DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N5875-2N5876-PNP
2N5877-2N5878-NPN

COMPLEMENTARY SILICON POWER TRANSISTORS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Ratings	Symbol	2N5875 2N5877	2N5876 2N5878	Unit
Collector-emitter voltage	V_{CEO}	60	80	V
Collector-base voltage	V_{CB}	60	80	V
Emitter-base voltage	V_{EB}	5		V
Continuous collector current	I_C	10		A
Peak collector current	I_C	20		A
Base current	I_B	4.0		A
Total device dissipation at T_C = 25°C **Derate above 25°C**	P_D	150 0.857		W W/°C
Operating and storage temperature range	T_J , T_{stg}	-65 to +200		°C
Thermal resistance, junction to case	Θ_{JC}	1.17		°C/W

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

Characteristics		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector- emitter sustaining voltage [1] **I_C = 200mA, I_B = 0**	2N5875, 2N5877 2N5876, 2N5878	$V_{CEO(sus)}$	60 80	- -	V
Collector cutoff current **V_{CE} = 30V, I_B = 0** **V_{CE} = 40V, I_B = 0**	 2N5875, 2N5877 2N5876, 2N5878	I_{CEO}	 - -	 1.0 1.0	mA
Collector cutoff current **V_{CE} = 60V, $V_{BE(off)}$ = 1.5V** **V_{CE} = 80V, $V_{BE(off)}$ = 1.5V** **V_{CE} = 60V, $V_{BE(off)}$ = 1.5V, T_C = 150°C** **V_{CE} = 80V, $V_{BE(off)}$ = 1.5V, T_C = 150°C**	 2N5875, 2N5877 2N5876, 2N5878 2N5875, 2N5877 2N5876, 2N5878	I_{CEX}	 - - - -	 0.5 0.5 5.0 5.0	mA
Collector cutoff current **V_{CB} = 60V, I_E = 0** **V_{CB} = 80V, I_E**	 2N5875, 2N5877 2N5876, 2N5878	I_{CBO}	 - -	 0.5 0.5	mA
Emitter cutoff current **V_{EB} = 5.0V, I_E = 0**		I_{EBO}	-	1.0	mA
ON CHARACTERISTICS					
DC current gain [1] **I_C = 1.0A, V_{CE} = 4.0V** **I_C = 4.0A, V_{CE} = 4.0V** **I_C = 10A, V_{CE} = 4.0V**		h_{FE}	 35 20 4.0	 - 100 -	-

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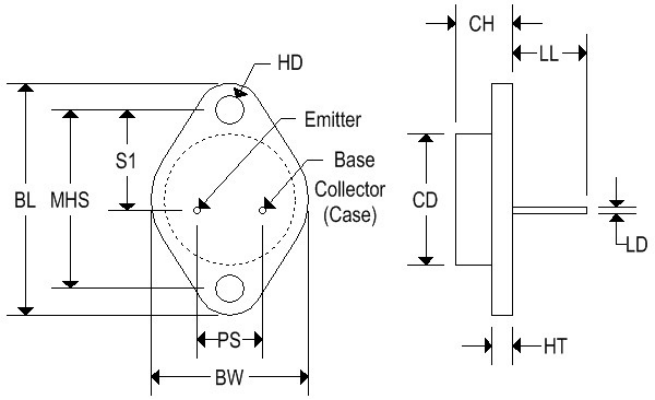
Characteristics		Symbol	Min	Max	Unit
Collector-emitter saturation voltage [1] **I_C = 5.0A, I_B = 0.5A** **I_C = 10A, I_B = 2.5A**		$V_{CE(sat)}$	- -	1.0 3.0	V
Base emitter saturation voltage [1] **I_C = 10A, I_B = 2.5A**		$V_{BE(sat)}$	-	2.5	V
Base emitter on voltage [1] **I_C = 4.0A, V_{CE} = 4.0V**		$V_{BE(on)}$	-	1.5	V
DYNAMIC CHARACTERISTICS					
Current-gain bandwidth product [2] **I_C = 0.5A, V_{CE} = 10V, f_{test} = 1.0MHz**		f_T	4.0	-	MHz
Output capacitance **V_{CB} = 10V, I_E = 0, f = 1.0MHz**	**2N5875, 2N5876** **2N5877, 2N5878**	C_{ob}	- -	500 300	pF
Small signal current gain **I_C = 1.0A, V_{CE} = 4.0V, f = 1.0kHz**		h_{fe}	20	-	-
SWITCHING CHARACTERSITICS					
Rise time	**V_{CC} = 30V, I_C = 4.0A,** **I_{B1} = I_{B2} = 0.4A (figure 2)**	t_r	-	0.7	µs
Storage time		t_s	-	1.0	µs
Fall time		t_f	-	0.8	µs

Note 1: Pulse test: pulse width ≤ 300µs. Duty cycle ≤ 2%.
Note 2: $f_T = |h_{FE}| \bullet f_{test}$.

