

IGBT Modules

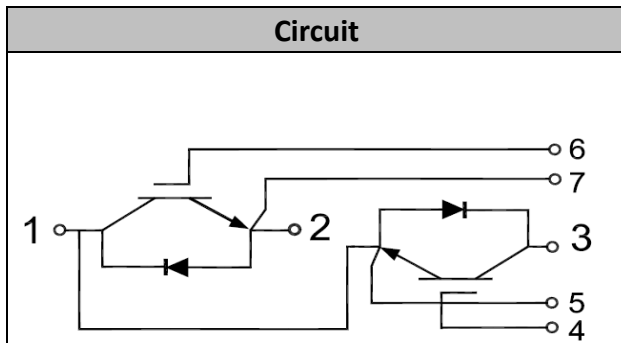
V_{CES} 1200V
 I_C 50A

Applications

- High frequency drivers
- Solar inverters
- UPS (Uninterruptible Power Supplies)
- Electric welding machine

Features

- Low switching losses
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance
- Maximum junction temperature 150°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	$T_C=100^{\circ}C$	50	A
Repetitive Peak Collector Current	I_{CRM}	$t_p=1ms$	100	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation	P_{tot}	$T_C=25^{\circ}C$ $T_{vjmax}=150^{\circ}C$	240	W



Characteristic Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1.7mA, T_{vj}=25^{\circ}C$	5.0	5.8	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	$V_{CE(sat)}$	$I_C=50A, V_{GE}=15V, T_{vj}=25^{\circ}C$		2.68		V
		$I_C=50A, V_{GE}=15V, T_{vj}=125^{\circ}C$		3.20		
		$I_C=50A, V_{GE}=15V, T_{vj}=150^{\circ}C$		3.34		
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^{\circ}C$		3.18		nF
Reverse Transfer Capacitance	C_{res}			0.73		nF
Internal Gate Resistance	R_{gint}			2.1		Ω
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA
Turn-on Delay Time	$t_{d(on)}$	$I_C=50A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=6.8\Omega$ $T_{vj}=25^{\circ}C$		2		ns
Rise Time	t_r			42.0		ns
Turn-off Delay Time	$t_{d(off)}$			121.9		ns
Fall Time	t_f			61.8		ns
Energy Dissipation During Turn-on Time	E_{on}			3.5		mJ
Energy Dissipation During Turn-off Time	E_{off}			1.1		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=50A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=6.8\Omega$ $T_{vj}=125^{\circ}C$		5		ns
Rise Time	t_r			43.8		ns
Turn-off Delay Time	$t_{d(off)}$			85.4		ns
Fall Time	t_f			76.5		ns
Energy Dissipation During Turn-on Time	E_{on}			4.7		mJ
Energy Dissipation During Turn-off Time	E_{off}			1.6		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=50A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=6.8\Omega$ $T_{vj}=150^{\circ}C$		6		ns
Rise Time	t_r			43.8		ns
Turn-off Delay Time	$t_{d(off)}$			90.2		ns
Fall Time	t_f			85.8		ns
Energy Dissipation During Turn-on Time	E_{on}			4.9		mJ
Energy Dissipation During Turn-off Time	E_{off}			1.7		mJ
SC Data	I_{sc}	$t_p \leq 10\mu s, V_{GE}=15V, T_{vj}=150^{\circ}C,$ $V_{CC}=600V, V_{CEM} \leq 1200V$		170		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		50	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1\text{ms}$	100	A

