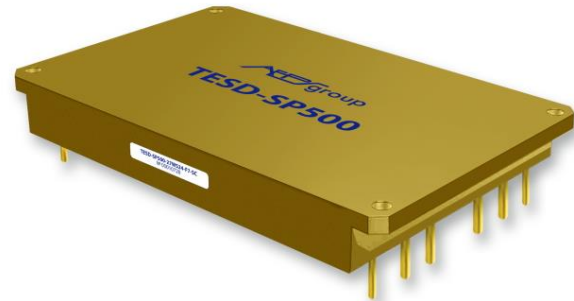


Features

- Up to 500 W output power, 59 W/in³
- **Feedback without optocoupling**
- Output voltage possible up to 150 VDC on request
- Additional input and output filter (MIL-461)
- Extreme case operating temp. range for request up to -60...+130 °C
- Efficiency up to 91 %
- 110x84x15 (mm) aluminium case (dim. without flanges) with **pin-side shielding**
- Input ranges:
"27W" - (15-50 VDC) - standard
- Output voltage adjustment
- Remote on/off
- Parallel operation
- External feedback



Description

TESD-SP-500-F7 are the series of isolated DC/DC converters **with no-optocoupler feedback and pin-side shielding**. The units include additional input and output EMC filters. Output power up to 500 Watts, power density up to 59 W/in³. Operational in wide input voltage range and at wide temperature range of standard -60° to +110° C. The units feature a full system of protections and service functions including remote on/off and output voltage trimming. Lack of internal empty spaces and materials, which produce gases when used in vacuum, allows to apply TESD-SP units at heights up to "near-space".

| series TESD-SP | | | | | |
|-----------------------------|---|---------------|---------------------------|------------------------|--------------------|
| One channel 500 W model* | Input voltage range** | Power max. | Output voltage nom.*** | Output current max. | Efficiency typ. |
| TESD-SP-500-27WS15-F7-xC | 15-50 VDC with output power derating (80 VDC 1s transient) | 500 W | 15 V | 33.3 A | 89 % |
| TESD-SP-500-27WS24-F7-xC | | 500 W | 24 V | 20.8 A | 90 % |
| TESD-SP-500-27WS27-F7-xC | | 500 W | 27 V | 18.5 A | 90 % |
| TESD-SP-500-27WS36-F7-xC | | 500 W | 36 V | 13.9 A | 91 % |
| TESD-SP-500-27WS48-F7-xC | | 500 W | 48 V | 10.4 A | 91 % |
| TESD-SP-500-27WS60-F7-xC | | 500 W | 60 V | 8.3 A | 91 % |

* Index of temperature range (instead of X): -60...+110 °C (M), -60...+130 °C (E)

** Units with different input voltage ranges, may be provided on request (please check the [selection guide](#)).

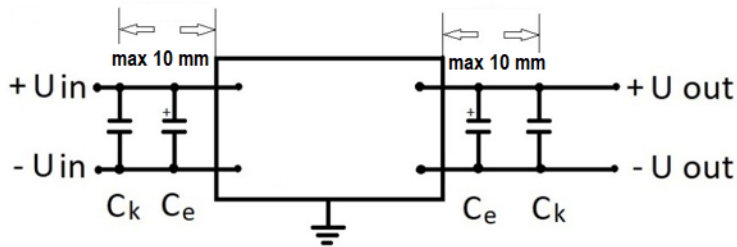
*** Models with custom output voltage may be provided on request.

