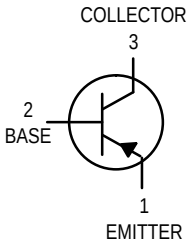
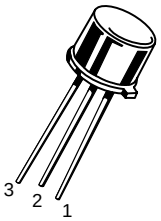
General Purpose Transistors

PNP Silicon

2N4036
2N4037





CASE 79–04, STYLE 1
TO–39 (TO–205AD)

MAXIMUM RATINGS

Rating	Symbol	2N4036	2N4037	Unit
Collector–Emitter Voltage	V_{CEO}	–65	–40	Vdc
Collector–Base Voltage	V_{CBO}	–90	–60	Vdc
Emitter–Base Voltage	V_{EBO}	–7.0	–7.0	Vdc
Base Current	I_B	–0.5		Adc
Collector Current — Continuous	I_C	–1.0		Adc
Continuous Power Dissipation at or Below T_C = 25°C Linear Derating Factor	P_D	 5.0 28.6	 5.0 28.6	 Watts mW/°C
Continuous Power Dissipation at or Below T_A = 25°C Linear Derating Factor	P_D	 1.0 5.72	 1.0 5.72	 Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +200		°C
Lead Temperature 1/16″ from Case for 10 Seconds	T_L	230		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	2N4036	2N4037	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	35	35	°C/W

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage(1) (I_C = –100 mAdc, I_B = 0)	 2N4036 2N4037	$V_{CEO(sus)}$	 –65 –40	 — —	Vdc
Collector–Base Breakdown Voltage (I_C = –0.1 mAdc)	 2N4037	$V_{(BR)CBO}$	–60	—	Vdc
Collector Cutoff Current (V_{CE} = –85 Vdc, V_{EB} = –1.5 Vdc) (V_{CE} = –30 Vdc, V_{EB} = –1.5 Vdc, T_C = 150°C)	 2N4036 2N4037	I_{CEX}	 — —	 –0.1 –100	mAdc
Collector Cutoff Current (V_{CB} = –90 Vdc, I_E = 0) (V_{CB} = –60 Vdc, I_E = 0)	 2N4036 2N4037	I_{CBO}	 — —	 –1.0 –0.25	μAdc
Emitter Cutoff Current (V_{EB} = –7.0 Vdc, I_C = 0) (V_{EB} = –5.0 Vdc, I_C = 0)	 2N4036 2N4037	I_{EBO}	 — —	 –10 –1.0	μAdc

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

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

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS					
DC Current Gain		h_{FE}			—
(I_C = –0.1 mAdc, V_{CE} = –10 Vdc)	2N4036		20	—	
(I_C = –1.0 mAdc, V_{CE} = –10 Vdc)	2N4037		15	—	
(I_C = –150 mAdc, V_{CE} = –10 Vdc)(1)	2N4036		40	140	
	2N4037		50	250	
(I_C = –150 mAdc, V_{CE} = –2.0 Vdc)(1)	2N4036		20	200	
(I_C = –500 mAdc, V_{CE} = –10 Vdc)(1)	2N4036		20	—	
Collector–Emitter Saturation Voltage(1)	2N4036	$V_{CE(sat)}$	—	–0.65	Vdc
(I_C = –150 mAdc, I_B = –15 mAdc)	2N4037		—	–1.4	
Base–Emitter Saturation Voltage(1)		$V_{BE(sat)}$	—	–1.4	Vdc
(I_C = –150 mAdc, I_B = –15 mAdc)	2N4036				
Base–Emitter On Voltage(1)		$V_{BE(on)}$	—	–1.5	Vdc
(I_C = –150 mAdc, V_{CE} = –10 Vdc)	2N4037				
SMALL–SIGNAL CHARACTERISTICS					
Collector–Base Capacitance		C_{cb}	—	30	pF
(V_{CB} = –10 Vdc, f = 1.0 MHz)	2N4037				
Current Gain — High Frequency	2N4036	$\|h_{fe}\|$	3.0	—	—
(I_C = –50 mAdc, V_{CE} = –10 Vdc, f = 20 MHz)	2N4037		3.0	10	
SWITCHING CHARACTERISTICS					
Rise Time		t_r	—	70	ns
(I_{B1} = –15 mAdc)	2N4036				
Storage Time		t_s	—	600	ns
(I_{B2} = –15 mAdc)	2N4036				
Fall Time		t_f	—	100	ns
(I_{B2} = –15 mAdc)	2N4036				
Turn–On Time		t_{on}	—	110	ns
(I_{B1} = I_{B2})	2N4036				
Turn–Off Time		t_{off}	—	700	ns
(I_{B1} = I_{B2})	2N4036				

