DGQ100N120CTL2A

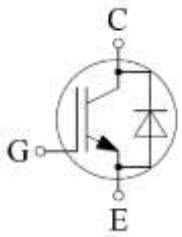
RoHS COMPLIANT



IGBT Discrete

V_{CE}	1200	V
I_C	100	A
$V_{CE(SAT)}$ I_C=100A	1.50	V

Circuit



Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

Features

- High breakdown voltage to 1200V for improved reliability
- Maximum junction temperature 175℃
- Positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	1200	V
DC Collector Current, limited by T_{jmax} T_C= 25°C T_C= 100°C	I_C	 150 100	A
Diode Forward Current, limited by T_{jmax} T_C= 25°C T_C= 100°C	I_F	 150 100	A
Continuous Gate-Emitter Voltage	V_{GE}	±20	V
Transient Gate-Emitter Voltage (tp≤10μs,D<0.010)	V_{GE}	±30	V
Turn off Safe Operating Area V_{CE}≤1200V, T_j≤ 150°C		200	A
Pulsed Collector Current, V_{GE}=15V, tp limited by T_{jmax}	I_{CM}	200	A
Diode Pulsed Current, tp limited by T_{jmax}	I_{Fpuls}	200	A
Short Circuit Withstand Time, V_{GE}= 15V, V_{CC}=600V， V_{CEM}≤1200V	T_{sc}	10	μs
Power Dissipation , Tj=175°C， T_C=25°C	P_{tot}	883	W

Operating Junction Temperature	T_j	-40...+175	°C
Storage Temperature	T_s	-55...+150	°C
Soldering Temperature, wave soldering 1.6mm (0.063in.) from case for 10s		260	°C

Electrical Characteristics of the IGBT（T_j= 25℃unless otherwise specified）:

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Collector-Emitter Breakdown Voltage	BV_{CES}	V_{GE}=0V, I_C=250μA	1200		-	V
Gate Threshold Voltage	$V_{GE(th)}$	V_{GE}=V_{CE}, I_C=1mA	4.8	5.8	6.8	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE}=15V, I_C=100A T_j=25°C, T_j=125°C T_j=150°C		1.50 1.75 1.85	1.90	V
Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=1200V, V_{GE}=0V T_j= 25°C, T_j=150°C			1 5	mA
Gate-Emitter Leakage Current	I_{GES}	V_{CE}= 0V, V_{GE}= ± 20V			100	nA

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic						
Input Capacitance	C_{ies}	V_{CE}= 25V, V_{GE}= 0V, f = 1MHz	-	12.9	-	nF
Reverse Transfer Capacitance	C_{res}		-	0.06	-	
Gate Charge	Q_G	V_{CC}=600V,I_C=100A, V_{GE}=15V	-	0.36	-	uC
Short Circuit Collector Current	I_{SC}	V_{GE}=15V, tsc≤10us, Vcc=600V	-	439	-	A

Electrical Characteristics of the Diode（T_j= 25℃unless otherwise specified）:

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Diode Forward Voltage	V_F	I_F= 100A T_j= 25°C, T_j= 125°C T_j= 150°C		2.00 2.05 2.05	2.60	V

Switching Characteristic, Inductive Load

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T_j= 25℃						
Turn-on Delay Time	$t_{d(on)}$	V_{CC}= 600V, I_C=100A, V_{GE}= -5V~15V, R_g=10Ω	-	208	-	ns
Rise Time	t_r		-	165	-	ns
Turn-on Energy	E_{on}		-	17.6	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	448	-	ns
Fall Time	t_f		-	144	-	ns
Turn-off Energy	E_{off}		-	6.6	-	mJ
Dynamic , at T_j= 125℃						
Turn-on Delay Time	$t_{d(on)}$	V_{CC}= 600V, I_C=100A, V_{GE}= -5V~15V, R_g=10Ω	-	237	-	ns
Rise Time	t_r		-	163	-	ns
Turn-on Energy	E_{on}		-	18.1	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	490	-	ns
Fall Time	t_f		-	309	-	ns
Turn-off Energy	E_{off}		-	8.7	-	mJ
Dynamic , at T_j= 150℃						
Turn-on Delay Time	$t_{d(on)}$	V_{CC}= 600V, I_C=100A, V_{GE}= -5V~15V, R_g=10Ω	-	251	-	ns
Rise Time	t_r		-	161	-	ns
Turn-on Energy	E_{on}		-	18.5	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	507	-	ns
Fall Time	t_f		-	262	-	ns
Turn-off Energy	E_{off}		-	9.6	-	mJ

