# THE DATASHEET OF

# RTS-2405/P

END OF LIFE Dec.2011

# Features

## Unregulated Converters

- 1kVDC and 3kVDC Isolation Options
- Approved for Medical Applications
- Suitable for Automated Assembly
- High Power Density
- Optional Continuous Short Circuit Protection
- Efficiency to 85 %
- RoHS 5/6 Conform

## 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 industrial and medical applications.

## Selection Guide

| Part Number SMD | (3kV) | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Efficiency (%) | Max Capacitive Load[1] |
|---|---|---|---|---|---|---|
| RTS**-xx3.3 | (H) | 5, 12, 15, 24 | 3.3 | 606 | 70-75 | 3300µF |
| RTS**-xx05 | (H) | 5, 12, 15, 24 | 5 | 400 | 80-85 | 1200µF |
| RTS**-xx09 | (H) | 5, 12, 15, 24 | 9 | 222 | 80-85 | 1200µF |
| RTS**-xx12 | (H) | 5, 12, 15, 24 | 12 | 167 | 80-85 | 680µF |
| RTS**-xx15 | (H) | 5, 12, 15, 24 | 15 | 133 | 80-85 | 680µF |
| RTS**-xx24 | (H) | 5, 12, 15, 24 | 24 | 83 | 80-85 | 220µF |
| RTD**-xx05 | (H) | 5, 12, 15, 24 | ±5 | ±200 | 70-75 | ±470µF |
| RTD**-xx09 | (H) | 5, 12, 15, 24 | ±9 | ±111 | 75-78 | ±470µF |
| RTD**-xx12 | (H) | 5, 12, 15, 24 | ±12 | ±83 | 75-83 | ±220µF |
| RTD**-xx15 | (H) | 5, 12, 15, 24 | ±15 | ±66 | 75-85 | ±220µF |
| RTD**-xx24 | (H) | 5, 12, 15, 24 | ±24 | ±42 | 78-85 | ±100µF |

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

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

* add suffix -R for tape&reel packing e.g. RTS-0505-R. For more details see Tapes Section.

## Case and Pinning Options (note restrictions on /H option)

RTS** : ** without marking denotes 5 pins out of 8 fitted (includes /H option)
** with marking **8** denotes 8 pins out of 8 fitted (/H option not available)

RTD** : ** without marking denotes 6 pins out of 10 fitted (includes /H option)
** with marking **10** denotes with 10 pins out of 10 fitted (/H option not available)

## Specifications (measured at $T_A$ = 25°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 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. |
| Minimum Load = 0% | | Specifications valid for 10% minimum load only. |

cont.

# ECONOLINE

DC/DC-Converter

with 3 year Warranty

RECOM

# 2 Watt SMD Single & Dual Output

RoHS 2002/95/EC 5/6

**EN-60950-1 Certified (All Suffixes)**
**EN-60601-1 Certified (Suffix H3)**

# RTS-RTD

# EOL Dec.2011

END OF LIFE: Please do not use for new design, replace with new SMD converter R2S (single output) and/or R2D (dual output).

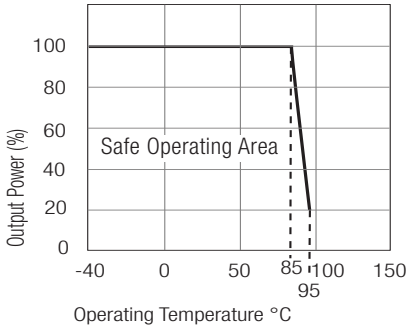
**Refer to Application Notes**

**Refer to Application Notes**

## Specifications - Continued

| | | | |
|---|---|---|---|
| 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 |
| Reflow Temperature | ROHS compliant | | 245°C (30 sec) max. |
| Vapour Phase Process | (for more details see Application Notes) | | 230°C (90 sec) max. |
| Relative Humidity | | | 95% RH |
| Package Weight | | RTS types | 2.1g |
| | | RTD types | 2.5g |
| Packing Quantity | | RTS, RTS8 | 40 pcs per Tube |
| | | RTS12, RTD | 33 pcs per tube |
| | | All Types | 500 pcs per Reel |
| MTBF (+25°C) } *Detailed Information see* | | using MIL-HDBK 217F | 886 x $10^3$ hours |
| (+85°C) } *Application Notes chapter "MTBF"* | | using MIL-HDBK 217F | 128 x $10^3$ hours |

## Derating-Graph
(Ambient Temperature)

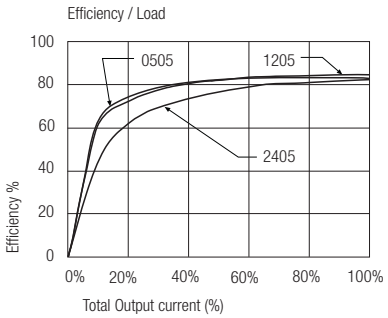


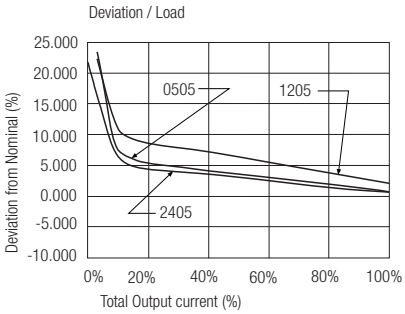

Notes

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.

