

## FEATURES

- High Voltage Operation :  $V_{DS}=50V$
- High Power : 300W (min.) @  $P_{in}=15.8W$  (42dBm)
- High Efficiency: 48%(typ.) @  $P_{in}=15.8W$  (42dBm)
- Broad Band: 2.9 to 3.5GHz
- Impedance Matched  $Z_{in}/Z_{out} = 50 \text{ ohm}$

**High Voltage - High Power GaN-HEMT for Radar**



## DESCRIPTION

Sumitomo GaN-HEMT ES/SGN2935-300D-R offers high power, high efficiency and greater consistency covering 2.9 to 3.5GHz for S-band radar applications with 50V operation and pulse condition of up to 300μsec pulse width and duty of up to 10%.

## ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Rating	Unit
Operating Voltage	$V_{DS}$		55	V
Drain-Source Voltage	$V_{DS}$	$V_{GS}=-8V$	160	V
Gate-Source Voltage	$V_{GS}$		- 15	V
Storage Temperature	$T_{stg}$		-65 to +175	deg.C
Channel Temperature	$T_{ch}$		250	deg.C

## RECOMMENDED OPERATING CONDITION(Case Temperature $T_c=25 \text{ deg.C}$ )

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	$V_{DS}$		$\leq 50$	V
Forward Gate Current	$I_{GF}$	$RG=6.2 \text{ ohm}$	$\leq 408$	mA
Reverse Gate Current	$I_{GR}$	$RG=6.2 \text{ ohm}$	$\geq -15.6$	mA
Pulse Width	PW	Duty 10%	$\leq 300$	μ sec
Channel Temperature	$T_{ch}$		180	deg.C

Sumitomo recommends that the use of a reflective harmonic rejection filter at the device output be avoided. With highly compressed saturation operation, the voltage portion of the RF signal may exceed the device breakdown voltage due to phasor combination of reflected harmonic voltages. Permanent damage may result. If a harmonic rejection filter is necessary, Sumitomo recommends using either a lossy filter or a harmonic isolator in front of a reflective filter.

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

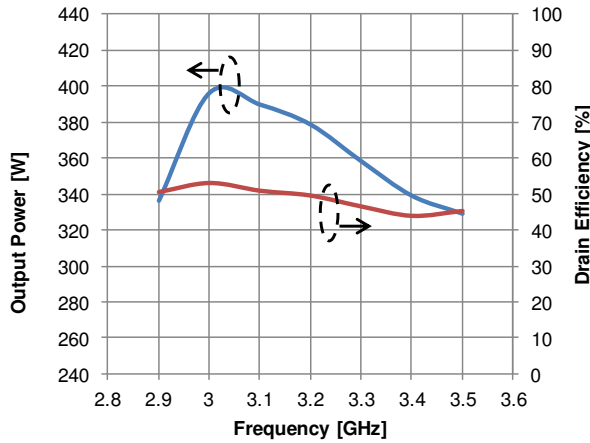
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-Off Voltage	$V_p$	$V_{DS}=50V$ $I_{DS}=108.8mA$	-1.0	-2.0	-3.5	V
Output Power	$P_{out}$	$V_{DS}=50V$	300	350	-	W
Drain Efficiency	$\eta_d$	$I_{DS(DC)}=1500mA$	-	48	-	%
Power Gain	$G_p$	$P_{in}=15.8W$ (42dBm)	12.8	-	-	dB
Gain Flatness	GF	$f=2.9, 3.1, 3.3, 3.5GHz$ $PW=200 \mu \text{ sec}, \text{Duty } 10\%$	-	0.8	1.5	dB
Thermal Resistance	$R_{th}$	Channel to Case Measured w/CW at 105W $P_{DC}$	-	0.55	0.7	deg.C/W

