

26 dB Gain Block Amplifier Operating From 50 MHz to 4 GHz with 23 dBm P1dB and SMA



SPA-040-26-002-SMA

Features

- 50 MHz to 4 GHz Frequency Range
- P1dB: 23 dBm
- High Small Signal Gain: 26 dB
- IP3: 35 dBm
- 50 Ohm Input and Output Matched
- -40 to +75°C Operating Temperature
- Unconditionally Stable
- Single DC Positive Supply
- Built-in Voltage Regulator

Applications

- Laboratory Applications
- R&D Labs
- Military Radio
- Radar Systems
- Telecom Infrastructure
- Test Instrumentation
- Military & Space
- Communication Systems
- Wireless Communication
- Microwave Radio Systems
- Cellular Base Stations
- Low Noise Amplifier
- General Purpose Amplification
- General Purpose Wireless
- Wideband Gain Block
- IF Amplifier/RF Driver Amplifier
- RF Wideband Front Ends
- RF Pre-amplification

Description

The SPA-040-26-002-SMA is wideband general purpose RF coaxial gain block amplifier operating in the 0.05 GHz to 4 GHz frequency range. The amplifier offers 23 dBm of P1dB, 26 dB of Gain, IP3 of 35 dBm. This exceptional technical performance is achieved through the use of hybrid MIC design and advanced GaAs PHEMT devices. This gain block amplifier requires only a single positive supply, typically a +12V DC power supply and includes built-in voltage regulation, is unconditionally stable and operates over the temperature range of -40°C and +75°C.

Electrical Specifications

(TA = +25°C, DC Voltage = 11.5 and 12 Volts, DC Current = 120mA)

Description	Minimum	Typical	Maximum	Units
Frequency Range	0.05		4	GHz
Small Signal Gain	24	26	28	dB
Gain Flatness		±1	±1.25	dB
Gain Variance at OTR*			±1	dB
Output at 1 dB Compression Point	+22	+23		dBm
Output 3rd Intercept Point	+32	+35		dBm
Noise Figure		5	6.5	dB
Input VSWR		1.6:1	1.8:1	
Output VSWR		1.6:1	1.8:1	
Reverse Isolation	45	55		dB
Operating DC Voltage	11.5	12	13	Volts
Operating DC Current		120	220	mA
Quiescent Current		150		mA
Operating Temperature	-40		+75	°C

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*OTR= Base Plate Operating Temperature Range

Absolute Maximum Rating

Parameter	Rating	Units
Source Voltage	+13	Volts
RF input Power	+10	dBm
Operating Temperature (base-plate)	-40 to +75	°C
Storage Temperature	-55 to +125	°C



ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in approved ESD Workstation.

Mechanical Specifications

Size

Length	2.08 in [52.83 mm]
Width	1.08 in [27.43 mm]
Height	0.5 in [12.7 mm]
Weight	0.0625 lbs [28.35 g]
Input Connector	SMA Female
Output Connector	SMA Female

Environmental Specifications

Temperature

Operating Range	-40 to +75 deg C
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Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

- Values at +25 °C, sea level

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Amplifier Power-up Precautions

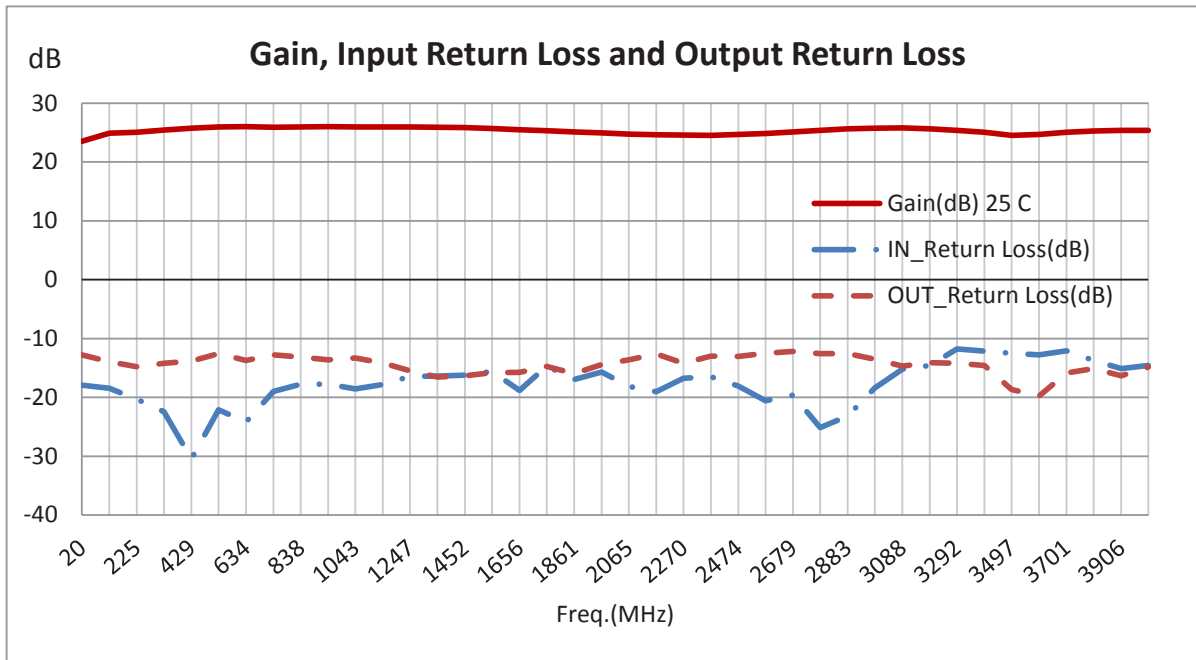
- 1.) Confirm that proper ESD precautions and controls are always in place before handling any Amplifier module.
- 2.) Confirm adequate thermal management is in place to effectively dissipate heat away from the Amplifier package. The Amplifier operational baseplate temperature must be within the operational 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.

