RDD05 SERIES

DC - DC CONVERTER
5 ~ 6W SINGLE & DUAL OUTPUT

FEATURES

- EFFICIENCY UP TO 88%
- 2:1 WIDE INPUT RANGE
- I/O ISOLATION
- INPUT Pi FILTER
- SHORT CIRCUIT PROTECTION
- 3 YEARS WARRANTY

MODEL LIST

MODEL NO.	INPUT VOLTAGE	INPUT CURRENT (typ.)	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
Single Output Models								
RDD05 - 03S1	9~18 VDC	0.55A	5 WATTS	+3.3 VDC	1500 mA	74%	76%	2200 μF
RDD05 - 05S1	9~18 VDC	0.53A	5 WATTS	+ 5 VDC	1000 mA	77%	79%	1500 μF
RDD05 - 12S1	9~18 VDC	0.61A	6 WATTS	+ 12 VDC	500 mA	81%	83%	270 μF
RDD05 - 15S1	9~18 VDC	0.60A	6 WATTS	+ 15 VDC	400 mA	82%	84%	180 μF
RDD05 - 03S2	18~36 VDC	0.27A	5 WATTS	+3.3 VDC	1500 mA	77%	79%	2200 μF
RDD05 - 05S2	18~36 VDC	0.26A	5 WATTS	+ 5 VDC	1000 mA	80%	82%	1500 μF
RDD05 - 12S2	18~36 VDC	0.29A	6 WATTS	+ 12 VDC	500 mA	84%	86%	270 μF
RDD05 - 15S2	18~36 VDC	0.28A	6 WATTS	+ 15 VDC	400 mA	85%	87%	180 μF
RDD05 - 03S3	35~75 VDC	0.13A	5 WATTS	+3.3 VDC	1500 mA	78%	80%	2200 μF
RDD05 - 05S3	35~75 VDC	0.13A	5 WATTS	+ 5 VDC	1000 mA	81%	83%	1500 μF
RDD05 - 12S3	35~75 VDC	0.14A	6 WATTS	+ 12 VDC	500 mA	85%	87%	270 μF
RDD05 - 15S3	35~75 VDC	0.14A	6 WATTS	+ 15 VDC	400 mA	86%	88%	180 μF
Dual Output Models								
RDD05 - 05D1	9~18 VDC	0.54A	5 WATTS	± 5 VDC	± 500 mA	76%	78%	± 680 μF
RDD05 - 12D1	9~18 VDC	0.61A	6 WATTS	± 12 VDC	± 250 mA	80%	82%	± 150 μF
RDD05 - 15D1	9~18 VDC	0.60A	6 WATTS	± 15 VDC	± 200 mA	81%	83%	± 68 μF
RDD05 - 05D2	18~36 VDC	0.26A	5 WATTS	± 5 VDC	± 500 mA	78%	80%	± 680 μF
RDD05 - 12D2	18~36 VDC	0.30A	6 WATTS	± 12 VDC	± 250 mA	83%	85%	± 150 μF
RDD05 - 15D2	18~36 VDC	0.29A	6 WATTS	± 15 VDC	± 200 mA	84%	86%	± 68 μF
RDD05 - 05D3	35~75 VDC	0.13A	5 WATTS	± 5 VDC	± 500 mA	79%	81%	± 680 μF
RDD05 - 12D3	35~75 VDC	0.15A	6 WATTS	± 12 VDC	± 250 mA	84%	86%	± 150 μF
RDD05 - 15D3	35~75 VDC	0.15A	6 WATTS	± 15 VDC	± 200 mA	85%	87%	±± 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		150		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	-25		+ 71	°C
Case temperature	Operating at Vi nom, Io nom			+ 90	°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 H12.7			mm
MTBF	Bellcore issue 6@40°C, GB		1,120,000		Hours
Cooling	Free air convection				
Vibration	meet IEC 60068-2-6 (Random wave, 10-2KHz, 5G, each along X, Y, Z axes 10 min/cycle, 60min)				

INPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Input voltage range	Ta min ... Ta max, Io nom		9	12	18	VDC
			18	24	36	VDC
			36	48	72	VDC
No load input current	Vi nom, Io = 0	12V			30	mA
		24V			25	mA
		48V			15	mA
Input voltage w/o damage	Io nom	12V			20	VDC
		24V			40	VDC
		48V			75	VDC
Startup voltage	Io nom	12V		8.7		VDC
		24V		17.4		VDC
		48V		31.5		VDC
Input filter	Pi type					

OUTPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Output voltage accuracy	Vi nom, Io nom				± 2	%
Minimum load	Vi nom	single output models	0			%
		dual output models (each output)	20			%
Line regulation	Io nom, Vi min ...Vi max				± 1	%
Load regulation	Vi nom, Io 0 ...Io nom, single output models				± 2	%
	Vi nom, Io min ...Io nom, dual output models				± 3	%
Cross regulation (Dual model)	Aymmetrical load 20% - 100% FL				± 5	%
Startup time	Vi nom, Io nom				500	ms
Transient recovery time	Vi nom, 1~0.5 Io nom				500	μs
Ripple & noise	Vi nom, Io nom, BW = 20MHz				100	mV
Efficiency	Vi nom, Io nom, Po / Pi		Up to 88%, See model list and efficiency curve			

