TARGET DATASHEET

SCSD0011XP230m23

XP-Type phase leg SiC MOSFET module

V_{DSS} = 2300 V
R_{DSon} = 1.1 m Ohms

- *m23* generation SiC MOSFET chips
- 2000 A implemented current
- Baseplate isolation with low Rth Si_3N_4 ceramic
- Cu baseplate for low thermal resistance
- Industry standard package with reduced internal impedance

Maximum ratings[1]

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
Drain – source voltage	V_{DSS}	V_{GS} </= 0 V, T_{vj} = 25 °C		2300	V
Continuous drain and source current	I_D, I_S	T_C = 75 °C, V_{GS} = 18 V, T_{vj} = 175 °C		1350	A
Peak drain and source current	I_{DM}, I_{SM}	t_p = 1 ms, limited by T_{vjmax}		4000	A
Gate-source voltage (DC)	V_{GSS}		-8	22	V
Gate-source surge voltage	$V_{GSS\ surge}$	t_{surge} < 300ns, D < 1%	-10	25	V
Recommended gate voltage	V_{GS}		-5	18	V
Surge current				TBD	A
MOSFET SCSOA	t_{psc}	V_{DS} = 1500 V, V_{GSon} = 18 V, T_{vj} < 175 °C		TBD	µs
Isolation voltage	V_{isol}	1 min, f = 50 Hz		4000	Vrms
Junction operating temperature	$T_{vj(op)}$		-40	175	°C
Case temperature	T_C		-40	125[2]	°C
Storage temperature	T_{stg}		-40	125	°C
Mounting torques [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;
[2] For UL1557 compliance T_{Cmax} must be limited to 125°C
[3] For details, please refer to the mounting instructions.

MOSFET[4]

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} </= 0 V, I_D= 1 mA, T_{vj} = -40 .. 25°C		2300			V
Static drain-source on-state resistance[5]	$R_{DS(on)}$	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	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	I_{GSS}	V_{GS} = +22 / -10 V		-300		300	nA
Gate-emitter threshold voltage	$V_{GS(th)}$	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	Q_G	I_D = 2000 A, V_{DS} = 1500 V, V_{GS} = -5 V ... 18 V			5.6		µC
Input capacitance	C_{iss}	V_{DS} = 1500 V, V_{GS} = 0 V, f = 100 kHz, T_{vj} = 25 °C			1530		nF
Output capacitance	C_{oss}				5.05		nF
Reverse tansfer capacitance	C_{rss}				0.42		nF
Internal gate resistor	R_{Gint}	Per switch			0.1		Ω
Turn-on delay time	$t_{d(on)}$	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	t_r		T_{vj} = 25 °C				ns
			T_{vj} = 125 °C				ns
			T_{vj} = 175 °C				ns
Turn-off delay time	$t_{d(off)}$	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	t_f		T_{vj} = 25 °C				ns
			T_{vj} = 125 °C				ns
			T_{vj} = 175 °C				ns
Turn-on switching energy	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	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	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	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Drain-source reverse voltage[7]	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	I_{frm}	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	Q_f		T_{vj} = 25 °C				µC
			T_{vj} = 125 °C				µC
			T_{vj} = 175 °C				µC
MOSFET forward recovery time	t_{fr}		T_{vj} = 25 °C				ns
			T_{vj} = 125 °C				ns
			T_{vj} = 175 °C				ns
MOSFET forward recovery energy	E_{fr}		T_{vj} = 25 °C				mJ

NTC Thermistor

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Rated resistance	R_{25}	T_C = 25 °C		5		kΩ
R100	R_{100}	T_C = 100 °C	468		518	Ω
B-value B	$B_{25/50}$	$R_2 = R_{25} \exp [B_{25/50}(1/T2 - 1/(298.15K))]$		3375		K
B-value B	$B_{25/100}$	$R_2 = R_{25} \exp [B_{25/100}(1/T2 - 1/(298.15K))]$		3433		K

[6] Characteristic values according to IEC 60747-8
[7] Given at chip level

Package properties [8]