MECHANICAL CHARACTERISTICS

Case	TO-3
Marking	Alpha-numeric
Polarity	See below



	TO-3			
	Inches		Millimeters	
	Min	Max	Min	Max
CD	-	0.875	-	22.220
CH	0.250	0.380	6.860	9.650
HT	0.060	0.135	1.520	3.430
BW	-	1.050	-	26.670
HD	0.131	0.188	3.330	4.780
LD	0.038	0.043	0.970	1.090
LL	0.312	0.500	7.920	12.700
BL	1.550 REF		39.370 REF	
MHS	1.177	1.197	29.900	30.400
PS	0.420	0.440	10.670	11.180
S1	0.655	0.675	16.640	17.150

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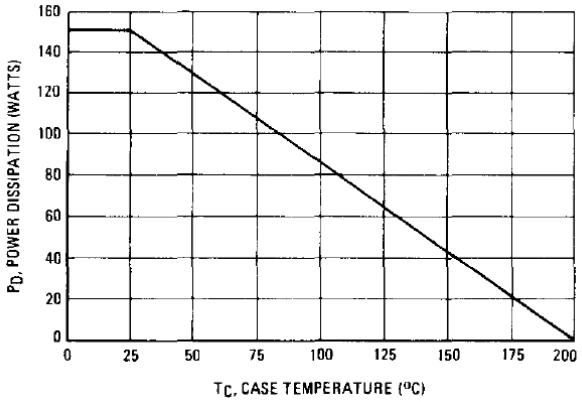
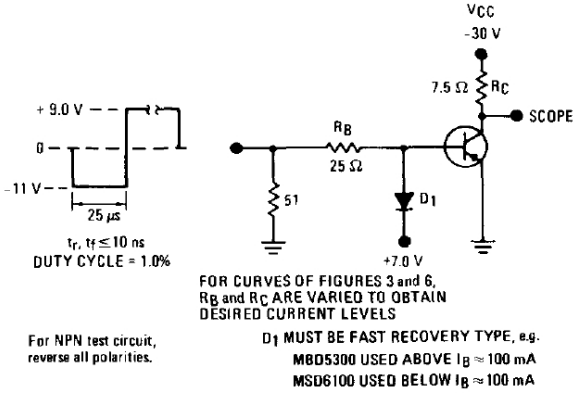
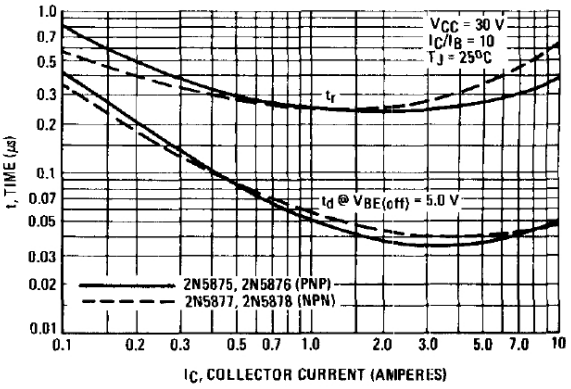


