

Fuji Discrete Package IGBT

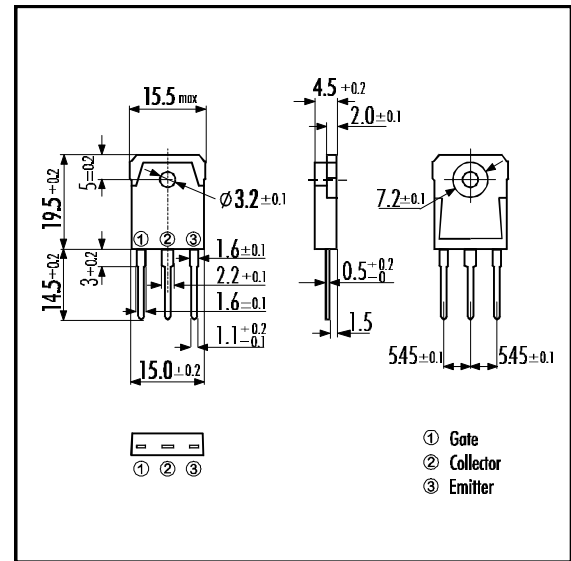
■ Features

- Square RBSOA
- Low Saturation Voltage
- Less Total Power Dissipation
- Minimized Internal Stray Inductance

■ Applications

- High Power Switching
- A.C. Motor Controls
- D.C. Motor Controls
- Uninterruptible Power Supply

■ Outline Drawing

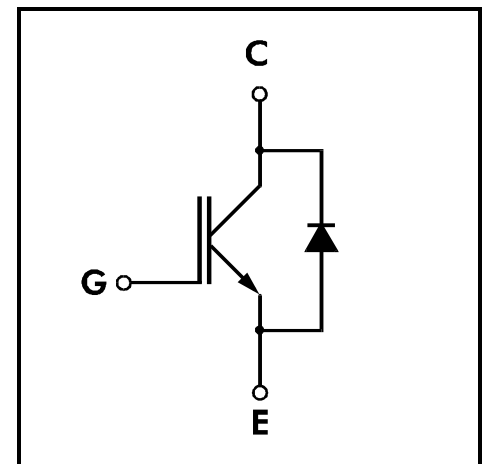


■ Maximum Ratings and Characteristics

• Absolute Maximum Ratings ($T_c=25^{\circ}\text{C}$)

Items	Symbols	Ratings	Units
Collector-Emitter Voltage	V_{CES}	1200	V
Gate -Emitter Voltage	V_{GES}	± 20	V
Collector Current	DC $T_c=25^{\circ}\text{C}$	I_{C25}	9
	DC $T_c=100^{\circ}\text{C}$	I_{C100}	5
	1ms $T_c=25^{\circ}\text{C}$	I_{CPULSE}	27
IGBT Max. Power Dissipation	P_C	100	W
FWD Max. Power Dissipation	P_C	60	W
Operating Temperature	T_j	+150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +150	$^{\circ}\text{C}$
Mounting Screw Torque		50	Nm

■ Equivalent Circuit



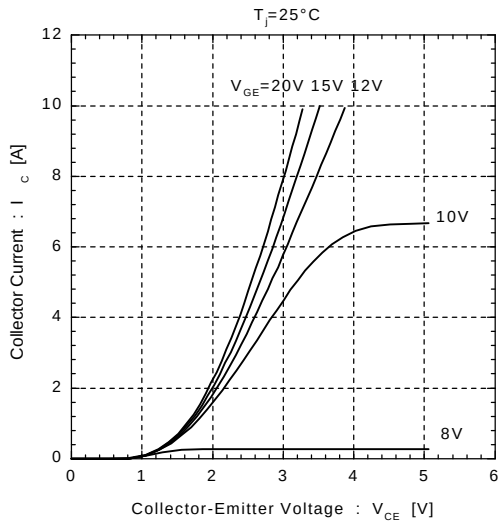
• Electrical Characteristics (at $T_j=25^{\circ}\text{C}$)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0\text{V}$ $V_{CE}=1200\text{V}$			1.0	mA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0\text{V}$ $V_{GE}=\pm 20\text{V}$			20	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20\text{V}$ $I_C=5\text{mA}$	5.5		8.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15\text{V}$ $I_C=5\text{A}$			3.5	V
Input capacitance	C_{ies}	$V_{GE}=0\text{V}$		650		pF
Output capacitance	C_{oes}	$V_{CE}=10\text{V}$		150		
Reverse Transfer capacitance	C_{res}	$f=1\text{MHz}$		40		
Switching Time	Turn-on Time	t_{ON}			1.2	μs
		t_r			0.6	
	Turn-off Time	t_{OFF}			1.5	
		t_f			0.5	
	Turn-on Time	t_{ON}		0.16		μs
		t_r		0.11		
		t_{OFF}		0.30		
		t_f			0.5	
Diode Forward On-Voltage	V_F	$I_F=5\text{A}$ $V_{GE}=0\text{V}$			3.0	V
Reverse Recovery Time	t_{rr}	$I_F=5\text{A}$, $V_{GE}=-10\text{V}$, $di/dt=100\text{A}/\mu\text{s}$			350	ns

