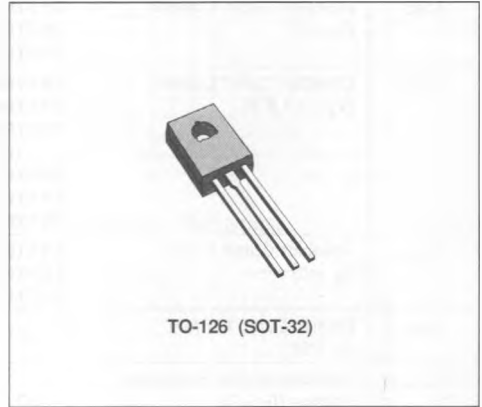




MEDIUM POWER LINEAR AND SWITCHING APPLICATIONS

DESCRIPTION

The 2N5190, 2N5191, 2N5192 are silicon epitaxial-base NPN power transistors in Jedec TO-126 plastic package, intended for use in medium power linear and switching applications. The complementary PNP types are the 2N5193, 2N5194 and 2N5195 respectively.



INTERNAL SCHEMATIC DIAGRAMS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	2N5190 2N5193	2N5191 2N5194	2N5192 2N5195	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)		40	60	80	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)		40	60	80	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)			5		V
I_C	Collector Current			4		A
I_{CM}	Collector Peak Current ($t \leq 10$ ms)			7		A
I_B	Base Current			1		A
P_{TOT}	Total Power Dissipation at $T_{case} \leq 25$ °C			40		W
T_{stg}	Storage Temperature			- 65 to 150		°C
T_j	Junction Temperature			150		°C

* For PNP types voltage and current values are negative.

THERMAL DATA

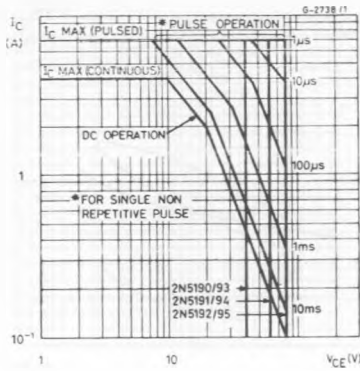
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	3.12	$^{\circ}C/W$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	100	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

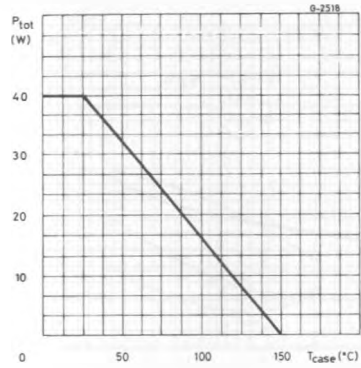
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for 2N5190/93 $V_{CB} = 40\ V$ for 2N5191/94 $V_{CB} = 60\ V$ for 2N5192/95 $V_{CB} = 80\ V$			100 100 100	μA μA μA
I_{CEX}	Collector Cutoff Current ($V_{EB} = 1.5\ V$)	for 2N5190/93 $V_{CE} = 40\ V$ for 2N5191/94 $V_{CE} = 60\ V$ for 2N5192/95 $V_{CE} = 80\ V$ $T_{case} = 125^{\circ}C$ for 2N5190/93 $V_{CE} = 40\ V$ for 2N5191/94 $V_{CE} = 60\ V$ for 2N5192/95 $V_{CE} = 80\ V$			100 100 100 2 2 2	μA μA μA mA mA mA
I_{CEO}	Collector Cutoff Current ($I_B = 0$)	for 2N5190/93 $V_{CE} = 40\ V$ for 2N5191/94 $V_{CE} = 60\ V$ for 2N5192/95 $V_{CE} = 80\ V$			1 1 1	mA mA mA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\ V$			1	mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage ($I_B = 0$)	$I_C = 100\ mA$ for 2N5190/93 for 2N5191/94 for 2N5192/95	40 60 80			V V V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 1.5\ A$ $I_B = 0.15\ A$ $I_C = 4\ A$ $I_B = 1\ A$ for 2N5190/91/92 for 2N5193/94/95			0.6 1.4 1.2	V V V
V_{BE}^*	Base-emitter Voltage	$I_C = 1.5\ A$ $V_{CE} = 2\ V$			1.2	V
h_{FE}^*	DC Current Gain	$I_C = 1.5\ A$ $V_{CE} = 2\ V$ for 2N5190/93 for 2N5191/94 for 2N5192/95 $I_C = 4\ A$ $V_{CE} = 2\ V$ for 2N5190/93 for 2N5191/94 for 2N5192/95	25 25 20 10 10 7		100 100 80	
f_T	Transistion Frequency	$I_C = 1\ A$ $V_{CE} = 10\ V$	2			MHz

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

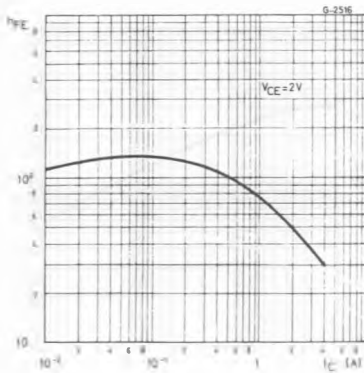
Safe Operating Areas.



