










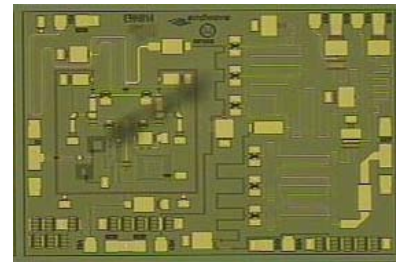
## EWX2801ZZ

*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 Bias Circuitry
-  100% DC and RF tested
-  Die size: 2.7 x 2.0 x 0.1 mm
-  RoHS Compliant

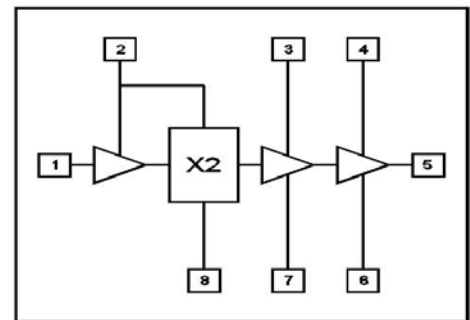
### Device Photo



### Description

The Endwave *EWX2801ZZ* is a 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. This device has integrated ESD Protection Bias Circuitry and can be used for a wide range of applications from defense electronics to commercial communication systems. All die are 100% DC and RF tested and visually inspected to 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 ( $P_{out}$ ) @ $2F_0$ <sup>(1)</sup>	12	14		dBm
Input Power ( $P_{in}$ ) @ $F_0$ <sup>(2)</sup>		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 ( $V_{g2}$ ) <sup>(3)</sup>	-1.5		0	V
Gate Bias Voltage ( $V_{g3}$ ) <sup>(3)</sup>	-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

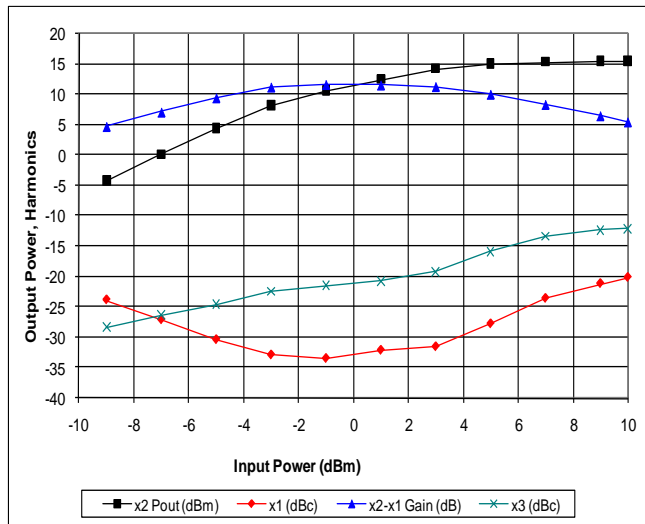
Note 1:  $P_{in}$  = +5 dBm to +10 dBm. For  $P_{in}$  < +5 dBm,  $P_{out}$  decreases monotonically.

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

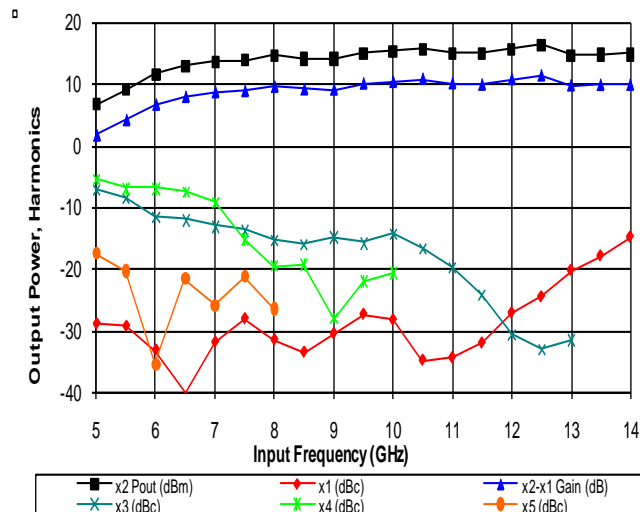
Note 3: Set gate voltage to achieve appropriate drain current without RF applied.

