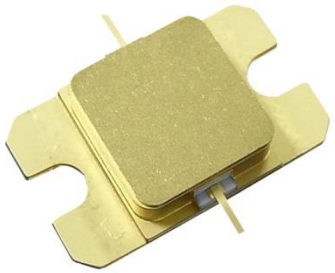
■ Features

- High Output Power: P5dB=48.0dBm (Typ.)
- High Linear Gain: GL=12.5dB (Typ.)
- High Power Added Efficiency: PAE=40% (Typ.)
- Broad Band: 5.85 to 6.75GHz
- Hermetically Sealed Package



■ Description

The SGK5867-60A 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	-	13.0	-	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	-	-3.0	-	V
Output Power at 5dB G.C.P.	P_{5dB}	V_{DS}=24V(typ.) $I_{DS(DC)}$=2.6A(typ.) f=5.85 to 6.75 GHz Vgs-constant	47.0	48.0	-	dBm
Linear Gain at Pin=25.5dBm	GL		11.5	12.5	-	dB
Drain Current at 5dB G.C.P.	I_{DSR}		-	5.4	7.0	A
Power Added Efficiency at 3dB G.C.P.	PAE		-	40	-	%
Gain Flatness	ΔG		-	-	1.6	dB
3rd Order Inter Modulation Distortion	IM_3	f=5.85GHz, 6.75GHz 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, Pdiss=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

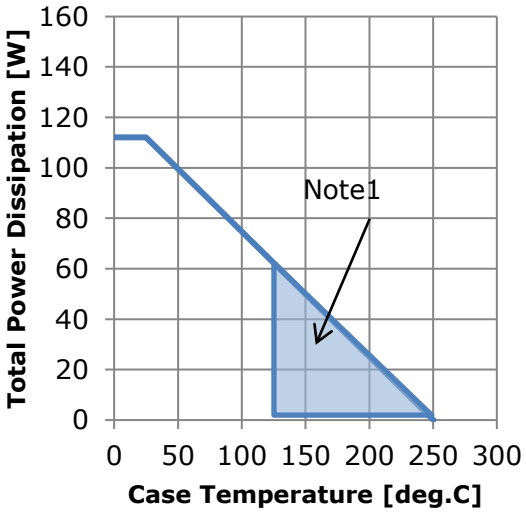
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

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)