Electrical Characteristics of the DIODE

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T_j= 25℃						
Reverse Recovery Current	I_{rr}	I_F=100A, V_R=600V, di/dt= -590A/μs	-	26	-	A
Diode reverse recovery time	trr		-	273	-	ns
Reverse Recovery Charge	Q_{rr}		-	4.43	-	uC
Reverse Recovery Energy	Erec		-	1.25	-	mJ
Dynamic , at Tj= 125℃						
Reverse Recovery Current	I_{rr}	I_F=100A, V_R=600V, di/dt= -590A/μs	-	38	-	A
Diode reverse recovery time	trr		-	421	-	ns
Reverse Recovery Charge	Q_{rr}		-	10.25	-	uC
Reverse Recovery Energy	Erec		-	3.19	-	mJ
Dynamic , at Tj= 150℃						
Reverse Recovery Current	I_{rr}	I_F=100A, V_R=600V, di/dt= -590A/μs	-	45	-	A
Diode reverse recovery time	trr		-	496	-	ns
Reverse Recovery Charge	Q_{rr}		-	12.44	-	uC
Reverse Recovery Energy	Erec		-	4.13	-	mJ

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R_{th}(j-c)	0.17	K/W
Diode Thermal Resistance, Junction - Case	R_{th}(j-c)	0.27	K/W
Thermal Resistance, Junction - Ambient	R_{th}(j-a)	40	K/W

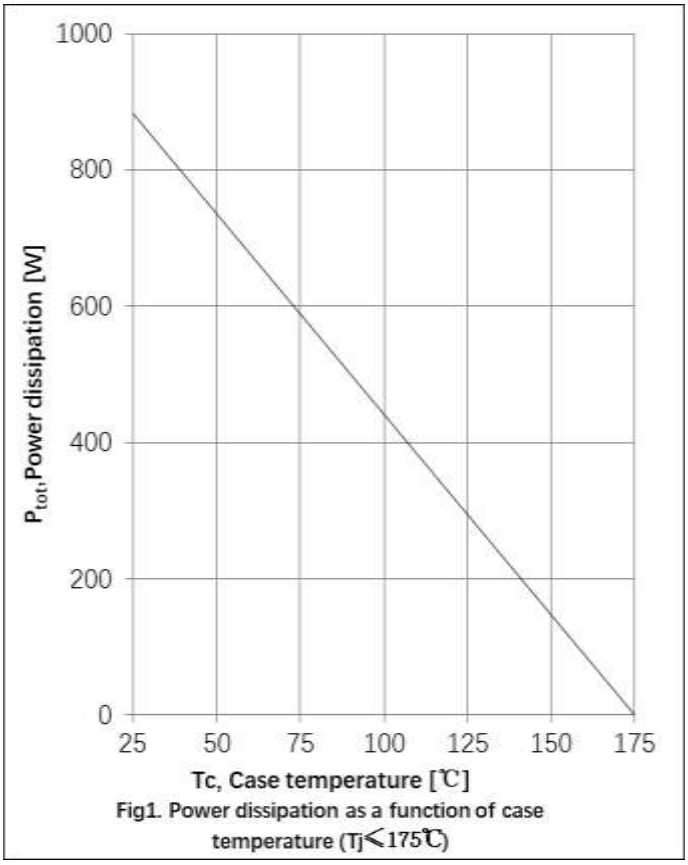


Fig1. Power dissipation as a function of case temperature (Tj≤175℃)

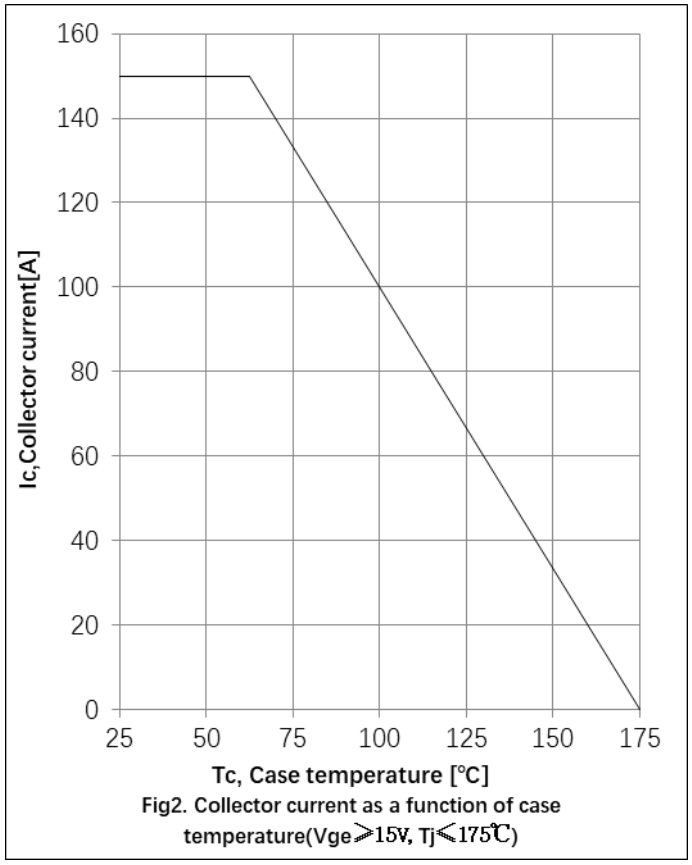


Fig2. Collector current as a function of case temperature(Vge≥15V, Tj≤175℃)

