



Size: 0.50in x 0.44in x 0.29in
(12.7mm x 11.2mm x 7.25mm)

FEATURES

- Fixed Input Voltage
- Isolated & Unregulated Single Outputs
- Compact SMD Package
- Internal Surface Mounted Design
- International Standard Pin-Out
- Continuous Short Circuit Protection
- No External Component Required
- RoHS Compliant

APPLICATIONS

- Industrial Robotics
- Where Isolated Voltage is Required
- Distributed Power System
- Voltage of Input Power Supply is Stable (Voltage Variation: $\pm 10\%V_{in}$)
- Isolation Between Input & Output is Necessary (Isolation voltage $\leq 1500VDC$)
- Output Voltage Regulation and Ripple & Noise of Output Voltage is Not Strictly Required
- Digital Circuit Condition, Normal Low-Frequency Artificial Circuit Condition, Relay Drive Circuit Condition etc.

DESCRIPTION

The RBAX1 series of DC/DC converters offers 1 watt of power in a very compact 0.5" x 0.44" x 0.29" SMD package. This series consists of isolated and unregulated single output models with fixed input voltage ranges. Features of this series consist of continuous short circuit protection, internal surface mounted design, as well as international standard pin-out. This series is RoHS compliant and is protected against short circuit conditions. Please contact factory for order details.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency @ Full Load		Load Regulation	Certification	Maximum Capacitive Load	Output Power
			Min Load	Max Load	Min.	Typ.				
RBAX1-033S03	3.3VDC (2.97~3.63VDC)	3.3VDC	30mA	303mA	65%	69%	18%	CE	220µF	1 Watt
RBAX1-033S05		5VDC	20mA	200mA	70%	74%	12%	UL/CE		
RBAX1-033S09		9VDC	12mA	111mA	76%	80%	8%	-		
RBAX1-033S12		12VDC	9mA	84mA	76%	80%	7%	CE		
RBAX1-033S15		15VDC	7mA	67mA	76%	80%	6%			
RBAX1-033S24		24VDC	4mA	42mA	76%	80%	5%			
RBAX1-05S03	5VDC (4.5~5.5VDC)	3.3VDC	30mA	303mA	68%	72%	18%	UL/CE	220µF	1 Watt
RBAX1-05S05		5VDC	20mA	200mA	76%	80%	12%			
RBAX1-05S06		6VDC	17mA	167mA	76%	80%	10%			
RBAX1-05S09		9VDC	12mA	111mA	76%	80%	8%			
RBAX1-05S12		12VDC	9mA	84mA	76%	80%	7%			
RBAX1-05S15		15VDC	7mA	67mA	76%	80%	6%			
RBAX1-05S24	24VDC	4mA	42mA	76%	80%	5%				
RBAX1-12S03	12VDC (10.8~13.2VDC)	3.3VDC	30mA	303mA	68%	72%	18%	UL/CE	220µF	1 Watt
RBAX1-12S05		5VDC	20mA	200mA	76%	80%	12%			
RBAX1-12S09		9VDC	12mA	111mA	76%	80%	8%			
RBAX1-12S12		12VDC	9mA	84mA	76%	80%	7%			
RBAX1-12S15		15VDC	7mA	67mA	76%	80%	6%			
RBAX1-12S24		24VDC	4mA	42mA	76%	80%	5%			
RBAX1-15S05	15VDC (13.5~16.5VDC)	5VDC	20mA	200mA	76%	80%	12%	CE	220µF	1 Watt
RBAX1-15S09		9VDC	12mA	111mA	76%	80%	8%	-		
RBAX1-15S15		15VDC	7mA	67mA	76%	80%	6%	CE		
RBAX1-24S03	24VDC (21.6~26.4VDC)	3.3VDC	30mA	303mA	67%	71%	18%	-	220µF	1 Watt
RBAX1-24S05		5VDC	20mA	200mA	76%	80%	12%	UL/CE		
RBAX1-24S09		9VDC	12mA	111mA	76%	80%	8%			
RBAX1-24S12		12VDC	9mA	84mA	76%	80%	7%			
RBAX1-24S15		15VDC	7mA	67mA	76%	80%	6%	UL/CE		
RBAX1-24S24		24VDC	4mA	42mA	76%	80%	5%			

