Features

Unregulated Converters

- High efficiency uo to 84% full load
- Low deviation (10% - 100% load)
- 1kVDC and 2kVDC isolation option
- UL60950-1 and EN/IEC60950-1 certified
- -40°C to +100°C operating temperature range
- 1W SIP7 package

RECOM
DC/DC Converter

RB/E

1 Watt SIP7 Single Output

3 YEAR Warranty

Description

The RB/E series is an unregulated DC/DC converter in standard SIP7 package style. This series has been designed to offer exceptionally high efficiency at low loads, an extended operating temperature range and low deviation (10% to 100%). Uses include applications with restricted energy budget and industrial applications where a high efficiency level is required.

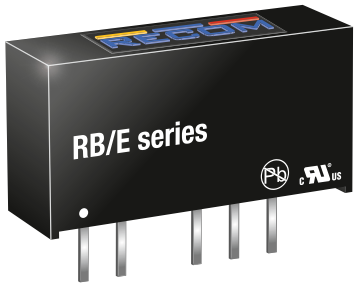
Selection Guide

Part Number	nom. Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]	Efficiency typ. (1) [%]	max. Capacitive Load (2) [µF]
RB-3.305S/E (3,4)	3.3	5	200	83	2200
RB-0505S/E (3,4)	5	5	200	84	2200
RB-1205S/E (3,4)	12	5	200	84	2200
RB-2405S/E (3,4)	24	5	200	81	2200

Notes:

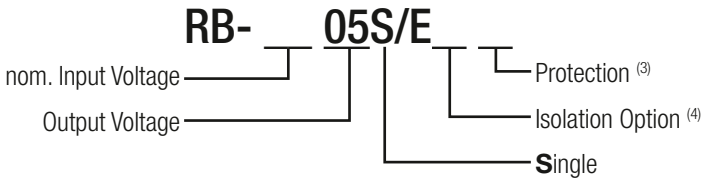
Note1: Efficiency is tested at nominal input and full load at +25°C ambient

Note2: Max Cap Load is tested at nominal input and full resistive load and is defined as the capacitive load that will allow start up in under 1s without damage to the converter



UL60950-1 certified
CAN/CSA-C22.2 No 60950-1 certified
EN60950-1 certified
IEC60950-1 certified

Model Numbering



Notes:

Note3: standard part is without continuous short circuit protection
add suffix „/P“ for continuous short circuit protection

Note4: add suffix „/H“ for 2kVDC isolation
or add suffix „/HP“ for 2kVDC isolation and continuous short circuit protection

Ordering Examples:

RB-1205S/E: 12VDC Input Voltage, 5VDC Output Voltage, Single Output
RB-3.305S/EP: 3.3VDC Input Voltage, 5VDC Output Voltage, Single Output with continuous short circuit protection
RB-0505S/EH: 5VDC Input Voltage, 5VDC Output Voltage, Single Output with 2kVDC isolation
RB-0505S/EHP: 5VDC Input Voltage, 5VDC Output Voltage, Single Output with 2kVDC isolation and continuous short circuit protection

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

BASIC CHARACTERISTICS

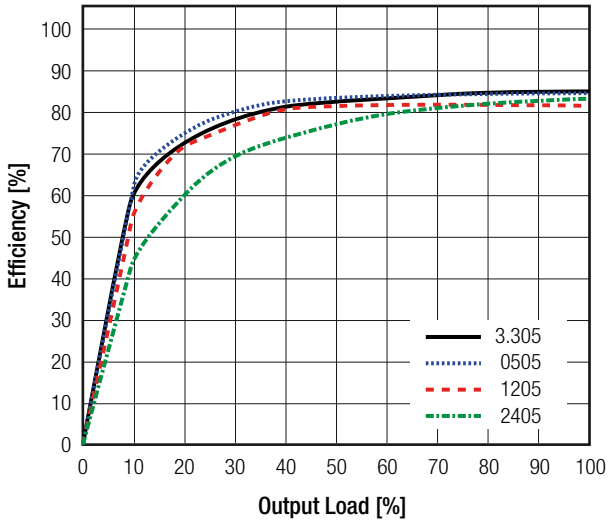
Parameter	Condition	Min.	Typ.	Max.
Internal Input Filter				type
Input Voltage Range			±10%	
Start-uo time				250ms
Minimum Load [5]		0%		
Internal Operating Frequency		20kHz		90kHz
Output Ripple and Noise	20MHz BW		50mVp-p	100mVp-p

