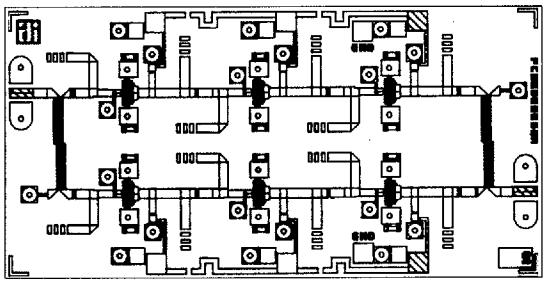
37–40 GHz GaAs MMIC Amplifier

AA038P1–00

Features

- Broad Coverage of Ka–Band
- 14 dB Small Signal Gain
- 18 dBm Output Power at P 1dB at 38 GHz
- Dual Drain Bias
- 0.25 μm Ti/Pt/Au Gates
- Passivated Surface

Chip Layout



Description

Alpha's three–stage reactively–matched Ka–band MMIC amplifier has a P1 dB in excess of 18 dBm with 13 dB associated gain over the band 37–40 GHz. The chip uses Alpha's proven 0.25 μm MESFET technology and is based upon MBE layers and electron beam lithography for the highest uniformity and repeatability. The MMICs employ surface passivation to ensure a rugged reliable part with through–substrate via holes and gold–based backside metallization to facilitate epoxy die attach processes. All chips are screened for gain, output power, efficiency and s–parameters over the band 37–40 GHz prior to shipment for guaranteed performance. A broad range of applications exist in both the military and commercial areas where medium power and gain are required. This amplifier covers both the US and European Ka–band PCN bands.

Electrical Specifications at 25°C

(Vds = +6V, Ids = 360 mA Typical, f = 37–40 GHz)					
		Value			
Parameter	Symbol	Min	Typ	Max	Unit
Small Signal Gain	G	11	14	–	dB
Input Return Loss	RLi	–	–15	–9	dB
Output Return Loss	RLo	–	–13	–9	dB
Output Power at 1dB Gain Compression	P1dB	16	18	–	dBm
Saturated Output Power	Psat	19	21	–	dBm
Gain at Saturation	Gsat	8	10	–	dB
* Not measured on a 100% basis.					

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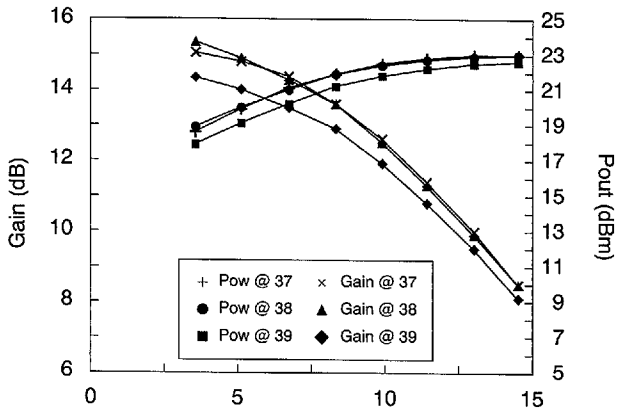
Typical Output Power Compression (f = 38 GHz, Vds = +6V, Ids = 360 mA)

Pin (dBm)	Pout (dBm)	G (dB)	RLi (dB)	Padd (%)
–6	10.5	16.5	–14.0	0.525
–4	12.2	16.3	–14.2	0.776
–2	14.0	16.0	–14.3	1.180
–0	15.9	15.9	–14.4	1.830
2	17.8	15.7	–14.5	2.850
4	19.5	15.6	–14.5	4.240
6	21.1	15.1	–14.6	6.160
8	22.3	14.4	–14.5	8.140
10	23.2	13.2	–14.4	10.000
12	23.8	11.8	–14.2	11.400
14	24.0	10.1	–13.9	11.700



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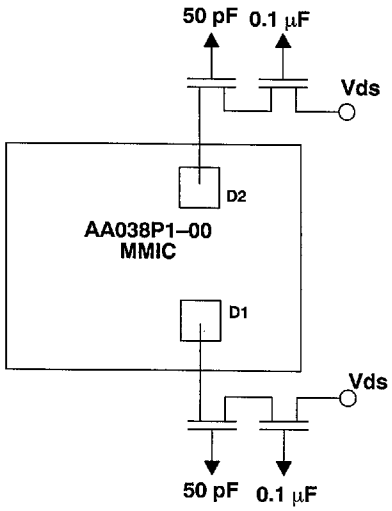
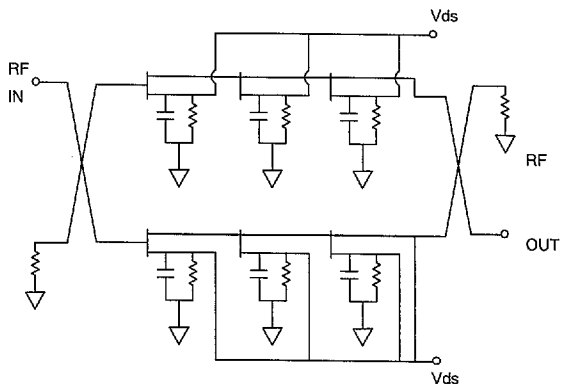
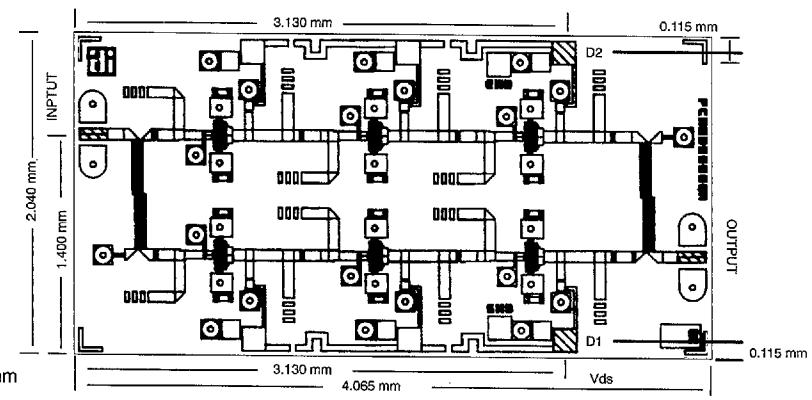
Bias Arrangement



Circuit Schematic



Chip Outline



Chip Thickness = 0.1 mm

RF GaAs MMIC Products in Metal Packages

Numerical Index