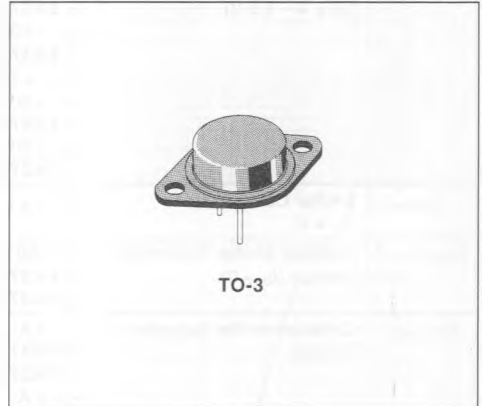


EPITAXIAL-BASE NPN/PNP
DESCRIPTION

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

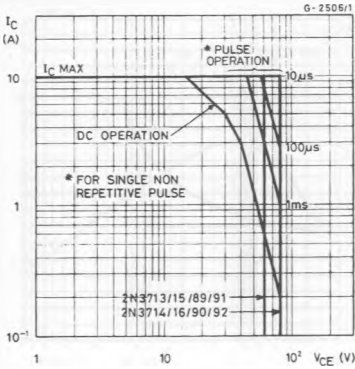
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	1.17	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

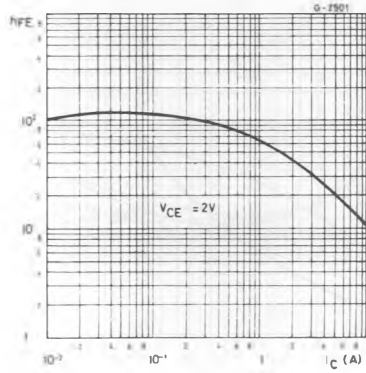
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEX}	Collector Cutoff Current ($V_{BE} = -1.5\text{ V}$)	$V_{CE} = 80\text{ V}$ for 2N3713/15/89/91 $V_{CE} = 100\text{ V}$ for 2N3714/16/90/92 $T_{case} = 150\text{ °C}$ $V_{CE} = 60\text{ V}$ for 2N3713/15/89/91 $V_{CE} = 80\text{ V}$ for 2N3713/14/90/92			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 2N3713/15/89/91 for 2N3714/16/90/92	60 80			V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 5\text{ A}$ $I_B = 0.5\text{ A}$ for 2N3713/14/91/92 for 2N3715/16 $I_C = 4\text{ A}$ $I_B = 0.5\text{ A}$ for 2N3789/90			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 2N3713/14/89/90 for 2N3715/16/91/92			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 2N3713/14/89/90 for 2N3715/16 for 2N3791/92 $I_C = 3\text{ A}$ $V_{CE} = 2\text{ V}$ for 2N3713/14/89/90 for 2N3715/16/91/92 $I_C = 10\text{ A}$ $V_{CE} = 4\text{ V}$	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 μ s, duty cycle = 1.5%.

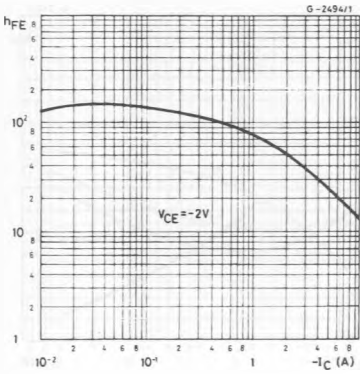
Safe Operating Areas.



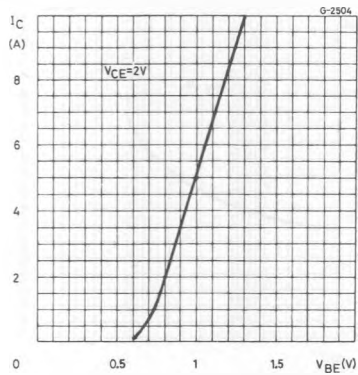
DC Current Gain (NPN types).



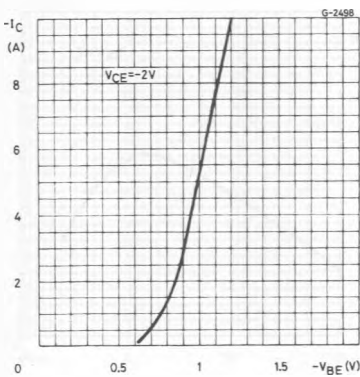
DC Current Gain (PNP types).



