

# RDD05U SERIES

DC - DC CONVERTER  
4 ~ 6W SINGLE & DUAL OUTPUT



## FEATURES

- 2:1 & 4:1 WIDE INPUT RANGE
- I/O ISOLATION
- INPUT Pi FILTER
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- 3 YEARS WARRANTY



## MODEL LIST

MODEL NO.	INPUT VOLTAGE	INPUT CURRENT (typ.)   (max.)		OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
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### Single Output Models

RDD05 - 03S1U	9~18 VDC	0.52A	0.73A	5 WATTS	+3.3 VDC	1500 mA	77%	79%	2200 $\mu$ F
RDD05 - 05S1U	9~18 VDC	0.51A	0.72A	5 WATTS	+ 5 VDC	1000 mA	79%	81%	1500 $\mu$ F
RDD05 - 12S1U	9~18 VDC	0.60A	0.83A	6 WATTS	+ 12 VDC	500 mA	82%	84%	270 $\mu$ F
RDD05 - 15S1U	9~18 VDC	0.60A	0.83A	6 WATTS	+ 15 VDC	400 mA	83%	85%	180 $\mu$ F
RDD05 - 03S2U	18~36 VDC	0.26A	0.36A	5 WATTS	+3.3 VDC	1500 mA	77%	79%	2200 $\mu$ F
RDD05 - 05S2U	18~36 VDC	0.25A	0.36A	5 WATTS	+ 5 VDC	1000 mA	79%	81%	1500 $\mu$ F
RDD05 - 12S2U	18~36 VDC	0.30A	0.42A	6 WATTS	+ 12 VDC	500 mA	81%	83%	270 $\mu$ F
RDD05 - 15S2U	18~36 VDC	0.30A	0.42A	6 WATTS	+ 15 VDC	400 mA	81%	83%	180 $\mu$ F
RDD05 - 03S3U	35~75 VDC	0.13A	0.19A	5 WATTS	+3.3 VDC	1500 mA	77%	79%	2200 $\mu$ F
RDD05 - 05S3U	35~75 VDC	0.13A	0.18A	5 WATTS	+ 5 VDC	1000 mA	79%	81%	1500 $\mu$ F
RDD05 - 12S3U	35~75 VDC	0.15A	0.22A	6 WATTS	+ 12 VDC	500 mA	80%	82%	270 $\mu$ F
RDD05 - 15S3U	35~75 VDC	0.15A	0.22A	6 WATTS	+ 15 VDC	400 mA	81%	83%	180 $\mu$ F
RDD05 - 03S4U	9~36 VDC	0.22A	0.62A	4 WATTS	+3.3 VDC	1200 mA	75%	77%	2200 $\mu$ F
RDD05 - 05S4U	9~36 VDC	0.27A	0.76A	5 WATTS	+ 5 VDC	1000 mA	77%	79%	1500 $\mu$ F
RDD05 - 12S4U	9~36 VDC	0.31A	0.87A	6 WATTS	+ 12 VDC	500 mA	80%	82%	270 $\mu$ F
RDD05 - 15S4U	9~36 VDC	0.31A	0.87A	6 WATTS	+ 15 VDC	400 mA	80%	82%	180 $\mu$ F
RDD05 - 03S5U	18~75 VDC	0.11A	0.31A	4 WATTS	+3.3 VDC	1200 mA	75%	77%	2200 $\mu$ F
RDD05 - 05S5U	18~75 VDC	0.13A	0.38A	5 WATTS	+ 5 VDC	1000 mA	77%	79%	1500 $\mu$ F
RDD05 - 12S5U	18~75 VDC	0.15A	0.43A	6 WATTS	+ 12 VDC	500 mA	80%	82%	270 $\mu$ F
RDD05 - 15S5U	18~75 VDC	0.15A	0.43A	6 WATTS	+ 15 VDC	400 mA	80%	82%	180 $\mu$ F

