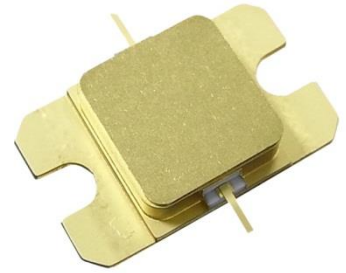


FEATURES

- High Output Power: $P_{out}=44.0\text{dBm}$ (Typ.)
- High Gain: $GL=8.0\text{dB}$ (Typ.)
- High P.A.E.: $\eta_{add}=29\%$ (Typ.)
- Broad Band: 13.75 to 14.5GHz
- Impedance Matched $Z_{in}/Z_{out} = 50\text{ohm}$
- Hermetically Sealed Package

DESCRIPTION

The SGK1314-25A is a high power GaN-HEMT that is internally matched for standard communication bands to provide optimum power and gain in a 50ohm system.



ABSOLUTE MAXIMUM RATING (Case Temperature $T_c=25\text{ deg.C}$)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	26	V
Gate-Source Voltage	V_{GS}	-10	V
Total Power Dissipation	P_T	94	W
Storage Temperature	T_{stg}	-55 to +125	deg.C
Channel Temperature	T_{ch}	+250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V_{DS}		≤ 24	V
Forward Gate Current	I_{GF}	$R_g=100\text{ohm}$	≤ 8.8	mA
Reverse Gate Current	I_{GR}	$R_g=100\text{ohm}$	≥ -2.7	mA
Channel Temperature	T_{ch}		$< +192$	deg.C

ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25\text{ deg.C}$)

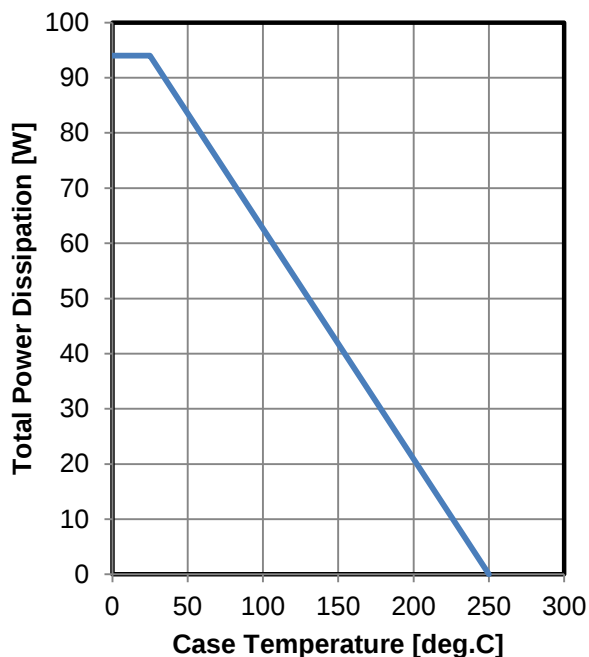
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	$V_{DS}=10\text{V}, V_{GS}=0\text{V}$	-	5.5	-	A
Trans Conductance	G_m	$V_{DS}=24\text{V}, I_{DS}=1.1\text{A}$	-	2.6	-	S
Pinch-off Voltage	V_p	$V_{DS}=10\text{V}, I_{DS}=1.1\text{mA}$	-1.5	-3	-4.5	V
Output Power at $P_{in}=39\text{dBm}$	P_{out}	$V_{DS}=24\text{V(Typ.)}$ $I_{DS(DC)}=0.75\text{A(Typ.)}$ $f=13.75\text{ to }14.5\text{ GHz}$	43.0	44.0	-	dBm
Linear Gain at $P_{in}=24\text{dBm}$	GL		7.0	8.0	-	dB
Drain Current at $P_{in}=39\text{dBm}$	I_{DSR}		-	2.5	3.0	A
Power Added Efficiency at $P_{in}=39\text{dBm}$	η_{add}		-	29	-	%
Gain Flatness	ΔG		-	-	1.6	dB
3 rd Order Inter modulation Distortion	IM_3	$f=13.75\text{GHz}, 14.5\text{GHz}$ $\Delta f=10\text{MHz}, 2\text{-tone Test}$ $P_{out}=37\text{dBm (S.C.L.)}$	-25	-	-	dBc
Thermal Resistance	R_{th}	Channel to Case	-	1.8	2.4	deg.C/W
Channel Temperature Rise	ΔT_{ch}	$(V_{DS} \times I_{DSR} - P_{out} + P_{in}) \times R_{th}$	-	77	150	deg.C

