



IGBT Modules

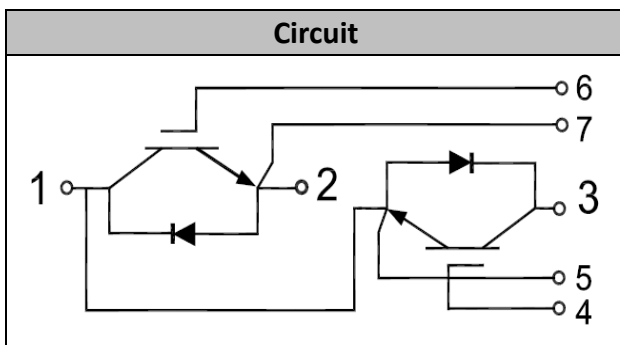
V_{CES}	1200V
I_c	150A

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
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance
- Maximum junction temperature 175°C



● IGBT

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_c=1mA, T_{vj}=25^{\circ}C$	1200	V
Continuous Collector Current	I_c	$T_c=100^{\circ}C$	150	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	300	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation	P_{tot}	$T_c=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	714	W



Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=4mA, T_{vj}=25^{\circ}C$	5.2	5.85	6.4	V
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=150A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.60	2.30	V
		$I_C=150A, V_{GE}=15V, T_{vj}=150^{\circ}C$		1.95		
		$I_C=150A, V_{GE}=15V, T_{vj}=175^{\circ}C$		2.00		
Gate Charge	Q_G			1.6		uC
Internal Gate Resistance	R_{gint}			1.37		Ω
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$		19.8		nF
Reverse Transfer Capacitance	C_{res}	$f=1MHz, T_{vj}=25^{\circ}C$		0.2		nF
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA
Turn-on Delay Time	$t_{d(on)}$	$I_C=150A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=4.7\Omega$ $T_{vj}=25^{\circ}C$		201		ns
Rise Time	t_r			119		ns
Turn-off Delay Time	$t_{d(off)}$			347		ns
Fall Time	t_f			240		ns
Energy Dissipation During Turn-on Time	E_{on}			18.5		mJ
Energy Dissipation During Turn-off Time	E_{off}			12.6		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=150A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=4.7\Omega$ $T_{vj}=150^{\circ}C$		214		ns
Rise Time	t_r			128		ns
Turn-off Delay Time	$t_{d(off)}$			388		ns
Fall Time	t_f			380		ns
Energy Dissipation During Turn-on Time	E_{on}			26.9		mJ
Energy Dissipation During Turn-off Time	E_{off}			17.0		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=150A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=4.7\Omega$ $T_{vj}=175^{\circ}C$		215		ns
Rise Time	t_r			131		ns
Turn-off Delay Time	$t_{d(off)}$			396		ns
Fall Time	t_f			402		ns
Energy Dissipation During Turn-on Time	E_{on}			28.7		mJ
Energy Dissipation During Turn-off Time	E_{off}			17.9		mJ
SC Data	I_{sc}	$t_p \leq 8\mu s, V_{GE}=15V, T_{vj}=150^{\circ}C,$ $V_{CC}=600V, V_{CEM} \leq 1200V$		600		A



● Diode

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	$T_{vj}=25^{\circ}\text{C}$	1200	V
Continuous DC Forward Current	I_F		150	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1\text{ms}$	300	A

