



- ▶ Power density max 560 W/dm<sup>3</sup> (9,2 W/in<sup>3</sup>)
- ▶ 2 year warranty
- ▶ Output current max. 12 A, rated output power up to 75 W
- ▶ Input voltage ranges 100...264 VAC; 187...242 VAC; 81...138 VAC
- ▶ Low-profile design (23,5 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 output isolation
- ▶ Overvoltage, short-circuit and thermal protection
- ▶ Typical efficiency 88% (U<sub>out</sub>=28 VDC)
- ▶ Parallel or series mode
- ▶ Polymer potting sealing
- ▶ Maximum load capacity 45000 μF (U<sub>out</sub>=5 V)
- ▶ Recommended for application in new developments
- ▶ Polymer potting sealing
- ▶ Maximum load capacity 78000 μF (U<sub>out</sub>=15 VDC)

## DESCRIPTION

Power supply modules of MAA60, MAA75 series are designed for industrial and special purpose equipment. Despite small size (111×61×23,5 mm) the maximum output power of these modules can reach up to 75 W. They are able to operate in a wide range of case operating temperature (-50...+85°C). Depending on application they have one, two or three galvanically isolated output channels and full range protection (overload, short circuit, thermal). Modules can operate in parallel and series mode. Polymer potting sealing ensures reliable environmental protection and excludes damage to the converter caused by vibration, dirt, moisture or salt fog.

Module case is designed as a U-shaped aluminum base. The PCB is protected from mechanical and climatic influences 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 60 - 2 S 15 15 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
MAA60-1C05 SXX	100...264 VAC	60 W	5 VDC / 12 A	81%
MAA60-1C09 SXX	100...264 VAC	60 W	9 VDC / 6,67 A	83%
MAA60-1C12 SXX	100...264 VAC	60 W	12 VDC / 5 A	84%
MAA60-1C15 SXX	100...264 VAC	60 W	15 VDC / 4 A	85%
MAA60-1C24 SXX	100...264 VAC	60 W	24 VDC / 2,5 A	87%
MAA60-1C28 SXX	100...264 VAC	60 W	28 VDC / 2,22 A	88%
MAA60-1S05 SXX	187...242 VAC	60 W	5 VDC / 12 A	81%
MAA60-1S09 SXX	187...242 VAC	60 W	9 VDC / 6,67 A	83%
MAA60-1S12 SXX	187...242 VAC	60 W	12 VDC / 5 A	84%
MAA60-1S15 SXX	187...242 VAC	60 W	15 VDC / 4 A	85%
MAA60-1S24 SXX	187...242 VAC	60 W	24 VDC / 2,5 A	87%
MAA60-1S28 SXX	187...242 VAC	60 W	28 VDC / 2,22 A	88%
MAA60-1K05 SXX	81...138 VAC	60 W	5 VDC / 12 A	81%
MAA60-1K09 SXX	81...138 VAC	60 W	9 VDC / 6,67 A	83%
MAA60-1K12 SXX	81...138 VAC	60 W	12 VDC / 5 A	84%
MAA60-1K15 SXX	81...138 VAC	60 W	15 VDC / 4 A	85%
MAA60-1K24 SXX	81...138 VAC	60 W	24 VDC / 2,5 A	87%
MAA60-1K28 SXX	81...138 VAC	60 W	28 VDC / 2,22 A	88%
MAA75-1C05 SXX	100...264 VAC	75 W	5 VDC / 15 A	81%
MAA75-1C09 SXX	100...264 VAC	75 W	9 VDC / 8,3 A	83%
MAA75-1C12 SXX	100...264 VAC	75 W	12 VDC / 6,25 A	84%
MAA75-1C15 SXX	100...264 VAC	75 W	15 VDC / 5 A	85%
MAA75-1C24 SXX	100...264 VAC	75 W	24 VDC / 3,13A	87%
MAA75-1C28 SXX	100...264 VAC	75 W	28 VDC / 2,78 A	88%
MAA75-1S05 SXX	187...242 VAC	60 W	5 VDC / 12 A	81%
MAA75-1S09 SXX	187...242 VAC	75 W	9 VDC / 8,3 A	83%
MAA75-1S12 SXX	187...242 VAC	75 W	12 VDC / 6,25 A	84%
MAA75-1S15 SXX	187...242 VAC	75 W	15 VDC / 5 A	85%
MAA75-1S24 SXX	187...242 VAC	75 W	24 VDC / 3,13A	87%
MAA75-1S28 SXX	187...242 VAC	75 W	28 VDC / 2,78 A	88%
MAA75-1K05 SXX	81...138 VAC	60 W	5 VDC / 12 A	81%
MAA75-1K09 SXX	81...138 VAC	75 W	9 VDC / 8,3 A	83%
MAA75-1K12 SXX	81...138 VAC	75 W	12 VDC / 6,25 A	84%
MAA75-1K15 SXX	81...138 VAC	75 W	15 VDC / 5 A	85%
MAA75-1K24 SXX	81...138 VAC	75 W	24 VDC / 3,13A	87%
MAA75-1K28 SXX	81...138 VAC	75 W	28 VDC / 2,78 A	88%

Optionally custom design modules with output voltage from 5 to 60 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.