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
INPUT SPECIFICATIONS							
Input Voltage Range	3.3VDC Nominal Input Models		2.97	3.3	3.63		VDC
	5VDC Nominal Input Models		4.5	5	5.5		
	12VDC Nominal Input Models		10.8	12	13.2		
	15VDC Nominal Input Models		13.5	15	16.5		
	24VDC Nominal Input Models		21.6	24	26.4		
Full Load Input Current	3.3VDC Nominal Input Models			404			mA
	5VDC Nominal Input Models			250			
	12VDC Nominal Input Models			104			
	15VDC Nominal Input Models			82			
	24VDC Nominal Input Models			52			
No Load Input Current	3.3VDC Nominal Input Models			25	70		mA
	5VDC Nominal Input Models			20	60		
	12VDC Nominal Input Models			15	50		
	15VDC Nominal Input Models			10	35		
	24VDC Nominal Input Models			7	30		
Reflected Ripple Current				15			mA
Surge Voltage	1 Sec. Max.	3.3VDC Nominal Input Models	-0.7		5		VDC
		5VDC Nominal Input Models	-0.7		9		
		12VDC Nominal Input Models	-0.7		18		
		15VDC Nominal Input Models	-0.7		21		
		24VDC Nominal Input Models	-0.7		30		
Input Filter			Filter Capacitor				
OUTPUT SPECIFICATIONS							
Output Voltage			See Table				
Voltage Accuracy			See Tolerance Envelope Curves				
Line Regulation	Input Voltage Change: ±1%	3.3VDC Output Other Outputs			±1.5 ±1.2		-
Load Regulation	10%-100% Load		See Table				
Output Power			See Table				
Output Current			See Table				
Maximum Capacitive Load	Tested at input voltage range and full load		See Table				
Ripple & Noise ⁽¹⁾	20MHz Bandwidth			60	150		mVp-p
Temperature Coefficient	Full Load				±0.03		%/°C
PROTECTION							
Short Circuit Protection ⁽²⁾	3.3VDC Nominal Input, 24VDC Nominal Input, & RBAX1-05S24 Model Others				1		S Continuous, Self-Recovery
ENVIRONMENTAL SPECIFICATIONS							
Operating Temperature	Derating if temperature ≥100°C		-40		+105		°C
Storage Temperature			-55		+125		°C
Case Temperature Rise	Ta=25°C, Nominal Input, Full Load Output			25			°C
Storage Humidity	Non-Condensing				95		%RH
Pin Welding Resistance Temperature	Welding Spot is 1.5mm away from the casing, 10 seconds				300		°C
Reflow Soldering Temperature ⁽³⁾	Peak Temperature		≤245°C				
	Maximum Duration Time		≤60s at 217°C				
Cooling Method			Free Air Convection				
MTBF	MIL-HDBK-217F @25°C		3500				K Hours
GENERAL SPECIFICATIONS							
Efficiency	@Full Load		See Table				
Switching Frequency	Full Load, Nominal Input Voltage			100			KHz
Isolation Voltage	Input-Output, test time of 1 minute & leak current lower than 1mA		1500				VDC
Isolation Resistance	Input-Output, Isolation Voltage 500VDC		1000				MΩ
Isolation Capacitance							
PHYSICAL SPECIFICATIONS							
Weight			0.057oz (1.6g)				
Dimensions (L x W x H)			0.50in x 0.44in x 0.29in (12.70mm x 11.20mm x 7.25mm)				
SAFETY CHARACTERISTICS							
EMI	CE		CISPR22/EN55022				Class B ⁽⁴⁾
	RE		CISPR22/EN55022				Class B ⁽⁴⁾
EMS	ESD	IEC/EN61000-4-2	Contact				Perf. Criteria B

