

## Advantages

- Output power up to 25 W, 31 W/in<sup>3</sup>
- Made in Russia (as part of the import substitution program)\*
- Export deliveries are possible
- Maximum operating temperature of the housing up to -60°C ...+110°C
- Ultra-wide input network - up to 9-80 V
- Running on a large output capacity
- Efficiency up to 92 %
- 40x30x11 (mm) low profile aluminum housing with mounting flanges (dimensions are specified without flanges)
- Input voltage options:  
standard "48W" - (9-80 VDC)  
possible: "12W", "24W", "48W"
- Output voltage adjustment
- Remote control
- One or two galvanically isolated outputs

\*Under a License agreement with AEPS-group



## Description

TESDs25-F2 isolated converters are DC/DC modules for operation in harsh operating conditions. Output power up to 25 W is available at a power density of 31 W/in<sup>3</sup>. The modules are operable in a wide range of input voltages and operating temperatures up to -60...+110°C.

They have a full range of protection and service functions, including remote on/off and output voltage adjustment.

The optimal combination of low price, ultra-wide input range of 9-80 V and technical parameters allows these modules to be used in a variety of areas – at high, low and medium altitude, in all types of transport, in mining, in supercomputers, in low- and high-temperature areas, in screens of information display systems, in radars, etc. - wherever small sizes are important and forced blowing or conductive heat removal is possible

When ordering, the power can be selected from a range of 15 or 25 watts					
Single channel 25 W Model	Input voltage	Pout. max.	Output Voltage nominal.**	Output current max.	Typical efficiency
TESDs25-48WS05-F2-Ux	9-80 V (1s 100 V transient)	25 W	05 V	5.00 A	84 %
TESDs25-48WS12-F2-Ux		25 W	12 V	2.08 A	86 %
TESDs25-48WS15-F2-Ux		25 W	15 V	1.67 A	86 %
TESDs25-48WS24-F2-Ux		25 W	24 V	1.04 A	87 %
TESDs25-48WS27-F2-Ux		25 W	27 V	0.93 A	87 %
TESDs25-48WS36-F2-Ux		25 W	36 V	0.69 A	88 %
TESDs25-48WS48-F2-Ux		25 W	48 V	0.52 A	88 %
TESDs25-48WS60-F2-Ux		25 W	60 V	0.42 A	89 %

\*Temperature version (index instead of X): -40°C...+110°C (S), -60°C...+110°C (T)

\*\* Modules with non-standard output voltage are available on request

**When ordering, the power can be selected from a range of 15 or 25 watts**

Dual channel 25 W Model	Input voltage	Pout. max.	Output Voltage nominal.**	Output current max. on channel	Typical efficiency
TESDs25-48WD0505-F2-Ux	<b>9-80 V</b> (1s 100 V transient)	25 W	2 x 05 V	2.50 A	83 %
TESDs25-48WD1212-F2-Ux		25 W	2 x 12 V	1.04 A	85 %
TESDs25-48WD1515-F2-Ux		25 W	2 x 15 V	0.83 A	85 %
TESDs25-48WD2424-F2-Ux		25 W	2 x 24 V	0.52 A	86 %
TESDs25-48WD2727-F2-Ux		25 W	2 x 27 V	0.46 A	86 %
TESDs25-48WD3636-F2-Ux		25 W	2 x 36 V	0.35 A	87 %
TESDs25-48WD4848-F2-Ux		25 W	2 x 48 V	0.26 A	87 %
TESDs25-48WD6060-F2-Ux		25 W	2 x 60 V	0.21 A	88 %

\*Temperature version (index instead of X): -40°C...+110°C (S), -60°C...+110°C (T)

