

SX3040RVP GaN TRANSISTOR

Document Number: SX3040RVP
Preliminary Datasheet V1.1

Gallium Nitride 50V, 400W, RF Power Transistor

Description

The SX3040RVP is a 400-watt, unmatched GaN HEMT in form of push-pull configuration, designed for general purposes and wide band amplifier applications with frequencies from HF to 2GHz. There is no guarantee of performance when this part is used in applications designed outside of these frequencies.



• Typical Performance (On Innogrator broadband application board):

$I_{DQ} = 200 \text{ mA, CW}$

Freq(MHz)	Drain Voltage(V)	Psat(W)	Gain(dB)	Eff(%)
370-470	50	330-360	22	65-70

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 (50V)
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

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	+200	Vdc
Gate--Source Voltage	V_{GS}	-8 to 0	Vdc
Operating Voltage	V_{DD}	0 to 55	Vdc
Maximum forward gate current	I_{gf}	50	mA
Storage Temperature Range	T_{stg}	-65 to +150	C
Case Operating Temperature	T_C	-55 to +150	C
Operating Junction Temperature	T_J	+225	C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case $T_C = 85^\circ\text{C}, T_J = 200^\circ\text{C}, \text{DC Power Dissipation, FEA}$	$R_{\theta JC}$	0.7	C/W

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	$V_{GS} = -8\text{V}; I_{DS} = 50\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{DS} = 10\text{V}, I_D = 50\text{mA}$	$V_{GS(th)}$	-4	-	-3	V
Gate Quiescent Voltage	$V_{DS} = 50\text{V}, I_{DS} = 200\text{mA},$ Measured in Functional Test	$V_{GS(Q)}$		-3.12		V

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Figure 2. Network analyzer output S11/S21 VDS=50V IDQ=300mA

