

The RF Line
VHF Linear Power Transistor

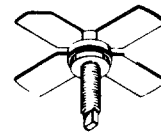
TPV394A

... designed specifically for band III TV transposers and transmitter amplifiers. The TPV394A is internally matched and uses gold metallized die with diffused emitter ballast resistors to enhance reliability, ruggedness and linearity.

- Band III (170–230 MHz)
- 5 W — P_{ref} (α — 55 dB IMD)
- 28 V — V_{CC}
- High Gain — 16 dB Typ, Class A

28 V — 170–230 MHz
VHF LINEAR
POWER TRANSISTOR

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.280 SOE
CASE 244C-01, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	55	Vdc
Emitter-Base Voltage	V_{EBO}	4	Vdc
Collector Current — Continuous	I_C	4	Adc
Total Device Dissipation (α $T_C = 25^\circ\text{C}$ Derate above 25°C)	P_D	50 1	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 ($T_C = 70^\circ\text{C}$)	$R_{\theta JC}$	2.5	$^\circ\text{C}/\text{W}$
Thermal Resistance, Case to Heatsink	$R_{\theta CH}$	1	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 50$ mA, $I_B = 0$)	$V_{(BR)CEO}$	30	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 20$ mA, $I_E = 0$)	$V_{(BR)CBO}$	55	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 2$ mA, $I_C = 0$)	$V_{(BR)EBO}$	4	—	—	Vdc
Collector-Emitter Breakdown Voltage ($I_C = 20$ mA, $R_{BE} = 10$ Ω)	$V_{(BR)CER}$	55	—	—	Vdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 100$ mA, $V_{CE} = 5$ V)	h_{FE}	10	—	—	—
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DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 28$ V, $I_E = 0$, $f = 1$ MHz)	C_{ob}	—	—	35	pF
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(continued)

TPV394A

ELECTRICAL CHARACTERISTICS — continued

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain ($V_{CE} = 28\text{ V}$, $P_{out} = 5\text{ W}$, $f = 225\text{ MHz}$, $I_C = 1\text{ A}$)	GPE	15	16	—	dB
Load Mismatch ($V_{CE} = 28\text{ V}$, $P_{out} = 5\text{ W}$, $I_C = 1\text{ A}$, $f = 225\text{ MHz}$, Load VSWR = $\infty:1$, All Phase Angles)	ψ	No Degradation in Output Power			
Intermodulation Distortion, 3 Tone ($f = 225\text{ MHz}$, $V_{CE} = 28\text{ V}$, $I_C = 1\text{ A}$, $P_{ref} = 5\text{ W}$, Vision Carrier = -8 dB ref., Sound Carrier = -7 dB ref., Sideband Signal = -16 dB ref., Specification TV05001)	IMD ₁	—	—	55	dB

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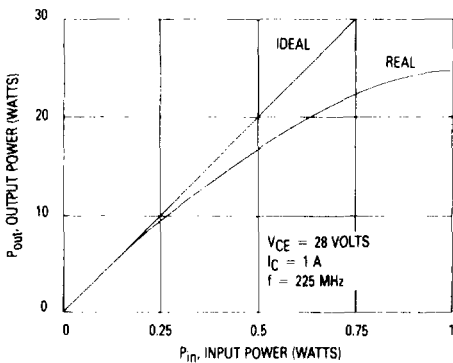


