

L-Band, GaN/SiC, RF Power Module

1030-1090 MHz | 2200 W typ | 57% Efficiency typ | 16dB Gain typ | 50 V | Mode S ELM

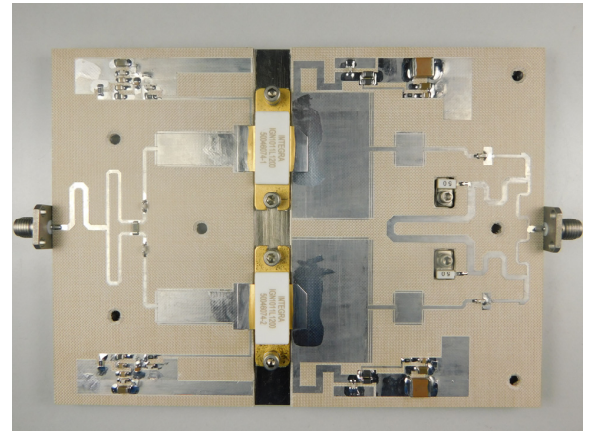
IGNP1011L2400 is a high power GaN-on-SiC RF power module that has been designed specifically for IFF/SSR Systems operating under either Mode S ELM [48x (32μs on, 18μs off), 6.4% Long Term Duty Cycle] or standard Mode S [128μs, 2% Duty Cycle] pulse conditions. It supplies a minimum of 2200W of peak output power, with typically >16 dB of gain and 57% efficiency. It operates from a 50V supply voltage.

FEATURES

- GaN on SiC HEMT Transistor Technology
- Matched to 50Ω at both input and output
- Suitable for both 1030 and 1090 MHz
- 100% RF Tested Under Mode S ELM pulse conditions

APPLICATIONS

- L-band Avionics IFF & SSR Systems
- Suitable for both uplink and downlink (Transponder)
- Suitable for both Standard Mode S and Mode S ELM applications



Absolute Maximum Ratings (Not Simultaneous)

Parameter	Symbol	Value	Units	Test Conditions
DC Drain-Source Voltage	V_{DS}	50	V	25 °C
DC Gate-Source Voltage	V_{GS}	-8 to +1	V	25 °C
DC Drain Current	I_D	85	A	25 °C
DC Gate Current	I_G	TBD	mA	25 °C
RF Input Power	$P_{RF,IN}$	55	W	25 °C
Storage Temperature	T_{STG}	-55 to +150	°C	

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

DC Electrical Characteristics (Case temperature = 25+/-2 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Drain-Gate Breakdown Voltage	BV_{DG}	150			V	Source terminal open, $I_{DG} = 4mA$
Gate Pinch-Off Voltage	V_P	-5			V	$V_{DS} = 50V, I_{DS} = 1mA$
Quiescent Gate Voltage	V_Q		-2.6		V	$V_{DS} = 50V, I_{DS} = 200mA$

RF Electrical Characteristics (Case temperature = 25+/-5 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Output Power	P_{OUT}	2200			W	$P_{IN} = 55W$ $f = 1030, 1090 \text{ MHz}$ Mode S ELM pulse conditions (48 x [32µs on, 18µs off]), LTDC = 6.4% $V_{DS} = 50V, I_{DQ} = 200mA,$
Gain	G	16			dB	
Gain Flatness	OPF			1.5	dB	
Drain Efficiency	η	55			%	
Pulse Droop	D	-0.6			dB	
Input Return Loss	IRL	10			dB	
Delta Insertion Phase Variation	d-IP	-20		+20	Degrees	
Load Mismatch Stability	VSWR-S	2:1				
VSWR Withstand	VSWR-LMT	3:1				

