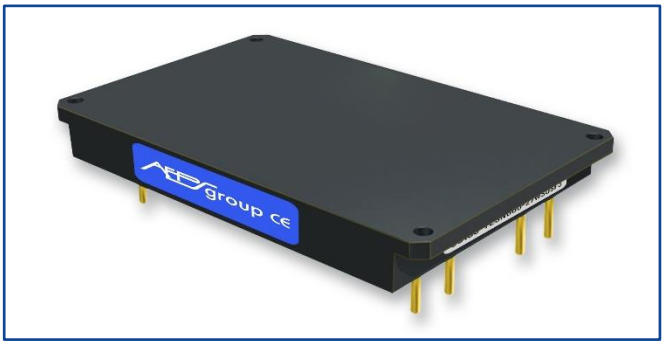
TESND100-F3

Features



- **Output power up to 100 W, 95 W/inch^3**
- **Operating case temperature -60 ... +125 °C**
- **Efficiency up to 91 %**
- **Case dimensions (without flanges): 48x33x11 (mm) - F3**
- **CNC milled case**
- **Input "28W" (16-50 VDC) - standard, possible: "48" (34-75 VDC), "48W" (9-80 VDC)**
- **Remote off**

Description

TESND series of DC/DC isolated converters with mounting flanges meant for operation in harsh environmental conditions. A packet of electro-technical and mechanical parameters creates versality for the series to be used in various application fields: both low and high altitude in unprotected equipment compartments, in all types of transport, in supercomputers, in low and high temperature environments, digital signage equipment, in radar systems. The series is an optimal fit for any environment which requires low-profile, minimized dimensions and weight, high efficiency and wide temperature range.

Ordering information

TESND	100	- 28W	S	24	- T	- F3
1	2	3	4	5	6	7

1 Series name.
2 Nominal output power, W: default **100 W,** other output power limits may be provided on request.
3 Input voltage range: default **"28W" 16-50 VDC**; possible to provide **"48" or "48W"** range on request.
4 Number of output channels: **"S"** - 1 channel, **"D"** - 2 channels, **"T"** - 3 channels.
5 Nominal output voltage of channel or channels; i.e., for 2 channels of 05 VDC each - "0505".
6 Index of case operating temperature range: **"T"** - default **-60 ... +125 °C**; other temperature ranges possible on request.
7 Index of case form-factor.

Base models (1 channel), input "28W"					
Model part number	**Input voltage**	**Output power**	**Output voltage**	**Output current per channel**	**Typical efficiency at 70 % load**
TESND100-28WS3.3-T-F3	**16-50 VDC (28 VDC nom.)** 80 VDC 1s transient	**46 W**	**3.3 VDC**	**14.00 A**	**85 %**
TESND100-28WS05-T-F3		**70 W**	**05 VDC**	**14.00 A**	**88 %**
TESND100-28WS12-T-F3		**100 W**	**12 VDC**	**8.33 A**	**90 %**
TESND100-28WS15-T-F3		**100 W**	**15 VDC**	**6.67 A**	**90 %**
TESND100-28WS24-T-F3		**100 W**	**24 VDC**	**4.17 A**	**91 %**
TESND100-28WS27-T-F3		**100 W**	**27 VDC**	**3.70 A**	**91 %**
TESND100-28WS36-T-F3		**100 W**	**36 VDC**	**2.78 A**	**91 %**
TESND100-28WS48-T-F3		**100 W**	**48 VDC**	**2.08 A**	**91 %**

Base models (1 channel), input "48W"					
Model part number	**Input voltage**	**Output power**	**Output voltage**	**Output current per channel**	**Typical efficiency at 70 % load**
TESND70-48WS3.3-T-F3	**9-80 VDC (48 VDC nom.)** 100 VDC 1s transient	**33 W**	**3.3 VDC**	**10.00 A**	**83 %**
TESND70-48WS05-T-F3		**50 W**	**05 VDC**	**10.00 A**	**86 %**
TESND70-48WS12-T-F3		**70 W**	**12 VDC**	**5.83 A**	**88 %**
TESND70-48WS15-T-F3		**70 W**	**15 VDC**	**4.67 A**	**88 %**
TESND70-48WS24-T-F3		**70 W**	**24 VDC**	**2.92 A**	**89 %**
TESND70-48WS27-T-F3		**70 W**	**27 VDC**	**2.59 A**	**89 %**
TESND70-48WS36-T-F3		**70 W**	**36 VDC**	**1.94 A**	**89 %**
TESND70-48WS48-T-F3		**70 W**	**48 VDC**	**1.46 A**	**89 %**

