

WGM200HC120T1

1200V, 200A dual IGBT module with Trench Field Stop technology



Features:

- Trench-FS IGBT
- Low $V_{CE\ set}$
- Low Switching Loss
- Low L_s
- $T_j\ max=175\ ^\circ C$
- 100%RBSOA Tested (2Ic)
- $V_{CE\ set}$ with positive temp. coefficient
- RoHS

Applications:

- Motor Drives
- Servo Drives
- UPS
- Welding

Maximum Rated Valued of IGBT

集电极-发射极电压 Collector-emitter voltage	V_{CES}	$T_J=25^\circ C$	1200	V
栅极-发射极峰值电压 Gate-emitter peak voltage	V_{GES}		± 20	V
连续集电极电流 Continuous collector current	I_C	$T_C=100^\circ C$ $T_C=25^\circ C$	200 400	A
集电极重复峰值电流 Repetitive peak collector current	I_{CM}	$T_J=175^\circ C, t_P=1ms$	400	A
最大损耗功率 Maximum power dissipation per IGBT	P_D	$T_C=25^\circ C$ $T_{J\ max}=175^\circ C$	1440	W



Electrical Characteristics of IGBT

				Min.	Typ.	Max.	
集电极-发射极饱和电压 Collector-emitter saturation voltage	$V_{CE\ sat}$	$I_C=200A, V_{GE}=15V$	$T_J=25^\circ C$ $T_J=125^\circ C$ $T_J=150^\circ C$		1.6 1.8 1.9		V V V
栅极阈值电压 Gate threshold voltage	$V_{GE(th)}$	$I_C=4mA, V_{CE}=V_{GE}$	$T_J=25^\circ C$	5.0	5.7	6.8	V
栅极电荷 Gate charge	Q_G	$V_{GE} = -15 V \dots +15 V$	$T_J=25^\circ C$		1.07		μC
内部栅极电阻 Internal gate resistor	R_{Gint}		$T_J=25^\circ C$		3.75		Ω
输入电容 Input capacitance	C_{ies}	$f=1MHz, V_{CE}=25V, V_{GE}=0V$	$T_J=25^\circ C$		16.60		nF
反向传输电容 Reverse transfer capacitance	C_{res}	$f=1MHz, V_{CE}=25V, V_{GE}=0V$	$T_J=25^\circ C$		0.58		nF
集电极-发射极截止电流 Collector-emitter cut-off current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V$	$T_J=25^\circ C$			1	mA
栅极-发射极漏电流 Gate-emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=\pm 20V$	$T_J=25^\circ C$			400	nA
开通延迟时间 (电感负载) Turn-on delay time	$t_{d\ on}$	$V_{CC}=600V, I_C=200A, R_{Gon}=2\Omega,$ $V_{GE}=\pm 15V$	$T_J=25^\circ C$ $T_J=125^\circ C$ $T_J=150^\circ C$		0.31 0.31 0.31		μs μs μs
上升时间 (电感负载) Rise time	t_r	$V_{CC}=600V, I_C=200A, R_{Gon}=2\Omega,$ $V_{GE}=\pm 15V$	$T_J=25^\circ C$ $T_J=125^\circ C$ $T_J=150^\circ C$		0.10 0.11 0.11		μs μs μs
关断延迟时间 (电感负载) Turn-off delay time	$t_{d\ off}$	$V_{CC}=600V, I_C=200A, R_{Goff}=2\Omega,$ $V_{GE}=\pm 15V$	$T_J=25^\circ C$ $T_J=125^\circ C$ $T_J=150^\circ C$		0.31 0.33 0.34		μs μs μs
下降时间 (电感负载) Fall time	t_f	$V_{CC}=600V, I_C=200A, R_{Goff}=2\Omega,$ $V_{GE}=\pm 15V$	$T_J=25^\circ C$ $T_J=125^\circ C$ $T_J=150^\circ C$		0.18 0.32 0.34		μs μs μs
开通损耗能量 Turn-on energy loss per pulse	E_{on}	$V_{CC}=600V, I_C=200A, R_{Gon}=2\Omega,$ $V_{GE}=\pm 15V$ $di/dt=1620A/\mu s (T_J=150^\circ C)$	$T_J=25^\circ C$ $T_J=125^\circ C$ $T_J=150^\circ C$		14.70 18.90 20.20		mJ mJ mJ
关断损耗能量 Turn-off energy loss per pulse	E_{off}	$V_{CC}=600V, I_C=200A, R_{Goff}=2\Omega,$ $V_{GE}=\pm 15V$ $du/dt=3765V/\mu s (T_J=150^\circ C)$	$T_J=25^\circ C$ $T_J=125^\circ C$ $T_J=150^\circ C$		15.70 22.70 24.70		mJ mJ mJ
短路数据 SC data	I_{SC}	$V_{GE}=\pm 15V, V_{CC}=600V, R_G=4.7\Omega,$ $t_P=10\mu s$	$T_J=150^\circ C$		994		A
结-外壳热阻 Thermal resistance, junction to case	$R_{th\ JC}$	per leg			0.104		K/W



