



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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V_{CES}	650V
$I_C (100^\circ\text{C})$	20A
$V_{CE(sat)} (Typ.)$	1.5V@ $I_C=30\text{A}$
P_D	72W

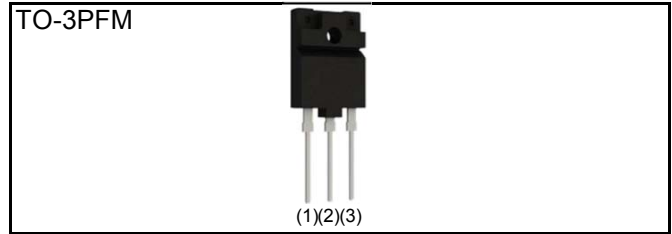
●Features

- 1) Low Collector - Emitter Saturation Voltage
- 2) High Speed Switching
- 3) Low Switching Loss & Soft Switching
- 4) Pb - free Lead Plating ; RoHS Compliant

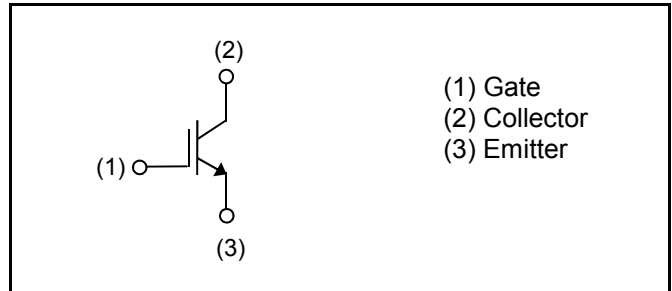
●Applications

- PFC
- UPS
- Welding
- Solar Inverter
- IH

●Outline



●Inner Circuit



●Packaging Specifications

Type	Packaging	Tube
	Reel Size (mm)	-
	Tape Width (mm)	-
	Basic Ordering Unit (pcs)	450
	Packing Code	C11
	Marking	RGW60TK65

●Absolute Maximum Ratings (at $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit	
Collector - Emitter Voltage	V_{CES}	650	V	
Gate - Emitter Voltage	V_{GES}	± 30	V	
Collector Current	$T_C = 25^\circ\text{C}$	I_C	33	A
	$T_C = 100^\circ\text{C}$	I_C	20	A
Pulsed Collector Current	I_{CP}^{*1}	120	A	
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	72	W
	$T_C = 100^\circ\text{C}$	P_D	36	W
Operating Junction Temperature	T_j	-40 to +175	$^\circ\text{C}$	
Storage Temperature	T_{stg}	-55 to +175	$^\circ\text{C}$	

*1 Pulse width limited by T_{jmax} .

●Thermal Resistance

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Thermal Resistance IGBT Junction - Case	$R_{\theta(j-c)}$	-	-	2.07	°C/W

●IGBT Electrical Characteristics (at $T_j = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Collector - Emitter Breakdown Voltage	BV_{CES}	$I_C = 10\mu\text{A}, V_{GE} = 0\text{V}$	650	-	-	V
Collector Cut - off Current	I_{CES}	$V_{CE} = 650\text{V}, V_{GE} = 0\text{V}$	-	-	10	μA
Gate - Emitter Leakage Current	I_{GES}	$V_{GE} = \pm 30\text{V}, V_{CE} = 0\text{V}$	-	-	± 200	nA
Gate - Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = 5\text{V}, I_C = 20.0\text{mA}$	5.0	6.0	7.0	V
Collector - Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 30\text{A}, V_{GE} = 15\text{V}$	-	1.5	1.9	V
		$T_j = 25^\circ\text{C}$	-	1.85	-	
		$T_j = 175^\circ\text{C}$	-			

