**Key Parameters**

V_{CE} = 1200V
 I_C = 200A

Features

- Low $V_{ce(sat)}$
- Fast switching
- High short circuit capability (10 μ s)
- Low inductance module structure

Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS
- Soft switching welding machine

Prepared by : ABA

Date of Publication : 10.2022

Approved by :

Revision : 0

Absolute Maximum Ratings						
Symbol	Characteristic	Value	Unit			
V _{CES}	Collector-Emitter Voltage	1200	V			
I _{CD}	Continuous DC Collector Current (T _c =100°C, T _j =175°C)	200	A			
I _{CRM}	Peak Collector Current (tp=1ms)	400	A			
V _{GES}	Gate-Emitter Voltage	±20	V			
P _{tot}	Total Power Dissipation (T _c =25°C, T _j =175°C)	1000	W			
IGBT Characteristics						
Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
BV _{CES}	Collector-Emitter breakdown Voltage	V _{GE} =0V, I _C =250μA, T _{vj} =25°C	1200			V
I _{CE}	Collector-Emitter leakage Current	V _{CE} =1200V, V _{GE} =0V, T _{vj} =25°C			5.0	mA
I _{GE}	Gate-Emitter leakage Current	V _{CE} =0V, V _{GE} =±20V, T _{vj} =25°C			400	ηA
V _{GE(th)}	Gate-emitter Threshold Voltage	V _{GE} =V _{CE} , I _C =1.5mA, T _{vj} =25°C	5.5	6.5	7.5	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C =200A, V _{GE} =15V, T _{vj} =25°C		1.65	2.00	V
		I _C =200A, V _{GE} =15V, T _{vj} =125°C		2.05		V
		I _C =200A, V _{GE} =15V, T _{vj} =150°C		2.2		V
Q _G	Gate Charge	V _{CC} =600V, V _{GE} =0/15V, I _C =200A T _{vj} =25°C		960		nC
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f=1MHz, T _{vj} =25°C		19.5		ηF
C _{oes}	Output Capacitance			1.0		ηF
C _{res}	Reverse Transfer Capacitance			0.28		ηF
R _{gint}	Internal Gate Resistance			2.0		Ω
t _{d(on)}	Turn-on Delay Time	I _C =200 A V _{CE} = 600 V V _{GE} = 0/15V R _G = 2.0Ω T _{vj} =25°C , L _{load} =0.82mH Energy loss include tail and diode reverse recovery		83		ηs
t _r	Rise Time			75		ηs
t _{d(off)}	Turn-off Delay Time			307		ηs
t _f	Fall Time			88		ηs
E _{on}	Energy Dissipation During Turn-on Time			16.5		mJ
E _{off}	Energy Dissipation During Turn-off Time		8.0		mJ	
t _{d(on)}	Turn-on Delay Time	I _C =200 A V _{CE} = 600 V V _{GE} = 0/15V R _G = 2.0Ω T _{vj} =150°C , L _{load} =0.82mH Energy loss include tail and diode reverse recovery		93		ηs
t _r	Rise Time			95		ηs
t _{d(off)}	Turn-off Delay Time			396		ηs
t _f	Fall Time			140		ηs
E _{on}	Energy Dissipation During Turn-on Time			28.1		mJ
E _{off}	Energy Dissipation During Turn-off Time		13.9		mJ	
I _{sc}	SC Data	t _{sc} ≤10μs, V _{GE} =15V, T _{vj} =25°C, V _{CC} =600V,		750		A
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Diode Characteristics										
Symbol	Characteristic	Conditions	Value			Unit				
			Min.	Typ.	Max.					
I_F	Diode DC Forward Current	$T_c=100^{\circ}\text{C}$, $T_j=150^{\circ}\text{C}$		200		A				
I_{FRM}	Diode Peak Forward Current	$t_p=1\text{ms}$		400		A				
V_F	Forward Voltage	$I_F=200\text{A}, T_{vj}=25^{\circ}\text{C}$		1.85	2.25	V				
		$I_F=200\text{A}, T_{vj}=125^{\circ}\text{C}$		1.65		V				
		$I_F=200\text{A}, T_{vj}=150^{\circ}\text{C}$		1.60		V				
Q_{rr}	Recovered Charge	$I_F=200\text{ A}$		16.4		μC				
I_{rr}	Peak Reverse Recovery Current	$V_R=600\text{V}$		113		A				
E_{rec}	Reverse Recovery Energy	$-di_F/dt = 2116\text{A}/\mu\text{s}$ $T_{vj}=25^{\circ}\text{C}$		5.4		mJ				
Module Characteristics										
Symbol	Characteristic	Conditions	Value			Unit				
			Min.	Typ.	Max.					
V_{isol}	Isolation voltage	$t=1\text{min}, f=50\text{Hz}$	2500			V				
T_{jmax}	Maximum Junction Temperature				175	$^{\circ}\text{C}$				
$T_{vj op}$	Operating Junction Temperature		-40		150	$^{\circ}\text{C}$				
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$				
$R_{CC+EE'}$	Module lead resistance terminal to chip			0.70		$\text{m}\Omega$				
L_{SCE}	Stray Inductance, Module			20		nH				
$R_{\theta jc}$	Junction-to Case	per IGBT-inverter		0.12		$^{\circ}\text{C}/\text{W}$				
		per Diode-inverter		0.18		$^{\circ}\text{C}/\text{W}$				
$R_{\theta cs}$	Case to Sink	per IGBT-inverter		0.034		$^{\circ}\text{C}/\text{W}$				
		per Diode-inverter		0.05		$^{\circ}\text{C}/\text{W}$				
		Conductive grease applied		0.01		K/W				
M_t	Module Electrodes Torque	Recommended(M6)	2.5		5.0	N·m				
M_s	Module-to-Sink Torque	Recommended(M6)	3.0		6.0	N·m				
G	Weight of Module			320		g				
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• Typical Electrical Characteristics

