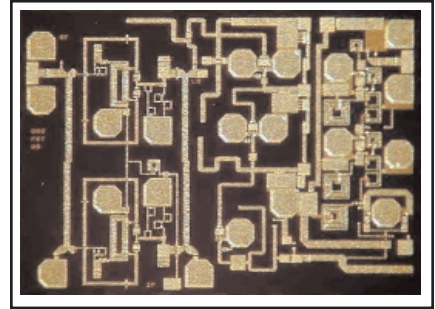


### FEATURES

- Integrated Monolithic Downconverter
- High Linearity
- Single Supply Voltage Operation
- High Reliability

### DESCRIPTION

The FMM5117X is a double, single balanced diode mixer downconverter designed for applications in the 20 to 32GHz frequency range. The device consists of a low noise mixer, LO amplifier, and LO frequency doubler. This downconverter is uniquely suited for point-to-point radios, local multi-point distribution systems (LMDS) and satellite communications, as it offers a high dynamic range over a large bandwidth.



### ABSOLUTE MAXIMUM RATINGS (Ambient Temperature Ta=25°C)

Parameter	Symbol	Rating	Unit
DC Supply Voltage	$V_{DD1,2}$	8	V
Input Power	$P_{inRF}$	20	dBm
Input Power	$P_{inLO}$	10	dBm
Storage Temperature	$T_{stg}$	-65 to +175	°C

### RECOMMENDED OPERATING CONDITIONS

Item	Symbol	Recommend			Unit
		Min.	Typ.	Max.	
DC Supply Voltage	$V_{DD1,2}$		5.0		V
Input LO Power Level	$P_{inLO}$	0.0	3.0	5.0	dBm
Operating Backside Temperature	$T_{bs}$	-45	25	110	°C

Note 1: This product should be hermetically packaged.

### ELECTRICAL CHARACTERISTICS (Ambient Temperature Ta=25°C)

Item	Symbol	Conditions	Limits			Unit
			Min.	Typ.	Max.	
RF Frequency Range	$f_{RF}$	$V_{DD1,2}=5V,$ $V_{GG}=0V,$ $P_{LO}=3dBm,$ $P_{RF}=0dBm$	20	-	32	GHz
LO Frequency Range	$f_{LO}$		9.5	-	16.5	GHz
IF Frequency Range (Note 2)	$f_{IF}$		0.1	-	3	GHz
Conversion Gain	G		-18	-10	-	dB
Conversion Gain Flatness (fixed $f_{IF}$ , swept $f_{LO}$ ) ( $f_{IF}=1.0GHz$ )	$\Delta G$		-	5	-	dB
Conversion Gain Flatness (fixed $f_{LO}$ , swept $f_{IF}$ ) ( $f_{LO}=13.5GHz$ )	$\Delta G$		-	2	-	dB
Return Loss (RF/LO)	$RL_{RF}, RL_{LO}$		-	12	-	dB
Return Loss (IF)	$RL_{IF}$		-	4	-	dB
Input P1dB at RF Port	$P1dB_{RFIN}$		-	15	-	dBm
3rd Order Input Intercept Point	IIP3		-	23	-	dBm
DC Current Consumption	$I_{DC}$		-	100	150	mA
RF Current Consumption	$I_{RF}$		-	140	200	mA

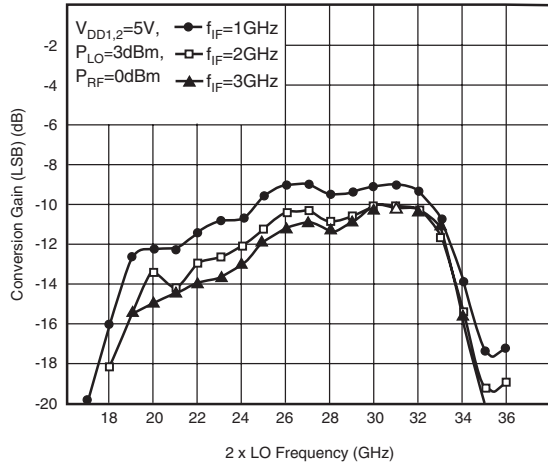
Note 1: The electrical characteristics are measured on a sample basis at 10pcs/wafer. Criteria: (accept/reject)=(0/1)

Note 2: The IF frequency range is dependent on the selected LO and RF frequency.

