The RF Line

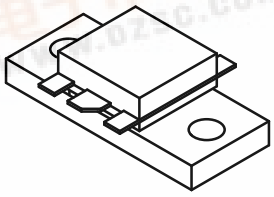
UHF Power Transistor

TP3061

The TP3061 is designed for 960 MHz mobile 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. Including double input and output matching networks, the TP3060 features high impedances and is easy to match.

- Motorola Advanced Amplifier Concept Package
- Oxynitride Passivation
- Specified 26 Volts, 960 MHz Characteristics
  Output Power = 45 Watts
  Minimum Gain = 8.0 dB
  Efficiency = 50%
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.

**45 W, 960 MHz
UHF POWER
TRANSISTOR
NPN SILICON**



CASE 333A–02, STYLE 2

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CER}	40	Vdc
Collector–Base Voltage	V_{CBO}	48	Vdc
Emitter–Base Voltage	V_{EBO}	4.0	Vdc
Collector Current — Continuous	I_C	10	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	175 1.0	Watts W/°C
Storage Temperature Range	T_{stg}	–65 to +150	°C
Operating Junction Temperature	T_J	200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case (1) at 70°C Case	$R_{\theta JC}$	1.2	°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 = 60 mA, R_{BE} = 75 Ω)	$V_{(BR)CER}$	40	—	—	Vdc
Emitter–Base Breakdown Voltage (I_C = 6.0 mAdc)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector–Base Breakdown Voltage (I_E = 60 mAdc)	$V_{(BR)CBO}$	48	—	—	Vdc
Collector–Emitter Leakage (V_{CE} = 26 V, R_{BE} = 75 Ω)	I_{CER}	—	—	15	mA

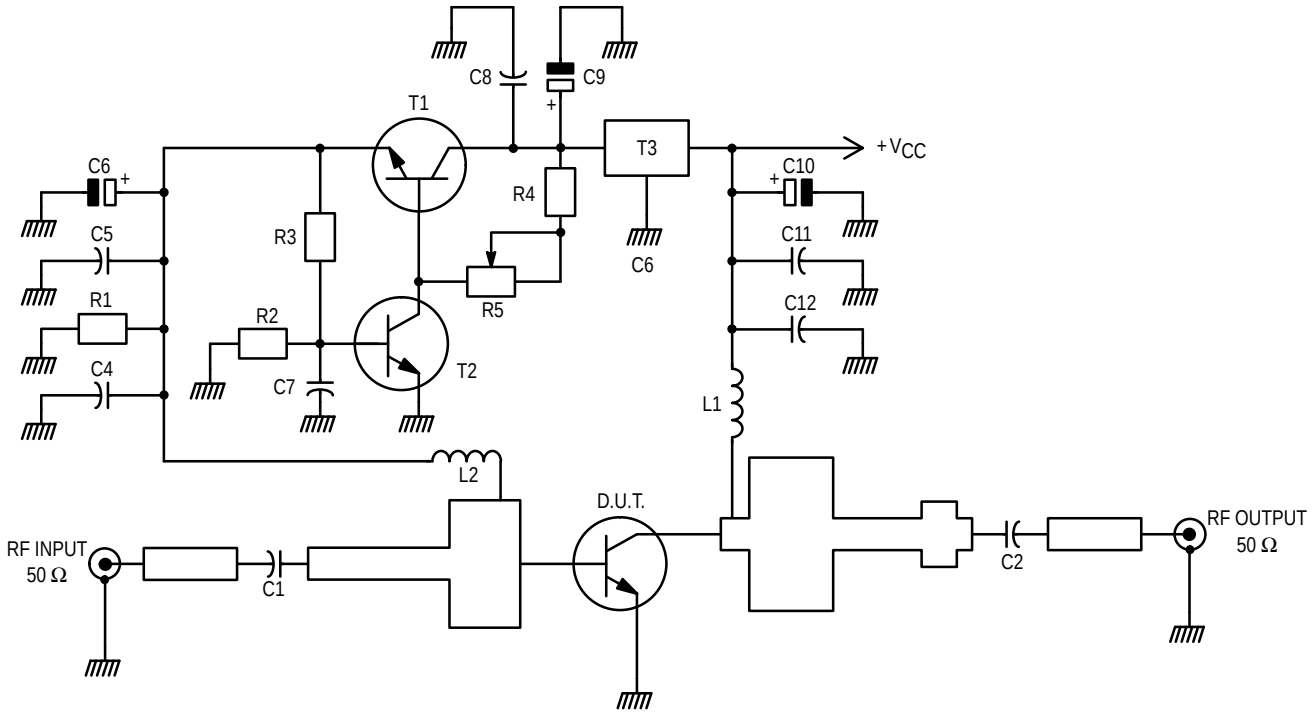
NOTE:
1. Thermal resistance is determined under specified RF operating condition.

(continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I_C = 1.0 Adc, V_{CE} = 10 Vdc)	h_{FE}	15	—	100	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (2) (V_{CB} = 26 V, I_E = 0, f = 1.0 MHz)	C_{ob}	45	60	—	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Power Gain (V_{CC} = 26 V, P_{out} = 45 W, I_{CQ} = 200 mA, f = 960 MHz)	G_p	8.0	8.8	—	dB
Collector Efficiency (V_{CC} = 26 V, P_{out} = 45 W, f = 960 MHz)	η	50	53	—	%
Load Mismatch (V_{CC} = 26 V, P_{out} = 45 W, I_{CQ} = 200 mA, Load VSWR = 5:1, at all phase angles)	ψ	No Degradation in Output Power Before and After Test			
Overdrive (V_{CC} = 26 V, P_{in} = 15 W, f = 960 MHz)	OD	No Degradation in Output Power			

NOTE:
2. Value of "C_{ob}" is that of die only. It is not measurable in TP3061 because of internal matching network.



C1, C4, C7, C12 — Capacitor Chip 0805 330 pF 5%
C2 — Capacitor Chip 82 pF ATC
C5, C11, C8 — Capacitor Chip 0805 15 nF 5%
C6, C9, C10 — Capacitor Chip 0805 6.0, 8.0 μF 35 V
L1, L2 — 1.5 Turns #18 AWG Choke
R1 — Chip Resistor 47 Ω 1206 5%
R2 — Chip Resistor 270 Ω 0805 5%
R3 — Chip Resistor 47 Ω 0805 5%
R4 — Chip Resistor 100 Ω 0805 5%
R5 — Trimmer 1.0 kΩ
T1 — SMD Transistor MJD31C or Similar
T2 — SMD Transistor
T3 — Voltage Regulator 7805
Board Material — 1/50″, Teflon Glass, ε_r = 2.5, Cu Clad 2 Sides, 35 μm Thick

