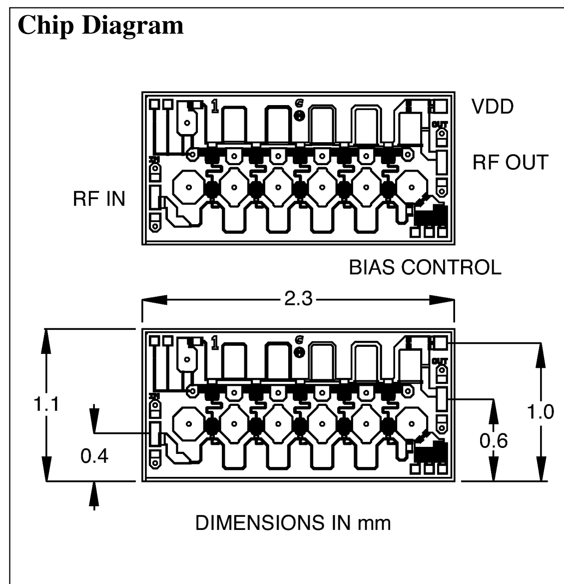
2.0 to 22.0 GHz GaAs MMIC Power Amplifier

Advanced Product Information
August 2004 *(1 of 3)*

Features

- ❑ **Small Size: 45 x 92 mils**
- ❑ **High Gain: 11.5 dB, Nom**
- ❑ **Medium Power: +25 dBm, Typ P1dB @14 GHz**
- ❑ **Directly Cascadable – Fully Matched**
- ❑ **Unconditionally Stable**
- ❑ **Single Bias Operation**
- ❑ **Bias Control**
- ❑ **pHEMT Technology**
- ❑ **Silicon Nitride Passivation**

Chip Diagram



Specifications (TA = 25°C, Vdd = 8V)[1]

Parameters	Units	Min	Typ	Max
Frequency Range	GHz	2.0		22.0
Small Signal Gain	dB	10.0		13.5
Gain Flatness	±dB			0.8
Gain Variation (-40°C to +85°C)	±dB			0.35
Input Return Loss	dB		-10.0	
Output Return Loss	dB		-9.0	
Power Output (@1 dB Gain Compression) [1]	dBm	22.5		
P1dB Variation (over operating frequency)	dBm			4.5
P1dB Variation (-40°C to +85°C)	±dBm			0.25
Saturated Output Power	dBm	24.0		29.0
Second Order Intercept Point @ 10 GHz	dBm		48.0	
Third Order Intercept Point @ 10 GHz	dBm		37.5	
Noise Figure	dB			7.5
Current	mA	250	295	340
Thermal Resistance	°C/W			33.0
Stability [2]	Unconditionally Stable			

Notes: 1. Tested on Celeritek Connectorized evaluation board (standard assembly condition detailed on page 3).
2. Stability factor measured on-wafer.

Absolute Maximum Ratings

Parameter	Rating
Drain Voltage	7V (min.) / 9V (max.)
Drain Current	350 mA
Continuous Power Dissipation	2.8 W
Input Power	+20 dBm
Storage Temperature	-50°C to +150°C
Channel Temperature	+175°C
Operating Backside Temperature	-40 to (see note 2)°C

Notes: 1. Operation outside these limits can cause permanent damage.
2. Calculation maximum operating temperature:
Tmax = 175–(Pdis [W] x 33.0) [°C].

Die Attach and Bonding Procedures

Die Attach: Eutectic die attach is recommended. For eutectic die attach: Preform: AuSn (80% Au, 20% Sn); Stage Temperature: 290°C, ±5°C; Handling Tool: Tweezers; Time: 1 min or less.

Wire Bonding: Wire Size: 0.7 to 1.0 mil in diameter (pre-stressed); Thermocompression bonding is preferred over thermosonic bonding. For thermocompression bonding: Stage Temperature: 250°C; Bond Tip Temperature: 150°C; Bonding Tip Pressure: 18 to 40 gms depending on size of wire.

