SGC1112-100A-R

X-Band Internally Matched GaN-HEMT

FEATURES

- High Output Power: Psat=51.0dBm (Typ.)
- High Gain: Gp=9.0dB(Typ.)
- High Power Added Efficiency: PAE=36% (Typ.)
- Broad Band: 11.4 to 12.0GHz
- Hermetically Sealed Package

DESCRIPTION

The SGC1112-100A-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=100ohm	6.0	**mA**
Reverse Gate Current	I_{GR}	Rg=100ohm	4.5	**mA**
Channel Temperature	T_{ch}		<+200	**deg.C**

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

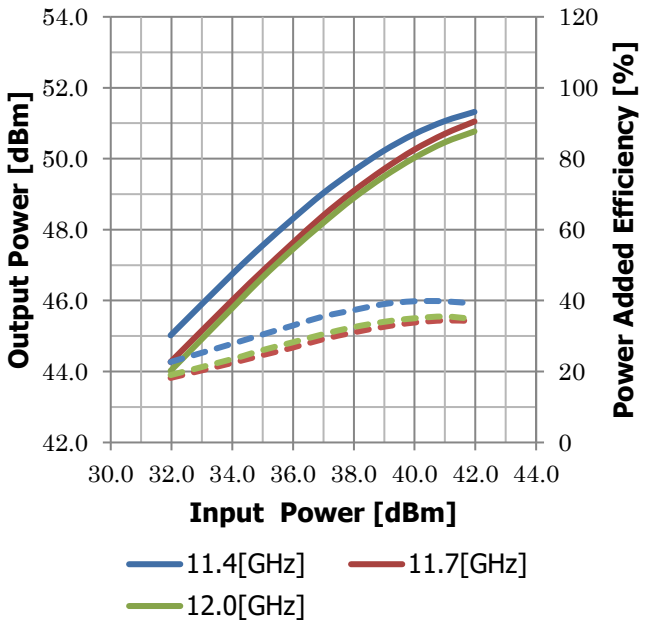
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Saturated Drain Current	I_{DSS}	V_{DS}=10V, V_{GS}=0V	-	11	-	**A**
Pinch-off Voltage	V_P	V_{DS}=50V, I_{DS}=6.5mA	-	-4.5	-	**V**
Frequency Range	Freq.	V_{DS}=50V-typ. $I_{DS(DC)}$=1.0A-typ. Pulse Width=100μsec. Duty=10%	11.4	-	12.0	**GHz**
Output Power at Pin=42dBm	P_{sat}		49.5	51.0	-	**dBm**
Power Gain at Pin=42dBm	G_P		7.5	9.0	-	**dB**
Drain Current at Pin=42dBm	I_{DSR}		-	6.1	7.9	**A**
Power Added Efficiency at Pin=42dBm	PAE		-	36	-	**%**
Gain Flatness	ΔG		-	1.6	-	**dB**
Thermal Resistance	R_{th}	Channel to Case (P_{diss}=100W, CW)	-	1.4	1.8	**deg.C/W**

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

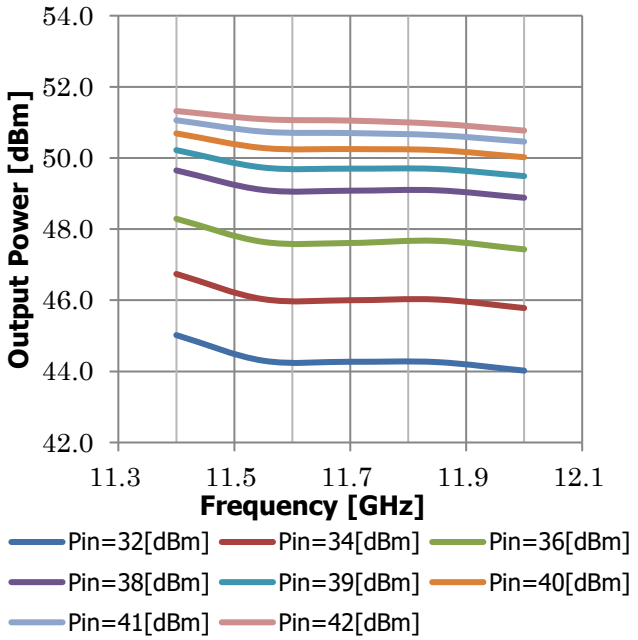
Note: **Based on ANSI/ESDA/JEDEC JS-001-2012(C=100pF, R=1.5kohm)**

