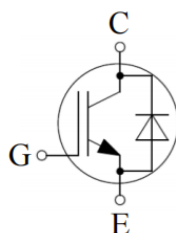


Circuit



IGBT Discrete

V_{CE}	1200	V
I_C	75	A
$V_{CE(SAT)} I_C=75A$	1.65	V

Applications

- PV power
- Uninterruptible power supplies
- Three-level Solar String Inverter

Features

- High speed smooth switching device for hard & soft switching
- Maximum junction temperature 175°C
- Positive temperature coefficient
- High ruggedness, temperature stable

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 ($t_p \leq 10\mu s, D < 0.010$)	V_{GE}	± 30	V
Turn off Safe Operating Area $V_{CE} \leq 1200V$, $T_j \leq 150^\circ C$		300	A
Pulsed Collector Current, $V_{GE}=15V$, t_p limited by T_{jmax}	I_{CM}	300	A
Diode Pulsed Current, t_p limited by T_{jmax}	I_{Fpuls}	300	A
Power Dissipation, $T_j=175^\circ C$, $T_C=25^\circ C$	P_{tot}	535	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	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1.4mA$	4.8	5.5	6.2	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=75A$ $T_j=25^\circ\text{C}$, $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$	1.50	1.65 2.05 2.15	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}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	5.51	-	nF
Reverse Transfer Capacitance	C_{res}		-	0.05	-	
Gate Charge	Q_G	$V_{CC}=960V, I_C=75A,$ $V_{GE}=15V$	-	0.65	-	uC