Characteristic Values

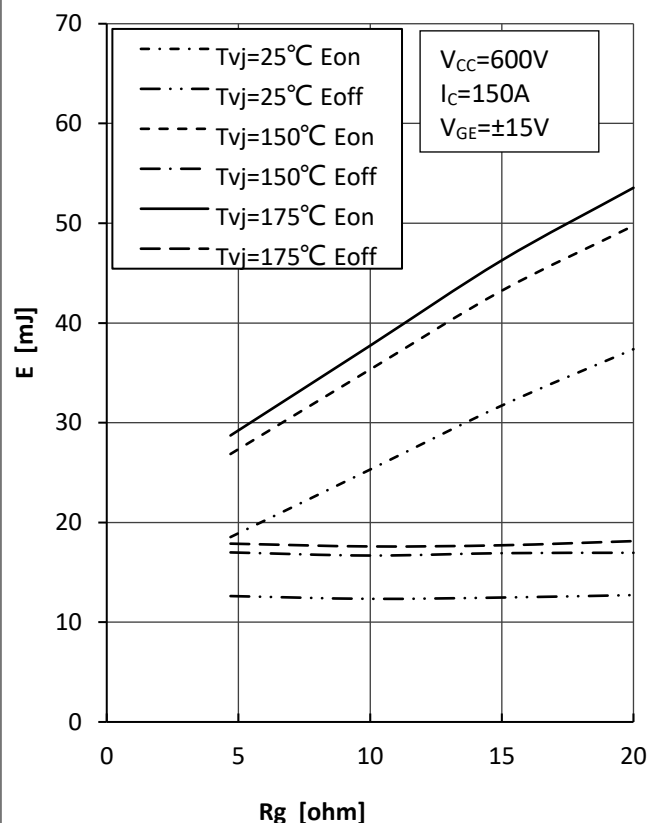
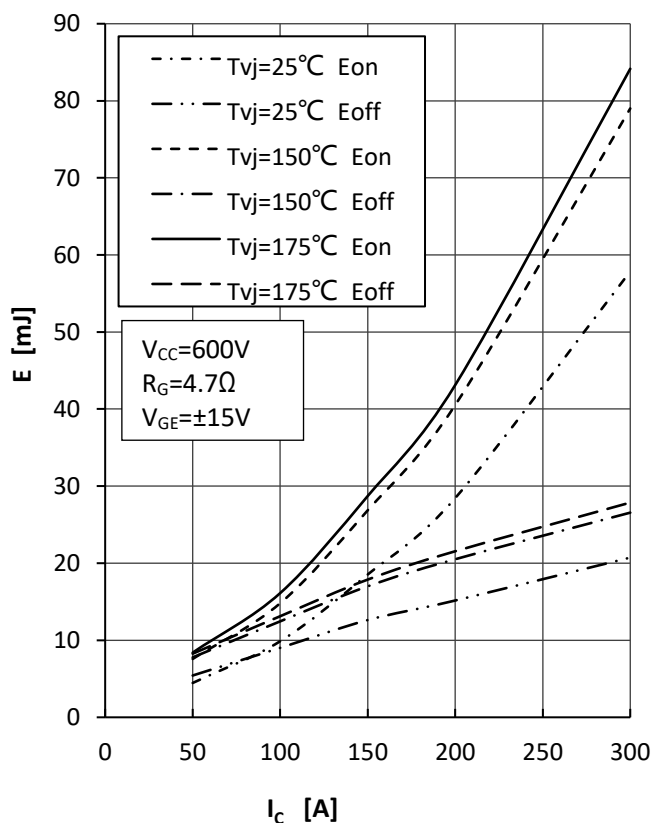
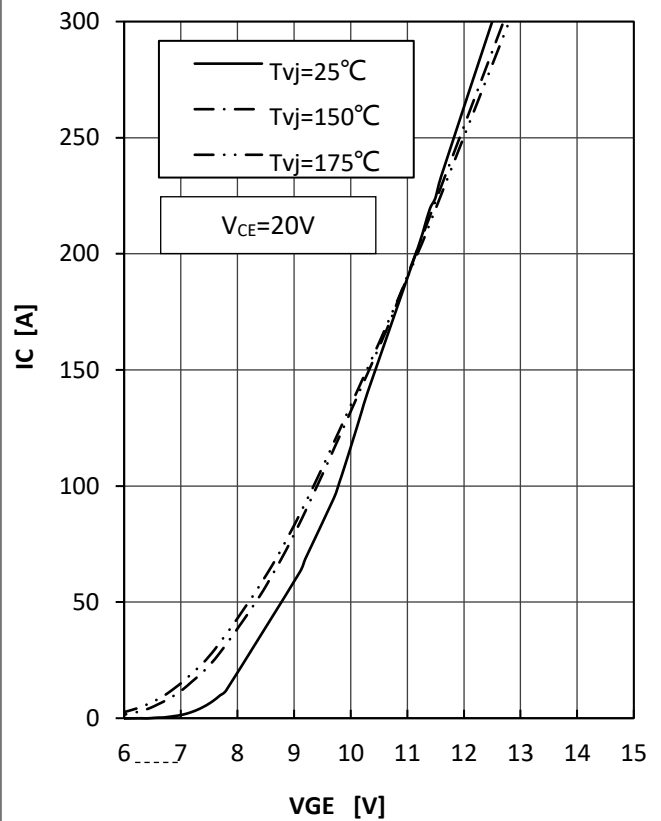
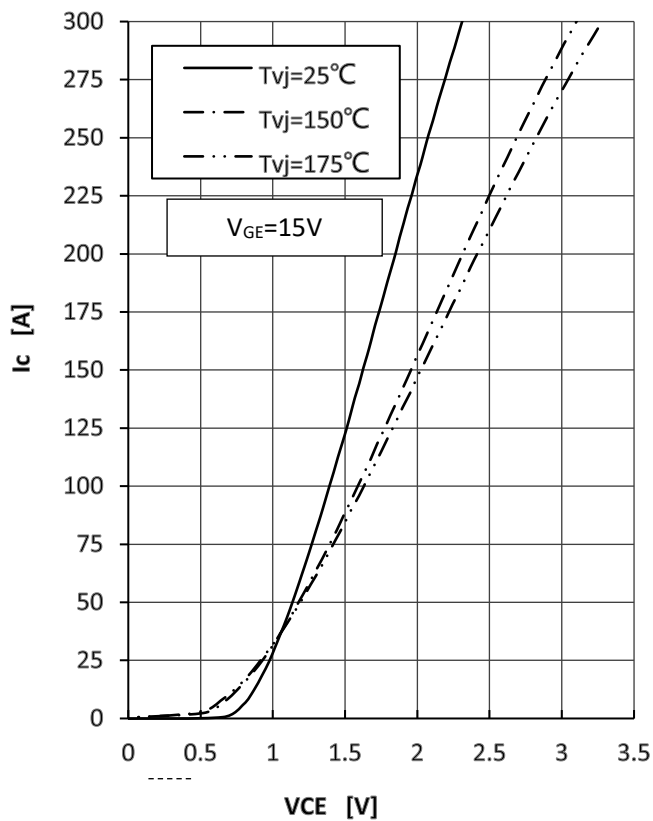
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=150\text{A}, T_{vj}=25^{\circ}\text{C}$		2.00	2.80	V
		$I_F=150\text{A}, T_{vj}=150^{\circ}\text{C}$		1.72		
		$I_F=150\text{A}, T_{vj}=175^{\circ}\text{C}$		1.65		
Recovered Charge	Q_{rr}	$I_F=150\text{A}$ $V_R=600\text{V}$ $-di_F/dt=2000\text{A/us}$ $T_{vj}=25^{\circ}\text{C}$		8		μC
Peak Reverse Recovery Current	I_{rr}			40		A
Reverse Recovery Energy	E_{rec}			2.9		mJ
Recovered Charge	Q_{rr}	$I_F=150\text{A}$ $V_R=600\text{V}$ $-di_F/dt=2000\text{A/us}$ $T_{vj}=150^{\circ}\text{C}$		21		μC
Peak Reverse Recovery Current	I_{rr}			66		A
Reverse Recovery Energy	E_{rec}			7.8		mJ
Recovered Charge	Q_{rr}	$I_F=150\text{A}$ $V_R=600\text{V}$ $-di_F/dt=2000\text{A/us}$ $T_{vj}=175^{\circ}\text{C}$		25		μC
Peak Reverse Recovery Current	I_{rr}			72		A
Reverse Recovery Energy	E_{rec}			9.2		mJ

