High voltage inverter discharge device

What is a high-voltage traction inverter?

The market for automotive powertrain electrification products like the high-voltage (HV) traction inverter grows as consumers and regulating agencies demand fewer emissions. In response, manufacturers of hybrid and electric vehicles (xEV) have doubled the HV battery level.

Do EV traction inverters need a DC link active discharge?

Every EV traction inverter requires a DC link active dischargeas a safety-critical function. The discharge circuit is required to discharge the energy in the DC link capacitor under the following conditions and requirements: Power transistor on,off control using the TPSI3050-Q1.

What is a high power density inverter?

Weight and power density - The wide band-gap switch and powertrain integration are the key technologies enabling high-power density inverter design. The inverter power density target of OEMs continues to, for example, 100 kW/L in the US market by 2025. The use of SiC enables 800-V DC bus voltage, reduce the current rating and wiring harness.

What technologies are used in traction inverters?

The devices and technologies used to enable traction inverters,including isolation,high-voltage domain,and low-voltage domain technology,are also covered. Finally,the document focuses on the system engineering concepts and designs to accelerate traction inverter design time. Figure 2-1.

How do EV traction inverters work?

To control the voltage so that the voltage does not exceed 50 V (touch safe), the auxiliary power supply has to turn on and power up safety-relevant circuits that can discharge the DC link caps (active discharge) or actively short circuit the motor. Every EV traction inverter requires a DC link active discharge as a safety-critical function.

Can a flyback converter provide a low-voltage discharge circuit?

The study introduces a low-voltage discharge circuitenabled by a flyback converter using MOSFET in linear mode,presenting two distinct approaches. The paper includes a simulation comparison of winding-based discharge with the proposed Hybrid discharge technique.

The generation of plasma by DBD has the advantages of low environmental requirements, simple operation, wide industrial applications, and the ability to stably generate low-temperature plasma. The high-frequency and high-voltage AC power supply is the main component of the DBD device. To achieve an adjustable frequency of the output voltage of ...

Claims. 1.-10. (canceled) 11. A control apparatus for a three-phase inverter of a vehicle prime mover, wherein

the control apparatus is configured: to actuate an active discharge of a DC link of the inverter,to simultaneously switch on lower half-bridge switches of the inverter during an active discharge, andto switch on one of upper half-bridge switches of the inverter in ...

The GD3160 is a programmable high-voltage gate driver with advanced functional safety, control and protection features developed for automotive and EV powertrain applications. GD3160 supports implementation of high-voltage HEV/EV traction inverters, and DC/DC converters using silicon IGBTs or SiC MOSFETs. GD3160: ADVANCED HIGH-VOLTAGE ...

1. Make sure your system and SPD has a good, low-resistance connection to the ground. 2. Match the surge protection device to the inputs of your power conversion equipment you want to protect by ensuring the "U c " voltage in the surge protection device datasheet is at or just slightly (preferably 0 to 10 V) above the maximum continuous voltage on the conductors to be ...

18-42, the term "impulse" refers to a voltage transient from a VSD or a special high-voltage "surge" tester. PD in a winding creates low-voltage pulses in response to the applied "impulse." For these technical specifications, a term called the repetitive partial discharge inception voltage (RPDIV) is defined as the

The high voltage multiplier circuits are responsible for rectification and multiplication of the high voltage transformer secondary voltage. These circuits use high voltage diodes and capacitors in a "charge pump" voltage doubler connection. As with the high voltage transformer, high voltage multiplier design requires specific expertise.

In this paper, the merits of a high-frequency resonant converter for supplying dielectric barrier discharges (DBD) devices are established. It is shown that, thanks to its high-frequency operating condition, such a converter allows to supply DBD devices with short discharge current pulses, a high repetition rate, and to control the injected power. In addition, ...

A DC link capacitor coupled to positive and negative DC busses between a high voltage DC source and an electric vehicle inverter is quickly discharged during a shutdown. An active discharge circuit connected across the link capacitor has a discharge resistor in series with a discharge switch. The discharge switch has a control terminal for selectably turning the ...

when an Electrical Vehicle (EV) encounters an accident or the vehicle is taken to a service station, the DC-link capacitor in the inverter must be discharged to ensure safety of ...

What is a High Voltage Inverter? A high voltage inverter is a device that converts the direct current (DC) electricity from solar panels or batteries into high voltage alternating current (AC) electricity that can be used by appliances and devices, or fed into the grid. A ...

High battery voltage. The inverter will shut down when the DC input voltage is too high. The LEDs will

signal shutdown due to high battery. The inverter will first wait 30 seconds and will only resume operation once the battery voltage has dropped to an acceptable level.

