

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	t
V_{CES}	Collector Emitter Voltage	$T_J = 25^\circ\text{C}$	1200	V
V_{GES}	Gate Emitter Voltage		± 20	
I_C	DC Collector Current	$T_C = 25^\circ\text{C}$	75	A
		$T_C = 80^\circ\text{C}$	50	
I_{CM}	Repetitive Peak Collector Current	$t_p = 1\text{ms}$	100	
P_{tot}	Power Dissipation Per IGBT		410	W

Diode-inverter

ABSOLUTE MAXIMUM RATINGS

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

Symbol	Parameter/Test Conditions		Values	t
V_{RRM}	Repetitive Reverse Voltage	$T_J = 25^\circ\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_C = 80^\circ\text{C}$	25	A
I_{FRM}	Repetitive Peak Forward Current	$t_p = 1\text{ms}$	50	
I^2t		$T_J = 45^\circ\text{C}$, $t = 10\text{ms}$, $V_R = 0\text{V}$	16	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.	t	
V _{GE(th)}	Gate - Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =1.4mA	4.5	5.5	6	V	
V _{CE(sat)}	Collector - Emitter Saturation Voltage (terminal)	I _C =50A, V _{GE} =15V, T _J =25°C		3.10	3.50		
		I _C =50A, V _{GE} =15V, T _J =125°C		3.15			
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°			1	mA	
I _{GES}	Gate Leakage Current	V _{CE} =0V, V _{GE} =±15V, T _J =125°C	-200		200	nA	
Q _g	Gate Charge	V _{CE} =600V, I _C =50A , V _{GE} =15V			4.2	μC	
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz		4.6		nF	
C _{res}	Reverse Transfer Capacitance			770		pF	
t _{d(on)}	Turn on Delay Time	V _{CC} =600V, I _C =50A, R _G =10Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		6		ns
			T _J =125°C		8		ns
t _r	Rise Time		T _J =25°C		28		ns
			T _J =125°C		28		ns
t _{d(off)}	Turn off Delay Time		T _J =25°C		236		ns
			T _J =125°C		276		ns
t _f	Fall Time		T _J =25°C		56		ns
			T _J =125°C		58		ns
E _{on}	Turn on Energy	V _{CC} =600V, I _C =50A, R _G =10Ω, V _{GE} =±15V, Inductive Load	T _J =25°C		1.43		mJ
			T _J =125°C		2.43		mJ
E _{off}	Turn off Energy		T _J =25°C		1.68		mJ
			T _J =125°C		2.97		mJ
t _{pSC}	IGBT Short Circuit SOA		V _{GE} ≤15V, V _{CC} =800V T _J ≤125°C, V _{CEM} ≤1200V			10	μs
R _{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)				0.3	K /W	

Diode-inverter

ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	t
V _F	Forward Voltage	I _F =25A , V _{GE} =0V, T _J =25°C		1.75	2.15	V
		I _F =25A , V _{GE} =0V, T _J =125°C		1.70		
I _{RRM}	Max. Reverse Recovery Current	I _F =25A , V _R =600V		22		A
Q _{RR}	Reverse Recovery Charge	di _F /dt=-600A/μs		3.8		μC
E _{rec}	Reverse Recovery Energy	T _J =125°C		1.2		mJ
R _{thJC}	Junction to Case Thermal Resistance （ Per Diode ）				1.25	K /W

MODULE CHARACTERISTICS

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	t
$T_{J\max}$	Max. Junction Temperature				150	$^\circ\text{C}$
$T_{J\text{op}}$	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 (M5)	2.5		5	Nm
Weight				160		g

