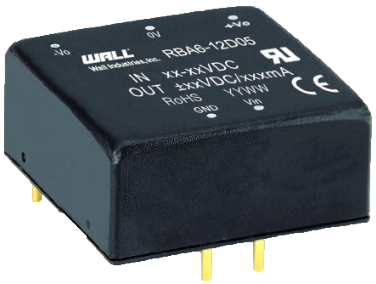


cULus CE CB Patent Protection RoHS

Size: 1in x 1in x 0.46in (25.4 x 25.4 x 11.7mm)

FEATURES

- Wide 2:1 Input Voltage Range
- High Efficiency
- Isolated Converter in YMD Package
- No Load power consumption as low as 0.12W
- I/O Test Isolation Voltage of 1.5kVDC
- Industry Standard Pin-Out
- RoHS Compliant
- Input Under Voltage Protection
- Output Over Voltage, Over Current, and Short Circuit Protection
- Meets CISPR32/EN55032 Class A without Extra Components
- IEC60950, UL60950, and EN60950 Approval

APPLICATIONS

- Industrial Robotics
- Communications
- Medical Care

DESCRIPTION

The RBA6 series of DC/DC converters offers 6 watts of output power in a 1" x 1" x 0.46" through hole package. This series consists of isolated dual and single output models with a wide 2:1 input voltage range. Features of this series include high efficiency, I.O test isolation voltage of 1.5kVDC, and protection against input under voltage and output over voltage, over current, and short circuit conditions. This series has IEC60950, UL60950, and EN60950 approvals and is RoHS compliant.

MODEL SELECTION TABLE

Single Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency[1]		Maximum Capacitive Load[2]	Certification	Ripple & Noise	Output Power
			Min Load	Max Load	Min.	Typ.				
RBA6-12S05	12VDC (9~18VDC)	5VDC	0mA	1200mA	79%	81%	1000µF	CE	60mVp-p	6W
RBA6-12S12		12VDC	0mA	500mA	83%	85%	470µF	CE		
RBA6-24S03	24VDC (18~36VDC)	3.3VDC	0mA	1500mA	75%	77%	1800µF	CE	60mVp-p	6W
RBA6-24S05		5VDC	0mA	1200mA	80%	82%	1000µF	CE		
RBA6-24S09		9VDC	0mA	667mA	83%	85%	470µF	-		
RBA6-24S12		12VDC	0mA	500mA	83%	85%	470µF	CE		
RBA6-24S15		15VDC	0mA	400mA	84%	86%	220µF	CE		
RBA6-24S24		24VDC	0mA	250mA	83%	85%	100µF	CE		
RBA6-48S03	48VDC (36-756VDC)	3.3VDC	0mA	1500mA	77%	79%	1800µF	-	60mVp-p	6W
RBA6-48S05		5VDC	0mA	1200mA	81%	83%	1000µF	-		
RBA6-48S12		12VDC	0mA	500mA	85%	87%	470µF	-		
RBA6-48S15		15VDC	0mA	400mA	86%	88%	220µF	-		
RBA6-48S24		24VDC	0mA	250mA	86%	88%	100µF	-		

MODEL SELECTION TABLE

Dual Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current		Efficiency[1]		Maximum Capacitive Load[2]	Certification	Ripple & Noise	Output Power
			Min Load	Max Load	Min.	Typ.				
RBA6-12D05	12VDC (9~18VDC)	±5VDC	0mA	±600mA	79%	81%	470µF	UL/CE/CB	60mVp-p	6W
RBA6-12D12		±12VDC	0mA	±250mA	83%	85%	100µF	UL/CE/CB		
RBA6-12D15		±15VDC	0mA	±200mA	81%	83%	100µF	-		
RBA6-24D05	24VDC (18~36VDC)	±5VDC	0mA	±600mA	81%	83%	470µF	UL/CE/CB	60mVp-p	6W
RBA6-24D12		±12VDC	0mA	±250mA	85%	87%	100µF	UL/CE/CB		
RBA6-24D15		±15VDC	0mA	±200mA	85%	87%	100µF	UL/CE/CB		