RoHS COMPLIANCE | Yes

**ESD characteristic**

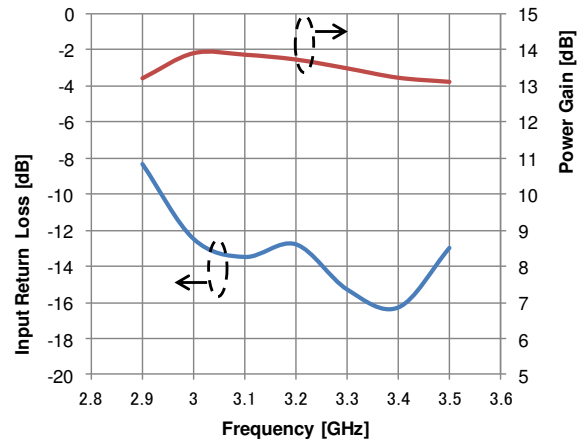
Test Methodology	Class
Human Body Model (per JESD22-A114)	TBD

Preliminary



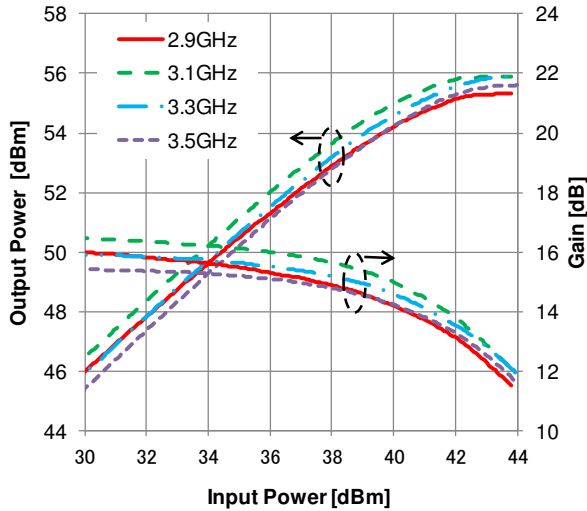
$V_{DS}=50V$ ,  $I_{DS}(DC)=1.5A$ ,  $P_{in}=15.8W$ ,  
 $PW=200\mu\text{sec}$ , Duty 10%

Figure 1. Output Power and Drain Efficiency vs Frequency



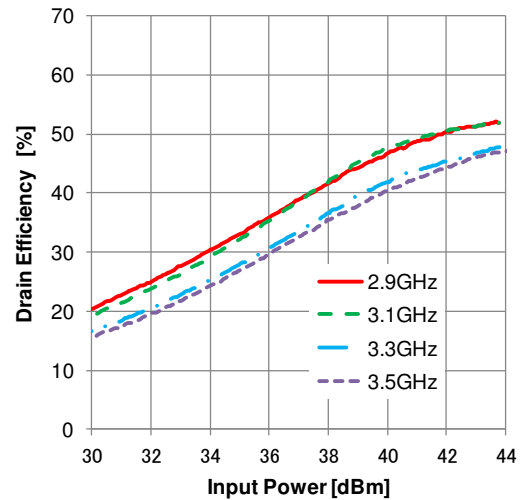
$V_{DS}=50V$ ,  $I_{DS}(DC)=1.5A$ ,  $P_{in}=15.8W$ ,  
 $PW=200\mu\text{sec}$ , Duty 10%

Figure 2. Input Return Loss and Power Gain vs Frequency



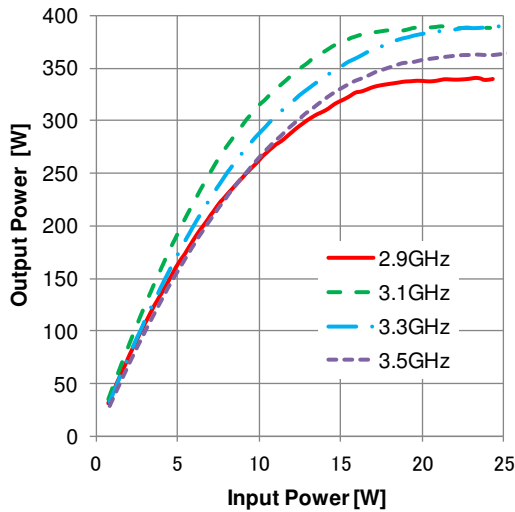
$V_{DS}=50V$ ,  $I_{DS}(DC)=1.5A$ ,  
 $PW=200\mu\text{sec}$ , Duty 10%

