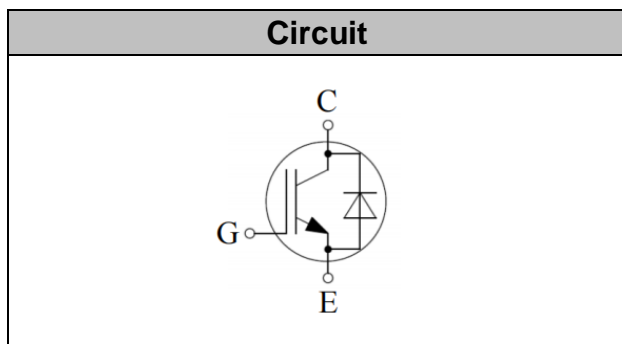


## IGBT Discrete

$V_{CE}$	<b>1200</b>	<b>V</b>
$I_C$	<b>100</b>	<b>A</b>
$V_{CE(SAT)} I_C=100A$	<b>1.70</b>	<b>V</b>



## 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°C
- 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 $T_{jmax}$ $T_C=25^\circ C$ $T_C=100^\circ C$	$I_C$	150 100	A
Diode Forward Current, limited by $T_{jmax}$ $T_C=25^\circ C$ $T_C=100^\circ C$	$I_F$	150 100	A
Continuous Gate-Emitter Voltage	$V_{GE}$	$\pm 20$	V
Transient Gate-Emitter Voltage ( $t_p \leq 10\mu s, D < 0.010$ )	$V_{GE}$	$\pm 30$	V
Turn off Safe Operating Area $V_{CE} \leq 1200V$ , $T_j \leq 150^\circ C$		200	A
Pulsed Collector Current, $V_{GE}=15V$ , $t_p$ limited by $T_{jmax}$	$I_{CM}$	200	A
Diode Pulsed Current, $t_p$ limited by $T_{jmax}$	$I_{Fpuls}$	200	A
Short Circuit Withstand Time, $V_{GE}=15V, V_{CC}=600V, V_{CEM} \leq 1200V$	$T_{sc}$	10	$\mu s$
Power Dissipation, $T_j=175^\circ C, T_C=25^\circ C$	$P_{tot}$	789	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** ( $T_j = 25^\circ\text{C}$  unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Collector-Emitter Breakdown Voltage	$BV_{CES}$	$V_{GE}=0V, I_C=250\mu A$	1200		-	V
Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=6mA$	5.0	5.8	6.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=100A$ $T_j=25^\circ\text{C}$ , $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$	1.40	1.70 2.05 2.15	2.00	V
Zero Gate Voltage Collector Current	$I_{CES}$	$V_{CE}=1200V, V_{GE}=0V$ $T_j=25^\circ\text{C}$ , $T_j=150^\circ\text{C}$			0.25 5	mA
Gate-Emitter Leakage Current	$I_{GES}$	$V_{CE}=0V, V_{GE}=\pm 20V$			100	nA

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Dynamic</b>						
Input Capacitance	$C_{ies}$	$V_{CE}=25V, V_{GE}=0V,$ $f=1\text{MHz}$	-	11.5	-	nF
Reverse Transfer Capacitance	$C_{res}$		-	0.24	-	
Gate Charge	$Q_G$	$V_{CC}=960V, I_C=75A,$ $V_{GE}=15V$	-	0.55	-	uC
Short Circuit Collector Current	$I_{SC}$	$V_{GE}=15V, t_{sc}\leq 10\mu s,$ $V_{CC}=600V$	-	618	-	A

**Electrical Characteristics of the Diode** (T<sub>j</sub>= 25°C unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Diode Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 100A T <sub>j</sub> = 25°C, T <sub>j</sub> = 125°C T <sub>j</sub> = 150°C		2.20 2.05 2.00	2.70	V

**Switching Characteristic, Inductive Load**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Dynamic , at T<sub>j</sub>= 25°C</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>CC</sub> = 600V, I <sub>C</sub> =100A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =1Ω	-	40	-	ns
Rise Time	t <sub>r</sub>		-	70	-	ns
Turn-on Energy	E <sub>on</sub>		-	8.9	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	139	-	ns
Fall Time	t <sub>f</sub>		-	251	-	ns
Turn-off Energy	E <sub>off</sub>		-	6.6	-	mJ
<b>Dynamic , at T<sub>j</sub>= 125°C</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>CC</sub> = 600V, I <sub>C</sub> =100A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =1Ω	-	45	-	ns
Rise Time	t <sub>r</sub>		-	71	-	ns
Turn-on Energy	E <sub>on</sub>		-	9.2	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	152	-	ns
Fall Time	t <sub>f</sub>		-	333	-	ns
Turn-off Energy	E <sub>off</sub>		-	7.8	-	mJ
<b>Dynamic , at T<sub>j</sub>= 150°C</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>CC</sub> = 600V, I <sub>C</sub> =100A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =1Ω	-	48	-	ns
Rise Time	t <sub>r</sub>		-	72	-	ns
Turn-on Energy	E <sub>on</sub>		-	9.4	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	160	-	ns
Fall Time	t <sub>f</sub>		-	358	-	ns
Turn-off Energy	E <sub>off</sub>		-	8.5	-	mJ

