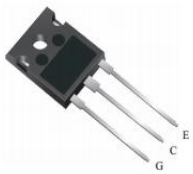
Insulated Gate Bipolar Transistor

General Description：

Using DongHai's proprietary Planar design and advanced FS technology, the 1200V FS IGBT offers superior conduction and switching performances, high avalanche ruggedness and easy parallel operation.

V_{CES}	1200	V
I_C	25	A
P_{tot} T_C=25℃）	278	W
$V_{CE(SAT)}$	2.0	V



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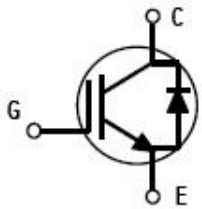
Features：

- FS Trench Technology, Positive temperature coefficient
- Low saturation voltage: $V_{CE(sat)}$, typ = 2.0V
  @ I_C =25A and T_C = 100°C
- Extremely enhanced avalanche capability

Applications：

Aircondition、Welding、UPS…



Absolute Maximum Ratings（Tc= 25℃ unless otherwise specified）：

Symbol	Parameter	Rating	Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate- Emitter Voltage	±20	V
I_C	Collector Current	50	A
	Collector Current @TC = 100 °C	25	
I_{CM}[a1]	Pulsed Collector Current	75	A
I_F	Diode Continuous Forward Current @TC = 100 °C	25	A
I_{FM}	Diode Maximum Forward Current	75	A
P_D	Power Dissipation @ TC = 25°C	278	W
	Power Dissipation @TC = 100 °C	111	
T_J	Operating Junction	150	℃
T_{stg}	Storage Temperature Range	-55～150	℃
T_L	Maximum Temperature for Soldering	300	℃

Thermal Characteristics

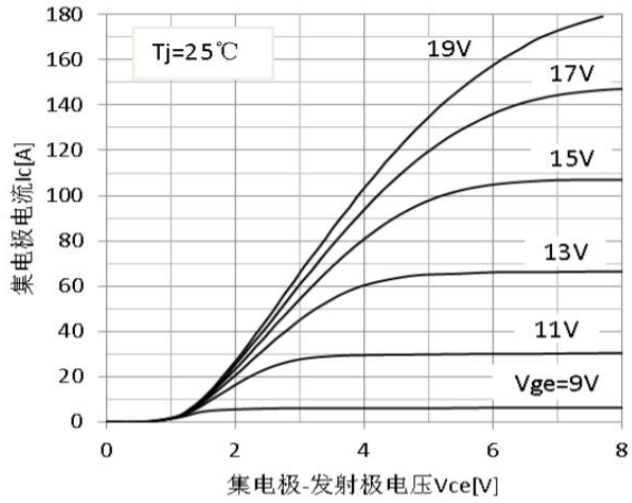
Symbol	Parameter	Typ.	Max.	Units
$R\theta_{JC}$	Thermal Resistance, Junction to case for IGBT	--	0.45	℃/W
$R\theta_{JA}$	Thermal Resistance, Junction to Ambient	--	52	℃/W

ELECTRICAL CHARACTERISTICS (Ta=25℃)

