

# Features

## Regulated Converter

- Wide 4:1 input voltage range
- 2.25kVDC isolation
- Efficiency up to 89%
- Six-sided continuous shield
- EN50155, UL/IEC/EN60950-1 certified

**RECOM**  
DC/DC Converter

## RP20-FR

20 Watt

2" x 1"

Single and Dual Output



EN50155 certified  
UL60950-1 certified  
IEC/EN60950-1 certified  
EN55032 compliant  
EN55024 compliant  
EN50121-3-2 compliant

## Description

The RP20-FR series wide range input DC/DC converters are certified to UL60950-1 and cUL 60950-1. This makes them ideal for all telecom and industrial applications where approved safety standards are required. The 110VDC input versions have been especially designed for railway applications.

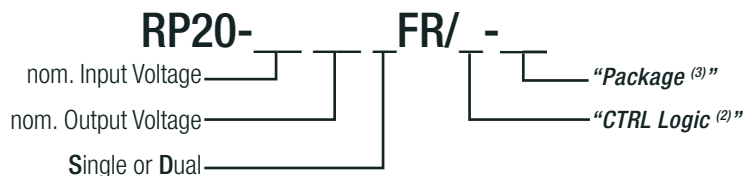
## Selection Guide

| Part Number                     | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [mA] | Input <sup>(1)</sup> Current [mA] | Efficiency <sup>(1)</sup> typ. [%] | Max. Capacitive Load [μF] |
|---------------------------------|---------------------------|----------------------|---------------------|-----------------------------------|------------------------------------|---------------------------|
| RP20-243.3SFR <sup>(2,3)</sup>  | 9-36                      | 3.3                  | 4500                | 728                               | 85                                 | 7000                      |
| RP20-2405SFR <sup>(2,3)</sup>   | 9-36                      | 5                    | 4000                | 947                               | 88                                 | 5000                      |
| RP20-2412SFR <sup>(2,3)</sup>   | 9-36                      | 12                   | 1670                | 938                               | 89                                 | 850                       |
| RP20-2415SFR <sup>(2,3)</sup>   | 9-36                      | 15                   | 1330                | 945                               | 88                                 | 700                       |
| RP20-483.3SFR <sup>(2,3)</sup>  | 18-75                     | 3.3                  | 4500                | 364                               | 85                                 | 7000                      |
| RP20-4805SFR <sup>(2,3)</sup>   | 18-75                     | 5                    | 4000                | 473                               | 88                                 | 5000                      |
| RP20-4812SFR <sup>(2,3)</sup>   | 18-75                     | 12                   | 1670                | 469                               | 89                                 | 850                       |
| RP20-4815SFR <sup>(2,3)</sup>   | 18-75                     | 15                   | 1330                | 467                               | 89                                 | 700                       |
| RP20-1103.3SFR <sup>(2,3)</sup> | 43-160                    | 3.3                  | 4500                | 159                               | 85                                 | 7000                      |
| RP20-11005SFR <sup>(2,3)</sup>  | 43-160                    | 5                    | 4000                | 209                               | 87                                 | 5000                      |
| RP20-11012SFR <sup>(2,3)</sup>  | 43-160                    | 12                   | 1670                | 207                               | 88                                 | 850                       |
| RP20-11015SFR <sup>(2,3)</sup>  | 43-160                    | 15                   | 1330                | 206                               | 88                                 | 700                       |
| RP20-2412DFR <sup>(2,3)</sup>   | 9-36                      | ±12                  | ±833                | 947                               | 88                                 | ±500                      |
| RP20-2415DFR <sup>(2,3)</sup>   | 9-36                      | ±15                  | ±667                | 937                               | 89                                 | ±350                      |
| RP20-4812DFR <sup>(2,3)</sup>   | 18-75                     | ±12                  | ±833                | 473                               | 88                                 | ±500                      |
| RP20-4815DFR <sup>(2,3)</sup>   | 18-75                     | ±15                  | ±667                | 468                               | 89                                 | ±350                      |
| RP20-11012DFR <sup>(2,3)</sup>  | 43-160                    | ±12                  | ±833                | 207                               | 88                                 | ±500                      |
| RP20-11015DFR <sup>(2,3)</sup>  | 43-160                    | ±15                  | ±667                | 204                               | 89                                 | ±350                      |

### Notes:

Note1: Maximum values at nominal input voltage and full load

## Model Numbering



### Notes:

Note2: no suffix for CTRL function with positive logic (1=ON, 0=OFF)  
add suffix "N" for CTRL function with negative logic (0=ON, 1=OFF)  
or add suffix "XC" for omitted CTRL pin (refer to "Dimension Drawing (mm)")