Figure 1. Output Power versus Input Power

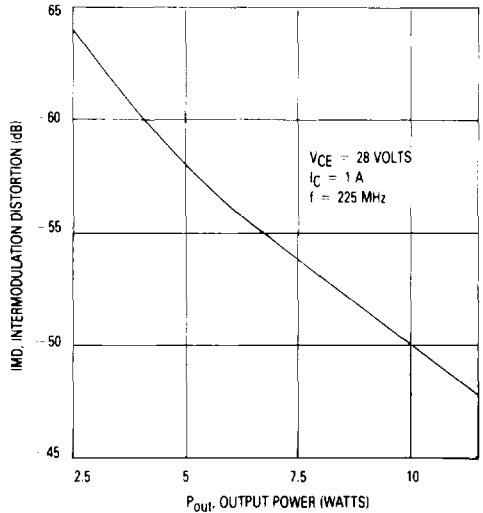


Figure 2. Intermodulation Distortion versus Output Power

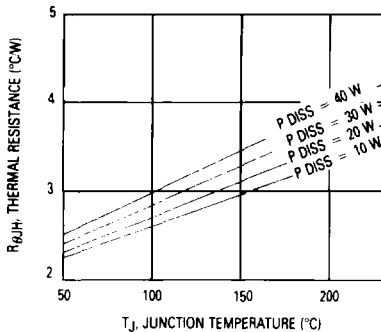


Figure 3. Thermal Resistance Junction Heatsink versus Temperature of Junction for Various Power's Dissipated

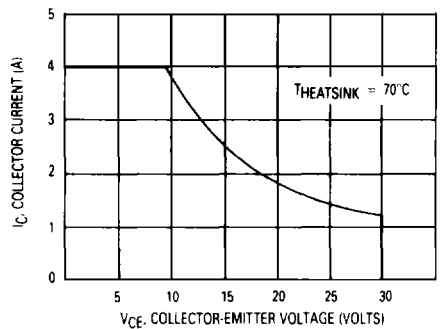


Figure 4. Safe Operating Area

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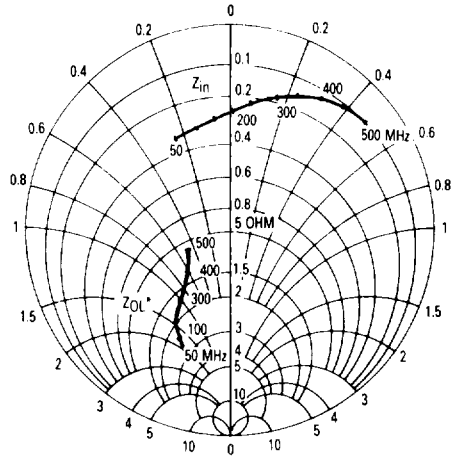


Figure 5. Large Signal Impedances versus Frequency
 $V_{CE} = 28 \text{ V} - I_C = 1 \text{ A}$

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

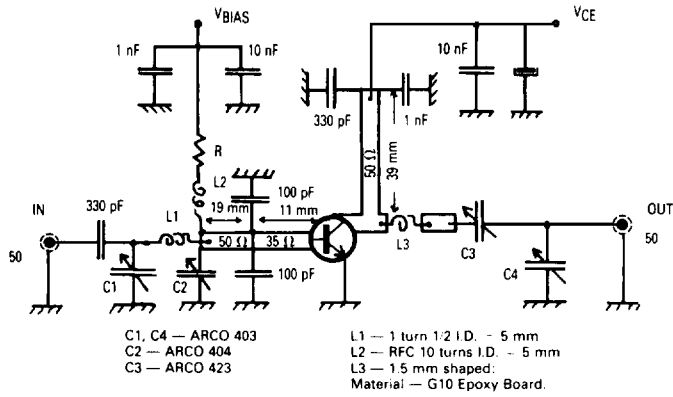


Figure 6. 225 MHz Test Circuit

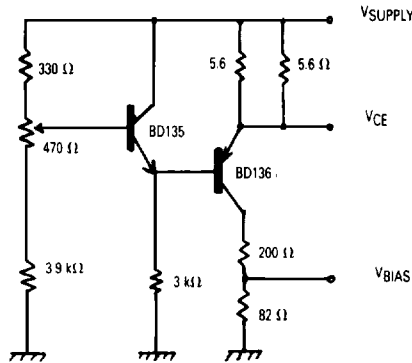


Figure 7. Class A Bias Circuit