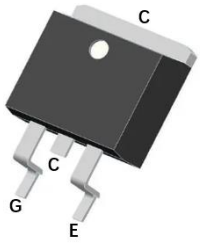
DGB10N65CTL0

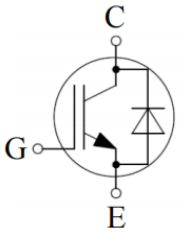
RoHS COMPLIANT

IGBT Discrete



V_{CE}	650	V
I_C	10	A
$V_{CE(SAT)}$ I_C=10A	1.40	V

Circuit



Applications

- Soft switching applications
- Air conditioning
- Motor drive inverter

Features

- High speed smooth switching device for hard & soft switching
- Maximum junction temperature 175℃
- Positive temperature coefficient
- High ruggedness, temperature stable

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	650	V
DC Collector Current, limited by T_{jmax} T_C= 25°C T_C= 100°C	I_C	 20 10	A
Diode Forward Current, limited by T_{jmax} T_C= 25°C T_C= 100°C	I_F	 20 10	A
Continuous Gate-Emitter Voltage	V_{GE}	±20	V
Transient Gate-Emitter Voltage (tp≤10μs,D<0.010)	V_{GE}	±30	V
Turn off Safe Operating Area V_{CE}≤ 600V, T_j≤ 150°C		40	A
Pulsed Collector Current, V_{GE}=15V, tp limited by T_{jmax}	I_{CM}	40	A
Short Circuit Withstand Time, VGE= 15V, VCE≤ 400V	Tsc	5	μs
Diode Pulsed Current, tp limited by T_{jmax}	I_{Fpuls}	40	A
Power Dissipation , Tj=175°C,Tc=25°C	P_{tot}	100	W

Operating Junction Temperature	T_j	-40...+175	°C
Storage Temperature	T_s	-55...+150	°C
Soldering Temperature, wave soldering 1.6mm (0.063in.) from case for 10s		260	°C

Electrical Characteristics of the IGBT（T_j= 25℃unless otherwise specified）:

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Collector-Emitter Breakdown Voltage	BV_{CES}	V_{GE}=0V, I_C=250μA	650		-	V
Gate Threshold Voltage	$V_{GE(th)}$	V_{GE}=V_{CE}, I_C=1mA	4.4	5.2	6.0	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE}=15V, I_C=10A T_j=25°C, T_j=125°C T_j=150°C		1.40 1.55 1.60	1.70	V
Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=650V, V_{GE}=0V T_j= 25°C, T_j=150°C			0.25 1.00	mA
Gate-Emitter Leakage Current	I_{GES}	V_{CE}= 0V, V_{GE}= ± 20V			±200	nA

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic						
Input Capacitance	C_{ies}	V_{CE}= 25V, V_{GE}= 0V, f = 1MHz	-	0.89	-	nF
Output capacitance	C_{oes}		-	0.04	-	
Reverse Transfer Capacitance	C_{res}		-	0.01	-	
Gate Charge	Q_G	V_{CC}=300V,I_C=10A, V_{GE}=15V	-	0.059	-	uC
Short circuit collector current	$I_{C(SC)}$	V_{GE}=15V,t_{SC}≤5us V_{CC}=400V, $T_{j,start}$=25°C	-	110	-	A

Electrical Characteristics of the Diode（T_j= 25℃unless otherwise specified）:

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Diode Forward Voltage	V_F	I_F= 10A T_j= 25°C, T_j= 125°C T_j= 150°C		1.70 1.50 1.40	2.20	V