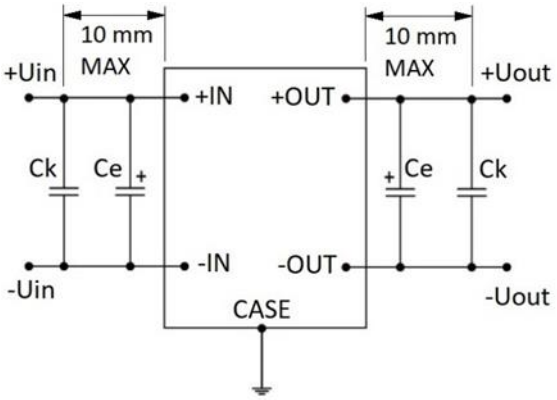
Additional ordering information:

1) The units may be provided with a different range of input voltage on request, please see available ranges in our selection guide.
2) Units with non-standard output voltage may be provided on request.
3) Units with non-standard output power may be provided on request.
4) Maximum power values for **"48" input models** are the same as for **"28W" input models**.

General characteristics [3]		
Switching frequency		330 kHz typ. (PWM modulation)
Temperature ranges	case operating temperature	–60° C ... +125° C (default "T")
	storage temperature	–60° C ... +125° C
Over-temperature protection		+125° C typ.
Thermal mode and cooling method	cooling methods, from most preferred (for the unit to be used with a coldplate or heatsink it's necessary to consult with the producer)	1. Conductive - heatsink-coldplate. 2. Forced air heatsink cooler. 3. Convectional heatsink cooling with vertical orientation of itself and vertical orientation of its ribs for free air flow from bottom to top. 4. Without a heatsink - with means of natural convection.
Thermal resistance	case to ambient	9.4 K/W
Humidity (non-condensing)		5-95 % rel. H
Insulation	in/case, in/out	1500 VDC
	out/case	1000 VDC
	out/out	500 VDC
Isolating resistance @ 500 VDC		>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)		55 g
Input characteristics [3]		
Input voltage range (with power derating)	"28W"	16-50 VDC, 28 VDC nom., 80 VDC 1s transient
	"48"	34-75 VDC, 48 VDC nom., 100 VDC 1s transient
	"48W"	9-80 VDC, 48 VDC nom., 100 VDC 1s transient
Start-up input voltage	for "28W" input	typ. 14 VDC
EMC standard compliance[1]	CE MIL-STD-461F with typical connection scheme, apply JETDF5 for improved filtration	
Output characteristics [3]		
Power derating based on input voltage	for input "28W" - linear derating	derating from 100 W to 70 W with input voltage decrease from 20 VDC to 16 VDC
	for inputs "48", "48W"	-
Output voltage adjustment	±5 % via ADJ output (see drawing)	
Output voltage regulation	input variance Uin,min to Uin,max	±0.5 % for load 10-100 %
	load variance 10 % to 100 %	±1 %
Ripple and noise (peak-to-peak)	20 MHz bandwidth	<1 % for load 10-100 %
Protection	over-current	auto-reset at 110-150 % of Iout,nom
	over-voltage	<130 % Uout
Capacitive load (max)	24 VDC, 50% Pout,nom	typ. 7 000 uF
Remote OFF	connect ON to -IN or apply 0-0.5 VDC to ON	

1. See available filters on www.aeps-group.com.
2. -
3. All specifications are valid for normal climatic conditions, nominal output voltage and current, unless stated otherwise.

