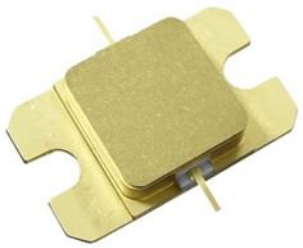
■ Features

- High Output Power: P_{5dB}=48.0dBm (Typ.)
- High Gain: GL=12.0dB (Typ.)
- High Power Added Efficiency: PAE=39% (Typ.)
- Broad Band: 6.4 to 7.2GHz
- Hermetically Sealed Package



■ Description

The SGK6472-60A 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 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	112	W
Storage Temperature	T_{stg}	-55 to +125	deg.C
Channel Temperature	T_{ch}	+250	deg.C
Case Temperature	T_c	-40 to +125	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V_{DS}		<=24	V
Forward Gate Current	I_{GF}	Rg=51ohm	<=12.2	mA
Reverse Gate Current	I_{GR}	Rg=51ohm	>=-6.4	mA
Channel Temperature	T_{ch}		<+192	deg.C

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

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	V_{DS}=10V, V_{GS}=0V	-	13	-	A
Trans Conductance	G_m	V_{DS}=24V, I_{DS}=2.6A	-	6.0	-	S
Pinch-off Voltage	V_P	V_{DS}=24V, I_{DS}=2.6mA	-	-3	-	V
Output Power at 5dB G.C.P.	P_{5dB}	VDS=24V(typ.) IDS(DC)=2.6A(typ.) f=6.4 to 7.2 GHz Vgs-constant	47.0	48.0	-	dBm
Linear Gain at Pin=26dBm	GL		11.0	12.0	-	dB
Drain Current at 5dB G.C.P.	I_{DSR}		-	5.4	7.0	A
Power Added Efficiency at 3dB G.C.P.	PAE		-	39	-	%
Gain Flatness	ΔG		-	-	1.6	dB
3rd Order Inter modulation Distortion	IM_3	f=6.4GHz, 7.2GHz Δf=10MHz, 2-tone Test Pout=32.0dBm (S.C.L.)	-40.0	-	-	dBc
Thermal Resistance	R_{th}	Channel to Case (T_c=25deg.C, P_{diss}=62.4W)	-	1.3	1.5	deg.C/W
Channel Temperature Rise	ΔT_{ch}	(V_{DS} x I_{DSR} – Pout + Pin) x R_{th}	-	100	150	deg.C

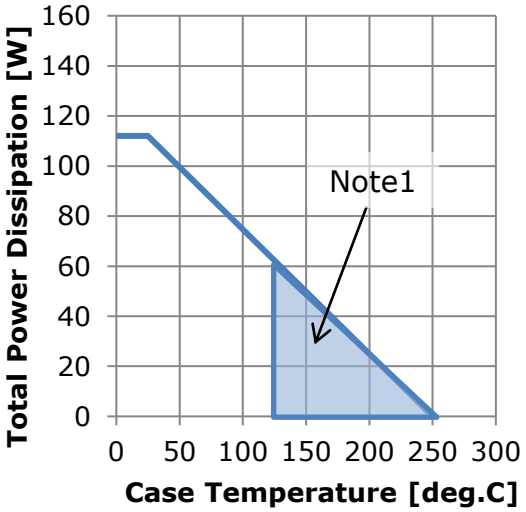
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

