



- ◀ Power density max 612 W/dm³ (10 W/in³)
- ◀ 2 year warranty
- ◀ Output current max. 6 A, rated output power up to 50 W
- ◀ Input voltage ranges 100...264 VAC; 187...242 VAC; 81...138 VAC
- ◀ Low-profile design (20 mm) with blade contacts or connector block
- ◀ DIN-rail mount (optional)
- ◀ Case operating temperature range -40...+85°C, -50...+85°C
- ◀ Single, dual or triple output models
- ◀ Galvanic isolation output/output, input/case
- ◀ Overvoltage, short-circuit and thermal protection
- ◀ Efficiency min. 80% (U_{out}=5 V)
- ◀ Parallel or series mode
- ◀ Polymer potting sealing
- ◀ Maximum load capacity 22500 μF (U_{out}=5 VDC)
- ◀ Recommended for application in new developments
- ◀ Polymer potting sealing
- ◀ Maximum load capacity 1800 μF (U_{out}=5 VDC)

DESCRIPTION

Power modules of MAA30, MAA50 series are designed for industrial and special purpose equipment. With small dimensions (101×51×20 mm) maximum output power of the modules can reach up to 50 W. These modules are able to operate in a wide range of case operating temperatures (-50...+85°C).

Depending on a version they can have one, two or three galvanically isolated output channels, full range of protections (overcurrent, short-circuit, overheating), they can be used in parallel or serial mode. Polymer potting sealing ensures reliable environmental protection and excludes damage to the converter caused by vibration, dirt, moisture or salt fog.

Case of the modules has u-shaped aluminum base. The PCB of the module is protected from mechanical and climatic load by a thin-walled steel cover.

COMPLIANCE

Designed to meet MIL-STD-810G

Designed to meet MIL-STD-461E with additional circuit

ORDERING INFORMATION

MAA 30 - 2 S 12 12 S D N
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① - MAA series
- ② - Rated output power, W
- ③ - Quantity of output channels (1, 2, 3)
- ④ - Index of nominal input voltage
 - C - 220 VAC, extend (100...264 VAC)
 - S - 220 VAC (187...242 VAC)
 - K - 115 VAC (81...138 VAC)
- ⑤ - Nominal output voltage, VDC (two signs per channel)
- ⑥ - Polymer potting sealing
- ⑦ - Index of design type
 - G - compact metal case with cover and terminal blocks
 - D - compact metal case with cover and blade contacts
- ⑧ - Index of case operating temperature range
 - N - from -40 to +85°C
 - P - from -50 to +85°C