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		2.40 2.10 2.00	3.00	V

Switching Characteristic, Inductive Load

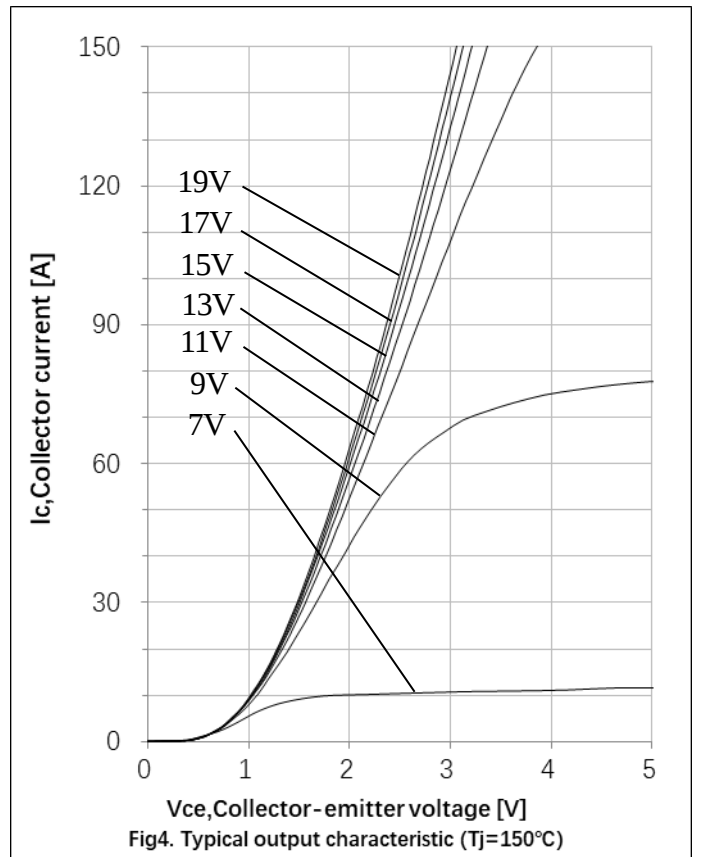
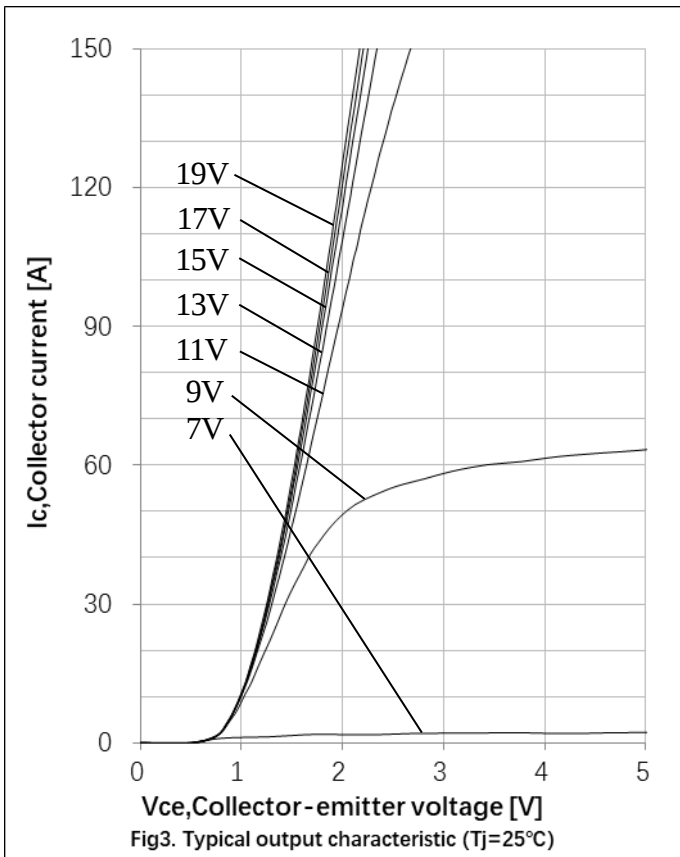
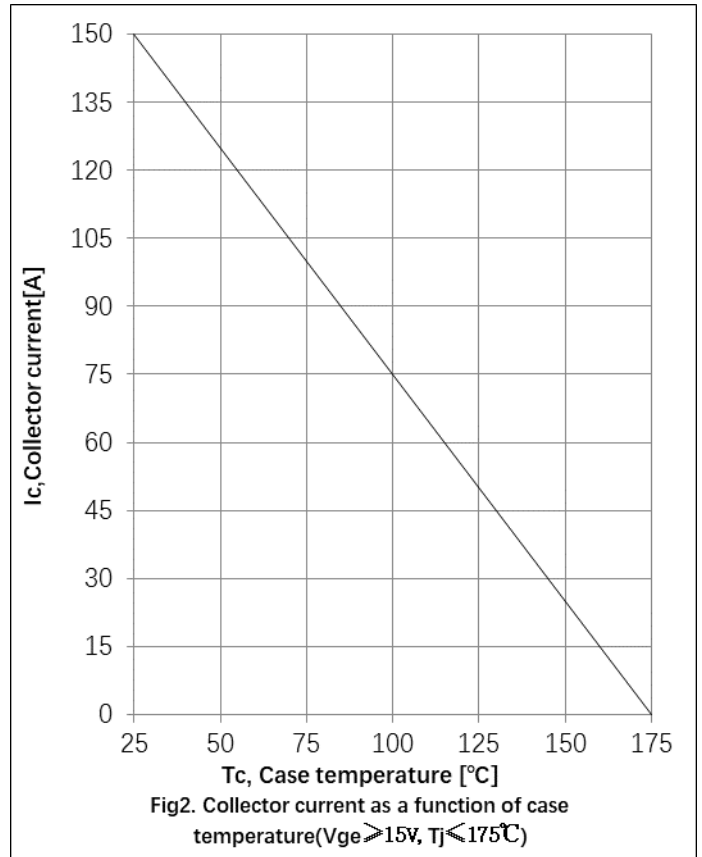
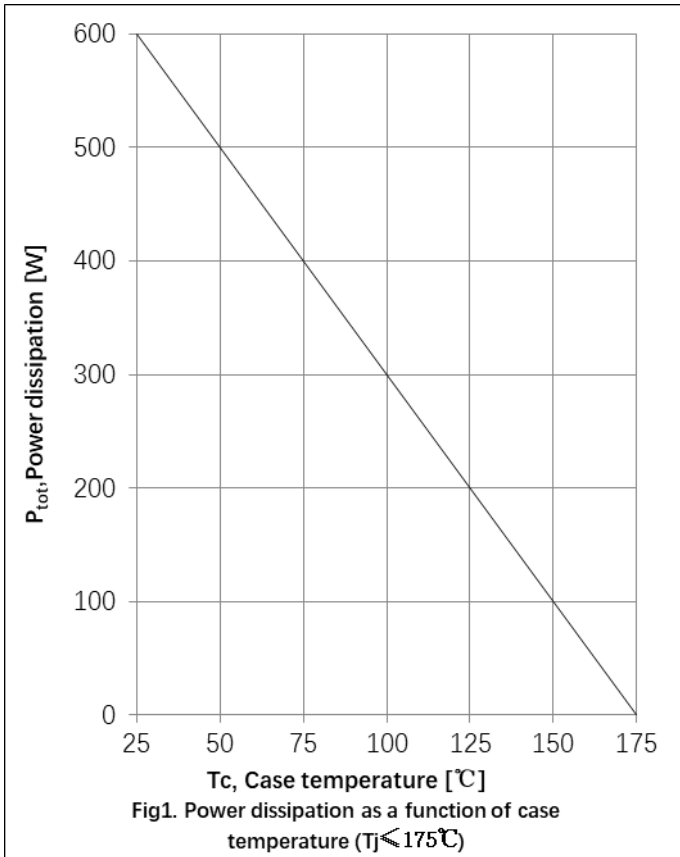
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} = 600V, I _C =75A, V _{GE} = -5V~15V, R _g =10Ω	-	52	-	ns
Rise Time	t _r		-	58	-	ns
Turn-on Energy	E _{on}		-	5.25	-	mJ
Turn-off Delay Time	t _{d(off)}		-	80	-	ns
Fall Time	t _f		-	85	-	ns
Turn-off Energy	E _{off}		-	1.87	-	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	-	53	-	ns
Rise Time	t _r		-	60	-	ns
Turn-on Energy	E _{on}		-	5.42	-	mJ
Turn-off Delay Time	t _{d(off)}		-	90	-	ns
Fall Time	t _f		-	100	-	ns
Turn-off Energy	E _{off}		-	2.36	-	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	-	54	-	ns
Rise Time	t _r		-	62	-	ns
Turn-on Energy	E _{on}		-	5.51	-	mJ
Turn-off Delay Time	t _{d(off)}		-	95	-	ns
Fall Time	t _f		-	108	-	ns
Turn-off Energy	E _{off}		-	2.49	-	mJ

