

# Regulated Converters

- RECOM**  
DC/DC Converter

## REC7.5-RW

**7.5 Watt**  
**DIP24 or**  
**SMD Metal Case**  
**Single and Dual**



**UL<sup>®</sup>**  
**C US**  
**E358085**



UL60950-1 certified  
IEC60950-1 certified  
EN60950-1 certified  
EN55032 complaint

The REC7.5-xxxxSRW/DRW series offer single and dual regulated outputs in a DIP24 package with 1kVDC/1s, 2kVDC/1s or 3kVDC/1s options and are suitable for higher power industrial applications. ON/OFF CTRL is possible with the /CTRL option and SMD pinning is offered with the /SMD option. The converters can deliver 140% rated power for short periods of time to cope with applications with large capacitive loads or high start up currents.

| Part Number     | Input Voltage Range [VDC] | Output Voltage [VDC] | Output Current [mA] | Efficiency typ. <sup>(1)</sup> [%] | max. Capacitive Load <sup>(2)</sup> [μF] |
|-----------------|---------------------------|----------------------|---------------------|------------------------------------|------------------------------------------|
| REC7.5-xx3.3SRW | 9-18, 18-36, 36-72        | 3.3                  | 1800                | 78                                 | 6800                                     |
| REC7.5-xx05SRW  | 9-18, 18-36, 36-72        | 5                    | 1500                | 79-82                              | 6800                                     |
| REC7.5-xx09SRW  | 9-18, 18-36, 36-72        | 9                    | 833                 | 81-84                              | 6800                                     |
| REC7.5-xx12SRW  | 9-18, 18-36, 36-72        | 12                   | 625                 | 82-85                              | 6800                                     |
| REC7.5-xx15SRW  | 9-18, 18-36, 36-72        | 15                   | 500                 | 83-86                              | 6800                                     |
| REC7.5-xx05DRW  | 9-18, 18-36, 36-72        | ±5                   | ±750                | 79-82                              | ±2200                                    |
| REC7.5-xx09DRW  | 9-18, 18-36, 36-72        | ±9                   | ±417                | 81-84                              | ±2200                                    |
| REC7.5-xx12DRW  | 9-18, 18-36, 36-72        | ±12                  | ±312                | 82-85                              | ±2200                                    |
| REC7.5-xx15DRW  | 9-18, 18-36, 36-72        | ±15                  | ±250                | 83-86                              | ±2200                                    |

Note1: Efficiency is tested at nominal input and full load at +25°C ambient  
Note2: Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter

**REC7.5-** **RW/H /A/M/SMD/CTRL-R**

nom. Input Voltage — Packaging <sup>(6)</sup>

Output Voltage — CTRL Option <sup>(5)</sup>

**S**ingle or **D**ual — Case Style <sup>(4)</sup>

Isolation <sup>(3)</sup>

Note3: **"/H1"** = 1kVDC/1s isolation  
**"/H2"** = 2kVDC/1s isolation  
**"/H3"** = 3kVDC/1s isolation

Note4: add suffix **"/SMD"** for SMD package, without suffix = standard DIP24 THT package.  
 If the option **"/SMD"** is used, the maximum allowed isolation voltage is 2kVDC/1s because of the shorter distance between pins and the metal case

Note5: add **"/CTRL"** for Control Pin option. If CTRL option is not chosen, Pin 1 will be absent.

Note6: add suffix **"-R"** for tape and reel packaging, without suffix standard tube packaging.  
 tape and reel option only available for SMD case style

|                             |          |         |               |                 |                  |     |                         |
|-----------------------------|----------|---------|---------------|-----------------|------------------|-----|-------------------------|
| REC7.5-1205SRW/H3/A/M/CTRL  | 9-18Vin  | 5Vout   | Single output | 3KVDC isolation | with CTRL Pin    | THT | tube packaging          |
| REC7.5-2412DRW/H2/A/SMD-R   | 18-36Vin | ±12Vout | Dual output   | 2KVDC isolation | no CTRL function | SMD | tape and reel packaging |
| REC7.5-2412SRW/H1/A/M       | 18-36Vin | 12Vout  | Single output | 1KVDC isolation | without CTRL Pin | THT | tube packaging          |
| REC7.5-4815DRW/H2/A/M/SMD-R | 36-72Vin | ±15Vout | Dual output   | 2KVDC isolation | no CTRL function | SMD | tape and reel packaging |

