

- High frequency switching application
- Resonant converters
- Uninterruptible power supply
- Welding converters

- High speed smooth switching device for hard & soft switching
- Maximum junction temperature 175
- Positive temperature coefficient
- High ruggedness, temperature stable
- Pb-free lead plating; RoHS compliant

Collector-Emitter Breakdown Voltage	V_{CE}	650	V
DC Collector Current, limited by T_{jmax} $T_C=25^\circ\text{C}$ value limited by bondwire $T_C=100^\circ\text{C}$	I_C	85 80	A
Diode Forward Current, limited by T_{jmax} $T_C=25^\circ\text{C}$ value limited by bondwire $T_C=100^\circ\text{C}$	I_F	85 80	A
Continuous Gate-Emitter Voltage	V_{GE}	± 20	V
Transient Gate-Emitter Voltage ($t_p=10\mu\text{s}, D<0.010$)	V_{GE}	± 30	V
Turn off Safe Operating Area $V_{CE}=650\text{V}$, $T_j=150^\circ\text{C}$		300	A
Pulsed Collector Current, $V_{GE}=15\text{V}$, t_p limited by T_{jmax}	I_{CM}	300	A
Diode Pulsed Current, t_p limited by T_{jmax}	I_{Fpuls}	300	A
Power Dissipation, $T_j=175^\circ\text{C}, T_C=25^\circ\text{C}$	P_{tot}	395	W
Operating Junction Temperature	T_j	-40...+175	$^\circ\text{C}$
Storage Temperature	T_s	-55...+150	$^\circ\text{C}$
Soldering Temperature, wave soldering 1.6mm (0.063in.) from case for 10s		260	$^\circ\text{C}$



$T_j = 25$ unless otherwise specified

Collector-Emitter Breakdown Voltage	BV _{CE(S)}	$V_{GE}=0V, I_C=250\mu A$	650		-	V
Gate Threshold Voltage	V _{GE(th)}	$V_{GE}=V_{CE}, I_C=0.75mA$	4.25	5.05	5.85	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	$V_{GE}=15V, I_C=75A$ $T_j=25^\circ C,$ $T_j=125^\circ C$ $T_j=150^\circ C$	1.45	1.65 2.05 2.15	1.95	V
Zero Gate Voltage Collector Current	I _{CE(S)}	$V_{CE}=650V, V_{GE}=0V$ $T_j=25^\circ C,$ $T_j=150^\circ C$			0.25 3.00	mA
Gate-Emitter Leakage Current	I _{GES}	$V_{CE}=0V, V_{GE}=\pm 20V$			200	nA

Input Capacitance	C _{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	8.15	-	nF
Reverse Transfer Capacitance	C _{res}		-	0.24	-	
Gate Charge	Q _G	$V_{CC}=300V, I_C=75A, V_{GE}=15V$	-	0.58	-	uC



Turn-on Delay Time	$t_{d(on)}$	$V_{CC}=300V, I_C=75A,$ $V_{GE}= 0v\sim 15V,$ $Rg=10 \mu s, Ls=60nH$	-	75	-	ns
Rise Time	t_r		-	91	-	ns
Turn-on Energy	E_{on}		-	2.5	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	468	-	ns
Fall Time	t_f		-	41	-	ns
Turn-off Energy	E_{off}		-	1.3	-	mJ
Total switching energy	E_{ts}			3.8		mJ

Turn-on Delay Time	$t_{d(on)}$	$V_{CC}=300V, I_C=75A,$ $V_{GE}= 0v\sim 15V,$ $Rg=10 \mu s, Ls=60nH$	-	70	-	ns
Rise Time	t_r		-	79	-	ns
Turn-on Energy	E_{on}		-	3.5	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	508	-	ns
Fall Time	t_f		-	48	-	ns
Turn-off Energy	E_{off}		-	1.6	-	mJ
Total switching energy	E_{ts}			5.1		mJ

Turn-on Delay Time	$t_{d(on)}$	$V_{CC}=300V, I_C=75A,$ $V_{GE}= 0v\sim 15V,$ $Rg=10 \mu s, Ls=60nH$	-	68	-	ns
Rise Time	t_r		-	76	-	ns
Turn-on Energy	E_{on}		-	3.7	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	519	-	ns
Fall Time	t_f		-	52	-	ns
Turn-off Energy	E_{off}		-	1.7	-	mJ
Total switching energy	E_{ts}			5.4		mJ