| General specifications | | |
|---|---|--|
| Switching frequency | | 300 kHz typ. (PWM modulation) |
| Temperature ranges | operating case temp. | -40 °C to +110 °C (Standard "S" range) |
| | storage temp. | -60 °C to +130 °C |
| Over-temperature protection | | +115 °C typ. |
| Thermal mode and cooling method | | conductive via heatsink |
| Humidity (non-condensing) | | 5-95 % rel. H |
| Insulation | input/case, input/output | 1500 VDC |
| | output/case | 1000 VDC |
| Isolating resistance @ 500 VDC | | >20 MOhm |
| Thermal shock, mechanical shock & vibration | | MIL-STD-810F |
| Safety standards | | IEC/EN 60950-1 |
| Typical MTBF | $P_{out} = 0.7 \cdot P_{out,max}$ | 115 000 hrs (Tcase = 50 °C) |
| Weight (max) | | 403 g |
| Input specifications | | |
| Input voltage range | range "27W" | 15-50 VDC (80 VDC 1s transient) |
| Start-up input voltage | | 12-15 VDC |
| EMC standard compliance* | CE MIL-STD-461F, with typical connection scheme | |
| Output specifications | | |
| Power derating based on input voltage | linear derating from 500 to 340 W from 20 VDC to 15 VDC | |
| Output voltage adjustment | in range $\pm 5\%$, via ADJ output (see drawing) | |
| Output voltage regulation | input variance $U_{in,min}$ to $U_{in,max}$ | $\pm 0.5\%$ for load 10-100 % |
| | load var. 10 % to 100 % | $\pm 2\%$ |
| Ripple and noise (peak-to-peak) | 20 MHz bandwidth | <2 % for load 10-100 % |
| Protection | over-load | auto-reset at 110-150 % of $I_{out,nom}$ |
| | over-voltage | <130 % U_{out} |
| Capacitive load (max) | 24 VDC output (50% P_{out}) - typ. 32 000 μF | |
| Remote Off | connect ON to -IN or apply 0-0.5 VDC to ON | |

Please contact the tech. team at aeps@aeps-group.cz for more information.

All specifications are valid for normal climatic conditions, nominal output voltage and current, unless otherwise stated.

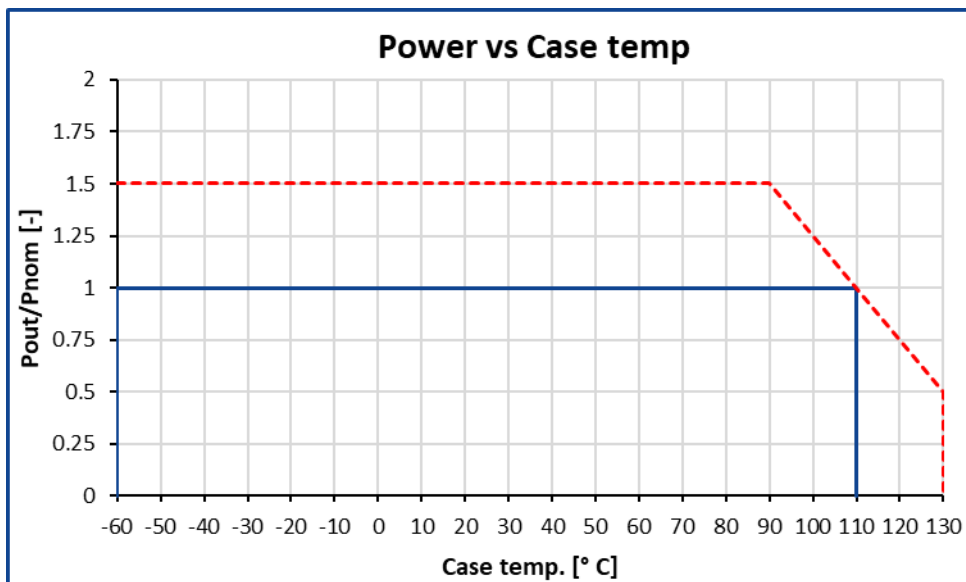
Typical connection scheme (minimum required)



The design of the units allows their use only when mounted on a PCB. When using the units with typical connection scheme it's necessary to use certain type components. In the figure: Ck – ceramic capacitors of a certain operating voltage and of several μF capacity; Ce – electrolytic capacitors of a certain operating voltage and of

polymer, aluminum or tantalum type of tens to hundreds μF capacity. For component values – please see point 5.5 in [Reference Technical Material for DC/DC units](#).

Max output power based on case temperature



— Standard maximum power output based on case temperature.

- - - Possible range of output power for customized product.

Before operation, the product label on converter top side has to be removed.

