

Absolute Maximum Ratings $T_c=25\text{ }^\circ\text{C}$ unless otherwise noted**IGBT**

Symbol	Description	Values	Unit
V_{CES}	Collector- Emitter Voltage	1700	V
V_{GES}	Gate- Emitter Voltage	± 20	V
I_C	Collector Current @ $T_c=25\text{ }^\circ\text{C}$	198	A
	@ $T_c=100\text{ }^\circ\text{C}$	100	
I_{CM}	Pulsed Collector Current $t_p \leq 1\text{ ms}$	200	A
P_D	Maximum Power Dissipation @ $T_j=175\text{ }^\circ\text{C}$	828	W

Diode

Symbol	Description	Values	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	1700	V
I_F	Diode Continuous Forward Current	100	A
I_{FM}	Diode Maximum Forward Current $t_p \leq 1\text{ ms}$	200	A

Module

Symbol	Description	Values	Unit
T_{jmax}	Maximum Junction Temperature	175	$^\circ\text{C}$
T_{jop}	Operating Junction Temperature	-40 to +150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-40 to +125	$^\circ\text{C}$
V_{ISO}	Isolation Voltage RMS, $f=50\text{ Hz}$, $t=1\text{ min}$	4000	V

IGBT Characteristics $T_c=25^\circ\text{C}$ unless otherwise noted

Symb ol	Paramet er	Test Conditions	Min.	Typ.	Max.	Unit	
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C=100\text{A}, V_{GE}=15\text{V}, T_j=25^\circ\text{C}$		1.85	2.20	V	
		$I_C=100\text{A}, V_{GE}=15\text{V}, T_j=125^\circ\text{C}$		2.25			
		$I_C=100\text{A}, V_{GE}=15\text{V}, T_j=150^\circ\text{C}$		2.35			
$V_{GE(th)}$	Gate- Emitter Threshold Voltage	$I_C=4.0\text{mA}, V_{CE}=V_{GE}, T_j=25^\circ\text{C}$	5.6	6.2	6.8	V	
I_{CES}	Collector Cut- Off Current	$V_{CE}=V_{CES}, V_{GE}=0\text{V}, T_j=25^\circ\text{C}$			5.0	mA	
I_{GES}	Gate- Emitter Leakage Current	$V_{GE}=V_{GES}, V_{CE}=0\text{V}, T_j=25^\circ\text{C}$			400	nA	
R_{Gint}	Internal Gate Resistance			4.8		Ω	
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, f=1\text{MHz}, V_{GE}=0\text{V}$		12.0		nF	
C_{res}	Reverse Transfer Capacitance			0.29		nF	
Q_G	Gate Charge	$V_{GE}=-15 \dots +15\text{V}$		0.94		μC	
$t_{d(on)}$	Turn- On Delay Time	$V_{CC}=900\text{V}, I_C=100\text{A}, R_G=4.8\Omega, V_{GE}=\pm 15\text{V}, T_j=25^\circ\text{C}$		187		ns	
t_r	Rise Time			31		ns	
$t_{d(off)}$	Turn- Off Delay Time			434		ns	
t_f	Fall Time			363		ns	
E_{on}	Turn- On Switching Loss			18.5		mJ	
E_{off}	Turn- Off Switching Loss			20.8		mJ	
$t_{d(on)}$	Turn- On Delay Time		$V_{CC}=900\text{V}, I_C=100\text{A}, R_G=4.8\Omega, V_{GE}=\pm 15\text{V}, T_j=125^\circ\text{C}$		194		ns
t_r	Rise Time				44		ns
$t_{d(off)}$	Turn- Off Delay Time				503		ns
t_f	Fall Time				637		ns
E_{on}	Turn- On Switching Loss			30.3		mJ	
E_{off}	Turn- Off Switching Loss			32.1		mJ	
$t_{d(on)}$	Turn- On Delay Time	$V_{CC}=900\text{V}, I_C=100\text{A}, R_G=4.8\Omega, V_{GE}=\pm 15\text{V}, T_j=150^\circ\text{C}$			202		ns
t_r	Rise Time				55		ns
$t_{d(off)}$	Turn- Off Delay Time				512		ns
t_f	Fall Time				720		ns
E_{on}	Turn- On Switching Loss			33.0		mJ	
E_{off}	Turn- Off Switching Loss			34.8		mJ	
I_{SC}	SC Data		$t_p \leq 10\mu\text{s}, V_{GE}=15\text{V}, T_j=150^\circ\text{C}, V_{CC}=1000\text{V}, V_{CEM} \leq 1700\text{V}$		400		A