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

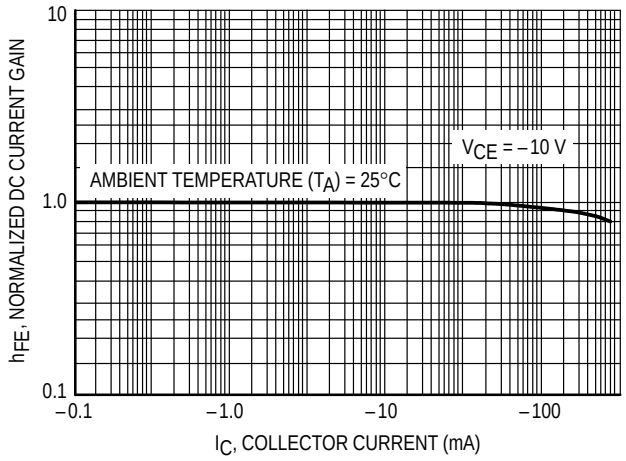


Figure 1. Current Gain Characteristics versus Collector–Emitter Voltage

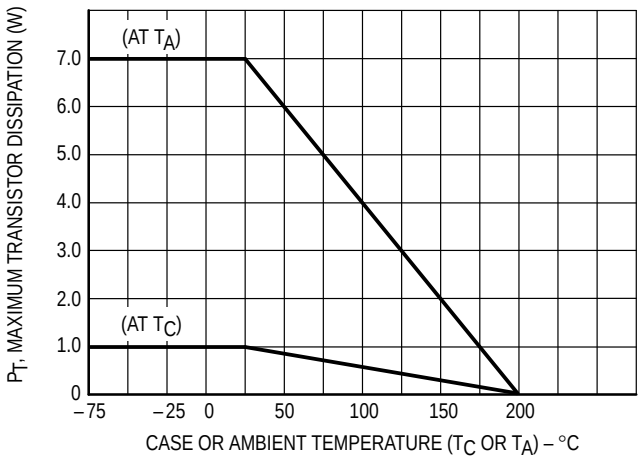


Figure 2. Dissipation Derating Curve

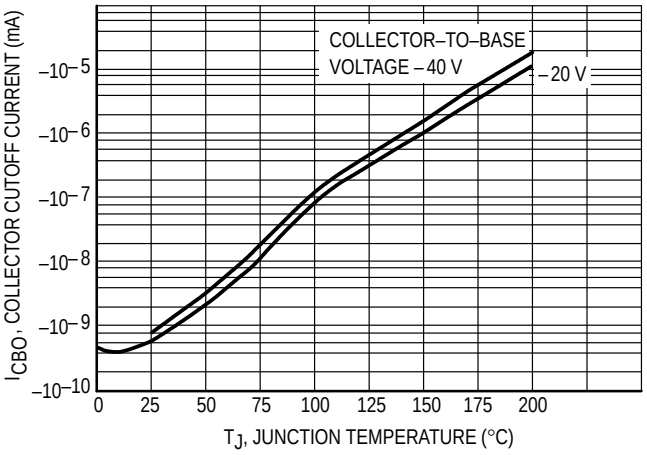


Figure 3. Typical Collector–Cutoff Current versus Junction Temperature

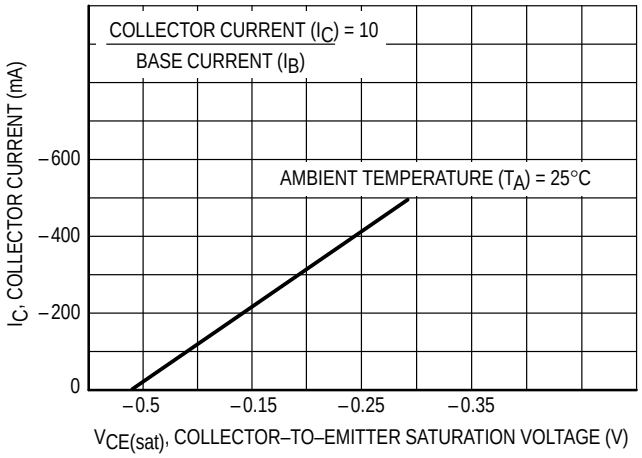


Figure 4. Typical Saturation–Voltage Characteristics

