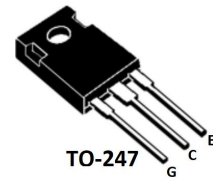


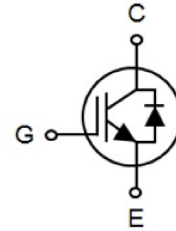
Features

- Low gate charge
- Trench-Stop Technology
- High speed switching
- Saturation voltage:
 $V_{CE(sat),typ} = 1.4V@60A$



Applications

- General purpose inverters
- Induction heating(IH)
- Welding Converters
- UPS



Absolute Ratings (Tc=25°C)

Parameter	Symbol		MSG80D60FLC	Unit
Collector-Emitter Voltage	Vces		600	V
Collector Current-continuous	Ic	T _C =25°C	180	A
		T _C =100°C	80	A
Collector Current-pulse(note 1)	I _{CM}		300	A
Gate-emitter voltage	V _{GES}		±30	V
Diode RMS forward current	I _F	T _C =25°C	180	A
		T _C =100°C	80	A
Diode Forward Current-pulse	I _F		300	A
Power Dissipation	P _D		260	W
Operating Temperature Range	T _J		-55~+150	°C
Storage Temperature Range	T _{STG}		-55~150	°C
Maximum Lead Temperature for Soldering Purposes	T _L		300	°C

Electrical Characteristics(TC=25°C, unless otherwise noted)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emitter Voltage	BV _{CES}	I _C =100uA, V _{GE} =0V	600	-	-	V
Zero Gate Voltage Collector Current	I _{CES}	V _{CE} =V _{CES} , V _{GE} =0V, T _J =125°C			25	μA
					250	
Gate-body leakage current	I _{GES}	V _{CE} =0V, V _{GE} =±20V	-	-	±100	nA
Transconductance	g _{fs}	V _{CE} =10V, I _C =50A	30	48	-	S
On-Characteristics						
Gate-Emitter Threshold	V _{GE(th)}	V _{CE} =V _{GE} ,	3.5	4.5	5.5	V

Voltage		Ic=100uA				
Collector-Emitter saturation Voltage	V _{CE(sat)}	V _{GE} =15V,I _C =30A, V _{GE} =15V,I _C =60A,	- -	1.1 1.4	- -	V
Dynamic Characteristics						
Input capacitance	C _{ies}	VCE=25V, VGE=0V, f=1.0MHZ	-	3190	-	pF
Output capacitance	C _{oes}		-	175	-	pF
Reverse transfer capacitance	C _{res}		-	43	-	pF
Switching Characteristics						
Turn-On delay time	t _{d(on)}	V _{CE} =480V,I _C =60A, R _G =5Ω,V _{GE} =15.0V T _J =25℃ Inductive Load	-	25	-	ns
Turn-On rise time	t _r		-	30	-	ns
Turn-off delay time	t _{d(off)}		-	334	-	ns
Turn-off Fall time	t _f		-	224	-	ns
Turn-on energy	E _{on}		-	0.95	-	mJ
Turn-off energy	E _{off}		-	2.90	-	mJ
Total Gate Charge	Q _g	V _{CE} =0.5*V _{CES} , I _C =50A,V _{GE} =15V (note2,3)	-	110	-	nC
Gate to emitter charge	Q _{ge}			21		nC
Gate to collector charge	Q _{gc}		-	42	-	nC
Anti-Parallel Diode Characteristics						
Drain-Source Diode Forward Voltage	V _F	I _F =30A	-	1.2	1.5	V
Diode Reverse Recovery Time	t _{rr}	V _R =480V,I _F =60A, -di _f /dt=500A/μs T _J =25℃	-	132	-	ns
Diode Reverse Recovery charge	Q _{rr}		-	1.2	-	μC
Diode Reverse Recovery Current	I _{rr}		-	13.5	-	A

