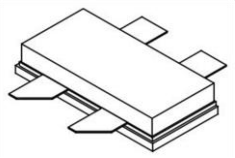
XK2044RHS GaN TRANSISTOR

Document Number: XK2044RHS
Preliminary Datasheet V1.0

Gallium Nitride 28V 440W, RF Power Transistor

XK2044RHS



Description

The XK2044RHS is a 440W 28V, GaN HEMT, designed for multiple applications with frequencies up to 1.5GHz.

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

- Typical broadband performance (on Innogration wideband fixture with device soldered)

XK2044RHS V_{DS}=28V V_{GS}=-3.08V I_{dq}=120mA CW								
F (MHz)	Pin (dBm)	Psat (dBm)	Psat (W)	Id (A)	Gain (dB)	Eff (%)	2nd	3rd
400	37.4	56.30	427	25.10	18.9	60.7	-26.20	-43.40
420	36.1	56.70	468	25.50	20.6	65.5	-29.60	-47.30
440	36.0	56.70	468	24.85	20.7	67.2	-23.40	-54.30
460	36.6	56.90	490	24.40	20.3	71.7	-30.00	-51.30
480	37.3	57.00	501	23.60	19.7	75.8	-44.40	-33.50
500	38.0	56.00	398	20.20	18.0	70.4	-41.80	-31.80

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 (28V)
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 (Not simultaneous, TC = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	150	Vdc
Gate--Source Voltage	V_{GS}	-10,+2	Vdc
Operating Voltage	V_{DD}	40	Vdc
Maximum Forward Gate Current	Igmax	126	mA
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature(See note 1)	T_J	+225	°C

1. **Continuous operation at maximum junction temperature will affect MTTF**

2. Bias Conditions should also satisfy the following expression: Pdiss < (Tj – Tc) / RJC and Tc = Tcase

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, DC Power Dissipation(See note 1)	$R_{\theta JC-DC}$	0.4	C/W

$R_{\theta JC-DC}$ is tested at only DC condition, it is related to the highest thermal resistor value among all test conditions. It might be differently lower in different RF operation conditions like CW signal ,pulsed RF signal etc.

Table 3. Electrical Characteristics (T_C = 25℃ unless otherwise noted)

DC Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=-8V; I_{DS}=126mA	V_{DSS}	150			V
Gate Threshold Voltage	V_{DS} = 28V, I_D =126mA	V_{GS}(th)	-4	-	-2	V
Gate Quiescent Voltage	V_{DS} =28V, I_{DS}=200mA, Measured in Functional Test	$V_{GS(Q)}$		-3		V