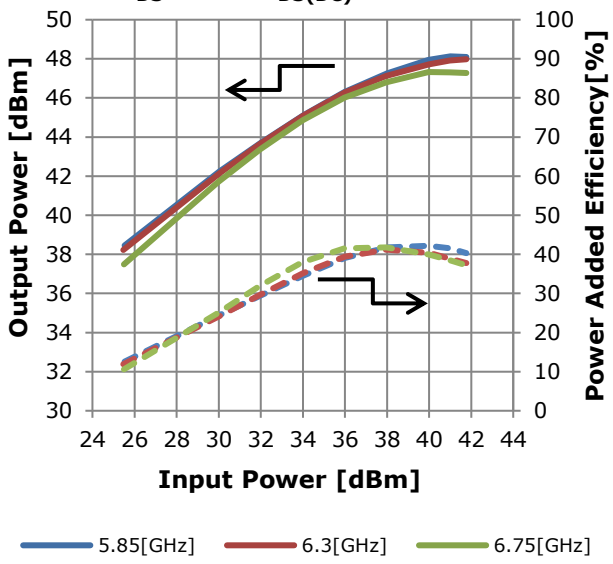
● RF Characteristics

Power Derating Curve

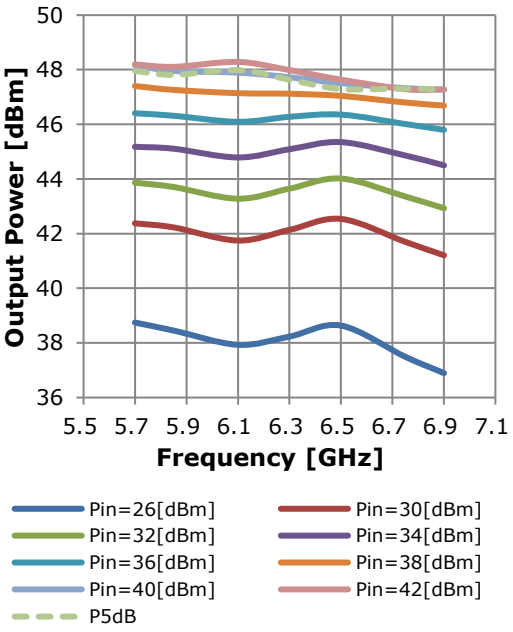


Note 1: Shaded area exceeds Maximum Case Operating Temperature (See Page1)

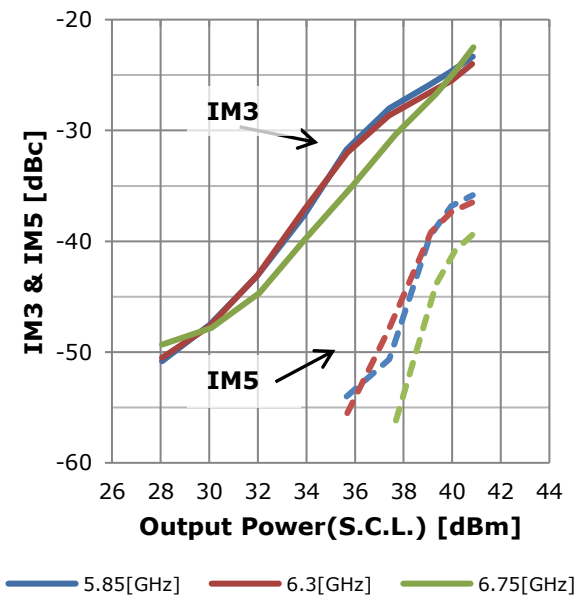
Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, $I_{DS(DC)}$=2600mA



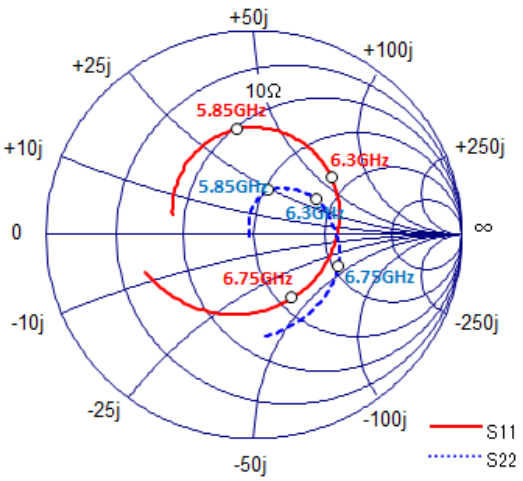
Output Power vs. Frequency
V_{DS}=24V, $I_{DS(DC)}$=2600mA

