

## Features

## Unregulated Converters

- UL/CSA and EN-60950-1 Safety certified
- EN-60601 for Medical Applications
- 6kVDC Isolation
- Optional Continuous Short Circuit Protection
- Efficiency up to 80%
- Space Saving „Skinny DIP“ Package
- Very Low Isolation Capacitance

## Selection Guide

| Part Number<br>SIP 7 | Input Voltage<br>(VDC) | Output Voltage<br>(VDC) | Output Current<br>(mA) | Efficiency<br>Std (%) | Max Capacitive Load <sup>(1)</sup> |
|----------------------|------------------------|-------------------------|------------------------|-----------------------|------------------------------------|
| RV-xx3.3S            | 3.3, 5, 12, 15, 24     | 3.3                     | 600                    | 70                    | 3300µF                             |
| RV-xx05S             | 3.3, 5, 12, 15, 24     | 5                       | 400                    | 70-75                 | 1200µF                             |
| RV-xx09S             | 3.3, 5, 12, 15, 24     | 9                       | 222                    | 70-75                 | 1200µF                             |
| RV-xx12S             | 3.3, 5, 12, 15, 24     | 12                      | 167                    | 70-75                 | 680µF                              |
| RV-xx15S             | 3.3, 5, 12, 15, 24     | 15                      | 132                    | 75-80                 | 680µF                              |
| RV-xx24S             | 3.3, 5, 12, 15, 24     | 24                      | 83                     | 75-80                 | 470µF                              |
| RV-xx3.3D            | 3.3, 5, 12, 15, 24     | ±3.3                    | ±300                   | 70                    | ±1500µF                            |
| RV-xx05D             | 3.3, 5, 12, 15, 24     | ±5                      | ±200                   | 70-75                 | ±470µF                             |
| RV-xx09D             | 3.3, 5, 12, 15, 24     | ±9                      | ±111                   | 70-75                 | ±470µF                             |
| RV-xx12D             | 3.3, 5, 12, 15, 24     | ±12                     | ±85                    | 70-75                 | ±220µF                             |
| RV-xx15D             | 3.3, 5, 12, 15, 24     | ±15                     | ±66                    | 75-80                 | ±220µF                             |
| RV-xx24D             | 3.3, 5, 12, 15, 24     | ±24                     | ±42                    | 75-80                 | ±100µF                             |

xx = Input Voltage. Other input and output voltage combinations available on request.

No suffix is 6kVDC functional isolation

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RV-0505S/P, RV-0505D/P

## Specifications (measured at $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

|                                                   |                                                 |
|---------------------------------------------------|-------------------------------------------------|
| Input Voltage Range                               | ±10%                                            |
| Output Voltage Accuracy                           | ±5%                                             |
| Line Voltage Regulation                           | 1.2%/1% of $V_{in}$ typ.                        |
| Load Voltage Regulation                           | 3.3V output types 20% max.                      |
| (10% to 100% full load)                           | 5V output type 15% max.                         |
|                                                   | 9V, 12V, 15V, 24V output types 10% max.         |
| Output Ripple and Noise (20MHz limited)           | 200mVp-p max.                                   |
| Operating Frequency                               | 20kHz min. / 50kHz typ. / 85kHz max.            |
| Efficiency at Full Load                           | 70% min. / 75% typ.                             |
| Minimum Load = 0%                                 | Specifications valid for 10% minimum load only. |
| Isolation Voltage                                 | (tested for 1 second) 6000VDC                   |
|                                                   | (rated for 1 minute) 3000VAC / 60Hz             |
| Isolation Capacitance                             | 2pF min. / 12pF max.                            |
| Isolation Resistance                              | 15 GΩ min.                                      |
| Short Circuit Protection                          | 1 Second                                        |
| P-Suffix                                          | Continuous                                      |
| Operating Temperature Range (free air convection) | -40°C to +85°C (see Graph)                      |
| Storage Temperature Range                         | -55°C to +125°C                                 |
| Relative Humidity                                 | 95% RH                                          |
| Package Weight                                    | 9g                                              |
| Packing Quantity                                  | 15 pcs per Tube                                 |
|                                                   | cont.                                           |

