

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

Symbol	Description	Values	Unit
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_C	Collector Current @ $T_C=25^{\circ}\text{C}$ @ $T_C=100^{\circ}\text{C}$	363 200	A
I_{CRM}	Repetitive Peak Collector Current tp limited by T_{vjop}	400	A
P_D	Maximum Power Dissipation @ $T_{vj}=175^{\circ}\text{C}$	1293	W

Diode

Symbol	Description	Values	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	200	A
I_{FRM}	Repetitive Peak Forward Current tp limited by T_{vjop}	400	A

Module

Symbol	Description	Values	Unit
T_{vjmax}	Maximum Junction Temperature	175	$^{\circ}\text{C}$
T_{vjop}	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, $f=50\text{Hz}$, $t=1\text{min}$	2500	V

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage	$I_C=200\text{A}, V_{GE}=15\text{V}, T_{vj}=25^{\circ}\text{C}$		1.75	2.20	V
		$I_C=200\text{A}, V_{GE}=15\text{V}, T_{vj}=125^{\circ}\text{C}$		2.00		
		$I_C=200\text{A}, V_{GE}=15\text{V}, T_{vj}=150^{\circ}\text{C}$		2.05		
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=8.0\text{mA}, V_{CE}=V_{GE}, T_{vj}=25^{\circ}\text{C}$	5.6	6.2	6.8	V
I_{CES}	Collector Cut-Off Current	$V_{CE}=V_{CES}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$			1.0	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=V_{GES}, V_{CE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$			400	nA
R_{Gint}	Internal Gate Resistance			1.0		Ω
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, f=1\text{MHz}, V_{GE}=0\text{V}$		18.6		nF
C_{res}	Reverse Transfer Capacitance			0.52		nF
Q_G	Gate Charge	$V_{GE}=-15\dots+15\text{V}$		1.40		μC
$t_{d(on)}$	Turn-On Delay Time	$V_{CC}=600\text{V}, I_C=200\text{A}, R_G=2.0\Omega, L_s=50\text{nH}, V_{GE}=\pm 15\text{V}, T_{vj}=25^{\circ}\text{C}$		140		ns
t_r	Rise Time			31		ns
$t_{d(off)}$	Turn-Off Delay Time			239		ns
t_f	Fall Time			188		ns
E_{on}	Turn-On Switching Loss			11.2		mJ
E_{off}	Turn-Off Switching Loss			13.4		mJ
$t_{d(on)}$	Turn-On Delay Time	$V_{CC}=600\text{V}, I_C=200\text{A}, R_G=2.0\Omega, L_s=50\text{nH}, V_{GE}=\pm 15\text{V}, T_{vj}=125^{\circ}\text{C}$		146		ns
t_r	Rise Time			36		ns
$t_{d(off)}$	Turn-Off Delay Time			284		ns
t_f	Fall Time			284		ns
E_{on}	Turn-On Switching Loss			19.4		mJ
E_{off}	Turn-Off Switching Loss			18.9		mJ
$t_{d(on)}$	Turn-On Delay Time	$V_{CC}=600\text{V}, I_C=200\text{A}, R_G=2.0\Omega, L_s=50\text{nH}, V_{GE}=\pm 15\text{V}, T_{vj}=150^{\circ}\text{C}$		148		ns
t_r	Rise Time			37		ns
$t_{d(off)}$	Turn-Off Delay Time			294		ns
t_f	Fall Time			303		ns
E_{on}	Turn-On Switching Loss			21.7		mJ
E_{off}	Turn-Off Switching Loss			19.8		mJ
I_{SC}	SC Data	$t_p \leq 10\mu\text{s}, V_{GE}=15\text{V}, T_{vj}=150^{\circ}\text{C}, V_{CC}=800\text{V}, V_{CEM} \leq 1200\text{V}$		800		A

