ERF-SFFPA-0001

100W 20MHZ TO 520MHZ

ANTARES
DEFENCE SYSTEMS

The ERF-SFFPA-0001 is a solid-state, Class AB broadband power amplifier module based on advanced GaN HEMT technology. The ERF-SFFPA-0001 is ideal for pulsed or CW applications, offering exceptional performance and functionality in a small and lightweight form factor. The design employs proprietary matching networks and combining techniques that ensure optimum performance at low cost. Advanced and unique features are accessible via an FPGA-based serial interface. The module primary functions may also be controlled using the discrete I/O interface.

PRODUCT FEATURES

- Small Form Factor (180 x 90 x 16 mm): Half the Height and Volume Compared with Competing Models
- Exceptional Bandwidth, Output Power and Efficiency
- Ultra-Fast and Effective Mute Function
- Comprehensive Built-In Test, Telemetry and Protection
- High-Resolution Gain Control
- Supports Internally-Stored Calibration Look-Up Tables
- High Reliability and Ruggedness
- Innovative Space-Saving Connector System

TYPICAL APPLICATIONS

The ERF-SFFPA-0001 is ideal for:

- Electronic Warfare/Countermeasures
- Broadband Mobile Jamming Applications
- Airborne, Aircraft and UAV Equipment
- Power Amplifier Stage for Wireless Infrastructure
- Test and Measurement Equipment
- General Purpose Broadband Transmitter Amplification

ELECTRICAL CHARACTERISTICS

TC = +25 °C, 28 VDC, 50 Ω System (unless otherwise noted)

PARAMETER	MIN	TYP	MAX	UNITS
Operating Frequency Range	20		520	MHz
Rated Output Power CW (ROP)		50		dBm
Saturated Output Power (Psat)	50 [1]	51	52	dBm
Power-Added Efficiency @ ROP	45	50		%
Small Signal Gain	53		57	dB
Input Return Loss	15			dB
Output Return Loss	10			dB
Input Power @ ROP	-5		2	dBm
Input Power @ Psat			5	dBm
Noise Figure			15	dB
Output Third-Order Intercept Point	55			dBm
Second Harmonic Emissions			-14	dBc
Third Harmonic Emissions			-11	dBc
Higher Harmonic Emissions			-20	dBc
Non-Harmonic Spurious Emissions			-65	dBc
DC Supply Voltage		28		V
Current Consumption			9.6	A
Mute / Enable Mode Switching Characteristics:				
tenable, tmute (50% CTRL to 10/90% RF)		700	1000	ns
Isolation in Mute Mode	80			dB
Output Noise Floor in Mute Mode [2]		-165		dBm/Hz
Current Consumption in Mute Mode		250		mA
Gain Control Characteristics:				
Adjustment Range		31		dB
Adjustment Resolution		0.5		dB

[1] TC = 85 °C. [2] Assumes noise floor at input ≤-144 dBm/Hz.

CONTROL CHARACTERISTICS AND ADVANCED FEATURES [3]

PARAMETER	VALUE
Ultra-Fast Mute/Enable Switching	Control via discrete input Additional control via serial comms interface
Serial Communications Interface (High Noise Immunity)	2-wire serial interface required to access advanced features Interface: RS-485 Half Duplex Data Rate: 1 Mbps
High-Resolution Power/Gain Control	Control via serial comms interface
User Memory	16 MB (128 Mbit) serial flash memory Supports multiple calibration tables or user-specific data Control via serial comms interface
Built-In Test Functions	Power-on BIT (PBIT) Continuous BIT (CBIT) Initiated BIT (IBIT) All BIT data is accessible via the serial comms interface
Temperature BIT	Baseplate and Core temperatures monitored Range: -40 °C to +125 °C Accuracy: ±3 °C
Voltage BIT	All critical voltage rails monitored Accuracy: ±5 %
Current BIT	Critical device currents and total input current monitored Accuracy: ±5 %
Memory Integrity BIT	CRC checking of User Settings and Factory Settings
Alarm Output	Discrete output Logical OR status of individual BIT flags Behaviour may be modified or disabled via serial comms interface
Elapsed On-Time Recorder	34 years of total (power-on) time accumulation 17-Bit power-up event counter
Electronic Identification Data (Non-Volatile)	Part number Serial number Revision
Thermal Overload Protection	Set Threshold: +90 °C Clear Threshold: +82 °C
Additional Features	DC supply reverse polarity protection Control interface ESD protection Shutdown function

[3] Control Interface is described fully in the Interface Control Document for SFF PA Module (Doc. No. 01-000-0004-01). Please contact Antares for details.

MECHANICAL CHARACTERISTICS

PARAMETER	VALUE	UNITS
Dimensions (excluding RF connectors)	180 x 90 x 16	mm
Mass	520 ±20	g
RF In / Out Connectors	SMA Female	-
DC In / Control Connector [4]	Mixed Technology Male: 2 Power + 8 Signal	-
Cooling Method	External Heatsink to Baseplate (Not Supplied)	-

[4] Please contact Antares for connector specifics.