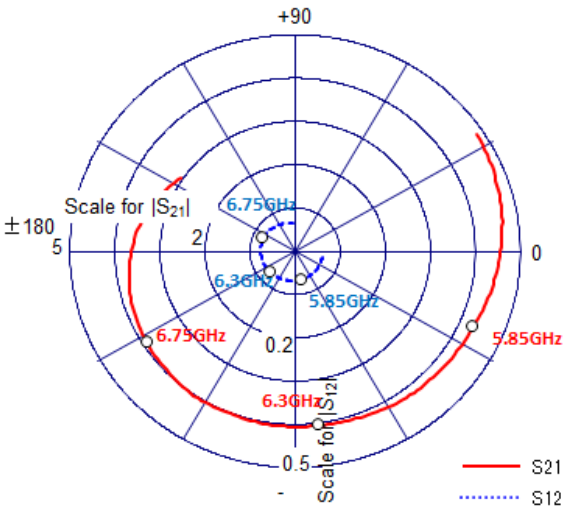


IMD vs. Output Power
V_{DS}=24V, $I_{DS(DC)}$ =2600mA



● S-Parameter



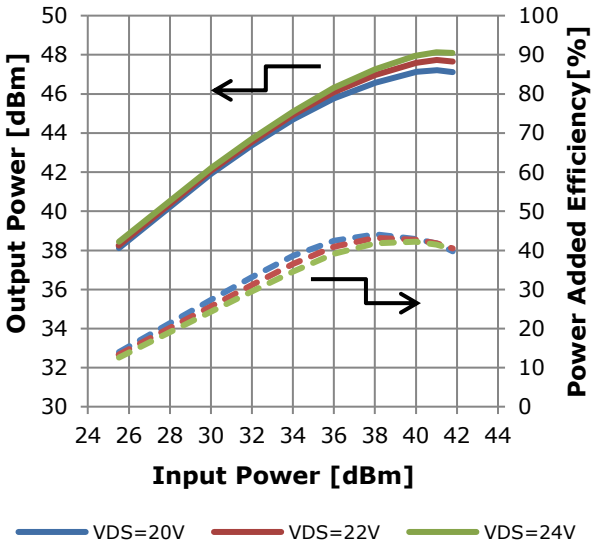


Bias Condition V_{DS}=24V, $I_{DS(DC)}$=2.6A
Rg = 51ohm

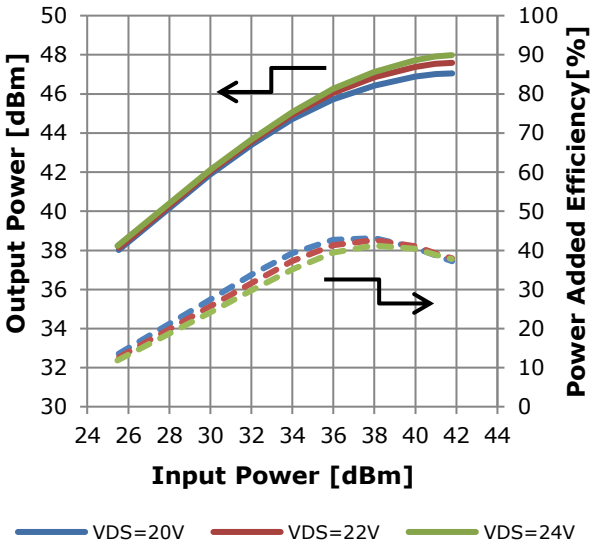
Freq.	S11		S21		S12		S22	
	mag	phase	mag	phase	mag	phase	mag	phase
5600MHz	0.467	136.5	4.684	11.2	0.063	-39.3	0.101	99.9
5700MHz	0.498	120.3	4.533	-3.1	0.065	-55.2	0.162	86.8
5850MHz	0.524	98.3	4.311	-23.7	0.066	-77.3	0.226	72.1
6000MHz	0.523	78.2	4.223	-43.3	0.068	-98.2	0.271	56.8
6100MHz	0.511	64.9	4.170	-56.2	0.070	-111.6	0.301	46.7
6200MHz	0.492	51.1	4.097	-69.4	0.071	-124.9	0.328	37.3
6300MHz	0.465	36.3	4.059	-82.5	0.073	-138.4	0.349	28.8
6400MHz	0.435	20.2	4.049	-96.0	0.074	-151.9	0.365	19.5
6500MHz	0.402	1.5	4.023	-109.7	0.076	-165.5	0.379	9.3
6600MHz	0.376	-19.9	4.022	-124.2	0.077	179.7	0.402	-2.0
6750MHz	0.363	-59.4	3.919	-147.2	0.077	157.3	0.436	-20.6
6900MHz	0.401	-102.1	3.724	-171.8	0.074	133.8	0.456	-42.5
7000MHz	0.454	-128.1	3.533	171.6	0.071	117.9	0.472	-59.3

