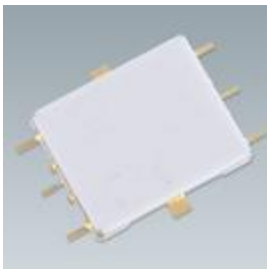
■ Features

- High Output Power: P_{sat}=47.5dBm (Typ.)
- High Gain: G_p=22.5dB (Typ.)
- Frequency Band: 9.2 to 9.5GHz
- Impedance Matched Zin/Zout = 50ohm
- Hermetically Sealed SMT Package



■ Description

The SGM6906VU is a 50ohm matched X-band 50W GaN-HEMT 2-stage module in a small hermetically sealed ceramic SMT package. The SGM6906VU provides optimum power and high gain for X-band applications.

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=360ohm 2nd stage Rg=75ohm	<=9.8 <=45.0	mA
Reverse Gate Current	I_{GR}	1st stage Rg=360ohm 2nd stage Rg=75ohm	>=-0.6 >=-2.6	mA
Channel Temperature	T_{ch}		<+200	deg.C
Pulse Width	PW	Duty=10%	<=100	µsec

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}=0.8mA	-	-4.5	-	V
	V_P (2nd stage)	V_{DS}=50V, I_{DS}=3mA	-	-4.5	-	V
Frequency Range	Freq	V_{DS}=50V $I_{DS(DC)1}$=40mA $I_{DS(DC)2}$=160mA Pulse Width=50µsec Duty=5% Pin=25dBm	9.2	-	9.5	GHz
Output Power	P_{sat}		46.4	47.5	-	dBm
Power Gain	G_p		21.4	22.5	-	dB
Drain Current	I_{DSR}		-	3.0	4.1	A
Power Added Efficiency	PAE		-	37	-	%

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

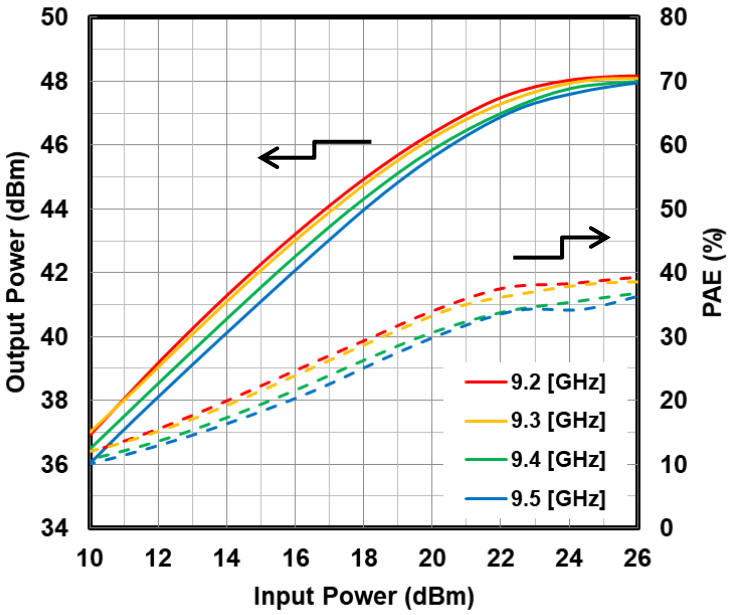
Note: **Based on ANSI/ESDA/JEDEC JS-001-2012(C=100pF, R=1.5kohm)**

ORDERING INFORMATION

Part Number	Order Unit	Packing
SGM6906VU	No limitation	48 pcs./Tray x 4 Tray = 192 pcs. / Packing
SGM6906VUT	500pcs.	500 pcs./Reel x 1 Reel = 500 pcs. / Packing

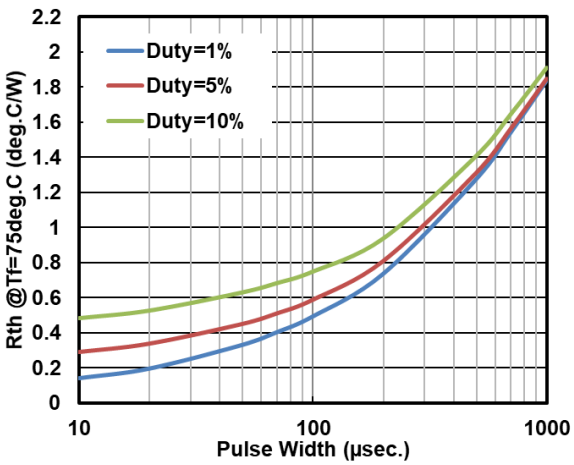
● RF Characteristics

Output Power, PAE vs. Input Power
V_{DS}=50V, V_{GS}=-2.75/-5.0V, $I_{DS(DC)1}$+$I_{DS(DC)2}$ =200mA, PW=50µsec., Duty=5%

