

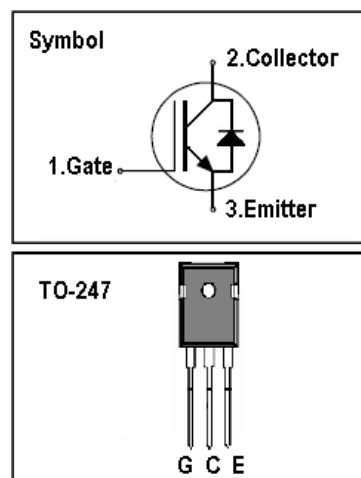


Features

- 650V 75A, $V_{CE(sat)(typ.)} = 1.70\text{ V}@75\text{A}$
- Field Stop IGBT Technology.
- 10 μs Short Circuit Capability.
- Square RBSOA.
- Positive VCE (on) Temperature Coefficient.

Benefits

- High Efficiency for Motor Control.
- Rugged Performance.
- Excellent Current Sharing in Parallel Operation



Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	650	V
V_{GES}	Gate-Emitter Voltage	± 30	V
I_C	Continuous Collector Current ($T_C=25\text{ }^{\circ}\text{C}$)	150	A
	Continuous Collector Current ($T_C=100^{\circ}\text{C}$)	75	A
I_{CM}	Pulsed Collector Current (Note 1)	300	A
I_F	Diode Continuous Forward Current ($T_C=100\text{ }^{\circ}\text{C}$)	80	A
I_{FM}	Diode Maximum Forward Current (Note 1)	300	A
t_{sc}	Short Circuit Withstand Time	10	us
I_{sc}	Short Circuit Current	410	A
P_D	Maximum Power Dissipation ($T_C=25\text{ }^{\circ}\text{C}$)	625	W
P_D	Maximum Power Dissipation ($T_C=100^{\circ}\text{C}$)	250	W
T_J	Operating Junction Temperature Range	-55 to +150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to +150	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case for IGBT	0.20	$^{\circ}\text{C}/\text{W}$
$R_{th\ j-c}$	Thermal Resistance, Junction to case for Diode	0.55	$^{\circ}\text{C}/\text{W}$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	80	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics (T_C=25°C 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} = 650V, 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	-	5.5	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 15V, I _C = 75A	-	1.70		V
Q _g	Total Gate Charge	V _{CC} = 480V V _{GE} = 15V I _C = 75A	-	340		nC
Q _{ge}	Gate-Emitter Charge		-	50		nC
Q _{gc}	Gate-Collector Charge		-	180		nC
t _{d(on)}	Turn-on Delay Time	V _{CC} = 400V V _{GE} = 15V I _C = 75A R _G = 10Ω Inductive Load T _C = 25 °C	-	38	-	ns
t _r	Turn-on Rise Time		-	118	-	ns
t _{d(off)}	Turn-off Delay Time		-	267	-	ns
t _f	Turn-off Fall Time		-	81	-	ns
E _{on}	Turn-on Switching Loss		-	4.65	-	mJ
E _{off}	Turn-off Switching Loss		-	2.45	-	mJ
C _{ies}	Input Capacitance	V _{CE} = 25V	-	2850	-	pF
C _{oes}	Output Capacitance	V _{GE} = 0V	-	410	-	pF
C _{res}	Reverse Transfer Capacitance	f = 1MHz	-	185	-	pF
R _{Gint}	Integrated gate resistor	f = 1MHz; V _{pp} = 1V		1.10		Ω

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _F	Diode Forward Voltage	I _F = 75A	-	1.50		V
t _{rr}	Diode Reverse Recovery Time	V _{CE} = 400V I _F = 75A dI _F /dt = 500A/us	-	80		ns
I _{rrm}	Diode peak Reverse Recovery Current		-	12.5		A
Q _{rr}	Diode Reverse Recovery Charge		-	580		nC

Notes:

