



**Key Parameters**

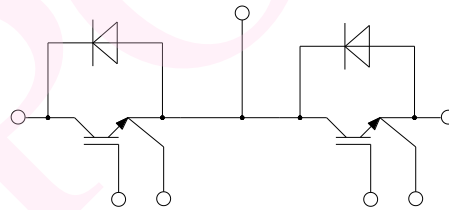
$V_{CE}$  = 1200V  
 $I_c$  = 150A

**Features**

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

**Applications**

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



Equivalent Circuit Schematic

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Absolute Maximum Ratings						
Symbol	Characteristic	Value	Unit			
$V_{CES}$	Collector-Emitter Voltage	1200	V			
$I_{CDC}$	Continuous DC Collector Current ( $T_c=100^\circ\text{C}$ , $T_j=175^\circ\text{C}$ )	150	A			
$I_{CRM}$	Peak Collector Current ( $t_p=1\text{ms}$ )	300	A			
$V_{GES}$	Gate-Emitter Voltage	$\pm 20$	V			
$P_{tot}$	Total Power Dissipation ( $T_c=25^\circ\text{C}$ , $T_j=175^\circ\text{C}$ )	830	W			
IGBT Characteristics						
Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
$BV_{CES}$	Collector-Emitter breakdown Voltage	$V_{GE}=0\text{V}$ , $I_C=250\mu\text{A}$ , $T_{vj}=25^\circ\text{C}$	1200			V
$I_{CES}$	Collector-Emitter leakage Current	$V_{CE}=1200\text{V}$ , $V_{GE}=0\text{V}$ , $T_{vj}=25^\circ\text{C}$			5.0	mA
$I_{GES}$	Gate-Emitter leakage Current	$V_{CE}=0\text{V}$ , $V_{GE}=\pm 20\text{V}$ , $T_{vj}=25^\circ\text{C}$			400	$\eta\text{A}$
$V_{GE(th)}$	Gate-emitter Threshold Voltage	$V_{GE}=V_{CE}$ , $I_C=1.5\text{mA}$ , $T_{vj}=25^\circ\text{C}$	5.5	6.5	7.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150\text{A}$ , $V_{GE}=15\text{V}$ , $T_{vj}=25^\circ\text{C}$		1.65	2.00	V
		$I_C=150\text{A}$ , $V_{GE}=15\text{V}$ , $T_{vj}=150^\circ\text{C}$		2.2		V
		$I_C=150\text{A}$ , $V_{GE}=15\text{V}$ , $T_{vj}=175^\circ\text{C}$		2.3		V
$Q_G$	Gate Charge	$V_{CC}=600\text{V}$ , $V_{GE}=0/15\text{V}$ , $I_C=150\text{A}$ , $T_{vj}=25^\circ\text{C}$		660		nC
$C_{ies}$	Input Capacitance	$V_{CE}=25\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$ , $T_{vj}=25^\circ\text{C}$		14.66		$\eta\text{F}$
$C_{oes}$	Output Capacitance			0.58		$\eta\text{F}$
$C_{res}$	Reverse Transfer Capacitance			0.2		$\eta\text{F}$
$R_{gint}$	Internal Gate Resistance			2.0		$\Omega$
$t_{d(on)}$	Turn-on Delay Time	$I_C=150\text{A}$ $V_{CE}=600\text{V}$ $V_{GE}=\pm 15\text{V}$ $R_G=2.0\Omega$ $T_{vj}=25^\circ\text{C}$ , $L_{load}=0.8\text{mH}$ Energy loss include tail and diode reverse recovery		106		$\eta\text{s}$
$t_r$	Rise Time			58		$\eta\text{s}$
$t_{d(off)}$	Turn-off Delay Time			215		$\eta\text{s}$
$t_f$	Fall Time			157		$\eta\text{s}$
$E_{on}$	Energy Dissipation During Turn-on Time			9.04		mJ
$E_{off}$	Energy Dissipation During Turn-off Time			8.50		mJ
$I_{sc}$	SC Data		$t_{sc}\leq 10\mu\text{s}$ , $V_{GE}=15\text{V}$ , $T_{vj}=25^\circ\text{C}$ , $V_{CC}=600\text{V}$ ,		740	

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Diode Characteristics						
Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
$I_F$	Diode DC Forward Current			150		A
$I_{FRM}$	Diode Peak Forward Current	$t_p=1ms$		300		A
		$I_F=150A, T_{vj}=150^{\circ}C$		1.60		V
		$I_F=150A, T_{vj}=175^{\circ}C$		1.55		V
$Q_{rr}$	Recovered Charge	$I_F=150 A$		7.89		$\mu C$
$I_{rr}$	Peak Reverse Recovery Current	$V_R=600V$		80		A
$E_{rec}$	Reverse Recovery Energy	$-di_F/dt = 2070A/\mu s$ $T_{vj}=25^{\circ}C$		2.92		mJ