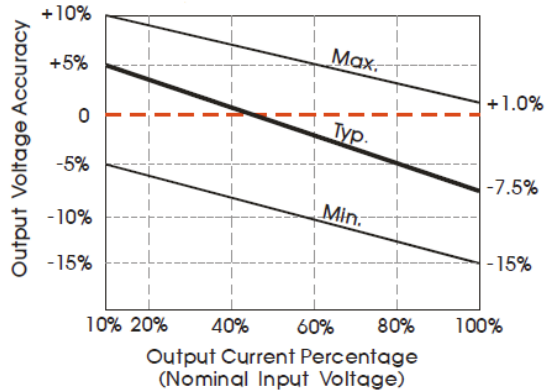
NOTES

1. Ripple and Noise are measured by "parallel cable" method.
2. Supply voltage must be discontinued at end of short circuit duration for 3.3VDC Nominal Input Models, 24VDC Nominal Input Models, & RBAX1-05S24 model.
3. For actual application, please refer to IPC/JEDEC J-STD-020D.1
4. See Design Reference: EMC Solution for recommended circuit.
5. If product is not operated with in required load range, product performance cannot be guaranteed to comply with parameters in data sheet.
6. Customization is available, please contact factory.
7. This product is Listed to applicable standards and requirements by UL.

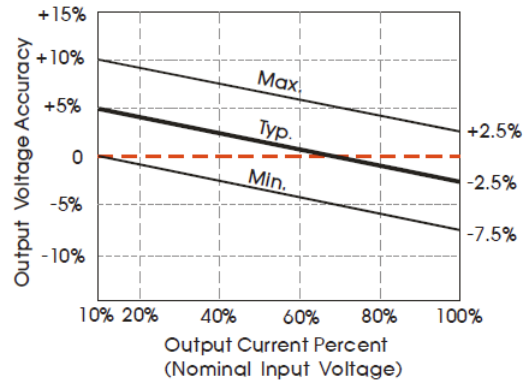
**Due to advances in technology, specifications subject to change without notice.*

CHARACTERISTIC CURVES

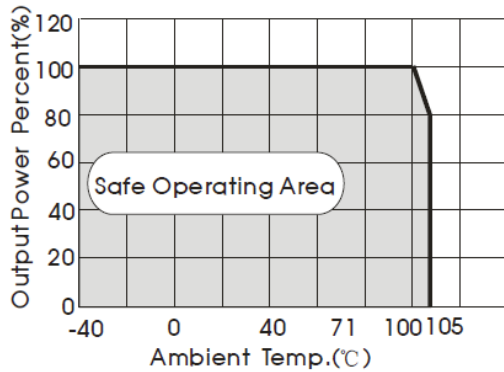
3.3VDC Output Tolerance Envelope Curve



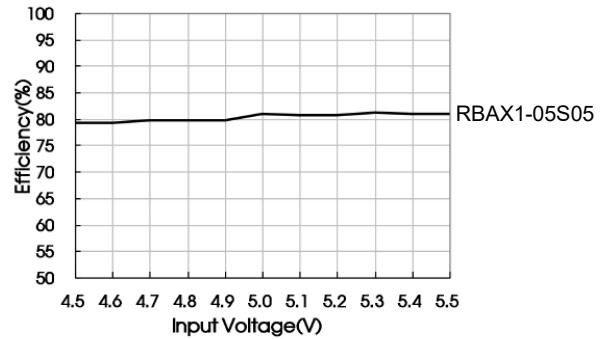
Other Outputs Tolerance Envelope Curve



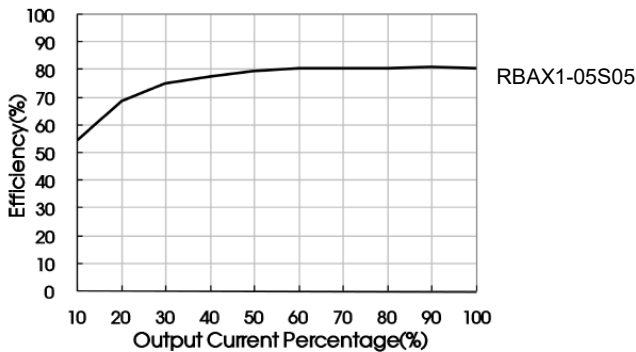
Temperature Derating Curve



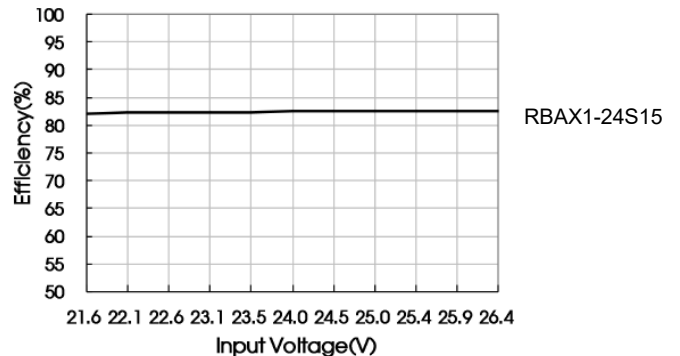
Efficiency vs Input Voltage (Full Load)