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	12VDC Nominal Input		9	12	18	VDC
	24VDC Nominal Input		18	24	36	
	48VDC Nominal Input		36	48	75	
Maximum Input Voltage[3]	12VDC Nominal Input				20	VDC
	24VDC Nominal Input				40	
	48VDC Nominal Input				80	
Full Load Input Current	12VDC Nominal Input			603	633	mA
	24VDC Nominal Input	3.3VDC Output		268	275	
		Other Models		296	313	
	48VDC Nominal Input	3.3VDC Output		130	134	
		Other Models		150	155	
No Load Input Current	12VDC Nominal Input			10	22	mA
	24VDC Nominal Input	3.3VDC Output		5	15	
		Other Models		5	15	
	48VDC Nominal Input	3.3VDC Output		4	8	
		Other Models		4	8	
Reflected Ripple Current				20		mA
Surge Voltage (1 sec. max.)	12VDC Nominal Input		-0.7		25	VDC
	24VDC Nominal Input		-0.7		50	
	48VDC Nominal Input		-0.7		100	
Start-up Voltage	12VDC Nominal Input				9	VDC
	24VDC Nominal Input				18	
	48VDC Nominal Input				36	
Input Under-Voltage Protection	12VDC Nominal Input		5.5	6.5		VDC
	24VDC Nominal Input		12	15.5		
	48VDC Nominal Input		26	30		
Input Filter			Pi Filter			
Hot Plug			Unavailable			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	5%-100% Load			±1	±3	%
	0%-5% Load	±5VDC Output		±2	±5	
		Others		±1	±3	
Line Regulation[4]	Input voltage variation from low to high at full load	Vo1		±0.2	±0.5	%
		Vo2		±0.5	±1	
Load Regulation	5%-100% Load	Vo1		±0.5	±1	%
		Vo2		±0.5	±1.5	
Cross Regulation	Vo1 load at 50%. Vo2 load at range of 10%-100%				±5	%
Output Power			See Table			
Output Current			See Table			
Maximum Capacitive Load	Tested at input voltage range and full load		See Table			
Ripple & Noise[5]	20MHz bandwidth, 5%-100% Load			60	85	mVp-p
Transient Recovery Time	25% Load Step Change			300	500	µs
Transient Response Deviation	25% Load Step Change	3.3VDC, 5VDC, & ±5VDC Outputs		±5	±8	%
		Other Models		±3	±5	
Temperature Coefficient	Full Load				±0.03	%/°C
No Load Power Consumption			0.12			W
PROTECTION						
Short Circuit Protection	Input Voltage Range		Continuous, Self-Recovery			
Over Current Protection	Input Voltage Range		110	140	190	%Io
Over Voltage Protection	Input Voltage Range		110		160	%Vo
ENVIRONMENTAL SPECIFICATIONS						
Operating Temperature	See derating curve		-40		+85	°C
Storage Temperature			-55		+125	°C
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away for case for 10 seconds				+300	°C
Storage Humidity	Non-Condensing		5		95	%RH
Vibration			10-55Hz, 2G, 30 Min. along X, Y, and Z			
MTBF	MIL-HDBK-217F @25°C		1000			KHours

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.