●IGBT Electrical Characteristics (at $T_j = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{ies}	$V_{CE} = 30\text{V}$	-	2530	-	pF
Output Capacitance	C_{oes}	$V_{GE} = 0\text{V}$	-	65	-	
Reverse Transfer Capacitance	C_{res}	$f = 1\text{MHz}$	-	46	-	
Total Gate Charge	Q_g	$V_{CE} = 400\text{V}$	-	84	-	nC
Gate - Emitter Charge	Q_{ge}	$I_C = 30\text{A}$	-	17	-	
Gate - Collector Charge	Q_{gc}	$V_{GE} = 15\text{V}$	-	31	-	
Turn - on Delay Time	$t_{d(on)}$	$I_C = 30\text{A}, V_{CC} = 400\text{V}$	-	37	-	ns
Rise Time	t_r	$V_{GE} = 15\text{V}, R_G = 10\Omega$	-	13	-	
Turn - off Delay Time	$t_{d(off)}$	$T_j = 25^\circ\text{C}$	-	114	-	
Fall Time	t_f	Inductive Load	-	35	-	
Turn - on Switching Loss	E_{on}	* E_{on} includes diode	-	0.48	-	mJ
Turn - off Switching Loss	E_{off}	reverse recovery	-	0.49	-	
Turn - on Delay Time	$t_{d(on)}$	$I_C = 30\text{A}, V_{CC} = 400\text{V}$	-	36	-	ns
Rise Time	t_r	$V_{GE} = 15\text{V}, R_G = 10\Omega$	-	14	-	
Turn - off Delay Time	$t_{d(off)}$	$T_j = 175^\circ\text{C}$	-	133	-	
Fall Time	t_f	Inductive Load	-	76	-	
Turn - on Switching Loss	E_{on}	* E_{on} includes diode	-	0.49	-	mJ
Turn - off Switching Loss	E_{off}	reverse recovery	-	0.63	-	
Reverse Bias Safe Operating Area	RBSOA	$I_C = 120\text{A}, V_{CC} = 520\text{V}$ $V_P = 650\text{V}, V_{GE} = 15\text{V}$ $R_G = 100\Omega, T_j = 175^\circ\text{C}$	FULL SQUARE			-

