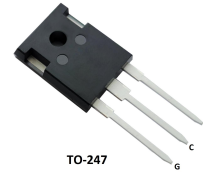


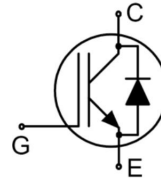
Features

- Low gate charge
- Trench FS Technology,
- saturation voltage: $V_{CE(sat)}$,
type =1.6V, $I_C=50A$ and $T_C=25^{\circ}C$
- RoHS product



Applications

- General purpose inverters
- UPS



Absolute Ratings ($T_C=25^{\circ}C$)

Parameter	Symbol	Value	Unit
Collector-Emmitter Voltage	V_{CES}	650	V
*Collector Current-continuous	I_C $T=25^{\circ}C$ $T=100^{\circ}C$	100	A
		50	A
Collector Current-pulse(note 1)	I_{CM}	200	A
Diode RMS forward current	I_F $T=25^{\circ}C$ $T=100^{\circ}C$	100	A
		50	A
Gate-Emmitter Voltage	V_{GES}	± 30	V
Power Dissipation	P_D $T_C=25^{\circ}C$	368	W
Operating Temperature Range	T_J	-55~175	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55~+175	$^{\circ}C$
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^{\circ}C$

*Collector current limited by maximum Junction temperature

Thermal Characteristic

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emmitter Voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$	650	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V, T_C=25^{\circ}C$	-	-	0.2	mA
Gate-body leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 30V$	-	-	± 200	nA
On-Characteristics						

Gate-Emmitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_c=250\mu A$	4.0	-	6.5	V
Collector-Emmitter saturation Voltage	V_{CESAT}	$V_{GE}=15V, I_c=50A, T_c=25^{\circ}C$	-	1.6	2.2	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1.0MHZ, T_c=25^{\circ}C$	-	3330	-	pF
Output capacitance	C_{oes}		-	270	-	pF
Reverse transfer capacitance	C_{res}		-	78	-	pF
Total Gate Charge	Q_g	$V_{CC}=520V, I_C=50A, V_{GE}=15V, T_c=25^{\circ}C$	-	118	-	nC
Gate to emitter charge	Q_{ge}		-	33	-	
Gate to collector charge	Q_{gc}		-	48	-	
Switching Characteristics						
Turn-On delay time	$t_d(on)$	$V_{CC}=400V, I_c=50A, R_G=10\Omega, V_{GE}=15V, T_c=25^{\circ}C$	-	33	-	ns
Turn-On rise time	t_r		-	105	-	ns
Turn-off delay time	$t_d(off)$		-	140	-	ns
Turn-off Fall time	t_f		-	72	-	ns
Turn-on energy	E_{on}		-	0.65	-	mJ
Turn-off energy	E_{off}		-	1.53	-	mJ
Total switching Energy	E_{tot}		-	2.20	-	mJ
Anti-Paraller Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_F	$V_{GE}=0V, I_F=50A.$	-	1.7	2.4	V
Diode Reverse recovery time	t_{rr}	$V_{GE}=0V, V_R=400V, I_F=50A, dl=dt=200A/us$	-	125	-	ns
Reverse recovery charge	Q_{rr}		-	15	-	uC
Diode Reverse recovery Current	I_{rrm}		-	1.2	-	A

Electrical Characteristics

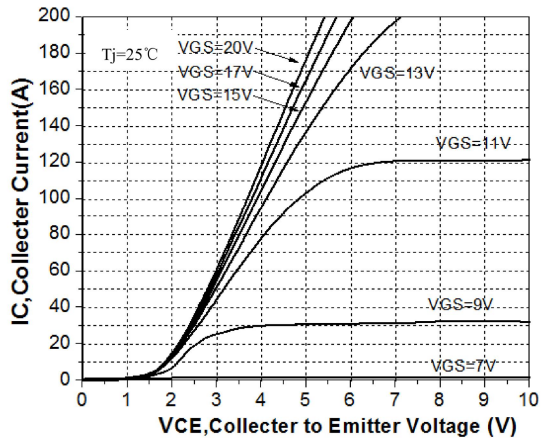
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.34	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	34	$^\circ C/W$

Notes:

