New Jersey Semi-Conductor Products, Inc.

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2N6182 thru 2N6185 (SILICON)
2N6186 thru 2N6189

MEDIUM-POWER PNP SILICON TRANSISTORS

. . . designed for switching and wide-band amplifier applications.

- Low Collector-Emitter Saturation Voltage — $V_{CE(sat)}$ = 1.2 Vdc (Max) @ I_C = 10 Adc
- DC Current Gain Specified to 5 Amperes
- Excellent Safe Operating Area
- Packaged in the Compact, High Dissipation TO-59 Case
- Isolated Collector Configuration
- 2N6182 thru 2N6185 Complement to NPN 2N5477 thru 2N5480
  2N6186 thru 2N6189 Complement to NPN 2N5346 thru 2N5349

10 AMPERE POWER TRANSISTORS

PNP SILICON

80-100 VOLTS
60 WATTS

***MAXIMUM RATINGS**

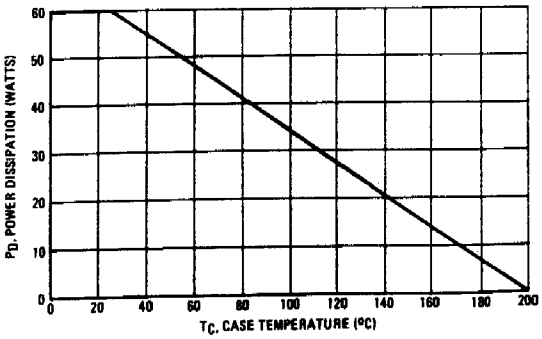
Rating	Symbol	2N6182 2N6183 2N6186 2N6187	2N6184 2N6185 2N6188 2N6189	Unit
Collector-Emitter Voltage	V_{CEO}	80	100	Vdc
Collector-Base Voltage	V_{CB}	80	100	Vdc
Emitter-Base Voltage	V_{EB}	6.0		Vdc
Collector Current — Continuous	I_C	10		Adc
Base Current	I_B	2.0		Adc
Total Device Dissipation @ T_C = 25°C	P_D	60		Watts
Derate above 25°C		343		mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C

THERMAL CHARACTERISTICS

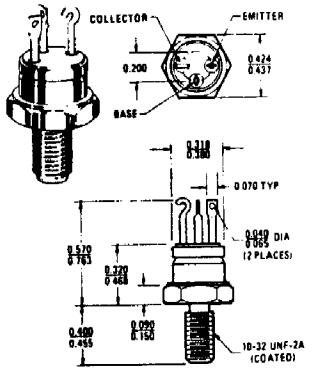
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	θ_{JC}	2.91	°C/W

*Indicates JEDEC Registered Data

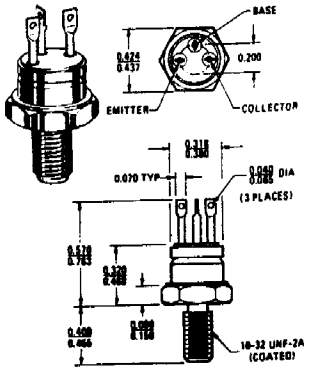
FIGURE 1 — POWER-TEMPERATURE DERATING



Safe Area Curves are indicated by Figure 5. All limits are applicable and must be observed.



2N6182 thru 2N6185 TO-59



2N6186 thru 2N6189 TO-59

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2N6182 thru 2N6185, 2N6186 thru 2N6189 (continued)

