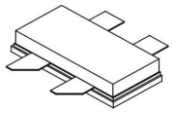
Gallium Nitride 28V, 250W,1.3-1.5GHz RF Power Transistor

NK1522HS



Description

The NK1522HS is a 250W， both input and output matched GaN HEMT, ideal for multiple applications from 1.3-1.5GHz, 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 1.3-1.5GHz class AB application circuit with device soldered

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

Freq (MHz)	Psat (dBm)	Psat (W)	Ids (A)	Pin (dBm)	Gain (dB)	Eff (%)	2nd (dBl)
1300	54.03	252.9	15.14	40.78	13.25	60.00	-20.1
1350	54.44	278.0	15.06	39.6	14.84	65.92	-22
1400	54.37	273.5	15.6	40.48	13.89	62.62	-16.1
1450	54.63	290.4	15.45	40.36	14.27	67.13	-19.4
1500	54.14	259.4	13.5	41.75	12.39	68.63	-20.7

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	RθJC	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	1.4 GHz, Pout=250W Pulsed CW All phase, No device damages	VSWR		10:1		

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

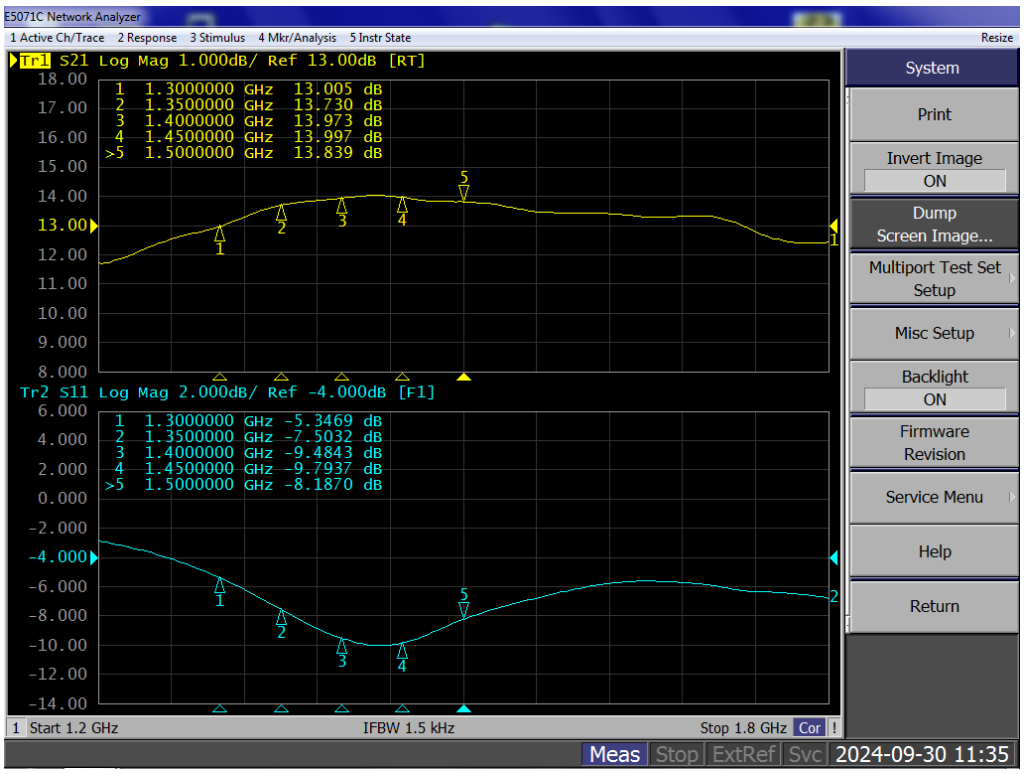


Figure 4: Picture of application board 1.3-1.5GHz class AB

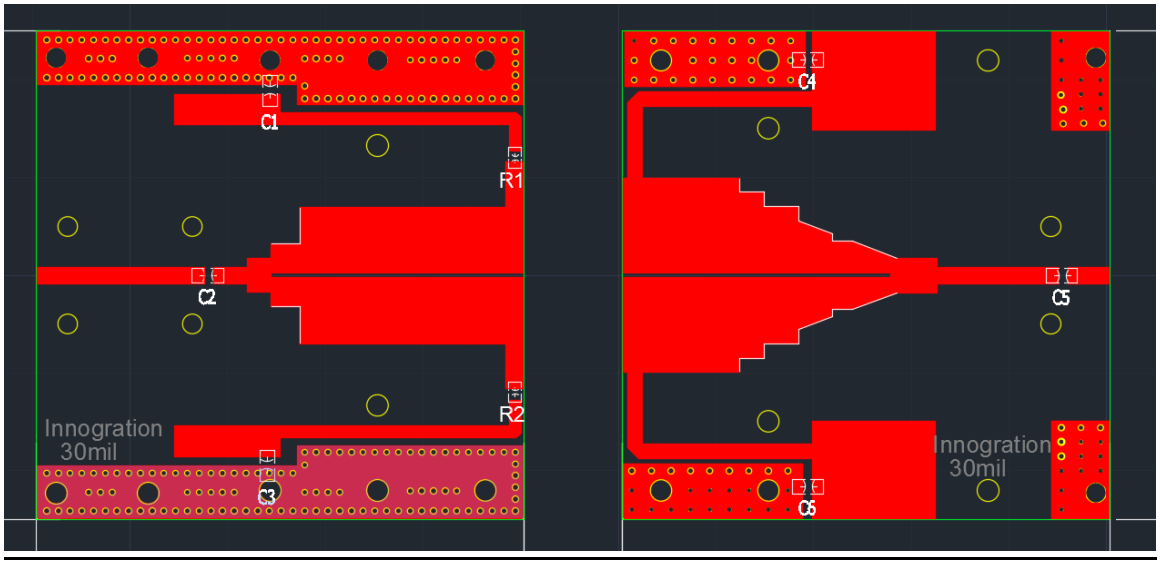
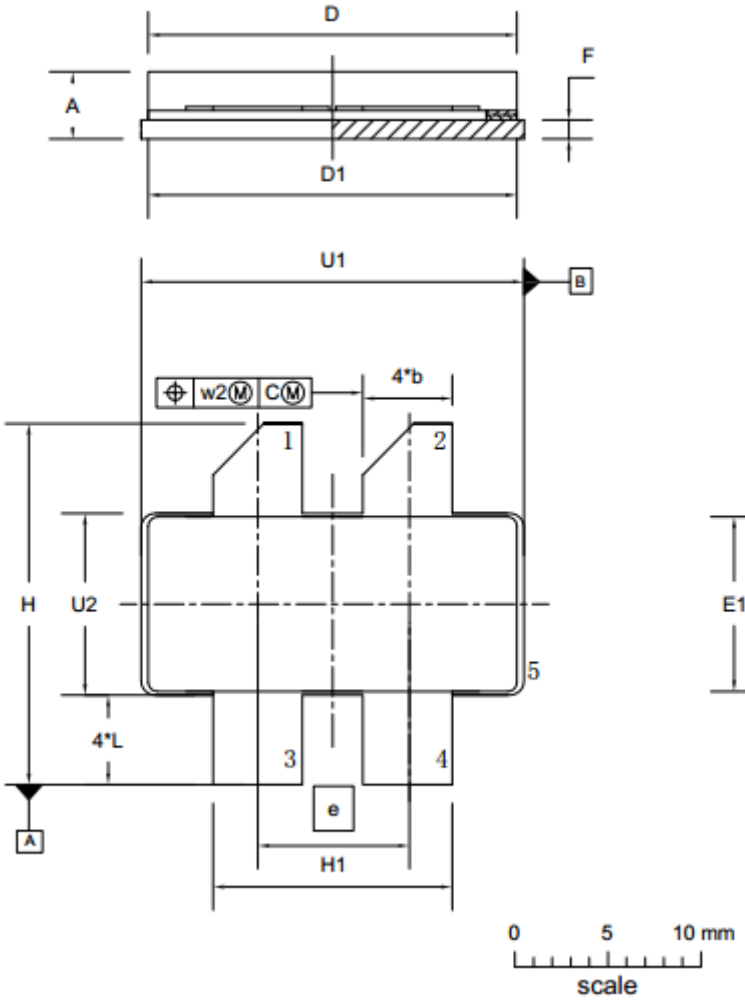


Table 4. Bill of materials of application board (PCB layout upon request)

C1,C3,C4,C6	10uF/1210	/
C2	33pF/0603	/
C5	33pF/MQ301111	BEIJING YUANLU HONGYUAN ELECTRONICTECHNOLOGY CO., LTD.
R1,R2	10Ω/1206	/

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
2024/10/11	**V1.0**	**Preliminary Datasheet Creation**

Application data based on: SJJ-24-09

Notice