

■ Features

- High Power: 160W(Typ.) @ Pin=4W(36dBm)
- High Efficiency: 60%(Typ.) @ Pin=4W(36dBm)
- Broad Band: 2.7 to 3.1GHz
- Impedance Matched $Z_{in}/Z_{out} = 50 \text{ ohm}$
- Hermetically Sealed Package


■ Description

Sumitomo Electric's GaN-HEMT SGN2731-130L-R offers high power, high efficiency and greater consistency covering 2.7 to 3.1 GHz for S-band radar applications with 50V operation.

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

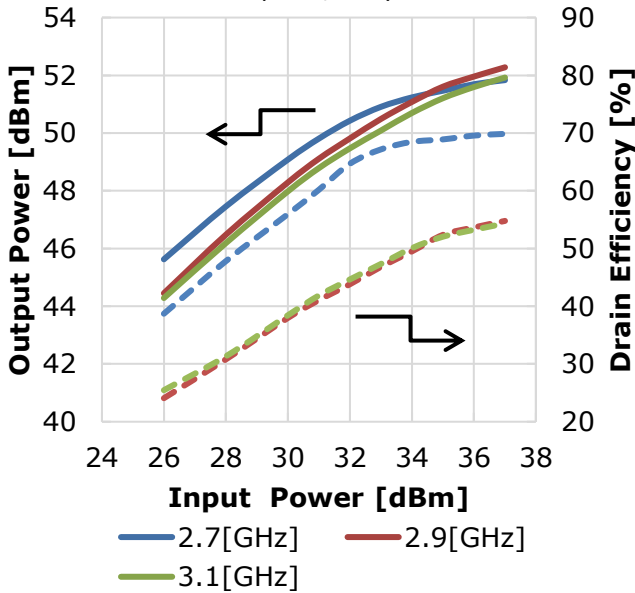
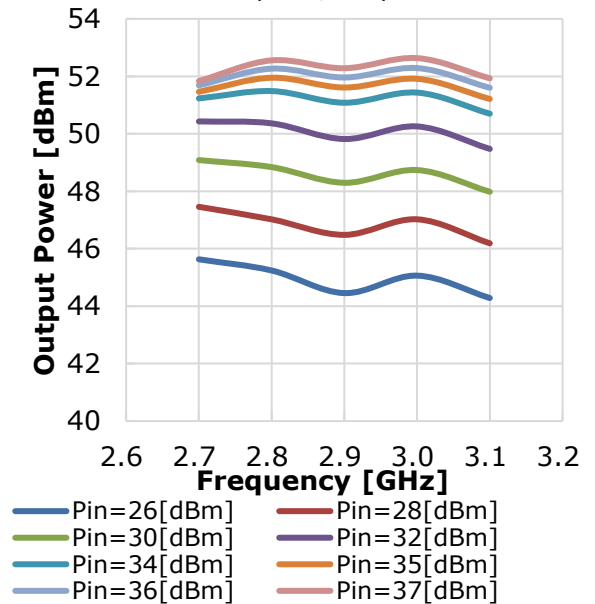
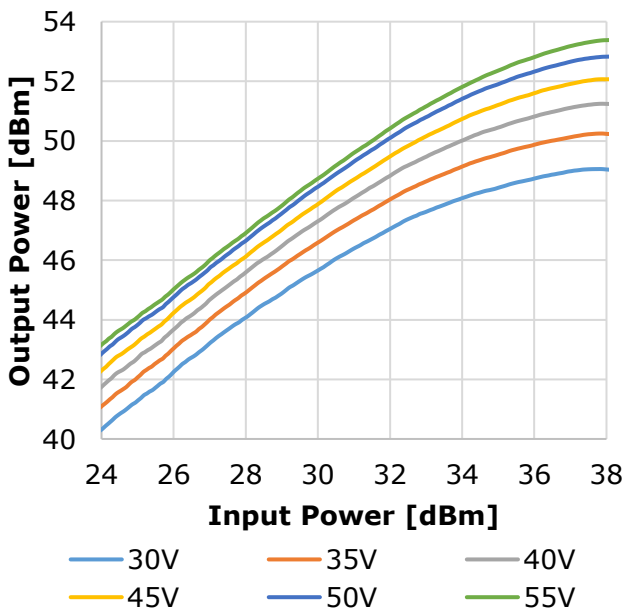
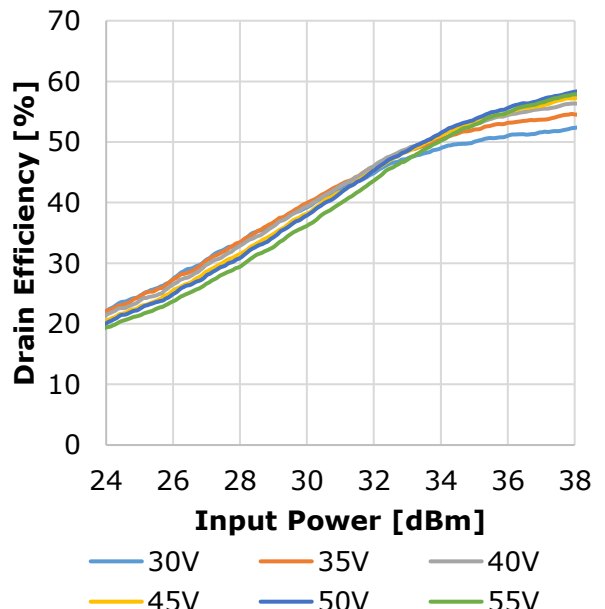
RECOMMENDED OPERATING CONDITION

