

FEATURES

- High Output Power: P_{5dB}=50.5dBm (Typ.)
- High Gain: GL=13.5dB (Typ.)
- High Power Added Efficiency: PAE=45% (Typ.)
- Broad Band: 5.85 to 6.75GHz
- Hermetically Sealed Package

DESCRIPTION

The SGK5867-100A/001 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	212	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}	R _g =15ohm	≤24.4	mA
Reverse Gate Current	I _{GR}	R _g =15ohm	≥-12.8	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		26		A
Trans Conductance	G _m	V _{DS} =24V, I _{DS} =5.3A	-	12	-	S
Pinch-off Voltage	V _P	V _{DS} =10V, I _{DS} =5.3mA	-	-3	-	V
Frequency Range	f		5.85	-	6.75	GHz
Output Power at 5dB G.C.P.	P _{5dB}		49.5	50.5	-	dBm
Linear Gain at Pin=26.5dBm	GL	V _{DS} =24V(Typ.) I _{DS(DC)} =4.0A(Typ.)	12.5	13.5	-	dB
Drain Current at 5dB G.C.P.	I _{DSR}	V _{gs} -constant	-	10	14	A
Power Added Efficiency at 3dB G.C.P.	PAE		-	45	-	%
Gain Flatness	ΔG				1.6	dB
3 rd Order Inter modulation Distortion	IM ₃	f=5.85GHz, 6.75GHz Δf=10MHz, 2-tone Test P _{out} =44.0dBm (S.C.L.)	-25.0	-	-	dBc
Thermal Resistance	R _{th}	Channel to Case (T _c =25deg.C, P _{diss} =96W)	-	0.55	0.75	deg.C/W
Channel Temperature Rise	ΔT _{ch}	(V _{DS} x I _{DSR} - P _{out} + P _{in}) x R _{th}	-	85	140	deg.C

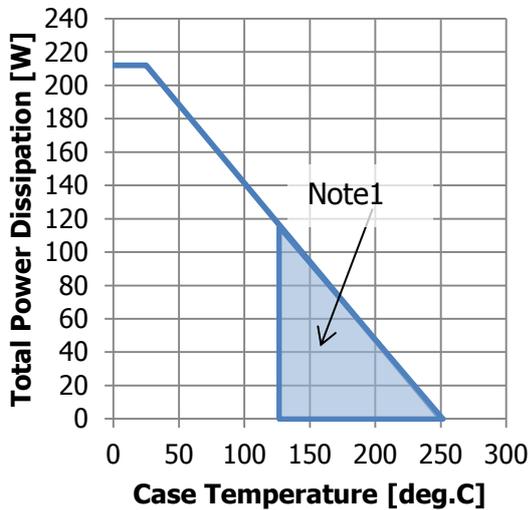
G.C.P. : Gain Compression Point, S.C.L. : Single Carrier Level