## ECONOLINE

## DC/DC-Converter

with 3 year Warranty

RECOM

## 2 Watt DIP24 Miniature Single & Dual Output



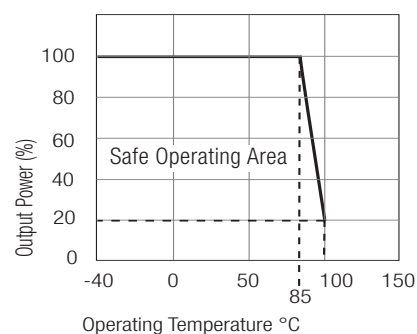
**EN-60950-1 Certified**  
**EN-60601-1 Certified**  
**UL/CSA 60950-1 Certified**  
**IEC 60601-1 CB Report**

# RV

## Description

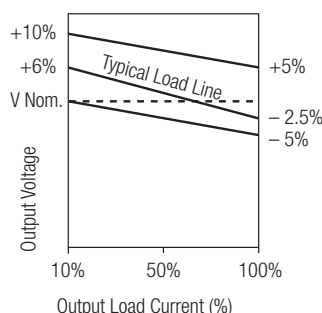
Very high isolation in a small size are the main features of this miniature DIP24 converter, ideal for highly sophisticated industrial, test and measurement and medical designs where board space is at a premium.

## Derating-Graph (Ambient Temperature)



Refer to Application Notes

### Tolerance Envelope



### Specifications (continued)

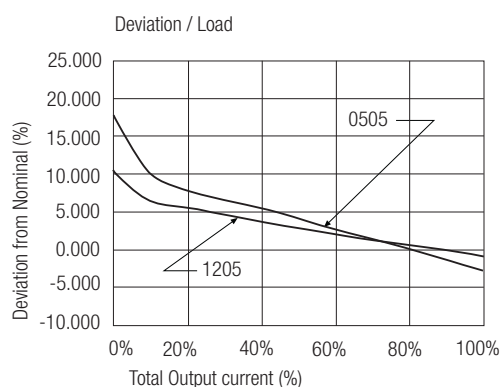
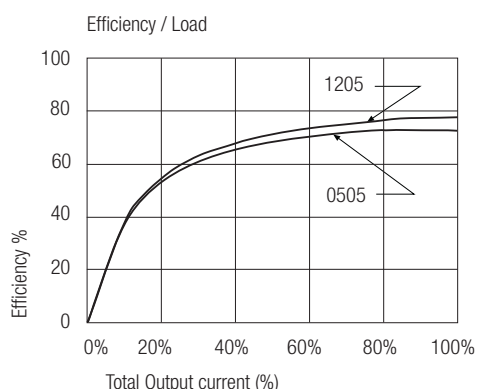
|                |                                                                    |                                                                                                                                                  |                                                  |
|----------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| MTBF (+25°C)   | Detailed Information see Application Notes chapter "MTBF"          | using MIL-HDBK 217F                                                                                                                              | 1154 x 10 <sup>3</sup> hours                     |
| (+85°C)        |                                                                    | using MIL-HDBK 217F                                                                                                                              | 168 x 10 <sup>3</sup> hours                      |
| Certifications | UL/cUL General Safety<br>EN General Safety<br>CB/EN Medical Safety | Report: E248550<br>Report: PS-R7219C1<br>Report: MDD1205098-4 + RM1205098-4 IEC/EN 60601-1 3rd Edition Medical Report + ISO14971 Risk Assessment | UL 60950-1 1st Ed.<br>EN60950-1:2001 + A11: 2004 |

