

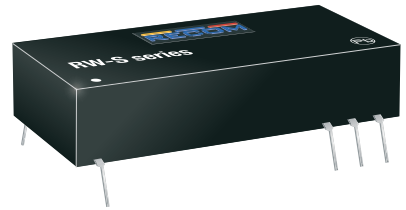
# Features

- 1kVDC isolation
- DIP24 low profile or SMD package style
- UL94V-0 package material
- Short circuit protected
- IEC/EN60950-1 certified
- Feedback regulated output

# Regulated Converters

## RW-S

**3 Watt**  
**DIP24 (low profile) or SMD**  
**Single Output**



IEC/EN60950-1 certified  
EN55032 compliant

### Description

The RW-S series with 2:1 input voltage ranges and max. height of 7.0 mm has been designed for the industrial automation markets. They are aimed at applications where pcb-space is at a premium so SMD pinning is also available. The converters supply the full 3 watts without additional heat-sinks over the temperature range -40°C to +80°C (3.3Vout excepted).

### Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. <sup>(1)</sup> [%]	max. Capacitive Load <sup>(2)</sup> [µF]
RW-053.3S	4.5-9	3.3	650	68	4700
RW-0505S	4.5-9	5	600	69	4700
RW-0509S	4.5-9	9	333	70	3300
RW-0512S	4.5-9	12	250	72	2200
RW-0515S	4.5-9	15	200	73	2200
RW-123.3S	9-18	3.3	650	70	4700
RW-1205S	9-18	5	600	73	4700
RW-1209S	9-18	9	333	78	3300
RW-1212S	9-18	12	250	79	2200
RW-1215S	9-18	15	200	79	2200
RW-243.3S	18-36	3.3	650	75	4700
RW-2405S	18-36	5	600	78	4700
RW-2409S	18-36	9	333	82	3300
RW-2412S	18-36	12	250	84	2200
RW-2415S	18-36	15	200	85	2200
RW-483.3S	36-72	3.3	650	73	4700
RW-4805S	36-72	5	600	78	4700
RW-4809S	36-72	9	333	82	3300
RW-4812S	36-72	12	250	84	2200
RW-4815S	36-72	15	200	85	2200

#### Notes:

- Note1: Efficiency is tested at nominal input and full load at +25°C ambient  
 Note2: Max Cap Load is tested at nominal input and full resistive load

### Model Numbering



#### Notes:

Note3: without suffix = standard DIP24 THT package, add suffix „/SMD“ for SMD package

#### Ordering Examples:

RW-2405S	18-36Vin	Single	5Vout	DIP24
RW-0512S/SMD	4.5-9Vin	Single	12Vout	SMD
RW-48015S/SMD	36-72Vin	Single	15Vout	SMD

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

**BASIC CHARACTERISTICS**

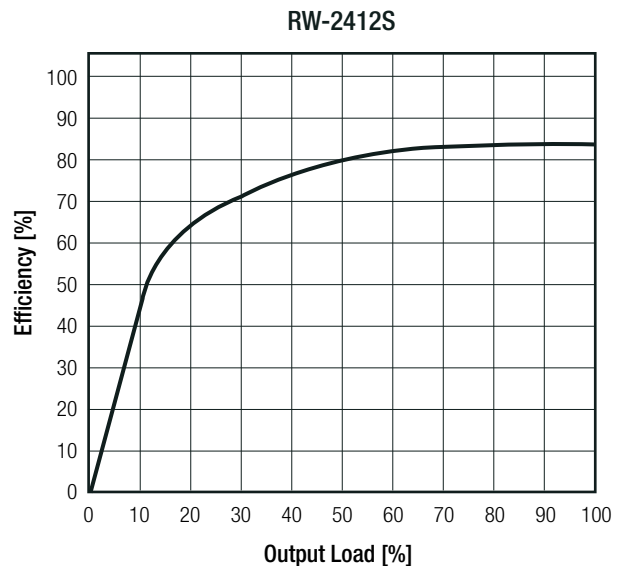
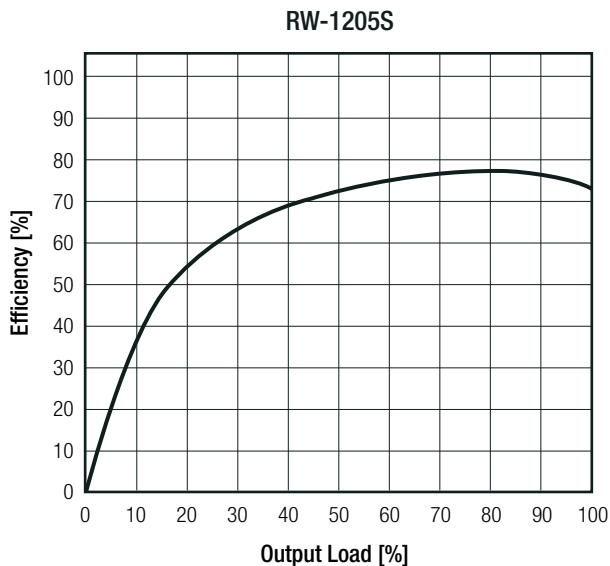
Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range	5VDC nom. Vin= 12VDC 24VDC 48VDC	4.5VDC 9VDC 18VDC 36VDC		9VDC 18VDC 36VDC 72VDC
No Load Power Consumption				250mW
Minimum Load <sup>(4)</sup>		10%		
Internal Operating Frequency		85kHz	100kHz	
Output Ripple and Noise <sup>(5)</sup>	20MHz BW			70mVp-p

