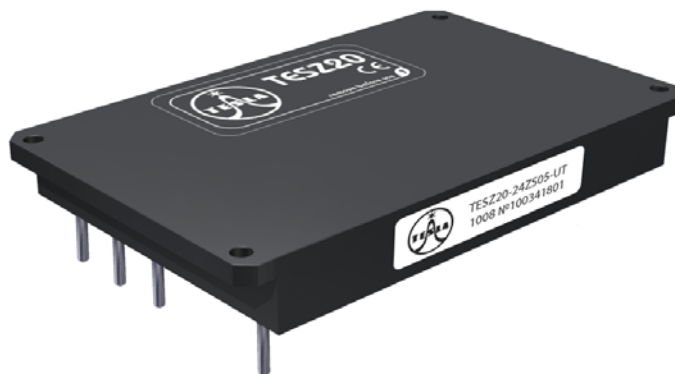




## DC/DC converters TESZ20 series



### Features

- Class: Industrial
- Cases with mounting flanges; or copper case (optional)
- Output current up to 5 A, output power 20 W; one or two output channels
- Input voltage ranges: 14,4...34 VDC, 22...51 VDC, 29...67 VDC, 43...101 VDC, 58...135 VDC, 66...160 VDC
- Protection against input overvoltage and surges according to EN50121-3-2, EN50155, IEC60571, RIA12 up to 500 VDC with duration of 20 msec (for input network 110 VDC)
- Power density up to **862** W/dm<sup>3</sup>
- Low profile 10 mm design
- Case operating temperature range: -60°C...+125°C
- Magnetic feedback without optocouplers
- Output voltage adjustment, remote on/off
- Max capacitance 7500 µF for U<sub>out</sub>=5 VDC

### 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 (-60...+125°C). The absence of optocouplers in the converter's circuit allows its operation in conditions of ionizing radiations and high temperature during units entire lifetime. 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 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.

Upon customers' request this modules can be produced in copper cases (covered by "Black chrome"), allowing its installation on aluminum heat sink and providing a positive effect on the modules EMC and heat transfer.

## Ordering information

### TESZ 20 - 110Z S 12 - U T

1 2 3 4 5 6 7

- 1 - «TESZ» Series
- 2 - Max output power, W
- 3 - Input voltages
  - 24 Z – 24 VDC (14,4...34 VDC)
  - 36 Z – 36 VDC (22...51 VDC)
  - 48 Z – 48 VDC (29...67 VDC)
  - 72 Z – 72 VDC (43...101 VDC)
  - 96 Z – 96 VDC (58...135 VDC)
  - 110 Z – 110 VDC (66...160 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...+125°C

