

■ Features

- High Output Power: $P_{\text{sat}}=54.0\text{dBm}$ (Typ.)
- High Gain: $G_p=10.0\text{dB}$ (Typ.)
- High Power Added Efficiency: $\text{PAE}=38\%$ (Typ.)
- Broad Band: 8.5 to 9.8GHz
- Impedance Matched $Z_{\text{in}}/Z_{\text{out}} = 50\text{ohm}$
- Hermetically Sealed Package

■ Description

The SGC8598-200A-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 $T_c=25\text{ deg.C}$)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	-15	V
Storage Temperature	T_{stg}	-55 to +125	deg.C
Channel Temperature	T_{ch}	+250	deg.C

RECOMMENDED OPERATING CONDITION

Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V_{DS}		≤ 50	V
Forward Gate Current	I_{GF}	$R_g=51\text{ohm}$	≤ 12.0	mA
Reverse Gate Current	I_{GR}	$R_g=51\text{ohm}$	≥ -9.0	mA
Channel Temperature	T_{ch}		$< +200$	deg.C

ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25\text{ deg.C}$)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-off Voltage	V_p	$V_{\text{DS}}=50\text{V}$, $I_{\text{DS}}=13.0\text{mA}$	-	-4.5	-	V
Frequency Range	Freq.	$V_{\text{DS}}=50\text{V-tp.}$ $I_{\text{DS(DC)}}=0.66\text{A-tp.}$ Pulse Width=100μsec. Duty=10%	8.5	-	9.8	GHz
Output Power at $\text{Pin}=44\text{dBm}$	P_{sat}		53.0	54.0	-	dBm
Power Gain at $\text{Pout}=53\text{dBm}$	G_p		9.0	10.0	-	dB
Drain Current at $\text{Pin}=44\text{dBm}$	I_{DSR}		-	11.8	14.5	A
Power Added Efficiency at $\text{Pin}=44\text{dBm}$	PAE		-	38	-	%
Gain Flatness	ΔG		-	1.6	-	dB
Thermal Resistance	R_{th}	Channel to Case ($P_{\text{diss}}=100\text{W}$, CW)	-	0.6	0.8	deg.C/W

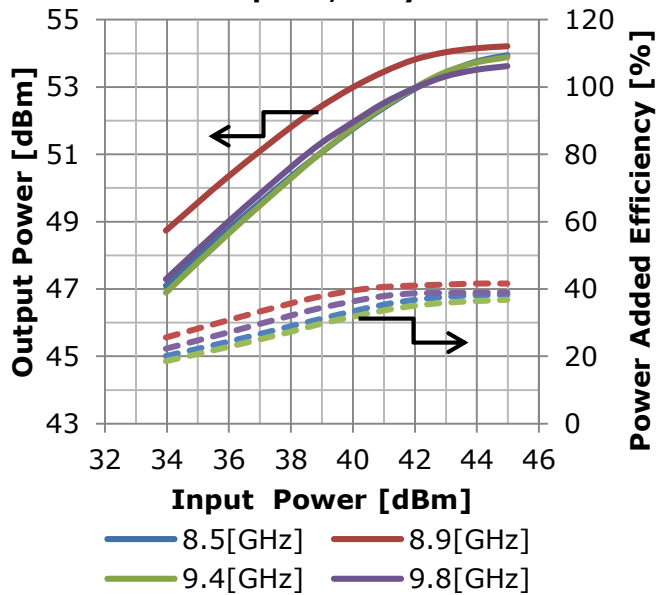
CASE STYLE	IK		
RoHS Compliance	YES		
ESD	Class 2	2000V to <4000V	

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

● RF Characteristics

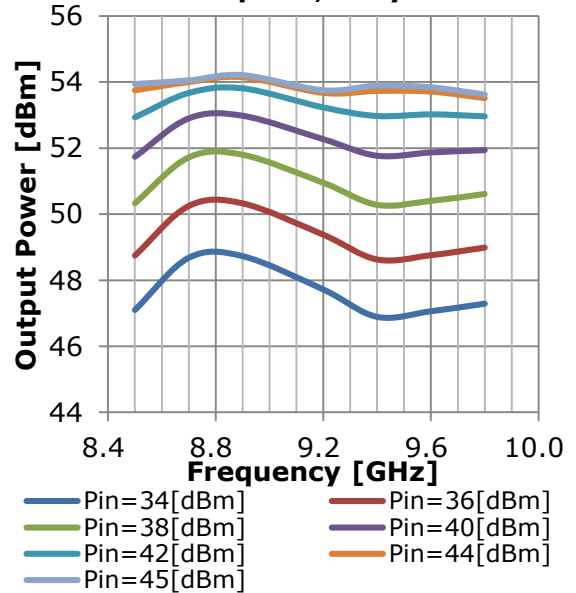
**Output Power &
Power Added Efficiency vs. Input Power**