Note3: add suffix "-HC" for premounted Heat-sink with clamps

### Ordering Examples

RP20-2405SFR = 24V input, 5V output, single, positive Logic CTRL pin

RP20-4812DFR/N-HC = 48V input, ±12V output, dual, negative Logic CTRL pin, Heat-sink premounted

RP20-11005SFR/XC = 110V input, 5V output, single, no CTRL pin

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

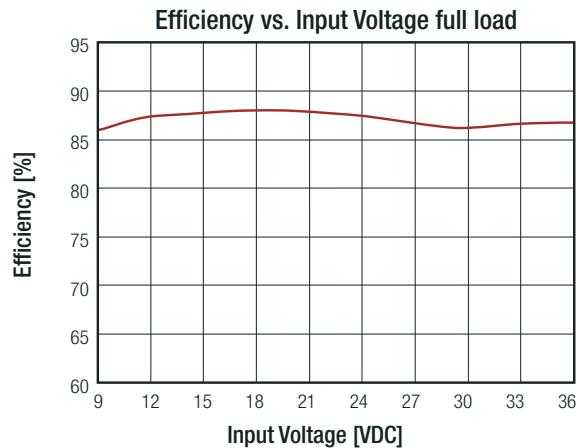
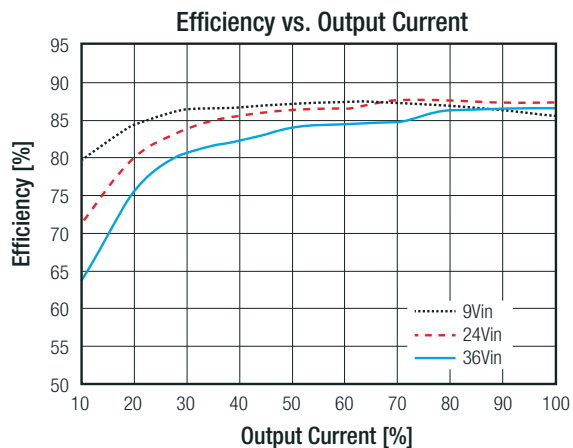
**BASIC CHARACTERISTICS**

| Parameter                      | Condition                                                 |                                                                                    | Min.                                                                                     | Typ.                                        | Max.                      |
|--------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------|
| Input Filter                   | nom. Vin = 24VDC, nom. Vin = 48VDC<br>nom. Vin = 110VDC   |                                                                                    | Common Mode Choke<br>Pi-Type                                                             |                                             |                           |
| Input Voltage Range            | nom. Vin = 24VDC<br>nom. Vin = 48VDC<br>nom. Vin = 110VDC |                                                                                    | 9VDC<br>18VDC<br>43VDC                                                                   | 24VDC<br>48VDC<br>110VDC                    | 36VDC<br>75VDC<br>160VDC  |
| Input Surge Voltage            | 100s max.                                                 | nom. Vin = 24VDC<br>nom. Vin = 48VDC<br>nom. Vin = 110VDC                          |                                                                                          |                                             | 50VDC<br>100VDC<br>170VDC |
| Under Voltage Lockout (UVLO)   | nom. Vin = 24VDC                                          | DC-DC ON<br>DC-DC OFF                                                              |                                                                                          | 8VDC                                        | 9VDC                      |
|                                | nom. Vin = 48VDC                                          | DC-DC ON<br>DC-DC OFF                                                              |                                                                                          | 16VDC                                       | 18VDC                     |
|                                | nom. Vin = 110VDC                                         | DC-DC ON<br>DC-DC OFF                                                              |                                                                                          | 40VDC                                       | 43VDC                     |
| Output Voltage Trimming        | refer to <b>"OUTPUT VOLTAGE TRIMMING"</b>                 |                                                                                    | -10%                                                                                     |                                             | +10%                      |
| Input Reflected Ripple Current |                                                           |                                                                                    |                                                                                          | 30mA <sub>p-p</sub>                         |                           |
| Start-up Time                  | Power up<br>ON/OFF CTRL                                   |                                                                                    |                                                                                          |                                             | 30ms<br>30ms              |
| ON/OFF CTRL <sup>(4)</sup>     | Positive Logic                                            | DC-DC ON<br>DC-DC OFF                                                              | Open or 3.0VDC < V <sub>CTRL</sub> < 15VDC<br>Short or 0VDC < V <sub>CTRL</sub> < 1.2VDC |                                             |                           |
|                                | Negative Logic                                            | DC-DC ON<br>DC-DC OFF                                                              | Short or 0VDC < V <sub>CTRL</sub> < 1.2VDC<br>Open or 3.0VDC < V <sub>CTRL</sub> < 15VDC |                                             |                           |
| Input Current of CTRL pin      | DC-DC ON                                                  |                                                                                    | -0.5mA                                                                                   |                                             | +1.0mA                    |
| Standby Current                | DC-DC OFF                                                 |                                                                                    |                                                                                          | 2.5mA                                       |                           |
| Internal Operating Frequency   |                                                           |                                                                                    | 297kHz                                                                                   | 330kHz                                      | 363kHz                    |
| Ripple and Noise               | measured at 20MHz BW<br>with a 1µF/50V X7R MLCC           | 3.3V <sub>out</sub> , 5V <sub>out</sub><br>12V <sub>out</sub> , 15V <sub>out</sub> |                                                                                          | 75mV <sub>p-p</sub><br>100mV <sub>p-p</sub> |                           |

