

## DC/DC converters TESD60



### Features

- Class: Industrial, power density up to **2586 W/dm<sup>3</sup>**
- Low profile 10 mm design
- Working case temperature  $-60^{\circ}\text{C} \dots +110^{\circ}\text{C}$ , for special order – up to  $125^{\circ}\text{C}$
- Output power 60 W; one or two output channels
- Input voltage ranges: 10,5...36 VDC, 18...75 VDC
- Output voltage adjustment, remote on/off
- Max capacitance 15000  $\mu\text{F}$  (for  $U_{\text{out}}=5$  VDC, 50% Output power)
- Metal case, with mounting flanges

### Description

**Ultra-compact isolated DC/DC converters (modules)** are especially designed for industrial applications and harsh environment operation. These compact units (58 x 40 x 10 mm) have output power up to 60 W and wide operating temperature range between  $-60 \dots +110^{\circ}\text{C}$ , for special order  $-60^{\circ}\text{C} \dots +125^{\circ}\text{C}$ .

These modules are available with one or two **galvanic isolated** channels, can be switched on/off by a signal, have full protection complex against over current, shorting and overheating and can be connected in parallel or in series.

These modules are built using specially designed electronic components and sealed with heat-conducting potting material. They have wide operating temperature range and thermal protection chip. These modules undergo special thermal and limit tests, including burn-in-tests with extreme on/off modes. They are available in metal cases with mounting flanges.

### TESD 60 - 24W S 12 - U T

1 2 3 4 5 6 7

- 1 - «TESD» Series
- 2 - Output power, W
- 3 - Input voltages
  - 12W - 12 VDC (10,5...36 VDC)
  - 24W - 24 VDC (18...75 VDC)
- 4 - Index of output channels quantity
  - S – one
  - D – two
- 5 - Nominal output voltage, VDC (two signs for a channel)
- 6 - Index of case design
  - U – metal case with flanges
- 7 - Index of operating temperature range of the case
  - T –60°C...+110°C (standard version), for special order –60°C...+125°C

## Technical information

### Standard models with one output

| Module           | Input voltage range | Output power | Output voltage / nominal output current | Typical efficiency <sup>1</sup> |
|------------------|---------------------|--------------|---|---------------------------------|
| TESD60-12WS05-XX | 10,5...36 VDC       | 60 W         | 5 VDC / 12 A                            | 82%                             |
| TESD60-12WS12-XX |                     |              | 12 VDC / 5 A                            | 87%                             |
| TESD60-12WS15-XX |                     |              | 15 VDC / 4 A                            | 87%                             |
| TESD60-12WS24-XX |                     |              | 24 VDC / 2,5 A                          | 88%                             |
| TESD60-12WS27-XX |                     |              | 27 VDC / 2,22 A                         | 88%                             |
| TESD60-12WS48-XX |                     |              | 48 VDC / 1,25 A                         | 89%                             |
| TESD60-24WS05-XX | 18...75 VDC         | 60 W         | 5 VDC / 12 A                            | 84%                             |
| TESD60-24WS12-XX |                     |              | 12 VDC / 5 A                            | 88%                             |
| TESD60-24WS15-XX |                     |              | 15 VDC / 4 A                            | 89%                             |
| TESD60-24WS24-XX |                     |              | 24 VDC / 2,5 A                          | 90%                             |
| TESD60-24WS27-XX |                     |              | 27 VDC / 2,22 A                         | 90%                             |
| TESD60-24WS48-XX |                     |              | 48 VDC / 1,25 A                         | 91%                             |

### Standard models with two outputs

| Module             | Input voltage range | Output power | Output voltage / nominal output current | Typical efficiency <sup>1</sup> |
|--------------------|---------------------|--------------|---|---------------------------------|
| TESD60-12WD0505-XX | 10,5...36 VDC       | 60 W         | 5 VDC / 6 A ; 5 VDC / 6 A               | 82%                             |
| TESD60-12WD0512-XX |                     |              | 5 VDC / 6 A ; 12 VDC / 2,5 A            | 84%                             |
| TESD60-12WD1212-XX |                     |              | 12 VDC / 2,5 A ; 12 VDC / 2,5 A         | 87%                             |
| TESD60-12WD1515-XX |                     |              | 15 VDC / 2 A ; 15 VDC / 2 A             | 88%                             |
| TESD60-12WD2424-XX |                     |              | 24 VDC / 1,25 A ; 24 VDC / 1,25 A       | 89%                             |
| TESD60-12WD4848-XX |                     |              | 48 VDC / 0,62 A ; 48 VDC / 0,62 A       | 90%                             |
| TESD60-24WD0505-XX | 18...75 VDC         | 60 W         | 5 VDC / 6 A ; 5 VDC / 6 A               | 84%                             |
| TESD60-24WD0512-XX |                     |              | 5 VDC / 6 A ; 12 VDC / 2,5 A            | 86%                             |
| TESD60-24WD1212-XX |                     |              | 12 VDC / 2,5 A ; 12 VDC / 2,5 A         | 88%                             |
| TESD60-24WD1515-XX |                     |              | 15 VDC / 2 A ; 15 VDC / 2 A             | 89%                             |
| TESD60-24WD2424-XX |                     |              | 24 VDC / 1,25 A ; 24 VDC / 1,25 A       | 90%                             |
| TESD60-24WD4848-XX |                     |              | 48 VDC / 0,62 A ; 48 VDC / 0,62 A       | 91%                             |

Modules with non-standard output voltage from 3 to 60 VDC could be delivered on request.

