



**VDB Solar Solutions**

# **Solid state power controller aircraft**

*Lower cost  
larger system*

**20Kwh**

**30Kwh**



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## Overview

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What is a high-power solid-state power controller (SSPC)?

Abstract: The high-power solid-state power controller (SSPC) will be a critical component for the future electrified aircraft propulsion system. This article presents the development of a 1 kV 500 A bidirectional dc SSPC using SiC power modules and transient voltage suppression (TVS) diodes.

What is HVDC solid-state power controller (SSPC)?

Abstract: 270V high-voltage direct-current (HVDC) power supply system is the preferred power supply scheme for multi-electric aircraft (MEA). In order to improve the intelligence and reliability of the power supply system, the HVDC solid-state power controller (SSPC) is gradually replacing the traditional mechanical protection device.

Can solid state power controller be used for DC-DC converter?

This paper deals with the design of a solid state power controller (SSPC) for a DC-DC converter in an aeronautic application. First, the specifications are drawn appropriately with the aeronautic environment. Then the design and experimental validation are described. Introduction.

Which SSPC solution should be used for future aircraft?

After comparing the conduction losses, maximum junction temperature, power density, weight and volume, the single device solution is recommended as a preferable SSPC option for future aircraft. The thermal images of the SSPCs during steady-state operation with 100 A current. References is not available for this document. Need Help?

Are high-power sspcs suitable for a 270vdc network?

This paper tries to fill this gap and presents the development of high-power



SSPCs for a  $\pm 270\text{VDC}$  network of a future turboprop aircraft. Comprehensive designs of proper over-voltage suppression along with SSPC thermal management are presented in this paper.

Can sspcs be used for 28V DC aircraft onboard network?

Although the high-voltage direct current (HVDC) electrical system can bring sustainable savings on the cables' weight and losses, the protection can be considerably challenging. SSPCs have been successfully utilized for 28V DC aircraft onboard network.



## Solid state power controller aircraft

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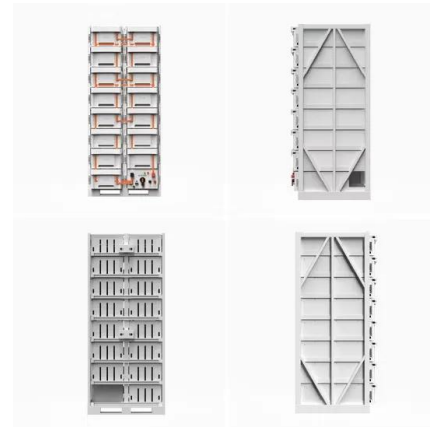


### Aircraft Electrical Solid State Power Controller SSPC Market

The Global Aircraft Electrical Solid State Power Controller SSPC market was valued at USD 476.9 million in 2023 and is anticipated to project robust growth in the forecast period with a CAGR of 9.48% through 2029, reaching USD 828.57 million. The global aircraft

### Development of High-Current Solid-State Power Controllers for Aircraft

DOI: 10.1109/ACCESS.2021.3099257 Corpus ID: 236522339 Development of High-Current Solid-State Power Controllers for Aircraft High-Voltage DC Network Applications @article{Huang2021DevelopmentOH, title={Development of High-Current Solid-State Power Controllers for Aircraft High-Voltage DC Network Applications}, author={Zhen Huang and Tao ...



### Implementation of a Solid-State Power Controller for High-Voltage ...

DOI: 10.17877/DE290R-7742 Corpus ID: 55606516 Implementation of a Solid-State Power Controller for High-Voltage DC Grids in Aircraft @inproceedings{Terorde2015ImplementationOA, title={Implementation of a Solid-State Power Controller for High-Voltage DC Grids in Aircraft}, author={Michael Terorde and Florian Grumm ...

### Power semiconductor devices for solid state power controller ...

Protective devices such as circuit breakers play a



critical role in electric power distribution systems in more electric aircraft (MEA). Due to the extreme safety requirements, fast response and arc-less operation is critical for protection and fault isolation of the electric power system of the aircraft and therefore solid-state power controller (SSPC) technology is gaining interest in ...



LPW48V100H  
48.0V or 51.2V

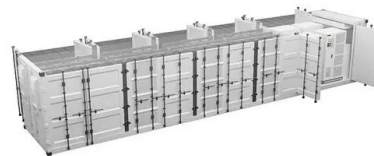


### Safety Analysis and Comprehensive Testing of the Solid-State Power

The Solid-State Power Controller (SSPC) is an important part of Secondary Power Distribution Assembly (SPDA), which is used on the civil aircraft power system design. As the SSPC using the same technique, it needs to consider the common mode failure effect to the function of utilization system even the whole aircraft. It can acquire the effect to the air-craft function basing on the ...

