

Fuji Discrete Package IGBT

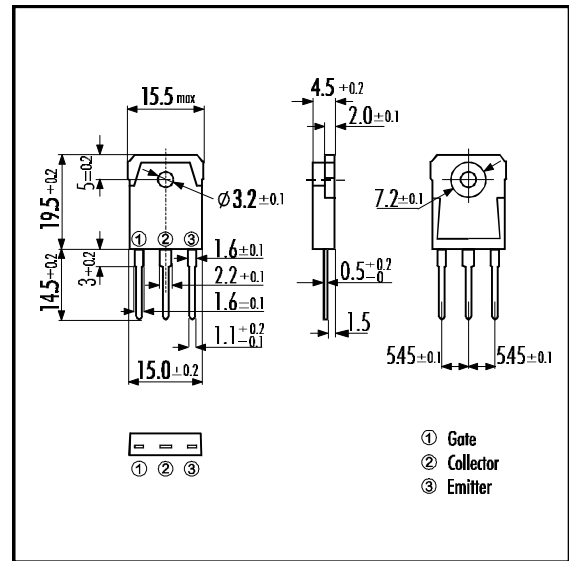
■ Outline Drawing

■ 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

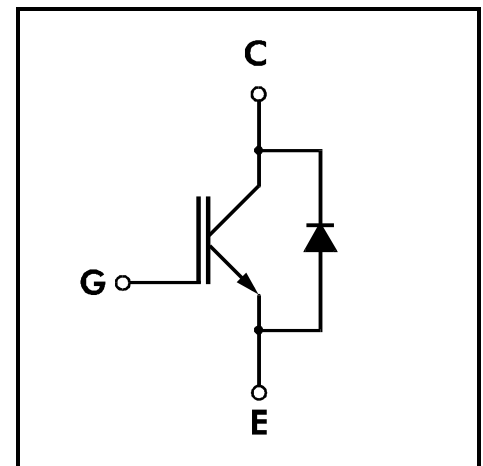


■ Maximum Ratings and Characteristics

• 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}	16
	DC $T_c=100^\circ\text{C}$	I_{C100}	10
	1ms $T_c=25^\circ\text{C}$	I_{CPULSE}	48
IGBT Max. Power Dissipation	P_C	135	W
FWD Max. Power Dissipation	P_C	85	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



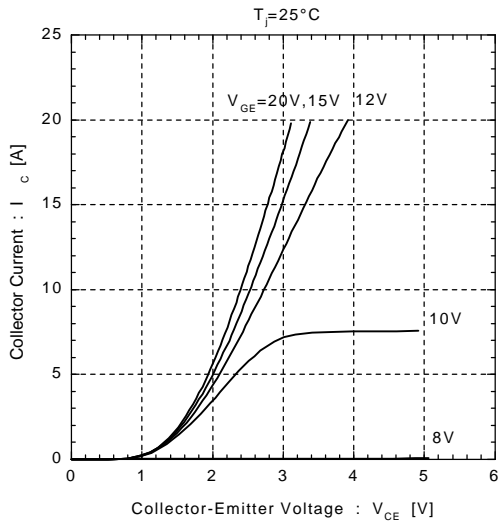
• Electrical Characteristics (at $T_j=25^\circ\text{C}$)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units	
Zero Gate Voltage Collector Current	I_{CES}	$V_{GE}=0V$ $V_{CE}=1200V$			1.0	mA	
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$ $V_{GE}=\pm 20V$			20	μA	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=20V$ $I_C=10\text{mA}$	5.5		8.5	V	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$ $I_C=10A$			3.5	V	
Input capacitance	C_{ies}	$V_{GE}=0V$		1200		pF	
Output capacitance	C_{oes}	$V_{CE}=10V$		250			
Reverse Transfer capacitance	C_{res}	$f=1\text{MHz}$		80			
Switching Time	Turn-on Time	t_{ON}	$V_{CC}=600V$			1.2	μs
		t_r	$I_C=10A$			0.6	
		t_{OFF}	$V_{GE}=\pm 15V$			1.5	
		t_f	$R_G=160\Omega$			0.5	
	Turn-off Time	t_{ON}	$V_{CC}=600V$		0.16		μs
		t_r	$I_C=10A$		0.11		
		t_{OFF}	$V_{GE}=\pm 15V$		0.30		
		t_f	$R_G=16\Omega$			0.5	
Diode Forward On-Voltage	V_F	$I_F=10A$ $V_{GE}=0V$			3.0	V	
Reverse Recovery Time	t_{rr}	$I_F=10A$, $V_{GE}=-10V$, $di/dt=100A/\mu\text{s}$			350	ns	

