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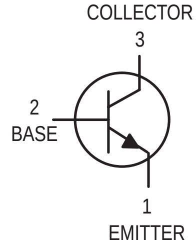
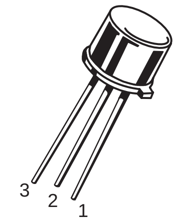
General Purpose Transistor
NPN Silicon

2N1711





CASE 79–04, STYLE 1
TO–39 (TO–205AD)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CER}	50	Vdc
Collector–Base Voltage	V_{CBO}	75	Vdc
Emitter–Base Voltage	V_{EBO}	7.0	Vdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	800 4.57	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	3.0 17.15	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +200	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	58	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	219	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (I_C = 100 mAdc, pulsed; R_{BE} ≤ 10 Ω)(1)	$V_{CER(sus)}$	50	—	—	Vdc
Collector–Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	75	—	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	$V_{(BR)EBO}$	7.0	—	—	Vdc
Collector Cutoff Current (V_{CB} = 60 Vdc, I_E = 0) (V_{CB} = 60 Vdc, I_E = 0, T_A = 150°C)	I_{CBO}	 — —	 0.001 —	 0.01 10	μAdc
Emitter Cutoff Current (V_{EB} = 5.0 Vdc, I_C = 0)	I_{EBO}	—	—	0.005	μAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 0.01 mAdc, V_{CE} = 10 Vdc) (I_C = 0.1 mAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 10 Vdc, T_A = –55°C) (I_C = 150 mAdc, V_{CE} = 10 Vdc)(1) (I_C = 500 mAdc, V_{CE} = 10 Vdc)(1)	h_{FE}	 20 35 75 35 100 40	 — — — — — —	 — — — — 300 —	—
Collector–Emitter Saturation Voltage(1) (I_C = 150 mAdc, I_B = 15 mAdc)	$V_{CE(sat)}$	—	0.24	1.5	Vdc
Base–Emitter Saturation Voltage(1) (I_C = 150 mAdc, I_B = 15 mAdc)	$V_{BE(sat)}$	—	1.0	1.3	Vdc

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

(Replaces 2N718A/D)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
SMALL–SIGNAL CHARACTERISTICS					
Current–Gain — Bandwidth Product (I_C = 50 mAdc, V_{CE} = 10 Vdc, f = 20 MHz)	f_T	70	300	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	—	4.0	25	pF
Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	—	20	80	pF
Input Impedance	h_{ib}				Ω
(I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		24	—	34	
(I_C = 5.0 mAdc, V_{CB} = 10 Vdc, f = 1.0 kHz)		4.0	—	8.0	
Voltage Feedback Ratio	h_{rb}				X 10^{-4}
(I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		—	—	5.0	
(I_C = 5.0 mAdc, V_{CB} = 10 Vdc, f = 1.0 kHz)		—	—	5.0	
Small–Signal Current Gain	h_{fe}				—
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc, f = 1.0 kHz)		50	—	200	
(I_C = 5.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)		70	—	300	
Output Admittance	h_{ob}				μmhos
(I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		0.05	—	0.5	
(I_C = 5.0 mAdc, V_{CB} = 10 Vdc, f = 1.0 kHz)		0.05	—	0.5	
Noise Figure (I_C = 300 μAdc, V_{CE} = 10 Vdc, f = 1.0 kHz)	NF	—	—	8.0	dB

