SGC8598-200A-R

X-Band Internally Matched GaN-HEMT

FEATURES

- High Output Power: Psat=54.0dBm (Typ.)
- High Gain: Gp=10dB (Typ.)
- High P.A.E.: PAE=38% (Typ.)
- Broad Band: 8.5 to 9.8GHz
- Impedance Matched Zin/Zout = 50ohm
- 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 Tc=25 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}	Rg=51ohm	<=12.0	mA
Reverse Gate Current	I_{GR}	Rg=51ohm	>=-9.0	mA
Channel Temperature	T_{ch}		<+200	deg.C

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

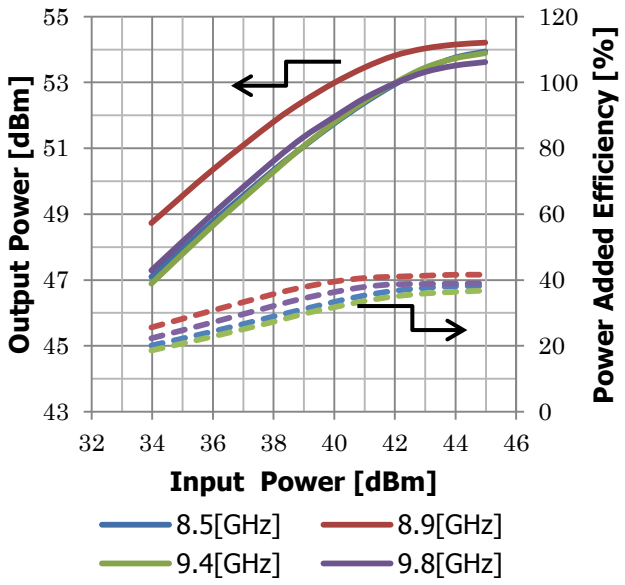
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	V_{DS}=10V, V_{GS}=0V		22		A
Pinch-off Voltage	V_P	V_{DS}=50V, I_{DS}=13mA	-	-4.5	-	V
Frequency Range	Freq.	V_{DS}=50V-typ. $I_{DS(DC)}$=1.3A-typ. Pulse Width=100usec. Duty=10%	8.5	-	9.8	GHz
Output Power at Pin=44dBm	Psat		53.0	54.0	-	dBm
Power Gain at Pout=53dBm	GP		9.0	10.0	-	dB
Drain Current at Pin=44dBm	I_{DSR}		-	11.8	14.5	A
Power Added Efficiency at Pin=44dBm	PAE		-	38	-	%
Gain Flatness	ΔG			1.6	-	dB
Thermal Resistance	R_{th}	Channel to Case (P_{diss}=100W, CW)	-	0.6	0.8	deg.C/W

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

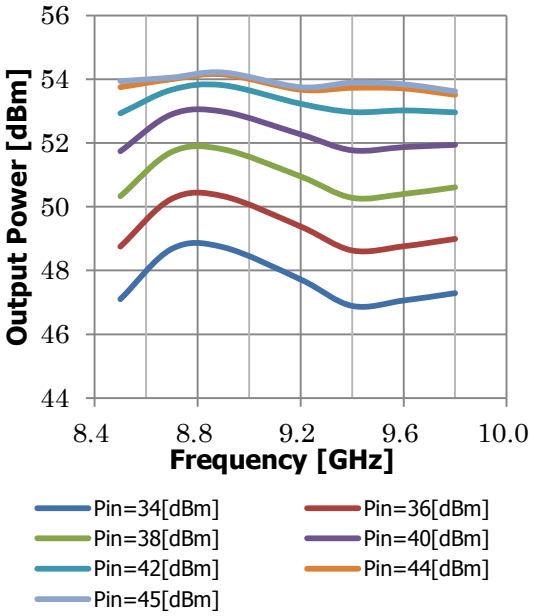
Note : **Based on ANSI/ESDA/JEDEC JS-001-2012(C=100pF, R=1.5kohm)**

RF Characteristics

Output Power & Power Added Efficiency vs. Input Power
VDS=50V, IDS(DC)=1.3A
PW=100usec., Duty=10%