Maximum Rated Valued of Diode

反向重复峰值电压 Repetitive peak reverse voltage	V_{RRM}		$T_C=25^{\circ}\text{C}$	1200	V
正向连续电流 continuous forward current	I_F		$T_C=25^{\circ}\text{C}$	200	A
正向峰值电流 Maximum forward voltage	I_{FM}	$t_p=1\text{ms}$	$T_C=25^{\circ}\text{C}$	400	A

Electrical Characteristics of Diode

			Min.	Typ.	Max.	
正向电压 Forward voltage	V_F	$I_F=200\text{A}$	$T_J=25^{\circ}\text{C}$	1.60		V
			$T_J=125^{\circ}\text{C}$	1.70		V
			$T_J=150^{\circ}\text{C}$	1.70		V
反向恢复峰值电流 Peak reverse recovery current	I_{RM}	$V_R=600\text{V}, I_F=200\text{A}, V_{GE}=-15\text{V}$ $-di/dt=1855\text{A/us}$ ($T_J=150^{\circ}\text{C}$)	$T_J=25^{\circ}\text{C}$	128		A
			$T_J=125^{\circ}\text{C}$	144		A
			$T_J=150^{\circ}\text{C}$	150		A
反向恢复时间 Reverse recovery time	t_{rr}	$V_R=600\text{V}, I_F=200\text{A}, V_{GE}=-15\text{V}$ $-di/dt=1855\text{A/us}$ ($T_J=150^{\circ}\text{C}$)	$T_J=25^{\circ}\text{C}$	0.32		us
			$T_J=125^{\circ}\text{C}$	0.53		us
			$T_J=150^{\circ}\text{C}$	0.56		us
恢复电荷 Recovery charge	Q_r	$V_R=600\text{V}, I_F=200\text{A}, V_{GE}=-15\text{V}$ $-di/dt=1855\text{A/us}$ ($T_J=150^{\circ}\text{C}$)	$T_J=25^{\circ}\text{C}$	20.7		uC
			$T_J=125^{\circ}\text{C}$	34.5		uC
			$T_J=150^{\circ}\text{C}$	38.8		uC
反向恢复损耗 (每脉冲) Reverse recovery energy	E_{rec}	$V_R=600\text{V}, I_F=200\text{A}, V_{GE}=-15\text{V}$ $-di/dt=1855\text{A/us}$ ($T_J=150^{\circ}\text{C}$)	$T_J=25^{\circ}\text{C}$	8.5		mJ
			$T_J=125^{\circ}\text{C}$	14.1		mJ
			$T_J=150^{\circ}\text{C}$	16.5		mJ
结-外壳热阻 Thermal resistance, junction to case	R_{thJC}	per leg		0.166		K/W



Module			Min.	Typ.	Max.	
绝缘电压 Isolation voltage	V _{ISO}	f=50Hz, t=1min, RMS, All terminals shorted	2500			V
绝缘电压 Isolation voltage	L _{SCE}			20		nH
相对电痕指数 Comparative tracking index	CTI		200			V
最高结温 Maximum junction temperature	T _{J max}		-40		175	°C
工作结温 Operating junction temperature	T _{J OP}		-40		150	°C
储存温度 Storage temperature	T _{stg}		-40		125	°C
外壳-散热器热阻 Thermal resistance, case to heatsink	R _{thCH}	Thermal grease applied		0.030		K/W
安装扭矩 Mounting torque	T	Power terminals screw: M6 Mounting screw: M6	4.0 4.0		6.0 6.0	N·m N·m
重量 Weight	G			300		g



