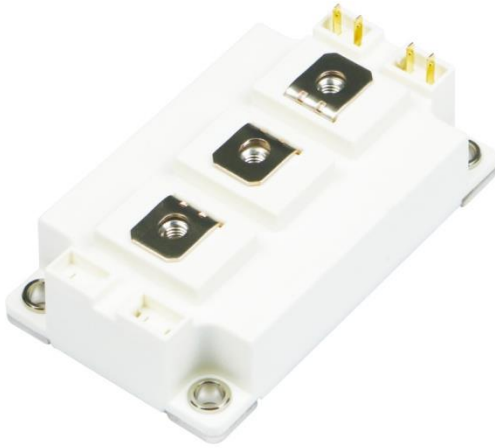




IGBT Modules

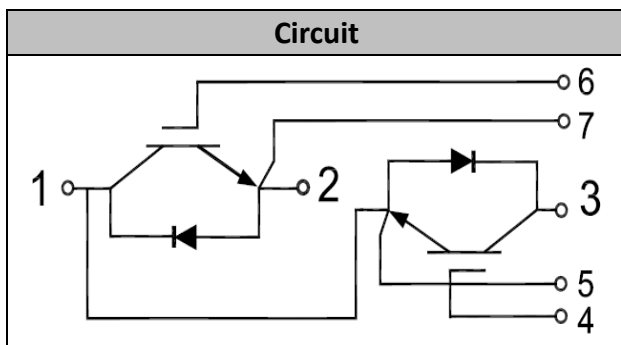
V _{CES}	1200V
I _C	300A

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	300	A
Repetitive Peak Collector Current	I _{CRM}	t _p =1ms	600	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	2000	W


Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=12mA, T_{vj}=25^{\circ}C$	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	$V_{CE(sat)}$	$I_C=300A, V_{GE}=15V, T_{vj}=25^{\circ}C$		3.0	3.5	V
		$I_C=300A, V_{GE}=15V, T_{vj}=125^{\circ}C$		3.8		
Gate Charge	Q_G			3.4		uC
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1MHz, T_{vj}=25^{\circ}C$		19.3		nF
Reverse Transfer Capacitance	C_{res}			1.2		nF
Gate-Emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA
Turn-on Delay Time	$t_{d(on)}$	$I_C=300A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_{GON}=3.3\Omega$ $R_{GOFF}=1.7\Omega$ $T_{vj}=25^{\circ}C$		105		ns
Rise Time	t_r			80		ns
Turn-off Delay Time	$t_{d(off)}$			288		ns
Fall Time	t_f			25		ns
Energy Dissipation During Turn-on Time	E_{on}			33.5		mJ
Energy Dissipation During Turn-off Time	E_{off}			8.3		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=300A$ $V_{CE}=600V$ $V_{GE}=\pm 15V$ $R_{GON}=3.3\Omega$ $R_{GOFF}=1.7\Omega$ $T_{vj}=125^{\circ}C$		114		ns
Rise Time	t_r			87		ns
Turn-off Delay Time	$t_{d(off)}$			332		ns
Fall Time	t_f			29		ns
Energy Dissipation During Turn-on Time	E_{on}			46.7		mJ
Energy Dissipation During Turn-off Time	E_{off}			11.8		mJ
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V,$ $T_{vj}=150^{\circ}C, V_{cc}=600V,$ $V_{CEM} \leq 1200V$		2200		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		300	A
Repetitive Peak Forward Current	I_{FRM}	$t_p=1\text{ms}$	600	A

Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Forward Voltage	V_F	$I_F=300\text{A}, T_{vj}=25^{\circ}\text{C}$		1.70	2.0	V
		$I_F=300\text{A}, T_{vj}=125^{\circ}\text{C}$		1.75		
Recovered Charge	Q_{rr}	$I_F=300\text{A}$		16.8		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=3600\text{A}/\mu\text{s}$		240		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=25^{\circ}\text{C}$		10.2		mJ
Recovered Charge	Q_{rr}	$I_F=300\text{A}$		36.5		μC
Peak Reverse Recovery Current	I_{rr}	$V_R=600\text{V}$ $-di_F/dt=3600\text{A}/\mu\text{s}$		290		A
Reverse Recovery Energy	E_{rec}	$T_{vj}=125^{\circ}\text{C}$		20.3		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	$T_{j\text{max}}$				150	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{vj\text{op}}$		-40		125	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Stray inductance module	L_{sCE}			20		nH
Module lead resistance, terminals - chip	$R_{\text{CC}'+\text{EE}'}$			0.7		m Ω
Thermal Resistance Junction-to Case	$R_{\theta\text{JC}}$	per IGBT			0.06	K/W
		per Diode			0.10	
Thermal Resistance Case-to Sink	$R_{\theta\text{CS}}$	Conductive grease applied		0.035		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

