



- ◀ Power density max 724 W/dm³ (11,9 W/in³)
- ◀ 2 year warranty
- ◀ Output current max. 30 A, rated output power up to 250 W
- ◀ Input voltage ranges 100...264 VAC; 187...242 VAC; 81...138 VAC
- ◀ Low-profile design (33 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
- ◀ Typ efficiency 89% (U_{out}=28 VDC)
- ◀ Remote off/on
- ◀ Voltage output adjustment
- ◀ Parallel or series mode
- ◀ Maximum load capacity 135000 µF (U_{out}=5 VDC)
- ◀ Recommended for application in new developments
- ◀ Polymer potting sealing

DESCRIPTION

Power supply modules of MAA 150, MAA200, and MAA250 series are designed for industrial and special application. With compact dimensions (134×84×33 mm) output power of these modules can reach up to 250 W. They can operate in a wide range of case operating temperatures between -50...+85°C.

Depending on a version they have one, two or three galvanically isolated output channels with remote off/on function and the full range protection (over current, overvoltage and thermal). They can be used in parallel or series 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 150 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)
- 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
MAA 150-1C05 Sxx	100...264 VAC	150 W	5 VDC / 30 A	82%
MAA 150-1C09 Sxx	100...264 VAC	150 W	9 VDC / 16,7 A	84%
MAA 150-1C12 Sxx	100...264 VAC	150 W	12 VDC / 12,6 A	85%
MAA 150-1C15 Sxx	100...264 VAC	150 W	15 VDC / 10 A	86%
MAA 150-1C24 Sxx	100...264 VAC	150 W	24 VDC / 6,3 A	88%
MAA 150-1C28 Sxx	100...264 VAC	150 W	28 VDC / 5,56 A	89%
MAA 150-1S05 Sxx	187...242 VAC	150 W	5 VDC / 30 A	82%
MAA 150-1S09 Sxx	187...242 VAC	150 W	9 VDC / 16,7 A	84%
MAA 150-1S12 Sxx	187...242 VAC	150 W	12 VDC / 12,6 A	85%
MAA 150-1S15 Sxx	187...242 VAC	150 W	15 VDC / 10 A	86%
MAA 150-1S24 Sxx	187...242 VAC	150 W	24 VDC / 6,3 A	88%
MAA 150-1S28 Sxx	187...242 VAC	150 W	28 VDC / 5,56 A	89%
MAA 150-1K05 Sxx	81...138 VAC	150 W	5 VDC / 30 A	82%
MAA 150-1K09 Sxx	81...138 VAC	150 W	9 VDC / 16,7 A	84%
MAA 150-1K12 Sxx	81...138 VAC	150 W	12 VDC / 12,6 A	85%
MAA 150-1K15 Sxx	81...138 VAC	150 W	15 VDC / 10 A	86%
MAA 150-1K24 Sxx	81...138 VAC	150 W	24 VDC / 6,3 A	88%
MAA 150-1K28 Sxx	81...138 VAC	150 W	28 VDC / 5,56 A	89%
MAA200-1C05 Sxx	100...264 VAC	150 W	5 VDC / 30 A	82%
MAA200-1C09 Sxx	100...264 VAC	200 W	9 VDC / 22,2 A	84%
MAA200-1C12 Sxx	100...264 VAC	200 W	12 VDC / 16,6 A	85%
MAA200-1C15 Sxx	100...264 VAC	200 W	15 VDC / 13,3 A	86%
MAA200-1C24 Sxx	100...264 VAC	200 W	24 VDC / 8,33 A	88%
MAA200-1C28 Sxx	100...264 VAC	200 W	28 VDC / 7,4 A	89%
MAA200-1S05 Sxx	187...242 VAC	150 W	5 VDC / 30 A	82%
MAA200-1S09 Sxx	187...242 VAC	200 W	9 VDC / 22,2 A	84%
MAA200-1S12 Sxx	187...242 VAC	200 W	12 VDC / 16,6 A	85%
MAA200-1S15 Sxx	187...242 VAC	200 W	15 VDC / 13,3 A	86%
MAA200-1S24 Sxx	187...242 VAC	200 W	24 VDC / 8,33 A	88%
MAA200-1S28 Sxx	187...242 VAC	200 W	28 VDC / 7,4 A	89%
MAA200-1K05 Sxx	81...138 VAC	150 W	5 VDC / 30 A	82%
MAA200-1K09 Sxx	81...138 VAC	200 W	9 VDC / 22,2 A	84%
MAA200-1K12 Sxx	81...138 VAC	200 W	12 VDC / 16,6 A	85%

SINGLE OUTPUT MODELS (cont.)

