

**1200V/200A 2 in one-package**

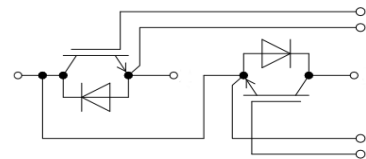
**Features:**

- 1200V200A, VCE(sat)(typ.)=3.0V
- Ultrafast switching speed
- Excellent short circuit ruggedness
- 62mm half bridge module



**General Applications:**

Daxin's IGBTs offer ultrafast switching speed for application such as welding, inductive heating, UPS and other high frequency applications



Equivalent Circuit Schematic

**Absolute Maximum Ratings of IGBT**

V <sub>CES</sub>	Collector to Emitter Voltage		1200	V
V <sub>GES</sub>	Continuous Gate to Emitter Voltage		±30	V
I <sub>C</sub>	Continuous Collector Current	T <sub>C</sub> = 25°C	400	A
		T <sub>C</sub> = 100°C	200	
I <sub>CM</sub>	Pulse Collector Current	T <sub>J</sub> = 150°C	400	A
P <sub>D</sub>	Maximum Power Dissipation (IGBT)	T <sub>C</sub> = 25°C, T <sub>J</sub> = 150°C	860	W
t <sub>sc</sub>	Short Circuit Withstand Time		> 10	μs
T <sub>J</sub>	Maximum IGBT Junction Temperature		150	°C
T <sub>JOP</sub>	Maximum Operating Junction Temperature Range		-40 to +150	°C
T <sub>stg</sub>	Storage Temperature Range		-40 to +125	°C

**Absolute Maximum Ratings of Freewheeling Diode**

V <sub>RRM</sub>	Repetitive Peak Reverse Voltage Preliminary Data		1200	V
I <sub>F</sub>	Diode Continuous Forward Current	T <sub>C</sub> = 25°C	400	A
		T <sub>C</sub> = 100°C	200	
I <sub>FM</sub>	Diode Maximum Forward Current		400	A

**Electrical Characteristics of IGBT at T<sub>J</sub> = 25°C** (Unless Otherwise Specified)

Parameter	Test Conditions	Min	Typ	Max	Unit	
BV <sub>CES</sub>	Collector to Emitter Breakdown Voltage	V <sub>GE</sub> = 0V, I <sub>C</sub> = 1mA	1200		V	
I <sub>CES</sub>	Collector to Emitter Leakage Current	V <sub>GE</sub> = 0V, V <sub>CE</sub> = V <sub>CES</sub>		5	mA	
I <sub>GES</sub>	Gate to Emitter Leakage Current	V <sub>GE</sub> = ±30V, V <sub>CE</sub> = 0V		400	nA	
V <sub>GE(th)</sub>	Gate Threshold Voltage	I <sub>C</sub> = 1mA, V <sub>CE</sub> = V <sub>GE</sub>	4.5	5.7	V	
V <sub>CE(sat)</sub>	Collector to Emitter Saturation Voltage (Module Level)	I <sub>C</sub> = 200A, V <sub>GE</sub> = 15V	T <sub>J</sub> = 25°C	3.00	3.20	V
			T <sub>J</sub> = 125°C	3.60		

**Switching Characteristics of IGBT**

t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>CC</sub> = 600V I <sub>C</sub> = 200A R <sub>G</sub> = 4.7Ω V <sub>GE</sub> = ±15V Inductive Load	T <sub>J</sub> = 25°C	90	ns
			T <sub>J</sub> = 125°C	95	
t <sub>r</sub>	Turn-on Rise Time		T <sub>J</sub> = 25°C	85	ns
			T <sub>J</sub> = 125°C	90	
t <sub>d(off)</sub>	Turn-off Delay Time		T <sub>J</sub> = 25°C	670	ns
			T <sub>J</sub> = 125°C	725	
t <sub>f</sub>	Turn-off Fall Time		T <sub>J</sub> = 25°C	110	ns
			T <sub>J</sub> = 125°C	130	
E <sub>on</sub>	Turn-on Switching Loss		T <sub>J</sub> = 25°C	8.5	mJ
			T <sub>J</sub> = 125°C	10.5	
E <sub>off</sub>	Turn-off Switching Loss	T <sub>J</sub> = 25°C	11.0	mJ	
		T <sub>J</sub> = 125°C	14.0		
Q <sub>g</sub>	Total Gate Charge	T <sub>J</sub> = 25°C	1740	nC	
R <sub>gint</sub>	Integrated gate resistor	f = 1M; V <sub>pp</sub> = 1V	T <sub>J</sub> = 25°C	2.5	Ω
C <sub>ies</sub>	Input Capacitance	V <sub>CE</sub> = 25V V <sub>GE</sub> = 0V f = 1MHz	T <sub>J</sub> = 25°C	17.5	nF
C <sub>oes</sub>	Output Capacitance		T <sub>J</sub> = 25°C	2.4	
C <sub>res</sub>	Reverse Transfer Capacitance		T <sub>J</sub> = 25°C	1.4	
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case (IGBT)			0.145	°C/W

