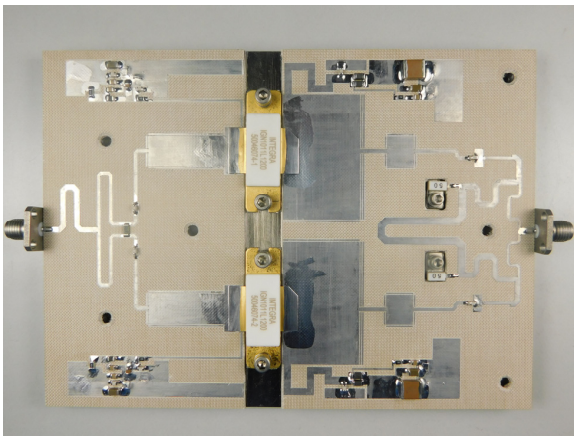
L-Band, GaN/SiC, RF Power Module

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 ^{0}C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Output Power	P_{OUT}	2200			W	
Gain	G	16			dB	P_{IN} = 55W f = 1030, 1090 MHz Mode S ELM pulse conditions (48 x [32µs on, 18µs off]), LTDC = 6.4% V_{DS} = 50V, I_{DQ} = 200mA,
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				

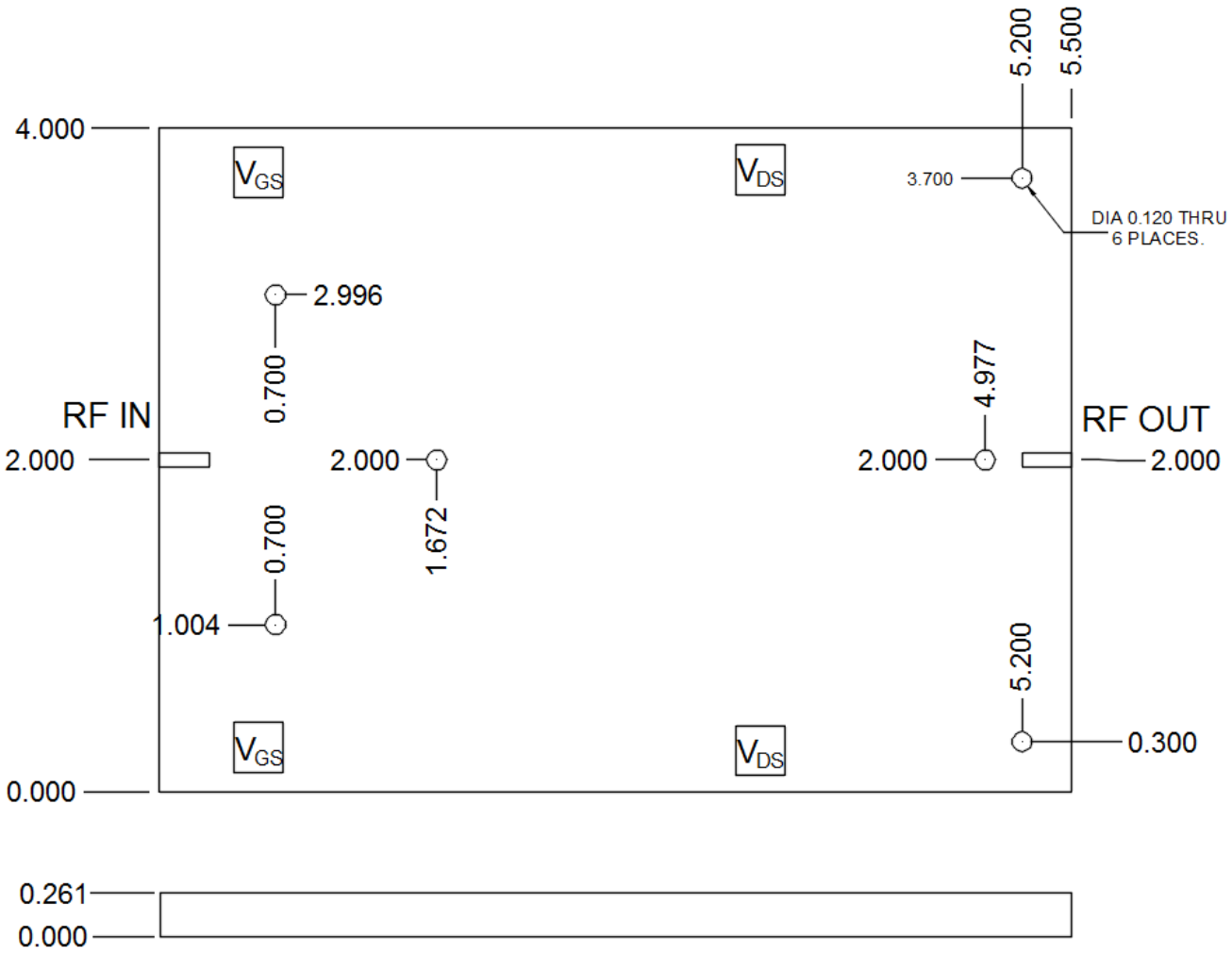
Note: Consult Integra Technologies Application Note 001 for information on how RF output power and pulse droop are measured.

Thermal Resistance (Case temperature = 25+/-5 ^{0}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		^{0}C/W	P_{OUT} = 2200W f = 1030, 1090 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 Sensitivty Level (MSL)	0	IPC/JEDEC J-STD-020

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