### Notes

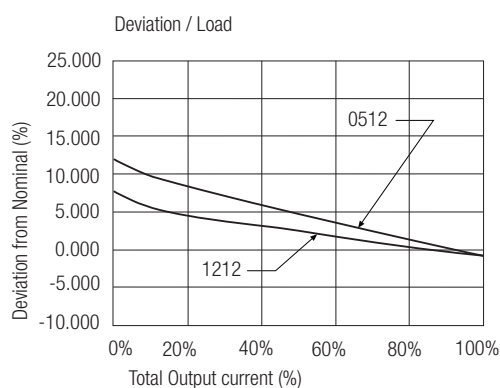
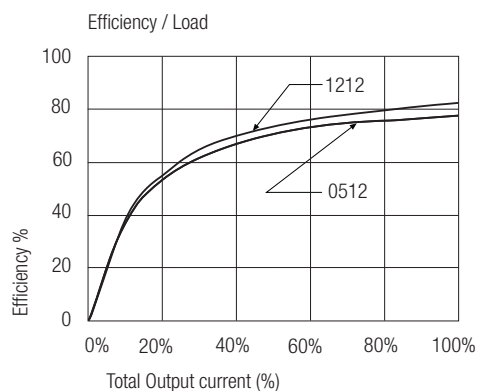
Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Typical Characteristics

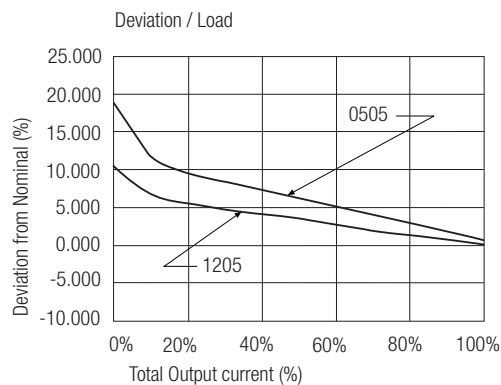
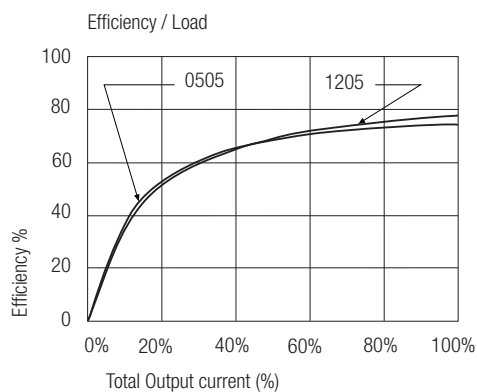
## RV-xx05S



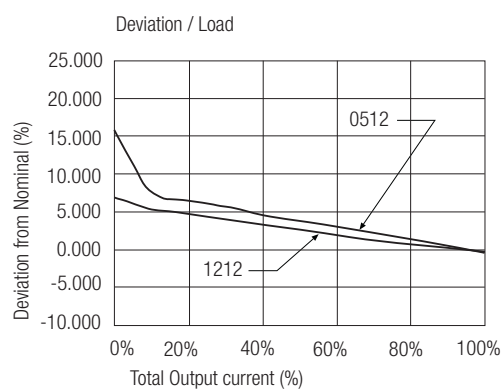
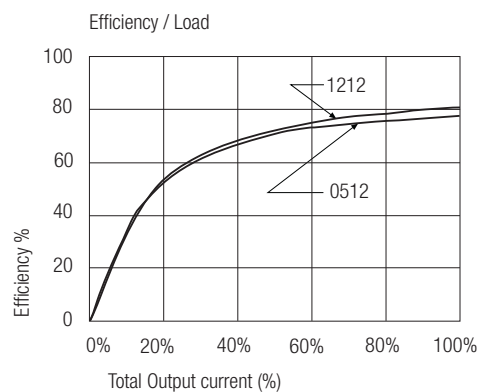
## RV-xx12S



