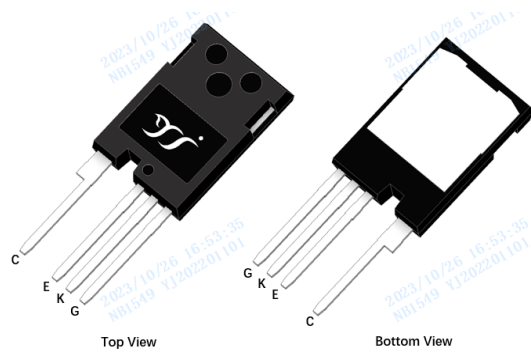
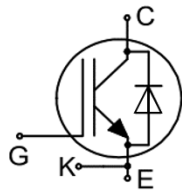




IGBT Discrete

V_{CE}	650	V
I_C	160	A
$V_{CE(SAT)} I_C=160A$	1.55	V

Circuit



Applications

- Energy storage inverter
- Uninterruptible power supplies
- Solar inverters

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}	650	V
DC Collector Current, limited by T_{jmax} $T_C=25^{\circ}C$ value limited by bondwire $T_C=100^{\circ}C$	I_C	180 160	A
Diode Forward Current, limited by T_{jmax} $T_C=25^{\circ}C$ value limited by bondwire $T_C=100^{\circ}C$	I_F	180 160	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 $V_{CE} \leq 650V$, $T_j \leq 150^{\circ}C$		320	A
Pulsed Collector Current, $V_{GE}=15V$, t_p limited by T_{jmax}	I_{CM}	320	A
Diode Pulsed Current, t_p limited by T_{jmax}	I_{Fpuls}	320	A
Power Dissipation, $T_j=175^{\circ}C$, $T_C=25^{\circ}C$	P_{tot}	714	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}	$V_{GE}=0V, I_C=250\mu A$	650		-	V
Gate Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=1mA$	3.2	4.0	4.8	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=160A$ $T_j=25^\circ\text{C},$ $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$		1.55 1.75 1.85	1.85	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V$ $T_j=25^\circ\text{C},$ $T_j=150^\circ\text{C}$			0.25 3.00	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}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	6.93	-	nF
Reverse Transfer Capacitance	C_{res}		-	0.07	-	
Gate Charge	Q_G	$V_{CC}=400V, I_C=160A,$ $V_{GE}=-5V\sim+15V$	-	0.35	-	uC

**Electrical Characteristics of the Diode** ($T_j = 25^\circ\text{C}$ unless otherwise specified):

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Diode Forward Voltage	V_F	$I_F = 160\text{A}$ $T_j = 25^\circ\text{C}$, $T_j = 125^\circ\text{C}$ $T_j = 150^\circ\text{C}$		2.10 1.95 1.90	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} =400V, I _C =160A, V _{GE} = -5v~15V, R _g =10Ω Inductive Load	-	47	-	ns
Rise Time	t _r		-	88	-	ns
Turn-on Energy	E _{on}		-	4.6	-	mJ
Turn-off Delay Time	t _{d(off)}		-	210	-	ns
Fall Time	t _f		-	70	-	ns
Turn-off Energy	E _{off}		-	3.3	-	mJ
Dynamic , at T _j = 125℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} =400V, I _C =160A, V _{GE} = -5v~15V, R _g =10Ω Inductive Load	-	42	-	ns
Rise Time	t _r		-	93	-	ns
Turn-on Energy	E _{on}		-	6.7	-	mJ
Turn-off Delay Time	t _{d(off)}		-	214	-	ns
Fall Time	t _f		-	71	-	ns
Turn-off Energy	E _{off}		-	3.9	-	mJ
Dynamic , at T _j = 150℃						
Turn-on Delay Time	t _{d(on)}	V _{CC} =400V, I _C =160A, V _{GE} = -5v~15V, R _g =10Ω Inductive Load	-	41	-	ns
Rise Time	t _r		-	96	-	ns
Turn-on Energy	E _{on}		-	7.3	-	mJ
Turn-off Delay Time	t _{d(off)}		-	217	-	ns
Fall Time	t _f		-	72	-	ns
Turn-off Energy	E _{off}		-	4.2	-	mJ

