

Gallium Nitride 28V, 5W, DC-6 GHz HEMT

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

Features

- Broadband operation from DC-6 GHz
- 28V Operation
- Industry Standard Plastic Package
- High Drain Efficiency (>60%)



Applications

- Wireless LAN
- High Dynamic Range LNA's
- Broadband General Purpose
- Defense Communications
- Land Mobile Radio
- Wireless Infrastructure
- ISM Applications

DC-6 GHz
5W
GaN HEMT



Product Description

The NPTB00004Q GaN HEMT is a wideband transistor optimized for DC-6 GHz operation in a user friendly package ideal for high bandwidth applications. This device has been designed for CW, pulsed, and linear operation with output power levels of 5W (37 dBm) in an industry standard, low inductance, surface mount QFN4X4-24 plastic package. The pads of the package form a coplanar launch that naturally absorbs lead parasitics and features a small PCB outline for space constrained applications.

RF Specifications (CW, 2.5 GHz): $V_{DS} = 28V$, $I_{DQ} = 50mA$, $T_C = 25^{\circ}C$

Symbol	Parameter	Min	Typ	Max	Units
G_{SS}	Small-signal Gain	-	17	-	dB
P_{SAT}	Saturated Output Power	-	37	-	dBm
η_{SAT}	Efficiency at Saturated Output Power	-	55	-	%
G_P	Gain at $P_{OUT} = 5W$	-	15	-	dB
η	Drain Efficiency at $P_{OUT} = 5W$	-	50	-	%
V_{DS}	Drain Voltage	-	28	-	V
Ψ	Ruggedness: Output Mismatch, all phase angles	VSWR = 10:1, 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 ($V_{GS}=-8\text{V}$, $V_{DS}=100\text{V}$)	-	-	2	mA
I_{GLK}	Gate-Source Leakage Current ($V_{GS}=-8\text{V}$, $V_{DS}=0\text{V}$)	-	-	1	mA
On Characteristics					
V_T	Gate Threshold Voltage ($V_{DS}=28\text{V}$, $I_D=2\text{mA}$)	-2.5	-1.5	-0.5	V
V_{GSQ}	Gate Quiescent Voltage ($V_{DS}=28\text{V}$, $I_D=50\text{mA}$)	-2.1	-1.2	-0.3	V
R_{ON}	On Resistance ($V_{DS}=2\text{V}$, $I_D=15\text{mA}$)	-	2.0	-	Ω
$I_{D, MAX}$	Maximum Drain Current ($V_{DS}=7\text{V}$ pulsed, 300 μs pulse width, 0.2% Duty Cycle)	-	1.4	-	A

Thermal Resistance Specification:

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Thermal Resistance (Junction-to-Case), $T_J = 180^\circ\text{C}$	17	$^\circ\text{C/W}$

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	100	V
V_{GS}	Gate-Source Voltage	-10 to 3	V
I_G	Gate Current	4	mA
P_T	Total Device Power Dissipation (Derated above 25°C)	10.3	W
T_{STG}	Storage Temperature Range	-65 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature	200	$^\circ\text{C}$
HBM	Human Body Model ESD Rating (per JESD22-A114)	TBD	
MSL	Moisture sensitivity level (per IPC/JEDEC J-STD-020)	TBD	

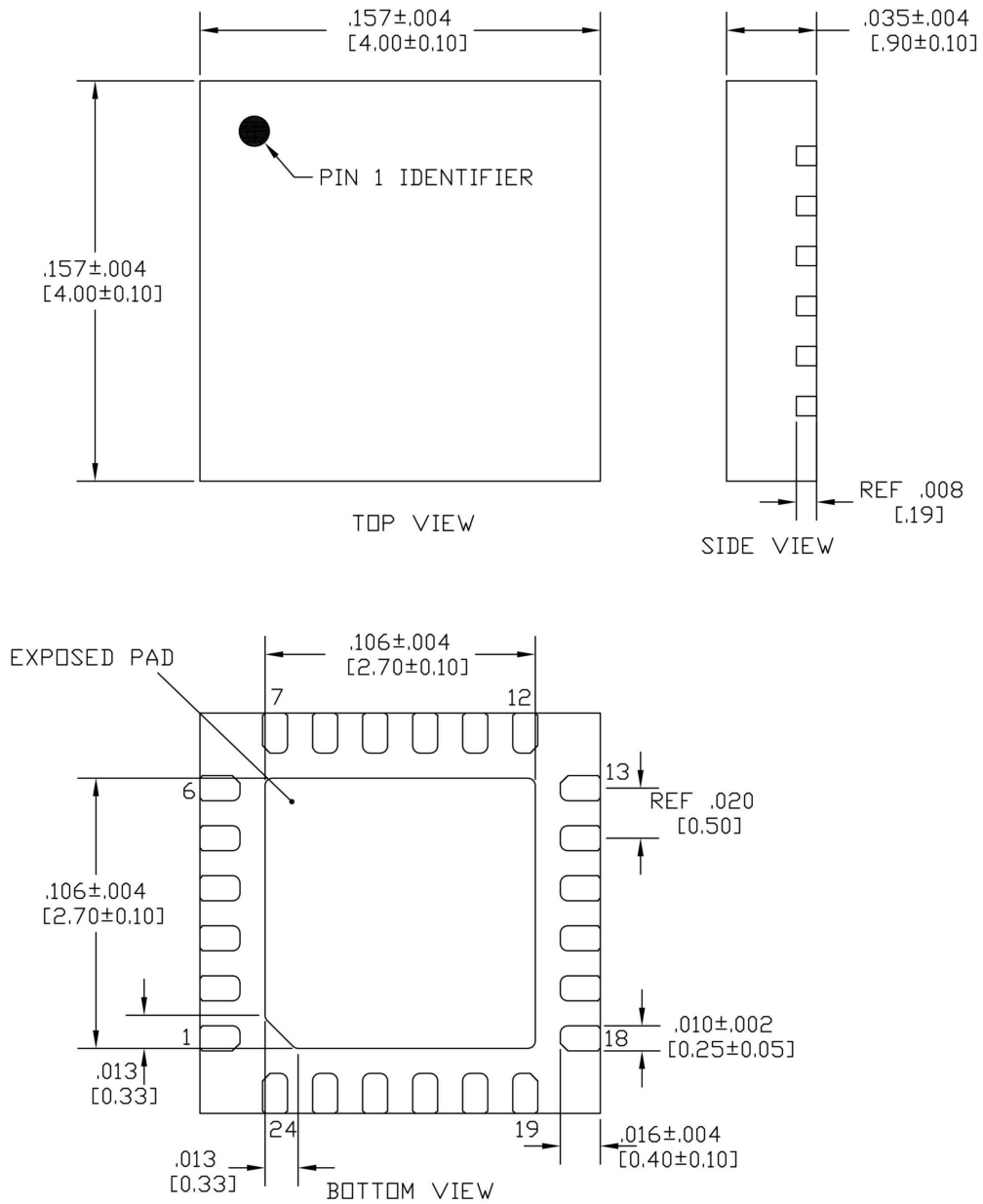


Figure 1 - QFN4X4-24 Plastic Package Dimensions (all dimensions in inches [millimeters])

Pin	Function
3, 4	Gate — RF Input
15, 16	Drain — RF Output
Exposed Pad	Source — Ground
1, 2, 5-14, 17-24	No Connect*

* All No Connect pins may be left floating or grounded

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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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