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	$I_F=200\text{A}, V_{GE}=0\text{V}, T_{vj}=25^{\circ}\text{C}$		1.85	2.30	V
		$I_F=200\text{A}, V_{GE}=0\text{V}, T_{vj}=125^{\circ}\text{C}$		1.90		
		$I_F=200\text{A}, V_{GE}=0\text{V}, T_{vj}=150^{\circ}\text{C}$		1.95		
Q_r	Recovered Charge	$V_R=600\text{V}, I_F=200\text{A},$ $-di/dt=5710\text{A}/\mu\text{s}, L_s=50\text{nH},$ $V_{GE}=-15\text{V}, T_{vj}=25^{\circ}\text{C}$		20.0		μC
I_{RM}	Peak Reverse Recovery Current			220		A
E_{rec}	Reverse Recovery Energy			7.5		mJ
Q_r	Recovered Charge	$V_R=600\text{V}, I_F=200\text{A},$ $-di/dt=4740\text{A}/\mu\text{s}, L_s=50\text{nH},$ $V_{GE}=-15\text{V}, T_{vj}=125^{\circ}\text{C}$		34.3		μC
I_{RM}	Peak Reverse Recovery Current			209		A
E_{rec}	Reverse Recovery Energy			12.9		mJ
Q_r	Recovered Charge	$V_R=600\text{V}, I_F=200\text{A},$ $-di/dt=4400\text{A}/\mu\text{s}, L_s=50\text{nH},$ $V_{GE}=-15\text{V}, T_{vj}=150^{\circ}\text{C}$		38.7		μC
I_{RM}	Peak Reverse Recovery Current			204		A
E_{rec}	Reverse Recovery Energy			14.6		mJ

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

Symbol	Parameter	Min.	Typ.	Max.	Unit
R_{thJC}	Junction-to-Case (per IGBT)			0.116	K/W
	Junction-to-Case (per Diode)			0.185	
R_{thCH}	Case-to-Heatsink (per IGBT)		0.150		K/W
	Case-to-Heatsink (per Diode)		0.239		
	Case-to-Heatsink (per Module)		0.046		
M	Terminal Connection Torque, Screw M5	2.5		3.5	N.m
	Mounting Torque, Screw M5	2.5		3.5	
G	Weight of Module		200		g