### DUAL OUTPUT MODELS

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA60-2C0505 SXX	100...264 VAC	60 W	5 VDC / 6 A; 5 VDC / 6 A	78%
MAA60-2C1212 SXX	100...264 VAC	60 W	12 VDC / 2,5 A; 12 VDC / 2,5 A	80%
MAA60-2C1515 SXX	100...264 VAC	60 W	15 VDC / 2 A; 15 VDC / 2 A	81%
MAA60-2S0505 SXX	187...242 VAC	60 W	5 VDC / 6 A; 5 VDC / 6 A	78%
MAA60-2S1212 SXX	187...242 VAC	60 W	12 VDC / 2,5 A; 12 VDC / 2,5 A	80%
MAA60-2S1515 SXX	187...242 VAC	60 W	15 VDC / 2 A; 15 VDC / 2 A	81%
MAA60-2K0505 SXX	81...138 VAC	60 W	5 VDC / 6 A; 5 VDC / 6 A	78%
MAA60-2K1212 SXX	81...138 VAC	60 W	12 VDC / 2,5 A; 12 VDC / 2,5 A	80%
MAA60-2K1515 SXX	81...138 VAC	60 W	15 VDC / 2 A; 15 VDC / 2 A	81%
MAA75-2C0505 SXX	100...264 VAC	75 W	5 VDC / 7,5 A; 5 VDC / 7,5 A	78%
MAA75-2C1212 SXX	100...264 VAC	75 W	12 VDC / 3,13 A; 12 VDC / 3,13 A	80%
MAA75-2C1515 SXX	100...264 VAC	75 W	15 VDC / 2,5 A; 15 VDC / 2,5 A	81%
MAA75-2S0505 SXX	187...242 VAC	60 W	5 VDC / 6 A; 5 VDC / 6 A	78%
MAA75-2S1212 SXX	187...242 VAC	75 W	12 VDC / 3,13 A; 12 VDC / 3,13 A	80%
MAA75-2S1515 SXX	187...242 VAC	75 W	15 VDC / 2,5 A; 15 VDC / 2,5 A	81%
MAA75-2K0505 SXX	81...138 VAC	60 W	5 VDC / 6 A; 5 VDC / 6 A	78%
MAA75-2K1212 SXX	81...138 VAC	75 W	12 VDC / 3,13 A; 12 VDC / 3,13 A	80%
MAA75-2K1515 SXX	81...138 VAC	75 W	15 VDC / 2,5 A; 15 VDC / 2,5 A	81%

### TRIPLE OUTPUT MODELS

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA60-3C051212 SXX	100...264 VAC	60 W	5 VDC / 6 A; 12 VDC / 1,25 A; 12 VDC / 1,25 A	77%
MAA60-3C051515 SXX	100...264 VAC	60 W	5 VDC / 6 A; 15 VDC / 1 A; 15 VDC / 1 A	78%
MAA60-3S051212 SXX	187...242 VAC	60 W	5 VDC / 6 A; 12 VDC / 1,25 A; 12 VDC / 1,25 A	77%
MAA60-3S051515 SXX	187...242 VAC	60 W	5 VDC / 6 A; 15 VDC / 1 A; 15 VDC / 1 A	78%
MAA60-3K051212 SXX	81...138 VAC	60 W	5 VDC / 6 A; 12 VDC / 1,25 A; 12 VDC / 1,25 A	77%
MAA60-3K051515 SXX	81...138 VAC	75 W	5 VDC / 7,5 A; 15 VDC / 1 A; 15 VDC / 1 A	78%
MAA75-3C051212 SXX	100...264 VAC	60 W	5 VDC / 6 A; 12 VDC / 1,25 A; 12 VDC / 1,25 A	77%
MAA75-3C051515 SXX	100...264 VAC	60 W	5 VDC / 6 A; 15 VDC / 1 A; 15 VDC / 1 A	78%
MAA75-3S051212 SXX	187...242 VAC	60 W	5 VDC / 6 A; 12 VDC / 1,25 A; 12 VDC / 1,25 A	77%
MAA75-3S051515 SXX	187...242 VAC	60 W	5 VDC / 6 A; 15 VDC / 1 A; 15 VDC / 1 A	78%
MAA75-3K051212 SXX	81...138 VAC	60 W	5 VDC / 6 A; 12 VDC / 1,25 A; 12 VDC / 1,25 A	77%
MAA75-3K051515 SXX	81...138 VAC	60 W	5 VDC / 6 A; 15 VDC / 1 A; 15 VDC / 1 A	78%

