

Wall Industries, Inc.

RGUW2 SERIES

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



FEATURES

- 2 Watts Maximum Output Power
- Single and Dual Outputs
- SMT & DIP Packages: 0.74 x 0.50 x 0.33 Inches
- 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-V0 Package Materials
- CE Mark Meets 2006/95/EC, 93/68/EEC, and 2004/108EC
- Compliant to RoHS EU Directive 2002/95/EC
- UL60950-1, EN60950-1, and IEC60950-1 Safety Approvals

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 RGUW2 series of DC/DC power converters provides 2 watts of output power in a 0.74 x 0.50 x 0.33 inch DIP or SMT package without derating up to 85°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, continuous short circuit protection, and no minimum load requirements. All models have UL60950-1 EN60950-1, and IEC 60950-1 safety approvals as well as RoHS compliance.

SPECIFICATIONS: RGUW2 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
INPUT SPECIFICATIONS						
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			
OUTPUT SPECIFICATIONS						
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	%
		Dual Output Models	-1		+0.1	
	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					2	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		+0.02	%/°C
PROTECTION						
Short Circuit Protection			continuous, automatic recovery			
GENERAL SPECIFICATIONS						
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	
REMOTE ON/OFF (See Page 4 for application circuits)						
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
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	no derating		-40		+85	°C
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; MSL Report Level 3			
MTBF (See Note 1)	BELLCORE TR-NWT-000332		4,615,000 hours			
	MIL-HDBK-217F		2,052,000 hours			
PHYSICAL SPECIFICATIONS						
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)			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals (Pending)			IEC60950-1, UL60950-1, EN60950-1			
EMI (See Note 6)	EN55022		Class A			
ESD	EN61000-4-2	Air Contact	±8KV ±6KV	Perf. Criteria A		
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 ⁽⁴⁾ Ripple & Noise	Output Power	Efficiency ⁽⁴⁾	Maximum ⁽⁵⁾ Capacitive Load
			Min. Load	Full Load	No Load ⁽³⁾	Full Load ⁽²⁾				
RG12S3.3UW2	12 VDC (4.5 – 18 VDC)	3.3 VDC	0mA	500mA	20mA	196mA	30mVp-p	1.65W	74%	3300µF
RG12S5UW2		5 VDC	0mA	400mA	20mA	217mA	30mVp-p	2W	81%	1680µF
RG12S9UW2		9 VDC	0mA	222mA	20mA	222mA	30mVp-p	2W	79%	1000µF
RG12S12UW2		12 VDC	0mA	167mA	20mA	217mA	30mVp-p	2W	81%	820µF
RG12S15UW2		15 VDC	0mA	134mA	20mA	209mA	30mVp-p	2W	84%	680µF
RG24S3.3UW2	24 VDC (9 – 36 VDC)	3.3 VDC	0mA	500mA	10mA	98mA	30mVp-p	1.65W	74%	3300µF
RG24S5UW2		5 VDC	0mA	400mA	10mA	108mA	30mVp-p	2W	81%	1680µF
RG24S9UW2		9 VDC	0mA	222mA	10mA	111mA	30mVp-p	2W	79%	1000µF
RG24S12UW2		12 VDC	0mA	167mA	10mA	104mA	30mVp-p	2W	84%	820µF
RG24S15UW2		15 VDC	0mA	134mA	10mA	104mA	30mVp-p	2W	84%	680µF
RG48S3.3UW2	48 VDC (18 – 75 VDC)	3.3 VDC	0mA	500mA	7mA	49mA	30mVp-p	1.65W	74%	3300µF
RG48S5UW2		5 VDC	0mA	400mA	7mA	54mA	30mVp-p	2W	81%	1680µF
RG48S9UW2		9 VDC	0mA	222mA	7mA	56mA	30mVp-p	2W	79%	1000µF
RG48S12UW2		12 VDC	0mA	167mA	7mA	54mA	30mVp-p	2W	82%	820µF
RG48S15UW2		15 VDC	0mA	134mA	7mA	54mA	30mVp-p	2W	82%	680µF