The unit must be operated on a heatsink with thermal conductive paste applied between the unit surface and a heatsink for quality contact (with thickness less than 100 μm , with thermal conductivity greater than 2 W/K.m). Mesh stencil should be used to apply paste in a pattern of 2x2 mm to 4x4 mm squares mm with 0.5-1 mm spacing between the squares. This allows paste to be evenly spread in a thin layer and excess air to escape when tightening screws during unit mounting.

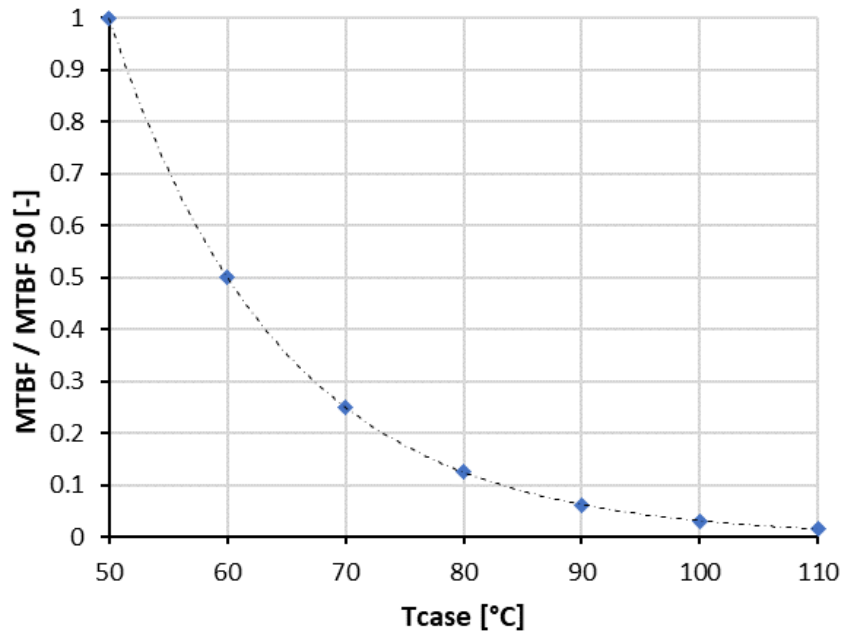
If it's necessary to shortly turn on the unit (for example for input-control testing), an aluminium (or copper) coldplate must be used as a heatsink. Its width and length must be not less than of the unit itself, with thickness at least 4 mm. It's prohibited to use the units without the specified coldplate.

Note:

The units have a short-circuit output protection, which is for emergency only, not for long-term operation. It's prohibited to use the units with reversed input voltage polarity or turn on the units with short-circuited outputs (the units have the special detectors inside). If you have any questions please contact us directly at aeps@aeps-group.cz.

