Features

- Low VCE(sat) Trench-FS IGBT technology
- Positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)
- Halogen Free. “Green” Device (Note 1)
- 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 drive amplifier
- Uninterruptible power supply

Maximum Ratings

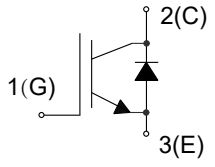
- Operating Junction Temperature Range : -40°C to +175°C
- Storage Temperature Range: -55°C to +150°C
- IGBT Thermal Resistance: 0.75°C/W Junction to Case
- Diode Thermal Resistance: 1.35°C/W Junction to Case
- Thermal Resistance: 40°C/W Junction to Ambient

Parameter		Symbol	Rating	Unit
Collector-Emitter Voltage		V_{CE}	1200	V
DC Collector Current(2)	T_C=25°C	I_C	30	A
	T_C=100°C		15	
Pulsed Collector Current (3) VGE=15V		I_{CM}	60	A
Diode Forward Current (2)	T_C=25°C	I_F	30	A
	T_C=100°C		15	
Diode Pulsed Current (3)		$I_{F,puls}$	60	A
Gate-Emitter Voltage		V_{GE}	±20	V
Transient Gate-Emitter Voltage			±30	
Short Circuit Withstand Time V_{GE}=15V, V_{CC}=900V, V_{CEM}≤1200V		t_{SC}	10	μs
Power Dissipation	T_j=25°C	P_D	200	W

Note:

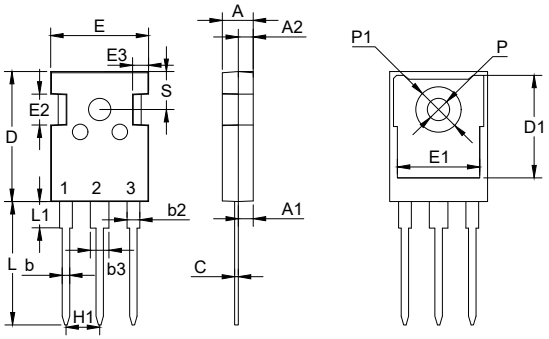
1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. Limited by T_{Jmax}.
3. T_p limited by T_{Jmax}.

Internal Structure



Trench and Field Stop IGBT 1200V 15A

TO-247AB



DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.189	0.205	4.80	5.20	
A1	0.087	0.103	2.21	2.61	
A2	0.073	0.085	1.85	2.15	
b	0.039	0.055	1.00	1.40	
b2	0.075	0.087	1.91	2.21	
C	0.020	0.028	0.50	0.70	
D	0.815	0.839	20.70	21.30	
D1	0.640	0.663	16.25	16.85	
E	0.610	0.634	15.50	16.10	
E1	0.512	0.535	13.00	13.60	
E2	0.189	0.205	4.80	5.20	
E3	0.091	0.106	2.30	2.70	
L	0.772	0.796	19.62	20.22	
L1	-	0.169	-	4.30	
P	0.134	0.150	3.40	3.80	Φ
P1		0.287	-	7.30	Φ
S	0.242		6.15		TYP
H1	0.214		5.44		TYP
b3	0.110	0.126	2.80	3.20	