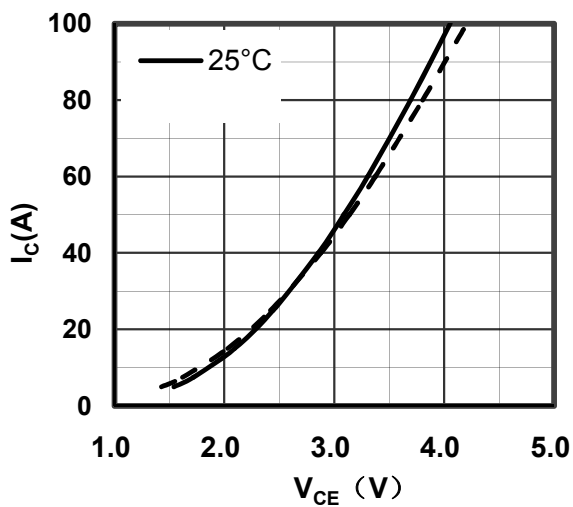


Figure 1. Typical Output Characteristics IGBT-inverter

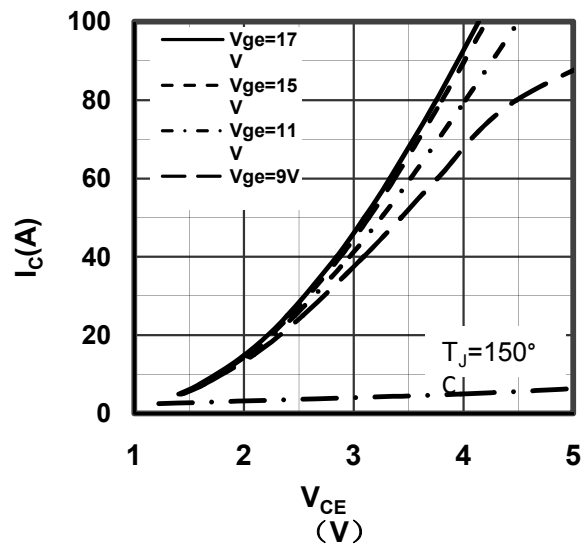


Figure 2. Typical Output Characteristics IGBT-inverter

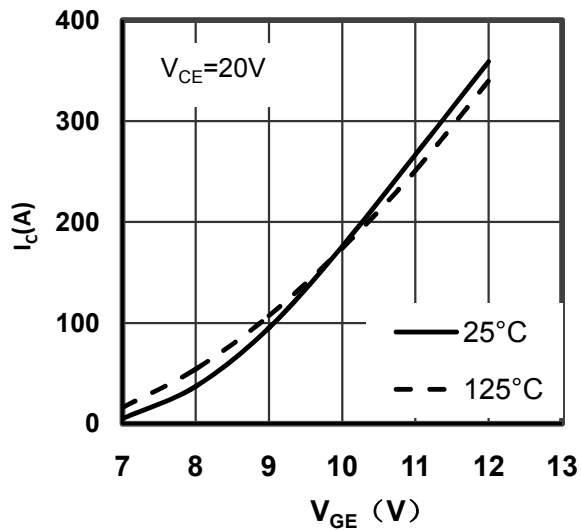


Figure 3. Typical Transfer characteristics IGBT-inverter

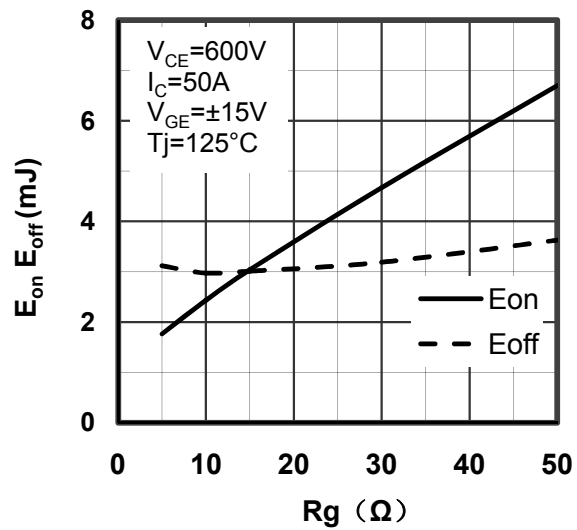


Figure 4. Switching Energy vs Gate Resistor IGBT-inverter

