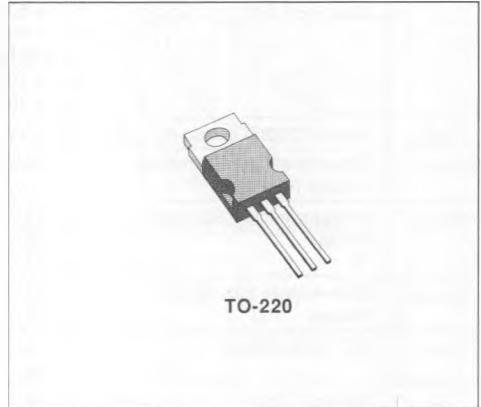




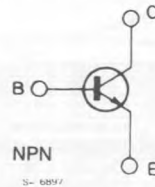
HIGH VOLTAGE POWER SWITCH

DESCRIPTION

The MJE13004/13005 are silicon multi-epitaxial mesa NPN transistors in Jedec TO-220 plastic package particularly intended for switch-mode applications.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		MJE13004	MJE13005	
V_{CEV}	Collector-emitter Voltage	600	700	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	300	400	V
V_{EBO}	Emitter-base ($I_C = 0$)	9		V
I_C	Collector Current	4		A
I_{CM}	Collector Peak Current	8		A
I_B	Base Current	2		A
I_{BM}	Base Peak Current	4		A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25^\circ C$	75		W
T_{stg}	Storage Temperature	- 65 to 150		$^\circ C$
T_j	Junction Temperature	150		$^\circ C$

THERMAL DATA

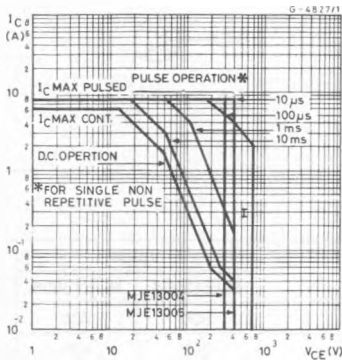
$R_{th(j-case)}$	Thermal Resistance Junction-case	max	1.67	°C/W
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ELECTRICAL CHARACTERISTICS($T_{case} = 25^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CEV}	Collector Cutoff Current ($V_{BE} = -1.5V$)	for MJE13004			1	mA
		$V_{CE} = 600V$			5	mA
		$V_{CE} = 600V$ $T_{case} = 100^{\circ}C$				
		for MJE13005			1	mA
I_{CEV}		$V_{CE} = 700V$			5	mA
		$V_{CE} = 700V$ $T_{case} = 100^{\circ}C$				
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 9V$			1	mA
$V_{CEO(sus)}^*$	Collector-emitter Sustaining Voltage ($I_B = 0$)	$I_C = 10mA$	for MJE13004	300		V
			for MJE13005	400		V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 1A$	$I_B = 0.2A$		0.5	V
		$I_C = 2A$	$I_B = 0.5A$		0.6	V
		$I_C = 4A$	$I_B = 1A$		1	V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 1A$	$I_B = 0.2A$		1.2	V
		$I_C = 2A$	$I_B = 0.5A$		1.6	V
h_{FE}	DC Current Gain	$I_C = 1A$	$V_{CE} = 5V$	10	30	60
		$I_C = 2A$	$V_{CE} = 5V$	8		40
t_{on}	Turn-on Time	$I_C = 2A$			0.8	μs
t_s	Storage Time	$I_{B1} = -I_{B2} = 0.4A$			4	μs
t_f	Fall Time	$V_{CC} = 250V$			0.9	μs

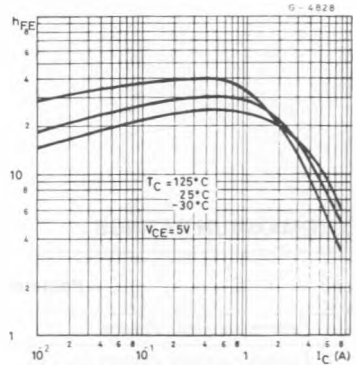
* Pulsed : pulse duration = 300 μs , duty cycle = 1.5%.