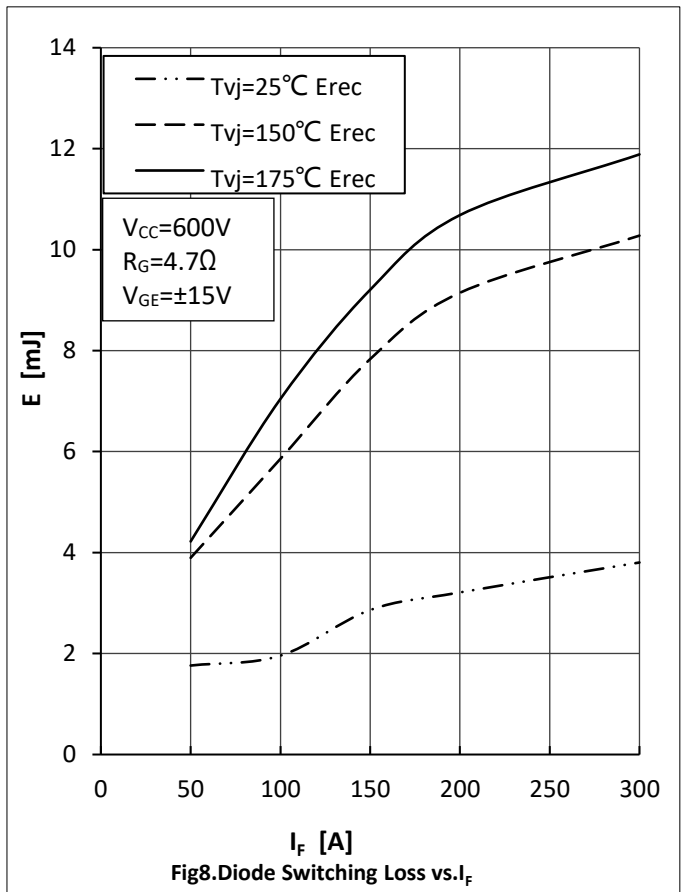
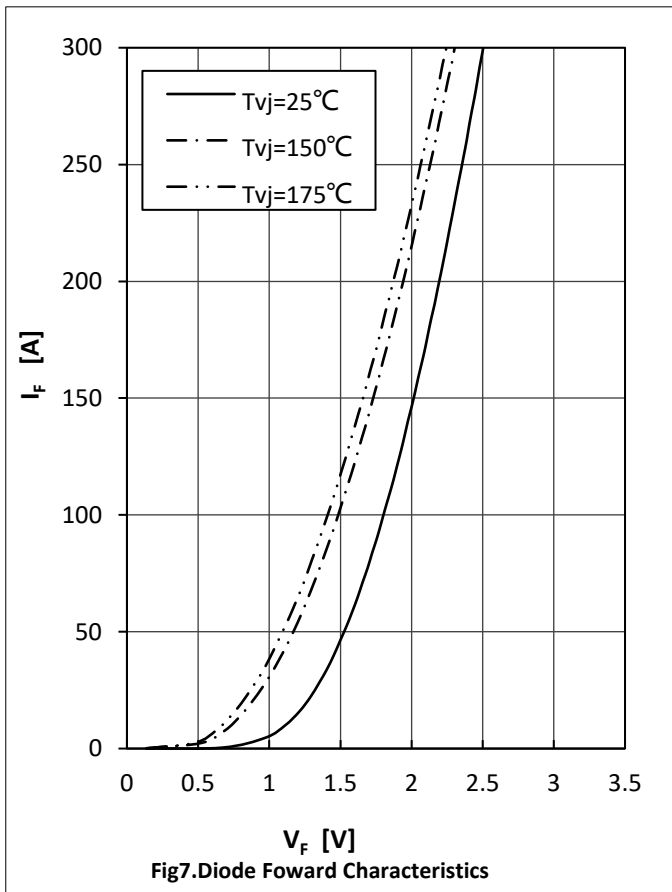
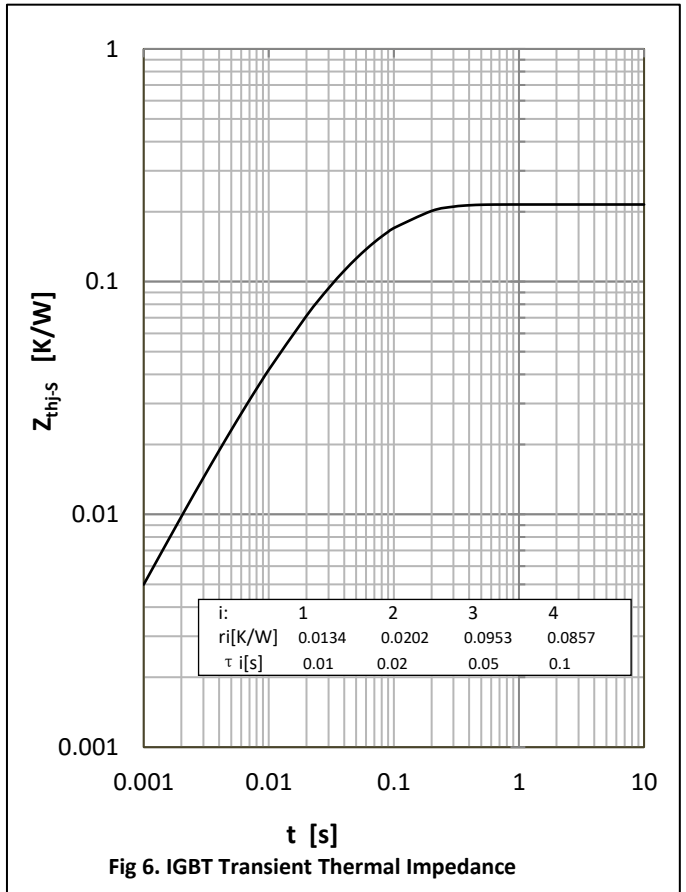
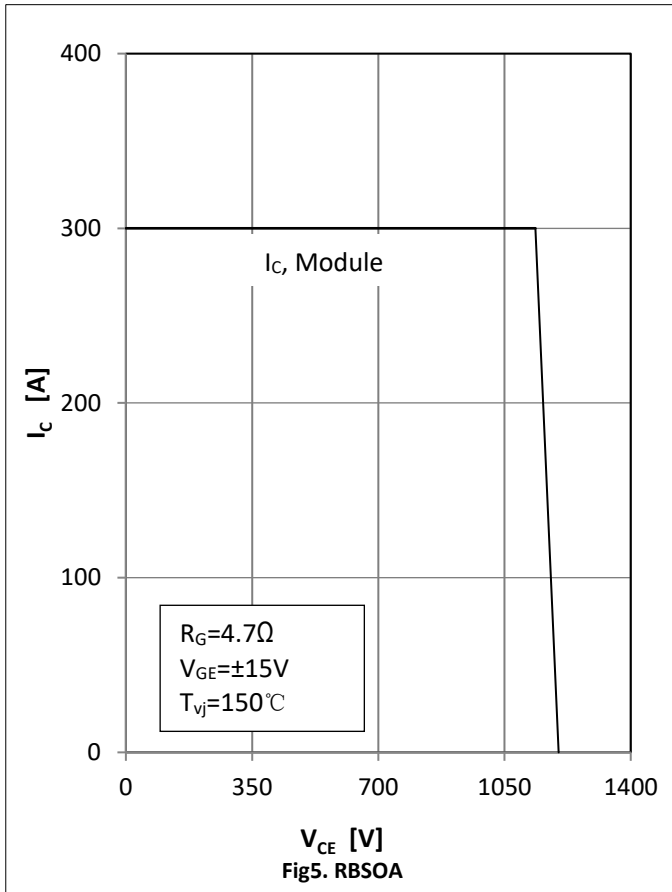