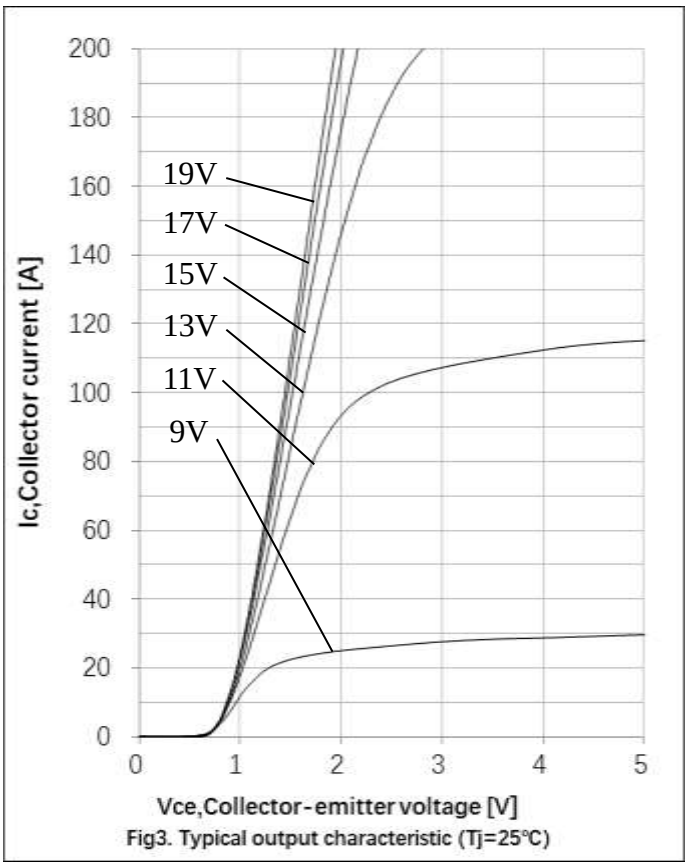


Fig3. Typical output characteristic (Tj=25℃)

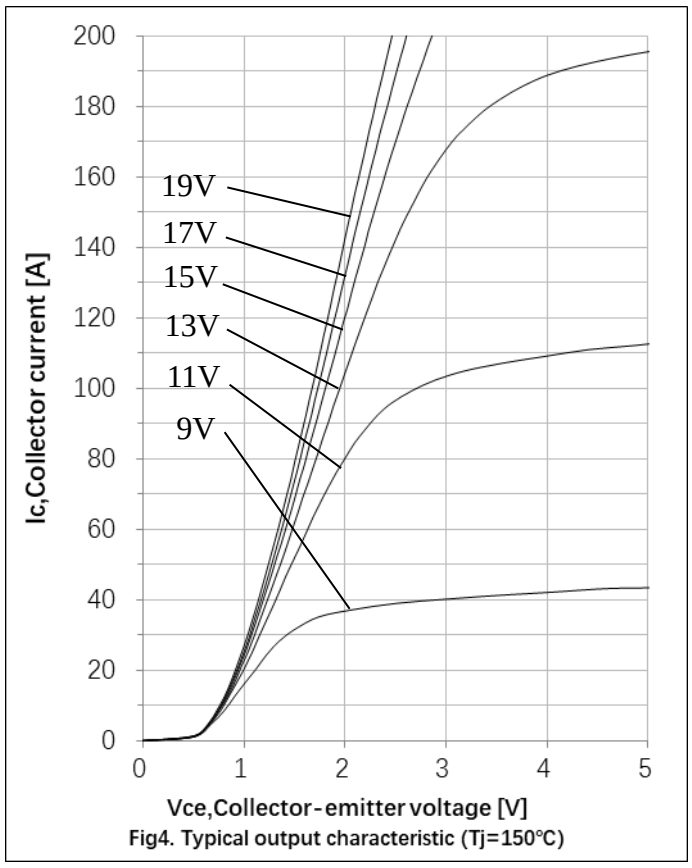


Fig4. Typical output characteristic (Tj=150℃)

