

# NX4018H GaN TRANSISTOR

Document Number: NX4018H  
Preliminary Datasheet V1.0

## Gallium Nitride 28V 180W, RF Power Transistor

### Description

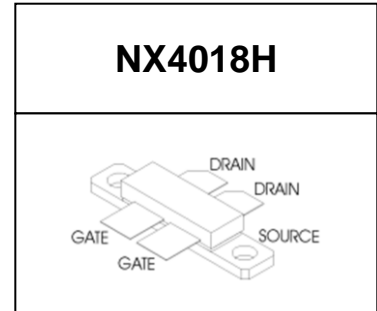
The NX4018H is a 180W 28V, GaN HEMT, designed for multiple applications with frequencies up to 3GHz.

There is no guarantee of performance when this part is used in applications designed Outside of these frequencies.

- Typical performance (on Innogration narrow band fixture with device soldered)

$V_{DD}=28V$   $I_{DQ}=1400mA$ , CW.

Frequency(MHz)	Gp (dB)	$P_{1dB}$ (W)	Efficiency (%)
1300	19	180	65



### Applications and Features

- Suitable for wireless communication infrastructure, wideband amplifier, EMC testing, ISM etc.
- High Efficiency and Linear Gain Operations
- Thermally Enhanced Industry Standard Package
- High Reliability Metallization Process
- Excellent thermal Stability and Excellent Ruggedness
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

### Important Note: Proper Biasing Sequence for GaN HEMT Transistors

#### Turning the device ON

1. Set VGS to the pinch-off (VP) voltage, typically -5 V
2. Turn on VDS to nominal supply voltage (28V)
3. Increase VGS until IDS current is attained
4. Apply RF input power to desired level

#### Turning the device OFF

1. Turn RF power off
2. Reduce VGS down to VP, typically -5 V
3. Reduce VDS down to 0 V
4. Turn off VGS

**Table 1. Maximum Ratings (Not simultaneous, TC = 25°C unless otherwise noted)**

Rating	Symbol	Value	Unit
Drain--Source Voltage	$V_{DSS}$	150	Vdc
Gate--Source Voltage	$V_{GS}$	-10,+2	Vdc
Operating Voltage	$V_{DD}$	40	Vdc
Maximum Forward Gate Current	$I_{gmax}$	54	mA
Storage Temperature Range	$T_{stg}$	-65 to +150	°C
Case Operating Temperature	$T_c$	+150	°C
Operating Junction Temperature(See note 1)	$T_j$	+200	°C
Total Device Power Dissipation (Derated above 25°C, see note 2)	$P_{diss}$	220	W

1. Continuous operation at maximum junction temperature will affect MTF
2. Bias Conditions should also satisfy the following expression:  $P_{diss} < (T_j - T_c) / R_{JC}$  and  $T_c = T_{case}$

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**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_C = 85^\circ\text{C}$ , $T_J = 200^\circ\text{C}$ , DC Power Dissipation(See note 1)	$R_{\theta\text{JC-DC}}$	0.8	C/W

$R_{\theta\text{JC-DC}}$  is tested at only DC condition, it is related to the highest thermal resistor value among all test conditions. It might be differently lower in different RF operation conditions like CW signal ,pulsed RF signal etc.

**Table 3. Electrical Characteristics** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

## DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{\text{GS}} = -8\text{V}$ ; $I_{\text{DS}} = 54\text{mA}$	$V_{\text{DSS}}$	150			V
Gate Threshold Voltage	$V_{\text{DS}} = 28\text{V}$ , $I_{\text{D}} = 54\text{mA}$	$V_{\text{GS(th)}}$		-2.7		V
Gate Quiescent Voltage	$V_{\text{DS}} = 28\text{V}$ , $I_{\text{DS}} = 1400\text{mA}$ , Measured in Functional Test	$V_{\text{GS(Q)}}$		-2.4		V

**Functional Tests (In Innogration narrow band Test Fixture, 50 ohm system) :**  $V_{\text{DD}} = 28\text{Vdc}$ ,  $I_{\text{DQ}} = 1400\text{mA}$ ,  $f = 1300\text{MHz}$ , CW

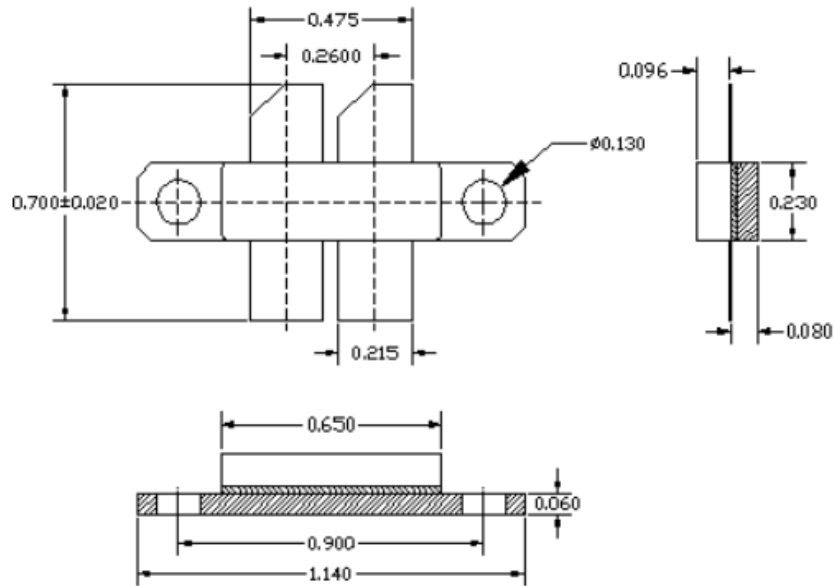
Characteristic	Symbol	Min	Typ	Max	Unit
Power Gain @ $P_{1\text{dB}}$	Gp		19		dB
Drain Efficiency @ $P_{1\text{dB}}$	Eff		65		%
1dB compressed Power	$P_{1\text{dB}}$		180		W
Input Return Loss	IRL		-7		dB
Mismatch stress at all phases (Device no damage)	VSWR		10:1		$\Psi$

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## Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads



Tolerance .XX +/-0.01 .XXX +/- .005 inches

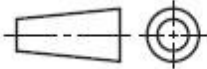
OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-LB					03/12/2013

Figure 1. Package Outline PKG-LB(LBB)

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## Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2017/6/19	V1.0	Preliminary Datasheet Creation

### Notice

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