



Size: 0.46in x 0.24in x 0.4in (11.60mm x 6mm x 10.16mm)

### FEATURES

- Fixed Input Voltage
- Isolated & Unregulated Single Output
- International Standard Pin-Out
- Compact SIP Package
- Continuous Short Circuit Protection
- RoHS Compliant
- Meets UL62368 & EN62368 Standards (Pending)

### APPLICATIONS

- Industrial Robotics
- Where Isolated Voltage is Required in Distributed Power System
- Pure Digital Circuits
- Low Frequency Analog Circuits
- Relay-Driven Circuits
- Data Switching Circuits

### DESCRIPTION

The RBAT1 series of DC/DC converters offers 1 watt of output power in a very compact 0.46" x 0.24" x 0.4" SIP package. This series consists of isolated and unregulated single output models with fixed input voltage. Each model features international standard pin-out, continuous short circuit protection, and RoHS compliance. This series also meets UL62368 and EN62368 standards (pending). Contact factory for order details.

### MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current		Ripple & Noise		Efficiency		Maximum Capacitive Load	Output Power
			Min Load	Max Load	Typ.	Max.	Min.	Typ.		
RBAT1-05S03	5VDC (4.5~5.5VDC)	3.3VDC	30mA	303mA	30mVp-p	75mVp-p	70%	74%	2400µF	1 Watt
RBAT1-05S05		5VDC	20mA	200mA	30mVp-p	75mVp-p	78%	82%	2400µF	
RBAT1-05S09		9VDC	12mA	111mA	30mVp-p	75mVp-p	79%	83%	1000µF	
RBAT1-05S12		12VDC	9mA	84mA	30mVp-p	75mVp-p	79%	83%	560µF	
RBAT1-05S15		15VDC	7mA	67mA	30mVp-p	75mVp-p	79%	83%	560µF	
RBAT1-05S24		24VDC	4mA	42mA	50mVp-p	100mVp-p	81%	85%	220µF	

### SPECIFICATIONS

All specifications are based on 25°C, Humidity <75%RH, Nominal Input Voltage, and Rated Output Load unless otherwise noted.  
 We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
<b>INPUT SPECIFICATIONS</b>						
Input Voltage Range			4.5	5	5.5	VDC
Input Current	3.3VDC & 5VDC Output Models	Full Load		270	286	mA
		No Load		5	10	
	9VDC & 12VDC Output Models	Full Load		241	254	
		No Load		12	20	
15VDC & 24VDC Output Models	Full Load		241	254	mA	
	No Load		18	30		
Reflected Ripple Current				15		mA
Surge Voltage	1 sec. Max.		-0.7		9	VDC
Input Filter			Capacitor Filter			
<b>OUTPUT SPECIFICATIONS</b>						
Output Voltage			See Table			
Voltage Accuracy			See Tolerance Envelope Curves			
Line Regulation	Input Voltage Change: ±1%	3.3VDC Output Model			1.5	%
		Other Output Model			1.2	
Load Regulation	10%-100% Load	3.3VDC Output Model		15	20	%
		5VDC Output Model		10	15	
		9VDC Output Model		8	10	
		12VDC Output Model		7	10	
		15VDC Output Model		6	10	
		24VDC Output Model		5	10	
Output Power			See Table			
Output Current			See Table			
Maximum Capacitive Load	Tested at input voltage range and full load		See Table			
Ripple & Noise <sup>(1)</sup>	20MHz Bandwidth		See Table			
Temperature Coefficient	100% Load			±0.02		%/°C

**SPECIFICATIONS**

All specifications are based on 25°C, Humidity <75%RH, Nominal Input Voltage, and Rated Output Load unless otherwise noted.  
We reserve the right to change specifications based on technological advances.