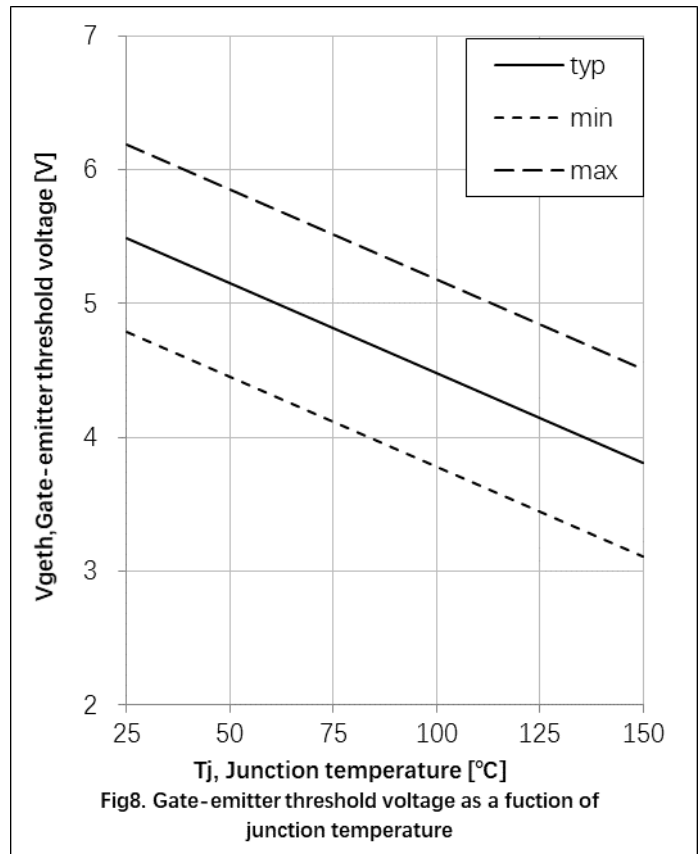
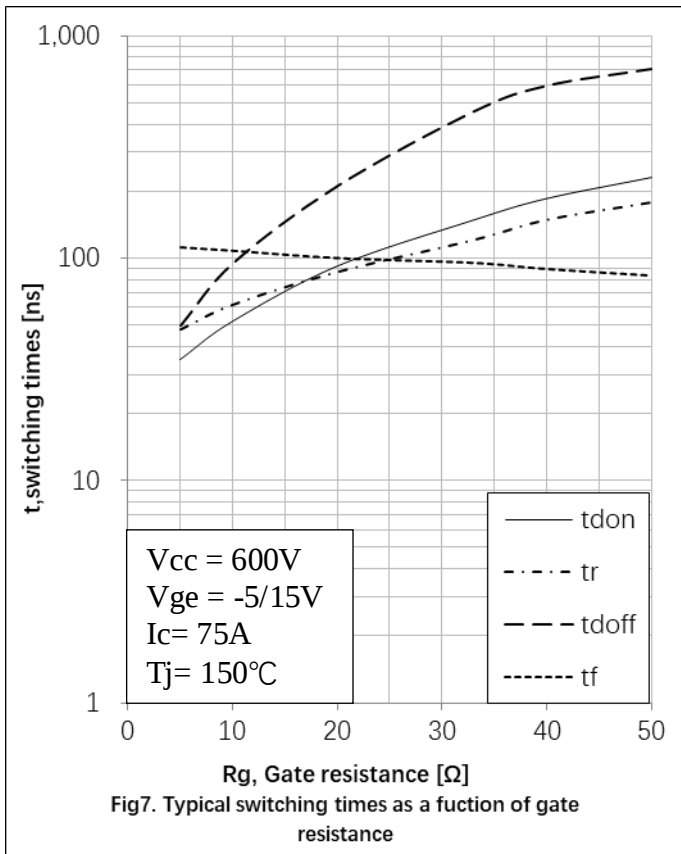
