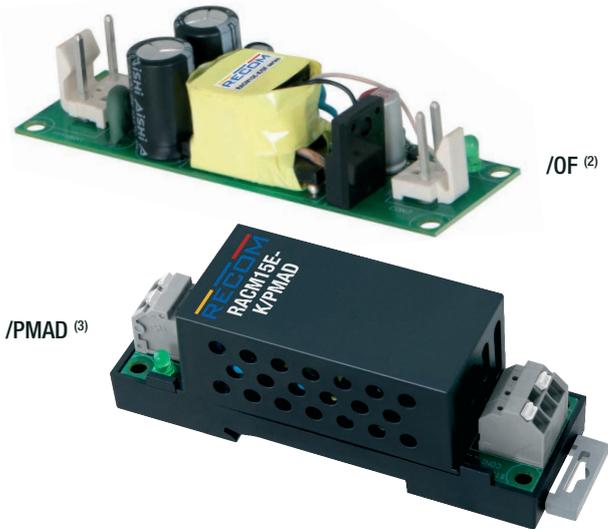


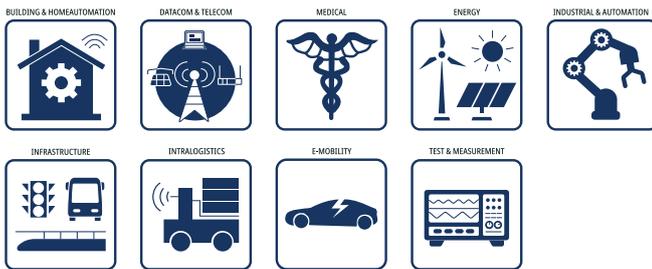
### FEATURES

- Panel- and DIN-rail mount or open card fixation
- CV/CC: constant voltage; constant current limited
- -40°C to +85°C operating temperature ratings
- OVC III rated up to 3000m Altitude
- 2MOPP rating
- EN55032 class “B” compliant @ floating load
- 1.5U cabinet space requirements
- 3 year warranty



/OF= Open frame: 3.1 x 0.9 x 0.8 inch  
 /PMAD= Panel & Din rail mount: 3.2 x 1.0 x 1.1 inch

### APPLICATIONS



### SAFETY & EMC



### DESCRIPTION

RACM15E-K, the cost-effective chameleons among AC/DC power supply series, adheres to different connection and mounting criteria such as open card placement for connection via pre-assembled harness, or IP20-protected enclosures with push-in terminals for direct fixation to mounting plates, as well as for snapping onto DIN rails with 1.5U slotsize. CV/CC regulated output voltages from 3.3 to 30Vdc with overcurrent limited power of 15 Watt are provided under still air convection at -40° to 50°C ambient temperature. International certifications to medical; household; industrial and safety transformer standards ensure simplified integration into applications for use up to 5000m altitude or 3000m at OVC III overvoltage rating requirements. All models meet EN55032 Class “B” EMI guidelines in floating load configurations.

### SELECTION GUIDE

| Part Number                   | Input Voltage Range [VAC] | Output Voltage nom. [VDC] | Output Current rated [mA] | Efficiency <sup>(1)</sup> typ. [%] | Output Power max. [W] |
|-------------------------------|---------------------------|---------------------------|---------------------------|------------------------------------|-----------------------|
| RACM15E-3.3SK <sup>(2)</sup>  | 80-275                    | 3.3                       | 3640                      | 78                                 | 12                    |
| RACM15E-05SK <sup>(2,3)</sup> | 80-275                    | 5                         | 3000                      | 82                                 | 15                    |
| RACM15E-12SK <sup>(2,3)</sup> | 80-275                    | 12                        | 1250                      | 84.5                               | 15                    |
| RACM15E-15SK <sup>(2,3)</sup> | 80-275                    | 15                        | 1000                      | 85                                 | 15                    |
| RACM15E-24SK <sup>(2,3)</sup> | 80-275                    | 24                        | 625                       | 86                                 | 15                    |
| RACM15E-30SK <sup>(2,3)</sup> | 80-275                    | 30                        | 500                       | 86                                 | 15                    |

Note1: Efficiency is tested at 230VAC and full load at +25°C ambient

# RACM15E-K Series $\diamond$ AC/DC Power Supply

15W  $\diamond$  Input: 100V-240VAC

## Model Numbering



Note2: add suffix "/OF" for open frame version

add suffix "/PMAD" for panel mount version with 45° angled push-in terminal (except 3.3Vout)

Note3: Refer to „PACKAGING INFORMATION“

## BASIC CHARACTERISTICS (measured @ T<sub>AMB</sub>= 25°C, nom. V<sub>IN</sub>, full load and after warm-up unless otherwise stated)

| Parameter                              | Condition          | Min.                       | Typ.  | Max.     |
|--|--------------------|----------------------------|-------|----------|
| Nominal Input Voltage                  | 50/60Hz            | 100VAC                     |       | 240VAC   |
| Operating Range <sup>(4)</sup>         | 47-63Hz            | 80VAC                      |       | 275VAC   |
|  | DC                 | 120VDC                     |       | 370VDC   |
| Input Current                          | 115/230VAC         | 200mA                      | 250mA | 450mA    |
| Inrush Current                         | cold start at 25°C | 115VAC                     |       | 20A      |
|  |                    | 230VAC                     |       | 30A      |
| No Load Power Consumption              | RACM15E-30SK       |                            | 100mW | 150mW    |
|  | others             |                            | 75mW  | 100mW    |
| Input Frequency Range                  | AC Input           | 47Hz                       |       | 63Hz     |
| Minimum Load                           |                    | 0%                         |       |          |
| Power Factor                           | 115VAC             |                            | 0.6   |          |
|  | 230VAC             |                            | 0.5   |          |
| Start-up time                          |                    |                            | 600ms | 1000ms   |
| Rise time                              |                    |                            |       | 60ms     |
| Hold-up time                           | 230VAC             | 50ms                       |       |          |
| Internal Operating Frequency           |                    |                            |       | 70kHz    |
| Output Ripple and Noise <sup>(5)</sup> | 20MHz BW           | RACM15E-24SK; RACM15E-30SK |       | 1% Vout  |
|  |                    | others                     |       | 150mVp-p |