## Technical information

### Standard models with one output

Module	Input voltage range	Output power	Output voltage / nominal output current	Typical efficiency
TESZ20-24ZS05-UT	14,4...34 VDC	20 W	5 VDC / 4 A	75%
TESZ20-24ZS12-UT	14,4...34 VDC	20 W	12 VDC / 1,67 A	77%
TESZ20-24ZS15-UT	14,4...34 VDC	20 W	15 VDC / 1,33 A	77%
TESZ20-24ZS24-UT	14,4...34 VDC	20 W	24 VDC / 0,83 A	78%
TESZ20-24ZS27-UT	14,4...34 VDC	20 W	27 VDC / 0,74 A	78%
TESZ20-24ZS48-UT	14,4...34 VDC	20 W	48 VDC / 0,42 A	81%
TESZ20-36ZS05-UT	22...51 VDC	20 W	5 VDC / 4 A	76%
TESZ20-36ZS12-UT	22...51 VDC	20 W	12 VDC / 1,67 A	78%
TESZ20-36ZS15-UT	22...51 VDC	20 W	15 VDC / 1,33 A	78%
TESZ20-36ZS24-UT	22...51 VDC	20 W	24 VDC / 0,83 A	77%
TESZ20-36ZS27-UT	22...51 VDC	20 W	27 VDC / 0,74 A	77%
TESZ20-36ZS48-UT	22...51 VDC	20 W	48 VDC / 0,42 A	82%
TESZ20-48ZS05-UT	29...67 VDC	20 W	5 VDC / 4 A	76%
TESZ20-48ZS12-UT	29...67 VDC	20 W	12 VDC / 1,67 A	78%
TESZ20-48ZS15-UT	29...67 VDC	20 W	15 VDC / 1,33 A	78%
TESZ20-48ZS24-UT	29...67 VDC	20 W	24 VDC / 0,83 A	79%
TESZ20-48ZS27-UT	29...67 VDC	20 W	27 VDC / 0,74 A	79%
TESZ20-48ZS48-UT	29...67 VDC	20 W	48 VDC / 0,42 A	82%
TESZ20-72ZS05-UT	43...101 VDC	20 W	5 VDC / 4 A	77%
TESZ20-72ZS12-UT	43...101 VDC	20 W	12 VDC / 1,67 A	79%
TESZ20-72ZS15-UT	43...101 VDC	20 W	15 VDC / 1,33 A	79%
TESZ20-72ZS24-UT	43...101 VDC	20 W	24 VDC / 0,83 A	80%
TESZ20-72ZS27-UT	43...101 VDC	20 W	27 VDC / 0,74 A	80%
TESZ20-72ZS48-UT	43...101 VDC	20 W	48 VDC / 0,42 A	83%
TESZ20-96ZS05-UT	58...135 VDC	20 W	5 VDC / 4 A	77%
TESZ20-96ZS12-UT	58...135 VDC	20 W	12 VDC / 1,67 A	79%
TESZ20-96ZS15-UT	58...135 VDC	20 W	15 VDC / 1,33 A	79%
TESZ20-96ZS24-UT	58...135 VDC	20 W	24 VDC / 0,83 A	80%
TESZ20-96ZS27-UT	58...135 VDC	20 W	27 VDC / 0,74 A	80%
TESZ20-96ZS48-UT	58...135 VDC	20 W	48 VDC / 0,42 A	83%
TESZ20-110ZS05-UT	66...160 VDC	20 W	5 VDC / 4 A	77%
TESZ20-110ZS12-UT	66...160 VDC	20 W	12 VDC / 1,67 A	79%
TESZ20-110ZS15-UT	66...160 VDC	20 W	15 VDC / 1,33 A	79%

Module	Input voltage range	Output power	Output voltage / nominal output current	Typical efficiency
TESZ20-110ZS24-UT	66...160 VDC	20 W	24 VDC / 0,83 A	80%
TESZ20-110ZS27-UT	66...160 VDC	20 W	27 VDC / 0,74 A	80%
TESZ20-110ZS48-UT	66...160 VDC	20 W	48 VDC / 0,42 A	83%

Modules with non-standard output voltage from 5 to 80 VDC with maximal output current up to 5 A, could be delivered by request.