**Notes:**

Note4: If suffix "XC" is specified, pin6 will be absent. If fitted, the ON/OFF control function can be positive or negative logic. The pin voltage is referenced to -Vin pin

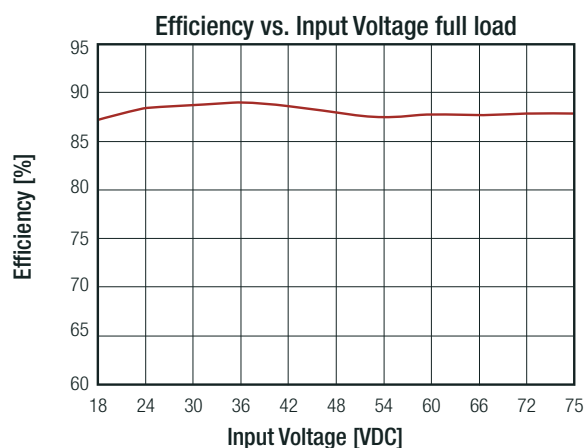
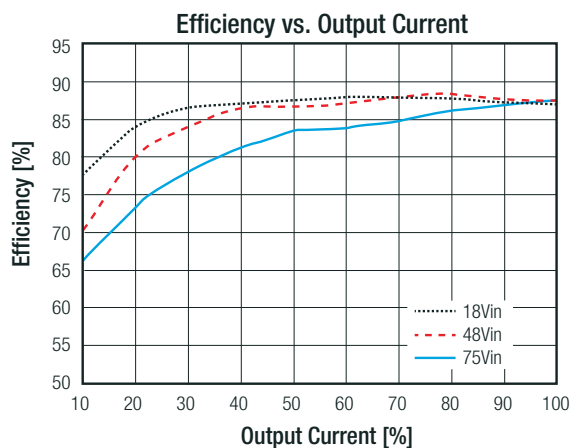
**RP20-2405SFR**



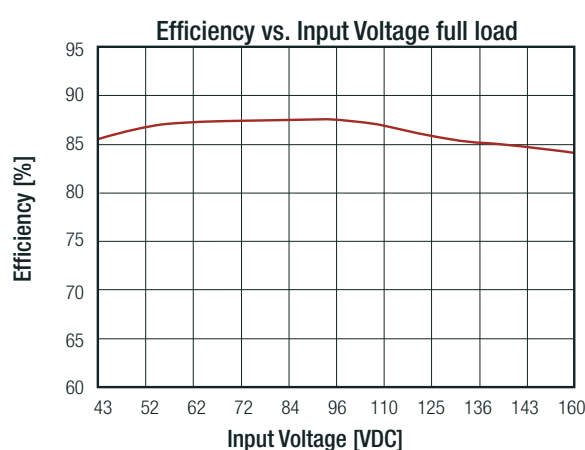
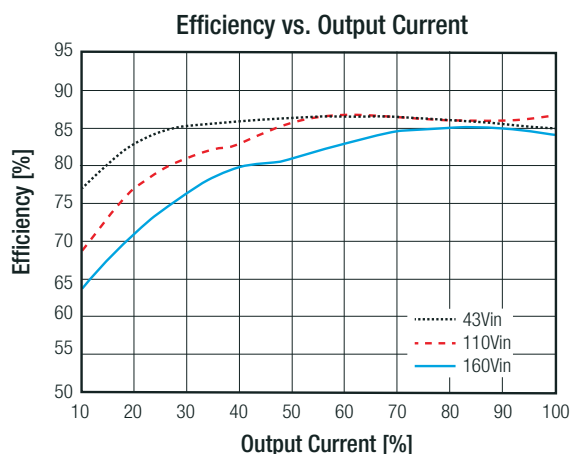
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**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , nom. Vin, full load unless otherwise stated)

