

FEATURES

- High Output Power: Pout=47.0dBm (Typ.)
- High Gain: GL=8.0dB (Typ.)
- High P.A.E.: η_{add} =29% (Typ.)
- Broad Band: 13.75 to 14.5GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package



DESCRIPTION

The SGK1314-50A 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 Tc=25 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	140	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 =50ohm	≤10	mA
Reverse Gate Current	I _{GR}	R _g =50ohm	≥-5	mA
Channel Temperature	T _{ch}		<+192	deg.C

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25 deg.C)

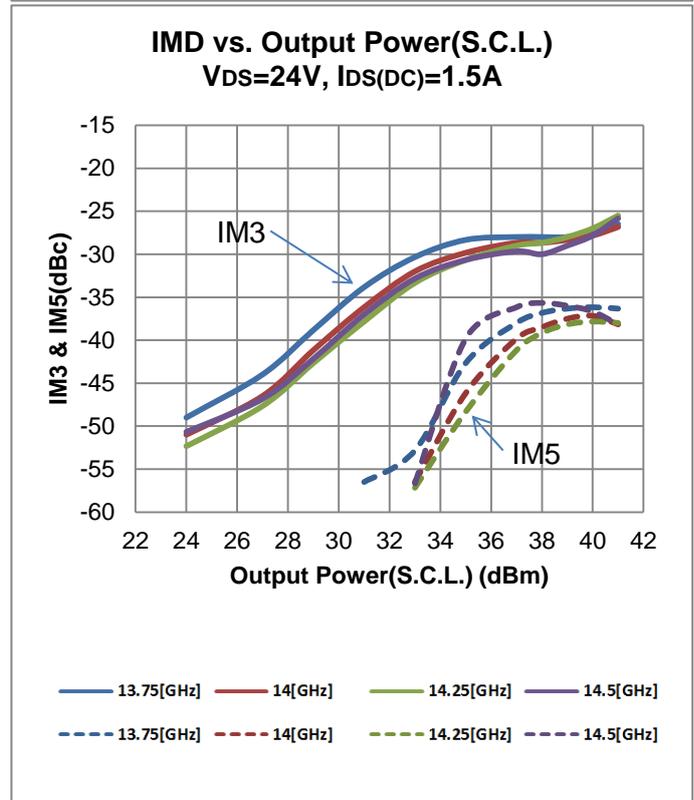
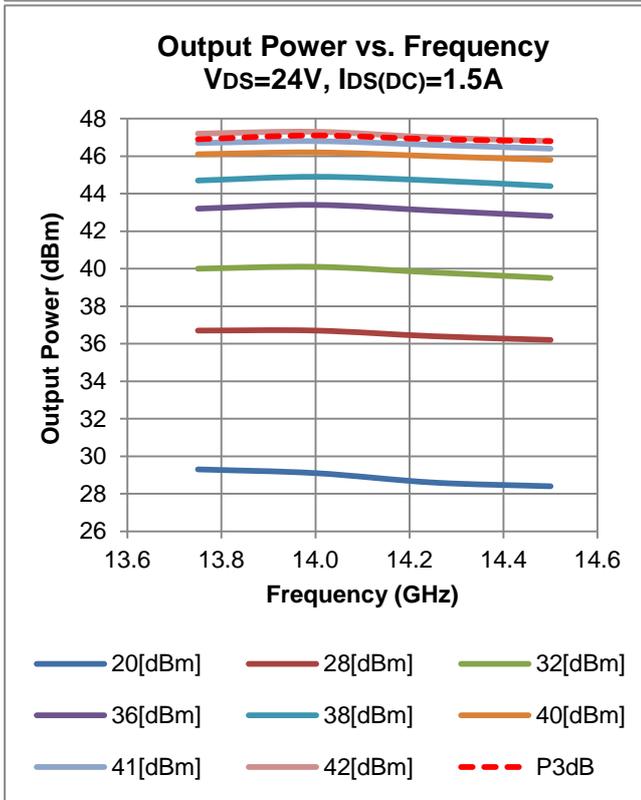
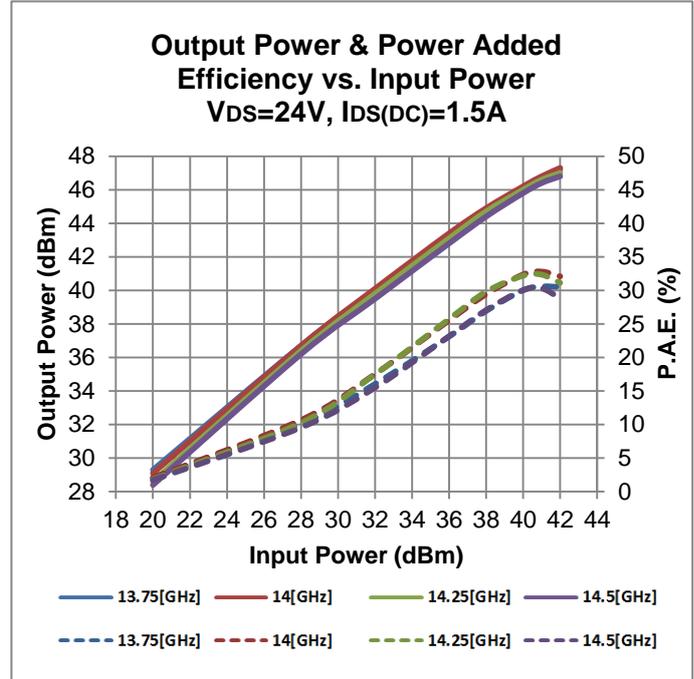
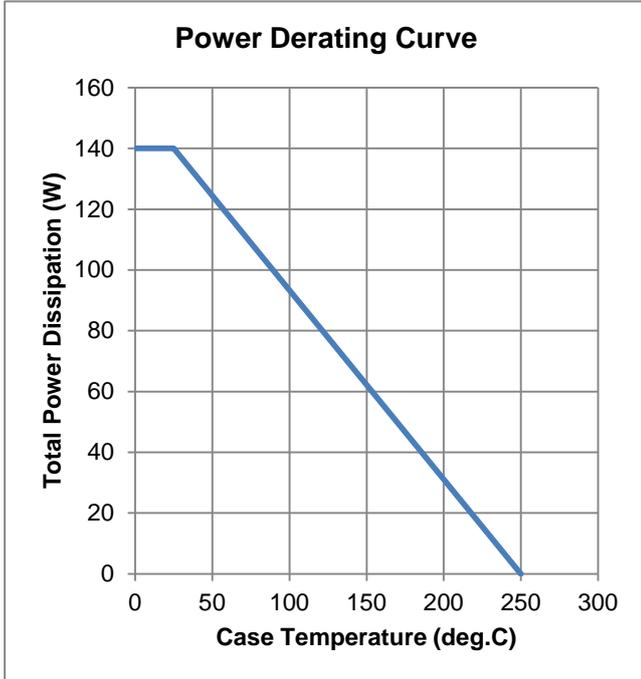