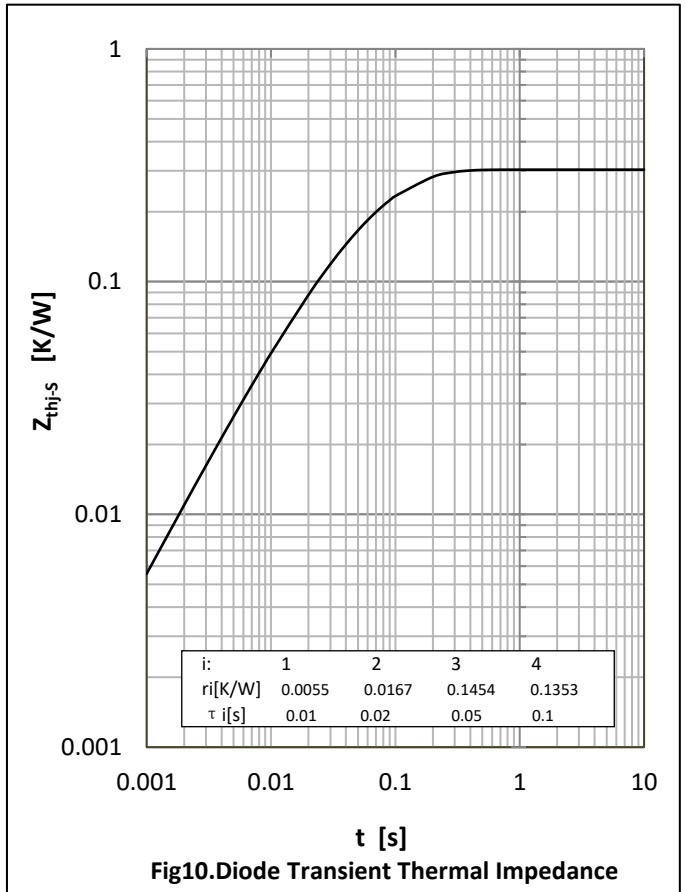
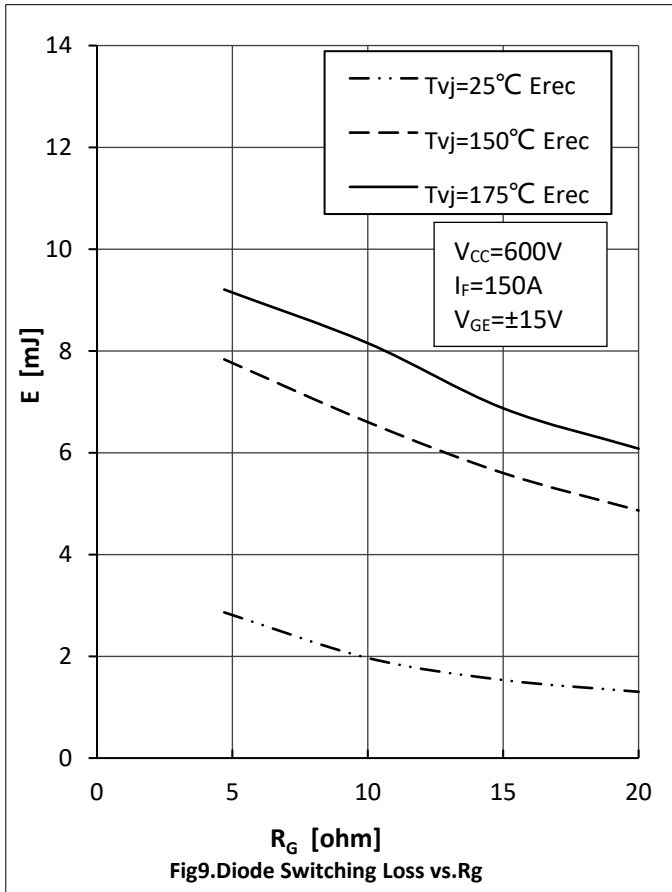
● Module Characteristics

