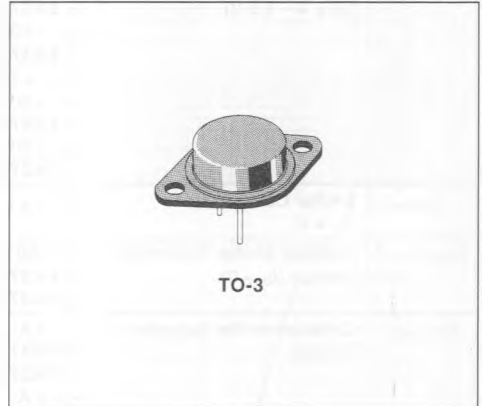


**EPITAXIAL-BASE NPN/PNP**
**DESCRIPTION**

The 2N3713, 2N3714, 2N3715 and 2N3716 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 2N3789, 2N3790, 2N3791 and 2N3792 respectively.


**INTERNAL SCHEMATIC DIAGRAMS**

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	PNP* PNP* NPN NPN	2N3789 2N3791 2N3713 2N3715	2N3790 2N3792 2N3714 2N3716	Unit
$V_{CBO}$	Collector-base Voltage ( $I_E = 0$ )		80	100	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )		60	80	V
$V_{EBO}$	Emitter-base Voltage ( $I_C = 0$ )		7		V
$I_C$	Collector Current		10		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

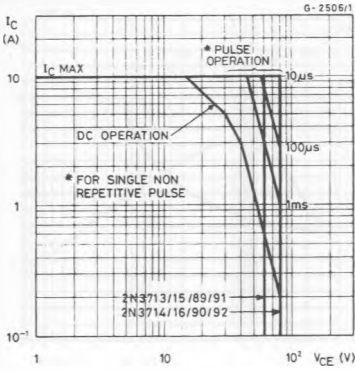
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	1.17	°C/W
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ELECTRICAL CHARACTERISTICS ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

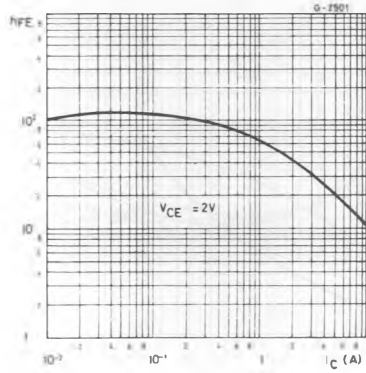
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CEX}$	Collector Cutoff Current ( $V_{BE} = -1.5\text{ V}$ )	$V_{CE} = 80\text{ V}$ for <b>2N3713/15/89/91</b> $V_{CE} = 100\text{ V}$ for <b>2N3714/16/90/92</b> $T_{case} = 150\text{ °C}$ $V_{CE} = 60\text{ V}$ for <b>2N3713/15/89/91</b> $V_{CE} = 80\text{ V}$ for <b>2N3713/14/90/92</b>			1 1 10 10	mA mA mA mA
$I_{EBO}$	Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = 7\text{ V}$			5	mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 200\text{ mA}$ for <b>2N3713/15/89/91</b> for <b>2N3714/16/90/92</b>	60 80			V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 5\text{ A}$ $I_B = 0.5\text{ A}$ for <b>2N3713/14/91/92</b> for <b>2N3715/16</b> $I_C = 4\text{ A}$ $I_B = 0.5\text{ A}$ for <b>2N3789/90</b>			1 0.8 1	V V V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 5\text{ A}$ $I_B = 0.5\text{ A}$ for <b>2N3713/14/89/90</b> for <b>2N3715/16/91/92</b>			2 1.5	V V
$V_{BE}^*$	Base-emitter Voltage	$I_C = 3\text{ A}$ $V_{CE} = 2\text{ V}$			1.5	V
$h_{FE}^*$	DC Current Gain	$I_C = 1\text{ A}$ $V_{CE} = 2\text{ V}$ for <b>2N3713/14/89/90</b> for <b>2N3715/16</b> for <b>2N3791/92</b> $I_C = 3\text{ A}$ $V_{CE} = 2\text{ V}$ for <b>2N3713/14/89/90</b> for <b>2N3715/16/91/92</b> $I_C = 10\text{ A}$ $V_{CE} = 4\text{ V}$	25 50 50 15 30 5		90 150 180	
$f_T$	Transition Frequency	$I_C = 0.5\text{ A}$ $V_{CE} = 10\text{ V}$	4			MHz

\* Pulsed : pulse duration = 300 $\mu$ s, duty cycle = 1.5%.

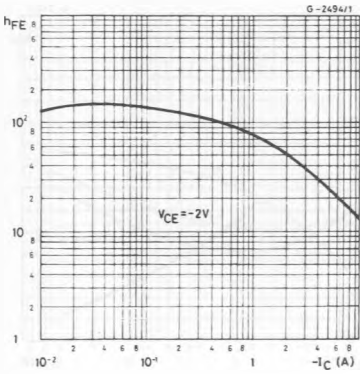
Safe Operating Areas.



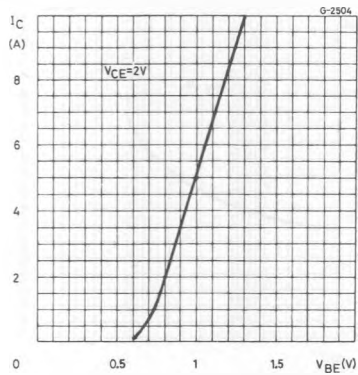
DC Current Gain (NPN types).



