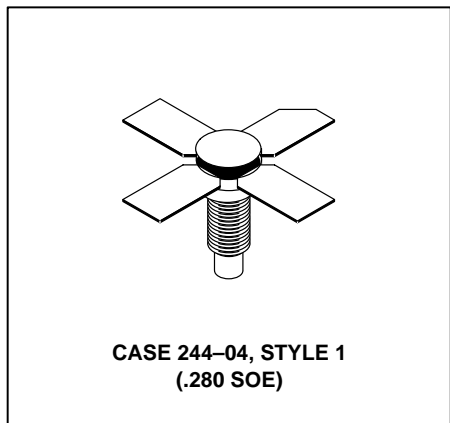
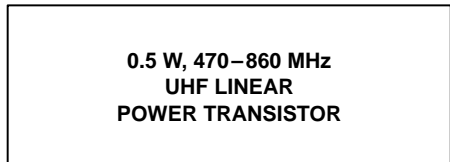


## The RF Line UHF Linear Power Transistor

... designed for very high output 1.5 V MATV amplifiers up to 860 MHz and 500 mW Band V TV transposer stages. Gold metallization and diffused emitter ballast resistors are used to enhanced reliability, ruggedness and linearity.

- Band IV and V (470–860 MHz)
- 0.5 W —  $P_{ref}$  @ -58 dB IMD
- High Gain — 12 dB Typ, Class A,  $f = 860$  MHz
- Gold Metallization for Reliability



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	24	Vdc
Collector–Base Voltage	$V_{CBO}$	45	Vdc
Emitter–Base Voltage	$V_{EBO}$	3.5	Vdc
Collector Current — Continuous	$I_C$	0.7	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	8.75 0.05	Watts W/ $^\circ\text{C}$
Operating Junction Temperature	$T_J$	200	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +200	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case ( $T_C = 70^\circ\text{C}$ )	$R_{\theta JC}$	20	$^\circ\text{C/W}$

### ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ( $I_C = 20$ mA, $I_B = 0$ )	$V_{(BR)CEO}$	24	—	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = 1.0$ mA, $I_E = 0$ )	$V_{(BR)CBO}$	45	—	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 4.0$ mA, $I_C = 0$ )	$V_{(BR)EBO}$	3.5	—	—	Vdc
Emitter–Base Leakage Current ( $V_{EB} = 2.0$ V)	$I_{EBO}$	—	—	0.25	mA
Collector Cutoff Current ( $V_{CB} = 28$ V, $I_E = 0$ )	$I_{CBO}$	—	—	1.0	mAdc
Collector–Emitter Breakdown Voltage ( $I_C = 20$ mA, $R_{BE} = 10 \Omega$ )	$V_{(BR)CER}$	50	—	—	Vdc

### ON CHARACTERISTICS

DC Current Gain ( $I_C = 100$ mA, $V_{CE} = 5.0$ V)	$h_{FE}$	15	—	120	—
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### DYNAMIC CHARACTERISTICS

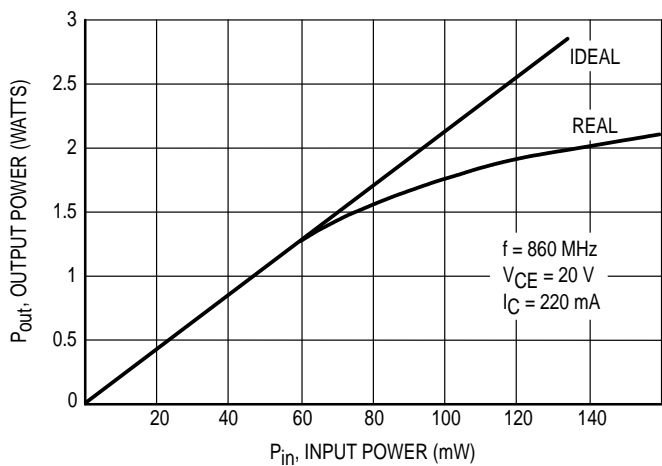
Output Capacitance ( $V_{CB} = 28$ V, $I_E = 0$ , $f = 1.0$ MHz)	$C_{ob}$	—	—	5.0	pF
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(continued)

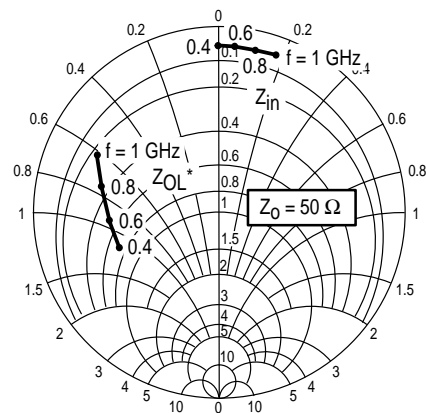
**ELECTRICAL CHARACTERISTICS — continued**