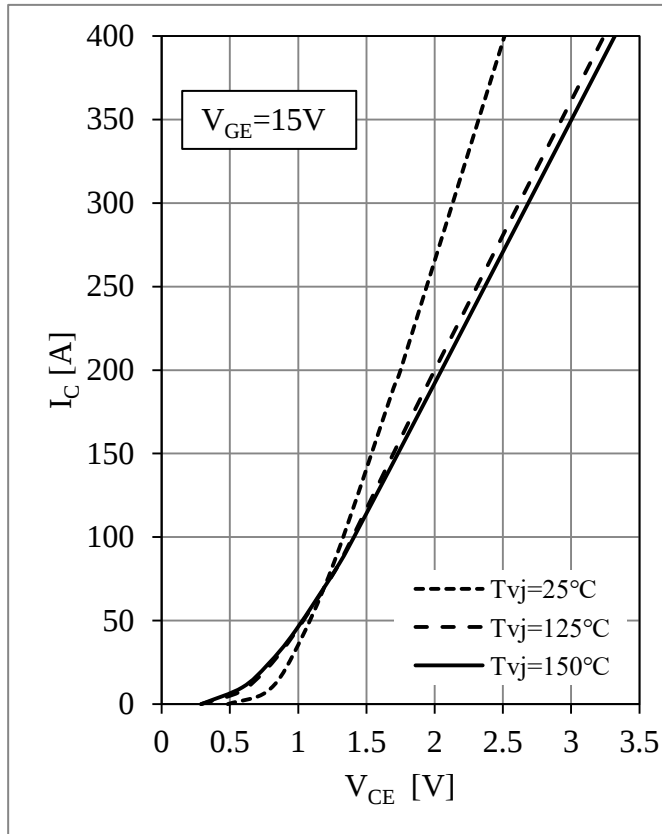


Fig 1. IGBT Output Characteristics

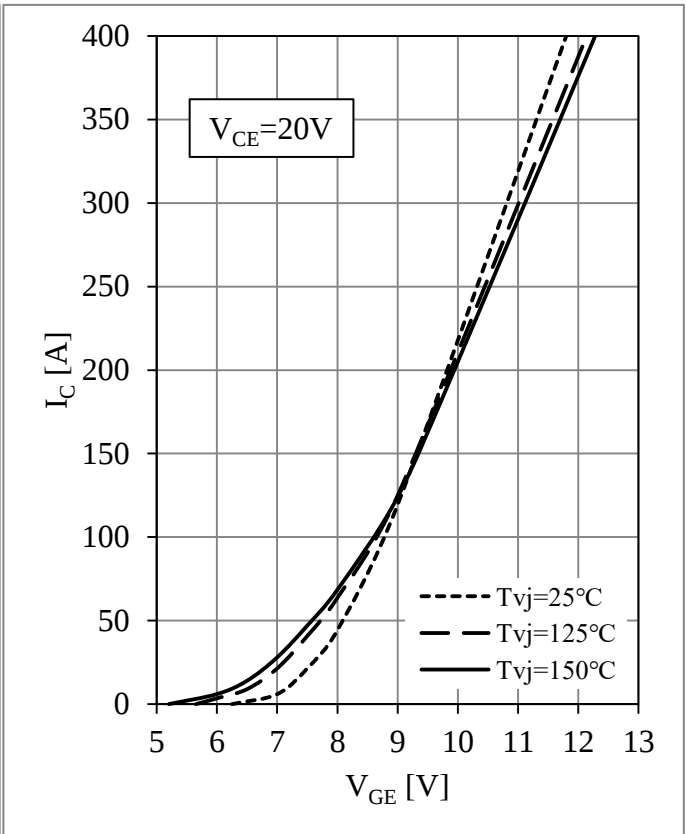
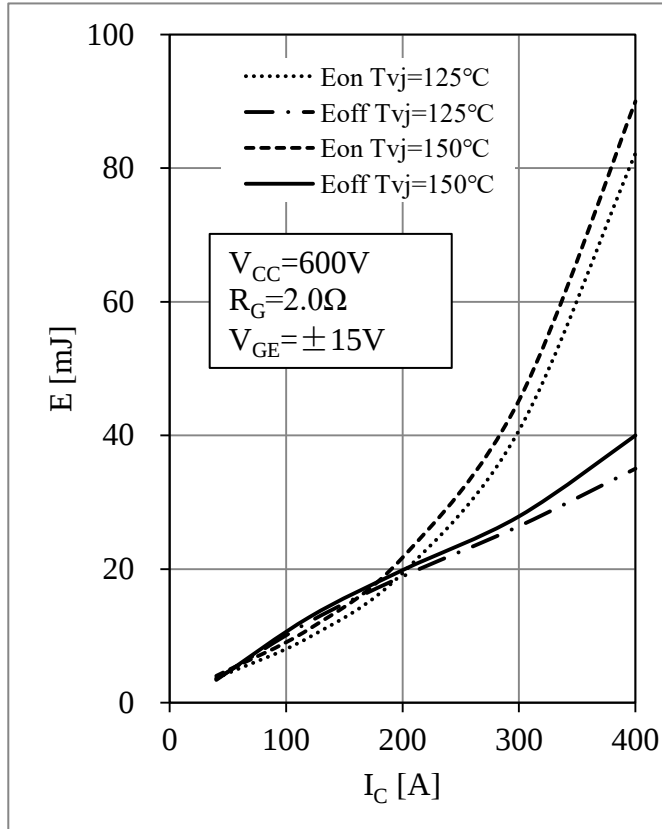
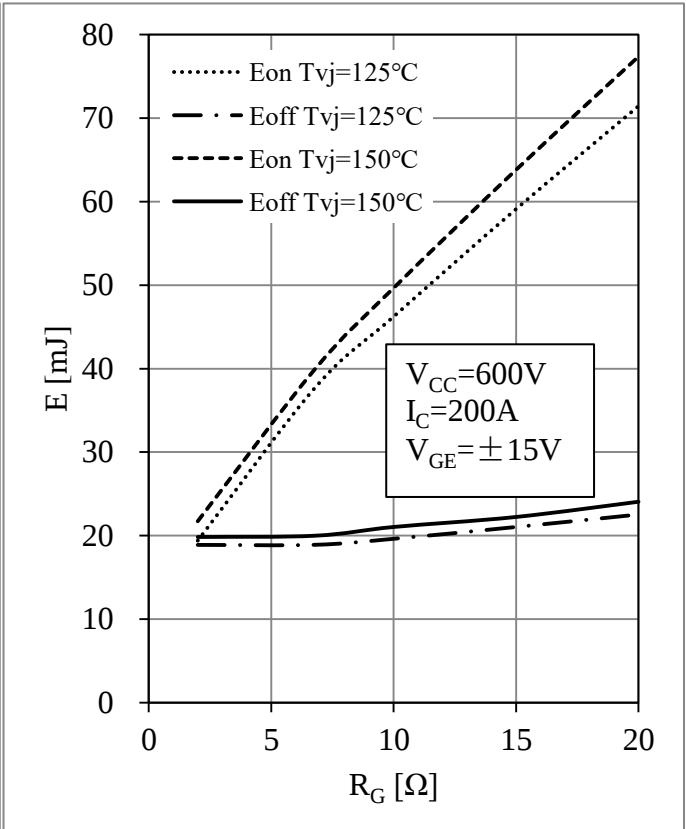