**Electrical and Switching Characteristics of Freewheeling Diode**

V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 200A , V <sub>GE</sub> = 0V	T <sub>J</sub> = 25°C	1.90	2.20	V
			T <sub>J</sub> = 125°C	1.90		
t <sub>rr</sub>	Diode Reverse Recovery Time	I <sub>F</sub> = 200A, di/dt=2600A/μs, V <sub>rr</sub> = 600V,	T <sub>J</sub> = 25°C	160		ns
			T <sub>J</sub> = 125°C	220		
I <sub>rr</sub>	Diode Peak Reverse Recovery Current	I <sub>F</sub> = 200A, di/dt=2600A/μs, V <sub>rr</sub> = 600V,	T <sub>J</sub> = 25°C	170		A
			T <sub>J</sub> = 125°C	210		
Q <sub>rr</sub>	Diode Reverse Recovery Charge	I <sub>F</sub> = 200A, di/dt=2600A/μs, V <sub>rr</sub> = 600V,	T <sub>J</sub> = 25°C	16.50		nC
			T <sub>J</sub> = 125°C	26.50		
E <sub>rr</sub>	Diode Reverse Recovery Energy	I <sub>F</sub> = 200A, di/dt=2600A/μs, V <sub>rr</sub> = 600V,	T <sub>J</sub> = 25°C	5.50		mJ
			T <sub>J</sub> = 125°C	9.00		
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case (Diode)				0.157	°C/W

**Module Characteristics**

Parameter		Min.	Typ.	Max.	Unit
V <sub>iso</sub>	Isolation Voltage (All Terminals Shorted), f = 50Hz, 1minute	2500			V
R <sub>ecs</sub>	Case-To-Sink(Conductive Grease Applied)		0.1		°C/W
M	Power Terminals Screw: M6	3.0		5.0	N·m
M	Mounting Screw: M6	4.0		6.0	N·m
G	Weight		315		g