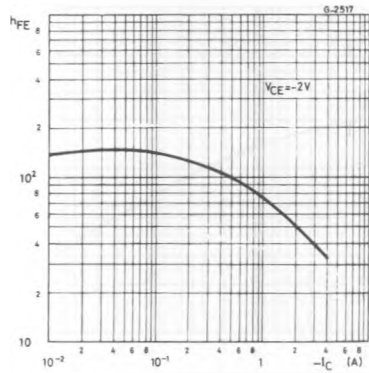
Power Rating Chart.



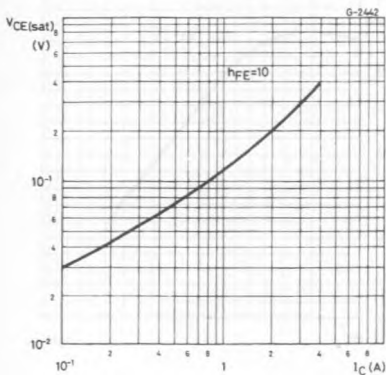
DC Current Gain (NPN types).



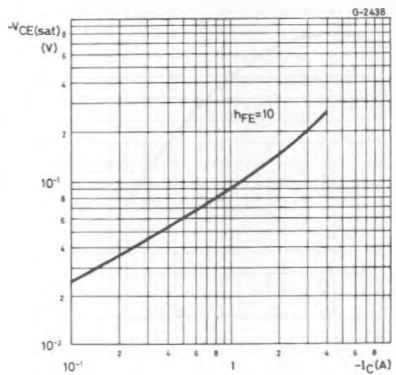
DC Current Gain (PNP types).



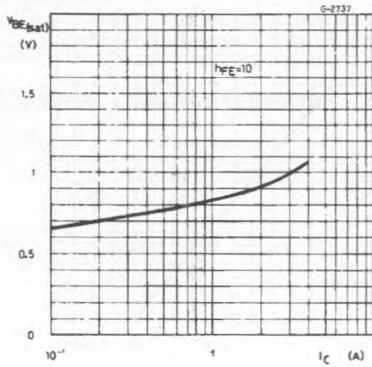
Collector-emitter Saturation Voltage (NPN types).



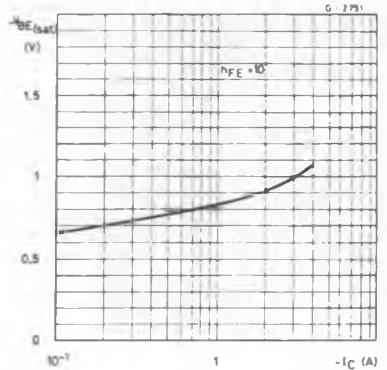
Collector-emitter Saturation Voltage (PNP types).



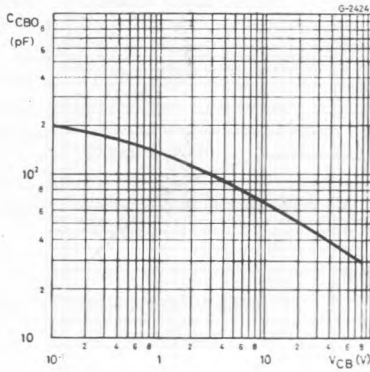
Base-emitter Saturation Voltage (NPN types).



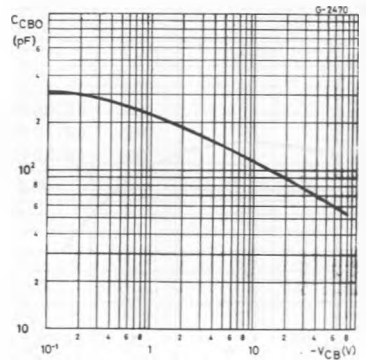
Base-emitter Saturation Voltage (PNP types).



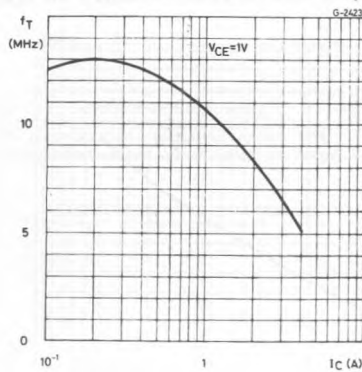
Collector-base Capacitance (NPN types).



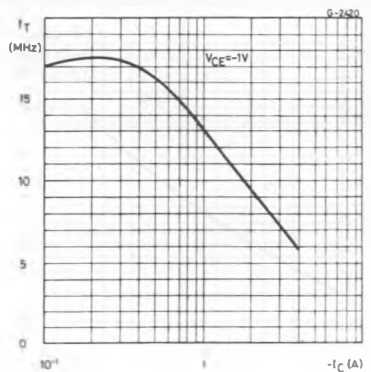
Collector-base Capacitance (PNP types).



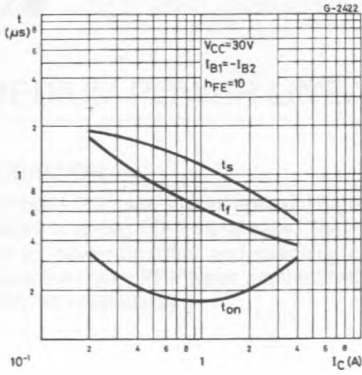
Transition Frequency (NPN types).



Transition Frequency (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).

