

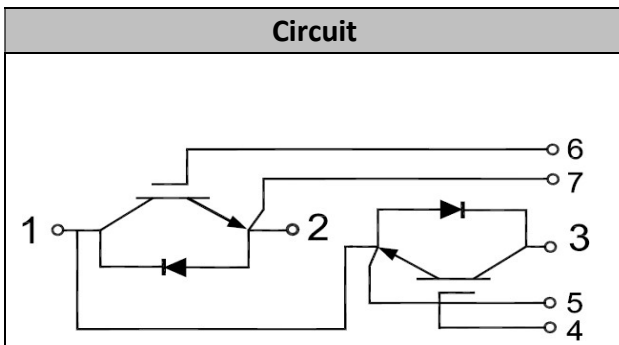


## IGBT Modules

V<sub>CEs</sub>            1200V  
I<sub>C</sub>                 40A

## Applications

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



## Features

- High speed IGBT in NPT technology
- Low switching losses
- High short circuit capability(10us)
- 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 <sub>CEs</sub>	V <sub>GE</sub> =0V, I <sub>C</sub> =1mA, T <sub>vj</sub> =25°C	1200	V
Continuous Collector Current	I <sub>C</sub>	T <sub>c</sub> =80°C	40	A
Repetitive Peak Collector Current	I <sub>CRM</sub>	tp=1ms	80	A
Gate-Emitter Voltage	V <sub>GES</sub>	T <sub>vj</sub> =25°C	± 20	V
Total Power Dissipation	P <sub>tot</sub>	T <sub>c</sub> =25°C T <sub>vjmax</sub> =150°C	312	W



## Characteristic values

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1.6mA, T_{vj}=25^{\circ}C$	5.0	5.8	6.5	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	$V_{CE(sat)}$	$I_C=40A, V_{GE}=15V, T_{vj}=25^{\circ}C$		2.0	3.5	V	
		$I_C=40A, V_{GE}=15V, T_{vj}=125^{\circ}C$		2.3			
Input Capacitance	$C_{ies}$	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^{\circ}C$		3.5		nF	
Reverse Transfer Capacitance	$C_{res}$			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	$t_{d(on)}$	$I_C=40A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_{GON}=10\Omega$ $R_{GOFF}=5.1\Omega$ $L_s=35nH$ $L_d=320uH$ $T_{vj}=25^{\circ}C$		21		ns	
Rise Time	$t_r$			42		ns	
Turn-off Delay Time	$t_{d(off)}$			192		ns	
Fall Time	$t_f$			28		ns	
Energy Dissipation During Turn-on Time	$E_{on}$				3.7		mJ
Energy Dissipation During Turn-off Time	$E_{off}$				1.5		mJ
Turn-on Delay Time	$t_{d(on)}$		$I_C=40A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_{GON}=10\Omega$ $R_{GOFF}=5.1\Omega$ $L_s=35nH$ $L_d=320uH$ $T_{vj}=125^{\circ}C$		28		ns
Rise Time	$t_r$			45		ns	
Turn-off Delay Time	$t_{d(off)}$			250		ns	
Fall Time	$t_f$			30		ns	
Energy Dissipation During Turn-on Time	$E_{on}$				5.1		mJ
Energy Dissipation During Turn-off Time	$E_{off}$				2.2		mJ
SC Data	$I_{sc}$	$T_p \leq 10\mu s, V_{GE}=15V, T_{vj}=125^{\circ}C,$ $V_{cc}=600V, V_{CEM} \leq 1200V$			240		A



## ● Diode

### Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$	$T_{vj}=25^{\circ}C$	1200	V
Continuous DC Forward Current	$I_F$		40	A
Repetitive Peak Forward Current	$I_{FRM}$	$t_p=1ms$	80	A