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

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

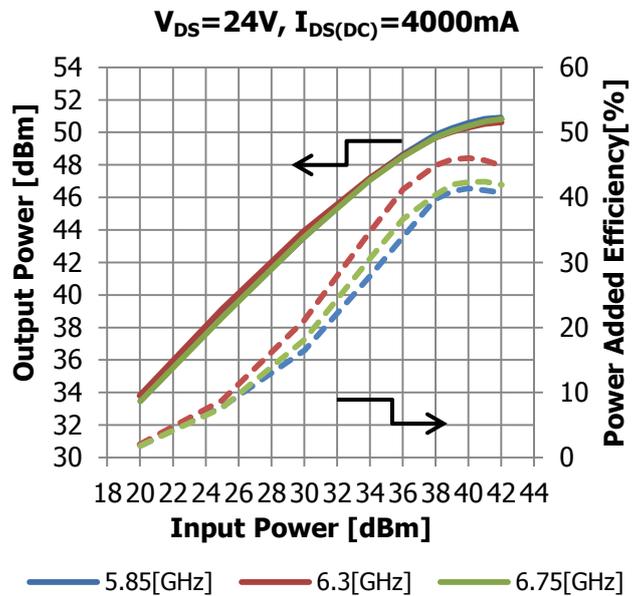
● RF Characteristics

Power Derating Curve

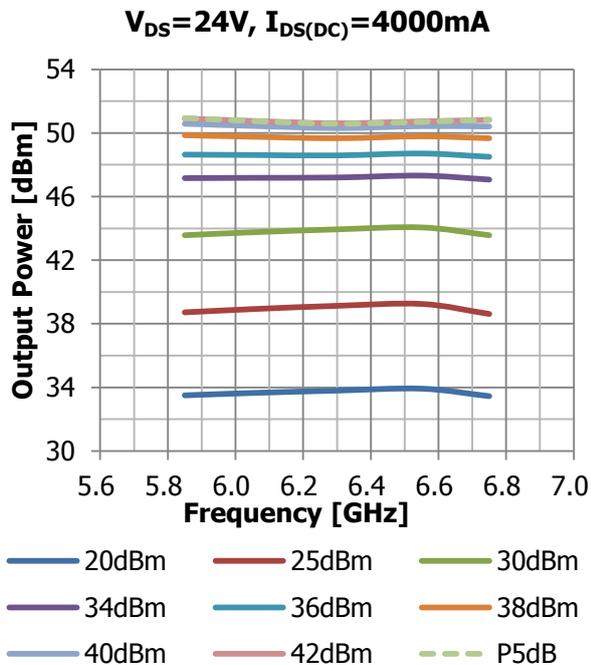


Note 1: Shaded area exceeds Maximum Case Temperature (See Page1)

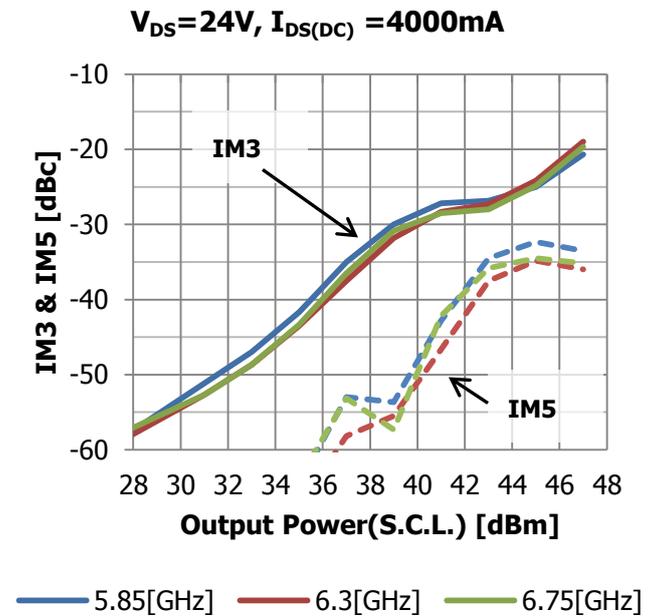
Input Power vs. Output Power and Power Added Efficiency



