Fairview Microwave
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SPA-025-43-10-SMA DATA SHEET

43 dB Gain High Power GaN Amplifier at 10 Watt Psat Operating from 30 MHz to 2.5 GHz with SMA

The SPA-025-43-10-SMA is a 10W Class AB, High Gain GaN Linear Power Amplifier operating in the 0.03 to 2.5 GHz frequency range. The amplifier offers high linear transmit power with superior EVM performance. It's capable of supporting any signal type and modulation format, including but not limited to 3-4G telecom, WLAN, OFDM, DVB, and CW/AM/FM. The latest device technologies and design methods are employed to offer high power density, efficiency, and linearity in a small, lightweight package. The amplifier has a Wide Dynamic Range with impressive typical performance including 40 dBm Psat, 43 dB small signal gain, and +/- 2 dB gain flatness. The driver amplifier has a built-in voltage regulation with a versatile DC Supply of +9V to +36V and is unconditionally stable. Other desirable features include bias sequencing, and reverse bias protection for added reliability. The amplifier operates over the temperature range of -20°C and +80°C. An available heatsink (FMAMG5011) is recommended to maintain an optimum baseplate temperature during operation.

Electrical Specifications

(TA = +25°C)

Description	Min	Typ	Max	Unit
Frequency Range	0.03		2.5	GHz
Small Signal Gain		43		dB
Gain Flatness			±2	dB
Input Power (CW)			+12	dBm
Psat	+36	+40		dBm
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input Return Loss	-12	-14		dB
Switching Speed for On/Off Switch Gate		1	2	uS
TTL Control	"1": On, "0": Off, Enable: 5V, Disable: 0V			
Operating DC Voltage	+9	+28	+32	Volts
Operating DC Current		1.2		A
Quiescent Current Bias		200		mA
Operating Temperature Range	-20		+80	°C

Electrical Specification Notes:
1.) Gain flatness recorded represents a peak-to-peak measurement across the entire operating band. Gain Flatness is typically much lower across significant portions of this band.
2.) SPA-025-43-10-SMA power amplifier can handle a maximum output mismatch or VSWR of 10:1 while maintaining stability.

Mechanical Specifications

Size	
Length	3.75 in [95.25 mm]
Width	2 in [50.8 mm]
Height	1.063 in [27 mm]
Weight	0.651 lbs [295.29 g]
Input Connector	SMA Female
Output Connector	SMA Female

Features:

- 0.03 GHz to 2.5 GHz Frequency Range
- Psat 10 Watts typ
- Small Signal Gain: 43 dB typ
- Gain Flatness: ±2.0 dB maximum
- Switching Speed 1 usec typical
- Superior EVM performance
- Versatile DC Supply of +9V to +36V
- 50 Ohms Input and Output Matched
- Unconditionally Stable
- Integrated DC Voltage Regulation & Bias Sequencing
- SMA Female RF Connectors
- DC/Control Connector 7W2 D Sub
- Over/Under/Reverse Votlage Protection
- Temperature Compensation
- High Speed On/Off Control

Applications:

- L-band Military Radar
- Commercial Air Traffic Control
- Weather & Earth Observation Satellites
- Radar & Communication Systems
- High Gain Driver Power Amplifier
- High Gain Output Power Amplifier

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Cooling	HEATSINK REQUIRED use FMAMC5013

Environmental Specifications

Temperature	
Operating Range	-20 to +80 deg C
Storage Range	-65 to +150 deg C
PA Baseplate Shutoff Temperature	90 deg C
Humidity	0-100%
Shock	MIL-STD-810
Vibration	MIL-STD-810
Altitude	0-30,000 ft

Compliance Certifications (see product page for current document)

Plotted and Other Data

Notes:

- Values at 25 °C, sea level
- ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in approved ESD Workstation.
- Heat Sink Required for Proper Operation, Unit is cooled by conduction to heat sink.

Amplifier Power-up Precautions

1.) Confirm that proper ESD precautions and controls are always in place before handling any Amplifier module.

2.) Confirm adequate thermal management is in place to effectively dissipate heat away from the Amplifier package. The Amplifier operational baseplate temperature must be within the operational temperature range stated in the Amplifier datasheet. Depending on the design and thermal requirements, using a heatsink with cooling fan is always recommended for safe reliable operation. A heat sink without a cooling fan may also be used. Damage caused from overheating will void the warranty.

3.) Confirm adequate system grounding is established. The DC power supply and Amplifier must have a common ground in order to operate properly.

4.) Power Amplifiers may require additional DC Current when initially powered-up. Depending on the design, the input current draw could range from an additional 10% to 100% above the maximum rated DC current of the Amplifier. This varies based on product part number.