### Self-testing Solid-State Power Controller for High-Voltage-DC Aircraft

Nowadays solid-state power controllers (SSPC) are widely used in aircraft secondary power supply, because of a higher count of switching cycles, small weight, flexible trip behavior, and a fieldbus connection. Typically, they protect loads and their connection lines.



### Solid State Power Controllers (SSPC) Information

1 ??· Solid state power controllers (SSPC) are semiconductor devices that control power (voltage and/or current) supplied to a load. They perform supervisory and diagnostic functions in order to identify overload conditions and prevent short circuits. SSPCs are similar to electronic circuit breakers that



### A Bidirectional Solid-State Power Controller for 270V HVDC Aviation

270V high-voltage direct-current (HVDC) power supply system is the preferred power supply scheme for multi-electric aircraft (MEA). In order to improve the intelligence and reliability of the power supply system, the HVDC solid-state power controller (SSPC) is gradually replacing the traditional mechanical protection device. A 270V/20A bidirectional HVDC SSPC is designed in ...



- TELECOM CABINET
- BRAND NEW ORIGINAL
- HIGH-EFFICIENCY



### A Bidirectional Solid-State Power Controller for 270V HVDC ...

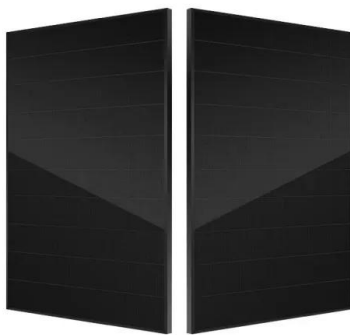
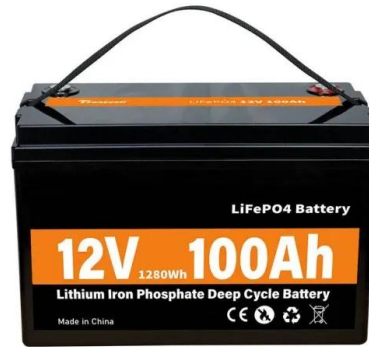
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### Development of High-Power Bidirectional DC Solid-State Power Controller

DOI: 10.1109/JESTPE.2021.3139903 Corpus ID: 245623497 Development of High-Power Bidirectional DC Solid-State Power Controller for Aircraft Applications @article{Dong2022DevelopmentOH, title={Development of High-Power Bidirectional DC Solid-State Power Controller for Aircraft



Applications}, author={Zhou Dong and Ren Ren and Fei ...



### [Power Distribution and Management Systems](#)

Collins Aerospace's solid state distribution systems are the standard on numerous airplane platforms with over 2 million devices in service. Our systems are designed to provide power distribution functionality for the aircraft of today and tomorrow.

### **A Design of Solid State Power Controller for a bidirectional DC ...**

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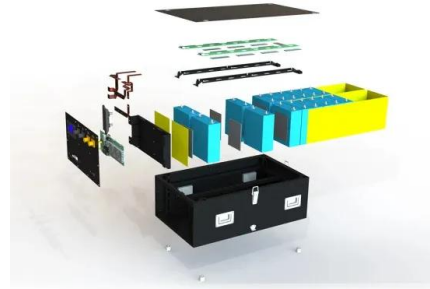
### **Aircraft Electrical Solid-State Power Controller Market Growth**

The aircraft solid-state power controller (SSPC) market is estimated to grow at a CAGR of 5.3% over the next eight years to reach US\$ 478 million by 2032. A gradual shift from traditional circuit breakers to SSPCs can be seen in the aircraft industry. SSPCs offer superior performance, improved efficiency, and enhanced safety coupled with weight and space savings.



## Implementation of a Solid-State Power Controller for High ...

Implementation of a Solid-State Power Controller for High-Voltage DC Grids in Aircraft Michael Terörde, Florian Grumm, Detlef Schulz Helmut Schmidt University / University of the Federal Armed



## Development of High-Power Bidirectional DC Solid-State Power Controller

16 the developed SSPC are superior to state-of-the-art counterparts 17 to show the advantage of the developed one. 18 Index Terms--Electrified aircraft, SiC power module, solid-19 state circuit breaker, solid-state power controller, TVS diode. 20 I. I 21 T

## Solid-State Power Controllers

Power management with PDC's Solid-State Power Controller (SSPC) solutions offer dramatic SWaP-C saving advantages over the electromechanical switches, relays, and circuit breakers they replace. PDC's power conversion and supply solutions, offering greater than 92% efficiency, provide high quality conditioned power in a space saving, reliable, and field-proven, "fit and

...