## RV-xx05D

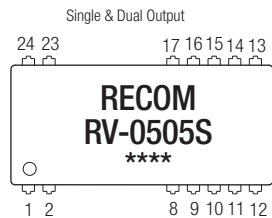
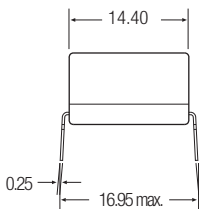
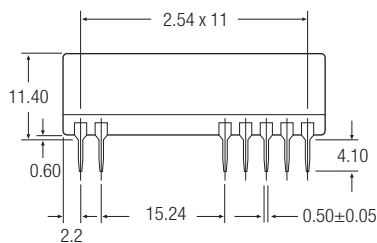


## RV-xx12D

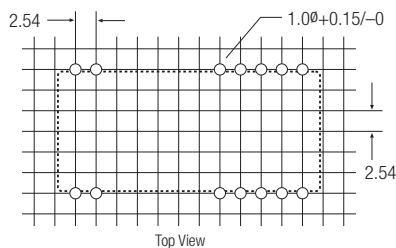
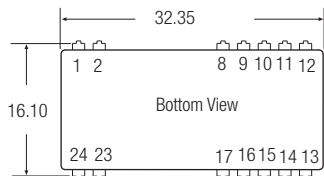


Package Style and Pinning (mm)

24 PIN DIP Miniature Package Style



Recommended Footprint Details



Pin Connections

| Pin #          | Single |
|----------------|--------|
| 1              | +Vin   |
| 2              | -Vin   |
| 8, 9, 11, 14   | NC     |
| 10, 15         | -Vout  |
| 12 & 13        | +Vout  |
| 16, 17, 23, 24 | NC     |

NC = No Connection

Pin Connections

| Pin #                 | Dual  |
|-----------------------|-------|
| 1                     | +Vin  |
| 2                     | -Vin  |
| 8, 17                 | -Vout |
| 9, 11, 14, 16, 23, 24 | NC    |
| 10 & 15               | Com   |
| 12, 13                | +Vout |

NC = No Connection

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

## Features

### Unregulated Converters

- UL/CSA and EN-60950-1 Safety certified
- EN-61010 for Test, Measurement and Lab Use
- UL/CSA and EN-60601 for Medical Applications
- 6.4kVDC or 8kV Reinforced Isolation
- Optional Continuous Short Circuit Protection
- Efficiency to 88%
- Space Saving „Skinny DIP“ Package
- Very Low Isolation Capacitance

### Selection Guide

| Part Number<br>SIP 7 | Reinforced Isolation<br>(kVDC) | Input Voltage<br>(VDC) | Output Voltage<br>(VDC) | Output Current<br>(mA) | Efficiency<br>Std (%) | Max Capacitive Load <sup>(1)</sup> |
|----------------------|--------------------------------|------------------------|-------------------------|------------------------|-----------------------|------------------------------------|
| RV-xx3.3S            | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | 3.3                     | 600                    | 70-78                 | 3300µF                             |
| RV-xx05S             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | 5                       | 400                    | 76-80                 | 1200µF                             |
| RV-xx09S             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | 9                       | 222                    | 78-85                 | 1200µF                             |
| RV-xx12S             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | 12                      | 167                    | 78-85                 | 680µF                              |
| RV-xx15S             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | 15                      | 132                    | 78-88                 | 680µF                              |
| RV-xx3.3D            | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | ±3.3                    | ±300                   | 70-78                 | ±1500µF                            |
| RV-xx05D             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | ±5                      | ±200                   | 75-82                 | ±470µF                             |
| RV-xx09D             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | ±9                      | ±111                   | 76-84                 | ±470µF                             |
| RV-xx12D             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | ±12                     | ±85                    | 78-86                 | ±220µF                             |
| RV-xx15D             | /R6.4 & /R8                    | 3.3, 5, 12, 15, 24     | ±15                     | ±66                    | 78-86                 | ±220µF                             |

xx = Input Voltage. Other input and output voltage combinations available on request.