## PREFERRED ALTERNATIVES

For new medical applications:

## REM6E



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

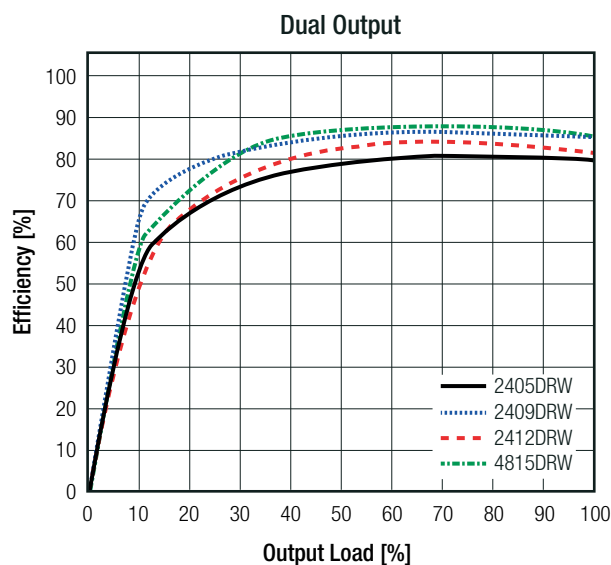
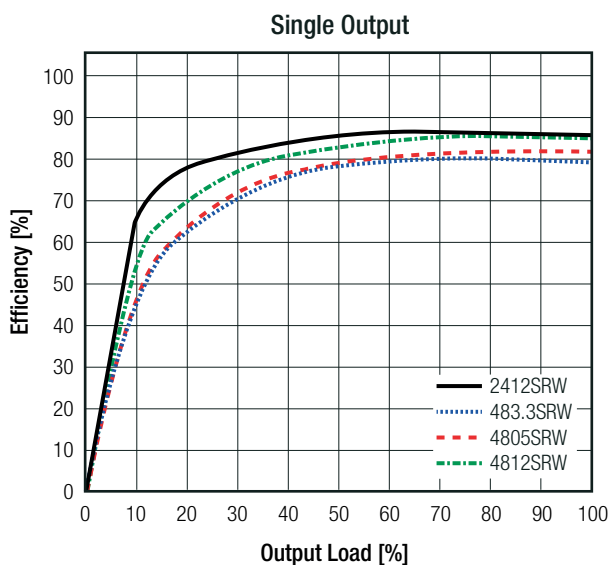
### BASIC CHARACTERISTICS

| Parameter                    | Condition             |                  | Min.                                                                                          | Typ. | Max.                |
|------------------------------|-----------------------|------------------|-----------------------------------------------------------------------------------------------|------|---------------------|
| Internal Input Filter        |                       |                  | PI Network                                                                                    |      |                     |
| Input Voltage Range          | 12VDC                 | nom. $V_{in} =$  | 9VDC                                                                                          |      | 18VDC               |
|                              | 24VDC                 |                  | 18VDC                                                                                         |      | 36VDC               |
|                              | 48VDC                 |                  | 36VDC                                                                                         |      | 72VDC               |
| Minimum Load <sup>(7)</sup>  |                       |                  | 10%                                                                                           |      |                     |
| No Load Power Consumption    |                       |                  |                                                                                               |      | 300mW               |
| ON/OFF CTRL                  | DC-DC ON<br>DC-DC OFF |                  | Open or $0\text{VDC} < V_{CTRL} < 1.2\text{VDC}$<br>$2.2\text{VDC} < V_{CTRL} < 12\text{VDC}$ |      |                     |
| Internal Operating Frequency |                       |                  | 150kHz                                                                                        |      | 240kHz              |
| Output Ripple and Noise      | 20MHz BW              | 3.3VDC<br>others |                                                                                               |      | 100mVp-p<br>50mVp-p |

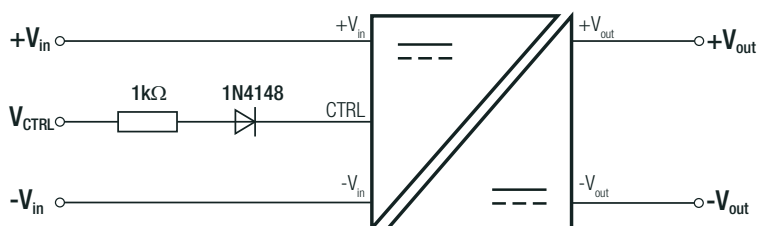
#### Notes:

