

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.

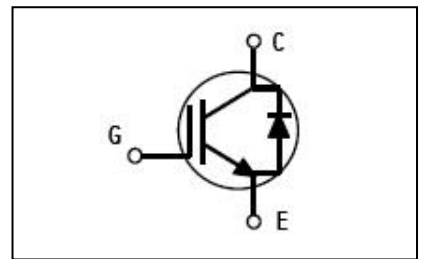
Features:

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

Applications:

Aircondition、Welding、UPS...

V_{CES}	1200	V
I_C	25	A
P_{tot} ($T_C = 25^\circ C$)	278	W
$V_{CE(sat)}$	2.0	V



Absolute Maximum Ratings ($T_C = 25^\circ C$ 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 @ $T_C = 100^\circ C$	25	
I_{CM}^{a1}	Pulsed Collector Current	75	A
I_F	Diode Continuous Forward Current @ $T_C = 100^\circ C$	25	A
I_{FM}	Diode Maximum Forward Current	75	A
P_D	Power Dissipation @ $T_C = 25^\circ C$	278	W
	Power Dissipation @ $T_C = 100^\circ C$	111	
T_J	Maximum Temperature for Soldering	150	$^\circ C$
T_{stg}	Operating Junction and Storage Temperature Range	-55~150	$^\circ C$
T_L	Maximum Temperature for Soldering	300	$^\circ C$

Thermal Characteristics

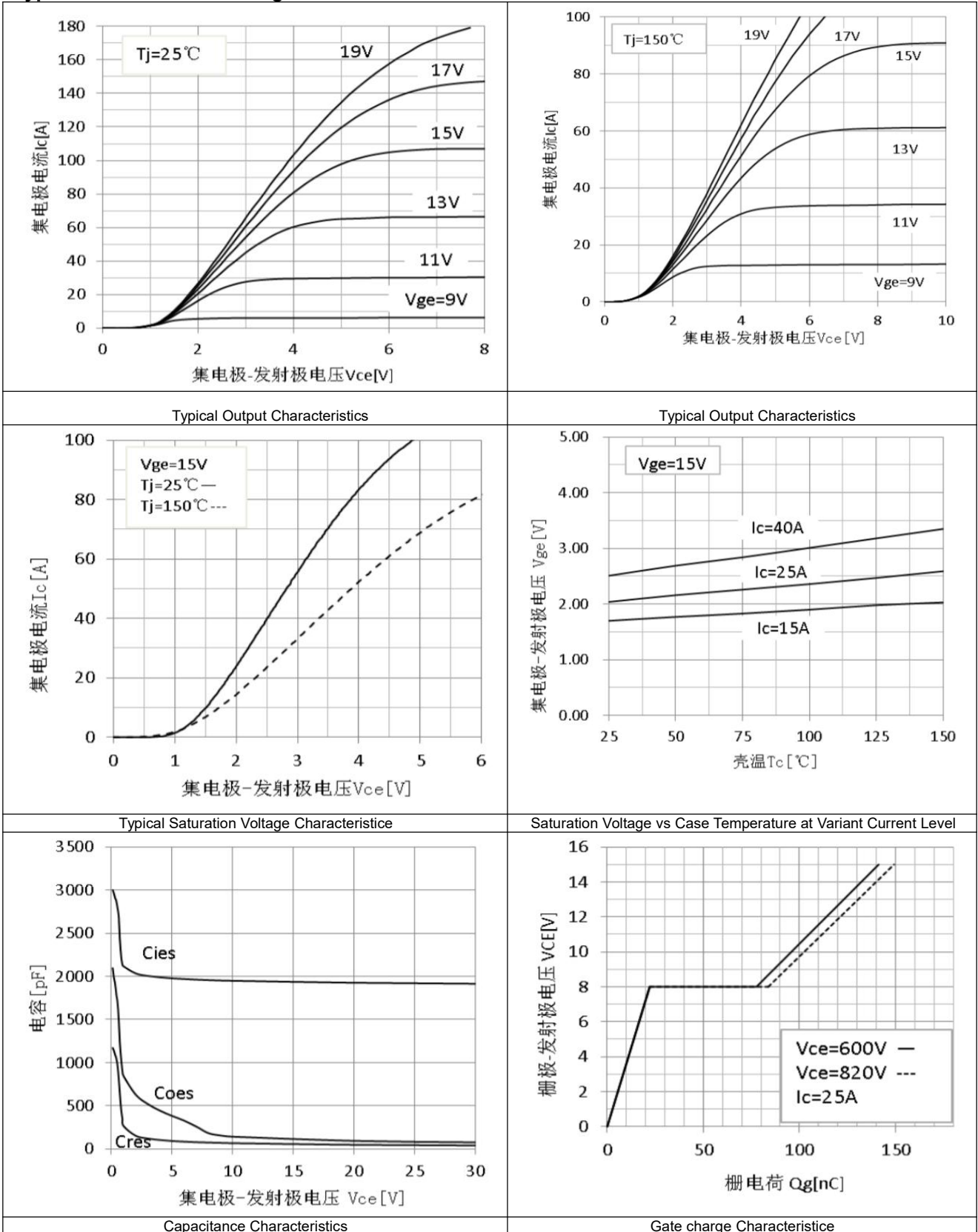
Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to case for IGBT	--	0.45	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	--	52	$^\circ C/W$