Fig 2. IGBT Transfer Characteristics

Fig 3. IGBT Switching Loss vs. I_C Fig 4. IGBT Switching Loss vs. R_G

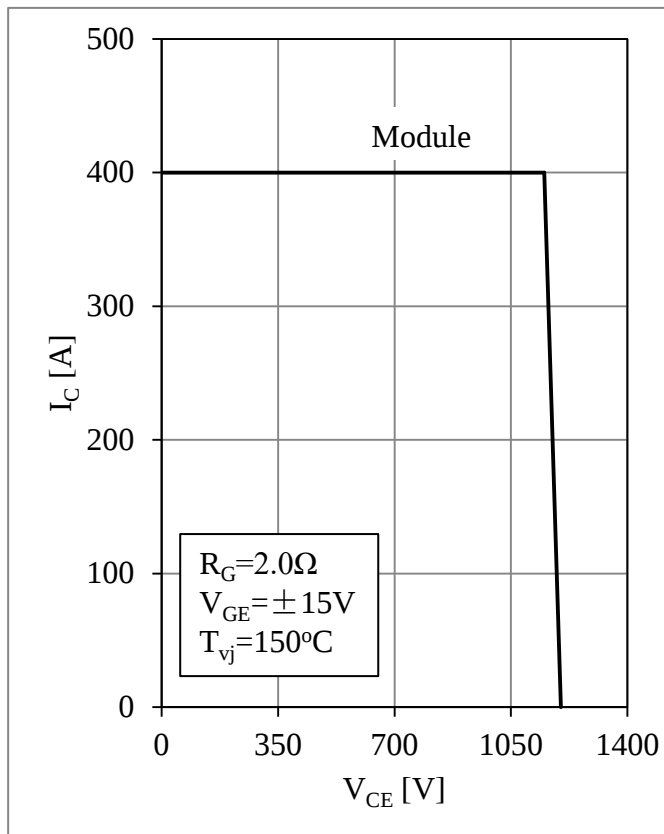


Fig 5. RBSOA

