5SLA 3600E170300
HiPak Single DIODE Module

V_{RRM} = 1700 V
I_F = 3600 A

Ultra low-loss, rugged SPT+ diode
Smooth switching SPT+ diode for good EMC
AlSiC base-plate for high power cycling capability
AlN substrate for low thermal resistance
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} ≥ 25 °C		1700	V
DC forward current	I_F			3600	A
Peak forward current	I_{FRM}	t_p = 1 ms		7200	A
Total power dissipation	P_{tot}	T_C = 25 °C, T_{vj} = 150 °C		10300	W
Surge current	I_{FSM}	V_R = 0 V, T_{vj} = 150 °C, t_p = 10 ms, half-sinewave		18000	A
Isolation voltage	V_{isol}	1 min, f = 50 Hz		4000	V
Junction temperature	T_{vj}			150	°C
Junction operating temperature	$T_{vj(op)}$		-50	150	°C
Case temperature	T_C		-50	150	°C
Storage temperature	T_{stg}		-50	125	°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 = 3600 A	T_{vj} = 25 °C		1.85	2.2	V
			T_{vj} = 125 °C		1.95	2.3	V
			T_{vj} = 150 °C		1.9		V
Continuous reverse current	I_R	V_R = 1700 A	T_{vj} = 25 °C		0.02		mA
			T_{vj} = 125 °C		20	40	mA
			T_{vj} = 150 °C		70		mA
Reverse recovery current	I_{rr}	V_{CC} = 900 V, I_F = 3600 A, di/dt = 11.5 kA/µs L_σ = 50 nH, inductive load switch: 5SNA 3600E170300	T_{vj} = 25 °C		2030		A
			T_{vj} = 125 °C		2340		A
			T_{vj} = 150 °C		2500		A
Recovered charge	Q_{rr}		T_{vj} = 25 °C		1000		µC
			T_{vj} = 125 °C		1560		µC
			T_{vj} = 150 °C		1820		µC
Reverse recovery time	t_{rr}		T_{vj} = 25 °C		900		ns
			T_{vj} = 125 °C		1230		ns
			T_{vj} = 150 °C		1320		ns
Reverse recovery energy	E_{rec}		T_{vj} = 25 °C		710		mJ
			T_{vj} = 125 °C		1080		mJ
			T_{vj} = 150 °C		1260		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	$R_{th(j-c)DIODE}$					0.012	K/W
Diode thermal resistance [2)] case to heatsink	$R_{th(c-s)DIODE}$	Diode, λ grease = 1W/m x K			0.018		K/W
Comparative tracking index	CTI			600			
Module stray inductance	$L_{\sigma AC}$				8		nH
Resistance, terminal-chip	$R_{AA'+CC'}$		T_C = 25 °C		0.055		mΩ
			T_C = 125 °C		0.075		
			T_C = 150 °C		0.080		

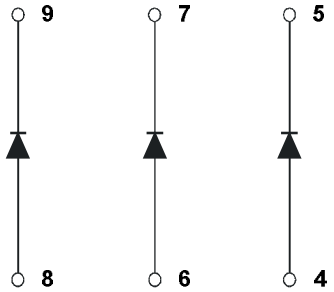
[2)] For detailed mounting instructions refer to ABB Document No. 5SYA 2039

Mechanical properties [5)]

