

High-Power NPN Silicon Transistors

... designed for use in industrial-military power amplifier and switching circuit applications.

- High Collector Emitter Sustaining —
 $V_{CEO(sus)} = 100 \text{ Vdc (Min)} — 2N6274$
 $= 120 \text{ Vdc (Min)} — 2N6275$
 $= 150 \text{ Vdc (Min)} — 2N6277$
- High DC Current Gain —
 $h_{FE} = 30-120 @ I_C = 20 \text{ Adc}$
 $= 10 \text{ (Min)} @ I_C = 50 \text{ Adc}$
- Low Collector-Emitter Saturation Voltage —
 $V_{CE(sat)} = 1.0 \text{ Vdc (Max)} @ I_C = 20 \text{ Adc}$
- Fast Switching Times @ $I_C 20 \text{ Adc}$
 $t_r = 0.35 \mu\text{s (Max)}$
 $t_s = 0.8 \mu\text{s (Max)}$
 $t_f = 0.25 \mu\text{s (Max)}$
- Complement to 2N6377-79

MAXIMUM RATINGS(1)

Rating	Symbol	2N6274	2N6275	2N6277	Unit
Collector-Base Voltage	V_{CB}	120	140	180	Vdc
Collector-Emitter Voltage	V_{CEO}	100	120	150	Vdc
Emitter-Base Voltage	V_{EB}	6.0			Vdc
Collector Current — Continuous Peak	I_C	50 100			Adc
Base Current	I_B	20			Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	250 1.43			Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200			$^\circ\text{C}$

THERMAL CHARACTERISTIC

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	0.7	$^\circ\text{C/W}$

(1) Indicates JEDEC Registered Data.

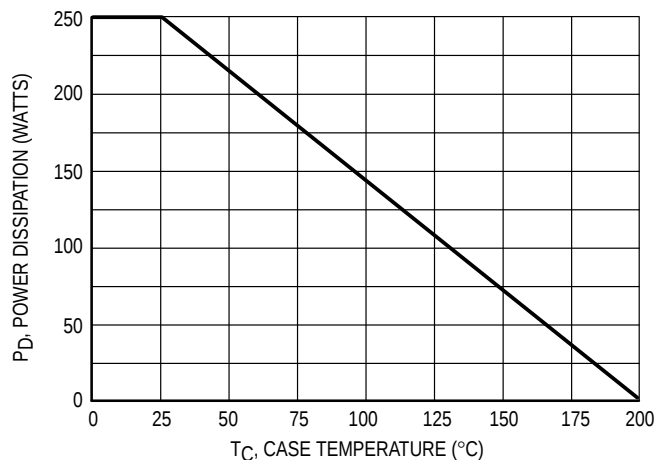


Figure 1. Power Derating

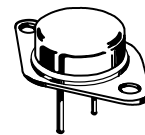
Preferred devices are Motorola recommended choices for future use and best overall value.

REV 7

2N6274
2N6275
2N6277*

*Motorola Preferred Device

50 AMPERE
POWER TRANSISTORS
NPN SILICON
100, 120, 140, 150 VOLTS
250 WATTS



CASE 197A-05
TO-204AE
(TO-3)

2N6274 2N6275 2N6277

*ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (1) $I_C = 50 \text{ mAdc}$, $I_B = 0$	$V_{CEO(sus)}$	100 120 150	—	Vdc
Collector Cutoff Current ($V_{CE} = 50 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 60 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 75 \text{ Vdc}$, $I_B = 0$)	I_{CEO}	— — —	50 50 50	μAdc
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CB}$, $V_{EB(off)} = 1.5 \text{ Vdc}$) ($V_{CE} = \text{Rated } V_{CB}$, $V_{EB(off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$)	I_{CEX}	— —	10 1.0	μAdc mAdc
Emitter Cutoff Current ($V_{BE} = 6.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	100	μAdc

ON CHARACTERISTICS (1)