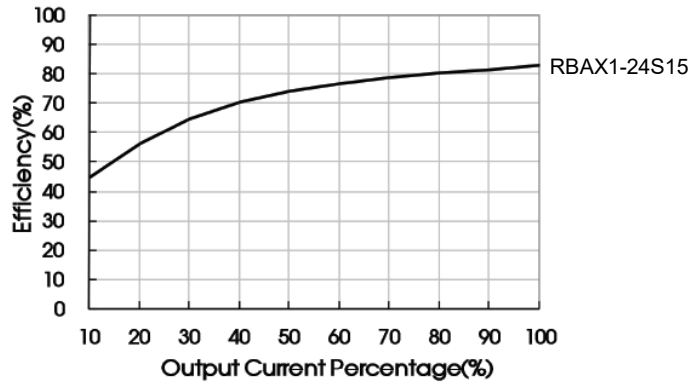
Efficiency vs. Input Voltage Load (Vin=5V)



Efficiency vs. Input Voltage (Full Load)



Efficiency vs. Output Load (Vin=24V)



MECHANICAL DRAWINGS

THIRD ANGLE PROJECTION

Top View dimensions:
 Total width: 12.70 ± 0.50 [0.500 ± 0.020]
 Pin 8 to Pin 5 distance: 7.62 [0.300]
 Pin 1 to Pin 2 distance: 0.60 [0.024]
 Pin 2 to Pin 4 distance: 2.54 [0.100]
 Pin 1 to Pin 4 distance: 11.20 ± 0.30 [0.441 ± 0.012]
 Pin 1 to Pin 5 distance: 8.30 [0.327]

Front View dimensions:
 Total height: 7.25 [0.285]
 Pin height: 7.00 [0.276]

Right View dimensions:
 Pin height: 0.88 [0.035]

Detail A: Corner fillet radius 0.25 [0.010] with a $\pm 5^\circ$ chamfer.

THIRD ANGLE PROJECTION (Inset):
 Pin 1 to Pin 2 distance: 1.00 [0.039]
 Pin 2 to Pin 4 distance: 2.54 [0.100]
 Pin 1 to Pin 5 distance: 2.10 [0.083]
 Pin 1 to Pin 8 distance: 7.62 [0.300]
 Pin 2 to Pin 5 distance: 12.20 [0.480]

Note: Grid 2.54*2.54mm
Pin Out

Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: No Connection

Note:
 Unit: mm[inch]
 Pin section tolerances: ± 0.10 [±0.004]
 General Tolerances: ± 0.25 [±0.010]

DESIGN REFERENCE

1. Typical Application Circuit

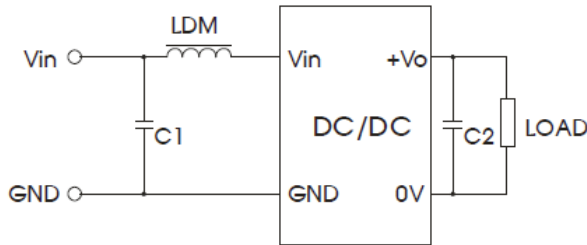
If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals (see below). Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in table below.



Recommended Capacitive Load Value Table

Vin (VDC)	Cin (µF)	Vo (VDC)	Cout (µF)
3.3	4.7	3.3	10
5	4.7	5/6	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1
-	-	24	0.47

2. EMC Solution-Recommended Circuit



Input Voltage (VDC)		3.3/5/12/15/24
EMI	C1	4.7µF/50V
	C2	Refer to the Cout in Typical Application Circuit Above
	LDM	6.8µH

3. Output Load Requirements

In order to ensure converter can work reliably with high efficiency, the minimum load should not be less than 10% rated load when it is used. If needed power is indeed small, please parallel a resistor on the output side (the sum of the efficient power and resistor consumption is no less than 10%)

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: 2015 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.

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