MOSPEC

SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage,high-speed,power switching in inductive circuit, they are particularly suited for 115 and 220 V switchmode applications such as switching regulator's,inverters,DC -DC conveter,Motor Controls, Solenoid drive and Deflection circuits.

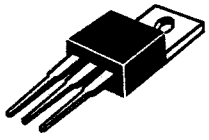
NPN

MJE13008
MJE13009

12 AMPERE
POWER
TRANASISTORS
300-400 VOLTS
100 WATTS

FEATURES:

*Collector-Emitter Sustaining Voltage-
$V_{CEO(SUS)}$ = 400 V and 300 V
* Collector-Emitter Saturation Voltage -
$V_{CE(sat)}$ = 3.0 V (Max.) @ I_C = 12 A, I_B = 3.0 A
* Switching Time - t_f =0.7 us (Max.) @ I_C =8.0 A
* SOA and Switching Aplication Information.



O-220

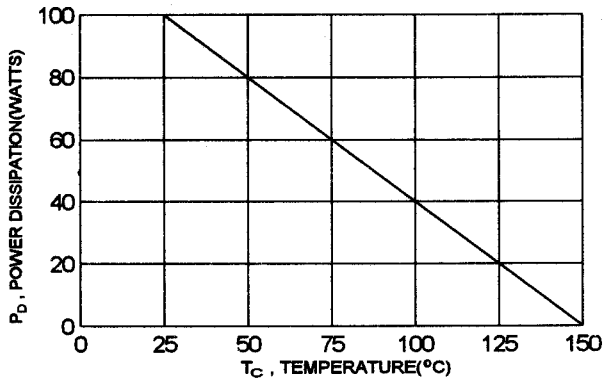
MAXIMUM RATINGS

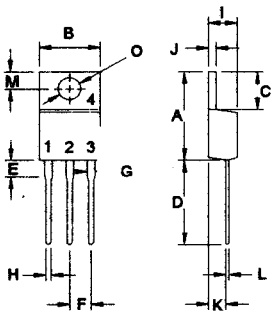
Characteristic	Symbol	MJE13008	MJE13009	Unit
Collector-Emitter Voltage	V_{CEO}	300	400	V
Collector-Emitter Voltage	V_{CEV}	600	700	V
Emitter-Base Voltage	V_{EBO}	9		V
Collector Current - Continuous - Peak	I_C I_{CM}	12 24		A
Base current	I_B	6		A
Total Power Dissipation @T_C = 25°C Derate above 25°C	P_D	100 0.8		W W/°C
Operating and Storage Junction Temperature Range	T_J , T_{STG}	-65 to +150		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	1.25	°C/W

FIGURE -1 POWER DERATING





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

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

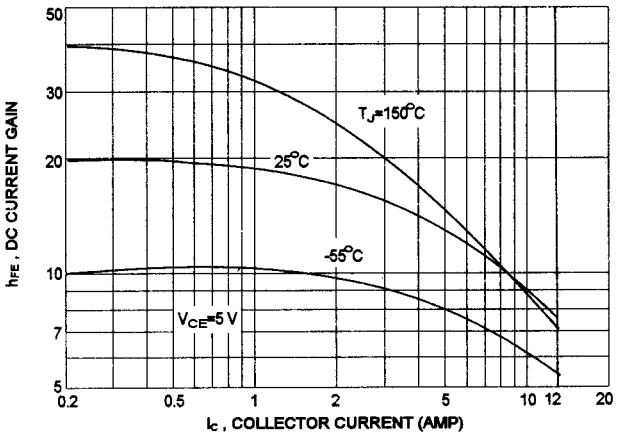
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Sustaining Voltage (I_C= 10 mA, I_B= 0) MJE13008 MJE13009	$V_{CEO(sus)}$	300 400		V
Collector Cutoff Current (V_{CEV}= Rated Value, $V_{BE(off)}$=1.5 V) (V_{CEV}= Rated Value, $V_{BE(off)}$=1.5 V , T_C=100 °C)	I_{CEV}		1.0 5.0	mA
Emitter Cutoff Current (V_{EB}= 9.0 V, I_C= 0)	I_{EBO}		1.0	mA
ON CHARACTERISTICS (1)				
DC Current Gain (I_C= 5.0 A, V_{CE}= 5.0 V) (I_C= 8.0 A, V_{CE}= 5.0 V)	hFE	8.0 6.0	40 30	
Collector-Emitter Saturation Voltage (I_C= 5.0 A, I_B= 1.0 A) (I_C= 8.0 A, I_B= 1.6 A) (I_C= 12 A, I_B= 3.0 A)	$V_{CE(sat)}$		1.0 1.5 3.0	V
Base-Emitter Saturation Voltage (I_C= 5.0 A, I_B= 1.0 A) (I_C= 8.0 A, I_B= 1.6 A)	$V_{BE(sat)}$		1.2 1.6	V
DYNAMIC CHARACTERISTICS				
Current Gain - Bandwidth Product (I_C = 500 mA , V_{CE} = 10 V ,f = 1.0 MHz)	f_T	4.0		MHz
Output Capacitance (V_{CB} = 10 V , I_E = 0, f = 0.1 MHz)	C_{ob}	180(typ)		pF

