

# FDC10(W) SERIES

DC / DC Single & Dual Output: 10 Watts



## Features

- 2:1 standard input range
- 4:1 wide Input range option 9~36V & 18~75V
- Single & Dual outputs
- Industry Standard 2 x 1in package
- High efficiency up to 83%
- Regulated output & Short circuit protection
- 1600V isolation
- Five sided continuous copper shield
- Remote ON / OFF ( Negative or Positive option )
- High operating temperature +85°C
- Zero load operation
- M1 option: -40°C to +85°C ( non-derating )
- M2 option: W series: -40°C to +85°C ( with derating )

## Specifications:

<b>Input Voltage</b>	12VDC ( 9 ~ 18 ) 24VDC ( 18 ~ 36 ) 48VDC ( 36 ~ 75 )	<b>Efficiency</b>	Model dependant 78 ~ 87%
Option ( W ) models	24VDC ( 9 ~ 36 ) 48VDC ( 18 ~ 75 )	<b>Isolation</b>	1600VDC
<b>Input Filter</b>	Pi type	<b>Isolation Cap.</b>	300pF
<b>Input Surge Voltage.</b> ( 100mS )	12V: 36VDC 24V: 50VDC. 48V: 100VDC	<b>Switching Freq.</b>	Standard 300KHz W series 400KHz
<b>Input Reflected Ripple Current</b>	30mA pk-pk ( @ nominal input & 100% load	<b>Safety</b>	EN60950-1, UL60950-1
<b>Start Up time</b>	20mS constant resistive load	<b>Case Material</b>	Nickel-coated copper
<b>Remote ON/OFF</b> ( Positive logic )	DC-DC ON Open or $3.0V < V_r < 12V$ DC-DC OFF Short or $0V < V_r < 1.2V$	<b>Base Material</b>	Non-conductive black plastic
( Negative logic )	DC-DC ON Short or $0V < V_r < 1.2V$ DC-DC OFF Open or $3.0V < V_r < 12V$	<b>Potting</b>	Epoxy UL94-V0
( Option )	Input current of remote control pin: 0.5mA Remote off state input current: 2.5mA	<b>Dimensions</b>	50.8 x 25.4 x 10.2mm
<b>Output power</b>	10 watts	<b>Weight</b>	27g
<b>Voltage Accuracy</b>	±1.0%	<b>MTBF</b>	1.976 x 10 <sup>6</sup> Hrs
<b>Minim Load</b>	Zero	<b>Operating Temp</b>	Standard: -25°C to +85°C ( with derating ) M1 option: -40°C to +85°C ( non-derating ) M2 option: W series: -40°C to +85°C with derating
<b>Line Regulation</b>	Single ±0.2% Dual ±0.5%	<b>Case Temp</b>	+100°C maximum case temperature
<b>Load Regulation</b>	Single ±0.5% , Dual ±1% ( 0% -100% load )	<b>Thermal Impedance</b>	12°C / watt Standard convection 10°C / watt with optional heatsink
<b>Cross Regulation</b>	±5% Asymmetrical load: 25-100% load )	<b>Thermal shock</b>	MIL-STD-810F
<b>Ripple &amp; noise</b>	See table. 20MHZ bandwidth	<b>Vibration</b>	10-55Hz, 10G, 30min along X, Y,Z
<b>Temp. Coefficient</b>	±0.02% / °C	<b>Humidity</b>	5-95% RH
<b>Transient Response</b>	250uS ( 25% load step change )	<b>EMC</b>	EN55022 Class A Consult office for Class B design
<b>Over Voltage Protection</b>	3.3V: 3.9V 5.0V: 6.2V 12V: 15V 15V: 18V	<b>ESD</b>	EN61000-4-2
<b>Overload Protection</b>	Typically 150% of load	<b>Radiated Immunity</b>	EN61000-4-3
<b>Short Circuit protection</b>	Continuous hiccup mode	<b>Fast Transients</b>	EN61000-4-4
		<b>Surge</b>	EN61000-4-5
		<b>Conducted Immunity</b>	EN61000-4-6

