TELEDYNE
MICROWAVE SOLUTIONS
Everywhereyoulook™

Rev. 3/13

A2CP14221 8.0-14.0 GHz COUGARPAK® AMPLIFIER

Typical Values	A2CP14221
High Gain	21.3 dB
Low Noise Figure	3.2 dB
High Reverse Isolation	45.0 dB
High Performance Thin Film	
High Frequency Two-stage CougarPak® Package	

SPECIFICATIONS*

Parameter	Typical	Guaranteed 0 to 50 °C	Guaranteed -55 to +85 °C
Frequency (Min.)	8.0-14.0 GHz	8.0-14.0 GHz	8.0-14.0 GHz
Small Signal Gain (Min.)	21.3 dB	20.2 dB	19.0 dB
Gain Flatness (Max.)	±0.7 dB	±1.5 dB	±1.5 dB
Noise Figure (Max.)	3.2 dB	4.0 dB	5.0 dB
SWR (Max.) Input/Output	1.8:1	2.0:1	2.0:1
Power Output (Min.) @ 1dB comp.	+25.0 dBm	+23.0 dBm	+22.5 dBm
Reverse Isolation	-45.0 dB	—	—
DC Current (Max.)	185 mA	195 mA	205 mA

* Measured in a 50-ohm system at +12 Vdc unless otherwise specified.

INTERMODULATION PERFORMANCE

Typical @ 25 °C @ 9.0 GHz	A2CP14221
Second Order Harmonic Intercept Point	+49 dBm
Second Order Two Tone Intercept Point	+43 dBm
Third Order Two Tone Intercept Point	+33 dBm

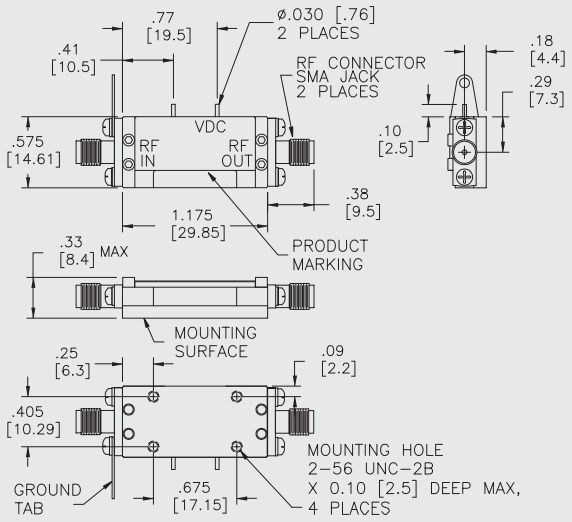
ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-65 to +150 °C
Maximum Case Temperature	+125 °C
Maximum DC Voltage	+14 Volts
Maximum Continuous RF Input Power	+20 dBm
Maximum Short Term Input Power (1 Minute Max.)	+23 dBm
Maximum Peak Power (3 µsec Max.)	+27 dBm
Burn-in Temperature	+125 °C
Thermal Resistance[1] (θjc)	+11.4 °C/Watt
Junction Temperature Rise Above Case (Tjc)	+25.3 °C

[1] Thermal resistance is based on total power dissipation.

A2CP14221

High Frequency CougarPak® SMA Package (two-stage)



DIMENSIONS ARE IN INCHES [MILLIMETERS]

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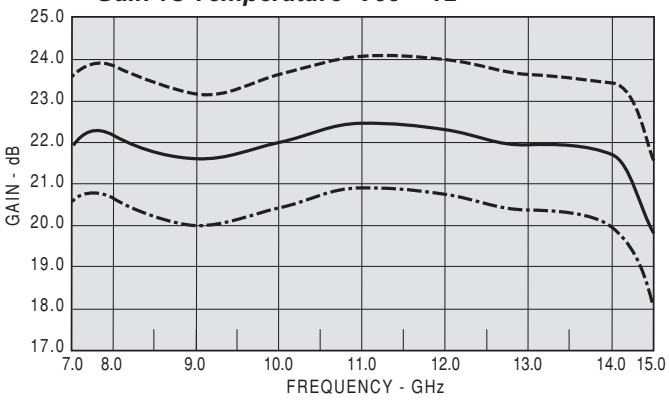
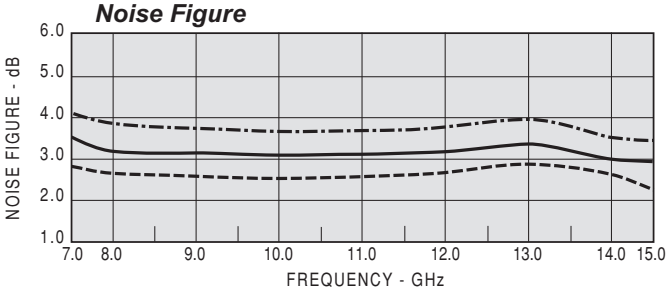
TYPICAL PERFORMANCE

