

PRODUCT FEATURES

- ☐ IGBT CHIP(1200V NPT technology)
- ☐ Low switching losses
- ☐ $V_{CE(sat)}$ with positive temperature coefficient
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery



APPLICATIONS

- ☐ AC motor control
- ☐ Motion/servo control
- ☐ Inverter and power supplies

IGBT-inverter

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	$T_J=25^{\circ}\text{C}$	1200	V
V_{GES}	Gate Emitter Voltage		± 20	
I_C	DC Collector Current	$T_C=25^{\circ}\text{C}$	300	A
		$T_C=80^{\circ}\text{C}$	200	
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	400	
P_{tot}	Power Dissipation Per IGBT		1250	W

Diode-inverter

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^{\circ}\text{C}$	200	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	400	
I^2t		$T_J=125^{\circ}\text{C}$, $t=10\text{ms}$, $V_R=0\text{V}$	7500	A^2S

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IGBT-inverter

ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit		
V _{GE(th)}	Gate Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =8mA	5	5.8	6.5	V		
V _{CE(sat)}	Collector Emitter Saturation Voltage (terminal)	I _C =200A, V _{GE} =15V, T _J =25°C		3.2	3.7			
		I _C =200A, V _{GE} =15V, T _J =125°C		3.3				
I _{CES}	Collector Leakage Current	V _{CE} =1200V, V _{GE} =0V, T _J =25°C			100	μA		
		V _{CE} =1200V, V _{GE} =0V, T _J =125°C			1	mA		
I _{GES}	Gate Leakage Current	V _{CE} =0V,V _{GE} =±15V, T _J =125°C	-400		400	nA		
Q _g	Gate Charge	V _{CE} =600V, I _C =200A , V _{GE} =15V		1.2		μC		
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		17		nF		
C _{res}	Reverse Transfer Capacitance				2.2		nF	
t _{d(on)}	Turn on Delay Time	V _{CC} =600V,I _C =200 A R _G =10Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		90		ns	
			T _J =125°C		100		ns	
t _r	Rise Time		T _J =25°C		80		ns	
			T _J =125°C		85		ns	
t _{d(off)}	Turn off Delay Time		T _J =25°C		650		ns	
			T _J =125°C		700		ns	
t _f	Fall Time		T _J =25°C		50		ns	
			T _J =125°C		65		ns	
E _{on}	Turn on Energy	V _{CC} =600V,I _C =200 A R _G =10Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		19		mJ	
			T _J =125°C		24		mJ	
E _{off}	Turn off Energy		T _J =25°C		7		mJ	
			T _J =125°C		11		mJ	
t _{psc}	IGBT Short Circuit SOA		V _{GE} ≤15V,V _{CC} =600V T _J ≤125°C,V _{CEM} ≤1200V		10		μs	
R _{thJC}	Junction to Case Thermal Resistance (Per IGBT)					0.1	K /W	

Diode-inverter

ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V _F	Forward Voltage	I _F =200A , V _{GE} =0V, T _J =25°C		1.65	2.15	V
		I _F =200A , V _{GE} =0V, T _J =125°C		1.65		
I _{RRM}	Max. Reverse Recovery Current	I _F =200A , V _R =600V		150		A
Q _{RR}	Reverse Recovery Charge	di _F /dt=-1900A/μs		38		μC
E _{rec}	Reverse Recovery Energy	T _J =125°C		17		mJ
R _{thJCD}	Junction to Case Thermal Resistance (Per Diode)				0.2	K /W

MODULE CHARACTERISTICS

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

Symbol	Parameter/Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature		150	$^\circ\text{C}$
T_{Jop}	Operating Temperature		-40~125	
T_{stg}	Storage Temperature		-40~125	
V_{isol}	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	3000	V
Torque	to heatsink	Recommended (M6)	3~5	Nm
	to terminal	Recommended (M6)	2.5~5	Nm
Weight			320	g

