



FEATURES

- ☐ High short circuit capability, self limiting short circuit current
- ☐ $V_{CE(sat)}$ with positive temperature coefficient
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐ Low switching losses

APPLICATIONS

- ☐ High frequency switching application
- ☐ Medical applications
- ☐ Motion/servo control
- ☐ UPS systems



ABSOLUTE MAXIMUM RATINGS

$T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	$T_{vj}=25^{\circ}\text{C}$	600	V
V_{GES}	Gate - Emitter Voltage		± 20	V
I_C	DC Collector Current	$T_C=25^{\circ}\text{C}$	400	A
		$T_C=70^{\circ}\text{C}$	300	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	600	A
P_{tot}	Power Dissipation Per IGBT		940	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_{vj}=25^{\circ}\text{C}$	600	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^{\circ}\text{C}$	400	A
		$T_C=70^{\circ}\text{C}$	300	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	600	A
I^2t		$T_{vj}=125^{\circ}\text{C}$, $t=10\text{ms}$, $V_R=0\text{V}$	8000	A^2s

ELECTRICAL AND THERMAL CHARACTERISTICS $T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
IGBT						
V _{GE(th)}	Gate - Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =4.8mA	4.9	5.8	6.5	V
V _{CE(sat)}	Collector - Emitter Saturation Voltage	I _C =300A, V _{GE} =15V, T _{VJ} =25°C		1.45		V
		I _C =300A, V _{GE} =15V, T _{VJ} =125°C		1.6		V
I _{CES}	Collector Leakage Current	V _{CE} =600V, V _{GE} =0V, T _{VJ} =25°C			1	mA
		V _{CE} =600V, V _{GE} =0V, T _{VJ} =125°C			5	mA
I _{GES}	Gate Leakage Current	V _{CE} =0V,V _{GE} ± 15V, T _{VJ} =125°C	-400		400	nA
R _{Gint}	Integrated Gate Resistor			1		Ω
Q _{ge}	Gate Charge	V _{CE} =300V, I _C =300A , V _{GE} =± 15V		3.2		μC
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		19		nF
C _{res}	Reverse Transfer Capacitance			0.57		nF
t _{d(on)}	Turn - on Delay Time	V _{CC} =300V,I _C =300A, T _{VJ} =25°C		110		ns
		R _G =2.4 Ω , T _{VJ} =125°C		120		ns
t _r	Rise Time	V _{GE} =± 15V, T _{VJ} =25°C		50		ns
		Inductive Load T _{VJ} =125°C		60		ns
t _{d(off)}	Turn - off Delay Time	V _{CC} =300V,I _C =300A, T _{VJ} =25°C		490		ns
		R _G =2.4 Ω , T _{VJ} =125°C		520		ns
t _f	Fall Time	V _{GE} =± 15V, T _{VJ} =25°C		60		ns
		Inductive Load T _{VJ} =125°C		70		ns
E _{on}	Turn - on Energy	V _{CC} =300V,I _C =300A, T _{VJ} =25°C		2.0		mJ
		R _G =2.4 Ω , T _{VJ} =125°C		3.1		mJ
E _{off}	Turn - off Energy	V _{GE} =± 15V, T _{VJ} =25°C		9		mJ
		Inductive Load T _{VJ} =125°C		12		mJ
I _{sc}	Short Circuit Current	t _{pse} ≤6μS , V _{GE} =15V T _{VJ} =125°C,V _{CC} =360V		1500		A
R _{thJC}	Junction-to-Case Thermal Resistance （ Per IGBT ）				0.16	K /W
Diode						
V _F	Forward Voltage	I _F =300A , V _{GE} =0V, T _{VJ} =25°C		1.55		V
		I _F =300A , V _{GE} =0V, T _{VJ} =125°C		1.50		V
I _{RRM}	Max. Reverse Recovery Current	I _F =300A , V _R =300V di _F /dt=-6500A/μs T _{VJ} =125°C		235		A
Q _{rr}	Reverse Recovery Charge			24.0		μC
E _{rec}	Reverse Recovery Energy			6.2		mJ
R _{thJCD}	Junction-to-Case Thermal Resistance （ Per Diode ）				0.32	K /W

MODULE CHARACTERISTICS $T_C=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$T_{VJ\max}$	Max. Junction Temperature				175	$^{\circ}\text{C}$
$T_{VJ\text{op}}$	Operating Temperature		-40		150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
V_{isol}	Insulation Test Voltage	AC, $t=1\text{min}$		3000		V
CTI	Comparative Tracking Index		350			
Torque	Module-to-Sink	Recommended (M6)	3		5	N·m
Torque	Module Electrodes	Recommended (M6)	2.5		5	N·m
Weight				320		g

