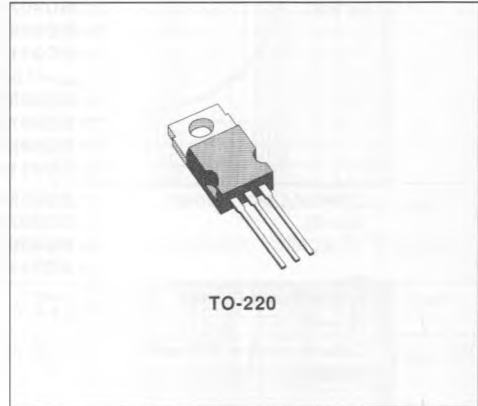


## POWER LINEAR AND SWITCHING APPLICATIONS

### DESCRIPTION

The BD905, BD907, BD909, BD911 are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package. They are intended for use in power linear and switching applications.

The complementary PNP types are the BD906, BD908, BD910 and BD912 respectively.



### INTERNAL SCHEMATIC DIAGRAMS



### ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value				Unit
			BD905 BD906	BD907 BD908	BD909 BD910	BD911 BD912	
$V_{CE0}$	Collector-emitter Voltage ( $I_E = 0$ )		45	60	80	100	V
$V_{CE0}$	Collector-emitter Voltage ( $I_B = 0$ )		45	60	80	100	V
$V_{EB0}$	Emitter-base Voltage ( $I_C = 0$ )		5				V
$I_E, I_C$	Emitter and Collector Current		15				A
$I_B$	Base Current		5				A
$P_{Tot}$	Total Power Dissipation at $T_{case} \leq 25^\circ C$		90				W
$T_{Stg}$	Storage Temperature		- 65 to 150				$^\circ C$
$T_j$	Junction Temperature		150				$^\circ C$

\* For PNP types voltage and current values are negative.

**THERMAL DATA**

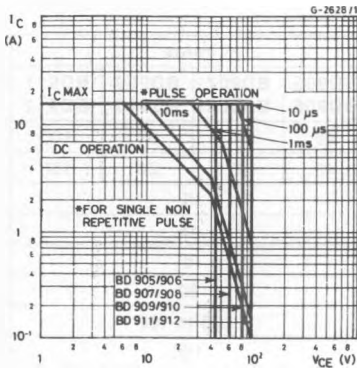
$R_{th(j-cas)}$	Thermal Resistance Junction-case	Max	1.4	°C/W
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**ELECTRICAL CHARACTERISTICS** ( $T_{case} = 25\text{ °C}$  unless otherwise specified)

