

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
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Applications

- Inverter for Motor Drive
- AC and DC Servo Driver Amplifier
- UPS(Uninterruptible Power Supplies)
- Soft Switching Welding Machine

Maximum Ratings

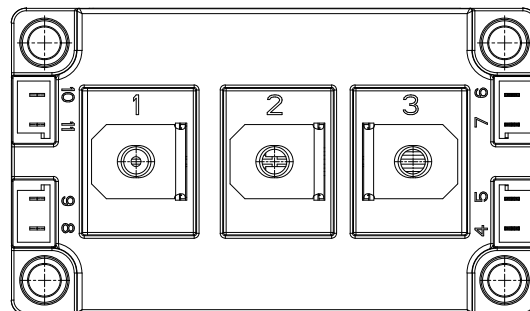
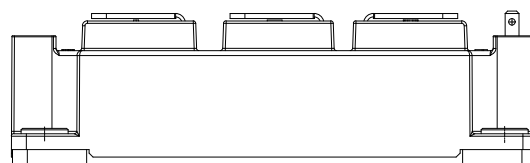
- Maximum Junction Temperature : 175°C
- Operating Junction Temperature Range : -40°C to +150°C
- Storage Temperature Range: -40°C to +125°C
- IGBT Thermal Resistance: 0.12 K/W Junction to Case
- Diode Thermal Resistance: 0.20 K/W Junction to Case
- Type Conductive Grease Applied Thermal Resistance: 0.046K/W Junction to Case-To-Sink

Parameter	Symbol	Rating	Unit	
Collector-Emitter Voltage@ $V_{GE}=0V, I_C=1mA, T_{vj}=25^{\circ}C$	V_{CES}	1200	V	
Continuous Collector Current @ $T_C=100^{\circ}C$	I_C	200	A	
Peak Collector Current @ $T_p=1ms$	I_{CRM}	400	A	
Gate-Emitter Voltage@ $T_{vj}=25^{\circ}C$	V_{GE}	± 20	V	
Isolation Voltage @ $f=50Hz, t=1min$	V_{iso}	2500(Min)	V	
Weight of Module	G	315	g	
Module Electrodes Torque:M5	M_t	2.5~5	N*m	
Module-to-Sink Torque :M6	M_s	3~5	N*m	
Total Power Dissipation (IGBT-Inverter)	$T_C=25^{\circ}C$	P_{tot}	1250	W
	$T_{vjmax}=175^{\circ}C$			

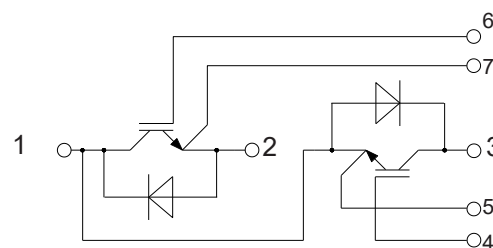
IGBT Modules

1200V 200A

C2



Circuit Diagram



Electrical Characteristics of IGBT @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=7.6mA, T_{vj}=25^{\circ}C$	5	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	$V_{CE(sat)}$	$V_{GE}=15V, I_C=200A, T_{vj}=25^{\circ}C$		1.85	2.20	V
		$V_{GE}=15V, I_C=200A, T_{vj}=125^{\circ}C$		2.20		
		$V_{GE}=15V, I_C=200A, T_{vj}=150^{\circ}C$		2.30		
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		
Internal Gate Resistance	R_{gint}			3.8		Ω
Gate Emitter Leakage Current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA
Turn-On Delay Time	$t_{d(on)}$	$V_{CE}=600V,$ $I_C=200A,$ $V_{GE}=\pm 15V,$ $R_G=3.3\Omega,$ $T_{vj}=25^{\circ}C$		280		ns
Rise Time	t_r			45		
Turn-Off Delay Time	$t_{d(off)}$			320		
Fall Time	T_f			120		
Energy Dissipation During Turn-on Time	E_{on}			15.8		
Energy Dissipation During Turn-off Time	E_{off}		16.4			
Turn-On Delay Time	$t_{d(on)}$	$V_{CE}=600V,$ $I_C=200A,$ $V_{GE}=\pm 15V,$ $R_G=3.3\Omega,$ $T_{vj}=150^{\circ}C$		393		ns
Rise Time	t_r			53		
Turn-Off Delay Time	$t_{d(off)}$			483		
Fall Time	T_f			132		
Energy Dissipation During Turn-on Time	E_{on}			27.5		
Energy Dissipation During Turn-off Time	E_{off}		29.4			
SC data	I_{SC}	$T_P \leq 10\mu s, V_{GE}=15V,$ $T_{vj}=150^{\circ}C, V_{CC}=900, V_{CEM} \leq 1200V$		1000		A

