DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N5239-2N5240

SILICON NPN 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

Parameter	Symbol	2N5239	2N5240	Unit
Collector-base voltage	V_{CBO}	300	375	V
Collector-emitter voltage, $R_{BE} \leq 50\Omega$	$V_{CER(sus)}$	250	350	V
Collector-emitter voltage	$V_{CEO(sus)}$	225	300	V
Emitter-base voltage	V_{EBO}	6		V
Collector current – continuous	I_C	5		A
Base current	I_B	2		A
Total power dissipation **$T_C \leq 25°C$ & $V_{CE} \leq 125V$** **$T_C \leq 25°C$ & $V_{CE} \leq 125V$** **$T_C > 25°C$ & $V_{CE} > 125V$**	P_T	100 FIGURE 1 FIGURE 1		W
Junction and storage temperature range	T_J, T_{stg}	-65 to 200		°C

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

Parameter	Symbol	Conditions	2N5239		2N5240		Units
			Min	Max	Min	Max	
Collector cutoff current	I_{CEO}	V_{CE} = 200V, I_B = 0	-	5	-	2	mA
Collector cutoff current	I_{CEV}	V_{CE} = 300V, V_{BE} = -1.5V V_{CE} = 375V, V_{BE} = -1.5V V_{CE} = 300V, V_{BE} = -1.5V, T_C = 150°C	- - -	4 - 5	- - -	- 2 3	mA
Emitter cutoff current	I_{EBO}	V_{EB} = 5V, I_C = 0 V_{EB} = 6V, I_C = 0	- -	5 20	- -	1 20	mA
Emitter-base breakdown voltage	V_{EBO}	I_B = 0.02A	6	-	6	-	V
Collector-emitter sustaining voltage	$V_{CEO(sus)}$ $V_{CER(sus)}$	I_C = 0.2A I_C = 0.2A, $R_{BE} \leq 50\Omega$	225 250	- -	300 350	- -	V
DC current gain	h_{FE}	I_C = 0.4A, V_{CE} = 10V I_C = 2A, V_{CE} = 10V I_C = 4.5A, V_{CE} = 10V	20 20 5	80 80 -	20 20 5	80 80 -	
Base-emitter voltage	V_{BE}	I_C = 2A, V_{CE} = 10V	-	3	-	3	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 2A, I_B = 0.25A I_C = 4.5A, I_B = 1.125A	- -	2.5 5	- -	2.5 5	V
Current gain – bandwidth product	f_T	I_C = 0.2A, V_{CE} = 10V	2	-	2	-	MHz
Output capacitance	C_{obo}	I_C= 0, V_{CB} = 10V, f_{test} = 1.0MHz	-	250	-	250	pF
Thermal resistance, junction to case	$R_{\Theta JC}$		-	1.75	-	1.75	°C/W

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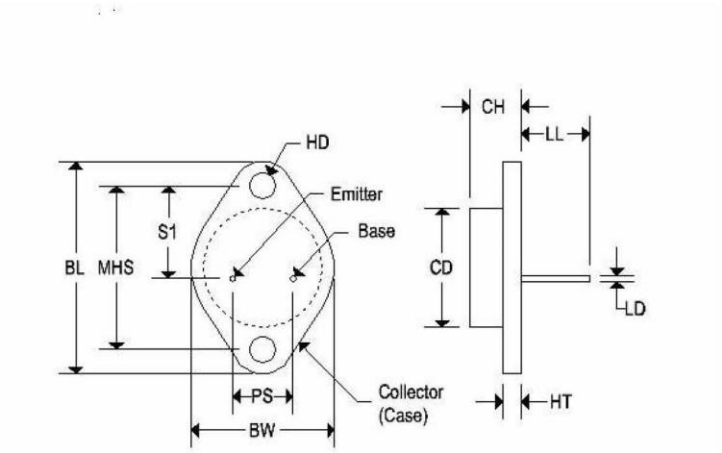
MECHANICAL CHARACTERISTICS

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

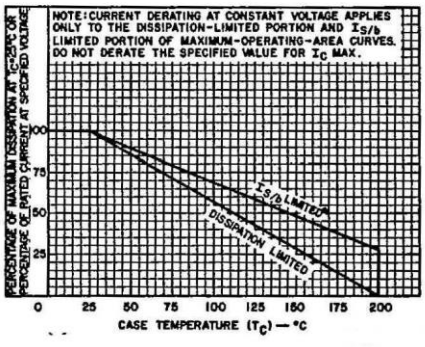


Fig. 1 – Derating curves for both types.

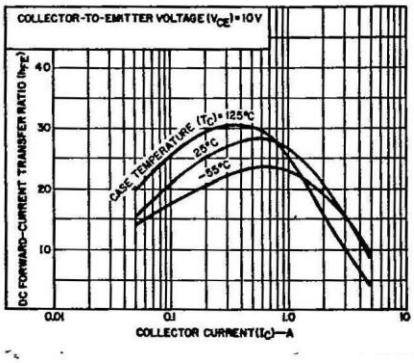


Fig. 2 — Typical dc beta characteristics for both types.