• RF Characteristics

Output Power &
Power Added Efficiency vs. Input Power
VDS=50V, IDS(DC)=1.0A
PW=100μsec., Duty=10%

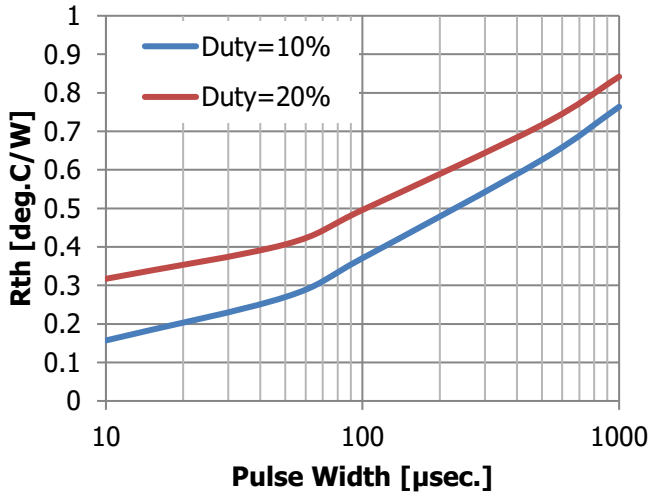


Output Power vs. Frequency
VDS=50V, IDS(DC)=1.0A
PW=100μsec., Duty=10%

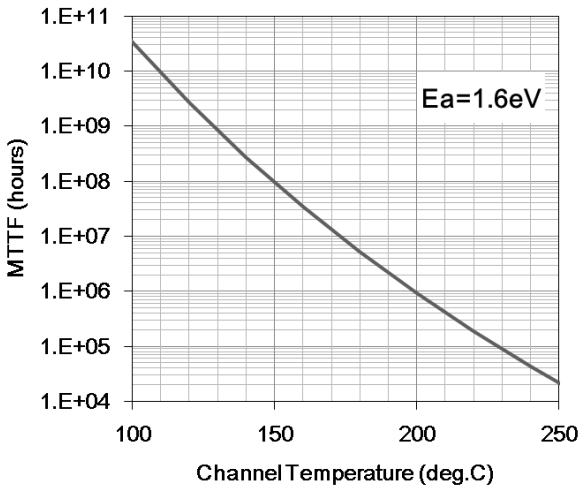