Switching Characteristic, Inductive Load

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T_j= 25℃						
Turn-on Delay Time	$t_{d(on)}$	T_j=25°C V_{CC}= 300V, I_C=10A, V_{GE}=-5V~15V, Rg=51Ω	-	10	-	ns
Rise Time	t_r		-	26	-	ns
Turn-on Energy	E_{on}		-	0.36	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	68	-	ns
Fall Time	t_f		-	135	-	ns
Turn-off Energy	E_{off}		-	0.17	-	mJ
Dynamic , at T_j= 125℃						
Turn-on Delay Time	$t_{d(on)}$	T_j=125°C V_{CC}= 300V, I_C=10A, V_{GE}=-5V~15V, Rg=51Ω	-	14	-	ns
Rise Time	t_r		-	35	-	ns
Turn-on Energy	E_{on}		-	0.42	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	68	-	ns
Fall Time	t_f		-	162	-	ns
Turn-off Energy	E_{off}		-	0.29	-	mJ
Dynamic , at T_j= 150℃						
Turn-on Delay Time	$t_{d(on)}$	T_j=150°C V_{CC}= 300V, I_C=10A, V_{GE}=-5V~15V, Rg=51Ω	-	16	-	ns
Rise Time	t_r		-	41	-	ns
Turn-on Energy	E_{on}		-	0.46	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	69	-	ns
Fall Time	t_f		-	181	-	ns
Turn-off Energy	E_{off}		-	0.33	-	mJ

Electrical Characteristics of the DIODE

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T_j= 25℃						
Reverse Recovery Current	I_{rr}	I_F=10A, V_R=300V, -di/dt= 365A/μs,	-	6	-	A
Diode reverse recovery time	trr		-	176	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.12	-	uC
Reverse Recovery Energy	Erec		-	0.05	-	mJ
Dynamic , at Tj= 125℃						
Reverse Recovery Current	I_{rr}	I_F=10A, V_R=300V, -di/dt= 365A/μs,	-	7	-	A
Diode reverse recovery time	trr		-	189	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.48	-	uC
Reverse Recovery Energy	Erec		-	0.09	-	mJ
Dynamic , at Tj= 150℃						
Reverse Recovery Current	I_{rr}	I_F=10A, V_R=300V, -di/dt= 365A/μs,	-	8	-	A
Diode reverse recovery time	trr		-	195	-	ns
Reverse Recovery Charge	Q_{rr}		-	0.62	-	uC
Reverse Recovery Energy	Erec		-	0.11	-	mJ

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R_{th}(j-c)	1.5	K/W
Diode Thermal Resistance, Junction - Case	R_{th}(j-c)	2.0	K/W
Thermal Resistance, Junction - Ambient	R_{th}(j-a)	60	K/W

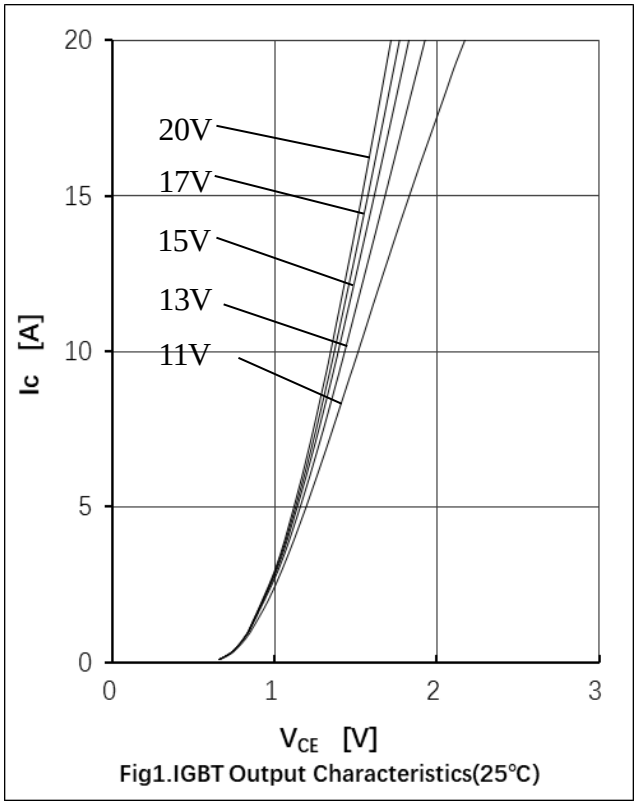


Fig1.IGBT Output Characteristics(25℃)

