



IGBT Modules

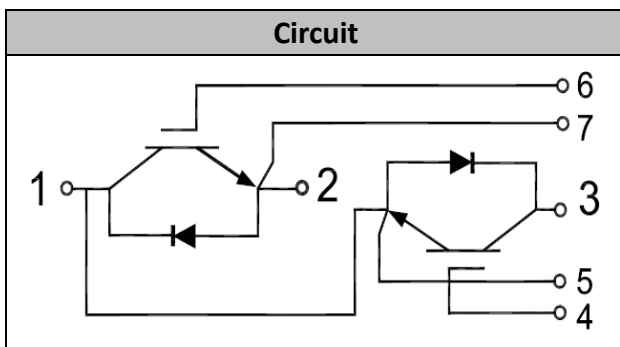
V _{CES}	1200V
I _C	200A

Applications

- Motion/sevo control
- High frequency switching application
- UPS (Uninterruptible Power Supplies)
- Welding machine

Features

- Low V_{ce(sat)} with Trench technology
- Low switching losses especially E_{off}
- V_{ce(sat)} with positive temperature coefficient
- High short circuit capability(10us)
- Including ultra fast & soft recovery anti-parallel FWD
- Low inductance package
- 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°C	1200	V
Continuous Collector Current	I _C	T _c =100°C	200	A
Repetitive Peak Collector Current	I _{CRM}	tp=1ms	400	A
Gate-Emitter Voltage	V _{GES}	T _{vj} =25°C	± 20	V
Total Power Dissipation	P _{tot}	T _c =25°C T _{vjmax} =175°C	1250	W



Characteristic values

Parameter	Symbol	Conditions	Value			Unit		
			Min.	Typ.	Max.			
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=7.6mA, T_{vj}=25^{\circ}C$	5.0	5.8	6.6	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	$V_{CE(sat)}$	$I_C=200A, V_{GE}=15V, T_{vj}=25^{\circ}C$		2.10	2.40	V		
		$I_C=200A, V_{GE}=15V, T_{vj}=125^{\circ}C$		2.45				
Gate Charge	Q_G			1.2		uC		
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^{\circ}C$		12.8		nF		
Reverse Transfer Capacitance	C_{res}				0.5		nF	
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA		
Turn-on Delay Time	$t_{d(on)}$	$I_C=200A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=3.3\Omega$ $T_{vj}=25^{\circ}C$		290		ns		
Rise Time	t_r				50		ns	
Turn-off Delay Time	$t_{d(off)}$				330		ns	
Fall Time	t_f				72		ns	
Energy Dissipation During Turn-on Time	E_{on}				12.4		mJ	
Energy Dissipation During Turn-off Time	E_{off}				9.4		mJ	
Turn-on Delay Time	$t_{d(on)}$		$I_C=200A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=3.3\Omega$ $T_{vj}=125^{\circ}C$		340		ns	
Rise Time	t_r					60		ns
Turn-off Delay Time	$t_{d(off)}$					460		ns
Fall Time	t_f					75		ns
Energy Dissipation During Turn-on Time	E_{on}				18.0		mJ	
Energy Dissipation During Turn-off Time	E_{off}				14.2		mJ	
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V,$ $T_{vj}=150^{\circ}C, V_{cc}=900V,$ $V_{CEM} \leq 1200V$			1100		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		200	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1ms$	400	A