Characteristic Values

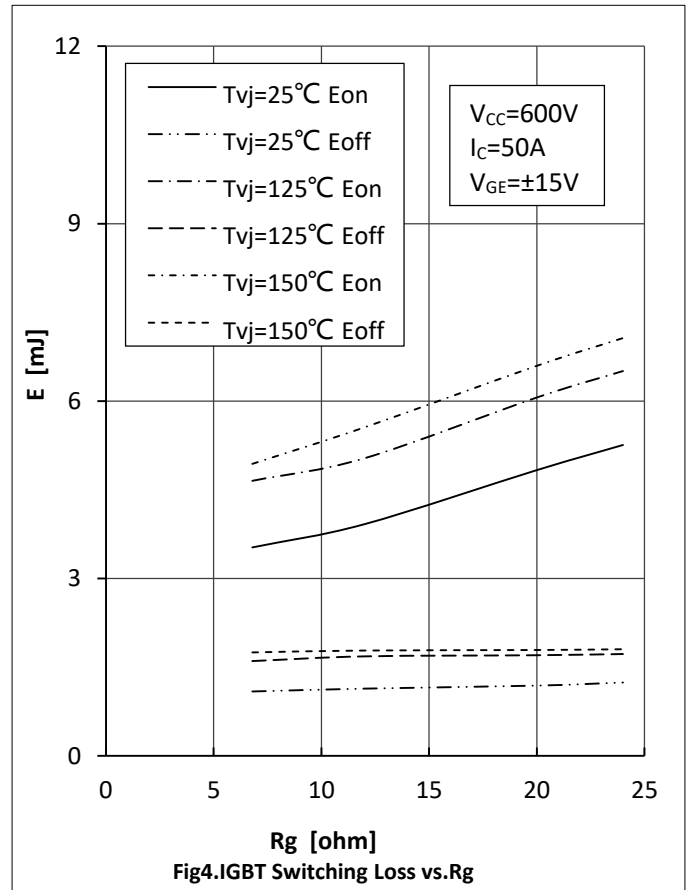
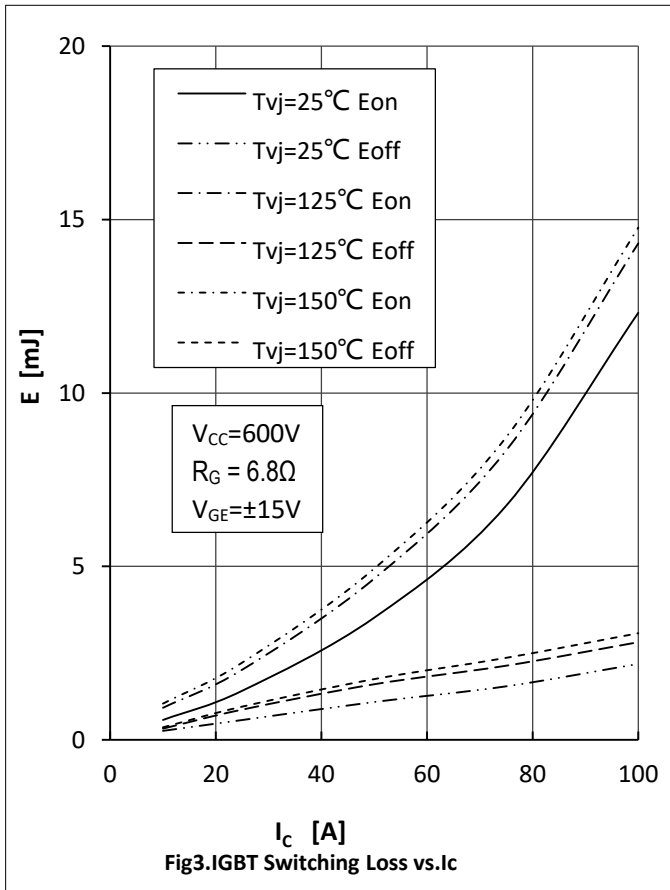
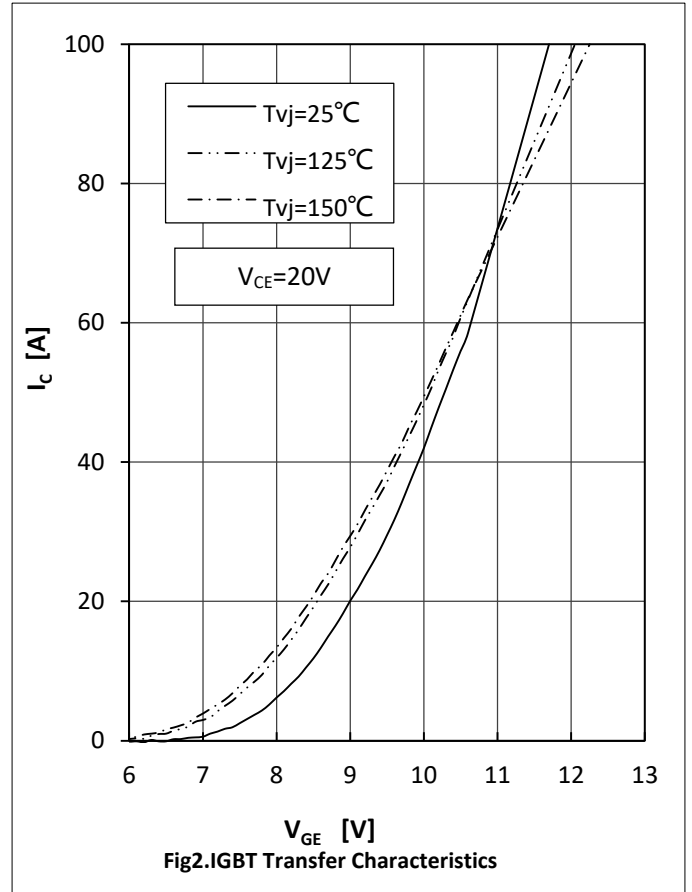
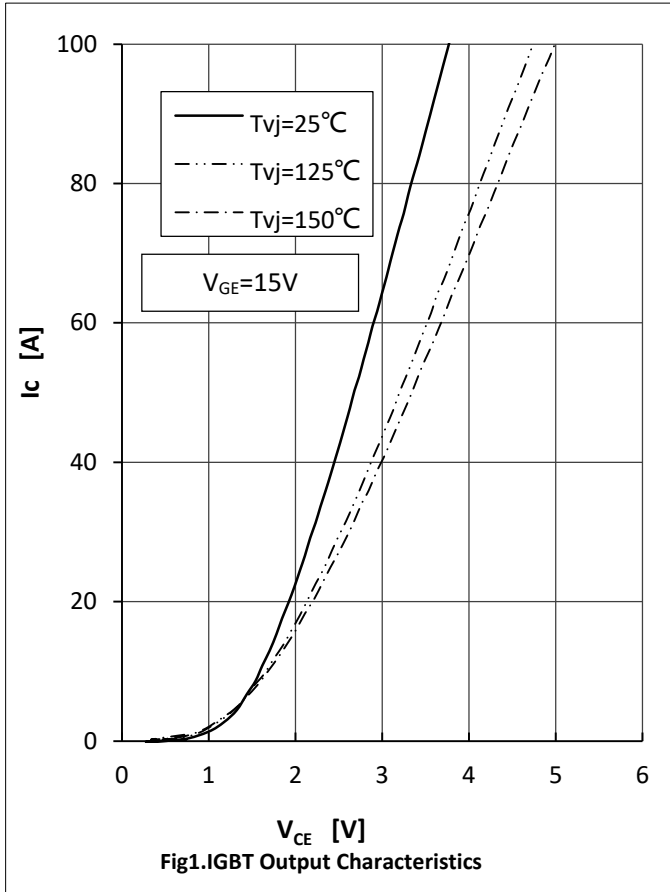
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			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=50\text{A}, T_{vj}=25^{\circ}\text{C}$		2.19		V
		$I_F=50\text{A}, T_{vj}=125^{\circ}\text{C}$		1.97		
		$I_F=50\text{A}, T_{vj}=150^{\circ}\text{C}$		1.91		
Recovered Charge	Q_{rr}	$I_F=50\text{A}$		3.2		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=800\text{A}/\mu\text{s}$		20.5		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=25^{\circ}\text{C}$		1.3		mJ
Recovered Charge	Q_{rr}	$I_F=50\text{A}$		6.2		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=800\text{A}/\mu\text{s}$		28.4		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=125^{\circ}\text{C}$		2.6		mJ
Recovered Charge	Q_{rr}	$I_F=50\text{A}$		7.1		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=800\text{A}/\mu\text{s}$		29.8		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=150^{\circ}\text{C}$		2.9		mJ

