

Wall Industries, Inc.

RGW2 SERIES

**2:1 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
- SMT Package Qualified for Lead Free Reflow Solder Process
- According to IPC J-STD-020D
- 2:1 Wide Input Voltage Range
- High Efficiency up to 84%
- 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 RGW2 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 2:1 wide input voltage ranges of 4.5-9VDC, 9-18VDC, 18-36VDC, and 36-75VDC. 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: RGW2 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	5VDC nominal input models		4.5	5	9	VDC
	12VDC nominal input models		9	12	18	
	24VDC nominal input models		18	24	36	
	48VDC nominal input models		36	48	75	
Input Surge Voltage (1 sec max)	5VDC nominal input models				15	VDC
	12VDC nominal input models				25	
	24VDC nominal input models				50	
	48VDC nominal input models				100	
Input Reflected Ripple Current <i>(See Note 6)</i>	5VDC nominal input models			80		mAp-p
	12VDC nominal input models			40		
	24VDC nominal input models			30		
	48VDC nominal input models			20		
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		+1.0	%
		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					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” <i>(See Note 9)</i>				50	
REMOTE ON/OFF <i>(See Page 4 for application circuits)</i>						
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; Level 2A			
MTBF <i>(See Note 1)</i>	BELLCORE TR-NWT-000332		5,107,000 hours			
	MIL-HDBK-217F		2,886,000 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 <i>(See Note 6)</i>	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 <i>(See Note 7)</i>	EN61000-4-4		±2KV	Perf. Criteria A		
Surge <i>(See Note 7)</i>	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⁾				
RG5S3.3W2	5 VDC (4.5 – 9 VDC)	3.3 VDC	0mA	500mA	35mA	471mA	30mVp-p	1.65W	74%	3300µF
RG5S5W2		5 VDC	0mA	400mA	35mA	526mA	30mVp-p	2W	80%	1680µF
RG5S9W2		9 VDC	0mA	222mA	35mA	533mA	30mVp-p	2W	79%	1000µF
RG5S12W2		12 VDC	0mA	167mA	35mA	520mA	30mVp-p	2W	81%	820µF
RG5S15W2		15 VDC	0mA	134mA	40mA	506mA	30mVp-p	2W	83%	680µF
RG12S3.3W2	12 VDC (9 – 18 VDC)	3.3 VDC	0mA	500mA	20mA	196mA	30mVp-p	1.65W	74%	3300µF
RG12S5W2		5 VDC	0mA	400mA	20mA	217mA	30mVp-p	2W	81%	1680µF
RG12S9W2		9 VDC	0mA	222mA	20mA	222mA	30mVp-p	2W	79%	1000µF
RG12S12W2		12 VDC	0mA	167mA	20mA	217mA	30mVp-p	2W	81%	820µF
RG12S15W2		15 VDC	0mA	134mA	20mA	209mA	30mVp-p	2W	84%	680µF
RG24S3.3W2	24 VDC (18 – 36 VDC)	3.3 VDC	0mA	500mA	10mA	98mA	30mVp-p	1.65W	74%	3300µF
RG24S5W2		5 VDC	0mA	400mA	10mA	108mA	30mVp-p	2W	81%	1680µF
RG24S9W2		9 VDC	0mA	222mA	10mA	111mA	30mVp-p	2W	79%	1000µF
RG24S12W2		12 VDC	0mA	167mA	10mA	104mA	30mVp-p	2W	84%	820µF
RG24S15W2		15 VDC	0mA	134mA	10mA	104mA	30mVp-p	2W	84%	680µF
RG48S3.3W2	48 VDC (36 – 75 VDC)	3.3 VDC	0mA	500mA	7mA	49mA	30mVp-p	1.65W	74%	3300µF
RG48S5W2		5 VDC	0mA	400mA	7mA	54mA	30mVp-p	2W	81%	1680µF
RG48S9W2		9 VDC	0mA	222mA	7mA	56mA	30mVp-p	2W	79%	1000µF
RG48S12W2		12 VDC	0mA	167mA	7mA	54mA	30mVp-p	2W	82%	820µF
RG48S15W2		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⁾				
RG5D5W2	5 VDC (4.5 – 9 VDC)	±5 VDC	0mA	±200mA	40mA	540mA	30mVp-p	2W	78%	±1000µF
RG5D12W2		±12 VDC	0mA	±83mA	40mA	520mA	30mVp-p	2W	81%	±470µF
RG5D15W2		±15 VDC	0mA	±67mA	40mA	513mA	30mVp-p	2W	82%	±330µF
RG12D5W2	12 VDC (9 – 18 VDC)	±5 VDC	0mA	±200mA	25mA	225mA	30mVp-p	2W	78%	±1000µF
RG12D12W2		±12 VDC	0mA	±83mA	25mA	211mA	30mVp-p	2W	83%	±470µF
RG12D15W2		±15 VDC	0mA	±67mA	25mA	214mA	30mVp-p	2W	82%	±330µF
RG24D5W2	24 VDC (18 – 36 VDC)	±5 VDC	0mA	±200mA	10mA	113mA	30mVp-p	2W	78%	±1000µF
RG24D12W2		±12 VDC	0mA	±83mA	10mA	104mA	30mVp-p	2W	84%	±470µF
RG24D15W2		±15 VDC	0mA	±67mA	10mA	104mA	30mVp-p	2W	84%	±330µF
RG48D5W2	48 VDC (36 – 75 VDC)	±5 VDC	0mA	±200mA	7mA	56mA	30mVp-p	2W	78%	±1000µF
RG48D12W2		±12 VDC	0mA	±83mA	7mA	53mA	30mVp-p	2W	83%	±470µF
RG48D15W2		±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: RG24S5W2S).

