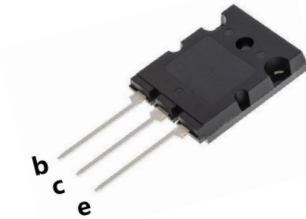


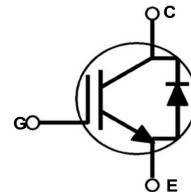
Features

- Low Gate charge
- $V_{CE(sat)} = 4.35V @ I_C = 50A$
- High Input Impedance
- Short circuit withstand time 10 μs



Applications

- PFC
- UPS
- Inverter



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-Emitter voltage		V_{CES}	1700	V
Gate-emitter voltage		V_{GES}	± 30	
Collector current	$T_C = 25^\circ C$	I_C	140	A
	$T_C = 100^\circ C$		70	
Pulsed collector current, pulse time limited by T_{jmax}		I_{CM}	210	
Diode forward current @ $T_C = 100^\circ C$		I_F	70	
Diode pulsed current, Pulse time limited by T_{jmax}		I_{FM}	420	
Power dissipation	$T_C = 25^\circ C$	P_D	625	W
	$T_C = 100^\circ C$		313	
Operating Junction and storage temperature rang		T_J	-55 to 175	$^\circ C$
		T_{stg}	-55 to 175	
Maximum Lead Temperature for Soldering Purposes		T_L	300	$^\circ C$

Electrical Characteristics ($T_C = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Collector-emitter breakdown voltage	BV_{CES}	$I_C = 500\mu A, V_{GE} = 0V$	1700	-	-	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}, I_C = 250\mu A$	4	-	6	
Zero gate voltage collector current	I_{CES}	$V_{CE} = 1700V, V_{GE} = 0V$	-		200	μA
Gate-emitter leakage current	I_{GES}	$V_{GE} = 20V, V_{CE} = 0V$	-	-	100	nA
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 50A, V_{GE} = 15V, T_C = 25^{\circ}C$	-	4.35	5.5	V
		$I_C = 50A, V_{GE} = 15V, T_C = 125^{\circ}C$	-	5.50	-	
Dynamic and Switching Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V,$	-	4670	-	pF

Reverse transfer capacitance	C_{oes}	$V_{GE}=0V,$ $f=1.0MHz$	-	232	-	
Output capacitance	C_{res}		-	100	-	
Total gate charge	Q_g	$V_{CE} = 850V, I_C = 70A,$ $V_{GE} = 15V$	-	160	-	nC
Gate to emitter Charge	Q_{ge}		-	26	-	
Gate to collector Charge	Q_{gc}		-	90	-	
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC} = 850V,$ $I_C = 70A, R_G = 10\Omega,$ Inductive Load, $T_C = 25^\circ C$	-	100	-	ns
Rise time	t_r		-	80	-	
Turn-off delay time	$t_{d(off)}$		-	230	-	
Fall time	t_f		-	110	-	
Turn-on switching energy	E_{on}		-	2.4	-	mJ
Turn-off switching energy	E_{off}		-	1.5	-	
Total switching energy	E_{ts}		-	3.9	-	
Turn-on delay time	$t_{d(on)}$	$V_{GE} = 15V, V_{CC} = 850V,$ $I_C = 70A, R_G = 10\Omega,$ Inductive Load, $T_C = 125^\circ C$	-	96.2	-	ns
Rise time	t_r		-	77.6	-	
Turn-off delay time	$t_{d(off)}$		-	239	-	
Fall time	t_f		-	124.3	-	
Turn-on switching energy	E_{on}		-	3.1	-	mJ
Turn-off switching energy	E_{off}		-	1.63	-	
Total switching energy	E_{ts}		-	4.73	-	

Diode Characteristics ($T_C = 25^\circ C$ unless otherwise specified)