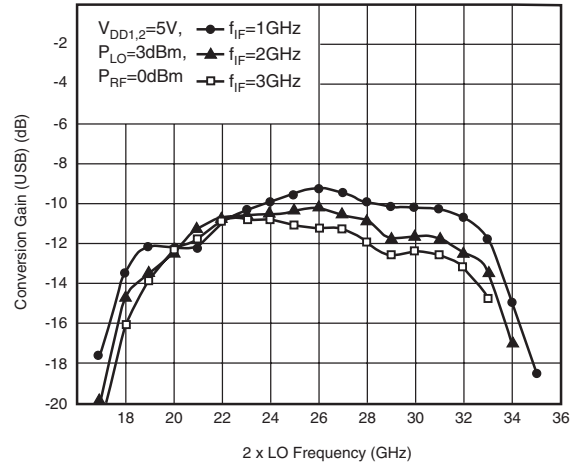
# FMM5117X

20-32GHz Downconverter MMIC

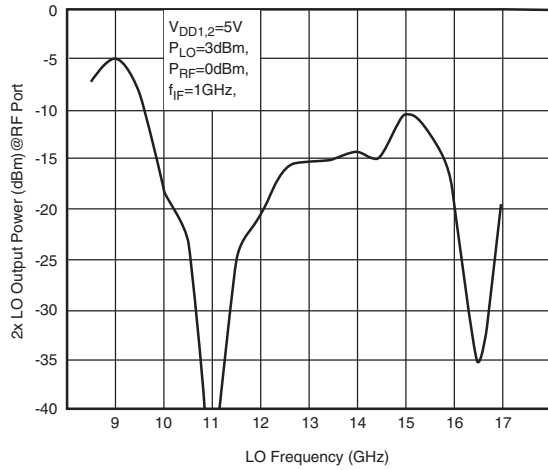
**CONVERSION GAIN (LSB) vs. FREQUENCY**



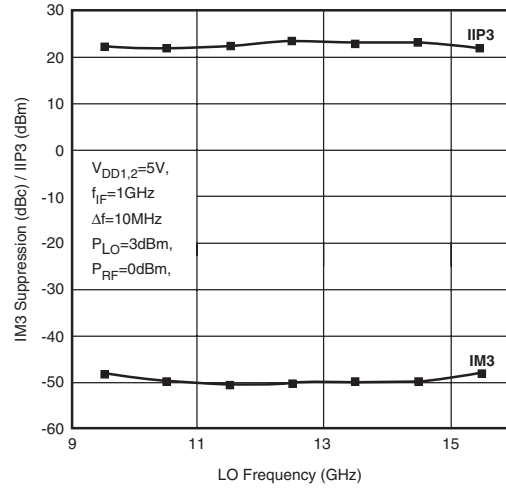
**CONVERSION GAIN (USB) vs. FREQUENCY**



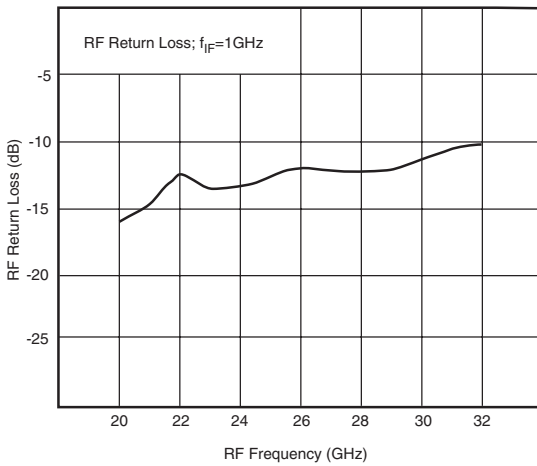