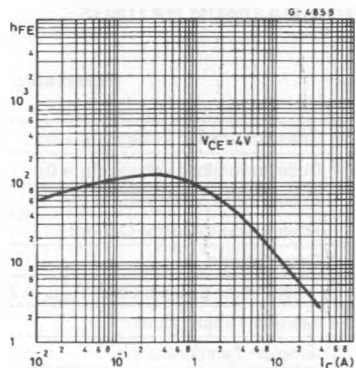
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	for <b>BD905/906</b> $V_{CB} = 45\text{ V}$ for <b>BD907/908</b> $V_{CB} = 60\text{ V}$ for <b>BD909/910</b> $V_{CB} = 80\text{ V}$ for <b>BD911/912</b> $V_{CB} = 100\text{ V}$ $T_{case} = 150\text{ °C}$ for <b>BD905/906</b> $V_{CB} = 45\text{ V}$ for <b>BD907/908</b> $V_{CB} = 60\text{ V}$ for <b>BD909/910</b> $V_{CB} = 80\text{ V}$ for <b>BD911/912</b> $V_{CB} = 100\text{ V}$			500 500 500 500 5 5 5 5	$\mu\text{A}$ $\mu\text{A}$ $\mu\text{A}$ $\mu\text{A}$ mA mA mA mA
$I_{CEO}$	Collector Cutoff Current ( $I_B = 0$ )	for <b>BD905/906</b> $V_{CE} = 30\text{ V}$ for <b>BD907/908</b> $V_{CE} = 30\text{ V}$ for <b>BD909/910</b> $V_{CE} = 40\text{ V}$ for <b>BD911/912</b> $V_{CE} = 50\text{ V}$			1 1 1 1	mA mA mA mA
$I_{EBO}$	Emitter Cutoff Current ( $I_C = 0$ )	$V_{EB} = 5\text{ V}$			1	mA
$V_{CE0(sus)}$ *	Collector-emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 100\text{ mA}$	for <b>BD905/906</b> for <b>BD907/908</b> for <b>BD909/910</b> for <b>BD911/912</b>	45 60 80 100		V V V V
$V_{CE(sat)}$ *	Collector-emitter Saturation Voltage	$I_C = 5\text{ A}$ $I_C = 10\text{ A}$	$I_B = 0.5\text{ A}$ $I_B = 2.5\text{ A}$		1 3	V V
$V_{BE(sat)}$ *	Base-emitter Saturation Voltage	$I_C = 10\text{ A}$	$I_B = 2.5\text{ A}$		2.5	V
$V_{BE}$ *	Base-emitter Voltage	$I_C = 5\text{ A}$	$V_{CE} = 4\text{ V}$		1.5	V
$h_{FE}$ *	DC Current Gain	$I_C = 0.5\text{ A}$ $I_C = 5\text{ A}$ $I_C = 10\text{ A}$	$V_{CE} = 4\text{ V}$ $V_{CE} = 4\text{ V}$ $V_{CE} = 4\text{ V}$	40 15 5	250 150	
$f_T$	Transition Frequency	$I_C = 0.5\text{ A}$	$V_{CE} = 4\text{ V}$	3		MHz

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

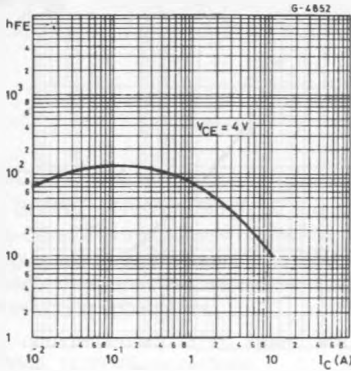
**Safe Operating Areas.**



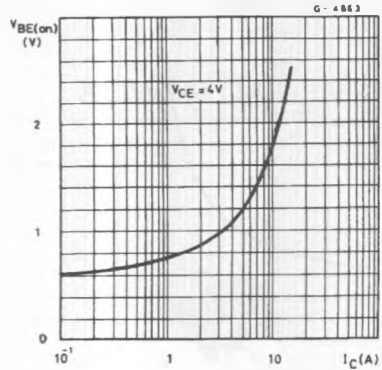
**DC Current Gain (NPN types).**



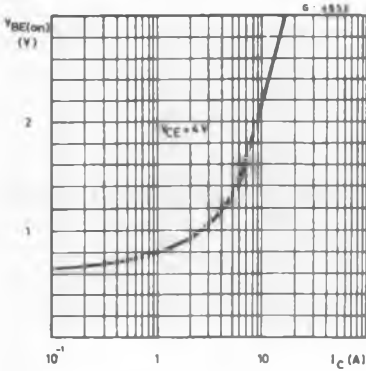
DC Current Gain (PNP types).



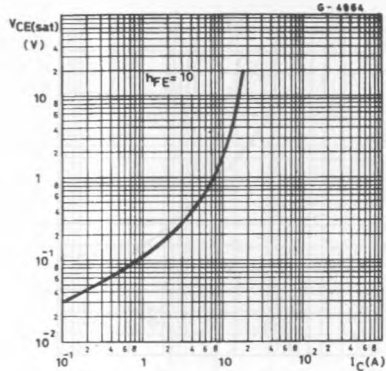
DC Transconductance (NPN types).



