








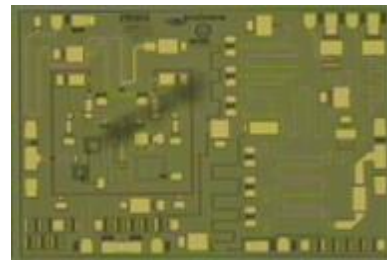
EWX2801ZZ

Production

Features

-  Broadband Performance: 14 to 26 GHz
-  Wide Input Power Range: -10 to +10 dBm
-  Output Power: +14 dBm typical
-  Fundamental Rejection: 25 dBc typical
-  Low Power Consumption: 0.6 Watts
-  ESD Protection Gate Bias Circuitry
-  Die size: 2.7 x 2.0 x 0.1 mm

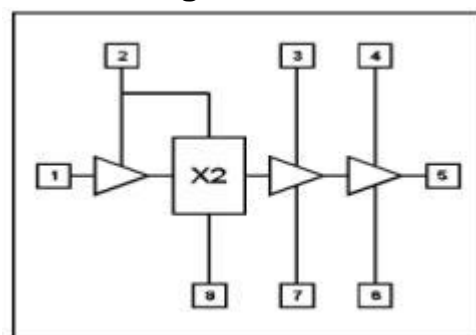
Device Photo



Description

The Endwave *EWX2801ZZ* is a 0.15 um GaAs pHEMT broadband active x2 frequency multiplier MMIC. The multiplier provides +14 dBm typical output power from 14 to 26 GHz with +5 dBm RF input level. The chip has integrated ESD Protection Gate Bias Circuitry and may be used for a wide range of applications from defense electronics to commercial communication systems. All parts are 100% DC and RF tested and visually inspected using Mil-Std-883 Method 2010.

Block Diagram



Electrical Characteristics (Temperature = +25 °C)

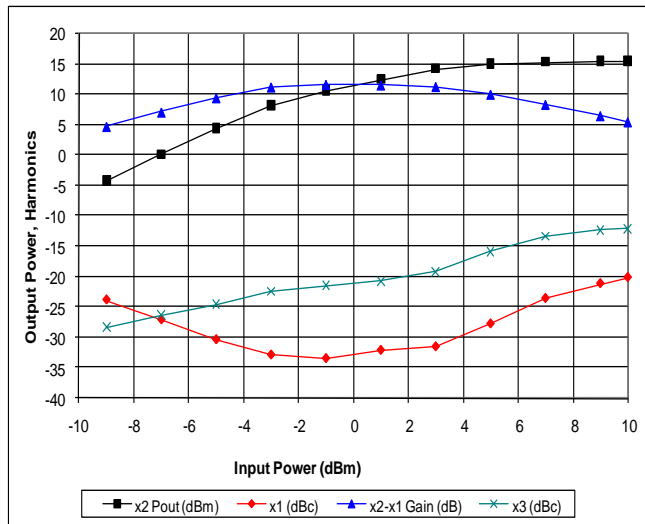
Parameter	Min.	Typ.	Max.	Units
Input Frequency Range (F_0)	7		13	GHz
Input Frequency Range ($2F_0$)	14		26	GHz
Output Power (P_{out}) @ $2F_0^{(1)}$	12	14		dBm
Input Power (P_{in}) @ $F_0^{(2)}$		5		dBm
F_0 Rejection (with respect to $2F_0$ output level)	20	25		dBc
$3F_0$ Rejection (with respect to $2F_0$ output level)	11	12		dBc
Input Return Loss		10		dB
Output Return Loss		16		dB
Drain Bias Voltages ($V_{d1,2,3}$)		4.4		V
Gate Bias Voltage (V_{g1})		-1.2		V
Gate Bias Voltage ($V_{g2}^{(3)}$)	-1.5		0	V
Gate Bias Voltage ($V_{g3}^{(3)}$)	-1.5		0	V
Drain Bias Current (I_{d1}); Quiescent (no RF)		46		mA
Drain Bias Current (I_{d1}); RF input @ +5 dBm		59		mA
Drain Bias Current (I_{d2}); Quiescent (no RF)		27		mA
Drain Bias Current (I_{d2}); RF input @ +5 dBm		30		mA
Drain Bias Current (I_{d3}); Quiescent (no RF)		42		mA
Drain Bias Current (I_{d3}); RF input @ +5 dBm		50		mA

