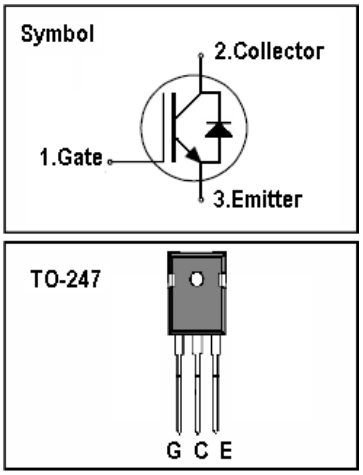
LGEGW75N65F

650V/75A Trench Field Stop IGBT

Features

- 650V 75A, $V_{CE(sat)(typ.)}$ = 2.3V
- Field Stop IGBT Technology
- 10μs Short Circuit Capability
- Square RBSOA
- Positive VCE (on) Temperature Coefficient.



General Description

LGE's IGBTs offer lower losses and higher energy for application such as motor drive ,UPS, inverter and other soft switching applications.

Absolute Maxinmun Ratings

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	650	V
V_{GES}	Gate-Emitter Voltage	30	V
I_C	Continuous Collector Current (T_C=25 ℃)	150	A
	Continuous Collector Current (T_C=100℃)	75	A
I_{CM}	Pulsed Collector Current (Note 1)	300	A
I_F	Diode Continuous Forward Current (T_C=100 ℃)	60	A
I_{FM}	Diode Maximum Forward Current (Note 1)	240	A
t_{sc}	Short Circuit Withstand Time	10	us
Isc	Short Circuit Current	410	A
P_D	Maximum Power Dissipation (T_C=25 ℃)	286	W
P_D	Maximum Power Dissipation (T_C=100℃)	71	W
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	0.35	℃/ W
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for Diode	0.45	℃/ 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	650	-	-	V
I_{CES}	Collector-Emitter Leakage Current	V_{CE}= 600V, V_{GE}= 0V	-	-	50	uA
I_{GES}	Gate Leakage Current, Forward	V_{GE}=30V, V_{CE}= 0V	-	-	200	nA
	Gate Leakage Current, Reverse	V_{GE}= -30V, V_{CE}= 0V	-	-	-200	nA
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE}= V_{CE}, I_C= 0.75mA	4.0	-	6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C= 75A	-	2.3	2.5	V
Q_g	Total Gate Charge	V_{CC}=400V V_{GE}=15V I_C=75A	-	192	-	nC
Q_{ge}	Gate-Emitter Charge		-	27	-	nC
Q_{gc}	Gate-Collector Charge		-	105	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=400V V_{GE}=15V I_C=75A R_G=12Ω Inductive Load T_C=25 ℃	-	38	-	ns
t_r	Turn-on Rise Time		-	123	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	183	-	ns
t_f	Turn-off Fall Time		-	91	-	ns
Eon	Turn-on Switching Loss		-	3.5	-	mJ
Eoff	Turn-off Switching Loss		-	2.4	-	mJ
C_{ies}	Input Capacitance	V_{CE}=25V V_{GE}=0V f = 1MHz	-	2.54	-	nF
C_{oes}	Output Capacitance		-	230	-	pF
C_{res}	Reverse Transfer Capacitance		-	60	-	pF
R_{Gint}	Integrated gate resistor	f=1M;Vpp=1V		1.6	-	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=60A	-	1.5	-	V
t_{rr}	Diode Reverse Recovery Time	V_{CE} = 400V I_F= 60A dIF/dt = 500A/us	-	115	-	ns
I_{rrm}	Diode peak Reverse Recovery Current		-	16.0	-	A
Q_{rr}	Diode Reverse Recovery Charge		-	0.88	-	uC

Notes:

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

Typical Performance Characteristics

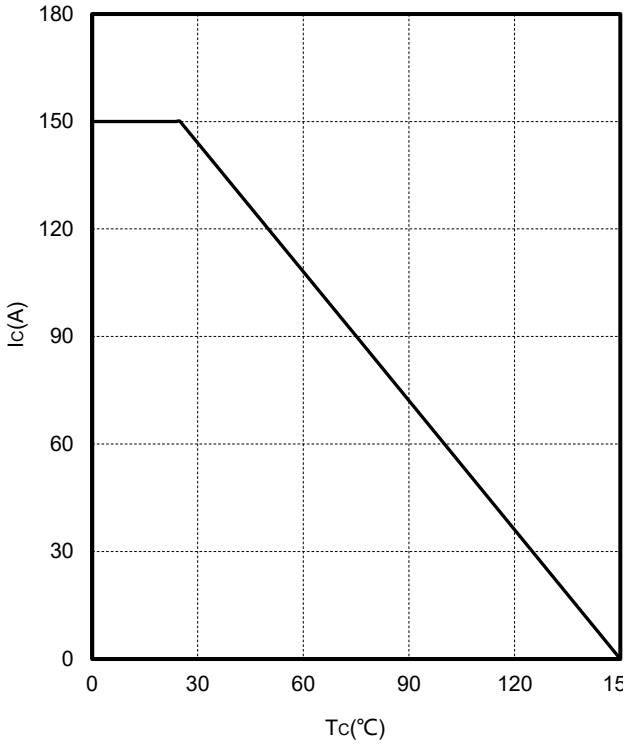


Fig 1. DC Collector current as a function of case temperature (VGE≥15V , Tj≤150°C)