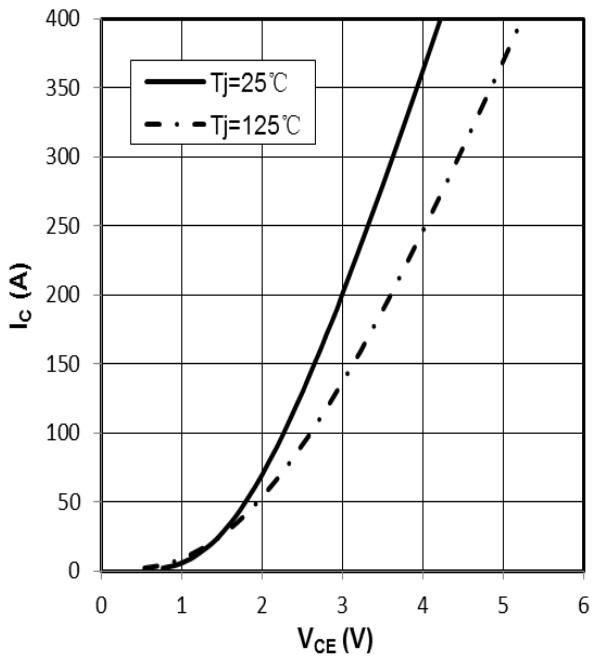


Fig 1. output characteristic IGBT,  
 $I_c=f(V_{CE}), V_{GE}=15V$

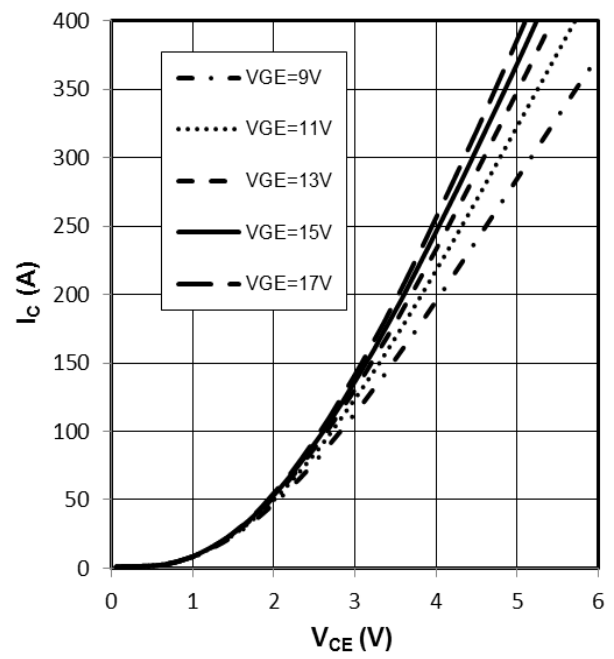


Fig 2. output characteristic IGBT,  
 $I_c=f(V_{CE}), T_j=125^\circ C$

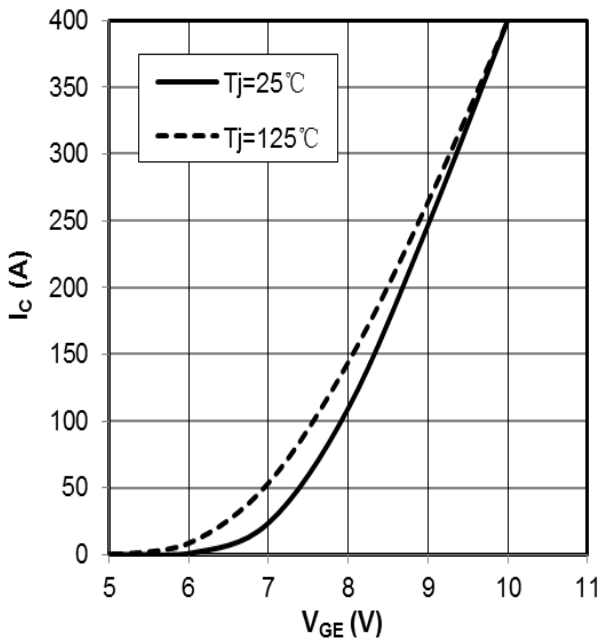


Fig 3. transfer characteristic IGBT,  
 $I_c=f(V_{GE}), V_{CE}=20V$

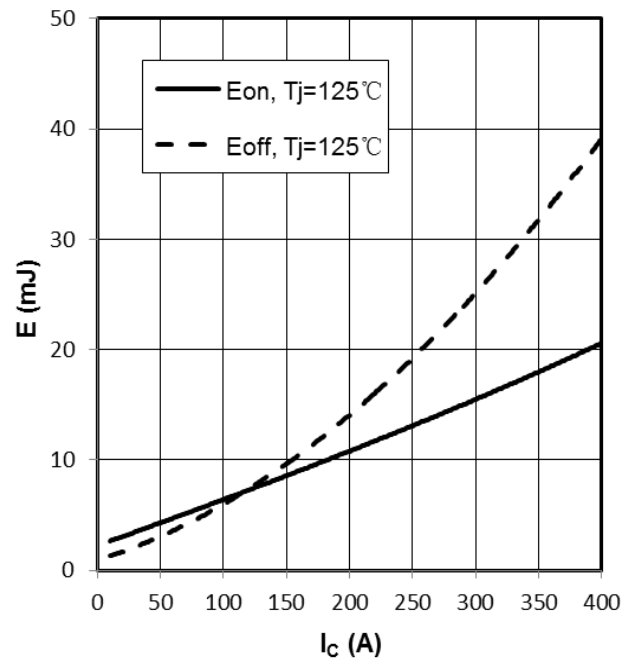


Fig 4. switching losses IGBT,  $E_{on}=f(I_c), E_{off}=f(I_c)$ ,  
 $V_{GE}=\pm 15V, R_{Gon}=4.7\Omega, R_{Goff}=4.7\Omega, V_{CE}=600V$