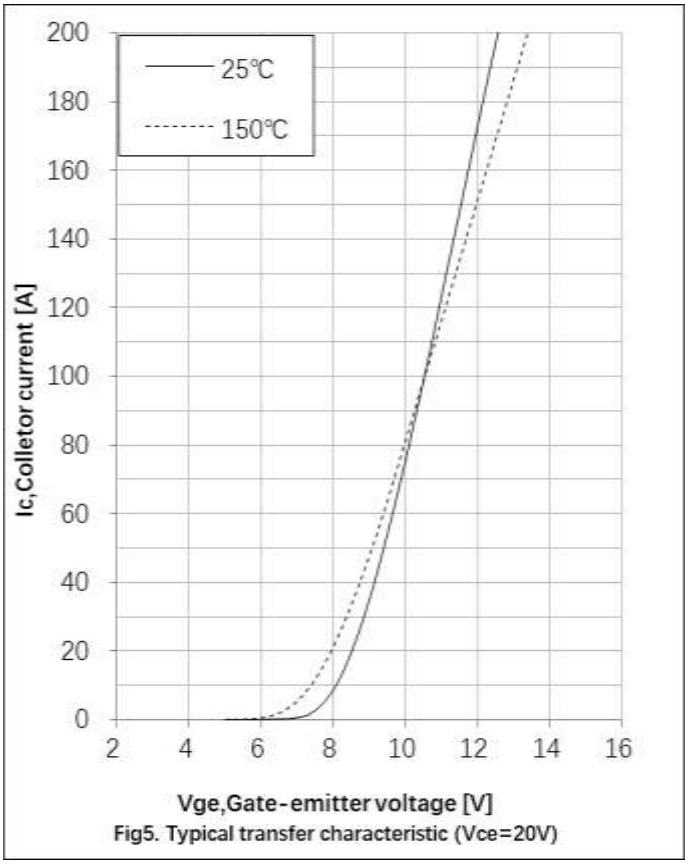


Fig5. Typical transfer characteristic (Vce=20V)