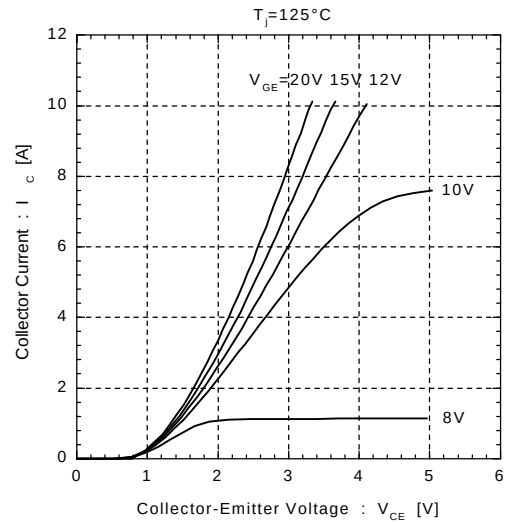
• Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			1.25	$^{\circ}\text{C}/\text{W}$
	$R_{th(j-e)}$	Diode			2.08	

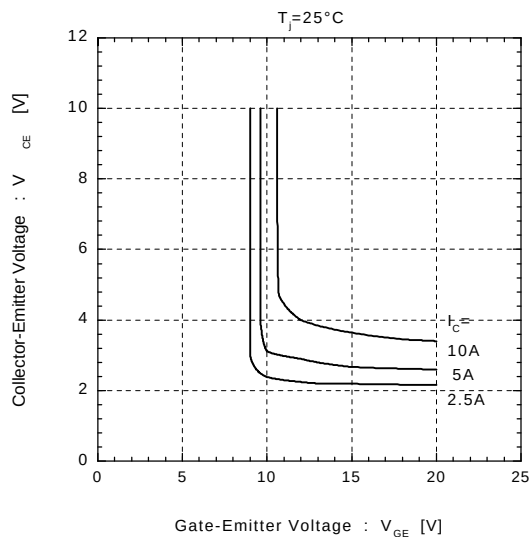
Collector Current vs. Collector-Emittor Voltage



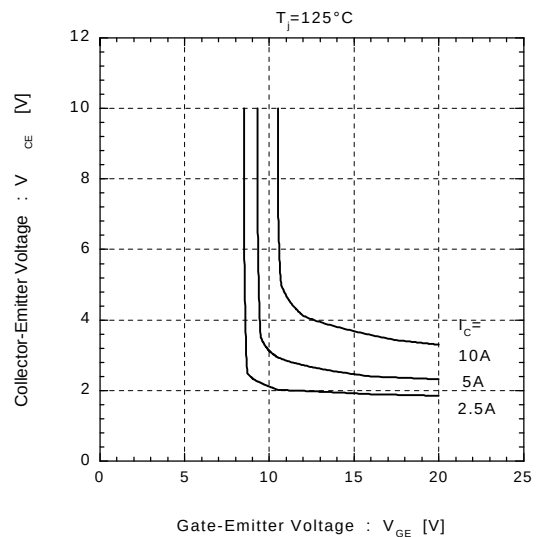
Collector Current vs. Collector-Emittor Voltage



