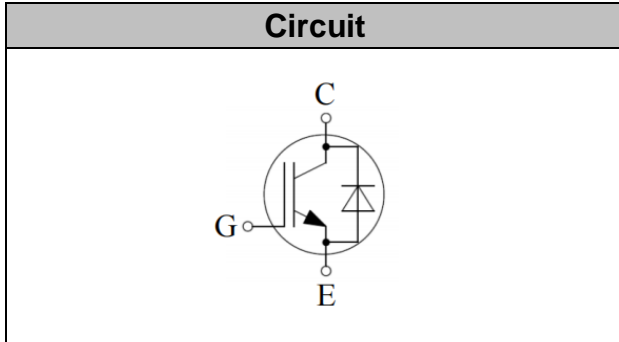




## IGBT Discrete

$V_{CE}$	1200	V
$I_C$	75	A
$V_{CE(SAT)} I_C=75A$	1.60	V



## Applications

- Inverter for motor drive
- Three-level Solar String Inverter
- Motor controller

## 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 75	A
Diode Forward Current, limited by $T_{jmax}$ $T_C= 25^{\circ}C$ $T_C= 100^{\circ}C$	$I_F$	150 75	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 $V_{CE} \leq 1200V$ , $T_j \leq 150^{\circ}C$		300	A
Pulsed Collector Current, $V_{GE}=15V$ , $t_p$ limited by $T_{jmax}$	$I_{CM}$	300	A
Diode Pulsed Current, $t_p$ limited by $T_{jmax}$	$I_{Fpuls}$	300	A
Short Circuit Withstand Time, $V_{GE}= 15V, V_{CC}=600V, V_{CEM} \leq 1200V$	$T_{sc}$	10	$\mu s$
Power Dissipation , $T_j=175^{\circ}C, T_C=25^{\circ}C$	$P_{tot}$	555	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	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=2.8mA$	5.0	5.8	6.5	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=75A$ $T_j=25^\circ\text{C}$ , $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$	1.30	1.60 1.90 2.00	1.90	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	$C_{ies}$	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	10.02	-	nF
Reverse Transfer Capacitance	$C_{res}$		-	0.15	-	
Gate Charge	$Q_G$	$V_{CC}=960V, I_C=75A,$ $V_{GE}=15V$	-	1.05	-	uC

## 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> = 75A T <sub>j</sub> = 25°C, T <sub>j</sub> = 125°C T <sub>j</sub> = 150°C		2.00 1.90 1.80	2.60	V