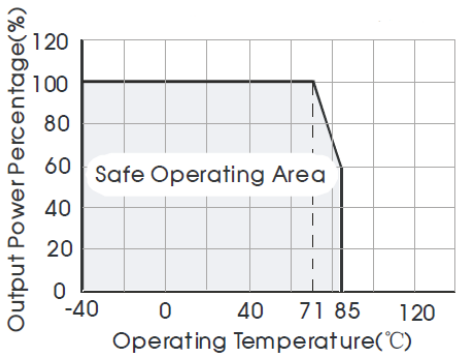
SPECIFICATION	TEST CONDITIONS			Min	Typ	Max	Unit
GENERAL SPECIFICATIONS							
Efficiency	Full Load				See Table		
Switching Frequency[6]	PWM Mode				300		kHz
Isolation	Input-Output Electric Strength Test for 1 minute with a leakage current of 1mA max			1500			VDC
Insulation Resistance	Input-Output, resistance of 500VDC			1000			MΩ
Isolation Capacitance	Input-Output capacitance at 100KHz/0.1V				1000		pF
PHYSICAL SPECIFICATIONS							
Weight	Through Hole				0.44oz (12.5g)		
Dimensions (L x W x H)	Through Hole				1in x 1in x 0.46in (25.4mm x 25.4mm x 11.7mm)		
Case Material					Aluminum Alloy		
Cooling Method					Free Air Convection		
SAFETY CHARACTERISTICS							
Safety Approvals	IEC60950, UL60950[7], EN60950						
EMI	CE	12VDC & 24VDC Nominal Input	CISPR32/EN55032		Class A (without external components) Class B[8]		
		48VDC Nominal Input	CISPR32/EN55032		Class B[8]		
	RE	12VDC & 24VDC Nominal Input	CISPR32/EN55032		Class A (without external components) Class B[8]		
		48VDC Nominal Input	CISPR32/EN55032		Class B[8]		
Immunity	EMS	IEC/EN61000-4-2	Contact ±4kV		Perf. Criteria B		
	RS	IEC/EN61000-4-3	10V/m		Perf. Criteria A		
	EFT	IEC/EN61000-4-4	±2kV[8]		Perf. Criteria B		
	Surge	IEC/EN61000-4-5	Line to Line ±2kV[8]		Perf. Criteria B		
	CS	IEC/EN61000-4-6	3 Vr.m.s		Perf. Criteria A		
	Voltage Dips, Short Interruptions & Voltage Variations Immunity	IEC/EN61000-4-29	0%, 70%		Perf. Criteria B		

NOTES

1. Efficiency is measured in nominal input voltage and rated output load.
2. Capacitive load of positive and negative outputs are identical
3. Exceeding maximum input voltage may cause permanent damage.
4. Load regulation for 0%-100% load is ±5%.
5. Ripple & noise at ≤5% is 5%Vo Max. The "parallel cable" method is used for Ripple and Noise test. Contact factory for more information
6. Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.
7. This product is Listed to applicable standards and requirements by UL.
8. See Design Reference for recommended circuit.
9. Recommended unbalanced degree of the dual output module load is ≤±5%. If the degree exceeds ±5%, then the product performance cannot be guaranteed to comply with all parameters in the datasheet. Please contact factory for more information.
10. Maximum capacitive load offered were tested at input voltage range and full load.
11. Customization is available, please contact factory.
12. Our products should be classified according to ISO14001 and related environmental laws and regulations, and should be handled by qualified units.

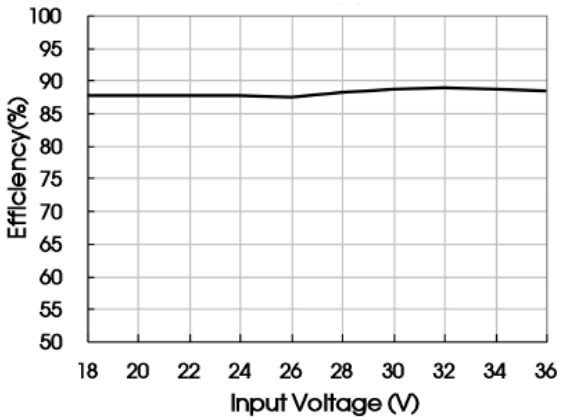
**Due to advances in technology, specifications subject to change without notice.*

