Features

Unregulated Converters

- 12.5kVAC/1 minute isolation
- Compact SIP16 case with >30mm pin separation
- Low 4pF max. isolation capacitance
- Wide operating temperature range from -40°C to +80°C at full load
- Efficiency up to 81%

RECOM
DC/DC Converter

RHV3

3 Watt SIP16 Single and Dual Output

3 YEAR Warranty

Description

The RHV3 is a DC/DC converter with exceptionally high 20kVDC (12.5KVAC/1 minute) isolation in a compact SIP16 case. Input voltages can be 5, 12 or 24VDC and outputs 5V, 12V, 24V, ±5V or ±12V. The operating temperature is -40°C to +80°C without derating. Applications include high vacuum monitoring, X-Ray equipment, HVAC dust extraction systems and other high voltage industrial applications where a very high isolation remote power supply is required.





Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
RHV3-0505S/R20	5	5	600	76	1000
RHV3-0512S/R20	5	12	250	78	330
RHV3-0524S/R20	5	24	125	80	100
RHV3-1205S/R20	12	5	600	78	1000
RHV3-1212S/R20	12	12	250	79	330
RHV3-1224S/R20	12	24	125	80	100
RHV3-2405S/R20	24	5	600	80	1000
RHV3-2412S/R20	24	12	250	80	330
RHV3-2424S/R20	24	24	125	81	100
RHV3-0505D/R20	5	±5	±300	78	±680
RHV3-0512D/R20	5	±12	±125	80	±150
RHV3-1205D/R20	12	±5	±300	78	±680
RHV3-1212D/R20	12	±12	±125	81	±150
RHV3-2405D/R20	24	±5	±300	80	±680
RHV3-2412D/R20	24	±12	±125	80	±150

Notes:

Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: The capacitive load is tested at minimum input and constant resistive load

RoHS 2+ compliant 10 from 10

REACH compliant

IEC/EN62368-1 certified
IEC/EN61010-1 certified

Model Numbering

RHV3- ___ ___ /R20

- Output Power
- nom. Input Voltage
- Output Voltage
- Isolation Voltage
- Single or Dual Output

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

BASIC CHARACTERISTICS

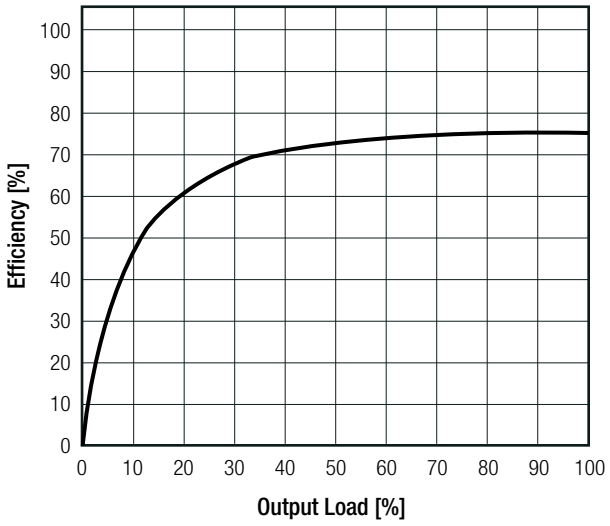
Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				capacitors
Input Voltage Range			±10%	
Minimum Load		0%		
Internal Operating Frequency		20kHz	45kHz	
Output Ripple and Noise [3]	20MHz BW		150mVp-p	200mVp-p

Notes:

Note3: Measurements are made with a 0.1µF MLCC across output (low ESR)