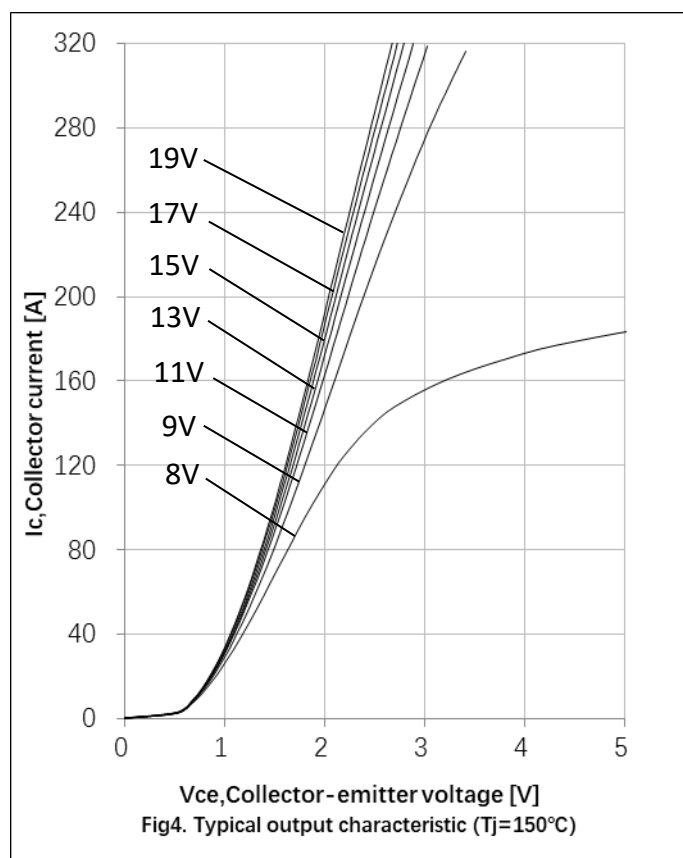
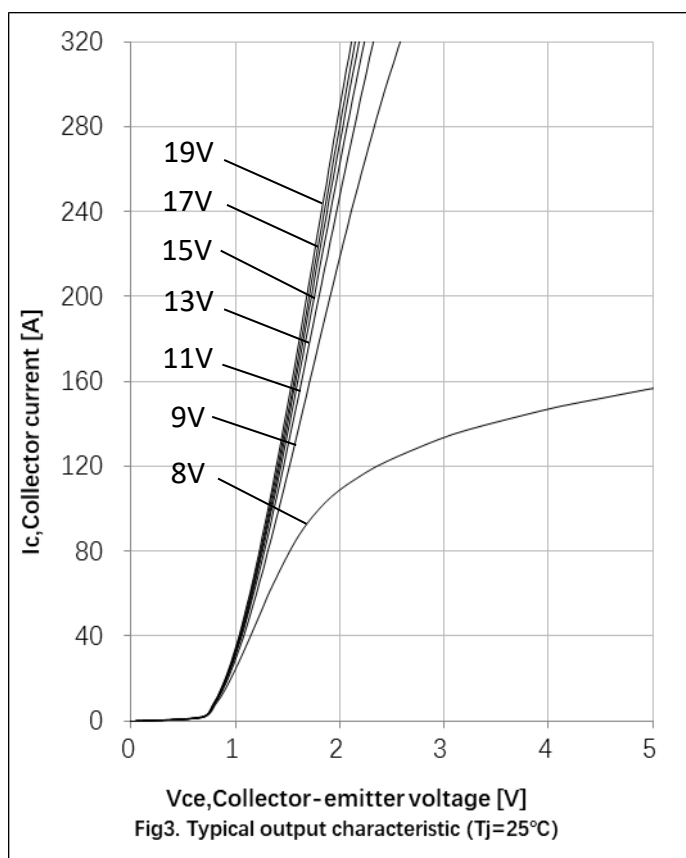
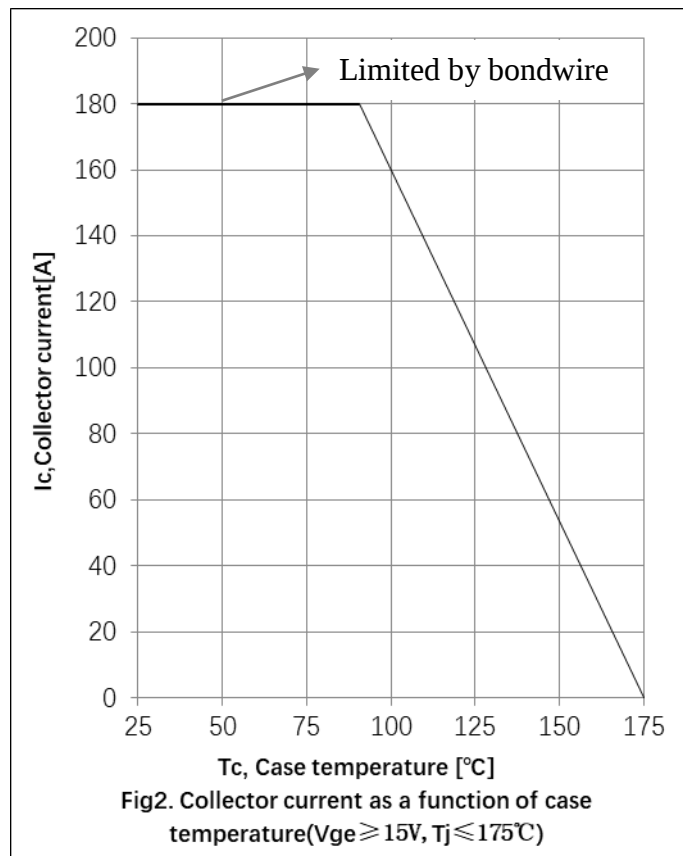
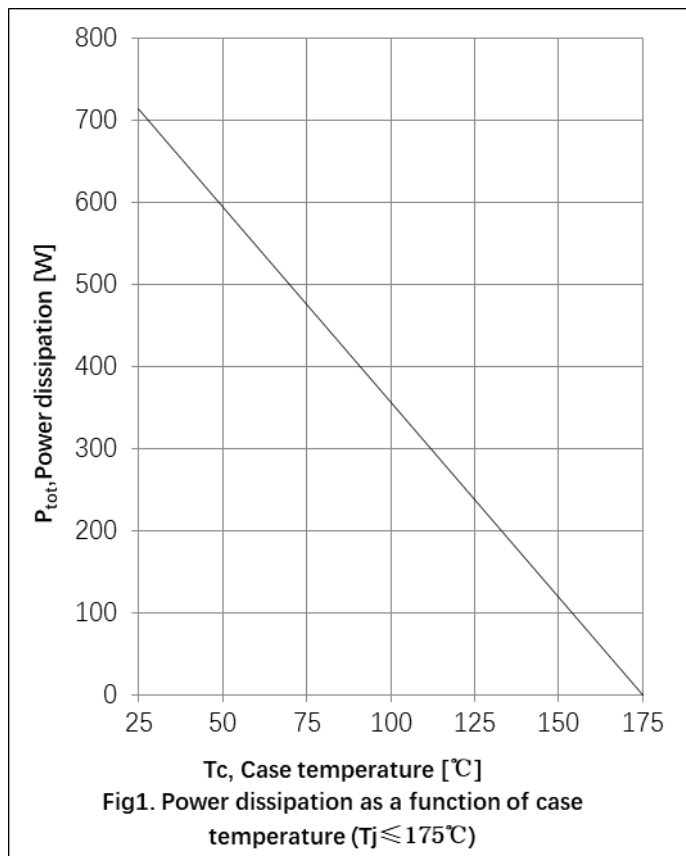


