

RBW-2W Series

2W 4:1 Regulated Single & Dual output



electronic powersolutions

Features

- 8 Pin SIL
- Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 79%
- -40°C ~ 85°C Operation Temperature Range
- Remote on/off Control



The RBW series is a family of cost effective and high performed 2W single & dual output DC-DC converters. These converters are built in non-conductive black plastic package in a 8-pin SIL miniature compact case with high performance features wide range devices operate over 4:1 input voltage range providing stable output voltage which is much smaller than package of DIL 24- Same power rating but only 43% of the traditional volume. Devices are encapsulated using flame retardant resin. Input voltages of 12, 24, 48 with output voltage of 3.3, 5, 12, 15, ± 5 , ± 12 , ± 15 Vdc. High performance features include high efficiency operation up to 79% and output voltage accuracy of $\pm 1\%$ maximum.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS		PHYSICAL SPECIFICATIONS	
Voltage Accuracy	$\pm 1\%$, max.	Case Material	Non conductive black plastic
Output Current	See table, max.	Package Material	Silicon (UL94 V-0 rated)
Line Regulation	$\pm 0.2\%$, max.	Pin Material	C5191R-H Solder-coated
Load Regulation	Single (From 0% to 100% Load) $\pm 1.0\%$, max. Dual (From 10% to 100% Load) $\pm 1.0\%$, max.	Weight	4.5g, typ.
Cross Regulation (Dual Output) (1)	$\pm 5\%$	Dimensions	0.86"x0.36"x0.44"
Ripple & Noise (20 Mhz bandwidth)(2)	30mVpk-pk, max.	ENVIRONMENT SPECIFICATIONS	
Short Circuit Protection	Indefinite (Automatic Recovery)	Operating Temperature	-40°C ~ +71°C
Temperature Coefficient	$\pm 0.02\%/^{\circ}\text{C}$	Maximum Case Temperature	100°C
Capacitive Load(3)	See table, max.	Storage Temperature	-40°C~125°C
Transient Recovery Time (4)	250 μs , typ.	Cooling	Nature Convection
Transient Response Deviation(4)	$\pm 3\%$, max.	ABSOLUTE MAXIMUM RATINGS(6)	
INPUT SPECIFICATIONS		These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Voltage Range	See table	Input Surge Voltage(100ms max)	
Start up Time(Nominal Vin and constant resistive load)	30mS, typ.	12 Models	25Vdc, max.
Input Current (No Load)	See table, max.	24 Models	50Vdc, max.
Input Current (Full Load)	See table, typ.	48 Models	100Vdc, max.
Input Filter	Capacitor	Soldering Temperature	260°C max.
Input Reflected Ripple Current(5)	20mA pk-pk, typ.	(1.5mm from case 10sec max.)	
Remote on/off		EMC SPECIFICATIONS	
ON:	open or high impedance	Radiated Emissions	EN55032 CLASS A
OFF:	2-4mA input current (via 1K)	Conducted Emissions (7)	EN55032 CLASS A
Off stand by input current(Nominal Vin)	2.5mA, max.	ESD	IEC 61000-4-2 Perf. Criteria A
GENERAL SPECIFICATIONS		RS	IEC 61000-4-3 Perf. Criteria A
Efficiency	See table, typ.	EFT (8)	IEC 61000-4-4 Perf. Criteria A
I/O Isolation Voltage (60sec)	1600Vdc	Surge (8)	IEC 61000-4-5 Perf. Criteria A
I/O Isolation Capacity	200 pF, max.	CS	IEC 61000-4-6 Perf. Criteria A
I/O Isolation Resistance	1000M Ohm, min.	PFMF	IEC 61000-4-8 Perf. Criteria A
Switching Frequency	100kHz, min.		
Humidity	95%relH		
Reliability Calculated MTBF (MIL-HDBK-217F)	>1.7Mhrs@25°C		
Safety Standard	IEC/EN 60950-1, 62368-1		
Safety Approvals	IEC/EN 60950-1, 62368-1		

RBW - 2W 4:1 Regulated Single & Dual output
PART NUMBER STRUCTURE
RBW - 24 05 SD 2

