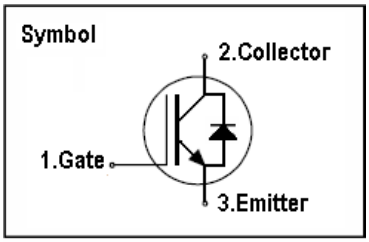
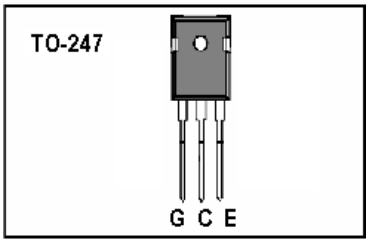
HM30N120T

IGBT





Features

- 1200V,30A,$V_{CE(sat)(typ.)}$=2.1V@V_{GE}=15V
- High speed switching
- Higher system efficiency
- Soft current turn-off waveforms
- Square RBSOA

General Description

H&M IGBTs offer lower losses and higher energy efficiency for application such as Motor driver, UPS, General inverter and other soft switching applications.

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℃)	55	A
	Continuous Collector Current (T_C=100℃)	28	A
I_{CM}	Pulsed Collector Current (Note 1)	240	A
I_F	Diode Continuous Forward Current (T_C=100℃)	25	A
I_{FM}	Diode Maximum Forward Current (Note 1)	240	A
P_D	Maximum Power Dissipation (T_C=25℃)	300	W
	Maximum Power Dissipation (T_C=100℃)	120	W
TSC	Short circuit withstand time	10	us
T_J	Operating Junction Temperature Range	-55 to +150	℃
T_{STG}	Storage Temperature Range	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for IGBT	0.42	℃ / W
$R_{th\ j\text{-}cd}$	Thermal Resistance, Junction to case for Diode	0.83	℃ / W
$R_{th\ j\text{-}a}$	Thermal Resistance, Junction to Ambient	40	℃ / W

Electrical Characteristics (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
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	4.0	5.0	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C= 30A	-	2.1	2.3	V
Q_g	Total Gate Charge	V_{CC}=960V V_{GE}=15V I_C=30A	-	178		nC
Q_{ge}	Gate-Emitter Charge		-	36		nC
Q_{gc}	Gate-Collector Charge		-	84		nC
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V V_{GE}=0V/15V I_C=30A R_G=28Ω Inductive Load T_C=25℃	-	54	-	ns
t_r	Turn-on Rise Time		-	72	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	671	-	ns
t_f	Turn-off Fall Time		-	44	-	ns
Eon	Turn-on Switching Loss		-	2.9	-	mJ
Eoff	Turn-off Switching Loss		-	2.2	-	mJ
Ets	Total Switching Loss		-	5.1	-	mJ
C_{ies}	Input Capacitance	V_{CE}=30V V_{GE}=0V f = 100kHz	-	645	-	pF
C_{oes}	Output Capacitance		-	206	-	pF
C_{res}	Reverse Transfer Capacitance		-	115	-	pF
R_{Gint}	Integrated gate resistor			2.1		Ω

Electrical Characteristics of Diode (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	I_F=30A	-	2.0	2.2	V
t_{rr}	Diode Reverse Recovery Time	V_{CE} = 600V I_F= 30A dI_F/dt = 500A/us	-	197	-	ns
I_{rr}	Diode peak Reverse Recovery Current		-	20	-	A
Q_{rr}	Diode Reverse Recovery Charge		-	1923	-	nC