Efficiency vs. Load

RHV3-0505S/R20



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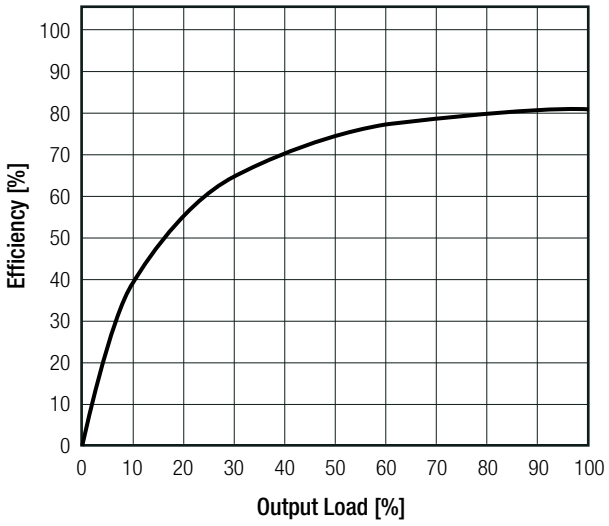

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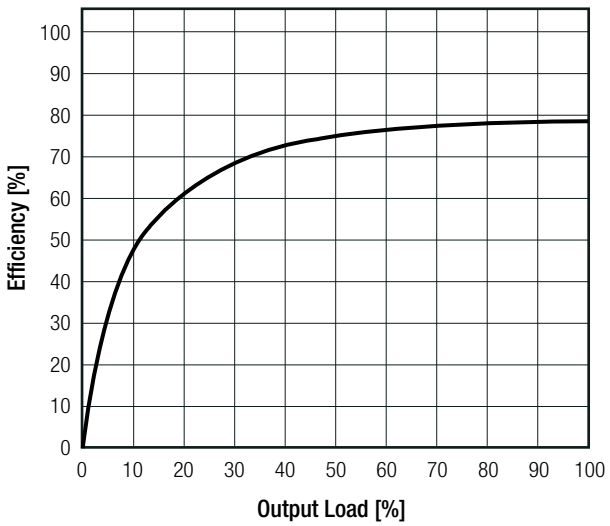

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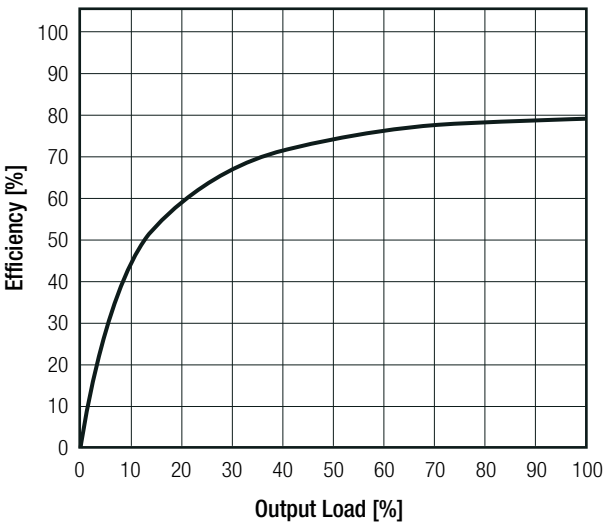


Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

REGULATIONS

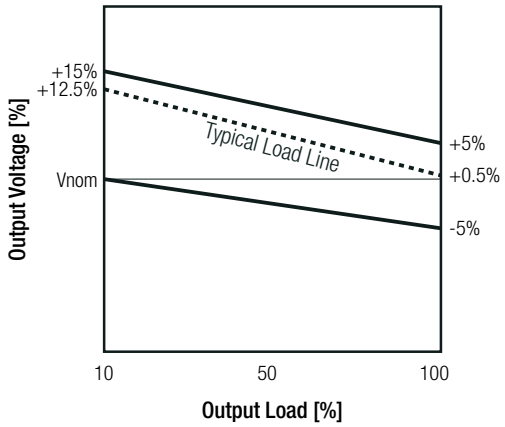
Parameter	Condition		Value
Output Accuracy			±5.0% max.
Line Regulation	low line to high line, full load		±1.2% of 1.0% Vin typ.
Load Regulation (4)	10% to 100% load	5Vin	15.0% max.
		others	10.0% max.
Cross Regulation	10% to 100% load		±7.5% typ.