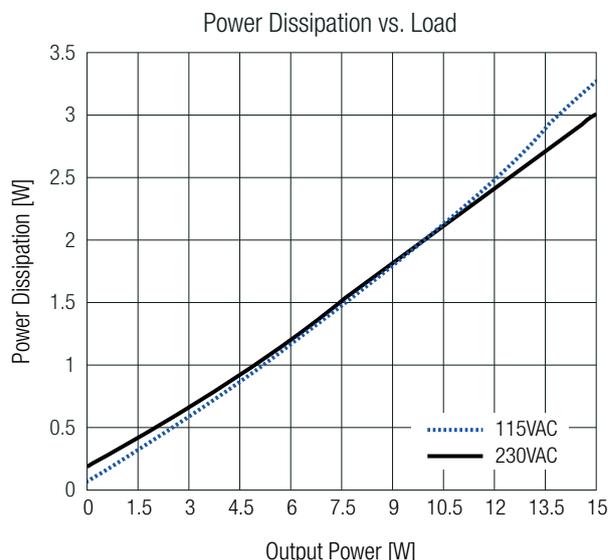
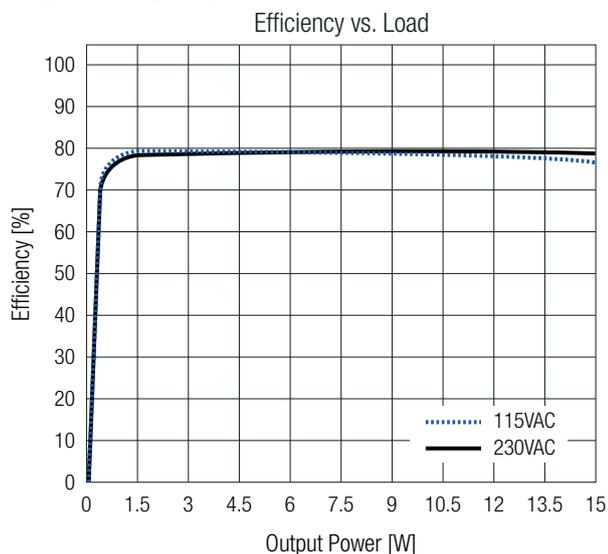
Note4: The products were submitted for safety files at AC-Input operation.

Note5: Measurements are made with a 0.1µF MLCC & 10µF E-cap in parallel across output. (low ESR)

The test setup can have an impact on ripple noise values (placement of scope probe, capacitors, it's specifications, wires, PCB tracks, distances, etc.)

### RACM15E-3.3SK/277; RACM15E-05SK/277

RACM15E-3.3SK = 12W max.

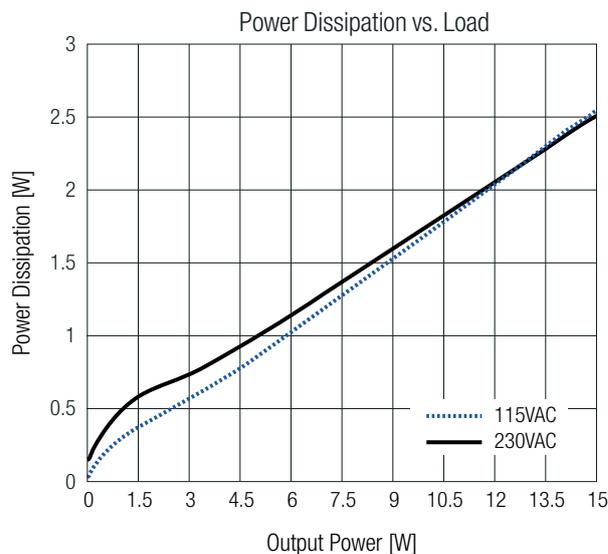
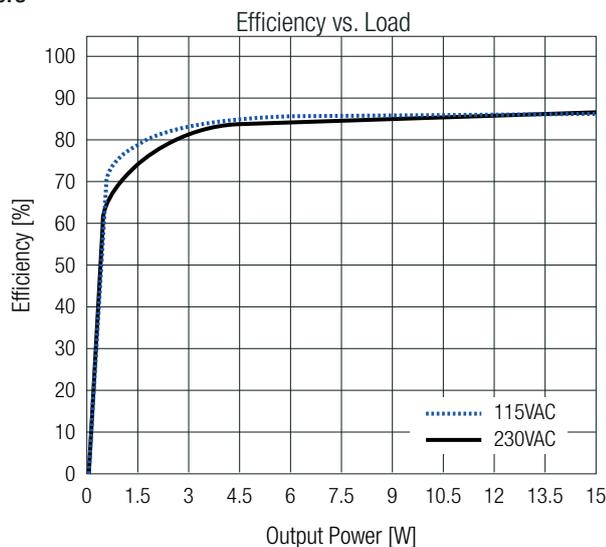


