

### FEATURES

- Frequency Range: 5 to 500 MHz
- High Gain: 28.0 dB
- 5-Volt Supply
- Temperature Compensated

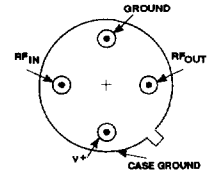
### APPLICATIONS

- IF/RF Amplification

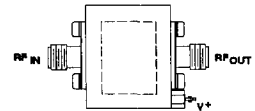
### DESCRIPTION

The 558 Series is a two-stage thin-film bipolar RF amplifier that operates on 5-volt bias to provide efficiency, high gain and relatively low noise figure. Resistive feedback and active bias provide temperature compensation and increased immunity to

bias voltage variations. Internal blocking capacitors couple the RF through the amplifier. The 558 Series amplifiers are available in either the TO-8 hermetic case or connected TC-1 package.



UTO—TO-8T, p. 16-48

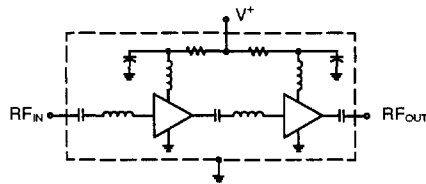


UTC—TC-1, p. 16-42

### ELECTRICAL SPECIFICATIONS (Measured in a 50-ohm system @ +5 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical $T_c = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_c = 0^\circ\text{ to } 50^\circ\text{C}$	$T_c = -55^\circ\text{ to } +85^\circ\text{C}$	
BW	Frequency Range	5-500	5-500	5-500	MHz
GP	Small Signal Gain (Min.)	29.5	28.0	27.0	dB
—	Gain Flatness (Max.)	$\pm 0.2$	$\pm 0.7$	$\pm 0.7$	dB
NF	Noise Figure (Max.)	2.7	3.2	3.6	dB
$P_{1\text{ dB}}$	Power Output @ +1 dB Compression (Min.)	+14.5	+13.5	+13.0	dBm
—	Input VSWR (Max.)	<1.5:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.6:1	2.0:1	2.0:1	—
$IP_3$	Two Tone 3rd Order Intercept Point	+23.0	—	—	dBm
$IP_2$	Two Tone 2nd Order Intercept Point	+26.0	—	—	dBm
$HP_2$	One Tone 2nd Harmonic Intercept Point	+33.0	—	—	dBm
$I_b$	DC Current	70	—	—	mA

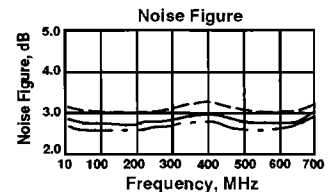
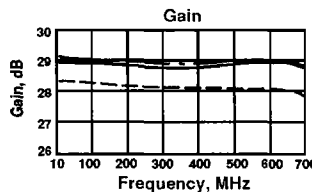
### SCHEMATIC



### TYPICAL PERFORMANCE OVER TEMPERATURE

(@ +5 VDC unless otherwise noted)

KEY: +25°C ———  
+85°C - - - -  
-55°C - · - ·



### MAXIMUM RATINGS

DC Voltage	+9 Volts
Continuous RF Input Power	+13 dBm
Operating Case Temperature	-55°C to +125°C
Storage Temperature	-62°C to +150°C
"R" Series Burn-In Temperature	+125°C