Diode Characteristics $T_c=25^\circ\text{C}$ unless otherwise noted

Symb ol	P aramet er	Test Conditions	Min.	Typ	Max	Unit
V_F	Diode Forward Voltage	$I_F=100\text{ A}, V_{GE}=0\text{ V}, T_j=25^\circ\text{C}$		1.80	2.25	V
		$I_F=100\text{ A}, V_{GE}=0\text{ V}, T_j=125^\circ\text{C}$		1.90		
		$I_F=100\text{ A}, V_{GE}=0\text{ V}, T_j=150^\circ\text{C}$		1.95		
Q_r	Recovered Charge			17.8		μC
I_{RM}	Peak Reverse Recovery Current	$V_R=900\text{ V}, I_F=100\text{ A},$ $-di/dt=3550\text{ A}/\mu\text{s}, V_{GE}=-15\text{ V}$ $T_j=25^\circ\text{C}$		103		A
E_{rec}	Reverse Recovery Energy			9.78		mJ
Q_r	Recovered Charge			33.7		μC
I_{RM}	Peak Reverse Recovery Current	$V_R=900\text{ V}, I_F=100\text{ A},$ $-di/dt=3550\text{ A}/\mu\text{s}, V_{GE}=-15\text{ V}$ $T_j=125^\circ\text{C}$		107		A
E_{rec}	Reverse Recovery Energy			19.4		mJ
Q_r	Recovered Charge			37.4		μC
I_{RM}	Peak Reverse Recovery Current	$V_R=900\text{ V}, I_F=100\text{ A},$ $-di/dt=3550\text{ A}/\mu\text{s}, V_{GE}=-15\text{ V}$ $T_j=150^\circ\text{C}$		106		A
E_{rec}	Reverse Recovery Energy			23.8		mJ

Module Characteristics $T_c=25^\circ\text{C}$ unless otherwise noted

Symb ol	P aramet er	Min.	Typ	Max	Unit
L_{CE}	Stray Inductance			20	nH
$R_{CC'+EE'}$	Module Lead Resistance, Terminal to Chip		0.35		m Ω
R_{thJC}	Junction- to- Case (per IGBT)			0.181	K/W
	Junction- to- Case (per Diode)			0.315	
R_{thCH}	Case- to- Heatsink (per IGBT)		0.031		K/W
	Case- to- Heatsink (per Diode)		0.055		
	Case- to- Heatsink (per Module)		0.010		
M	Terminal Connection Torque, Screw M6	2.5		5.0	N.m
	Mounting Torque, Screw M6	3.0		5.0	
G	Weight of Module		300		g