S.C.L. : Single Carrier Level

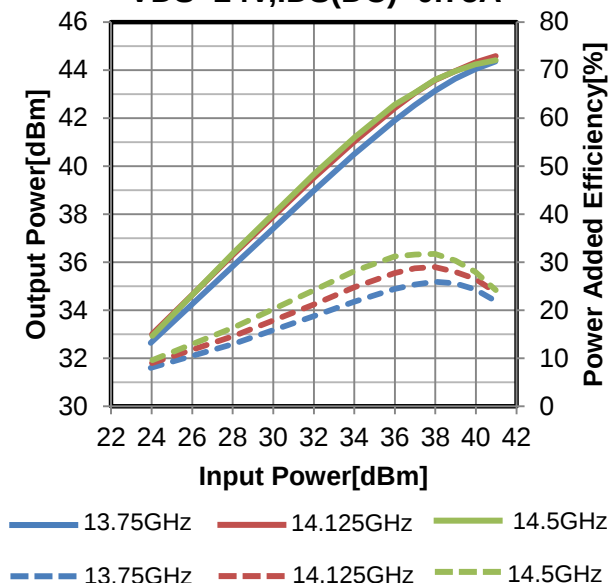
CASE STYLE	IBK	
RoHS Compliance	YES	
ESD	Class 1C	1000V to <2000V

Note : Based on ANSI/ESDA/JEDEC JS-001-2012($C=100\text{pF}, R=1.5\text{kohm}$)

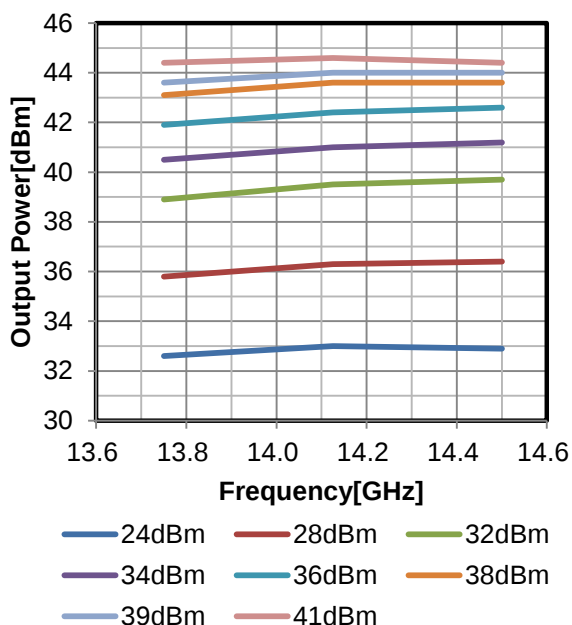
Power Derating Curve



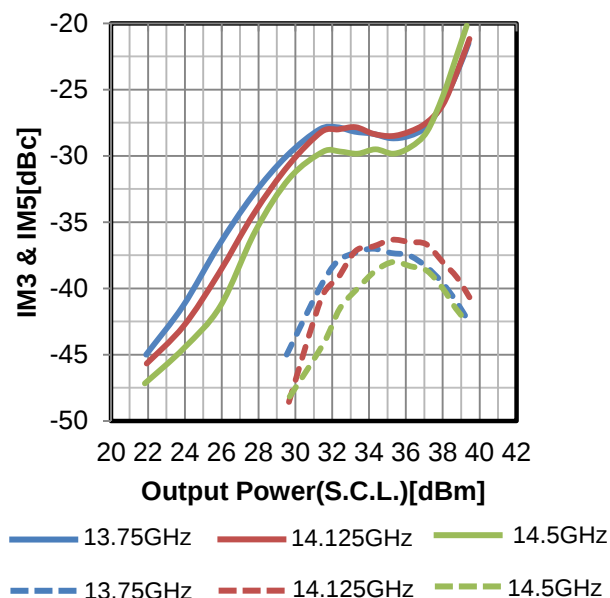
Output Power & Power Added Efficiency vs. Input Power
VDS=24V, IDS(DC)=0.75A



