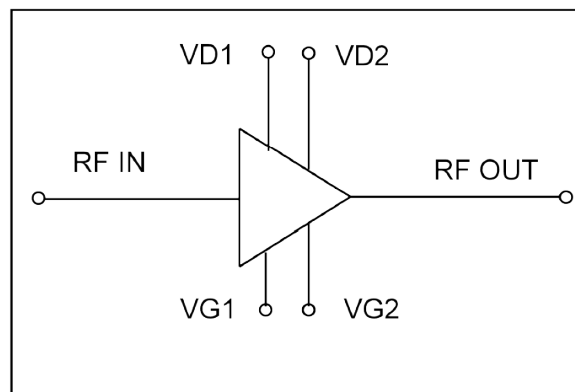


# X-BAND 7.5W HIGH POWER AMPLIFIER GaAs MMIC

## FMA3015

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 II-VI Compound Semiconductors Ltd 0.5µm process.



## KEY CHARACTERISTICS

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

## APPLICATIONS

- Test Instrumentation
- Electronic Warfare
- Communication Infrastructure

## BARE DIE

4.521 mm x 3.048 mm x 0.1 mm

**100% RoHS Compliant**

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## Typical Performance

Parameter	Min	TYP	Max	Unit	Conditions
Electrical Specifications					$T_{\text{Ambient}} = 25^{\circ}\text{C}$ , $Z_0 = 50\Omega$
Operating Frequency	9		10	GHz	
Small Signal Gain		12		dB	$V_D = 9\text{ V}$ , $V_G = -0.5\text{ V}$ nominal
Input Return Loss	10.0	10		dB	$V_D = 9\text{ V}$ , $V_G = -0.5\text{ V}$ nominal
Output Return Loss		10		%	$V_D = 9\text{ V}$ , $V_G = -0.5\text{ V}$ nominal
Reverse Isolation		40			$V_D = 9\text{ V}$ , $V_G = -0.5\text{ V}$ nominal
Peak Saturated Output Power*	37.0	39		dBm	$V_D = 9\text{ V}$ , $V_G = -0.5\text{ V}$ nominal $P_{\text{in}} = 27\text{ dBm}$ with frequency of 9-9.5 GHz
	37.5				$V_D = 9\text{ V}$ , $V_G = -0.5\text{ V}$ nominal $P_{\text{in}} = 27\text{ dBm}$ with frequency of 10 GHz
Peak Supply Current	1.6	2.1	2.7	mA	$V_D = 9\text{ V}$ , $V_G = -0.5\text{ V}$ nominal $P_{\text{in}} = 0\text{ dBm}$ with frequency of 9-10 GHz

\* Pulsed operation may be appropriate dependant on application's heat sinking capability

## Absolute Maximum Ratings<sup>1</sup>

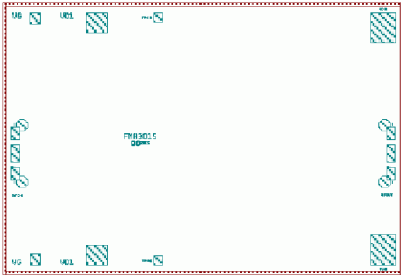
Parameters	Rating	Unit
Maximum Input Power ( $P_{\text{IN}}$ )	+29	dBm
Drain Voltage	+12	V
Operating Temperature ( $T_{\text{OPER}}$ )	-40 to 85	$^{\circ}\text{C}$
Storage Temperature ( $T_{\text{STOR}}$ )	-55 to 150	$^{\circ}\text{C}$

## 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

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## Die Layout



Die Size (μm)	Die Thickness (μm)	MIN. Bond Pad Pitch (μm)	MIN. Bond Pad Opening (μm x μm)
4521 x 3048	100	200	92 x 92



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).

The information in this publication is believed to be accurate and reliable. However, no responsibility is assumed by II-VI Compound Semiconductors Ltd for its use, nor for any infringement of patents, or other rights of third parties, resulting from its use. No license is granted by implication or otherwise under any patent or patent rights of II-VI Compound Semiconductors Ltd. II-VI Compound Semiconductors Ltd reserves the right to change component circuitry, recommended application circuitry and specifications at any time without prior notice.

## 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 LMIS4 is recommended. For manual dispense Ablestick 84-1 LMI or 84-1 LMIT are recommended. These should be cured at a temperature of 150°C for one 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 time at maximum temperature 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 25μm diameter gold wire be used. Recommended lead bond technique is thermocompression wedge bonding with 0.001" (25μm) diameter wire. Bond force, time, stage temperature, and ultrasonics are all critical parameters and the settings are dependent on the setup and application being used. 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.



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### ESD/MSL Rating

These devices should be treated as Class 0B (125V to <250V) as defined in JEDEC Standard No. JS-001 and subsequent revisions. Further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263.

### Reliability

An MTTF in excess of 4 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

Delivery Quantity	Ordering Code
Full Pack (100)	FMA3015 - 100
Small Quantity (25)	FMA3015 - 025
Sample Quantity (3)	FMA3015 - 003