TELEDYNE
MICROWAVE SOLUTIONS
Everywhereyoulook™

Rev. 5/10

AP2509

10 TO 2500 MHz TO-8 CASCADABLE AMPLIFIER

Typical Values	AP2509
High Output Power	+27.5 dBm
High Third Order	+39 dBm
High Second Harmonics @ +12 volts	+69 dBm
High Performance Thin Film	
Standard Size TO-8 Package	

SPECIFICATIONS*

Parameter	Typical	Guaranteed 0 to 50 °C	Guaranteed -55 to +85 °C
Frequency (Min.)	**10-2500 MHz**	**10-2500 MHz**	**10-2500 MHz**
Small Signal Gain (Min.)	8.5 dB	8.0 dB	7.5 dB
Gain Flatness (Max.)	±0.4 dB	±0.5 dB	±0.8 dB
Noise Figure (Max.) 200-2500 MHz	4.3† dB	5.0† dB	5.5† dB
SWR (Max.) Input/Output	1.6:1	1.7:1^	1.8:1^
Power Output (Min.) @ 1dB comp.	+27.5 dBm	+26.0 dBm	+25.5 dBm
Reverse Isolation	17.0 dB	—	—
DC Current (Max.)	185.0 mA	190.0 mA	195.0 mA

* Measured in a 50-ohm system at +15 Vdc unless otherwise specified.
^ 2.1:1 below 20 MHz. † 1.0 dB higher between 100-200 MHz and 2000-2500 MHz.

INTERMODULATION PERFORMANCE

Typical @ 25 °C	Vcc = +12.0 V	Vcc = +15.0 V
Second Order Harmonic Intercept Point	+69 dBm	+58 dBm
Second Order Two Tone Intercept Point	+63 dBm	+52 dBm
Third Order Two Tone Intercept Point	+39 dBm	+40 dBm

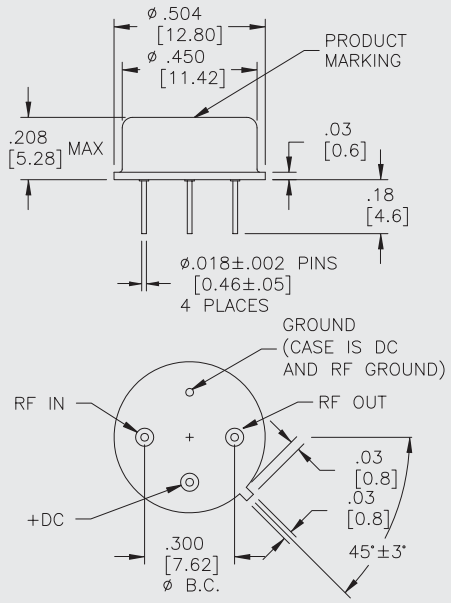
ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-62 to +125 °C
Maximum Case Temperature	+105 °C
Maximum DC Voltage	+17 Volts
Maximum Continuous RF Input Power	+20 dBm
Maximum Short Term Input Power (1 Minute Max.)	250 Milliwatts
Maximum Peak Power (3 µsec Max.)	0.5 Watt
Burn-in Temperature	+85 °C
Thermal Resistance[1] (θjc)	+24 °C/Watt
Junction Temperature Rise Above Case (Tjc)	+69.3 °C

