

IGBT Discrete

V_{CE}	1200	V
I_C	75	A
$V_{CE(SAT)} I_C=75A$	1.55	V

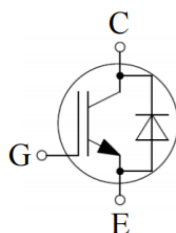
Applications

- Resonant converters
- Uninterruptible power supplies
- Mid to high range switching frequency

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)

Circuit



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}	± 20	V
Transient Gate-Emitter Voltage ($tp \leq 10\mu s, D < 0.010$)	V_{GE}	± 30	V
Turn off Safe Operating Area $V_{CE} \leq 1200V$, $T_j \leq 150^{\circ}C$		300	A
Pulsed Collector Current, $V_{GE}=15V$, tp limited by T_{jmax}	I_{CM}	300	A
Diode Pulsed Current, tp 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	μs
Power Dissipation, $T_j=175^{\circ}C$, $T_C=25^{\circ}C$	P_{tot}	645	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
Static						
Collector-Emitter Breakdown Voltage	BV_{CES}	$V_{GE}=0V, I_C=250\mu A$	1200		-	V
Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=2.6mA$	4.8	5.6	6.4	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=75A$ $T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$		1.55 1.80 1.90	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
Dynamic						
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	6.92	-	nF
Reverse Transfer Capacitance	C_{res}		-	0.06	-	
Gate Charge	Q_G	$V_{CC}=600V, I_C=75A,$ $V_{GE}=15V$	-	0.48	-	uC
Short Circuit Collector Current	I_{SC}	$V_{GE}=15V, t_{sc}\leq 10\mu s,$ $V_{CC}=600V$	-	350	-	A

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Diode Forward Voltage	V _F	I _F = 75A T _j = 25°C, T _j = 125°C T _j = 150°C		2.00 1.90 1.80	2.60	V

