The RF Line **UHF Power Transistor**

The TP3005 is designed for 960 MHz base stations in both analog and digital applications. It incorporates high value emitter ballast resistors, gold metallizations and offers a high degree of reliability and ruggedness.

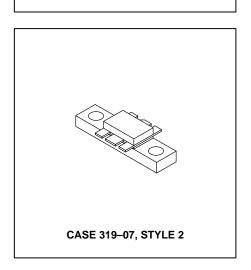
- Specified 26 Volts, 960 MHz Characteristics
 Output Power = 4.0 Watts
 Minimum Gain = 8.5 dB
 Class AB
 IQ = 60 mA
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.

TP3005

4.0 W, 960 MHz UHF POWER TRANSISTOR NPN SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	VCER	40	Vdc
Collector-Base Voltage	V _{СВО}	48	Vdc
Emitter-Base Voltage	V _{EBO}	4.0	Vdc
Collector Current — Continuous	IC	2.0	Adc
Total Device Dissipation @ T _C = 25°C Derate above 25°C	PD	25 0.2	Watts W/°C
Storage Temperature Range	T _{stg}	-65 to +150	°C
Operating Junction Temperature	TJ	200	°C



THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (1) at 70°C Case	$R_{\theta JC}$	7.0	°C/W

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

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage ($I_C = 15 \text{ mA}, R_{BE} = 75 \Omega$)	V(BR)CER	45	_	_	Vdc
Emitter–Base Breakdown Voltage (I _C = 3.0 mAdc)	V(BR)EBO	4.0	_	_	Vdc
Collector–Base Breakdown Voltage (I _E = 15 mAdc)	V(BR)CBO	55	_	_	Vdc
Collector–Emitter Leakage $(V_{CE} = 26 \text{ V}, R_{BE} = 75 \Omega)$	ICER	_	_	3.0	mA
ON CHARACTERISTICS	•		•		
DC Current Gain (I _C = 0.5 Adc, V _{CE} = 10 Vdc)	hFE	15	_	100	_

NOTE:

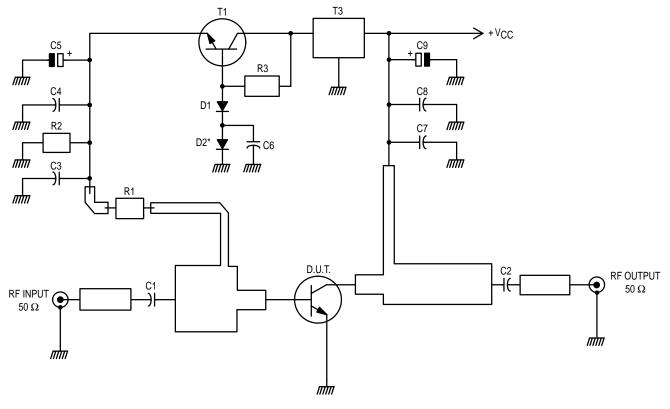
1. Thermal resistance is determined under specified RF operating condition.



(continued)

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

Characteristic	Symbol	Min	Тур	Max	Unit
DYNAMIC CHARACTERISTICS					
Output Capacitance (V _{CB} = 26 V, I _E = 0, f = 1.0 MHz)	C _{ob}	7.5	_	12.5	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V _{CC} = 26 V, P _{out} = 4.0 W, I _{CQ} = 60 mA, f = 960 MHz)	Gp	8.5	9.5	_	dB
Load Mismatch (V _{CC} = 26 V, P _{out} = 4.0 W, I _{CQ} = 60 mA, Load VSWR = 5:1, at all phase angles)	Ψ	No Degradation in Output Power Before and After Test			
Collector Efficiency (V _{CC} = 26 V, P _{Out} = 4.0 W, f = 960 MHz)	ης	50	55	_	%
Power Saturation P _{in} = 1.0 W	P _{sat}	7.0	_	_	W



