

SX6024RVP GaN TRANSISTOR

Document Number: SX6024RVP
Preliminary Datasheet V1.

Gallium Nitride 50V, 240W, RF Power Transistor

Description

The SX6024RVP is a 240-watt, unmatched GaN HEMT in form of push-pull configuration, designed for general purposes and wide band amplifier applications with frequencies from HF to 4GHz. There is no guarantee of performance when this part is used in applications designed outside of these frequencies.



• Typical RF Performance (On Innogrator broadband application board):

SX6024RVP Vds=50V Idq=80mA Vgs=-3.2V Pulsed CW: 500uS/50%						
F(MHz)	Pin (dBm)	Psat (dBm)	Psat (W)	Id(A)	Gain (dB)	Eff(%)
700.0	40.99	54.33	271	4.19	13.3	64.7
750.0	40.55	53.71	235	3.76	13.2	62.5
800.0	40.86	53.46	222	3.62	12.6	61.3
850.0	41.23	53.09	204	3.89	11.9	52.4
900.0	40.9	53.70	234	4.30	12.8	54.5
950.0	40.6	53.60	229	4.13	13.0	55.5
1000.0	40.33	53.63	231	4.11	13.3	56.1
1050.0	40.33	53.93	247	4.56	13.6	54.2
1100.0	40.3	54.20	263	4.57	13.9	57.6
1150.0	40.4	54.20	263	4.27	13.8	61.6
1200.0	40.3	54.23	265	4.45	13.9	59.5
1250.0	40	54.38	274	4.44	14.4	61.7
1300.0	40.2	53.57	228	3.63	13.4	62.7

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

SX6024RVP GaN TRANSISTOR

Document Number: SX6024RVP
Preliminary Datasheet V1.

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

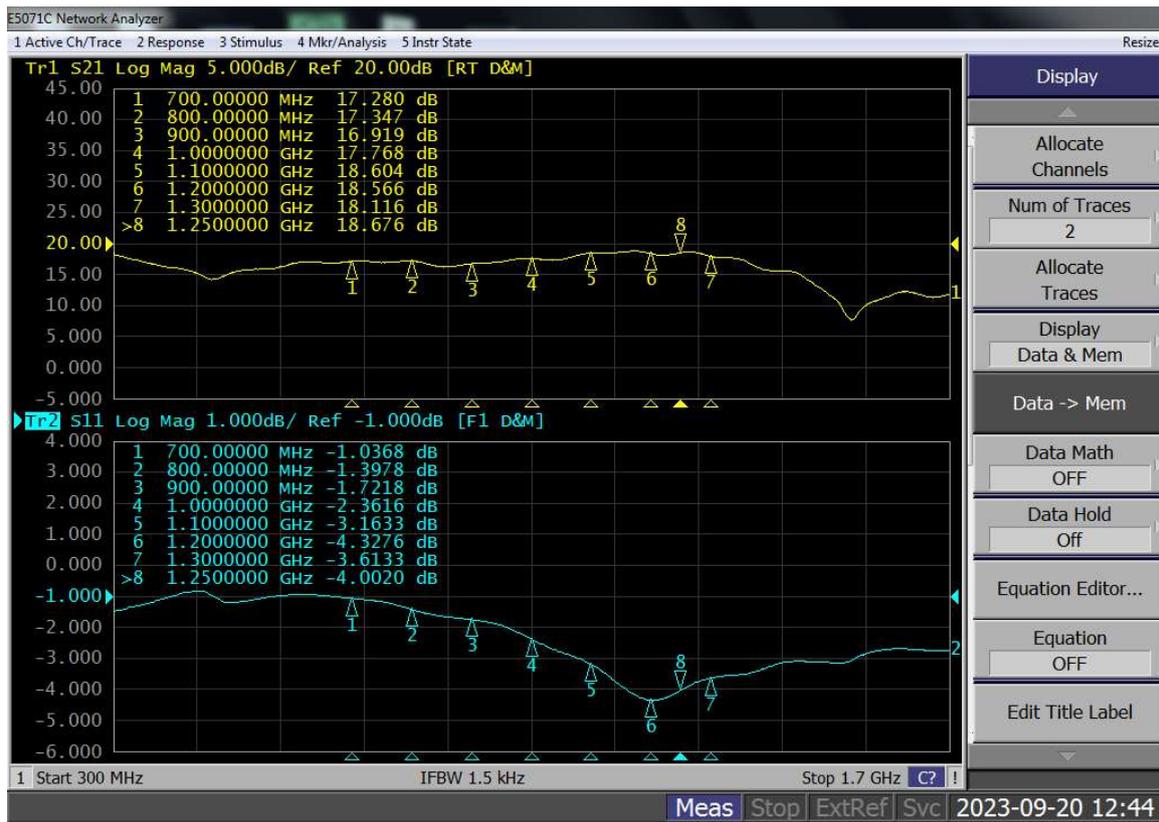
Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T _c = 85°C, T _j =200°C, DC Power Dissipation, FEA	R _{θJC}	1	C/W