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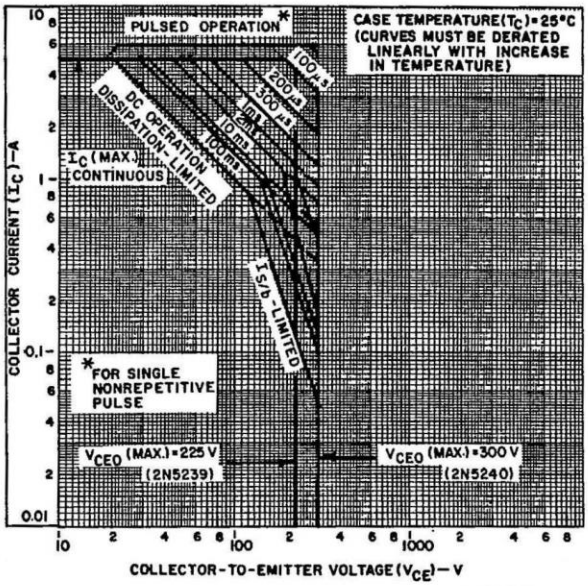

Fig. 3 – Maximum operating areas for both types.

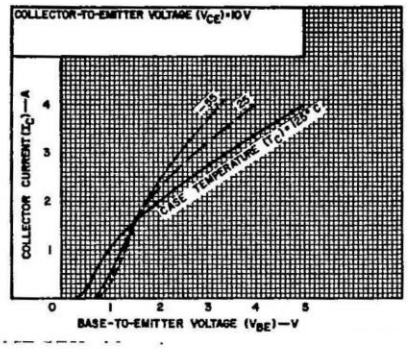

Fig. 4 — Typical transfer characteristics for both types.

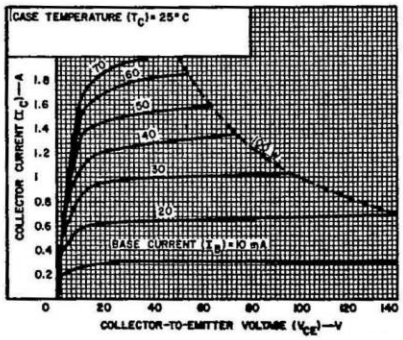

Fig. 5 — Typical output characteristics for both types.

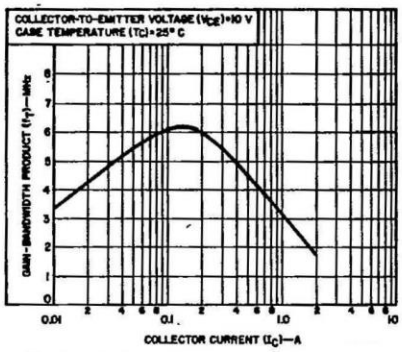

Fig. 6 — Typical gain-bandwidth product as a function of collector current for both types.

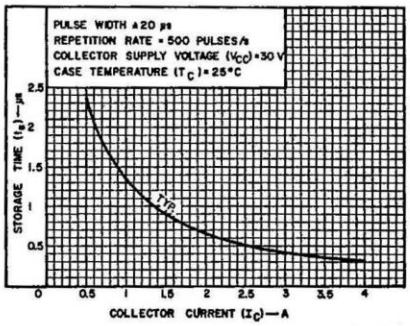

Fig. 7 — Typical saturated-switching time (storage) as a function of collector current for both types.

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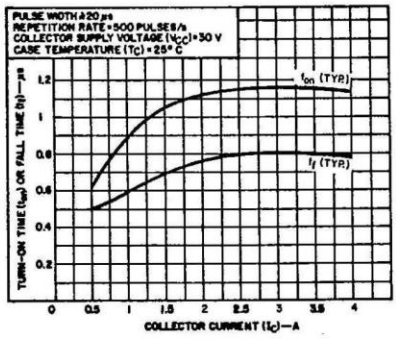

Fig. 8 — Typical saturated-time (turn-on or fall) as a function of collector current for both types.

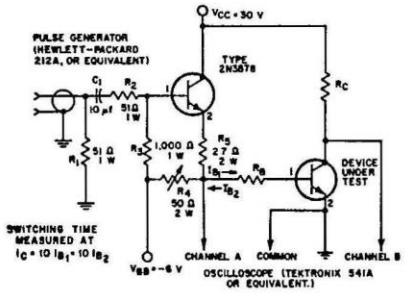

Fig. 9 — Circuit used to measure sustaining voltages, V_{CEO}(sus) and V_{CER}(sus) for both types.

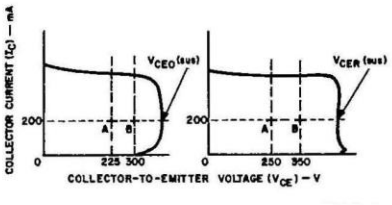

Fig. 10 — Oscilloscope display for V_{CEO}(sus) and V_{CER}(sus) measurement.

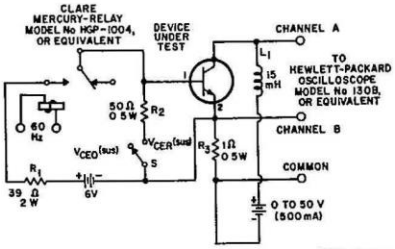

Fig. 11 — Circuit used to measure switching times for both types.

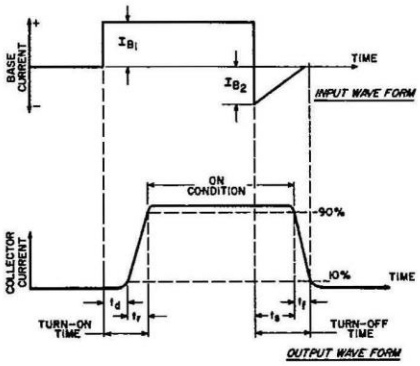

Fig. 12 — Phase relationship between input and output currents showing reference points for specification of switching times.