●Electrical Characteristic Curves

Fig.1 Power Dissipation vs. Case Temperature

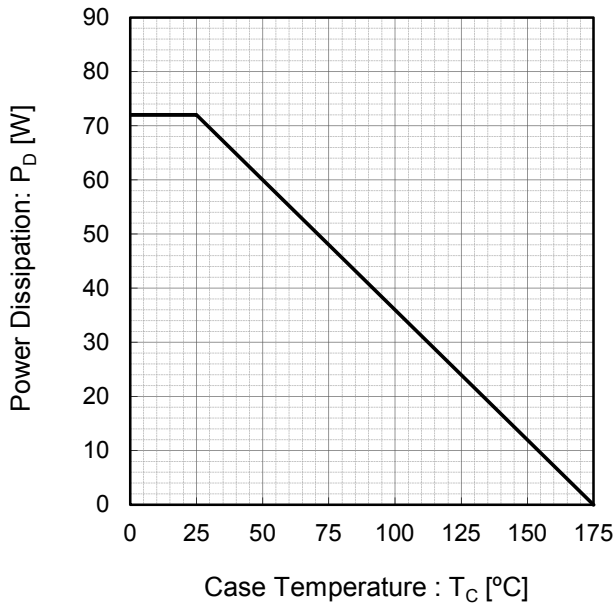


Fig.2 Collector Current vs. Case Temperature

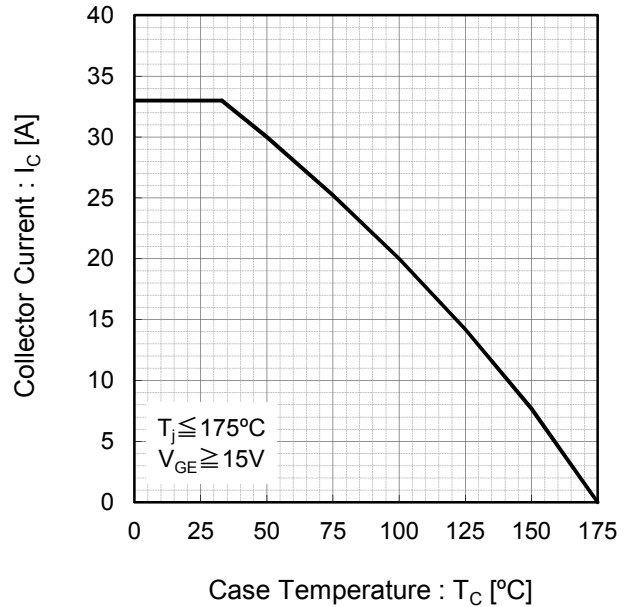


Fig.3 Forward Bias Safe Operating Area

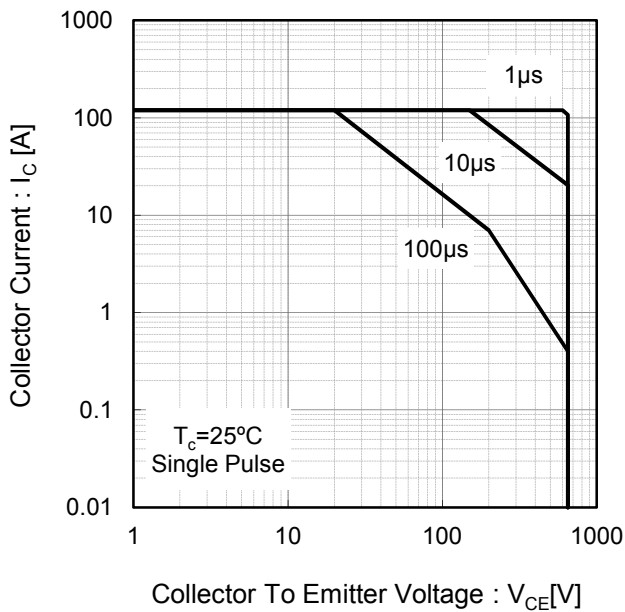
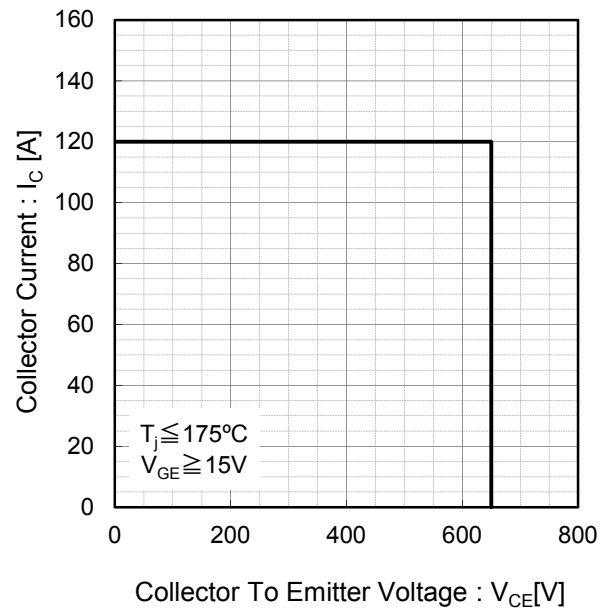