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

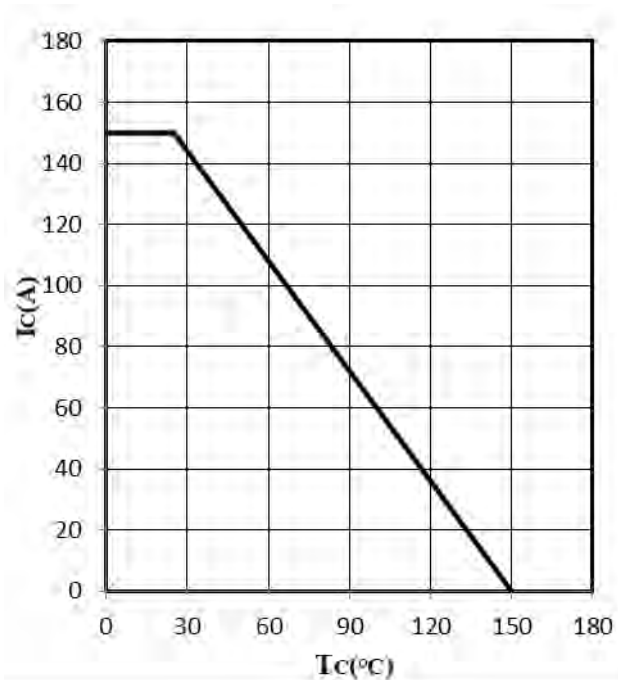


Fig 1. DC Collector current as a function of case temperature ($V_{GE} \geq 15V$, $T_j \leq 150^\circ C$)

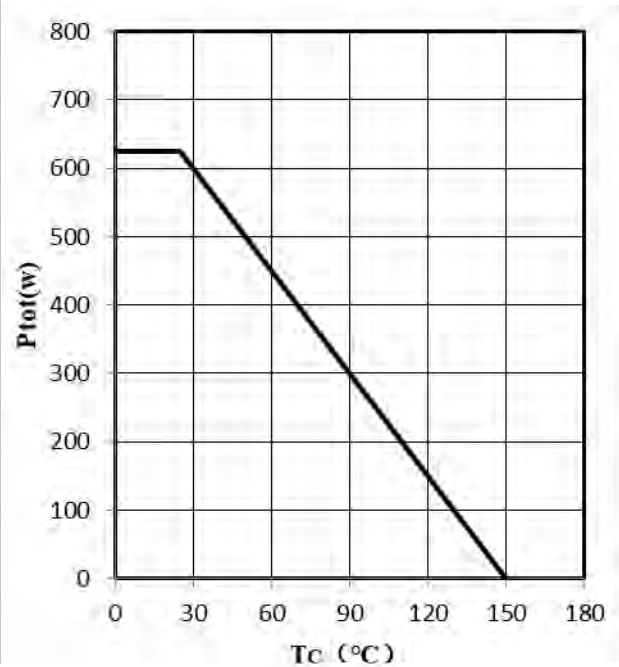


Fig 2. Power dissipation as a function of case temperature ($T_j \leq 150^\circ C$)

