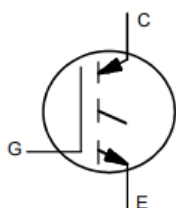




## IGBT Discrete

$V_{CE}$	<b>1200</b>	<b>V</b>
$I_C$	<b>80</b>	<b>A</b>
$V_{CE(SAT)} I_C=80A$	<b>1.75</b>	<b>V</b>
$P_D$	<b>735</b>	<b>W</b>

### Circuit



### Applications

- PTC heater

### Features

- High breakdown voltage to 1200V for improved reliability
- Maximum junction temperature 150°C
- Positive temperature coefficient

## Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	$V_{CE}$	1200	V
DC Collector Current, limited by $T_{jmax}$ $T_C=25^\circ C$ $T_C=100^\circ C$	$I_C$	145* 80	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 $V_{CE} \leq 1200V$ , $T_j \leq 150^\circ C$		240	A
Pulsed Collector Current, $V_{GE}=15V$ , $t_p$ limited by $T_{jmax}$	$I_{CM}$	240	A
Power Dissipation, $T_j=150^\circ C$ , $T_C=25^\circ C$	$P_{tot}$	735	W

\*Bond wire current limit is 80A



Operating Junction Temperature	$T_j$	-40...+150	°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	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=2.6mA$	5.5	6.0	6.7	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=33A$ $T_j=25^\circ\text{C},$ $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$		1.35 1.48 1.55	1.65	V
		$V_{GE}=15V, I_C=80A$ $T_j=25^\circ\text{C},$ $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$		1.75 2.15 2.25	2.30	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 1.0	mA
Gate-Emitter Leakage Current	$I_{GES}$	$V_{CE}=0V, V_{GE}=\pm 20V$			$\pm 100$	nA

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Dynamic</b>						
Input Capacitance	$C_{ies}$	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	7.94	-	nF
Reverse Transfer Capacitance	$C_{res}$		-	0.19	-	
Gate Charge	$Q_G$	$V_{CC}=960V, I_C=80A,$ $V_{GE}=15V$	-	0.65	-	uC

