

5SLD 1000N330300

HiPak DIODE Module

$V_{RRM} = 3300\text{ V}$
 $I_F = 2 \times 1000\text{ A}$

Ultra low-loss, rugged SPT+ diode
 Smooth switching SPT+ diode for good EMC
 AISiC base-plate for high power cycling capability
 AlN substrate for low thermal resistance
 2 diodes in 1 package
 Improved high reliability package
 Recognized under UL1557, File E196689



Maximum rated values ¹⁾

Parameter	Symbol	Conditions	min	max	Unit
Repetitive peak reverse voltage	V_{RRM}	$T_{vj} \geq 25\text{ }^\circ\text{C}$		3300	V
DC forward current	I_F			1000	A
Peak forward current	I_{FRM}	$t_p = 1\text{ ms, per Diode}$		2000	A
Total power dissipation	P_{tot}	$T_C = 25\text{ }^\circ\text{C, } T_{vj} = 150\text{ }^\circ\text{C, per Diode}$		4900	W
Surge current	I_{FSM}	$V_R = 0\text{ V, } T_{vj} = 150\text{ }^\circ\text{C, } t_p = 10\text{ ms, half-sinewave, per Diode}$		9000	A
Isolation voltage	V_{isol}	1 min, $f = 50\text{ Hz}$		6000	V
Junction temperature	T_{vj}			175	$^\circ\text{C}$
Junction operating temperature	$T_{vj(op)}$		-50	150	$^\circ\text{C}$
Case temperature	T_C		-50	150	$^\circ\text{C}$
Storage temperature	T_{stg}		-50	125	$^\circ\text{C}$
Mounting torques ²⁾	M_s	Base-heatsink, M6 screws	4	6	Nm
	M_{t1}	Main terminals, M8 screws	8	10	

¹⁾ Maximum rated values indicate limits beyond which damage to the device may occur per IEC 60747

²⁾ For detailed mounting instructions refer to Document No. 5SYA 2039

Diode characteristic values ³⁾

Parameter	Symbol	Conditions	min	typ	max	Unit
Forward voltage ⁴⁾	V _F	I _F = 1000 A	T _{vj} = 25 °C	2.05	2.5	V
			T _{vj} = 125 °C	2.25	2.6	V
			T _{vj} = 150 °C	2.20		V
Continuous reverse current	I _R	V _R = 3300 V	T _{vj} = 25 °C		0.5	mA
			T _{vj} = 125 °C	6	12	mA
			T _{vj} = 150 °C	30		mA
Reverse recovery current	I _{rr}		T _{vj} = 25 °C	1010		A
			T _{vj} = 125 °C	1180		A
			T _{vj} = 150 °C	1230		A
Recovered charge	Q _{rr}	V _{CC} = 1800 V, I _F = 1000 A, di/dt = 4 kA/μs L _σ = 100 nH, inductive load switch: 5SNA 1000N330300 Per Diode	T _{vj} = 25 °C	630		μC
			T _{vj} = 125 °C	1020		μC
			T _{vj} = 150 °C	1180		μC
Reverse recovery time	t _{rr}		T _{vj} = 25 °C	1125		ns
			T _{vj} = 125 °C	1440		ns
			T _{vj} = 150 °C	1630		ns
Reverse recovery energy	E _{rec}		T _{vj} = 25 °C	700		mJ
			T _{vj} = 125 °C	1210		mJ
			T _{vj} = 150 °C	1420		mJ

³⁾ Characteristic values according to IEC 60747 - 2

⁴⁾ Forward voltage is given at chip level

Package properties ⁵⁾

Parameter	Symbol	Conditions	min	typ	max	Unit
Diode thermal resistance junction to case	R _{th(j-c)DIODE}	Per Diode			0.025	K/W
Diode thermal resistance ²⁾ case to heatsink	R _{th(c-s)DIODE}	Per Diode, λ grease = 1W/m x K		0.024		K/W
Comparative tracking index	CTI		600			
Module stray inductance	L _{σ AC}	Per Diode		24		nH
Resistance, terminal-chip	R _{AA'+CC'}	Per Diode	T _C = 25 °C	0.166		mΩ
			T _C = 125 °C	0.226		
			T _C = 150 °C	0.240		