Characteristic values

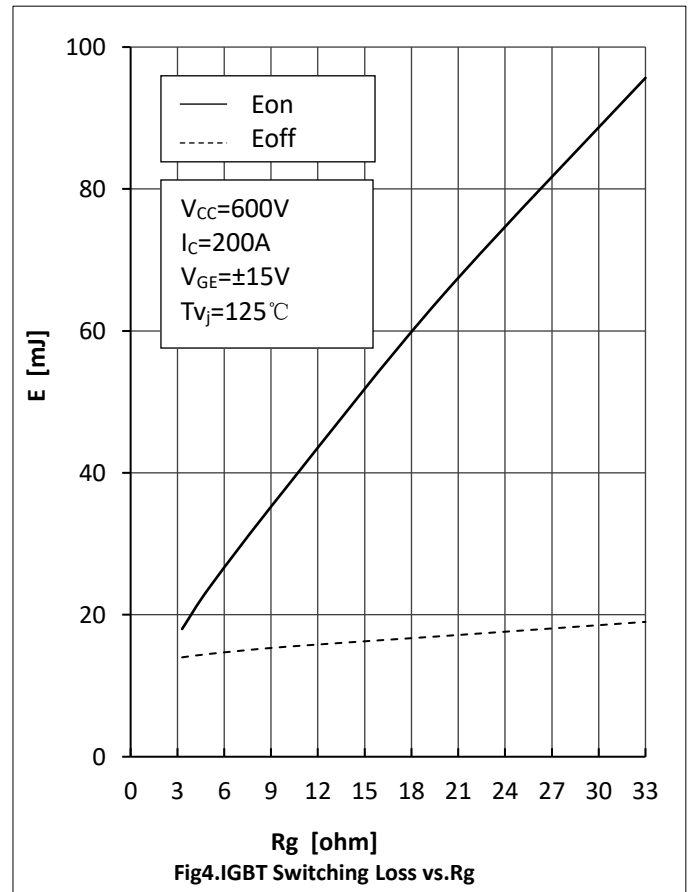
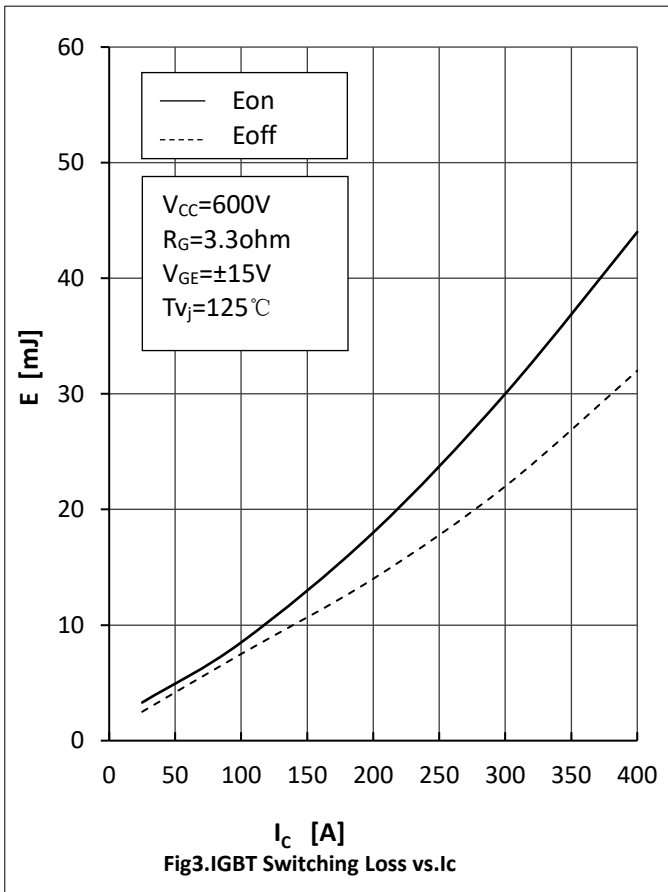
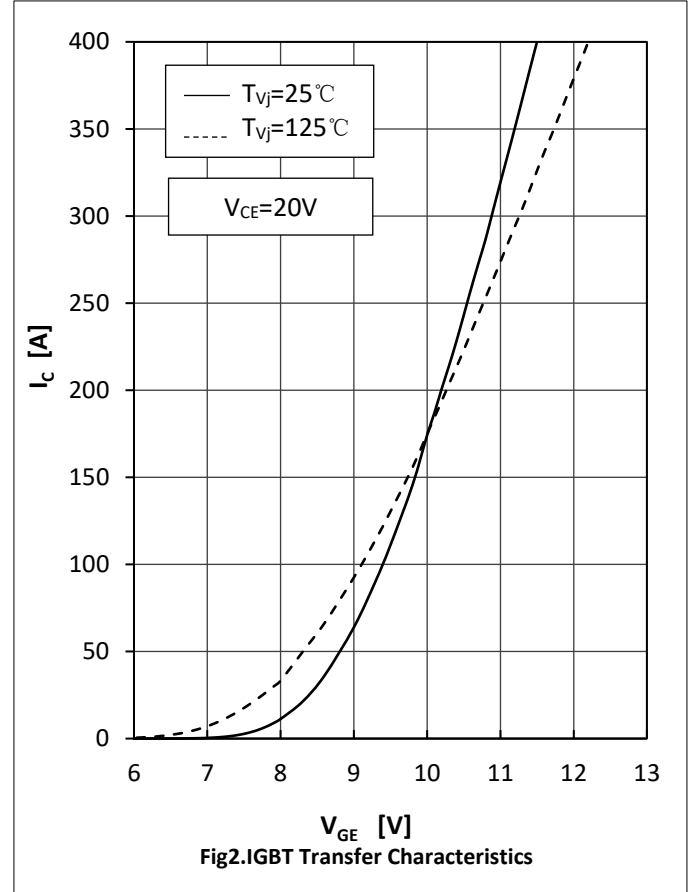
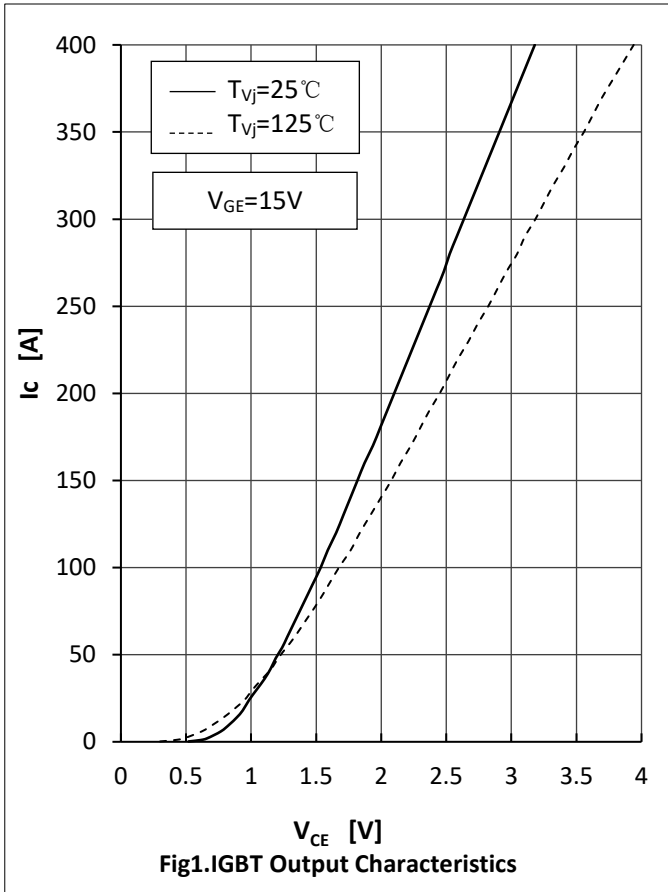
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=200A, T_{vj}=25^{\circ}C$		2.10	2.60	V
		$I_F=200A, T_{vj}=125^{\circ}C$		2.10		
Recovered Charge	Q_{rr}	$I_F=200A$		14.2		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600V$ $-di_F/dt=2500A/\mu s$		155		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=25^{\circ}C$		9.0		mJ
Recovered Charge	Q_{rr}	$I_F=200A$		27.5		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600V$ $-di_F/dt=2500A/\mu s$		176		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=125^{\circ}C$		13.8		mJ