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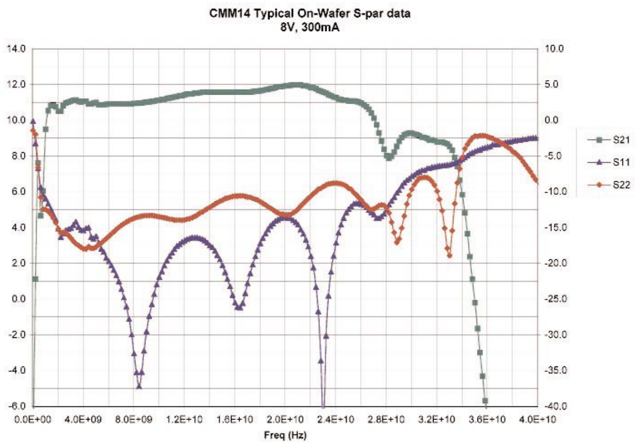
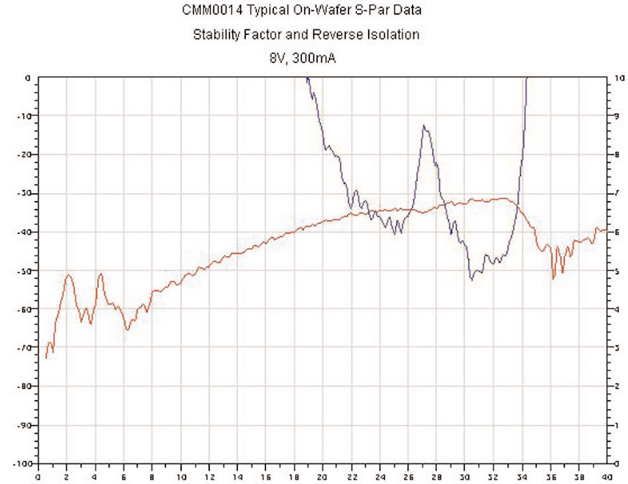
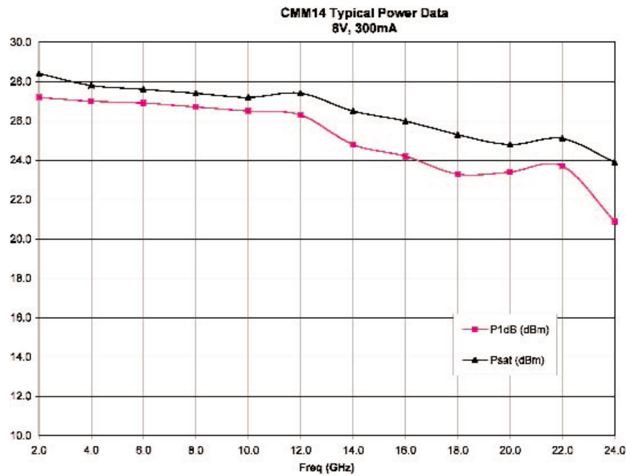
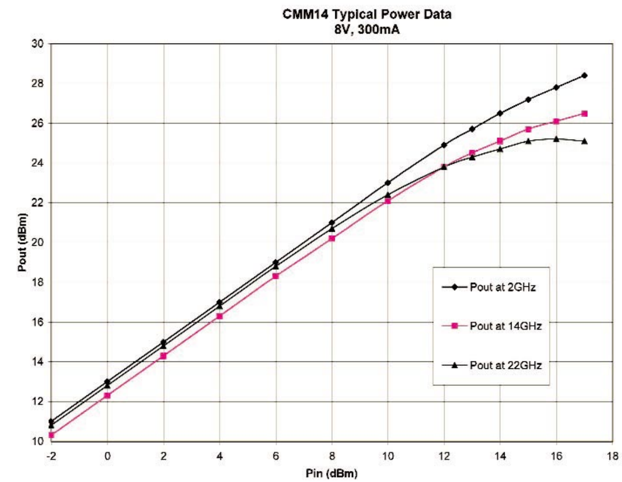
Typical Performance (Vdd = 8V, 300 mA)









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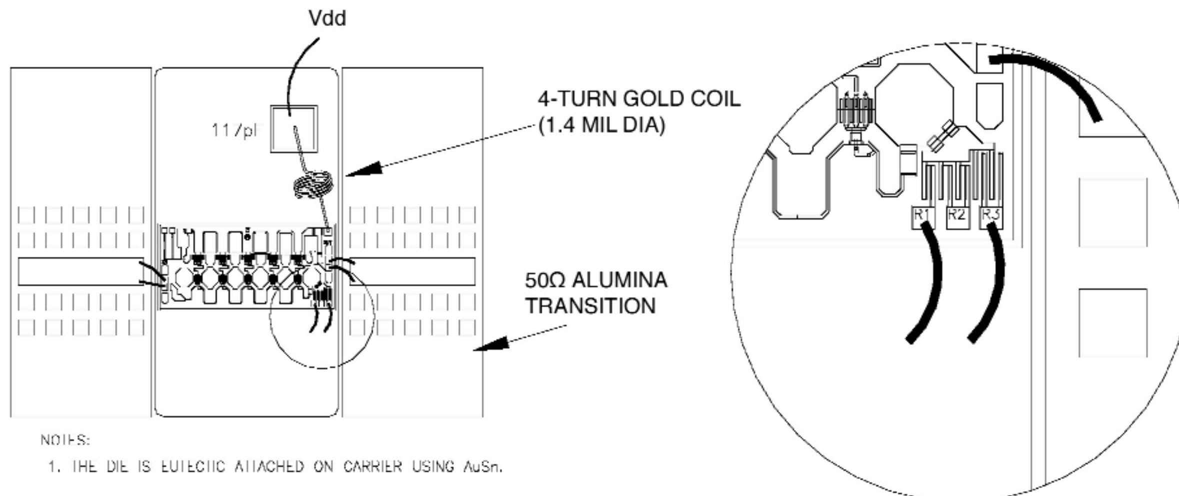
Assembly Example



Note:
1. Eutectic attach on at least 30mil thick CuW or CuMo carrier is recommend.
2. For evaluation, a 1.4mil wire diameter lithium gold air coil has been used .

Ordering Information

The CMM-0014-BD is available in bare die and is shipped in Gel Pak.

Part Number for Ordering	Package
CMM0014-BD	**Bare Die**

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