

DC-DC POWER MODULE
5~6W SINGLE & DUAL OUTPUTS
2:1 Input Range
I/O Isolation
Input Pi Filter
Short Circuit Protection



SINGLE OUTPUT MODELS

Part Number	Input Voltage	Input Current		Output Wattage	Output Voltage	Output Current	Efficiency		Capacitor Load (max)
		(typ)	(Max)				(min)	(typ.)	
CD05RDD03S1U	9~18 VDC	0.52A	0.73A	5 Watts	3.3 VDC	1500mA	79%	81%	2200uF
CD05RDD05S1U	9~18 VDC	0.51A	0.72A	5 Watts	5VDC	1000mA	80%	82%	1500uF
CD05RDD12S1U	9~18 VDC	0.60A	0.83A	6 Watts	12VDC	500mA	83%	85%	270uF
CD05RDD15S1U	9~18 VDC	0.60A	0.83A	6 Watts	15VDC	400mA	83%	85%	180uF
CD05RDD03S2U	18~36 VDC	0.26A	0.36A	5 Watts	3.3 VDC	1500mA	78%	80%	2200uF
CD05RDD05S2U	18~36 VDC	0.25A	0.36A	5 Watts	5VDC	1000mA	80%	82%	1500uF
CD05RDD12S2U	18~36 VDC	0.30A	0.42A	6 Watts	12VDC	500mA	81%	83%	270uF
CD05RDD15S2U	18~36 VDC	0.30A	0.42A	6 Watts	15VDC	400mA	81%	83%	180uF
CD05RDD03S3U	35~75 VDC	0.13A	0.19A	5 Watts	3.3 VDC	1500mA	78%	80%	2200uF
CD05RDD05S3U	35~75 VDC	0.13A	0.18A	5 Watts	5VDC	1000mA	80%	82%	1500uF
CD05RDD12S3U	35~75 VDC	0.15A	0.22A	6 Watts	12VDC	500mA	80%	82%	270uF
CD05RDD15S3U	35~75 VDC	0.15A	0.22A	6 Watts	15VDC	400mA	81%	83%	180uF

DUAL OUTPUT MODELS

Part Number	Input Voltage	Input Current		Output Wattage	Output Voltage	Output Current	Efficiency		Capacitor Load (max)
		(typ)	(Max)				(min)	(typ.)	
CD05RDD05D1U	9~18 VDC	0.51A	0.72A	5 Watts	+/-5VDC	+/-500mA	80%	82%	+/-680uF
CD05RDD12D1U	9~18 VDC	0.60A	0.83A	6 Watts	+/-12VDC	+/-250mA	82%	84%	+/-150uF
CD05RDD15D1U	9~18 VDC	0.59A	0.83A	6 Watts	+/-15VDC	+/-200mA	83%	85%	+/-68uF
CD05RDD05D2U	18~36 VDC	0.26A	0.36A	5 Watts	+/-5VDC	+/-500mA	79%	81%	+/-680uF
CD05RDD12D2U	18~36 VDC	0.30A	0.42A	6 Watts	+/-12VDC	+/-250mA	81%	83%	+/-150uF
CD05RDD15D2U	18~36 VDC	0.31A	0.42A	6 Watts	+/-15VDC	+/-200mA	80%	82%	+/-68uF
CD05RDD05D3U	35~75 VDC	0.13A	0.19A	5 Watts	+/-5VDC	+/-500mA	80%	82%	+/-680uF
CD05RDD12D3U	35~75 VDC	0.15A	0.22A	6 Watts	+/-12VDC	+/-250mA	81%	83%	+/-150uF
CD05RDD15D3U	35~75 VDC	0.15A	0.22A	6 Watts	+/-15VDC	+/-200mA	80%	82%	+/-68uF

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/IV		1000		P F
Ambient Temp	Operating @ Vi nom, Io nom	-40		+71	C
Case Temperature	Operating at Vi nom, Io nom			+100	C
Derating	Vi nom	See derating curve			%/C
Storage Temp.	Non Operational	-40		+100	C
Relative humidity	Vi nom, Io nom	20		95	%RH
MTBF	Bellcore issue 6@40C, 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	9	12	18	VDC
		18	24	36	VDC
		35	48	75	VDC
No load input current	Vi nom, Io = 0	12V models		30	mA
		24V models		25	mA
		48V models		20	mA
Input voltage w/o damage	Io Nom	12V models		20	VDC
		24V models		40	VDC
		48V models		80	VDC
Startup voltage	Io Nom	12V models	8.7		VDC
		24V models	17.4		VDC
		48V models	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 model	0			%
	Vi nom dual output (each output)	10			%
Line regulation	Io nom, Vi min ... Vi max			+/-0.5	%
Load regulation	Single output models			+/-0.5	%
	Vi nom, Io 0 ... Io nom Dual output models			+/-0.5	%
Cross regulation (Dual)	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
Temperature coefficient	Vi nom, Io nom			+/-0.02	%/C
Ripple & Noise*	Vi nom, Io nom, BW =20MHz			50	mV
Efficiency	Vi nom, Io nom, Po/Pi	Up to 85% See model list			