Forward voltage	V_F	$I_F=50A, T_C=25^\circ C$	-	1.3	1.5	V
		$I_F=50A, T_C=125^\circ C$	-	1.6	-	
Reverse recovery time	t_{rr}	$I_F=70A, di/dt=100A/\mu s$ $T_C=25^\circ C$	-	240	-	ns
Reverse recovery current	I_{rr}		-	45	-	A
Reverse recovery charge	Q_{rr}		-	1300	-	nC
Reverse recovery time	t_{rr}	$I_F=70A, di/dt=100A/\mu s$ $T_C=125^\circ C$	-	260	-	ns
Reverse recovery current	I_{rr}		-	35	-	A
Reverse recovery charge	Q_{rr}		-	1500	-	nC

Notes:

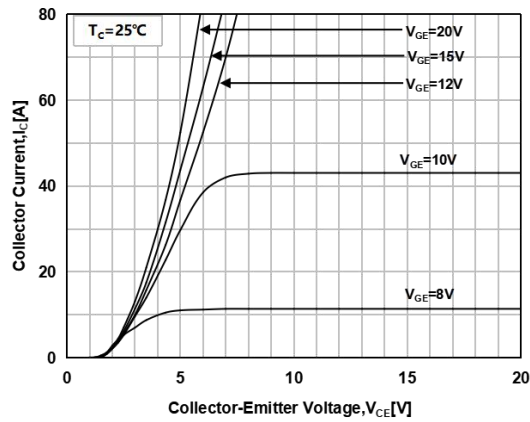
- 1: Pulse width limited by maximum junction temperature
- 2: Allowed number of short circuits: <1000; time between short circuits: >1s.
- 3: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$
- 4: Essentially independent of operating temperature

Thermal Characteristics

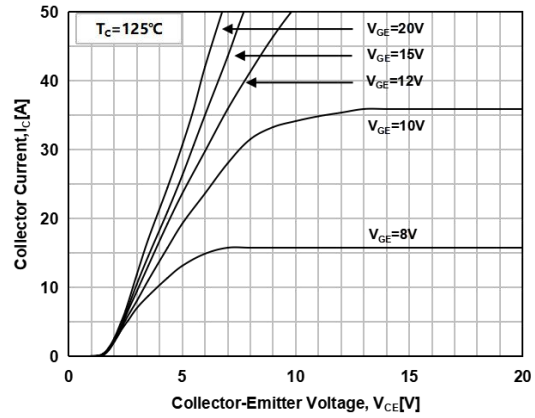
Parameter	Symbol	Value	Unit
Thermal resistance junction-to-ambient	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal resistance junction-to-case for IGBT	$R_{\theta JC}$	0.24	
Thermal resistance junction-to-case for Diode	$R_{\theta JC}$	0.36	