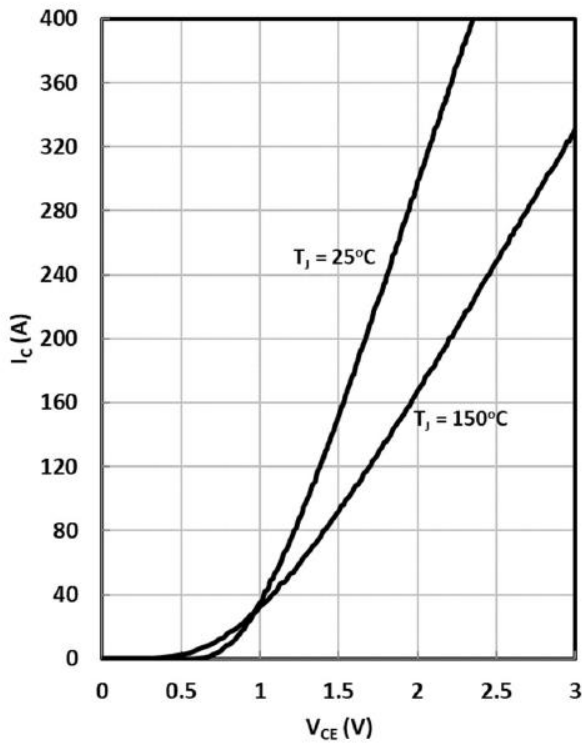


Fig. 1 IGBT (Inverter) Output Characteristics

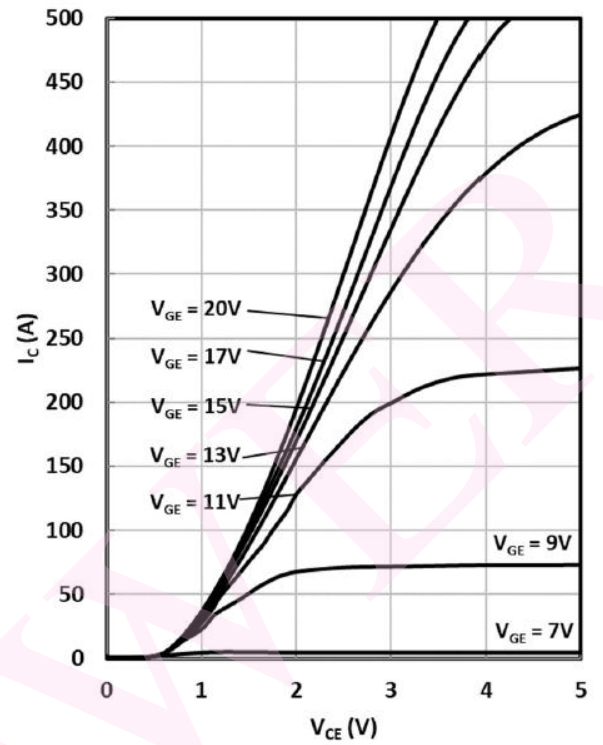


Fig. 2 IGBT (Inverter) Output Characteristics

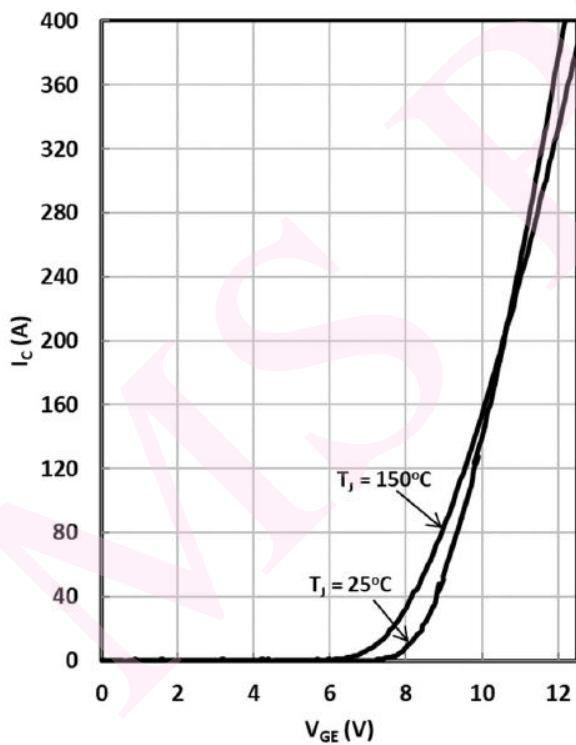


