



IGBT Discrete

V_{CE}	1200	V
I_C	15	A
$V_{CE(SAT)} I_C=15A$	1.85	V

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Features
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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	30 15	A
Diode Forward Current, limited by T_{jmax} $T_C=25^{\circ}C$ $T_C=100^{\circ}C$	I_F	30 15	A
Continuous Gate-Emitter Voltage	V_{GE}	± 20	V
Transient Gate-Emitter Voltage	V_{GE}	± 30	V
Turn off Safe Operating Area $V_{CE} 1200V$, $T_j 150^{\circ}C$		60	A
Pulsed Collector Current, $V_{GE}=15V$, t_p limited by T_{jmax}	I_{CM}	60	A
Diode Pulsed Current, t_p limited by T_{jmax}	I_{Fpuls}	60	A
Short Circuit Withstand Time, $V_{GE}=15V$, $V_{CC}=900V$, $V_{CEM} 1200V$	T_{sc}	10	μs
Power Dissipation, $T_j=175^{\circ}C$, $T_c=25^{\circ}C$	P_{tot}	200	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 $T_j=25$ 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	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=0.5mA$	5.1	5.8	6.4	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V, I_C=15A$ $T_j=25^\circ C,$ $T_j=125^\circ C$ $T_j=150^\circ C$		1.85 2.20 2.30	2.35	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V$ $T_j=25^\circ C,$ $T_j=150^\circ C$			0.25 5.00	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}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz$	-	1.2	-	nF
Reverse Transfer Capacitance	C_{res}		-	0.04	-	
Gate Charge	Q_G	$V_{CC}=960V, I_C=15A,$ $V_{GE}=15V$	-	0.14	-	uC
Short Circuit Collector Current	I_{SC}	$V_{GE}=15V, t_{sc} 10\mu s,$ $V_{CC}=900V, T_j 150^\circ C$	-	60	-	A



Electrical Characteristics of the Diode $T_j = 25$ unless otherwise specified

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static						
Diode Forward Voltage	V_F	$I_F = 15A$ $T_j = 25^\circ C$, $T_j = 125^\circ C$ $T_j = 150^\circ C$		2.00 1.80 1.70	2.40	V

Switching Characteristic, Inductive Load

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at $T_j = 25$						
Turn-on Delay Time	$t_{d(on)}$	$V_{CC} = 600V, I_C = 15A,$ $V_{GE} = -15V \sim 15V,$ $R_g = 33$	-	45	-	ns
Rise Time	t_r		-	52	-	ns
Turn-on Energy	E_{on}		-	1.5	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	128	-	ns
Fall Time	t_f		-	186	-	ns
Turn-off Energy	E_{off}		-	0.9	-	mJ
Dynamic , at $T_j = 125$						
Turn-on Delay Time	$t_{d(on)}$	$V_{CC} = 600V, I_C = 15A,$ $V_{GE} = -15V \sim 15V,$ $R_g = 33$	-	50	-	ns
Rise Time	t_r		-	55	-	ns
Turn-on Energy	E_{on}		-	2.2	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	160	-	ns
Fall Time	t_f		-	135	-	ns
Turn-off Energy	E_{off}		-	1.3	-	mJ
Dynamic , at $T_j = 150$						
Turn-on Delay Time	$t_{d(on)}$	$V_{CC} = 600V, I_C = 15A,$ $V_{GE} = -15V \sim 15V,$ $R_g = 33$	-	52	-	ns
Rise Time	t_r		-	58	-	ns
Turn-on Energy	E_{on}		-	2.4	-	mJ
Turn-off Delay Time	$t_{d(off)}$		-	170	-	ns
Fall Time	t_f		-	138	-	ns
Turn-off Energy	E_{off}		-	1.45	-	mJ



