

Advantages

- Output power up to 60 W, 2586 W/dm³
- Non-optocoupler feedback
- Made in Russia (as part of the import substitution program)*
- Export deliveries are possible
- Maximum operating temperature of the housing up to -60°C ...+125°C
- Efficiency up to 93 %
- 58x40x11 (mm) low profile aluminum housing with mounting flanges (dimensions are specified without flanges)
- Input voltage options: standard "28W" - (16-50 VDC) possible: "12W", "24W", "28W"
- Output voltage adjustment
- Remote control
- One or two galvanically isolated outputs
- The ability to receive an increased output voltage by serial connection of outputs
- Short circuit and overvoltage protection, thermal protection
- Insulation In/out 1500 W

*Under a License agreement with AEPS-group



Description

TESD60 isolated converters with **non-optocoupler feedback** - DC/DC power supply modules for operation in harsh operating conditions.

Output power up to **60 W** is available at a power density of **2586 W/dm³**. The modules are operable in a wide range of input voltages and operating temperatures, standard up to **-40...+110°C**, on request up to **-60...+125°C**.

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

The optimal combination of technical parameters and affordable price makes it possible to use these modules in a wide 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 information display system screens, 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 40 or 60 watts

Single-channel 60 W Model*	Input Voltage	Pout. max.	Output voltage nom.**	Output current max.	Typical efficiency
TESD60-28WS05-Ux	16-50 V (1s 80 V transient.)	60 W	05 V	12.0A	89 %
TESD60-28WS12-Ux		60 W	12 V	5.0 A	91 %
TESD60-28WS15-Ux		60 W	15 V	4.0 A	92 %
TESD60-28WS24-Ux		60 W	24 V	2.5 A	92 %
TESD60-28WS27-Ux		60 W	27 V	2.22 A	92 %
TESD60-28WS36-Ux		60 W	36 V	1.66 A	93 %
TESD60-28WS48-Ux		60 W	48 V	1.25 A	93 %
TESD60-28WS60-Ux		60 W	60 V	1.0 A	93 %

*Temperature version (index instead of X): -40°C...+110°C (S), -60°C...+125°C (T)

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

Ordering information

TESD 60 - 12WS24 - U T

1 2 3 4 5 6 7

- 1 «TESD» 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
 - 28W 27 V (16...50 V), transient 80 V (standard)
- 4 Index of the number of output channels:
 - S one
- 5 Nominal output voltage, V (two characters per channel)
- 6 Index of constructive execution:
 - U reinforced housing with flanges
 - C housing without flanges
- 7 Index of the operating temperature range of the housing:
 - S -40°C...+110°C
 - T -60°C...+125°C

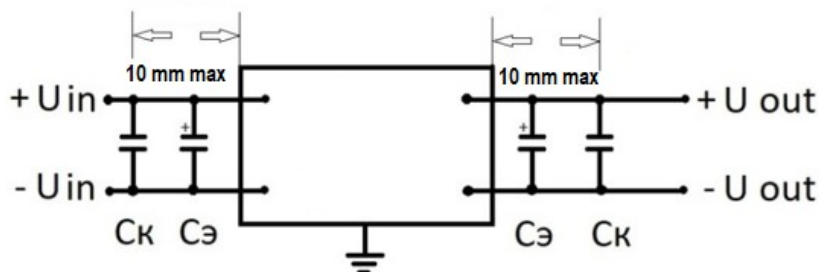
General specifications		
Switching frequency		400 kHz typ. PWM
Temperature range	Operating case temp.	-40°C to +110°C (Standard "S")
	Storage temp	-60°C to +130°C
Overheat protection		+115°C typ.
Cooling method		Conductive with radiator
Case thermal resistance	case - ambient	7.4°C/W typ.
Humidity		5-95 % rel. H
Insulation	input/output, input/case	=1500 V
	output/case	=1000 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	170 000 hrs (Tcase = 50°C)
Weight (max)		120 g
Input specifications		
Input voltage range	range "28W"	16-50 V (80 V 1s transient)
EMC standard*	CE MIL-STD-461F, with typical connection scheme, use JETDF10 to improve filtration	
Output specifications		
Output voltage adjustment	In range ±5 % via ADJ output (see drawing)	
Instability of the output voltage	when changing from Uin,min to Uin,max	±0.5 %
	Load var from 10 % to 100 %	±2 %
Ripple and noise (peak-to-peak)	20 MHz bandwidth	<2 %
Protection	Over-load	Auto-reset at 110-150 % of Iout,nom
	Over-voltage	<130 % Uout,nom
Capacitive load (max)	12 V model (50% load) - typ. 2000 uF	
Minimum load	Not required	
Remote OFF	connect «-IN» & «NO» or apply 0-0.5 VDC to «ON»	

* See product page for filters at www.te-power.ru.

* If necessary, contact us by e-mail 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.

