

INS3112

2500-6000MHz 10W Broadband GaN Power Amplifier



Description

The Model INS3112 is a high power, class AB solid state amplifier which utilizes the latest GaN Technology to offer broadband performance from 2500 to 6000MHz. Inspower’s ISO9001 quality management system assures consistent performance and highest reliability.

Product Features

- 50Ω RF impedance, Fully Integrated Matching
- 10W Output
- Single Supply Operation: Nominally 24V
- Built-in monitoring functions
- High reliability and ruggedness

Electrical Specifications @ +24.0VDC, 25°C, 50Ω System

Symbol	Parameter	Unit	Min.	Typ.	Max.
BW	Operating Frequency	MHz	2500		6000
P _{SAT}	Power Output Saturated	Watt	10	15	
P _{1dB}	Power Output P1dB	Watt		8	
G _{1dB}	Power Gain	dB	40		
P _{IN}	Input Power for Rated P _{SAT}	dBm		0	3
ΔG _{SS}	Small Signal Gain Flatness	dB			±4.0
ΔG _P	Power Gain Flatness	dB			±2.0
VVA	Gain Adjustment Range			25	
S11	Input Return Loss	dB			-10
NF	Noise Figure	dB			10
IP ₃	Third Order Intercept Point 2-Tone@ 28dBm/Tone, 100KHz Spacing	dBm		+45	
H	Harmonics @Pout= 10W	dB		-20	
Spur	Spurious Signal	dBc		-70	-60
V _{DC}	Operation Voltage	Volt	24.0	28.0	30.0
I _{DD}	Current Consumption @Pout=10W	Amp		2	3.0
I _{EQ}	Quiescent Current	Amp		1	
I _{SQ}	Current Consumption @Shutdown	mA			200
T _{ON/OFF}	Switching Time	uSec		2	5

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Mechanical Specification

Parameters	Value	Limit	Unit
Dimension (W × D × H)	152.4 * 76.2 * 25.4 (6 * 3 * 1)	-	mm (inch)
RF Connector Input/output	SMA Female	-	-
DC Interface Connector	D-Sub 9pin Male	-	-
Weight	500	Max	gram
Cooling	External Heat-sink	-	-

Environmental Characteristics

Parameters	Specifications	Remark
Operating Case Temperature Range	-40°C to +80°C	
Storage Temperature	-40°C to +85°C	
Relative Humidity non-condensing	95%	

Protection

Item	Specifications for Activation	Remark
Input Overdrive	+10dBm Max	
Load VSWR	∞: 1	
Thermal Degradation	85°C Min	

I/O Interface (D-sub 9pin Male)

Pin No	Pin Description	Specifications	Remark
1	NC	Not Connected	
2	Current Monitor	Analog Voltage Relative to IDD @ 50mV/100mA	
3	Temp Monitor	Vout=10mV/°C×Temp+500mV	
4	VVA	Control voltage range: 0-3.6VDC Maximum Gain: 0VDC, Minimum Gain: 3.6VDC	
5	Shutdown	Enable: TTL "0" or Open Disable: TTL "1" = 3.3-5V	
6	VDD	+28VDC	
7	VDD	+28VDC	
8	GND	Ground	
9	GND	Ground	

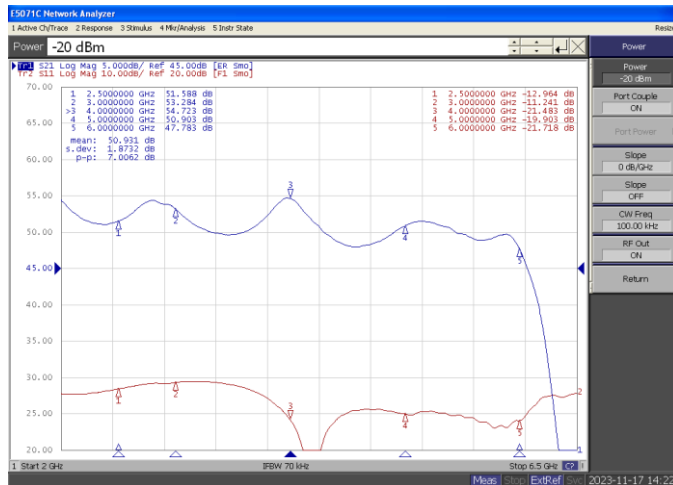
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Typical Characteristics @ +28VDC, 25°C

