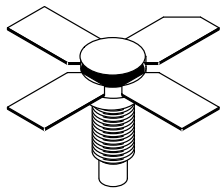
The RF Line
UHF Linear Power Transistor

. . . designed for 1.0 watt stages in Band V TV transposer amplifiers. Gold metallized dice and diffused emitter ballast resistors are used to enhance reliability, ruggedness and linearity.

- Band IV and V (470–860 MHz)
- 1.0 W — P_{ref} @ –58 dB IMD
- 20 V — V_{CC}
- High Gain — 11 dB Typ, Class A @ f = 860 MHz
- Gold Metallization for Reliability

TPV597

1.0 W, 470–860 MHz
UHF LINEAR
POWER TRANSISTOR



CASE 244–04, STYLE 1
(.280 SOE)

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	1.4	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	19 0.11	Watts W/°C
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	–65 to +200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	9.0	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 40 mA, I_B = 0)	$V_{(BR)CEO}$	24	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 2.0 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}	—	—	0.5	mA
Collector–Emitter Breakdown Voltage (I_C = 40 mA, R_{BE} = 10 Ω)	$V_{(BR)CER}$	50	—	—	Vdc
Collector Cutoff Current (V_{CB} = 30 V, I_E = 0)	I_{CBO}	—	—	1.2	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 200 mA, V_{CE} = 5.0 V)	h_{FE}	15	—	120	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 28 V, I_E = 0, f = 1.0 MHz)	C_{ob}	—	—	7.0	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CE} = 20 V, P_{out} = 1.0 W, f = 860 MHz, I_E = 0.44 A)	G_{PE}	10.5	11	—	dB
Load Mismatch (V_{CE} = 20 V, P_{out} = 2.0 W, I_E = 0.44 A, f = 860 MHz, Load VSWR = ∞:1, All Phase Angles)	ψ	No Degradation in Output Power			

(continued)

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS (continued)					
Intermodulation Distortion, 3 Tone (f = 860 MHz, V_{CE} = 20 V, I_E = 0.44 A, P_{ref} = 1.0 W, Vision Carrier = –8.0 dB, Sound Carrier = –7.0 dB, Sideband Signal = –16 dB, Specification TV05001)	IMD_1	—	–60	–58	dB
Cutoff Frequency (V_{CE} = 20 V, I_E = 0.44 A)	f_τ	2.2	2.5	—	GHz
Intermodulation Distortion (IDEM) (f = 860 MHz, V_{CE} = 20 V, I_E = 0.44 A, P_{ref} = 2.0 W, Vision Carrier = –8.0 dB, Sound Carrier = –10 dB, Sideband Signal = –16 dB)	IMD_2	—	—	–51	dB

