

## Wall Industries, Inc.

### RGUW3 SERIES

**4:1 Ultra Wide Input Voltage Range  
DIP and SMT Packages  
Single and Dual Outputs  
3 Watt DC/DC Power Converters**



#### FEATURES

- 3 Watts Maximum Output Power
- Single and Dual Outputs
- SMT & DIP Packages: 0.74 x 0.50 x 0.33 Inches
- SMT Package Qualified for Lead Free Reflow Solder Process According to IPC J-STD-020D
- 4:1 Ultra Wide Input Voltage Range
- High Efficiency up to 83%
- 1600VDC I/O Isolation (3000VDC I/O Isolation Available)
- Low Ripple & Noise
- External ON/OFF Control
- Switching Frequency (100KHz, min)
- Continuous Short Circuit Protection
- UL94V-0 Package Materials
- CE Mark Meets 2006/95/EC, 93/68/EEC, and 2004/108EC
- UL60950-1, EN60950-1, and IEC60950-1 Safety Approvals (Pending)
- Compliant to RoHS EU Directive 2002/95/EC

#### APPLICATIONS

- Wireless Networks
- Telecom / Datacom
- Industry Control Systems
- Measurement Equipment
- Semiconductor Equipment

#### OPTIONS

- 3000VDC I/O Isolation (Suffix "H")
- Surface Mount Package (Suffix "S")

#### DESCRIPTION

The RGUW3 series of DC/DC power converters provides 3 watts of output power in a 0.74 x 0.50 x 0.33 inch DIP or SMT package without derating up to 71°C. This series has single and dual output models with 4:1 ultra wide input voltage ranges of 4.5-18VDC, 9-36VDC, and 18-75VDC. Some features include high efficiency, low ripple and noise, 3000VDC I/O isolation option, remote ON/OFF, and continuous short circuit protection. All models are RoHS compliant.

SPECIFICATIONS: RGUW3 Series							
All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted. We reserve the right to change specifications based on technological advances.							
SPECIFICATION	TEST CONDITIONS		Min	Nom	Max	Unit	
<b>INPUT SPECIFICATIONS</b>							
Input Voltage Range	12VDC nominal input models		4.5	12	18	VDC	
	24VDC nominal input models		9	24	36		
	48VDC nominal input models		18	48	75		
Input Surge Voltage (1 sec max)	12VDC nominal input models				25	VDC	
	24VDC nominal input models				50		
	48VDC nominal input models				100		
Input Reflected Ripple Current (See Note 6)	12VDC nominal input models			80		mAp-p	
	24VDC nominal input models			40			
	48VDC nominal input models			30			
Input Filter						Capacitor type	
<b>OUTPUT SPECIFICATIONS</b>							
Output Voltage						See Table	
Line Regulation	Low line to high line at full load		-0.2		+0.2	%	
Load Regulation	No load to full load		Single Output Models	-1.0	+1.0	%	
			Dual Output Models	-1.0	+1.0		
	10% load to 90% load		Single Output Models	-0.5	+0.5		
			Dual Output Models	-0.8	+0.8		
Cross Regulation (Dual Output Models)	Asymmetrical load 25% to 100% full load		-5		+5	%	
Voltage Accuracy	Full load an nominal Vin		-1		+1	%	
Output Power						3	W
Output Current						See Table	
Ripple & Noise (20MHz Bandwidth)	Nominal Vin and full load			30		mVp-p	
Transient Response Recovery Time	25% load step change			250		µs	
Start-Up Time	Nominal Vin and constant resistive load		Power Up		5	ms	
			Remote ON/OFF		5		
Minimum Load						0	%
Temperature Coefficient						-0.02	%/°C
<b>PROTECTION</b>							
Short Circuit Protection						continuous, automatic recovery	
<b>GENERAL SPECIFICATIONS</b>							
Efficiency	Nominal Vin and full load		See Table				
Switching Frequency	Full load to minimum load		100			KHz	
Isolation Voltage (Input to Output)	Standard		1600			VDC	
	Suffix "H"		3000				
Isolation Resistance			10			GΩ	
Isolation Capacitance	Standard				50	pF	
	Suffix "H" (See Note 9)				50		
<b>REMOTE ON/OFF (See Page 4 for application circuits)</b>							
Remote ON/OFF	DC/DC ON		Open or high impedance				
	DC/DC OFF		Control pin applied current 2 ~ 4mA max. (via 1KΩ)				
Remote Off State Input Current	Nominal Vin				2.5	mA	
<b>ENVIRONMENTAL SPECIFICATIONS</b>							
Operating Ambient Temperature	Without derating		-40		+71	°C	
	With derating		+71		+85		
Storage Temperature			-55		+125	°C	
Relative Humidity (non-condensing)			5		90	% RH	
Thermal Shock						MIL-STD-810F	
Vibration						MIL-STD-810F	
Lead-Free Reflow Solder Process						IPC J-STD-020D	
Moisture Sensitivity Level (MSL)						IPC J-STD-033B; Level 2A	
MTBF (See Note 1)	BELLCORE TR-NWT-000332				3,963,000 hours		
	MIL-HDBK-217F				1,707,000 hours		
<b>PHYSICAL SPECIFICATIONS</b>							
Weight						0.16oz (4.5g)	
Dimensions (L x W x H)						0.74 x 0.50 x 0.33 inches (18.9 x 12.8 x 8.4 mm)	
<b>SAFETY &amp; EMC CHARACTERISTICS</b>							
Safety Approvals (Pending)						IEC60950-1, UL60950-1, EN60950-1	
EMI (See Note 6)	EN55022		Class A				
ESD	EN61000-4-2		Air	±8KV		Perf. Criteria A	
			Contact	±6KV			
Radiated Immunity	EN61000-4-3		10 V/m		Perf. Criteria A		
Fast Transient (See Note 7)	EN61000-4-4		±2KV		Perf. Criteria A		
Surge (See Note 7)	EN61000-4-5		±1KV		Perf. Criteria A		
Conducted Immunity	EN61000-4-6		10 Vrms		Perf. Criteria A		