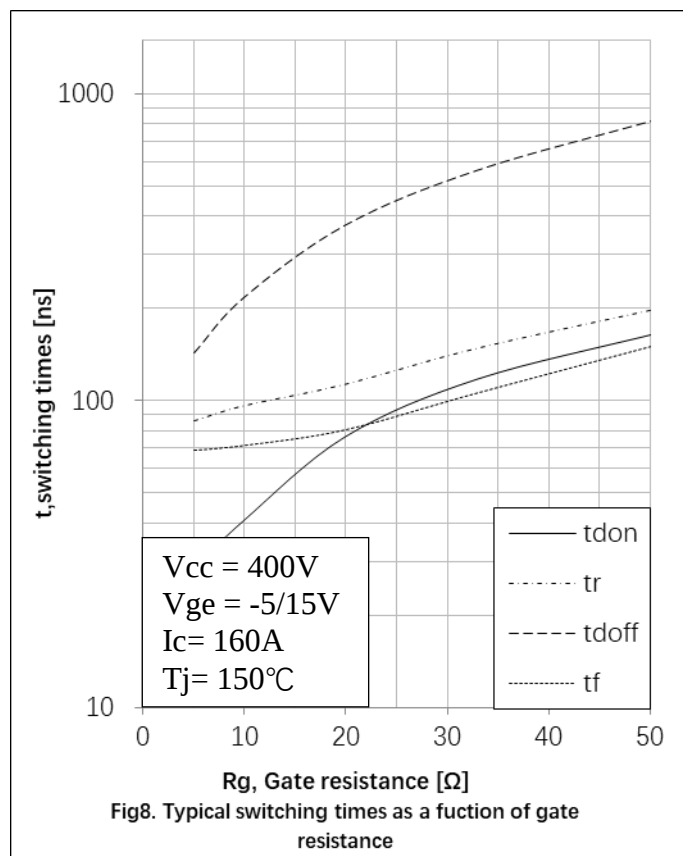
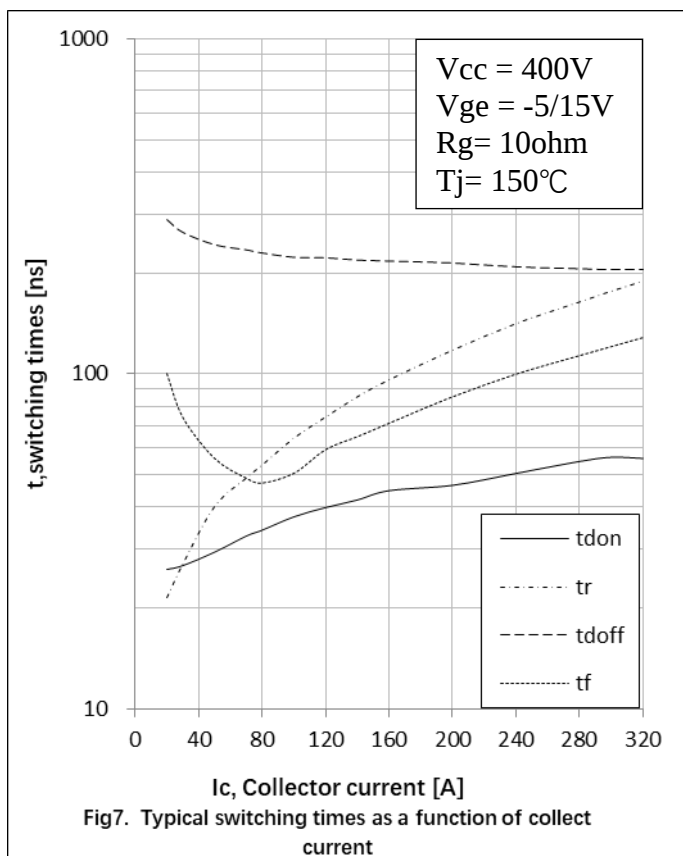
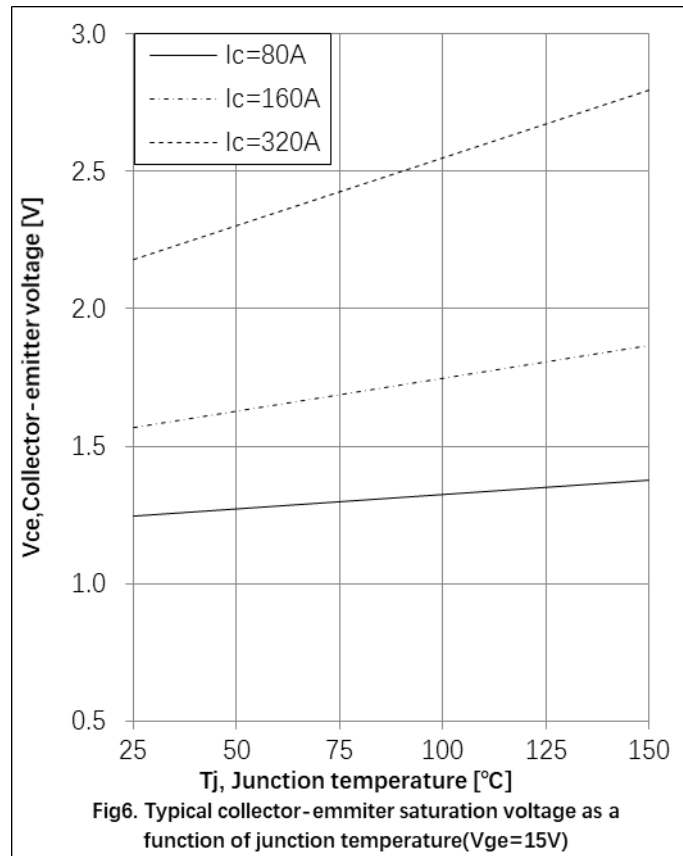
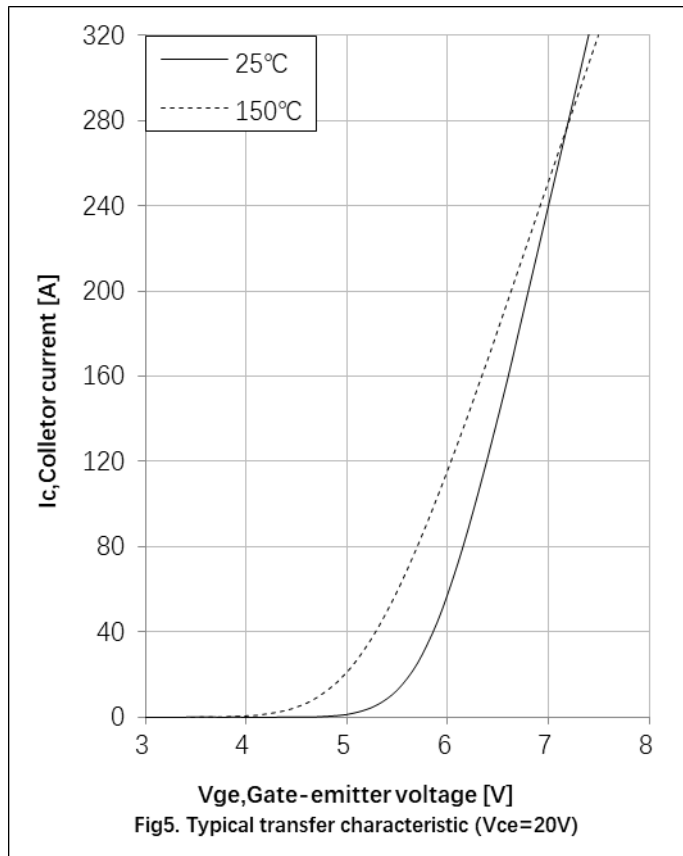
Electrical Characteristics of the DIODE

