

How do you connect a capacitor to a bus bar?

The most common and easiest connection method for a capacitor onto a bus bar is a screw or bolt on connection. Soldering or spot welding connection methods can also be used, but they greatly increase the cost and complexity of the design. In sum, the bus bar design starts along with the power electronics converter design.

Why does a bus bar have a high frequency capacitor?

The laminated structure of the bus bar creates a high frequency capacitor that helps mitigate the noise propagation, though this unintended filter is likely not enough to completely remove the issue. An unavoidable result of fast switching devices is the high frequency harmonics, termed Electromagnetic Interference (EMI).

What is a bus bar conductor sized for?

Typically, the bus bar conductors are sized for a 30 C self-heating temperature. The lower boundaries in bus bar design require: a minimum conductor thickness to prevent it from melting when the nominal current is applied and a minimum insulation thickness to sustain the intended operating voltage.

How to design a bus bar?

As illustrated by Fig. 1 a bus bar design is composed of several steps. Power semiconductors and DC-link capacitor geometry are chosen to optimize the power density as well as to minimize the bus bar complexity. Some examples are presented at the first step including air and water cooled configurations.

How to design a bus bar with a small inductance?

It can be seen in (4) that the way to design a bus bar with a total inductance as small as possible is to design it with the maximized mutual inductance and is to maximize the over-lap area of two conductors. Therefore, the laminated bus bar structure is preferred in the design.

What are the different types of bus bar configurations?

Simpler bus bar configurations are shown in Fig. 3(c) and (e). Type C consists of a flat bus bar connecting the input and output with the dc-link capacitor, while type E is shaped around the capacitors. In most cases, the ability to share the heat sink between the power semiconductors and dc-link capacitor is lost in this configuration.

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rated power and shape are investigated regarding their ...

Traditionally capacitors are connected to bus bars by screw or solder connections which may cause increased inductance in the sub-assembly. Mersen Fischerlink 2.0 uses laser welding to connect capacitor terminals to bus bars, thus improving the overall performance of the assembly and reducing the footprint. Laser welding the connections has several advantages compared ...

... successful modelling, acceleration and verification of the bus bar macro models, we can now start investigating the actual dc link impedance characteristics. For that purpose, several...

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This paper focuses on designing a distributed dc-link capacitor bank using multi-layer series-connected ceramic capacitors (MLSCs) which have higher operating temperature, lower ESL and lower volume than film capacitors. The paper addresses the design of a busbar assembly connecting several MLSCs to the inverter power modules and the power ...

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Figure 1 shows the shunt capacitor size, which is the optimal size for each bus bar location. Figure 2 shows the total losses for each optimal shunt capacitor size installed at each busbar...

Laminated bus bars provide a low inductance connection for capacitors. The assembly was designed for an automated production process and the assembly is the DC capacitor bank used in conjunction with high current, high speed switching applications. Positive and negative layers are formed and laminated without outside insulation. This design ...

Busbars are critical components that connect high-current and high-voltage subcomponents in high-power converters. This paper reviews the latest busbar design methodologies and offers design recommendations for both laminated and PCB-based busbars.

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This paper presents a comprehensive analysis about bus bar design procedure. Some applications in terms of rated power and shape are investigated regarding their particular requirements and challenges. The dc-link capacitor selection is one of the first and most important steps. It not only dictates the bus bar complexity but also is the key to ...

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