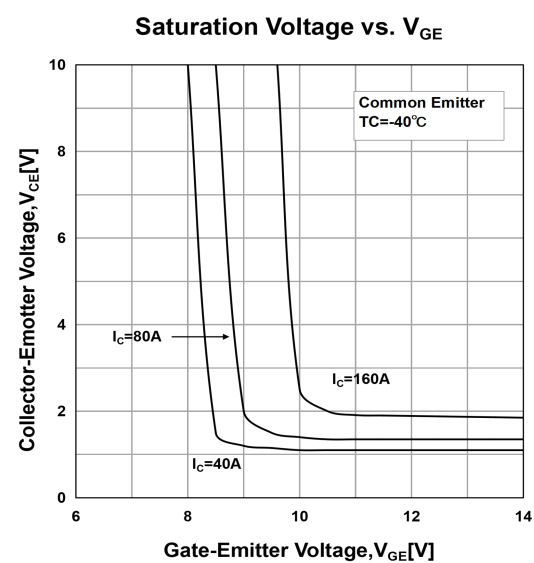
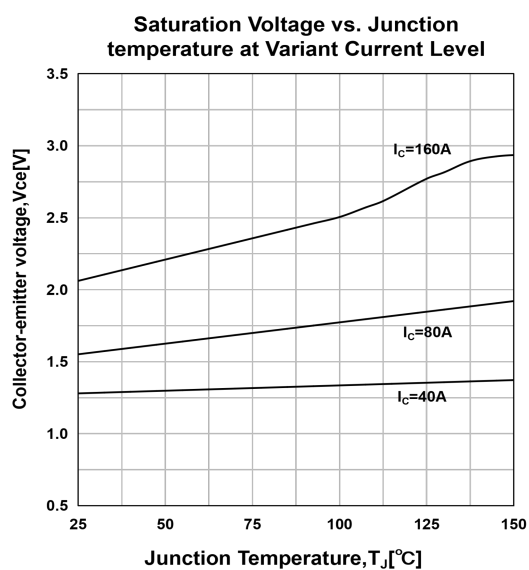
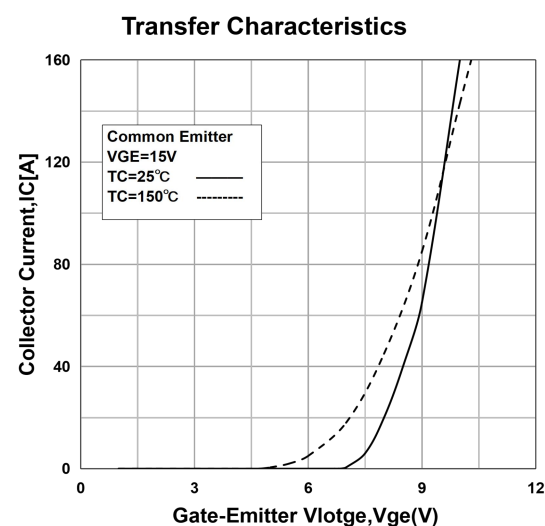
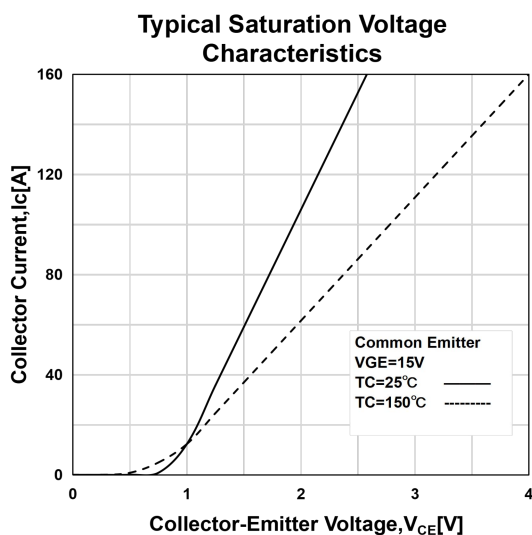
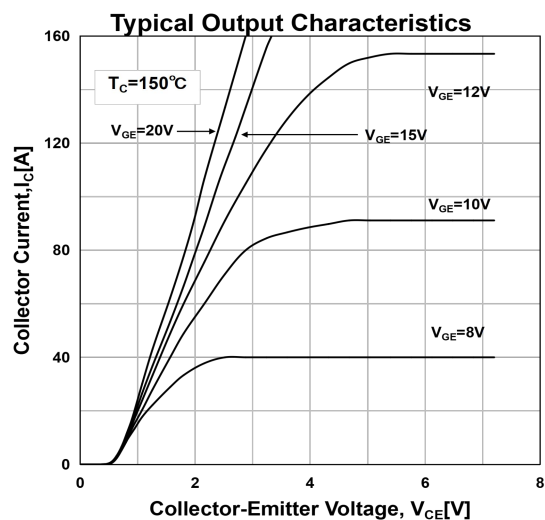
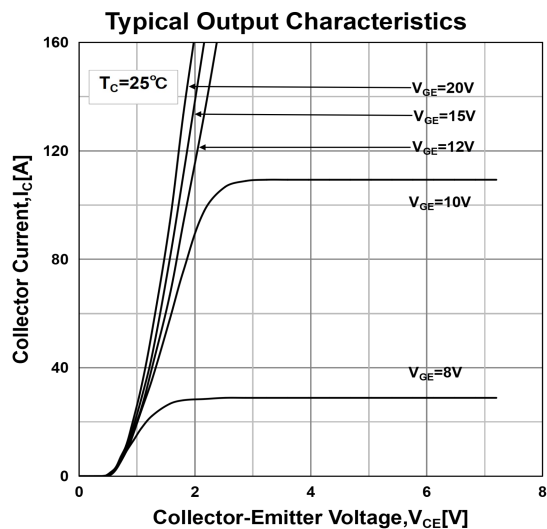
Thermal Characteristics

