POWER MATE TECHNOLOGY

FDC15 - SERIES

FEATURES

- **15 WATTS OUTPUT POWER**
- **OUTPUT CURRENT UP TO 3A**
- **STANDARD 2.0 X 1.6 X 0.4 INCH PACKAGE**
- **HIGH EFFICIENCY UP TO 82%**
- **4:1 WIDE INPUT VOLTAGE RANGE**
- **SIX-SIDED CONTINUOUS SHIELD**
- **FIXED SWITCHING FREQUENCY**
- **CE MARK MEETS 2006/95/EC,93/68/EEC AND 2004/108/EC**
- **UL60950-1, EN60950-1 AND IEC60950-1 LICENSED**
- **ISO9001 CERTIFIED MANUFACTURING FACILITIES**
- **COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC**

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement Equipment
Semiconductor Equipment

DESCRIPTION

The FDC15 series offer 15 watts of output power from a 2 x 1.6 x 0.4 inch package. The FDC15 series have 4:1 wide input voltage of 9-36 and 18-75VDC. The FDC15 features 1600VDC of isolation, short-circuit and over-voltage protection.

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25ºC otherwise noted

OUTPUT SPECIFICATIONS			
Output power			15 Watts, max.
Voltage accuracy	Full load and nominal Vin		± 1%
Minimum load (Note 6)			See Table
Voltage adjustability			± 10%
Line regulation	LL to HL at Full Load		± 0.2%
Load regulation	Min. load to Full load	Single Dual	± 0.5% ± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth		See table
Temperature coefficient			±0.02% / ºC, max.
Transient response recovery time	25% load step change		250µS
Over voltage protection Zener diode clamp	5V output 12V output 15V output		6.2VDC 15VDC 18VDC
Over load protection	% of FL at nominal input		150%, max.
Short circuit protection			Hiccup, automatics recovery

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage		1600VDC, min.
Isolation resistance		10^9 ohms, min.
Isolation capacitance		300pF, max.
Switching frequency		270KHz, typ.
Approvals and standard		IEC60950-1, UL60950-1, EN60950-1
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
Potting material		Epoxy (UL94-V0)
Dimensions		2.00 X 1.60 X 0.40 Inch (50.8 X 40.6 X 10.2 mm)
Weight		48g (1.69oz)
MTBF (Note 1)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	2.041×10^6 hrs 9.140×10^5 hrs

INPUT SPECIFICATIONS			
Input voltage range	24V nominal input 48V nominal input		9 – 36VDC 18 – 75VDC
Input filter			Pi type
Input surge voltage 100mS max	24V input 48V input		50VDC 100VDC
Input reflected ripple current	Nominal Vin and full load		20mAp-p
Start up time	Nominal Vin and constant resistive load	Power up	20mS, typ.
Remote ON/OFF (Note 7) (Positive logic)	DC-DC ON DC-DC OFF		Open or 3.5V < Vr < 12V Short or 0V < Vr < 1.2V
Input current of remote control pin	Nominal Vin		-0.5mA~+0.5mA
Remote off state input current	Nominal Vin		20mA

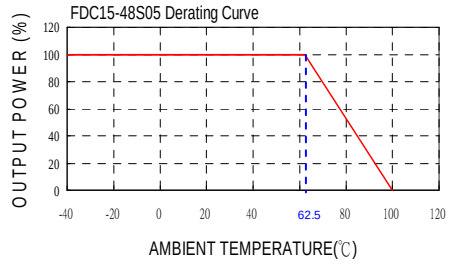
ENVIRONMENTAL SPECIFICATIONS		
Operating ambient temperature		-40ºC ~ +85ºC (with derating)
Maximum case temperature		100ºC
Storage temperature range		-55ºC ~ +105ºC
Thermal impedance (Note 8)	Nature convection Nature convection with heat-sink	10ºC/Watt 8.24ºC/Watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH

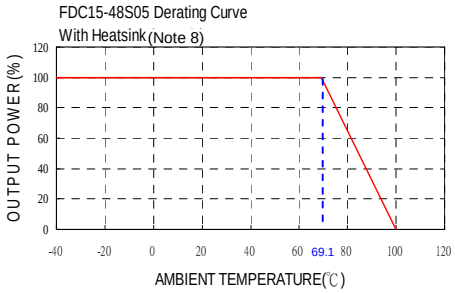
EMC CHARACTERISTICS			
EMI	EN55022		Class A
ESD	EN61000-4-2	Air ± 8KV Contact ± 6KV	Perf. Criteria B
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 9)	EN61000-4-4	± 2KV	Perf. Criteria B
Surge (Note 9)	EN61000-4-5	± 1KV	Perf. Criteria B
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