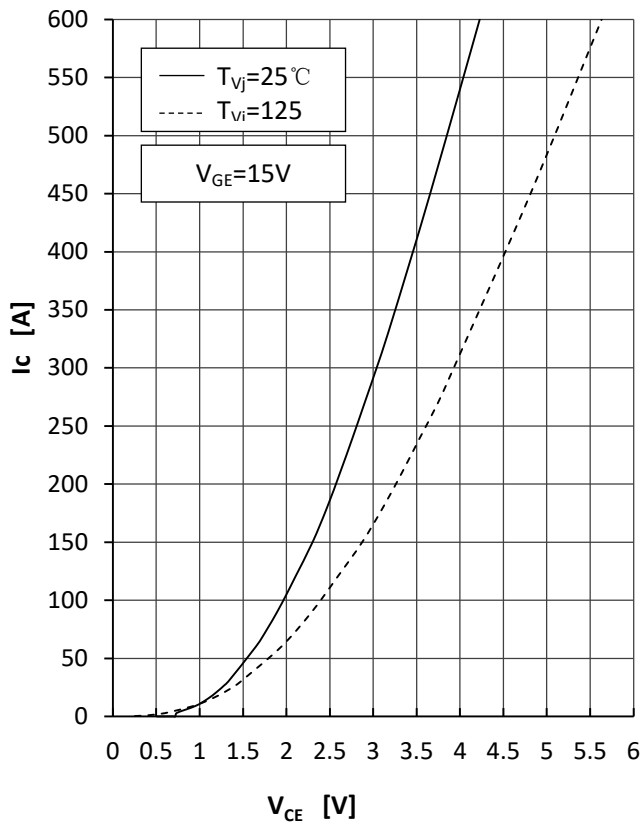


Fig1.IGBT Output Characteristics

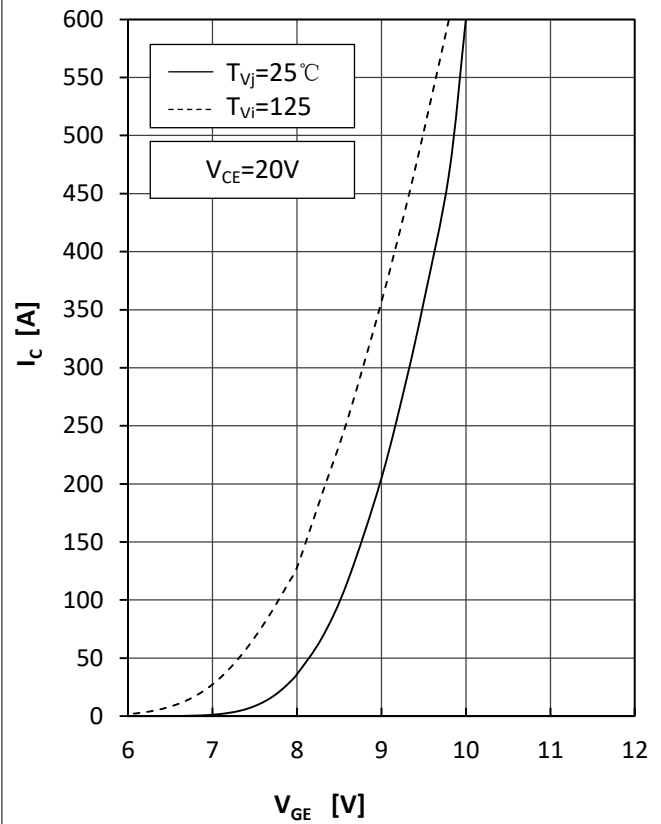


Fig2.IGBT Transfer Characteristics

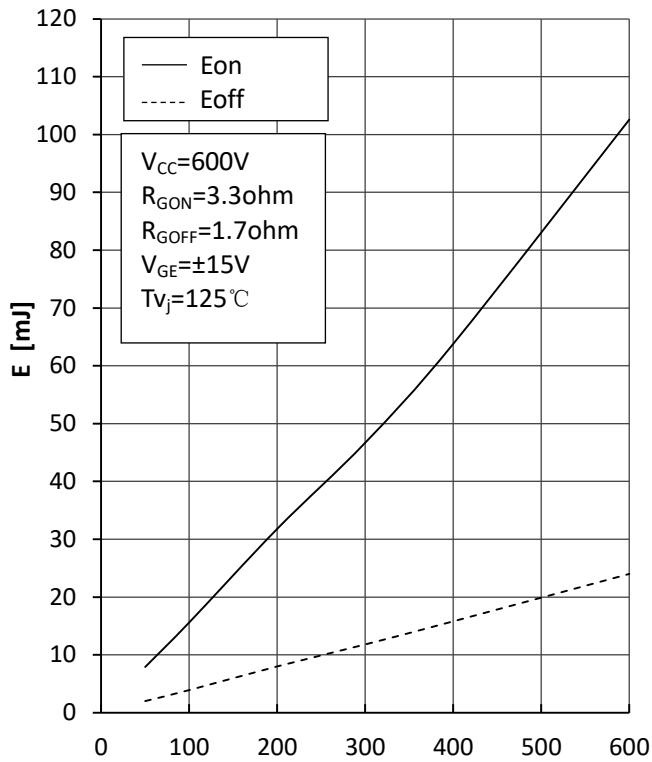


Fig3.IGBT Switching Loss vs.Ic