No suffix is 6kVDC functional isolation

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RV-0505S/P, RV-0505D/P

\* add Suffix "/R6.4" or "/R8" for Reinforced Isolation, e.g. RV-0505S/R6.4, RV-0505D/P/R8

### Specifications (measured at $T_A = 25^\circ\text{C}$ , nominal input voltage, full load and after warm-up)

|                                                    |                                                                                                  |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Input Voltage Range                                | ±10%                                                                                             |
| Output Voltage Accuracy                            | ±5%                                                                                              |
| Line Voltage Regulation                            | 1.2%/1% of $V_{in}$ typ.                                                                         |
| Load Voltage Regulation<br>(10% to 100% full load) | 3.3V output types 20% max.<br>5V output type 15% max.<br>9V, 12V, 15V, 24V output types 10% max. |
| Output Ripple and Noise (20MHz limited)            | 200mVp-p max.                                                                                    |
| Operating Frequency                                | 20kHz min. / 50kHz typ. / 85kHz max.                                                             |
| Efficiency at Full Load                            | 70% min. / 75% typ.                                                                              |
| Minimum Load = 0%                                  | Specifications valid for 10% minimum load only.                                                  |
| /R6.4                                              | (tested for 1 second) 6400VDC<br>(rated for 1 minute) 3200VAC / 60Hz                             |
| /R8                                                | (tested for 1 second) 8000VDC<br>(rated for 1 minute) 4000VAC / 60Hz                             |
| Isolation Capacitance                              | 2pF min. / 12pF max.                                                                             |
| Isolation Resistance                               | 15 GΩ min.                                                                                       |
| Short Circuit Protection<br>P-Suffix               | 1 Second Continuous                                                                              |
| Operating Temperature Range (free air convection)  | -40°C to +85°C (see Graph)                                                                       |
| Storage Temperature Range                          | -55°C to +125°C                                                                                  |
| Relative Humidity                                  | 95% RH                                                                                           |
| Package Weight                                     | 9g                                                                                               |
| Packing Quantity                                   | 15 pcs per Tube<br>cont.                                                                         |

## ECONOLINE

### DC/DC-Converter

with 3 year Warranty

RECOM

## 2 Watt DIP24 Miniature Single & Dual Output



E-224736



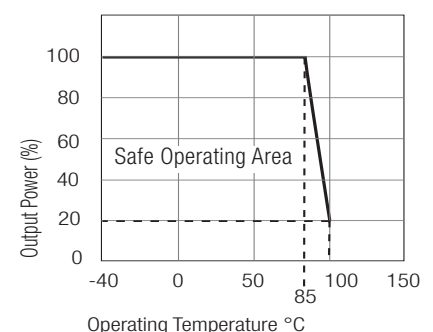
**EN-60950-1 Certified**  
**EN-60601-1 Certified**  
**UL/CSA 60950-1 Certified**  
**UL-60601-1 Certified**  
**EN-61010-1 Certified**  
**IEC-60601-1 CB Report**

# RV/R

### Description

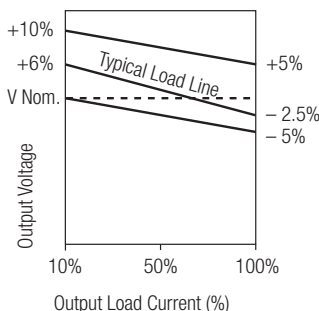
Very high isolation in a small size are the main features of this miniature DIP24 converter, ideal for highly sophisticated industrial, test and measurement and medical designs where board space is at a premium.