**Notes:**

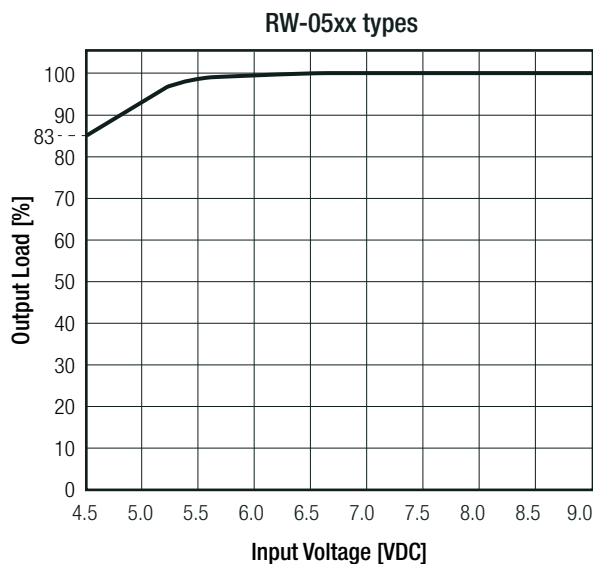
Note4: Operation below 10% load won't harm the converter, but specifications may not be met.

Note5: Measurements are made with a 0.1µF MLCC across output. (low ESR)

**Efficiency vs. Load**



**Input Voltage vs Output Voltage**



**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		±0.2% typ.
Load Regulation	10% to 100% load	0.5% typ.

**PROTECTIONS**

Parameter	Type	Value
Short Circuit Protection	below 100mΩ	continuous, auto recovery
Isolation Voltage <sup>(6)</sup>	tested for 1 second	1kVDC
	rated for 1 minute	500VAC/60Hz
Isolation Resistance		1GΩ min.
Isolation Capacitance		40pF min./ 60pF max.
Insulation Grade		functional

**Notes:**

Note6: For repeat Hi-Pot testing, reduce the time and/or the test voltage

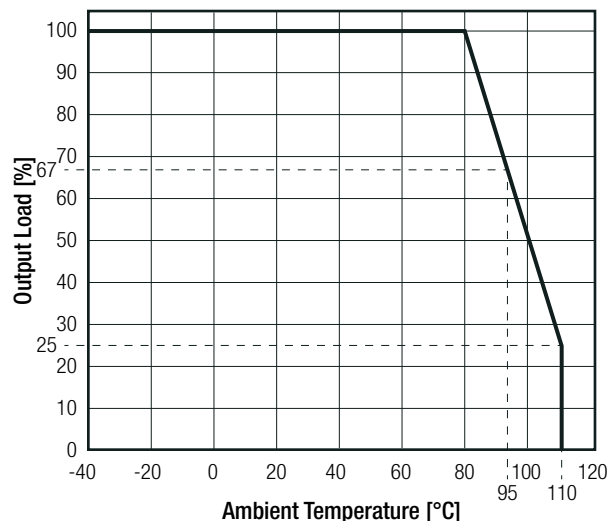
Note7: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

**ENVIRONMENTAL**

Parameter	Condition	Value	
Operating Temperature Range	full load @ free air convection (refer to "Derating Graph")	-40°C to +80°C	
Operating Altitude		2000m	
Operating Humidity	non-condensing	95% RH max.	
Pollution Degree		PD2	
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	1034 x 10 <sup>3</sup> hours
		+80°C	168 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)

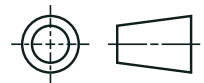
### SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	SPCLVD1605077-10	IEC60950-1: 2005, 2nd Edition + A2: 2013 EN60950-1:2006 + A2:2013
Medical Electric Equipment, General Requirements for Safety and Essential Performance	WD-SE-R-180675-A0	IEC60601-1:2005 , 3rd Edition + A1:2012 EN60601-1:2006 + A12:2014
EAC	RU-AT.AB49.B.09571	TP TC 004/2011
RoHS 2+		RoHS 2011/65/EU + AM-2015/863

