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**NPN**      **PNP**  
**2N6383**   **2N6648**  
**2N6384**   **2N6649**  
**2N6385**   **2N6650**

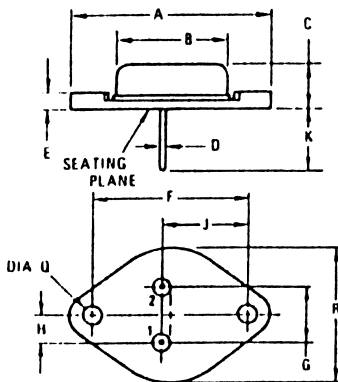
COMPLEMENTARY SILICON POWER  
 DARLINGTON TRANSISTORS

\*MAXIMUM RATINGS

Rating	Symbol	2N6383 2N6648	2N6384 2N6649	2N6385 2N6650	Unit
Collector-Emitter Voltage	$V_{CE(sus)}$	40	60	80	Vdc
Collector-Emitter Voltage	$V_{CEX}$	40	60	80	Vdc
Collector-Emitter Voltage	$V_{CBO}$	40	60	80	Vdc
Emitter Base Voltage	$V_{EBO}$	5.0			Vdc
Collector Current - Continuous	$I_C$	10			Adc
Peak (1)**	$I_{CM}$	15			
Base Current - Continuous	$I_B$	0.25			Arc
Total Power Dissipation @ $T_C = 25^\circ C$ (2) Derate above $25^\circ C$	$P_D$	100			Watts
		0.571			W/ $^\circ C$
Operating and Storage Junction Temperature Range (2)	$T_J, T_{stg}$	-65 to +200			$^\circ C$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.75	$^\circ C/W$
Maximum Lead Temperature for Soldering Purposes: 1/32" from Case for 5 Seconds	$T_L$	235	$^\circ C$

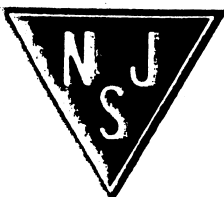


STYLE 1.  
 PIN 1. BASE  
 2. EMITTER  
 CASE COLLECTOR

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	39.37	-	1.550
B	-	21.08	-	0.830
C	6.35	7.62	0.250	0.300
D	0.99	1.09	0.039	0.043
E	-	3.43	-	0.135
F	29.90	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.33	5.59	0.210	0.220
J	16.64	17.15	0.655	0.675
K	11.18	12.19	0.440	0.480
O	3.84	4.09	0.151	0.161
R	-	26.67	-	1.050

Collector connected to case.

(TO-3)



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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**OFF CHARACTERISTICS**

*Collector-Emitter Sustaining Voltage (1) ( $I_C = 200 \text{ mAdc}$ , $I_B = 0$ )	2N6383, 2N6648 2N6384, 2N6649 2N6385, 2N6650	$V_{CE(sus)}$	40 60 80	— — —	Vdc
Collector Cutoff Current ( $V_{CE} = \text{Rated Value}$ )		$I_{CEO}$	—	1.0	mAdc
*Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CE(sus)}$ Value, $V_{BE(off)} = 1.5 \text{ Vdc}$ ) ( $V_{CE} = \text{Rated } V_{CE(sus)}$ Value, $V_{BE(off)} = 1.5 \text{ Vdc}$ , $T_C = 150^\circ\text{C}$ )		$I_{CEV}$	—	0.3 3.0	mAdc
*Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ Vdc}$ , $I_C = 0$ )		$I_{LEO}$	—	10	mAdc
Collector-Emitter Sustaining Voltage (1) ( $R_{BE} = 100 \Omega$ , $I_C = 200 \text{ mA}$ )	2N6383, 2N6648 2N6384, 2N6649 2N6385, 2N6650	$V_{CER(sus)}$	40 60 80	— — —	Vdc
Collector-Emitter Sustaining Voltage (1) ( $V_{BE(off)} = 1.5 \text{ V}$ , $I_C = 200 \text{ mA}$ )	2N6383, 2N6648 2N6384, 2N6649 2N6385, 2N6650	$V_{CLV(sus)}$	40 60 80	— — —	Vdc

**ON CHARACTERISTICS (1)**

*DC Current Gain ( $I_C = 5.0 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ ) ( $I_C = 10 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ )		$h_{FE}$	1000 100	20,000 —	—
*Collector-Emitter Saturation Voltage ( $I_C = 5.0 \text{ Adc}$ , $I_B = 0.01 \text{ Adc}$ ) ( $I_C = 10 \text{ Adc}$ , $I_B = 0.1 \text{ Adc}$ )		$V_{CE(sat)}$	—	2.0 3.0	Vdc
*Base-Emitter On Voltage ( $I_C = 5.0 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ ) ( $I_C = 10 \text{ Adc}$ , $V_{CE} = 3.0 \text{ Vdc}$ )		$V_{BE(on)}$	— —	2.8 4.5	Vdc
Diode Forward Voltage ( $I_F = 10 \text{ Adc}$ )		$V_F$	—	4.0	Vdc

**\*DYNAMIC CHARACTERISTICS**

Output Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f_{test} = 1.0 \text{ MHz}$ )		$C_{ob}$	—	200	pF
*Magnitude of Common-Emitter Small-Signal Short-Circuit Current Transfer Ratio ( $I_C = 1.0 \text{ Adc}$ , $V_{CE} = 5.0 \text{ Vdc}$ , $f = 1.0 \text{ MHz}$ )		$h_{fc}$	20	—	—
Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio ( $I_C = 1.0 \text{ Adc}$ , $V_{CE} = 5.0 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )		$h_{fe}$	1000	—	—

**SECOND BREAKDOWN**

Second Breakdown Collector Current with Base-Forward Biased	$I_{S/B}$	See Figures 8 and 9		
Second Breakdown Energy with Base Reverse-Biased ( $L = 12 \text{ mH}$ , $R_{BE} = 100 \Omega$ , $V_{BE(off)} = 1.5 \text{ Vdc}$ , $I_C = 4.5 \text{ Adc}$ )	$E_{S/B}$	120	—	mJ

(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle = 2%.

\* Indicates JEDEC Registered Data.