Switching Characteristic, Inductive Load

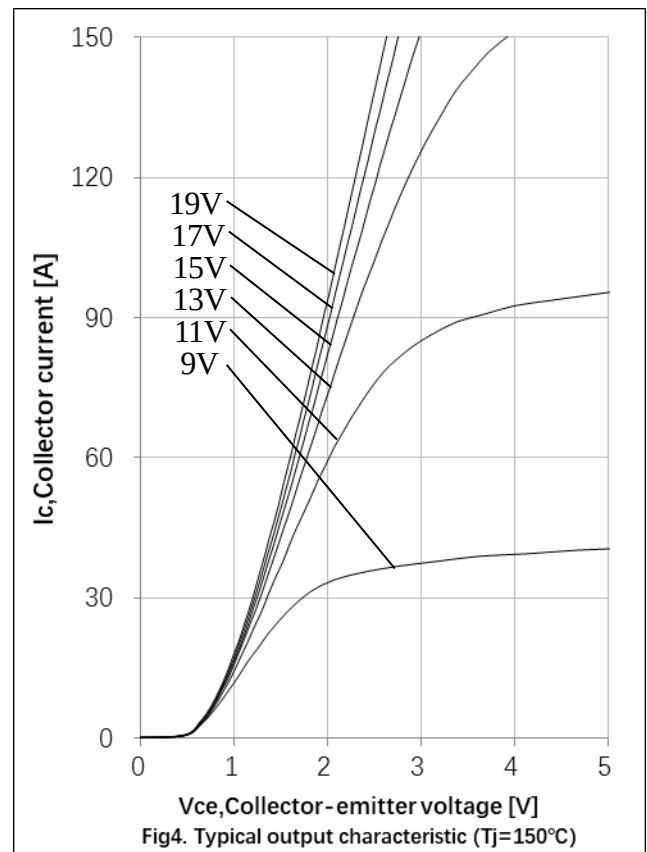
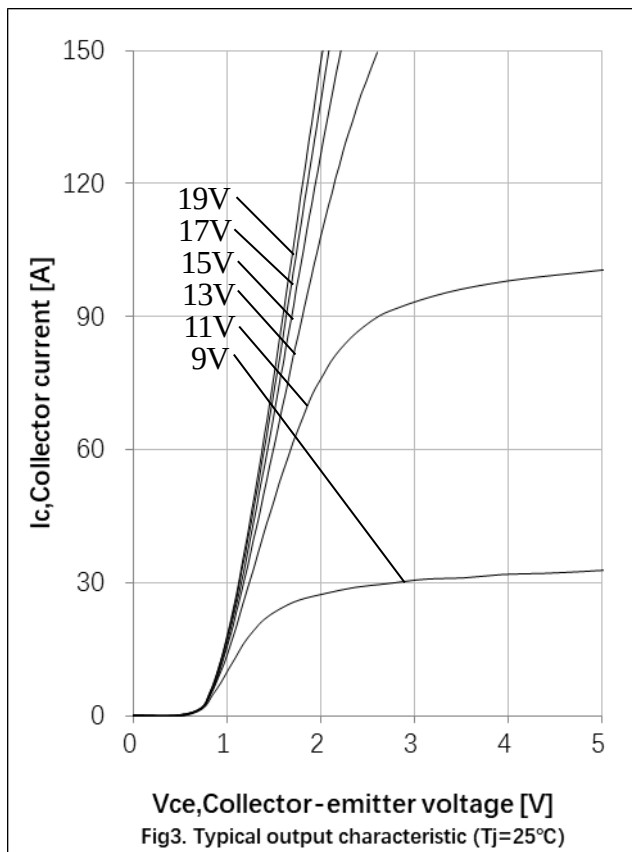
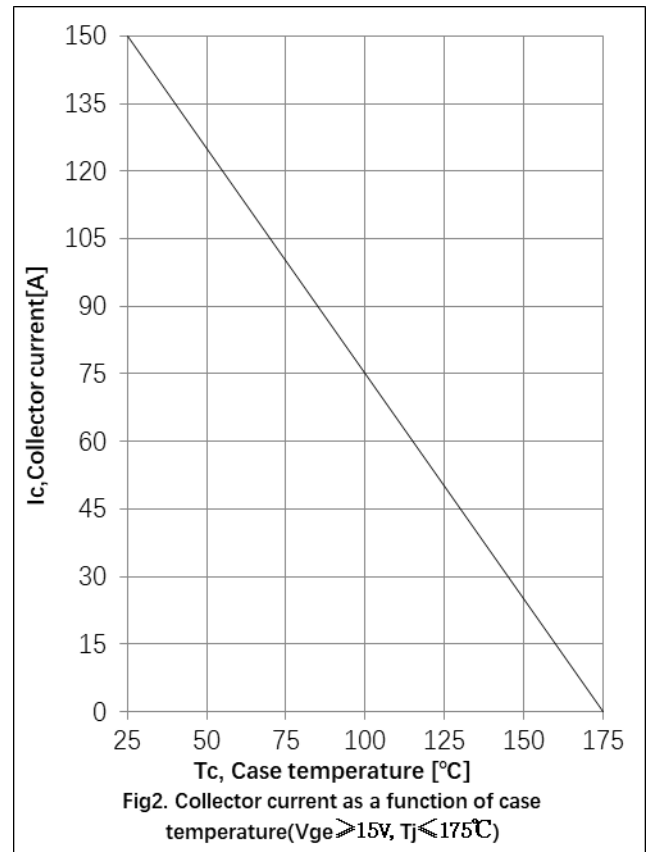
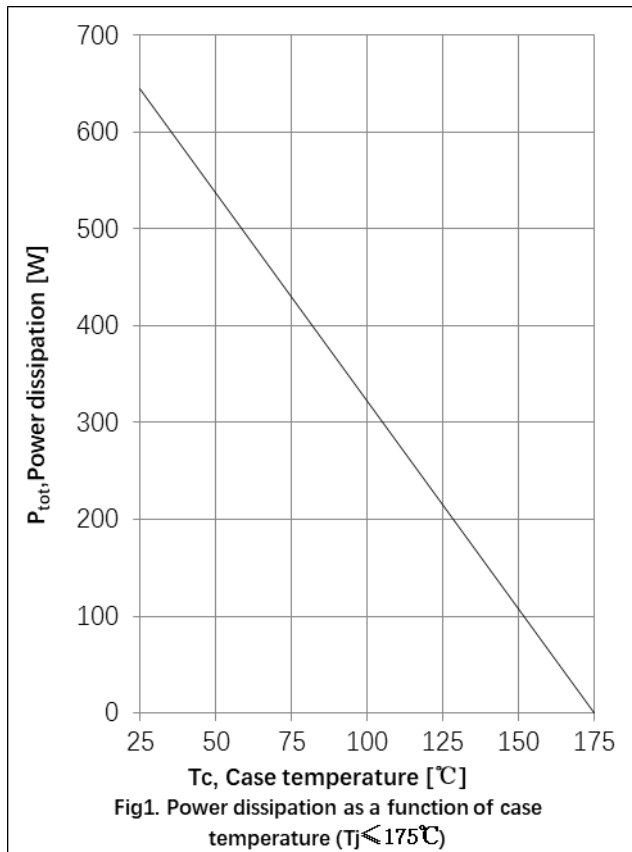
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C =75A, V _{GE} = -5V~15V, R _g =10Ω	-	135	-	ns
Rise Time	t _r		-	106	-	ns
Turn-on Energy	E _{on}		-	8.5	-	mJ
Turn-off Delay Time	t _{d(off)}		-	345	-	ns
Fall Time	t _f		-	210	-	ns
Turn-off Energy	E _{off}		-	5.1	-	mJ
Dynamic , at T _j = 125℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C =75A, V _{GE} = -5V~15V, R _g =10Ω	-	135	-	ns
Rise Time	t _r		-	110	-	ns
Turn-on Energy	E _{on}		-	10.5	-	mJ
Turn-off Delay Time	t _{d(off)}		-	365	-	ns
Fall Time	t _f		-	315	-	ns
Turn-off Energy	E _{off}		-	7.0	-	mJ
Dynamic , at T _j = 150℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C =75A, V _{GE} = -5V~15V, R _g =10Ω	-	135	-	ns
Rise Time	t _r		-	121	-	ns
Turn-on Energy	E _{on}		-	10.8	-	mJ
Turn-off Delay Time	t _{d(off)}		-	375	-	ns
Fall Time	t _f		-	345	-	ns
Turn-off Energy	E _{off}		-	7.5	-	mJ

