



## DC/DC converters TESD500



### Features

- Class: Industrial
- Cases with mounting flanges; or copper case (optional)
- Parallel operation
- Feedback from load
- Output current up to 40 A, output power 500 W; one output channel
- Input voltage ranges: 17...75 (**84**) VDC, 18...36 VDC, 36...75 VDC
- Power density up to **3608** W/dm<sup>3</sup>
- Low profile 15 mm design
- Case operating temperature range: -60°C...+125°C
- Magnetic feedback without optocouplers
- Output voltage adjustment, remote on/off
- Max capacitance 90000 µF for U<sub>out</sub>=27 VDC

### Description

**Ultra-compact isolated DC/DC converters (modules)** are especially designed for industrial applications and harsh environment operation. These compact units (110 x 84 x 15 mm) have output power up to 500 W and wide operating temperature range between -60...+125°C. The absence of optocouplers in the converter's circuit empowers safeness during unit's entire lifetime even when performing in conditions of ionizing radiations and at high temperature. These modules have full protection complex against over current, shorting and overheating, can be switched on/off by a signal and 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.

Upon customers' request this module can be produced in copper case with protecting coating, allowing its installation on aluminum heatsink and providing a positive effect on the modules EMC and heat transfer.

Upon customers' request a low-cost version of a module is available (input voltage ranges 18...36 VDC, 36...75 VDC, or customer-considered simplified construction).

## Ordering information

### TESD 500 - 24WS 12 - U T B

1 2 3 4 5 6 7 8

- 1 - «TESD» Series
- 2 - Max output power, W
- 3 - Input voltage
  - 24** - 24 VDC (18...36 VDC)
  - 24W** - 24 VDC (17...75 (**84**) VDC)
  - 48** - 48 VDC (36...75 VDC)
- 4 - Index of output channels quantity
  - S** - one
- 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...+125°C
- 8 - Index of low cost version
  - B** - Low cost version (input voltage ranges 18...36 VDC, 36...75 VDC, or customer-considered simplified construction)

## Technical information

### Standard models with one output

Module	Input voltage range	Output power	Output voltage / nominal output current	Typical efficiency
<b>TESD500-24WS12-XX</b>	17...75 (84) VDC	480 W	12 VDC / 40 A	85%
<b>TESD500-24WS15-XX</b>	17...75 (84) VDC	500 W	15 VDC / 33,3 A	85%
<b>TESD500-24WS24-XX</b>	17...75 (84) VDC	500 W	24 VDC / 20,83 A	87%
<b>TESD500-24WS27-XX</b>	17...75 (84) VDC	500 W	27 VDC / 18,52 A	87%
<b>TESD500-24WS48-XX</b>	17...75 (84) VDC	500 W	48 VDC / 10,42 A	87%
<b>TESD500-24S12-XXB</b>	18...36 VDC	480 W	12 VDC / 40 A	85%
<b>TESD500-24S15-XXB</b>	18...36 VDC	500 W	15 VDC / 33,3 A	85%
<b>TESD500-24S24-XXB</b>	18...36 VDC	500 W	24 VDC / 20,83 A	87%
<b>TESD500-24S27-XXB</b>	18...36 VDC	500 W	27 VDC / 18,52 A	87%
<b>TESD500-24S48-XXB</b>	18...36 VDC	500 W	48 VDC / 10,42 A	87%
<b>TESD500-48S12-XXB</b>	36...75 VDC	480 W	12 VDC / 40 A	85%
<b>TESD500-48S15-XXB</b>	36...75 VDC	500 W	15 VDC / 33,3 A	85%
<b>TESD500-48S24-XXB</b>	36...75 VDC	500 W	24 VDC / 20,83 A	87%
<b>TESD500-48S27-XXB</b>	36...75 VDC	500 W	27 VDC / 18,52 A	87%
<b>TESD500-48S48-XXB</b>	36...75 VDC	500 W	48 VDC / 10,42 A	87%

Modules with non-standard output voltage from 3 to 80 VDC with maximal output current up to 40 A, could be delivered by request.

