

INS2180

400-440MHz 200W Power Amplifier

Description

The Model INS2180 is designed for band specific applications. This high power, solid state amplifier utilizes LDMOS power devices to offer excellent efficiency and linearity characteristics from 400 to 440MHz. Inspower's ISO9001 quality management system assures consistent performance and highest reliability.

Product Features

- 50Ω RF Impedance, Fully Integrated Matching
- 200W Minimum Saturated Output Power
- Single Supply Operation: Nominally 32Vdc
- Output VSWR Protection, High Temp Protection
- High reliability and ruggedness

Electrical Specifications @ +32.0VDC, 25°C, 50Ω System

Symbol	Parameter	Unit	Min.	Typ.	Max.
BW	Frequency of Operation	MHz	400		440
PSAT	Power Output Saturated	Watt	200	230	
P1	Power Output P1dB	Watt		160	
PG	Power Gain@ Pin=0dBm	dB	53		
PIN	Input Power for Rated Psat	dBm		0	3
ΔGSS	Small Signal Gain Flatness	dB			±2.0
ΔGP	Power Gain Flatness	dB			±1.0
S11/S22	Input & output VSWR	-			1.5:1
ΔGTEMP	Gain variation with temperature	dB		±1.0	
IMD	Third Order Intermodulation Distortion 2- Tone@ 44dBm/Tone, 2MHz Spacing	dBc		-25	-18
H	Harmonics @ Pout=200W	dBc		-40	-35
SPUR	Spurious Signal	dBc			-60
VDC	Operation Voltage	Volt	26	32	34
IDQ	Quiescent Current	Amp		0.8	1.2
IDD	Current Consumption @ Pout=200W	Amp		15	17

Mechanical Specifications

Parameters	Value	Unit
Dimensions (W x D x H)	190 x 155 x 28	mm
RF Connector Input/output	SMA Female/ N-Type Female	
DC Interface Connector	D-Sub Hybrid 7W2@ Male, 4-40 Screw	
Weight	1.5	Kg

Environmental Characteristics

Parameters	Specifications	Remark
Operating Case Temperature Range	-30°C to +80°C	
Storage Temperature Range	-40°C to +85°C	
Operating Humidity	95% non-condensing	
Cooling	External Heat-Sink	

Protection

Item	Specifications	Remark
Input Overdrive Level	+5dBm Max	Max
VSWR Shutdown	3:1 Max (Return Loss=6dB)	
VSWR Shutdown Threshold	Threshold 45dBm min	
Thermal Overload	+90 °C ±5 °C Shutdown, +70 °C ±5 °C Auto-recover	

I/O Interface (D-sub, Hybrid 7W2, Male)

Pin No	Pin Description	Specifications
1	Forward Power Monitor	RMS Detector. Vout=2.0V±0.05V@53dBm, Slope: 50mV/dB
2	Reverse Power Monitor	RMS Detector. Vout=2.0V±0.05V@53dBm, Slope: 50mV/dB
3	VSWR Fail Alarm	High +5V TTL Output when VSWR reached 3:1
4	Over Temp Alarm	High +5V TTL Output @Case Temperature +90°C±5.0 Auto Restart @ Case Temperature +70°C±5.0
5	Enable/Disable	Enable: Active Low (GND) Disable: High +5V or Open status *Pulled-up @ 5V with 10k ohm
A1	VDD	+32VDC
A2	GND	Ground

Typical Characteristics @ 25°C

Operating Voltage: +32VDC

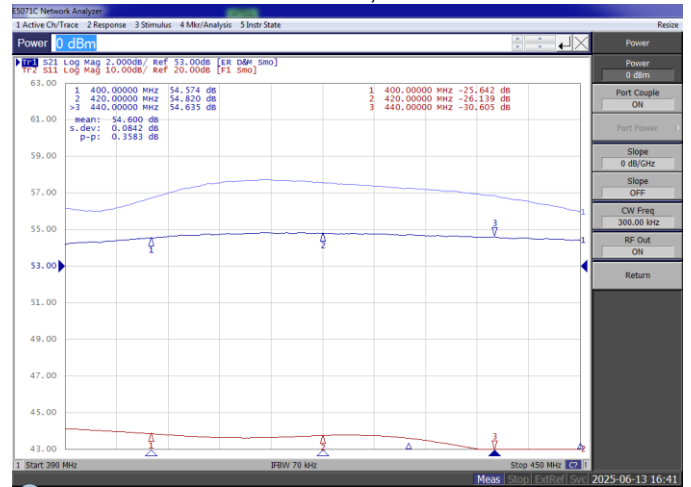
Plot 1 – Small Signal Gain

Top Curve: Small Signal Gain @ Pin= -20dBm
Reference: 53dB, 2dB/div
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div



