








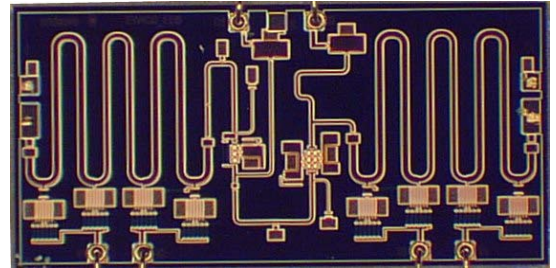


## EWG1501ZZ

### Features

-  Integrated VVA and RF Amp
-  RF Bandwidth: 10 - 19 GHz
-  Maximum Gain: 12 dB, typical
-  Dynamic Range: 50 dB, typical
-  Output IP3: +22 dBm, typical (max gain)
-  Output P1dB: +17 dBm, typical (max gain)
-  100% RF and DC tested
-  Die Size: 3.0 x 1.5 x 0.1mm
-  RoHS Compliant

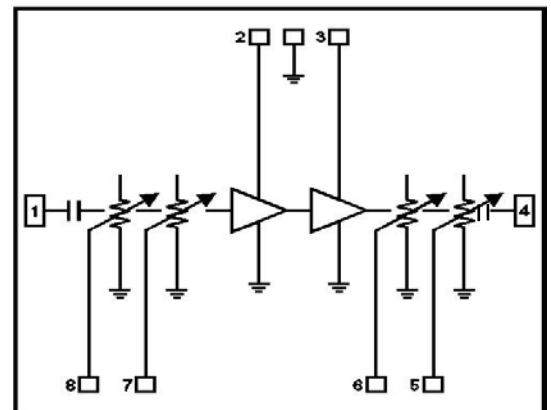
### Device Photo



### Description

The Endwave *EWG1501ZZ* is a highly integrated GaAs pHEMT variable gain amplifier MMIC which provides 12 dB of gain and 50 dB dynamic range with +22 dBm output IP3 at minimum attenuation. The high dynamic range is achieved through the use of voltage variable attenuators surrounding a fixed gain amplifier. This device 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

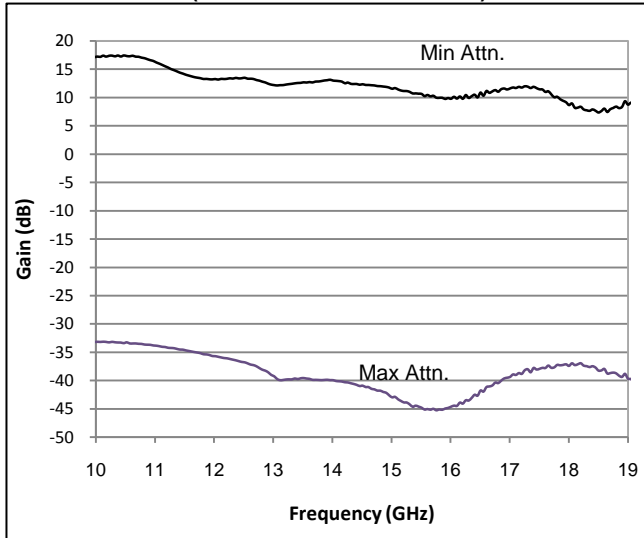


### Electrical Characteristics (Temperature = +25 °C)

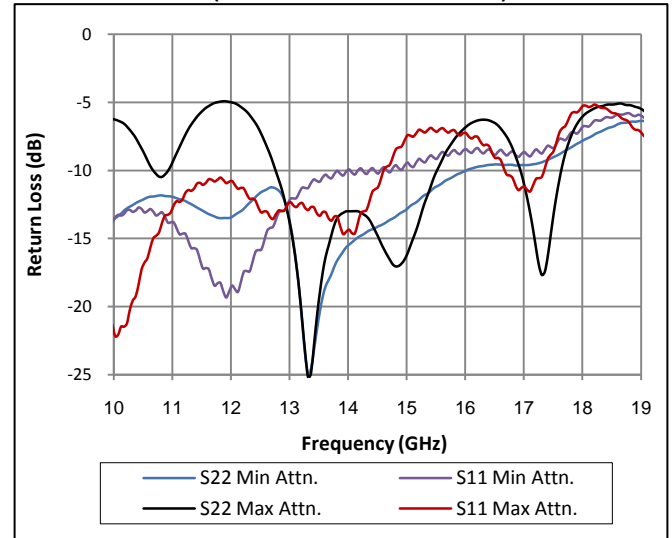
Parameter	Min.	Typ.	Max.	Units
Frequency Range	10		19	GHz
Gain (Max for Vctrl 1, 2 = -1.5 V)		12		dB
Dynamic Range (Gmax – Gmin)		50		dB
Input Return Loss (over dynamic range)		8		dB
Output Return Loss (over dynamic range)		8		dB
Output IP3 (minimum attenuation)		22		dBm
Gain Control Voltage <sup>1</sup> (Vctrl 1, 2)	-2		0	V
Drain Bias Voltages (Vd 1, 2)		4.2		V
Drain Bias Currents (Id1 + Id2)		120		mA

