

SWITCHMODE SERIES NPN SILICON POWER TRANSISTORS

The MJE13070 and MJE13071 transistors are designed for high-voltage, high-speed, power switching in inductive circuits, where fall time is critical. They are particularly suited for line-operated switchmode applications such as switching regulator's, inverters, DC -DC converter, Motor Controls, Solenoid drive and Deflection circuits.

FEATURES:

*Collector-Emitter Sustaining Voltage-

$V_{CE(sus)} = 400\text{ V and }450\text{ V}$

* Collector-Emitter Saturation Voltage -

$V_{CE(sat)} = 3.0\text{ V (Max.) @ }I_C = 5.0\text{ A, }I_B = 1.0\text{ A}$

* Switching Time - $t_f = 0.5\text{ us (Max.) @ }I_C = 3.0\text{ A}$

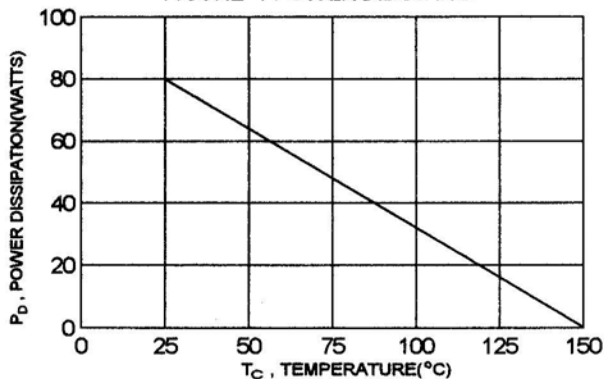
MAXIMUM RATINGS

Characteristic	Symbol	MJE13070	MJE13071	Unit
Collector-Emitter Voltage	V_{CEO}	400	450	V
Collector-Emitter Voltage	V_{CEV}	650	750	V
Emitter-Base Voltage	V_{EBO}	6		V
Collector Current - Continuous	I_C	5		A
Collector Current - Peak	I_{CM}	8		A
Base current	I_B	2		A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	80	0.64	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.56	$^\circ\text{C/W}$

FIGURE -1 POWER DERATING

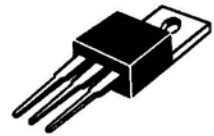


NPN

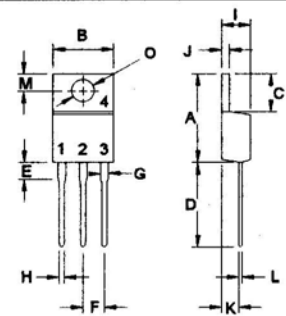
**MJE13070
MJE13071**

5 AMPERE

**POWER
TRANSISTORS
400-450 VOLTS
80 WATTS**



TO-220



PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.00
B	9.78	10.42
C	5.02	6.60
D	13.00	14.62
E	3.10	4.19
F	2.41	2.67
G	1.10	1.67
H	0.69	1.01
I	3.21	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.48	3.00
O	3.50	4.00

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage ($I_C = 100\text{ mA}$, $I_B = 0$) MJE13070 MJE13071	$V_{CEO(sus)}$	400 450		V
Collector Cutoff Current ($V_{CEV} = \text{Rated Value}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CEV} = \text{Rated Value}$, $V_{BE(off)} = 1.5\text{ V}$, $T_C = 100^\circ\text{C}$)	I_{CEV}		0.5 2.5	mA
Emitter Cutoff Current ($V_{EB} = 6.0\text{ V}$, $I_C = 0$)	I_{EBO}		1.0	mA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 3.0\text{ A}$, $V_{CE} = 5.0\text{ V}$)	h_{FE}	8.0		
Collector-Emitter Saturation Voltage ($I_C = 3.0\text{ A}$, $I_B = 0.6\text{ A}$) ($I_C = 5.0\text{ A}$, $I_B = 1.0\text{ A}$) ($I_C = 3.0\text{ A}$, $I_B = 0.6\text{ A}$, $T_C = 100^\circ\text{C}$)	$V_{CE(sat)}$		1.0 3.0 2.0	V
Base-Emitter Saturation Voltage ($I_C = 3.0\text{ A}$, $I_B = 0.6\text{ A}$) ($I_C = 3.0\text{ A}$, $I_B = 0.6\text{ A}$, $T_C = 100^\circ\text{C}$)	$V_{BE(sat)}$		1.5 1.5	V

DYNAMIC CHARACTERISTICS

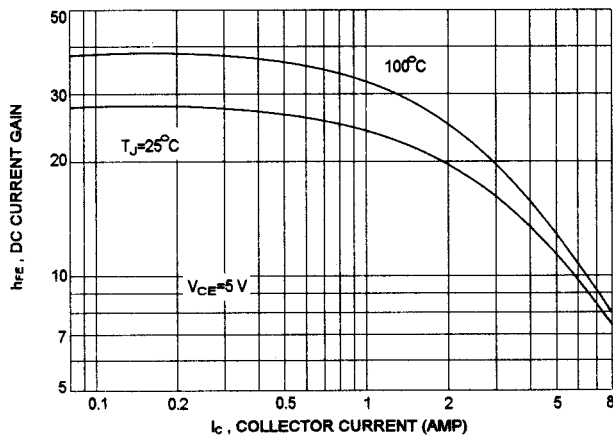
Output Capacitance ($V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 1.0\text{ kHz}$)	C_{ob}		250	pF
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SWITCHING CHARACTERISTICS