Fig.1 Typical saturation voltage characteristics vs temp.
IGBT, Inverter

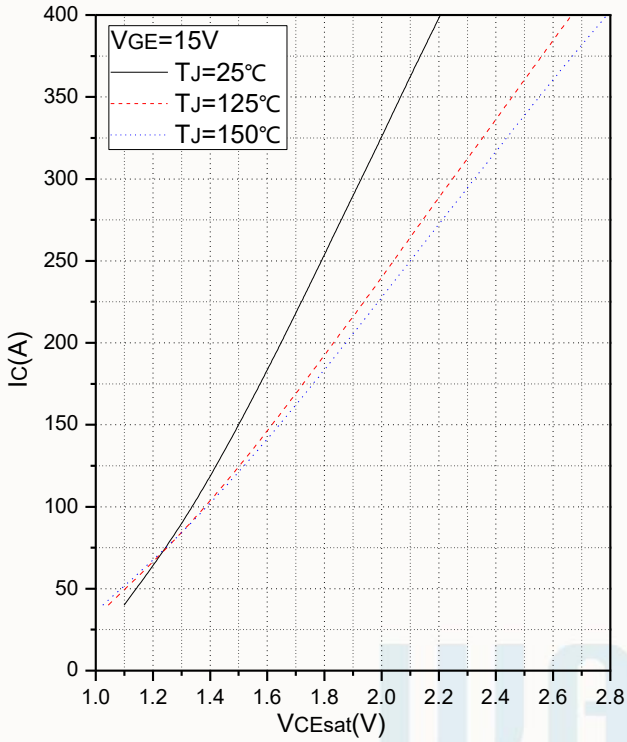


Fig.2 Typical output characteristics vs VGE
IGBT, Inverter

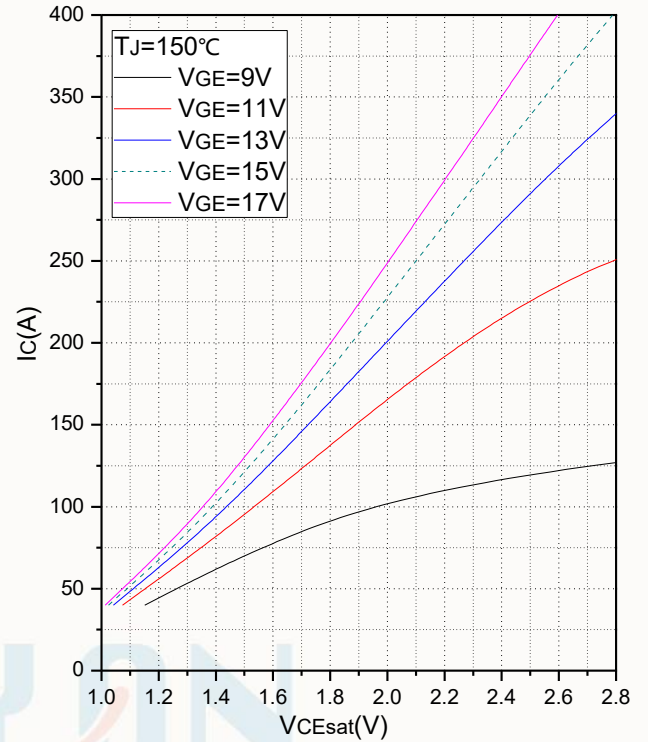


Fig.3 Transfer Characteristic

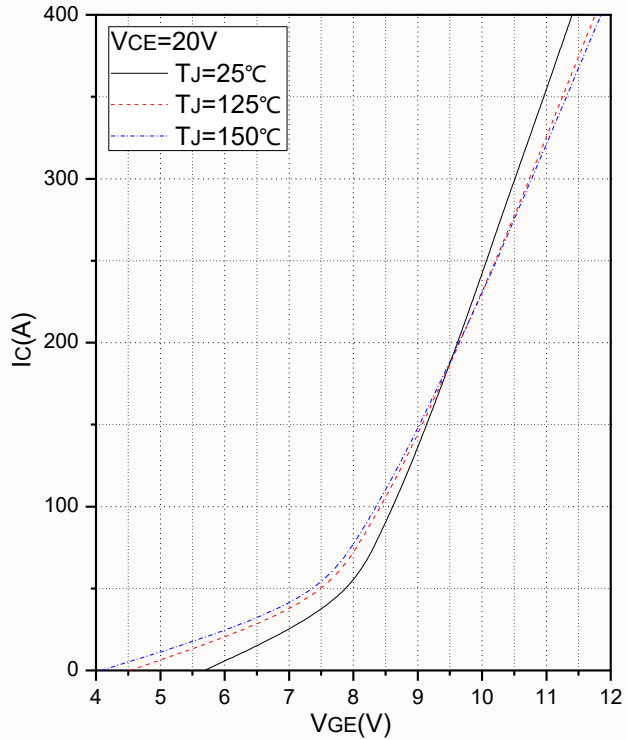