### RP20-4805SFR



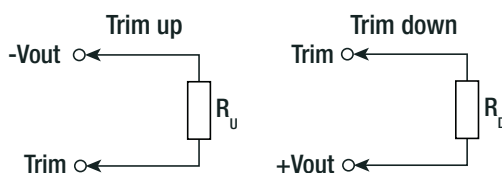
### RP20-11005SFR



## OUTPUT VOLTAGE TRIMMING

### Output Voltage Trimming

Single output Powerline converters offer the feature of trimming the output voltage over a certain range around the nominal value by using external trim resistors. No general equation can be given for calculating the trim resistors, but the following trim tables give typical values for choosing these trimming resistors. If voltages between the given trim points are required, extrapolate between the two nearest given values to work out the resistor required or use a variable resistor to set the output voltage. Output can be externally trimmed by using the method shown below.



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### Specifications (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

| RP20-xx3.3SFR    |        |        |        |        |        |        |        |       |       |       |       |
|------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| Trim up          | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 3.333  | 3.366  | 3.399  | 3.432  | 3.465  | 3.498  | 3.531  | 3.564 | 3.597 | 3.63  | [VDC] |
| R <sub>u</sub> = | 385.07 | 191.51 | 126.99 | 94.73  | 75.37  | 62.47  | 53.25  | 46.34 | 40.96 | 36.66 | [kΩ]  |
|                  |        |        |        |        |        |        |        |       |       |       |       |
| Trim down        | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 3.267  | 3.234  | 3.201  | 3.168  | 3.135  | 3.102  | 3.069  | 3.036 | 3.003 | 2.97  | [VDC] |
| R <sub>d</sub> = | 116.72 | 54.78  | 34.13  | 23.81  | 17.62  | 13.49  | 10.54  | 8.33  | 6.60  | 5.23  | [kΩ]  |
| RP20-xx05SFR     |        |        |        |        |        |        |        |       |       |       |       |
| Trim up          | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 5.05   | 5.10   | 5.15   | 5.20   | 5.25   | 5.30   | 5.35   | 5.4   | 5.45  | 5.50  | [VDC] |
| R <sub>u</sub> = | 253.45 | 125.70 | 83.18  | 61.83  | 49.05  | 40.53  | 34.45  | 29.89 | 26.34 | 23.50 | [kΩ]  |
|                  |        |        |        |        |        |        |        |       |       |       |       |
| Trim down        | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 4.95   | 4.90   | 4.85   | 4.80   | 4.75   | 4.70   | 4.65   | 4.60  | 4.55  | 4.50  | [VDC] |
| R <sub>d</sub> = | 248.34 | 120.59 | 78.01  | 56.72  | 43.94  | 35.42  | 29.34  | 24.78 | 21.23 | 18.39 | [kΩ]  |
| RP20-xx12SFR     |        |        |        |        |        |        |        |       |       |       |       |
| Trim up          | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 12.12  | 12.24  | 12.36  | 12.48  | 12.60  | 12.72  | 12.84  | 12.96 | 13.08 | 13.20 | [VDC] |
| R <sub>u</sub> = | 203.22 | 99.06  | 64.33  | 46.97  | 36.56  | 29.61  | 24.65  | 20.93 | 18.04 | 15.72 | [kΩ]  |
|                  |        |        |        |        |        |        |        |       |       |       |       |
| Trim down        | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 11.88  | 11.76  | 11.64  | 11.52  | 11.40  | 11.28  | 11.16  | 11.04 | 10.92 | 10.8  | [VDC] |
| R <sub>d</sub> = | 776.56 | 380.72 | 248.78 | 182.81 | 143.22 | 116.83 | 97.99  | 83.84 | 72.85 | 64.06 | [kΩ]  |
| RP20-xx15SFR     |        |        |        |        |        |        |        |       |       |       |       |
| Trim up          | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 15.15  | 15.3   | 15.45  | 15.60  | 15.75  | 15.90  | 16.05  | 16.20 | 16.35 | 16.50 | [VDC] |
| R <sub>u</sub> = | 161.56 | 78.22  | 50.45  | 36.56  | 28.22  | 22.67  | 18.70  | 15.72 | 13.41 | 11.56 | [kΩ]  |
|                  |        |        |        |        |        |        |        |       |       |       |       |
| Trim down        | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8     | 9     | 10    | [%]   |
| Vout =           | 14.85  | 14.70  | 14.55  | 14.40  | 14.25  | 14.10  | 13.95  | 13.80 | 13.65 | 13.50 | [VDC] |
| R <sub>d</sub> = | 818.22 | 401.56 | 262.67 | 193.22 | 151.56 | 123.78 | 103.94 | 89.06 | 77.48 | 68.22 | [kΩ]  |