Note 1: P_{in} = +5 dBm to +10 dBm. For P_{in} < +5 dBm, P_{out} decreases monotonically.

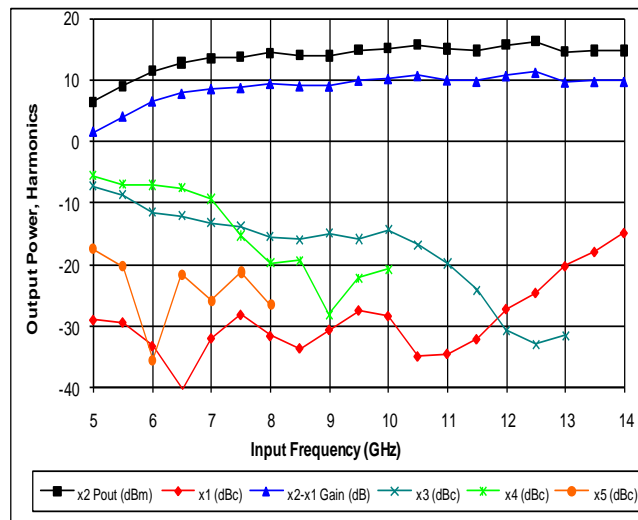
Note 2: Range for best conversion gain. Other metrics based upon P_{in} = +5 dBm (typ).

Note 3: Set gate voltage to achieve appropriate drain current without RF applied.

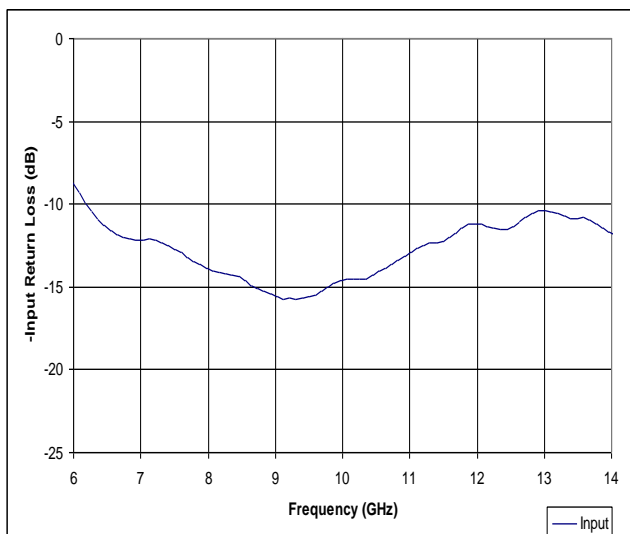
Conversion Gain and Harmonic Levels vs Input Power
RF Input at 9.5 GHz, Bias conditions: $V_d = +4.4V$, $I_d = 135\text{ mA}$



