



## Single Side Band Modulator, 18 to 33 GHz Band

### Description:

**Model SFM-18333313-KFKFSF-N1-M** is an 18 to 33 GHz Band single side band modulator that covers the frequency range of 18 to 33 GHz. The typical conversion loss of the modulator is 13 dB with the quadrature IF driving signals of  $\pm 10 V_{p-p}/5 \text{ mA}$  for both I and Q ports. The typical input/output isolation and image rejection is 20 dB, respectively. In addition, the modulator can be readily used as an I/Q mixer or image rejection mixer by using one of the RF as LO port and/or adding the IF hybrid coupler.



### Features:

- Compact Package
- Low Conversion Loss
- High Port Isolations
- IF Port DC Coupled for Phase Detection

### Applications:

- Phase Detection
- Speed and Ranging Radar Systems
- Communication Systems
- Test Equipment

### Electrical Specifications:

Parameter	Minimum	Typical	Maximum
Input RF Frequency Range	18 GHz		33 GHz
Output RF Frequency Range	18 GHz		33 GHz
IF Frequency Range	DC		5.0 GHz
IF I/Q Port Signal Amplitude		$\pm 10 V_{p-p}/5 \text{ mA}$	$\pm 15 V_{p-p}/10 \text{ mA}$
IF I/Q Port Signal Phase		$\pm 90^\circ$	
Conversion Loss		13 dB	18 dB
RF Input P <sub>-1dB</sub>		+6 dBm	
RF In to RF Out Isolation		35 dB	
Image Rejection		20 dB	
RF Damage Power			+16 dBm
Specification Temperature		+25 °	
Operation Temperature	0 °		+85 °

### Mechanical Specifications:

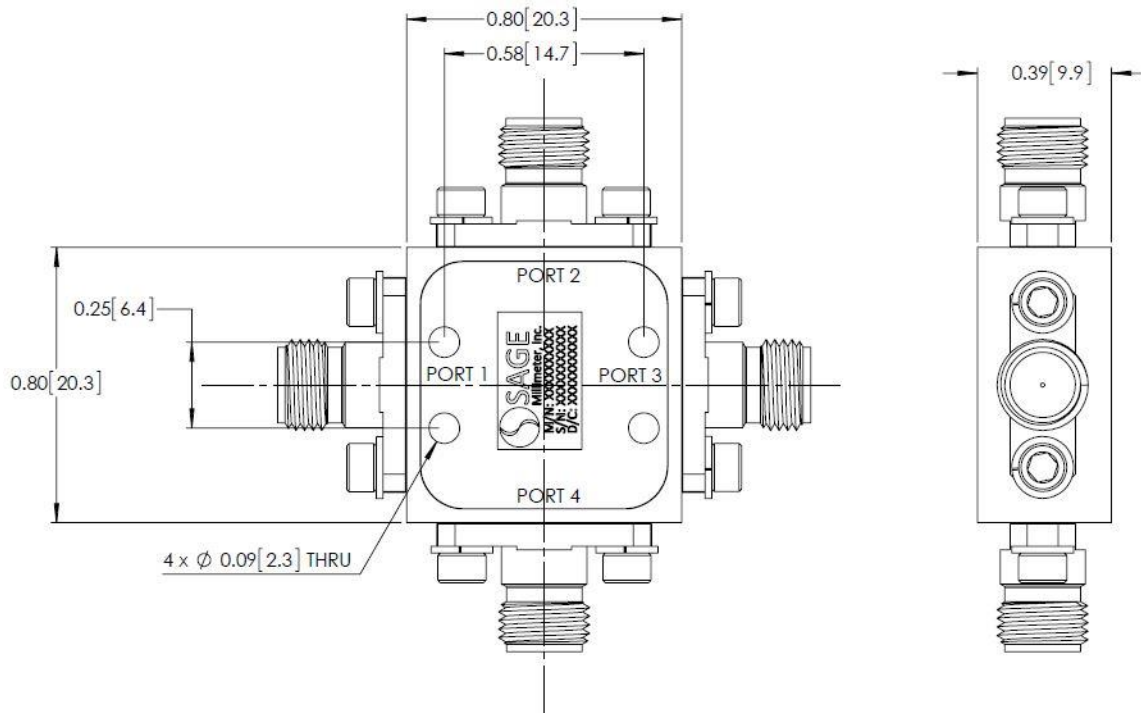
Item	Specification
RF IN	K(F)
RF OUT	K(F)
IF-I	SMA(F)
IF-Q	SMA(F)
Case Material	Aluminum
Finish	Gold Plated
Weight	0.68 Oz
Outline	UH-235-4C





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**Mechanical Outline:** (Unless otherwise specified, all dimensions are in inches [millimeters])



**Note:**

- The I/Q mixer can be configured as an image rejection mixer or used as an I/Q up-converter, single sideband modulator and phase detector.
- SAGE Millimeter, Inc. reserves the right to change the information presented without notice.

**Caution:**

- Exceeding absolute maximum ratings will damage the device.
- The mixer is a static sensitive device. Always follow ESD rules when working with the device.
- The IF ports are DC coupled. Use DC blocks if necessary. **Do not apply an external bias voltage to the IF port.**
- Proper torque,  $8.0 \pm 0.15$  inch-pounds ( $0.92 \pm 0.05$  Nm), should be applied. **SAGE Millimeter torque wrench, model SCH-08008-S1, is highly recommended.**

