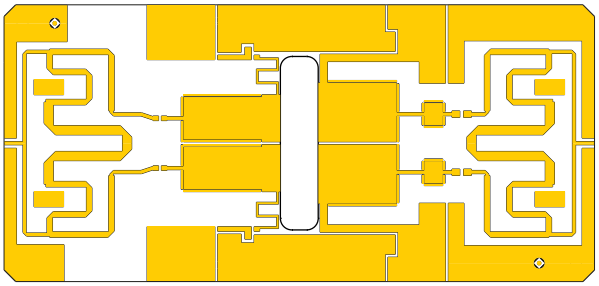
L-Band, GaN/SiC, RF Power Amplifier Pallet

960 - 1220 MHz | 6000 W typ | 75% Efficiency typ | 19 dB Gain typ | 125 V | 32μs Pulse Length, 4% Duty Cycle

IGNP0912S5000 is a high power RF power amplifier pallet that has been desIgned to suit the unique needs of TACAN, DME and IFF/SSR avionics systems. Under 32μs, 4% duty cycle pulse conditions, it supplies 5000 W of peak output power, with 18dB of associated gain and 70% efficiency. It operates from a 125 V supply voltage.



FEATURES

- GaN on SiC HEMT Technology
- Output Power >5000 W
- Input impedance fully matched to 50Ω
- High Efficiency - up to 75% during the RF pulse
- 100% RF Tested

APPLICATIONS

- TACAN and DME Systems
- IFF/SSR Systems

Table 1. RF Electrical Characteristics (Case temperature = 30 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Gain	G	17	18	20	dB	P_{OUT} = 5000W
Drain Efficiency	η	60	70	80	%	f = 960, 1090, 1220 MHz
Pulse Droop	D	-0.5	-0.3	+0.2	dB	32μs pulse length, 4% duty cycle
Input Return Loss	IRL	6	11	20	dB	
Load Mismatch Stability	VSWR-S	2:1				V_{DS} = 125V, I_{DS} = 75mA per side
VSWR Withstand	VSWR-LMT	3:1				

Note 1: Consult Integra Technologies Application Note 001 for information on how RF output power and pulse droop are measured.

Table 2. DC Electrical Characteristics (Case temperature = 25 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Gate Pinch-Off Voltage	V_P	-5.0			V	V_{DS} = 125V, I_{DS} = 1mA
Quiescent Gate Voltage	V_Q		-2.8		V	V_{DS} = 125V, I_{DS} = 75mA per side

Table 3. Absolute Maximum Ratings (Not Simultaneous)

Parameter	Symbol	Value	Units	Test Conditions
DC Drain-Source Voltage	V_{DS}	400	V	25 °C
DC Gate-Source Voltage	V_{GS}	-8 to +1.0	V	25 °C
DC Drain Current	I_D	156	A	25 °C
DC Gate Current	I_G	156	mA	25 °C
RF Input Power	$P_{RF,IN}$	110	W	25 °C
Operating Channel Temperature	T_J	-55 to +225	°C	
Storage Temperature	T_{STG}	-55 to +150	°C	

Note: Operation outside the limits given in this table may cause permanent damage to the transistor

Table 4. Thermal Resistance (Case temperature = 85 °C unless otherwise stated)

Parameter	Symbol	Typ	Units	Test Conditions
Peak Thermal Resistance (total device), Channel to underneath side of pallet	R_{TH}	0.04	°C/W	P_{diss} = 2142W 32µs pulse length, 4% duty cycle V_{DS} = 125V