SINGLE OUTPUT MODELS

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA30-1C05 SXX	100...264 VAC	30 W	5 VDC / 6 A	78%
MAA30-1C09 SXX	100...264 VAC	30 W	9 VDC / 3,33 A	80%
MAA30-1C12 SXX	100...264 VAC	30 W	12 VDC / 2,5 A	82%
MAA30-1C15 SXX	100...264 VAC	30 W	15 VDC / 2 A	82%
MAA30-1C24 SXX	100...264 VAC	30 W	24 VDC / 1,25 A	84%
MAA30-1C28 SXX	100...264 VAC	30 W	28 VDC / 1,11 A	85%
MAA30-1S05 SXX	187...242 VAC	30 W	5 VDC / 6 A	78%
MAA30-1S09 SXX	187...242 VAC	30 W	9 VDC / 3,33 A	80%
MAA30-1S12 SXX	187...242 VAC	30 W	12 VDC / 2,5 A	82%
MAA30-1S15 SXX	187...242 VAC	30 W	15 VDC / 2 A	82%
MAA30-1S24 SXX	187...242 VAC	30 W	24 VDC / 1,25 A	84%
MAA30-1S28 SXX	187...242 VAC	30 W	28 VDC / 1,11 A	85%
MAA30-1K05 SXX	81...138 VAC	30 W	5 VDC / 6 A	78%
MAA30-1K09 SXX	81...138 VAC	30 W	9 VDC / 3,33 A	80%
MAA30-1K12 SXX	81...138 VAC	30 W	12 VDC / 2,5 A	82%
MAA30-1K15 SXX	81...138 VAC	30 W	15 VDC / 2 A	82%
MAA30-1K24 SXX	81...138 VAC	30 W	24 VDC / 1,25 A	84%
MAA30-1K28 SXX	81...138 VAC	30 W	28 VDC / 1,11 A	85%
MAA50-1C05 SXX	100...264 VAC	30 W	5 VDC / 6 A	78%
MAA50-1C09 SXX	100...264 VAC	50 W	9 VDC / 5,6 A	80%
MAA50-1C12 SXX	100...264 VAC	50 W	12 VDC / 4,2 A	82%
MAA50-1C15 SXX	100...264 VAC	50 W	15 VDC / 3,3 A	82%
MAA50-1C24 SXX	100...264 VAC	50 W	24 VDC / 2,1 A	84%
MAA50-1C28 SXX	100...264 VAC	50 W	28 VDC / 1,9 A	85%
MAA50-1S05 SXX	187...242 VAC	30 W	5 VDC / 6 A	78%
MAA50-1S09 SXX	187...242 VAC	50 W	9 VDC / 5,6 A	80%
MAA50-1S12 SXX	187...242 VAC	50 W	12 VDC / 4,2 A	82%
MAA50-1S15 SXX	187...242 VAC	50 W	15 VDC / 3,3 A	82%
MAA50-1S24 SXX	187...242 VAC	50 W	24 VDC / 2,1 A	84%
MAA50-1S28 SXX	187...242 VAC	50 W	28 VDC / 1,9 A	85%
MAA50-1K05 SXX	81...138 VAC	30 W	5 VDC / 6 A	78%
MAA50-1K09 SXX	81...138 VAC	50 W	9 VDC / 5,6 A	80%
MAA50-1K12 SXX	81...138 VAC	50 W	12 VDC / 4,2 A	82%
MAA50-1K15 SXX	81...138 VAC	50 W	15 VDC / 3,3 A	82%
MAA50-1K24 SXX	81...138 VAC	50 W	24 VDC / 2,1 A	84%
MAA50-1K28 SXX	81...138 VAC	50 W	28 VDC / 1,9 A	85%

Optionally custom design modules with output voltage from 5 to 60 V and maximum output current 6 A can be produced.

* Maximum output power for input voltage C (wide circuit) at Uout 100...187 V is reducing according to Power reduction diagram of module according to input voltage.