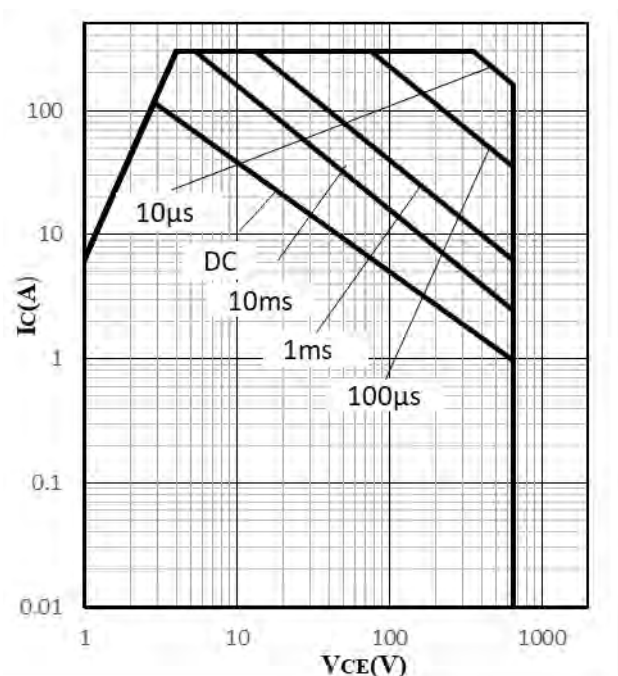


Fig 3. IGBT Forward safe operation area

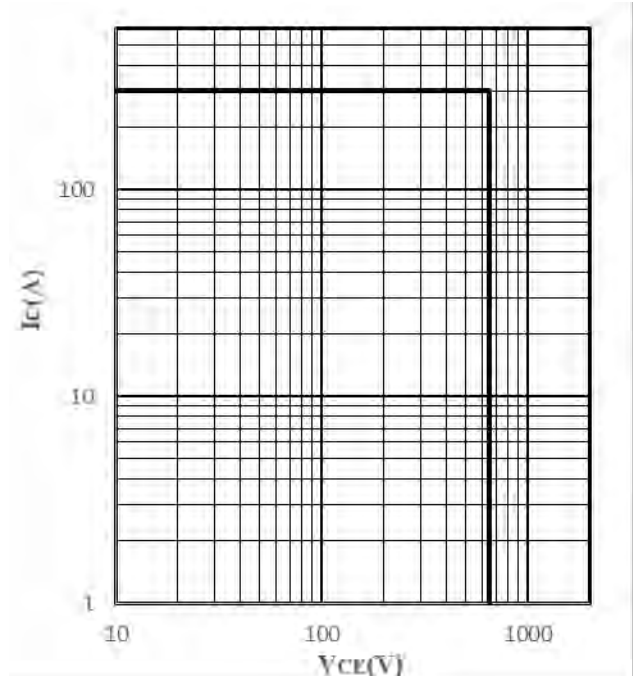


Fig 4. IGBT Reverse safe operation area

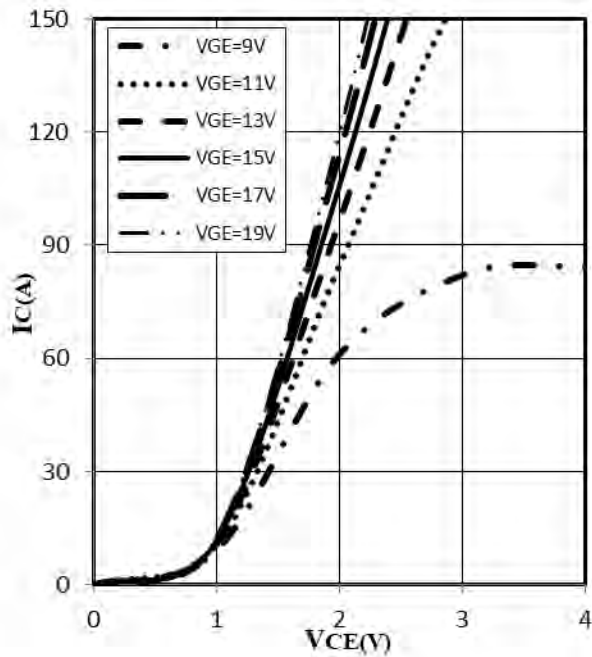


Fig 5. Typical output characteristic ($T_j=25^{\circ}\text{C}$)

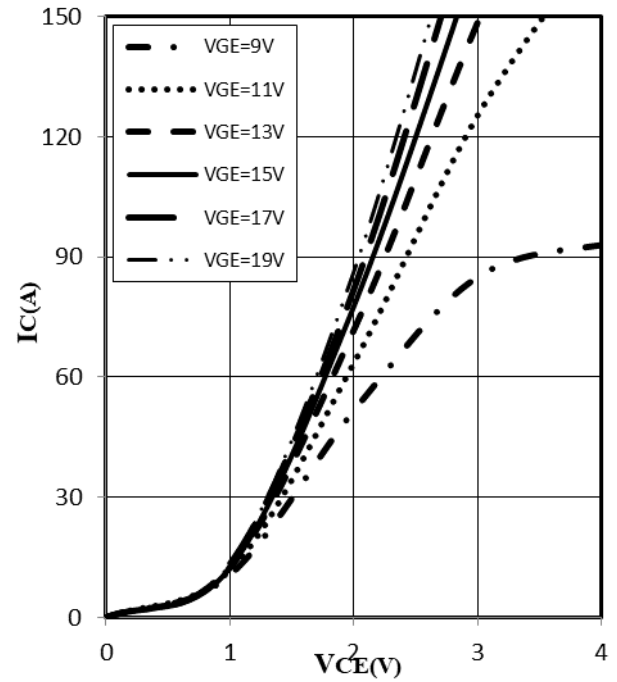


Fig 6. Typical output characteristic ($T_j=125^{\circ}\text{C}$)

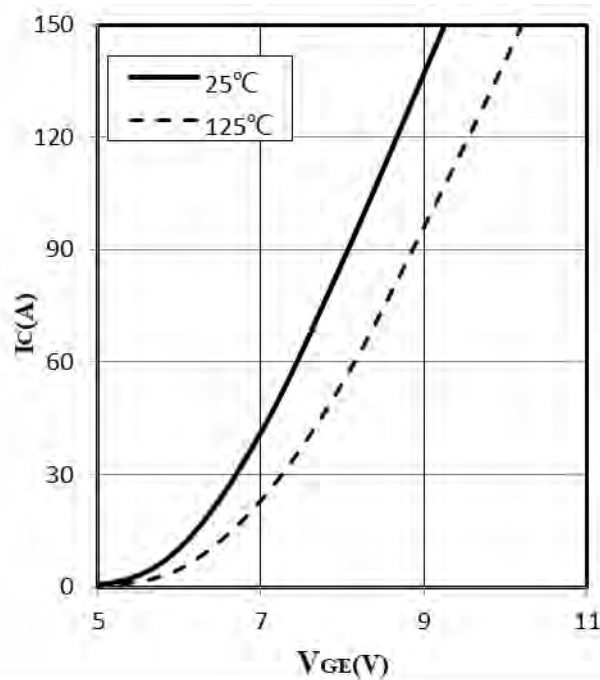


Fig 7. Typical transfer characteristic ($V_{ce}=20\text{V}$)

