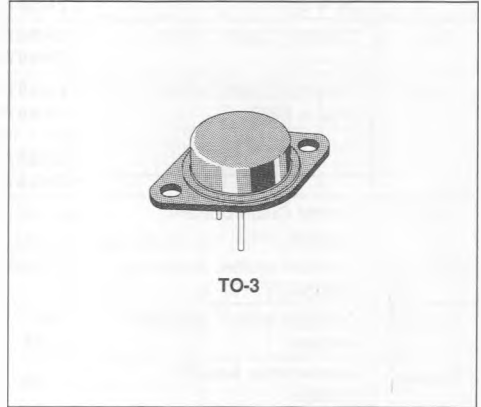




**SILICON HIGH POWER TRANSISTORS**

**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

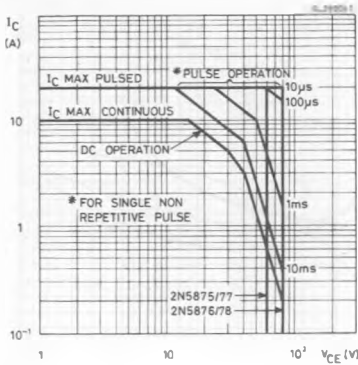
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	1.17	$^{\circ}C/W$
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ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

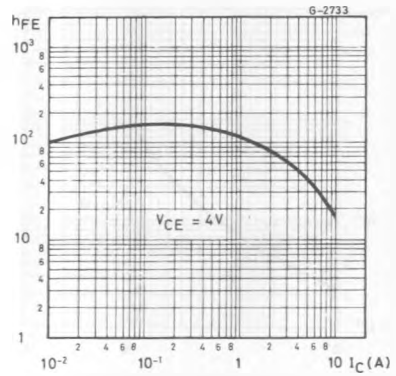
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	for <b>2N5877/75</b> $V_{CB} = 60V$ for <b>2N5878/76</b> $V_{CB} = 80V$			0.5 0.5	$mA$ $mA$
$I_{CEO}$	Collector Cutoff Current ( $I_B = 0$ )	for <b>2N5877/75</b> $V_{CE} = 30V$ for <b>2N5878/76</b> $V_{CE} = 40V$			1 1	$mA$ $mA$
$I_{CEX}$	Collector Cutoff Current ( $V_{BE} = 1.5V$ )	for <b>2N5877/75</b> $V_{CE} = 60V$ for <b>2N5878/76</b> $V_{CE} = 80V$ $T_{case} = 150^{\circ}C$ for <b>2N5877/75</b> $V_{CE} = 60V$ for <b>2N5878/76</b> $V_{CE} = 80V$			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 <b>2N5877/75</b> for <b>2N5878/76</b>	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 <b>2N5877/2N5878</b> for <b>2N5875/2N5876</b>			300 500	$pF$ $pF$
$t_r$	Rise Time	$I_C = 4A$ $V_{CC} = 30V$ $I_{B1} = 0.4A$			0.7	$\mu s$
$t_s$	Storage Time	$I_C = 4A$ $V_{CC} = 30V$			1	$\mu s$
$t_f$	Fall Time	$I_{B1} = -I_{B2} = 0.4A$			0.8	$\mu s$

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

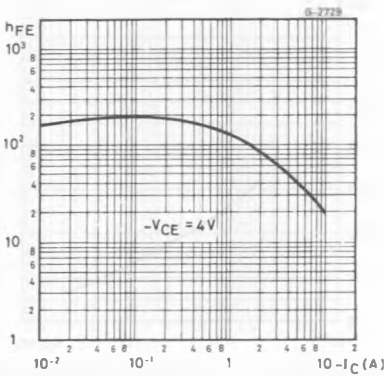
Safe Operating Areas.



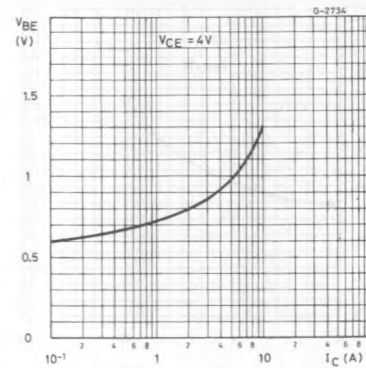
DC Current Gain (NPN types).