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Collector-Emitter Breakdown Voltage	$V_{(BR)CES}$	V_{GE}=0V, I_C=250μA	1200			V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE}=15V, I_C=15A, T_J=25℃		1.85	2.35	V
		V_{GE}=15V, I_C=15A, T_J=125℃		2.20		
		V_{GE}=15V, I_C=15A, T_J=150℃		2.30		
G-E Threshold Voltage	$V_{GE(th)}$	I_C=500μA, V_{GE}=V_{CE}	5.1	5.8	6.4	V
C-E Leakage Current	I_{CES}	V_{CE}=1200V, V_{GE}=0V, TJ=25℃			0.25	mA
		V_{CE}=1200V, V_{GE}=0V, T_J=150℃			5.00	
G-E Leakage Current	I_{GES}	V_{CE}=0V, V_{GE}=±20V			100	nA
Dynamic Characteristics						
Input Capacitance	C_{ies}	V_{CE}=25V,V_{GE}=0V,f=1MHz		1.2		nF
Reverse Transfer Capacitance	C_{res}			0.04		
Gate Charge	Q_g	V_{CC}=960V,I_C=15A,V_{GE}=15V		0.14		μC
Short Circuit Collector Current	Isc	V_{GE}=15V, tsc≤10us, V_{cc}=900V,T_j≤150°C		60		A
IGBT Switching Characteristics						
Turn-On Delay Time	$td_{(on)}$	V_{CC}=600V, I_C=15A, V_{GE}=-15~15V, R_G=47Ω		45		ns
Rise Time	t_r			52		
Turn-Off Delay Time	$td_{(off)}$			128		
Fall Time	t_f			186		
Turn-On Energy	E_{on}			1.5		mJ
Turn-Off Energy	E_{off}			0.9		
Turn-On Delay Time	$td_{(on)}$	V_{CC}=600V, I_C=15A, V_{GE}=-15~15V, R_G=33Ω, TJ=125°C		50		ns
Rise Time	t_r			55		
Turn-Off Delay Time	$td_{(off)}$			160		
Fall Time	t_f			135		
Turn-On Energy	E_{on}			2.2		mJ
Turn-Off Energy	E_{off}			1.3		
Turn-On Delay Time	$td_{(on)}$	V_{CC}=600V, I_C=15A, V_{GE}=-15~15V, R_G=33Ω, TJ=150°C		52		ns
Rise Time	t_r			58		
Turn-Off Delay Time	$td_{(off)}$			170		
Fall Time	t_f			138		
Turn-On Energy	E_{on}			2.4		mJ
Turn-Off Energy	E_{off}			1.45		

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Diode Static Characteristics						
Diode Forward Voltage	V_F	I_F=15A, T_J=25℃		2.00	2.40	V
		I_F=15A, T_J=125℃		1.80		
		I_F=15A, T_J=150℃		1.70		
Diode Dynamic Characteristics						
Diode Forward Voltage	V_{FM}	I_F=15A		1.90		V
Reverse Recovery Current	I_{rr}	V_R=600V, I_F=15A, di_F/dt=-240A/μs, T_J=25℃		7.5		A
Reverse Recovery Charge	Q_{rr}			1.8		μC
Reverse Recovery Energy	E_{rec}			0.60		mJ
Reverse Recovery Current	I_{rr}	V_R=600V, I_F=15A, di_F/dt=-240A/μs, T_J=125℃		9.0		A
Reverse Recovery Charge	Q_{rr}			2.4		μC
Reverse Recovery Energy	E_{rec}			0.9		mJ
Reverse Recovery Current	I_{rr}	V_R=600V, I_F=15A, di_F/dt=-240A/μs, T_J=150℃		9.5		A
Reverse Recovery Charge	Q_{rr}			2.6		μC
Reverse Recovery Energy	E_{rec}			1.0		mJ