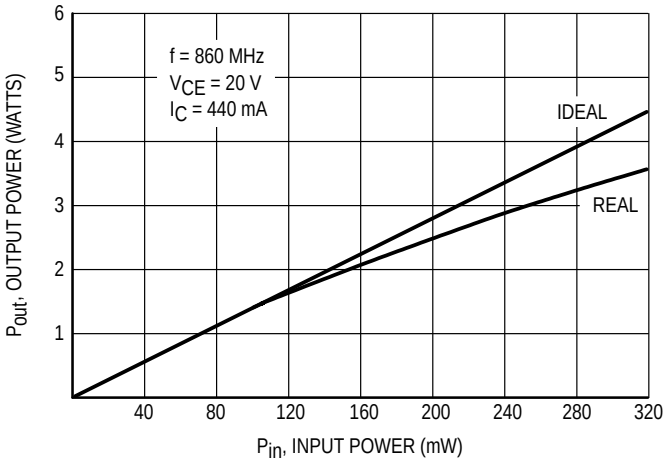


Figure 1. Power Output versus Power Input

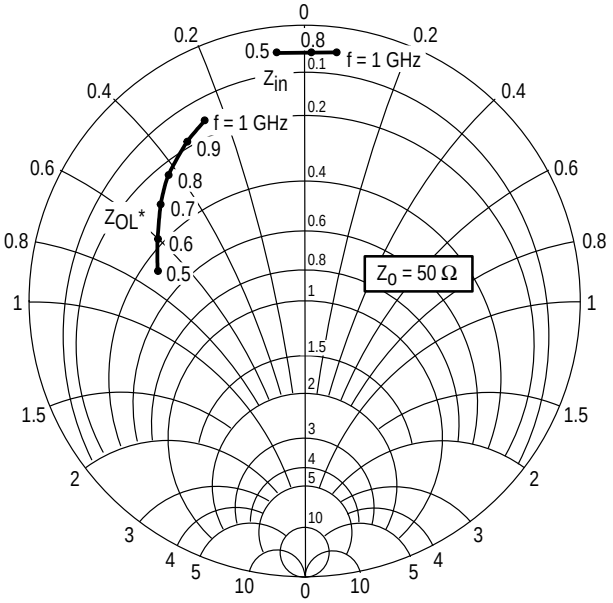


Figure 2. Large Signal Impedances
V_{CE} = 20 V — I_C = 440 mA

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

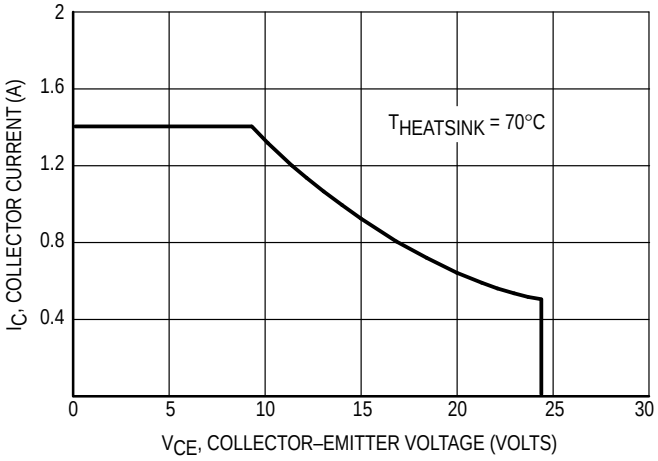


Figure 3. Safe Operating Area

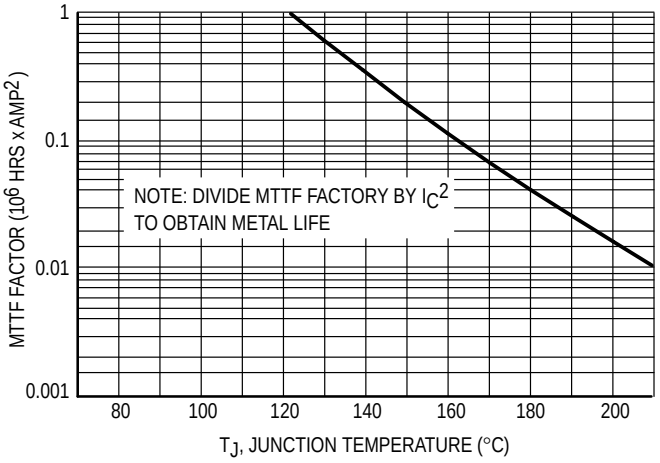
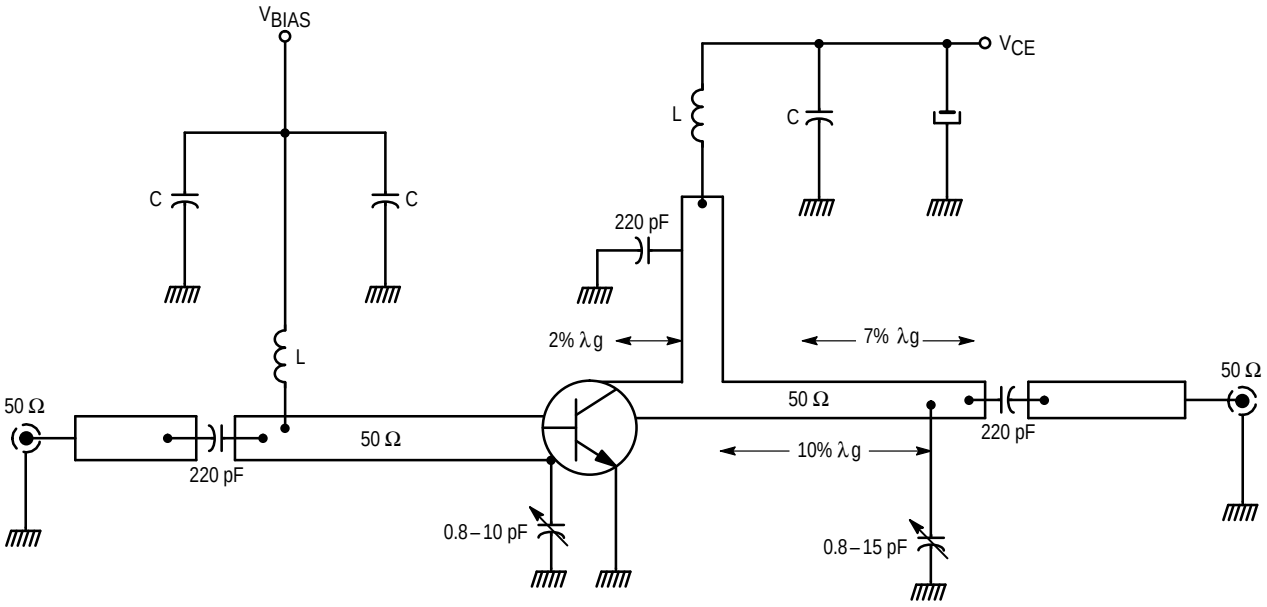