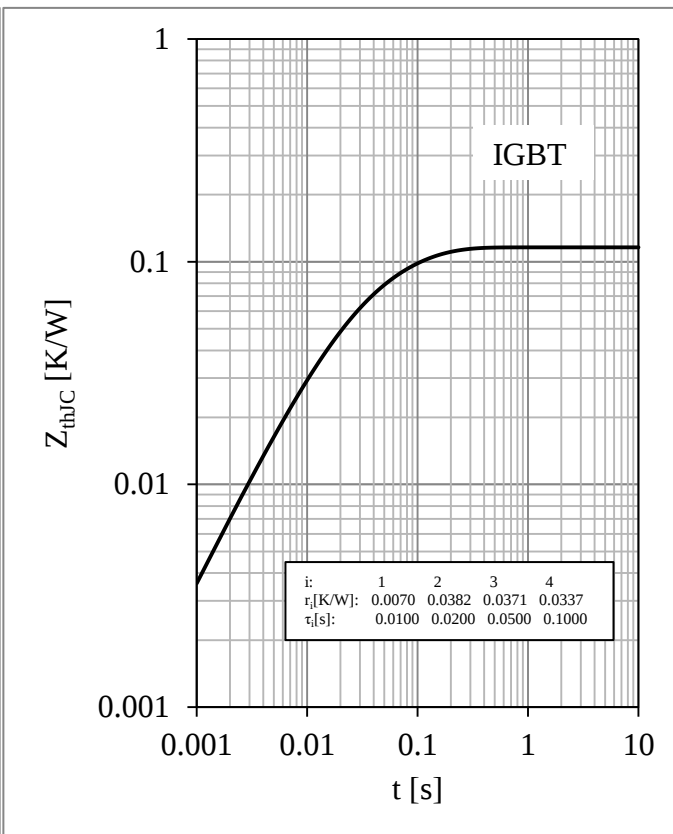


Fig 6. IGBT Transient Thermal Impedance

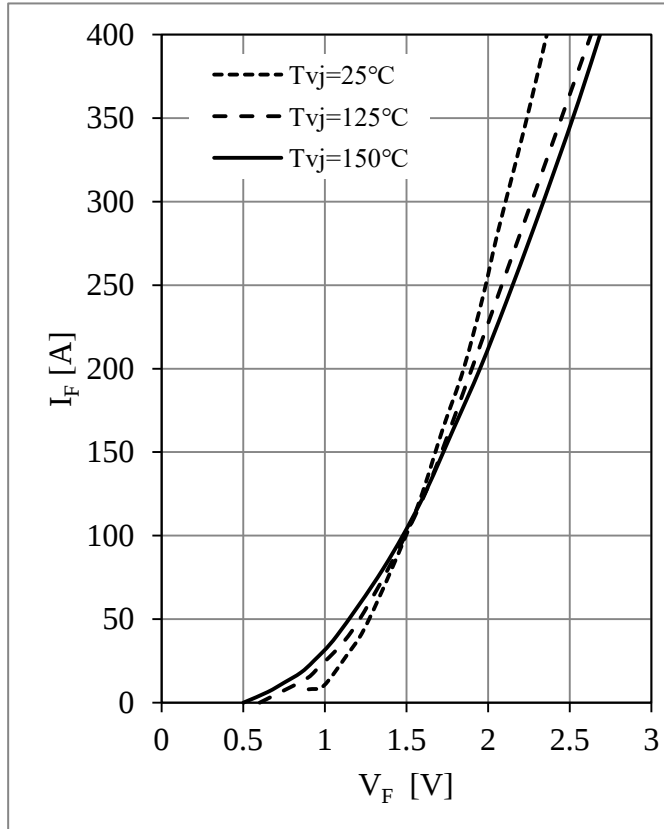
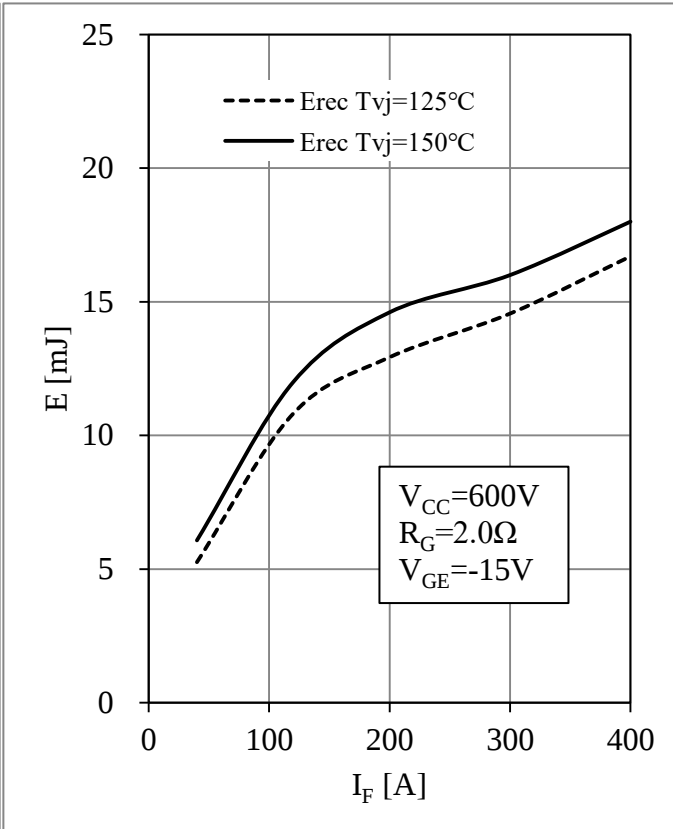