**MODEL SELECTION TABLES**

SINGLE OUTPUT MODELS										
Model Number	Input Voltage Range	Output Voltage	Output Current		Input Current		Output <sup>(4)</sup> Ripple & Noise	Output Power	Efficiency <sup>(4)</sup>	Maximum <sup>(5)</sup> Capacitive Load
			Min. Load	Full Load	No Load <sup>(3)</sup>	Full Load <sup>(2)</sup>				
RG12S3.3UW3	12 VDC (4.5 – 18 VDC)	3.3 VDC	0mA	700mA	35mA	271mA	30mVp-p	2.3W	75%	3300µF
RG12S5UW3		5 VDC	0mA	600mA	35mA	325mA	30mVp-p	3W	81%	1680µF
RG12S9UW3		9 VDC	0mA	333mA	35mA	329mA	30mVp-p	3W	80%	1000µF
RG12S12UW3		12 VDC	0mA	250mA	35mA	320mA	30mVp-p	3W	82%	820µF
RG12S15UW3		15 VDC	0mA	200mA	35mA	320mA	30mVp-p	3W	82%	680µF
RG24S3.3UW3	24 VDC (9 – 36 VDC)	3.3 VDC	0mA	700mA	20mA	136mA	30mVp-p	2.3W	75%	3300µF
RG24S5UW3		5 VDC	0mA	600mA	20mA	164mA	30mVp-p	3W	80%	1680µF
RG24S9UW3		9 VDC	0mA	333mA	20mA	164mA	30mVp-p	3W	80%	1000µF
RG24S12UW3		12 VDC	0mA	250mA	20mA	160mA	30mVp-p	3W	82%	820µF
RG24S15UW3		15 VDC	0mA	200mA	20mA	160mA	30mVp-p	3W	82%	680µF
RG48S3.3UW3	48 VDC (18 – 75 VDC)	3.3 VDC	0mA	700mA	13mA	68mA	30mVp-p	2.3W	75%	3300µF
RG48S5UW3		5 VDC	0mA	600mA	13mA	82mA	30mVp-p	3W	80%	1680µF
RG48S9UW3		9 VDC	0mA	333mA	13mA	82mA	30mVp-p	3W	80%	1000µF
RG48S12UW3		12 VDC	0mA	250mA	13mA	79mA	30mVp-p	3W	83%	820µF
RG48S15UW3		15 VDC	0mA	200mA	13mA	80mA	30mVp-p	3W	82%	680µF

