DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N6542, 2N6543

NPN 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	2N6542	2N6543	Unit
Collector-emitter voltage	$V_{CEO(SUS)}$	300	400	V
Collector-emitter voltage	V_{CEV}	650	850	V
Emitter-base voltage	V_{EBO}	8.0		V
Collector current – continuous **Peak** [1]	I_C	5.0 10		A
Base current – continuous	I_B	5.0		A
Emitter current – continuous **Peak**	I_E I_{EM}	10 20		A
Total power dissipation @T_C = 25°C **Derate above 25°C**	P_T	100 0.570		W W/°C
Operating junction and storage temperature range	T_J, T_{stg}	-65 to +200		°C
THERMAL CHARACTERISTICS				
Maximum thermal resistance, junction-to-case	$R_{\theta JC}$	1.75		°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**	2N6542 2N6543	$V_{(BR)SUS}$	300 400	- -	V
Collector cutoff current					
V_{CEV} = 650V, $V_{BE(OFF)}$ = 1.5V	2N6542	I_{CEO}	-	0.5	mA
V_{CEV} = 850V, $V_{BE(OFF)}$ = 1.5V	2N6543		-	0.5	
V_{CEV} = 650V, $V_{BE(OFF)}$ = 1.5V, T_C = 100°C	2N6542		-	3.0	
V_{CEV} = 850V, $V_{BE(OFF)}$ = 1.5V, T_C = 100°C	2N6543		-	3.0	
Emitter cutoff current **V_{EB} = 8V, I_C = 0**		I_{EBO}	-	1.0	mA
ON-CHARACTERISTICS[1]					
DC current gain **I_C = 1.5A, V_{CE} = 2.0V** **I_C = 3.0A, V_{CE} = 2.0V**		h_{FE}	12 7.0	60 35	-
Collector-emitter saturation voltage **I_C = 3.0A, I_B = 0.6A** **I_C = 5.0A, I_B = 1.0A**		$V_{CE(sat)}$	- -	1.0 5.0	V
Base-emitter saturation voltage **I_C = 3.0A, I_B = 0.6A**		$V_{BE(sat)}$	-	1.4	V
Current gain – bandwidth [2] **I_C = 200mA, V_{CE} = 10V, f = 1.0MHz**		f_T	6.0	35	MHz

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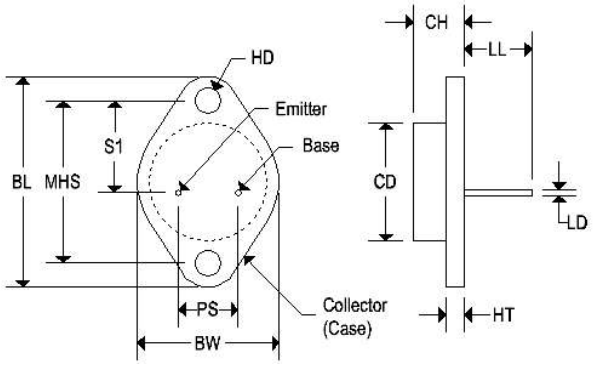
Characteristics		Symbol	Min.	Max.	Unit
SWITCHING CHARACTERISTICS					
Delay time	V_{CC} = 250V, I_C = 3.0A, I_{B1} = -I_{B2} = 0.6A, t_p = 0.1ms, duty cycle ≤ 2.0%	t_d	-	0.05	µs
Rise time		t_r	-	0.7	µs
Storage time		T_s	-	4.0	µs
Fall time		t_f	-	0.8	µs

Note 1: Pulse test: pulse width = 300µs, duty cycle ≤ 2.0%.
Note 2: Ih_{fe} · f_{test}

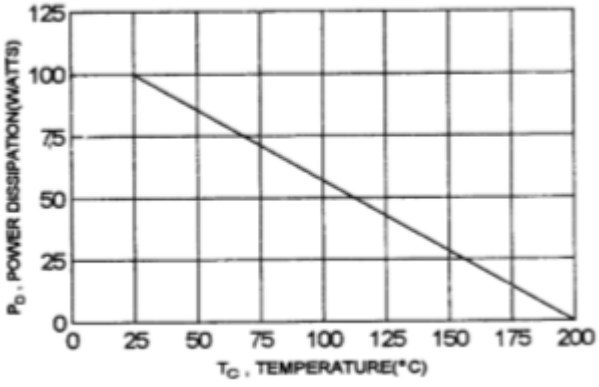
MECHANICAL CHARACTERISTICS

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	0.335	6.350	8.510
HT	0.055	0.135	1.400	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

FIGURE -1 POWER DERATING



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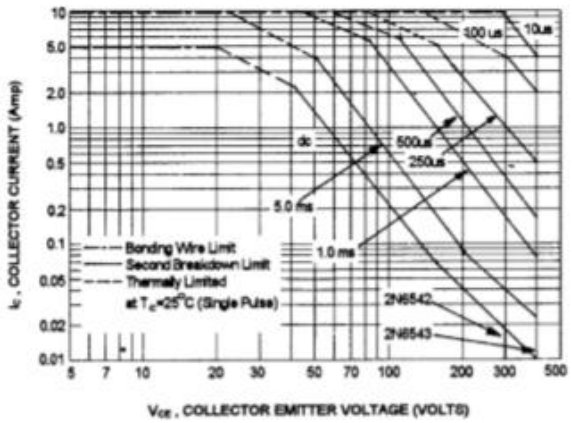
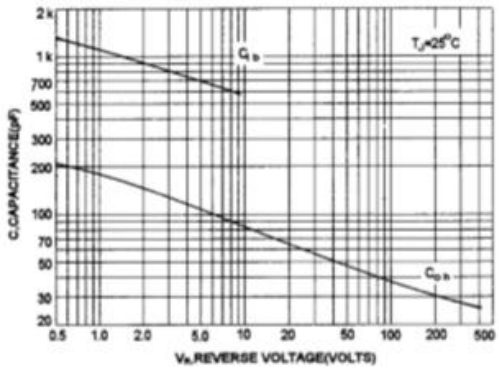
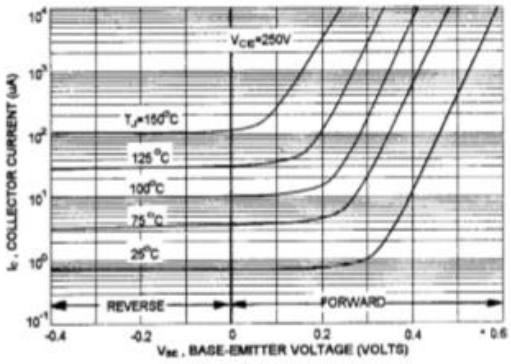
ACTIVE-REGION SAFE OPERATING AREA (SOA)



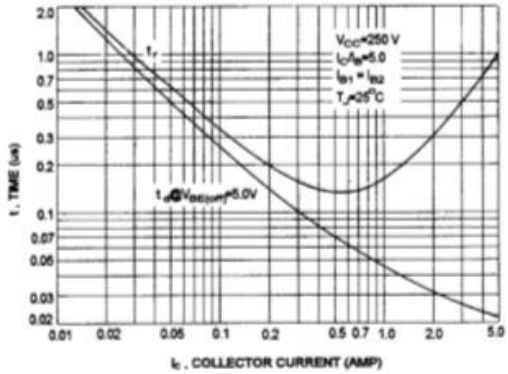
CAPACITANCES



COLLECTOR CUT-OFF REGION



TURN-ON TIME



TURN-OFF TIME