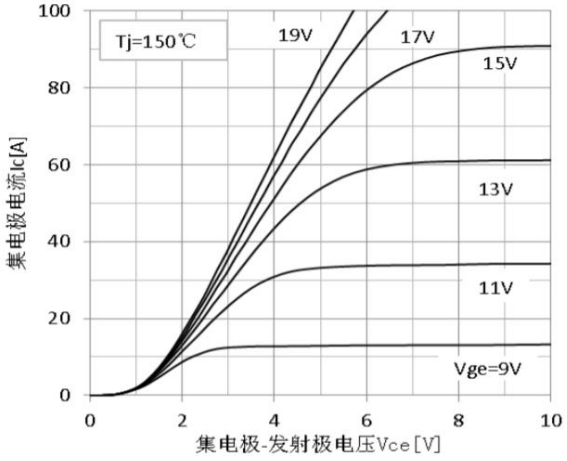
SYMBOL	CHARACTERISTIC	TEST CONDITION	Norm value			UNIT
			MIN	TYP	MAX	
Static						
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	V_{GE}=0V,I_{CE}=250uA	1200	--	--	V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V,V_{CE}=1200V	--	--	1.0	mA
$I_{GES(F)}$	Gate to Emitter Forward Leakage	V_{GE}=+20V	--	--	+250	nA
$I_{GES(R)}$	Gate to Source Reverse Leakage	V_{GE} =-20V	--	--	-250	nA
ON Characteristics						
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=25A ,V_{GE}=15V	--	2.0	2.5	V
$V_{GE(th)}$	Gate Threshold Voltage	I_C=250uA ,V_{CE}=V_{GE}	4.5	5.8	7.0	V
pulse width tp≤380μs,δ≤2%						
Dynamic characteristics						
C_{ies}	Input Capacitance	V_{CE}=30V,V_{GE}=0V f=1MHz	--	1914	--	pF
C_{oes}	Output Capacitance		--	77	--	
C_{res}	Reverse Transfer Capacitance		--	40	--	
Switching characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{CE}=600V,I_C=25A, R_g=10Ω,V_{GE}=15V, Inductive Load,Tc=25℃.	--	48	--	ns
t_r	Rise Time		--	50	--	
$t_{d(off)}$	Turn-Off Delay Time		--	200	--	
t_f	Fall Time		--	35	--	
E_{on}	Turn-On Switching Loss		--	2.7	--	mJ
E_{off}	Turn-Off Switching Loss		--	0.8	--	
E_{ts}	Total Switching Loss		--	3.5	--	
Q_g	Total Gate Charge	V_{CE}=960V,I_C=25A, V_{GE}=15V,	--	141.2	--	nC
Q_{ge}	Gate to Emitter Charge		--	22.2	--	
Q_{gc}	Gate to Collector Charge		--	77.6	--	
Characteristics of anti parallel diode						
V_F	Diode Forward Voltage	I_F=25A	--	2.7	3.2	V

