Fairview Microwave
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SPA-265-33-01-K DATA SHEET

Medium Power GaAs Amplifier at 1 Watt P1dB Operating from 18 GHz to 26.5 GHz with 38 dBm IP3, 2.92mm Input, 2.92mm Output and 33 dB Gain

The SPA-265-33-01-K is a K-band GaAs MMIC-based high gain and high power ouput coaxial amplifier, operating in the 18 to 26.5 GHz frequency range. The amplifier offers 31 dBm of P1dB and 33 dB high small signal gain, with the excellent gain flatness of ±1.25 dB, along with an outstanding IP3 performance of 38 dBm. This technical performance is achieved through the use of advanced GaAs PHEMT circuitry. This power amplifier is Unconditionally stable, requires only a single positive DC supply, and operates over the temperature range of -40°C to 75°C.

Electrical Specifications

(TA = +25°C, DC Voltage = 12Volts , DC Current = 1.8A)

Description	Min	Typ	Max	Unit
Frequency Range	18		26.5	GHz
Small Signal Gain	30	33	36	dB
Gain Flatness		±1.25	±1.75	dB
P1dB	+30	+31		dBm
Output 3rd Order Intercept Point	+37	+38		dBm
Noise Figure		5	6	dB
Spurious			-60	dBc
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input VSWR		2:1	2.5:1	
Output VSWR		2:1	2.5:1	
Operating DC Voltage	8		12	Volts
Operating DC Current		1.8	2.2	A
Operating Temperature Range	-40		+75	°C

Mechanical Specifications

Size

Length	1.9 in [48.26 mm]
Width	1.5 in [38.1 mm]
Height	0.5 in [12.7 mm]
Weight	0.1505 lbs [68.27 g]
Input Connector	2.92mm Female
Output Connector	2.92mm Female

Environmental Specifications

Temperature

Operating Range	-40 to +75 deg C
Storage Range	-45 to +125 deg C

Features:

- 18 to 26.5 GHz Frequency Range
- P1dB: 31 dBm
- Small Signal Gain: 33 dB
- Gain Flatness: ±1.25 dB
- Gain Variation Over the Temperature Range: ±2.5 dB
- High Output IP3: 38 dBm
- 50 Ohm Input and Output Matched
- -40 to +75°C Operating Temperature
- Unconditionally Stable
- Single DC Positive Supply
- Built-in DC Voltage Regulator

Applications:

- K-band Satellite Communication
- Military & Commercial SATCOM
- Point-to-Point Radio
- Point-to-Multipoint Radio
- Communication Systems
- VSAT
- R&D Labs
- Radar Systems
- Military & Space
- Communication Systems
- High Power Output Amplifier

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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.
  Caution: This Power Amplifier is matched for a 50 ohm input and output load impedance. Applications such as driving a wideband antenna can introduce a load impedance mismatch condition that could result in reflected waves potentially damaging the amplifier output power stage which will void the warranty. Pasternack highly recommends using an Isolator at the output port of the power amplifier where the termination load will absorb any potentially damaging signal reflections.

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.) Preform 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.

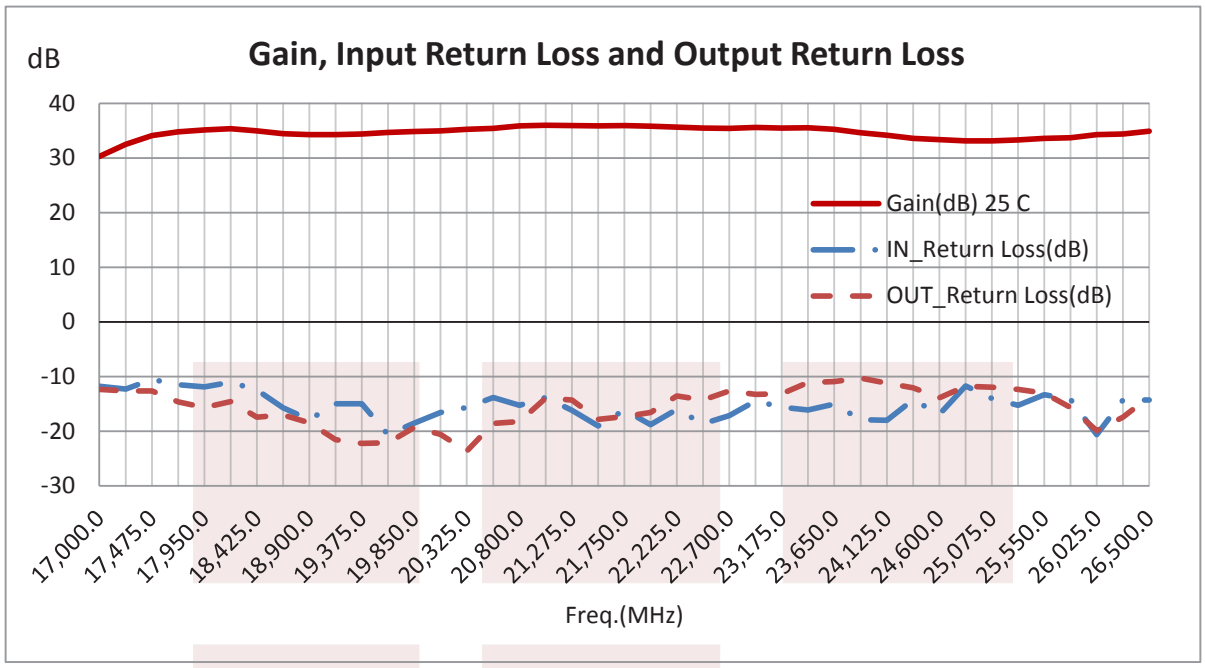
11.) As long as the input and output ports of the amplifier are connected to a 50Ohm load and RF signal power is applied, the Amplifier can be powered up with DC voltage.