DUAL OUTPUT MODELS

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA30-2C0505 SXX	100...264 VAC	30 W	5 VDC / 3 A; 5 VDC / 3 A	78%
MAA30-2C1212 SXX	100...264 VAC	30 W	12 VDC / 1,25 A; 12 VDC / 1,25 A	82%
MAA30-2C1515 SXX	100...264 VAC	30 W	15 VDC / 1 A; 15 VDC / 1 A	82%
MAA30-2C2828 SXX	100...264 VAC	30 W	28 VDC / 0,56 A; 28 VDC / 0,56 A	85%
MAA30-2S0505 SXX	187...242 VAC	30 W	5 VDC / 3 A; 5 VDC / 3 A	78%
MAA30-2S1212 SXX	187...242 VAC	30 W	12 VDC / 1,25 A; 12 VDC / 1,25 A	82%
MAA30-2S1515 SXX	187...242 VAC	30 W	15 VDC / 1 A; 15 VDC / 1 A	82%
MAA30-2S2828 SXX	187...242 VAC	30 W	28 VDC / 0,56 A; 28 VDC / 0,56 A	85%
MAA30-2K0505 SXX	81...138 VAC	30 W	5 VDC / 3 A; 5 VDC / 3 A	78%
MAA30-2K1212 SXX	81...138 VAC	30 W	12 VDC / 1,25 A; 12 VDC / 1,25 A	82%
MAA30-2K1515 SXX	81...138 VAC	30 W	15 VDC / 1 A; 15 VDC / 1 A	82%
MAA30-2K2828 SXX	81...138 VAC	30 W	28 VDC / 0,56 A; 28 VDC / 0,56 A	85%
MAA50-2C0505 SXX	100...264 VAC	30 W	5 VDC / 3 A; 5 VDC / 3 A	78%
MAA50-2C1212 SXX	100...264 VAC	50 W	12 VDC / 2,1 A; 12 VDC / 2,1 A	82%
MAA50-2C1515 SXX	100...264 VAC	50 W	15 VDC / 1,7 A; 15 VDC / 1,7 A	82%
MAA50-2C2828 SXX	100...264 VAC	50 W	28 VDC / 0,93 A; 28 VDC / 0,93 A	85%
MAA50-2S0505 SXX	187...242 VAC	30 W	5 VDC / 3 A; 5 VDC / 3 A	78%
MAA50-2S1212 SXX	187...242 VAC	50 W	12 VDC / 2,1 A; 12 VDC / 2,1 A	82%
MAA50-2S1515 SXX	187...242 VAC	50 W	15 VDC / 1,7 A; 15 VDC / 1,7 A	82%
MAA50-2S2828 SXX	187...242 VAC	50 W	28 VDC / 0,93 A; 28 VDC / 0,93 A	85%
MAA50-2K0505 SXX	81...138 VAC	30 W	5 VDC / 3 A; 5 VDC / 3 A	78%
MAA50-2K1212 SXX	81...138 VAC	50 W	12 VDC / 2,1 A; 12 VDC / 2,1 A	82%
MAA50-2K1515 SXX	81...138 VAC	50 W	15 VDC / 1,7 A; 15 VDC / 1,7 A	82%
MAA50-2K2828 SXX	81...138 VAC	50 W	28 VDC / 0,93 A; 28 VDC / 0,93 A	85%

Optionally custom design modules with output voltage from 5 to 68 V and maximum output current 15 A can be produced.

* Maximum output power for input voltage C (wide circuit) at Uout 100...187 V is reducing according to Power reduction diagram of module according to input voltage.

TRIPLE OUTPUT MODELS

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA30-3C051212 SXX	100...264 VAC	30 W	5 VDC / 3 A; 12 VDC / 0,63 A; 12 VDC / 0,63 A	77%
MAA30-3C051515 SXX	100...264 VAC	30 W	5 VDC / 3 A; 15 VDC / 0,5 A; 15 VDC / 0,5 A	79%
MAA30-3S051212 SXX	187...242 VAC	30 W	5 VDC / 3 A; 12 VDC / 0,63 A; 12 VDC / 0,63 A	77%
MAA30-3S051515 SXX	187...242 VAC	30 W	5 VDC / 3 A; 15 VDC / 0,5 A; 15 VDC / 0,5 A	79%
MAA30-3K051212 SXX	81...138 VAC	30 W	5 VDC / 3 A; 12 VDC / 0,63 A; 12 VDC / 0,63 A	77%
MAA30-3K051515 SXX	81...138 VAC	30 W	5 VDC / 3 A; 15 VDC / 0,5 A; 15 VDC / 0,5 A	79%
MAA50-3C051212 SXX	100...264 VAC	30 W	5 VDC / 3 A; 12 VDC / 0,63 A; 12 VDC / 0,63 A	77%
MAA50-3C051515 SXX	100...264 VAC	30 W	5 VDC / 3 A; 15 VDC / 0,5 A; 15 VDC / 0,5 A	79%
MAA50-3S051212 SXX	187...242 VAC	30 W	5 VDC / 3 A; 12 VDC / 0,63 A; 12 VDC / 0,63 A	77%
MAA50-3S051515 SXX	187...242 VAC	30 W	5 VDC / 3 A; 15 VDC / 0,5 A; 15 VDC / 0,5 A	79%
MAA50-3K051212 SXX	81...138 VAC	30 W	5 VDC / 3 A; 12 VDC / 0,63 A; 12 VDC / 0,63 A	77%
MAA50-3K051515 SXX	81...138 VAC	30 W	5 VDC / 3 A; 15 VDC / 0,5 A; 15 VDC / 0,5 A	79%

Optionally custom design modules with output voltage from 5 to 68 V and maximum output current 15 A can be produced.