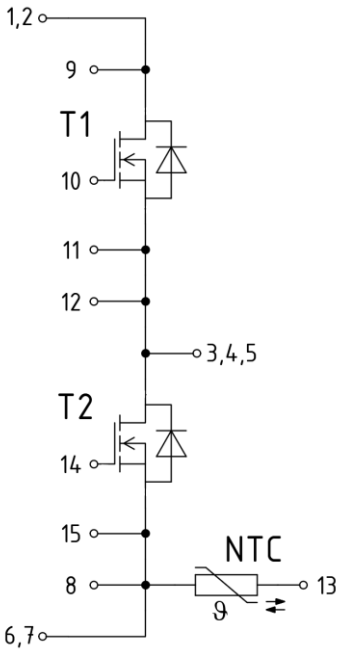
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Thermal resistance junction to case	$R_{th(j-c)}$	Per switch				18	K/kW
Thermal resistance case to heatsink	$R_{th(c-s)}$	per switch			12		K/kW
Comparative tracking index	CTI			600			
Module stray inductance	$L_{s\,CE}$	Per switch			11		nH
Resistance, terminal chip	$R_{DD'+SS'}$	Per switch	T_{vj} = 25 °C		0.3		mΩ
			T_{vj} = 125 °C				mΩ
			T_{vj} = 175 °C				mΩ

Mechanical properties

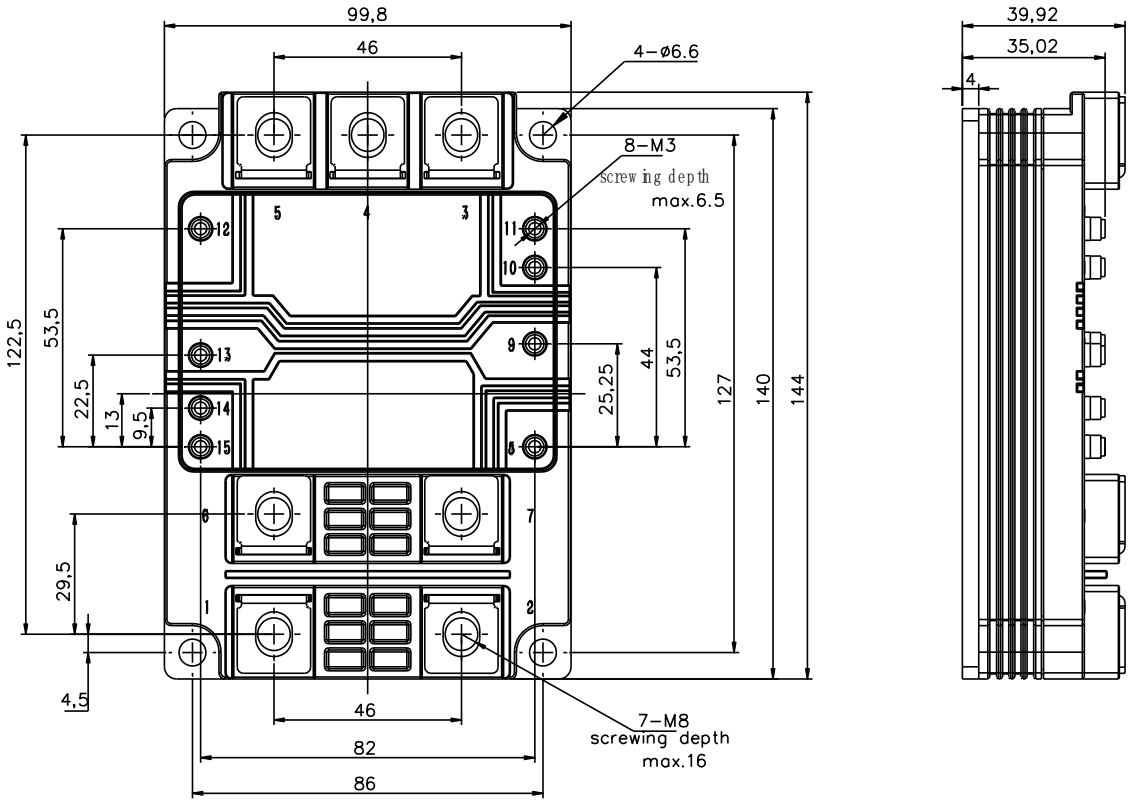
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Dimensions	L x W x H	Typical		140 x 100 x 40			mm^3
Clearance distance in air	d_a	According to IEC 60664-1 and EN 50124-1	Terminal to base:	31			mm
			Terminal to terminal:	8			mm
Surface creepage distance	d_s	According to IEC 60664-1 and EN 50124-1	Terminal to base:	40			mm
			Terminal to terminal:	34			mm
Mass	m				1100		g

[8] Package and mechanical properties according to IEC 60747-15

Electrical configuration



Outline drawing



This is an electrostatic sensitive device.
This product has been designed and qualified for Industrial Level.

Revision History

Release	Version	Description
2026-09-16	V2.0	Target Datasheet 目标数据表