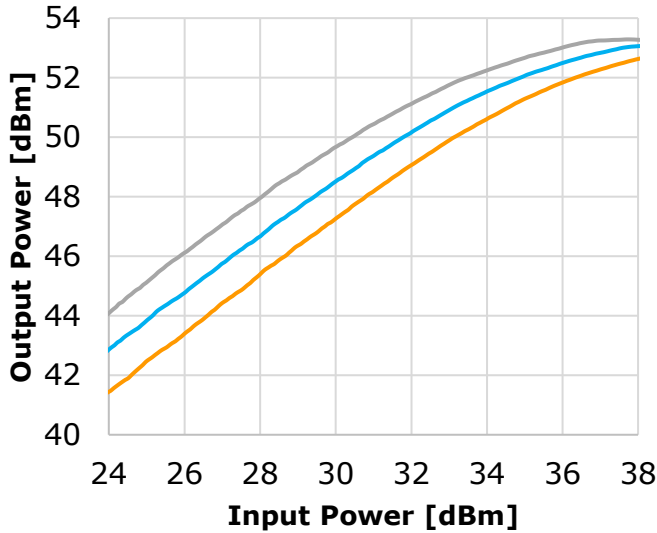
Item	Symbol	Condition	Limit	Unit
Drain-Source Voltage	V_{DS}		≤ 50	V
Forward Gate Current	I_{GF}	$R_g=12\text{ohm}$	≤ 76	mA
Reverse Gate Current	I_{GR}	$R_g=12\text{ohm}$	≥ -5.2	mA
Channel Temperature	T_{ch}		$< +200$	deg.C
Output Power	P_{out}		$\leq P5dB$	dBm

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

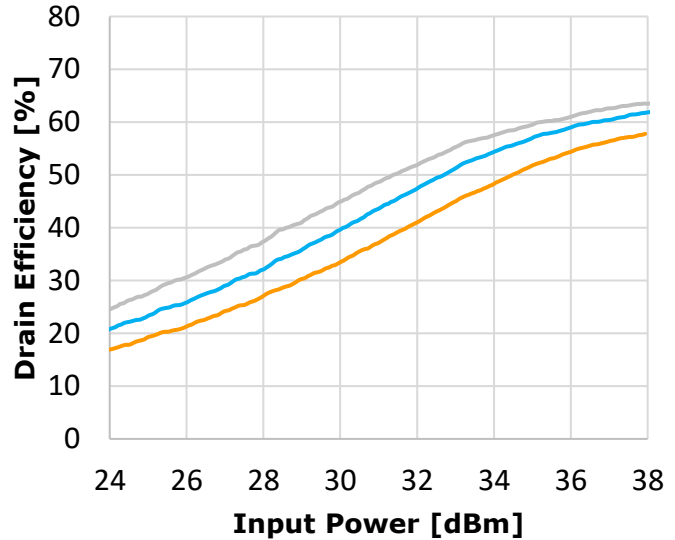
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-off Voltage	V_p	$V_{DS}=50V, I_{DS}=28mA$	-3.45	-3.00	-2.45	V
Frequency Range	Freq.	$V_{DS}=50V\text{-typ.}$ $I_{DS(DC)}=0.5A\text{-typ.}$ Pulse Width=400 $\mu\text{sec.}$ Duty=25% Pin=36dBm	2.7	-	3.1	GHz
Output Power	P_{sat}		51.2	52.2	-	dBm
Power Gain	G_p		15.2	16.2	-	dB
Drain Efficiency	DE		-	60.0	-	%
Gain Flatness	GF		-	0.7	1.5	dB
Load Mismatch Ruggedness	VSWR		-	10:1	-	-
Thermal Resistance	R_{th}		Channel to Case at 45W P_{DC}	-	1.1	1.3