Fig.4 Typical switching loss vs Collector current
IGBT, Inverter

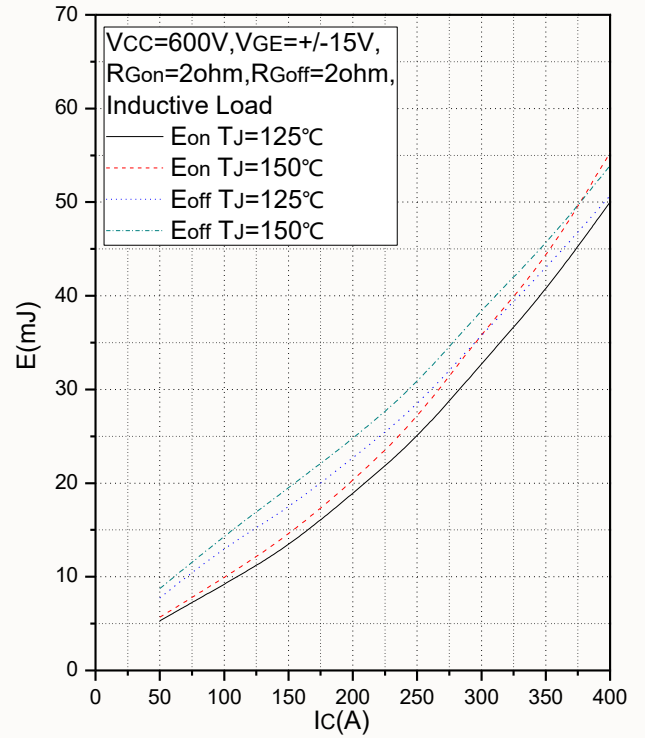


Fig.5 Typical switching loss vs Gate resistance
IGBT, Inverter

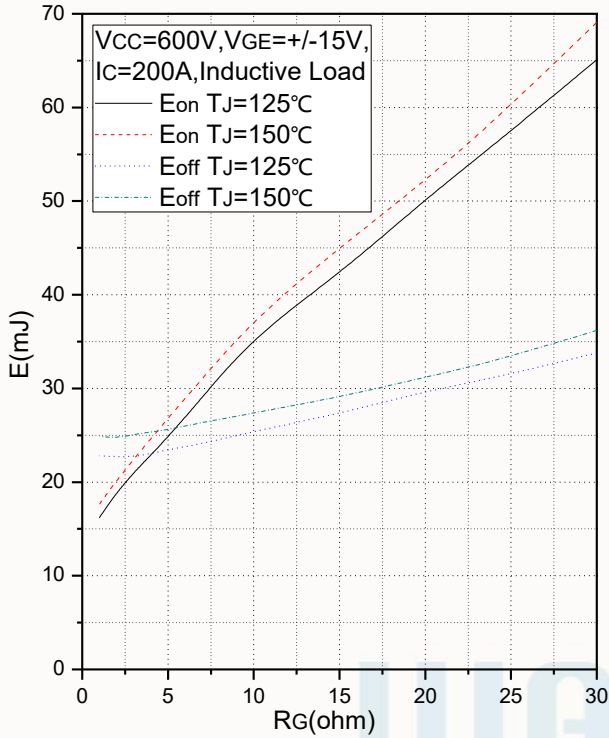


Fig.7 Typical forward characteristic