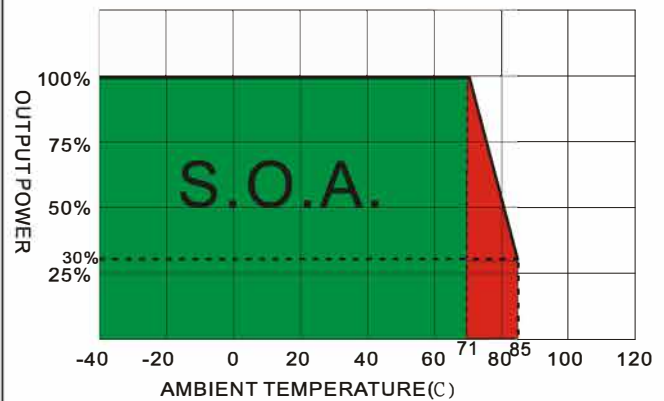
 Series Name
W: wide range

 Input Voltage Range
12 - 4.5 ~ 18V
24 - 9 ~ 36V
48 - 18 ~ 75V

 Case Type
S - SIP Single Output
SD - SIP Dual Output

 Nominal Output Voltage
3R3 - 3.3V
05 - 5V
12 - 12V
15 - 15V

Watt

Derating Curve

MODEL SELECTION GUIDE

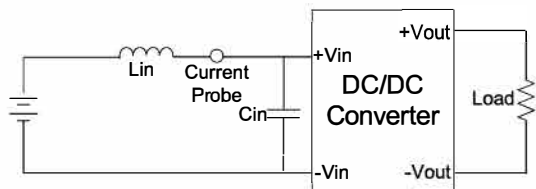
MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL (%) (typ.)	Capacitor Load @FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. Load (mA)	Full Load (mA)		
RBW-123R3S2	4.5-18	40	196	3.3	0	500	70	1000uF
RBW-1205S2	4.5-18	40	225	5	0	400	74	1000uF
RBW-1212S2	4.5-18	40	213	12	0	167	78	220uF
RBW-1215S2	4.5-18	40	213	15	0	133	78	100uF
RBW-1205SD2	4.5-18	30	219	±5	0	±200	77	±470uF
RBW-1212SD2	4.5-18	30	213	±12	0	±83	78	±100uF
RBW-1215SD2	4.5-18	40	216	±15	0	±66	77	±47 uF
RBW-243R3S2	9-36	25	96	3.3	0	500	71	1000uF
RBW-2405S2	9-36	20	106	5	0	400	78	1000uF
RBW-2412S2	9-36	30	105	12	0	167	79	220uF
RBW-2415S2	9-36	30	105	15	0	133	79	100uF
RBW-2405SD2	9-36	30	111	±5	0	±200	75	±470uF
RBW-2412SD2	9-36	30	108	±12	0	±83	77	±100uF
RBW-2415SD2	9-36	30	106	±15	0	±66	78	±47 uF
RBW-483R3S2	18-75	10	47	3.3	0	500	72	1000uF
RBW-4805S2	18-75	15	55	5	0	400	75	1000uF
RBW-4812S2	18-75	15	55	12	0	167	75	220uF
RBW-4815S2	18-75	15	54	15	0	133	76	100uF
RBW-4805SD2	18-75	15	56	±5	0	±200	74	±470uF
RBW-4812SD2	18-75	15	56	±12	0	±83	74	±100uF
RBW-4815SD2	18-75	15	55	±15	0	±66	75	±47 uF

NOTE

- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Measured with a 1μF ceramic capacitor.
- Test by minimal Vin and constant resistive load.
- Test by normal Vin and 100%-25% load, 25% load step change.
- Measured Input reflected ripple current with a simulated source inductance of 12μH and a source capacitor Cin(47μF, ESR<1.0Ω at 100KHz).
- Exceeding the absolute ratings of the unit could cause damage. It's not allowed for continuous operating ratings.
- Input filter components are required to help meet conducted emission class A, which application refer to the EMI Filter of design & feature configuration.
- An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
The filter capacitor suggest: Nippon - chemi - con KY series, 220μF/100V.

TEST CONFIGURATIONS
Input Reflected Ripple Current Test Step

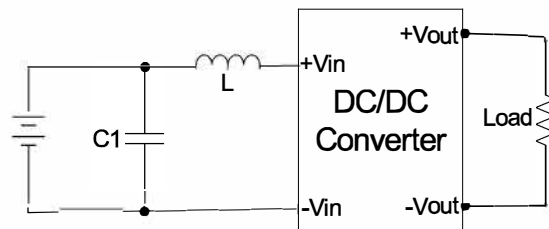
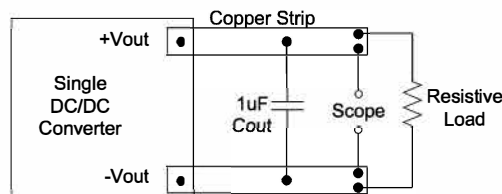
Input reflected ripple current is measured through a source inductor L_{in} ($12\mu\text{H}$) and a source capacitor C_{in} ($47\mu\text{F}$, $\text{ESR} < 1.0\Omega$ at 100KHz) at nominal input and full load.


