

Avantek Products

Wideband Monolithic Surface Mount Amplifier 10 to 2000 MHz

Technical Data

PPA-2041

1

Features

- Wideband, Flat Gain Response
- High Gain Density: 25 dB (Typ) per 0.25" Square
- No External Components Required
- Monolithic Silicon Technology
- Hermetic Surface Mount Package

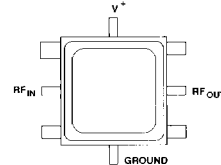
Applications

- IF/RF Amplification
- Cellular/PCN Base Stations
- Spread Spectrum Transceivers
- Fiber Optic Transmission Systems
- Missile Systems
- EW Systems

Description

The PPA-2041 is an unconditionally stable, high gain, medium power silicon MMIC amplifier. This complete hybrid amplifier incorporates input/output blocking capacitors, DC bias circuitry and is matched to 50 Ω . The PPA-2041 is offered in the 0.25 inch square, hermetic surface mount *PlanarPak* package.

Pin Configuration PP-25



(See Section 5 for detailed case drawings.)

Maximum Ratings

Parameter	Maximum
DC Voltage	+17 Volts
Continuous RF Input Power	+13 dBm
Operating Case Temperature	-55 to +100°C
Storage Temperature	-62 to +150°C
"R" Series Burn-In Temperature (T_C)	+100°C

Thermal Characteristics¹

θ_{JC}	100°C/W
Active Transistor Power Dissipation	300 mW
Junction Temperature Above Case Temperature	30°C

Note 1: For further information, see Reliability Screening, Section 6.

Weight: (typical) 0.21 grams

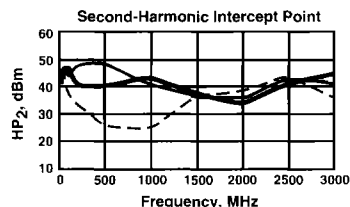
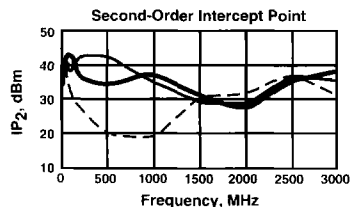
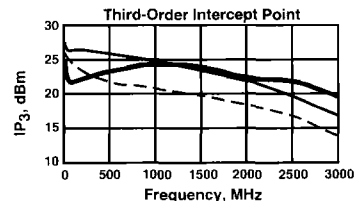
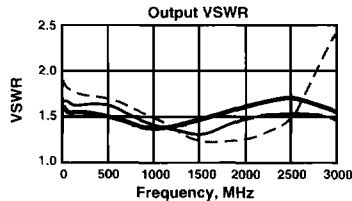
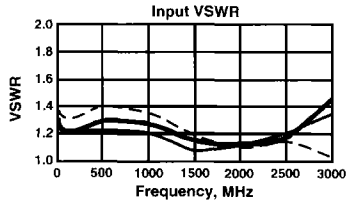
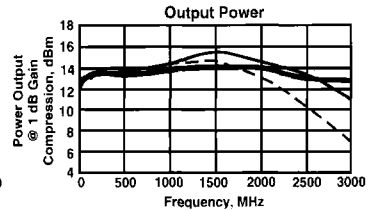
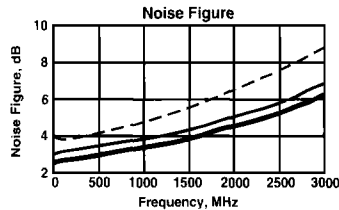
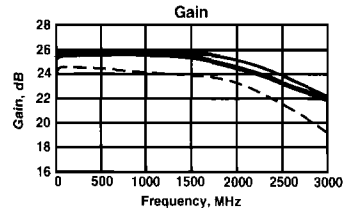
Electrical Specifications

(Measured in 50 Ω system @ +15 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical $T_c = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_c = 0 \text{ to } 50^\circ\text{C}$	$T_c = -55 \text{ to } +85^\circ\text{C}$	
BW	Frequency Range	10-2000	10-2000	10-2000	MHz
GP	Small Signal Gain (Min.)	25.0	21.0	20.0	dB
—	Gain Flatness (Max.)	± 0.5	± 0.7	± 1.0	dB
NF	Noise Figure (Max.)	4.5	7.0	8.0	dB
P _{1dB}	Power Output @ +1 dB Comp. (Min.)	+13.5	+10.0	+9.0	dBm
—	Input VSWR (Max.)	1.3:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	1.6:1	2.0:1	2.2:1	—
IP ₃	Two Tone 3rd Order Intercept Point	+22.5	—	—	dBm
IP ₂	Two Tone 2nd Order Intercept Point	+29.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+35.0	—	—	dBm
I _D	DC Voltage (1% Reg.)	15	—	—	Volts
I _D	DC Current	95	—	—	mA