Curve Characteristics

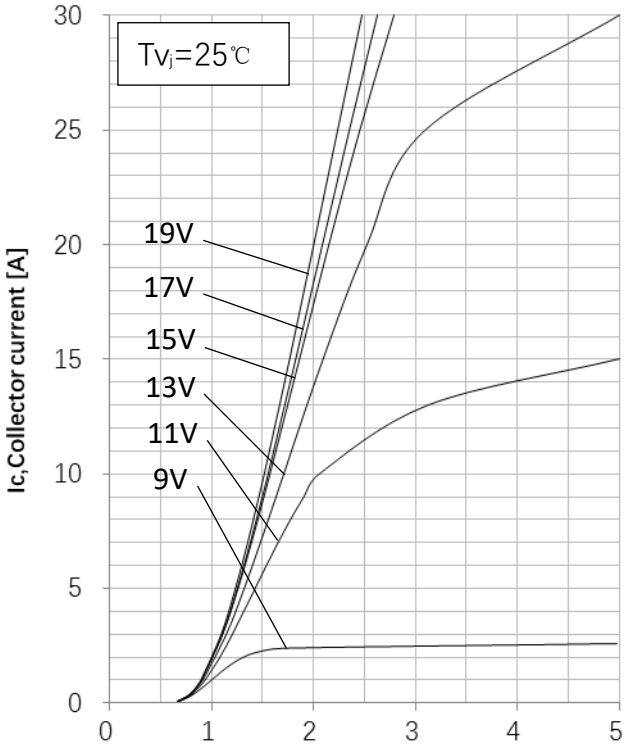


Fig1. Typical output characteristic

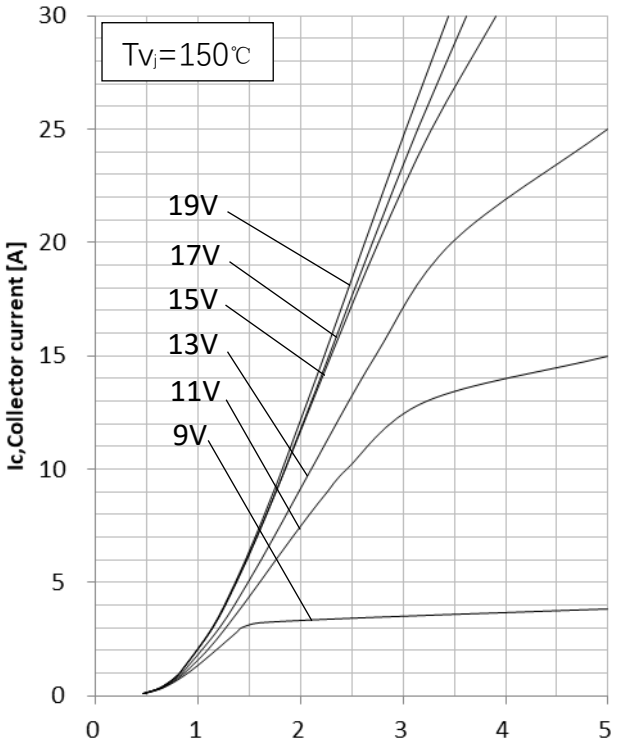


Fig2. Typical output characteristic

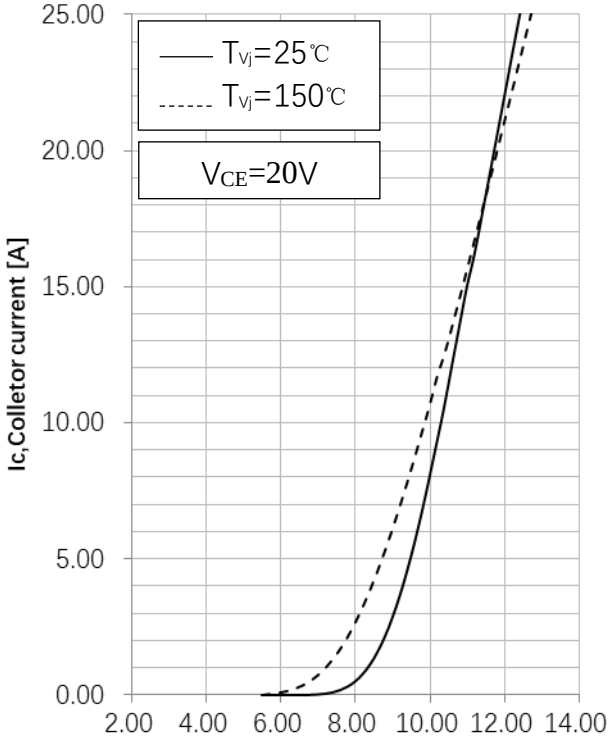


Fig3. Typical transfer characteristic