5.) Confirm the DC power supply, if limited, is set to allow for additional start-up current that's rated for the Power Amplifier.

6.) Confirm the system is designed and calibrated for 50 ohms. Any impedance mismatch may cause performance issues.

7.) Perform a CALIBRATION (if required) with the loads before connecting the Amplifier to the Network Analyzer to ensure proper performance.

8.) Use a fixed attenuator between the signal source and input port of the Amplifier to optimize the input VSWR match.

9.) Confirm the input power level at the input port of the amplifier does not exceed the maximum rated limit for input power (as stated in the Amplifier datasheet).
   P_{in} for Small Signal Gain = P1dB-SSG-10 dB
   P_{in} for P1dB = P1dB-SSG+1 dB

10.) Confirm the Network Analyzer is always connected to the Amplifier first before DC power is applied to the Amplifier.

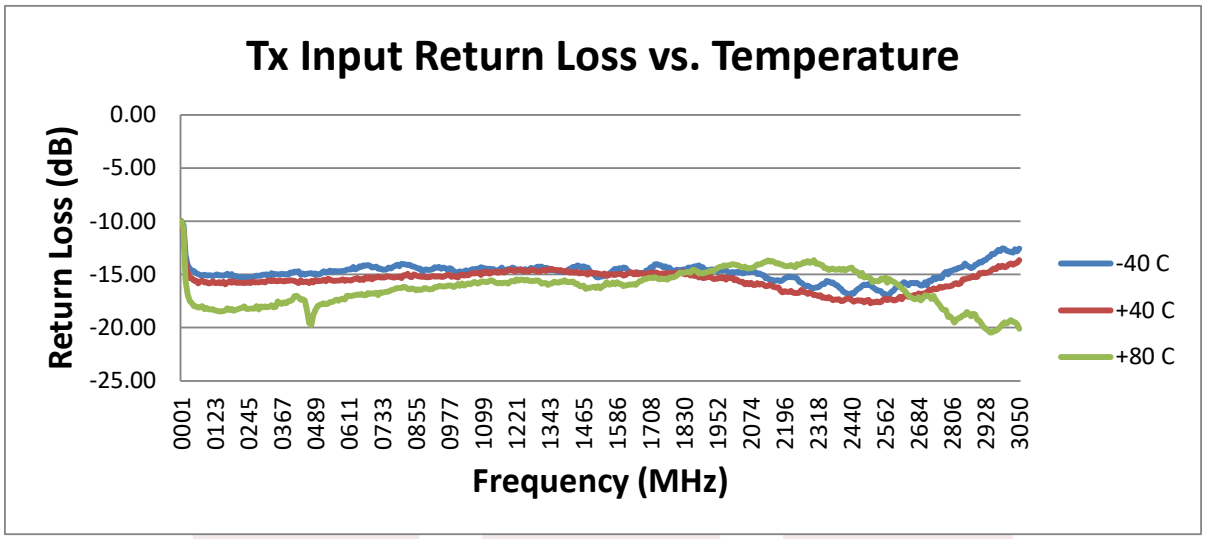
11.) As long as the input and output ports of the amplifier are connected to a 50Ohm load and RF signal power is applied, the Amplifier can be powered up with DC voltage.

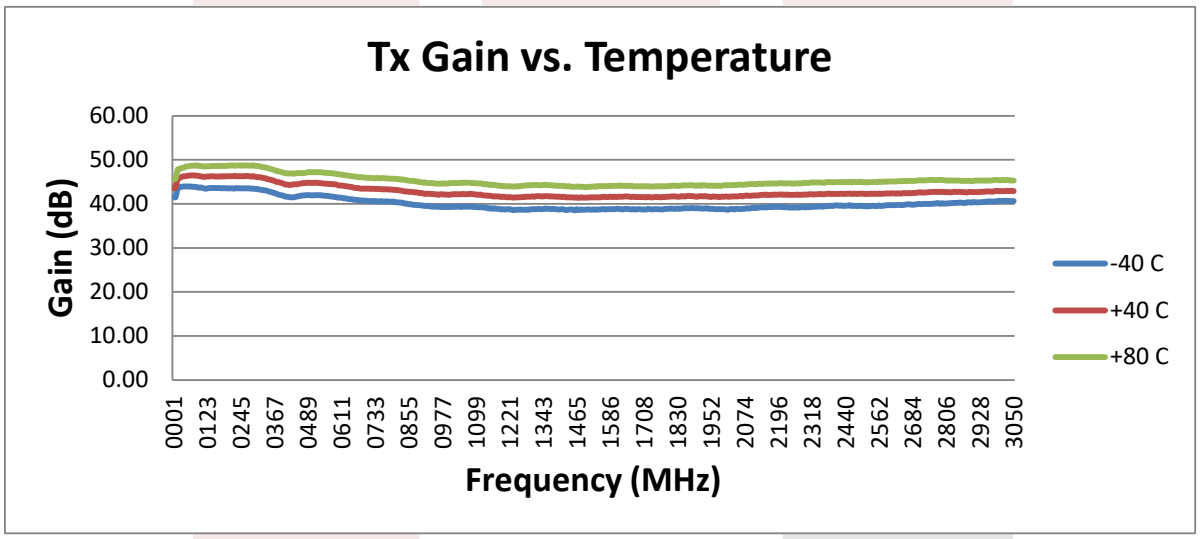
12.) Confirm the Amplifier output load is matched for a 50 Ohm impedance and will not exceed the maximum rated VSWR or Return Loss limit for the Amplifier. Exceeding the maximum rated VSWR or Return Loss limit will result in reflected signal power that could damage the Amplifier and void the warranty.