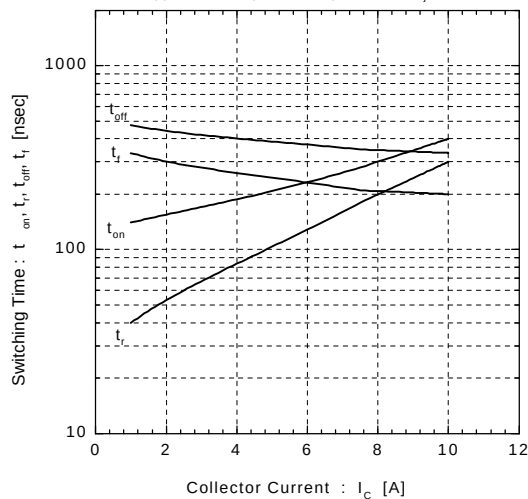
Collector-Emittor Voltage vs. Gate-Emittor Voltage



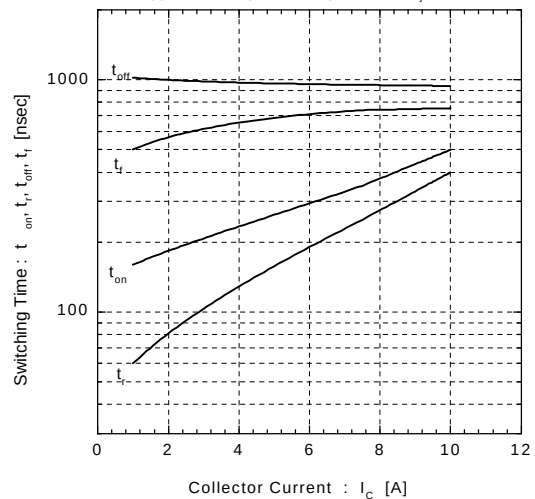
Collector-Emittor Voltage vs. Gate-Emittor Voltage

