

TARGET DATASHEET 规格书

SCSD0011XP230m23

XP-Type phase leg SiC MOSFET module

XP 封装半桥 SiC MOSFET 模块



$V_{DSS} = 2300 \text{ V}$

$R_{DSon} = 1.1 \text{ m Ohms}$

- *m23* generation SiC MOSFET chips; *m23* SiC MOSFET 芯片 – Ultra-low R_{DSon} ; 超低 R_{DSon}
 - 2000 A implemented current
 - Baseplate isolation with low R_{th} Si_3N_4 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
Drain – source voltage 漏极 – 源极电压	V_{DSS}	$V_{GS} \leq 0 \text{ V}$, $T_{vj} = 25 \text{ }^\circ\text{C}$		2300	V
Continuous drain and source current 漏极和源极连续电流	I_D , I_S	$T_C = 75 \text{ }^\circ\text{C}$, $V_{GS} = 18 \text{ V}$, $T_{vj} = 175 \text{ }^\circ\text{C}$		1350	A
Peak drain and source current 漏极和源极峰值电流	I_{DM} , I_{SM}	$t_p = 1 \text{ ms}$, limited by T_{vjmax}		4000	A
Gate-source voltage (DC) 栅源电压 (直流)	V_{GSS}		-8	22	V
Gate-source surge voltage 栅源浪涌电压	$V_{GSS \text{ surge}}$	$t_{\text{surge}} < 300\text{ns}$, $D < 1\%$	-10	25	V
Recommended gate voltage 建议栅极电压	V_{GS}		-5	18	V
Surge current 浪涌电流				TBD	A
MOSFET SCSOA	t_{psc}	$V_{DS} = 1500 \text{ V}$, $V_{GSon} = 18 \text{ V}$, $T_{vj} < 175 \text{ }^\circ\text{C}$		TBD	μs
Isolation voltage 绝缘电压	V_{isol}	1 min, $f = 50 \text{ Hz}$		4000	Vrms
Junction operating temperature 运行结温	$T_{vj(op)}$		-40	175	$^\circ\text{C}$
Case temperature 壳温	T_C		-40	125 ²	$^\circ\text{C}$
Storage temperature 存储温度	T_{stg}		-40	125	$^\circ\text{C}$
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 $^\circ\text{C}$

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

MOSFET⁴

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	
Drain-source breakdown voltage 漏极-源极击穿电压	V _{(BR)DSS}	V _{GS} </= 0 V, I _D = 1 mA, T _{vj} = -40 .. 25°C		2300			V	
Static drain-source on-state resistance ⁵ 静态漏极-源极导通电阻	R _{DS(on)}	I _D = 2000 A, V _{GS} = 18 V	T _{vj} = 25 °C		1.1		mΩ	
			T _{vj} = 175 °C		3		mΩ	
Zero gate voltage drain current 零栅极电压漏极电流	I _{DSS}	V _{DS} = 1200 V, V _{GS} = 0 V	T _{vj} = 25 °C		28	1000	μA	
			T _{vj} = 175 °C		140		μA	
Gate leakage current 栅极漏电流	I _{GSS}	V _{GS} = +22 / -10 V		-300		300	nA	
Gate-emitter threshold voltage 栅极-发射极阈值电压	V _{GS(th)}	V _{GS} = V _{DS} , I _D = 140 mA	T _{vj} = 25°C	2.5	3	3.5	V	
			T _{vj} = 175°C		TBD		V	
Gate charge 栅极电荷	Q _G	I _D = 2000 A, V _{DS} = 1500 V, V _{GS} = -5 V ... 18 V			5.6		μC	
Input capacitance 输入电容	C _{iss}	V _{DS} = 1500 V, V _{GS} = 0 V, f = 100 kHz, T _{vj} = 25 °C			1530		nF	
Output capacitance 输出电容	C _{oss}				5.05		nF	
Reverse transfer capacitance 反向传输电容	C _{rss}				0.42		nF	
Internal gate resistor 栅极内阻	R _{Gint}	Per switch			0.1		Ω	
Turn-on delay time 开通延迟	t _{d(on)}	V _{CC} = 1500 V, I _D = 2000 A, R _G = TBD Ω, V _{GS} = -5 / +18 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	t _{d(off)}	V _{CC} = 1500 V, I _D = 2000 A, R _G = TBD Ω, V _{GS} = -5 / +18 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} = 1500 V, I _D = 2000 A, R _G = TBD Ω, V _{GS} = -5 / +18 V, L _s = 20 nH, inductive load, t _{dead} =500 ns	T _{vj} = 25 °C				mJ	
			T _{vj} = 125 °C				mJ	
			T _{vj} = 175 °C		470		mJ	
Turn-off switching energy 关断损耗	E _{off}		V _{CC} = 1500 V, I _D = 2000 A, R _G = TBD Ω, V _{GS} = -5 / +18 V, L _s = 20 nH, inductive load	T _{vj} = 25 °C				mJ
				T _{vj} = 125 °C				mJ
				T _{vj} = 175 °C		400		mJ
Short circuit current 短路电流	I _{SC}	t _{pCS} ≤ 1.5 μs, V _{GE} = 18 V, T _{vj} = 175 °C, V _{CC} = 1500 V, V _{DSM} Chip ≤ 2300 V			TBD		A	