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA200-1K12 Sxx	81...138 VAC	200 W	12 VDC / 16,6 A	85%
MAA200-1K15 Sxx	81...138 VAC	200 W	15 VDC / 13,3 A	86%
MAA200-1K24 Sxx	81...138 VAC	200 W	24 VDC / 8,33 A	88%
MAA200-1K28 Sxx	81...138 VAC	200 W	28 VDC / 7,4 A	89%
MAA250-1C05 Sxx	100...264 VAC	150 W	5 VDC / 30 A	82%
MAA250-1C09 Sxx	100...264 VAC	250 W	9 VDC / 28,7 A	84%
MAA250-1C12 Sxx	100...264 VAC	250 W	12 VDC / 20,8 A	85%
MAA250-1C15 Sxx	100...264 VAC	250 W	15 VDC / 16,6 A	86%
MAA250-1C24 Sxx	100...264 VAC	250 W	24 VDC / 10,4 A	88%
MAA250-1C28 Sxx	100...264 VAC	250 W	28 VDC / 9,25 A	89%
MAA250-1S05 Sxx	187...242 VAC	150 W	5 VDC / 30 A	82%
MAA250-1S09 Sxx	187...242 VAC	250 W	9 VDC / 28,7 A	84%
MAA250-1S12 Sxx	187...242 VAC	250 W	12 VDC / 20,8 A	85%
MAA250-1S15 Sxx	187...242 VAC	250 W	15 VDC / 16,6 A	86%
MAA250-1S24 Sxx	187...242 VAC	250 W	24 VDC / 10,4 A	88%
MAA250-1S28 Sxx	187...242 VAC	250 W	28 VDC / 9,25 A	89%
MAA250-1K05 Sxx	81...138 VAC	150 W	5 VDC / 30 A	82%
MAA250-1K09 Sxx	81...138 VAC	250 W	9 VDC / 28,7 A	84%
MAA250-1K12 Sxx	81...138 VAC	250 W	12 VDC / 20,8 A	85%
MAA250-1K15 Sxx	81...138 VAC	250 W	15 VDC / 16,6 A	86%
MAA250-1K24 Sxx	81...138 VAC	250 W	24 VDC / 10,4 A	88%
MAA250-1K28 Sxx	81...138 VAC	250 W	28 VDC / 9,25 A	89%