Fig. 3 IGBT (Inverter) Transfer Characteristics

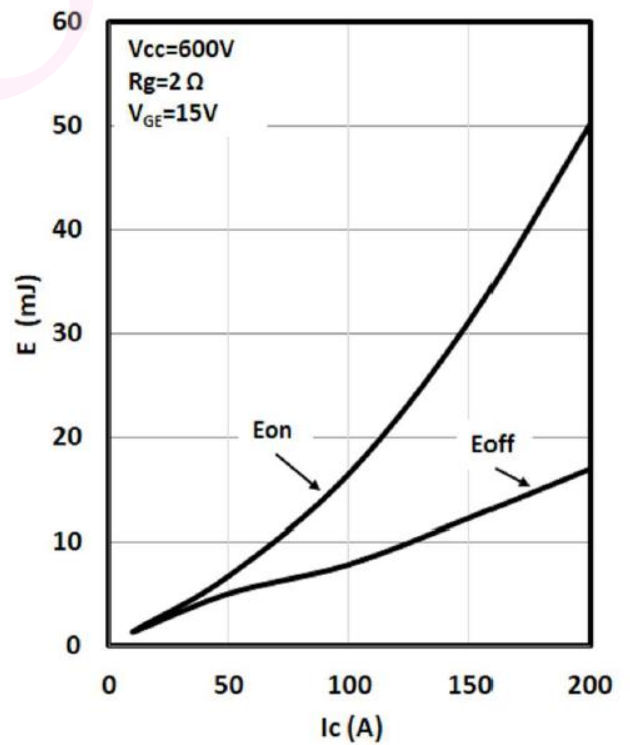


Fig. 4 IGBT (Inverter) Switching Loss vs. Ic

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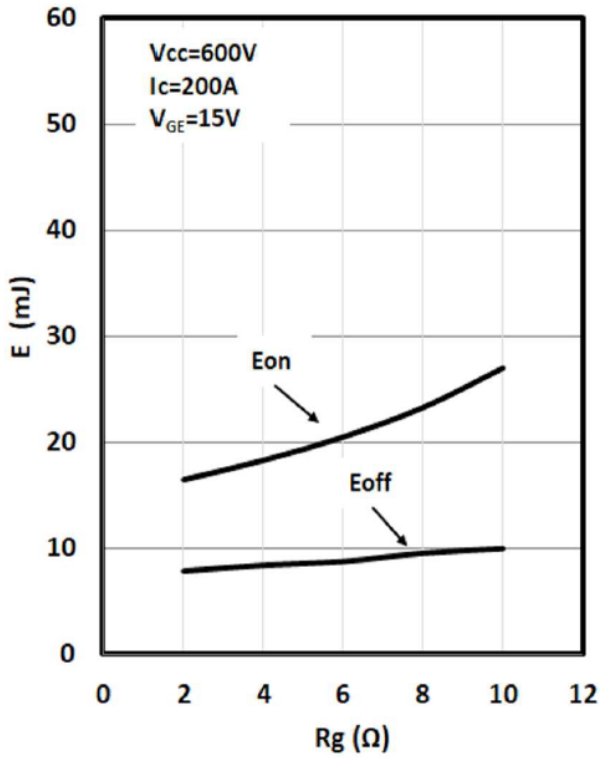