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

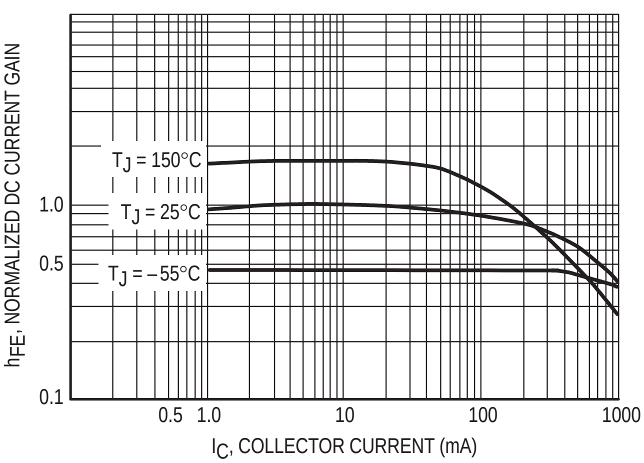


Figure 1. DC Current Gain

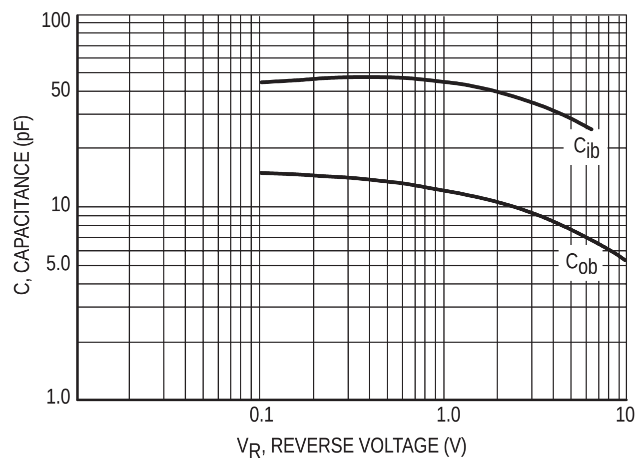


Figure 2. Capacitance

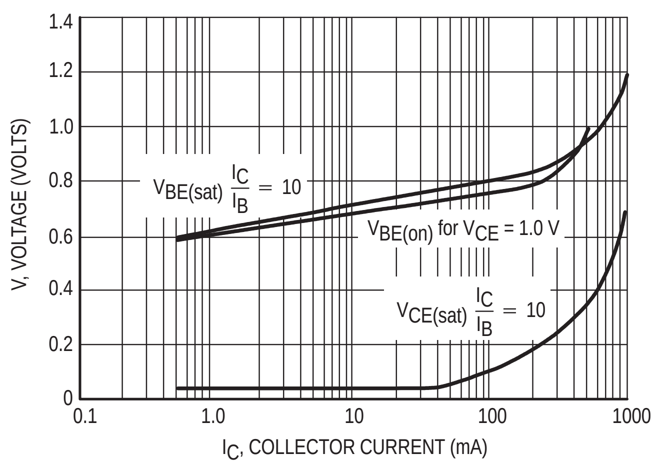


Figure 3. “On” Voltages

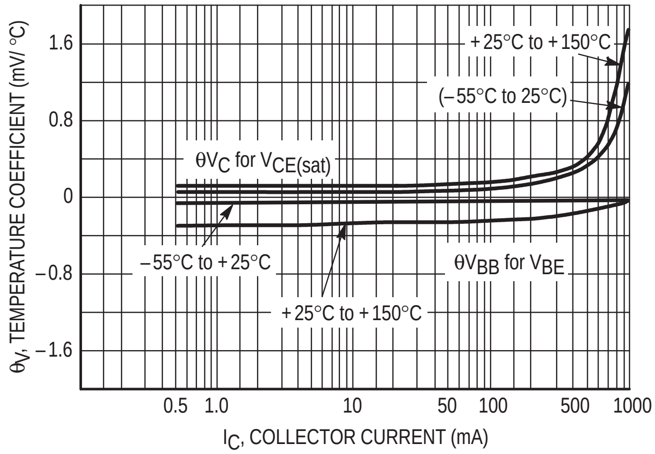


Figure 4. Temperature Coefficients

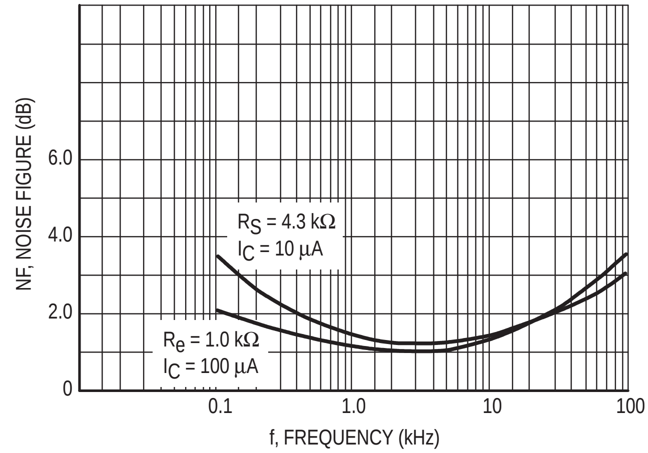


Figure 5. Frequency Effects

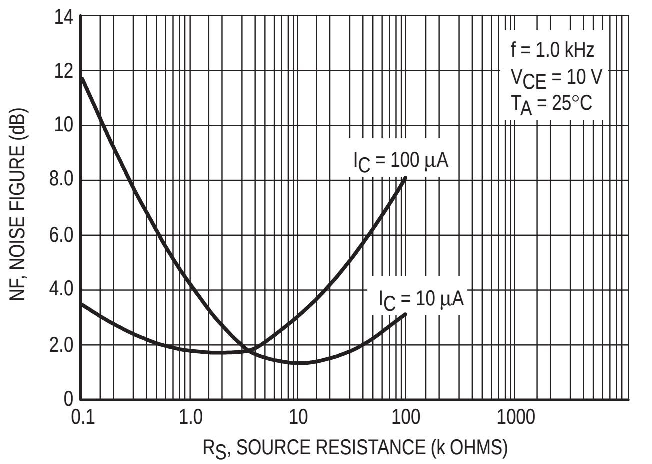


Figure 6. Source Resistance Effects

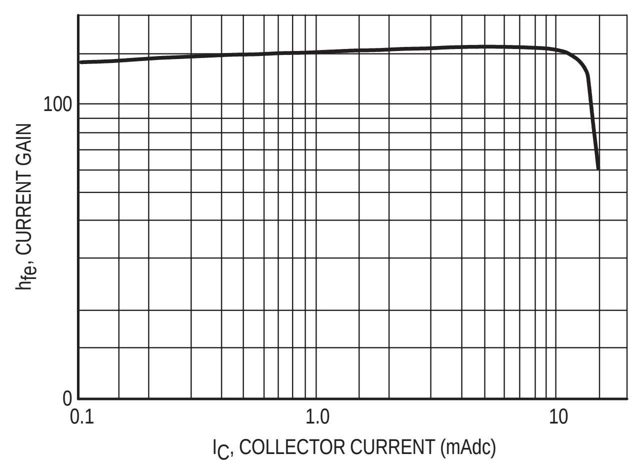


Figure 7. Current Gain Bandwidth Product versus Collector Current — 1.0 kHz h_{fe}

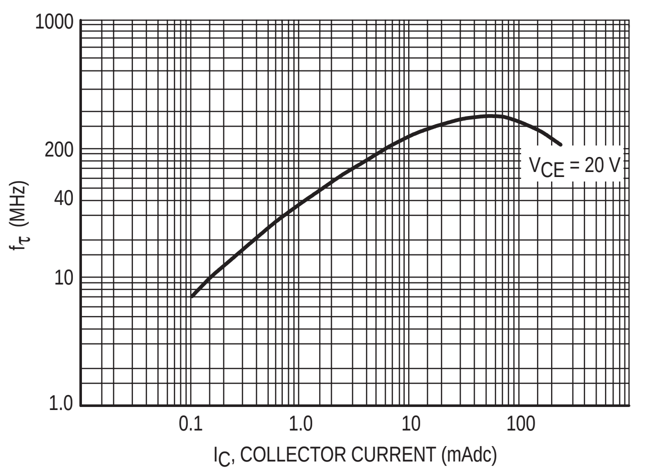


Figure 8. Current Gain — Bandwidth Product

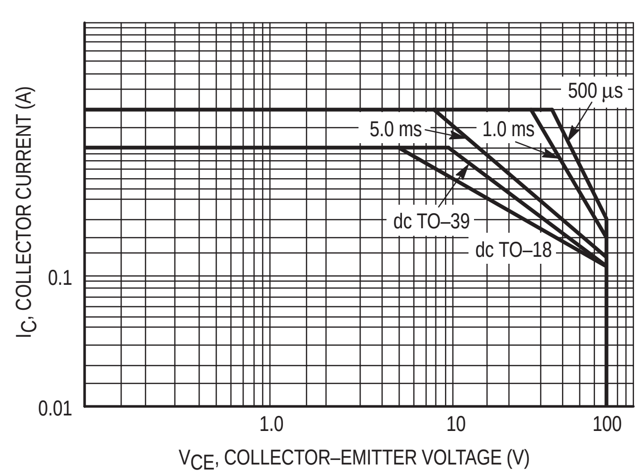