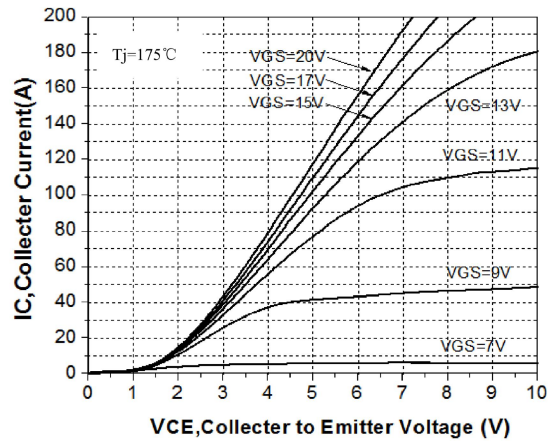
- 1: Pulse width limited by maximum junction temperature
- 2: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 3: Essentially independent of operating temperature

Electrical Characteristics (curves)

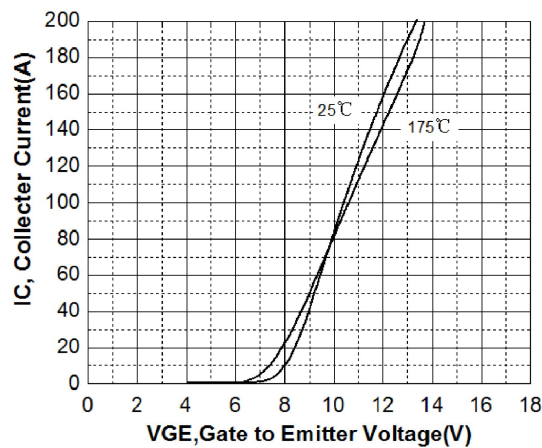
Output Characteristics (25°C)



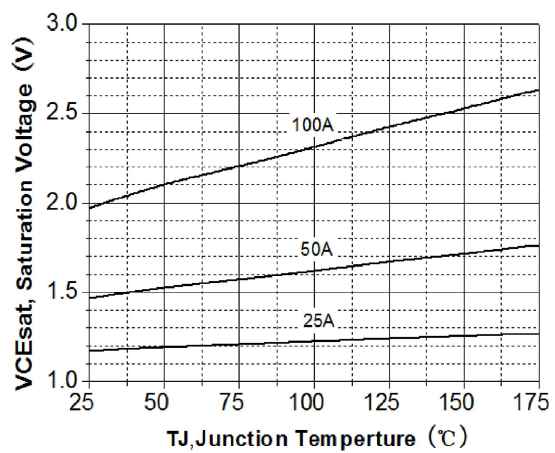
Output Characteristics (175°C)