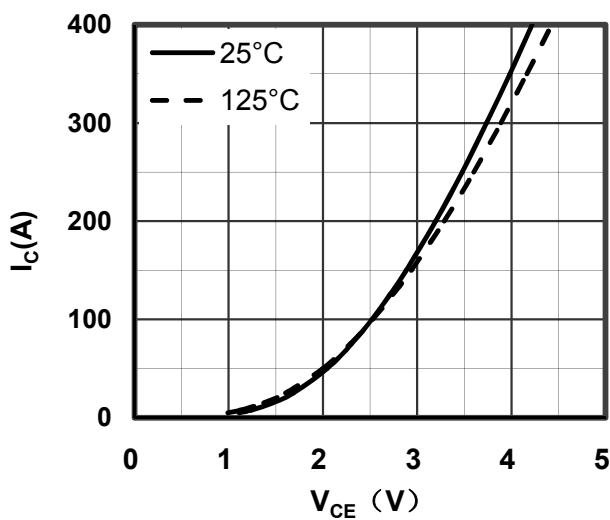


Figure 1. Typical Output Characteristics IGBT-inverter

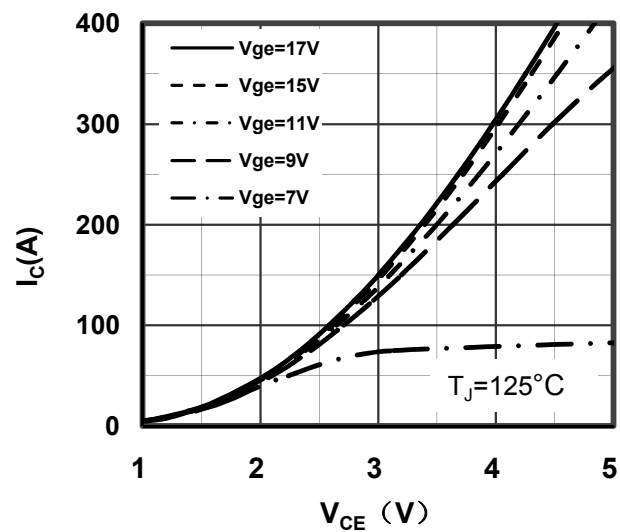


Figure 2. Typical Output Characteristics IGBT-inverter

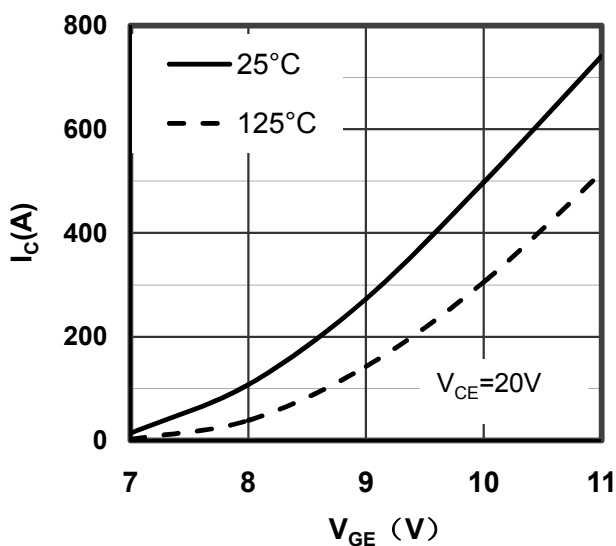


Figure 3. Typical Transfer characteristics IGBT-inverter

