



GaN 50V, 250W, L band RF Power Transistor

Description

The SK2022VPS is a 250W, input and output matched GaN HEMT, ideal for multiple applications within L band.

It can support CW, pulse or any modulated signal .In typical broadband application within 1.2-2GHz, it can

deliver >250W CW with higher efficiency

There is no guarantee of performance when this part is used outside of stated frequencies.

SK2022VPS



- Typical performance across 1.2-2GHz class AB application circuit with device soldered

VDS= 50V, IDQ=250mA(Vgs=-3.4V, CW

Freq (MHz)	P2dB (dBm)	P2dB (W)	P2dB Eff(%)	P2dB Gain(dB)	P3dB (dBm)	P3dB (W)	P3dB Eff(%)
1100	52.90	195.0	53.9	17.3	53.26	211.8	53.8
1200	53.89	244.9	49.9	14.6	54.33	270.8	51.2
1300	53.81	240.2	50.6	14.2	54.31	269.6	52.7
1400	53.86	243.4	49.9	14.5	54.38	274.0	52.3
1500	53.97	249.5	52.4	15.4	54.43	277.4	54.6
1600	54.39	274.7	58.4	16.2	54.74	298.1	60.4
1700	54.52	282.9	62.3	16.9	54.78	300.8	63.8
1800	54.35	272.1	62.2	18.5	54.65	291.4	63.7
1900	53.99	250.8	60.6	19.9	54.46	279.4	62.8
2000	53.53	225.6	55.7	17.7	54.17	261.1	58.5
2100	53.09	203.5	51.4	12.8	53.87	243.7	55.1

Applications

- L band power amplifier
- GPS signal booster
- ISM at 1.3GHz, 1.6GHz

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

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V _{DSS}	+200	Vdc
Gate--Source Voltage	V _{GS}	-10 to +2	Vdc
Operating Voltage	V _{DD}	55	Vdc
Maximum gate current	I _{gs}	28.8	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 $T_C = 85^{\circ}\text{C}$, $P_{\text{diss}} = 130\text{W}$,	$R_{\theta\text{JC}}$	0.85	$^{\circ}\text{C}/\text{W}$

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

DC Characteristics (measured on wafer prior to packaging)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{\text{GS}} = -8\text{V}$; $I_{\text{DS}} = 28.8\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{\text{DS}} = 10\text{V}$, $I_{\text{D}} = 28.8\text{mA}$	$V_{\text{GS(th)}}$	-4		-2	V
Gate Quiescent Voltage	$V_{\text{DS}} = 50\text{V}$, $I_{\text{DS}} = 250\text{mA}$, Measured in Functional Test	$V_{\text{GS(Q)}}$		-3.4		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1GHz, $P_{\text{out}} = 250\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		

1.2-2GHz

Figure 2: Network analyzer output, S11 and S21 ($V_{\text{DS}} = 50\text{V}$ $V_{\text{GS}} = -3.4\text{V}$ $I_{\text{DQ}} = 250\text{mA}$)





Figure 3: Picture of application board (RO4350B 20mils)

