



Gallium Nitride 28V, 300W, DC-1.5GHz RF Power Transistor

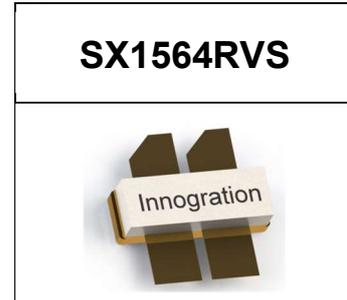
Description

The SX1564RVS is a 300W, input matched, single ended GaN HEMT, designed for multiple applications with frequencies up to 1.5GHz. It can support CW, pulse or any modulated signal.

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

- VDS=28V Vgs=-3.13V Idq=350mA Signal mode: Pulsed CW, 20us width, 10% duty cycle.

Freq (MHz)	P1dB (dBm)	P1dB (W)	P1dB Eff (%)	P1dB Gain (dB)	P3dB (dBm)	P3dB (W)	P3dB Eff (%)
900	54.31	269.9	55.5	15.91	55.83	382.7	65.3
950	53.71	235.0	56.9	16.08	55.43	348.8	68.1
1000	53.43	220.3	54.2	15.14	55.3	338.9	66.2



Applications

- L band power amplifier application
- P band power amplifier application

Important Note: Proper Biasing Sequence for GaN HEMT Transistors

Turning the device ON

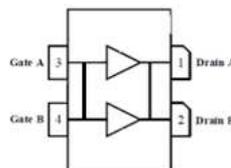
- Set VGS to the pinch-off (VP) voltage, typically -5 V
- Turn on VDS to nominal supply voltage
- Increase VGS until IDS current is attained
- Apply RF input power to desired level

Turning the device OFF

- Turn RF power off
- Reduce VGS down to VP, typically -5 V
- Reduce VDS down to 0 V
- Turn off VGS

Figure 1: Pin Connection definition

Transparent top view (Backside grounding for source)



***Notice: Both leads at input and output are internally connected**

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+200	Vdc
Gate--Source Voltage	V _{GS}	-8 to +0.5	Vdc
Operating Voltage	V _{DD}	32	Vdc
Maximum gate current	I _{gs}	80	mA
Storage Temperature Range	T _{stg}	-65 to +150	°C
Case Operating Temperature	T _c	+150	°C
Operating Junction Temperature	T _J	+225	°C

Table 2. Thermal Characteristics



Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case by FEA T _c = 85°C, at Pd=110W,	R _{θJC}	0.45	°C /W

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

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{GS} =-8V; I _{DS} =80mA	V _{DSS}		200		V
Gate Threshold Voltage	V _{DS} =10V, I _D = 80mA	V _{GS(th)}	-4		-2	V
Gate Quiescent Voltage	V _{DS} =28V, I _{DS} =350mA, Measured in Functional Test	V _{GS(Q)}		-3.13		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	28V 1.5GHz, P _{out} =300W pulsed CW, All phase, No device damages	VSWR		10:1		

Figure 2: Power gain and drain efficiency as function of average load power P_{out} under pulsed condition