\*\* Modules with non-standard output voltage are available on request

## Ordering information

### TESDs 25 - 48WD0505 - F2 - UT

1    2    3    4    5    6    7 8

- 1 «TESDs» Series
- 2 Nominal output power, W
- 3 Index of the nominal input voltage:
  - 12W**      12 V (10,2...36 V), transient 40 V
  - 24W**      24 V (18...75 V), transient 80 V
  - 48W**      **48 V (9...80 V), transient 100 V (standard)**
- 4 Index of the number of output channels:
  - S** one
  - D** two
- 5 Nominal output voltage , V (two characters on channel)
- 6 Case size
- 7 Index of constructive execution:
  - U** reinforced housing with flanges
  - C** housing without flanges
- 8 Index of the operating temperature range of the housing:
  - S** -40°C...+110°C
  - T** -60°C...+110°C

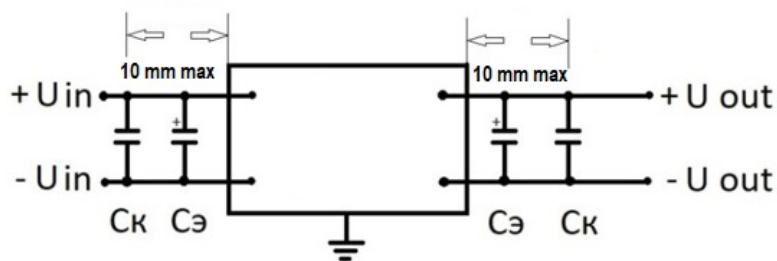
General specifications		
Switching frequency		400 kHz typ. PWM
Temperature range	Operating case temp	-40 °C до +110 °C (Standard "S")
	Storage temp	-60 °C до +130 °C
Overheat protection		+115 °C typ.
Cooling method	conductive through radiator or natural convection	
Case thermal resistance	case - ambient	14.4 K/W typ.
Humidity		5-95 % rel. H
Insulation	in/out, in/case	=1500 V
	out/case	=1000 V
	out/out	=500 V
Isolating resistance @ =500 V		>20 MOhm
Thermal, shock, mechanical shock & vibration		MIL-STD-810F
Safety standards		IEC/EN 60950-1
Typical MTBF	Pout = 0,7 Pout max	190 000 hrs (Tcase = 50 °C)
Weight (max)		30 g
Input specifications		
Input voltage range	range "48W"	9-80 V (1s 100 V transient.)
Starting voltage		Start 9 V
EMC Standards*	CE MIL-STD-461F, with typical connection scheme, use JETDF5 to improve filtration	
Output specifications		
Output voltage adjustment	In range $\pm 5\%$ via ADJ output (see drawing)	
Instability of the output voltage	when changing from Uin,min to Uin,max	$\pm 0.5\%$ for load. 10-100 %
	Load var from 10 % to 100 %	$\pm 2\%$
Ripple and noise (peak-to-peak)	20 MHz range	<2 % for load. 10-100 %
Protection	Over-load	Auto-reset at 110-150 % or Iout,nom
	Over-voltage	<130 % Uout,nom
Capacitive load (max)	24 V model (50% load) - typ. 6500 uF	
Remote OFF	connect «-IN» & «ON» or apply 0-0.5 VDC to «ON»	

\*See product page for filters at [www.te-power.ru](http://www.te-power.ru).

\*If necessary, contact us by e-mail [russia@te-power.ru](mailto:russia@te-power.ru).

All characteristics are given for the NCC, Uin.nom., Iout.nom., unless otherwise specified.

## Typical connection scheme (minimum required)



The design of the units allows their use only when installed on a PCB.