TEMPERATURE DERATING CURVE

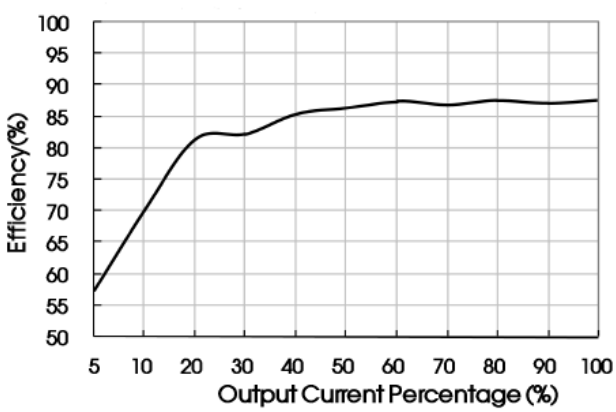


EFFICIENCY GRAPHS

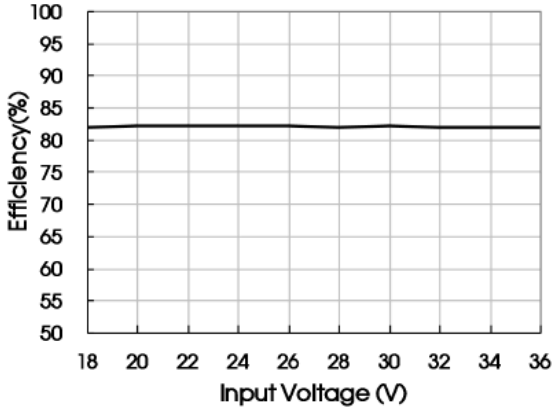
Efficiency vs. Input Voltage (Full Load) RBA6-24D15



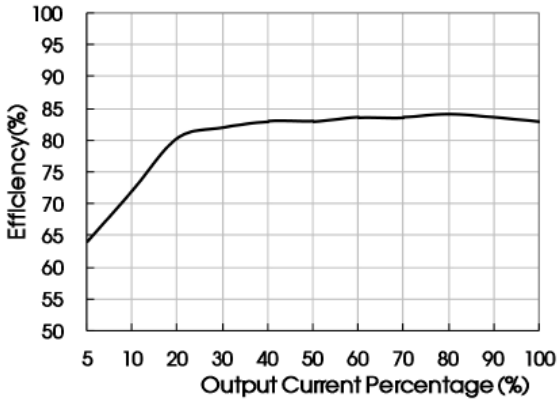
Efficiency vs. Output Load (Vin=24V) RBA6-24D15