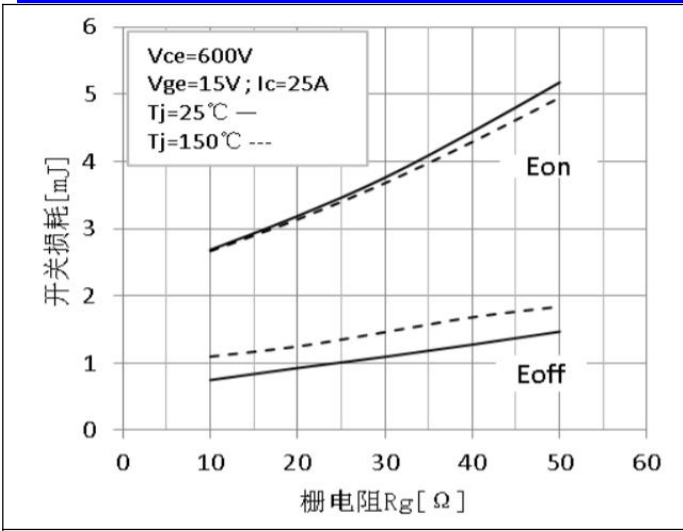
ELECTRICAL CHARACTERISTICS (Ta=25°C)

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, T _c =25°C.	--	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

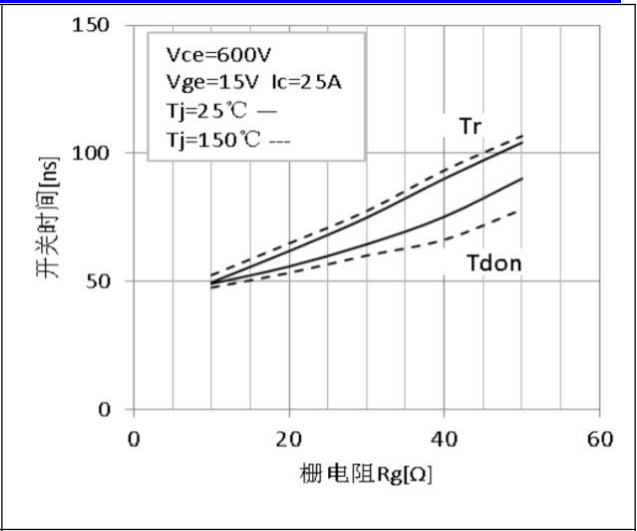
^{a1}: Repetitive rating; pulse width limited by maximum junction temperature

