

### FEATURES

- High Output Power: P5dB=45.0dBm (Typ.)
- High Gain: GL=12.0dB (Typ.)
- High PAE:  $\eta_{add}$ =35% (Typ.)
- Broad Band: 9.2 to 10.0GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package



### DESCRIPTION

The SGK0910-30A-R is a high power GaN-HEMT that is internally matched for X-band radar 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 <sub>DS</sub>	26	V
Gate-Source Voltage	V <sub>GS</sub>	-10	V
Total Power Dissipation	P <sub>T</sub>	75	W
Storage Temperature	T <sub>STG</sub>	-55 to +125	deg.C
Channel Temperature	T <sub>CH</sub>	+250	deg.C

### RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>		<=24	V
Forward Gate Current	I <sub>GF</sub>	Rg=100ohm	<=6	mA
Reverse Gate Current	I <sub>GR</sub>	Rg=100ohm	>=-3	mA
Channel Temperature	T <sub>CH</sub>		<+192	deg.C

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

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I <sub>dss</sub>	V <sub>ds</sub> =10V, V <sub>gs</sub> =0V	-	6.5	-	A
Trans Conductance	gm	V <sub>ds</sub> =24V, I <sub>ds</sub> =1.3A	-	3.0	-	S
Pinch-off Voltage	V <sub>p</sub>	V <sub>ds</sub> =10V, I <sub>ds</sub> =1.3mA	-	-3	-	V
Output Power at 5dB G.C.P.	P <sub>5dB</sub>	V <sub>DS</sub> =24V(Typ.)	44.0	45.0	-	dBm
Linear Gain at Pin=23.0dBm	GL	I <sub>DSDC</sub> =1.3A(Typ.)	10.5	12.0	-	dB
Drain Current at 5dB G.C.P.	I <sub>dsr</sub>	Pulse Width=100usec.	-	3.0	3.9	A
Power Added Efficiency at 3dB G.C.P.	$\eta_{add}$	Duty=10%	-	35	-	%
Gain Flatness	$\Delta G$	f=9.2 to 10.0 GHz	-	1.0	-	dB
Thermal Resistance	R <sub>th</sub>	Channel to Case	-	2.2	3.0	deg.C/W

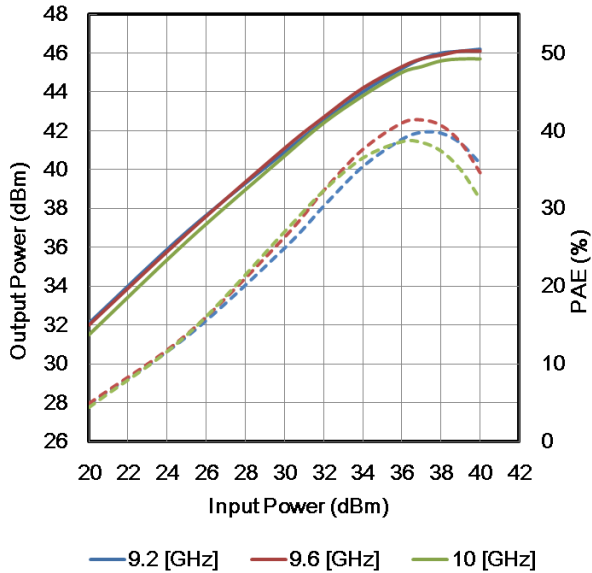
G.C.P. : Gain Compression Point

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)