### REGULATIONS

| Parameter                        | Condition                           |        | Value      |
|----------------------------------|-------------------------------------|--------|------------|
| Output Accuracy                  |                                     |        | ±1.0%      |
| Line Regulation                  | low line to high line,<br>full load | Single | ±0.2%      |
|                                  |                                     | Dual   | ±0.5%      |
| Load Regulation                  | 0% to 100% load                     | Single | ±0.2%      |
|                                  |                                     | Dual   | ±1.0%      |
|                                  | 10% to 90% load                     | Single | ±0.1%      |
|                                  |                                     | Dual   | ±0.8%      |
| Cross Regulation                 | asymmetrical 25%<>100% load         |        | ±5.0%      |
| Transient Response Recovery Time | 25% load step change                |        | 250μs typ. |

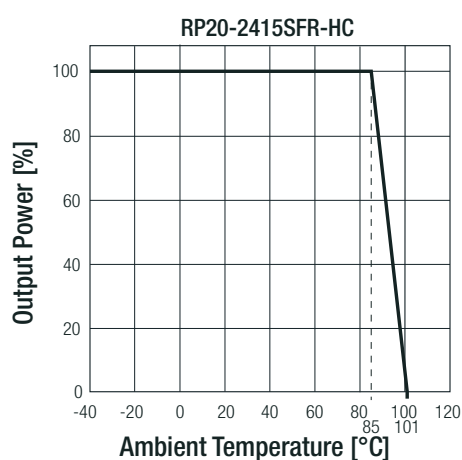
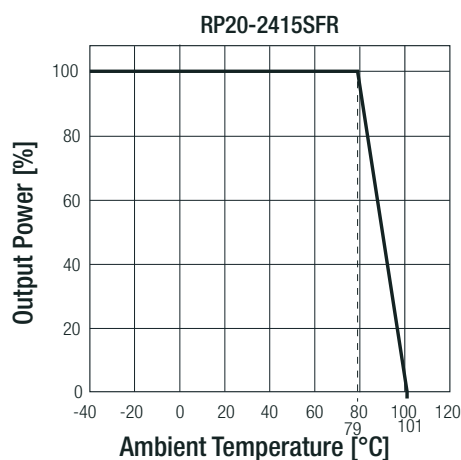
### Specifications (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

| PROTECTIONS                                                                                                                                                                                                                |                                  |                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------------|
| Parameter                                                                                                                                                                                                                  | Condition                        | Value                                                                        |
| Short Circuit Protection (SCP)                                                                                                                                                                                             |                                  | continuous, automatic recovery                                               |
| Over Voltage Protection (OVP)                                                                                                                                                                                              | zener diode clamp                | 3.3Vout<br>5Vout<br>12Vout<br>15Vout                                         |
|                                                                                                                                                                                                                            |                                  | 3.7VDC - 5.4VDC<br>5.6VDC - 7.0VDC<br>13.5VDC - 19.6VDC<br>16.8VDC - 20.5VDC |
| Over Load Protection (OLP)                                                                                                                                                                                                 | % Iout rated                     | 150% typ.                                                                    |
| Isolation Voltage <sup>(6)</sup>                                                                                                                                                                                           | I/P to O/P<br>I/P to O/P to case | 2.25kVDC/1minute<br>1.6kVDC/1minute                                          |
| Isolation Resistance                                                                                                                                                                                                       | Viso= 500VDC                     | 1GΩ min.                                                                     |
| Isolation Capacitance                                                                                                                                                                                                      |                                  | 3000pF max.                                                                  |
| <b>Notes:</b><br>Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage<br>Note6: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type |                                  |                                                                              |