Typical characteristics diagrams

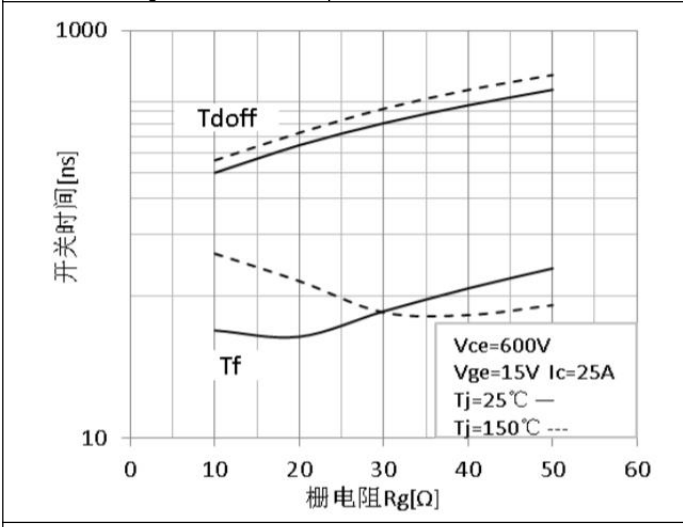




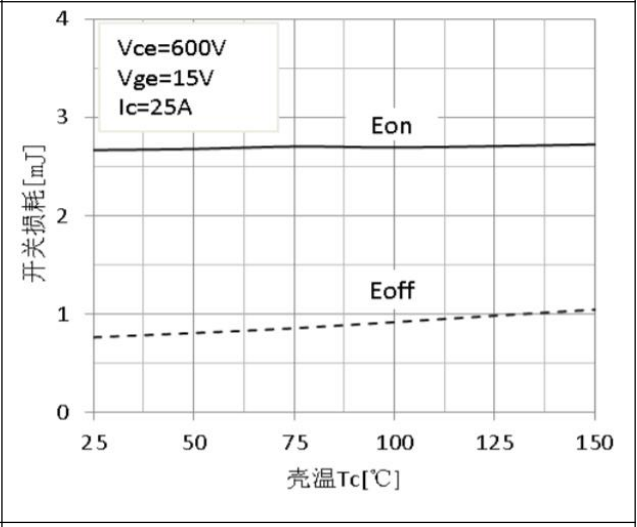
Switching Loss vs Case Temperature at Variant Current Level



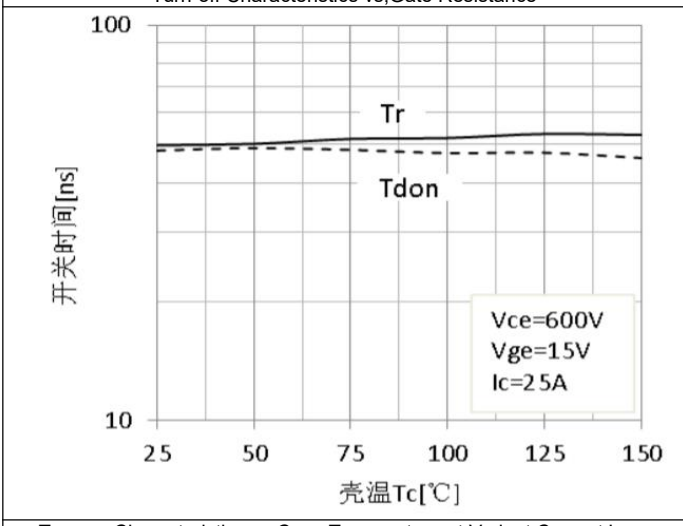
Turn-on Characteristics vs, Gate Resistance



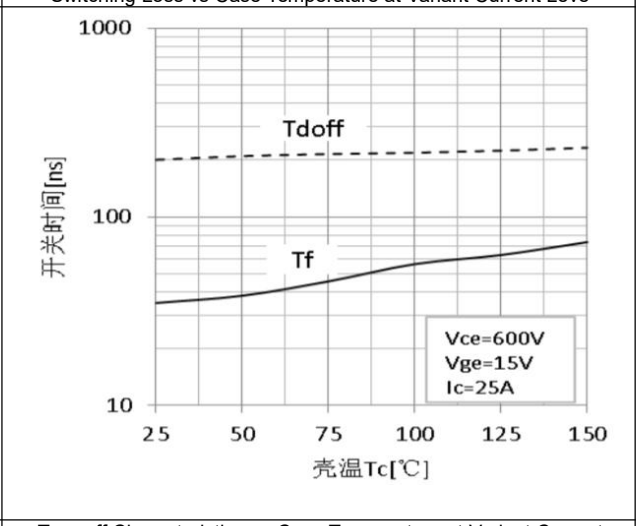
Turn-off Characteristics vs, Gate Resistance