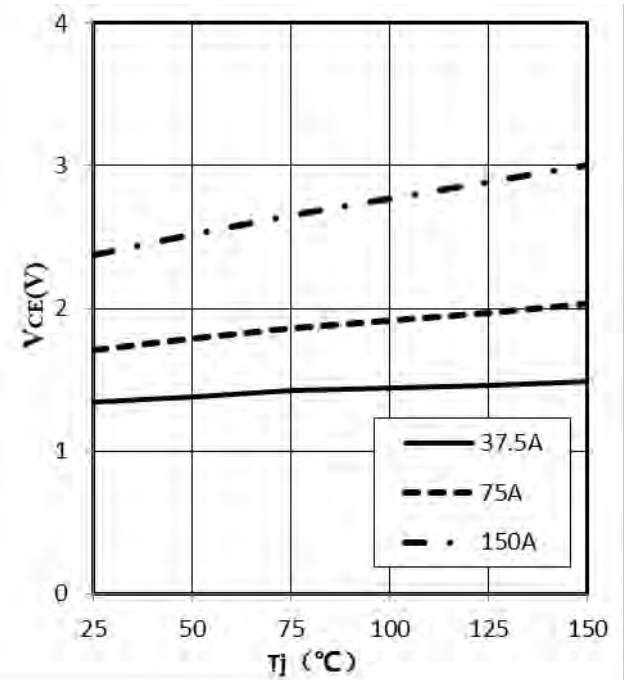


Fig 8. Typical collector-emitter saturation voltage as a function of junction temperature ($V_{ge}=15\text{V}$)

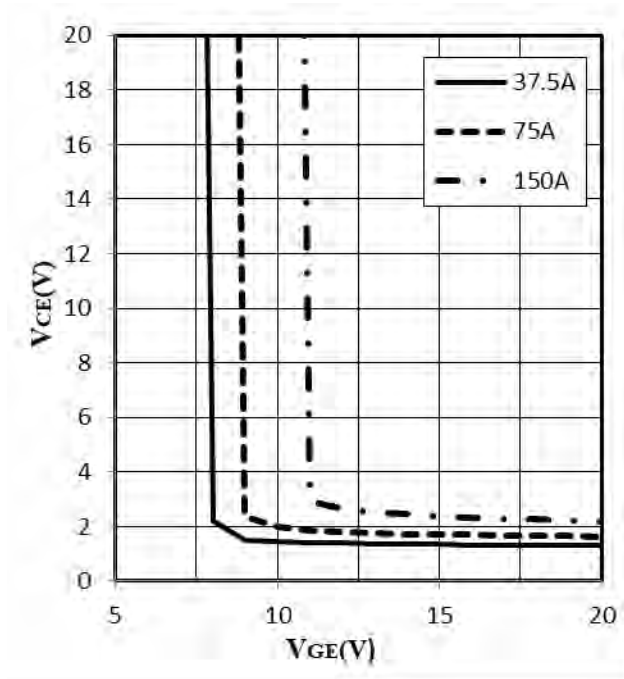


Fig 9. Typical collector-emitter saturation voltage as a function of V_{GE} ($T_j=25^\circ\text{C}$)

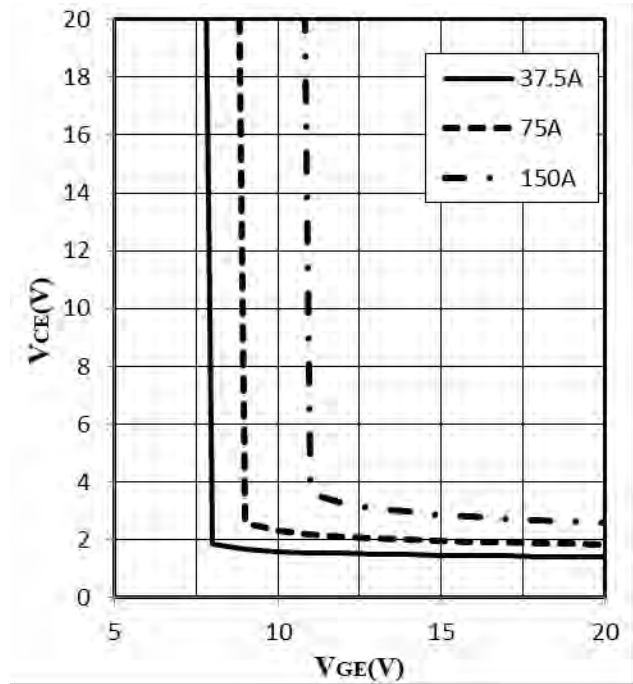


Fig 10. Typical collector-emitter saturation voltage as a function of V_{GE} ($T_j=125^\circ\text{C}$)