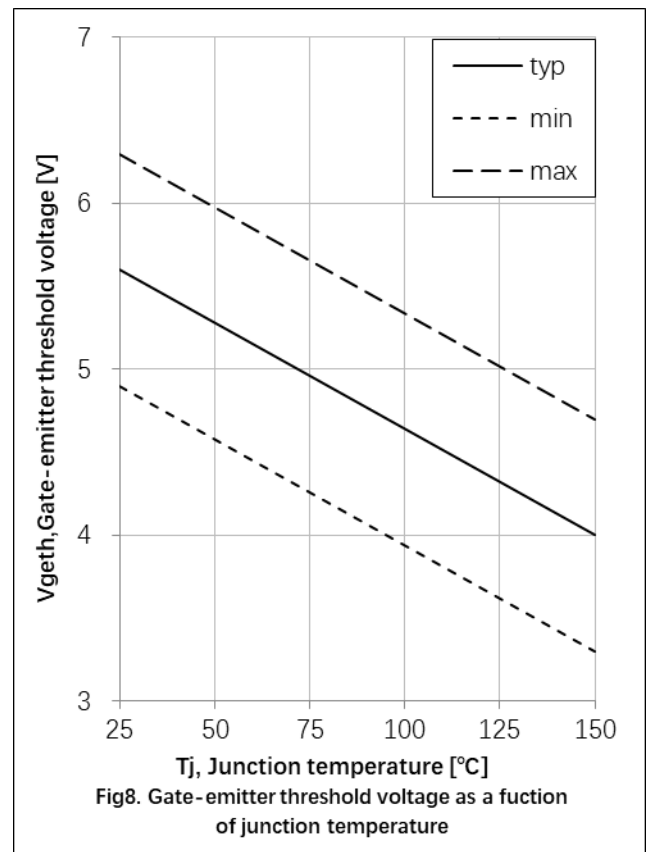
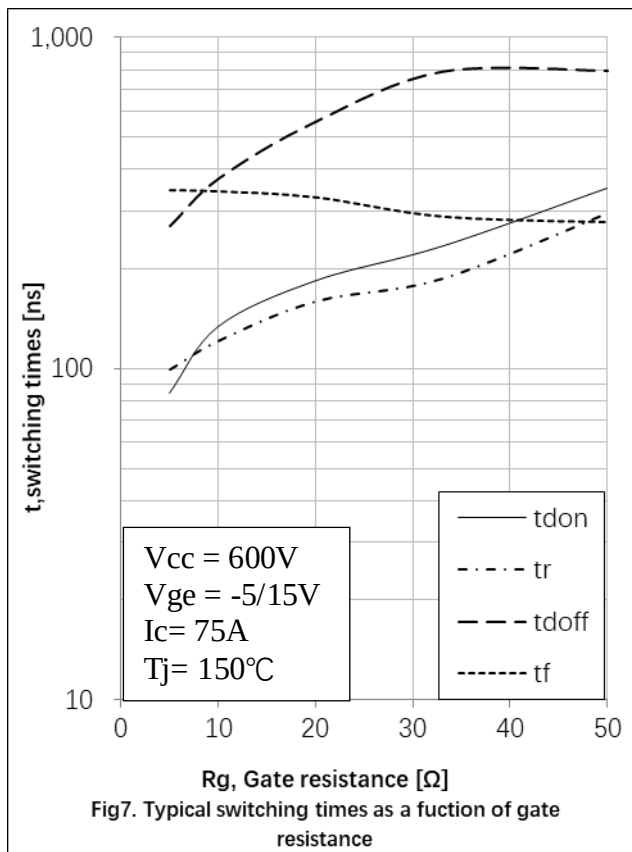
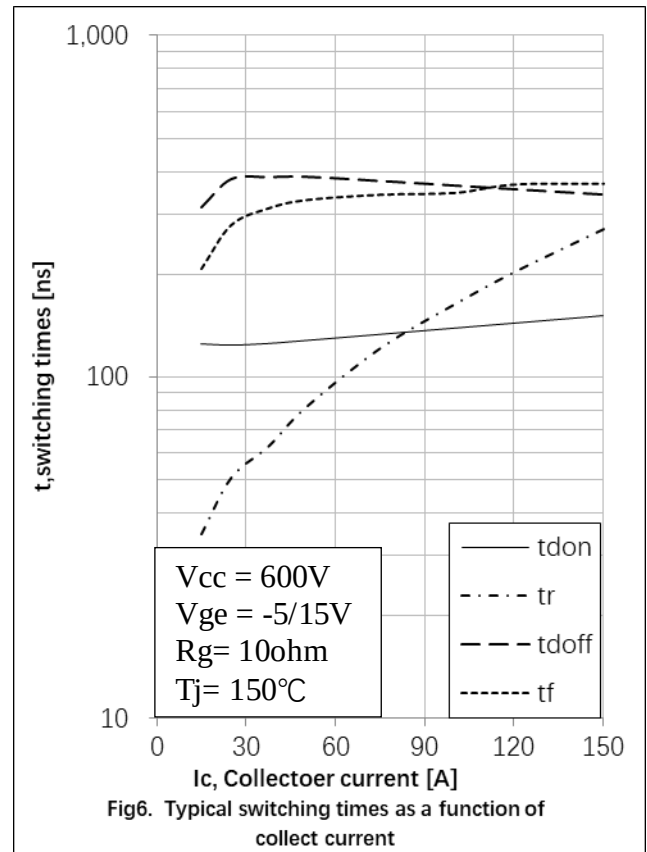
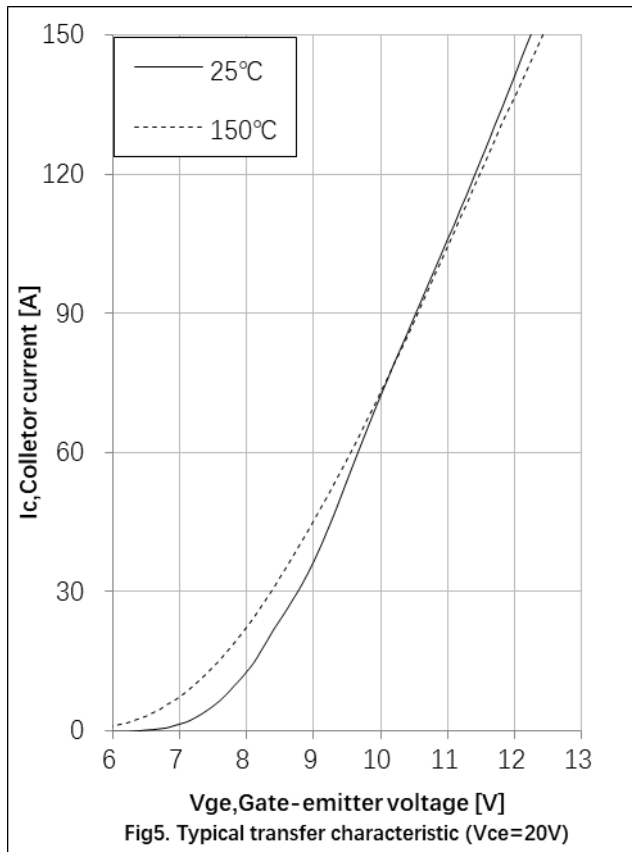
Electrical Characteristics of the DIODE