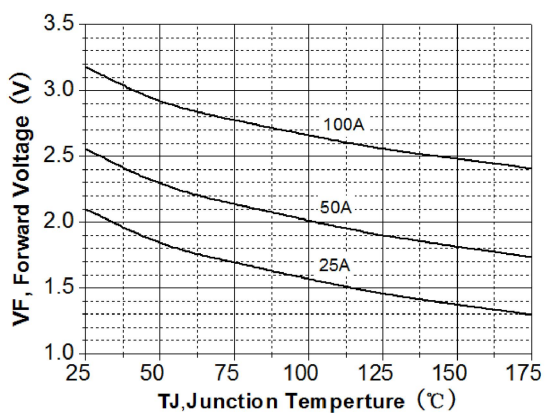
Transfer Characteristics



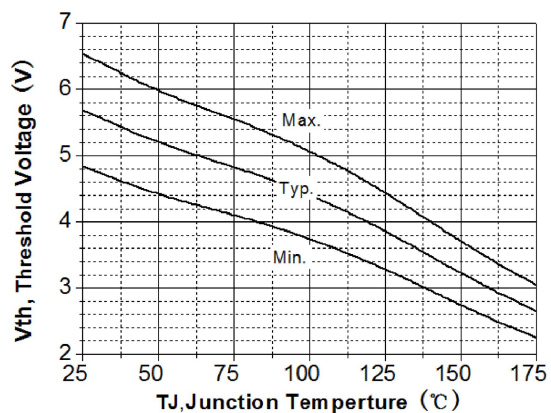
Vcesat vs. Tj



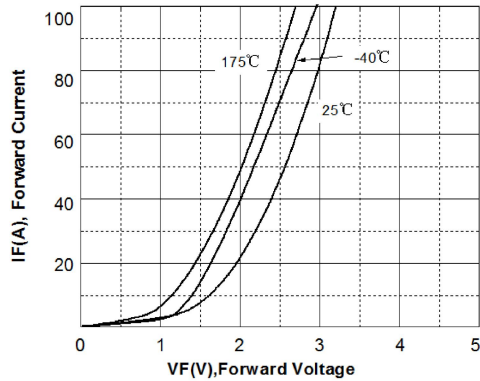
VF vs. Tj



Vth vs. Tj

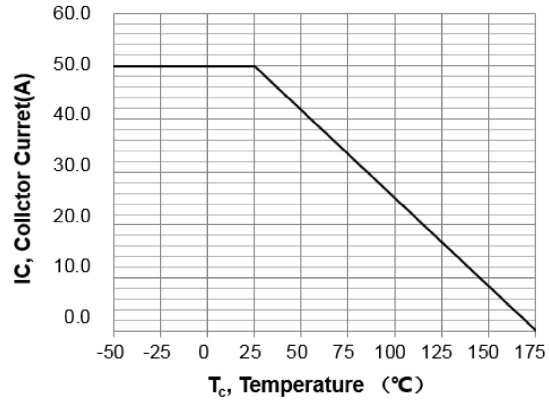


Diode Characteristic



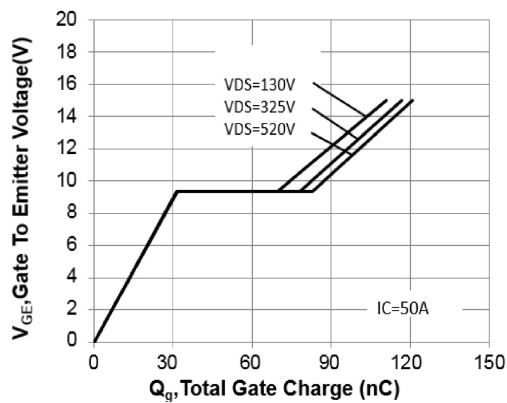
Collector current vs. case temperature

$V_{GE} \geq 15V$, $T_j \leq 175^\circ C$



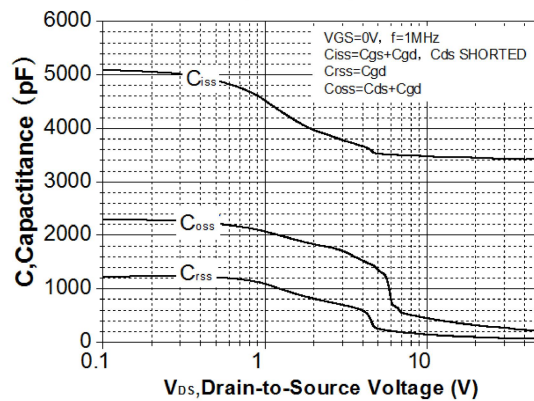
Gate Charge Characteristics

$V_{GE}=15V$, $I_C=50A$



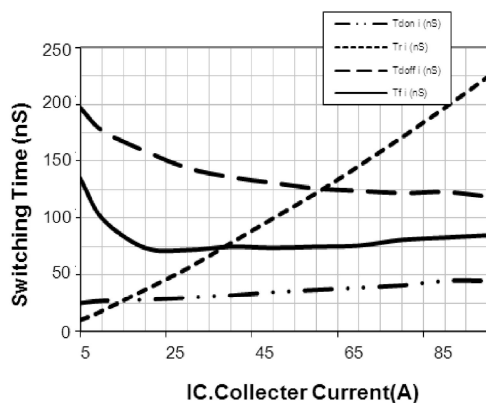
Capacitance Characteristic

$V_{ce}=25V$, $V_{GE}=0V$, $f=1.0MHz$



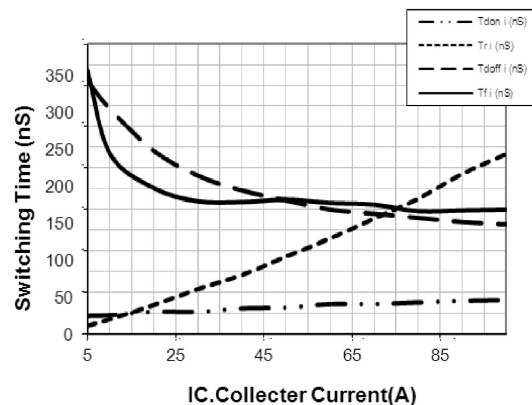
Switching Time vs. I_C (25°C)

$V_{CE}=400V$, $V_{GE}=15V$, $R_G=10\Omega$



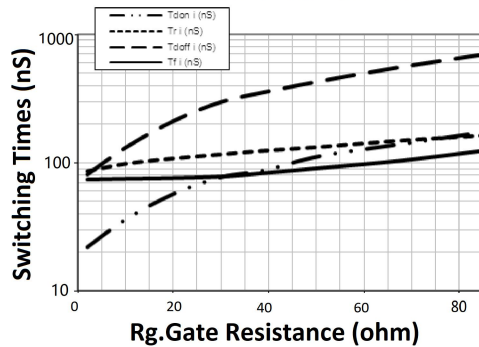
Switching Time vs. I_C (175°C)