# RACM15E-K Series $\diamond$ AC/DC Power Supply

15W  $\diamond$  Input: 100V-240VAC

**BASIC CHARACTERISTICS** (measured @  $T_{AMB}= 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

others



**REGULATIONS** (measured @  $T_{AMB}= 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

| Parameter                      | Condition                        |                             | Value                  |
|--------------------------------|----------------------------------|-----------------------------|------------------------|
| Output Accuracy                |                                  |                             | $\pm 2.0\%$ max.       |
| Line Regulation                | low line to high line, full load | RACM15E-3.3SK; RACM15E-05SK | $\pm 0.5\%$ max.       |
|                                |                                  | others                      | $\pm 0.2\%$ max.       |
| Load Regulation <sup>(6)</sup> | 10% to 100% load                 |                             | 1.0% max.              |
| Transient Response             | 25% load step change             |                             | 4.0% max.              |
|                                | recovery time                    |                             | 500 $\mu\text{s}$ typ. |

Note6: Operation below 10% load will not harm the converter, but specifications may not be met

**PROTECTIONS** (measured @  $T_{AMB}= 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

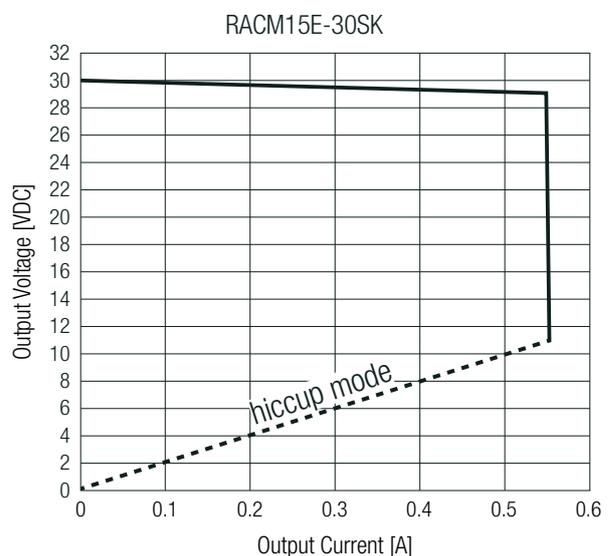
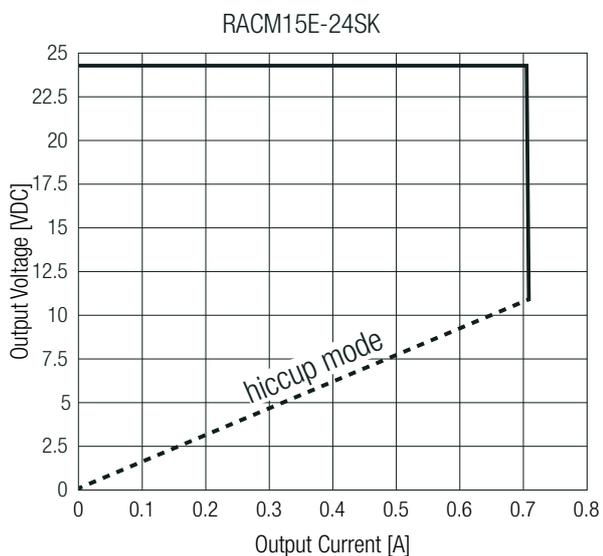
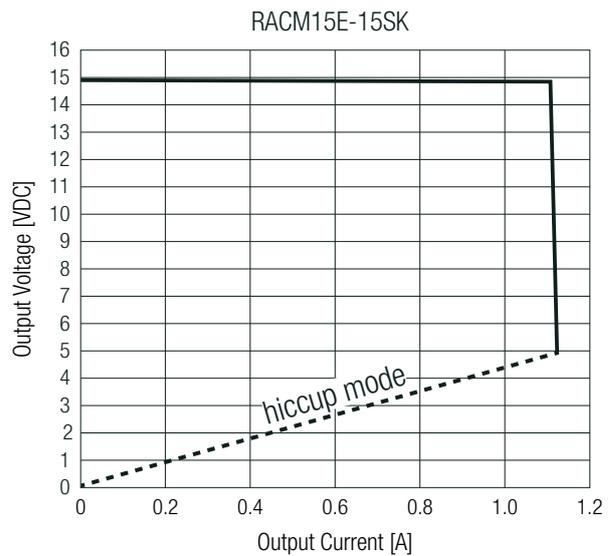
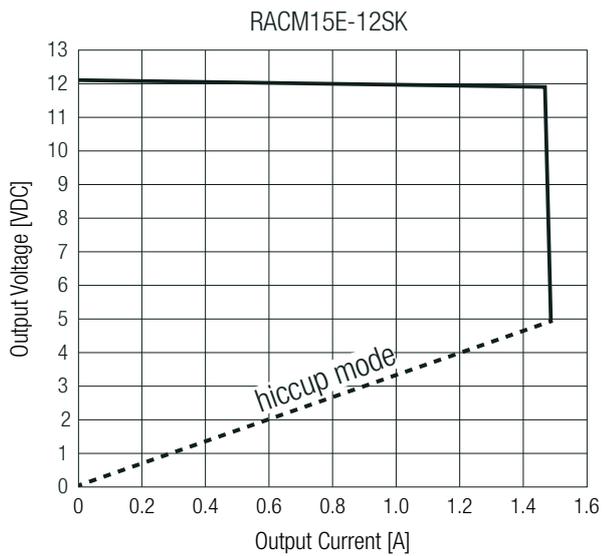
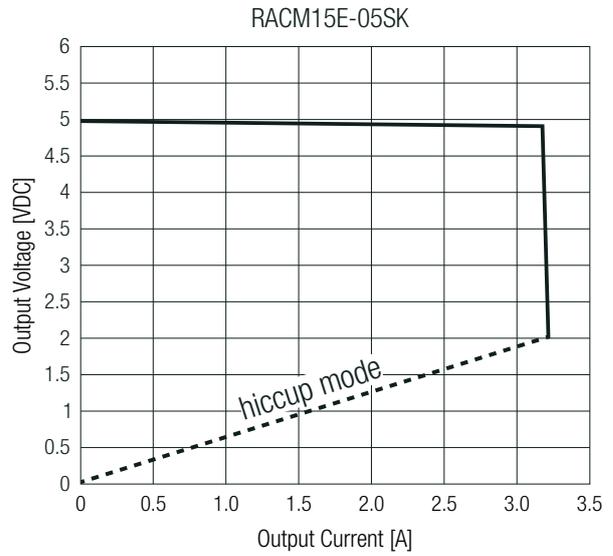
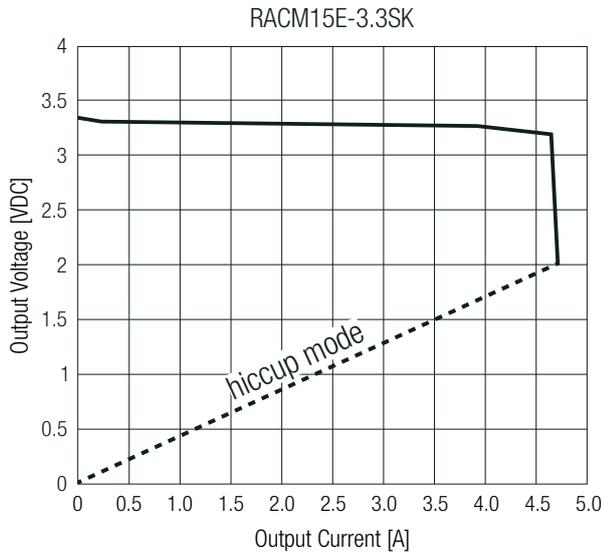
| Parameter                        | Type   |                      | Value   |
|----------------------------------|--|----------------------|---|
| Input Fuse <sup>(7)</sup>        | internal                                     |                      | T2A, slow blow type                           |
| Limited Power Source (LPS)       |  |                      | yes   |
| Short Circuit Protection (SCP)   | below 100m $\Omega$                          |                      | hiccup mode; auto recovery                    |
| Over Load Protection             | refer to „Output Voltage vs. Output Current“ |                      | constant current limitation until hiccup mode |
| Over Voltage Protection (OVP)    |  |                      | 120% - 195%, hiccup mode                      |
| Over Voltage Category (OVC)      | according to 62368-1, 60601-1                |                      | OVCII (5000m)                                 |
|                                  | according to 61558-2-16, 60335-1             |                      | OVCIII (3000m)                                |
| DC ON LED                        |  |                      | green light, output voltage present           |
| Class of Equipment               |  |                      | Class II                                      |
| Isolation Voltage <sup>(8)</sup> | I/P to O/P; 1 minute                         | according to 61558   | 4.2kVAC                                       |
|                                  |  | according to 62368-1 | 4kVDC   |
| Isolation Resistance             | $V_{iso}=500\text{VDC}$                      |                      | 1G $\Omega$ min.                              |
| Isolation Capacitance            | I/P to O/P, 100kHz/0.1V                      |                      | 100pF max.                                    |
| Insulation Grade                 | I/P to O/P                                   |                      | reinforced                                    |
| Means of Protection              | according to 60601-1                         |                      | 2MOPP   |
| Medical Device Classification    | built-in power supply                        |                      | designed to support type BF applications      |
| Touch Current                    | 264VAC/63Hz                                  | normal condition     | <100 $\mu\text{A}$                            |
|                                  |  | single fault         | <500 $\mu\text{A}$                            |