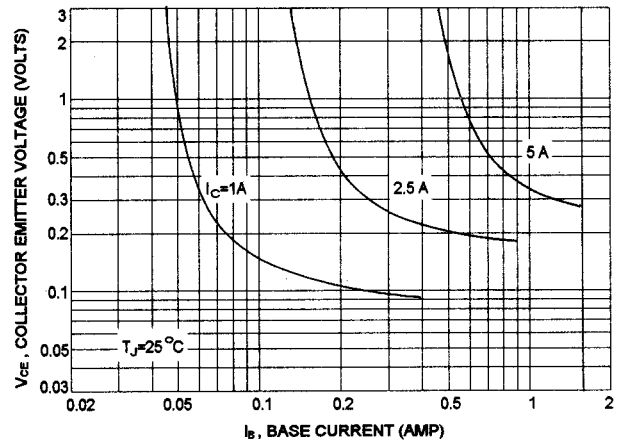
Delay Time	$V_{CC} = 250\text{ V}$, $I_C = 3.0\text{ A}$ $I_{B1} = 0.4\text{ A}$, $V_{BE(off)} = 5\text{ V}$ $t_p = 30\text{ us}$, Duty Cycle $\leq 1.0\%$	t_d		0.05	us
Rise Time		t_r		0.40	us
Storage Time		t_s		1.50	us
Fall Time		t_f		0.50	us