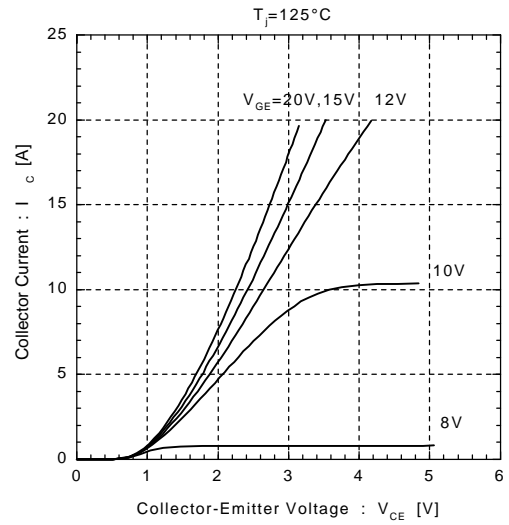
• Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(j-c)}$	IGBT			0.92	$^\circ\text{C/W}$
	$R_{th(j-e)}$	Diode			1.47	

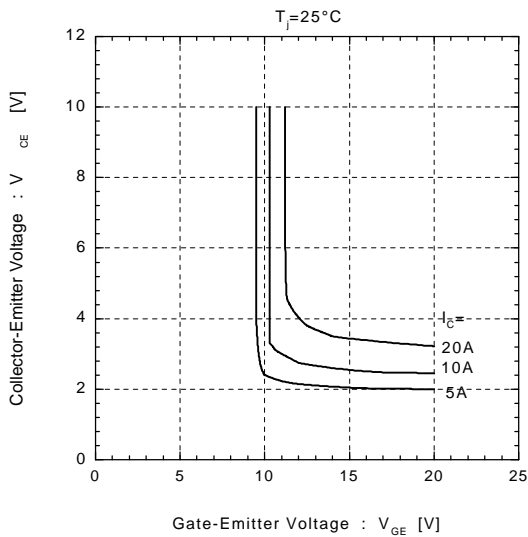
Collector Current vs. Collector-Emittor Voltage



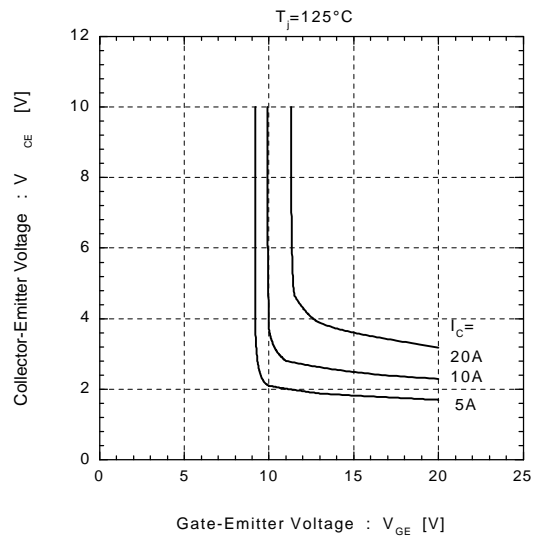
Collector Current vs. Collector-Emittor Voltage



