

IGBT Modules



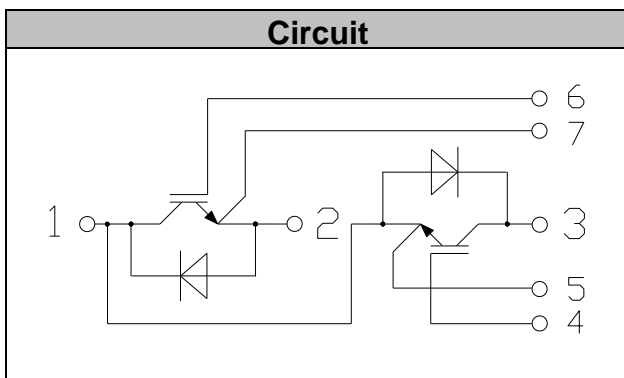
V_{CES} 1200V
I_C 75A

Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)
- Soft switching welding machine

Features

- Low V_{ce(sat)} with Trench technology
- V_{ce(sat)} with positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)
- Low inductance module structure



● Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V _{CES}	V _{GE} =0V, I _C =1mA, T _{vj} =25°C	1200	V
Continuous Collector Current	I _C	T _c =80°C	75	A
Peak Collector Current	I _{CRM}	T _p =1ms	150	A
Gate-Emitter Voltage	V _{GES}	T _{vj} =25°C	±20	V
Total Power Dissipation (IGBT-inverter)	P _{tot}	T _c =25°C T _{vjmax} =175°C	476	W



● IGBT Characteristics

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=2.6mA, T_{vj}=25^{\circ}C$	5.8	6.5	7.2	V	
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1.0	mA	
		$I_C=75A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.85	2.15	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=75A, V_{GE}=15V, T_{vj}=125^{\circ}C$		2.05		V	
		$I_C=75A, V_{GE}=15V, T_{vj}=150^{\circ}C$		2.10		V	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^{\circ}C$		4.00		nF	
Output Capacitance	C_{oes}			0.60		nF	
Reverse Transfer Capacitance	C_{res}			0.30		nF	
Internal Gate Resistance	R_{gint}			2.5		Ω	
Turn-on Delay Time	$t_{d(on)}$	$I_C=75A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=5.1\Omega$ $T_{vj}=25^{\circ}C$		100		ns	
Rise Time	t_r			78		ns	
Turn-off Delay Time	$t_{d(off)}$			380		ns	
Fall Time	t_f			32		ns	
Energy Dissipation During Turn-on Time	E_{on}			5.6		mJ	
Energy Dissipation During Turn-off Time	E_{off}			3.6		mJ	
Turn-on Delay Time	$t_{d(on)}$		$I_C=75A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=5.1\Omega$ $T_{vj}=125^{\circ}C$		110		ns
Rise Time	t_r				85		ns
Turn-off Delay Time	$t_{d(off)}$				450		ns
Fall Time	t_f				36		ns
Energy Dissipation During Turn-on Time	E_{on}			8.8		mJ	
Energy Dissipation During Turn-off Time	E_{off}			6.4		mJ	
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V,$ $T_{vj}=150^{\circ}C, V_{cc}=900V,$ $V_{CEM} \leq 1200V$			400		A



