

# AC509 5 TO 500 MHz TO-8 CASCADABLE AMPLIFIER

Typical Values	AC509
Medium Gain	13.3 dB
High Output Power	+21.5 dBm
High Third Order I.P.	+34.0 dBm
Low Noise Figure	4.2 dB
High Performance Thin Film	
Standard Size TO-8	

## SPECIFICATIONS\*

Parameter	Typical	Guaranteed		
		0 to 50° C	-55 to +85° C	5-500 MHz
Frequency (Min.)	3-600 MHz	5-500 MHz	5-500 MHz	
Small Signal Gain (Min.)	13.3† dB	12.5† dB	12.0† dB	
Gain Flatness (Max.)	< ±0.25 dB	±0.5 dB	±0.7 dB	
Noise Figure (Max.)	4.2 dB	5.0 dB	5.5 dB	
SWR (Max.)	Input/Output < 1.5:1	1.7:1^	1.9:1^	
Power Output (Min.) @ 1dB comp.	+21.5 dBm	+20.5 dBm	+20.0 dBm	
DC Current (Max.)	88.0 mA	92.0 mA	96.0 mA	

\* Measured in a 50-ohm system at +15 Vdc unless otherwise specified.  
 † 1.0 dB lower below 10 MHz. ^ 2.0:1 below 10 MHz.

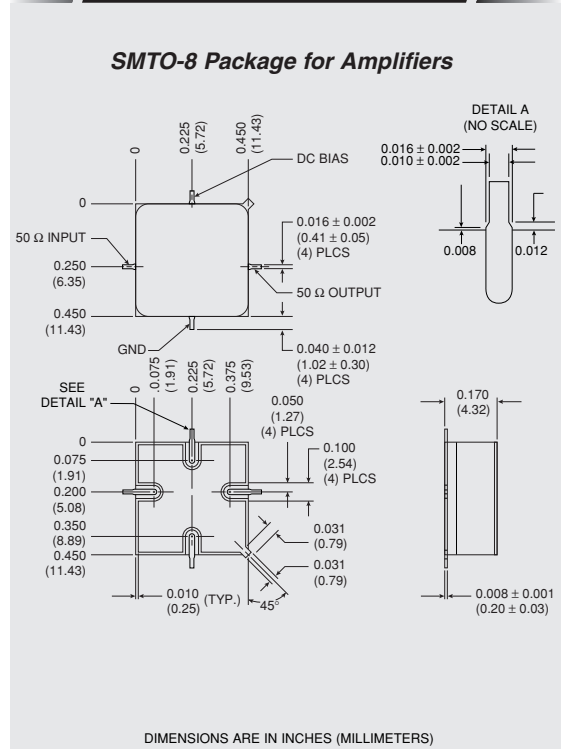
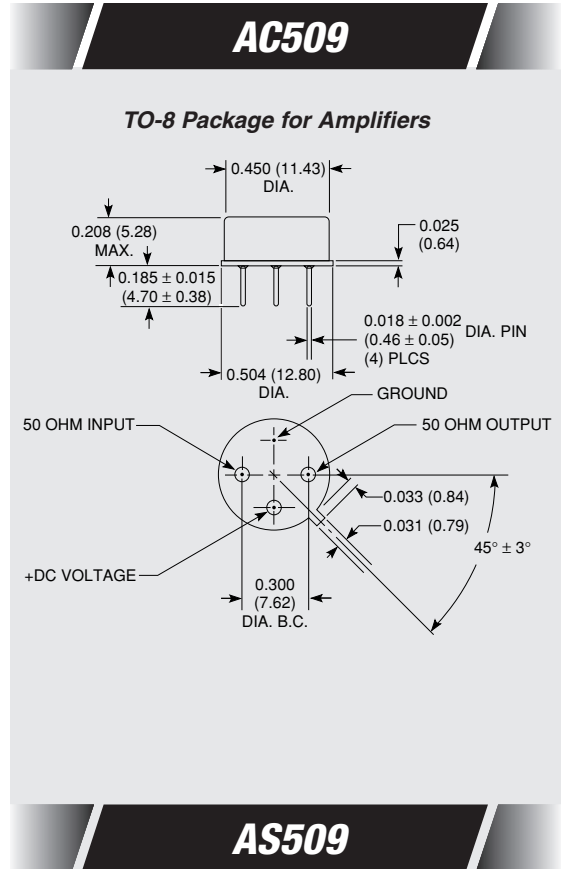
## INTERMODULATION PERFORMANCE