Fig.4 Reverse Bias Safe Operating Area



●Electrical Characteristic Curves

Fig.5 Typical Output Characteristics

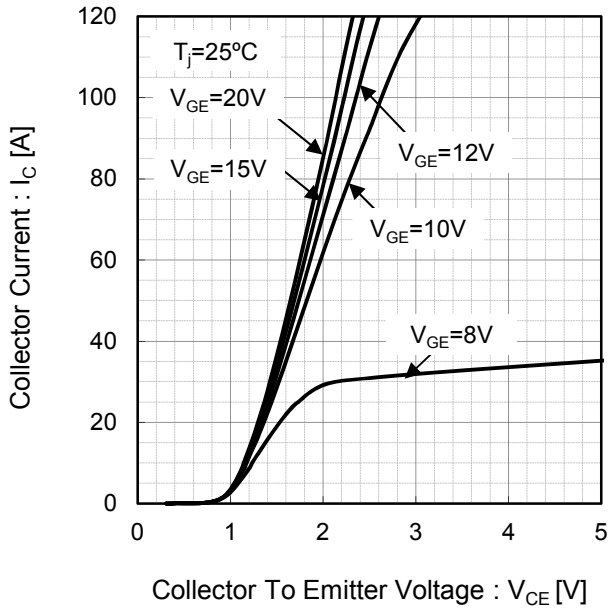


Fig.6 Typical Output Characteristics

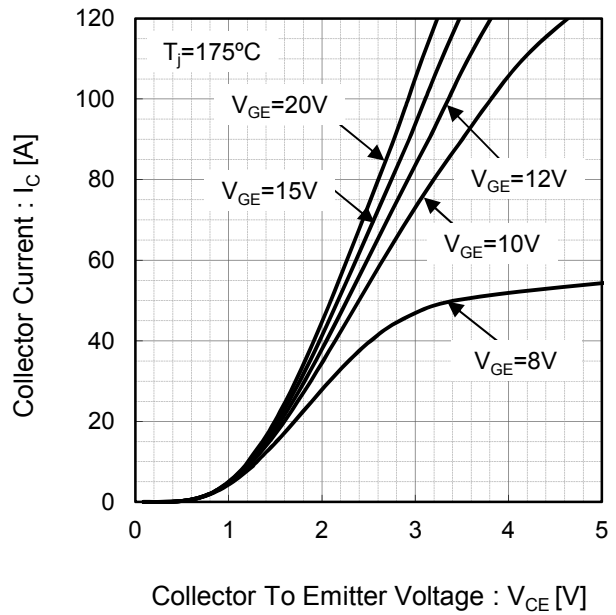


Fig.7 Typical Transfer Characteristics

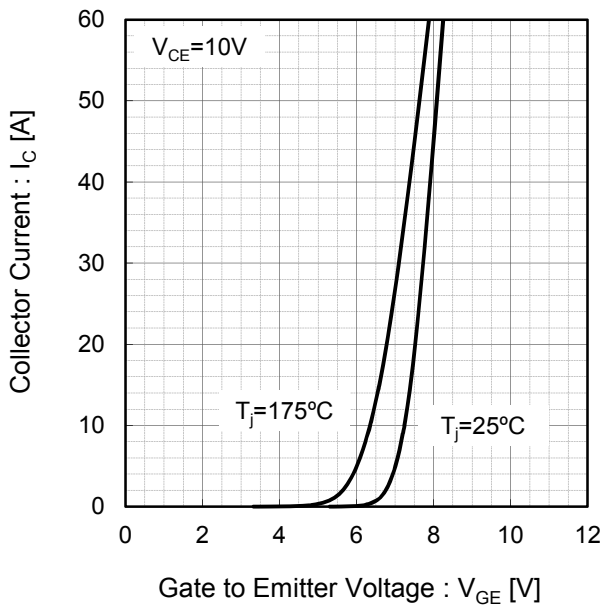
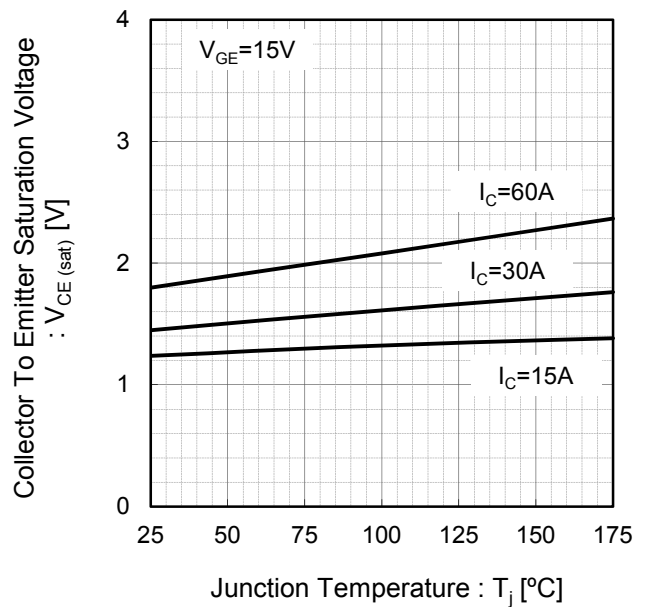


Fig.8 Typical Collector To Emitter Saturation Voltage vs. Junction Temperature



●Electrical Characteristic Curves

Fig.9 Typical Collector To Emitter Saturation Voltage vs. Gate To Emitter Voltage