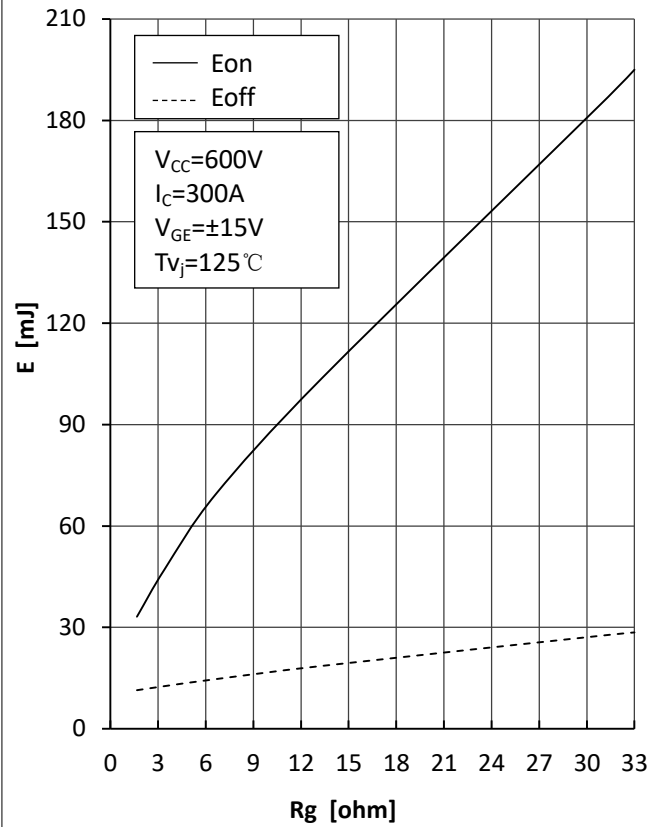


Fig4.IGBT Switching Loss vs.Rg

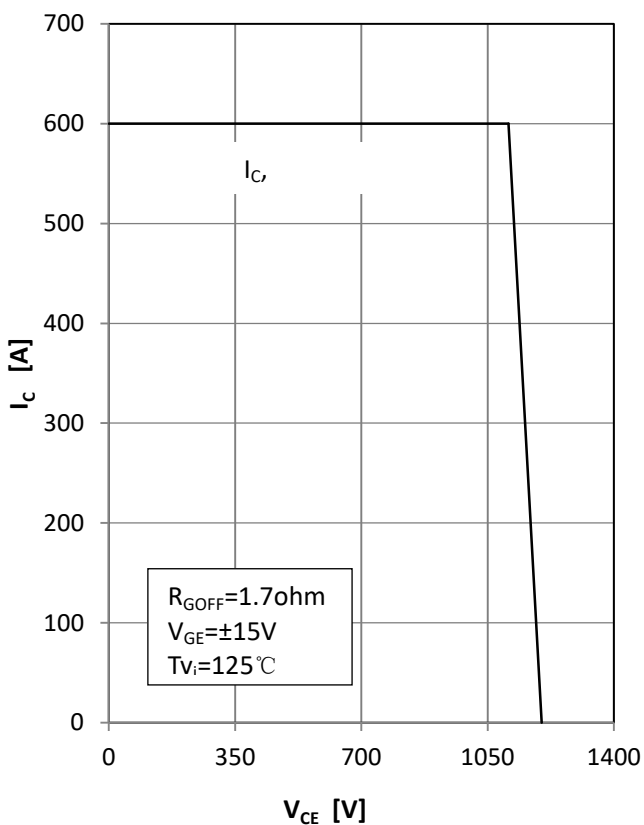


Fig5. RBSOA

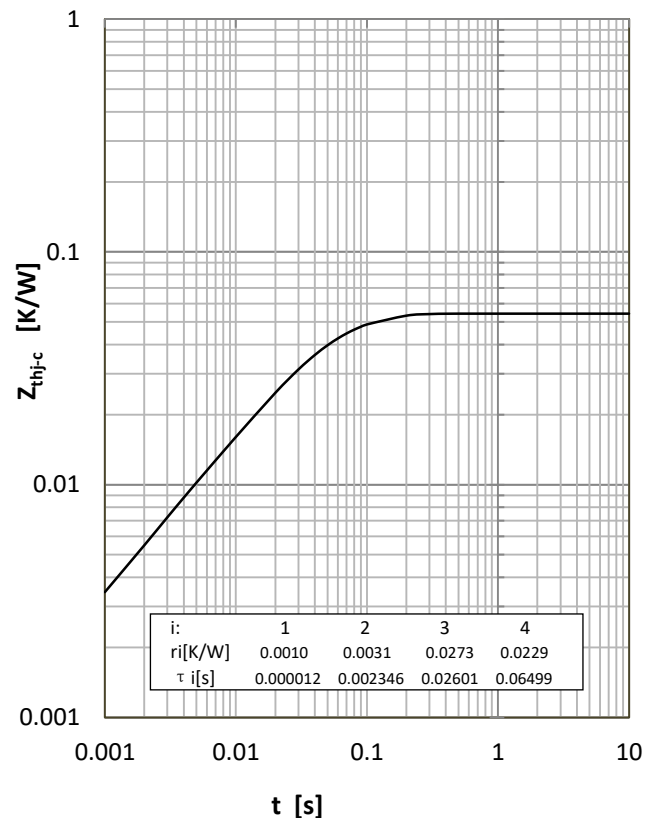


Fig 6. IGBT Transient Thermal Impedance