Notes：

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

Typical Performance Characteristics

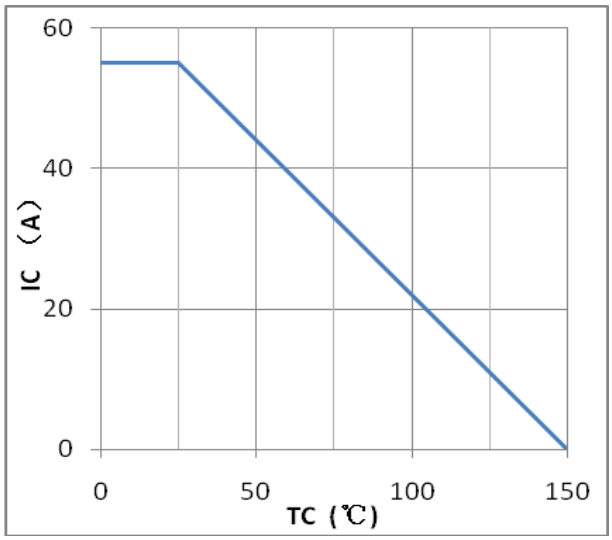


Figure1:maximum DC collector current VS. case temprature

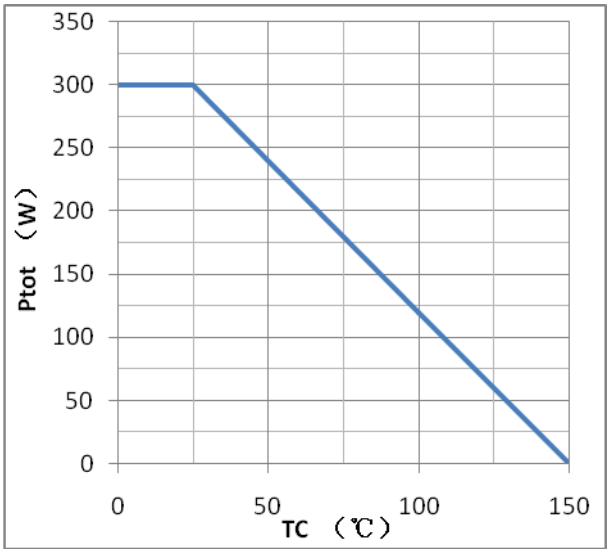


Figure2:power dissipation VS. case temprature

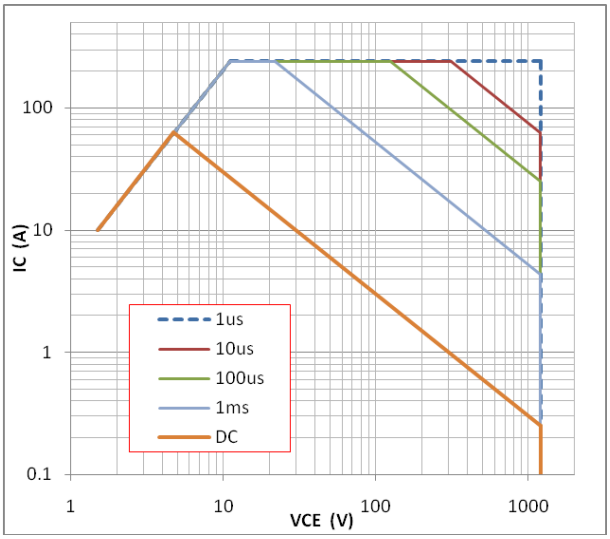


Figure3:forward SOA,TC=25℃,TJ≤150℃