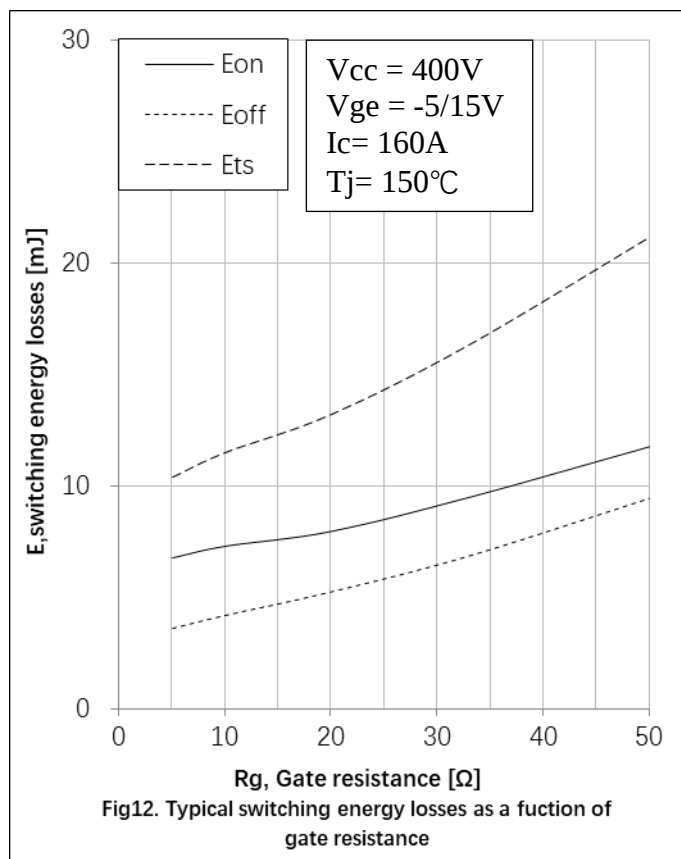
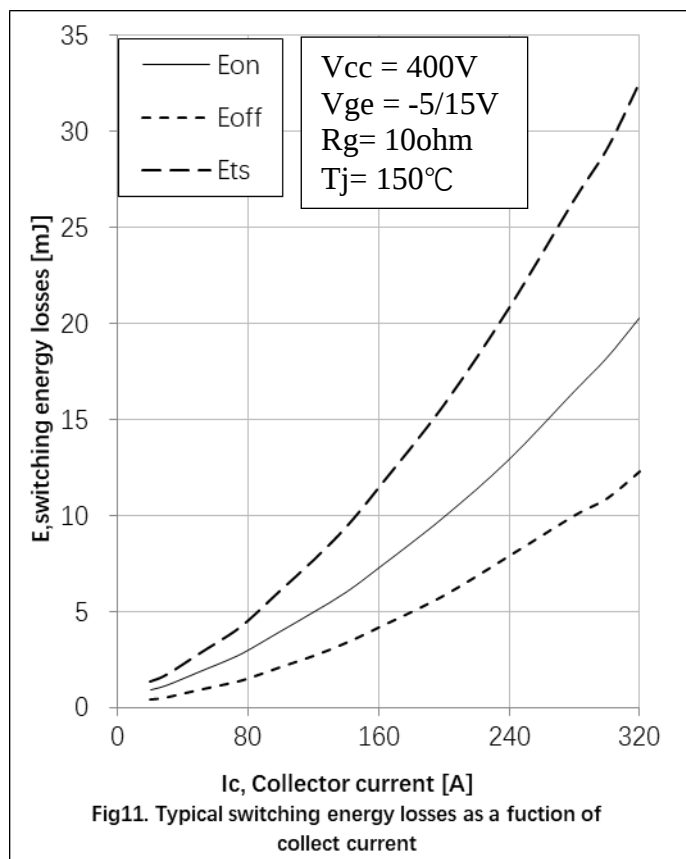
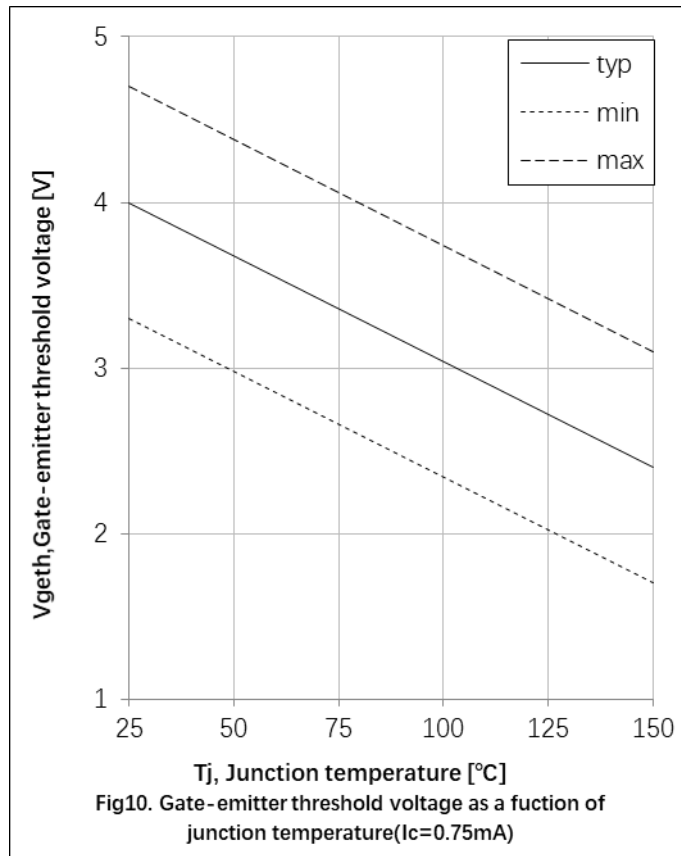
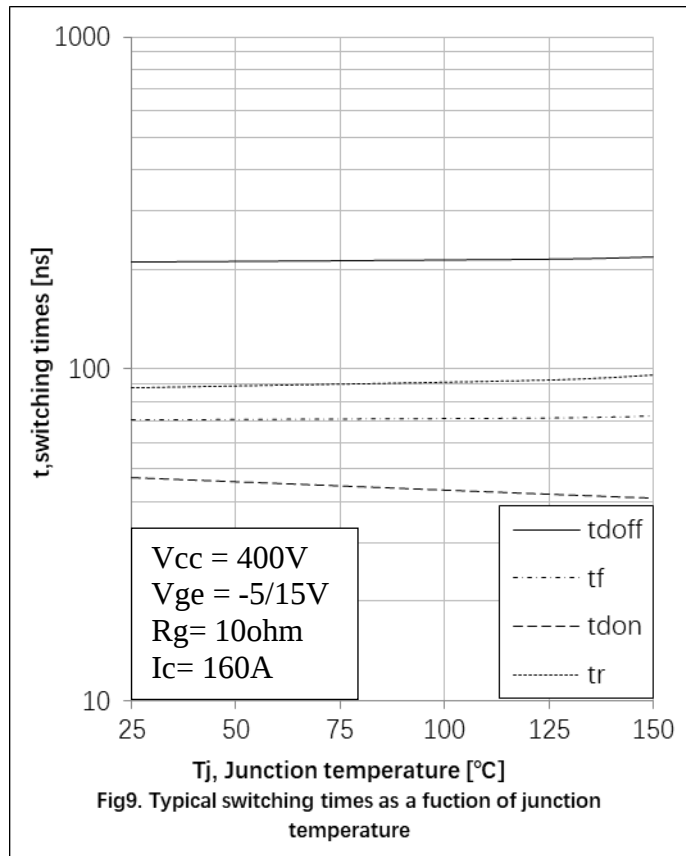
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25°C						
Reverse Recovery Current	I _{rr}	I _F =160A, V _R =400V -di/dt=1200A/μs,	-	30	-	A
Reverse Recovery Charge	Q _{rr}		-	1.05	-	uC
Diode reverse recovery time	trr		-	55	-	ns
Reverse Recovery Energy	E _{rec}		-	0.15	-	mJ
Dynamic , at T _j = 125°C						
Reverse Recovery Current	I _{rr}	I _F =160A, V _R =400V -di/dt=1200A/μs,	-	69	-	A
Reverse Recovery Charge	Q _{rr}		-	4.97	-	uC
Diode reverse recovery time	trr		-	104	-	ns
Reverse Recovery Energy	E _{rec}		-	0.88	-	mJ
Dynamic , at T _j = 150°C						
Reverse Recovery Current	I _{rr}	I _F =160A, V _R =400V -di/dt=1200A/μs,	-	89	-	A
Reverse Recovery Charge	Q _{rr}		-	6.93	-	uC
Diode reverse recovery time	trr		-	131	-	ns
Reverse Recovery Energy	E _{rec}		-	1.27	-	mJ

