A45 / SMA45

1 to 4 GHz
TO-8 CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ HIGH GAIN 17.5 dB (TYP.)
- ◆ LOW NOISE 4.5 dB (TYP.)
- ◆ HIGH OUTPUT POWER: +19.5 dBm (TYP.)
- ◆ GaAs FET DESIGN

Specifications*

Characteristic	Typical	Guaranteed 0° to 50°C	Guaranteed -55° to +85°C
Frequency (Min.)	1-4 GHz	1-4 GHz	1-4 GHz
Small Signal Gain (Min.)	17.5 dB	16.5 dB	15.5 dB
Gain Flatness (Max.)	±0.6 dB	±0.8 dB	±1.0 dB
Noise Figure (Max.)			
1-2 GHz	4.5 dB	5.5 dB	6.0 dB
2-4 GHz	4.0 dB	5.0 dB	5.5 dB
Power Output			
at 1dB Compression (Min.)	+19.5 dBm	+18 dBm	+17 dBm
VSWR (Max.) Input	1.8:1	2.1:1	2.2:1
VSWR (Max.) Output	1.7:1	2.1:1	2.2:1
DC Current (Max.) at +15 volts	120 mA	125 mA	130 mA

*Measured in a 50-ohm system at +15 Vdc Nominal.
Notes:
1. *WJ-CA45 is a standard WJ-A45 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 .....+44 dBm (Typ.)
Second Order Two Tone Intercept Point .....+39 dBm (Typ.)
Third Order Two Tone Intercept Point .....+29 dBm (Typ.)

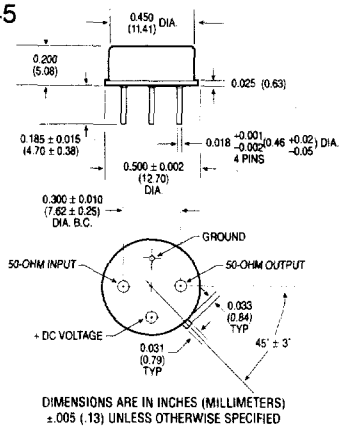
Absolute Maximum Ratings

Storage Temperature .....-65°C to +125°C
Maximum Case Temperature .....85°C
Maximum DC Voltage .....+16 Volts
Maximum Continuous RF Input Power .....+13 dBm
Maximum Short Term RF Input Power (1 Minute Max.) .....100 Milliwatts
Maximum Peak Power .....0.25 Watts (3 μsec Max.)
"S" Series Burn-In Temperature (Case) .....85°C

Weight approximately 2.0 grams (0.07 oz.)

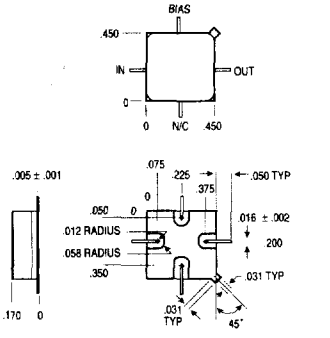
Outline Drawings

A45



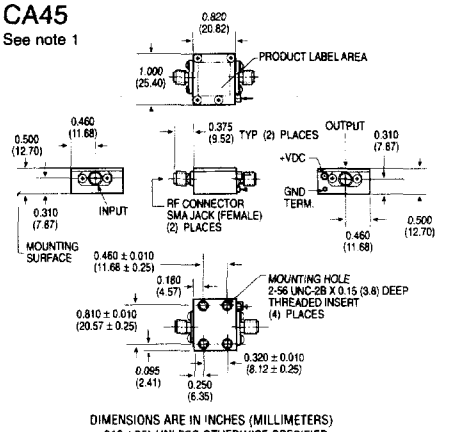
DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.005 (.13) UNLESS OTHERWISE SPECIFIED

SMA45



DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.010 (.25) UNLESS OTHERWISE SPECIFIED

CA45
See note 1

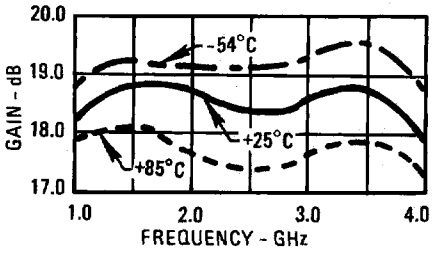


DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.010 (.25) UNLESS OTHERWISE SPECIFIED

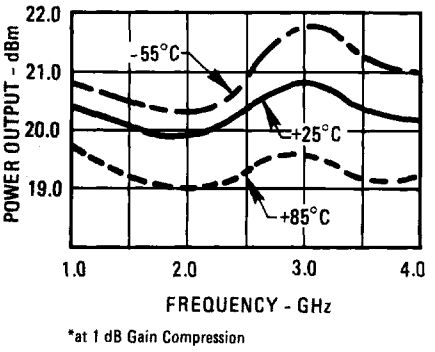
WJ Customer Service: 1-800-WJ1-4401 • FAX: 415-813-2758 • e-mail: mw.devices@wj.com

