NPT2021

Advanced



Gallium Nitride 48V, 50W, DC-2.2 GHz HEMT

Built using the SIGANTIC[®] process - A proprietary GaN-on-Silicon technology

Features

- Suitable for linear and saturated applications
- Tunable from DC-2.2 GHz
- 48V Operation
- Industry Standard Package
- High Drain Efficiency (>60%)



Applications

- Defense Communications
- Land Mobile Radio
- Avionics
- Wireless Infrastructure
- ISM Applications
- VHF/UHF/L-Band Radar



DC-2.2 GHz



Product Description

The NPT2021 GaN HEMT is a wideband transistor optimized for DC-2.2 GHz operation. This device has been designed for CW, pulsed, and linear operation with output power levels to 50W (47 dBm) in an industry standard plastic package with a bolt down flange.

Symbol	Parameter	Min	Тур	Max	Units
G _{SS}	Small-signal Gain	-	17	-	dB
P _{SAT}	Saturated Output Power	-	47.5	-	dBm
η_{SAT}	Efficiency at Saturated Output Power	-	60	-	%
G _P	Gain at P _{OUT} = 50W	-	15	-	dB
η	Drain Efficiency at P _{OUT} = 50W	-	55	-	%
V _{DS}	Drain Voltage	-	48	-	V
Ψ	Ruggedness: Output Mismatch, all phase angles	VSWR = TBD:1, No Device Damage			

RF Specifications (CW, 2.15 GHz): $V_{DS} = 48V$, $I_{DQ} = 300$ mA, $T_{C} = 25$ °C



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DC Specifications: T_C = 25°C

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Symbol	Parameter	Min	Тур	Max	Units
Off Ch	aracteristics				
I _{DLK}	Drain-Source Leakage Current (V _{GS} =-8V, V _{DS} =160V)	-	-	12	mA
I _{GLK}	Gate-Source Leakage Current (V _{GS} =-8V, V _{DS} =0V)	-	-	6	mA
On Cha	aracteristics		-	-	
V _T	Gate Threshold Voltage (V _{DS} =48V, I _D =12mA)	-2.5	-1.5	-0.5	V
V_{GSQ}	Gate Quiescent Voltage (V _{DS} =48V, I _D =300mA)	-2.1	-1.2	-0.3	V
R _{on}	On Resistance $(V_{DS}=2V, I_{D}=90mA)$	-	0.4	-	Ω
I _{D, MAX}	Maximum Drain Current (V _{DS} =7V pulsed, 300µS pulse width, 0.2% Duty Cycle)	-	7	-	A

Thermal Resistance Specification:

Symbol	Parameter	Тур	Units
$R_{ ext{ hetaJC}}$	Thermal Resistance (Junction-to-Case), $T_J = 200 \ ^{\circ}C$	1.9	°C/W

Junction Temperature (T_J) measured using IR Microscopy, Case Temperature (T_C) measured using a thermocouple embedded in heatsink.

Absolute Maximum Ratings: Not simultaneous, T_C = 25°C unless otherwise noted

Symbol	Parameter	Мах	Units
V _{DS}	Drain-Source Voltage	160	V
V _{GS}	Gate-Source Voltage	-10 to 3	V
l _G	Gate Current	24	mA
Ρ _T	Total Device Power Dissipation (Derated above 25°C)	105	W
T _{STG}	Storage Temperature Range	-65 to 150	°C
TJ	Operating Junction Temperature	225	°C
HBM	Human Body Model ESD Rating (per JESD22-A114)	TBD	
MSL	Moisture sensitivity level (per IPC/JEDEC J-STD-020)	TBD	

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Figure 19 - TO272-2 Bolt-Down Plastic Package Dimensions (all dimensions in inches [millimeters])

Function
Gate — RF Input
Drain — RF Output (Cut lead)
Source — Ground (Flange)







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Additional Information

This part is lead-free and is compliant with the RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

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