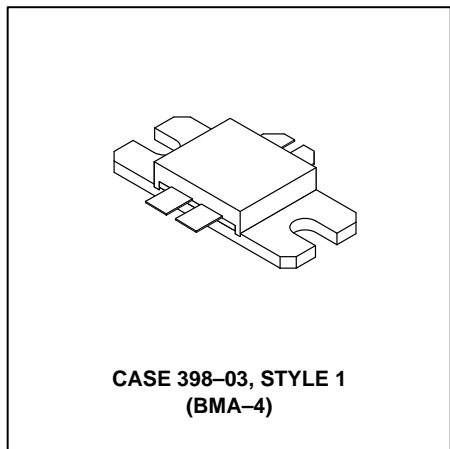
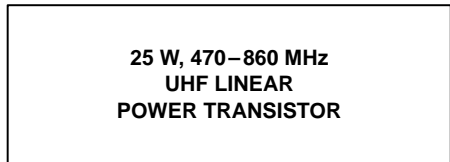


## The RF Line UHF Linear Power Transistor

... designed for output stages in Band IV & V TV transmitter amplifiers. Internal matching of both input and output along with use of a push-pull package configuration aids broadband amplifier designs.

Gold metallized dice with diffused emitter ballast resistors enhances reliability, ruggedness and linearity.

- Band IV & V (470–860 MHz)
- 25 W —  $P_{ref}$  @ -45 dB IMD
- 25 V —  $V_{CC}$
- Push-Pull Package
- Gold Metallization for Reliability



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	28	Vdc
Collector–Base Voltage	$V_{CBO}$	45	Vdc
Emitter–Base Voltage	$V_{EBO}$	4.0	Vdc
Operating Junction Temperature	$T_J$	200	°C
Storage Temperature Range	$T_{stg}$	-50 to +200	°C
Operating Case Temperature	$T_C$	70	°C

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case ( $T_C = 70^\circ\text{C}$ )	$R_{\theta JC}$	1.5	°C/W

### ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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#### OFF CHARACTERISTICS (1)

Collector–Emitter Breakdown Voltage ( $I_C = 120\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	28	—	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = 20\text{ mA}$ , $I_E = 0$ )	$V_{(BR)CBO}$	45	—	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 6.0\text{ mA}$ , $I_C = 0$ )	$V_{(BR)EBO}$	4.0	—	—	Vdc

#### ON CHARACTERISTICS (1)

DC Current Gain ( $I_C = 1.0\text{ A}$ , $V_{CE} = 20\text{ V}$ )	$h_{FE}$	10	—	60	—
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#### DYNAMIC CHARACTERISTICS (1)

Output Capacitance ( $V_{CB} = 28\text{ V}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ob}$	64	—	80	pF
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NOTE:

1. Each transistor chip measured separately.

(continued)

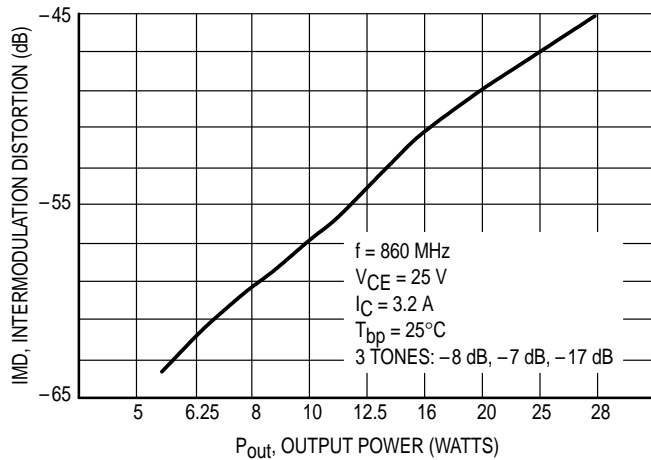
**ELECTRICAL CHARACTERISTICS — continued**

Characteristic	Symbol	Min	Typ	Max	Unit
<b>FUNCTIONAL TESTS (2)</b>					
Common-Emitter Amplifier Power Gain ( $V_{CE} = 25\text{ V}$ , $P_{Out} = 25\text{ W}$ , $f = 860\text{ MHz}$ , $I_{CQ} = 3.2\text{ A}$ )	GPE	9.0	—	10.5	dB
Load Mismatch ( $V_{CE} = 25\text{ V}$ , $P_{Out} = 24\text{ W}$ , $f = 860\text{ MHz}$ , Load VSWR = $\infty:1$ , All Phase Angles)	$\psi$	No Degradation in Output Power			
Overdrive ( $f = 470\text{ MHz}$ , 2 tones, $V_{CE} = 25\text{ V}$ , $I_C = 3.2\text{ A}$ ) (No Degradation)	$P_{inover}$	24	—	—	W
Intermodulation Distortion, 3 Tone ( $f = 860\text{ MHz}$ , $V_{CE} = 25\text{ V}$ , $I_C = 3.2\text{ A}$ , $P_{ref} = 25\text{ W}$ , Vision Carrier = $-8.0\text{ dB}$ , Sound Carrier = $-7.0\text{ dB}$ , Sideband Signal = $-16\text{ dB}$ , Specification TV05001)	IMD <sub>1</sub>	—	—	-45	dB
Cross Modulation Distortion ( $P_{ref} = 25\text{ W}$ , $f = 860\text{ MHz}$ , $\Delta\%$ Sound = $(-7.0\text{ dB})$ , Vision 0 – Peak)	XMOD	—	—	20	%