SPECIFICATION

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

CONTROL AND PROTECTION

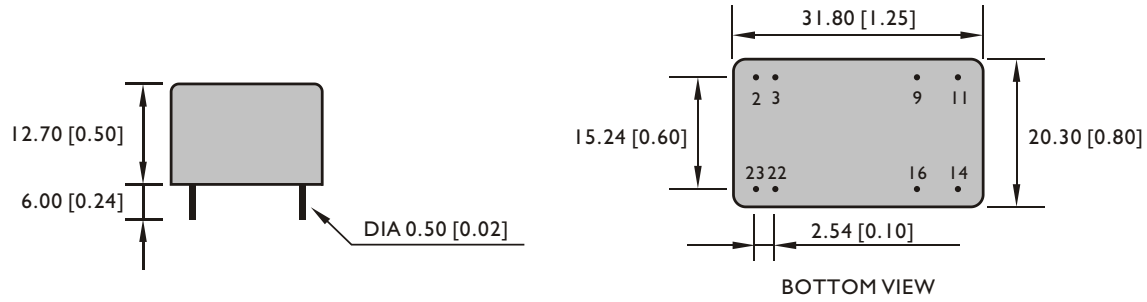
Input reversed	Shunt diode built in, external fuse recommended 1A
Output short circuit	Current limited (Auto-recovery)
Rated over load protection	110%min....140%max

PHYSICAL CHARACTERISTICS

Case size	31.8 x 20.3 x 12.7 mm (1.25 x 0.8 x 0.5 inches)
Case material	Plastic
Weight	15 g
Potting material	Epoxy

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]

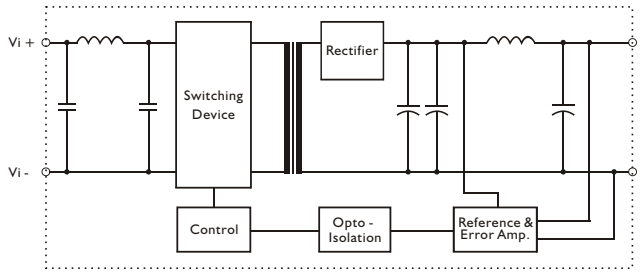
PIN ASSIGNMENT

GENERAL

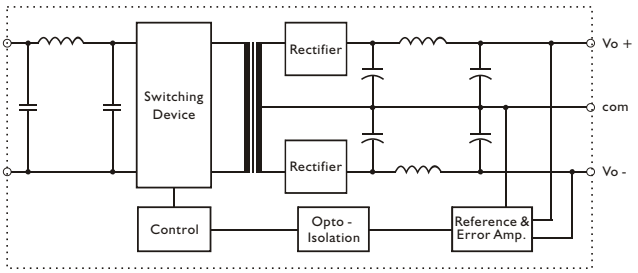
PIN NO.	2 & 3	9	11	14	16	22 & 23
SINGLE	Vi -	NO PIN	N. C.	Vo+	Vo -	Vi+
DUAL	Vi -	com	Vo -	Vo+	com	Vi+

CIRCUIT SCHEMATIC

• Block diagram for RDD05 series with single output

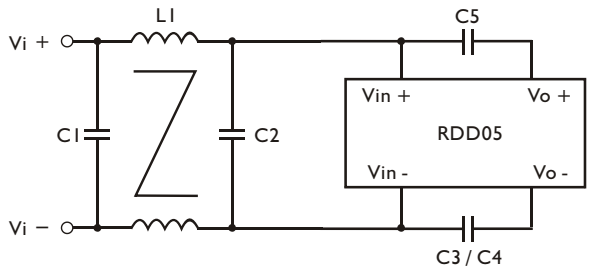


• Block diagram for RDD05 series with dual output



RECOMMENDED CIRCUIT

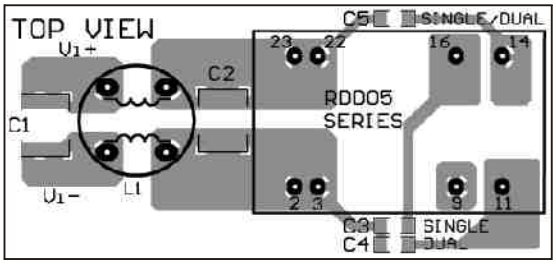
• Recommended filter for EN55022 Class B compliance.



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

	C1	C2	C3 / C4	C5	L1
RDD05-XXX1	2.2μF / 50V MLCC	4.7μF / 50V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	1.5mH Common Choke
RDD05-XXX2	2.2μF / 50V MLCC	4.7μF / 50V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	1.5mH Common Choke
RDD05-XXX3	2.2μF / 100V MLCC	2.2μF / 100V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	1.5mH Common Choke

• Recommended EN 55022 Class B filter circuit layout.



DERATING AND EFFICIENCY CURVE