Active Discharge and Pre-charge A of EV High Voltage Power Bus K G 400V BATTERY SCR PN# D2PAK Breakdown Voltage Peak Current Current rise dI/dt Package Pre-charge R > 0.2 Ohms TN4035HA-8 * > 800V < 2000A < 450 A/µs D2PAK Discharge R > 0.2 Ohms TN4035HA-8 * > 800V < 2000A < 450 A/µs D2PAK * Production pre-release 800V ...

Design Priorities in EV Traction Inverter With Optimum Performance (Rev. A) This technical white paper explores key system trends, architecture, and technology for traction ...

Power Safety Devices DIScharge Resistors Our power safety devices as POWERfuse® and POWERcloser® offer: Miba POWERcloser® Emergency stop switch for HV applications In the event of a technical malfunction or accident, the Miba POWERfuse ® discon-nects the battery quickly and safely from the vehicle"s high-voltage electrical system.

Discharge of the HVDC bus is required at certain times. For instance, in some vehicles the HVDC bus must be discharged to a threshold safe state, e.g., below 60 VDC, within a calibrated ...

We have developed a bipolar pulsed dc glow plasma discharge system using an inverter power supply. A target of the developed system is a low-cost surface modification operated in a low background pressure region (10 1 -10 3 Pa) obtained with rotary pumps. In this pressure region, breakdown voltages for most gases have minimum values without the help of ...

The traction inverter efficiently converts DC power from a high-voltage battery to alternating phases of power needed to drive multi-phase motors. Galvanic isolation is required to protect people, as well as the low-voltage components on the cold side of the system, from the high-voltage traction inverter on the hot side of the system.

GoodWe"s new hybrid inverters have efficiency ratings of 98.0% and European efficiency ratings of 97.5 %. They are available in five versions, with power outputs ranging from 15 kW to 30 kW.

This design features a high-voltage inverter combined with a power factor correction (PFC) circuit utilizing the latest GaN FET technology for high efficiency. A powerful MCU provides precision motor control, while GreenPAK and HVPAK devices ensure hardware-based circuit protection. The result is a low-cost, highly efficient industrial motor drive.

Safety Requirement in ISO-6469 specify discharge in less than 10s but SCR Discharge in few milliseconds will limit the risk of Fire. In critical events the HV system shall be ...

High-Voltage Interlock Loop. The interlock loop is a 12-volt, low-current safety interlock (integrity) loop

circuit. These safety loop circuits tie in with all HV connectors, harnesses and other ...

A DC filter is used to create a smooth voltage from irregular or pulsating voltage sources. High peak currents and ripple currents are dissipated by capacitors storing and releasing charge in a controlled fashion. Inverter An inverter is a device that converts direct current power input to alternating polarity power output. Resonant Charge Circuit

and Piquet, Hubert and Meynard, Thierry A High Voltage High Frequency Resonant Inverter for Supplying DBD Devices with Short Discharge Current Pulses. (2014) IEEE Transactions on Power Electronics, vol. 29 (n° 8). pp. 4261-4269. ISSN 0885-8993 Any correspondence concerning this service should be sent to the repository administrator:

The proposed technique enhances redundancy, decreases the discharge time and minimize the risk of DC-link voltage overshoot during the regeneration action caused by quadrature axis ...

The corona discharge ionizer has been widely used to eliminate electrostatic charges on insulators in a variety of manufacturing industries for the prevention of electrostatic discharge (ESD) problems. High-speed electrostatic ...

The piezoelectric direct discharge (PDD) is a comparatively new type of atmospheric pressure gaseous discharge for production of cold plasma. The generation of such discharge is possible using the piezoelectric cold plasma generator (PCPG) which comprises the resonant piezoelectric transformer (RPT) with voltage transformation ratio of more than 1000, ...

Design Priorities in EV Traction Inverter With Optimum Performance Xun Gong Systems Manager, HEV/EV Traction Inverter ABSTRACT This technical white paper explores key system trends, architecture, and technology for traction inverters. The devices and technologies used to enable traction inverters, including isolation, high-voltage domain, and

To provide operational safety, the DC-Link capacitor must be discharged in two distinct operational scenarios: normal operation, such as after turning off the vehicle, and emergency situations, like post-vehicle collision or dangerous fault scenarios during ...

We have developed a bipolar pulsed dc glow plasma discharge system using an inverter power supply. A target of the developed system is a low-cost surface modification operated in a low background pressure region (10 1 -10 3 Pa) obtained with rotary pumps this pressure region, breakdown voltages for most gases have minimum values without the help of ...

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