## Derating-Graph (Ambient Temperature)



Refer to Application Notes

### Tolerance Envelope



### Specifications (continued)

|                                                   |                          |                                           |                              |
|---------------------------------------------------|--------------------------|-------------------------------------------|------------------------------|
| MTBF (+25°C) } <i>Detailed Information see</i>    |                          | using MIL-HDBK 217F                       | 1154 x 10 <sup>3</sup> hours |
| (+85°C) } <i>Application Notes chapter "MTBF"</i> |                          | using MIL-HDBK 217F                       | 168 x 10 <sup>3</sup> hours  |
| Reinforced Isolation                              | Transformer Creepage     | /R6.4 Types                               | 5.5 mm min.                  |
|                                                   | Transformer Clearance    | /R6.4 Types                               | 5.5 mm min.                  |
|                                                   | PCB Creepage & Clearance | /R6.4 Types                               | 4.8 mm min.                  |
| Certifications                                    |                          |                                           |                              |
| Measurement, Control and Laboratory Use Safety    |                          | Report: IL091212010M1                     | EN 61010-1 : 2001            |
| CSA General Safety                                |                          |                                           | UL 60950-1 1st Ed.           |
|                                                   |                          |                                           | C22.2 No. 60950-1-03         |
| UL/cUL Medical Safety                             |                          | Report: E314885-A2-UL                     | UL60601-1 1st Edition        |
| CSA Medical Safety                                |                          | Report: 2207629                           | CAN/CSA-22.2 No 601.1-M90    |
| EN General Safety                                 |                          | Report: PS-R7219C1                        | EN60950-1:2001 + A11: 2004   |
| EN Medical Safety                                 |                          | Report: MDD1205098-1 + RM1205098-1        | IEC/EN 60601-1 3rd Edition   |
|                                                   |                          | Medical Report + ISO14971 Risk Assessment |                              |

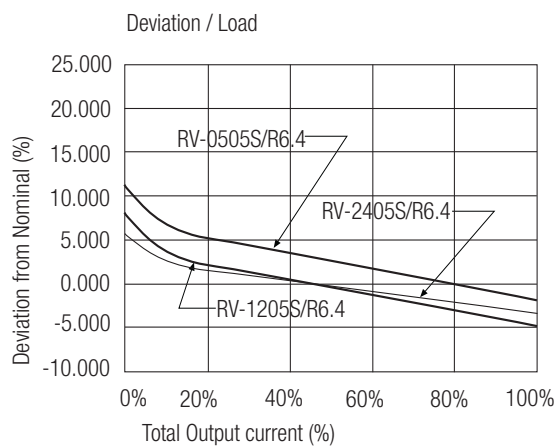
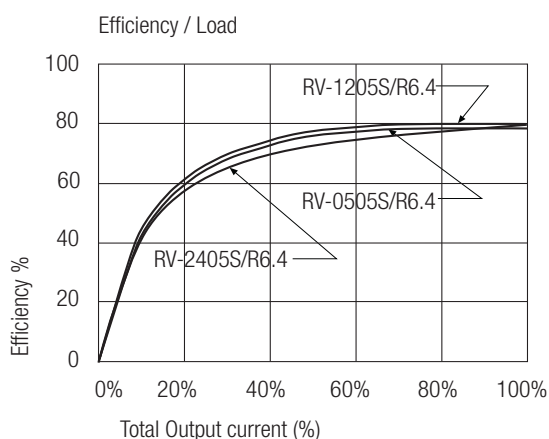
### Notes

Note 1 Maximum capacitive load is defined as the capacitive load that will allow start up in under 1 second without damage to the converter.