CASE STYLE	IV
RoHS Compliance	YES

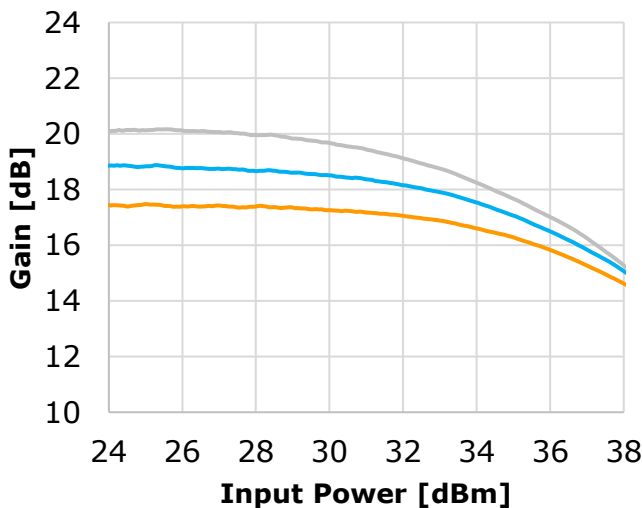
RF Characteristics
Output Power & Drain Efficiency vs. Input Power
 $V_{DS}=50V, I_{DS(DC)}=0.5A$
 $PW=400\mu\text{sec.}, \text{Duty}=25\%$

Output Power vs. Frequency by Pin
 $V_{DS}=50V, I_{DS(DC)}=0.5A$
 $PW=400\mu\text{sec.}, \text{Duty}=25\%$

Output Power vs. Input Power by Drain Voltage
 $f=2.9\text{GHz}, I_{DS(DC)}=0.5A$
 $PW=400\mu\text{sec.}, \text{Duty}=25\%$

Drain Efficiency vs. Input Power by Drain Voltage
 $f=2.9\text{GHz}, I_{DS(DC)}=0.5A$
 $PW=400\mu\text{sec.}, \text{Duty}=25\%$


RF Characteristics
**Output Power vs. Input Power
by case temperature**
 $f=2.9\text{GHz}$, $V_{DS}=50\text{V}$, $I_{DS(DC)}=0.5\text{A}$
 $PW=400\mu\text{sec.}$, $\text{Duty}=25\%$


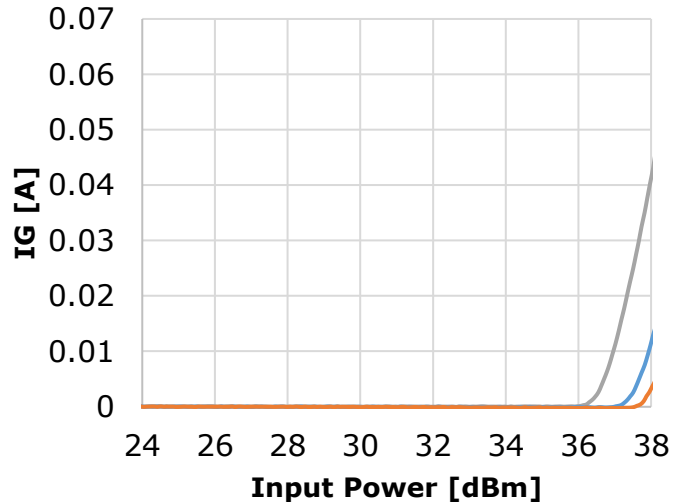
— -40 deg.C — 25 deg.C — 85 deg.C

**Drain Efficiency vs. Input Power
by case temperature**
 $f=2.9\text{GHz}$, $V_{DS}=50\text{V}$, $I_{DS(DC)}=0.5\text{A}$
 $PW=400\mu\text{sec.}$, $\text{Duty}=25\%$