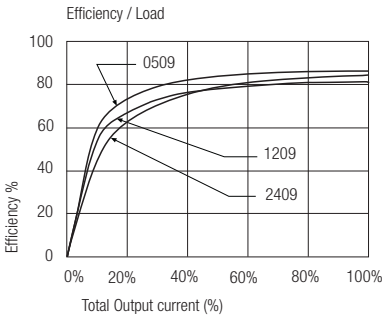
## Typical Characteristics

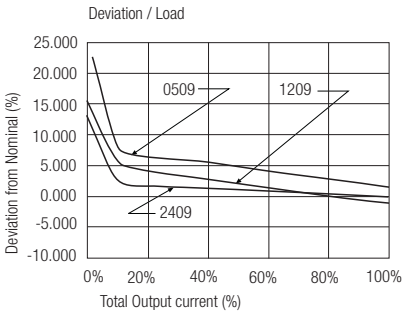
### RTS-xx05




### RTS-xx09



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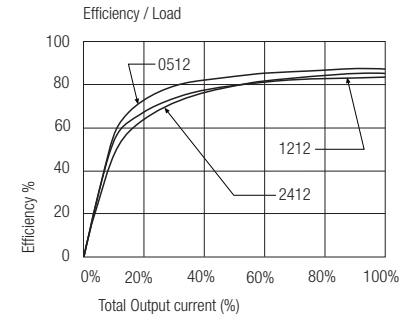
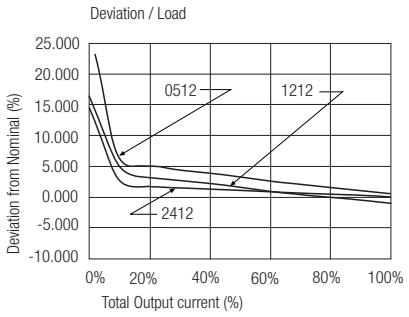
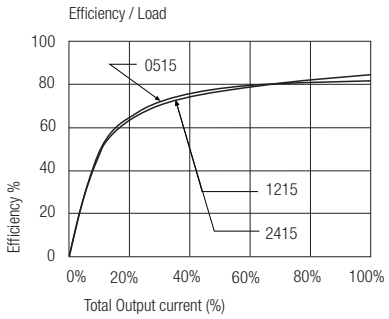
## Typical Characteristics