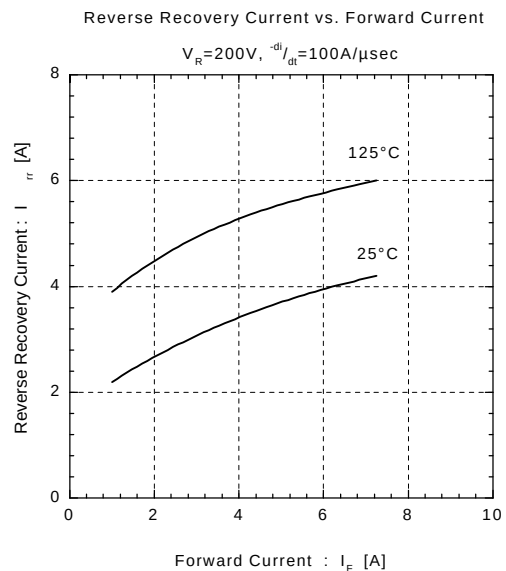
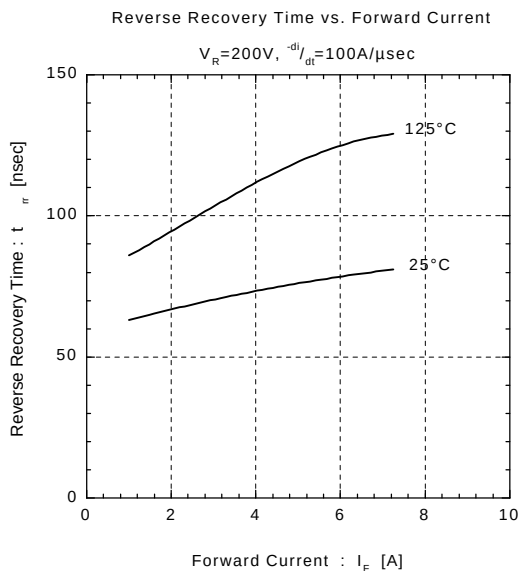
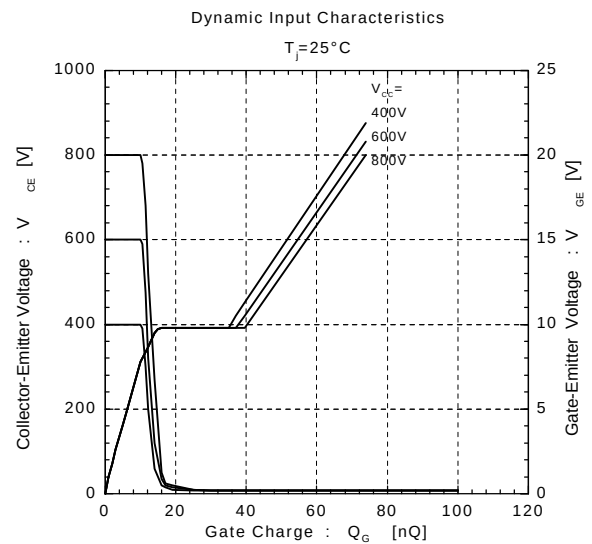
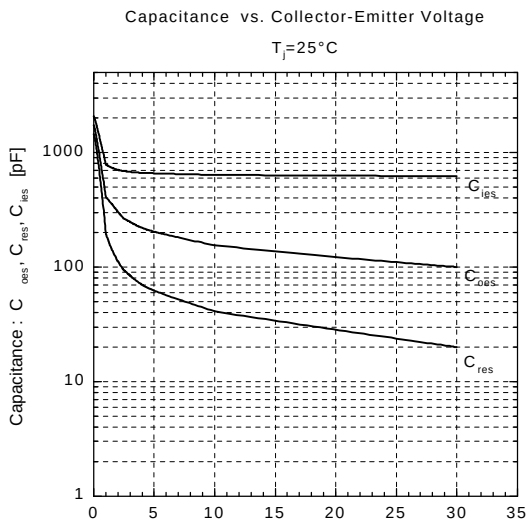
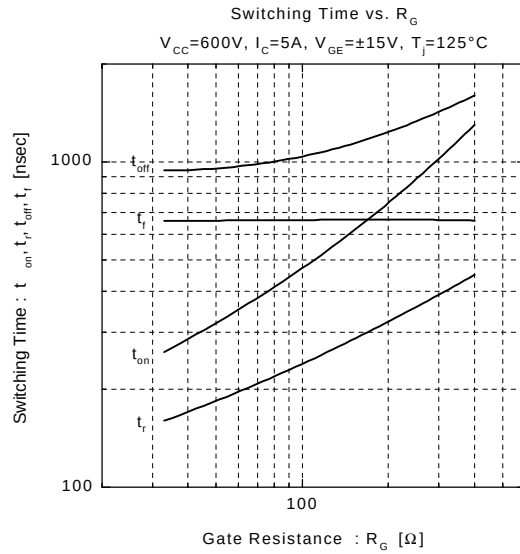
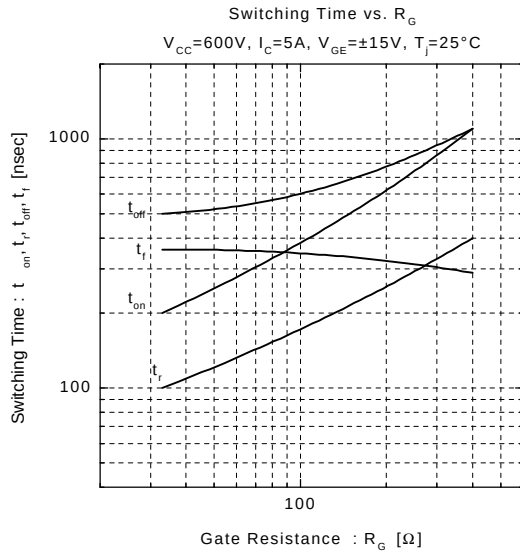