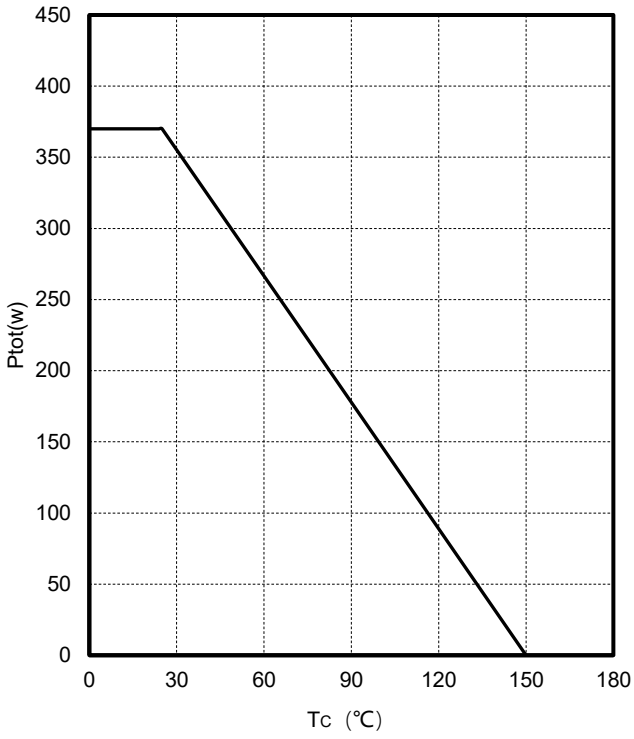


Fig 2. Power dissipation as a function of case temperature (Tj≤150°C)

