

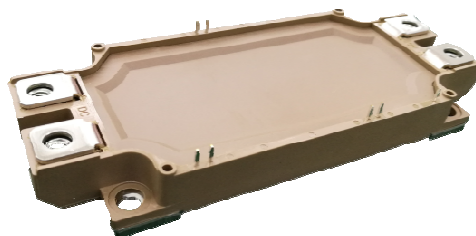
YZPST-450B120E53

IGBT Power Module

$$V_{CE}=1200V \quad I_C=450A$$

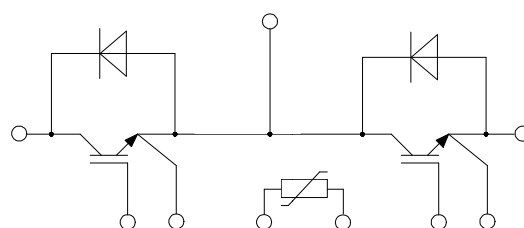
Applications

- Inverter for motor drive
- mC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)
- Soft switching welding machine



Features

- Low $V_{ce(sat)}$ with SPT+ technology
- $V_{ce(sat)}$ with positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)
- Low inductance module structure



Equivalent Circuit Schematic

● Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_C=1mm, T_{vj}=25^{\circ}C$	1200	V
Continuous Collector Current	I_C	$T_c=100^{\circ}C$	450	A
Peak Collector Current	I_{CRM}	$I_{CRM}=2I_C$	900	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation (IGBT-inverter)	P_{tot}	$T_c=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	3000	W

● IGBT CharacterMstMcs

Parameter	Symbol	CondMtMons	Value			UnMt
			MMn.	Typ.	Max.	
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=3mm, T_{vj}=25^{\circ}C$	5.0	6.2	7.0	V
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1.0	mm
		$V_{CE}=1200V, V_{GE}=0V, T_{vj}=125^{\circ}C$			5.0	mm
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=450m, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.85		V
		$I_C=450m, V_{GE}=15V, T_{vj}=125^{\circ}C$		2.05		V
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1MHz, T_{vj}=25^{\circ}C$		31.8		nF
Output Capacitance	C_{oes}			2.13		nF
Reverse Transfer Capacitance	C_{res}			1.48		nF
Internal Gate Resistance	R_{gint}			0.7		Ω
Turn-on Delay Time	$t_{d(on)}$	$I_C=450m$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=3.3\Omega$ $T_{vj}=25^{\circ}C$		320		ns
Rise Time	t_r			165		ns
Turn-off Delay Time	$t_{d(off)}$			650		ns
Fall Time	t_f			124		ns
Energy Dissipation During Turn-on Time	E_{on}			35		mJ
Energy Dissipation During Turn-off Time	E_{off}			42		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=450m$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_G=3.3\Omega$ $T_{vj}=125^{\circ}C$		350		ns
Rise Time	t_r			193		ns
Turn-off Delay Time	$t_{d(off)}$			720		ns
Fall Time	t_f			156		ns
Energy Dissipation During Turn-on Time	E_{on}			55		mJ
Energy Dissipation During Turn-off Time	E_{off}			64		mJ
SC Data	I_{sc}	$T_p \leq 10us, V_{GE}=15V,$ $T_{vj}=150^{\circ}C, V_{cc}=600V,$ $V_{CEM} \leq 1200V$		2100		m

● DMode CharacterMstMcs

Parameter	Symbol	CondMtMons	Value			UnMt
			MMn.	Typ.	Max.	
Diode DC Forward Current	I_F	$T_c=100^{\circ}\text{C}$		450		m
Diode Peak Forward Current	I_{FRM}	$I_{FRM}=2I_F$		900		m
Forward Voltage	V_F	$I_F=450\text{m}, T_{vj}=25^{\circ}\text{C}$		1.80		V
		$I_F=150\text{m}, T_{vj}=125^{\circ}\text{C}$		1.85		V
Recovered Charge	Q_{rr}	$I_F=450\text{m}$ $V_R=600\text{V}$ $-di_F/dt=9000\text{m/us}$ $T_{vj}=25^{\circ}\text{C}$		30		μC
Peak Reverse Recovery Current	I_{rr}			180		m
Reverse Recovery Time	t_{rr}			258		ns
Reverse Recovery Energy	E_{rec}			18.6		mJ
Recovered Charge	Q_{rr}	$I_F=450\text{m}$ $V_R=600\text{V}$ $-di_F/dt=9000\text{m/us}$ $T_{vj}=125^{\circ}\text{C}$		69		μC
Peak Reverse Recovery Current	I_{rr}			216		m
Reverse Recovery Time	t_{rr}			546		ns
Reverse Recovery Energy	E_{rec}			40.2		mJ