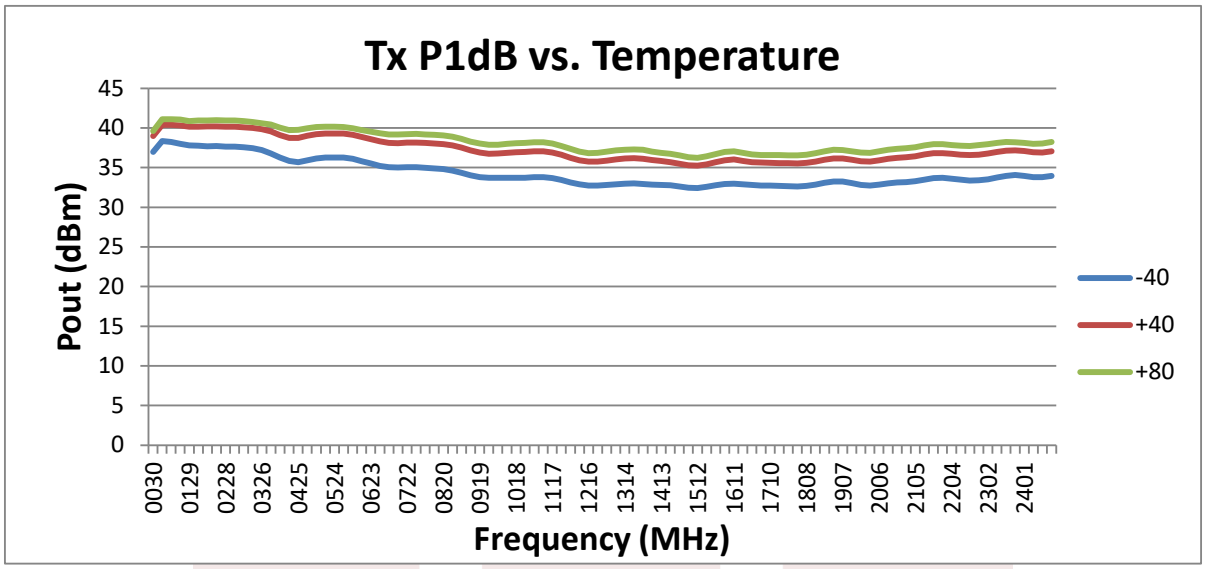
13.) **Power Amplifier connected to an Antenna for signal transmission** - It's strongly recommended to use a high power fixed attenuator pad or an Isolator between the output port of the Amplifier and input port to the antenna. Any reflected signal power due to impedance mismatch will likely damage the Amplifier and void the warranty.

