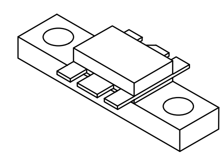
The RF Line
NPN Silicon
RF Power Transistor

TP3032

The TP3032 is designed for 26 volts, common emitter, 960 MHz base station amplifiers, for use in analog and digital systems.

- Specified 26 Volts, 960 MHz Characteristics
  Output Power — 21 Watts
  Gain — 7.5 dB min
- Silicon Nitride Passivated
- Gold Metallized, Emitter Ballasted for Long Life and Resistance to Metal Migration
- Class AB Operation
- Circuit board photomaster available upon request by contacting RF Tactical Marketing in Phoenix, AZ.

21 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	52.5 0.3	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)	$R_{\theta JC}$	3.3	°C/W

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

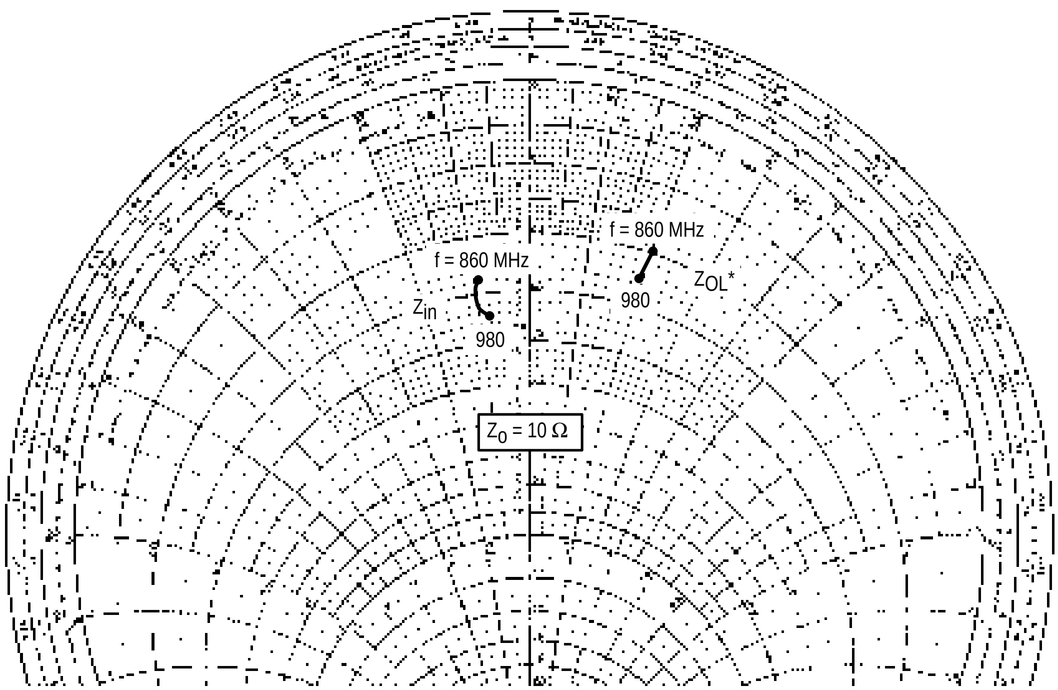
Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 30 mA, R_{BE} = 75 Ω)	$V_{(BR)CER}$	40	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 5 mAdc)	$V_{(BR)EBO}$	3.5	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 30 mAdc)	$V_{(BR)CBO}$	48	—	—	Vdc
Collector–Emitter Leakage (V_{CE} = 26 V, R_{BE} = 75 Ω)	I_{CER}	—	—	8	mA
ON CHARACTERISTICS					
DC Current Gain (I_C =1 Adc, V_{CE} = 10 Vdc)	h_{FE}	15	—	80	—

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
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 26 V, I_E = 0, f = 1 MHz)	C_{ob}	—	30	—	pF
FUNCTIONAL TESTS					
Common–Emitter Amplifier Gain (V_{CC} = 26 V, P_{out} = 21 W, I_{CQ} = 100 mA, f = 960 MHz)	G_p	7.5	8.5	—	dB
Load Mismatch (V_{CC} = 26 V, P_{out} = 21 W, I_{CQ} = 100 mA, Load VSWR = 5:1, at All Phase Angles at Frequency of Test)	ψ	No Degradation in Output Power			
Collector Efficiency (V_{CC} = 26 V, P_{out} = 21 W, f = 960 MHz)	η	50	55	—	%
Over Drive (V_{CC} = 26 V, P_{in} = 6 W, f = 960 MHz)	OD	No Degradation in Output Power			