SWITCHING CHARACTERISTICS

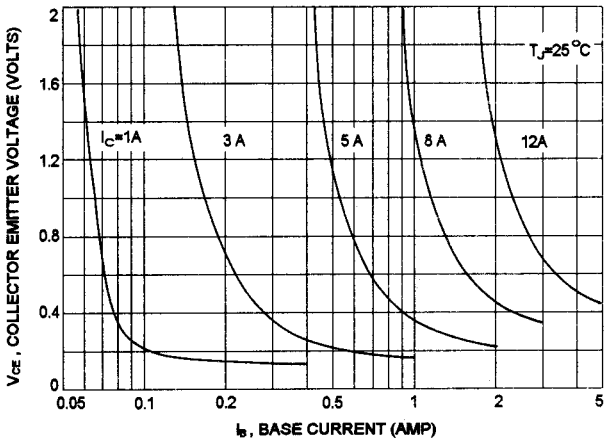
Delay Time	V_{CC} = 125 V, I_C = 8.0 A	t_d		0.1	us
Rise Time	I_{B1} = -I_{B2} =1.6A,	t_r		1.0	us
Storage Time	tp = 25 us,Duty Cycle ≦1.0%	t_s		3.0	us
Fall Time		t_f		0.7	us

(1) Pulse Test: Pulse Width =300 us,Duty Cycle ≦ 2.0%

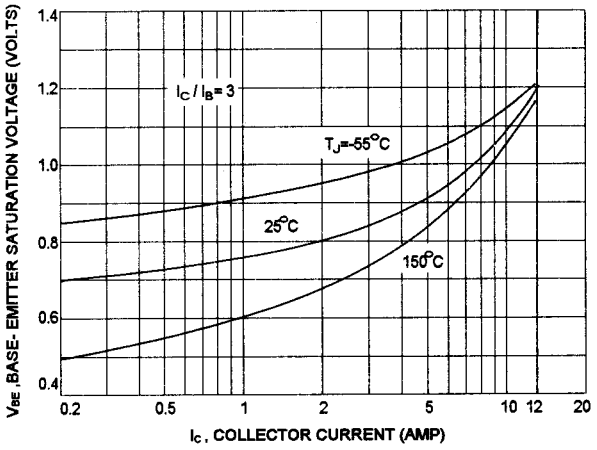
DC CURRENT GAIN



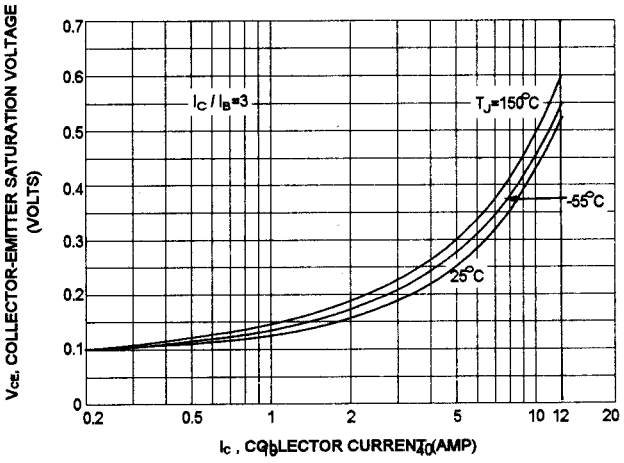
COLLECTOR SATURATION REGION



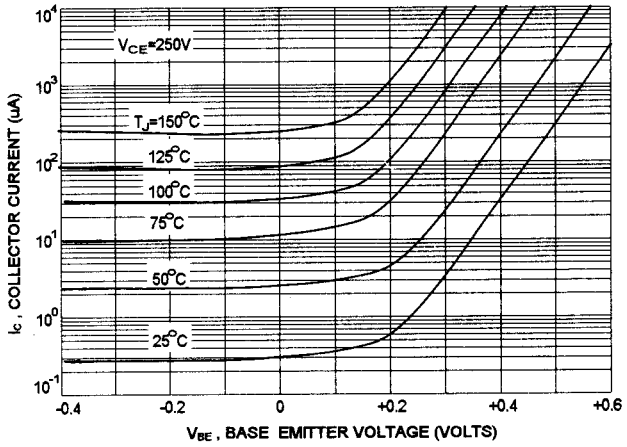
