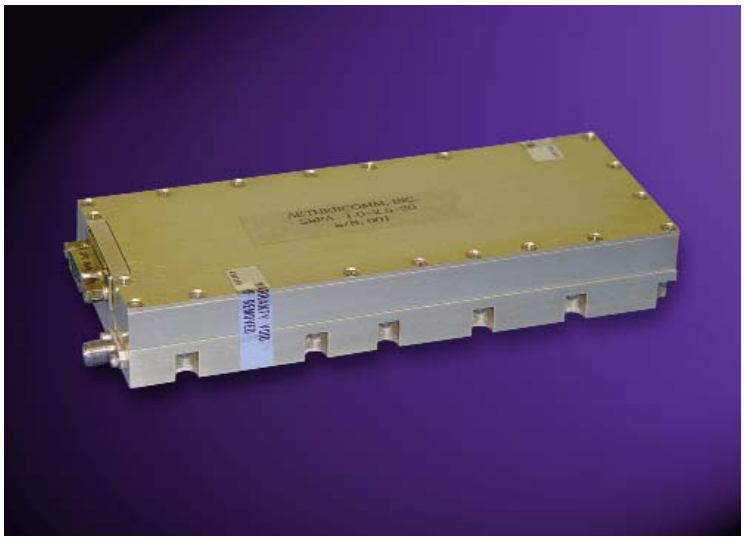
Silicon Carbide

Broadband Power Amplifier

Aethercomm Model Number SSPA 1.0-2.5-20 is a high power, broadband, silicon carbide (SiC) RF amplifier that operates from 1.0 to 2.5 GHz. This PA is ideal for broadband military platforms as well as commercial applications because it is robust and offers high power over a multi-octave bandwidth. This RF module employs temperature compensation to keep the gain constant over the temperature extremes. The power response changes by a ±0.5dB typical over temperature. This amplifier operates with a base plate temperature of 85C with no degradation in the MTBF for the SiC devices inside. It is packaged in a modular, robust housing that is approximately 2.5" (W) by 6.4" (L) by 1.0 (H)". This amplifier has a typical P1dB of 15 watts at room temperature. Saturated output power across the band is typically 15-20 watts. Noise figure at room temperature is 8.0dB typical. This amplifier offers a typical gain of 49 dB with a typical gain flatness of ± 1.0dB. Typical OIP3 is 52dBm. Input and Output VSWR is 2.0:1 maximum. Class A current is ~4.0 amps typical employing a +28Vdc supply. This PA operates from a 27.0 Vdc to 29.0 Vdc input voltage. Worst case harmonic values are -15 dBc in band at P1dB. This SSPA includes an external DC blanking command that enables and disables the module in 10uSec typical. Standard features include over/under voltage protection, reverse polarity protection and internal DC-DC converter. The output is fully protected from an open or short circuit presented to this port with no damage. Input/output RF connectors are SMA Female. DC and Command voltages are accessible via a DSUB connector. This amplifier operates from -40C to +85C base plate. Test data is found on the next page of this data sheet.

- **Silicon Carbide Broadband Power Amplifier**
- **Operation from 1.0 GHz to 2.5 GHz min.**
- **Small Signal Gain 49 dB typ.**
- **52 dBm OIP3 typ.**
- **20 Watts PSat typ.**



This is an example of an Aethercomm standard product. Aethercomm designs and manufactures high performance, high power CW or pulsed SSPA's for commercial, military and satellite communications customer.

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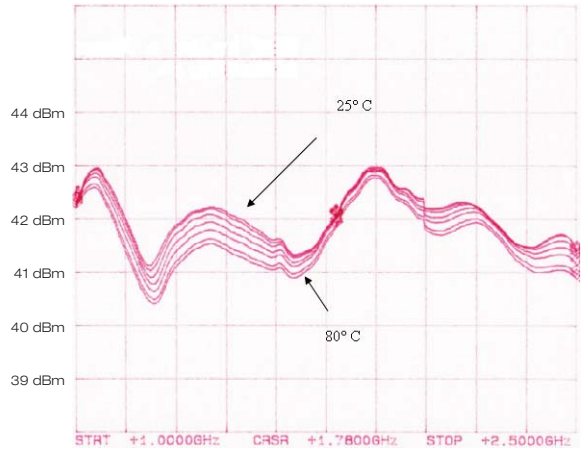
SSPA 1.0-2.5-20 Typical Performance @ 25°C