## Switching Characteristic, Inductive Load

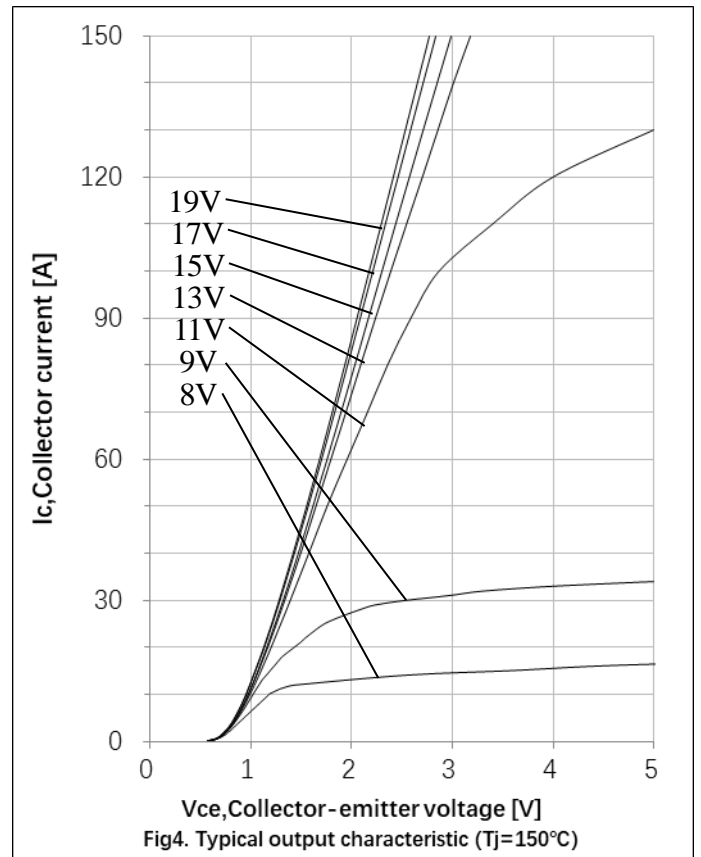
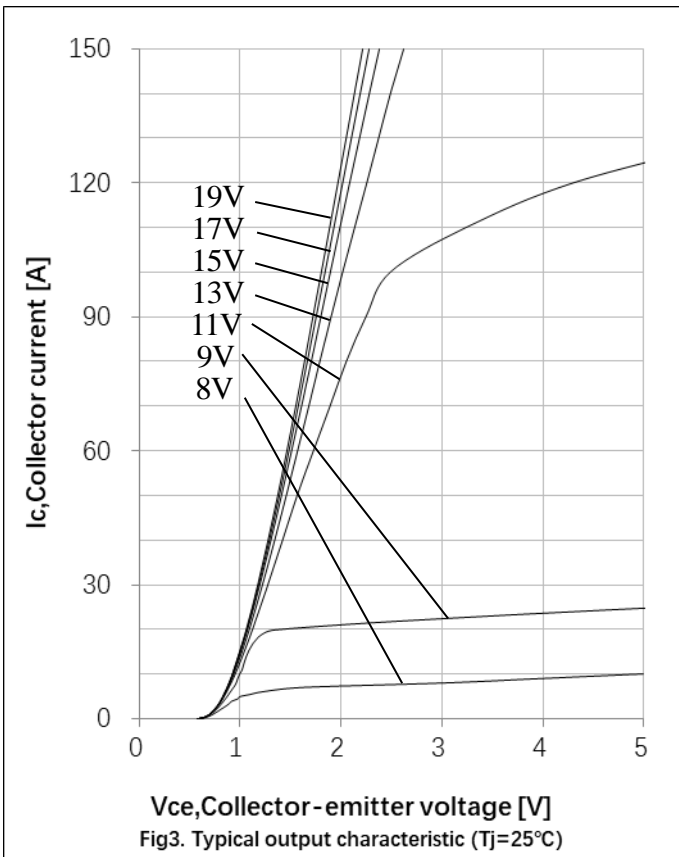
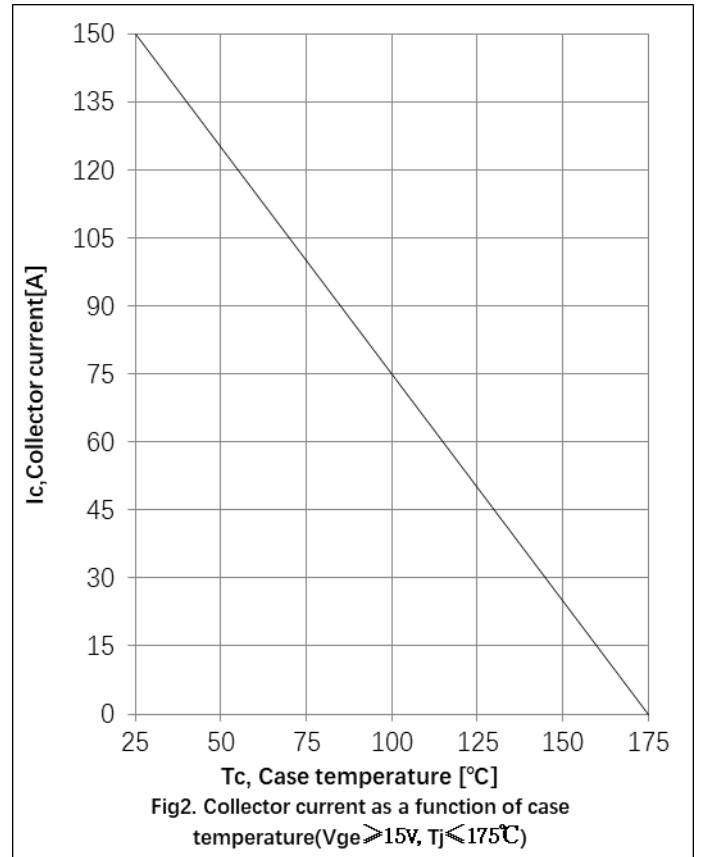
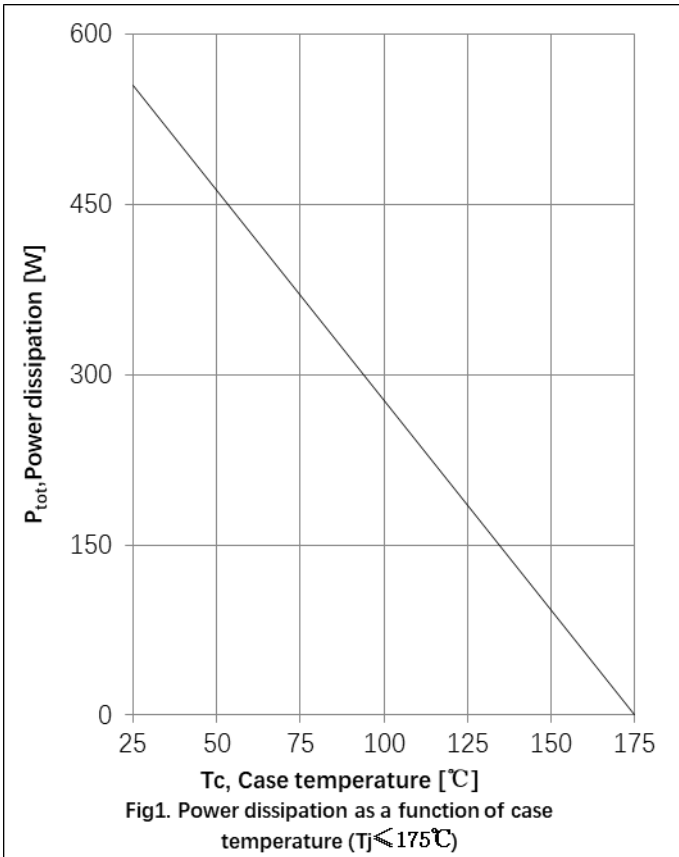
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Dynamic , at T<sub>j</sub>= 25°C</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>CC</sub> = 600V, I <sub>C</sub> =75A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =10Ω	-	20	-	ns
Rise Time	t <sub>r</sub>		-	102	-	ns
Turn-on Energy	E <sub>on</sub>		-	12.6	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	375	-	ns
Fall Time	t <sub>f</sub>		-	355	-	ns
Turn-off Energy	E <sub>off</sub>		-	6.9	-	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> =75A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =10Ω	-	21	-	ns
Rise Time	t <sub>r</sub>		-	105	-	ns
Turn-on Energy	E <sub>on</sub>		-	12.9	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	444	-	ns
Fall Time	t <sub>f</sub>		-	522	-	ns
Turn-off Energy	E <sub>off</sub>		-	9.7	-	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> =75A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =10Ω	-	21	-	ns
Rise Time	t <sub>r</sub>		-	111	-	ns
Turn-on Energy	E <sub>on</sub>		-	13.2	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	468	-	ns
Fall Time	t <sub>f</sub>		-	598	-	ns
Turn-off Energy	E <sub>off</sub>		-	10.3	-	mJ