### Characteristic values

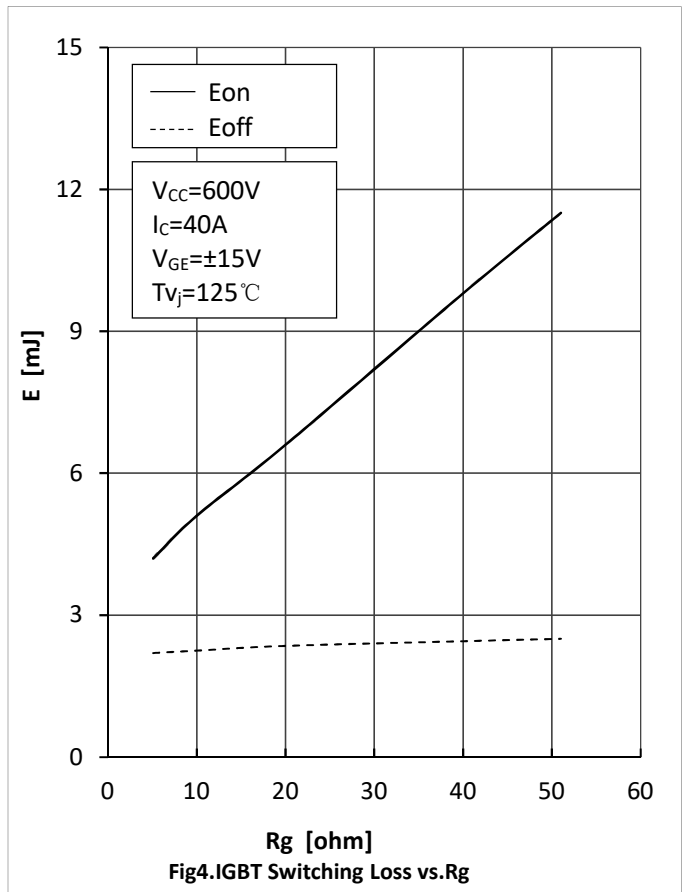
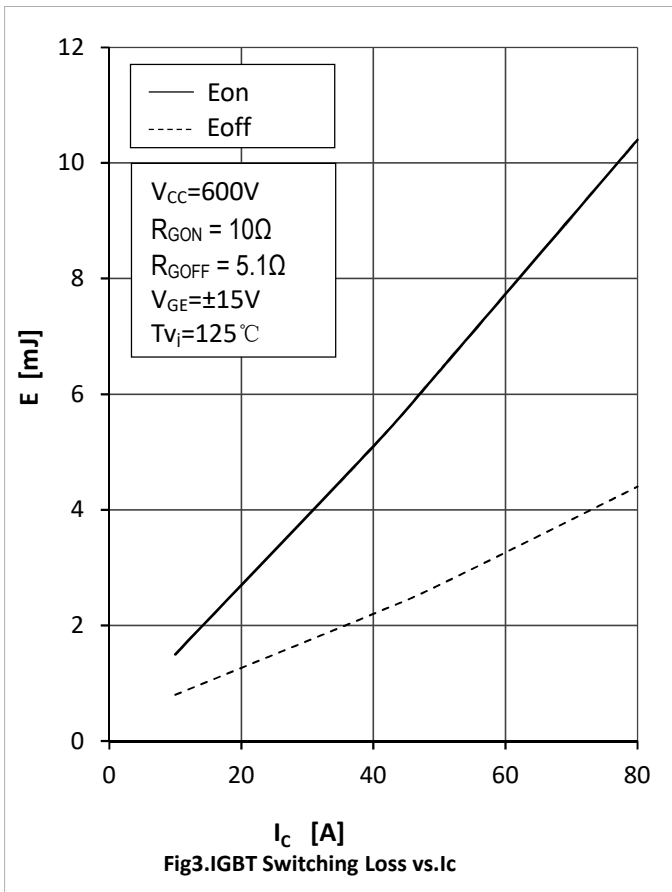
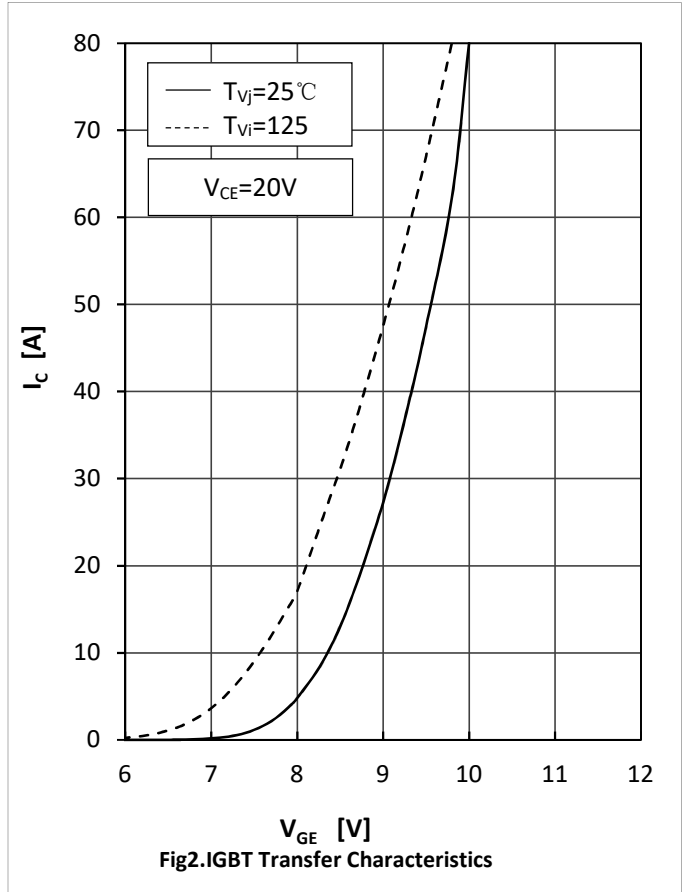
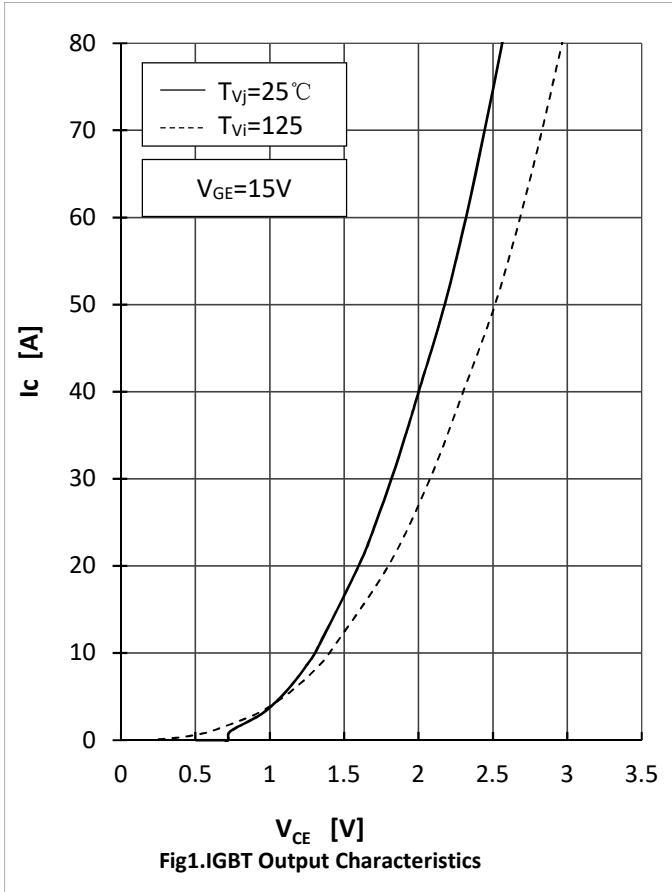
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	$V_F$	$I_F=40A, T_{vj}=25^{\circ}C$		1.85	2.10	V
		$I_F=40A, T_{vj}=125^{\circ}C$		1.80		
Recovered Charge	$Q_{rr}$	$I_F=40A$		2.85		$\mu C$
Peak Reverse Recovery Current	$I_{rr}$	$V_R=600V$ $-di_F/dt=900A/\mu s$		45		A
Reverse Recovery Energy	$E_{rec}$	$T_{vj}=25^{\circ}C$		0.80		mJ
Recovered Charge	$Q_{rr}$	$I_F=40A$		5.16		$\mu C$
Peak Reverse Recovery Current	$I_{rr}$	$V_R=600V$ $-di_F/dt=900A/\mu s$		50		A
Reverse Recovery Energy	$E_{rec}$	$T_{vj}=125^{\circ}C$		1.55		mJ