400-500MHz

Figure 1: Network analyzer output, S11 and S21

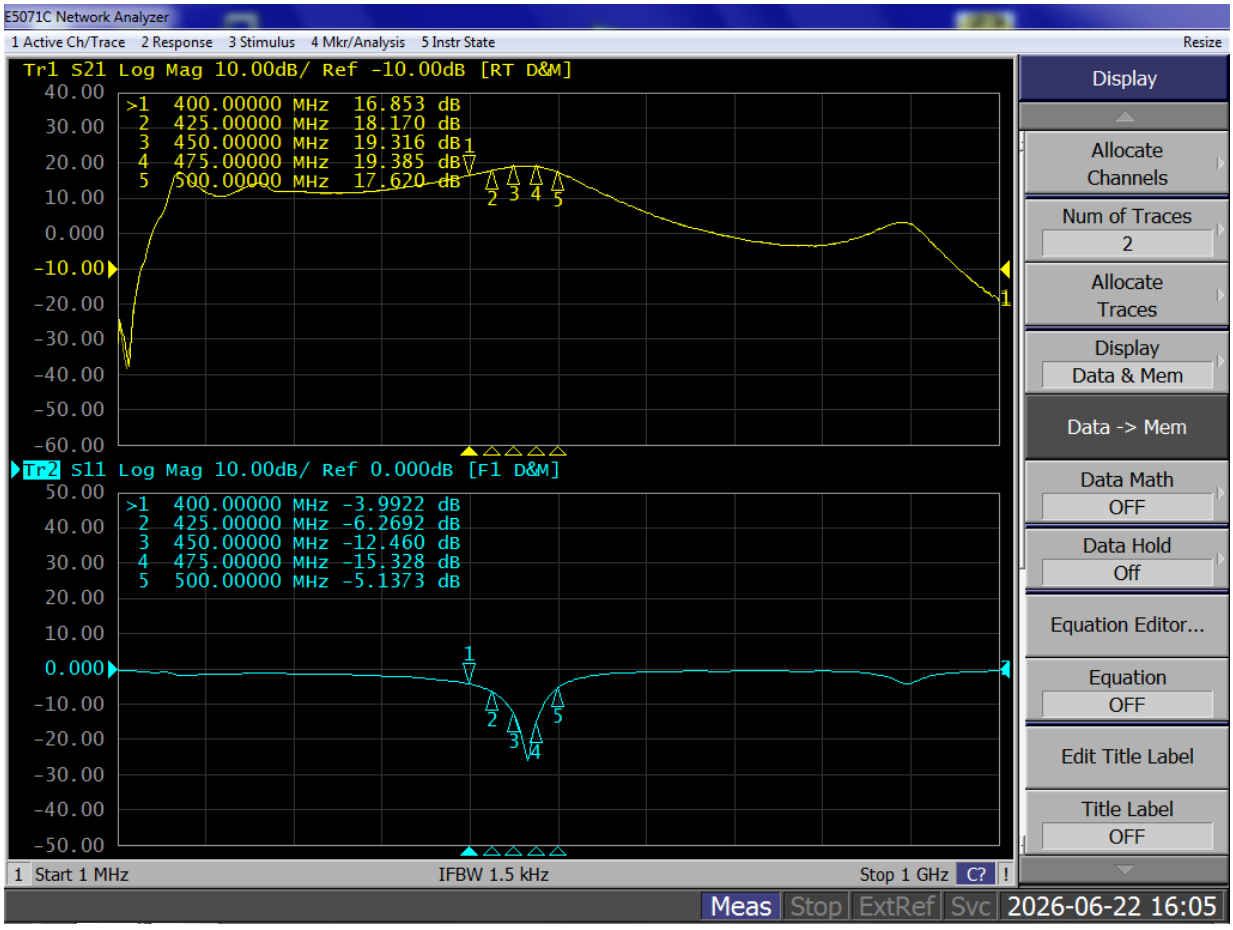


Figure 4: Picture of application board

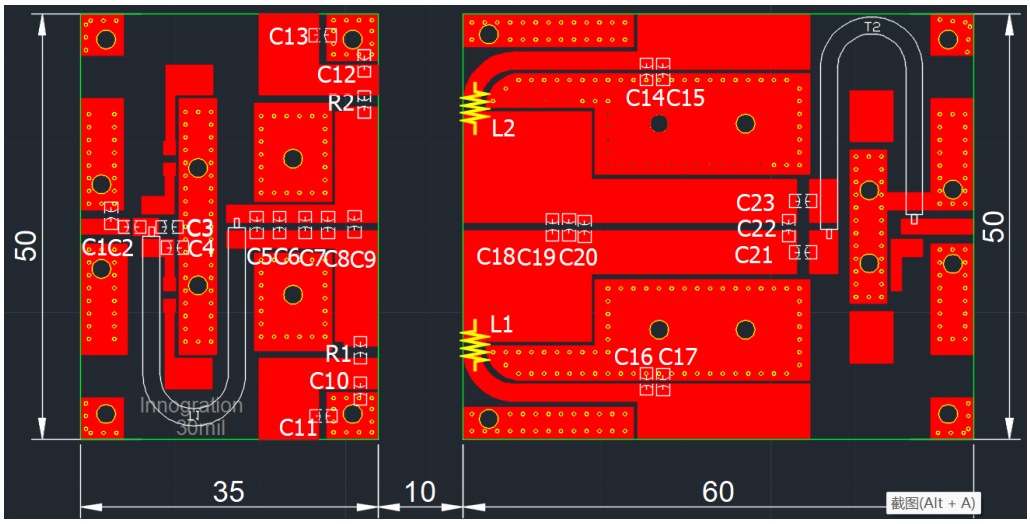


Table 4. Bill of materials of application board (PCB layout upon request)