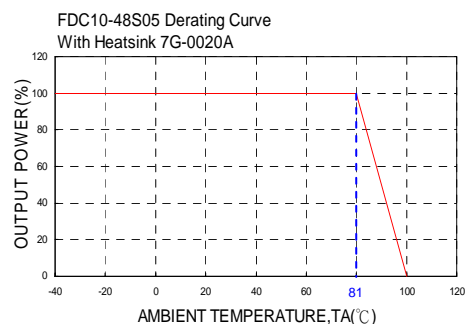
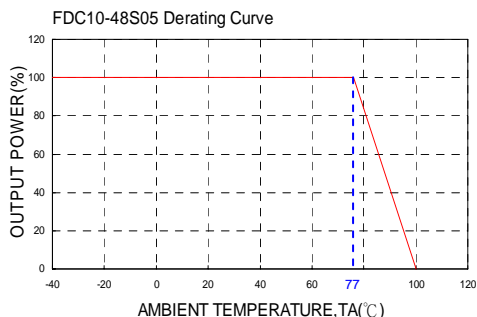
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Model	Input V	Output V	Output Current		Output Ripple & Noise	Input Current		Eff (%)	Capacitor Load max
			Min. load	Full load		No load A	Full load A		
FDC10-12S33	9 – 18 V	3.3 V	0mA	2000mA	50mVp-p	17mA	724mA	80	6800uF
FDC10-12S05	9 – 18 V	5 V	0mA	2000mA	50mVp-p	21mA	1082mA	81	4700uF
FDC10-12S12	9 – 18 V	12 V	0mA	830mA	50mVp-p	38mA	1037mA	84	690uF
FDC10-12S15	9 – 18 V	15 V	0mA	670mA	50mVp-p	36mA	1046mA	84	470uF
FDC10-12D05	9 – 18 V	± 5 V	0mA	± 1000mA	75mVp-p	39mA	1042mA	84	± 680uF
FDC10-12D12	9 – 18 V	± 12 V	0mA	± 416mA	75mVp-p	47mA	1053mA	83	± 330uF
FDC10-12D15	9 – 18 V	± 15 V	0mA	± 333mA	75mVp-p	45mA	1041mA	84	± 110uF
FDC10-24S33 (W)	18 – 36 (9 – 36) V	3.3 V	0mA	2000(2500mA)	50mVp-p	15(13mA)	362(465mA)	80(78)	6800uF
FDC10-24S05 (W)	18 – 36 (9 – 36) V	5 V	0mA	2000mA	50mVp-p	22(11mA)	534 (548mA)	82 (80)	4700uF
FDC10-24S12 (W)	18 – 36 (9 – 36) V	12 V	0mA	830mA	50mVp-p	18(16mA)	519 (519mA)	84 (84)	690uF
FDC10-24S15 (W)	18 – 36 (9 – 36) V	15 V	0mA	670mA	50mVp-p	36(26mA)	523 (544mA)	84 (81)	470uF
FDC10-24D05 (W)	18 – 36 (9 – 36) V	± 5 V	0mA	± 1000mA	75mVp-p	28(15mA)	527 (534mA)	83 (82)	± 680uF
FDC10-24D12 (W)	18 – 36 (9 – 36) V	± 12 V	0mA	± 416mA	75mVp-p	24(15mA)	513 (547mA)	85 (80)	± 330uF
FDC10-24D15 (W)	18 – 36 (9 – 36) V	± 15 V	0mA	± 333mA	75mVp-p	31(22mA)	520 (548mA)	84 (80)	± 110uF
FDC10-48S33 (W)	36 – 75 (18 – 75) V	3.3 V	0mA	2000(2500mA)	50mVp-p	11(10mA)	181(239mA)	80(76)	6800uF
FDC10-48S05 (W)	36 – 75 (18 – 75) V	5 V	0mA	2000mA	50mVp-p	14(9mA)	260 (270mA)	84 (81)	4700uF
FDC10-48S12 (W)	36 – 75 (18 – 75) V	12 V	0mA	830mA	50mVp-p	14(9mA)	253 (259mA)	86 (84)	690uF
FDC10-48S15 (W)	36 – 75 (18 – 75) V	15 V	0mA	670mA	50mVp-p	10(11mA)	252 (262mA)	87 (84)	470uF
FDC10-48D05 (W)	36 – 75 (18 – 75) V	± 5 V	0mA	± 1000mA	75mVp-p	16(12mA)	260 (267mA)	84 (82)	± 680uF
FDC10-48D12 (W)	36 – 75 (18 – 75) V	± 12 V	0mA	± 416mA	75mVp-p	19(20mA)	254 (281mA)	86 (78)	± 330uF
FDC10-48D15 (W)	36 – 75 (18 – 75) V	± 15 V	0mA	± 333mA	75mVp-p	16(20mA)	256 (270mA)	85 (81)	± 110uF

