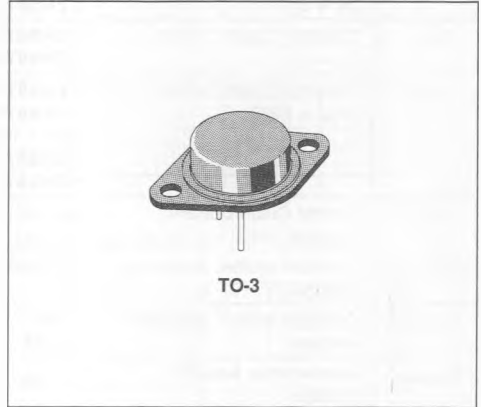




SILICON HIGH POWER TRANSISTORS

DESCRIPTION

The 2N5877 and 2N5878 are silicon epitaxial-base NPN power transistors in Jedec TO-3 metal case. They are intended for use in power linear and switching applications. The complementary PNP types are the 2N5875 and 2N5876 respectively.



INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN	2N5877	2N5878	Unit
		PNP	2N5875	2N5876	
V_{CBO}	Collector-base Voltage ($I_E = 0$)		60	80	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)		60	80	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)		5		V
I_C	Collector Current		10		A
I_{CM}	Collector Peak Current		20		A
I_B	Base Current		4		A
P_{Tot}	Total Power Dissipation at $T_{case} \leq 25^\circ C$		150		W
T_{stg}	Storage Temperature		- 65 to 200		$^\circ C$
T_j	Junction Temperature		200		$^\circ C$

* For PNP types voltage and current values are negative.

THERMAL DATA

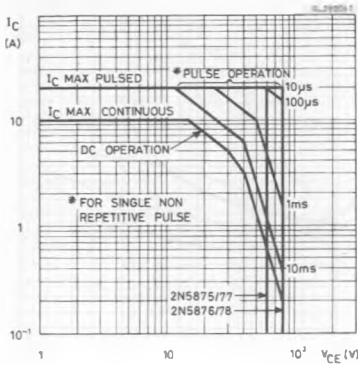
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	1.17	$^{\circ}C/W$
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

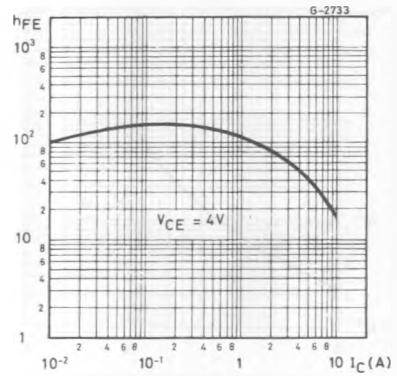
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for 2N5877/75 $V_{CB} = 60V$ for 2N5878/76 $V_{CB} = 80V$			0.5 0.5	 mA mA
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	for 2N5877/75 $V_{CE} = 30V$ for 2N5878/76 $V_{CE} = 40V$			1 1	 mA mA
I_{CEX}	Collector Cutoff Current ($V_{BE} = 1.5V$)	for 2N5877/75 $V_{CE} = 60V$ for 2N5878/76 $V_{CE} = 80V$ $T_{case} = 150^{\circ}C$ for 2N5877/75 $V_{CE} = 60V$ for 2N5878/76 $V_{CE} = 80V$			0.5 0.5 5 5	 mA mA mA mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5V$			1	 mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage ($I_B = 0$)	$I_C = 200mA$ for 2N5877/75 for 2N5878/76	60 80			 V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 5A$ $I_B = 0.5A$ $I_C = 10A$ $I_B = 2.5A$			1 3	 V V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 10A$ $I_C = 2.5A$			2.5	 V
V_{BE}^*	Base-emitter Voltage	$I_C = 4A$ $V_{CE} = 4V$			1.5	 V
h_{FE}^*	DC Current Gain	$I_C = 4A$ $V_{CE} = 4V$ $I_C = 10A$ $V_{CE} = 4V$	20 4		100	
f_T	Transition Frequency	$I_C = 0.5V$ $V_{CE} = 10V$	4			 MHz
C_{CBO}	Collector-base Capacitance	$V_{CB} = 10V$ $f = 1MHz$ $I_E = 0$ for 2N5877/2N5878 for 2N5875/2N5876			300 500	 pF pF
t_r	Rise Time	$I_C = 4A$ $V_{CC} = 30V$ $I_{B1} = 0.4A$			0.7	 μs
t_s	Storage Time	$I_C = 4A$ $V_{CC} = 30V$			1	 μs
t_f	Fall Time	$I_{B1} = -I_{B2} = 0.4A$			0.8	 μs

* Pulsed : pulse duration = 300 μs , duty cycle = 1.5%.
For PNP types voltage and current values are negative.