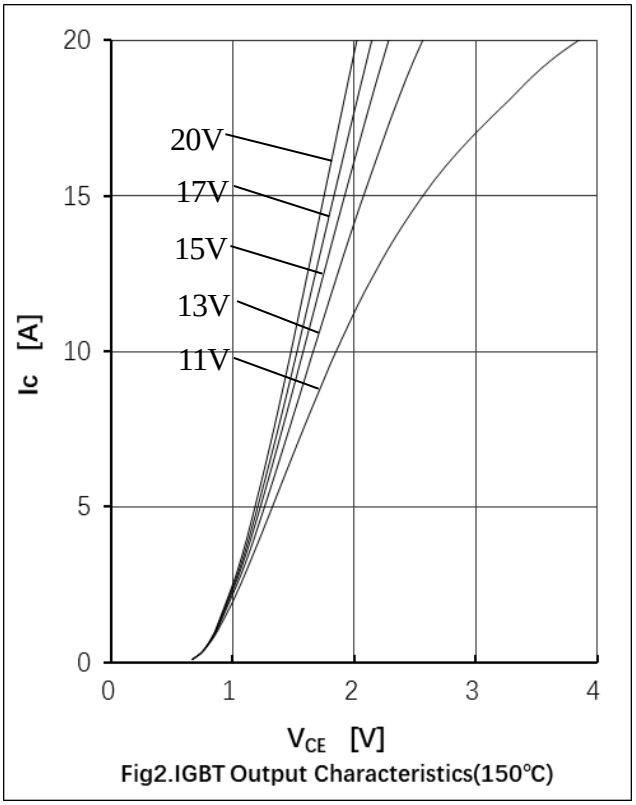


Fig2.IGBT Output Characteristics(150℃)