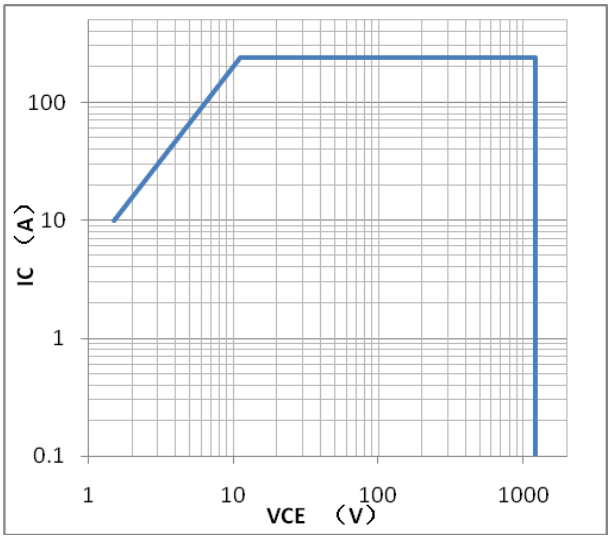


Figure4:reverse bias SOA,TJ=150℃,VGE=15V

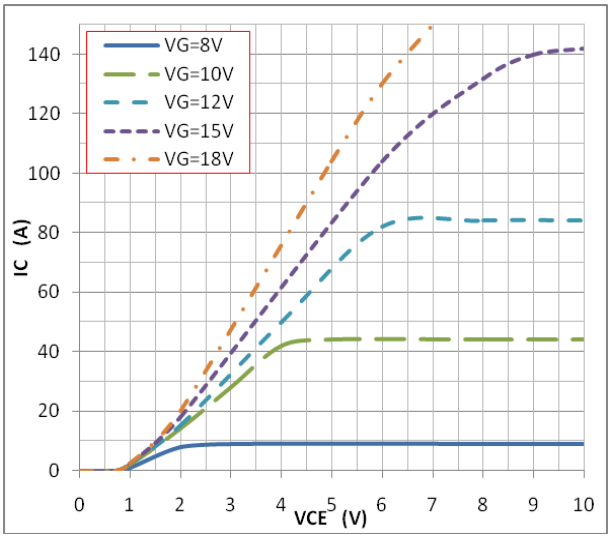


Figure5:typical IGBT output characteristics, TJ=25℃;tp=300us

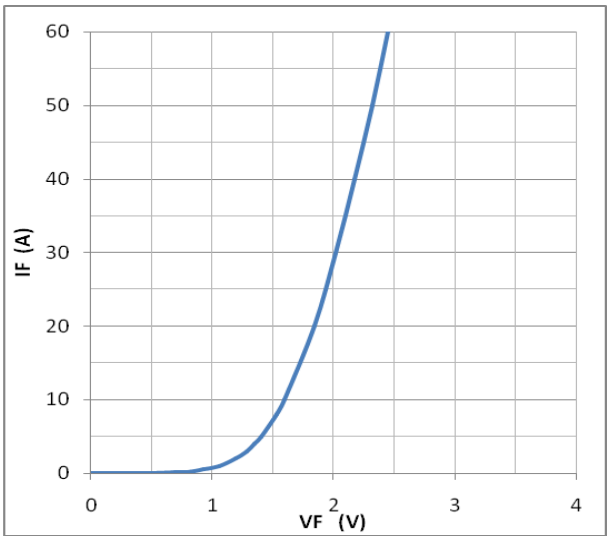


Figure6:typical trans characteristics,VCE=20V,tp=20us

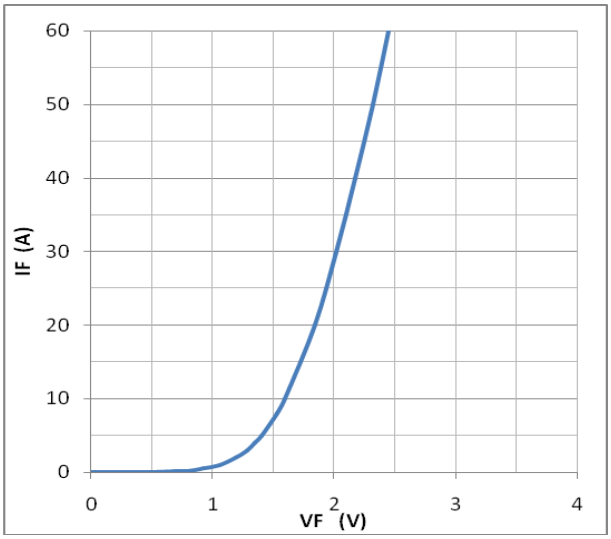


