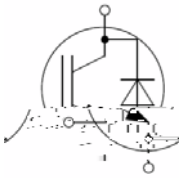
RoHS
COMPLIANT

IGBT Discrete

Circuit



Applications

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Features

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Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	1200	V
DC Collector Current, limited by T_{jmax} T_C= 25°C T_C= 100°C	I_C	 30 15	A
Diode Forward Current, limited by T_{jmax} T_C= 25°C T_C= 100°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°C		60	A
Pulsed Collector Current, V_{GE}=15V, tp limited by T_{jmax}	I_{CM}	60	A
Diode Pulsed Current, tp 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 , Tj=175°C,Tc=25°C	P_{tot}	200	W

Operating Junction Temperature	T_j	-40...+175	°C
Storage Temperature	T_s		

T_j= 25 unless otherwise specified

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-Emitter Breakdown Voltage	BV_{CES}	V_{GE}=0V, I_C=250μA	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°C, T_j=125°C T_j=150°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°C, T_j=150°C			0.25 5.00	mA
Gate-Emitter Leakage Current	I_{GES}	V_{CE}= 0V, V_{GE}= ± 20V			100	nA

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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, tsc≤10us, Vcc=900V,Tj 150°C	-	60	-	A

T_j= 25 unless otherwise specified

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-on Delay Time	$t_{d(on)}$	V_{CC}= 600V, I_C=15A, V_{GE}= -15v~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
Turn-on Delay Time	$t_{d(on)}$	V_{CC}= 600V, I_C=15A, V_{GE}= -15v~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
Turn-on Delay Time	$t_{d(on)}$	V_{CC}= 600V, I_C=15A, V_{GE}= -15v~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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
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	Erec		-	0.60		mJ
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	Erec		-	0.9		mJ
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	Erec		-	1.0		mJ