KEY: +25 C
+85 C
-55 C

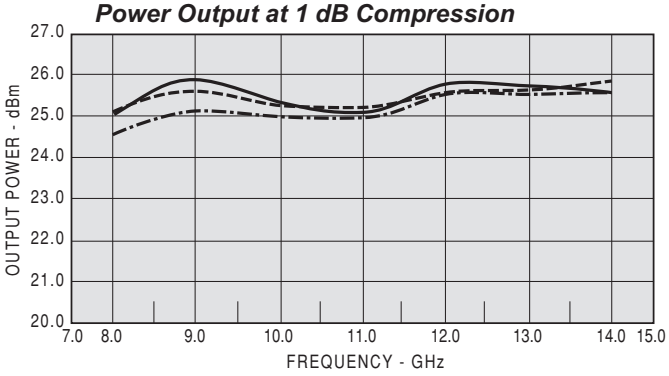
Gain vs Temperature Vcc = 12



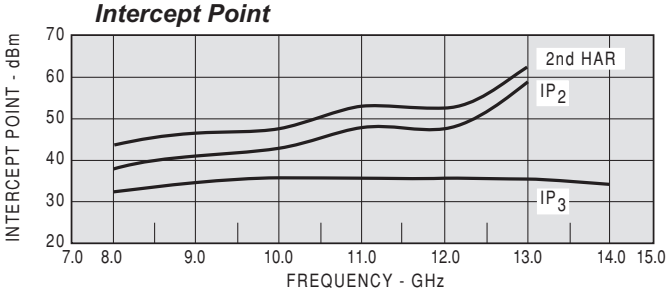
Noise Figure



Power Output at 1 dB Compression



Intercept Point



TYPICAL AUTOMATIC TEST DATA

Model: A2CP14221 Vcc=+12V Icc=184.1

FREQ	SWR	SWR	GAIN	PHASE	DELAY	REV/ISO
GHZ	IN	OUT	DB	DEG	NSEC	DB
6.0	1.82	1.28	21.95	30.91	0.474	-56.21
6.2	1.83	1.31	21.72	-2.68	0.460	-53.91
6.4	1.82	1.32	21.62	-35.47	0.453	-53.56
6.6	1.78	1.32	21.66	-67.93	0.453	-55.16
6.8	1.70	1.29	21.80	-100.39	0.454	-52.27
7.0	1.62	1.26	22.01	-133.44	0.459	-52.93
7.2	1.53	1.23	22.22	-167.12	0.472	-53.03
7.4	1.48	1.19	22.37	158.78	0.475	-50.84
7.6	1.46	1.18	22.38	124.50	0.473	-52.58
7.8	1.46	1.17	22.30	90.60	0.469	-51.21
8.0	1.48	1.18	22.13	57.41	0.456	-49.87
8.2	1.46	1.19	21.94	24.91	0.449	-49.38
8.4	1.44	1.21	21.77	-7.01	0.439	-50.55
8.6	1.40	1.23	21.63	-38.24	0.431	-52.21
8.8	1.35	1.24	21.54	-69.68	0.434	-50.25
9.0	1.31	1.26	21.56	-100.48	0.424	-48.95
9.2	1.24	1.27	21.61	-131.67	0.441	-49.12
9.4	1.20	1.27	21.67	-162.72	0.425	-48.32
9.6	1.16	1.27	21.76	166.16	0.440	-46.00
9.8	1.14	1.26	21.88	134.88	0.433	-51.77
10.0	1.13	1.27	21.99	103.35	0.430	-49.68
10.2	1.12	1.26	22.12	71.56	0.445	-47.18
10.4	1.12	1.27	22.27	39.49	0.452	-46.01
10.6	1.11	1.30	22.35	6.99	0.450	-46.74
10.8	1.10	1.31	22.42	-25.15	0.460	-45.53
11.0	1.14	1.33	22.45	-57.71	0.453	-44.47
11.2	1.17	1.34	22.48	-90.25	0.456	-43.56
11.4	1.22	1.35	22.43	-122.87	0.455	-46.92
11.6	1.26	1.36	22.39	-155.34	0.450	-43.56
11.8	1.28	1.36	22.37	172.08	0.435	-45.20
12.0	1.30	1.38	22.26	139.76	0.437	-43.72
12.2	1.31	1.41	22.19	107.59	0.449	-45.54
12.4	1.32	1.44	22.09	75.59	0.445	-44.91
12.6	1.34	1.49	22.01	43.23	0.459	-42.57
12.8	1.37	1.50	21.97	10.70	0.449	-44.03
13.0	1.42	1.51	21.92	-21.48	0.448	-44.02
13.2	1.48	1.53	21.94	-54.06	0.456	-41.55
13.4	1.56	1.51	21.88	-86.90	0.456	-40.84
13.6	1.62	1.46	21.87	-120.16	0.463	-42.08
13.8	1.68	1.36	21.84	-153.90	0.477	-40.46
14.0	1.75	1.26	21.66	171.54	0.486	-40.65
14.2	1.85	1.15	21.45	137.49	0.475	-41.18
14.4	2.06	1.13	21.12	102.85	0.468	-41.70
14.6	2.26	1.21	20.68	69.06	0.462	-41.16
14.8	2.46	1.30	20.22	35.60	0.459	-42.20
15.0	2.49	1.36	19.76	2.96	0.461	-43.94
15.2	2.40	1.41	19.40	-29.59	0.458	-43.42
15.4	2.14	1.45	19.09	-62.77	0.476	-43.39
15.6	1.80	1.51	18.79	-96.09	0.483	-45.27
15.8	1.46	1.58	18.37	-130.23	0.475	-45.87
16.0	1.20	1.67	17.90	-164.37	0.478	-45.36
16.2	1.18	1.72	17.30	161.21	0.484	-49.38
16.4	1.39	1.72	16.58	127.52	0.459	-53.38
16.6	1.62	1.66	15.87	94.90	0.455	-50.30
16.8	1.80	1.56	15.15	62.38	0.440	-43.68
17.0	1.93	1.42	14.51	30.73	0.436	-41.52