Typical Performance Characteristic

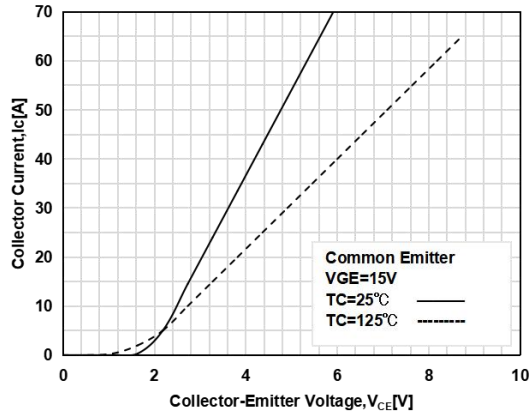
Typical Output Characteristics



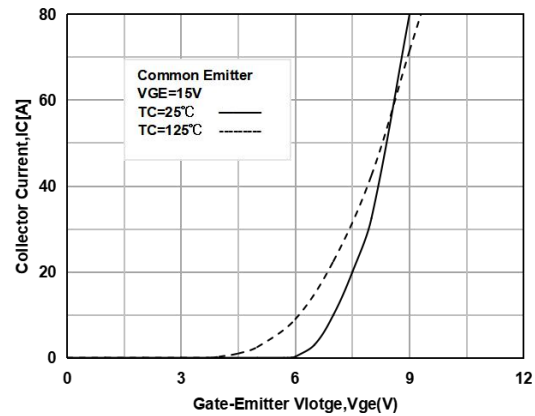
Typical Output Characteristics



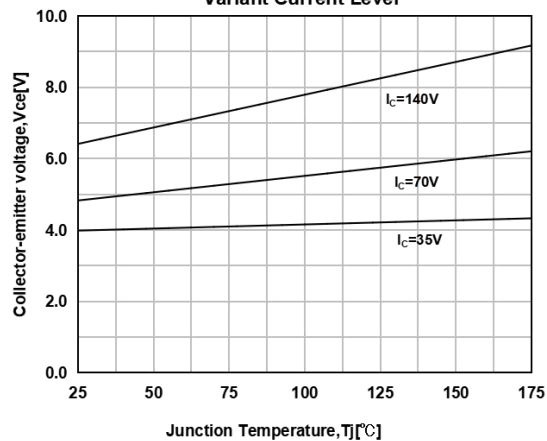
Typical Saturation Voltage Characteristics



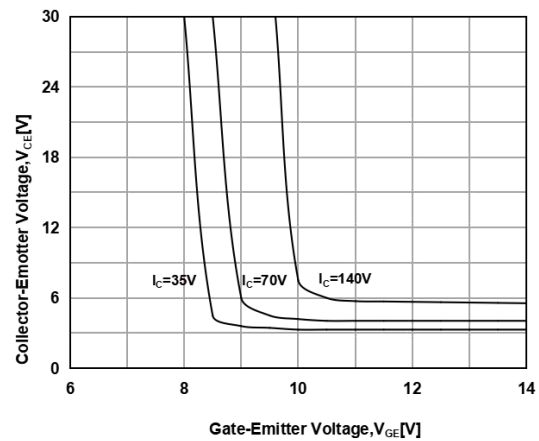
Transfer Characteristics



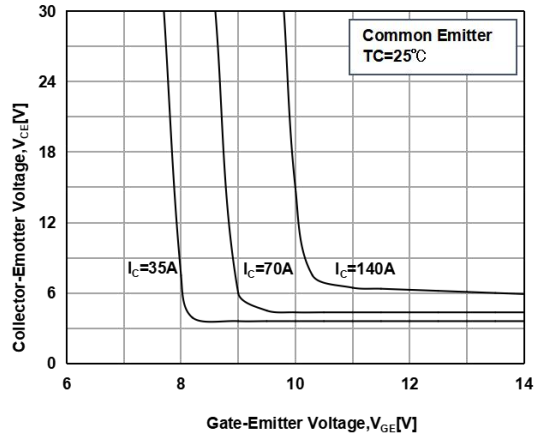
Saturation Voltage vs. Junction temperature at Variant Current Level



