

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	2N5683	2N5684	Unit
Collector emitter voltage	V_{CEO}	60	80	V
Collector base voltage	V_{CBO}	60	80	V
Emitter base voltage	V_{EBO}	5.0		V
Base current	I_B	15		A
Collector current	I_C	50		A
Total power dissipation ⁽¹⁾ @ $T_C = 25^\circ\text{C}$	P_T	300		W
Total power dissipation ⁽¹⁾ @ $T_C = 100^\circ\text{C}$		171		W
Operating and storage temperature range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$
Thermal resistance, junction to case	$R_{\theta JC}$	0.584		$^\circ\text{C/W}$

Note 1: Derate linearly 1.715W/ $^\circ\text{C}$ between $T_C = 25^\circ\text{C}$ and $T_C = 200^\circ\text{C}$.

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector emitter breakdown voltage ($I_C = 200\text{mA}$)	2N5683 2N5684	$V_{BR(CEO)}$	60 80	- - V
Collector emitter cutoff current ($V_{CE} = 30\text{V}$) ($V_{CE} = 40\text{V}$)	2N5683 2N5684	I_{CEO}	- -	5.0 5.0 μA
Collector emitter cutoff current ($V_{CE} = 60\text{V}, V_{BE} = 1.5\text{V}$) ($V_{CE} = 80\text{V}, V_{BE} = 1.5\text{V}$)	2N5683 2N5684	I_{CEX}	- -	5.0 5.0 μA
Collector base cutoff current ($V_{CE} = 60\text{V}$) ($V_{CE} = 80\text{V}$)	2N5683 2N5684	I_{CBO}	- -	5.0 5.0 μA
Emitter base cutoff current ($V_{EB} = 5.0\text{V}$)		I_{EBO}	-	5.0 μA
ON CHARACTERISTICS ⁽²⁾				
Forward current transfer ratio ($I_C = 5.0\text{A}, V_{CE} = 2.0\text{V}$) ($I_C = 25\text{A}, V_{CE} = 2.0\text{V}$) ($I_C = 50\text{A}, V_{CE} = 5.0\text{V}$)		h_{FE}	30 15 5.0	- 60 - -
Collector emitter saturation voltage ($I_C = 25\text{A}, I_B = 2.5\text{A}$) ($I_C = 50\text{A}, I_B = 10\text{A}$)		$V_{CE(sat)}$	- -	1.0 5.0 V
Base-emitter saturation voltage ($I_C = 25\text{A}, I_B = 2.5\text{A}$)		$V_{BE(sat)}$	-	2.0 V

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Characteristic	Symbol	Min	Max	Unit
Base-emitter voltage ($I_C = 25\text{A}$, $V_{CE} = 2.0\text{A}$)	$V_{BE(on)}$	-	2.0	V
DYNAMIC CHARACTERISTICS				
Magnitude of common emitter small signal short circuit forward current transfer ratio ($I_C = 5.0\text{A}$, $V_{CE} = 10\text{V}$, $f_{test} = 1\text{MHz}$)	$ h_{fe} $	2.0	20	-
Small signal short circuit forward current transfer ratio ($I_C = 10\text{A}$, $V_{CE} = 5.0\text{V}$, $f_{test} = 1\text{kHz}$)	h_{re}	15	-	-
Output capacitance ($V_{CB} = 10\text{V}$, $I_E = 0$, $0.1\text{MHz} \leq f \leq 1.0\text{MHz}$)	C_{obo}	-	2000	pF
SWITCHING CHARACTERISTICS				
Turn on time ($V_{CC} = 30\text{V}$, $I_C = 25\text{A}$, $I_B = 2.5\text{A}$)	t_{on}	-	1.5	μs
Turn off time ($V_{CC} = 30\text{V}$, $I_C = 25\text{A}$, $I_{B1} = I_{B2} = 2.5\text{A}$)	t_{off}	-	3.0	μs
SAFE OPERATING AREA				
DC tests $T_C = 25^\circ\text{C}$, 1 cycle, $t = 1.0\text{s}$				
Test 1 $V_{CE} = 6.0\text{V}$, $I_C = 50\text{A}$	All types			
Test 2 $V_{CE} = 30\text{V}$, $I_C = 10\text{A}$	All types			
Test 3 $V_{CE} = 50\text{V}$, $I_C = 560\text{mA}$ $V_{CE} = 60\text{V}$, $I_C = 640\text{mA}$	2N5683 2N5684			

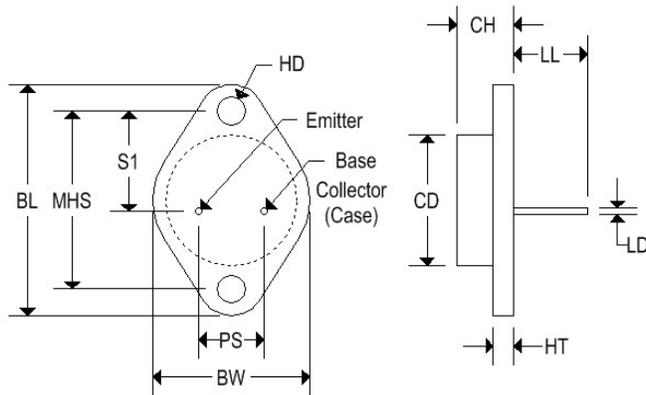
Note 2: Pulse test: pulse width = $300\mu\text{s}$, duty cycle $\leq 2\%$.

2N5683-2N5684

NPN SILICON POWER TRANSISTORS

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