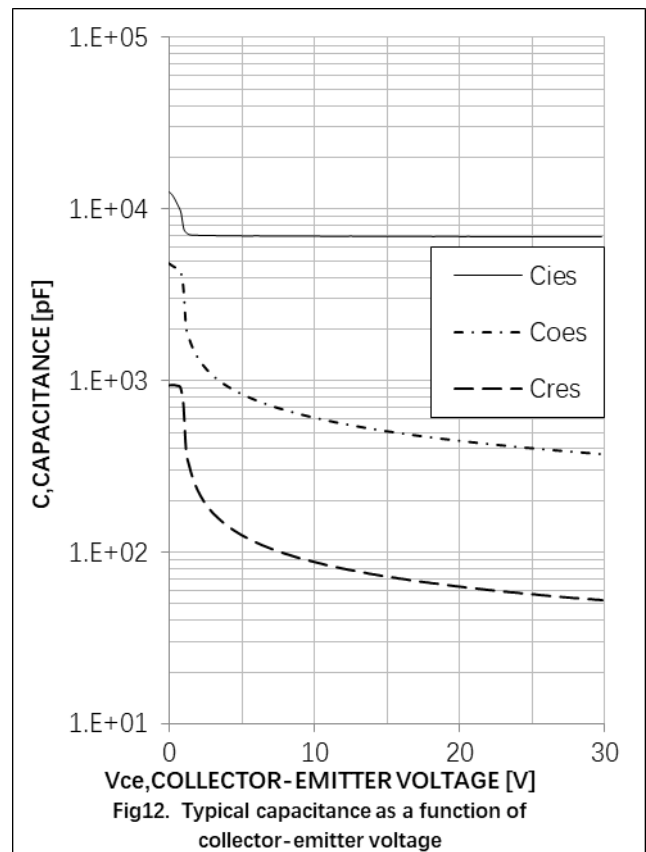
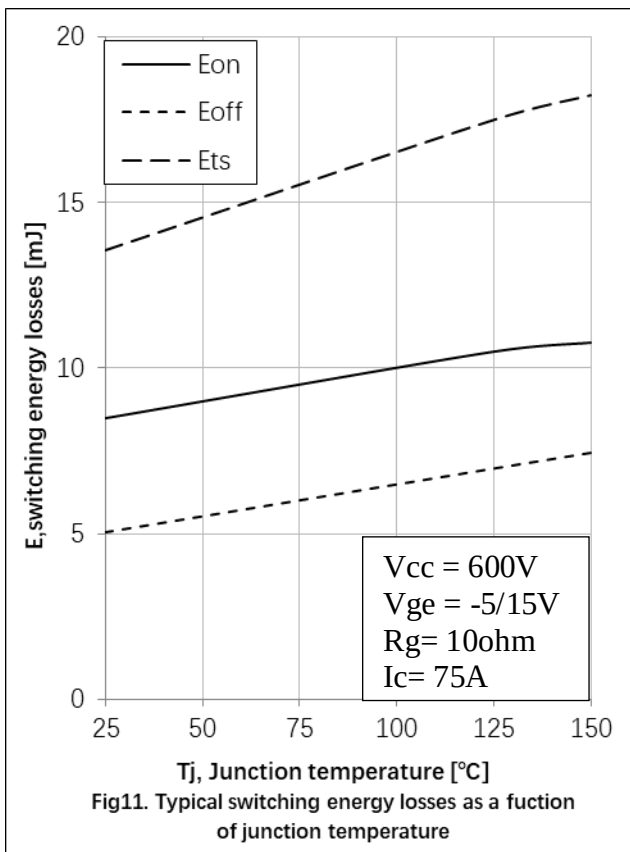
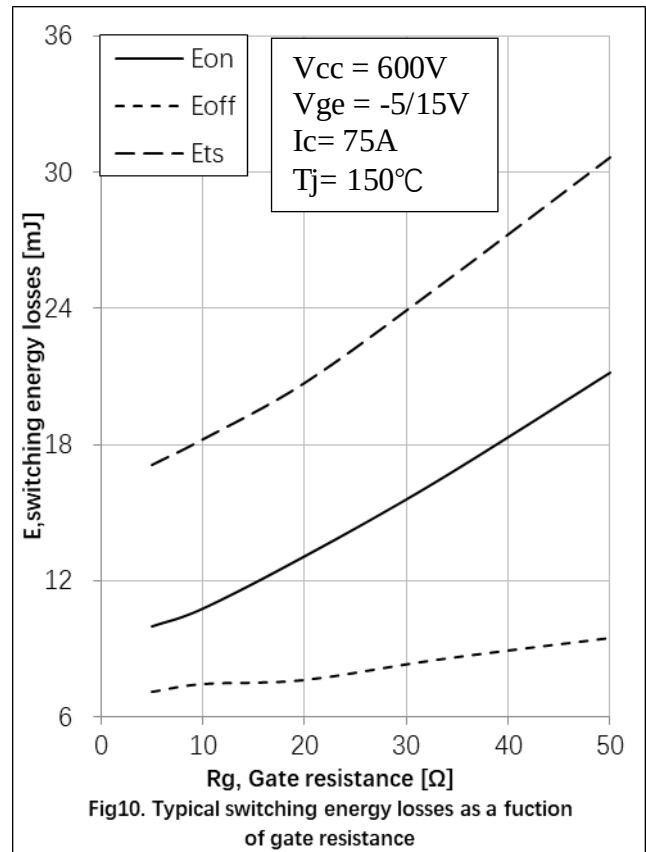
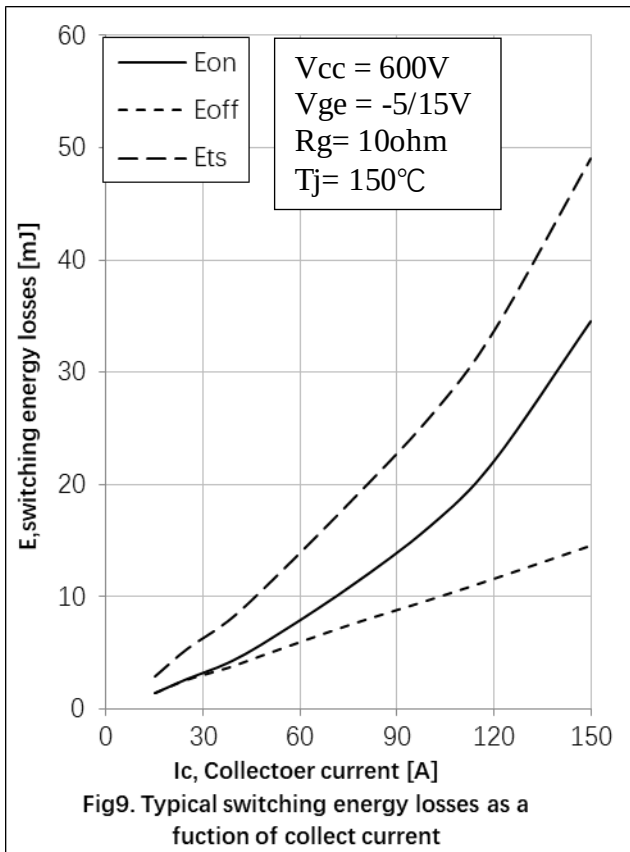
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25°C						
Reverse Recovery Current	I _{rr}	I _F =75A, V _R =600V, di/dt= -500A/μs	-	9	-	A
Diode reverse recovery time	trr		-	268	-	ns
Reverse Recovery Charge	Q _{rr}		-	3.42	-	uC
Reverse Recovery Energy	E _{rec}		-	1.52	-	mJ
Dynamic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