| ENVIRONMENTAL                                                                                                                  |                                                                                                                                                          |                                     |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Parameter                                                                                                                      | Condition                                                                                                                                                | Value                               |
| Operating Temperature Range                                                                                                    | without derating<br>with derating                                                                                                                        | -40°C to +79°C<br>-40°C to +101°C   |
| Maximum Case Temperature                                                                                                       |                                                                                                                                                          | +105°C                              |
| Temperature Coefficient                                                                                                        |                                                                                                                                                          | ±0.02%/K max.                       |
| Thermal Impedance                                                                                                              | @ natural convection 0.1m/s                                                                                                                              | without heat-sink<br>with heat-sink |
|                                                                                                                                |                                                                                                                                                          | 12K/W<br>10K/W                      |
| Operating Humidity                                                                                                             | non-condensing                                                                                                                                           | 5% - 95% RH                         |
| Environmental testing Part 2-1: Tests<br>Test A: Cold                                                                          | Temperature: -40°C<br>Dwell Time: 2 hours                                                                                                                | according to EN60068-2-1:2007       |
| Environmental testing Part 2-2: Tests<br>Test B: Dry heat                                                                      | Temperature: +85°C<br>Dwell Time: 6 hours                                                                                                                | according to EN60068-2-2:2007       |
| Environmental testing Part 2-30: Tests<br>Test Db: Damp heat, cyclic (12 h + 12 h cycle)                                       | Temperature: +25 to +55°C<br>Humidity: 90% to 100%RH<br>Test Duration: 24 hours/cycle, 2 cycles, total 48 hours                                          | according to EN60068-2-30:2005      |
| Railway applications – Rolling stock equipment –<br>Shock and vibration tests                                                  | Random vibration test 5Hz to 150Hz, Z-Axis<br>1.01m/s <sup>2</sup> (0.103Grms), Y-Axis, X-Axis 0.70m/s <sup>2</sup><br>(0.0714Grms), Duration 10min/Axis | according to EN61373:2010           |
| Fire protection on railway vehicles                                                                                            |                                                                                                                                                          | according to EN45545-2:2013         |
| Fire hazard testing Part 2-11: Glowing/hot-wire<br>based test methods – Glow-wire flammability test<br>method for end-products | Oxygen index test                                                                                                                                        | according to EN ISO 4589-2 OI       |
| Fire hazard testing Part 11-10: Test flames – 50 W<br>horizontal and vertical flame test methods                               | Glow-wire test                                                                                                                                           | according to EN60695-2-11           |
| Shock                                                                                                                          |                                                                                                                                                          | according to MIL-STD-810F           |
| Thermal Shock                                                                                                                  |                                                                                                                                                          | according to MIL-STD-810F           |
| Vibration                                                                                                                      |                                                                                                                                                          | according to MIL-STD-810F           |
| MTBF                                                                                                                           | according to MIL-HDBK-217F, G.B.                                                                                                                         | 1523 x 10 <sup>3</sup> hours        |
| continued on next page                                                                                                         |                                                                                                                                                          |                                     |

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

Derating Graph <sup>(7)</sup>



**Notes:**

Note7: Derating graphs are valid only for the shown part numbers. If you need detailed derating-information about a part-number not shown here please contact RECOM Techsupport for detailed information

### SAFETY AND CERTIFICATIONS

| Certificate Type (Safety)                                               | Condition                                                         | Standard                                                                        |
|-------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Information Technology Equipment, General Requirements for Safety       | E196683                                                           | UL60950-1, 2nd Edition, 2014<br>CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2014 |
| Information Technology Equipment, General Requirements for Safety (LVD) | TW1708011-001                                                     | IEC60950-1:2005, 2nd Edition + A2:2013<br>EN60950-1:2006 + A2:2013              |
| Railway Applications - Electrical Equipment used on rolling stock       | 15A100702E-C                                                      | EN50155:2007                                                                    |
| EAC                                                                     | RU-AT.49.09571                                                    | TP TC 004/2011                                                                  |
| RoHS2                                                                   |                                                                   | RoHS-2011/65/EU + AM-2015/863                                                   |
| EMC Compliance (Railway)                                                | Condition                                                         | Standard / Criterion                                                            |
| Railway Applications - Electromagnetic Compatibility                    |                                                                   | EN50121-3-2:2006                                                                |
| ESD Electrostatic Discharge Immunity Test                               | Air ±2, ±4, ±8kV<br>Contact ±2, ±4, ±6kV                          | EN61000-4-2, Criteria A                                                         |
| Radiated, Radio-Frequency, Electromagnetic Field Immunity Test          | 20V/m (80-1000MHz)<br>10V/m (1400-2100MHz)<br>5V/m (2100-2500MHz) | EN61000-4-3, Criteria A                                                         |
| Fast Transient and Burst Immunity <sup>(8)</sup>                        | DC Power Port: ±2kV                                               | EN61000-4-4, Criteria A                                                         |
| Surge Immunity <sup>(8)</sup>                                           | DC Power Port: L-L ±0.5, 1kV<br>DC Power Port: L-E ±0.5, 1, 2kV   | EN61000-4-5, Criteria A                                                         |
| Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields   | DC Power Port: 10V                                                | EN61000-4-6, Criteria A                                                         |