$V_{CE}=400V$, $V_{GE}=15V$, $R_G=10\Omega$



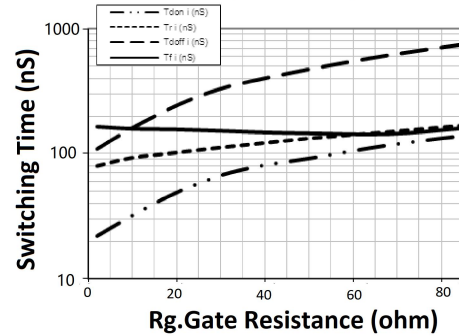
Switching Time vs. Rg (25°C)

VGE=15V, VCE=400V, IC=50A



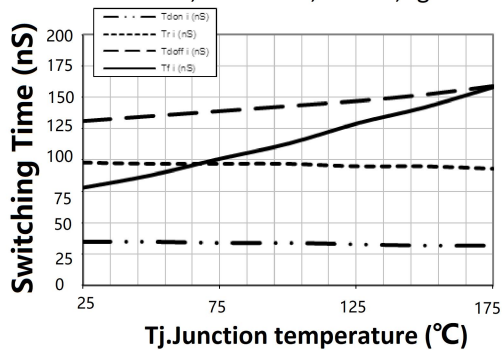
Switching Time vs. Rg (175°C)

VGE=15V, VCE=400V, IC=50A



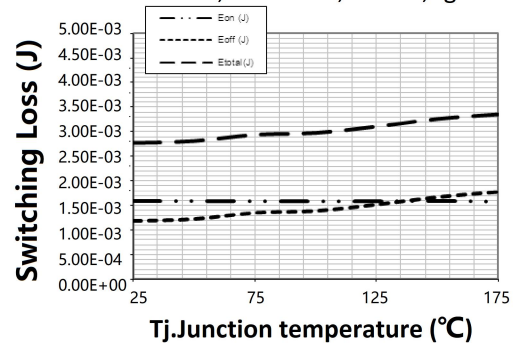
Switching Time vs. Tj

VGE=15V, VCE=400V, IC=50A, Rg=10Ω



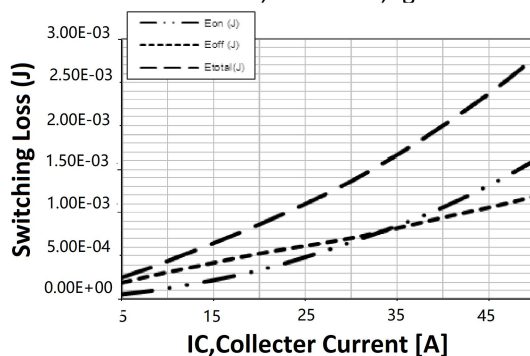
Switching Loss vs. Tj

VGE=15V, VCE=400V, IC=50A, Rg=10Ω



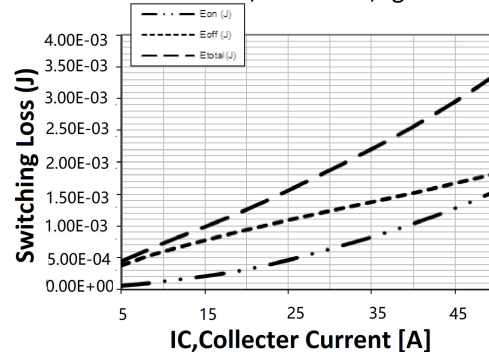
Switching Loss vs. IC (25°C)