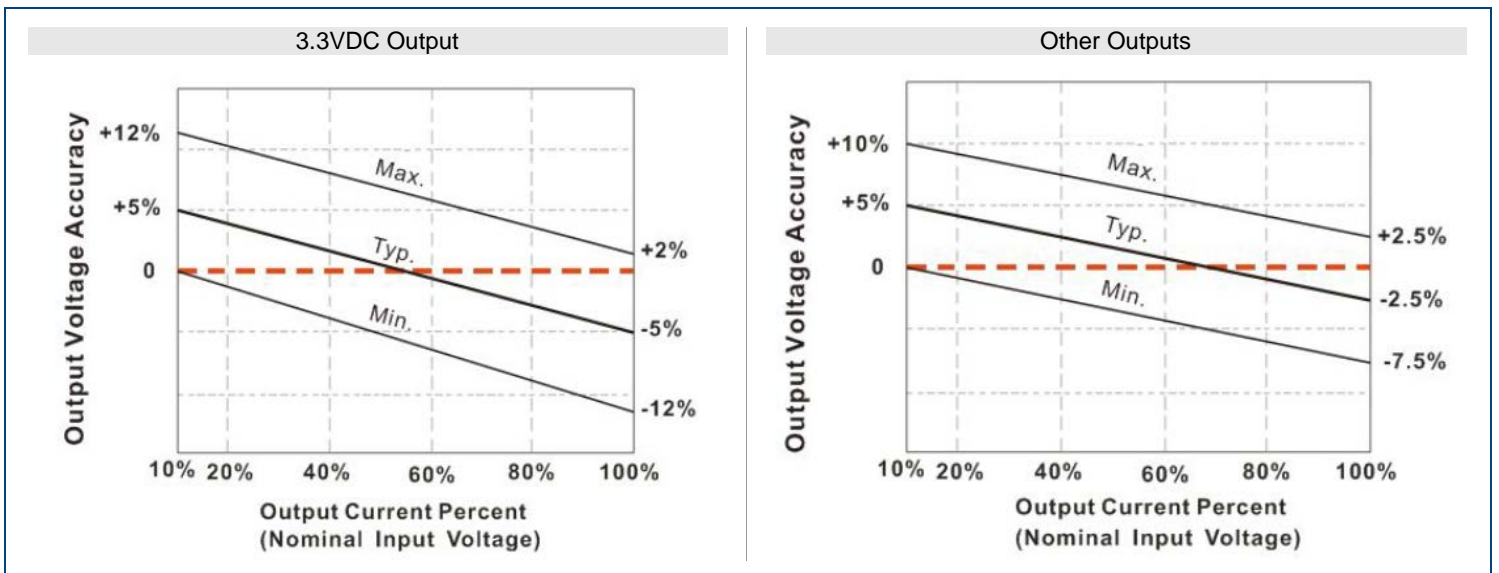
SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
<b>PROTECTION</b>					
Short Circuit Protection		Continuous, Self-Recovery			
<b>ENVIRONMENTAL SPECIFICATIONS</b>					
Operating Temperature	Derating if the temperature $\geq 85^{\circ}\text{C}$	-40		105	$^{\circ}\text{C}$
Storage Temperature		-55		125	$^{\circ}\text{C}$
Case Temperature Rise	Ta=25°C	3.3VDC Output		25	$^{\circ}\text{C}$
		Other Outputs		15	
Storage Humidity	Non-Condensing			95	%RH
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds			300	$^{\circ}\text{C}$
Cooling Method		Free Air Convection			
MTBF	MIL-HDBK-217F@25°C	3500			kHours
<b>GENERAL SPECIFICATIONS</b>					
Efficiency	@Full Load	See Table			
Switching Frequency	100% Load, Nominal Input Voltage		270		KHz
Insulation Voltage	Input-Output, with test time of 1 minute & leak current lower than 1mA	1500			VDC
	Input-Output, with test time of 1 second & leak current lower than 1mA	3000			
Insulation Resistance	Input-Output, Insulation Voltage 500VDC	1000			MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V		20		pF
<b>PHYSICAL SPECIFICATIONS</b>					
Weight		0.046oz (1.3g)			
Dimensions (L x W x H)		0.46in x 0.24in x 0.4in (11.60mm x 6mm x 10.16mm)			
Case Material		Black Flame-Retardant and Heat-Resistance Plastic (UL94 V-0)			
<b>SAFETY CHARACTERISTICS</b>					
Safety (Pending)		UL62368, EN62368			
EMI	CE	CISPR32/EN55032			Class B <sup>(2)</sup>
	RE	CISPR32/EN55032			Class B <sup>(2)</sup>
EMS	ESD	IEC/EN61000-4-2	Air $\pm 8\text{kV}$ , Contact $\pm 6\text{kV}$		Perf. Criteria B

**NOTES**

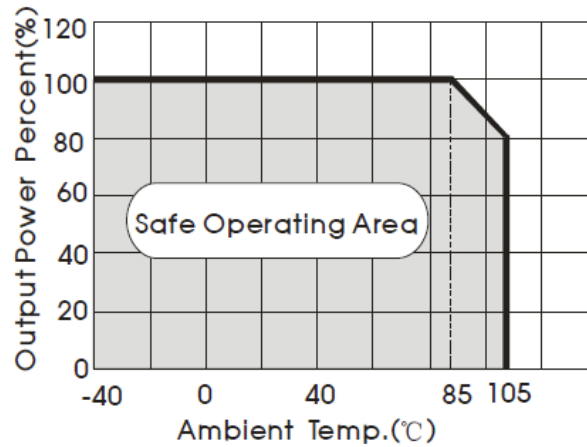
1. Ripple and noise tested with "parallel cable" method.
2. See Design Reference: EMC Solution for recommended circuit.
3. If product is not operated within required load range, the product's performance cannot be guaranteed to comply with all parameters in data sheet.
4. Customization service is available, please contact factory.