LINEAR S-PARAMETERS

Model: A2CP14221 Vcc=+12V Icc=184.1

FREQ.	S11		S21		S12		S22	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG.
6.0	0.291	85.41	12.52	30.91	0.0015	-102.13	0.124	65.71
6.5	0.285	18.27	12.08	-54.98	0.0021	155.42	0.137	-7.66
7.0	0.236	-34.37	12.61	-133.44	0.0023	100.38	0.116	-65.86
7.5	0.187	-73.63	13.18	138.19	0.0023	3.65	0.082	-113.00
8.0	0.192	-115.36	12.78	57.41	0.0032	-75.54	0.084	-157.47
8.5	0.173	-177.87	12.13	-25.54	0.0034	-141.99	0.100	140.28
9.0	0.134	120.31	11.96	-100.48	0.0036	119.32	0.116	84.87
9.5	0.080	59.16	12.15	178.73	0.0043	77.66	0.119	33.11
10.0	0.059	32.73	12.58	103.35	0.0033	5.57	0.119	-3.05
10.5	0.049	-1.00	13.03	20.21	0.0038	-74.90	0.125	-38.54
11.0	0.064	-4.88	13.27	-57.71	0.0060	-167.88	0.141	-77.92
11.5	0.111	-47.49	13.24	-142.46	0.0049	116.49	0.150	-121.73
12.0	0.130	-95.47	12.97	139.76	0.0065	41.41	0.160	-159.83
12.5	0.137	-136.26	12.65	55.94	0.0064	-18.20	0.188	159.13
13.0	0.172	-165.15	12.47	-21.48	0.0063	-115.43	0.204	120.76
13.5	0.232	158.81	12.42	-106.95	0.0073	177.25	0.193	76.41
14.0	0.274	128.95	12.10	171.54	0.0093	99.10	0.115	39.51
14.5	0.372	94.48	10.99	82.30	0.0078	10.89	0.079	85.59
15.0	0.427	48.82	9.72	2.96	0.0064	-36.26	0.153	69.31
15.5	0.318	-6.31	8.80	-82.56	0.0075	-129.91	0.195	44.36
16.0	0.090	-27.46	7.85	-164.37	0.0054	115.37	0.251	18.21
16.5	0.212	27.13	6.45	107.96	0.0018	-74.17	0.260	-23.64
17.0	0.318	-15.61	5.32	30.73	0.0084	-145.53	0.175	-61.90