

TARGET DATASHEET 规格书

SISD1800XP170i23

XP-Type phase leg IGBT module

XP 封装半桥 IGBT 模块



$V_{CE} = 1700 \text{ V}$

$I_C = 2 \times 1800 \text{ A}$

- i23 ultra-low loss micropattern Trench IGBT chip-set
i23 超低损耗微沟槽栅 IGBT 芯片组
- Baseplate isolation with low R_{th} Si3N4 ceramic
低热阻氮化硅绝缘陶瓷基板
- Cu baseplate for low thermal resistance
铜底板
- Industry standard package with reduced internal impedance
行业标准封装，低内部阻抗

Maximum ratings¹ 最大额定值¹

PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件	MIN 最小值	MAX 最大值	UNIT 单位
Collector-emitter voltage 集电极-发射极电压	V_{CES}	$V_{GE} = 0 \text{ V}$, $T_{vj} = 25 \text{ °C}$		1700	V
DC collector current 集电极直流电流	I_C	$T_C = 110 \text{ °C}$, $T_{vj} = 175 \text{ °C}$		1800	A
Peak collector current 集电极峰值电流	I_{CM}	$t_p = 1 \text{ ms}$		3600	A
Gate-emitter voltage 栅极-发射极驱动电压	V_{GES}		-20	20	V
DC forward current 二极管直流正向电流	I_F			1800	A
Peak forward current 二极管最大脉冲正向电流	I_{FRM}	$t_p = 1 \text{ ms}$		3600	A
Surge current 二极管最大浪涌电流	I_{FSM} I^2t	$V_R = 0 \text{ V}$, $T_{vj} = 150 \text{ °C}$, $t_p = 10 \text{ ms}$, half-sinewave		5600 156800	A A ² s
Isolation voltage 绝缘电压	V_{isol}	1 min, $f = 50 \text{ Hz}$		4000	V
Junction operating temperature 运行结温	$T_{vj(op)}$		-40	175	°C
Case temperature 壳温	T_C		-40	125 ²	°C
Storage temperature 存储温度	T_{stg}		-40	125	°C
Mounting torques 紧固力矩 ³	M_s	Base-heatsink, M6 screws	3	6	Nm
	M_{t1}	Main terminals, M8 screws	8	10	Nm
	M_{t2}	Signal terminals, M3 screws	0.9	1.1	Nm



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¹ Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747; 根据标准 IEC 60747 要求，最大额定值表示超过该限值可能会对器件造成损坏

² For UL1557 compliance T_{Cmax} must be limited to 125°C

³ For details, please refer to the mounting instructions. 详细信息，请参考安装说明书

**IGBT⁴**

PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件	MIN 最小值	TYP 典型	MAX 最大值	UNIT 单位
Collector(-emitter) breakdown voltage 集电极-发射极击穿电压	V _{(BR)CES}	V _{GE} = 0 V, I _C = 1 mA, T _{vj} = 25°C	1700			V
Collector-emitter saturation voltage ⁵ 集电极-发射极饱和电压	V _{CEsat}	I _C = 1800 A, V _{GE} = 15 V	T _{vj} = 25 °C	1.75	2.1	V
			T _{vj} = 125 °C	2.0		V
			T _{vj} = 175 °C	2.15		V
Collector cut-off current 集电极截止电流	I _{CES}	V _{CE} = 1700 V, V _{GE} = 0 V	T _{vj} = 25 °C		1	mA
			T _{vj} = 125 °C	10		mA
			T _{vj} = 175 °C	90		mA
Gate leakage current 栅极漏电流	I _{GES}	V _{CE} = 0 V, V _{GE} = ±20 V	-0.5		0.5	μA
Gate-emitter threshold voltage 栅极-发射极阈值电压	V _{GE(th)}	I _C = 60 mA, V _{CE} = V _{GE} , T _{vj} = 25°C	5.0	6.0	7.0	V
Gate charge 栅极电荷	Q _G	I _C = 1800 A, V _{CE} = 900 V, V _{GE} = -15 V .. 15 V		16		μC
Input capacitance 输入电容	C _{ies}	V _{CE} = 25 V, V _{GE} = 0 V, f = 100 kHz, T _{vj} = 25 °C		226		nF
Output capacitance 输出电容	C _{oes}			5.8		nF
Reverse transfer capacitance 反向传输电容	C _{res}			1.4		nF
Internal gate resistor 栅极内阻	R _{Gint}	Per switch, f = 1 MHz, V _{GE} = 0V, CE short		0.17		Ω
Turn-on delay time 开通延迟时间	t _{d(on)}	V _{CC} = 900 V, I _C = 1800 A, R _G = 0.5 Ω, V _{GE} = ± 15 V, L _s = 20 nH, inductive load	T _{vj} = 25 °C			ns
			T _{vj} = 125 °C			ns
			T _{vj} = 175 °C			ns
Rise time 上升时间	t _r		T _{vj} = 25 °C			ns
			T _{vj} = 125 °C			ns
			T _{vj} = 175 °C			ns
Turn-off delay time 关断延迟时间	t _{d(off)}	V _{CC} = 900 V, I _C = 1800 A, R _G = 1.5 Ω, V _{GE} = ± 15 V, L _s = 20 nH, inductive load	T _{vj} = 25 °C			ns
			T _{vj} = 125 °C			ns
			T _{vj} = 175 °C			ns
Fall time 下降时间	t _f		T _{vj} = 25 °C			ns
			T _{vj} = 125 °C			ns
			T _{vj} = 175 °C			ns
Turn-on switching energy 开通损耗	E _{on}	V _{CC} = 900 V, I _C = 1800 A, R _G = 0.5 Ω, V _{GE} = ± 15 V, L _s = 20 nH, inductive load	T _{vj} = 25 °C	435		mJ
			T _{vj} = 125 °C	510		mJ
			T _{vj} = 175 °C	555		mJ
Turn-off switching energy 关断损耗	E _{off}	V _{CC} = 900 V, I _C = 1800 A, R _G = 1.5 Ω, V _{GE} = ± 15 V, L _s = 20 nH, inductive load	T _{vj} = 25 °C	430		mJ
			T _{vj} = 125 °C	560		mJ
			T _{vj} = 175 °C	625		mJ
Short circuit current 短路电流	I _{SC}	t _{pCS} ≤ 6 μs, V _{GE} = 15 V, T _{vj} = 175 °C, R _{G,on} = 1.5 Ω, V _{CC} = 1100V, V _{CEM Chip} ≤ 1700 V		7000		A