Figure 4. MTTF Factor versus Junction Temperature



L = 6 turns ID = 1 mm Wire diameter = 0.6 mm
The lengths are given for f = 860 MHz

NOTE: λg is the wave length in the microstrip circuit

Figure 5. 860 MHz Test Circuit

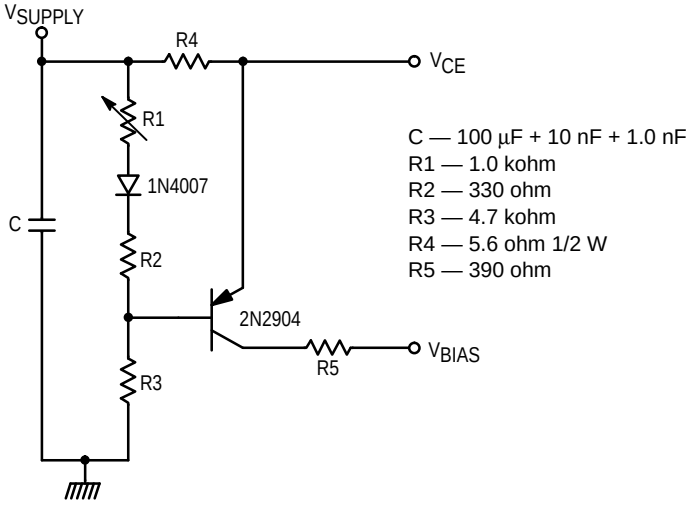
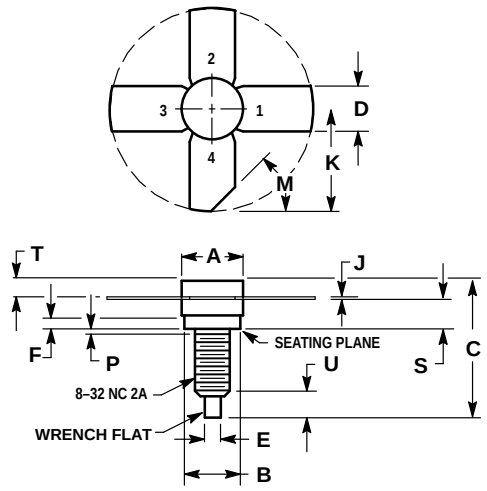


Figure 6. Class A Bias Circuit

PACKAGE DIMENSIONS



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES 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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