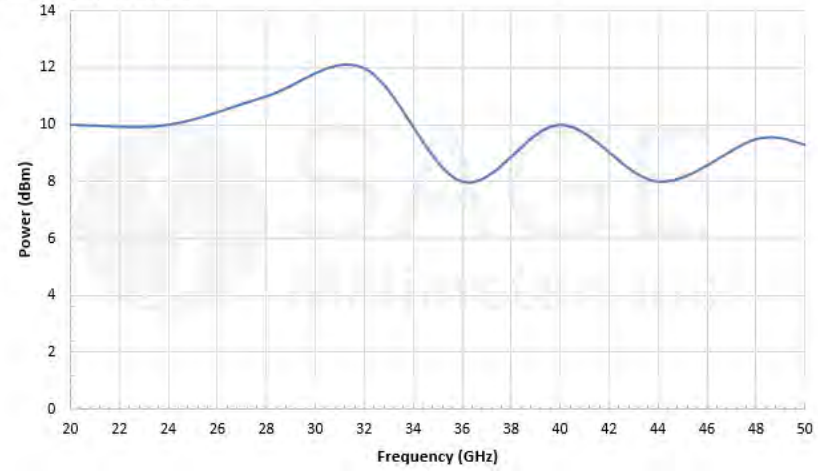
SFA-203503410-2FSF-S1

Features:

- 20 to 50 GHz
- X4 Multiplying Factor
- +10 dBm Output Power
- SFA Family Has More than 75 Models

Parameter	Minimum	Typical	Maximum
Input Frequency	5.0 GHz		12.5 GHz
Input Power	-5 dBm	+5 dBm	+15 dBm
Output Frequency	20.0 GHz		50.0 GHz
Output Power		+10 dBm	
Harmonic Suppression		-15 dBc	
Spurious		-60 dBc	
Port Return Loss		10 dB	
DC Voltage	+6 V_{DC}	+8 V_{DC}	+12 V_{DC}
DC Supply Current		500 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C

Typical Output Power vs. Frequency
Pin= +3 dBm, 12 Vdc/460 mA



ACTIVE MULTIPLIER

FAMILY: SFA
60 to 90 GHz

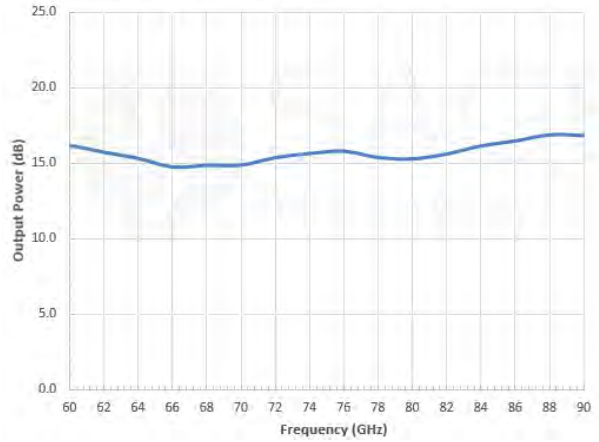
SFA-603903816-12SF-S1

Features:

- 60 to 90 GHz
- X2, X4, X6 or X8 Multiplying Factor
- +16 dBm Output Power
- SFA Family Has More than 75 Models

Parameter	Minimum	Typical	Maximum
Input Frequency	10 GHz		15 GHz
Input Power		+3 dBm	+20 dBm
Output Frequency	60 GHz		90 GHz
Output Power		+16 dBm	
Harmonic Suppression		-20 dBc	
Spurious		-60 dBc	
Port Return Loss		10 dB	
DC Voltage	+6 V_{DC}	+8 V_{DC}	+16 V_{DC}
DC Supply Current		650 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C

Typical Output Power vs. Frequency
Bias: +8 V_{DC}/650 mA, Input Power: +3 dBm



DIELECTRIC RESONATOR OSCILLATOR

FAMILY: SOD
37 GHz

SOD-37301213-22-S1

Features:

- 37 GHz
- Mechanical Tunable
- 1 to 40 GHz Coverage
- 50+ Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Center Frequency		37 GHz	
Power Output		+13 dBm	
Mechanical Tuning Range		±50 MHz	
Frequency Stability			±4 ppm
Phase Noise @ 100 kHz Offset		-95 dBc/Hz	
Spurious			-75 dBc
Harmonics			-25 dBc
Bias Voltage	+6 V_{DC}	+8 V_{DC}	+12 V_{DC}
Bias Current		500 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C

PHASE LOCKED OSCILLATOR

FAMILY: SOP
28 GHz

SOP-28310115-KF-I1

Features:

- 28 GHz
- Low Phase Noise
- Internal/External Referenced
- 50+ Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Frequency		28 GHz	
Output Power		+15 dBm	
Phase Noise (Internally Referenced) @ 10 kHz		-100 dBc/Hz	
Harmonics		-25 dBc	
Spurious		-75 dBc	
DC Voltage Supply		+12 Vdc/450 mA	
Phase Lock Indicator (Lock)		TTL High	
Frequency Stability (Internally Referenced)		±5 ppm	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C

BIAS TUNED GUNN OSCILLATOR

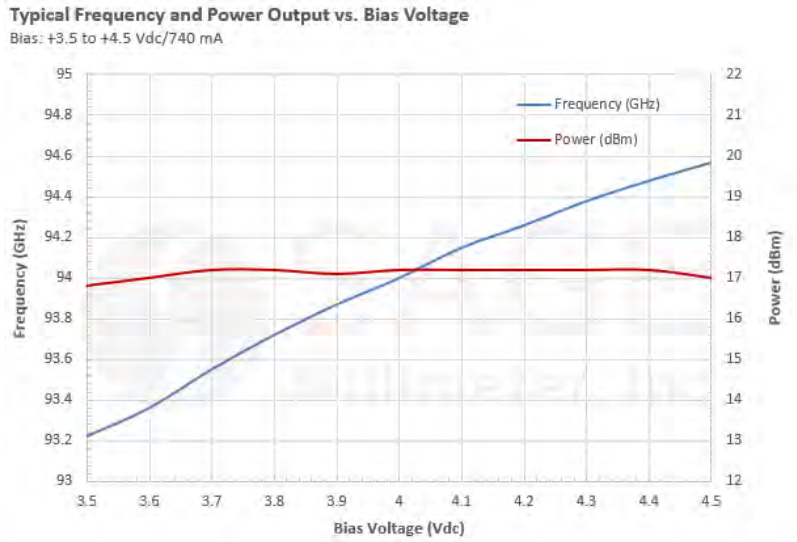
FAMILY: SOB
94 GHz

SOB-94301317-10-S1

Features:

- 94 GHz
- Low AM/FM Noise and Harmonics
- Mechanical Tunable
- 10+ Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Center Frequency	93.5 GHz	94 GHz	94.5 GHz
Power Output		+17 dBm	
Mechanical Tuning Range		±100 MHz	
Bias Tuning Range (+3.5 to +4.5 V_{DC})		±500 MHz	
Bias Voltage	+3.5 V_{DC}	+4.0 V_{DC}	+4.5 V_{DC}
Bias Tuning Speed		100 µS	
Bias Current		750 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	0 ˚C		+50 ˚C



VIRACTOR TUNED GUNN OSCILLATOR

FAMILY: SOV
94 GHz

SOV-94306310-10-G1

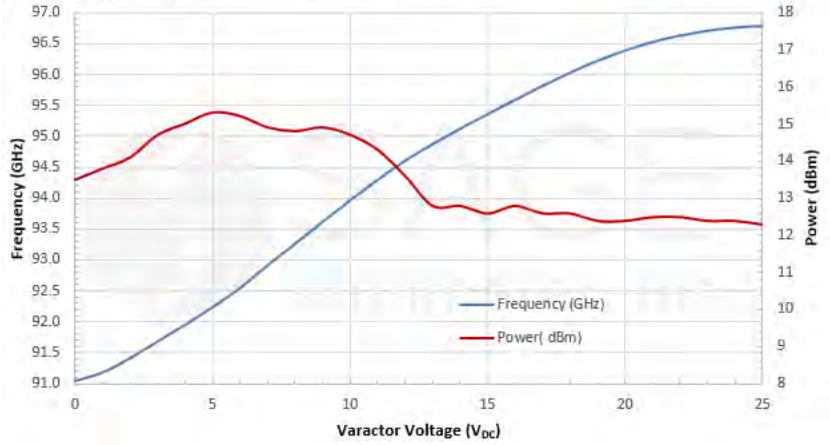
Features:

- 94 GHz
- Low AM/FM Noise and Harmonics
- Mechanical Tunable
- 25+ Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Center Frequency	91.25 GHz	94.00 GHz	95.75 GHz
Power Output	+10 dBm	+13 dBm	
Mechanical Tuning Range		±100 MHz	
Varactor Tuning Range		±3.0 GHz	
Bias Voltage		+5.0 V_{DC}	+5.5 V_{DC}
Bias Current		780 mA	
Varactor Tuning Voltage Range	0 V_{DC}		+30 V_{DC}
Specification Temperature		+25˚C	
Operating Temperature	+0˚C		+50˚C

Frequency and Power Output vs. Bias Voltage

Bias: +5.0 V_{DC}/760 mA



VOLTAGE TUNED OSCILLATOR

FAMILY: SOW
13 to 17 GHz

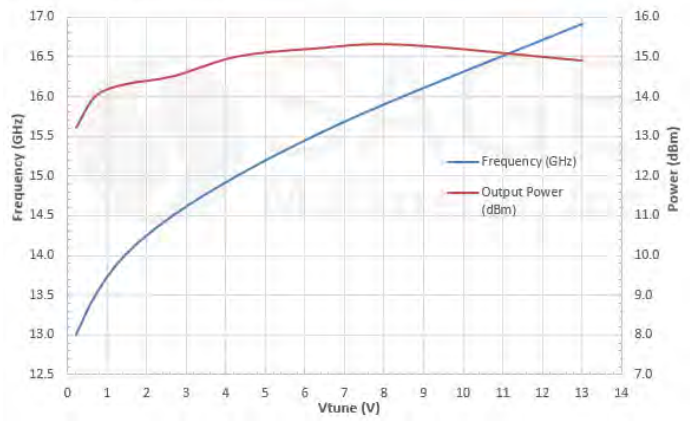
SOW-15303315-SM-S1-H

Features:

- 13 to 17 GHz
- Broad Tuning Bandwidth
- Good Power Flatness
- 4 Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Frequency Range	13 GHz		16.5 GHz
Power Output		+15 dBm	
Frequency Tuning Range		±1.75 GHz	
Harmonics and Sub-harmonics		-18 dBc	
Phase Noise		-85 dBc/Hz @ 100 kHz Offset	
VCO Bias Voltage	+7.0 V_{DC}	+8.0 V_{DC}	+9.0 V_{DC}
Bias Current		200 mA	
Heater Bias		+15 Vdc/100 mA	+15 Vdc/700 mA
Tuning Voltage Range	+0.2 V_{DC}		+13 V_{DC}
Temperature Stability w/ heater		0.3 MHz/°C	
Specification Temperature		+25 °C	
Operating Temperature	0 °C		+50 °C

Output Frequency and Power vs. Tuning Voltage
Bias: +8V/200mA, Heater: +15V



VOLTAGE TUNED OSCILLATOR

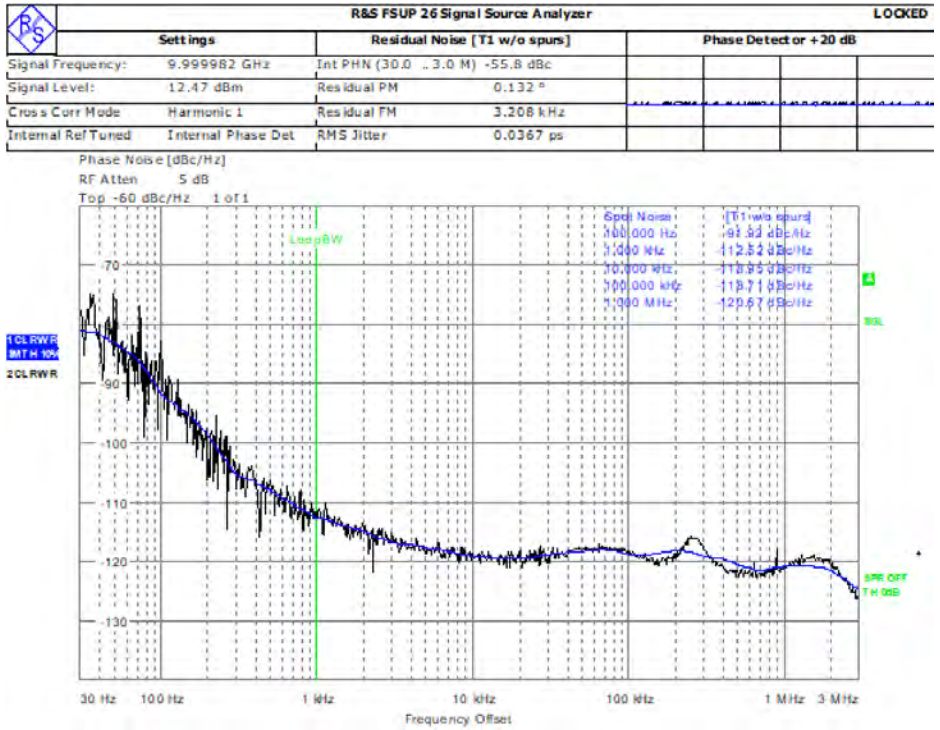
FAMILY: SOT
200 MHz to 20 GHz

SOT-02220313200-SF-B6

Features:

- 200 MHz to 20 GHz
- Low Phase Noise
- Fast Switching Time
- 3 Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Output Frequency Range	0.2 GHz		20.0 GHz
Step Size		0.1 Hz	
Output Power*	-20 to +13 dBm (Controllable by Command)		
Output Power Flatness	±2.5 dBm		
Frequency Stability	±0.2 ppm or Same as External Reference		
Frequency Accuracy	±0.2 ppm or Same as External Reference		
Output Spurious		-70 dBc	-65 dBc
Output Harmonics	≤-30 dBc/0.2-12 GHz and ≤-20 dBc/12-20 GHz @ +5 dBm P_{out}		
External Reference	10 MHz/ +5 dBm ± 3 dBm		
Lock Indicator	TTL High		
Phase Noise (Internal)** RF Frequency at 20 GHz	≤-101 dBc/Hz @ 1 kHz; ≤-110 dBc/Hz @ 10 kHz ≤-110 dBc/Hz @ 100 kHz; ≤-115 dBc/Hz @ 1,000 kHz		
Frequency Switching Time	≤200 µS (Excludes the Series Port Communication Time)		
Control Interface	SPI		
Pulse Modulation Depth	≥60 dBc @ Output Power + 10 dBm		
Pulse Modulation Pulse Width	0.1 mS	5 mS	10 mS
Pulse Modulation Time	≤30 nS Raise/50 nS Fall		
Supply Voltage/Current		+12 V_{DC}/1,600 mA	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+70 °C



FULL WAVEGUIDE JUNCTION CIRCULATOR

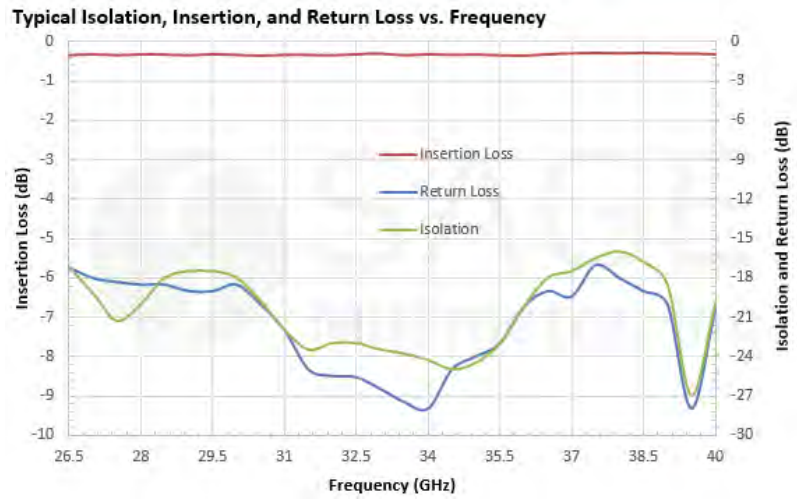
FAMILY: SNF
Ka BAND

SNF-28-C5

Features:

- 26.5 to 40 GHz
- Full Waveguide Bandwidth Coverage
- 18 to 26.5 GHz and 22 to 33 GHz Models
- Total 6 Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
RF Frequency	26.5 GHz		40 GHz
Insertion Loss		0.4 dB	0.7 dB
Isolation*		15 dB	
Return Loss		15 dB	
Forward Power Handling			20 W (CW)
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+80 ˚C



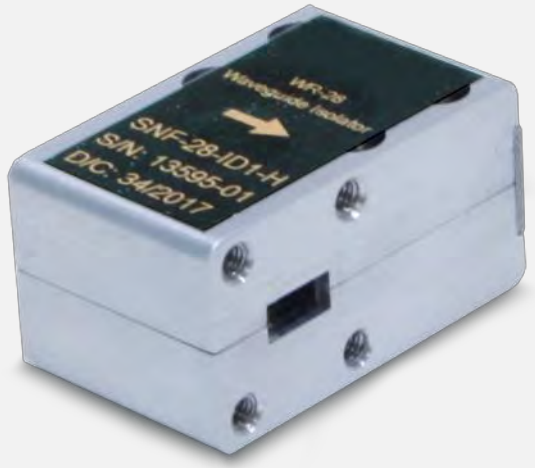
FULL WAVEGUIDE JUNCTION ISOLATOR

FAMILY: SNF
Ka BAND

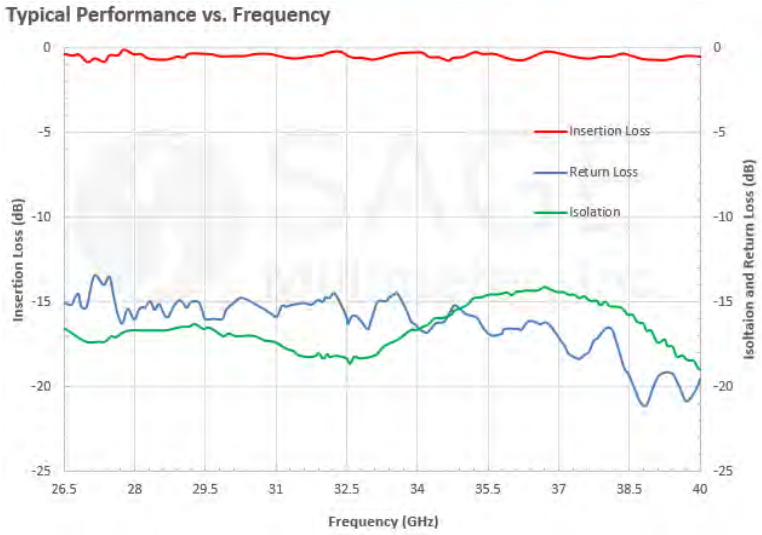
SNF-28-I5

Features:

- 26.5 to 40 GHz
- Full Waveguide Bandwidth Coverage
- 18 to 26.5 GHz and 22 to 33 GHz Models
- Total 6 Models to Support 5G Bands



Parameter	Minimum	Typical	Maximum
RF Frequency	26.5 GHz		40.0 GHz
Insertion Loss		0.50 dB	0.80 dB
Isolation		17 dB	
Return Loss		15 dB	
Forward Power Handling			25 W (CW)
Reverse Power Handling			10 W (CW)
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



WAVEGUIDE JUNCTION CIRCULATOR

FAMILY: SNW
E BAND

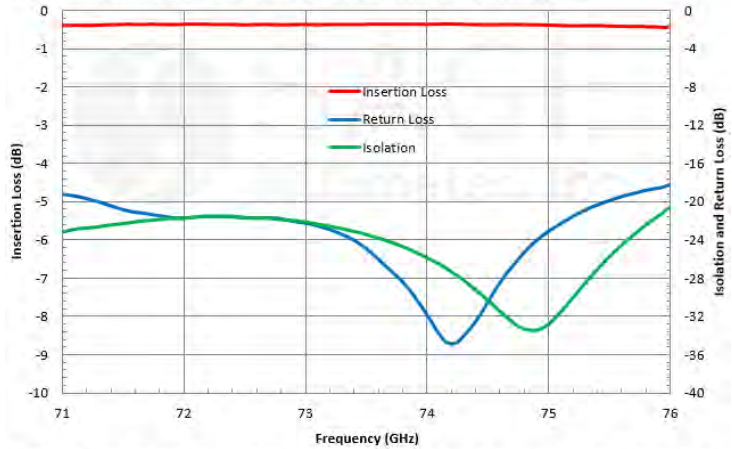
SNW-7137630818-12-C1

Features:

- 71 to 76 GHz
- Broad Bandwidth Coverage
- 81 to 86 and 76 to 81 GHz Models
- 40+ Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Frequency	71 GHz		76 GHz
Insertion Loss		0.8 dB	
Isolation		18 dB	
Return Loss		16 dB	
Power Handling			3 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

Typical Insertion Loss, Isolation and Return Loss vs. Frequency



Note: The insertion loss, isolation and return loss between other ports, such as port 2 to port 3, port 3 to port 1 are similar to above given plots.