Electrical Characteristics of DIODE @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Diode DC Forward Current	I_F			200		A
Diode Peak Forward Current	I_{FRM}	$t_p=1ms$		400		A
Forward Voltage	V_F	$I_F=200A, T_{vj}=25^{\circ}C$		2.0		V
		$I_F=200A, T_{vj}=125^{\circ}C$		2.0		
		$I_F=200A, T_{vj}=150^{\circ}C$		1.95		
Recovered Charge	Q_{rr}	$V_R=600V, I_F=200A,$ $-di_F/dt=2500A/us,$ $T_{vj}=25^{\circ}C$		15.4		μC
Peak Reverse Recovery Current	I_{rr}			150		A
Reverse Recovery Energy	E_{rec}			8.8		mJ
Recovered Charge	Q_{rr}	$V_R=600V, I_F=200A,$ $-di_F/dt=2500A/us,$ $T_{vj}=125^{\circ}C$		30.6		μC
Peak Reverse Recovery Current	I_{rr}			180		A
Reverse Recovery Energy	E_{rec}			14.8		mJ
Recovered Charge	Q_{rr}	$V_R=600V, I_F=200A,$ $-di_F/dt=2500A/us,$ $T_{vj}=150^{\circ}C$		35.4		μC
Peak Reverse Recovery Current	I_{rr}			197		A
Reverse Recovery Energy	E_{rec}			16.2		mJ

