FEATURES

- W-band, 86 – 106 GHz
- Harmonic isolation, 20 dBc typ.

DESCRIPTION

The gXQB0012 GaAs pHEMT MMIC is a highly efficient X4 W-band multiplier ideal for point to point radio and radar applications. The integrated output buffers deliver high output power at a low drive level. At the recommended drive level of 5 to 10 dBm the output power is typically 0 dBm with better than 20 dBc harmonic isolation and 300 mW power dissipation.

TYPICAL APPLICATIONS

- W-band point-to-point radio
- Remote sensing
- Active imaging
- Test instrumentation

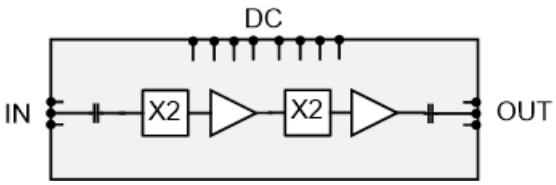

Figure 1. Circuit functional diagram.

Gotmic AB, Arvid Hedvalls Backe 4, S-411 33 Göteborg, Sweden. Tel: +46 (0) 31 184 030
http://www.gotmic.se/

Electrical Performance

Table 1. Electrical performance T_A=25C

Parameter	Min	Typ	Max	Unit
Output frequency	77		100	GHz
Input frequency	19.25		25	GHz
Multiplication factor		4		
Output power	-5	0		dBm
Recommended input drive power		10		dBm
Harmonic isolation (relative to X8 output)		20		dBc
Output return loss		TBD		dB
Input return loss		TBD		dB
Power dissipation (signal off)		285		mW
Power dissipation (signal on)	350	400	450	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

Gotmic AB, Arvid Hedvalls Backe 4, S-411 33 Göteborg, Sweden. Tel: +46 (0) 31 184 030
http://www.gotmic.se/

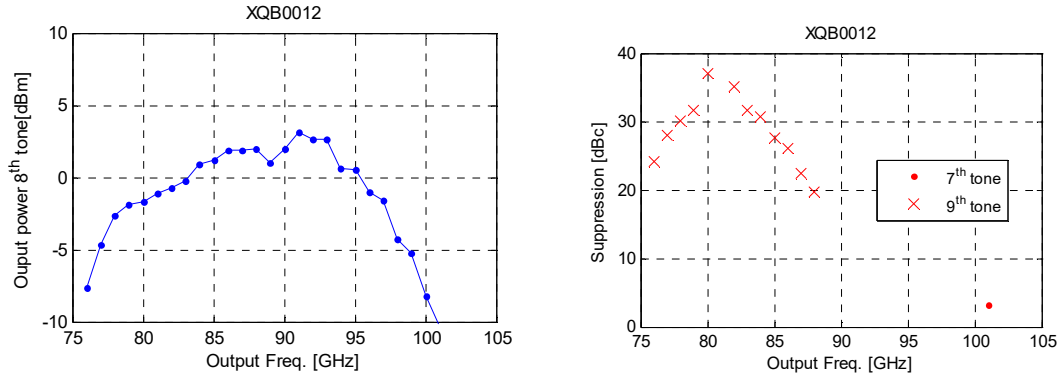

Figure 2. Output power vs X4 output frequency (left). Harmonic isolation vs X4 output frequency (right).

Gotmic AB, Arvid Hedvalls Backe 4, S-411 33 Göteborg, Sweden. Tel: +46 (0) 31 184 030
http://www.gotmic.se/

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	
VG1_X2	9	-1.1	-0.9	-0.7	Input
VD1_X2	8	2.5	3 /2	3.3	Input
VG1_AMP	7	-0.6	-0.4	-0.2	Input
VD1_AMP	6	2.5	3 / 20	3.3	Input
GND	5				Ground
VG2_X2	4	-1.1	-0.9	-0.7	Input
VD2_X2	3	2.5	3 / 2	3.3	Input
VG2_AMP	2	-0.6	-0.4	-0.2	Input
VD2_AMP	1	2.5	3 / 61	3.3	Input

Table 4. Electrical settings, P2 pads

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

Table 5. Electrical settings, P3 pads

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

Gotmic AB, Arvid Hedvalls Backe 4, S-411 33 Göteborg, Sweden. Tel: +46 (0) 31 184 030
http://www.gotmic.se/

ABSOLUTE MAXIMUM RATINGS

Table 6. Absolute Maximum Ratings

Gate supply voltage	-2 to + 0.7 V
Drain supply voltage	4.5 V
Gate-drain breakdown	8 V
Input level	+ 15 dBm
Operating temperature	-40 to + 85 C
Storage temperature	-65 to +150 C

OUTLINE DRAWING

Dimensions are in µm. Substrate thickness is 50 µm (GaAs). Drawing is also available in dxf-file format on the web.

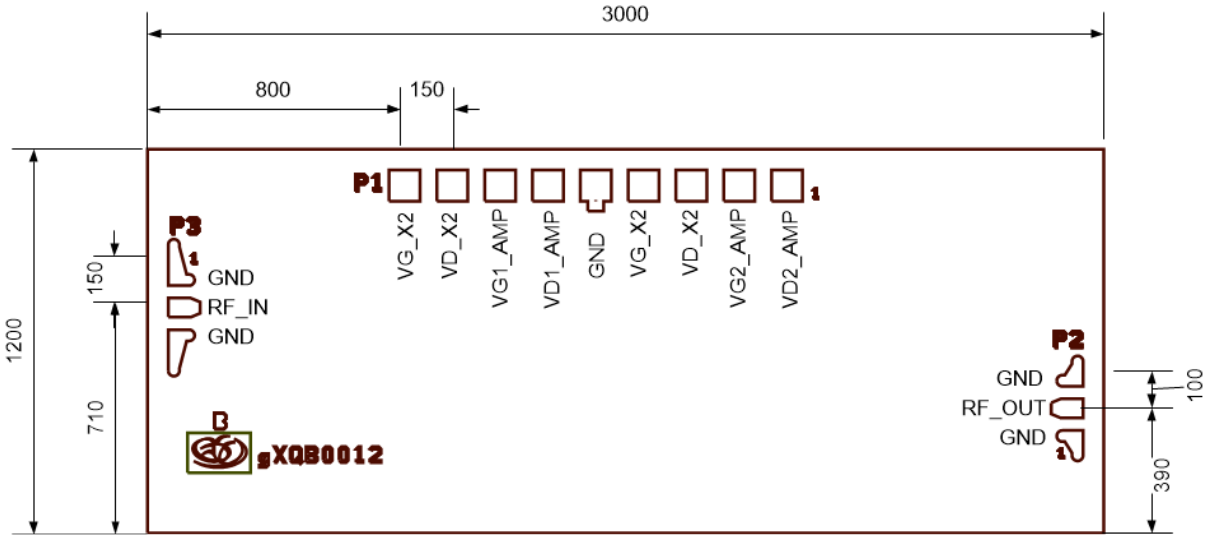

Figure 3. Outline drawing, dimensions are in um.

Gotmic AB, Arvid Hedvalls Backe 4, S-411 33 Göteborg, Sweden. Tel: +46 (0) 31 184 030
http://www.gotmic.se/