Optionally custom design modules with output voltage from 5 to 68 V and maximum output current 30 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
MAA150-2C0505 Sxx	100...264 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA150-2C1212 Sxx	100...264 VAC	150 W	12 VDC / 6,25 A; 12 VDC / 6,25 A	80%
MAA150-2C1515 Sxx	100...264 VAC	150 W	15 VDC / 5 A; 15 VDC / 5 A	81%
MAA150-2C2424 Sxx	100...264 VAC	150 W	24 VDC / 3,1 A; 24 VDC / 3,1 A	83%
MAA150-2C2828 Sxx	100...264 VAC	150 W	28 VDC / 2,77 A; 28 VDC / 2,77 A	85%
MAA150-2S0505 Sxx	187...242 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA150-2S1212 Sxx	187...242 VAC	150 W	12 VDC / 6,25 A; 12 VDC / 6,25 A	80%
MAA150-2S1515 Sxx	187...242 VAC	150 W	15 VDC / 5 A; 15 VDC / 5 A	81%
MAA150-2S2424 Sxx	187...242 VAC	150 W	24 VDC / 3,1 A; 24 VDC / 3,1 A	83%
MAA150-2S2828 Sxx	187...242 VAC	150 W	28 VDC / 2,77 A; 28 VDC / 2,77 A	85%
MAA150-2K0505 Sxx	81...138 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA150-2K1212 Sxx	81...138 VAC	150 W	12 VDC / 6,25 A; 12 VDC / 6,25 A	80%
MAA150-2K1515 Sxx	81...138 VAC	150 W	15 VDC / 5 A; 15 VDC / 5 A	81%
MAA150-2K2424 Sxx	81...138 VAC	150 W	24 VDC / 3,1 A; 24 VDC / 3,1 A	83%
MAA150-2K2828 Sxx	81...138 VAC	150 W	28 VDC / 2,77 A; 28 VDC / 2,77 A	85%
MAA200-2C0505 Sxx	100...264 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA200-2C1212 Sxx	100...264 VAC	200 W	12 VDC / 8,33 A; 12 VDC / 8,33 A	80%
MAA200-2C1515 Sxx	100...264 VAC	200 W	15 VDC / 6,66 A; 15 VDC / 6,66 A	81%
MAA200-2C2424 Sxx	100...264 VAC	200 W	24 VDC / 4,16 A; 24 VDC / 4,16 A	83%
MAA200-2C2828 Sxx	100...264 VAC	200 W	28 VDC / 3,7 A; 28 VDC / 3,7 A	85%
MAA200-2S0505 Sxx	187...242 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA200-2S1212 Sxx	187...242 VAC	200 W	12 VDC / 8,33 A; 12 VDC / 8,33 A	80%
MAA200-2S1515 Sxx	187...242 VAC	200 W	15 VDC / 6,66 A; 15 VDC / 6,66 A	81%
MAA200-2S2424 Sxx	187...242 VAC	200 W	24 VDC / 4,16 A; 24 VDC / 4,16 A	83%
MAA200-2S2828 Sxx	187...242 VAC	200 W	28 VDC / 3,7 A; 28 VDC / 3,7 A	85%
MAA200-2K0505 Sxx	81...138 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA200-2K1212 Sxx	81...138 VAC	200 W	12 VDC / 8,33 A; 12 VDC / 8,33 A	80%
MAA200-2K1515 Sxx	81...138 VAC	200 W	15 VDC / 6,66 A; 15 VDC / 6,66 A	81%
MAA200-2K2424 Sxx	81...138 VAC	200 W	24 VDC / 4,16 A; 24 VDC / 4,16 A	83%
MAA200-2K2828 Sxx	81...138 VAC	200 W	28 VDC / 3,7 A; 28 VDC / 3,7 A	85%
MAA250-2C0505 Sxx	100...264 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA250-2C1212 Sxx	100...264 VAC	250 W	12 VDC / 10,4 A; 12 VDC / 10,4 A	80%

DUAL OUTPUT MODELS (cont.)

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA250-2C1515 Sxx	100...264 VAC	250 W	15 VDC / 8,33 A; 15 VDC / 8,33 A	81%
MAA250-2C2424 Sxx	100...264 VAC	250 W	24 VDC / 5,2 A; 24 VDC / 5,2 A	83%
MAA250-2C2828 Sxx	100...264 VAC	250 W	28 VDC / 4,62 A; 28 VDC / 4,62 A	85%
MAA250-2S0505 Sxx	187...242 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA250-2S1212 Sxx	187...242 VAC	250 W	12 VDC / 10,4 A; 12 VDC / 10,4 A	80%
MAA250-2S1515 Sxx	187...242 VAC	250 W	15 VDC / 8,33 A; 15 VDC / 8,33 A	81%
MAA250-2S2424 Sxx	187...242 VAC	250 W	24 VDC / 5,2 A; 24 VDC / 5,2 A	83%
MAA250-2S2828 Sxx	187...242 VAC	250 W	28 VDC / 4,62 A; 28 VDC / 4,62 A	85%
MAA250-2K0505 Sxx	81...138 VAC	150 W	5 VDC / 15 A; 5 VDC / 15 A	78%
MAA250-2K1212 Sxx	81...138 VAC	250 W	12 VDC / 10,4 A; 12 VDC / 10,4 A	80%
MAA250-2K1515 Sxx	81...138 VAC	250 W	15 VDC / 8,33 A; 15 VDC / 8,33 A	81%
MAA250-2K2424 Sxx	81...138 VAC	250 W	24 VDC / 5,2 A; 24 VDC / 5,2 A	83%
MAA250-2K2828 Sxx	81...138 VAC	250 W	28 VDC / 4,62 A; 28 VDC / 4,62 A	85%

