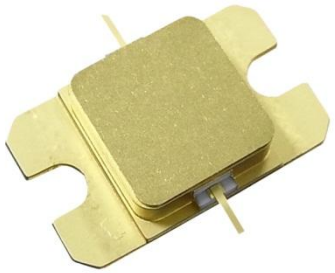
■ Features

- High Output Power: P5dB=48.0dBm (Typ.)
- High Linear Gain: GL=14.0dB (Typ.)
- High Power Added Efficiency: PAE=39% (Typ.)
- Broad Band: 5.85 to 6.75GHz
- Hermetically Sealed Package



■ Description

The SGK5867-60C 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	150	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	<=8.8	mA
Reverse Gate Current	I_{GR}	Rg=51ohm	>=-4.6	mA
Channel Temperature	T_{ch}		<+193	deg.C

Note:Electrical specifications are measured under specified test conditions. Not all recommended operating conditions can be guaranteed to meet specifications.

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	-	16.6	-	A
Trans Conductance	G_m	V_{DS}=24V, I_{DS}=1.92A	-	4.4	-	S
Pinch-off Voltage	V_P	V_{DS}=24V, I_{DS}=1.92mA	-2.5	-4.0	-5.5	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	14.0	-	dB
Drain Current at 5dB G.C.P.	I_{DSR}		-	6.4	7.0	A
Power Added Efficiency at 3dB G.C.P.	PAE		-	39.0	-	%
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	-42.0	-	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

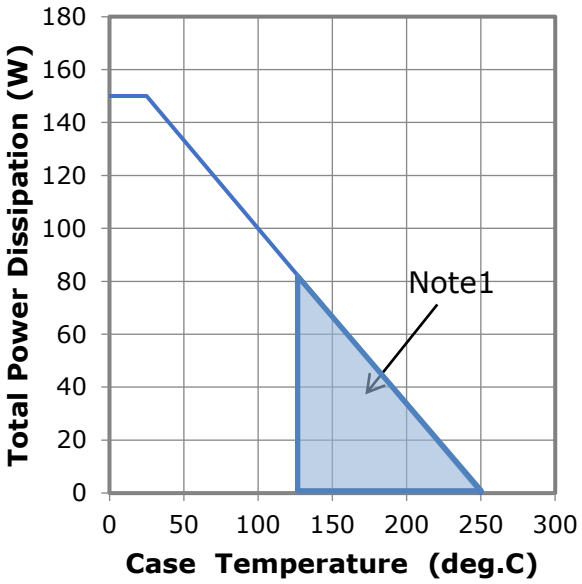
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

CASE STYLE	IBK	
RoHS Compliance	YES	
ESD [*1]	Class 2	2000V to < 4000V

Note : [*1] Based on ANSI/ESDA/JEDEC JS-001(C=100pF, R=1.5kohm)