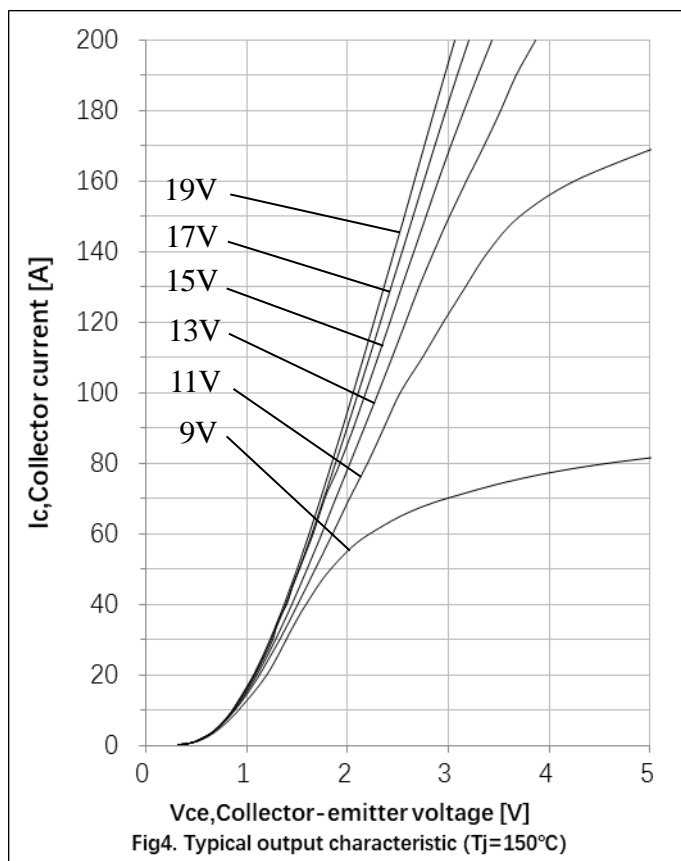
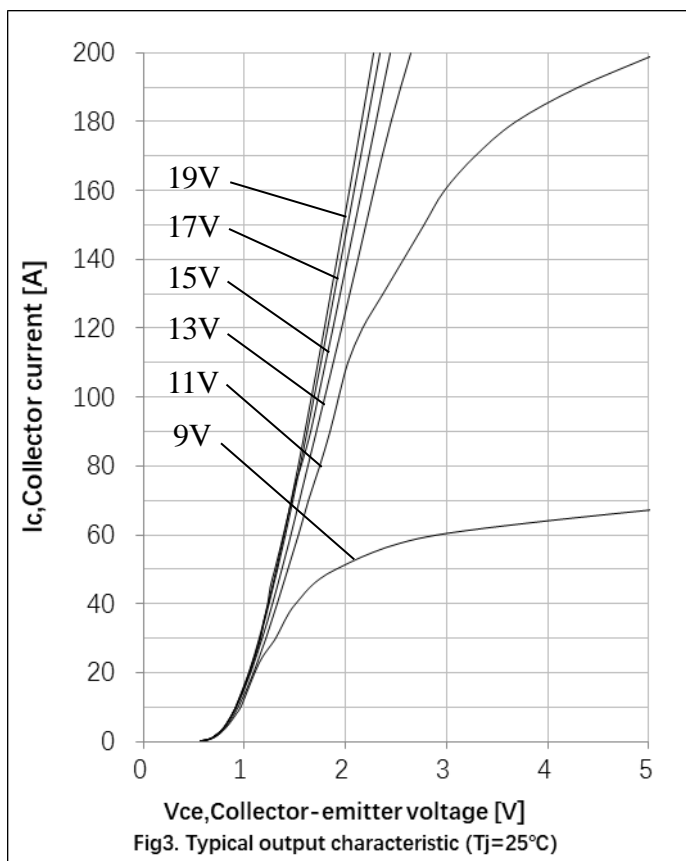
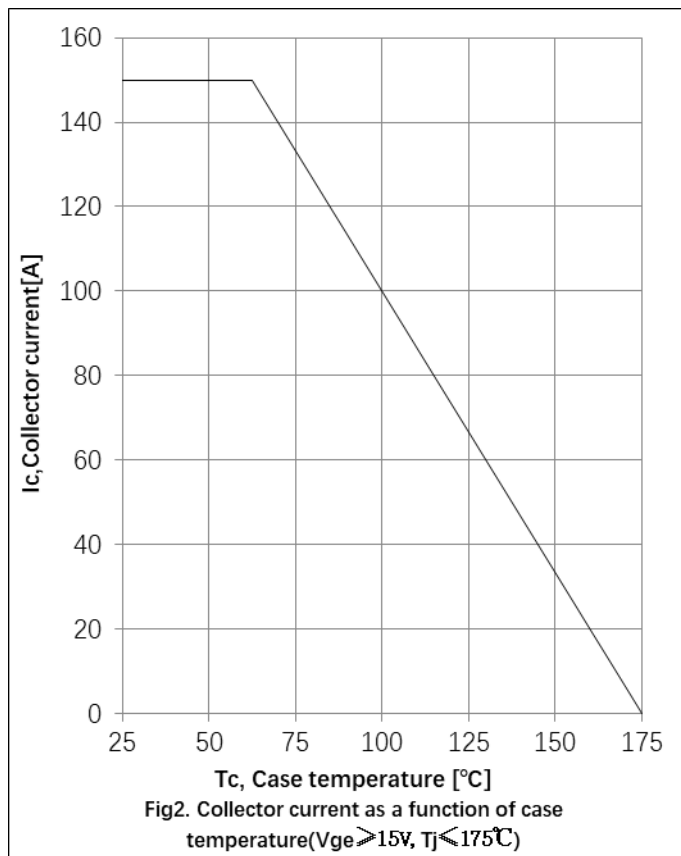
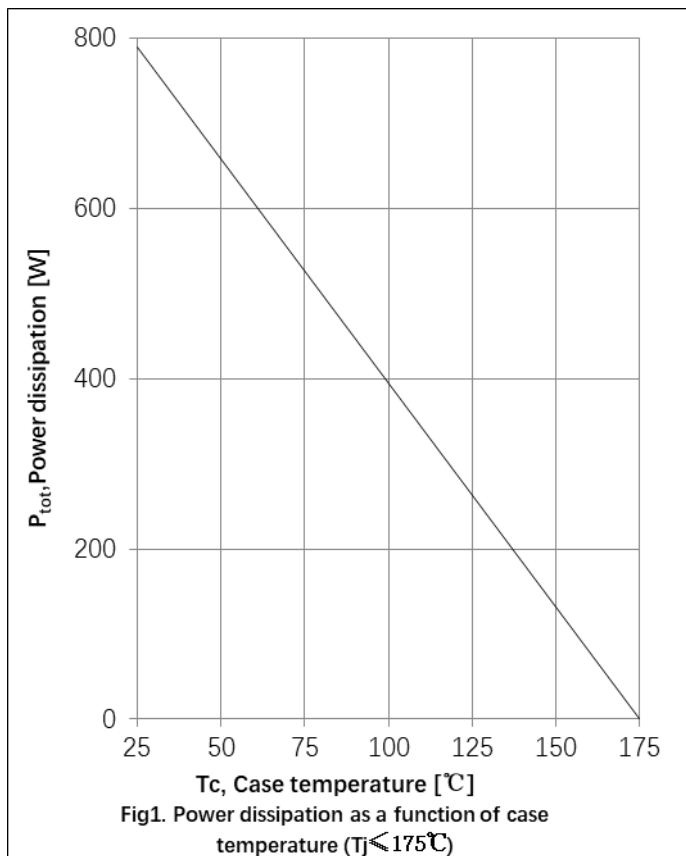


