

## Features

## Unregulated Converters

- 1kVDC Isolation
- Internal SMD Construction
- UL94V-0 Package Material
- Optional Continuous Short Circuit Protected
- Efficiency to 85%

### Selection Guide

| Part Number | Input Voltage (3kV) | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency (%) |
|-------------|---------------------|---------------------|----------------------|---------------------|----------------|
| 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)

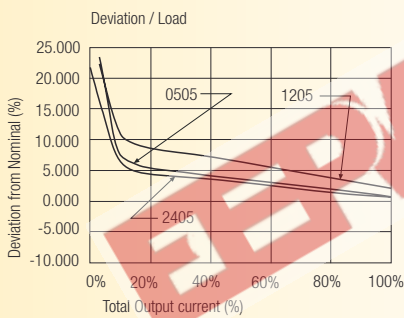


**Specifications (Core Operating Area)**

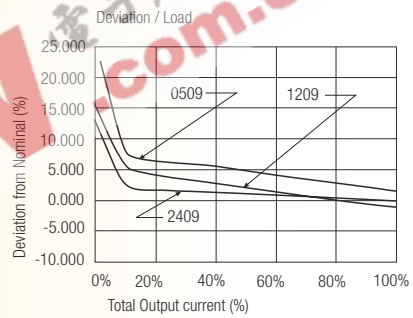
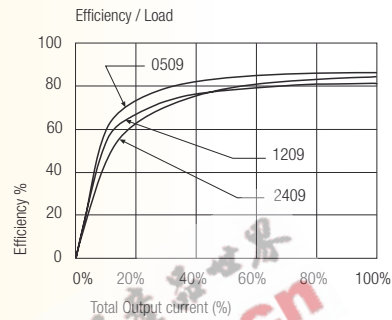
|                    |  |                     |                             |
|--------------------|--|---------------------|-----------------------------|
| Reflow Temperature | ROHS compliant (for more details see Application Notes)      | 245°C (30 sec) max. |                             |
| Relative Humidity  |  | 95% RH              |                             |
| Package Weight     | RTS types  | 2.1g                |                             |
|                    | RTD types  | 2.5g                |                             |
| MTBF (+25°C)       | Detailed Information see<br>Application Notes chapter "MTBF" | using MIL-HDBK 217F | 886 x 10 <sup>3</sup> hours |
|                    |  | 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



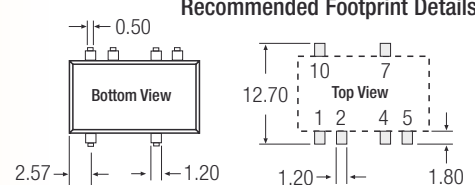
10 PIN Dual SMD Package



Recommended Footprint Details



Recommended Footprint Details



**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