DUAL OUTPUT MODELS										
Model Number	Input Voltage Range	Output Voltage	Output Current		Input Current		Output <sup>(4)</sup> Ripple & Noise	Output Power	Efficiency <sup>(4)</sup>	Maximum <sup>(5)</sup> Capacitive Load
			Min. Load	Full Load	No Load <sup>(3)</sup>	Full Load <sup>(2)</sup>				
RG12D5UW3	12 VDC (4.5 – 18 VDC)	±5 VDC	0mA	±300mA	40mA	333mA	30mVp-p	3W	79%	±1000µF
RG12D12UW3		±12 VDC	0mA	±125mA	40mA	320mA	30mVp-p	3W	82%	±470µF
RG12D15UW3		±15 VDC	0mA	±100mA	45mA	325mA	30mVp-p	3W	81%	±330µF
RG24D5UW3	24 VDC (9 – 36 VDC)	±5 VDC	0mA	±300mA	20mA	167mA	30mVp-p	3W	79%	±1000µF
RG24D12UW3		±12 VDC	0mA	±125mA	20mA	160mA	30mVp-p	3W	82%	±470µF
RG24D15UW3		±15 VDC	0mA	±100mA	20mA	162mA	30mVp-p	3W	81%	±330µF
RG48D5UW3	48 VDC (18 – 75 VDC)	±5 VDC	0mA	±300mA	13mA	83mA	30mVp-p	3W	79%	±1000µF
RG48D12UW3		±12 VDC	0mA	±125mA	13mA	80mA	30mVp-p	3W	82%	±470µF
RG48D15UW3		±15 VDC	0mA	±100mA	13mA	81mA	30mVp-p	3W	81%	±330µF

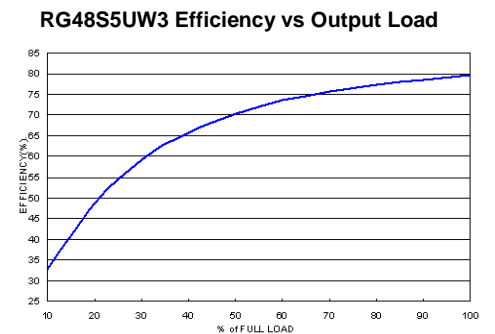
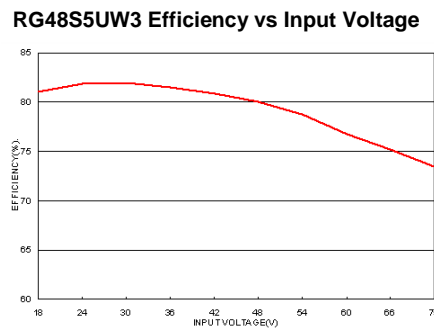
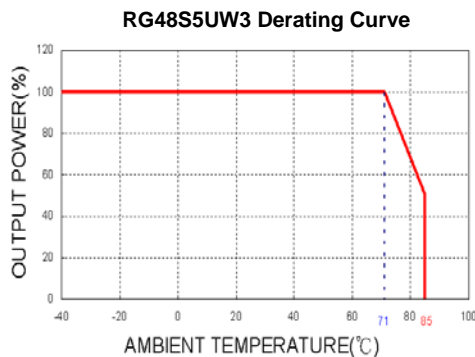
**NOTES**

1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.  
MIL-HDBK-217F Notice2 @Ta=25°C, Full load (Ground, Benign, controlled environment).
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum Vin and constant resistive load.
6. The RGUW3 series meets EN55022 Class A and input reflected ripple current with an external L-C filter before the input pins to the converter. (See Class B figure for connecting network)  
Recommended: 12Vin: C1=4.7µF/25V 1812 MLCC C3=220pF/3KV 1808 MLCC L1=10µH 0504 SMD Inductor P/N: PMT-047  
24Vin: C1=4.7µF/50V 1812 MLCC C3=220pF/3KV 1808 MLCC L1=12µH 0504 SMD Inductor P/N: PMT-062  
48Vin: C1=4.7µF/100V 1812 MLCC C3=220pF/3KV 1808 MLCC L1=10µH 0504 SMD Inductor P/N: PMT-047
7. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor suggested is Nippon chemi-con KY series, 220µF /100V, ESR 48mΩ.
8. To order surface mount version, add the suffix "S" to the model number (Ex: RG24S5UW3S).
9. To order 3000VDC I/O isolation version, add the suffix "H" to the model number (Ex: RG24S5UW3H).
10. **CAUTION:** This power module is not internally fused. An input line fuse must always be used.  
*\*Due to advances in technology, specifications subject to change without notice.*

