SGK0910-120A-R

X-Band Internally Matched GaN-HEMT

FEATURES

- High Output Power: P5dB=51.0dBm (Typ.)
- High Gain: GL=11.5dB (Typ.)
- High PAE: ηadd=35% (Typ.)
- Broad Band: 9.2 to 10.0GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed Package

DESCRIPTION

The SGK0910-120A-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_{DS}	26	**V**
Gate-Source Voltage	V_{GS}	-10	**V**
Total Power Dissipation	P_T	265	**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
DC Input Voltage	V_{DS}		<=24	**V**
Forward Gate Current	I_{GF}	Rg=25ohm	<=24	**mA**
Reverse Gate Current	I_{GR}	Rg=25ohm	>=-12	**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	**Idss**	Vds=10v, Vgs=0v	-	26	-	**A**
Trans Conductance	**gm**	Vds=24V, Ids=5.3A	-	12	-	**S**
Pinch-off Voltage	V_P	Vds=24V, Ids=5.3mA	-	-3	-	**V**
Output Power at 5dB G.C.P.	P_{5dB}	V_{DS}=24V(Typ.) I_{DSDC}=5.3A(Typ.) Pulse Width=100usec. Duty=10% f=9.2 to 10.0 GHz	50.0	51.0	-	**dBm**
Linear Gain at Pin=29.5dBm	**GL**		10.0	11.5	-	**dB**
Drain Current at 5dB G.C.P.	I_{dsr}		-	11.6	15.1	**A**
Power Added Efficiency at 3dB G.C.P.	η_{add}		-	35	-	**%**
Gain Flatness	**ΔG**		-	1.0	-	**dB**
R_{th}	R_{th}	Channel to Case	-	0.65	0.85	**deg.C/W**

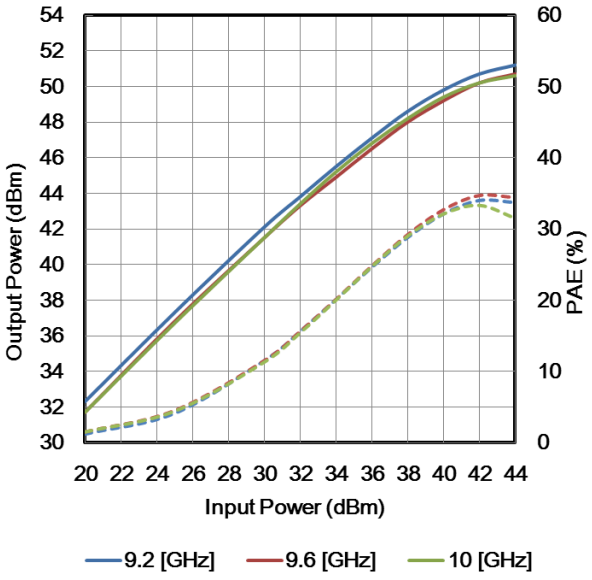
G.C.P. : Gain Compression Point

CASE STYLE	**I2F**	
RoHS Compliance	**YES**	
ESD	**Class 1C**	**1000V to 2000V**

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

● RF Characteristics

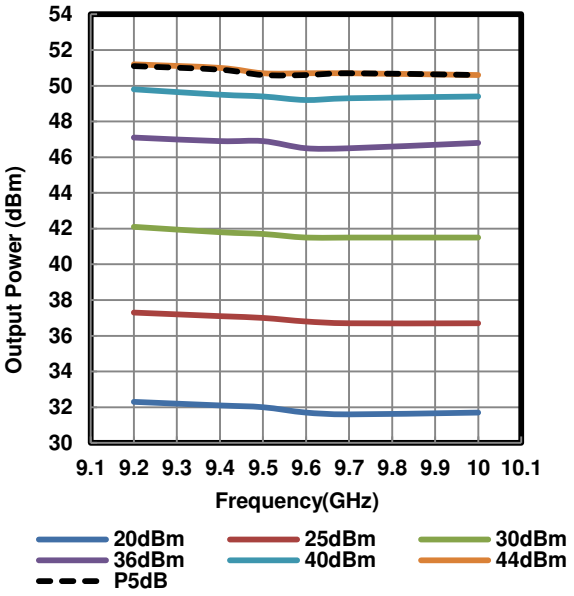
Output Power &
Power Added Efficiency vs. Input Power
V_{DS}=24V, $I_{DS(DC)}$=5.3A
PW=100usec, Duty 10%