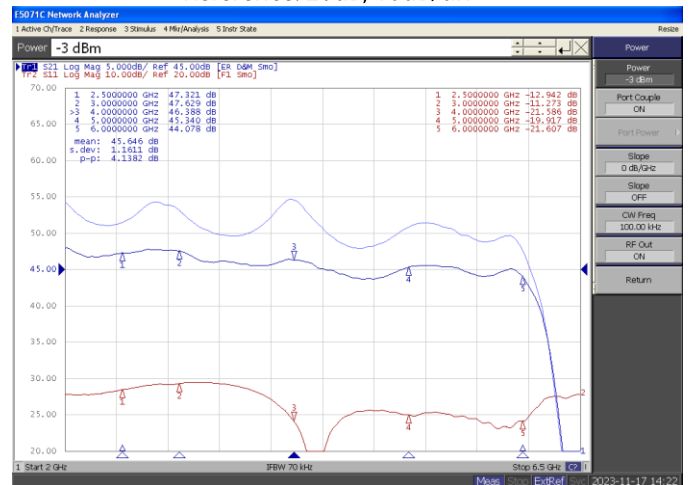
Plot 1 – Small Signal Gain

Top Curve: Small Signal Gain @ $P_{in} = -20\text{dBm}$
Reference: 45dB, 5dB/div
Bottom Curve: Input Return Loss
Reference: 20dB, 20dB/div



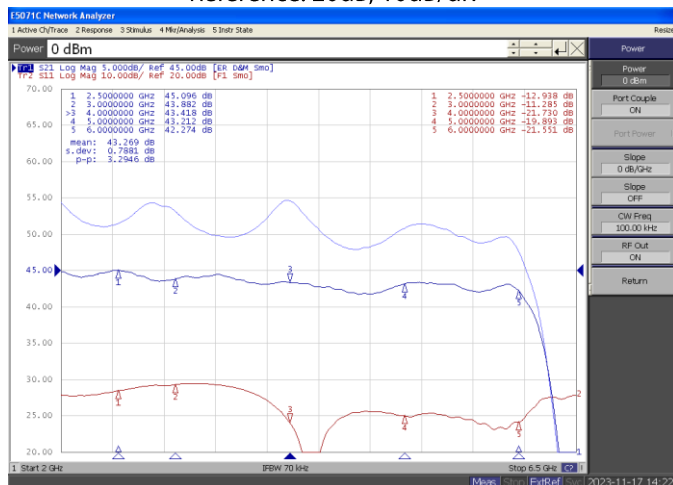
Plot 2 – Small Signal Gain & P_{SAT}

Top Curve: Small Signal Gain @ $P_{in} = -20\text{dBm}$
Middle Curve: Power Gain @ P_{SAT} , $P_{in} = -3\text{dBm}$
Reference: 45dB, 5dB/div
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div



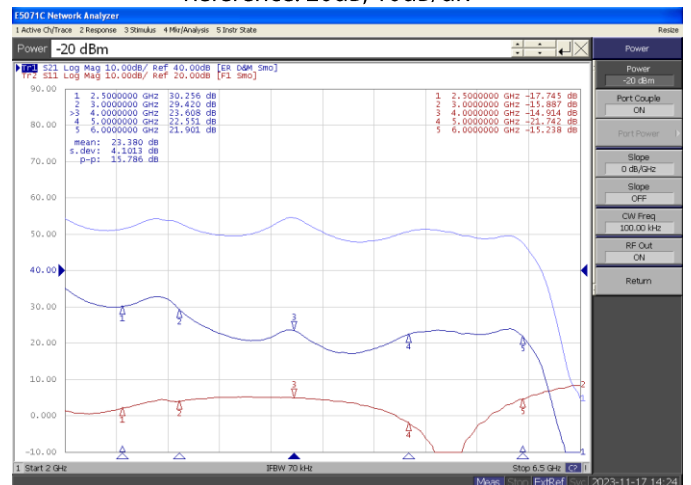
Plot 3 – Small Signal Gain & P_{SAT}

Top Curve: Small Signal Gain @ $P_{in} = -20\text{dBm}$
Middle Curve: Power Gain @ P_{SAT} , $P_{in} = 0\text{dBm}$
Reference: 45dB, 5dB/div
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div