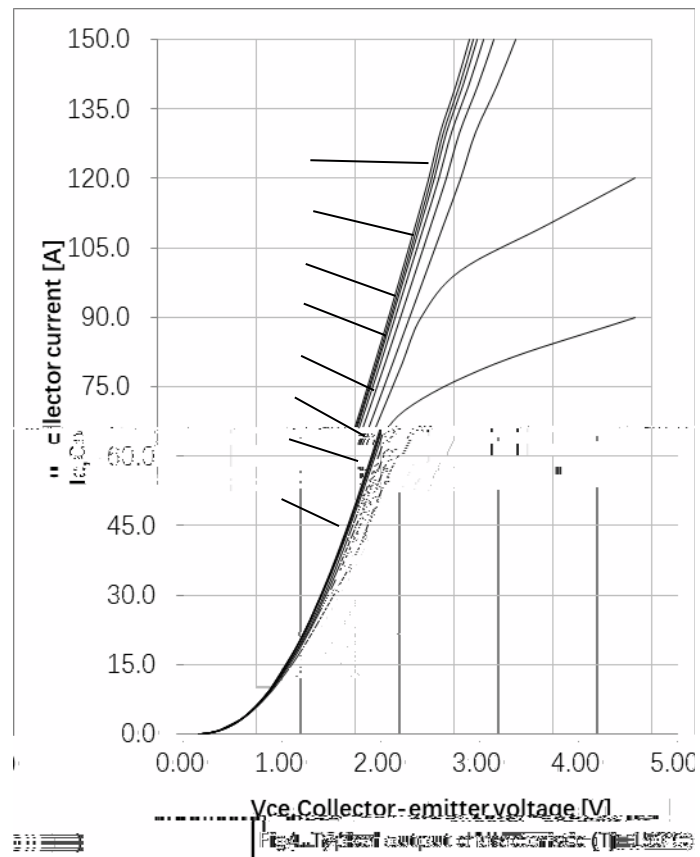
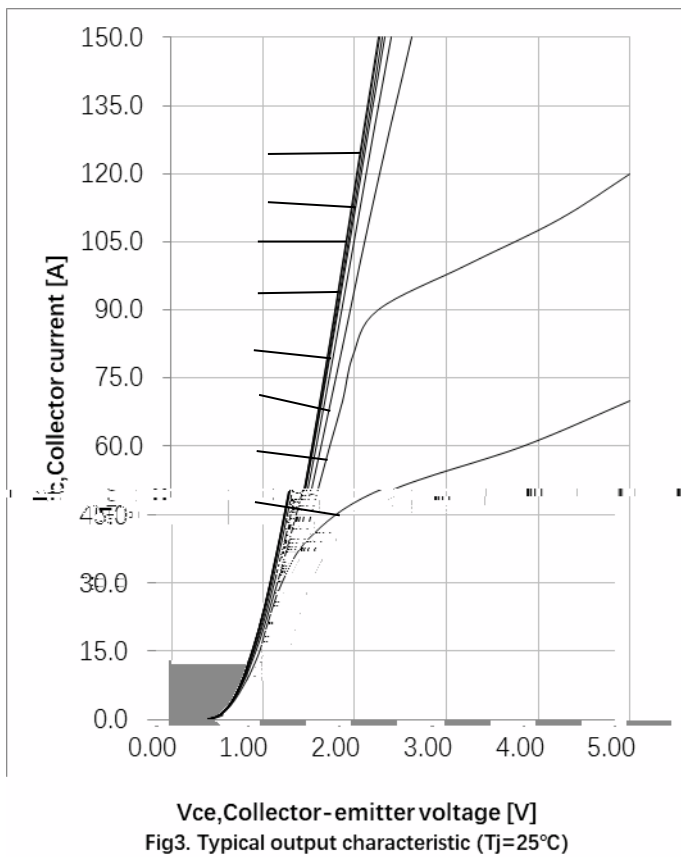
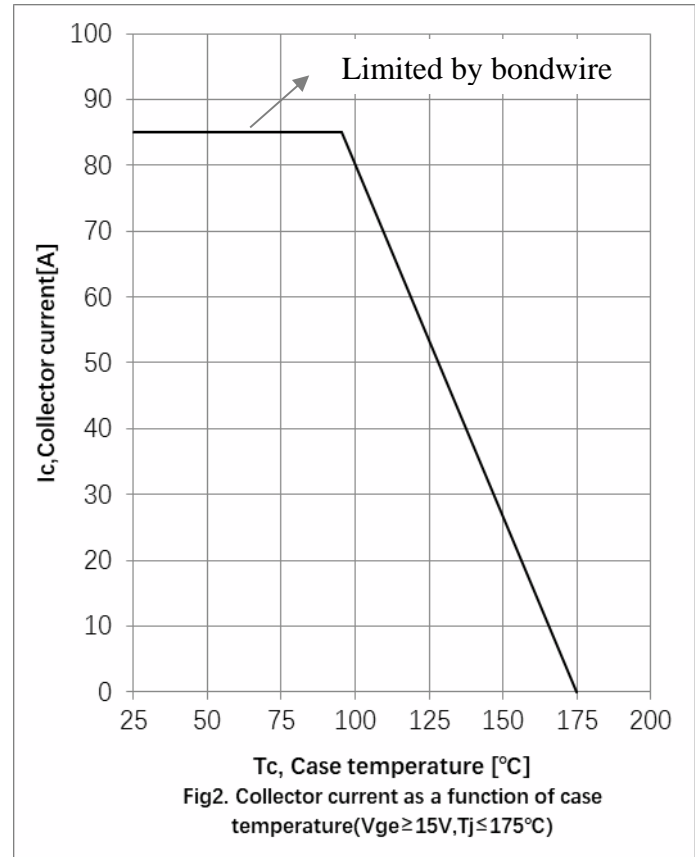
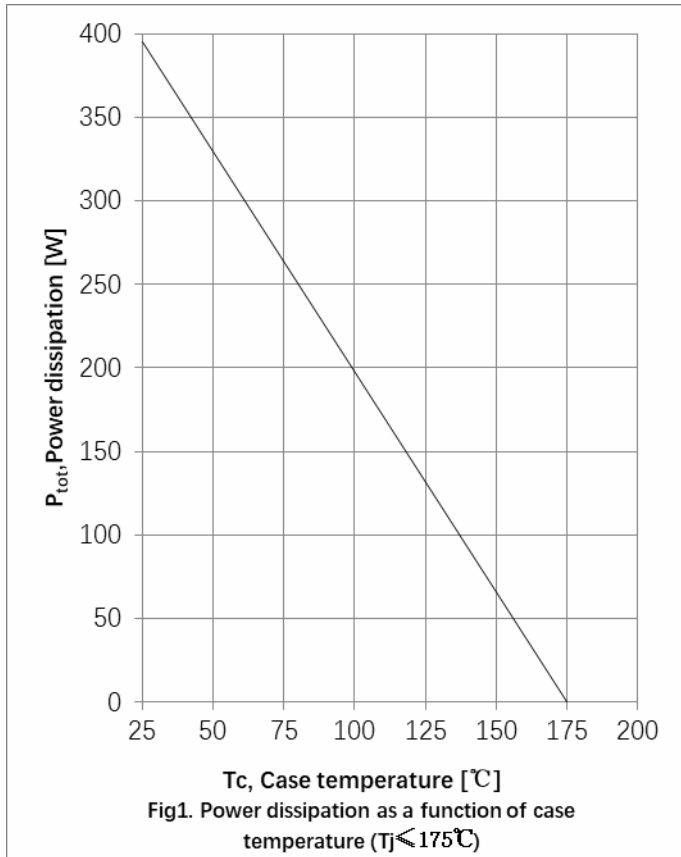
$T_j = 25$ unless otherwise specified

Diode Forward Voltage	V_F	$I_F= 75A$ $T_j= 25^\circ C,$ $T_j= 125^\circ C$ $T_j= 150^\circ C$	1.30	1.61 1.45 1.41	1.90	V



Reverse Recovery Current	I_{rr}	$I_F=75A, V_R=300V$ $-di/dt=550A/\mu s,$	-	13	-	A
Reverse Recovery Charge	Q_{rr}		-	0.73	-	μC
Diode reverse recovery time	t_{rr}		-	100	-	ns
Reverse Recovery Energy	E_{rec}		-	0.12		mJ
Reverse Recovery Current	I_{rr}	$I_F=75A, V_R=300V$ $-di/dt=550A/\mu s,$	-	32	-	A
Reverse Recovery Charge	Q_{rr}		-	3.4	-	μC
Diode reverse recovery time	t_{rr}		-	140	-	ns
Reverse Recovery Energy	E_{rec}		-	0.4		mJ
Reverse Recovery Current	I_{rr}	$I_F=75A, V_R=300V$ $-di/dt=550A/\mu s,$	-	38	-	A
Reverse Recovery Charge	Q_{rr}		-	3.58	-	μC
Diode reverse recovery time	t_{rr}		-	160	-	ns
Reverse Recovery Energy	E_{rec}		-	0.49		mJ