Electrical Characteristics of the DIODE

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Dynamic , at T_j= 25						
Diode Forward Voltage	V _{FM}	I _F = 15A	-	1.90	-	V
Reverse Recovery Current	I _{rr}	I _F =15A, V _R =600V, -di/dt=240A/μs,	-	7.5	-	A
Reverse Recovery Charge	Q _{rr}		-	1.8	-	uC
Reverse Recovery Energy	E _{rec}		-	0.60		mJ
Dynamic , at T_j= 125						
Reverse Recovery Current	I _{rr}	I _F =15A, V _R =600V, -di/dt=240A/μs,	-	9	-	A
Reverse Recovery Charge	Q _{rr}		-	2.4	-	uC
Reverse Recovery Energy	E _{rec}		-	0.9		mJ
Dynamic , at T_j= 150						
Reverse Recovery Current	I _{rr}	I _F =15A, V _R =600V, -di/dt=240A/μs,	-	9.5	-	A
Reverse Recovery Charge	Q _{rr}		-	2.6	-	uC
Reverse Recovery Energy	E _{rec}		-	1.0		mJ

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT Thermal Resistance, Junction - Case	R _{th(j-c)}	0.75	K/W
Diode Thermal Resistance, Junction - Case	R _{th(j-c)}	1.35	K/W
Thermal Resistance, Junction - Ambient	R _{th(j-a)}	40	K/W