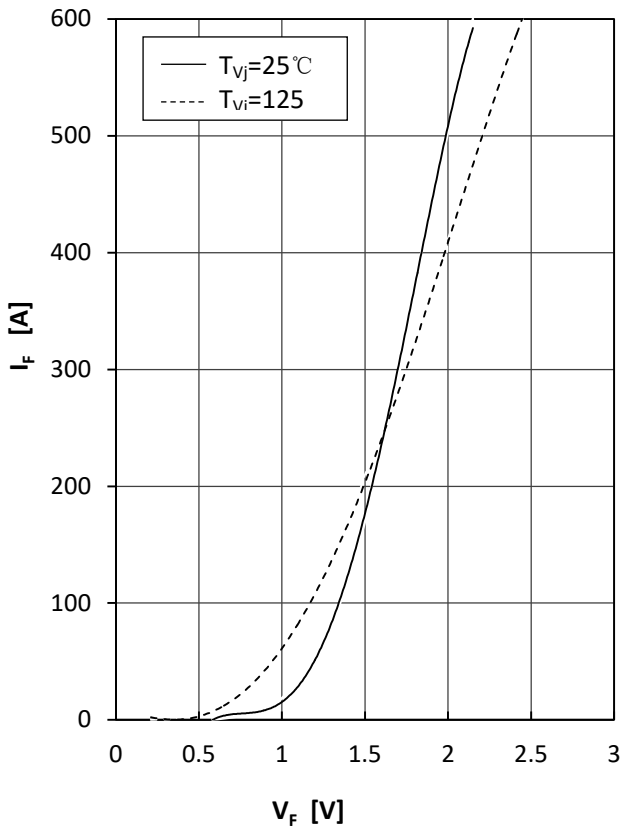


Fig7. Diode Forward Characteristics

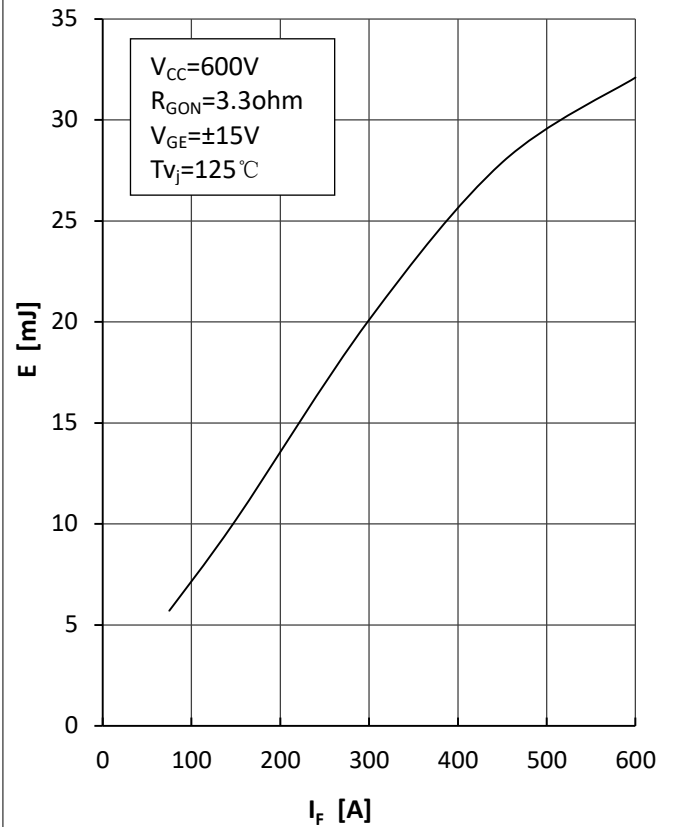


Fig8. Diode Switching Loss(Erec) vs. I_F

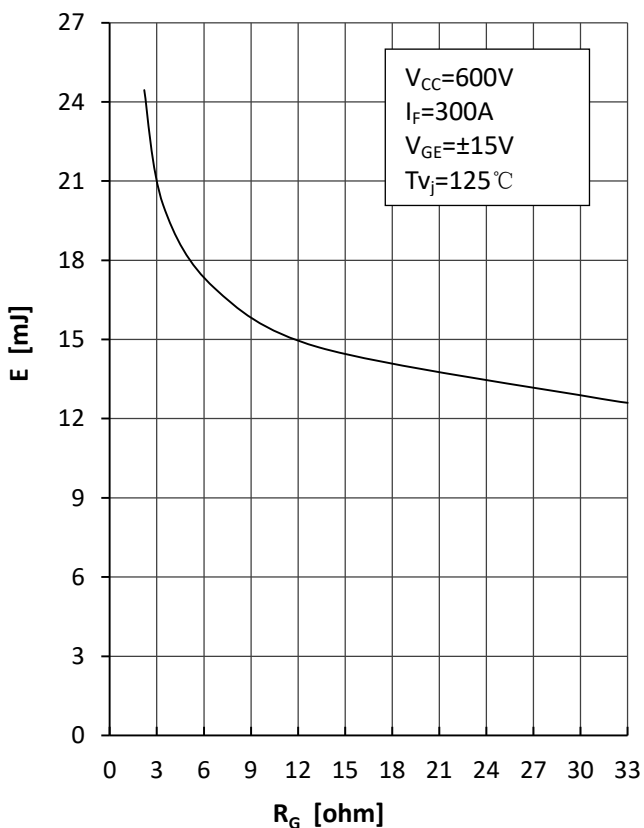


Fig9. Diode Switching Loss(Erec) vs. R_G