WAVEGUIDE JUNCTION ISOLATOR

FAMILY: SNW
E BAND

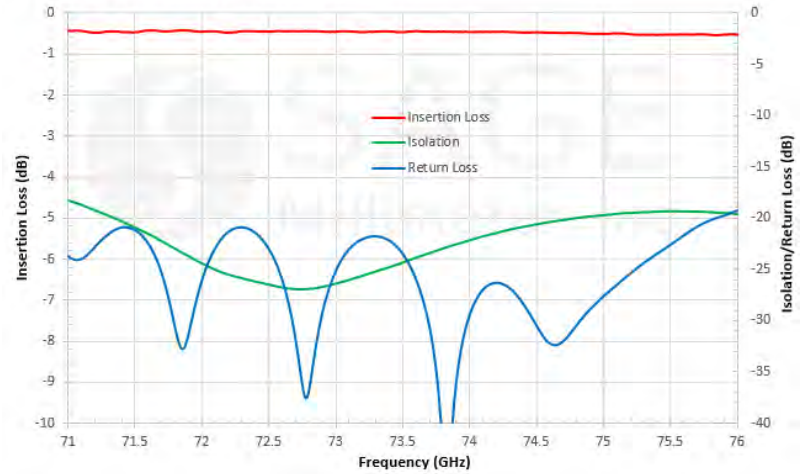
SNW-7137630818-12-I1

Features:

- 71 to 76 GHz
- Broad Bandwidth Coverage
- 81 to 86 and 76 to 81 GHz Models
- 40+ Models to Support 5G Bands

Parameter	Minimum	Typical	Maximum
Frequency	71 GHz		76 GHz
Insertion Loss		0.8 dB	
Isolation		18 dB	
Return Loss		16 dB	
Forward Power Handling			3 W (CW)
Reverse Power Handling			1 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

Typical Performance vs. Frequency



ELECTRICAL ATTENUATOR

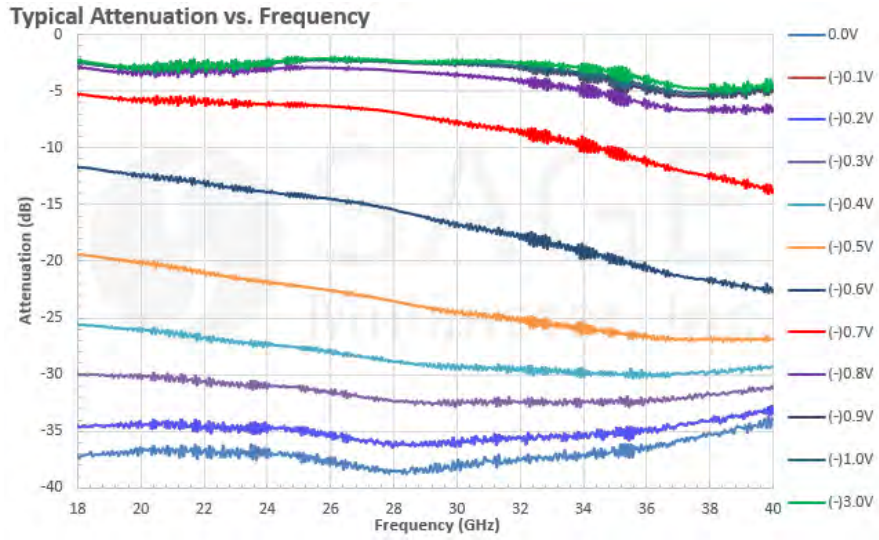
FAMILY: SKA
18 to 40 GHz

SKA-1834033537-KFKF-A1-M

Features:

- 18 to 40 GHz
- 35 dB Dynamic Range
- High Speed
- SKA Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	18 GHz		40 GHz
Insertion Loss		3.5 dB	
Attenuation Range		37 dB	
Input P_{1dB}		+10 dBm	
Damage RF Power Level			+30 dBm
Control Voltage		0 to -3 V_{DC}	
Damage Control Voltage Level			-5 V_{DC}
Input Return Loss		8 dB	
Output Return Loss		9 dB	
Specification Temperature		+25 °C	
Operating Temperature	0 °C		+50 °C



ELECTRICAL ATTENUATOR

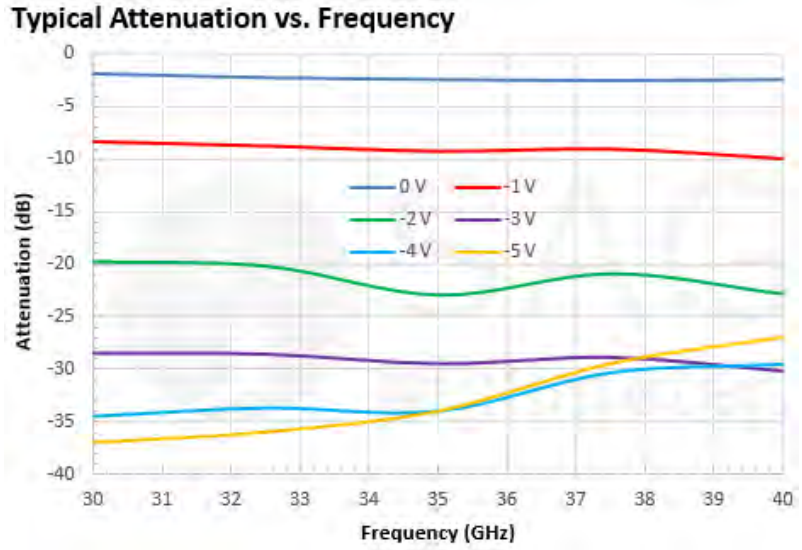
FAMILY: SKA
26.5 to 40 GHz

SKA-2734032530-2828-A1

Features:

- 26.5 to 40 GHz
- 30 dB Dynamic Range
- High Speed
- SKA Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	26.5 GHz		40 GHz
Insertion Loss		2.5 dB	3.0 dB
Attenuation		30 dB	
Power Handling		+20 dBm	+23 dBm
Control Voltage		0 to -5 V_{DC}	
Control Current		10 mA	
Control Speed		100 ns	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



ELECTRICAL ATTENUATOR

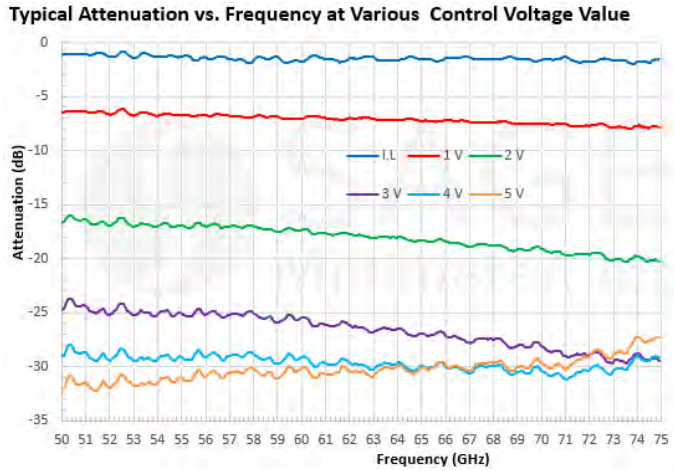
FAMILY: SKA
50 to 75 GHz

SKA-5037533030-1515-A1

Features:

- 50 to 75 GHz
- 33 dB Dynamic Range
- High Speed
- SKA Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	50 GHz		75 GHz
Insertion Loss		2.5 dB	3.0 dB
Attenuation	2.5 dB	30 dB	
Power Handling		+20 dBm	+23 dBm
Control Voltage		0 to -5 V_{DC} /5 mA	0 to -6 V_{DC} /8 mA
Control Speed		100 ns	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



SPST PIN SWITCH

FAMILY: SKS
30 to 40 GHz

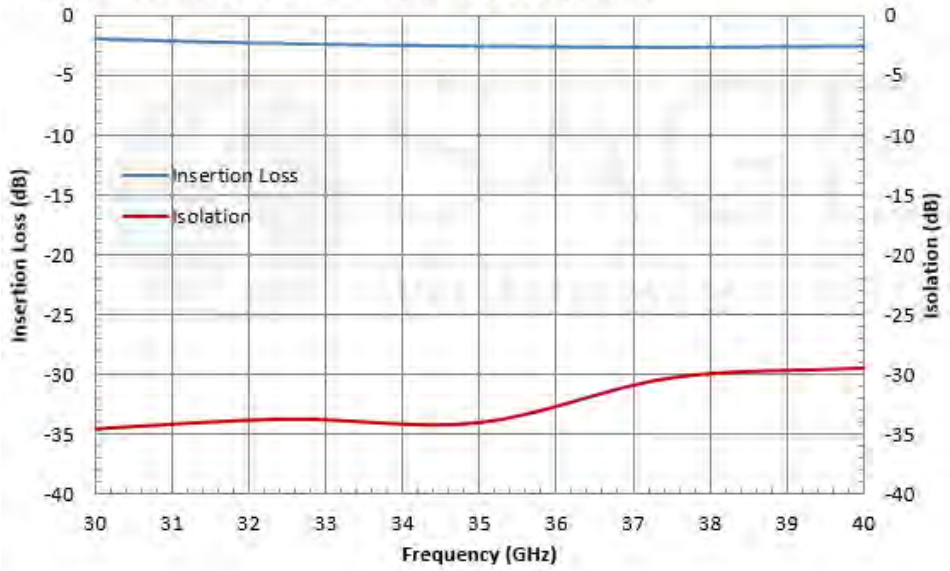
SKS-3034032030-KFKF-A1-M

Features:

- 30 to 40 GHz
- 30 dB Control Range
- 100 ns Switching Speed
- SKS Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	30 GHz		40 GHz
Insertion Loss		2.0 dB	
Isolation		30 dB	
Return Loss		9 dB	
Power Handling			+23 dBm
Bias Voltage		±5 V_{DC}	
Bias Current		25 mA	
Control Signal		TTL	
Switching Speed		100 nS	
Switch Type		Absorptive	
Specification Temperature		+25 °C	
Operating Temperature	-25 °C		+65 °C

Typical Insertion Loss and Isolation vs. Frequency



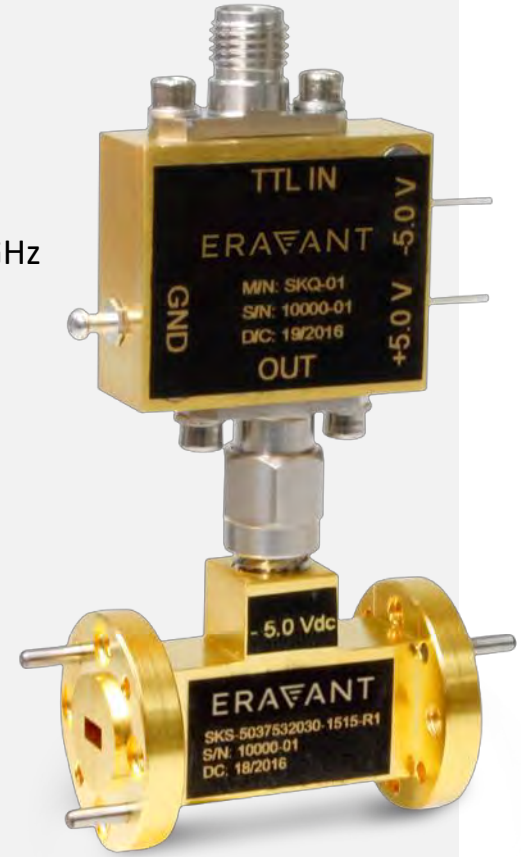
SPST PIN SWITCH

FAMILY: SKS
75 to 110 GHz

SKS-7531142520-1010-R1

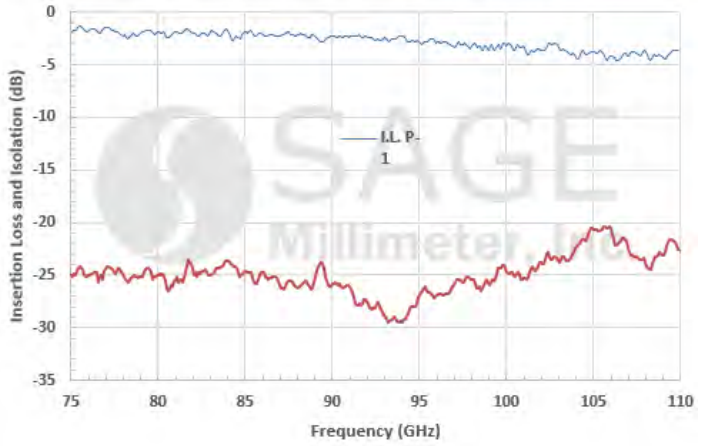
Features:

- 75 to 110 GHz
- 25 dB Control Range
- 100 ns Switching Speed
- SKS Family Covers up to 110 GHz



Parameter	Minimum	Typical	Maximum
RF Frequency	75 GHz		110 GHz
Insertion Loss		2.5 dB	
Isolation		15 dB	
Power Handling		+20 dBm	+23 dBm
Bias Voltage		±5 V_{DC}	
Bias Current		10 mA	
Control Signal		TTL	
Switching Speed		100 ns	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

Typical Insertion Loss and Isolation vs. Frequency



SP4T PIN SWITCH

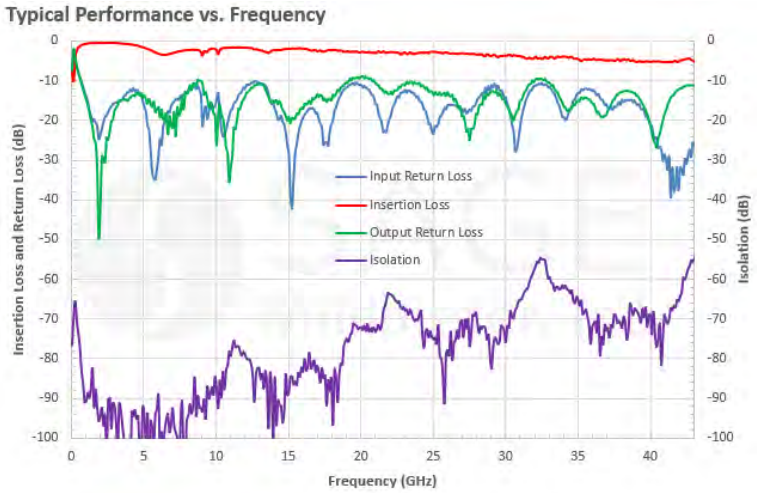
FAMILY: SK4
0.5 to 43 GHz

SK4-0524335060-KFKF-A3

Features:

- 0.5 to 43 GHz
- 60 dB Control Range
- 100 ns Switching Speed
- SK4 Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	0.5 GHz		43 GHz
Insertion Loss		5.0 dB	
Return Loss		10 dB	
Isolation	45 dB	60 dB	
Operational RF Input Power			+20 dBm
Damage RF Input Power			+27 dBm
Bias Voltage		±5 V_{DC}	
Bias Current		100/50 mA	
Control		TTL	
Switching Speed		100 ns	
Specification Temperature		+25 °C	
Operation Temperature	0 °C		+50 °C



SP8T PIN SWITCH

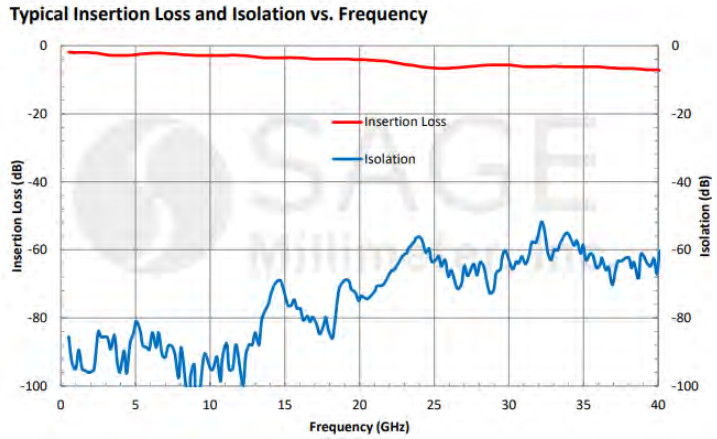
FAMILY: SK8
0.5 to 40 GHz

SK8-0524036550-KFKF-AD1

Features:

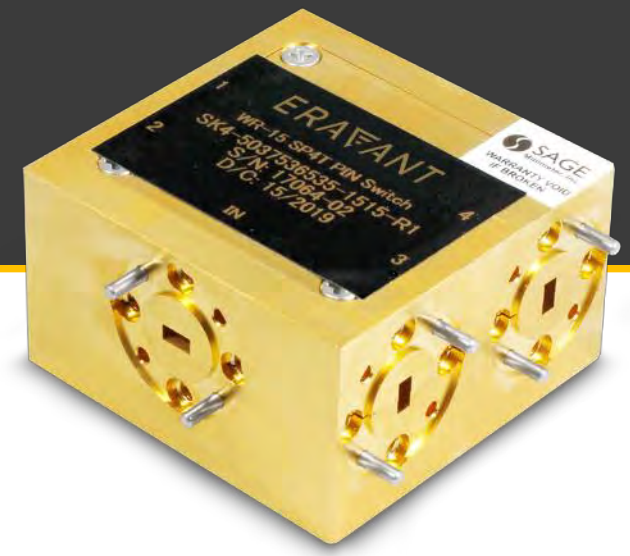
- 0.5 to 40 GHz
- 50 dB Control Range
- 50 ns Switching Speed
- SK8 Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	0.5 GHz		40 GHz
Insertion Loss		6.5 dB	8.5 dB
Isolation	50 dB		
Return Loss		7 dB	6 dB
Input RF Power		+20 dBm	+23 dBm
Bias Voltage	-5 V_{DC}		+5 V_{DC}
Bias Current	30 mA		100 mA
Control		TTL	
Switching Speed		50 ns	
Switch Type		Absorptive	
Specification Temperature		+25 °C	
Operating Temperature	0 °C		+50 °C



SP4T PIN SWITCH

FAMILY: SK4
60 to 90 GHz



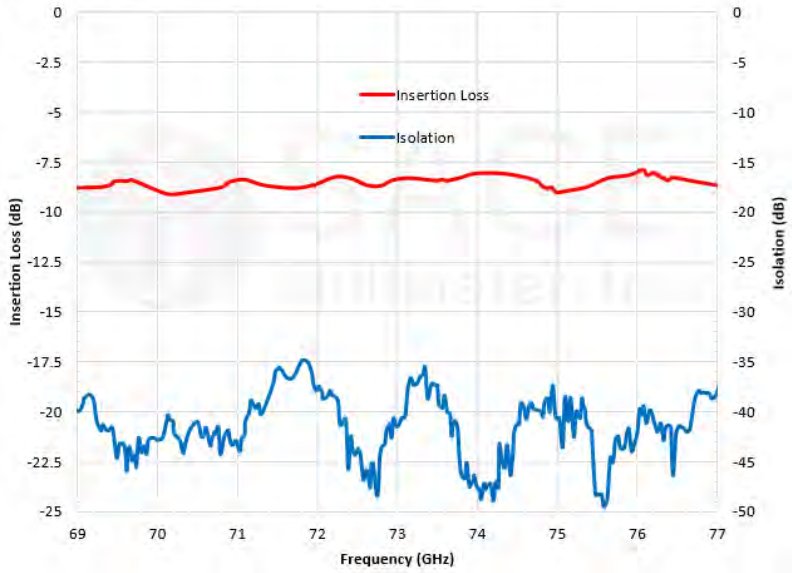
SK4-6039038030-1212-R1-M

Features:

- 60 to 90 GHz
- 30 dB Control Range
- 100 ns Switching Speed
- SK4 Family Covers up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	60 GHz		90 GHz
Insertion Loss		8 dB	
Return Loss		10 dB	
Isolation		30 dB	
Maximum Input RF Power		+20 dBm	+23 dBm
Bias Voltage		±5 V_{DC}	
Bias Current		30 mA	
Control		TTL	
Switching Speed		100 nS	
Specification Temperature		+25 °C	
Operation Temperature	0 °C		+50 °C

Typical Insertion Loss and Isolation vs. Frequency
Bias: ±5 V_{DC}/30 mA



WAVEGIDE POWER DIVIDER 2 WAY, RIGHT ANGLE

FAMILY: SWP
26.5 to 40 GHz

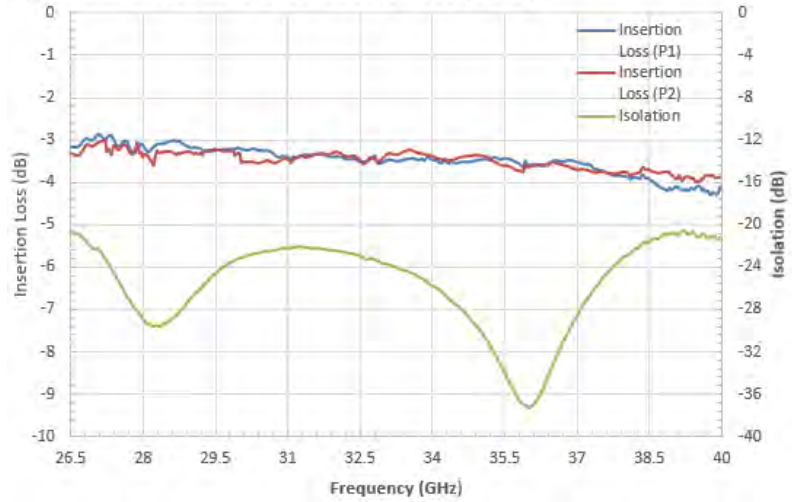
SWP-27340302-28-S1

Features:

- 26.5 to 40 GHz
- Right Angle and End Launch
- 2-Way, 4-Way, 8-Way and 16-Way
- 50+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	27 GHz		40 GHz
Amplitude Unbalance		±0.2 dB	
Insertion Loss		0.4 dB	
Port Isolation		20 dB	
Port Return Loss		20 dB	
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C

Typical Insertion Loss & Isolation vs. Frequency



WAVEGIDE POWER DIVIDER 2 WAY, RIGHT ANGLE

FAMILY: SWP
50 to 75 GHz

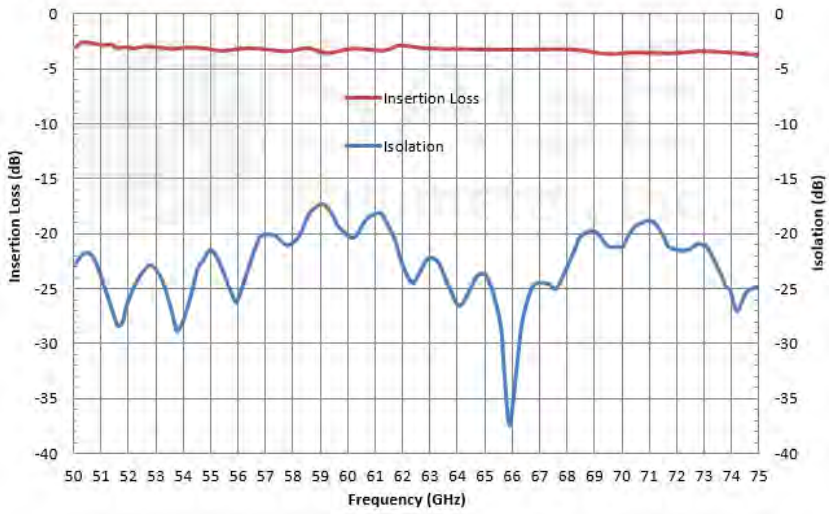
SWP-50375302-15-S1

Features:

- 50 to 75 GHz
- Right Angle and End Launch
- 2-Way, 4-Way, 8-Way and 16-Way
- 50+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	50 GHz		75 GHz
Power Unbalance			±0.20 dB
Insertion Loss		0.5 dB	0.8 dB
Isolation		20 dB	
Input/Output VSWR			1.5:1
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C

Typical Insertion Loss and Isolation vs. Frequency



WAVEGIDE POWER DIVIDER 2 WAY, INLINE

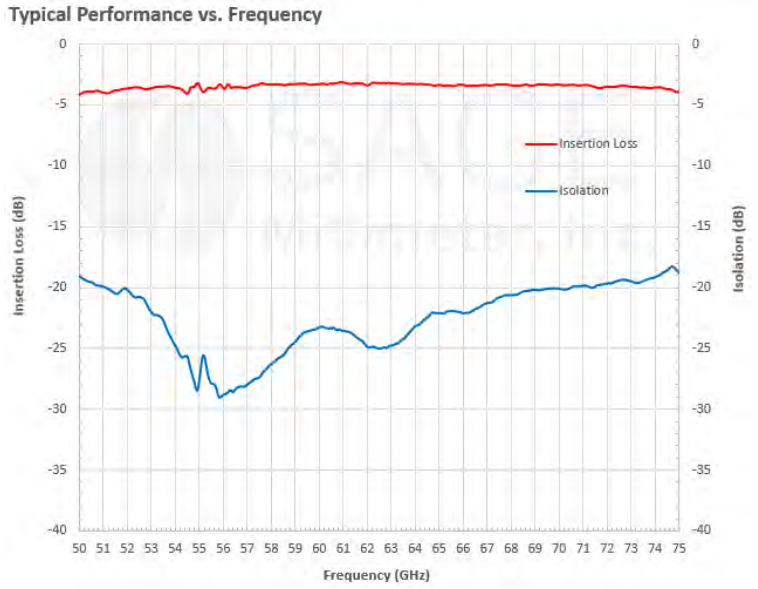
FAMILY: SWP
50 to 75 GHz

SWP-50375302-15-E2

Features:

- 50 to 75 GHz
- Right Angle and End Launch
- 2-Way, 4-Way, 8-Way and 16-Way
- 50+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	50 GHz		75 GHz
Power Unbalance			±0.20 dB
Insertion Loss		0.5 dB	
Isolation		20 dB	
Return Loss		15 dB	
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C



WAVEGIDE POWER DIVIDER
4 WAY, INLINE

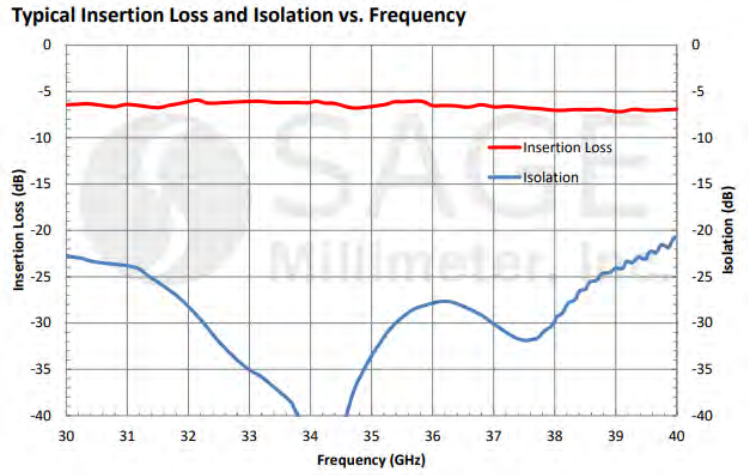
FAMILY: SWP
30 to 40 GHz

SWP-30340304-28-E1

Features:

- 30 to 40 GHz
- Right Angle and End Launch
- 2-Way, 4-Way, 8-Way and 16-Way
- 50+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	30 GHz		40 GHz
Insertion Loss		0.5 dB	
Power Unbalance		±0.4 dB	
Port Isolation		20 dB	
Port Return Loss		15 dB	
Power Handling			100 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



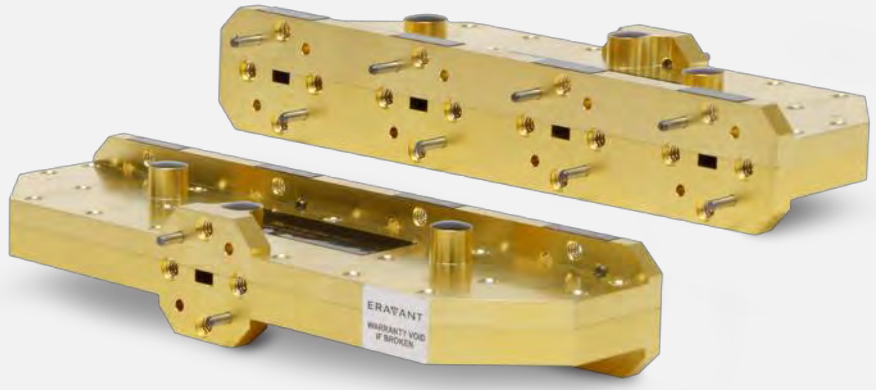
WAVEGIDE POWER DIVIDER 4 WAY, INLINE

FAMILY: SWP
50 to 75 GHz

SWP-50375304-15-E1

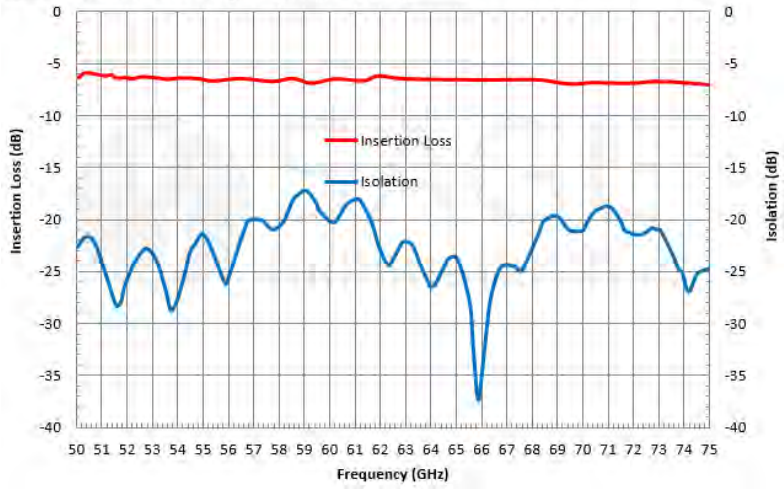
Features:

- 50 to 75 GHz
- Right Angle and End Launch
- 2-Way, 4-Way, 8-Way and 16-Way
- 50+ Models to Support 5G Bands
- Frequency up to 110 GHz



Parameter	Minimum	Typical	Maximum
Frequency	50 GHz		75 GHz
Power Unbalance			±0.20 dB
Insertion Loss		1.0 dB	1.2 dB
Isolation		20 dB	
Input/ Output Return Loss		20 dB	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

Typical Insertion Loss and Isolation vs. Frequency
Isolation was tested between adjacent ports (i.e. 1-2, 3-4)



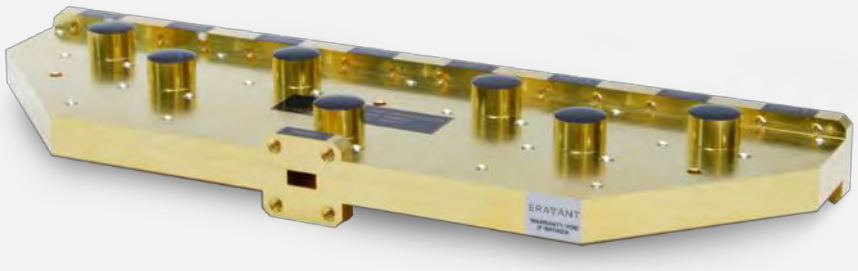
WAVEGIDE POWER DIVIDER 8 WAY, INLINE

FAMILY: SWP
28 to 31 GHz

SWP-29331308-28-E1

Features:

- 28 to 31 GHz
- Right Angle and End Launch
- 2-Way, 4-Way, 8-Way and 16-Way
- 50+ Models to Support 5G Bands
- Frequency up to 110 GHz



Parameter	Minimum	Typical	Maximum
Frequency	28.5 GHz		30.5 GHz
Power Unbalance		±0.20 dB	
Insertion Loss		0.9 dB	
Isolation		25 dB	
Return Loss		15 dB	
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

COAX POWER DIVIDER

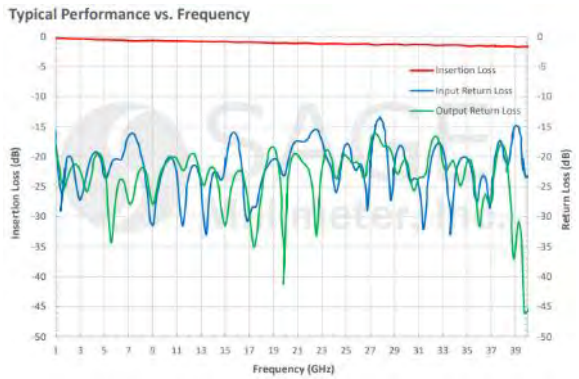
FAMILY: SCS
1 to 40 GHz

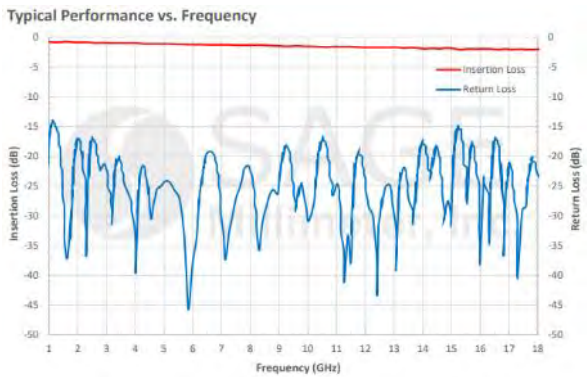
More Than 50 Models: 2 Way, 4 Way, 8 Way and 16 Way

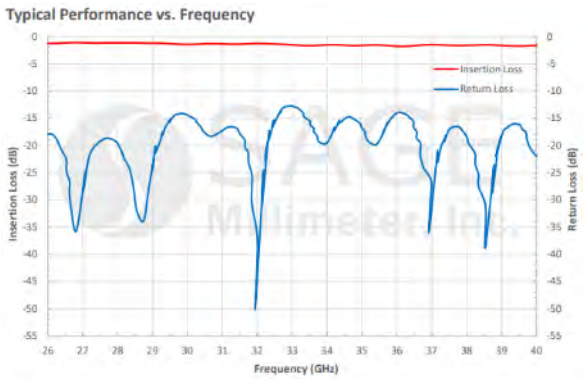
SCS-0134031215-KFKF-22
1 to 40 GHz, 2 Way

SCS-0134035014-KFKF-42
1 to 40 GHz, 4 Way

SCS-1034032615-KFKF-82
10 to 40 GHz, 8 Way







COAX HYBRID COUPLER

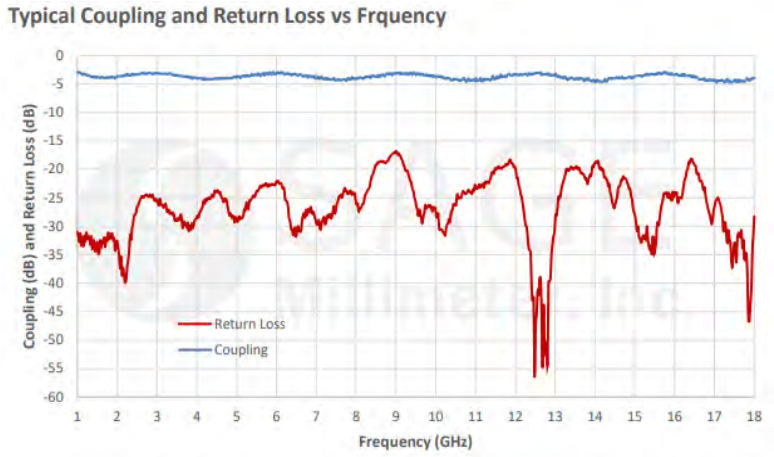
FAMILY: SCZ
1 to 40 GHz

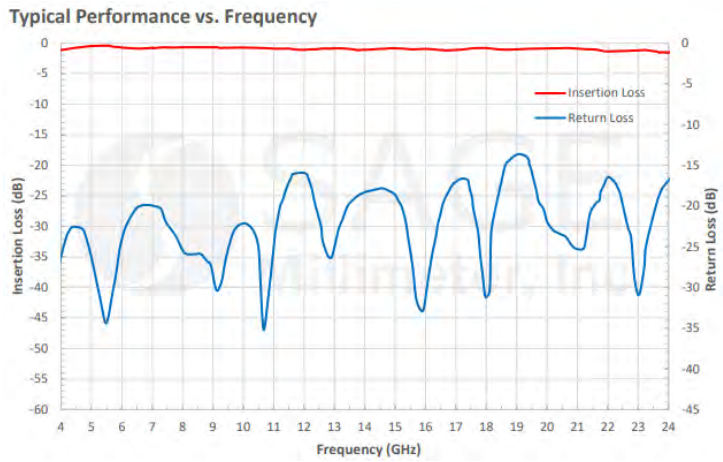
More Than 15 Models: 2.92 mm, SMA

SCZ-0131831509-SFSF-43
1 to 18 GHz, 90 Degree

SCZ-0432431409-SFSF-43
4 to 24 GHz, 90 Degree

SCZ-1834031209-KFKF-43
18 to 40 GHz, 90 Degree





MAGIC TEE

FAMILY: SWM
33 to 50 GHz

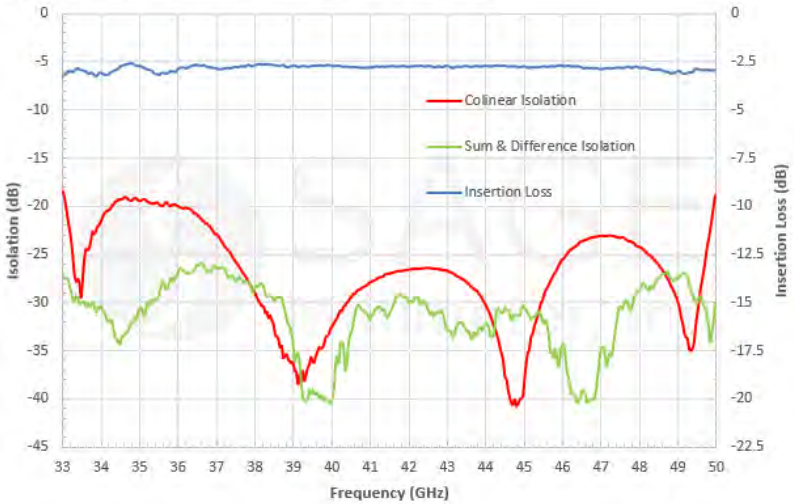
SWM-33350320-22-SB

Features:

- 33 to 50 GHz
- Full Waveguide Band
- High Performance
- 10+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter		Minimum	Typical	Maximum
Frequency		33 GHz		50 GHz
Insertion Loss			0.3 dB	
Isolation	Sum and Difference Ports		30 dB	
	Collinear Ports	15 dB	20 dB	
Return Loss			14 dB	
Specification Temperature			+25°C	
Operating Temperature		-40°C		+85°C

Typical Isolation and Insertion Loss vs. Frequency



MAGIC TEE

FAMILY: SWM
75 to 110 GHz

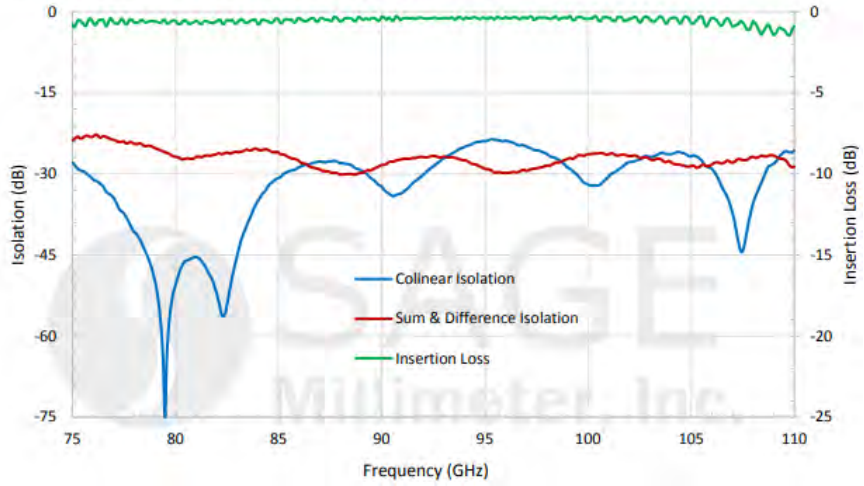
SWM-75311420-10-SB

Features:

- 75 to 110 GHz
- Full Waveguide Band
- High Performance
- 10+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter		Minimum	Typical	Maximum
Frequency		75 GHz		110 GHz
Insertion Loss			0.3 dB	
Isolation	Sum and Difference Ports		30 dB	
	Collinear Ports		20 dB	
Return Loss			14 dB	
Specification Temperature			+25 °C	
Operating Temperature		-40 °C		+85 °C

Typical Isolation and Insertion Loss vs Frequency



WAVEGUIDE DIRECTIONAL COUPLER

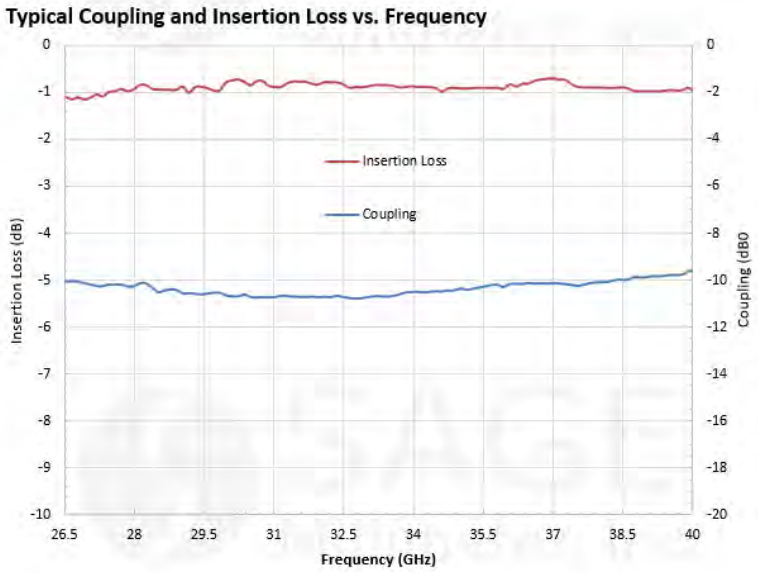
FAMILY: SWD
24 to 42 GHz

SWD-1040H-28-SB

Features:

- 24 to 42 GHz
- 3, 6, 10, 20, 30 and 40 dB
- 3 Port, Bi-Directional and Dual-Directional
- 100+ Models to Support 5G Bands
- Frequency up to 170 GHz

Parameter	Minimum	Typical	Maximum
Frequency	26.5 GHz		40 GHz
Insertion Loss*		0.5 dB	
Coupling*		10 dB	
Directivity*	35 dB		
Return Loss			26 dB
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



WAVEGUIDE DIRECTIONAL COUPLER

FAMILY: SWD
50 to 75 GHz

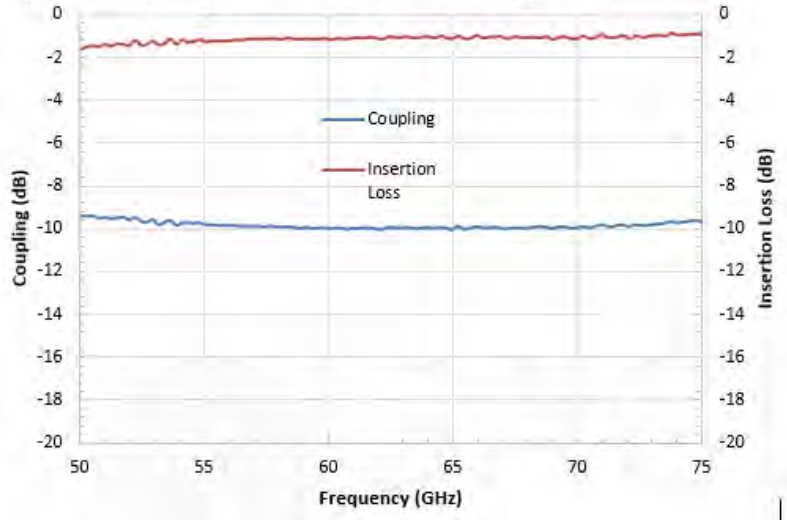
SWD-1040H-15-SB

Features:

- 50 to 75 GHz
- 3, 6, 10, 20, 30 and 40 dB
- 3 Port, Bi-Directional and Dual-Directional
- 100+ Models to Support 5G Bands
- Frequency up to 170 GHz

Parameter	Minimum	Typical	Maximum
Frequency	50 GHz		75 GHz
Insertion Loss*		0.7 dB	
Coupling*		10 dB	
Directivity*	30 dB	40 dB	
VSWR			1.1:1
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C