Note7: For system integration with DC operation, consider a suitable DC fuse in front of the input

Note8: For repeat Hi-Pot testing, reduce the time and/or the test voltage

PROTECTIONS (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)

### Output Voltage vs. Output Current



# RACM15E-K Series $\diamond$ AC/DC Power Supply

## 15W $\diamond$ Input: 100V-240VAC

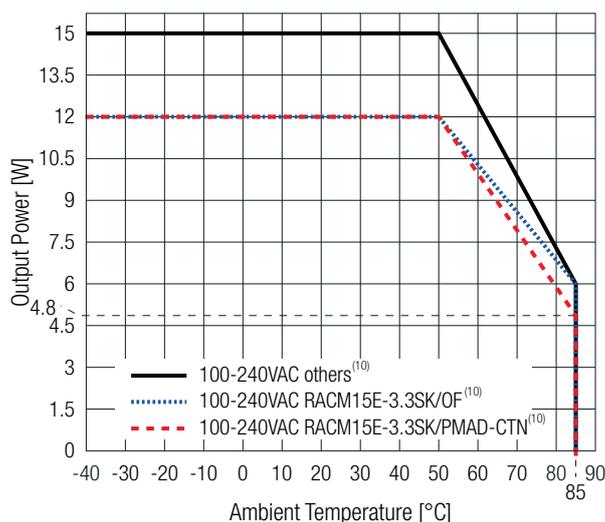
**ENVIRONMENTAL (measured @  $T_{AMB} = 25^{\circ}\text{C}$ , nom.  $V_{IN}$ , full load and after warm-up unless otherwise stated)**

| Parameter                           | Condition  |                                 | Value   |
|-------------------------------------|--|---------------------------------|---|
| Operating Ambient Temperature Range | @ natural convection (0.1m/s); refer to „Derating Graph“ |                                 | -40°C to +85°C  |
| Maximum Case Temperature            |  |                                 | +110°C  |
| Temperature Coefficient             |  |                                 | $\pm 0.02\%/K$  |
| Operating Altitude <sup>(9)</sup>   | according to 62368-1, 60601-1                            |                                 | 5000m (OVCI)  |
|                                     | according to 61558-2-16, 60335-1                         |                                 | 3000m (OVCI)  |
| Operating Humidity                  | non-condensing   |                                 | 90% RH max.   |
| Pollution Degree                    |  |                                 | PD2   |
| Vibration                           | according to MIL-STD-202G                                |                                 | 10-500Hz, 10min.: 1cycle, period / 60min. each along x,y,z axes |
| MTBF                                | according to MIL-HDBK-217, G.B.                          | $T_{AMB} = +25^{\circ}\text{C}$ | $1261 \times 10^3$ hours  |
|                                     |  | $T_{AMB} = +40^{\circ}\text{C}$ | $1091 \times 10^3$ hours  |
| Design Lifetime                     | 230VAC and full load                                     | $T_{AMB} = +50^{\circ}\text{C}$ | $30 \times 10^3$ hours  |