Note 1: Min gain for Vctrl1 = Vctrl2 = 0 volts

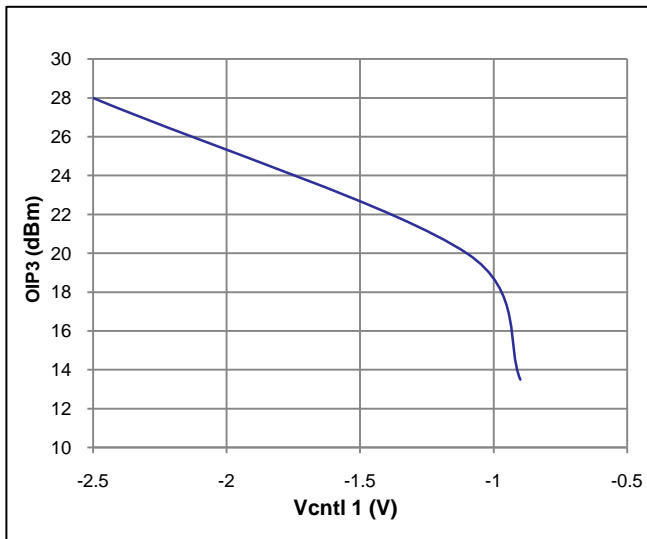
**Variable Gain vs. Frequency**  
(Vd = +4.2 V and Id = 120 mA)



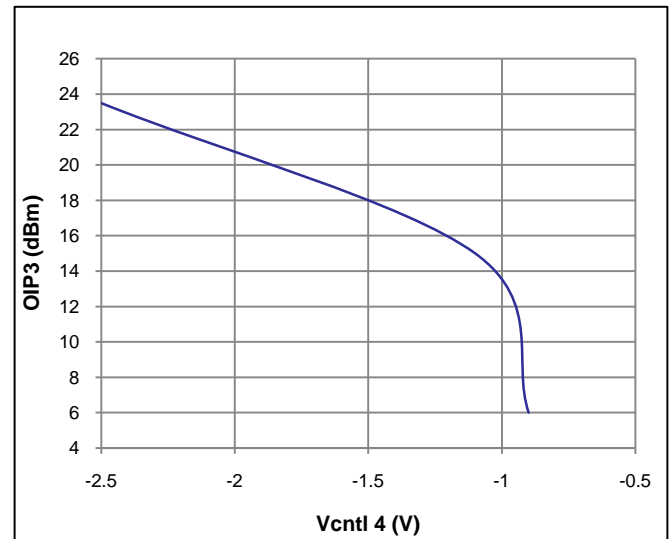
**Return Loss vs. Frequency**  
(Vd = +4.2 V and Id = 120 mA)



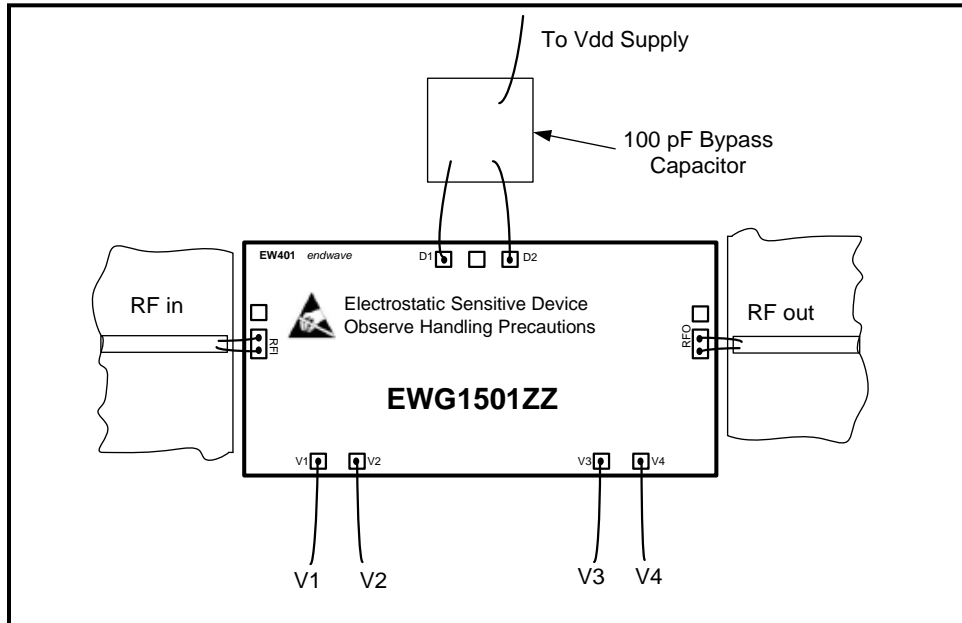
**OIP3 vs. Vcntrl1**  
(Vd = +4.2 V and Id = 120 mA; -5 dBm/tone Pin @ 15.4 GHz;  
Vcntrl2 = Vcntrl3 = Vcntrl4 = -2.5V)