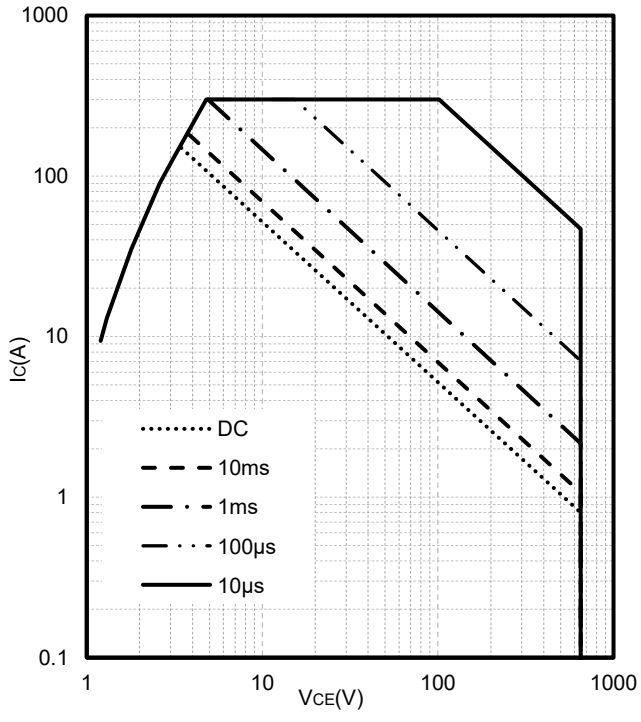


Fig 3. IGBT Forward safe operation area

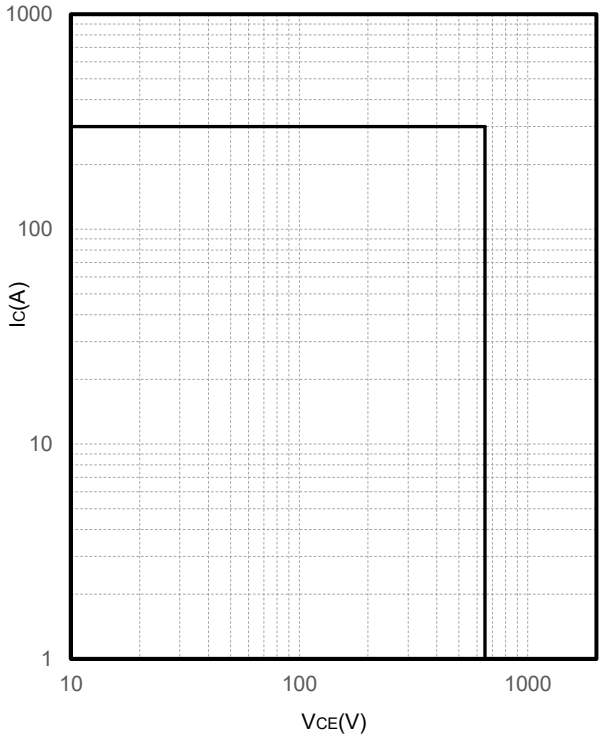


Fig 4. IGBT Reverse safe operation area

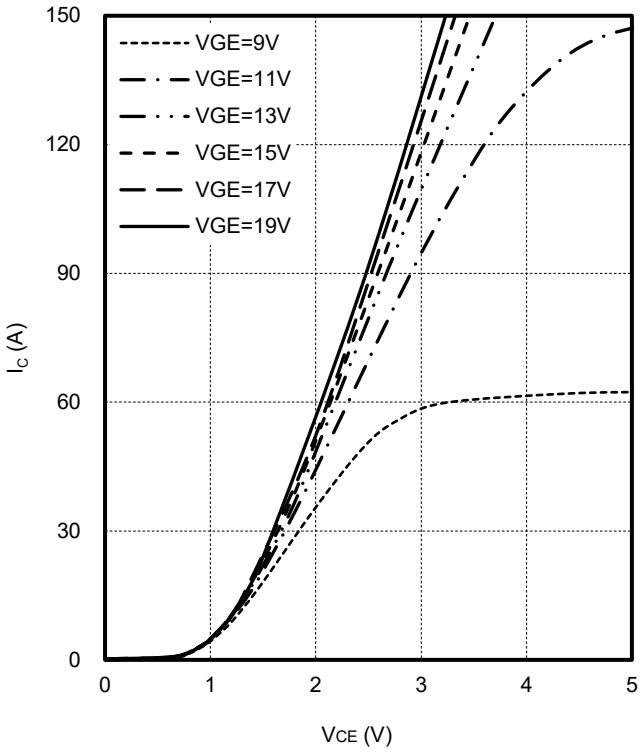


Fig 5. Typical output characteristic （Tj=25℃）

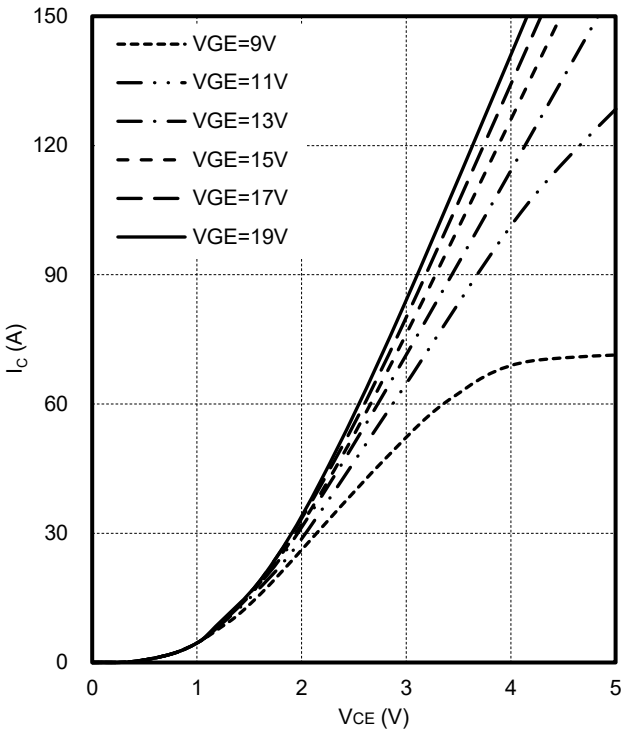


Fig 6. Typical output characteristic （Tj=125℃）

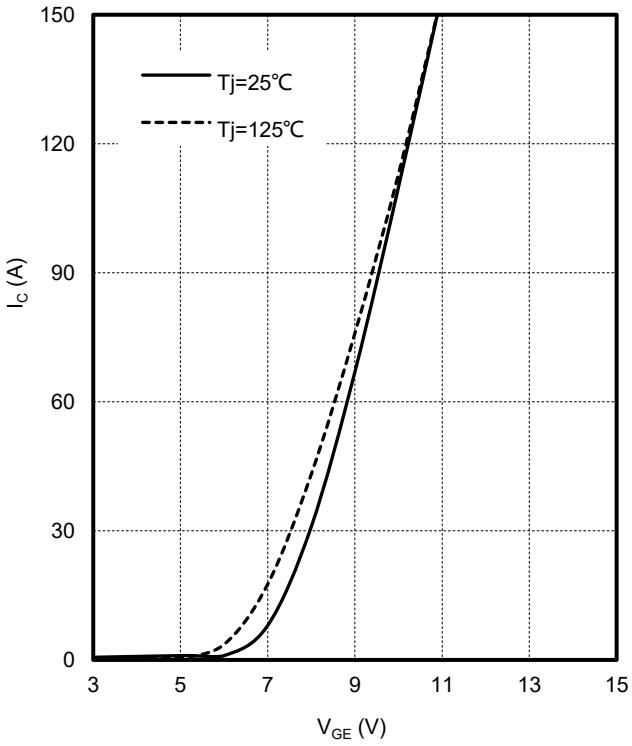


Fig 7. Transfer characteristic IGBT,
IC=f(VGE),VCE=20V

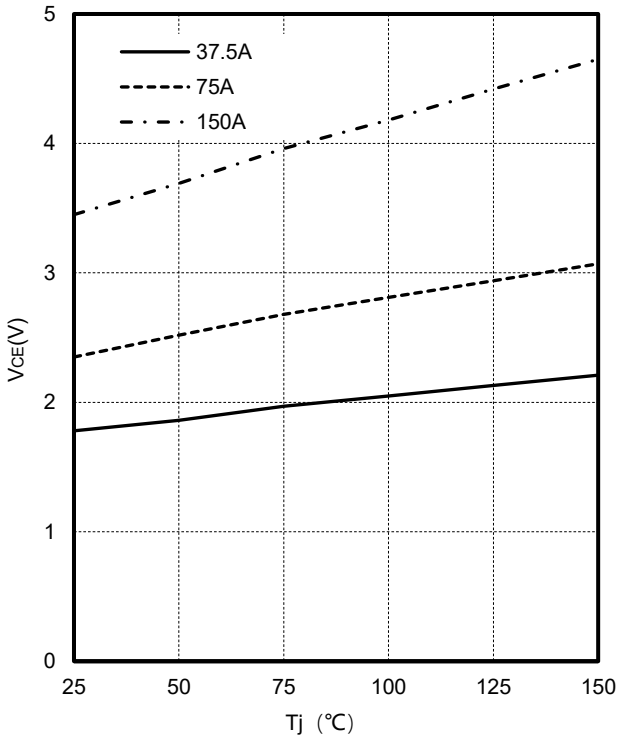


Fig 8. Typical collector-emitter saturation voltage
as a function of junction temperature,
IGBT VCEsat = f(Tvj) ,VGE = 15 V