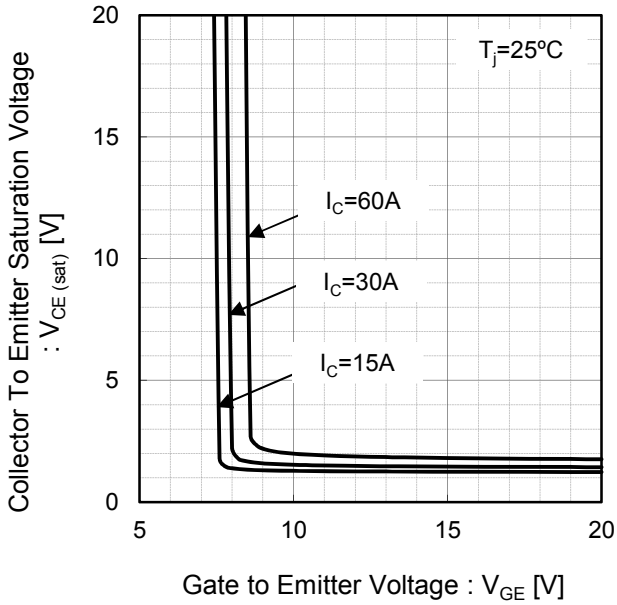


Fig.10 Typical Collector To Emitter Saturation Voltage vs. Gate To Emitter Voltage

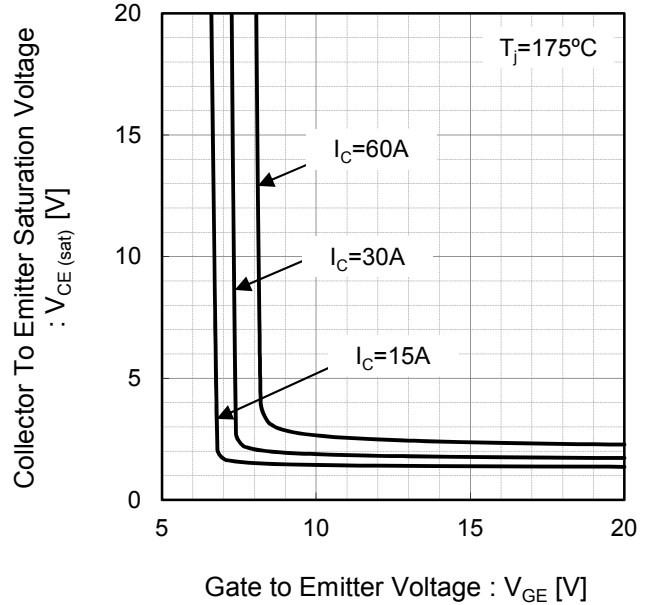


Fig.11 Typical Switching Time vs. Collector Current

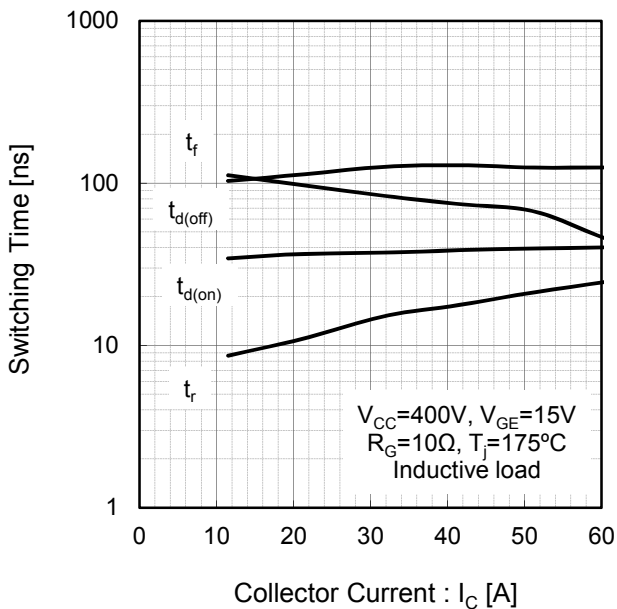
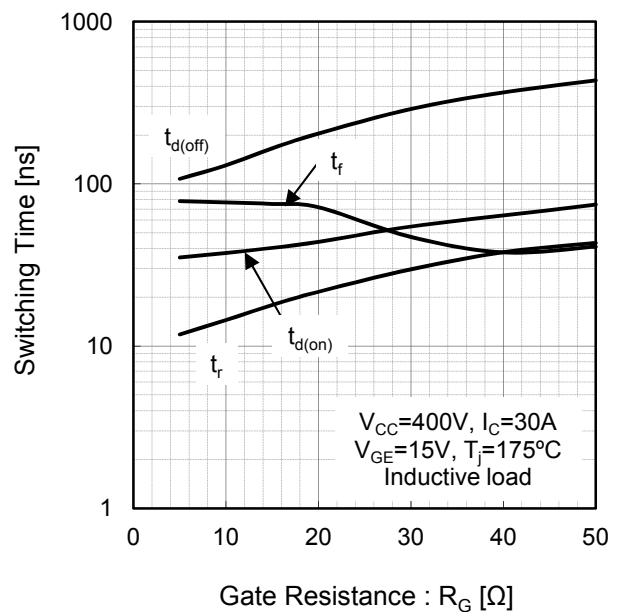


