

# AP3509 100 TO 3500 MHz TO-8 CASCADABLE AMPLIFIER

**Typical Values**

<b>Ultra Broad Bandwidth</b> .....	<b>AP3509</b>
<b>High Output Level</b> .....	<b>100-3500 MHz</b>
<b>High Performance Thin Film</b>	<b>+27.5 dBm</b>
<b>Standard Size TO-8</b>	

## SPECIFICATIONS

Parameter	Typical	Guaranteed*		
		0 to 50° C	-55 to +85° C	
Frequency (Min.)	50-3600 MHz	100-3500 MHz	100-3500 MHz	
Small Signal Gain (Min.)	8.5 dB	8.0 dB	7.5 dB	
Gain Flatness (Max.)	±0.3 dB	±0.6 dB	±0.7 dB	
Noise Figure (Max.)				
	0.5-3.5 GHz	5.5 dB	6.5 dB	7.0 dB
	0.1-0.5 GHz	7.0 dB	8.0 dB	8.5 dB
SWR (Max.)				
	Input	1.6:1	1.8:1	2.0:1
	Output	1:9:1	2:2:1	2:3:1
Power Output (Min.) @ 1dB comp.	+27.0 dBm	+26.0 dBm	+25.5 dBm	
DC Current (Max.)	190.0 mA	200.0 mA	205.0 mA	

\* Measured in a 50-ohm system at +15.0 Vdc unless otherwise specified.

## INTERMODULATION PERFORMANCE

**Typical @ 25° C**

<b>Second Order Harmonic Intercept Point</b> .....	<b>AP3509</b>
<b>Second Order Two Tone Intercept Point</b> .....	<b>+54 dBm</b>
<b>Third Order Two Tone Intercept Point</b> .....	<b>+48 dBm</b>
<b>Third Order Two Tone Intercept Point</b> .....	<b>+38 dBm</b>

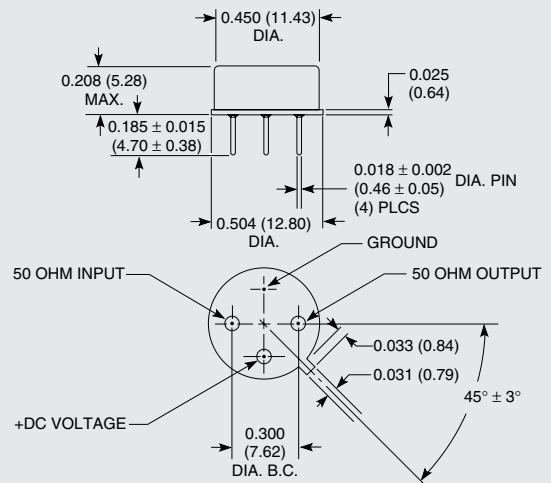
## ABSOLUTE MAXIMUM RATINGS

<b>Storage Temperature</b> .....	<b>-62 to 125° C</b>
<b>Maximum Case Temperature</b> .....	<b>+100° C</b>
<b>Maximum DC Voltage</b> .....	<b>+17 Volts</b>
<b>Maximum Continuous RF Input Power</b> .....	<b>+22 dBm</b>
<b>Maximum Short Term Input Power (1 Minute Max.)</b> .....	<b>200 Milliwatts</b>
<b>Maximum Peak Power (3 μsec Max.)</b> .....	<b>0.25 Watt</b>
<b>Burn-in Temperature</b> .....	<b>+75° C</b>
<b>Thermal Resistance<sup>1</sup> (θjc)</b> .....	<b>+25° C/Watt</b>
<b>Junction Temperature Rise Above Case (Tjc)</b> .....	<b>+64.8° C</b>

<sup>1</sup>Thermal resistance is based on total power dissipation.