● Diode Characteristics

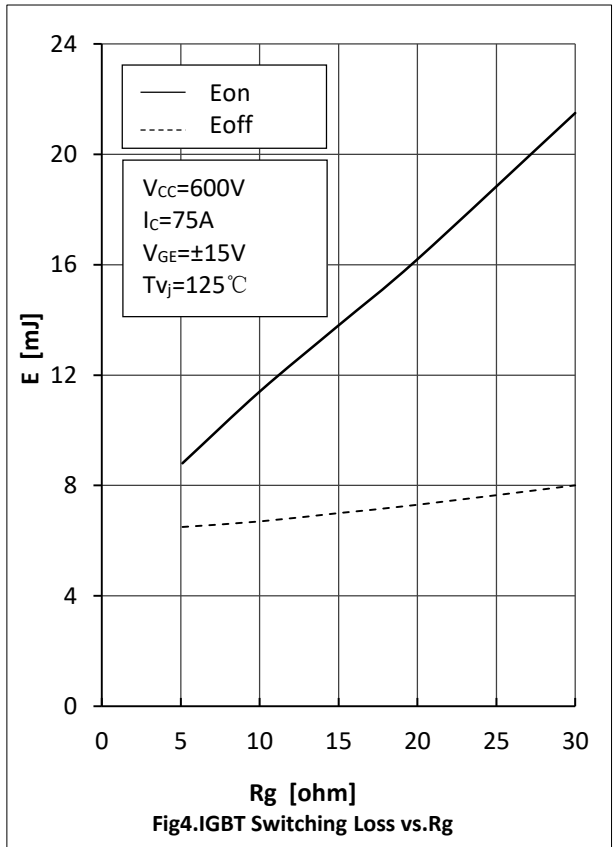
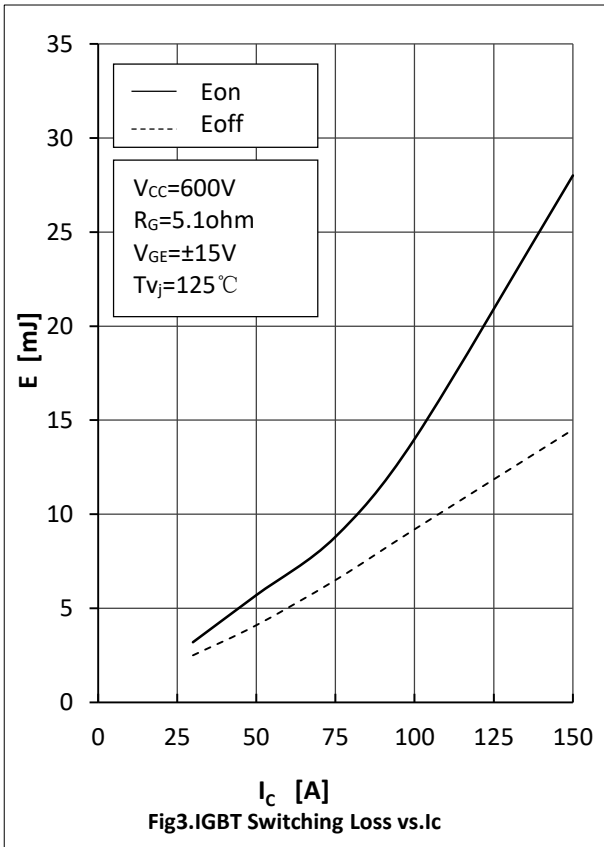
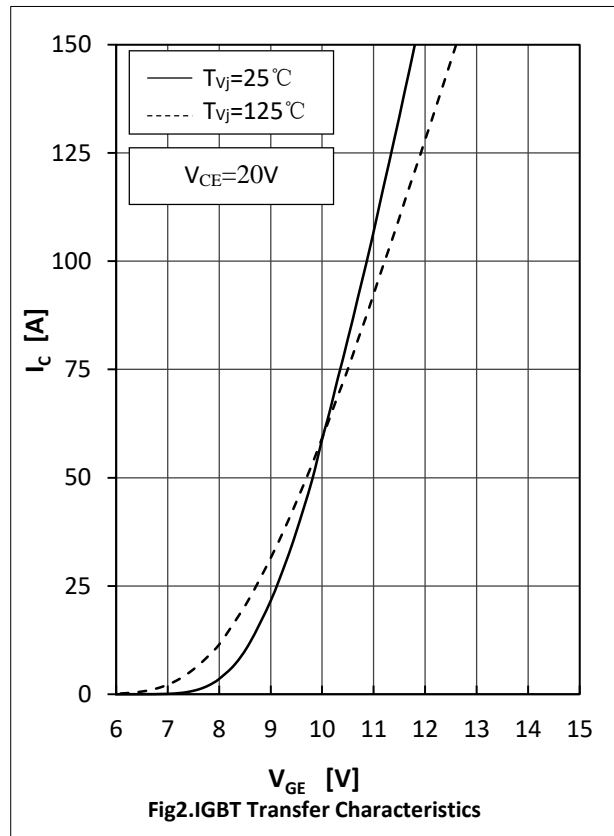
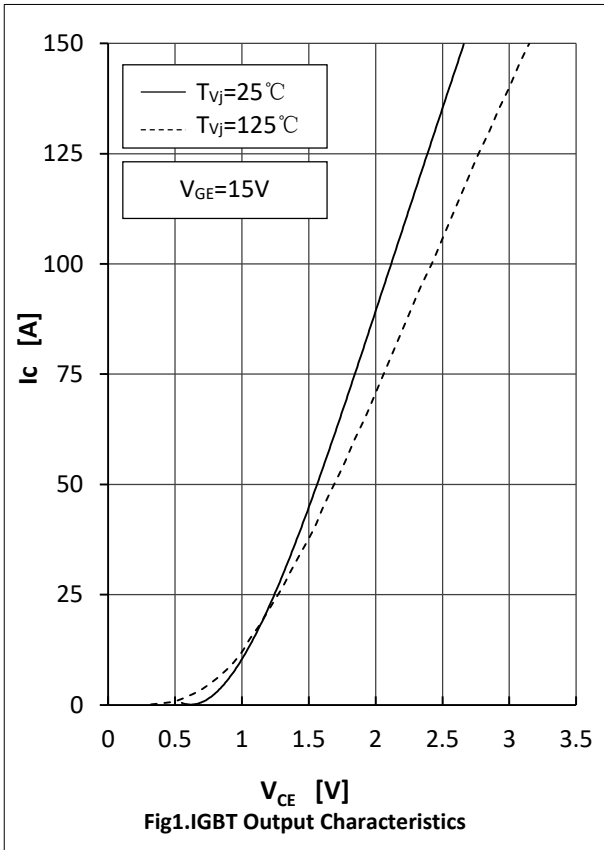
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode DC Forward Current	I_F	$T_c=80^\circ\text{C}$		75		A
Diode Peak Forward Current	I_{FRM}	$I_{FRM}=2I_F$		150		A
Forward Voltage	V_F	$I_F=75\text{A}, T_{vj}=25^\circ\text{C}$		2.00	2.30	V
		$I_F=75\text{A}, T_{vj}=125^\circ\text{C}$		2.10		V