### Dual Output Models

RDD05 - 05D1U	9~18 VDC	0.51A	0.72A	5 WATTS	$\pm$ 5 VDC	$\pm$ 500 mA	80%	82%	$\pm$ 680 $\mu$ F
RDD05 - 12D1U	9~18 VDC	0.60A	0.83A	6 WATTS	$\pm$ 12 VDC	$\pm$ 250 mA	82%	84%	$\pm$ 150 $\mu$ F
RDD05 - 15D1U	9~18 VDC	0.59A	0.83A	6 WATTS	$\pm$ 15 VDC	$\pm$ 200 mA	83%	85%	$\pm$ 68 $\mu$ F
RDD05 - 05D2U	18~36 VDC	0.26A	0.36A	5 WATTS	$\pm$ 5 VDC	$\pm$ 500 mA	79%	81%	$\pm$ 680 $\mu$ F

# RDD05U SERIES

SINGLE & DUAL OUTPUT

## MODEL LIST

MODEL NO.	INPUT VOLTAGE	INPUT CURRENT		OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
		(typ.)	(max.)						

### Dual Output Models

RDD05 - 12D2U	18~36 VDC	0.30A	0.42A	6 WATTS	± 12 VDC	± 250 mA	81%	83%	± 150 μF
RDD05 - 15D2U	18~36 VDC	0.31A	0.42A	6 WATTS	± 15 VDC	± 200 mA	80%	82%	± 68 μF
RDD05 - 05D3U	35~75 VDC	0.13A	0.19A	5 WATTS	± 5 VDC	± 500 mA	79%	81%	± 680 μF
RDD05 - 12D3U	35~75 VDC	0.15A	0.22A	6 WATTS	± 12 VDC	± 250 mA	81%	83%	± 150 μF
RDD05 - 15D3U	35~75 VDC	0.15A	0.22A	6 WATTS	± 15 VDC	± 200 mA	80%	82%	± 68 μF
RDD05 - 05D4U	9~36 VDC	0.27A	0.76A	5 WATTS	± 5 VDC	± 500 mA	77%	79%	± 680 μF
RDD05 - 12D4U	9~36 VDC	0.31A	0.87A	6 WATTS	± 12 VDC	± 250 mA	80%	82%	± 150 μF
RDD05 - 15D4U	9~36 VDC	0.31A	0.87A	6 WATTS	± 15 VDC	± 200 mA	80%	82%	± 68 μF
RDD05 - 05D5U	18~75 VDC	0.13A	0.38A	5 WATTS	± 5 VDC	± 500 mA	77%	79%	± 680 μF
RDD05 - 12D5U	18~75 VDC	0.15A	0.43A	6 WATTS	± 12 VDC	± 250 mA	80%	82%	± 150 μF
RDD05 - 15D5U	18~75 VDC	0.15A	0.43A	6 WATTS	± 15 VDC	± 200 mA	80%	82%	± 68 μF

## SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

### GENERAL

Characteristics	Conditions	min.	typ.	max.	unit
Switching frequency	Vi nom, Io nom		280		KHz
Isolation voltage	Input / Output	1,500			VDC
Isolation resistance	Input / Output, @ 500VDC	100			MΩ
Isolation capacitance	100KHz / 1V		1,000		PF
Ambient temperature	Operating at Vi nom, Io nom	-40		+ 71	°C
Case temperature	Operating at Vi nom, Io nom			+ 100	°C
Derating	Vi nom	See derating curve			
Storage temperature	Non operational	-40		+ 100	°C
Relative humidity	Vi nom, Io nom	20		95	% RH
Temperature coefficient	Vi nom, Io min			± 0.02	% / °C
Dimension		L31.8 x W20.3 x H10.2			mm
MTBF	Bellcore issue 6@40°C, GB		1,120,000		Hours
Cooling	Free air convection				

### INPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit	
Input voltage range	Ta min ... Ta max, Io nom	2:1	9	12	18	VDC
			18	24	36	VDC
			35	48	75	VDC
		4:1	9	24	36	VDC
			18	48	75	VDC
No load input current	Vi nom, Io = 0	12V		30	mA	
		24V		30	mA	
		48V		20	mA	
Input voltage w/o damage	Io nom	12V		20	VDC	
		24V		40	VDC	
		48V		80	VDC	
Startup voltage	Io nom	12V	8.7		VDC	
		24V	17.4		VDC	
		48V	31.5		VDC	
Input filter	Pi type					

### SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

#### OUTPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Output voltage accuracy	Vi nom, Io nom			± 2	%
Minimum load	Vi nom single output models	0			%
	Vi nom dual output models (each output)	10			%
Line regulation	Io nom, Vi min ...Vi max			± 0.5	%
Load regulation	Vi nom, Io 0 ...Io nom, single output models			± 0.5	%
	Vi nom, Io min ...Io nom, dual output models			± 1	%
Cross regulation (Dual model)	Aymmetrical load 10% - 100% FL			± 5	%
Startup time	Vi nom, Io nom			700	ms
Transient recovery time	Vi nom, I ~0.5 Io nom			1	ms
Ripple & noise	Vi nom, Io nom, BW = 20MHz			50	mV
Efficiency	Vi nom, Io nom, Po / Pi	Up to 85%, See model list and efficiency curve			

#### CONTROL AND PROTECTION

Input reversed	Shunt diode built in, external fuse recommended 1A
Output short circuit	Current limited (Auto-recovery)
Rated over load protection	110%min....165%max

#### APPROVALS AND STANDARD

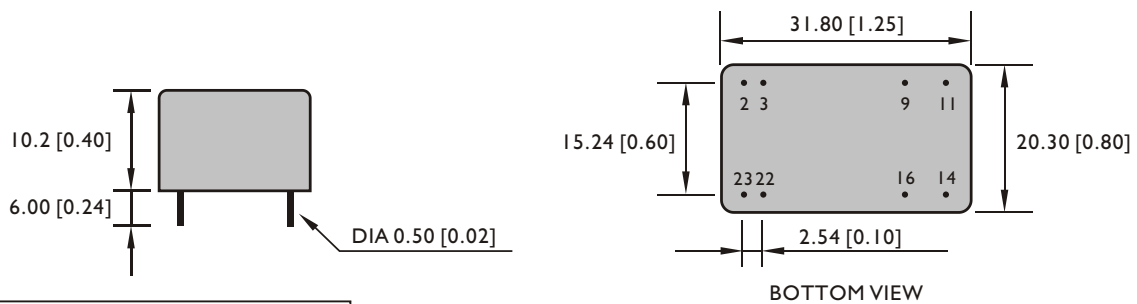
UL/cUL	UL 60950-1 Recognized
TUV	EN 60950-1
CE	EN 61204-3, EN 55032, Class A, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6
Vibration	meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)

#### PHYSICAL CHARACTERISTICS

Case size	31.8 x 20.3 x 10.2 mm (1.25 x 0.8 x 0.4 inches)
Case material	Plastic base / Metal case
Weight	18 g
Potting material	Silicone

#### MECHANISM & PIN CONFIGURATION

mm [inch]



GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

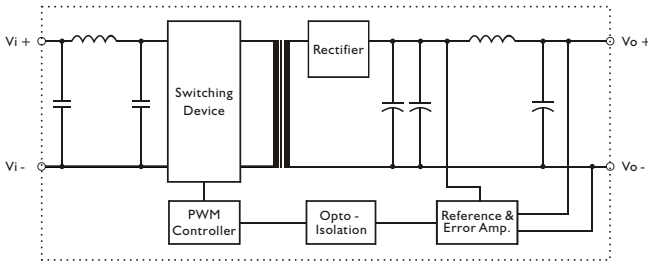
#### PIN ASSIGNMENT

##### GENERAL

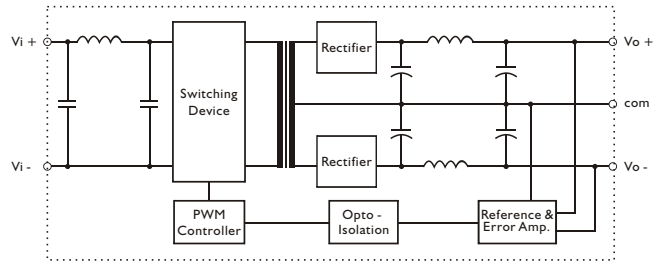
PIN NO.	2 & 3	9	11	14	16	22 & 23
SINGLE	Vi -	N. C.	N. C.	Vo+	Vo -	Vi+
DUAL	Vi -	com	Vo -	Vo+	com	Vi+