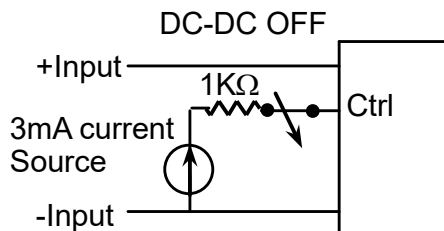
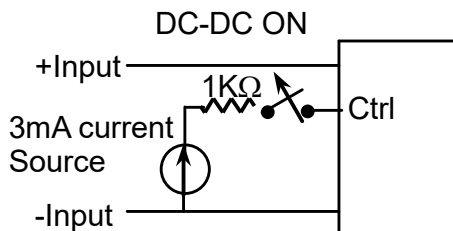
-To order 3000VDC I/O isolation version, add the suffix "H" to the model number (Ex: RG24S5W2H).

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 RGW2 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: 5Vin: C1=10μF/25V 1810 MLCC C3=220pF/3KV 1808 MLCC L1=2.2μH 0504 SMD Inductor P/N: PMT-059
12Vin: C1=6.8μF/50V 1810 MLCC C3=220pF/3KV 1808 MLCC L1=18μH 0504 SMD Inductor P/N: PMT-046
24Vin: C1=4.7μF/100V 1810 MLCC C3=220pF/3KV 1808 MLCC L1=18μH 0504 SMD Inductor P/N: PMT-046
48Vin: C1=4.7μF/100V 1810 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: RG24S5W2S).
9. To order 3000VDC I/O isolation version, add the suffix "H" to the model number (Ex: RG24S5W2H).
10. **CAUTION:** This power module is not internally fused. An input line fuse must always be used.

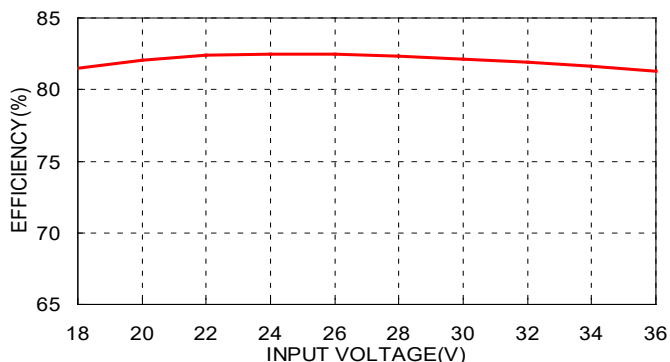
**Due to advances in technology, specifications are subject to change without notice.*