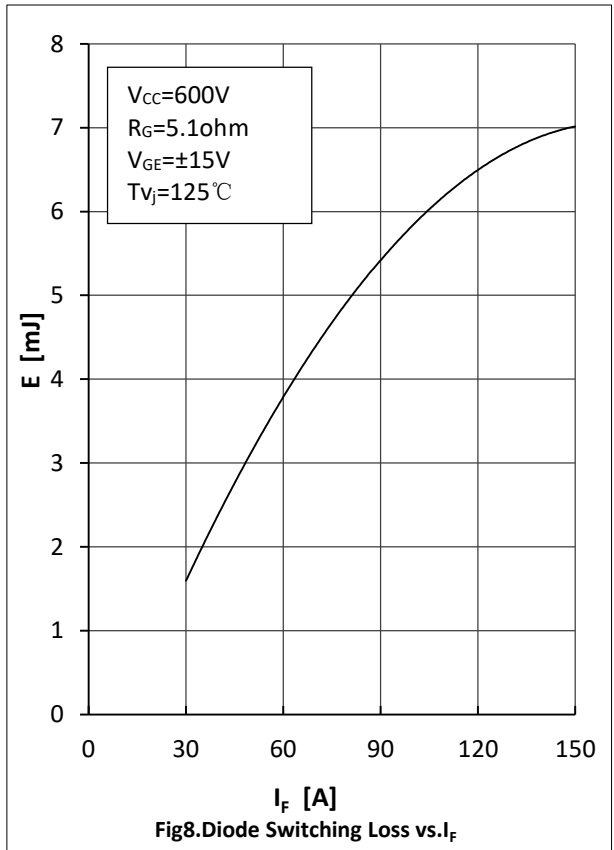
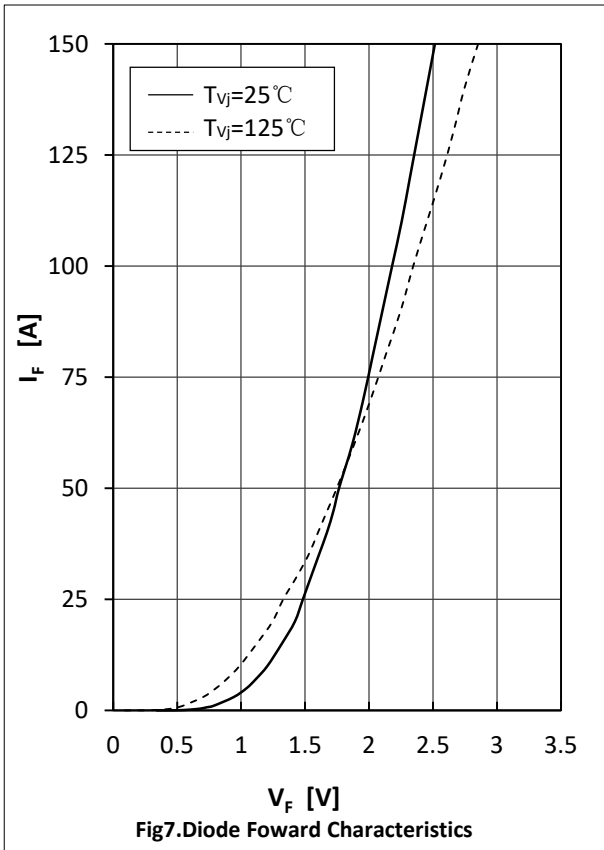
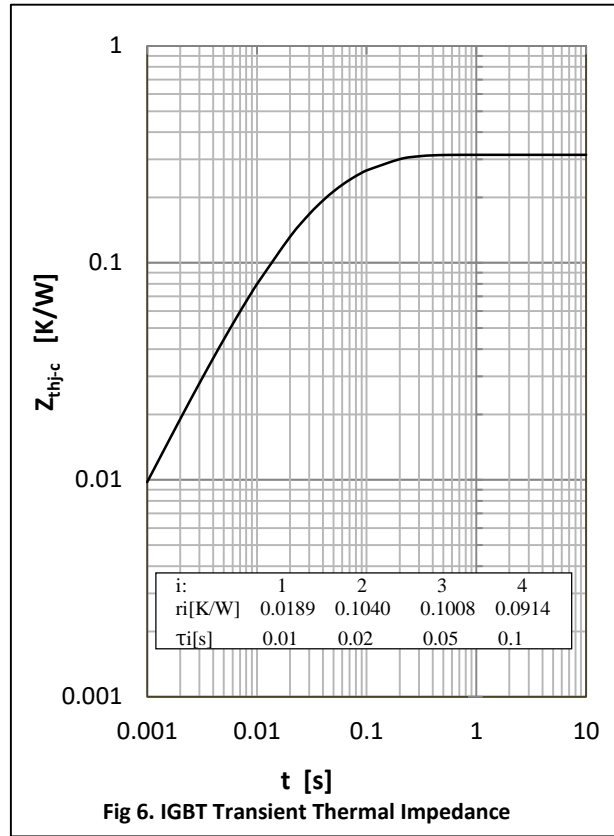
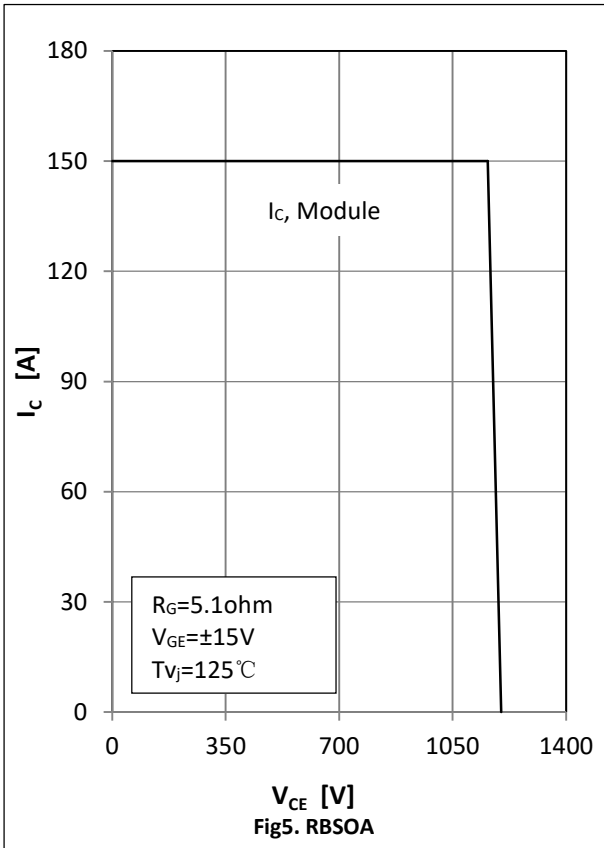
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Recovered Charge	Q_{rr}	$I_F=75\text{A}$ $V_R=600\text{V}$ $-di_F/dt=900\text{A}/\mu\text{s}$ $T_{vj}=25^\circ\text{C}$		4.2		μC
Peak Reverse Recovery Current	I_{rr}			75		A
Reverse Recovery Time	t_{rr}			150		ns
Reverse Recovery Energy	E_{rec}			2.06		mJ
Recovered Charge	Q_{rr}	$I_F=75\text{A}$ $V_R=600\text{V}$ $-di_F/dt=900\text{A}/\mu\text{s}$ $T_{vj}=125^\circ\text{C}$		9.6		μC
Peak Reverse Recovery Current	I_{rr}			92		A
Reverse Recovery Time	t_{rr}			180		ns
Reverse Recovery Energy	E_{rec}			4.34		mJ