Curve Characteristics

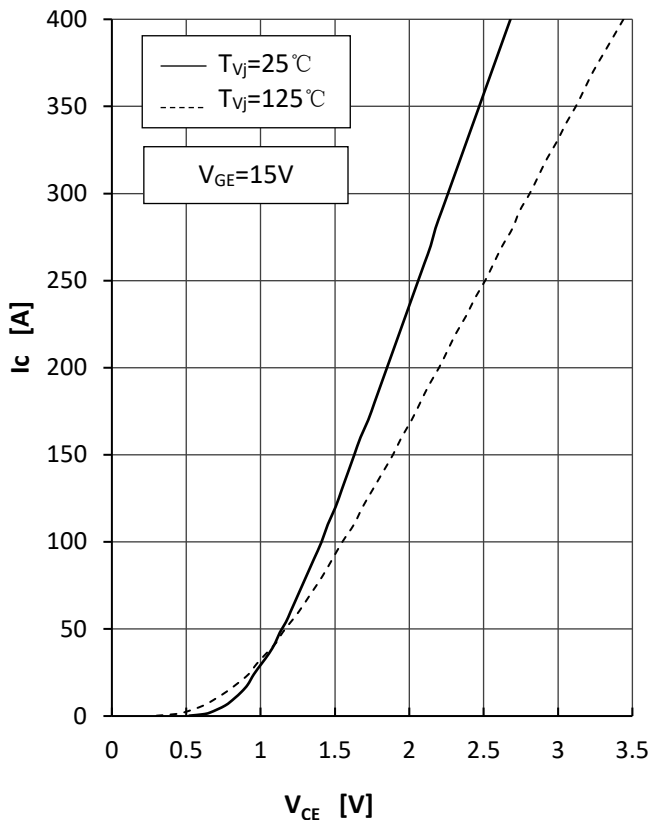


Fig1.IGBT Output Characteristics

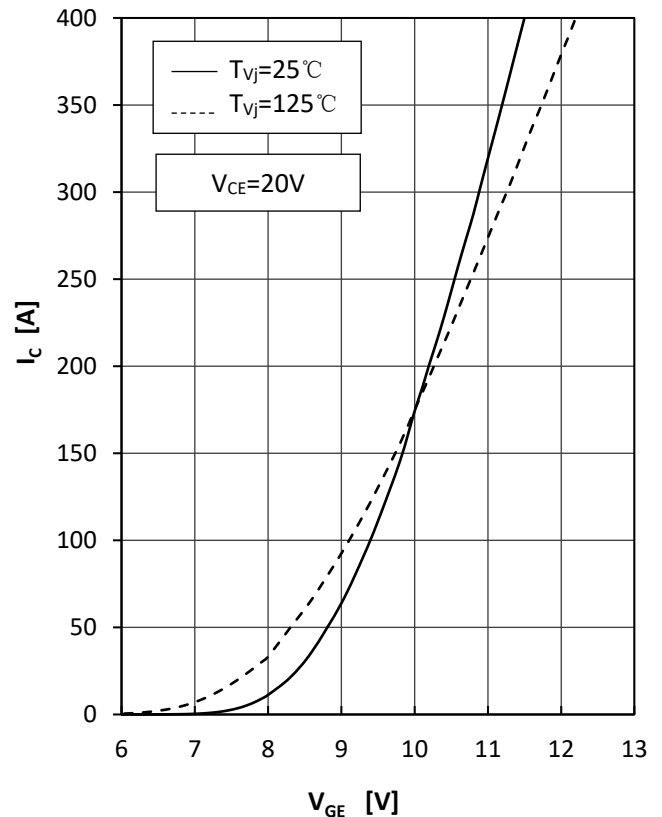


Fig2.IGBT Transfer Characteristics

Curve Characteristics

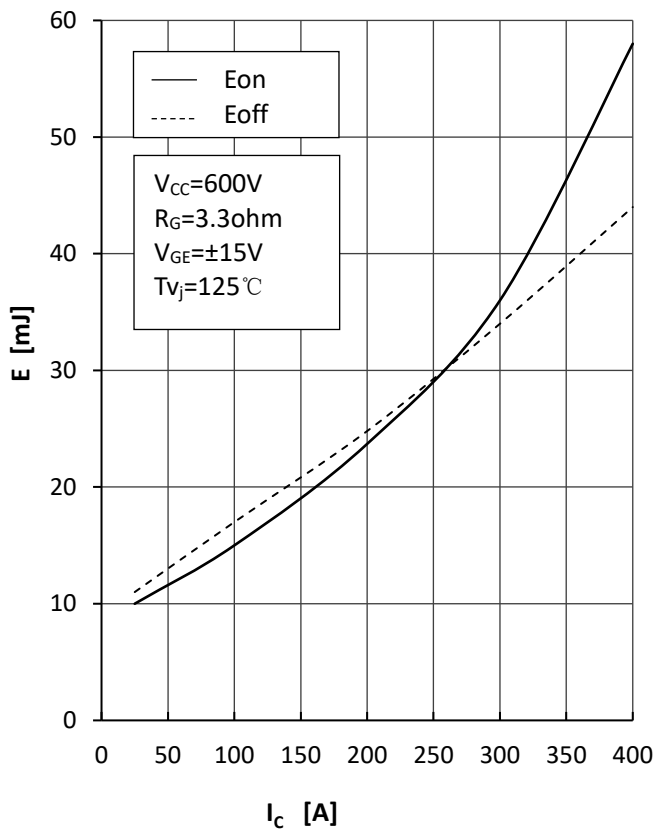


