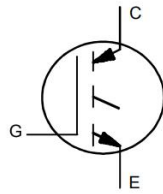


IGBT Discrete

V_{CE}	650	V
I_C	50	A
$V_{CE(SAT)} I_C=50A$	1.40	V

Circuit



Applications

- Hair removal device

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	80 60	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 $V_{CE} \leq 650V$, $T_j \leq 150^{\circ}C$		200	A
Pulsed Collector Current, $V_{GE}=15V$, t_p limited by T_{jmax}	I_{CM}	200	A
Power Dissipation, $T_j=175^{\circ}C$, $T_c=25^{\circ}C$	P_{tot}	283	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	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=0.50mA$	3.8	4.8	5.8	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=50A$ $T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$ $T_j=150^\circ\text{C}$	1.10	1.40 1.60 1.70	1.70	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}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	2.86	-	nF
Reverse Transfer Capacitance	C_{res}		-	0.02	-	
Gate Charge	Q_G	$V_{CC}=520V, I_C=50A,$ $V_{GE}=15V$	-	0.14	-	uC

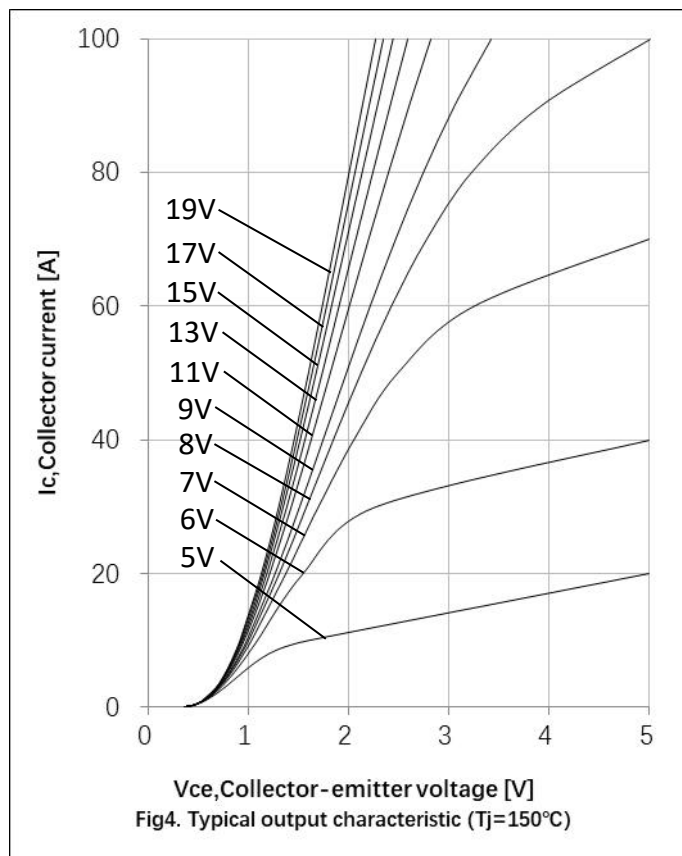
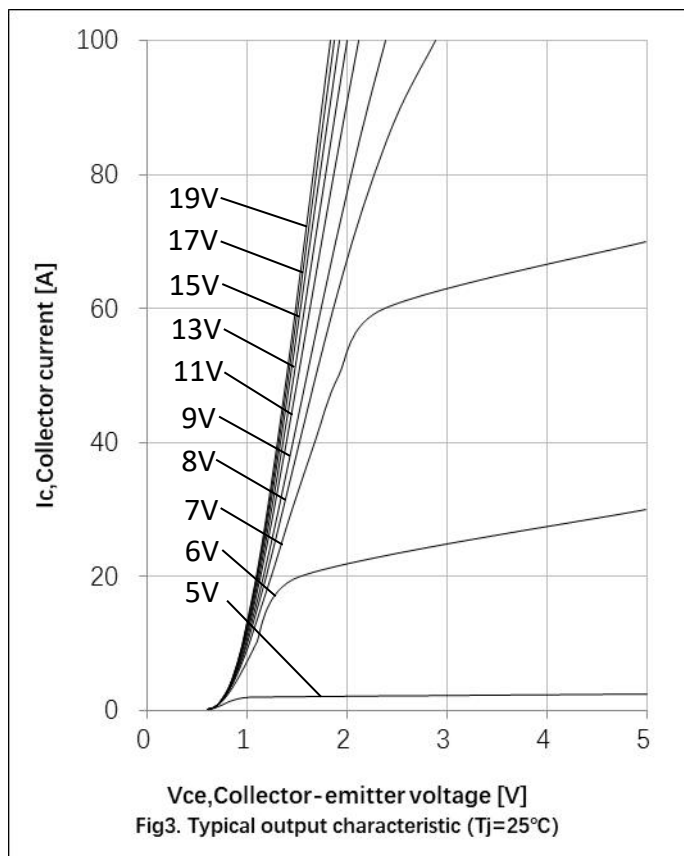
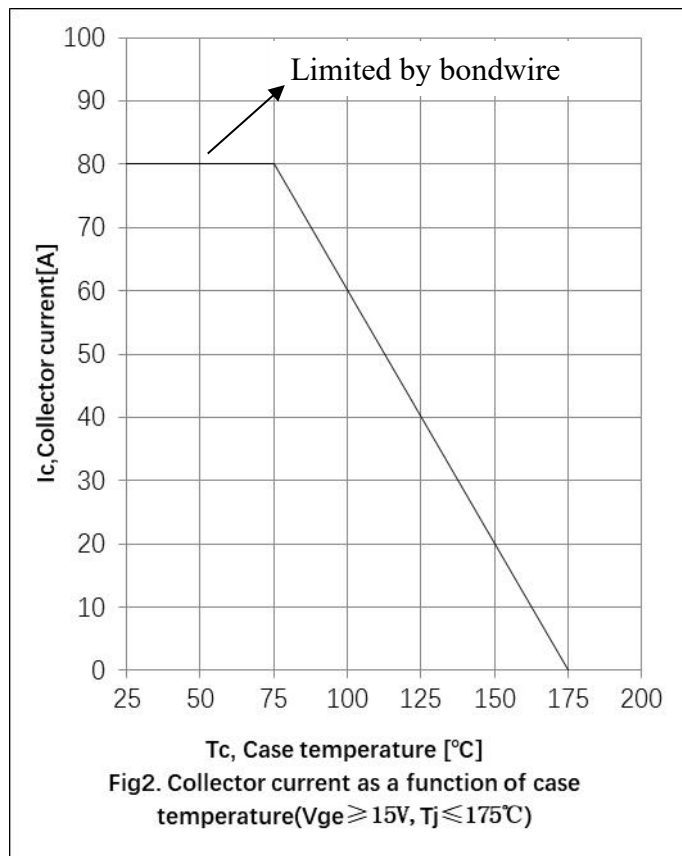
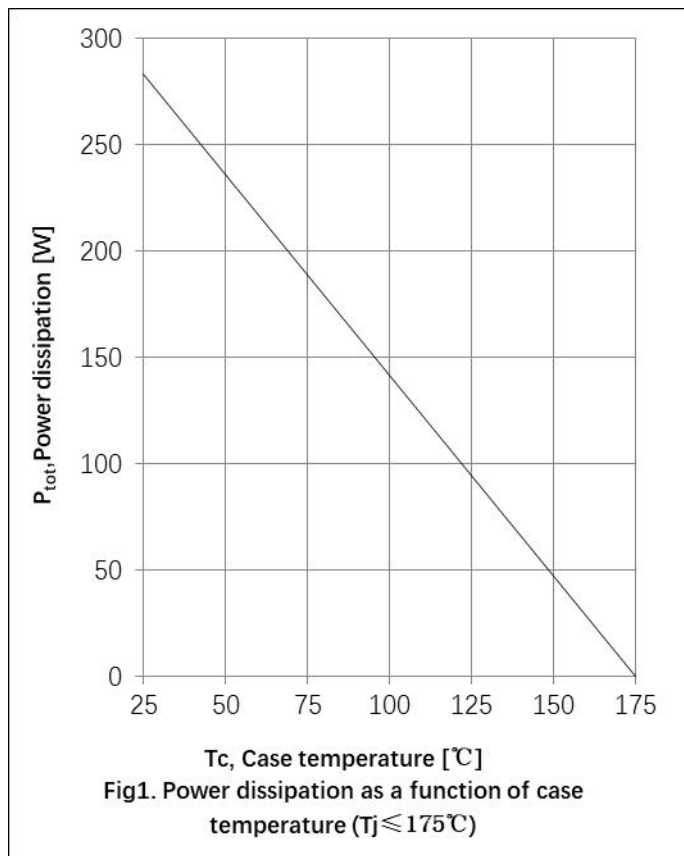