Notes:

Note5: Operation below 10% load will not harm the converter, but specifications may not be met

Efficiency vs. Load

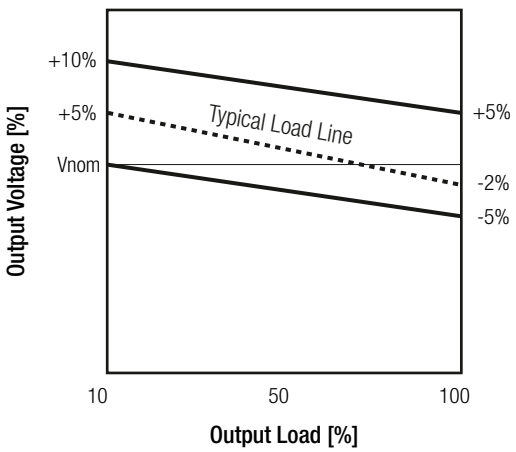
RB-xx05S/E



REGULATIONS

Parameter	Condition	Value
Output Accuracy		±5.0% max.
Line Regulation	low line to high line	±1.2% max.
Load Regulation	10% to 100% load	12.0% typ.

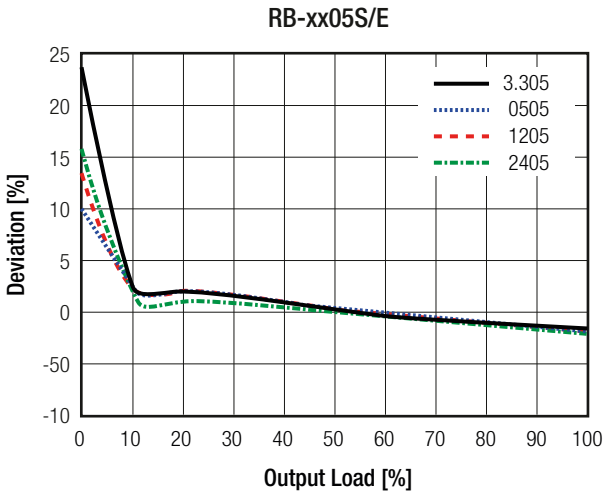
Tolerance Envelope



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

Deviation vs. Load



PROTECTIONS

Parameter	Type			Value
Short Circuit Protection (SCP)	without suffix With suffix "/P"			1 second continuous
Isolation Voltage [6]	I/P to O/P	without suffix	tested for 1 second rated for 1 minute	1kVDC 500VAC
		with suffix "/H"	tested for 1 second rated for 1 minute	2kVDC 1kVDC
Isolation Resistance				10GΩ min.
Isolation Capacitance				75pF max.
Insulation Grade				basic

Notes:

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

Note7: Refer to local wiring regulations if input over-current protection is also required. Recommended fuse: T1A slow blow type

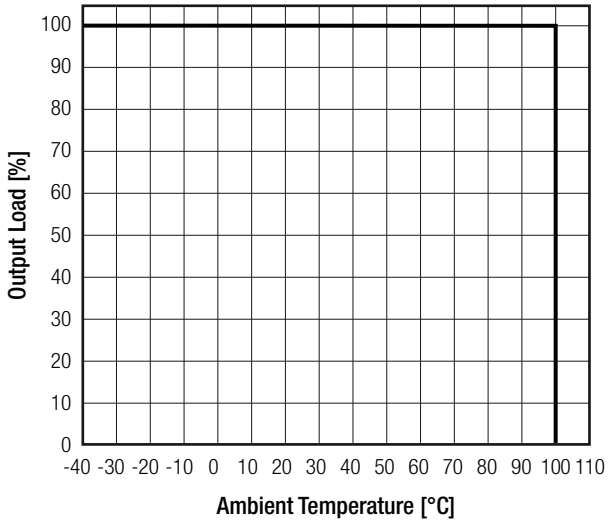
ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	full load @ free air convection (see graph)		-40°C to + 100°C
Operating Altitude			2000m
Operating Humidity	non-condensing		95% RH max.
Pollution Degree			PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C +100°C	3459 x 10^3 hours 756 x 10^3 hours

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

Derating Graph
(@ free air convection)