Safe Operating Areas.

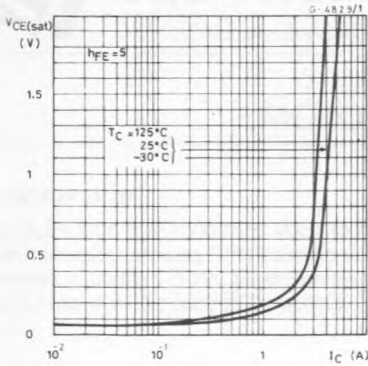


1 - Area of permissible operation during turn-on provided $R_{th} < 100\Omega$ and $t_p < 0.25\mu s$.

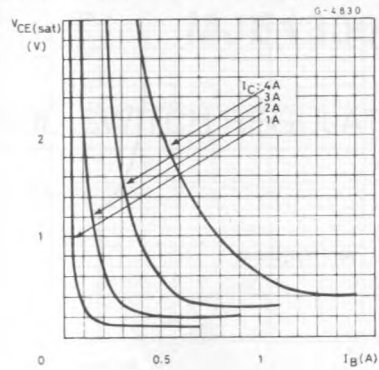
DC Current Gain.



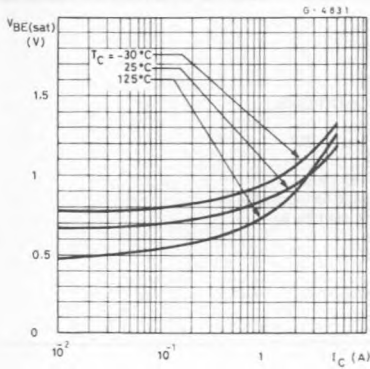
Collector-emitter Saturation Voltage.



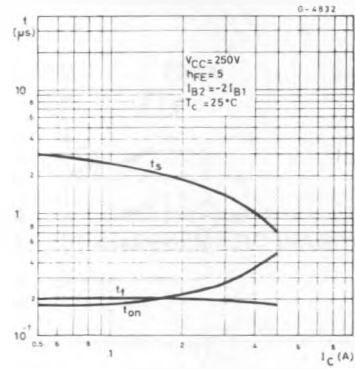
Collector-emitter Saturation Voltage.



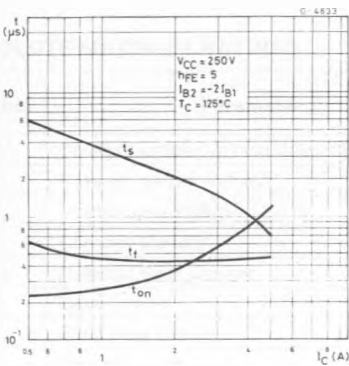
Base-emitter Saturation Voltage.



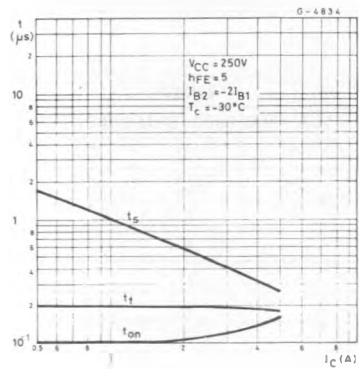
Saturated Switching Characteristics.



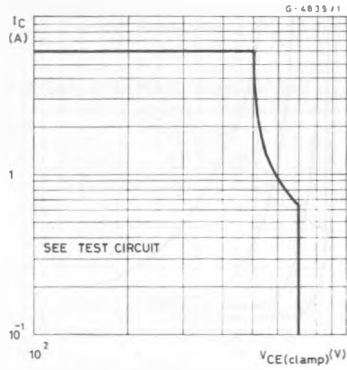
Saturated Switching Characteristics.



Saturated Switching Characteristics.



Clamped Reverse bias Safe Operating Areas.



Clamped $E_{S/b}$ Test Circuit.

