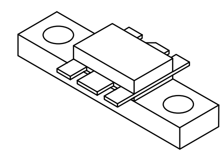
The RF Line
NPN Silicon
RF Power Transistor

TP3034

The TP3034 is designed for 960 MHz cellular radio base stations in both analog and digital applications. It incoporates high value emitter ballast resistors, gold metallizations and offers a high degree of reliability and ruggedness.

- Specified 24 Volts, 960 MHz Characteristics
  Output power — 35 Watts
  Gain — 7 dB Min
  Efficiency — 50% Min
- Class AB Operation
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.

35 W, 960 MHz
RF POWER TRANSISTOR
NPN SILICON



CASE 319–07, 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}	3.5	Vdc
Collector Current — Continuous	I_C	4	Adc
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	76 0.43	Watts W/°C
Storage Temperature Range	T_{stg}	– 65 to +150	°C
Operating Junction Temperature	T_J	200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.3	°C/W

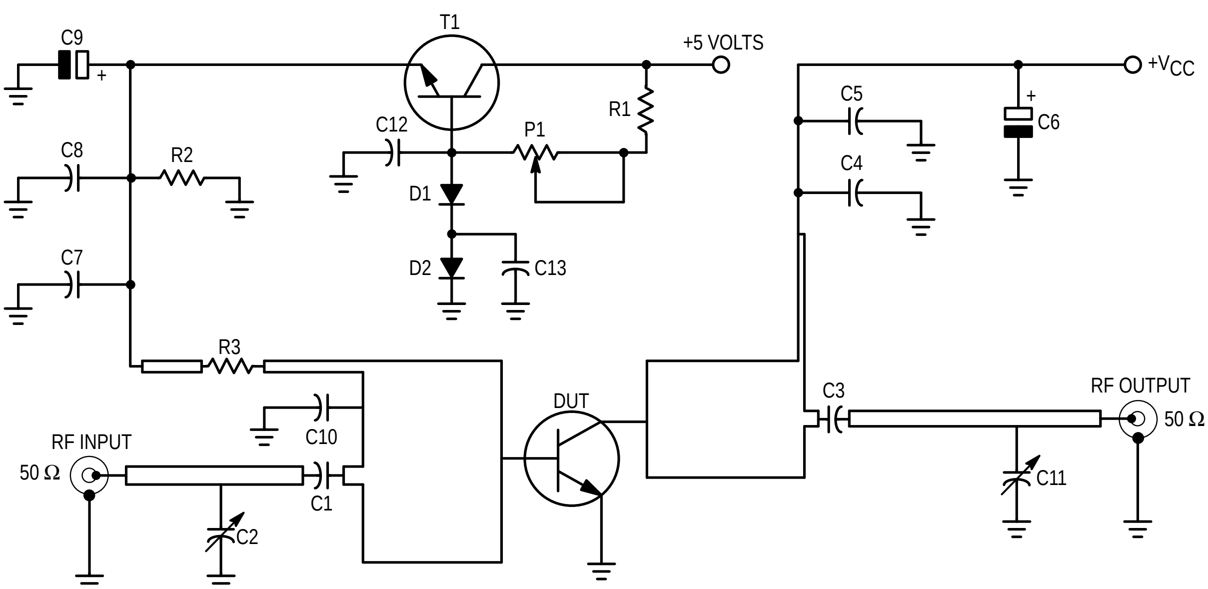
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 50 mA, R_{BE} = 75 Ω)	$V_{(BR)CER}$	40	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 50 mAdc)	$V_{(BR)CBO}$	48	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 6 mA, I_C = 0)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector–Emitter Leakage (V_{CE} = 26 V, I_C = 1 A, R_{BE} = 75 Ω)	I_{CER}	—	—	10	mA
ON CHARACTERISTICS					
DC Current Gain (I_C = 1 Adc, V_{CE} = 10 Vdc)	h_{FE}	15	—	100	—
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 24 Vdc, I_E = 0, f = 1 MHz)	C_{ob}	—	40	—	pF

(continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
FUNCTIONAL TESTS					
Common–Emitter Amplifier Gain (P_{out} = 35 W, I_{CQ} = 60 mA, V_{CC} = 24 V, f = 960 MHz)	G_{p1}	7	8	—	dB
Collector Efficiency (P_{out} = 35 W, V_{CC} = 24 V, f = 960 MHz)	η_{c1}	50	55	—	%
Load Mismatch (P_{out} = 35 W, I_{CQ} = 60 mA, V_{CC} = 24 V, f = 960 MHz, Load VSWR = 20:1, All Phase Angles at frequency of test)	ψ	—	No Degradation in Output Power		
Input Return Loss (P_{out} = 35 W, I_{CQ} = 60 mA, V_{CC} = 24 V, f = 960 MHz)	IRL	12	—	—	dB
Common–Emitter Amplifier Gain (P_{out} = 15 W, I_{CQ} = 100 mA, V_{CC} = 25 V, f = 960 MHz)	G_{p2}	8	—	—	dB
Collector Efficiency (P_{out} = 15 W, I_{CQ} = 100 mA, V_{CC} = 25 V, f = 960 MHz)	η_{c2}	40	—	—	%



C1, C3	100 pF, ATC Chip Capacitor 100A	D1, D2	Diode, Type BAS16
C2, C11	0.5 – 20 pF, Trimmer Capacitor	P1	1 kΩ, Trimmer
C4, C7	330 pF, Chip Capacitor 0805	R1	1 kΩ, Resistor 0805
C5, C6, C12, C13	10 nF, Chip Capacitor 0805	R2	56 Ω, Resistor 0805
C6	4.7 µF, 50 Volts, Capacitor	R3	2.2 Ω, Resistor 0805
C9	10 µF, 16 Volts, Capacitor	T1	Transistor, NPN Type MJD31C
C10	5.6 pF, ATC Chip Capacitor 100A		