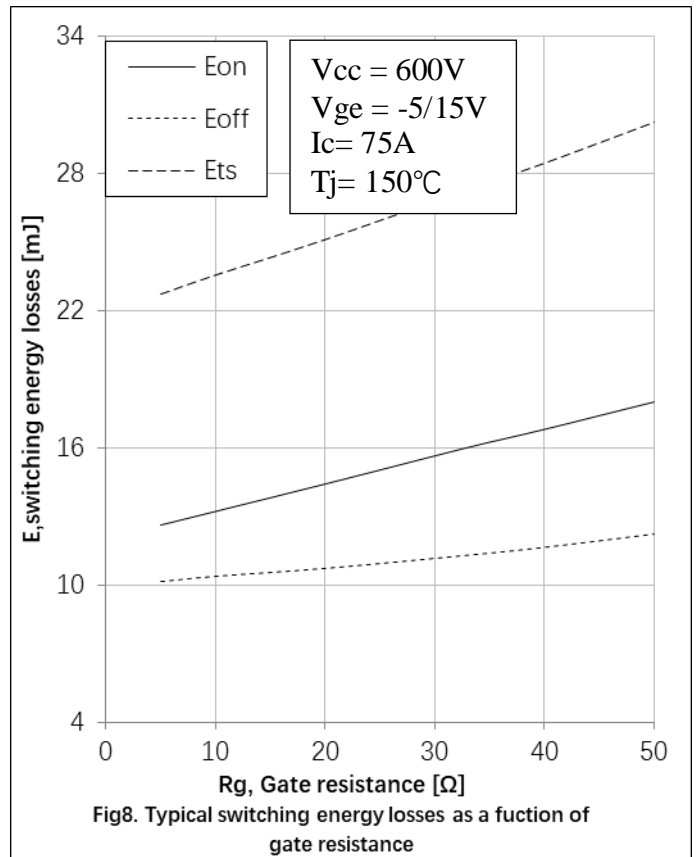
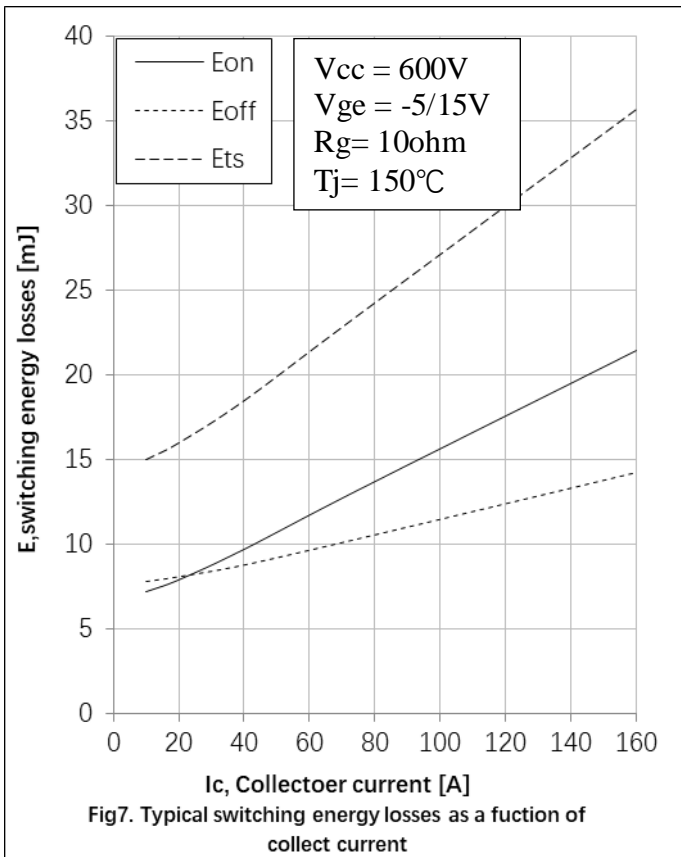
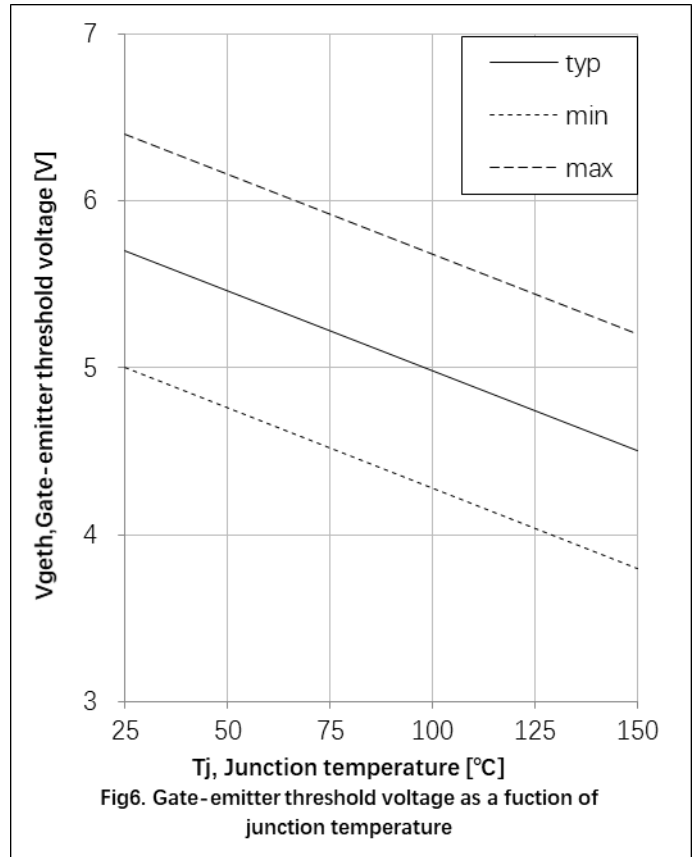
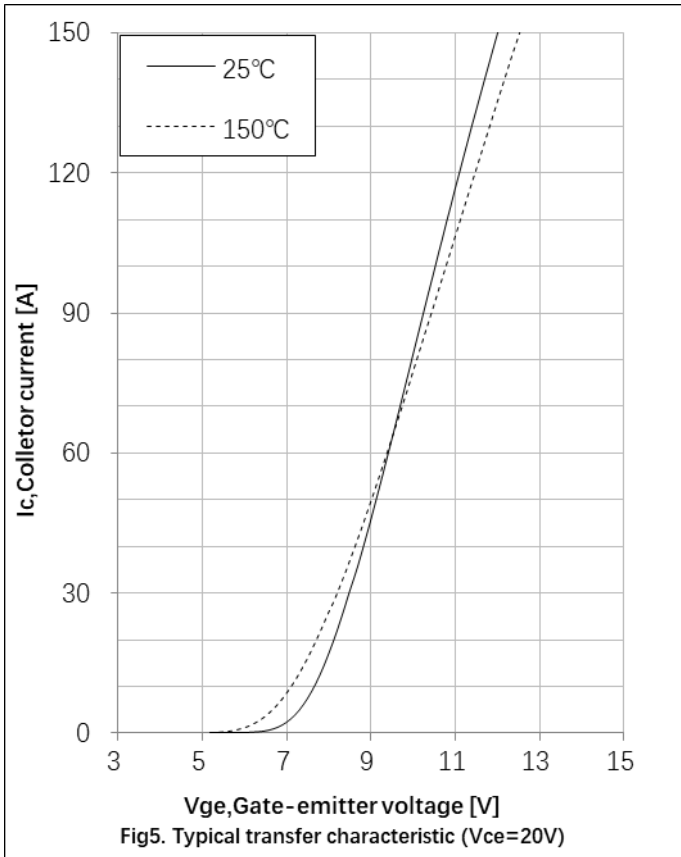
## Electrical Characteristics of the DIODE

