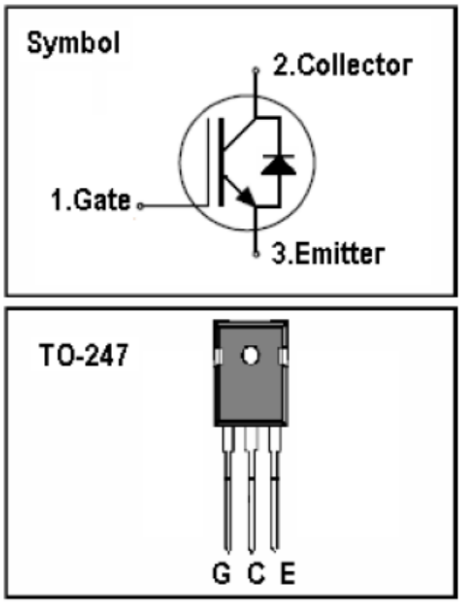
GENERAL DESCRIPTON

NPT IGBTs offer lower losses and higher energy efficiency for application such as IH (induction heating), UPS, general inverter and other soft switching applications.



FEATURES

- 1200V,25A
- $V_{CE(sat)(typ.)}$=2.2V@V_{GE}=15V,I_C=25A
- High speed switching
- Higher system efficiency
- Soft current turn-off waveforms
- Square RBSOA using NPT technology

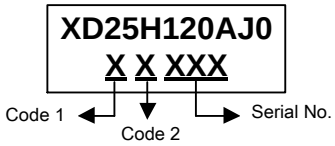
Ordering Information

XD25H120AJ0 □ □

Package Code	RoHS Code
S: TO-247	G: Green (Halogen Free) Device L: PB Free Device

Marking Information

TO-247



Code 1	8	9	A	B		G	H	J	K
Year	2018	2019	2020	2021	• • •	2026	2027	2028	2029
Code 2	1	2	3	4		9	A	B	C
Month	Jan.	Feb.	Mar.	Apr.		Sep.	Oct.	Nov.	Dec.

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate- Emitter Voltage	±30	V
I_C	Continuous Collector Current (T_C=25 ℃)	45	A
	Continuous Collector Current (T_C=100℃)	25	A
I_{CM}	Pulsed Collector Current (Note 1)	80	A
I_F	Diode Continuous Forward Current (T_C=100 ℃)	25	A
I_{FM}	Diode Maximum Forward Current (Note 1)	60	A
t_{sc}	Short Circuit Withstand Time	10	us
P_D	Maximum Power Dissipation (T_C=25 ℃)	220	W
	Maximum Power Dissipation (T_C=100℃)	100	W
T_J	Operating Junction Temperature Range	-55 to 150	℃
T_{STG}	Storage Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to case for IGBT	0.45	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction to case for Diode	0.85	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	40	℃/W

Electrical Characteristics (T_c= 25℃ unless otherwise noted.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CES}	Collector-Emitter Breakdown Voltage	V_{GE}= 0V, I_C= 250uA	1200	---	---	V
I_{CES}	Collector-Emitter Leakage Current	V_{CE}= 1200V, V_{GE}= 0V	---	---	250	uA
I_{GES}	Gate Leakage Current, Forward	V_{GE}=30V, V_{CE}= 0V	---	---	100	nA
	Gate Leakage Current, Reverse	V_{GE}= -30V, V_{CE}= 0V	---	---	-100	nA
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE}= V_{CE}, I_C= 250uA	4.5	-5.0	5.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C= 25A	--	2.2	2.5	V
Qg	Total Gate Charge	V_{CC}=960V V_{GE}=15V I_C=25A	---	130	---	nC
Qge	Gate-Emitter Charge		---	30	---	nC
Qgc	Gate-Collector Charge		---	70	---	nC
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V V_{GE}=15V I_C=25A R_G=10Ω Inductive Load T_C=25 ℃	---	22	---	nS
t_r	Turn-on Rise Time		--	35	--	nS
$t_{d(off)}$	Turn-off Delay Time		---	290	---	nS
t_f	Turn-off Fall Time		---	170	---	nS
E_{on}	Turn-on Switching Loss		---	2.2	---	mJ
E_{off}	Turn-off Switching Loss		--	1.4	--	mJ
E_{ts}	Total Switching Loss		---	3.6	---	mJ
C_{ies}	Input Capacitance	V_{CE}=25V V_{GE}=0V f = 1MHz	---	1250	---	pF
C_{oes}	Output Capacitance		---	210	---	pF
C_{res}	Reverse Transfer Capacitance		---	150	---	pF
R_{Gint}	Integrated gate resistor			3.8		Ω