DC Current Gain $I_C = 1.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$ $I_C = 20 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$ $I_C = 50 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$	h_{FE}	50 30 10	— 120 —	—
Collector–Emitter Saturation Voltage $I_C = 20 \text{ Adc}$, $I_B = 2.0 \text{ Adc}$ $I_C = 50 \text{ Adc}$, $I_B = 10 \text{ Adc}$	$V_{CE(sat)}$	— —	1.0 3.0	Vdc
Base–Emitter Saturation Voltage $I_C = 20 \text{ Adc}$, $I_B = 2.0 \text{ Adc}$ $I_C = 50 \text{ Adc}$, $I_B = 10 \text{ Adc}$	$V_{BE(sat)}$	— —	1.8 3.5	Vdc
Base–Emitter On Voltage ($I_C = 20 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$)	$V_{BE(on)}$	—	1.8	Vdc

DYNAMIC CHARACTERISTICS

Current–Gain Bandwidth Product (2) ($I_C = 1.0 \text{ Adc}$, $V_{CE} = 10 \text{ Vdc}$, $f_{test} = 10 \text{ MHz}$)	f_T	30	—	MHz
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 0.1 \text{ MHz}$)	C_{ob}	—	600	pF

SWITCHING CHARACTERISTICS

Rise Time ($V_{CC} = 80 \text{ Vdc}$, $I_C = 20 \text{ Adc}$, $I_{B1} = 2.0 \text{ Adc}$, $V_{BE(off)} = 5.0 \text{ Vdc}$)	t_r	—	0.35	μs
Storage Time ($V_{CC} = 80 \text{ Vdc}$, $I_C = 20 \text{ Adc}$, $I_{B1} = I_{B2} = 2.0 \text{ Adc}$)	t_s	—	0.80	μs
Fall Time ($V_{CC} = 80 \text{ Vdc}$, $I_C = 20 \text{ Adc}$, $I_{B1} = I_{B2} = 2.0 \text{ Adc}$)	t_f	—	0.25	μs

* Indicates JEDEC Registered Data.

