

## Features

## Unregulated Converters

- 1kVDC Isolation
- Internal SMD Construction
- UL94V-O Package Material
- Optional Continuous Short Circuit Protected
- Efficiency to 85%

### Selection Guide

| Part Number |       | Input Voltage    | Output Voltage | Output Current | Efficiency |
|-------------|-------|------------------|----------------|----------------|------------|
| SMD         | (3kV) | (VDC)            | (VDC)          | (mA)           | (%)        |
| RTS-xx3.3   | (H)   | 5, 9, 12, 15, 24 | 3.3            | 606            | 70-75      |
| RTS-xx05    | (H)   | 5, 9, 12, 15, 24 | 5              | 400            | 80-85      |
| RTS-xx09    | (H)   | 5, 9, 12, 15, 24 | 9              | 222            | 80-85      |
| RTS-xx12    | (H)   | 5, 9, 12, 15, 24 | 12             | 167            | 80-85      |
| RTS-xx15    | (H)   | 5, 9, 12, 15, 24 | 15             | 133            | 80-85      |
| RTS-xx24    | (H)   | 5, 9, 12, 15, 24 | 24             | 83             | 80-85      |
| RTD-xx05    | (H)   | 5, 9, 12, 15, 24 | ±5             | ±200           | 70-75      |
| RTD-xx09    | (H)   | 5, 9, 12, 15, 24 | ±9             | ±111           | 75-78      |
| RTD-xx12    | (H)   | 5, 9, 12, 15, 24 | ±12            | ±83            | 75-83      |
| RTD-xx15    | (H)   | 5, 9, 12, 15, 24 | ±15            | ±66            | 75-85      |
| RTD-xx24    | (H)   | 5, 9, 12, 15, 24 | ±24            | ±42            | 78-85      |

xx = Input Voltage

\* add Suffix "P" for Continuous Short Circuit Protection, e.g. RTS-0505/P, RTD-0505/P

### Description

Compared to standard 2 Watt packages, space savings of 80% and 77% respectively are achieved by these RTS & RTD 2 Watts SMD-Miniature DC/DC Converters. They have been specifically designed for applications where board space is at a premium since these 2 Watt converters have only a slightly larger foot print than conventional 1 Watt converters.

With efficiencies up to 85%, external cooling is not needed, as the full output power is available over the operating temperature range -40°C to +85°C. All converters have an I/O-Isolation of 1kVDC, or optionally 3kV, making them suitable for many applications.

### Specifications (Core Operating Area)

|                                                   |                                      |                                      |
|---------------------------------------------------|--------------------------------------|--------------------------------------|
| Input Voltage Range                               | ±10%                                 |                                      |
| Output Voltage Accuracy                           | ±5%                                  |                                      |
| Line Voltage Regulation                           | 1.2%/1% of Vin max.                  |                                      |
| Load Voltage Regulation (10% to 100% full load)   | 3.3V output types                    | 20% max.                             |
|                                                   | 5V output type                       | 15% max.                             |
|                                                   | 9V, 12V, 15V, 24V output types       | 10% max.                             |
| Output Ripple and Noise (20MHz limited)           | 150mVp-p max.                        |                                      |
| Operating Frequency                               | 20kHz min. / 50kHz typ. / 85kHz max. |                                      |
| Efficiency at Full Load                           | 70% min. / 80% typ.                  |                                      |
| No Load Power Consumption                         | RTS typ.                             | 124mW min. / 186mW typ. / 250mW max. |
|                                                   | RTD typ.                             | 159mW min. / 192mW typ. / 240mW max. |
| Isolation Voltage                                 | (tested for 1 second)                | 1000VDC min.                         |
| H-Suffix                                          | (tested for 1 second)                | 3000VDC min.                         |
| Rated Working Voltage                             | (long term isolation)                | see Application Notes                |
| Isolation Capacitance                             | 40pF min. / 115pF max.               |                                      |
| Isolation Resistance                              | 10 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                      |                                      |

continued on next page

**ECONOLINE**

DC/DC-Converter

## RTS & RTD Series

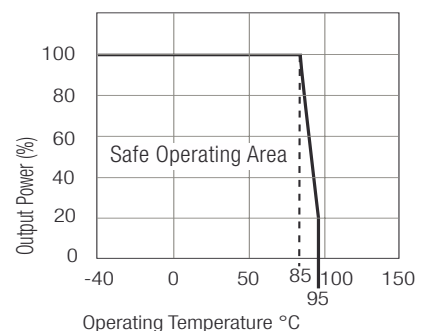
## 2 Watt SMD Single & Dual Output



**EN-60601-1 Certified (Suffix H3)**

**RECOM**

## Derating-Graph (Ambient Temperature)



## Specifications (Core Operating Area)

Reflow Temperature ROHS compliant (for more details see Application Notes) 245°C (30 sec) max.