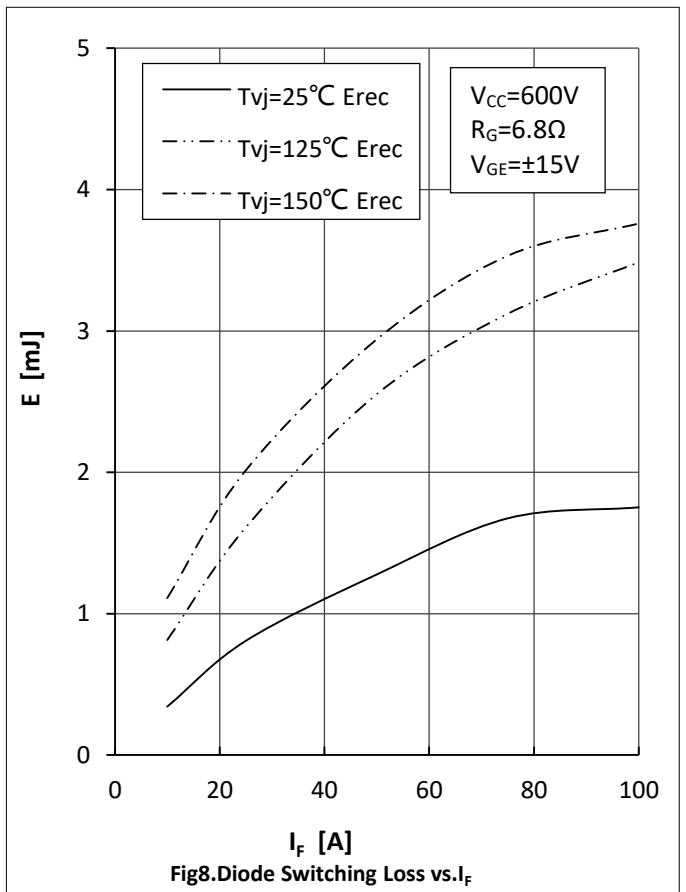
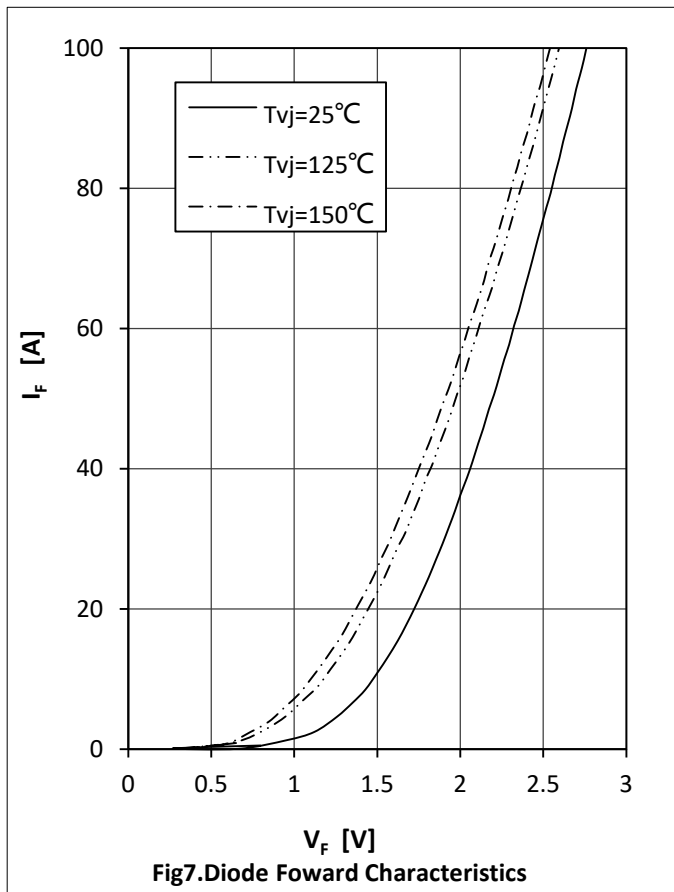