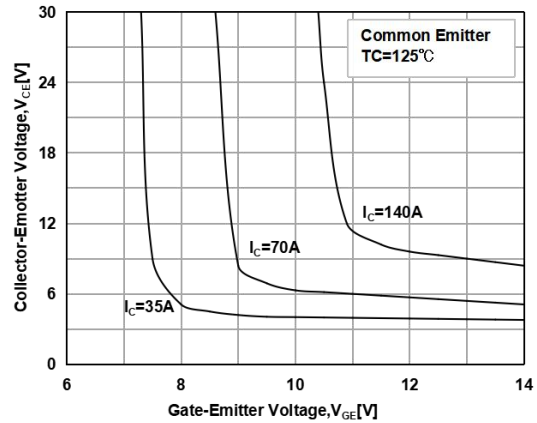
Saturation Voltage vs. V_{GE}



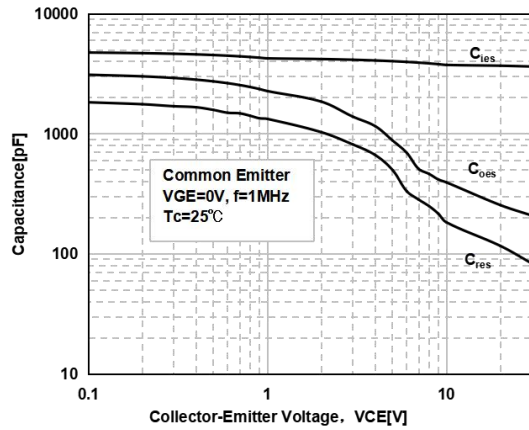
Saturation Voltage vs. V_{GE}



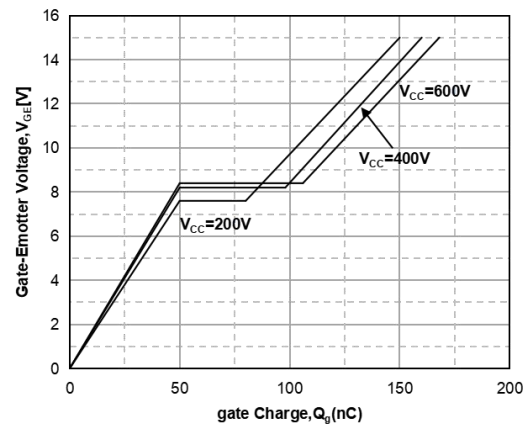
Saturation Voltage vs. V_{GE}



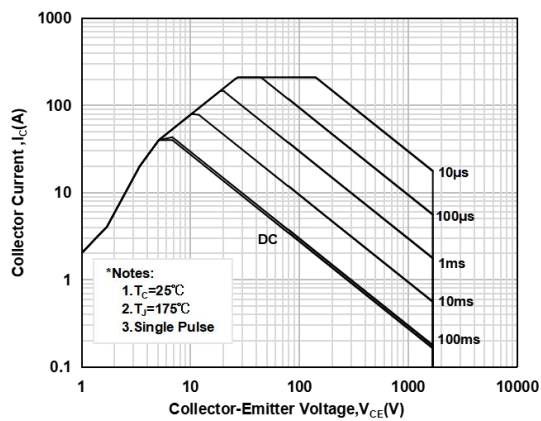
Capacitance Characteristics