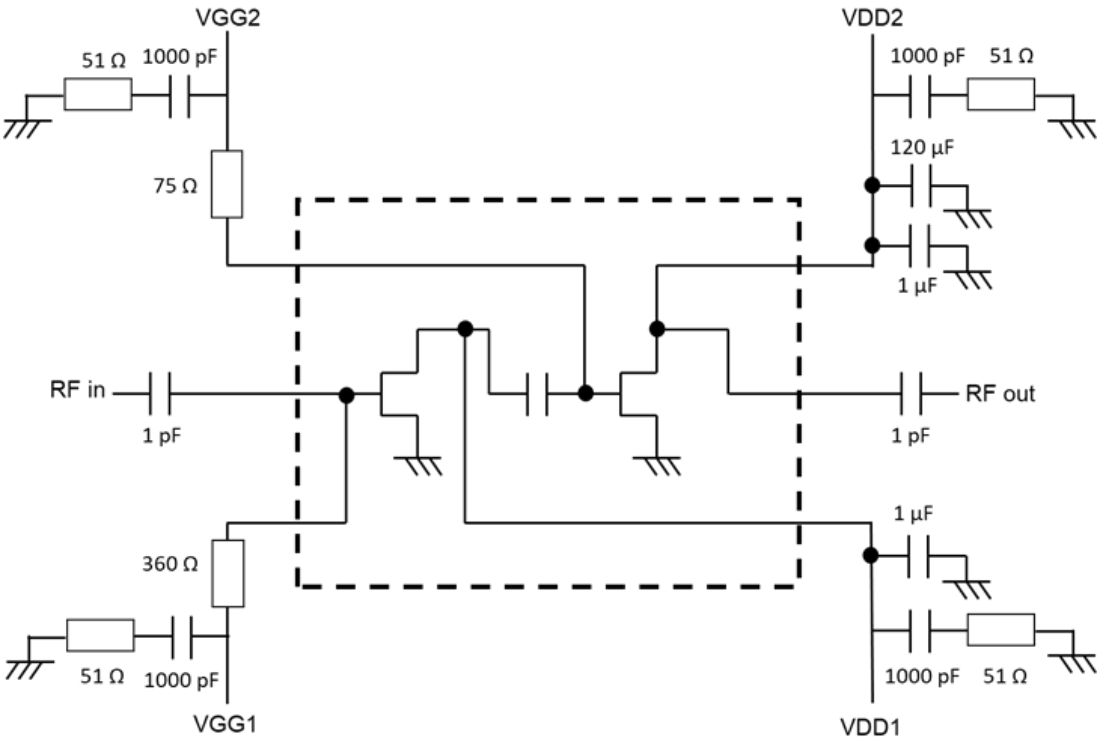


● Transient Thermal Resistanc

Rth vs. Pulse Width

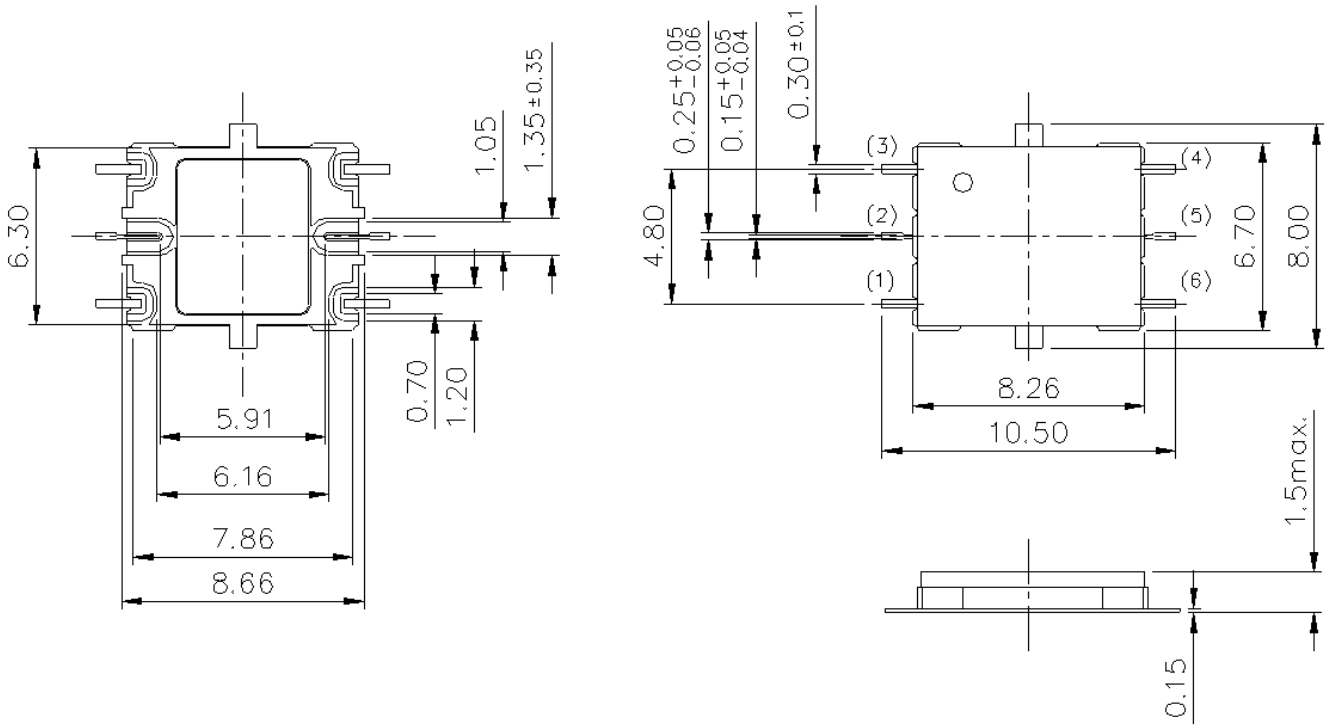