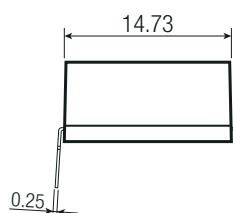
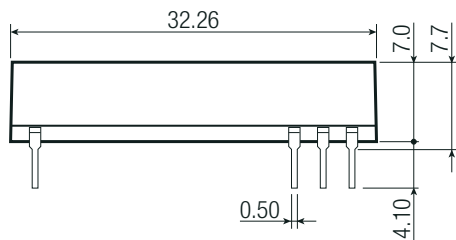
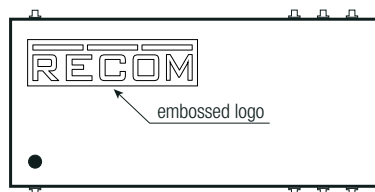
### DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case potting	non-conductive black plastic, (UL94V-0) epoxy, (UL94V-0)
Dimension (LxWxH)	DIP24 SMD	32.3 x 14.7 x 7.0mm 32.2 x 14.5 x 10.2mm
Weight	DIP24 SMD	7.0g typ. 7.7g typ.

#### Dimension Drawing DIP24 (mm)



#### DIP24 Version

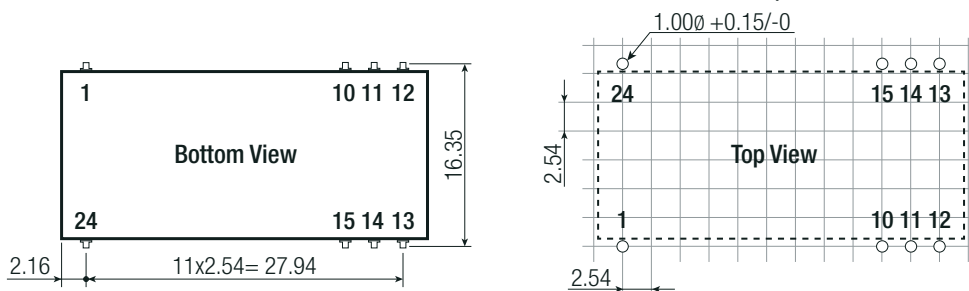


#### Pinning information

Pin #	Single
1,24	+Vin
10,15	-Vout
11,14	+Vout
12,13	-Vin

Tolerance: xx.x= ±0.5mm  
xx.xx= ±0.25mm

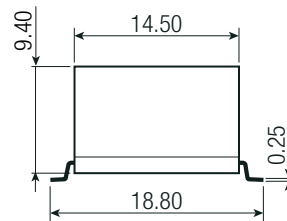
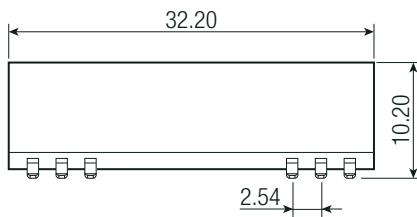
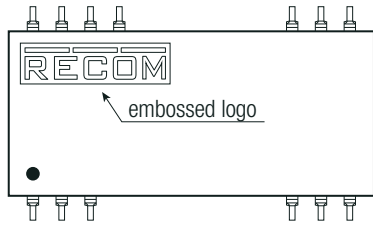
#### Recommended Footprint Details



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

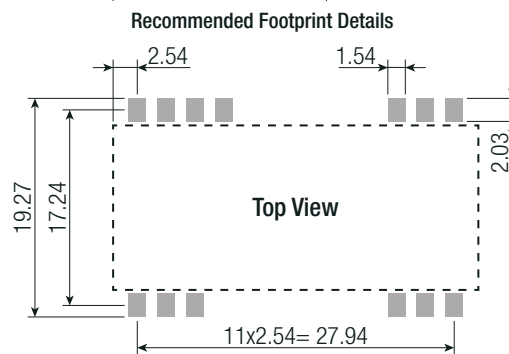
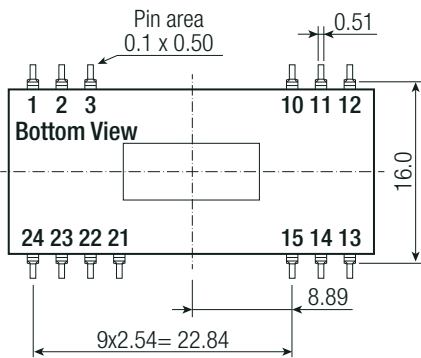
**SMD Version (/SMD)**



**Pinning information**

Pin #	Single
1,24	+Vin
10,15	-Vout
11,14	+Vout
12,13	-Vin

Tolerance: xx.x= ±0.5mm  
xx.xx= ±0.25mm



**PACKAGING INFORMATION**

Parameter	Type	Value
Packaging Dimension (LxWxH)	tube	530.0 x 21.0 x 18.0mm
Packaging Quantity		15pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	95% RH max.

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