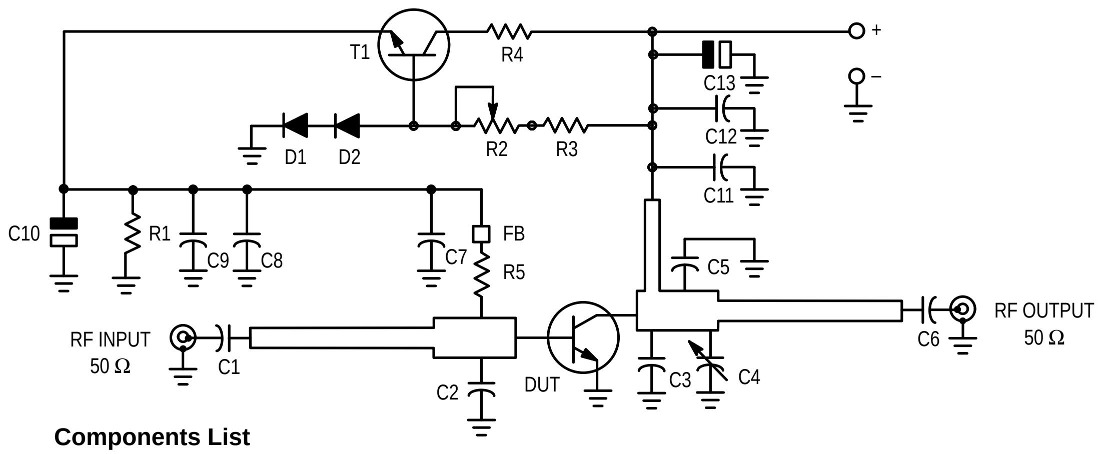


V_{CE} = 26 V P_{out} = 21 W

f (MHz)	Z_{in} (Ω)	Z_{OL}* (Ω)
860	2.9 – j0.4	2 + j2.2
880	2.9 – j0.9	2.1 + j2.2
900	2.9 – j1.45	2.25 + j2.5
935	3.2 – j0.95	2.4 + j2.3
960	3.25 – j1.5	2.5 + j2
980	3.55 – j1.1	2.6 + j2.15

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

Figure 1. Series Equivalent Input and Output Impedances



Components List

C1	300 pF, ATC Chip Capacitor 100B	D1,D2	Diode, 1N4148
C2	12 pF, ATC Chip Capacitor 100A	FB	Ferrite Bead
C3	10 pF, ATC Chip Capacitor 100A	R1	75 Ω, Chip Resistor 1206
C4	1–4.5 pF, Johanson Capacitor 9410–0	R2	10 kΩ, Trimmer Resistor
C5	6.8 pF, ATC Chip Capacitor 100A	R3	1 kΩ, 1/2 W, Resistor
C6	82 pF, ATC Chip Capacitor 100B	R4	82 Ω, 3 W, Resistor
C7,C8,C11	330 pF, Chip Capacitor	R5	1 Ω, 1/4 W, Resistor
C9,C12	15 nF, Chip Capacitor	T1	Transistor, BD135
C10,C13	6.8 μF, 35 V, Tantalum Capacitor		

