The RAC01-GA series are low cost AC/DC power supplies, ideal for PCB mounted, compact, board level industrial applications. They feature universal AC input voltage range, regulated and short-circuit-proof isolated DC outputs, low standby power consumption and -25°C to +80°C operating temperature range. The RAC01-GA have a built-in Class A / FCC Part 15 EMC filter, are certified to EN60335, EN60950 and EN62368 safety standards and come with a three year warranty.

### Features
- Universal input 85-264VAC
- <150mW No load power consumption
- Class II installations (without FG)
- -25°C to +80°C Operating temperature
- Continuous SCP, OCP
- EN/IEC/UL60950, EN/IEC/UL62368 & EN60335-1 certified

### Selection Guide

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RAC01-05SGA</td>
<td>85-264</td>
<td>5</td>
<td>200</td>
<td>63</td>
<td>500</td>
</tr>
<tr>
<td>RAC01-12SGA</td>
<td>85-264</td>
<td>12</td>
<td>83</td>
<td>68</td>
<td>200</td>
</tr>
</tbody>
</table>

**On Request**
- RAC01-3.3SGA 85-264 3.3 303 63 500
- RAC01-15SGA 85-264 15 66 63 200

**Notes:**
- Note1: Measured with all input voltages at 25°C with constant resistant mode at full load
- Note2: Max Cap Load is tested at nominal input and full resistive load
- Note3: Minimum order quantity ≥2000pcs

### Model Numbering

```
RAC01-__ SGA
```

**Ordering Examples:**
- RAC01-12SGA 12Vout Single Output EMC Class A

IEC/EN60950-1 certified
CAN/CSA-C22.2 No. 62368 certified
UL62368-1 certified
IEC/EN62368-1 certified
EN60335-1 certified
EN55032 compliant
EN55024 compliant
CB Report pending
## Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

### BASIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Input Filter</td>
<td>Pi-type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Voltage Range (4,5,6) nom. Vin= 230VAC</td>
<td>85VAC</td>
<td>230VAC</td>
<td>264VAC</td>
<td></td>
</tr>
<tr>
<td>Input Current</td>
<td>115VAC</td>
<td>25mA</td>
<td>18mA</td>
<td>30mA</td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>20mA</td>
<td></td>
<td>40A</td>
</tr>
<tr>
<td>Inrush Current</td>
<td>cold start at 25°C</td>
<td>115VAC</td>
<td></td>
<td>30A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>230VAC</td>
<td></td>
<td>40A</td>
</tr>
<tr>
<td>No load Power Consumption</td>
<td></td>
<td></td>
<td></td>
<td>150mW</td>
</tr>
<tr>
<td>Input Frequency Range</td>
<td></td>
<td>47Hz</td>
<td></td>
<td>63Hz</td>
</tr>
<tr>
<td>Minimum Load</td>
<td></td>
<td>0%</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>Power Factor</td>
<td>115VAC, 230VAC</td>
<td>0.4</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>Start-up Time</td>
<td>115VAC</td>
<td>1s</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td>2s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hold-up time</td>
<td>115VAC</td>
<td></td>
<td>18ms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230VAC</td>
<td></td>
<td>80ms</td>
<td></td>
</tr>
<tr>
<td>Internal Operating Frequency</td>
<td>100% load at nominal Vin</td>
<td></td>
<td>65kHz</td>
<td></td>
</tr>
<tr>
<td>Output Ripple and Noise</td>
<td>20MHz BW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0°C to 80 °C</td>
<td>5Vout</td>
<td></td>
<td>100mVp-p</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12Vout</td>
<td></td>
<td>200mVp-p</td>
</tr>
<tr>
<td></td>
<td>-25 °C to 0 °C</td>
<td>5Vout</td>
<td></td>
<td>200mVp-p</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12Vout</td>
<td></td>
<td>300mVp-p</td>
</tr>
</tbody>
</table>

### Notes:

- Note4: No proper operation with DC input voltage
- Note5: The products were submitted for safety files at AC-Input operation
- Note6: Refer to “Line Derating”