Part	description	Model
R1,R2	10Ω/1206	Chip Resistor
L1,L2	1.5mm wire ， 3mm inner diameter, 4Turns	DIY
C1,C3	3.0PF MQ301111	
C2	47PF MQ301111	
C4,C11,C13,C15,C17	10UF 1210	Chip Resistor
C5,C6,C19,C20	3.0PF MQ301111	
C7	18PF MQ301111	
C8	20PF MQ301111	
C9	22PF MQ301111	
C10,C12	470PF MQ10111	
C14,C16	10nF 1210	Chip Resistor
C18	10PF MQ10111	
C21,C23	75PF MQ10111	
C22	7.5PF MQ10111	
T1	RFSFBU-086-25 60mm	
T1	SFF-35-3 65mm	
PCB	30mil Rogers4350B	

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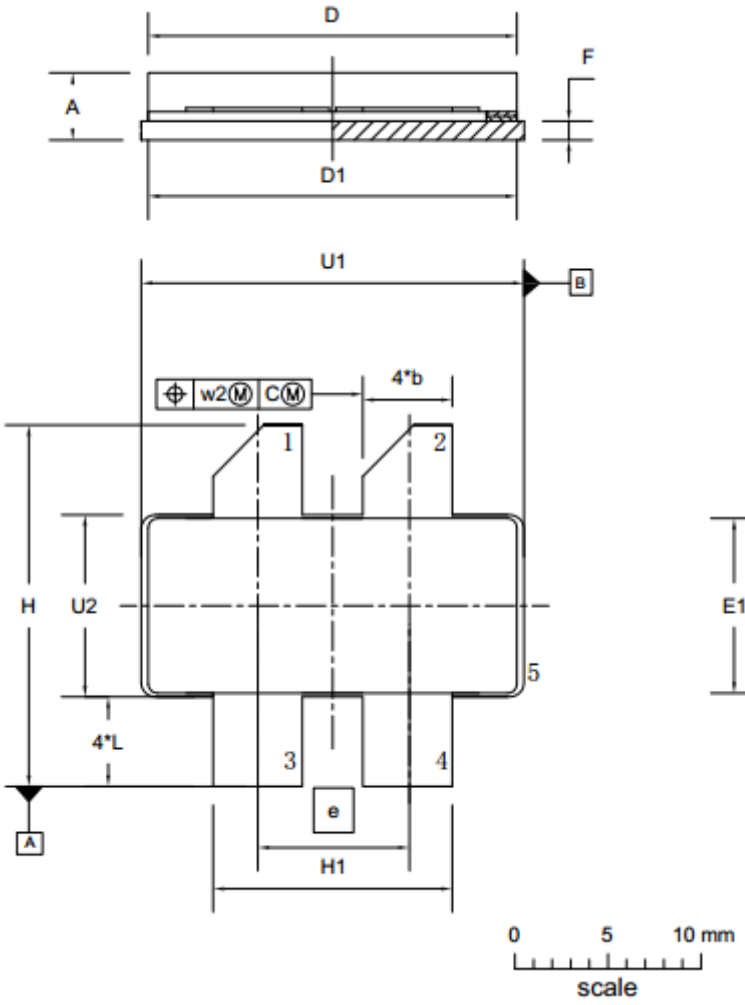
Earless Flanged Ceramic Package; 4 leads



Drain		Gate		Source
1	2	3	4	5

UNIT	A	b	c	D	D_1	e	E	E_1	F	H	H1	L	Q	U_1	U_2	W_1	W_2
mm	4.72 3.43	4.67 4.93	0.15 0.08	20.02 19.61	19.96 19.66	7.90	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	12.98 12.73	5.33 4.32	1.70 1.45	20.70 20.45	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.194 0.184	0.006 0.003	0.788 0.772	0.786 0.774	0.311	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.511 0.501	0.210 0.170	0.067 0.057	0.815 0.805	0.390 0.380	0.01	0.02

OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-B4					03/12/2013

Revision history

Table 4. Document revision history

Date	Revision	Datasheet Status
2026/6/22	V1.0	Preliminary datasheet creation

Application data based on SYX-26-35

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