### Typical Characteristics

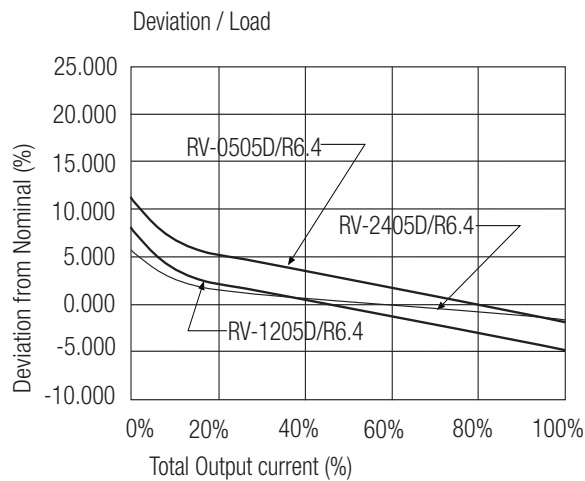
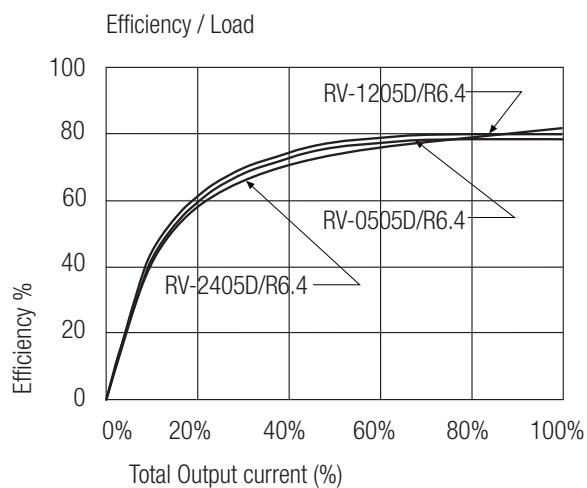
## RV-xx05S/R6.4

## RV-xx05S/R8



## RV-xx05D/R6.4

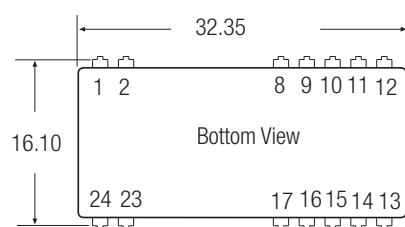
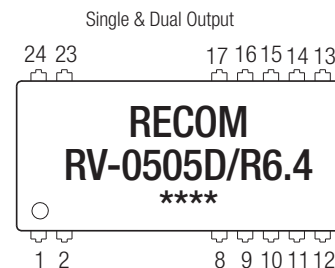
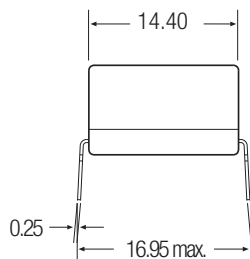
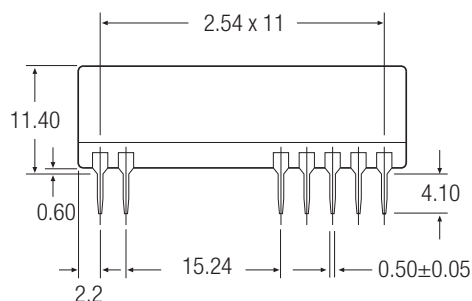
## RV-xx05D/R8



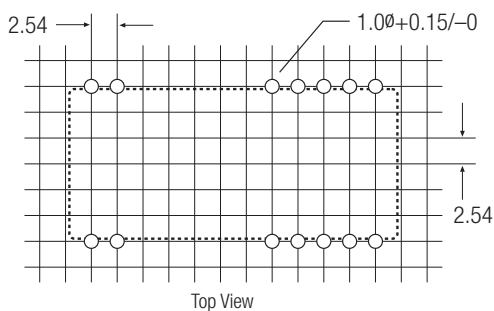
## Package Style and Pinning (mm)

### 24 PIN DIP Miniature Package Style

3rd angle projection



### Recommended Footprint Details



#### Pin Connections

| Pin #          | Single |
|----------------|--------|
| 1              | +Vin   |
| 2              | -Vin   |
| 8, 9, 11, 14   | NC     |
| 10, 15         | -Vout  |
| 12 & 13        | +Vout  |
| 16, 17, 23, 24 | NC     |

XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

#### Pin Connections

| Pin #                 | Dual  |
|-----------------------|-------|
| 1                     | +Vin  |
| 2                     | -Vin  |
| 8, 17                 | -Vout |
| 9, 11, 14, 16, 23, 24 | NC    |
| 10 & 15               | Com   |
| 12, 13                | +Vout |

NC = No Connection



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- 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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**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.