- **RF Characteristics-V_{DS} dependence**

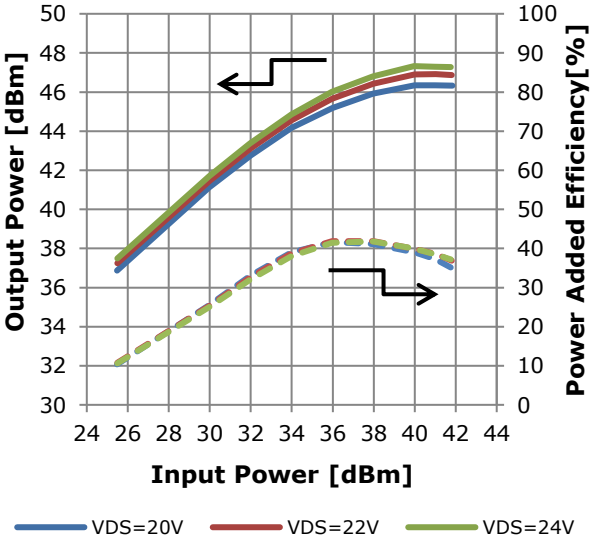
Input Power vs. Output Power and Power Added Efficiency
$I_{DS(DC)}$=2600mA, freq.=5.85GHz



Input Power vs. Output Power and Power Added Efficiency
$I_{DS(DC)}$=2600mA, freq.=6.3GHz

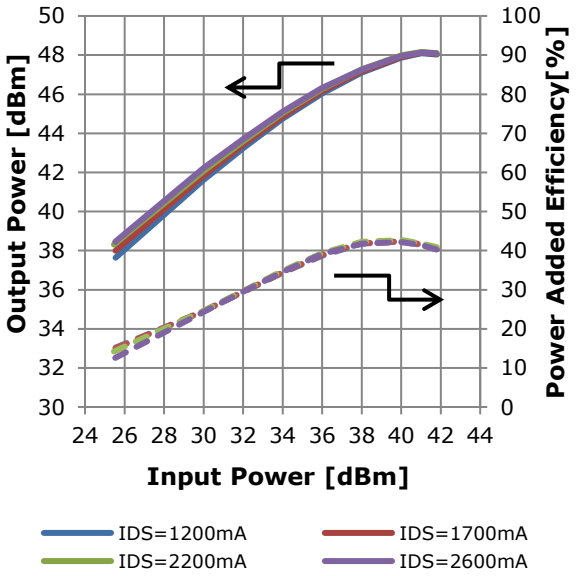


Input Power vs. Output Power and Power Added Efficiency
$I_{DS(DC)}$=2600mA, freq.=6.75GHz