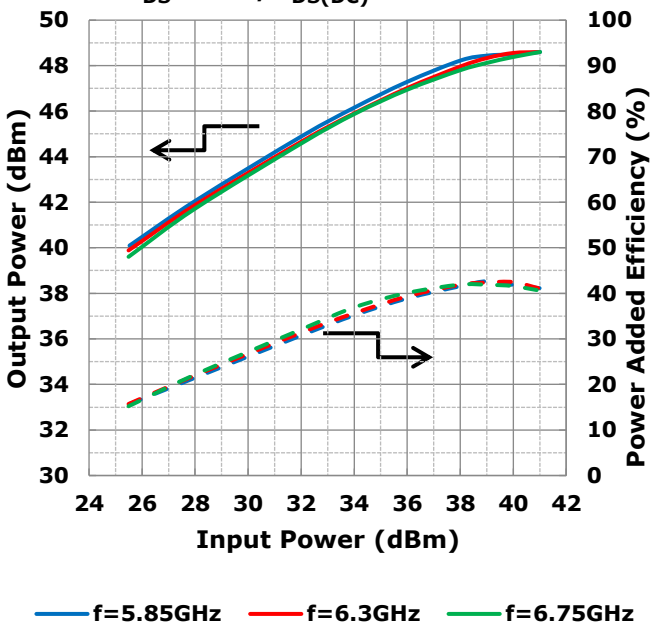
● RF Characteristics

Power Derating Curve

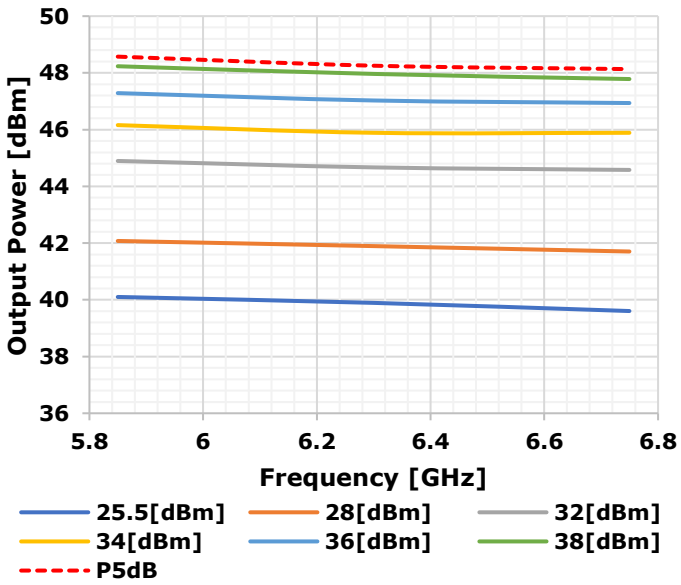


Note 1: Shaded area exceeds Maximum Case Operating Temperature (See Page1)

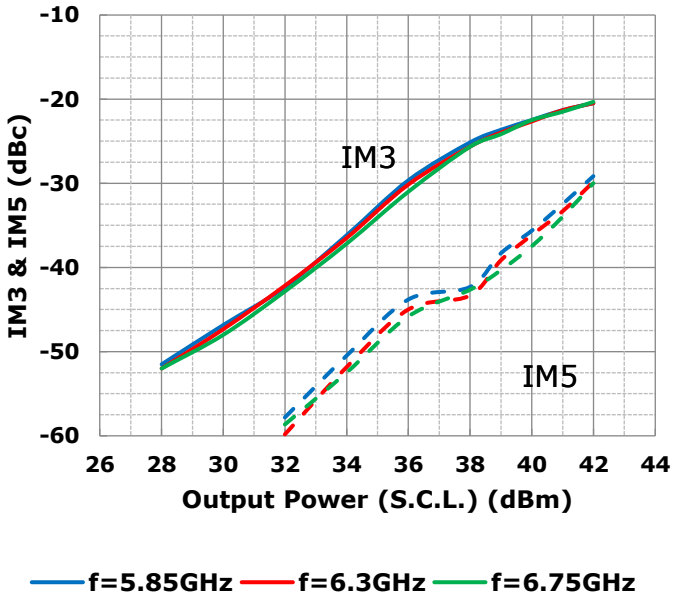
Output Power and Power Added Efficiency vs. Input Power
V_{DS}=24V, $I_{DS(DC)}$=2.6A



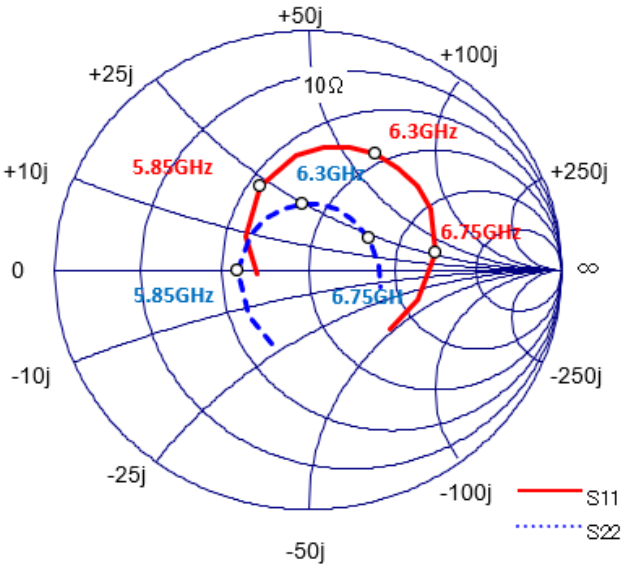
Output Power vs. Frequency
V_{DS}=24V, $I_{DS(DC)}$=2.6A