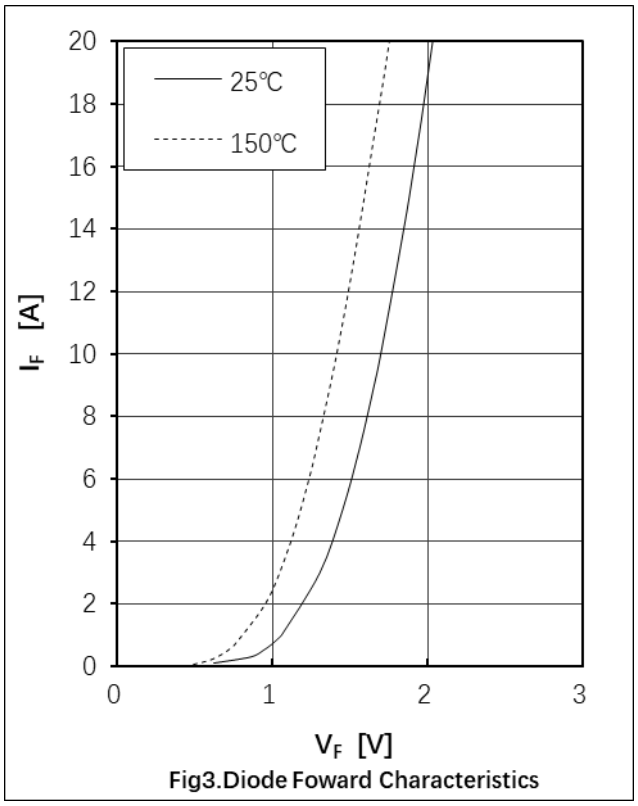


Fig3.Diode Foward Characteristics

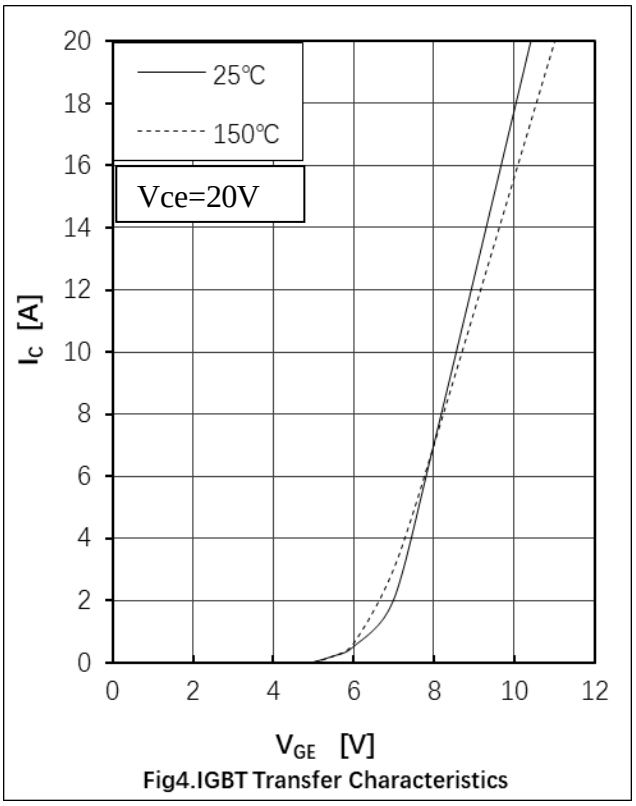


Fig4.IGBT Transfer Characteristics

Rg=51ohm

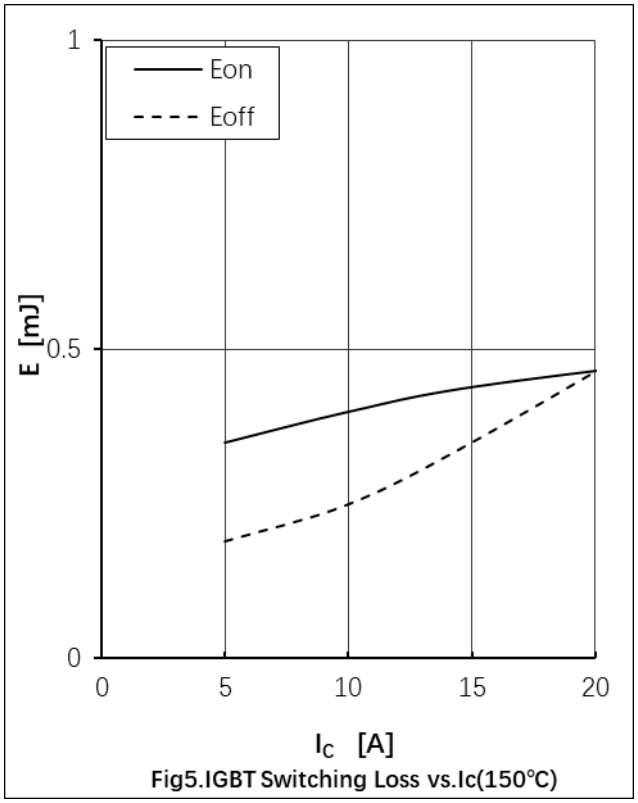


Fig5.IGBT Switching Loss vs.Ic(150℃)