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

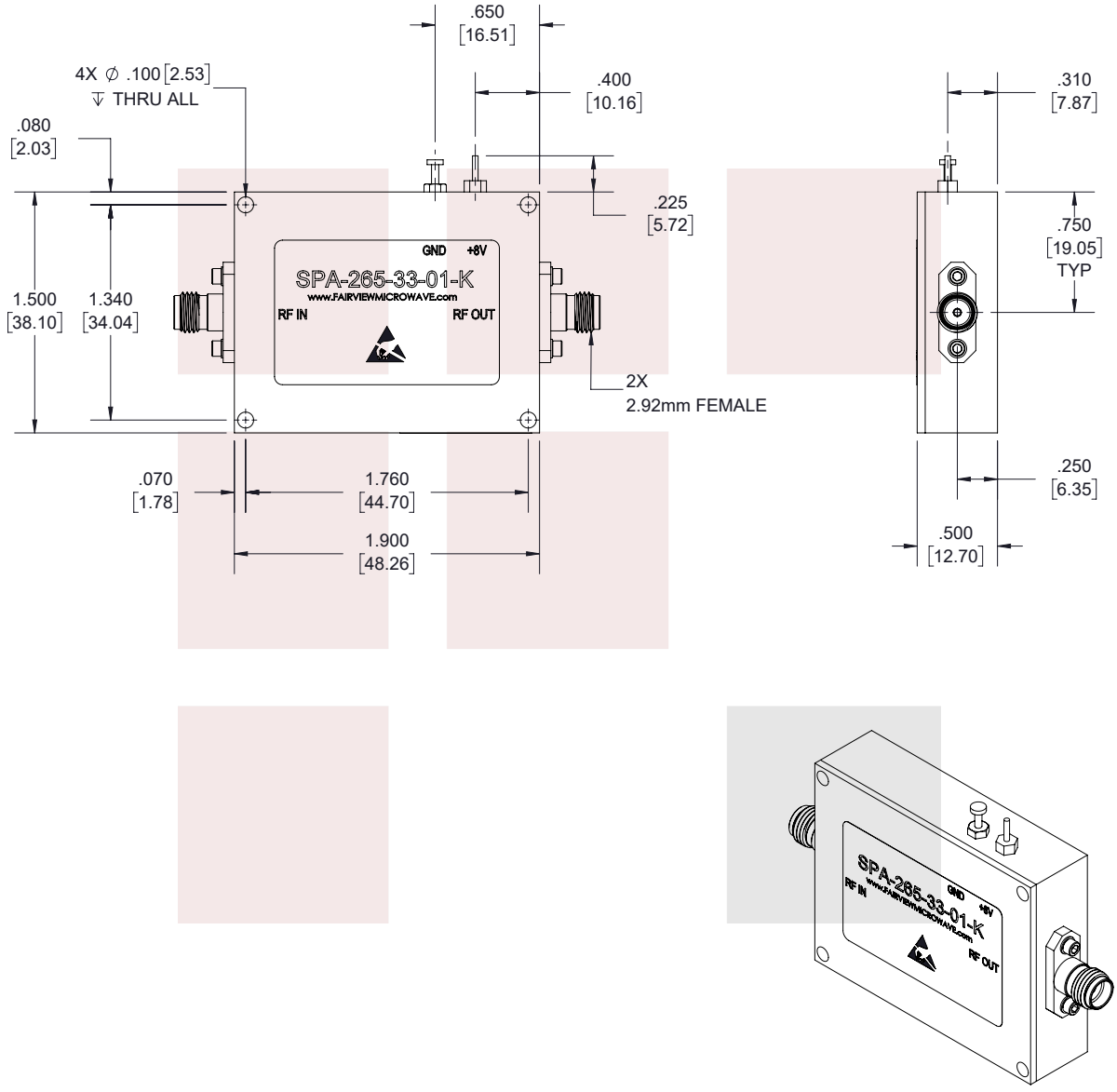


Medium Power GaAs Amplifier at 1 Watt P1dB Operating from 18 GHz to 26.5 GHz with 38 dBm IP3, 2.92mm Input, 2.92mm Output and 33 dB Gain from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Allen, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: Medium Power GaAs Amplifier at 1 Watt P1dB Operating from 18 GHz to 26.5 GHz with 38 dBm IP3, 2.92mm Input, 2.92mm Output and 33 dB Gain SPA-265-33-01-K

URL: https://www.fairviewmicrowave.com/medium-power-amplifier-1watt-33db-spa-265-33-01-k-p.aspx

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	PCR PE15A4021	1/17/2020	T.GALLA



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TITLE

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2.92mm Input, 2.92mm Output and 33 dB Gain

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

TOLERANCES:

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

THIRD-ANGLE PROJECTION

SHEET 1 OF 1

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

SCALE N/A

SIZE	CAGE CODE	DRAWN BY	ITEM NO.	REV
A	3FKR5	K.DANG	SPA-265-33-01-K	A

T-Rev.D