Figure7:typical diode forward characteristic,tp=300us

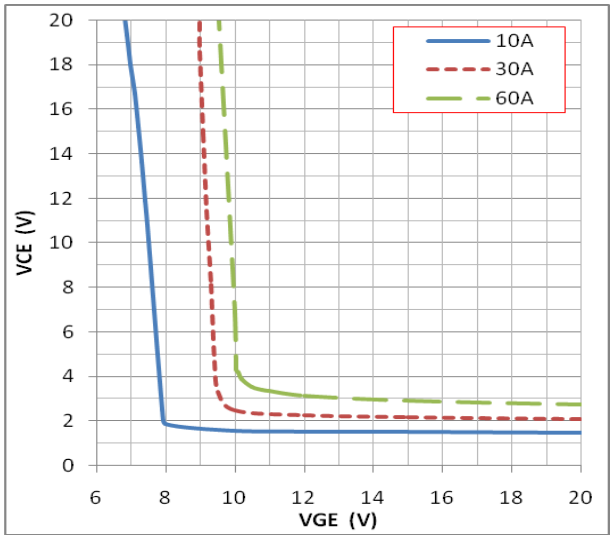


Figure8:typical VCE VS. VGE,TJ=25℃

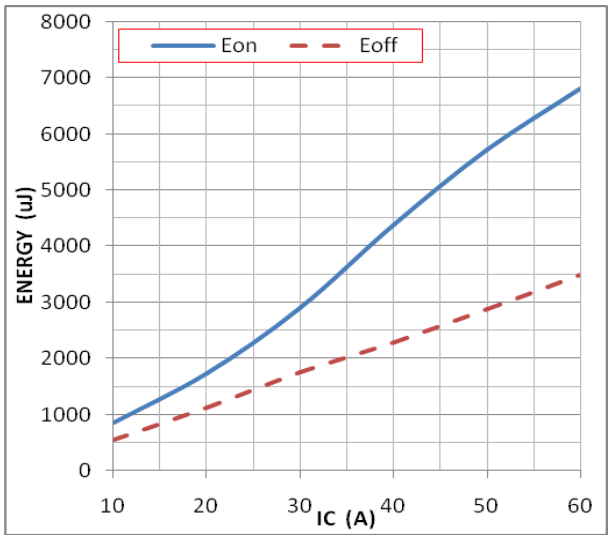


Figure 9: typical energy loss VS. IC, TC=25℃,L=500uH, VCE=600V,VGE=15V,Rg=28Ω

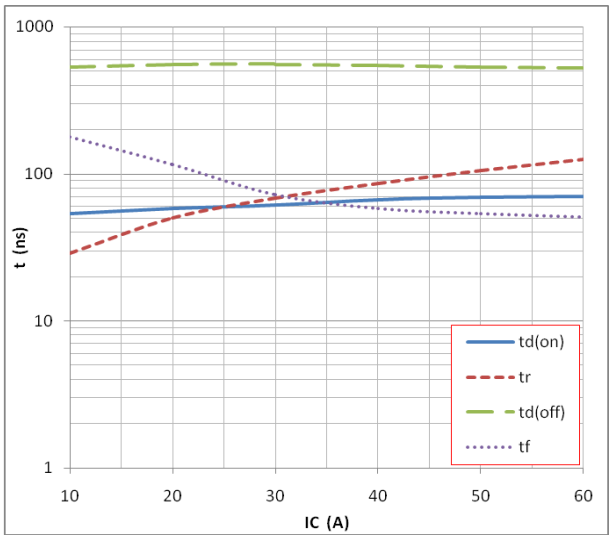


Figure10: typical switching time VS. IC, TC=25℃, L=500uH, VCE=600V,VGE=15V,Rg=28Ω