All Specifications Typical at Nominal Line, Full Load, 25 C Unless Noted Otherwise



DC-DC POWER MODULE
4~6W SINGLE & DUAL OUTPUTS
4:1 Input Range
I/O Isolation
Input Pi Filter
Short Circuit Protection

SINGLE OUTPUT MODELS

Part Number	Input Voltage	Input Current		Output Wattage	Output Voltage	Output Current	Efficiency		Capacitor Load (max)
		(typ)	(Max)				(min)	(typ.)	
CD05RDD03S4U	9~36 VDC	0.22A	0.62A	4 Watts	3.3 VDC	1200mA	75%	77%	2200uF
CD05RDD05S4U	9~36 VDC	0.27A	0.76A	5 Watts	5 VDC	1000mA	77%	79%	1500uF
CD05RDD12S4U	9~36 VDC	0.31A	0.87A	6 Watts	12 VDC	500mA	80%	82%	270uF
CD05RDD15S4U	9~36 VDC	0.31A	0.87A	6 Watts	15 VDC	400mA	80%	82%	180uF
CD05RDD03S5U	18~75 VDC	0.11A	0.31A	4 Watts	3.3 VDC	1200mA	75%	77%	2200uF
CD05RDD05S5U	18~75 VDC	0.13A	0.38A	5 Watts	5 VDC	1000mA	77%	79%	1500uF
CD05RDD12S5U	18~75 VDC	0.15A	0.43A	6 Watts	12 VDC	500mA	80%	82%	270uF
CD05RDD15S5U	18~75 VDC	0.15A	0.43A	6 Watts	15 VDC	400mA	80%	82%	180uF

DUAL OUTPUT MODELS

Part Number	Input Voltage	Input Current		Output Wattage	Output Voltage	Output Current	Efficiency		Capacitor Load (max)
		(typ)	(Max)				(min)	(typ.)	
CD05RDD05D4U	9~36 VDC	0.27A	0.76A	5 Watts	+/-5 VDC	+/-500mA	77%	79%	+/-680uF
CD05RDD12D4U	9~36 VDC	0.31A	0.87A	6 Watts	+/-12 VDC	+/-250mA	80%	82%	+/-150uF
CD05RDD15D4U	9~36 VDC	0.31A	0.87A	6 Watts	+/-15 VDC	+/-200mA	80%	82%	+/-68uF
CD05RDD05D5U	18~75 VDC	0.13A	0.38A	5 Watts	+/-5 VDC	+/-500mA	77%	79%	+/-680uF
CD05RDD12D5U	18~75 VDC	0.15A	0.43A	6 Watts	+/-12 VDC	+/-250mA	80%	82%	+/-150uF
CD05RDD15D5U	18~75 VDC	0.15A	0.43A	6 Watts	+/-15 VDC	+/-200mA	80%	82%	+/-68uF