Output Power vs. Frequency



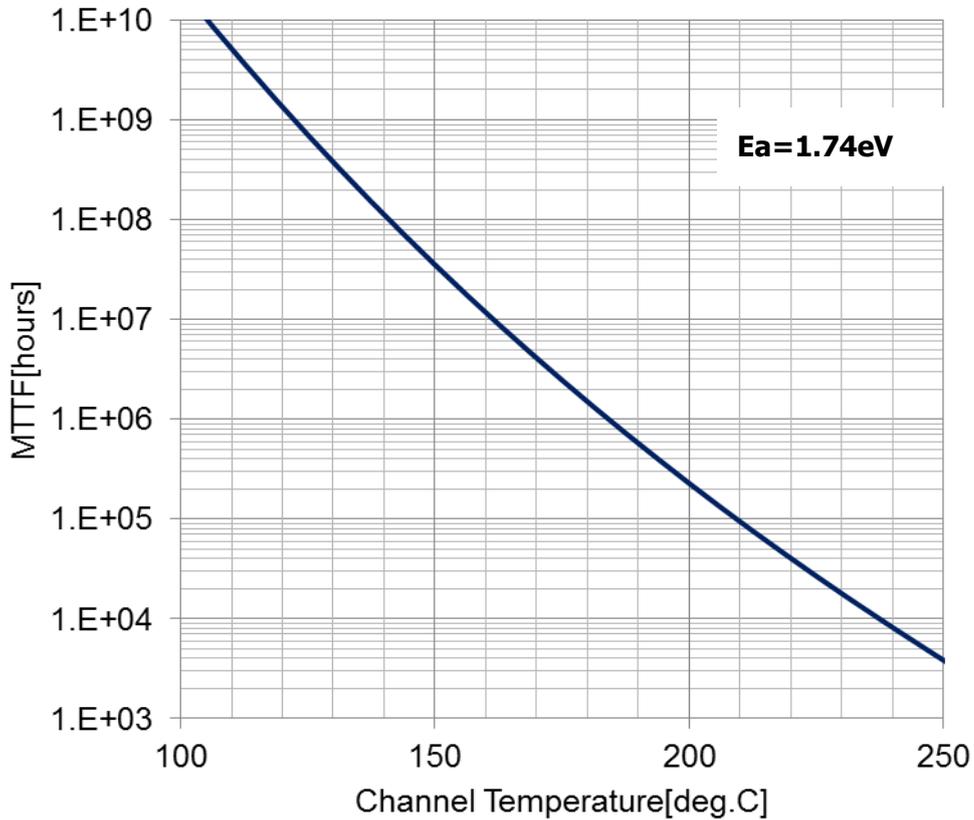
IMD vs. Output Power



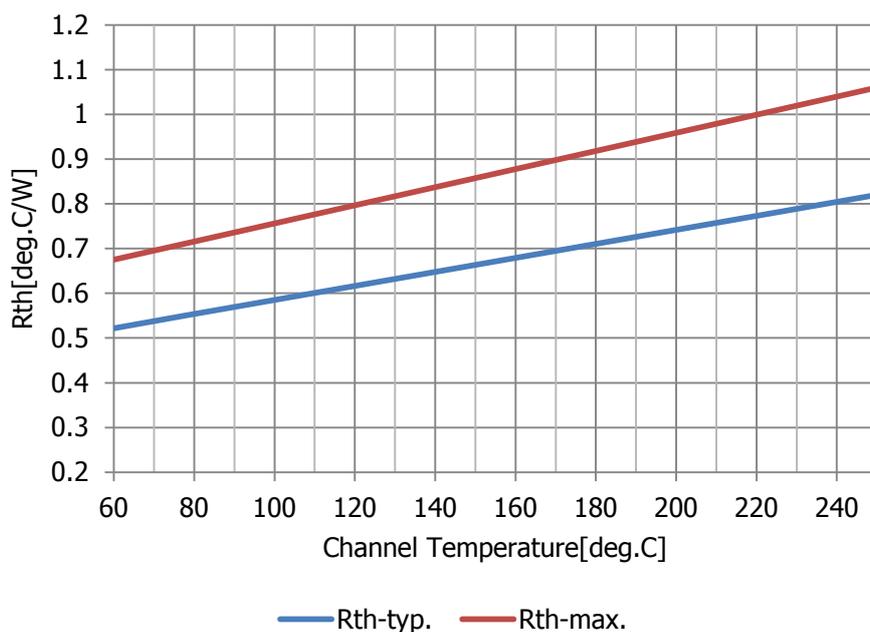
Rth of 100W class IM-GaN device at CW operation

Condition: $W_{diss}=96W$, $R_{th-typ.}=0.55deg.C/W$ @ $T_c=25deg.C$, $R_{th-max.}=0.75deg.C/W$ @ $T_c=25deg.C$

- **MTTF vs. Tch**

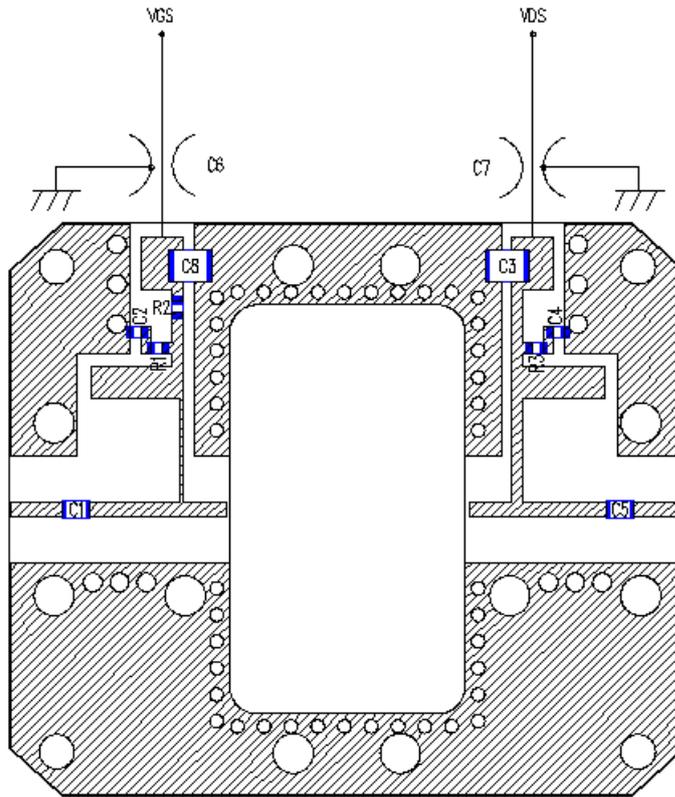


Rth vs. Tch



● **Amplifier Circuit Outline**

SGK5867-100A/001



C1	3.0pF
C2	1000pF
C3	0.1uF
C4	1000pF
C5	3.0pF
C6	1000pF
C7	1000pF
C8	0.1uF
R1	51ohm
R2	15ohm
R3	51ohm

Substrate : Rogers RO4003C

h=0.542mm, $\epsilon_r=3.38$

Cu=18um

C1, C5 : ATC600L(size:0805), +/- 0.1pF

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

● **Package Outline**
Case Style : I2F