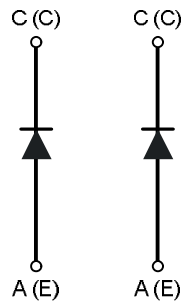
²⁾ For detailed mounting instructions refer to Document No. 5SYA 2039

Mechanical properties ⁵⁾

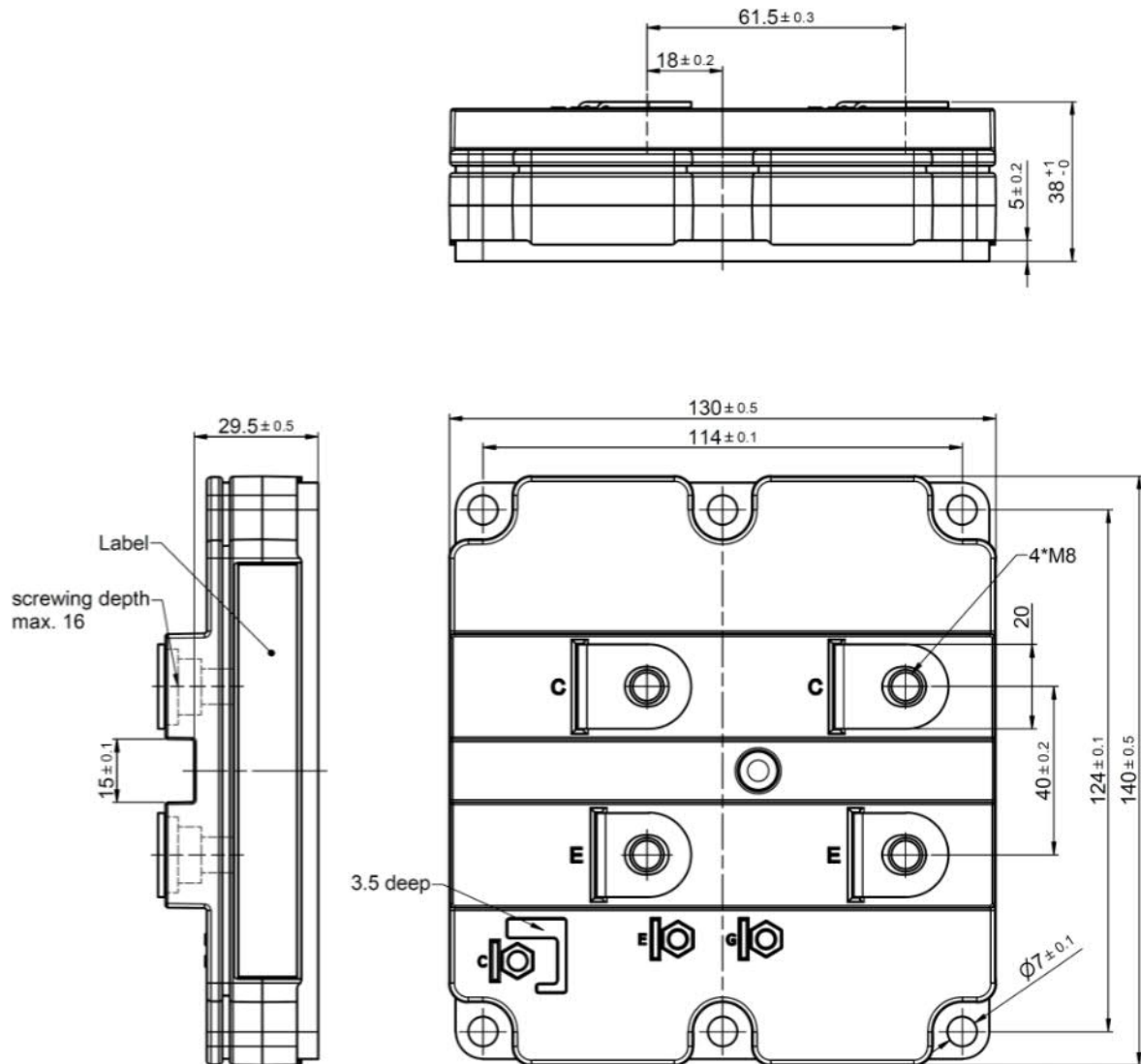
Parameter	Symbol	Conditions	min	typ	max	Unit
Dimensions	L x W x H	Typical		130 x 140 x 38		mm
Clearance distance in air	d _a	according to IEC 60664-1 and EN 50124-1	Term. to base:	19		mm
			Term. to term:	19		
Surface creepage distance	d _s	according to IEC 60664-1 and EN 50124-1	Term. to base:	28.2		mm
			Term. to term:	28.2		
Mass	m			790		g