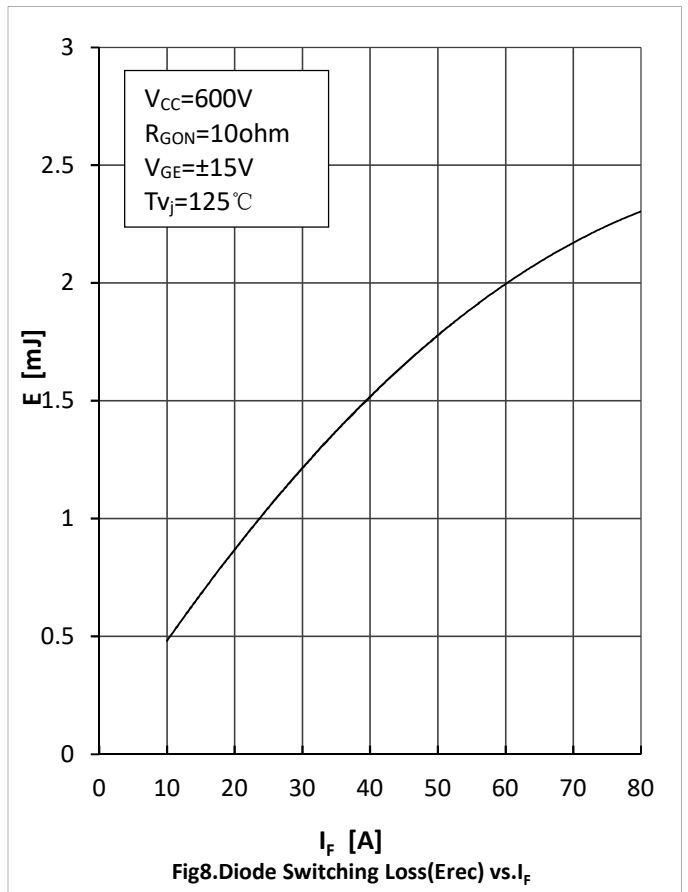
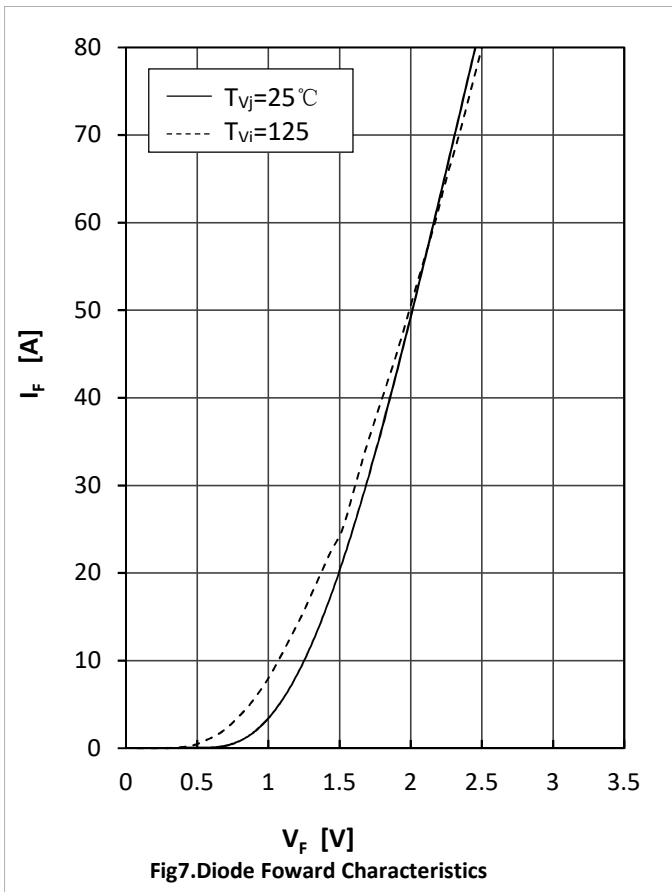
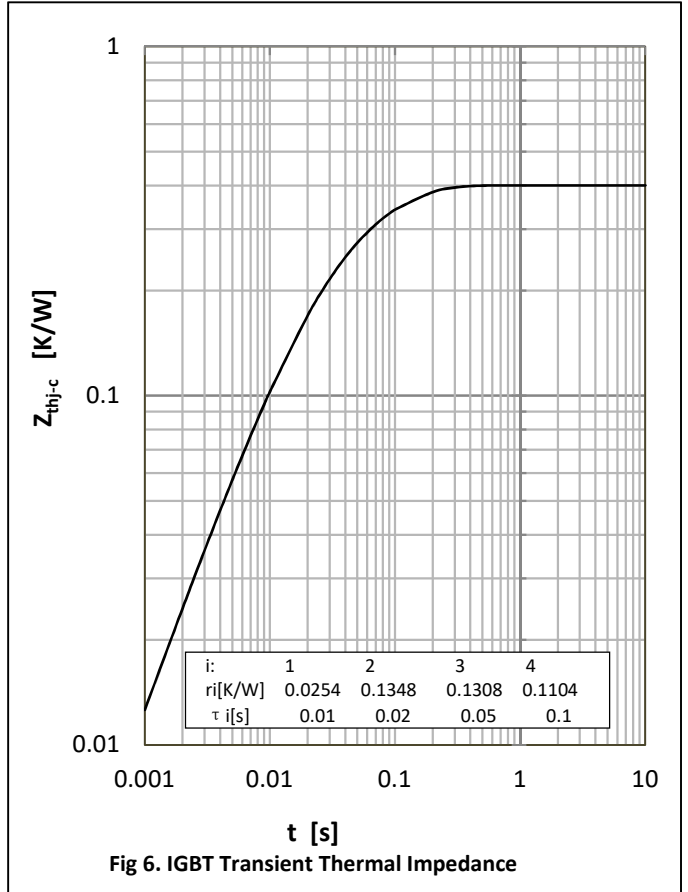
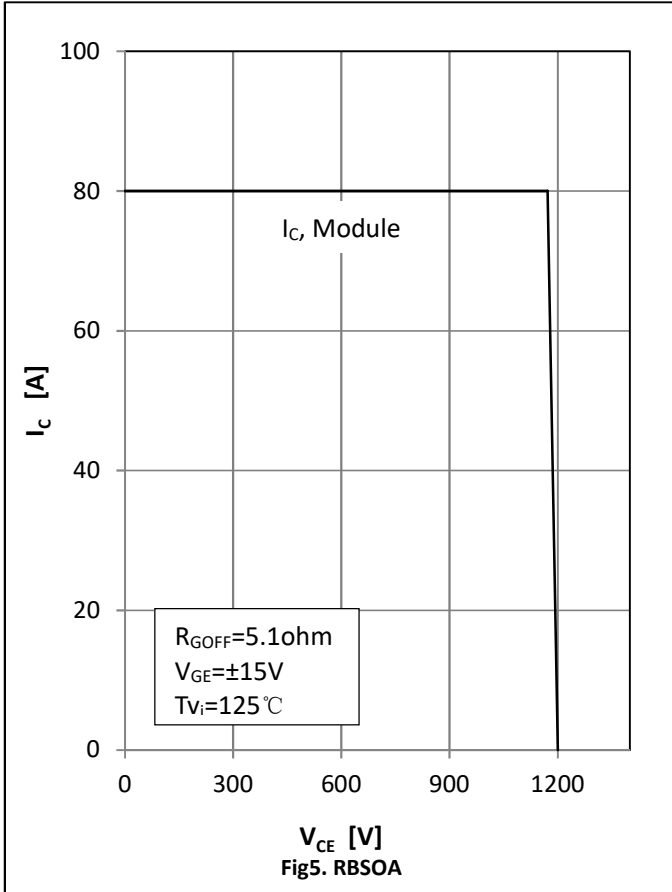