Parameter	Symbol	Max.	Unit
IGBT Thermal Resistance, Junction to Case	R _{th(j-c)}	0.48	K/W
Diode Thermal Resistance, Junction to Case	R _{th(j-c)}	1.1	K/W
Thermal Resistance, Junction to Ambient	R _{th(j-A)}	40	K/W

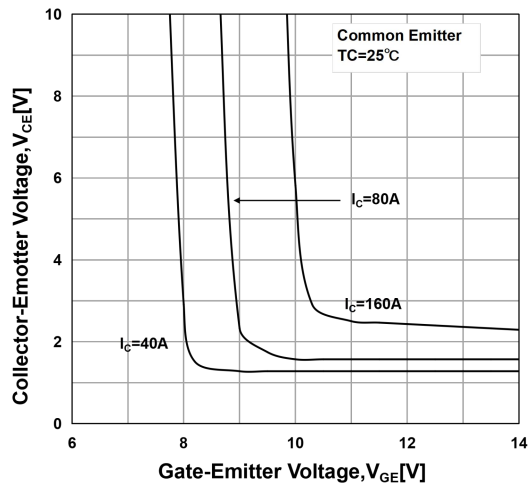
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%
- 3: Essentially independent of operating temperature

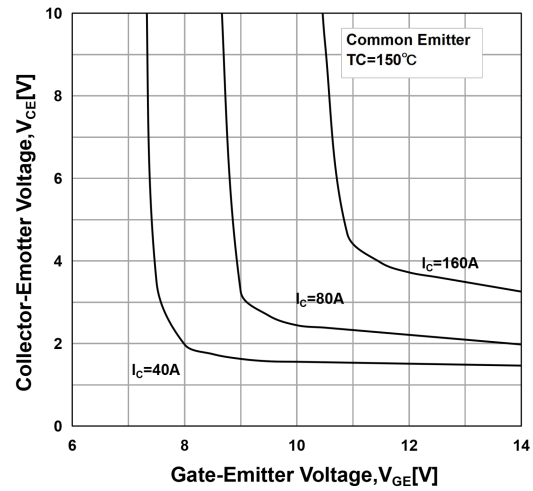
Electrical Characteristics (curves)



