Avantek Products

Wideband Monolithic Surface Mount Amplifier 10 to 2000 MHz

Technical Data

PPA-2041

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

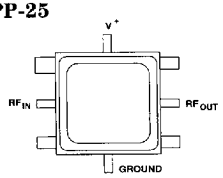
- **IF/RF Amplification**
- **Cellular/PCN Base Stations**
- **Spread Spectrum Transceivers**
- **Fiber Optic Transmission Systems**
- **Missile Systems**
- **EW Systems**

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 Characteristics[1]

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

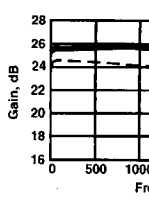
Electrical Specifications

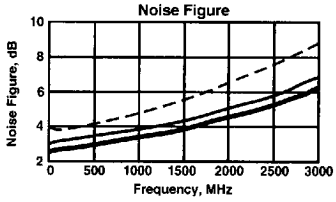
(Measured in 50 Ω system @ +15 VDC nominal unless otherwise noted)

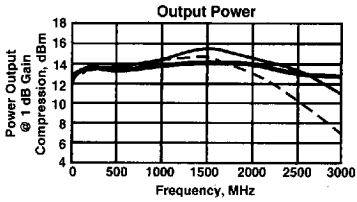
Symbol	Characteristic	Typical	Guaranteed Specifications		Unit
		T_C = 25°C	T_C = 0 to 50°C	T_C = –55 to +85°C	
BW	Frequency Range	10-2000	10-2000	10-2000	MHz
GP	Small Signal Gain (Min.)	25.0	21.0	20.0	dB
—	Gain Flatness (Max.)	±0.5	±0.7	±1.0	dB
NF	Noise Figure (Max.)	4.5	7.0	8.0	dB
P_{1dB}	Power Output @ +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

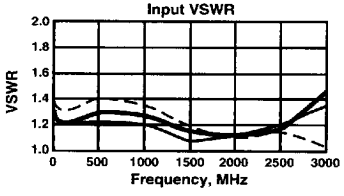
Typical Performance Over Temperature (@ +15 VDC unless otherwise noted)

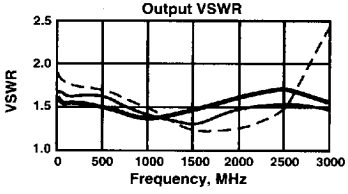
Key: +25°C ——— +85°C — — -55°C ———

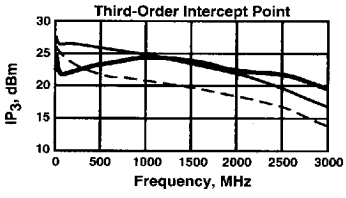


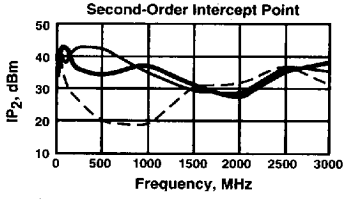


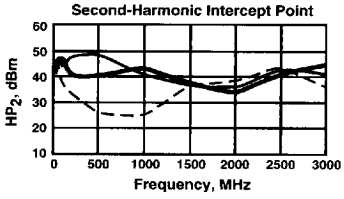












Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)

S-Parameters and Numerical Readings **Bias = 15.00 Volts; Current = 95 mA**

FREQ	S_{11}		S_{21}		S_{12}		S_{22}		GPDEL	PHASE
GHz	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang	ns	DEG
.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