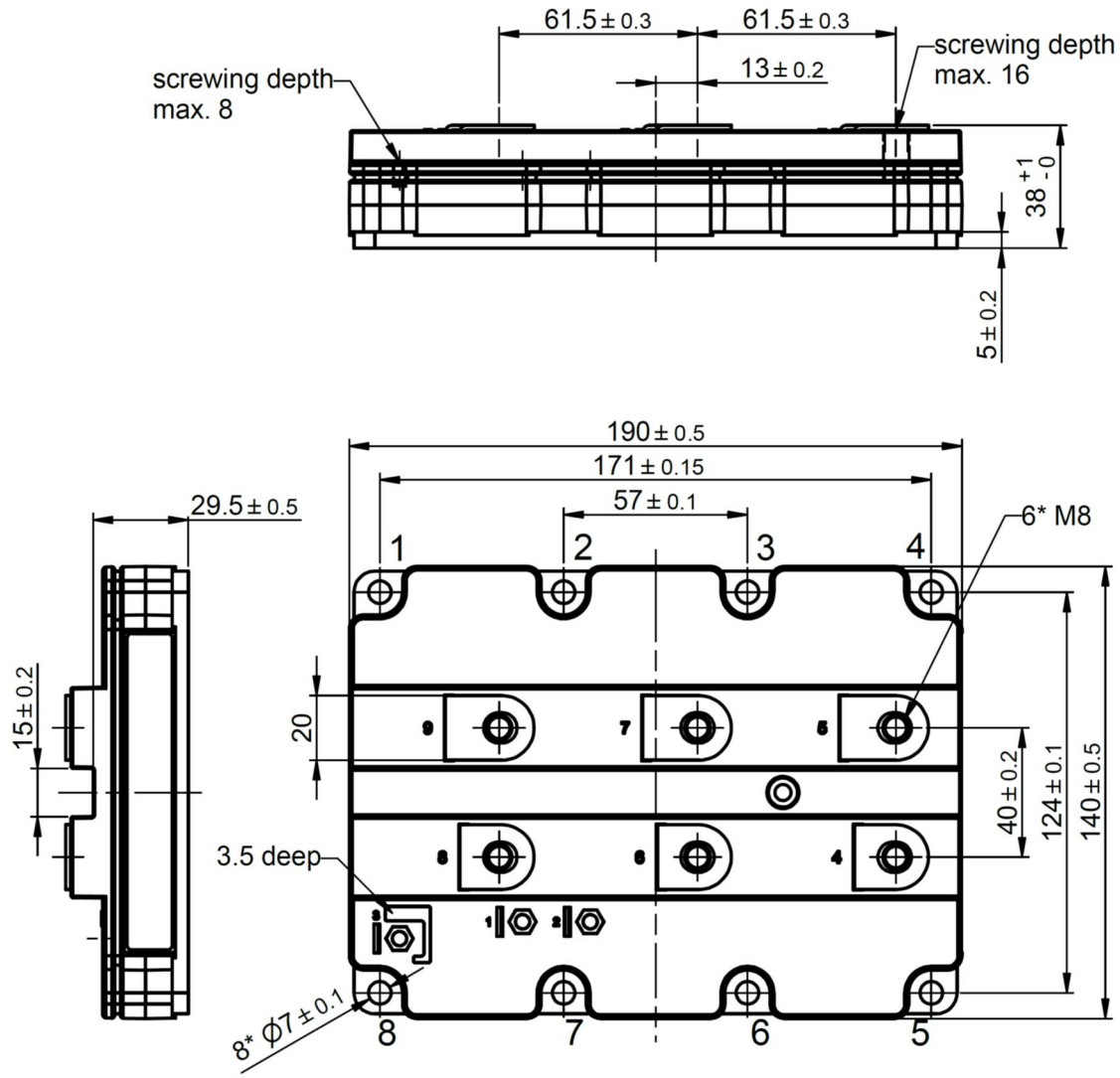
Parameter	Symbol	Conditions		min	typ	max	Unit
Dimensions	L x W x H	Typical		190 x 140 x 38			mm
Clearance distance in air	d_a	according to IEC 60664-1 and EN 50124-1	Term. to base:	23			mm
			Term. to term:	19			
Surface creepage distance	d_s	according to IEC 60664-1 and EN 50124-1	Term. to base:	28.2			mm
			Term. to term:	28.2			
Mass	m				1200		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.

