

## FEATURES

- Full V-band coverage, 57 – 66 GHz
- Output power, 8 dBm typ.
- Harmonic isolation, 15 dBc typ.

## DESCRIPTION

The gXSB0019 GaAs pHEMT MMIC is an efficient X6 V-band multiplier ideal for point to point radio applications. The chip has an integrated output buffer. At the recommended drive level of 10 dBm the output power is typically 8 dBm with better than 15 dBc harmonic isolation and 450 mW power dissipation.

## TYPICAL APPLICATIONS

- V-band point-to-point radio
- Active imaging and sensors
- Test instrumentation

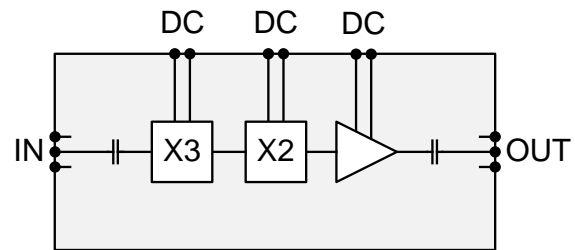


Figure 1. Circuit functional diagram.

## ELECTRICAL PERFORMANCE

Table 1. Electrical performance  $T_A=25^{\circ}\text{C}$

Parameter	Min	Typ	Max	Unit
Output frequency	57		66	GHz
Input frequency	9.5		11	GHz
Multiplication factor		6		
Output power	6	8		dBm
Output power flatness		3		dBpp
Recommended input drive power		10		dBm
Harmonic isolation (relative to X6 output)		15		dBc
Output return loss	10			dB
Input return loss	10			dB
Power dissipation (signal off)		390		mW
Power dissipation (signal on)	400	450	500	mW

## MEASURED PERFORMANCE

Measurements have been performed on-wafer at room temperature with typical bias settings and an input drive power if not specified otherwise.

Table 2. Test conditions

Parameter	Setting
Input drive power	10 dBm
Temperature	25°C

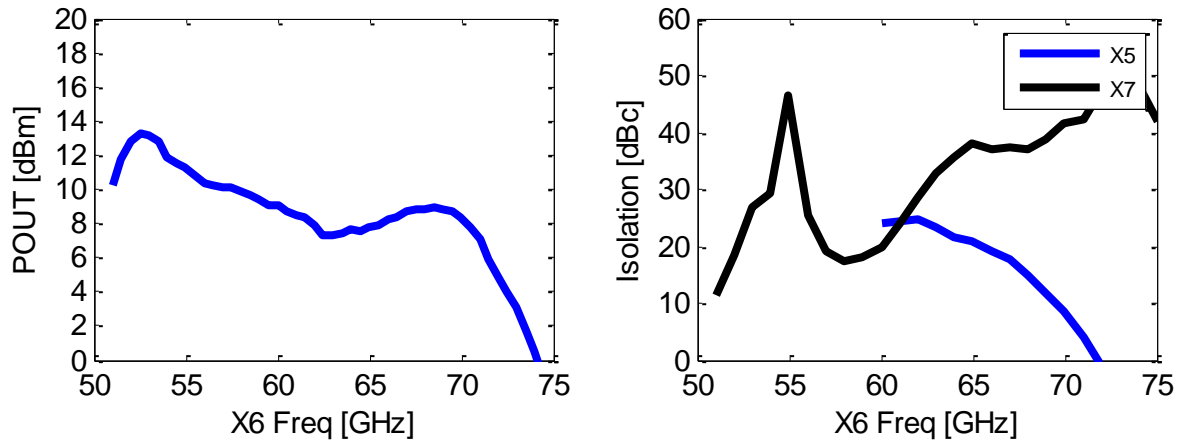


Figure 2. Output power vs X6 output frequency (left). Harmonic isolation vs X6 output frequency (right).

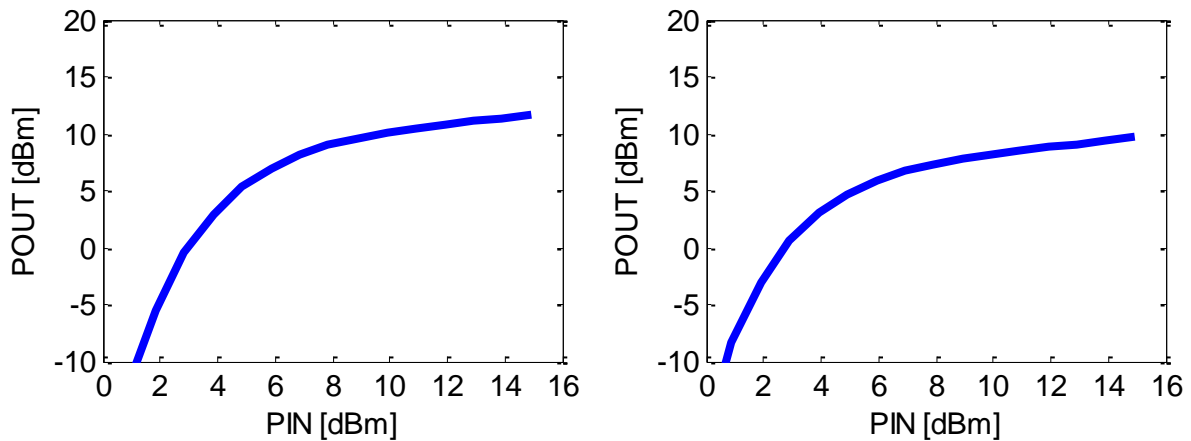


Figure 3. Output power vs input power at 57 GHz (left). Output power vs input power at 66 GHz (right).

