

WJ-PA12 / SMPA12

10 to 1200 MHz
TO-8 CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ HIGH OUTPUT POWER:
+24.5 dBm (TYP.) @ +20 Vdc
- ◆ WIDE POWER SUPPLY RANGE:
+12 TO +20 VOLTS
- ◆ WIDE BANDWIDTH: 10 TO 1200 MHz
- ◆ LOW VSWR: < 1.5:1 (TYP.)

Specifications *

Characteristics	Typical	Guaranteed	
		0° to -50°C	-54° to 85°C ²
Frequency (Min.)	5-1300 MHz	10-1200 MHz	10-1200 MHz
Small Signal Gain (Min.)	9.5 dB	9.0 dB	8.5 dB
Gain Flatness (Max.)	<±0.2 dB	±0.5 dB	±0.7 dB
Noise Figure (Max.)	8.5 dB	9.5 dB	10.0 dB
Power Output at 1 dB Compression (Min.)			
V _{CC} = +15 Volts	+22.5 dBm	+20.0 dBm	+19.5 dBm
V _{CC} = +20 Volts ²	+24.5 dBm	+23.0 dBm	+22.5 dBm
VSWR (Max.) Input/Output	< 1.5:1	2.0:1	2.0:1
DC Current (Max.)			
At +15 Volts	95 mA	100 mA	105 mA
At +20 Volts ²	130 mA	132 mA	134 mA

* Measured in a 50-ohm system with V_{CC} = +15 V Nominal.

Notes:

1. WJ-CPA12 is a standard WJ-PA12 installed in a miniature SMA connector housing and guaranteed over 0°C to 50°C temperature range.

2. +71° max case temperature when V_{CC} = 20V.

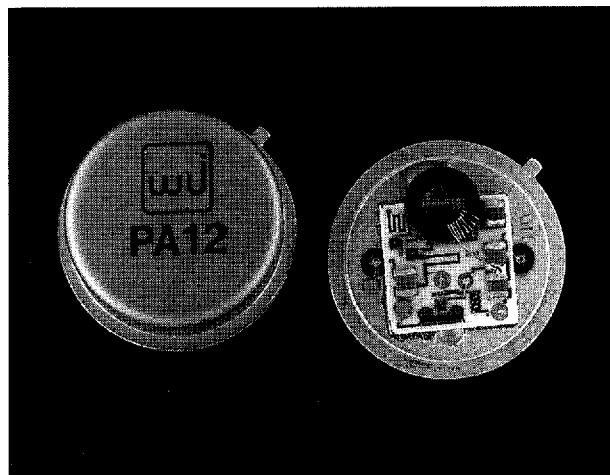
Typical Intermodulation Performance at 25°C (Typ. +15 Vdc)

Second Order Harmonic Intercept Point.....> +45 dBm
Second Order Two Tone Intercept Point.....+45 dBm
Third Order Two Tone Intercept Point.....+35 dBm

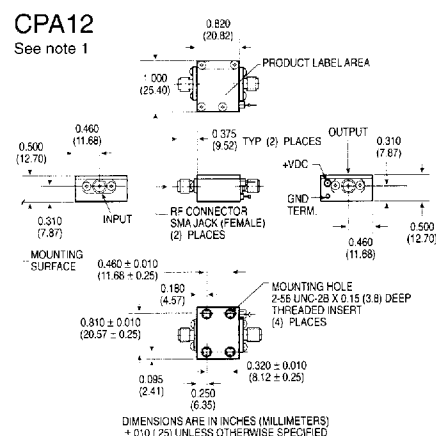
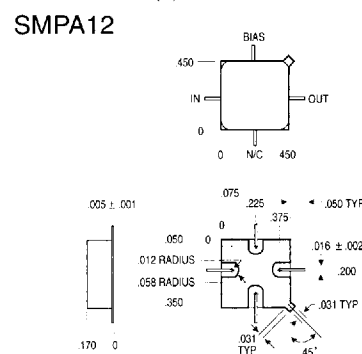
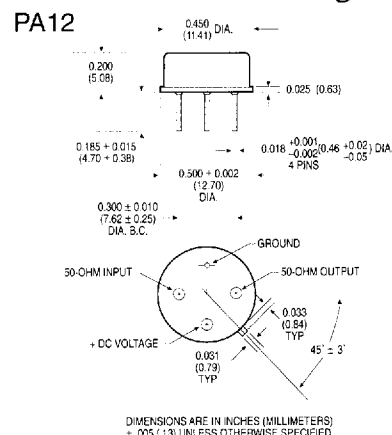
Absolute Maximum Ratings