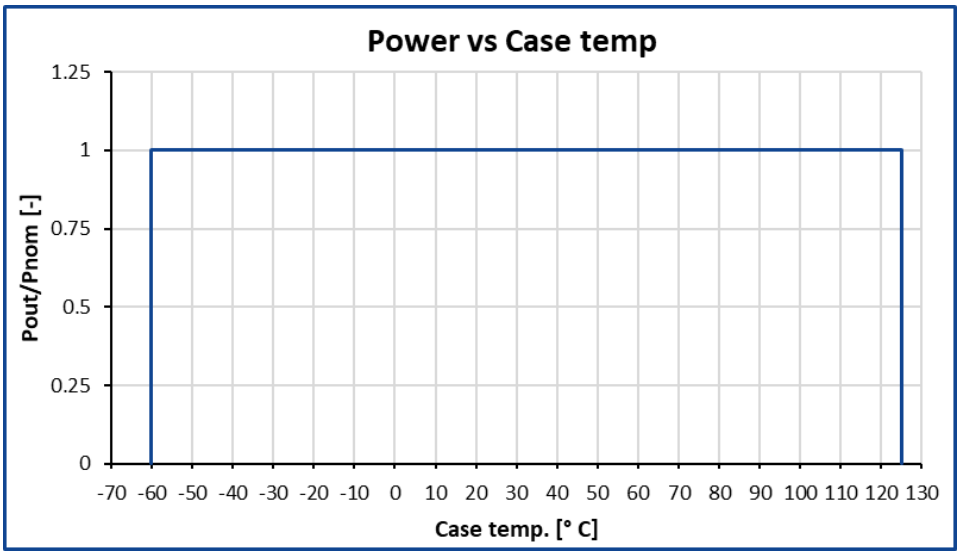
Minimal necessary connection scheme

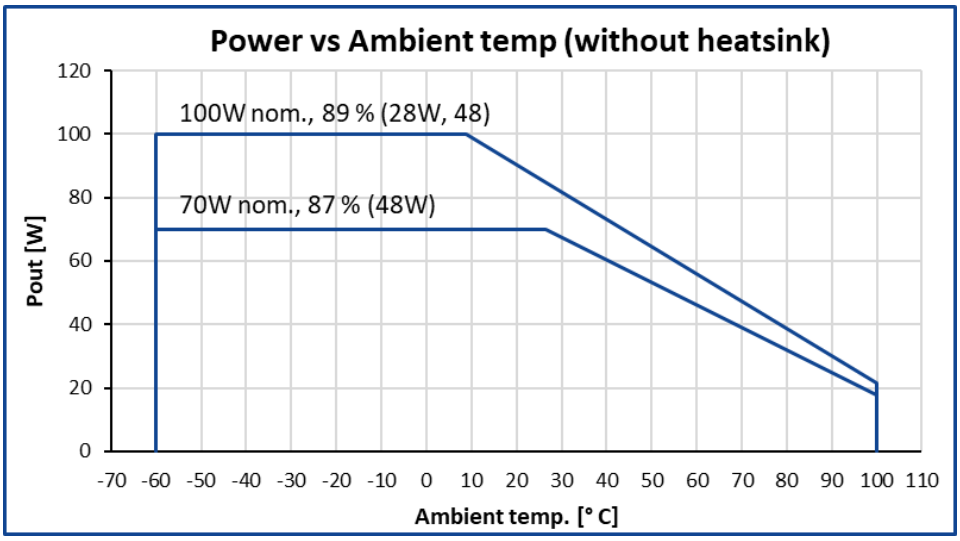


In any system application it's necessary to at least use minimal connection scheme consisting of components shown on the picture.

Ck – ceramic capacitors of a certain operating voltage and of several µF capacity; Ce – electrolytic capacitors of a certain operating voltage and of polymer, aluminum or tantalum type of tens to hundreds µF capacity. For component values – please see point 5.5 in Reference Technical Material for DC/DC units.

Power-temperature relationship





Additional application information

1. Value of case temperature

The case temperature is measured at the middle of the long side of the case base. When using a thermocouple, it is necessary to fixate the conductors (connected to the thermocouple end) to the base surface at a distance of at least 20 mm. The thermocouple measuring end and its conductors must be covered with a layer of heat-conducting paste 2-3 mm thick to provide correct measurements.

2. Possible cooling methods

1) Conductive cooling with aluminum (or copper) **heatsink-coldplate,** for example, aluminum plate thicker than 2 mm.

2) Forced air.

3) Convectional heatsink cooling with vertical orientation of itself and vertical orientation of its ribs for free air flow from bottom to top.