Freq (MHz)	Pout @ P1dB	Pin @ P1dB	Gain @ P1dB	28.0 Volt Current @ P1dB	2nd Harm @ P1dB	3rd Harm @ P1dB	Pout @ Psat	28.0 Volt Current @ Psat	Small Signal Gain Pin = .16 dBm	OIP3@ Pout=30 dBm Avg. 500 kHz spacing	Noise Figure (dB)	Spurious Emissions IB OOB (200 MHz-18 GHz)	Turn On Time	Turn Off Time
1000	41.5	-5.8	47.3	4.55	-25.0	-32.0	42.5	4.87	49.0	53.0	8.0	N/A	N/A	N/A
1150	41.1	-7.9	49.0	4.58	-18.0	-32.0	42.6	4.54	49.8	53.0	8.0	N/A	N/A	N/A
1300	40.5	-8.2	48.7	4.56	-19.0	-33.0	42.5	4.58	50.2	52.5	8.2	N/A	N/A	N/A
1450	40.3	-8.8	49.1	4.67	-22.0	-31.0	42.0	4.81	49.3	52.5	8.3	N/A	N/A	N/A
1600	41.0	-7.2	48.2	4.64	-21.0	-32.0	42.3	4.79	49.0	52.0	8.8	N/A	N/A	N/A
1750	41.0	-7.2	48.2	4.61	-25.0	-37.0	42.2	4.86	48.8	51.5	9.5	<-60	6.00	10.00
1900	41.6	-8.2	49.8	4.66	-27.0	-43.0	42.8	4.65	50.5	51.5	9.2	N/A	N/A	N/A
2050	41.4	-8.3	49.7	4.67	-39.0	-47.0	42.8	4.92	50.5	51.5	9.2	N/A	N/A	N/A
2200	41.9	-7.3	49.2	4.56	-40.5	-50.0	43.2	4.83	50.3	51.0	9.0	N/A	N/A	N/A
2350	41.0	-7.3	48.3	4.45	-43.0	-42.0	42.7	4.78	49.2	51.0	8.5	N/A	N/A	N/A
2500	41.0	-7.3	48.3	4.50	-42.0	-42.0	41.9	4.65	49.1	51.0	8.7	N/A	N/A	N/A

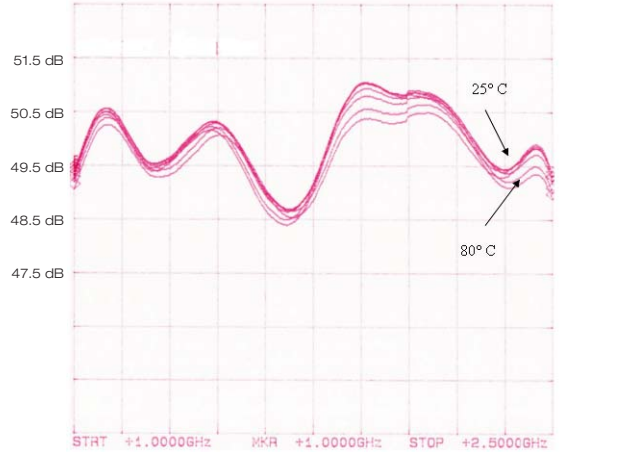
SSPA 1.0-2.5-20 Typical Performance @ 85°C Base Plate

Freq (MHz)	Pout @ P1dB	Pin @ P1dB	Gain @ P1dB	28.0 Volt Current @ P1dB	2nd Harm @ P1dB	3rd Harm @ P1dB	Pout @ Psat	28.0 Volt Current @ Psat	Small Signal Gain Pin = .16 dBm	OIP3@ Pout=30 dBm Avg. 500 kHz spacing	Noise Figure (dB)	Spurious Emissions IB OOB (200 MHz-18 GHz)	Turn On Time	Turn Off Time
1000	41.6	-6.5	48.1	4.25	-24.0	-41.3	41.3	4.45	48.9	53.0	7.9	N/A	N/A	N/A
1150	39.8	-9.1	48.9	4.41	-18.0	-41.4	41.4	4.53	49.9	53.0	8.2	N/A	N/A	N/A
1300	39.7	-9.1	48.8	4.38	-22.0	-41.5	41.5	4.48	49.3	53.0	8.5	N/A	N/A	N/A
1450	39.5	-9.8	49.3	4.42	-25.0	-41.0	41.0	4.51	49.9	52.5	8.5	N/A	N/A	N/A
1600	39.9	-7.7	47.6	4.48	-23.0	-41.1	41.1	4.47	48.3	51.0	8.7	N/A	N/A	N/A
1750	39.8	-8.5	48.3	4.42	-28.0	-41.5	41.5	4.56	48.5	51.0	8.8	<-60	7.00	11.00
1900	40.5	-9.7	50.2	4.51	-30.0	-42.0	42.0	4.52	50.9	51.0	9.0	N/A	N/A	N/A
2050	40.3	-9.7	50.0	4.38	-39.0	-41.8	41.8	4.51	50.7	51.5	8.7	N/A	N/A	N/A
2200	40.9	-8.4	49.3	4.32	-41.0	-42.2	42.2	4.50	50.0	51.0	8.5	N/A	N/A	N/A
2350	40.5	-7.2	47.7	4.31	-41.0	-42.0	42.0	4.48	48.6	51.0	8.5	N/A	N/A	N/A
2500	40.2	-7.5	47.7	4.32	-40.0	-41.0	41.0	4.49	48.5	51.0	9.1	N/A	N/A	N/A

P1dB DATA from 25°C to 80°C Base Plate



Small Signal Gain DATA from 25°C to 80°C Base Plate



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