Figure 3. Output Power and Gain vs Input Power



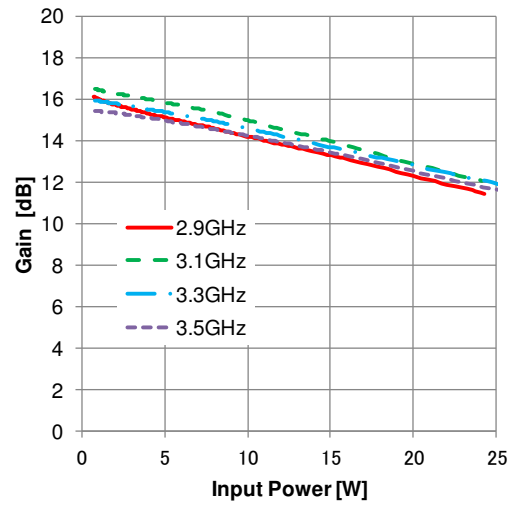
$V_{DS}=50V$ ,  $I_{DS}(DC)=1.5A$ ,  
 $PW=200\mu\text{sec}$ , Duty 10%

Figure 4. Drain Efficiency vs Input Power



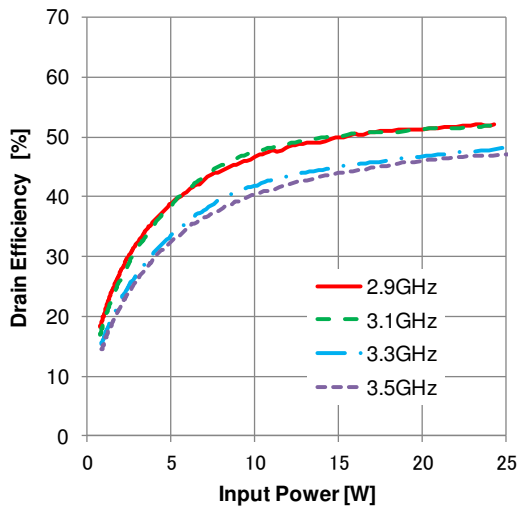
$V_{DS}=50V$ ,  $I_{DS(DC)}=1.5A$ ,  
 $PW=200\mu\text{sec}$ , Duty 10%