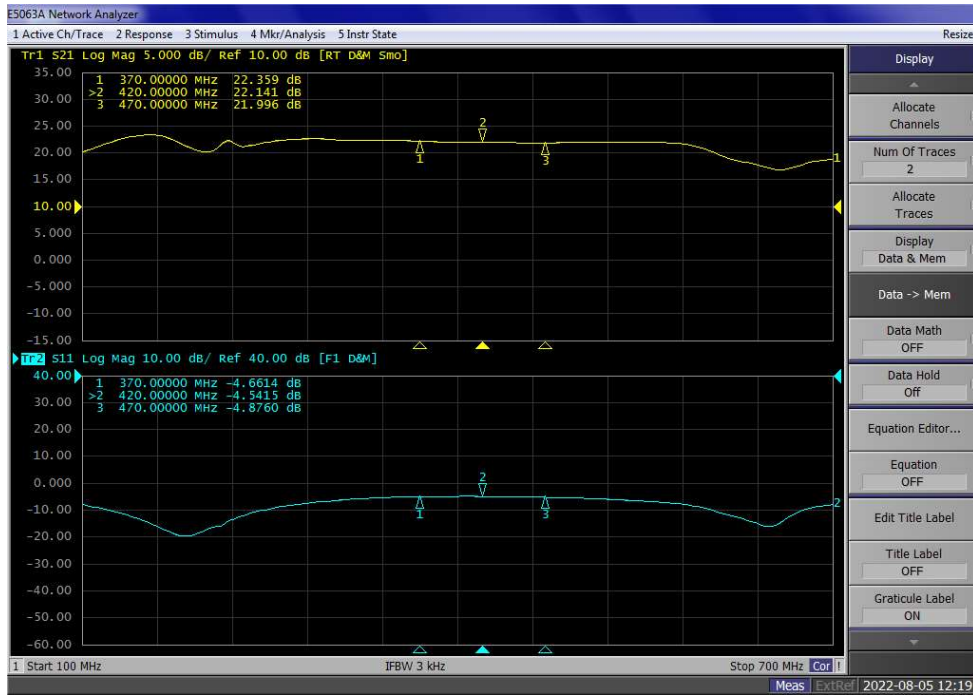


Figure 3. Test Circuit Component Layout

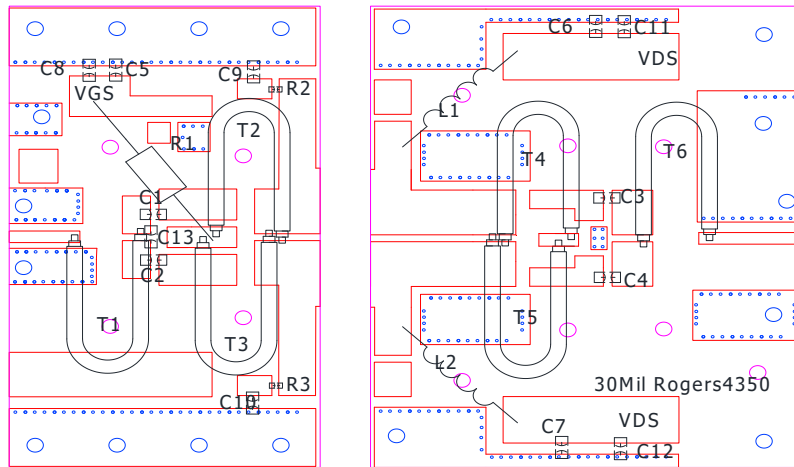


Table 4. Test Circuit Component Designations and Values

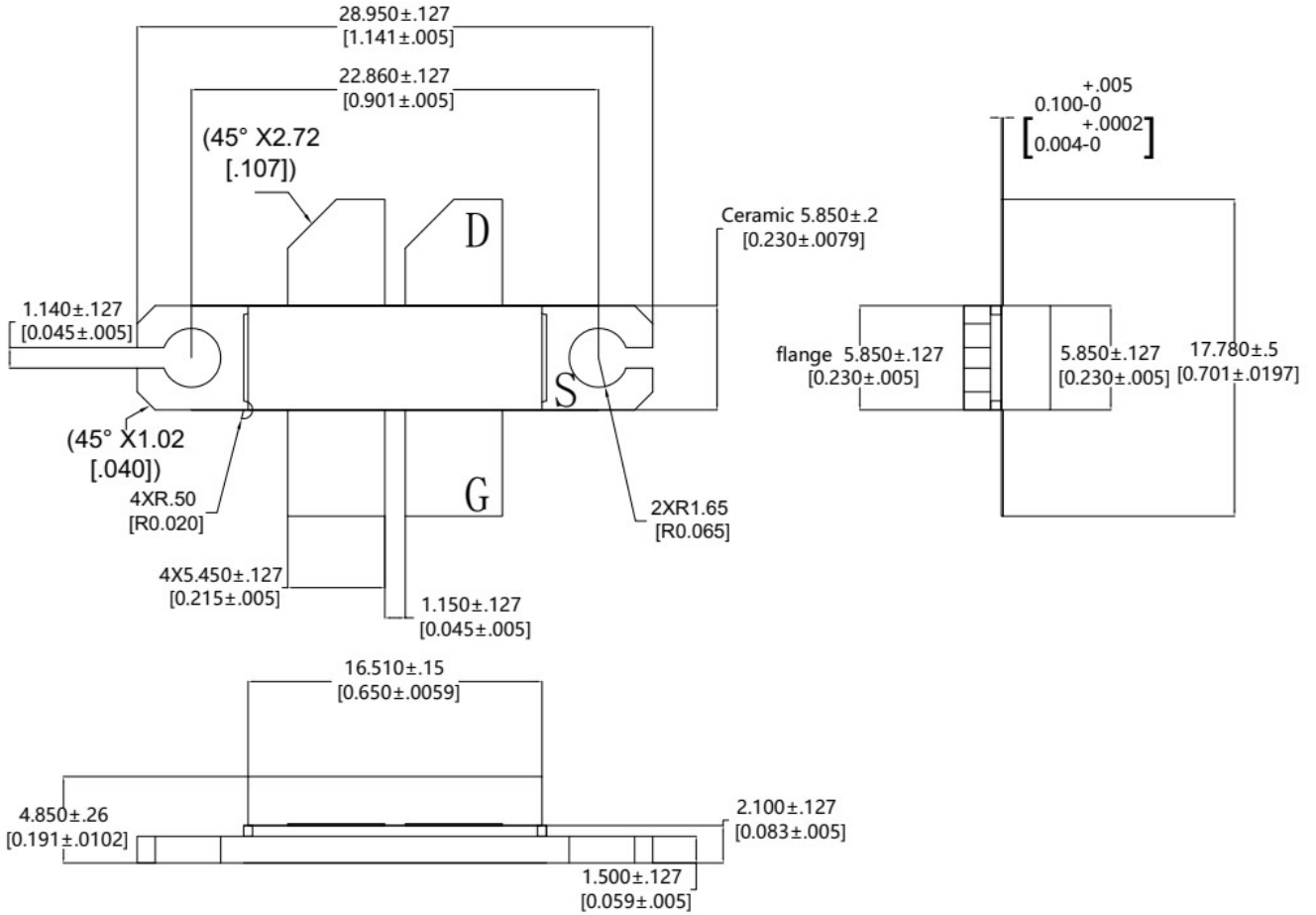
Component	Description	Suggested Manufacturer
C1~C7	200pF	DLC70B
C8~C12	10uF/100V	
C13	3.0pF	DLC70B
R1	300 Ω	
R2,R3	6.8 Ω	
T1,T6	50ohm,60mm	
T2,T3	16.7ohm,60mm	
T4,T5	25ohm,60mm	
L1,L2	2 turns,绕经 5mm,1.2mm 漆包线	
PCB	30Mils, Roger4350B	

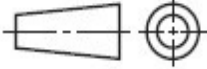
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Package Outline

Flanged ceramic package; 2 mounting holes; 4 leads



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

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Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2022/8/5	Rev 1.0	Preliminary Datasheet (NX/SX shared)
2023/5/5	Rev 1.1	Modify the upper limits of frequency to 2GHz

Application data based on HL-22-32

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