Characteristic	Symbol	Min	Typ	Max	Unit
<b>FUNCTIONAL TESTS</b>					
Common-Emitter Amplifier Power Gain ( $V_{CE} = 20\text{ V}$ , $P_{out} = 0.5\text{ W}$ , $f = 860\text{ MHz}$ , $I_E = 0.22\text{ A}$ )	GPE	11.5	12	—	dB
Load Mismatch ( $V_{CE} = 20\text{ V}$ , $P_{out} = 1.0\text{ W}$ , $I_E = 0.22\text{ A}$ , $f = 860\text{ MHz}$ , Load VSWR = $\infty:1$ , All Phase Angles)	$\psi$	No Degradation in Output Power			
Intermodulation Distortion, 3 Tone ( $f = 860\text{ MHz}$ , $V_{CE} = 20\text{ V}$ , $I_E = 0.22\text{ A}$ , $P_{ref} = 1.0\text{ W}$ , Vision Carrier = $-8.0\text{ dB}$ , Sound Carrier = $-7.0\text{ dB}$ , Sideband Signal = $-16\text{ dB}$ , Specification TV05001)	IMD <sub>1</sub>	—	—	$-50$	dB
Intermodulation Distortion (IDEM) ( $f = 860\text{ MHz}$ , $V_{CE} = 20\text{ V}$ , $I_E = 0.22\text{ A}$ , $P_{ref} = 0.5\text{ W}$ , Vision Carrier = $-8.0\text{ dB}$ , Sound Carrier = $-10\text{ dB}$ , Sideband Signal = $-16\text{ dB}$ )	IMD <sub>2</sub>	—	$-60$	$-58$	dB