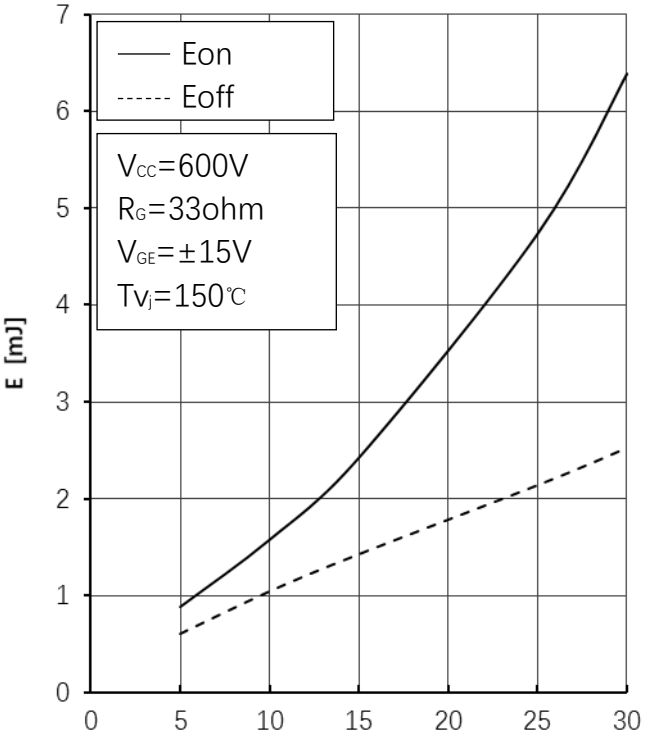


Fig4.IGBT Switching Loss vs.Ic

Curve Characteristics

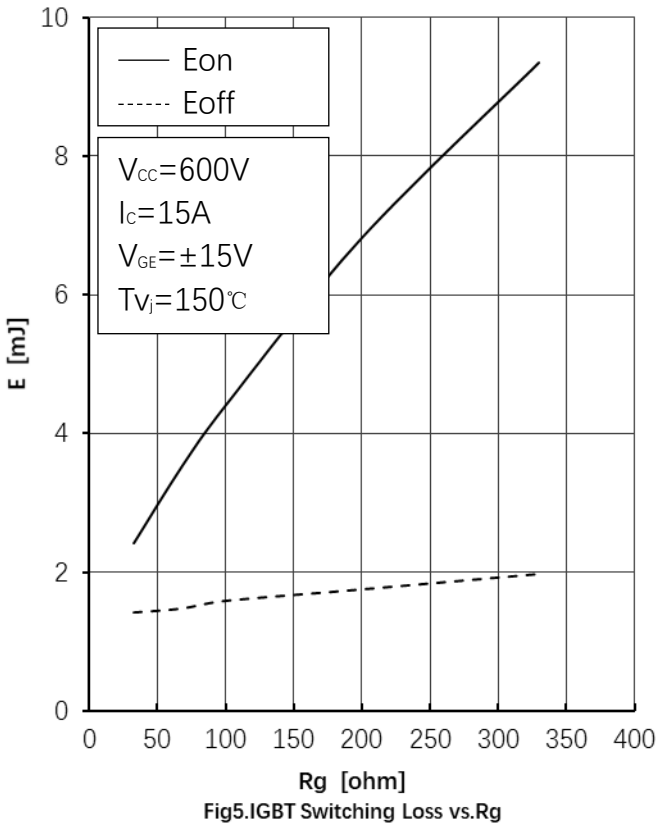


Fig5.IGBT Switching Loss vs.Rg

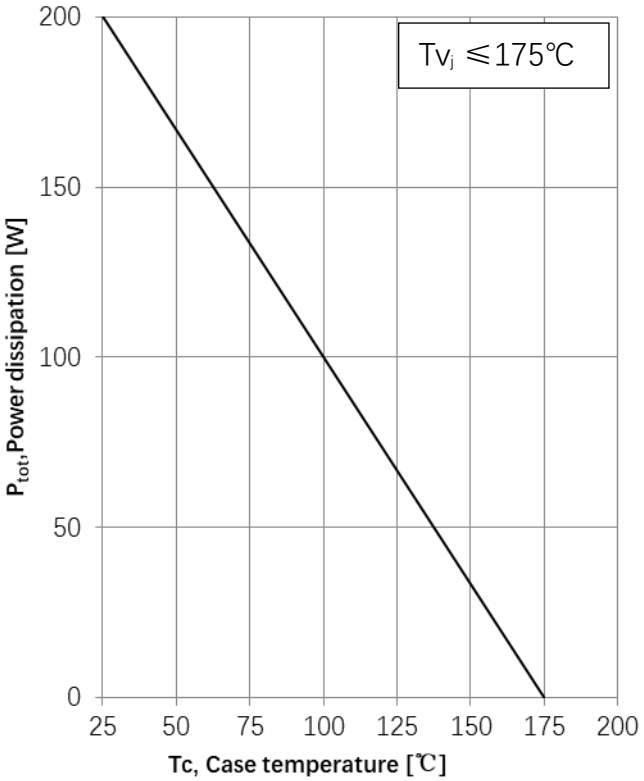


Fig6. Power dissipation as a function of case temperature

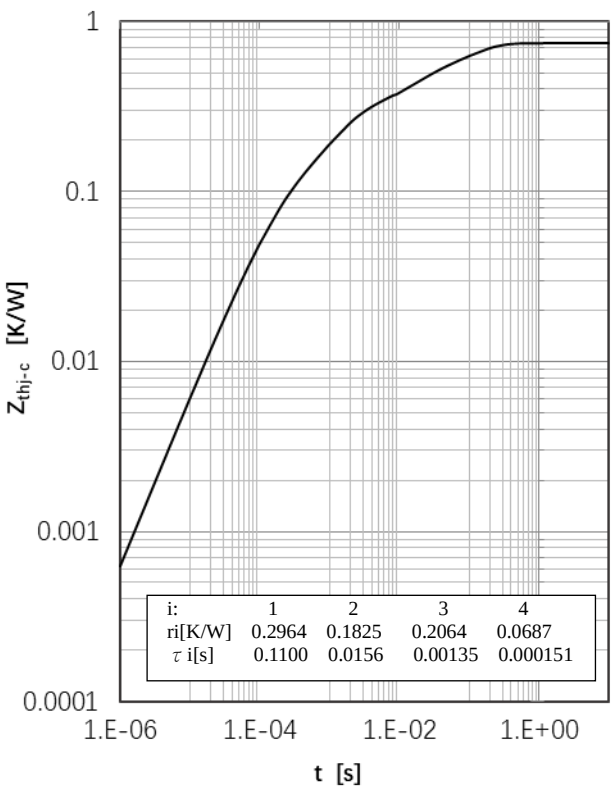