[a1]: Repetitive rating; pulse width limited by maximum junction temperature

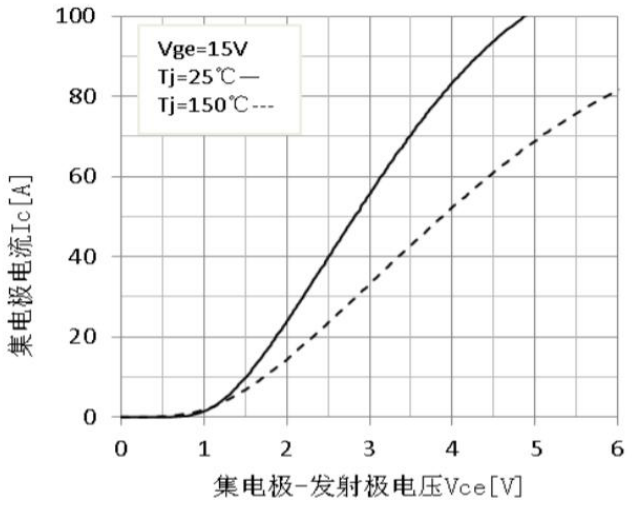
Typical characteristics diagrams



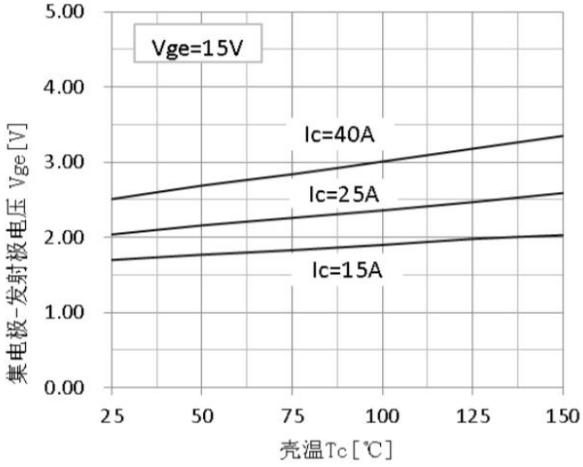
Typical Output Characteristics



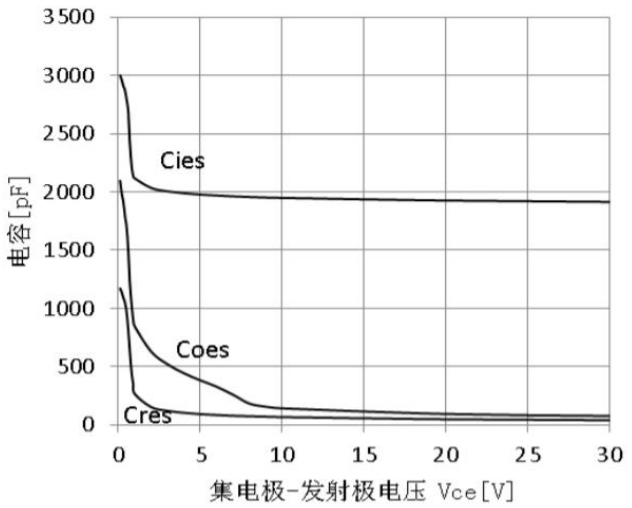
Typical Output Characteristics



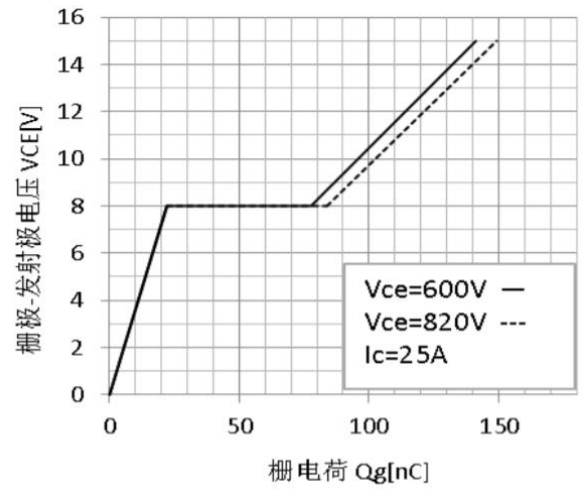
Typical Saturation Voltage Characteristice



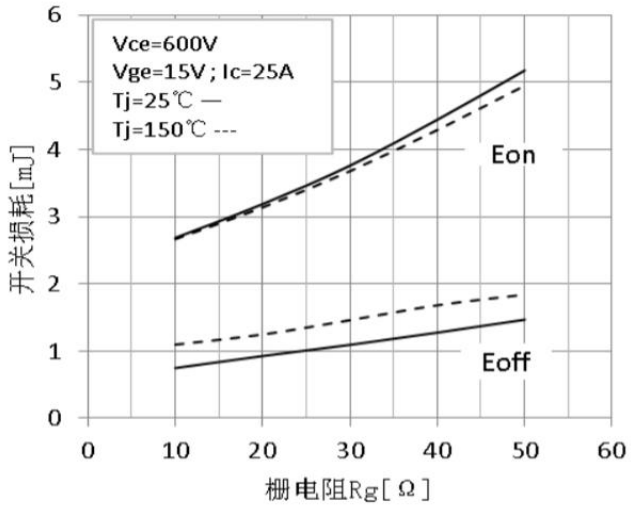
Saturation Voltage vs Case Temperature at Variant Current Level



