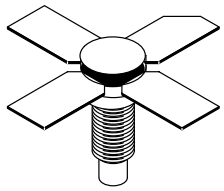
The RF Line
UHF Linear Power Transistor

Designed for 4.0 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)
- 4.0 W — P_{ref} @ –60 dB IMD
- 25 V — V_{CC}
- High Gain — 7.0 dB Min, Class A @ f = 860 MHz
- Gold Metallization for Reliability

TPV598

4.0 W, 470–860 MHz
UHF LINEAR
POWER TRANSISTOR



CASE 244–04, STYLE 1
(.280 SOE)

MAXIMUM RATINGS

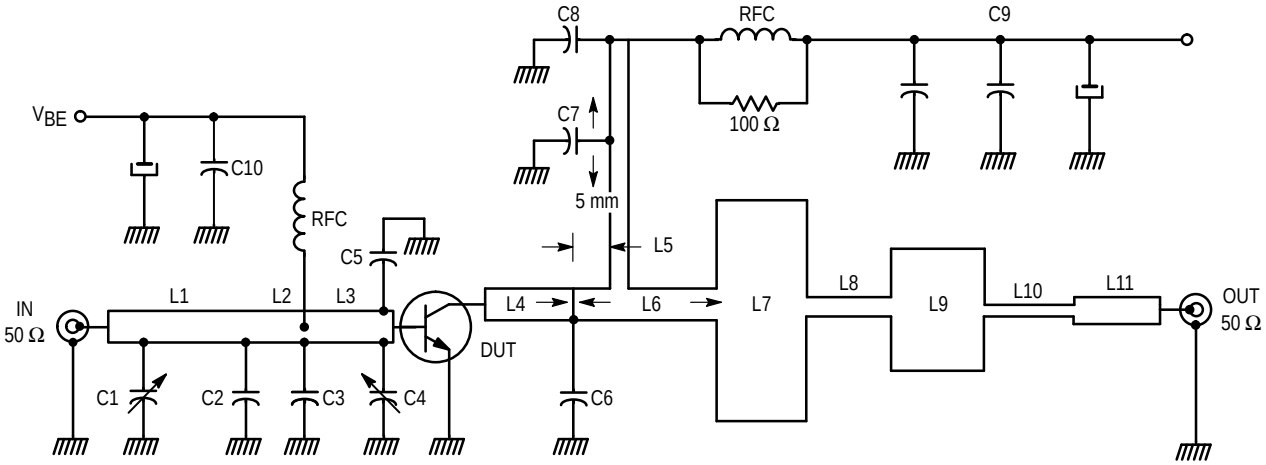
Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	27	Vdc
Collector–Base Voltage	V_{CBO}	45	Vdc
Emitter–Base Voltage	V_{EBO}	4.0	Vdc
Operating Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{stg}	–65 to +200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (T_C = 70°C)	$R_{\theta JC}$	6.2	°C/W
Thermal Resistance, Case to Heatsink	$R_{\theta CH}$	0.4 Typ	°C/W

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 60 mA, I_B = 0)	$V_{(BR)CEO}$	27	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 10 mA, I_E = 0)	$V_{(BR)CBO}$	45	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 3.0 mA, I_C = 0)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector–Emitter Leakage Current (V_{CE} = 20 V)	I_{CEO}	—	—	5.0	mA
ON CHARACTERISTICS					
DC Current Gain (I_C = 500 mA, V_{CE} = 20 V)	h_{FE}	10	—	—	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 25 V, I_E = 0, f = 1.0 MHz)	C_{ob}	—	—	20	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CE} = 25 V, P_{out} = 4.0 W, f = 860 MHz, I_C = 850 mA)	G_{PE}	7.0	—	—	dB
Intermodulation Distortion, 3 Tone (f = 860 MHz, V_{CE} = 25 V, I_E = 850 mA, P_{ref} = 4.0 W, Vision Carrier = –8.0 dB, Sound Carrier = –7.0 dB, Sideband Signal = –16 dB, Specification TV05001)	IMD_1	—	—	–58	dB
Cutoff Frequency (V_{CE} = 25 V, I_C = 850 mA)	f_τ	—	2.0	—	GHz



C1 — Variable 0.5–4.7 pF Airtronic
C2, C3 — ATC 4.7 pF
C4 — ATC 10 pF + Variable 0.5–4.7 pF Airtronic
C5 — ATC 10 pF + ATC 5.6 pF
C6 — ATC 18 pF + 0.5–4.7 pF Variable Airtronic
C7 — 470 pF Chip Capacitor
C8 — 1.0 nF + 10 nF Decoupling
C9 — 1.0 nF + 10 nF + 0.1 μF + 10 μF
C10 — 10 nF + 1.0 μF + 10 μF
RFC = 8 turns, ID 2.5 mm, Wire = 0.5 mm

L1 — 50 Ω line 6.2% λg at 860 MHz
L2 — 50 Ω line 4.2% λg at 760 MHz
L3 — 50 Ω line 4.9% λg at 860 MHz
L4 — 20 Ω line 6.5% λg at 860 MHz
L5 — 50 Ω line 5% λg at 860 MHz
L6 — 20 Ω line 9.5% λg at 860 MHz
L7 — 4.0 Ω line 8% λg at 860 MHz
L8 — 55 Ω line 7.5% λg at 860 MHz
L9 — 7.5 Ω line 8% λg at 860 MHz
L10 — 100 Ω line 8% λg at 860 MHz
L11 — 20 Ω line 8% λg at 860 MHz
Note: λg is the wavelength in the microstrip circuit

Figure 1. Broadband Test Circuit

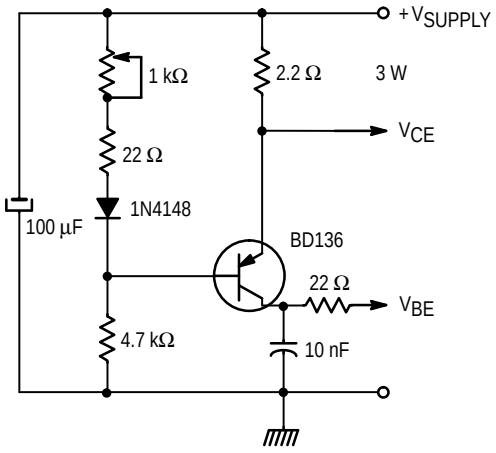
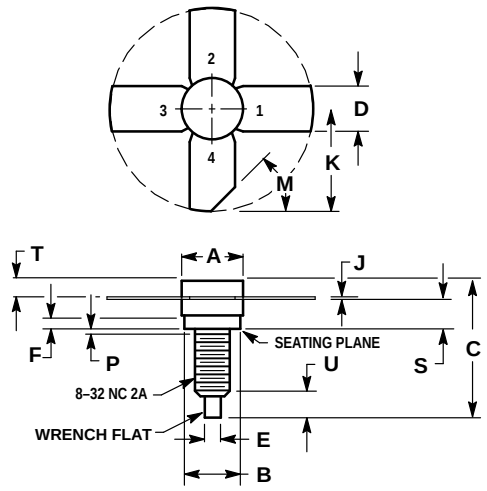


Figure 2. Class A Bias Circuit

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

How to reach us:
USA / EUROPE: Motorola Literature Distribution;
P.O. Box 20912; Phoenix, Arizona 85036. 1–800–441–2447

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE (602) 244–6609
INTERNET: http://Design–NET.com

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

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298