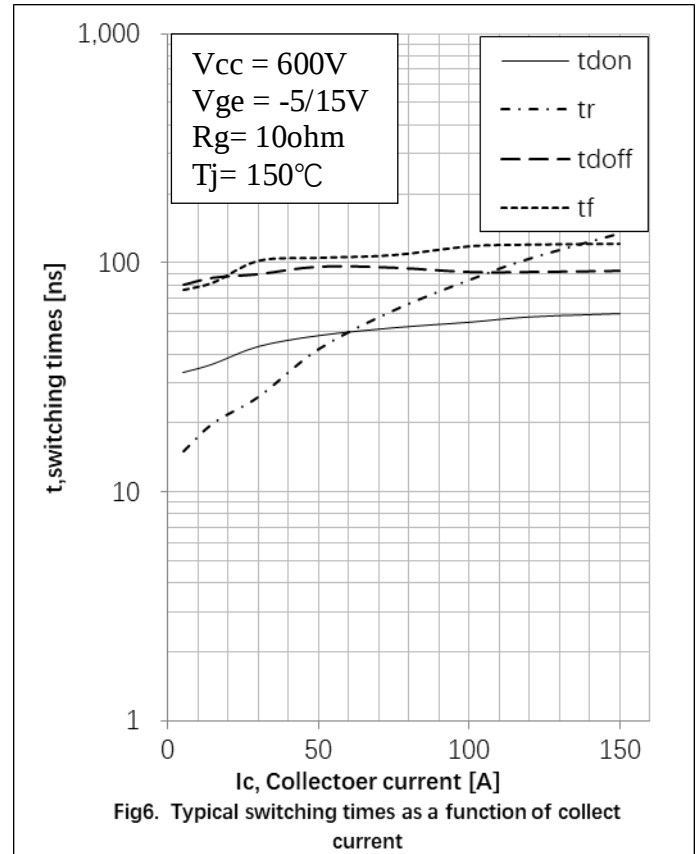
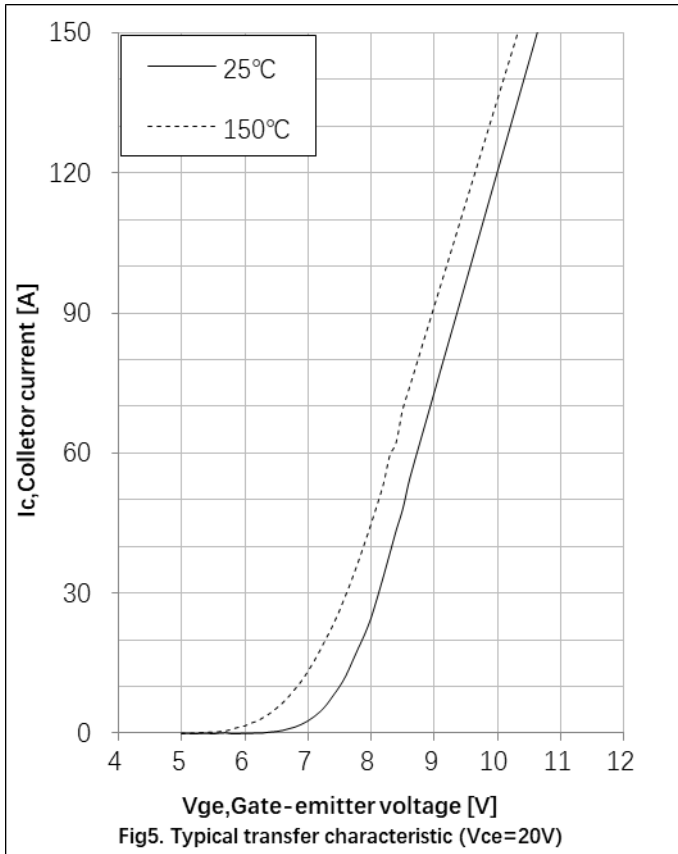
Electrical Characteristics of the DIODE

