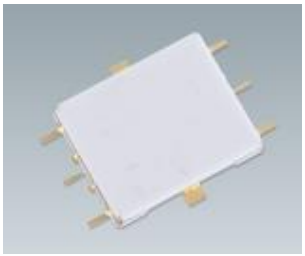
ES/SGM6901VU

X-Band 30W GaN-HEMT Module



FEATURES

- High Output Power: Psat=45.3dBm (Typ.)
- High Gain: GP=23.3dB (Typ.)
- frequency Band: 8.5 to 10.1GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed SMT Package

DESCRIPTION

The ES/SGM6901VU is a 30W GaN-HEMT Module 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}**	1st stage RG=750ohm 2nd stage RG=150ohm	0.4 1.8	**mA**
Reverse Gate Current	**I_{GR}**	1st stage RG=750ohm 2nd stage RG=150ohm	-0.3 -1.3	**mA**
Channel Temperature	**T_{ch}**		<+200	**deg.C**

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

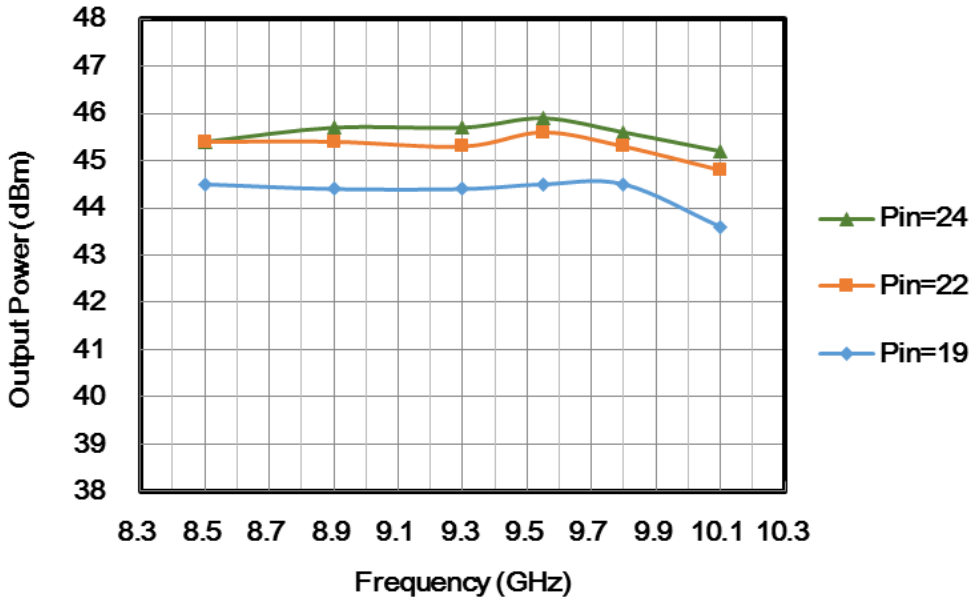
Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Pinch-off Voltage	**V_P (1st stage)**	V_{DS}=50V, I_{DS}=0.4mA	-	-4.5	-	**V**
	V_P (2nd stage)	V_{DS}=50V, I_{DS}=2mA	-	-4.5	-	**V**
Frequency Range	**freq**	V_{DS}=50V(Typ.) $I_{DS(DC)1}$=40mA(Typ.) $I_{DS(DC)2}$=160mA(Typ.) V_{GG1} =-2.88V(Typ.) V_{GG2} =-2.88V(Typ.) Pulse Width=100µsec Duty=10% Pin=22dBm	8.5	-	10.1	**GHz**
Output Power	**Psat (8.5GH, 8.9GHz, 9.3GHz, 9.55GHz, 9.8GHz)**		43.8	45.3	-	**dBm**
	Psat (10.1GHz)		43.3	44.8	-	**dBm**
Power Gain	**Gp**		-	23.3	-	**dB**
Drain Current	**I_{DSR}**		-	1.8	2.4	**A**
Power Added Efficiency	**PAE**		-	38	-	**%**
Gain Flatness	**ΔG**		-	0.8	-	**dB**
Thermal Resistance	**R_{th}***	Channel to Case	-	2.9	3.9	**deg.C/W**