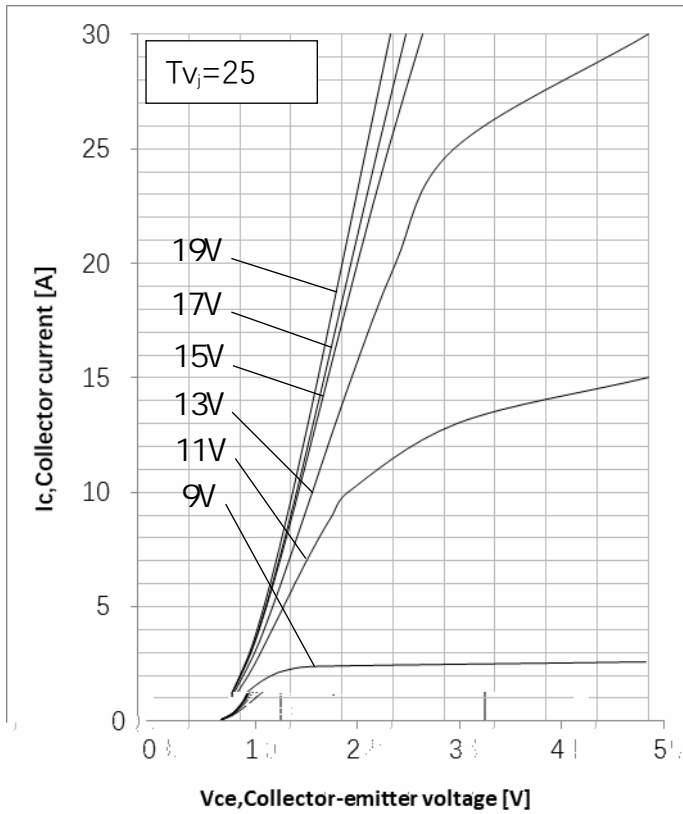


Fig1. Typical output characteristic

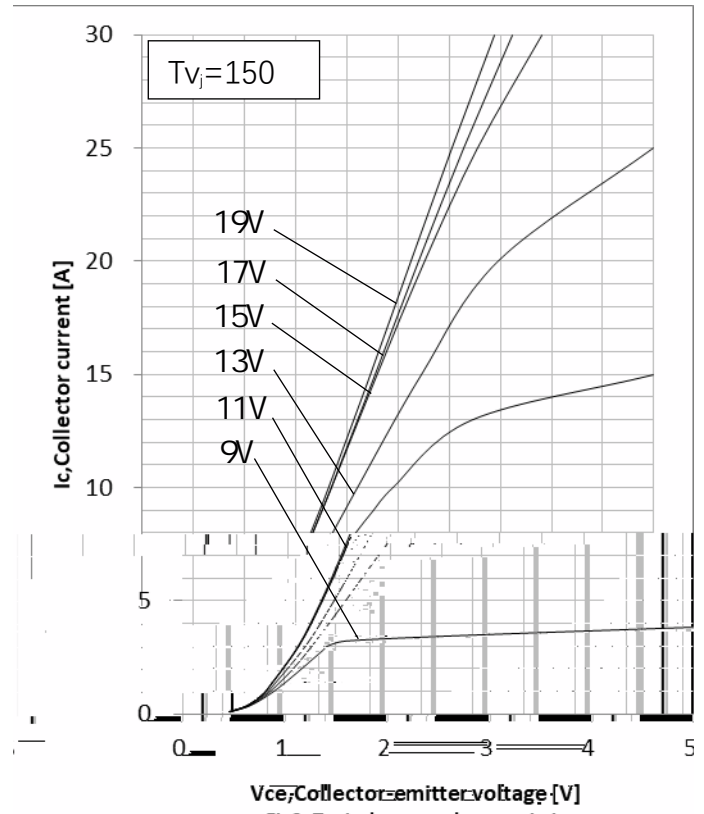


Fig2. Typical output characteristic

