



NEC
NEW ENGLAND SEMICONDUCTOR

**2N6377
2N6378
2N6379**

HIGH-POWER PNP SILICON POWER TRANSISTORS

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

- **High Collector Emitter Sustaining Voltage -**
 $V_{CE(sus)} = 80 \text{ Vdc (Min) - 2N6377}$
 $= 100 \text{ Vdc (Min) - 2N6378}$
 $= 120 \text{ Vdc (Min) - 2N6379}$
- **Low Collector-Emitter Saturation Voltage -**
 $V_{CE(sat)} = 1.0 \text{ Vdc (Max) @ } I_C = 20 \text{ Adc}$
- **Fast Switching Times @ $I_C = 20 \text{ Adc}$**
 $t_r = 0.35 \mu\text{s (Max)}$
 $t_s = 0.80 \mu\text{s (Max)}$
 $t_f = 0.25 \mu\text{s (Max)}$
- **High DC Current Gain -**
 $h_{FE} = 30 - 120 @ I_C = 20 \text{ Adc}$
 $= 10 \text{ (Min) @ } I_C = 50 \text{ Adc}$
- **Complement to 2N6474 - 77**

MAXIMUM RATINGS(1)

Rating	Symbol	2N6377	2N6378	2N6379	Unit
Collector-Base Voltage	V_{CB}	100	120	140	Vdc
Collector-Emitter Voltage	V_{CEO}	80	100	120	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 Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	250 1.43			Watts $\text{W}/^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200			$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

(1) Indicates JEDEC Registration Data

FIGURE 1 - POWER DERATING

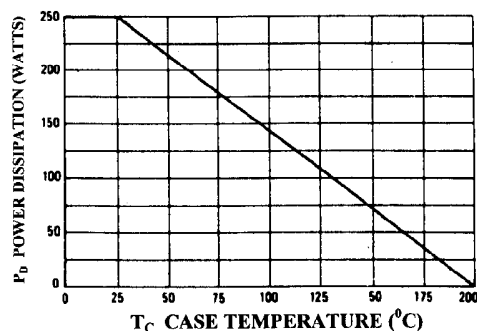
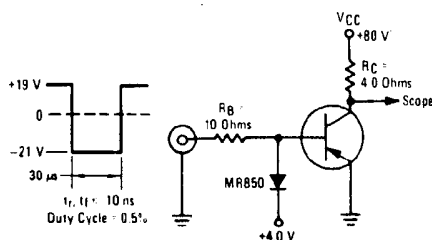
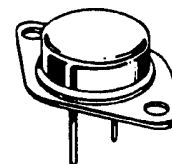


FIGURE 2 - SWITCHING TIMES
TEST CIRCUIT

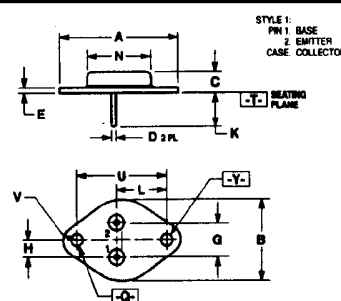


**50 AMPERE
POWER TRANSISTORS
PNP SILICON
80, 100, 120 VOLTS
250 WATTS**



TO-3

MECHANICAL OUTLINE



DIM	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	38.86 REF		1.530 REF	
B	25.15	26.67	0.990	0.340
C	6.35	8.51	0.250	0.034
D	1.45	1.60	0.057	0.063
E	1.53	1.77	0.60	0.070
G	10.92 BSC		0.430 BSC	
H	5.46 BSC		0.215 BSC	
K	11.18	12.19	0.440	0.480
L	16.89 BSC		0.665 BSC	
N	19.31	21.08	0.760	0.830
Q	3.84	4.19	0.151	0.165
U	30.15 BSC		1.187 BSC	
V	3.33	4.77	0.131	0.188

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T4-4.8-860-353 REV: --



NES

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

Characteristics	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage(1) $I_C = 50 \text{ mAdc}$, $I_B = 0$	$V_{CEO} \text{ (SUS)}$	80 100 120		Vdc
Collector Cutoff Current $V_{CE} = 50 \text{ Vdc}$, $I_B = 0$ $V_{CE} = 60 \text{ Vdc}$, $I_B = 0$ $V_{CE} = 70 \text{ Vdc}$, $I_B = 0$	I_{CEO}		50 50 50	μAdc
Collector Cutoff Current $V_{CE} = 90\% \text{ Rated } V_{CB}$, $V_{BE} \text{ (off)} = 1.5 \text{ Vdc}$ $V_{CE} = 90\% \text{ Rated } V_{CB}$, $V_{BE} \text{ (off)} = 1.5 \text{ Vdc}$, $T_C = 150^\circ\text{C}$	I_{CEX}		10 1.0	μAdc mAdc
Emitter Cutoff Current $V_{EB} = 6.0 \text{ Vdc}$, $I_C = 0$	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 $I_C = 20 \text{ Adc}$, $I_B = 2.0 \text{ Adc}$ $I_C = 50 \text{ Adc}$, $I_B = 10 \text{ Adc}$	$V_{CE} \text{ (sat)}$		1.2 3.0	Vdc
Base-Emitter Saturation Voltage $I_C = 20 \text{ Adc}$, $I_B = 2.0 \text{ Adc}$ $I_C = 50 \text{ Adc}$, $I_B = 10 \text{ Adc}$	$V_{BE} \text{ (sat)}$		1.8 3.5	Vdc
DYNAMIC CHARACTERISTICS				
Current-Gain-Bandwidth Product (2) $I_C = 1.0 \text{ Adc}$, $V_{CE} = 10 \text{ Vdc}$, $f_{\text{test}} = 10 \text{ MHz}$	fT	30		MHz
Output Capacitance $V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 0.1 \text{ MHz}$	C_{ob}		1500	pF
SWITCHING CHARACTERISTICS (Figure 2)				
Rise Time	$V_{CC} = 80 \text{ Vdc}$, $I_C = 20 \text{ Adc}$, $I_{B1} = I_{B2} = 2.0 \text{ Adc}$	t_r	0.35	μs
Storage Time		t_s	0.80	μs
Fall Time		t_f	0.25	μs

(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%. (2) $fT = |h_{fe}| \cdot f_{\text{test}}$

FIGURE 3 - TURN ON TIME

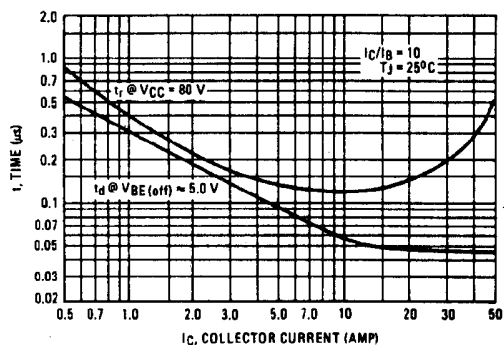
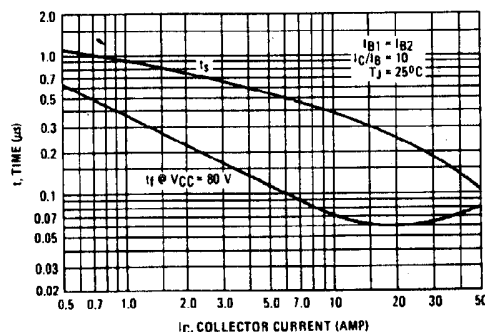


FIGURE 4 - TURN OFF TIME



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