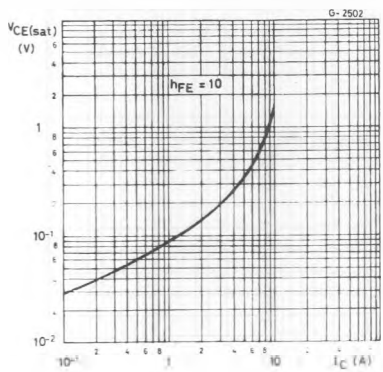
DC Transconductance (NPN types).



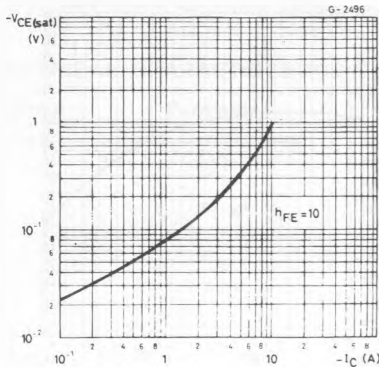
DC Transconductance (PNP types).



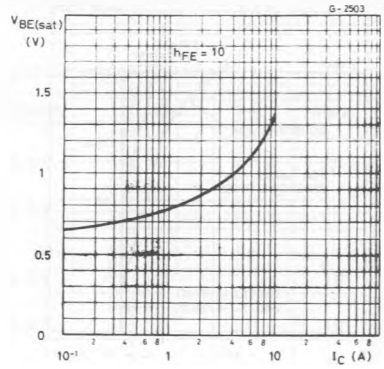
Collector-emitter Saturation Voltage (NPN types).



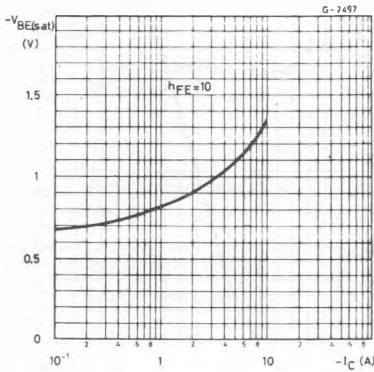
Collector-emitter Saturation Voltage (PNP types).



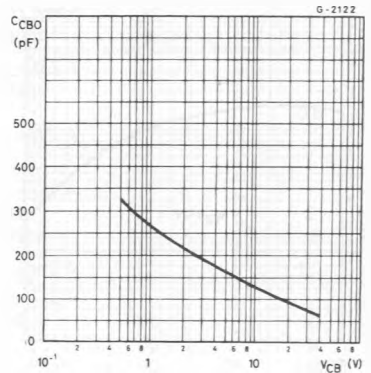
Base-emitter Saturation Voltage (NPN types).



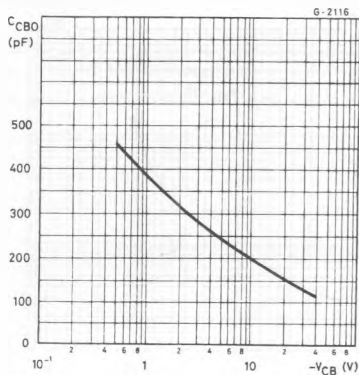
Base-emitter Saturation Voltage (PNP types).



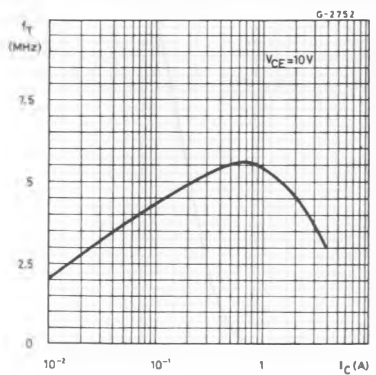
Collector-base Capacitance (NPN types).



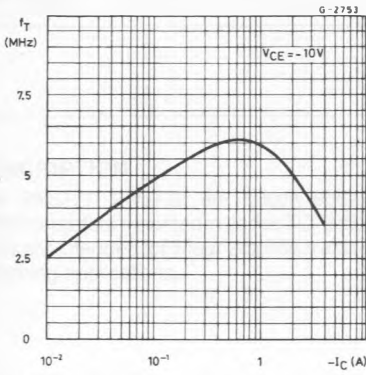
Collector-base Capacitance (PNP types).



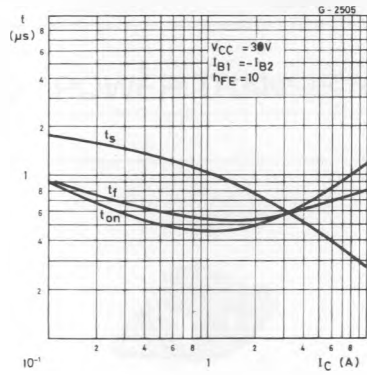
Transition Frequency (NPN types).



Transition Frequency (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).

