# NX2530H GaN TRANSISTOR

Document Number: NX2530H
Preliminary Datasheet V1.1

## Gallium Nitride 28V 300W, RF Power Transistor

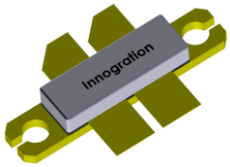
### Description

The NX2530H is a 300W 28V, GaN HEMT, designed for multiple applications with frequencies up to 2.5GHz.

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

It is also the dual-path version of single ended NU2515H.

**NX2530H**




- Typical performance (on Innogration **1.1-1.3GHz** band fixture with device soldered)

$V_{DD}$=28V $I_{DQ}$=200mA, CW.

| Freq(MHz) | Pin(dBm) | Psat(dBm) | Psat(W) | IDS(A) | Gain(dB) | Eff(%) |
|---|---|---|---|---|---|---|
| 1100 | 40 | 53.88 | 244.3 | 13.4 | 13.88 | 65 |
| 1150 | 39.75 | 53.76 | 237.7 | 12.87 | 14.01 | 66 |
| 1200 | 39.4 | 53.57 | 227.5 | 12.4 | 14.17 | 66 |
| 1250 | 38.6 | 53.34 | 215.8 | 11.85 | 14.74 | 65 |
| 1300 | 38.8 | 53.17 | 207.5 | 11.23 | 14.37 | 66 |

- Typical performance (on Innogration **1.5-1.62GHz** band fixture with device soldered)

$V_{DD}$=28V $I_{DQ}$=200mA, CW

| Freq(MHz) | Pin(dBm) | Psat(dBm) | Psat(W) | IDS(A) | Gain(dB) | Eff(%) |
|---|---|---|---|---|---|---|
| 1500 | 39.4 | 53.9 | 245.5 | 14.09 | 14.5 | 62 |
| 1540 | 39.2 | 53.9 | 245.5 | 13.5 | 14.7 | 65 |
| 1580 | 39.4 | 53.77 | 238.2 | 12.49 | 14.37 | 68 |
| 1620 | 39.4 | 53.26 | 211.8 | 11.3 | 13.86 | 67 |

### 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 | Igmax | 72 | mA |
| Storage Temperature Range | $T_{stg}$ | -65 to +150 | °C |
| Case Operating Temperature | $T_C$ | +150 | °C |
| Operating Junction Temperature(See note 1) | $T_J$ | +225 | °C |

1. **Continuous operation at maximum junction temperature will affect MTTF**
2. **Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase**

**Table 2. Thermal Characteristics**

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance, Junction to Case<br>$T_C$= 85°C, $T_J$=200°C, DC Power Dissipation(See note 1) | $R_{\theta JC\text{-}DC}$ | 0.6 | C/W |

**$R_{\theta JC\text{-}DC}$ 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℃ unless otherwise noted)

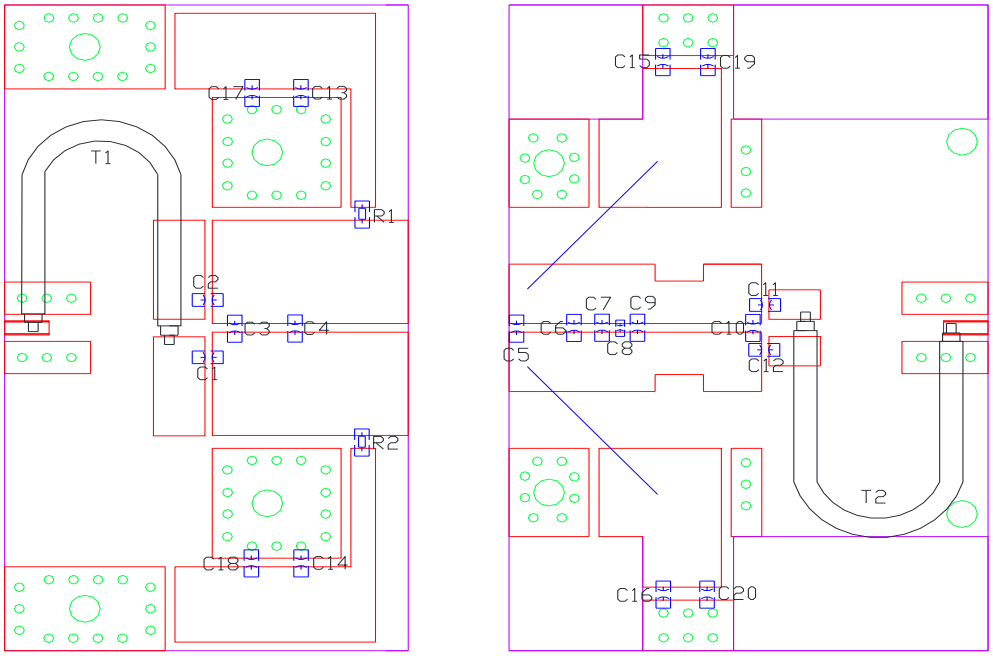
**DC Characteristics**

| Characteristic | Conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{GS}$=-8V; $I_{DS}$=72mA | $V_{DSS}$ | 150 | | | V |
| Gate Threshold Voltage | $V_{DS}$ = 28V, $I_D$ =72mA | $V_{GS}$(th) | -4 | - | -2 | V |
| Gate Quiescent Voltage | $V_{DS}$ =28V, $I_{DS}$=200mA, Measured in Functional Test | $V_{GS(Q)}$ | | -2.7 | | V |