HFGM100A 1700V

IGBT Module

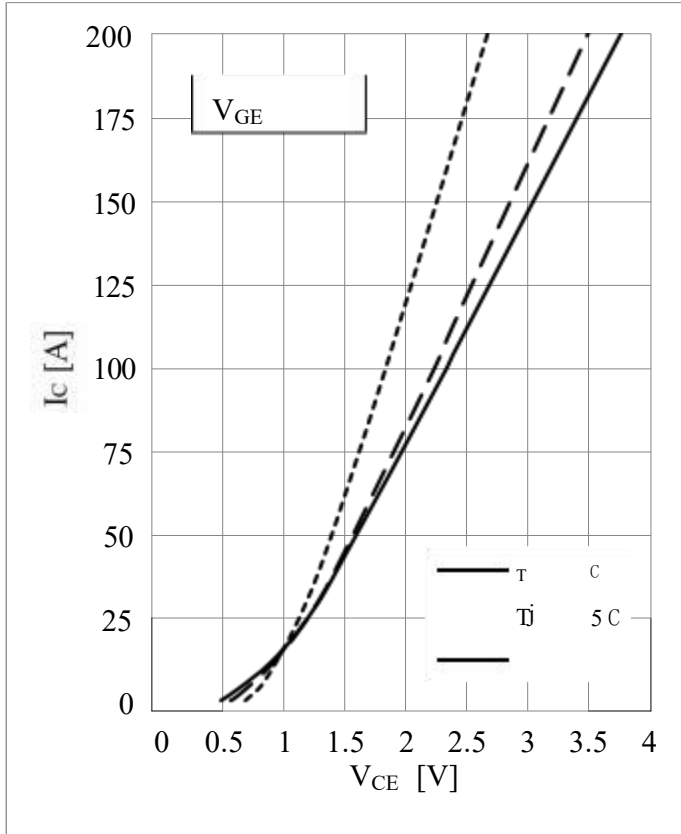


Fig 1. IGBT Output Characteristics

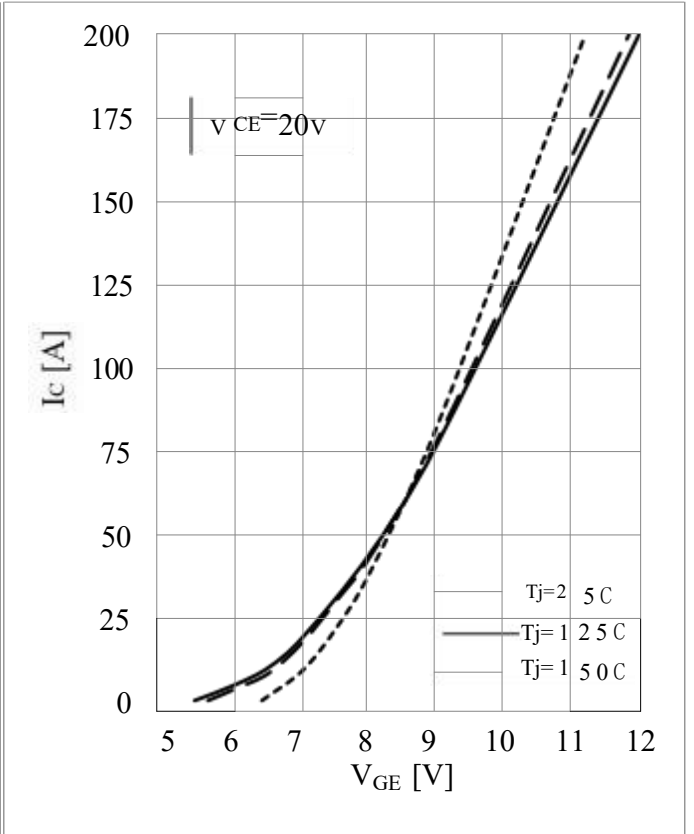


Fig 2. IGBT Transfer Characteristics

