



## Features

- Class: Industrial, power density up to **1443 W/dm<sup>3</sup>**
- Low profile 15 mm design
- Case operating temperature range:  $-40^{\circ}\text{C} \dots +85^{\circ}\text{C}$ , for request up to  $+110^{\circ}\text{C}$
- Output current up to 17 A, output power 200 W
- Input voltage ranges: 43...108 VDC, 57...144 VDC, 66...165 VDC
- Parallel operation
- Feedback from load
- Protection against input overvoltage and surges according to EN50121-3-2, EN50155, IEC60571, RIA12
- Output voltage adjustment, remote on/off
- Max capacitance 6500  $\mu\text{F}$  (for  $U_{\text{out}}=12$  VDC, 50% Output power)
- Metal case, with mounting flanges

For all special requirements placed on the last page of datasheet [please click here.](#)

## Description

**DC/DC converters with protection from transient voltage surges on the input** are especially designed for industrial applications and harsh environment operation. Modules are perfect for power systems mobile and stationary objects, powered by a generator. Modules are able to operate in a wide temperature range ( $-40 \dots 85^{\circ}\text{C}$ ). These modules 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 a 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. An operating unit can withstand drop of input voltage in relation to the normal input voltage, and in many cases the module is able to provide needed output power when the input voltage decreases 10-30% compared to the normative.

## Ordering information

### TESZ 200 - 110Z S 24 - U N

1 2 3 4 5 6 7

- 1 - «TESZ» Series
- 2 - Max output power, W
- 3 - Input voltages
  - 72 Z – 72 VDC (43...108 VDC)
  - 96 Z – 96 VDC (57...144 VDC)
  - 110 Z – 110 VDC (66...165 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
  - N –40°C...+85°C, for request up to +110°C

## Technical information

### Standard models with one output

Module	Input voltage range	Output power	Output voltage / nominal output current	Typical efficiency
TESZ200-72ZS15-UN	43...108 VDC	200 W	15 VDC / 13,33 A	84%
TESZ200-72ZS24-UN	43...108 VDC	200 W	24 VDC / 8,33 A	86%
TESZ200-72ZS27-UN	43...108 VDC	200 W	27 VDC/ 7,4 A	86%
TESZ200-72ZS48-UN	43...108 VDC	200 W	48 VDC / 4,16 A	86%
TESZ200-96ZS15-UN	57...144 VDC	200 W	15 VDC / 13,33 A	86%
TESZ200-96ZS24-UN	57...144 VDC	200 W	24 VDC / 8,33 A	88%
TESZ200-96ZS27-UN	57...144 VDC	200 W	27 VDC/ 7,4 A	88%
TESZ200-96ZS48-UN	57...144 VDC	200 W	48 VDC / 4,16 A	88%
TESZ200-110ZS15-UN	66...165 VDC	200 W	15 VDC / 13,33 A	86%
TESZ200-110ZS24-UN	66...165 VDC	200 W	24 VDC / 8,33 A	88%
TESZ200-110ZS27-UN	66...165 VDC	200 W	27 VDC/ 7,4 A	88%
TESZ200-110ZS48-UN	66...165 VDC	200 W	48 VDC / 4,16 A	88%

Modules with non-standard output voltage from 12 to 60 VDC with maximal output current up to 17 A, could be delivered on request.

### Specifications for DC/DC converters TESZ200 series\*

Input specifications	
Input voltage range 72 Z	=43...108 VDC
Input voltage range 96 Z	=57...144 VDC
Input voltage range 110 Z	=66...165 VDC
Surge and transient protection **	
Input surge protection 72 Z	252 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
Input surge protection 96 Z	336 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω
Input surge protection 110 Z	385 VDC @ 20 ms trise=tfall = 2 ms, Rsource=0,2 Ω