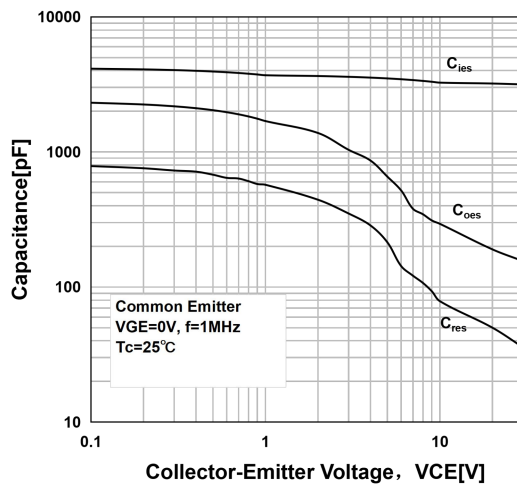
Saturation Voltage vs. V_{GE}



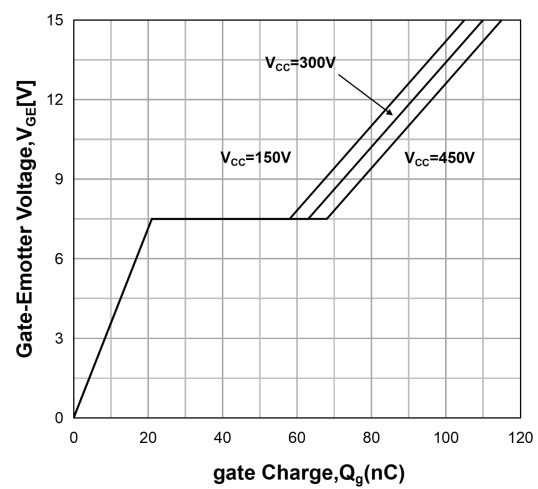
Saturation Voltage vs. V_{GE}



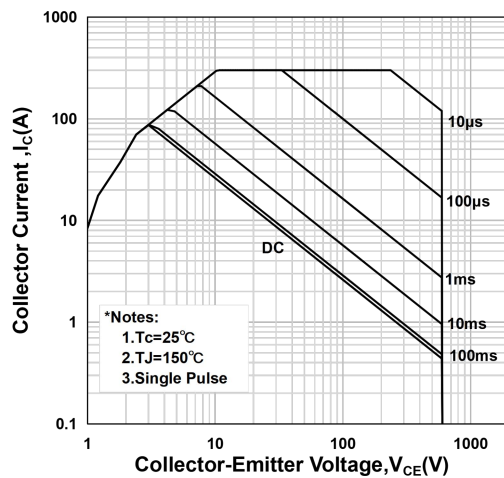
Capacitance Characteristics



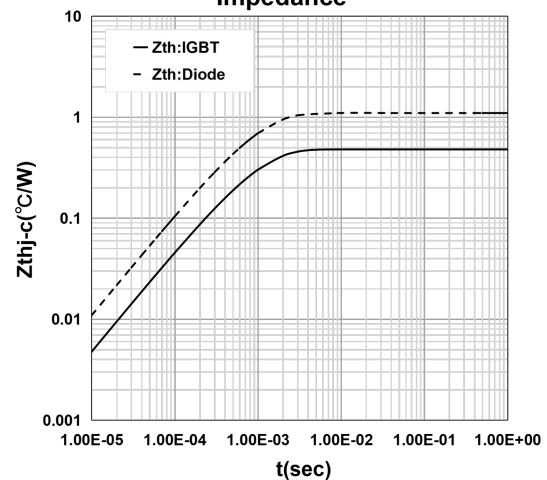
Gate Charge Characteristics



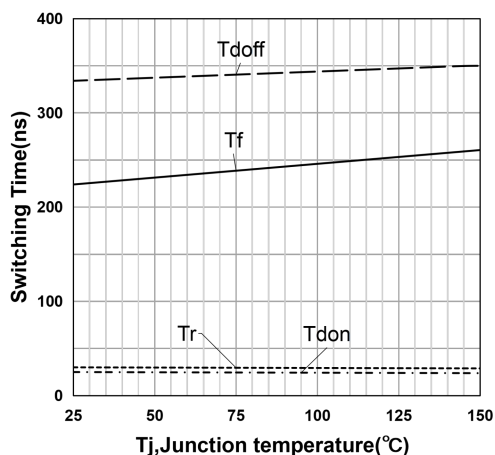
Foward Bias Safe Operating Area



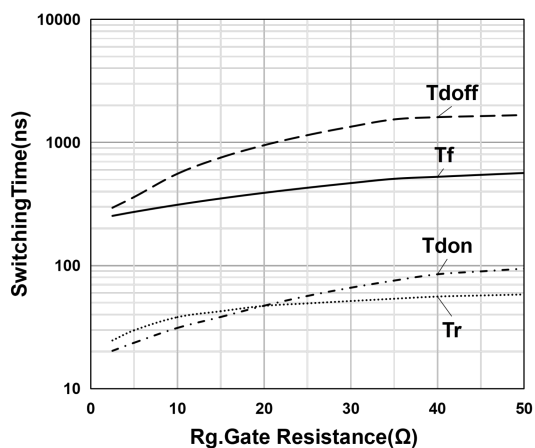