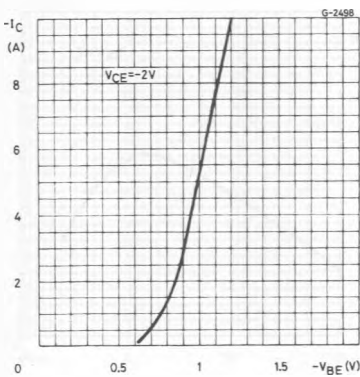
DC Current Gain (PNP types).



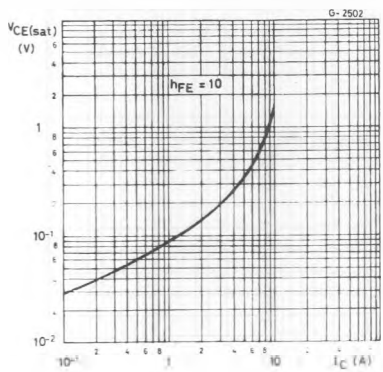
DC Transconductance (NPN types).



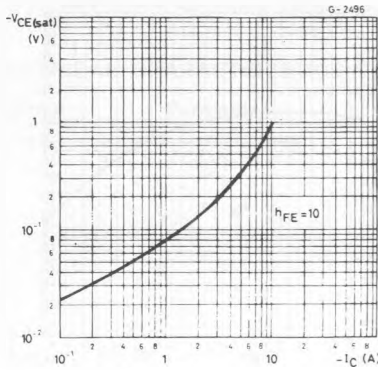
DC Transconductance (PNP types).



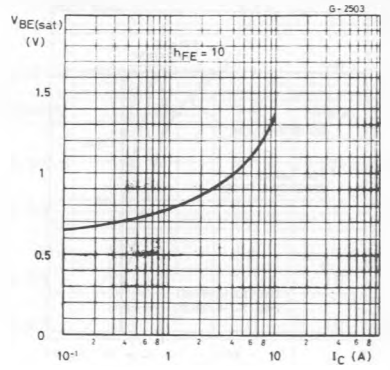
Collector-emitter Saturation Voltage (NPN types).



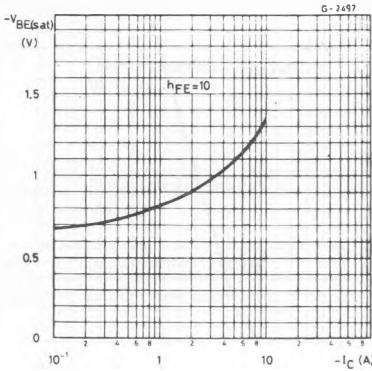
Collector-emitter Saturation Voltage (PNP types).



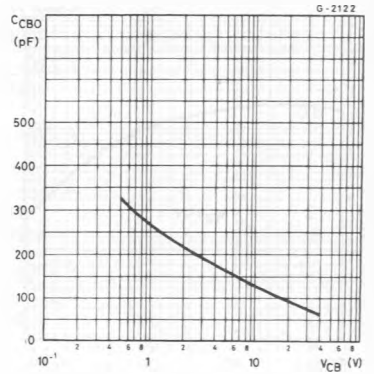
Base-emitter Saturation Voltage (NPN types).



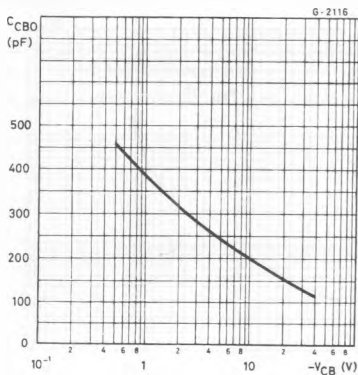
Base-emitter Saturation Voltage (PNP types).



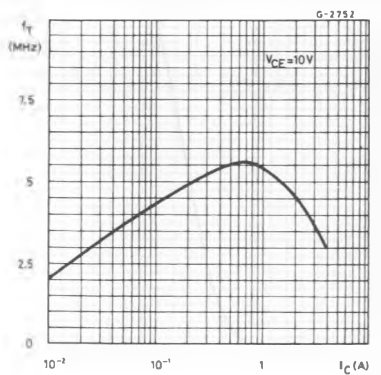
Collector-base Capacitance (NPN types).



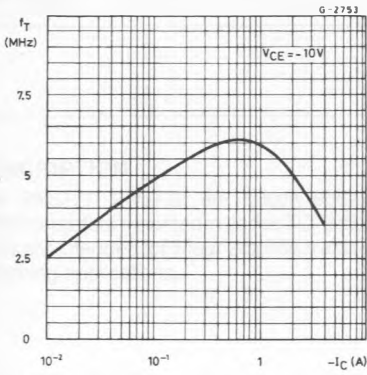
Collector-base Capacitance (PNP types).



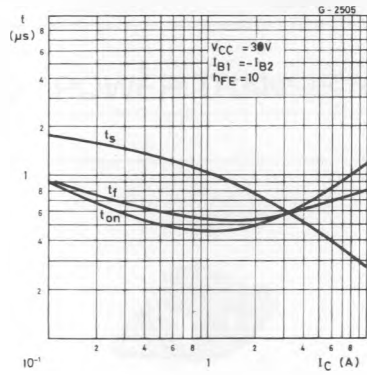
Transition Frequency (NPN types).



Transition Frequency (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).