### Standard models with two outputs

Module	Input voltage range	Output power	Output voltage / nominal output current	Typical efficiency
TESZ20-24ZD0505-UT	14,4...34 VDC	20 W	5 VDC / 2 A ; 5 VDC / 2 A	74%
TESZ20-24ZD0512-UT	14,4...34 VDC	20 W	5 VDC / 2 A ; 12 VDC / 0,83 A	74%
TESZ20-24ZD1212-UT	14,4...34 VDC	20 W	12 VDC / 0,83 A ; 12 VDC / 0,83 A	76%
TESZ20-24ZD1515-UT	14,4...34 VDC	20 W	15 VDC / 0,67 A ; 15 VDC / 0,67 A	76%
TESZ20-24ZD2727-UT	14,4...34 VDC	20 W	27 VDC B / 0,37 A ; 27 VDC / 0,37 A	77%
TESZ20-36ZD0505-UT	22...51 VDC	20 W	5 VDC / 2 A ; 5 VDC / 2 A	75%
TESZ20-36ZD0512-UT	22...51 VDC	20 W	5 VDC / 2 A ; 12 VDC / 0,83 A	75%
TESZ20-36ZD1212-UT	22...51 VDC	20 W	12 VDC / 0,83 A ; 12 VDC / 0,83 A	77%
TESZ20-36ZD1515-UT	22...51 VDC	20 W	15 VDC / 0,67 A ; 15 VDC / 0,67 A	77%
TESZ20-36ZD2727-UT	22...51 VDC	20 W	27 VDC B / 0,37 A ; 27 VDC / 0,37 A	78%
TESZ20-48ZD0505-UT	29...67 VDC	20 W	5 VDC / 2 A ; 5 VDC / 2 A	75%
TESZ20-48ZD0512-UT	29...67 VDC	20 W	5 VDC / 2 A ; 12 VDC / 0,83 A	75%
TESZ20-48ZD1212-UT	29...67 VDC	20 W	12 VDC / 0,83 A ; 12 VDC / 0,83 A	77%
TESZ20-48ZD1515-UT	29...67 VDC	20 W	15 VDC / 0,67 A ; 15 VDC / 0,67 A	77%
TESZ20-48ZD2727-UT	29...67 VDC	20 W	27 VDC B / 0,37 A ; 27 VDC / 0,37 A	78%
TESZ20-72ZD0505-UT	43...101 VDC	20 W	5 VDC / 2 A ; 5 VDC / 2 A	76%
TESZ20-72ZD0512-UT	43...101 VDC	20 W	5 VDC / 2 A ; 12 VDC / 0,83 A	76%
TESZ20-72ZD1212-UT	43...101 VDC	20 W	12 VDC / 0,83 A ; 12 VDC / 0,83 A	78%
TESZ20-72ZD1515-UT	43...101 VDC	20 W	15 VDC / 0,67 A ; 15 VDC / 0,67 A	78%
TESZ20-72ZD2727-UT	43...101 VDC	20 W	27 VDC B / 0,37 A ; 27 VDC / 0,37 A	79%
TESZ20-96ZD0505-UT	58...135 VDC	20 W	5 VDC / 2 A ; 5 VDC / 2 A	76%
TESZ20-96ZD0512-UT	58...135 VDC	20 W	5 VDC / 2 A ; 12 VDC / 0,83 A	76%
TESZ20-96ZD1212-UT	58...135 VDC	20 W	12 VDC / 0,83 A ; 12 VDC / 0,83 A	78%
TESZ20-96ZD1515-UT	58...135 VDC	20 W	15 VDC / 0,67 A ; 15 VDC / 0,67 A	78%
TESZ20-96ZD2727-UT	58...135 VDC	20 W	27 VDC B / 0,37 A ; 27 VDC / 0,37 A	79%
TESZ20-110ZD0505-UT	66...160 VDC	20 W	5 VDC / 2 A ; 5 VDC / 2 A	76%
TESZ20-110ZD0512-UT	66...160 VDC	20 W	5 VDC / 2 A ; 12 VDC / 0,83 A	76%
TESZ20-110ZD1212-UT	66...160 VDC	20 W	12 VDC / 0,83 A ; 12 VDC / 0,83 A	78%
TESZ20-110ZD1515-UT	66...160 VDC	20 W	15 VDC / 0,67 A ; 15 VDC / 0,67 A	78%
TESZ20-110ZD2727-UT	66...160 VDC	20 W	27 VDC B / 0,37 A ; 27 VDC / 0,37 A	79%

Modules with non-standard output voltage from 5 to 80 VDC with maximal output current up to 5 A, could be delivered by request.