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

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

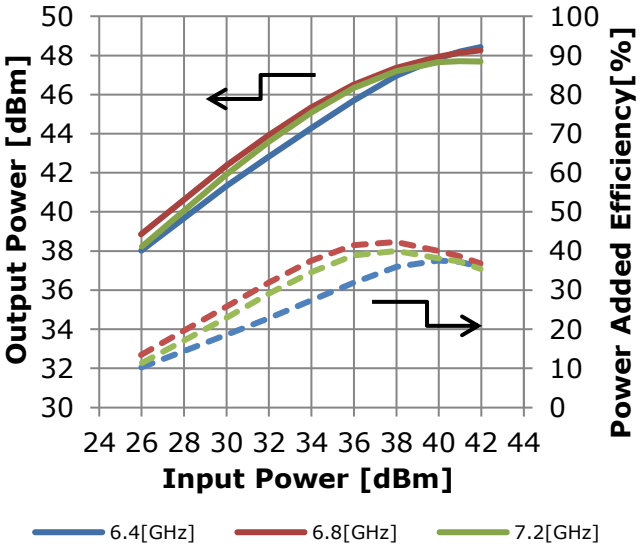
● RF Characteristics

Power Derating Curve

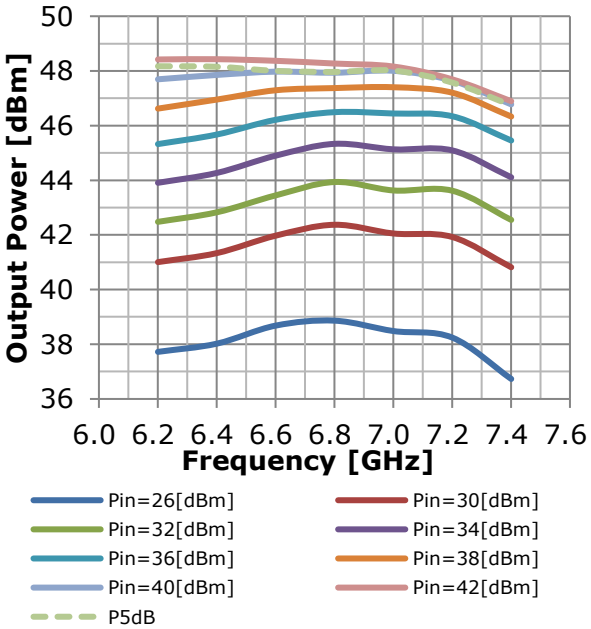


Note 1: Shaded area exceeds Maximum Case Temperature (See Page1)

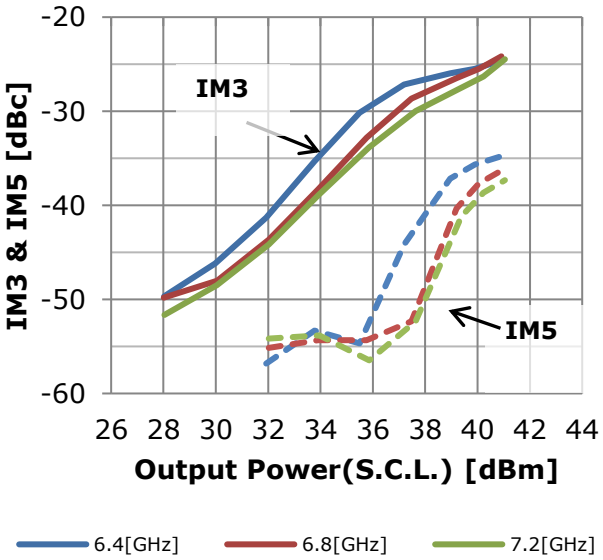
Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, $I_{DS(DC)}$=2600mA



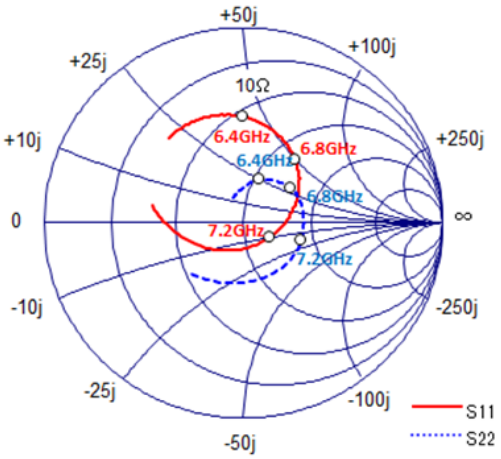
Output Power vs. Frequency
V_{DS}=24V, $I_{DS(DC)}$=2600mA

