

WJ-PA48/SMPA48

1.0 TO 4.0 GHz
TO-8B² CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ ULTRA WIDE BANDWIDTH: 0.8-4.2 GHz (TYP.)
- ◆ HIGH OUTPUT LEVEL: +24.0 dBm (TYP.)
- ◆ HIGH GAIN: 16.0 dB (TYP.)
- ◆ GaAs FET AMPLIFIER



Specifications*

Characteristics	Typical	0° to -50°C	Guaranteed -54°C to +85°C
Frequency (Min.)	0.8-4.2 GHz	1.0-4.0 GHz	1.0-4.0 GHz
Small Signal Gain (Min.)	16.0 dB	14.0 dB	13.5 dB
Gain Flatness (Max.)	±0.4 dB	±0.7 dB	±0.8 dB
Noise Figure (Max.)	5.5 dB	7.0 dB	7.5 dB
Power Output at 1 dB Compression (Min.)	+24.0 dBm	+22.5 dBm	+21.5 dBm
VSWR (Max.)			
Input	1.7:1	2.0:1	2.2:1
Output	1.6:1	1.9:1	2.1:1
DC Current (Max.) at +15 Volts	225 mA	235 mA	245 mA

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

Notes:

- WJ-CPA48 is a standard WJ-PA48 installed in a miniature SMA connector housing and guaranteed over 0°C to 50°C temperature range.
- WJ-PA48 amplifier TO-8B package is slightly larger than the standard TO-8 package.

Typical Intermodulation Performance at 25°C

Second Order Harmonic Intercept Point.....	+55 dBm (Typ.)
Second Order Two Tone Intercept Point.....	+45 dBm (Typ.)
Third Order Two Tone Intercept Point.....	+34 dBm (Typ.)

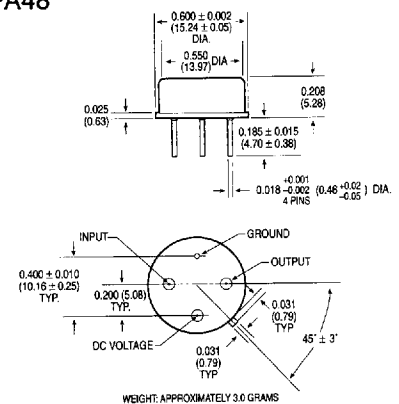
Absolute Maximum Ratings

Storage Temperature	-62°C to +125°C
Maximum Case Temperature	85°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 Power	0.25 Watt (3 μ sec Max.)
"S" Series Burn-In Temperature (Case)	85°C

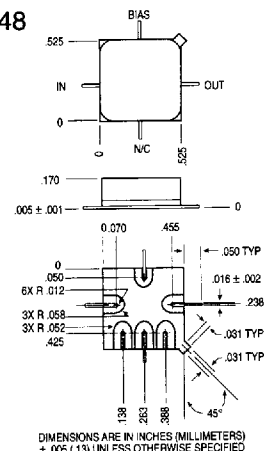
Weight approximately 3.0 grams (0.11 oz.)

Outline Drawings

PA48

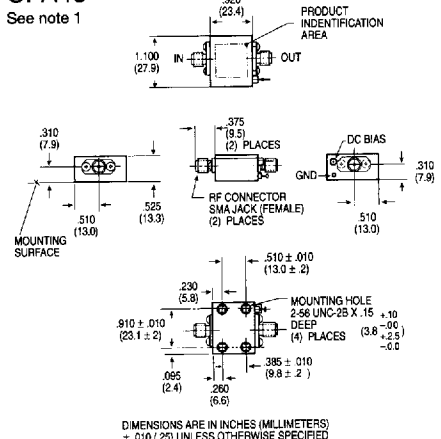


SMPA48



CPA48

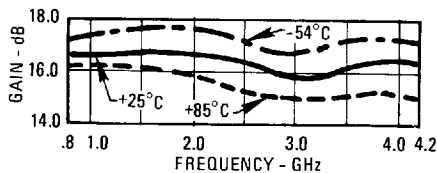
See note 1



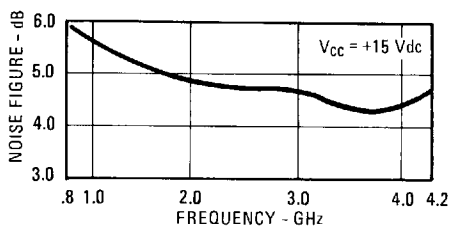
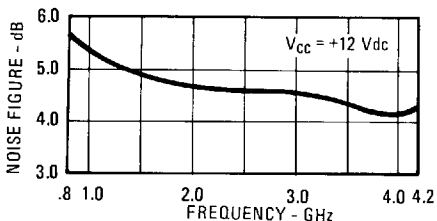
Typical Performance at 25°C