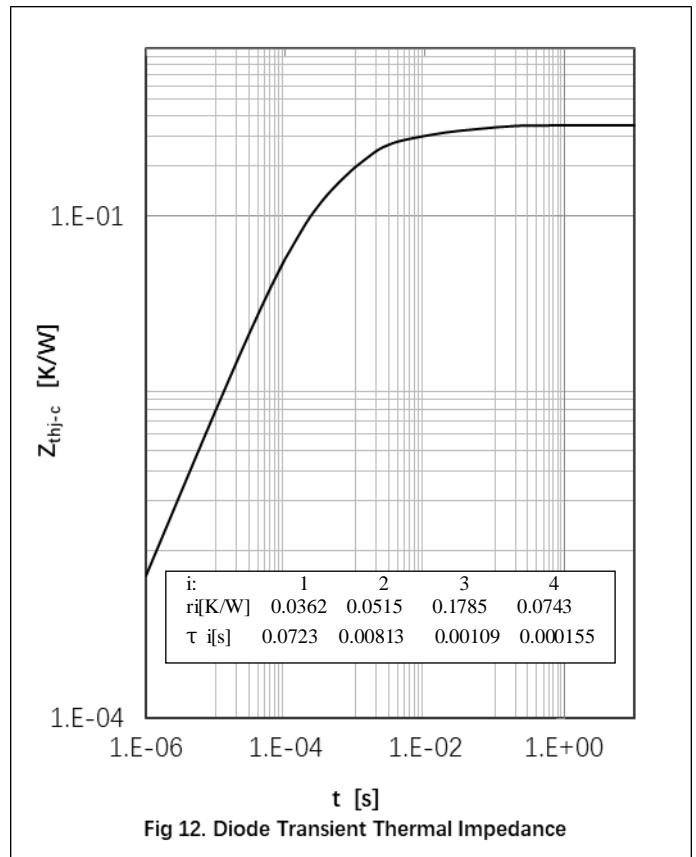
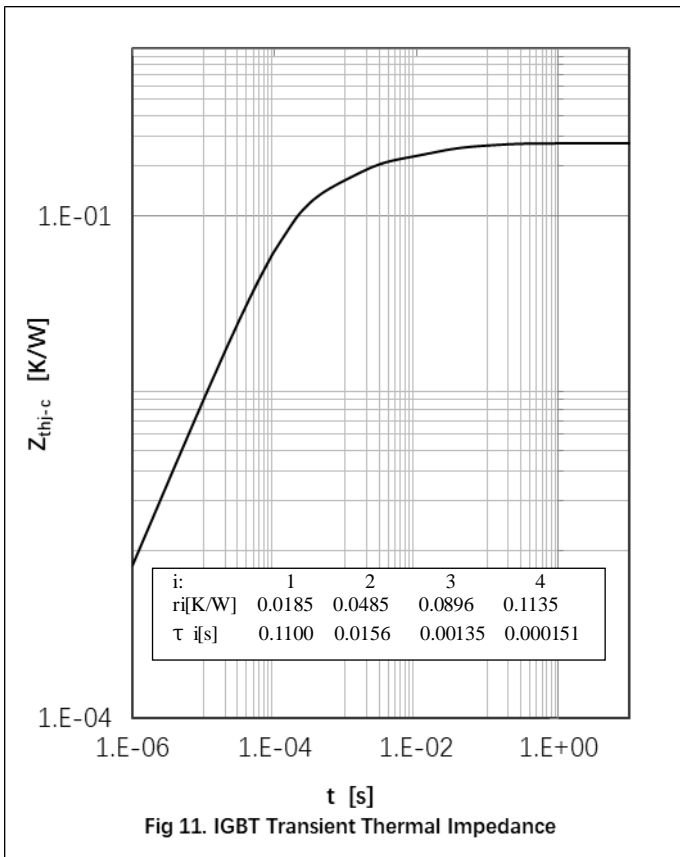
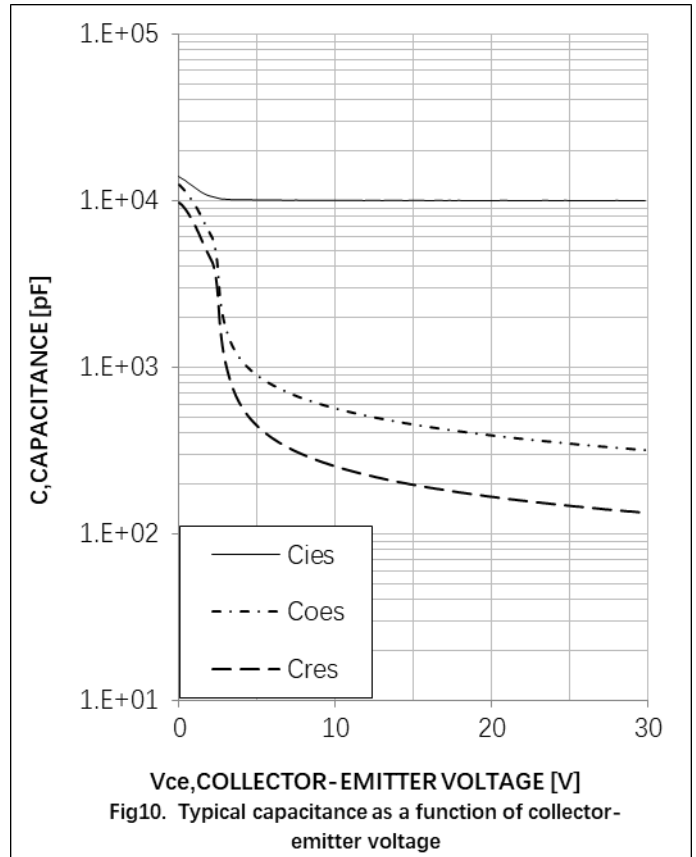
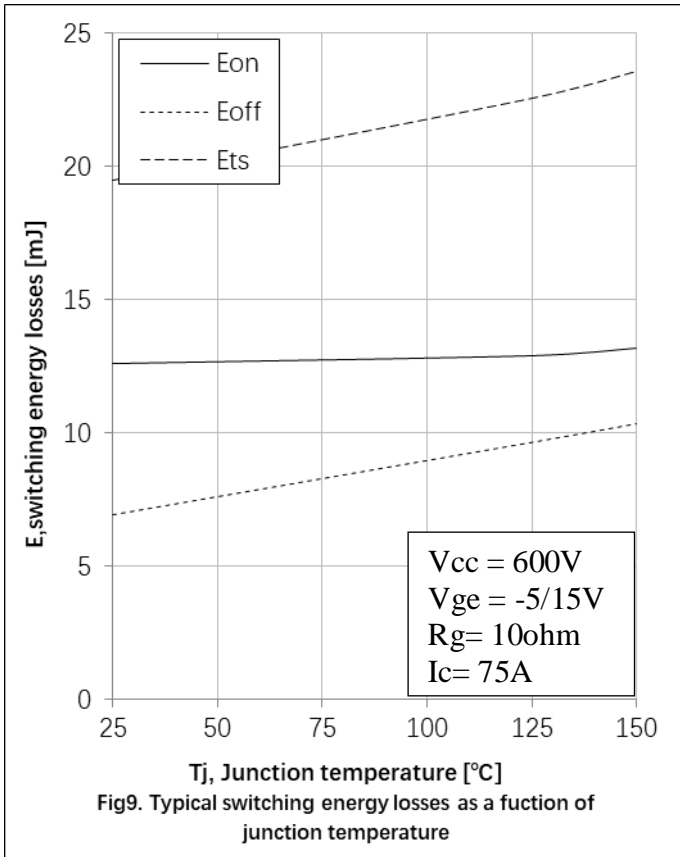
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Dynamic , at T<sub>j</sub>= 25°C</b>						
Reverse Recovery Current	I <sub>rr</sub>	I <sub>F</sub> =75A, V <sub>R</sub> =600V, di/dt= -500A/μs	-	9	-	A
Diode reverse recovery time	trr		-	268	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	3.42	-	uC
Reverse Recovery Energy	E <sub>rec</sub>		-	1.52	-	mJ
<b>Dynamic , at T<sub>j</sub>= 125°C</b>						
Reverse Recovery Current	I <sub>rr</sub>	I <sub>F</sub> =75A, V <sub>R</sub> =600V, di/dt= -500A/μs	-	12	-	A
Diode reverse recovery time	trr		-	337	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	6.58	-	uC
Reverse Recovery Energy	E <sub>rec</sub>		-	3.18	-	mJ
<b>Dynamic , at T<sub>j</sub>= 150°C</b>						
Reverse Recovery Current	I <sub>rr</sub>	I <sub>F</sub> =75A, V <sub>R</sub> =600V, di/dt= -500A/μs	-	14	-	A
Diode reverse recovery time	trr		-	375	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	9.45	-	uC
Reverse Recovery Energy	E <sub>rec</sub>		-	3.73	-	mJ