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

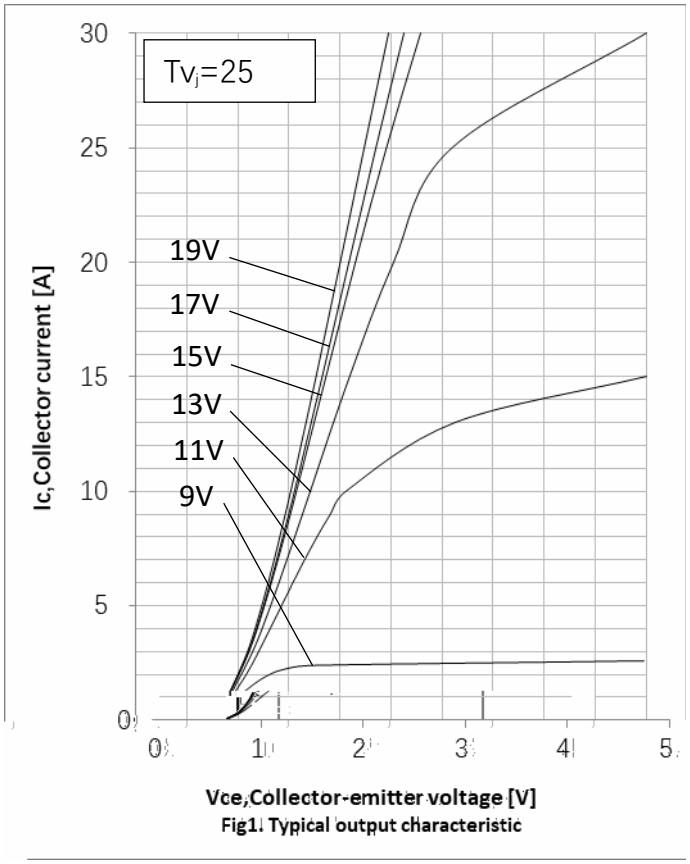


Fig1. Typical output characteristic

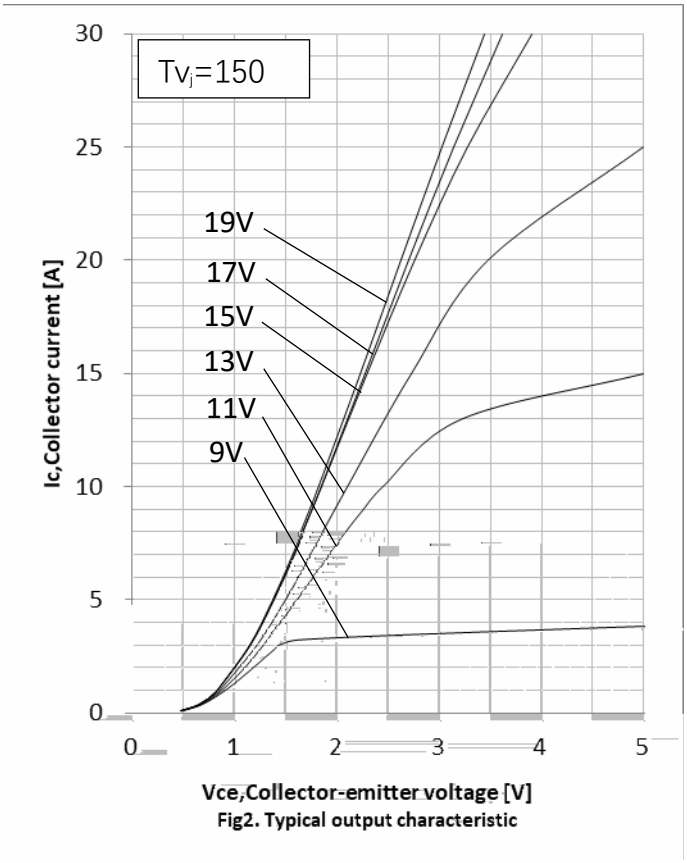