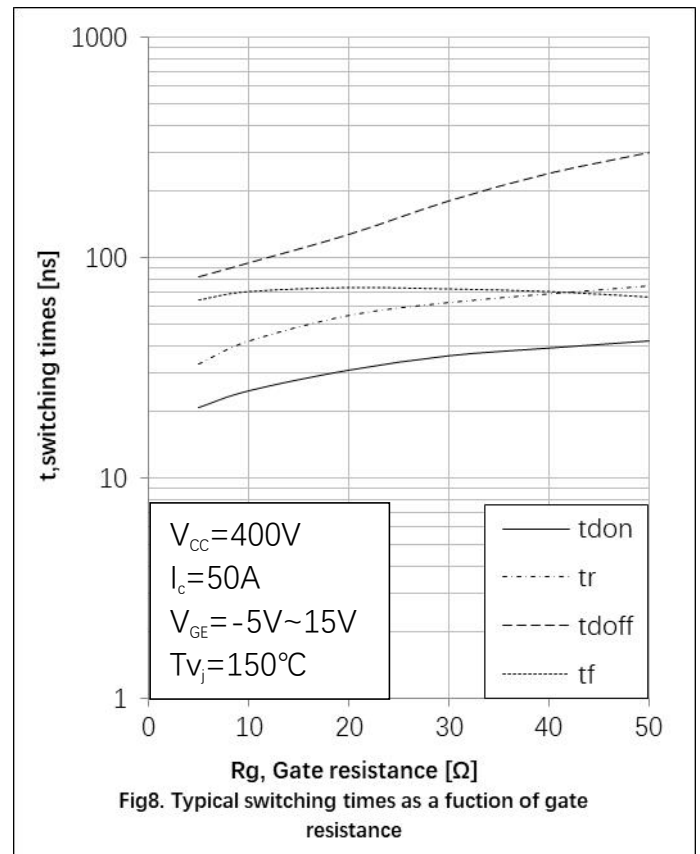
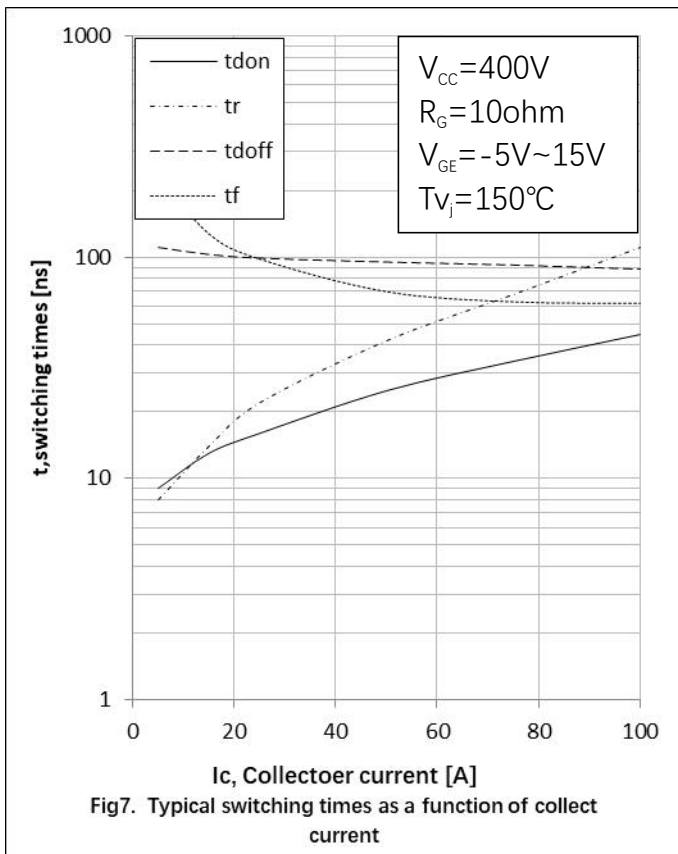
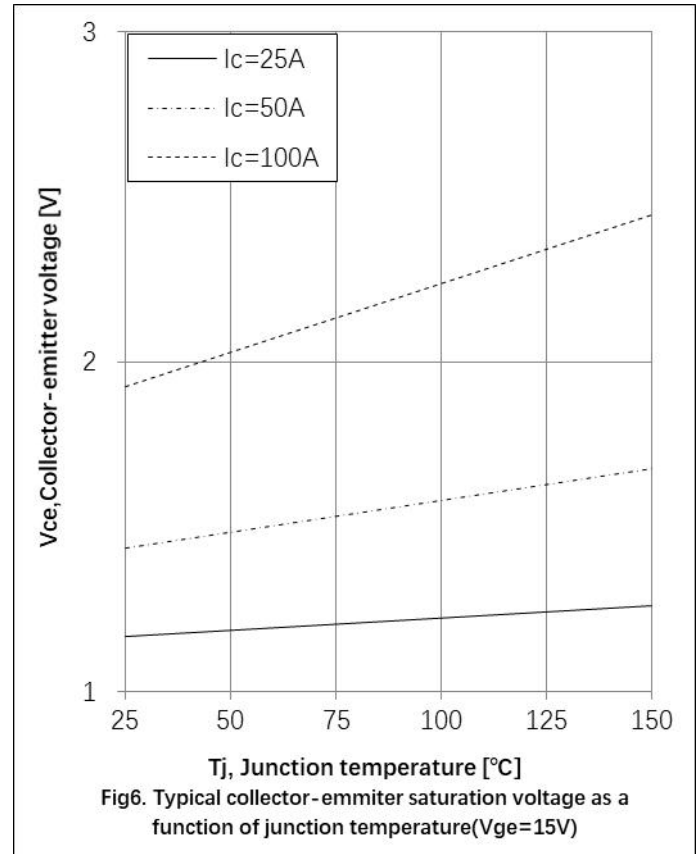
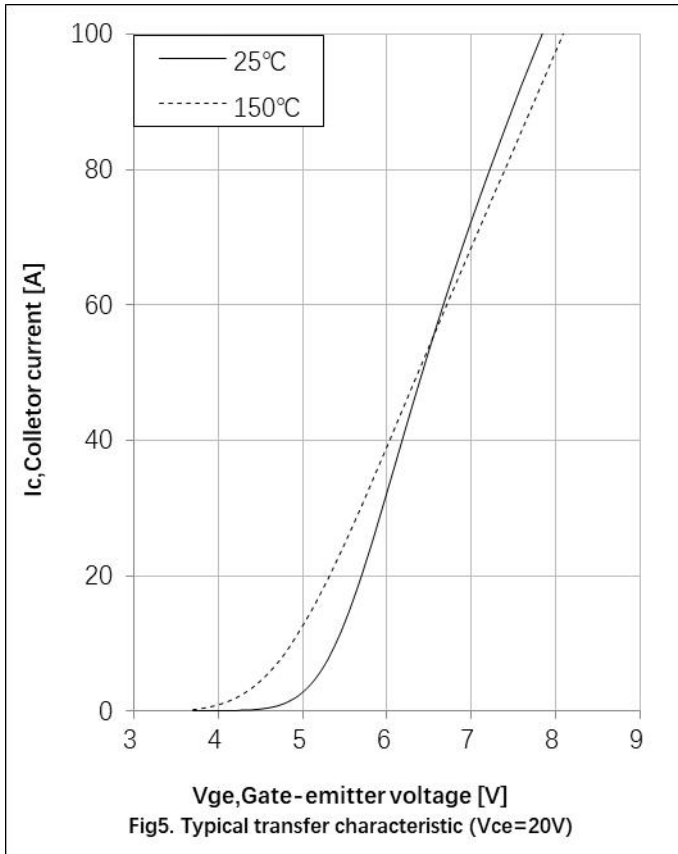
Switching Characteristic, Inductive Load