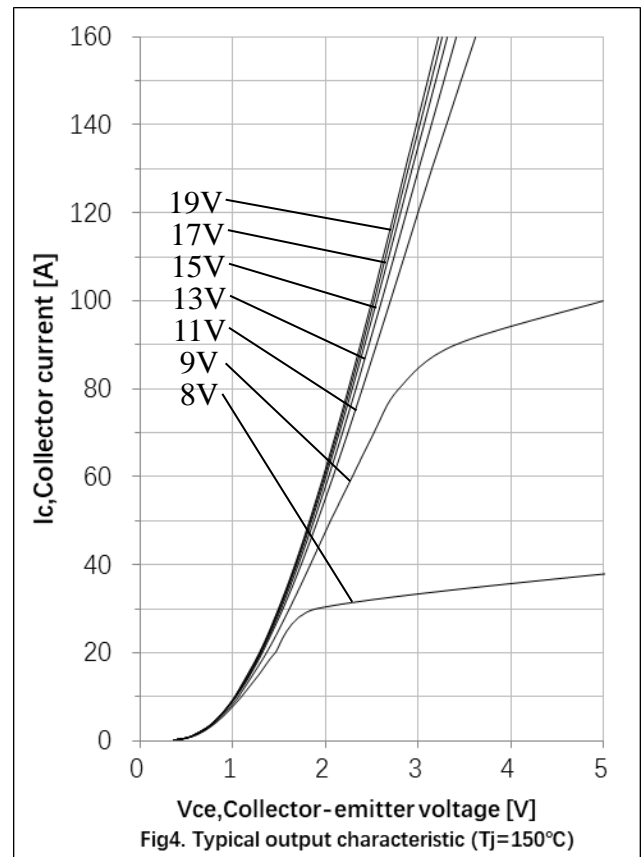
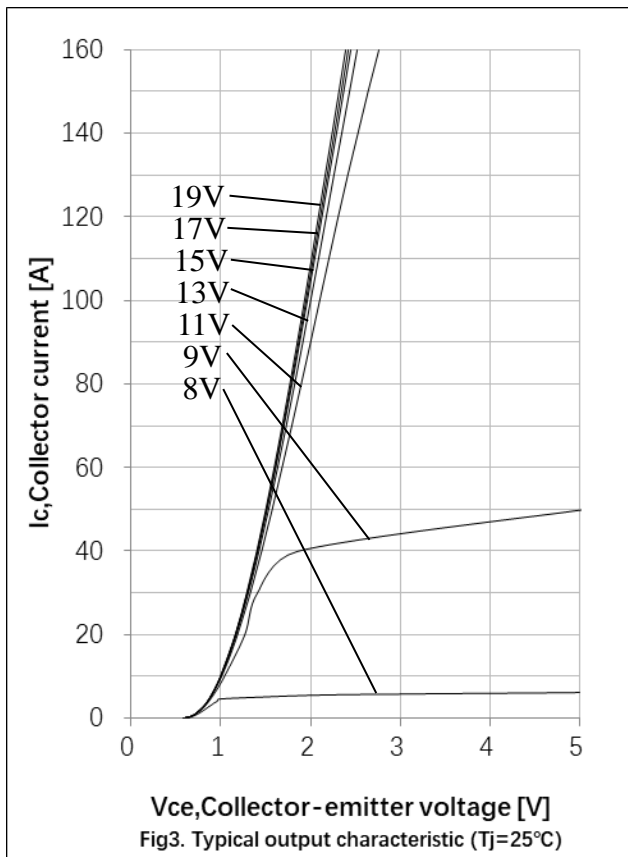
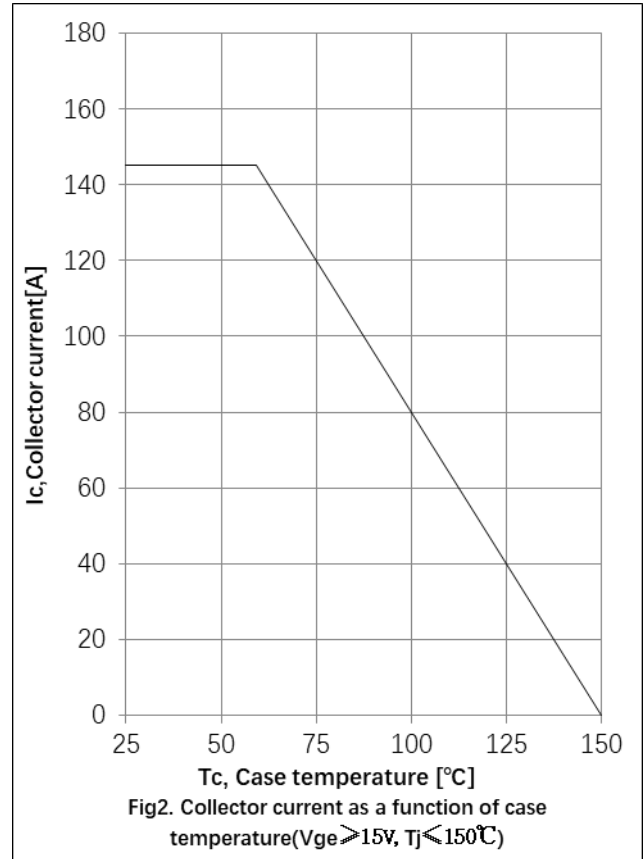
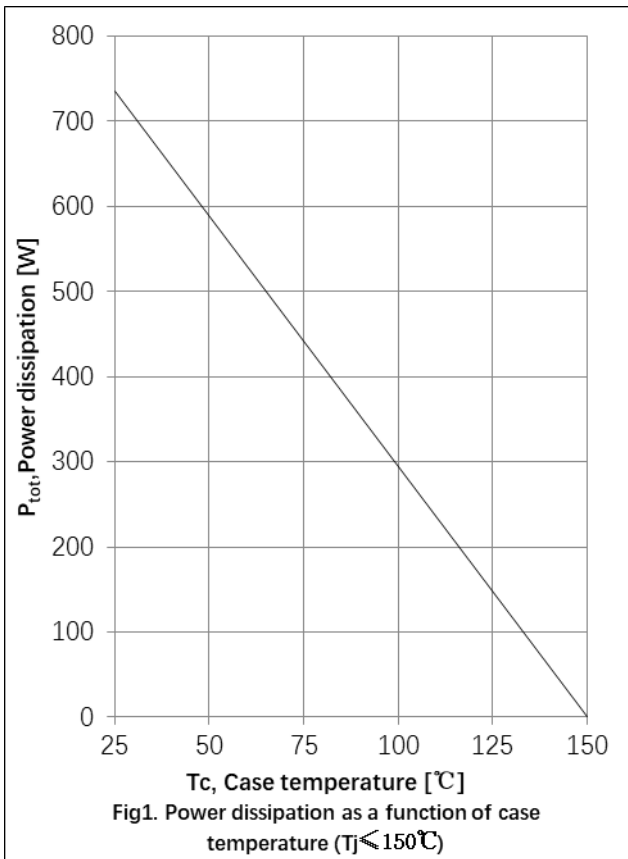


