

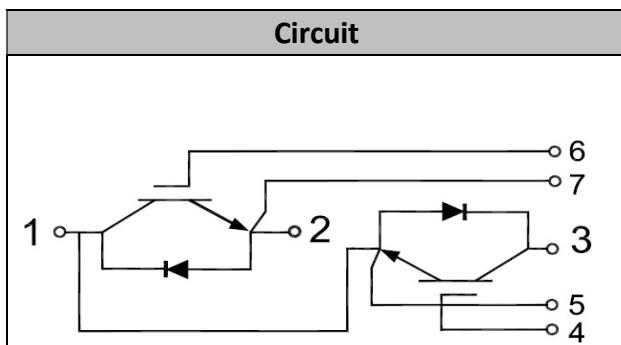


IGBT Modules

V_{CES} 1200V
I_C 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 _{CES}	V _{GE} =0V, I _C =1mA, T _{vj} =25°C	1200	V
Continuous Collector Current	I _C	T _c =80°C	40	A
Repetitive Peak Collector Current	I _{CRM}	tp=1ms	80	A
Gate-Emitter Voltage	V _{GES}	T _{vj} =25°C	± 20	V
Total Power Dissipation	P _{tot}	T _c =25°C T _{vjmax} =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}	$T_p \leq 10us$, $V_{GE}=15V$, $T_{vj}=125^{\circ}C$, $V_{cc}=600V$, $V_{CEM} \leq 1200V$		240		A