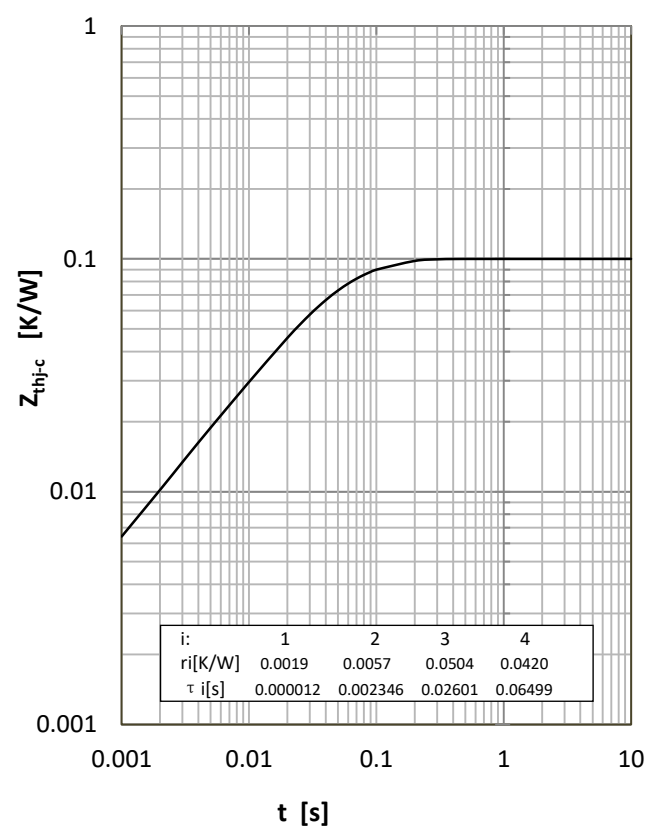
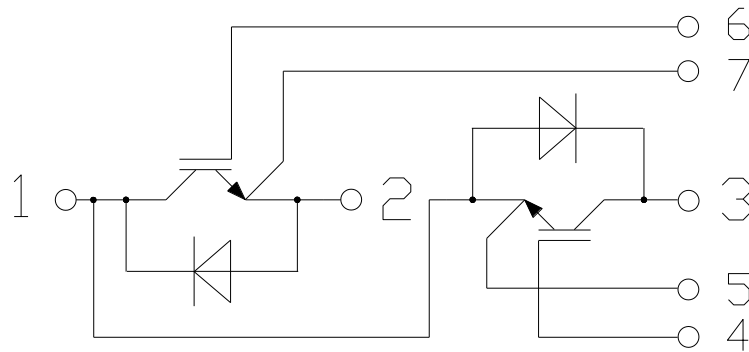


Fig10. Diode Transient Thermal Impedance

● Circuit Diagram



● Package Outline Information

Dimensions in Millimeters