DUAL OUTPUT MODELS										
Model Number	Input Voltage Range	Output Voltage	Output Current		Input Current		Output ⁽⁴⁾ Ripple & Noise	Output Power	Efficiency ⁽⁴⁾	Maximum ⁽⁵⁾ Capacitive Load
			Min. Load	Full Load	No Load ⁽³⁾	Full Load ⁽²⁾				
RG12D5UW2	12 VDC (4.5 – 18 VDC)	±5 VDC	0mA	±200mA	25mA	225mA	30mVp-p	2W	78%	±1000µF
RG12D12UW2		±12 VDC	0mA	±83mA	25mA	211mA	30mVp-p	2W	83%	±470µF
RG12D15UW2		±15 VDC	0mA	±67mA	25mA	214mA	30mVp-p	2W	82%	±330µF
RG24D5UW2	24 VDC (9 – 36 VDC)	±5 VDC	0mA	±200mA	10mA	113mA	30mVp-p	2W	78%	±1000µF
RG24D12UW2		±12 VDC	0mA	±83mA	10mA	104mA	30mVp-p	2W	84%	±470µF
RG24D15UW2		±15 VDC	0mA	±67mA	10mA	104mA	30mVp-p	2W	84%	±330µF
RG48D5UW2	48 VDC (18 – 75 VDC)	±5 VDC	0mA	±200mA	7mA	56mA	30mVp-p	2W	78%	±1000µF
RG48D12UW2		±12 VDC	0mA	±83mA	7mA	53mA	30mVp-p	2W	83%	±470µF
RG48D15UW2		±15 VDC	0mA	±67mA	7mA	53mA	30mVp-p	2W	83%	±330µF

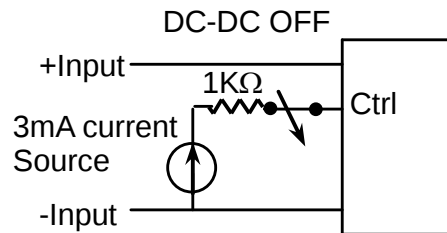
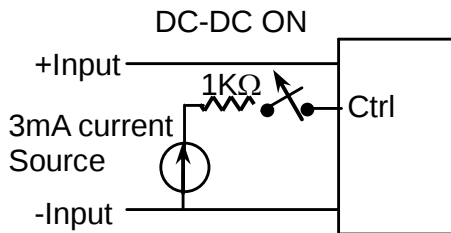
-To order surface mount version, add the suffix "S" to the model number (Ex: RG24S5UW2S).

-To order 3000VDC I/O isolation version, add the suffix "H" to the model number (Ex: RG24S5UW2H).

NOTES

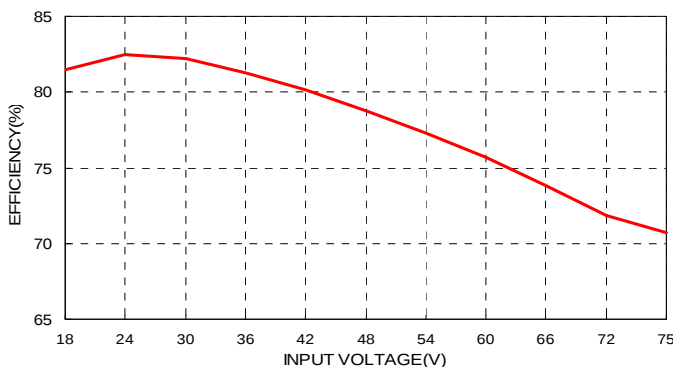
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
MIL-HDBK-217F Notice2 @Ta=25°C, Full load (Ground, Benign, controlled environment).
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum Vin and constant resistive load.
6. The RGUW2 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=10μF/25V 1812 MLCC C3=220pF/3KV 1808 MLCC L1=2.2μH 0504 SMD Inductor P/N: PMT-059
24Vin: C1=6.8μF/50V 1812 MLCC C3=220pF/3KV 1808 MLCC L1=18μH 0504 SMD Inductor P/N: PMT-046
48Vin: C1=4.7μF/100V 1812 MLCC C3=220pF/3KV 1808 MLCC L1=18μH 0504 SMD Inductor P/N: PMT-046
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: RG24S5UW2S).
9. To order 3000VDC I/O isolation version, add the suffix "H" to the model number (Ex: RG24S5UW2H).
10. **CAUTION:** Internal fusing is not included so we suggest using an input line fuse.