Fig3. IGBT Switching Loss vs. Ic

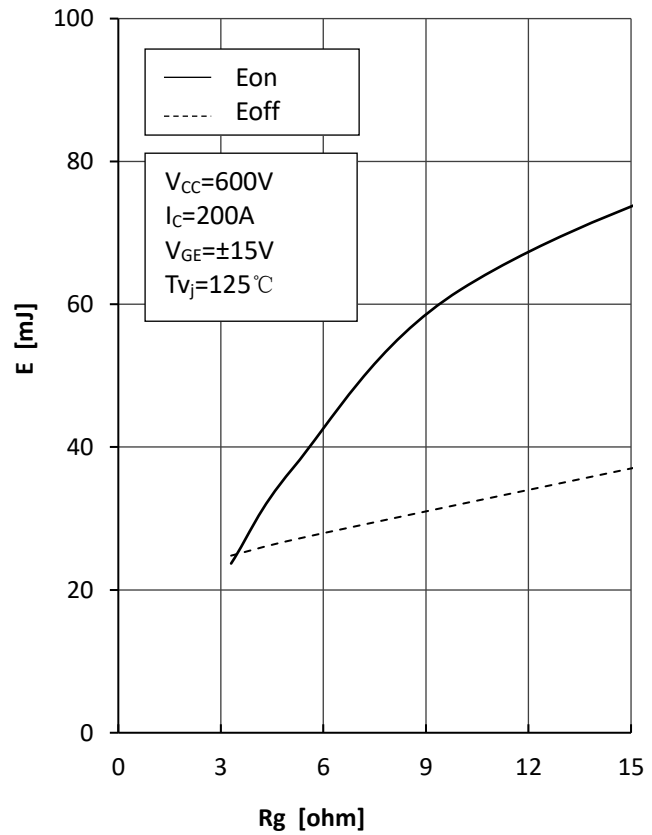


Fig4. IGBT Switching Loss vs. Rg

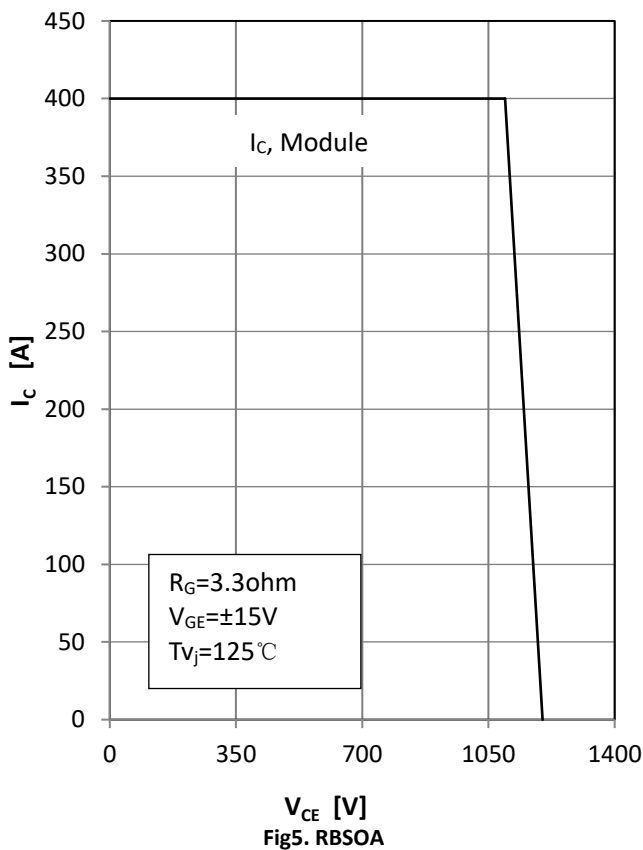


Fig5. RBSOA

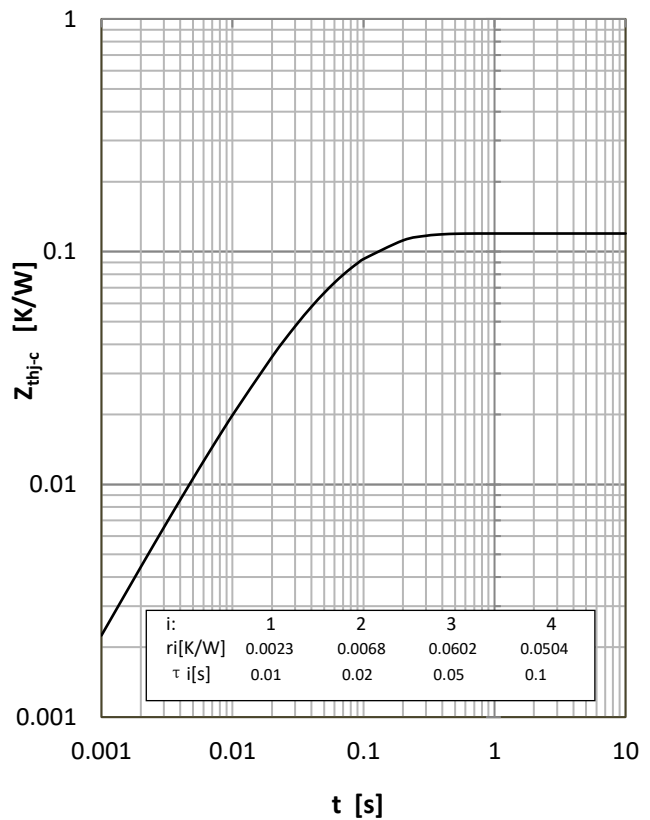


Fig 6. IGBT Transient Thermal Impedance