Diode Characteristics of Diode (Tc=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	I_F=25A	---	2.3	2.5	V
t_{rr}	Diode Reverse Recovery Time	V_{CE} = 600V I_F= 25A dIF/dt = 500A/us	---	190	---	ns
I_{rr}	Diode peak Reverse Recovery Current		---	20	---	A
Q_{rr}	Diode Reverse Recovery Charge		---	1600	---	nC

Notes：

1. Repetitive Rating: Pulse width limited by maximum junction temperature

Typical Characteristics

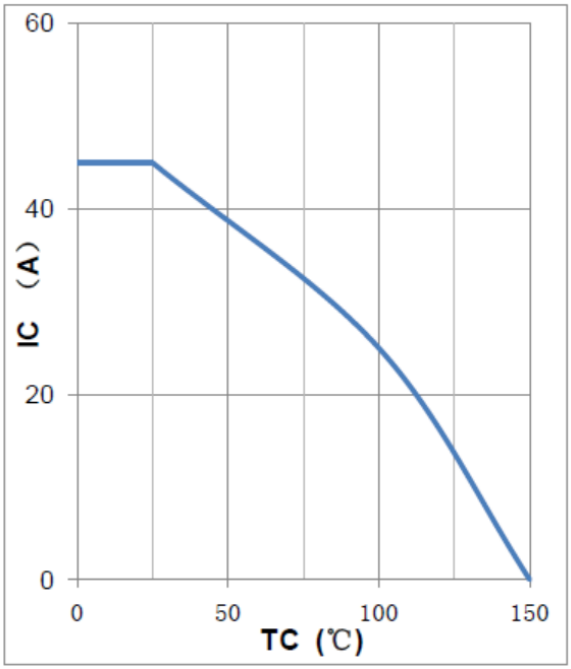


Fig.1 maximum DC collector current VS. case temperature

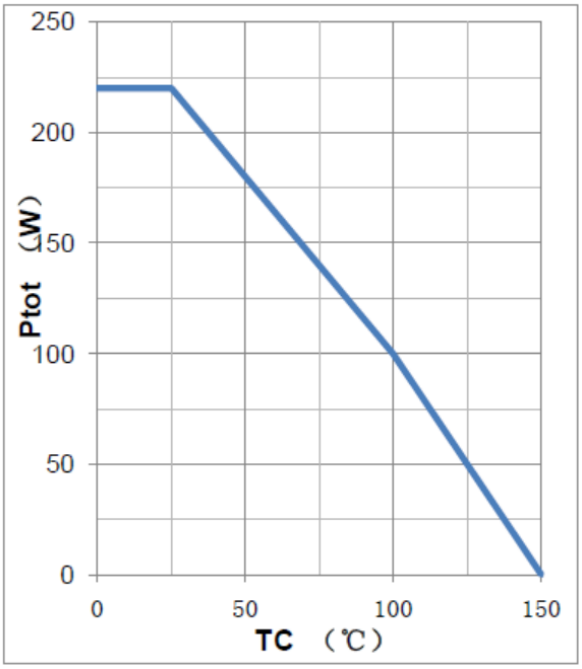


Fig.2 power dissipation VS. case temperature

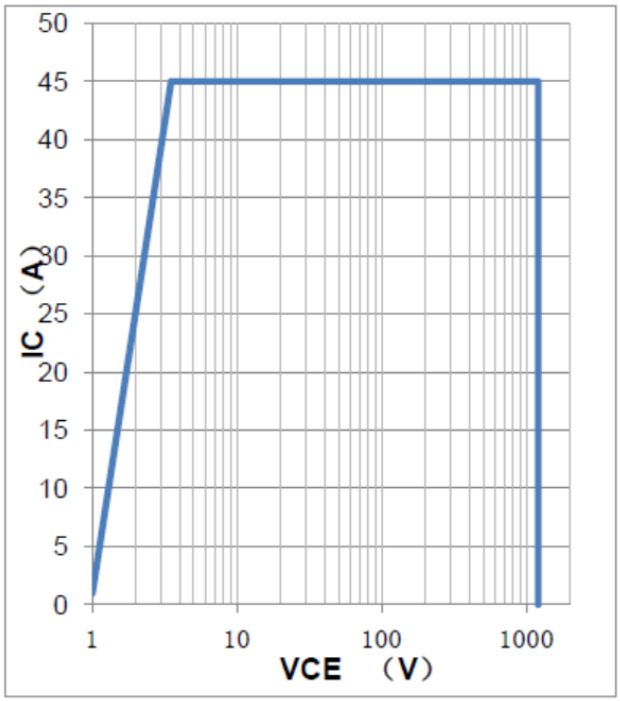


Fig.3 reverse bias SOA,T_J=150℃,V_{GE}=15V

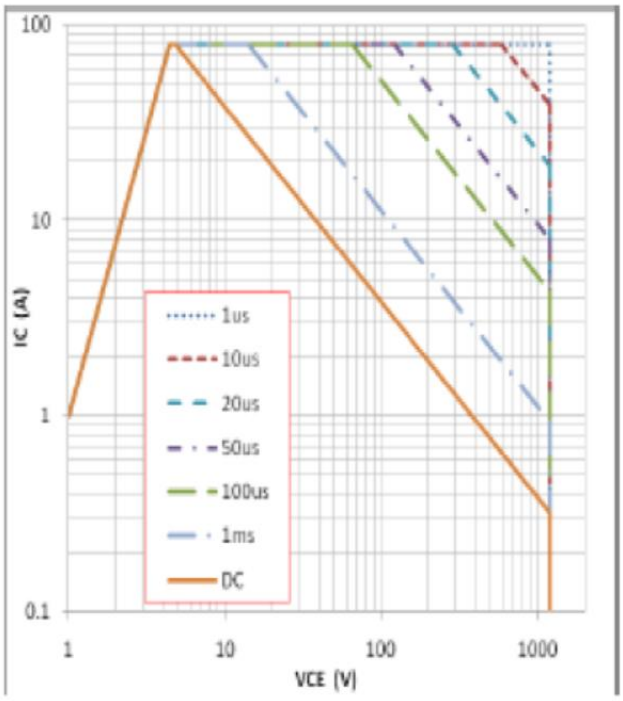


Fig.4 forward SOA,T_C=25℃,T_J≤150℃

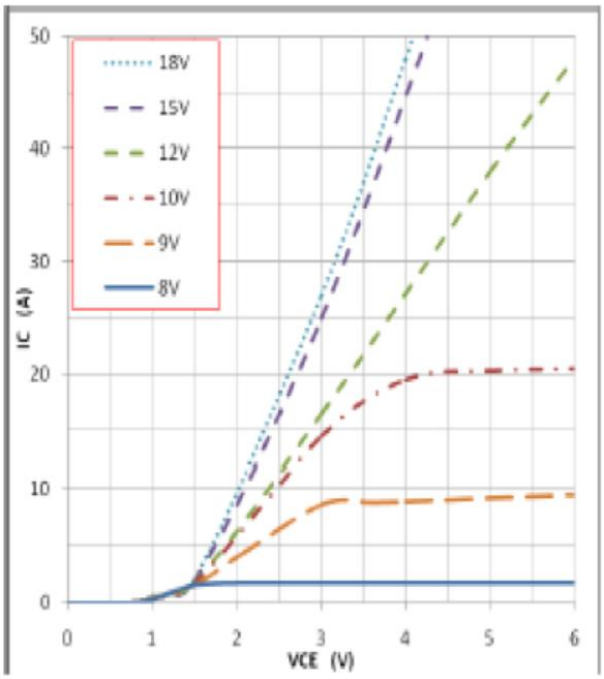


Fig.5 typical IGBT output characteristics, T_J=25℃;tp=300us