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I _{DSS}	V _{DS} =10V, V _{GS} =0V	-	11.0	-	A
Trans Conductance	G _m	V _{DS} =24V, I _{DS} =2.2A	-	5.1	-	S
Pinch-off Voltage	V _P	V _{DS} =10V, I _{DS} =2.2mA	-1.5	-3	-4.5	V
Output Power at Pin=42dBm	P _{out}	V _{DS} =24V(Typ.) I _{DS(DC)} =1.5A(Typ.) f=13.75 to 14.5 GHz	46.0	47.0	-	dBm
Linear Gain at Pin=27dBm	GL		7.0	8.0	-	dB
Drain Current at Pin=42dBm	I _{DSR}		-	5.0	6.0	A
Power Added Efficiency at Pin=42dBm	η_{add}		-	29	-	%
Gain Flatness	ΔG		-	-	1.6	dB
3 rd Order Inter modulation Distortion	IM ₃	f=14.5GHz Δf =10MHz, 2-tone Test P _{out} =40dBm (S.C.L.)	-25	-	-	dBc
Thermal Resistance	R _{th}	Channel to Case	-	1.3	1.6	deg.C/W
Channel Temperature Rise	ΔT_{ch}	(V _{DS} × I _{DSR} - P _{out} + P _{in}) × R _{th}	-	110	150	deg.C