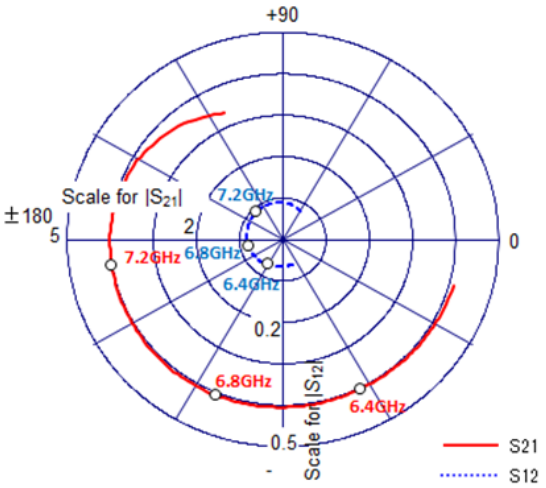


IMD vs. Output Power
V_{DS}=24V, $I_{DS(DC)}$=2600mA



● S-Parameter



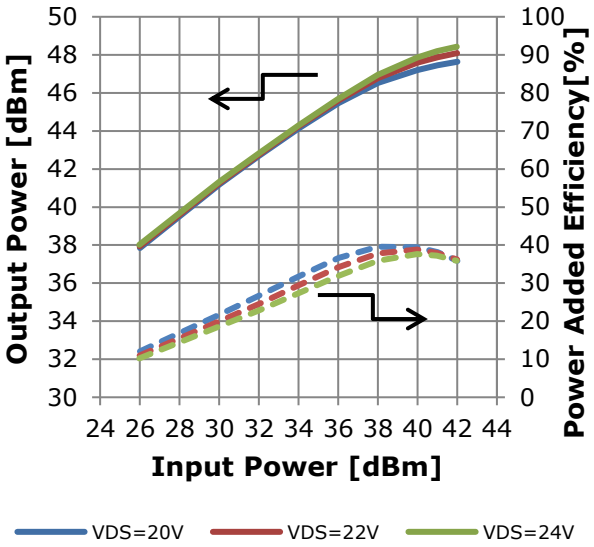


Bias Condition V_{DS}=24V, I_{DS}=2.6A
Rg = 51ohm

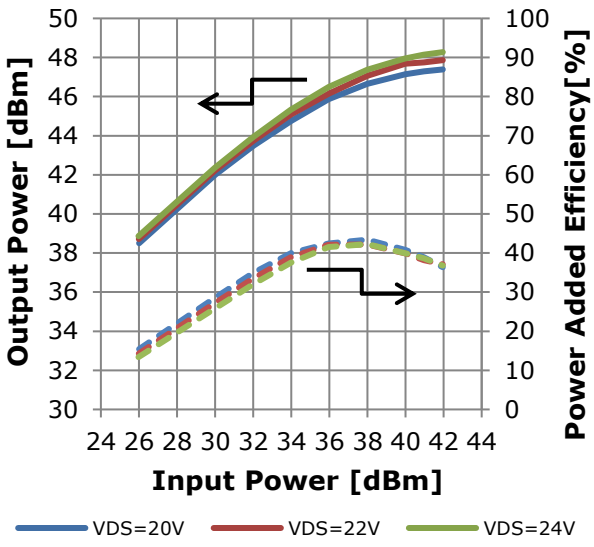
Freq.	S11		S21		S12		S22	
	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.	Mag.	Ang.
6200MHz	0.573	109.4	4.045	-40.2	0.066	-95.9	0.195	84.9
6300MHz	0.561	99.6	4.028	-51.9	0.068	-108.2	0.219	77.4
6400MHz	0.544	90.2	4.024	-63.6	0.071	-120.7	0.239	70.0
6500MHz	0.520	80.9	4.032	-75.4	0.073	-132.8	0.252	62.6
6600MHz	0.493	71.7	4.045	-87.1	0.075	-145.1	0.268	54.0
6700MHz	0.459	62.0	4.058	-99.4	0.078	-157.4	0.284	44.9
6800MHz	0.416	51.2	4.066	-112.2	0.081	-169.9	0.298	36.5
6900MHz	0.362	39.1	4.063	-125.6	0.084	177.2	0.306	27.4
7000MHz	0.297	25.2	4.050	-139.6	0.086	163.2	0.305	15.0
7100MHz	0.224	5.6	4.030	-154.8	0.089	149.0	0.303	0.7
7200MHz	0.151	-27.7	4.018	-171.1	0.091	133.4	0.304	-17.3
7300MHz	0.132	-90.0	3.999	171.3	0.092	116.8	0.300	-39.4
7400MHz	0.212	-141.8	3.893	152.8	0.091	98.8	0.296	-67.3

