

DC/DC Converters

ATF200, ATF400, 200–400 W



Advantages

- Derating of impulse load on the input network
- Low-profile design, compact dimensions compared with conventional capacitive storage
- Output power 200 W, 400 W
- Input voltage of 9...18, 18...36, 36...72, 200...340 VDC
- Switching frequency 470...530 kHz, external synchronization
- Typical efficiency 92...95%
- Operating temperature –60...+125°C

Description

Compact modular active current filter (ATF) is designed to reduce the pulse component of the current consumed from the input network in systems featuring pulsed load current. ATF is optimized for joint use with power sources of MDA series to provide power supply of transmit-receive units of active electronically scanned arrays (AESA). Apart from this it can be used in other power systems with load of pulse nature.

ATF is a step-up DC/DC converter without galvanic isolation. The pulse current consumed by the load is filtered by limiting charging current of the storage capacitor connected between ATF and the subsequent cascade of the power supply system.

The floating galvanically isolated synchronization entry allows to synchronize the conversion frequency of the ATF and ensure reliable hardware or software filtration of its electromagnetic interference.

High conversion frequency does not only positively impact the weight and dimensions of the ATF, but allows to isolate in different ranges the operating frequency area of the equipment of transmit-receive units of AESA and ATF's switching noise.

With small dimensions (120,9×38×12,85 mm) the output power of the ATF can reach up to 400 W, it can operate within the temperature range –60...+125°C. ATF has the function of on-command power off and is equipped with overcurrent and overvoltage protection at the output.

ATF can be equipped with different input, output and service contacts, for example, with axial or radial arrangement of pins, blade contacts, flexible mounting outputs, terminal blocks, etc.

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Ordering information

ATF 400 M 380 U
① ② ③ ④ ⑤

- ① - Active current filter
- ② - Rated output power, W
- ③ - Index of nominal input voltage
A – 12 V (9...18 V)
V – 27 V (18...36 V)
D – 60 V (36...72 V)
M – 300 V (200...340 V)
- ④ - Nominal output voltage, VDC
- ⑤ - Index of case design
U – case with flanges
B – caseless design

ATF200 standard models

Model	Input voltage range	Rated output power	Output voltage / rated output current
ATF200 A 24 x	9...18 VDC	200 W	24 VDC / 8,3 A
ATF200 A 27 x	9...18 VDC	200 W	27 VDC / 7,4 A
ATF200 V 48 x	18...36 VDC	200 W	48 VDC / 4,1 A
ATF200 V 60 x	18...36 VDC	200 W	60 VDC / 3,3 A
ATF200 D 96 x	36...72 VDC	200 W	96 VDC / 2,1 A
ATF200 D 110 x	36...72 VDC	200 W	110 VDC / 1,8 A
ATF200 M 380 x	200...340 VDC	200 W	380 VDC / 0,53 A
ATF200 M 400 x	200...340 VDC	200 W	400 VDC / 0,5 A

ATF400 standard models

Model	Input voltage range	Rated output power	Output voltage / rated output current
ATF400 A 24 x	9...18 VDC	400 W	24 VDC / 16,7 A
ATF400 A 27 x	9...18 VDC	400 W	27 VDC / 14,8 A
ATF400 V 48 x	18...36 VDC	400 W	48 VDC / 8,3 A
ATF400 V 60 x	18...36 VDC	400 W	60 VDC / 6,7 A
ATF400 D 96 x	36...72 VDC	400 W	96 VDC / 4,2 A
ATF400 D 110 x	36...72 VDC	400 W	110 VDC / 3,6 A
ATF400 M 380 x	200...340 VDC	400 W	380 VDC / 1,05 A
ATF400 M 400 x	200...340 VDC	400 W	400 VDC / 1 A

Customized units can be supplied with different values of output power, input and output voltage.

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Specifications*

Input specifications	
Input voltage range	A 9...18 V V 18...36 V D 36...72 V M 200...340 V
Input filter	none
Ripple amplitude of the input current under dynamic load	max ±10%
Output specifications	
Total regulation	max ±10%
Ripple and noise (p-p)	max 2% of Uout. nom.
Overload protection**	110–130% Pnom.
Short circuit protection	none
Overvoltage protection at output	max 115% Uout. nom.
General specifications	
Efficiency at constant rated power load	min 92%
Switching frequency synchronization	
Synchronization frequency	470...530 kHz
Synchronization off-duty factor	1,25...5
Synchronization amplitude	2,4...5,5 V
Remote on/off	
Remote on/off is realized by connection of pins "OFF" and "-IN", or by supplying 0...0.4V to "OFF" pin in relation to "-IN" pin.	