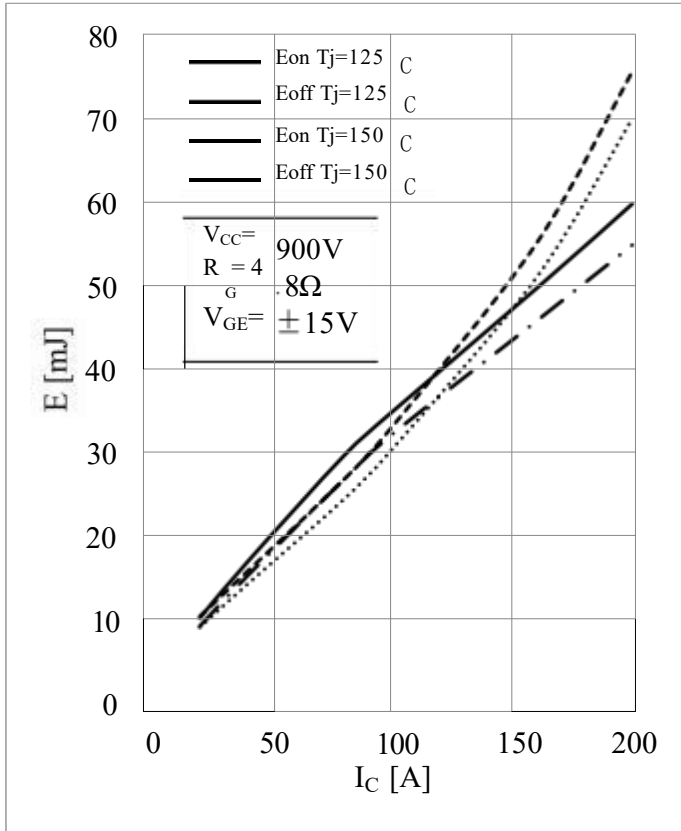


Fig 3. IGBT Switching Loss vs. I_c

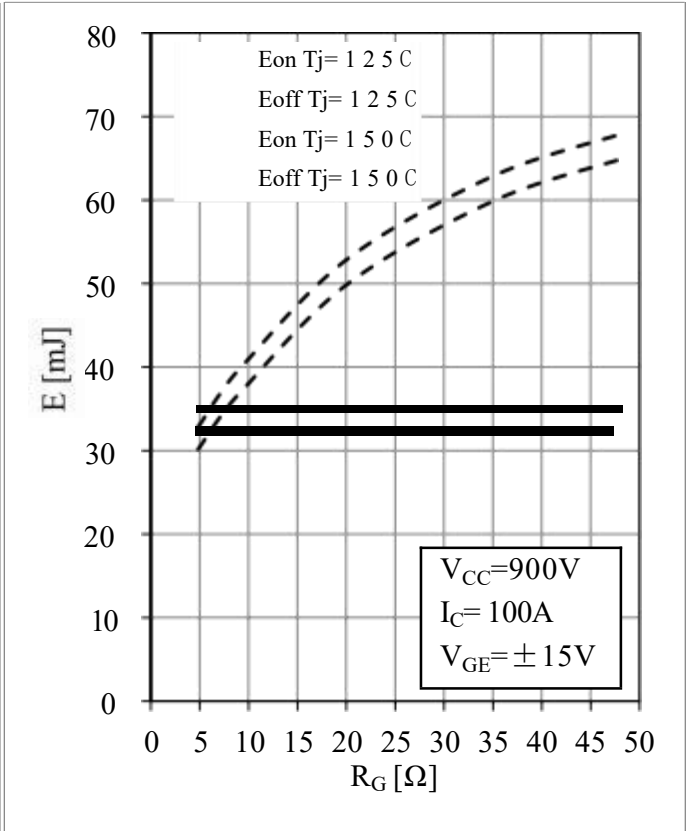


Fig 4. IGBT Switching Loss vs. R_g

HFGM100A 1700V

IGBT Module