Figure 1. 960 MHz Test Circuit

TYPICAL CHARACTERISTICS

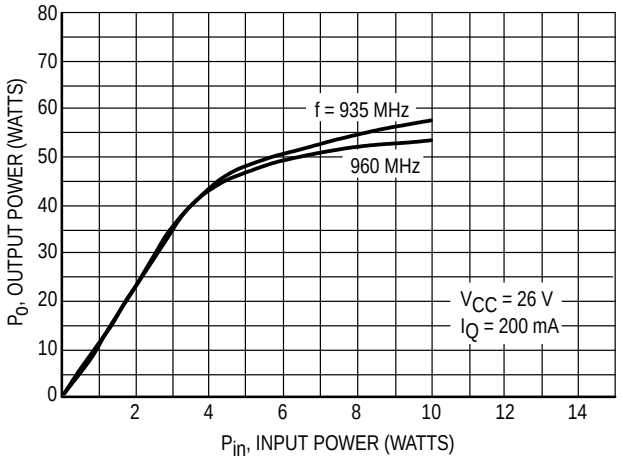


Figure 2. Output Power versus Input Power

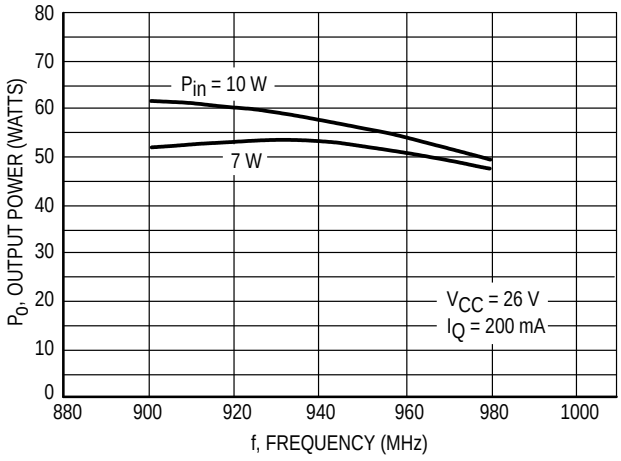


Figure 3. Output Power versus Frequency

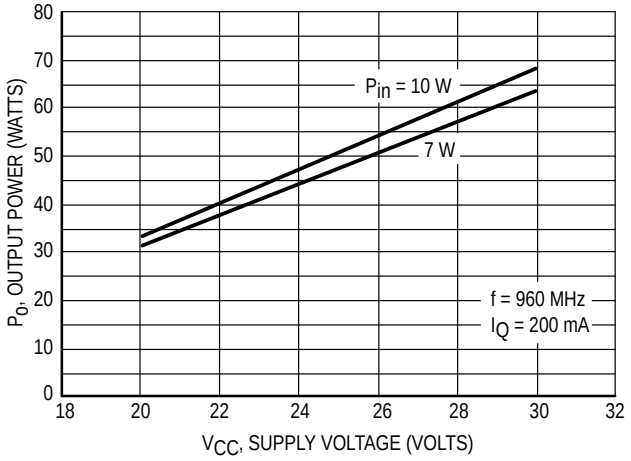


Figure 4. Power Output versus Supply Voltage

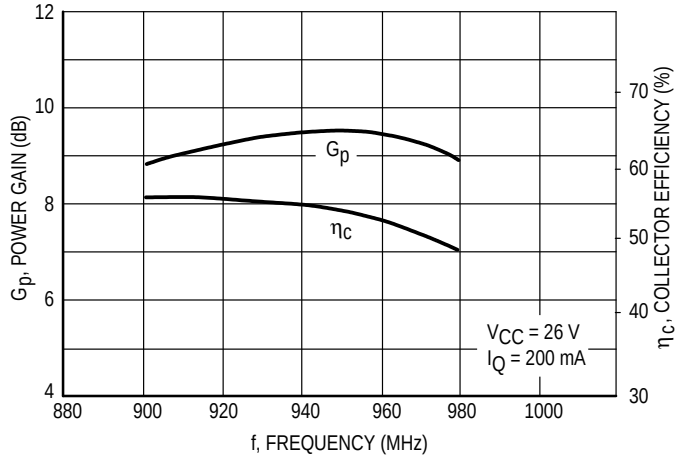
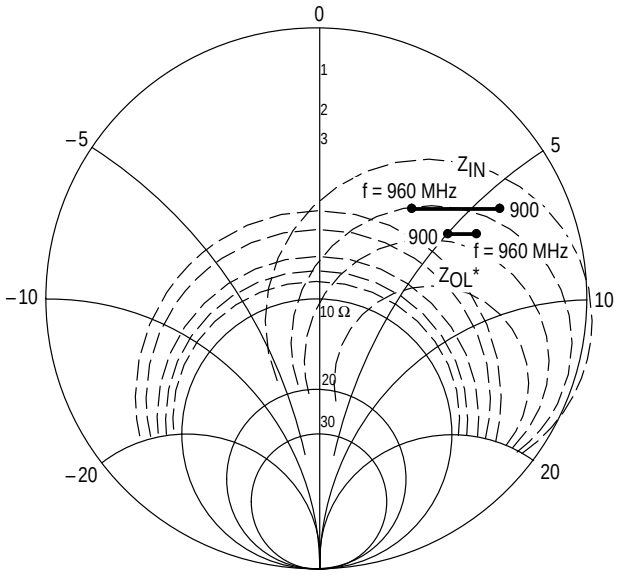


Figure 5. Typical Broadband Circuit Performance



P_{out} = 45 W V_{CE} = 26 V

f MHz	Z_{IN} OHMS	Z_{OL}* OHMS
850	—	—
900	2.8 + j6	4.1 + j5
950	3.95 + j3.55	3.7 + j5.2

