

WJ-PA38 / SMPA38

200 to 2000 MHz
TO-8 CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ WIDE BANDWIDTH: 200-2400 MHz (TYP.)
- ◆ HIGH OUTPUT LEVEL: +23.0 dBm (TYP.)
- ◆ LOW NOISE FIGURE: 4.0 dB (TYP.)
- ◆ HIGH THIRD ORDER INTERCEPT POINT:
+34 dBm (TYP.)

Specifications*

Characteristics	Typical	Guaranteed	
		0° to 50°C	-54°C to +85°C
Frequency (Min.)	200-2400 MHz	200-2000 MHz	200-2000 MHz
Small Signal Gain (Min.)	10.0 dB	8.5 dB	8.0 dB
Gain Flatness (Max.)	±0.3 dB	±0.7 dB	±1.0 dB
Noise Figure (Max.)	4.0 dB	4.7 dB	5.2 dB
Power Output at 1 dB Compression (Min.)	+23.0 dBm	+21.5 dBm	+21.0 dBm
VSWR (Max.)			
Input	1.7:1	1.9:1	2.0:1
Output	1.5:1	1.9:1	2.0:1
DC Current (Max.) at +15 Volts	150 mA	158 mA	160 mA

* Measured in a 50-ohm system at +15 Vdc Nominal.

Notes:

1. WJ-CPA38 is a standard WJ-PA38 installed in a miniature SMA connector housing and guaranteed over 0°C to 50°C temperature range.

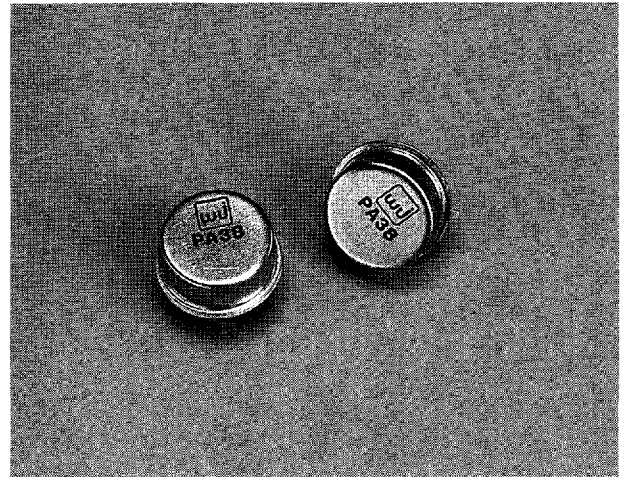
Typical Intermodulation Performance at 25°C

Second Order Harmonic Intercept Point.....+60 dBm (Typ.)
Second Order Two Tone Intercept Point.....+55 dBm (Typ.)
Third Order Two Tone Intercept Point.....+34 dBm (Typ.)

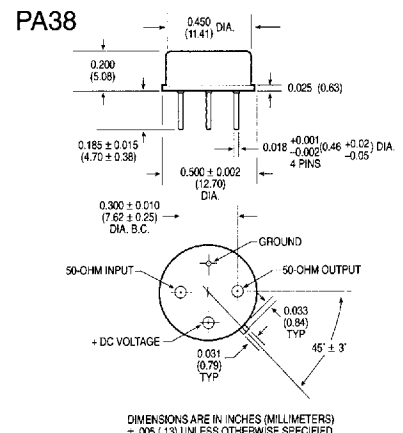
Absolute Maximum Ratings

Storage Temperature-62°C to +125°C
Maximum Case Temperature85°C
Maximum DC Voltage.....+16 Volts
Maximum Continuous RF Input Power+17 dBm
Maximum Short Term RF Input Power (1 Minute Max.).....100 Milliwatts
Maximum Peak Power1 Watt (3 µsec Max.)
"S" Series Burn-In Temperature (Case)85°C

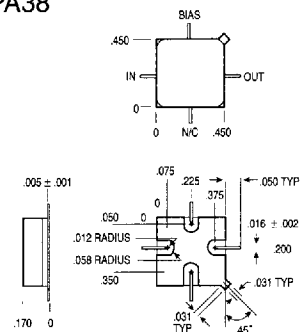
Weight approximately 2.0 grams (0.07 oz.)