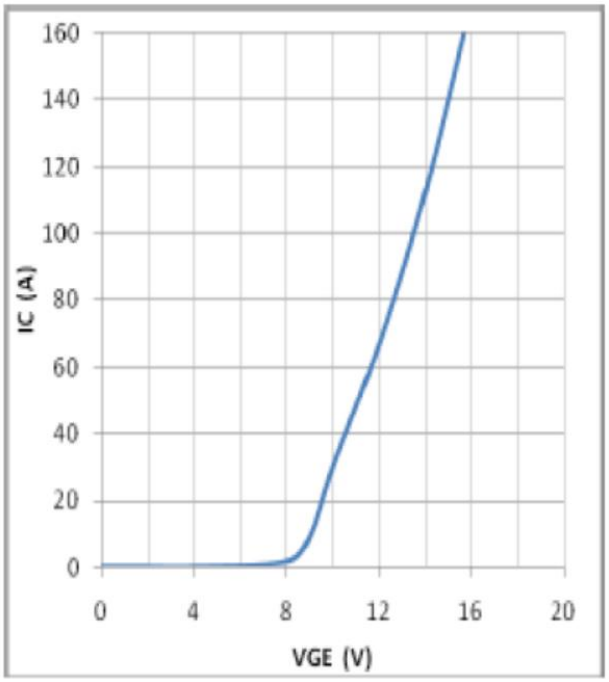


Fig.6 typical trans characteristics, V_{CE}=20V,tp=20us

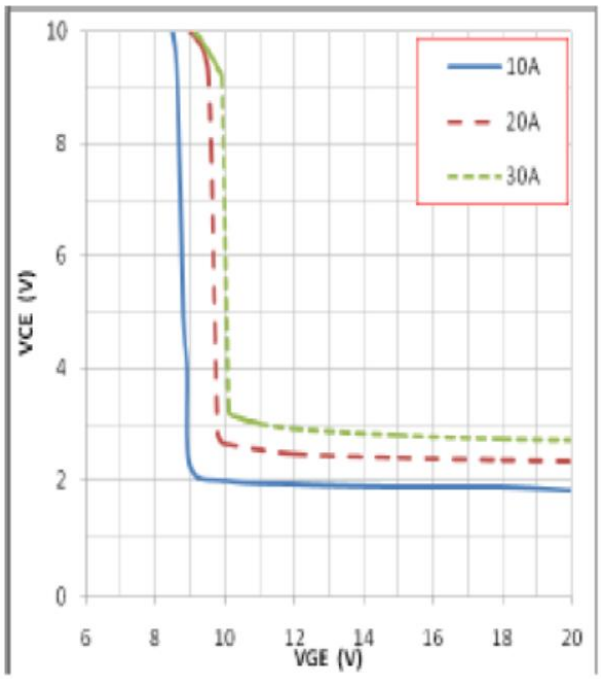


Fig.7 typical V_{CE} VS. V_{GE},T_J=25℃

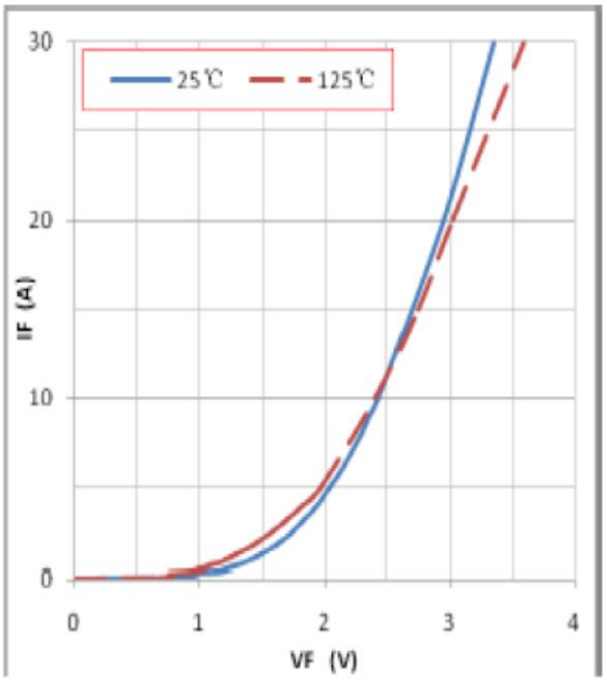


Fig.8 typical diode forward characteristic, tp=300us

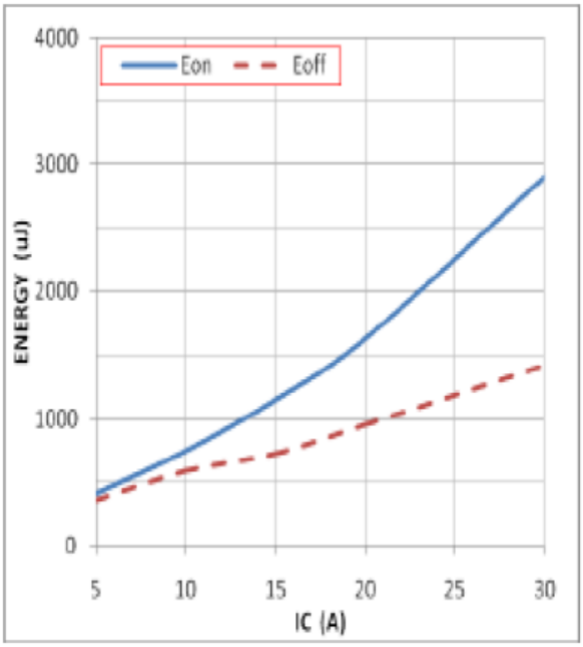


Fig.9 typical energy loss VS. IC, T_C=25℃, L=500uH, V_{CE}=600V,V_{GE}=15V,Rg=28Ω