⁴ Characteristic values according to IEC 60747-9⁵ Collector-emitter saturation voltage is given at chip-level 集电极-发射极饱和电压



Diode⁶

PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件		MIN 最小值	TYP 典型	MAX 最大值	UNIT 单位
Forward voltage ⁷ 正向压降	V _F	I _F = 1800 A	T _{Vj} = 25 °C		2.0	2.3	V
			T _{Vj} = 125 °C		2.25		V
			T _{Vj} = 175 °C		2.2		V
Peak reverse recovery current 反向恢复电流峰值	I _{RM}	V _R = 900 V, I _F = 1800 A, di _F /dt = TBD kA/μs (175 °C), R _G =0.5 Ω, V _{GE} = ± 15 V, L _s = 20 nH, inductive load	T _{Vj} = 25 °C		1400		A
			T _{Vj} = 125 °C		1650		A
			T _{Vj} = 175 °C		1850		A
Recovery charge 恢复电荷	Q _{rr}		T _{Vj} = 25 °C		290		μC
			T _{Vj} = 125 °C		500		μC
			T _{Vj} = 175 °C		620		μC
Reverse recovery time 反向恢复时间	t _{rr}		T _{Vj} = 25 °C				ns
			T _{Vj} = 125 °C				ns
			T _{Vj} = 175 °C				ns
Reverse recovery energy 反向恢复能量	E _{rec}		T _{Vj} = 25 °C		165		mJ
			T _{Vj} = 125 °C		280		mJ
			T _{Vj} = 175 °C		370		mJ

NTC Thermistor

PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件	MIN 最小值	TYP 典型	MAX 最大值	UNIT 单位
Rated resistance 额定电阻	R ₂₅	T _C = 25 °C		5		kΩ
R100	R ₁₀₀	T _C = 100 °C	468		518	Ω
B-value B 值	B _{25/50}	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298.15K))]$		3375		K
B-value B 值	B _{25/100}	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298.15K))]$		3433		K

⁶ Characteristic values according to IEC 60747-2

⁷ Forward voltage is given at chip-level 正向压降是芯片两端的电压值。



Package properties 封装特性⁸

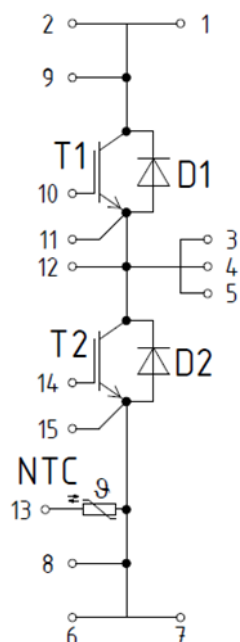
PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件		MIN 最小值	TYP 典型	MAX 最大值	UNIT 单位
IGBT thermal resistance junction to case IGBT 结-壳热阻	$R_{th(j-c)IGBT}$	Per switch 每一个开关				16.5	K/kW
Diode thermal resistance junction to case 二极管结-壳热阻	$R_{th(j-c)Diode}$					27.2	K/kW
IGBT thermal resistance case to heatsink IGBT 壳到散热器热阻	$R_{th(c-s)IGBT}$	IGBT per switch IGBT 每一个开关			14.4		K/kW
Diode thermal resistance case to heatsink 二极管壳到散热器热阻	$R_{th(c-s)Diode}$	diode per switch 二极管每一个开关			17.2		K/kW
Comparative tracking index 相对漏电起痕指数	CTI			600			
Module stray inductance 模块自身杂散电感	$L_{s\ CE}$	Per switch 每一个开关			11		nH
Resistance, terminal chip 端子到芯片之间的阻抗	$R_{CC'+EE'}$	Per IGBT 每一个 IGBT	$T_{vj} = 25\ ^\circ\text{C}$		0.2		mΩ
			$T_{vj} = 125\ ^\circ\text{C}$		0.285		mΩ
			$T_{vj} = 175\ ^\circ\text{C}$		0.315		mΩ
	$R_{AA'+DD'}$	Per Diode 每一个续流二极管	$T_{vj} = 25\ ^\circ\text{C}$		0.16		mΩ
			$T_{vj} = 125\ ^\circ\text{C}$		0.23		mΩ
			$T_{vj} = 175\ ^\circ\text{C}$		0.255		mΩ