● Diode

Absolute Maximum Ratings

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

Characteristic values

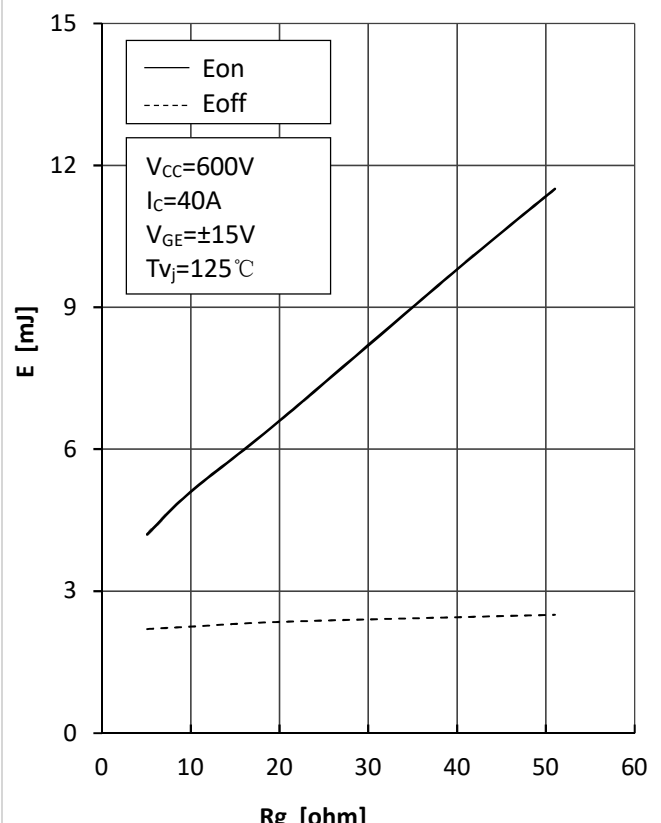
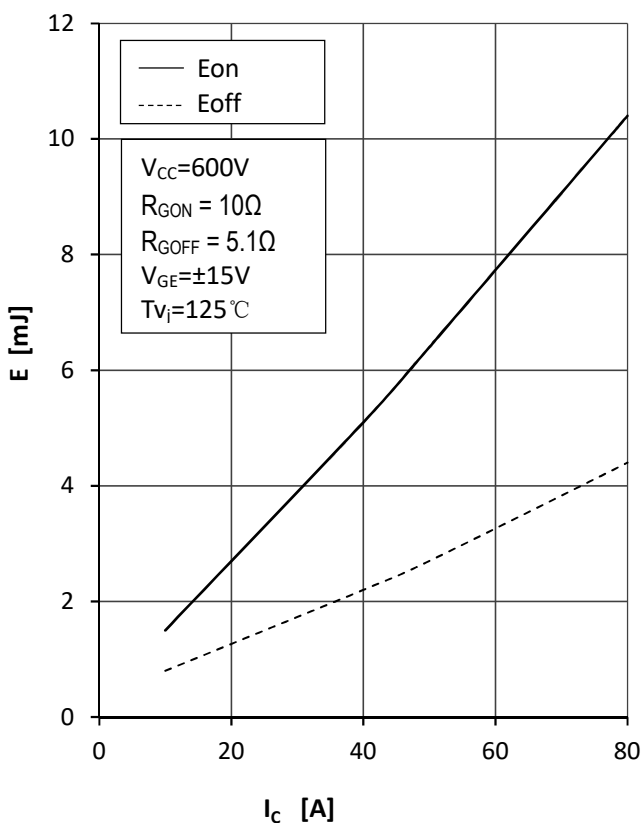
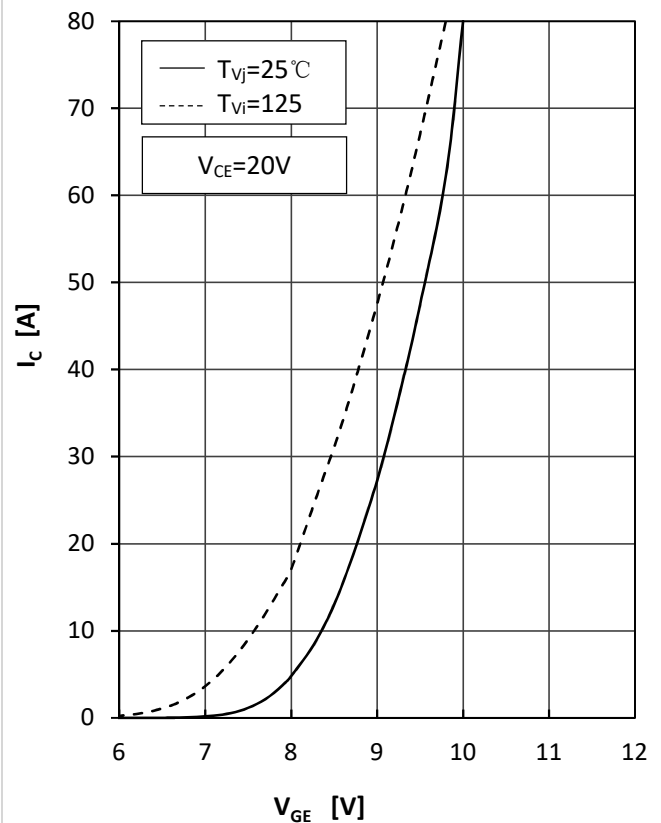
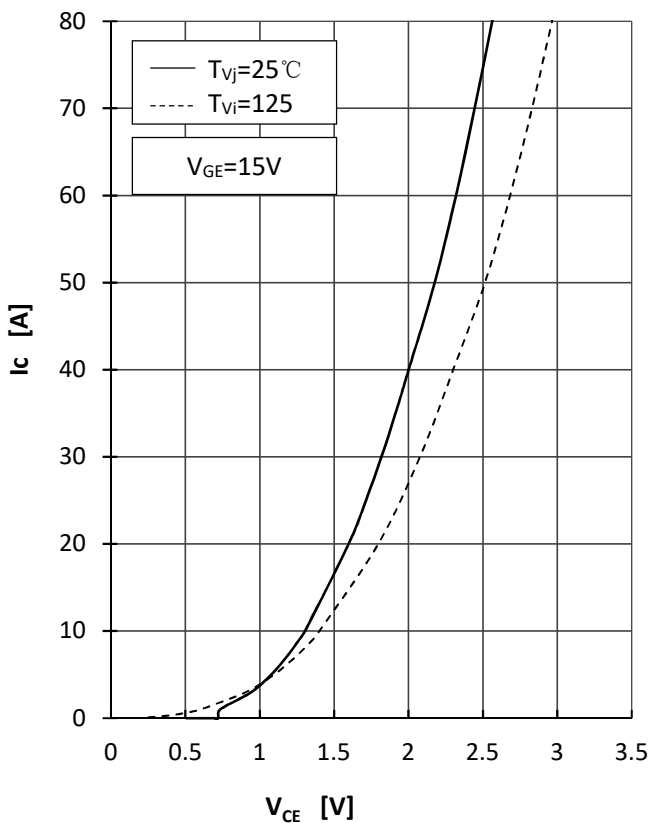
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=40\text{A}, T_{vj}=25^{\circ}\text{C}$		1.85	2.10	V
		$I_F=40\text{A}, T_{vj}=125^{\circ}\text{C}$		1.80		
Recovered Charge	Q_{rr}	$I_F=40\text{A}$		2.85		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=900\text{A}/\mu\text{s}$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