* Maximum output power for input voltage C (wide circuit) at Uout 100...187 V is reducing according to Power reduction diagram of module according to input voltage.

SPECIFICATIONS OF AC/DC CONVERTERS MAA30, MAA50*

Input specifications

Input voltage range**	C	100...264 VAC (141...372 VDC)
	S	187...242 VAC (263...340 VDC)
	K	81...138 VAC (113...198 VDC)
Input frequency	C, S	47...53 Hz
	K	360...440 Hz

Output specifications

Line and load regulation	max 2% for first channel max 10% for second (third) channel
Ripple and noise (peak-to-peak)	<2% Uout. nom.
Short circuit protection***	automatic repair
Overcurrent protection	Pout... 1,8 Pmax
Overload protection level***	<125% Uout. nom.

General specifications

Case temperature	operating "N"	-40...+85°C
	operating "P"	-50...+85°C
	storage	-50...+85°C
power derating (free convection) without power derating using heatsink		diagram (dashed, dash-dotted curve)
		diagram (solid curve)
Humidity		93...95% / 25°C
Efficiency		80% Uout=5 VDC 86% Uout=24 VDC
Switching frequency, constant		200 kHz
Isolation voltage	in./case	1500 VAC
	in./out.	1500 VAC
	out./case, out./out.	500 VAC
	isolation resistance @ 500 VDC	20 Mohm min
EMC standards		IEC 60950, EN55022 (CISPR22), Class B
Thermal resistance case-ambient		6,8°C/W
Typical MTBF		2000 kWhrs
Cooling		conductive (baseplate-cooled)
Weight		max 180 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.kwsystems.ru.

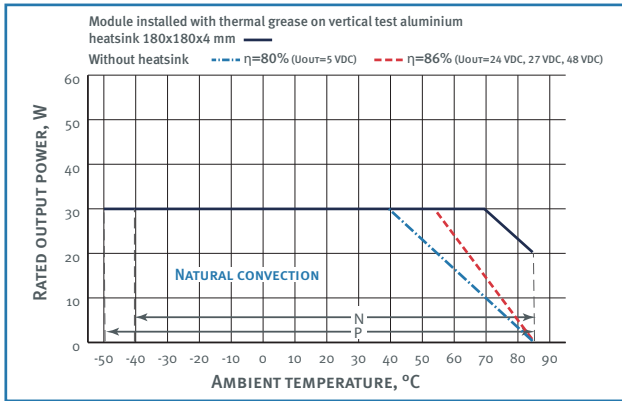
* All specifications are valid for normal climatic conditions, Uin. nom., Iout. nom., unless otherwise noted.

** Maximum output power for input voltage C (wide circuit) at Uout 100...187 VDC is reducing according to Power reduction diagram of module according to input voltage.

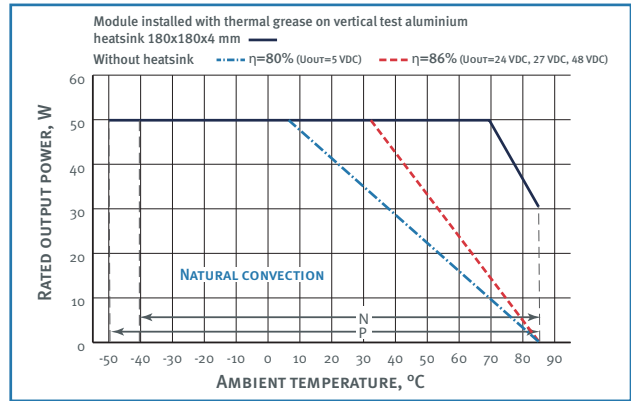
*** Parameters are stated for the information purposes and could not be used at long term work, exceeding maximum output current, operating outside of a working temperatures range or when output voltage is over the range of adjustment.