G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

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

Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5kohm)

● RF Characteristics

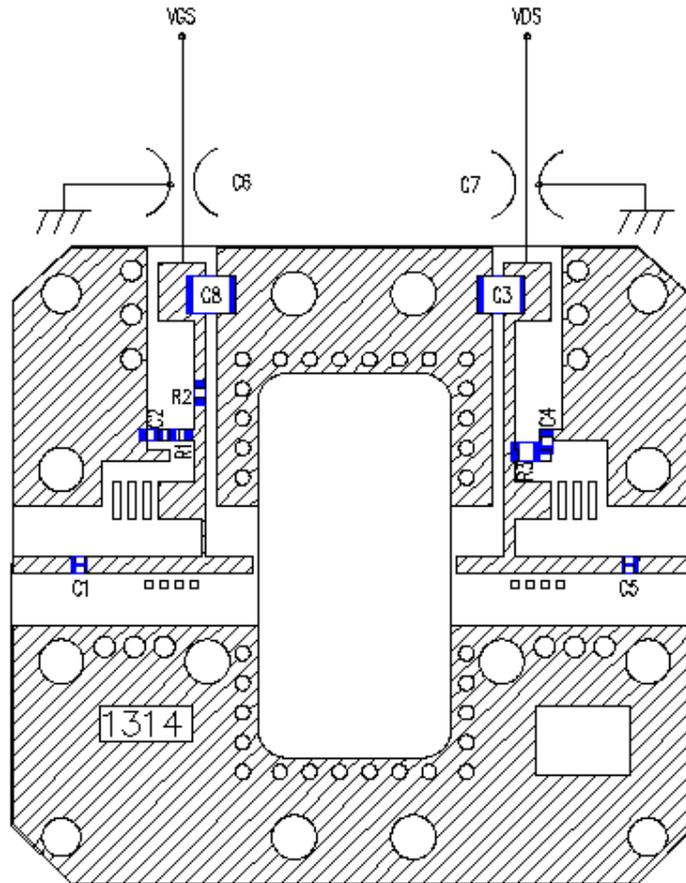


● **S-Parameter**

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
13500MHz	0.372	-178.1	2.734	-37.5	0.106	-89.4	0.134	-179.9
13600MHz	0.322	167.9	2.799	-48.7	0.109	-99.9	0.095	154.0
13750MHz	0.264	145.1	2.830	-64.2	0.110	-115.0	0.069	95.6
13800MHz	0.245	133.9	2.817	-70.8	0.111	-121.0	0.074	70.6
13900MHz	0.224	113.3	2.816	-81.6	0.112	-131.2	0.093	36.4
14000MHz	0.211	91.1	2.819	-92.9	0.113	-142.3	0.119	14.9
14100MHz	0.207	68.7	2.807	-104.5	0.114	-153.0	0.145	-4.7
14200MHz	0.207	47.6	2.782	-116.0	0.113	-164.1	0.171	-19.9
14300MHz	0.209	28.4	2.747	-127.3	0.112	-175.4	0.197	-34.9
14400MHz	0.212	8.7	2.709	-138.8	0.110	174.1	0.217	-48.9
14500MHz	0.210	-10.5	2.650	-150.3	0.108	162.7	0.244	-63.1
14600MHz	0.214	-31.2	2.589	-162.0	0.105	151.1	0.268	-77.8
14700MHz	0.218	-53.4	2.511	-174.2	0.102	140.0	0.298	-90.3

