



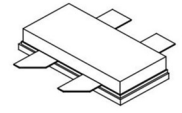
GaN 50V, 1200W, DC-1GHz RF Power Transistor

Description

The XK101K2RVPS is a 1200W, input matched GaN HEMT, ideal for multiple applications from DC-1GHz, with leading efficiency

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

XK101K2RVPS



- Typical performance 350MHz class AB application circuit with device soldered (VHF microstrip balun)

XK101K2RVPS		VGS=-3.4V	VDS=50V	IDQ=400mA	pulse	100us 10%
Freq (MHz)	Psat (dBm)	Psat (W)	IDS (A)	Pin (dBm)	Gain (dB)	Eff(%)
320	62.03	1505.9	4.17	40.52	21.51	76.54
330	61.82	1500.5	3.78	40.20	21.62	80.45
340	61.37	1370.9	3.33	39.30	22.07	82.34
350	60.93	1238.8	3.02	38.56	22.37	82.04
360	60.68	1169.5	2.87	39.09	21.59	81.50
370	60.56	1137.6	2.91	38.70	21.86	78.19
380	60.58	1142.9	3.05	38.28	22.30	74.94

Applications

- P band power amplifier
- UHF TV
- Wideband power amplifier
- ISM

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
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}	-10 to +2	Vdc
Operating Voltage	V _{DD}	55	Vdc
Maximum gate current	I _{gs}	160	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 $T_C = 25^{\circ}\text{C}$, $P_{\text{diss}} = 400\text{W}$	$R_{\theta\text{JC}}$	0.3	$^{\circ}\text{C}/\text{W}$

R_{J} at pulsed CW operation will be varied and lower than above DC test result, check with us for details

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	$V_{\text{GS}} = -8\text{V}$; $I_{\text{DS}} = 160\text{mA}$	V_{DSS}		200		V
Gate Threshold Voltage	$V_{\text{DS}} = 10\text{V}$, $I_{\text{D}} = 160\text{mA}$	$V_{\text{GS(th)}}$	-4		-2	V
Gate Quiescent Voltage	$V_{\text{DS}} = 50\text{V}$, $I_{\text{DS}} = 400\text{mA}$, Measured in Functional Test	$V_{\text{GS(Q)}}$		-3.5		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1GHz, $P_{\text{out}} = 1200\text{W}$ Pulsed CW All phase, No device damages	VSWR		10:1		

350MHz

Figure 2: Network analyzer output, S11 and S21 ($V_{\text{DS}} = 50\text{V}$ $V_{\text{GS}} = -3.2\text{V}$ $I_{\text{DQ}} = 1000\text{mA}$)