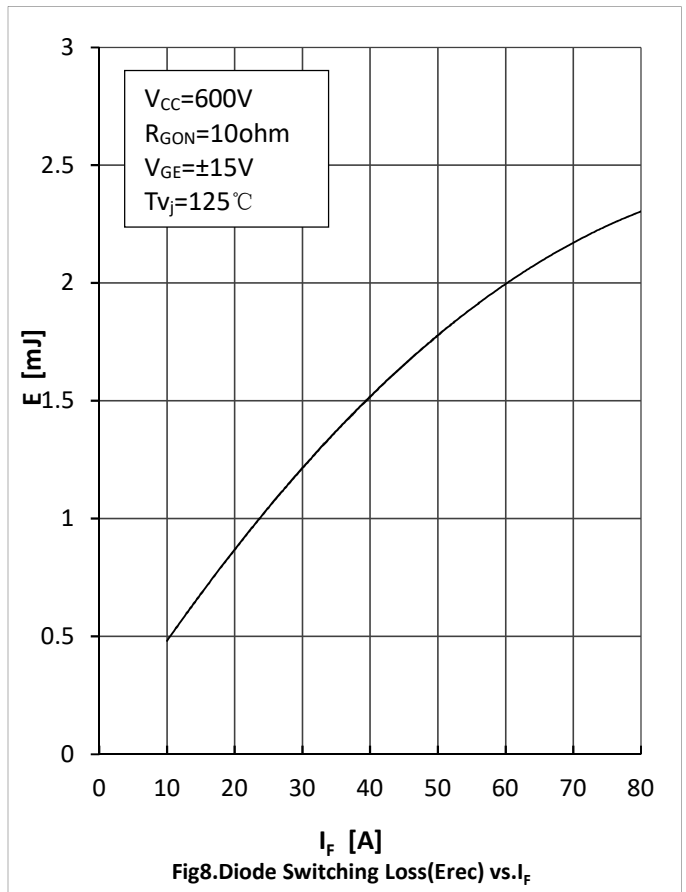
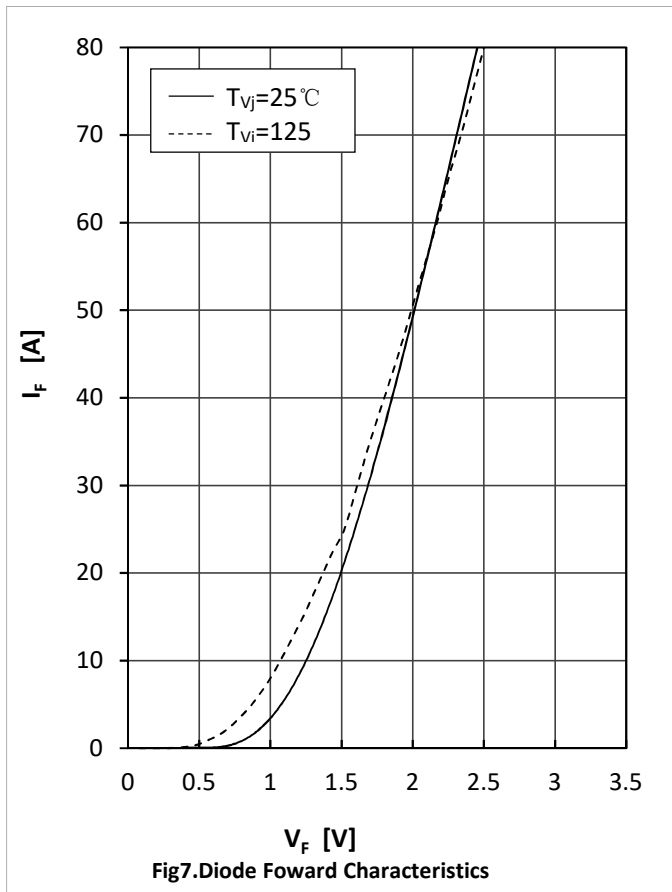
