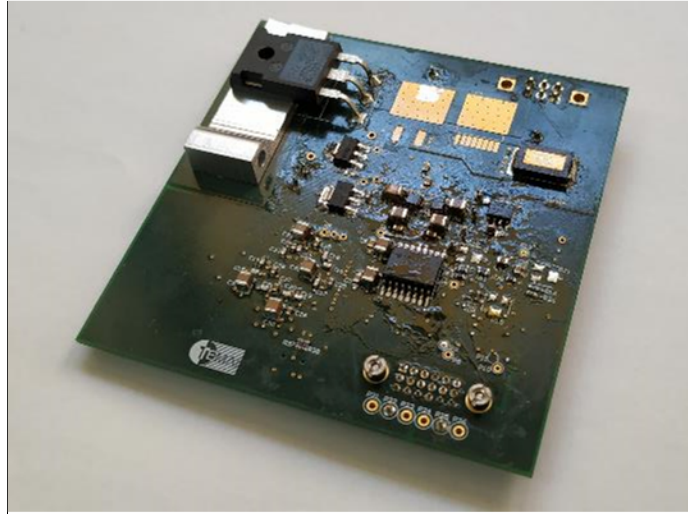




# High Voltage Direct Current Solid State Power Contactor (HVDC SSPC)

## Technical Specs

- Power Contactor based on Solid State technology, for secondary power distribution equipment or being integrated in primary power distribution equipment
- Technology Readiness Level: TRL5 reached, TRL6 in progress, TRL8/9 expected
- Two configurations supported:
  - 28V @ 80A
  - 270V @ 10A
- Silicon Carbide (SiC) MOSFETs
- Redundant Current, Voltage and Temperature analogue measurements
- Inductive Load switching off capability
- Soft start for capacitive loads (under 220 $\mu$ F @270V)
- Protection against switching on high capacitive loads (220 $\mu$ F or higher @270V)
- Protection against switching on short-circuit
- Protection against short-circuit when the device is switched on and delivering power
- Heat dissipation through passive elements. No forced refrigeration needed
- Logic, switching on procedure and protections are programmable parameters. Redundant CPLDs control.
- 87.5x90x16mm / 64g
- Developed according to DO-160G / MIL-STD-704F / DO-254-DALB



**HDVDC SSPC from TEMAI is a Power Contactor based on Solid State technology. Silicon Carbide (SiC) MOSFETs are used in order to operate at high voltage (over 270VDC) and to reduce the conduction resistance ( $R_{DS(on)}$ ).**

Silicon Carbide (SiC) MOSFETs provides a good balance between Blocking High Voltages, Low On-Resistance and reduced size, getting into the IGBT's domain.

HVDC SSPC supports two configurations:

- 28 Vdc @ 80 A nominal
- 270 Vdc @ 10 A nominal

HVDC SSPC is able to operate with Resistive, Capacitive and Inductive loads through an isolated external control, while measuring by mean of redundant Current, Voltage and Temperature sensors.

Also, HVDC SSPC provides a soft start which reduces the inrush current in the switching on of capacitive loads (under 220 $\mu$ F at 270VDC) and protections against high capacitive loads (over 220 $\mu$ F at 270VDC) and short-circuit (switching on short-circuit and short-circuit while the SSPC is closed and delivering power).

The programmable control, based on redundant CPLDs for DALA and DALB functions, allows to change the operating conditions (logic, protections levels and timings).

Performed endurance tests covered the normal operation of SSPC during its whole life installed in the aircraft (30.000 operating hours).

TRL6 development in progress covers the integration of the SSPC in a 270Vdc Power Distribution Unit and the DO160 and MIL-STD-704 qualification.

HVDC SSPC is being developed following the DO254 certification process for DAL B equipment and will be finally checked in a test flight with the whole 270HVDC system.