T_C=25°C unless otherwise specified

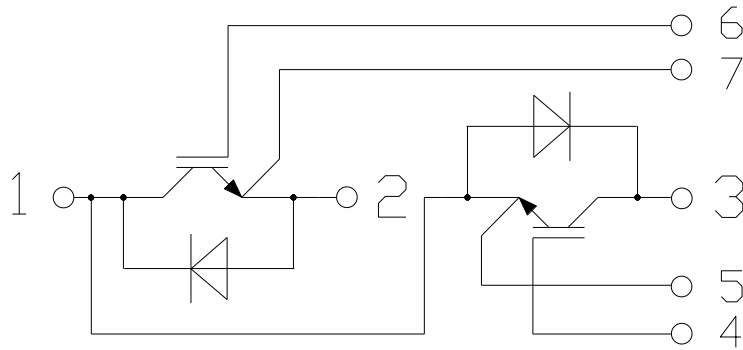
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V _{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	T _{jmax}				175	°C
Operating Junction Temperature	T _{vj op}		-40		150	°C
Storage Temperature	T _{stg}		-40		125	°C
Thermal Resistance Junction to Case	R _{θJC}	per IGBT			0.21	K/W
		per Diode			0.30	
Thermal Resistance Case to Sink	R _{θCS}	Conductive grease applied		0.012	0.035	K/W
Module Electrodes Torque	M _t	Recommended(M6)	3.0		5.0	N·m
Module to Sink Torque	M _s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			315		g