<sup>1</sup> - Typical efficiency values are given at nominal input voltage under normal climatic conditions

## Specifications for DC/DC converters TESD60\*

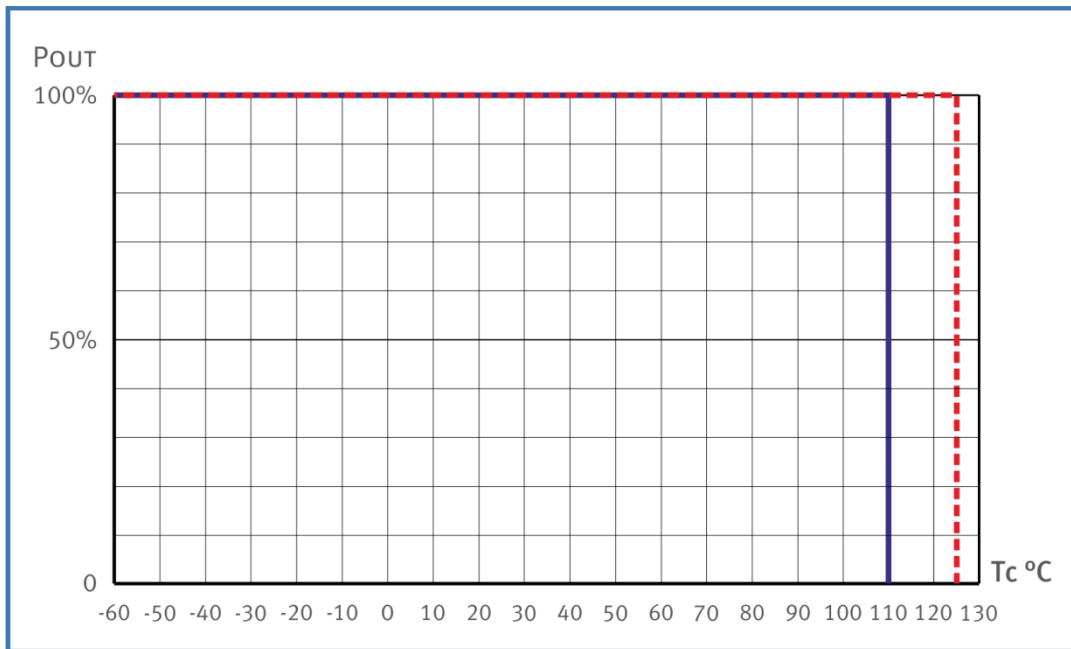
| <b>Input specifications</b>   |  |
|---|--|
| Input voltage range / transitional deviation, 1 sec 12W   | =10,5...36 VDC / =10,5...40 VDC  |
| Input voltage range / transitional deviation, 1 sec 24W   | =18...75 VDC / =17...84 VDC  |
| Input filter  | P-type   |
| <b>Output specifications</b>  |  |
| Output voltage adjustment (single-channel models only)  | ±5% Uout   |
| Instability of output voltage in accordance to changing of output current from 10 to 100% for single output model | ±2%  |
| Instability of output voltage in accordance to changing of output current from 30 to 100% for dual output model   | ±12% for chan.2  |
| Instability of output voltage in accordance to changing of input voltage  | ±0,5%  |
| Ripple and noise (peak-to-peak) (20 MHz)  | <2% Uout   |
| Short circuit protection**  | >150% Iout nom, auto repair  |
| Overvoltage protection**  | <130 % Uout  |
| Over current protection level**   | Pout ... 1.3·Pout  |
| Remote On/Off   | Shuts down outputs by applying 0...0,5VDC or connection of output «ON» and «- IN», I≤5mA |
| Max capacitance for Uout=5 VDC, 50% Output power***   | 15000 µF   |
| <b>General specifications</b>   |  |
| Case temperature (operating) index T  | -60°C ...+110°C, for order +125°C  |
| Case temperature (storage)  | -60°C ...+125°C  |
| High humidity   | 100% @35 °C  |
| Thermal resistance case — environment without heat sink   | 7,8 °C/W   |
| Conversion frequency  | 300 - 400 kHz  |
| Insulation voltage input/output   | =1500 VDC  |
| Insulation voltage input/case   | =1500 VDC  |
| Insulation voltage output/case  | =1000 VDC  |
| Insulation voltage output/output  | =500 VDC   |
| Isolation resistance @ 500 VDC  | >20 MOhm   |
| EMC standards   | EN 55022, class A; EN 55022, class B with additional filter                              |
| Safety standards  | IEC/ EN 60950  |
| Typical MTBF (Tcase = 50°C; Pout = 0,7 Pout max)  | 200 000 hrs  |
| Cooling metod   | Free air convection or forced air cooling  |
| Weight (max)  | 65 g   |

\* All specifications are valid for normal climatic conditions, Uin.nom., Iout.nom., unless otherwise stated.