⁵⁾ Package and mechanical properties according to IEC 60747 - 15

Electrical configuration



Outline drawing ²⁾



Note: all dimensions are shown in millimeters

²⁾ For detailed mounting instructions refer to Document No. 5SYA 2039

This is an electrostatic sensitive device, please observe the international standard IEC 60747-1, chap. IX.
This product has been designed and qualified for Industrial Level.

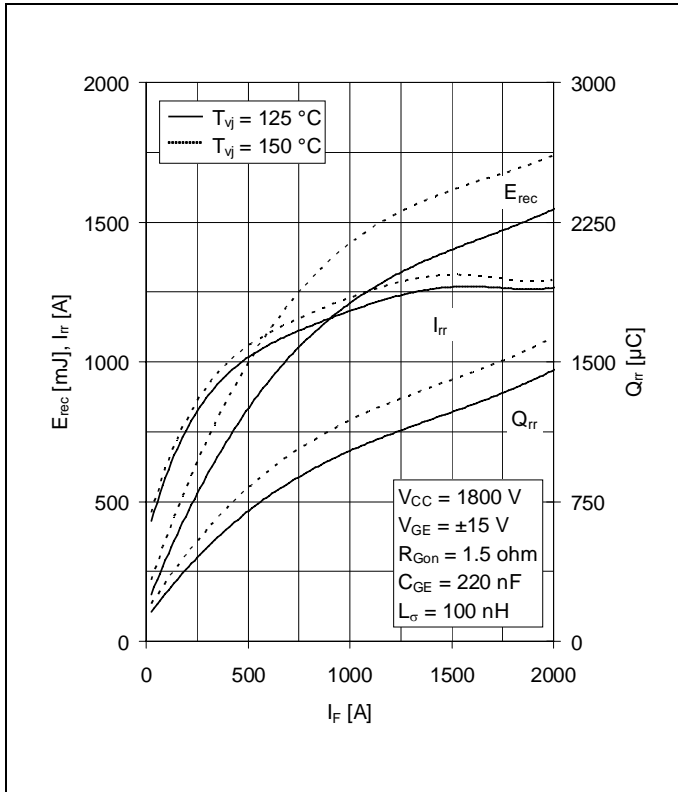


Fig. 1 Typical reverse recovery characteristics vs. forward current