## Specifications for DC/DC converters TESD500\*

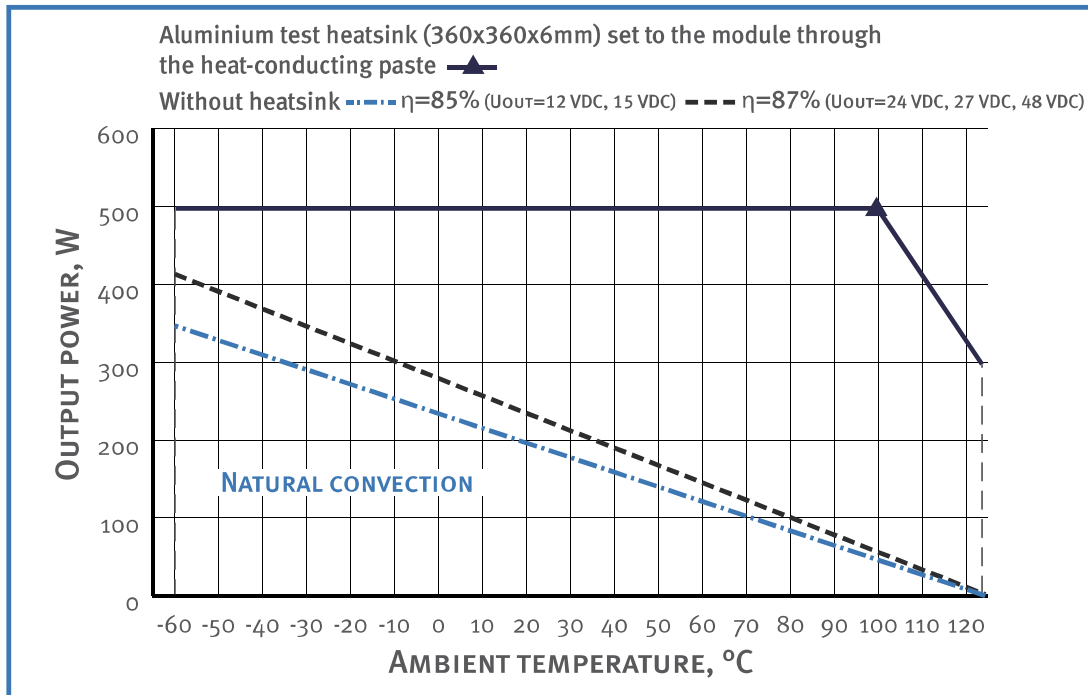
<b>Input specifications</b>	
Input voltage range / transitional deviation, 1 sec 24W	=17...75 VDC / =17...84 VDC
Input voltage range / transitional deviation, 1 sec 24	=18...36 VDC / =17...40 VDC
Input voltage range / transitional deviation, 1 sec 48	=36...75 VDC / =36...84 VDC
Input filter	P-type
<b>Output specifications</b>	
Output voltage adjustment	±5% Uout
Instability of output voltage in accordance to changing of output current from 10 to 100%	±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...1,1VDC or connection of output «ON» and «- IN», I≤5mA
The maximum output power without the heatsink, Tamb=50°C	142 W
<b>General specifications</b>	
Case temperature (operating)	-60°C ...+125°C ***
Case temperature (storage)	-60°C ...+125°C
Output power derating (natural convection)	See diagram (dashed, dash-dotted curve)
Output power with heatsink	See diagram (solid curve)
High humidity	100% @35 °C
Thermal resistance case — environment without heat sink	3,0 °C/W
Conversion frequency	300-350 kHz
Insulation voltage input/output	=1500 VDC
Insulation voltage input/case	=1500 VDC
Insulation voltage output/case	=1000 VDC
Isolation resistance @ 500 VDC	>20 MOhm
EMC standards	EN 55022, class A; EN 55022, class B with additional filter
Safety standard	IEC/ EN 60950
Typical MTBF (Tcase = 50°C; Pout = 0,7 Pout max)	50 000 hrs
Cooling metod	Free air convection or forced air cooling
Weight (max)	250 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.

\*\*\* Thermal protection chip starts operating at 118°...125 °C.