### Efficiency vs. Load

![Efficiency vs. Load](#)
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PROTECTIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Fuse (7)</td>
<td>internal fusible resistor, 1Ω/1W</td>
<td></td>
</tr>
<tr>
<td>Short Circuit Protection (SCP)</td>
<td>below 100mΩ</td>
<td>continuous, auto recovery</td>
</tr>
<tr>
<td>Over Voltage Category</td>
<td></td>
<td>OVCII</td>
</tr>
<tr>
<td>Over Current Protection (OCP)</td>
<td>5Vout, 0.22A - 0.5A, hiccup mode</td>
<td>12Vout, 0.25A - 0.91A, hiccup mode</td>
</tr>
<tr>
<td>Class of Equipment</td>
<td></td>
<td>Class II</td>
</tr>
<tr>
<td>Isolation Voltage (8)</td>
<td>I/P to O/P rated for 1 minute</td>
<td>3kVAC</td>
</tr>
<tr>
<td>Isolation Resistance</td>
<td></td>
<td>100MΩ min.</td>
</tr>
<tr>
<td>Insulation Grade</td>
<td></td>
<td>reinforced</td>
</tr>
<tr>
<td>Leakage Current</td>
<td>I/P to O/P</td>
<td>0.25mA max.</td>
</tr>
</tbody>
</table>

Notes:
- Note7: Refer to local wiring regulations if input over-current protection is also required
- Note8: For repeat Hi-Pot testing, reduce the time and/or the test voltage
- Note9: For operation at 230VAC, an external MOV is recommended. The Varistor should comply with IEC-61051-2. e.g. EPCOS S14 series

Protection Circuit
**ENVIROMENTAL**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature Range</td>
<td>@ natural convection 0.1 m/s</td>
<td>full load  -25°C to +70°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>refer to &quot;Derating Graph&quot;</td>
</tr>
<tr>
<td>Maximum Case Temperature</td>
<td></td>
<td>+120°C</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td></td>
<td>0.03%/K</td>
</tr>
<tr>
<td>Operating Altitude [m]</td>
<td></td>
<td>4000m</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>non-condensing</td>
<td>5% - 90% RH max.</td>
</tr>
<tr>
<td>Pollution Degree</td>
<td></td>
<td>PD2</td>
</tr>
<tr>
<td>Shock</td>
<td></td>
<td>10-150Hz, 2G 10min./cycle, period 60min. each along x, y, z axes</td>
</tr>
<tr>
<td>Vibration</td>
<td>according to MIL-STD-202G</td>
<td>20G/11ms pulse, 3 times at each x, y, z axes</td>
</tr>
<tr>
<td>MTBF (11)</td>
<td>according to MIL-HDBK-217F, method 2</td>
<td>+25°C 1691 x 10³ hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+70°C 424 x 10³ hours</td>
</tr>
</tbody>
</table>

**Notes:**
Note10: Recognized by UL for safe operation up to 4000m. High altitude operation may impact the performance and lifetime. Contact TechsupportAT@recom-power.com for advice
Note11: Based on calculation for 5Vout

**DERATING GRAPH**

(@ Chamber and natural convection 0.1 m/s)

**LINE DERATING**

<table>
<thead>
<tr>
<th>Ambient Temperature [°C]</th>
<th>Output Load [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>-25</td>
<td>20</td>
</tr>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output Load [%]</th>
<th>Input Voltage [VAC]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>85</td>
</tr>
<tr>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>20</td>
<td>95</td>
</tr>
<tr>
<td>30</td>
<td>80</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>90</td>
<td>10</td>
</tr>
</tbody>
</table>

**SAFETY AND CERTIFICATIONS**

<table>
<thead>
<tr>
<th>Certificate Type (Safety)</th>
<th>Report / File Number</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio/Video, information and communication technology equipment - Part1: Safety requirements</td>
<td>E196683-A5 and E19668-A6001</td>
<td>UL62368-1, 2nd Edition CAN/CSA-C22.2 No. 62368-1-14</td>
</tr>
<tr>
<td>Audio/Video, information and communication technology equipment - Part1: Safety requirements (CB Scheme)</td>
<td>SA1804152S 001</td>
<td>IEC62368-1:2014 2nd Edition</td>
</tr>
<tr>
<td>Audio/Video, information and communication technology equipment - Part1: Safety requirements</td>
<td></td>
<td>EN62368-1:2014+A11:2017</td>
</tr>
<tr>
<td>RoHS2</td>
<td></td>
<td>RoHS 2011/65/EU + AM2015/863</td>
</tr>
</tbody>
</table>