Fig 7. IGBT Transient Thermal Impedance

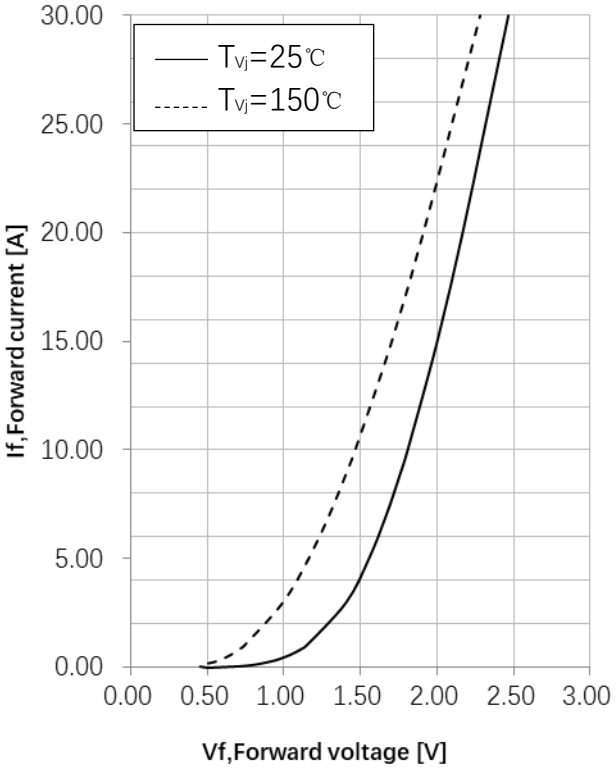


Fig8. diode forawrd current as a function of foraward voltage

Curve Characteristics

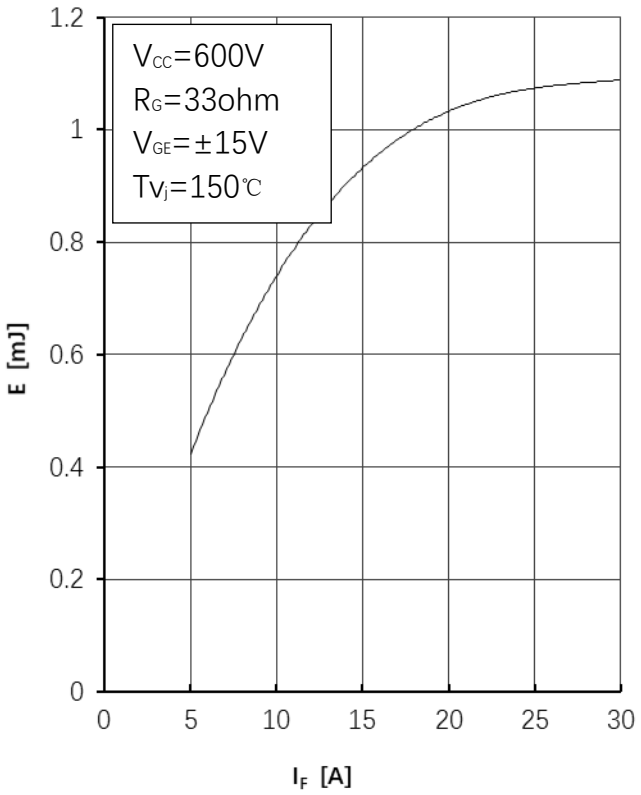


Fig9.Diode Switching Loss(Erec) vs.I_F