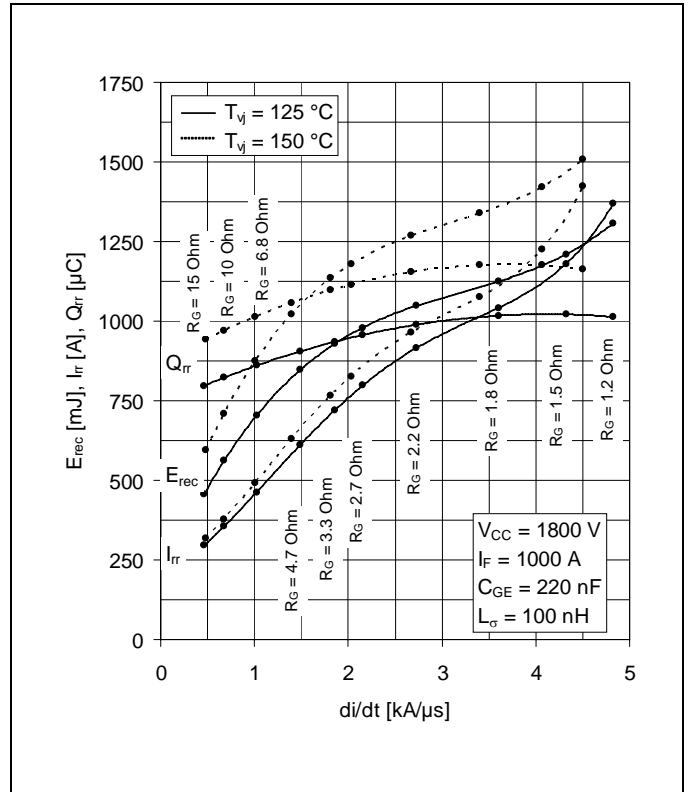


Fig. 2 Typical reverse recovery characteristics vs. di/dt

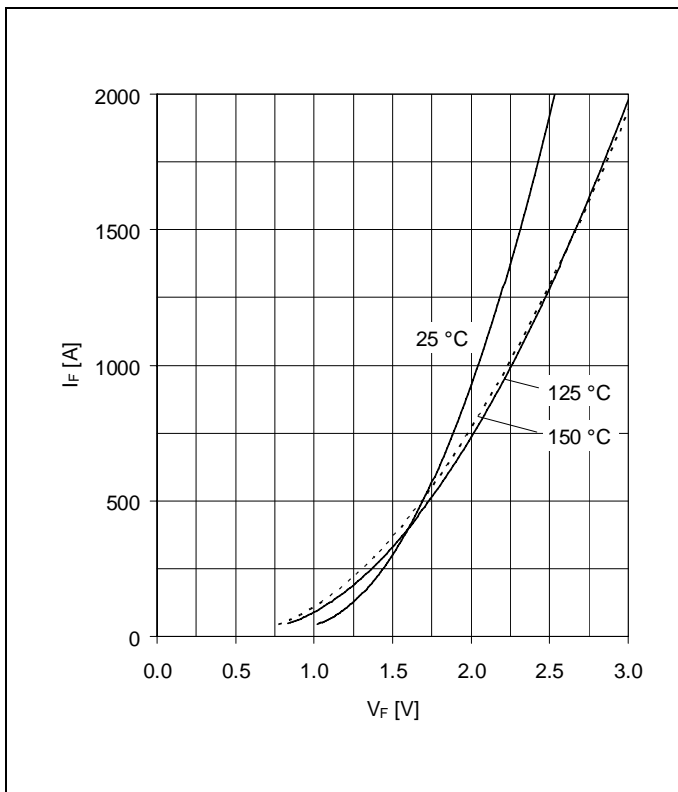


Fig. 3 Typical diode forward characteristics chip level

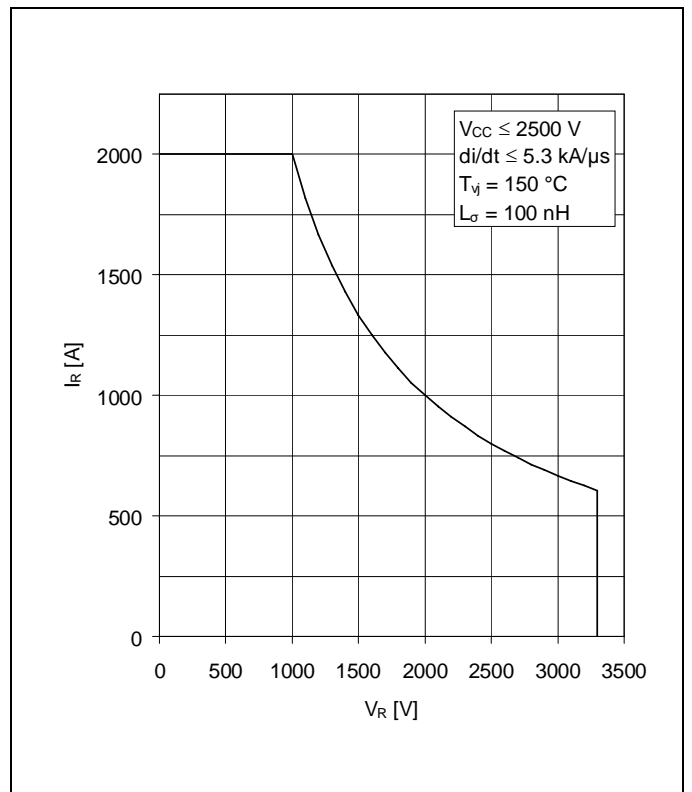


Fig. 4 Safe operating area diode (SOA)

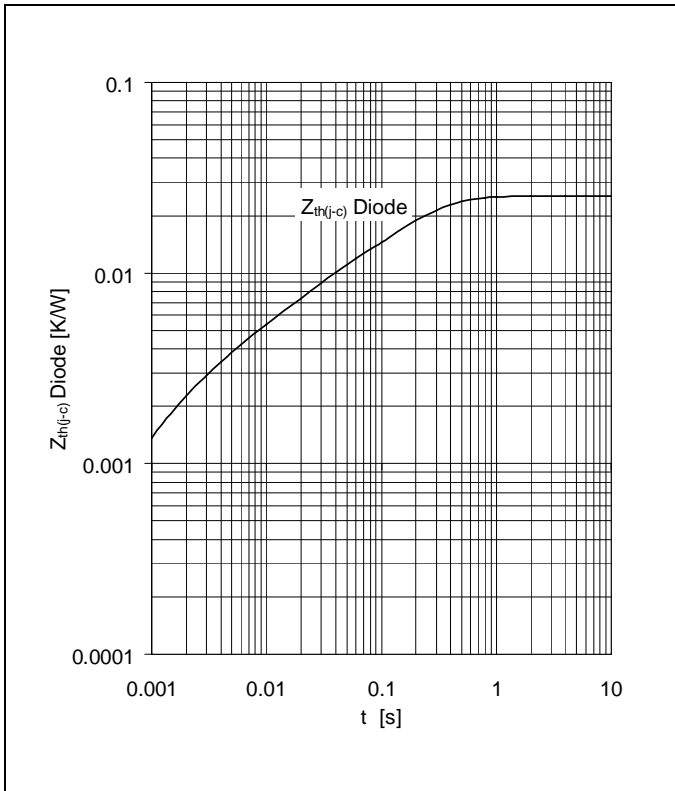


Fig. 5 Thermal impedance vs. time

Analytical function for transient thermal impedance:

$$Z_{th(j-c)}(t) = \sum_{i=1}^n R_i (1 - e^{-t/\tau_i})$$

DIODE	Ri(K/kW)	17.1	4.28	1.92	1.92	
	τ_i (ms)	203.6	30.1	7.53	1.57	

Related documents:

- 5SYA 2042 Failure rates of HiPak modules due to cosmic rays
- 5SYA 2043 Load - cycle capability of HiPaks
- 5SYA 2045 Thermal runaway during blocking
- 5SYA 2058 Surge currents for IGBT diodes
- 5SZK 9111 Specification of environmental class for HiPak Storage
- 5SZK 9112 Specification of environmental class for HiPak Transportation
- 5SZK 9113 Specification of environmental class for HiPak Operation (Industry)
- 5SZK 9120 Specification of environmental class for HiPak

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