Efficiency vs. Input Voltage (Full Load) RBA6-24S05

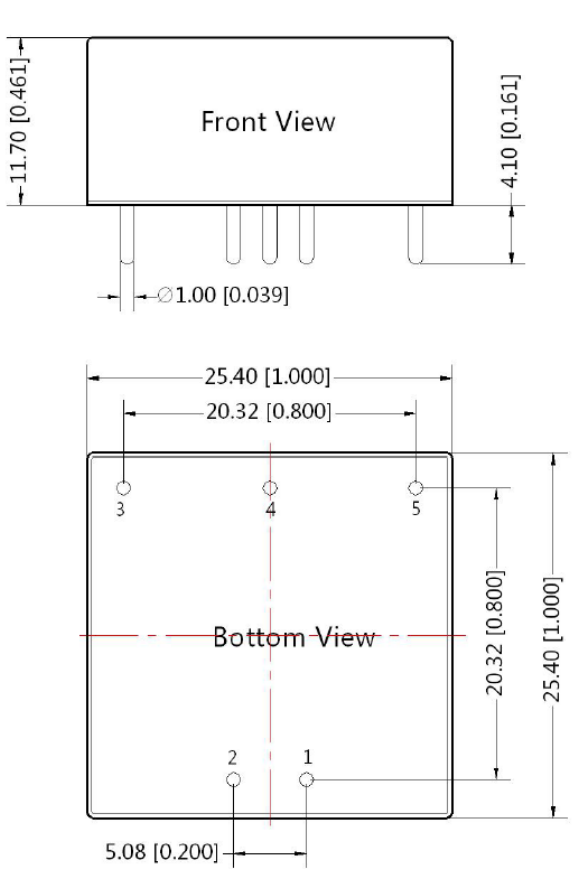


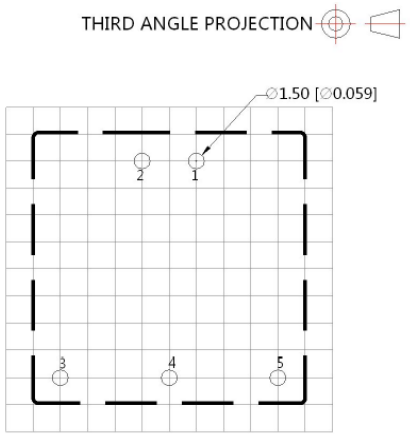
Efficiency vs. Output Load (Vin=24V) RBA6-24S05



MECHANICAL DRAWINGS

Through Hole





Note: Grid 2.54*2.54mm

Pin Out

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo

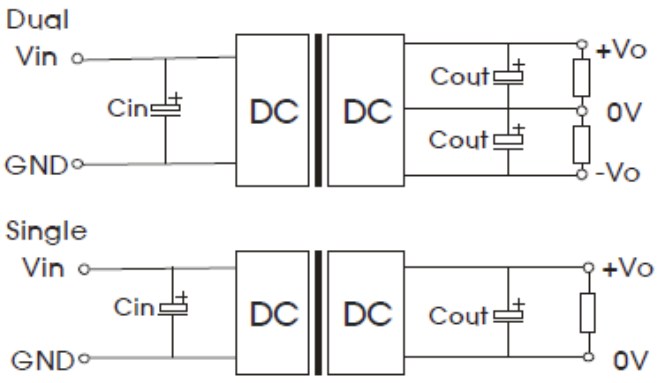
Note:
Unit: mm [inch]
Pin diameter tolerances: ±0.10 [±0.004]
General Tolerances: ±0.50 [±0.020]

DESIGN REFERENCE

1. Typical Application Circuit

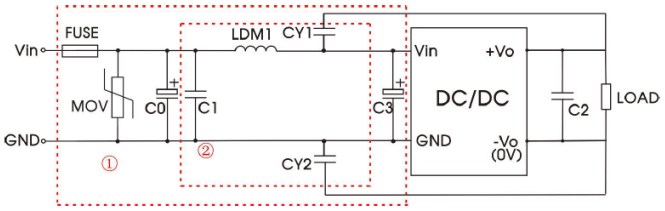
All the DC/DC converters in this series are tested according to the recommended circuit (below) before delivery.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.



Vin (VDC)	Cin(uF)	Cout(uF)
12	100	10
24	10-47	
48	100	

2. EMC Solution-Recommended Circuit



Notes: Part ① in the above figure is used for immunity and part ② for emissions test; selected based on needs.

Parameter Description

Model	Vin: 12V	Vin: 24V	Vin: 48V
FUSE	Choose according to actual input current		
MOV	S14K20	S20K30	14D101K
C0	1000μF/35V	1000μF/50V	330uF/100V
C1	1μF/50V		4.7uF/100V
C2	Refer to the Cout in Typ. Application Circuit		
C3	330μF/35V	330μF/50V	330μF/100B
LDM1	4.7μH		
CY1/CY2	1nF/2KV		

3. Products do not support parallel connection of their outputs

MODEL NUMBER SETUP

RBA	6	-	12	S	05
Series Name	Output Power		Input Voltage	Output Quantity	Ouptut Voltage
			12: 9~18VDC	**S:** Single	**3.3:** 3.3VDC
			24: 18~36VDC		**5:** 5VDC
			48: 36~75VDC		**9:** 9VDC
					12: 12VDC
					15: 15VDC
					24: 24VDC
				D: Dual	**5:** ±5VDC
					12: ±12VDC
					15: ±15VDC

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.

Contact **Wall Industries** for further information:

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