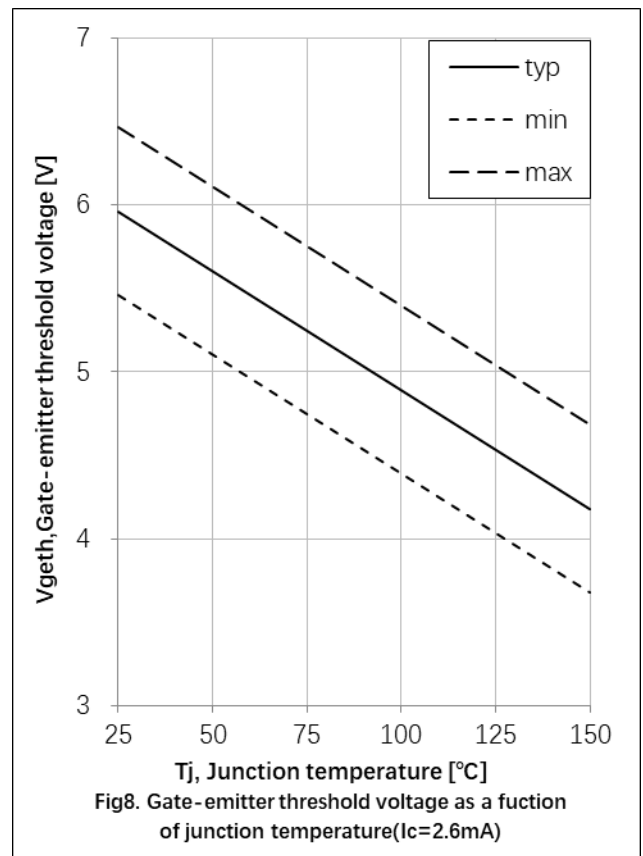
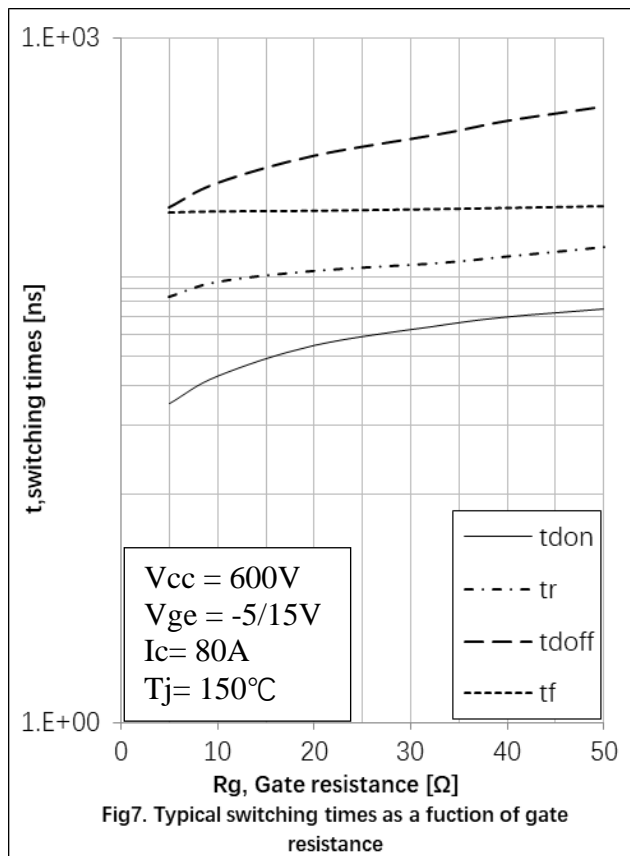
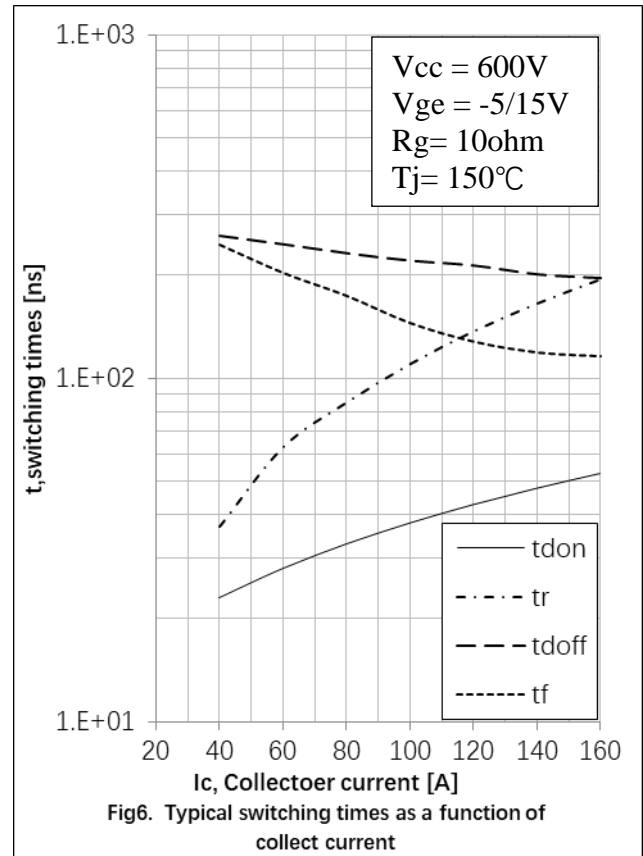
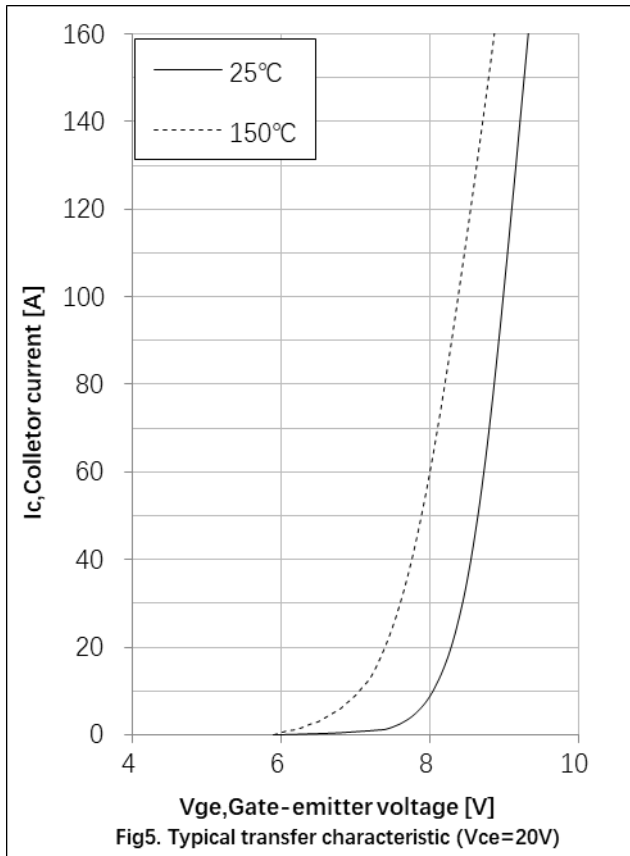
## Switching Characteristic, Inductive Load