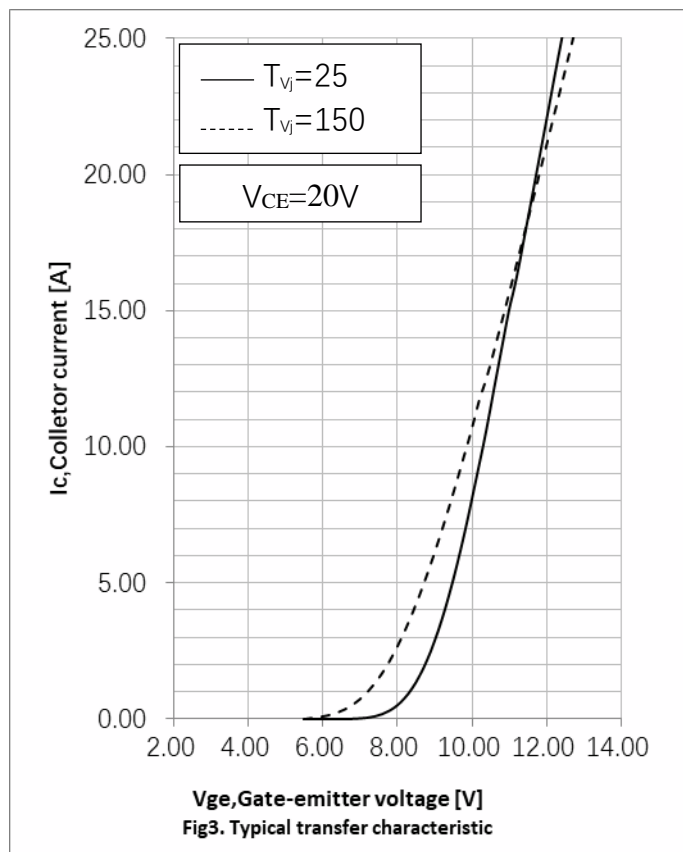


Fig3. Typical transfer characteristic

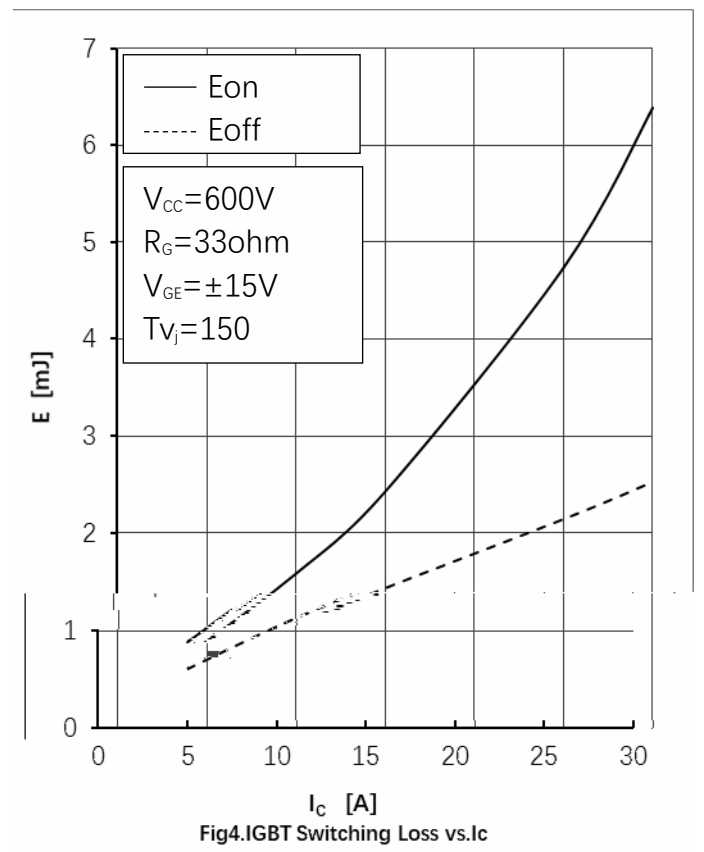