Output Power vs. Frequency

V_{DS}=24V, $I_{DS(DC)}$=5.3A

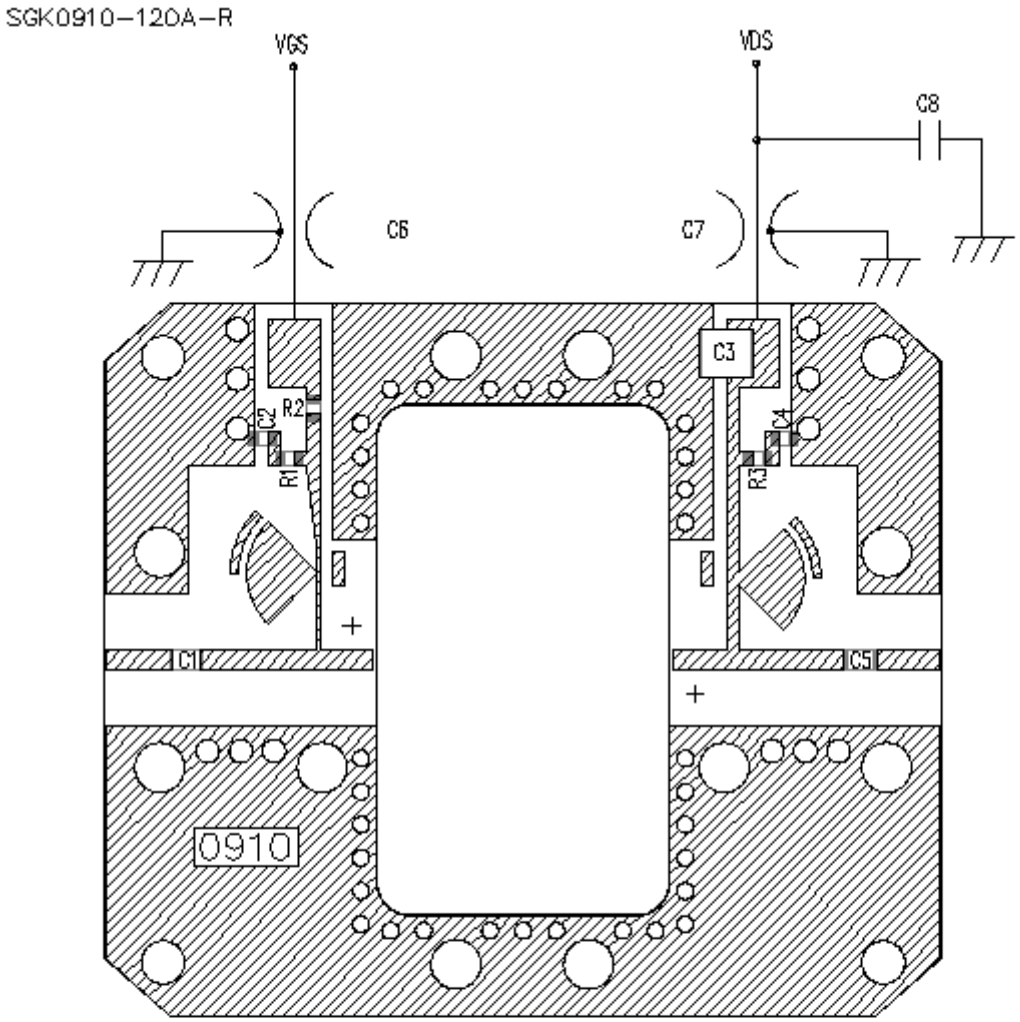
PW=100usec, Duty 10%



- **S-parameter**

Freq.	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
9.0GHz	0.080	-145.8	3.999	-9.1	0.107	-68.1	0.141	131.3
9.1GHz	0.042	89.6	3.942	-26.8	0.106	-85.2	0.196	97.3
9.2GHz	0.107	47.1	3.846	-43.1	0.103	-101.2	0.235	77.8
9.3GHz	0.147	29.0	3.713	-58.9	0.100	-115.9	0.253	64.7
9.4GHz	0.175	15.2	3.617	-74.0	0.099	-130.6	0.250	53.8
9.5GHz	0.186	-0.9	3.560	-88.9	0.097	-145.2	0.234	43.2
9.6GHz	0.200	-19.0	3.498	-104.3	0.096	-160.2	0.213	31.7
9.7GHz	0.221	-41.7	3.425	-120.6	0.094	-176.4	0.184	14.0
9.8GHz	0.257	-66.0	3.335	-136.8	0.091	167.4	0.157	-12.6
9.9GHz	0.319	-90.1	3.183	-153.4	0.086	150.2	0.153	-50.0
10.0GHz	0.399	-111.5	2.998	-170.1	0.080	133.6	0.186	-85.3
10.1GHz	0.483	-129.7	2.758	174.7	0.073	116.8	0.243	-109.1
10.2GHz	0.568	-145.2	2.555	158.7	0.066	101.4	0.314	-124.1