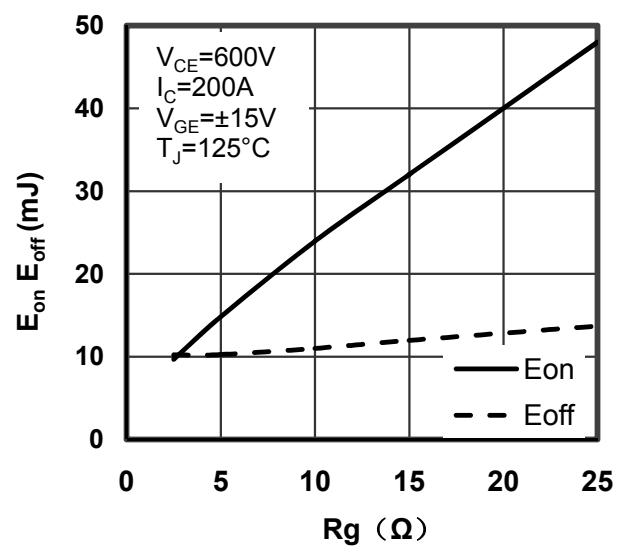


Figure 4. Switching Energy vs Gate Resistor IGBT-inverter

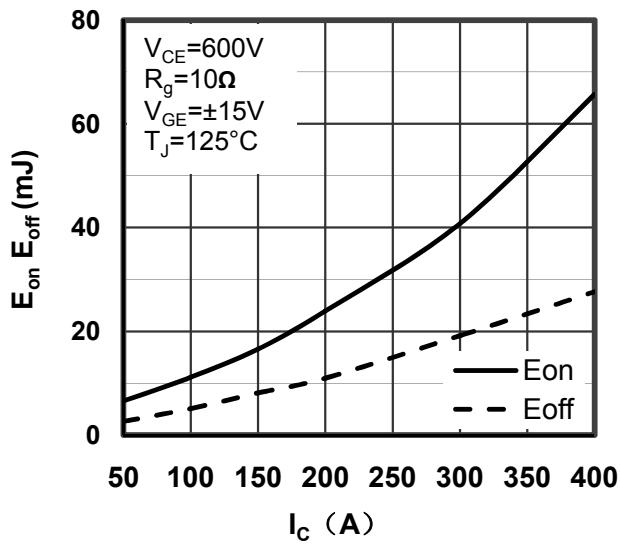


Figure 5. Switching Energy vs. Collector Current
IGBT-inverter

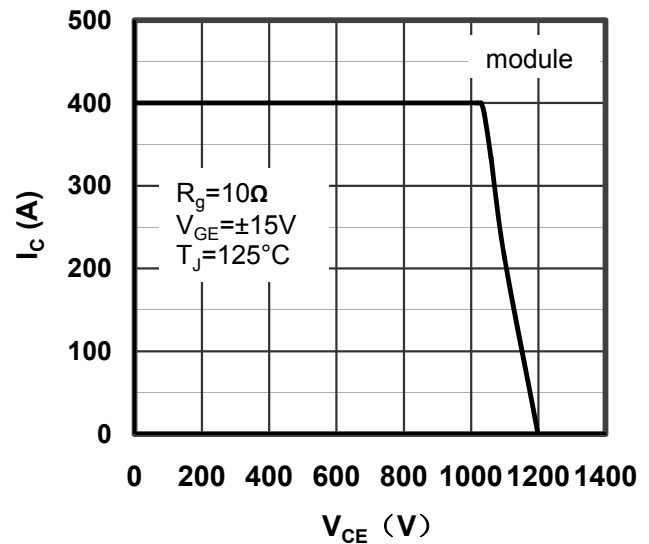


Figure 6. Reverse Biased Safe Operating Area