Typical @ 25° C	+12 volts	+15 volts
Second Order Harmonic Intercept Point	+48 dBm	+51 dBm
Second Order Two Tone Intercept Point	+42 dBm	+45 dBm
Third Order Two Tone Intercept Point	+31 dBm	+34 dBm

## ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-62 to 125° C
Maximum Case Temperature	+125° C
Maximum DC Voltage	+19 Volts
Maximum Continuous RF Input Power	+13 dBm
Maximum Short Term Input Power (1 Minute Max.)	100 Milliwatts
Maximum Peak Power (3 μsec Max.)	0.5 Watt
Burn-in Temperature	+105° C
Thermal Resistance <sup>1</sup> (θjc)	+21° C/Watt
Junction Temperature Rise Above Case (Tjc)	+40.5° C

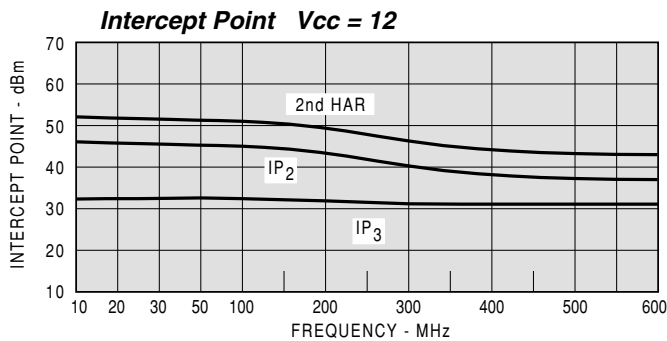
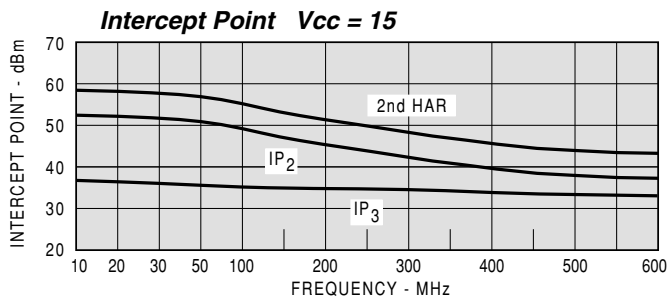
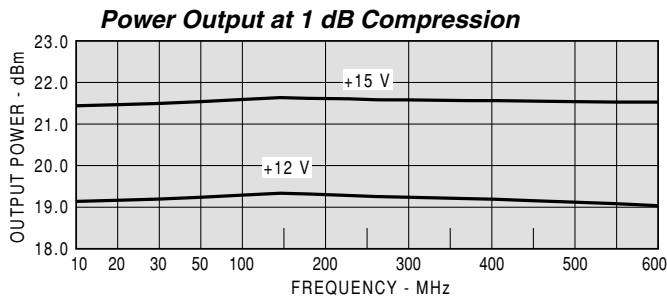
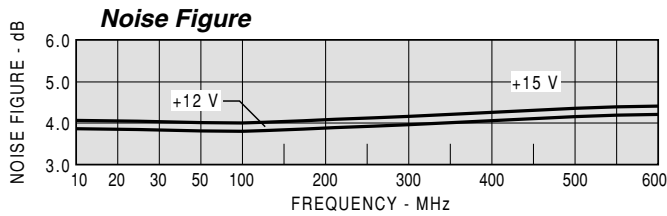
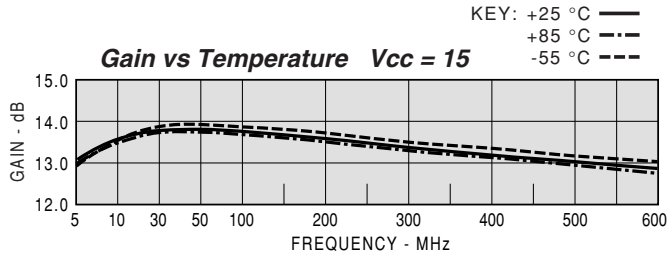
1. Thermal resistance is based on total power dissipation.