Fig2. Typical output characteristic

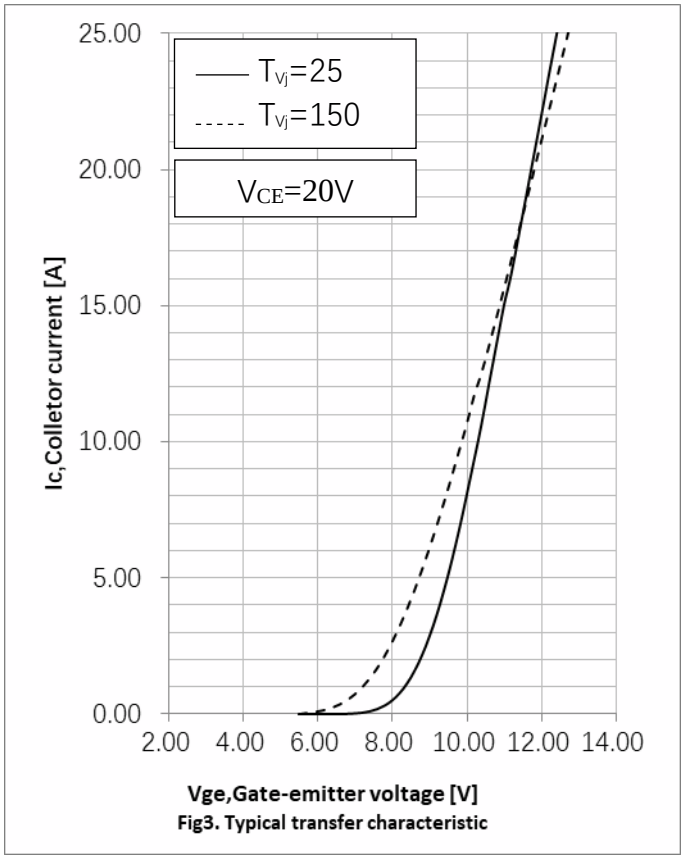


Fig3. Typical transfer characteristic

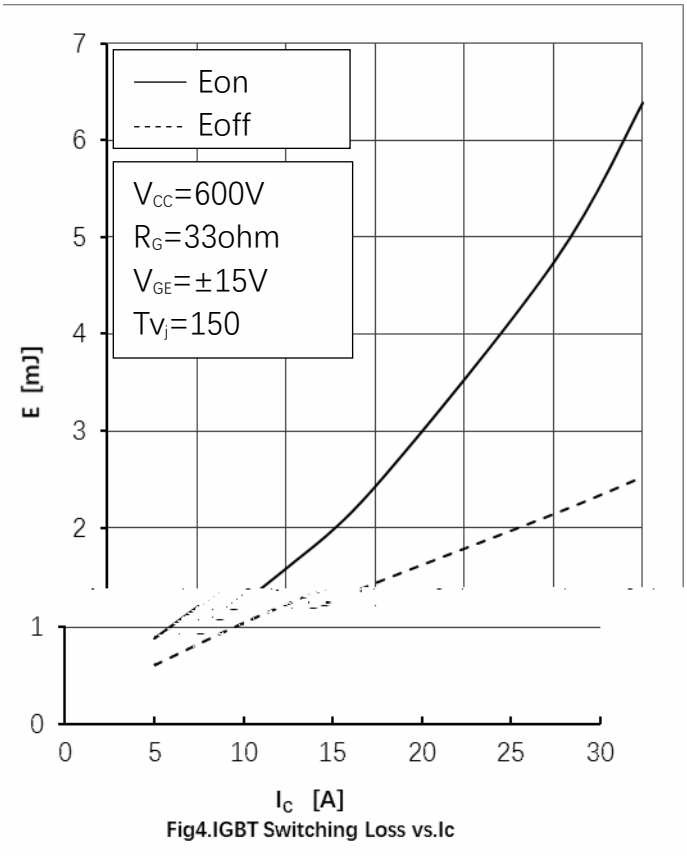