(1) Pulse Test: Pulse Width = 300 us, Duty Cycle $\leq 2.0\%$

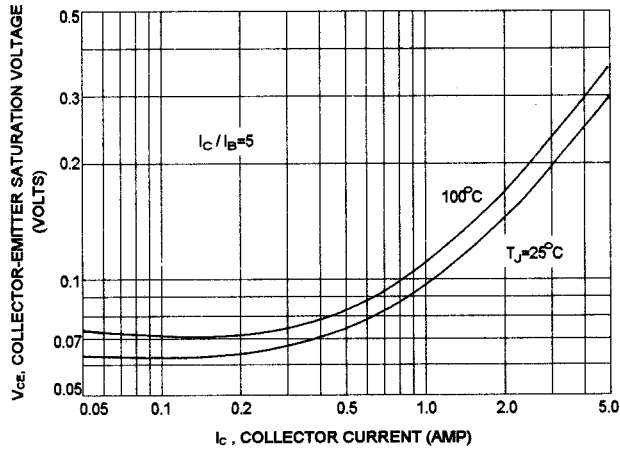
DC CURRENT GAIN



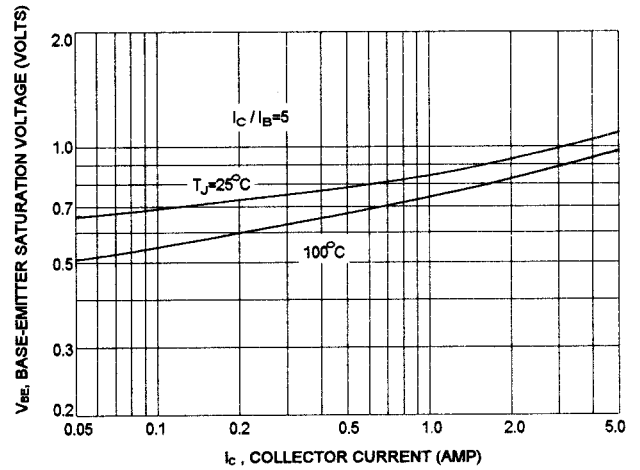
COLLECTOR SATURATION REGION



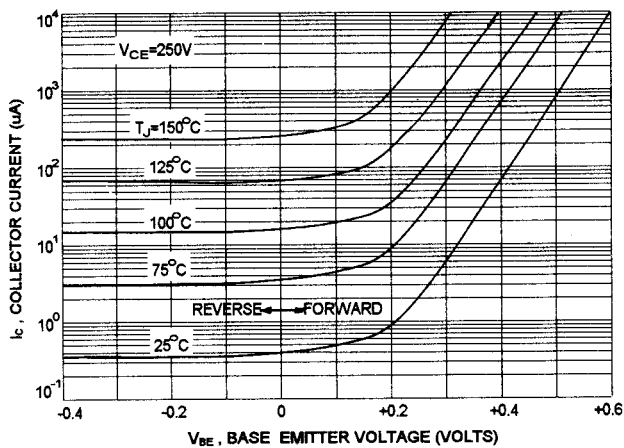
COLLECTOR-EMITTER SATURATION VOLTAGE



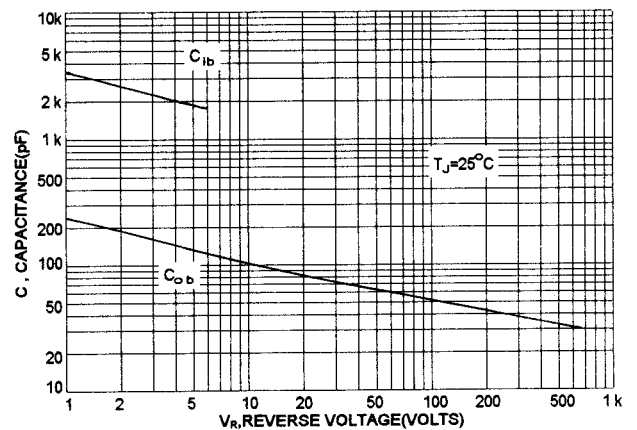
BASE-EMITTER SATURATION VOLTAGE



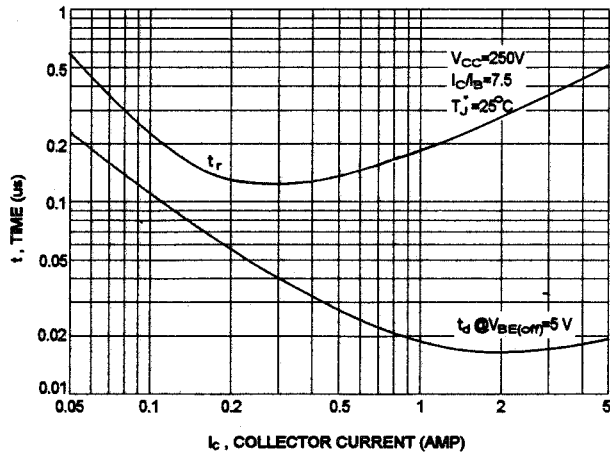
COLLECTOR CUT-OFF REGION



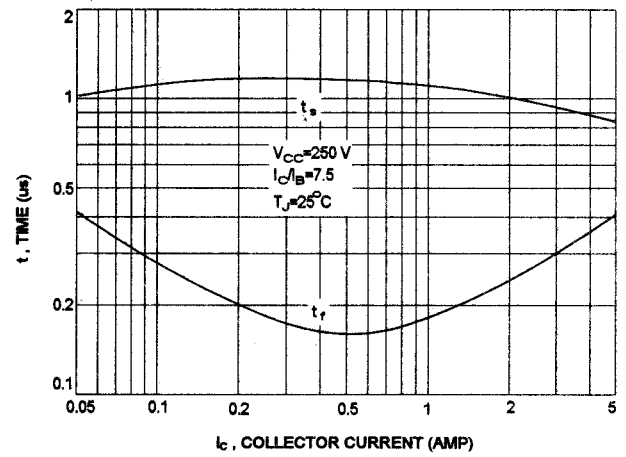
CAPACITANCE



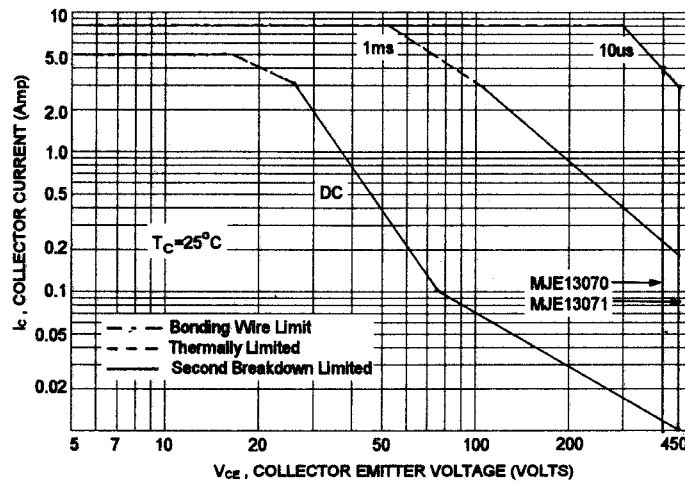
TURN-ON TIME



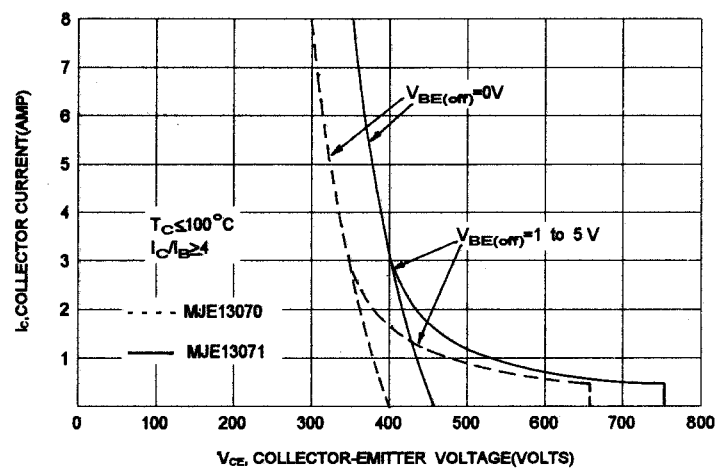
TURN-OFF TIME



ACTIVE REGION SAFE OPERATING AREA



REVERSE BIAS SWITCHING SAFE OPERATING AREA



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