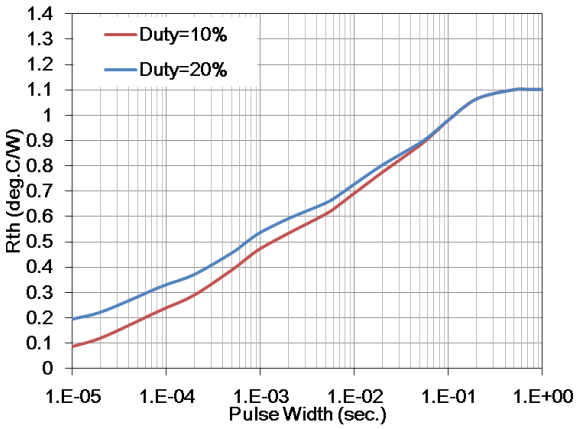


Output Power vs. Frequency
VDS=50V, IDS(DC)=1.3A
PW=100usec., Duty=10%

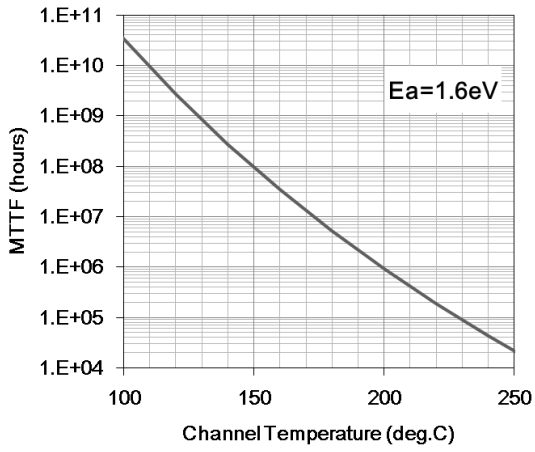


Thermal Characteristics In Pulsed Operation

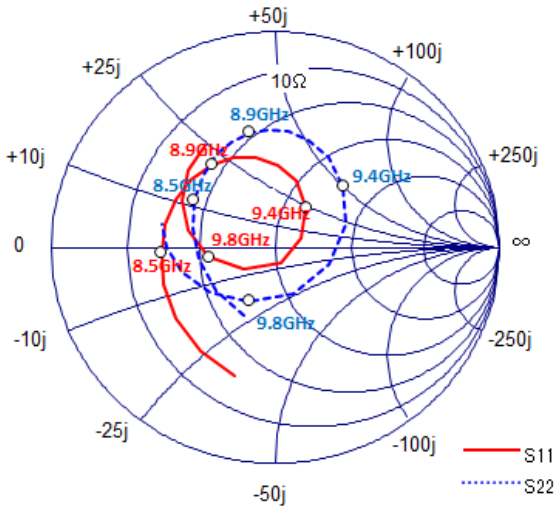
Rth vs. Pulse Width
Tc=75deg.C, Pdiss=364W