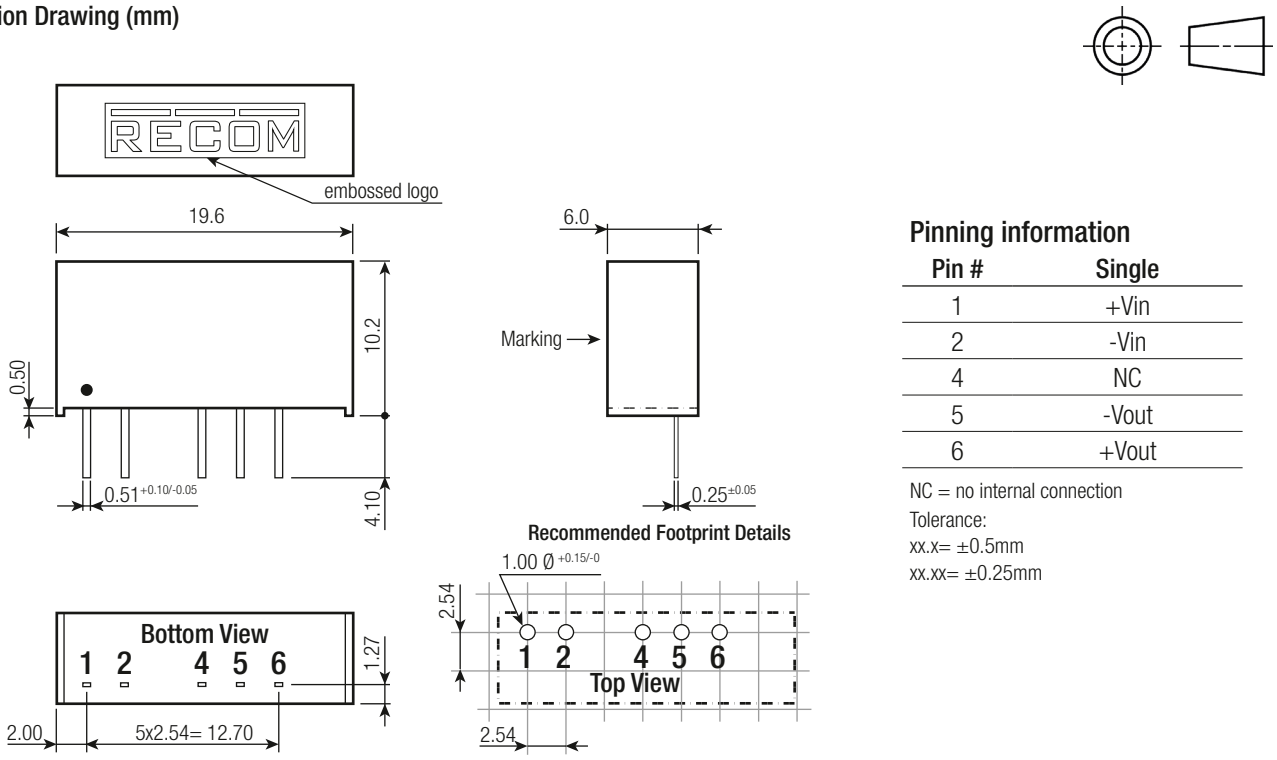
SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report / File Number**	**Standard**
Information Technology Equipment, General Requirements for Safety	1602031	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Information Technology Equipment, General Requirements for Safety	E358085-A4-UL	UL60950-1, 2nd Edition:2007 CAN/CSA C22.2 No. 60950-1-03, 2nd Edition:2007
EAC	RU-AT.49.09571	TP TC 004/2011
RoHs 2+		RoHS-2011/65/EU + AM-2015/863

DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Material	case potting PCB	non-conductive black plastic (UL94 V-0) epoxy, (UL94 V-0) FR4, (UL94 V-0)
Dimension (LxWxH)		19.6 x 6.0 x 10.2mm
Weight		2.2g typ.

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

Dimension Drawing (mm)



Pinning information

Pin #	Single
1	+Vin
2	-Vin
4	NC
5	-Vout
6	+Vout

NC = no internal connection
Tolerance:
xx.x= ±0.5mm
xx.xx= ±0.25mm

PACKAGING INFORMATION		
Parameter	**Type**	**Value**
Packaging Dimension (LxWxH)	tube	520.0 x 16.0 x 9.0mm
Packaging Quantity	tube	25pcs
Storage Temperature Range		-55°C to +125°C
Storage Humidity		95% RH max.

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