Block Diagram



- **Package Outline**

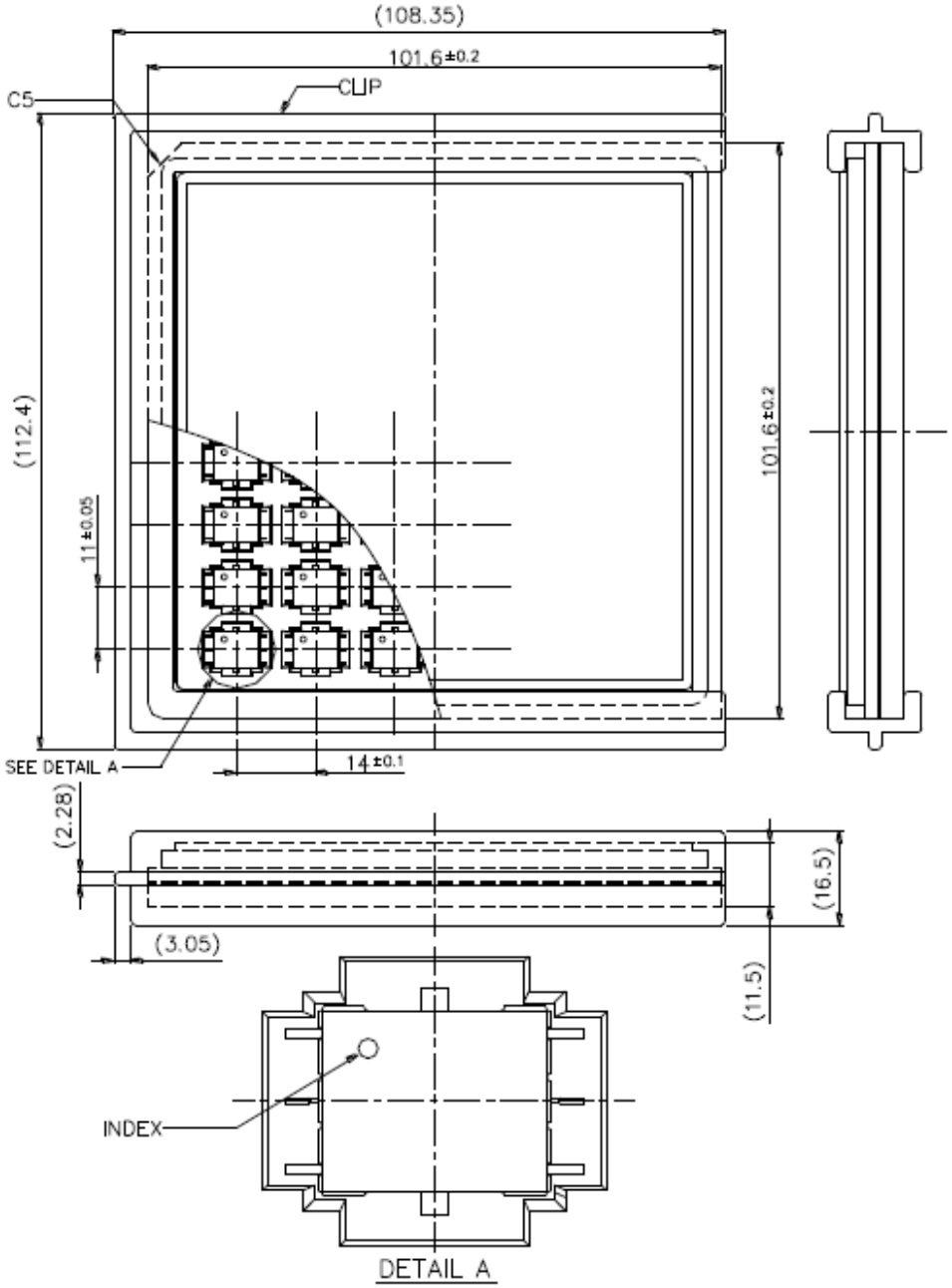
Case Style: VU



Tolerance : ±0.15