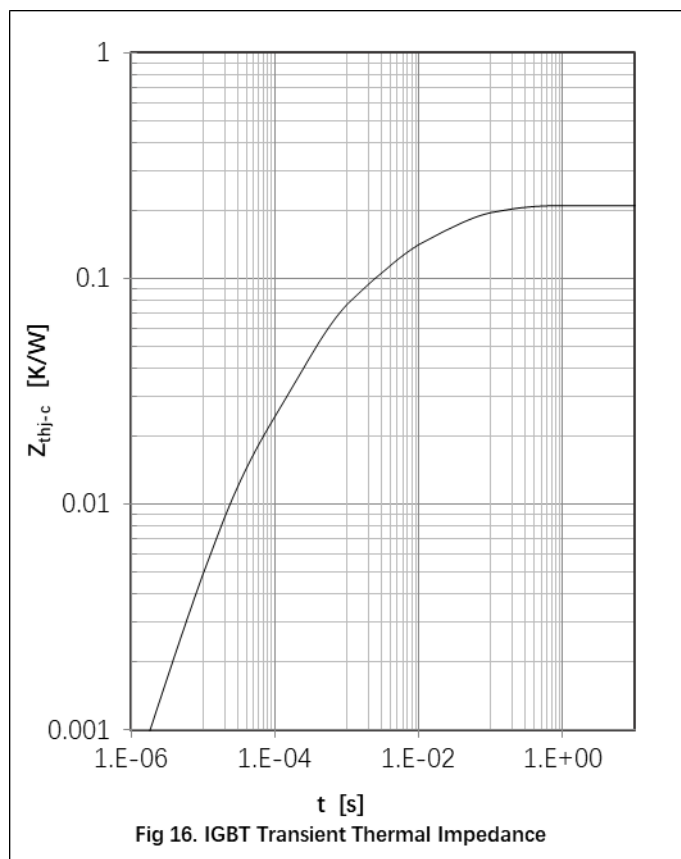
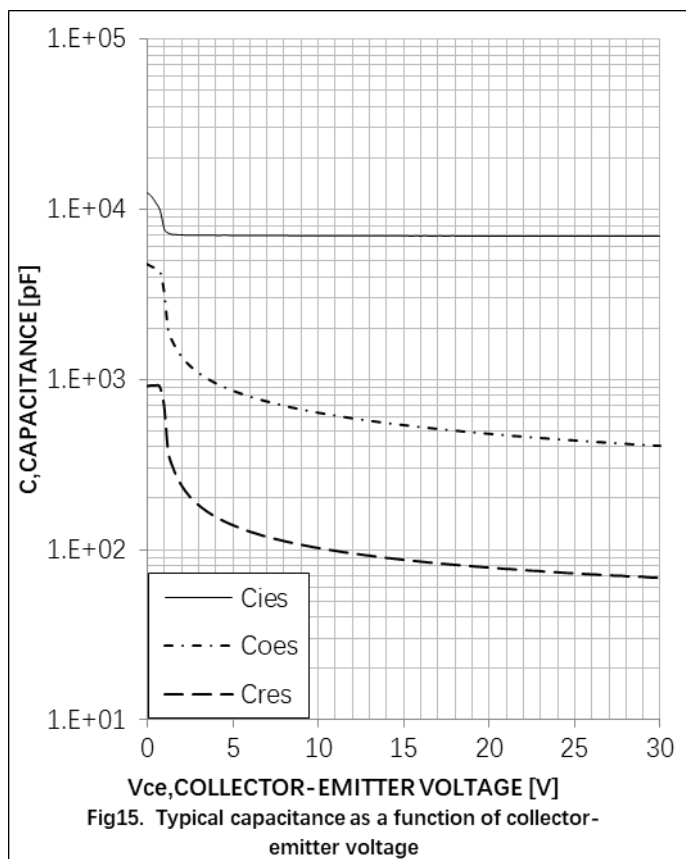
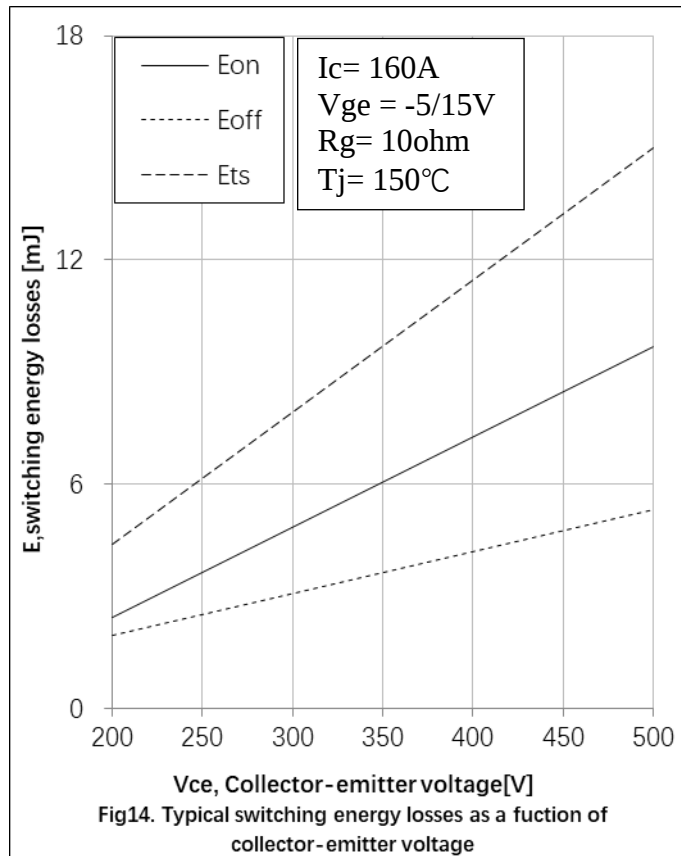
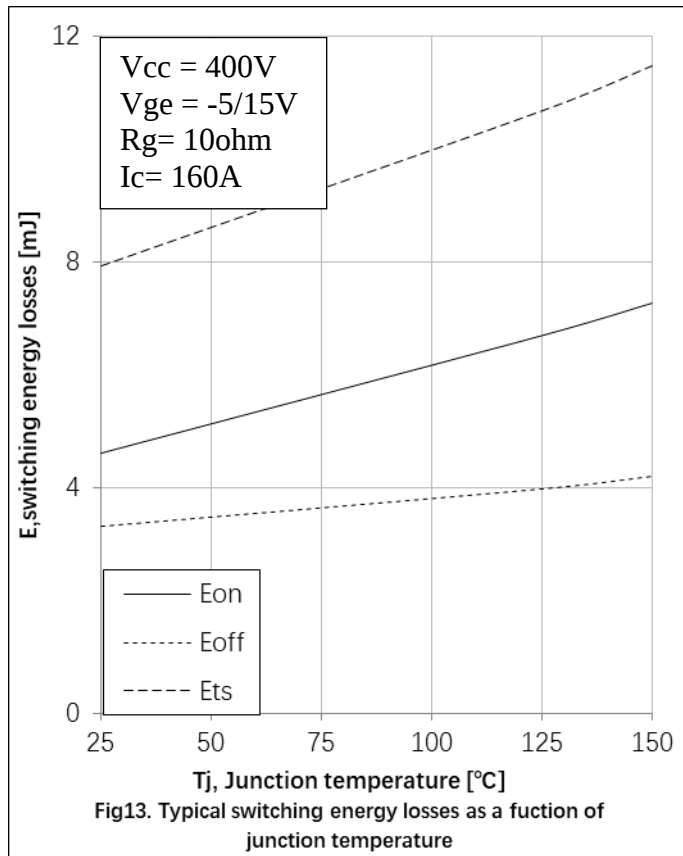
Thermal Resistance