Module Characteristics						
Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
$V_{isol}$	Isolation voltage	$t=1min, f=50Hz$	2500			V
$T_{jmax}$	Maximum Junction Temperature				175	$^{\circ}C$
$T_{vjop}$	Operating Junction Temperature		-40		150	$^{\circ}C$
$T_{stg}$	Storage Temperature		-40		125	$^{\circ}C$
$R_{CC'+EE'}$	Module lead resistance terminal to chip			0.70		$m\Omega$
$LSCE$	Stray Inductance, Module			20		nH
$R_{\theta jc}$	Junction-to Case	per IGBT-inverter		0.15		$^{\circ}C/W$
		per Diode-inverter		0.18		$^{\circ}C/W$
$R_{\theta cs}$	Case to Sink	per IGBT-inverter		0.034		$^{\circ}C/W$
		per Diode-inverter		0.05		$^{\circ}C/W$
		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

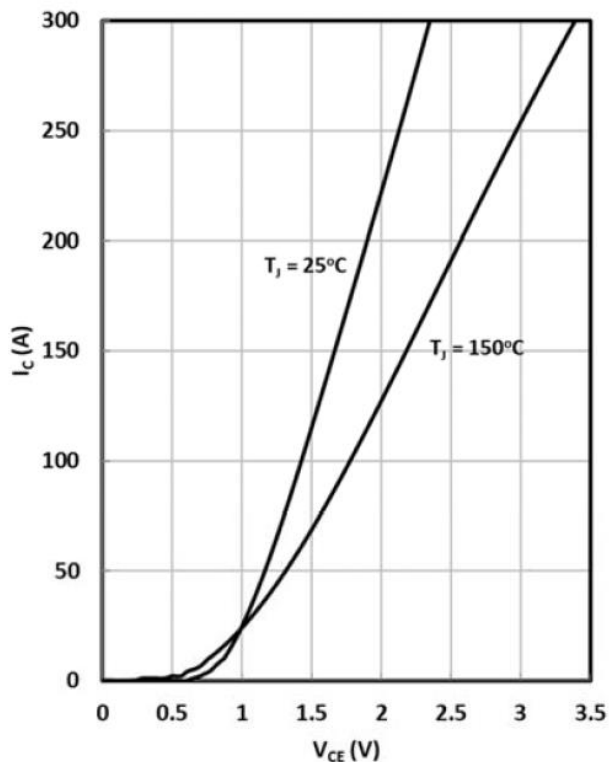


Fig. 1 IGBT (Inverter) Output Characteristics

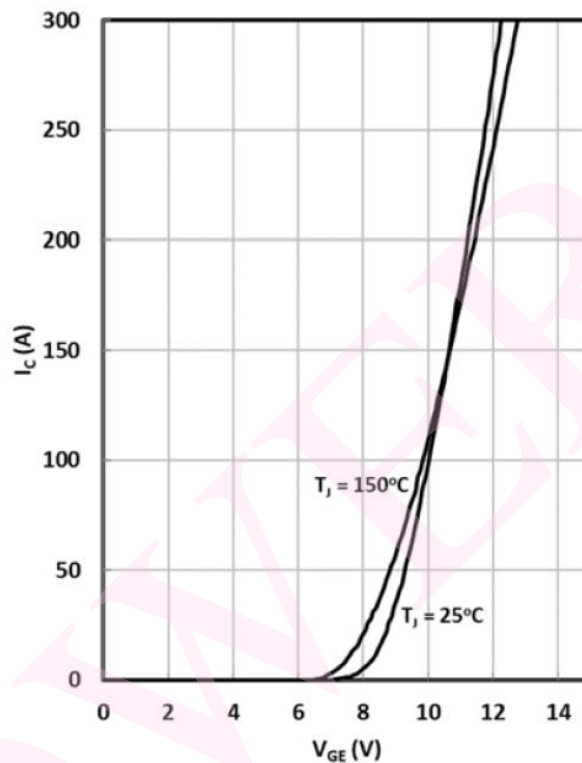


Fig. 2 IGBT (Inverter) Transfer Characteristics

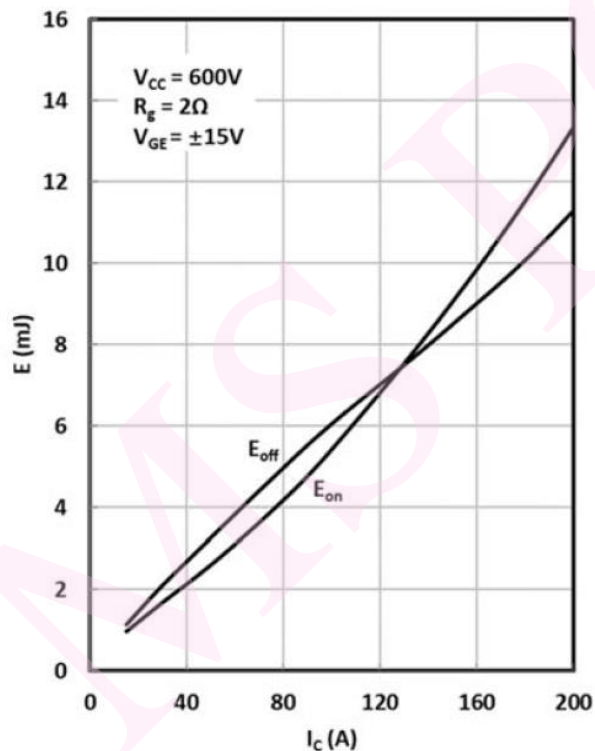


Fig. 3 IGBT (Inverter) Switching Loss vs. Ic

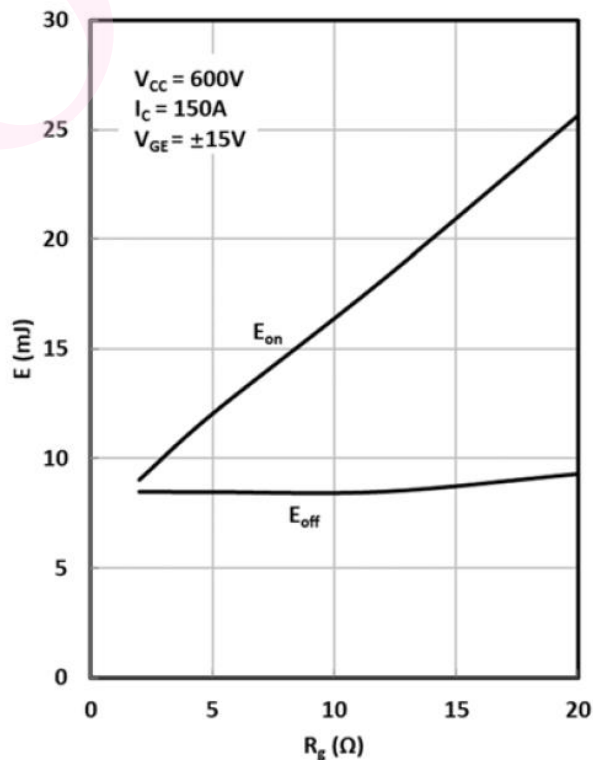


Fig. 4 IGBT (Inverter) Switching Loss vs. Rg

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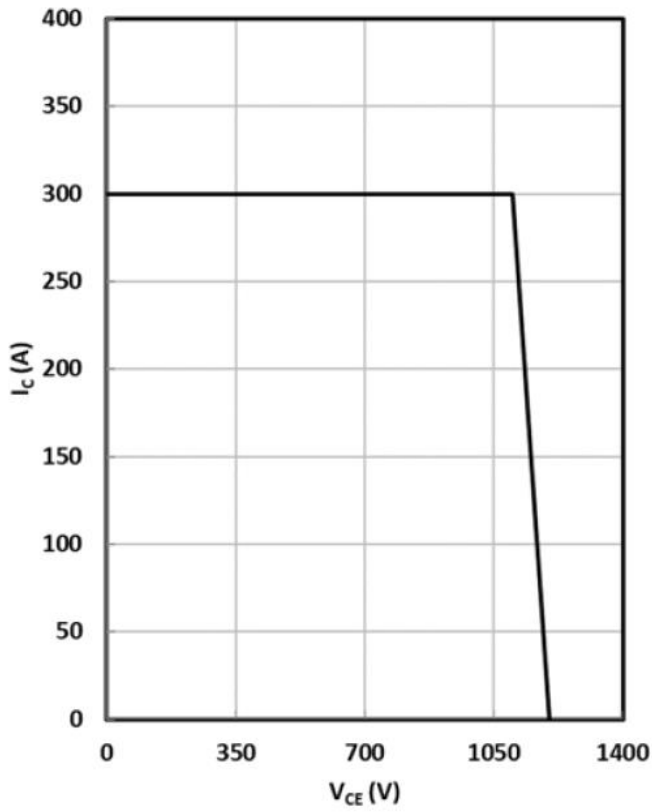