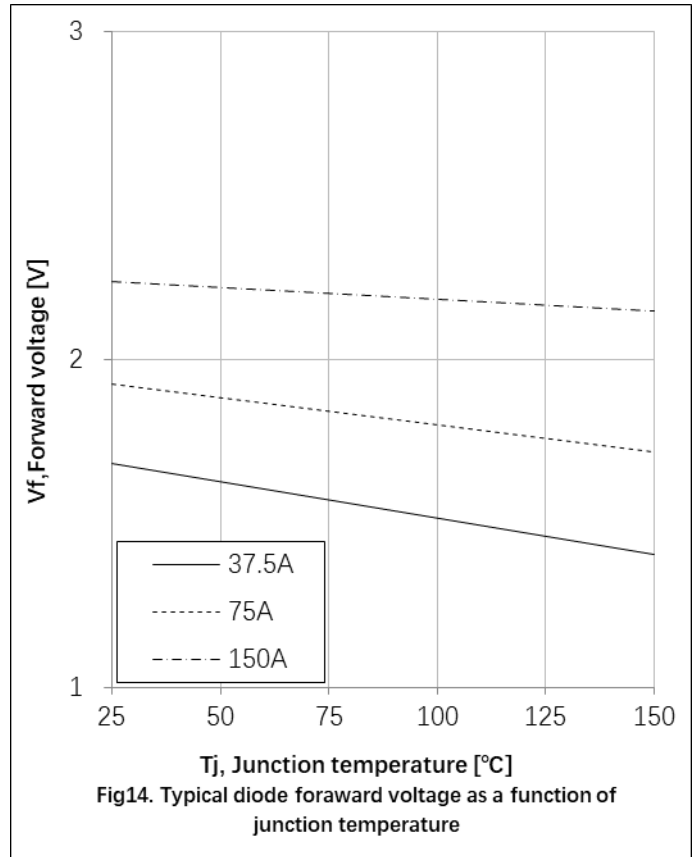
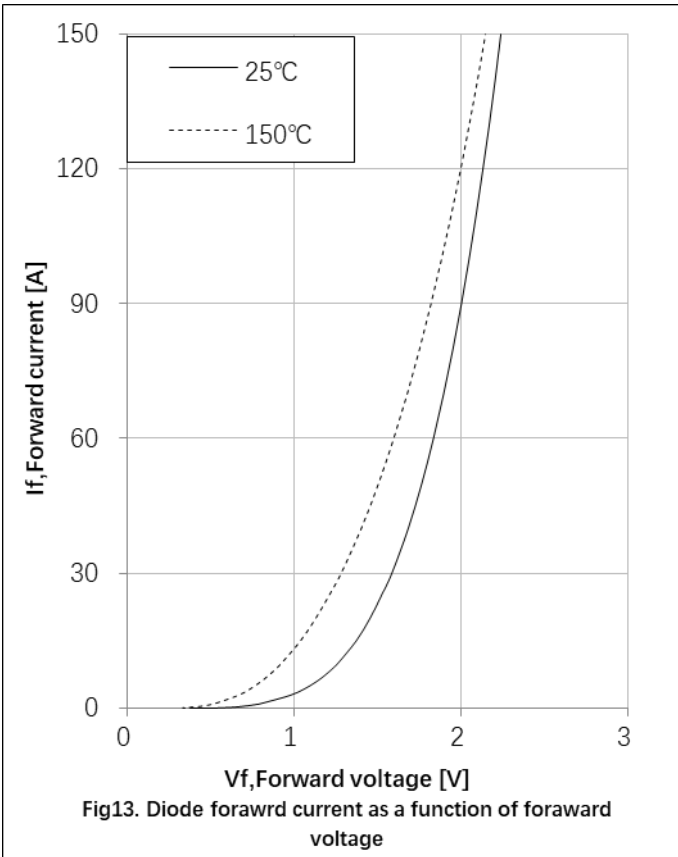
## Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R <sub>th(j-c)</sub>	0.27	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

