

# AC541 AC542

## 20 TO 500 MHz TO-8 CASCADABLE AMPLIFIERS

Typical Values	AC541	AC542
High Reverse Isolation	37 dB	36 dB
Low Noise Figure	2.8 dB	3.3 dB
High Output Level	+6.5 dBm	+14.0 dBm
High Third Order I.P.	+20.0 dBm	+28.0 dBm
High Efficiency		
High Performance Thin Film		
Standard Size TO-8 Package		

### SPECIFICATIONS\*

Parameter	Typical	Guaranteed	
		0 to 50 °C	-55 to +85 °C
<b>Frequency (Min.)</b>	<b>10-600 MHz</b>	<b>20-500 MHz</b>	<b>20-500 MHz</b>
<b>Small Signal Gain (Min.)</b>			
AC541	15.5 dB	14.5 dB	14.0 dB
AC542	17.5 dB	16.5 dB	16.0 dB
<b>Gain Flatness (Max.)</b>	< ±0.5 dB	±0.7 dB	±1.0 dB
<b>Noise Figure (Max.)</b>			
AC541	2.8 dB	3.3 <sup>^</sup> dB	4.0 <sup>^</sup> dB
AC542	3.3 dB	3.8 <sup>^</sup> dB	4.5 <sup>^</sup> dB
<b>SWR (Max.)</b>			
Input	< 1.8:1	2.0:1	2.0:1
Output	< 1.2:1	1.5:1	1.5:1
<b>Power Output (Min.)</b> @ 1dB comp.			
AC541	+6.5 dBm	+5.5 dBm	+5.0 dBm
AC542	+14.0 dBm	+13.5 dBm	+13.0 dBm
<b>Reverse Isolation</b>			
AC541	37.0 dB	—	—
AC542	36.0 dB	—	—
<b>DC Current (Max.)</b>			
AC541	27.0 mA	30.0 mA	32.0 mA
AC542	47.0 mA	50.0 mA	53.0 mA

\* Measured in a 50-ohm system at +15 Vdc unless otherwise specified.  
^ 0.4 higher above 450 MHz.

### INTERMODULATION PERFORMANCE

Typical @ 25 °C	AC541	AC542
Second Order Harmonic Intercept Point	+32 dBm	+41 dBm
Second Order Two Tone Intercept Point	+26 dBm	+35 dBm
Third Order Two Tone Intercept Point	+20 dBm	+28 dBm

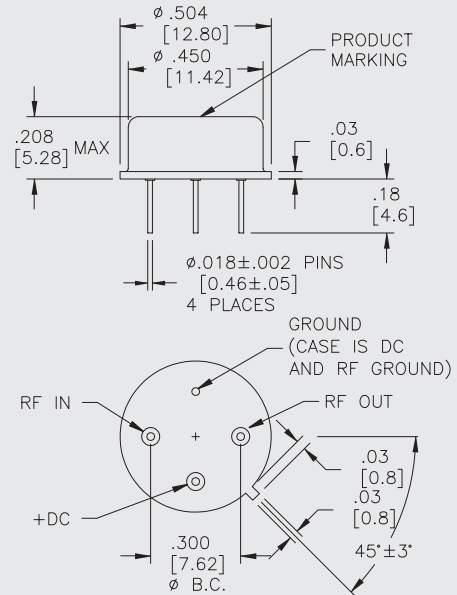
### ABSOLUTE MAXIMUM RATINGS

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.)	50 Milliwatts
Maximum Peak Power (3 μsec Max.)	0.5 Watt
Burn-in Temperature (AC541)	+125 °C
Burn-in Temperature (AC542)	+105 °C
Thermal Resistance <sup>1</sup> (θ <sub>jc</sub> ; AC541)	+53 °C/Watt
Thermal Resistance <sup>1</sup> (θ <sub>jc</sub> ; AC542)	+54 °C/Watt
Junction Temperature Rise Above Case (T <sub>jc</sub> ; AC541)	+23.9 °C
Junction Temperature Rise Above Case (T <sub>jc</sub> ; AC542)	+40.4 °C