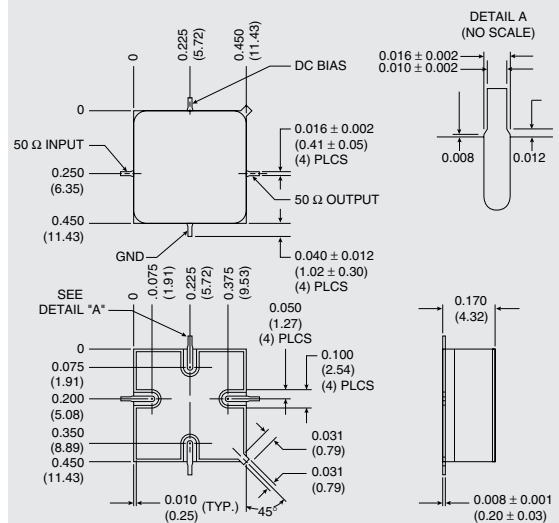
## AP3509

### TO-8 Package for Amplifiers



## APS3509

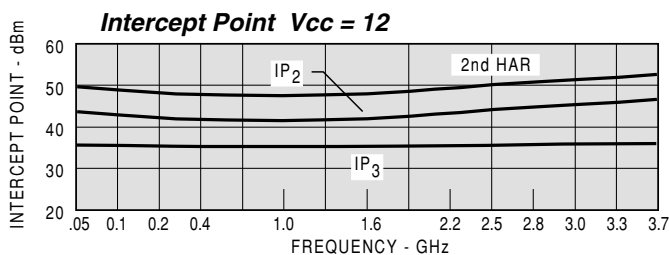
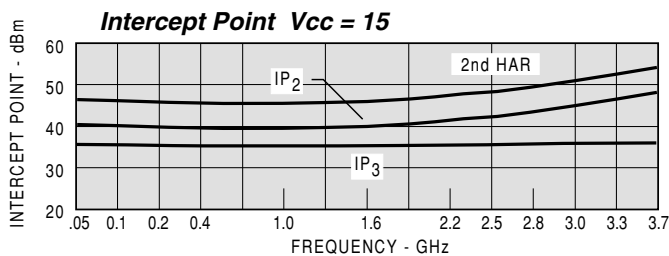
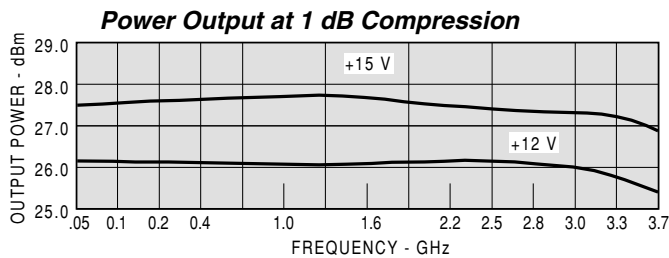
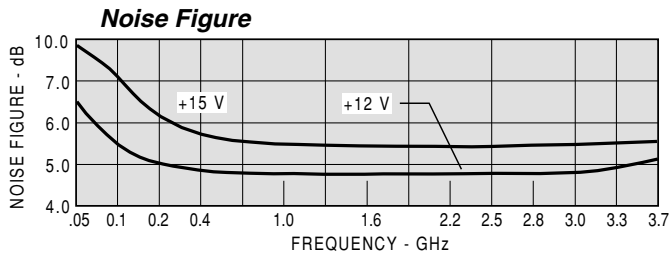
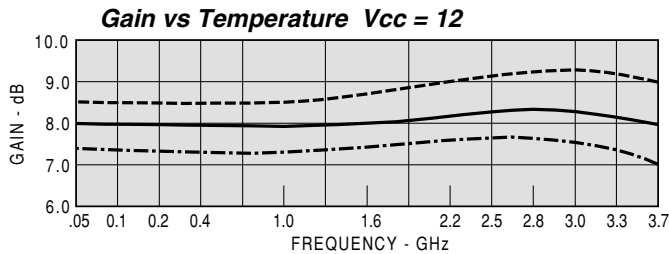
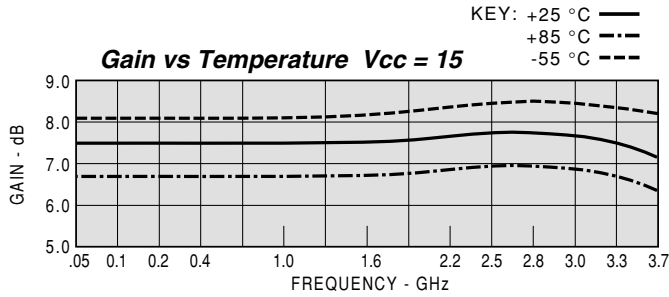
### SMT0-8 Package for Amplifiers



DIMENSIONS ARE IN INCHES (MILLIMETERS)