MTBF based on case temperature

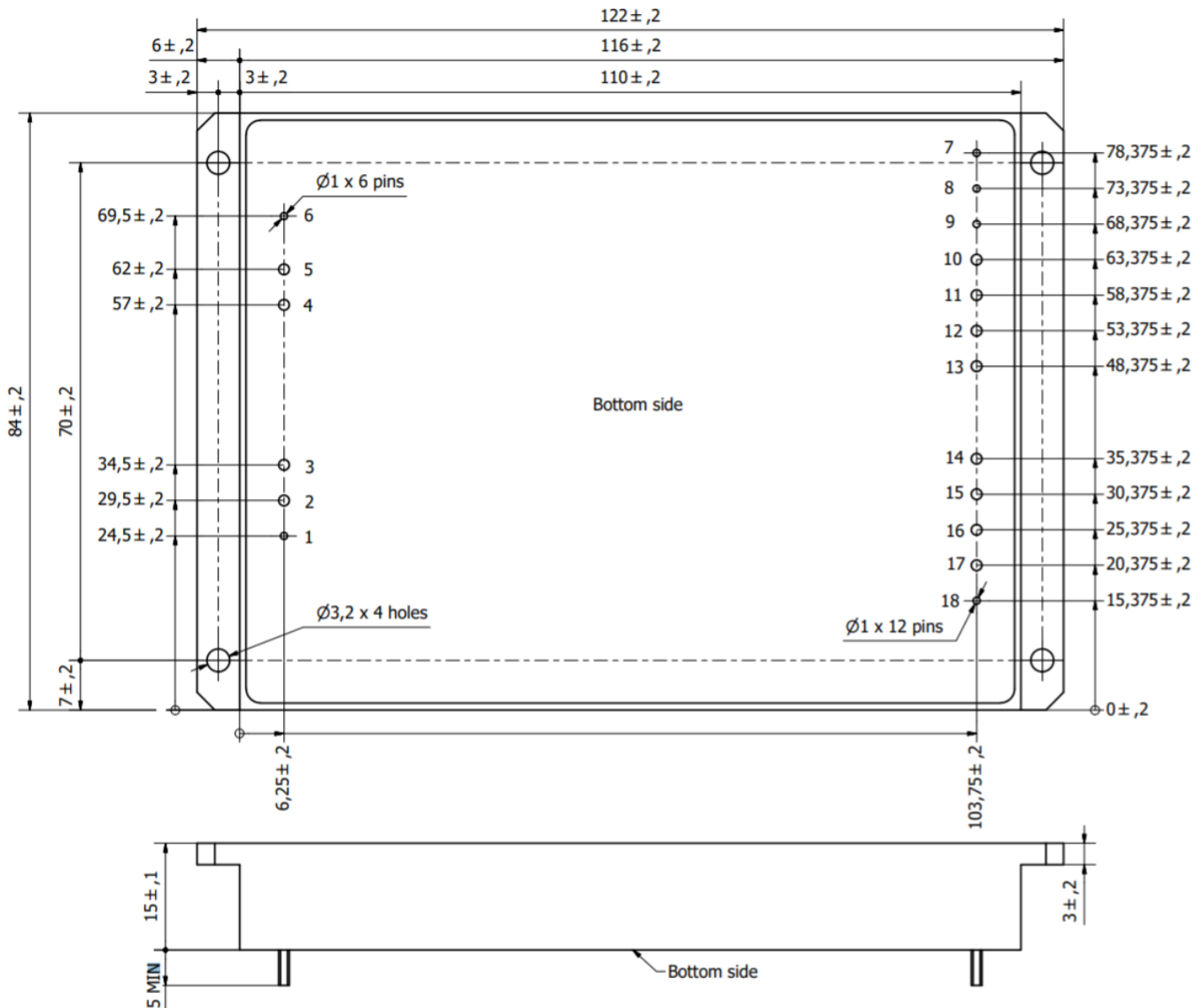
When using the unit, a customer must in one way or another monitor maximal heatsink temperature. Maximal heatsink temperature near the center point of the longer unit's side (considered as unit case temperature) must correspond to the expected unit's MTBF. Approximate MTBF function shown on the graph lower, where MTBF / MTBF 50 is unit's MTBF value at chosen unit's case operating temperature relative to value at 50°C unit's case temperature.



Dimensions

| 1 | 2,3 | 4,5 | 6 | 7 | 8 | 9 | 10, 11, 12, 13 | 14, 15, 16, 17 | 18 |
|----|-----|-----|------|-----|-----|-----|----------------|----------------|-----|
| ON | -IN | +IN | CASE | PAR | ADJ | -RS | -OUT | +OUT | +RS |

Dimensions in millimeters, 4 installation holes, PCB mounting only.



Additional information

After ordering the product - the customer is fully responsible for applying the product in strict compliance with mentioned rules and principles of use in the product datasheet and reference technical material (RTM) which is downloadable at www.aeps-group.com.

Please, note that all information in this material is for reference only. Further detailed information (including: additional requirements, manuals and circuit schemes) is found at www.aeps-group.com or provided via an email request at aeps@aeps-group.cz. All pictures shown are for illustration purpose only, actual product appearance may vary, incl. inner components choice and placement and connectors placement.

According to company's policy in view of constant improvements of the production design the manufacturer reserves the right to change the contents of specifications and promotional materials without prior notice! Make sure you are using the latest documentation downloadable at www.aeps-group.com.

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