— -40 deg.C — 25 deg.C — 85 deg.C

**Gain vs. Input Power
by case temperature**
 $f=2.9\text{GHz}$, $V_{DS}=50\text{V}$, $I_{DS(DC)}=0.5\text{A}$
 $PW=400\mu\text{sec.}$, $\text{Duty}=25\%$


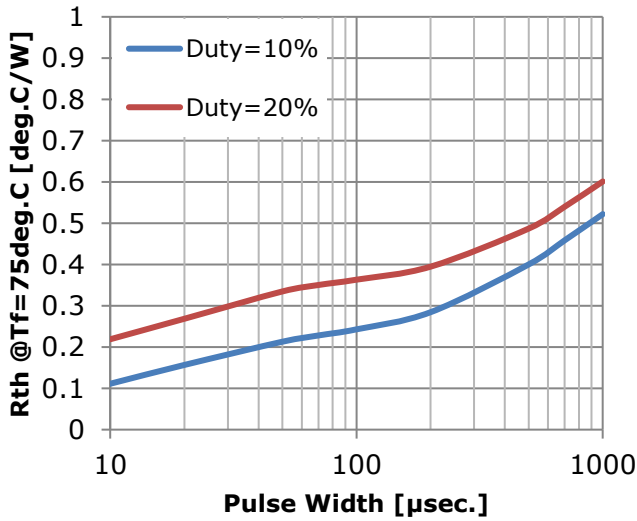
— -40 deg.C — 25 deg.C — 85 deg.C

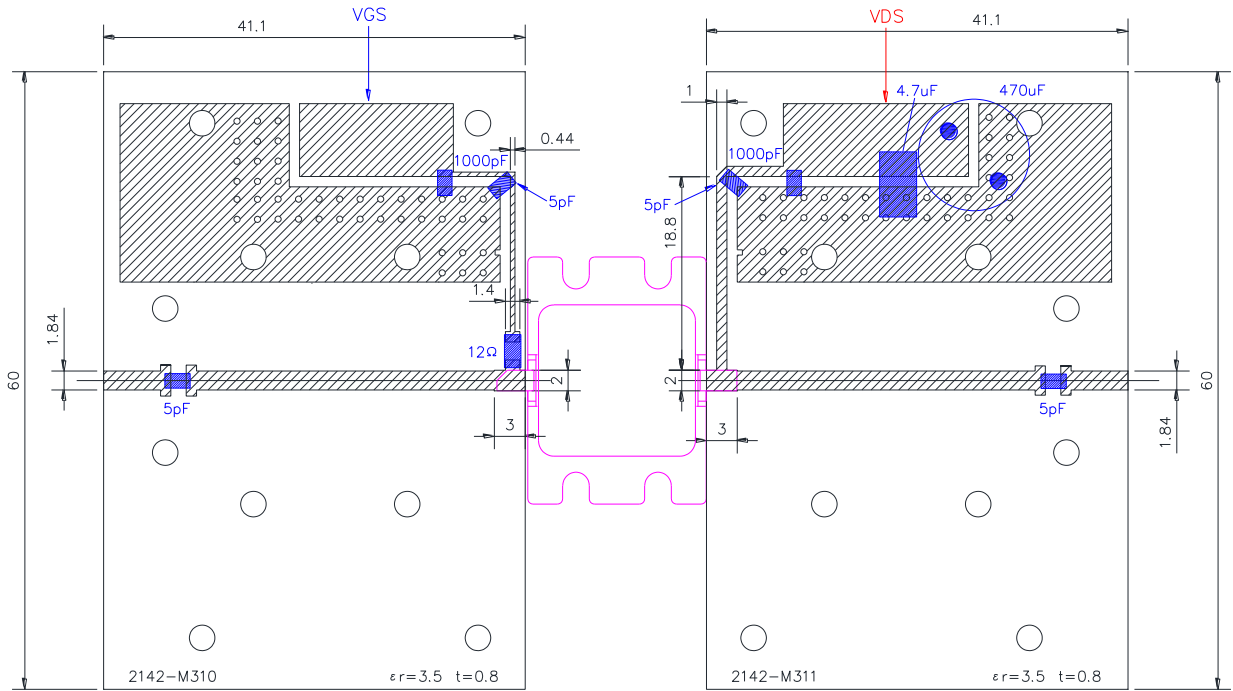
**IG vs. Input Power
by case temperature**
 $f=2.9\text{GHz}$, $V_{DS}=50\text{V}$, $I_{DS(DC)}=0.5\text{A}$
 $PW=400\mu\text{sec.}$, $\text{Duty}=25\%$