Typical Automatic Test Data

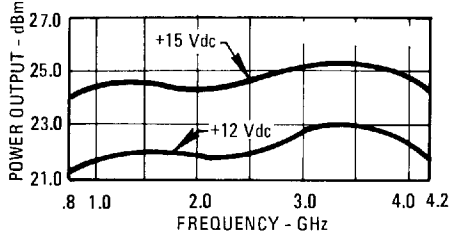
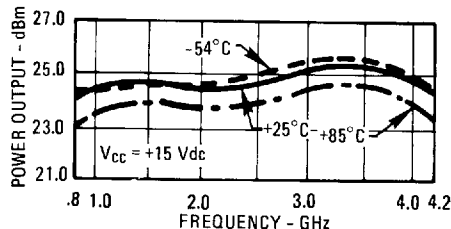
Gain



Noise Figure

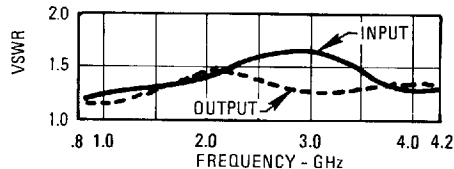


Power Output*

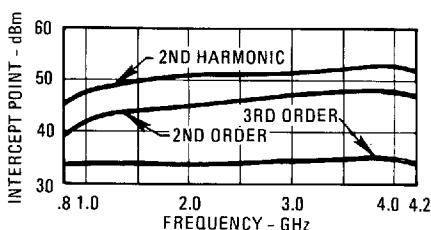


*at 1 dB Gain Compression

VSWR



Intercept Point



Vcc = 15.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
800.0	1.5	1.3	15.7
900.0	1.1	1.3	16.1
1000.0	1.2	1.3	16.1
1100.0	1.3	1.3	16.1
1200.0	1.4	1.3	16.2
1300.0	1.5	1.3	16.2
1400.0	1.5	1.3	16.2
1500.0	1.4	1.3	16.3
1600.0	1.4	1.3	16.4
1700.0	1.4	1.3	16.3
1800.0	1.4	1.3	16.4
1900.0	1.4	1.3	16.5
2000.0	1.3	1.4	16.5
2100.0	1.3	1.4	16.5
2200.0	1.2	1.4	16.6
2300.0	1.2	1.4	16.7
2400.0	1.3	1.4	16.8
2500.0	1.3	1.4	16.8
2600.0	1.3	1.4	16.8
2700.0	1.4	1.3	16.8
2800.0	1.4	1.3	16.7
2900.0	1.5	1.3	16.7
3000.0	1.5	1.2	16.7
3100.0	1.5	1.2	16.6
3200.0	1.5	1.2	16.6
3300.0	1.5	1.2	16.6
3400.0	1.4	1.3	16.6
3500.0	1.4	1.3	16.6
3600.0	1.3	1.3	16.5
3700.0	1.3	1.4	16.5
3800.0	1.2	1.4	16.4
3900.0	1.2	1.4	16.2
4000.0	1.2	1.4	16.1
4100.0	1.3	1.4	15.8
4200.0	1.3	1.4	15.8

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
800.0	.210	-76	6.062	-96	.020	-48	.127	76
900.0	.061	-85	6.360	-144	.022	-94	.135	25
1000.0	.070	-5	6.399	175	.022	-130	.138	-10
1100.0	.125	-22	6.406	137	.020	-163	.137	-37
1200.0	.159	-47	6.426	101	.021	167	.140	-62
1300.0	.184	-71	6.455	67	.021	132	.140	-87
1400.0	.194	-102	6.482	34	.019	105	.142	-113
1500.0	.182	-129	6.505	1	.019	77	.141	-138
1600.0	.181	-158	6.571	-31	.019	51	.142	-164
1700.0	.179	-172	6.568	-63	.021	23	.146	170
1800.0	.163	142	6.598	-94	.019	-4	.144	143
1900.0	.157	110	6.651	-125	.020	-31	.146	115
2000.0	.134	84	6.677	-156	.019	-56	.152	88
2100.0	.116	44	6.711	173	.019	-82	.154	63
2200.0	.105	9	6.798	143	.018	-107	.156	37
2300.0	.109	-30	6.841	112	.018	-137	.155	11
2400.0	.119	-68	6.885	82	.018	-160	.161	-14
2500.0	.131	-107	6.948	51	.018	172	.160	-38
2600.0	.139	-139	6.920	20	.019	147	.154	-63
2700.0	.167	-170	6.913	-11	.018	118	.143	-84
2800.0	.169	162	6.860	-41	.016	99	.126	-103
2900.0	.184	135	6.829	-72	.016	77	.113	-116
3000.0	.192	111	6.811	-102	.016	50	.107	-126
3100.0	.202	88	6.773	-133	.017	30	.102	-137
3200.0	.193	67	6.770	-163	.014	1	.102	-147
3300.0	.193	46	6.737	166	.015	-21	.103	-153
3400.0	.183	25	6.742	135	.016	-48	.113	-163
3500.0	.176	7	6.761	105	.015	-75	.129	-175
3600.0	.146	-10	6.701	73	.014	-99	.144	168
3700.0	.121	-24	6.665	42	.015	-120	.155	150
3800.0	.095	-30	6.601	11	.016	-143	.158	131
3900.0	.078	-17	6.453	-21	.016	-172	.160	112
4000.0	.086	-13	6.370	-52	.014	158	.157	94
4100.0	.116	-9	6.197	-83	.015	142	.152	78
4200.0	.148	-20	6.178	-114	.016	105	.158	65