IGBT-inverter

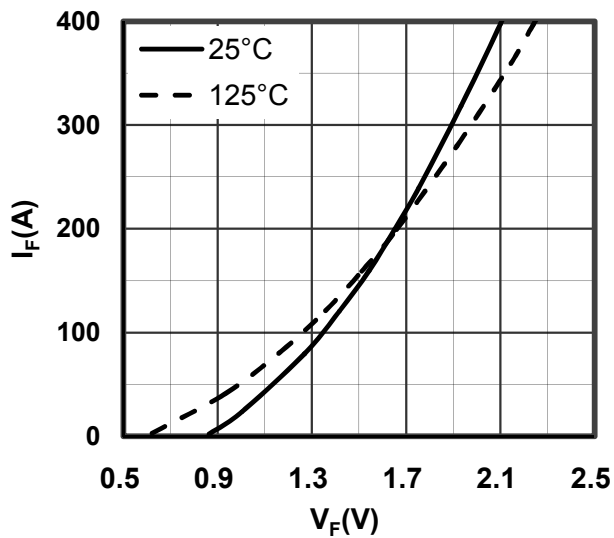


Figure 7. Diode Forward Characteristics
Diode -inverter

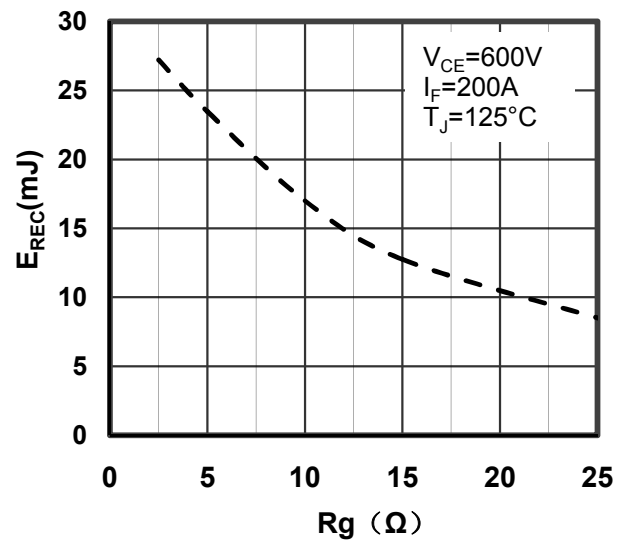


Figure 8. Switching Energy vs Gate Resistor
Diode -inverter

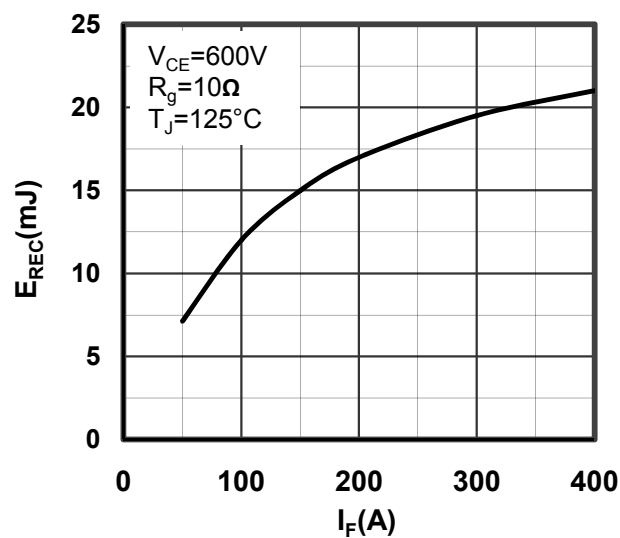


Figure 9. Switching Energy vs Forward Current