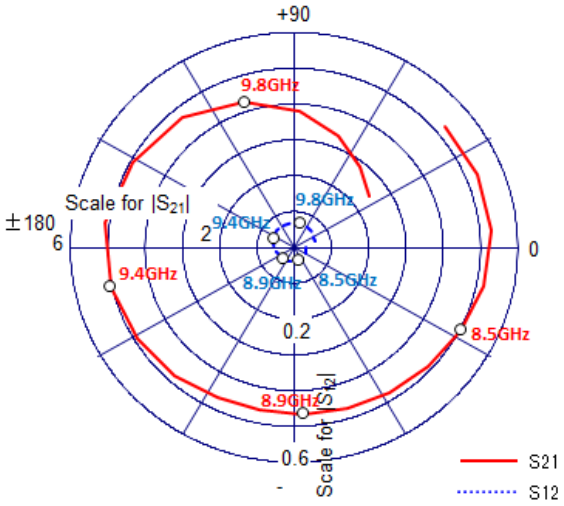


MTTF vs. Tch



- **S-parameter**



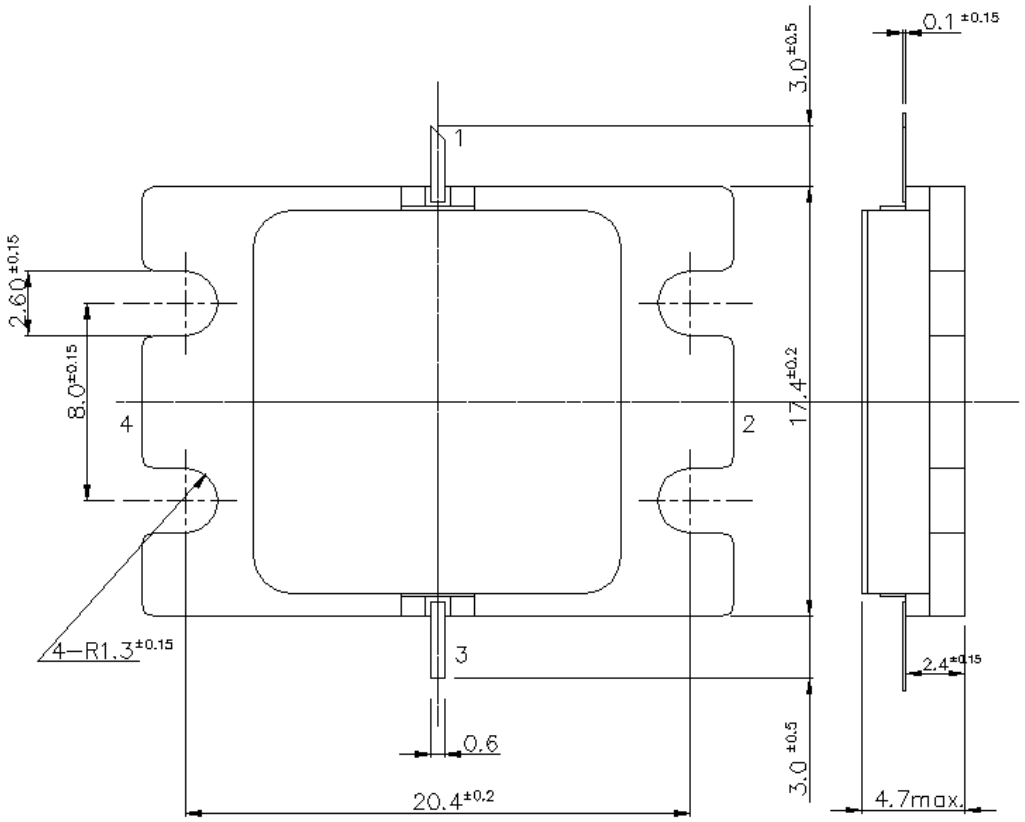


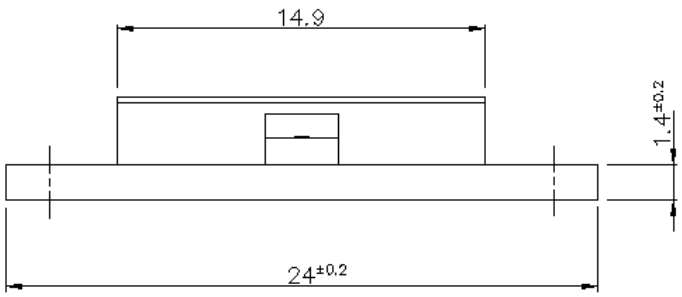
Bias Condition V_{DS}=50V, $I_{DS(DC)}$=1.3A

Freq.	S11		S21		S12		S22	
	mag	phase	mag	phase	mag	phase	mag	phase
8300MHz	0.550	-143.4	5.300	5.0	0.035	-34.4	0.343	-170.7
8400MHz	0.526	-160.9	5.196	-11.7	0.037	-51.7	0.381	166.4
8500MHz	0.510	-177.4	5.035	-27.5	0.038	-68.1	0.425	148.4
8600MHz	0.502	167.3	4.884	-42.8	0.039	-84.9	0.464	133.8
8700MHz	0.497	153.0	4.792	-57.6	0.041	-99.6	0.505	121.8
8800MHz	0.488	139.5	4.716	-72.3	0.041	-114.3	0.528	111.5
8900MHz	0.477	126.4	4.660	-87.0	0.043	-128.8	0.546	102.1
9000MHz	0.457	114.2	4.648	-101.6	0.045	-143.1	0.550	92.9
9100MHz	0.427	101.8	4.689	-116.2	0.047	-157.5	0.540	83.5
9200MHz	0.385	88.1	4.802	-131.9	0.051	-172.1	0.521	73.0
9300MHz	0.321	72.7	4.929	-148.8	0.055	171.8	0.481	60.1
9400MHz	0.231	52.9	5.046	-167.4	0.061	154.6	0.415	42.9
9500MHz	0.121	22.9	5.123	172.4	0.066	135.4	0.333	19.7
9600MHz	0.072	-72.2	4.966	151.2	0.069	115.8	0.250	-17.7
9700MHz	0.175	-144.7	4.696	129.4	0.071	95.1	0.227	-68.6
9800MHz	0.299	-171.9	4.272	108.2	0.069	75.6	0.275	-115.2
9900MHz	0.397	168.9	3.786	87.9	0.066	57.7	0.358	-144.4
10000MHz	0.472	152.5	3.306	69.3	0.063	42.3	0.430	-164.3

- **Package Out Line**

Case Style : IK





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

Unit: mm

Tolerance: ±0.15