Thermal Data: Vcc = 15 Vdc

Thermal Resistance θ_{jc} 67.4°C/W
 Transistor Power Dissipation P_d 1.280 W
 Junction Temperature Rise Above Case T_{jc} ... 86°C

Typical Automatic Test Data

V_{cc} = 12.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
800.0	1.5	1.4	16.1
900.0	1.1	1.4	16.3
1000.0	1.2	1.4	16.3
1100.0	1.3	1.4	16.3
1200.0	1.4	1.4	16.3
1300.0	1.5	1.4	16.4
1400.0	1.5	1.4	16.4
1500.0	1.5	1.4	16.5
1600.0	1.5	1.5	16.6
1700.0	1.5	1.5	16.6
1800.0	1.4	1.5	16.7
1900.0	1.4	1.5	16.8
2000.0	1.4	1.5	16.9
2100.0	1.3	1.5	16.9
2200.0	1.3	1.5	17.1
2300.0	1.3	1.6	17.2
2400.0	1.3	1.6	17.3
2500.0	1.3	1.6	17.4
2600.0	1.3	1.6	17.3
2700.0	1.4	1.5	17.4
2800.0	1.4	1.5	17.3
2900.0	1.5	1.4	17.3
3000.0	1.5	1.3	17.3
3100.0	1.5	1.2	17.2
3200.0	1.5	1.2	17.2
3300.0	1.5	1.1	17.1
3400.0	1.5	1.0	17.1
3500.0	1.5	1.1	17.1
3600.0	1.4	1.1	17.0
3700.0	1.3	1.2	16.9
3800.0	1.3	1.2	16.7
3900.0	1.2	1.3	16.5
4000.0	1.2	1.3	16.3
4100.0	1.2	1.4	16.0
4200.0	1.3	1.4	15.9

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
800.0	.188	-71	6.348	-100	.019	-51	.162	48
900.0	.053	-65	6.560	-147	.019	-92	.179	7
1000.0	.079	-6	6.540	173	.019	-128	.180	-24
1100.0	.137	-24	6.527	136	.018	-163	.179	-49
1200.0	.166	-47	6.561	101	.019	166	.179	-75
1300.0	.192	-72	6.596	67	.018	138	.181	-100
1400.0	.199	-99	6.637	34	.018	108	.182	-125
1500.0	.195	-128	6.666	2	.017	80	.181	-149
1600.0	.188	-156	6.757	-30	.017	54	.185	-175
1700.0	.186	174	6.781	-61	.019	30	.188	158
1800.0	.176	147	6.839	-92	.018	6	.188	132
1900.0	.171	115	6.927	-123	.017	-24	.194	105
2000.0	.150	89	6.975	-154	.018	-48	.204	79
2100.0	.133	54	7.017	175	.019	-72	.207	54
2200.0	.120	21	7.159	145	.020	-94	.212	27
2300.0	.127	-19	7.232	114	.019	-124	.216	1
2400.0	.125	-57	7.307	83	.019	-150	.222	-25
2500.0	.131	-95	7.409	52	.019	180	.223	-49
2600.0	.148	-126	7.367	21	.018	159	.221	-76
2700.0	.158	-158	7.374	-10	.018	142	.207	-101
2800.0	.171	174	7.352	-40	.020	109	.188	-125
2900.0	.190	146	7.304	-71	.018	85	.163	-148
3000.0	.189	119	7.299	-102	.018	57	.137	-169
3100.0	.205	98	7.245	-132	.018	34	.111	173
3200.0	.203	75	7.226	-163	.017	11	.081	154
3300.0	.211	54	7.185	167	.018	-18	.050	141
3400.0	.200	32	7.170	135	.019	-37	.023	169
3500.0	.192	14	7.141	104	.018	-66	.038	-155
3600.0	.170	-3	7.040	73	.019	-90	.066	-161
3700.0	.143	-19	6.973	41	.018	-117	.091	-179
3800.0	.118	-30	6.863	10	.019	-139	.108	164
3900.0	.092	-31	6.675	-21	.019	-165	.124	146
4000.0	.088	-23	6.519	-53	.019	168	.137	129
4100.0	.109	-16	6.312	-83	.020	139	.156	112
4200.0	.141	-22	6.232	-114	.019	113	.182	93