(1) Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

(2) $f_T = |h_{fe}| \cdot f_{test}$

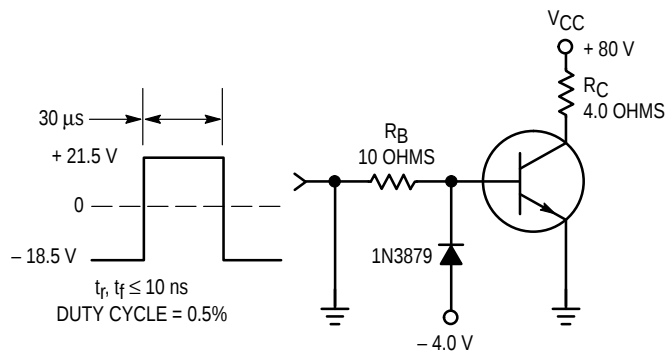


Figure 2. Switching Time Test Circuit

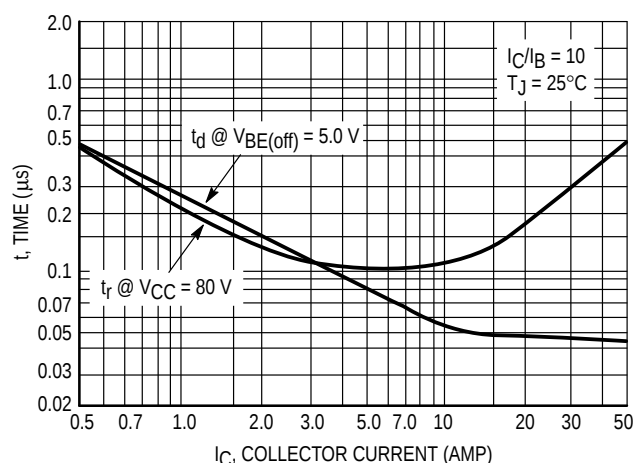


Figure 3. Turn-On Time

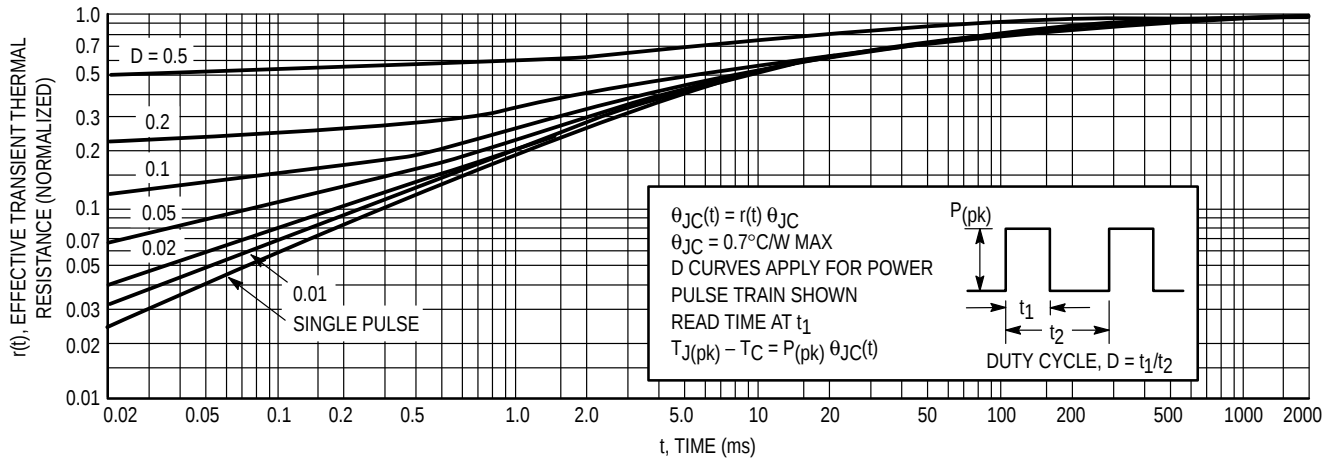


Figure 4. Thermal Response

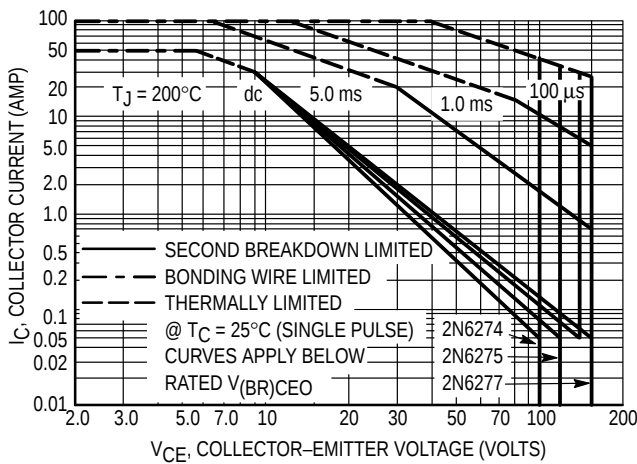


Figure 5. Active-Region Safe Operating Area

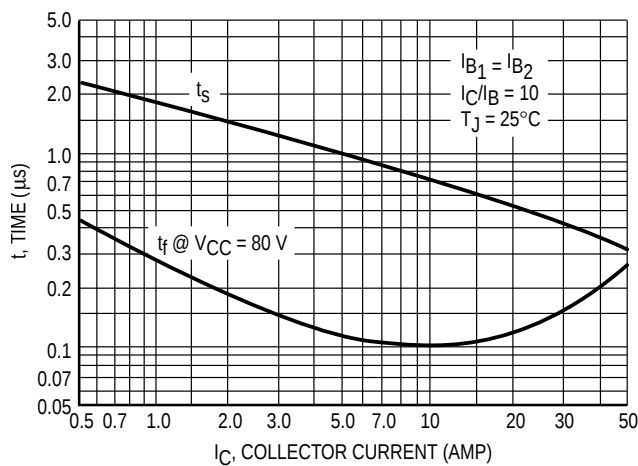


Figure 6. Turn-Off Time

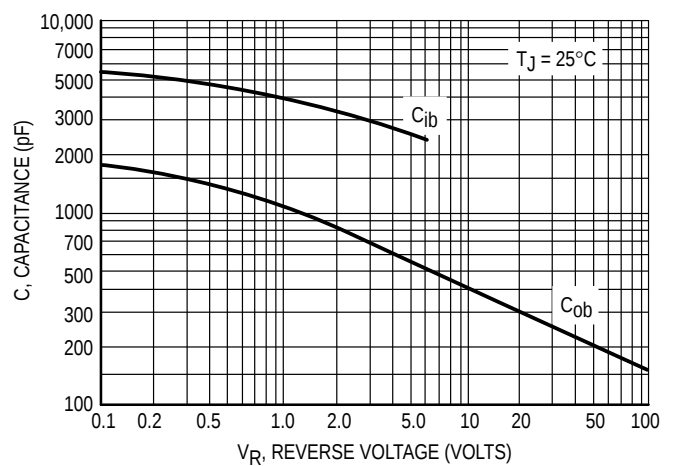


