

### Description

The Model INS2181 is designed for band specific applications. This high power, solid state amplifier utilizes LDMOS power devices to offer excellent efficiency and linearity characteristics from 890 to 1000MHz. 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  | 890  |      | 1000  |
| 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<br>2- Tone@ 44dBm/Tone, 2MHz Spacing | dBc  |      | -25  | -18   |
| H       | Harmonics@ Pout=200W                                                        | dBc  |      | -45  | -40   |
| SPUR    | Spurious Signal                                                             | dBc  |      |      | -60   |
| VDC     | Operation Voltage                                                           | Volt | 26   | 32   | 34    |
| IDQ     | Quiescent Current                                                           | Amp  |      | 2    | 2.5   |
| IDD     | Current Consumption@ Pout=200W                                              | Amp  |      | 20   | 24    |

### 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.<br>Vout=2.0V±0.05V@53dBm, Slope: 50mV/dB                                       |
| 2      | Reverse Power Monitor | RMS Detector.<br>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<br>Auto Restart @ Case Temperature +70°C±5.0 |
| 5      | Enable/Disable        | Enable: Active Low (GND)<br>Disable: High +5V or Open status<br>*Pulled-up @ 5V with 10k ohm |
| A1     | VDD                   | +32VDC                                                                                       |
| A2     | GND                   | Ground                                                                                       |

### Typical Characteristics @ 25°C

#### Operating Voltage: +32VDC

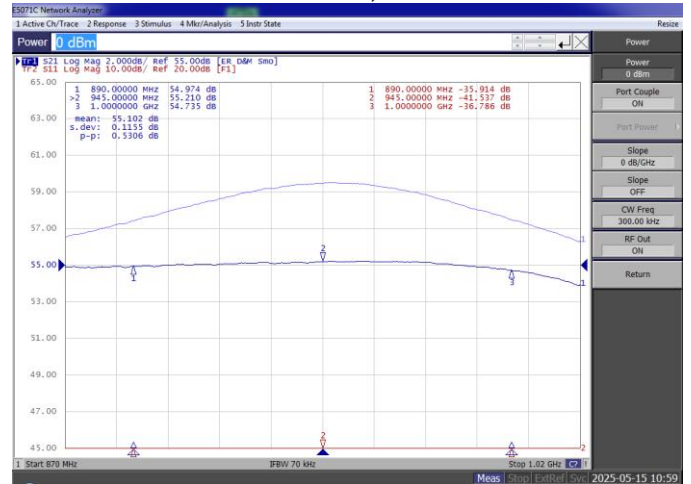
##### Plot 1 – Small Signal Gain

Top Curve: Small Signal Gain @ Pin= -20dBm  
Reference: 55dB, 2dB/div  
Bottom Curve: Input Return Loss  
Reference: 20dB, 10dB/div



##### Plot 2 – Small Signal Gain & P<sub>SAT</sub>

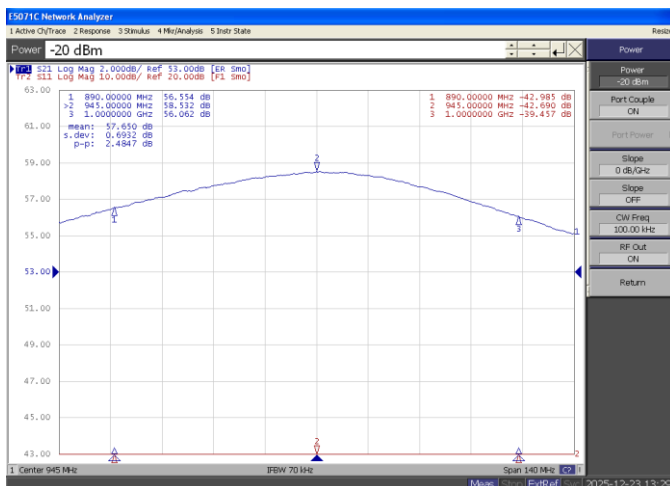
Top Curve: Small Signal Gain @ Pin= -20dBm  
Middle Curve: Power Gain @ P<sub>SAT</sub>, Pin= 0dBm  
Reference: 55dB, 2dB/div  
Bottom Curve: Input Return Loss  
Reference: 20dB, 10dB/div



#### Operating Voltage: +28VDC

##### 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<sub>SAT</sub>

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