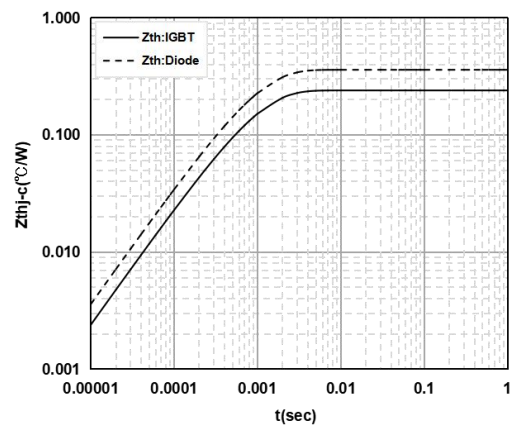
Gate Charge Characteristics



Foward Bias Safe Operating Area

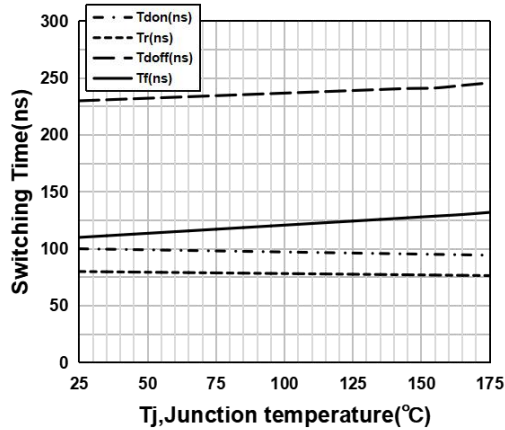


Transient Thermal Impedance



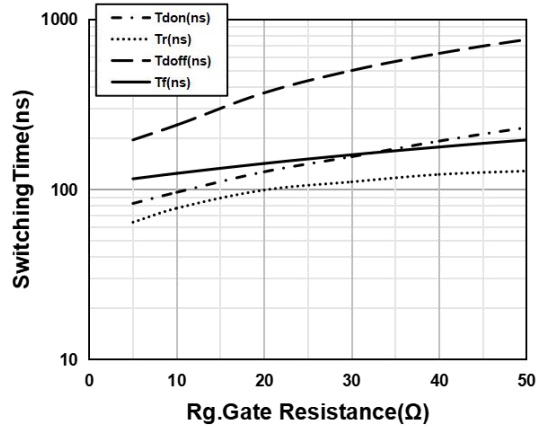
Switching Time vs. T_j

$V_{ge}=15V, V_{ce}=850V, I_c=70A, R_g=10\Omega$



