DIGITRON™ Semiconductors

High-reliability discrete products and engineering services since 1977

2N6383-2N6648 (NPN)
2N6648-2N6650 (PNP)

COMPLEMENTARY SILICON POWER DARLINGTON 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

Rating	Symbol	2N6383 2N6648	2N6384 2N6649	2N6384 2N6650	Units
Collector-emitter voltage	V_{CEO}	40	60	80	V
Collector-base voltage	V_{CBO}	40	60	80	V
Emitter base voltage	V_{EBO}	5.0			V
Collector current – continuous	I_C	10			A
Collector current – peak	I_C	15			A
Base current	I_B	0.25			A
Total power dissipation T_C = 25°C **Derate above 25°C**	P_D	100 0.571			W W/°C
Operating and storage junction temperature range	T_J, T_{stg}	-65 to +200			°C
Thermal resistance, junction to case	R_{thj-c}	1.75			°C/W

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-emitter sustaining voltage [1] (I_B = 0, I_C = 200mA)	2N6383, 2N6648 2N6384, 2N6649 2n6648, 2N6650	$V_{CEO(sus)}$	40 60 80	- - -	V
Collector cutoff current (V_{CE} = 40V, I_B = 0) (V_{CE} = 60V, I_B = 0) (V_{CE} = 80V, I_B = 0)	 2N6383, 2N6648 2N6384, 2N6649 2N6385, 2N6650	I_{CEO}	 - - -	 1.0 1.0 1.0	mA
Collector cutoff current (V_{CE} = 40V, $V_{BE(off)}$ = 1.5V) (V_{CE} = 60V, $V_{BE(off)}$ = 1.5V) (V_{CE} = 80V, $V_{BE(off)}$ = 1.5V) (V_{CE} = 40V, $V_{BE(off)}$ = 1.5V, T_J = 150°C) (V_{CE} = 60V, $V_{BE(off)}$ = 1.5V, T_J = 150°C) (V_{CE} = 80V, $V_{BE(off)}$ = 1.5V, T_J = 150°C)	 2N6383, 2N6648 2N6384, 2N6649 2N6284, 2N6650 2N6383, 2N6648 2N6384, 2N6649 2N6284, 2N6650	I_{CEX}	 - - - - - -	 0.3 0.3 0.3 3.0 3.0 3.0	mA
Emitter cutoff current (I_C = 0, V_{EB} = 5.0V)		I_{EBO}	-	10	mA
ON CHARACTERISTICS [1]					
DC current gain (I_C = 5.0A, V_{CE} = 3.0V) (I_C = 10A, V_{CE} = 3.0V)		h_{FE}	1000 100	20000 -	-

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

Characteristic	Symbol	Min	Max	Unit
Collector emitter saturation voltage				
(I_C = 5.0A, I_B = 40mA)	$V_{CE(sat)}$	-	2.0	V
(I_C = 10A, I_B = 200mA)		-	3.0	
Base emitter on voltage				
(I_C = 5.0A, V_{CE} = 3.0V)	$V_{BE(ON)}$	-	2.8	V
(I_C = 10A, V_{CE} = 3.0V)		-	4.5	
DYNAMIC CHARACTERISTICS				
Small signal current gain				
(I_C = 1.0A, V_{CE} = 5.0V, f = 1.0kHz)	h_{fe}	1000	-	-
Output capacitance				
(V_{CB} = 10V, I_E = 0, f = 1.0MHz)	C_{ob}	-	200	pF

Note 1: Pulse test: pulse width ≤ 300µs, duty cycle ≤ 2.0%.