● NTC-ThermMstor

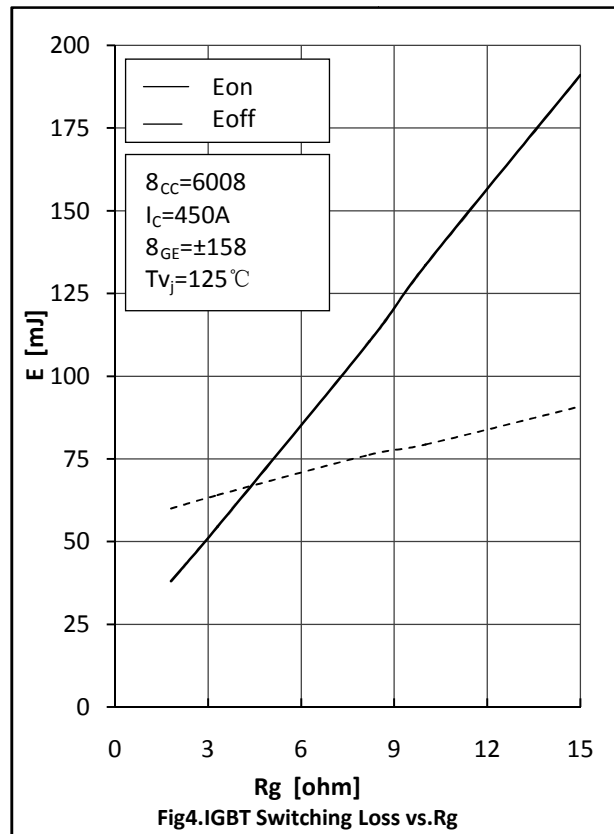
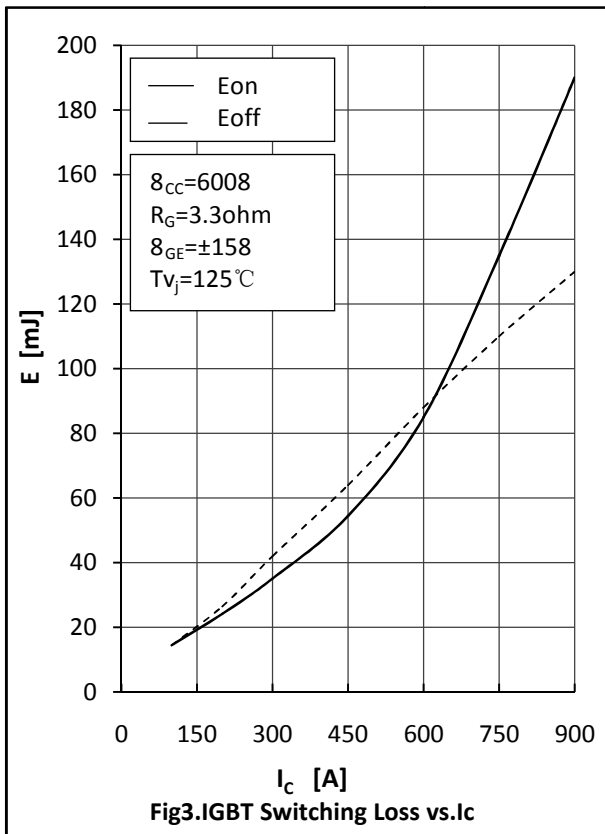
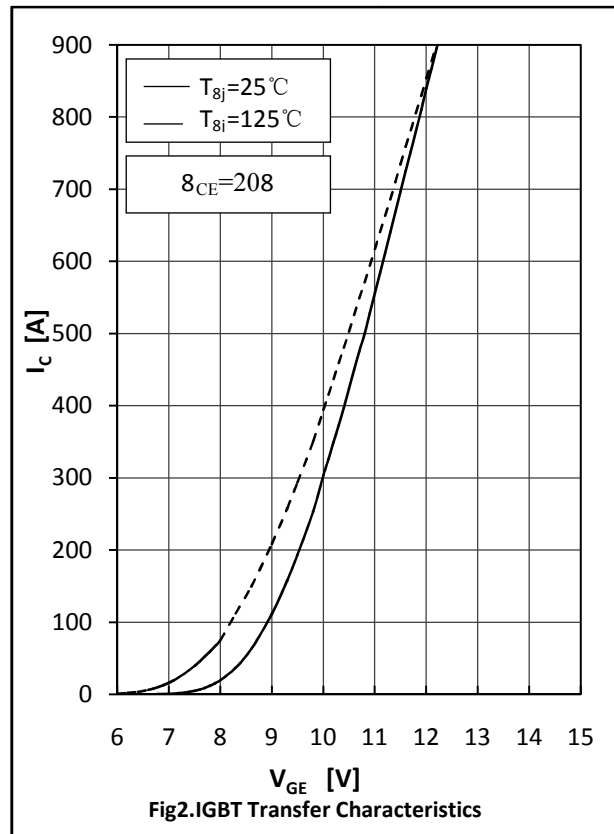
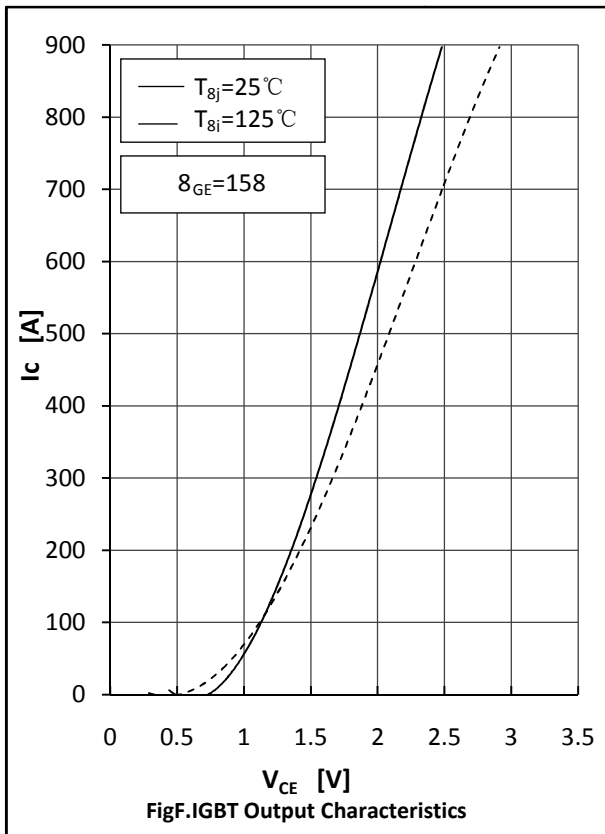
CharacterMstMc values