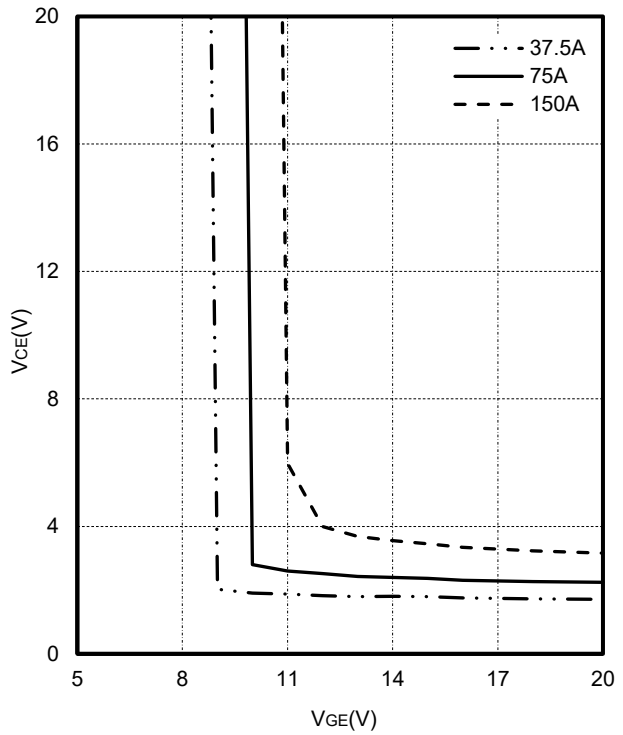


Fig 9. Typical collector-emitter saturation voltage as a function of VGE (Tj=25℃)

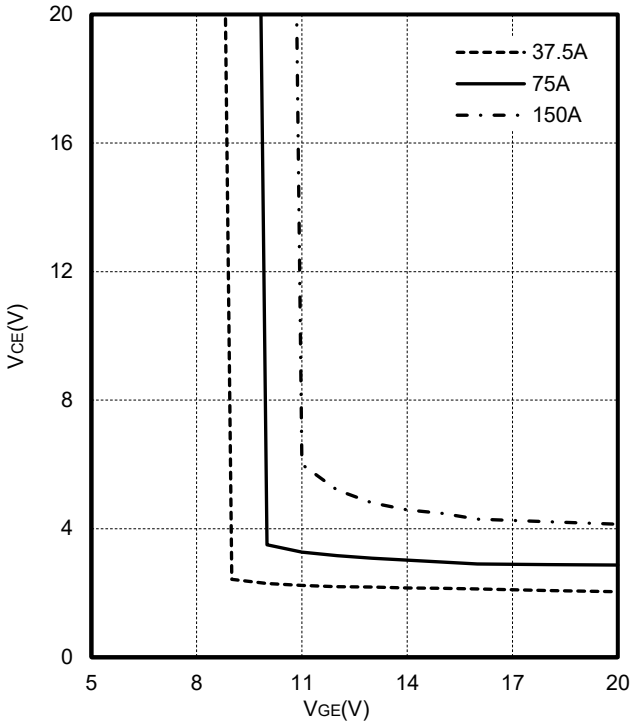


Fig 10. Typical collector-emitter saturation voltage as a function of VGE (Tj=125℃)

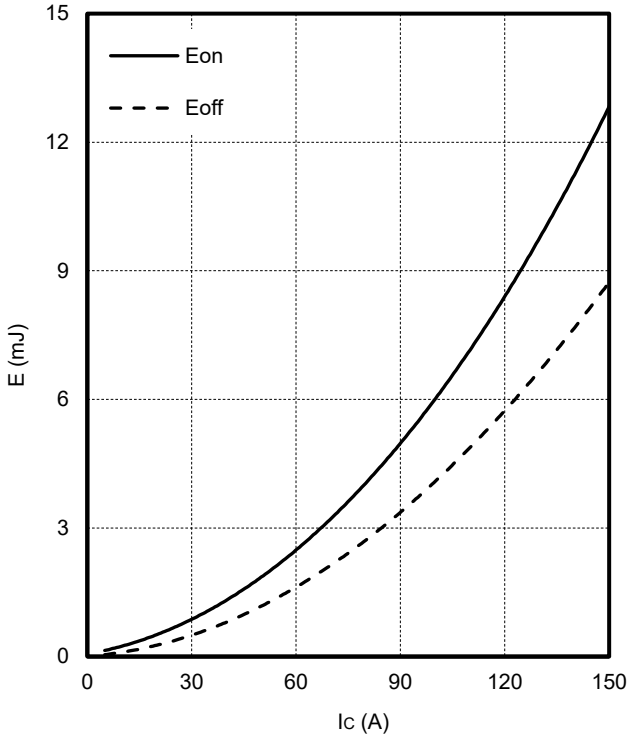


Fig 11. Typical switch energy as a function of Ic
(Inductive load,Tj =25℃,Vce =400V,Vge =15V,Rg =12Ω)