● RF Characteristics - V_{DS} dependence

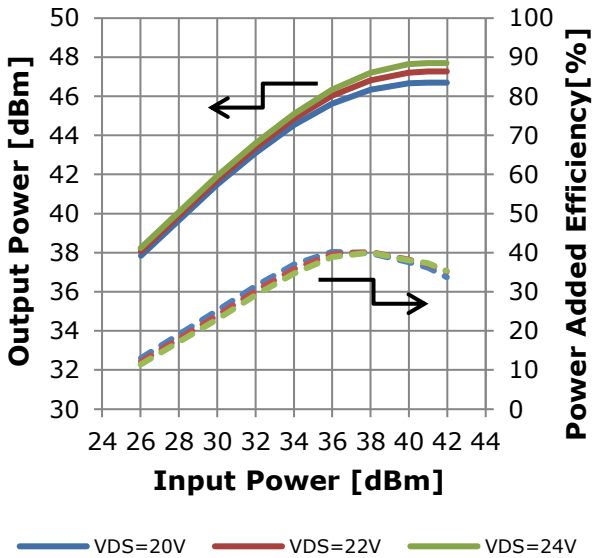
Input Power vs. Output Power and Power Added Efficiency
$I_{DS(DC)}$=2600mA, freq.=6.4GHz



Input Power vs. Output Power and Power Added Efficiency
$I_{DS(DC)}$=2600mA, freq.=6.8GHz

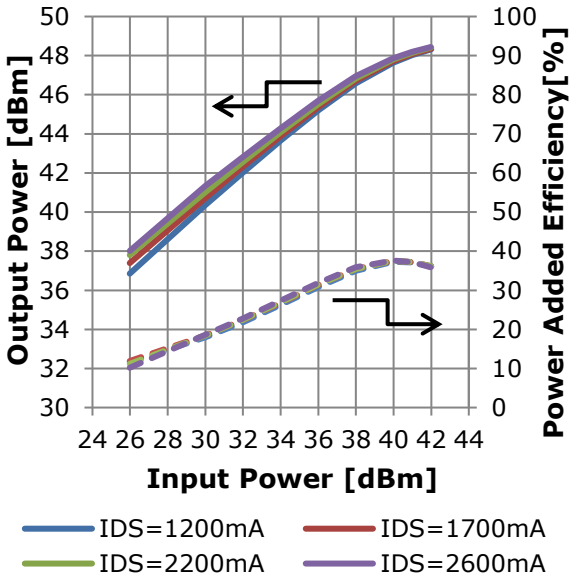


Input Power vs. Output Power and Power Added Efficiency
$I_{DS(DC)}$=2600mA, freq.=7.2GHz