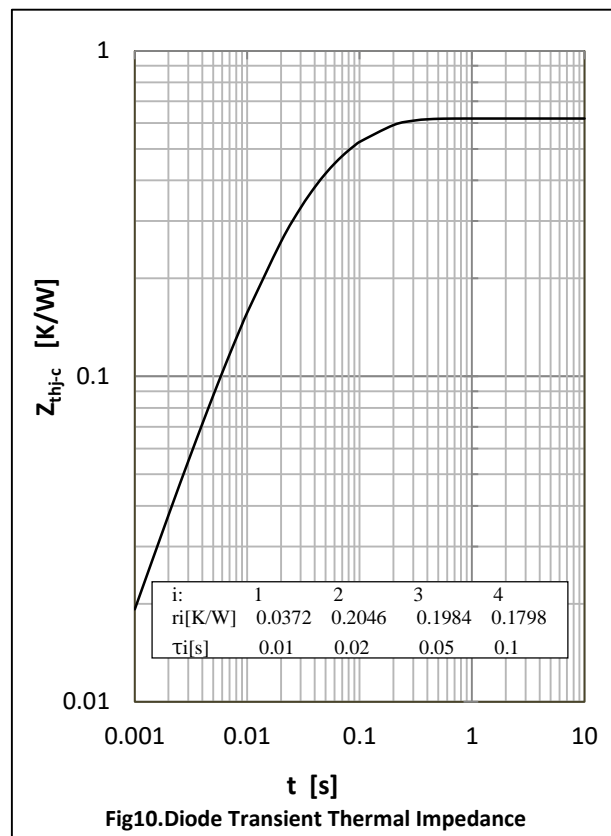
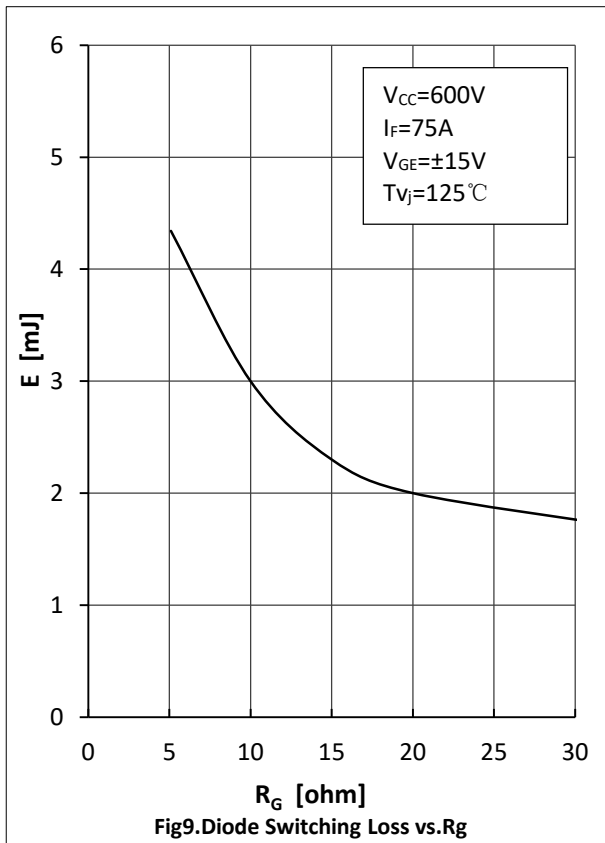