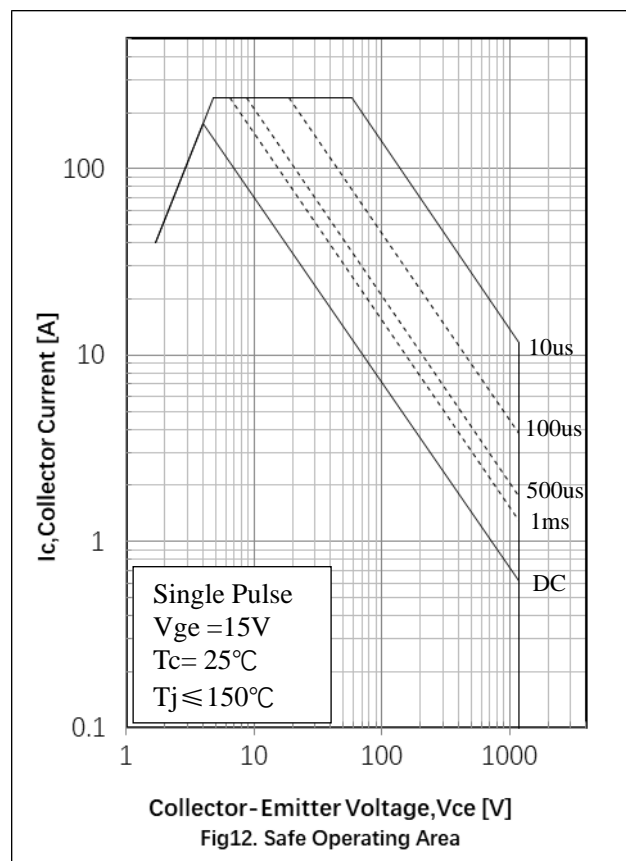
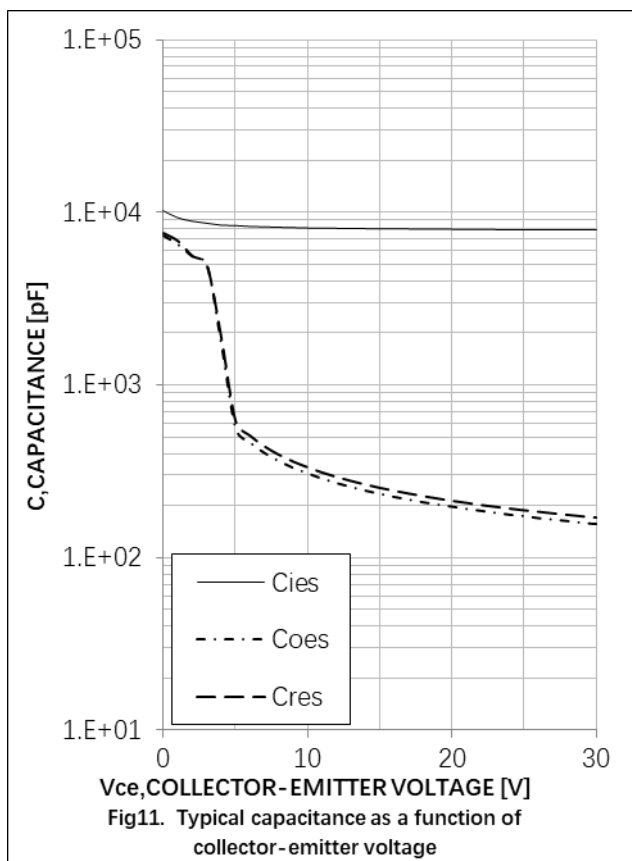
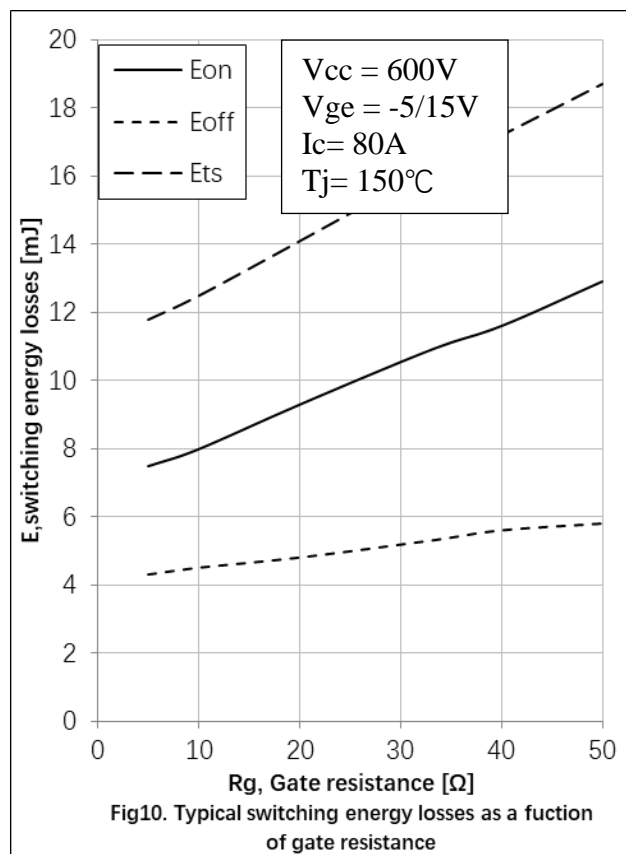
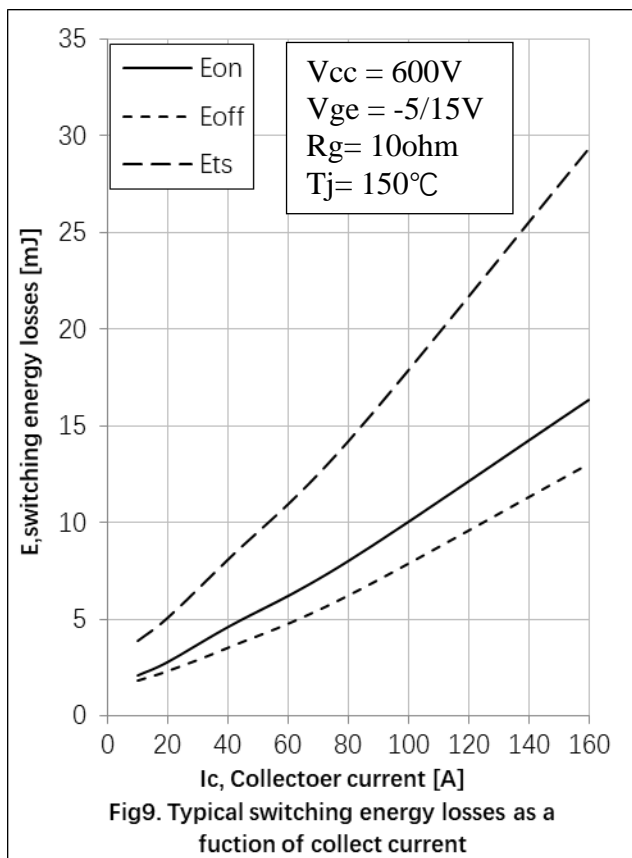
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Dynamic , at T<sub>j</sub>= 25°C</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>CC</sub> = 600V, I <sub>C</sub> =80A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =10Ω	-	33	-	ns
Rise Time	t <sub>r</sub>		-	85	-	ns
Turn-on Energy	E <sub>on</sub>		-	7.5	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	231	-	ns
Fall Time	t <sub>f</sub>		-	174	-	ns
Turn-off Energy	E <sub>off</sub>		-	4.6	-	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> =80A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =10Ω	-	30	-	ns
Rise Time	t <sub>r</sub>		-	79	-	ns
Turn-on Energy	E <sub>on</sub>		-	7.8	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	243	-	ns
Fall Time	t <sub>f</sub>		-	263	-	ns
Turn-off Energy	E <sub>off</sub>		-	5.5	-	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> =80A, V <sub>GE</sub> = -5V~15V, R <sub>g</sub> =10Ω	-	28	-	ns
Rise Time	t <sub>r</sub>		-	74	-	ns
Turn-on Energy	E <sub>on</sub>		-	8.0	-	mJ
Turn-off Delay Time	t <sub>d(off)</sub>		-	252	-	ns
Fall Time	t <sub>f</sub>		-	325	-	ns
Turn-off Energy	E <sub>off</sub>		-	6.2	-	mJ