Multiplier – Bare Die

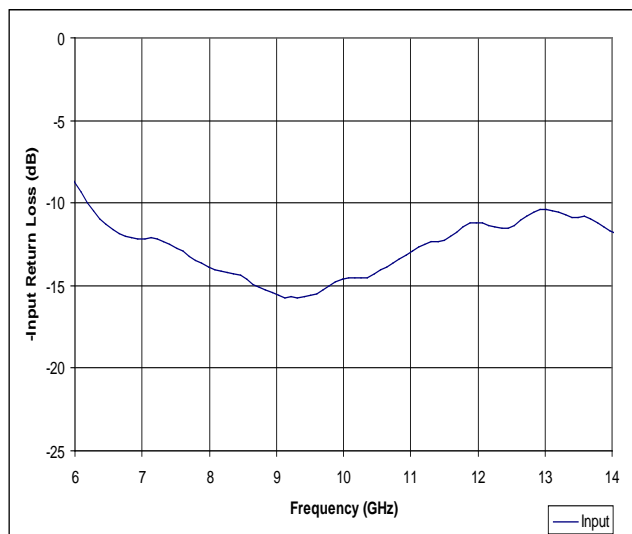
**Conversion Gain and Harmonic Levels vs. Input Power**  
RF Input at 9.5 GHz, Bias conditions:  $V_d = +4.4V$ ,  $I_d = 135\text{ mA}$



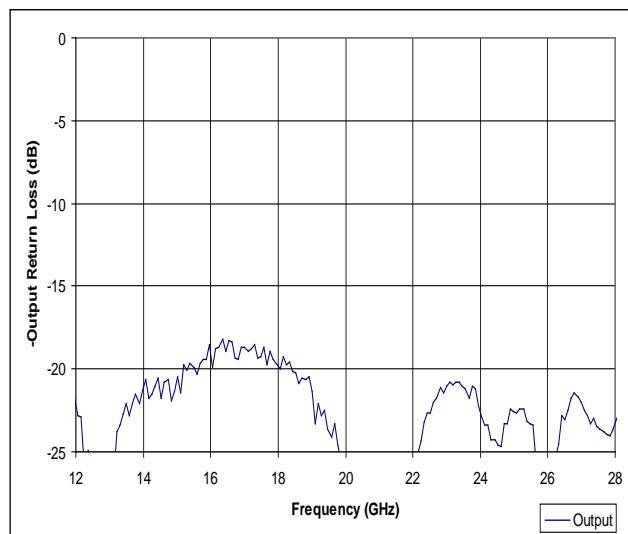
**Conversion Gain & Harmonic levels vs. Input Frequency**  
RF Input at +5 dBm, Bias Conditions:  $V_d = +4.4V$ ,  $I_d = 135\text{ mA}$



