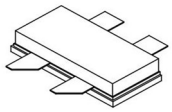
Gallium Nitride 28V, 250W,1.5-1.7GHz RF Power Transistor

NK1722HS



Description

The NK1722HS is a 250W， both input and output matched GaN HEMT, ideal for multiple applications from 1.5-1.7GHz, with leading performance. It can support CW, pulse or any modulated signal. There is no guarantee of performance when this part is used outside of stated frequencies.

- Typical performance across 1.5-1.7GHz class AB application circuit with device soldered

VDS= 28V, IDQ=200mA(Vgs=-2.71V) CW

Freq(MHz)	Pin(dBm)	Pout(dBm)	Pout(W)	IDS(A)	Gain(dB)	Eff(%)	2nd_harmonic
1500	41.52	54.61	289.1	16.95	13.09	60.9%	-20
1550	41.54	54.72	296.5	17.2	13.18	61.6%	-23
1600	41.59	54.6	288.4	16.27	13.01	63.3%	-23
1650	41.61	54.1	257.0	14.5	12.49	63.3%	-21
1700	41.63	53.81	240.4	13	12.18	66.1%	-20.5

Applications

- L band power amplifier
- GPS, Beidou jammer
- 1.5GHz LTE amplifier

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}	+150	Vdc
Gate--Source Voltage	V_{GS}	-10 to +2	Vdc
Operating Voltage	V_{DD}	32	Vdc
Maximum gate current	Igs	72	mA
Storage Temperature Range	Tstg	-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 Tj=200°C	$R_{\theta JC}$	0.8	°C /W

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

DC Characteristics (measured on wafer prior to packaging)

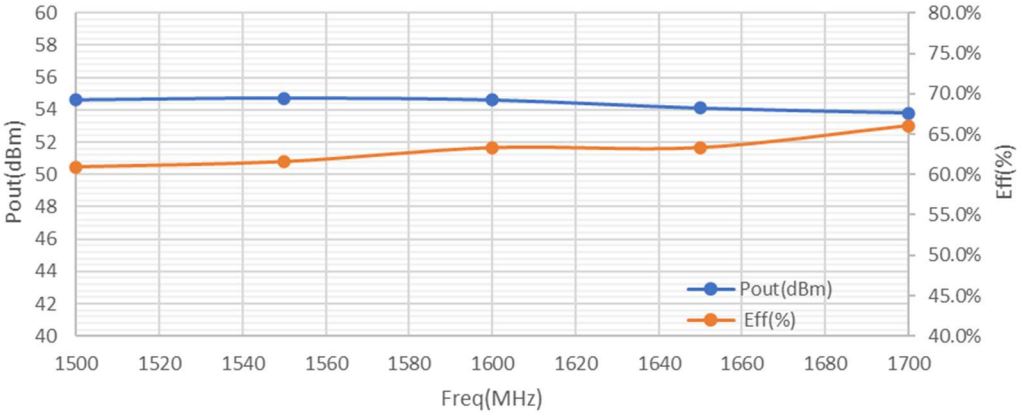
Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	VGS=-8V; IDS=72mA	V_{DSS}		150		V
Gate Threshold Voltage	VDS =10V, ID = 72mA	$V_{GS(th)}$	-4		-2	V

Gate Quiescent Voltage	VDS =50V, IDS=10mA, Measured in Functional Test	$V_{GS(Q)}$		-2.71		V

Ruggedness Characteristics

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Load mismatch capability	1.6 GHz, Pout=250W Pulsed CW All phase, No device damages	VSWR		10:1		