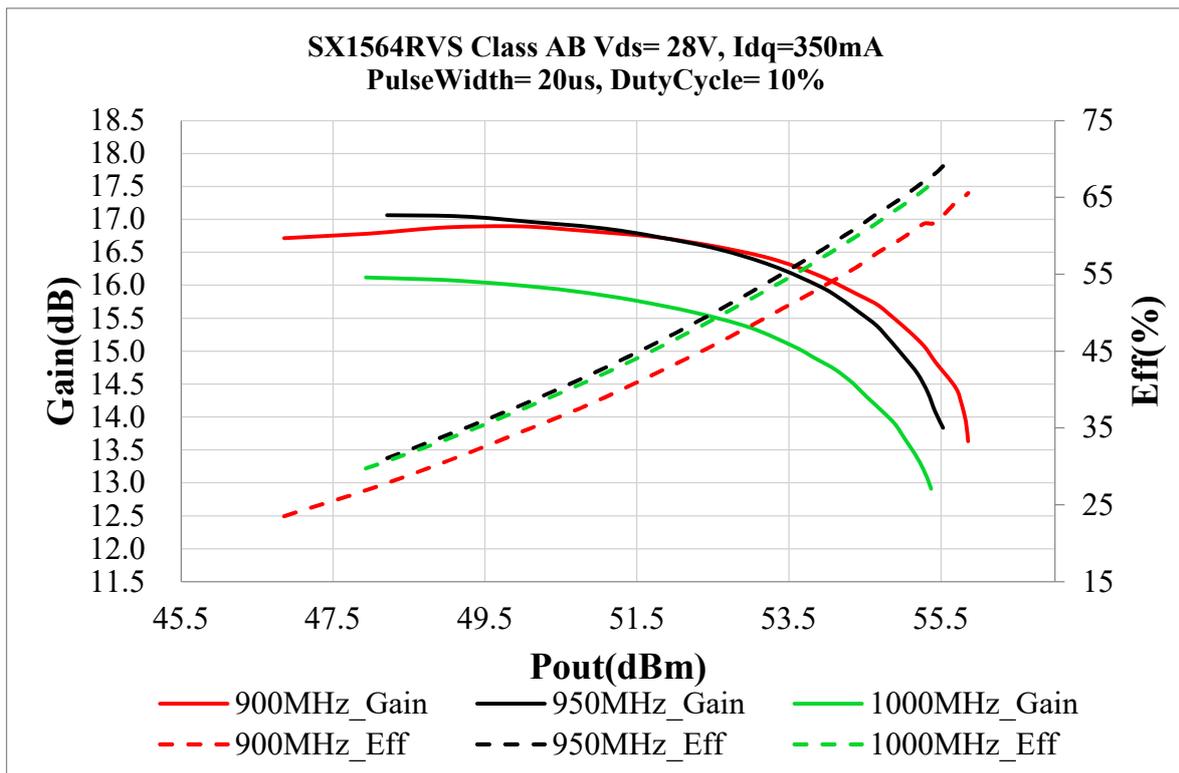




Figure 3: Network analyzer output, S11 and S21

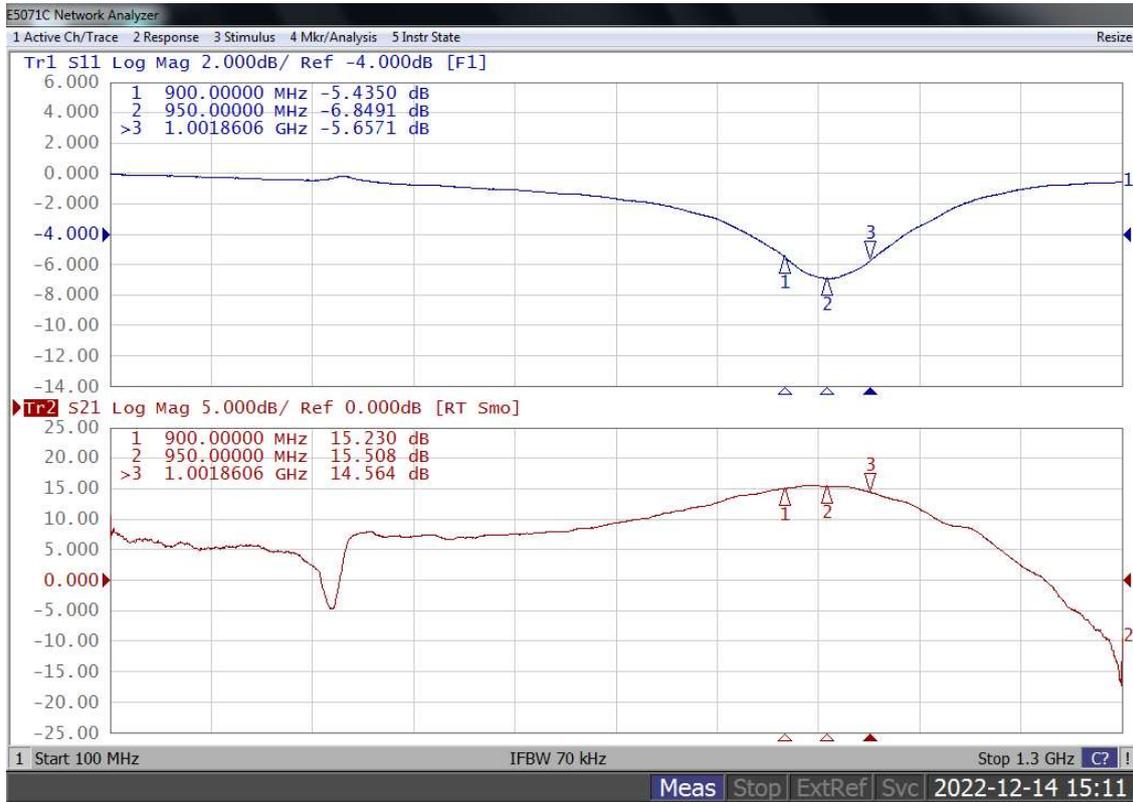


Figure 4: Picture of application board for 0.9-1GHz Class AB

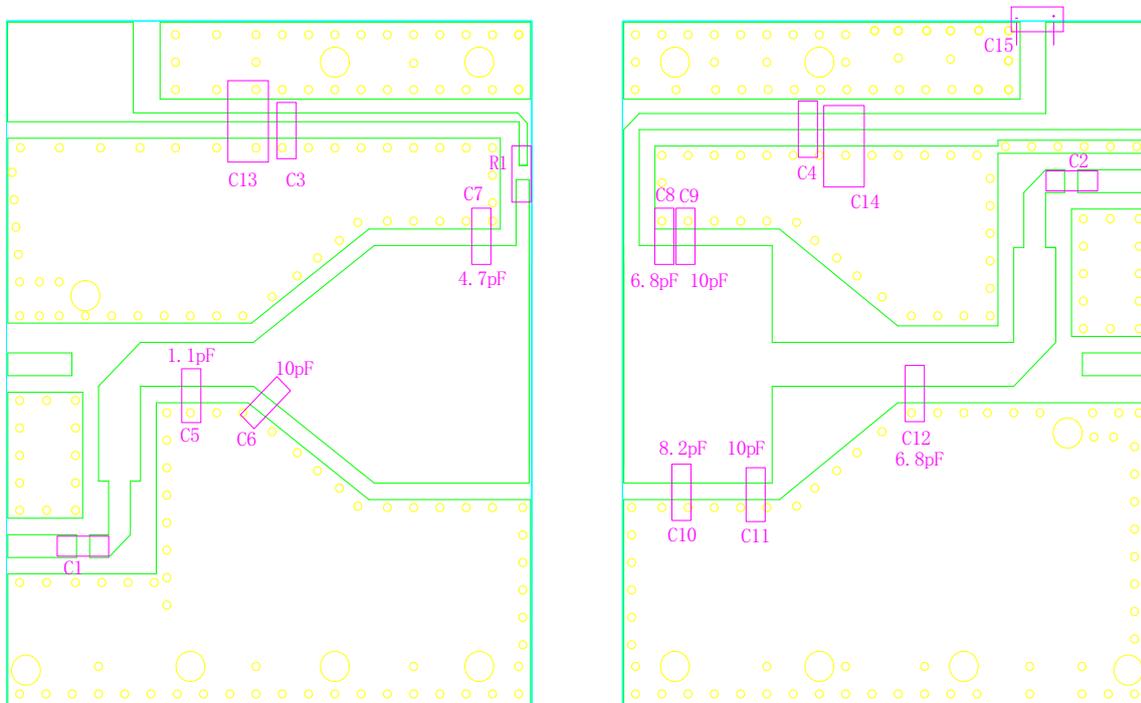




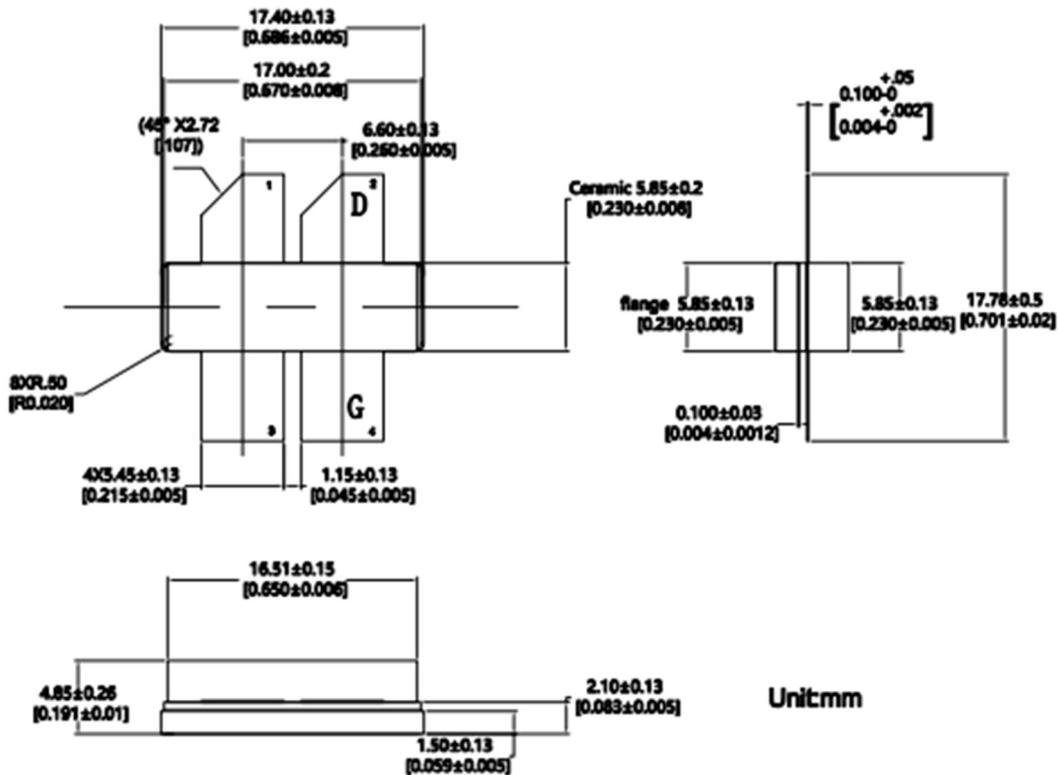
Table 4. Bill of materials of application board (PCB layout upon request, RO4350B 30Mils)

Designator	Footprint	Comment	Quantity
C1, C2, C3, C4	0805	43 pF	4
C5	0805	1.1 pF	3
C6, C9, C11	0805	10 pF	3
C7	0805	4.7 pF	1
C8, C12	0805	6.8 pF	2
C10	0805	8.2 pF	1
C13, C14	1210	10uF/100V	2
C15		100uF/63V	1
R1	0603	10R	1



Package Outline

Flangeless ceramic package; 4 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-LBS					07/17/2022

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2022/12/14	V1.0	Production Datasheet Creation

Application data based on LSM-22-20

Notice

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