Storage Temperature-62°C to +125°C
Maximum Case Temperature (At +15 Vdc)125°C
Maximum DC Voltage.....+22 Volts
Maximum Continuous RF Input Power+17 dBm
Maximum Short Term RF Input Power (1 Minute Max.)100 Milliwatts
Maximum Peak Power0. 5 Watt (3 μsec Max.)
"S" Series Burn-in Temperature (Case) (At +15 Vdc)125°C
Proper heatsinking required to insure reliable performance.

Weight approximately 2.0 grams (0.07 oz.)



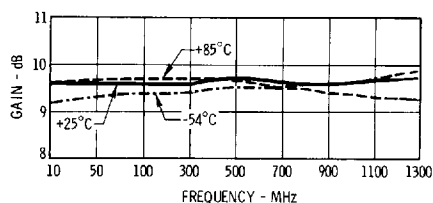
Outline Drawings



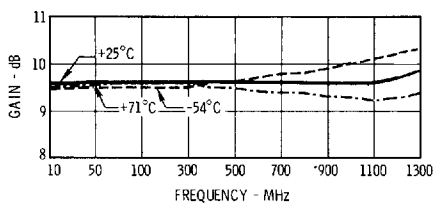
Typical Performance at 25°C

Gain

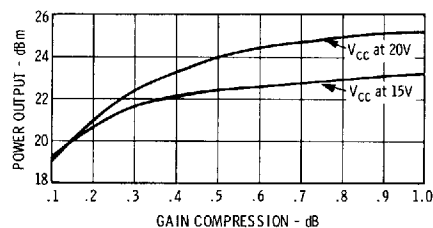
+15 V



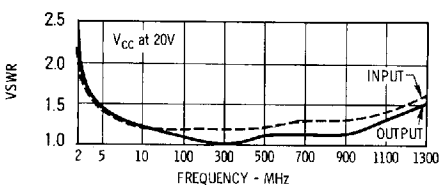
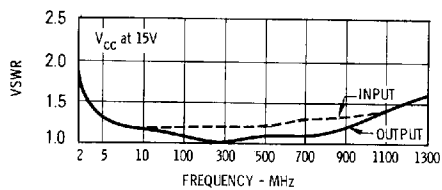
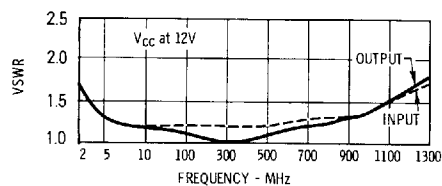
+20 V