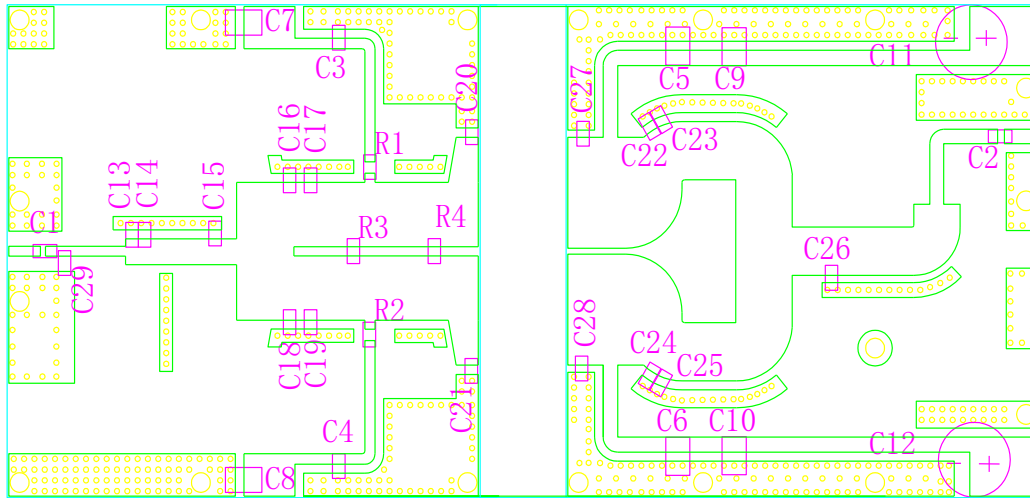
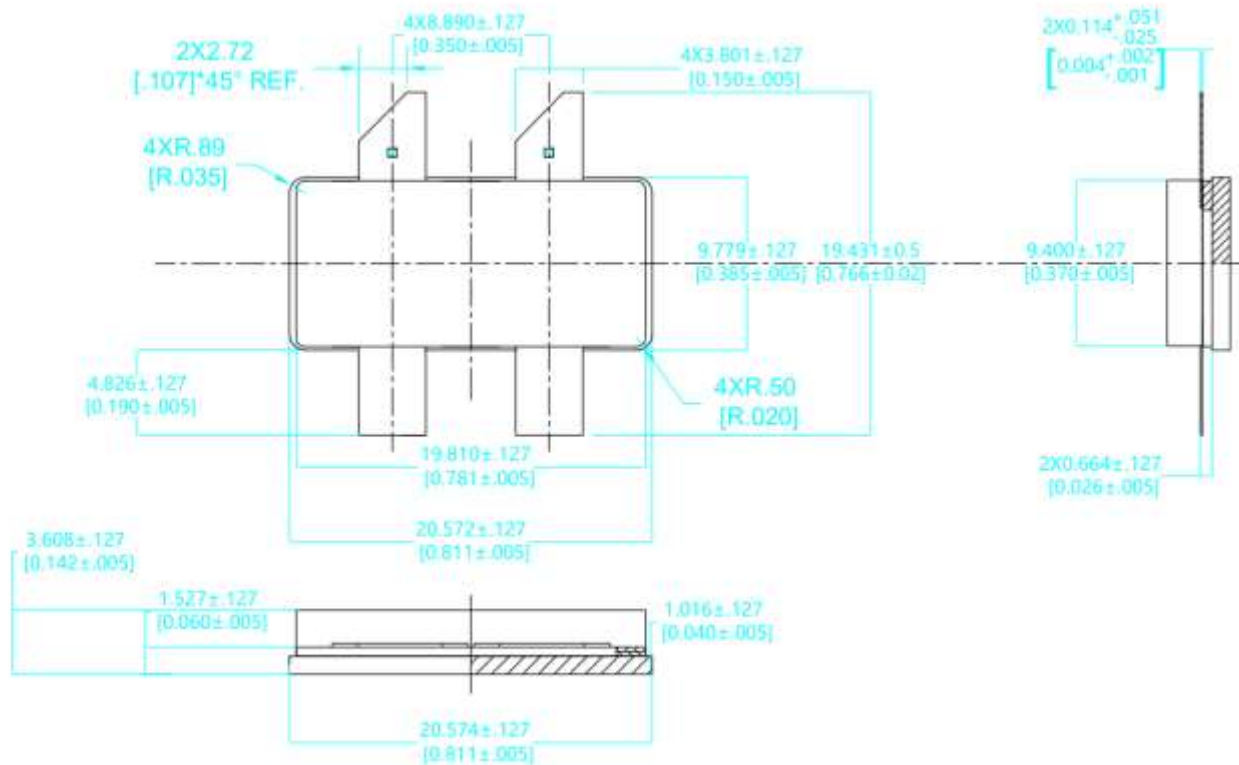


Table 4. Bill of materials of application board (PCB layout upon request)

Designator	Footprint	Comment	Quantity
C1, C3, C4	0603/0805	30 pF	3
C2, C5, C6	1210	30 pF	3
C7, C8, C9, C10	1210	10uF/100V	4
C11, C12		470uF/63V	2
C13, C14, C15, C16, C17, C18, C19, C22, C23, C24, C25, C26, C27, C28, C29	0603/0805	1.1 pF	15
C20, C21	0603/0805	2 pF	2
R1, R2, R3, R4	0603/0805	10Ω	4



Earless Flanged Ceramic Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/10/19	V1.0	Preliminary Datasheet Creation

Application data based on: LSM-26-31

Notice

Specifications are subject to change without notice. Innegration believes the information within the data sheet to be reliable. Innegration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose.

“Typical” parameter is the average values expected by Innegration in quantities and are provided for information purposes only. It can and do vary in different applications and related performance can vary over time. All parameters should be validated by customer’s technical experts for each application.

Innegration 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 Innegration 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, please check with Innegration and authorized distributors

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