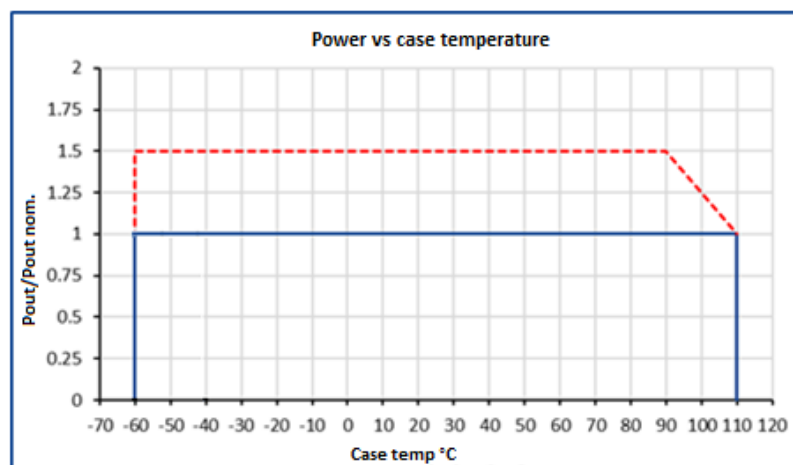
It is necessary to use the elements of the typical scheme shown in the figure.

CK – ceramic capacitors of the required operating voltage with a capacity of several  $\mu\text{F}$ .

Cэ – electrolytic capacitors of the required operating voltage of polymer, aluminum or tantalum type with a capacity of tens to hundreds of  $\mu\text{F}$ .

To select the nominal values of the elements, see clause 7.7 of [the Technical Specifications for the modules of the TESDs series](#).

## Max output power based on case temperature



— Standard maximum power output based on case temperature.

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

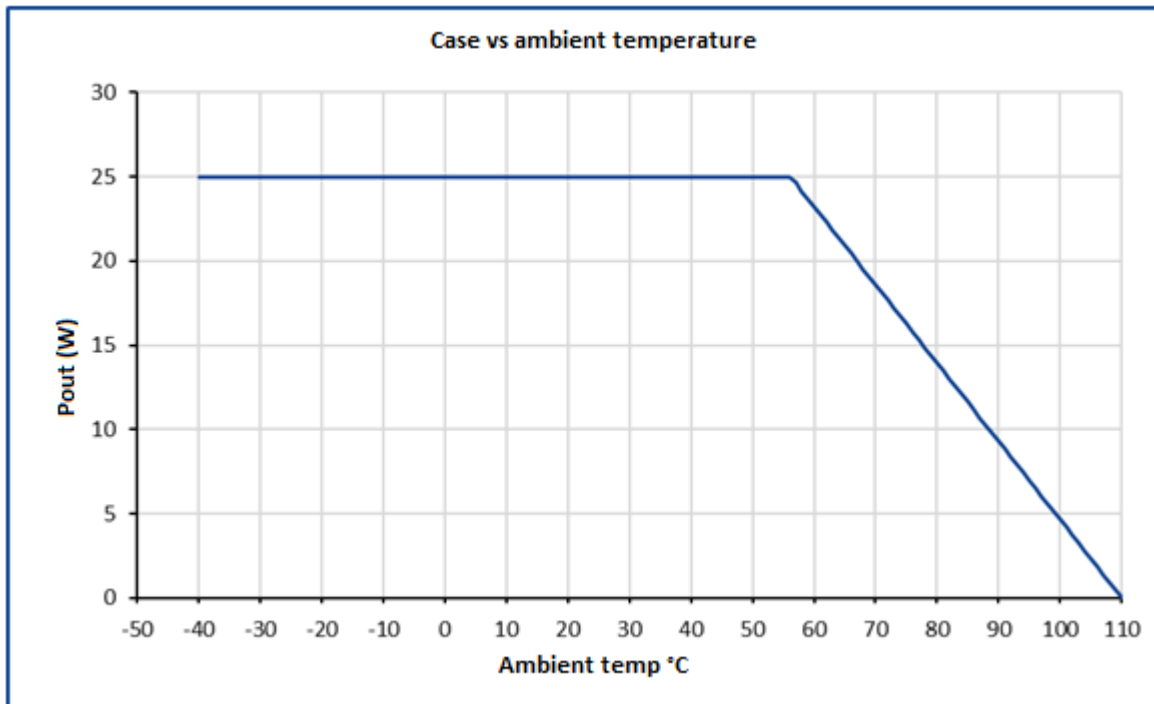
Before operation, the product label on converter top side has to be removed.