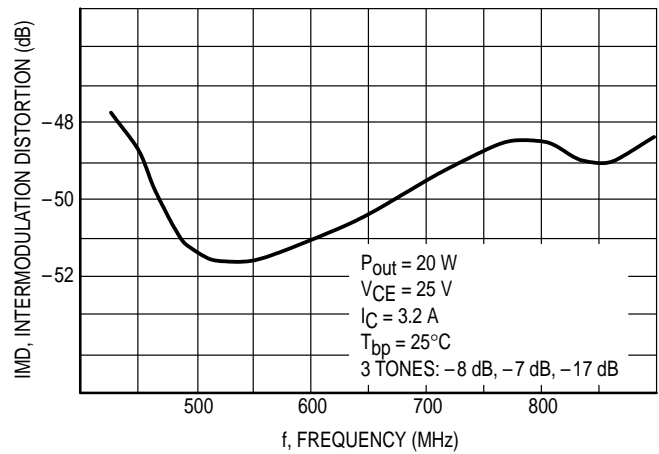
NOTE:

- Both transistor chips operating in push-pull amplifier.

**TYPICAL CHARACTERISTICS**



**Figure 1. IMD versus Output Power**



**Figure 2. IMD versus Frequency**

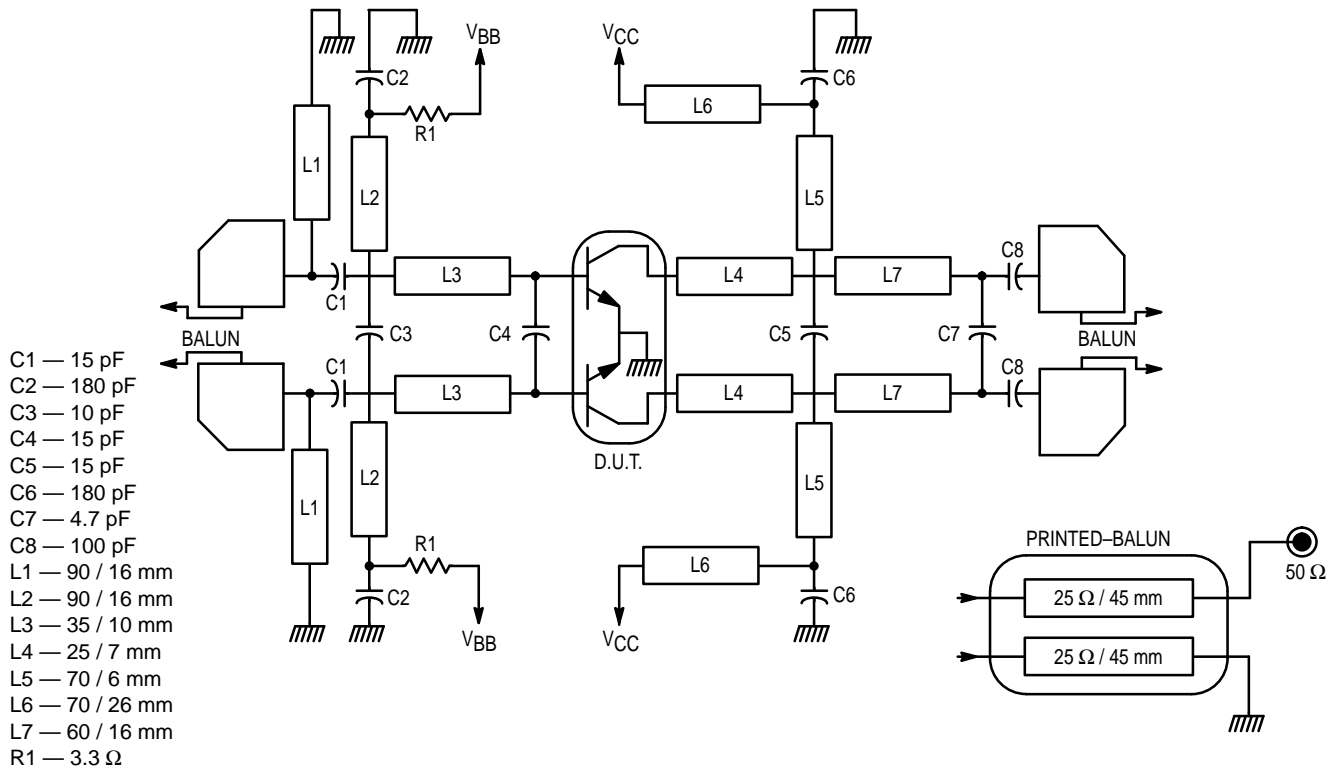
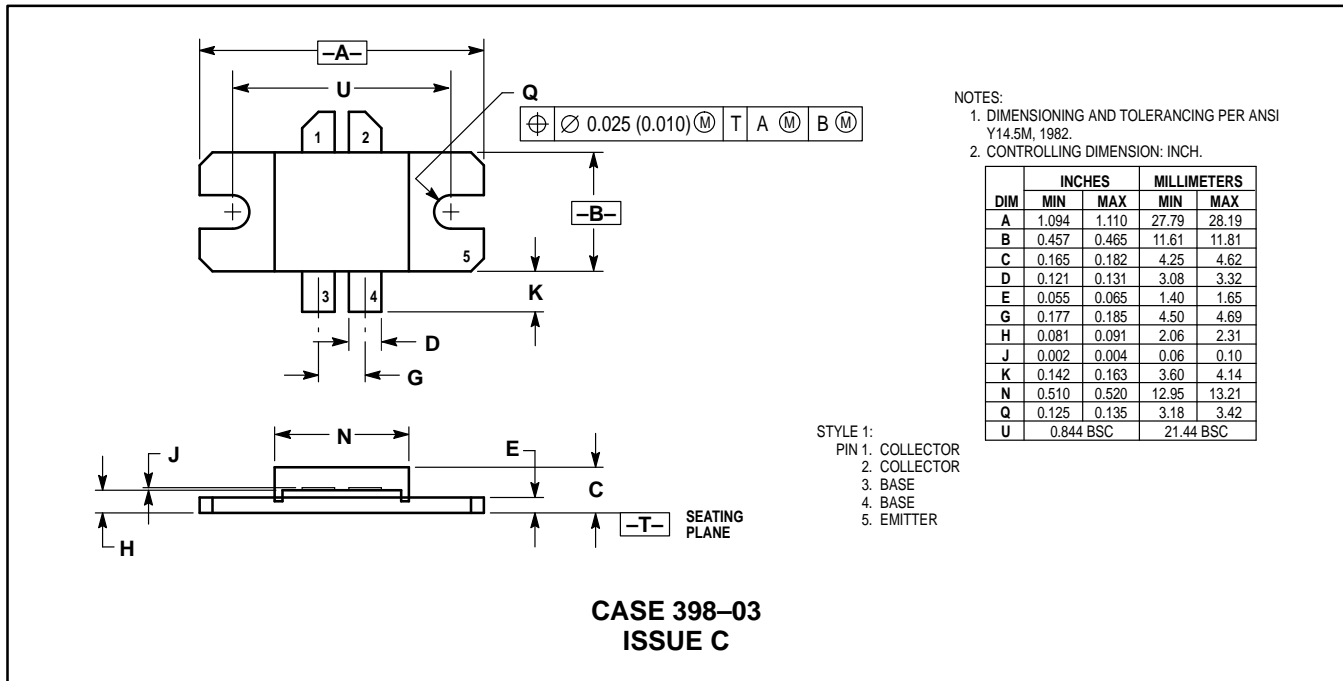