TRIPLE OUTPUT MODELS

MODEL	INPUT VOLTAGE RANGE	OUTPUT POWER	OUTPUT VOLTAGE / RATED OUTPUT CURRENT	EFFICIENCY
MAA 150-3C051212 Sxx	100...264 VAC	150 W	5 VDC / 15 A; 12 VDC / 3,1 A; 12 VDC / 3,1 A	77%
MAA 150-3C051515 Sxx	100...264 VAC	150 W	5 VDC / 15 A; 15 VDC / 2,5 A; 15 VDC / 2,5 A	78%
MAA 150-3S051212 Sxx	187...242 VAC	150 W	5 VDC / 15 A; 12 VDC / 3,1 A; 12 VDC / 3,1 A	77%
MAA 150-3S051515 Sxx	187...242 VAC	150 W	5 VDC / 15 A; 15 VDC / 2,5 A; 15 VDC / 2,5 A	78%
MAA 150-3K051212 Sxx	81...138 VAC	150 W	5 VDC / 15 A; 12 VDC / 3,1 A; 12 VDC / 3,1 A	77%
MAA 150-3K051515 Sxx	81...138 VAC	150 W	5 VDC / 15 A; 15 VDC / 2,5 A; 15 VDC / 2,5 A	78%
MAA 150-3C051212 Sxx	100...264 VAC	150 W	5 VDC / 15 A; 12 VDC / 3,1 A; 12 VDC / 3,1 A	77%
MAA 150-3C051515 Sxx	100...264 VAC	150 W	5 VDC / 15 A; 15 VDC / 2,5 A; 15 VDC / 2,5 A	78%
MAA 150-3S051212 Sxx	187...242 VAC	150 W	5 VDC / 15 A; 12 VDC / 3,1 A; 12 VDC / 3,1 A	77%
MAA 150-3S051515 Sxx	187...242 VAC	150 W	5 VDC / 15 A; 15 VDC / 2,5 A; 15 VDC / 2,5 A	78%
MAA 150-3K051212 Sxx	81...138 VAC	150 W	5 VDC / 15 A; 12 VDC / 3,1 A; 12 VDC / 3,1 A	77%
MAA 150-3K051515 Sxx	81...138 VAC	150 W	5 VDC / 15 A; 15 VDC / 2,5 A; 15 VDC / 2,5 A	78%

Optionally custom design modules with output voltage from 5 to 68 V and maximum output current 30 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 MAA 150, MAA200, MAA250*

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)
	C, S	47...53 Hz
Input frequency	K	360...440 Hz

Output specifications

Output voltage adjustment	10%
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.
Remote on/off	Off at 3.5 VAC (5 mA) output «Contr»

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
Switching frequency, constant		140 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.

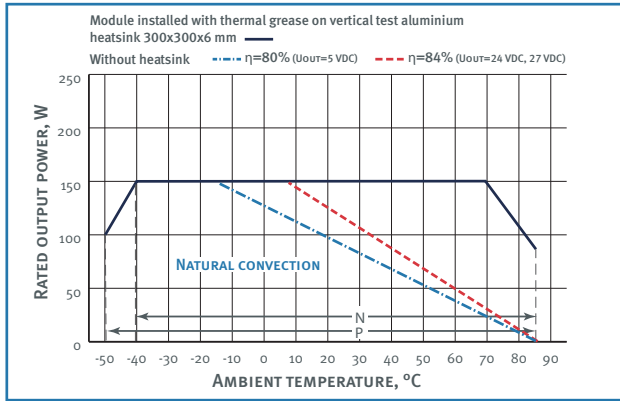
* All specifications are valid for normal climatic conditions, Uin. nom., Iout. nom., unless otherwise noted.

** 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.

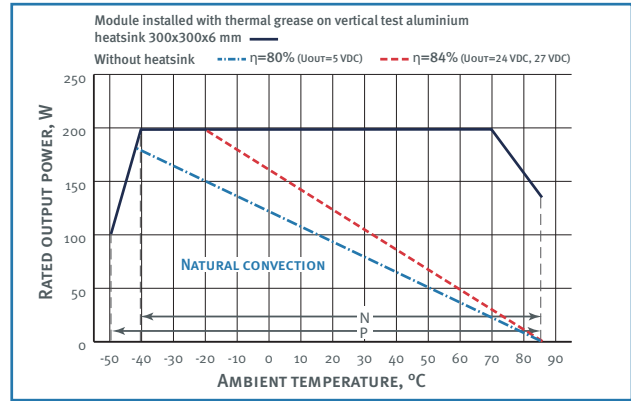
*** Parameters are stated for the information purposes and could not be used at long term work, exceeding maximum output current, operating outside of a working temperatures range or when output voltage is over the range of adjustment.