Curve Characteristics

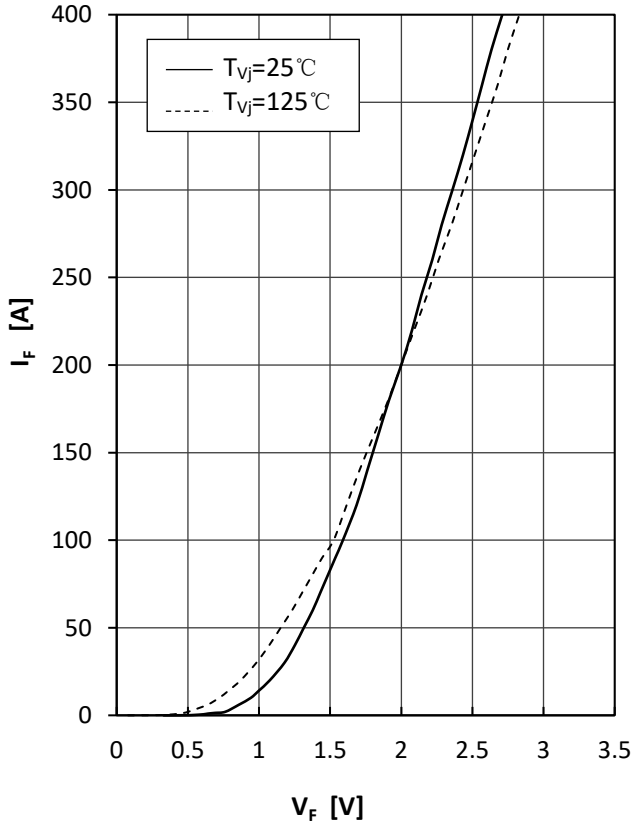


Fig7. Diode Forward Characteristics

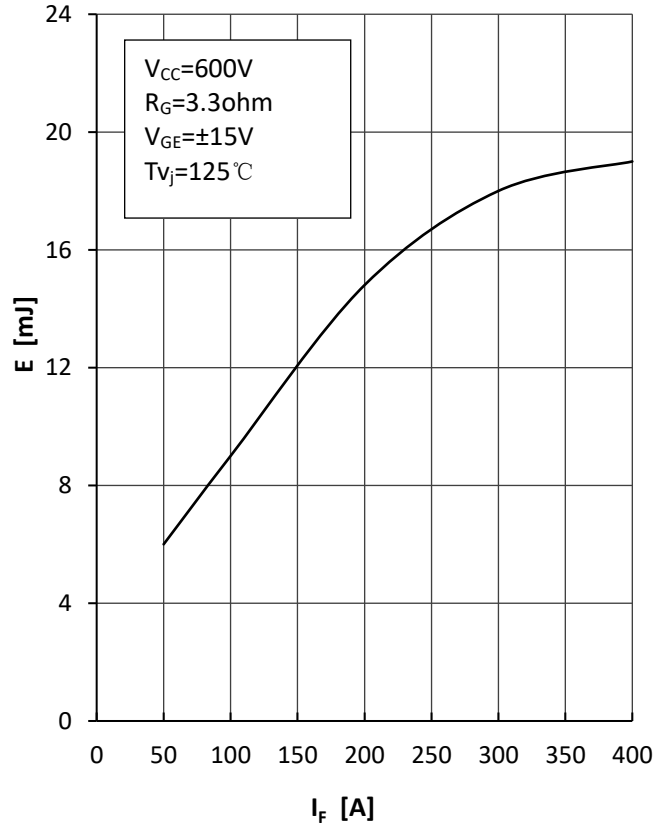


Fig8. Diode Switching Loss(Erec) vs. I_F

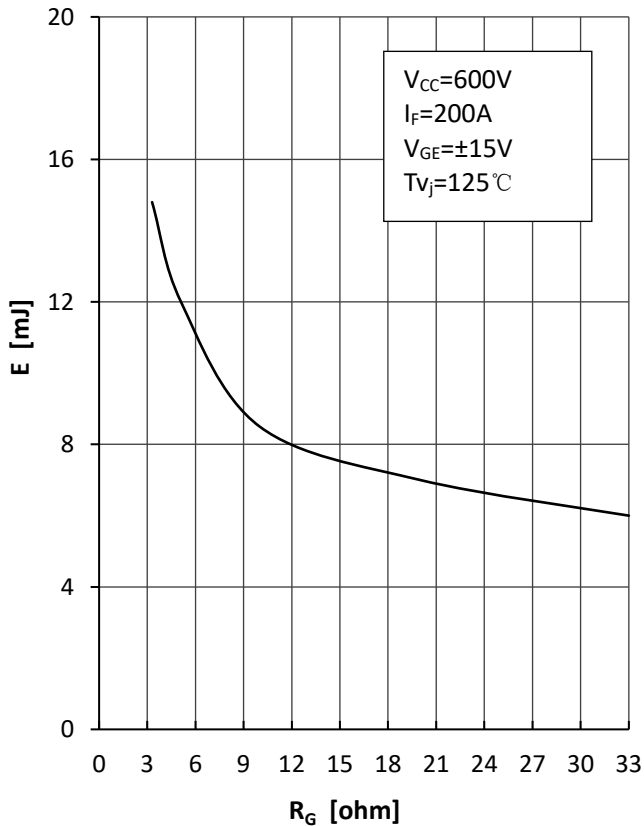