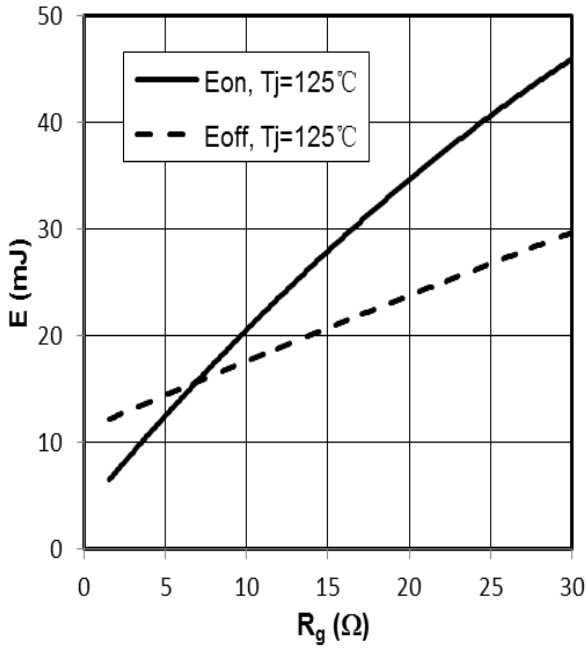


Fig 5. switching losses IGBT,  $E_{on}=f(R_G), E_{off}=f(R_G)$ ,  
 $V_{GE}=\pm 15V, I_C=200A, V_{CE}=600V$

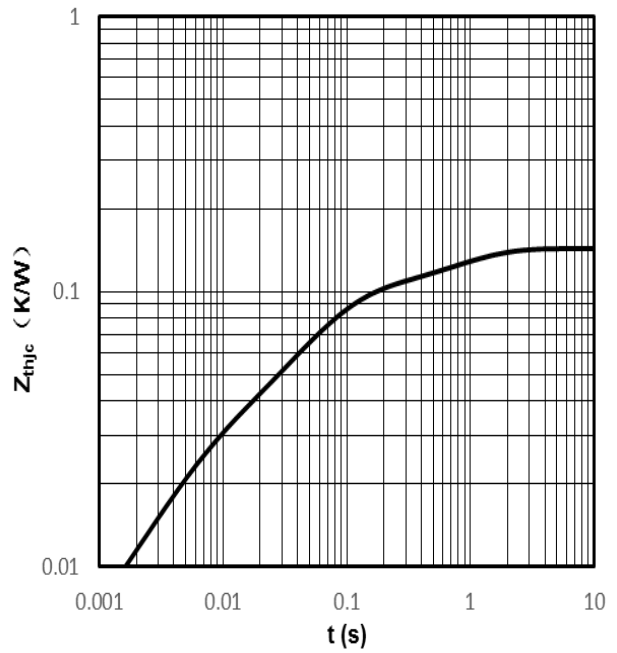


Fig 6. transient thermal impedance IGBT,  $Z_{thjc}=f(t)$

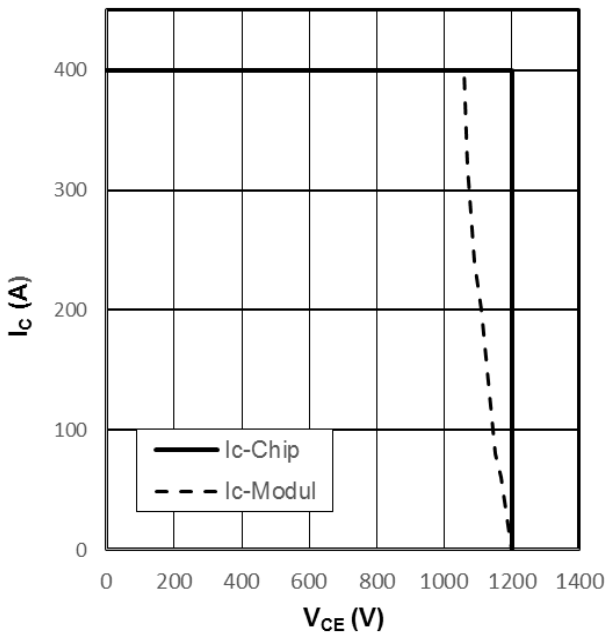


Fig 7. reverse bias safe operating area IGBT,  
 $I_C=f(V_{CE}), V_{GE}=\pm 15V, R_{Goff}=4.7\Omega, T_j=125^\circ C$