Diode, Inverter

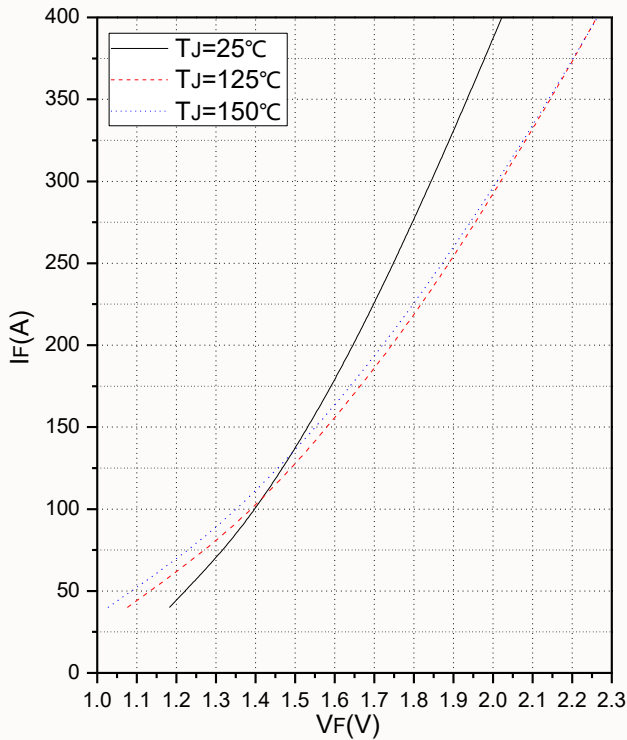


Fig.6 Transient thermal impedance
IGBT, Inverter

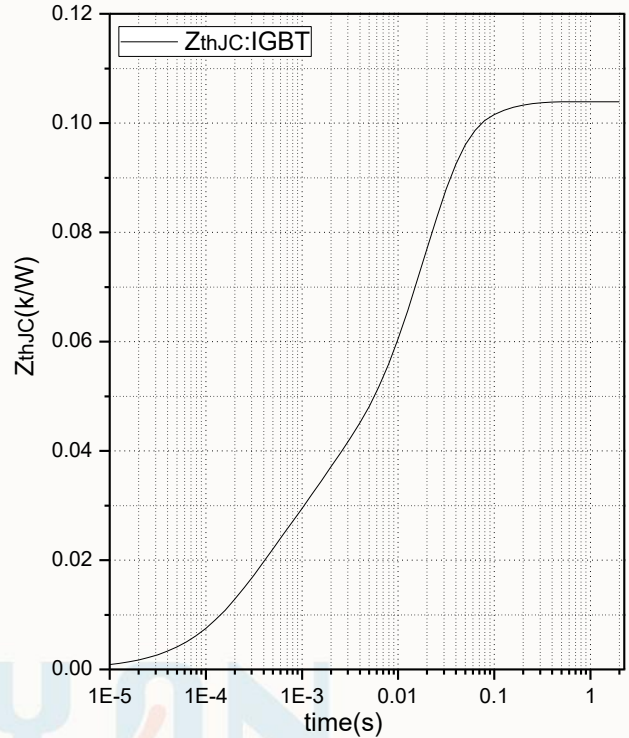


Fig.8 Typical switching loss vs Forward current
Diode, Inverter

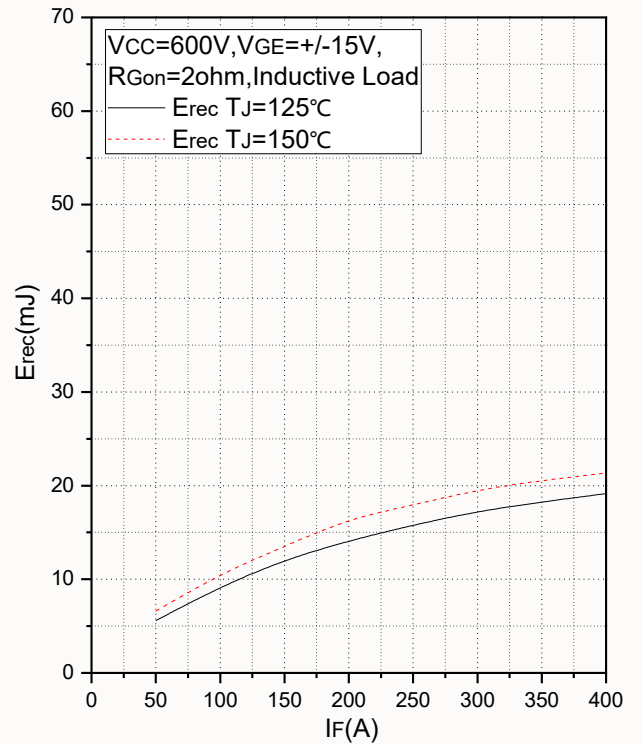