Fig 7. Diode Forward Characteristics

Fig 8. Diode Switching Loss vs. I_F

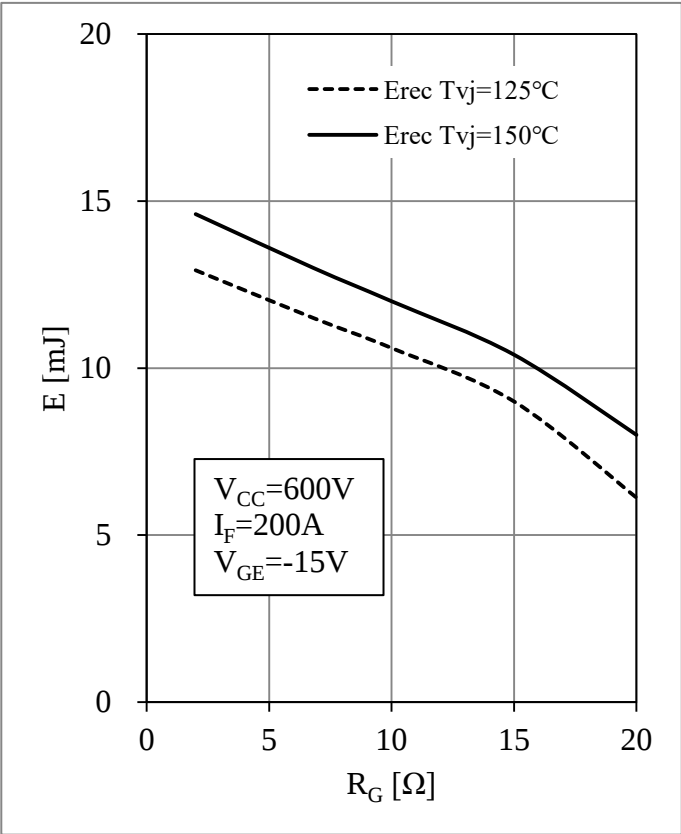


Fig 9. Diode Switching Loss vs. R_G

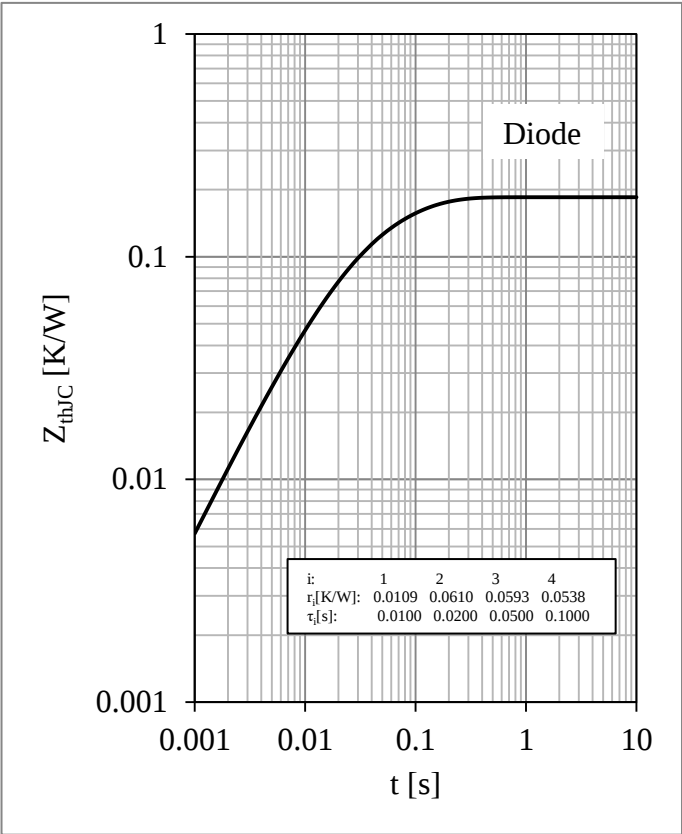
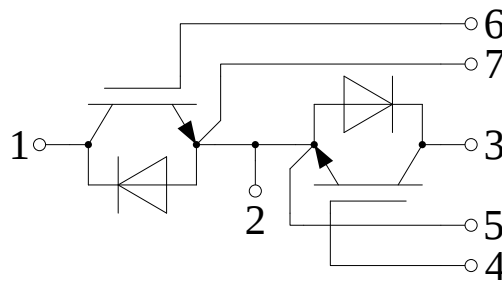