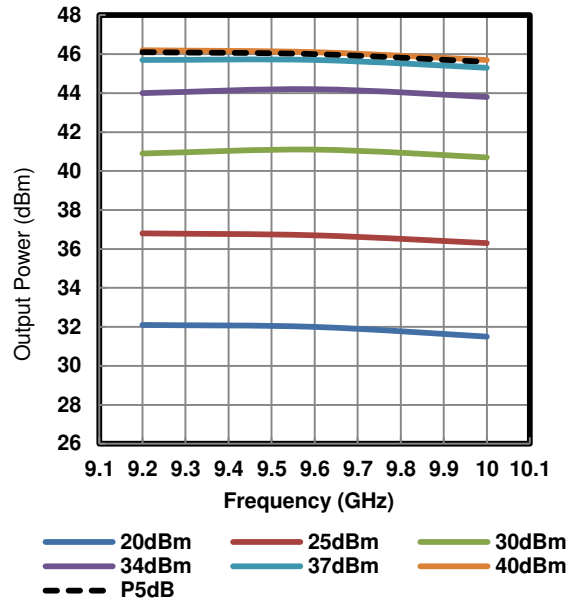
● **RF Characteristics**

**Output Power &  
Power Added Efficiency vs. Input Power**  
 $V_{DS}=24V, I_{DS(DC)}=1.3A$   
**PW=100usec, Duty 10%**



**Output Power vs. Frequency**

$V_{DS}=24V, I_{DS(DC)}=1.3A$   
**PW=100usec, Duty 10%**

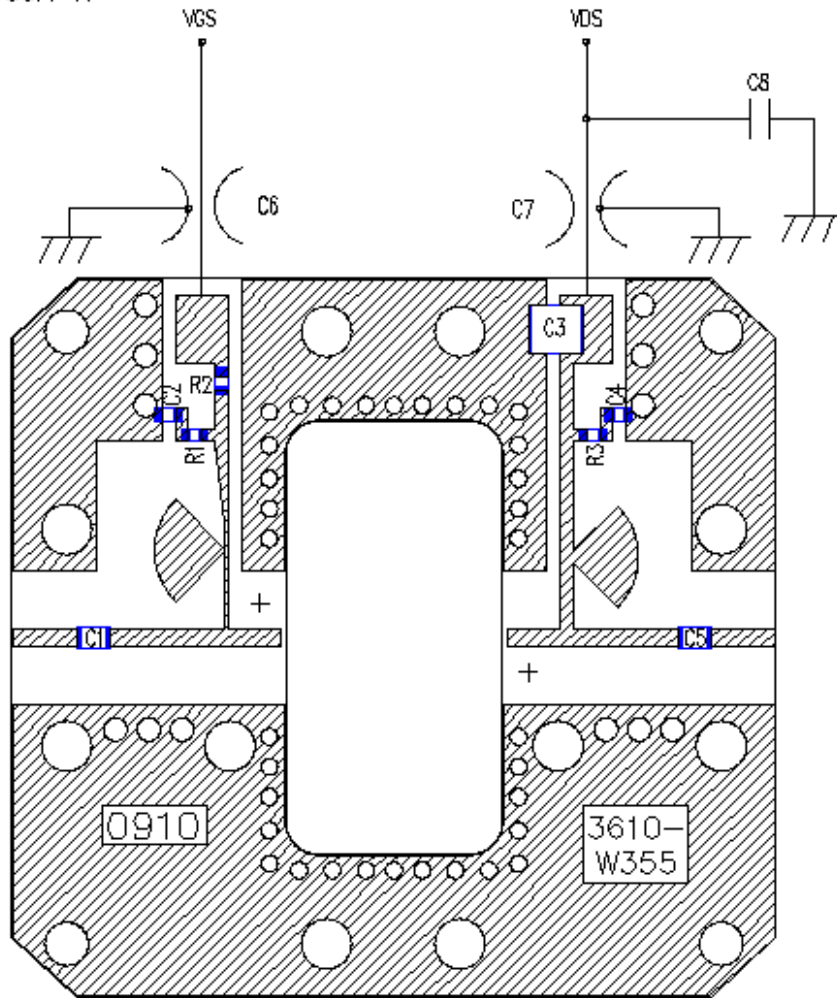


● **S-parameter**

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
9.0 GHz	0.550	0.4	3.148	-130.9	0.084	168.1	0.199	36.4
9.1 GHz	0.507	-5.7	3.146	-141.0	0.086	158.7	0.247	32.8
9.2 GHz	0.456	-11.2	3.160	-151.3	0.087	148.9	0.294	27.1
9.3 GHz	0.399	-17.2	3.179	-162.1	0.089	138.8	0.342	19.4
9.4 GHz	0.333	-22.5	3.186	-173.0	0.091	128.1	0.389	11.7
9.5 GHz	0.261	-27.5	3.170	175.4	0.091	116.5	0.437	2.6
9.6 GHz	0.185	-29.2	3.170	163.4	0.091	105.3	0.479	-6.8
9.7 GHz	0.111	-21.7	3.117	151.6	0.091	92.8	0.521	-16.6
9.8 GHz	0.070	21.8	3.056	139.1	0.090	80.5	0.558	-26.9
9.9 GHz	0.112	62.8	2.956	127.1	0.087	67.7	0.582	-37.0
10.0 GHz	0.186	69.8	2.862	115.3	0.085	55.5	0.604	-46.2
10.1 GHz	0.262	67.1	2.737	103.2	0.082	42.3	0.609	-55.8
10.2 GHz	0.334	60.8	2.617	91.6	0.079	30.2	0.618	-63.5

## ● Amplifier Circuit Outline

SGK0910-30A-R



C1	1.5pF
C2	1000pF
C3	4.7uF
C4	1000pF
C5	1.5pF
C6	1000pF
C7	1000pF
C8	1000uF
R1	51Ω
R2	100Ω
R3	51Ω