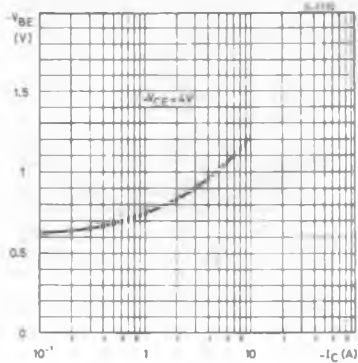
DC Current Gain (PNP types).



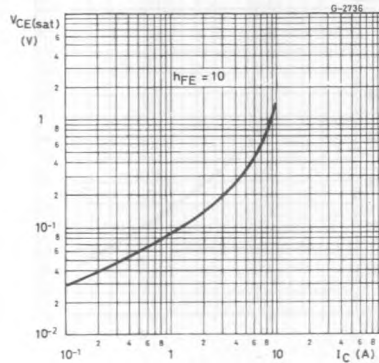
DC Transconductance (NPN types).



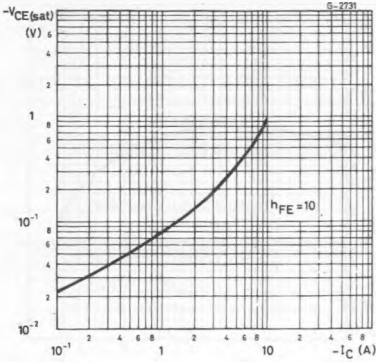
DC Transconductance (PNP types).



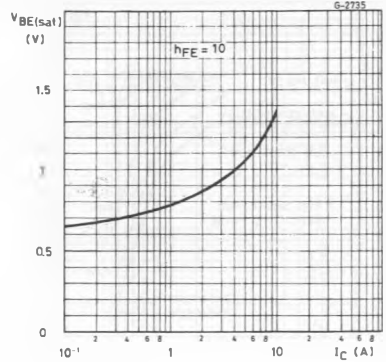
Collector-emitter Saturation Voltage (NPN types).



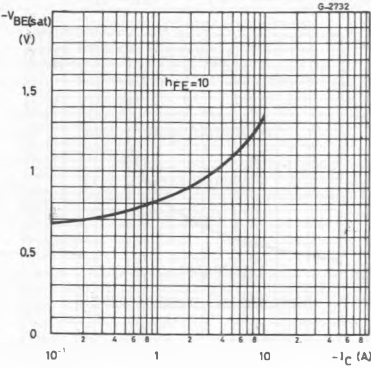
Collector-emitter Saturation Voltage (PNP types).



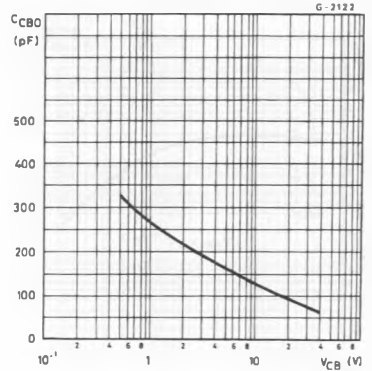
Base-emitter Saturation Voltage (NPN types).



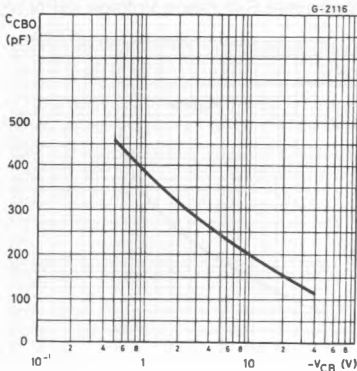
Base-emitter Saturation Voltage (PNP types).



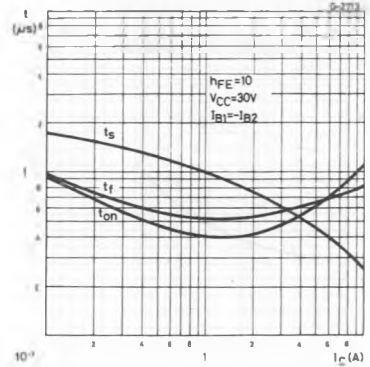
Collector-base Capacitance (NPN types).



Collector-base Capacitance (PNP types).



Saturated Switching Characteristics (NPN types).



## Saturated Switching Characteristics (PNP types).

