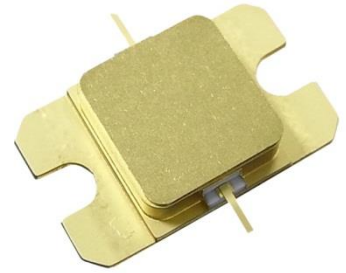


FEATURES

- High Output Power: $P_{out}=44.0\text{dBm}$ (Typ.)
- High Gain: $GL=10.0\text{dB}$ (Typ.)
- High P.A.E.: $\eta_{add}=33\%$ (Typ.)
- Broad Band: 10.7 to 11.7GHz
- Impedance Matched $Z_{in}/Z_{out} = 50\text{ohm}$
- Hermetically Sealed Package

DESCRIPTION

The SGK1011-25A 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	90	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 5dB G.C.P.	P_{5dB}	$V_{DS}=24\text{V(Typ.)}$ $I_{DS(DC)}=1.2\text{A(Typ.)}$ $f=10.7\text{ to }11.7\text{ GHz}$	43.0	44.0	-	dBm
Linear Gain at $P_{in}=24\text{dBm}$	GL		9.0	10.0	-	dB
Drain Current at 5dB G.C.P.	I_{DSR}		-	2.7	3.5	A
Power Added Efficiency at 5dB G.C.P.	η_{add}		-	33	-	%
Gain Flatness	ΔG		-	-	1.6	dB
3 rd Order Inter modulation Distortion	IM_3	$f=10.7, 11.7\text{GHz}$ $\Delta f=10\text{MHz}, 2\text{-tone Test}$ $P_{out}=29\text{dBm (S.C.L.)}$	-37	-42	-	dBc
Thermal Resistance	R_{th}	Channel to Case	-	1.9	2.5	deg.C/W
Channel Temperature Rise	ΔT_{ch}	$(V_{DS} \times I_{DSR} - P_{out} + P_{in}) \times R_{th}$	-	90	150	deg.C

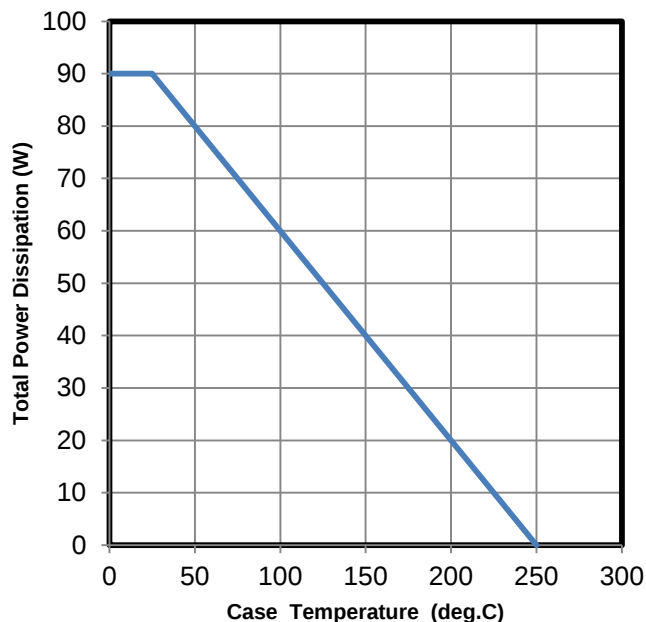
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

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

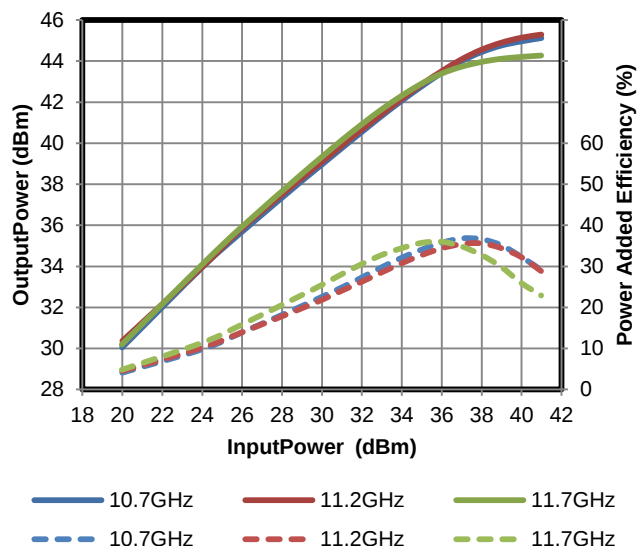
Note : Based on ANSI/ESDA/JEDEC JS-001-2012($C=100\text{pF}, R=1.5\text{kohm}$)