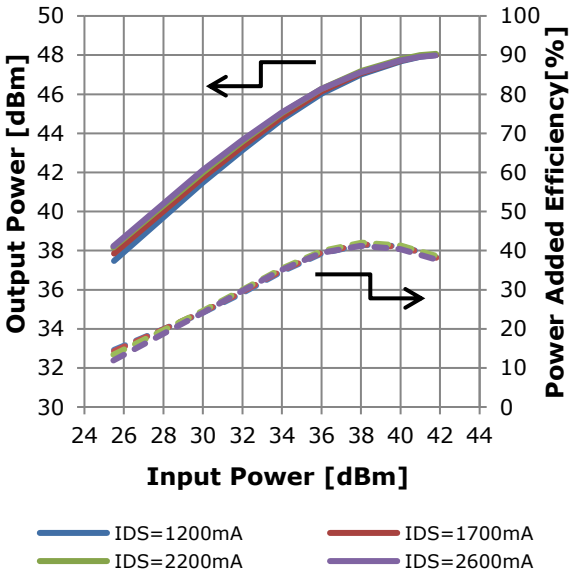


● RF Characteristics-$I_{DS(DC)}$ dependence

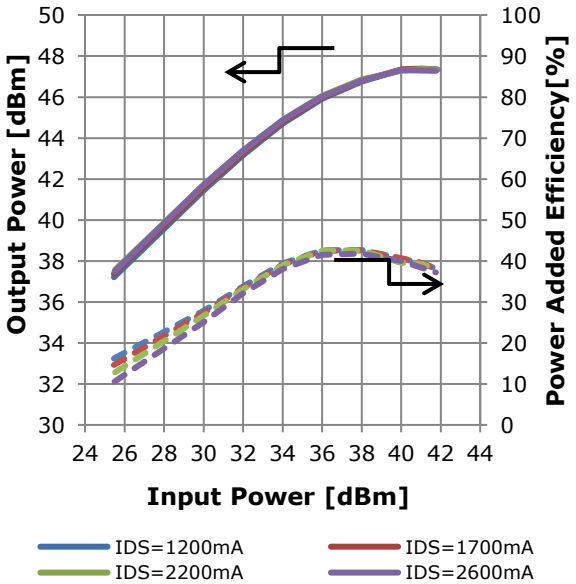
Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, freq.=5.85GHz



Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, freq.=6.3GHz

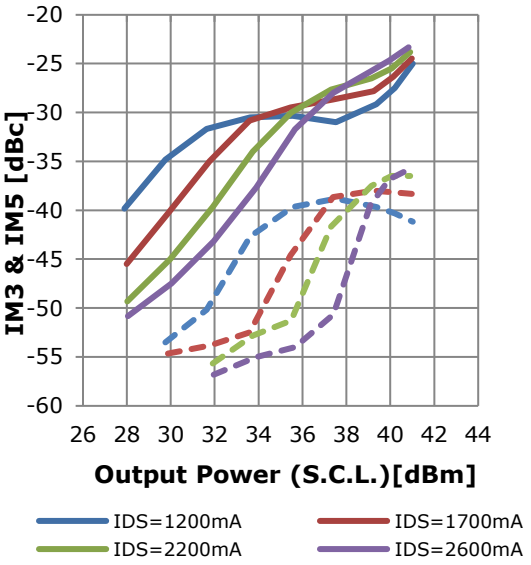


Input Power vs. Output Power and Power Added Efficiency
V_{DS}=24V, freq.=6.75GHz