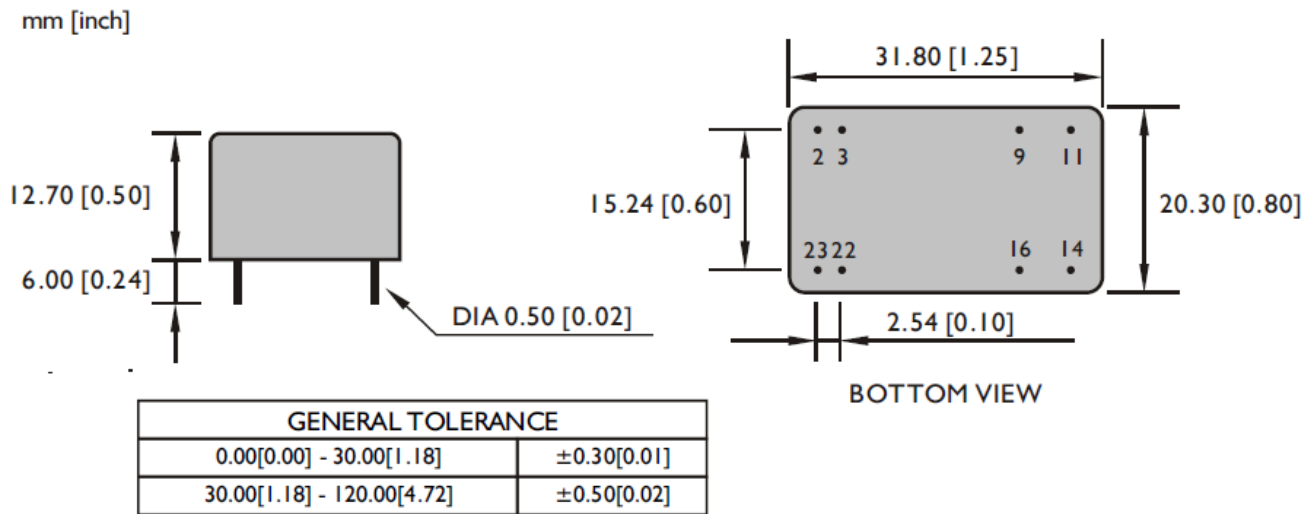
GENERAL					
Characteristics	Conditions	Min	Typ	Max	Unit
Switching frequency	Vi nom, Io nom		280		KHz
Isolation Voltage	Input/Output	1,500			VDC
Isolation Resistance	Input/Output, @500VDC	100			MΩ
Isolation capacitance	100KHz/IV		1000		P F
Ambient Temp	Operating @ Vi nom, Io nom	-40		+71	C
Case Temperature	Operating at Vi nom, Io nom			+100	C
Derating	Vi nom	See derating curve			%/C
Storage Temp.	Non Operational	-40		+100	C
Relative humidity	Vi nom, Io nom	20		95	%RH
MTBF	Bellcore issue 6@40C, GB		1,140,000		Hours
Cooling	Free air convection				

INPUT SPECIFICATIONS					
Characteristics	Conditions	Min	Typ	Max	Unit
Input Voltage Range	Ta min...Ta Max, Io nom	9	24	36	VDC
		18	48	75	VDC
No load input current	Vi nom, Io = 0	24V models		30	mA
		48V models		25	mA
Input voltage w/o damage	Io Nom	24V models		40	VDC
		48V models		80	VDC
Startup voltage	Io Nom	24V models	8.7		VDC
		48V models	17.4		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 model	0			%
	Vi nom dual output (each output)	10			%
Line regulation	Io nom, Vi min ... Vi max			+/-0.5	%
Load regulation	Single output models			+/-0.5	%
	Vi nom, Io 0 ... Io nom			+/-1	%
Cross regulation (Dual)	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
Temperature coefficient	Vi nom, Io nom			+/-0.02	%/C
Ripple & Noise	Vi nom, Io nom, BW =20MHz			50	mV
Efficiency	Vi nom, Io nom, Po/Pi	Up to 82% See model list			

Control & 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

Dimensions and Pinning

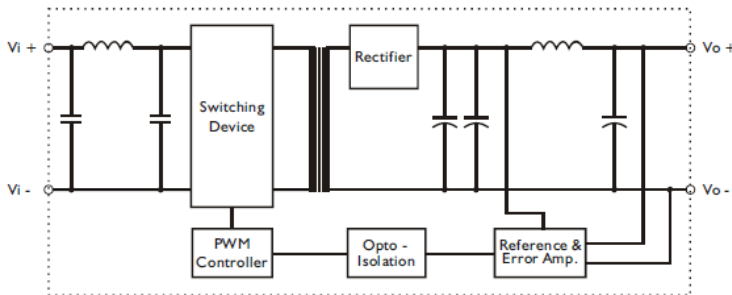


Case: Metal base /Plastic cover, silicone potting material, weight 18g

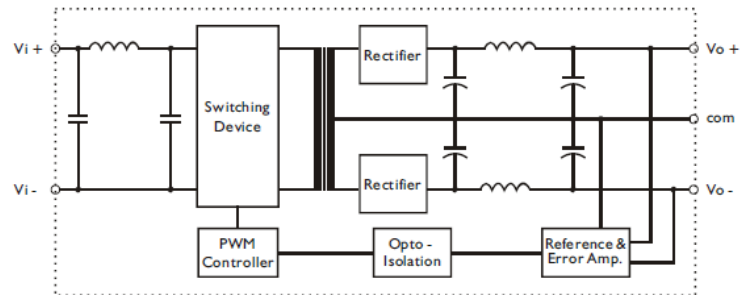
PIN ASSIGNMENT						
Pin No	2 & 3	9	11	14	16	22 & 23
SINGLE	Vi-	N.C.	N.C.	Vo+	Vo-	Vi+
DUAL	Vi-	Com	Vo-	Vo+	com	Vi+