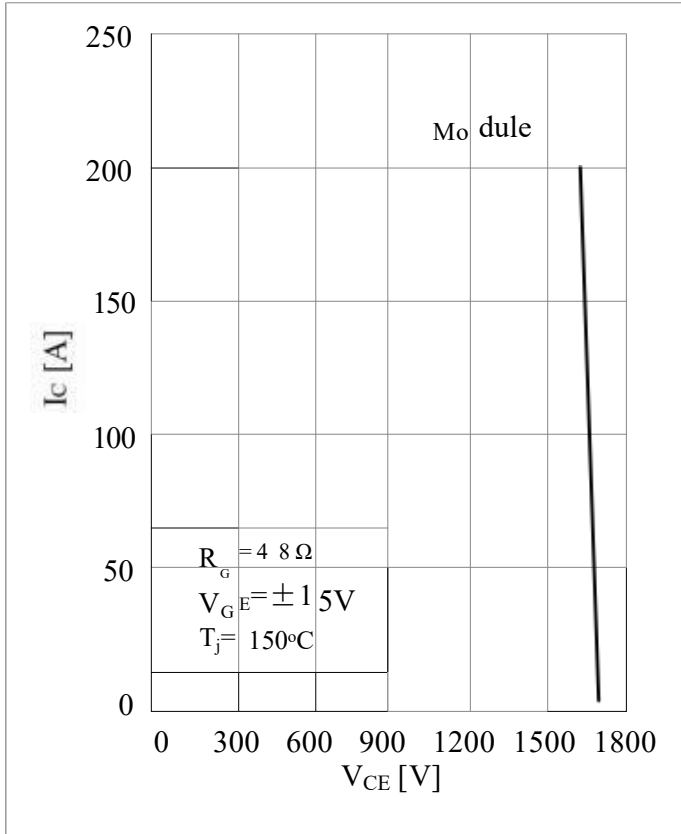


Fig 5. RBSOA

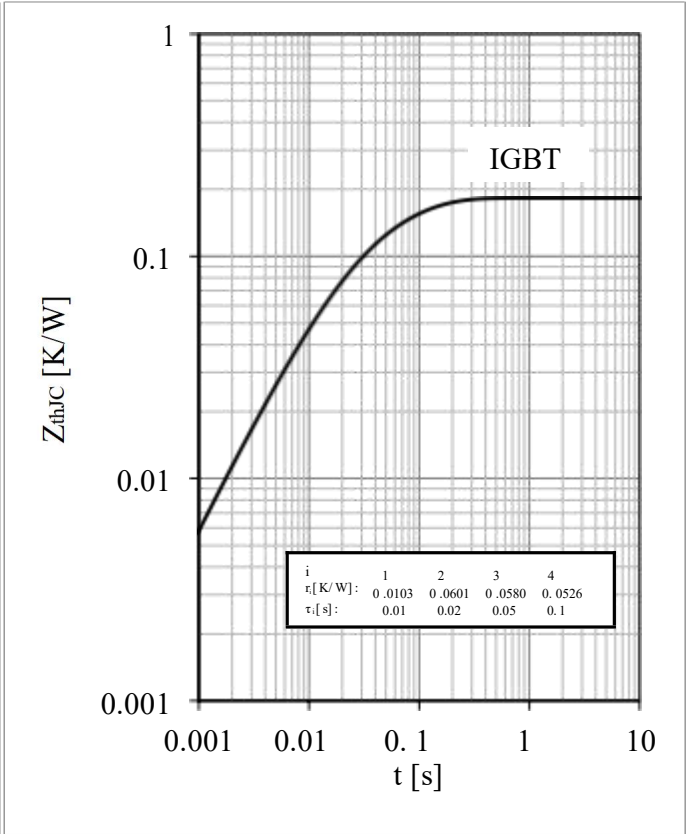


Fig 6. IGBT Transient Thermal Impedance

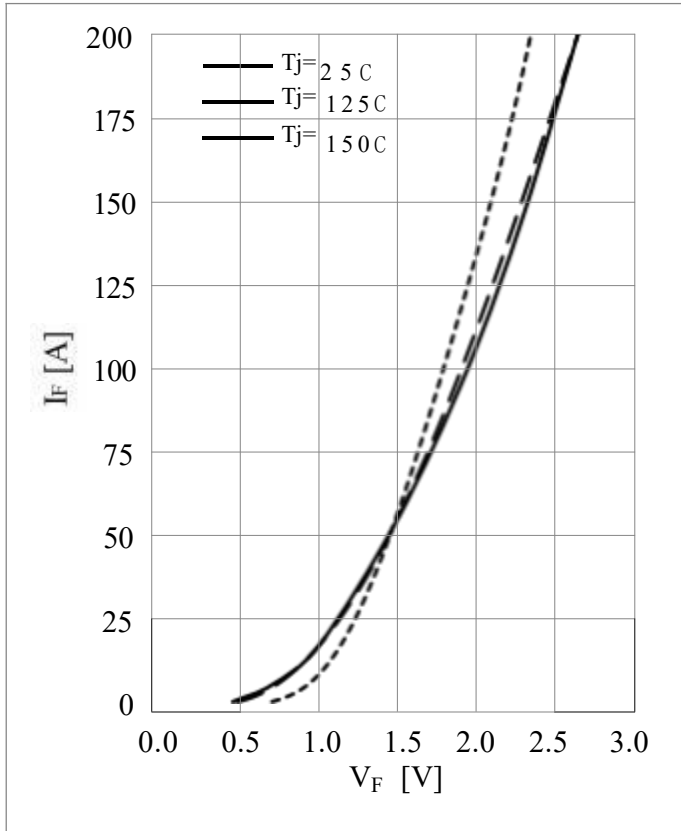