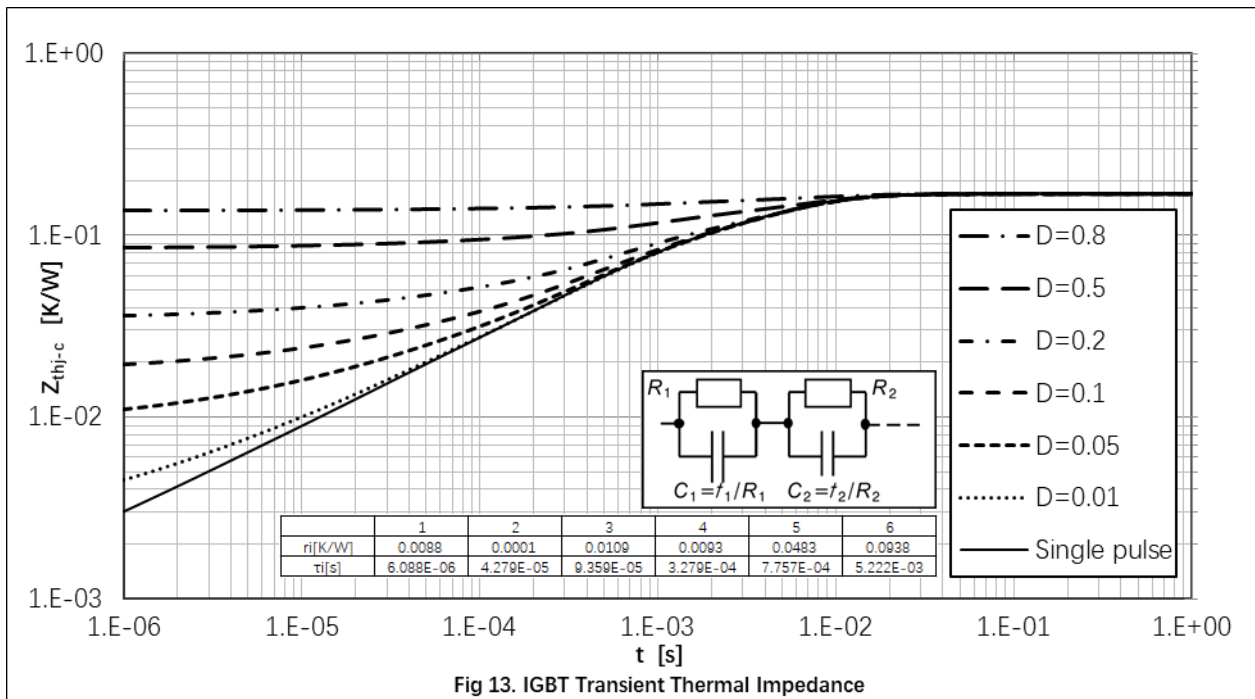
## Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R <sub>th(j-c)</sub>	0.17	K/W
Thermal Resistance, Junction - Ambient	R <sub>th(j-a)</sub>	62	K/W