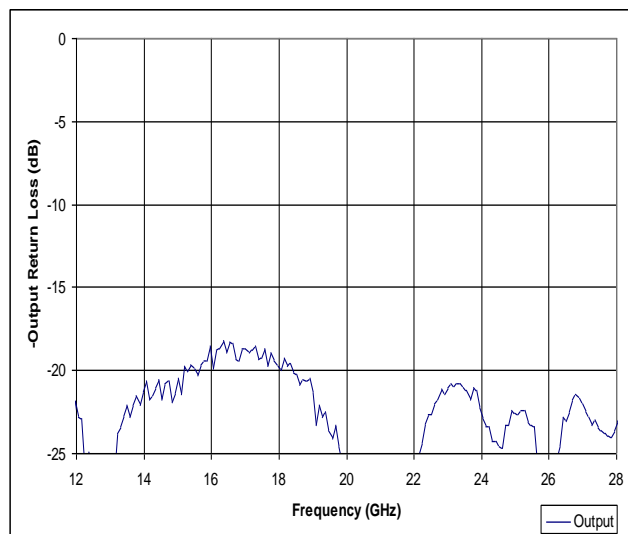
Conversion Gain & Harmonic levels vs Input Frequency
RF Input at +5 dBm, Bias Conditions: $V_d = +4.4V$, $I_d = 135\text{ mA}$



Input Return Loss vs. Frequency (+5 dBm RF Power)
Bias Conditions: $V_d = +4.2V$, $I_d = 135\text{ mA}$

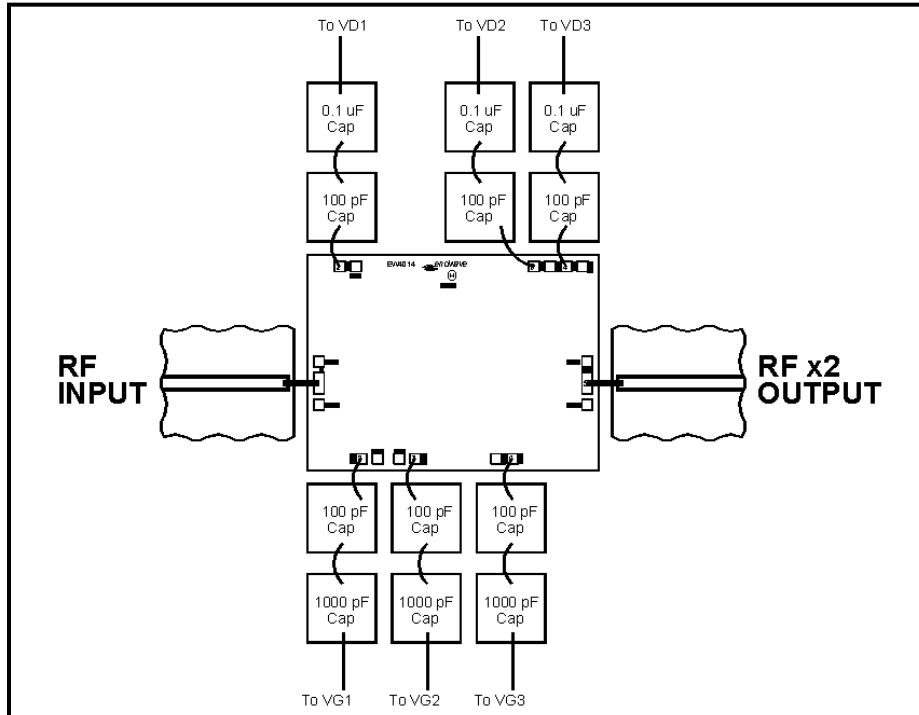


Output Return Loss vs. Frequency (+5 dBm RF Power)
Bias Conditions: $V_d = +4.2V$, $I_d = 135\text{ mA}$