Figure 5. Output Power vs Input Power



$V_{DS}=50V$ ,  $I_{DS(DC)}=1.5A$ ,  
 $PW=200\mu\text{sec}$ , Duty 10%

Figure 6. Gain vs Input Power



$V_{DS}=50V$ ,  $I_{DS(DC)}=1.5A$ ,  
 $PW=200\mu\text{sec}$ , Duty 10%

Figure 7. Drain Efficiency vs Input Power

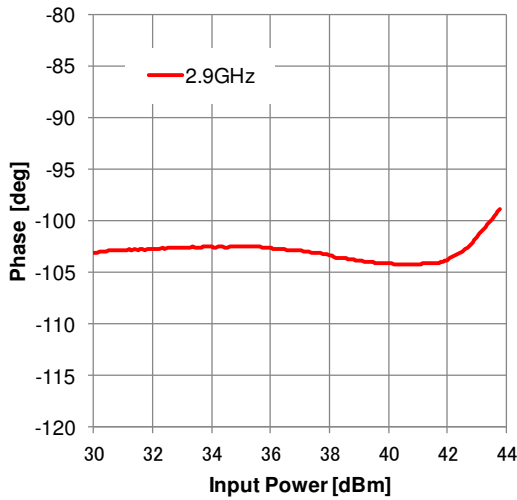


Figure 8. a) f=2.9GHz

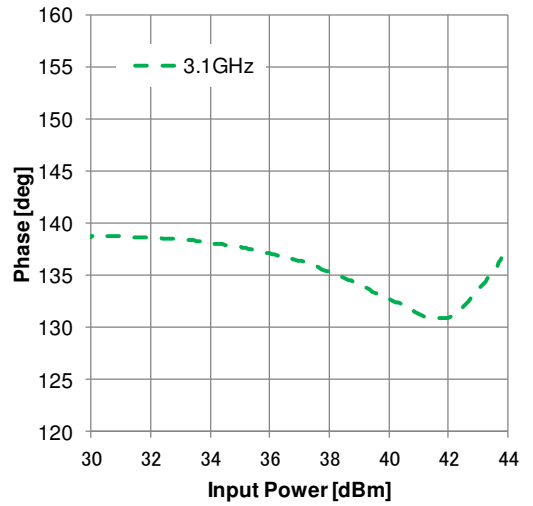


Figure 8. b) f=3.1GHz

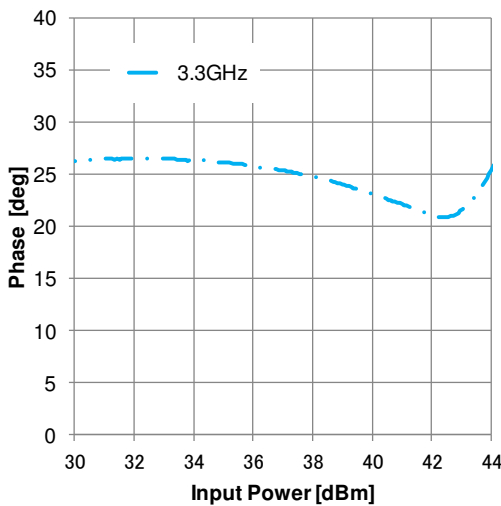


Figure 8. c) f=3.3GHz

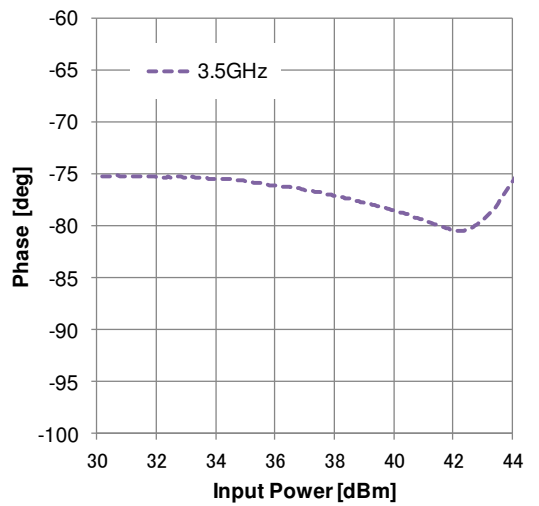