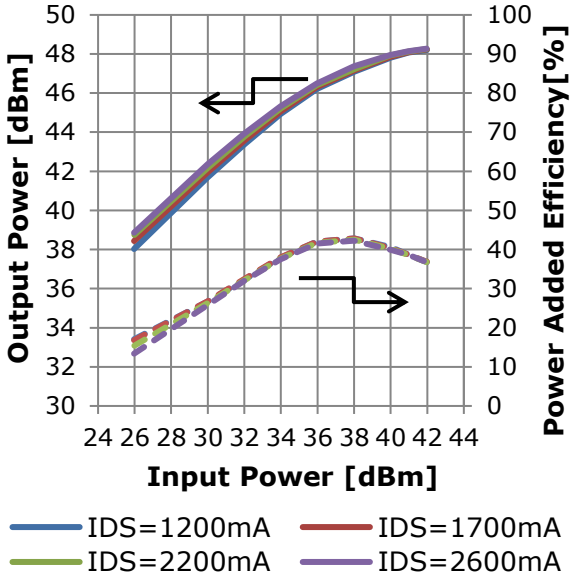


- **RF Characteristics - $I_{DS(DC)}$ dependence**

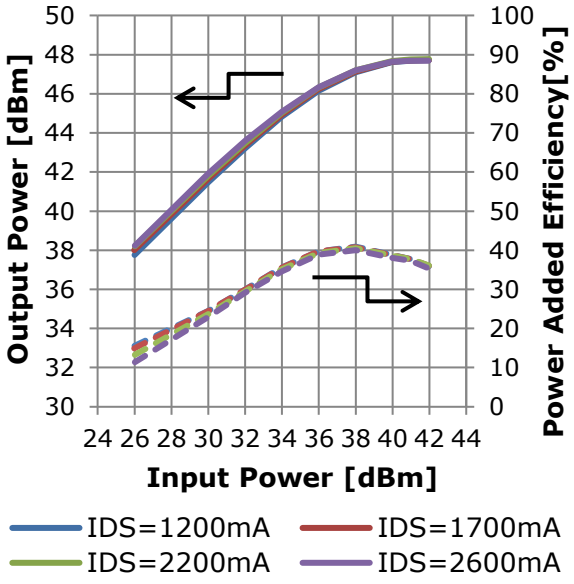
Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, freq.=6.4GHz



Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, freq.=6.8GHz

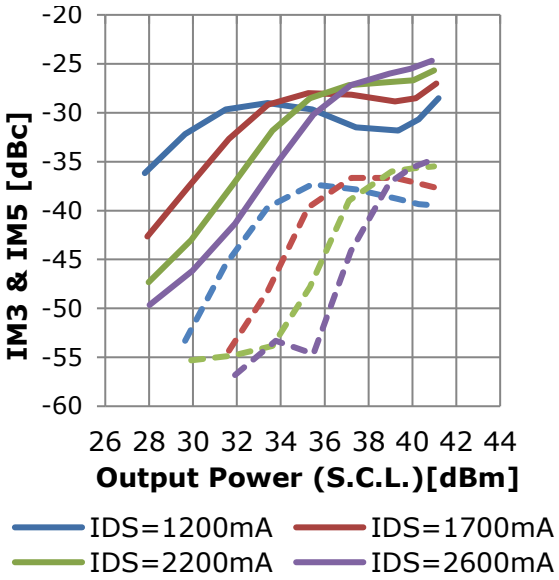


Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, freq.=7.2GHz

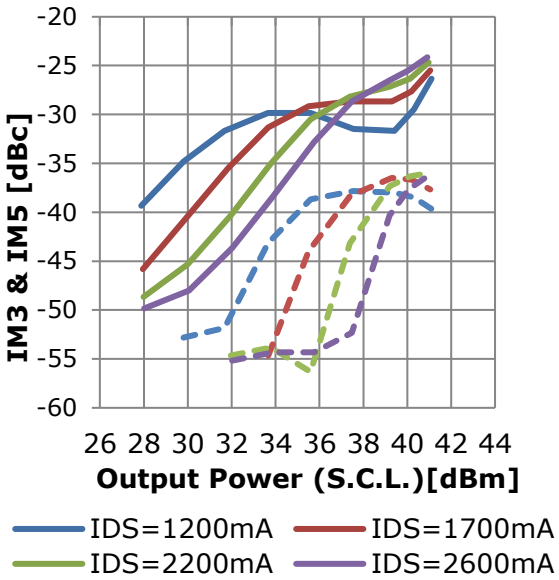


- **RF Characteristics—$I_{DS(DC)}$ dependence**

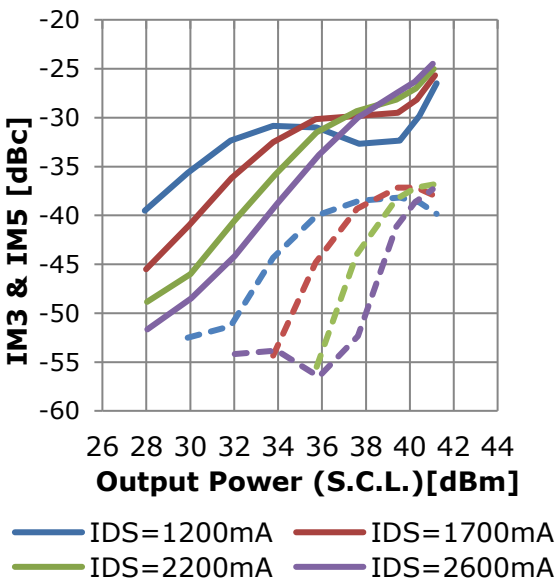
IMD vs. Output Power
V_{DS}=24V, freq.=6.4GHz