Typical Coupling and Insertion Loss vs. Frequency



COAXIAL DIRECTIONAL COUPLER

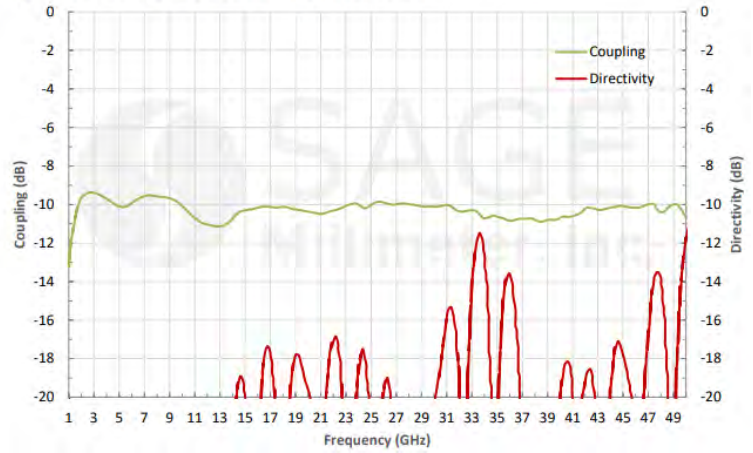
FAMILY: SCD
1 to 67 GHz

More Than 25 Models: 1.85 mm, 2.4 mm, 2.92 mm and SMA

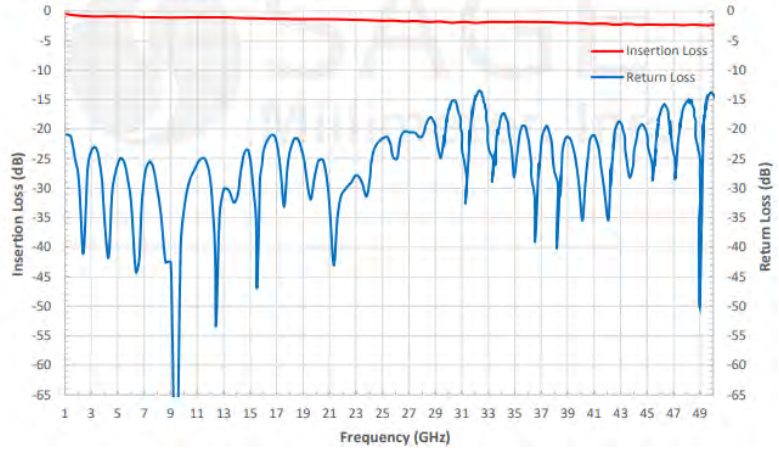
SCD-0135031008-2F-SA
1 to 50 GHz, 10 dB

SCD-0135032008-2F-SA
1 to 50 GHz, 20 dB

Typical Coupling and Directivity vs. Frequency



Typical Performance vs. Frequency



WAVEGUIDE BANDPASS FILTER

FAMILY: SWF
Ka BAND

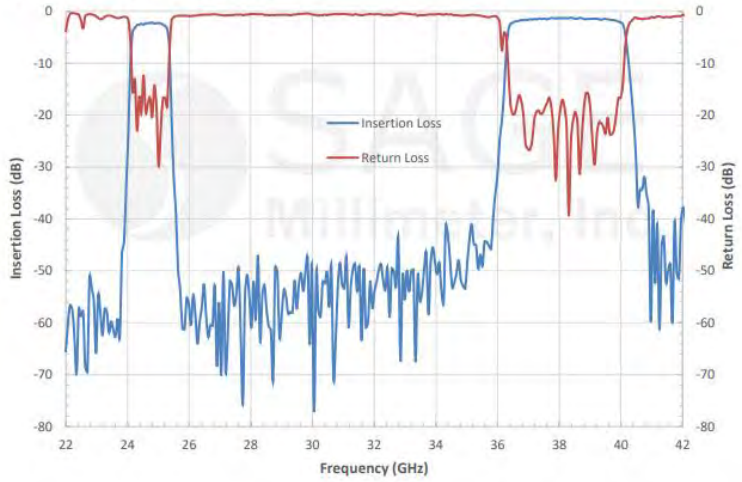
SWF-25301340-28-B2-D

Features:

- Dual Passband, 24 and 38 GHz
- High Rejection
- Waveguide Interface
- Other Frequency Available

Parameter	Minimum	Typical	Maximum
Passband Frequency	24.25 GHz		25.25 GHz
Passband Frequency 2	36.25 GHz		40.00 GHz
Passband Insertion Loss		3.0 dB	
Passband Ripple		±1.0 dB	
Rejection Frequency 1	DC		23.8 GHz
Rejection Frequency 2	27.0 GHz		35.5 GHz
Rejection Frequency 3	42.0 GHz		49.0 GHz
Rejection		40 dB	
Return Loss		14.0 dB	
Power Handling			10 Watts
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C

Typical Performance vs. Frequency



WAVEGUIDE LOWPASS FILTER

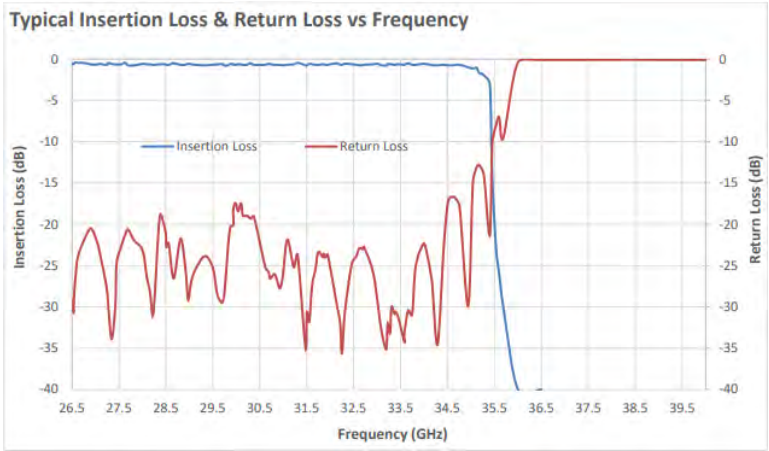
FAMILY: SWF
Ka BAND

SWF-34337340-28-L1

Features:

- 22 to 34 GHz
- High Rejection
- Waveguide Interface
- Other Frequency Available

Parameter	Minimum	Typical	Maximum
Passband Frequency	22 GHz		34 GHz
Passband Insertion Loss		1 dB	
Rejection Frequency, Low Side	DC		20 GHz
Rejection Frequency, High Side	37 GHz		70 GHz
Rejection		40 dB	
Passband Return Loss			14 dB
Power Handling			100 W (CW)
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



WAVEGUIDE HIGHPASS FILTER

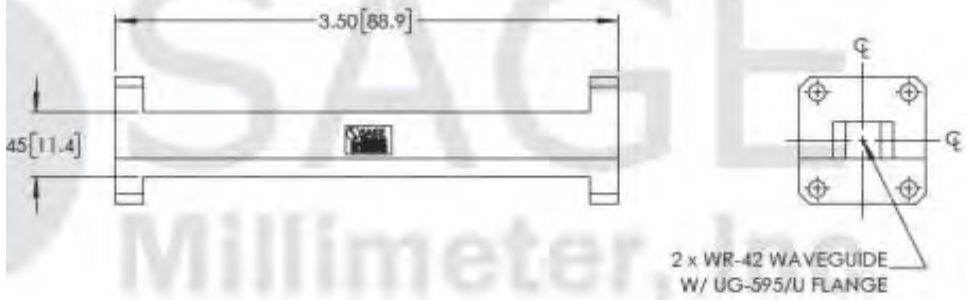
FAMILY: SWF
Ka BAND

SWF-24323340-42-H1

Features:

- Passband: 24 GHz and Higher
- High Rejection
- Waveguide Interface
- Other Frequency Available

Parameter	Minimum	Typical	Maximum
Passband Frequency	24.1 GHz		
Passband Insertion Loss		0.5 dB	
Rejection Frequency	DC		23.1 GHz
Rejection		40 dB	
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C



COAX FILTER, BANDPASS

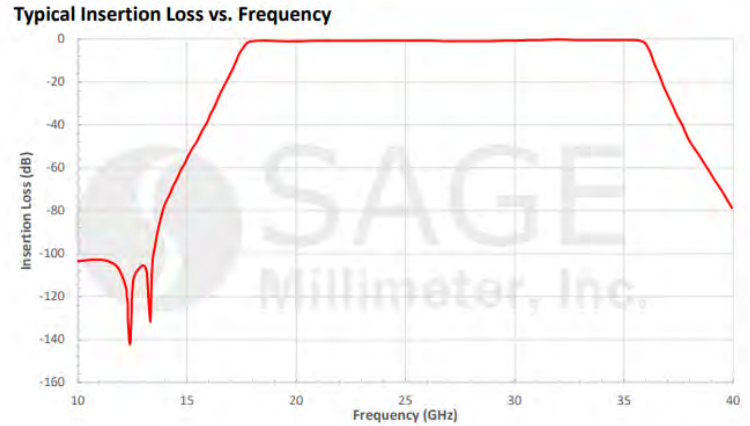
FAMILY: SCF
2 to 40 GHz

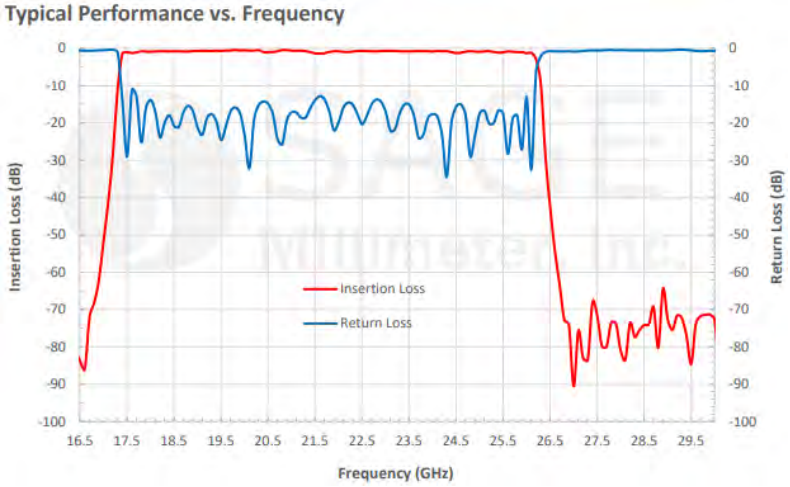
More Than 25 Models

Bandpass Filter

SCF-27317335-VFVF-B1
Passband: 18 to 35 GHz

SCF-22308340-SFSF-B3
Passband: 18 to 26.5 GHz





COAX FILTER, BANDSTOP

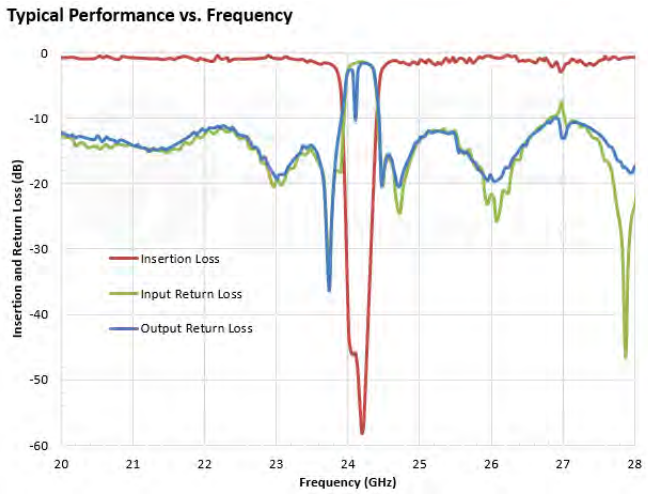
FAMILY: SCF

SCF-24324340-KFKF-N3

Features:

- Notch at 24.125 GHz
- High Rejection
- Narrow Notch Bandwidth
- Other Frequency Available

Parameter	Minimum	Typical	Maximum
Passband Frequency, Low Side	DC		23.5 GHz
Passband Frequency, High Side	25 GHz		40 GHz
Passband Insertion Loss		3.0 dB	
Rejection Frequency	24.0 GHz		24.25 GHz
Rejection		40 dB	
Passband Return Loss		9 dB	
Impedance		50 Ω	
Power Handling			1 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-20 °C		+60 °C



COAX FILTER, LOWPASS

FAMILY: SCF
15 to 110 GHz

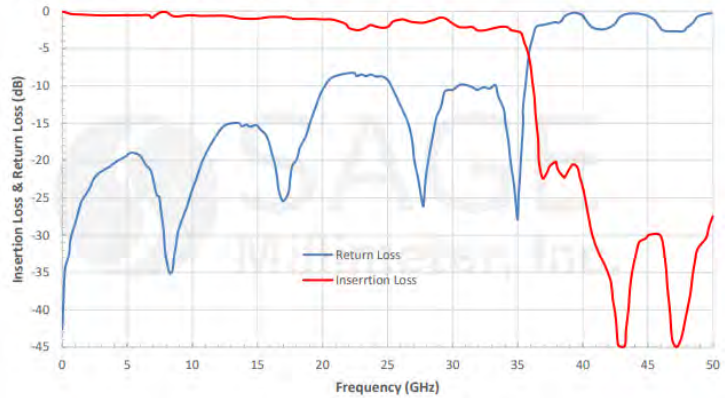
10 Models

Lowpass Filter

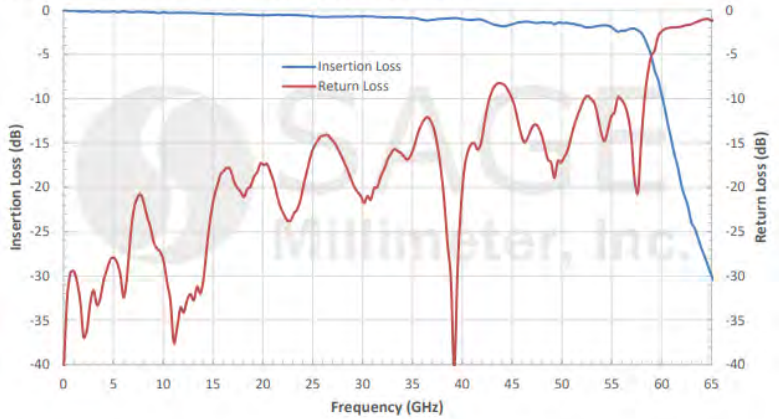
SCF-33337325-KFKM-L3
Passband: DC to 30 GHz

SCF-55375330-KFKM-L1
Passband: DC to 55 GHz

Typical Performance vs. Frequency



Typical Insertion and Return Loss vs Frequency



COAX FILTER, HIGHPASS

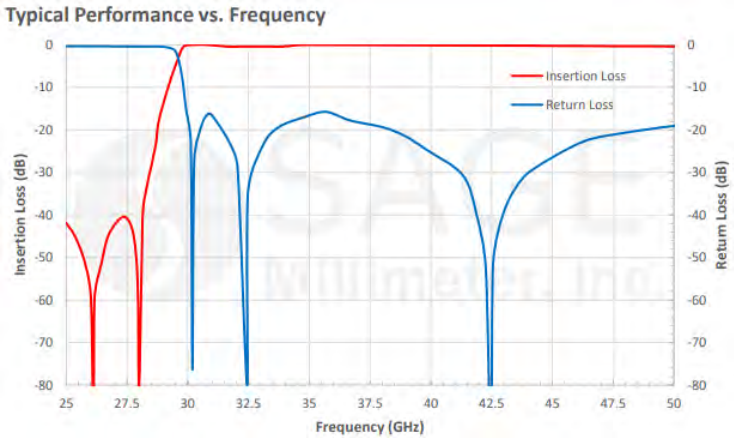
FAMILY: SCF
15 to 110 GHz

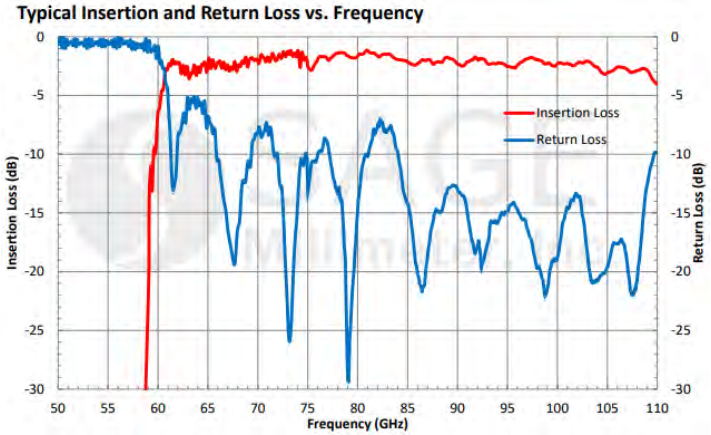
10 Models

Highpass Filter

SCF-30328330-2F2F-H3
Passband: 30 to 50 GHz

SCF-61358340-101F1F-H1
Passband: 61 to 110 GHz





INTERCONNECTION COMPONENTS

INTERCONNECTION COMPONENTS FOR INDUSTRIAL & SCIENTIFIC SYSTEMS

- Per the block diagram presented above, the following interconnection parts are essential for any industrial and scientific system integrations. This presentation includes some examples for introduction/illustration purpose.
  - **SWC:** Waveguide to Coaxial Adapter
  - **SWT:** Waveguide Taper and Mode Transition
  - **SWG:** Waveguide, Rigid and Flexible
  - **SWB:** Waveguide, Bends and Twist
  - **SUF:** Waveguide Connector - Uni-Guide™
  - **SCT:** Coaxial Adapter
  - **SCA:** Coaxial Attenuator
  - **STQ-CM:** Coaxial Matching Load
  - **SCB:** Coaxial DC Block
  - **SCV:** Coaxial Bias Tee
  - **SCW:** Coaxial Cable

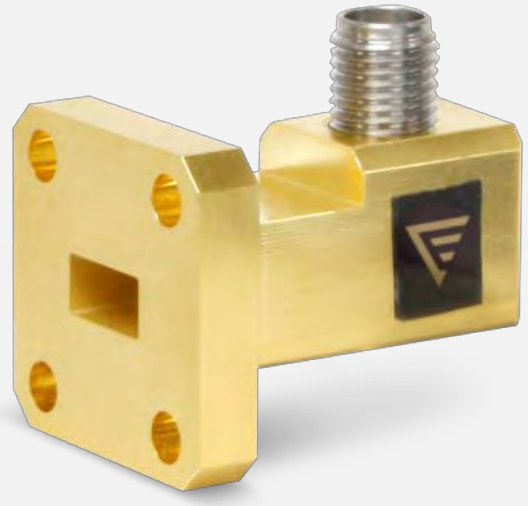
WAVEGUIDE TO COAXIAL ADAPTER, RIGHT ANGLE

FAMILY: SWC
26 to 40 GHz

SWC-28KF-R1 & SWC-28KM-R1

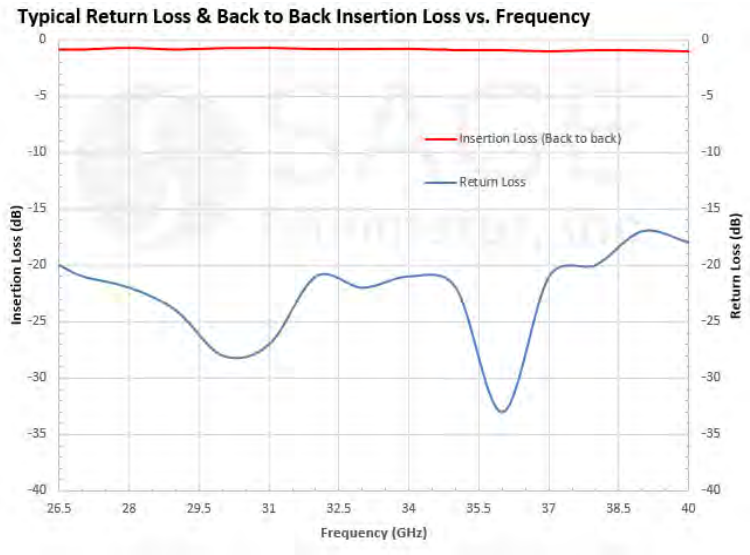
Features:

- 26 to 40 GHz
- Right Angle
- Low Insertion Loss and VSWR
- 60+ Models to Support 5G Bands
- Frequency up to 130 GHz



Parameter	Minimum	Typical	Maximum
Frequency Range	26.5 GHz		40.0 GHz
Insertion Loss*		0.35 dB	0.50 dB
Return Loss	17 dB	20 dB	
Power Handling			30 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

*Insertion loss is tested back to back with a male and female adapter. The result is divided by 2.



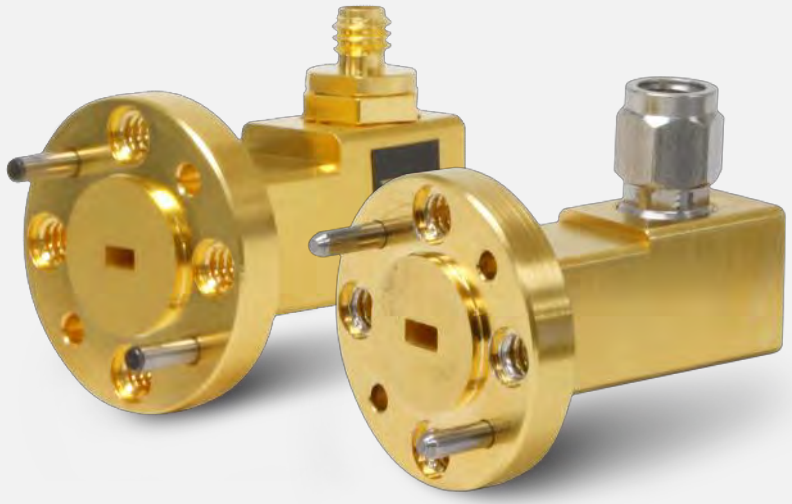
WAVEGUIDE TO COAXIAL ADAPTER, RIGHT ANGLE

FAMILY: SWC
75 to 110 GHz

SWC-101F-R1 & SWC-101M-R1

Features:

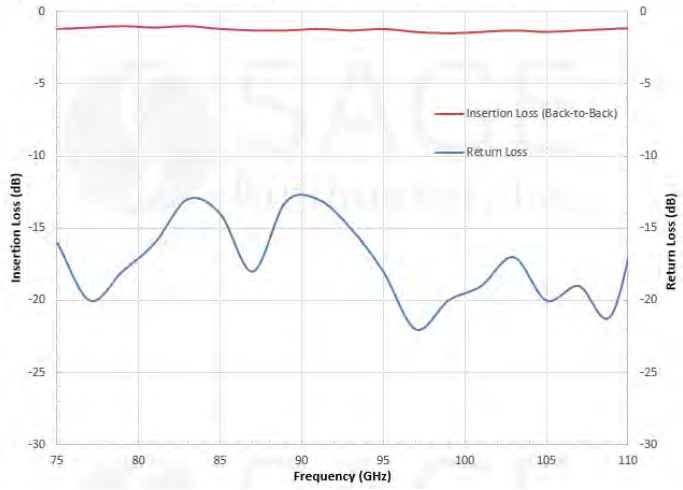
- 75 to 110 GHz
- Right Angle
- Low Insertion Loss and VSWR
- 50+ Models to Support 5G Bands
- Frequency up to 130 GHz



Parameter	Minimum	Typical	Maximum
Frequency Range	75 GHz		110 GHz
Insertion Loss*		1.2 dB	1.5 dB
Return Loss	12 dB	15 dB	
Power Handling			10 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

*Insertion loss is tested back to back with a male and female adapter, the result is divided by 2.