\*Due to advances in technology, specifications subject to change without notice.

**TOLERANCE ENVELOPE CURVES**

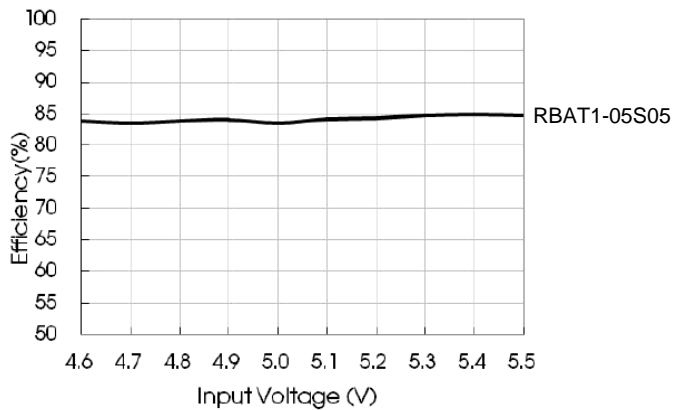


DERATING CURVES

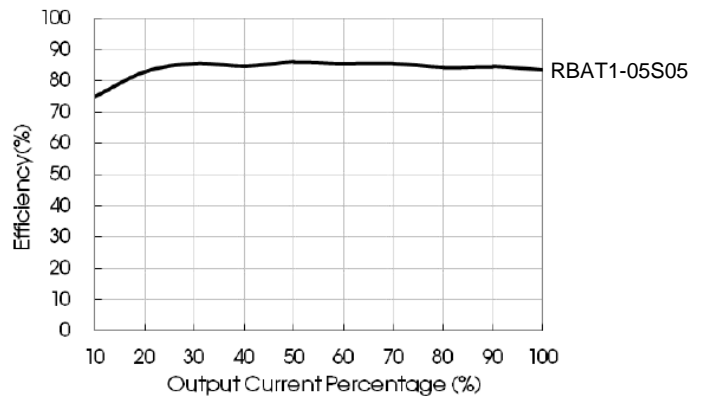


EFFICIENCY GRAPHS

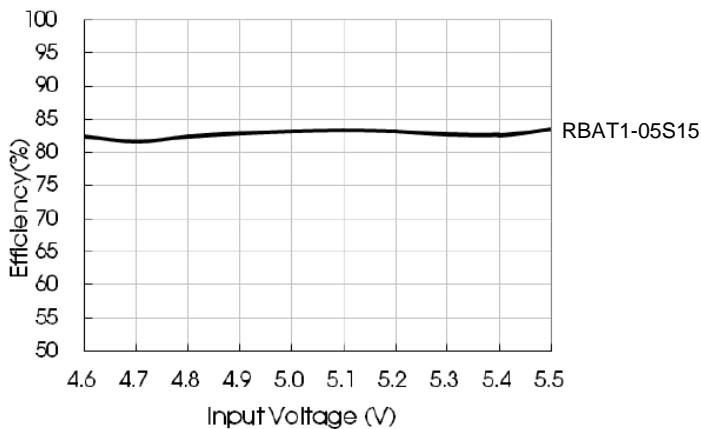
Efficiency vs. Input Voltage (Full Load)



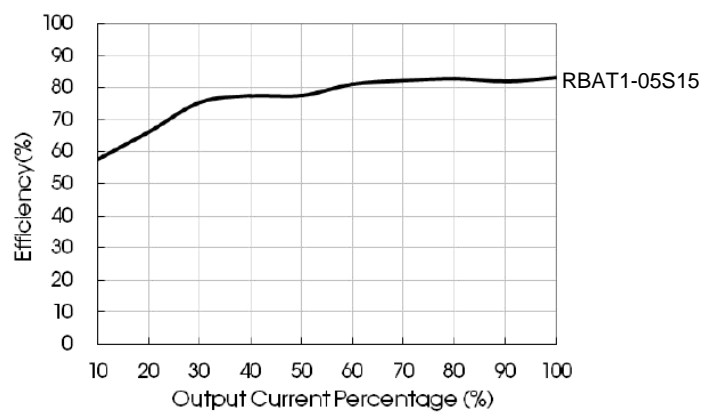
Efficiency vs. Output Load (Vin=5V)