Outline Drawings

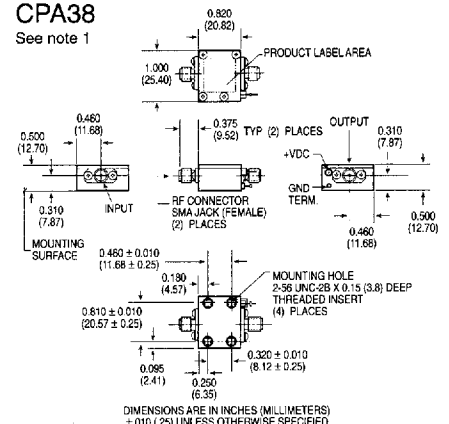


SMPA38



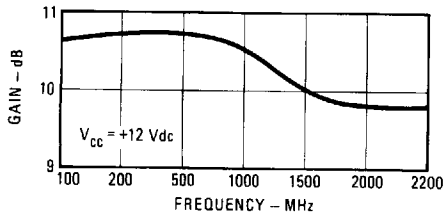
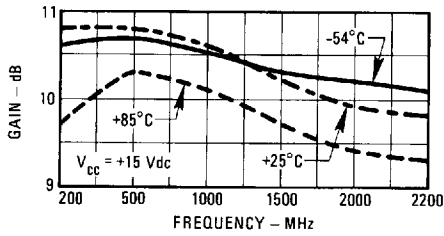
CPA38

See note 1

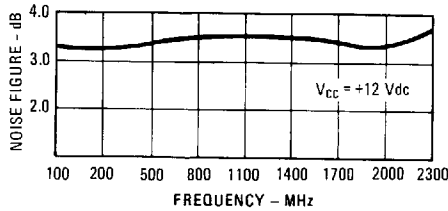
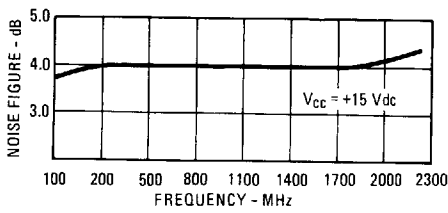


Typical Performance at 25°C

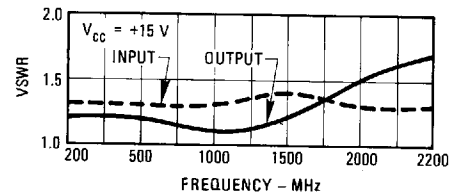
Gain



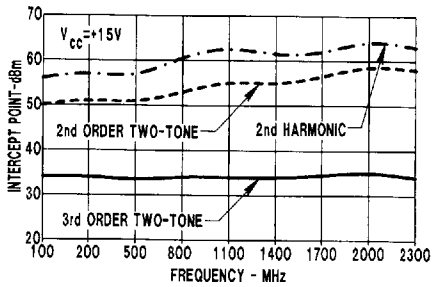
Noise Figure



VSWR



Intercept Point

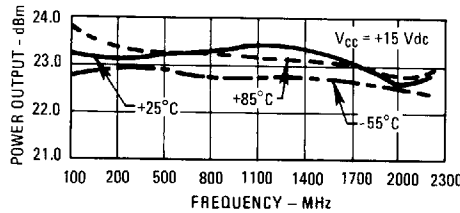


Typical Automatic Test Data

Vcc = 15.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	3.2	1.6	.5
5.0	2.6	1.3	2.8
10.0	2.4	1.5	4.0
50.0	1.7	1.4	8.8
100.0	1.4	1.3	9.7
200.0	1.3	1.2	10.1
300.0	1.3	1.2	10.1
400.0	1.3	1.2	10.3
500.0	1.3	1.2	10.3
600.0	1.4	1.2	10.4
700.0	1.5	1.2	10.4
800.0	1.5	1.2	10.4
900.0	1.5	1.2	10.4
1000.0	1.5	1.2	10.4
1100.0	1.5	1.2	10.4
1200.0	1.5	1.3	10.3
1300.0	1.5	1.3	10.3
1400.0	1.5	1.3	10.2
1500.0	1.4	1.3	10.1
1600.0	1.4	1.3	10.0
1700.0	1.3	1.3	10.1
1800.0	1.3	1.3	10.1
1900.0	1.3	1.3	10.3
2000.0	1.4	1.3	10.4
2100.0	1.4	1.3	10.5
2200.0	1.5	1.4	10.4

Power Output



Thermal Data: Vcc = 15 Vdc

Thermal Resistance θ_{jc} 147.8°C/W
 Transistor Power Dissipation P_d 0.525 W
 Junction Temperature Rise Above Case T_{jc} ... 78°C

