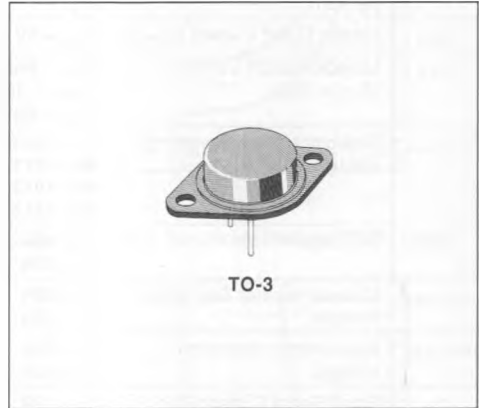


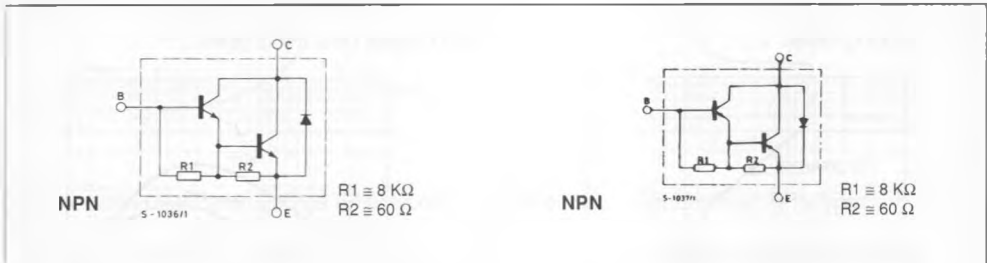
## COMPLEMENTARY POWER DARLINGTONS

### DESCRIPTION

The MJ11011/12/13/14/15/16 are epitaxial-base silicon transistors in monolithic Darlington configuration in Jedec TO-3 metal case. They are intended for general purpose and amplifier applications.



### INTERNAL SCHEMATIC DIAGRAMS



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	PNP NPN	Value			Unit
			MJ11011 MJ11012	MJ11013 MJ11014	MJ11015 MJ11016	
$V_{CE0}$	Collector-emitter Voltage ( $I_B = 0$ )		60	90	120	V
$V_{CBO}$	Collector-base Voltage ( $I_E = 0$ )		60	90	120	V
$V_{EBO}$	Base-emitter Voltage ( $I_C = 0$ )		5			V
$I_C$	Collector Current		30			A
$I_B$	Base Current		1			A
$P_{T01}$	Total Power Dissipation at $T_{case} \leq 25^\circ\text{C}$		200			W
$T_{stg}$	Storage Temperature		- 65 to 200			$^\circ\text{C}$
$T_j$	Junction Temperature		200			$^\circ\text{C}$

For PNP types voltage and current values are negative.

**THERMAL DATA**

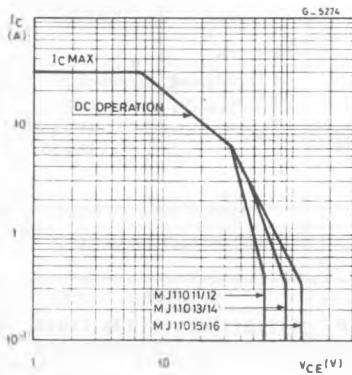
$R_{th(j-case)}$	Thermal Resistance Junction-case	Max	0.87	°C/W
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**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25^{\circ}C$  unless otherwise specified)

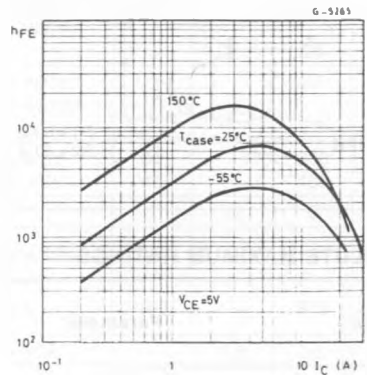
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CEO}$	Collector Cutoff Current ( $I_B = 0$ )	$V_{CE} = 50V$			1	mA
$I_{EBO}$	Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = 5V$			5	mA
$I_{CER}$	Collector Cutoff Current ( $R_{BE} = 1K\Omega$ )	$V_{CE} = \text{Rated } V_{CEO}$ $T_{case} = 150^{\circ}C$ $V_{CE} = \text{Rated } V_{CEO}$			1 5	mA
$V_{CE0(BUS)}$ *	Collector-emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100mA$ <b>MJ11011, MJ11012</b> <b>MJ11013, MJ11014</b> <b>MJ11015, MJ11016</b>	60 90 120			V V V
$h_{FE}$ *	DC Current Gain	$I_C = 20A$ $V_{CE} = 5V$ $I_C = 30A$ $V_{CE} = 5V$	1000 200			
$V_{CE(sat)}$ *	Collector-emitter Saturation Voltage	$I_C = 20A$ $I_B = 200mA$ $I_C = 30A$ $I_B = 300mA$			3 4	V V
$V_{BE(sat)}$ *	Base-emitter Saturation Voltage	$I_C = 20A$ $I_B = 200mA$ $I_C = 30A$ $I_B = 300mA$			3.5 5	V V
$h_{fB}$	Small Signal Current Gain	$I_C = 10A$ $V_{CE} = 3V$ $f = 1MHz$	4			