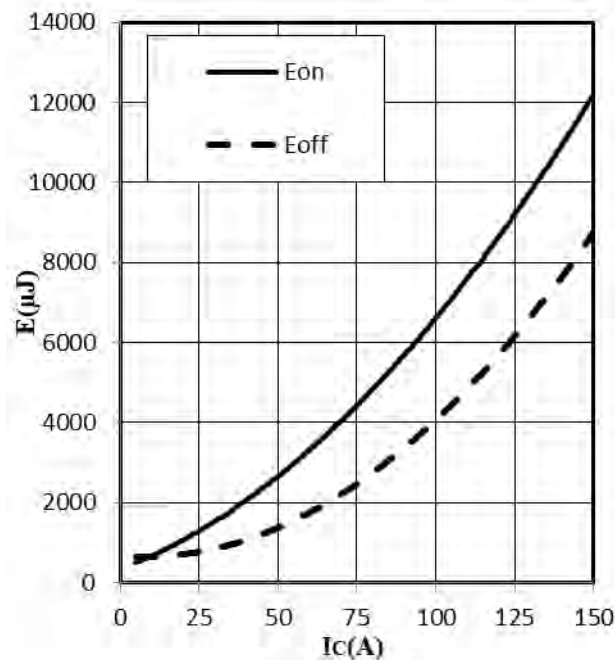


Fig 11. Typical switch energy as a function of I_c (inductive load, $T_j=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $R_G=10\Omega$)

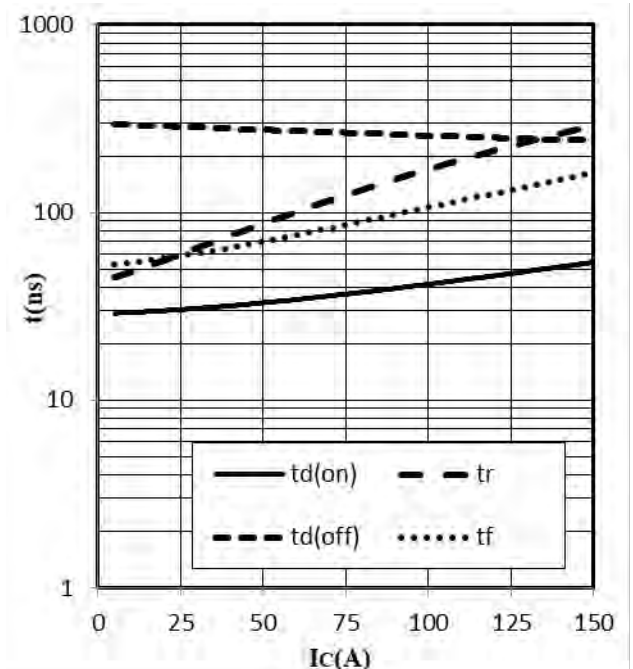


Fig 12. Typical switch time as a function of I_c (inductive load, $T_j=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $R_G=10\Omega$)

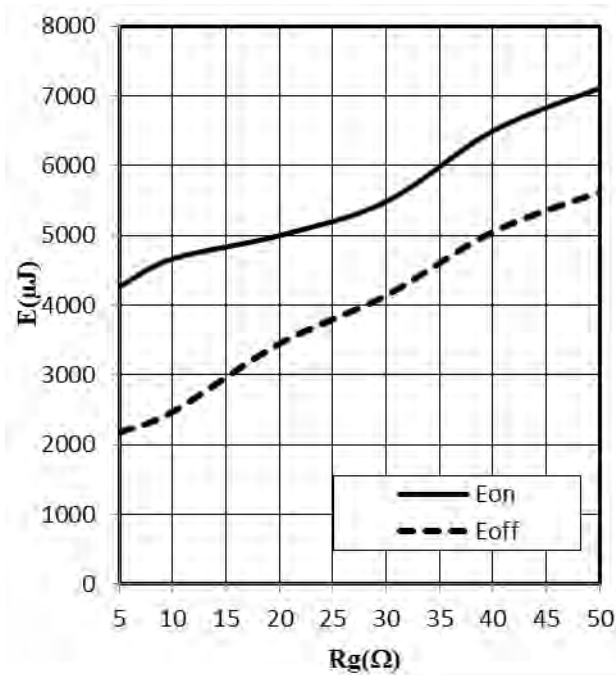


Fig 13. Typical switch energy as a function of R_G
(inductive load, $T_J=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_C=75\text{A}$)

