Quadrature Mixers and Phase Detectors, SFQ Series

FEATURES:

- Frequency coverage: 18 to 110 GHz
- Balanced configuration for low conversion loss
- Readily to be configured as image rejection mixers
- IF port DC coupling for phase detection

APPLICATIONS:

- Phase detector
- Ranging radar systems
- Communication systems
- Test instrumentation

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DESCRIPTION:

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SFQ series quadrature mixers, or I/Q mixers, are GaAs beam lead Schottky diode- or MMIC device-based mixers. Since the IF port of the quadrature mixer is DC coupled, the mixer can also be used as a phase detector. In addition, these mixers can readily be configured into image rejection mixers or single sideband modulators by adding an IF quadrature coupler.

The below offering covers the frequency range of 18 to 100 GHz, however, additional models can be offered to cover 18 to 110 GHz. The typical LO to RF port isolation of these standard models is 30 dB, which is high enough for most applications without the need for additional port filtering. The below standard models are designed for narrow bandwidth operations with specific package designs to address common industry requirements. However, custom models can be offered to meet differing application needs. Furthermore, subharmonically pumped quadrature mixers are also available. Check the website for more models.

CATALOG MODELS:

Band	Model Number	RF & LO Freq. Range (GHz)	IF Freq. Range (GHz)	Conversion Loss (dB)	LO Power (dBm)	Port Isola-tion (dB)	RF & LO Ports	Outline
K	SFQ-18327313-KFKFSF-F2	18.0 to 26.5	DC to 5.0	13	+17	25.0	K(F)	FM-AC
N/A	SFQ-22333313-KFKFSF-F2	22.0 to 33.0	DC to 5.0	13	+17	25.0	K(F)	FM-AC
Ka	SFQ-30340313-KFKFSF-F2	30.0 to 40.0	DC to 5.0	13	+17	25.0	K(F)	FM-AC
Q	SFQ-33350313-2222SF-F2	33.0 to 50.0	DC to 5.0	13	+17	25.0	WR-22	FQ-Q1
Q	SFQ-33350313-2F2FSF-F2	33.0 to 50.0	DC to 5.0	13	+17	25.0	2.4 (F)	FM-AC
U	SFQ-40350313-1919SF-F2	40.0 to 50.0	DC to 5.0	13	+17	25.0	WR-19	FQ-U1
V	SFQ-57366312-1515SF-F2	57.0 to 66.0	DC to 12.0	12	+12	30.0	WR-15	FQ-V1
E	SFQ-70390313-1212SF-F2	70.0 to 90.0	DC to 12.0	13	+10	30.0	WR-12	FQ-EE
W	SFQ-75310413-1010SF-F2	75.0 to 100.0	DC to 12.0	13	+10	30.0	WR-10	FQ-WE

CUSTOM MODELS:

SAGE Millimeter's quadrature mixer model numbers are configured per the following format. Customers may refer to the format and specify their own model numbers accordingly when placing an order.

SFQ - RFL RFH CL - CR CO CI - XY

RFL is the RF low frequency in MHz x 10N. For example: 38.0 GHz = 383
RFH is the RF high frequency in MHz x 10N. For example: 46.0 GHz = 463
CL is the small signal conversion loss in dB. For example: 14 dB = 14
CR is the RF port connector type. For example: WR-28 = 28
CO is the LO port connector type. For example: K(F) = KF
CI is the IF port connector type. For example: SMA (F) = SF
X is the mixer type. “F” is for fundamental LO and “E” is for externally-biased.
Y is for factory reserve.

Example: SFQ-38346314-22KFSF-E1 is an externally-biased I/Q mixer with an RF center frequency of 38 GHz to 46 GHz, and a conversion loss of 14 dB. The mixer has a WR-22 waveguide at the RF port, a female K connector at the LO port and a female SMA connector at the IF port. “1” is a factory assigned number.