Notes:

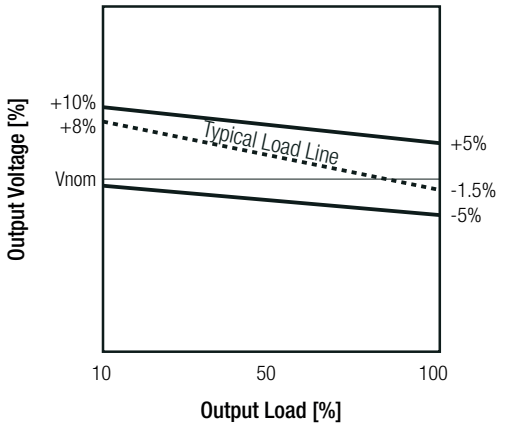
Note4: Operation below 10% load will not harm the converter, but specifications may not be met

Tolerance Envelope

RHV3-0505S/R20



RHV3-0524S/R20



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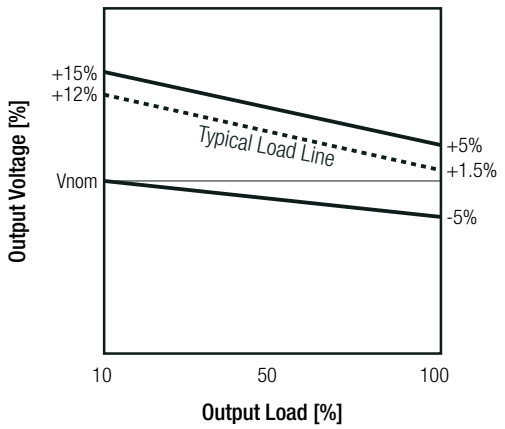

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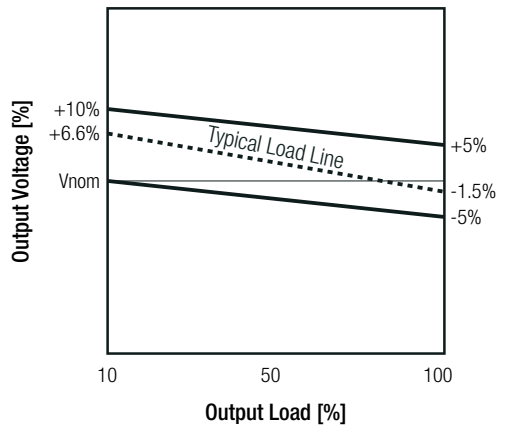

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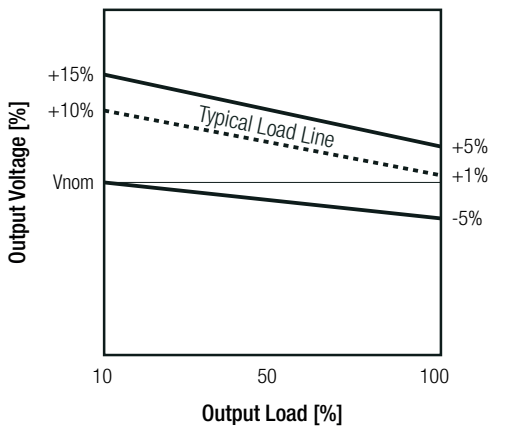

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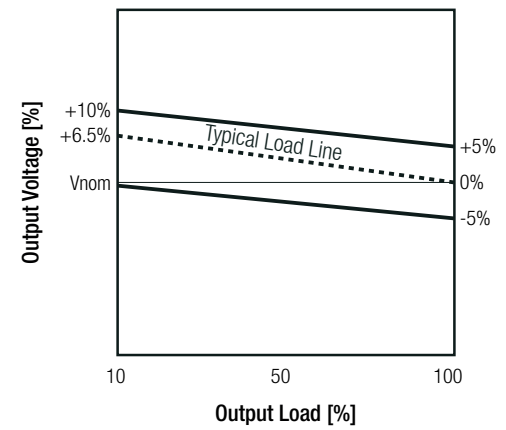


Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

PROTECTIONS

Parameter	Type		Value
Isolation Voltage [5]	I/P to O/P	tested for 1 second tested for 1 minute	20kVDC 12.5kVAC
Isolation Resistance			15GΩ min.
Isolation Capacitance			3.5pF typ./ 4pF max.
Insulation Grade			reinforced
Working Voltage			1400Vrms

Notes:

Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage

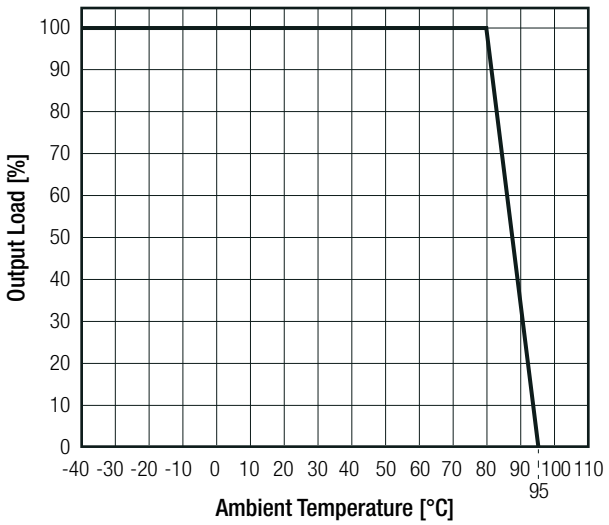
Note6: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	without derating @ natural convection 0.1m/s (see graph)		-40°C to +80°C
Maximum Case Temperature			+105°C
Temperature Coefficient			0.02%/K max.
Thermal Impedance			12K/W typ.
Operating Altitude			5000m
Operating Humidity	non-condensing		5% - 95% RH max.
Pollution Degree			PD2
Vibration			MIL-STD-202G
MTBF	according to MIL-HDBK-217F,G.B.	+25°C +80°C	13400 x 10^3 hours 3600 x 10^3 hours

Derating Graph

(@ Chamber and natural convection 0.1m/s)



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

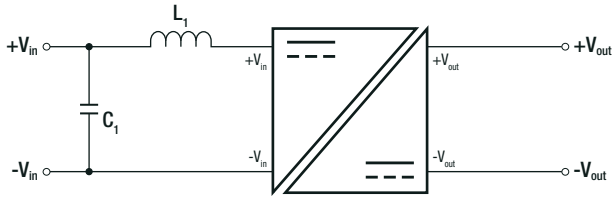
SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Audio/Video, information and communication technology equipment - Part1: Safety requirements	WD-SE-R-190305-A0	IEC62368-1:2014 2nd Edition EN62368-1:2014+AC:2015
Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	WD-SE-R-190305-B0	IEC61010:2010 EN61010:2010
RoHS 2		RoHS 2011/65/EU + AM2015/863

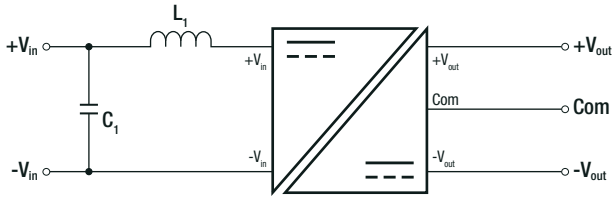
EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment – Emission Requirements	refer to ***"EMC Filtering Suggestions according to EN55032"***	EN55032, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD Electrostatic discharge immunity test	Air: ±2, 4, 8kV, Contact: ±2, 4kV	IEC61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	IEC61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	DC Power Port: ±0.5kV, ±1kV	IEC61000-4-4:2012, Criteria A
Surge Immunity	DC Power (Output) Port: ±0.5kV	IEC61000-4-5:2014+A1:2017, Criteria A
Immunity to conducted disturbances, induced by radio-frequency fields	DC Power (Output) Port: 3V	IEC61000-4-6:2013+C1:2015, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	IEC61000-4-8:2010, Criteria A

EMC Filtering Suggestions according to EN55032

Single Output



Dual Output



Component List Class B

nom. Input Voltage	C_1	L_1
5VDC, 12VDC, 24VDC	10µF, MLCC	18µH choke RLS-186

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case PCB potting	black plastic, (UL94V-0) FR4, (UL94V-0) epoxy, (UL94V-0)
Package Dimension (LxWxH)		45.0 x 15.0 x 17.0mm
Weight		19.7g typ.