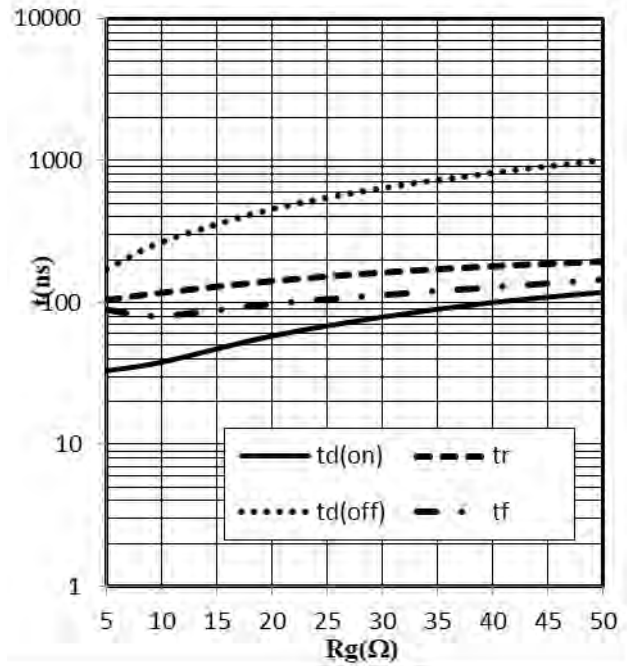


Fig 14. Typical switch time as a function of R_G
(inductive load, $T_J=25^\circ\text{C}$, $V_{CE}=400\text{V}$, $V_{GE}=15\text{V}$, $I_C=75\text{A}$)

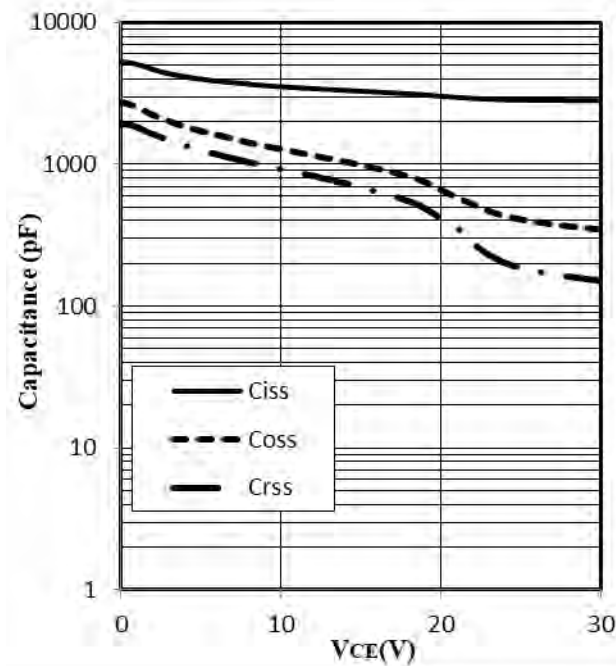


Fig 15. Typical capacitance as a function of collector-emitter voltage ($V_{GE}=0\text{V}$, $f=1\text{MHz}$)

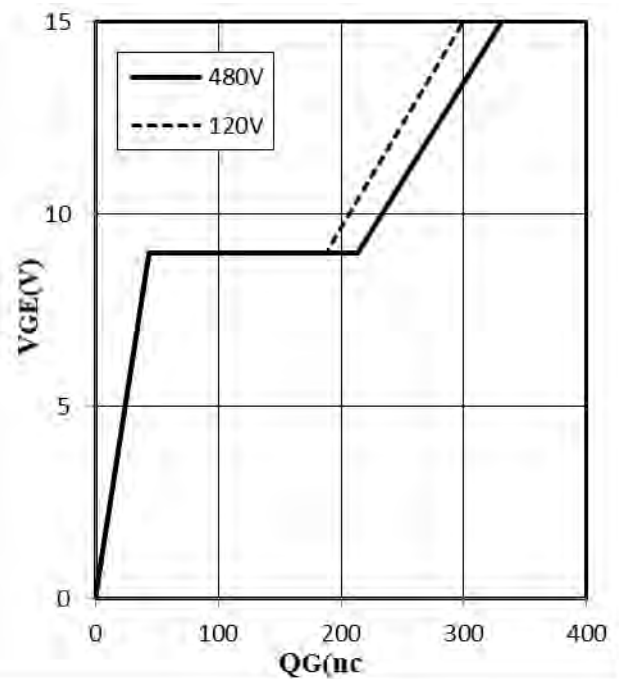


Fig 16. Typical gate charge ($I_C=75\text{A}$)