POWER DERATING VS AMBIENT TEMPERATURE AT UIN 187...242 VAC

MAA30



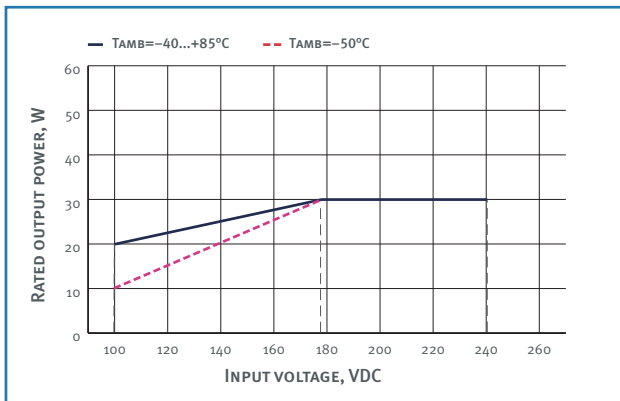
MAA50



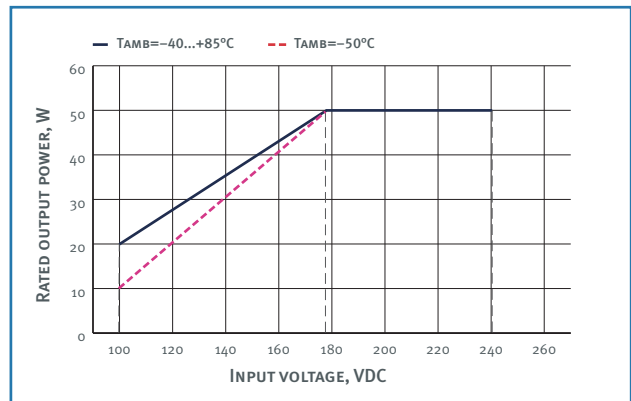
Decreasing parts of the dashed and dash-dotted curves correspond to the maximum case temperature (+85°C for models with index "N" and "P"). Output power must not exceed the values limited by curve for a given ambient temperature.

POWER DERATING DIAGRAM VS INPUT VOLTAGE

MAA30



MAA50



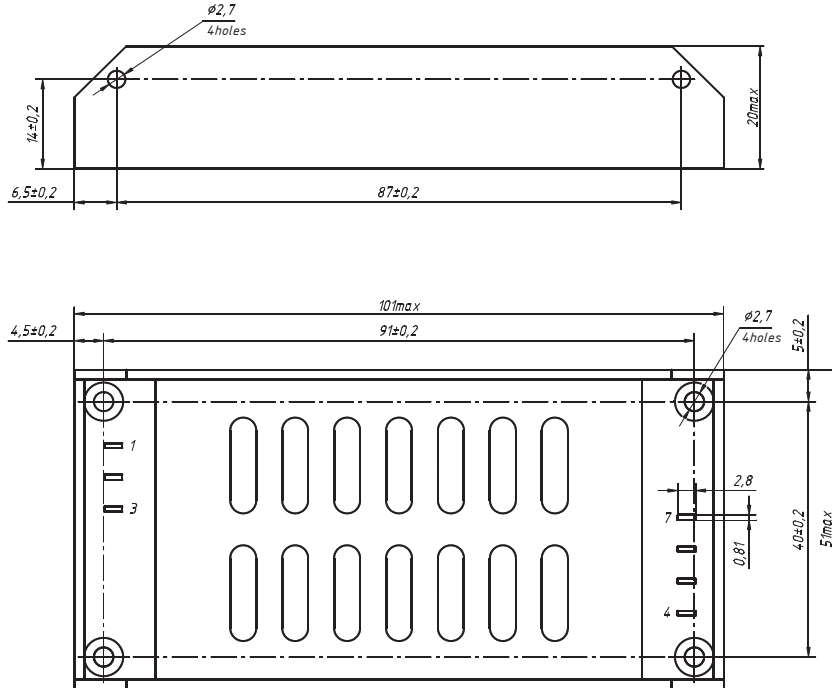
PIN OUT (DESIGN WITH BLADE CONTACTS) MAA30, MAA50