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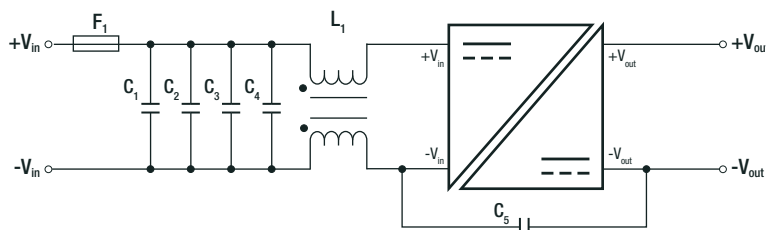
**Specifications** (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

| EMC Compliance (Multimedia)                                                                                                    | Condition                                                                    | Standard / Criterion                    |
|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------|
| Industrial, scientific and medical equipment - Radio frequency disturbance characteristics - Limits and methods of measurement | without external filter<br>without external filter                           | EN55011, Class A<br>EN55011, Class B    |
| Electromagnetic compatibility of multimedia equipment - Emission requirements (24Vin and 48Vin)                                | without external filter<br>without external filter                           | EN55032, Class A<br>EN55032, Class B    |
| Electromagnetic compatibility of multimedia equipment - Emission requirements (110Vin)                                         | without external filter<br>with external filter                              | EN55032, Class A<br>EN55032, Class B    |
| Information Technology Equipment - Immunity Characteristics - Limits and Methods of Measurement                                |                                                                              | EN55024:2010 + A1:2015                  |
| ESD Electrostatic Discharge Immunity Test                                                                                      | Air $\pm 2, \pm 4, \pm 8\text{kV}$<br>Contact $\pm 2, \pm 4, \pm 6\text{kV}$ | IEC61000-4-2:2008, Criteria A           |
| Radiated, Radio-Frequency, Electromagnetic Field Immunity Test                                                                 | 20V/m (80-1000MHz)                                                           | IEC61000-4-3:2006 + A2:2010, Criteria A |
| Fast Transient and Burst Immunity                                                                                              | DC Power Port: $\pm 2\text{kV}$                                              | IEC61000-4-4:2012, Criteria A           |
| Surge Immunity                                                                                                                 | DC Power Port: $\pm 0.5, \pm 1, \pm 2\text{kV}$                              | IEC61000-4-5:2014, Criteria A           |
| Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields                                                          | DC Power Port: 10V                                                           | IEC61000-4-6:2013, Criteria A           |
| Power Magnetic Field Immunity                                                                                                  | 50Hz 1A/m                                                                    | IEC61000-4-8:2009, Criteria A           |

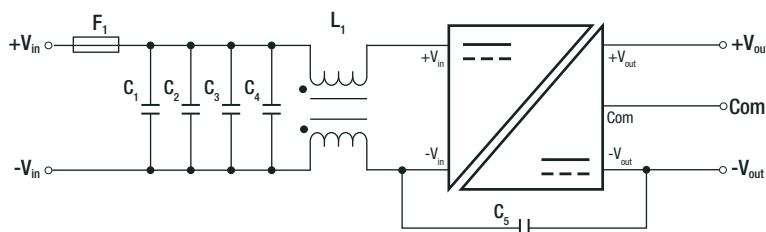
**Notes:**

Note8: An external input filter capacitor is required if the module has to meet EN61000-4-4, -5  
The filter Recom suggests: 24VDC and 48VDC input. Nippon chemi-con KY series, 220 $\mu\text{F}$ /100V  
110VDC input: Rubycon BXF series, 100 $\mu\text{F}$ /250V