4) Without a heatsink via means of natural convection. In such case it's assumed that the unit is mounted on a vertically positioned PCB, which doesn't contain any other significant heat sources. It's allowed to operate the unit on a horizontally placed PCB if the unit is mounted on its top side. In any case - it's necessary to provide un-constricted airflow around the unit. **To use the units without a heatsink it's recommended to consult with the producer.**

Most of the unit's dissipated heat (93-95 %) is concentrated on the bottom surface of the unit, its base, which must be attached to the heatsink-coldplate or ribbed heatsink surface. Requirements for the heatsink surface (preferably CNC milled) - flatness tolerance of the heatsink surface must be lower than 0.1 mm per 100 mm of length.

3. Unit heatsink fixation

If 4 mounting holes are available, then first one pair of diagonally located holes is connected with screws, then a second pair. First installation of the screws should be done without force. Then all the screws should be tightened with the recommended torque.

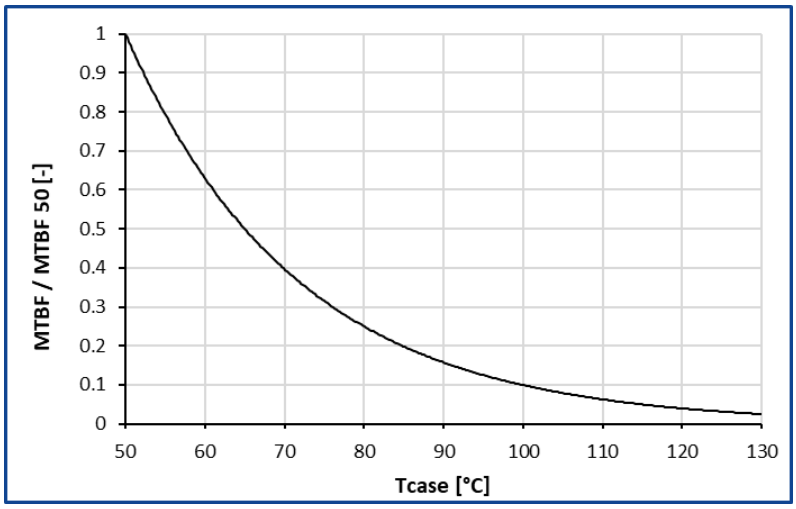
For quality contact between the unit and a heatsink - it's necessary to use thermal conductive paste with thickness less than 0.1 mm, with thermal conductivity **greater than 5 W/K.m**. The paste must be applied with mesh stencil in a pattern of squares (i.e. 2x2 mm to 4x4 mm squares mm with 0.5-1 mm spacing between the squares). This allows paste to be evenly spread in a thin layer and excess air to escape when tightening screws during unit mounting.

4. Short-term unit operation

If it's necessary to shortly turn on the unit for 3-5 minutes (for example for input-control testing), an aluminium (copper) coldplate must be used as a heatsink. Its width and length must be not less than of the unit itself, with thickness at least 4 mm. The unit must be placed on coldplate through a thin (0.15-0.3 mm) silicone-based heat-conducting sheet.

5. MTBF dependance 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. Maximal unit's case temperature is recorded by internal unit's thermal sensor-monitor.



6. Thermal protection tripping

When internal unit's thermal protection is tripped (typ. +125 °C) the unit is turned off (until automatic restart). **Such state should lead to measures of forced heatsink cooling, for example via fans turn-on.** Time before automatic restart of the unit after thermal protection tripping can last from several seconds up to several minutes depending on thermal inertia of the heatsink.