• Thermal Characteristics In Pulsed Operation

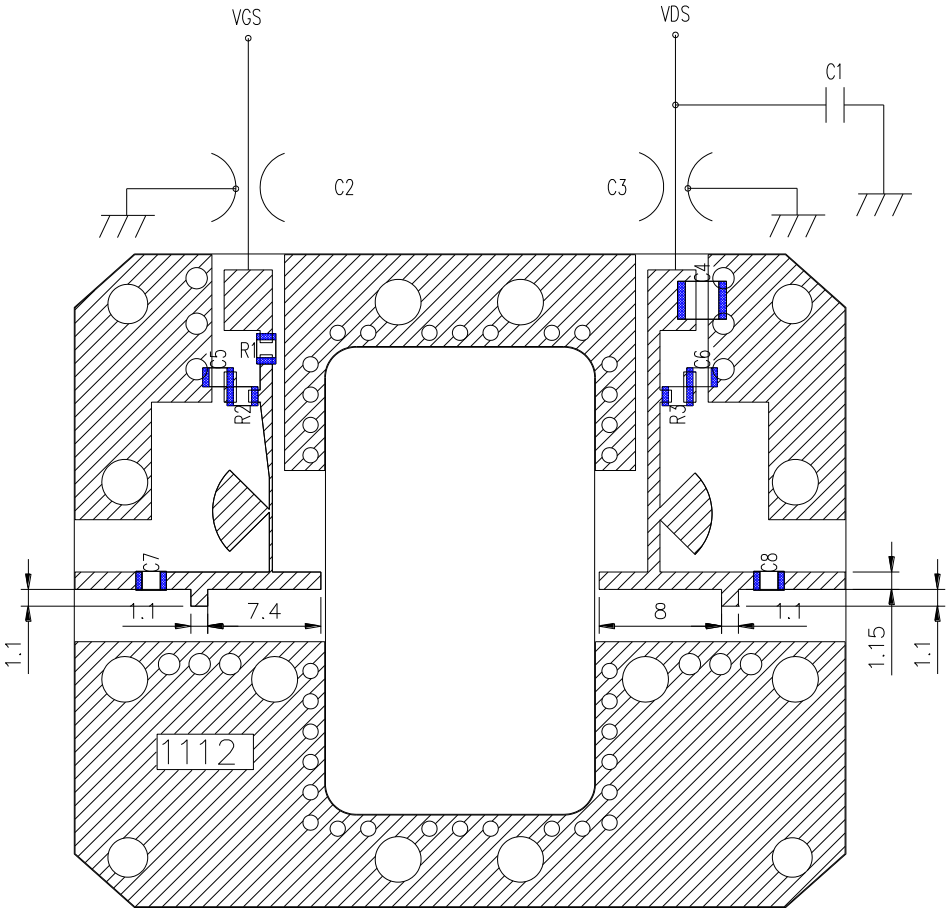
Rth vs. Pulse Width
Tc=75deg.C



MTTF vs. Tch



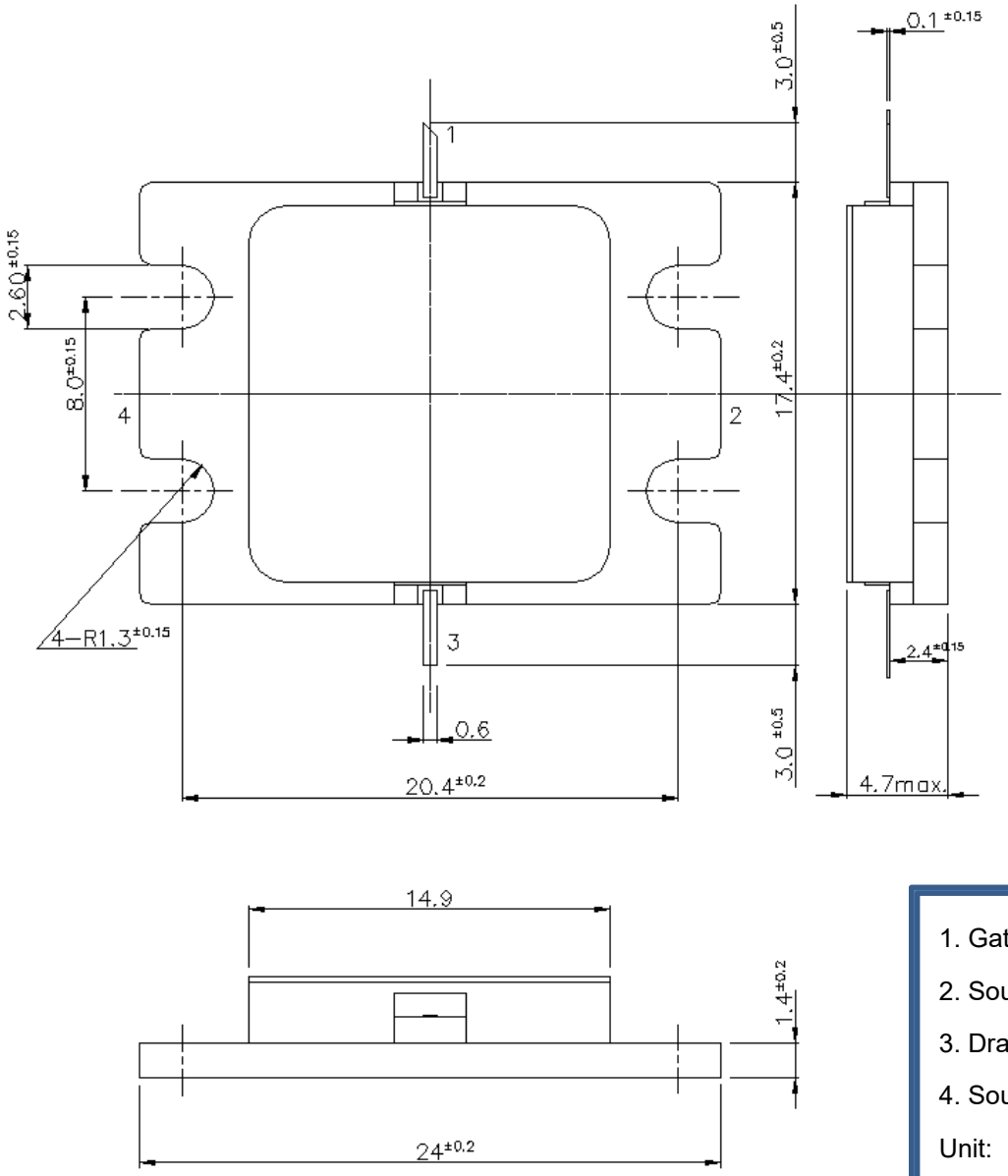
- **Evaluation Board**



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: ±0.15