## TYPICAL PERFORMANCE

## TYPICAL AUTOMATIC TEST DATA



MODEL: AP3509		Vcc = +15V		Icc = 190.30 mA	
FREQUENCY	VSWR	VSWR	GAIN	GROUP DELAY	REV/ISO
MHZ	IN	OUT	DB	NSEC	DB
50	1.38	1.27	7.5	0.417	-15.8
100	1.34	1.26	7.5	0.417	-15.9
300	1.33	1.23	7.6	0.235	-15.9
500	1.34	1.21	7.6	0.212	-15.9
700	1.34	1.18	7.7	0.203	-15.9
900	1.36	1.14	7.7	0.205	-16.1
1100	1.40	1.10	7.6	0.199	-16.3
1300	1.43	1.05	7.7	0.202	-16.4
1500	1.47	1.01	7.7	0.206	-16.6
1700	1.50	1.07	7.8	0.202	-16.9
1900	1.55	1.14	7.8	0.212	-17.1
2100	1.54	1.21	7.9	0.209	-17.2
2300	1.54	1.30	8.0	0.216	-17.5
2500	1.53	1.37	8.0	0.223	-17.6
2700	1.45	1.44	8.1	0.225	-17.6
2900	1.38	1.47	8.0	0.222	-17.8
3100	1.30	1.48	7.9	0.241	-17.8
3300	1.34	1.45	7.9	0.239	-17.8
3500	1.51	1.39	7.8	0.252	-17.9
3700	1.80	1.34	7.6	0.262	-18.0

MODEL: AP3509		Vcc = +15V		Icc = 190.30 mA				
FREQ.	S11	S21	S12	S22	ANG			
MHZ	MAG	ANG	MAG	ANG	MAG			
50	0.16	-23.5	2.36	-175.6	0.161	3	0.12	162.1
100	0.15	-20.6	2.38	177.1	0.161	-2	0.12	163.9
300	0.14	-34.8	2.40	160.2	0.160	-13	0.10	151.3
500	0.14	-51.0	2.40	144.8	0.161	-23	0.09	139.8
700	0.15	-68.6	2.42	130.2	0.160	-32	0.08	128.9
900	0.15	-85.5	2.41	115.5	0.156	-41	0.07	117.9
1100	0.17	-101.4	2.41	101.1	0.153	-50	0.05	108.6
1300	0.18	-116.7	2.43	86.8	0.152	-60	0.02	105.5
1500	0.19	-128.5	2.43	71.8	0.148	-69	0.01	-155.2
1700	0.20	-141.1	2.44	57.1	0.144	-79	0.03	-117.0
1900	0.21	-154.9	2.46	42.1	0.140	-87	0.06	-124.7
2100	0.21	-166.2	2.48	27.2	0.137	-97	0.10	-135.5
2300	0.21	-179.1	2.50	11.4	0.133	-106	0.13	-146.5
2500	0.21	164.4	2.51	-4.5	0.132	-114	0.15	-156.5
2700	0.18	147.6	2.53	-20.8	0.131	-124	0.18	-167.5
2900	0.16	124.1	2.52	-36.7	0.129	-133	0.19	-179.2
3100	0.13	94.1	2.49	-54.0	0.129	-142	0.19	168.4
3300	0.15	50.9	2.48	-71.2	0.128	-151	0.18	155.2
3500	0.20	8.5	2.45	-89.2	0.127	-162	0.16	142.2
3700	0.29	-18.4	2.39	-108.2	0.126	-172	0.15	127.8
3900	0.38	-40.2	2.34	-128.1	0.126	177	0.13	107.3

MODEL: AP3509		Vcc = +12V		Icc = 192.26 mA	
FREQUENCY	VSWR	VSWR	GAIN	GROUP DELAY	REV/ISO
MHZ	IN	OUT	DB	NSEC	DB
50	1.33	1.35	7.9	0.409	-16.2
100	1.30	1.35	7.9	0.409	-16.2
300	1.28	1.32	8.0	0.231	-16.3
500	1.28	1.29	8.0	0.210	-16.2
700	1.29	1.27	8.1	0.199	-16.3
900	1.30	1.23	8.1	0.201	-16.3
1100	1.33	1.19	8.0	0.195	-16.5
1300	1.35	1.14	8.1	0.196	-16.6
1500	1.39	1.08	8.1	0.206	-16.7
1700	1.43	1.02	8.2	0.198	-16.9
1900	1.46	1.05	8.3	0.209	-17.0
2100	1.47	1.12	8.3	0.203	-17.1
2300	1.47	1.19	8.4	0.215	-17.2
2500	1.46	1.25	8.4	0.217	-17.3
2700	1.40	1.32	8.5	0.223	-17.4
2900	1.34	1.34	8.5	0.220	-17.2
3100	1.23	1.34	8.5	0.235	-17.3
3300	1.23	1.31	8.5	0.237	-17.3
3500	1.34	1.24	8.4	0.251	-17.2
3700	1.59	1.20	8.3	0.262	-17.3