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Specifications* (cont.)

General specifications	
Heat-emitting surface operating temperature**, storage temperature	-60...+125°C
Isolation voltage in., out./case; input voltage of A, V, D input voltage M sync/in., out.; sync/case isolation resistance @ 500 VDC	500 VDC 1500 VAC 600 VDC min 20 MOhm
Humidity	98% / 25°C
Thermal resistance housing-ambient (housing with flanges)	6,4°C/W
MTBF	2000 kHrs
Cooling	convectonal with heatsink or forced fan
Weight (max) case with flanges caseless design	190 g 150 g

It is important to note that the information herein is not full. More detailed information (specific requirements, basic connection circuits, rules of operations etc.) can be found on our web-site: www.aedon.ru

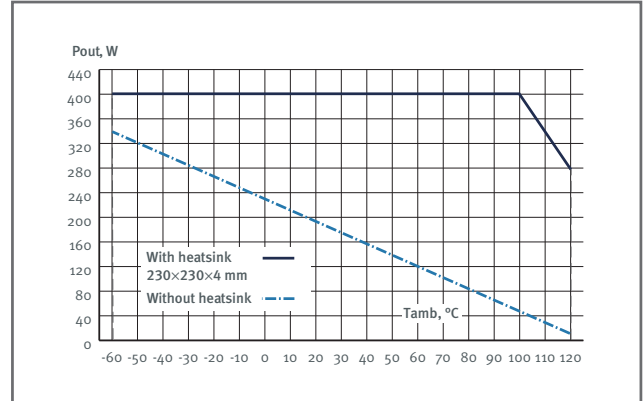
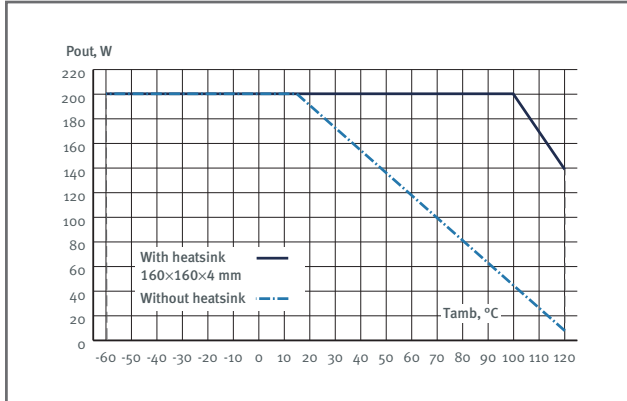
* All specifications valid at normal climatic conditions (ambient temp. +15...+35°C; relative humidity 45...80%; air pressure $8,6 \times 10^4 \dots 10,6 \times 10^4$ Pa), $U_{in.nom.}$, $I_{out.nom.}$, unless otherwise stated.

** 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.

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Output power derating VS ambient temperature (case with flanges)