**TYPICAL CHARACTERISTICS**

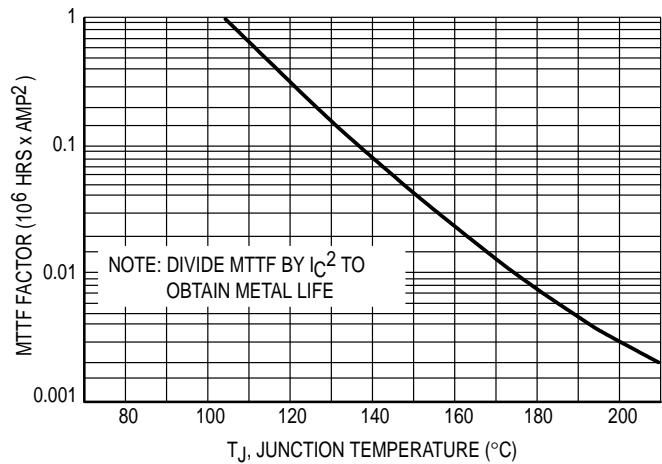


**Figure 1. Power Output versus Power Input**

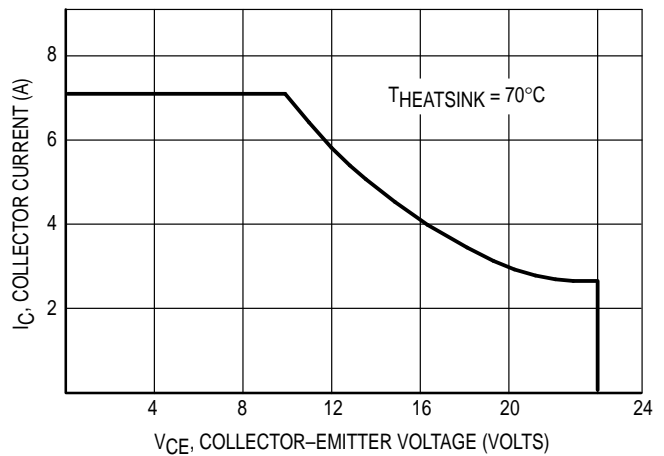


**Figure 2. Large Signal Impedances**  
 $V_{CE} = 20\text{ V} - I_C = 220\text{ mA}$

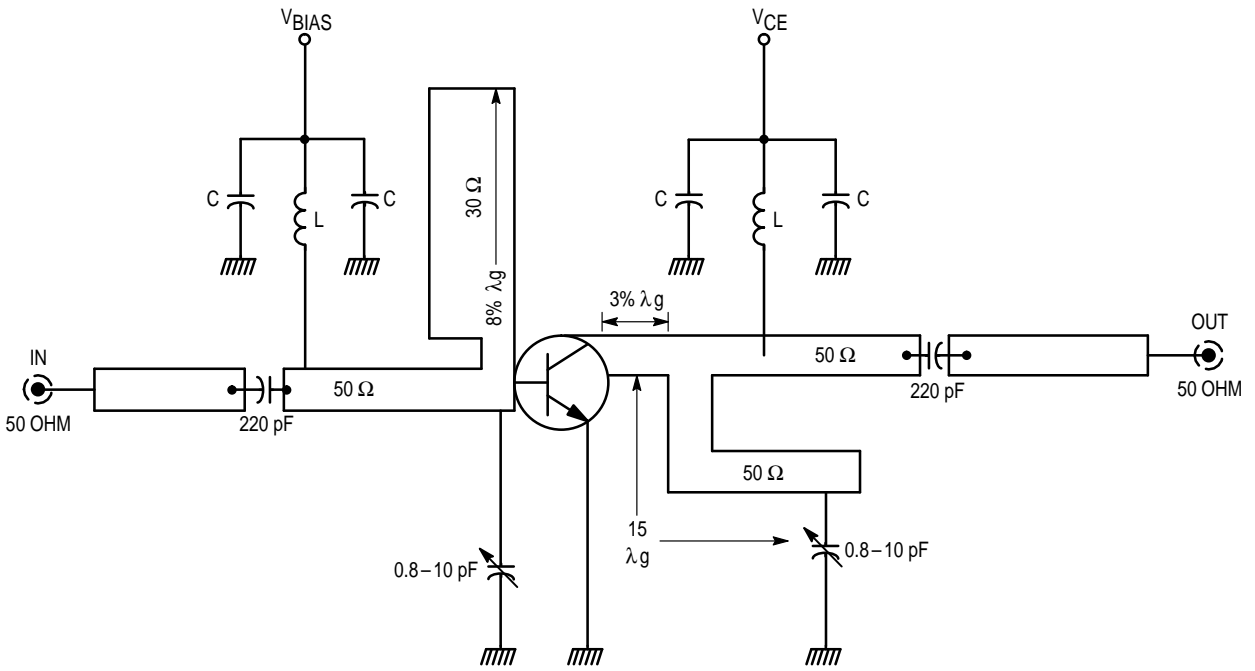
$Z_{OL}^*$  = Conjugate of the optimum load impedance into which the device output operates at a given output power, voltage and frequency.



**Figure 3. MTTF Factor versus Junction Temperature**

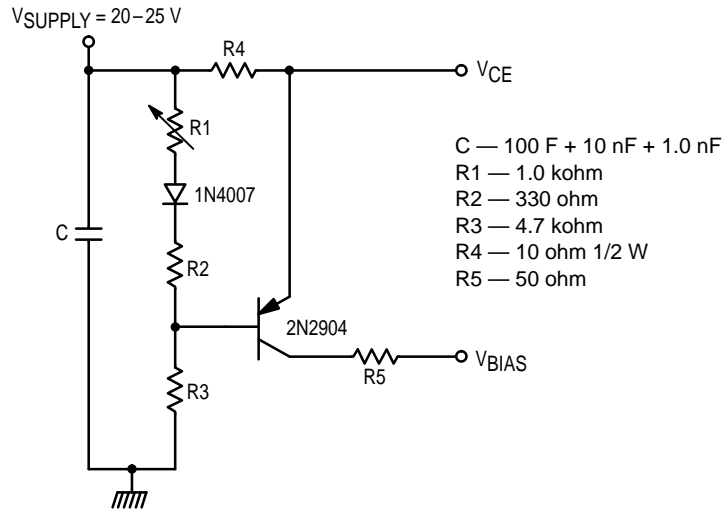


**Figure 4. DC Safe Operating Area**



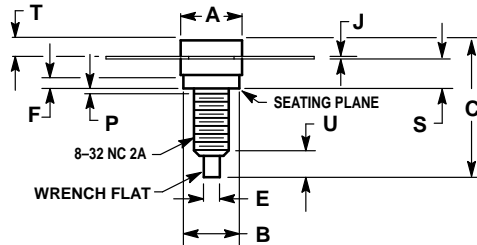
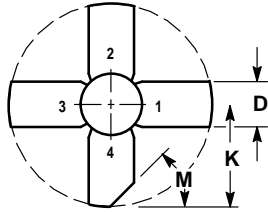
NOTE:  $\lambda_g$  is the wave length in the microstrip circuit

**Figure 5. 860 MHz Test Circuit**



**Figure 6. Class A Bias Circuit**


## PACKAGE DIMENSIONS



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	7.06	7.26	0.278	0.286
B	6.20	6.50	0.244	0.256
C	14.99	16.51	0.590	0.650
D	5.46	5.96	0.215	0.235
E	1.40	1.65	0.055	0.065
G	1.52	—	0.060	—
J	0.08	0.17	0.003	0.007
K	11.05	—	0.435	—
M	45° NOM		45° NOM	
P	—	1.27	—	0.050
S	3.00	3.25	0.118	0.128
T	1.40	1.77	0.055	0.070
U	2.92	3.68	0.115	0.145

STYLE 1:  
 PIN 1. EMITTER  
 2. BASE  
 3. EMITTER  
 4. COLLECTOR

### CASE 244-04 ISSUE J

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**How to reach us:**

**USA/EUROPE:** Motorola Literature Distribution;  
 P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,  
 6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

**MFAX:** RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609  
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**HONG KONG:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
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