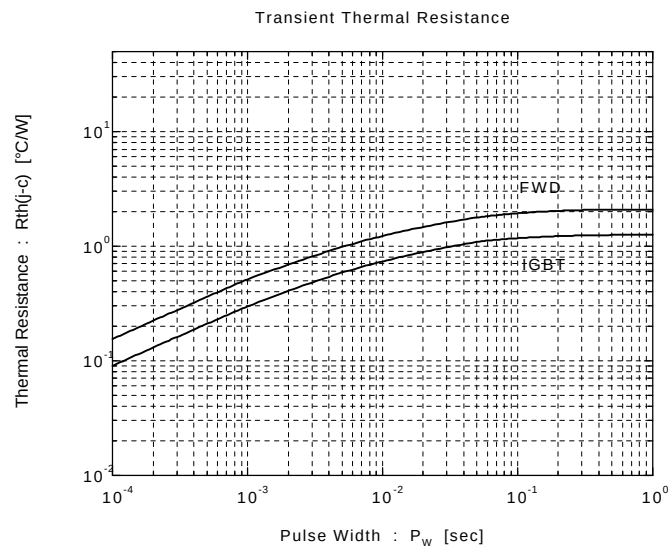
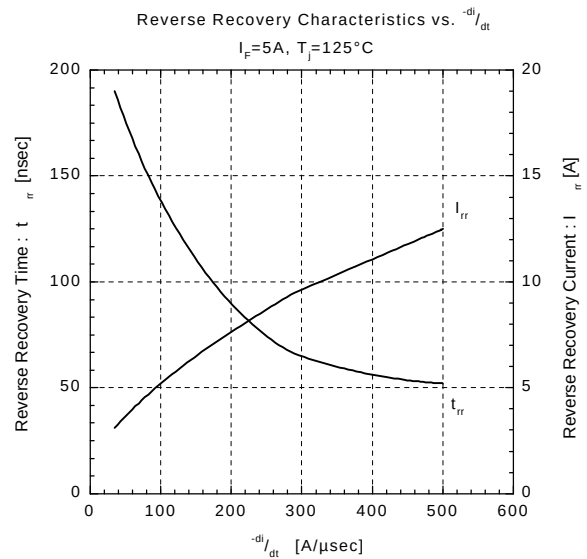
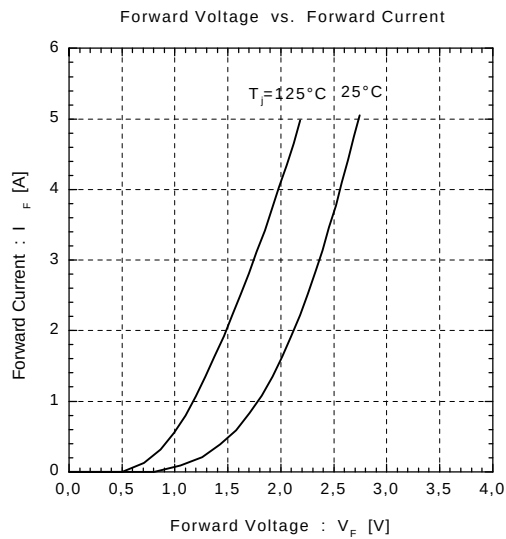
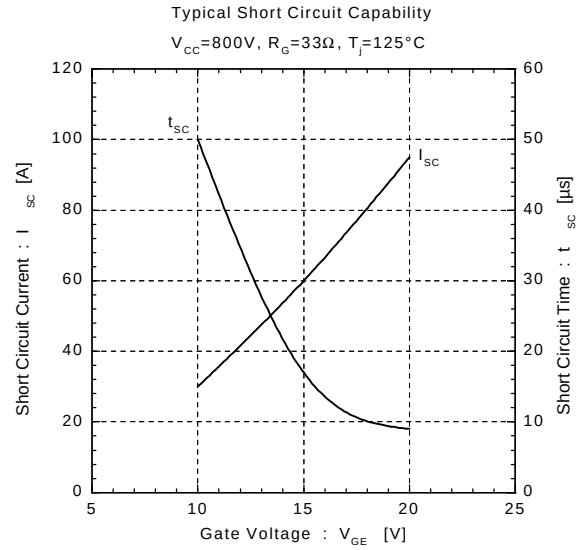
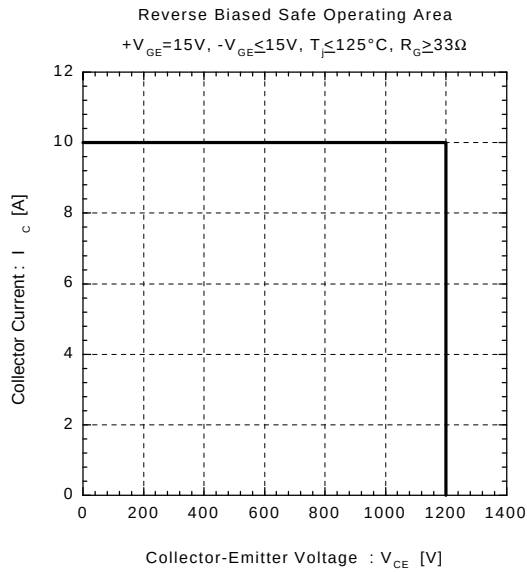
Switching Time vs. Collector Current
 $V_{CC} = 600V, R_G = 33\Omega, V_{GE} = \pm 15V, T_J = 25^\circ\text{C}$