Typical Return Loss and Back-to-Back Insertion Loss vs. Frequency



WAVEGUIDE TO COAXIAL ADAPTER, END LAUNCH

FAMILY: SWC
26 to 40 GHz

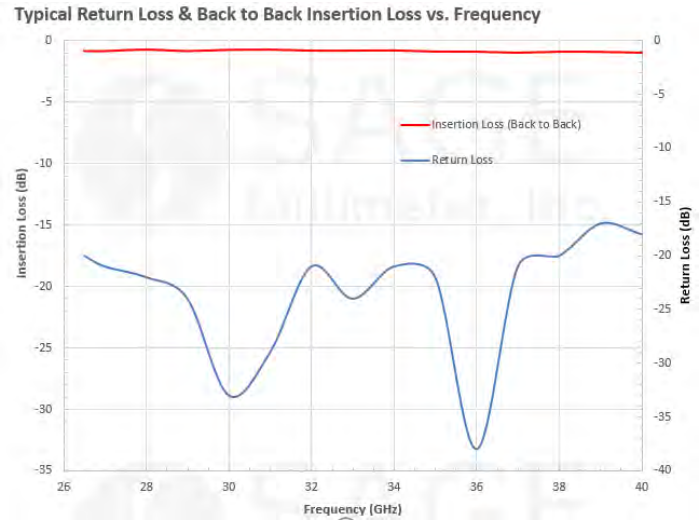
SWC-28KF-E1 & SWC-28KM-E1

Features:

- 26 to 40 GHz
- End Launch
- Low Insertion Loss and VSWR
- 60+ Models to Support 5G Bands
- Frequency up to 130 GHz

Parameter	Minimum	Typical	Maximum
Frequency Range	26.5 GHz		40.0 GHz
Insertion Loss*		0.35 dB	0.50 dB
Return Loss	17 dB	20 dB	
Power Handling			30 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

*Insertion loss is tested back to back with a male and female adapter. The result is divided by 2.



WAVEGUIDE TO COAXIAL ADAPTER, END LAUNCH

FAMILY: SWC
75 to 110 GHz

SWC-101F-E1 & SWC-101M-E1

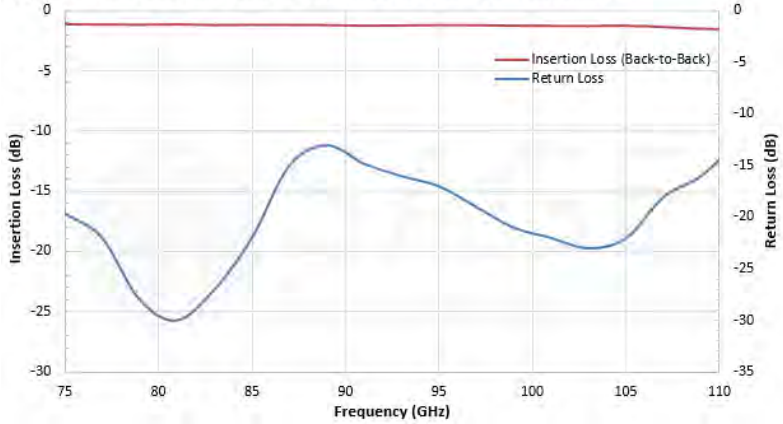
Features:

- 75 to 110 GHz
- End Launch
- Low Insertion Loss and VSWR
- 50+ Models to Support 5G Bands
- Frequency up to 130 GHz

Parameter	Minimum	Typical	Maximum
Frequency Range	75 GHz		110 GHz
Insertion Loss*		1.2 dB	1.5 dB
Return Loss	12 dB	15 dB	
Power Handling			10 W (CW)
Specification Temperature		+25°C	
Operating Temperature	-40°C		+85°C

*Insertion loss is tested back to back with a male and female adapter, the result is divided by 2.

Typical Return Loss and Back-to-Back Insertion Loss vs. Frequency



WAVEGUIDE TAPER TRANSITION

FAMILY: SWT
WR-19 to WR-10

SWT-1910-LB

Features:

- WR-19 to WR-10 Taper Transition
- In Series and Out Series
- Low Insertion Loss and VSWR
- 50+ Models to Support 5G Bands
- Frequency up to 220 GHz

Item	Specification
Waveguide Size	WR-10 Waveguide with UG-387/U-M Flange
Waveguide Size	WR-19 Waveguide with UG-383/U-M Flange
Insertion Length	1.5"
Outline	WT-UW
Material	Brass
Finish	Gold Plated
Weight	1.5 Oz

WAVEGUIDE MODE TRANSITION

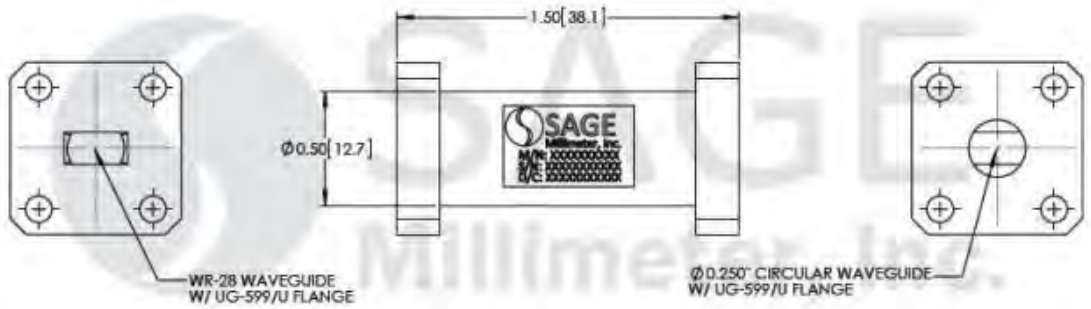
FAMILY: SWT
WR-28

SWT-28250-SB

Features:

- WR-28 to 0.250” D Mode Transition
- In Series and Out Series
- Low Insertion Loss and VSWR
- 50+ Models to Support 5G Bands
- Frequency up to 220 GHz

Item	Specification
Waveguide Size	WR-28 Waveguide with UG-599/U Flange
Waveguide Size	0.250" Diameter Circular Waveguide with UG-599/U-M Flange
Material	Brass
Finish	Gold Plated
Weight	2.2 Oz
Insertion Length	1.5”
Outline	WT-AC-250-1.5



WAVEGUIDE LOAD FIXED, LOW POWER

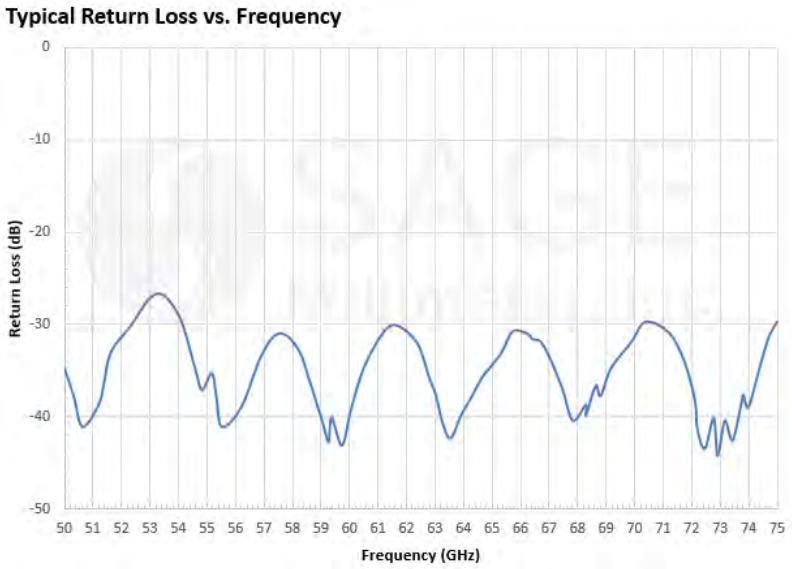
FAMILY: SWL
50 to 75 GHz

SWL-1527-S1

Features:

- 50 to 75 GHz
- Full Waveguide Band
- Fixed and Tunable
- Low and High Power up to 1 kW
- 100+ Models to Support 5G Bands
- Frequency up to 170 GHz

Parameter	Minimum	Typical	Maximum
Frequency	50 GHz		75 GHz
VSWR		1.05:1	
Power Handling		0.5 W (CW)	2 W (CW)
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C



WAVEGUIDE LOAD FIXED, HIGH POWER

FAMILY: SWL
50 to 75 GHz

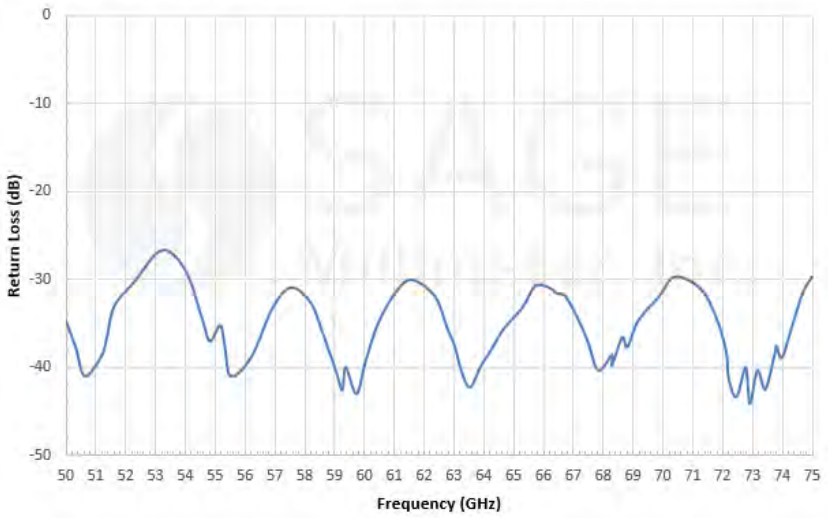
SWL-1537-S1

Features:

- 50 to 75 GHz
- Full Waveguide Band
- Fixed and Tunable
- Low and High Power up to 1 kW
- 100+ Models to Support 5G Bands
- Frequency up to 170 GHz

Parameter	Minimum	Typical	Maximum
Frequency	50 GHz		75 GHz
VSWR		1.06:1	
Power Handling		5 W (CW)	6 W (CW)
Specification Temperature		+25˚C	
Operating Temperature	-40˚C		+85˚C

Typical Return Loss vs. Frequency

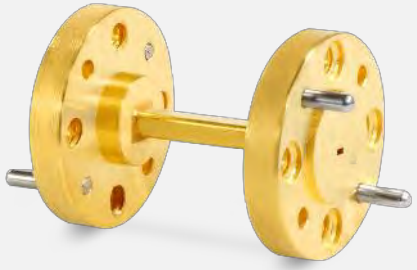


WAVEGUIDE, RIGID

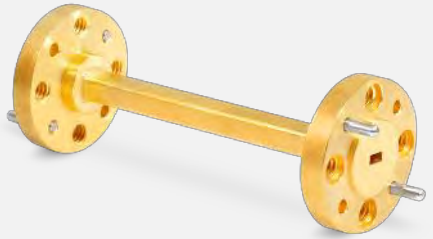
FAMILY: SWG
WR-42 to WR-03

Features:

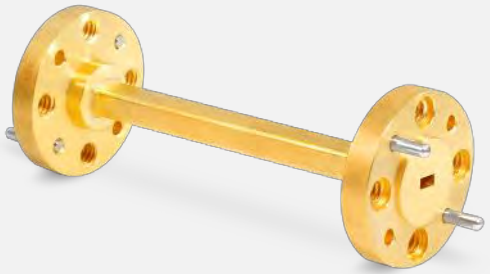
- WR-42 to WR-03
- Various Length
- 500+ Models to Support 5G Bands
- Frequency up to 325 GHz



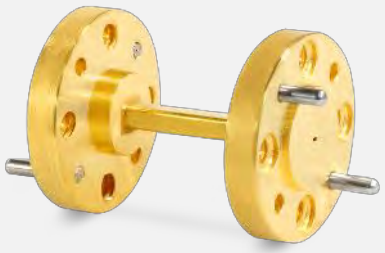
SWG-05020-FB
WR-05 Straight Section, 2”



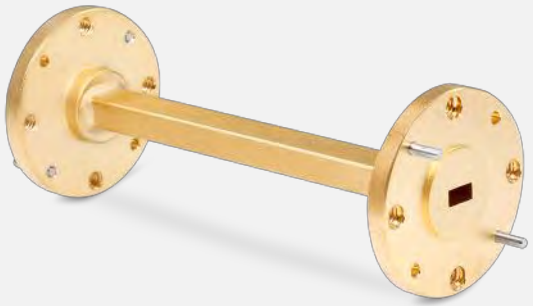
SWG-06040-FB
WR-06 Straight Section, 4”



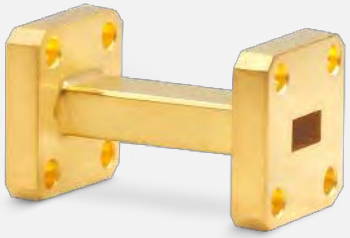
SWG-10020-FB
WR-10 Straight Section, 2”



SWG-03010-FB
WR-03 Straight Section, 1”



SWG-22030-FB
WR-22 Straight Section, 3”



SWG-28013-FB-1.25
WR-28 Straight Section, 1.25”

WAVEGUIDE, FLEXIBLE

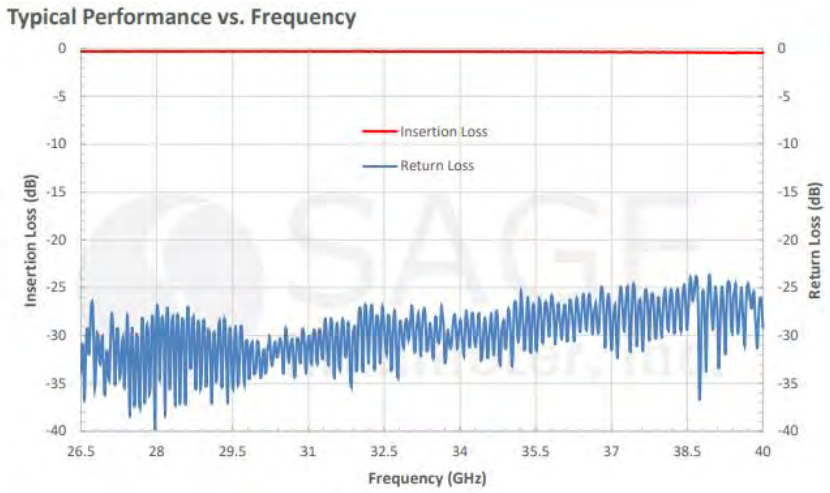
FAMILY: SWG
Ka BAND

SWG-28059-FB-FT-G

Features:

- 24 to 42 GHz
- Full Waveguide Band
- Various Length
- WR-42 to WR-10
- 100+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	26.5 GHz		40 GHz
Insertion Loss		0.3 dB	
Return Loss		21 dB	
Power Handling			75 W (CW)
Specification Temperature		+25 ˚C	
Operation Temperature	-40 ˚C		+85 ˚C



WAVEGUIDE, FLEXIBLE

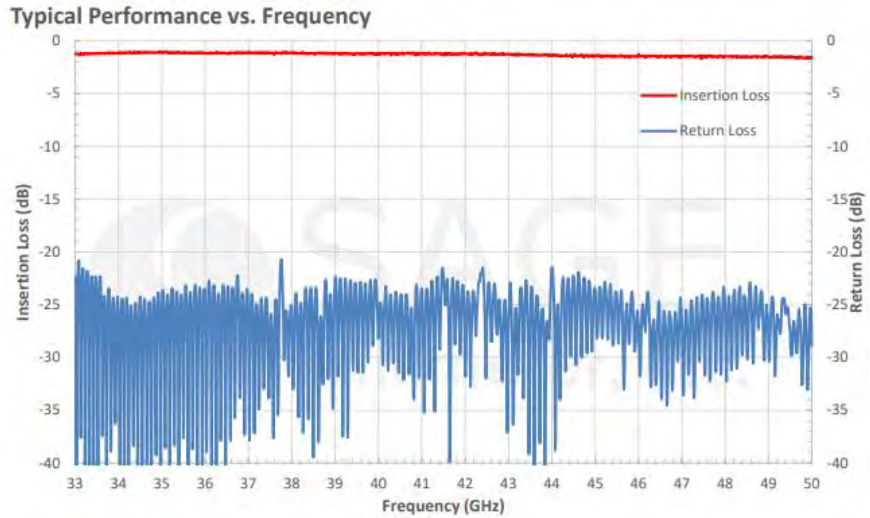
FAMILY: SWG
Q BAND

SWG-22354-FB-FT-A-G

Features:

- 33 to 50 GHz
- Full Waveguide Band
- Various Length
- WR-42 to WR-10
- 100+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	33 GHz		50 GHz
Insertion Loss		2.3 dB	
Return Loss		14 dB	
Specification Temperature		+25 ˚C	
Operation Temperature	-40 ˚C		+85 ˚C



WAVEGUIDE, FLEXIBLE

FAMILY: SWG
W BAND

SWG-10020-FB-F

Features:

- 75 to 110 GHz
- Full Waveguide Band
- Various Length
- WR-42 to WR-10
- 100+ Models to Support 5G Bands
- Frequency up to 110 GHz

Parameter	Minimum	Typical	Maximum
Frequency	75 GHz		110 GHz
Insertion Loss		1.5 dB	
Return Loss	10 dB	15 dB	
Power Handling (CW/PK)		15 W / 1 kW	30 W / 2.5 kW
Specification Temperature		+25 ˚C	
Operation Temperature	-40 ˚C		+85 ˚C

WAVEGUIDE, BENDS & TWISTS

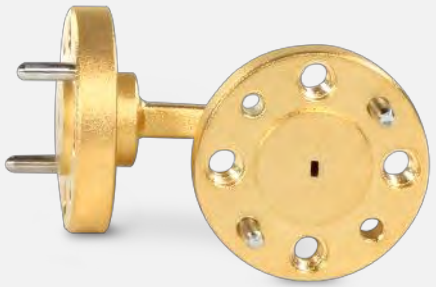
FAMILY: SWB
WR-42 to WR-03

Features:

- WR-42 to WR-03
- Various Length
- 500+ Models to Support 5G Bands
- Frequency up to 325 GHz

SWB-10090-HB
WR-10 H-Plane Bend, 90°

SWB-28090-EB
WR-28 E-Plane Bend, 90°



SWB-06090-EB
WR-06 E-Plane Bend, 90°

SWB-06090-TB
WR-06 Twist, 90°

SWB-12090-TB
WR-12 Twist, 90°

SWB-10090-TB
WR-10 Twist, 90°

WAVEGUIDE CONNECTOR UNI-GUIDE™

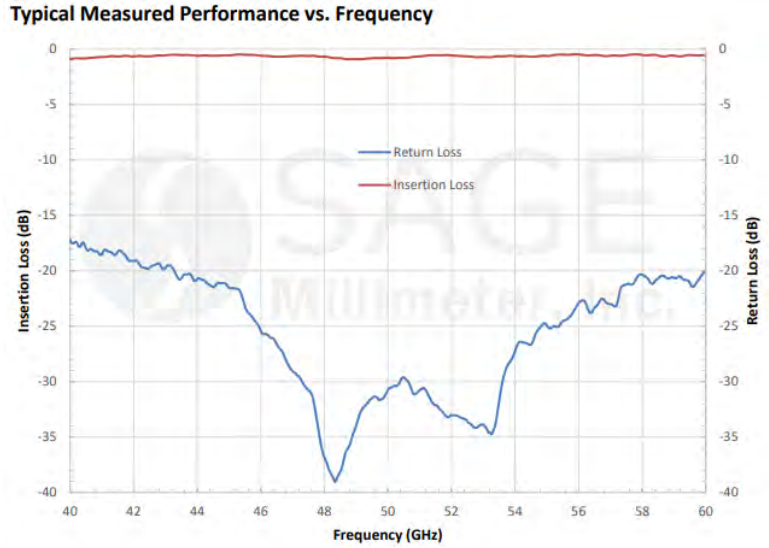
FAMILY: SUF
U BAND

SUF-1912-480-S1

Features:

- 40 to 60 GHz
- WR-28, WR-22 and WR-19 Bands
- 3 Models to Support 5G Bands
- Field Replaceable
- Interchangeable with Correspondent Coax Connector
- Hermetical Package Preservation

Parameter	Minimum	Typical	Maximum
Frequency Range	40 GHz		60 GHz
Insertion Loss		0.7 dB	
Return Loss		20 dB	
Power Handling			100 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



COAX ADAPTER (IN SERIES)