$V_{DS}=50V$, $I_{DS(DC)}=0.66A$
 $PW=100\mu sec.$, Duty=10%



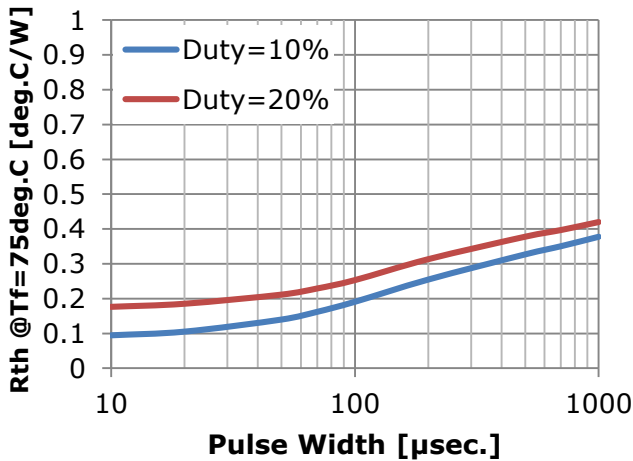
Output Power vs. Frequency

$V_{DS}=50V$, $I_{DS(DC)}=0.66A$
 $PW=100\mu sec.$, Duty=10%

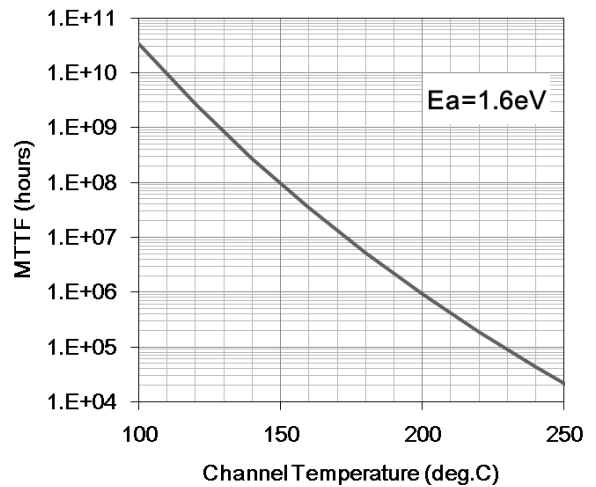


● Thermal Characteristics In Pulsed Operation

Rth vs. Pulse Width

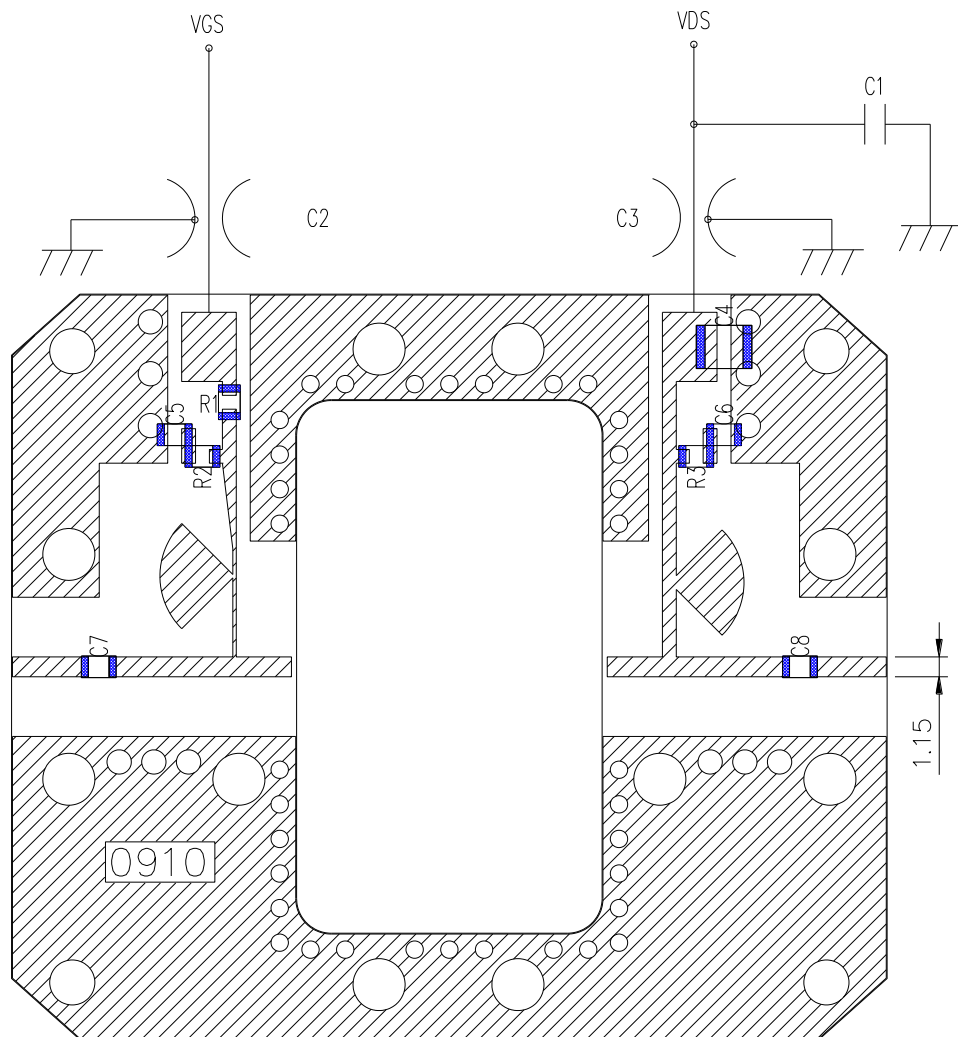


MTTF vs. Tch





● **Evaluation Board**

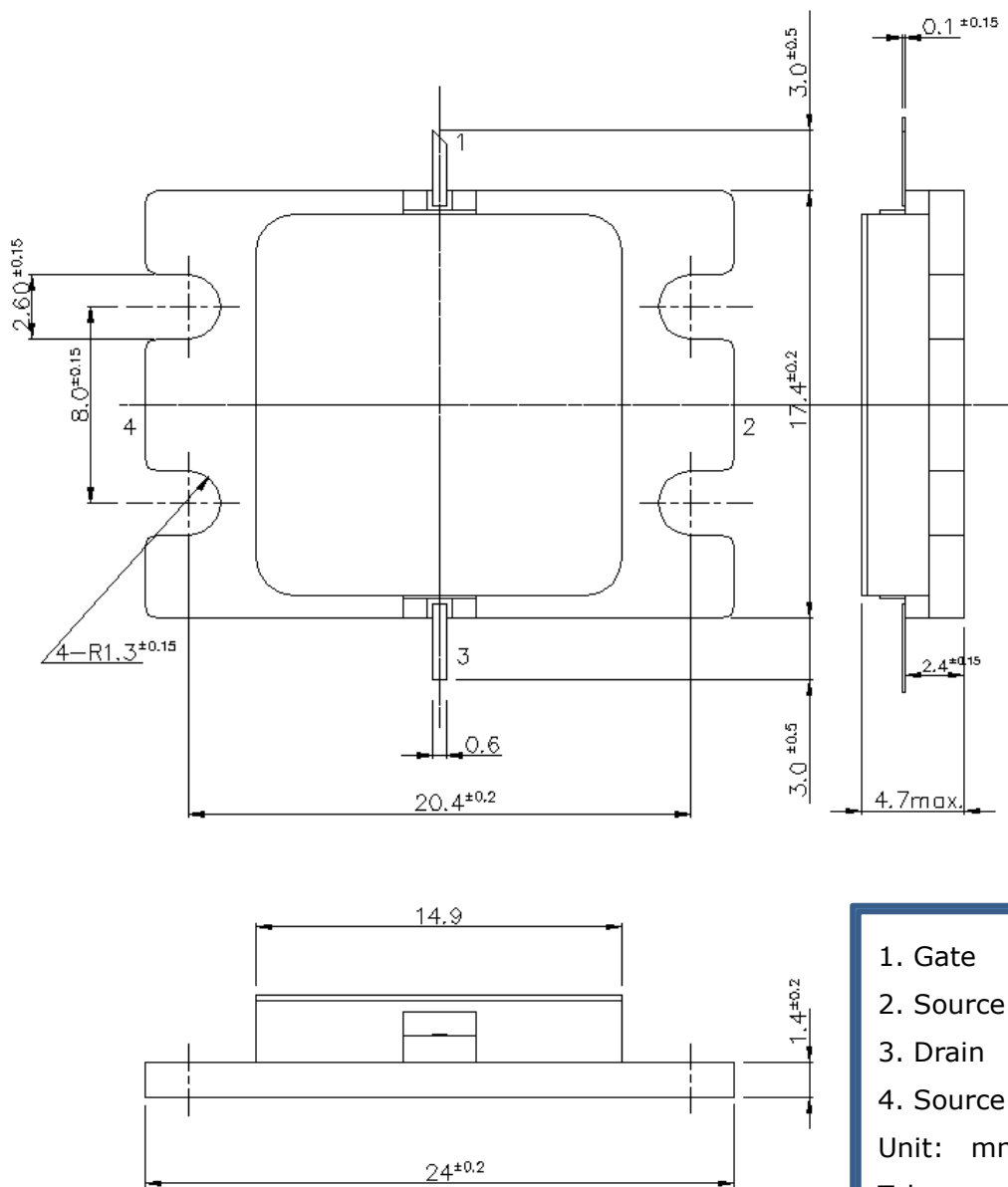


C1	1000uF	Nippon Chemi-Con EKY-800ELL102MMP1S
C2,C3	1000pF	Maruwa FTA352AR102S-S
C4	10uF	Murata GRM55DB31H106KA87L
C5,C6	1000pF	Murata GRM21AR72E102KW01
C7,C8	1.0pF	Murata GQM1875C2E1R0BB12
R1,R2,R3	51ohm	Panasonic ERJ6GEYJ510V
PCB		Rogers RO4003C, 20mil



● **Package Outline**

Case Style : IK



1. Gate
2. Source
3. Drain
4. Source
Unit: mm
Tolerance: \pm 0.15

For Safety, Observe the Following Procedures Environmental Management

- 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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