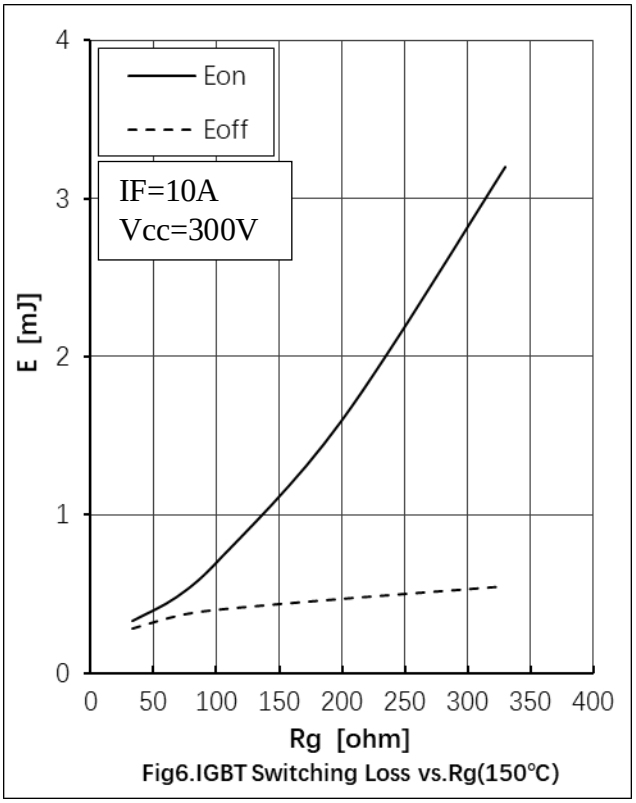


Fig6.IGBT Switching Loss vs.Rg(150℃)

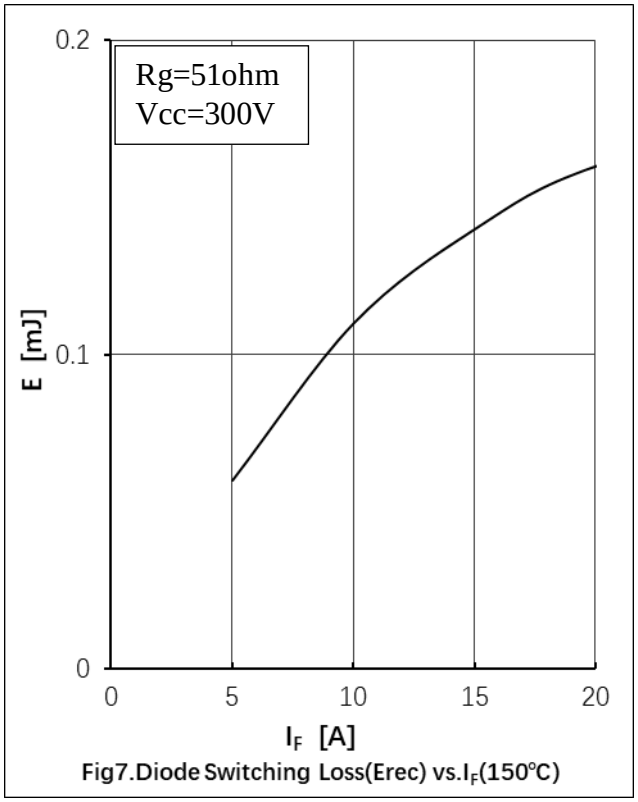


Fig7.Diode Switching Loss(Erec) vs.I_F(150℃)