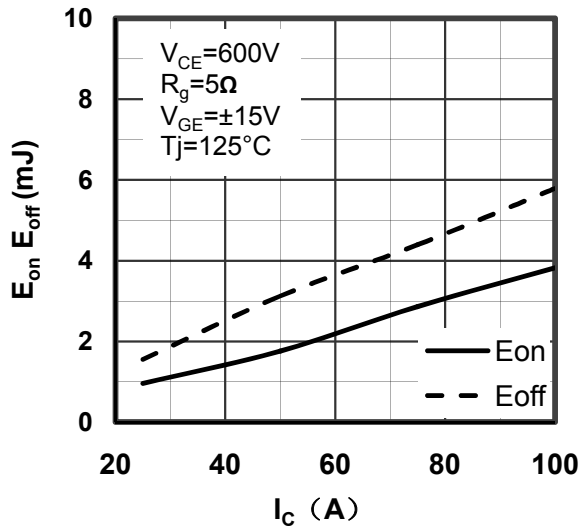


Figure 5. Switching Energy vs Collector Current IGBT-inverter

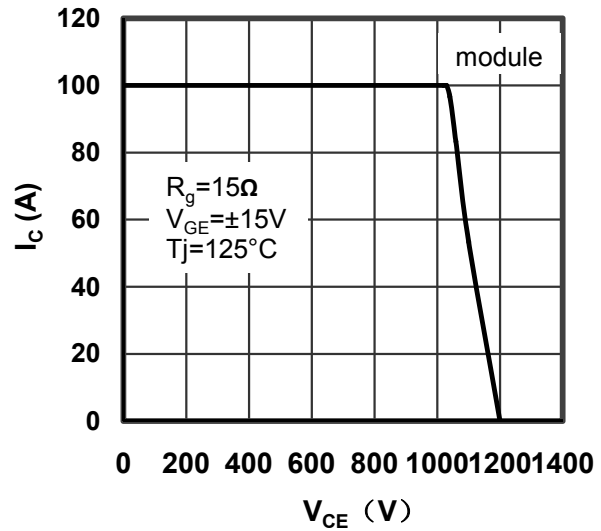


Figure 6. Reverse Biased Safe Operating Area

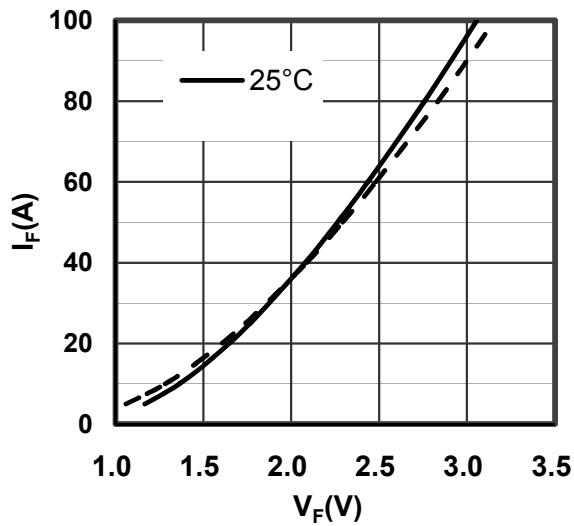


Figure 7. Diode Forward Characteristics Diode-inverter

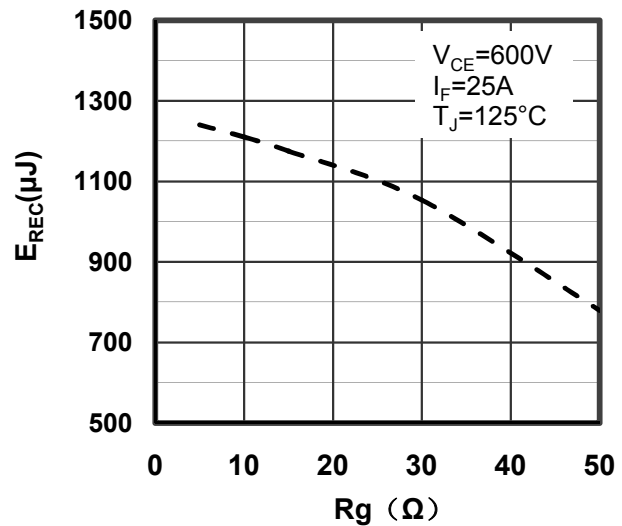


Figure 8. Switching Energy vs Gate Resistor Diode-inverter

