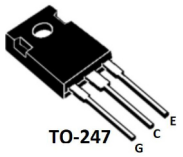
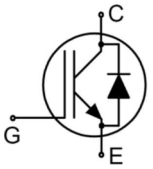
Features

- Low gate charge
- Trench-Stop Technology
- High speed switching
- Saturation voltage:VCE(sat),typ= 1.5V @ IC=50A and TC=25℃



Applications

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



Absolute Ratings（Tc=25℃）

Parameter	Symbol		MSG60T65HHC0	Unit
Collector-Emmiter Voltage	Vces		650	V
Collector Current-continuous	Ic	T=25℃	120	A
		T=100℃	60	A
Diode Forward current, limited by Tjmax	I_F	T=25℃	120	A
		T=100℃	60	A
Collector Current-pulse(note 1)	I_{CM}		240	A
Continuous Gate-Emmiter Voltage	V_{GE}		±20	V
Transient Gate-emitter voltage	V_{GE}		±30	V
Turn-off safe area	-		200	A
Power Dissipation	P_D	T_C=25℃	260	W
Operating Temperature Range	T_J		-55~175	℃
Storage Temperature Range	T_{STG}		-55~175	℃
Maximum Lead Temperature for Soldering Purposes	T_L		300	℃

Thermal Characteristic

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emmiter Voltage	BV_{CES}	I_C=250μA,V_{GE}=0V	650	-	-	V
		Ic=1mA,V_{GE}=0V	650			V

Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=650V,V_{GE}=0V, T_C=25℃	-	0.1	40	μA
		TC=150℃	-	2.25	-	μA
Gate-body leakage current	I_{GESF}	V_{CE}=0V,V_{GE}=±20V	-	-	200	nA
On-Characteristics						
Gate-Emmiter Threshold Voltage	$V_{GE(th)}$	VCE=VGE, Ic=250uA	3.0	5.0	6.0	V
Collector-Emmiter saturation Voltage	V_{CESAT}	V_{GE}=15V,I_C=50A	-	1.5	-	V
Dynamic Characteristics						
Input capacitance	Cies	VCE=25V, VGE=0V, f=1.0MHZ	-	3510	-	pF
Output capacitance	Coes		-	244	-	pF
Reverse transfer capacitance	Cres		-	81	-	pF
Switching Characteristics						
Turn-On delay time	t_d(on)	V_{CC}=400V,Ic=60A, R_G=10Ω, V_{GE}=0.0/15.0V Tc=25℃ Inductive Load	-	36	-	ns
Turn-On rise time	t_r		-	96	-	ns
Turn-off delay time	t_d(off)		-	101	-	ns
Turn-off Fall time	t_f		-	55	-	ns
Turn-on energy	E_{on}		-	1.65	-	mJ
Turn-off energy	E_{off}		-	1.1	-	mJ
Total switching Energy	E_{total}		-	2.75	-	mJ
Turn-On delay time	t_d(on)	V_{CC}=400V,Ic=60A, R_G=10Ω, V_{GE}=0.0/15.0V Tc=75℃ Inductive Load	-	33	-	ns
Turn-On rise time	t_r		-	108	-	ns
Turn-off delay time	t_d(off)		-	130	-	ns
Turn-off Fall time	t_f		-	105	-	ns
Turn-on energy	E_{on}		-	1.9	-	mJ
Turn-off energy	E_{off}		-	1.5	-	mJ
Total switching Energy	E_{total}		-	3.4	-	mJ
Total Gate Charge	Qg	VCE=480V,Ic=60A ,VGE=15V	-	132	-	nC
Gate to emitter Charge	Qge			33		nC
Gate to Collector charge	Qgc			55		nC

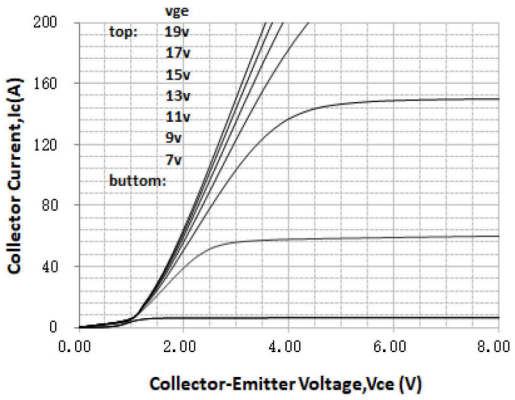
Anti-Paraller Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	VF	V_{GE}=0V,I_F=30A	-	-	1.4	V
Diode Forward Current	IF	T_C=100℃	-	-	60	A
Diode Reverse recovery time	t_{rr}	VGE=0V,VR=300V IF=40A dI=/dt=600/us (note 4)	-	90	-	ns
Reverse recovery charge	Q_{rr}		-	900	-	nC
Reverse Recovery Current	Irr		-	17	-	A