*Contact with RF Transistor

C1 — Capacitor Chip 0805 22 pF 5%

C2, C3, C6, C8 — Capacitor Chip 0805 330 pF 5%

C4, C7 — Capacitor Chip 0805 15 nF 5%

C5, C9 — Capacitor Chip 0805 6.0, 8.0 nF 35 V

D1, D2 — SMD Diode

R1 — Chip Resistor 2.2 Ω 1206 5%

R2 — Chip Resistor 51 Ω 0805 5%

R3 — Chip Resistor 470 Ω 0805 5% to be adjusted for I_Q = 60 mA

T1 — SMD Transistor BCX54 or Similar

T3 — Voltage Regulator 7805

Board Material — 0.8 mm, Epoxy Glass, Cu Clad, 2 Sides,

35 µm Thick

Figure 1. 960 MHz Test Circuit

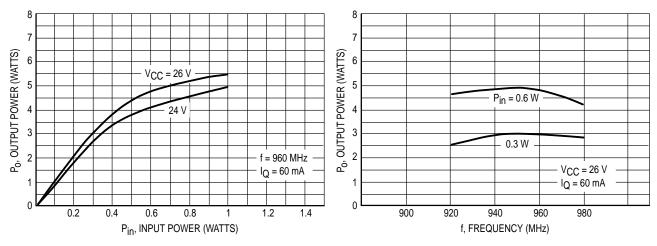


Figure 2. Output Power versus Input Power

Figure 3. Output Power versus Frequency

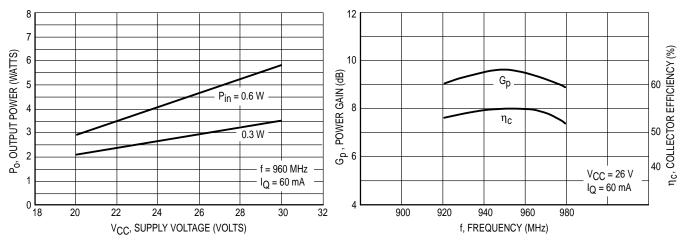
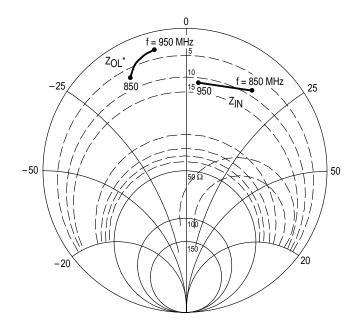


Figure 4. Output Power versus Supply Voltage

Figure 5. Typical Broadband Circuit Performance



 $P_{out} = 4.0 \text{ W}$ $V_{CE} = 26 \text{ V}$ Z_{IN} OHMS Z_{OL}* OHMS MHz 850 6.7 - j118.1 + j17900 9.1 + j12.74.0 - j10950 13.9 + j4.43.2 - j6.1

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

Figure 6. Series Equivalent Input/Output Impedances

MOTOROLA RF DEVICE DATA **TP3005**

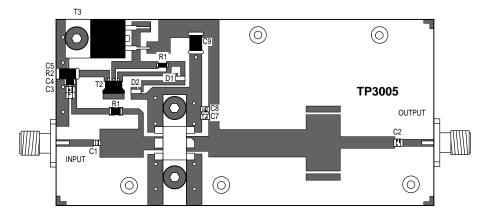
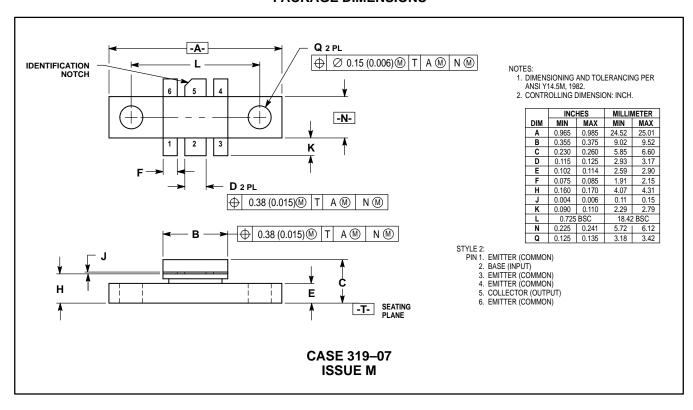


Figure 7. Test Circuit — Component Locations

PACKAGE DIMENSIONS



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