Figure 3. 470–860 MHz Broadband Test Circuit

V <sub>CE</sub> (Volts)	I <sub>C</sub> (A)	f (GHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
			Mag	φ	Mag	φ	Mag	φ	Mag	φ
25	2 x 1.8	0.44	1.0	178	1.25	80	0.02	29	0.89	156
		0.46	1.0	176	1.25	84	0.02	31	0.78	151
		0.48	1.0	174	1.30	81	0.02	30	0.70	148
		0.50	0.99	173	1.39	75	0.02	29	0.65	145
		0.52	0.98	171	1.42	70	0.03	26	0.59	142
		0.54	0.97	173	1.52	65	0.03	17	0.53	140
		0.56	0.97	171	1.67	67	0.03	12	0.46	139
		0.58	0.94	169	1.77	49	0.03	8.0	0.39	138
		0.60	0.92	164	1.93	40	0.04	0	0.31	142
		0.62	0.89	163	2.05	30	0.04	-9.0	0.23	157
		0.64	0.86	163	2.19	18	0.05	-19	0.21	-173
		0.66	0.82	164	2.29	4.0	0.05	-30	0.30	-150
		0.68	0.79	166	2.29	-11	0.05	-42	0.43	-147
		0.70	0.79	169	2.16	-26	0.05	-55	0.57	-150
		0.72	0.79	171	1.99	-40	0.05	-66	0.68	-155
		0.74	0.82	172	1.80	-52	0.05	-76	0.77	-161
		0.76	0.84	172	1.59	-63	0.04	-87	0.83	-168
		0.78	0.86	172	1.38	-74	0.04	-96	0.86	-173
		0.80	0.88	171	1.23	-82	0.03	-102	0.88	-178
		0.82	0.89	170	1.10	-88	0.03	-106	0.88	178
0.84	0.90	170	0.99	-94	0.03	-110	0.89	175		
0.86	0.90	169	0.89	-100	0.03	-115	0.88	172		
0.88	0.90	168	0.80	-107	0.03	-119	0.87	170		

Table 1. Common Emitter S-Parameters

## PACKAGE DIMENSIONS



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