Figure 1. 960 MHz Electrical Schematic

TYPICAL CHARACTERISTICS

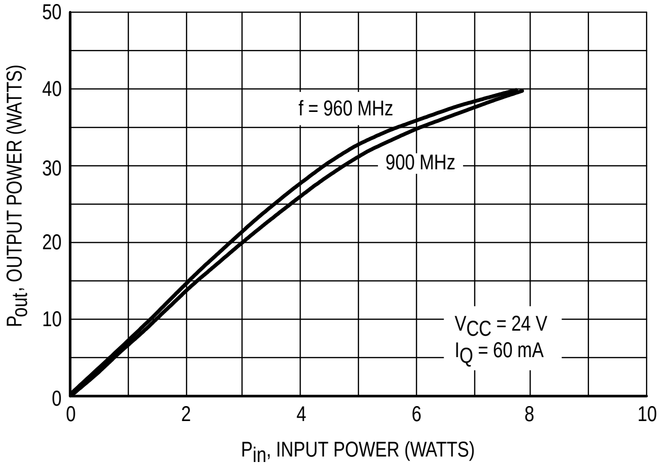


Figure 2. Output Power versus Input Power

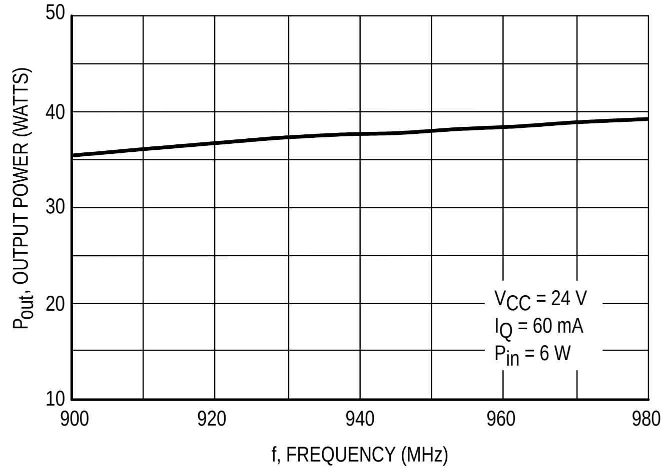


Figure 3. Output Power versus Frequency

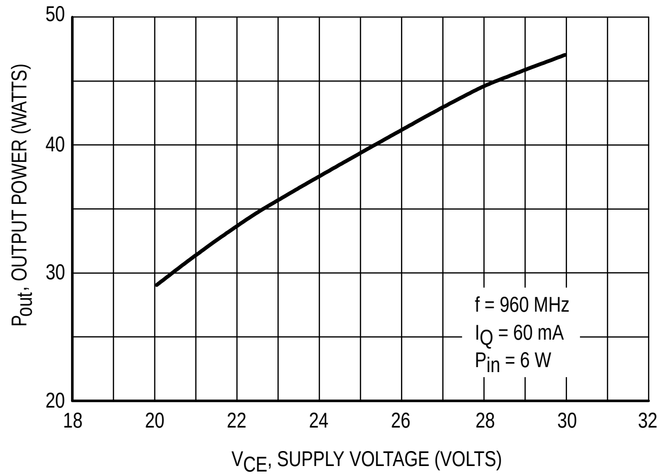
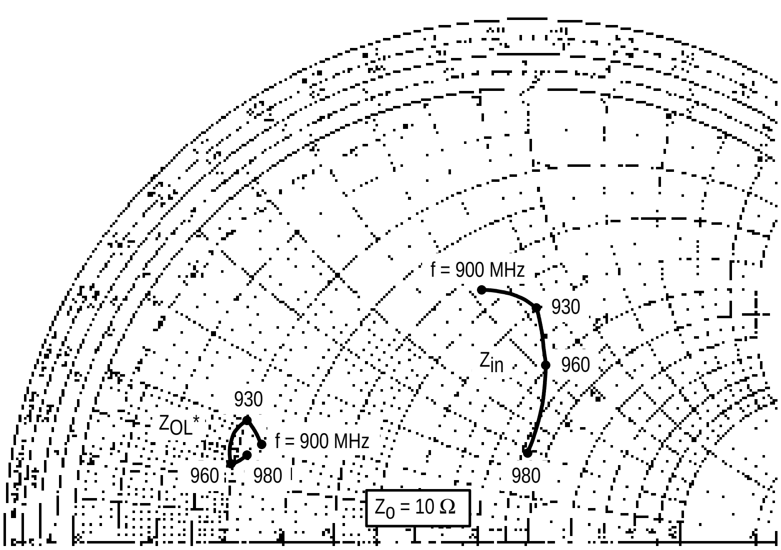


Figure 4. Output Power versus Supply Voltage



V_{CE} = 24 V P_{out} = 35 W

f (MHz)	Z_{in} (Ω)	Z_{OL}* (Ω)
900	4.5 + j7.4	2.4 + j1.7
930	5.8 + j8.4	2 + j2
960	7.9 + j7.2	2 + j1.3
980	9.4 + j3.8	2.2 + j1.5