Fig4.IGBT Switching Loss vs.Ic

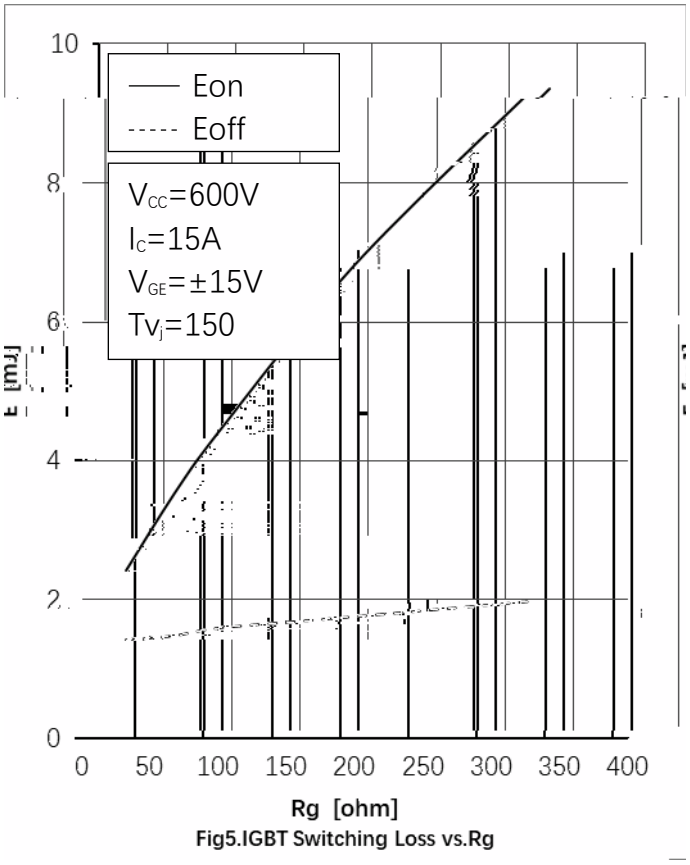


Fig5.IGBT Switching Loss vs.Rg

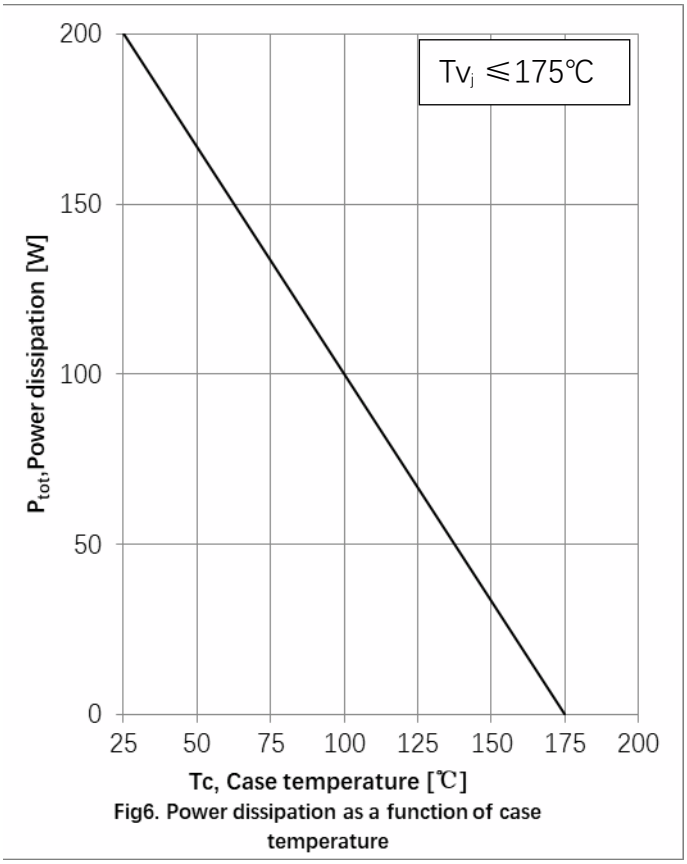
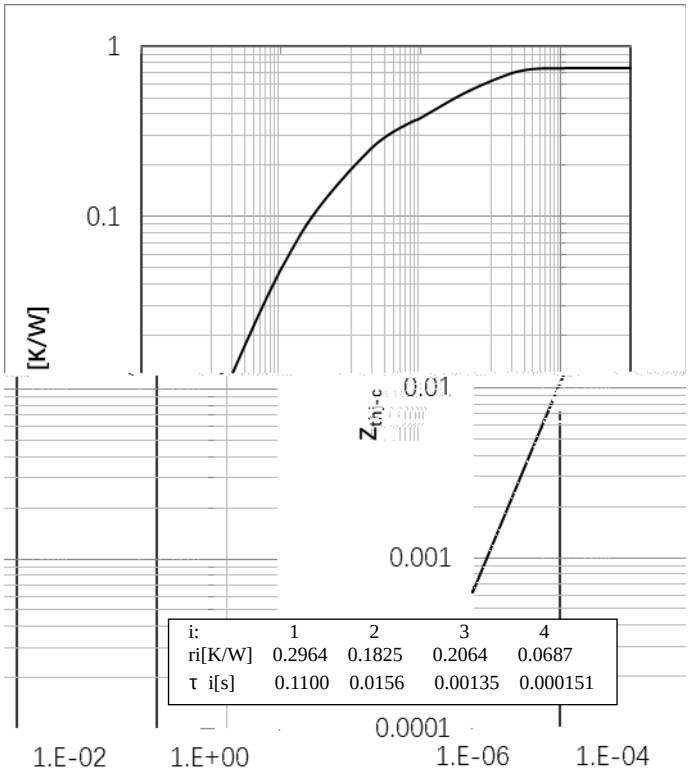