When using a module with a radiator (in the case of conductive cooling), for a high-quality fit to the radiator, it is necessary to use a heat-conducting paste with a layer thickness of no more than 0.1 mm and a thermal conductivity coefficient of at least  $2.0 \text{ W} / (\text{m} \cdot ^\circ\text{C})$ , applied using a mesh stencil with the formation of square sections of paste after its application (for example,  $2 \times 2 \text{ mm} - 4 \times 4 \text{ mm}$  and a distance between squares of 0.5-1 mm). This allows you to ensure the output of excess air and the minimum thickness of the paste layer when the module is attracted to the radiator.

### Note:

The modules have protection against short-term short circuit at the output, this mode is emergency, not for permanent working use. It is forbidden to turn on the modules when the output pins are short-circuited.

If necessary contact us by e-mail [russia@te-power.ru](mailto:russia@te-power.ru).

**Max output power based on ambient temperature**

The graph is given for a 25 W model and an efficiency of 87%.

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

When using a unit without a radiator, it is assumed that the units are located on a vertically spaced printed circuit board that has no other noticeable heat sources other than the units themselves. It is permissible to use units on a horizontally positioned printed circuit board when placing units on the upper side. In any case, the presence of uncomplicated air convection around the units is mandatory.

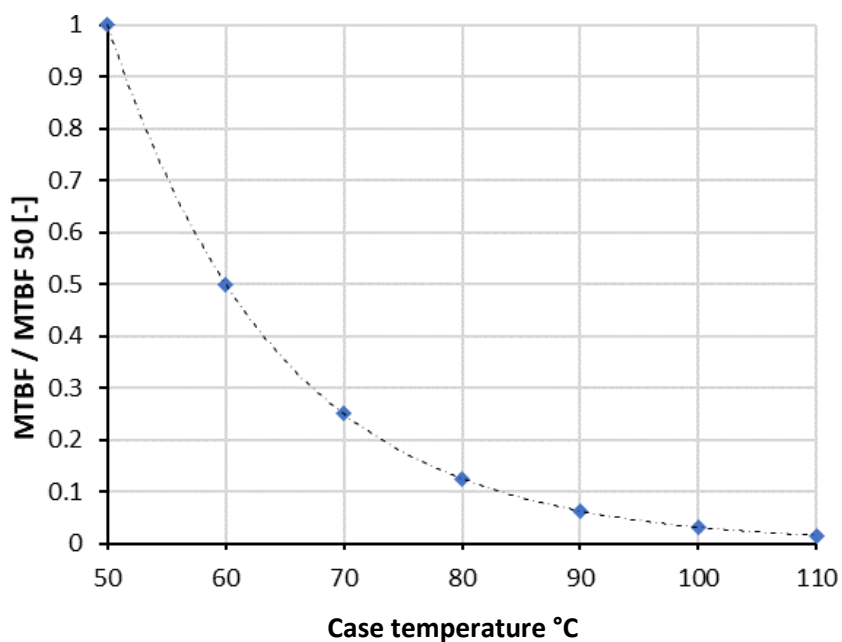
**Note:**

The units have protection against short-term short-circuit at the output, this mode is emergency, not for permanent working use. It is forbidden to turn on the units when the output pins are short-circuited.

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## 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.