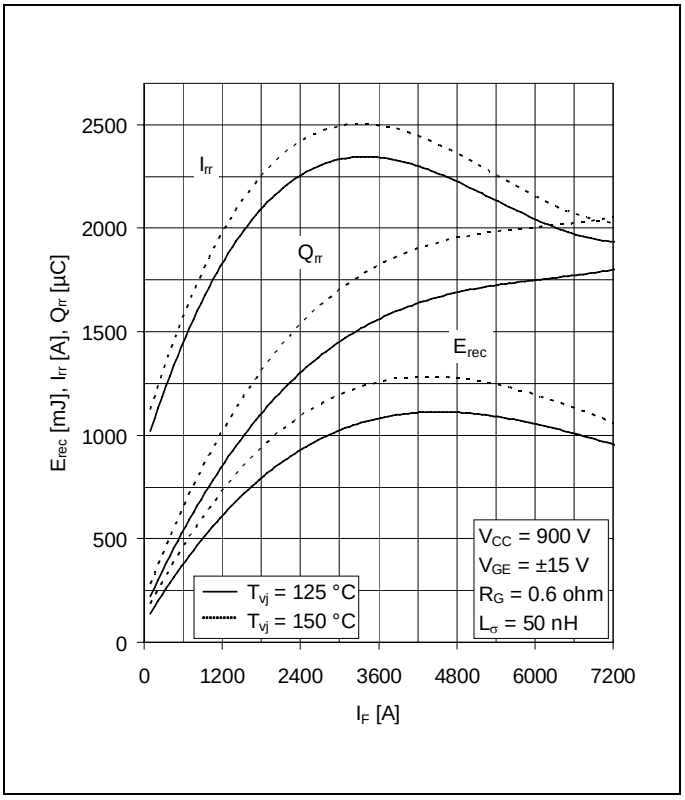


Fig. 1 Typical reverse recovery characteristics vs. forward current

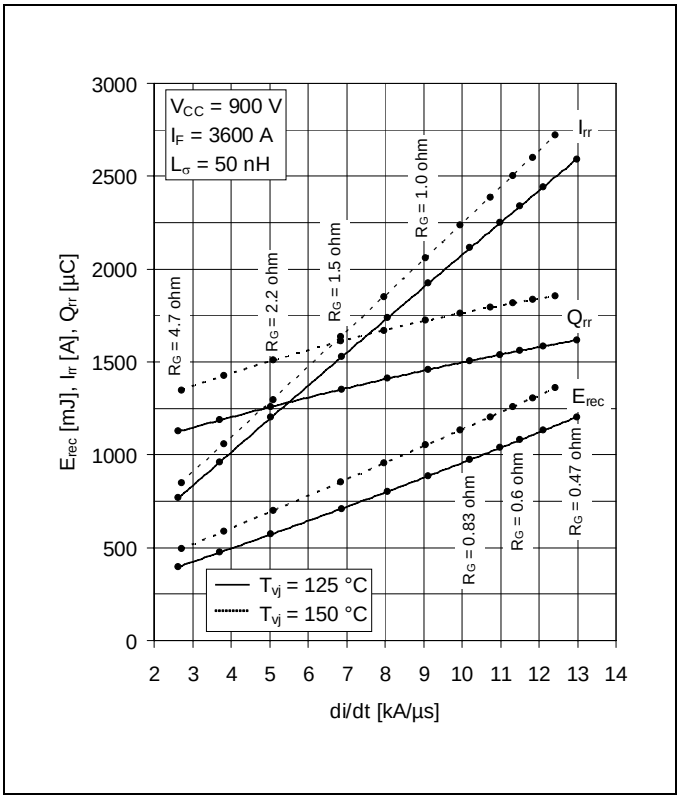


Fig. 2 Typical reverse recovery characteristics vs. di/dt

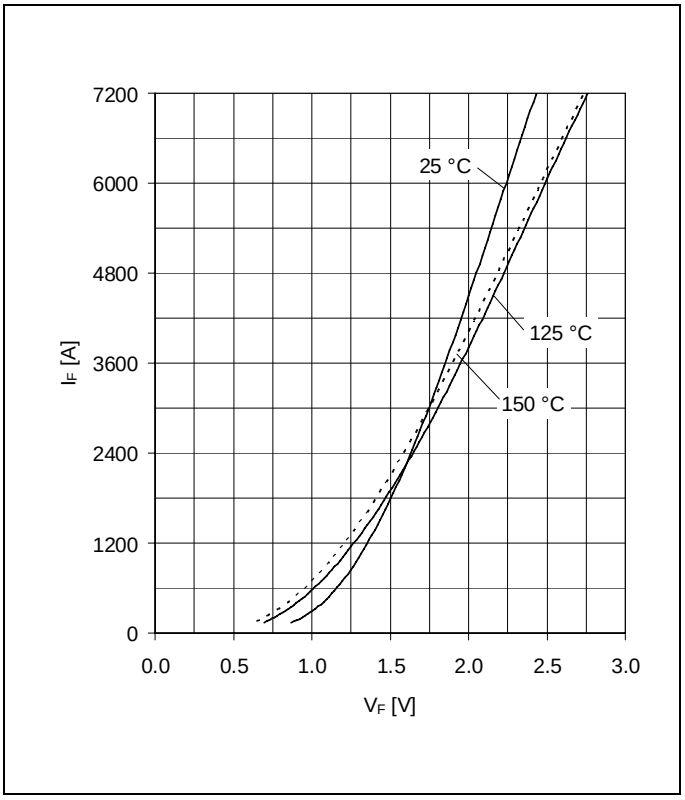


Fig. 3 Typicial diode forward characteristics chip level

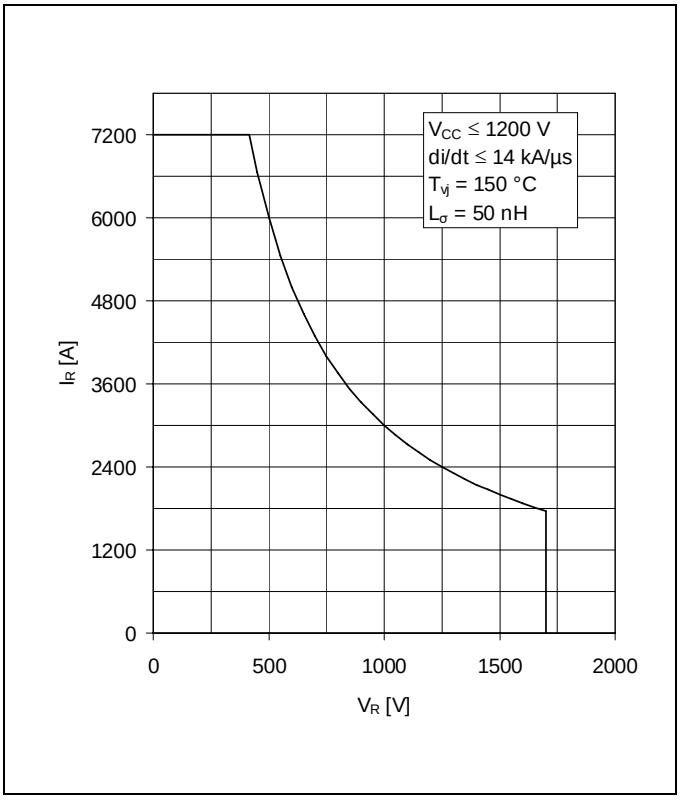


Fig. 4 Safe operating area diode (SOA)

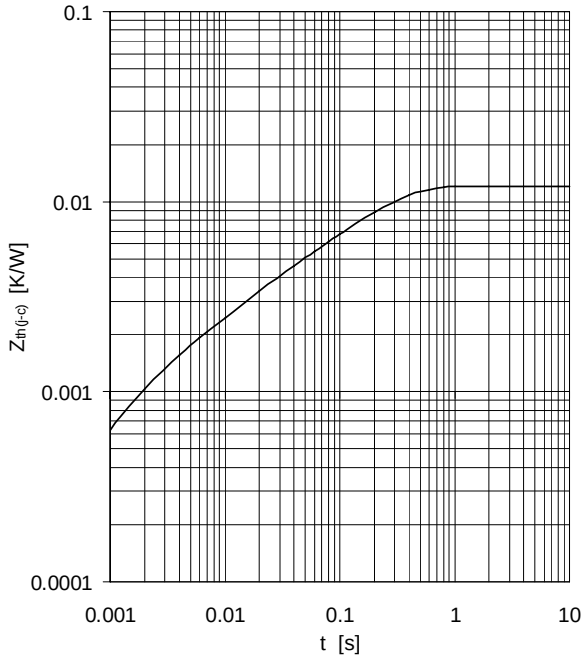


Fig. 5 Thermal impedance vs. time

Analytical function for transient thermal impedance:

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

DIODE	Ri(K/kW)	8.432	1.928	0.866	0.839	
	τi(ms)	210	29.6	7.01	1.49	

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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

ABB Power Grids Switzerland Ltd, Semiconductors
A Hitachi ABB Joint Venture
Fabrikstrasse 3
CH-5600 Lenzburg
Switzerland
www.hitachiabb-powergrids.com/semiconductors

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