Circuit Schematic

• Block diagram for series with single output

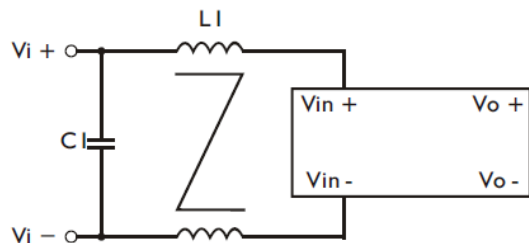


• Block diagram for series with dual output



Recommended Circuit

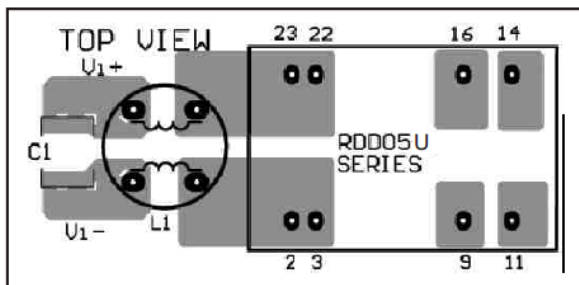
• Recommended filter for EN55022 Class B compliance



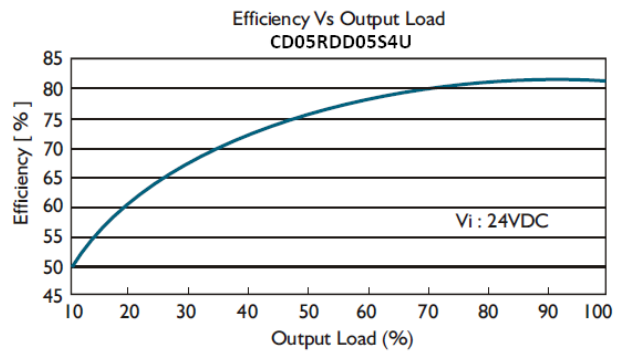
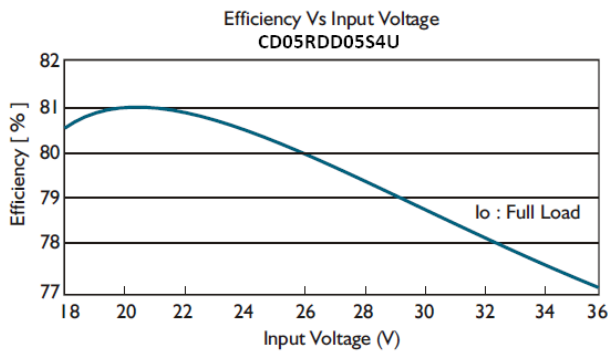
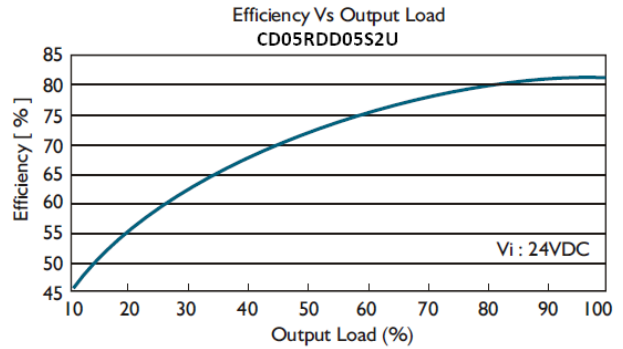
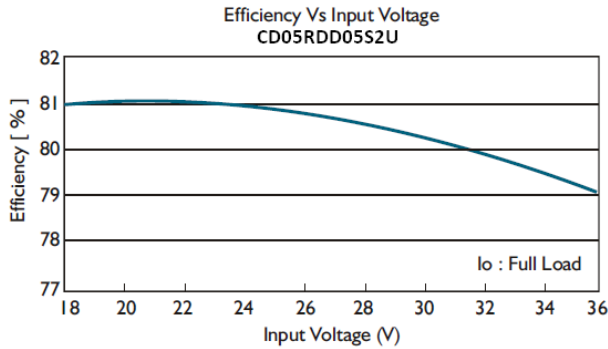
• The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

	C1	L1
CD05RDD-XXX1U	2.2 μ F / 50V MLCC	1.5mH common choke
CD05RDD-XXX2U	2.2 μ F / 50V MLCC	1.5mH common choke
CD05RDD-XXX3U	2.2 μ F / 100V MLCC	1.5mH common choke

• Recommended EN 55022 Class B filter circuit layout.



Efficiency Curves



Derating Curve