## **SOLID-STATE POWER CONTROLLER , Aviation Week Network**

The heightened attention on aircraft wire arcing and protection prompted AMETEK Aerospace to offer a small plug-in component, the AMPHION solid-state power controller, designed to offer better



### Solid State Power Controller Technology 931422

Advanced electrical power systems proposed for new platforms such as the more electric aircraft (MEA) require the use of electrical load management systems. A load management system is used to allow the aircraft power system to make critical decisions as to which loads at any given time are mission



### Aircraft Electrical Solid State Power Controller SSPC Market

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### Development of High-Current Solid-State Power Controllers for Aircraft

INDEX TERMS More-electric Aircraft, solid state power controller, thermal analysis, voltage clamping. I. INTRODUCTION The fossil fuel-driven aerospace industry contributes about 3% of the global





Solid-State Power Control Solutions

MIL-STD-704F Electric Power, Aircraft MIL-STD-1275D Vehicle Power, 28VDC MIL-STD-461E Electro-magnetic Interference DDC's Solid-State Power Controller (SSPC) cards, power distribution units, and modules provide state of the art switching and circuit

**INTEGRATED DESIGN**  
EASY TO TRANSPORT AND INSTALL,  
FLEXIBLE DEPLOYMENT



**Development of High-Power Bidirectional DC Solid-State Power ...**

The high-power solid-state power controller (SSPC) will be a critical component for the future electrified aircraft propulsion system. This article presents the development of a 1 ...

Solid-State Power Control Solutions

DDC's Solid-State Power Controller (SSPC) cards, power distribution units, and modules provide state of the art switching and circuit MIL-STD-704F Electric Power, Aircraft MIL-STD-1275D Vehicle Power, 28VDC MIL-STD-461E Electro-magnetic Interference



**Development of High-Power Bidirectional DC Solid-State Power Controller**

The high-power solid-state power controller (SSPC) will be a critical component for the future electrified aircraft propulsion system. This article presents the development of a 1 kV 500 A bidirectional dc SSPC using SiC power modules and transient voltage suppression (TVS) diodes. The design procedure and implementation of the SSPC are presented in detail and the ...





### Global Aircraft Solid-State Power Controller (SSPC) Market ...

List of Tables Table 1. Global Aircraft Solid-State Power Controller (SSPC) Market Size Growth Rate by Type, 2018 VS 2022 VS 2029 (US\$ Million) Table 2. Major Manufacturers of Single-Phase Controller Table 3. Major ...



### Starter/Generator Systems and Solid-State Power Controllers

The application of the more electric aircraft (MEA) concept will lead to the use of a large number of motor drives for functions such as fuel pumping, cabin pressurization, air conditioning, engine start, and flight control actuation, making power electronics an essential part of MEA technologies. Electrical generators can be coupled to both the ...

### Circuit and control strategy optimization of solid-state power

Solid-state power controller (SSPC) have been received increasing attention as it is vital to ensure the reliability and safety in All-electric System (AES). However, the traditional SSPC is easy to misjudge the high instantaneous current generated when capacitive or inductive load is started as load short circuit, activate tripping protection and cause misprotection.



### Review of design and challenges of DC SSPC in more electric ...

Abstract: Solid State Power Controller (SSPC) is gaining popularity, replacing mechanical switches and circuit breakers, in niche markets like electrical power distribution systems of the ...



### Development of High-Power Bidirectional DC Solid ...

The high-power solid-state power controller (SSPC) will be a critical component for the future electrified aircraft propulsion system. This article presents the development of a 1 kV



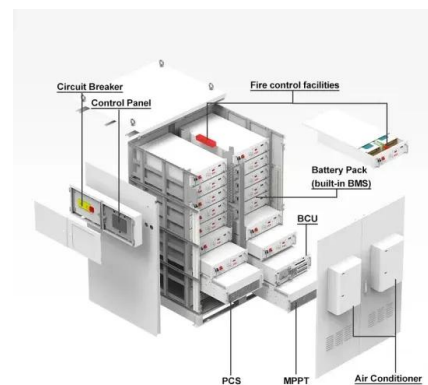
### Development of High-Power Bidirectional DC Solid-State Power ...

Development of High-Power Bidirectional DC Solid-State Power Controller for Aircraft Applications. Zhou Dong, Graduate Student Member, IEEE, Ren Ren, Member, IEEE, and ...



### Aircraft Electrical Solid-State Power Controller (SSPC)

The global aircraft electrical solid-state power controller or SSPC market was valued at US\$ 263 million in 2023 and registered a healthy growth of 5% during 2024-2032.





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