Fig.9 Typical switching loss vs Gate resistance
Diode, Inverter

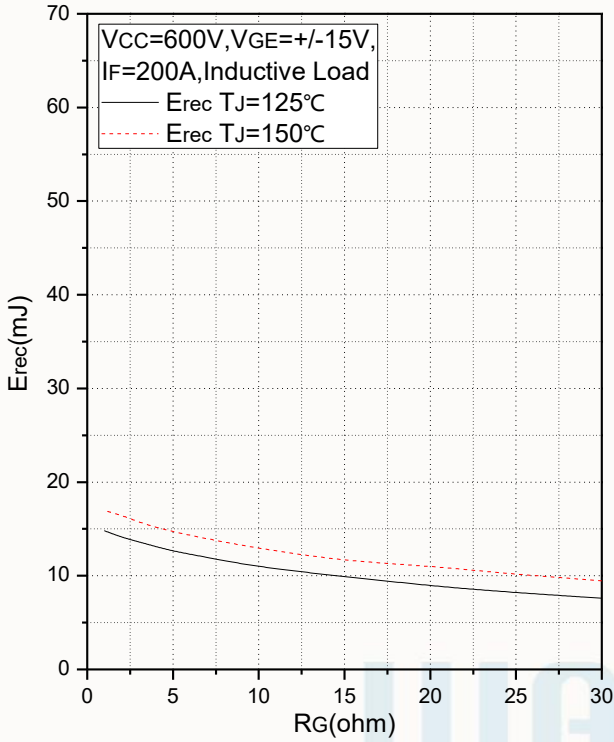


Fig.10 Transient thermal impedance
Diode, Inverter

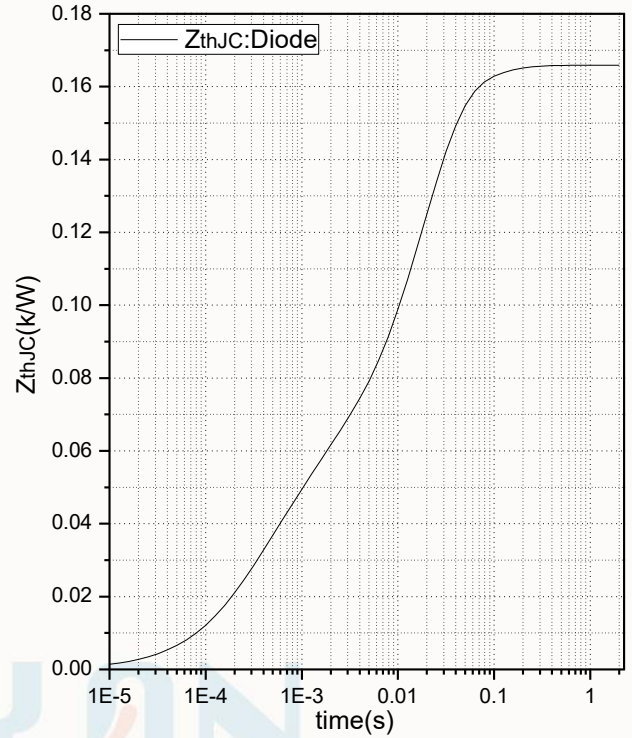
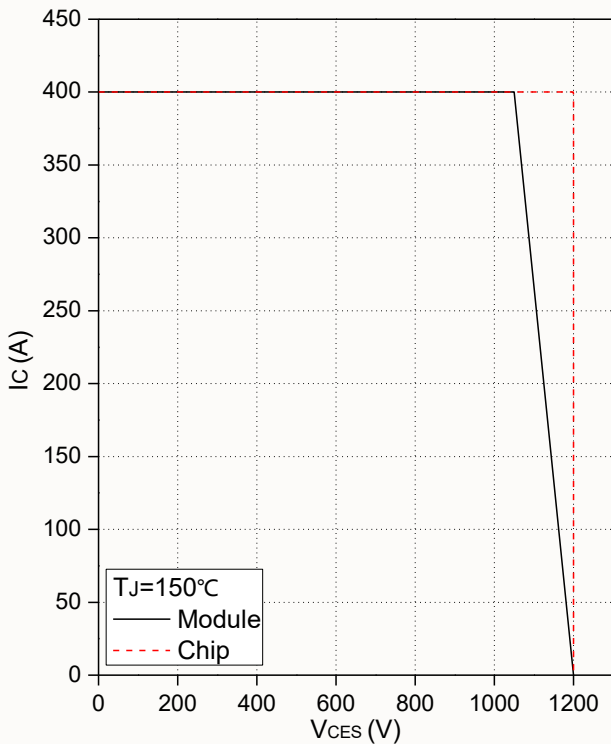
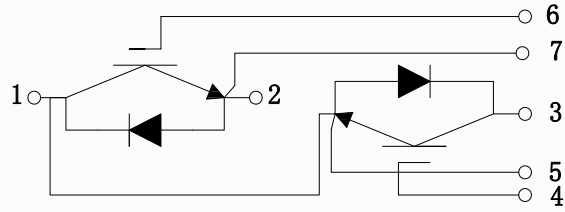