*** R_{th} of 2nd stage**

CASE STYLE	**VU**	
RoHS Compliance	**YES**	
ESD	**Class 1B**	**500V to <1000V**

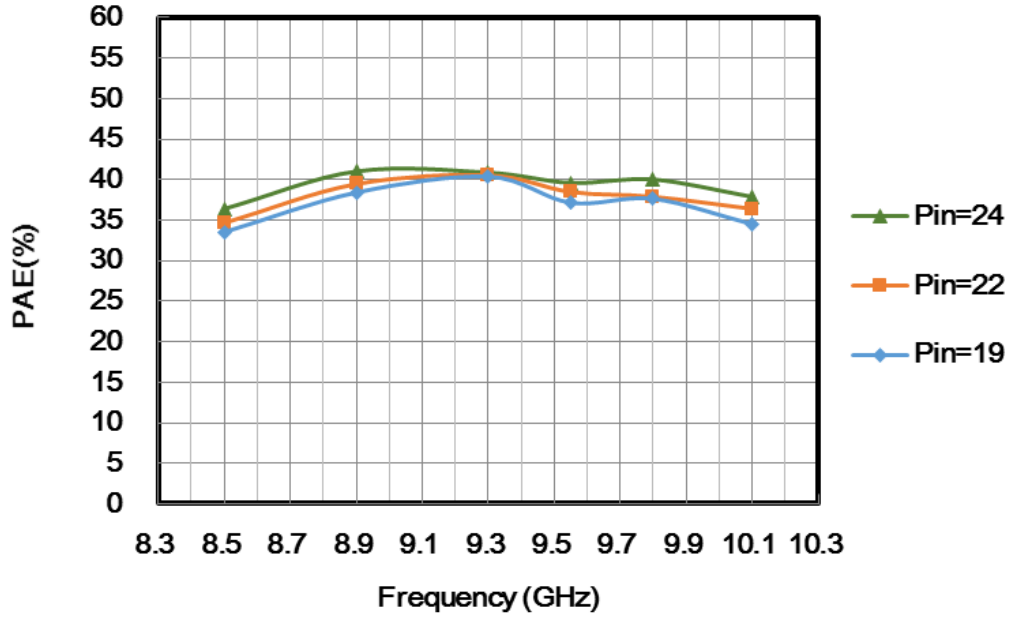
Note: **Based on ANSI/ESDA/JEDEC JS-001-2012(C=100pF, R=1.5kohm)**