PIN #	1	2	3	4	5	6	7	8	9
SINGLE CHANNEL	⊕	L	N	-TRIM	+TRIM	-OUT1	-OUT1	+OUT1	+OUT1
DUAL CHANNEL	⊕	L	N	-TRIM	+TRIM	-OUT1	+OUT1	-OUT1	+OUT2
TRIPLE CHANNEL	⊕	L	N	+TRIM	-TRIM	+OUT1	+OUT1	-OUT1	-OUT1

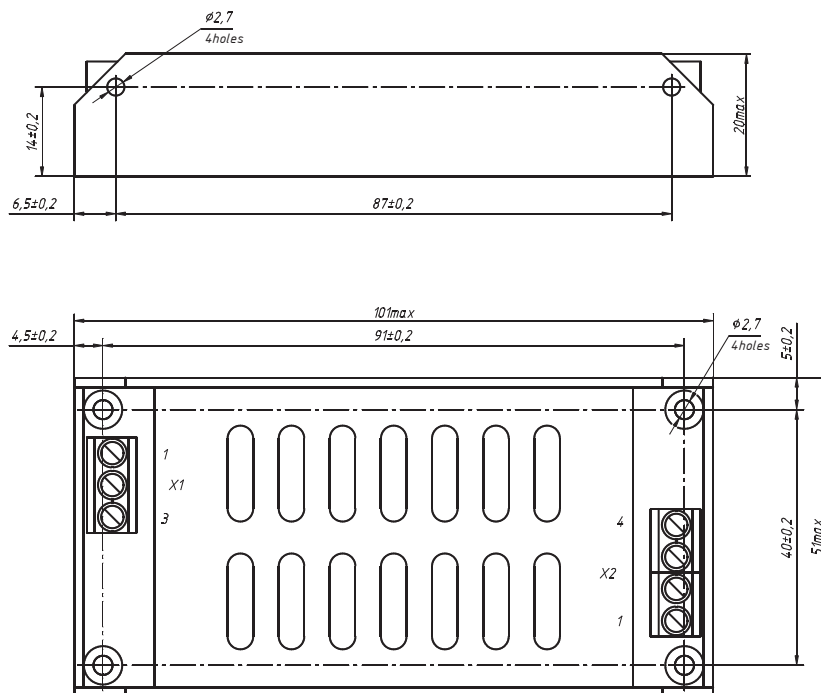
PIN OUT (DESIGN WITH CONNECTOR BLOCKS) MAA30, MAA50

PIN #	X1.1	X1.2	X1.3	X2.1	X2.2	X2.3	X2.4	X2.5	X2.6
SINGLE CHANNEL	⊕	L	N	+OUT1	+OUT1	-OUT1	-OUT1	—	—
DUAL CHANNEL	⊕	L	N	+OUT1	+OUT1	-OUT1	-OUT1	+OUT2	-OUT2
TRIPLE CHANNEL	⊕	L	N	+OUT1	-OUT1	+OUT2	-OUT2	+OUT3	-OUT3

