

New Fast Recovery Diodes for IGCT Applications

ABB Semiconductors is pushing the physical limits to meet your needs



ABB launches new fast recovery diode types 5SDF 11H4505, 5SDF 20L4520 and 5SDF 28L4520

Fast recovery diodes, an integral part of inverter design, have seldom received the same attention as the switching elements such as IGBTs or IGCTs. As a result, Clamp, Neutral-Point Clamping and Free-Wheeling Diodes often have limited an optimal equipment design.

ABB has now developed a new range of fast recovery diodes offering enhanced Safe Operating Area (SOA) and controlled soft recovery at very high di/dt and dv/dt levels which are ideally suited for IGCT applications.

Features:

- high operating temperature range up to 140 °C
- optimized forward and reverse recovery characteristics
- excellent softness and enhanced SOA
- cosmic radiation withstand rating
- presspack devices

Applications:

- Snubber, clamp or freewheeling diodes for IGCT, IGBT or GTO applications

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Product range for Fast Recovery Diodes for IGCT

Part number	V_{RRM} [V]	V_{DC} [V]	I_{FAV} $T_c=70^\circ\text{C}$ [A]	I_{FSM} 1 ms T_{vj} [kA]	I_{FSM} 10 ms T_{vj} [kA]	V_{FO} T_{vj} [V]	r_F T_{vj} [mΩ]	I_r [A]	di/dt MAX. [A/μs]	T_{vj} [°C]	R_{thjc} [K/kW]	R_{thch} [K/kW]	F_m [kN]	Housing
5SDF 03D4502	4500	2800	275	10	5.0	2.15	2.80	355	300	115	40	8	16	D
5SDF 05F4502	4500	2800	435	32	16.0	2.42	2.10	610	430	115	17	5	20	F
5SDF 10H4502	4500	2800	810	40	24.0	2.42	1.10	1150	650	115	12	3	40	H
5SDF 10H4503	4500	2800	1100	47	20.0	1.75	0.88	1520	600	125	12	3	40	H
new 5SDF 11H4505	4500	2800	1576	58	23.0	2.43	0.65	1250	1000	140	8	3	40	H
5SDF 10H4520	4500	2800	1440	56	25.0	1.75	0.88	1600	600	140	10	3	40	H
5SDF 16L4503	4500	2800	1650	47	26.0	1.90	0.79	1200	600	125	6.5	3	40	L
new 5SDF 20L4520	4500	2800	2010	70	30.0	1.86	0.71	2400	1200	140	6.5	3	40	L
new 5SDF 28L4520	4500	2800	2750	70	30.0	1.35	0.38	2800	1000	140	6.5	3	40	L
5SDF 02D6004	5500	3300	175	8	3.0	3.35	7.20	300	220	115	40	8	16	D
5SDF 04F6004	5500	3300	380	22	10.0	2.70	2.80	600	340	115	22	5	20	F
5SDF 08H6005	5500	3300	585	40	18.0	4.50	1.30	900	440	115	12	3	40	H

Table 1 - Product range

Document Title	Document Number
Recommendations regarding mechanical clamping of high power press pack semiconductors	5SYA2036
Field measurements on high power press pack semiconductors	5SYA2048
Voltage ratings of high power semiconductors	5SYA2051
Failure Rates of Fast Recovery Diodes due to Cosmic Rays	5SYA2061
Applying Fast Recovery Diodes	5SYA2064
Specification of environmental class for pressure contact diodes, PCTs and GTO, STORAGE	5SZK9104
Specification of environmental class for pressure contact diodes, PCTs and GTO, TRANSPORTATION	5SZK9105
Specification of environmental class for presspack Diodes, PCTs and GTOs - Operation (Industry) -	5SZK 9115-00
Specification of environmental class for presspack Diodes, PCTs and GTOs - Operation (Traction) -	5SZK 9116-00

Table 2 - Principal applications documents

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