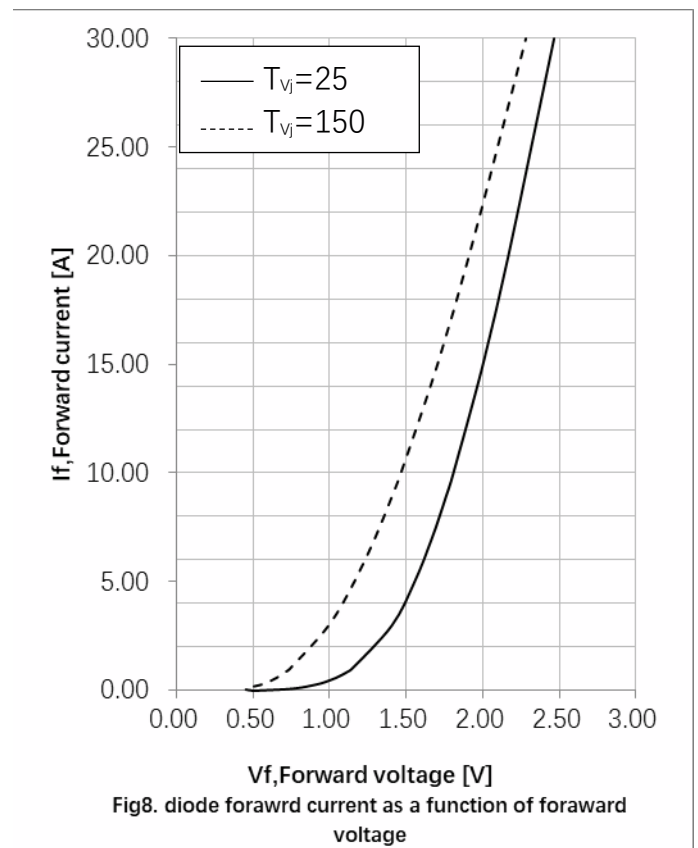
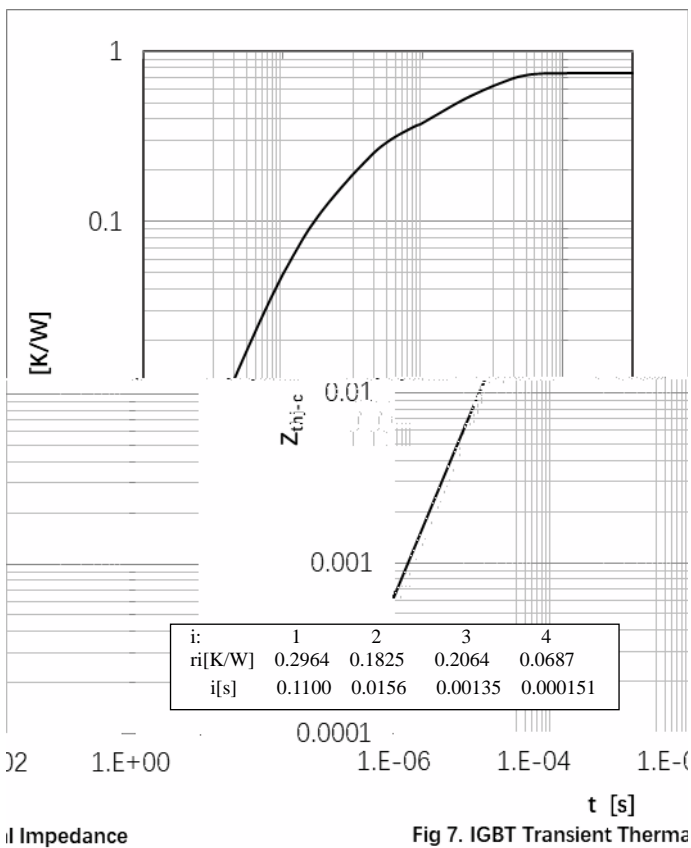
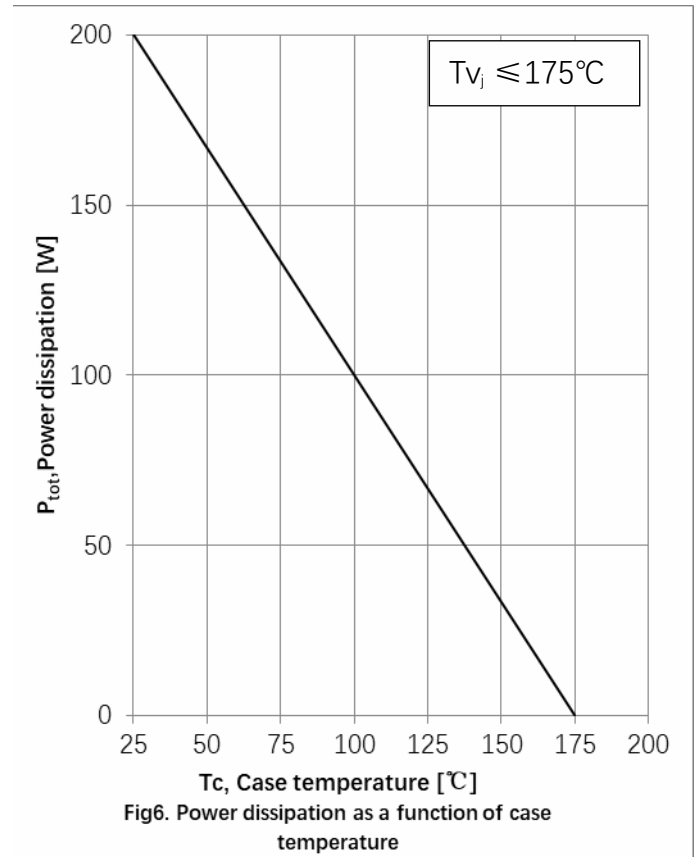
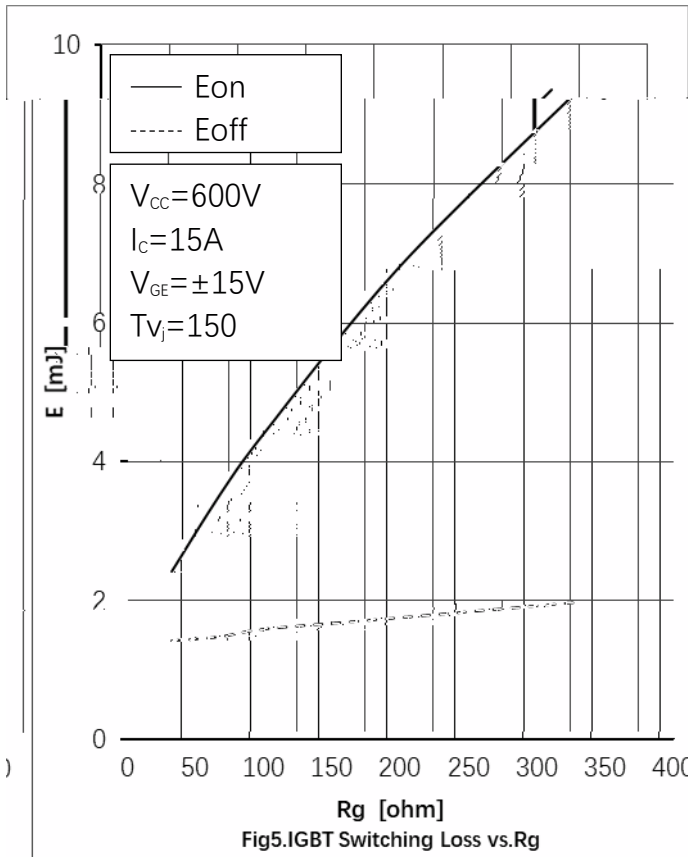