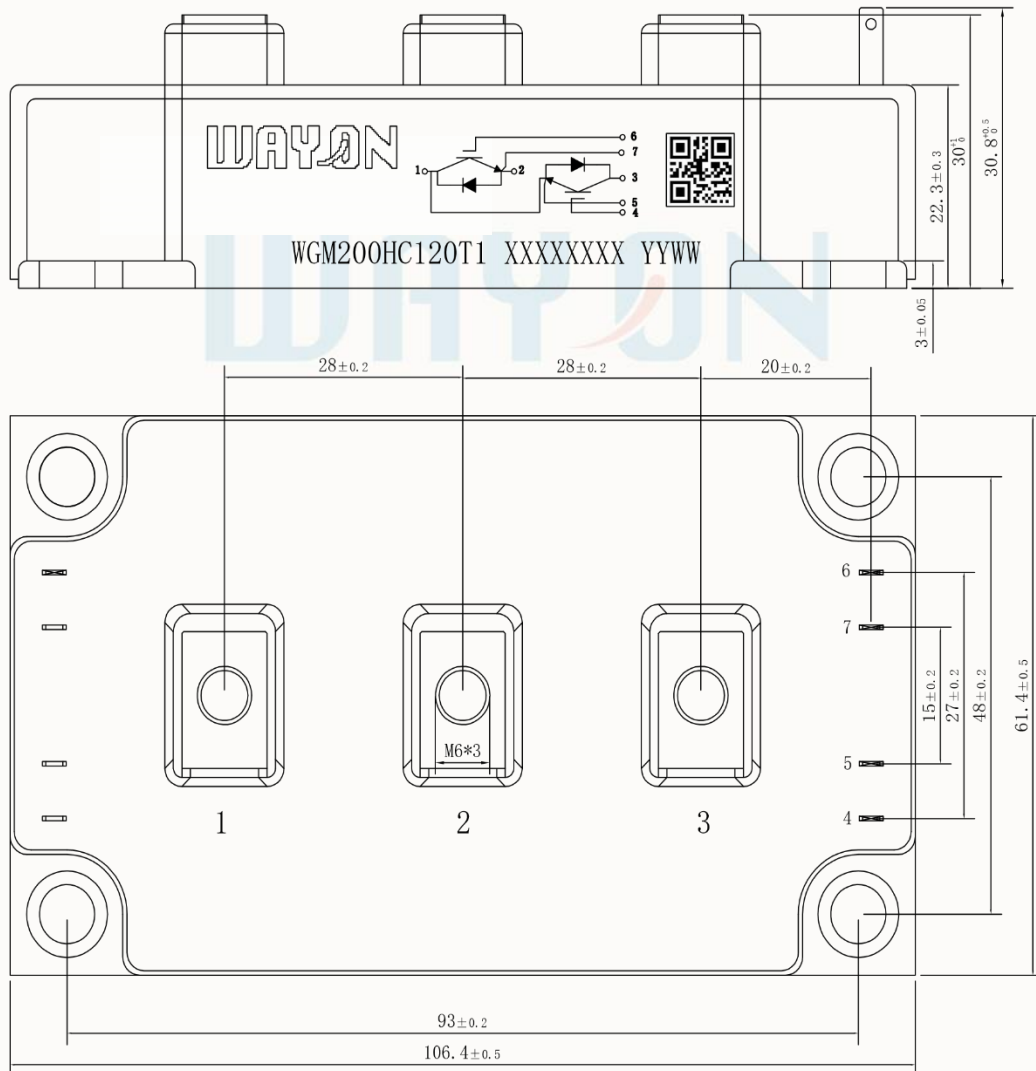
Fig.11 Reverse Bias Safe Operation Area (RBSOA)



Internal circuit



Package outline (mm)




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