- **Amplifier Circuit Outline**



C1	1.5pF
C2	1000pF
C3	4.7uF
C4	1000pF
C5	1.5pF
C6	1000pF
C7	1000pF
C8	1000uF
R1	51Ω
R2	25Ω
R3	51Ω

Rogers RO4003C

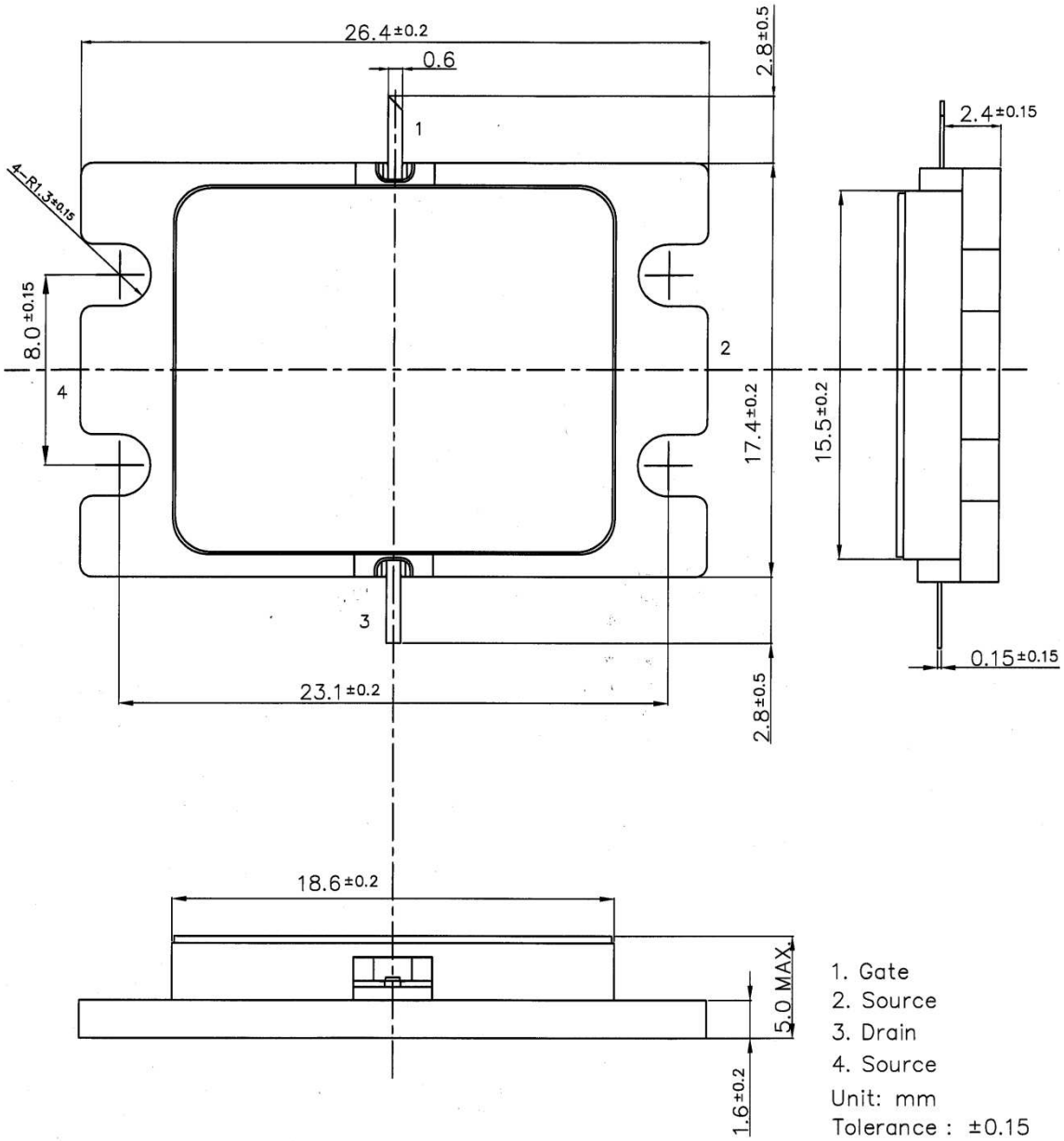
h=0.542mm εr=3.38

Cu=18um Unit: mm

C1 , C5 : ATC 600F(0805) , +/− 0.05pF
C6 , C7 : EMI FILTER MARUWA (FTA352AR102S-S)

Package Out Line

Case Style: I2F



For further information please contact:

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