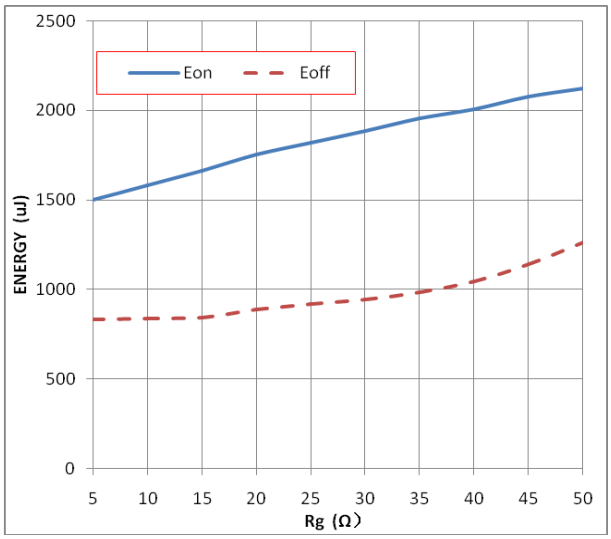


Figure11: typical energy loss VS. Rg,TC=25℃, L=500uH,VCE=600V,VGE=15V,IC=30A

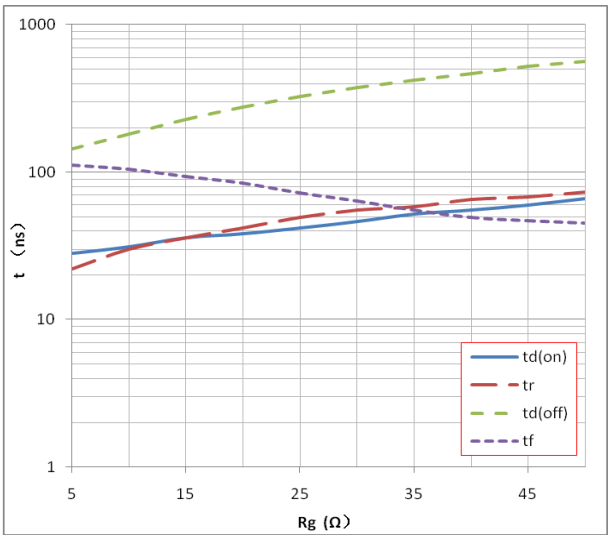


Figure12: typical switching time VS. Rg,TC=25℃, L=500uH,VCE=600V,VGE=15V,IC=30A

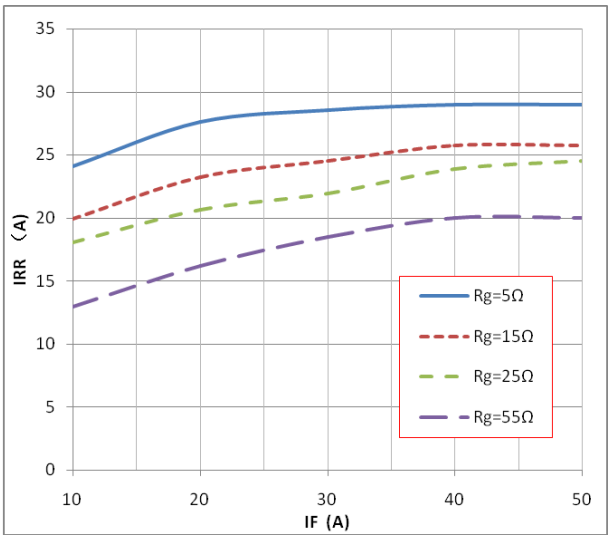


Figure13: typical diode IRR VS. IF, TC=25℃

VCC=600V,VGE=15V