Thermal Characteristic

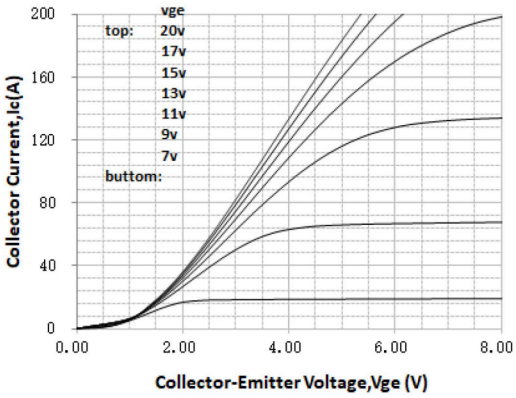
Parameter	Symbol	Max	Unit
IGBT Thermal Resistance,Junction to Case	$R_{th(j-c)}$	0.48	℃/W
Diode Thermal Resistance,Junction to Case	$R_{th(j-c)}$	1.1	℃/W
Thermal Resistance,Junction to Ambitent	$R_{th(j-A)}$	40	℃/W

Electrical Characteristics(curves)

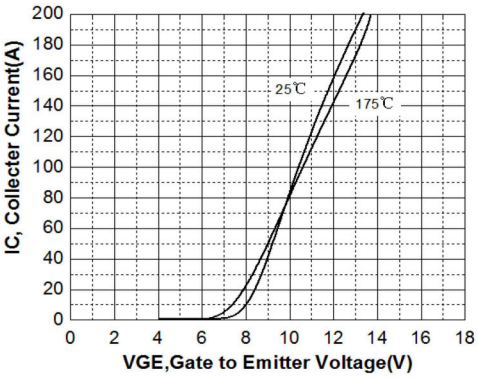
Output Characteristics（25℃）



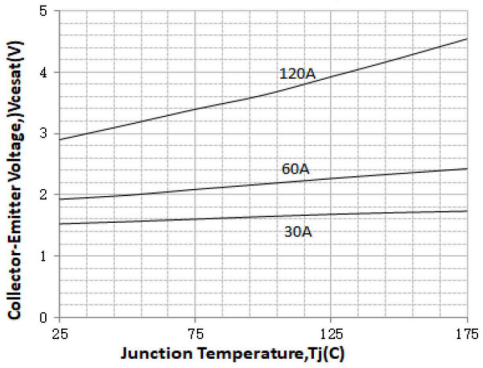
Output Characteristics（175℃）



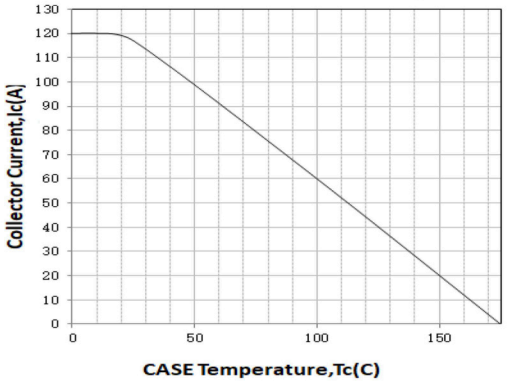
Transfer Characteristics



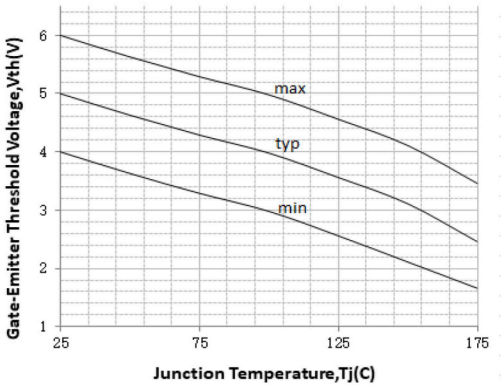
Vcesat vs. Tj



Colletcor current vs.case temperature

