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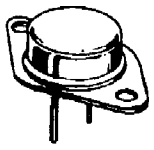
HIGH-CURRENT COMPLEMENTARY SILICON POWER TRANSISTORS

... designed for use in high-power amplifier and switching circuit applications

PNP	NPN
2N5683	2N5685
2N5684	2N5686

FEATURES:
* Continuous Collector Current - I_C = 50 A
* Power Dissipation - P_D = 300 W @ T_C = 25°C
* DC Current Gain - hFE = 15 ~ 60 @ I_C = 25 A

50 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
60 - 80 Volts
300 Watts



TO-3

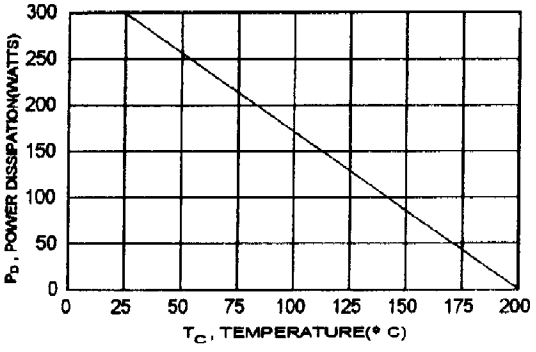
MAXIMUM RATINGS

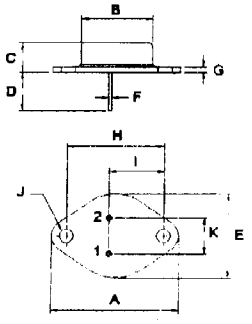
Characteristic	Symbol	2N5683 2N5685	2N5684 2N5686	Unit
Collector-Emitter Voltage	V_{CEO}	60	80	V
Collector-Base Voltage	V_{CBO}	60	80	V
Emitter-Base Voltage	V_{EBO}	5		V
Collector Current-Continuous	I_C	50		A
Base Current	I_B	15		A
Total Power Dissipation@T_C=25°C Derate above 25°C	P_D	300 1.715		W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	- 65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	0.584	°C/W

FIGURE -1 POWER DERATING





PIN 1.BASE
2.EMITTER
COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector - Emitter Sustaining Voltage (1) (I_C = 200 mA, I_B = 0)	2N5683, 2N5685 2N5684, 2N5686	$V_{CEO(SUS)}$	60 80		V
Collector Cutoff Current (V_{CE} = 30 V, I_B = 0) (V_{CE} = 40 V, I_B = 0)	2N5683, 2N5685 2N5684, 2N5686	I_{CEO}		1.0 1.0	mA
Collector Cutoff Current (V_{CE} = 60 V, $V_{BE(off)}$ = 1.5 V) (V_{CE} = 80 V, $V_{BE(off)}$ = 1.5 V) (V_{CE} = 60 V, $V_{BE(off)}$ = 1.5 V, T_C = 150°C) (V_{CE} = 80 V, $V_{BE(off)}$ = 1.5 V, T_C = 150°C)	2N5683, 2N5685 2N5684, 2N5686 2N5683, 2N5685 2N5684, 2N5686	I_{CEX}		2.0 2.0 10 10	mA
Collector Cutoff Current (V_{CB} = 60 V, I_E = 0) (V_{CB} = 80 V, I_E = 0)	2N5683, 2N5685 2N5684, 2N5686	I_{CBO}		2.0 2.0	mA
Emitter Cutoff Current (V_{EB} = 5.0 V , I_C = 0)		I_{EBO}		5.0	mA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C = 25 A, V_{CE} = 2.0 V) (I_C = 50 A, V_{CE} = 5.0 V)		hFE	15 5.0	60	
Collector-Emitter Saturation Voltage (I_C = 25 A, I_B = 2.5 A) (I_C = 50 A, I_B = 10 A)		$V_{CE(sat)}$		1.0 5.0	V
Base-Emitter Saturation Voltage (I_C = 25 A, I_B = 2.5 A)		$V_{BE(sat)}$		2.0	V
Base-Emitter On Voltage (I_C = 25 A, V_{CE} = 2.0 V)		$V_{BE(on)}$		2.0	V
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product (2) (I_C = 5 A, V_{CE} = 10 V, f = 1.0 MHz)		f_T	2.0		MHz
Small-Signal Current Gain (I_C = 10 A, V_{CE} = 5 V, f = 1 KHZ)		h_{fe}	15		

(1) Pulse Test: Pulse width = 300 us , Duty Cycle ≤ 2.0%

(2) $f_T = |h_{fe}| \cdot f_{test}$