Unit : mm

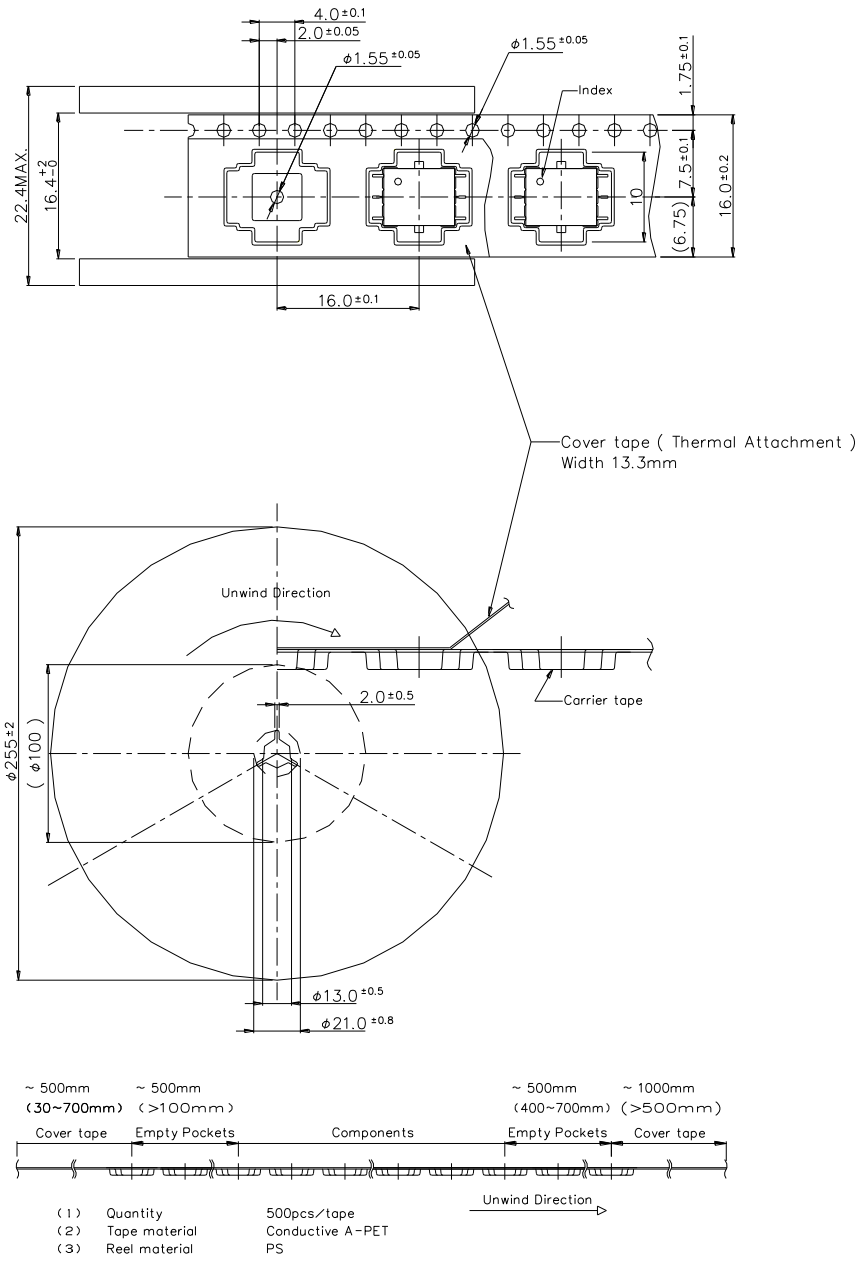
PIN Assignments
1. VGG1
2. RF in
3. VGG2
4. VDD2
5. RF out
6. VDD1