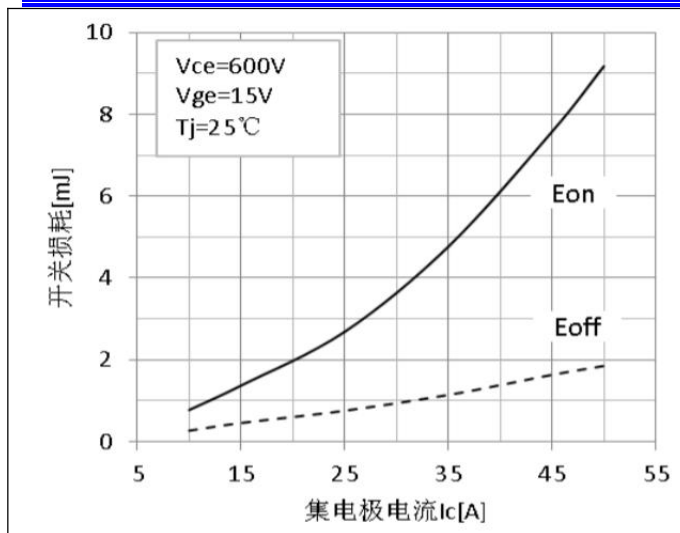
Switching Loss vs Case Temperature at Variant Current Level



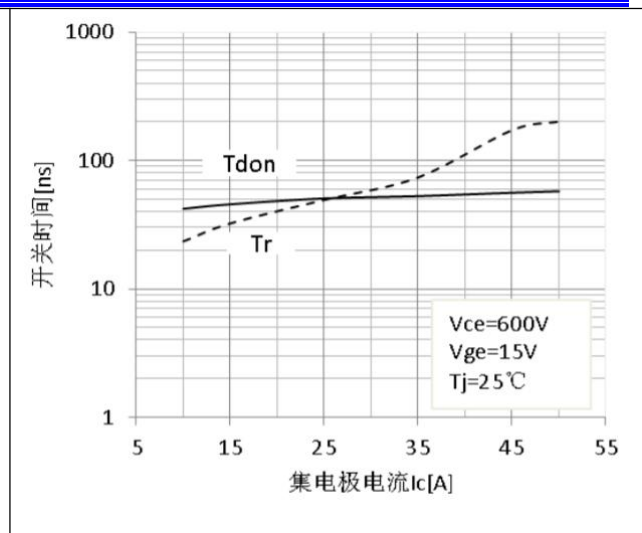
Turn-on Characteristics vs Case Temperature at Variant Current Level



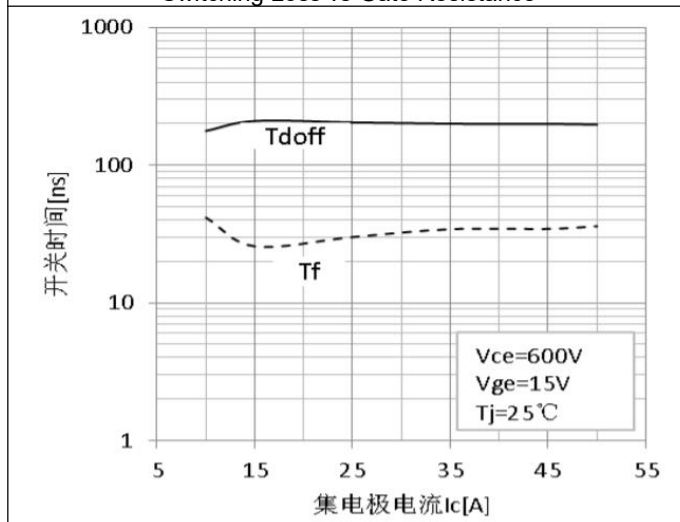
Turn-off Characteristic vs Case Temperature at Variant Current Level