Plot 2 – Small Signal Gain & P_{SAT}

Top Curve: Small Signal Gain @ Pin= -20dBm
Middle Curve: Power Gain @ P_{SAT}, Pin= 0dBm
Reference: 53dB, 2dB/div
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div



Operating Voltage: +28VDC

Plot 1 – Small Signal Gain

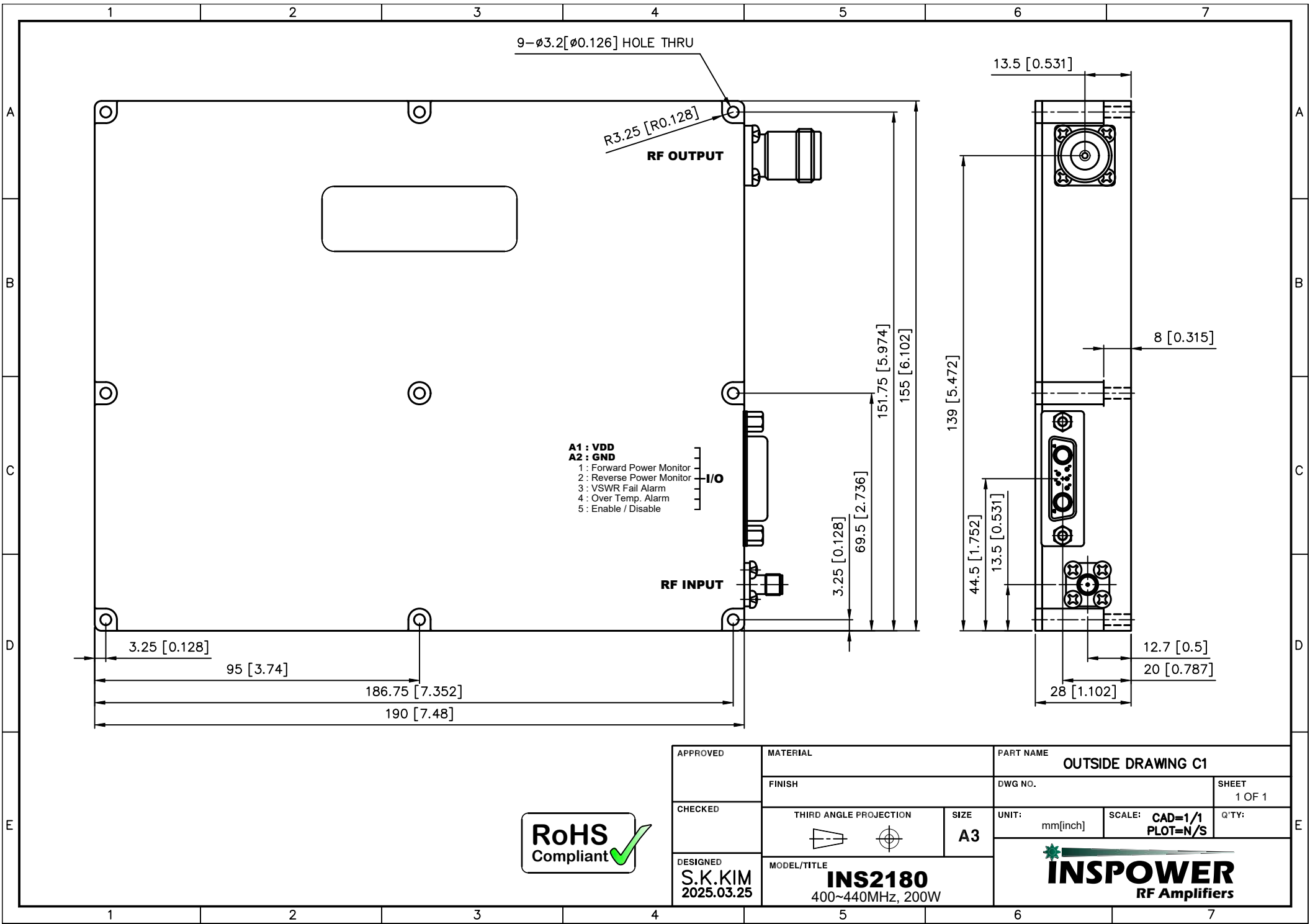
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Top Curve: Small Signal Gain @ Pin= -20dBm
Middle Curve: Power Gain @ P_{SAT}, Pin= 0dBm
Reference: 53dB, 2dB/div
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Reference: 20dB, 10dB/div





APPROVED	MATERIAL		PART NAME	
	FINISH		OUTSIDE DRAWING C1	
CHECKED	THIRD ANGLE PROJECTION		DWG NO.	SHEET
	A3		UNIT: mm[inch]	1 OF 1
DESIGNED	MODEL/TITLE		SCALE: CAD=1/1 PLOT=N/S	Q'TY:
S.K.KIM 2025.03.25	INS2180 400~440MHz, 200W		INSPOWER RF Amplifiers	