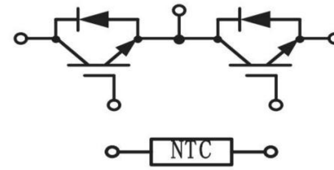
PRODUCT FEATURES

- ☐ IGBT CHIP(Trench+FS)
- ☐ Low saturation voltage and positive temperature coefficient
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐ Temperature sense included
- ☐ 10µs Short Circuit Withstand

APPLICATIONS



- ☐ Motor Drives
- ☐ Power Charging Equipment
- ☐ Solar Power
- ☐ Electric Vehicle

IGBT

ABSOLUTE MAXIMUM RATINGS(T_C = 25 °C *unless otherwise specified)*

Symbol	Parameter/ Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	T_J= 25 °C	1200	V
V_{GES}	Gate Emitter Voltage		±20	
I_C	DC Collector Current	T_C= 100 °C, T_{Jmax}= 175 °C	400	A
I_{CM}	Repetitive Peak Collector Current	tp= 1 ms	800	
P_{tot}	Power Dissipation Per IGBT	T_C= 25 °C, T_{Jmax}= 175 °C	2.8	kW

Diode

ABSOLUTE MAXIMUM RATINGS(T_C = 25 °C *unless otherwise specified)*

Symbol	Parameter/ Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	T_J= 25 °C	1200	V
$I_{F(AV)}$	Average Forward Current		400	A
I_{FRM}	Repetitive Peak Forward Current	tp= 1 ms	800	
I^2t		T_J= 150 °C，t=10ms，V_R=0V	27.2	kA^2s

MODULE CHARACTERISTICS(T_C = 25 °C *unless otherwise specified)*

Symbol	Parameter/ Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature		175	°C
T_{Jop}	Operating Temperature		-40~150	
T_{stg}	Storage Temperature		-40~125	
V_{isol}	Isolation Breakdown Voltage	AC，50Hz(R.M.S)，t=1minute	2500	V
CTI	Comparative Tracking Index		＞200	
Torque	to heatsink	Recommended （M5）	3~5	Nm
	to terminal	Recommended （M6）	3~5	Nm
Weight			340	g

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IGBT

ELECTRICAL CHARACTERISTICS *(T_C = 25 °C unless otherwise specified)*

Symbol	Parameter/ Test Conditions			Min.	Typ.	Max.	Unit
$V_{GE(th)}$	Gate Emitter Threshold Voltage	$V_{CE}=V_{GE}$, I_C=6mA		5.4	5.9	6.5	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	I_C=400A, V_{GE}=15V, T_J=25°C			1.65	2	V
		I_C=400A, V_{GE}=15V, T_J=125°C			1.95	2.35	V
		I_C=400A, V_{GE}=15V, T_J=150°C			2	2.4	V
I_{CES}	Collector Leakage Current	V_{CE}=1200V, V_{GE}=0V, T_J=25°C				1	mA
		V_{CE}=1200V, V_{GE}=0V, T_J=150°C				10	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±20V, T_J=25°C				±500	nA
R_{gint}	Integrated Gate Resistor				1		Ω
Q_g	Gate Charge	V_{CE}=600V, I_C=400A , V_{GE}=15V			4.6		μC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			62		nF
C_{res}	Reverse Transfer Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			0.82		pF
$t_{d(on)}$	Turn on Delay Time	V_{CC}=600V, I_C=400A, R_G =1.5Ω, V_{GE}=±15V, Inductive Load	T_J= 25°C		220		ns
			T_J= 150°C		230		ns
t_r	Rise Time		T_J= 25°C		70		ns
			T_J= 150°C		80		ns
$t_{d(off)}$	Turn off Delay Time	V_{CC}=600V, I_C=400A, R_G =1.5Ω, V_{GE}=±15V, Inductive Load	T_J= 25°C		530		ns
			T_J= 150°C		600		ns
t_f	Fall Time		T_J= 25°C		260		ns
			T_J= 150°C		330		ns
E_{on}	Turn on Energy	V_{CC}=600V, I_C=400A, R_G =1.5Ω, V_{GE}=±15V, Inductive Load	T_J= 25°C		9		mJ
			T_J= 150°C		15		mJ
E_{off}	Turn off Energy		T_J= 25°C		55		mJ
			T_J= 150°C		70		mJ
I_{SC}	Short Circuit Current	tpsc≤10μS , V_{GE}=15V T_J=150°C, V_{CC}=800V			2300		A
R_{thJC}	Junction to Case Thermal Resistance (Per IGBT)					0.052	K /W

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Diode-inverter

ELECTRICAL CHARACTERISTICS (T C =25°C unless otherwise specified)