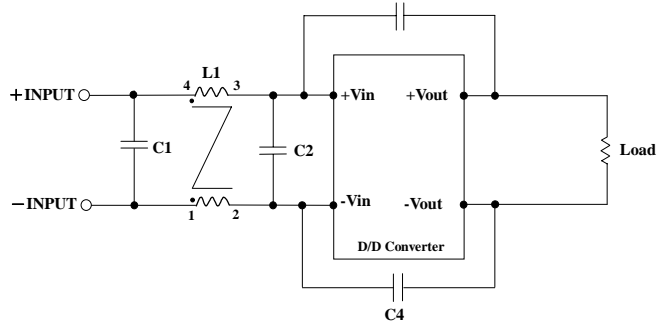
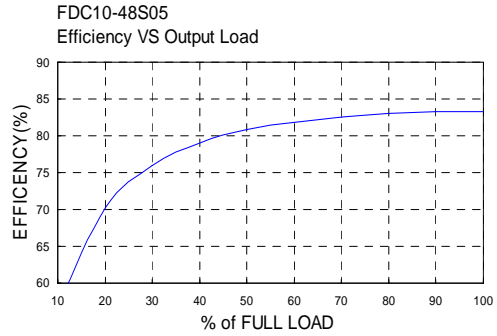
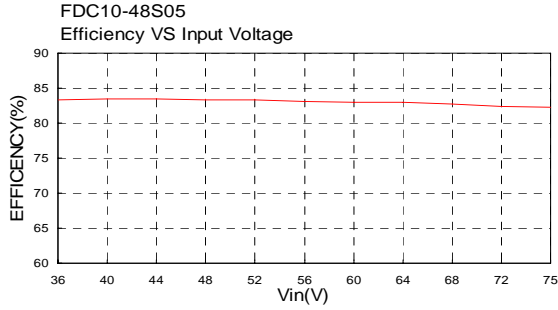
## Notes:

1. MTBF as per BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
2. Typical values at nominal input voltage and full load, resistive load
3. Remote ON/OFF control pin voltage is referenced to -Vin.  
To order positive logic ON/OFF control add the suffix-P ( eg: FDC10-12S05-P); To order negative logic ON-OFF control add the suffix-N (eg: FDC10-12S05-N)
4. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard and M2 version.
5. Heat sink is optional and P/N: 7G-0020A.
6. The FDC10 series can meet EN55022 Class A with parallel an external capacitor to the input pins.  
Recommend: 12Vin : 4.7µF/25V 1210 MLCC . 24Vin : 2.2µF/50V 1812 MLCC . 48Vin : 1.5µF/100V 1812 MLCC .
7. An external filter capacitor is required if the module has to meet EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ.



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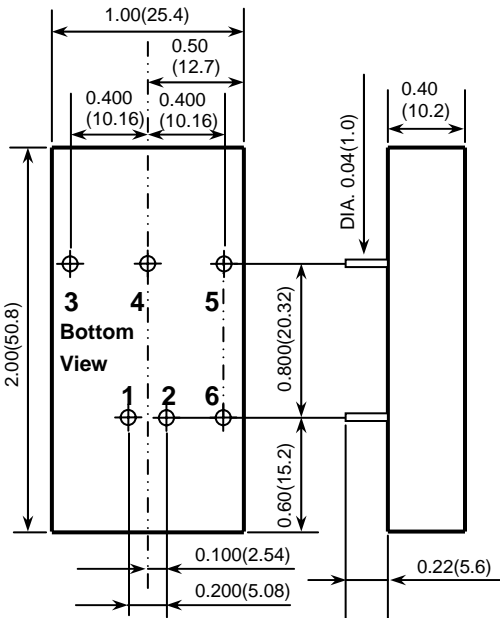


Recom

## Recommended Filter for EN55022 Class B Compliance

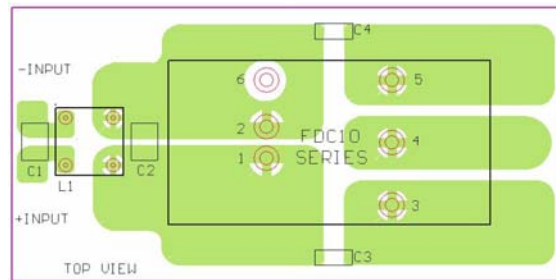
The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1	C2	C3	C4	L1
FDC10-12xxx	3.3uF/50V 1812 MLCC	N/A	1000P/2KV MLCC	1000P/2KV MLCC	325uH Common Choke PMT-050
FDC10-24xxx	2.2uF/50V 1812 MLCC	N/A	1000P/2KV MLCC	1000P/2KV MLCC	325uH Common Choke PMT-050
FDC10-48xxx	2.2uF/100V 1812 MLCC	2.2uF/100V 1812 MLCC	1000P/2KV MLCC	1000P/2KV MLCC	325uH Common Choke PMT-050



- All dimensions in Inches (mm)  
Tolerance: X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)
- Pin pitch tolerance ±0.01(0.25)
- Pin dimension tolerance ±0.004 (0.1)

Pin Assignment		
PIN	Single	Dual
1	+ Input	+ Input
2	- Input	- INPUT
3	+ Output	+ Output
4	NO PIN	COMMON
5	- Output	- Output
6	CTRL (Option)	CTRL (Option)



Recommended EN55022 Class B Filter Circuit Layout