Fig 7. Diode Forward Characteristics

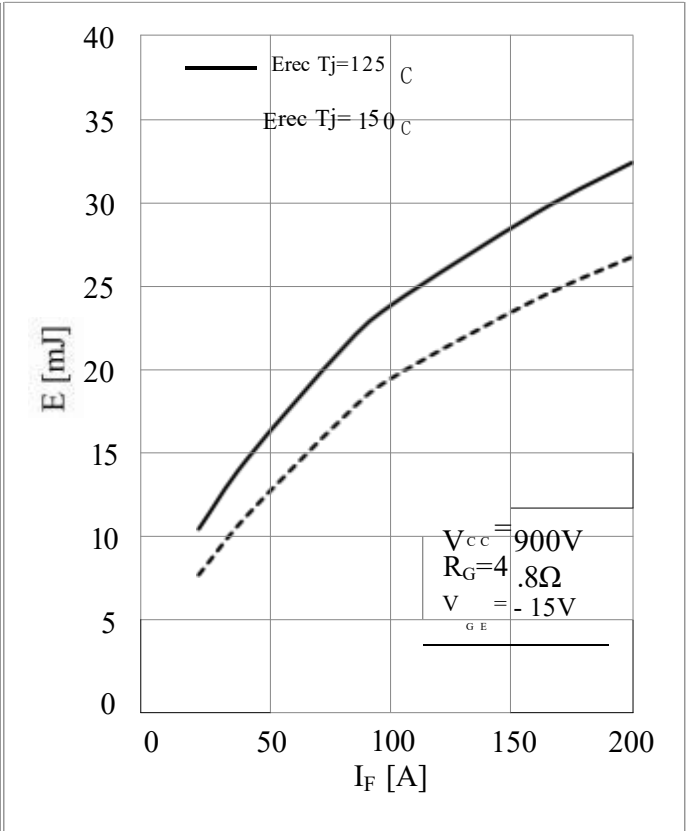


Fig 8. Diode Switching Loss vs. I_F

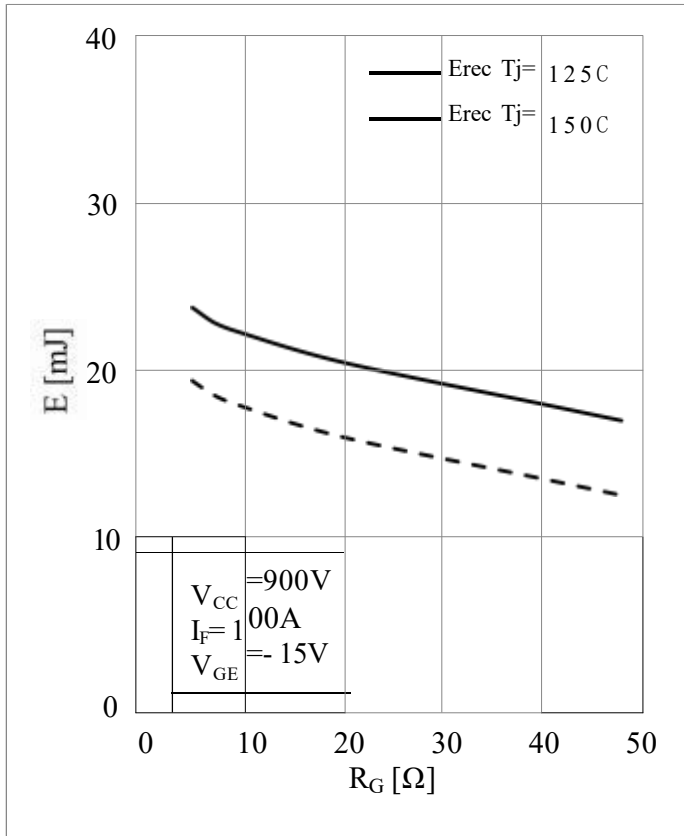


Fig 9. Diode Switching Loss vs. R_G