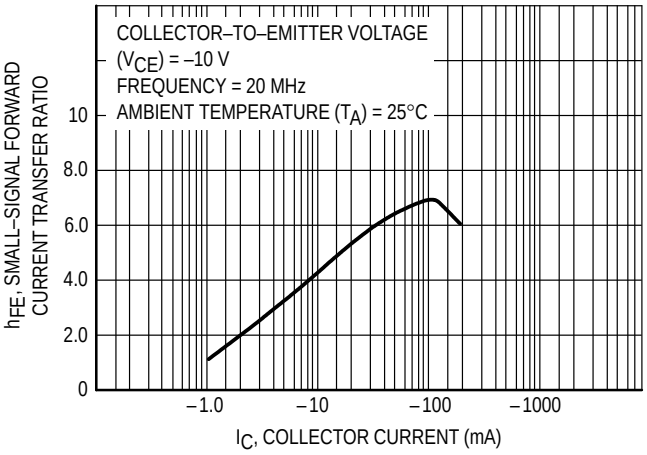


Figure 5. Typical Small–Signal Beta Characteristics

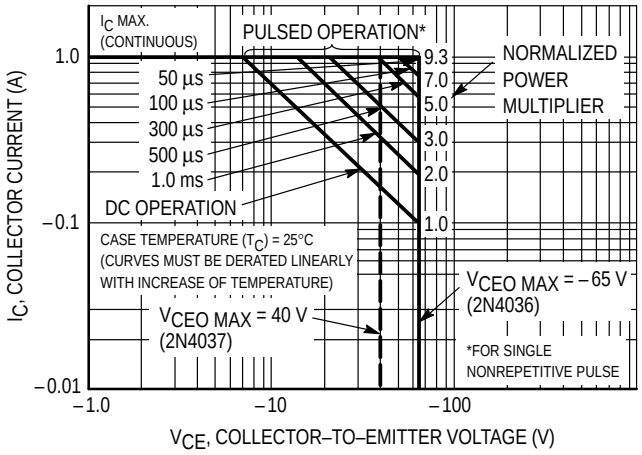
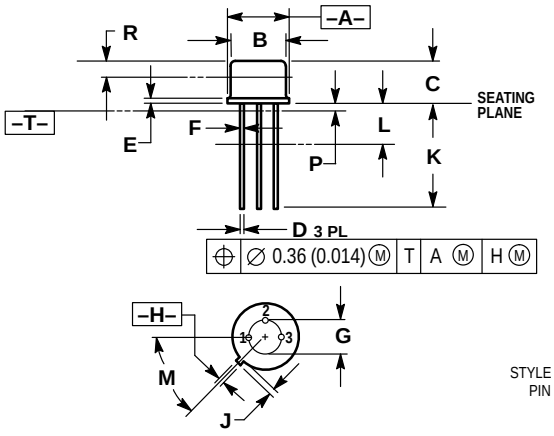


Figure 6. Maximum Safe Operating Areas (SOA)

PACKAGE DIMENSIONS



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

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	—

CASE 079–04
(TO–205AD)
ISSUE N

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