**REMOTE ON/OFF APPLICATION CIRCUITS**

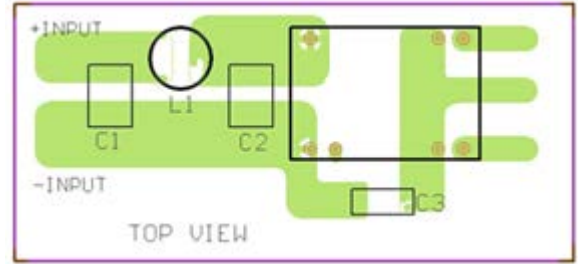
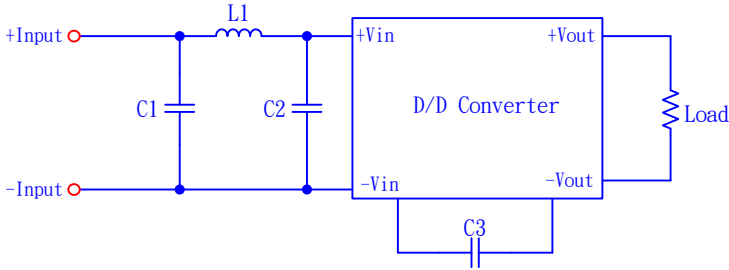


**CHARACTERISTICS**



**Recommended Filter for EN55022 Class B Compliance**

**Recommended EN55022 Class B Filter Circuit Layout**

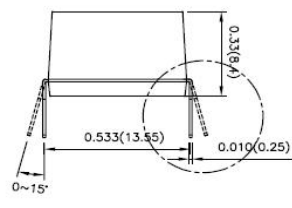
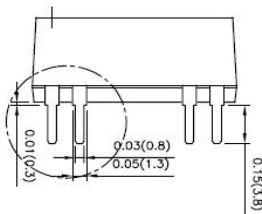
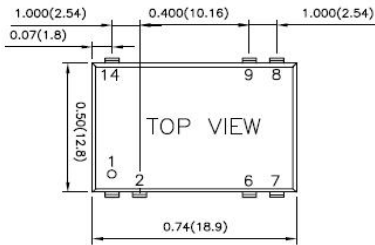


	C1	C2	C3	L1
RG12xxxUW3	6.8µF/50V 1812 MLCC	6.8µF/50V 1812 MLCC	220pF/3KV 1808 MLCC	10µH 0504 SMD Inductor PMT-047
RG24xxxUW3	4.7µF/50V 1812 MLCC	4.7µF/50V 1812 MLCC	220pF/3KV 1808 MLCC	12µH 0504 SMD Inductor PMT-062
RG48xxxUW3	4.7µF/100V 1812 MLCC	4.7µF/100V 1812 MLCC	220pF/3KV 1808 MLCC	18µH 0504 SMD Inductor PMT-046

**MECHANICAL DRAWINGS**

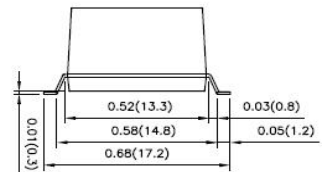
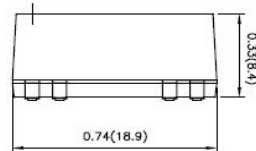
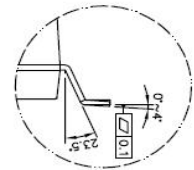
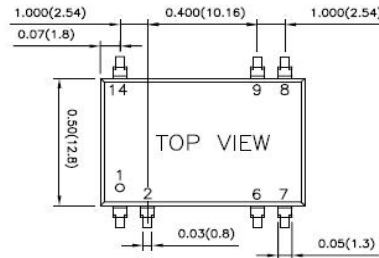
**DIP TYPE**

Unit: inches (mm)



**SMT TYPE (Suffix "S")**

Unit: inches (mm)



PIN CONNECTIONS		
Pin	Single	Dual
1	-Input	-Input
2	ON/OFF	ON/OFF
6	NC	Common
7	NC	-Output
8	+Output	+Output
9	-Output	Common
14	+Input	+Input

1. Tolerance:  $x.xx \pm 0.02$  ( $x.x \pm 0.5$ )  
 $x.xxx \pm 0.01$  ( $x.xx \pm 0.25$ )
2. Pin Pitch Tolerance:  $\pm 0.01$  (0.25)
3. Pin Dimension Tolerance:  $\pm 0.004$  (0.1)

PIN CONNECTIONS		
Pin	Single	Dual
1	-Input	-Input
2	ON/OFF	ON/OFF
6	NC	Common
7	NC	-Output
8	+Output	+Output
9	-Output	Common
14	+Input	+Input

## 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:

<u>Phone:</u>	☎ (603)778-2300
<u>Toll Free:</u>	☎ (888)587-9255
<u>Fax:</u>	☎ (603)778-9797
<u>E-mail:</u>	<a href="mailto:sales@wallindustries.com">sales@wallindustries.com</a>
<u>Web:</u>	<a href="http://www.wallindustries.com">www.wallindustries.com</a>
<u>Address:</u>	5 Watson Brook Rd. Exeter, NH 03833