⁴ Characteristic values according to IEC 60747-8

⁵ Given at chip level



Body Diode (MOSFET)⁶

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
Drain-source reverse voltage ⁷ 漏源反向电压	V _{SD}	I _D = -2000 A, V _{GS} = -5 V	T _{vj} = 25 °C		5.5		V
			T _{vj} = 175 °C		5		V
MOSFET peak forward recovery current 峰值正向恢复电流	I _{fr}	V _R = 1500 V, I _{SD} = 2000 A, dI/dt = TBD kA/μs, R _G = TBD Ω, V _{GS} = -5 / +18 V, L _s = 20 nH, inductive load	T _{vj} = 25 °C				A
			T _{vj} = 125 °C				A
			T _{vj} = 175 °C				A
MOSFET forward recovery charge 远期恢复费用	Q _f		T _{vj} = 25 °C				μC
			T _{vj} = 125 °C				μC
			T _{vj} = 175 °C				μC
MOSFET forward recovery time 正向恢复时间	t _{fr}		T _{vj} = 25 °C				ns
			T _{vj} = 125 °C				ns
			T _{vj} = 175 °C				ns
MOSFET forward recovery energy 正向恢复能量	E _{fr}		T _{vj} = 25 °C				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 60747-8

⁷ Given at chip level



Package properties 封装特性⁸

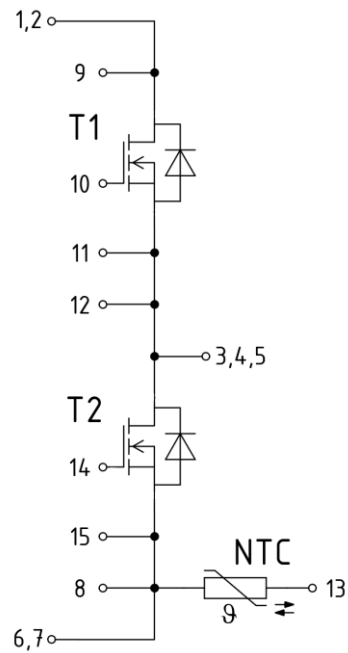
PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件		MIN 最小值	TYP 典型	MAX 最大值	UNIT 单位
Thermal resistance junction to case 结-壳热阻	$R_{th(j-c)}$	Per switch 每一个开关				18	K/kW
Thermal resistance case to heatsink 壳到散热器热阻	$R_{th(c-s)}$	per switch 每一个开关			12		K/kW
Comparative tracking index 相对漏电起痕指数	CTI			600			
Module stray 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	$R_{DD'+SS'}$	Per switch 每一个	$T_{vj} = 25\ ^\circ\text{C}$		0.3		mΩ
			$T_{vj} = 125\ ^\circ\text{C}$				mΩ
			$T_{vj} = 175\ ^\circ\text{C}$				mΩ