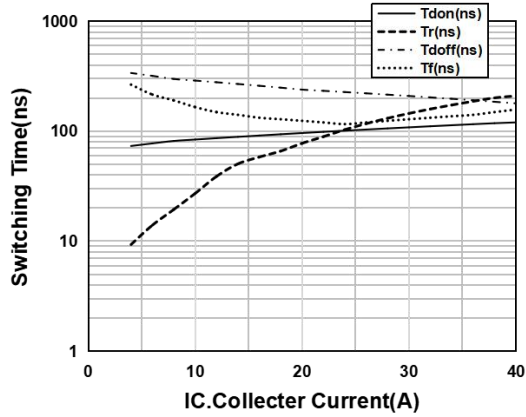
Switching Time Vs. $R_g(125^\circ C)$

$V_{ge}=15V, V_{ce}=850V, I_c=70A$



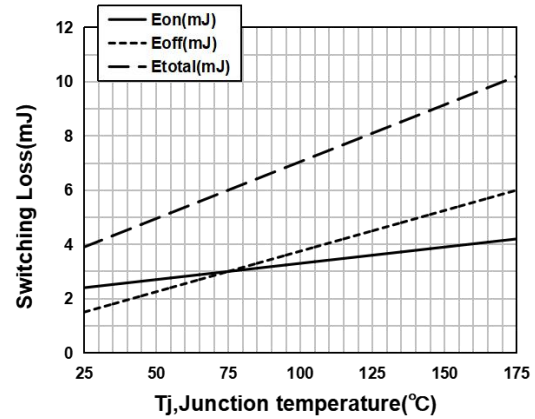
Switching Time vs. $I_c(125^\circ C)$

$V_{ce}=850V, V_{ge}=15V, R_g=10\Omega$



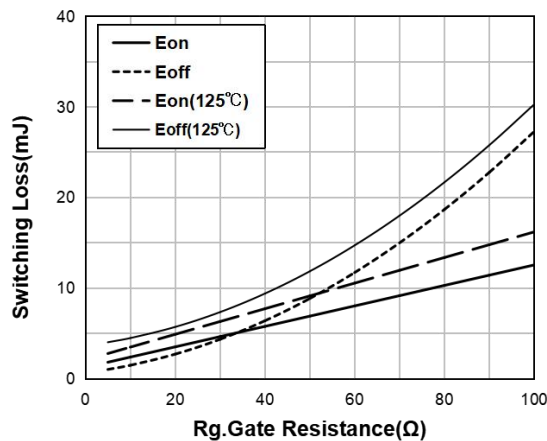