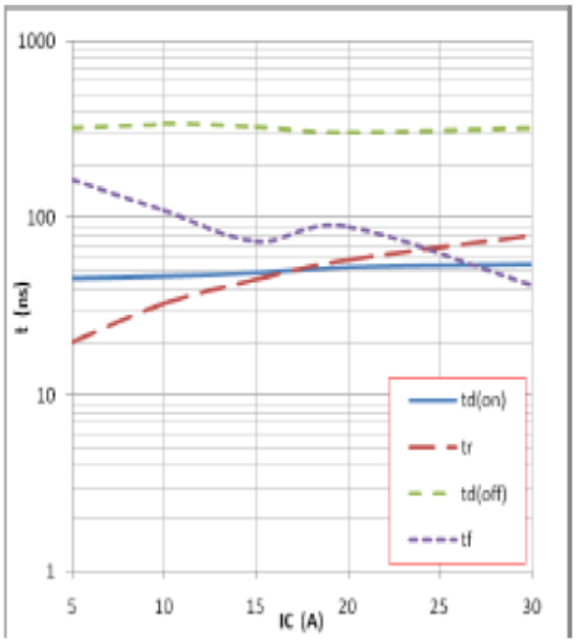


Fig.10 typical switching time VS. IC, T_C=25℃, L=500uH, V_{CE}=600V,V_{GE}=15V,Rg=28Ω

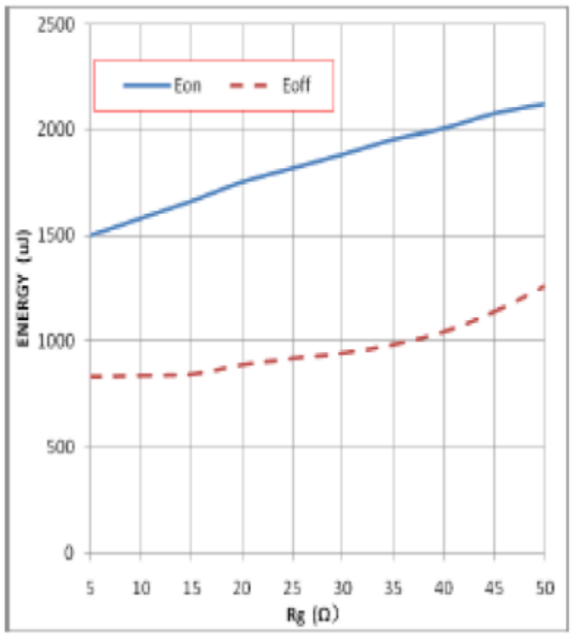


Fig.11 typical energy loss VS. Rg,T_C=25℃, L=500uH, V_{CE}=600V, V_{GE}=15V,I_C=25A

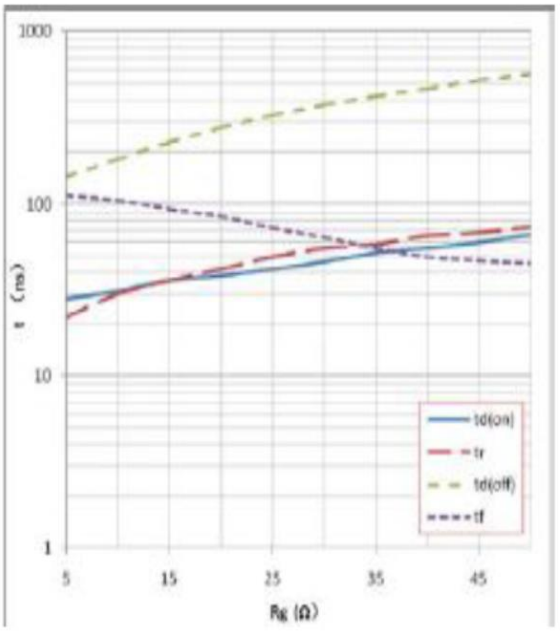


Fig.12 typical switching time VS. Rg, T_C=25℃, L=500uH,V_{CE}=600V,V_{GE}=15V,I_C=25A