continued on next page
RAC01-GA
Series

Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>case</td>
<td>black plastic (UL94V-2)</td>
</tr>
<tr>
<td></td>
<td>PCB</td>
<td>FR4 (UL94V-0)</td>
</tr>
<tr>
<td>Dimension (LxWxH)</td>
<td></td>
<td>33.7 x 22.2 x 19.0mm</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td>12g typ.</td>
</tr>
</tbody>
</table>

EMC Compliance

<table>
<thead>
<tr>
<th>Condition</th>
<th>Standard / Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnetic compatibility of multimedia equipment - Emission requirements</td>
<td>EN55032, Class A</td>
</tr>
<tr>
<td>ESD Electrostatic discharge immunity test</td>
<td>EN61000-4-2:2009, Criteria A</td>
</tr>
<tr>
<td>Radiated, radio-frequency, electromagnetic field immunity test</td>
<td>EN61000-4-3:2006 + A2:2010, Criteria A</td>
</tr>
<tr>
<td>Fast Transient and Burst Immunity</td>
<td>EN61000-4-4:2012, Criteria A</td>
</tr>
<tr>
<td>Surge Immunity</td>
<td>EN61000-4-5:2014, Criteria B</td>
</tr>
<tr>
<td>Immunity to conducted disturbances, induced by radio-frequency fields</td>
<td>EN61000-4-6:2014, Criteria A</td>
</tr>
<tr>
<td>Power Magnetic Field Immunity</td>
<td>EN61000-4-8:2009, Criteria A</td>
</tr>
<tr>
<td>Voltage Dips and Interruption</td>
<td>EN61000-4-11:2004, Criteria A</td>
</tr>
<tr>
<td>Voltage Dips &gt;95%</td>
<td>EN61000-4-11:2004, Criteria B</td>
</tr>
<tr>
<td>Voltage Dips 30%</td>
<td>EN61000-4-11:2004, Criteria B</td>
</tr>
<tr>
<td>Voltage Interruptions &gt;95%</td>
<td>EN61000-4-11:2004, Criteria B</td>
</tr>
</tbody>
</table>

ESD Electrostatic discharge immunity test

<table>
<thead>
<tr>
<th>Condition</th>
<th>Standard / Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air ±2, 4, 8kV</td>
<td>EN61000-4-2:2009, Criteria A</td>
</tr>
<tr>
<td>Contact ±2, 4kV</td>
<td>EN61000-4-2:2009, Criteria A</td>
</tr>
<tr>
<td>Radiated, radio-frequency, electromagnetic field immunity test</td>
<td>EN61000-4-3:2006 + A2:2010, Criteria A</td>
</tr>
<tr>
<td>Fast Transient and Burst Immunity</td>
<td>EN61000-4-4:2012, Criteria A</td>
</tr>
<tr>
<td>Surge Immunity</td>
<td>EN61000-4-5:2014, Criteria B</td>
</tr>
<tr>
<td>Immunity to conducted disturbances, induced by radio-frequency fields</td>
<td>EN61000-4-6:2014, Criteria A</td>
</tr>
<tr>
<td>Power Magnetic Field Immunity</td>
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</tr>
<tr>
<td>Voltage Dips and Interruption</td>
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</tr>
<tr>
<td>Voltage Dips &gt;95%</td>
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</tr>
<tr>
<td>Voltage Dips 30%</td>
<td>EN61000-4-11:2004, Criteria B</td>
</tr>
<tr>
<td>Voltage Interruptions &gt;95%</td>
<td>EN61000-4-11:2004, Criteria B</td>
</tr>
</tbody>
</table>

EMI Filtering according to EN60335-1 / EN55032 Class B Compliance

Vishay 564R30TS022, SLCC
X7R radial, 2.2nF, 3kVDC ±10%
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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PA-6