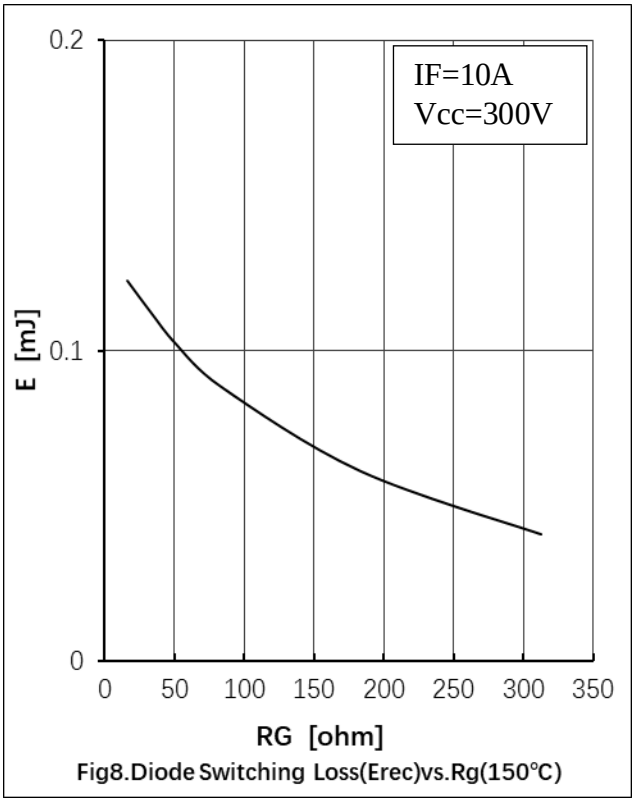


Fig8.Diode Switching Loss(Erec)vs.Rg(150℃)

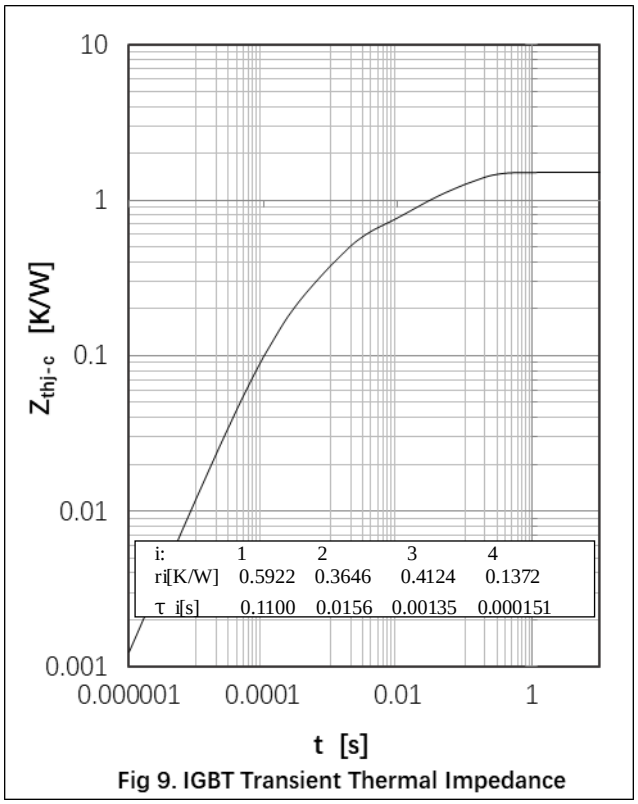


Fig 9. IGBT Transient Thermal Impedance

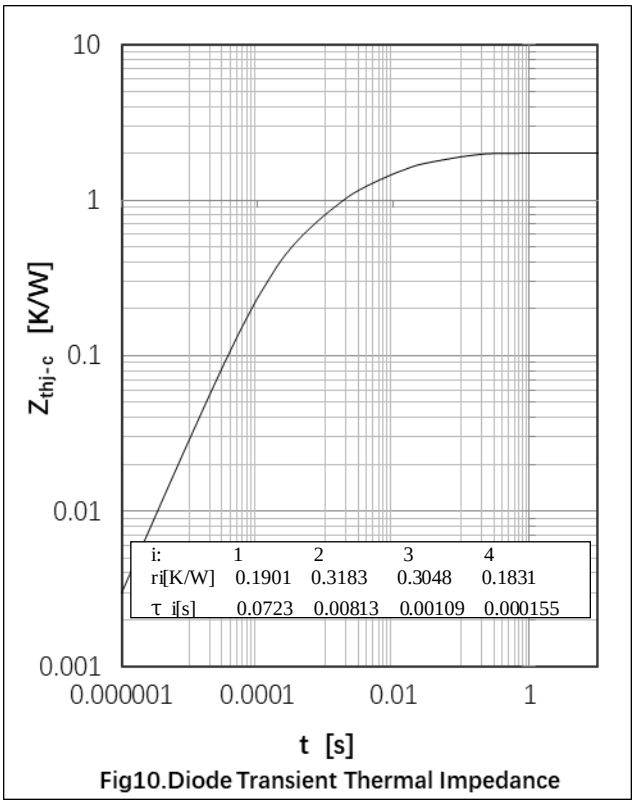
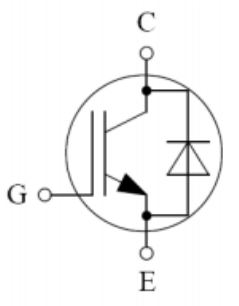