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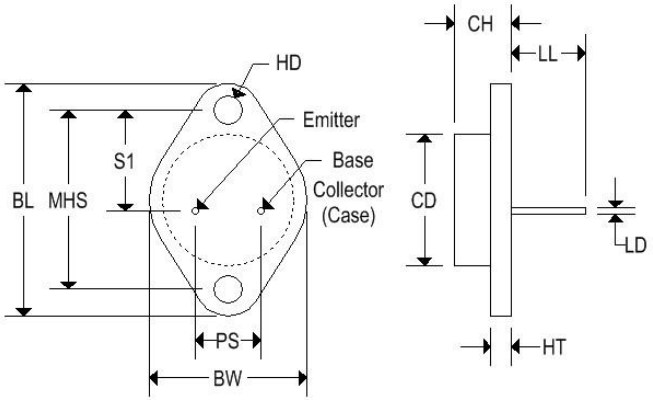
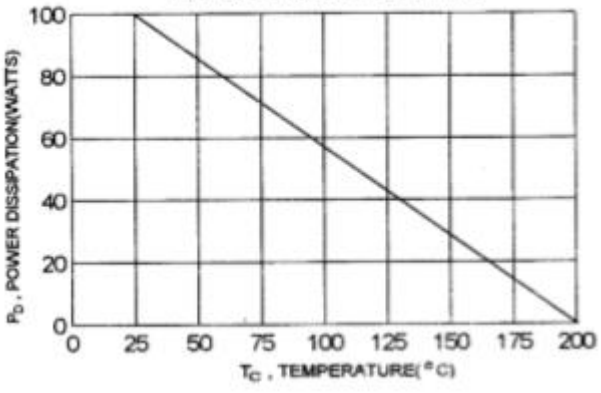
MECHANICAL CHARACTERISTICS

Case	TO-3
Marking	Alpha-numeric
Pin out	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

FIGURE -1 POWER DERATING



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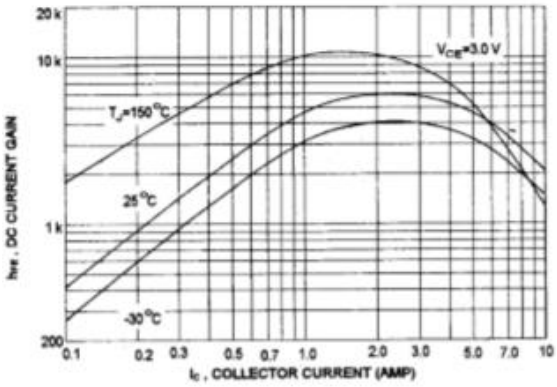
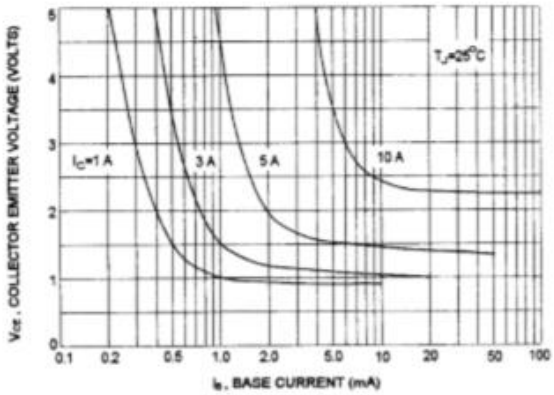
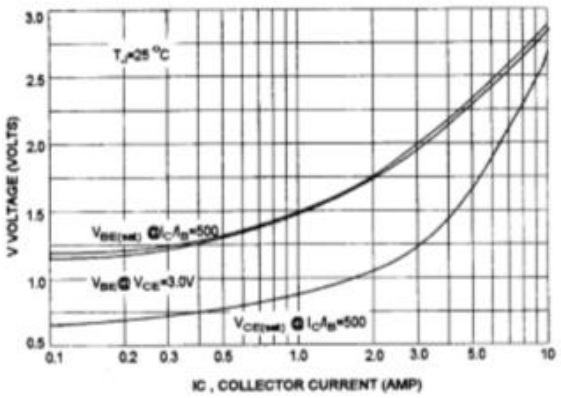
DC CURRENT GAIN



COLLECTOR SATURATION REGION



"ON" VOLTAGES



SWITCHING TIME