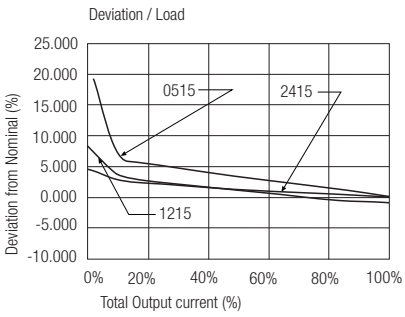
### RTS-xx12



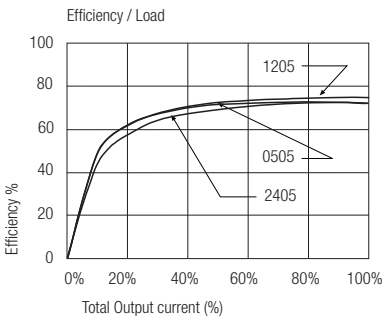



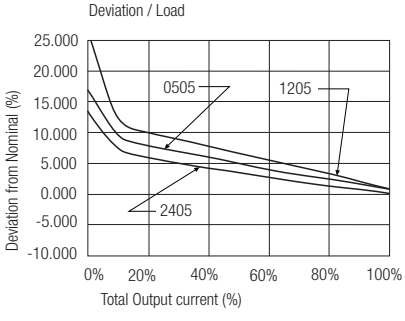

### RTS-xx15



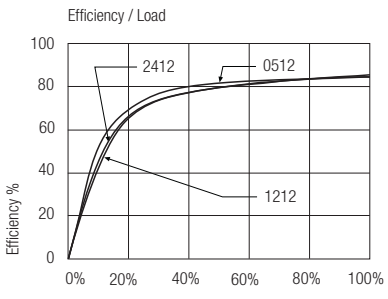



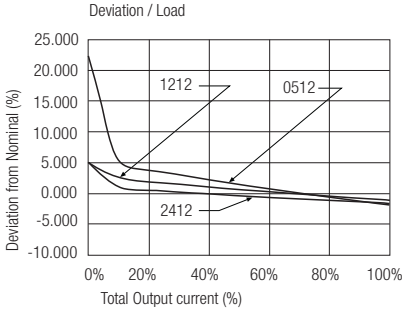

### RTD-xx05



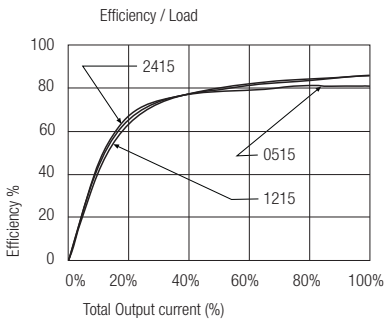



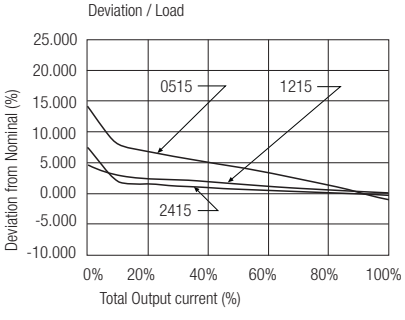

### RTD-xx12




### RTD-xx15



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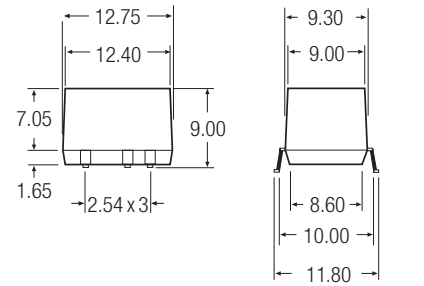
# ECONOLINE
DC/DC-Converter

# RTS & RTD Series

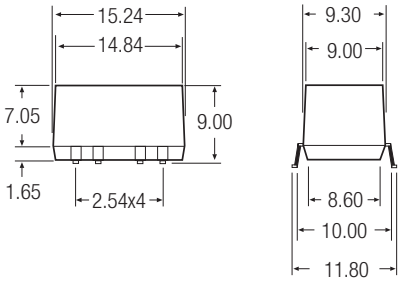
## Package Style and Pinning (mm)

3rd angle projection

### 8 PIN Single SMD Package




### 10 PIN Dual SMD Package



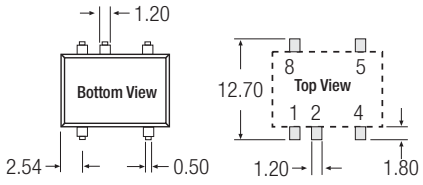

**Pin Connections**

| 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 |

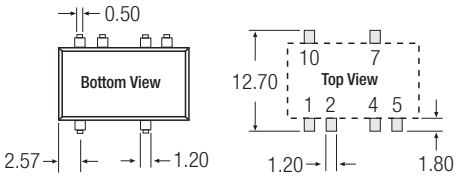
NC = No Connection

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

### Recommended Footprint Details

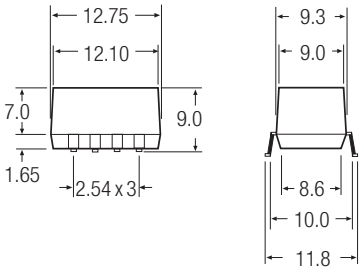



### Recommended Footprint Details

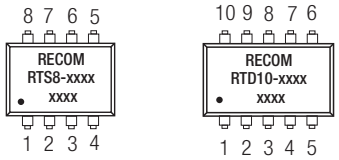





### Full 8 PIN Single SMD Package




Note: /H option is not available in these pin packages



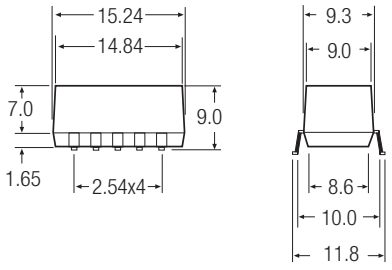

**Pin Connections**

| Pin # | Single | Dual |
|---|---|---|
| 1 | –Vin | –Vin |
| 2 | +Vin | +Vin |
| 3 | NC | NC |
| 4 | –Vout | Com |
| 5 | +Vout | –Vout |
| 6 | NC | NC |
| 7 | NC | +Vout |
| 8 | NC | NC |
| 9 | - | NC |
| 10 | - | NC |

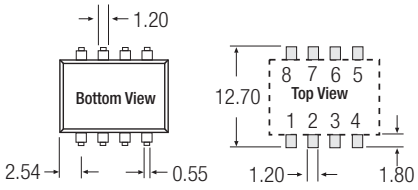
NC = No Connection

XX.X ± 0.5 mm
XX.XX ± 0.25 mm

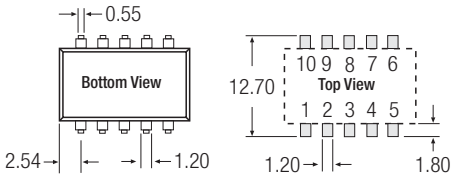
### Full 10 PIN Dual SMD Package




### Recommended Footprint Details




### Recommended Footprint Details

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