Switching Loss vs. T_j

$V_{ge}=15V, V_{ce}=850V, I_c=70A, R_g=10\Omega$



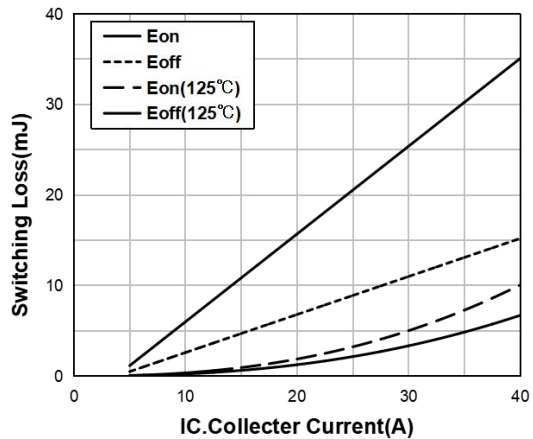
Switching Loss vs. $R_g(125^\circ C)$

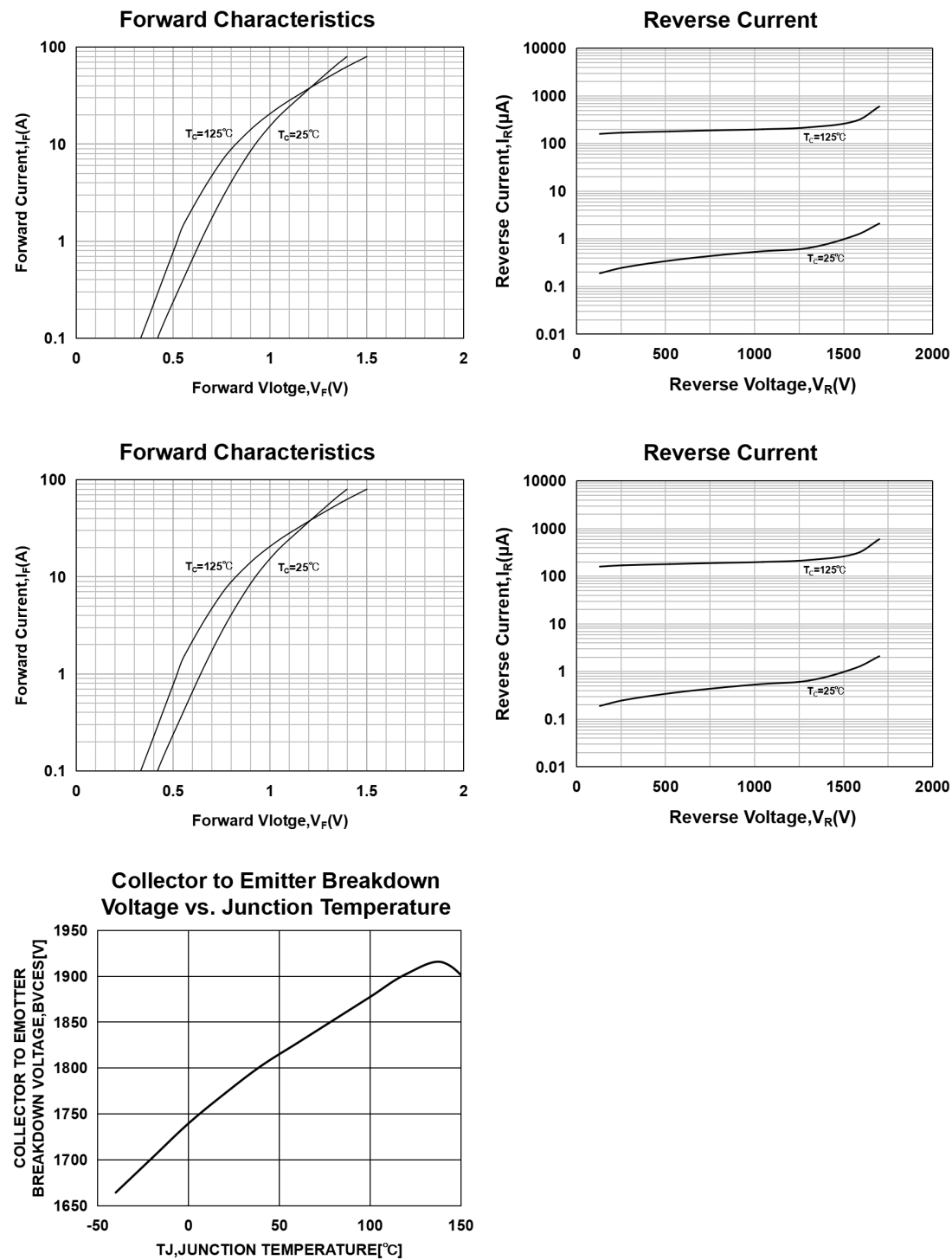
$V_{ge}=15V, V_{ce}=850V, I_c=70A$



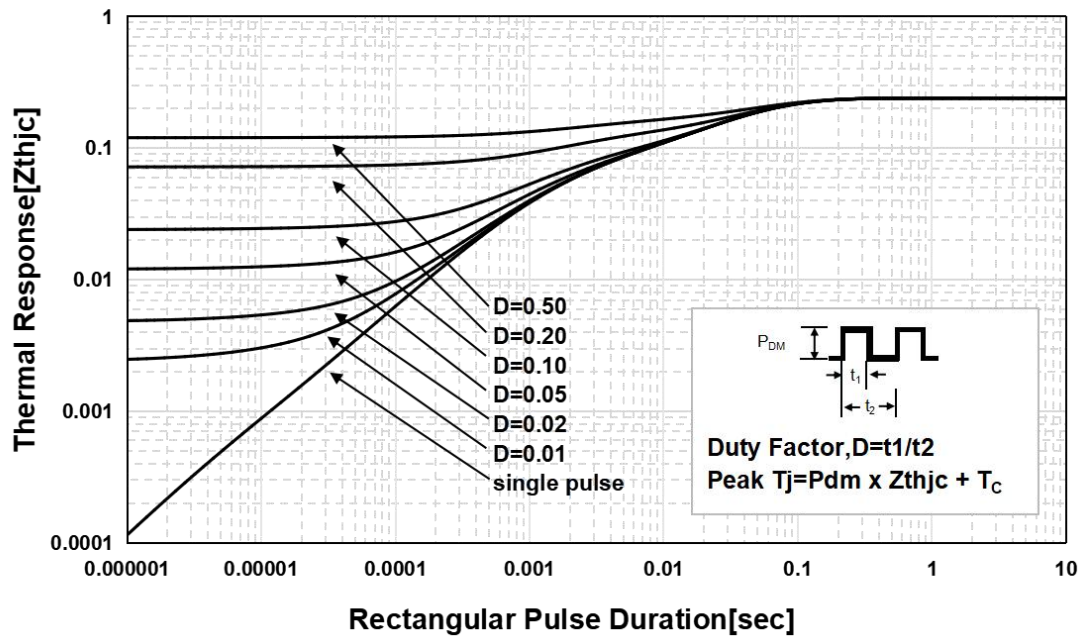