Note7: Operation below 10% load will not harm the converter, but specifications may not be met

### Efficiency vs. Load



### ON/OFF CTRL



**DC-DC ON:** Open or  $0\text{VDC} < V_{CTRL} < 1.2\text{VDC}$   
**DC-DC OFF:**  $2.2\text{VDC} < V_{CTRL} < 12\text{VDC}$

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

### REGULATIONS

| Parameter                      | Condition                        | Value      |
|--------------------------------|----------------------------------|------------|
| Output Accuracy                |                                  | ±2.0% max. |
| Line Regulation                | low line to high line, full load | 0.4% max.  |
| Load Regulation <sup>(7)</sup> | 25% to 100% load                 | 0.8% max.  |

### PROTECTIONS

| Parameter                                     | Type          |                                           | Value                     |
|-----------------------------------------------|---------------|-------------------------------------------|---------------------------|
| Short Circuit Protection (SCP) <sup>(8)</sup> | below 100mΩ   |                                           | continuous, auto recovery |
| Isolation Voltage <sup>(9)</sup>              | “/H1” version | tested for 1 second<br>rated for 1 minute | 1kVDC<br>500VAC/ 60Hz     |
|                                               | “/H2” version | tested for 1 second<br>rated for 1 minute | 2kVDC<br>1kVAC/ 60Hz      |
|                                               | “/H3” version | tested for 1 second<br>rated for 1 minute | 3kVDC<br>1.5kVAC/ 60Hz    |
| Isolation Resistance                          |               |                                           | 1GΩ min.                  |
| Isolation Capacitance                         |               |                                           | 50pF typ.                 |

**Notes:**

Note8: Max. Temperature = +50°C during the short circuit conditions

Note9: For repeat Hi-Pot testing, reduce the time and/or the test voltage

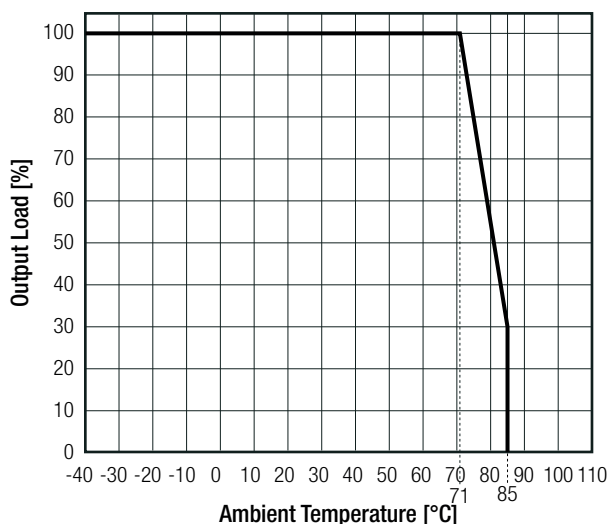
Note10: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

### ENVIRONMENTAL

| Parameter                   | Condition                                       |                | Value                                                       |
|-----------------------------|-------------------------------------------------|----------------|-------------------------------------------------------------|
| Operating Temperature Range | with derating @ free air convection (see graph) |                | -40°C to +85°C                                              |
| Thermal Impedance           | 0.1m/s natural convection                       |                | 12K/W                                                       |
| Operating Altitude          | according to 6060-1                             |                | 3000m                                                       |
| Operating Humidity          | non-condensing                                  |                | 95% RH max.                                                 |
| Pollution Degree            |                                                 |                | PD2                                                         |
| MTBF                        | according to MIL-HDBK-217F, G.B.                | +25°C<br>+71°C | 800 x 10 <sup>3</sup> hours<br>>200 x 10 <sup>3</sup> hours |

#### Derating Graph

(@ Chamber and free air convection)



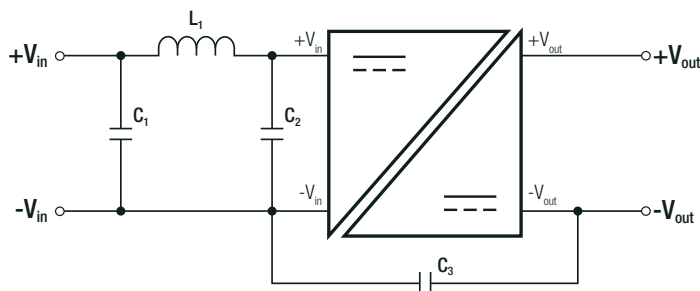
**Specifications** (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