Fig9. Diode Switching Loss(Erec) vs. R_g

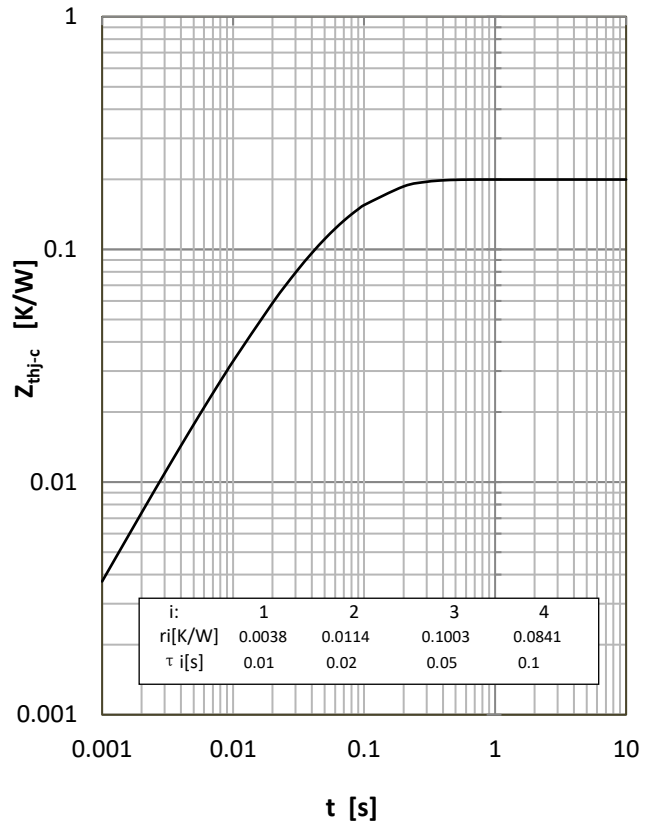


Fig10. Diode Transient Thermal Impedance

Ordering Information

Device	Packing
Part Number-BP	Bulk: 8pcs/Box ; 48pcs/Ctn

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