● TYPICAL PERFORMANCE



V_{DS}=50V, IDS(DC)=0.2A, PW=100μsec, Duty 10%

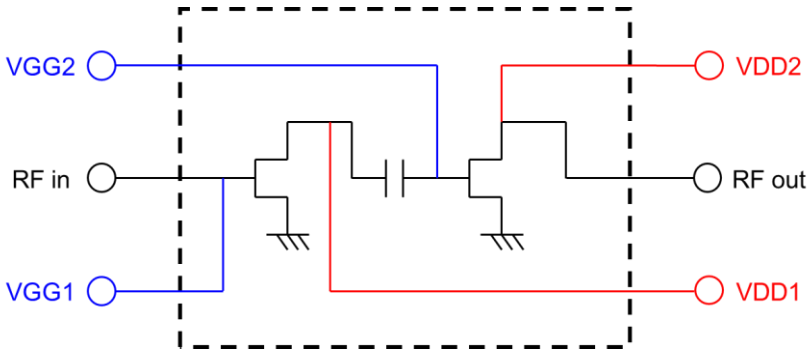
Figure 1. Output Power vs Frequency



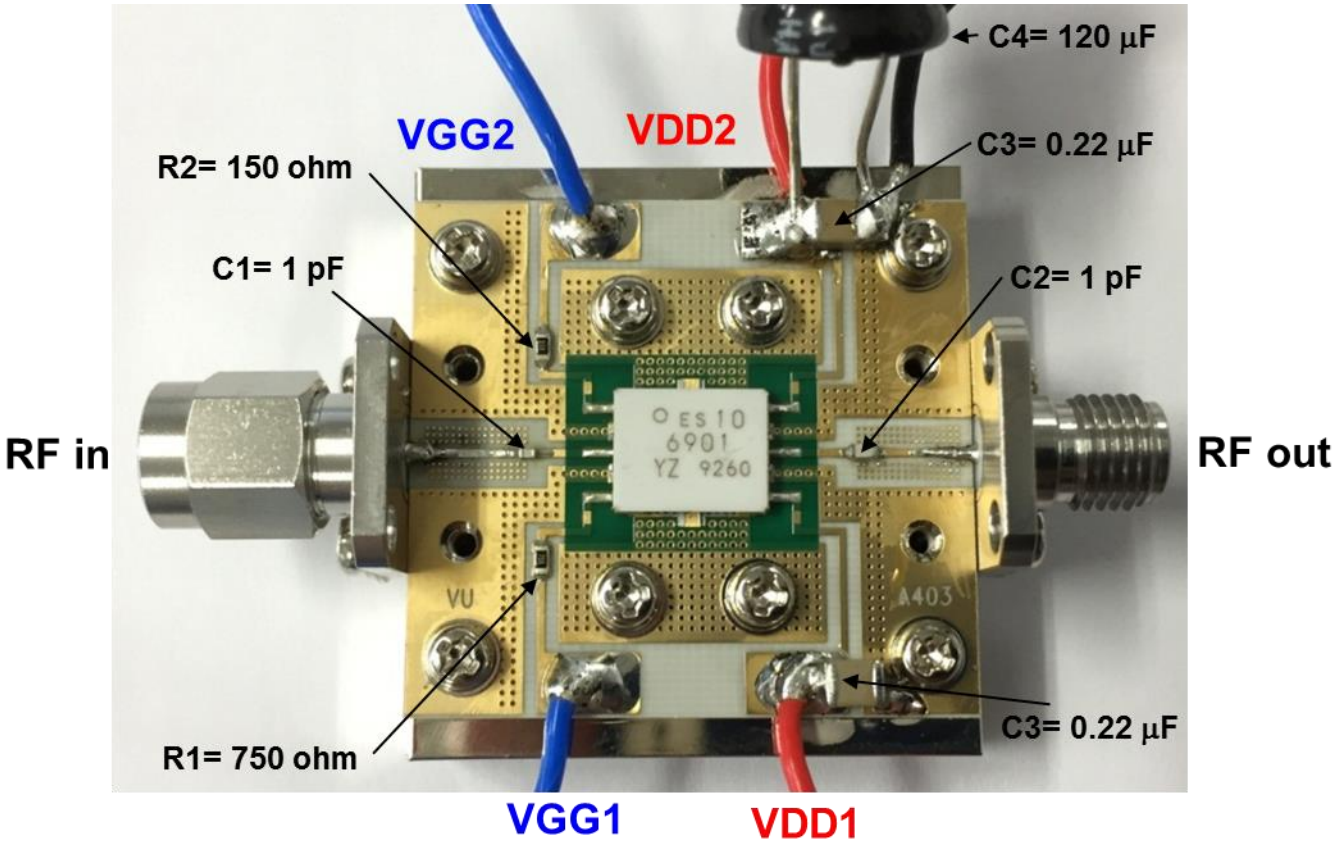
V_{DS}=50V, IDS(DC)=0.2A, PW=100μsec, Duty 10%