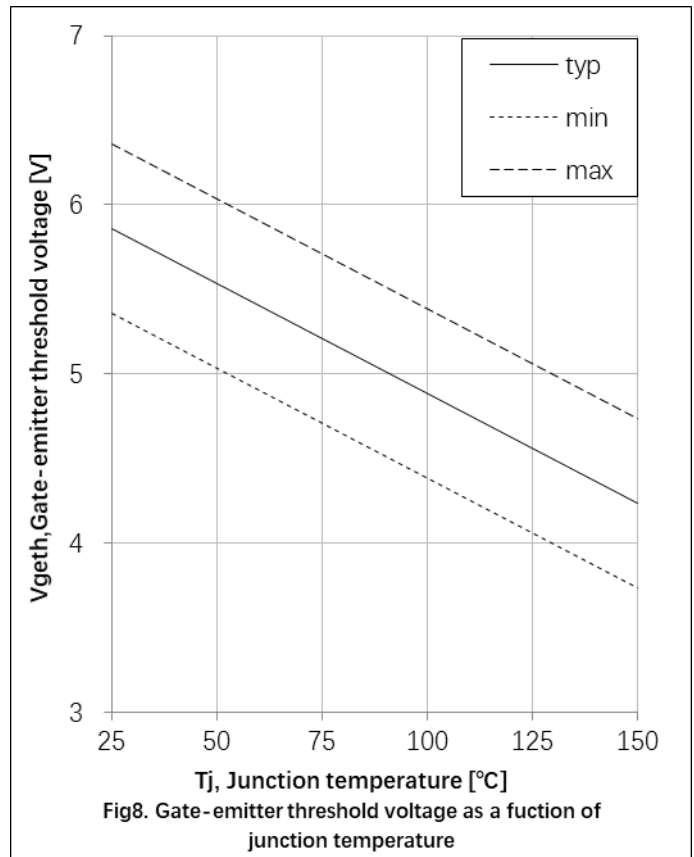
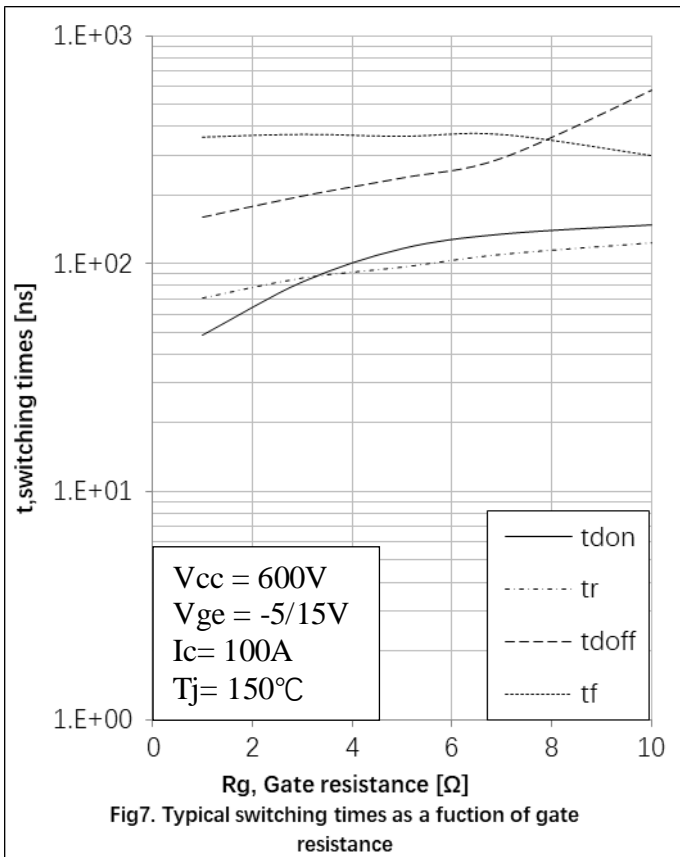
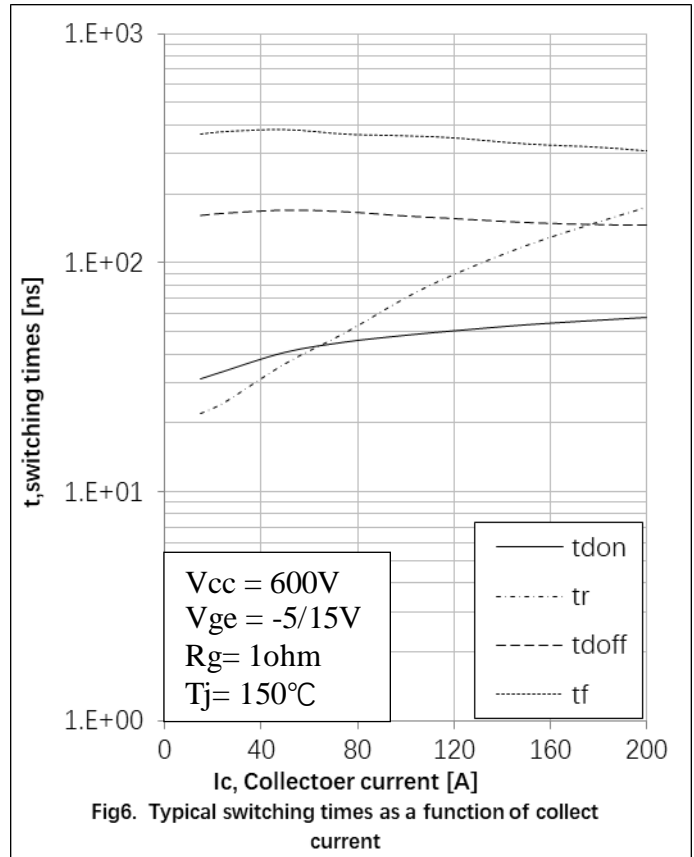
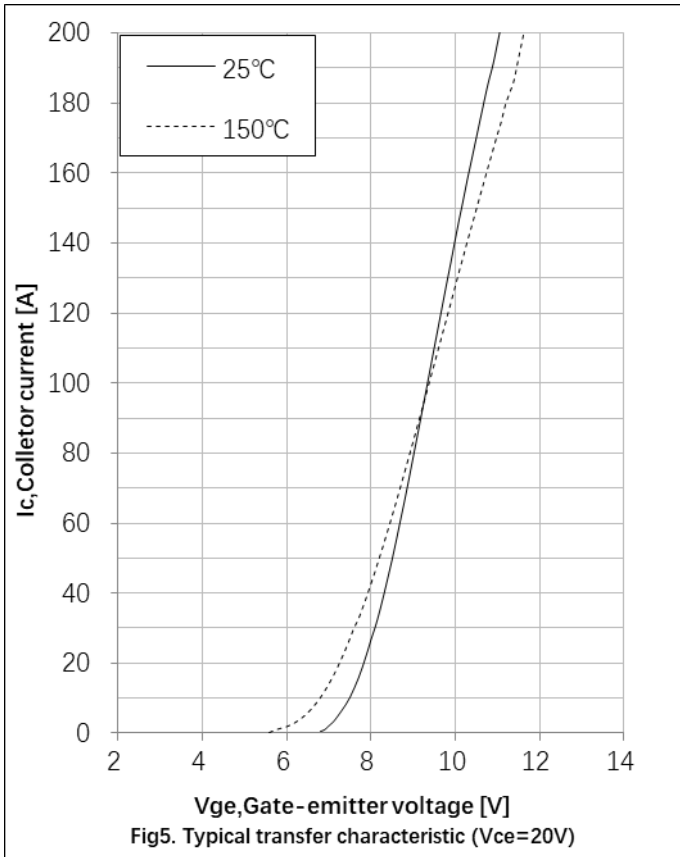
## Electrical Characteristics of the DIODE