TYPICAL PERFORMANCE

Gain & Efficiency vs Frequency

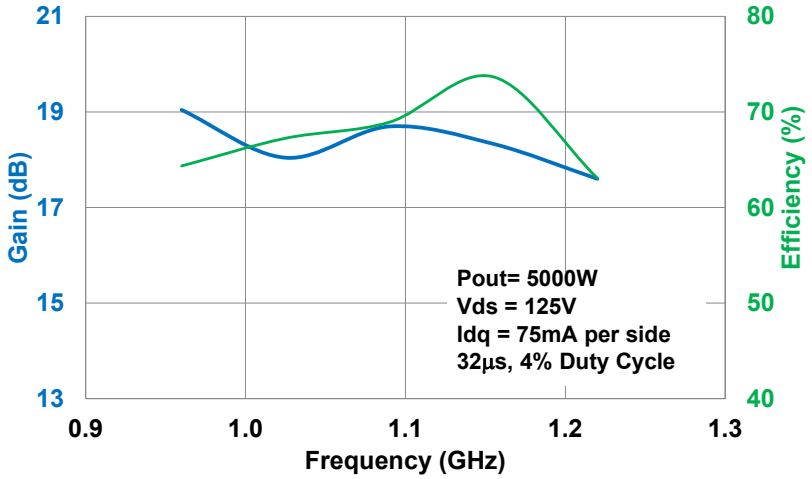
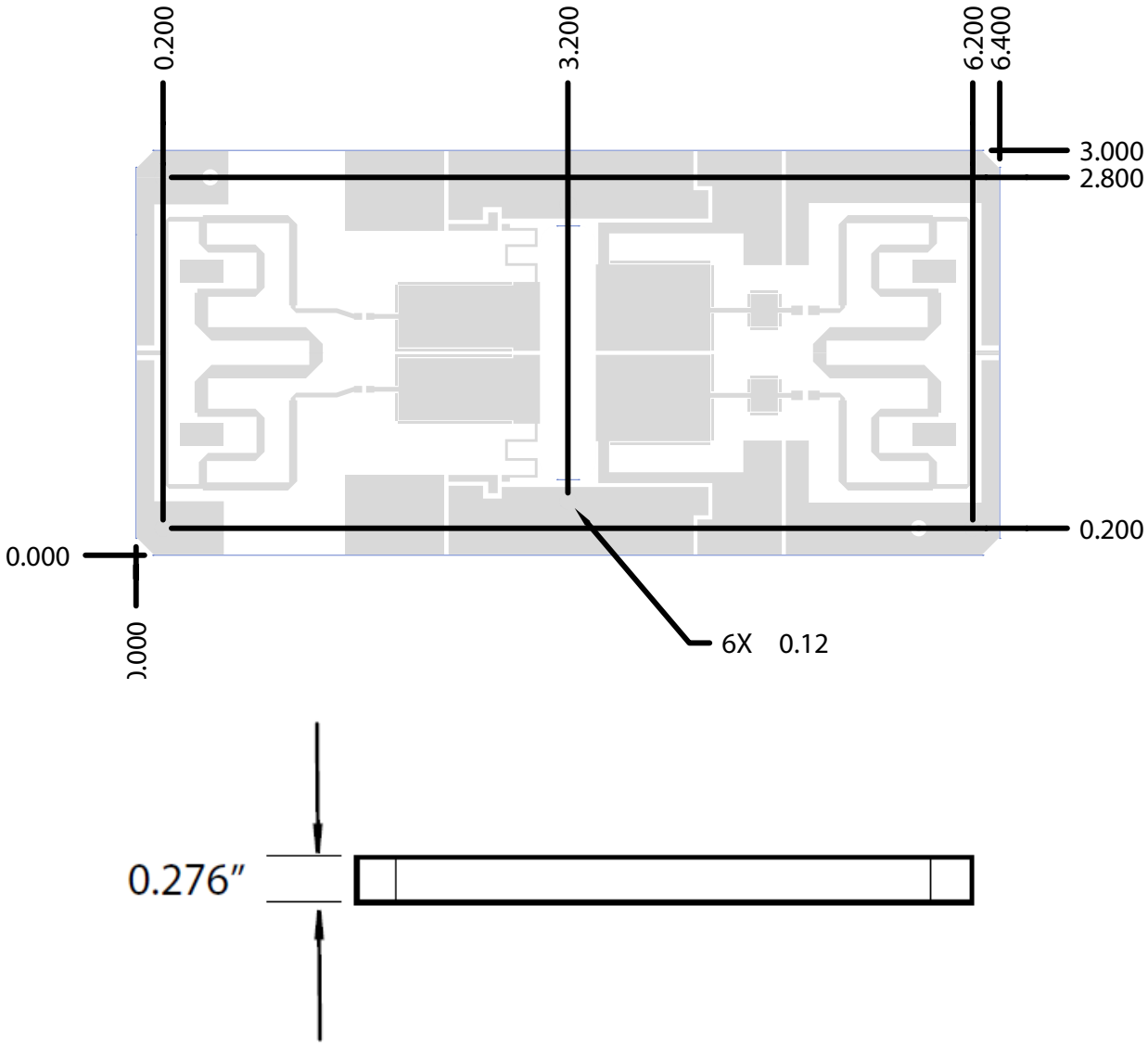


Figure 1

DIMENSIONS (INCHES)



ESD & MSL Rating

Parameter	Rating	Standard
ESD Human Body Model (HBM)	TBD	ESDA/JEDEC JS-001-2012
ESD Charged Device Model (CDM)	TBD	JEDEC JESD22-C101F
Moisture Sensitivty Level (MSL)	Unlimited Shelf Life	IPC/JEDEC J-STD-020

REACH Compliance

Integra Technologies supports EU Regulation number 1907/2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) as these apply to Integra semiconductor products, development tools, and shipping packaging.

In support of the REACH regulation, Integra will:

- Inform customers and recipients of Integra product if they contain any substances that are of very high concern (SVHC) per the European Chemical Agency (ECHA) website.
- Notify ECHA if any Integra product that contains any SVHCs which exceed guidelines for REACH chemicals by weight per part number and for total content weight per year for all products produced in or imported to the European market.
- Cease shipments of product containing REACH Annex XIV substances until authorization has been obtained.
- Cease shipment of product containing REACH Annex XVII chemicals when restrictions apply.

Integra has evaluated its materials, BOMs, and product specifications and product and has determined that this transistor conforms to all REACH and SVHC regulations and guidelines. Integra has implemented actions and control programs that will assure continued compliance.

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DEFINITIONS:
DATA SHEET STATUS
Advanced Specification - This data sheet contains Advanced specifications.
Preliminary Specification - This data sheet contains specifications based on preliminary measurements and data.
Final Specification - This data sheet contains final product specifications.
MAXIMUM RATINGS Stress above one or more of the maximum ratings may cause permanent damage to the device. These are maximum ratings only operation of the device at these or at any other conditions above those given in the characteristics sections of the specification is not implied. Exposure to maximum values for extended periods of time may affect device reliability.

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