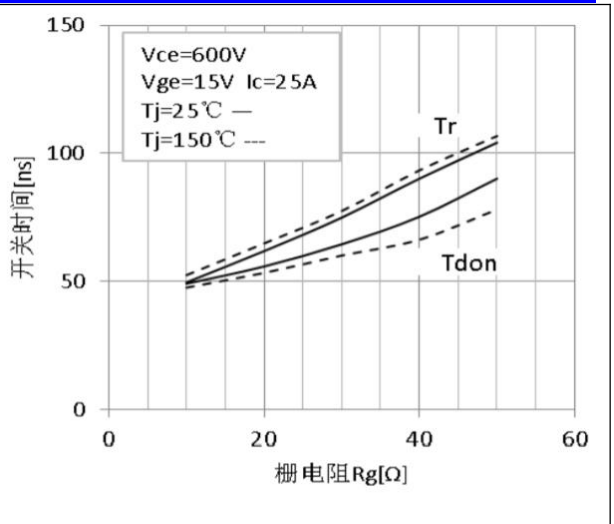
Capacitance Characteristics



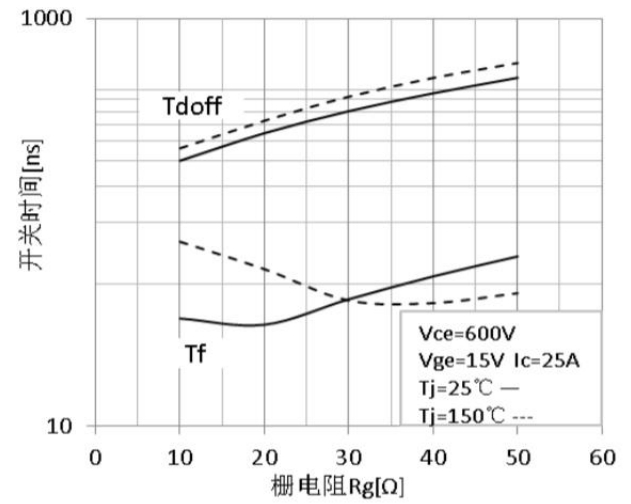
Gate charge Characteristice



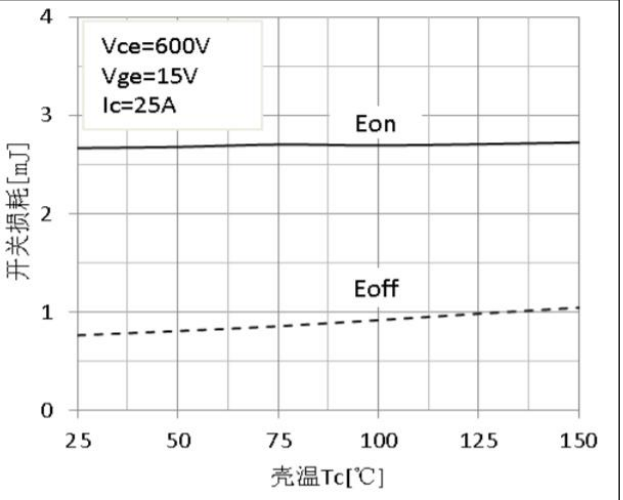
Switching Loss vs Case Temperature at Variant Current Level



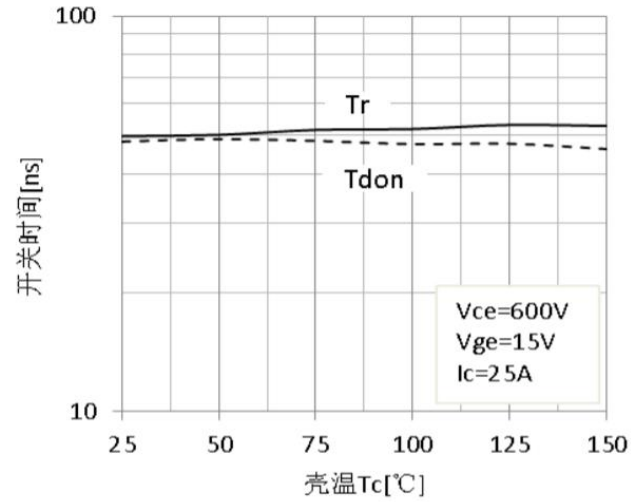
Turn-on Characteristics vs,Gate Resistance



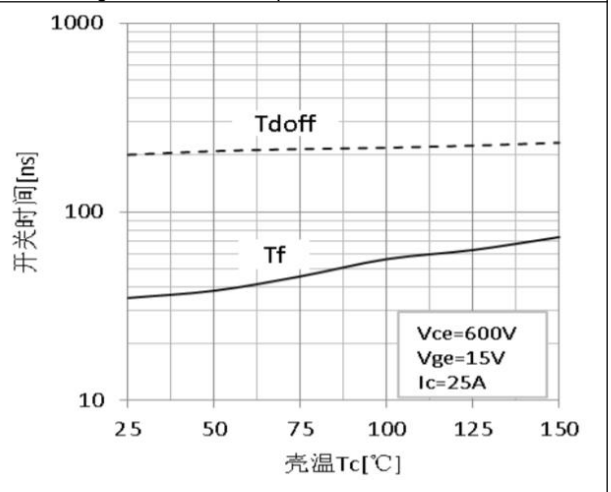
Turn-off Characteristics vs,Gate Resistance