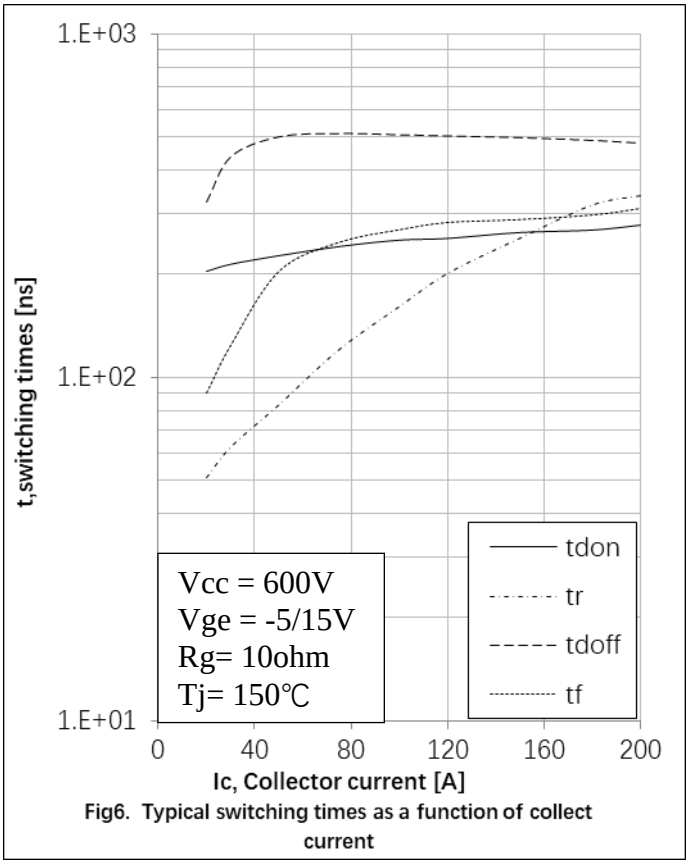


Fig6. Typical switching times as a function of collect current

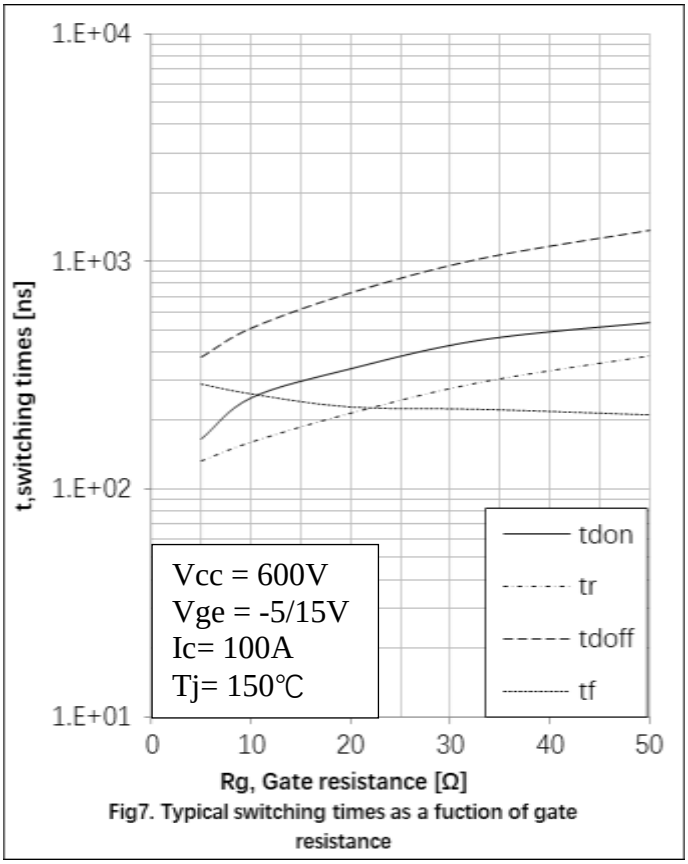


Fig7. Typical switching times as a fuction of gate resistance

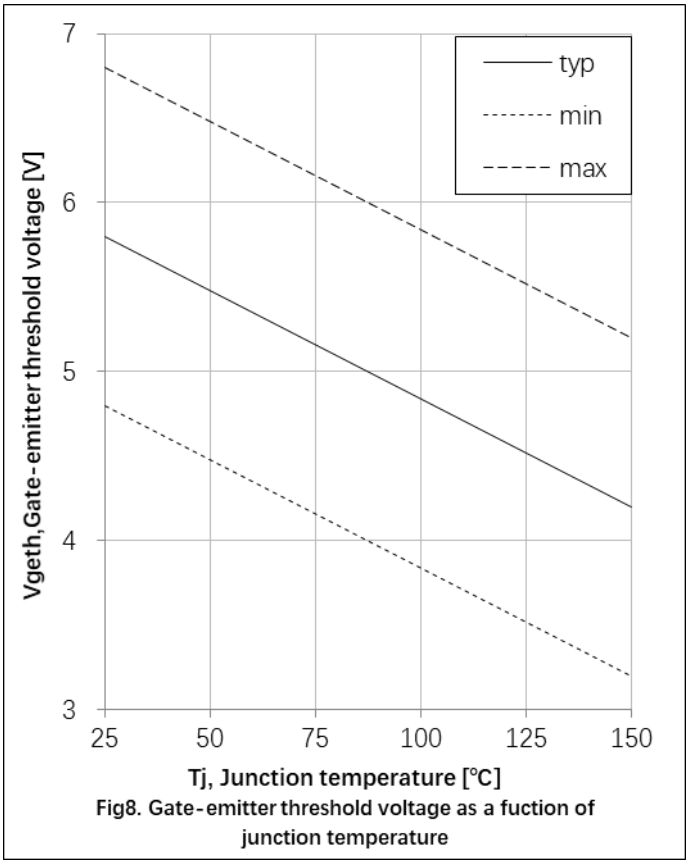


Fig8. Gate-emitter threshold voltage as a fuction of junction temperature

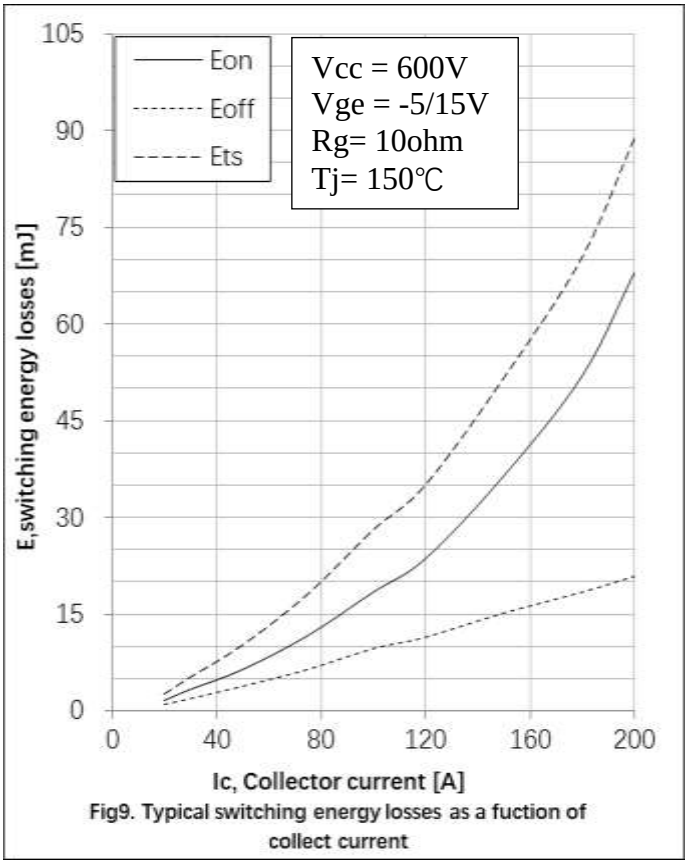


Fig9. Typical switching energy losses as a fuction of collect current

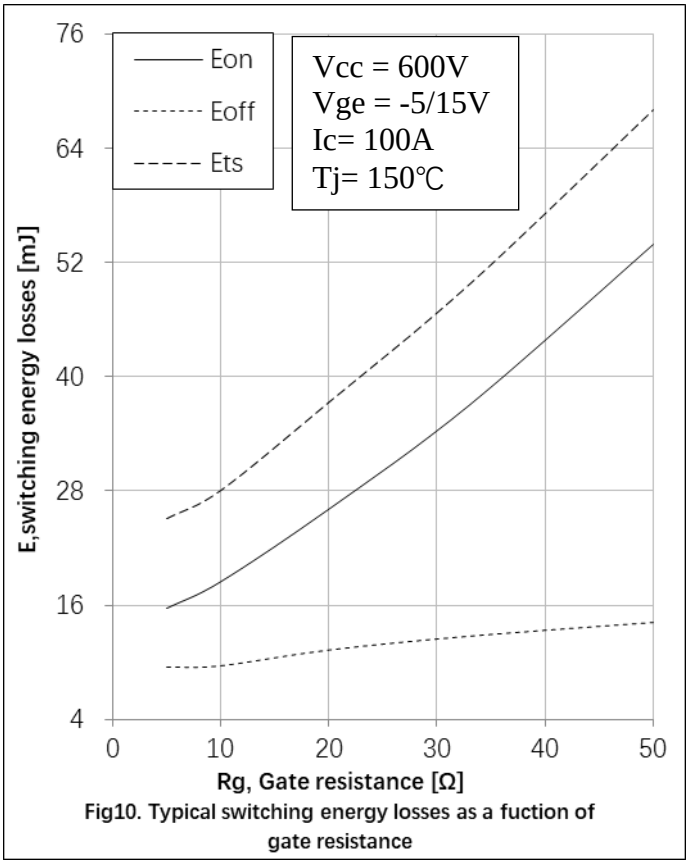