Fig.12 Typical Switching Time vs. Gate Resistance



●Electrical Characteristic Curves

Fig.13 Typical Switching Energy Losses vs. Collector Current

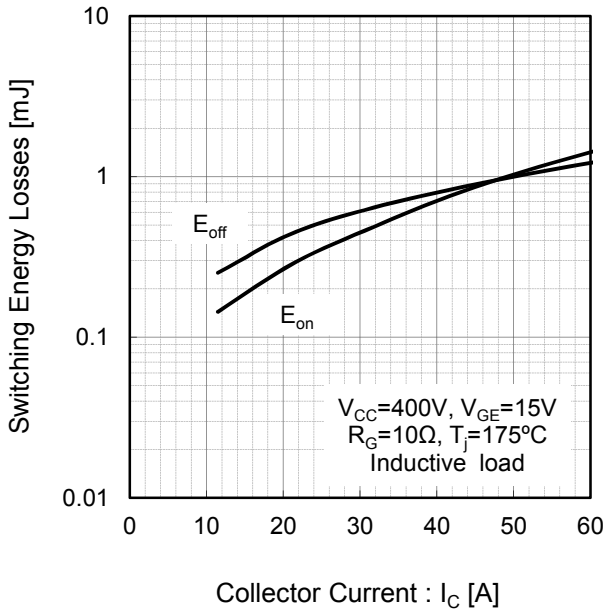


Fig.14 Typical Switching Energy Losses vs. Gate Resistance