BASE-EMITTER SATURATION VOLTAGE



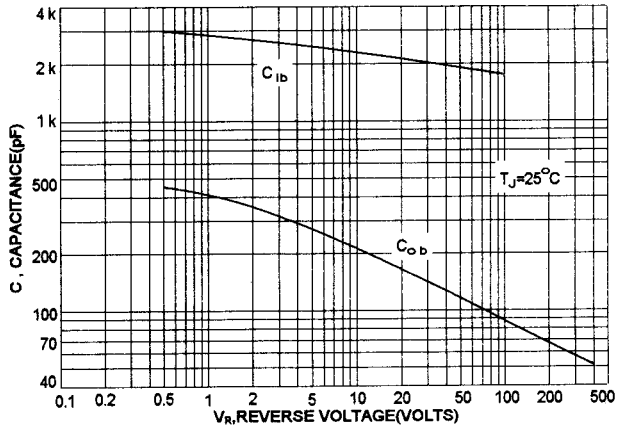
COLLECTOR-EMITTER SATURATION VOLTAGE



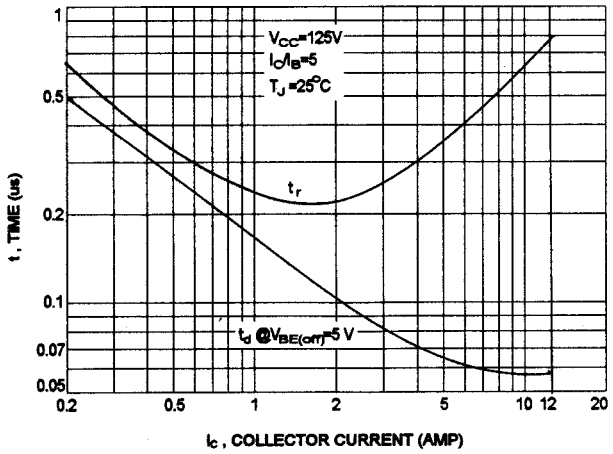
COLLECTOR CUT-OFF REGION



CAPACITANCE



TURN-ON TIME



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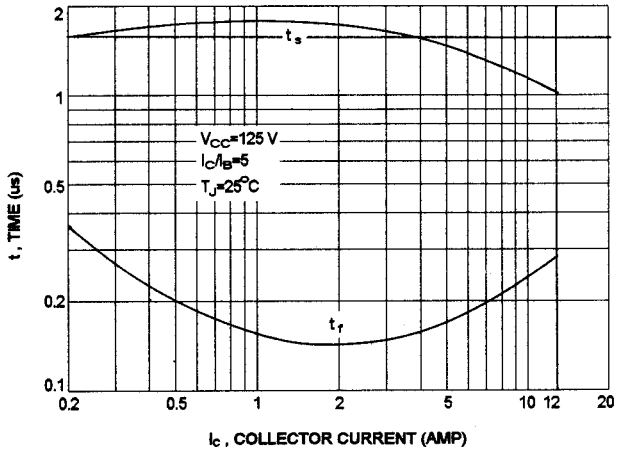
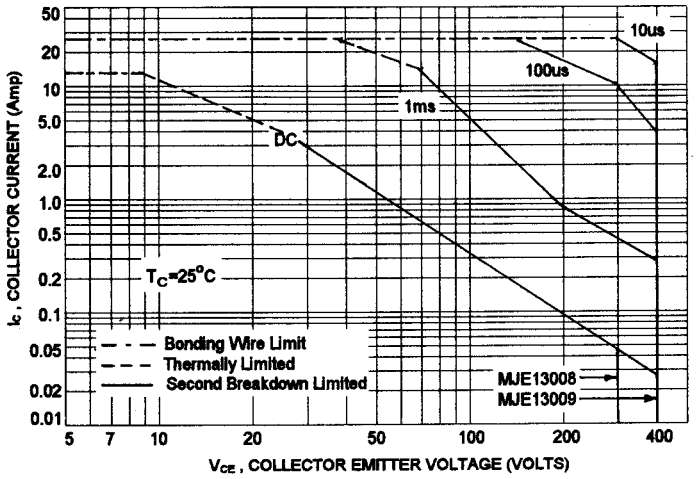
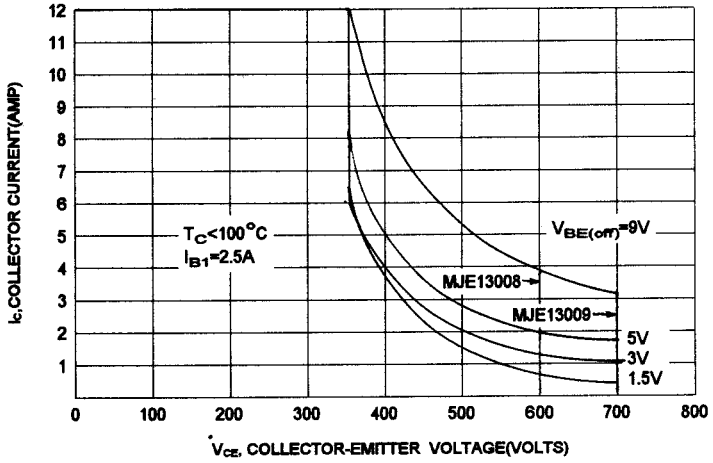


ACTIVE REGION SAFE OPERATING AREA



REVERSE BIAS SWITCHING SAFE OPERATING AREA