IGBT Thermal Resistance, Junction - Case	$R_{th(j-c)}$	0.38	K/W
Diode Thermal Resistance, Junction - Case	$R_{th(j-c)}$	0.45	K/W
Thermal Resistance, Junction - Ambient	$R_{th(j-a)}$	40	K/W



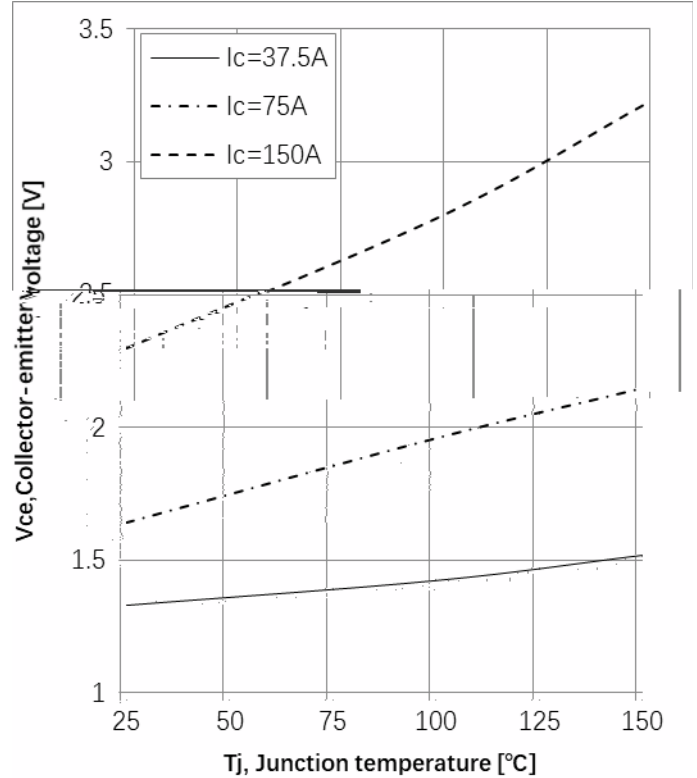


Fig6. Typical collector-emitter saturation voltage as a function of junction temperature (Vge=15V)

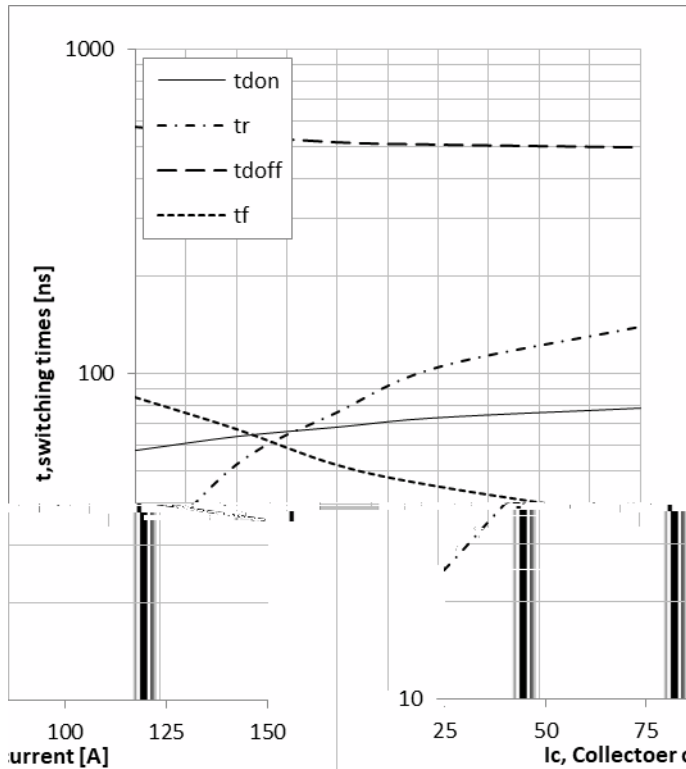


Fig7. Typical switching time as a function of collector current (inductive load, Tj=150°C, Vce=300V, Vge=0/15V, Rg=10Ω)