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Typical Performance Data



26 dB Gain Block Amplifier Operating From 50 MHz to 4 GHz with 23 dBm P1dB and 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.

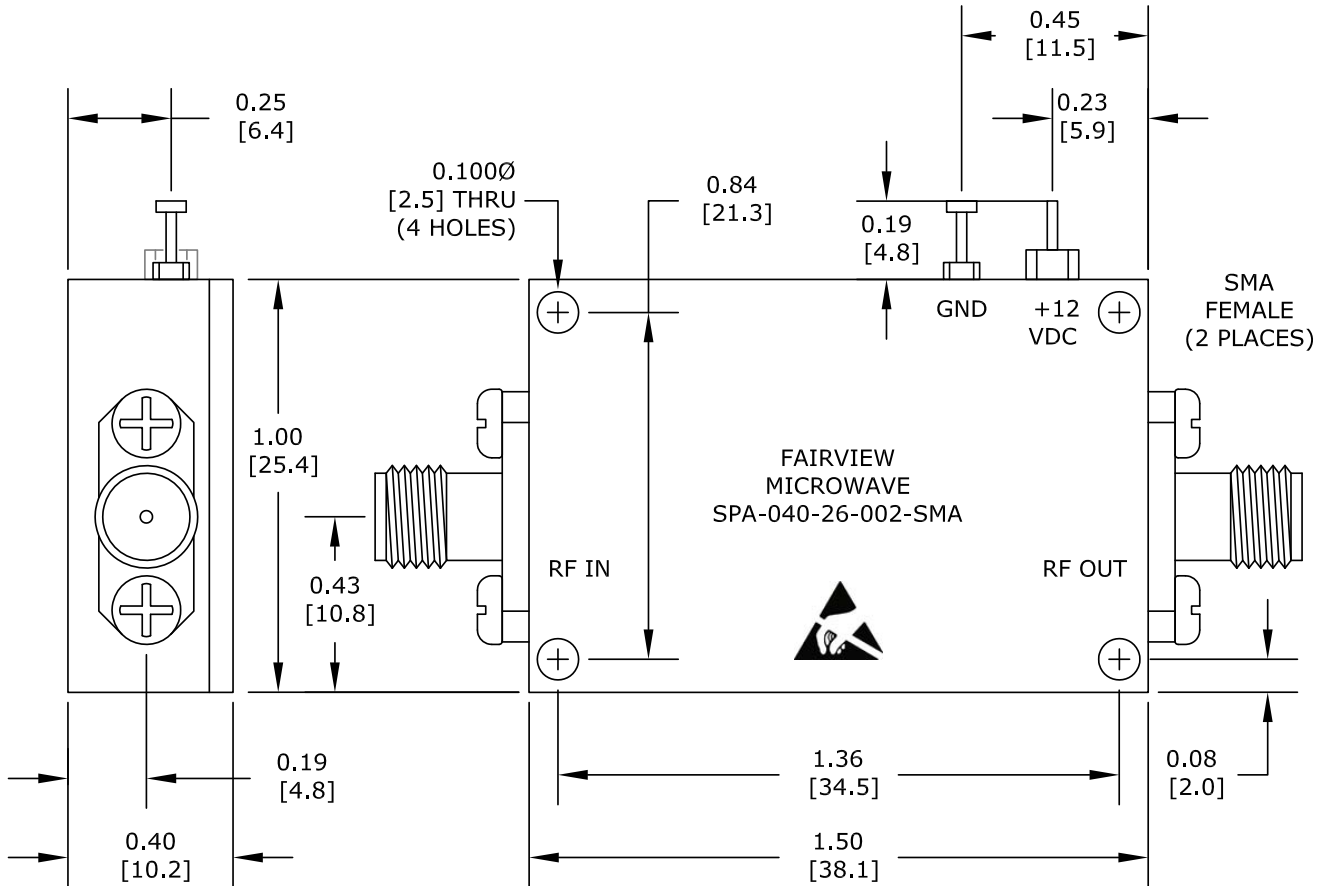
For additional information on this product, please click the following link: [26 dB Gain Block Amplifier Operating From 50 MHz to 4 GHz with 23 dBm P1dB and SMA SPA-040-26-002-SMA](https://www.fairviewmicrowave.com/26-db-gain-block-amplifier-4-ghz-spa-040-26-002-sma-p.aspx)

URL: <https://www.fairviewmicrowave.com/26-db-gain-block-amplifier-4-ghz-spa-040-26-002-sma-p.aspx>

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SPA-040-26-002-SMA CAD Drawing

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FAIRVIEW MICROWAVE INC. ALLEN, TX 75013 WWW.FAIRVIEWMICROWAVE.COM		NOTES: 1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE NOMINAL. 2. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AT ANY TIME. 3. DIMENSIONS ARE IN INCHES [mm].			
TITLE		DWG NO SPA-040-26-002-SMA		CAGE CODE 3FKR5	
		CAD FILE 082914	SHEET	SCALE N/A	SIZE A 2233