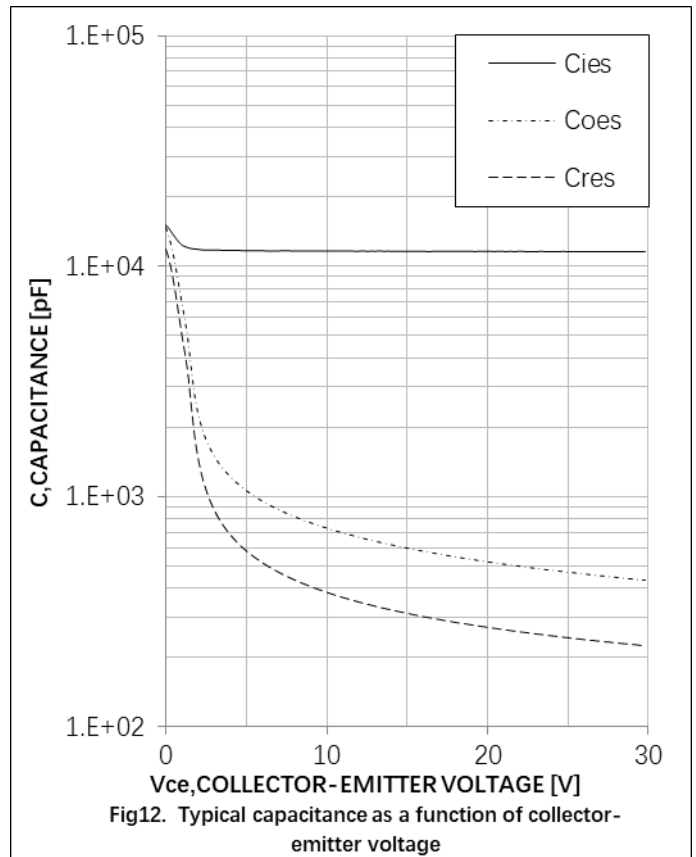
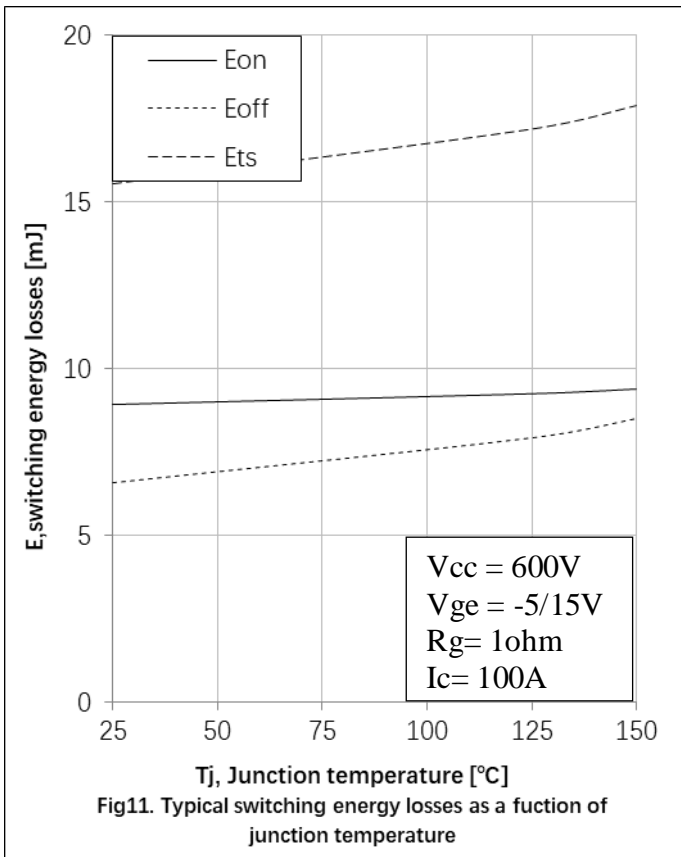
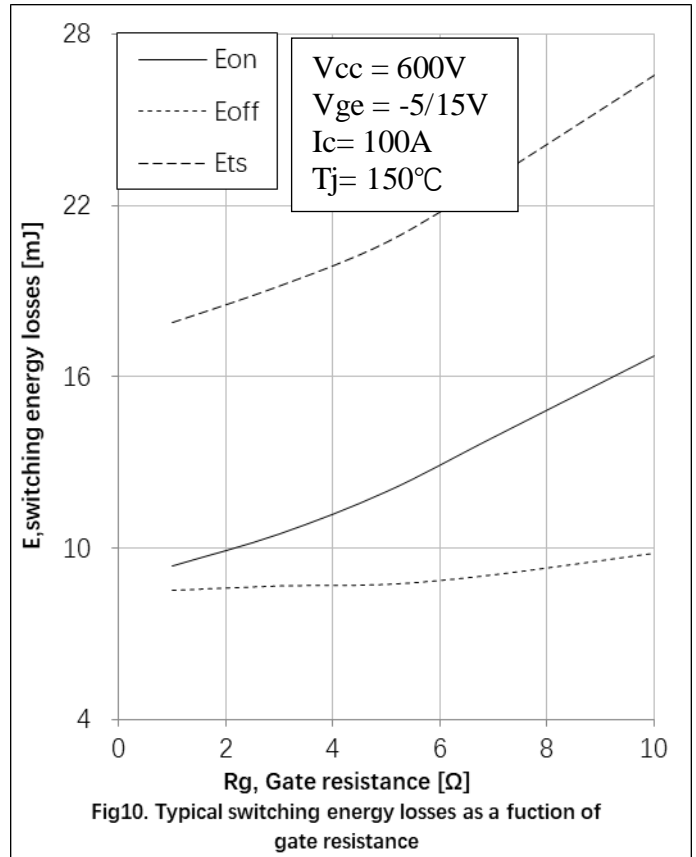
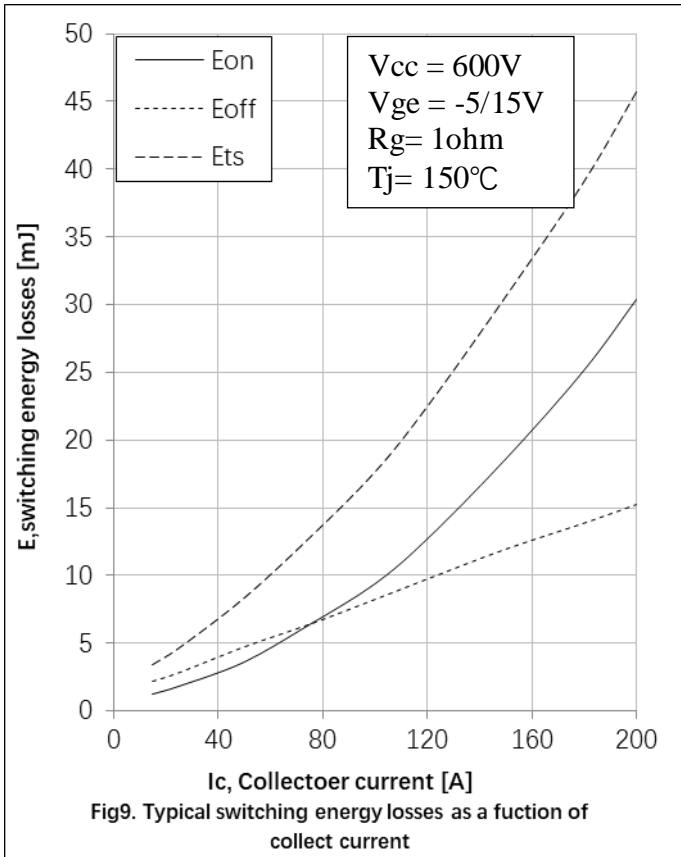
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Dynamic , at T<sub>j</sub>= 25°C</b>						
Reverse Recovery Current	I <sub>rr</sub>	I <sub>F</sub> =100A, V <sub>R</sub> =600V, di/dt= -500A/μs	-	12	-	A
Diode reverse recovery time	trr		-	298	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	4.12	-	uC
Reverse Recovery Energy	E <sub>rec</sub>		-	1.91	-	mJ
<b>Dynamic , at T<sub>j</sub>= 125°C</b>						
Reverse Recovery Current	I <sub>rr</sub>	I <sub>F</sub> =100A, V <sub>R</sub> =600V, di/dt= -500A/μs	-	15	-	A
Diode reverse recovery time	trr		-	365	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	7.28	-	uC
Reverse Recovery Energy	E <sub>rec</sub>		-	3.67	-	mJ
<b>Dynamic , at T<sub>j</sub>= 150°C</b>						
Reverse Recovery Current	I <sub>rr</sub>	I <sub>F</sub> =100A, V <sub>R</sub> =600V, di/dt= -500A/μs	-	17	-	A
Diode reverse recovery time	trr		-	411	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	10.66	-	uC
Reverse Recovery Energy	E <sub>rec</sub>		-	4.32	-	mJ