Note9: Recognized by safety agency for safe operation up to 5000m. High altitude operation may impact the performance and lifetime. Please contact RECOM tech support for advice

### Derating Graph

(@ Chamber and natural convection 0.1m/s) <sup>(10)</sup>



Note10: Nominal mains voltages are rated for tolerances of [nom. +  $\pm 10\%$ ]

### SAFETY & CERTIFICATIONS

| Certificate Type (Safety)   | Report Number      | Standard   |
|---|--------------------|--|
| Audio/Video, information and communication technology equipment - Part1: Safety requirements 3rd Edition (CB)                 | 085-230123101-000  | IEC62368-1:2018 3rd Edition  |
| Audio/Video, information and communication technology equipment - Part1: Safety requirements 3rd Edition                      |                    | EN IEC 62368-1:2020+A11:2020   |
| Audio/Video, information and communication technology equipment - Part1: Safety requirements 2nd Edition (LVD)                | 64.210.23.01232.01 | EN62368-1:2014+A11:2017  |
| Medical electrical equipment Part 1: General requirements for basic safety and essential performance                          | E511305-D6002-UL   | ANSI/AAMI ES60601-1:2005 + A2:2021 Edition 3.2<br>CAN/CSA-C22.2 No. 60601-1:14 A2:2022 Edition 3.2 |
| Medical electrical equipment Part 1: General requirements for basic safety and essential performance (CB)                     | 23SBDS03024-01721  | IEC60601-1:2005 + AMD2:2020 Edition 3.2  |
| Medical electrical equipment Part 1: General requirements for basic safety and essential performance                          |                    | EN60601-1:2006 + A2:2021   |
| Household and similar electrical appliances – Safety – Part 1: General requirements   | 64.260.23.01234.01 | IEC60335-1:2010 + C1:2016 5th Edition<br>EN60335-1:2012 + A15:2021                                 |
| Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure    |                    | EN62233:2008+AC:2008   |
| Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V 3rd Edition (CB) | 085-230123301-000  | IEC61558-1:2017 3rd Edition  |

# RACM15E-K Series ◊ AC/DC Power Supply

15W ◊ Input: 100V-240VAC



## SAFETY & CERTIFICATIONS

| Certificate Type (Safety)  | Report Number      | Standard                                 |
|--|--------------------|--|
| Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V 3rd Edition (LVD)                     | 64.250.23.01233.01 | EN IEC 61558-1:2019                      |
| Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V Part 2: Particular requirements (CB)  | 085-230123301-000  | IEC61558-2-16:2009 + A1:2013 1st Edition |
| Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V Part 2: Particular requirements (LVD) | 64.250.23.01233.01 | EN61558-2-16:2009 + A1:2013              |
| RoHS2  |                    | RoHS 2011/65/EU + AM2015/863             |

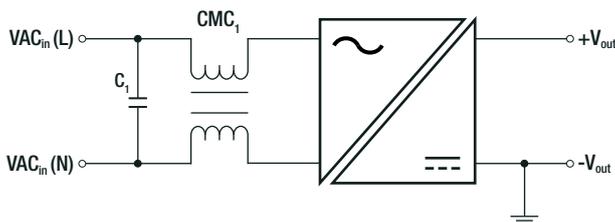
| EMC Compliance (EN60601-1-2)   | Condition   | Standard / Criterion                  |
|--|---|---------------------------------------|
| Medical electrical equipment Part 1-2: General requirements for basic safety and essential performance |   | EN60601-1-2:2015                      |
| ESD Electrostatic discharge immunity test  | Contact: ±8kV   | IEC61000-4-2:2008<br>EN61000-4-2:2009 |
| Radiated, radio-frequency, electromagnetic field immunity test   | 10 V/m (80-2700MHz),<br>27V/m (385MHz),<br>28V/m (450MHz),<br>9V/m (710, 745, 780MHz),<br>28V/m (810, 870, 930MHz),<br>28V/m (1720, 1845, 1970MHz),<br>28V/m (2450MHz),<br>9V/m (5240, 5500, 5785MHz) | IEC/EN61000-4-3:2066+A2:2010          |
| Fast Transient and Burst Immunity  | AC Port: L, N, L-N: 2kV   | IEC/EN61000-4-4:2012                  |
| Surge Immunity   | AC Port: L-N: ±0.5, 1, 2kV  | IEC/EN61000-4-5:2014 + A1:2017        |
| Immunity to conducted disturbances, induced by radio-frequency fields                                  | 3, 6Vrms (0.15-80MHz)   | IEC61000-4-6:2013<br>EN61000-4-6:2014 |
| Power Magnetic Field Immunity  | 30A/m   | IEC61000-4-8:2009<br>EN61000-4-8:2010 |
| Voltage Dips   | 100% (0.5P, 1.0P); 30%  | IEC/EN61000-4-11:2004+A1:2017         |
| Voltage Interruptions  | 100%  |                                       |