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

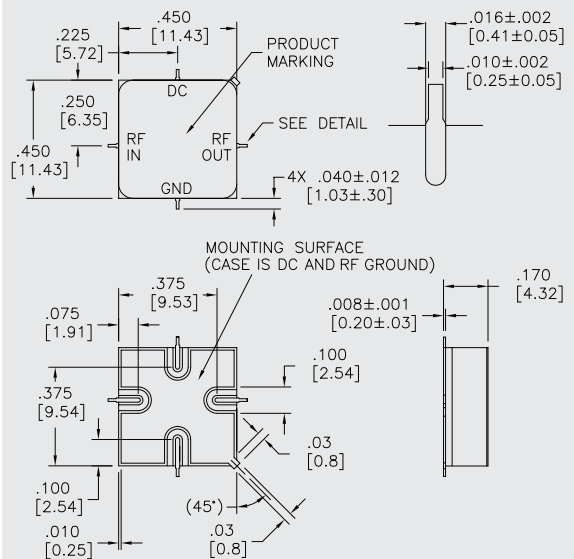
### AC541/AC542

#### TO-8 Package for Amplifiers



### AS541/AS542

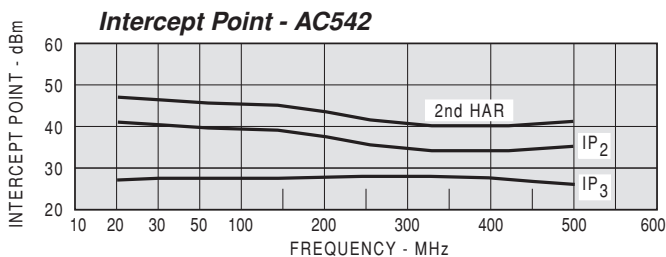
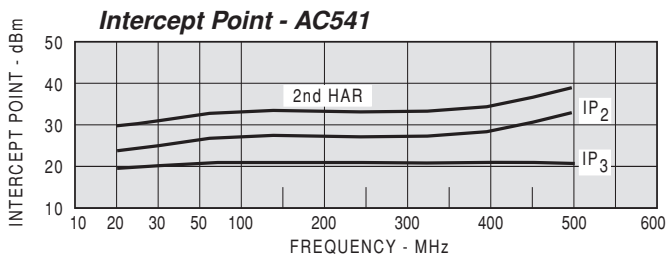
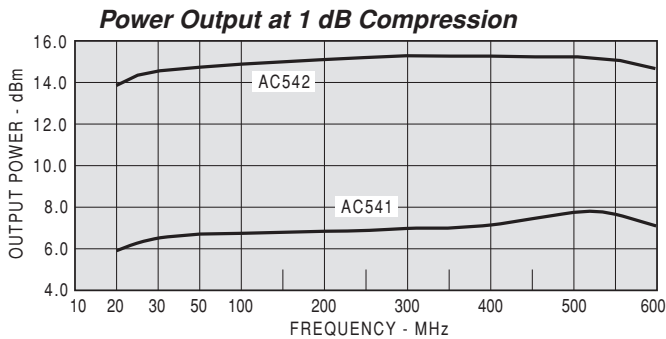
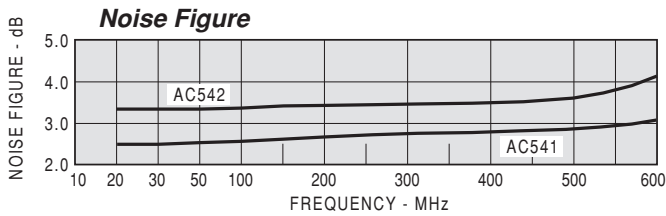
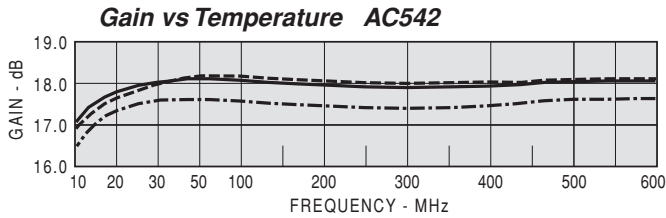
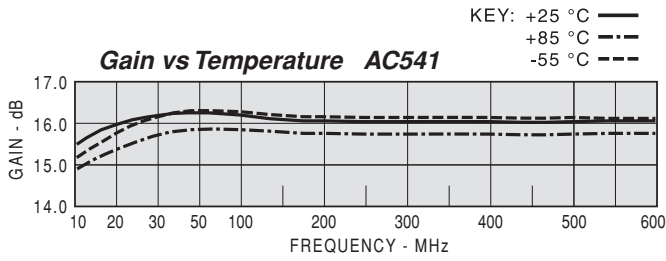
#### SMT0-8 Package for Amplifiers