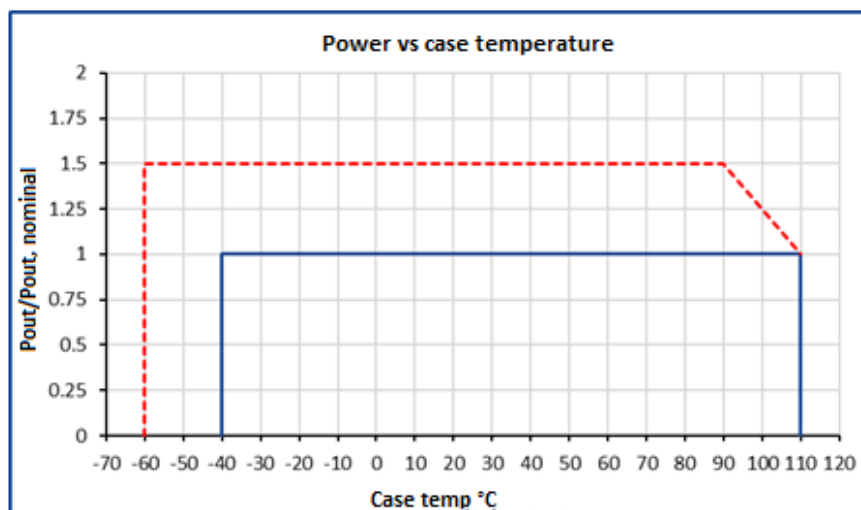
It is necessary to use the elements of the typical scheme shown in the figure.

Cк – ceramic capacitors of the required operating voltage with a capacity of several μF .

Cэ – electrolytic capacitors of the required operating voltage of polymer, aluminum or tantalum type with a capacity of tens to hundreds of μF .

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

Max output power based on case temperature



— Standard maximum power output based on case temperature.

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

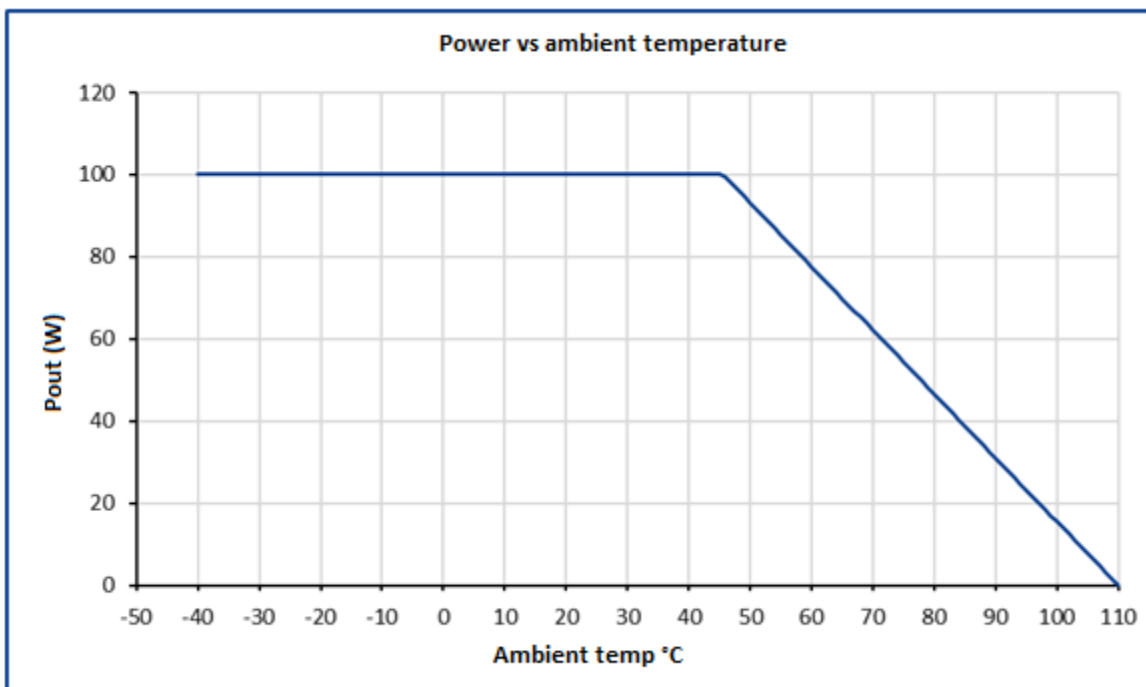
Before operation, the product label on converter top side has to be removed.

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 units have a short-circuit output protection, which is for emergency only, not for long-term operation. It's prohibited to use the units with reversed input voltage polarity or turn on the units with short-circuited outputs (the units have the special detectors inside).

If necessary, contact us by e-mail russia@te-power.ru.

Max output power based on ambient temperature

The graph is given for a 60 W model and an efficiency of 92%.

