



2.0 to 24.0 GHz GaAs MMIC Power Amplifier

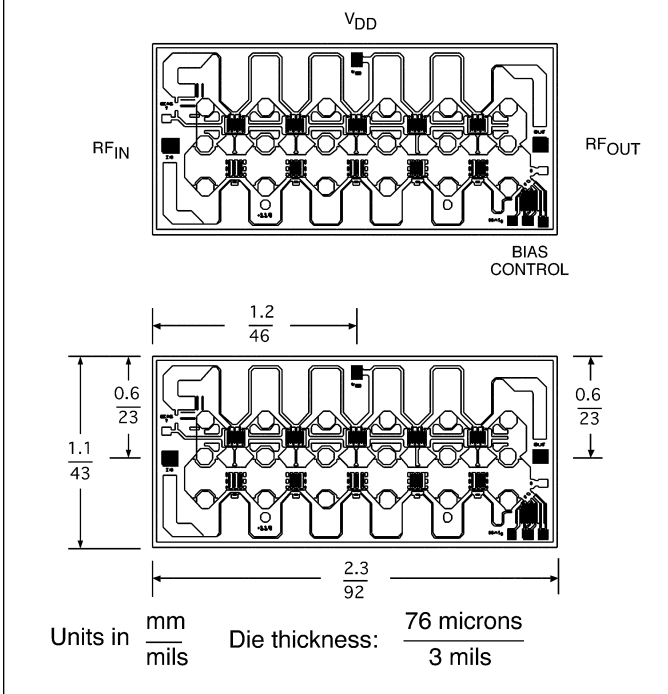
**Advanced Product Information
April 2003**

(1 of 2)

Features

- ❑ Small Size: 43 x 92 mils
- ❑ High Gain
- ❑ Directly Cascadable
- ❑ Medium Power: +24 dBm
- ❑ Ion-Implanted Active Layers
- ❑ Silicon Nitride Passivation

Chip Diagram



Specifications ($T_A = 25^\circ\text{C}$, $V_{DD} = 8\text{V}$)

| Parameters | Units | Min | Typ | Max |
|---------------------------------------|----------------|------|-------|-------|
| Frequency Range | GHz | 2.0 | | 24.0 |
| Small Signal Gain | dB | 11.0 | 12.0 | |
| Gain Flatness | $\pm\text{dB}$ | | 0.5 | 0.85 |
| Input/Output VSWR | — | | 1.8:1 | 2.0:1 |
| Power Output (@1 dB Gain Compression) | dBm | 22.0 | 24.0 | |
| Second Order Intercept Point | dBm | | 40.0 | |
| Third Order Intercept Point | dBm | | 30.0 | |
| Current | mA | 300 | | 330 |

Absolute Maximum Ratings

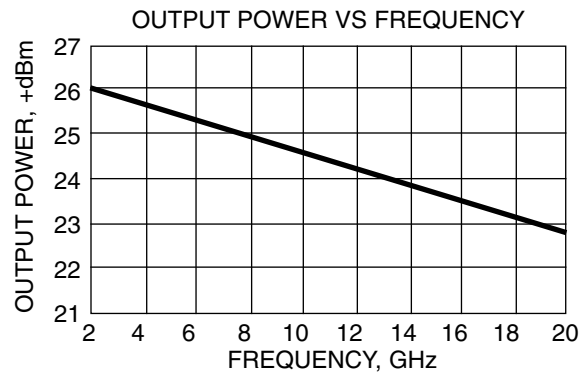
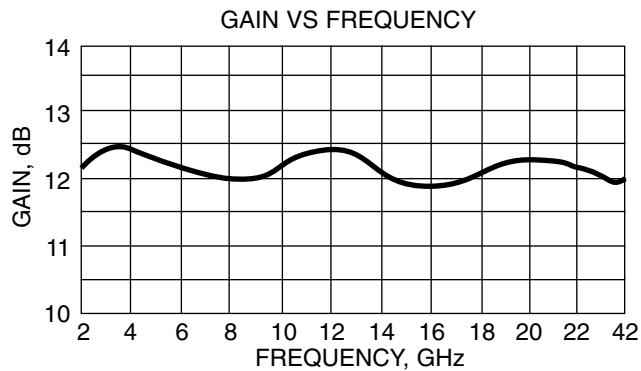
| Parameter | Rating |
|------------------------------|-----------------|
| Drain Voltage | 12V |
| Drain Current | 360 mA |
| Continuous Power Dissipation | 3.0 W |
| Channel Temperature | +175°C |
| Storage Temperature | -65°C to +175°C |
| Mounting Temperature | +320°C |
| Input Power | +23 dBm |