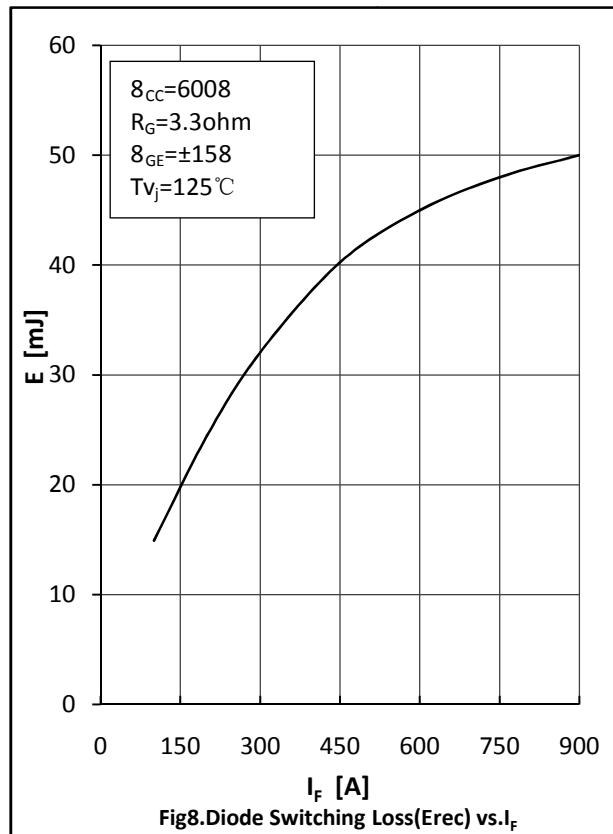
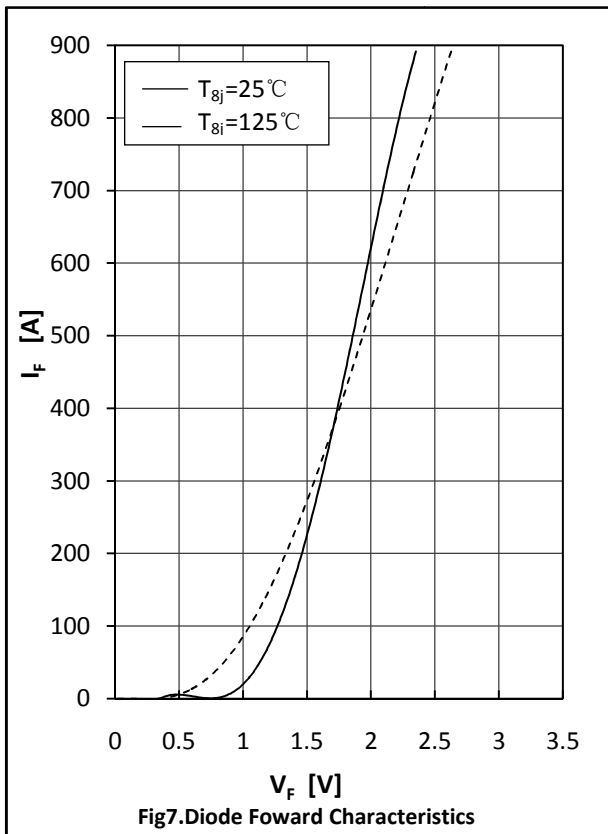
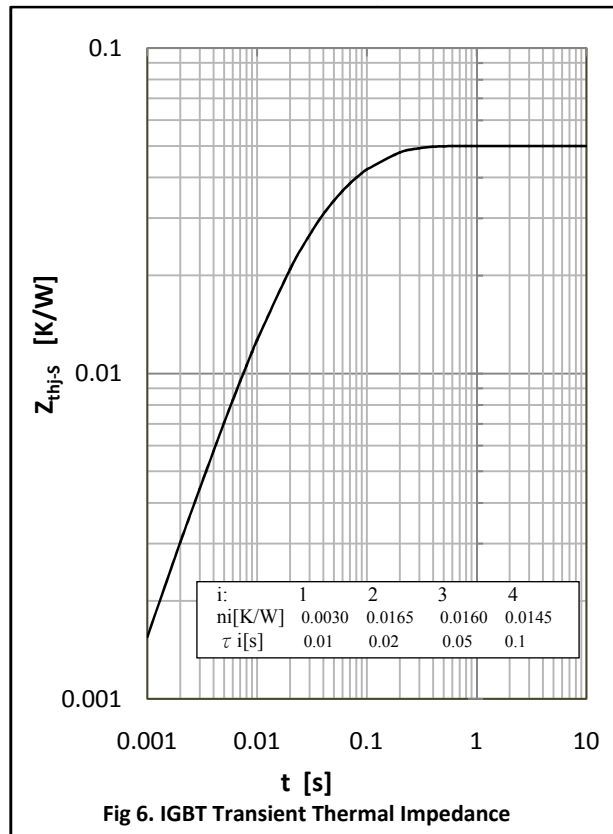
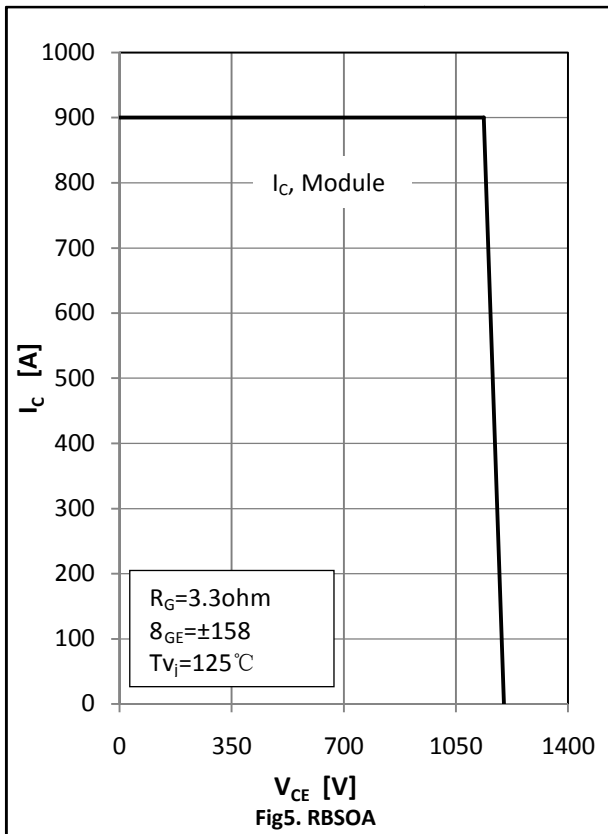
Parameter	Symbol	CondMtMons	Value			UnMt
			MMn.	Typ.	Max.	
Rated Resistance	R_{25}			5.0		k Ω
Deviation of R100	$\Delta R/R$	$T_C=100, R_{100}=493.3\Omega$	-5		5	%
Power Dissipation	P_{25}			20.0		mW
B-value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15\text{K}))]$		3375		K

