TARGET DATASHEET

SISD1800XP170i23

XP-Type phase leg IGBT module

V_{CE} = 1700 V
I_C = 2 x 1800 A

- *i23* ultra-low loss micropattern Trench IGBT chip-set
- Baseplate isolation with low Rth Si3N4 ceramic
- Cu baseplate for low thermal resistance
- Industry standard package with reduced internal impedance

Maximum ratings[1]

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
Collector-emitter voltage	V_{CES}	V_{GE} = 0 V, T_{vj} = 25 °C		1700	V
DC collector current	I_C	T_C = 110 °C, T_{vj} = 175 °C		1800	A
Peak collector current	I_{CM}	t_p = 1 ms		3600	A
Gate-emitter voltage	V_{GES}		-20	20	V
DC forward current	I_F			1800	A
Peak forward current	I_{FRM}	t_p = 1 ms		3600	A
Surge current	I_{FSM} I^2t	V_R = 0 V, T_{vj} = 150 °C, t_p = 10 ms, half-sinewave		5600 156800	A A^2s
Isolation voltage	V_{isol}	1 min, f = 50 Hz		4000	V
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.

IGBT[4]

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Collector(-emitter) breakdown voltage	$V_{(BR)CES}$	V_{GE} = 0 V, I_C = 1 mA, T_{vj} = 25°C		1700			V
Collector-emitter saturation voltage [5]	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	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	I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V		-0.5		0.5	µA
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C = 60 mA, V_{CE} = V_{GE}, T_{vj} = 25°C		5.0	6.0	7.0	V
Gate charge	Q_G	I_C = 1800 A, V_{CE} = 900 V, V_{GE} = -15 V .. 15 V			16		µC
Input capacitance	C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 100 kHz, T_{vj} = 25 °C			226		nF
Output capacitance	C_{oes}				5.8		nF
Reverse tansfer capacitance	C_{res}				1.4		nF
Internal gate resistor	R_{Gint}	Per switch, f = 1 MHz, V_{GE} = 0V, CE short			0.17		Ω
Turn-on delay time	$t_{d(on)}$	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	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} = 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	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} = 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	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	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 60747-9
[5] Collector-emitter saturation voltage is given at chip-level

Diode[6]

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Forward voltage[7]	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	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	Q_{rr}		T_{vj} = 25 °C		290		µC
			T_{vj} = 125 °C		500		µC
			T_{vj} = 175 °C		620		µC
Reverse recovery time	t_{rr}		T_{vj} = 25 °C				ns
			T_{vj} = 125 °C				ns
			T_{vj} = 175 °C				ns
Reverse recovery energy	E_{rec}		T_{vj} = 25 °C		165		mJ
			T_{vj} = 125 °C		280		mJ
			T_{vj} = 175 °C		370		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 60747-2
[7] Forward voltage is given at chip-level

Package properties [8]

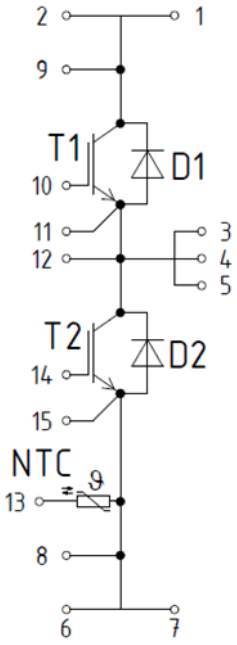
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
IGBT thermal resistance junction to case IGBT	$R_{th(j-c)IGBT}$	Per switch				16.5	K/kW
Diode thermal resistance junction to case	$R_{th(j-c)Diode}$					27.2	K/kW
IGBT thermal resistance case to heatsink	$R_{th(c-s)IGBT}$	IGBT per switch			14.4		K/kW
Diode thermal resistance case to heatsink	$R_{th(c-s)Diode}$	diode per switch			17.2		K/kW
Comparative tracking index	CTI			600			
Module stray inductance	$L_{s\,CE}$	Per switch			11		nH
Resistance, terminal chip	$R_{CC'+EE'}$	Per IGBT	T_{vj} = 25 °C		0.2		mΩ
			T_{vj} = 125 °C		0.285		mΩ
			T_{vj} = 175 °C		0.315		mΩ
	$R_{AA'+DD'}$	Per Diode	T_{vj} = 25 °C		0.16		mΩ
			T_{vj} = 125 °C		0.23		mΩ
			T_{vj} = 175 °C		0.255		mΩ