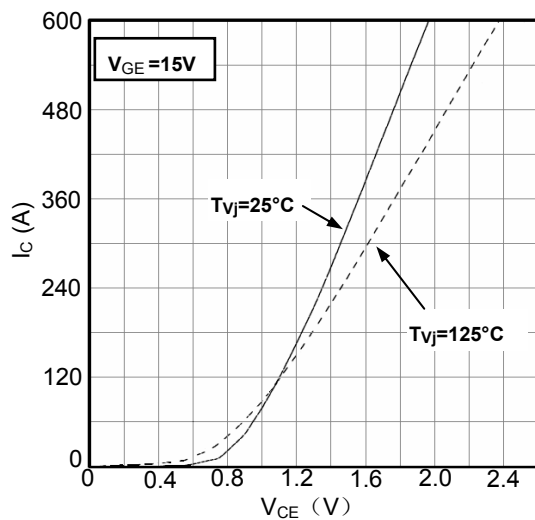


Figure1. Typical Output characteristics

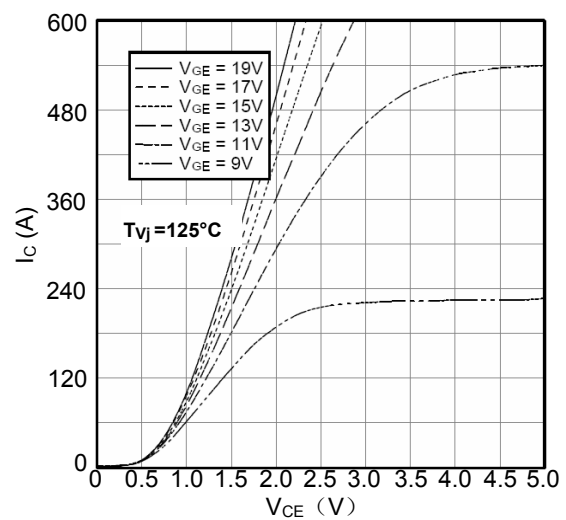


Figure2. Typical Output characteristics

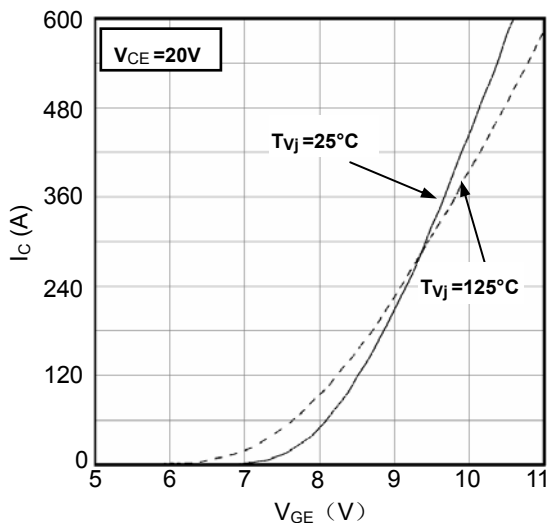


Figure3. Typical Transfer characteristics

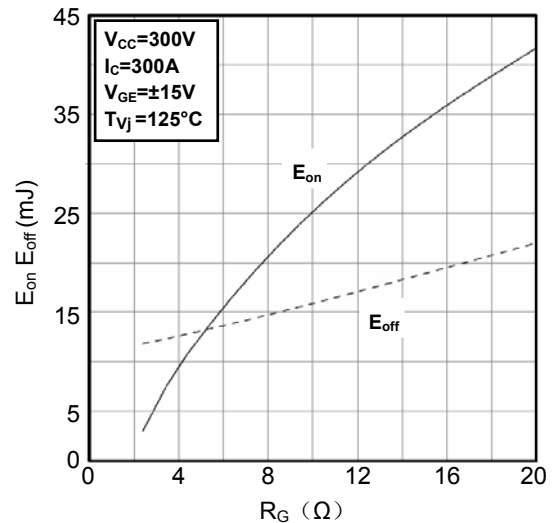


Figure4. Switching Energy vs. Gate Resistor

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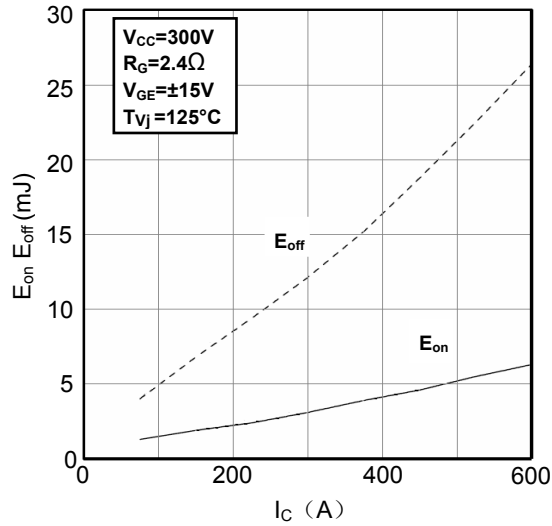