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

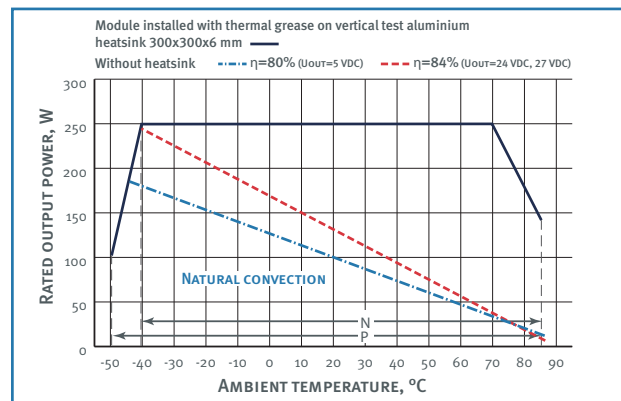
MAA 150



MAA200



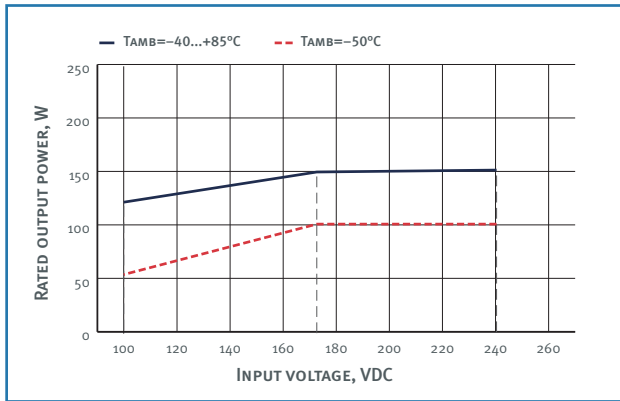
MAA250



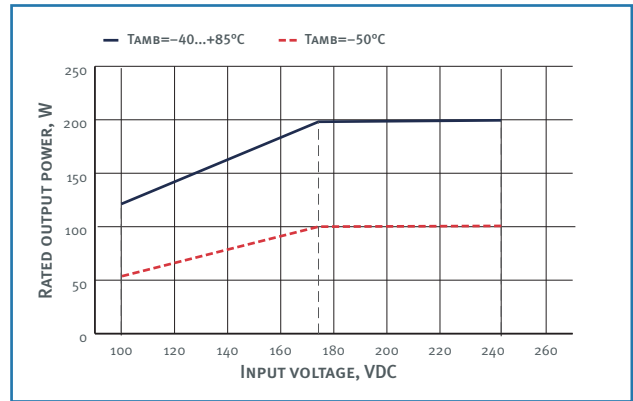
Decreasing parts of the dashed and dash-dotted curves correspond to the maximum case temperature (+85°C for models with index «N» and «P»). Output power must not exceed the values limited by curve for a given ambient temperature.