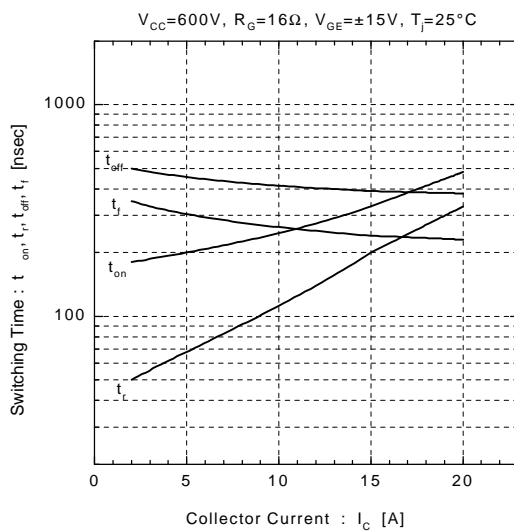
Collector-Emittor Voltage vs. Gate-Emittor Voltage



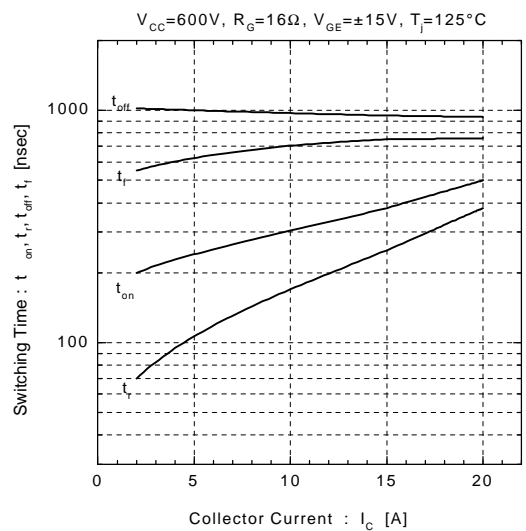
Collector-Emittor Voltage vs. Gate-Emittor Voltage