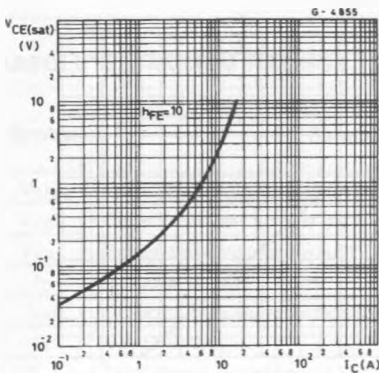
DC Transconductance (PNP types).



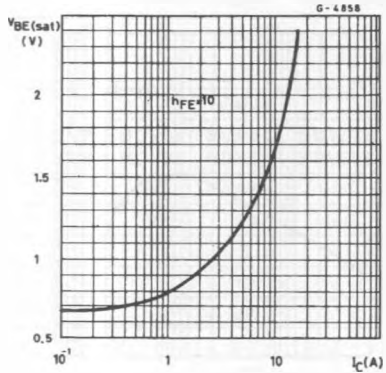
Collector-emitter Saturation Voltage (NPN types).



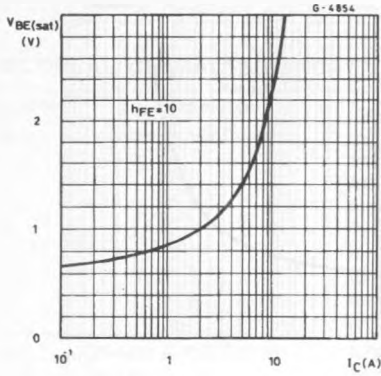
Collector-emitter Saturation Voltage (PNP types).



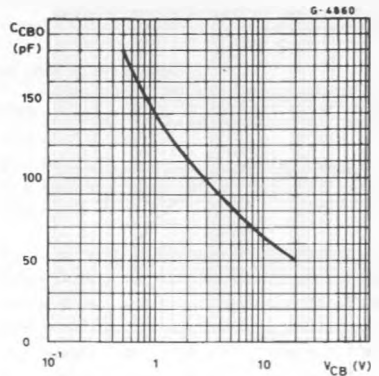
Base-emitter Saturation Voltage (NPN types).



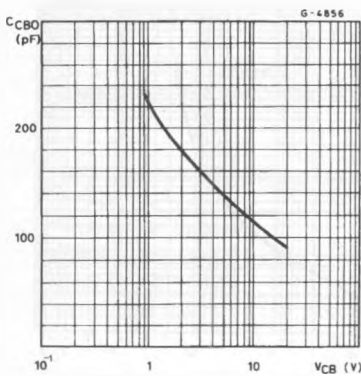
Base-emitter Saturation Voltage (PNP types).



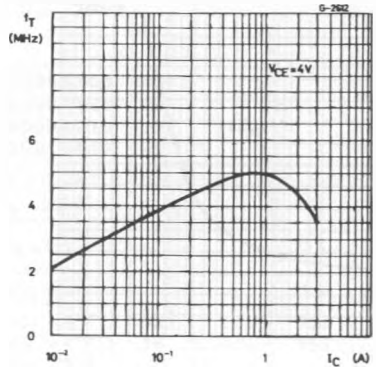
Collector-base Capacitance (NPN types).



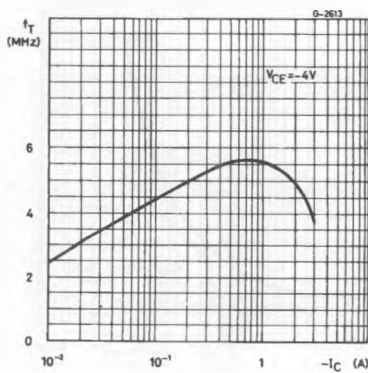
Collector-base Capacitance (PNP types).



Transition Frequency (NPN types).



Transition Frequency (PNP types).



Power Rating Chart.