POWER DERATING VS INPUT VOLTAGE DIAGRAM

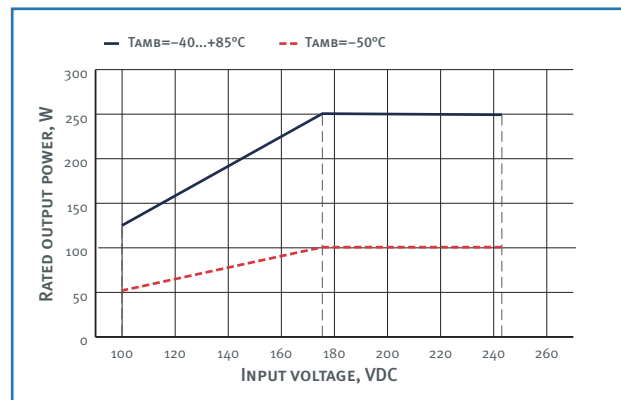
MAA150



MAA200



MAA250



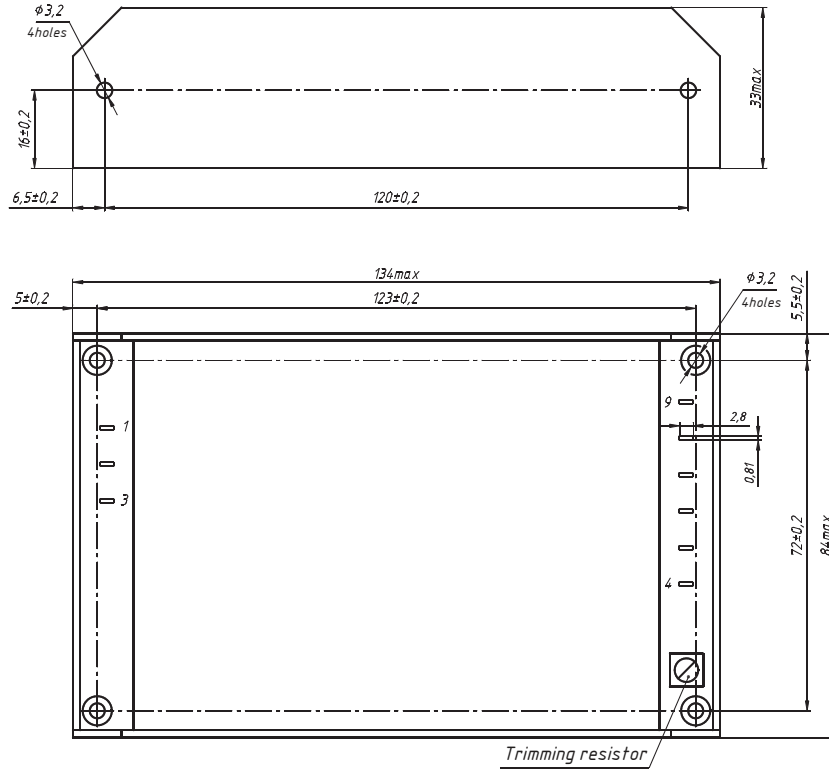
PIN OUT (DESIGN WITH BLADE CONTACTS)

PIN #	1	2	3	4	5	6	7	8	9	10	11	12	13
SINGLE CHANNEL	⊕	N	L	-TRIM	+TRIM	-OUT 1	+OUT 1	+OUT 1	+OUT 1	—	—	—	—
DUAL CHANNEL	⊕	N	L	-TRIM	+TRIM	-OUT 1	+OUT 1	-OUT 2	+OUT 2	—	—	—	—
TRIPLE CHANNEL	⊕	N	L	+ TRIM	-TRIM	+OUT 1	+OUT 1	-OUT 1	-OUT 1	+OUT 2	-OUT 2	+OUT 3	-OUT 3

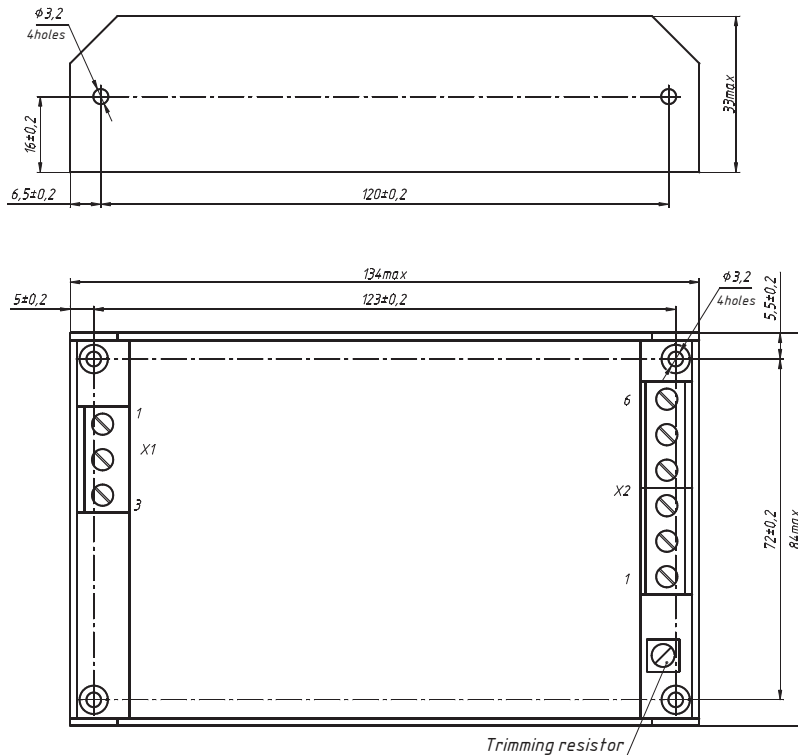
PIN OUT (DESIGN WITH CONNECTOR BLOCKS)

PIN #	X1.1	X1.2	X1.3	X2.1	X2.2	X2.3	X2.4	X2.5	X2.6	X2.7	X2.8	X2.9	X2.10
SINGLE CHANNEL	⊕	N	L	-TRIM	+TRIM	-OUT 1	+OUT 1	+OUT 1	+OUT 1	—	—	—	—
DUAL CHANNEL	⊕	N	L	-TRIM	+TRIM	-OUT 1	+OUT 1	-OUT 2	+OUT 2	—	—	—	—
TRIPLE CHANNEL	⊕	N	L	+TRIM	-TRIM	+OUT 1	+OUT 1	-OUT 1	-OUT 1	+OUT 2	-OUT 2	+OUT 3	-OUT 3