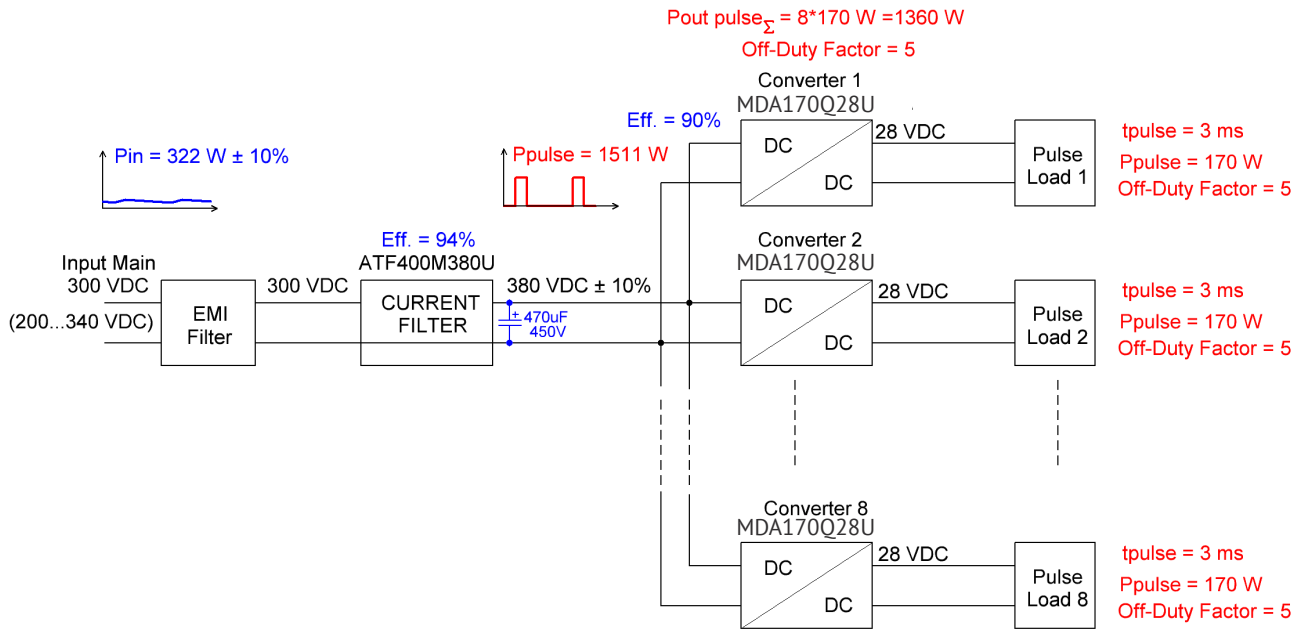
Decreasing parts of the curves correspond to the maximum temperature of the heat-emitting surface +125°C. Output power must not exceed the values limited by curve for the given ambient temperature.

ATF units can be used without heatsink only on condition of attaching thermal grease to the heat-distribution baseplate with length and width not less than case's and with thickness not less than 3 mm.

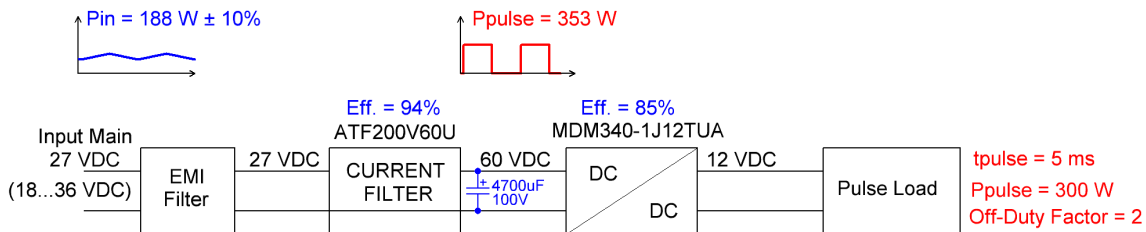
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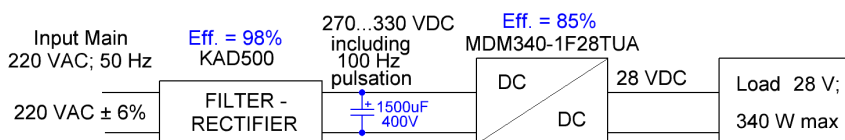
Examples of units` application



Example 1. Power supply system of eight transmit-receive units of AESA without significant pulse load to the input network.



Example 2. Power supply of a 12 V pulse consumer from a 27 V onboard network without significant pulse load for input network.



Example 3. Application of ATF as a typical step-up converter without galvanic isolation.

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Pin out

Nominal input voltage, VDC	Input voltage range, VDC	Items in use	
		ATF	MDA Units
12	9...18	ATF200 A27	MDA170 Ux
12		ATF400 A27	MDA340 Ux
24 (27)	18...36	ATF200 V60	MDA170 Jx
		ATF400 V60	MDA340 Jx, MDA500 Jx
60	36...72	ATF200 D110	MDA170 Kx
60		ATF400 D110	MDA340 Kx, MDA500 Kx
300	200...340	ATF200 M380	MDA170 Qx
300		ATF400 M380	MDA340 Qx, MDA500 Qx

Rated output power of active current filter (ATF) must be not less than 110% of average power consumed by its load.