Maximum Transient Thermal Impedance



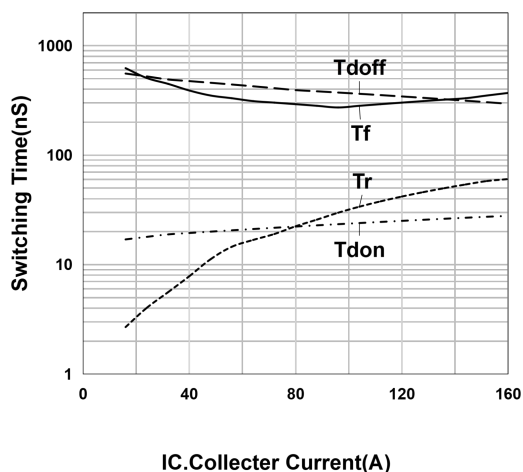
Switching Time vs. T_j
 $V_{ge}=15V, V_{ce}=480V, I_c=60A, R_g=5\Omega$



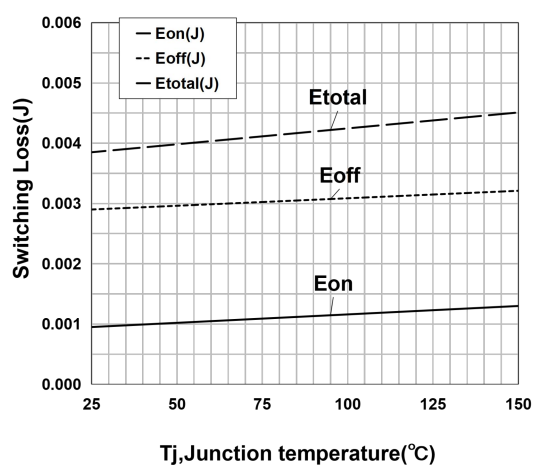
Switching Time Vs. $R_g(150^\circ C)$
 $V_{ge}=15V, V_{ce}=480V, I_c=60A$



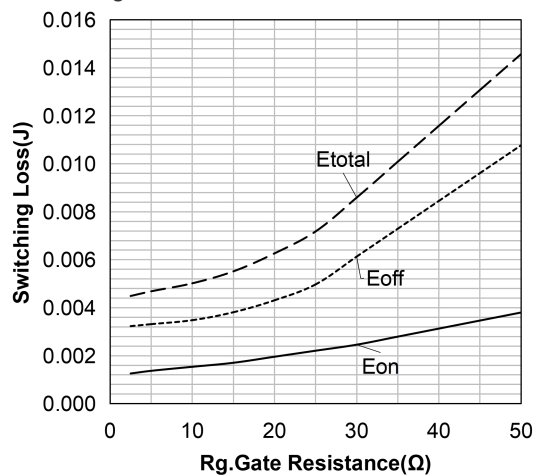
Switching Time vs. $I_c(150^\circ C)$
 $V_{ce}=480V, V_{ge}=15V, R_g=5\Omega$