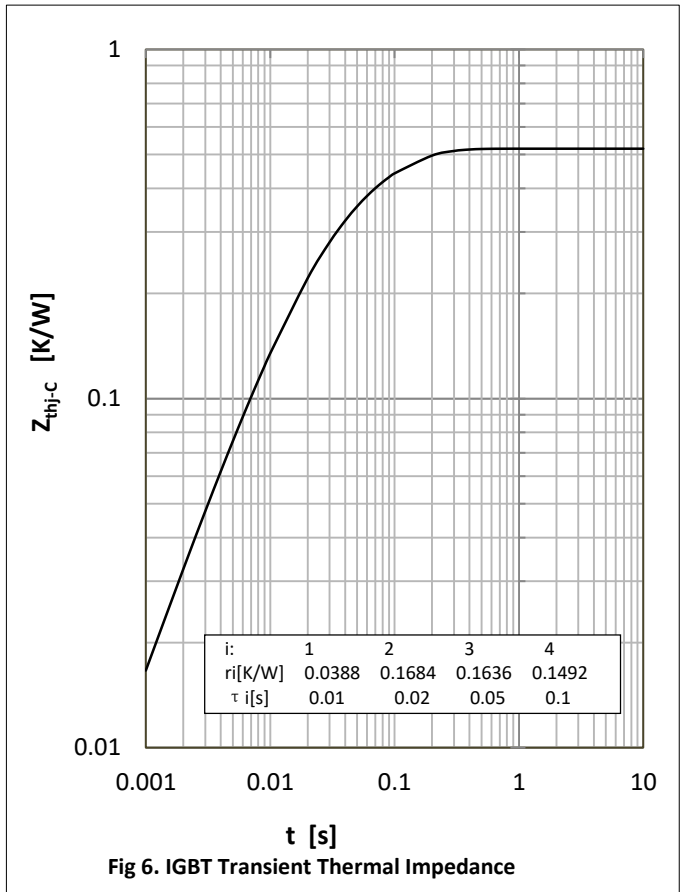
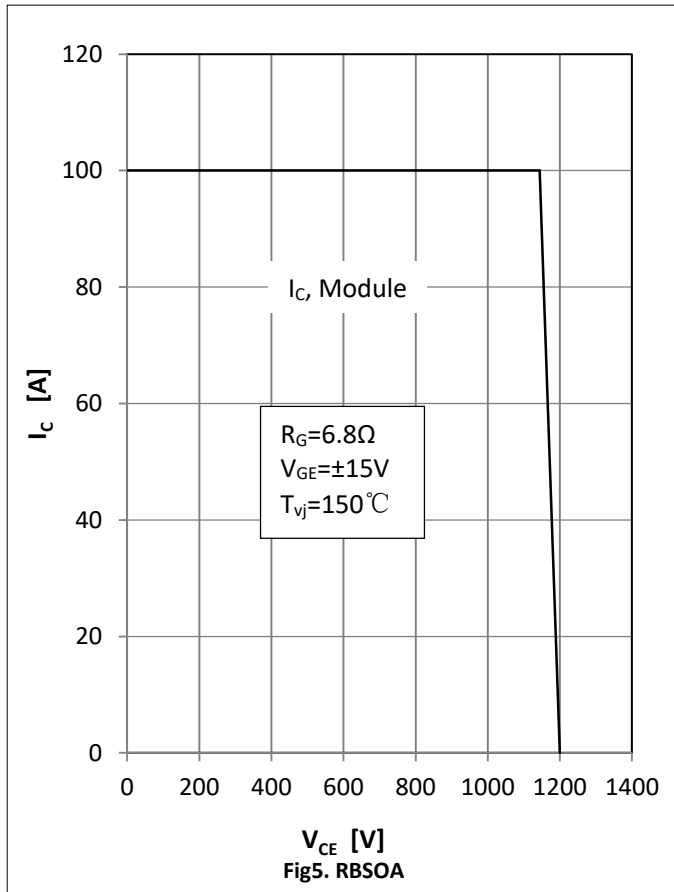