<b>Input transient protection ***</b>	
Input transient protection 72 Z, 96 Z, 110 Z	U <sub>max</sub> =960 V trise=10 μs, t <sub>duration</sub> =100 μs@0,5 U <sub>max</sub> R <sub>source</sub> =5Ω
	U <sub>max</sub> =1800 V trise=5 μs, t <sub>duration</sub> =50 μs@0,5 U <sub>max</sub> R <sub>source</sub> =5Ω
	U <sub>max</sub> =3600 V trise=0,5 μs, t <sub>duration</sub> =5 μs@0,5 U <sub>max</sub> R <sub>source</sub> =100Ω
	U <sub>max</sub> =4800 V trise=0,1 μs, t <sub>duration</sub> =0,1 μs@0,5 U <sub>max</sub> R <sub>source</sub> =100Ω
	U <sub>max</sub> =8400 V trise=0,05 μs, t <sub>duration</sub> =0,1 μs@0,5 U <sub>max</sub> R <sub>source</sub> =100Ω
Input filter	In accordance with EN50121-3-2, EN50155
<b>Output specifications</b>	
Output voltage adjustment	±5% U <sub>out</sub> nom.
Instability of output voltage in accordance to changing of output current from 10 to 100% for single output model	±2%
Ripple and noise (peak-to-peak) (20 MHz)	<2% U <sub>out</sub> nom.
Short circuit protection****	auto repair
Overvoltage protection****	<150 % U <sub>out</sub> nom.
Over current protection level****	P <sub>out</sub> ... 1.8·P <sub>out</sub>
Remote On/Off	Shuts down outputs by applying 0...1,1 VDC or connection of output «ON» and «- IN», I≤5 mA
The maximum output power without the heatsink, T <sub>amb</sub> =50°C	57 W
Max capacitance for U <sub>out</sub> =12 VDC, 50% Output power	6500 μF *****
<b>General specifications</b>	
Case temperature (operating)	-40°C ... +85°C
Case temperature (storage)	-40°C ... +85°C
Case temperature power decrease (natural convection)	See diagram (dashed, dash-dotted curve)
Case temperature without power decrease with heat sink	See diagram (solid curve)
High humidity	100% @35 °C
Thermal resistance case — environment without heat sink	3 °C/W
Conversion frequency	250 kHz typical
Insulation voltage input/output	~1500 VAC
Insulation voltage input/case	~1500 VAC
Insulation voltage output/case	~500 VAC
Isolation resistance @ 500 VDC	>20 MOhm
EMC standards	EN 55022, class A with additional filter
Safety standards	IEC/ EN 60950, EN50116
Surge and Transient Protection	EN50155, IEC60571, RIA12
Typical MTBF (T <sub>case</sub> = 50°C; P <sub>out</sub> = 0,7 P <sub>out</sub> max)	50 000 hrs
Cooling metod	Free air convection with heat sink or forced air cooling
Weight (max)	250 g

\* All specifications are valid for normal climatic conditions, U<sub>in</sub>.nom., I<sub>out</sub>.nom., unless otherwise stated.

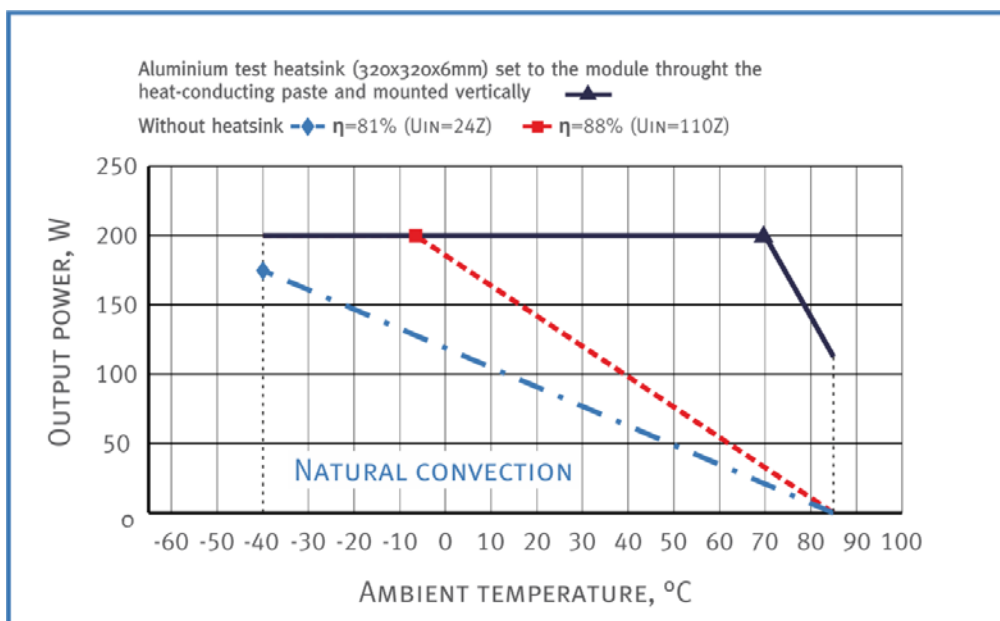
\*\* Surges and transients may be assumed to be non-repetitive, and they should not occur at time interval at less than 10 second.