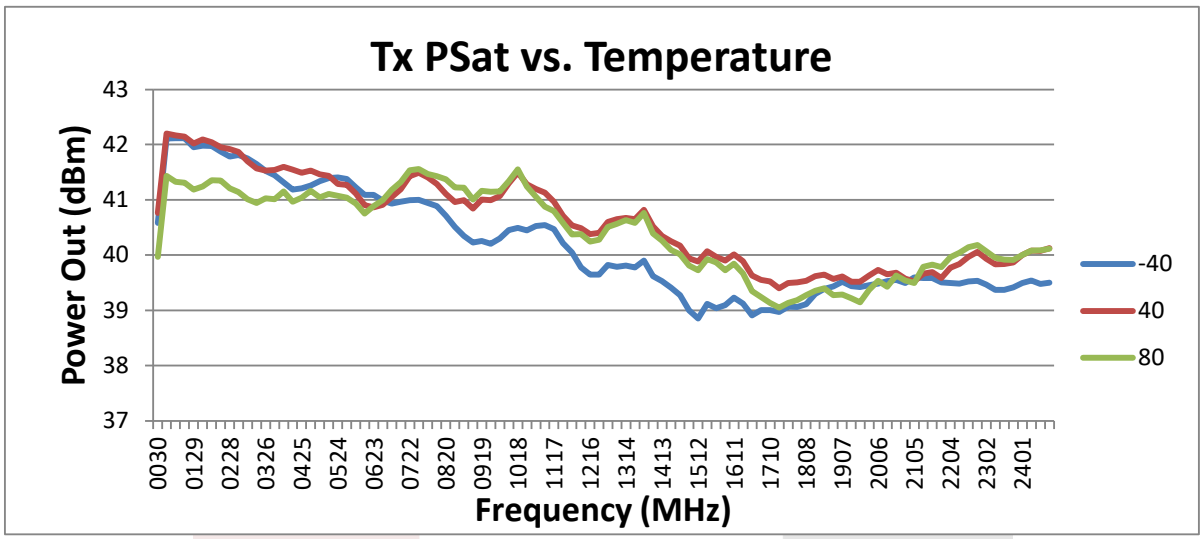
14.) The attenuator or isolator used at the output port of the Amplifier must be rated to handle the output power level and operational frequency band of the amplifier.