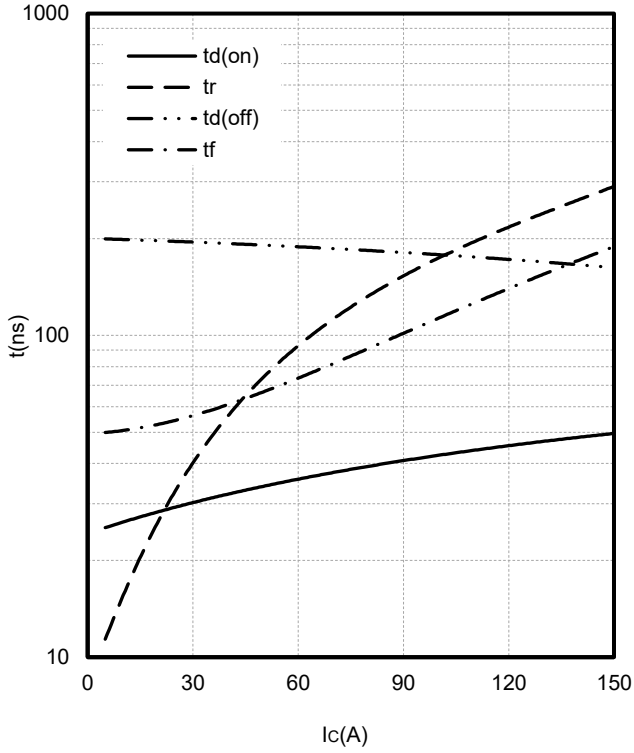


Fig 12. Typical switch time as a function of Ic
(Inductive load,Tj =25℃,Vce =400V,Vge =15V,Rg =12Ω)

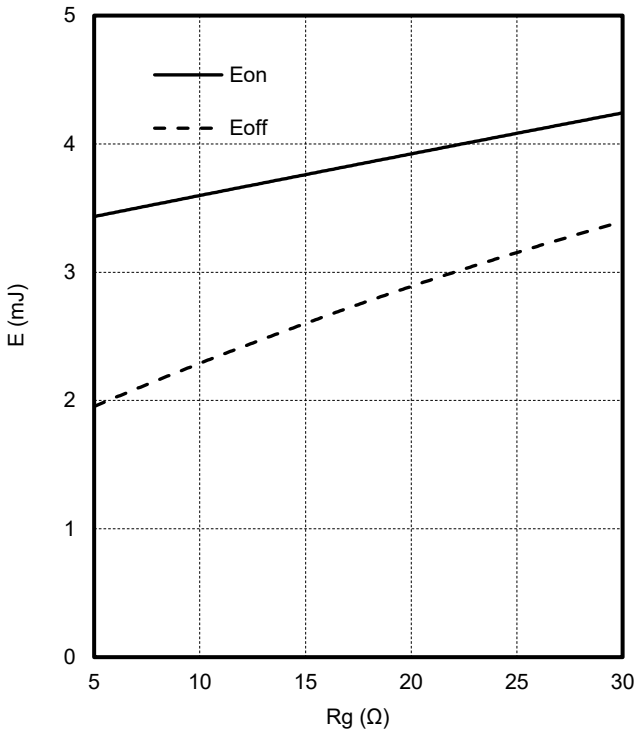


Fig 13. Typical switch energy as a function of Rg
(Inductive load,Tj=25℃,Vce=400V,Vge =15V,Ic=75A)

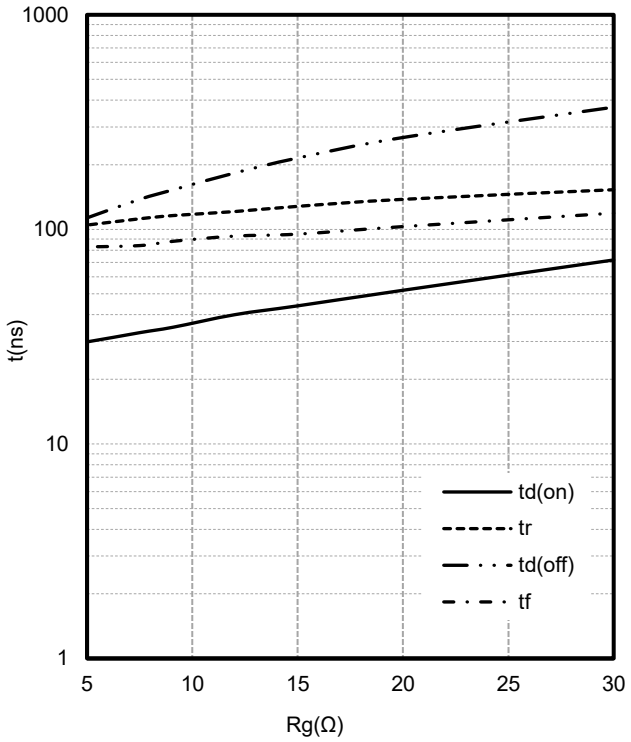


Fig 14. Typical switch time as a function of Rg
(Inductive load,Tj =25℃,Vce =400V,Vge =15V,Ic=75A)