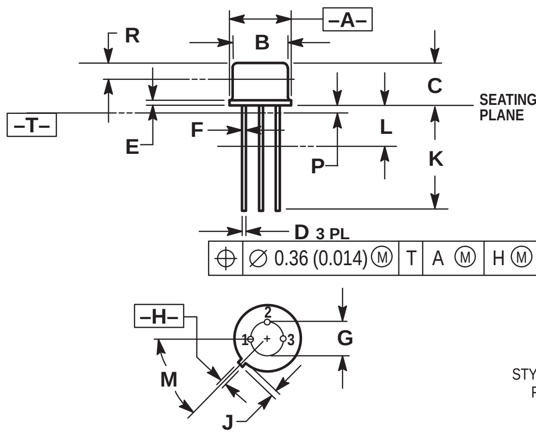


Figure 9. Active Region Safe Operating Area

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
4. DIMENSION B SHALL NOT VARY MORE THAN 0.25 (0.010) IN ZONE R. THIS ZONE CONTROLLED FOR AUTOMATIC HANDLING.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.335	0.370	8.51	9.39
B	0.305	0.335	7.75	8.50
C	0.240	0.260	6.10	6.60
D	0.016	0.021	0.41	0.53
E	0.009	0.041	0.23	1.04
F	0.016	0.019	0.41	0.48
G	0.200 BSC		5.08 BSC	
H	0.028	0.034	0.72	0.86
J	0.029	0.045	0.74	1.14
K	0.500	0.750	12.70	19.05
L	0.250	—	6.35	—
M	45 °BSC		45 °BSC	
P	—	0.050	—	1.27
R	0.100	—	2.54	—

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

CASE 079–04
(TO–205AD)
ISSUE N

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