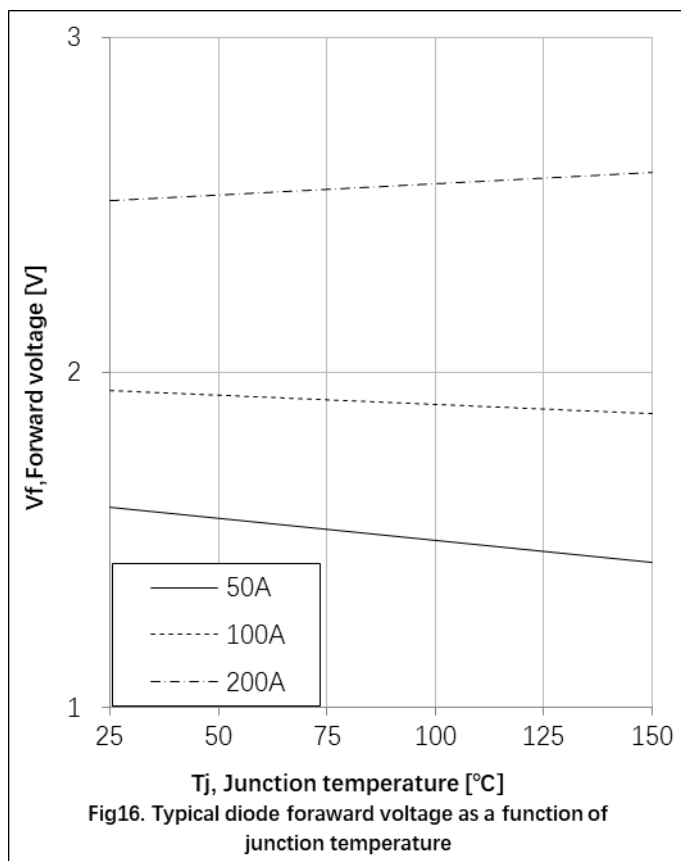
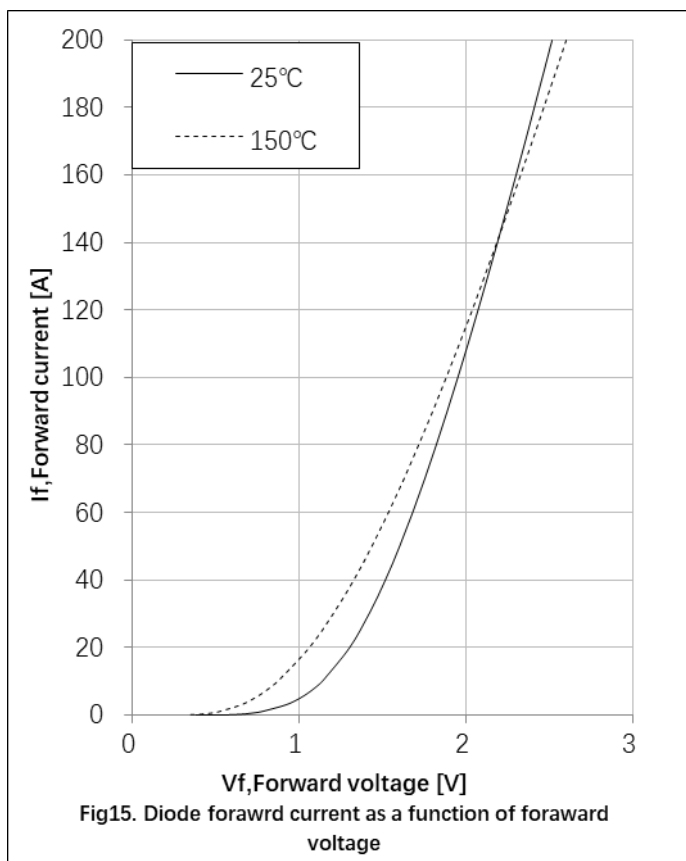
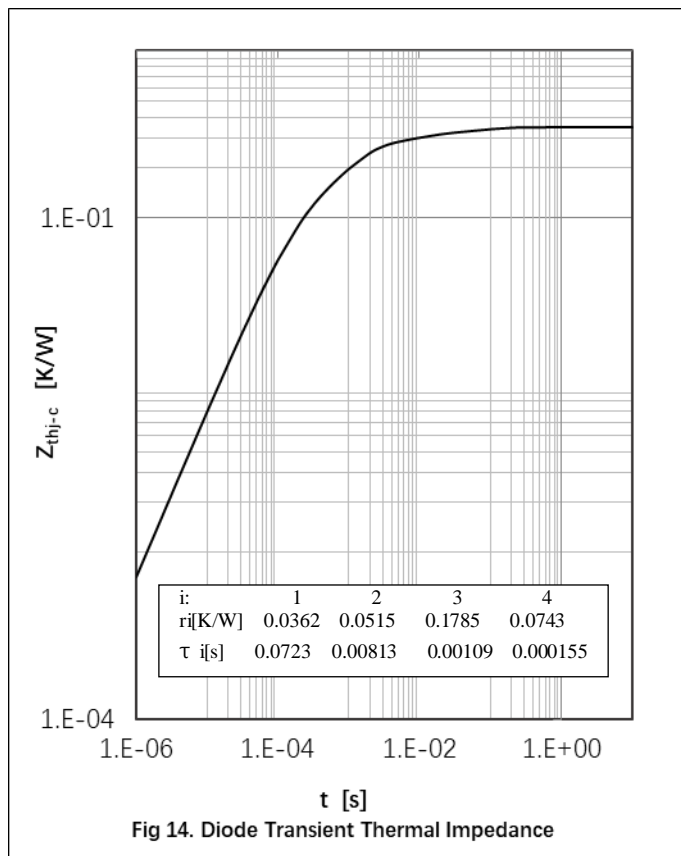
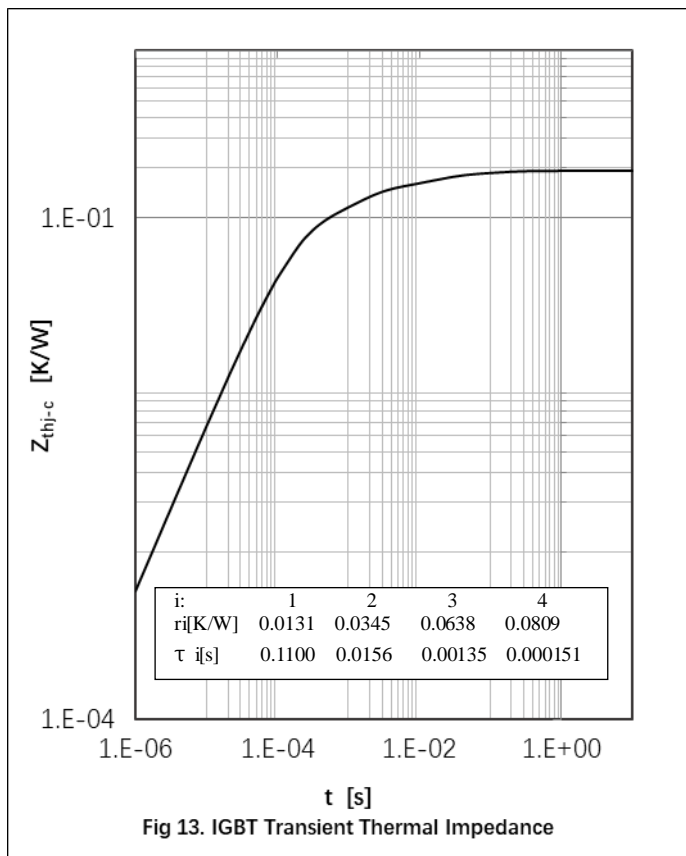
## Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R <sub>th(j-c)</sub>	0.19	K/W
Diode Thermal Resistance, Junction - Case	R <sub>th(j-c)</sub>	0.35	K/W
Thermal Resistance, Junction - Ambient	R <sub>th(j-a)</sub>	40	K/W