Symbol	Parameter/ Test Conditions		Min.	Typ.	Max.	Unit
V_F	Collector Emitter Voltage	I_F=400A,V_{GE}=0V,T_J= 25 °C		1.65	2.05	V
		IF=400A,VGE=0V,T_J= 125 °C		1.75		V
		IF=400A,VGE=0V,T_J= 150 °C		1.75		V
Trr	Gate Emitter Voltage	I_F=400A , V_R=600V dI_F/dt=-4700A/μs TJ =150℃		500		nS
I_{RRM}	DC Collector Current			365		A
Q_{RR}	Repetitive Peak Collector Current			90		μC
E_{rec}	Power Dissipation Per IGBT			27		mJ
R_{thJCD}	Junctionto CaseThermal Resistance（Per Diode）				0.086	kW

NTC CHARACTERISTICS (TC=25°C unless otherwise specified)

Symbol	Parameter/ Test Conditions		Min.	Typ.	Max.	Unit
R_{25}	Rated resistance	T_C= 25 °C		5		KΩ
△R/R	Deviation of R100	T_C= 100 °C, R_{100}=493Ω	-5		5	%
P_{25}	Power dissipation	T_C= 25 °C			20	mW
$B_{25/50}$	B-value	R_2= R_{25}exp [$B_{25/50}$(1/T_2-1/(298.15 K))]		3375		K

IGBT Typical Performance

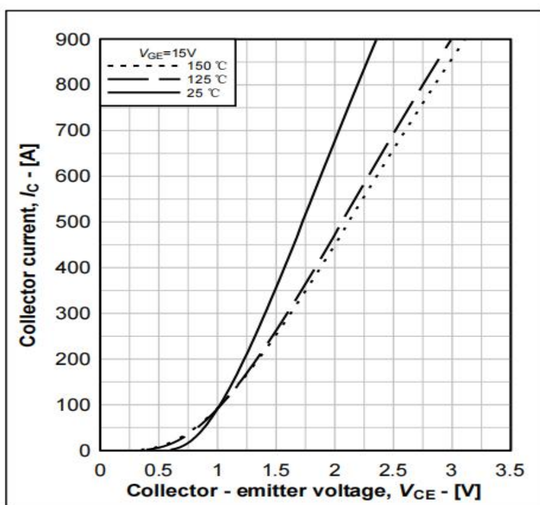

Figure1 Typical IGBT output characteristics

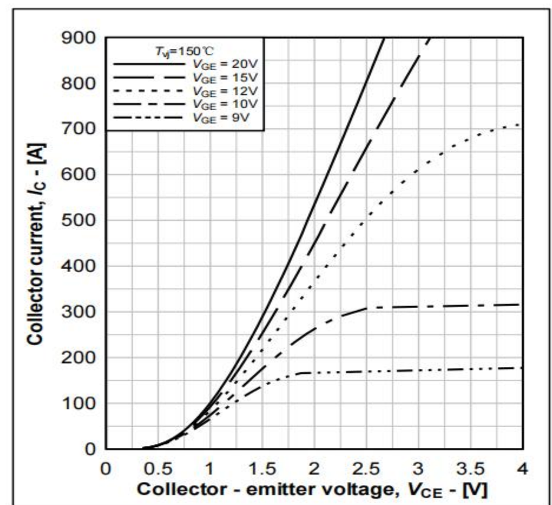

Figure2 Typical IGBT output characteristics

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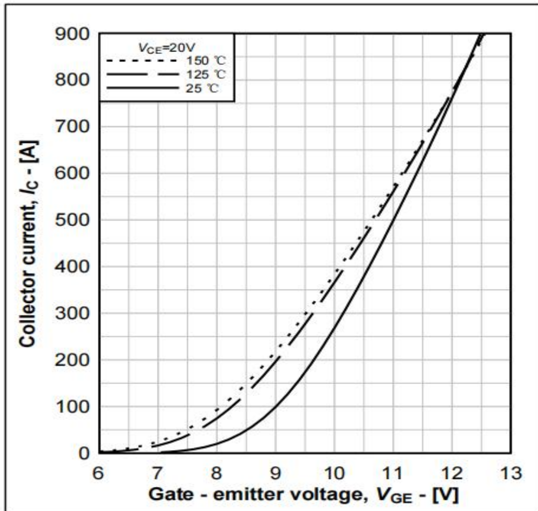