## Output power vs an ambient temperature at input voltage =17...75 (84) VDC (copper case)



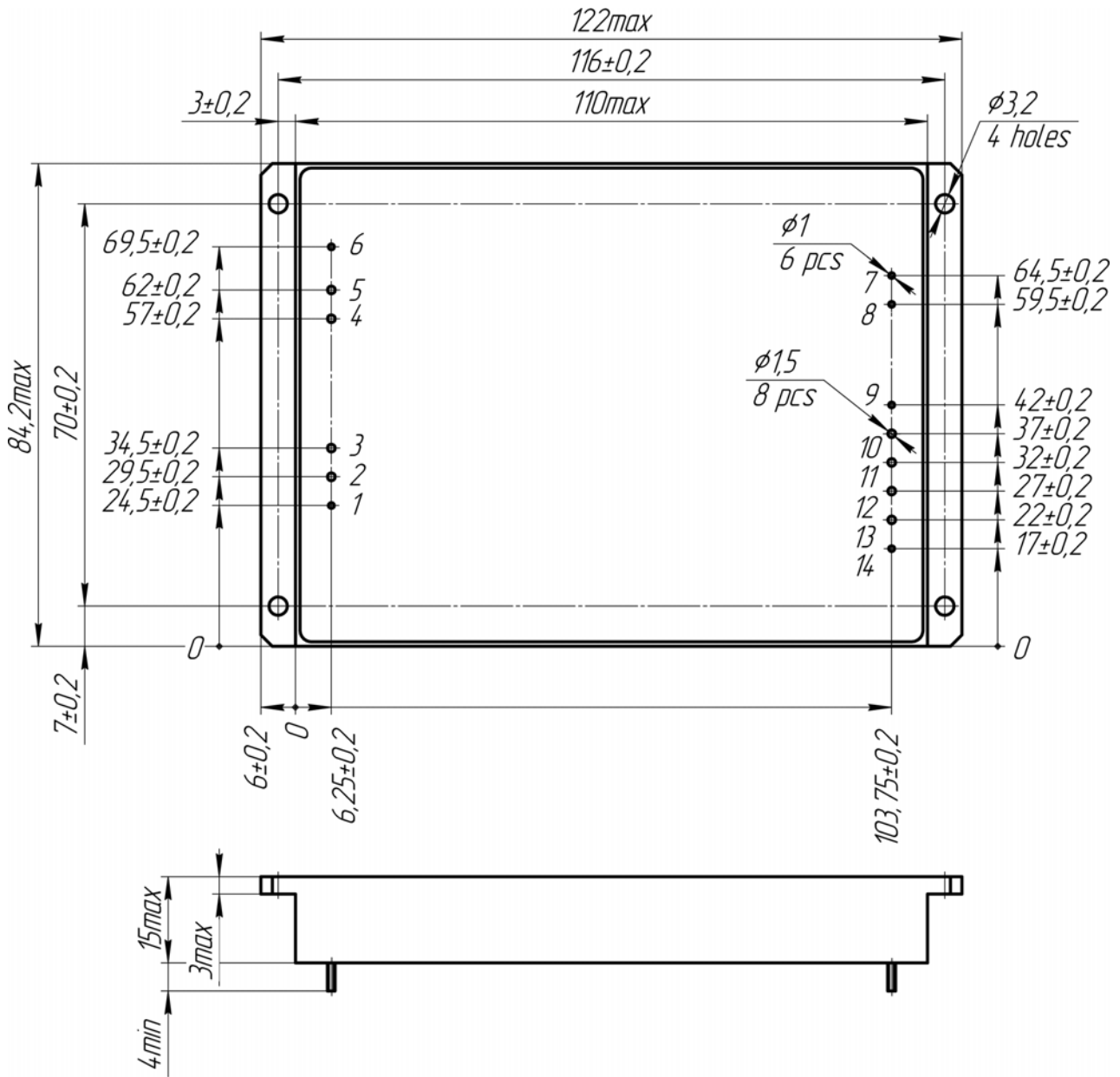
Dropping parts of the dashed and dash-dotted curves are in accordance with the **maximum temperature of the case**. Output power must not exceed the values which are limited by corresponding curve for a given ambient temperature. Modules can be used without a heat sink only when screwing them heat conductive plate with thermal paste and with the length and width not less than case size and thickness of not less than 3 mm.

At points ▲ simultaneously present several extreme worst-case conditions, such as the combination of maximum case temperature and maximum output power. Continuous module operation at these points should be avoided.

**Pin out**

Nº Pin	1	2,3	4,5	6	7	8	9	10,11	12,13	14
Single output	ON	-IN	+IN	CASE	PARAL	ADJ	-RS	-OUT	+OUT	+RS

**Single output model with flanges (VII case type)**



## Certificates

Certificate ISO\*  
CE conformity declaration

\*Management system of Alexander Electric is ISO certified

## Note

The label 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

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