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

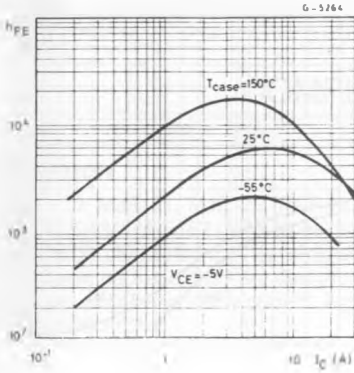
**Safe Operating Areas.**



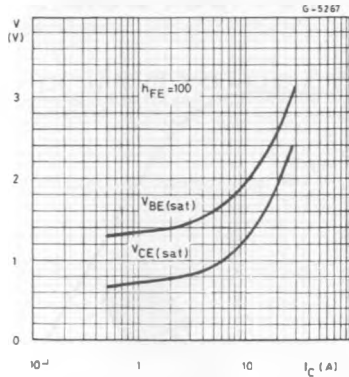
**DC Current Gain (NPN types).**



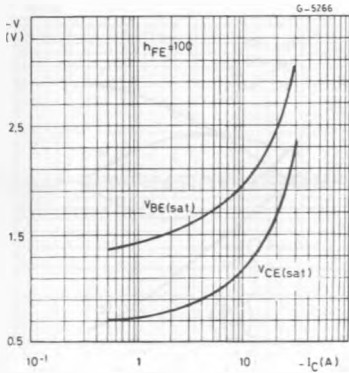
DC Current Gain (PNP types).



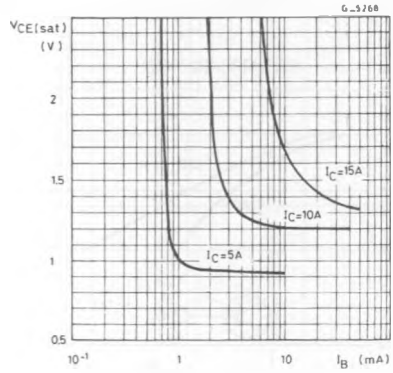
Saturation Voltages (NPN types).



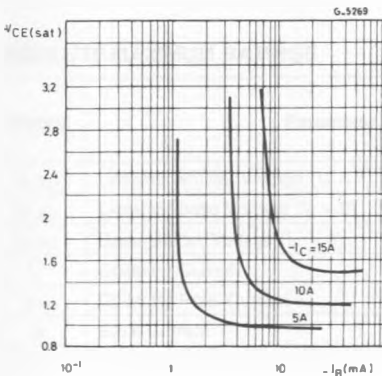
Saturation Voltages (PNP types).



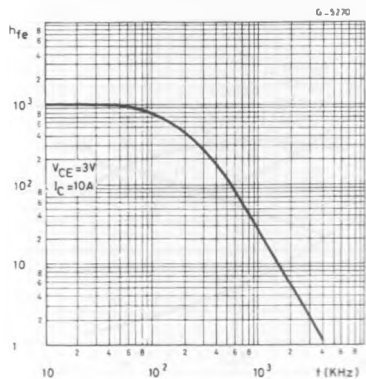
Collector-emitter Saturation Voltage (NPN types).



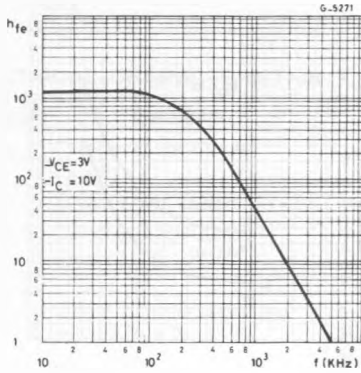
Collector-emitter Saturation Voltage (PNP types).



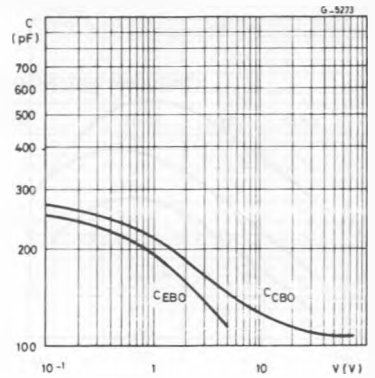
Small Signal Current Gain (NPN types).



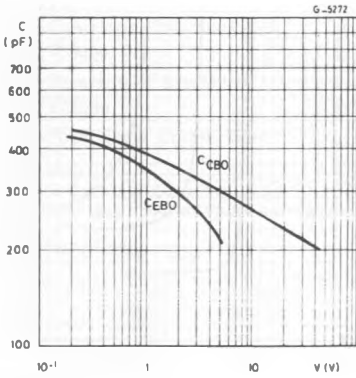
Small Signal Current Gain (PNP types).



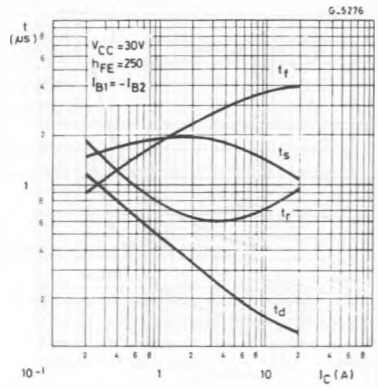
Capacitances (NPN types).



Capacitances (PNP types).



Saturated Switching Times (NPN types).



Saturated Switching Times (PNP types).