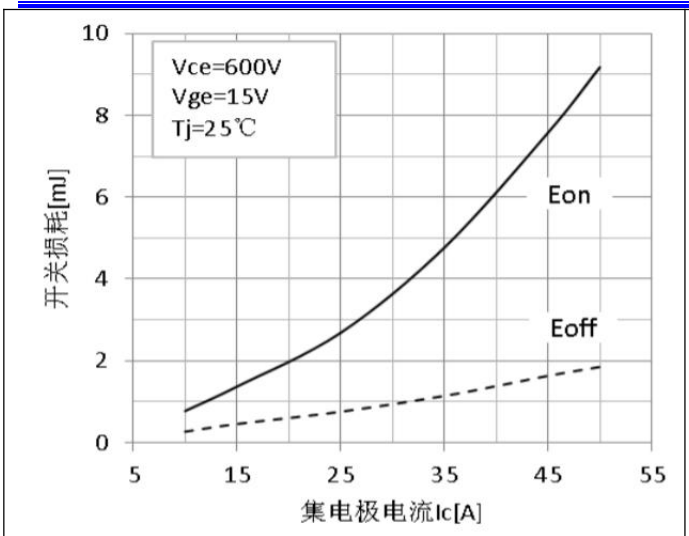
Switching Loss vs Case Temperature at Variant Current Leve



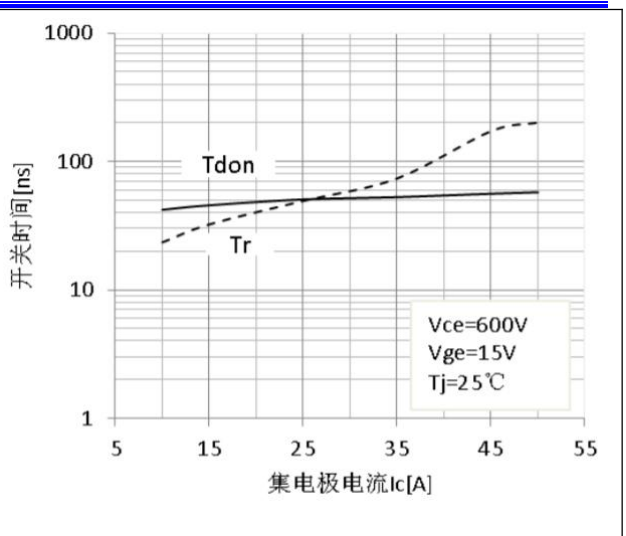
Turn-on Characteristics vs Case Temperature at Variant Current Leve



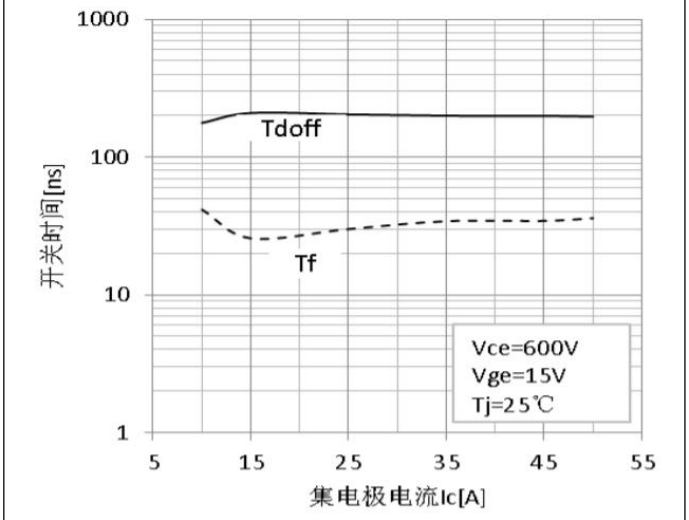
Turn-off Characteristice vs Case Temperature at Variant Current Leve