IMD vs. Output Power
V_{DS}=24V, freq.=6.8GHz



IMD vs. Output Power
V_{DS}=24V, freq.=7.2GHz



- **MTTF vs. Tch**

Fig.1 MTTF vs. Tch

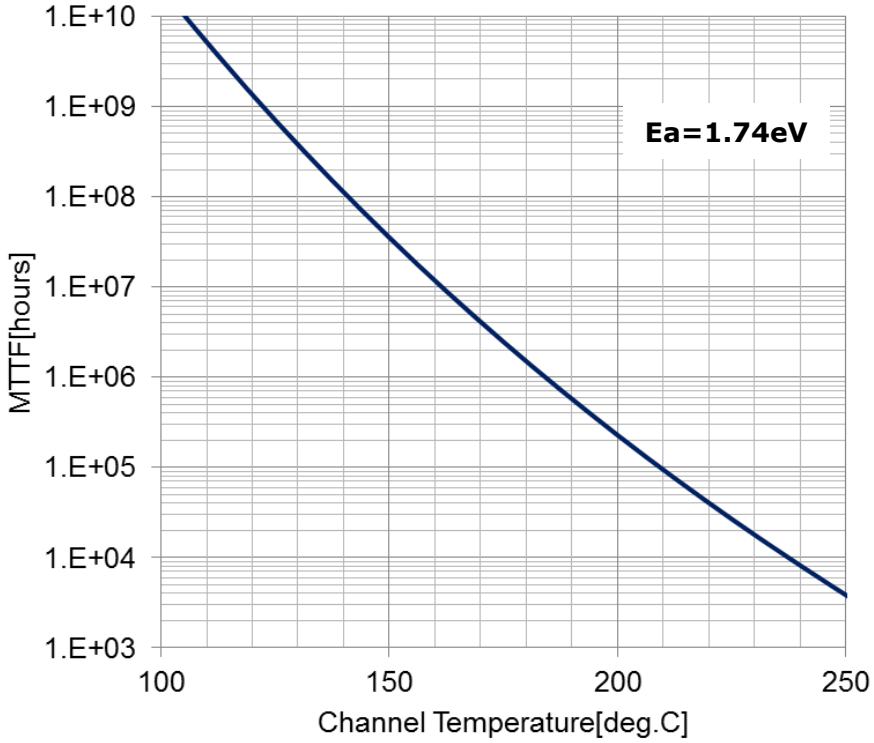
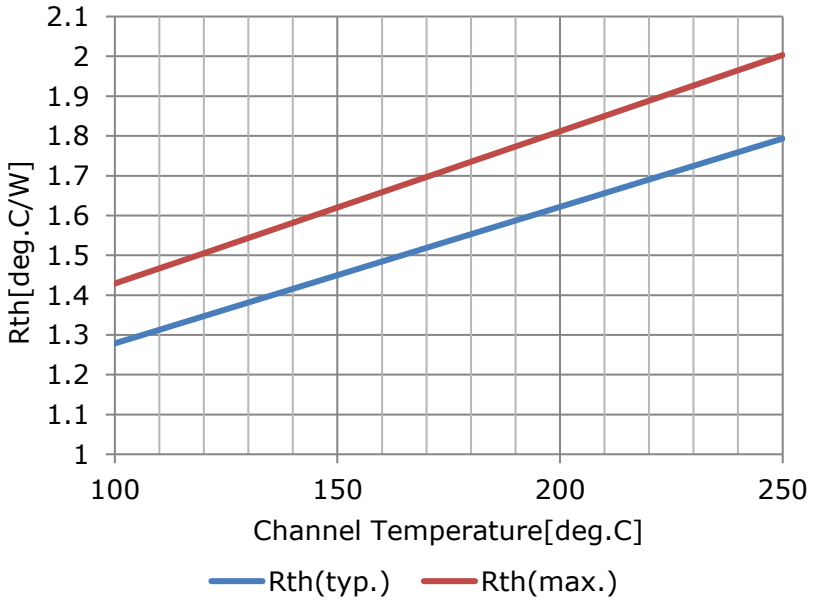
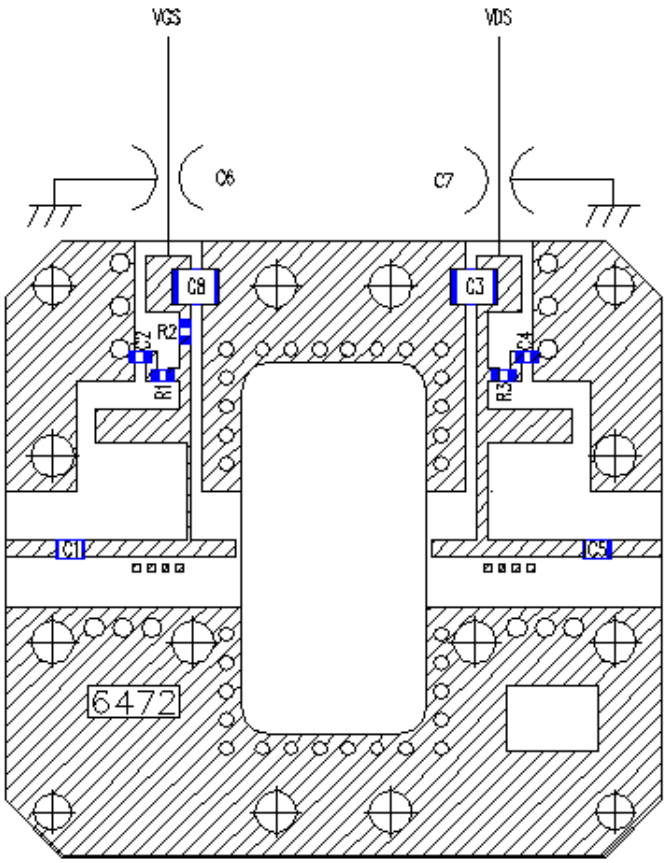