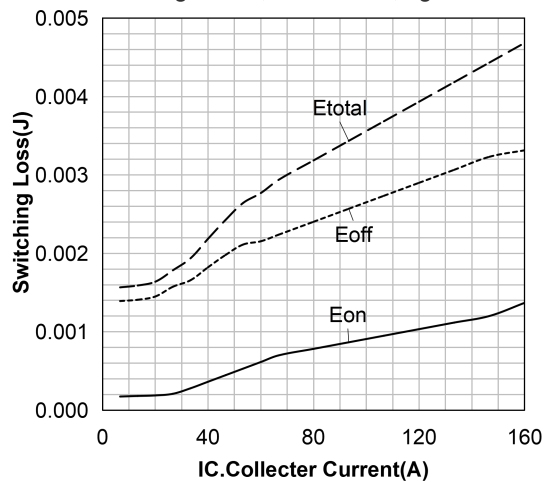
Switching Loss vs. T_j
 $V_{ge}=15V, V_{ce}=480V, I_c=60A, R_g=5\Omega$



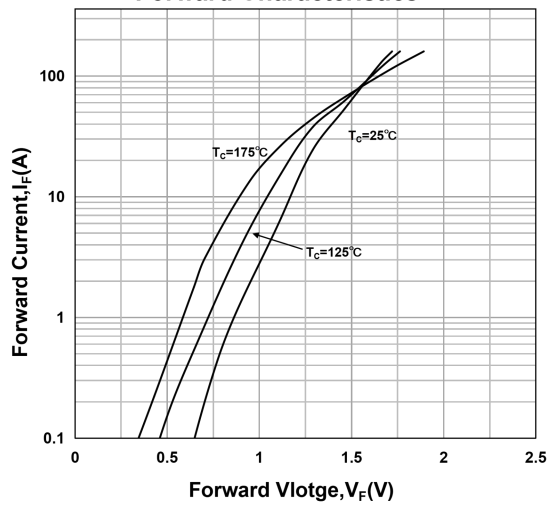
Switching Loss vs. $R_g(150^\circ C)$
 $V_{ge}=15V, V_{ce}=480V, I_c=60A$



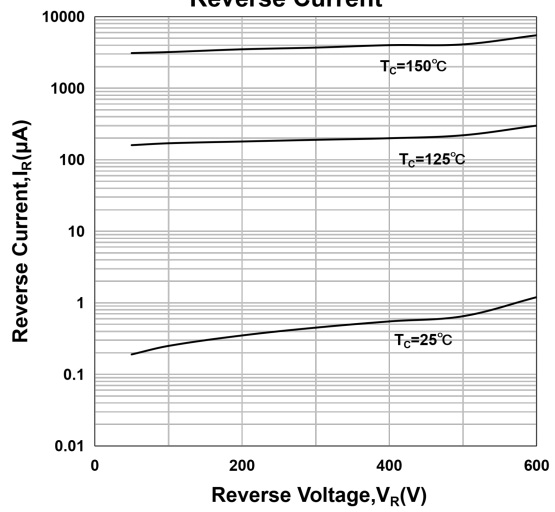
Switching Loss vs. $I_c(150^\circ C)$
 $V_{ge}=15V, V_{ce}=480V, R_g=5\Omega$