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

Characteristic		Fig. No.	Symbol	Min	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Sustaining Voltage (1)		–	$V_{CEO(sus)}$			Vdc
(I_C = 50 mAdc, I_B = 0)	2N6182, 83, 86, 87			80	–	
	2N6184, 85, 88, 89			100	–	
Collector Cutoff Current		–	I_{CEO}			μAdc
(V_{CE} = 75 Vdc, I_B = 0)	2N6182, 83, 86, 87			–	100	
(V_{CE} = 90 Vdc, I_B = 0)	2N6184, 85, 88, 89			–	100	
Collector Cutoff Current		12	I_{CEX}			μAdc
(V_{CE} = 75 Vdc, $V_{BE(off)}$ = 1.5 Vdc)	2N6182, 83, 86, 87			–	10	
(V_{CE} = 90 Vdc, $V_{BE(off)}$ = 1.5 Vdc)	2N6184, 85, 88, 89			–	10	
(V_{CE} = 75 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 150°C)	2N6182, 83, 86, 87			–	1.0	mAdc
(V_{CE} = 90 Vdc, $V_{BE(off)}$ = 1.5 Vdc, T_C = 150°C)	2N6184, 85, 88, 89			–	1.0	
Collector Cutoff Current		–	I_{CBO}			μAdc
(V_{CB} = Rated V_{CB}, I_E = 0)				–	10	
Emitter Cutoff Current		–	I_{EBO}			μAdc
(V_{BE} = 6.0 Vdc, I_C = 0)				–	100	
ON CHARACTERISTICS (1)						
DC Current Gain		8	h_{FE}			–
(I_C = 0.5 Adc, V_{CE} = 2.0 Vdc)	2N6182, 84, 86, 88			30	–	
	2N6183, 85, 87, 89			60	–	
(I_C = 2.0 Adc, V_{CE} = 2.0 Vdc)	2N6182, 84, 86, 88			30	120	
	2N6183, 85, 87, 89			60	240	
(I_C = 5.0 Adc, V_{CE} = 2.0 Vdc)	2N6182, 84, 86, 88			20	–	
	2N6183, 85, 87, 89			40	–	
Collector-Emitter Saturation Voltage		9, 10, 11	$V_{CE(sat)}$			Vdc
(I_C = 2.0 Adc, I_B = 0.2 Adc)				–	0.7	
(I_C = 10 Adc, I_B = 1.0 Adc)				–	1.2	
Base-Emitter Saturation Voltage		10, 11	$V_{BE(sat)}$			Vdc
(I_C = 2.0 Adc, I_B = 0.2 Adc)				–	1.2	
(I_C = 10 Adc, I_B = 1.0 Adc)				–	2.0	
DYNAMIC CHARACTERISTICS						
Current-Gain-Bandwidth Product (2) (I_C = 500 mAdc, V_{CE} = 10 Vdc, f_{Test} = 10 MHz)		–	f_T	30	–	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		7	C_{ob}	–	300	pF
Input Capacitance (V_{BE} = 2.0 Vdc, I_C = 0, f = 100 kHz)		7	C_{ib}	–	1250	pF
SWITCHING CHARACTERISTICS						
Delay Time	(V_{CC} = 40 Vdc, $V_{BE(off)}$ = 3.0 Vdc,	2, 3	t_d	–	100	ns
Rise Time	I_C = 2.0 Adc, I_{B1} = 200 mAdc)		t_r	–	100	ns
Storage Time	(V_{CC} = 40 Vdc, I_C = 2.0 Adc,	2, 6	t_s	–	2.0	μs
Fall Time	I_{B1} = I_{C2} = 200 mAdc)		t_f	–	200	ns

*Indicates JEDEC Registered Data
(1) Pulse Test: Pulse Width ≈ 300 μs, Duty Cycle ≈ 2.0%.
(2) $f_T = |h_{fe}| \cdot f_{Test}$

FIGURE 2 – SWITCHING TIME TEST CIRCUIT

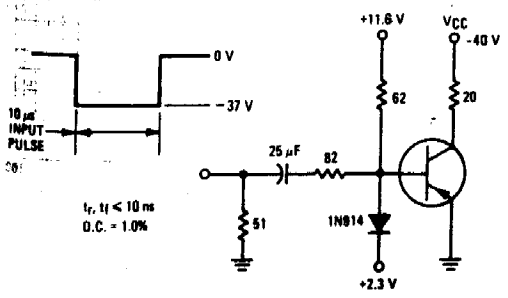
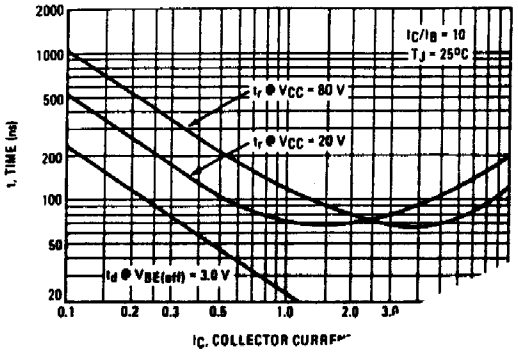


FIGURE 3 – TURN-ON TIME



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