Figure 2. Power Added Efficiency vs Frequency

- **BLOCK DIAGRAM**



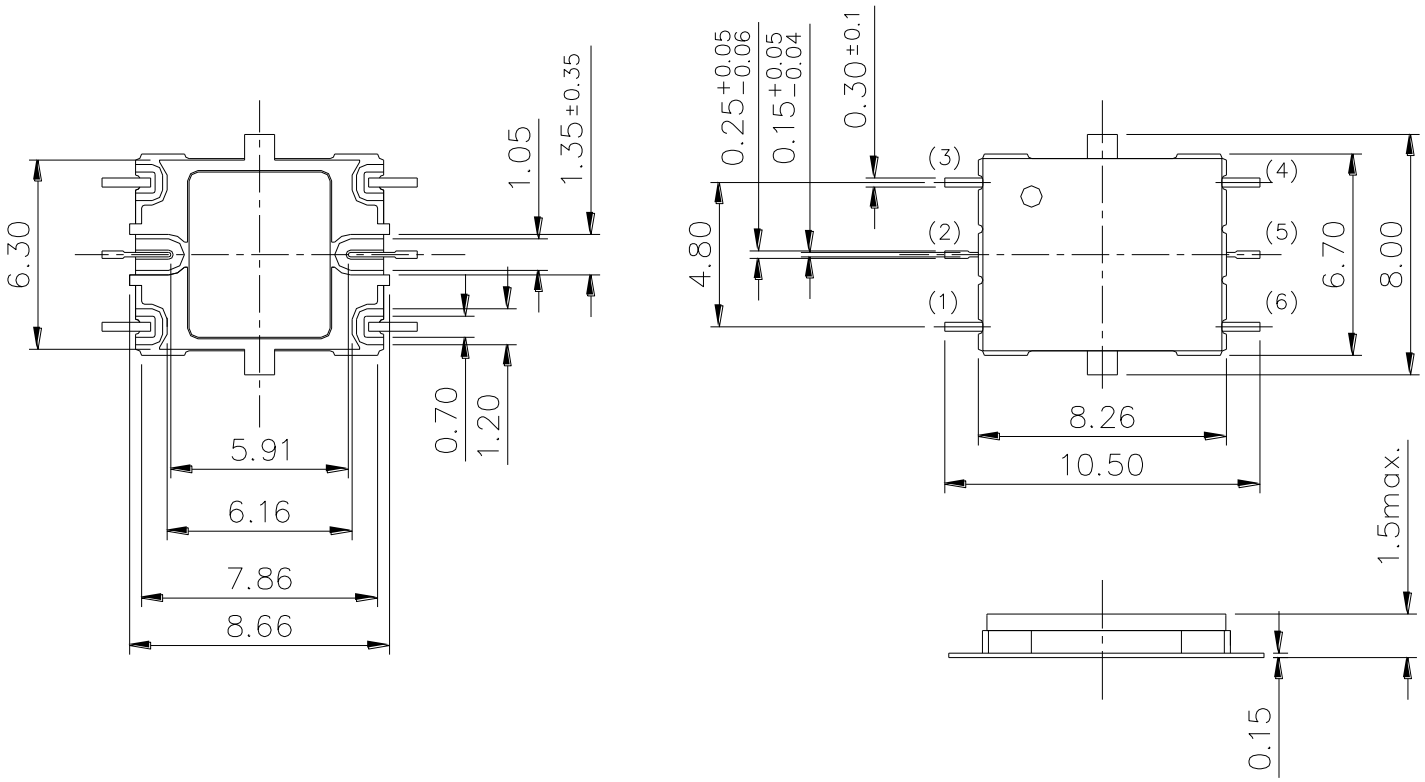
- **Evaluation Board**



Microchip Condencer	Type	Maker
C1= 1.0pF	GRM1552C1H1R0BA01D	muRata
C2= 1.0pF	GQM1884C2A1R0BB01B	muRata

- **Package Outline**

Case Style: VU



Tolerance : ±0.15
Unit : mm

PIN Assignments

1. VGG1
2. RF in
3. VGG2
4. VDD2
5. RF out
6. VDD1