DIMENSIONS ARE IN INCHES [MILLIMETERS]

## TYPICAL PERFORMANCE

## TYPICAL AUTOMATIC TEST DATA



Model: AC542				Vcc=+15V		Icc= 47.00	
FREQ	SWR	SWR	GAIN	DELAY	REV/ISO	DB	DB
MHZ	IN	OUT	DB	NSEC			
10	1.68	1.18	17.3				-37.2
20	1.35	1.11	17.8				-36.5
50	1.15	1.08	18.1	1.415			-35.9
100	1.13	1.09	18.0	0.865			-35.8
200	1.15	1.16	17.7	0.677			-36.1
300	1.22	1.22	17.7	0.641			-36.6
400	1.38	1.29	18.0	0.689			-36.5
500	1.54	1.29	18.5	0.730			-36.7
600	1.48	1.21	19.0	0.866			-36.7

LINEAR S-PARAMETERS

Model: AC542				Vcc=+15V				Icc= 47.00	
FREQ.	S11		S21		S12		S22		
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
10	0.25	-51.1	7.30	-160.3	0.014	15.0	0.08	121.5	
20	0.15	-50.6	7.80	-172.9	0.015	7.0	0.05	103.8	
50	0.07	-30.6	8.07	171.8	0.016	-3.0	0.04	84.7	
100	0.06	0.5	7.94	156.3	0.016	-9.0	0.04	78.6	
200	0.07	27.2	7.69	131.9	0.016	-26.0	0.07	63.3	
300	0.10	55.2	7.70	108.8	0.015	-40.0	0.10	45.1	
400	0.16	52.1	7.96	84.0	0.015	-58.0	0.12	24.4	
500	0.21	36.4	8.40	57.7	0.015	-80.0	0.13	3.8	
600	0.19	17.2	8.94	26.6	0.015	-106.0	0.10	-26.6	
700	0.06	12.3	8.92	-10.7	0.013	-140.0	0.04	-121.4	

Model: AC542				Vcc=+12V		Icc= 37.58	
FREQ	SWR	SWR	GAIN	DELAY	REV/ISO	DB	DB
MHZ	IN	OUT	DB	NSEC			
10	1.68	1.18	17.1				-37.2
20	1.36	1.11	17.7				-36.0
50	1.16	1.08	18.0	1.418			-36.0
100	1.16	1.09	17.8	0.850			-36.0
200	1.17	1.15	17.6	0.671			-36.1
300	1.22	1.21	17.6	0.636			-36.4
400	1.38	1.26	18.0	0.689			-36.0
500	1.53	1.27	18.6	0.742			-36.6
600	1.44	1.20	19.1	0.867			-36.5

Model: AC541				Vcc=+15V		Icc= 26.89	
FREQ	SWR	SWR	GAIN	DELAY	REV/ISO	DB	DB
MHZ	IN	OUT	DB	NSEC			
10	2.15	1.16	14.9				-38.8
20	1.75	1.10	15.6				-38.1
50	1.55	1.06	16.0	1.537			-37.3
100	1.56	1.06	15.8	0.915			-37.1
200	1.55	1.09	15.6	0.718			-37.6
300	1.51	1.11	15.6	0.677			-37.9
400	1.59	1.13	15.6	0.727			-38.1
500	1.73	1.10	16.2	0.790			-38.0
600	1.68	1.02	16.5	0.921			-38.2

Model: AC541				Vcc=+12V		Icc= 21.63	
FREQ	SWR	SWR	GAIN	DELAY	REV/ISO	DB	DB
MHZ	IN	OUT	DB	NSEC			
10	2.22	1.16	14.6				-38.7
20	1.82	1.10	15.3				-38.4
50	1.62	1.06	15.7	1.569			-37.7
100	1.61	1.05	15.5	0.917			-37.3
200	1.60	1.09	15.3	0.716			-38.4
300	1.53	1.11	15.3	0.686			-37.3
400	1.58	1.12	15.7	0.742			-37.6
500	1.68	1.09	16.1	0.804			-38.3
600	1.62	1.02	16.3	0.953			-38.5