Figure 2. 960 MHz Test Circuit Schematic

TYPICAL CHARACTERISTICS

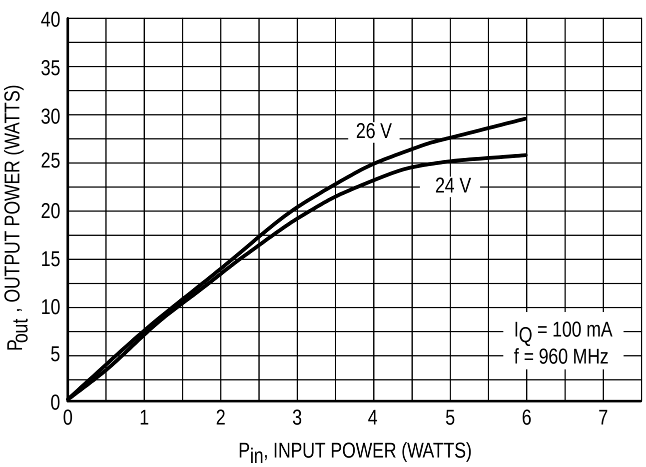


Figure 3. Output Power versus Input Power

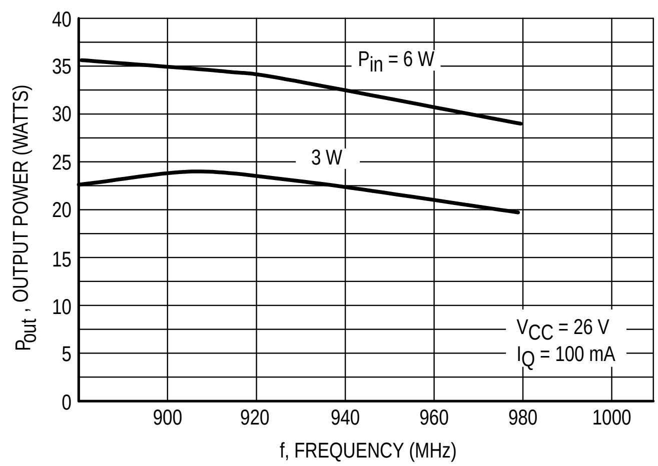


Figure 4. Output Power versus Frequency

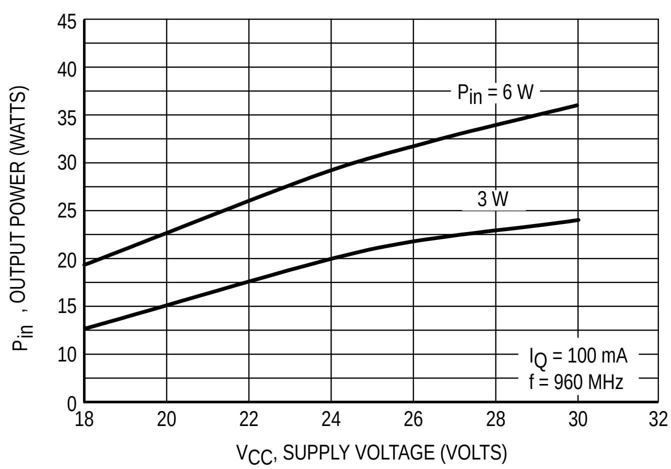


Figure 5. Output Power versus Supply Voltage

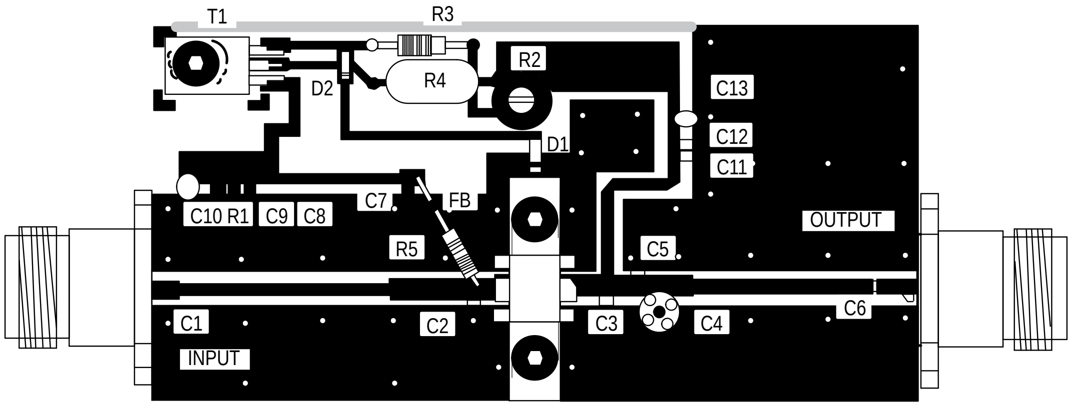
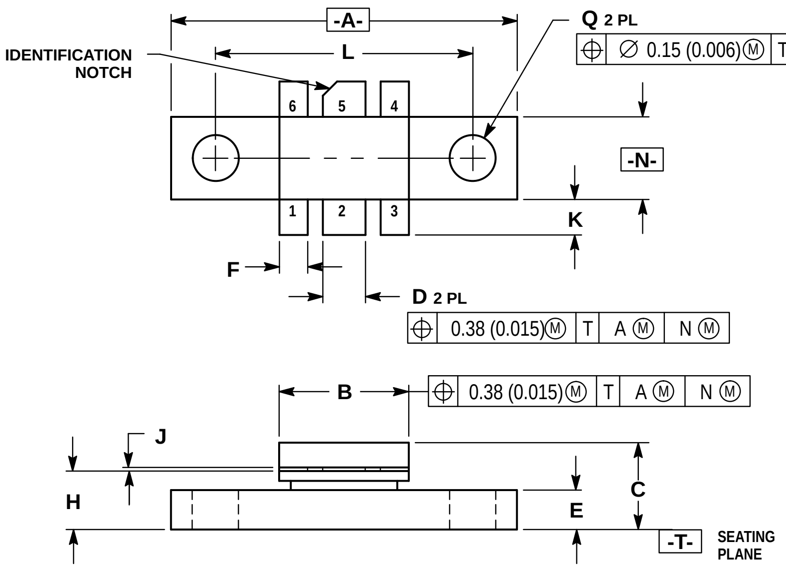


Figure 6. Test Circuit Components View

PACKAGE DIMENSIONS



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

	INCHES		MILLIMETER	
DIM	MIN	MAX	MIN	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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