Figure 7. Capacitance

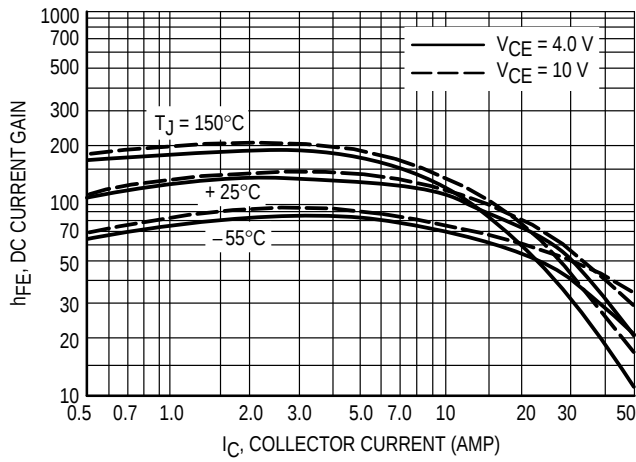


Figure 8. DC Current Gain

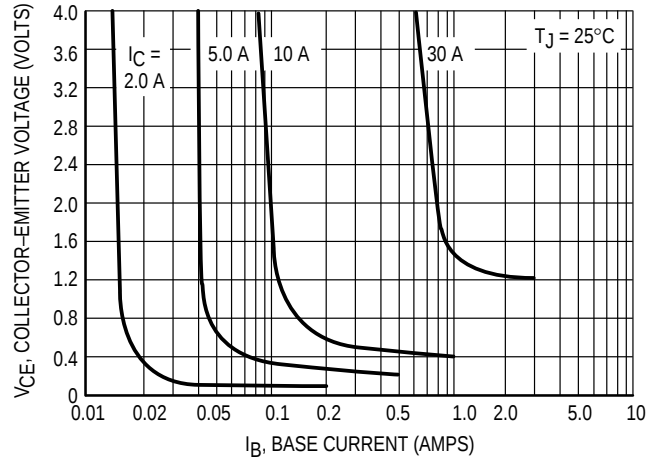


Figure 9. Collector Saturation Region

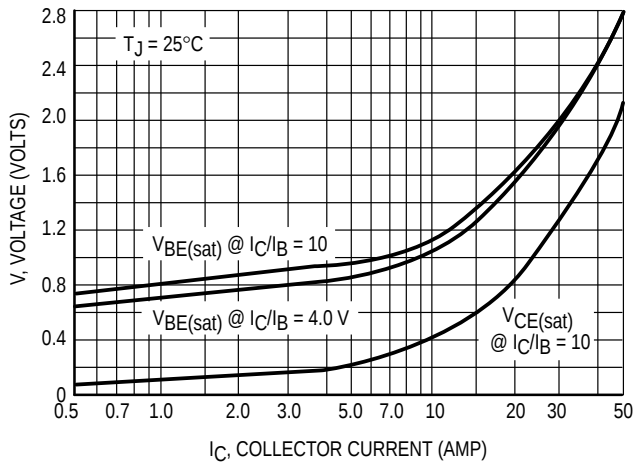


Figure 10. "On" Voltages

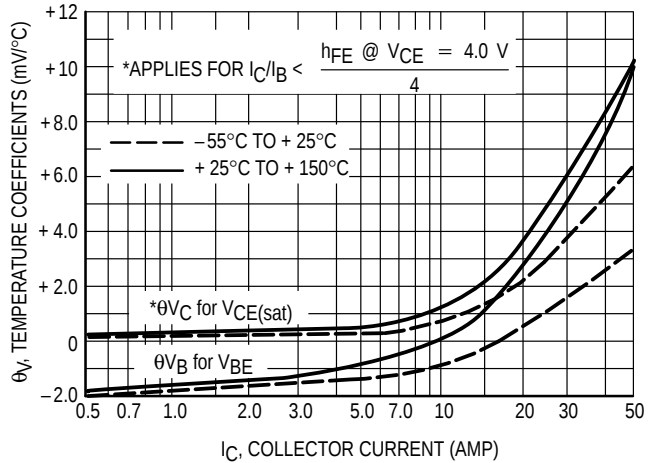


Figure 11. Temperature Coefficients

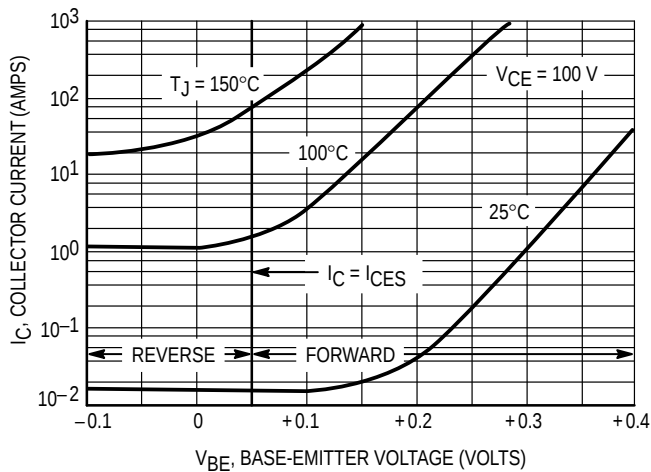


Figure 12. Collector Cut-Off Region

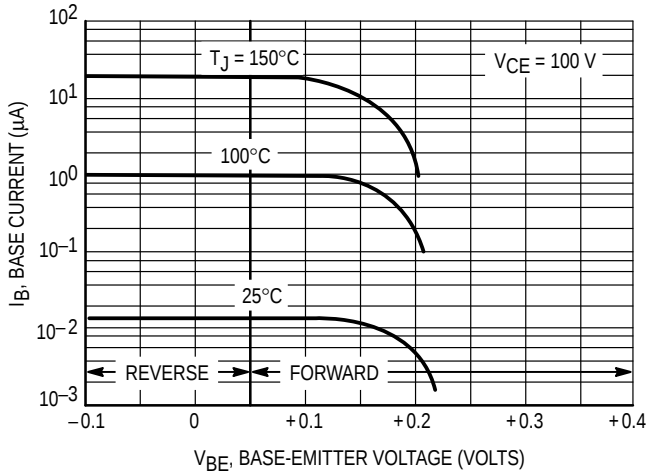
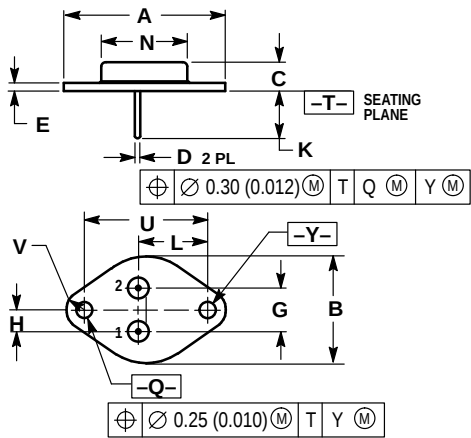


Figure 13. Base Cut-off Region

PACKAGE DIMENSIONS



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.530 REF		38.86 REF	
B	0.990	1.050	25.15	26.67
C	0.250	0.335	6.35	8.51
D	0.057	0.063	1.45	1.60
E	0.060	0.070	1.53	1.77
G	0.430 BSC		10.92 BSC	
H	0.215 BSC		5.46 BSC	
K	0.440	0.480	11.18	12.19
L	0.665 BSC		16.89 BSC	
N	0.760	0.830	19.31	21.08
Q	0.151	0.165	3.84	4.19
U	1.187 BSC		30.15 BSC	
V	0.131	0.188	3.33	4.77

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

CASE 197A-05
TO-204AE
ISSUE J

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