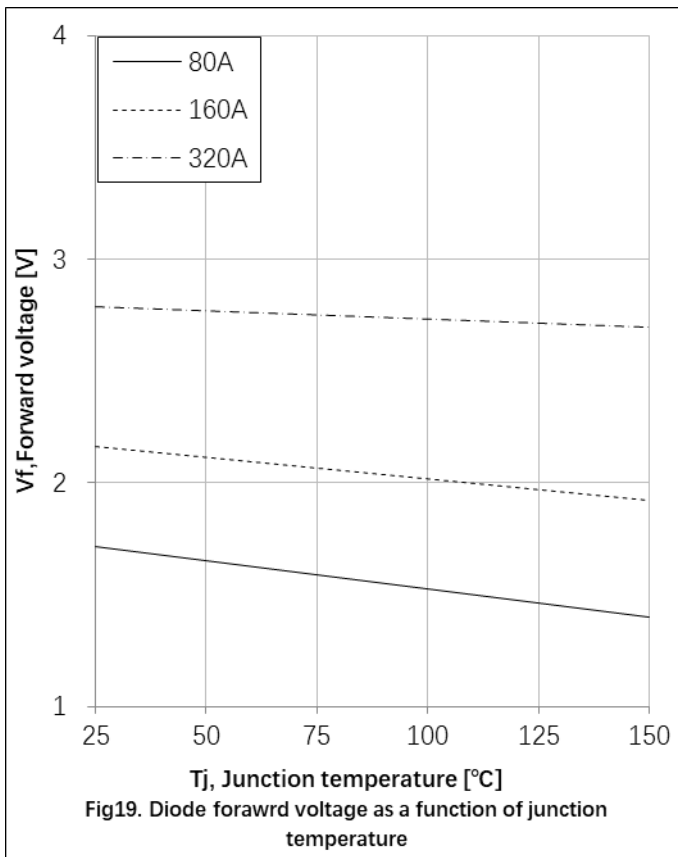
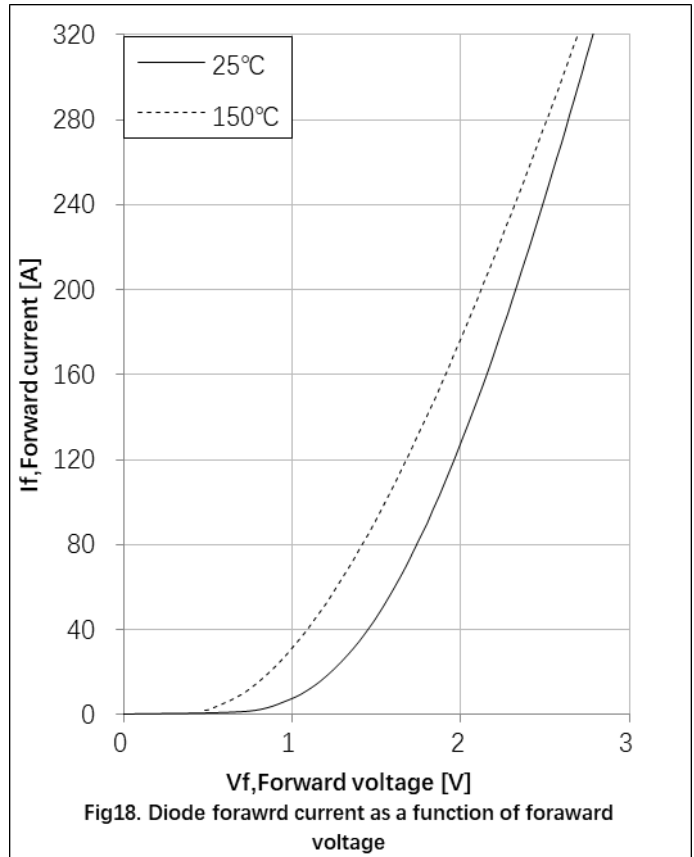
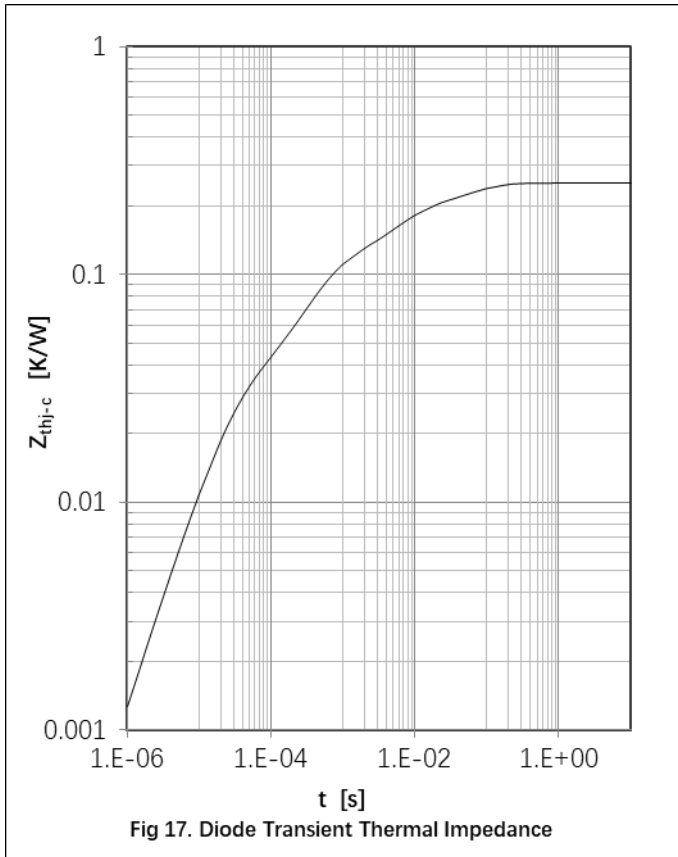
Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R _{th(j-c)}	0.21	K/W
Diode Thermal Resistance, Junction - Case	R _{th(j-c)}	0.25	K/W
Thermal Resistance, Junction - Ambient	R _{th(j-a)}	40	K/W



