MOSPEC

SWITCHMODE SERIES
NPN SILICON POWER TRANSISTORS

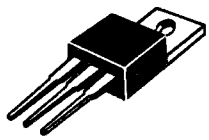
... designed for use in high-voltage,high-speed,power switching in inductive circuit, where fall time and RBSOA are critical. They are particularly well-suited for line-operated switchmode applications such as switching regulator's,inverters,Motor Controls,and Deflection circuits

NPN

MJE16002
MJE16004

5 AMPERE
POWER
TRANASISTORS
450 VOLTS
80 WATTS

FEATURES:
*Collector-Emitter Sustaining Voltage-
BV_{CEO}=450V
* Collector-Emitter Saturation Voltage -
$V_{CE(sat)}$ = 2.5 V (Max.) @ I_C = 3.0 A, I_B = 0.4A/ 0.3A
* Switching Time - t_f =0.4 us (Max.) @ I_C =3.0 A
* SOA and Switching Application Information:



TO-220

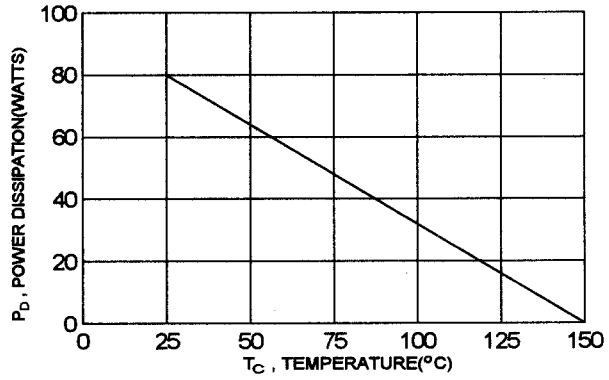
MAXIMUM RATINGS

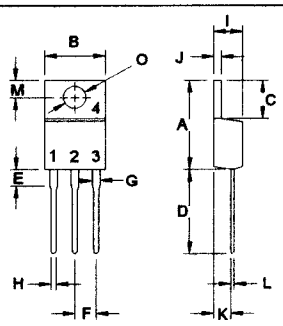
Characteristic	Symbol	MJE16002,MJE16004	Unit
Collector-Emitter Voltage	V_{CEO}	450	V
Collector-Emitter Voltage	V_{CEV}	850	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current - Continuous - Peak	I_C I_{CM}	5 10	A
Base current	I_B	4	A
Total Power Dissipation @T_C = 25°C Derate above 25°C	P_D	80 640	W mW/°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	1.56	°C/W

FIGURE -1 POWER DERATING





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

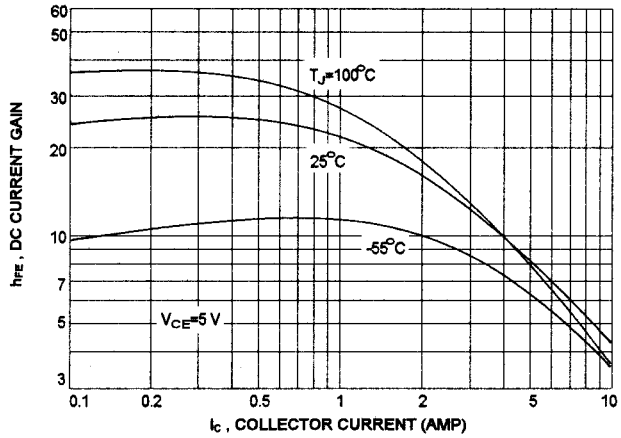
DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