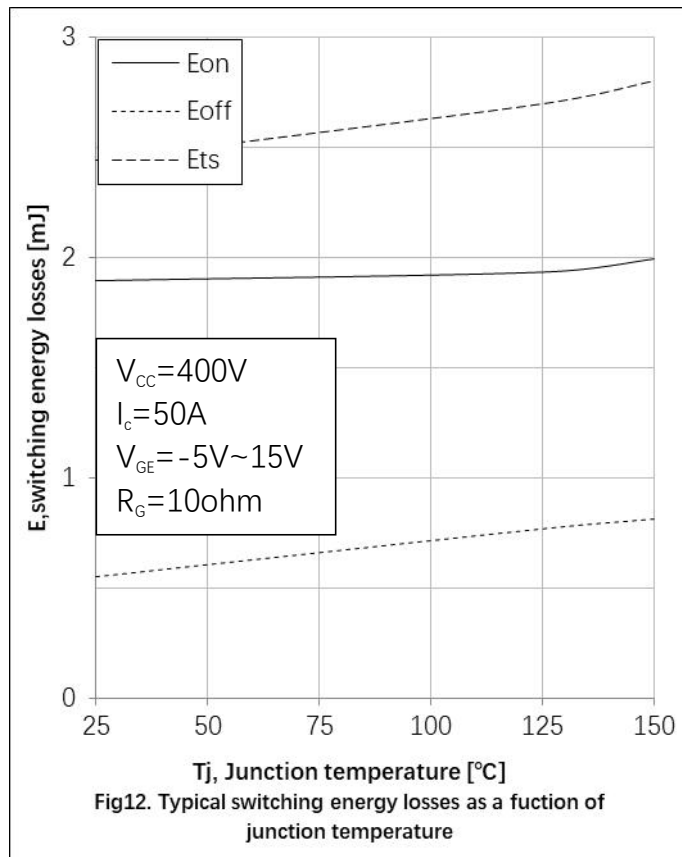
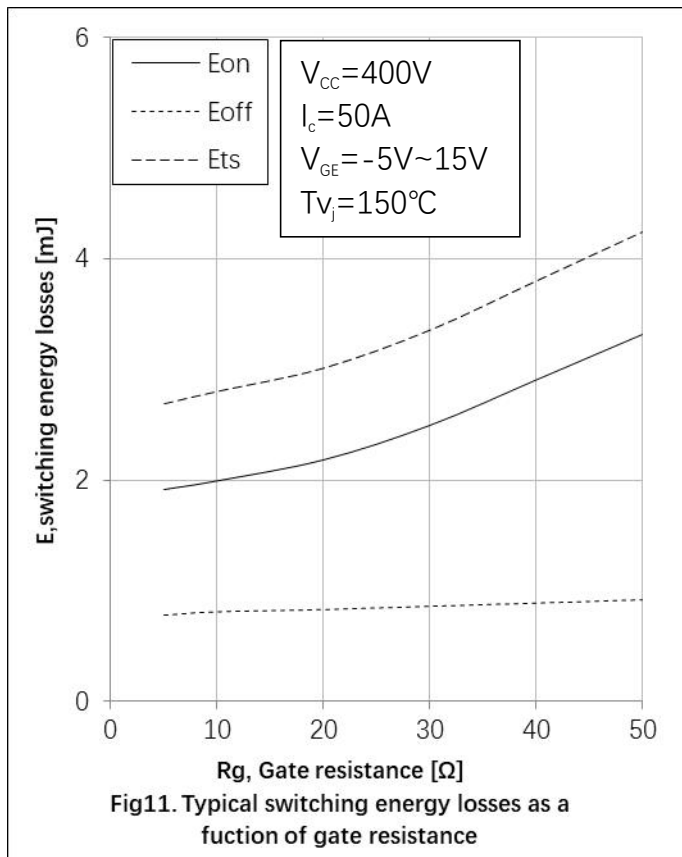
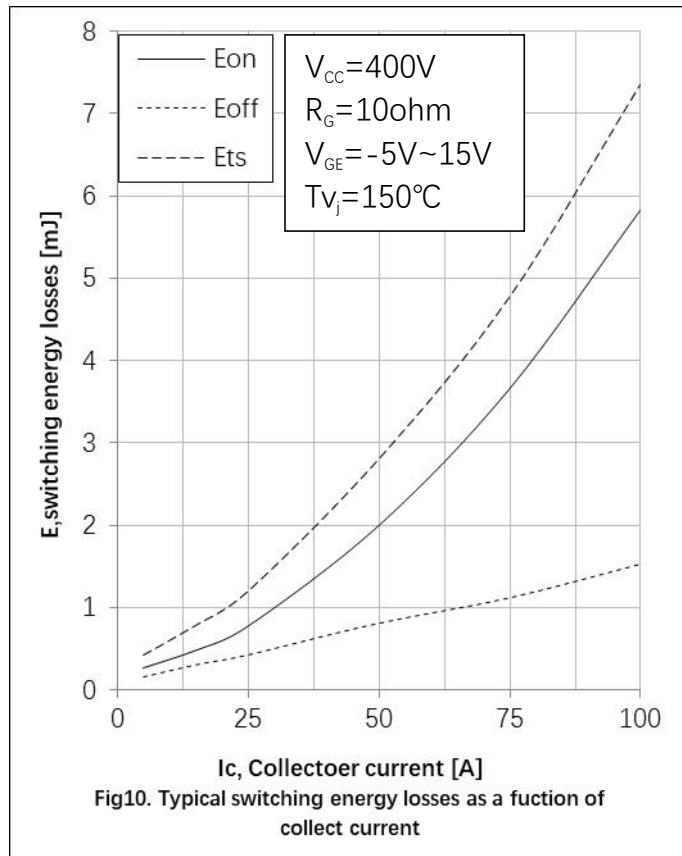
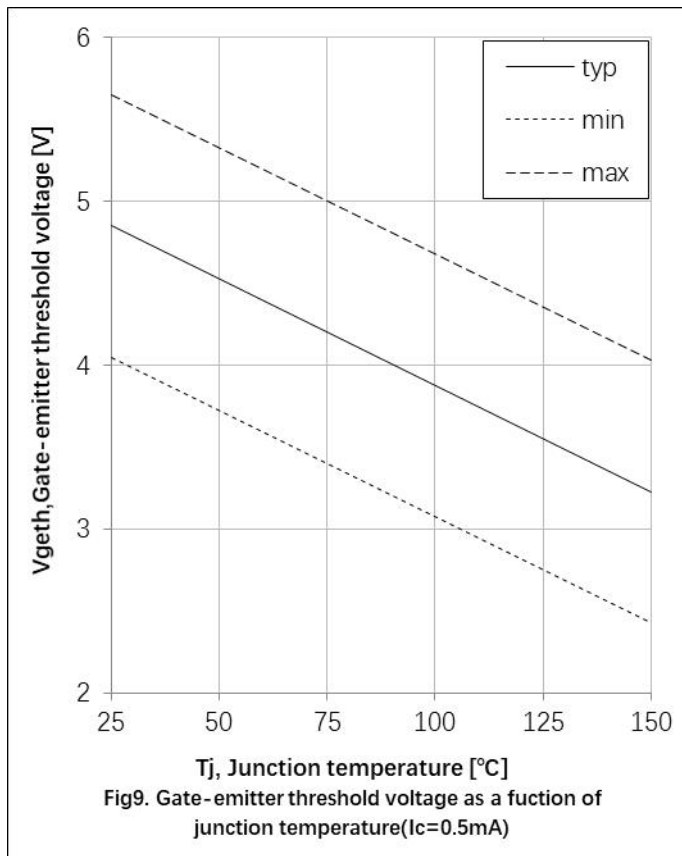
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T _j = 25°C						
Turn-on Delay Time	t _{d(on)}	V _{CC} =400V, I _C =50A, V _{GE} = -5V~15V, R _g =10Ω, Inductive Load	-	23	-	ns
Rise Time	t _r		-	31	-	ns
Turn-on Energy	E _{on}		-	1.89	-	mJ
Turn-off Delay Time	t _{d(off)}		-	83	-	ns
Fall Time	t _f		-	49	-	ns
Turn-off Energy	E _{off}		-	0.55	-	mJ
Total switching energy	E _{ts}		-	2.44	-	mJ
Dynamic , at T _j = 125°C						
Turn-on Delay Time	t _{d(on)}	V _{CC} =400V, I _C =50A, V _{GE} = -5V~15V, R _g =10Ω, Inductive Load	-	24	-	ns
Rise Time	t _r		-	38	-	ns
Turn-on Energy	E _{on}		-	1.93	-	mJ
Turn-off Delay Time	t _{d(off)}		-	90	-	ns
Fall Time	t _f		-	62	-	ns
Turn-off Energy	E _{off}		-	0.76	-	mJ
Total switching energy	E _{ts}		-	2.69	-	mJ
Dynamic , at T _j = 150°C						
Turn-on Delay Time	t _{d(on)}	V _{CC} =400V, I _C =50A, V _{GE} = -5V~15V, R _g =10Ω, Inductive Load	-	25	-	ns
Rise Time	t _r		-	42	-	ns
Turn-on Energy	E _{on}		-	1.99	-	mJ
Turn-off Delay Time	t _{d(off)}		-	95	-	ns
Fall Time	t _f		-	70	-	ns
Turn-off Energy	E _{off}		-	0.81	-	mJ
Total switching energy	E _{ts}		-	2.80	-	mJ