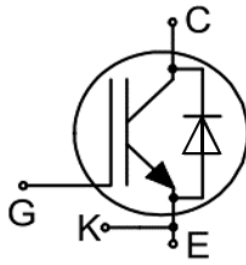






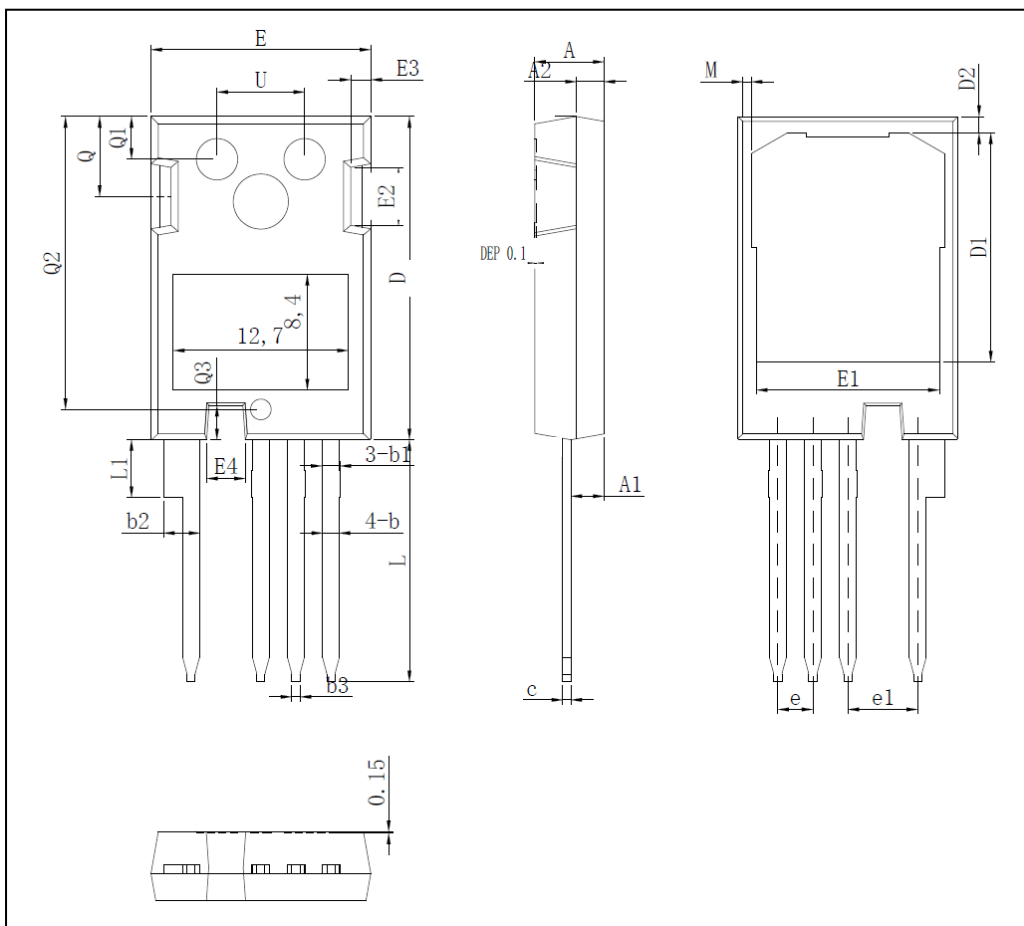


Circuit Diagram



● Package Outline Information

CASE: TO 247PLUS-4L



DIM	MILLIMETERS	
	MIN	MAX
A	4.83	5.21
A1	2.29	2.54
A2	1.91	2.16
b	1.07	1.33
b1	1.15	1.45
b2	2.39	2.94
b3	0.45	0.75
c	0.55	0.68
D	23.30	23.60
D1	16.35	16.95
D2	0.95	1.25
E	15.75	16.13
E1	13.05	13.45
E2	4.00	4.80
E3	1.00	1.90
E4	2.40	3.20
e	2.50	2.58
e1	5.03	5.13
L	17.31	17.82
L1	-	4.37
M	0.4	0.8
Q	5.49	6.00
Q1	2.80	3.40
Q2	19.95	21.55
Q3	2.35	2.65
U	6.05	6.55



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