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 POWER SUPPLIES MAA60, MAA75\*

#### 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		4,8°C/W
Typical MTBF		2000 kWhrs
Cooling		conductive (baseplate-cooled)
Weight		max 290 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](http://www.kwsystems.ru).

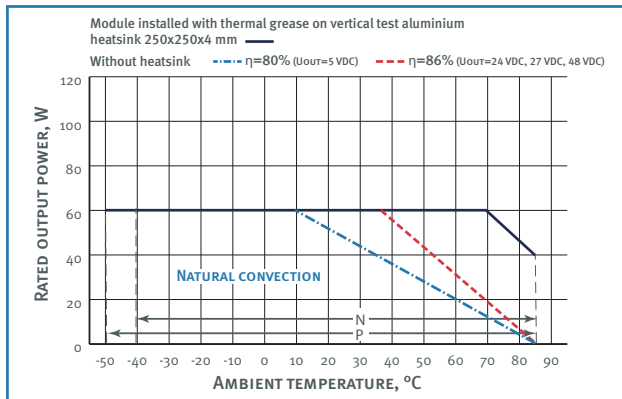
\* All specifications are valid for normal climatic conditions, Uin. nom., Iout. nom., unless otherwise noted.

\*\* 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.

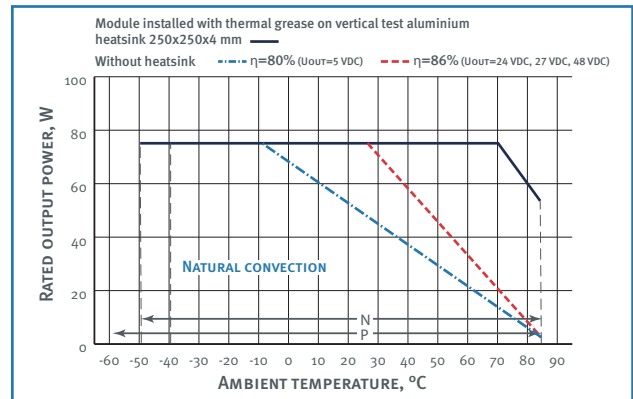
\*\*\* Parameters are stated for the information purposes and could not be used at long term work, exceeding maximum output current, operating outside of a working temperatures range or when output voltage is over the range of adjustment.

## POWER DERATING VS AMBIENT TEMPERATURE DIAGRAM FOR INPUT VOLTAGE 187...242 VAC

MAA60



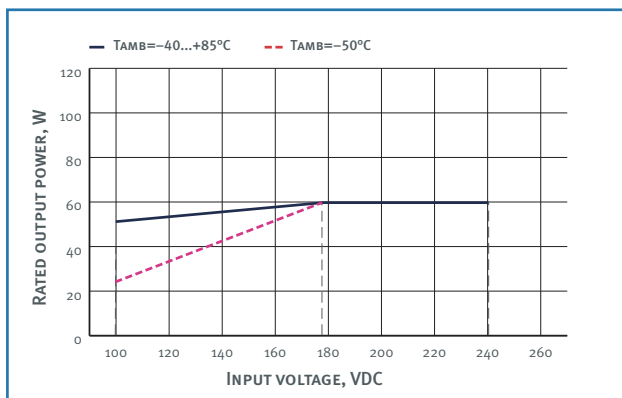
MAA75



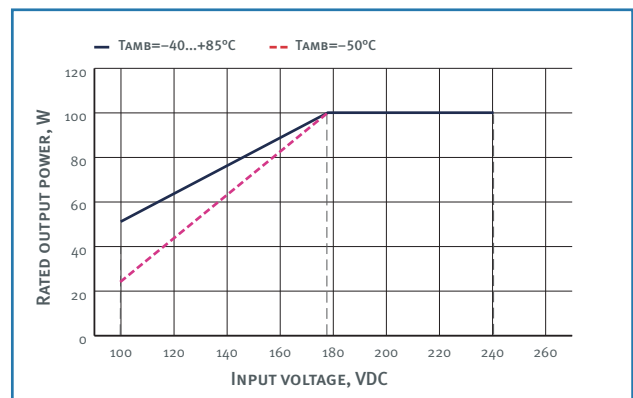
Decreasing parts of the dashed and dash-dotted curves correspond to the maximum case temperature (+85°C for models with index «N» and «P»). Output power must not exceed the values limited by curve for a given ambient temperature.