| EMC Compliance (EN61204-3)  | Condition  | Standard / Criterion   |
|---|--|--|
| Low voltage power supplies, d.c. output Part 3: Electromagnetic compatibility (EMC) |  | EN IEC 61204-3:2018, Class B                                   |
| ESD Electrostatic discharge immunity test   | Contact: ±4kV  | IEC61000-4-2:2008, Criteria A<br>EN61000-4-2:2009, Criteria A  |
| Radiated, radio-frequency, electromagnetic field immunity test                      | 10V/m (80-1000MHz),<br>3V/m (1400-2000MHz),<br>1V/m (2000-2700MHz) | IEC/EN61000-4-3:2006 + A2:2010,<br>Criteria A                  |
| Fast Transient and Burst Immunity   | AC Port: L, N, L-N: 2kV  | IEC/EN61000-4-4:2012, Criteria A                               |
| Surge Immunity  | AC Port: L-N: ±1kV   | IEC/EN61000-4-5:2014 + A1:2017, Criteria A                     |
| Immunity to conducted disturbances, induced by radio-frequency fields               | 10Vrms (0.15-80MHz)  | IEC61000-4-6: 2013, Criteria A<br>EN61000-4-6:2014, Criteria A |
| Power Magnetic Field Immunity   | 30A/m  | IEC61000-4-8:2009, Criteria A<br>EN61000-4-8:2010, Criteria A  |
| Voltage Dips  | 100% (0.5P; 1.0P), 20%, 30%  | IEC/EN61000-4-11:2004 + A1:2017, Criteria A                    |
|   | 60%  | IEC/EN61000-4-11:2004 + A1:2017, Criteria B                    |
| Voltage Interruptions   | 100%   | IEC/EN61000-4-11:2004 + A1:2017, Criteria B                    |
| Limits of Voltage Fluctuations & Flicker  |  | EN61000-3-3:2013 + A1:2019                                     |

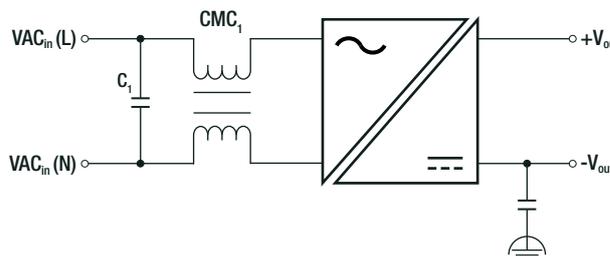
| EMC Compliance (EN55032)  | Condition   | Standard / Criterion                  |
|---|---|---------------------------------------|
| Electromagnetic compatibility of multimedia equipment - Emission Requirements                         | O/P connected to GND:<br>refer to: <b>"PELV installation"</b><br>and floating output; without external filter | EN55032:2015+A11:2020, Class B        |
| Limitations on the amount of electromagnetic interference allowed from digital and electronic devices |   | FCC 47 CFR Part 15 Subpart B, Class B |

### SAFETY & CERTIFICATIONS

**Suggested external filter for PELV installation**  
(refer to „EMC Compliance (EN55032)“)



**Suggested external filter for capacitive earth or GND coupled installations**



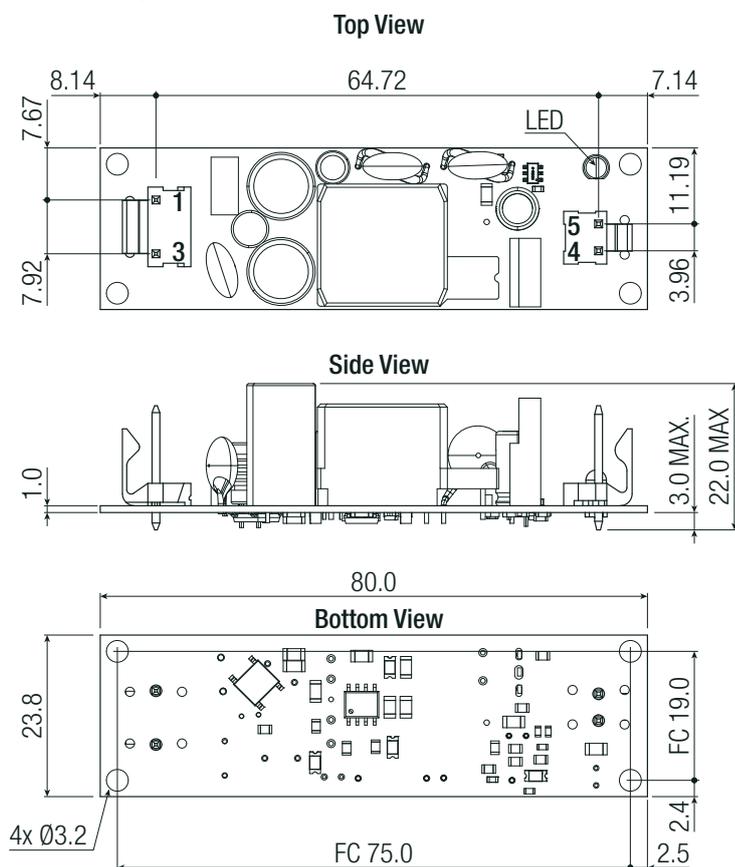
#### Component List

| C <sub>1</sub> | CMC <sub>1</sub>                         |
|----------------|--|
| 0.22 $\mu$ F   | 45mH:<br>RACMC45-500/UF9.8 (coming soon) |

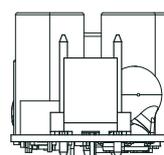
### DIMENSION & PHYSICAL CHARACTERISTICS

| Parameter         | Type                         | Value  |
|-------------------|------------------------------|--|
| Materials         | case/baseplate               | plastic, (UL94-V0)                           |
|                   | potting (PMAD versions only) | PU, (UL94-V0)                                |
|                   | PCB                          | FR4, (UL94-V0)                               |
| Dimension (LxWxH) | “/OF”                        | 80.0 x 23.8 x 22.0mm<br>3.1 x 0.9 x 0.8 inch |
|                   | “/PMAD”                      | 83.0 x 26.4 x 29.5mm<br>3.2 x 1.0 x 1.1 inch |
| Weight            | “/OF”                        | 48g typ.<br>0.10 lbs                         |
|                   | “/PMAD”                      | 60g typ.<br>0.13 lbs                         |