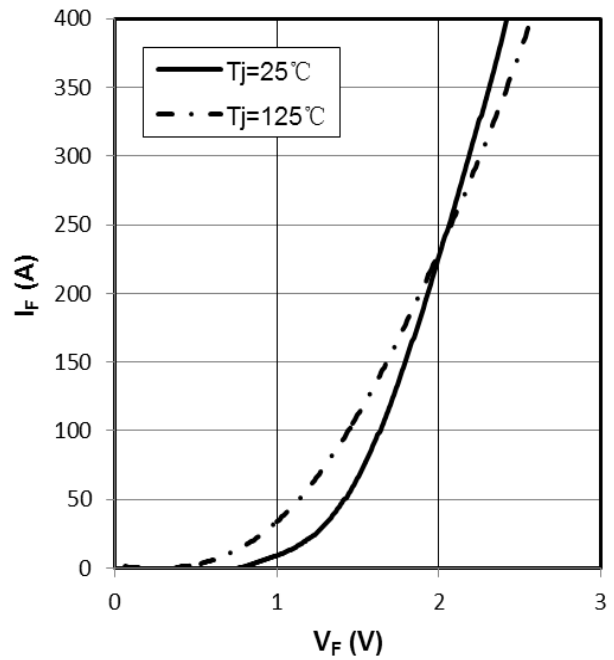


Fig 8. forward characteristic of Diode,  
 $I_F=f(V_F)$

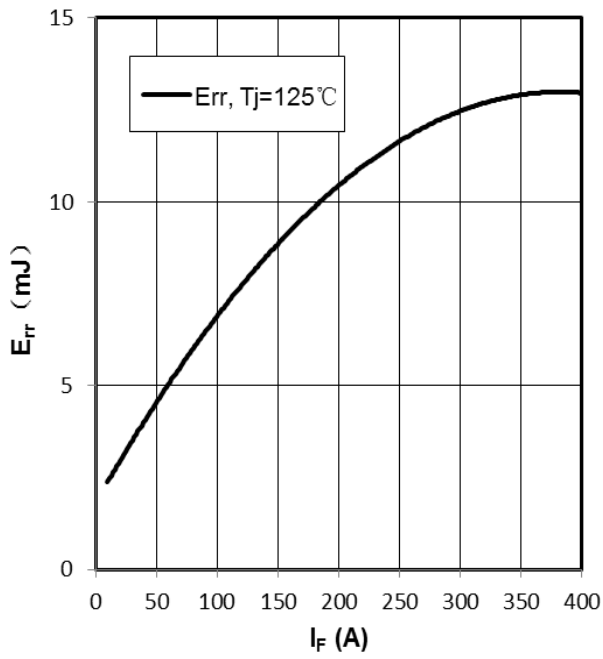


Fig 9. switching losses Diode,  
 $E_{err}=f(I_F)$ ,  $R_{Gon}=4.7\Omega$ ,  $V_{CE}=600V$