## POWER DERATING VS INPUT VOLTAGE DIAGRAM

MAA60



MAA75



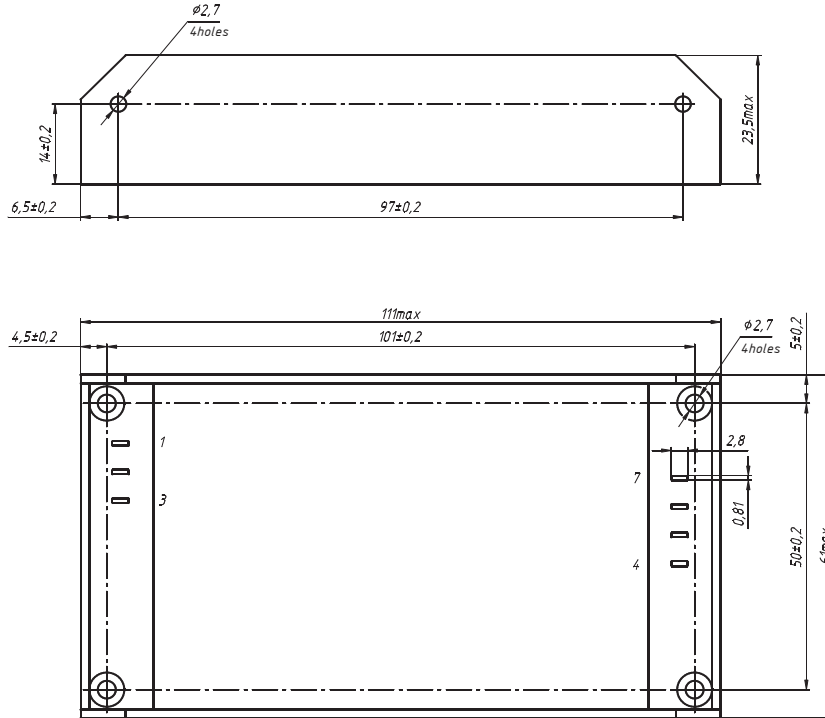
### PIN OUT (DESIGN WITH BLADE CONTACTS)

PIN #	1	2	3	4	5	6	7	8	9
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

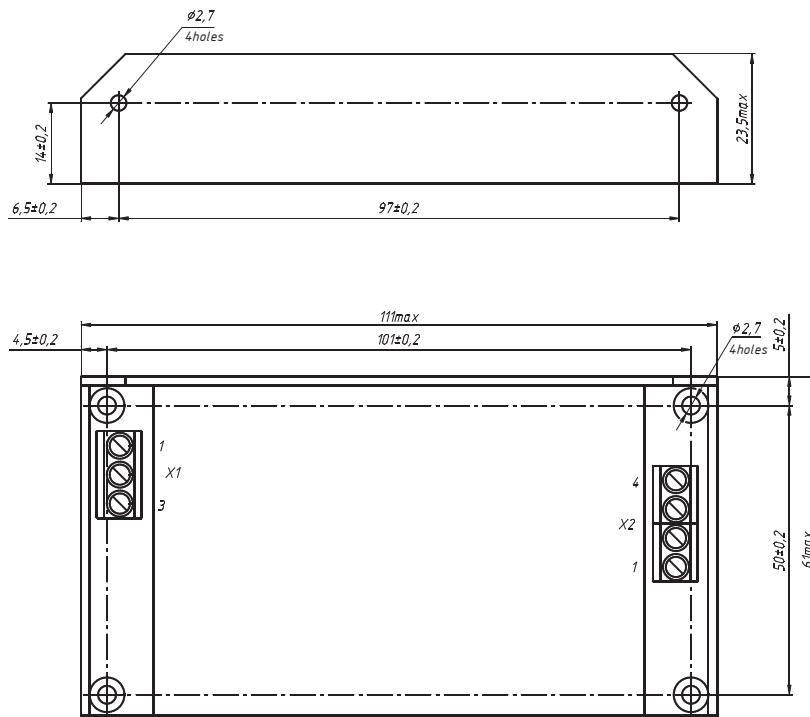
### PIN OUT (DESIGN WITH CONNECTOR BLOCKS)