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

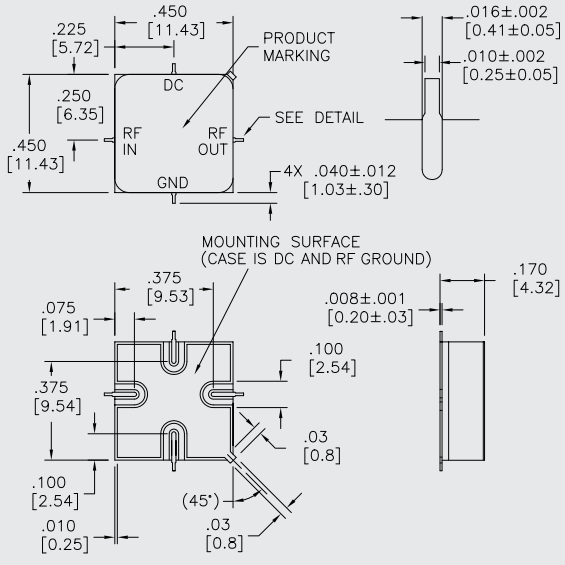
AP2509

TO-8 Package for Amplifiers



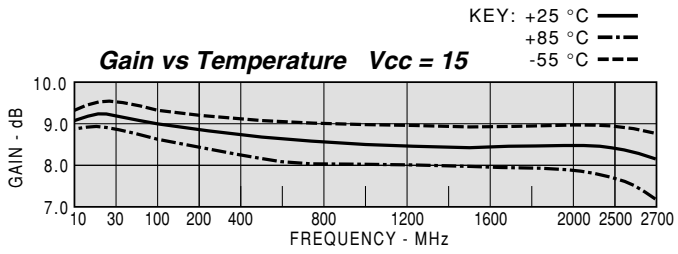
APS2509

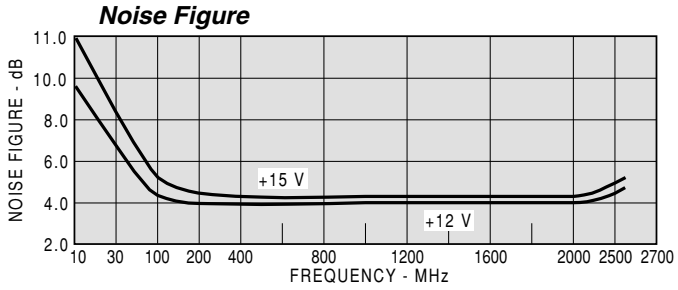
SMTO-8 Package for Amplifiers

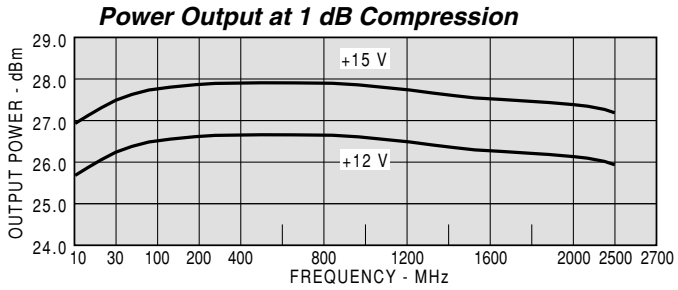


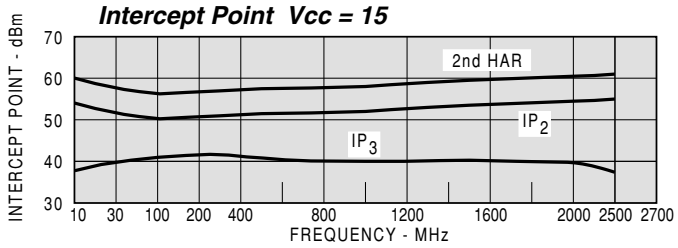
DIMENSIONS ARE IN INCHES [MILLIMETERS]