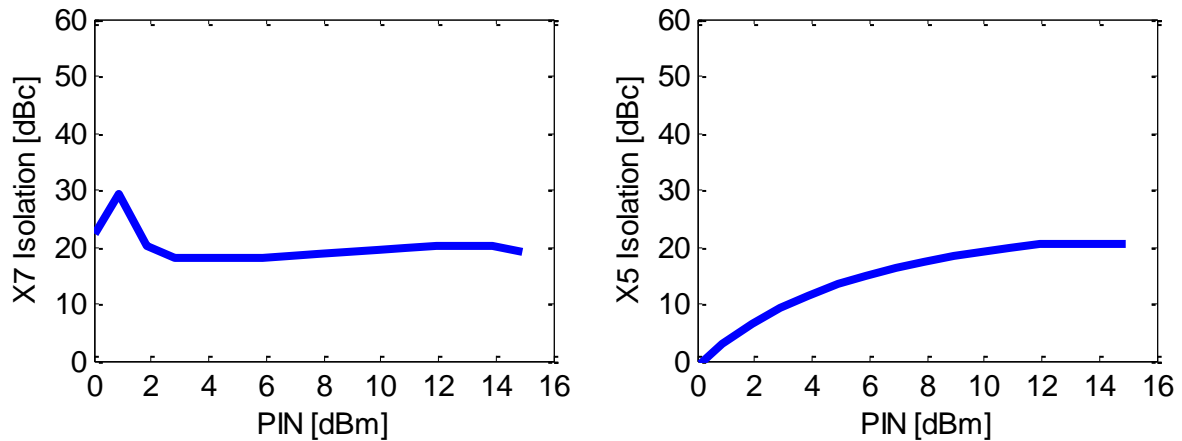


Figure 4. X7 isolation vs input power at 57 GHz (left). X5 isolation vs input power at 66 GHz (right).

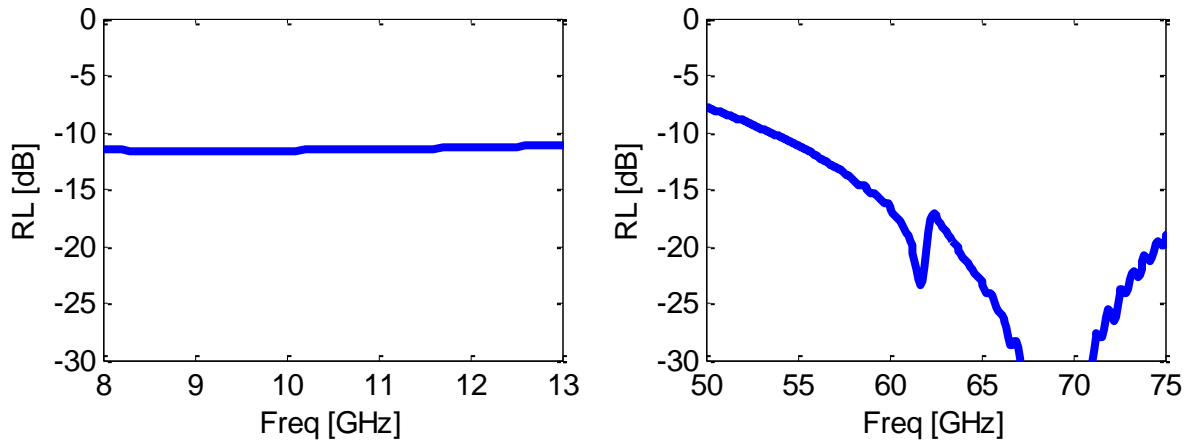


Figure 5. Input return loss (left). Output return loss (right).

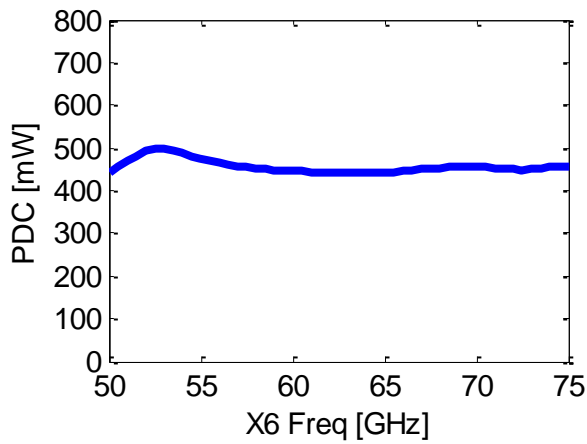


Figure 6. Power dissipation vs X6 output frequency.

## RECOMMENDED OPERATING CONDITIONS

Apply the gate (VG\_...) supplies first followed by the drain (VD\_...) supplies. Gate voltages are adjusted within the typical min/max range to obtain the specified drain currents. The drain currents are stated with all input signals off.

**Table 3. Electrical settings, P1 pads**

Connector P1	Pad No.	Bias settings (V / mA)			Function
		Min	Typ	Max	
NC	1				NC
NC	2				NC
VD_AMP	3	3.2	3.3 / 75	3.4	Input
VG_AMP	4	-0.6	-0.4	-0.2	Input
VD_X2	5	3.2	3.3 / 4	3.4	Input
GND	6				Ground
VG_X2	7	-1.1	-0.9	-0.7	Input
VD_X3	8	3.2	3.3 / 40	3.4	Input
VG_X3	9	-0.7	-0.5	-0.3	Input
NC	10				NC
NC	11				NC

**Table 4. Electrical settings, P2 pads**

Connector P2	Pad No.	Settings	Function
GND	1		Ground
RF_OUT	2	50 Ohm, open-circuit at DC	Output
GND	3		Ground

**Table 5. Electrical settings, P3 pads**

Connector P3	Pad No.	Settings	Function
GND	1		Ground
RF_IN	2	50 Ohm, open-circuit at DC	Input
GND	3		Ground