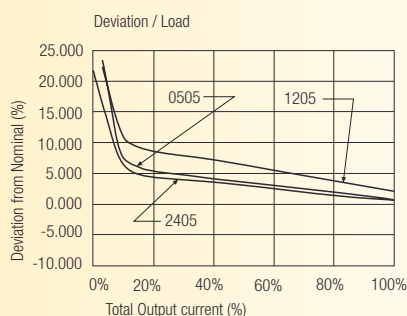
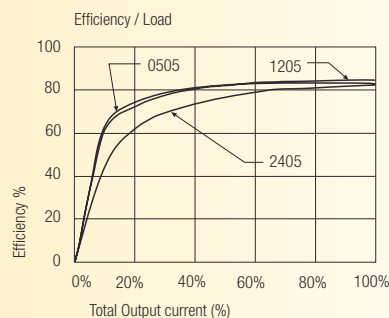
Relative Humidity 95% RH

Package Weight RTS types 2.1g  
RTD types 2.5g

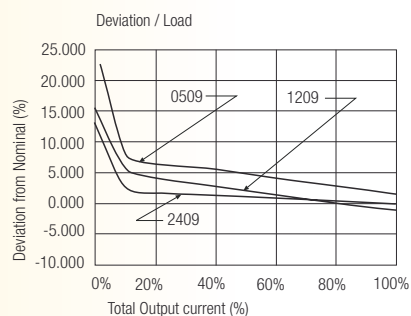
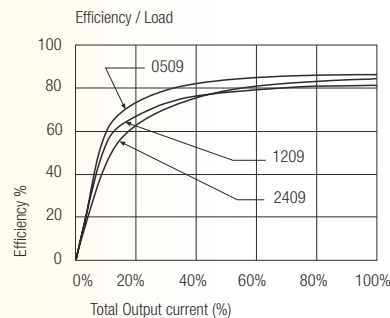
MTBF (+25°C) } Detailed Information see using MIL-HDBK 217F 886 x 10<sup>3</sup> hours  
(+85°C) } Application Notes chapter "MTBF" using MIL-HDBK 217F 128 x 10<sup>3</sup> hours

## Typical Characteristics

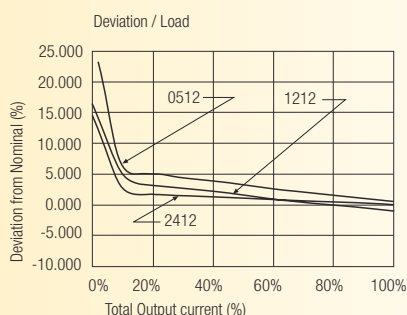
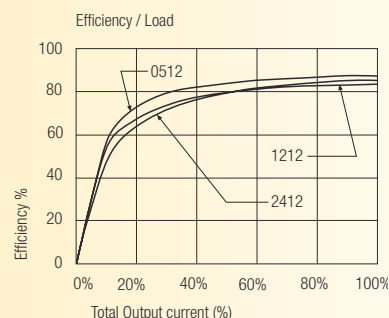
### RTS-xx05



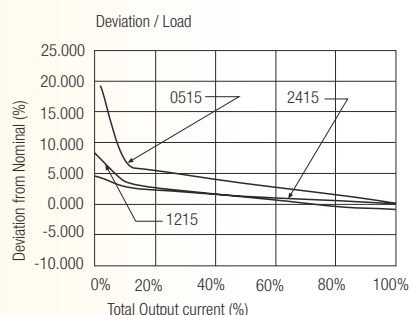
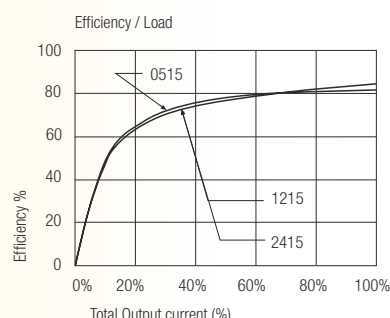
### RTS-xx09