Fig6. Power dissipation as a function of case temperature



: Thermal Impedance

Fig 7. IGBT Transient

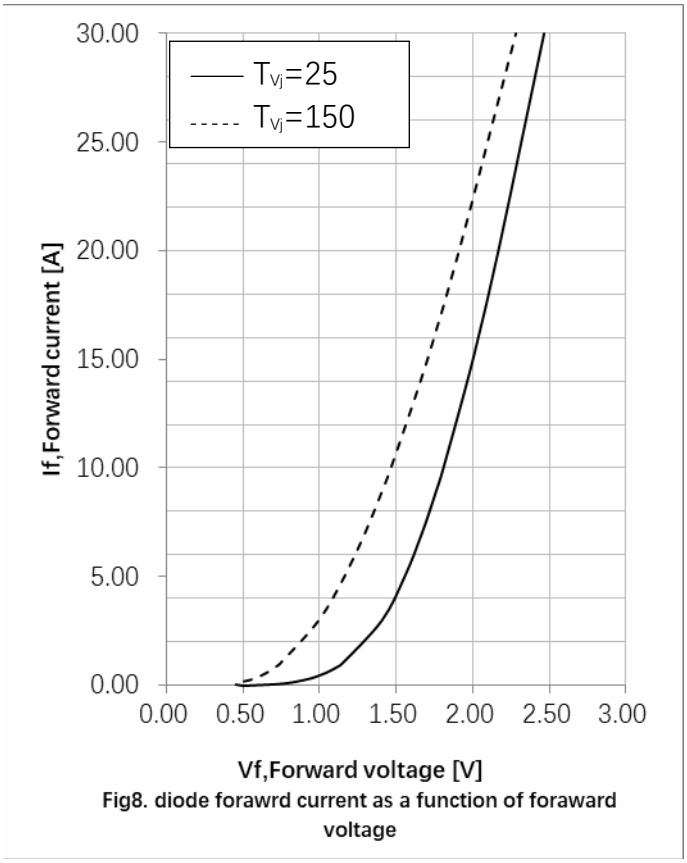


Fig8. diode forawrd current as a function of foraward voltage

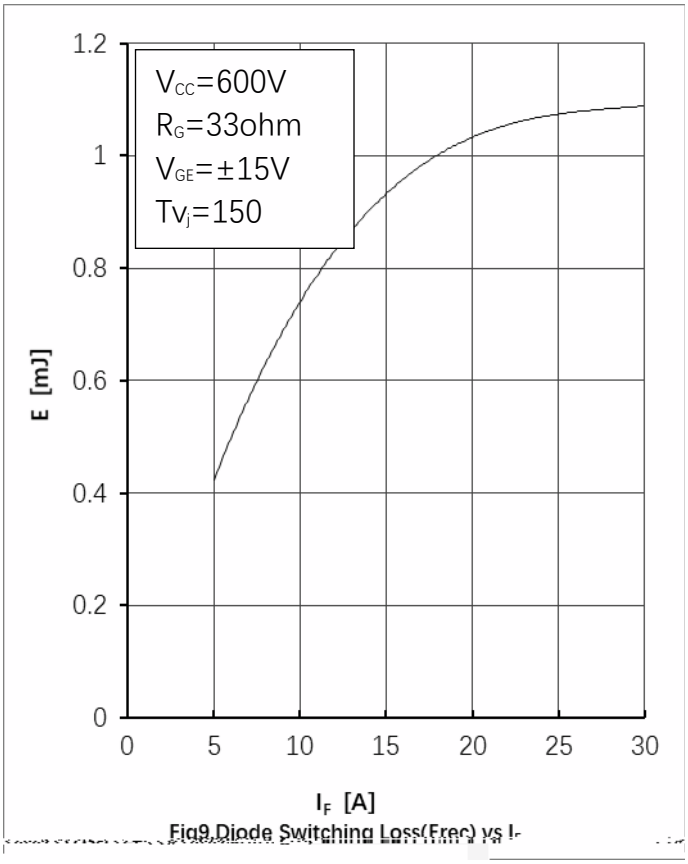


Fig9.Diode Switching Loss(Erec) vs I-