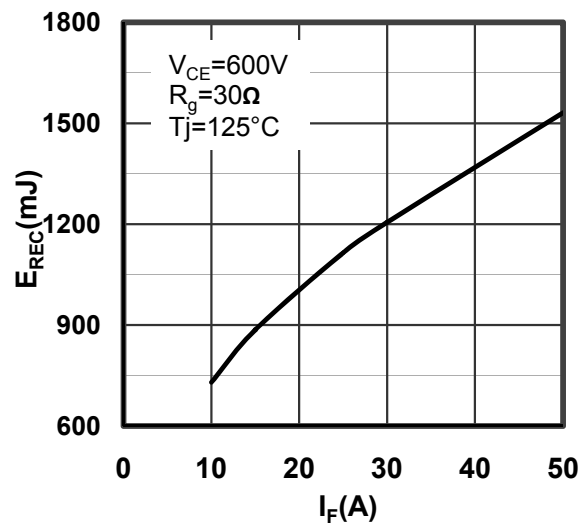


Figure 9. Switching Energy vs Forward Current Diode-inverter

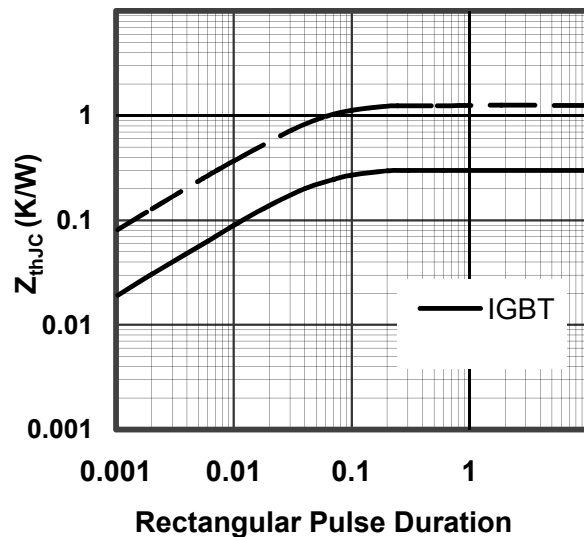


Figure 10. Transient Thermal Impedance of Diode and IGBT-inverter

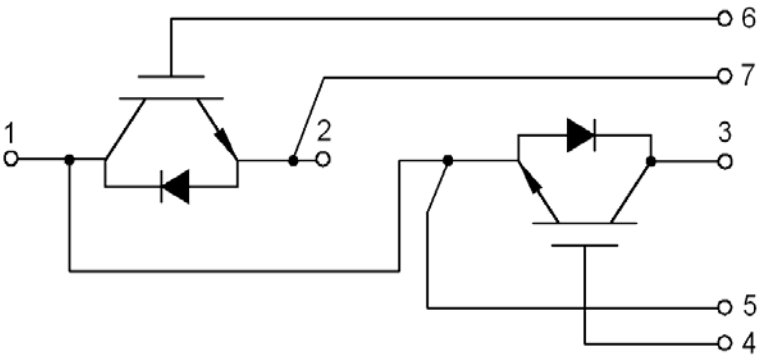
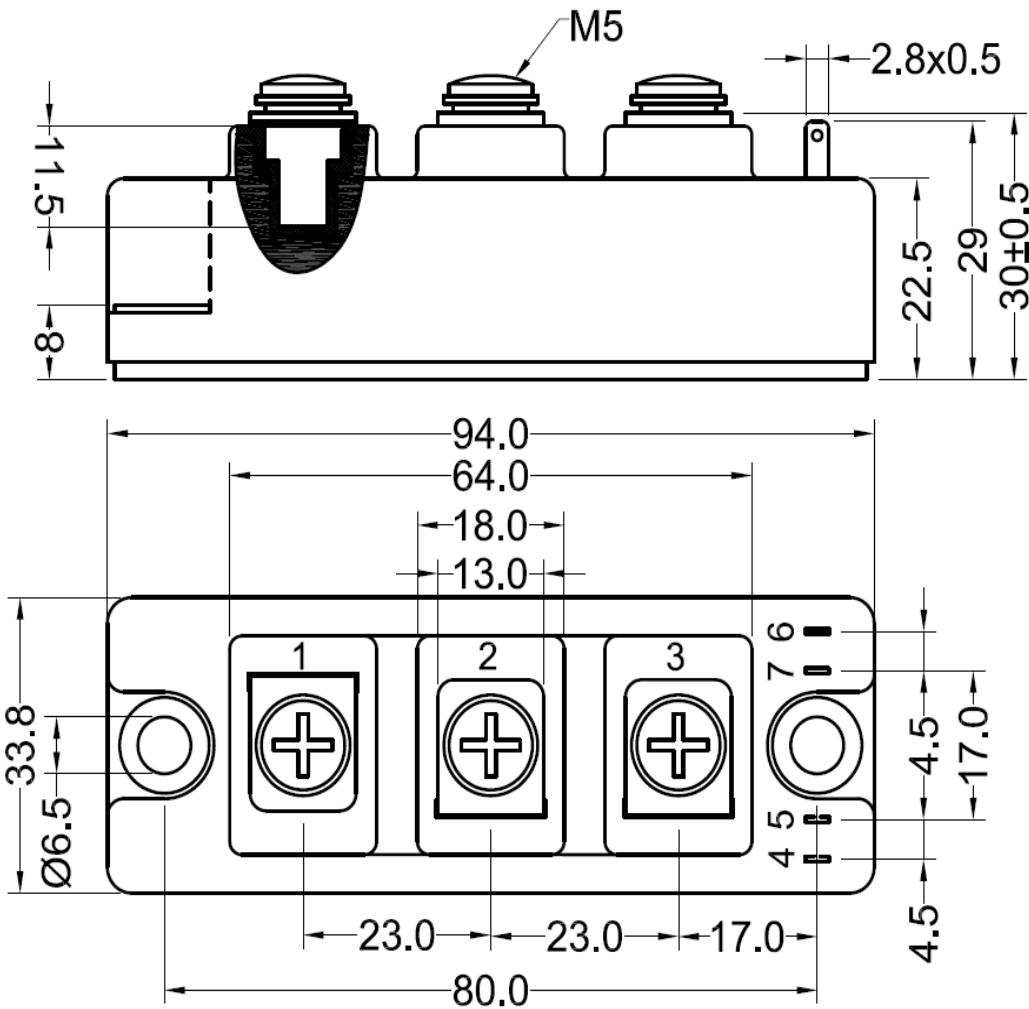


Figure 11. Circuit Diagram



Dimensions in Millimeters
Figure 12. Package Outline