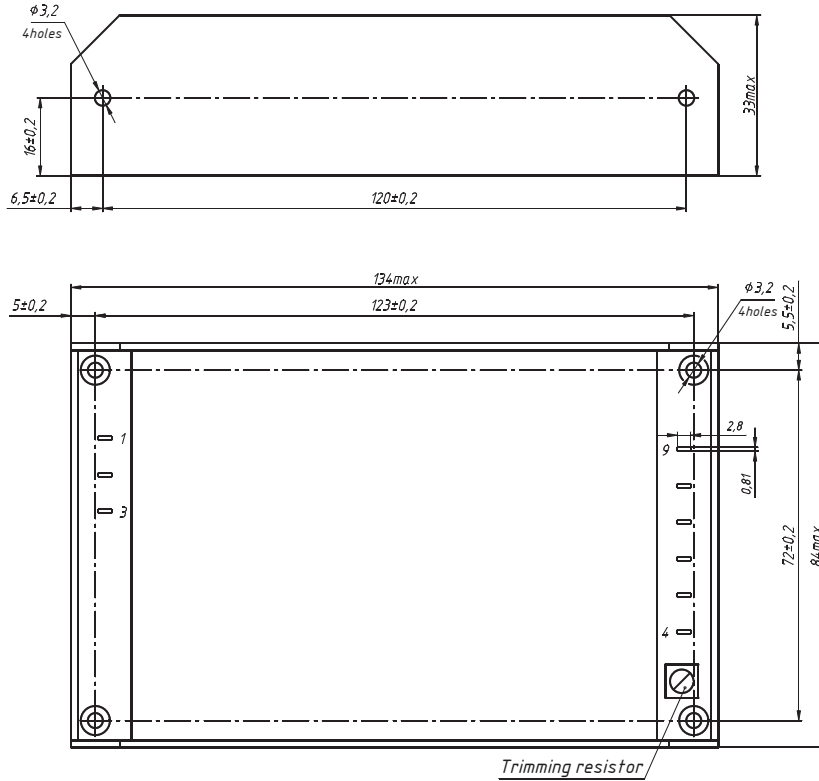
SINGLE CHANNEL DESIGN WITH BLADE CONTACTS



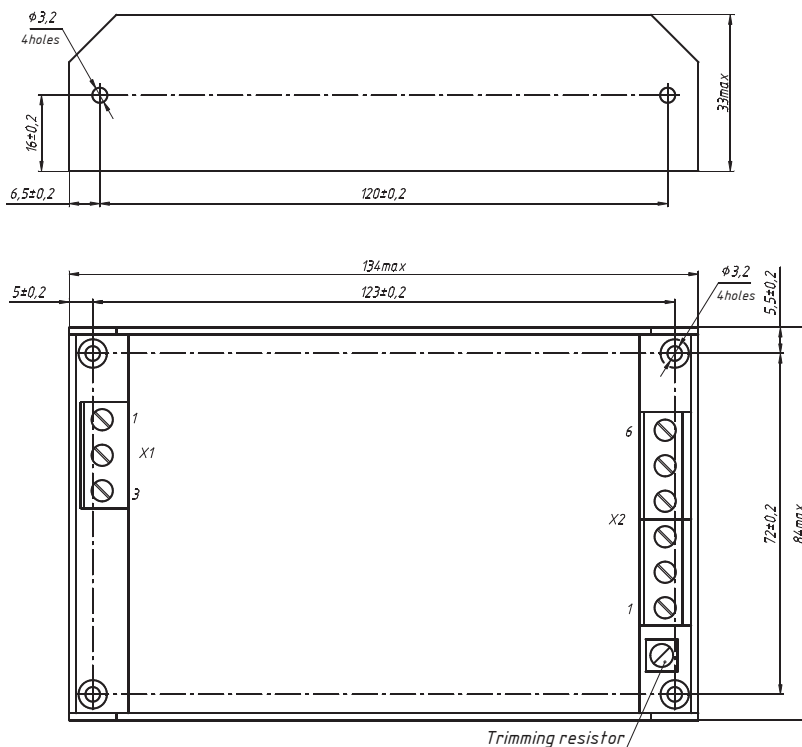
SINGLE CHANNEL DESIGN WITH CONNECTOR BLOCKS