Figure5. Switching Energy vs. Collector Current

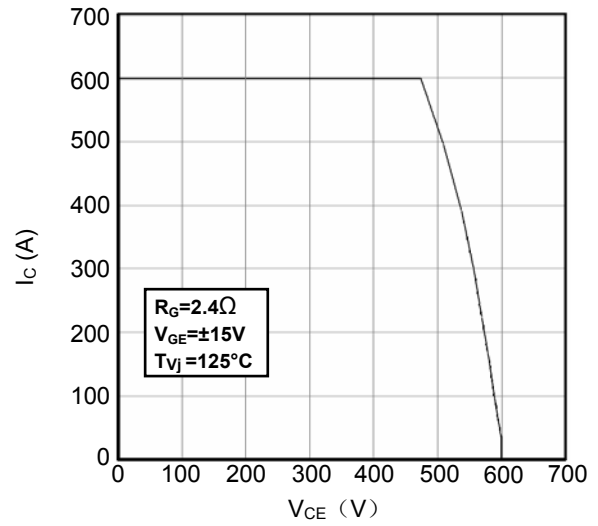


Figure6. Reverse Biased Safe Operating Area

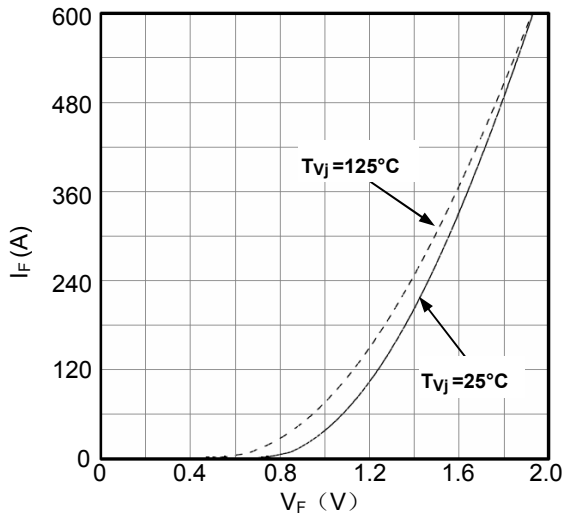


Figure7. Diode Forward Characteristics

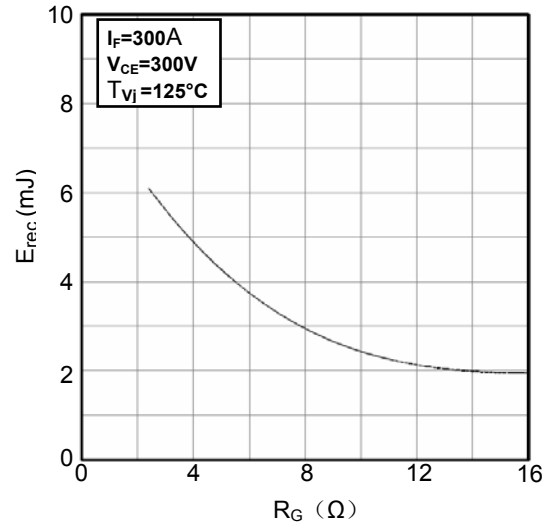


Figure8. Switching Energy vs. Gate Resistor

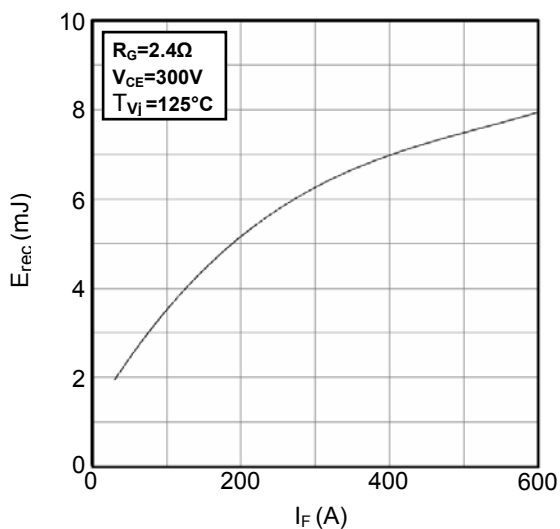