\*\*\* For capacitor discharge voltage transient test.

\*\*\*\* 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  $\frac{C_{max} \times U_{out}^2}{2}$  is a constant.

## Output power vs an ambient temperature at input voltage



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.

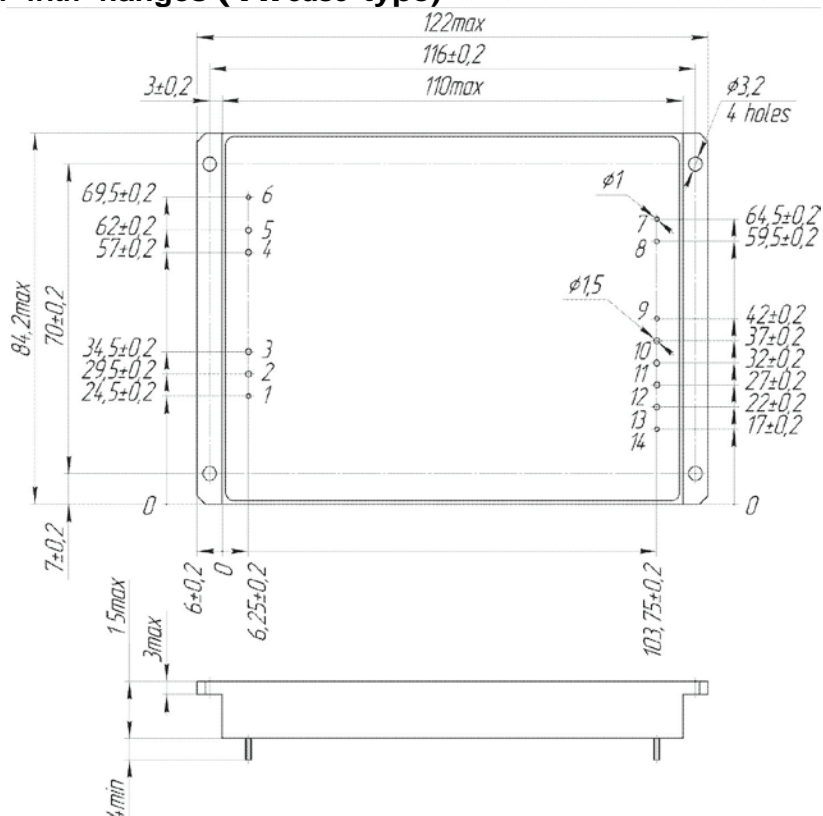
Modules can be used without a heat sink only when screwing them heat conductive plate with thermal paste and with the length and width not less than case size and thickness of not less than 3 mm.

At point  $\blacktriangle$ ,  $\blacklozenge$  and  $\blacksquare$  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 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.goncharov-jet.com>

## Contact information

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According to company's policy in view of constant improvements of the production design the manufacturer reserves the right to itself change the contents of promotional materials without prior notification.

## Special requirements