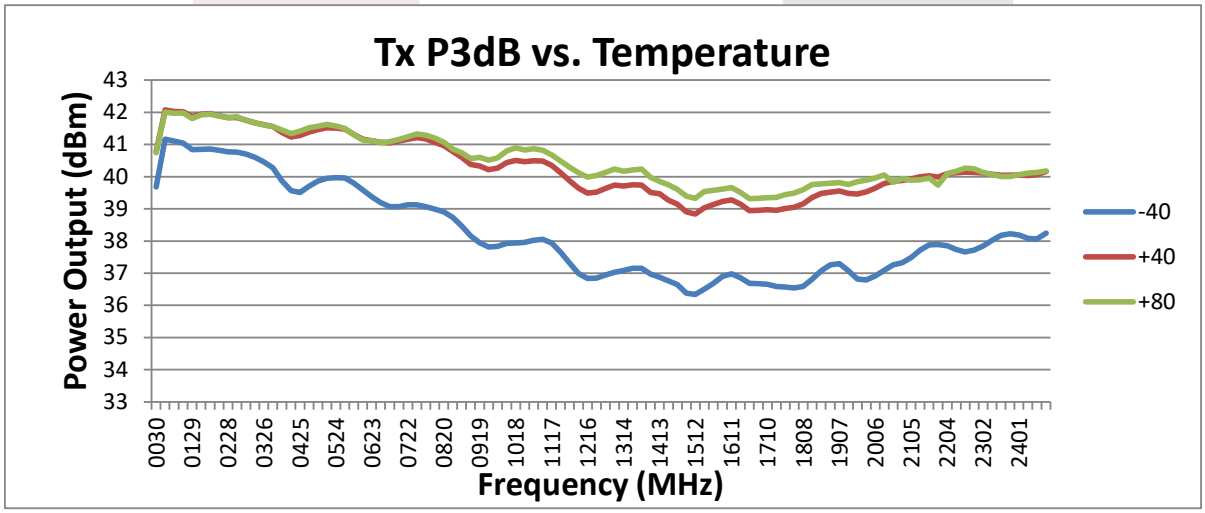
Typical Performance Data









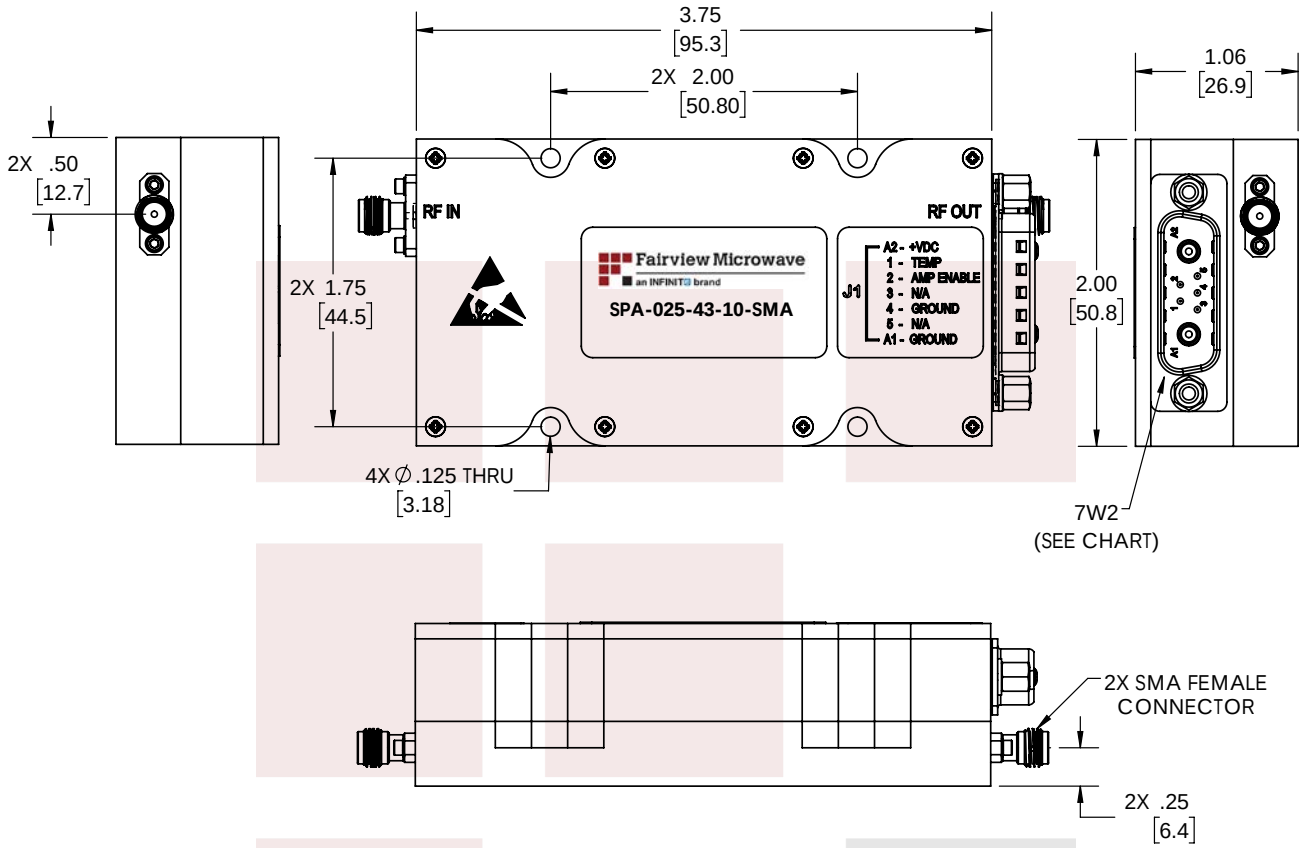


43 dB Gain High Power GaN Amplifier at 10 Watt Psat Operating from 30 MHz to 2.5 GHz with SMA from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Lewisville, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: 43 dB Gain High Power GaN Amplifier at 10 Watt Psat Operating from 30 MHz to 2.5 GHz with SMA SPA-025-43-10-SMA

URL: https://www.fairviewmicrowave.com/43db-high-power-high-gain-amplifier-10watt-spa-025-43-10-sma-p.aspx

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	09/07/2021	TGALLA



PIN	DESCRIPTION	SPECIFICATION
A1	GROUND	VDC GROUND
A2	+VDC	+9 TO +36VDC
1	TEMP SENSOR	TEMP MONITOR: TEMP IN DegC=(Vout-0.5V)*100
2	AMP ENABLE	TTL Hi (+5V) OR NO CONNECTION=ENABLE, TTL Lo (0V)=DISABLE
3	NO CONNECTION	NO CONNECTION
4	GROUND	GROUND
5	NO CONNECTION	NO CONNECTION

NOTE:
HEAT SINK REQUIRED FOR PROPER OPERATION,
UNIT IS COOLED BY CONDUCTING TO HEATSINK

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TITLE

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UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES
DIMENSIONS IN [ ] ARE MILLIMETERS

TOLERANCES:

.X = ±.2 [5.08] FRACTIONS
.XX = ±.02 [.51] ± 1/32
.XXX = ±.005 [.13] ANGLES ± 1°

CABLE LENGTH (L) TOLERANCES:

L ≤ 12 [305] = +1 [25] / -0
12 [305] < L ≤ 60 [1524] = +2 [51] / -0
60 [1524] < L ≤ 120 [3048] = +4 [102] / -0
120 [3048] < L ≤ 300 [7620] = +6 [152] / -0
300 [7620] < L = +5%L / -0

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

THIRD-ANGLE PROJECTION

SHEET 1 OF 1

SCALE N/A

SIZE	CAGE CODE	DRAWN BY	ITEM NO.	REV
A	3FKR5	BPUCHASKI	SPA-025-43-10-SMA	A

T-Rev.D