Fig10. Typical switching energy losses as a fuction of gate resistance

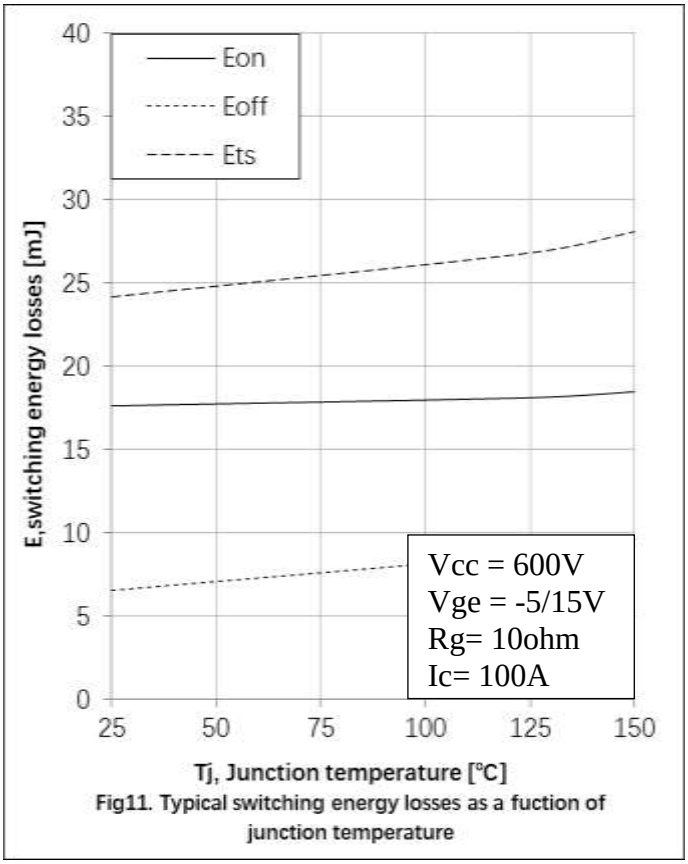


Fig11. Typical switching energy losses as a fuction of junction temperature

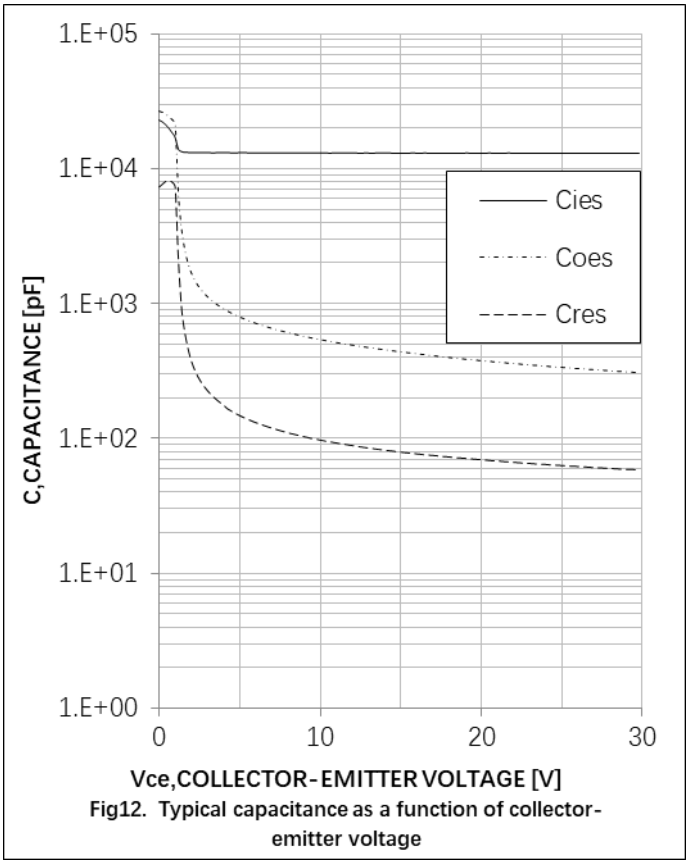


Fig12. Typical capacitance as a function of collector-emitter voltage

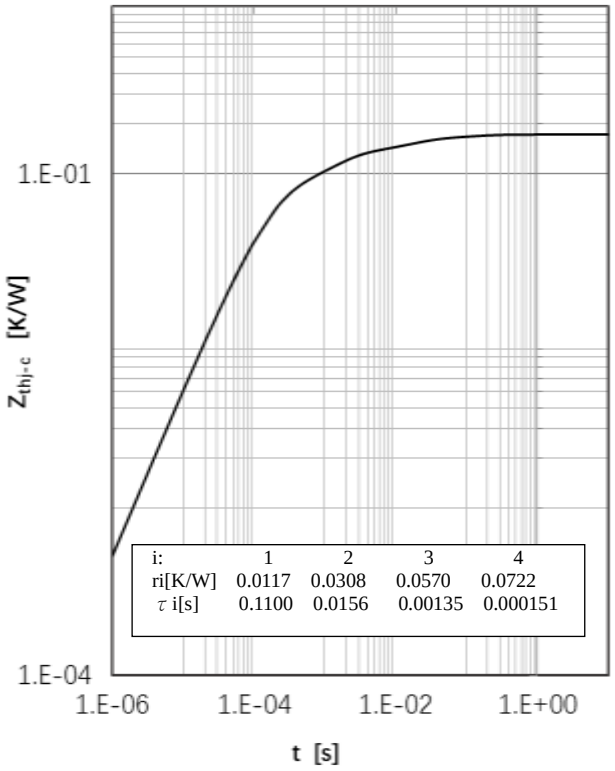


Fig 13. IGBT Transient Thermal Impedance

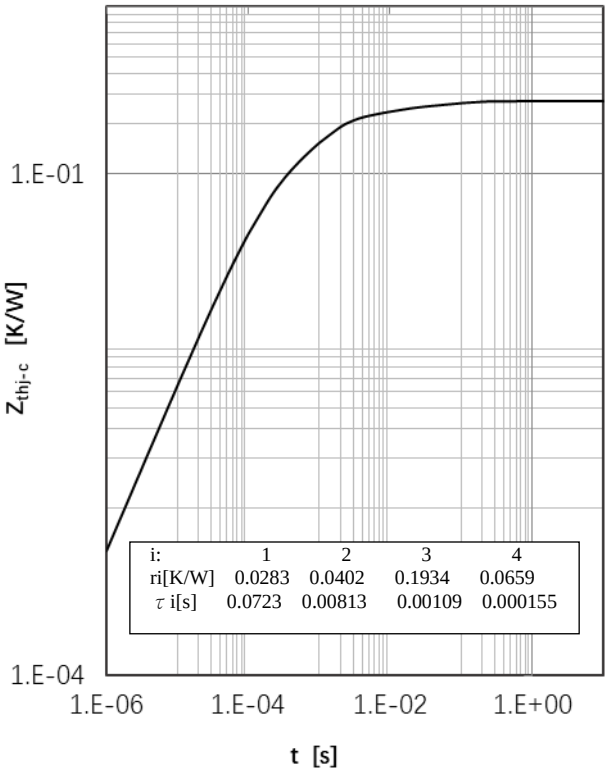


Fig 14. Diode Transient Thermal Impedance