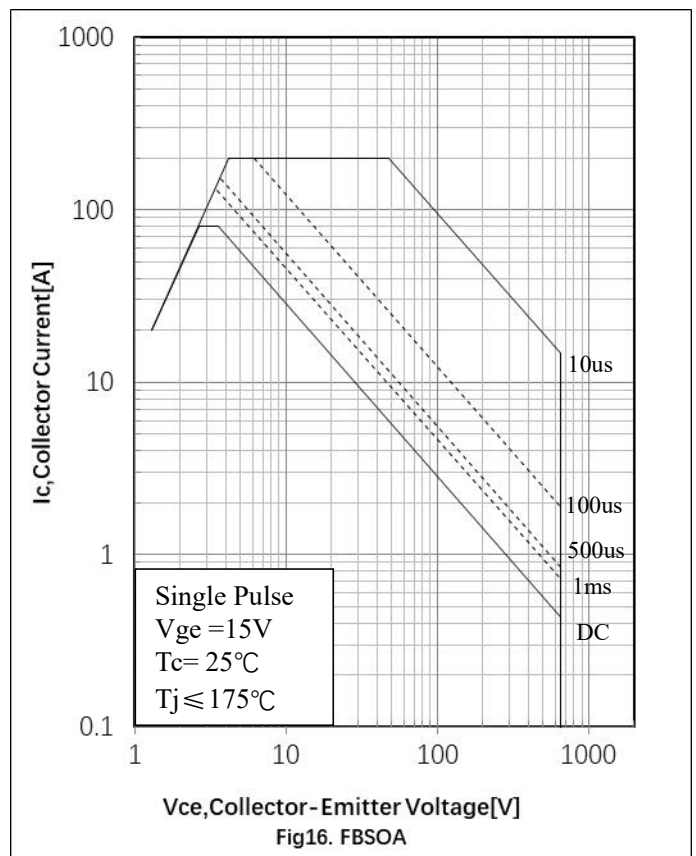
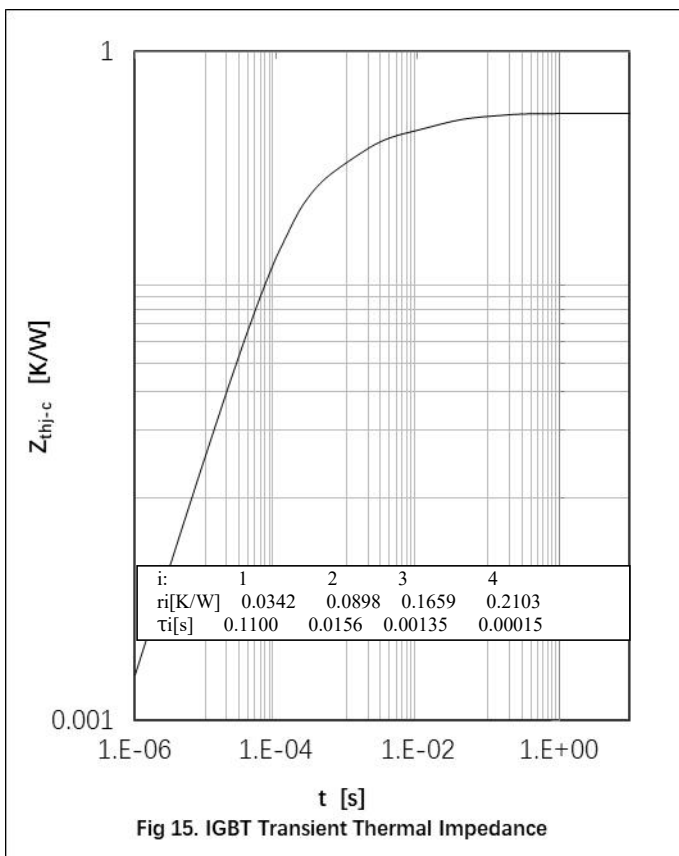
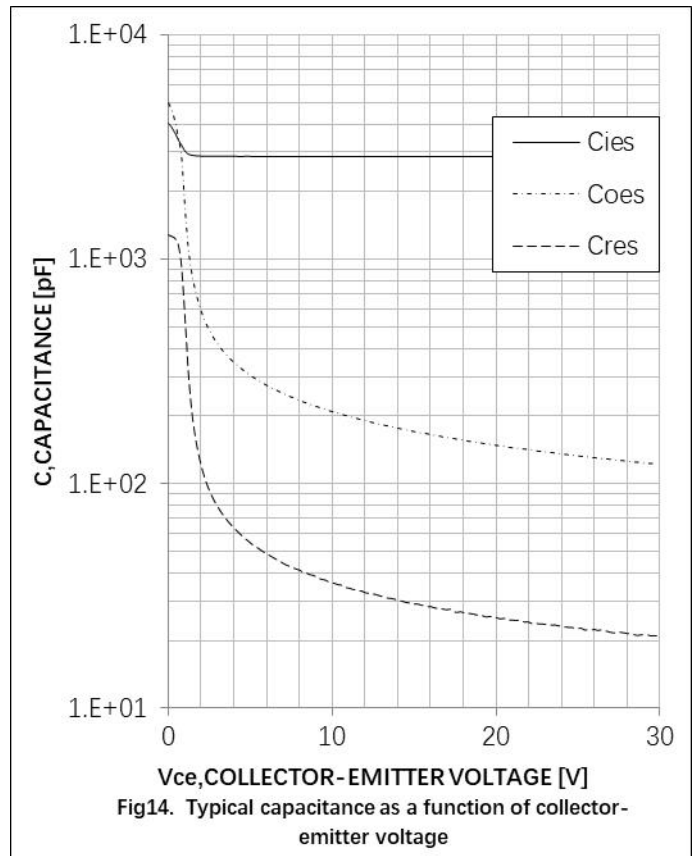
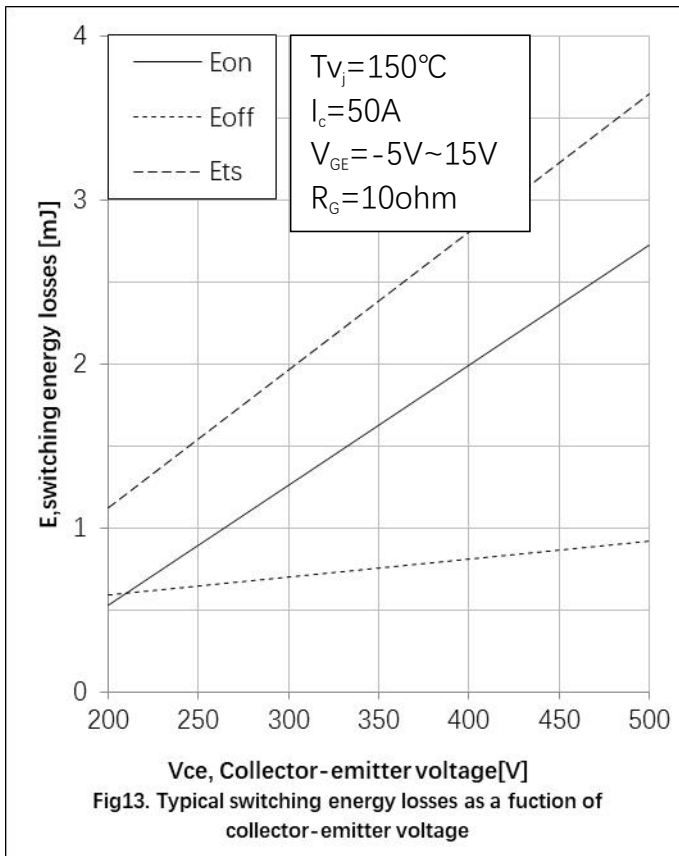
Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R _{th(j-c)}	0.53	K/W
Thermal Resistance, Junction - Ambient	R _{th(j-a)}	40	K/W