## SAFETY AND CERTIFICATIONS

| Certificate Type (Safety)                                                                            | Report / File Number | Standard                                                                        |
|------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------|
| Information Technology Equipment, General Requirements for Safety                                    | E358085              | UL60950-1, 2nd Edition, 2011<br>CAN/CSA-C22.2 No. 60950-1-03, 2nd Edition, 2011 |
| Information Technology Equipment, General Requirements for Safety                                    | LVD1605077-01        | IEC60950-1:2005, 2nd Edition + A2:2013<br>EN60950-1:2006, A2:2013               |
| Medical Electrical Equipment Part 1: General Requirements for Basic Safety and Essential Performance | SPC1006048           | IEC60601-1:1988 + A2:1995<br>EN60601-1:1990 + A13 :1996                         |
| EAC                                                                                                  | RU-AT.49.09571       | TP TC 004/2011                                                                  |
| RoHS                                                                                                 |                      | RoHS-2011/65/EU + AM-2015/863                                                   |

| EMC Compliance                                                                | Condition                                             | Standard / Criterion         |
|-------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------|
| Electromagnetic compatibility of multimedia equipment - Emission requirements | with external filter<br>(see filter suggestion below) | EN55032, Class A and Class B |

### EMC Filtering Suggestions according to EN55032



#### Component List Class A

| MODEL | C1               | C2               | C3           | L1  |
|-------|------------------|------------------|--------------|-----|
| all   | 10μF/50V<br>MLCC | 10μF/50V<br>MLCC | 1000pF/4kVDC | N/A |

#### Component List Class B

| MODEL | C1               | C2               | C3           | L1             |
|-------|------------------|------------------|--------------|----------------|
| all   | 10μF/50V<br>MLCC | 10μF/50V<br>MLCC | 1000pF/4kVDC | 820μH<br>Choke |

## DIMENSION AND PHYSICAL CHARACTERISTICS

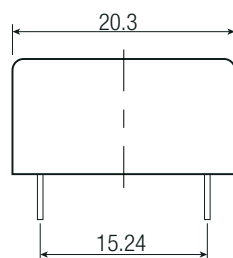
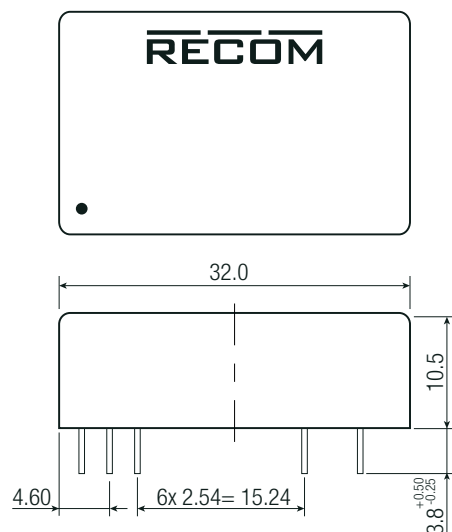
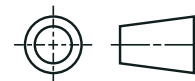
| Parameter         | Type                           | Value                                                                                        |
|-------------------|--------------------------------|----------------------------------------------------------------------------------------------|
| Material          | case<br>base<br>potting<br>PCB | nickel plated copper<br>non-conductive black plastic<br>epoxy, (UL94 V-0)<br>FR4, (UL94 V-0) |
| Dimension (LxWxH) | DIP24<br>SMD                   | 32.0 x 20.3 x 10.5mm<br>32.0 x 20.3 x 11.2mm                                                 |
| Weight            |                                | 16g typ.                                                                                     |

continued on next page

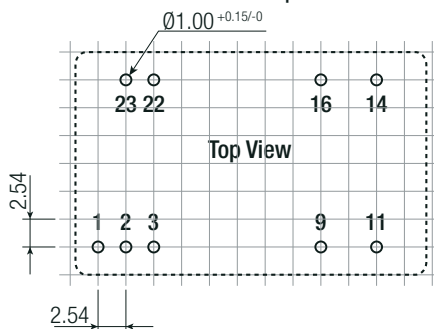
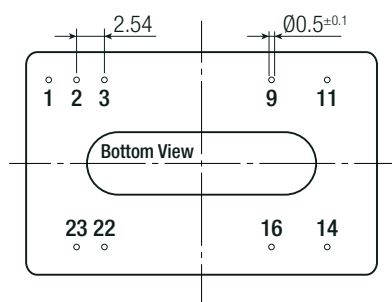
### Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

