

S-Band Radar Pallet Amplifier

IGNP2731M400 is a 50 Ω matched GaN-based pulsed power pallet amplifier for S-Band radar systems operating in the 2.7-3.1 GHz instantaneous frequency band. The pallet amplifier supplies a minimum of 400 watts of peak pulsed output power under the conditions of 300 μ s pulse width and 10% duty cycle. The pallet utilizes RF-activated gate bias switching circuitry for noise blanking during pulsed-RF operation. All units are 100% screened for large signal RF parameters.

GaN on Silicon Carbide HEMT
– High Power Gain

Class AB Operation
– High Efficiency

Balanced Amplifier Configuration
– Low Input/Output VSWR

Gate DC Bias Pulsing Circuitry
– Noise Blanking Function

Gold Metal System
– Maximum Reliability

Pallet Carrier
– Nickel-Plated Aluminum

RF Test Fixture
– 100% RF Screening
– No External Tuning Allowed

TYPICAL RF DATA

Freq (GHz)	V _{DD} (V)	P _{IN} (W)	IRL (dB)	P _{OUT} (W)	G _P (dB)	I _D (A)	η_D (%)	Droop (dB)
2.70	48	16	24	528	15.2	20.8	57.5	-0.48
2.90	48	16	22	501	15.0	18.3	62.3	-0.28
3.10	48	16	22	438	14.4	16.1	61.8	-0.40

Pulse Format: 300 μ s / 10%. I_{DQ,TOTAL}=100mA

RF ELECTRICAL CHARACTERISTICS

Screen	Parameter	Symbol	Min	Max	Units	Test Conditions
100%	Input Return Loss	IRL	10	--	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Output Power	P_{OUT}	400	--	W	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Drain Efficiency	N_d	50	--	%	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Power Gain	G_p	14	--	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Pulse Amplitude Droop	D	--	0.6	dB	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	Output Power Flatness	OPF		1.5	dB	Calculate from min/max gains at frequencies F1, F2, F3.
100%	Delta Insertion Phase	d-IP	-20	+20	--	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$
100%	2:1 Load Mismatch Stability	VSWR-S	--	2:1	--	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$ Rotate 2:1 output VSWR through 360° phase. No oscillatory or pulse break-up characteristics allowed on detected output pulse. All non-harmonically related signals must be at least -65 dBc.
100%	3:1 Load Mismatch Tolerance	LMT	--	3:1	--	$V_{DD}=V1, I_{DQ}=I_{DQ1}, PW=PW1, DF=DF1, T_F=T_{F1}, P_{IN}=P_{IN1}, F=F1, F2, F3.$ Rotate 3:1 output VSWR through 360° phase. Post test $P_O = \text{Pre test } P_O \pm 5W$
Note 1	$V1 = 48V; I_{DQ1} = 100mA \text{ total}; PW1 = 300\mu S; DF1 = 10\%$					
Note 2	Input Power Test Levels: $P_{IN1} = 16W$					
Note 3	Test Frequencies: $F1 = 2.7 \text{ GHz}, F2 = 2.9 \text{ GHz}, F3 = 3.1 \text{ GHz}.$					
Note 4	$T_{F1} = 25 \pm 5^\circ C = \text{Device flange temperature}.$					
Note 5	Screen 'BD' = parameter qualified By Design.					

DEFINITIONS

Data Sheet Status	
Proposed Specification	This data sheet contains proposed specifications.
Preliminary Specification	This data sheet contains specifications based on preliminary measurements and data.
Product 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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