RF Characteristics

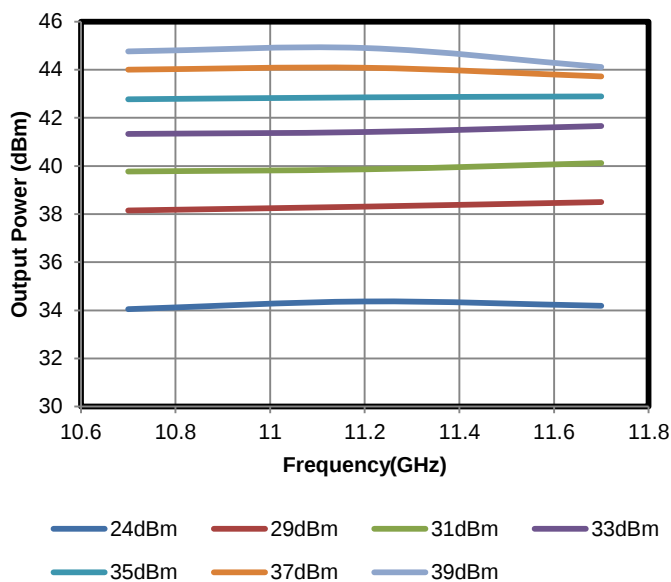
Power Derating Curve



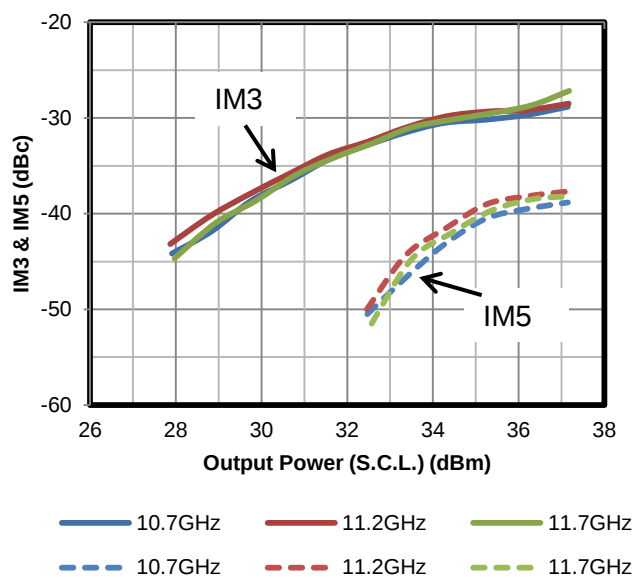
Output Power & Power Added Efficiency vs. Input Power
V_{DS}=24V, I_{DS(DC)}=1.2A



Output Power vs. Frequency
V_{DS}=24V, I_{DS(DC)}=1.2A



IMD vs. Output Power(S.C.L.)
V_{DS}=24V, I_{DS(DC)}=1.2A

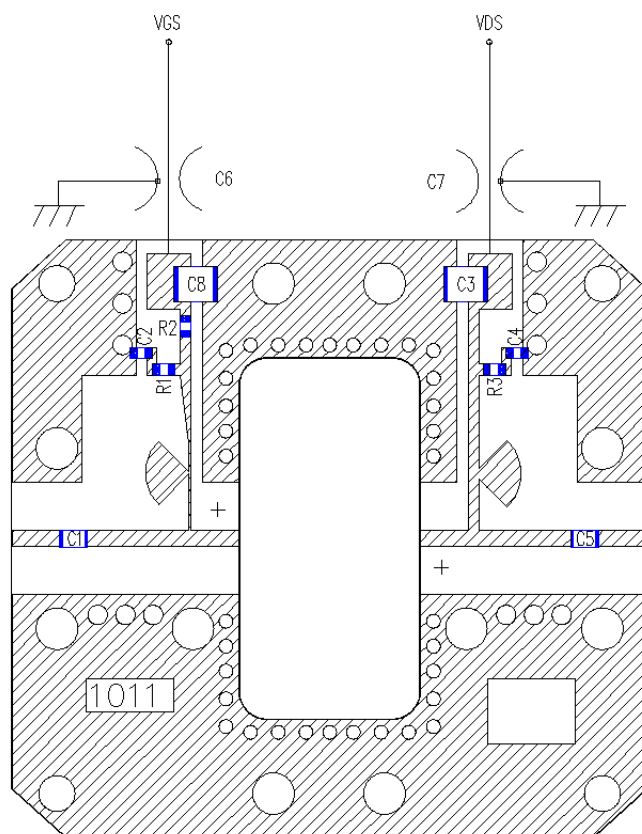


● S-Parameter

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
10500MHz	0.617	-23.0	3.010	114.1	0.094	49.2	0.081	-129.2
10600MHz	0.580	-38.0	3.082	97.9	0.097	33.4	0.084	-160.1
10700MHz	0.563	-46.2	3.127	90.0	0.099	25.1	0.087	-177.1
10800MHz	0.546	-55.1	3.168	81.9	0.100	17.1	0.092	166.8
10900MHz	0.503	-74.2	3.237	64.7	0.105	0.9	0.110	133.8
11100MHz	0.477	-84.4	3.267	55.9	0.107	-7.9	0.123	116.4
11200MHz	0.450	-95.6	3.294	46.4	0.109	-16.6	0.144	102.0
11300MHz	0.388	-121.5	3.348	26.8	0.113	-35.2	0.204	75.0
11400MHz	0.352	-136.7	3.345	16.7	0.114	-44.5	0.238	63.5
11500MHz	0.313	-155.2	3.331	5.9	0.114	-54.9	0.278	51.6
11600MHz	0.267	155.9	3.270	-15.9	0.113	-75.8	0.373	29.2
11700MHz	0.275	127.7	3.216	-27.2	0.110	-86.3	0.424	19.2
11800MHz	0.313	101.7	3.130	-38.3	0.106	-96.9	0.466	9.2
11900MHz	0.426	63.5	2.802	-60.2	0.094	-117.3	0.538	-9.9