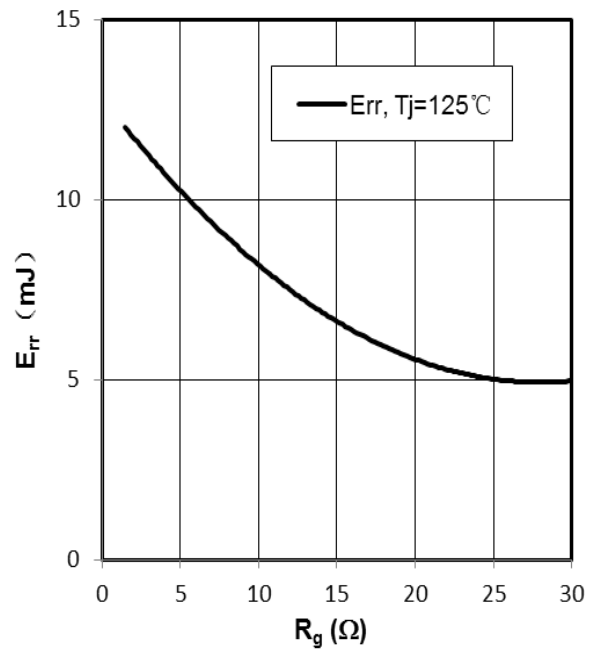
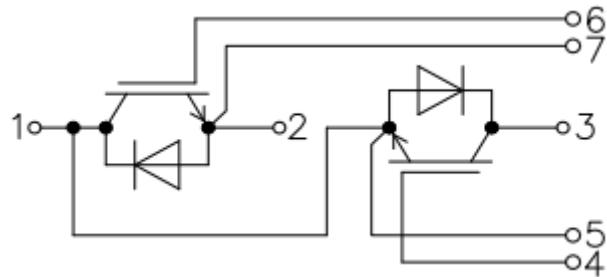
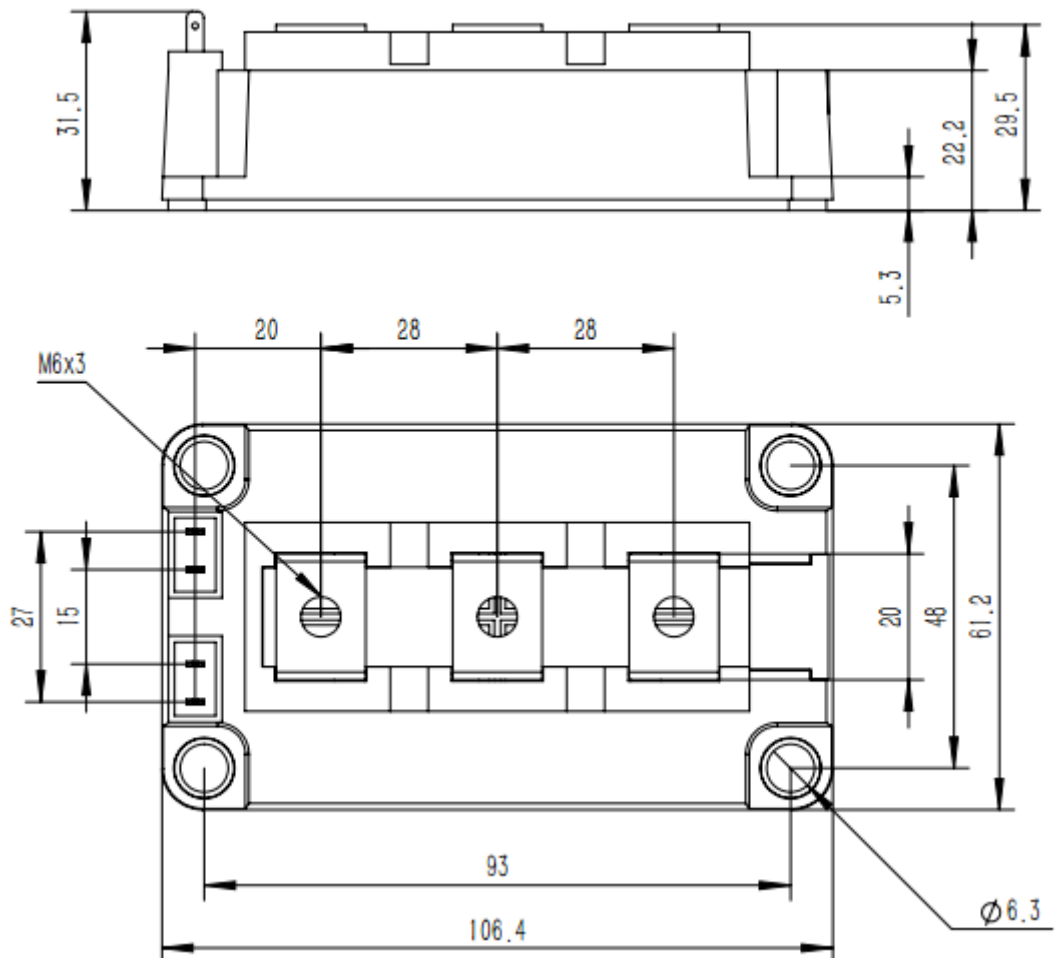


Fig 10. switching losses Diode,  
 $E_{err}=f(R_g)$ ,  $I_F=200A$ ,  $V_{CE}=600V$

Internal Circuit:



Package Dimension  
Dimensions in Millimeters



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