ENVIRONMENTAL CHARACTERISTICS

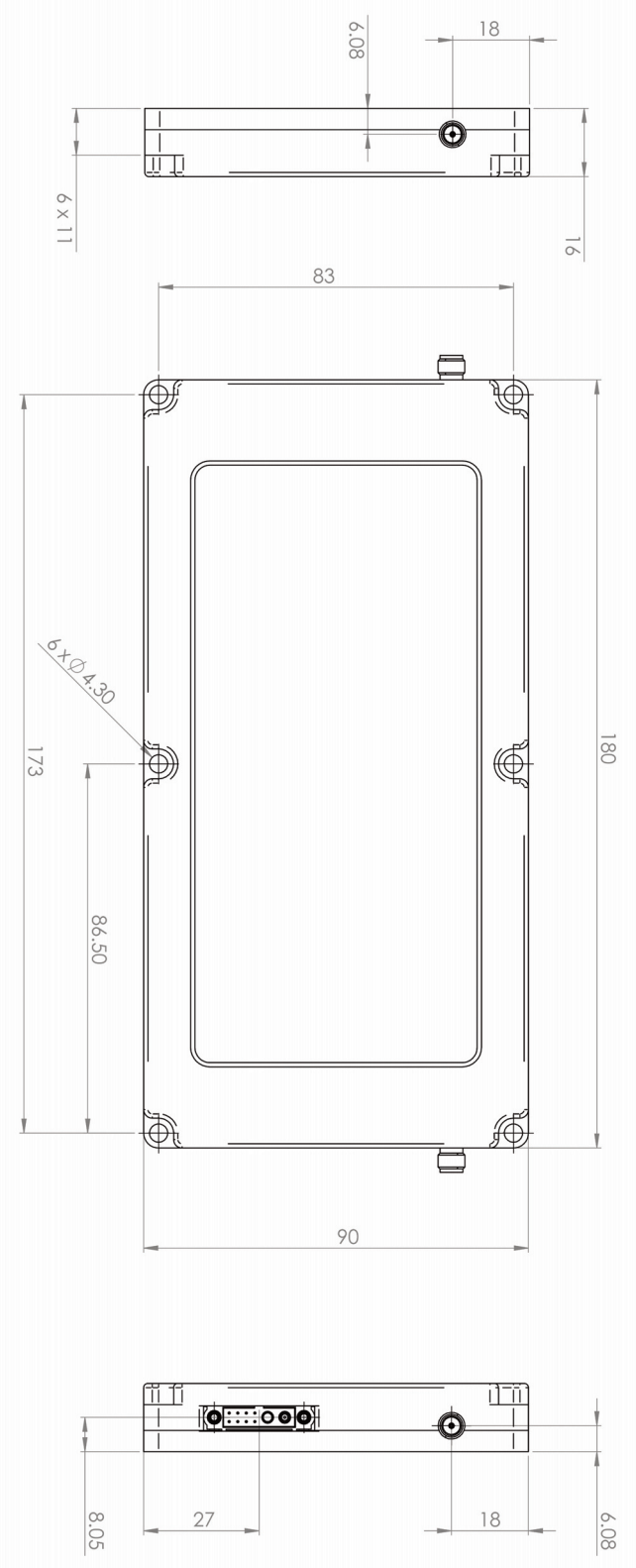
PARAMETER	MIN	TYP	MAX	UNITS
Case or Baseplate Temperature	-40		+85	°C
Relative Humidity (non-condensing)			95	%
Ingress Protection		IP51		-

ABSOLUTE MAXIMUM RATINGS (Not simultaneous)

RF Input Power	+15 dBm
RF Output Mismatch	VSWR ∞:1 at all phase angles (for 1 minute)
Case or Baseplate Temperature (Operating)	-40 °C to +85 °C
Case or Baseplate Temperature (Non-Operating)	-40 °C to +100 °C
DC Supply Voltage (DC IN+ to GND)	24 V to 32 V
Control Interface (I/O and RS485-HD to GND)	-0.5 V to 5.5 V
Mute / Enable Mode Switching Frequency	100 kHz
ESD Sensitivity	HBM Class 1A

Exceeding maximum ratings may cause permanent damage. Operation between operating range maximum and absolute maximum for extended periods may reduce device reliability. Absolute maximum ratings are stress figures only and functional operation under these conditions is not implied.

OUTLINE DIMENSIONED DRAWING: (in millimetres)



ESD PRECAUTIONS

Although this product contains circuitry to protect it from damage due to ESD, when handling this product observe the same precautions as with any other ESD-sensitive device.

RoHS COMPLIANCE

RoHS compliant parts and processes are used in the manufacture of this product.

QUALITY

This product is designed and manufactured in the United Kingdom in accordance with the ISO 9001:2008 Quality Management System.

ORDERING INFORMATION

MODEL NAME	PART NUMBER	FINISH
ERF-SFFPA-0001	10-000-0001-01	Iridite TM NCP

REVISION HISTORY

REVISION	DATE	CHANGE DESCRIPTION	ECN
A	-	-	-