Explanation of ATF and MDA indexes of nominal input voltage

Index of nominal input voltage	Nominal input voltage, VDC	Input voltage range, VDC
Input networks of ATF		
A	12	9...18
V	27	18...36
D	60	36...72
M	300	200...340
Input networks of MDA		
E	12	10,5...13,5
U	27	22...33
J	60	44...66
K	110	99...121
F	300	270...330
Q	380	342...418

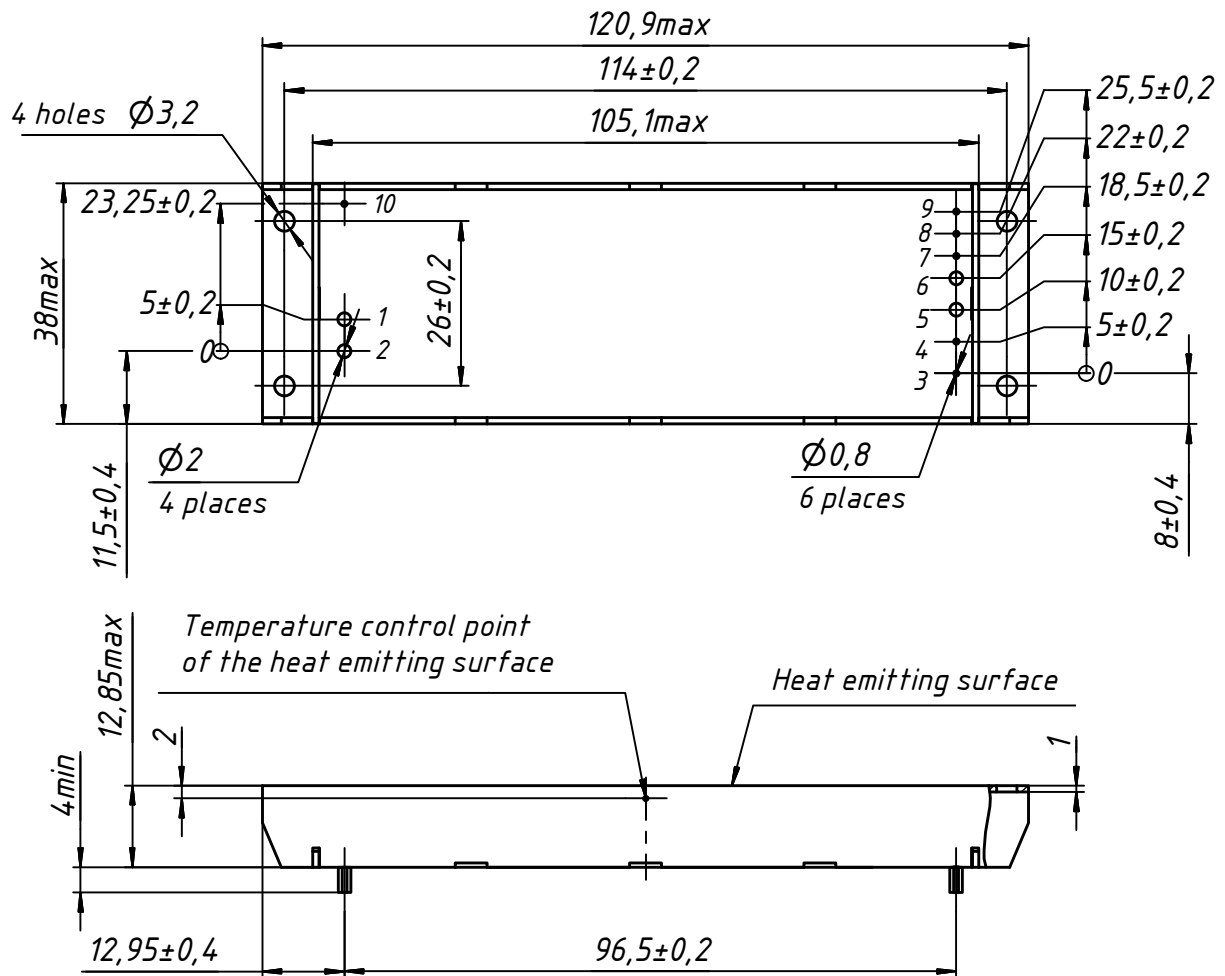
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Pin out

Pin #	1	2	3	4	5	6	7	8	9	10
Function	-IN	+IN	SYNC2	SYNC1	+OUT	-OUT	NOT USE	ON	NOT USE	CASE

Unit with vertical pin out, case with flanges



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ATF with vertical pin out, caseless design