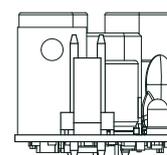
#### Dimension Drawing “/OF” version (mm)



#### AC Input Side



#### DC Output Side



#### Connector Information

##### AC Input (CON1)

| # | Function   | Wire cross section <sup>(11)</sup>  |
|---|------------|-------------------------------------|
| 1 | VAC in (L) | 26-21 AWG (0.5-1.5mm <sup>2</sup> ) |
| 3 | VAC in (N) | Usable wire: solid/stranded         |

##### DC Output (CON2)

| # | Function | Wire cross section <sup>(11)</sup>  |
|---|----------|-------------------------------------|
| 4 | +Vout    | 26-21 AWG (0.5-1.5mm <sup>2</sup> ) |
| 5 | -Vout    | Usable wire: solid/stranded         |

FC= Fixing centers

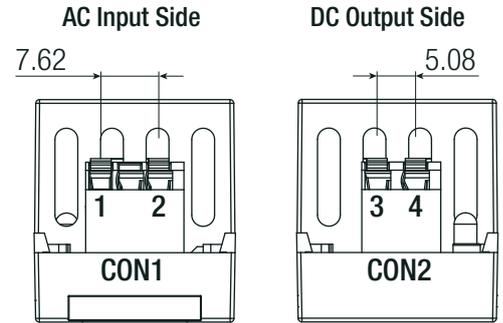
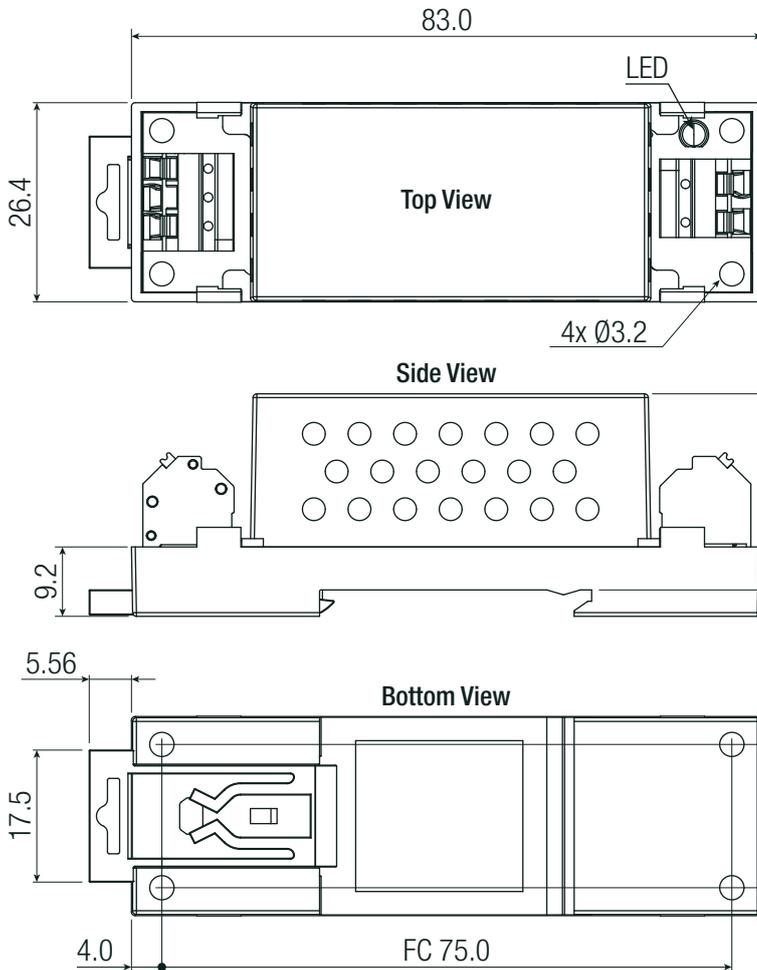
#### Compatible Connector

| Housing                             | Crimp Terminal                     |
|-------------------------------------|------------------------------------|
| Molex 41695 Series<br>or equivalent | Molex 2478 Series<br>or equivalent |

Tolerance: xx.x=  $\pm$ 0.5mm  
xx.xx=  $\pm$ 0.25mm

### DIMENSION & PHYSICAL CHARACTERISTICS

Dimension Drawing "/PMAD" version (mm)



#### Push-In Spring Terminal

##### AC Input (CON1)

| # | Function   | Wire cross section <sup>(1)</sup>   |
|---|------------|-------------------------------------|
| 1 | VAC in (L) | 26-21 AWG (0.5-1.5mm <sup>2</sup> ) |
| 2 | VAC in (N) | Usable wire: solid/stranded         |

##### DC Output (CON2)

| # | Function | Wire cross section <sup>(1)</sup>   |
|---|----------|-------------------------------------|
| 3 | +Vout    | 26-21 AWG (0.5-1.5mm <sup>2</sup> ) |
| 4 | -Vout    | Usable wire: solid/stranded         |

Wire stripping length: 10mm

FC= Fixing centers

Note11: Min. Wire cross section are suggested values only, and need to be aligned with the applicable safety regulation