Figure 8. d) f=3.5GHz

$V_{DS}=50V$ ,  $I_{DS}(DC)=1.5A$ ,  $PW=200\mu\text{sec}$ , Duty 10%

Figure 8. Insertion Phase shift vs Input Power

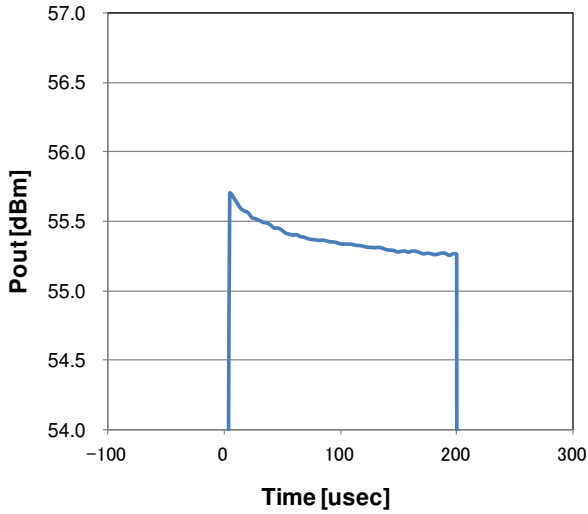


Figure 9. a) f=2.9GHz

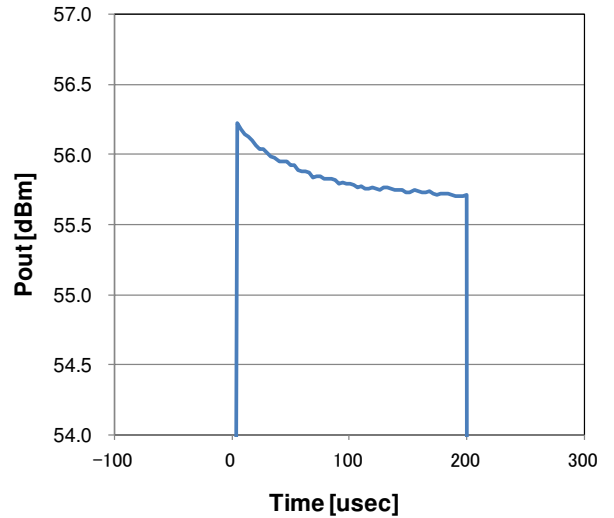


Figure 9. b) f=3.1GHz

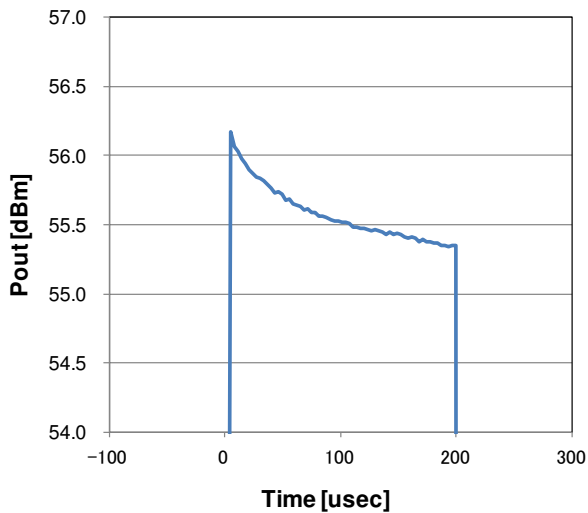


Figure 9. c) f=3.3GHz

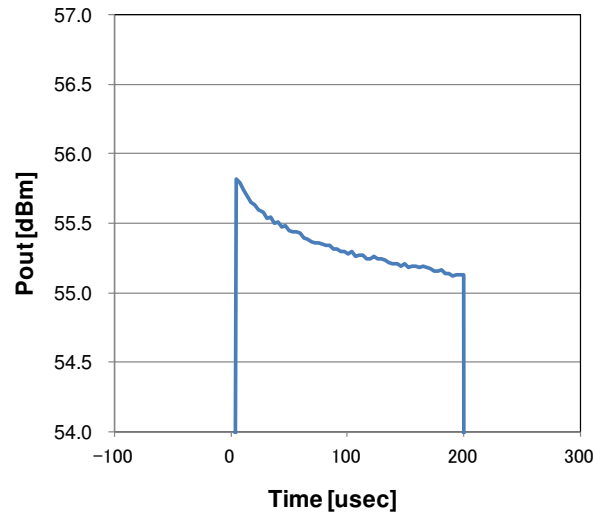
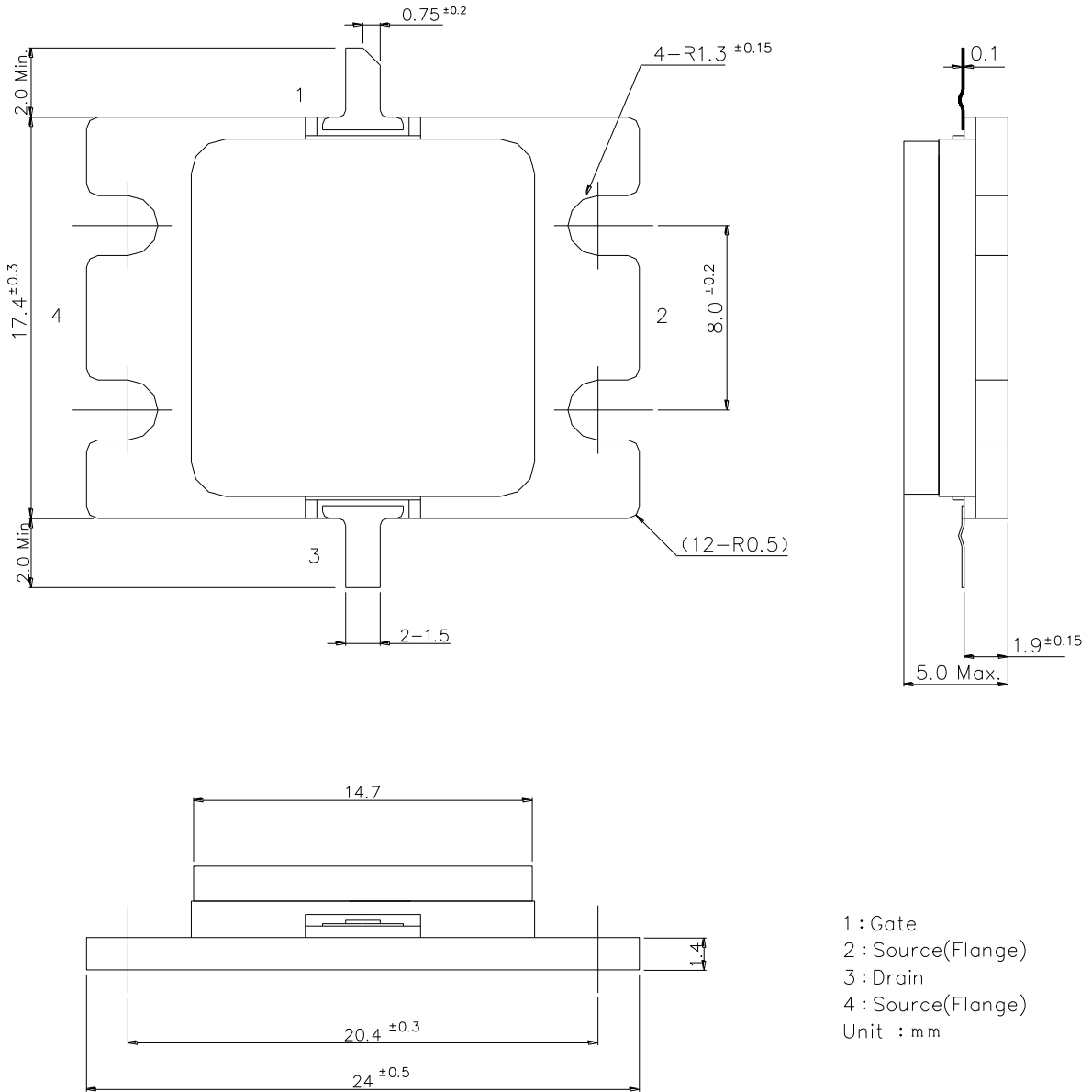


Figure 9. d) f=3.5GHz

$V_{DS}=50V, I_{DS(DC)}=1.5A, P_{in}=15.8WPW = 200\mu sec, Duty 10\%$

Figure 9. Pulse Performance (Power)

### IV Package Outline Metal-Ceramic Hermetic Package





**Preliminary**

**ES/SGN2935-300D-R**

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**Important Notice :**

ES/SGN2935-300D-R is still in ES phase and is not qualified part.

**For further information please contact:**

<http://global-sei.com/Electro-optic/about/office.html>

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