RRM-S06Wv3

6 W Regulated Single Output DC / DC Converter

- **24 Pin DIL Package**
- **Wide 4:1 Input Range**
- **Enhanced 6000 VDC Isolation, 2 x MOPP**
- **EN60601-1 (3rd edition) medical grade safety**
- **Efficiency up to 85 %**
- **Operating Temperature Range: – 40 °C ~ + 85 °C**
- **Continuous Short Circuit Protection**
- **Over Current Protection, Over and Under Voltage Protection**
- **Leakage current: < 5 µA (@240 VAC / 60 Hz conditions)**
- **8 mm Creepage and 5 mm Clearance distance**

Picture similar

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Output Specifications	
Voltage Accuracy	± 1 % typ., ± 3 % max.
Output Voltage Adjustability (Trim)	–
Maximum Output Current	See table
Line Regulation	± 0.5 % max.
Load Regulation	From 5 % to 100 % Load: ± 1 % max. –
Cross Regulation (Dual Output)	–
Over Voltage Protection	110 ~ 160 % of V_{out} max.
Over Current Protection	110 ~ 260 % of I_{out} max.
Short Circuit Protection	Continuous (Automatic Recovery)
Ripple & Noise (20 MHz bandwidth)	100 ~ 180 mV pk-pk max.
Temperature Coefficient	± 0.03 % / °C
Transient Recovery Time	300 µs typ.
Transient Response Deviation	± 3 ~ 5 % max.

Input Specifications	
Voltage Range	See table
Start-up Time	–
No-Load/Full-Load Input Current	See table
Input Filter	C/L (see filter details on following pages)
Input Reflected Ripple Current	20 mA pk-pk typ.
Remote ON	–
Remote OFF	–
OFF Idle Current	–
Surge Voltage (100 ms) [1]	
24 V Models 48 V Models	50 VDC max. 100 VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	6000 VDC
Isolation Voltage Case/Input&Output	–
I/O Isolation Capacitance	13 pF typ., 20 pF max.
I/O Isolation Resistance	10000 MΩ, min.
Switching Frequency	300 kHz typ.
Humidity	95 % rel H
Reliability Calculated MTBF	> 1.00 MHrs (MIL-HDBK-217 f)
Safety Standard(s)	EN60601-1:2006+A1:2013

Environmental Specifications	
Operating Temperature Range	– 40 °C ~ + 85 °C (see Derating Curve)
Maximum Case Temperature	–
Storage Temperature	– 55 °C ~ + 125 °C
Cooling	Natural Convection
Soldering Profile and Peak Temperature	Wave Flow: 260 °C (1.5 mm from case), 10 s, max.

Physical Specifications	
Case Material	Black flame-retardant, heat-resistant Plastic (UL94V-0 rated) –
Pin Material	–
Potting Material	–
Weight	13.0 g
Case Dimensions	1.25" x 0.80" x 0.40"

EMC Specifications	
Radiated / Conducted Emissions	EN55032 Class A see EMI Filter
ESD	IEC 61000-4-2 Perf. Criteria B
Rad. RF	–
EFT	IEC 61000-4-4 Perf. Criteria B
Surge	IEC 61000-4-5 Perf. Criteria B
Cond. RF	IEC 61000-4-6 Perf. Criteria A
PFMF	–
VD/SI/VV	IEC 61000-4-29 Perf. Criteria B

[1] These are stress ratings; exposure of devices to any of these conditions may adversely affect long-term reliability.
All specifications typical at T_a = 25 °C, nominal input voltage and full load, unless otherwise specified.
The information and specification contained in this data sheet are believed to be correct at time of publication. However, Acal BFi accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.