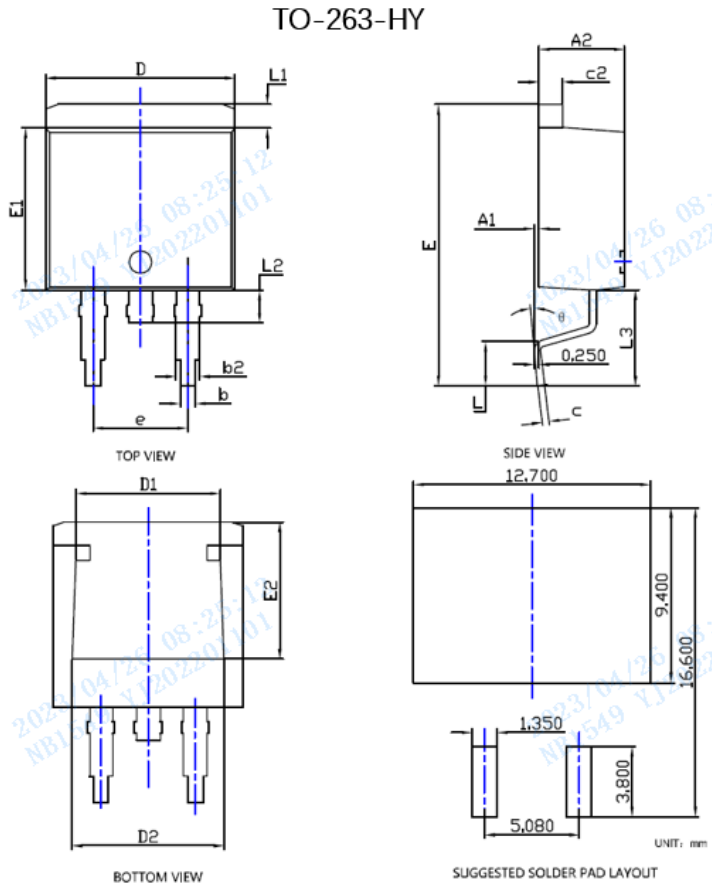
Fig10.Diode Transient Thermal Impedance

Circuit Diagram



Package Outline Information

CASE: TO 263



SYMBOL	DIMENSIONS					
	INCHES			Millimeter		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A1	0.000	---	0.010	0.000	---	0.250
A2	0.174	0.180	0.186	4.430	4.580	4.730
b	0.028	0.032	0.036	0.720	0.820	0.920
b2	0.046	0.050	0.054	1.180	1.280	1.380
c	0.013	0.015	0.018	0.330	0.390	0.450
c2	0.048	0.050	0.053	1.220	1.280	1.34
D	0.394	0.400	0.406	10.000	10.150	10.300
D1	0.295	0.307	0.319	7.500	7.800	8.100
D2	0.303	0.315	0.327	7.700	8.000	8.300
E	0.571	0.591	0.610	14.500	15.000	15.500
E1	0.337	0.341	0.348	8.550	8.700	8.850
E2	0.276	0.287	0.299	7.000	7.300	7.600
e	0.200BSC			5.080BSC		
L	0.070	---	0.110	1.790	---	2.790
L1	0.044	---	0.056	1.120	---	1.420
L2	0.030	---	0.070	0.770	---	1.770
L3	0.197REF			5.000REF		
θ	0°	---	8°	0°	---	8°

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

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