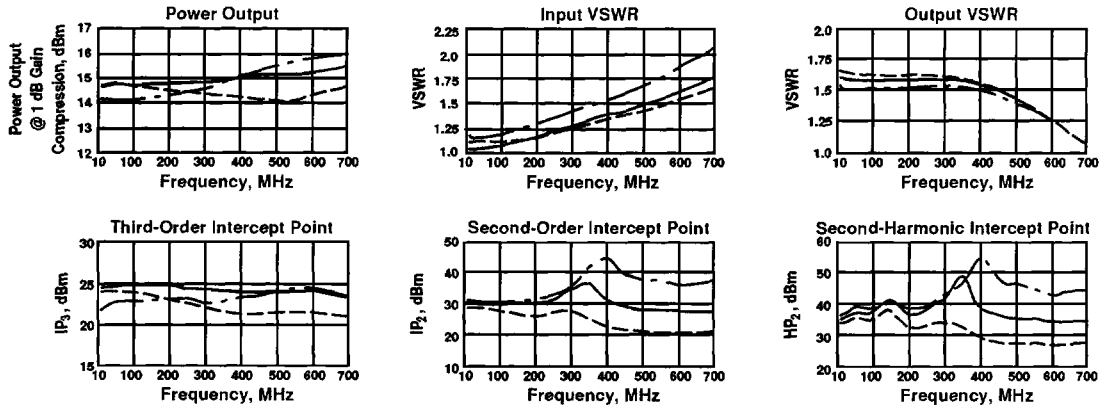
### THERMAL CHARACTERISTICS\*

$\theta_{JC}$	105/75°C/W
Active Transistor Power Dissipation	48/228 mW
Junction Temperature Above Case Temperature	5.0/17.0°C
MTBF (MIL-HDBK-217E, $A_{UF}$ @ 90°C)	572,300 Hrs.

\*For further information, see High Reliability section, p. 17-2.

WEIGHT: (typical) UTO—1.7 grams; UTC—21.5 grams

TYPICAL PERFORMANCE OVER TEMPERATURE (continued)



AUTOMATIC NETWORK ANALYZER MEASUREMENTS (Typical production unit at +25°C ambient)

S-PARAMETERS

BIAS = 5 VOLTS

FREQ MHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
.005	.03	141.3	28.7	21.8	-37.3	21.9	.25	172.18
.010	.01	68.3	28.6	8.2	-37.2	10.3	.23	176.01
.020	.01	3.3	28.7	-1	-37.2	4.5	.23	176.31
.030	.01	-25.2	28.7	-4.8	-37.2	2.3	.23	175.85
.040	.01	-44.0	28.7	-8.6	-37.2	.3	.22	175.25
.050	.02	-56.6	28.7	-12.0	-37.2	-.4	.22	174.53
.100	.03	-93.0	28.7	-27.2	-37.2	-5.5	.22	170.91
.150	.05	-114.6	28.6	-41.5	-37.3	-8.4	.22	167.12
.200	.07	-130.1	28.6	-55.6	-37.3	10.4	.22	162.93
.250	.00	-143.0	28.6	-69.6	-37.3	-13.9	.23	158.31
.300	.11	-153.6	28.5	-83.5	-37.4	-16.4	.23	153.27
.350	.14	-164.1	28.5	-97.6	-37.3	-19.2	.22	147.15
.400	.16	-174.6	28.6	-111.9	-37.4	-21.8	.21	139.73
.450	.17	174.5	28.6	-126.4	-37.4	-23.8	.20	131.54
.500	.19	162.9	28.6	-141.4	-37.5	26.3	.17	122.52
.550	.21	150.6	28.7	-156.9	-37.5	-29.8	.15	113.09
.600	.23	137.9	28.7	-173.1	-37.5	-33.4	.11	103.82
.650	.25	125.1	28.7	169.9	-37.4	-36.4	.08	98.50
.700	.27	112.6	28.6	151.9	-37.6	-40.4	.04	118.83
.750	.29	100.8	28.3	133.0	-37.8	42.8	.05	-169.85
.800	.28	89.8	27.8	113.3	-38.2	-46.8	.11	-163.55
.850	.26	80.6	27.0	93.5	-38.7	-48.8	.18	-172.30
.900	.23	74.2	25.9	74.3	-39.0	-50.2	.24	176.85
.950	.19	71.9	24.5	56.4	-39.3	-49.5	.29	166.35
1.000	.15	74.8	23.0	40.0	-39.4	-48.1	.33	157.12
1.500	.23	63.5	8.2	-66.6	-37.3	-72.1	.22	75.12
2.000	.35	23.8	-1.9	-135.1	-35.3	-93.3	.22	-23.14
3.000	.87	-24.4	-23.4	156.3	-33.5	103.1	.31	-170.17

FREQ GHz	GPDEL ns	PHASE DEG
.050	.87	.48
.075	.87	-.09
.100	.82	-.27
.125	.81	-.34
.150	.79	-.31
.175	.78	-.23
.200	.78	-.09
.225	.79	-.08
.250	.78	.03
.275	.78	.19
.300	.77	.29
.325	.78	.40
.350	.80	.32
.375	.79	.28
.400	.80	.29
.425	.80	.15
.450	.81	-.04
.475	.82	-.31
.500	.83	-.66

LINEARIZATION RANGE: .05 to .50 GHz