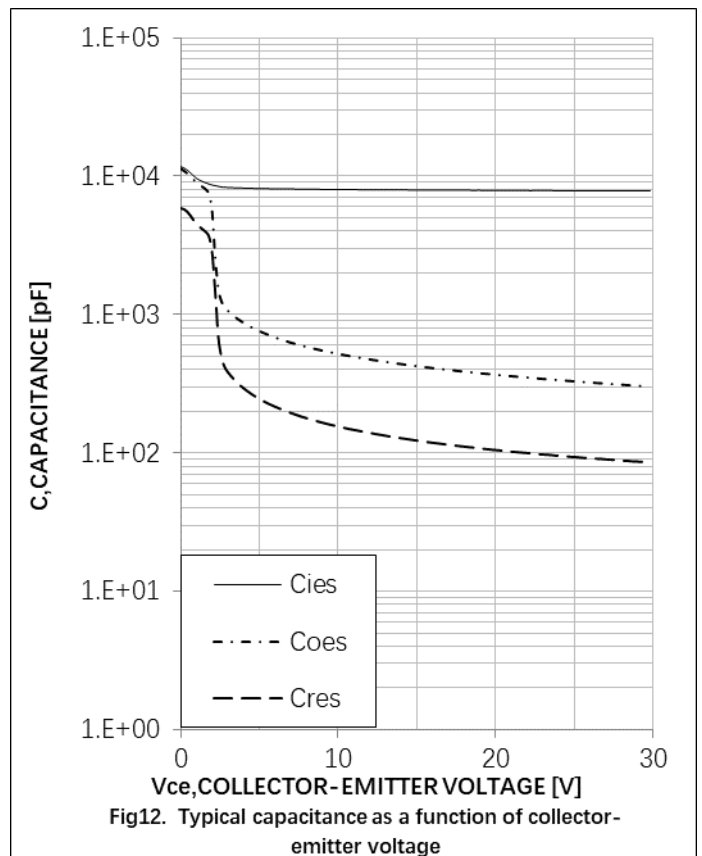
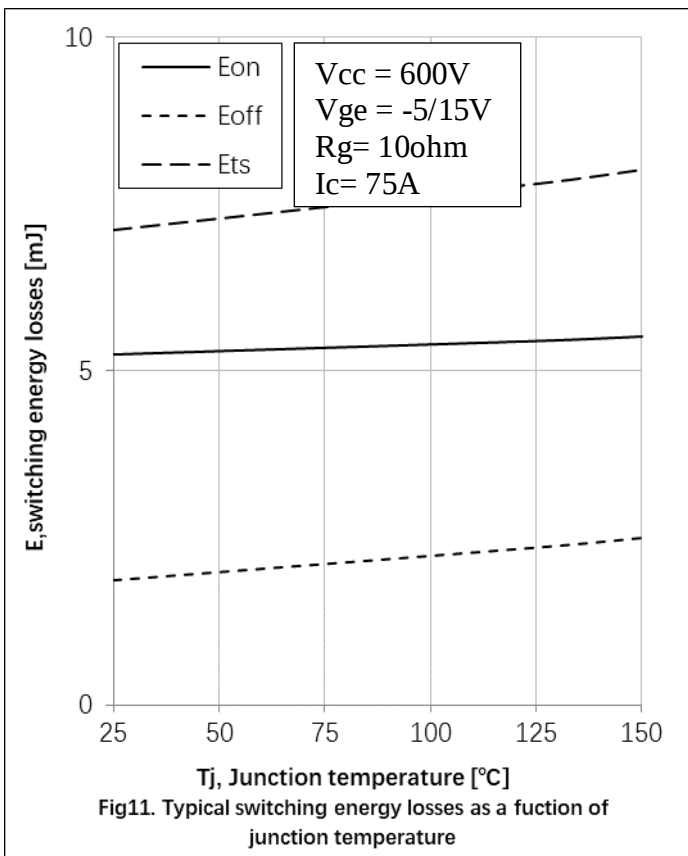
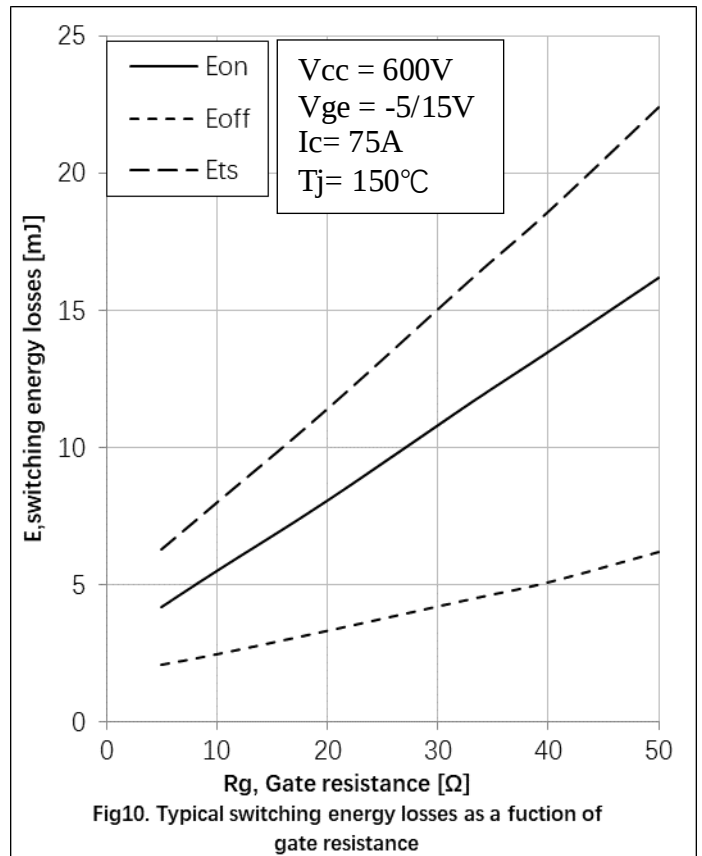
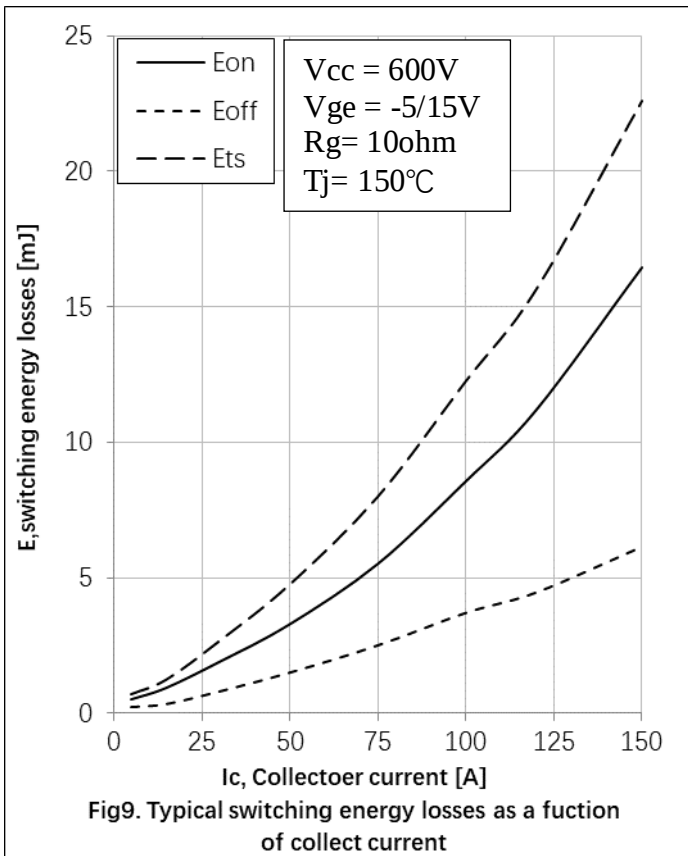
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25°C						
Reverse Recovery Current	I _{rr}	I _F =75A, V _R =600V, di/dt= -500A/μs	-	11	-	A
Diode reverse recovery time	trr		-	189	-	ns
Reverse Recovery Charge	Q _{rr}		-	3.01	-	uC
Reverse Recovery Energy	E _{rec}		-	1.35	-	mJ
Dynamic , at T _j = 125°C						
Reverse Recovery Current	I _{rr}	I _F =75A, V _R =600V, di/dt= -500A/μs	-	15	-	A
Diode reverse recovery time	trr		-	235	-	ns
Reverse Recovery Charge	Q _{rr}		-	6.74	-	uC
Reverse Recovery Energy	E _{rec}		-	2.92	-	mJ
Dynamic , at T _j = 150°C						
Reverse Recovery Current	I _{rr}	I _F =75A, V _R =600V, di/dt= -500A/μs	-	16	-	A
Diode reverse recovery time	trr		-	278	-	ns
Reverse Recovery Charge	Q _{rr}		-	8.47	-	uC
Reverse Recovery Energy	E _{rec}		-	3.28	-	mJ

