

# FDD03 SERIES



DC - DC CONVERTER  
2 ~ 3W SINGLE & DUAL OUTPUT

## FEATURES

- LOW COST
- 4:1 & 3:1 & 2:1 WIDE INPUT RANGE
- I/O ISOLATION
- SHORT CIRCUIT PROTECTION
- HIGH EFFICIENCY UP TO 73%

## MODEL LIST

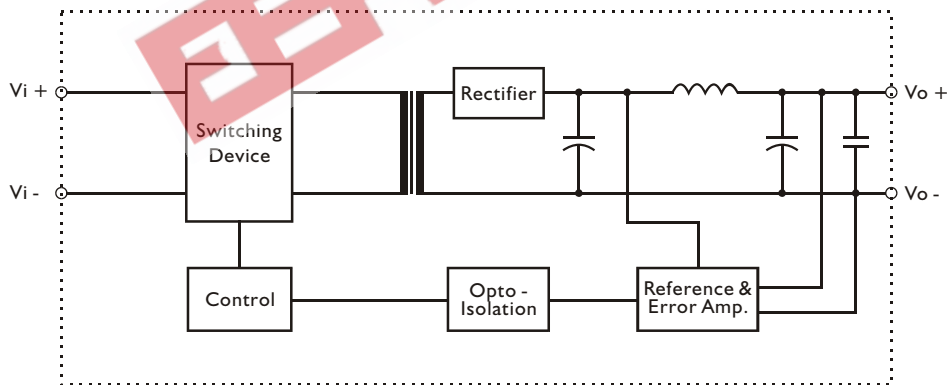
MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)
<b>Single Output Models</b>					
FDD03 - 05S	20~60 VDC	2.5 WATTS	+ 5 VDC	500 mA	68%
FDD03 - 12S	20~60 VDC	3 WATTS	+ 12 VDC	250 mA	70%
FDD03 - 15S	20~60 VDC	3 WATTS	+ 15 VDC	200 mA	70%
FDD03 - 05S1	9~18 VDC	2 WATTS	+ 5 VDC	400 mA	63%
FDD03 - 12S1	9~18 VDC	2.4 WATTS	+ 12 VDC	200 mA	65%
FDD03 - 15S1	9~18 VDC	2.2 WATTS	+ 15 VDC	150 mA	65%
FDD03 - 05S2	18~36 VDC	2.5 WATTS	+ 5 VDC	500 mA	68%
FDD03 - 12S2	18~36 VDC	3 WATTS	+ 12 VDC	250 mA	70%
FDD03 - 15S2	18~36 VDC	3 WATTS	+ 15 VDC	200 mA	70%
FDD03 - 05S3	36~72 VDC	2.5 WATTS	+ 5 VDC	500 mA	68%
FDD03 - 12S3	36~72 VDC	3 WATTS	+ 12 VDC	250 mA	70%
FDD03 - 15S3	36~72 VDC	3 WATTS	+ 15 VDC	200 mA	70%
FDD03 - 05S4	9~36 VDC	2.5 WATTS	+ 5 VDC	500 mA	68%
FDD03 - 12S4	9~36 VDC	3 WATTS	+ 12 VDC	250 mA	70%
FDD03 - 15S4	9~36 VDC	3 WATTS	+ 15 VDC	200 mA	70%
FDD03 - 05S5	18~72 VDC	2.5 WATTS	+ 5 VDC	500 mA	68%
FDD03 - 12S5	18~72 VDC	3 WATTS	+ 12 VDC	250 mA	70%
FDD03 - 15S5	18~72 VDC	3 WATTS	+ 15 VDC	200 mA	70%