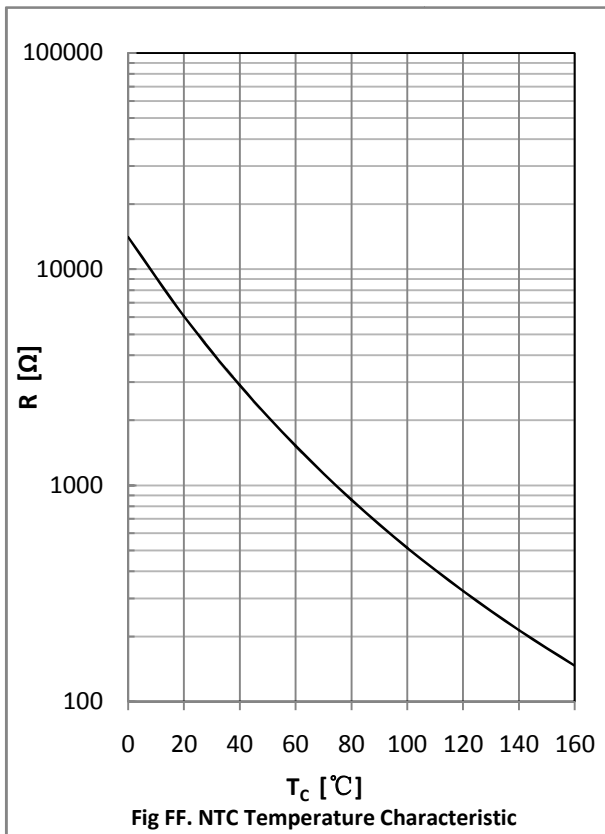
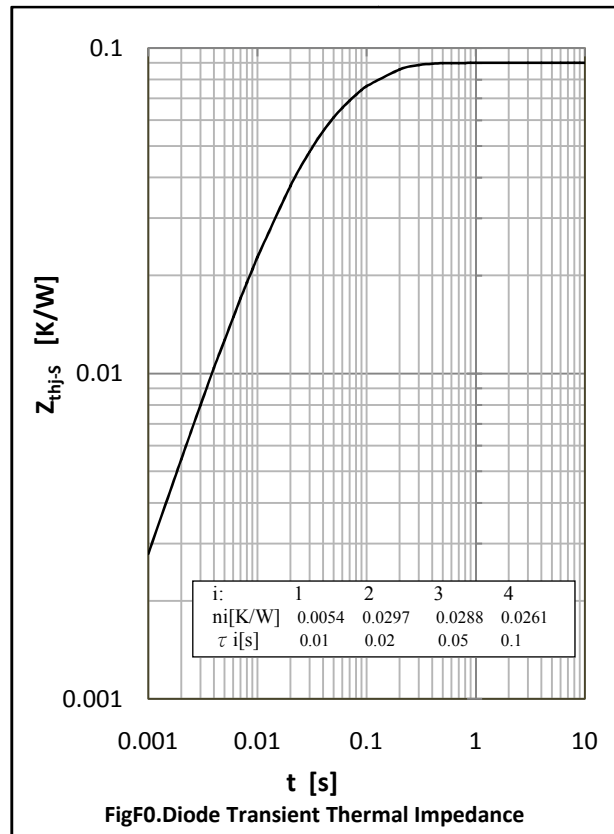
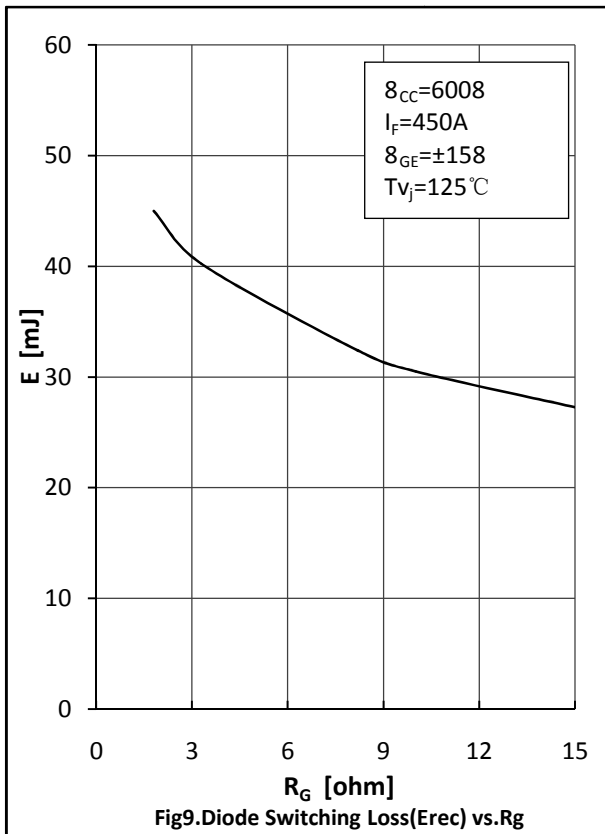
● Module CharacterMstMcs