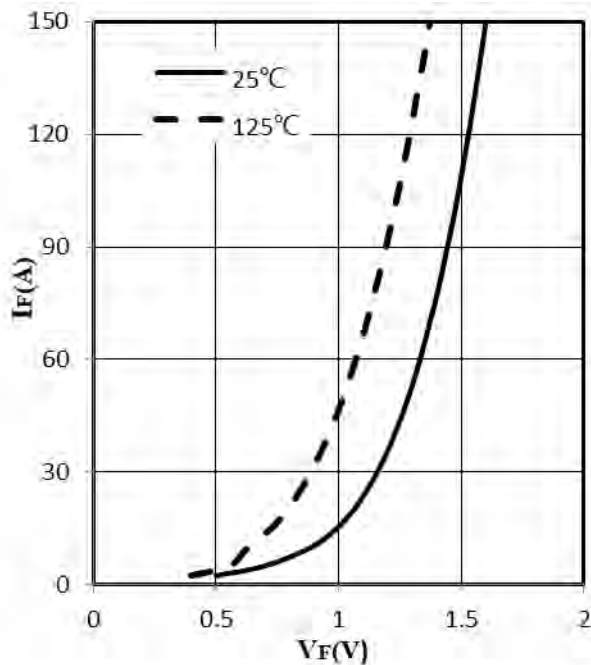


Fig 17. Typical diode forward current as a function of forward voltage

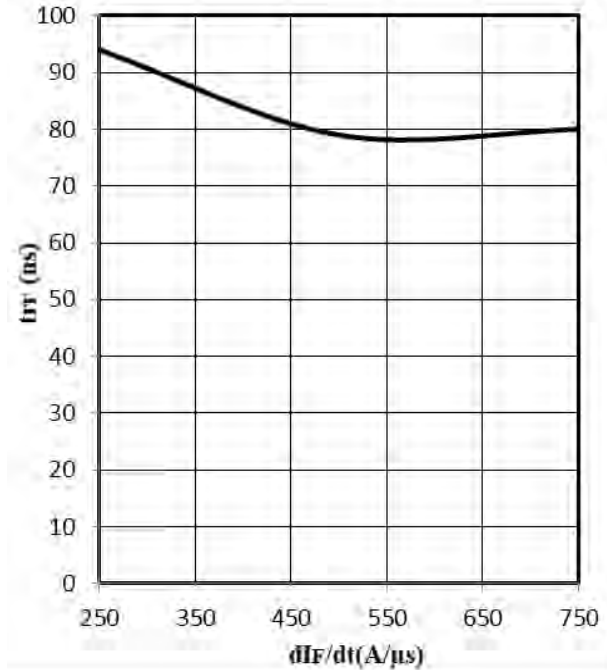


Fig 18. Typical t_{rr} as a function of dI_F/dt

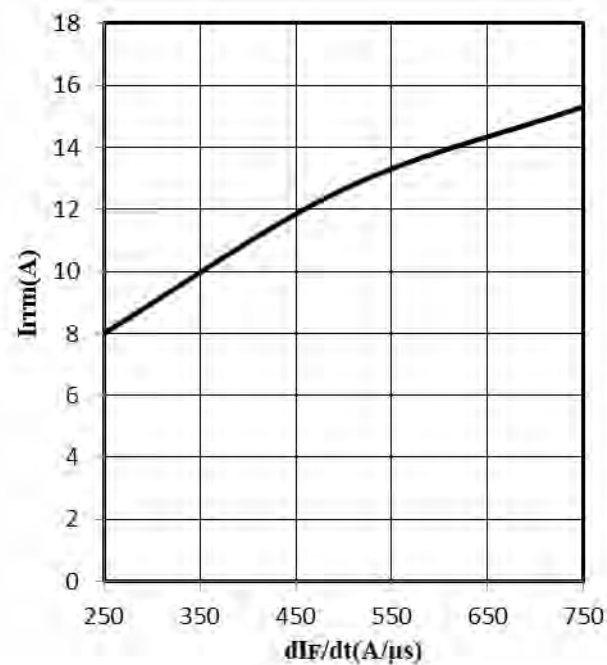


Fig 19. Typical I_{rrm} as a function of dI_F/dt