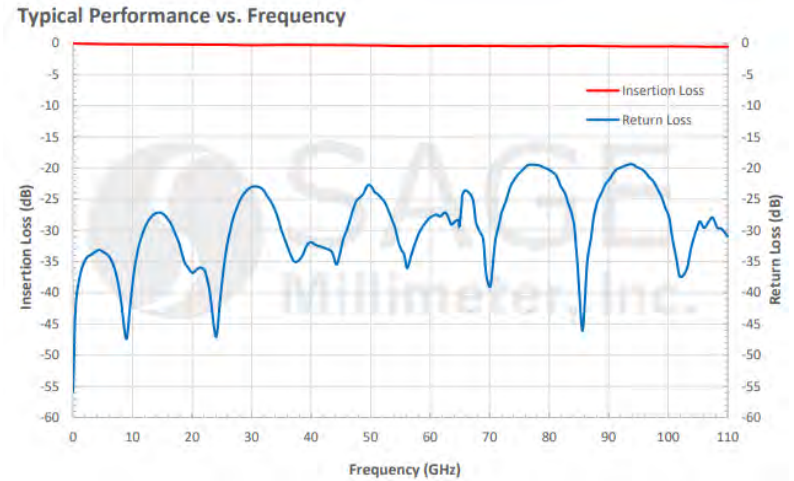
FAMILY: SCT
DC to 110 GHz

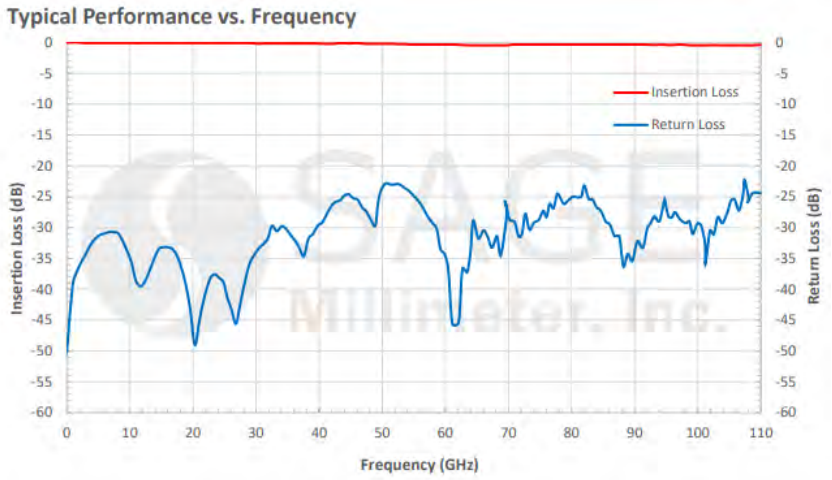
More Than 50 Models

1 mm, 1.35 mm, 1.85 mm, 2.4 mm, 2.92 mm, SMP, SMA

SWC-101F-R1
DC to 110 GHz

SCT-1M1M-UB
DC to 110 GHz





COAX ADAPTER (BETWEEN SERIES)

FAMILY: SCT
DC to 110 GHz

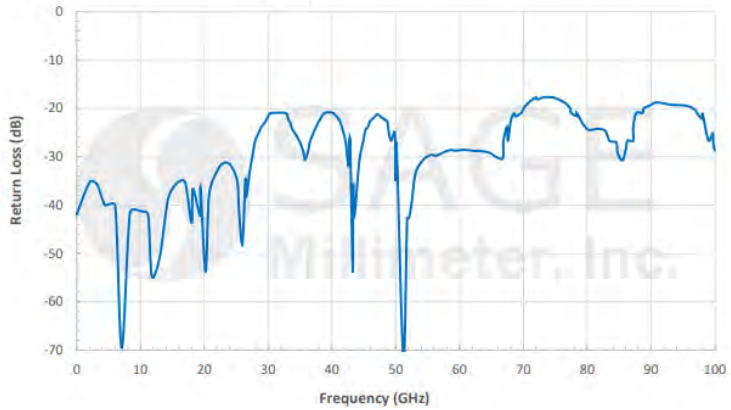
More Than 50 Models

1 mm, 1.35 mm, 1.85 mm, 2.4 mm, 2.92 mm, SMP, SMA

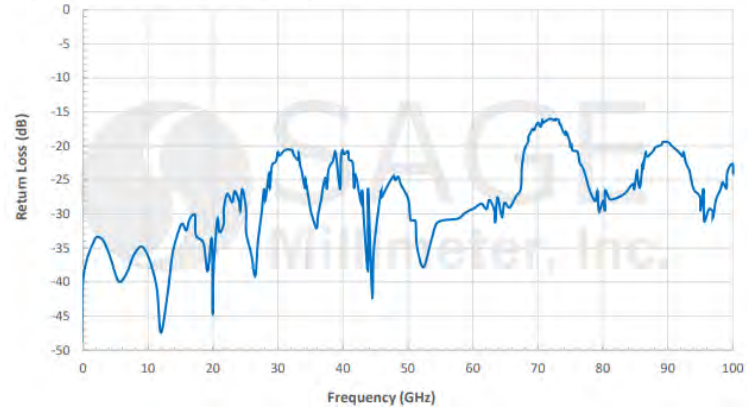
SCT-AF1M-UB
DC to 100 GHz

SCT-AF1F-UB
DC to 100 GHz

Typical Return Loss vs. Frequency



Typical Return Loss vs. Frequency



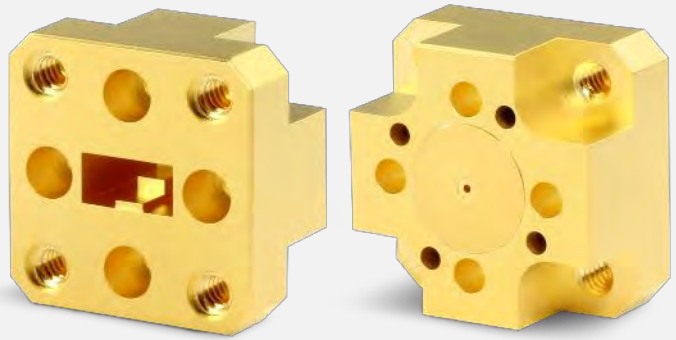
WAVEGUIDE CONNECTOR UNI-GUIDE™

FAMILY: SUF
Ka BAND

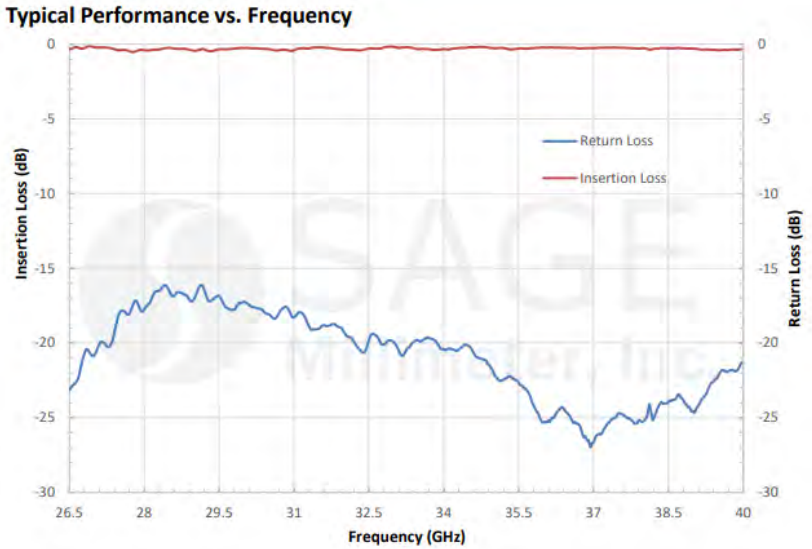
SUF-2812-480-S1

Features:

- 26.5 to 40 GHz
- WR-28, WR-22 and WR-19 Bands
- 3 Models to Support 5G Bands
- Field Replaceable
- Interchangeable with Correspondent Coax Connector
- Hermetical Package Preservation



Parameter	Minimum	Typical	Maximum
Frequency Range	26.5 GHz		40.0 GHz
Insertion Loss		0.5 dB	
Return Loss		20 dB	
Power Handling			100 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C



WAVEGUIDE CONNECTOR UNI-GUIDE™

FAMILY: SUF
Q BAND

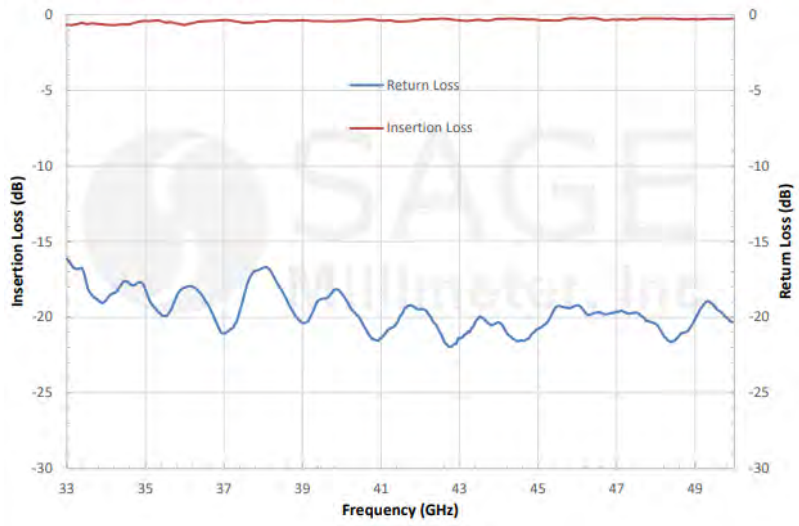
SUF-2212-480-S1

Features:

- 33 to 50 GHz
- WR-28, WR-22 and WR-19 Bands
- 3 Models to Support 5G Bands
- Field Replaceable
- Interchangeable with Correspondent Coax Connector
- Hermetical Package Preservation

Parameter	Minimum	Typical	Maximum
Frequency Range	33 GHz		50 GHz
Insertion Loss		0.6 dB	
Return Loss		20 dB	
Power Handling			100 W (CW)
Specification Temperature		+25 °C	
Operating Temperature	-40 °C		+85 °C

Typical Performance vs. Frequency



COAX ADAPTER (FIXED)

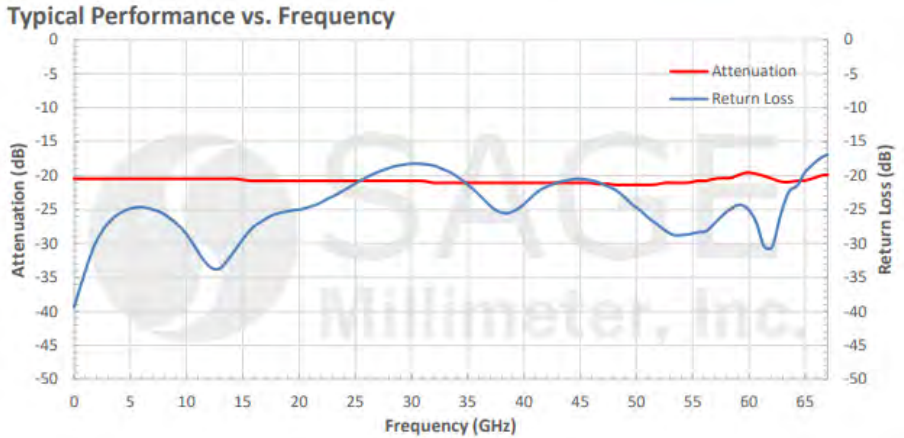
FAMILY: SCA
DC to 67 GHz
3 dB THRU 30 dB

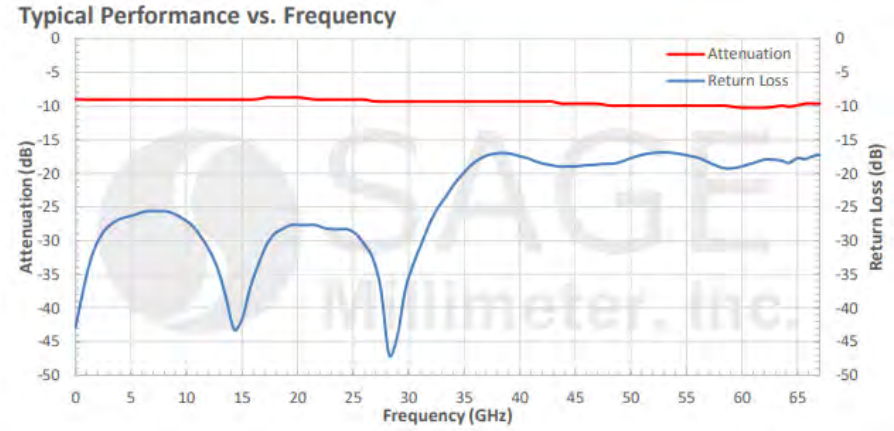
More Than 50 Models

1.85 mm, 2.4 mm, 2.92 mm. 3.5 mm and SMA

SCA-20-VMVF-S9
DC to 67 GHz

SCA-10-VMVF-S9
DC to 67 GHz





COAX MATCHING LOAD

FAMILY: STQ-CM
DC to 67 GHz

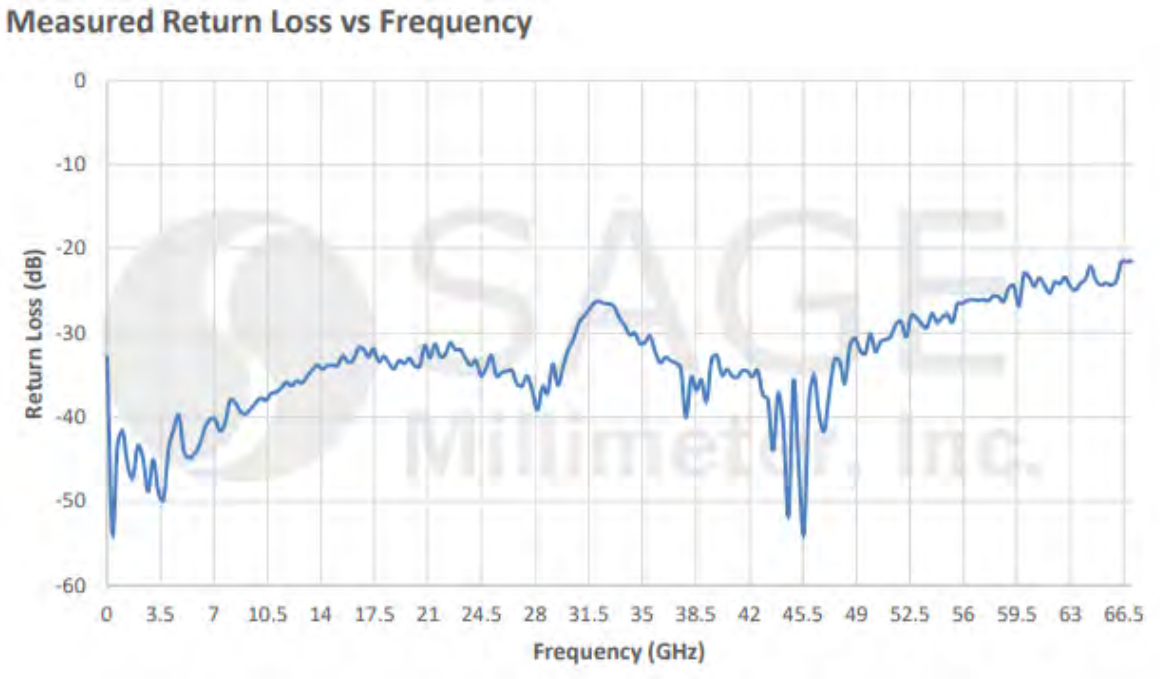
More Than 6 Models

1.85 mm, 2.4 mm, 2.92 mm

STQ-CM-KF27-U2
DC to 50 GHz

STQ-CM-VM27-U2
DC to 67 GHz

STQ-CM-2M27-U2
DC to 40 GHz



COAX DC BLOCK

FAMILY: SCB
DC to 67 GHz

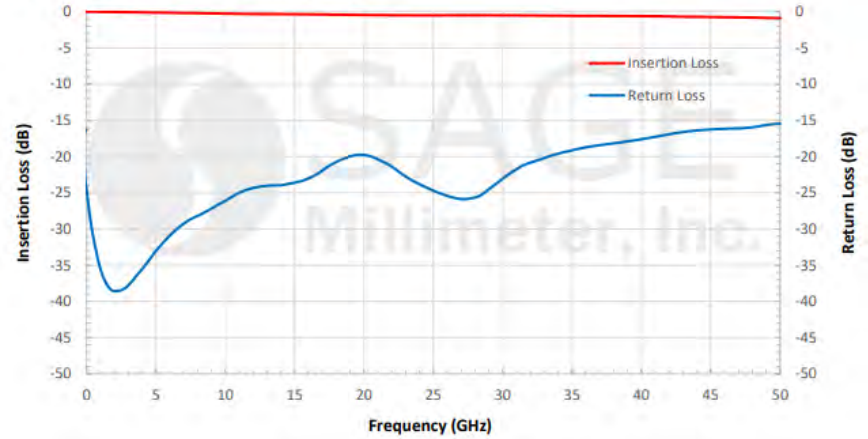
5 Models

1.85 mm, 2.4 mm, 3.5 mm, 2.92 mm

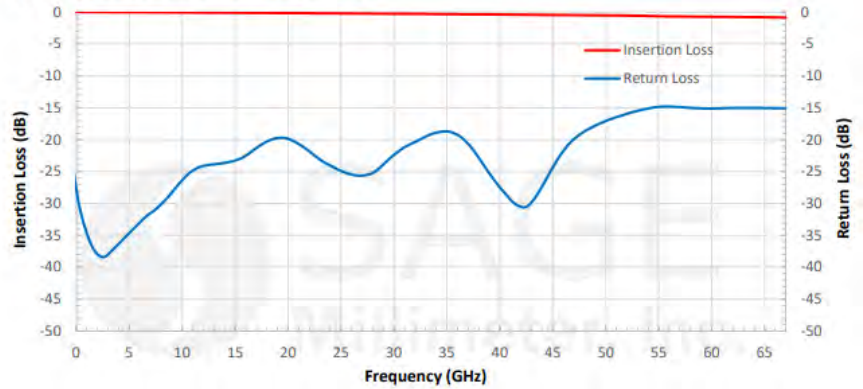
SCB-050-2F2M-U2
DC to 50 GHz

SCB-016-VFVM-U2
DC to 67 GHz

Typical Performance vs. Frequency



Typical Performance vs. Frequency



COAX BIAS TEE

FAMILY: SCV
DC to 85 GHz

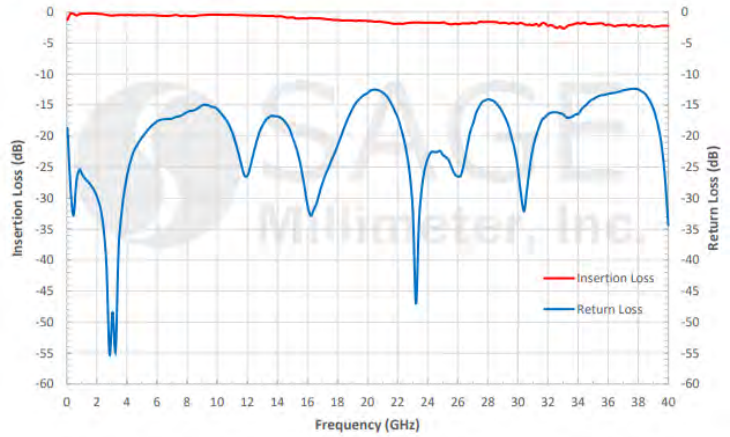
5 Models

1.85 mm, 2.4 mm, 3.5 mm, 2.92 mm

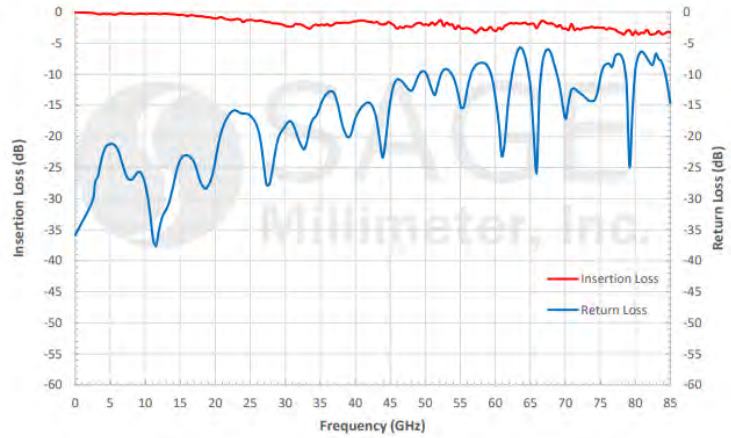
SCV-000403302508-KFKF-U3
DC to 40 GHz

SCV-000853402505-VFVF-U3
DC to 85 GHz

Typical Performance vs. Frequency



Typical Performance vs. Frequency



COAX CABLES (FLEXIBLE)

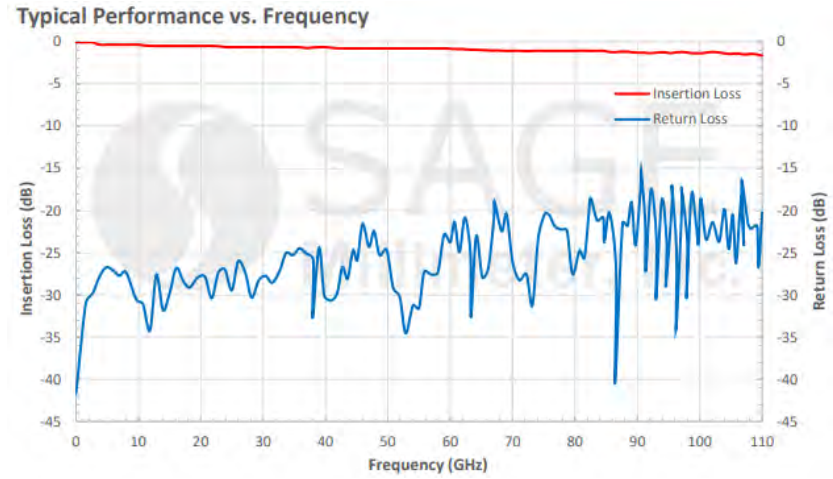
FAMILY: SCW
DC to 110 GHz

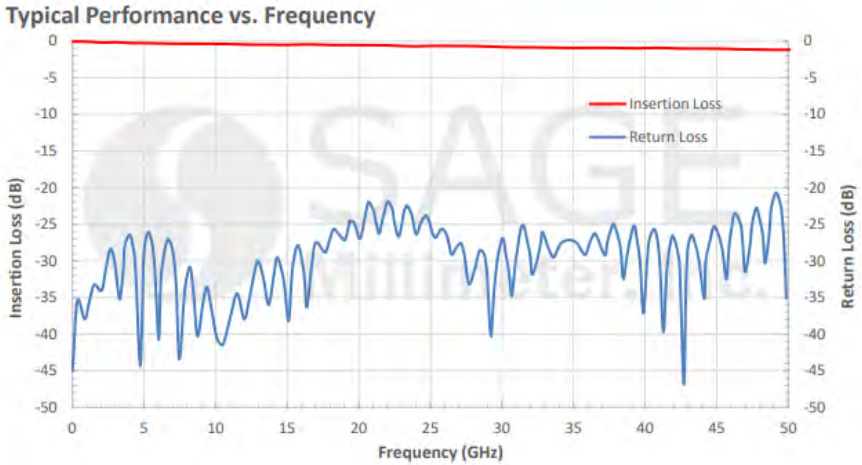
More Than 50 Models

1 mm, 1.85 mm, 2.4 mm, 2.92 mm

SCW-1M1M003-F1
DC to 110 GHz, 3”