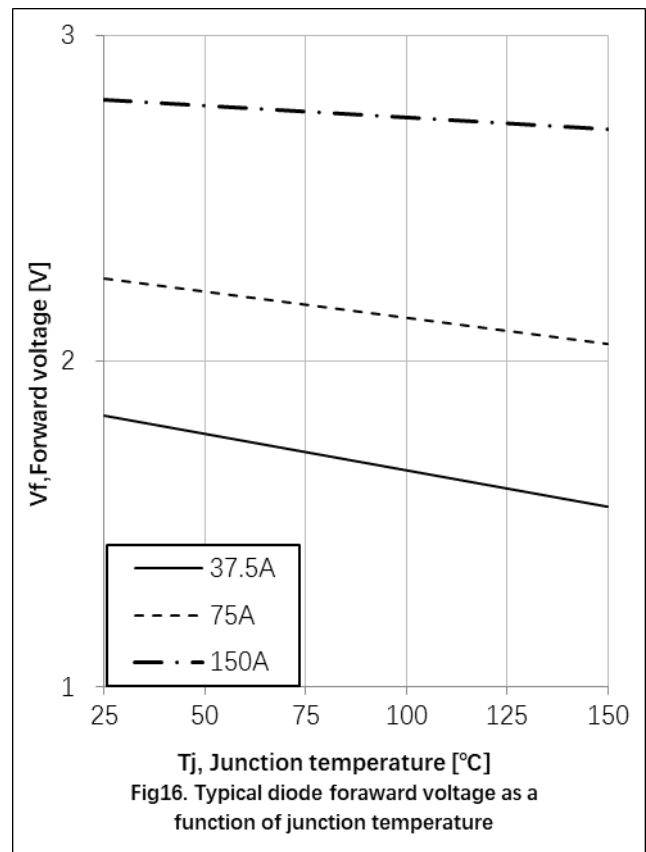
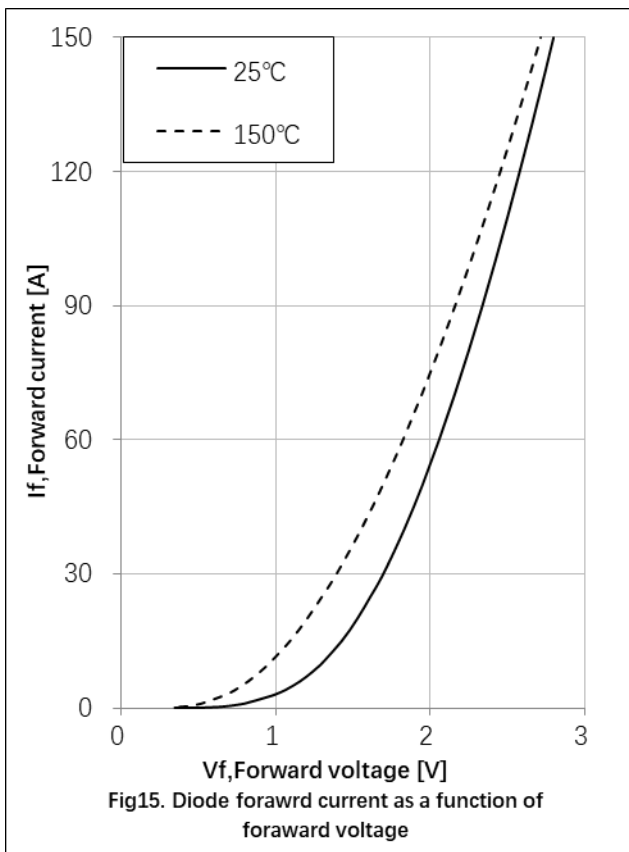
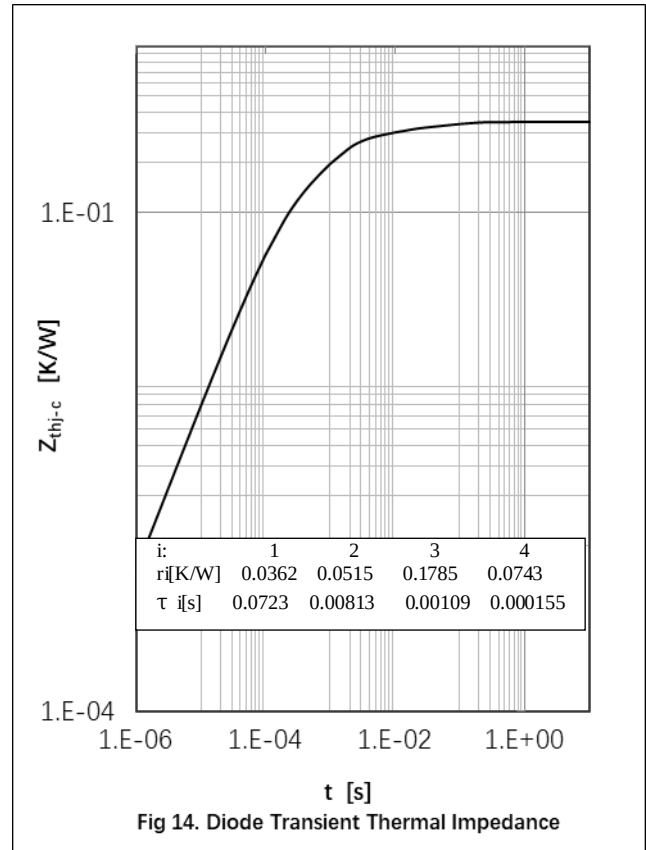
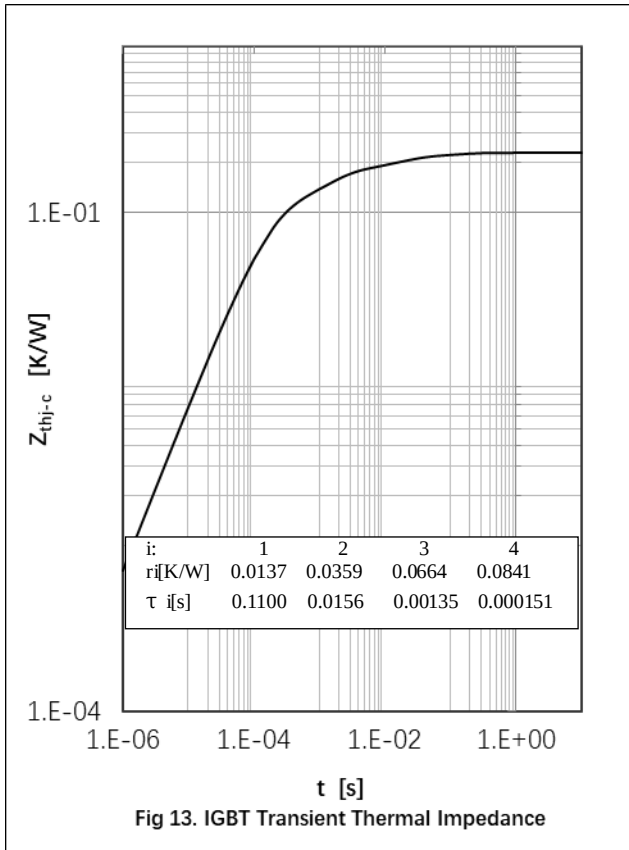
Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R _{th(j-c)}	0.23	K/W
Diode Thermal Resistance, Junction - Case	R _{th(j-c)}	0.35	K/W
Thermal Resistance, Junction - Ambient	R _{th(j-a)}	40	K/W