**Functional Tests (In Innogration narrow band Test Fixture, 50 ohm system) :**$V_{DD}$ = 28 Vdc, $I_{DQ}$ = 200 mA, f = 1300 MHz, Pulse CW

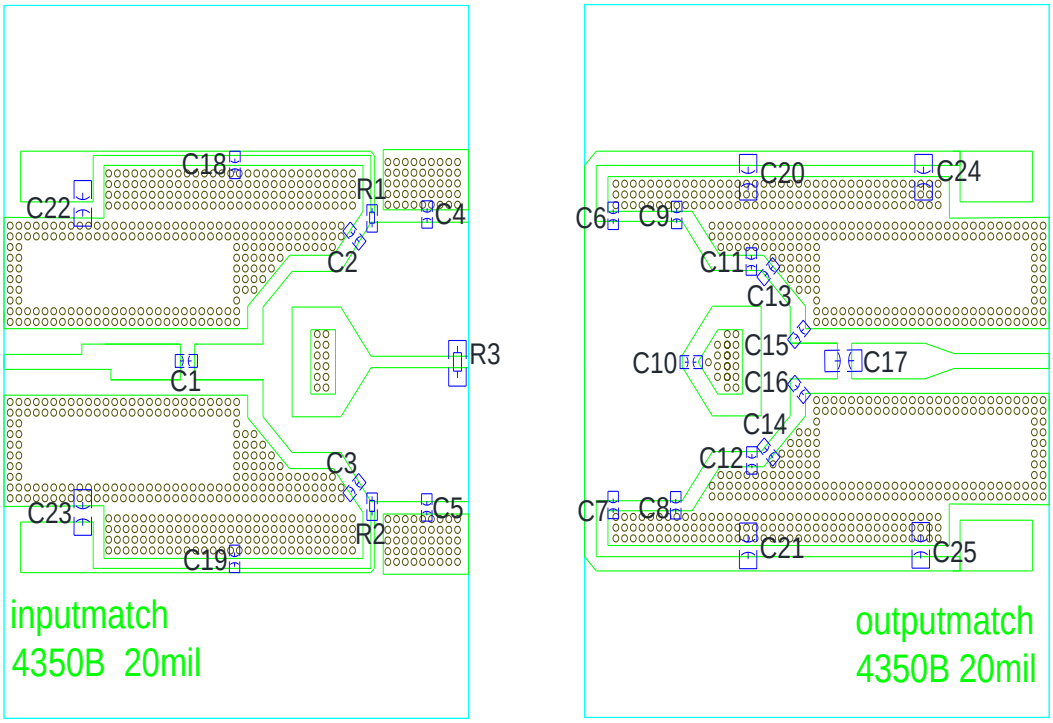
| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Power Gain @ $P_{sat}$ | Gp | | 16 | | dB |
| Drain Efficiency @ $P_{sat}$ | Eff | | 65 | | % |
| Saturated Power | $P_{sat}$ | | 300 | | W |
| Input Return Loss | IRL | | -7 | | dB |
| Mismatch stress at all phases (Device no damage) | VSWR | | 10:1 | | Ψ |

Figure 1: Test fixture ,BOM of **1.1-1.3GHz** application board (layout upon request, 30mils RO4350B)




| Part | description | Model |
|---|---|---|
| C1,C2,C11,C12,C13,C14,C15,C16 | 56pF | ATC800B |
| C3,C6 | 3.3pF | ATC800B |
| C4,C9 | 2.7pF | ATC800B |
| C5,C10 | 1pF | ATC800B |
| C7 | 0.5pF | ATC800B |
| C8 | 0.8pF | ATC600F |
| C17,C18,C19,C20 | 10uF | |
| T1 | 25ohm, 40mm | SF-086-25 |
| T2 | 35ohm, 40mm | SF-086-35 |
| R1,R2 | 9.1ohm | 1206 |