Fig.2 Rth vs. Tch



- **Amplifier Circuit Outline**

SGK6472-60A



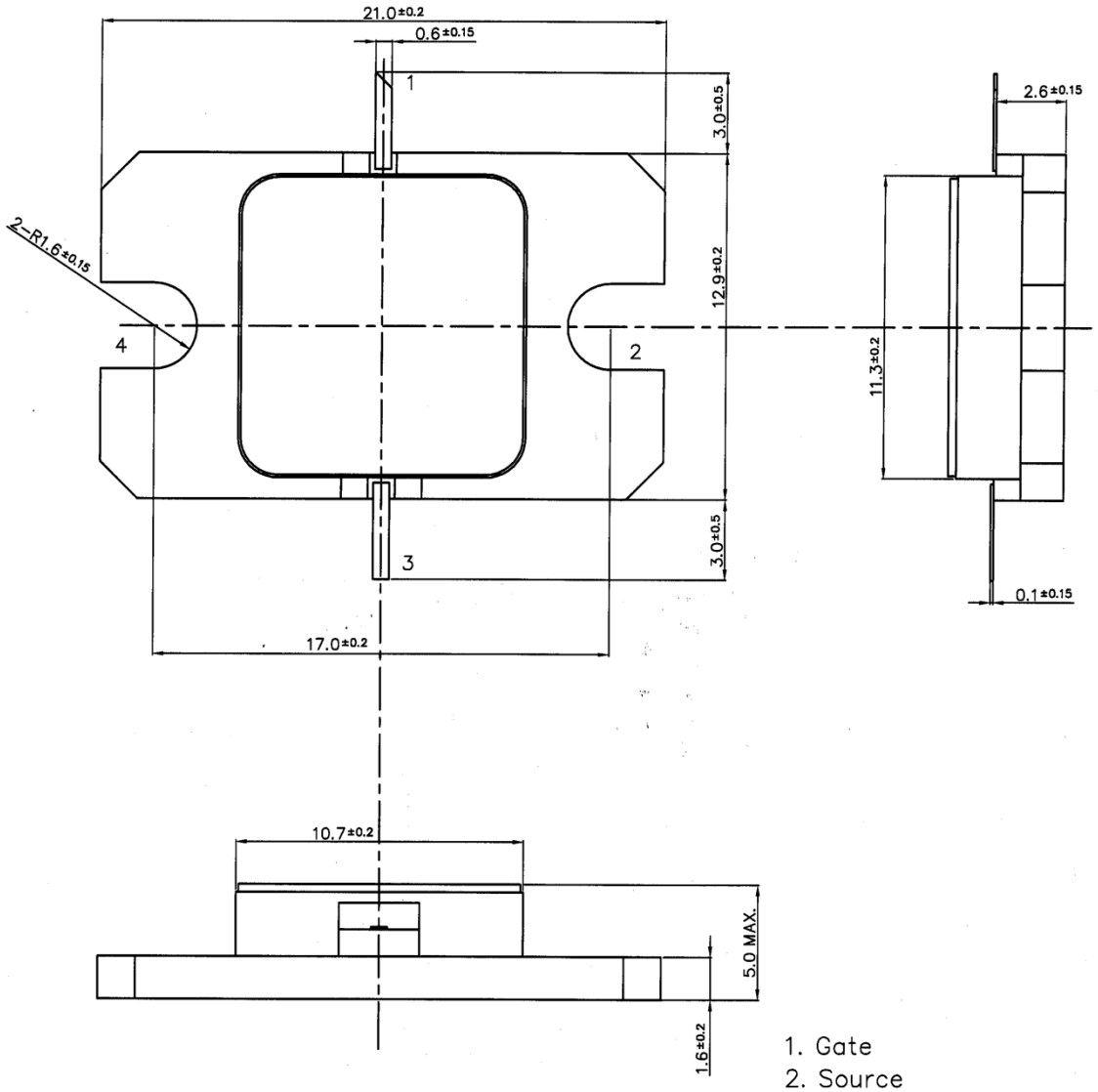
C1	3.0pF
C2	1000pF
C3	0.1uF
C4	1000pF
C5	3.0pF
C6	1000pF
C7	1000pF
C8	0.1uF
R1	51ohm
R2	51ohm
R3	51ohm

Substrate : Rogers RO4003C
h=0.542mm, εr=3.38
Cu=18um

C1, C5 : ATC600L(size:0805), +/- 0.1pF
C6, C7 : EMI FILTER MARUWA(FTA352AR102S-S)

Package Outline

Case Style : IBK



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