**EMI Filtering according to EN55032 Class B (110Vin Single)**



**EMI Filtering according to EN55032 Class B (110Vin Dual)**



**Component List**

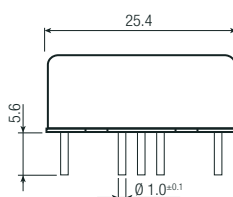
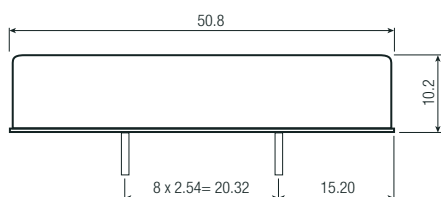
| MODEL                          | C1                                                         | C2/C3/C4                              | C5                      | L1                                               |
|--------------------------------|------------------------------------------------------------|---------------------------------------|-------------------------|--------------------------------------------------|
| RP20-110xxSFR<br>RP20-110xxDFR | 39 $\mu\text{F}$ /250V<br>Al Cap. (lie down)<br>Rubycon BX | 0.47 $\mu\text{F}$ /250V<br>1812 MLCC | 1000pF/3kV<br>1808 MLCC | CMC: 470 $\mu\text{H}$<br>ref.: WE-SL5 744272471 |

**Specifications** (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

### DIMENSIONS and PHYSICAL CHARACTERISTICS

| Parameter          | Type              | Value                |
|--------------------|-------------------|----------------------|
| Material           | case              | nickel coated copper |
|                    | base              | FR4 PCB              |
|                    | potting           | silicone (UL94 V-0)  |
| Dimensions (LxWxH) | without Heat-sink | 50.8 x 25.4 x 10.2mm |
|                    | with Heat-sink    | 56.8 x 25.4 x 16.8mm |
| Weight             | without Heat-sink | 30g                  |
|                    | with Heat-sink    | 40.89g               |

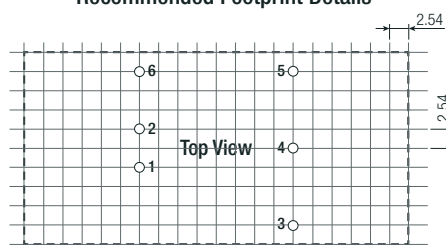
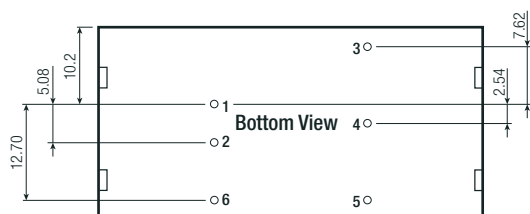
#### Dimension Drawing (mm)



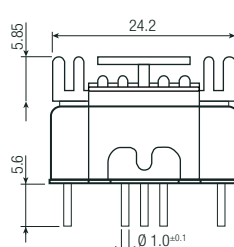
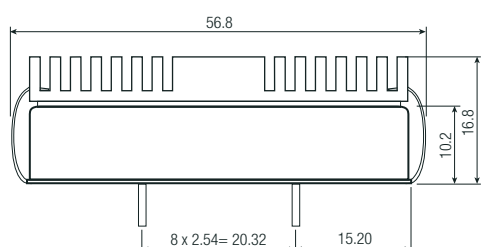
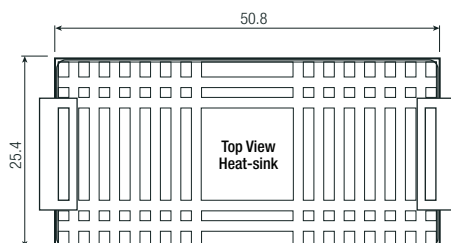
#### Pinning Information

| Pin # | Single              | Dual                |
|-------|---------------------|---------------------|
| 1     | +Vin                | +Vin                |
| 2     | -Vin                | -Vin                |
| 3     | +Vout               | +Vout               |
| 4     | Trim <sup>(4)</sup> | Com                 |
| 5     | -Vout               | -Vout               |
| 6     | CTRL <sup>(2)</sup> | CTRL <sup>(2)</sup> |

Tolerance: xx.x= ±0.5mm  
xx.xx= ±0.25mm



#### Dimension Drawing with Heat-sink (mm)



**Specifications** (measured @ Ta= 25°C, nom. Vin, full load unless otherwise stated)

| PACKAGING INFORMATION       |                |                   |                        |
|-----------------------------|----------------|-------------------|------------------------|
| Parameter                   | Type           |                   | Value                  |
| Packaging Dimension (LxWxH) | tube           | without heat-sink | 255.0 x 55.0 x 22.0mm  |
|                             | tray           | with heat-sink    | 302.5 x 222.0 x 20.0mm |
| Packaging Quantity          | tube           | without heat-sink | 9pcs                   |
|                             | tray           | with heat-sink    | 20pcs                  |
| Storage Temperature Range   |                |                   | -55°C to +125°C        |
| Storage Humidity            | non-condensing |                   | 5% - 95% RH            |

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.



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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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