EMI Filter

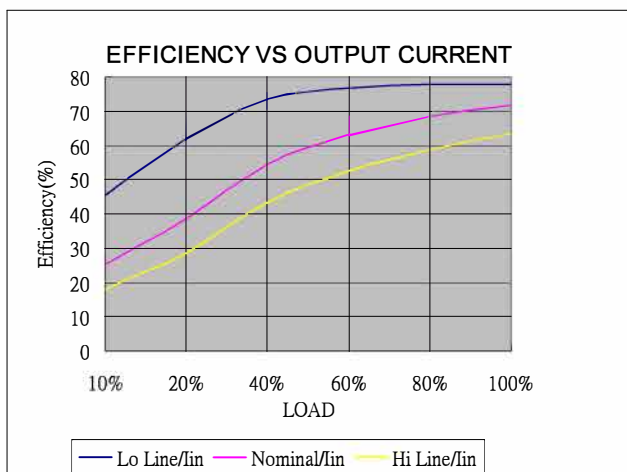
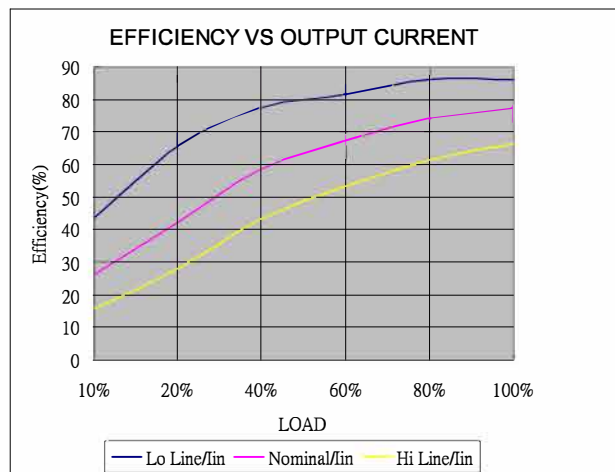
Input filter components (C_1 , L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

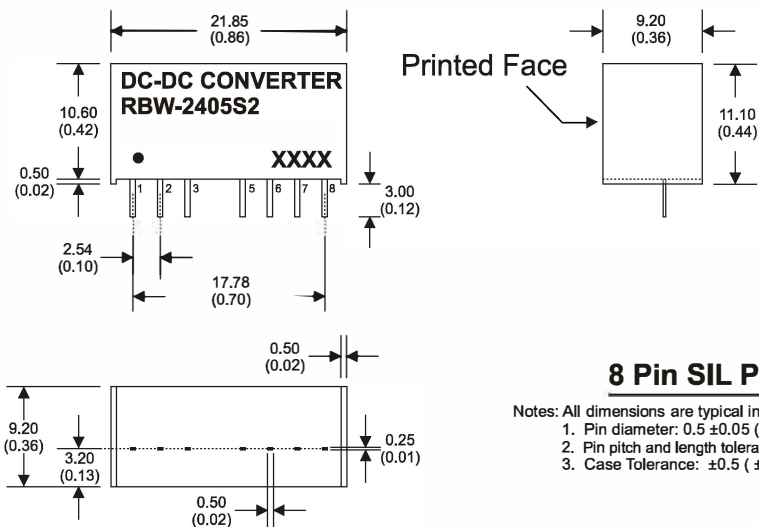
Output Ripple & Noise Measurement Test

Use a capacitor C_{out} ($1.0\mu\text{F}$) measurement. The Scope measurement bandwidth is $0\text{-}20\text{MHz}$.



	C1	L
RBW-12XXXXX	1210 10uF/35V	2.5uH
RBW-24XXXXX	1210 2.2uF/100V	10uH
RBW-48XXXXX	1210 2.2uF/100V	18uH


RBW-123R3S2

RBW-4815SD2

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MECHANICAL SPECIFICATIONS

8 Pin SIL Package

- Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-V Input	-V Input
2	+V Input	+V Input
3	Remote On/Off	Remote On/Off
5	N.C.	N.C.
6	+V Output	+V Output
7	-V Output	Common
8	N.C.	-V Output

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DRAWING: APPROVED:

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