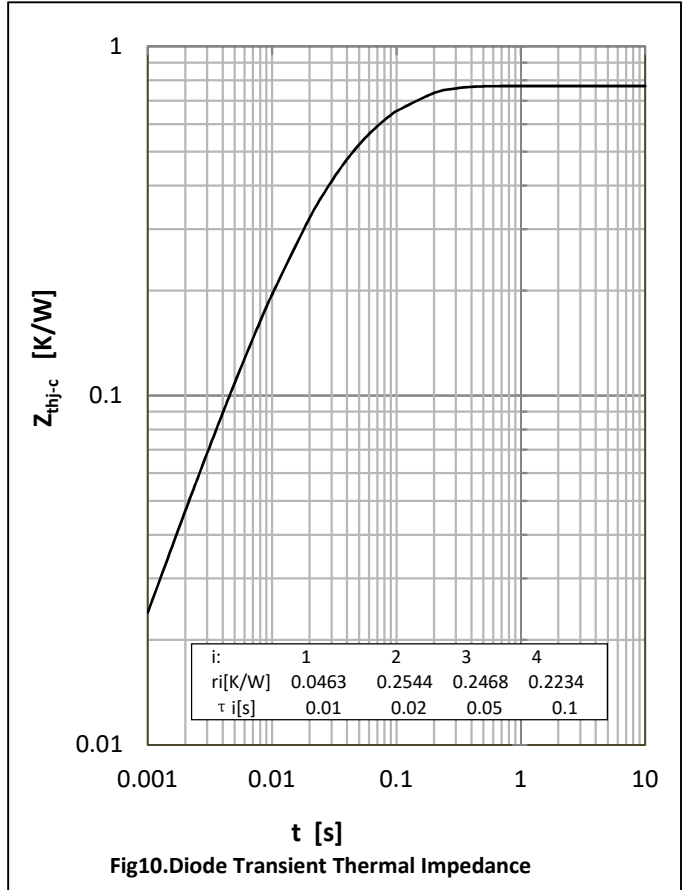
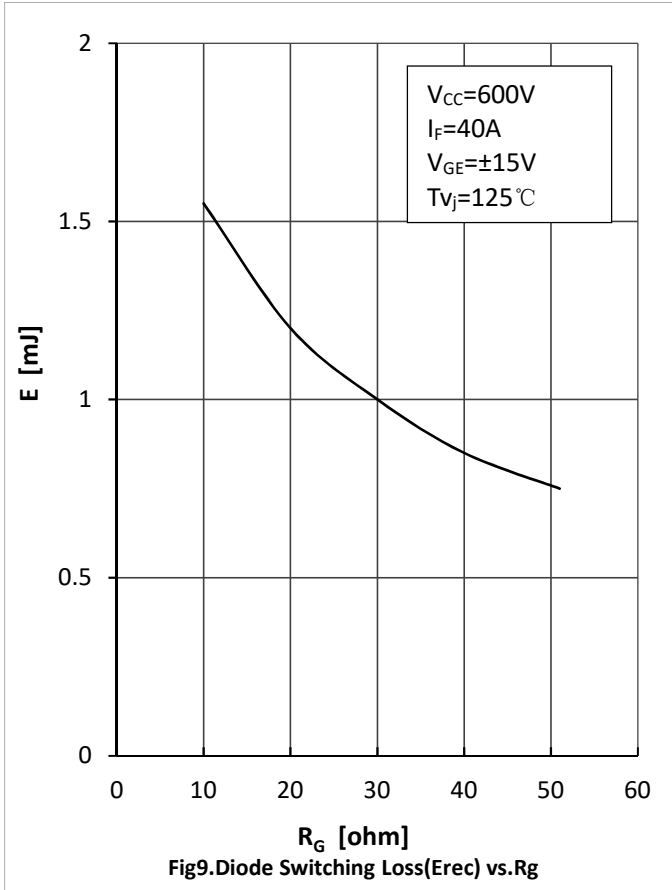
## ● Module Characteristics