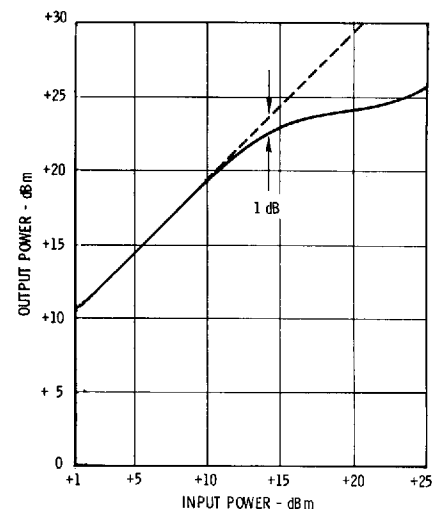
Output Power vs. Gain Compression



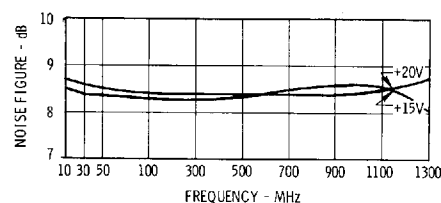
VSWR



Output Power vs. Input Power

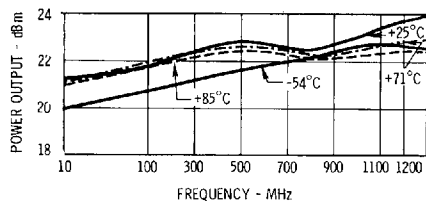


Noise Figure

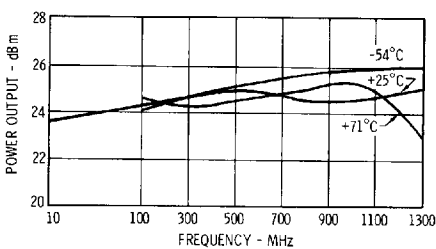


Power Output*

+15 V

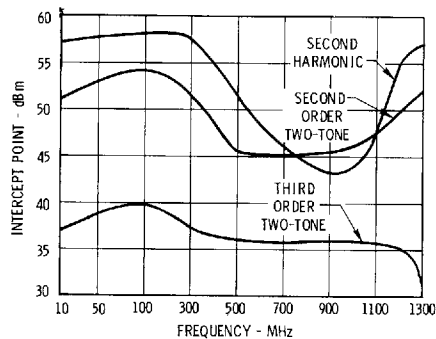


+20 V

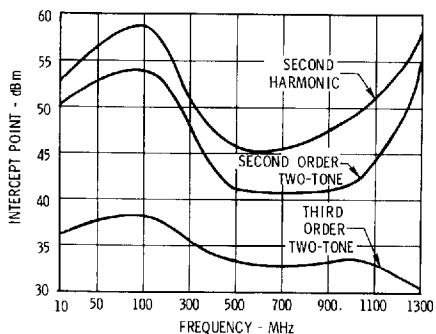


Intercept Point

+15 V



+20 V



*at 1 dB Gain Compression

Typical Automatic Test Data

V_{CC} = 20.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	1.6	1.8	9.5
5.0	1.3	1.3	9.8
10.0	1.2	1.2	9.8
50.0	1.2	1.2	10.0
100.0	1.2	1.2	9.9
200.0	1.2	1.2	9.9
300.0	1.3	1.1	9.9
400.0	1.3	1.1	9.9
500.0	1.3	1.1	9.8
600.0	1.3	1.1	9.8
700.0	1.4	1.1	9.8
800.0	1.4	1.2	9.8
900.0	1.4	1.3	9.7
1000.0	1.4	1.3	9.7
1100.0	1.4	1.4	9.6
1200.0	1.3	1.4	9.4
1300.0	1.4	1.4	9.1
1400.0	1.5	1.4	8.7

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.239	-97	2.992	-152	.147	31	.291	145
5.0	.129	-132	3.086	-170	.156	12	.138	146
10.0	.108	-151	3.107	-176	.157	6	.106	153
50.0	.109	-176	3.151	174	.160	-1	.082	157
100.0	.103	179	3.139	166	.160	-4	.077	148
200.0	.110	-176	3.134	151	.160	-10	.071	123
300.0	.122	-179	3.118	137	.160	-15	.063	94
400.0	.121	176	3.130	122	.162	-20	.046	60
500.0	.134	169	3.105	108	.162	-26	.035	7
600.0	.146	162	3.106	94	.164	-32	.044	-56
700.0	.149	153	3.107	79	.165	-37	.065	-99
800.0	.157	143	3.100	63	.167	-43	.092	-129
900.0	.166	124	3.070	49	.169	-49	.115	-154
1000.0	.166	106	3.055	33	.172	-55	.137	-180
1100.0	.149	81	3.014	16	.173	-61	.155	157
1200.0	.146	47	2.943	0	.178	-68	.161	133
1300.0	.159	2	2.856	-17	.182	-75	.162	107
1400.0	.209	-40	2.708	-35	.189	-83	.157	83