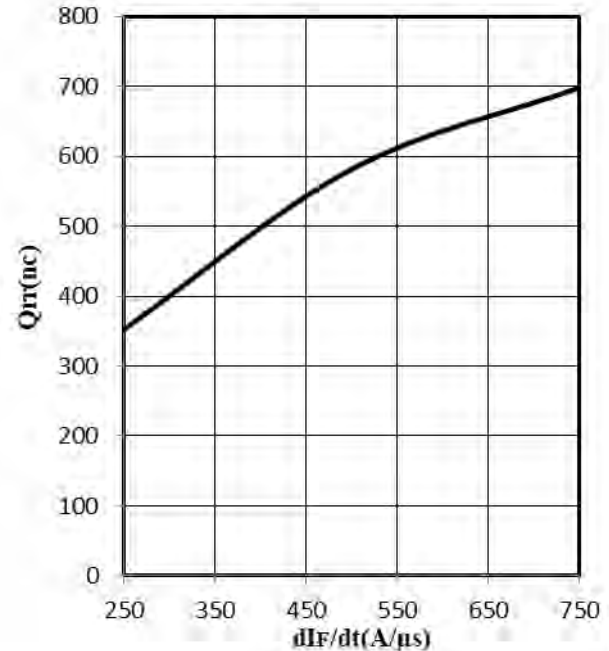
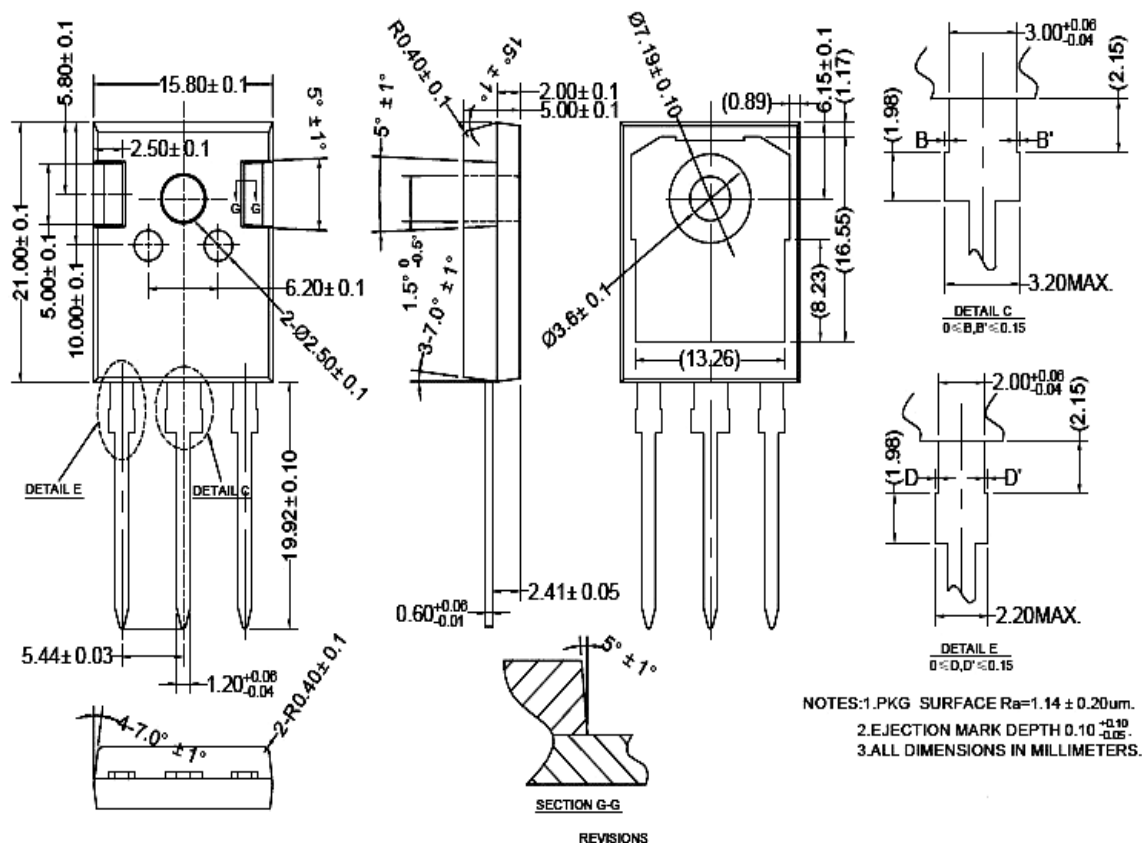


Fig 20. Typical Q_{rr} as a function of dI_F/dt

TO247 PACKAGE OUTLINE



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

 $0.5D, D' \leq 0.15$

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