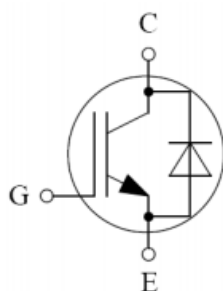






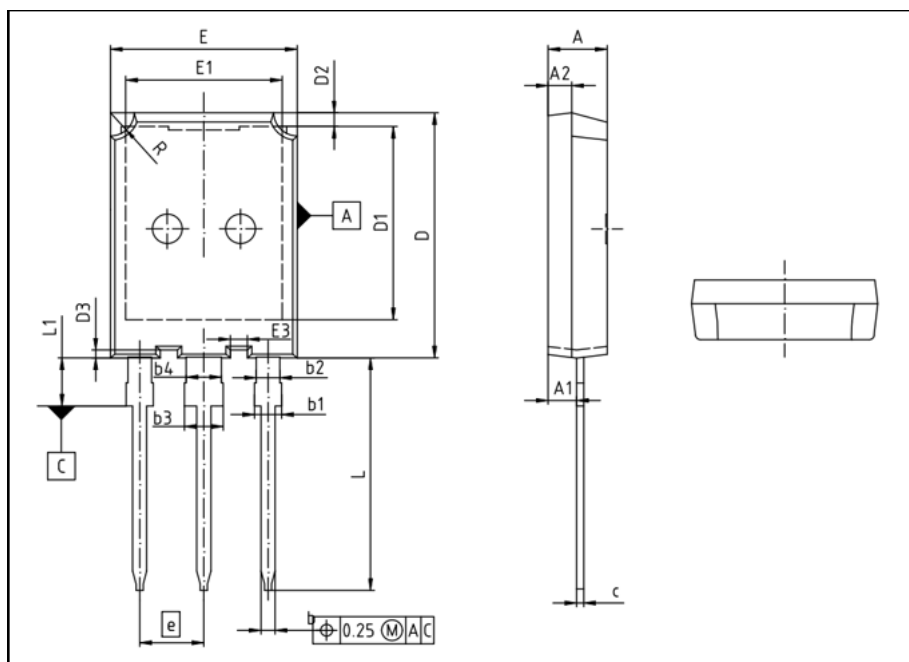


## Circuit Diagram



## ● Package Outline Information

### CASE: TO 247plus



DIM	MILLIMETERS	
	MIN	MAX
A	4.90	5.10
A1	2.31	2.51
A2	1.90	2.10
b	1.16	1.26
b1	1.86	2.16
b2	1.96	2.06
c	0.58	0.64
D	20.90	21.10
D1	16.25	16.85
D2	1.05	1.35
D3	0.58	0.78
E	15.70	15.90
E1	13.10	13.50
E3	1.35	1.55
e	5.44(BSC)	
L	19.78	20.08
L1	4.03	4.23
R	1.90	2.10



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