Fig. 5 IGBT (Inverter) Switching Loss vs. R_g

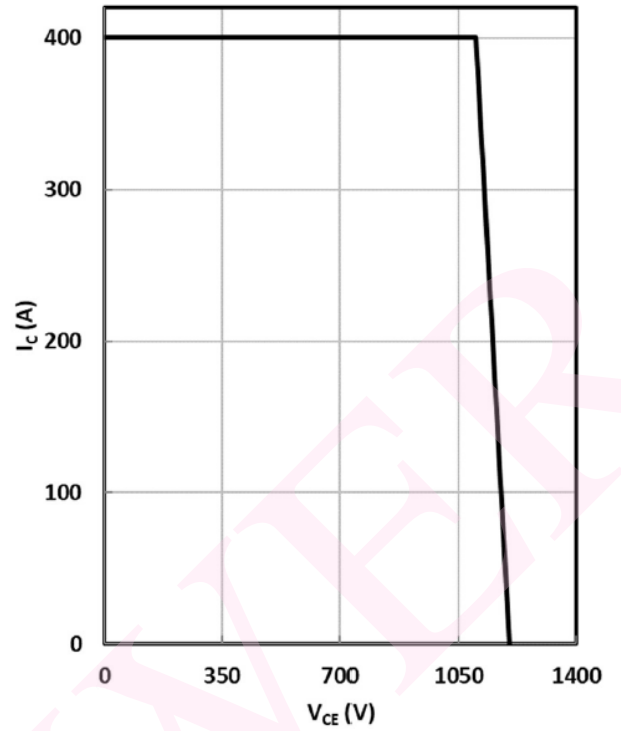


Fig. 6 RBSOA

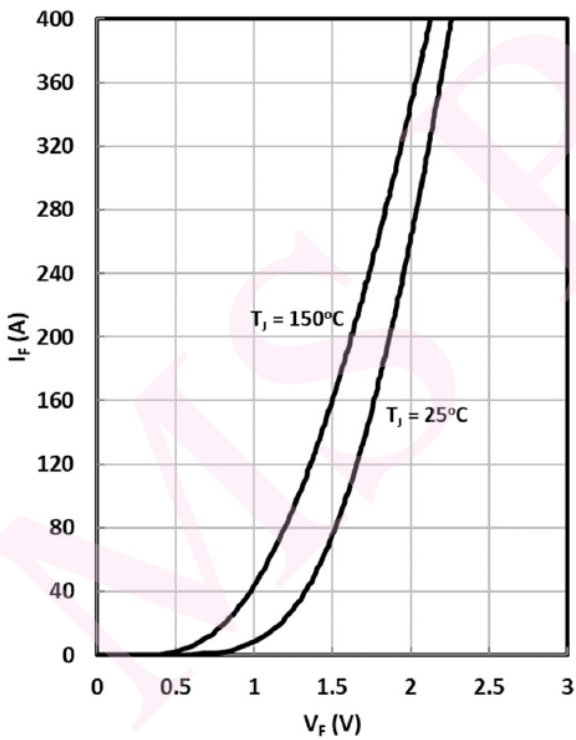
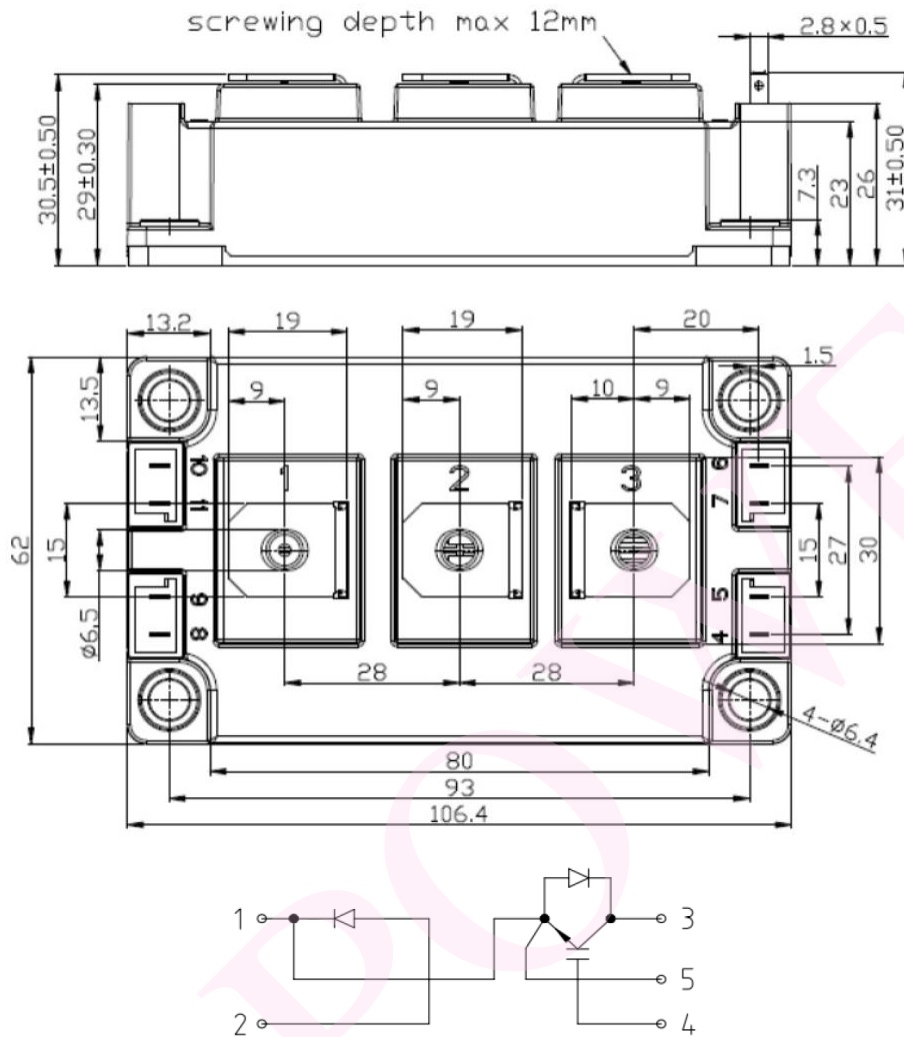


Fig. 7 Diode (Inverter) Forward Characteristics

Prepared by : ABA	Date of Publication : 10.2022
Approved by :	Revision : 0

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Prepared by : ABA	Date of Publication : 10.2022
Approved by :	Revision : 0