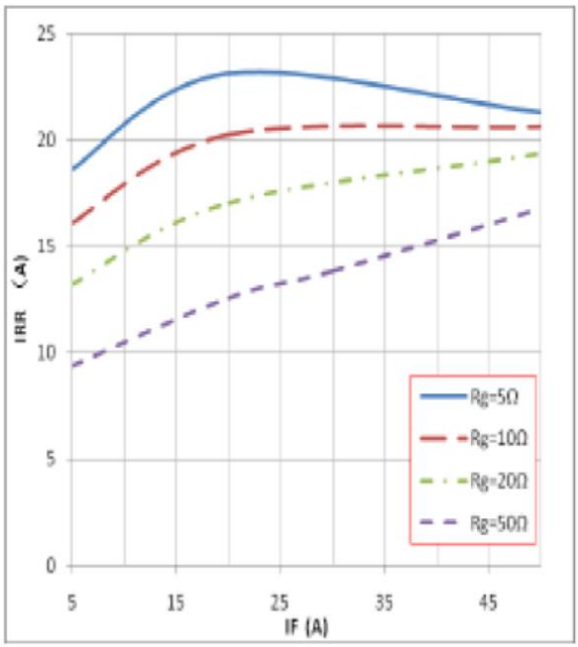


Fig.13 typical diode IRR VS. IF, T_C=25℃
V_{CC}=600V, V_{GE}=15V

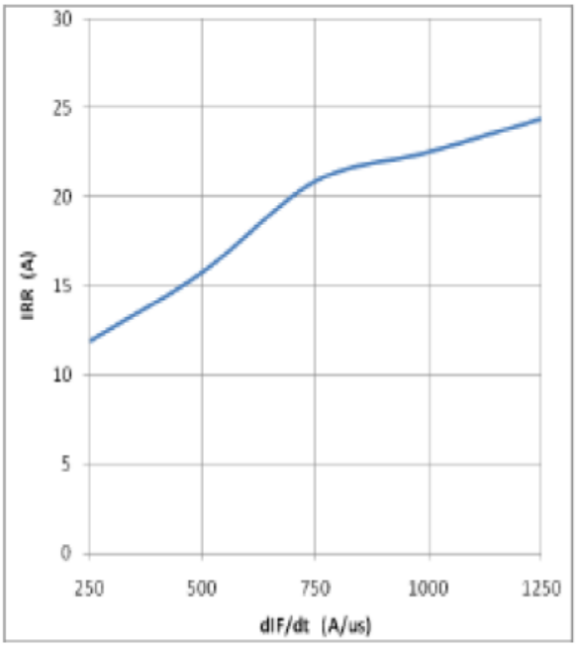


Fig.14 typical diode IRR VS. dIF/dt V_{CC}=600V,V_{GE}=15V

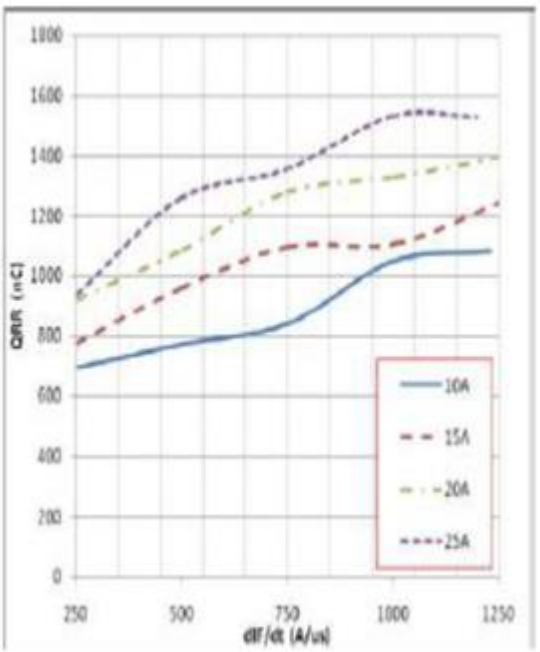


Fig.15 typical diode QRR VS. dIF/dt V_{CC}=600V,V_{GE}=15V

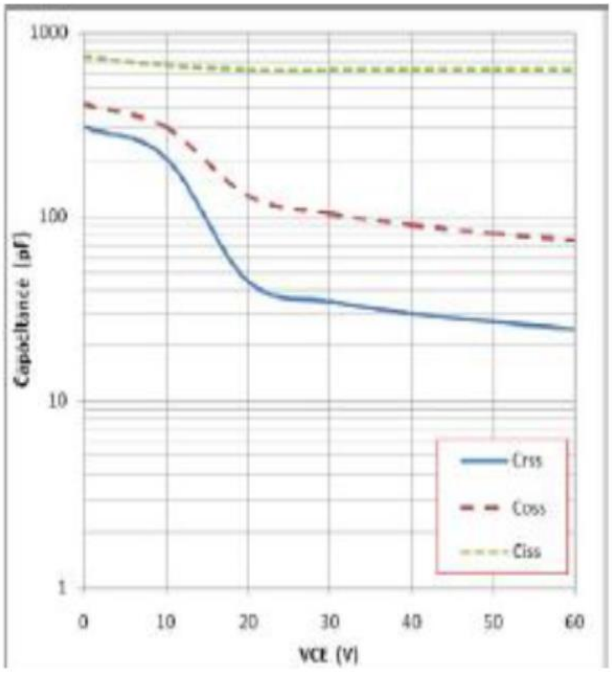