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

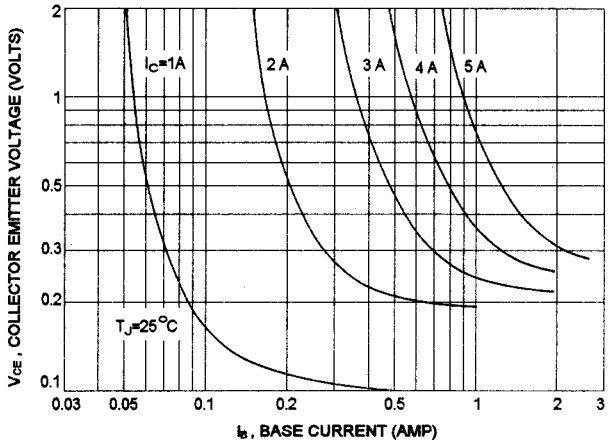
Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage (I_C= 100 mA, I_B= 0)		$V_{CEO(sus)}$	450		V
Collector Cutoff Current (V_{CEV}= Rated Value, $V_{BE(off)}$=1.5 V)		I_{CEV}		0.25	mA
(V_{CEV}= Rated Value, $V_{BE(off)}$=1.5 V , T_C=100 °C)				1.5	
Emitter Cutoff Current (V_{EB}= 6.0 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)	MJE16002	h_{FE}	5.0		
	MJE16004		7.0		
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$			V
(I_C= 1.5 A, I_B= 200 mA)	MJE16002			1.0	
(I_C= 1.5 A, I_B= 150 mA)	MJE16004			1.0	
(I_C= 3.0 A, I_B= 400 mA)	MJE16002			2.5	
(I_C= 3.0 A, I_B= 300 mA)	MJE16004			2.5	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$			V
(I_C= 3.0 A, I_B= 400 mA)	MJE16002			1.5	
(I_C= 3.0 A, I_B= 300 mA)	MJE16004			1.5	
DYNAMIC CHARACTERISTICS					
Output Capacitance (V_{CB} = 10 V , I_E = 0, f = 1.0 kHz)		C_{ob}		200	pF
SWITCHING CHARACTERISTICS					
Delay Time	V_{CC} = 250 V, I_C = 3.0 A	t_d		0.1	us
Rise Time	$2I_{B1}$ = $-I_{B2}$ =0.8 A	t_r		0.4	us
Storage Time	tp = 30 us,Duty Cycle ≦2.0%	t_s		3.0	us
Fall Time		t_f		0.4	us