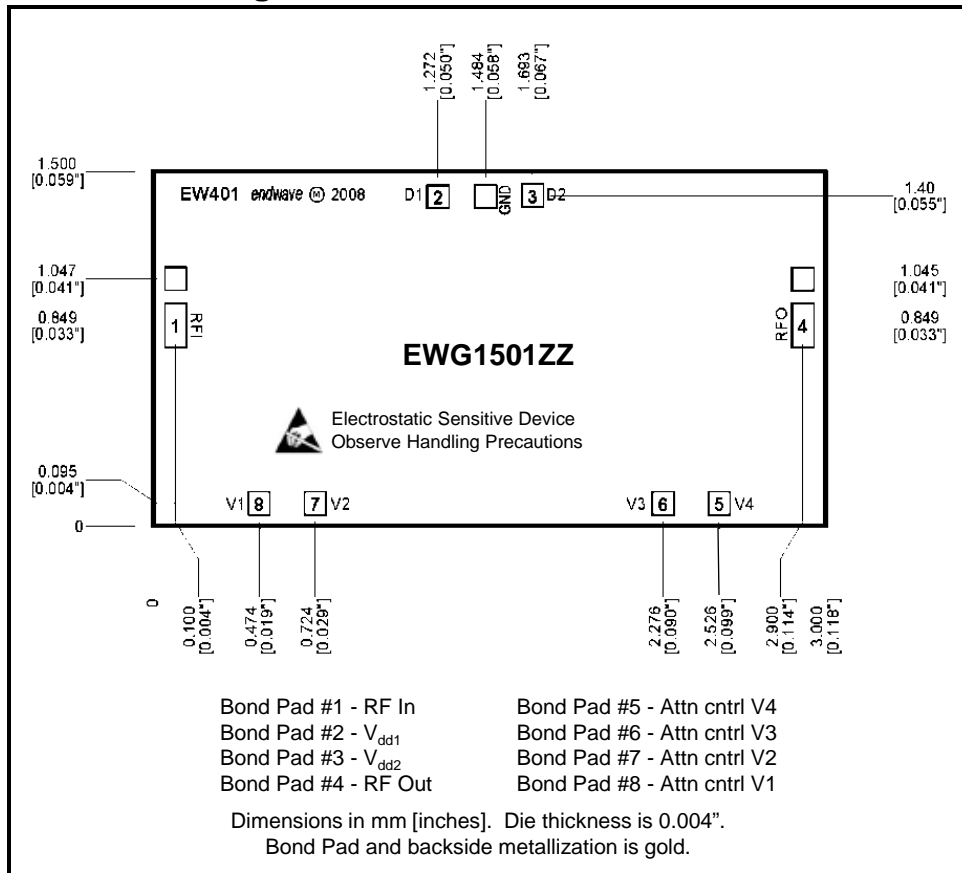
**OIP3 vs. Vcntrl 4**  
(Vd = +4.2 V and Id = 120 mA; -15.2 dBm/tone Pin @ 13 GHz;  
Vcntrl1 = Vcntrl2 = Vcntrl3 = -2.5V)



### Assembly Drawing



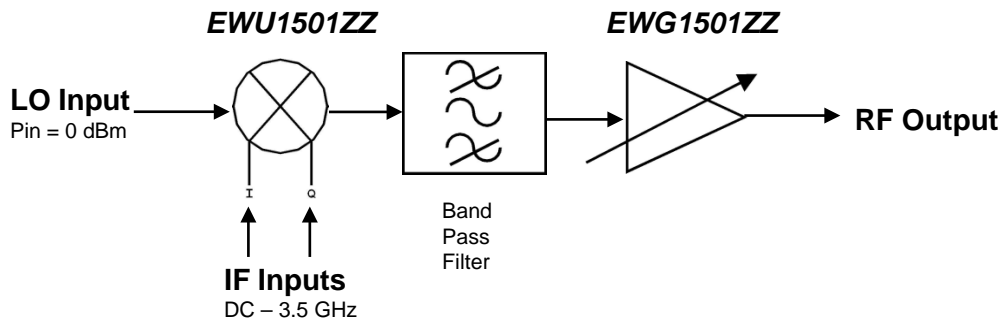
### Outline Drawing



### Absolute Maximum Ratings

RF Input Power (max gain)	+18 dBm
Supply Voltage (Vd1, 2)	+5.5V
Supply Current (Id1+ Id2)	240 mA
Control Voltage (Vctrl1, 2)	-2.5 to 0V
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
<i>EWG1501ZZ</i>	RoHS compliant bare die in waffle or gel packs
<i>EWG1501ZZ-EV</i>	<i>EWG1501ZZ</i> in a connectorized test fixture