Switching Loss vs. $I_c(125^\circ C)$

$V_{ge}=15V, V_{ce}=850V, R_g=10\Omega$

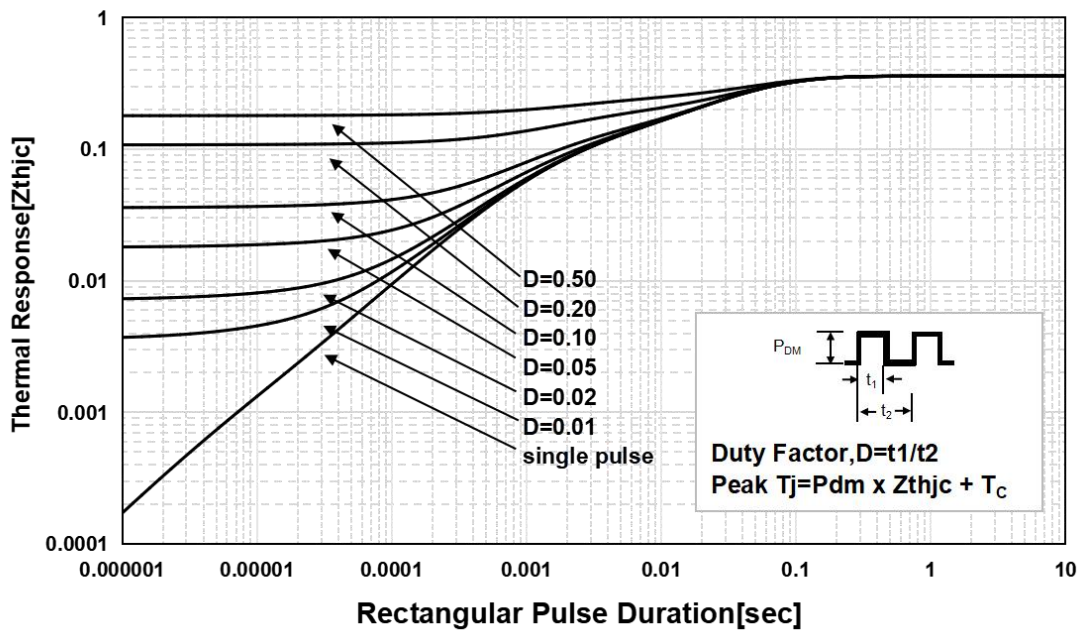




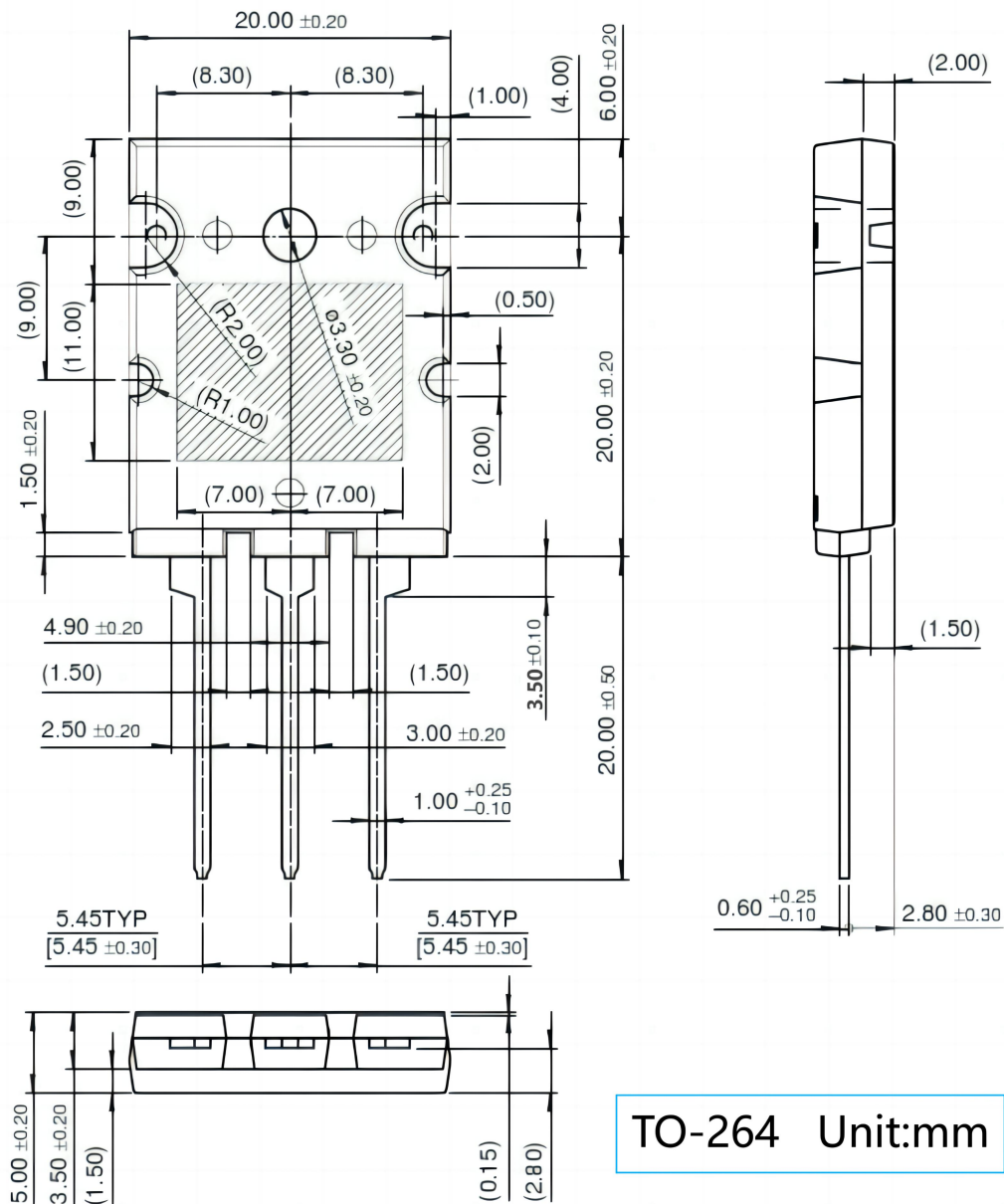
Transient Thermal Impedance of IGBT



Transient Thermal Impedance of Diode



Package outline dimension



TO-264 Unit:mm