### MODEL LIST

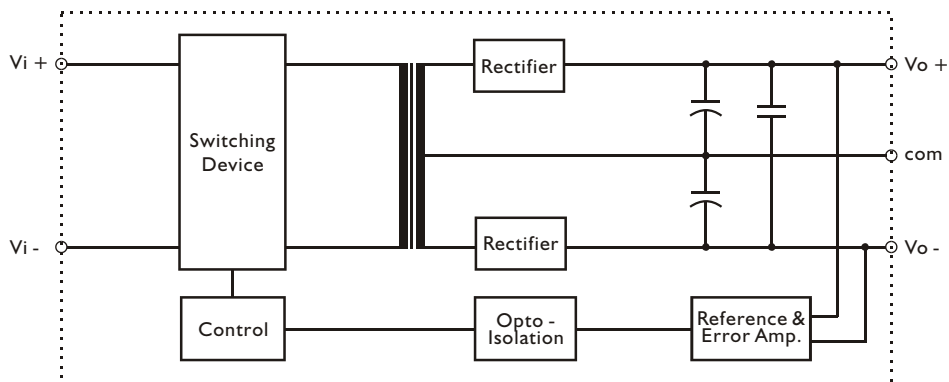
MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)
<b>Dual Output Models</b>					
FDD03 - 05D	20~60 VDC	2.5 WATTS	± 5 VDC	± 250 mA	70%
FDD03 - 12D	20~60 VDC	3 WATTS	± 12 VDC	± 125 mA	72%
FDD03 - 15D	20~60 VDC	3 WATTS	± 15 VDC	± 100 mA	73%
FDD03 - 05D1	9~18 VDC	2 WATTS	± 5 VDC	± 200 mA	65%
FDD03 - 12D1	9~18 VDC	2.4 WATTS	± 12 VDC	± 100 mA	67%
FDD03 - 15D1	9~18 VDC	2.4 WATTS	± 15 VDC	± 80 mA	67%
FDD03 - 05D2	18~36 VDC	2.5 WATTS	± 5 VDC	± 250 mA	70%
FDD03 - 12D2	18~36 VDC	3 WATTS	± 12 VDC	± 125 mA	72%
FDD03 - 15D2	18~36 VDC	3 WATTS	± 15 VDC	± 100 mA	73%
FDD03 - 05D3	36~72 VDC	2.5 WATTS	± 5 VDC	± 250 mA	70%
FDD03 - 12D3	36~72 VDC	3 WATTS	± 12 VDC	± 125 mA	72%
FDD03 - 15D3	36~72 VDC	3 WATTS	± 15 VDC	± 100 mA	73%
FDD03 - 05D4	9~36 VDC	2.5 WATTS	± 5 VDC	± 250 mA	70%
FDD03 - 12D4	9~36 VDC	3 WATTS	± 12 VDC	± 125 mA	72%
FDD03 - 15D4	9~36 VDC	3 WATTS	± 15 VDC	± 100 mA	73%
FDD03 - 05D5	18~72 VDC	2.5 WATTS	± 5 VDC	± 250 mA	70%
FDD03 - 12D5	18~72 VDC	3 WATTS	± 12 VDC	± 125 mA	72%
FDD03 - 15D5	18~72 VDC	3 WATTS	± 15 VDC	± 100 mA	73%

### CIRCUIT SCHEMATIC

• Block diagram for FDD03 series with single output



• Block diagram for FDD03 series with dual output



### 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	50			KHz
Isolation voltage	Input / Output	1,500			VDC
Isolation resistance	Input / Output, @ 500VDC	1G			Ω
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			% / °C
Storage temperature	Non operational	-40		+ 100	°C
M.T.B.F.	According to MIL-HDBK-217F, GF40		896,100		Hrs
Dimension	L20.3 x W31.8 x H12.7				mm
Cooling	Free air convection				
Case material	Plastic				

#### INPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Input voltage range	Ta min ... Ta max, Io nom	2:1 models	9	12	18	VDC
			18	24	36	VDC
			36	48	72	VDC
		3:1 models	20	48	60	VDC
		4:1 models	9	24	36	VDC
		18	48	72	VDC	
No load input current	Vi nom, Io = 0	12V models			18	mA
		24V models			12	mA
		48V models			8	mA
Input voltage w/o damage	Io nom	12V models			20	VDC
		24V models			40	VDC
		48V models			75	VDC