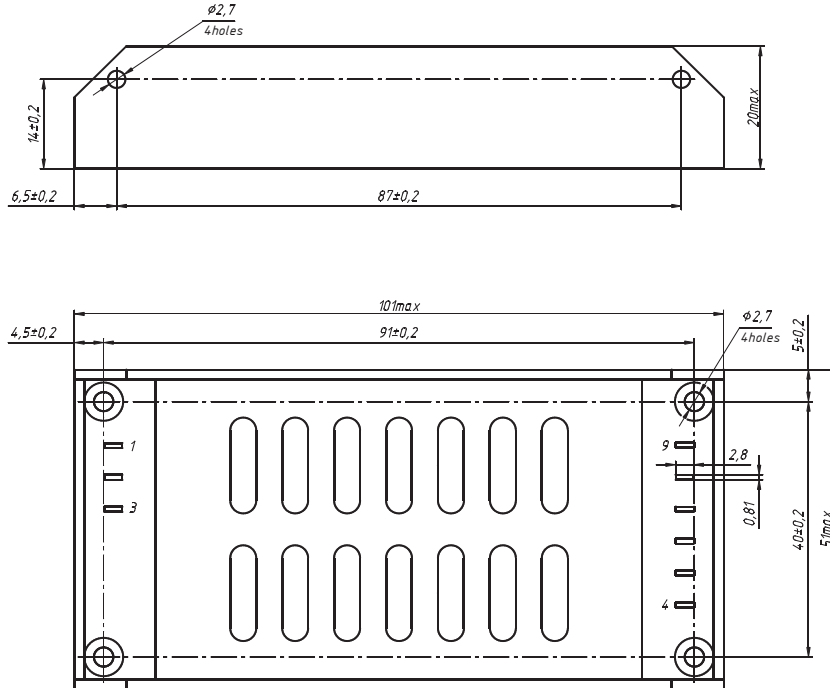
SINGLE CHANNEL DESIGN WITH BLADE CONTACTS



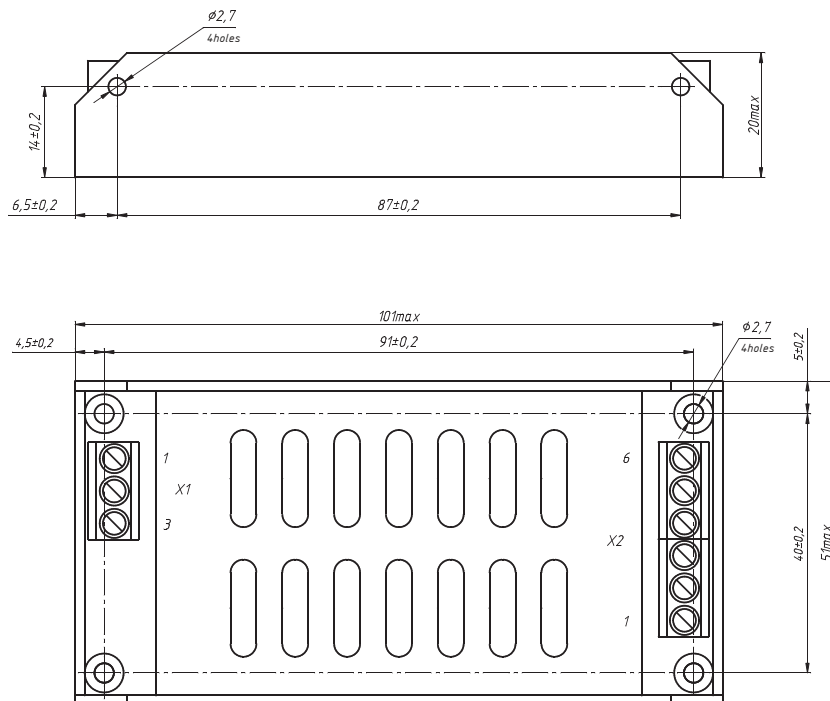
SINGLE CHANNEL DESIGN WITH CONNECTOR BLOCKS



DUAL AND TRIPLE CHANNEL DESIGN WITH BLADE CONTACTS



DUAL AND TRIPLE CHANNEL DESIGN WITH CONNECTOR BLOCKS



CASE DESIGN WITH EN50022-35X 15/7.5 CLAMP FOR DIN-RAIL MOUNT