Mechanical properties

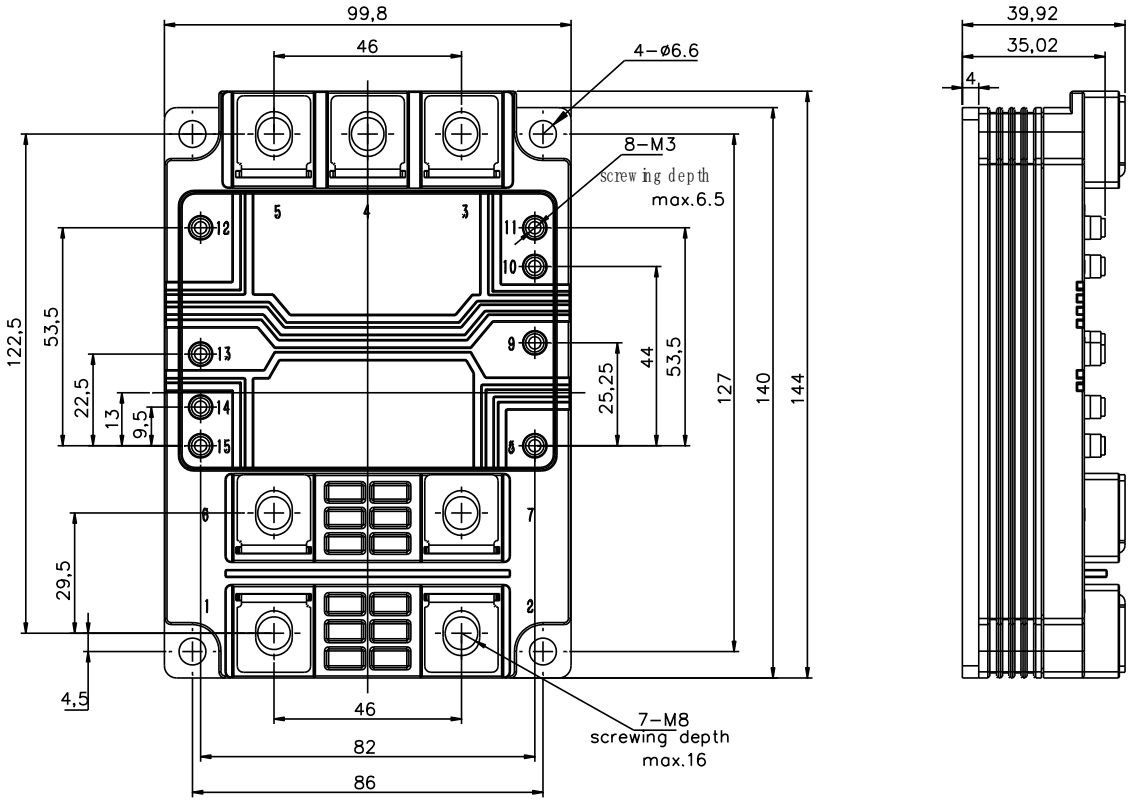
PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Dimensions	L x W x H	Typical			140 x 100 x 40		mm^3
Clearance distance in air	d_a	According to IEC 60664-1 and EN 50124-1 标准 IEC 60664-1EN 50124-1	Terminal to base:	31			mm
			Terminal to terminal:	8			mm
Surface creepage distance	d_s	According to IEC 60664-1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