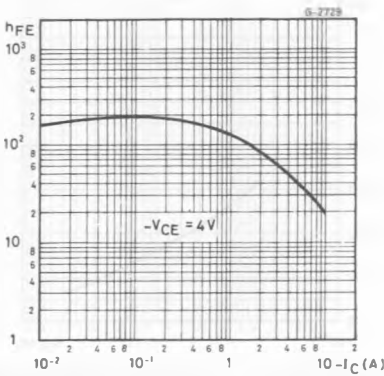
Safe Operating Areas.



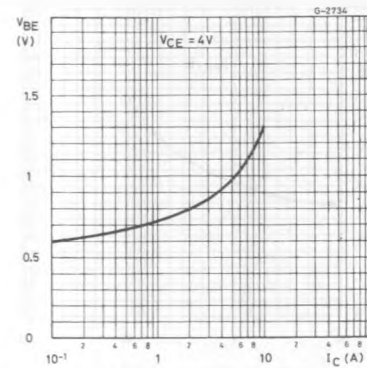
DC Current Gain (NPN types).



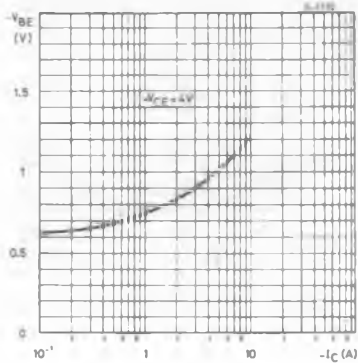
DC Current Gain (PNP types).



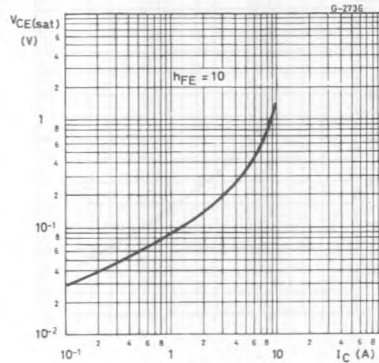
DC Transconductance (NPN types).



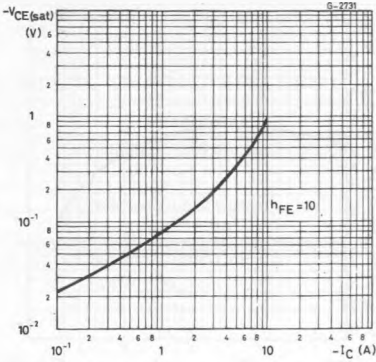
DC Transconductance (PNP types).



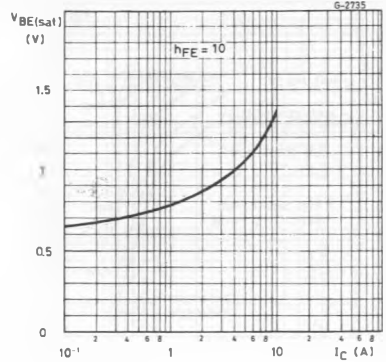
Collector-emitter Saturation Voltage (NPN types).



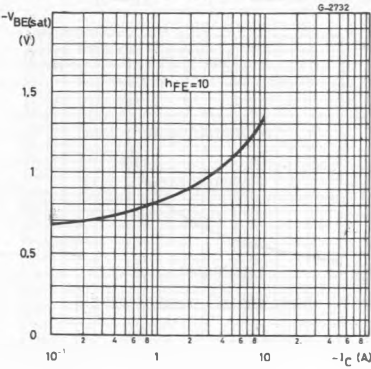
Collector-emitter Saturation Voltage (PNP types).



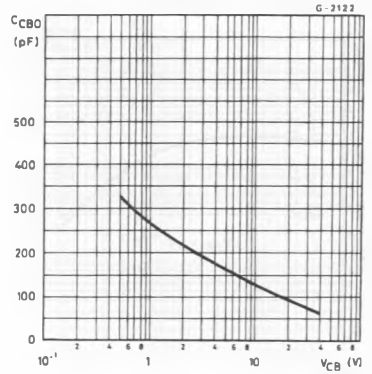
Base-emitter Saturation Voltage (NPN types).



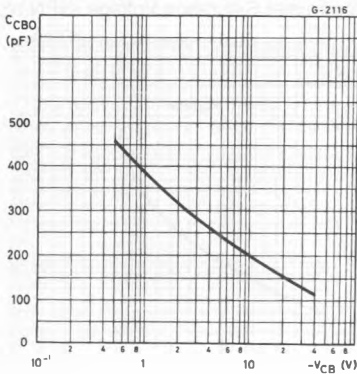
Base-emitter Saturation Voltage (PNP types).



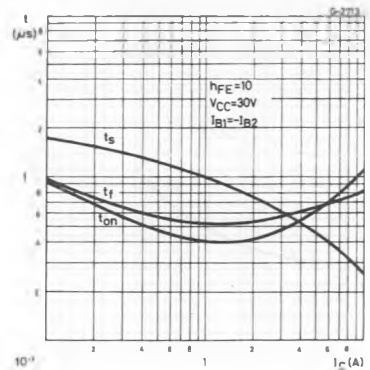
Collector-base Capacitance (NPN types).



Collector-base Capacitance (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).