Diode-inverter

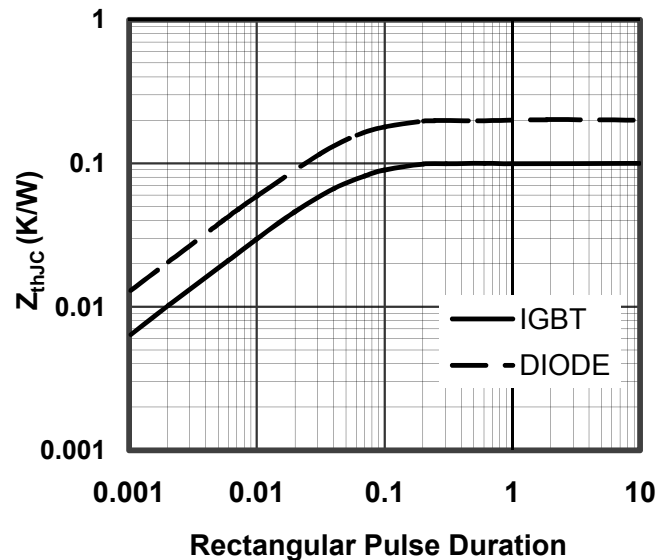


Figure 10. Transient Thermal Impedance of
Diode and IGBT-inverter

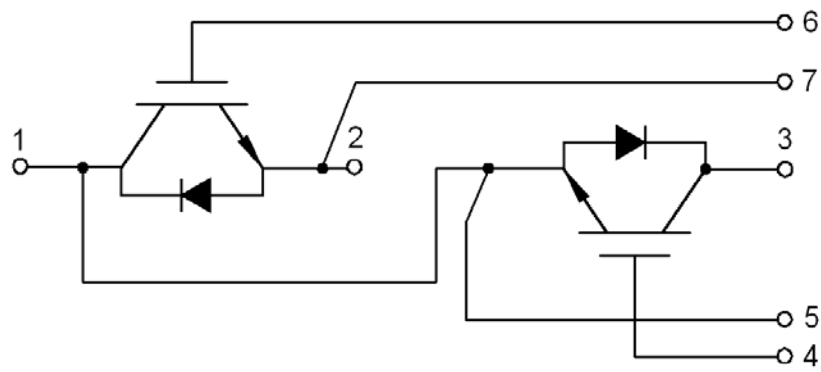
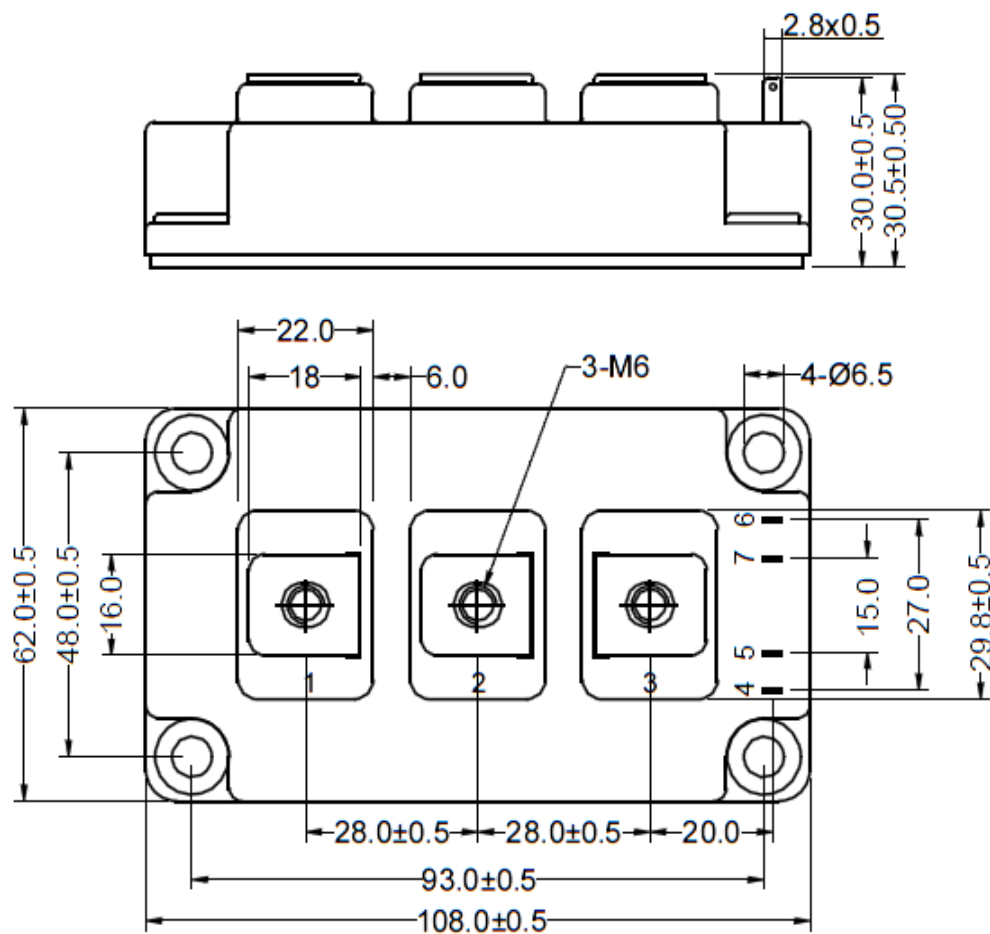


Figure 11. Circuit Diagram



Dimensions in (mm)
Figure 12. Package Outline