Mechanical properties 机械特性

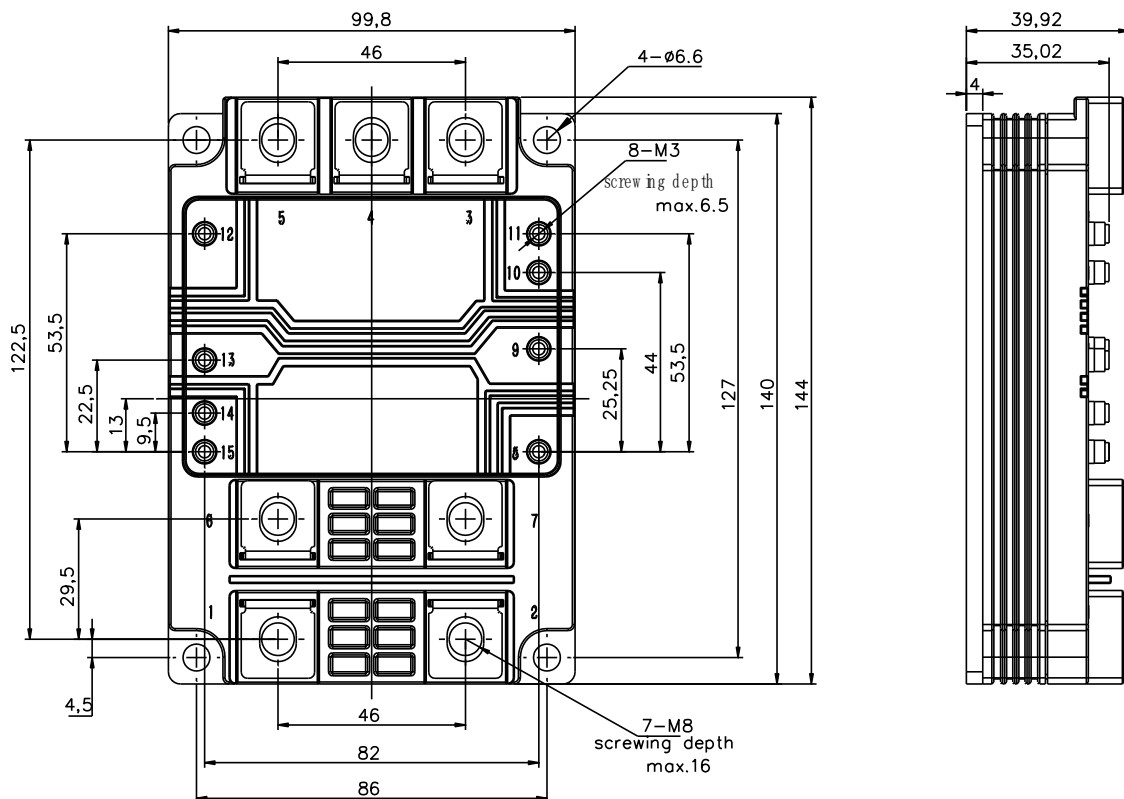
PARAMETER 参数	SYMBOL 符号	CONDITIONS 工作条件		MIN 最小值	TYP 典型	MAX 最大值	UNIT 单位
Dimensions	L x W x H	Typical		140 x 100 x 40			mm ³
Clearance distance in air 电气间隙	d_a	According to IEC 60664-1 and EN 50124-1 参考标准 IEC 60664-1 和 EN 50124-1	Terminal to base: 端子到底板	31			mm
			Terminal to terminal: 端子到端子	8			mm
Surface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