## 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 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): $V_{DS} = 48V$ , $I_{DQ} = 300$ mA, $T_{C} = 25$ °C

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

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**DC Specifications**: T<sub>C</sub> = 25°C

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

### **Thermal Resistance Specification:**

Symbol	Parameter	Тур	Units
$R_{ heta JC}$	Thermal Resistance (Junction-to-Case), $T_J = 200  ^{\circ}\text{C}$	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<sub>C</sub> = 25°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 <sub>G</sub>	Gate Current	24	mA
P <sub>T</sub>	Total Device Power Dissipation (Derated above 25°C)	105	W
T <sub>STG</sub>	Storage Temperature Range	-65 to 150	°C
T <sub>J</sub>	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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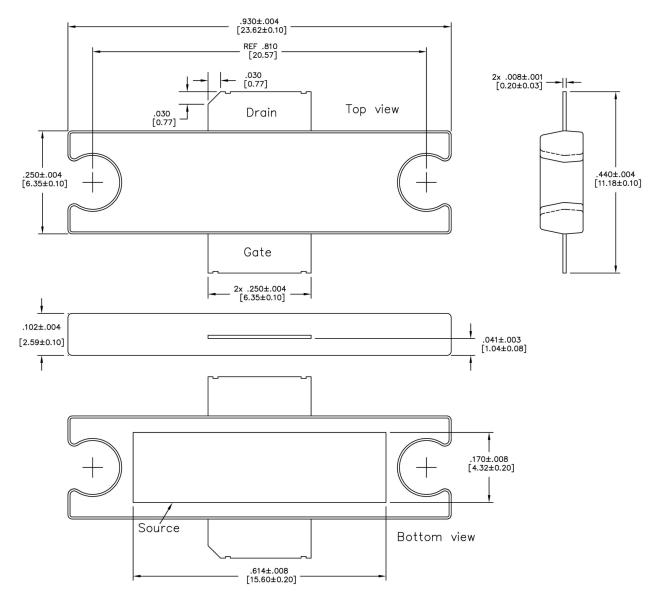


Figure 19 - TO272-2 Bolt-Down Plastic Package Dimensions (all dimensions in inches [millimeters])

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

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Nitronex, LLC

2305 Presidential Drive Durham, NC 27703 USA +1.919.807.9100 (telephone) +1.919.807.9200 (fax) info@nitronex.com www.nitronex.com

#### **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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