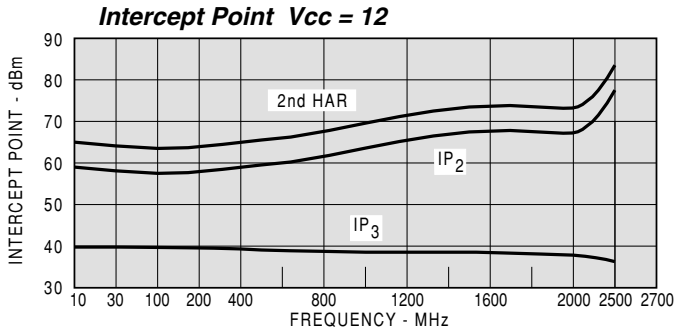
TYPICAL PERFORMANCE











TYPICAL AUTOMATIC TEST DATA

MODEL: AP2509 Vcc = +15V Icc = 186.92 mA

FREQ. MHZ	VSWR IN	VSWR OUT	GAIN DB	GROUP DELAY NSEC	REV/ISO DB
10	1.62	1.73	8.6		-16.9
50	1.10	1.56	8.7		-16.9
100	1.07	1.54	8.6	0.421	-16.8
300	1.08	1.45	8.4	0.274	-16.7
500	1.09	1.44	8.4	0.258	-16.9
700	1.07	1.45	8.4	0.265	-16.9
900	1.06	1.42	8.4	0.255	-17.1
1100	1.06	1.39	8.3	0.256	-17.2
1300	1.12	1.30	8.4	0.269	-17.3
1500	1.10	1.22	8.5	0.264	-17.5
1700	1.09	1.16	8.5	0.259	-17.6
1900	1.10	1.12	8.6	0.287	-17.7
2100	1.05	1.16	8.6	0.302	-18.1
2300	1.11	1.23	8.7	0.310	-18.5
2500	1.41	1.37	8.5	0.353	-19.3
2700	2.11	1.50	8.1	0.378	-20.8

LINEAR S-PARAMETERS

MODEL: AP2509 Vcc = +15V Icc = 186.92 mA

FREQ.	S11		S21		S12		S22	
MHZ	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
10	0.24	-73.7	2.69	-152.9	0.143	23	0.27	169.8
50	0.05	-61.2	2.72	-180.0	0.143	2	0.22	172.1
100	0.03	-49.9	2.68	172.3	0.144	-2	0.21	165.4
300	0.04	-65.1	2.62	152.7	0.147	-16	0.18	147.5
500	0.04	-84.0	2.63	134.1	0.142	-28	0.18	126.7
700	0.03	-113.4	2.63	115.2	0.142	-39	0.18	108.7
900	0.03	-148.8	2.65	96.6	0.140	-51	0.17	90.4
1100	0.03	173.2	2.61	78.3	0.138	-62	0.16	74.2
1300	0.06	170.9	2.62	59.3	0.136	-74	0.13	58.5
1500	0.05	170.2	2.65	40.1	0.134	-86	0.10	34.3
1700	0.04	176.3	2.67	21.3	0.132	-100	0.07	5.4
1900	0.05	155.5	2.70	0.9	0.130	-114	0.06	-43.5
2100	0.03	108.6	2.70	-20.9	0.125	-129	0.07	-89.2
2300	0.05	6.6	2.71	-43.2	0.119	-145	0.10	-121.3
2500	0.17	-29.4	2.67	-68.4	0.108	-163	0.15	-143.0
2700	0.36	-55.6	2.54	-95.7	0.091	178	0.20	-167.5
2900	0.57	-80.7	2.20	-125.3	0.061	168	0.22	151.7

MODEL: AP2509 Vcc = +12V Icc = 172.70 mA

FREQ. MHZ	VSWR IN	VSWR OUT	GAIN DB	GROUP DELAY NSEC	REV/ISO DB
10	1.61	1.78	8.6		-17.2
50	1.11	1.64	8.6		-17.2
100	1.08	1.63	8.5	0.425	-17.1
300	1.09	1.53	8.3	0.270	-16.9
500	1.10	1.51	8.4	0.256	-17.1
700	1.08	1.52	8.3	0.264	-17.1
900	1.07	1.49	8.4	0.255	-17.2
1100	1.06	1.46	8.3	0.252	-17.3
1300	1.13	1.38	8.3	0.266	-17.3
1500	1.11	1.29	8.4	0.264	-17.3
1700	1.10	1.21	8.4	0.260	-17.3
1900	1.12	1.13	8.6	0.283	-17.4
2100	1.07	1.09	8.6	0.304	-17.5
2300	1.10	1.11	8.7	0.307	-17.7
2500	1.37	1.20	8.6	0.354	-18.3
2700	2.13	1.30	8.2	0.389	-19.5