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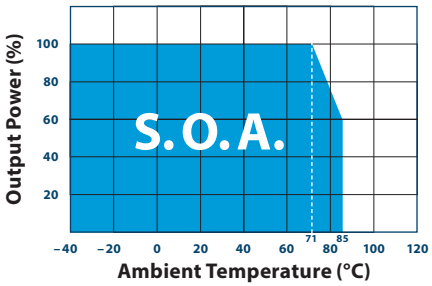
Number structure RRM Series

RRM	–	48	12	S	06	D	6	W	(v3)
Name / package		**V-input nom.**	**V-output**	**Output type**	**Power**	**Int. Code**	**Isolation (VDC)**	**Wide-Input**	
RRM = DIL24 Medical		24 = 9 V ~ 36 V 48 = 18 V ~ 75 V	05 = 5 V 06 = 6 V … 24 = 24 V	S = Single	06 = 6 W	Logistics Code	6 = 6.0 k	W = 4:1	

Temperature Derating Curve



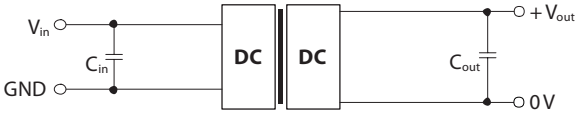
Model Selection Guide

Model Number	Input		Output		Efficiency	Capacitor Load
	Voltage (VDC) Nom. (Range)	max. Current (mA) full / no load	Voltage (VDC)	Current (mA) max. / min.	@ Full Load (%, Min. / Typ.)	@ Full Load (µF, max.)
RRM-2405S06D6Wv3	24 (9 ~ 36)	317 / 8	5	1200 / 0	78 / 80	2700
RRM-2406S06D6Wv3	24 (9 ~ 36)	317 / 8	6	1000 / 0	79 / 81	2200
RRM-2409S06D6Wv3	24 (9 ~ 36)	317 / 8	9	667 / 0	81 / 83	1800
RRM-2412S06D6Wv3	24 (9 ~ 36)	317 / 8	12	500 / 0	82 / 84	1000
RRM-2415S06D6Wv3	24 (9 ~ 36)	317 / 8	15	400 / 0	83 / 85	680
RRM-2424S06D6Wv3	24 (9 ~ 36)	317 / 8	24	250 / 0	82 / /84	470
RRM-4805S06D6Wv3	48 (18 ~ 75)	159 / 7	5	1200 / 0	79 / 81	2700
RRM-4809S06D6Wv3	48 (18 ~ 75)	159 / 7	9	667 / 0	81 / 83	1800
RRM-4812S06D6Wv3	48 (18 ~ 75)	159 / 7	12	500 / 0	82 / 84	1000
RRM-4815S06D6Wv3	48 (18 ~ 75)	159 / 7	15	400 / 0	83 / 85	680
RRM-4824S06D6Wv3	48 (18 ~ 75)	159 / 7	24	250 / 0	82 / 84	470

Design Reference

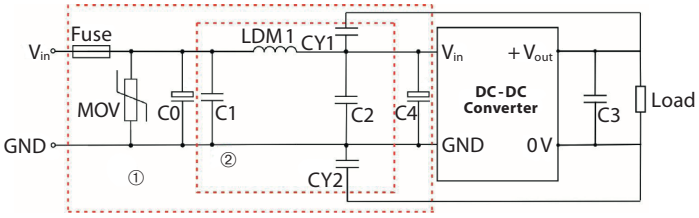
1. Typical application

All the DC - DC converters of this series are tested before delivery using the recommended circuit shown below. Input and / or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} 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.



V_{in}	C_{in} (µF)	C_{out} (µF)
24 VDC	100	10
48 VDC	10 ~ 47	10

2. EMC solution-recommended circuit

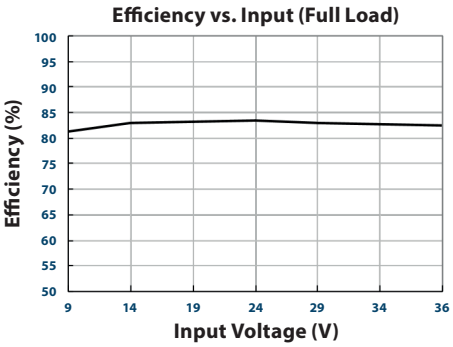


Notes:
For EMC tests we use part ① for immunity and part ② for emissions test. Selecting based on needs.