Die Attach and Bonding Procedures

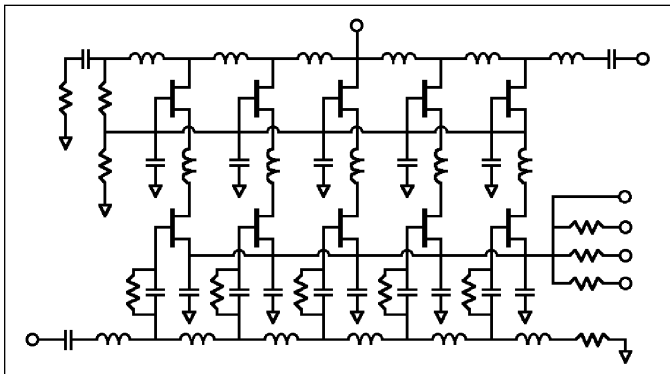
Die Attach: Eutectic die attach is recommended. For eutectic die attach: Preform: AuSn (80% Au, 20% Sn); Stage Temperature: 290°C, $\pm 5^\circ\text{C}$; Handling Tool: Tweezers; Time: 1 min or less.

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.

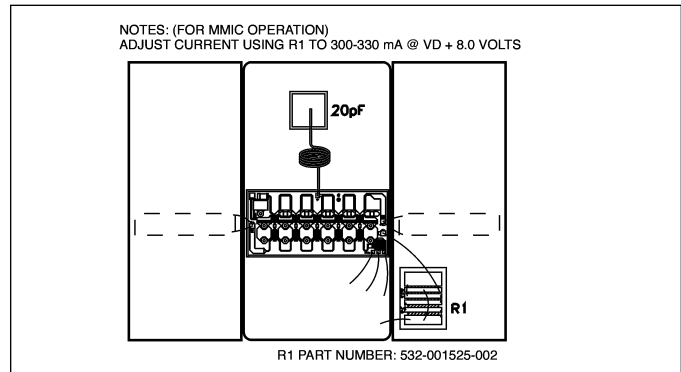
Typical Performance (TA=25°C, VDD = 8V)



Schematic Diagram



Assembly Example



Typical Scattering Parameters, TA = 25°C (S-Parameters Include Bonding Wire Parasitics)

| Freq (GHz) | S ₁₁ | | | S ₂₁ | | | S ₁₂ | | | S ₂₂ | | |
|------------|-----------------|-------------|-------|-----------------|-------------|-------|-----------------|-------------|-------|-----------------|-------------|-------|
| | (dB) | (Mag) | (Ang) | (dB) | (Mag) | (Ang) | (dB) | (Mag) | (Ang) | (dB) | (Mag) | (Ang) |
| 2.0 | -16.5 | 0.149623566 | -121 | 12.2 | 4.073802778 | 139 | -51.3 | 0.002722701 | -6 | -14.6 | 0.186208714 | 141 |
| 4.0 | -16.4 | 0.151356125 | -179 | 12.5 | 4.216965034 | 71 | -42.6 | 0.007413102 | 1 | -18.8 | 0.114815362 | 89 |
| 6.0 | -19.7 | 0.103514217 | 108 | 12.2 | 4.073802778 | 9 | -38.5 | 0.011885022 | -59 | -24.3 | 0.06095369 | 61 |
| 8.0 | -25.8 | 0.051286138 | -67 | 11.9 | 3.935500755 | -50 | -36.1 | 0.015667511 | -114 | -28.4 | 0.03801894 | -112 |
| 10.0 | -16.9 | 0.142889396 | -152 | 12.2 | 4.073802778 | -111 | -33.0 | 0.022387211 | -167 | -21.5 | 0.084139514 | -165 |
| 12.0 | -15.8 | 0.16218101 | 151 | 12.2 | 4.073802778 | -171 | -32.3 | 0.024266101 | 145 | -21.9 | 0.080352612 | 132 |
| 14.0 | -22.6 | 0.074131024 | 106 | 11.9 | 3.935500755 | 129 | -31.3 | 0.027227013 | 108 | -21.9 | 0.080352612 | -72 |
| 16.0 | -19.7 | 0.103514217 | -157 | 11.7 | 3.84591782 | 66 | -32.3 | 0.024266101 | 49 | -14.2 | 0.19498446 | -130 |
| 18.0 | -14.9 | 0.179887092 | 162 | 12.3 | 4.120975191 | 4 | -32.1 | 0.024831331 | -23 | -12.1 | 0.248313311 | -163 |
| 20.0 | -19.2 | 0.10964782 | 162 | 12.2 | 4.073802778 | -62 | -30.0 | 0.031622777 | -91 | -11.2 | 0.27542287 | -174 |
| 22.0 | -15.1 | 0.175792361 | 175 | 12.0 | 3.981071706 | -72 | -28.8 | 0.036307805 | -117 | -10.6 | 0.295120923 | 179 |
| 24.0 | -13.7 | 0.206538016 | 173 | 11.8 | 3.89045145 | -71 | -28.6 | 0.037153523 | -126 | -10.2 | 0.309029543 | 158 |

Ordering Information

The CMM-0224-BD is available in bare die and is shipped in Gel Pak.

Part Number for Ordering

CMM0224-BD

Optional Current Setting Resistor

Package

Bare Die

532-001525-002

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