Figure9. Switching Energy vs. Forward Current

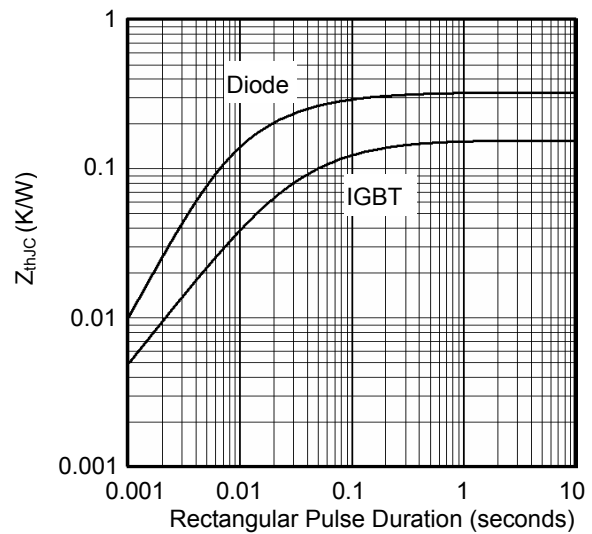


Figure10. Transient Thermal Impedance

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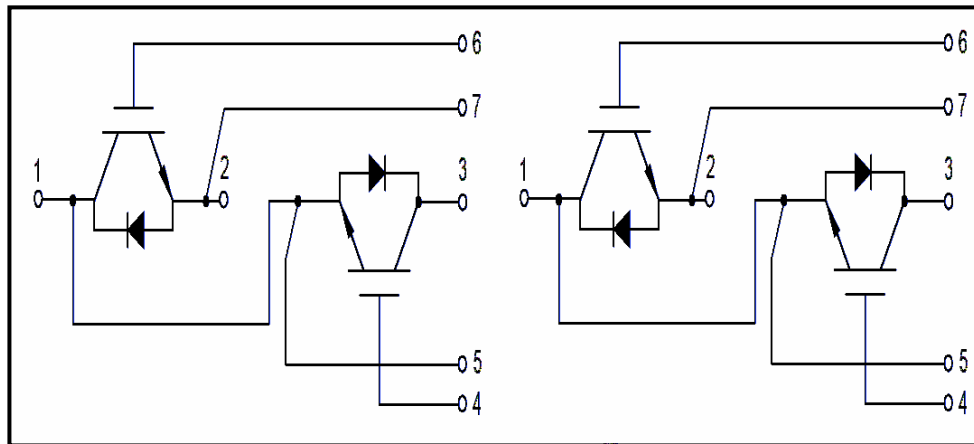
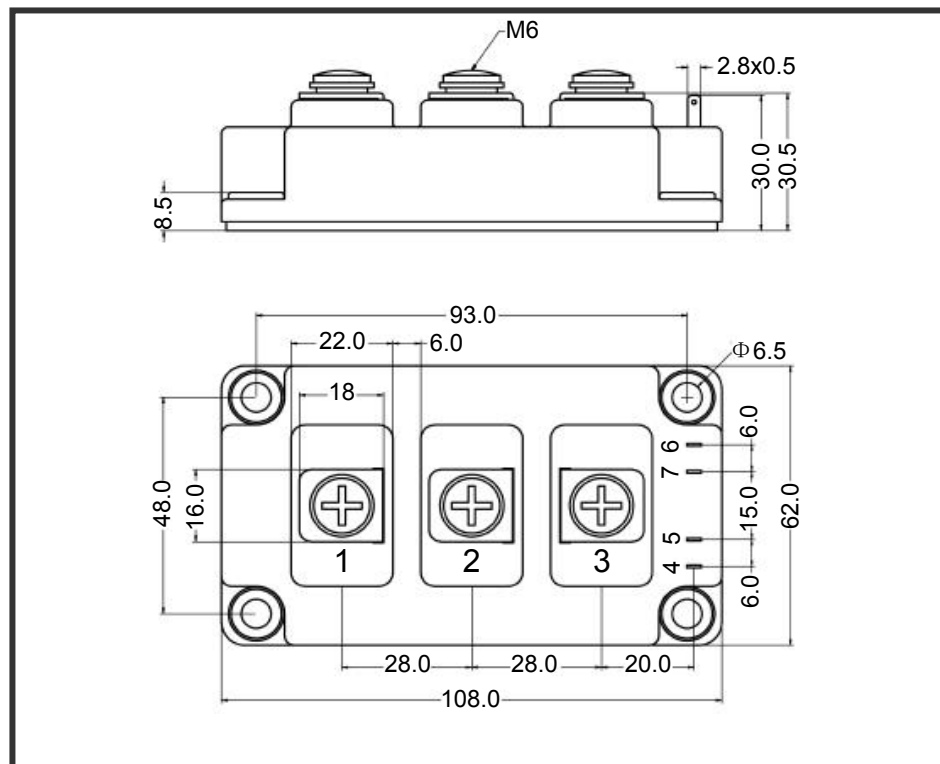


Figure11. Circuit Diagram



Dimensions (mm)
Figure12. Package Outline