### RTS-xx12

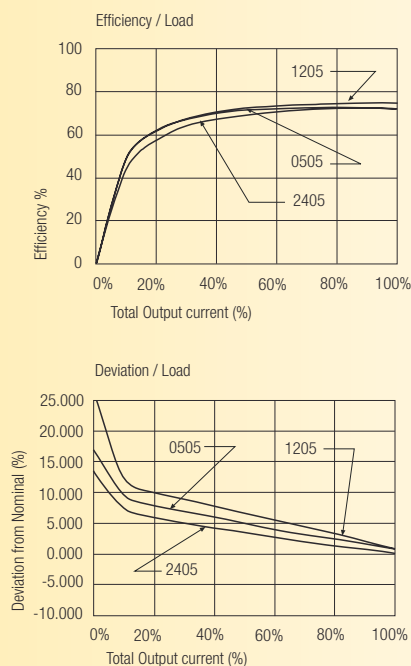


### RTS-xx15

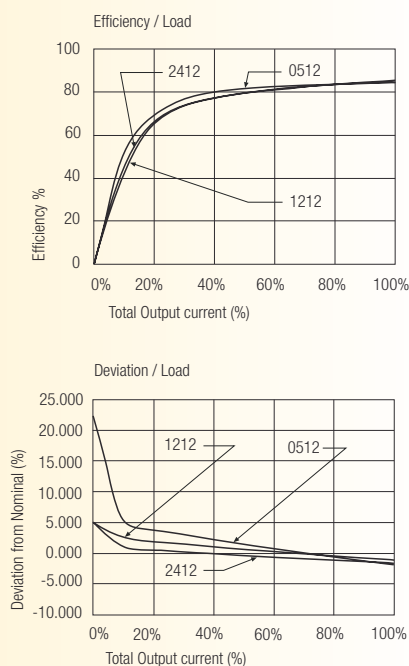


## Typical Characteristics

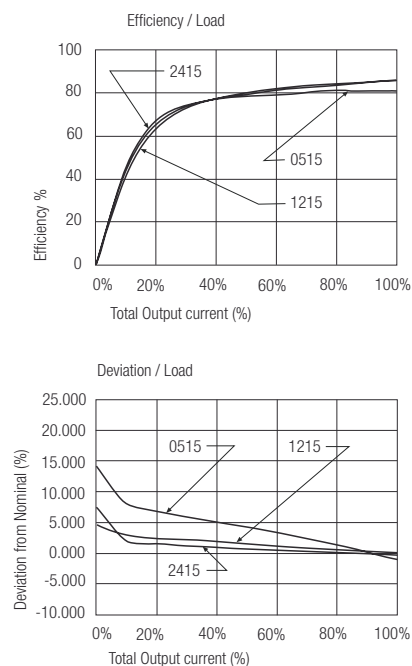
### RTD-xx05



### RTD-xx12

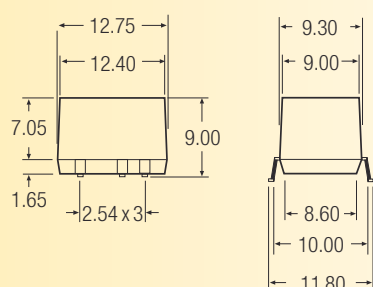


### RTD-xx15

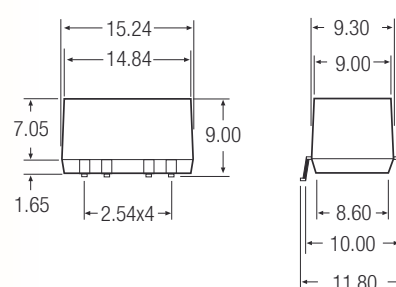


## Package Style and Pinning (mm)

### 8 PIN Single SMD Package



### 10 PIN Dual SMD Package

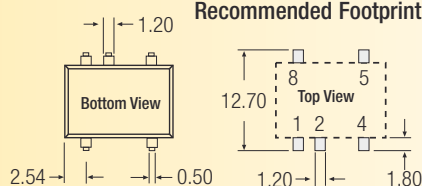


### Pin Connections

| Pin # | Single | Dual   |
|-------|--------|--------|
| 1     | -Vin   | -Vin   |
| 2     | +Vin   | +Vin   |
| 4     | -Vout  | Com    |
| 5     | +Vout  | -Vout  |
| 7     | No Pin | +Vout  |
| 8     | NC     | No Pin |
| 10    | No Pin | NC     |

NC = No Connection  
XX.X ± 0.5 mm  
XX.XX ± 0.25 mm

### Recommended Footprint Details



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