- **4-inch Tray Packing (Part No.: SGM6906VU)**



(1) Maximum Quantity : 48 pcs./Tray
(2) Tray Material : Conductive PS

● Tape and Reel Packing(Part No.: SGM6906VUT)



● Mounting Method of SMD(Surface Mount Devices) for Lead-free solder

Mounting Condition

(1) For soldering, Lead-free solder (Sn-3.0Ag-0.5Cu)*1 or equivalent shall be used.
(*1: The figure displays with weight %. A predominantly tin-rich alloy with 3.0% silver and 0.5% copper.)

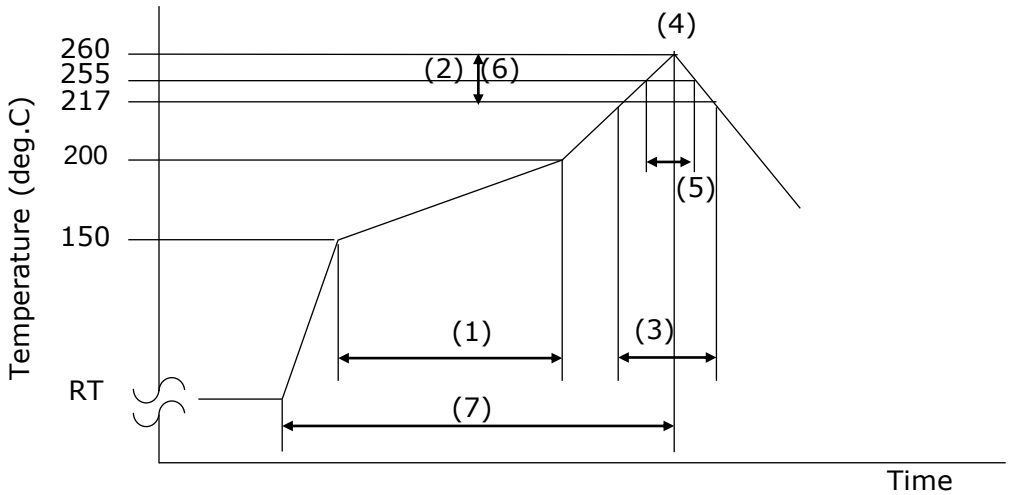
(2) A rosin type flux with a chlorine content of 0.2% or less shall be used. The rosin flux with low halogen content is recommended.

(3) When soldering, use one of the following time / temperature methods for acceptable solder joints. Make sure the devices have been properly prepared with flux prior soldering.

*** Reflow soldering method (Infrared reflow / Heat circulation reflow / Hot plate reflow):**

Limit solder to 3 reflow cycles because resin is used in the modules manufacturing process. Excessive reflow cycles will effect the resin resulting in a potential failure or latent defect. The recommended reflow temperature profile is shown below. The temperature of the reflow profile must be measured at the device body surface.

Reflow temperature profile and condition:



(1) Preheating:	150 to 200 deg.C, 60 to 120 seconds
(2) Ramp-up Rate:	3 deg.C /seconds max
(3) Liquidus temperature and time:	217 deg.C, 60 to 150 seconds
(4) Peak Temperature:	260 deg.C
(5) Time Peak Temperature:	255deg.C, 30seconds max
(6) Ramp-down Rate:	6 deg.C /seconds max
(7) Time RT to peak temperature:	8 minutes max

* Measurement point: Center of the package body surface

(4) The above-recommended conditions were confirmed using the manufacture's equipment and materials. However, when soldering these products, the soldering condition should be verified by customer using their equipment and materials.

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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