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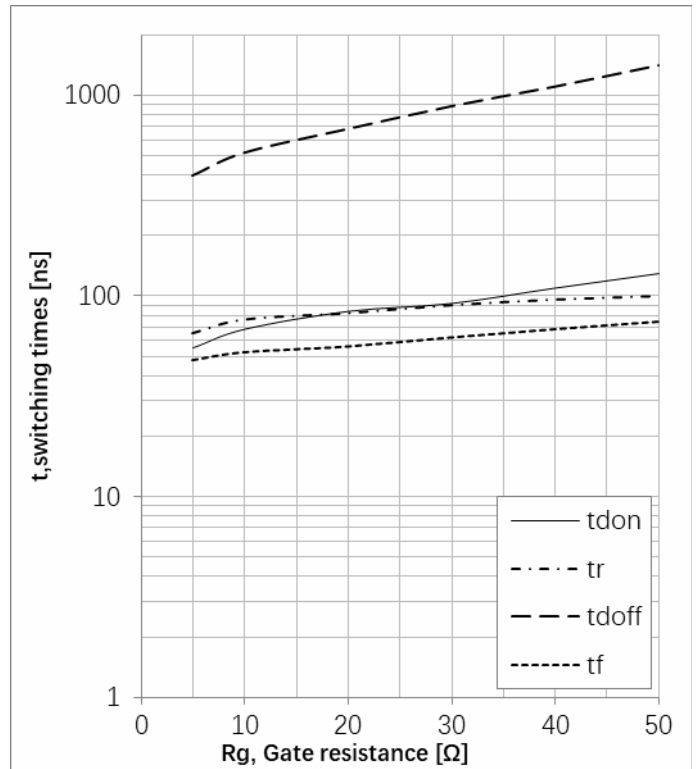
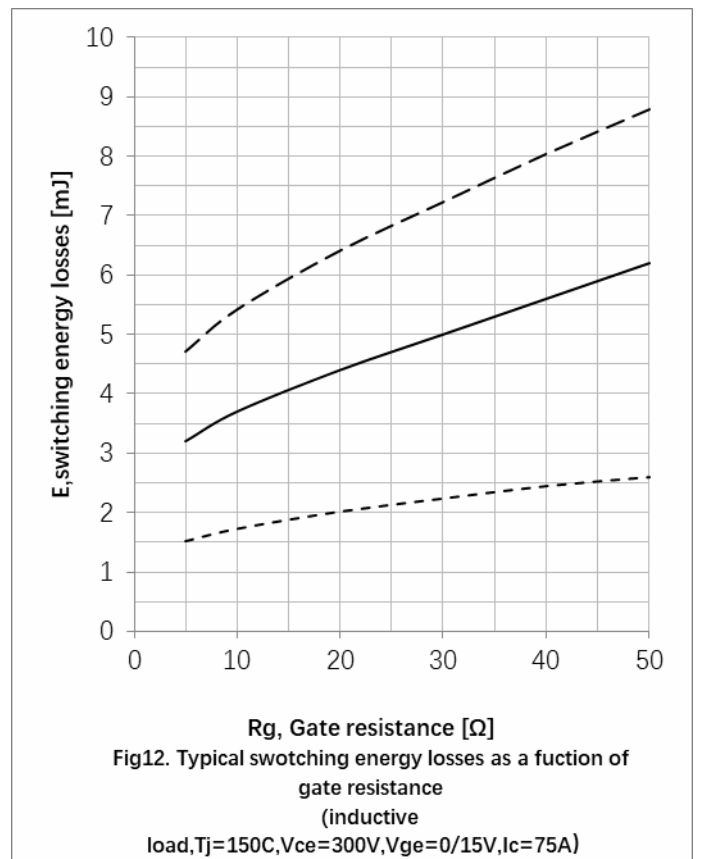
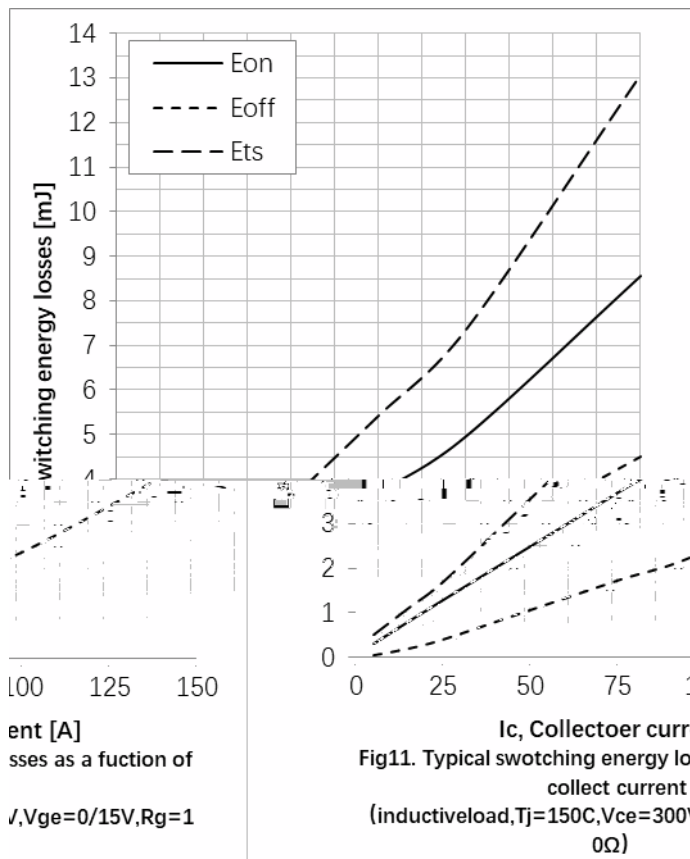
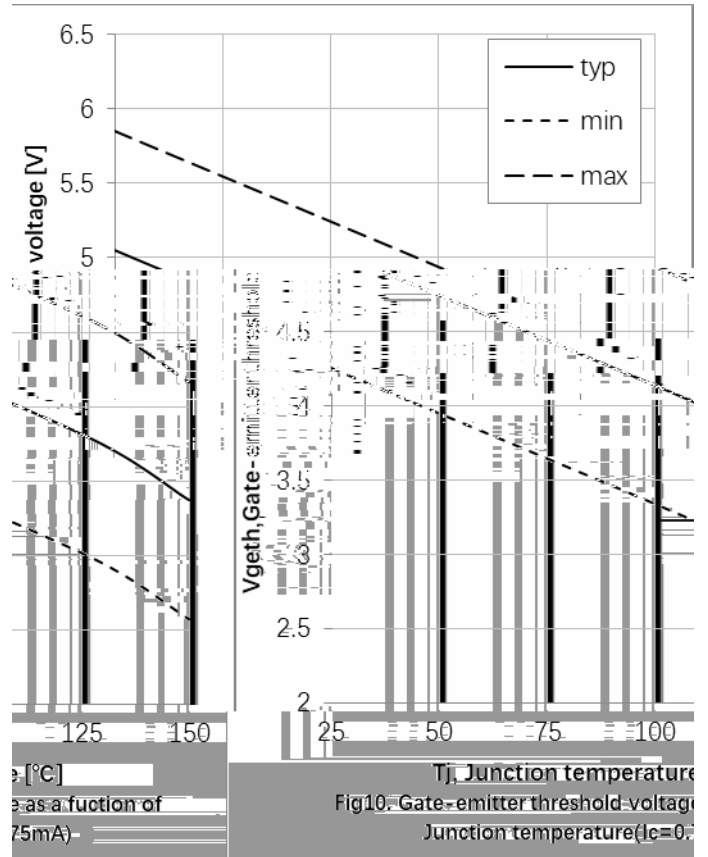
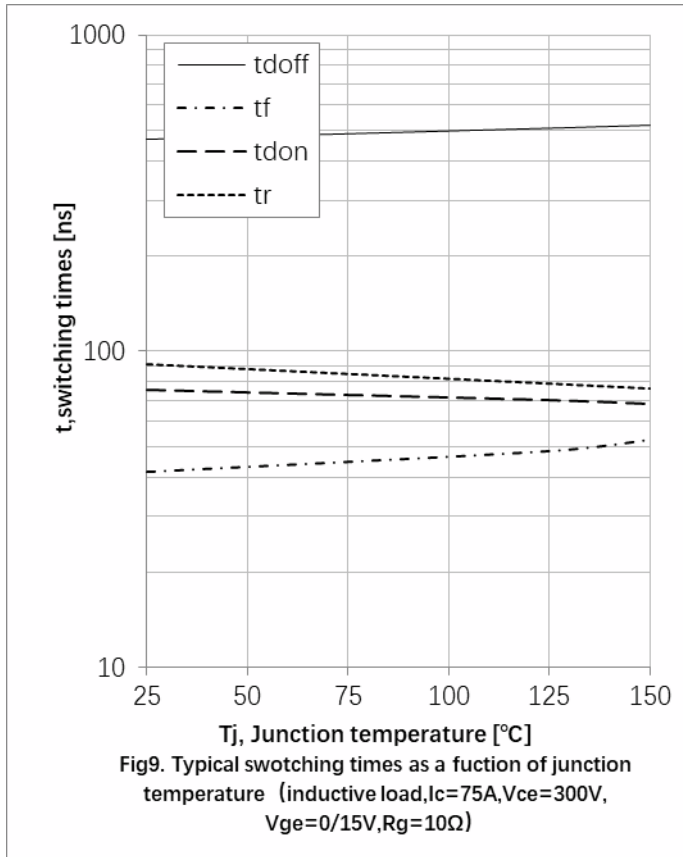