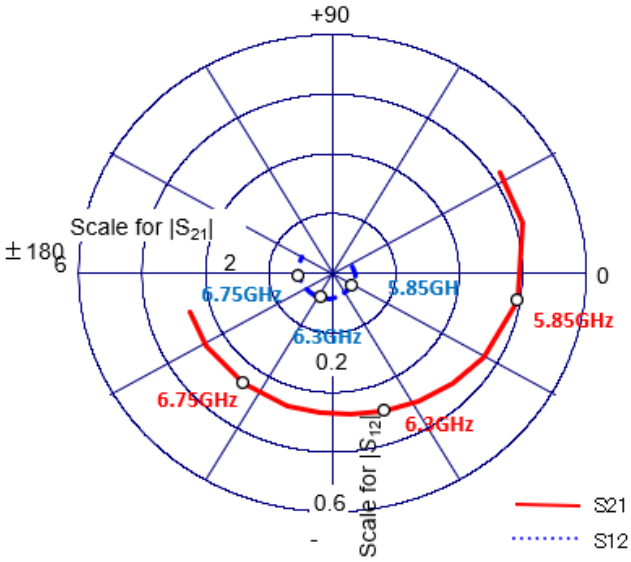


IMD vs. Output Power (S.C.L.)
V_{DS}=24V, $I_{DS(DC)}$=2.6 A ,Δf=10MHz



● S-Parameter

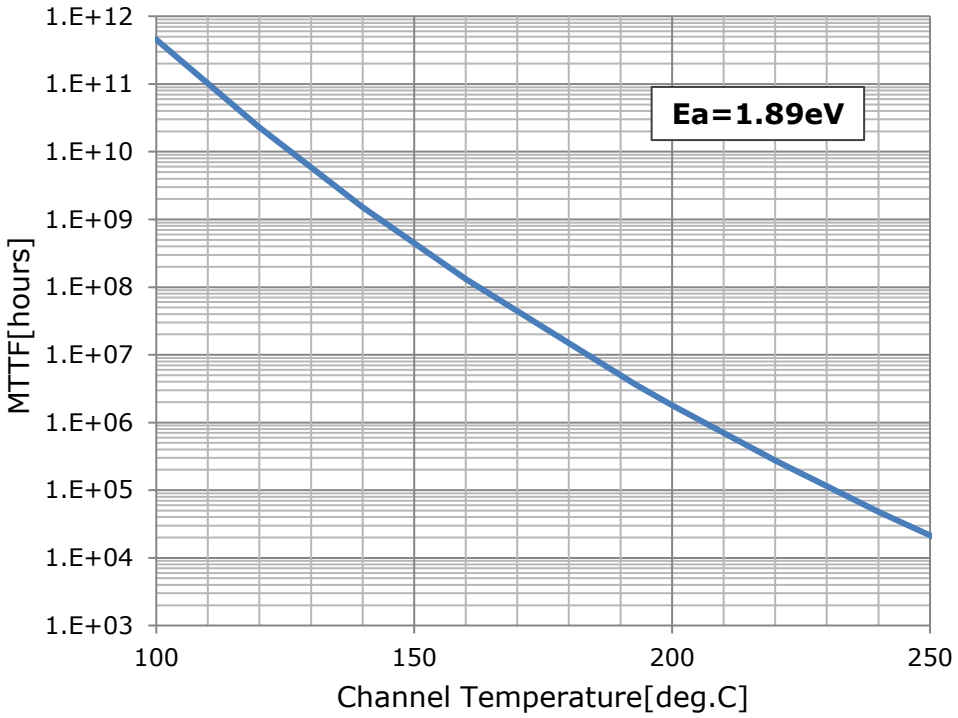




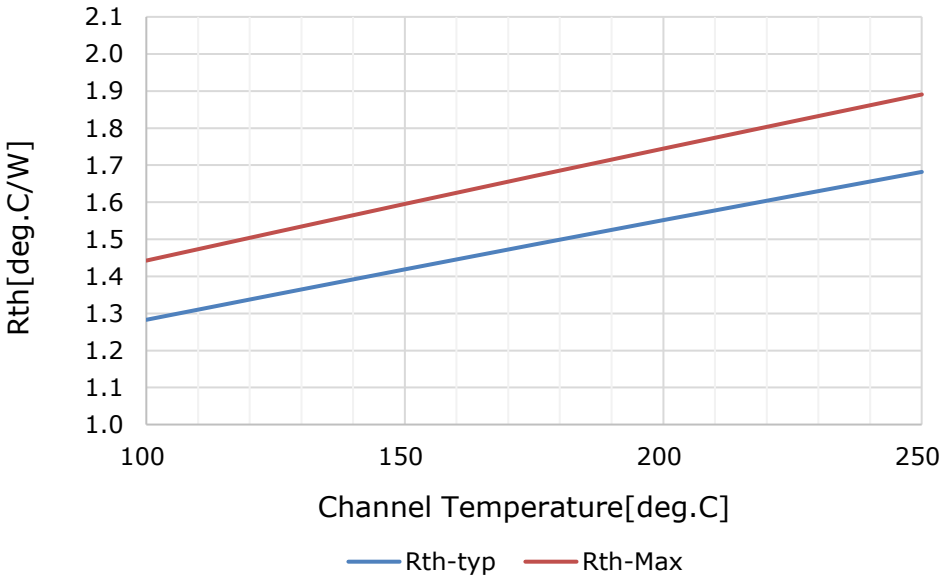
Bias Condition V_{DS}=24V, $I_{DS(DC)}$=2.6A
Rg = 51ohm

Freq.	S11		S21		S12		S22	
	mag	phase	mag	phase	mag	phase	mag	phase
5.6GHz	0.201	-174.8	6.253	32.7	0.035	21.1	0.338	-115.4
5.7GHz	0.282	150.7	6.216	15.7	0.036	-2.2	0.303	-141.0
5.85GHz	0.399	118.4	5.925	-8.7	0.038	-35.5	0.276	-179.5
6.0GHz	0.480	96.1	5.544	-30.8	0.040	-64.4	0.271	146.8
6.1GHz	0.513	83.5	5.281	-44.3	0.042	-81.3	0.273	127.6
6.2GHz	0.537	72.2	5.080	-57.5	0.043	-96.9	0.276	110.7
6.3GHz	0.551	61.2	4.907	-70.0	0.045	-112.0	0.278	95.1
6.4GHz	0.556	50.2	4.769	-82.7	0.047	-126.4	0.278	80.5
6.5GHz	0.554	39.3	4.697	-95.0	0.048	-140.2	0.276	66.1
6.6GHz	0.542	27.8	4.655	-107.5	0.050	-153.7	0.275	51.4
6.75GHz	0.504	8.3	4.633	-127.4	0.052	-174.0	0.273	28.7
6.9GHz	0.448	-16.3	4.656	-148.7	0.054	165.1	0.281	4.1
7.0GHz	0.407	-37.6	4.663	-163.8	0.056	150.6	0.292	-14.2

