

S-BAND SOLID STATE POWER AMPLIFIER (SSPA)

Highly Efficient and Reliable Power Amplifier

Features

- 8.3 watts typical output power
- 2.2 - 2.3 GHz frequency range
- Built-in DC-DC converter and regulators
- 22 - 36v input voltage
- High power-added efficiency (27%)
- Fully space qualified and radiation tolerant
- Electromagnetic compatibility (EMC) performance qualified to MIL-STD-461C
- Output power telemetry (TLM) (optional)
- System power toggle (optional)
- Current limiting (optional)

Benefits

Gallium arsenide (GaAs) power Monolithic Microwave Integrated Circuit (MMIC) technology improves the system's size, weight and power (SWAP) ratio, providing:

- High efficiency
- High reliability
- Small size
- Low mass



General Dynamics' space-qualified, S-Band Solid State Power Amplifier (SSPA) offers highly efficient and reliable power amplification and features an internal DC-DC power converter and voltage regulator. Operating over the 2.2 to 2.3 GHz frequency range, the SSPA serves as a companion unit to General Dynamics' Multi-Mode Standard Transponder (MST) or operates as a stand-alone power amplifier.

The General Dynamics Radio Frequency (RF) amplifier design represents the culmination of a 50-year heritage of trusted space flight performance. This design offers lower risk and development time, improving time to mission and reducing overall lifecycle cost.

This system features a DC-DC power converter and regulator designed to the unique specifications of the SSPA. Our SSPA provides analog telemetry signals operating in compression, maximizing efficiency for constant envelope modulation. The system also uses an Automatic Level Control (ALC) to maintain RF output power over temperature.

As a certified CMMI Level-3 provider, General Dynamics designs and manufactures high reliability space electronics designed to support any space mission. Our currently deployed 8W SSPA systems perform flawlessly in support of programs, including the Lunar Reconnaissance Orbiter (LRO), Global Precipitation Measurement (GPM), Landsat Data Continuity Mission (LDCM) and Communications, Navigation and Networking Re-Configurable testbed (CoNNeCT).

S-Band Solid State Power Amplifier

8.3 Watts output, 2.2 - 2.3 GHz

Performance Characteristics

Radio Frequency (RF)

- Output Power: > 7 Watts (8.3 Watts typical)
- Output Power Variation: ± 0.25 dB over any 50 MHz band
- Input Power: $+ 8 \pm 3$ dBm or $+ 11 \pm 3$ dBm (selected at manufacture)
- Input/Output Impedance: 50 ohms
- Input/VSWR: 1.5:1 maximum/output VSWR: 1.22:1 maximum
- Source/Load VSWR: 1.5:1 maximum
- Output Protection: No damage, any VSWR, any phase
- Spurious Outputs: < 60 dBc
- Harmonic Outputs: < 30 dBc
- RF Breakdown Margin: > 6 dB @ VSWR of < 10:1, any phase

User Interface

- RF Input: SMA
- RF Output: SMA
- DC Power/TLM: 15-Socket Sub-D On/off Command: NDL-Triax (7mA current loop)

Input Power

- Operating Voltage: 22 to 36 VDC
- Over/Under Voltage: 0 to +22, +36 to + 40 Vdc, no damage
- Power: 37 Watts max (31 Watts nominal)
- Isolation to Chassis: 1 to 100 megohms
- Inrush Current Limiter

General

- Maximum Dimensions: 6.85" L x 7.3" W x 1.4" H, including mounting feet
- Mass: 4.35 lbs. (1.98 kg)
- Flight Temperature: -34°C to +66°C
- Vibration: 25 Grms
- Pyrotechnic Shock: 2500 G
- Altitude: Sea level to vacuum
- Radiation : to 100 krads (Si)

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