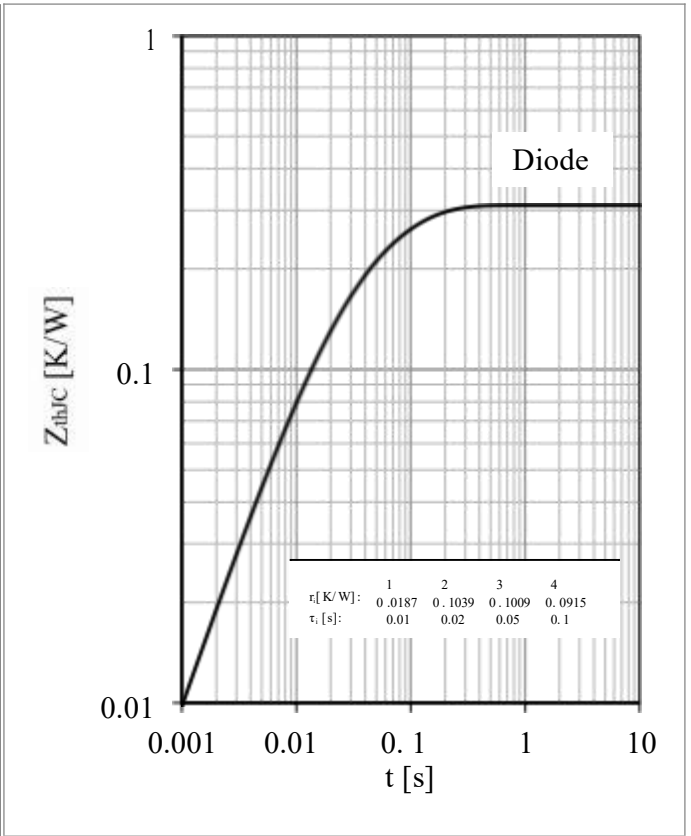
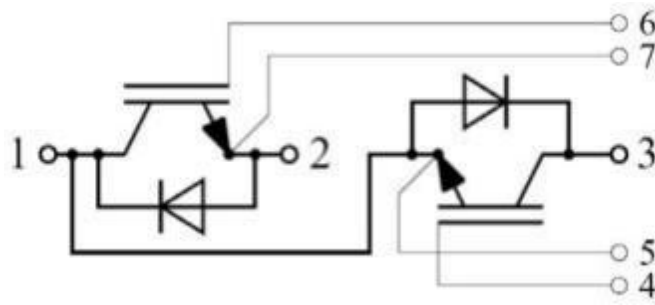


Fig 10. Diode Transient Thermal Impedance

Circuit Schematic



Package Dimensions

Dimensions in Millimeters