Figure3 Typical IGBT transfer characteristics

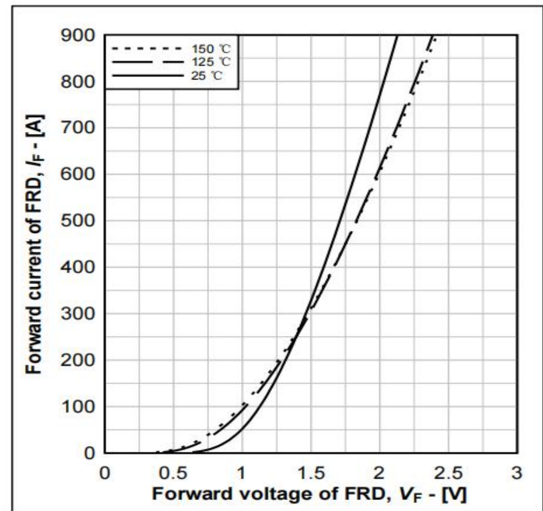

Figure4 Typical FRD output characteristics

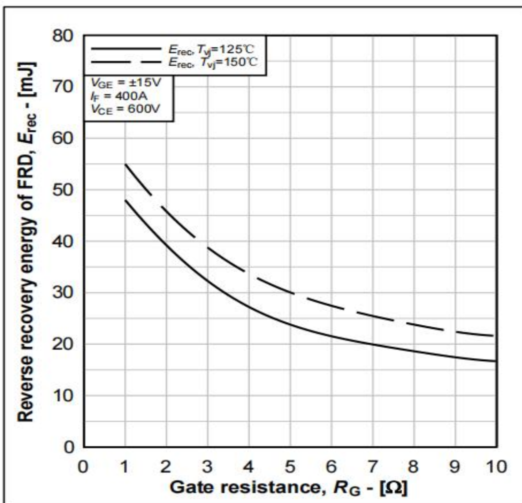

Figure5 Typical FRD Erec

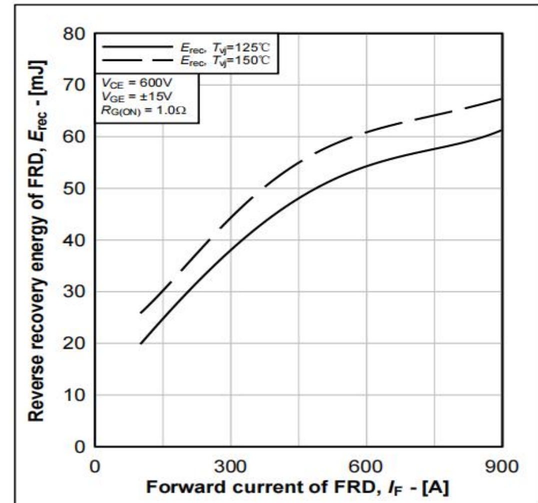

Figure6 Typical FRD Erec

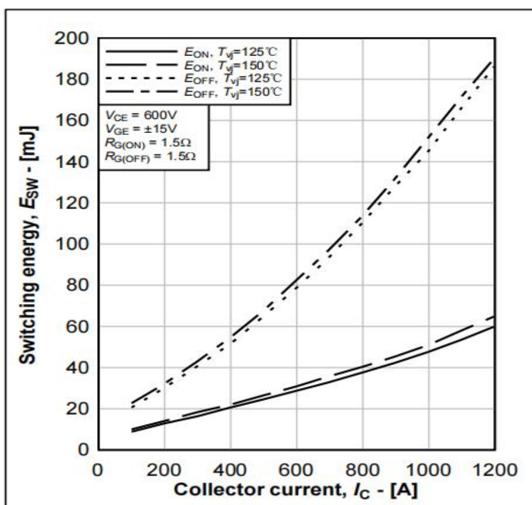

Figure7 Typical IGBT switching energy

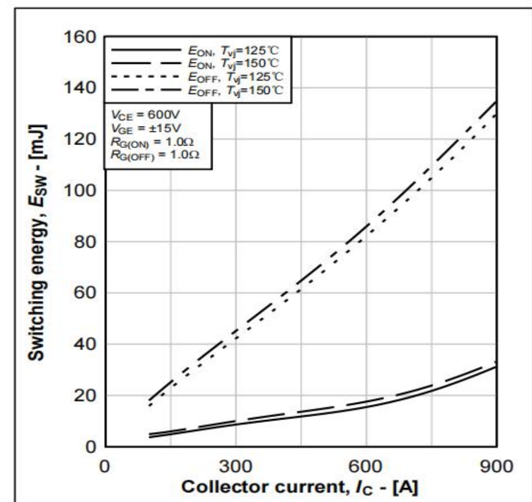

Figure8 Typical IGBT switching energy

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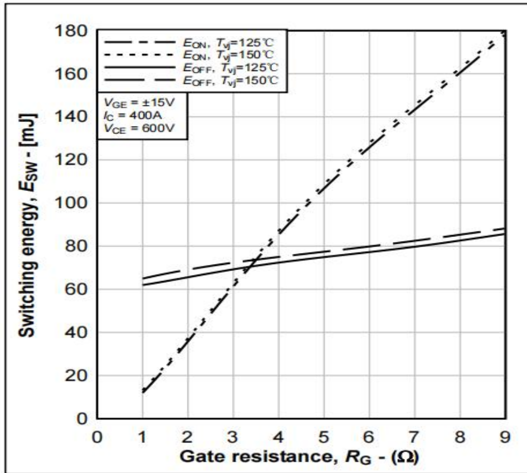