## Specifications for DC/DC converters TESZ20 series\*

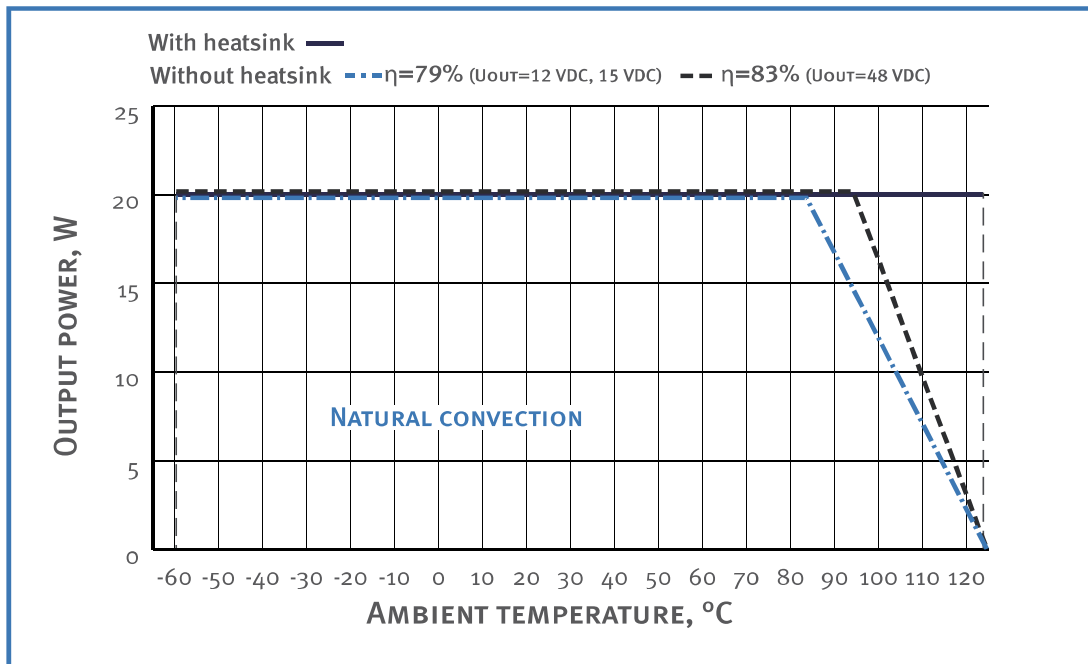
<b>Input specifications</b>	
Input voltage range 24 Z	=14,4...34 VDC
Input voltage range 36 Z	=22...51 VDC
Input voltage range 48 Z	=29...67 VDC
Input voltage range 72 Z	=43...101 VDC
Input voltage range 96 Z	=58...135 VDC
Input voltage range 110 Z	=66...160 VDC
Input transient protection 24 Z	120 VDC @ 20 ms 84 VDC @ 40 ms 48 VDC @ 1 s
Input transient protection 36 Z	180 VDC @ 20 ms 126 VDC @ 40 ms 72 VDC @ 1 s
Input transient protection 48 Z	240 VDC @ 20 ms 168 VDC @ 40 ms 96 VDC @ 1 ms
Input transient protection 72 Z	360 VDC @ 20 ms 252 VDC @ 40 ms 144 VDC @ 1 s
Input transient protection 96 Z	480 VDC @ 20 ms 336 VDC @ 40 ms 192 VDC @ 1 s
Input transient protection 110 Z	500 VDC @ 20 ms 350 VDC @ 40 ms 200 VDC @ 1 s
Input filter	In accordance with EN50121-3-2, EN50155
<b>Output specifications</b>	
Output voltage adjustment	±5% Uout nom.
Instability of output voltage in accordance to changing of output current from 10 to 100% for single output model	±6%
Instability of output voltage in accordance to changing of output current from 10 to 100% for dual output model	±2% for chan.1, ±7% for chan.2
Instability of output voltage in accordance to changing of output current for dual output model with a voltage value ≥20%	±2% for chan.1, ±12% for chan.2
Ripple and noise (peak-to-peak) (20 MHz)	<2% Uout nom.
Short circuit protection**	auto repair
Overvoltage protection**	<150 % Uout nom.
Over current protection level**	Pout ... 1.8·Pout
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, Tamb=50°C	20 W
<b>General specifications</b>	
Case temperature (operating)	-60°C ...+125°C ***
Case temperature (storage)	-60°C ...+125°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	7,8 °C/W
Conversion frequency	300 kHz typical
Insulation voltage input/output	=3000 VDC
Insulation voltage input/case	=2200 VDC
Insulation voltage output/case	=1500 VDC
Insulation voltage output/output	=1000 VDC
Isolation resistance @ 500 VDC	>20 MOhm
EMC standards	EN 55022, class A with additional filter
Safety standard	IEC/ EN 60950, EN50116
Surge and Transient Protection	EN50155, IEC60571, RIA12
Typical MTBF (Tcase = 50°C; Pout = 0,7 Pout max)	50 000 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.