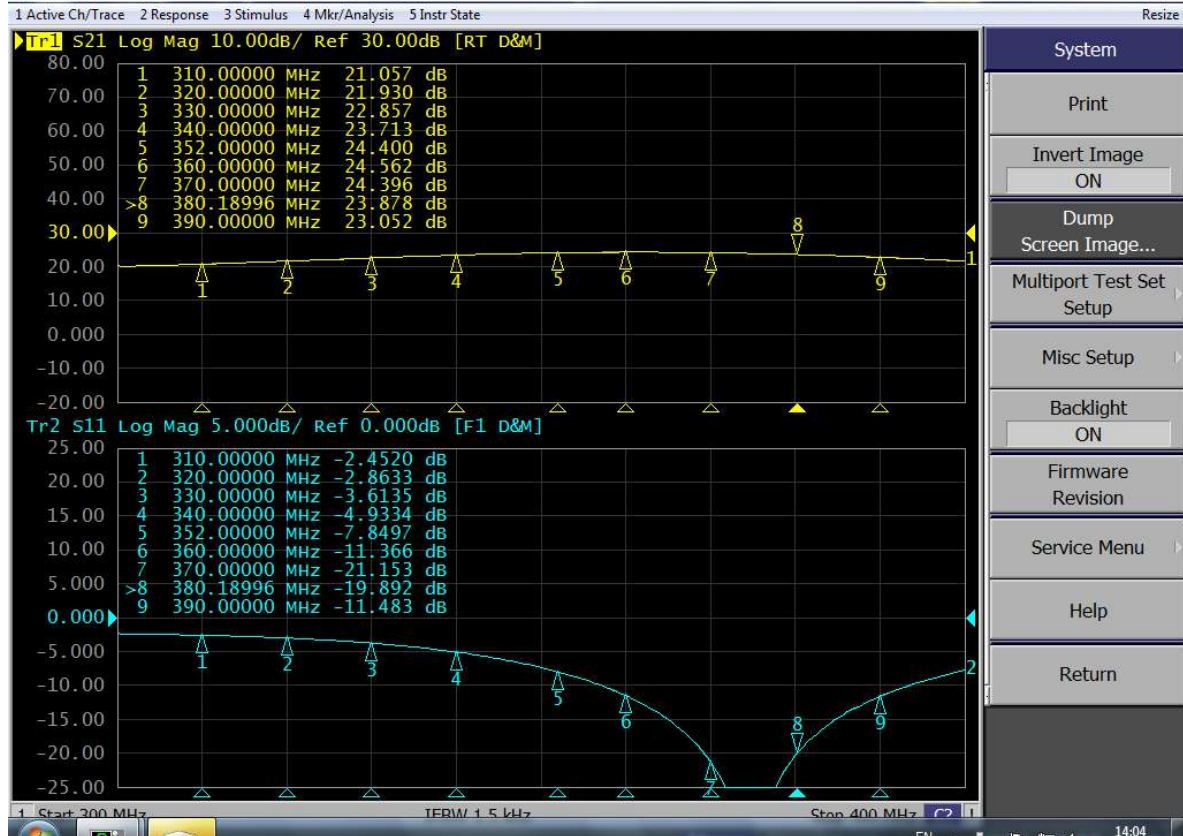


Figure 3: Picture of application board

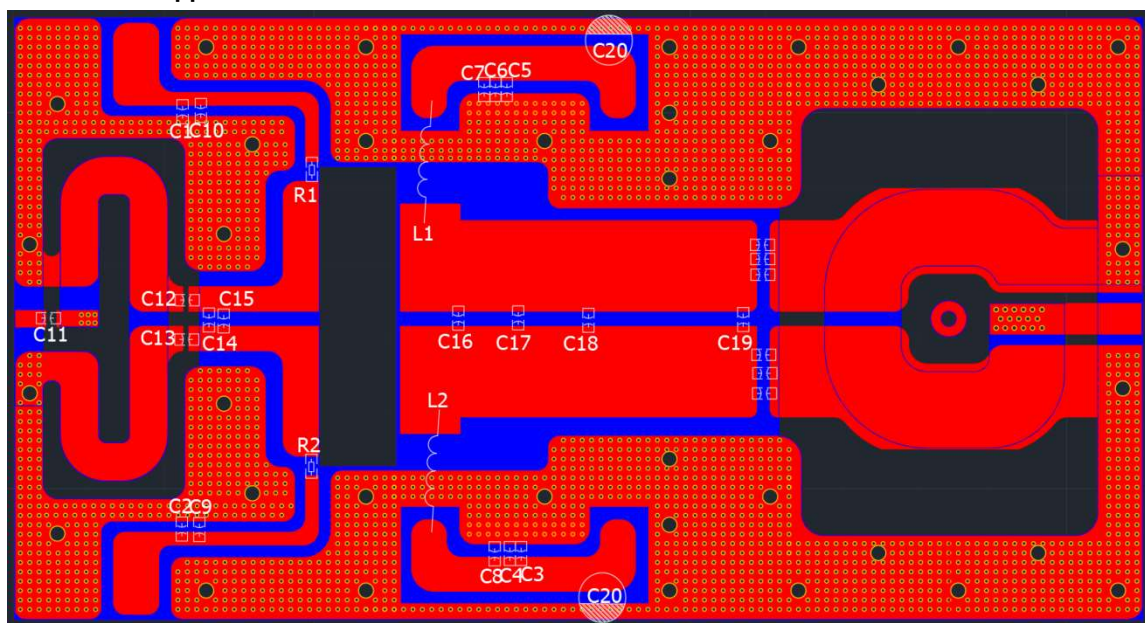
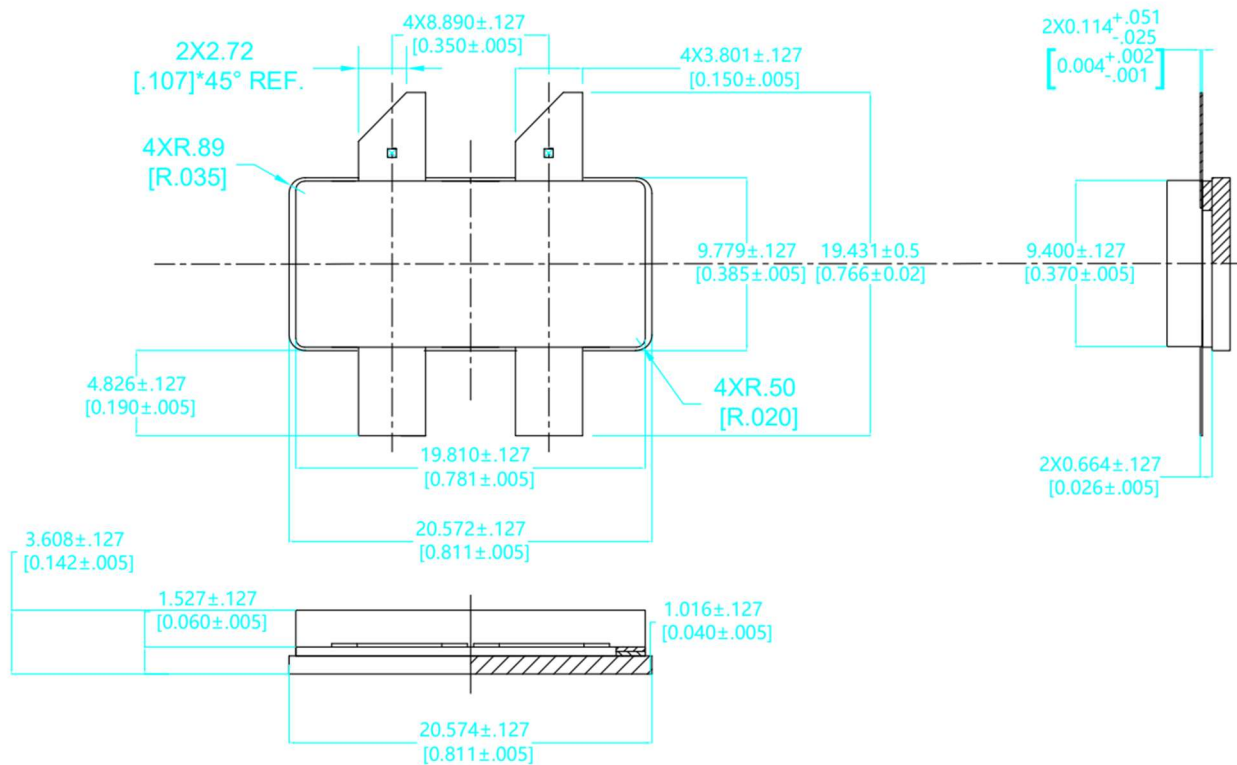


Table 4. Bill of materials of application board (PCB layout upon request)

Component	Description	Suggestion
C1~C6	10uF/200V-1210	Ceramic multilayer capacitor
C7~10	10nF/200V-1210	Ceramic multilayer capacitor
C11	100pF	
C12,C13	36pF	
C14	33pF	
C15	12pF	
C16	18pF	
C17,C19	20pF	
C18	10pF	
C20	4700uF-63V	Electrolytic Capacitor
R1,R2	51 Ω -1206	Chip Resistor
L1	1.5mm wire , 8mm inner diameter, 4Turns	DIY
PCB	30Mil Rogers tc350-plus	



Earless Flanged Ceramic Package; 4 leads



Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/10/23	V1.0	Preliminary Datasheet Creation

Application data based on: HL-26-27/28

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