



Product Description

The FMA3015 is a high performance X-Band Gallium Arsenide monolithic amplifier. It is suitable for use in communication, instrumentation and electronic warfare applications. The die is fabricated using RFMD's 0.5µm process.

Features

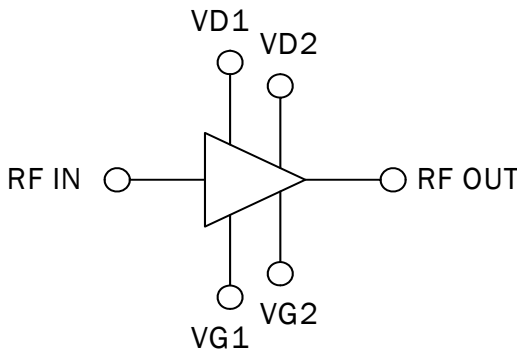
- 12dB Gain
- 7.5 W Saturated Output Power at 9V
- pHEMT Technology

Applications

- Test Instrumentation
- Electronic Warfare
- Communication Infrastructure

Optimum Technology Matching® Applied

- GaAs HBT
- GaAs MESFET
- InGaP HBT
- SiGe BiCMOS
- Si BiCMOS
- SiGe HBT
- GaAs pHEMT
- Si CMOS
- Si BJT
- GaN HEMT
- InP HBT
- RF MEMS
- LDMOS



Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Electrical Specifications					
T _{AMBIENT} = 25 °C, Z ₀ = 50Ω					
Gain		>12		dB	9GHz to 10GHz, V _D = 9V, V _G = -0.5V
Input Return Loss		-10		dB	9GHz to 10GHz, V _D = 9V, V _G = -0.5V
Output Return Loss		-10		dB	9GHz to 10GHz, V _D = 9V, V _G = -0.5V
Reverse Isolation		-40		dB	9GHz to 10GHz, V _D = 9V, V _G = -0.5V
Output Saturated Power		38.7		dBm	Drain voltage and input power pulsed at a prf of 1kHz, 5% duty cycle. V _D = 9V, V _G = -0.5V, input power = 27 dBm, frequency = 9.5GHz
Drain Current	80		135	mA	Drain voltage and input power pulsed at a prf of 1kHz, 5% duty cycle. V _D = 9V, V _G = -0.5V, input power = 0dBm

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Absolute Maximum Ratings

Parameter	Rating	Unit
Maximum Input Power (P_{IN})	+29	dBm
Drain Voltage (V_{DD})	+12	V
Operating Temperature (T_{OPER})	-40 to 85	°C
Storage Temperature (T_{STOR})	-55 to 150	°C



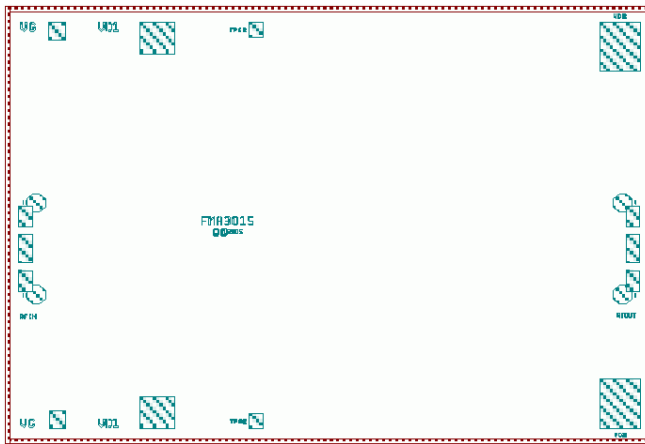
Caution! ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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Pad Layout



Pad	Name	Description
A	IN	RF input
B	VG1	South gate voltage 1
C	VD1	South drain voltage 1
D	VG2	South gate voltage 2
E	VD2	South drain voltage 2
F	OUT	RF output
G	VD2	North drain voltage 2
H	VG2	North gate voltage 2
I	VD1	North drain voltage 1
J	VG1	North gate voltage 1

Die Size (μm)	Die Thickness (μm)	Min. Bond Pad Pitch (μm)	Min. Bond Pad Opening ($\mu\text{m} \times \mu\text{m}$)
4521x3048	100	200	92x92

Preferred Assembly Instructions

GaAs devices are fragile and should be handled with great care. Specially designed collets should be used where possible.

The back of the die is metallized and the recommended mounting method is by the use of conductive epoxy. Epoxy should be applied to the attachment surface uniformly and sparingly to avoid encroachment of epoxy on to the top face of the die, and ideally should not exceed half the chip height. For automated dispense Ablestick LMISR4 is recommended, and for manual dispense Ablestick 84-1 LMI or 84-1 LMIT are recommended. These should be cured at a temperature of 150°C for 1 hour in an oven especially set aside for epoxy curing only. If possible the curing oven should be flushed with dry nitrogen. The gold-tin (80% Au 20% Sn) eutectic die attach has a melting point of approximately 280 °C but the absolute temperature being used depends on the leadframe material used and the particular application. The maximum time at used should be kept to a minimum.

This part has gold (Au) bond pads requiring the use of gold (99.99% pure) bondwire. It is recommended that 25.4µm diameter gold wire be used. Recommended lead bond technique is thermocompression wedge bonding with 0.001” (25µm) diameter wire. The bond tool force shall be 35grams to 38grams. Bonding stage temperature shall be 230 °C to 240 °C, heated tool (150 °C to 160 °C) is recommended. Ultrasonic or thermosonic bonding is not recommended.

Bonds should be made from the die first and then to the mounting substrate or package. The physical length of the bondwires should be minimized especially when making RF or ground connections.

Handling Precautions



To avoid damage to the devices, care should be exercised during handling. Proper Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing.

ESD/MSL Rating

These devices should be treated as Class 0 (0V to 250V) using the human body model as defined in JEDEC Standard No. 22-A114. Further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263. This is an unpackaged part and therefore no MSL rating applies.

Application Notes and Design Data

Application Notes and design data including S-parameters are available on request from www.rfmd.com.

Reliability

An MTTF of 4.2 million hours at a channel temperature of 150 °C is achieved for the process used to manufacture this device.

Disclaimers

This product is not designed for use in any space-based or life-sustaining/supporting equipment.

Ordering Information

Quantity	Ordering Code
Standard order quantity (waffle pack)	FMA3015-000
Small quantity (25)	FMA3015-000SQ
Sample quantity (3)	FMA3015-000S3