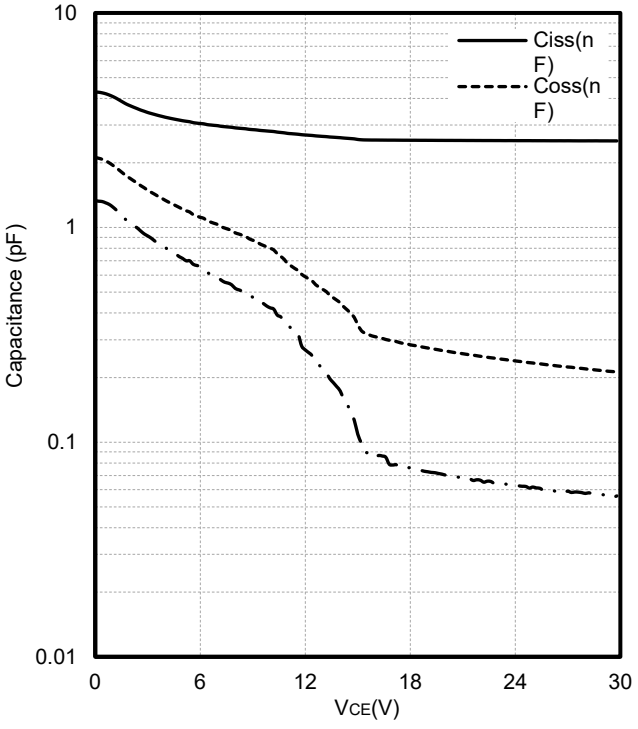


Fig 15. Typical capacitance as a function of
collector-emitter voltage (Vge =0V,f=1MHz)

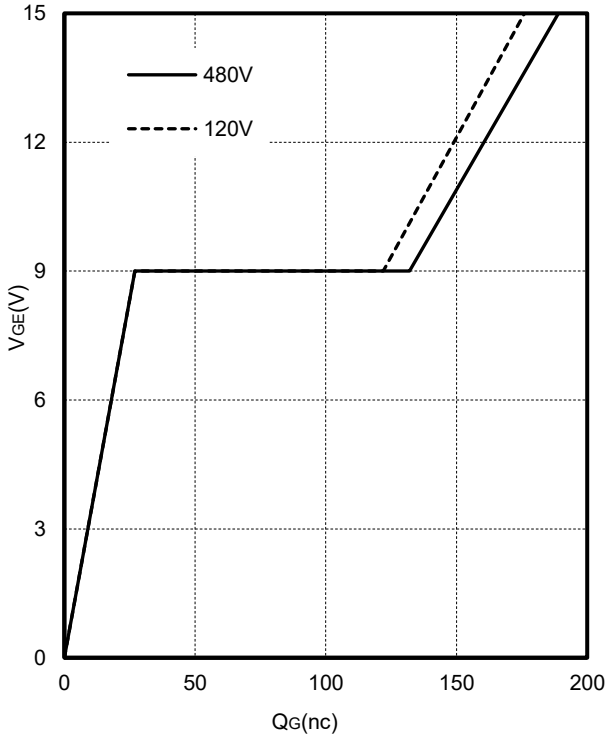


Fig 16. Typical gate charge (Ic=75A)