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

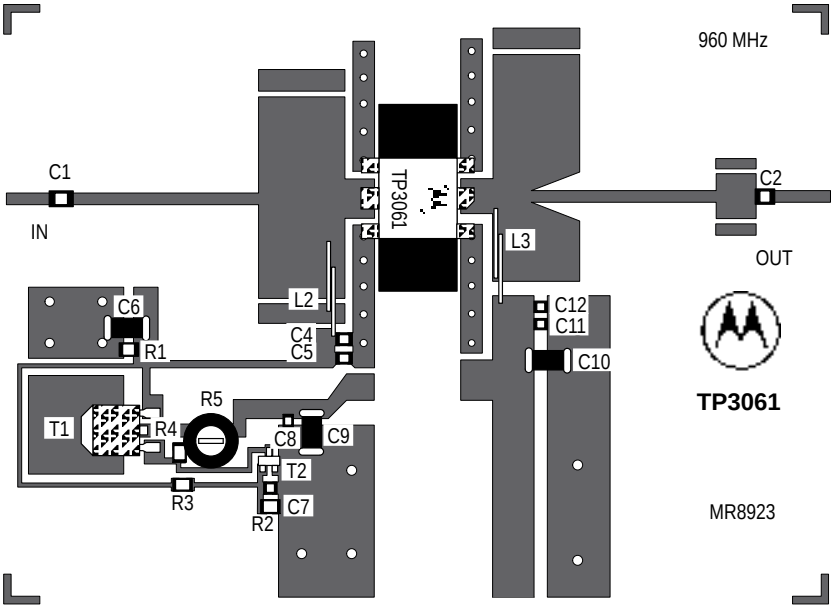
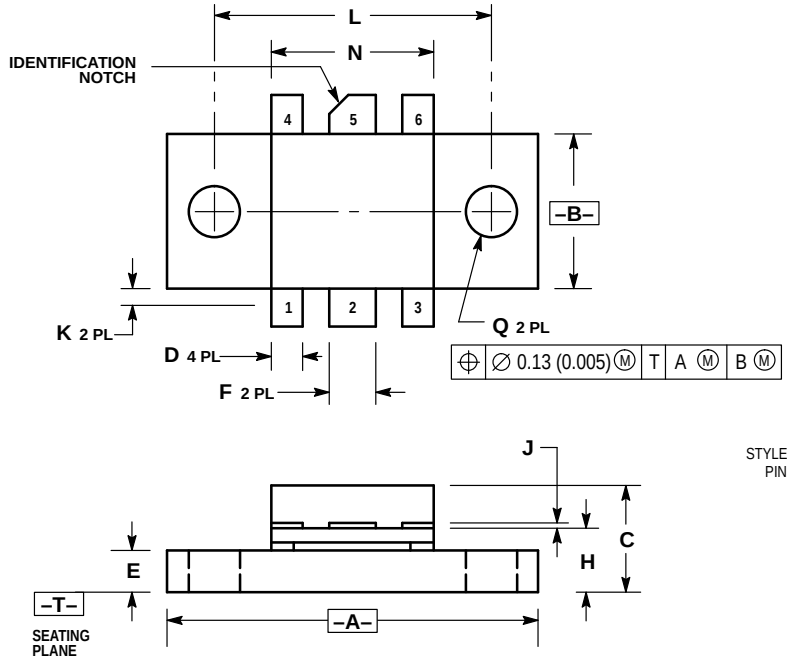


Figure 7. Test Circuit — Component Locations

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.965	0.985	24.52	25.01
B	0.390	0.410	9.91	10.41
C	0.250	0.290	6.35	7.36
D	0.075	0.090	1.91	2.28
E	0.095	0.115	2.42	2.92
F	0.110	0.130	2.80	3.30
H	0.155	0.175	3.94	4.44
J	0.004	0.006	0.11	0.15
K	0.090	0.116	2.29	2.94
L	0.725 BSC		18.41 BSC	
N	0.415	0.435	10.55	11.04
Q	0.120	0.135	3.05	3.42

STYLE 2:
PIN 1. EMITTER
2. BASE
3. EMITTER
4. EMITTER
5. COLLECTOR
6. EMITTER

CASE 333A–02
ISSUE C

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