Output Power vs. Frequency
VDS=24V, IDS(DC)=0.75A



IMD vs. Output Power(S.C.L.)
VDS=24V, IDS(DC)=0.75A

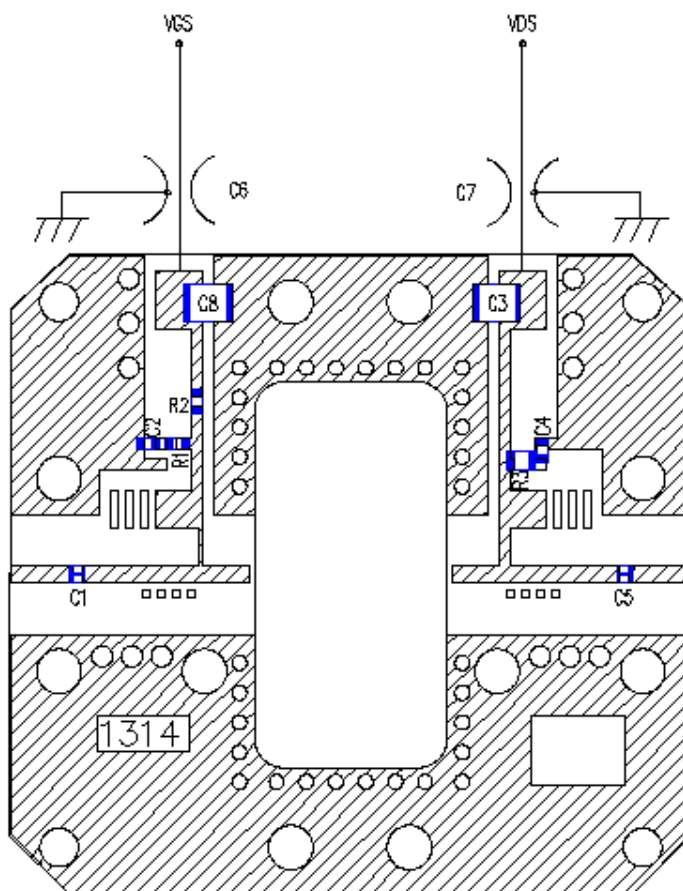


• S-parameter

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13500MHz	0.431	-62.1	2.307	-27.9	0.105	-86.5	0.491	45.9
13600MHz	0.410	-68.7	2.388	-36.6	0.109	-95.3	0.484	40.5
13750MHz	0.382	-76.2	2.450	-46.4	0.113	-105.1	0.470	34.5
13800MHz	0.346	-85.5	2.526	-56.4	0.117	-114.8	0.446	28.3
13900MHz	0.303	-97.5	2.614	-67.4	0.123	-125.1	0.412	21.1
14000MHz	0.260	-111.8	2.702	-77.8	0.128	-135.2	0.367	14.1
14100MHz	0.210	-133.6	2.778	-90.2	0.133	-146.9	0.300	5.6
14200MHz	0.169	-166.5	2.836	-103.5	0.138	-159.7	0.214	-3.2
14300MHz	0.166	149.4	2.844	-117.3	0.140	-173.1	0.111	-9.9
14400MHz	0.215	110.9	2.800	-131.7	0.140	172.9	0.017	78.2
14500MHz	0.285	85.4	2.712	-145.9	0.136	159.0	0.125	131.8
14600MHz	0.354	66.0	2.572	-160.0	0.131	145.0	0.241	124.4
14700MHz	0.412	50.3	2.412	-173.6	0.124	131.9	0.342	115.3

● Amplifier Circuit Outline

SGK1314-25A



C1	0.4pF x 2
C2	1000pF
C3	0.1uF
C4	1000pF
C5	0.4pF x 2
C6	1000pF
C7	1000pF
C8	0.1uF
R1	51ohm
R2	100ohm
R3	51ohm