Table 3. Electrical Characteristics (T_c = 25°C unless otherwise noted)

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{GS} =-8V; I _{DS} =32mA	V _{DSS}		200		V
Gate Threshold Voltage	V _{DS} = 10V, I _D = 32mA	V _{GS(th)}	-4	-	-3	V
Gate Quiescent Voltage	V _{DS} =50V, I _{DS} =200mA, Measured in Functional Test	V _{GS(Q)}		-3.12		V

Figure 2. Network analyzer output S11/S21 VDS=50V IDQ=350mA



SX6024RVP GaN TRANSISTOR

Document Number: SX6024RVP
Preliminary Datasheet V1.

Figure 3. Test Circuit Component Layout

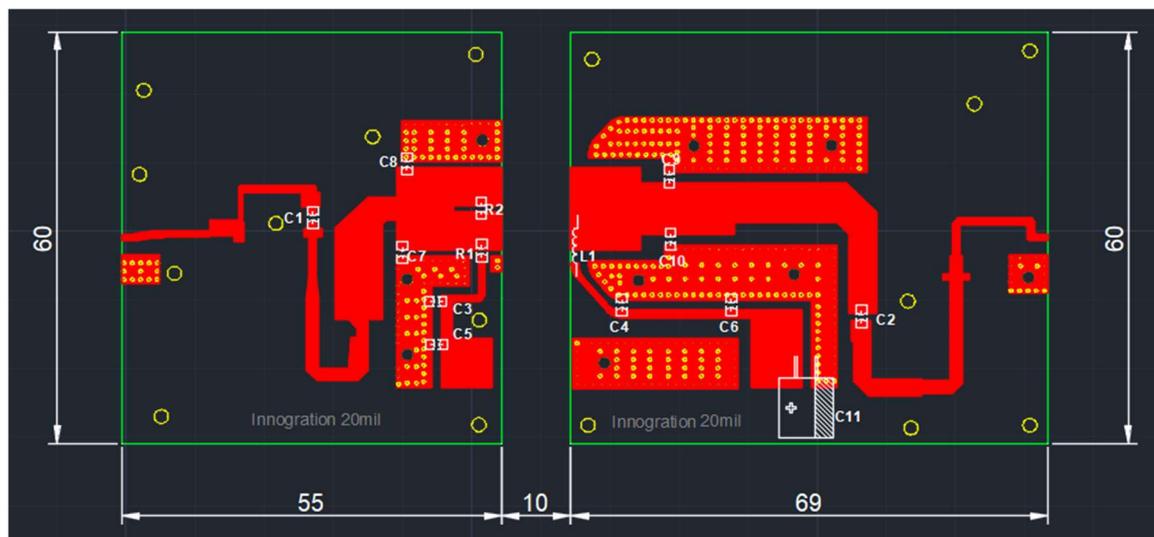


Table 4. Test Circuit Component Designations and Values

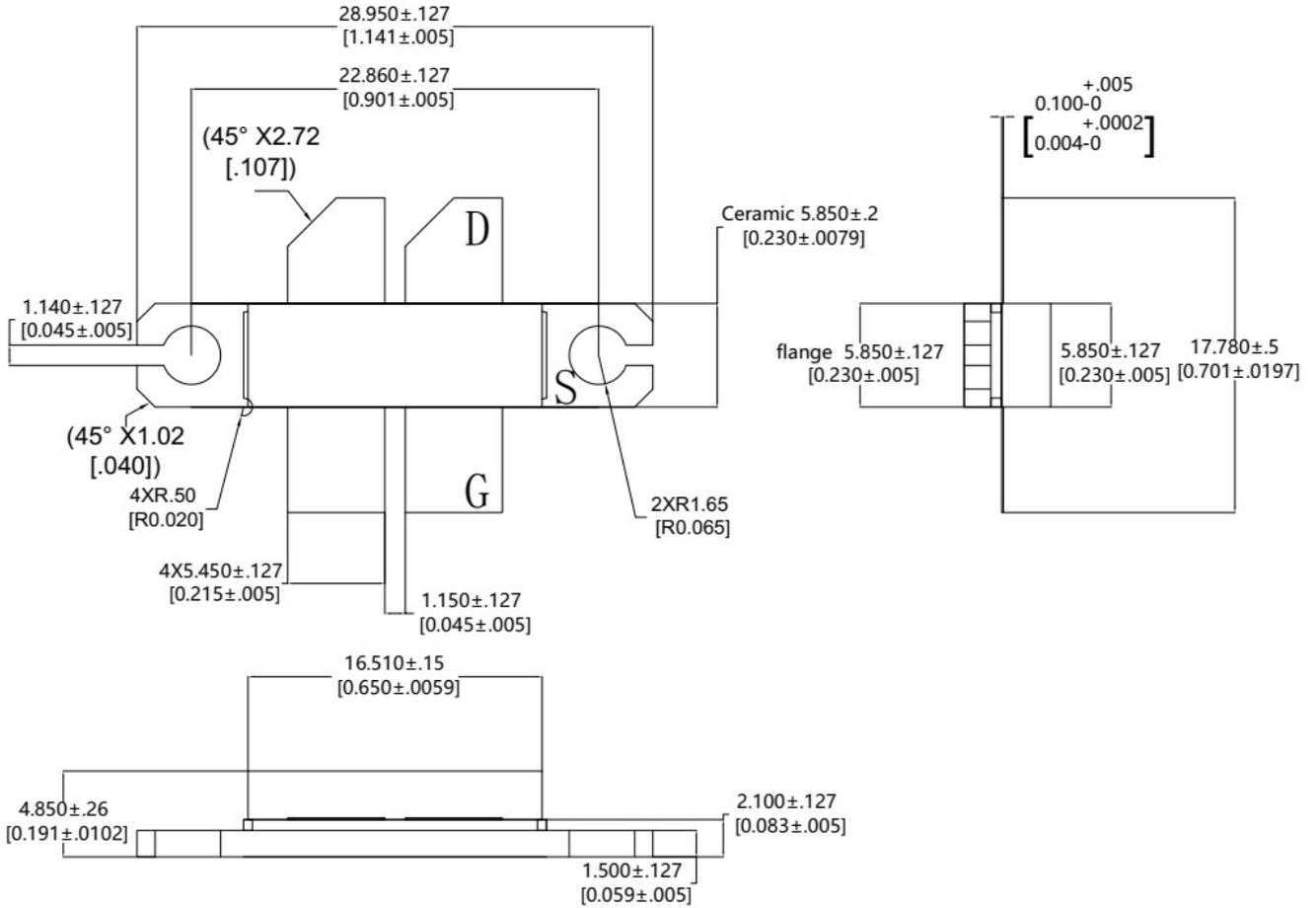
Component	Description	Suggestion
C1,C3	56pF MQ300805	
C2	68pF MQ301111	
C4	56pF MQ301111	
C5, C6	10uF 1210	
C7,c8	3.3pF MQ300805	
C9,C10	1.5pF MQ101111	
C11	4700uF/63V	
R1	10 Ω 1210	
R2	5.1 Ω 1210	
L1	DIY, d=1mm D=3mm 5 turns	
PCB	20mil Rogers4350B	

SX6024RVP GaN TRANSISTOR

Document Number: SX6024RVP
Preliminary Datasheet V1.

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

SX6024RVP GaN TRANSISTOR

Document Number: SX6024RVP
Preliminary Datasheet V1.

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2023/9/20	V1.0	Preliminary datasheet creation

Application data based on SYX-23-47

Disclaimers

Specifications are subject to change without notice. Innogration believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Innogration for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Innogration . Innogration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose. "Typical" parameters are the average values expected by Innogration in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer's technical experts for each application. Innogration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with Innogration and authorized distributors

Copyright © by Innogration (Suzhou) Co.,Ltd.