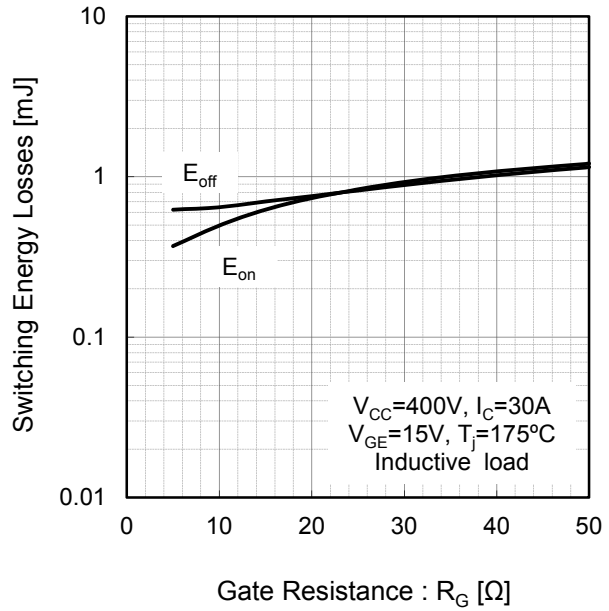


Fig.15 Typical Capacitance vs. Collector To Emitter Voltage

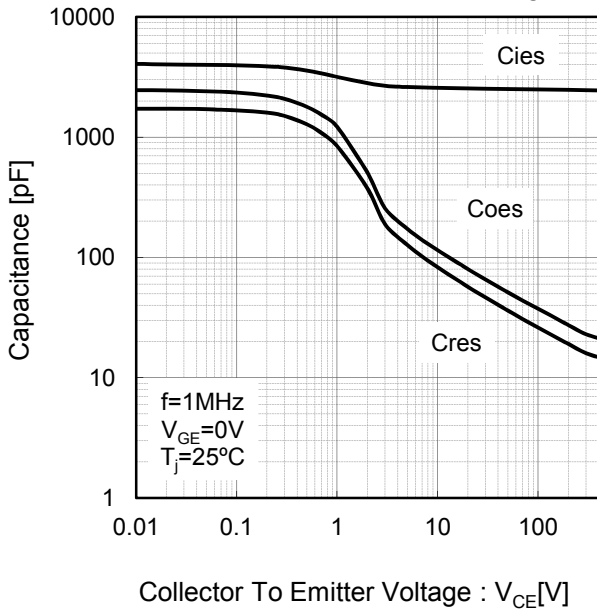
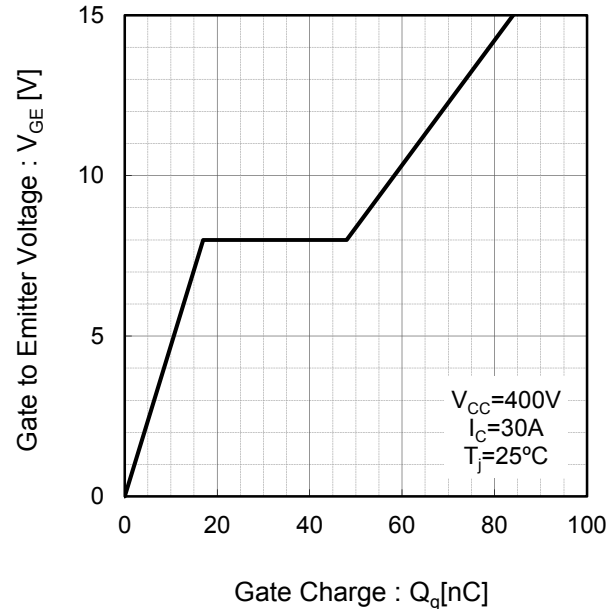
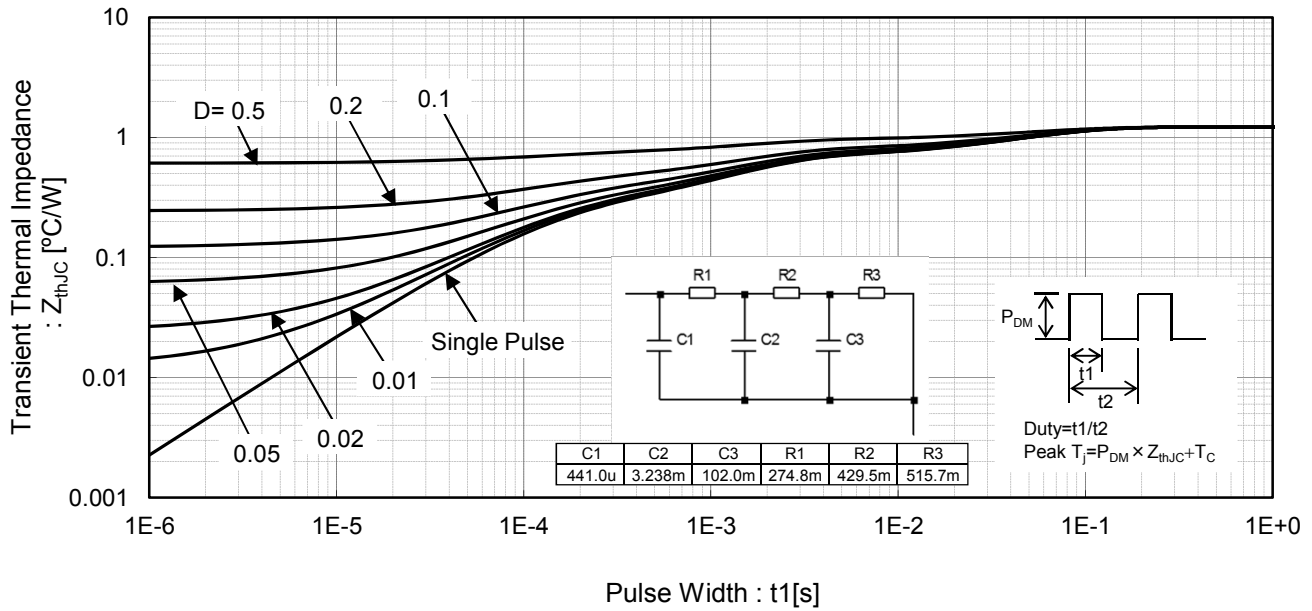