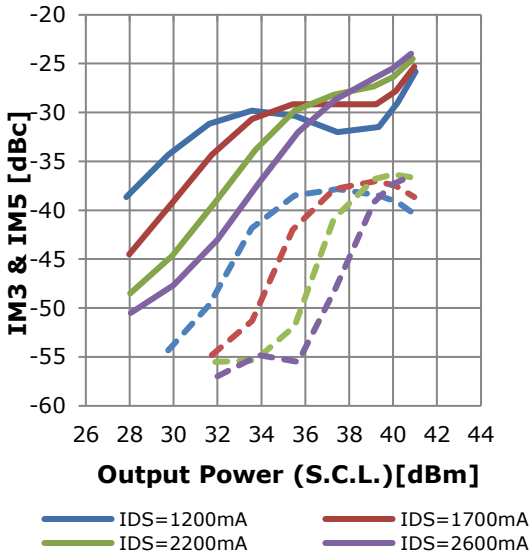


- **RF Characteristics-$I_{DS(DC)}$ dependence**

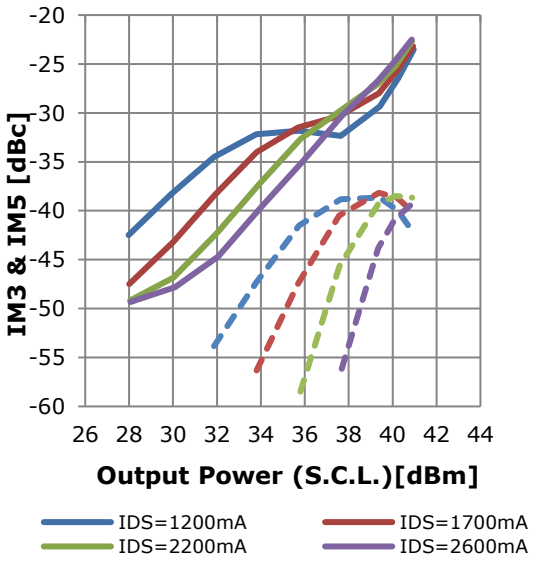
IMD vs. Output Power
V_{DS}=24V, freq.=5.85GHz



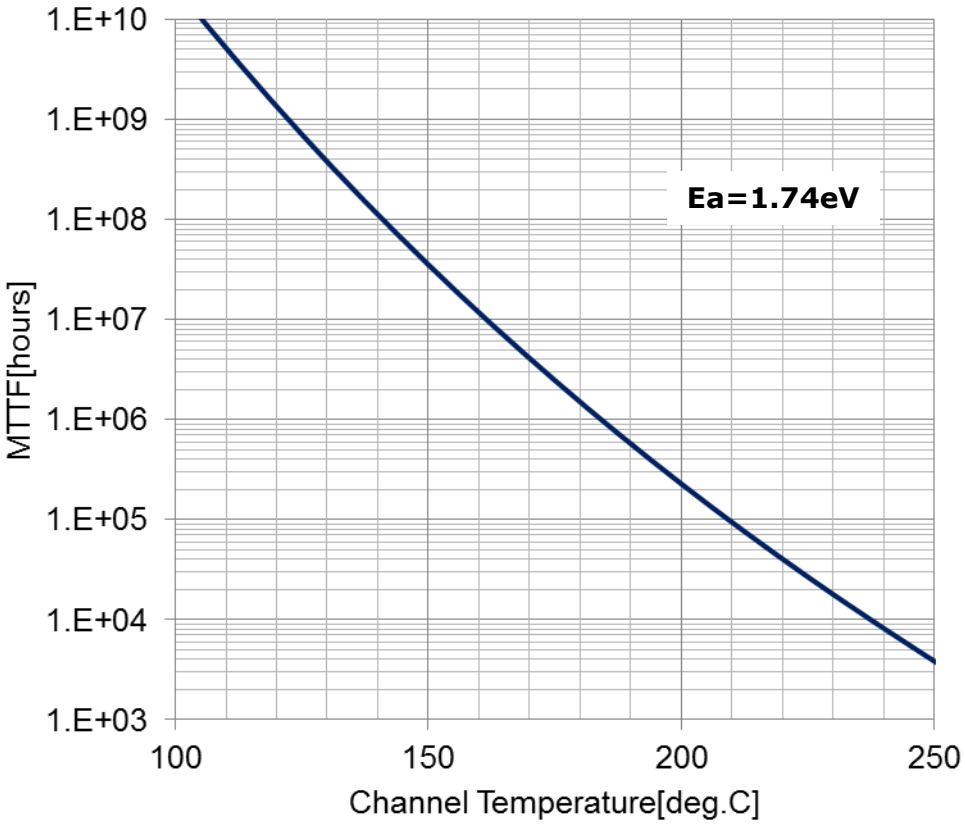
IMD vs. Output Power
V_{DS}=24V, freq.=6.3GHz