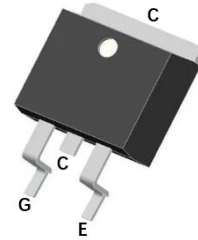
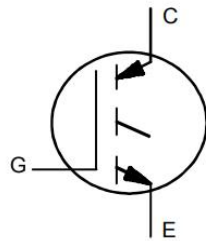






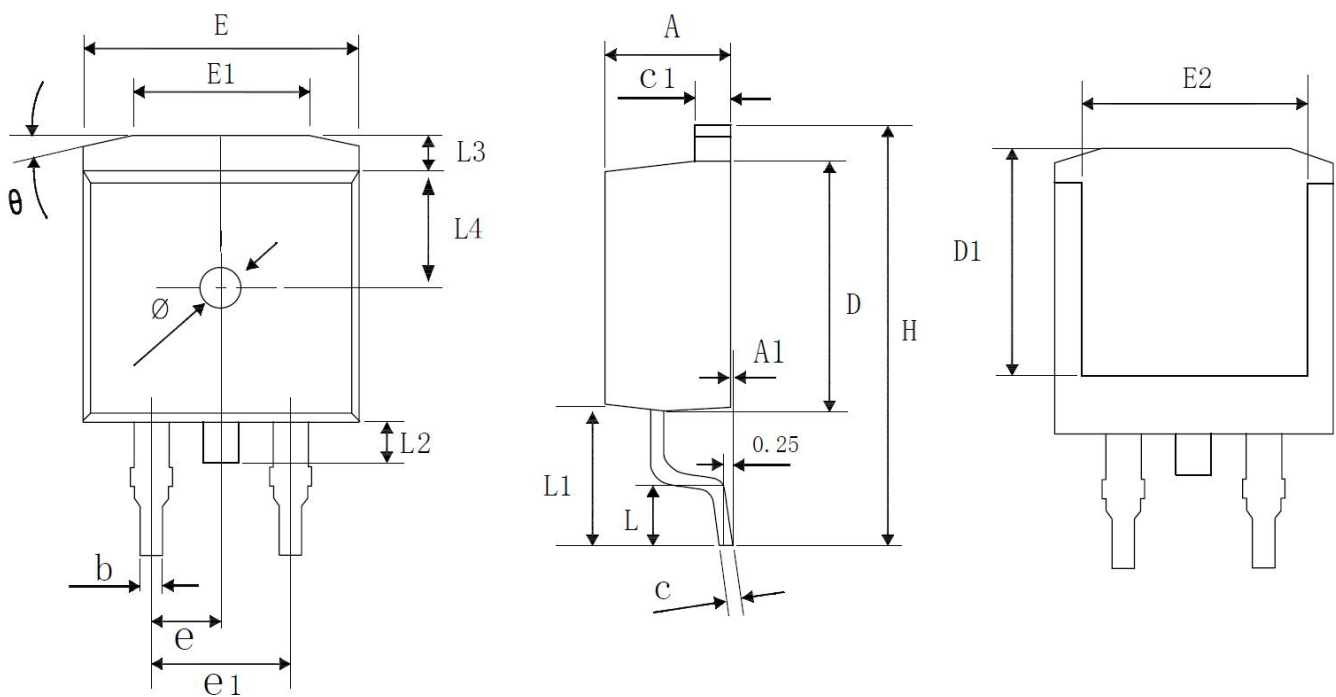


● Circuit Diagram



● Package Outline Information

CASE: TO 263



TO-263(mm)								
Dim	Min	Max	Dim	Min	Max	Dim	Min	Max
A	4.3	4.7	H	14.9	15.5	L2	1.3	1.7
A1	0	0.25	E	9.8	10.2	L3	1.15	1.35
b	0.7	0.9	E1	6.3	6.5	L4	4.5	4.6
c	0.4	0.6	E2	7.9	8.1	Ø	1.5 REF	
c1	1.25	1.35	e1	4.93	5.23	e	2.54 BSC	
D	9	9.2	L	1.85	2.45	θ	13° TYP	
D1	8	8.2	L1	4.45	4.85			



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