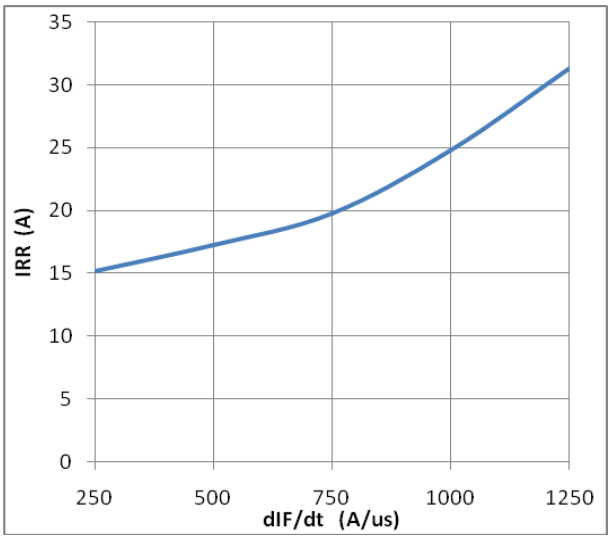


Figure14:typical diode IRR VS. dIF/dt

VCC=600V,VGE=15V,IF=30A

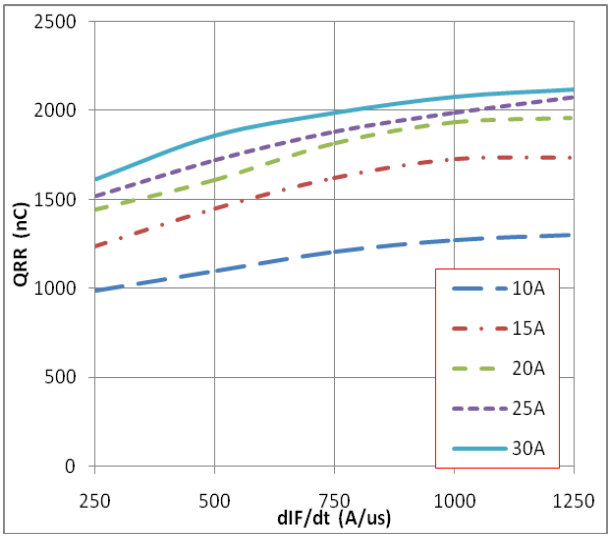


Figure15:typical diode QRR VS. dIF/dt,VCC=600V,VGE=15V

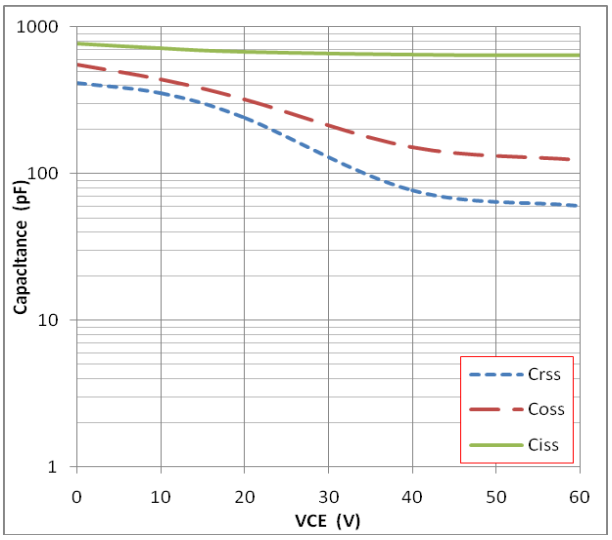


Figure16:typical capacitance VS. VCE,VGE=0V,f=100kHz

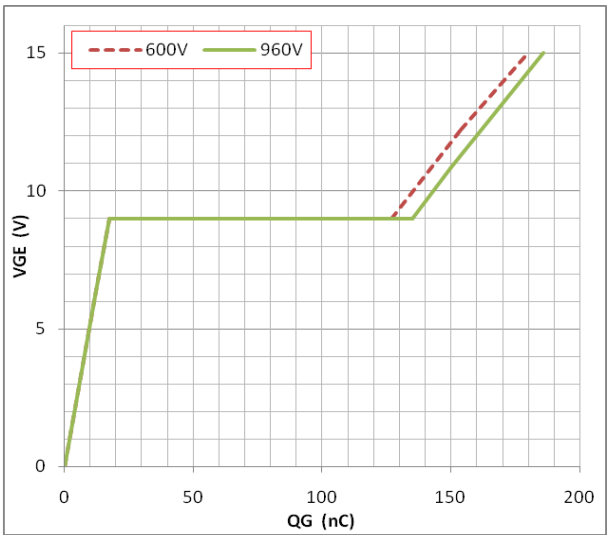


Figure17:typical gate charge VS. VGE,IC=30A