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

Figure 5. Series Equivalent Input and Output Impedances

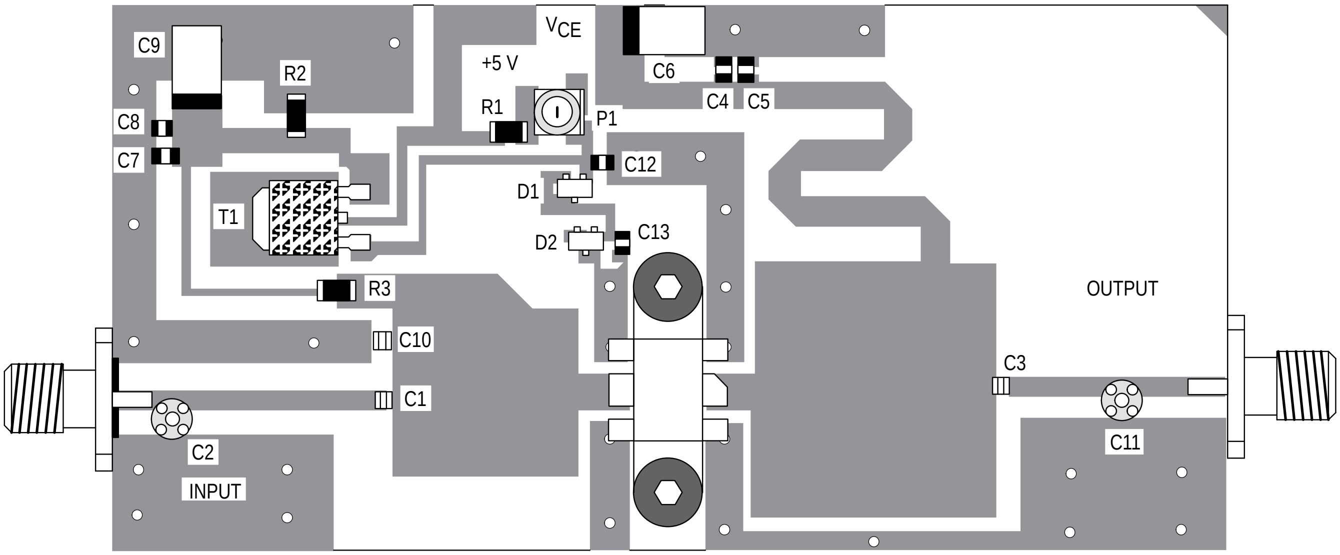
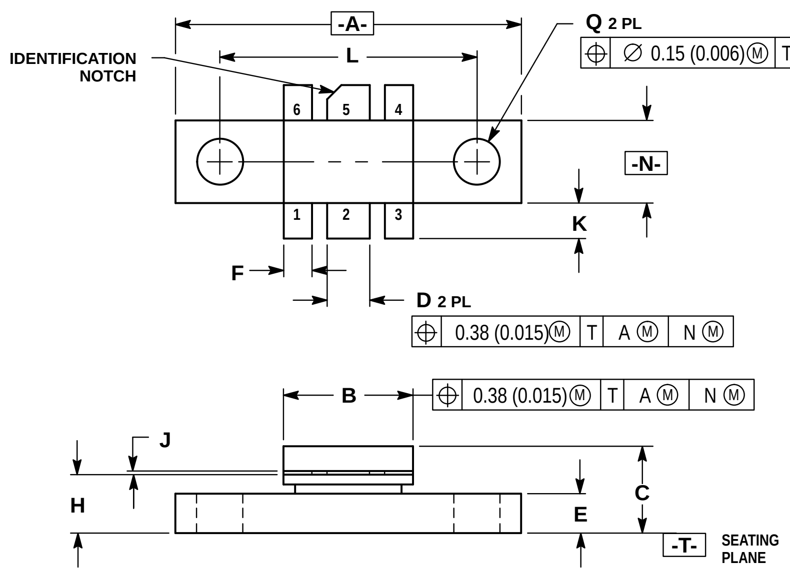


Figure 6. Test Circuit Components View

PACKAGE DIMENSIONS



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

DIM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	0.965	0.985	24.52	25.01
B	0.355	0.375	9.02	9.52
C	0.230	0.260	5.85	6.60
D	0.115	0.125	2.93	3.17
E	0.102	0.114	2.59	2.90
F	0.075	0.085	1.91	2.15
H	0.160	0.170	4.07	4.31
J	0.004	0.006	0.11	0.15
K	0.090	0.110	2.29	2.79
L	0.725 BSC		18.42 BSC	
N	0.225	0.241	5.72	6.12
Q	0.125	0.135	3.18	3.42

STYLE 2:
PIN 1. EMITTER (COMMON)
2. BASE (INPUT)
3. EMITTER (COMMON)
4. EMITTER (COMMON)
5. COLLECTOR (OUTPUT)
6. EMITTER (COMMON)

CASE 319–07
ISSUE M

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