— -40 deg.C — 25 deg.C — 85 deg.C

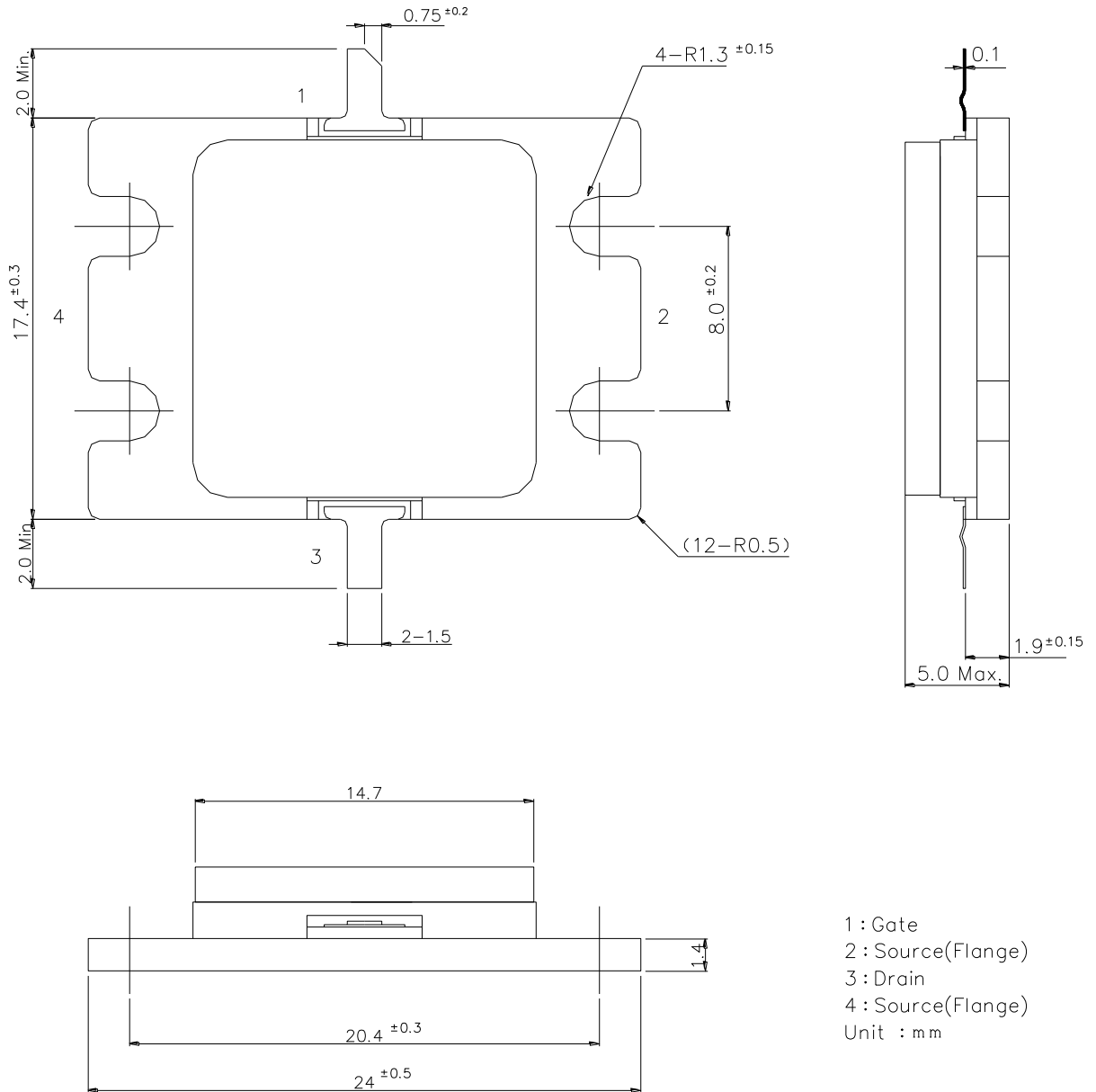
■ **Thermal Characteristics In Pulsed Operation**

Rth vs. Pulse Width by Duty



■ Test Fixture


PCB : $h=0.8\text{mm}$, $\epsilon_r=3.5$, $\text{Cu}=18\mu\text{m}$
 Unit : mm

● Package Outline
Case Style : IV


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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