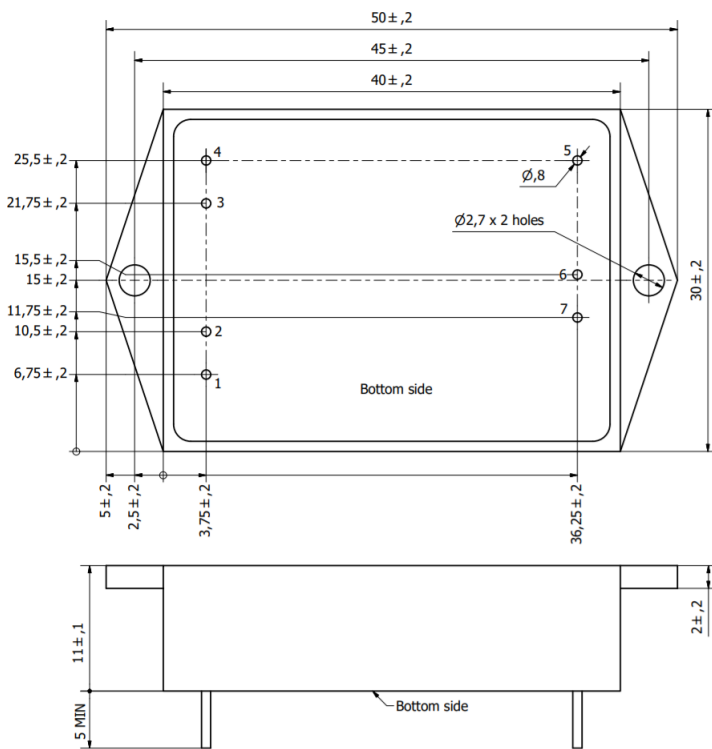


Dimensions

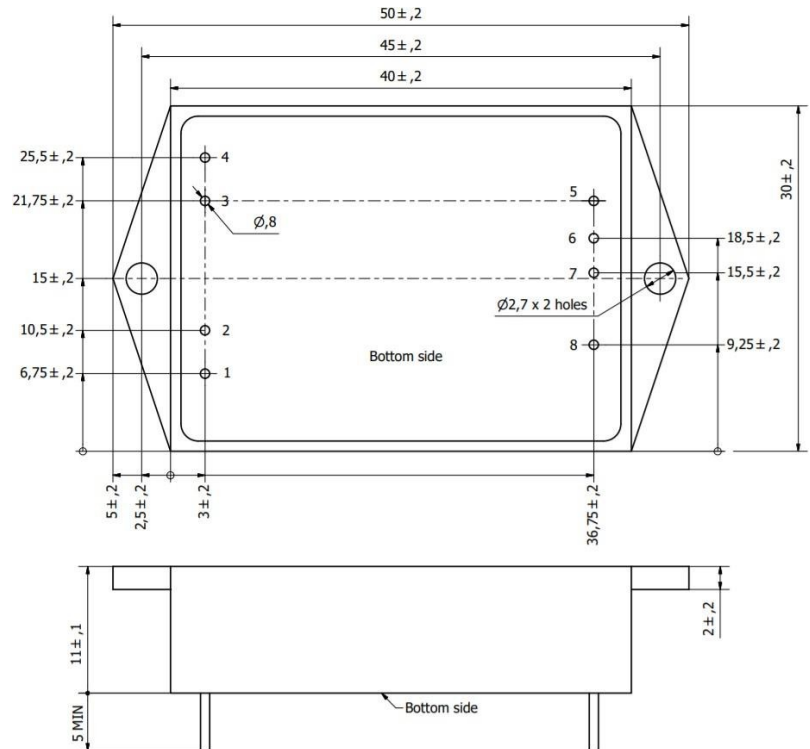
Pin #	1	2	3	4	5	6	7	8
Single channel	CASE	+IN	-IN	ON	-OUT	+OUT	ADJ	-
Dual channel	CASE	+IN	-IN	ON	-OUT2	+OUT2	-OUT1	+OUT1

Dimensions in millimeters, 2 installation holes, PCB mounting only

Single channel



Dual channel



Additional information

Please note that the information in this document is not complete. More detailed information (additional requirements, typical switching schemes, operating rules, etc.) is provided on the website [www.te-power.ru](http://www.te-power.ru). All images are for illustrative purposes only, the actual appearance of the product may vary, including the type and placement of internal components.

In accordance with the company's policy in connection with the continuous improvement of the design of products, the manufacturer reserves the right to change the content of specifications and promotional materials without prior notice! Make sure you are using the latest documentation, which can be downloaded at [www.te-power.ru](http://www.te-power.ru).

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