Fig. 5 RBSOA

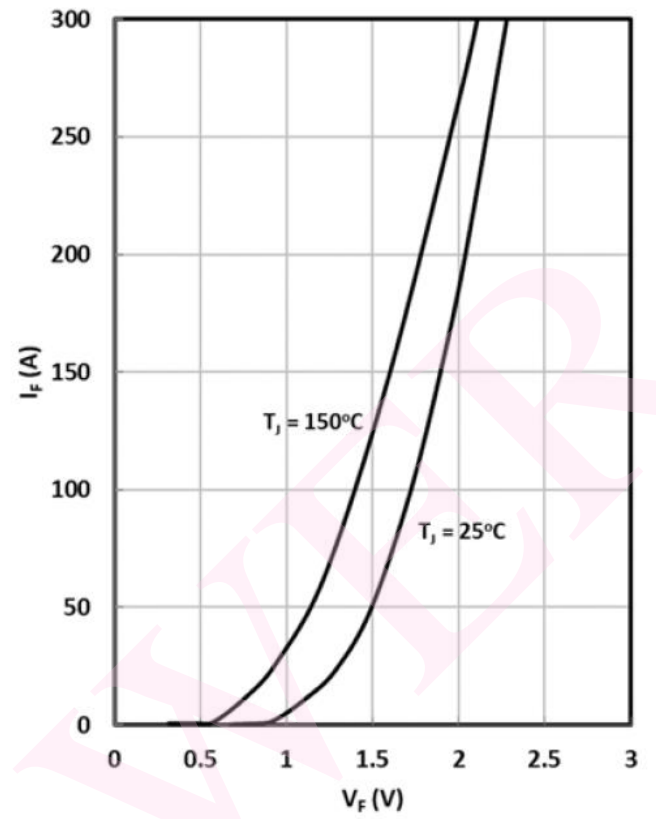
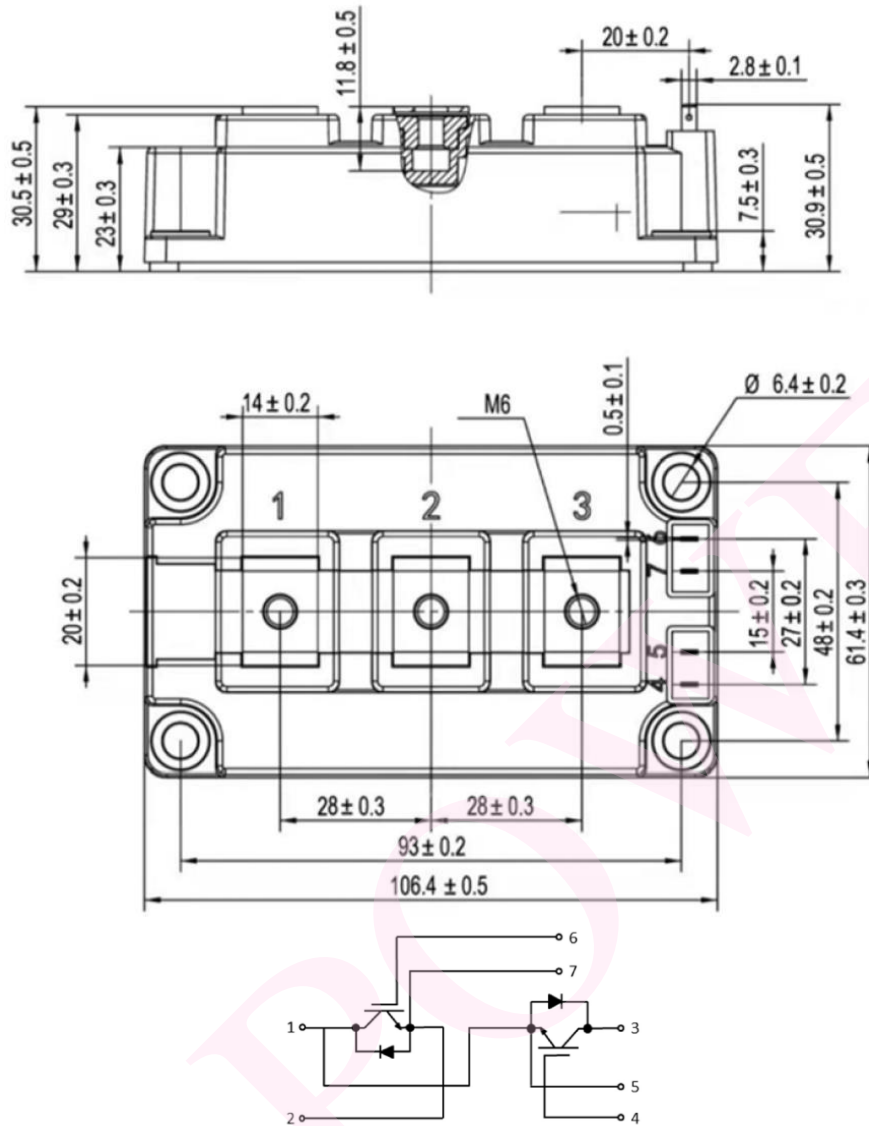


Fig. 6 Diode (Inverter) Forward Characteristics

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