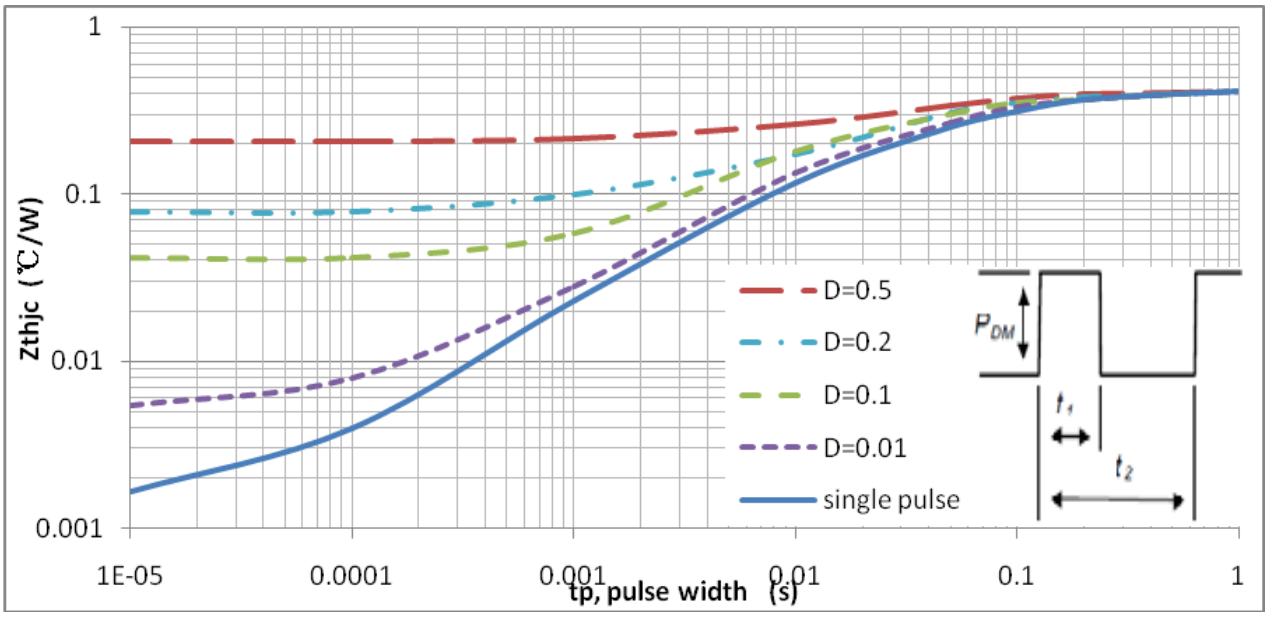
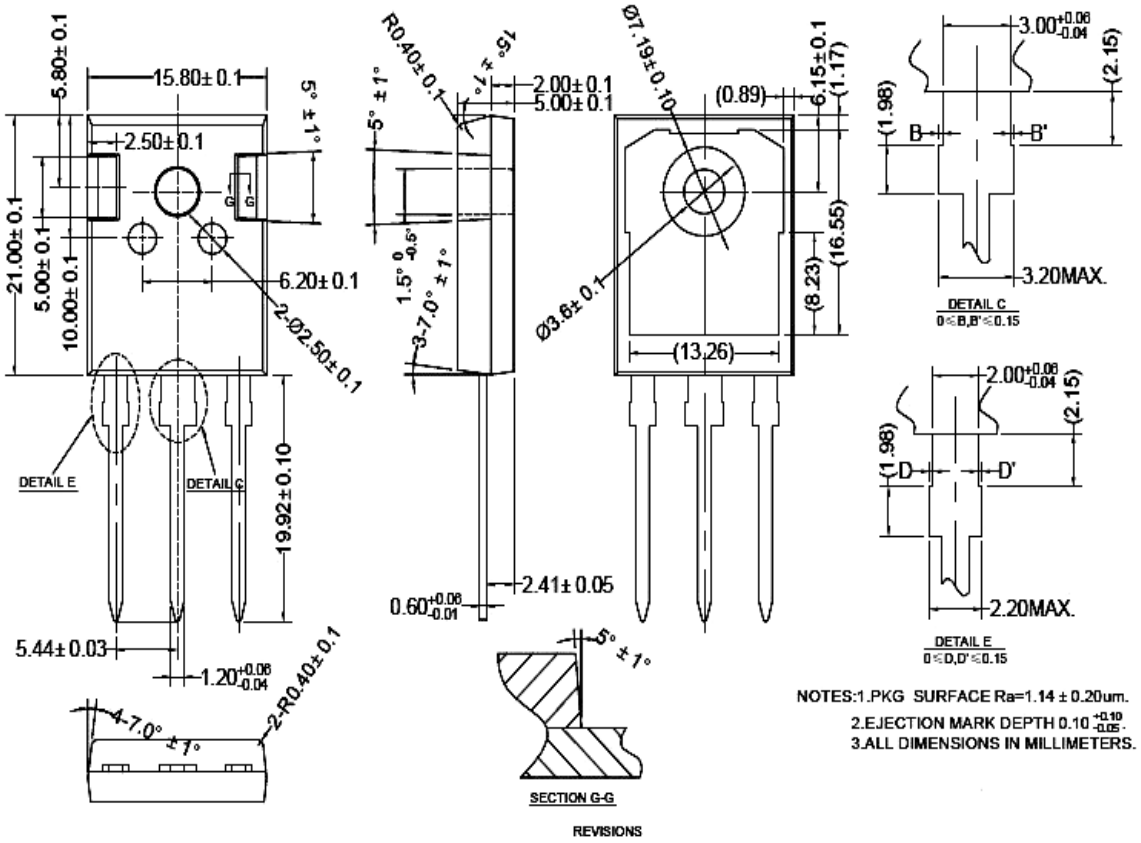


Figure18:normalized transient trermal impedance,junction-to-case

Note1.Duty factor D=t1/t2; Note2:peak TJ=PDM×Zthjc+TC

TO247 PACKAGE OUTLINE



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.

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