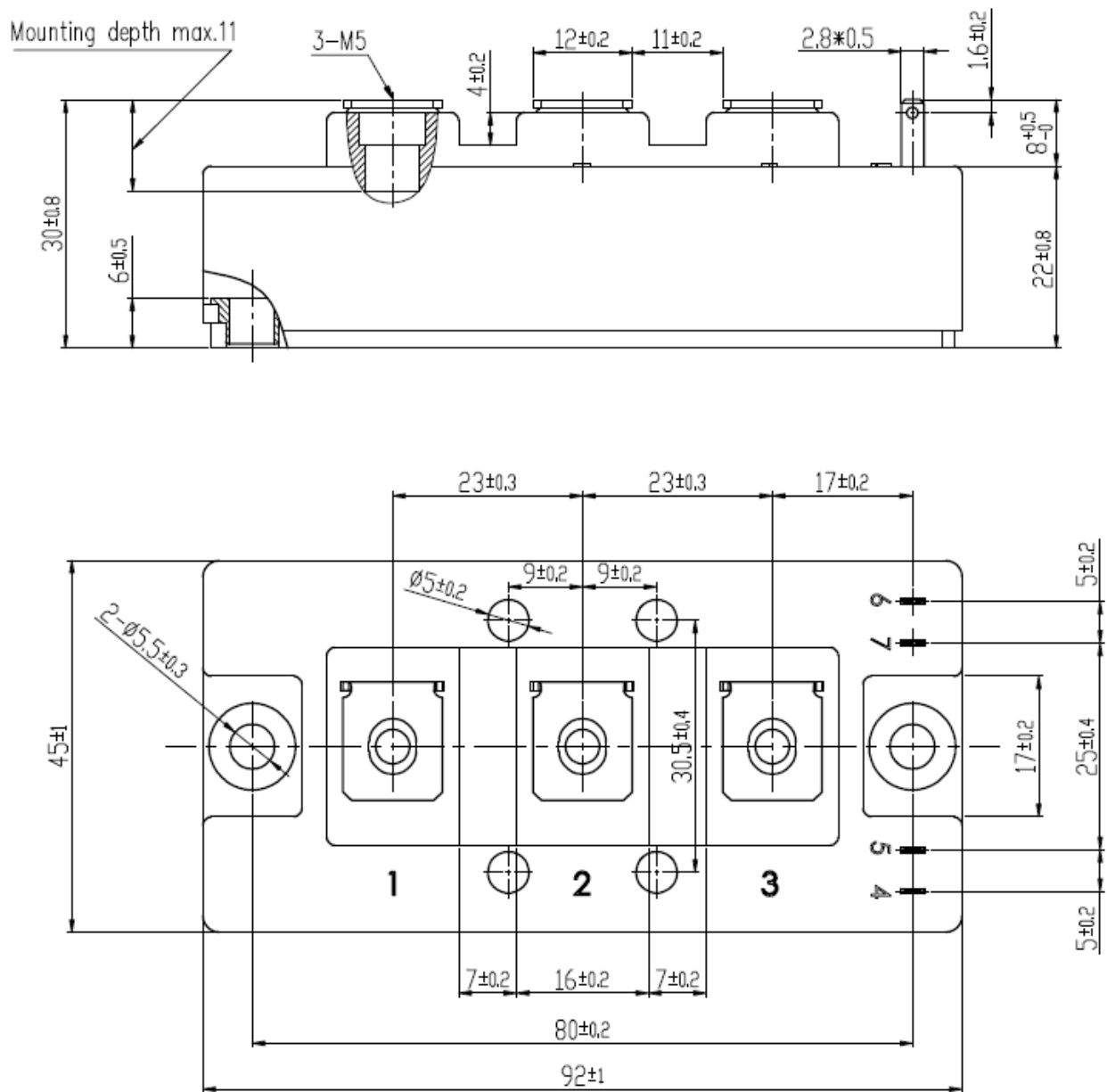
Fig 10. Diode Transient Thermal Impedance

Circuit Schematic



Package Dimensions

Dimensions in Millimeters



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