Mechanical properties 机械特性

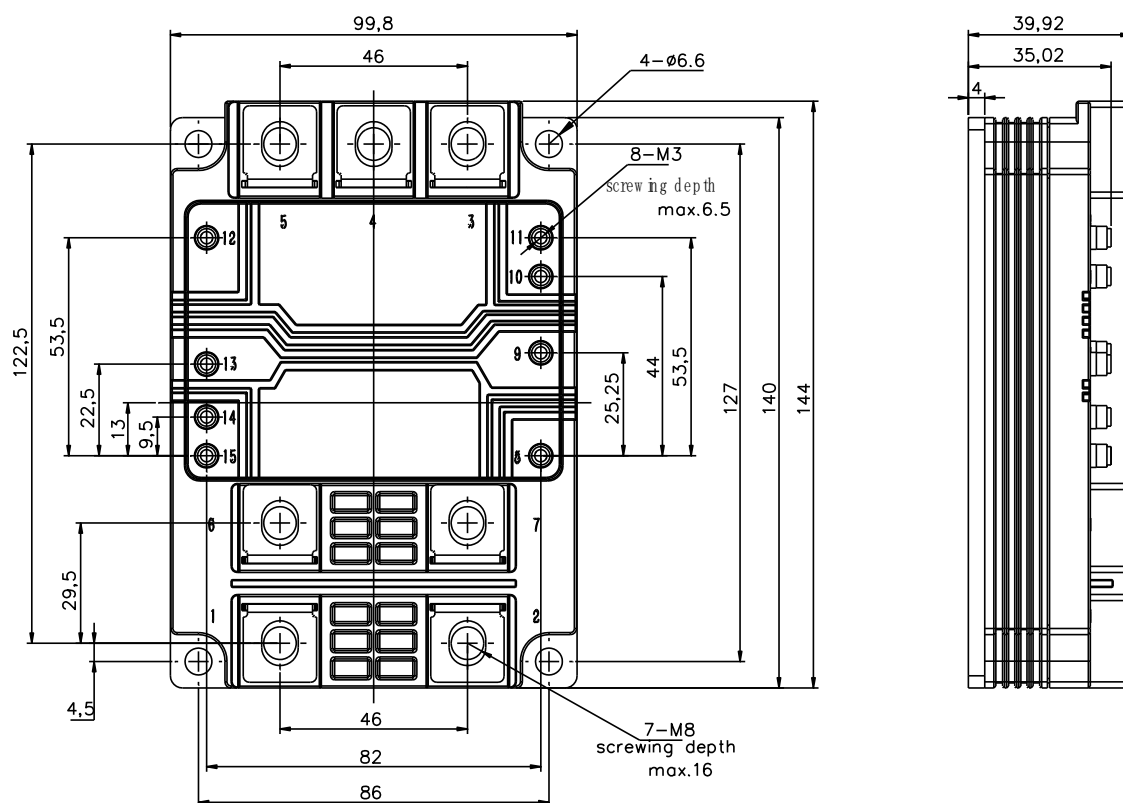
PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件		MIN 最小值	TYP 典型	MAX 最大值	UNIT 单位
Dimensions	L x W x H	Typical		140 x 100 x 40			mm ³
Clearance distance in air 电气间隙	d_a	According to IEC 60664-1 and EN 50124-1 参考标准 IEC 60664-1 和 EN 50124-1	Terminal to base: 端子到底板	31			mm
			Terminal to terminal: 端子到端子	8			mm
Surface creepage distance 爬电距离	d_s	According to IEC 60664-1 and EN 50124-1 参考标准 IEC 60664-1 和 EN 50124-1	Terminal to base: 端子到底板	40			mm
			Terminal to terminal: 端子到端子	34			mm
Mass 重量	m				1100		g

⁸ Package and mechanical properties according to IEC 60747-15

Electrical configuration 电气图



Outline drawing 外形图



This is an electrostatic sensitive device. 本产品对静电特别敏感.

This product has been designed and qualified for Industrial Level. 本产品的设计符合工业级标准。



Revision History 修订历史

Release 发布	Version 版本	Description 描述
2026-09-16	V2.0	Target Datasheet