Plot 4 – Small Signal Gain & P_{SAT}

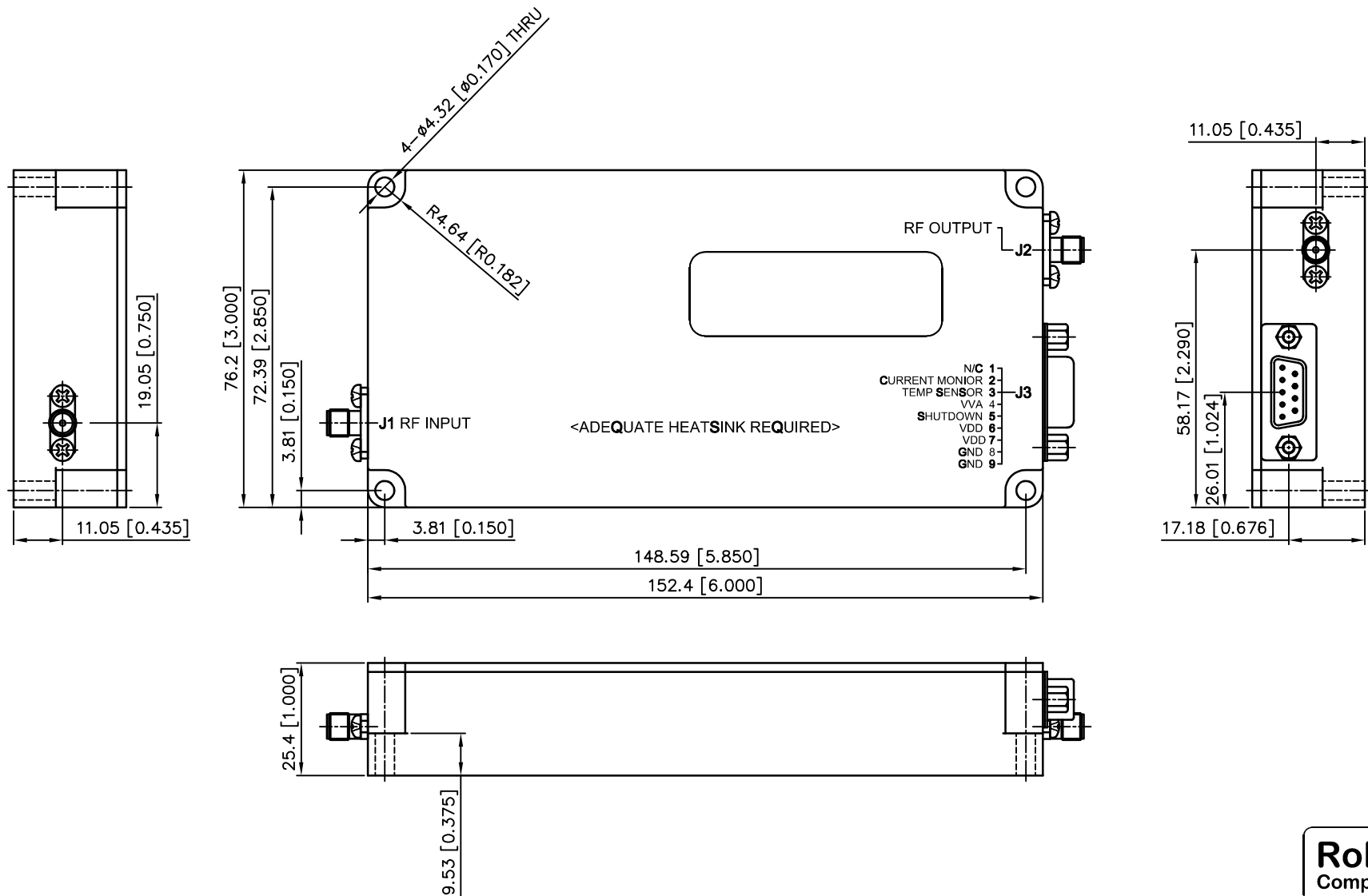
Top Curve: Max. Gain @ $V_{A_CTRL} = 0\text{V}$, $P_{in} = -20\text{dBm}$
Middle Curve: Min. Gain @ $V_{A_CTRL} = 3.6\text{V}$, $P_{in} = -20\text{dBm}$
Reference: 40dB, 10dB/div
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div



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APPROVED	MATERIAL		PART NAME	
	FINISH		OUTSIDE DRAWING	
CHECKED	THIRD ANGLE PROJECTION		SIZE	DWG NO.
			A3	UNIT: mm[INCH]
DESIGNED	MODEL/TITLE		SCALE: CAD=1/1 PLOT=N/S	
	INS3112		Q'TY:	
S.K.KIM 2023.06.08				