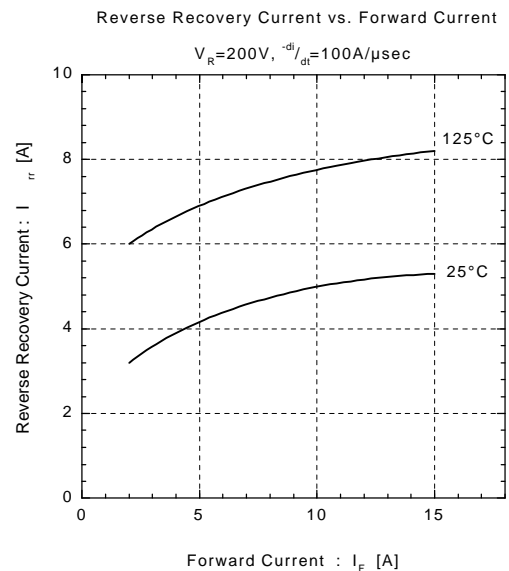
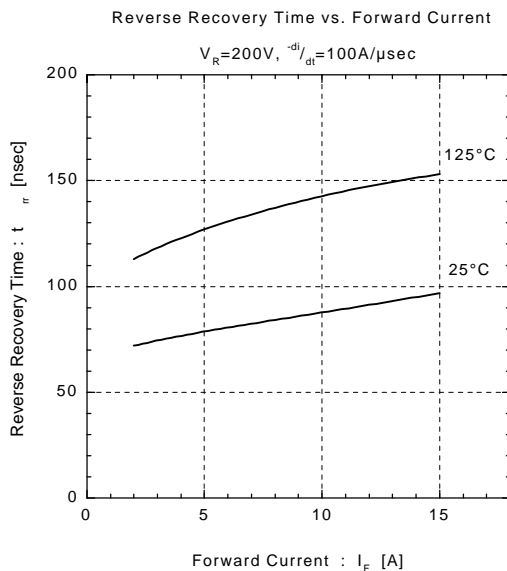
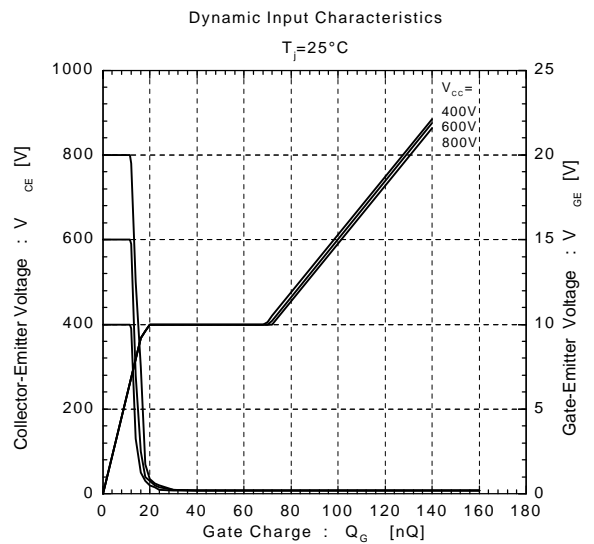
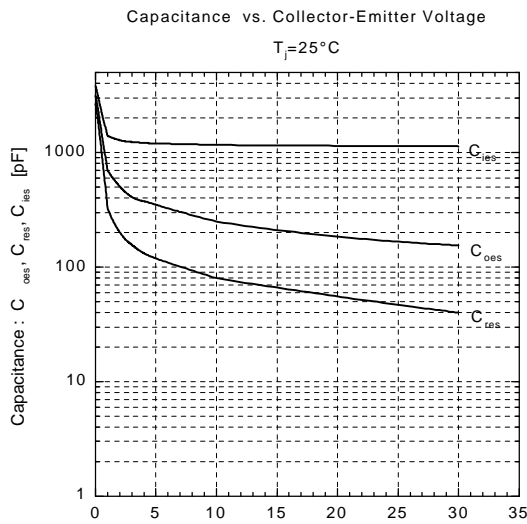
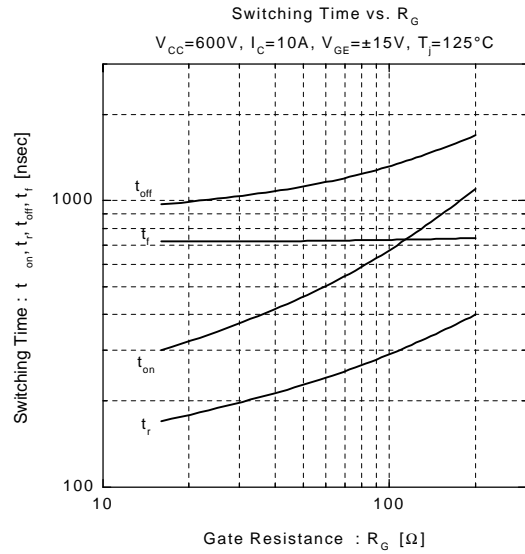
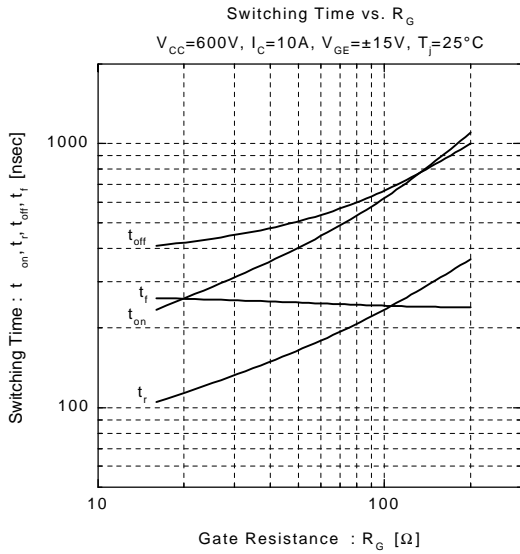