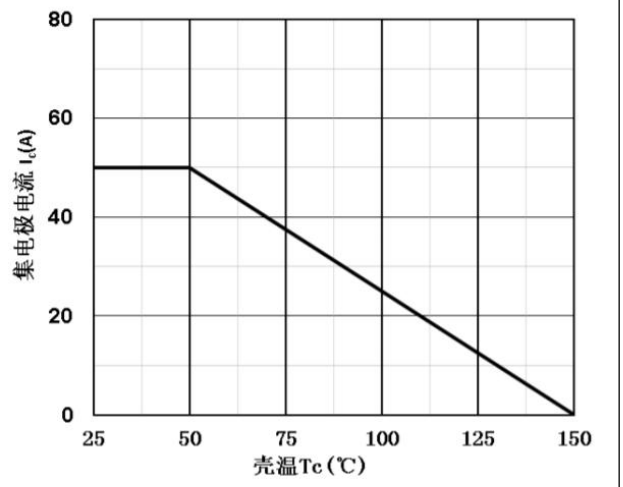
Switching Loss vs Gate Resistance



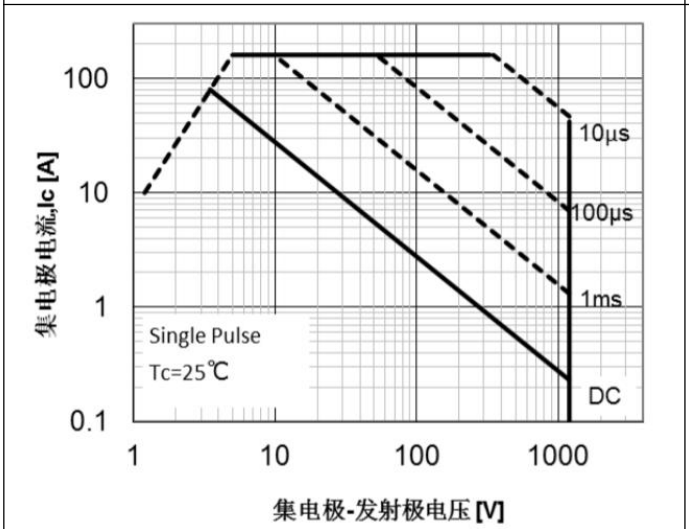
Turn-on Characteristics vs,Gate Resistance



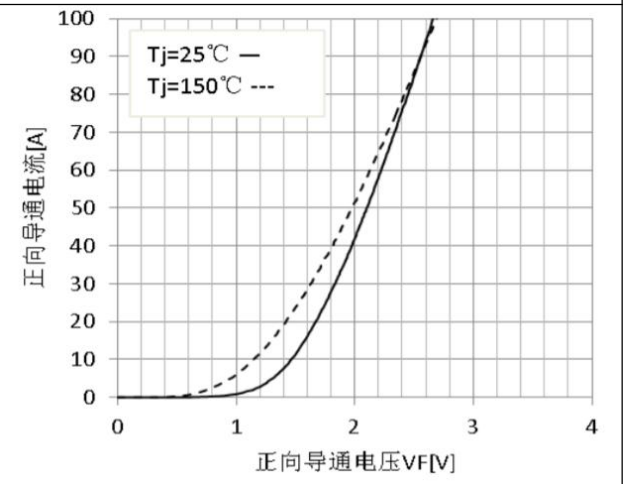
Turn-off Characteristice vs Collector Current