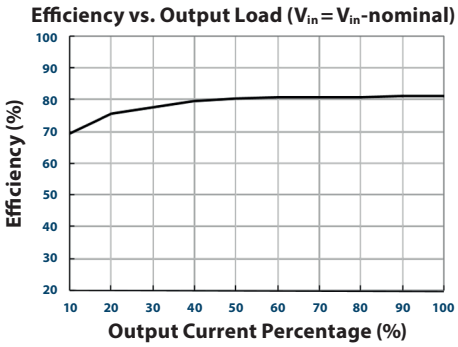
Model	V_{in} 24 V	V_{in} 48 V
Fuse	Choose according to actual input current.	
MOV	S20K30	S14K60
C0, C4	330 µF / 50 V	330 µF / 100 V
C1, C2	10 µF / 50 V	–
C3	Refer to C_{out} in table above.	
LDM1	10 µH	–
CY1, CY2	1 nF / 6 kV	–

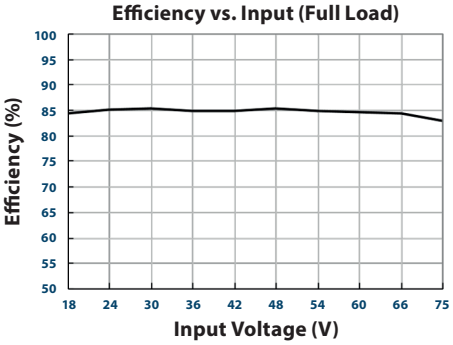
The models listed above are standard types. If you need special specifications or have questions regarding packing or need application support, please contact our specialists:
sales-de@acalbfi.de or +49 6074 4098-0

Electrical Characteristic Curves

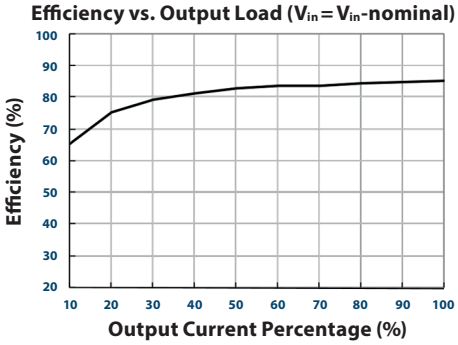


24 V_{in} / 5 V_{out} model

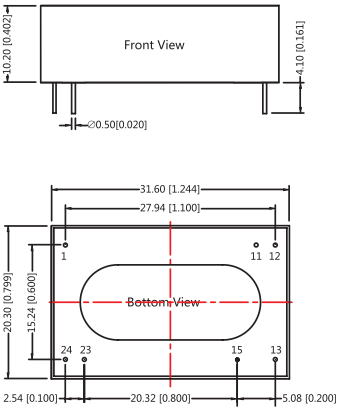


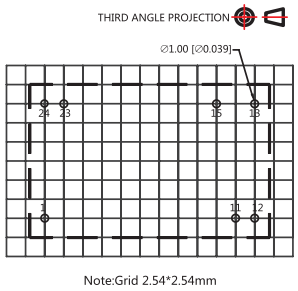


48 V_{in} / 15 V_{out} model



Mechanical Specifications





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

Pin	Function
1	+V_{in}
11	No Pin
12	0 V
13	+V_{out}
15	No Pin
23	GND
24	GND

Notes

- The max. capacitive load was tested at nominal input voltage and full load.
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of T_a = 25 °C, humidity < 75 %RH with nominal input voltage and rated output load.
- This product does not support parallel operation of the output.