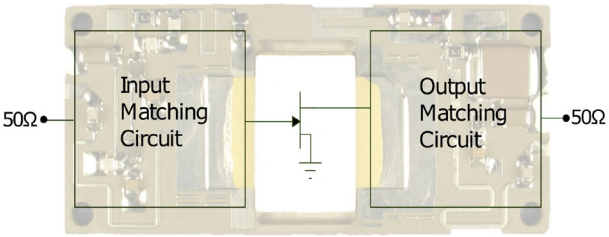
S-Band, GaN/SiC, RF Power Amplifier Pallet

2.7 - 3.0 GHz | 440W typ | 63% Efficiency typ | 10.8 dB Gain typ | 50 V | 150µs Pulse Length, 15% Duty Cycle

IGNP2730M380 is a high power GaN-on-SiC RF power amplifier pallet that has been designed to suit the unique needs of S band radar systems. It operates over the full 2.7 - 3.0 GHz frequency range. Under 150µs, 15% duty cycle pulse conditions, it supplies a minimum of 330 W of peak output power, with typically >11 dB of gain and 60% efficiency. It operates from a 50 V supply voltage.



Block Diagram of IGNP2730M380

FEATURES

- GaN on SiC HEMT Technology
- Output Power >330W
- Fully matched to 50Ω
- High Efficiency - up to 75%
- 100% RF Tested Under 150µs, 15% duty cycle pulse conditions

APPLICATIONS

- S-band Radar Systems

Table 1. RF Electrical Characteristics (Case temperature = 25 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
RF Ouput Power	$P_{OUT, RF}$	380 except at 3.0 GHz 330 at 3.0 GHz		520	W	P_{IN} = 34W f = 2.7, 2.8, 2.9, 3.0 GHz 150µs pulse length, 15% duty cycle V_{DS} = 50V, I_{DS} = 100mA
Gain	G	9.9	10.8	12	dB	
Drain Efficiency	η	45	60	75	%	
Pulse Droop	D	-0.5		+0.15	dB	
Load Mismatch Stability	VSWR-S	1.5:1				
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.

Table2. Absolute Maximum Ratings (Not Simultaneous)

Parameter	Symbol	Value	Units	Test Conditions
DC Drain-Source Supply Voltage	V_{DS}	50	V	25 °C
DC Gate-Source Voltage	V_{GS}	-8 to +0	V	25 °C
DC Drain Current	I_D	20	A	25 °C
DC Gate Current	I_G	81	mA	25 °C
RF Input Power	$P_{RF,IN}$	34	W	25 °C
Operating Ambient Temperature	T_{AMB}	-40 to +85	°C	
Storage Temperature	T_{STG}	-55 to +150	°C	
Operating Channel Temperature	T_{CH}	-55 to +225	°C	
Pallet Soldering Temperature	T_{SOLDER}	260 for 60s	°C	

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

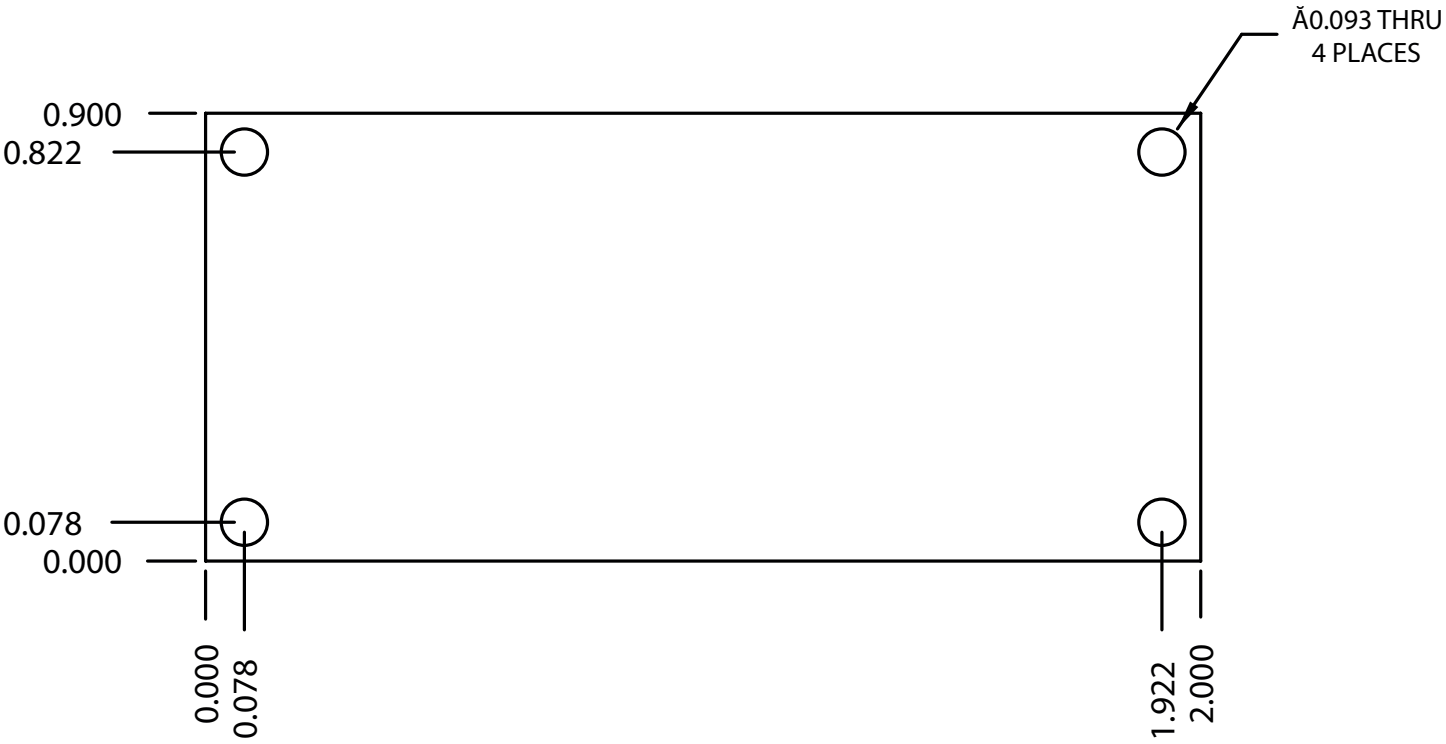
Table 3. DC Electrical Characteristics (Case temperature = 25 °C unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Gate Pinch-Off Voltage	V_P	-5.0			V	V_{DS} = 50V, I_{DS} = 1mA
Quiescent Gate Voltage	V_Q		-2.9		V	V_{DS} = 50V, I_{DS} = 100mA

Table 4. Thermal Resistance (Case temperature = 25 °C unless otherwise stated)

Parameter	Symbol	Typ	Max	Test Conditions
Peak Thermal Resistance, Channel to underneath side of pallet	R_{TH}	TBD	-	P_{OUT} = 380W f = 2.8 GHz 150µs pulse length, 15% duty cycle V_{DS} = 50V, I_{DS} = 100mA

DIMENSIONS



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