Typical Performance at 25°C

Gain

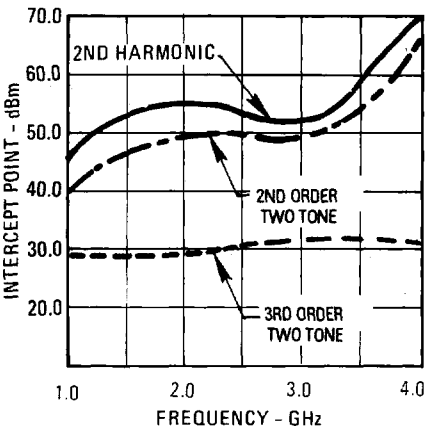


Power Output*

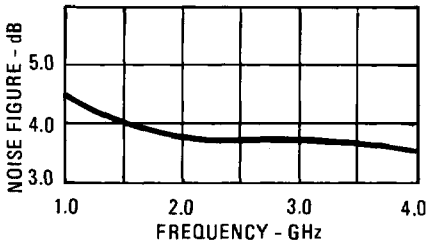


*at 1 dB Gain Compression

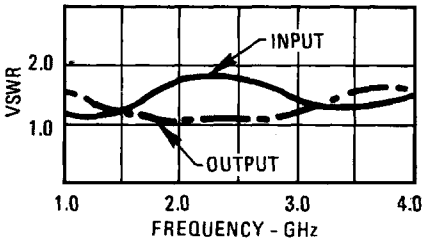
Intercept Point



Noise Figure



VSWR



Typical Automatic Test Data

V_{CC} = 15.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
800.0	1.3	1.2	19.5
900.0	1.4	1.3	19.1
1000.0	1.4	1.5	18.9
1100.0	1.4	1.5	18.9
1200.0	1.3	1.6	19.0
1300.0	1.2	1.6	19.2
1400.0	1.2	1.6	19.3
1500.0	1.1	1.6	19.4
1600.0	1.1	1.6	19.5
1700.0	1.1	1.5	19.6
1800.0	1.1	1.5	19.6
1900.0	1.2	1.4	19.7
2000.0	1.2	1.4	19.7
2100.0	1.3	1.3	19.6
2200.0	1.4	1.3	19.6
2300.0	1.4	1.2	19.6
2400.0	1.5	1.2	19.5
2500.0	1.5	1.1	19.4
2600.0	1.6	1.1	19.3
2700.0	1.6	1.1	19.2
2800.0	1.5	1.1	19.1
2900.0	1.5	1.1	19.0
3000.0	1.5	1.2	18.9
3100.0	1.5	1.2	18.8
3200.0	1.5	1.3	18.7
3300.0	1.5	1.4	18.6
3400.0	1.5	1.4	18.6
3500.0	1.5	1.5	18.6
3600.0	1.5	1.6	18.5
3700.0	1.5	1.6	18.5
3800.0	1.5	1.6	18.5
3900.0	1.5	1.7	18.5
4000.0	1.5	1.7	18.6
4100.0	1.5	1.7	18.7
4200.0	1.5	1.6	18.9

Linear S-Parameters

Frequency	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
800.0	.138	149	9.451	-98	.019	-24	.084	-103
900.0	.178	119	9.018	-144	.018	-65	.147	-166
1000.0	.176	91	8.803	176	.016	-104	.184	151
1100.0	.155	65	8.849	139	.015	-140	.210	113
1200.0	.133	41	8.962	104	.016	-167	.225	79
1300.0	.107	14	9.083	70	.016	166	.234	48
1400.0	.074	-7	9.226	36	.015	136	.237	19
1500.0	.043	-13	9.354	2	.016	113	.233	-8
1600.0	.027	-13	9.459	-31	.016	89	.228	-34
1700.0	.037	33	9.523	-63	.014	62	.213	-58
1800.0	.056	26	9.580	-95	.014	32	.197	-81
1900.0	.083	10	9.613	-127	.015	10	.177	-102
2000.0	.099	-19	9.623	-159	.014	-16	.155	-124
2100.0	.132	-42	9.598	169	.015	-37	.135	-145
2200.0	.150	-68	9.584	138	.013	-68	.116	-165
2300.0	.175	-88	9.506	107	.014	-91	.095	174
2400.0	.192	-111	9.414	77	.014	-118	.076	155
2500.0	.210	-134	9.372	46	.013	-135	.063	135
2600.0	.219	-159	9.231	15	.012	-158	.051	110
2700.0	.218	178	9.140	-15	.014	170	.049	80
2800.0	.211	155	9.010	-45	.013	143	.052	44
2900.0	.215	131	8.922	-75	.015	125	.062	9
3000.0	.203	105	8.828	-105	.014	98	.082	-22
3100.0	.204	83	8.724	-135	.012	74	.106	-47
3200.0	.194	59	8.657	-165	.013	46	.128	-70
3300.0	.197	36	8.555	165	.015	19	.155	-92
3400.0	.202	12	8.527	135	.013	2	.180	-114
3500.0	.203	-12	8.506	105	.013	-32	.203	-134
3600.0	.206	-37	8.437	75	.012	-51	.220	-155
3700.0	.212	-60	8.421	45	.013	-76	.235	-176
3800.0	.212	-85	8.439	16	.013	-101	.244	163
3900.0	.205	-111	8.421	-15	.013	-133	.252	141
4000.0	.213	-135	8.536	-45	.014	-159	.251	119
4100.0	.202	-160	8.579	-75	.014	172	.249	95
4200.0	.202	176	8.807	-107	.015	143	.245	70

Thermal Data: V_{CC} = 15 Vdc

Thermal Resistance θ_{jc} .....131°C/W
Transistor Power Dissipation P_d .....0.497 W
Junction Temperature Rise Above Case T_{jc} .....65°C