Fig8. Typical switching times as a function of gate resistance (inductive load, Tj=150°C, Vce=300V, Vge=0/15V, Ic=75A)



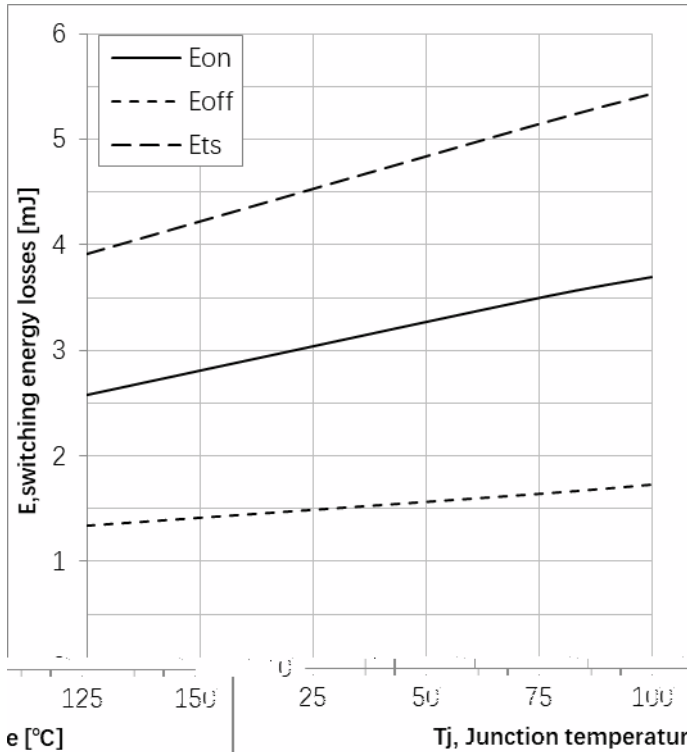


Fig13. Typical switching energy losses as a function of

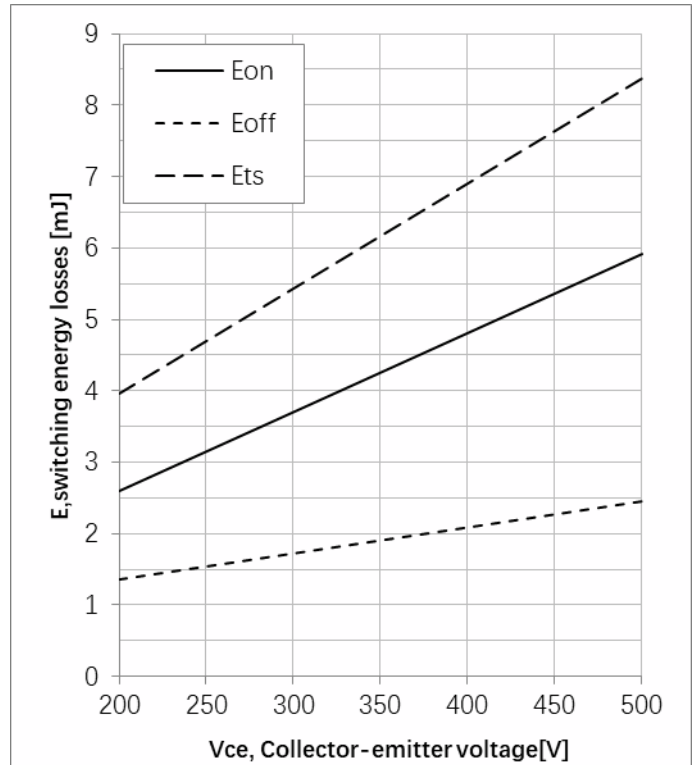


Fig14. Typical switching energy losses as a function of collector-emitter voltage (inductive load, T_j=150°C, I_c=75A, V_{ge}=0/15V, R_g=10Ω)