● Amplifier Circuit Outline

SGK1011-25A



C1	1.5pF
C2	1000pF
C3	0.1uF
C4	1000pF
C5	1.5pF
C6	1000pF
C7	1000pF
C8	0.1uF
R1	51ohm
R2	100ohm
R3	51ohm

Substrate : Rogers RO4003C

h=0.542mm, $\epsilon_r=3.38$

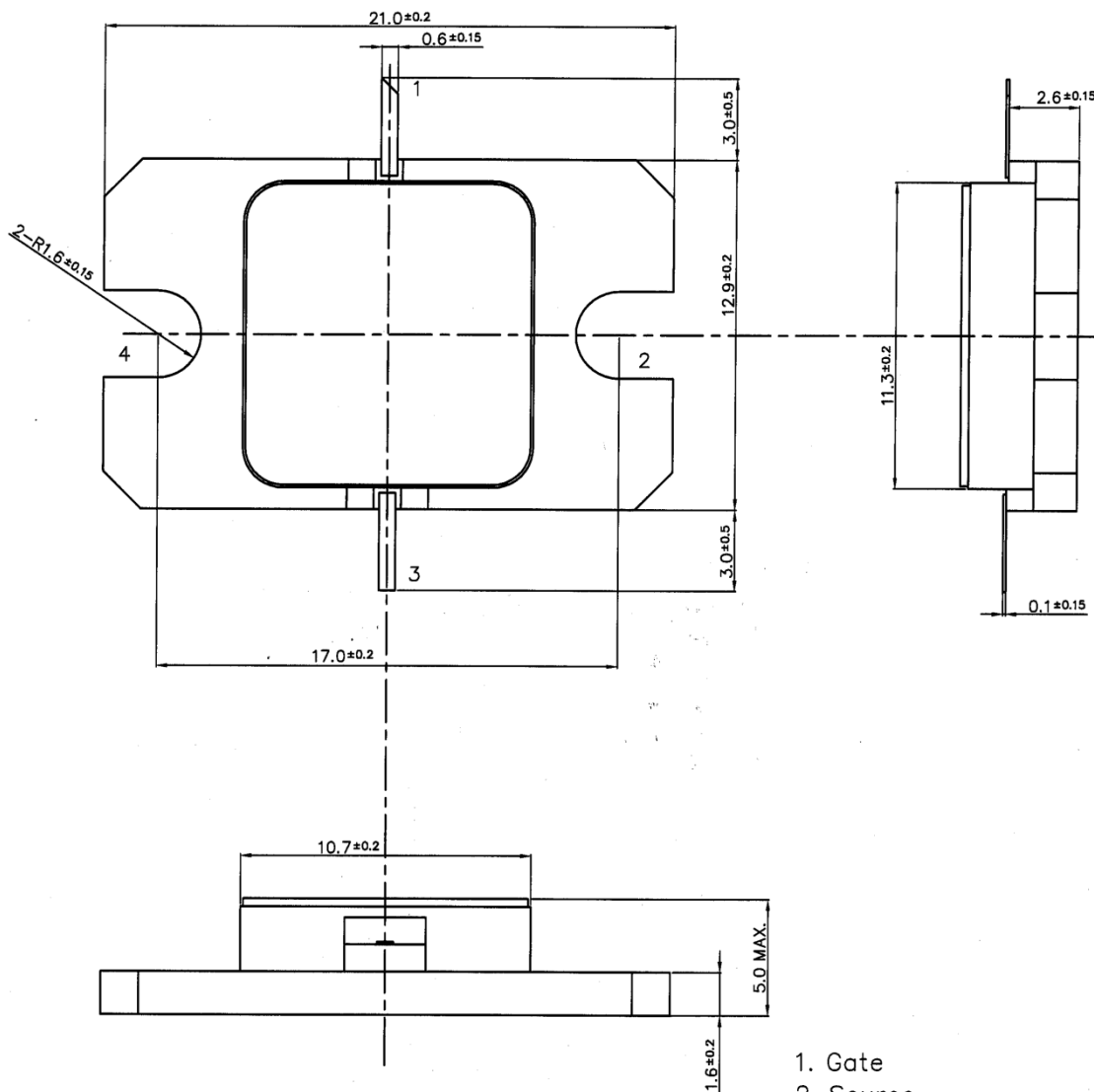
Cu=18um

C1, C5 : ATC600F(size:0805), +/- 0.1pF

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



SGK1011-25A

X-Band Internally Matched GaN-HEMT

For further information please contact:

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