- **MTTF vs. Tch**

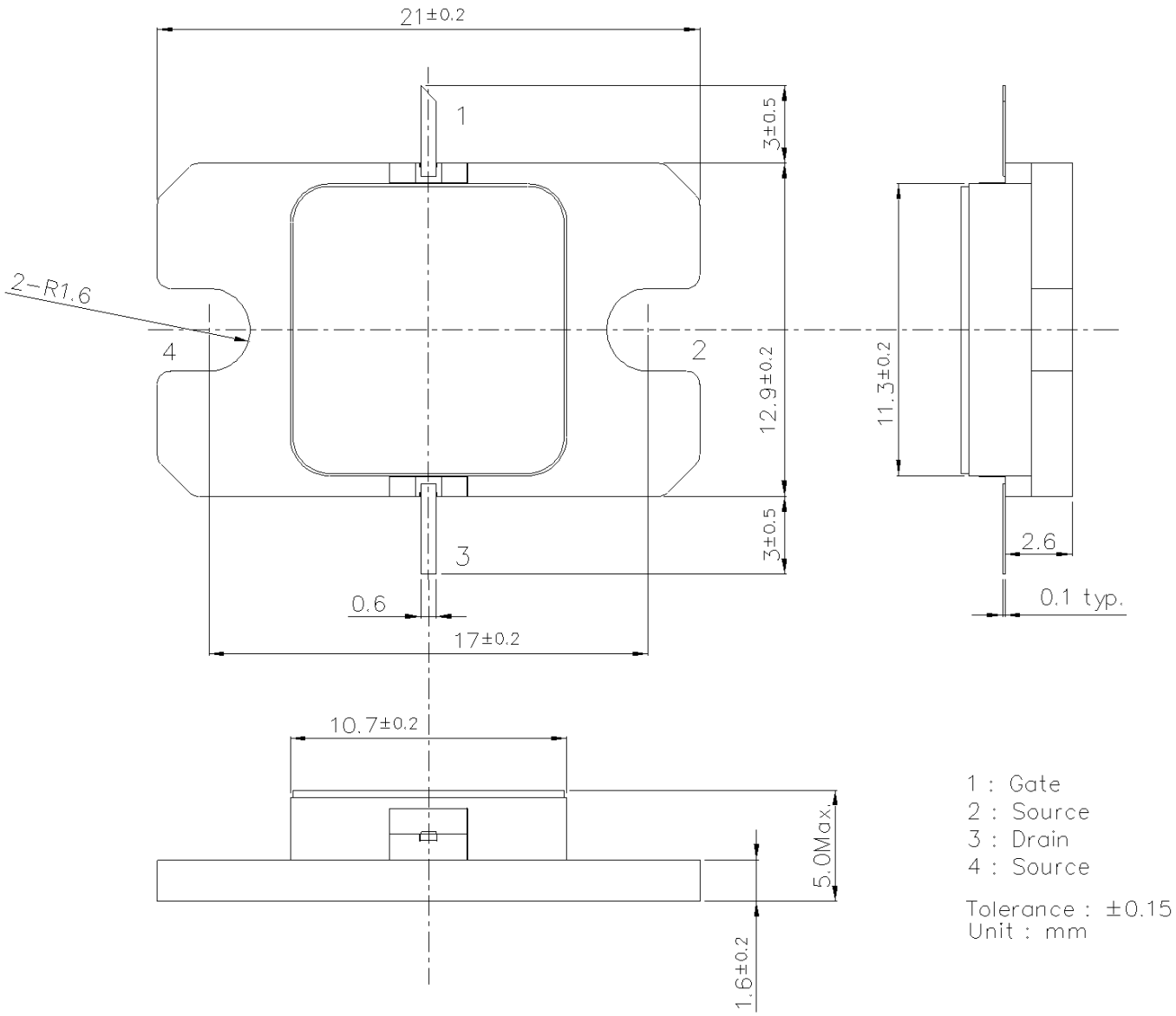


- **Rth vs. Tch**



Package Outline

Case Style : IBK



● Mounting Instructions for Packaged FETs

1. Screw Mounting

(1) The flange of package may be attached using screws. Torque conditions are shown in table 1.

Table1. Recommended and Maximum Torque for Screw Mounting

Package	Recommended Screws	Recommended Torque	Maximum Toruqe
IB, IBK, IZZ	M3.0	45 N-cm (4.0 in lbf)	50 N-cm (4.4 in lbf)

(2) The surface finish of the heat sink should be better than 0.8 μm, and the surface flatness must be better than 20 μm.

(3) Silicon based heat sink compounds should not be used for the thermal conductive grease. They cause poor grounding of the source flange, contamination and long term degradation of thermal resistance between the FET package and heat sink.

(4) If customers have use of thermal compounds and limited interface materials placed between the package flange and the heatsink to provide thermal transfer, any use of such materials is done at the customer's own risk and must be properly evaluated. Sumitomo Electric uses Panasonic carbon graphite sheet for mounting our devices. Our recommended sheet is EYGS182310. Recommended thickness is 0.1mm. Thermal conductivity is about 700 W/mK in the x-y direction. In the Z direction is about 15 W/mK.

2. Soldering for Gate and Drain Terminals

(1) Recommended solder are Tin-Lead solder (63Sn/37Pb), Lead-Free solder (Sn-3.0Ag-0.5Cu)*1 or equivalent.

(2) For soldering, Tin-Lead solder (63Sn/37Pb) or Lead-Free solder (Sn-3.0Ag-0.5Cu)*1 shall be used. (*1: The figure displays with weight %. A predominantly tin-rich alloy with 3.0% silver and 0.5% copper.)

(3) Recommended Flux is Rosin type with chlorine content: 0.2% or less and a low halogen content. After soldering, the flux residue should be removed by appropriate cleaning methods.

(4) The following is shown the recommended soldering conditions.

* Partial heating method (soldering iron, spot laser/air)
Product terminal temperature: 260 deg.C, max 10 s / terminal or 400 deg.C, max 3 s / terminal

Caution1: Soldering iron must be connected to the ground.
Caution2: Do not rapid cooling the devices.

Notes & Disclaimer

- 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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