### CIRCUIT SCHEMATIC

• Block diagram for RDD05U series with single output

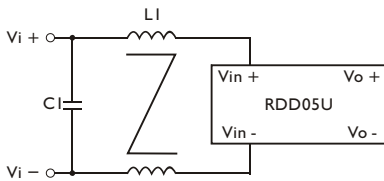


• Block diagram for RDD05U series with dual output

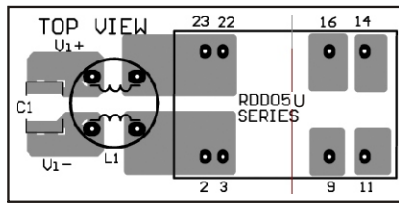


### RECOMMENDED CIRCUIT

• Recommended filter for EN 55032 Class B compliance



• Recommended EN 55032 Class B filter circuit layout.

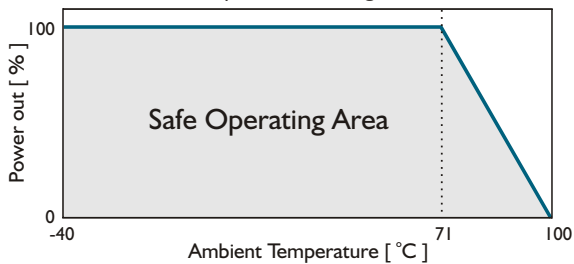


• The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

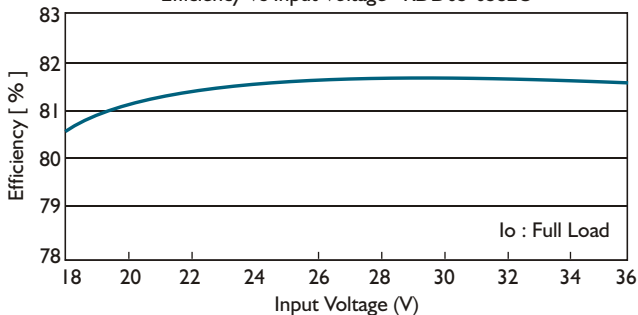
	CI	LI
RDD05-XXX1U	2.2 $\mu$ F / 50V MLCC	1.5mH common choke
RDD05-XXX2U	2.2 $\mu$ F / 50V MLCC	1.5mH common choke
RDD05-XXX3U	2.2 $\mu$ F / 100V MLCC	1.5mH common choke
RDD05-XXX4U	2.2 $\mu$ F / 50V MLCC	1.5mH common choke
RDD05-XXX5U	2.2 $\mu$ F / 100V MLCC	1.5mH common choke

### DERATING AND EFFICIENCY CURVE

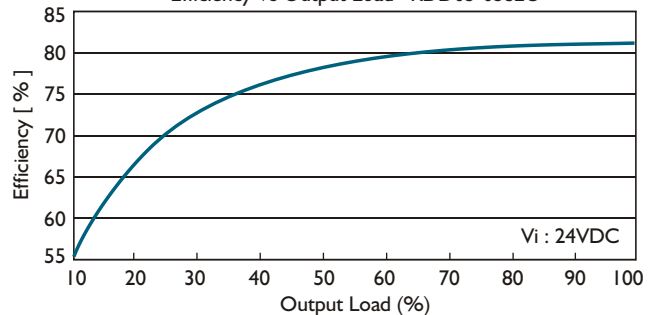
Temperature derating curve



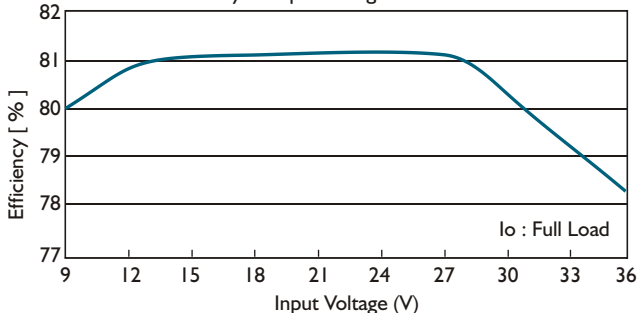
Efficiency Vs Input Voltage RDD05-05S2U



Efficiency Vs Output Load RDD05-05S2U



Efficiency Vs Input Voltage RDD05-05S4U



Efficiency Vs Output Load RDD05-05S4U