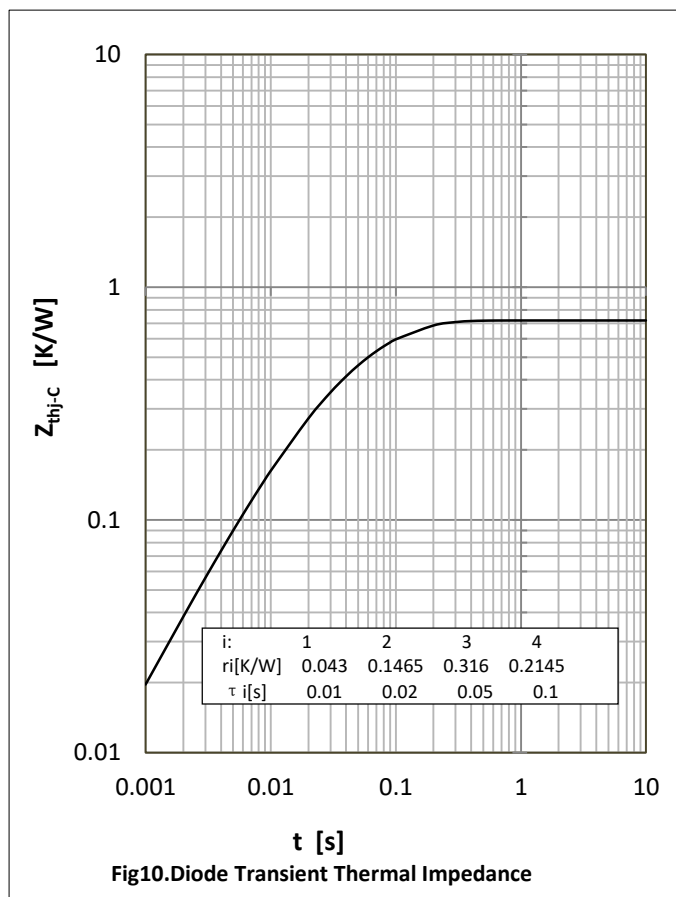
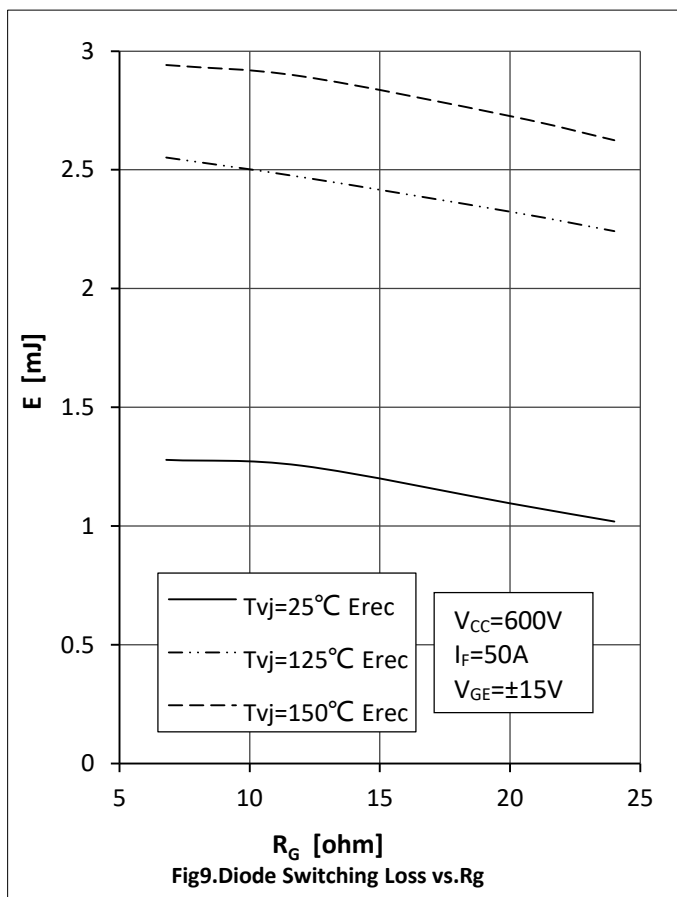
● Module Characteristics