**2xLO OUTPUT POWER vs. FREQUENCY**



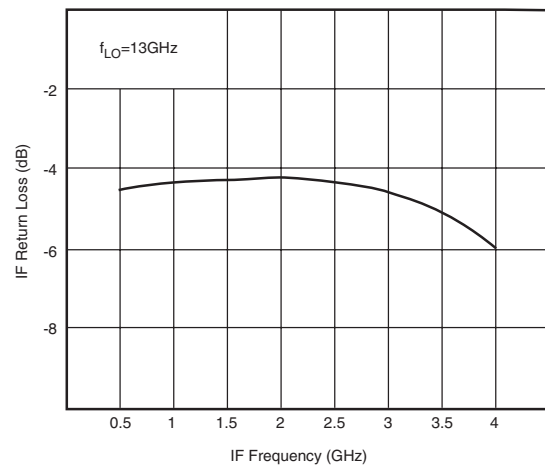
**IM3 vs. FREQUENCY**



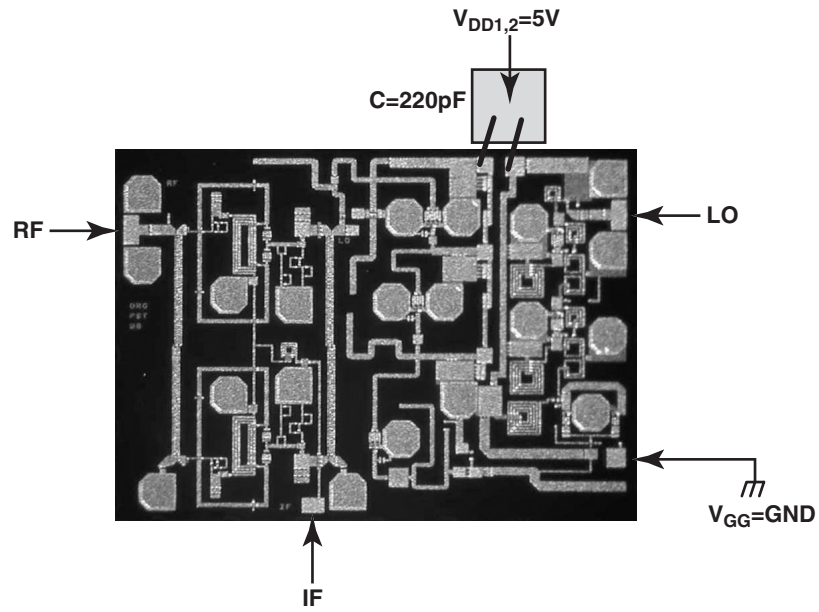
**RF RETURN LOSS vs. FREQUENCY**



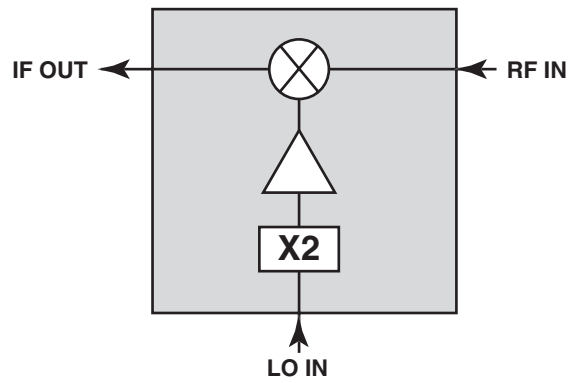
**IF RETURN LOSS vs. FREQUENCY**



## BONDING