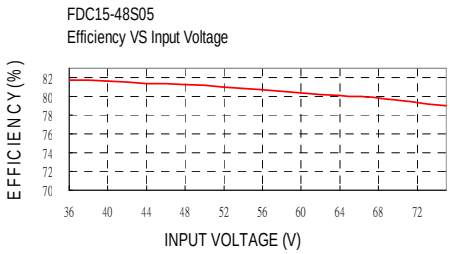
Model Number	Input Range	Output Voltage	Output Current		Output (4) Ripple & Noise	Input Current		Eff (4) (%)	Capacitor Load max(5)
			Min. load	Full load		No load (3)	Full load (2)		
FDC15-24S05	9 – 36 VDC	5 VDC	210mA	3000mA	75mVp-p	20mA	822mA	80	6800μF
FDC15-24S12	9 – 36 VDC	12 VDC	100mA	1250mA	75mVp-p	10mA	801mA	82	890μF
FDC15-24S15	9 – 36 VDC	15 VDC	80mA	1000mA	75mVp-p	20mA	801mA	82	570μF
FDC15-24D05	9 – 36 VDC	± 5 VDC	± 105mA	± 1500mA	75mVp-p	20mA	822mA	80	± 1700μF
FDC15-24D12	9 – 36 VDC	± 12 VDC	± 50mA	± 625mA	75mVp-p	20mA	801mA	82	± 300μF
FDC15-24D15	9 – 36 VDC	± 15 VDC	± 40mA	± 500mA	75mVp-p	20mA	801mA	82	± 200μF
FDC15-48S05	18 – 75 VDC	5 VDC	210mA	3000mA	75mVp-p	15mA	411mA	80	6800μF
FDC15-48S12	18 – 75 VDC	12 VDC	100mA	1250mA	75mVp-p	15mA	401mA	82	890μF
FDC15-48S15	18 – 75 VDC	15 VDC	80mA	1000mA	75mVp-p	10mA	401mA	82	570μF
FDC15-48D05	18 – 75 VDC	± 5 VDC	± 105mA	± 1500mA	75mVp-p	10mA	411mA	80	± 1700μF
FDC15-48D12	18 – 75 VDC	± 12 VDC	±50mA	± 625mA	75mVp-p	20mA	401mA	82	± 300μF
FDC15-48D15	18 – 75 VDC	± 15 VDC	± 40mA	± 500mA	75mVp-p	15mA	401mA	82	± 200 μF

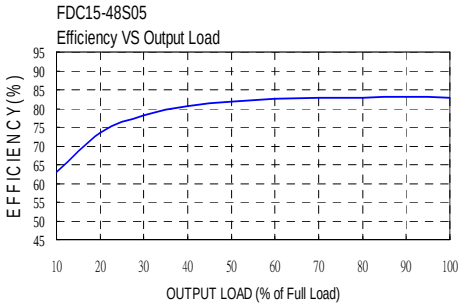
Note

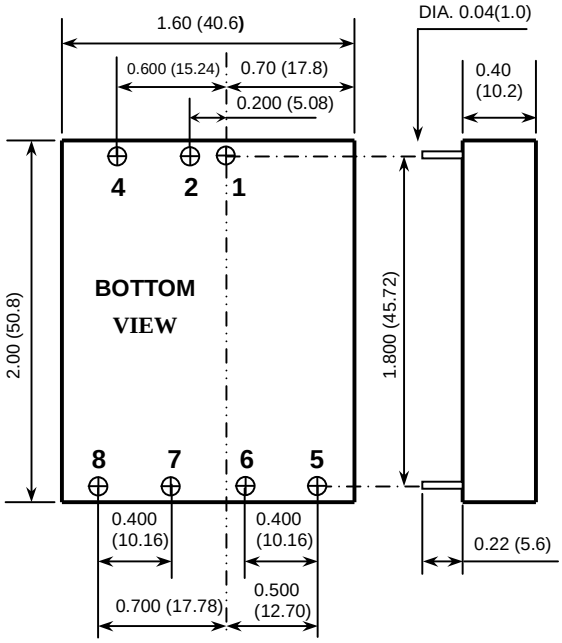
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment).
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum Vin and constant resistive load.
6. The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
7. The ON/OFF control pin voltage is reference to -Vin.
8. Heat-sink is optional and P/N: 7G-0011C-F.
9. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF /100V, ESR 48mΩ.









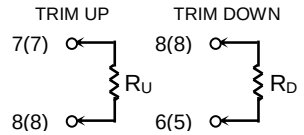


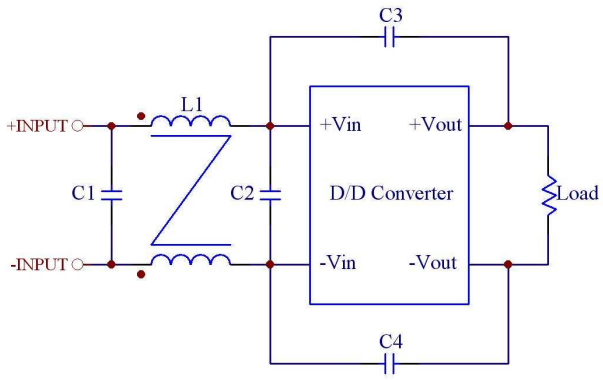
1. All dimensions in Inches (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
4	CTRL	CTRL
5	NO PIN	+ OUTPUT
6	+ OUTPUT	COMMON
7	- OUTPUT	- OUTPUT
8	TRIM	TRIM

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.
( ) for dual output trim

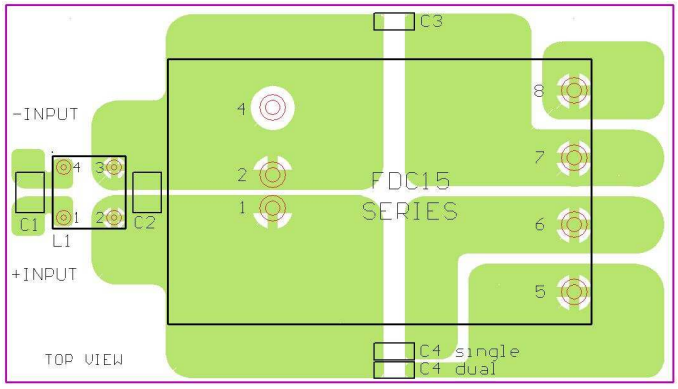




Recommended Filter for EN55022 Class B Compliance

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

	C1	C2	C3	C4	L1
FDC15-24xxx	6.8μF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	450μH Common Choke PMT-048
FDC15-48xxx	2.2μF/100V 1812 MLCC	2.2μF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	450μH Common Choke PMT-048



Recommended EN55022 Class B Filter Circuit Layout