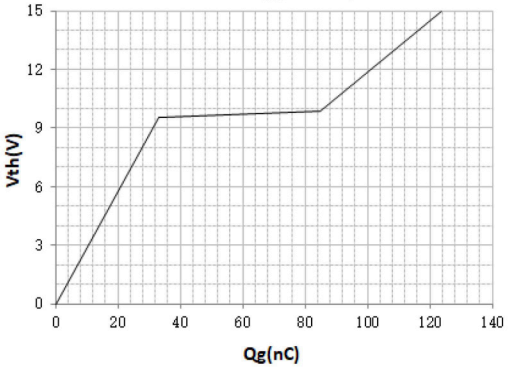


VTH vs. Tj



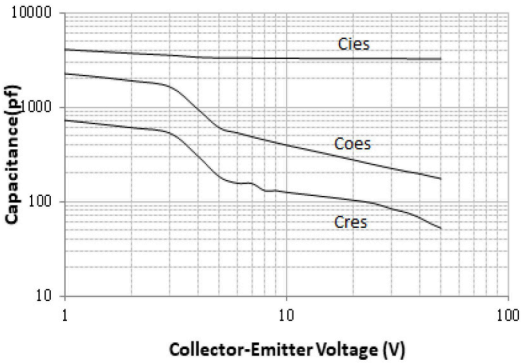
Gate Charge Characteristics

VGE=15V，V_{CC}=480V, IC=60A



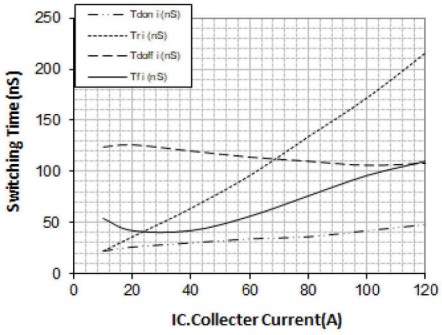
Capacitance Characteristic

VGE =0V，f=1.0MHZ



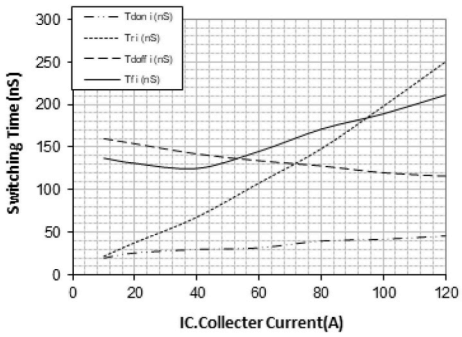
Switching Time vs. IC(25℃)

VCE=400V，VGE=15V，RG=10Ω



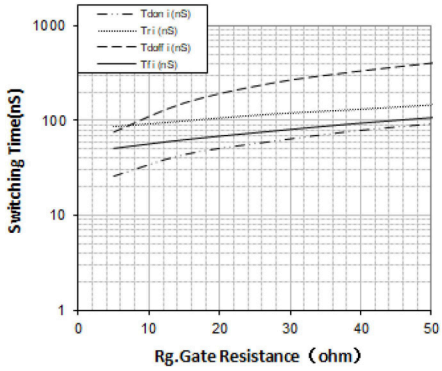
Switching Time vs. IC(175℃)

VCE=400V，VGE=15V，RG=10Ω



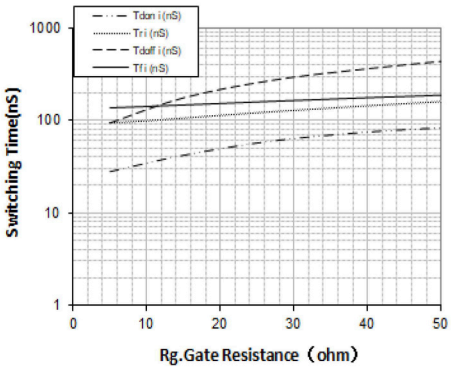
Switching Time vs. Rg(25℃)

VGE=15V，VCE=400V，IC=60A



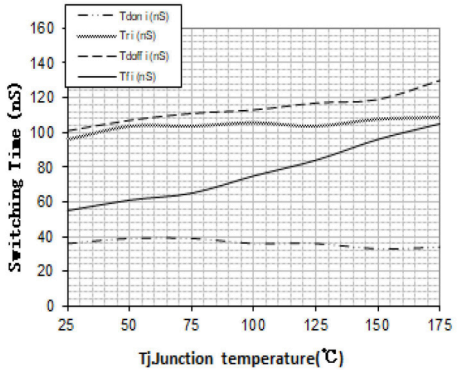
Switching Time vs. Rg(175℃)

