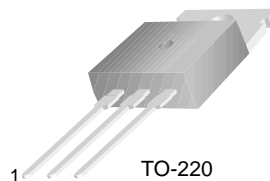


## MJE13006/13007

### High Voltage Switch Mode Application

- High Speed Switching
- Suitable for Switching Regulator and Motor Control



TO-220  
1.Base 2.Collector 3.Emitter

### NPN Silicon Transistor

#### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units	
$V_{CBO}$	Collector-Base Voltage	: MJE13006	600	V
		: MJE13007	700	V
$V_{CEO}$	Collector-Emitter Voltage	: MJE13006	300	V
		: MJE13007	400	V
$V_{EBO}$	Emitter- Base Voltage	9	V	
$I_C$	Collector Current (DC)	8	A	
$I_{CP}$	Collector Current (Pulse)	16	A	
$I_B$	Base Current	4	A	
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	80	W	
$T_J$	Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$	

#### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$BV_{CEO}$	Collector- Emitter Breakdown Voltage : MJE13006 : MJE13007	$I_C = 10\text{mA}, I_B = 0$	300			V
			400			V
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			1	mA
$h_{FE}$	*DC Current Gain	$V_{CE} = 5\text{V}, I_C = 2\text{A}$ $V_{CE} = 5\text{V}, I_C = 5\text{A}$	8		60	
			5		30	
$V_{CE(sat)}$	*Collector-Emitter Saturation Voltage	$I_C = 2\text{A}, I_B = 0.4\text{A}$ $I_C = 5\text{A}, I_B = 1\text{A}$ $I_C = 8\text{A}, I_B = 2\text{A}$			1	V
					2	V
					3	V
$V_{BE(sat)}$	*Base-Emitter Saturation Voltage	$I_C = 2\text{A}, I_B = 0.4\text{A}$ $I_C = 5\text{A}, I_B = 1\text{A}$			1.2	V
					1.6	V
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{V}, f = 0.1\text{MHz}$		110		pF
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}$	4			MHz
$t_{ON}$	Turn ON Time	$V_{CC} = 125\text{V}, I_C = 5\text{A}$ $I_{B1} = -I_{B2} = 1\text{A}$ $R_L = 50\Omega$			1.6	$\mu\text{s}$
$t_{STG}$	Storage Time				3	$\mu\text{s}$
$t_F$	Fall Time				0.7	$\mu\text{s}$

\* Pulse test:  $PW \leq 300\mu\text{s}$ , Duty cycle  $\leq 2\%$

# Typical Characteristics

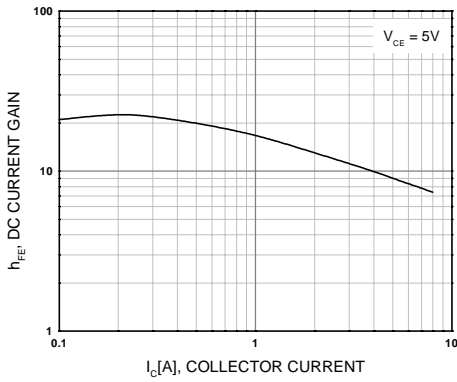


Figure 1. DC current Gain

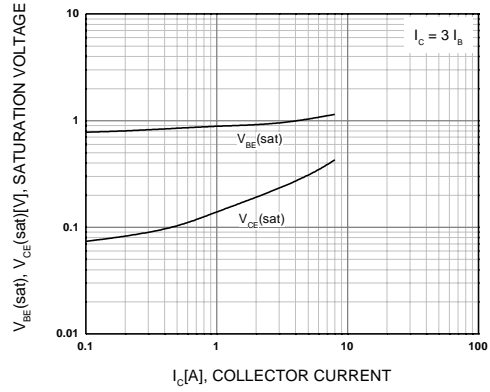


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

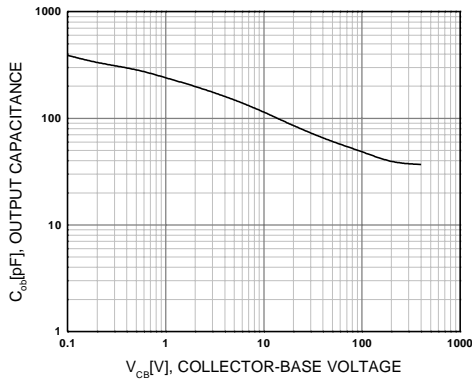


Figure 3. Collector Output Capacitance

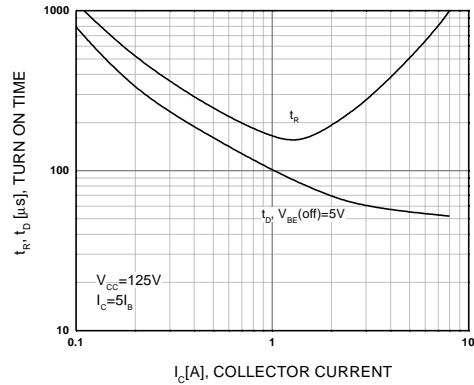


Figure 4. Turn On Time

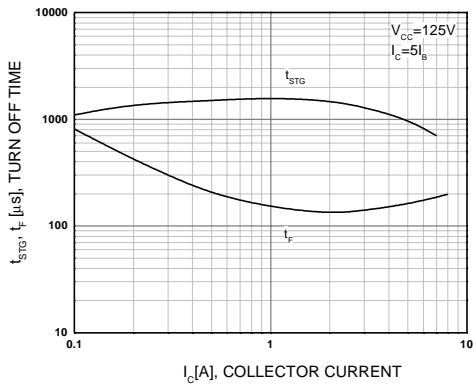


Figure 5. Turn Off Time

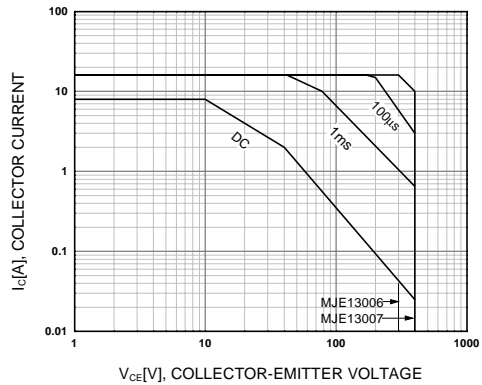


Figure 6. Safe Operating Area

### Typical Characteristics (Continued)

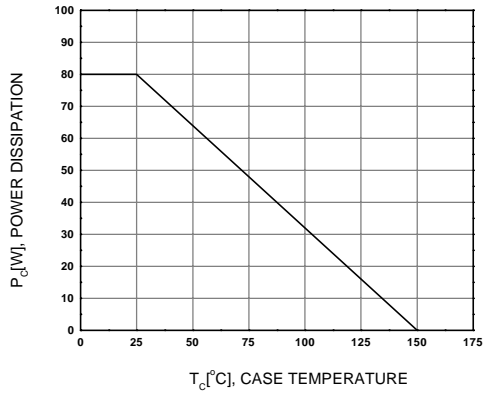


Figure 7. Power Derating

# Package Dimensions

## TO-220

MJE13006/13007



Dimensions in Millimeters

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DOME™	ISOPLANAR™	Quiet Series™	
E <sup>2</sup> CMOS™	MICROWIRE™	LILENT SWITCHER®	
EnSigna™	OPTOLOGIC™	SMART START™	
FACT™	OPTOPLANAR™	SuperSOT™-3	
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