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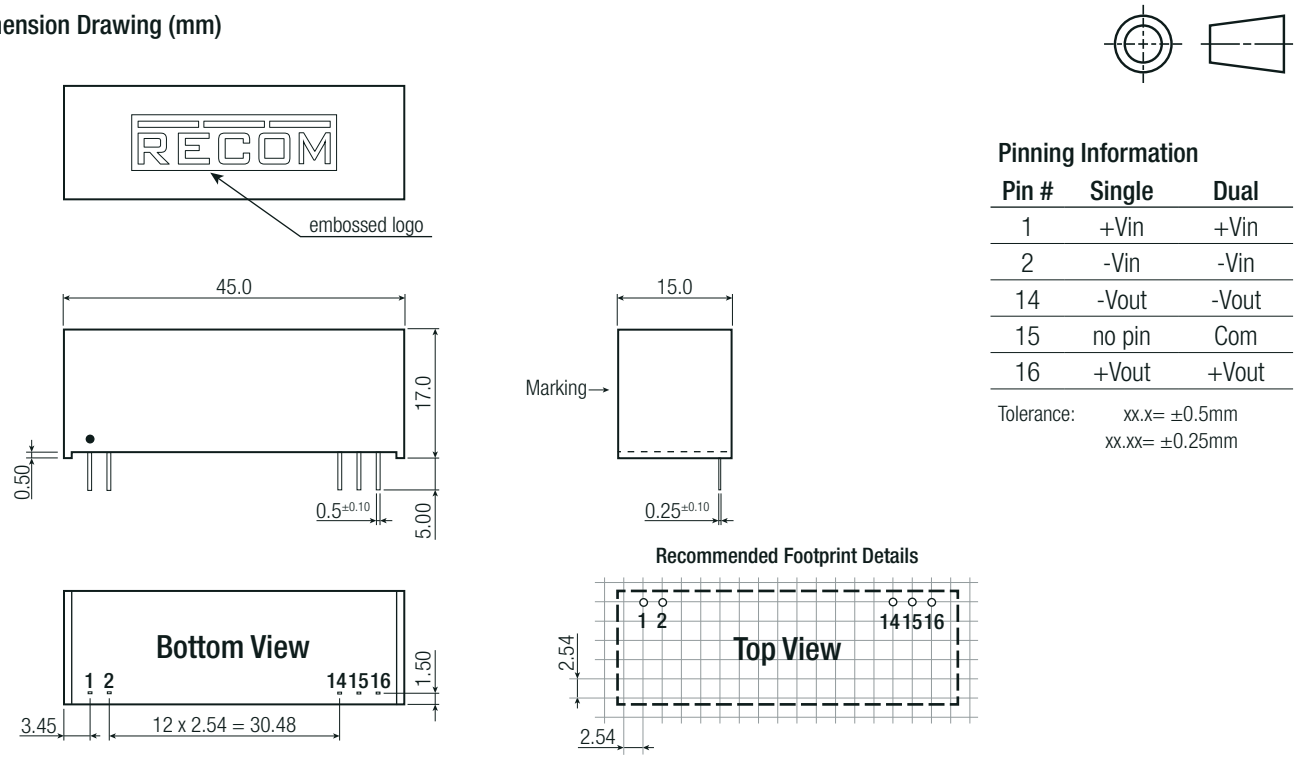
Specifications (measured @ Ta= 25°C, nom. Vin, full load and after warm-up unless otherwise stated)

Dimension Drawing (mm)



Pinning Information

Pin #	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
14	-Vout	-Vout
15	no pin	Com
16	+Vout	+Vout

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

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube	520.0 x 26.9 x 17.9mm
Packaging Quantity		10pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity	non-condensing	5% - 95% RH max.

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