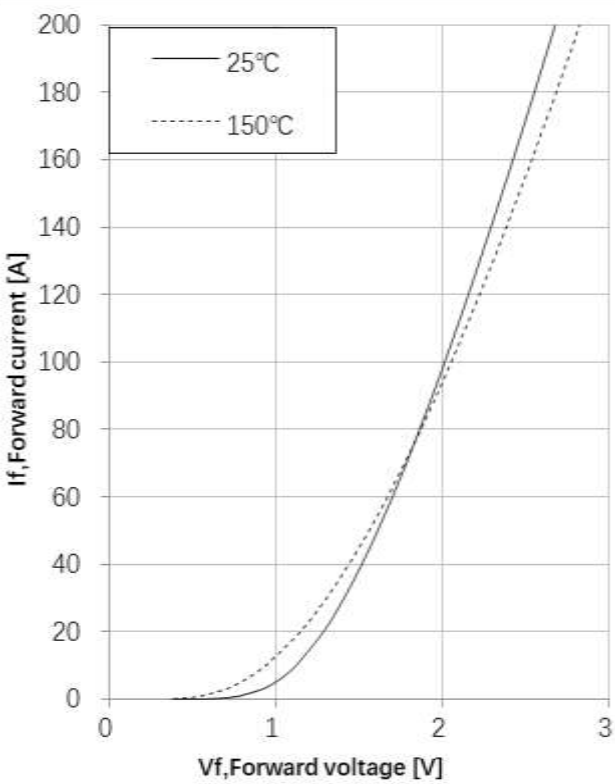


Fig15. Diode forawrd current as a function of foraward voltage

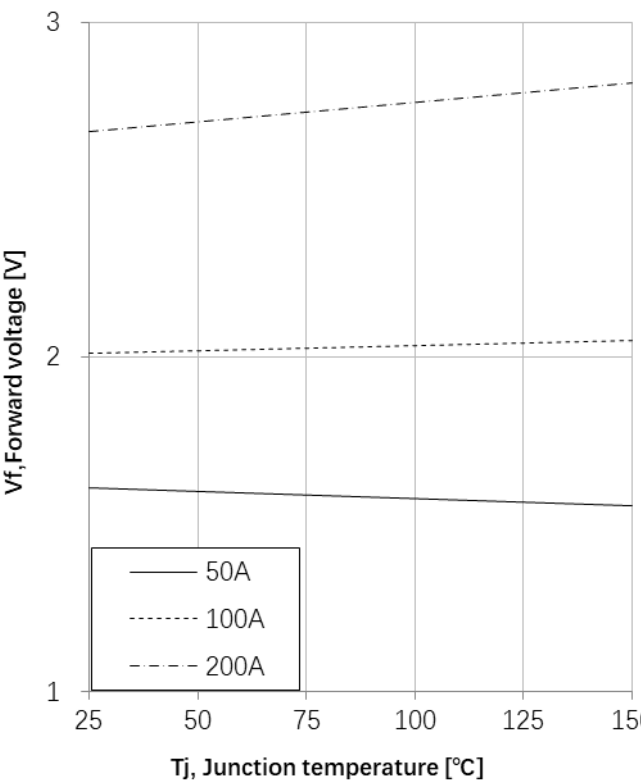
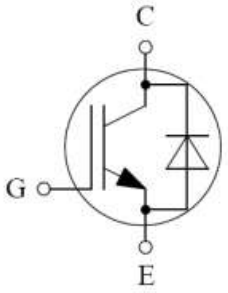


Fig16. Typical diode foraward voltage as a function of junction temperature

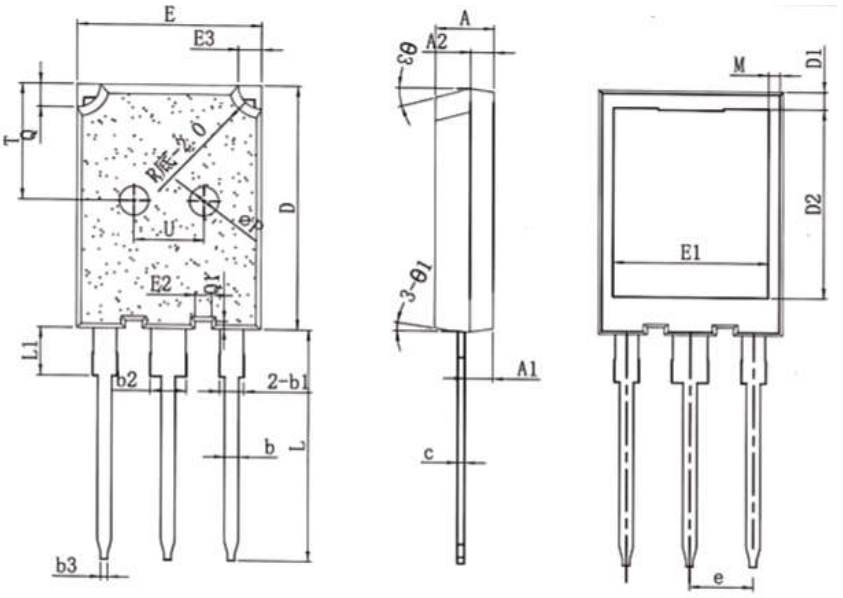
Circuit Diagram



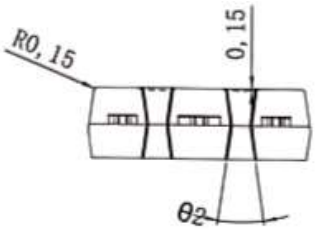


- **Package Outline Information**

CASE: TO 247plus



SYMBOL	mm		
	MIN	NOM	MAX
※A	4.90	5.00	5.10
※A1	2.30	2.40	2.50
A2	1.90	2.00	2.10
※b	1.15	1.20	1.25
※b1	1.95	2.10	2.25
※b2	2.95	3.10	3.25
b3	0.45	0.60	0.75
※c	0.55	0.60	0.65
※D	20.90	21.00	21.10
D1	1.00	1.20	1.40
D2	16.05	16.35	16.65
※E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	1.25	1.45	1.65
E3	1.80	2.00	2.20
※e	5.40	5.44	5.48
※L	19.80	19.95	20.10
※L1	–	–	4.30
M	0.50	0.70	0.90
※P	2.30	2.50	2.70
Q	1.80	2.00	2.20
Q1	0.50	0.68	0.80
T	9.80	10.00	10.20
U	5.80	6.00	6.20
θ1	5°	7°	9°
θ2	13°	16°	19°
θ3	13°	15°	17°



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