Figure9 Typical IGBT switching energy

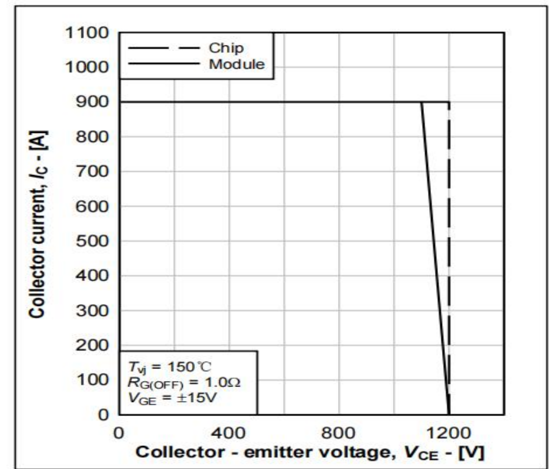


Figure10 Reverse bias safe operating area of IGBT

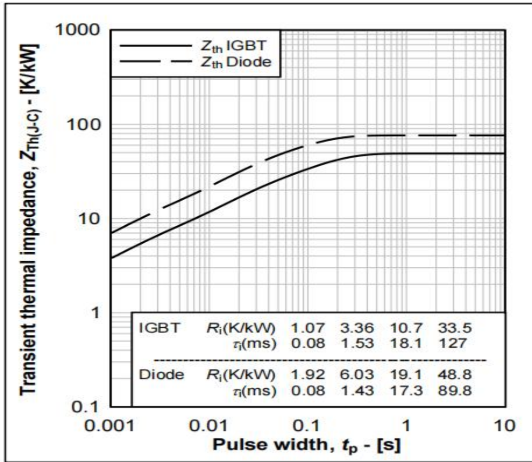


Figure11 Transient thermal impedance

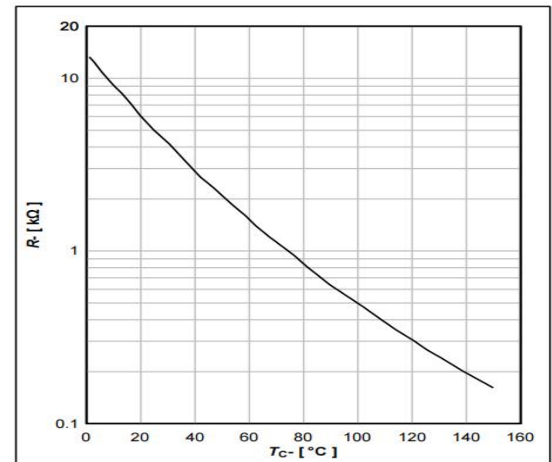
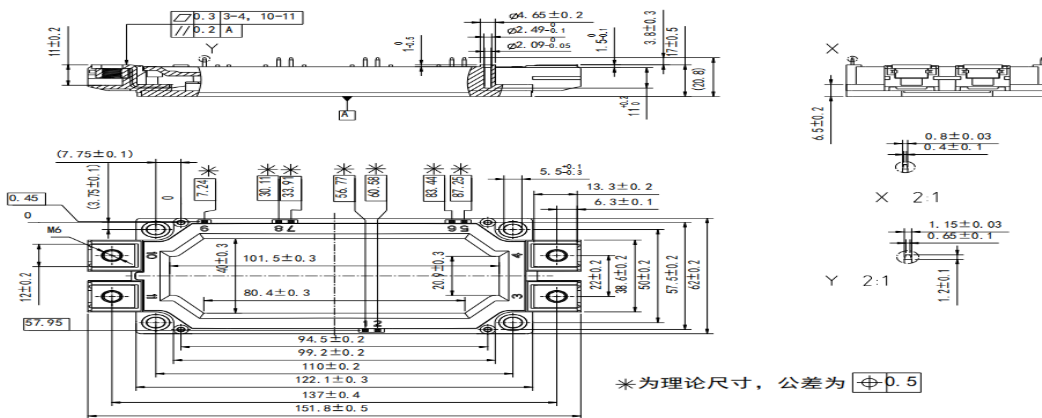


Figure12 Typical NTC thermistor characteristic

Package Dimensions: ED3



Dimensions in (mm)

Figure 11 Package Outline

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