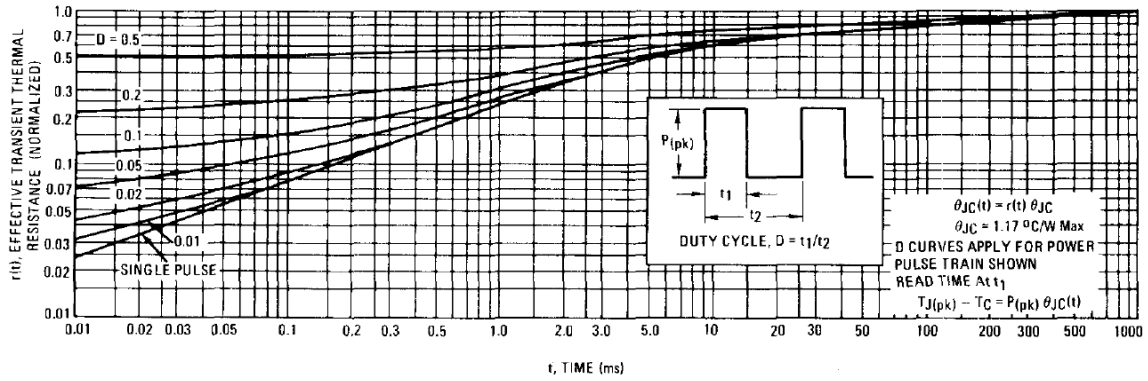
POWER DERATING
Figure 1



SWITCHING TEST CIRCUIT
Figure 2



TURN-ON TIME
Figure 3



THERMAL RESPONSE
Figure 4

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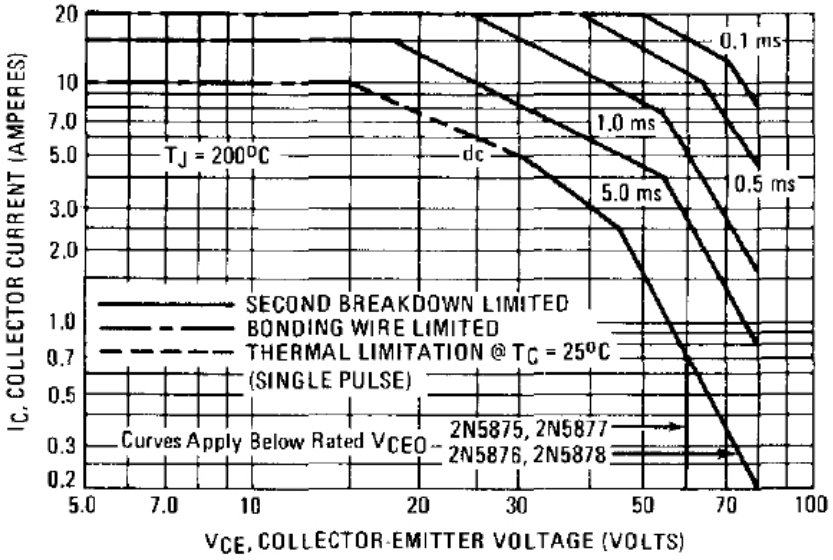
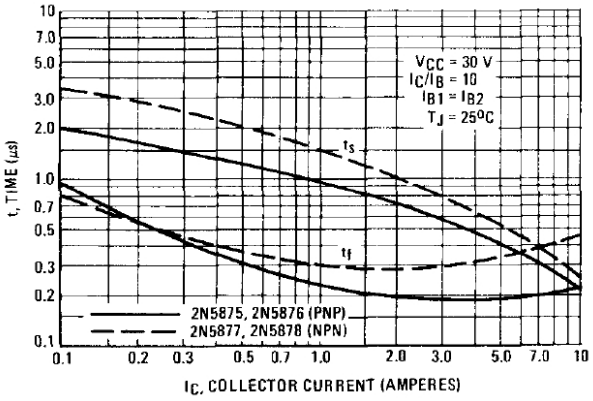
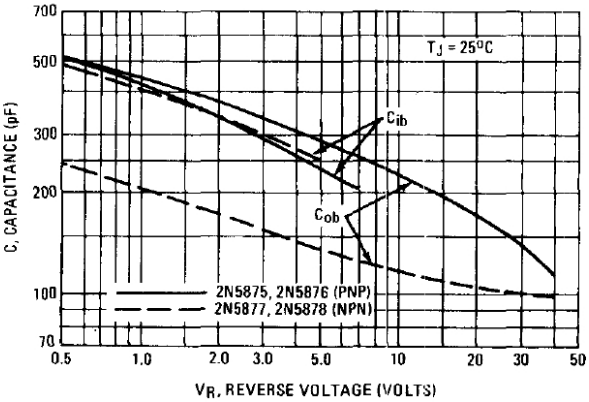


ACTIVE REGION SAFE OPERATING AREA
Figure 5



TURN-OFF TIME
Figure 6



CAPACITANCE
Figure 7