● Amplifier Circuit Outline

SGK1314-50A



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	51ohm
R3	51ohm

Substrate : Rogers RO4003C

h=0.542mm, $\epsilon_r=3.38$

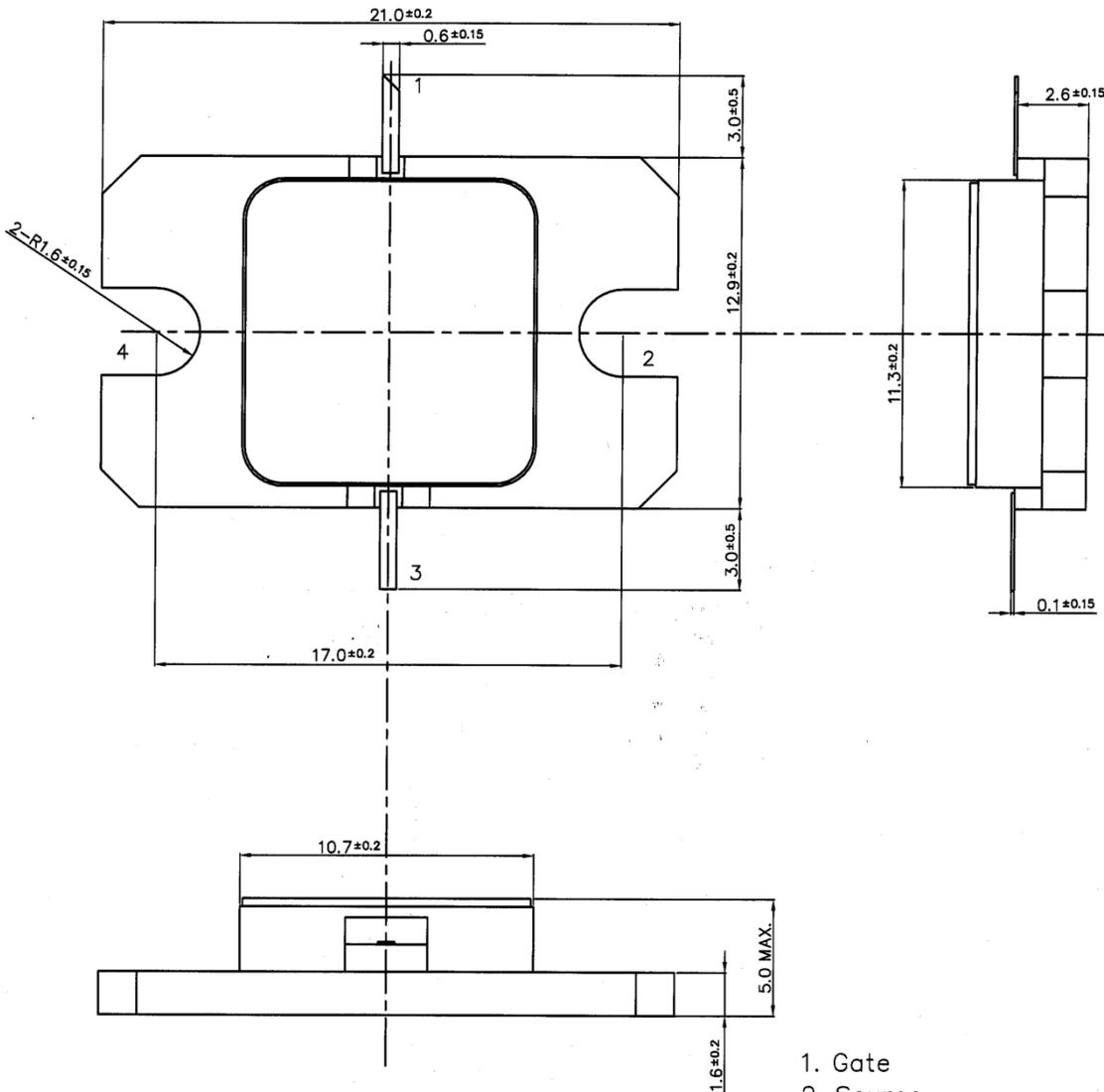
Cu=18um

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



SGK1314-50A

Ku-Band Internally Matched GaN-HEMT

For further information please contact:

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