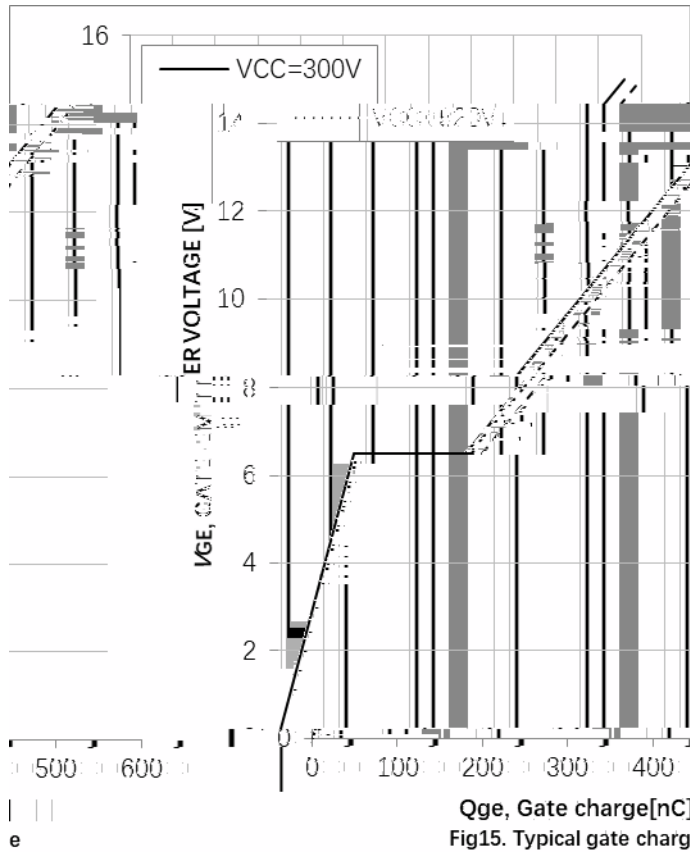


Fig15. Typical gate charge

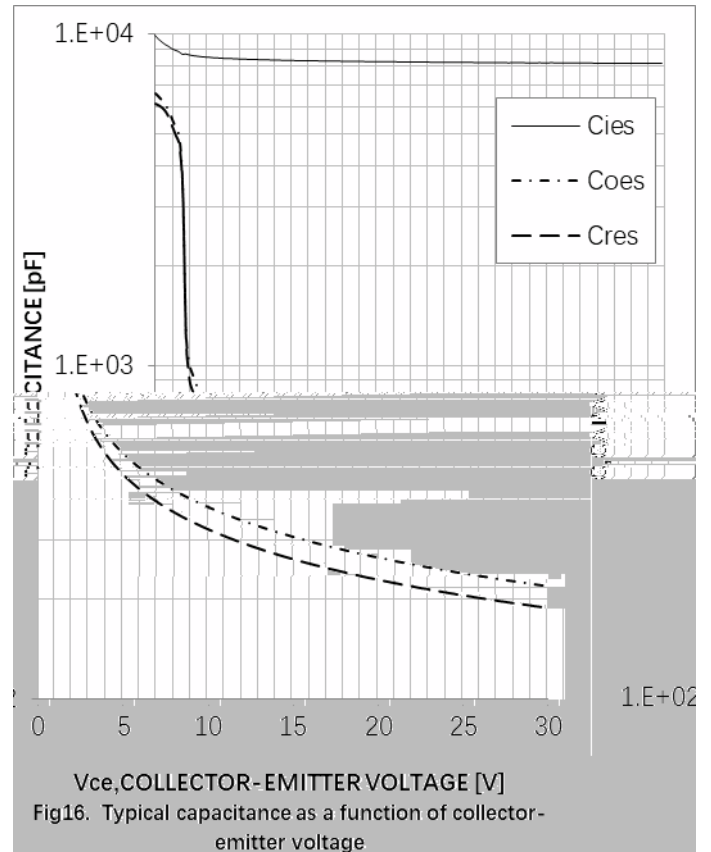
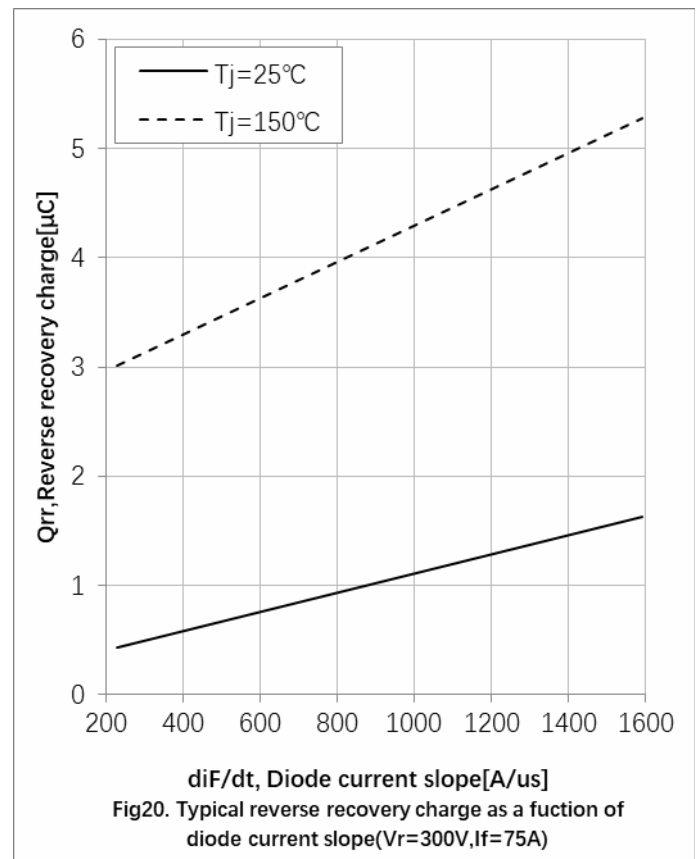
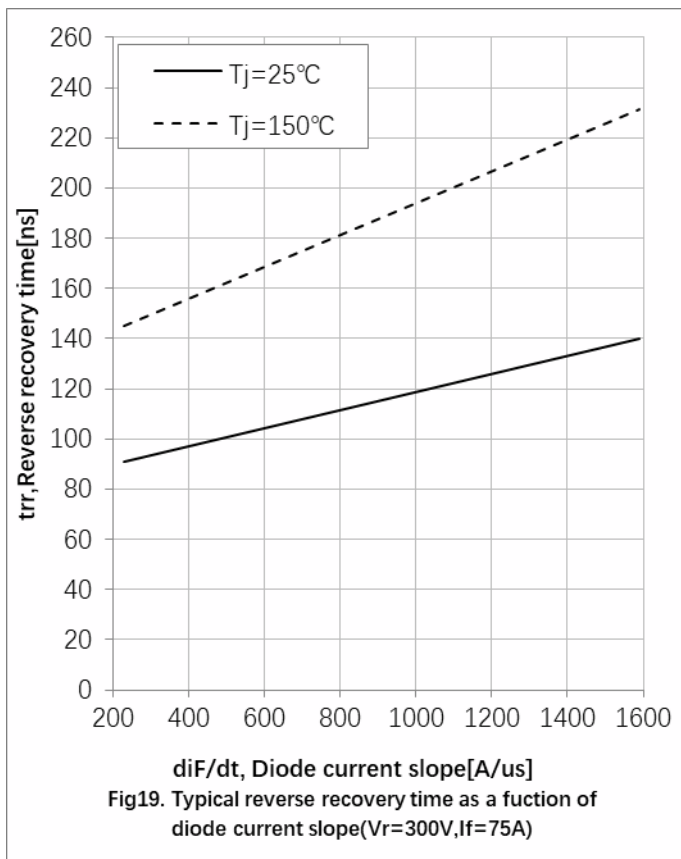
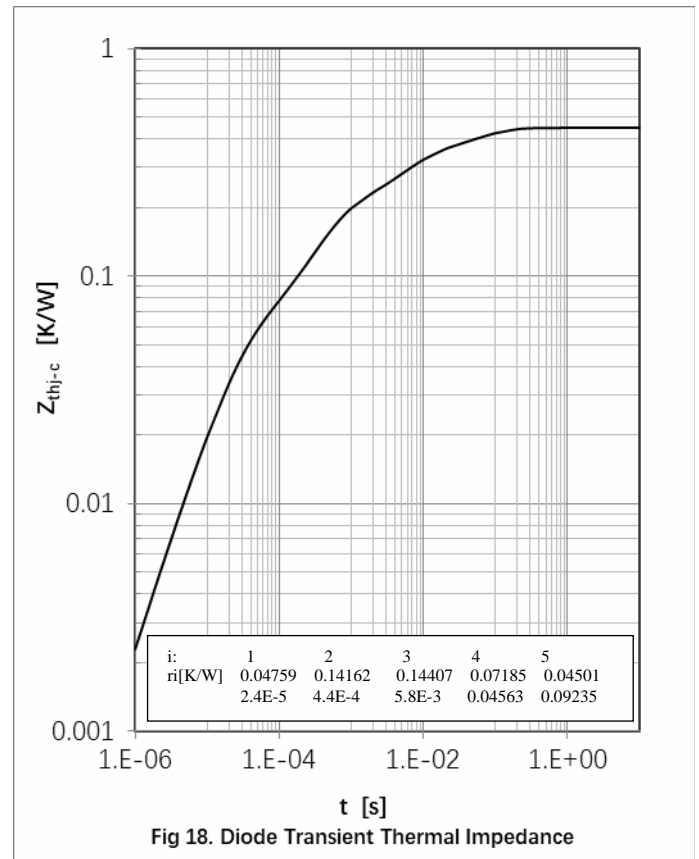
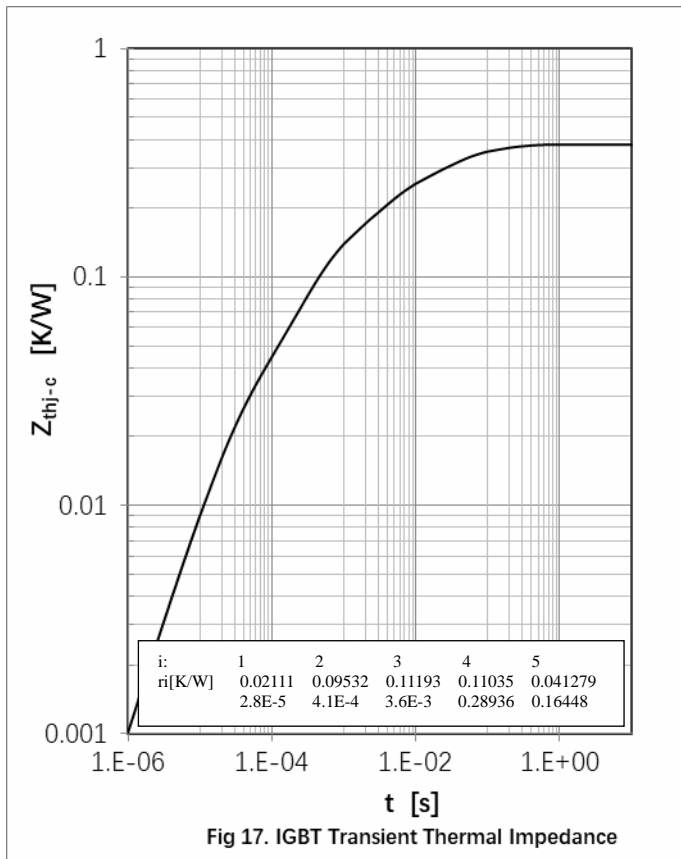