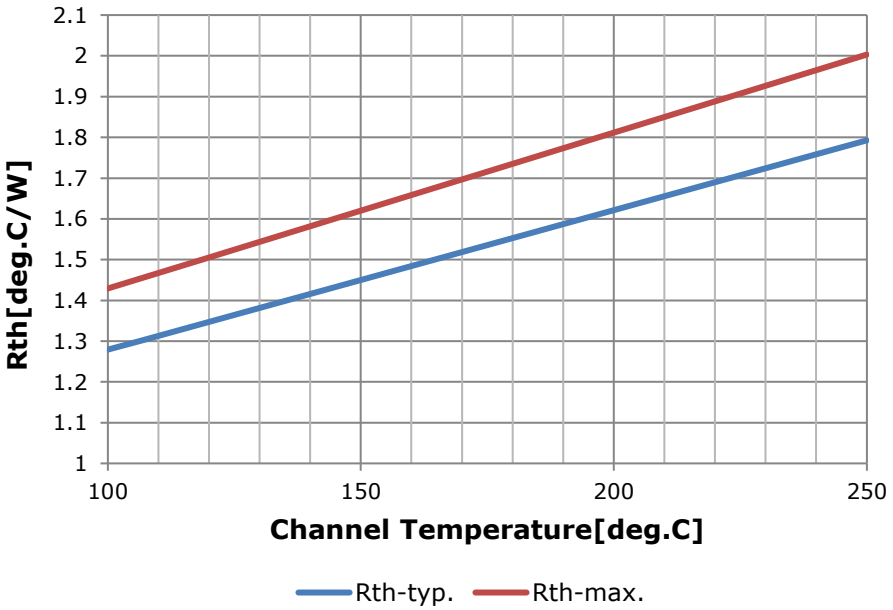
IMD vs. Output Power
V_{DS}=24V, freq.=6.75GHz