### Dimension Drawing (mm)

DIP24 package



### Recommended Footprint Details



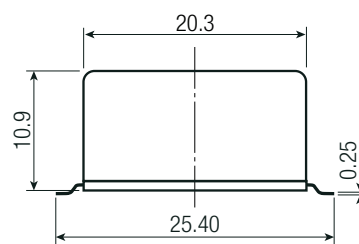
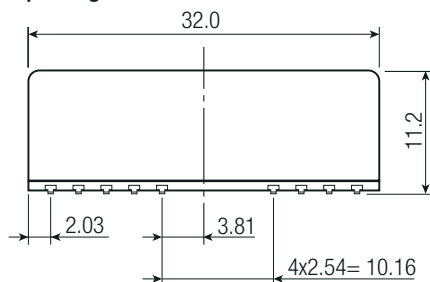
### DIP24 Pinning (/H1, /H2, /H3)

| Pin #      | Single | Dual  |
|------------|--------|-------|
| 1 (option) | CTRL   | CTRL  |
| 2, 3       | -Vin   | -Vin  |
| 9          | NC     | Com   |
| 11         | NC     | -Vout |
| 14         | +Vout  | +Vout |
| 16         | -Vout  | Com   |
| 22, 23     | +Vin   | +Vin  |

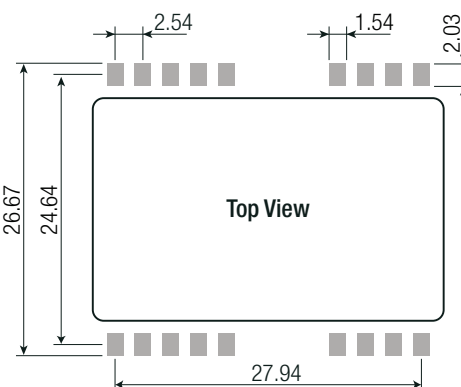
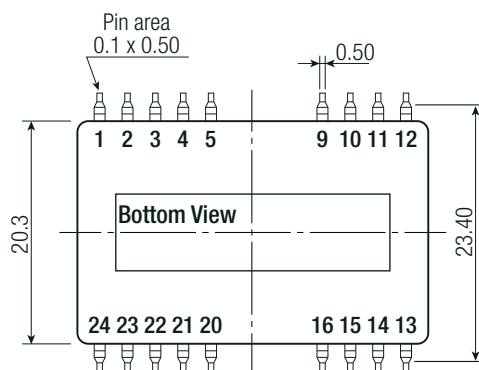
NC= No Connection

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

### SMD package



### Recommended Footprint Details



### SMD Pinning (/H1, /H2)

| Pin #       | Single | Dual  |
|-------------|--------|-------|
| 1 (option)  | CTRL   | CTRL  |
| 2, 3        | -Vin   | -Vin  |
| 4, 5        | NC     | NC    |
| 9           | NC     | Com   |
| 10,12,13,15 | NC     | NC    |
| 11          | NC     | -Vout |
| 14          | +Vout  | +Vout |
| 16          | -Vout  | Com   |
| 20, 21, 24  | NC     | NC    |
| 22, 23      | +Vin   | +Vin  |

NC= No Connection

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

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

| PACKAGING INFORMATION       |                |                        |                        |
|-----------------------------|----------------|------------------------|------------------------|
| Parameter                   | Type           |                        | Value                  |
| Packaging Dimension (LxWxH) | DIP24          | tube                   | 530.0 x 23.0 x 19.0mm  |
|                             | SMD            | tube                   | 530.0 x 32.0 x 19.0mm  |
|                             |                | tape and reel (carton) | 355.0 x 342.0 x 70.0mm |
| Packaging Quantity          | tube           |                        | 15pcs                  |
|                             | tape and reel  |                        | 100pcs                 |
| Tape Width                  |                |                        | 44mm                   |
| Storage Temperature Range   |                |                        | -55°C to +125°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.

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