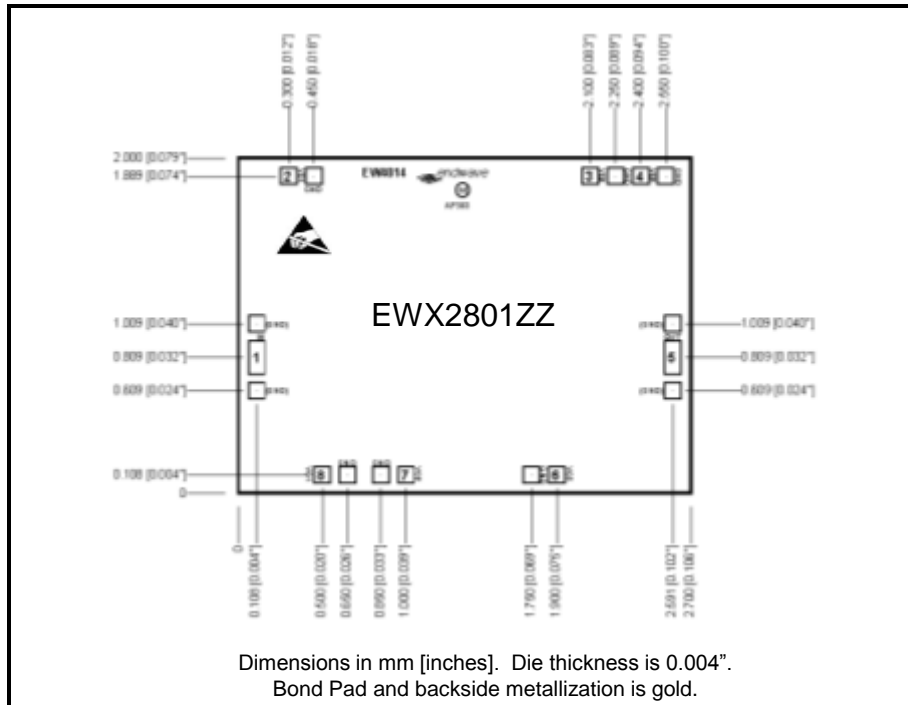


Multiplier - Chip

Assembly Drawing



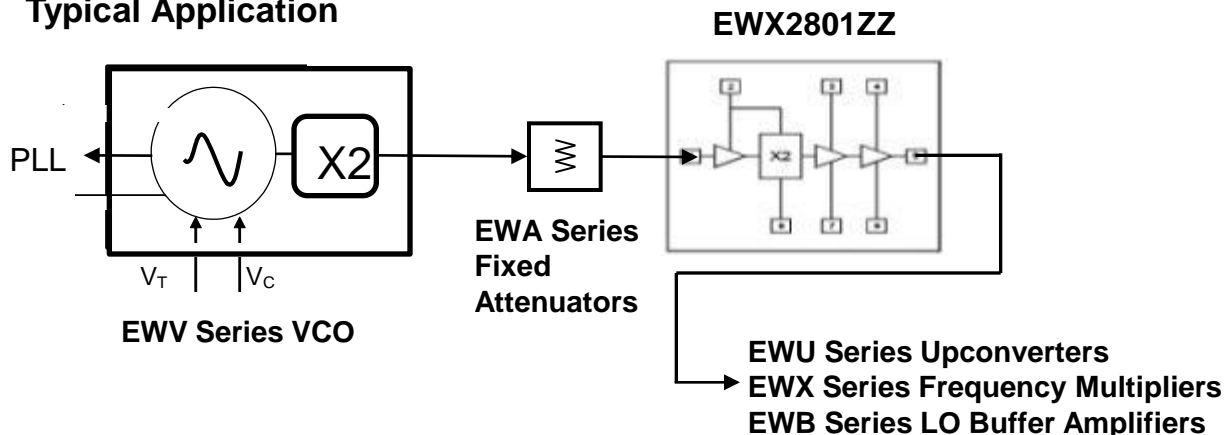
Outline Drawing



Absolute Maximum Ratings

Input Power	+15 dBm
Supply Voltage (Vd1, 2, 3)	+ 5.5 V
Supply Current (Id1 + Id2 + Id3)	250 mA
Storage Temperature	-65 to +150°C
Operating Temperature	-40 to +85°C
Channel Temperature	175°C

Typical Application



Support Documentation

Support documentation including Assembly Notes, Application Notes and Qualification Procedures can be found on our website at www.endwave.com.

Ordering Information

Part Number	Description
EWX2801ZZ	RoHs Compliant bare die in wafer or gel packs

Multiplier - Chip