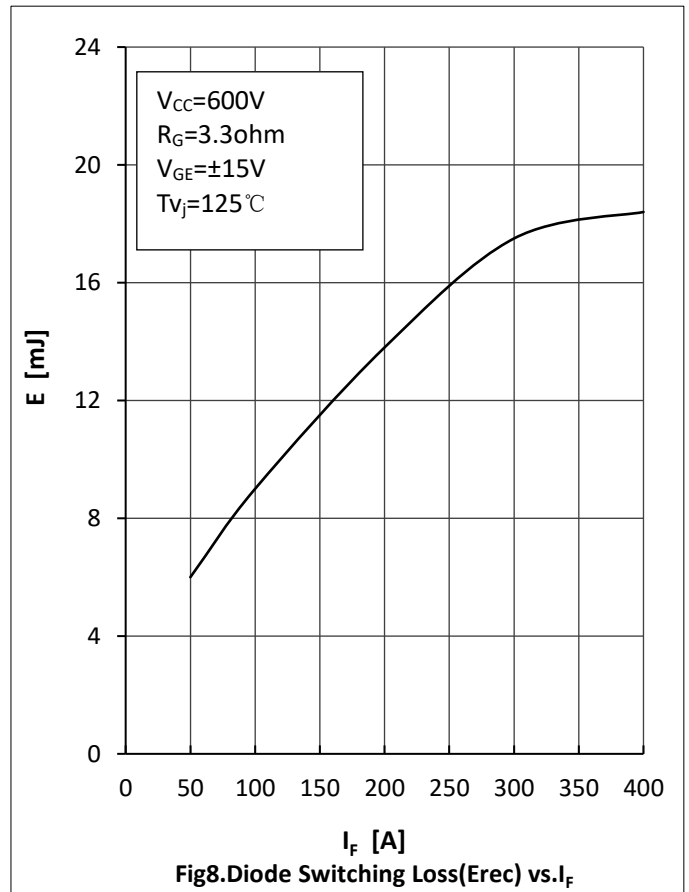
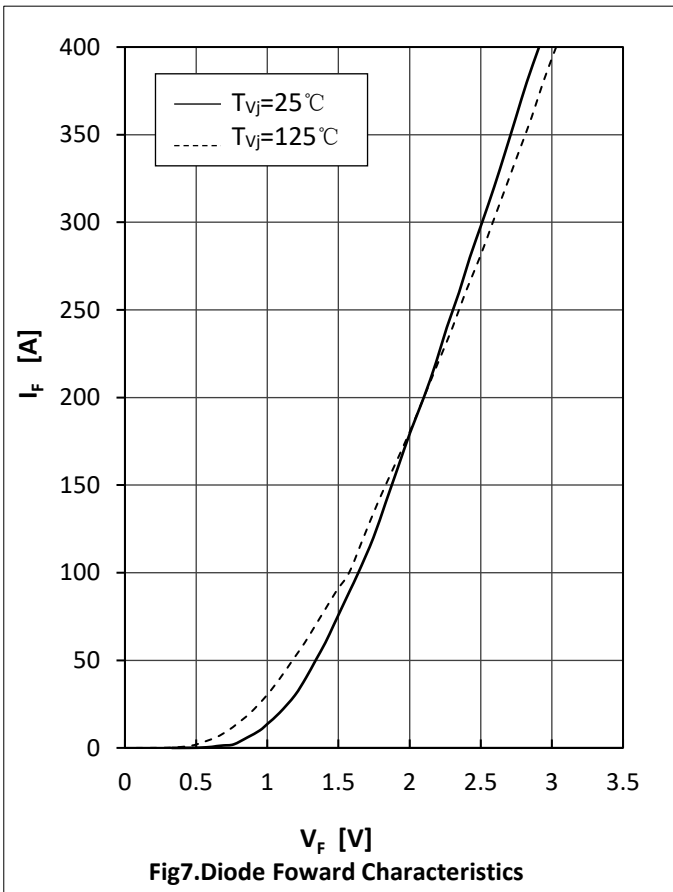
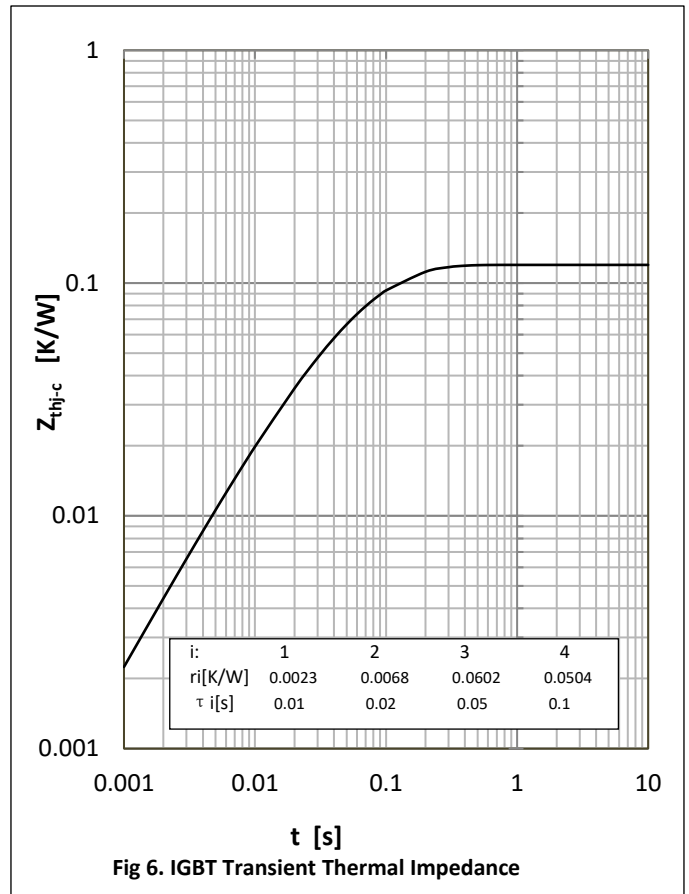
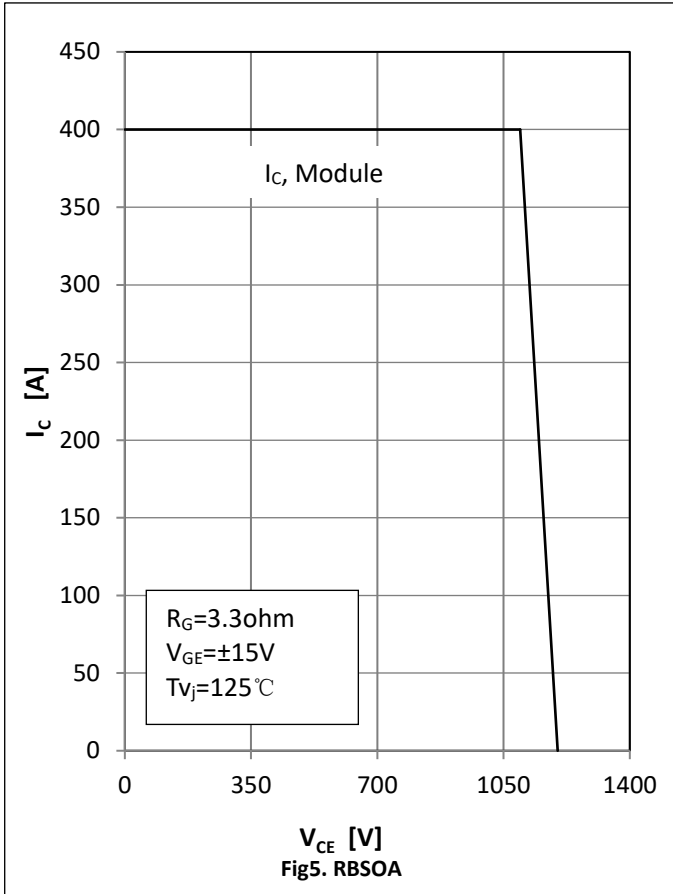


