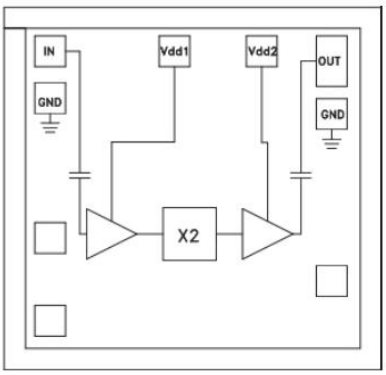
TFMUL2433
24~33 GHz GaAs MMIC x2 Active Frequency Multiplier

★1. Product Features

- High output power: +17 dBm
- Low input power drive: 0 dBm ~ +6 dBm
- Fo isolation: >25 dBc @ Fout = 28 GHz
- 100 kHz SSB phase noise: -132 dBc/Hz
- Single supply: +5 V @ 81 mA
- Die size: 1.18 mm × 1.23 mm × 0.1 mm

Functional diagram



★2. Product Introduction

TFMUL2433 is a ×2 active broadband frequency multiplier utilizing GaAs PHEMT technology. When driven by a +3 dBm signal, the multiplier provides +17 dBm typical output power from 24 GHz to 33 GHz. The Fo and 3Fo isolations are >25 dBc and >36 dBc respectively at 28 GHz.

TFMUL2433 is ideal for use in LO multiplier chains for point-to-point and VSAT radios, yielding reduced parts count versus traditional approaches. The low additive SSB phase noise of -132 dBc/Hz at 100 kHz offset helps maintain good system noise performance.

★3. Electrical Specifications

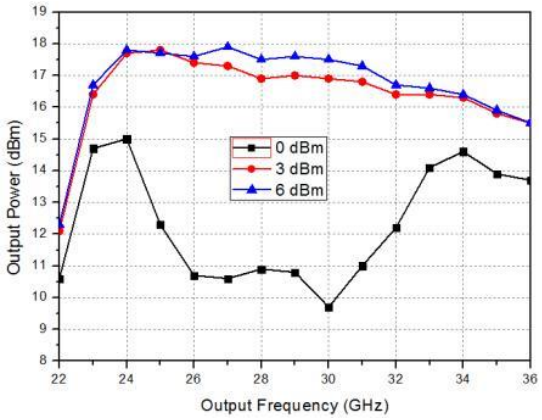
TA = +25 ℃, Vdd1, Vdd2 = 5 V, 3 dBm drive level

Parameter	Min.	Typ.	Max.	Units
Frequency Range, Input		12 - 16.5		GHz
Frequency Range, Output		24 - 33		GHz
Output Power	12	17		dBm
Fo Isolation (with respect to output level)		22		dBc
3Fo Isolation (with respect to output level)		35		dBc
Input Return Loss		10		dB
Output Return Loss		15		dB
SSB Phase Noise (100 kHz Offset)		-132		dBc/ Hz
Supply Current (Idd1 & Idd2)		85		mA

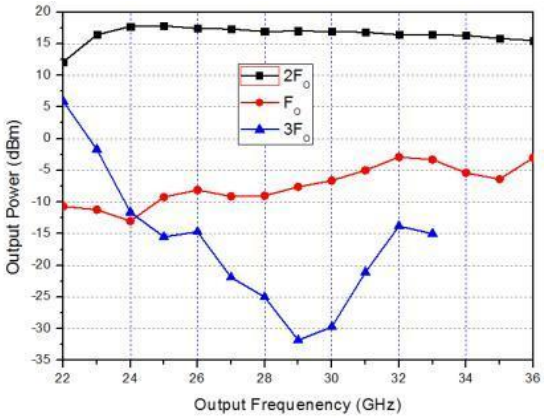
Email: ttf@ttfelectronic.com
Website:ttfelectronic.com
Address: Building 16, Area C, Entrepreneurship and R&D Park, Xi'an High-tech Industrial Development Zone, China

★4. Typical Performance Curves

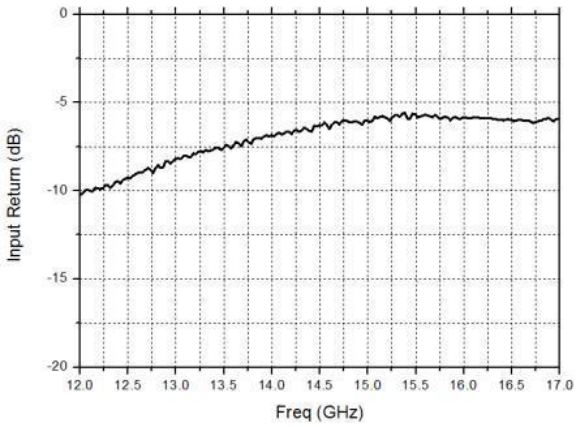
Output power vs. drive level



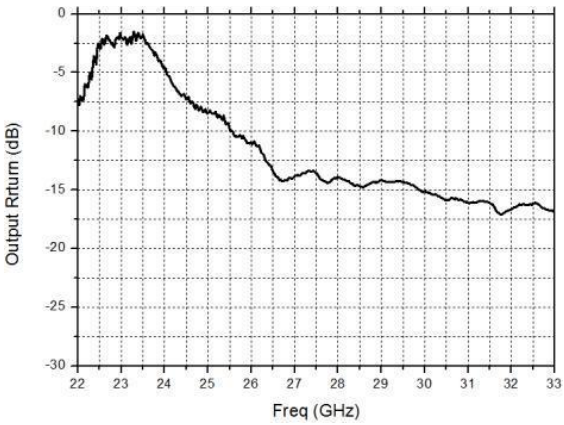
Isolation @ 3 dBm drive level



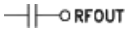
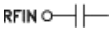
Input return loss vs. temperature