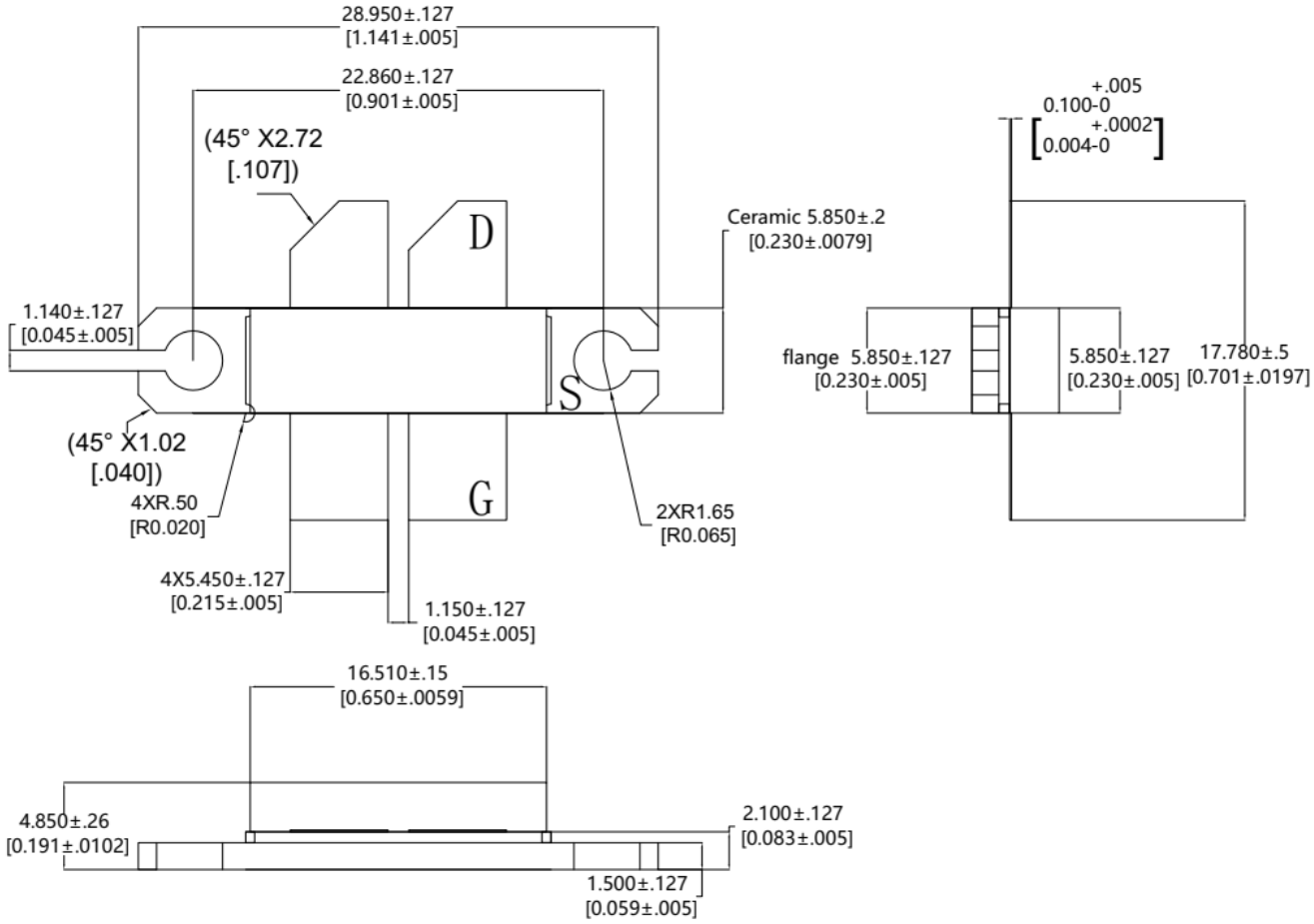
Figure 2: Test fixture ,BOM of **1.5-1.7GHz** application board (layout upon request, 20mils RO4350B)




| Part | description | Model |
|---|---|---|
| C1,C18,C19 | 39pF | ATC600F |
| C2,C3,C4,C5 | 1.8pF | ATC600F |
| C6,C7 | 2.4pF | ATC600F |
| C8,C9 | 0.8pF | ATC600F |
| C10,C11,C12,C13,C14,C15,C16 | 0.5pF | ATC600F |
| C17 | 47pF | ATC800B |
| C20,C21 | 33pF | ATC800B |
| C22,C23,C24,C25 | 10uF | 10uF/50V |
| R1,R2 | 13ohm | 0603 |
| R3 | 9.1ohm | 1206 |

## Package Outline

**Flanged ceramic package; 2 mounting holes; 4 leads**




| OUTLINE VERSION | REFERENCE | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | |
| PKG-LB | | | | | 05/21/2021 |

**Figure 1. Package Outline PKG-LB(LBB)**

## Revision history

**Table 4. Document revision history**

| Date | Revision | Datasheet Status |
|---|---|---|
| 2021/1/14 | V1.0 | Preliminary datasheet creation |
| 2021/5/21 | Rev 1.1 | Package outline update |

**Application data based on ZL-21-01/02**

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