V_{CC} = 12.0 V

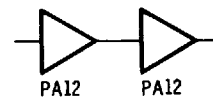
Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	1.6	1.7	9.4
5.0	1.3	1.3	9.6
10.0	1.3	1.2	9.6
50.0	1.2	1.1	9.7
100.0	1.2	1.1	9.7
200.0	1.3	1.1	9.7
300.0	1.3	1.1	9.6
400.0	1.3	1.0	9.7
500.0	1.3	1.0	9.6
600.0	1.4	1.1	9.7
700.0	1.4	1.2	9.6
800.0	1.4	1.2	9.6
900.0	1.4	1.3	9.6
1000.0	1.4	1.4	9.5
1100.0	1.4	1.4	9.3
1200.0	1.4	1.5	9.1
1300.0	1.4	1.5	8.8
1400.0	1.6	1.5	8.3

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.227	-101	2.936	-153	.148	30	.263	142
5.0	.127	-135	3.007	-170	.155	11	.119	142
10.0	.112	-153	3.030	-176	.157	6	.088	150
50.0	.108	-175	3.072	174	.159	-1	.063	159
100.0	.107	-179	3.054	166	.160	-4	.057	155
200.0	.117	-178	3.051	151	.160	-9	.049	141
300.0	.131	178	3.037	137	.161	-13	.038	126
400.0	.124	172	3.057	122	.164	-18	.021	138
500.0	.146	167	3.032	108	.166	-23	.021	-165
600.0	.153	158	3.046	93	.170	-28	.045	-150
700.0	.153	151	3.035	78	.173	-34	.075	-162
800.0	.168	139	3.031	63	.178	-40	.106	-178
900.0	.175	121	3.012	48	.184	-46	.132	163
1000.0	.172	102	2.984	31	.189	-52	.160	142
1100.0	.160	72	2.921	15	.194	-59	.183	121
1200.0	.161	37	2.859	-1	.203	-67	.194	97
1300.0	.183	-3	2.759	-18	.209	-75	.208	71
1400.0	.232	-43	2.596	-37	.217	-85	.211	46

TYPICAL CASCADED V_{CC} = 15.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	1.6	1.7	9.4
5.0	1.3	1.3	9.7
10.0	1.2	1.2	9.7
50.0	1.3	1.2	9.9
100.0	1.2	1.1	9.8
200.0	1.3	1.1	9.8
300.0	1.3	1.1	9.8
400.0	1.3	1.1	9.8
500.0	1.3	1.0	9.8
600.0	1.3	1.1	9.8
700.0	1.3	1.1	9.8
800.0	1.4	1.2	9.8
900.0	1.4	1.3	9.7
1000.0	1.4	1.3	9.7
1100.0	1.4	1.4	9.6
1200.0	1.3	1.4	9.4
1300.0	1.4	1.5	9.1
1400.0	1.5	1.5	8.7



Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.232	-99	2.964	-152	.148	30	.273	144
5.0	.126	-133	3.042	-170	.155	11	.125	144
10.0	.109	-153	3.064	-176	.157	6	.095	151
50.0	.113	-175	3.111	174	.159	-1	.070	158
100.0	.103	179	3.092	166	.159	-4	.064	152
200.0	.115	179	3.088	152	.160	-9	.058	133
300.0	.123	176	3.077	138	.161	-14	.047	111
400.0	.124	170	3.095	123	.163	-19	.025	92
500.0	.132	166	3.078	109	.165	-24	.001	-57
600.0	.146	161	3.092	94	.167	-30	.030	-119
700.0	.142	154	3.096	79	.170	-35	.061	-141
800.0	.160	141	3.090	64	.174	-41	.091	-161
900.0	.163	127	3.069	49	.178	-47	.117	178
1000.0	.160	107	3.062	33	.182	-53	.144	156
1100.0	.153	81	3.004	17	.187	-60	.165	134
1200.0	.148	47	2.953	1	.192	-67	.174	109
1300.0	.163	5	2.855	-16	.199	-75	.185	83
1400.0	.208	-38	2.718	-35	.206	-84	.185	57

Thermal Data: V_{CC} = 15 Vdc

Thermal Resistance θ_{JC} 45°C/W
 Transistor Power Dissipation P_d 0.968 W
 Junction Temperature Rise Above Case T_{JC} ... 44°C