- **MTTF vs. Tch**

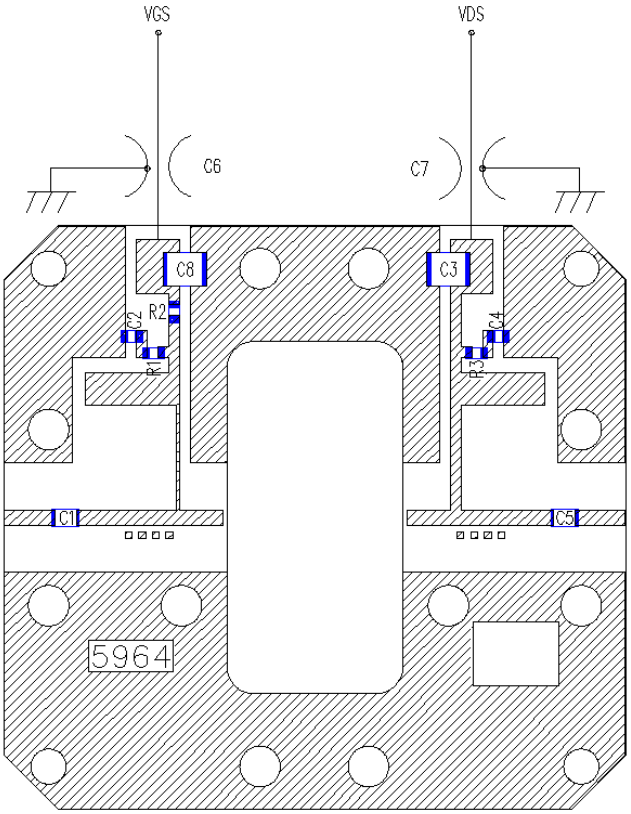


Rth vs. Tch



● Amplifier Circuit Outline

SGK5867-60A



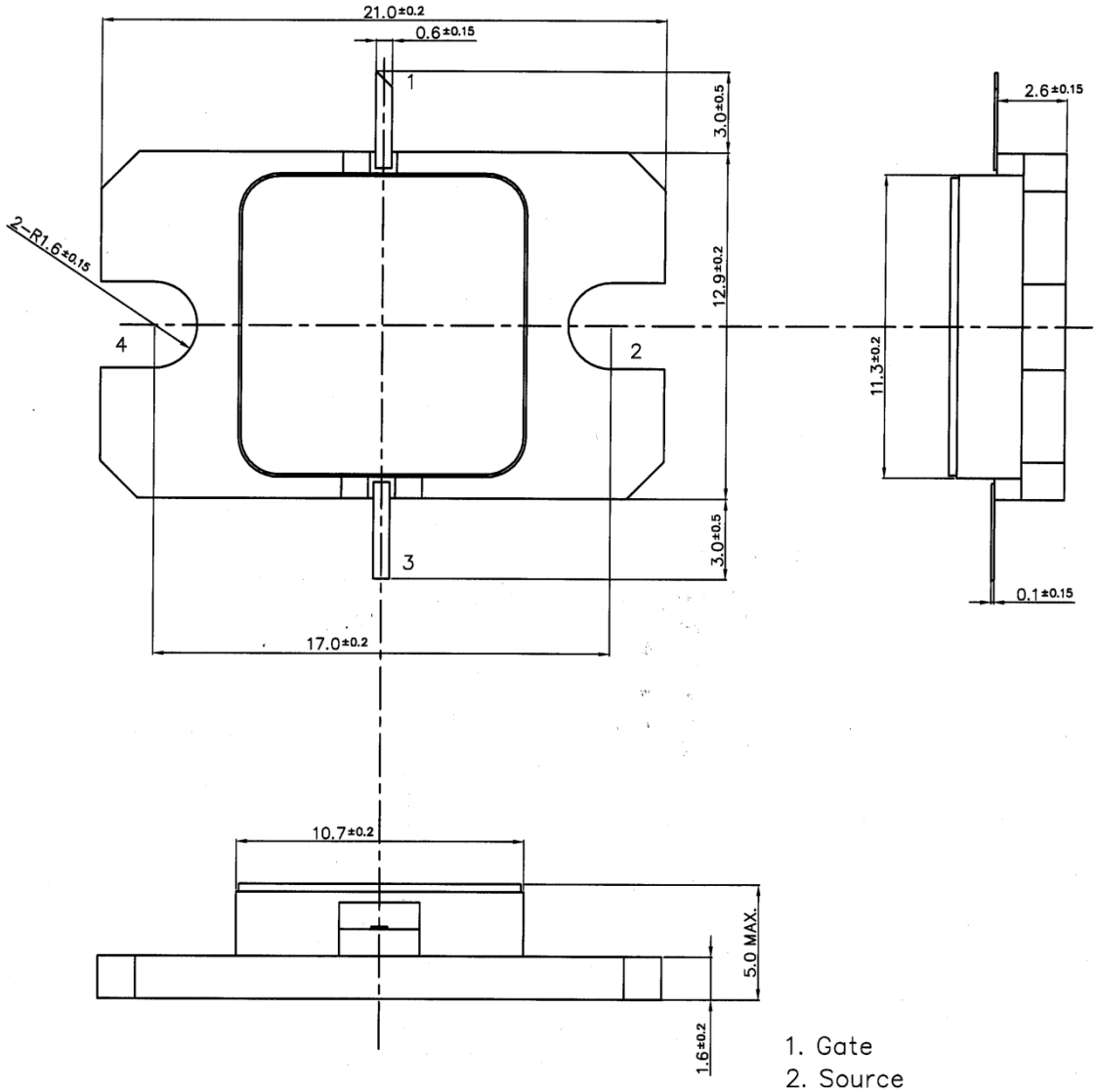
C1	3.0pF
C2	1000pF
C3	0.1uF
C4	1000pF
C5	3.0pF
C6	1000pF
C7	1000pF
C8	0.1uF
R1	51ohm
R2	51ohm
R3	51ohm

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

C1, C5 : ATC600F(size:0805), +/- 0.1pF
C6, C7 : EMI FILTER MARUWA(FTA352AR102S-S)

- **Amplifier Circuit Outline**

Case Style : IBK



1. Gate
2. Source
3. Drain
4. Source

Unit: mm
Tolerance : ±0.15

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- Do not put this product into the mouth.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Respect all applicable laws of the country when discarding this product.
  This product must be disposed in accordance with methods specified by applicable hazardous waste procedures.

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