Substrate : Rogers RO4003C

h=0.542mm, $\epsilon_r=3.38$

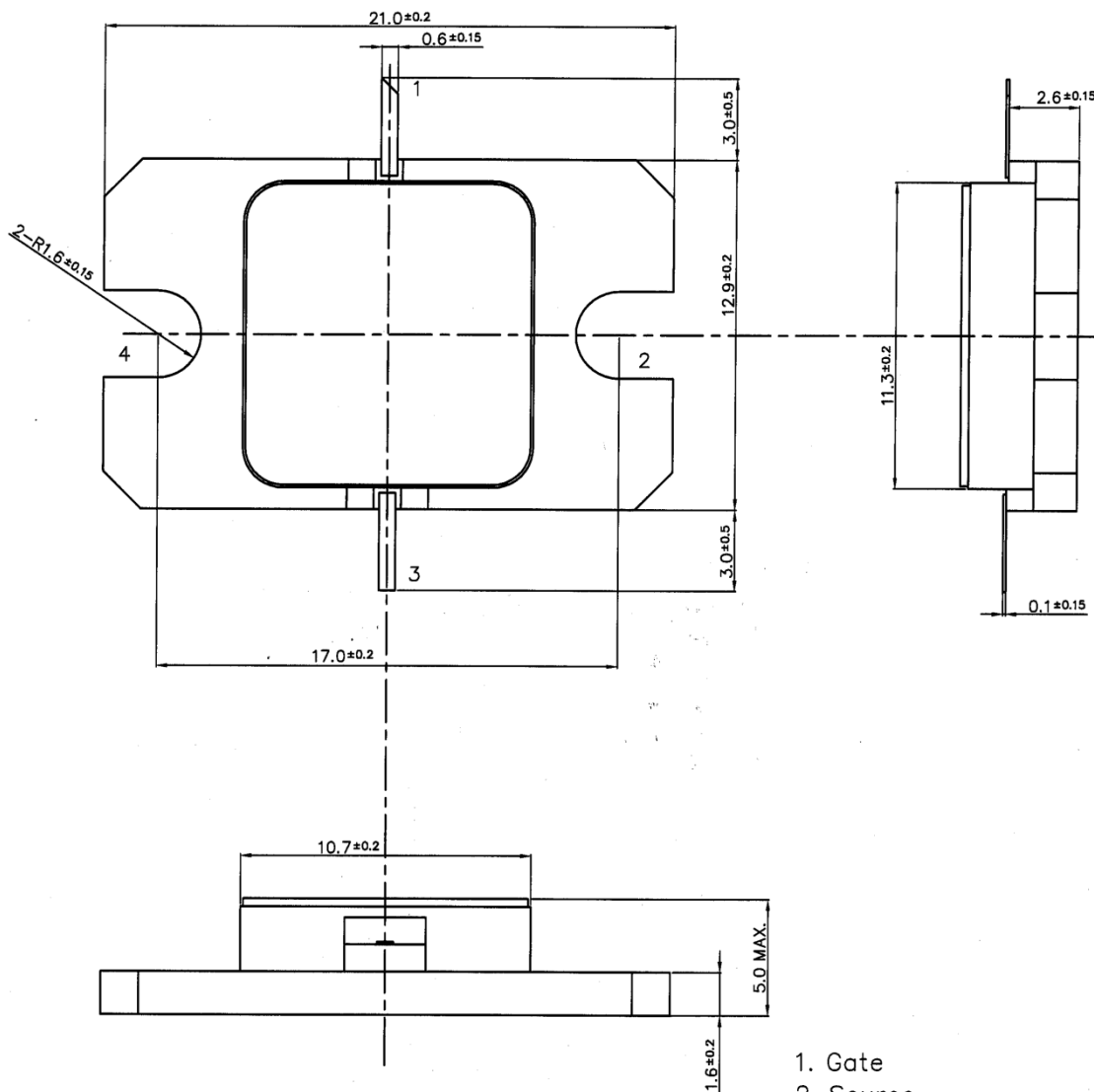
Cu=18um

C1, C5 : ATC600L(size:0603), +/- 0.05pF

C6, C7 : EMI FILTER MARUWA(FTA352AR102S-S)

● Package Out line

Case Style : IBK



1. Gate
 2. Source
 3. Drain
 4. Source
- Unit: mm
Tolerance : ± 0.15



SGK1314-25A

Ku-Band Internally Matched GaN-HEMT

For further information please contact:

<http://global-sei.com/Electro-optic/about/office.html>