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

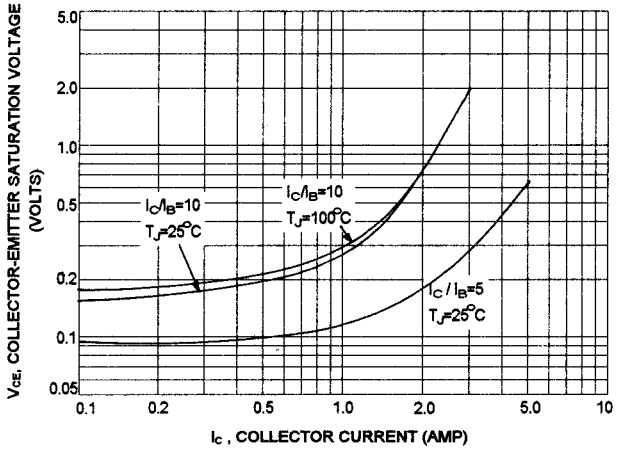
DC CURRENT GAIN



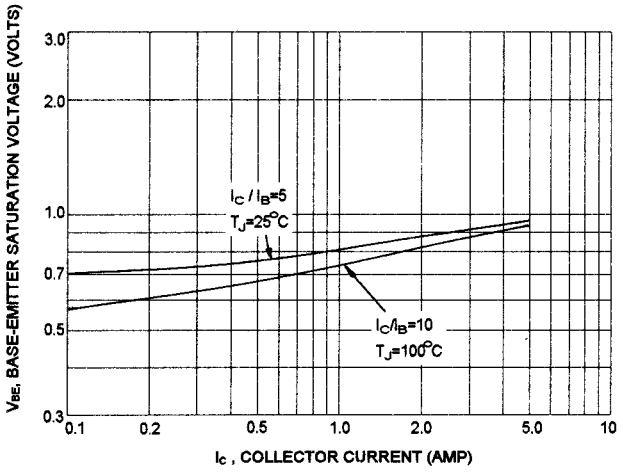
COLLECTOR SATURATION REGION



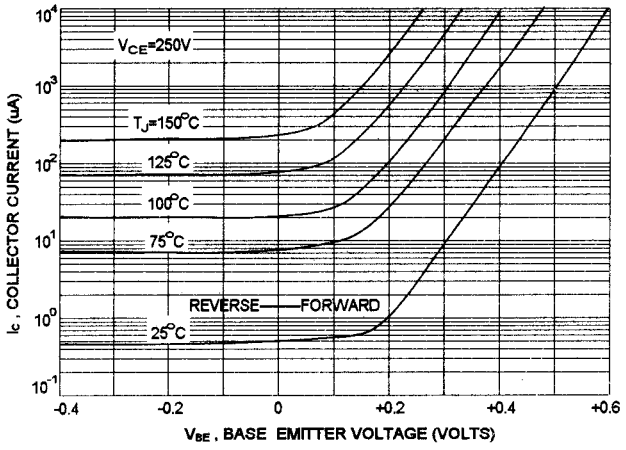
COLLECTOR-EMITTER SATURATION VOLTAGE



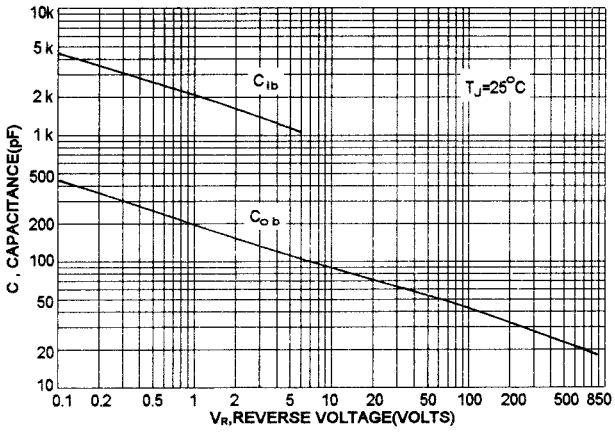
BASE-EMITTER SATURATION VOLTAGE



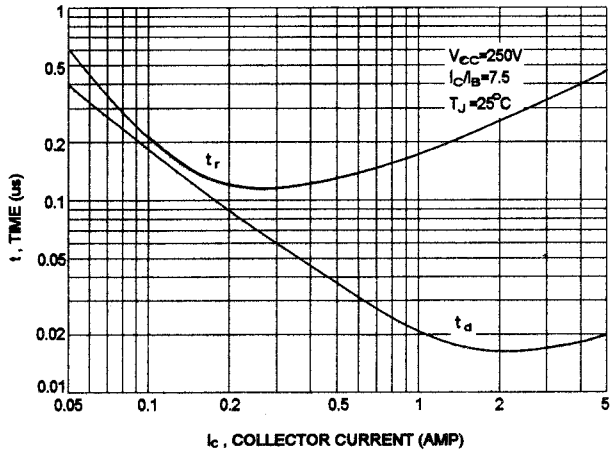
COLLECTOR CUT-OFF REGION



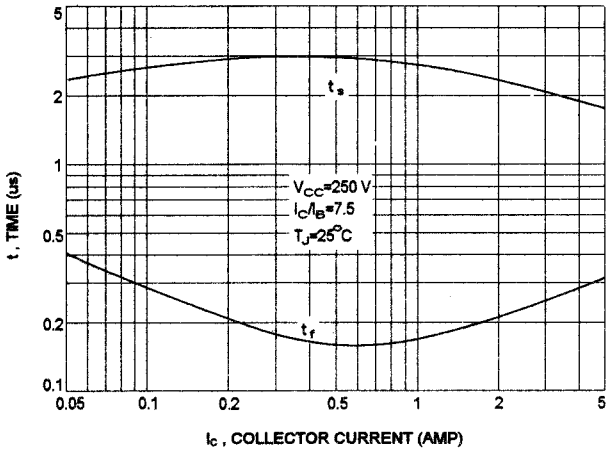
CAPACITANCE



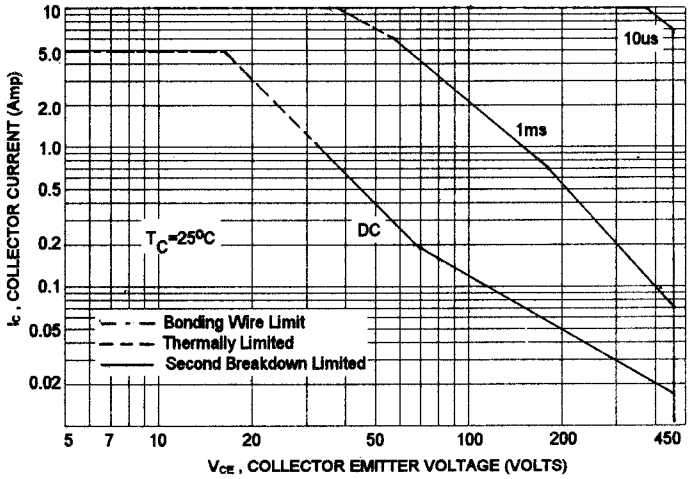
TURN-ON TIME



TURN-OFF TIME



ACTIVE REGION SAFE OPERATING AREA



REVERSE BIAS SWITCHING SAFE OPERATING AREA