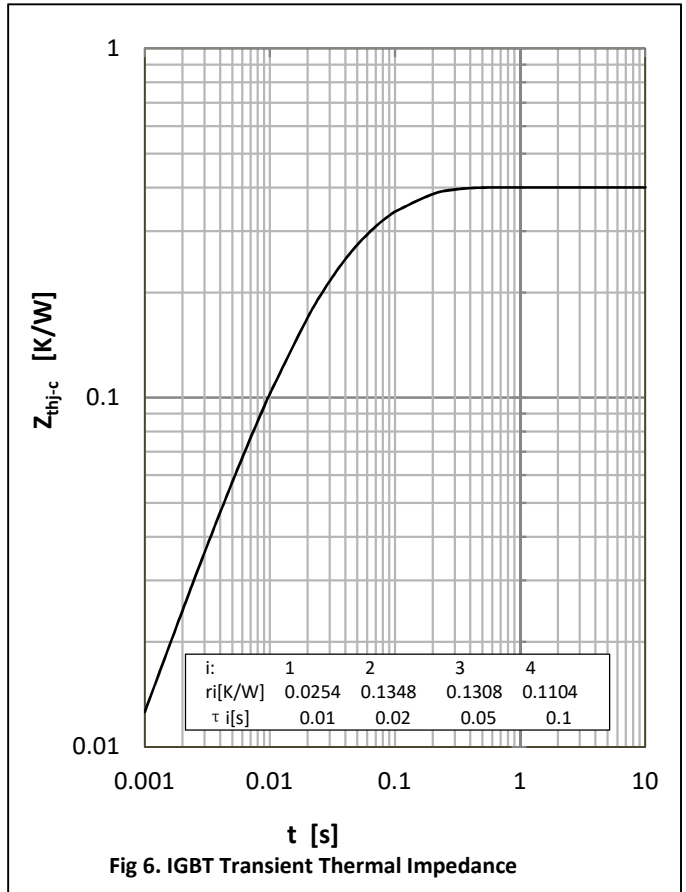
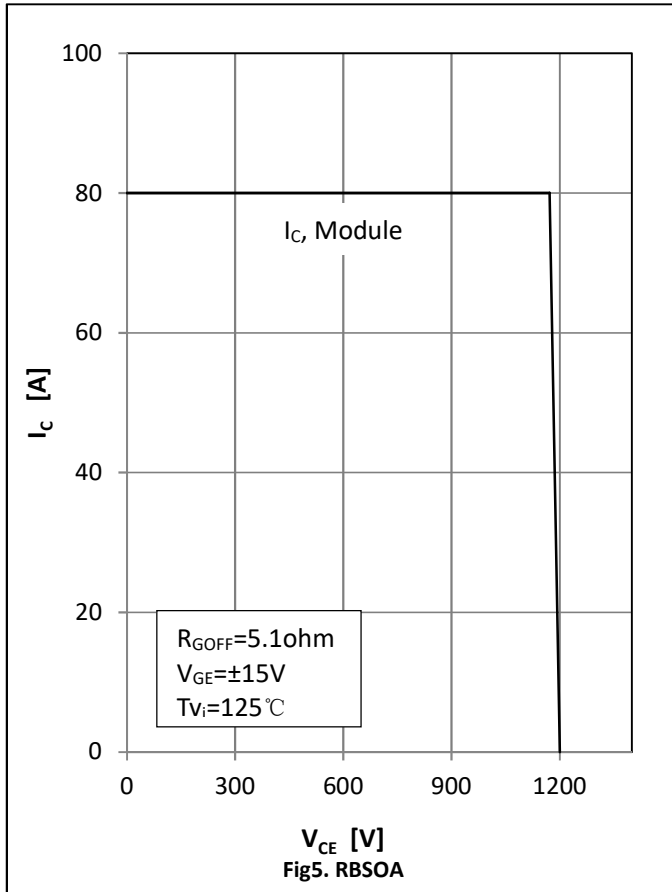