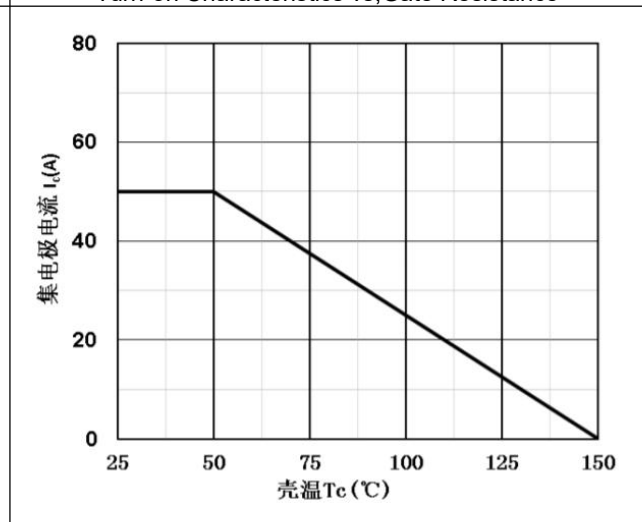
Switching Loss vs Gate Resistance



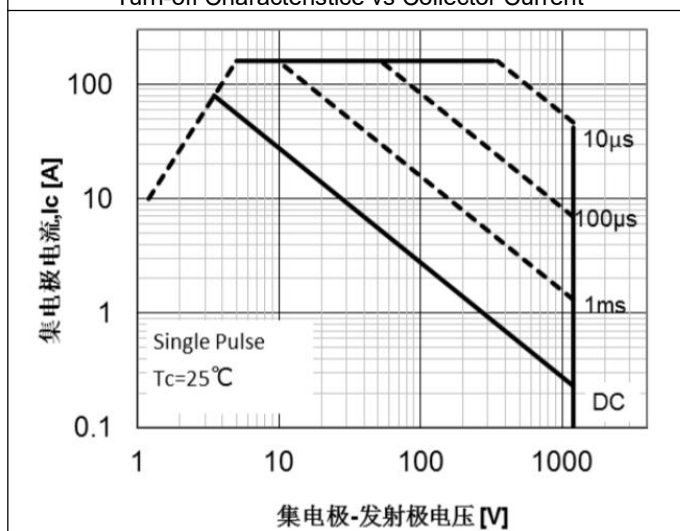
Turn-on Characteristics vs Gate Resistance



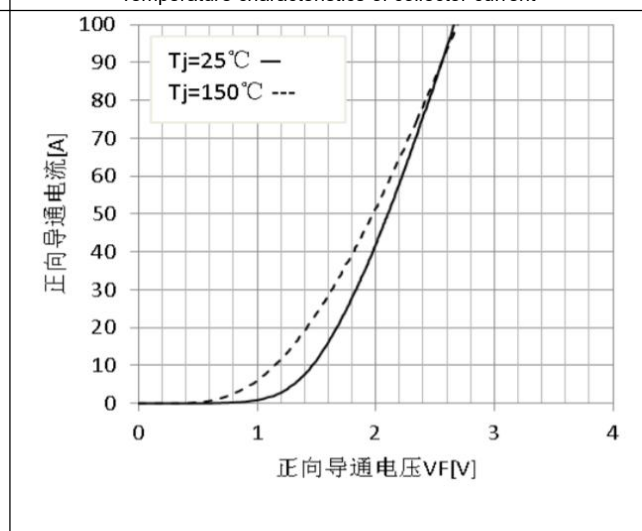
Turn-off Characteristic vs Collector Current