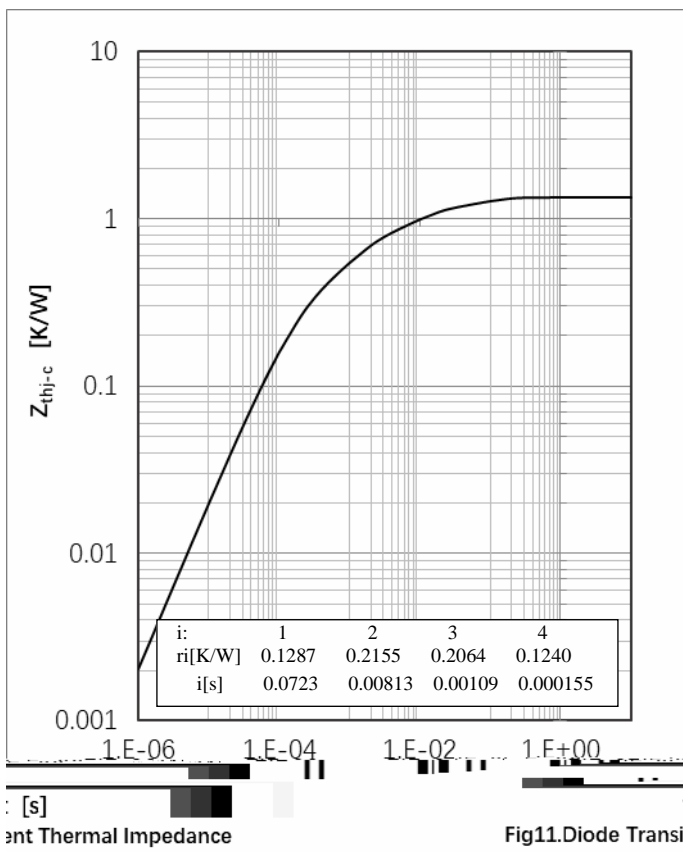
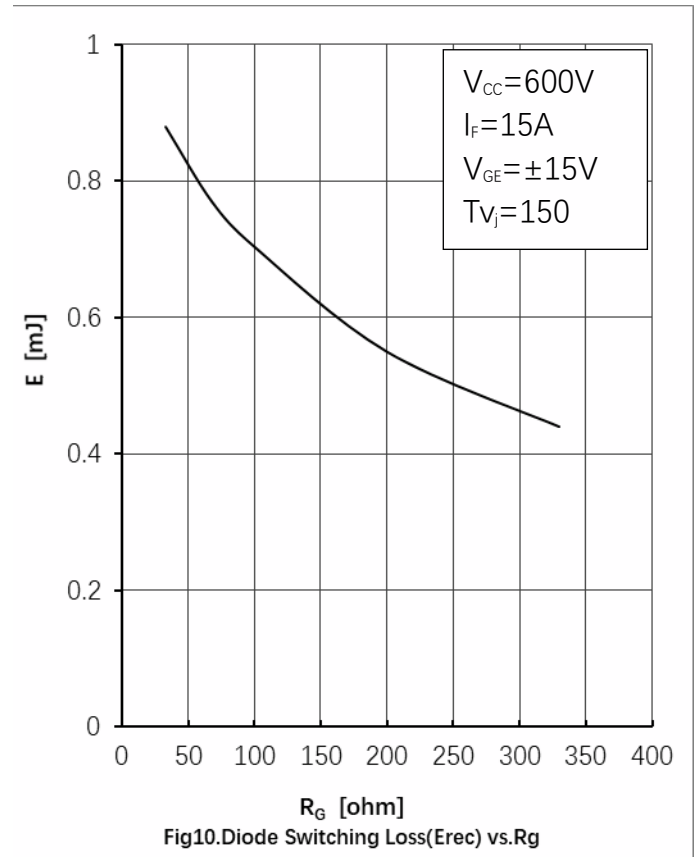
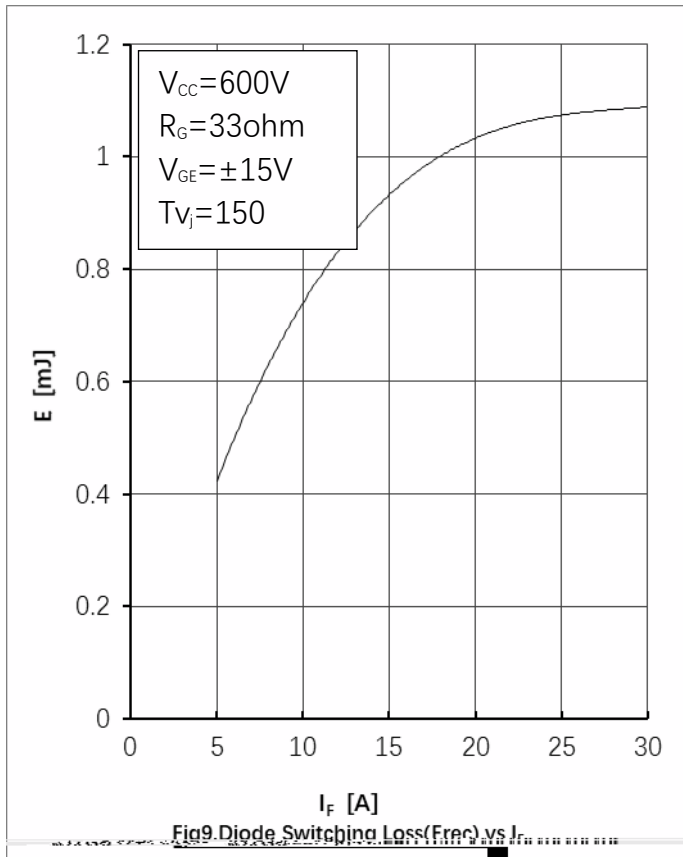
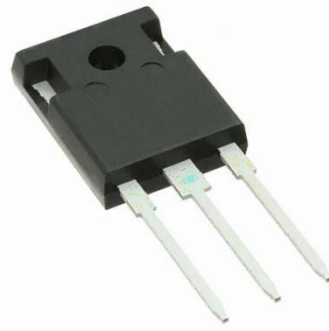
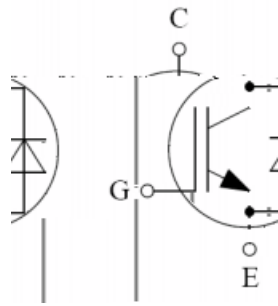


Fig4. IGBT Switching Loss vs. Ic





- Circuit Diagram



- Package Outline Information

CASE: TO 247