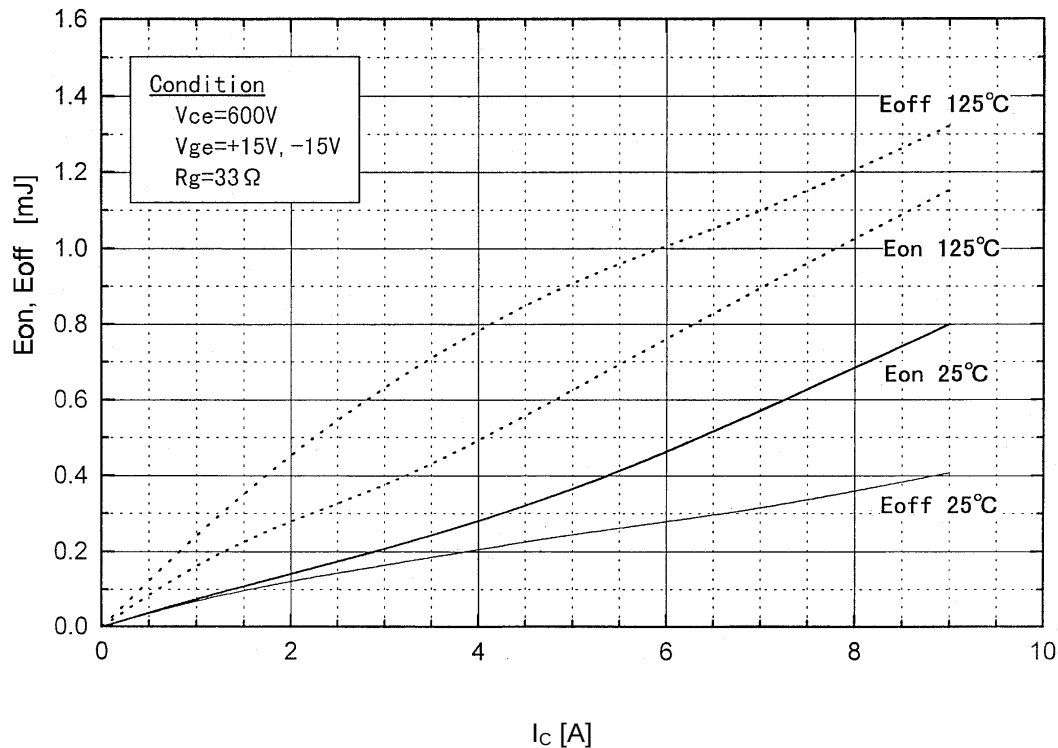
Switching Time vs. Collector Current
 $V_{CC} = 600V, R_G = 33\Omega, V_{GE} = \pm 15V, T_J = 125^\circ\text{C}$



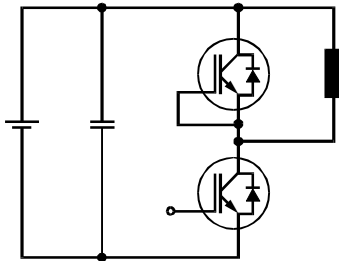




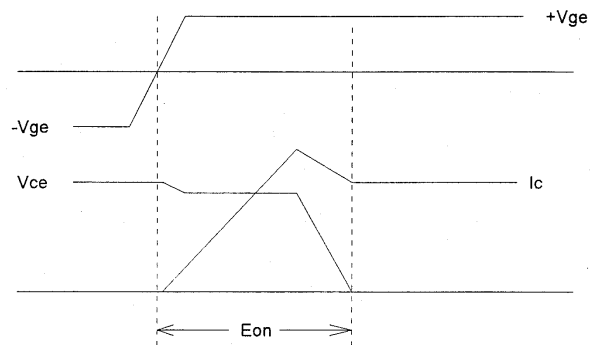
Switching losses (E_{on} , E_{off} vs. I_c)



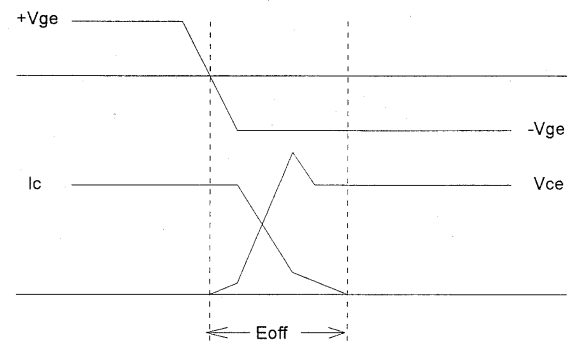
Test Circuit



Switching waveforms



Turn-on Waveforms



Turn-off Waveforms