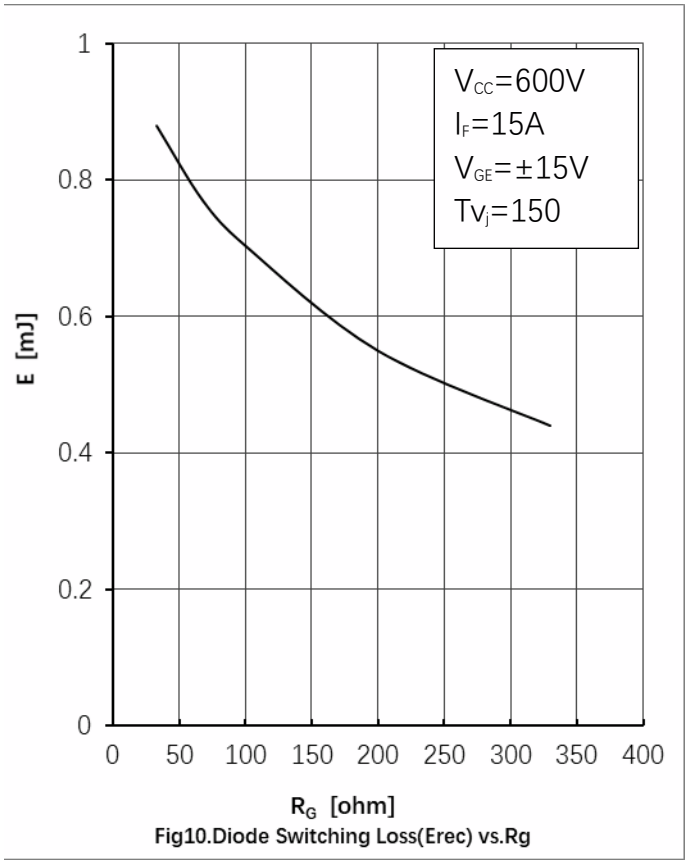
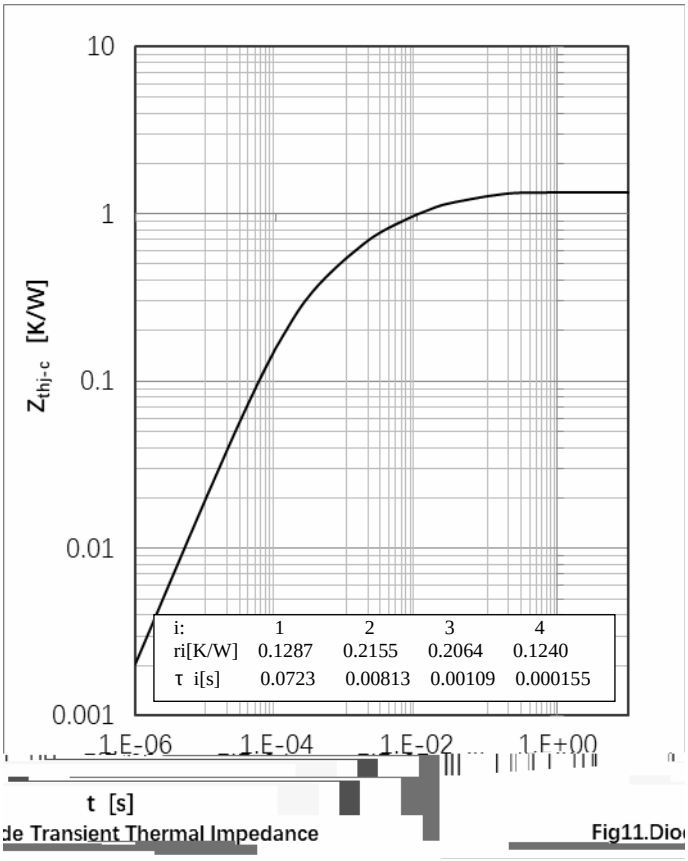
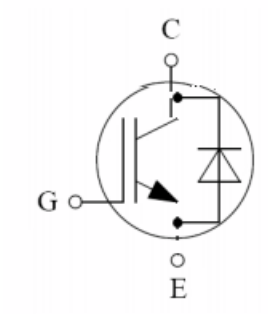


Fig10.Diode Switching Loss(Erec) vs.Rg



de Transient Thermal Impedance Fig11.Dio

- Circuit Diagram



- **Package Outline Information**

CASE: TO 247