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.

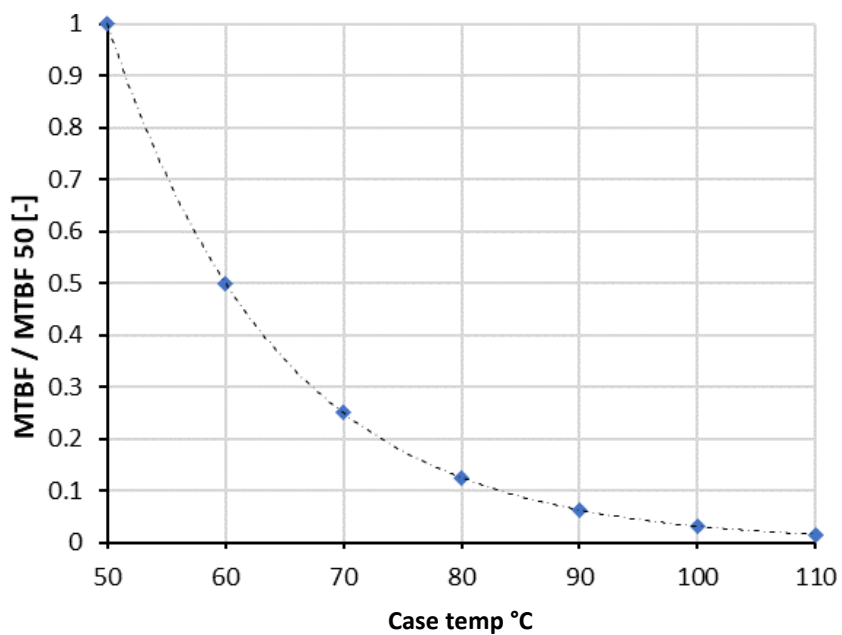
Note:

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

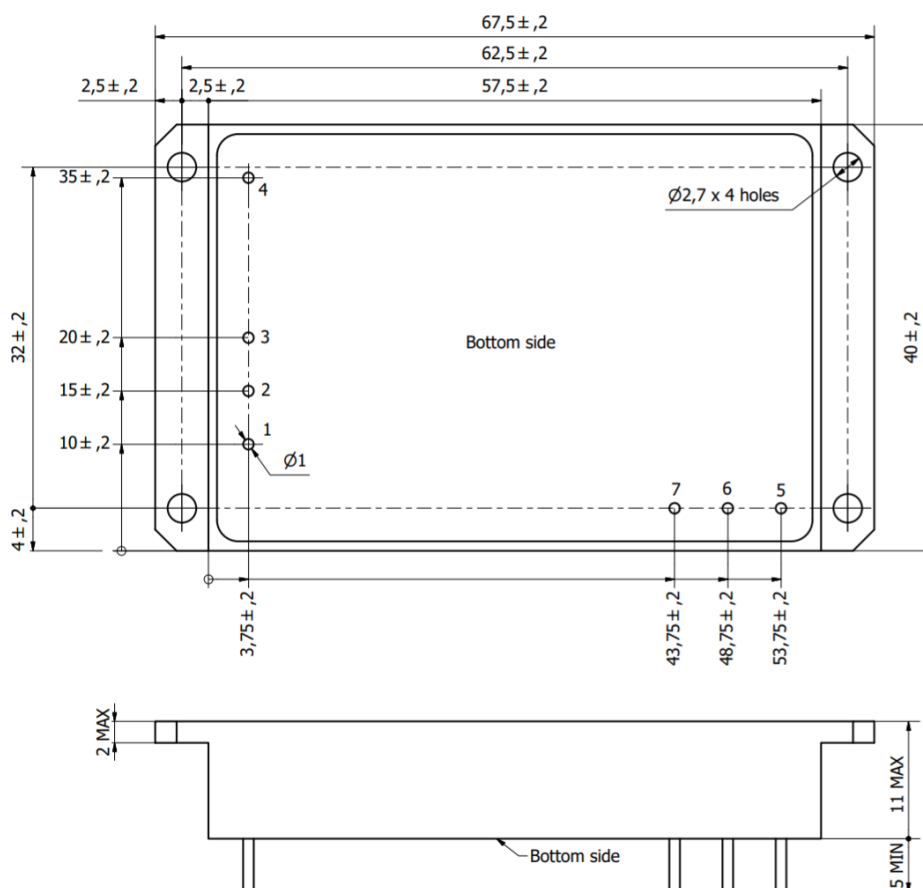
When using the unit, a customer must in one way or another monitor maximal heatsink temperature. Maximal heatsink temperature near the center point of the longer unit's side (considered as unit case temperature) must correspond to the expected unit's MTBF. Approximate MTBF function shown on the graph 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	ADJ	-OUT	-

Dimensions in millimeters, 4 installation holes, PCB mounting only



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. 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.

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