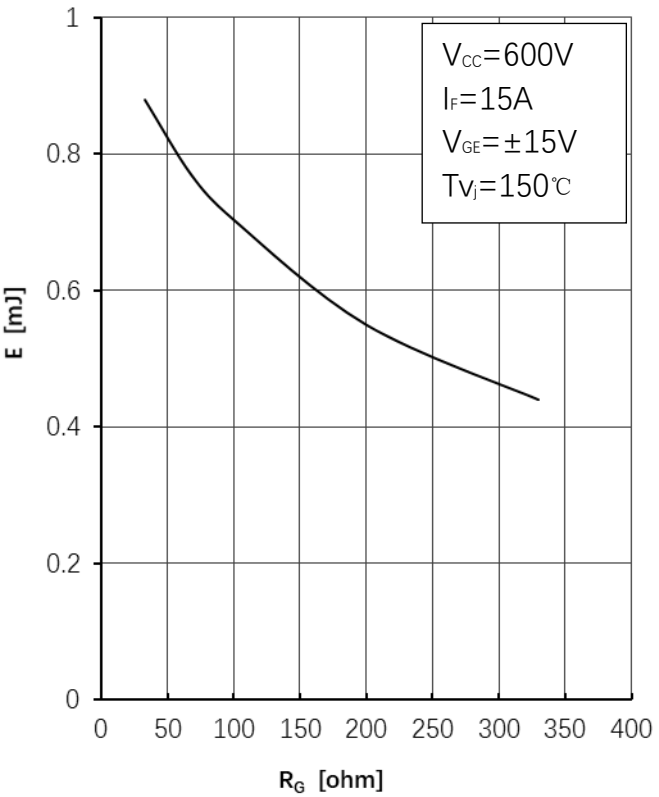


Fig10.Diode Switching Loss(Erec) vs.Rg

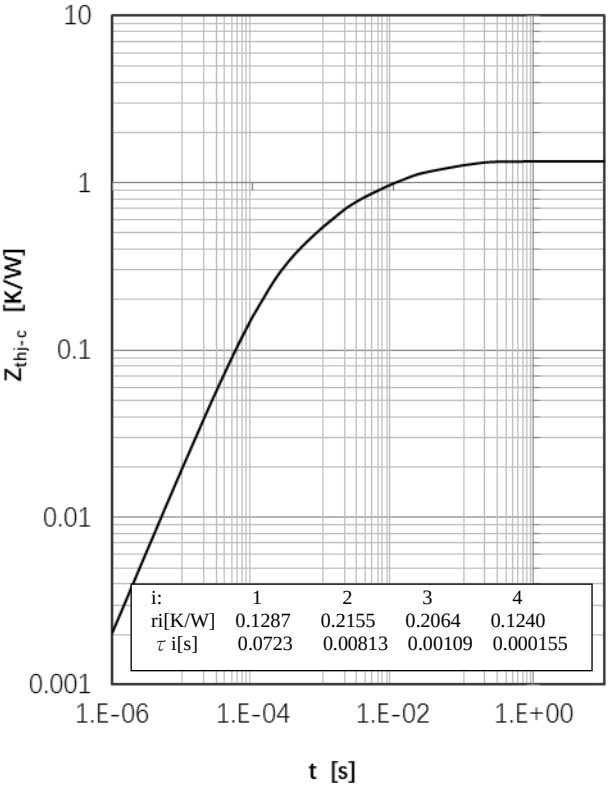


Fig11.Diode Transient Thermal Impedance

Ordering Information

Device	Packing
Part Number-BP	Tube: 30pcs/Tube, 1800pcs/Ctn

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