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

## Output power vs an ambient temperature at input voltage =43...101 VDC (copper case)

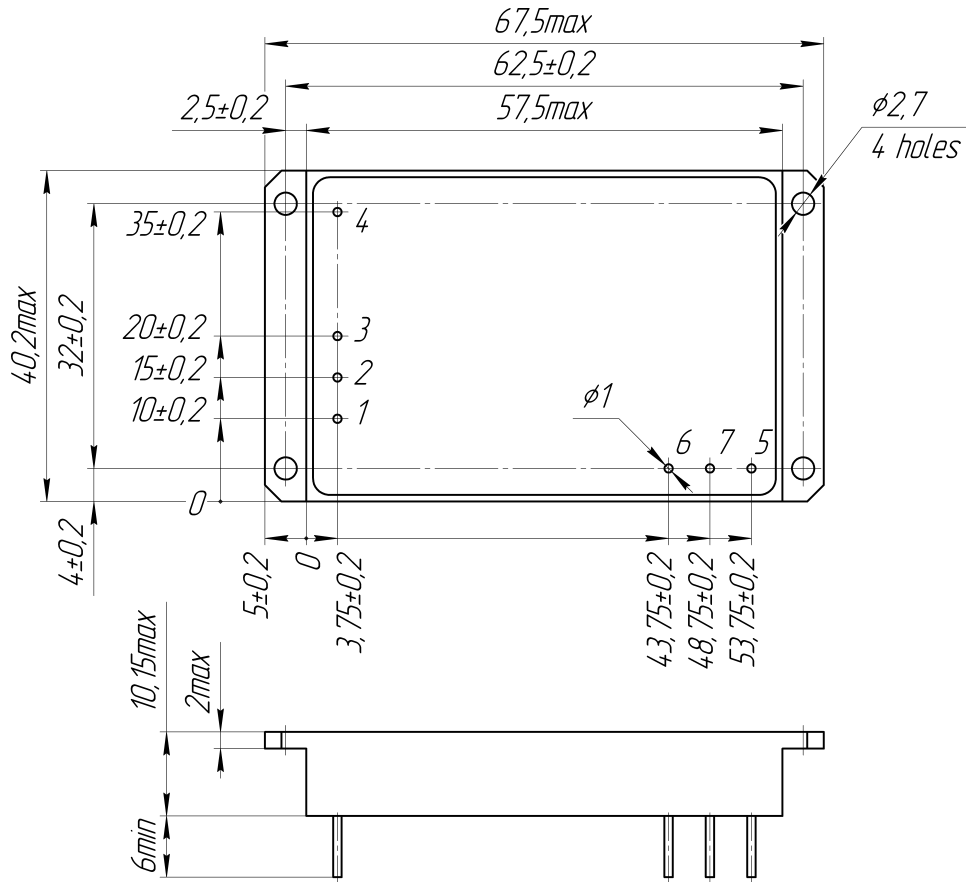


Dropping parts of the dashed and dash-dotted curves are in accordance with the **maximum temperature of the case**. Output power must not exceed the values which are limited by corresponding curve for a given ambient temperature.

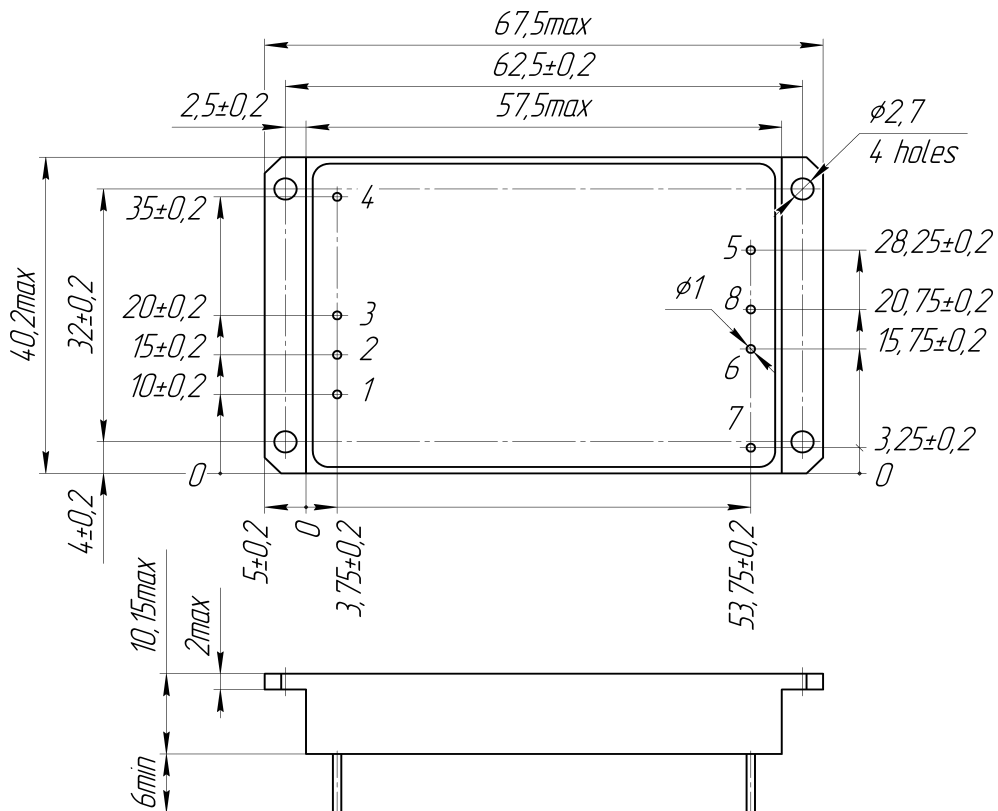
**Pin out**

Nº Pin	1	2	3	4	5	6	7	8
Single output	CASE	+IN	-IN	ON	+OUT	-OUT	ADJ	NOT USE
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\*  
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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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.

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