

37–42 GHz GaAs MMIC Driver Amplifier



AA038P3-00

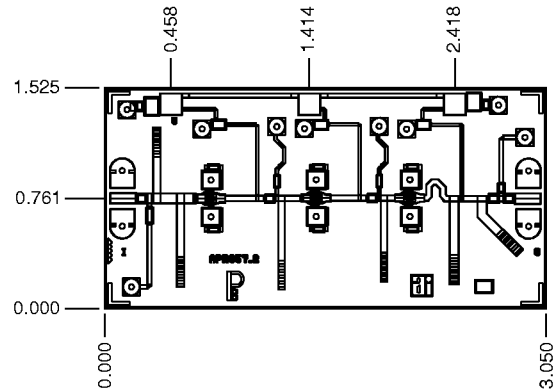
Features

- Single Bias Supply Operation (5 V)
- 17 dB Small Signal Gain
- 17 dBm Saturated Output Power at 38 GHz
- 0.25 μm Ti/Pd/Au Gates
- 100% On-Wafer RF and DC Testing
- 100% Visual Inspection to MIL-STD-883 MT 2010

Description

Alpha's three-stage reactively-matched Ka band GaAs MMIC amplifier has a $P_{1\text{ dB}}$ in excess of 14 dBm with 16 dB associated gain over the band 37–42 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 FETs 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 37–42 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.

Chip Outline



Dimensions indicated in mm.
All DC (V) pads are 0.1 x 0.1 mm and RF In, Out pads are 0.07 mm wide.
Chip thickness = 0.1 mm.

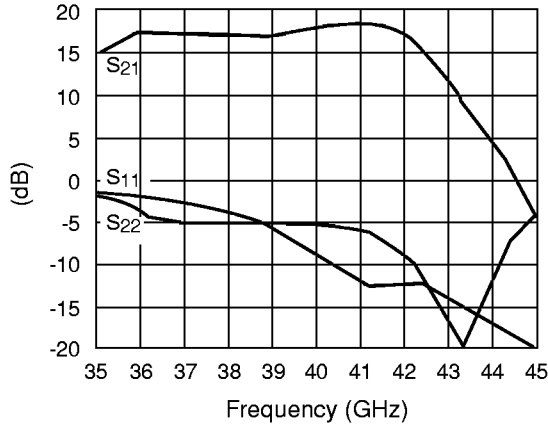
Absolute Maximum Ratings

Characteristic	Value
Operating Temperature (T_C)	-55°C to +90°C
Storage Temperature (T_{ST})	-65°C to +150°C
Bias Voltage (V_D)	7 V_{DC}
Power In (P_{IN})	16 dBm
Junction Temperature (T_J)	175°C

Electrical Specifications at 25°C ($V_{DS} = 5\text{ V}$)

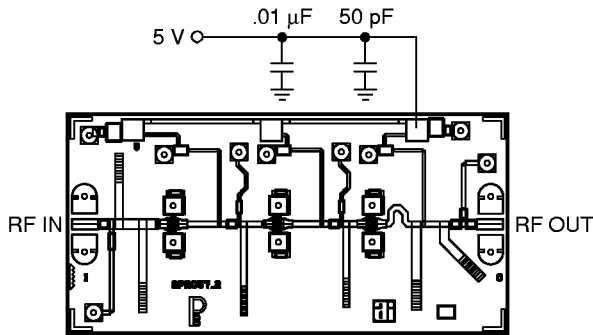
Parameter	Symbol	Min.	Typ.	Max.	Unit
Drain Current	I_{DS}		130	200	mA
Small Signal Gain	G	14	17		dB
Input Return Loss	RL_I		-6	-5	dB
Output Return Loss	RL_O		-6	-5	dB
Output Power at 1 dB Gain Compression	$P_{1\text{ dB}}$	13	14		dBm
Saturated Output Power	P_{SAT}	14	17		dBm
Gain at Saturation	G_{SAT}	12	14		dB
Thermal Resistance	Θ_{JC}		160		°C/W

Typical Performance Data



Typical Small Signal Performance S-Parameters ($V_{DS} = 5\text{ V}$)

Bias Arrangement



For biasing on, adjust V_{DS} from zero to the desired value (5 V recommended). For biasing off, reverse the biasing on procedure.

Circuit Schematic