REMOTE ON/OFF APPLICATION CIRCUITS

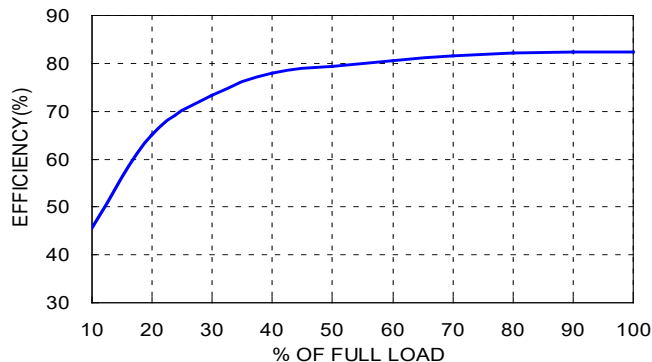


CHARACTERISTICS

RG24S5W2 Efficiency vs Input Voltage

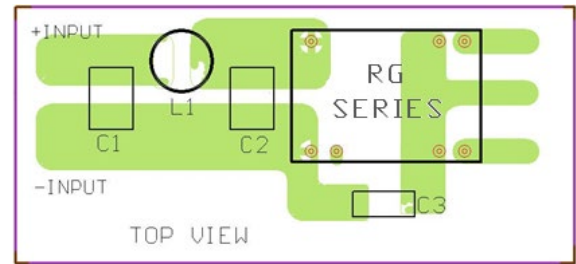
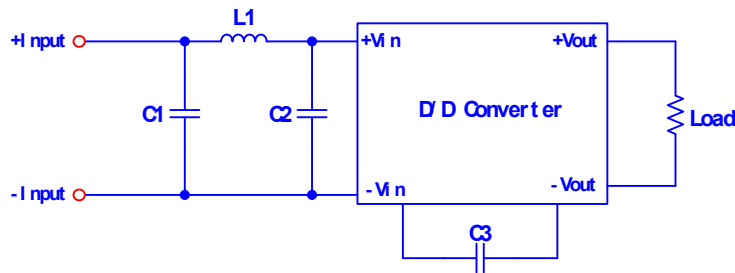


RG24S5W2 Efficiency vs Output Load



Recommended Filter for EN55022 Class B Compliance

Recommended EN55022 Class B Filter Circuit Layout

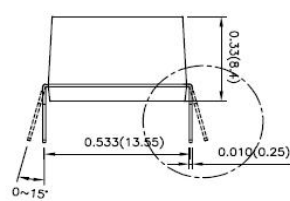
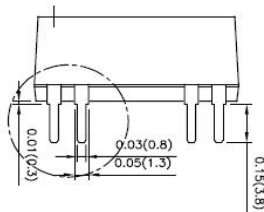
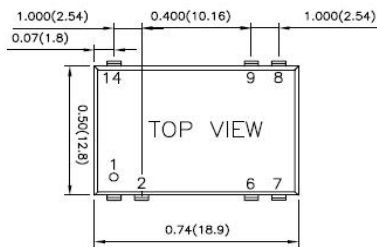


	C1, C2	C3	L1
RG5xxxW2	10µF/25V 1812 MLCC	220pF/3KV 1808 MLCC	2.2µH 0504 SMD Inductor PMT-059
RG12xxxW2	2.2µF/25V 1812 MLCC	220pF/3KV 1808 MLCC	18µH 0504 SMD Inductor PMT-046
RG24xxxW2	2.2µF/50V 1812 MLCC	220pF/3KV 1808 MLCC	27µH 0504 SMD Inductor PMT-
RG48xxxW2	2.2µF/100V 1812 MLCC	220pF/3KV 1808 MLCC	18µH 0504 SMD Inductor PMT-046

MECHANICAL DRAWINGS

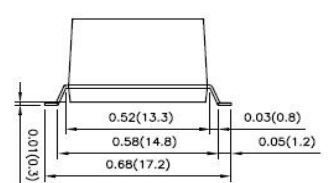
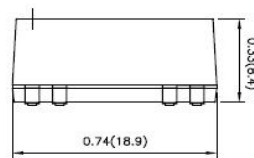
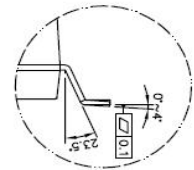
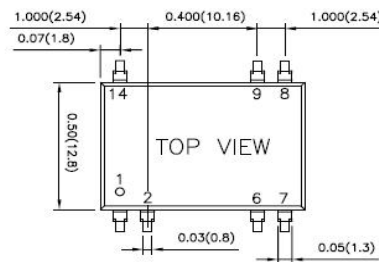
DIP TYPE

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: ± 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: 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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