MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

TP2330
TP2330F

The RF Line

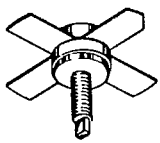
VHF Power Transistors

30 W — 175 MHz VHF POWER TRANSISTORS

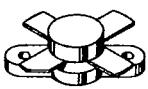
The TP2330 device is intended for use in VHF transmitter output stages where high gain is desired.

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



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



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

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°C Derate above 25°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°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 50 mA, I_B = 0)	$V_{(BR)CEO}$	16	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 50 mA, I_E = 0)	$V_{(BR)CBO}$	36	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 5 mA, I_C = 0)	$V_{(BR)EBO}$	4	—	—	Vdc
Collector Cutoff Current (V_{CE} = 15 V, V_{BE} = 0)	I_{CES}	—	—	10	mAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 1 A, V_{CE} = 5 V)	h_{FE}	20	—	250	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 15 V, I_E = 0, f = 1 MHz)	C_{ob}	—	70	100	pF

(continued)

ELECTRICAL CHARACTERISTICS — continued (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS						
Common-Emitter Amplifier Power Gain (V_{CE} = 12.5 V, P_{out} = 30 W, f = 175 MHz)	TP2330 TP2330F	G_{PE}	10 9	— —	— —	dB
Collector Efficiency (V_{CE} = 12.5 V, P_{out} = 30 W, f = 175 MHz)		η_C	60	—	—	%
Load Mismatch (V_{CE} = 12.5 V, P_{out} = 30 W, f = 175 MHz, Load VSWR = ∞:1, All Phase Angles)		ψ	No Degradation in Output Power			
Input Impedance, Common Emitter (Typ) (V_{CE} = 12.5 V, P_{out} = 30 W, f = 175 MHz)		Z_{in} = 1.05 + j0.5 Ohms				
Load Impedance, Common Emitter (Typ) (V_{CE} = 12.5 V, P_{out} = 30 W, f = 175 MHz)		Z_{Load} = 2.7 + j0.2 Ohms				

TYPICAL CHARACTERISTICS

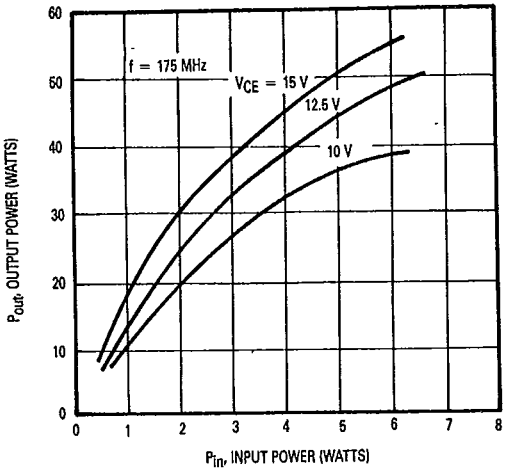


Figure 1. Output Power versus Frequency

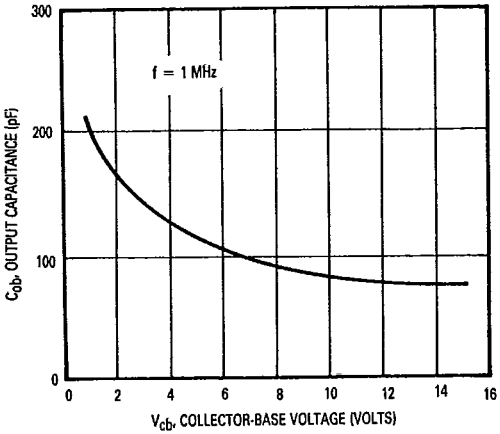
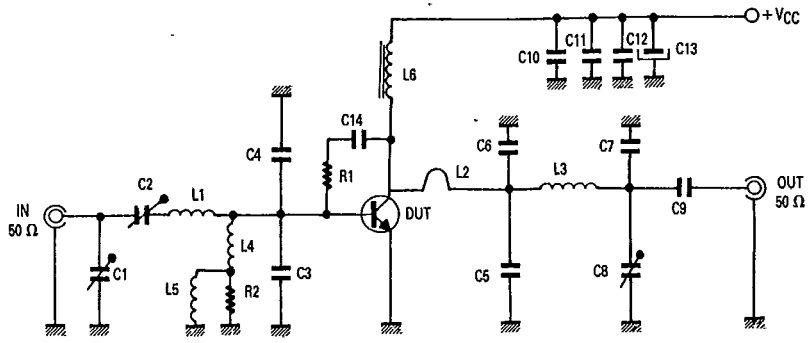


Figure 2. Output Capacitance versus Voltage



C1, C2 — 100 pF ARCO 423 trimmer capacitor
C3 — 200 pF UNELCO mica capacitor
C4 — 150 pF UNELCO mica capacitor
C5 — 120 pF UNELCO mica capacitor
C6 — 100 pF UNELCO mica capacitor
C7 — 25 pF UNELCO mica capacitor
C8 — 40 pF ARCO 403 trimmer capacitor
C9 — 1000 pF ceramic disc capacitor
C10 — 1000 pF UNELCO mica capacitor
C11, C14 — 100 nF ceramic capacitor
C12 — 10 nF ceramic capacitor
C13 — 47 μF 25 V electrolytic capacitor

L1 — 3 turns, 1 mm enameled wire, ID = 6 mm
L2 — Copper lead 8 x 6 mm
L3 — 1.5 mm wire, 30 mm length
L4 — 6 turns, 1 mm enameled wire, ID = 6 mm
L5 — 10 μH molded coil
L6 — 8 turns enameled wire wound on ferrite core 4C6 9 x 15 mm, μr = 120

R1 — 100 Ω 1 W Carbon composition resistor
R2 — 10 Ω 1/2 W Carbon composition resistor

Figure 3. 175 MHz Test Circuit