Fig.16 typical capacitance VS. V_{CE},V_{GE}=0V,f=100kHz

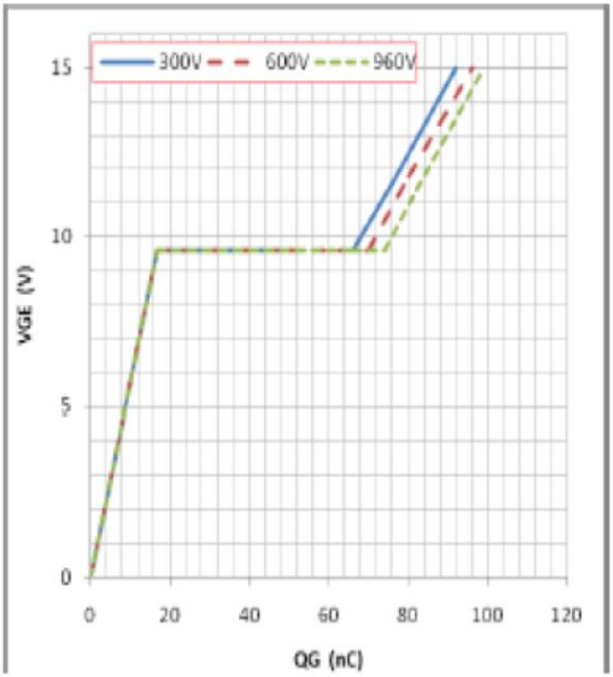


Fig.17 typical gate charge VS. V_{GE},I_C=25A

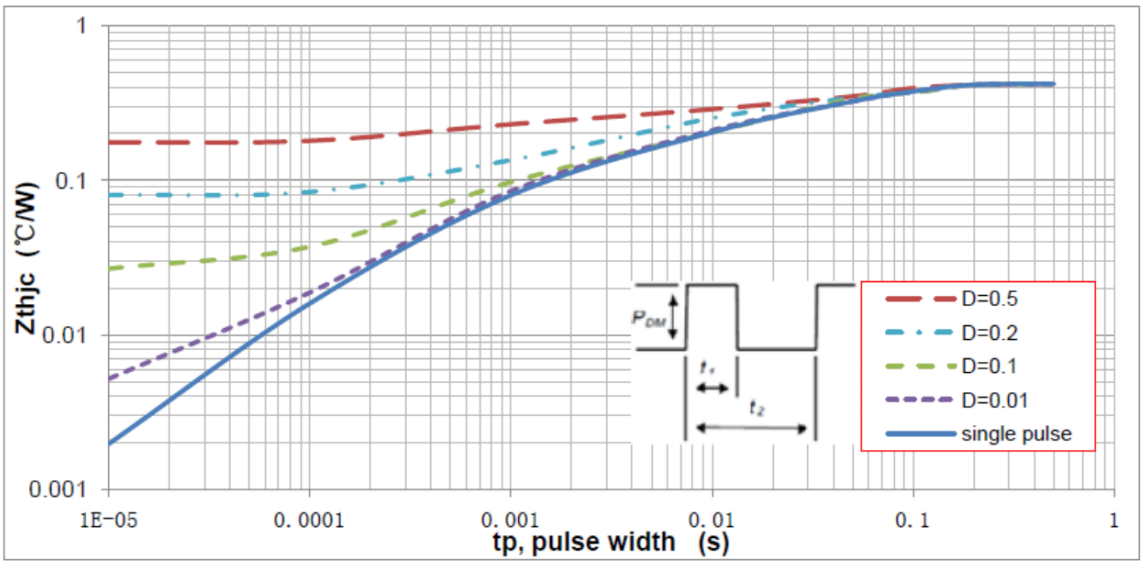
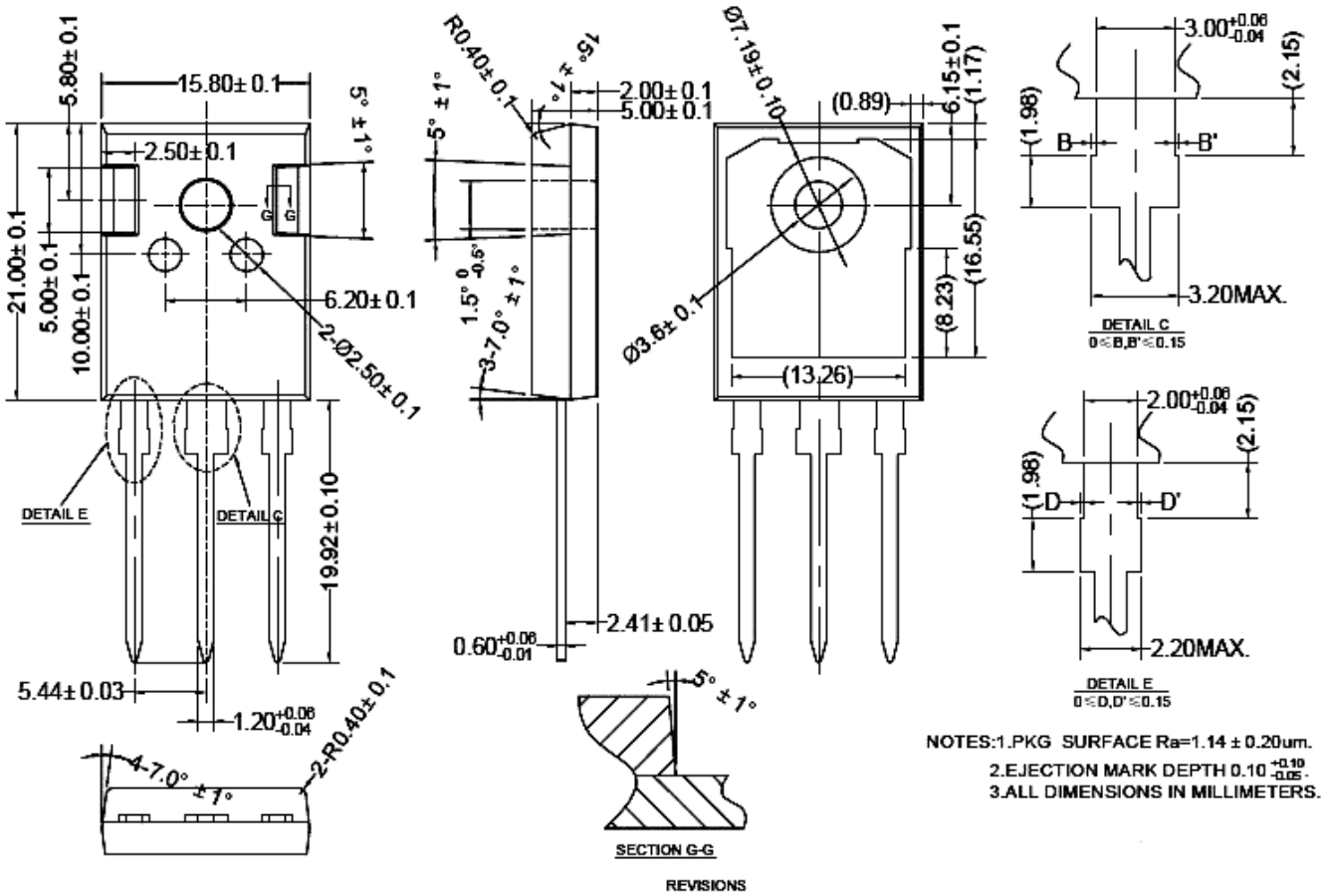


Fig18 normalized transient thermal impedance, junction-to-case

Note1.Duty factor D=t1/t2; Note2:peak T_J=PDMxZthjc+TC

Package Information

TO-247



NOTES:1.PKG SURFACE Ra=1.14 ± 0.20um.
2.EJECTION MARK DEPTH 0.10 +0.10 -0.05.
3.ALL DIMENSIONS IN MILLIMETERS.

公差标注	公差值	表面粗糙度
0	±0.2	Ra3.2~6.3
0.0	±0.1	Ra1.6~3.2
0.00	±0.01	Ra0.8~1.6
0.000	±0.005	Ra0.4~0.8
0.0000	±0.002	Ra0.2~0.4

0≤D,D'≤0.15

NOTES:1.PKG SURFACE Ra=1.14 ± 0.20um.
2.EJECTION MARK DEPTH 0.10 +0.10 -0.05.
3.ALL DIMENSIONS IN MILLIMETERS.