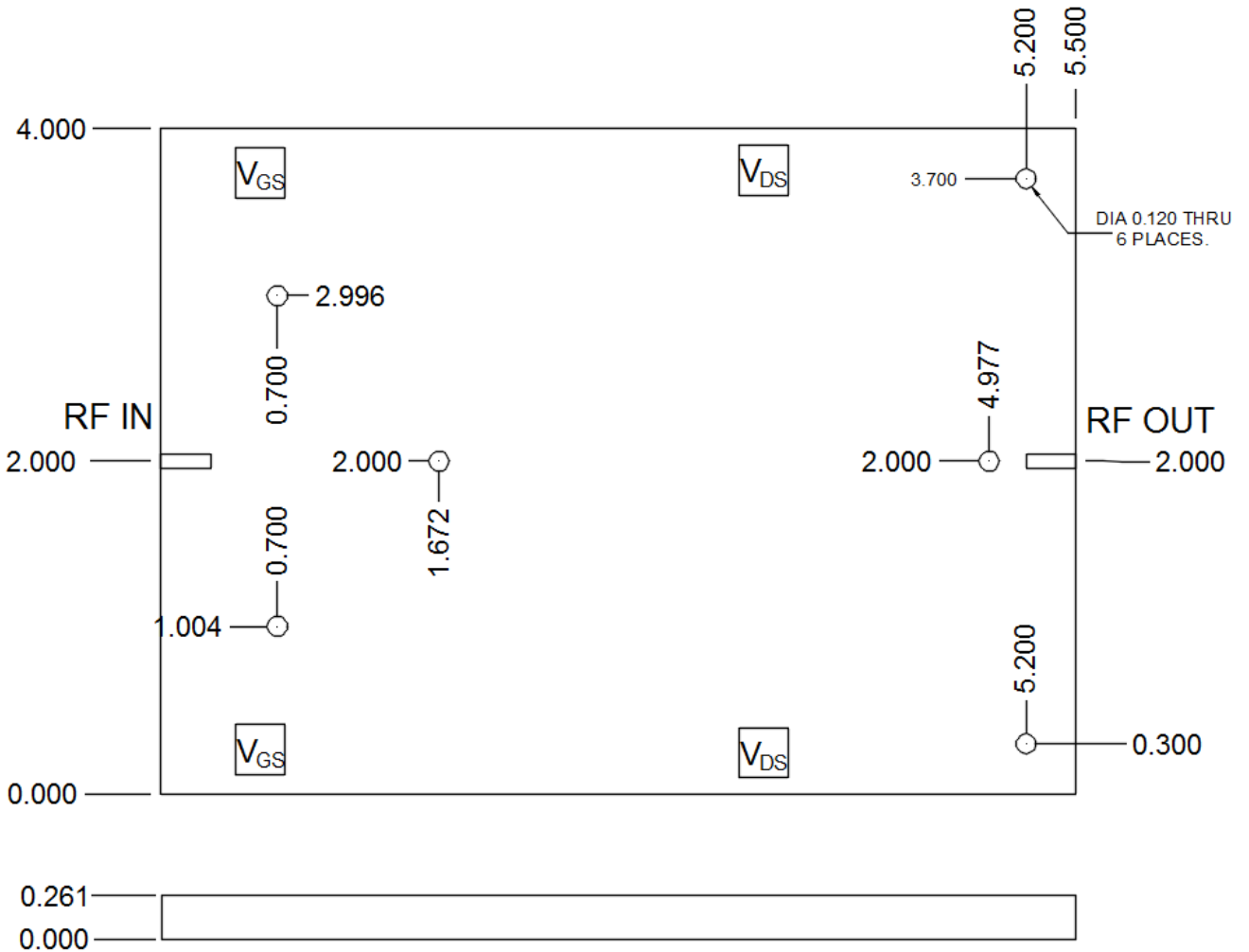
Note: Consult Integra Technologies Application Note 001 for information on how RF output power and pulse droop are measured.

Thermal Resistance (Case temperature = 25+/-5 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Peak Thermal Resistance, junction to underneath side of module	$R_{TH(JC)}$		TBD		°C/W	$P_{OUT} = 2200W$ $f = 1030, 1090 \text{ MHz}$ Mode S ELM pulse conditions (48 x [32µs on, 18µs off]), LTDC = 6.4% $V_{DS} = 50V, I_{DQ} = 200mA$

Typical Performance

Freq (MHz)	V_{DD} (V)	P_{IN} (W)	IRL (dB)	P_{OUT} (W)	G_P (dB)	I_d (A)	N_C (%)	Droop (dB)
1030	50	55.0	11.0	2232	16.08	77.09	57.84	-0.23
1090	50	55.0	14.0	2214	16.05	77.5	57.14	-0.13



Dimensions: Inches

ESD 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 Sensitivity Level (MSL)	0	IPC/JEDEC J-STD-020

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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Integra Technologies, 321 Coral Circle, El Segundo, CA 90245-4620 | Phone: 310-606-0855 | Fax: 310-606-0865