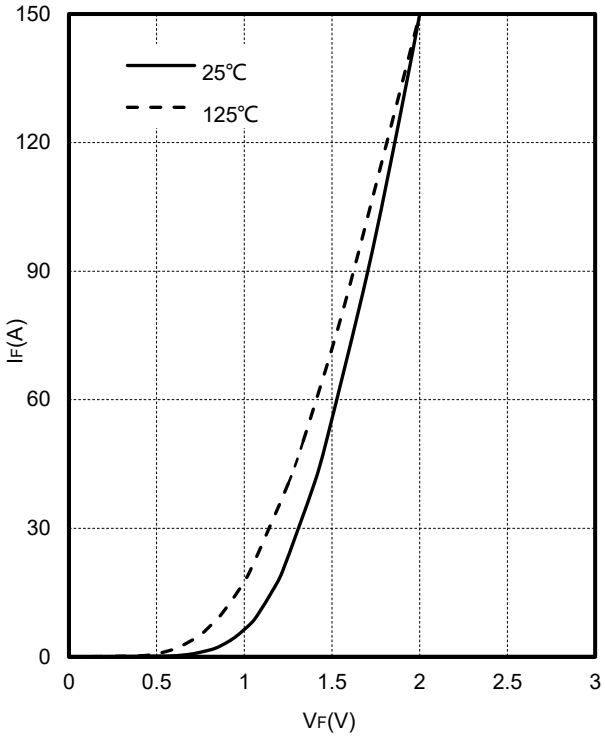


Fig 17. Typical diode forward current as a function of forward voltage

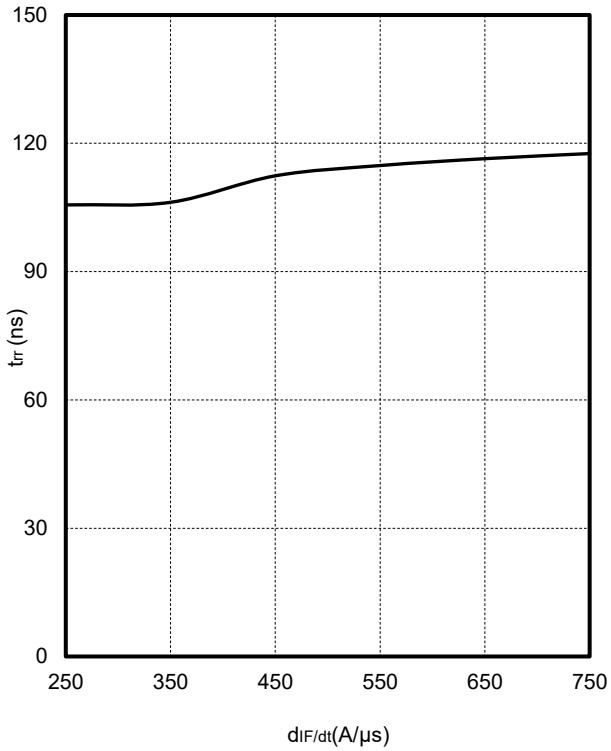


Fig 18. Typical trr as a function of dif/dt,Vr=400V, If=75A,Tj =25℃

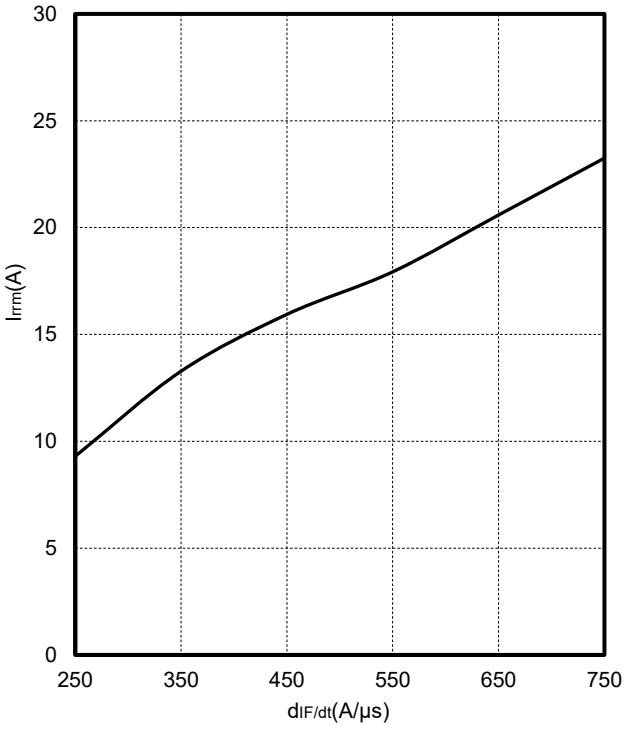


Fig 19. Typical Irrm as a function of dif/dt, Vr=400V, If=75A,Tj =25℃

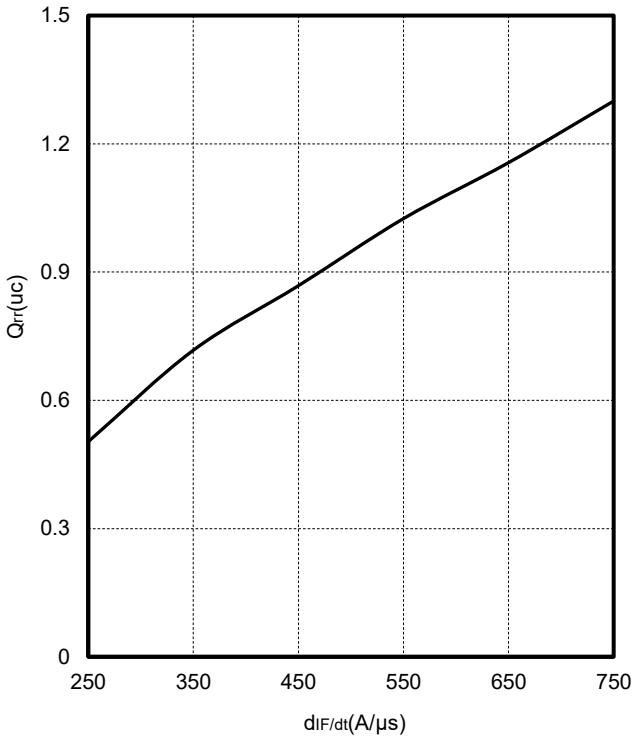


Fig 20. Typical Qrr as a function of dif/dt, Vr=400V, If=75A,Tj =25℃