7. Operation with shorted outputs

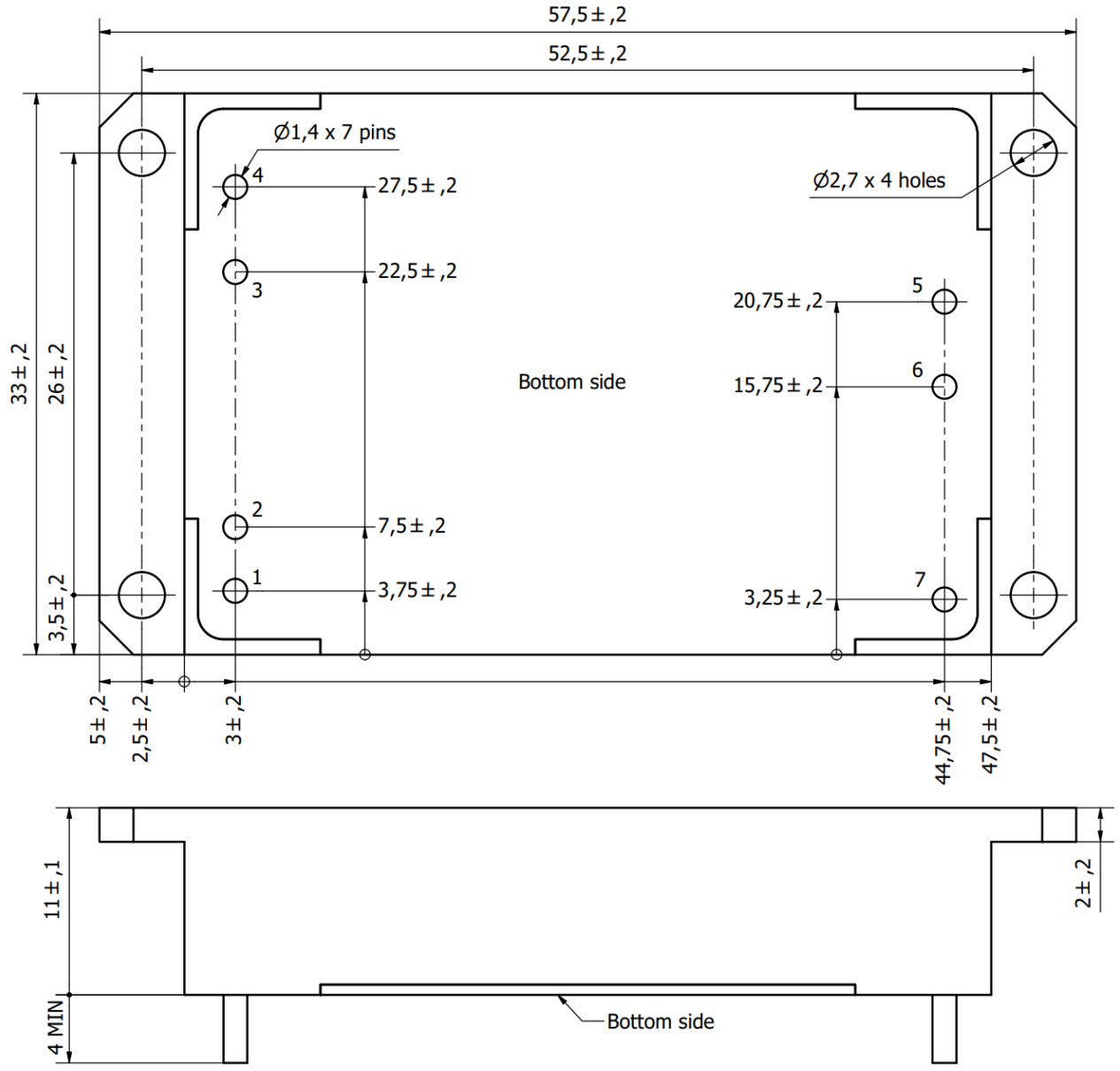
The units have a short-circuit output protection. **The protection is for emergency only, not for long-term operation. It's prohibited to use the units with shorted outputs (the units have the special detectors inside).**

If you have any questions, please contact us directly at aeps@aeps-group.cz.

Dimensions

1	2	3	4	5	6	7
CASE	+IN	-IN	ON	ADJ	+OUT	-OUT

Dimensions in millimeters, 4 installation holes, PCB mounting only.



Additional information

After ordering the product - the customer is fully responsible for applying the product in strict compliance with mentioned rules and principles of use in the product datasheet and reference technical material (RTM) which is downloadable at www.aeps-group.com.

Please, note that all information in this material is for reference only. Further detailed information (including: additional requirements, manuals and circuit schemes, etc.) is found at www.aeps-group.com or provided via an email request at aeps@aeps-group.cz. All pictures shown are for illustration purpose only, actual product appearance may vary, incl. inner components choice and placement and connectors placement.

According to company's policy in view of constant improvements of the production design the manufacturer reserves the right to change the contents of specifications and promotional materials without prior notice! Make sure you are using the latest documentation downloadable at www.aeps-group.com.