Rogers R04003C

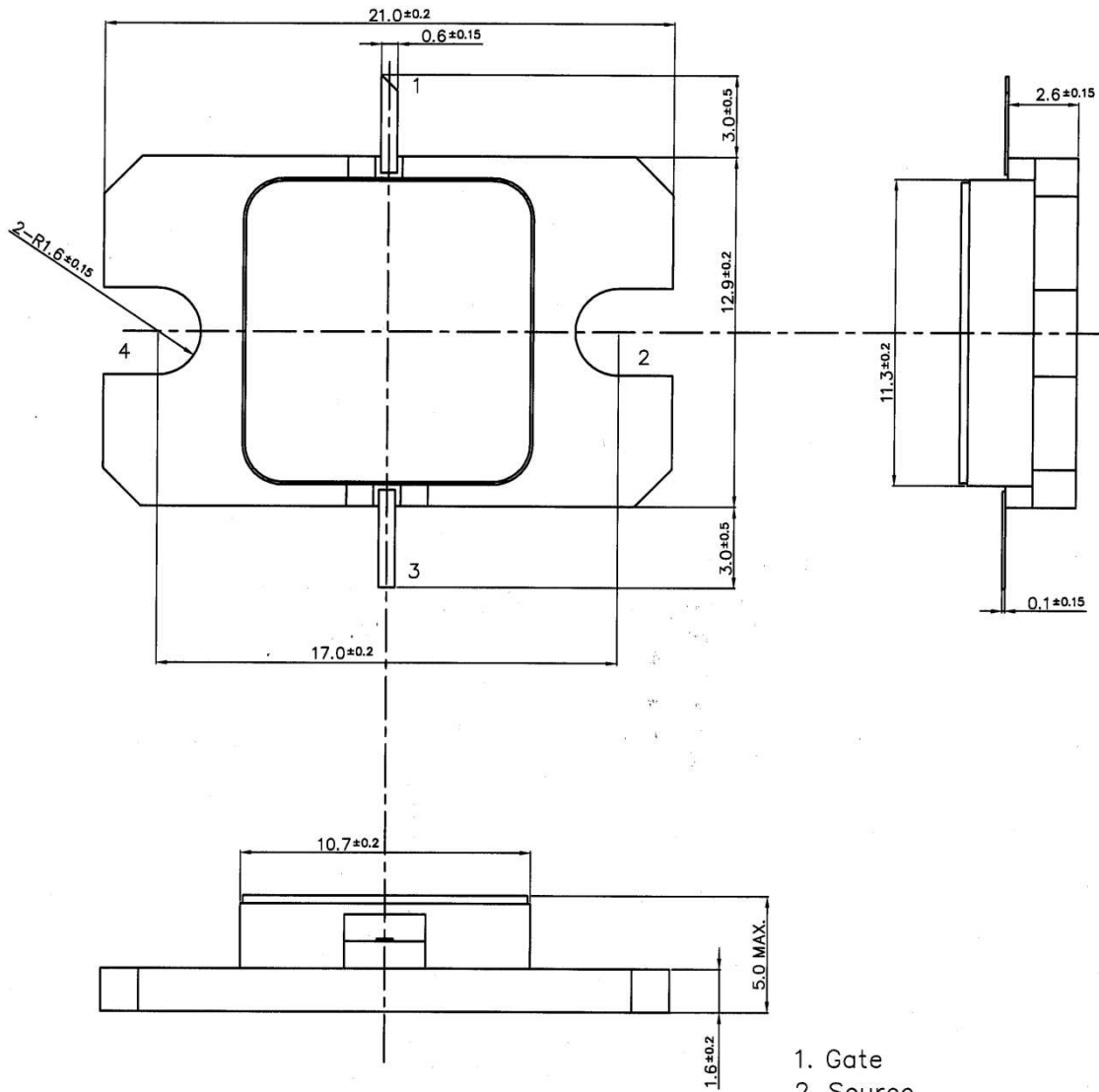
$h=0.542\text{mm}$   $\epsilon_r=3.38$

$Cu=18\mu\text{m}$  Unit: mm

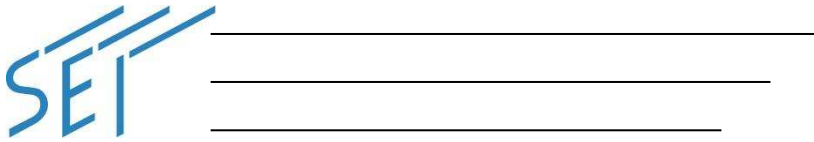
C1, C5 : ATC 60DF(0805) ,  $\pm 0.05\text{pF}$

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

● **Package Out Line**  
**Case Style: IBK**



- 1. Gate
  - 2. Source
  - 3. Drain
  - 4. Source
- Unit: mm  
Tolerance :  $\pm 0.15$



**SGK0910-30A-R**  
*X-Band Internally Matched GaN-HEMT*

**For further information please contact:**

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