DIAGRAM

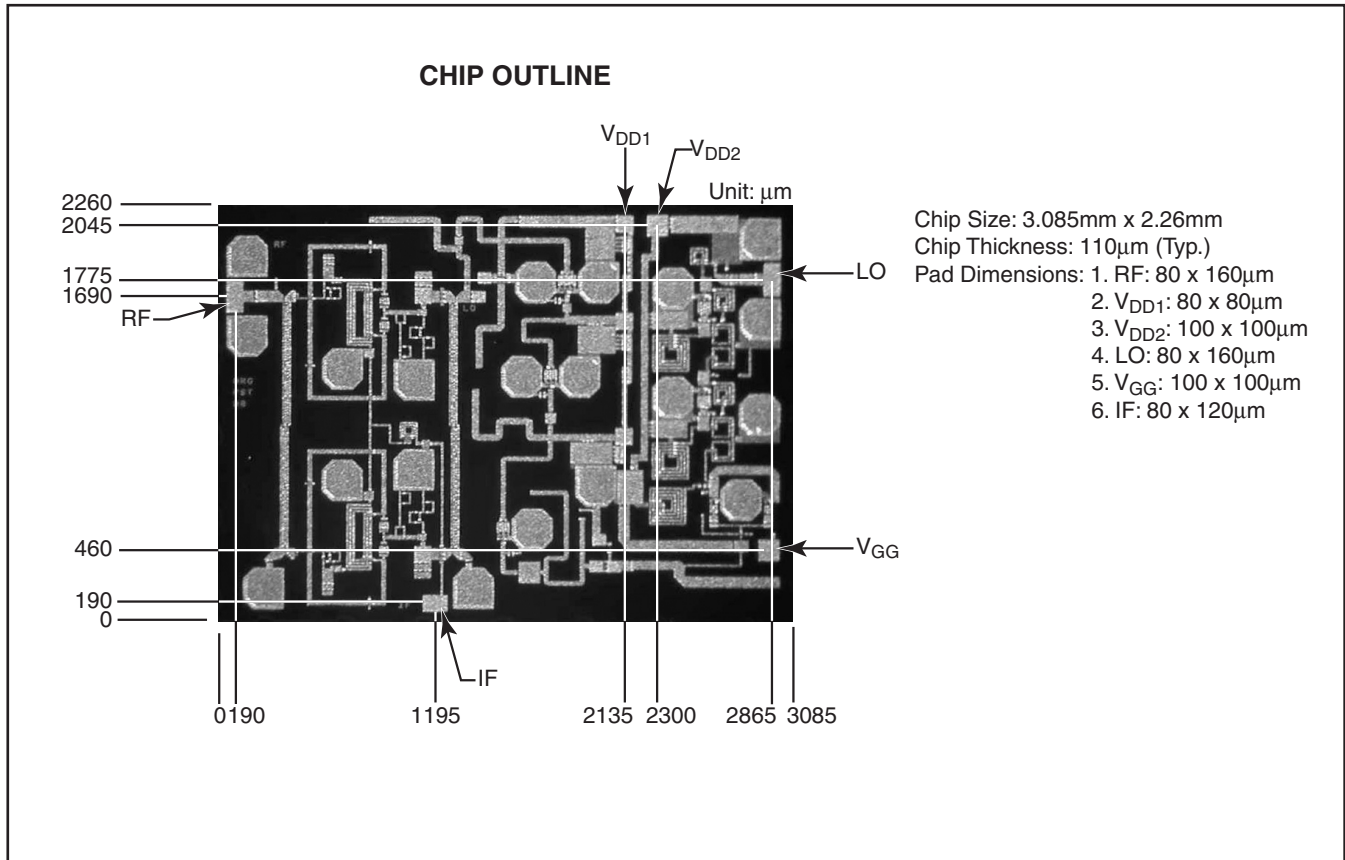


## FUNCTIONAL DIAGRAM



# FMM5117X

20-32GHz Downconverter MMIC



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- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.

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