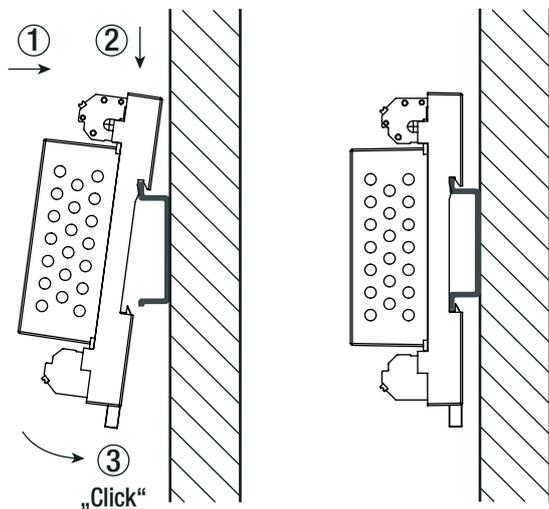
Tolerance: xx.x=  $\pm 0.5$ mm  
xx.xx=  $\pm 0.25$ mm

### INSTALLATION & APPLICATION

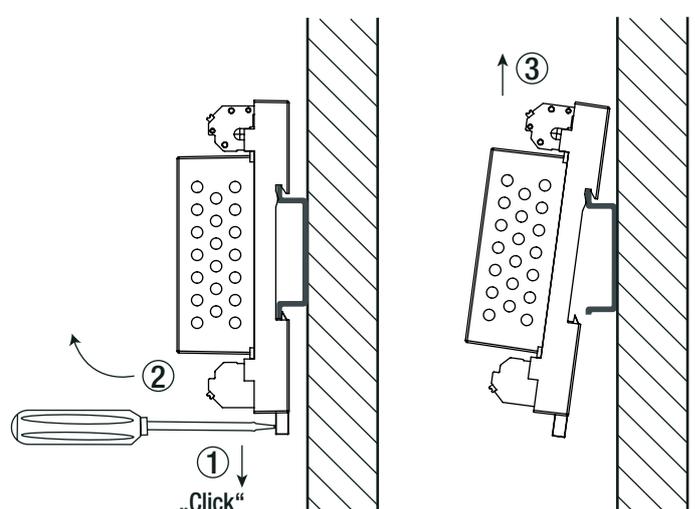
#### Mounting Instruction "/PMAD" Version

Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715

Mounting

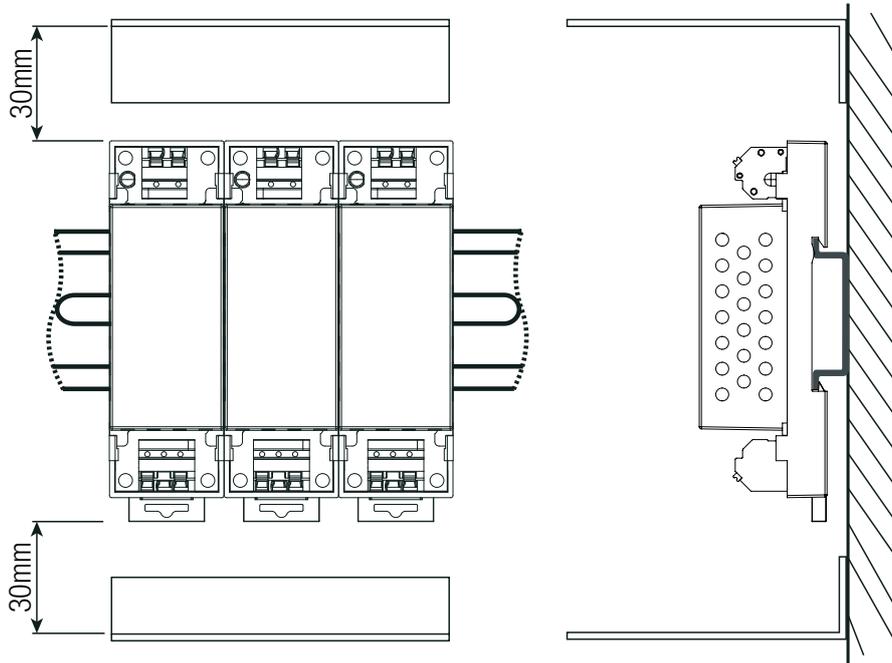


Release

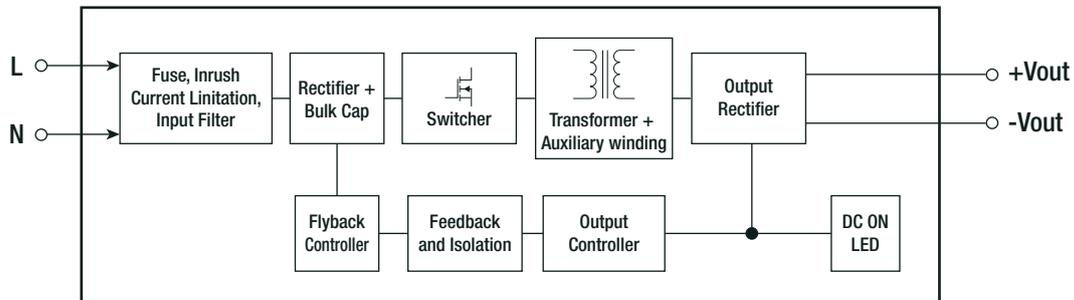


### INSTALLATION & APPLICATION

#### Installation Instruction



### BLOCK DIAGRAM



### PACKAGING INFORMATION

| Parameter                 | Type                        |                                 | Value                |
|---------------------------|-----------------------------|---------------------------------|----------------------|
|                           | Packaging Dimension (LxWxH) | "/OF"                           | tray                 |
| "/PMAD-CTN"               |                             | cardboard box (22x single pack) | 96.0 x 34.0 x 40.0mm |
| Packaging Quantity        | "/OF"                       |                                 | 18pcs                |
|                           | "/PMAD-CTN"                 |                                 | 22pcs                |
| Storage Temperature Range |                             |                                 | -40°C to +90°C       |
| Storage Humidity          | non-condensing              |                                 | 95% RH max.          |

The product information and specifications may be subject to changes even without prior written notice. The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.