Vcc = 12.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	3.1	1.4	1.1
5.0	2.6	1.4	2.9
10.0	2.4	1.6	4.1
50.0	1.7	1.4	8.8
100.0	1.4	1.3	9.7
200.0	1.3	1.3	10.1
300.0	1.3	1.3	10.1
400.0	1.4	1.3	10.3
500.0	1.4	1.3	10.3
600.0	1.4	1.3	10.3
700.0	1.5	1.2	10.4
800.0	1.5	1.2	10.4
900.0	1.5	1.2	10.4
1000.0	1.5	1.2	10.4
1100.0	1.5	1.2	10.4
1200.0	1.5	1.2	10.3
1300.0	1.5	1.3	10.3
1400.0	1.5	1.3	10.2
1500.0	1.4	1.3	10.1
1600.0	1.4	1.3	10.0
1700.0	1.4	1.3	10.1
1800.0	1.3	1.3	10.1
1900.0	1.3	1.3	10.3
2000.0	1.4	1.3	10.4
2100.0	1.4	1.4	10.5
2200.0	1.4	1.5	10.4

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.528	-23	1.063	-122	.142	62	.238	-122
5.0	.445	-16	1.381	-147	.178	24	.144	24
10.0	.419	-18	1.593	-152	.181	8	.212	-8
50.0	.260	-37	2.752	-164	.153	-9	.166	-90
100.0	.172	-38	3.064	-178	.139	-11	.132	-132
200.0	.134	-33	3.187	167	.134	-13	.109	-168
300.0	.133	-30	3.195	156	.134	-17	.100	-180
400.0	.144	-33	3.277	146	.133	-23	.107	174
500.0	.149	-38	3.282	136	.132	-28	.106	164
600.0	.166	-44	3.297	124	.130	-32	.103	157
700.0	.187	-52	3.303	114	.128	-37	.102	154
800.0	.198	-66	3.319	104	.127	-42	.100	148
900.0	.199	-76	3.315	94	.126	-47	.099	141
1000.0	.206	-87	3.330	83	.124	-51	.106	134
1100.0	.208	-101	3.306	73	.123	-57	.110	126
1200.0	.197	-115	3.285	63	.122	-63	.111	113
1300.0	.198	-129	3.265	53	.120	-69	.117	97
1400.0	.186	-147	3.228	42	.118	-74	.123	80
1500.0	.171	-163	3.210	31	.116	-79	.125	63
1600.0	.168	175	3.175	20	.115	-85	.129	42
1700.0	.144	154	3.191	10	.111	-90	.131	21
1800.0	.139	129	3.202	0	.108	-94	.131	1
1900.0	.139	97	3.259	-13	.107	-98	.127	-21
2000.0	.162	66	3.294	-24	.107	-102	.132	-45
2100.0	.172	32	3.333	-37	.108	-107	.146	-71
2200.0	.198	6	3.300	-51	.111	-112	.180	-96

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.511	-23	1.140	-126	.153	58	.166	-116
5.0	.437	-15	1.391	-149	.180	21	.171	11
10.0	.416	-17	1.600	-153	.181	7	.227	-14
50.0	.256	-37	2.747	-165	.150	-10	.177	-94
100.0	.178	-37	3.056	-178	.137	-11	.146	-136
200.0	.139	-33	3.182	167	.131	-13	.124	-171
300.0	.137	-29	3.201	156	.131	-17	.116	176
400.0	.151	-33	3.275	146	.130	-22	.120	168
500.0	.152	-39	3.271	136	.129	-27	.119	158
600.0	.169	-45	3.284	125	.128	-31	.114	150
700.0	.188	-53	3.294	115	.127	-36	.110	145
800.0	.205	-66	3.303	104	.126	-40	.105	139
900.0	.200	-77	3.309	94	.125	-45	.103	131
1000.0	.208	-89	3.304	84	.124	-49	.107	124
1100.0	.210	-101	3.293	74	.124	-54	.108	116
1200.0	.206	-114	3.283	64	.123	-60	.109	103
1300.0	.199	-129	3.261	53	.121	-66	.115	86
1400.0	.196	-144	3.226	42	.121	-72	.121	70
1500.0	.174	-160	3.210	32	.119	-77	.124	52
1600.0	.163	179	3.168	21	.117	-82	.129	31
1700.0	.150	156	3.202	11	.116	-87	.134	10
1800.0	.140	129	3.213	1	.114	-92	.134	-11
1900.0	.146	98	3.256	-11	.113	-96	.133	-35
2000.0	.157	66	3.293	-22	.115	-100	.139	-58
2100.0	.164	33	3.348	-36	.116	-106	.156	-84
2200.0	.183	10	3.306	-50	.118	-110	.190	-106