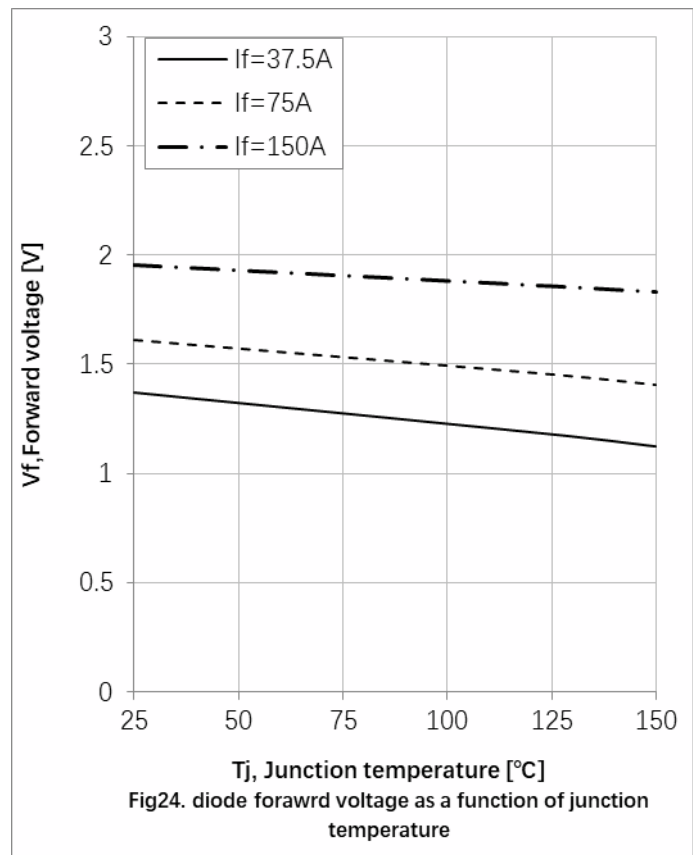
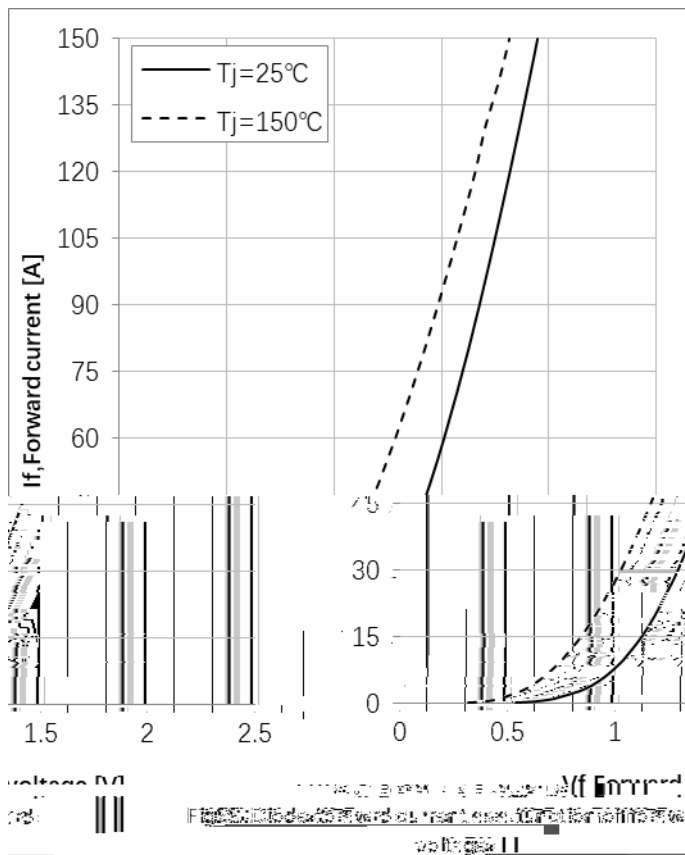
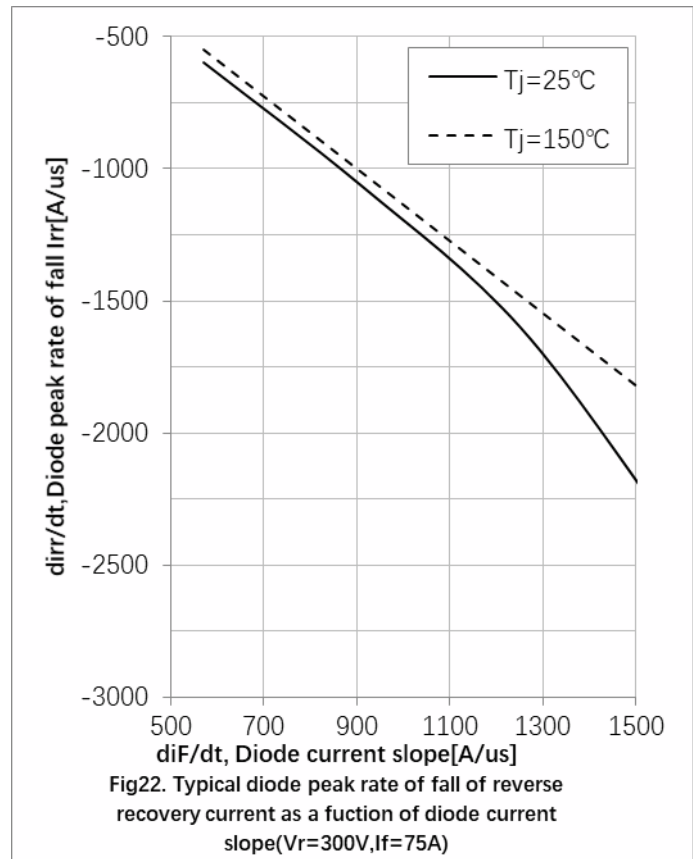
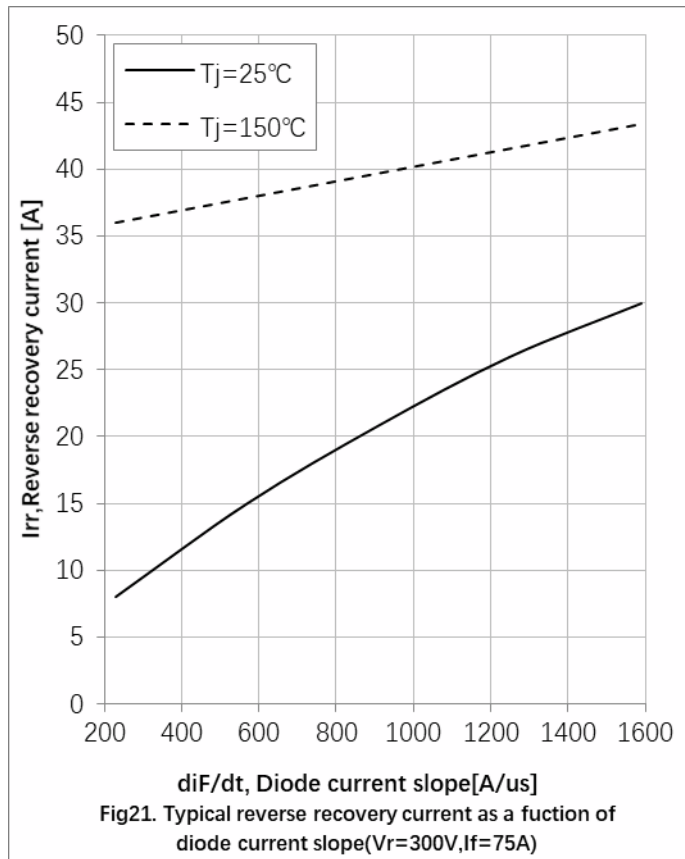
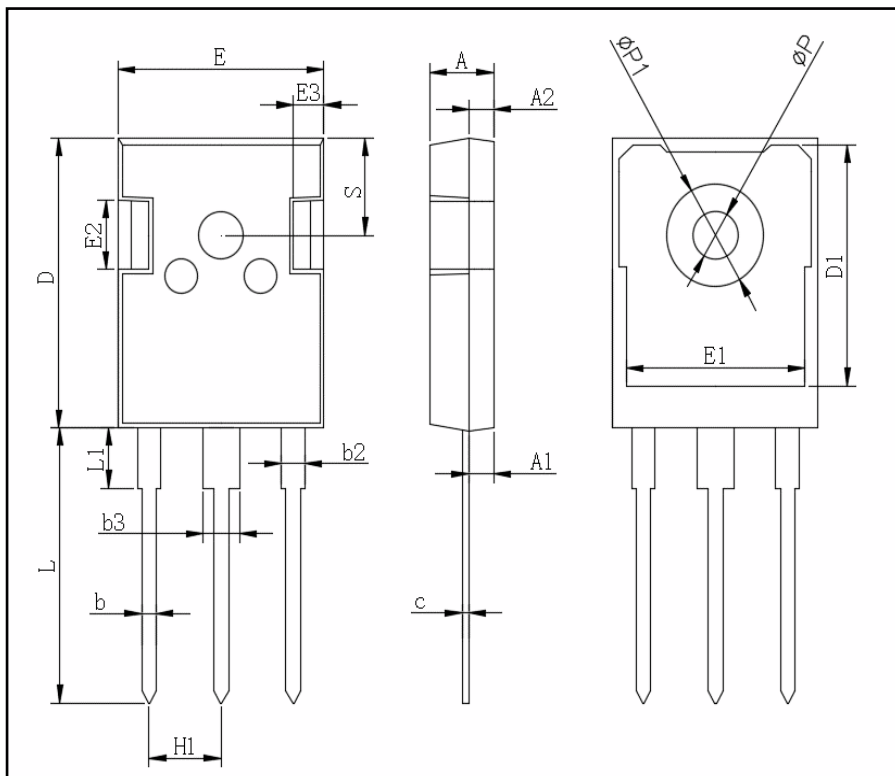
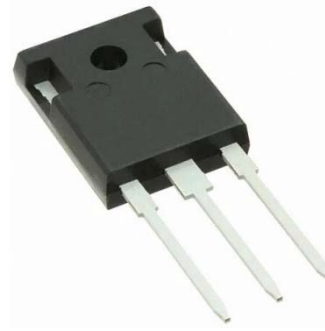
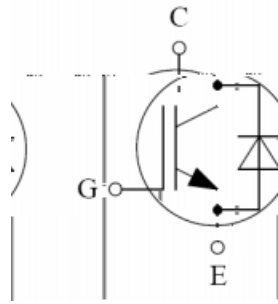


Fig16. Typical capacitance as a function of collector-emitter voltage







Dim	Min	Max
A	4.80	5.20
A1	2.21	2.61
A2	1.85	2.15
b	1.0	1.4
b2	1.91	2.21
C	0.5	0.7
D	20.70	21.30
D1	16.25	16.85
E	15.50	16.10
E1	13.0	13.6
E2	4.80	5.20
E3	2.30	2.70
L	19.62	20.22
L1	-	4.30
P	3.40	3.80
P1	-	7.30
S	6.15TYP	
H1	5.44TYP	
b3	2.80	3.20