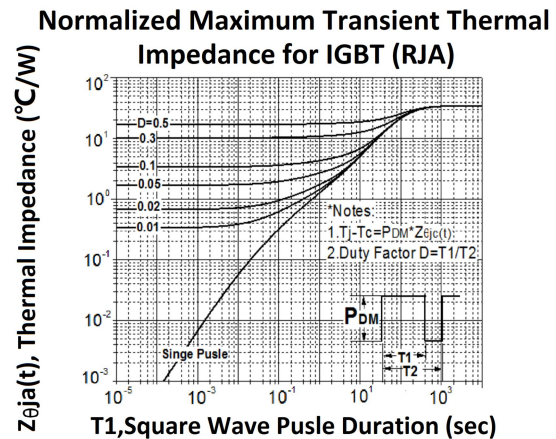
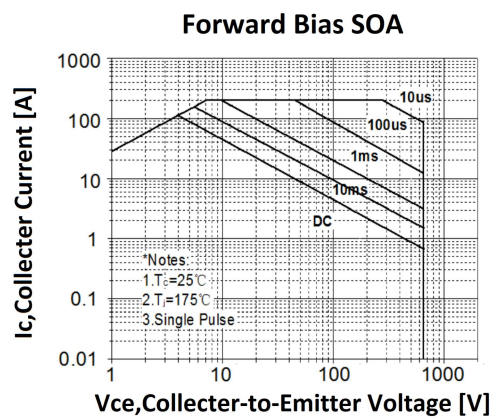
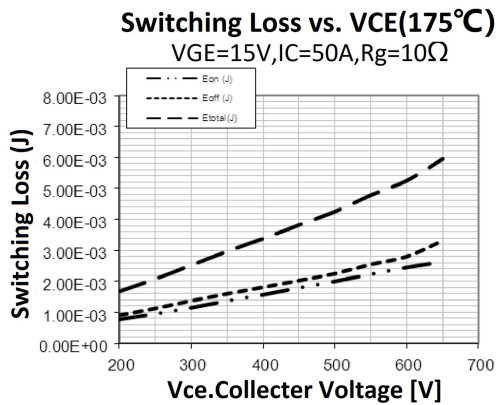
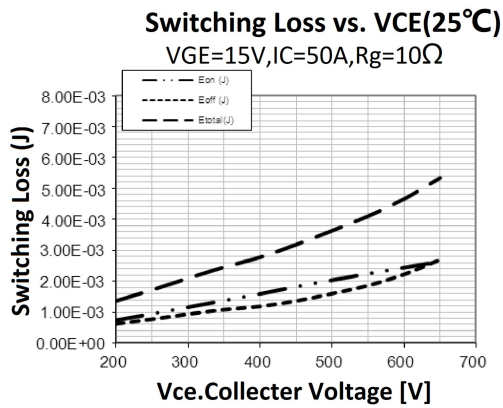
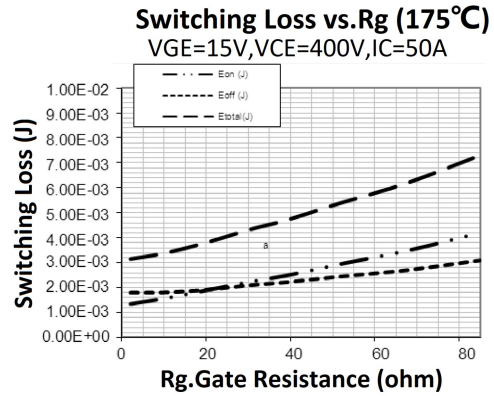
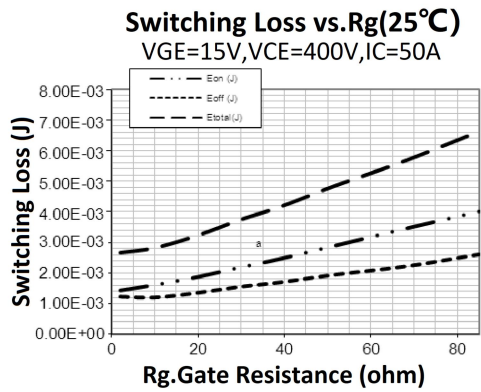
VGE=15V, VCE=400V, Rg=10Ω



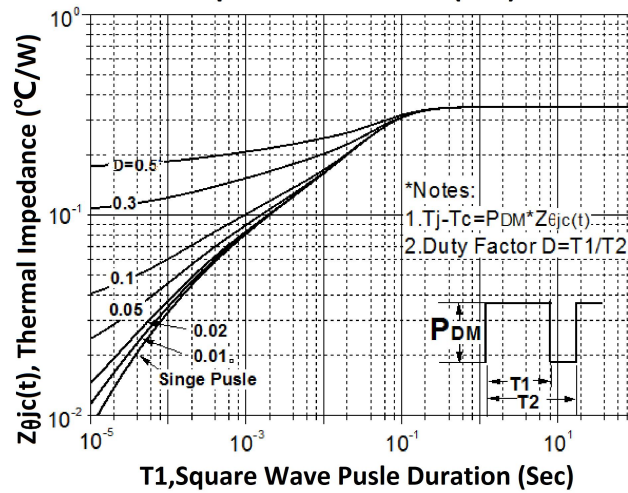
Switching Loss vs. IC (175°C)

VGE=15V, VCE=400V, Rg=10Ω





Normalized Maximum Thermal Impedance for IGBT (RJC)



Package Mechanical DATA