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**

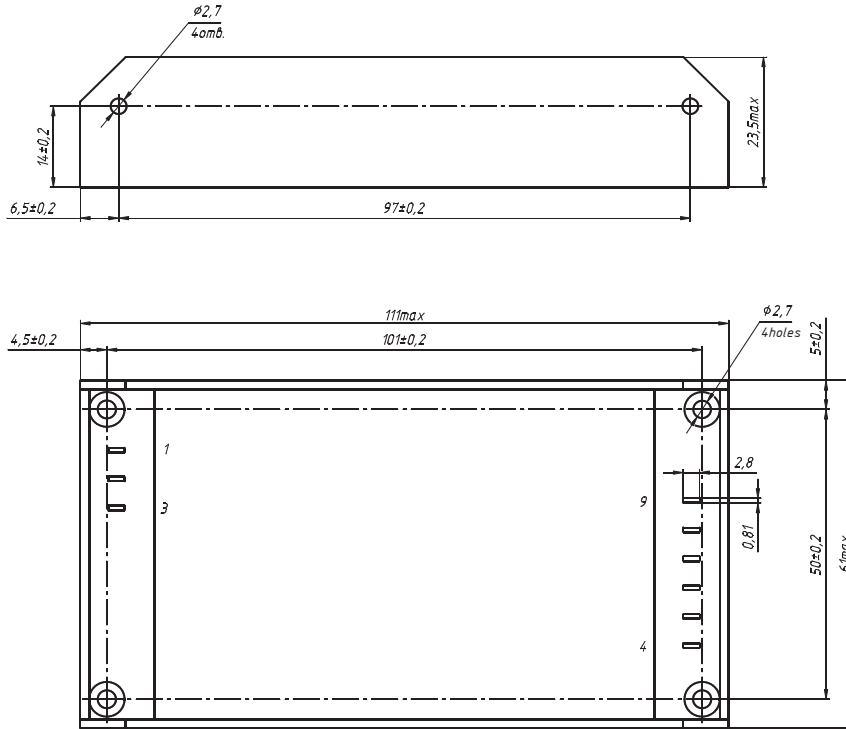


**SINGLE CHANNEL DESIGN WITH CONNECTOR BLOCKS**

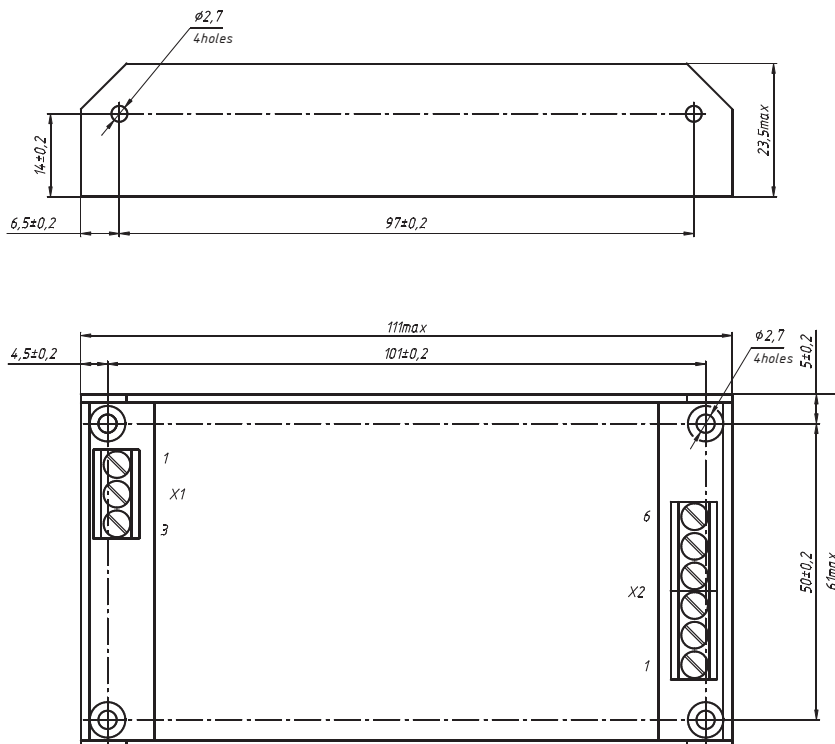




## DUAL AND TRIPLE CHANNEL DESIGN WITH BLADE CONTACTS



## DUAL AND TRIPLE CHANNEL DESIGN WITH CONNECTOR BLOCKS



## CASE DESIGN WITH EN50022-35X15/7.5 CLAMP FOR DIN-RAIL MOUNT