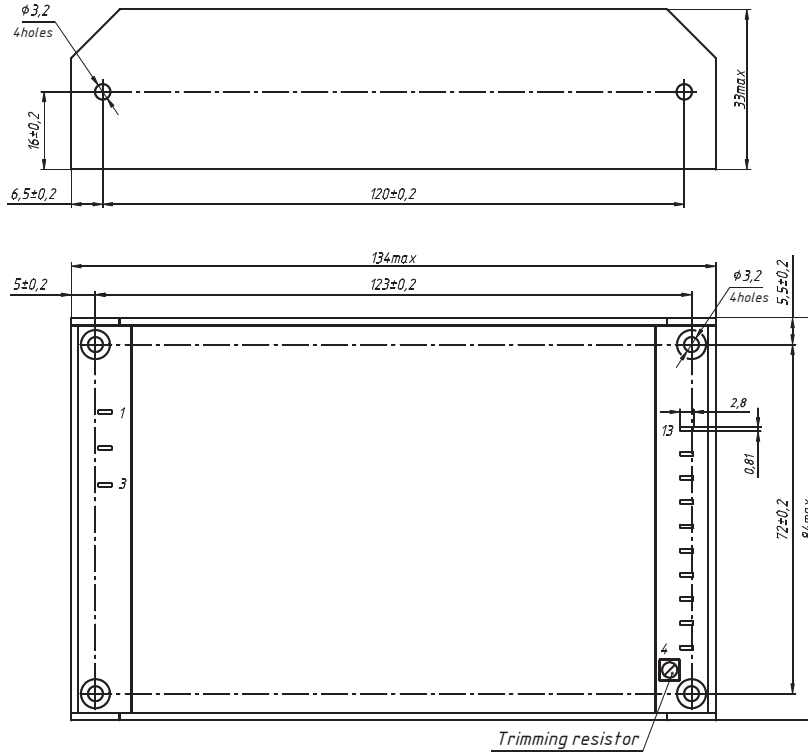
DUAL CHANNEL DESIGN WITH BLADE CONTACTS



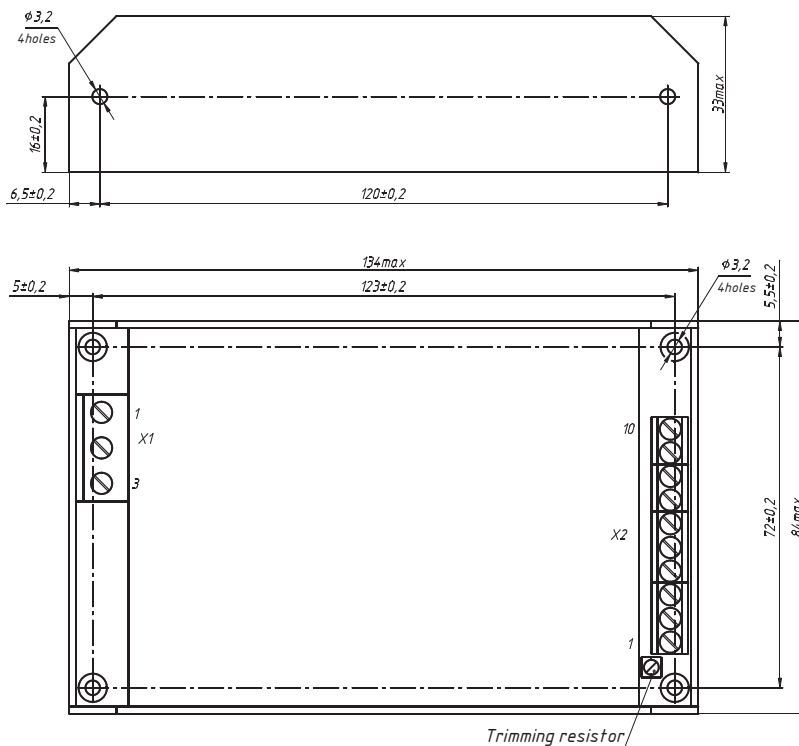
DUAL CHANNEL DESIGN WITH CONNECTOR BLOCKS



TRIPLE CHANNEL DESIGN WITH BLADE CONTACTS



TRIPLE CHANNEL DESIGN WITH CONNECTOR BLOCKS



DESIGN WITH CLAMP TYPE EN50022-35X15/7.5 FOR DIN-RAIL MOUNTING