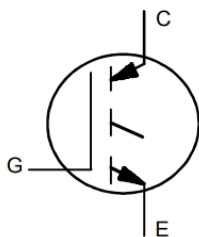






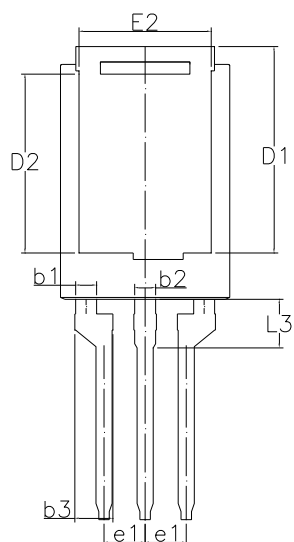
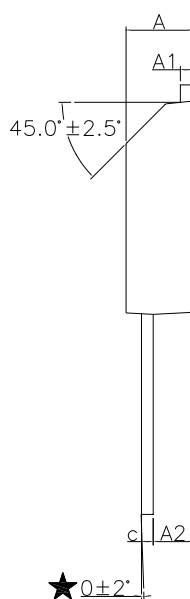
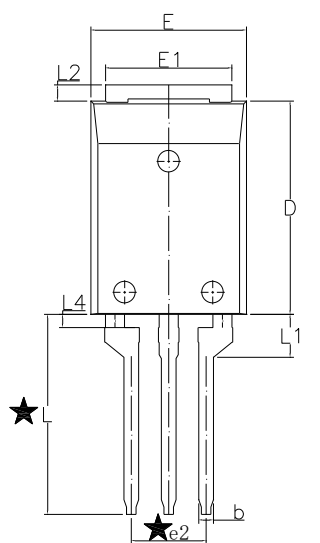


## Circuit Diagram



## ● Package Outline Information

CASE: STO 220



DIMENSIONS		
SYMBOL	Millimeter	
A	4.34	4.74
A1	0.70	1.00
A2	2.50	3.00
b	0.70	1.30
b1	1.25	1.65
b2	1.25	1.65
b3	2.16	2.36
c	0.70	1.00
D	14.00	15.00
D1	12.50	13.50
D2	10.54	11.54
E	10.00	11.00
E1	8.00	9.00
E2	7.70	8.70
e1	2.55 BSC	
e2	4.90	5.30
L	13.00	14.50
L1	2.65	3.15
L2	0.50	1.50
L3	2.75	3.25
L4	—	1.50

★：关键尺寸