VGE=15V，VCE=400V，IC=60A



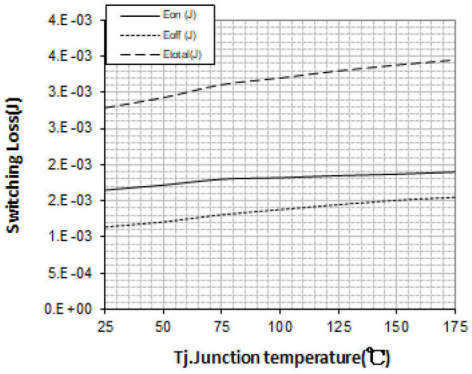
Switching Time vs.Tj

VGE=15V，VCE=400V，IC=60A，Rg=10Ω



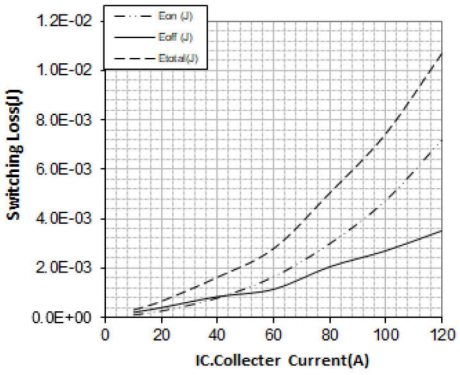
Switching Loss vs. Tj

VGE=15V，VCE=400V，IC=60A，Rg=10Ω



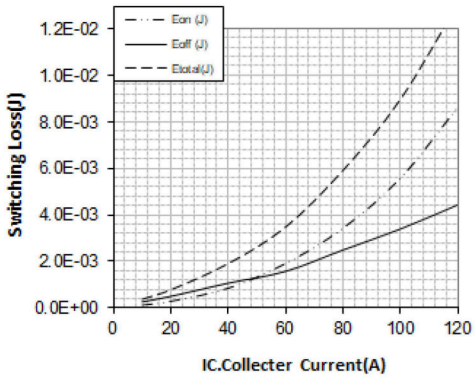
Switching Loss vs. IC(25℃)

VGE=15V，VCE=400V，Rg=10Ω



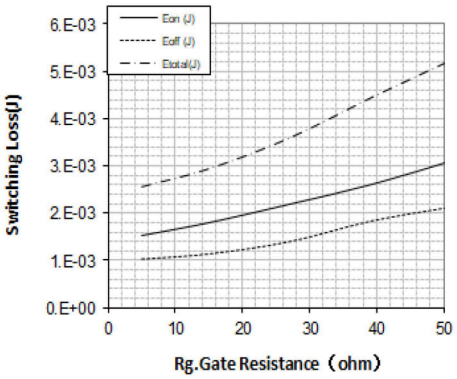
Switching Loss vs. IC(175℃)

VGE=15V，VCE=400V，Rg=10Ω



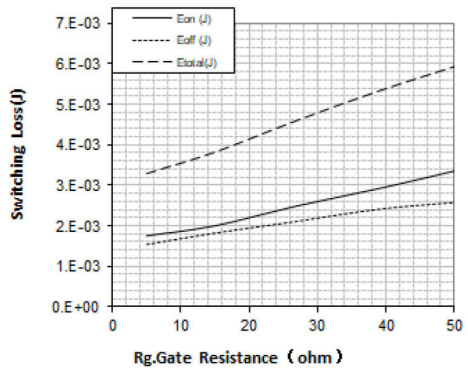
Switching Loss vs. Rg(25℃)

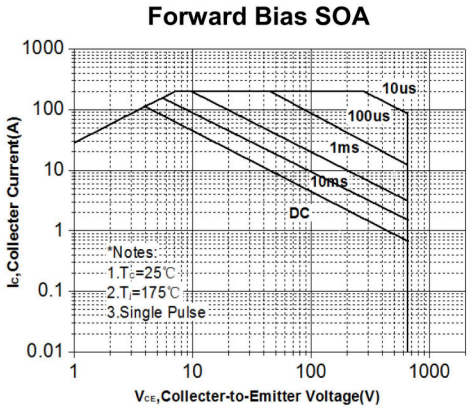
VGE=15V，VCE=400V，IC=60A

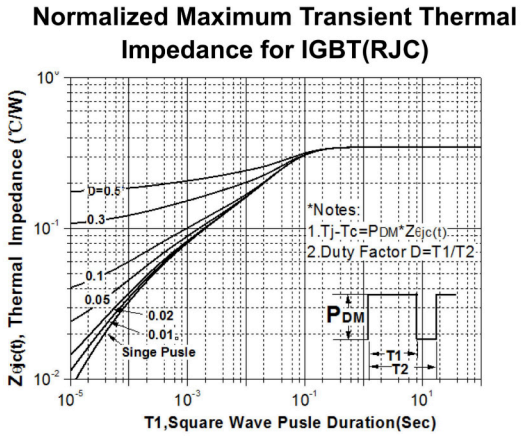


Switching Loss vs. Rg(175℃)

VGE=15V，VCE=400V，IC=60A







Package Mechanical DATA