SCW-2M2M006-F1
DC to 50 GHz, 6”





COAX CABLES (SEMI RIGID)

FAMILY: SCW
DC to 110 GHz

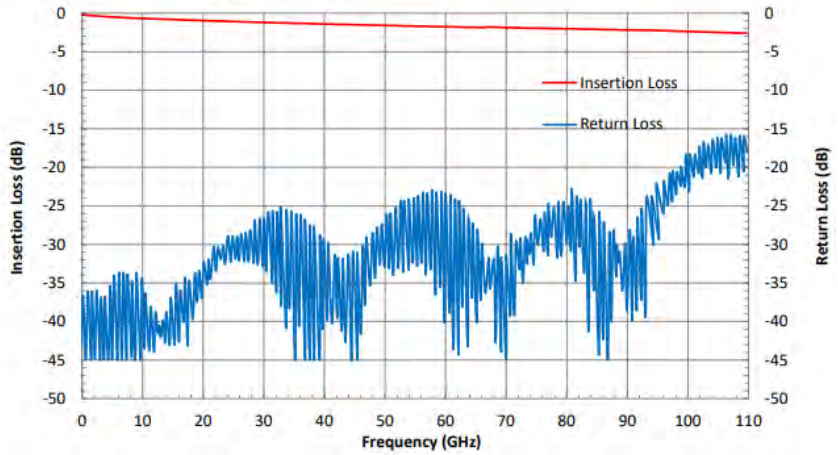
More Than 50 Models

1 mm, 1.85 mm, 2.4 mm, 2.92 mm

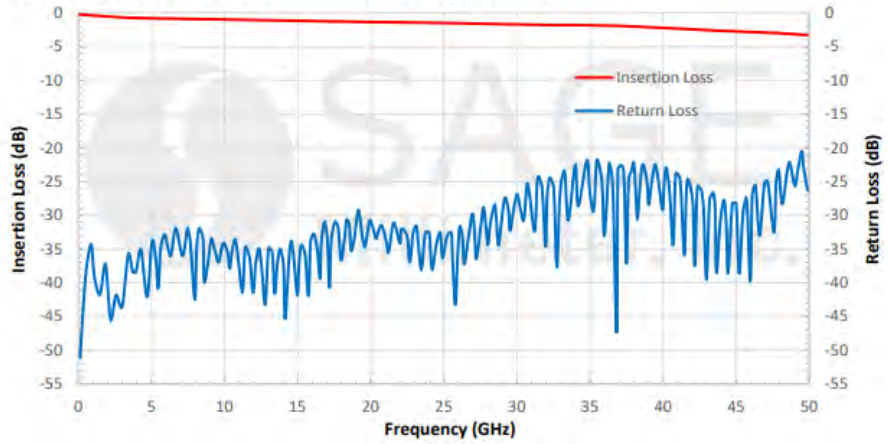
SCW-1M1M006-S1
DC to 110 GHz, 6”

SCW-2M2M012-S1
DC to 50 GHz, 12”

Typical Performance vs. Frequency



Typical Insertion Loss & Return Loss vs. Frequency



SUBASSEMBLIES

SUBASSEMBIES INDUSTRIAL & SCIENTIFIC SYSTEMS

- Eravant has designed and manufactured many integrated models for industrial and scientific system applications.
- In addition, many communication and Radar sub-assemblies can be constructed by using **Eravant** components.
- This presentation includes some examples for introduction/illustration purpose.
  - **SSS:** Doppler Sensor Heads - Without Antennas
  - **SSP:** Ranging Sensor Heads - Without Antennas
  - **SSM:** Doppler Sensor Modules
  - **SSD:** Ranging Sensor Modules
  - **SSR:** Receiver Modules
  - **SST:** Transceiver Modules
  - **SSC:** Transceiver Modules
  - **SSK:** Custom Build Transceivers

DOPPLER SENSOR MODULE

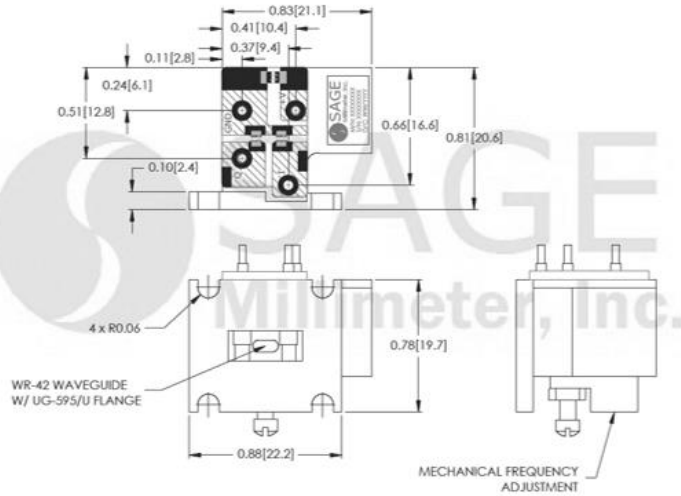
FAMILY: SSM
24.125 GHz

SSM-24307-D1-1

Features:

- 24.125 GHz Operation
- Low Flicker Noise
- Low Harmonic Emission
- FCC Part 15 Compliant
- Volume Production Ready

Parameter	Minimum	Typical	Maximum
RF Frequency Range	24.00 GHz	24.125 GHz	24.20 GHz
Transmitting Power		+7 dBm	
Receiver I/Q Phase Δ	60°		120°
Receiver I/Q Amplitude Δ		0 dB	3 dB
IF Frequency Range	DC		100 MHz
IF Offset Voltage		±0.5 V_{DC}	
Frequency Stability		-0.8 MHz/°C	
Power Stability		-0.03 dB/°C	
DC Supply Voltage		+5 V_{DC}/250 mA	
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C



RANGING SENSOR MODULE

FAMILY: SSP
24.125 GHz

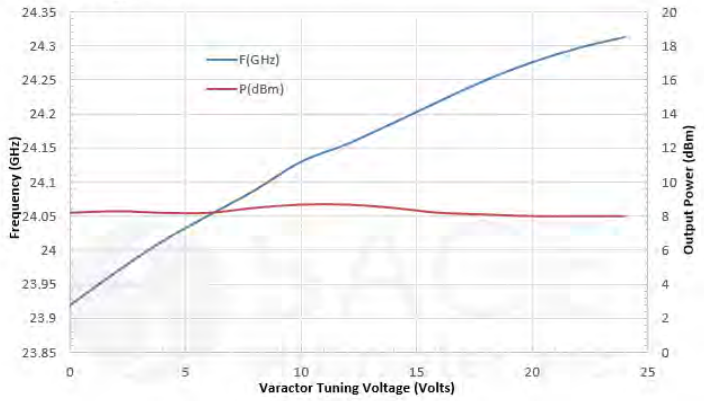
SSP-24303-D1

Features:

- 24.125 GHz FMCW Operation
- Low Flick Noise and High Sensitivity
- Low Harmonic Emission
- Directional Detection Capable
- Volume Production Ready

Parameter	Minimum	Typical	Maximum
TX Center Frequency		24.125 GHz	
TX Power		+3 dBm	
FMCW Tuning Bandwidth	±100 MHz	±150 MHz	
FMCW Tuning Voltage		0 to +20 Volts	
RX I/Q Phase Δ		80 to 100°	60 to 120°
RX I/Q Amplitude Δ		0 to 3 dB	
IF Frequency Range	DC		100 MHz
IF Offset Voltage		-0.5 to -1.0 V_{DC}	
Frequency Stability		-1.5 MHz/°C	
Power Stability		-0.03 dB/°C	
DC Supply Voltage		+5 V_{DC}/250 mA	+5.5 V_{DC}
Specification Temperature		+25 ˚C	
Operating Temperature	-40 ˚C		+85 ˚C

Typical Performance of Varactor Tuned Oscillator
Gunn Bias: +5 V_{DC}/183 mA



DOPPLER SENSOR HEADS, MICROSTRIP ARRAY ANTENNA

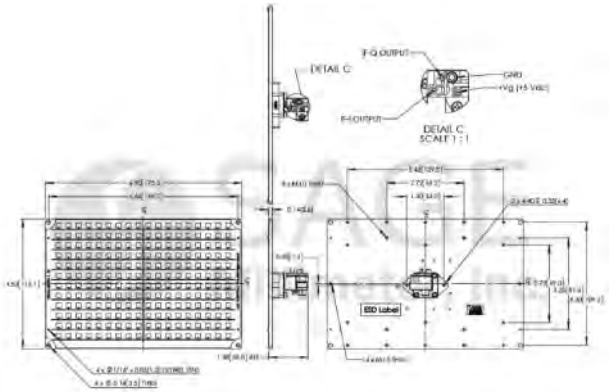
FAMILY: SSS
24.125 GHz

SSS-24307-27M-DW

Features:

- Doppler Sensor
- 24 GHz Operation
- Patch Array
- Volume Production Ready

Parameter	Minimum	Typical	Maximum
Antenna 3 dB Beamwidth		4.6° (H) x 6.8° (V)	
Antenna Side Lobes		-20 dBc	
Antenna Gain		27 dBi	
Antenna Polarization		Linear	
RF Frequency Range	24.050 GHz	24.125 GHz	24.200 GHz
Transmitting Power		+7 dBm	
Receiver I/Q Phase Δ	60°		120°
Receiver I/Q Amplitude Δ		0 dB	3 dB
IF Frequency Range	DC		100 MHz
IF Offset Voltage		-0.5 V_{DC}	
Frequency Stability		-0.8 MHz/°C	
Power Stability		-0.03 dB/°C	
DC Supply Voltage		+5 V_{DC}/250 mA	+5.5 V_{DC}
Specification Temperature		+25°C	
Operating Temperature	-40°C		+85°C



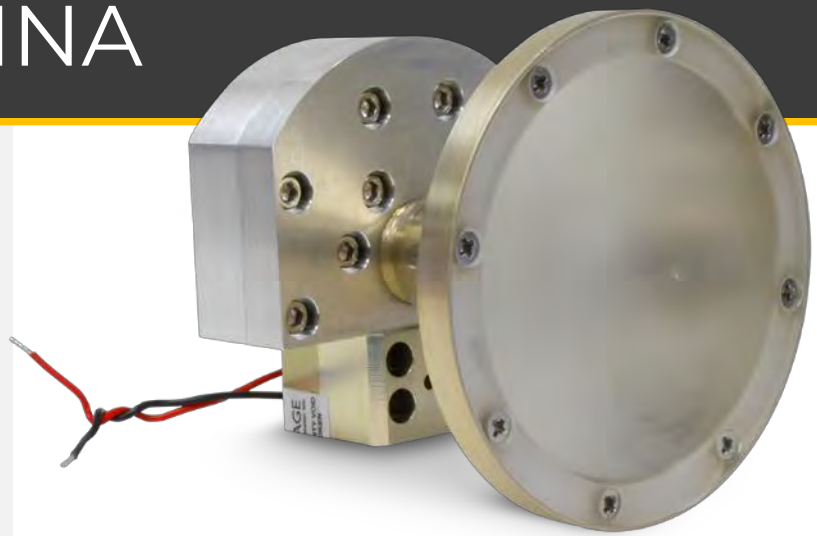
DOPPLER SENSOR HEADS, LENS CORRECTED ANTENNA

FAMILY: SSS
35 GHz

SSS-35310-22L-D2

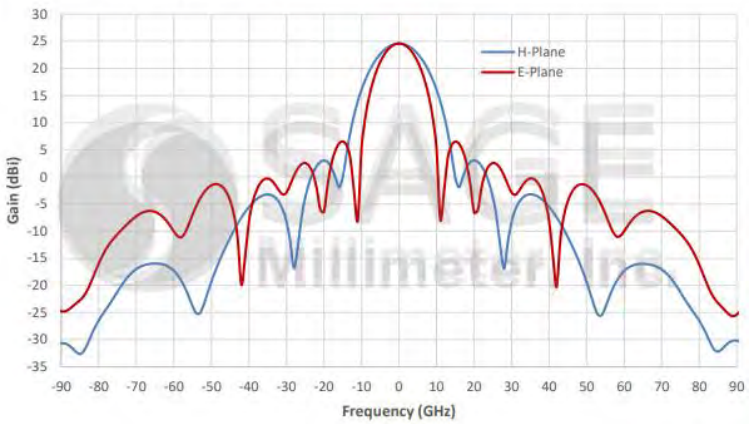
Features:

- Doppler Directional Sensor
- 35 GHz Operation
- Lens Corrected Antenna
- Volume Production Ready



Parameter	Minimum	Typical	Maximum
Antenna 3 dB Beamwidth		12°	
Antenna Side Lobes		-20 dB	
Antenna Gain		22 dBi	
Antenna Polarization		Right-Handed Circular	
RF Frequency Range	33.9 GHz	35.0 GHz	36.1 GHz
Transmitting Power		+10 dBm	
Receiver Gain		19 dB	
Receiver Noise Figure		2.5 dB	
Receiver I/Q Phase Δ	80°		100°
Receiver I/Q Amplitude Δ	0 dB		3 dB
IF Gain		35 dB	
IF Frequency Range	5 Hz		2 MHz
IF Offset Voltage		±0.1 V_{DC}	
System Gain		41 dB	
Frequency Stability		- 0.3 MHz/°C	
Power Stability		- 0.03 dB/°C	
DC Supply Voltage		+5.5 V_{DC}/350 mA	
Specification Temperature		+25°C	
Case Temperature	-40°C		+85°C

Simulated Patterns @ 35 GHz

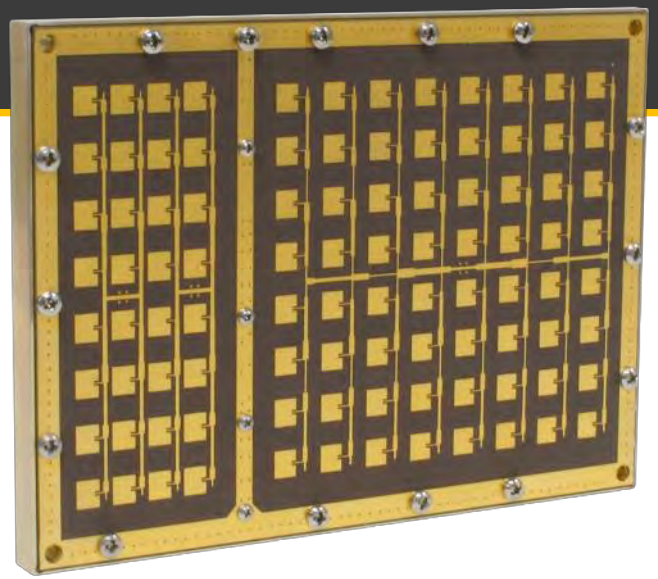


RANGING SENSOR MODULE, DIRECTIONAL

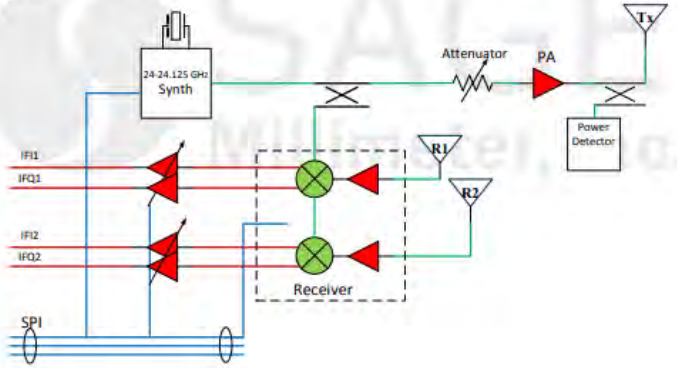
FAMILY: SSS
24.125 GHz

SSD-24307-2216M-A1

Parameter	Minimum	Typical	Maximum
Antenna			
Antenna Bandwidth		1,000 MHz @ VSWR <2:1	
Antenna Gain, Tx		22 dBi	
Antenna Gain, Rx		16 dBi	
Antenna Beamwidth, Tx		12˚(H) x 12˚(V)	
Antenna Beamwidth, Rx		12˚(H) x 50˚(V)	
Antenna Side Lobes, Tx		-20 dBc @ Elevation & Azimuth > ±20°	
Antenna Side Lobes, Rx		-20 dBc @ Elevation & Azimuth > ±20°	
Transmitter			
Transmit Frequency	24.000 GHz	24.125 GHz	24.250 GHz
Frequency Stability		-0.04 MHz/°C	
Output Power, EIRP	+12 dBm		+27 dBm
Phase Noise		-70 dBc/Hz @ 1 kHz PLL Locked -75 dBc/Hz @ 10 kHz PLL Locked -75 dBc/Hz @ 100 kHz PLL Locked	
FMCW Sweep Time	50 us		
Receiver			
Receiver Noise Figure			17 dB, SSB @ 100 kHz
IF Gain Range	21 dB		64 dB
IF, low *f* cutoff		50 Hz	
IF Bandwidth		1,000 kHz	
Receiver I/Q Channel		Channel One and Two	
Receiver I/Q Phase Δ		±10˚	
Receiver I/Q Amplitude Δ		±2 dB	
IF Frequency Range	DC		1,000 kHz
IF Offset Voltage		-0.5 V_{DC}	
Frequency Stability		±5 ppm	
Power Stability		- 0.03 dB/°C	
Operating Temperature	-25˚C		+60˚C
Supply Voltage	+5.0 V_{DC}	+5.5 V_{DC}	+6.0 V_{DC}
Supply Current		280 mA	



Block Diagram:



RECEIVER MODULE

FAMILY: SSR
W BAND

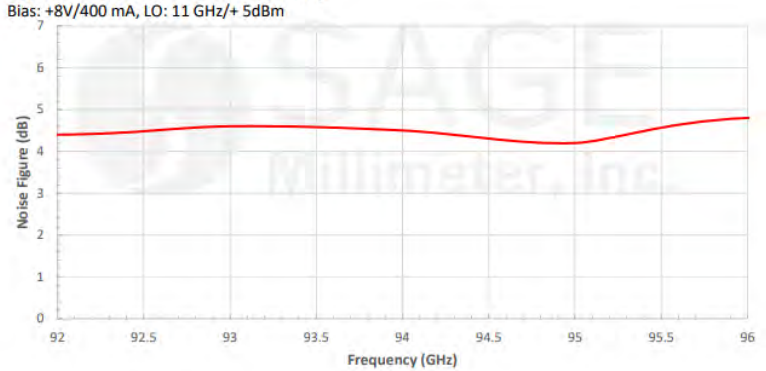
SSR-9430434030-10-M1-D

Features:

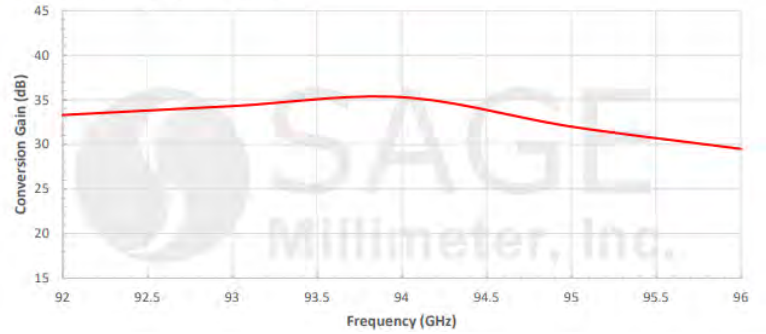
- 92 to 96 GHz
- Compact Size
- Fully Integrated
- More than 20 Models to Support Communication Systems

Parameter	Minimum	Typical	Maximum
RF Input Frequency	92 GHz		96 GHz
RF Input Power		-60 dBm	-24 dBm
Noise Figure		4 dB	
IF Output Frequency	4 GHz		8 GHz
I/Q Phase Unbalance		±15°	
I/Q Amplitude Unbalance		±1.0 dB	
RF to IF Conversion Gain		30 dB	
LO Frequency		11 GHz	
LO Input Power	0 dBm	+5 dBm	+10 dBm
DC Voltage Supply	+6 V_{DC}	+8 V_{DC}	+12 V_{DC}
Current Supply		400 mA	
Specification Temperature		+ 25 °C	
Operating Temperature	0 °C		+ 50 °C

Typical Noise Figure vs. Frequency
Bias: +8V/400 mA, LO: 11 GHz/+ 5dBm



Typical Conversion Gain vs. Frequency
Bias: +8V/400 mA, LO: 11 GHz/+ 5dBm



RECEIVER MODULE

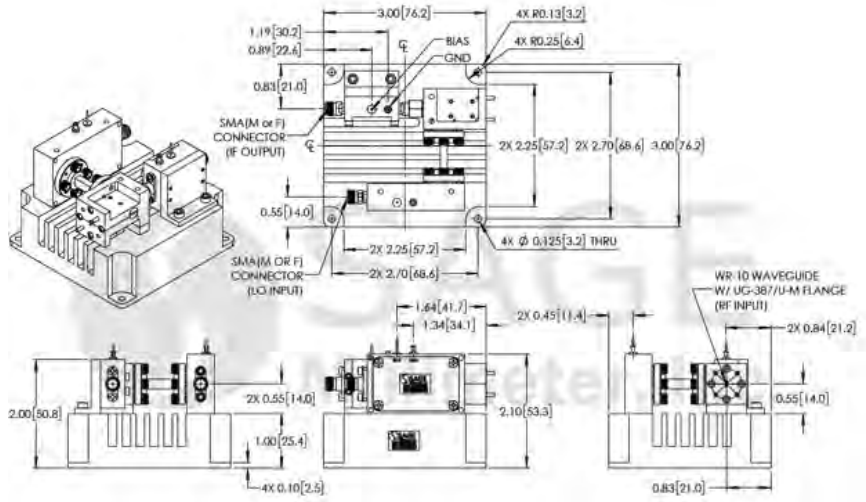
FAMILY: SSR
W BAND

SSR-9333531430-10-B1

Features:

- 75 to 110 GHz
- Bolt Together Solution
- More than 20 Models to Support Communication Systems

Parameter	Minimum	Typical	Maximum
RF Input Frequency	75 GHz		110 GHz
RF Input Power		-60 dBm	-10 dBm
Damage RF Power			-10 dBm
Noise Figure		14 dB	19 dB
IF Output Frequency	10 MHz		3 GHz
RF to IF Conversion Gain		30 dB	
LO Frequency	12.5 GHz		18.33 GHz
LO Input Power	+1 dBm	+2 dBm	+5 dBm
LO DC Bias Voltage	+10 V_{DC}	+12 V_{DC}	+14 V_{DC}
LO DC Bias Current		760 mA	
Specification Temperature		+ 25 °C	
Operating Temperature	0 °C		+ 50 °C



RECEIVER MODULE

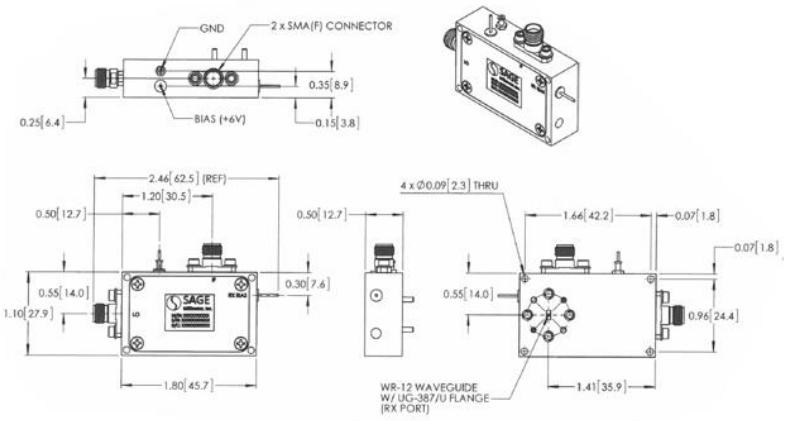
FAMILY: SSR
E BAND

SSR-7930837005-12-S1

Features:

- 71 to 86 GHz
- Compact Size
- Fully Integrated
- More than 20 Models to Support Communication Systems

Parameter	Minimum	Typical	Maximum
RF Input Frequency	71 GHz		86 GHz
IF Frequency Output	DC		12 GHz
LO Input Frequency	8.875 GHz		10.75 GHz
LO Power		+10 dBm	+14 dBm
Conversion Gain		4 dB	
Noise Figure		7 dB	
Harmonic Suppression		20 dB	
DC Bias	+5 V_{DC}	+12 V_{DC}	
DC Current		350 mA	
Specification Temperature		+ 25 °C	
Operating Temperature	0 °C		+ 50 °C



TRANSMITTER MODULE

FAMILY: SST
W BAND

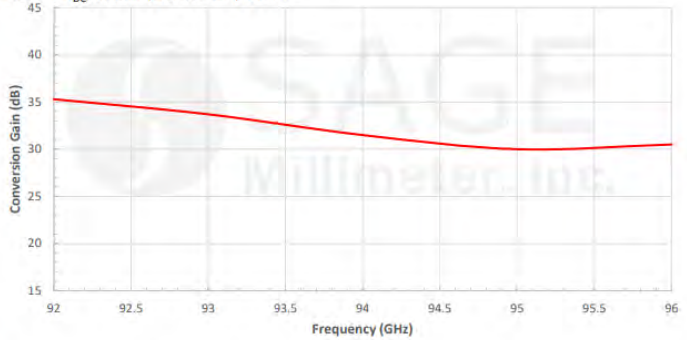
SST-9430432030-10-M1-D

Features:

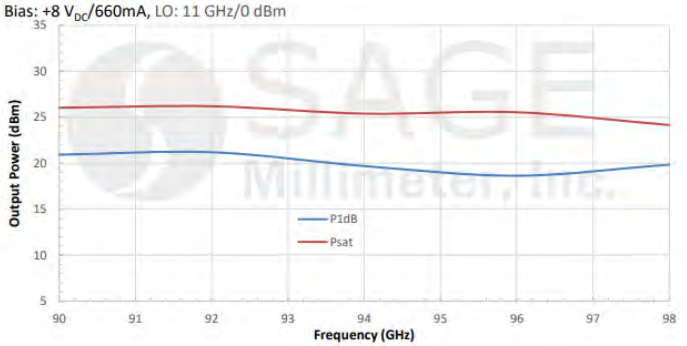
- 92 to 96 GHz
- Compact Size
- Fully Integrated
- More than 20 Models to Support 5G

Parameter	Minimum	Typical	Maximum
RF Output Frequency	92 GHz		96 GHz
IF Input Frequency	4 GHz	6 GHz	8 GHz
IF Input Power		-20 dBm	+7 dBm
RF to IF Conversion Gain		30 dB	
RF Output P_{1dB}/P_{sat}		+20/+24 dBm	
LO Frequency		11.00 GHz	
LO Input Power		0 dBm	+10 dBm
LO DC Voltage Supply	+6 V_{DC}	+8 V_{DC}	+16 V_{DC}
LO Current Supply		750 mA	
Specification Temperature		+ 25 °C	
Operating Temperature	0 °C		+ 50 °C

Typical Conversion Gain vs. Frequency
Bias: +8 V_{DC}/660 mA, LO: 11 GHz/0 dBm



Output Power vs. Frequency
Bias: +8 V_{DC}/660mA, LO: 11 GHz/0 dBm



TRANSMITTER MODULE

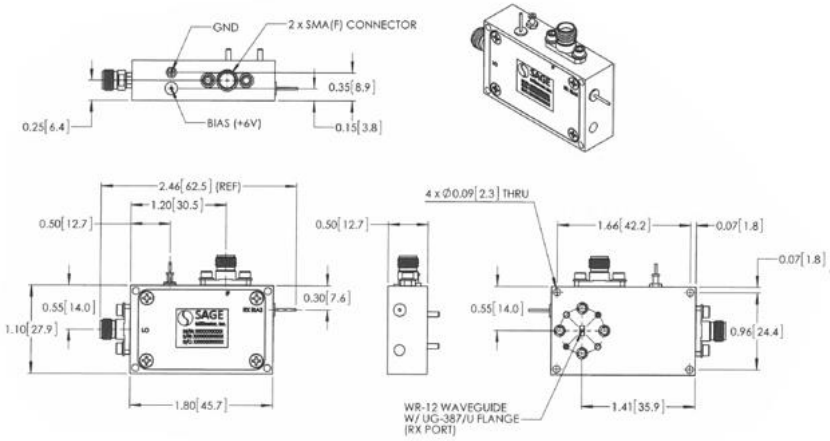
FAMILY: SST
E BAND

SST-7931531010-12-S1

Features:

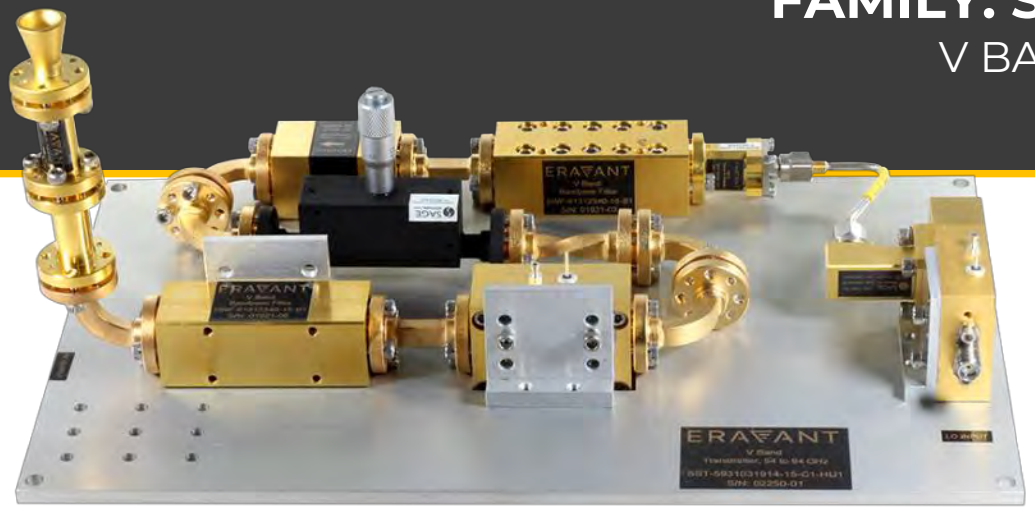
- 71 to 86 GHz
- Compact Size
- Fully Integrated
- More than 20 Models to Support Communication Systems

Parameter	Minimum	Typical	Maximum
RF Output Frequency	71 GHz		86 GHz
Damaged RF Power		+15 dBm	
Output P_{1dB}		+9 dBm	
Output Psat		+12 dBm	
IF Input Frequency	DC		12 GHz
RF to IF Conversion Gain		10 dB	
LO Frequency	11.8 GHz		14.4 GHz
LO Input Power	+5 dBm	+7 dBm	+15 dBm
DC Voltage		+8 V_{DC}	+15 V_{DC}
DC Current		250 mA	
Output Return Loss		10 dB	
Specification Temperature		+25 °C	
Operating Temperature	0 °C		+50 °C



TRANSMITTER MODULE

FAMILY: SST
V BAND

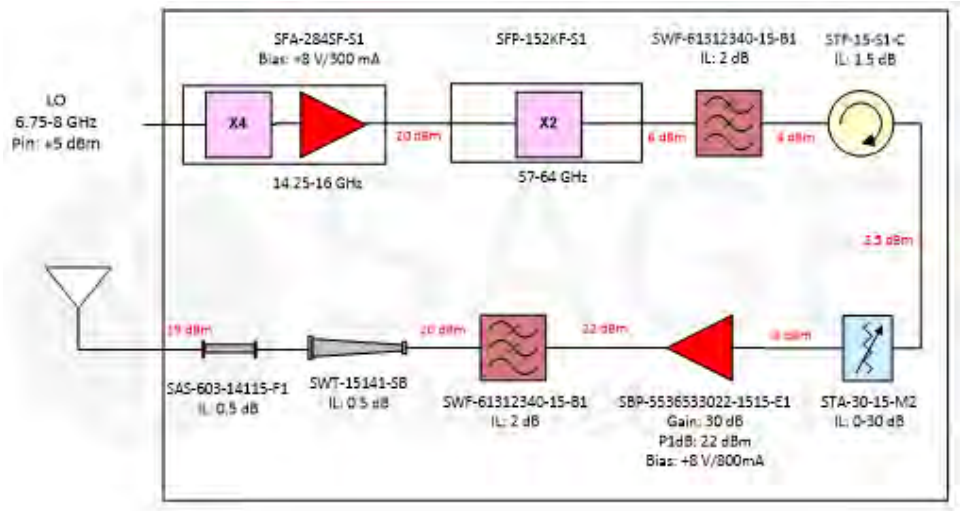


SST-5931031914-15-C1-HU1

Features:

- 54 to 64 GHz
- Bolt-Together Solution
- More than 20 Models to Support Communication Systems

Parameter	Minimum	Typical	Maximum
Output Frequency	54 GHz		64 GHz
TX Output Power		+19 dBm	
TX EIRP		+34 dBm	
LO to TX Linear Gain		14 dB	
Polarization		RHCP	
Horn Antenna Gain		15 dBi	
Amplifier Gain		30 dB	
LO Input Frequency	6.75 GHz		8 GHz
LO Input Power	+2 dBm	+5 dBm	+10 dBm
RF to LO Isolation		28 dB	
Variable Attenuation Range		30 dB	
DC Voltage Supply		+12 V_{DC}	+15 V_{DC}
LO Current Supply		1100 mA	
Specification Temperature		+25 °C	
Operating Temperature	0 °C		+50 °C



TRANSCEIVER MODULE

FAMILY: SSC
E BAND

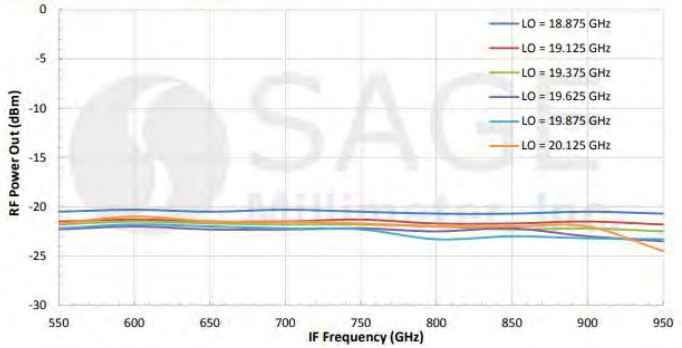
SSC-7737731200-1212-C1

Features:

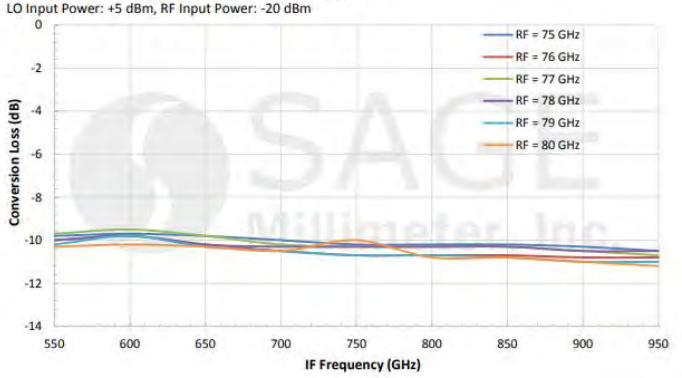
- 76 to 78 GHz
- Compact Size
- Fully Integrated
- Custom Modules Available

Parameter	Minimum	Typical	Maximum
TX RF Output Frequency	76 GHz		78 GHz
TX RF Output Power	-30 dBm		
TX IF Input Frequency	550 MHz		950 MHz
TX IF Input Power			0 dBm
RX RF Input Frequency	76 GHz		78 GHz
RX RF Input Power		-20 dBm	+3 dBm
RX IF Output Frequency	550 MHz		950 MHz
RX Conversion Loss		-12 dB	
LO Frequency	19.0 GHz		19.5 GHz
LO Input Power		+5 dBm	
TX Mixer DC Voltage Supply		+5V_{DC}	+6 V_{DC}
TX Mixer Current Supply		2.0 mA	2.5 mA
RX Mixer DC Voltage Supply		+5 V_{DC}	+6 V_{DC}
RX Mixer Current Supply		2.0 mA	2.5 mA
LO DC Voltage Supply		+6 V_{DC}	
LO Current Supply		300 mA	

Typical TX Output Power vs. IF Frequency
LO Multiplier Bias: +6 V_{DC}/300 mA, Mixer Bias: +2.9 V_{DC}/2 mA
LO Input Power: +5 dBm, IF Input Power: 0 dBm



Typical RX Conversion Loss vs. IF Frequency
LO Multiplier Bias: +6 V_{DC}/300 mA, Mixer Bias: +2.9 V_{DC}/2 mA
LO Input Power: +5 dBm, RF Input Power: -20 dBm



CONCLUSION

- Eravant has designed and fabricated total microwave and millimeterwave band COTS (Commercial of The Shelf) components and sub-assemblies to support full industrial applications. The product families are organized into 10 product families.
  - Antennas
  - Amplifiers
  - Coaxial Passive Components
  - Frequency Converters
  - Control Devices
  - Ferrite Devices
  - Oscillators
  - Subsystems
  - Test Equipment
  - Waveguide Passive Components
- While some of these products as shown in this presentation are designed for and manufactured for Industrial and Scientific systems, many products and custom solutions are available upon request. Contact support@eravant.com for more information.

ERAVANT

NEXT GENERATION MILLIMETERWAVE COMPONENTS

CHECK OUT OUR WEBSITE FOR MORE!

Featuring

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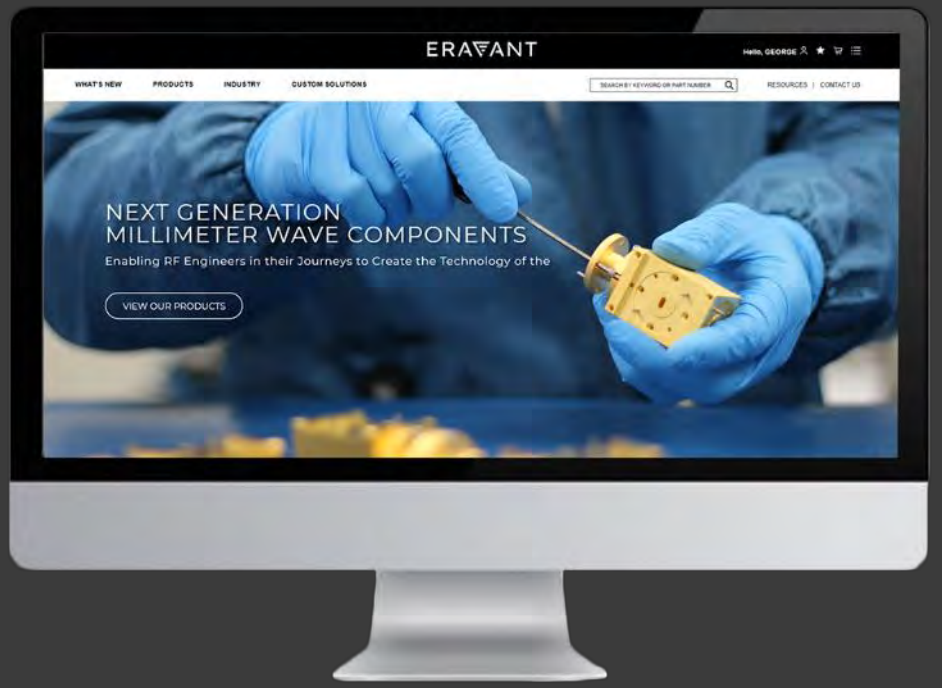
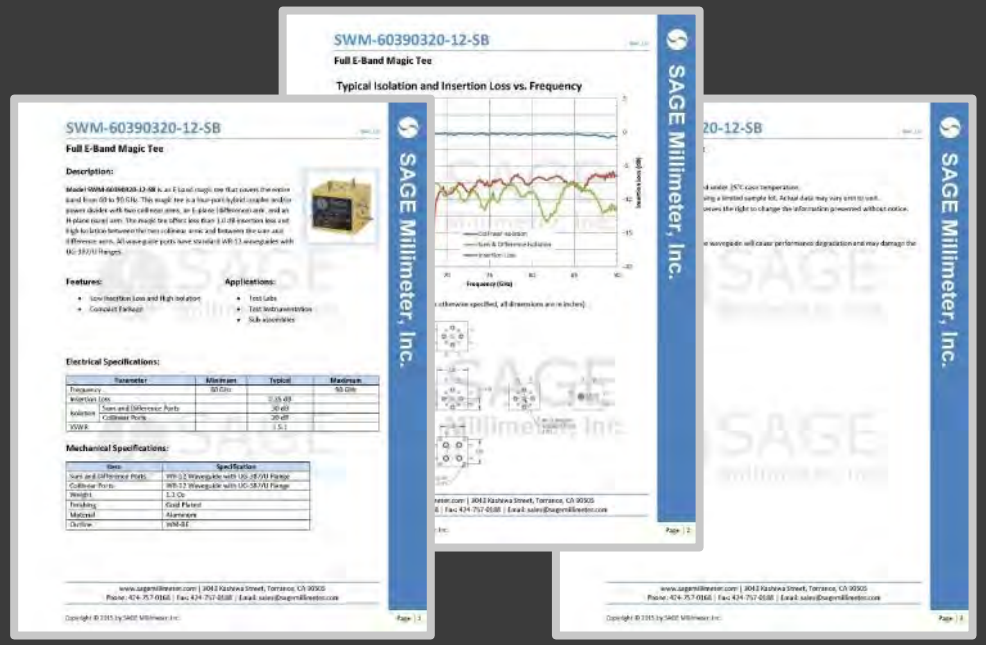
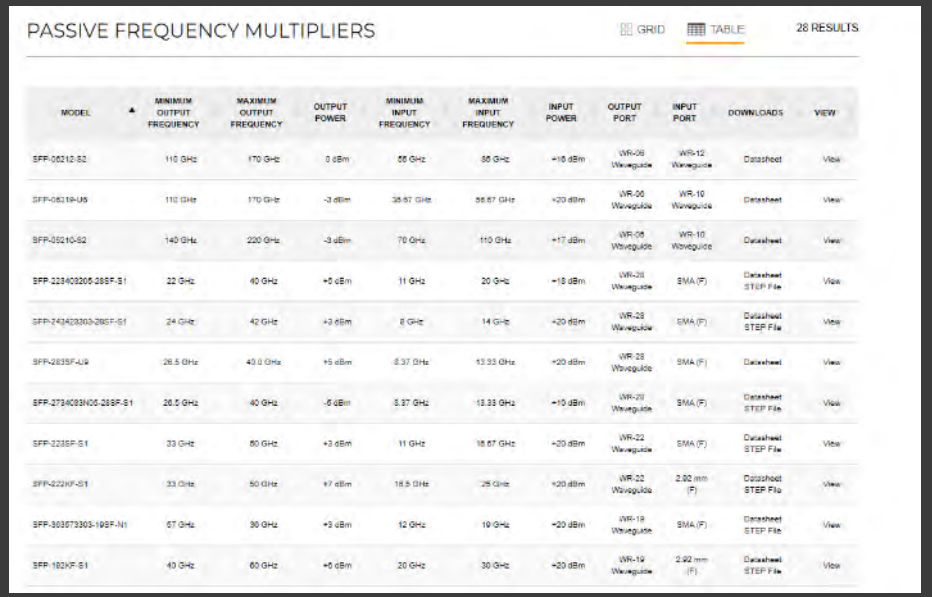
- Price and Delivery Available Online
- Product Categorization Filters
- Blogs, Calculators and Publications







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NEXT GENERATION MILLIMETERWAVE COMPONENTS

ERAVANT is supported by
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