Figure 2:Pout, Efficiency and power gain across 1.5-1.7GHz class AB) CW signal



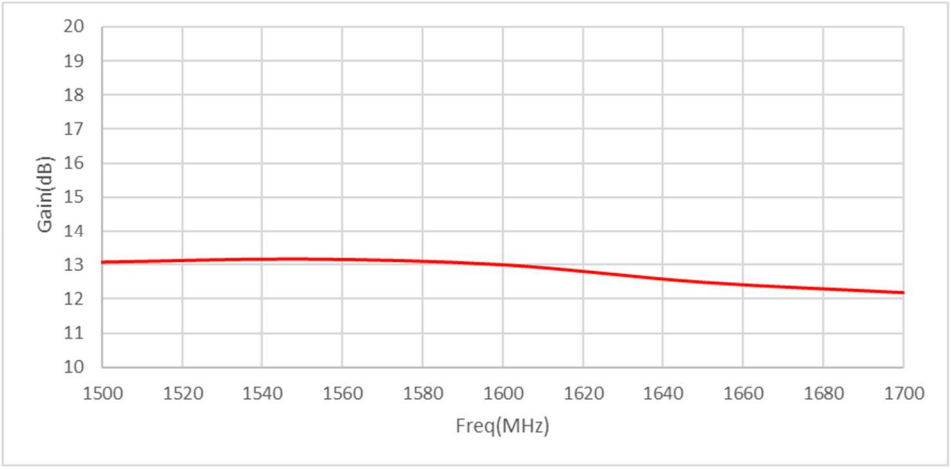


Figure 3: Network analyzer output, S11 and S21（ VDS=28V VGS=-2.75V IDQ=450mA）

Figure 4: Picture of application board 1.5-1.7GHz class AB

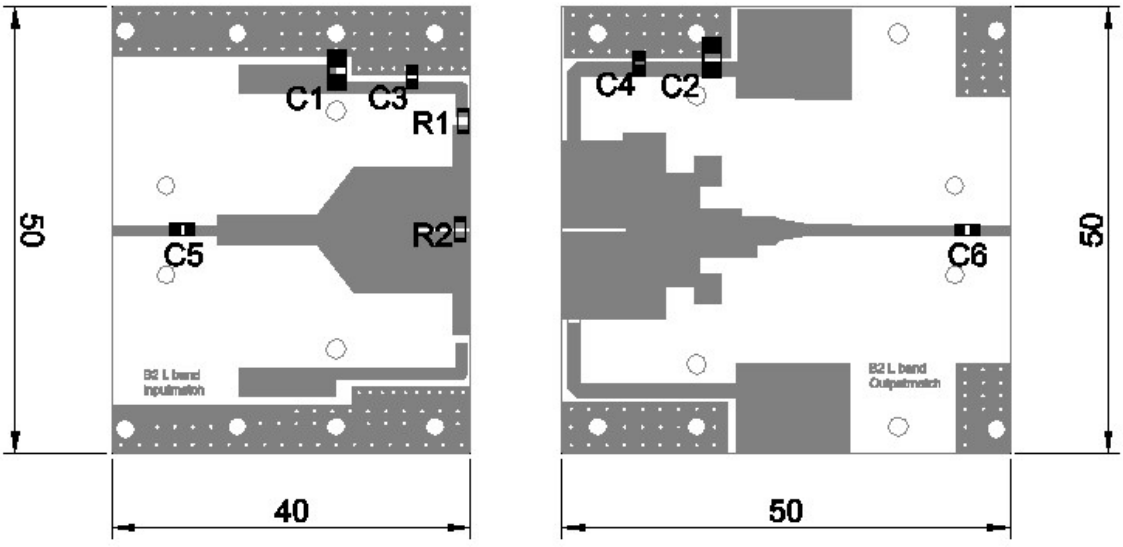
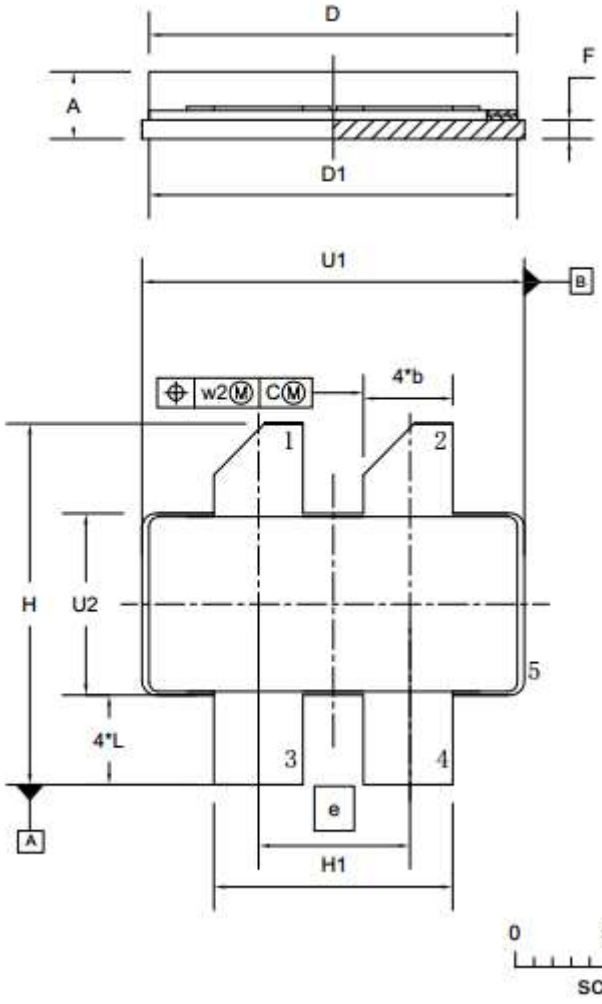


Table 4. Bill of materials of application board (PCB layout upon request)

Component	Description	
C1、C2	10uF/50V	1210
C3、C4、C5、C6	39pF	Beijing YN MQ101111
R1、R2	Chip Resistor,9.1Ω,1206	
PCB	20Mil Rogers 4350B	

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
2022/8/23	V1.0	Preliminary Datasheet Creation
2022/10/4	V1.1	Modify the picture and drawing from BY2 to BY4

Application data based on: JF-22-16

Notice