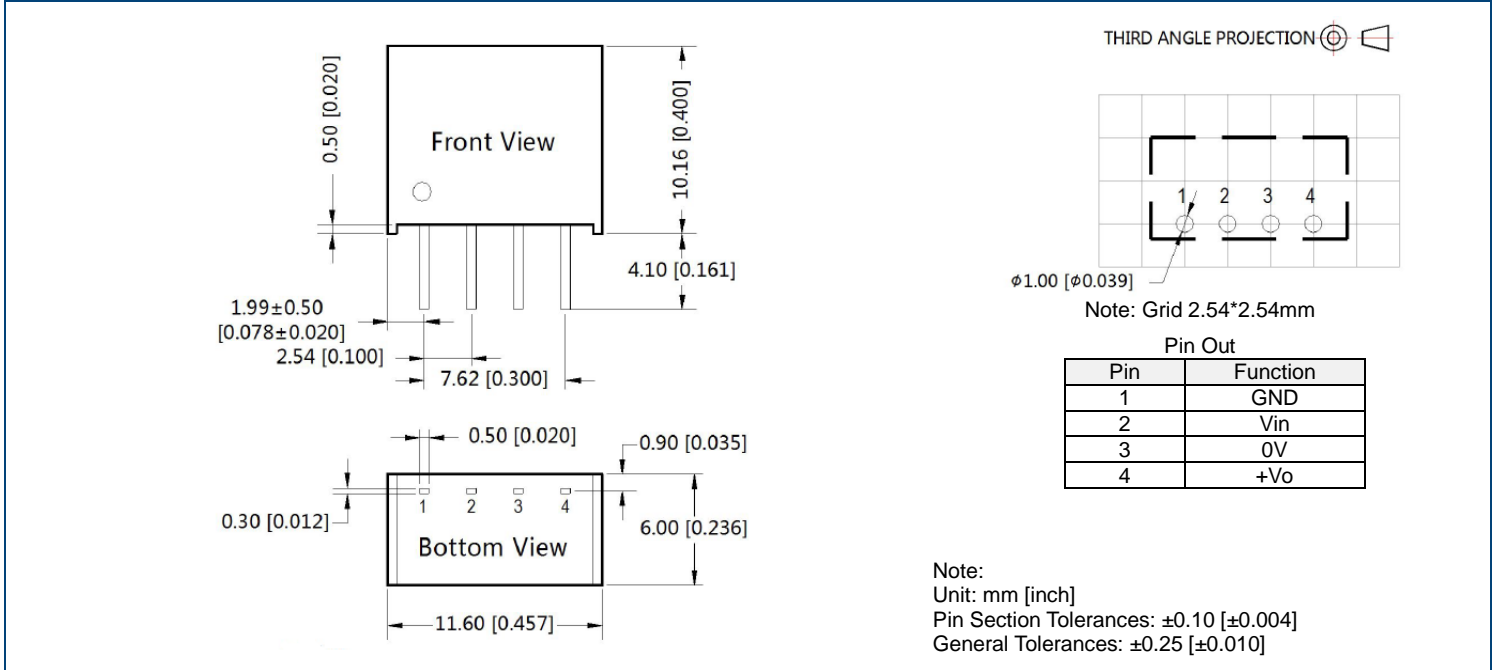
Efficiency vs. Input Voltage (Full Load)



Efficiency vs. Output Load (Vin=5V)



MECHANICAL DRAWINGS



DESIGN REFERENCE

1. Typical Application

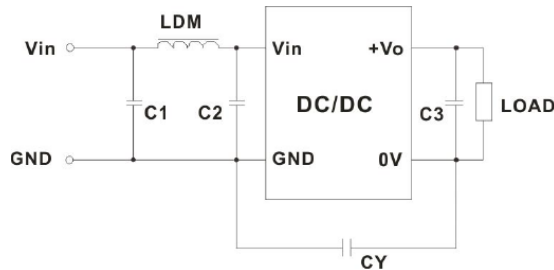
If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals (see figure below). Moreover, choosing suitable filter capacitor is very important, start-up problems may be caused by too large capacitance. To ensure modules are running well, the recommended capacitive load values are shown in table below.



Recommended Capacitive Load Value Table

Vin (VDC)	Cin ( $\mu$ F)	Vout (VDC)	Cout ( $\mu$ F)
5	4.7	3.3/5	10
-	-	9/12	2.2
-	-	15/24	1

2. EMC Solution-Recommended Circuit



EMC Recommended Circuit Value Table

Input Voltage 5VDC	Output Voltage (VDC)		
	EMI	3.3/5/9	12/15/24
C1/C2		4.7 $\mu$ F/25V	
CY		-	
C3		Refer to Cout in Capacitive Load Value Table	
	LDM	6.8 $\mu$ H	6.8 $\mu$ H

Note: In case of actual use, the requirements for EMI are high, it is subject to CY.

---

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎ (603)778-2300  
Toll Free: ☎ (888)597-9255  
Fax: ☎ (603)778-9797  
E-mail: [sales@wallindustries.com](mailto:sales@wallindustries.com)  
Web: [www.wallindustries.com](http://www.wallindustries.com)  
Address: 37 Industrial Drive  
Exeter, NH 03833