DIMENSIONS ARE IN INCHES (MILLIMETERS)



## TYPICAL PERFORMANCE



## TYPICAL AUTOMATIC TEST DATA

Model: AC509		Vcc=+15V				Icc=88.05	
FREQ	SWR	SWR	GAIN	PHASE	GROUP DELAY	REV/ISO	
MHZ	IN	OUT	DB	DEG	NSEC	DB	
5	1.79	1.48	13.19	-150.0		-18.4	
10	1.44	1.38	13.64	-166.0		-18.3	
30	1.32	1.34	13.85	180.0	2.00	-18.3	
50	1.31	1.33	13.86	173.0	0.85	-18.2	
100	1.31	1.32	13.81	162.0	0.64	-18.2	
200	1.32	1.31	13.63	142.0	0.56	-18.2	
300	1.35	1.30	13.41	123.0	0.52	-18.2	
400	1.38	1.29	13.22	105.0	0.51	-18.0	
500	1.43	1.30	13.05	86.0	0.52	-17.8	
600	1.50	1.35	12.90	67.0	0.53	-17.6	
700	1.64	1.46	12.66	47.0	0.55	-17.4	

Model: AC509		LINEAR S-PARAMETERS						Icc=88.05	
		Vcc=+15V							
FREQ.	S11	S21		S12		S22			
MHZ	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
5	0.28	-102.0	4.57	-150.2	0.12	26.5	0.19	-149.6	
10	0.18	-125.1	4.81	-165.8	0.12	12.8	0.16	-164.9	
30	0.14	-158.3	4.92	179.6	0.12	2.0	0.14	179.8	
50	0.13	-168.8	4.93	173.5	0.12	-1.7	0.14	174.4	
100	0.13	-178.5	4.91	161.9	0.12	-7.7	0.14	165.9	
200	0.14	170.3	4.80	141.9	0.12	-17.2	0.13	152.2	
300	0.15	158.4	4.68	123.1	0.12	-26.4	0.13	142.4	
400	0.16	140.3	4.58	104.6	0.13	-35.5	0.13	136.8	
500	0.18	116.3	4.49	85.8	0.13	-45.8	0.13	136.0	
600	0.20	86.7	4.42	66.7	0.13	-56.8	0.15	139.6	
700	0.24	55.1	4.29	46.8	0.13	-68.6	0.19	140.3	

Model: AC509		Vcc=+12V				Icc=69.84	
FREQ	SWR	SWR	GAIN	PHASE	GROUP DELAY	REV/ISO	
MHZ	IN	OUT	DB	DEG	NSEC	DB	
5	1.77	1.46	13.14	-151.0		-18.3	
10	1.44	1.36	13.60	-166.0		-18.3	
30	1.32	1.33	13.83	180.0	2.00	-18.2	
50	1.31	1.32	13.85	173.0	0.87	-18.2	
100	1.31	1.31	13.80	162.0	0.64	-18.2	
200	1.32	1.30	13.61	142.0	0.56	-18.1	
300	1.36	1.30	13.39	123.0	0.53	-18.1	
400	1.40	1.29	13.19	104.0	0.52	-17.9	
500	1.45	1.31	13.00	85.0	0.53	-17.6	
600	1.51	1.39	12.83	66.0	0.54	-17.4	
700	1.66	1.52	12.56	45.0	0.56	-17.2	

Model: AC509		LINEAR S-PARAMETERS						Icc=69.84	
		Vcc=+12V							
FREQ.	S11	S21		S12		S22			
MHZ	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
5	0.28	-101.8	4.54	-150.6	0.12	25.8	0.19	-147.0	
10	0.18	-124.7	4.79	-166.0	0.12	12.3	0.15	-162.9	
30	0.14	-157.7	4.91	179.6	0.12	1.8	0.14	-178.9	
50	0.13	-167.7	4.93	173.4	0.12	-1.9	0.14	176.4	
100	0.13	-176.8	4.90	161.8	0.12	-7.8	0.13	168.4	
200	0.14	172.8	4.79	141.6	0.12	-17.1	0.13	156.0	
300	0.15	161.5	4.67	122.5	0.13	-26.4	0.13	147.3	
400	0.17	143.2	4.56	103.9	0.13	-34.9	0.13	143.5	
500	0.18	119.4	4.47	84.9	0.13	-45.1	0.13	143.3	
600	0.20	89.7	4.38	65.6	0.14	-56.4	0.16	145.7	
700	0.25	57.1	4.24	45.4	0.14	-68.6	0.21	144.4	