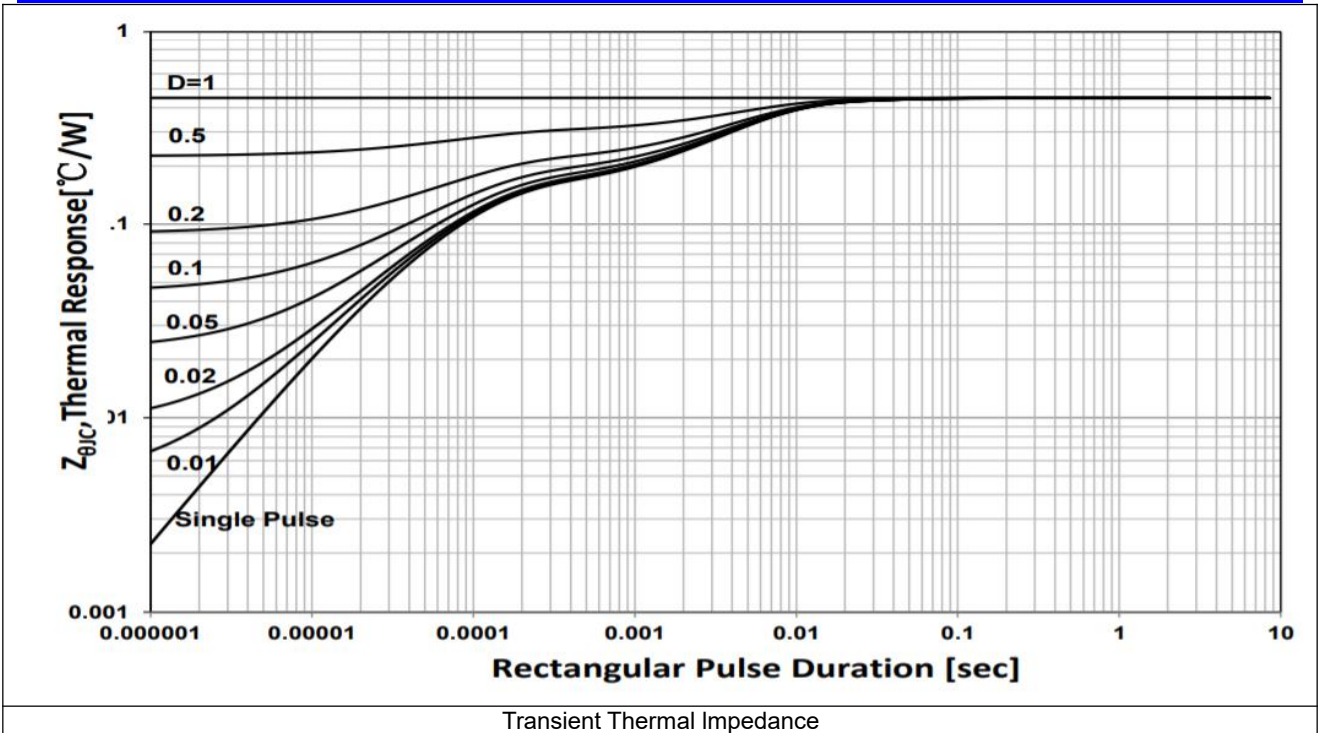
Temperature characteristics of collector current



SOA Characteristics

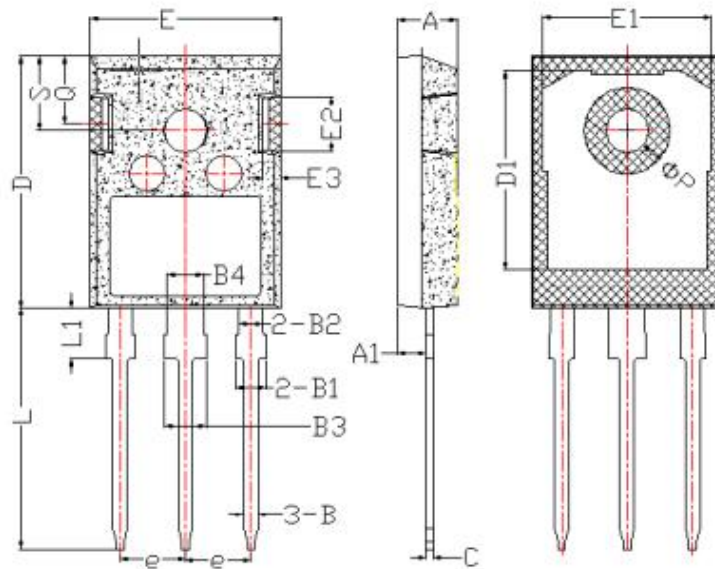


Forward Characteristics



Transient Thermal Impedance

Package Information



TO-247 封装

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