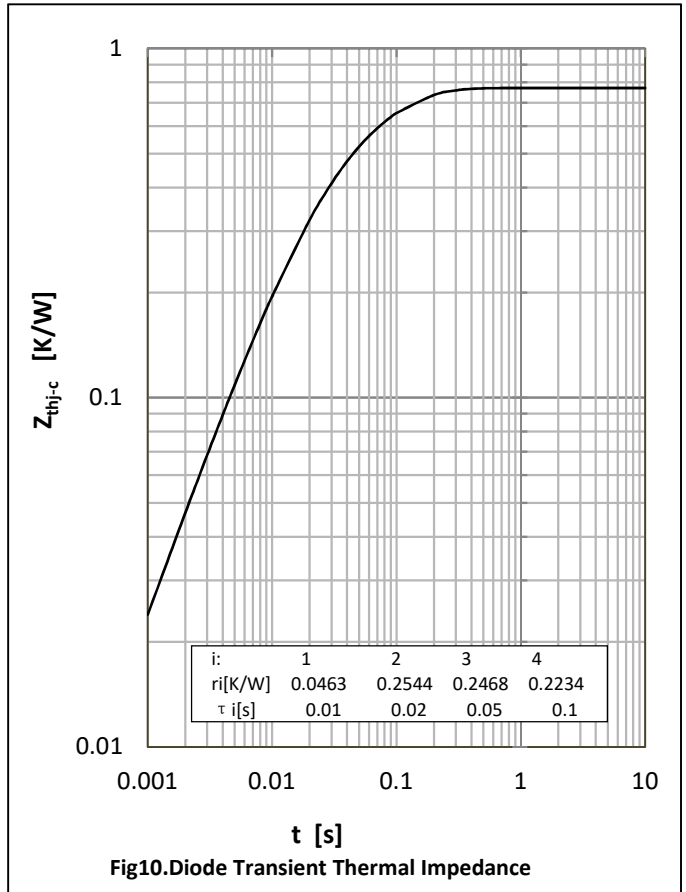
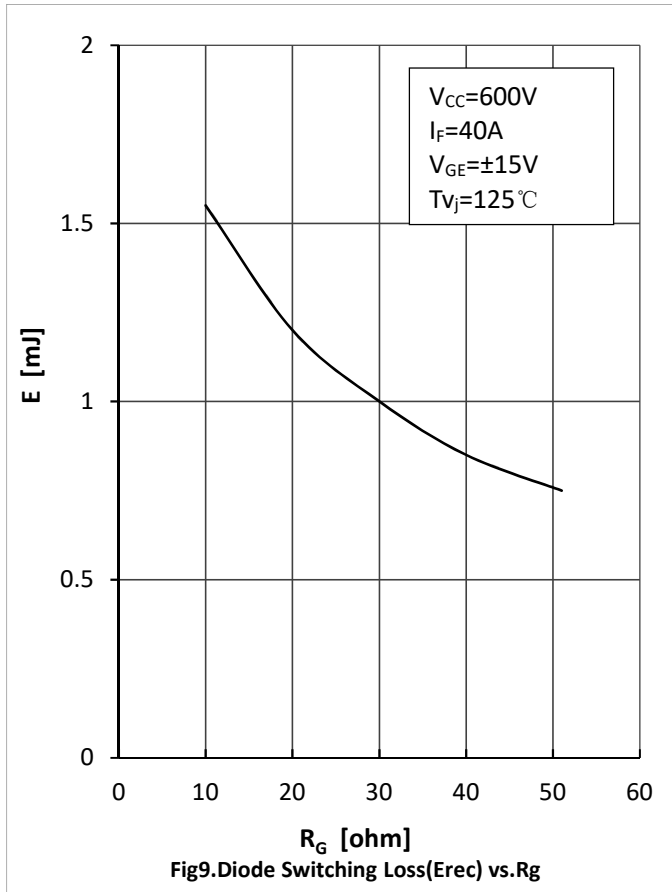
● Module Characteristics

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

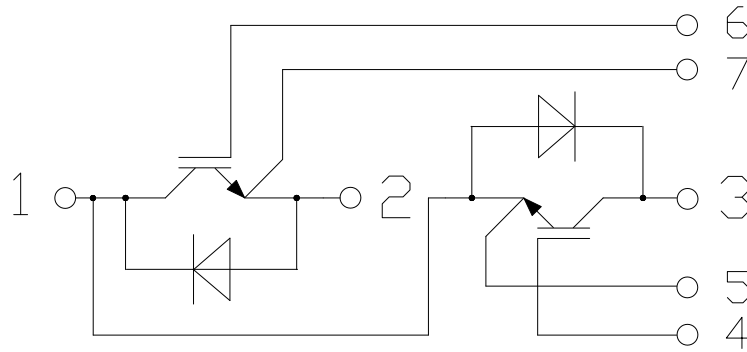
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	T_{jmax}				150	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		125	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40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