Typical Performance Over Temperature (@ +15 VDC unless otherwise noted)

Key: +25°C —
+85°C —
-55°C —



Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)

S-Parameters and Numerical Readings

Bias = 15.00 Volts; Current = 95 mA

FREQ GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂		GPDEL ns	PHASE DEG
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang		
.5	-7.10	-38.3	14.56	-103.8	-42.07	40.5	-4.81	-63.5	99.37	—
1.0	-9.75	-33.9	18.33	-121.7	-40.75	17.7	-8.05	-82.7	99.37	—
2.5	-12.53	-33.7	22.60	-142.1	-41.37	5.5	-10.85	-124.8	28.40	—
5.0	-15.20	-31.2	24.28	-157.8	-41.76	1.1	-11.39	-148.9	11.70	—
7.5	-16.54	-27.1	24.74	-164.8	-41.80	.5	-11.48	-159.7	6.05	—
10.0	-17.30	-23.3	24.92	-168.8	-41.91	.4	-11.52	-165.7	3.62	9.15
20.0	-18.26	-16.1	25.15	-175.9	-41.73	-.1	-11.64	-176.3	2.02	3.33
50.0	-18.22	-10.7	25.04	176.2	-41.81	.3	-11.61	172.5	0.60	-.52
100.0	-18.34	-11.9	25.06	167.7	-41.72	-.6	-11.82	163.3	0.44	-1.91
200.0	-18.30	-18.6	25.00	153.3	-41.57	-3.0	-11.95	147.5	0.38	-2.10
500.0	-16.66	-51.2	25.12	112.4	-42.09	-7.4	-12.50	106.8	0.39	-0.50
750.0	-16.94	-95.3	24.98	77.3	-41.50	-2.9	-13.28	79.7	0.39	-0.18
1000.0	-18.29	-128.4	24.92	43.6	-40.30	-7.5	-14.59	48.1	0.38	1.57
1250.0	-20.75	-152.8	25.04	9.1	-38.97	-14.7	-16.99	7.5	0.40	2.49
1500.0	-26.35	-163.4	25.19	-27.1	-37.99	-26.9	-20.49	-50.1	0.42	1.69
1750.0	-30.09	-107.0	25.19	-65.3	-37.51	-40.7	-21.18	-135.3	0.43	-1.07
2000.0	-23.72	-100.8	24.90	-104.9	-37.50	-54.9	-17.15	163.2	0.44	-5.25
2250.0	-21.12	-124.3	24.26	-144.9	-37.84	-68.7	-14.93	131.2	0.44	—
2500.0	-21.54	-148.4	23.31	175.6	-38.48	-83.1	-14.75	118.7	0.43	—
2750.0	-24.27	-154.8	22.19	137.4	-39.19	-91.5	-13.95	123.0	0.44	—
3000.0	-24.70	-131.9	21.16	99.5	-39.71	-100.1	-10.76	120.4	0.45	—
3200.0	-21.63	-146.0	21.57	80.6	-38.47	-108.9	-9.31	103.0	—	—
3400.0	-21.98	-159.7	20.98	47.7	-38.18	-115.2	-6.07	84.0	—	—
3600.0	-26.10	155.9	19.93	10.5	-37.09	-129.0	-3.39	58.5	—	—
3800.0	-24.51	41.1	17.67	-27.8	-36.85	-148.4	-2.12	30.6	—	—
4000.0	-18.32	-1.0	14.53	-60.0	-38.02	-159.9	-2.05	7.8	—	—
4200.0	-15.19	-21.6	11.20	-86.1	-38.54	179.8	-2.45	-8.2	—	—
4400.0	-13.23	-33.6	8.07	-107.3	-40.11	172.7	-2.88	-19.1	—	—
4600.0	-11.94	-43.1	5.32	-125.2	-41.50	167.6	-3.22	-26.9	—	—
4800.0	-11.15	-50.7	3.02	-141.1	-42.15	166.3	-3.48	-33.2	—	—
5000.0	-10.55	-57.0	1.03	-155.7	-43.43	170.3	-3.73	-38.4	—	—
5400.0	-10.06	-67.4	-1.89	174.6	-41.28	-179.1	-4.44	-46.9	—	—
6000.0	-11.12	-82.4	-4.57	121.9	-37.27	133.1	-6.97	-45.9	—	—

Linearization Range: 10 to 2000 MHz