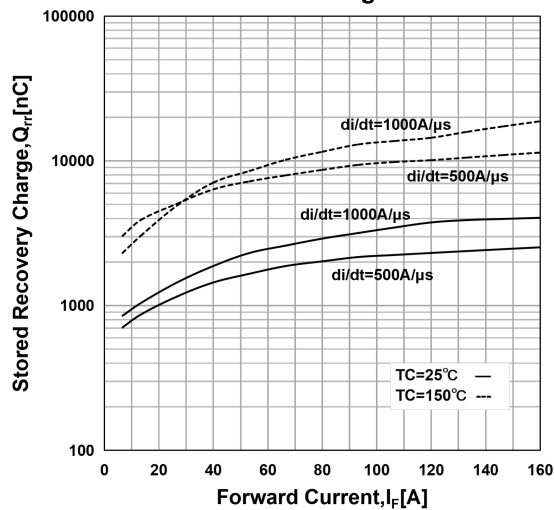
Forward Characteristics



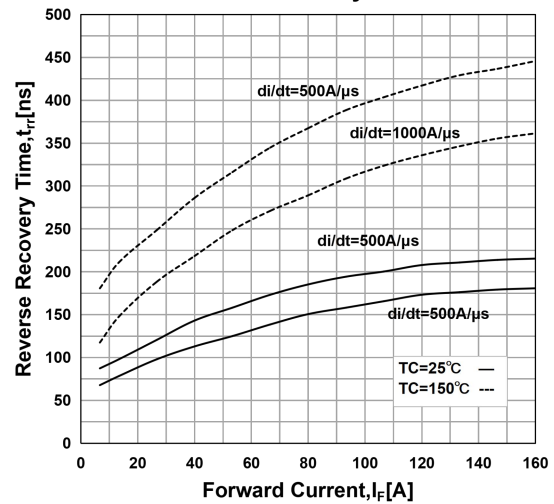
Reverse Current



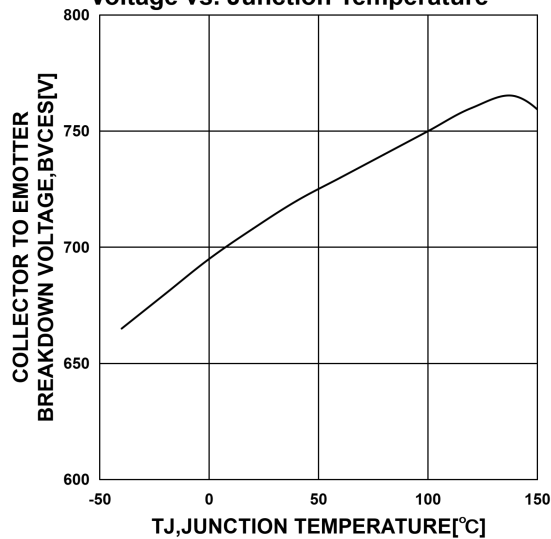
Stored Charge



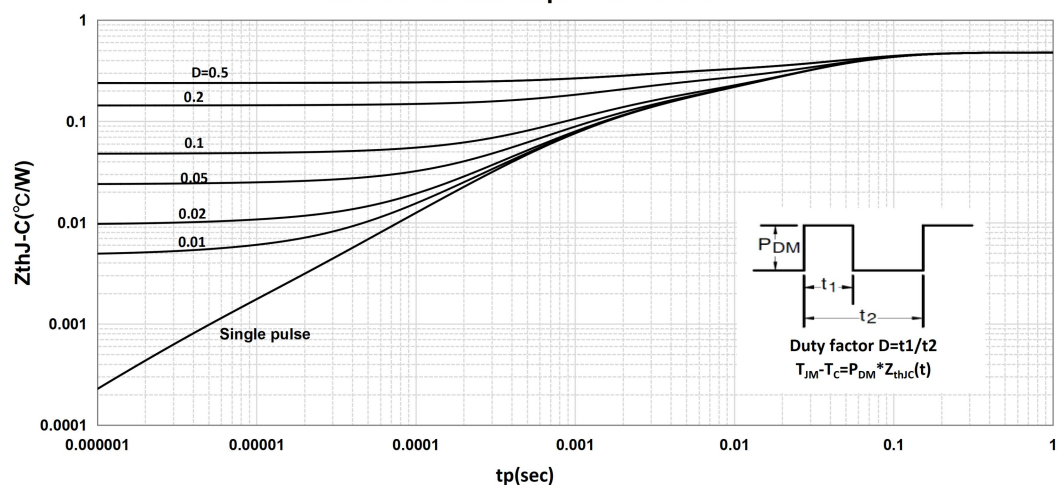
Reverse Recovery Time



Collector to Emitter Breakdown Voltage vs. Junction Temperature



Transient Thermal Impedance-IGBT



Transient Thermal Impedance-FRD