\*\* Parameters are stated for the information purposes and could not be used at long term work, exciding maximum output current, at work outside of a range of operating temperatures.

\*\*\* For other output voltages the maximum output capacity is calculated from the fact that  $C_{max} \times U_{out}^2$  is a constant.

## Maximum output power vs ambient temperature



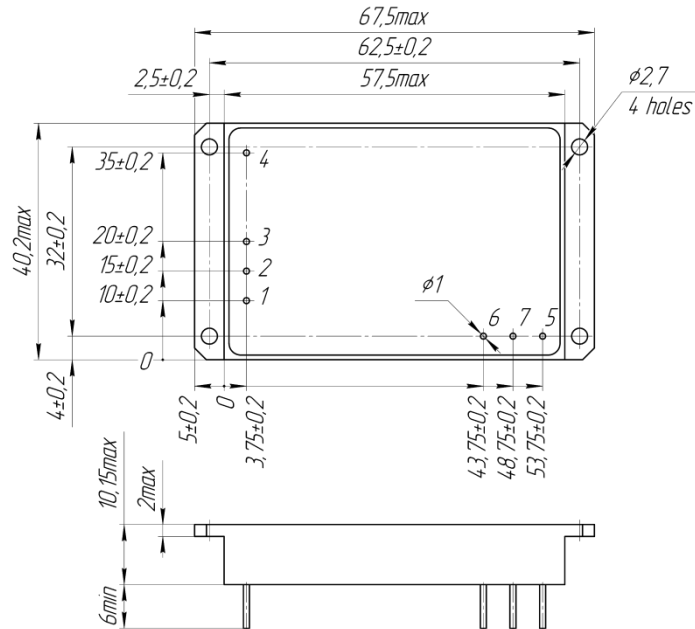
- Allowed power output and case temperature range for standard version of unit.
- - - Possible range of output power and case temperature up to 125°C for special order.

For modeling optimal heatsink and its delivery, with goal of providing allowed case temperatures, please contact us directly [aeps@aeps-group.cz](mailto:aeps@aeps-group.cz)

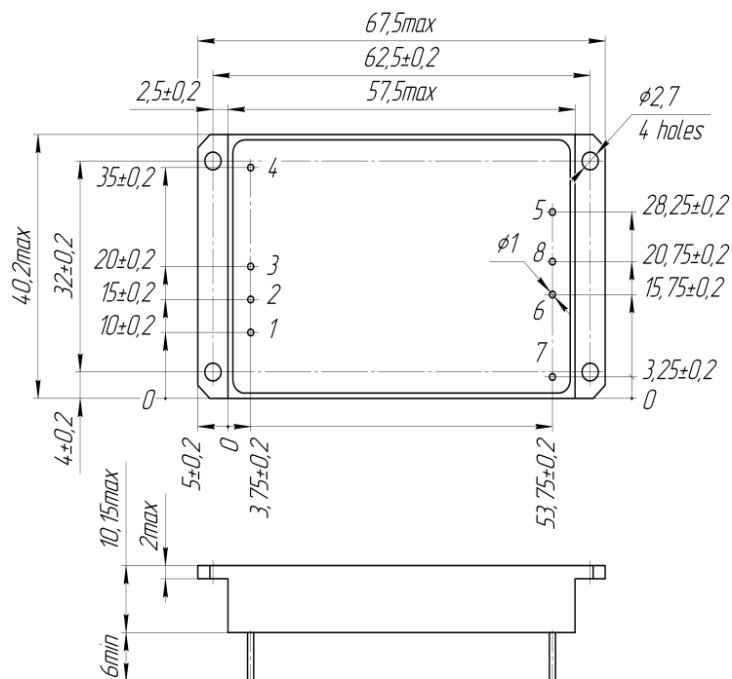
## Pin out

| Nº Pin        | 1    | 2   | 3   | 4  | 5     | 6     | 7     | 8     |
|---------------|------|-----|-----|----|-------|-------|-------|-------|
| Single output | CASE | +IN | -IN | ON | + OUT | -OUT  | ADJ   | -     |
| Dual output   | CASE | +IN | -IN | ON | +OUT1 | +OUT2 | -OUT2 | -OUT1 |

## Single output model with flanges (IV case type)



## Dual output model with flanges (IV case type)



## Certificates

Certificate ISO 9001\*  
CE conformity declaration

\* Management system and R&D of Alexander Electric is ISO certified

## Note

The label with sign "remove before use" can be placed on the top surface of the module and must be removed before installation.

Please, note that all information in this material is for reference only. Further detailed information (including: additional requirements, manuals and circuit schemes) is found on our website <http://www.teslaelectric-eu.com>.

## Contact information

<http://www.teslaelectric-eu.com>, e-mail: [aeps@aeps-group.cz](mailto:aeps@aeps-group.cz), phone/fax: +420 281 001 341

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