REMOTE ON/OFF APPLICATION CIRCUITS

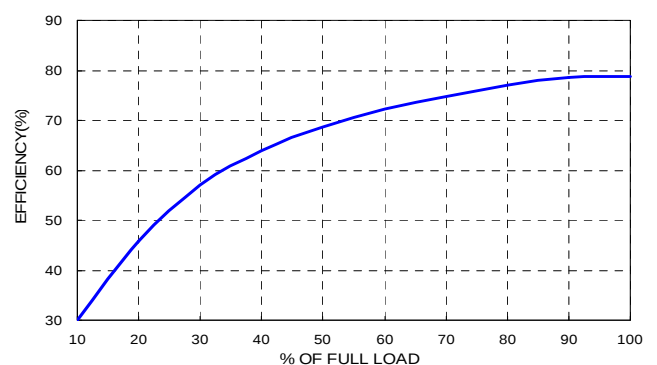


CHARACTERISTICS

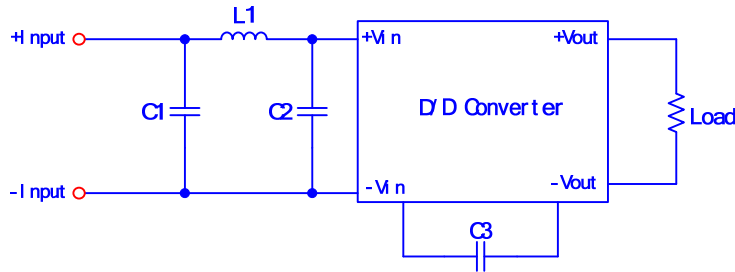
RG48S5UW2 Efficiency vs Input Voltage



RG48S5UW2 Efficiency vs Output Load

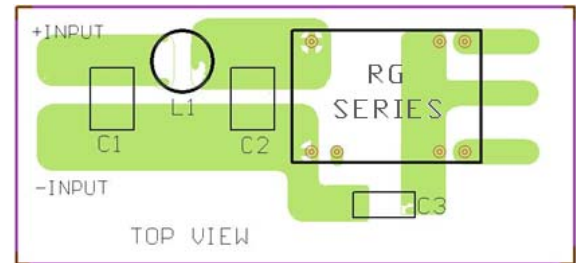


Recommended Filter for EN55022 Class B Compliance



	C1, C2	C3	L1
RG12xxxUW2	10 μ F/25V 1812 MLCC	220pF/3KV 1808 MLCC	2.2 μ H 0504 SMD Inductor PMT-059
RG24xxxUW2	2.2 μ F/50V 1812 MLCC	220pF/3KV 1808 MLCC	18 μ H 0504 SMD Inductor PMT-046
RG48xxxUW2	2.2 μ F/100V 1812 MLCC	220pF/3KV 1808 MLCC	27 μ H 0504 SMD Inductor PMT-

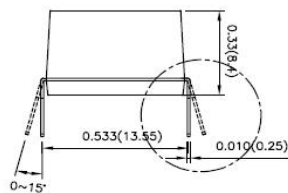
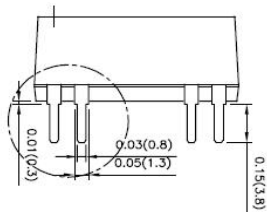
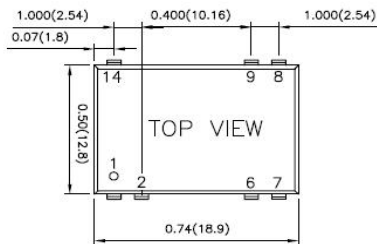
Recommended EN55022 Class B Filter Circuit Layout



MECHANICAL DRAWINGS

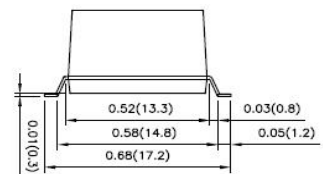
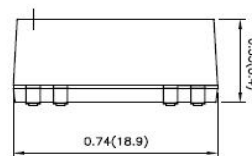
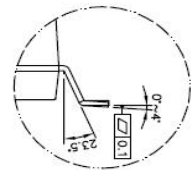
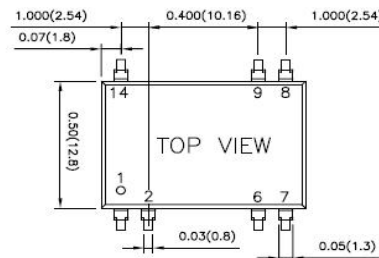
DIP TYPE

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: ± 0.01 (0.25)
3. Pin Dimension Tolerance: ± 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:

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