



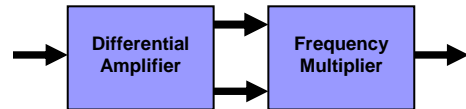
### Frequency Multiplier

GRFM1

#### Description

The GRFM1 is 10 GHz to 20 GHz Frequency multiplier designed on 2 um InGaP HBT process. GRFM1 multiplies the input frequency from 10 GHz to 20 GHz by the factor of 2 so as to produce the output of 20 GHz to 40 GHz. Conversion gain of frequency multiplier is 0dB ±2dB. Power requirement of Frequency multiplier is 2 mA at 4.2 V.

#### Functional Diagram



#### Applications.

- Frequency Multiplier (X 2)
- LMDS, SATCOM, VSAT

#### Key Features

- Wide band operation
- Low power requirement
- Operating Temperature 0 to 85 °C Range
- Pout is -1 dBm

#### Electrical Specification

Conditions: Vcc = 4.2 V, Ic = 26 mA @ 25 °C

Parameter	Min	Typical	Max	Units
Input Frequency Range	10		20	GHz
Gain		0		dB
Pout		-1		dBm
Input Return Loss		7		dB
Output Return Loss		7		dB
Multiplying Factor		2		
Operating Current		26		mA
Supply voltage		4.2		V

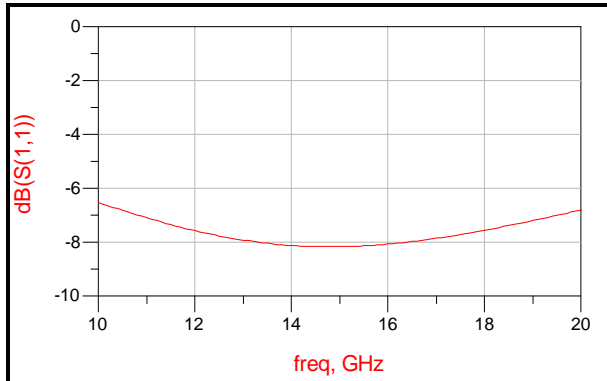


# Frequency Multiplier

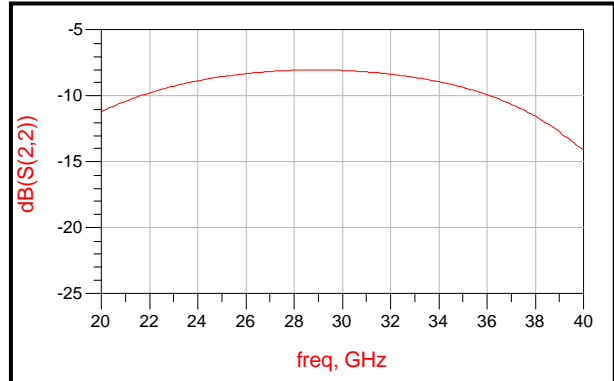
GRFM1

## Simulated Results

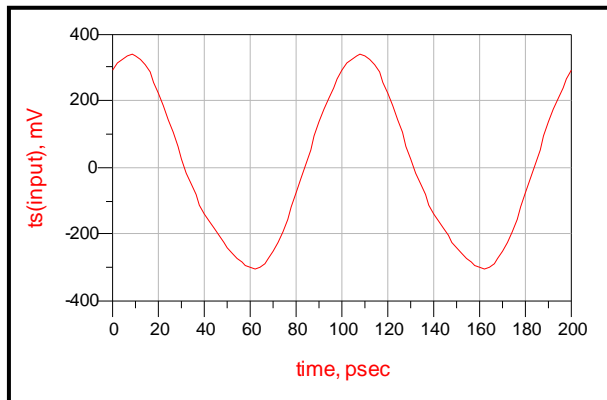
Input Return Loss



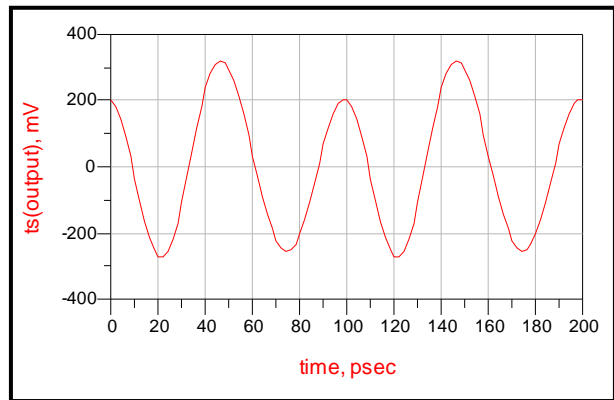
Output Return Loss



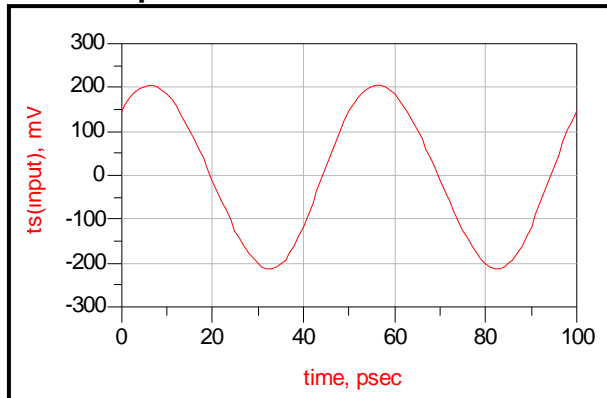
Input waveform at 10 GHz



Output Waveform at 20 GHz



Input Waveform at 20 GHz



Output Waveform at 40 GHz