**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:  $V_d = +4.2V$ ,  $I_d = 135\text{ mA}$

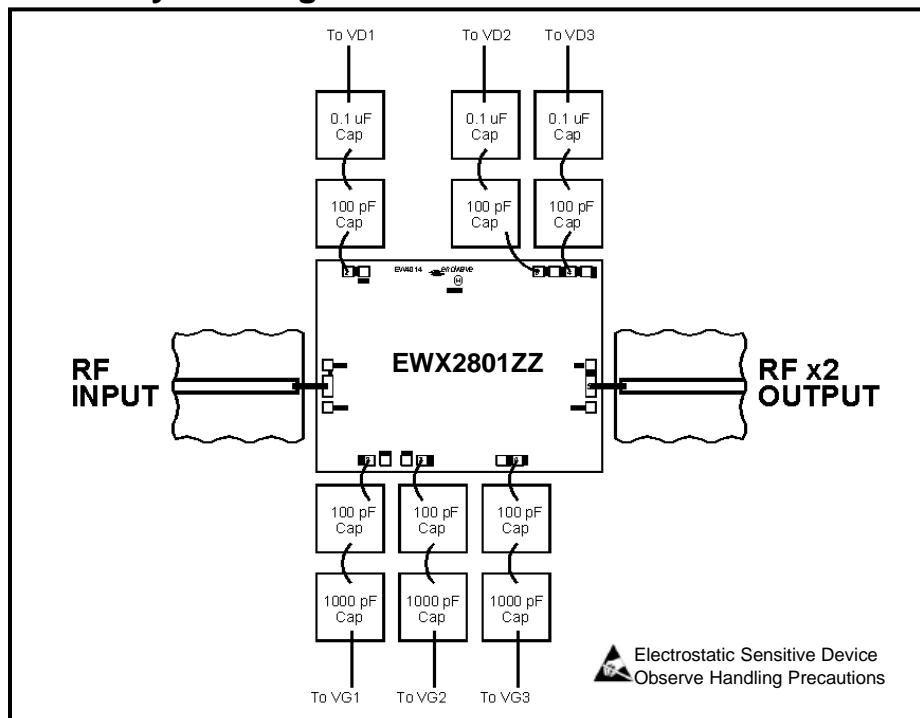


**EWX2801ZZ**

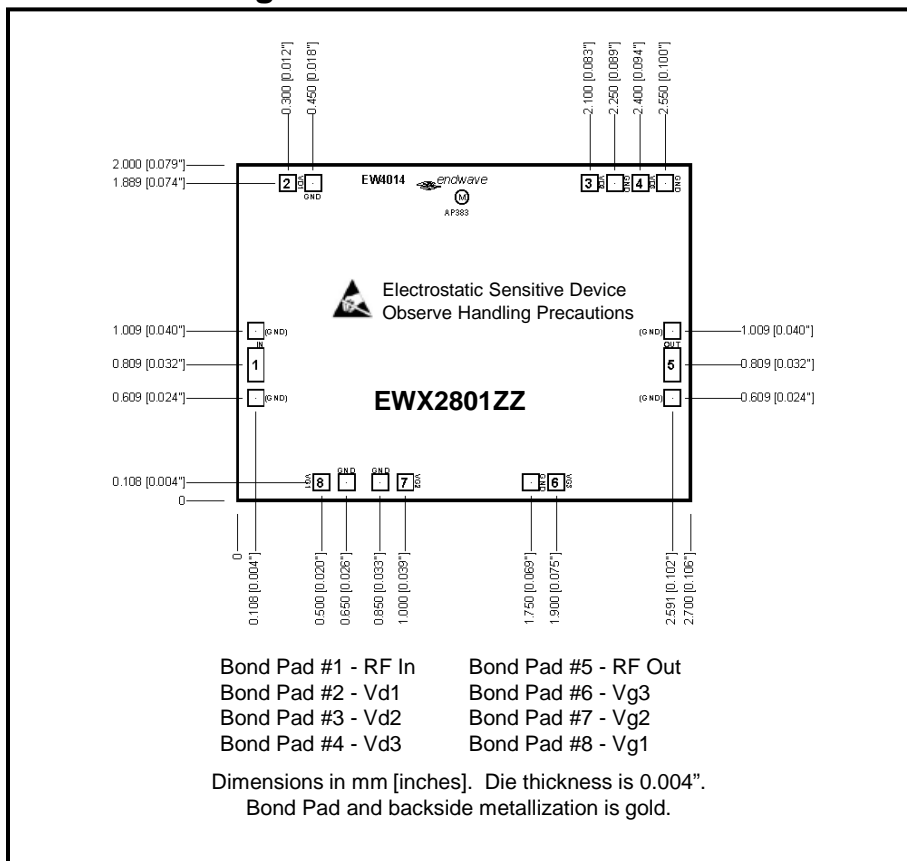
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**Assembly Drawing**



**Outline Drawing**

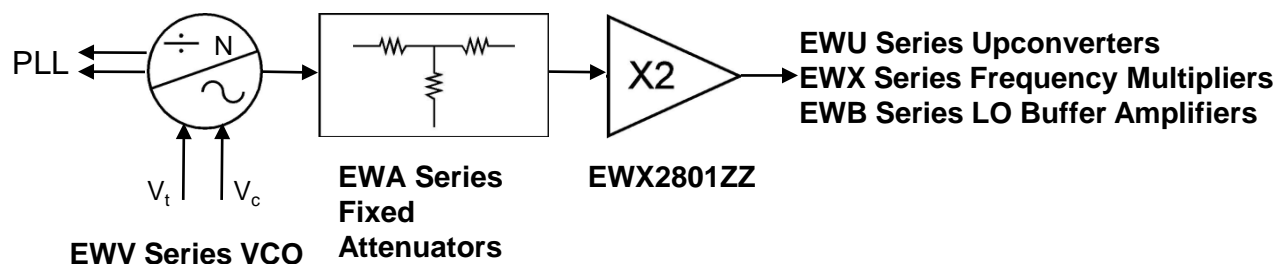


Multiplier - Bare Die

**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](http://www.endwave.com).

**Ordering Information**

Part Number	Description
EWX2801ZZ	RoHS compliant bare die in waffle or gel packs
EWX2801ZZ-EV	EWX2801ZZ in a connectorized test fixture