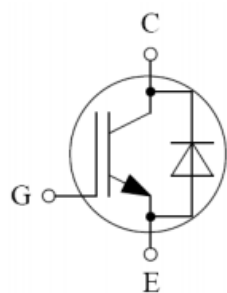






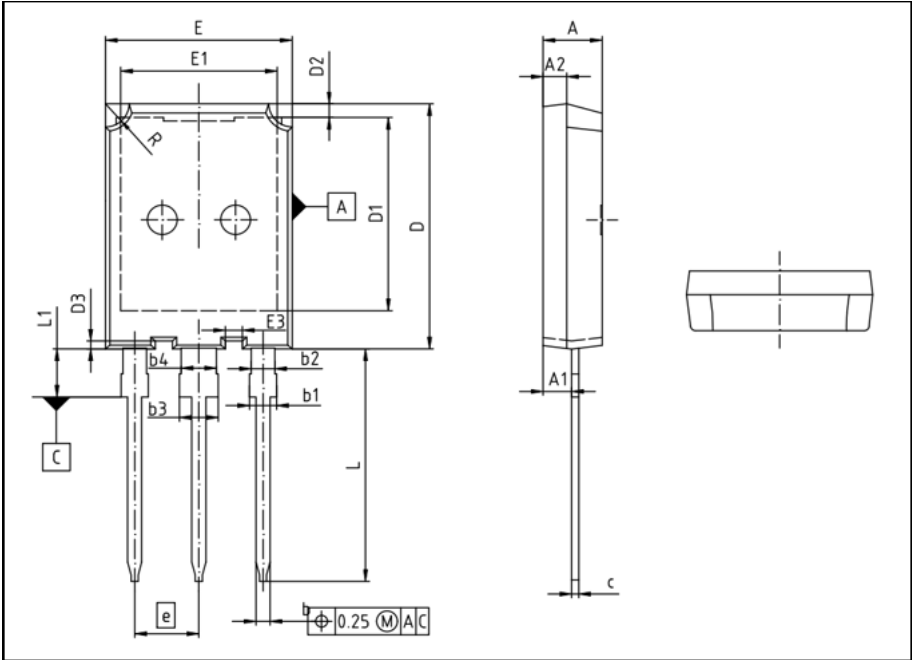


Circuit Diagram



● 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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