

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
50W
GaN HEMT



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.

RF Specifications (CW, 2.15 GHz): $V_{DS} = 48V$, $I_{DQ} = 300mA$, $T_C = 25^\circ C$

Symbol	Parameter	Min	Typ	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			

DC Specifications: $T_C = 25^\circ\text{C}$

Symbol	Parameter	Min	Typ	Max	Units
Off Characteristics					
I_{DLK}	Drain-Source Leakage Current ($V_{GS}=-8\text{V}$, $V_{DS}=160\text{V}$)	-	-	12	mA
I_{GLK}	Gate-Source Leakage Current ($V_{GS}=-8\text{V}$, $V_{DS}=0\text{V}$)	-	-	6	mA
On Characteristics					
V_T	Gate Threshold Voltage ($V_{DS}=48\text{V}$, $I_D=12\text{mA}$)	-2.5	-1.5	-0.5	V
V_{GSQ}	Gate Quiescent Voltage ($V_{DS}=48\text{V}$, $I_D=300\text{mA}$)	-2.1	-1.2	-0.3	V
R_{ON}	On Resistance ($V_{DS}=2\text{V}$, $I_D=90\text{mA}$)	-	0.4	-	Ω
$I_{D, MAX}$	Maximum Drain Current ($V_{DS}=7\text{V}$ pulsed, 300 μs pulse width, 0.2% Duty Cycle)	-	7	-	A

Thermal Resistance Specification:

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Thermal Resistance (Junction-to-Case), $T_J = 200^\circ\text{C}$	1.9	$^\circ\text{C/W}$

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

Absolute Maximum Ratings: Not simultaneous, $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Max	Units
V_{DS}	Drain-Source Voltage	160	V
V_{GS}	Gate-Source Voltage	-10 to 3	V
I_G	Gate Current	24	mA
P_T	Total Device Power Dissipation (Derated above 25°C)	105	W
T_{STG}	Storage Temperature Range	-65 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature	225	$^\circ\text{C}$
HBM	Human Body Model ESD Rating (per JESD22-A114)	TBD	
MSL	Moisture sensitivity level (per IPC/JEDEC J-STD-020)	TBD	

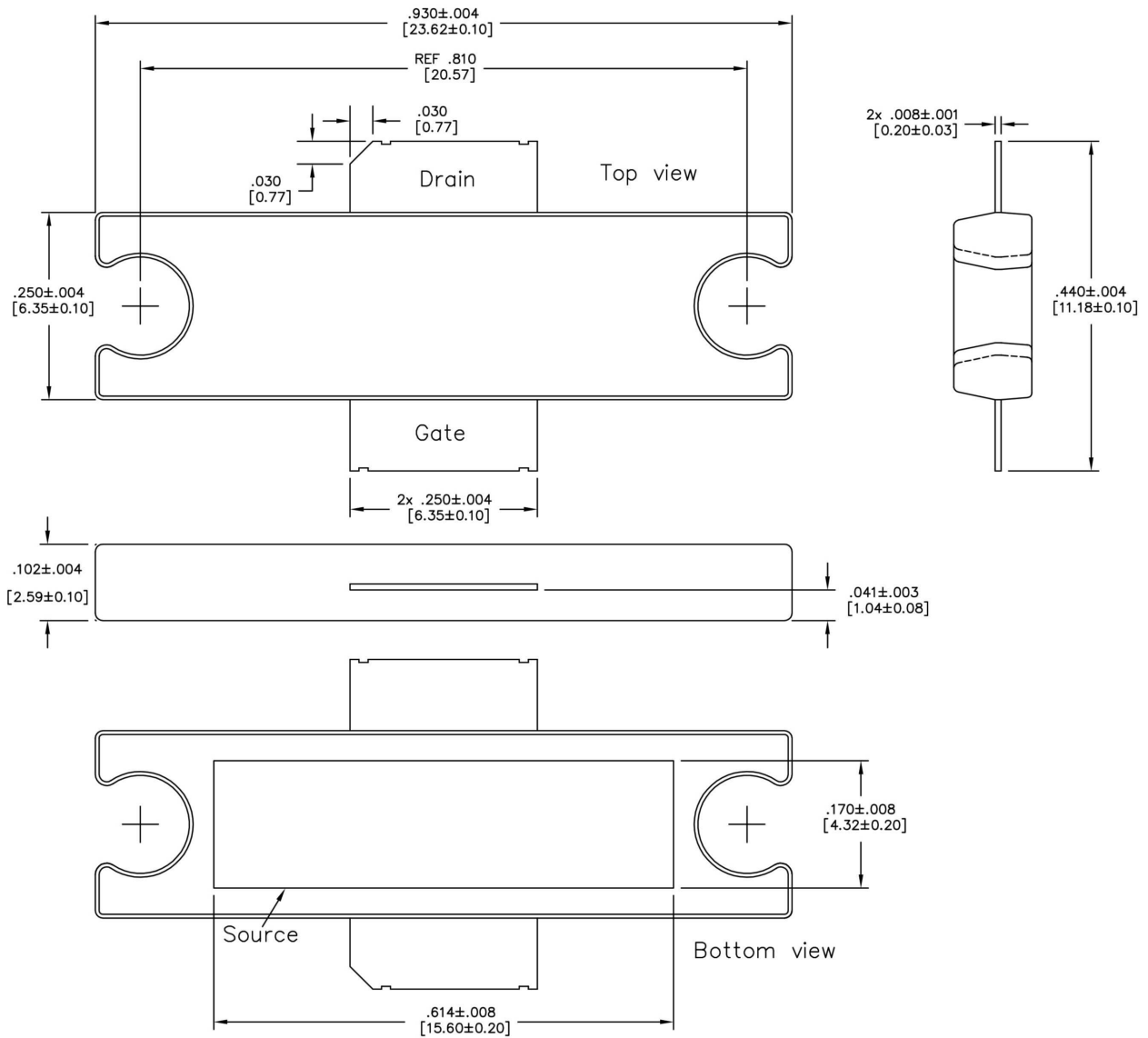


Figure 19 - TO272-2 Bolt-Down Plastic Package Dimensions (all dimensions in inches [millimeters])

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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