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

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	$V_{\text{isol}}$	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	$T_{\text{jmax}}$				150	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		125	$^{\circ}\text{C}$
Storage Temperature	$T_{\text{stg}}$		-40		125	$^{\circ}\text{C}$
Thermal Resistance Junction-to Case	$R_{\theta\text{JC}}$	per IGBT			0.40	K/W
		per Diode			0.78	
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

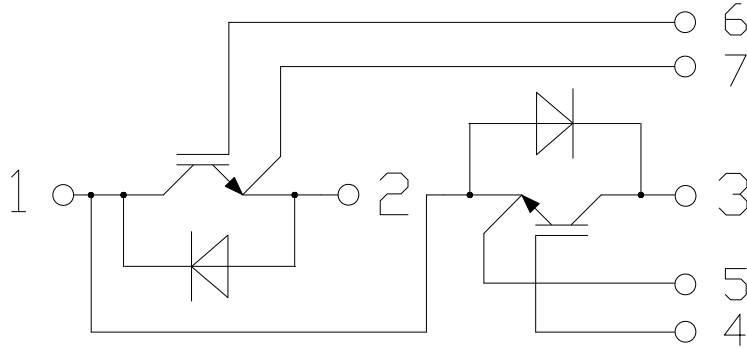








## ● Circuit Diagram



## ● Package Outline Information

Dimensions in Millimeters