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

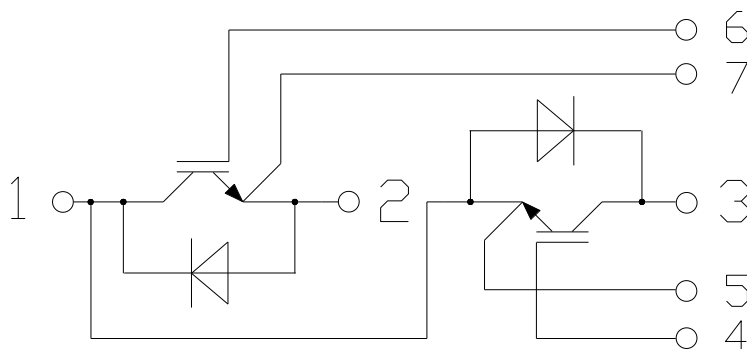
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation Voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	T_{jmax}				150	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		125	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Thermal Resistance Junction to Case	$R_{\theta\text{JC}}$	per IGBT			0.52	K/W
		per Diode			0.72	
Thermal Resistance 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







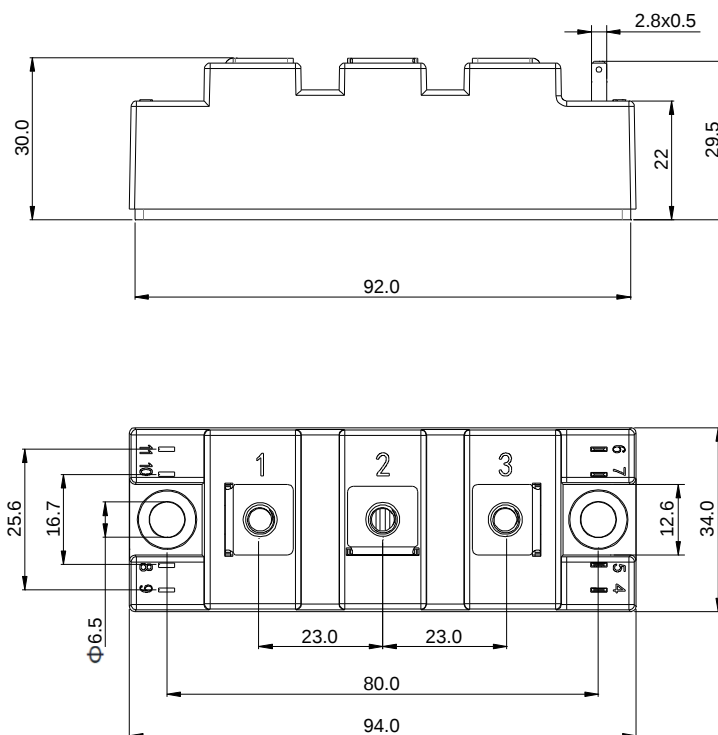
- **Circuit Diagram**



● Package Outline Information

Dimensions in Millimeters

screwing depth max 10mm





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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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