Fig.16 Typical Gate Charge



●Electrical Characteristic Curves

Fig.17 Typical IGBT Transient Thermal Impedance



● Inductive Load Switching Circuit and Waveform

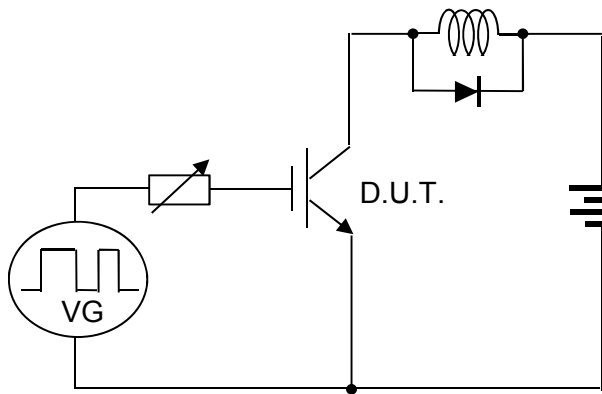


Fig.18 Inductive Load Circuit

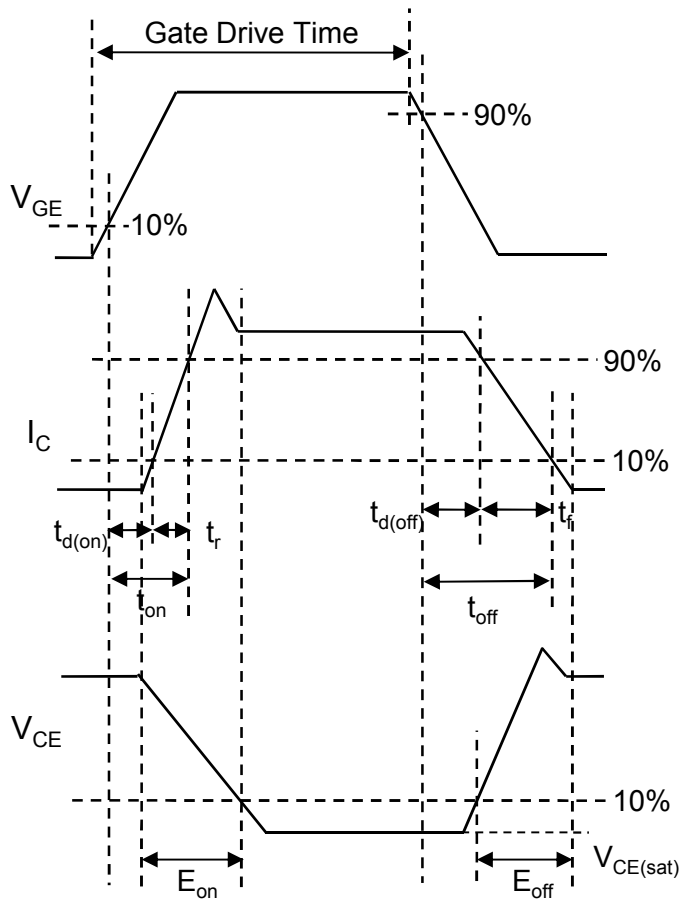


Fig.19 Inductive Load Waveform

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RGW60TK65 - Web Page

Part Number	RGW60TK65
Package	TO-3PFM
Unit Quantity	450
Minimum Package Quantity	30
Packing Type	Tube
Constitution Materials List	inquiry
RoHS	Yes