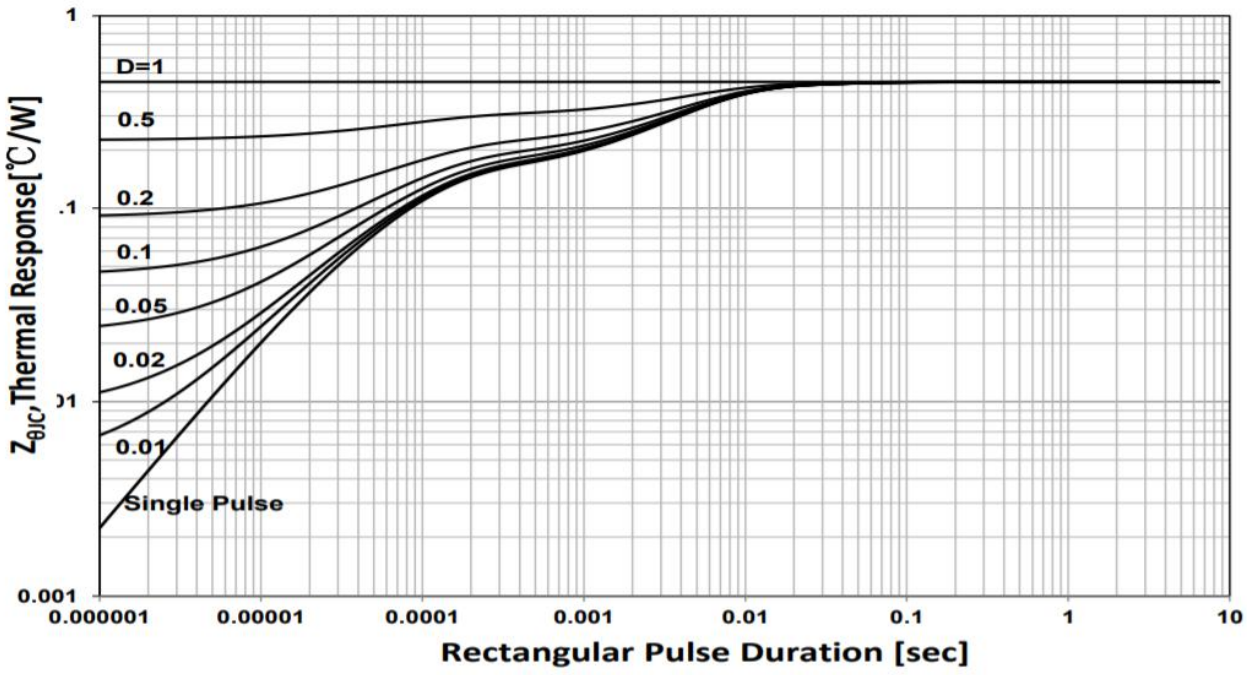
Temperature characteristics of collector current



SOA Characteristics

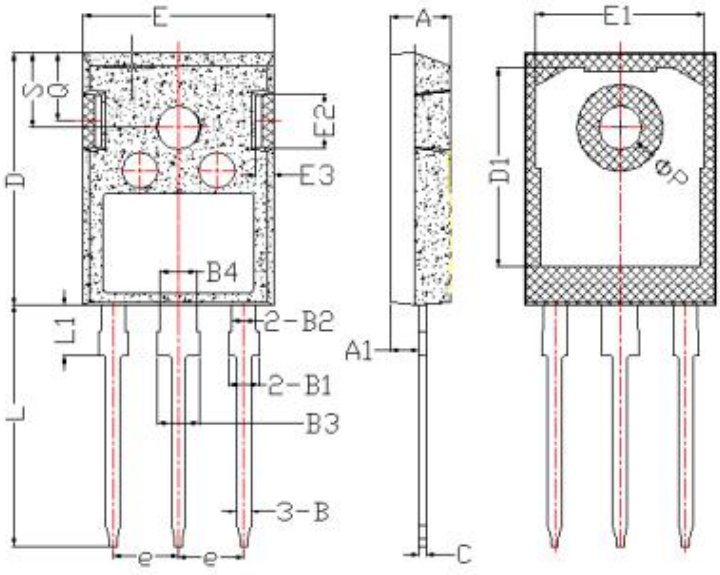


Forward Characteristics



Transient Thermal Impedance

Package Information



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Items	Values(mm)	
	MIN	MAX
A	4.6	5.2
A1	2.2	2.6
B	0.9	1.4
B1	1.75	2.35
B2	1.75	2.15
B3	2.8	3.35
B4	2.8	3.15
C	0.5	0.7
D	20.60	21.30
D1	16	18
E	15.5	16.10
E1	13	14.7
E2	3.80	5.3
E3	0.8	2.60
e	5.2	5.7
L	19	20.5
L1	3.9	4.6
ΦP	3.3	3.70
Q	5.2	6.00
S	5.8	6.6