Switching Time vs. Collector Current

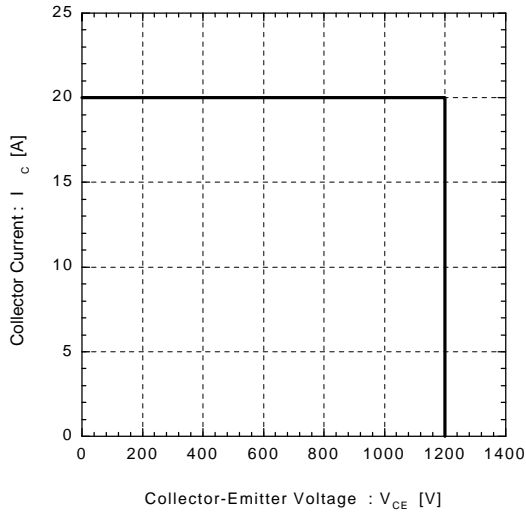


Switching Time vs. Collector Current

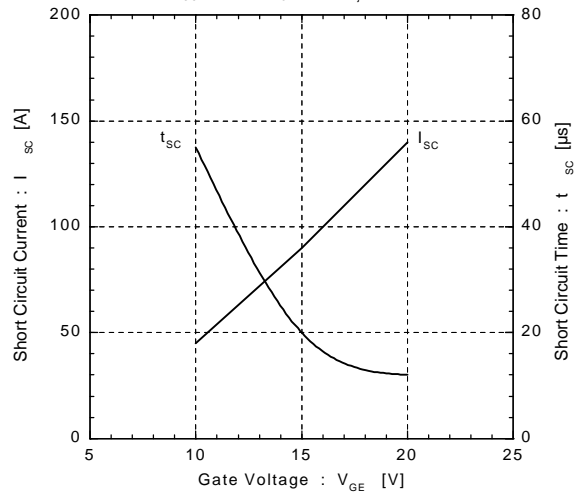




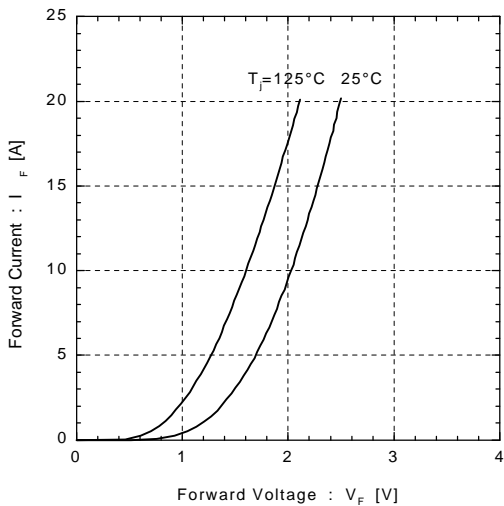
Reverse Biased Safe Operating Area
+V_{GE}=15V, -V_{GE}≤15V, T_J≤125°C, R_G≥16Ω



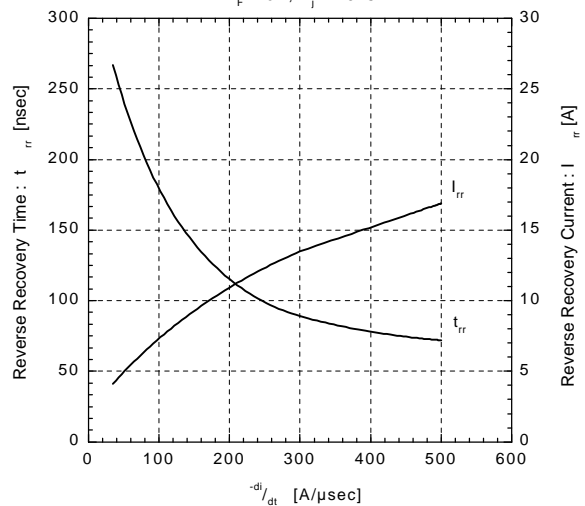
Typical Short Circuit Capability
V_{CC}=800V, R_G=16Ω, T_J=125°C