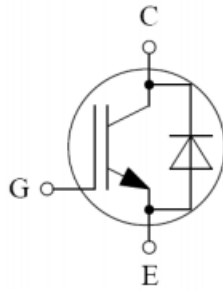






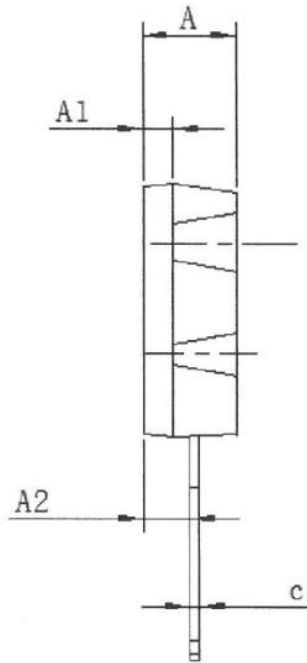
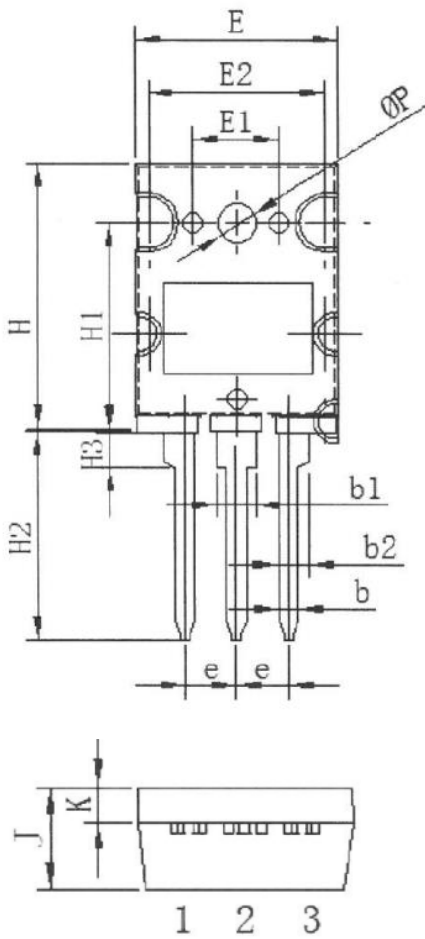


● Circuit Diagram



● Package Outline Information

CASE: TO 264



To-264		
Dim	Min	Max
A	4.80	5.20
A1	1.80	2.20
A2	3.20	3.60
b	0.80	1.20
b1	2.90	3.30
b2	2.40	2.80
C	0.50	0.70
e	5.25	5.65
E	19.8	20.2
E1	17.6	18.0
E2	8.60	9.00
H	25.8	26.2
H1	19.8	20.2
H2	19.8	20.8
H3	2.00	3.00
G	6.00	6.40
φP	3.00	3.40
J	4.80	5.20
K	1.30	1.70