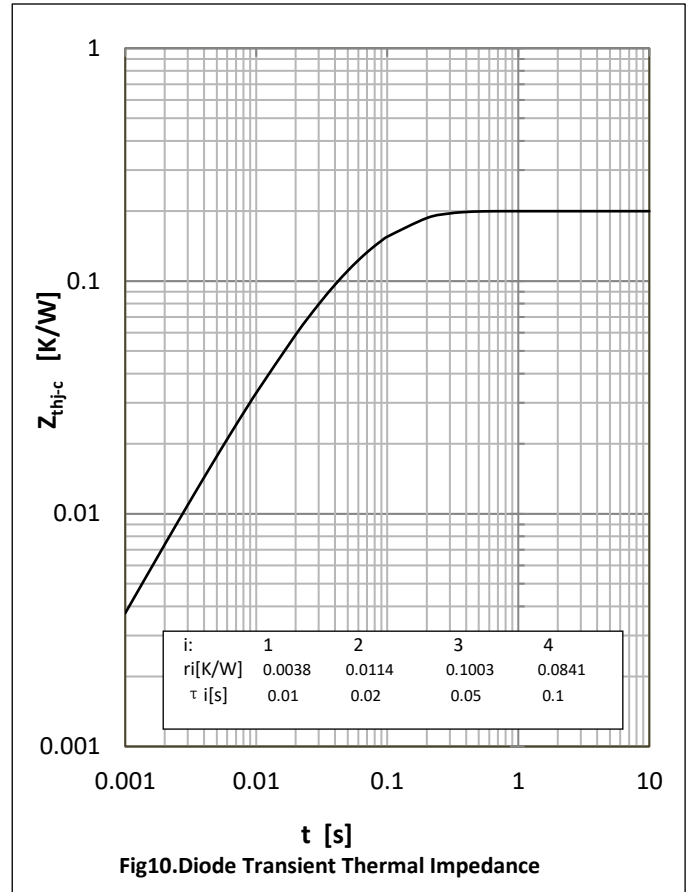
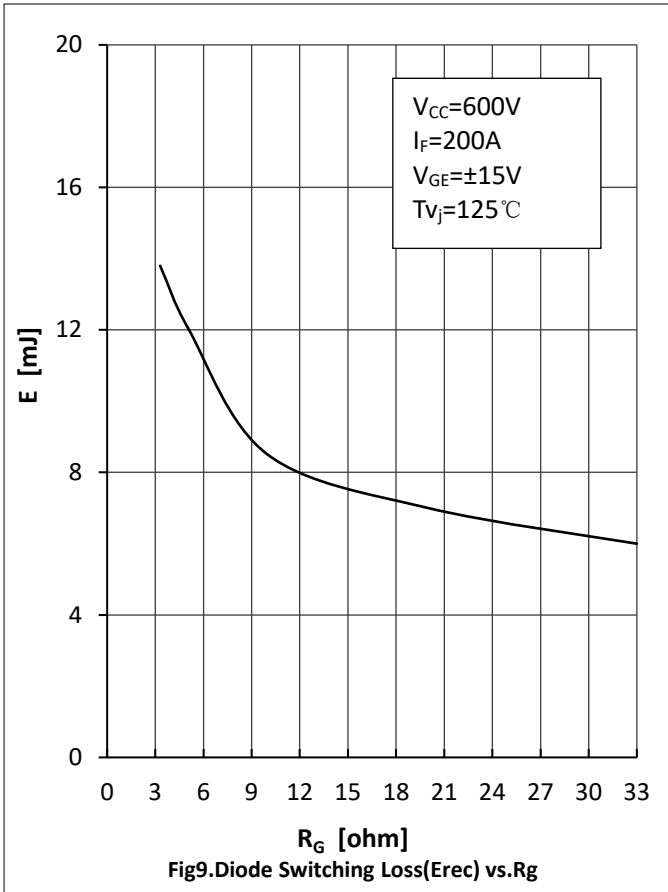
● Module Characteristics