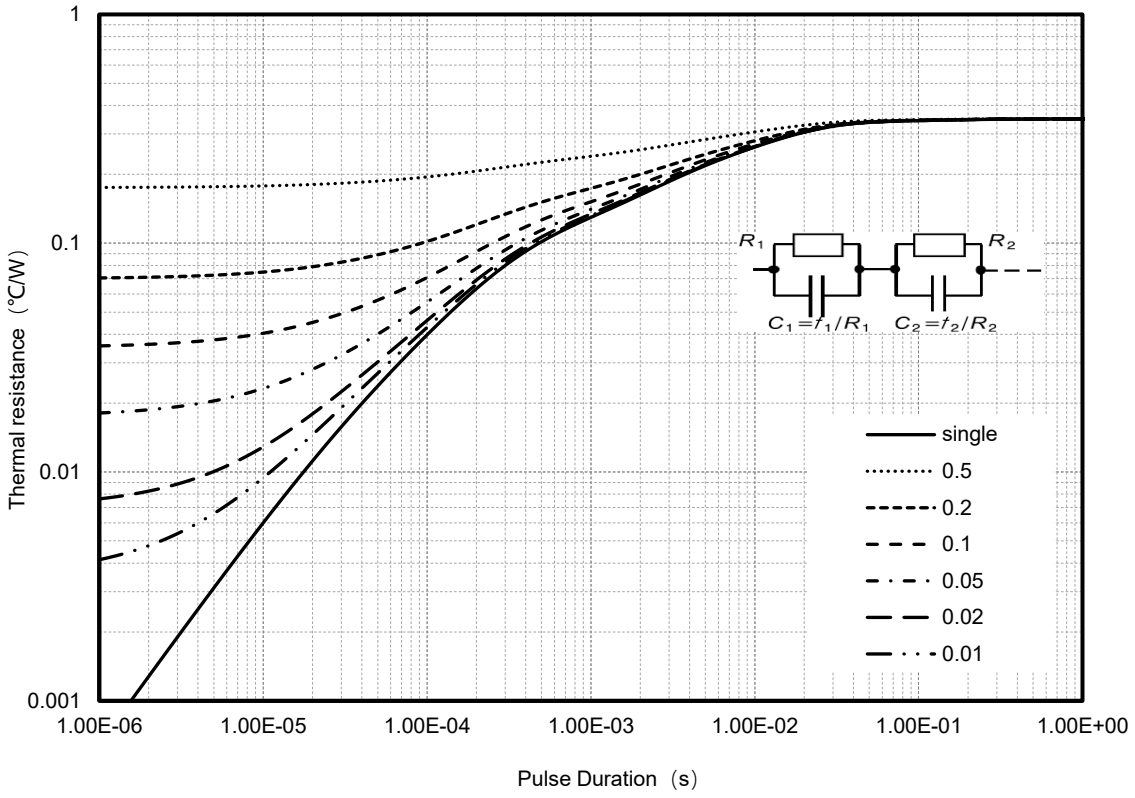


Fig 21. IGBT transient thermal impedance, Zth=f(tp),D=tp/T

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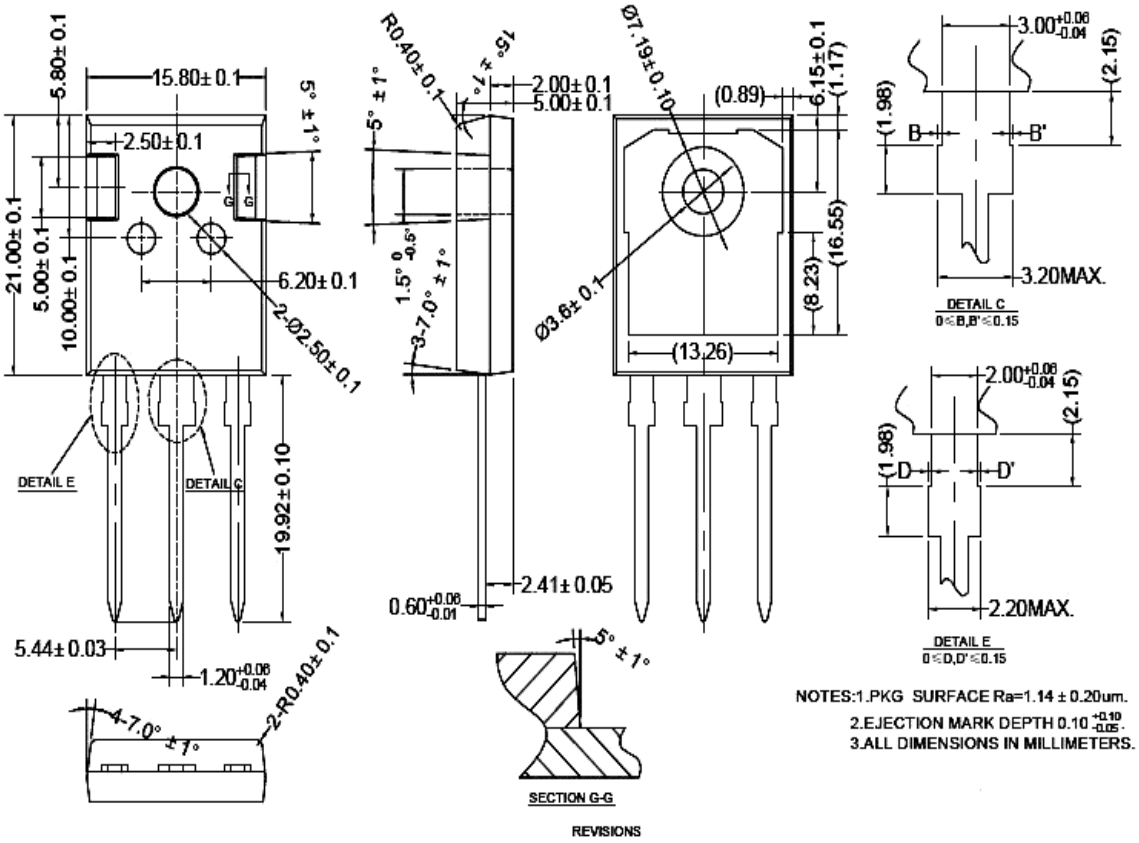
TO247 PACKAGE OUTLINE



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

REVISIONS

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.
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