#### OUTPUT SPECIFICATIONS

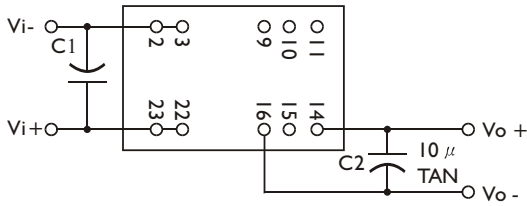
Characteristics	Conditions	min.	typ.	max.	unit
Output voltage accuracy	Vi nom, Io nom			± 2	%
Minimum load	Vi nom, single output models	0			%
	Vi nom, dual output models (each output)	20			%
Line regulation	Io nom, Vi min ... Vi max			± 1	%
Load regulation	Vi nom, Io 0 ... Io nom, single output models			± 2	%
	Vi nom, Io min ... Io nom, dual output models			± 5	%
Temperature coefficient	Vi nom, Io nom			± 0.02	% / °C
Ripple & noise	Vi nom, Io nom, BW = 20MHz			Vout x ± 2%	mV
Efficiency	Vi nom, Io nom, Po / Pi	Up to 73%, See model list			

#### CONTROL AND PROTECTION

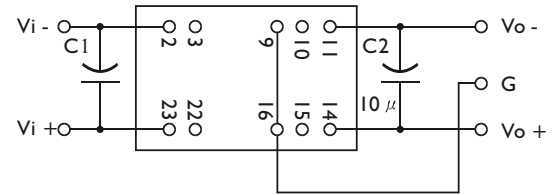
Input reversed	Shunt diode built in, external fuse recommended
Output short circuit	Continuous

### APPLICATION CIRCUIT

a. SINGLE OUTPUT MODELS :  
(BOTTOM VIEW)



b. DUAL OUTPUT MODELS :  
(BOTTOM VIEW)

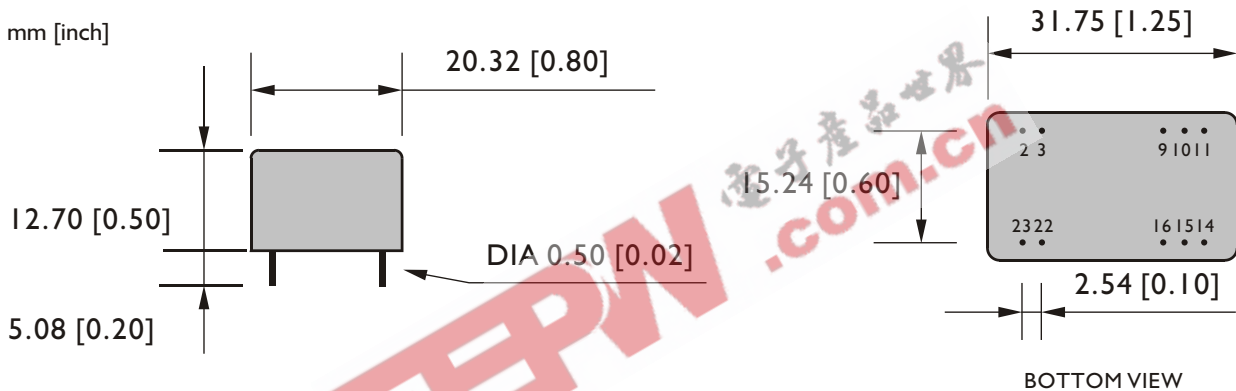


#### NOTE:

- $C1 = 4.7 \mu F / 100V$ ,  $C2 = 10 \mu F$
- $C1$  MUST BE ADDED WHEN APPLICATION .
- $C2$  OPTIONAL TO MINIMIZE THE R&N < 100mV .
- MAX. 80% LOAD WHEN INPUT VOLTAGE AT 9-11VDC FOR 9-36VDC INPUT MODELS & 18-21VDC FOR 18-72VDC INPUT MODELS .

### MECHANISM & PIN CONFIGURATION

mm [inch]



### PHYSICAL CHARACTERISTICS

CASE SIZE	20.3 x 31.8 x 12.7 mm 0.8 x 1.25 x 0.5 inches
CASE MATERIAL	Plastic
WEIGHT	15 g

### PIN ASSIGNMENT

#### GENERAL

PIN NO.	2&3	9	10&15	11	14	16	22&23
SINGLE	Vi -	N. C.	N. C.	N. C.	Vo+	Vo -	Vi+
DUAL	Vi -	com	N. C.	Vo-	Vo+	com	Vi+

### DERATING