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R _{th(j-c)}	0.28	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







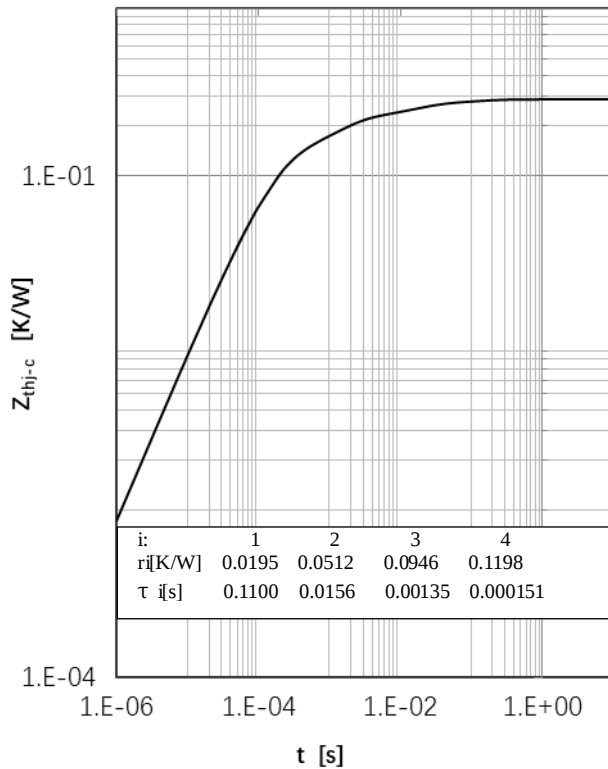


Fig 13. IGBT Transient Thermal Impedance

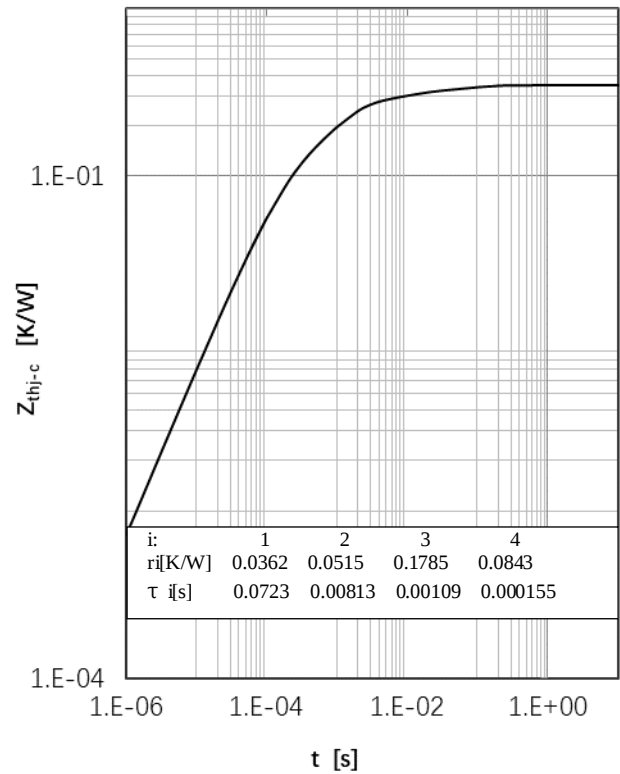


Fig 14. Diode Transient Thermal Impedance

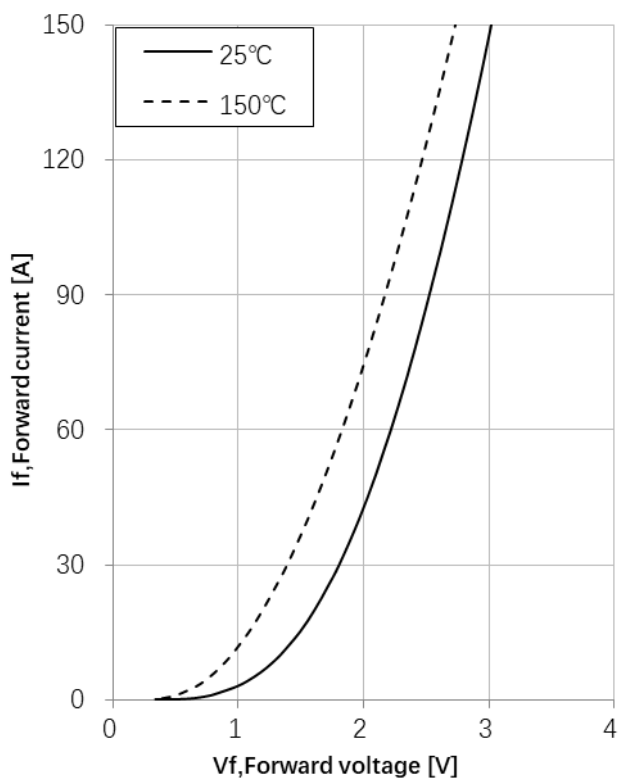
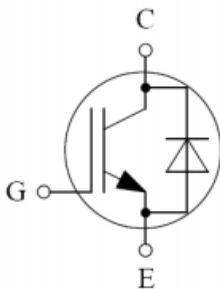


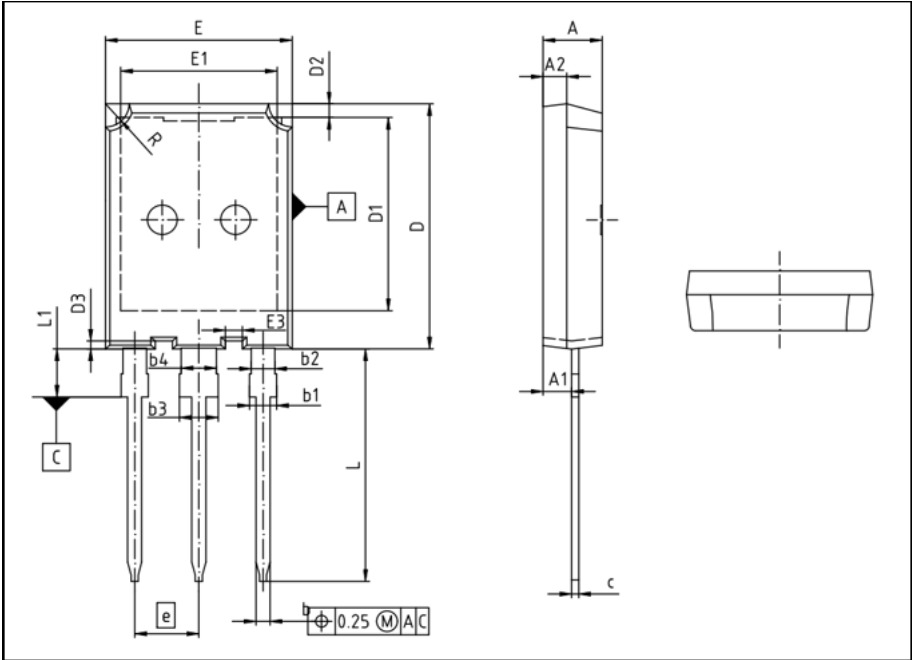
Fig15. Diode forward current as a function of forward voltage

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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