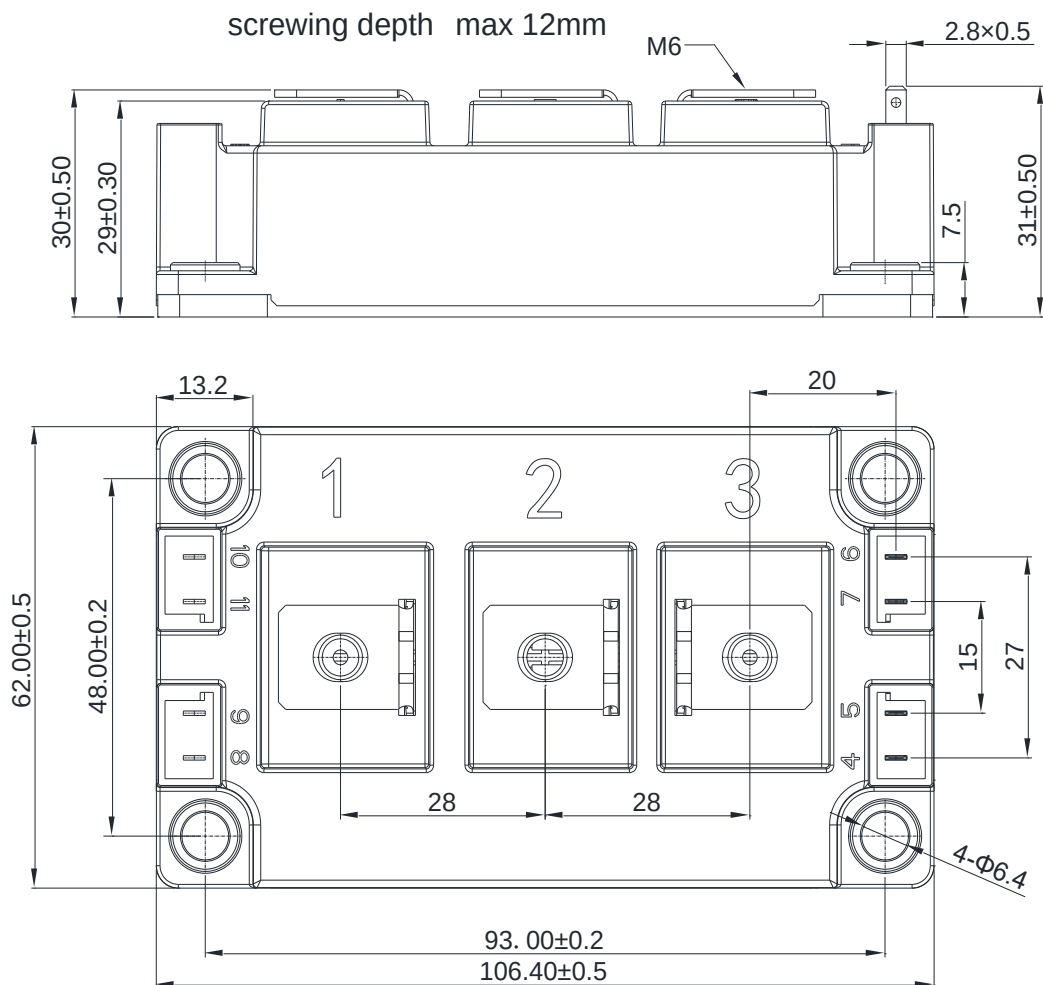


- **Circuit Diagram**



● Package Outline Information

Dimensions in Millimeters





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IGBTs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.

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