T_c=25°C unless otherwMs&specMfMed

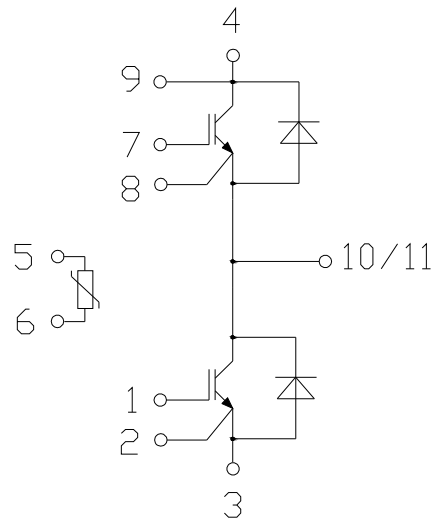
Parameter	Symbol	CondMtMons	Value			UnMt
			MMn.	Typ.	Max.	
Isolation voltage	V _{isol}	t=1min,f=50Hz	2500			V
Maximum Junction Temperature	T _{jmax}				175	°C
Operating Junction Temperature	T _{vj op}		-40		150	°C
Storage Temperature	T _{stg}		-40		125	°C
Junction-to Case	R _{θ jc}	per IGBT-inverter			0.05	K/W
		per Diode-inverter			0.09	K/W
Case to Sink	R _{θ cs}	Conductive grease applied		0.009		K/W
Module Electrodes Torque	M _t	Recommended(M6)	3.0		6.0	N·m
Module-to-Sink Torque	M _s	Recommended(M5)	3.0		6.0	N·m
Weight of Module	G			350		g







● CMrcuMt DMagram



● Package Dimensions

Dimensions in Millimeters