Output return loss vs. temperature

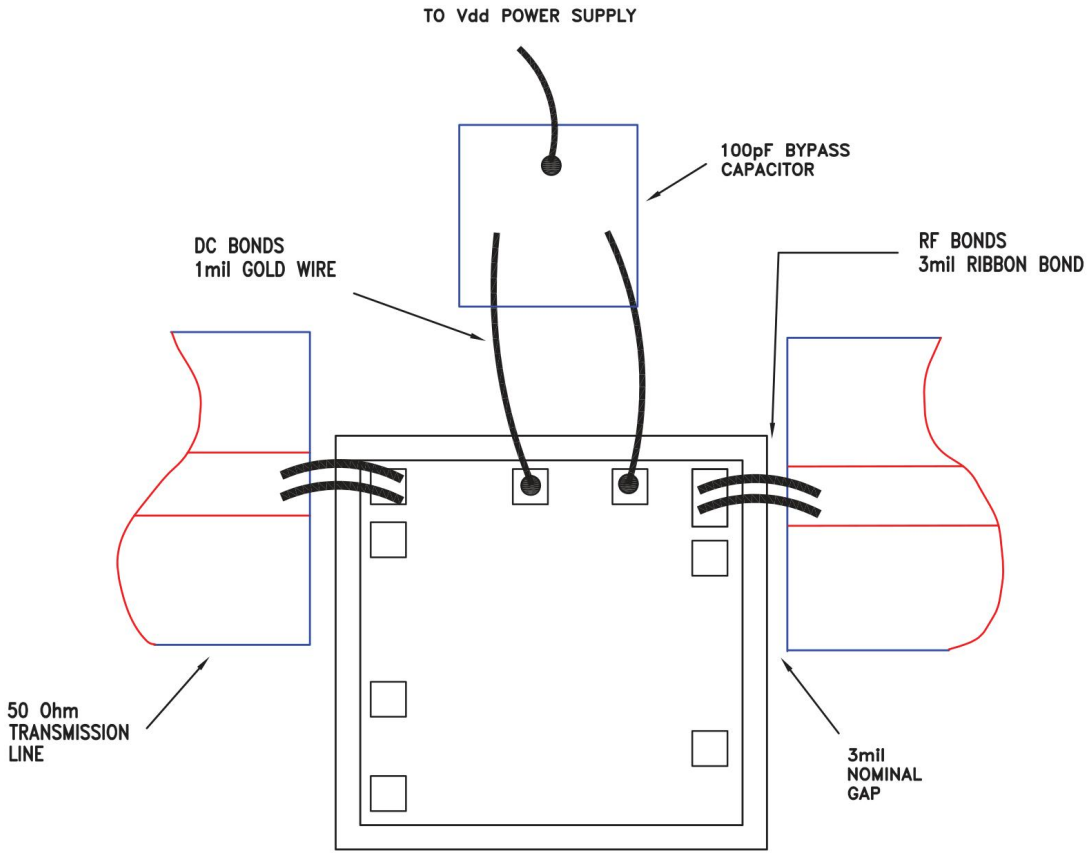


★5. Pad Description

Pad number	Function	Description	Interface schematic
1, 2	Vdd1, Vdd2	Supply voltage 5 V ± 0.5 V.	
3	RFOUT	Pad is AC coupled and matched to 50 Ohm from 24 GHz ~ 33 GHz.	
4, 5	GND	Die bottom must be connected to RF ground.	
6	RFIN	Pad is AC coupled and matched to 50 Ohm from 12 GHz ~ 16.5 GHz.	

Email: ttf@ttfelectronic.com
Website:ttfelectronic.com
Address: Building 16, Area C, Entrepreneurship and R&D Park, Xi'an High-tech Industrial Development Zone, China

★6. Assembly Diagram



★7. Absolute Maximum Ratings

Absolute Maximum Ratings	Numerical value
RF input (Vdd = +5 V)	+13 dBm
Supply voltage (Vdd1, Vdd2)	+6.0 Vdc
Channel temperature	175 ℃
Continuous Pdiss (T = 85 ℃) (derate 7.8 mW/℃ above 85 ℃)	703 mW
Thermal resistance (channel to die bottom)	128 ℃/W
Storage temperature	-65 ~ +150 ℃
Operating temperature	-55 ~ +85 ℃

Vdd (V)	Idd (mA)
4.5	81
5.0	81
5.5	81



ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS

Email: ttf@ttfelectronic.com
Website:ttfelectronic.com
Address: Building 16, Area C, Entrepreneurship and R&D Park, Xi'an High-tech Industrial Development Zone, China