● **Module Characteristics** $T_C=25^{\circ}\text{C}$ unless otherwise specified

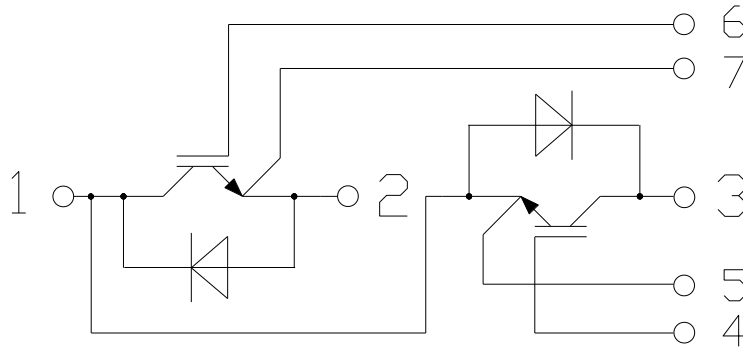
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	T_{jmax}				175	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Junction-to Case	$R_{\theta \text{jc}}$	per IGBT-inverter			0.315	K/W
		per Diode-inverter			0.620	K/W
Case to Sink	$R_{\theta \text{cs}}$	Conductive grease applied		0.05		K/W
Module Electrodes Torque	M_{t}	Recommended(M5)	2.5		5.0	N·m
Module-to-Sink Torque	M_{s}	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			150		g







- **Circuit Diagram**



- **Package Dimensions**

Dimensions in Millimeters

