

**The RF Line**  
**VHF Power Transistors**

The TP2330 device is intended for use in VHF transmitter output stages where high gain is desired.

Use of gold metallization and diffused emitter ballast resistors result in enhanced reliability and ruggedness.

- 175 MHz
- 30 W —  $P_{out}$
- 12.5 V —  $V_{CC}$
- High Gain — 10 dB @ 175 MHz

**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	16	Vdc
Collector-Base Voltage	$V_{CBO}$	36	Vdc
Emitter-Base Voltage	$V_{EBO}$	4	Vdc
Collector Current — Continuous	$I_C$	8	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	80 0.46	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	$R_{\theta JC}$	2.2	°C/W

**ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$  unless otherwise noted)**

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Collector-Emitter Breakdown Voltage ( $I_C = 50\text{ mA}, I_B = 0$ )	$V_{(BR)CEO}$	16	—	—	Vdc
Collector-Base Breakdown Voltage ( $I_C = 50\text{ mA}, I_E = 0$ )	$V_{(BR)CBO}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 5\text{ mA}, I_C = 0$ )	$V_{(BR)EBO}$	4	—	—	Vdc
Collector Cutoff Current ( $V_{CE} = 15\text{ V}, V_{BE} = 0$ )	$I_{CES}$	—	—	10	mAdc

**ON CHARACTERISTICS**

DC Current Gain ( $I_C = 1\text{ A}, V_{CE} = 5\text{ V}$ )	$h_{FE}$	20	—	250	—
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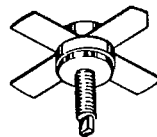
**DYNAMIC CHARACTERISTICS**

Output Capacitance ( $V_{CB} = 15\text{ V}, I_E = 0, f = 1\text{ MHz}$ )	$C_{ob}$	—	70	100	pF
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(continued)

**TP2330**  
**TP2330F**

**30 W — 175 MHz**  
**VHF POWER**  
**TRANSISTORS**



**.380 SOE**  
**CASE 145D-01, STYLE 1**  
**TP2330**



**.380 SOE F**  
**CASE 211-07, STYLE 1**  
**TP2330F**

**ELECTRICAL CHARACTERISTICS — continued** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit	
<b>FUNCTIONAL TESTS</b>						
Common-Emitter Amplifier Power Gain ( $V_{CE} = 12.5\text{ V}$ , $P_{Out} = 30\text{ W}$ , $f = 175\text{ MHz}$ )	TP2330 TP2330F	GPE	10 9	— —	— —	dB
Collector Efficiency ( $V_{CE} = 12.5\text{ V}$ , $P_{Out} = 30\text{ W}$ , $f = 175\text{ MHz}$ )		$\eta_c$	60	—	—	%
Load Mismatch ( $V_{CE} = 12.5\text{ V}$ , $P_{Out} = 30\text{ W}$ , $f = 175\text{ MHz}$ , Load VSWR = $\infty:1$ , All Phase Angles)		$\psi$	No Degradation in Output Power			
Input Impedance, Common Emitter (Typ) ( $V_{CE} = 12.5\text{ V}$ , $P_{Out} = 30\text{ W}$ , $f = 175\text{ MHz}$ )			$Z_{in} = 1.05 + j0.5\text{ Ohms}$			
Load Impedance, Common Emitter (Typ) ( $V_{CE} = 12.5\text{ V}$ , $P_{Out} = 30\text{ W}$ , $f = 175\text{ MHz}$ )			$Z_{Load} = 2.7 + j0.2\text{ Ohms}$			

**TYPICAL CHARACTERISTICS**

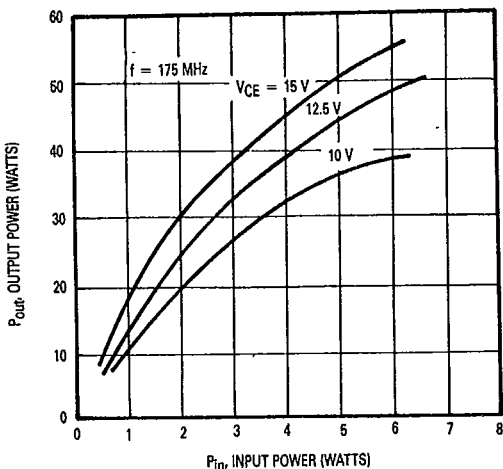


Figure 1. Output Power versus Frequency

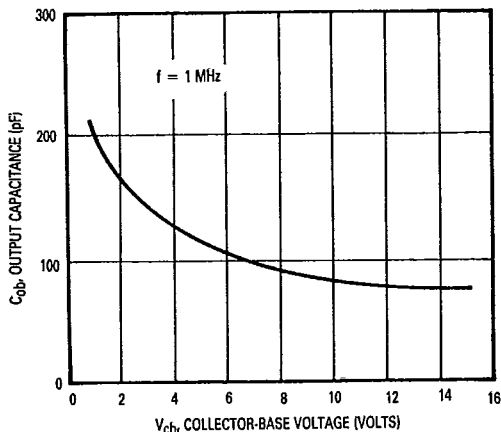


Figure 2. Output Capacitance versus Voltage

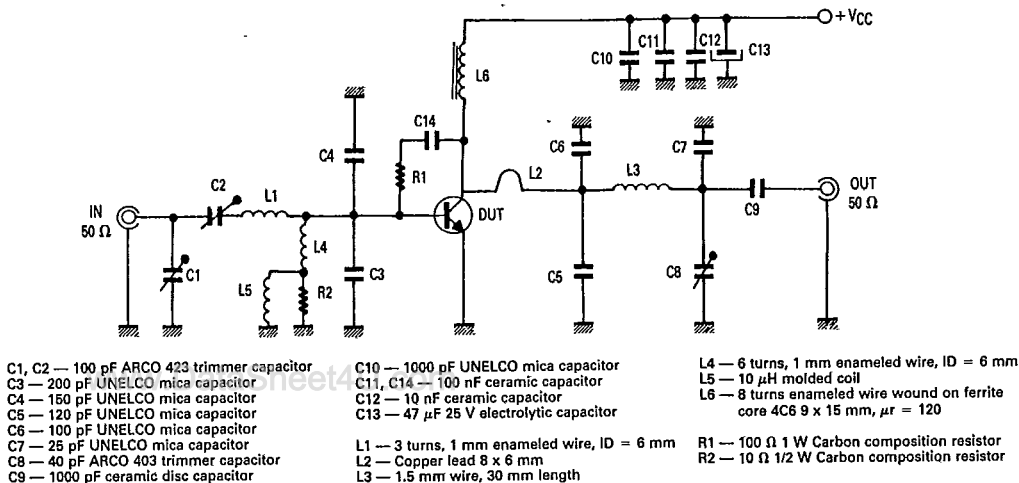


Figure 3. 175 MHz Test Circuit