T_c=25°C unless otherwise specified

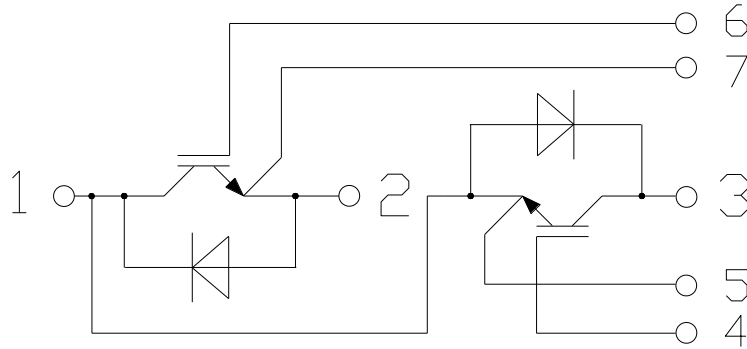
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V _{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	T _{jmax}				175	°C
Operating Junction Temperature	T _{vj op}		-40		150	°C
Storage Temperature	T _{stg}		-40		125	°C
Thermal Resistance Junction-to Case	R _{θJC}	per IGBT			0.12	K/W
		per Diode			0.20	
Thermal Resistance Case-to Sink	R _{θCS}	Conductive grease applied		0.046		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