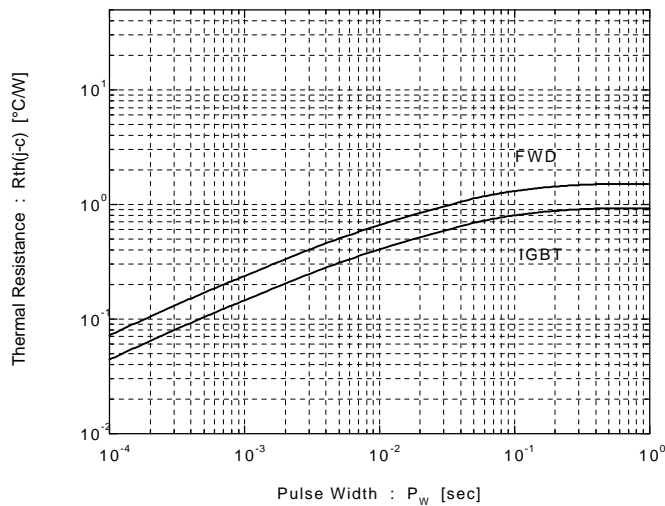
Forward Voltage vs. Forward Current



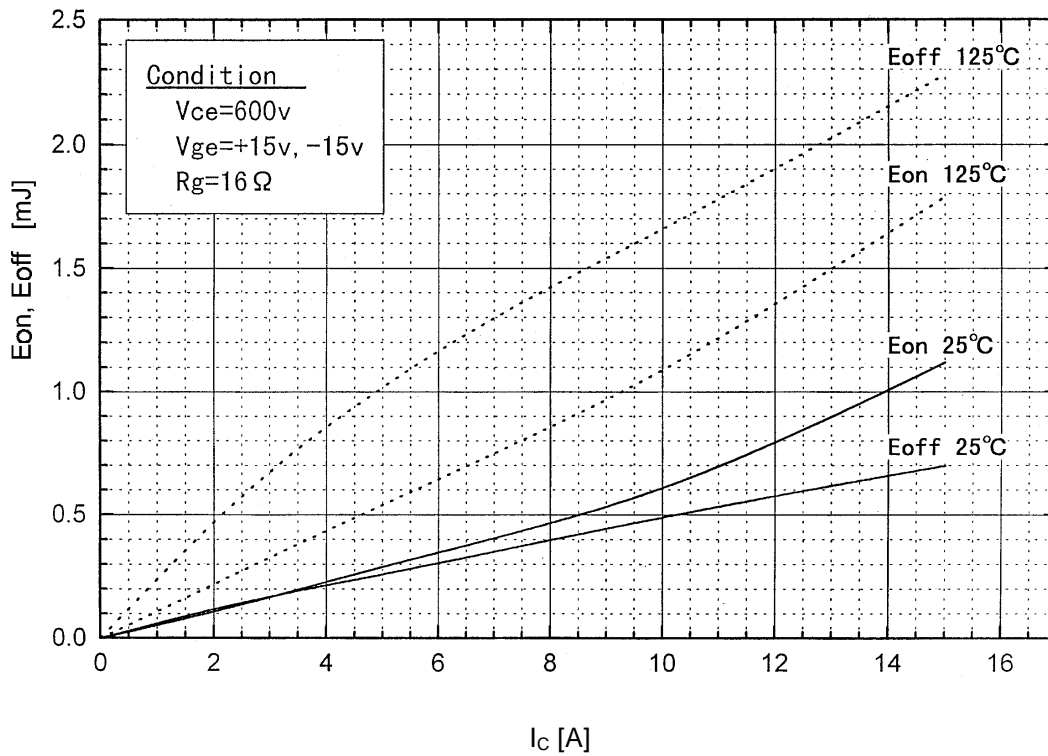
Reverse Recovery Characteristics vs. -di/dt
I_F=10A, T_J=125°C



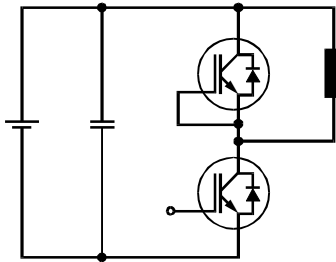
Transient Thermal Resistance



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



Test Circuit



Switching waveforms

