POWER MATE TECHNOLOGY CO., LTD.

FDC10(W) SERIES

10 WATTS DC-DC CONVERTER

FEATURES

- **10 WATTS OUTPUT POWER**
- **OUTPUT CURRENT UP TO 2.5A**
- **STANDARD 2.0 X 1.0 X 0.4 INCH PACKAGE**
- **HIGH EFFICIENCY UP TO 87%**
- **2:1 AND 4:1 WIDE INPUT VOLTAGE RANGE**
- **SIX-SIDED CONTINUOUS SHIELD**
- **FIXED SWITCHING FREQUENCY (300kHz)**
- **UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS**
- **CE MARKED**
- **COMPLIANT TO RoHS II & REACH**

OPTIONS

NEGATIVE & POSITIVE LOGIC REMOTE ON/OFF

APPLICATIONS

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

DESCRIPTION

The FDC10 and FDC10-W series offer 10 watts of output power from a 2.0 x 1.0 x 0.4 inch package. FDC10 series have 2:1 wide input voltage of 9 ~ 18, 18 ~ 36 and 36 ~ 75VDC. FDC10-W series have 4:1 ultra wide input voltage of 9 ~ 36 and 18 ~ 75VDC.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS

Output power			10 Watts, max.
Voltage accuracy		Single / Dual	± 1%
Minimum load			0%
Line regulation	LL to HL at Full Load	Single / Dual	± 0.2%
Load regulation	No Load to Full Load	Single Dual	± 0.5% ± 1%
Cross regulation(Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth	Single Dual	See table
Temperature coefficient			±0.02% / ºC, max.
Transient response recovery time	25% load step change		250µs
Over voltage protection Zener diode clamp	3.3VDC output 5VDC output 12VDC output 15VDC output		3.9VDC 6.2VDC 15VDC 18VDC
Over load protection	% of FL at nominal input		150%, max.
Short circuit protection			Continuous, automatics recovery

GENERAL SPECIFICATIONS

Efficiency		See table
Isolation voltage	Input to Output Input(Output) to Case	1600VDC, min. 1minute 1600VDC, min. 1minute
Isolation resistance	500VDC	10^9 ohms, min.
Isolation capacitance		300pF, max.
Switching frequency		300kHz±10%
Safety approvals		IEC60950-1, UL60950-1, & EN60950-1
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
Potting material		Epoxy (UL94 V-0)
Dimensions		2.00 X 1.00 X 0.40 Inch (50.8 X 25.4 X 10.2 mm)
Weight		27g (0.95oz)
MTBF (Note 1)	MIL-HDBK-217F	3.342 x 10^6 hrs

INPUT SPECIFICATIONS

Input voltage range	FDC10	12VDC nominal input	9 ~ 18VDC
		24VDC nominal input	18 ~ 36VDC
		48VDC nominal input	36 ~ 75VDC
	FDC10-W	24VDC nominal input	9 ~ 36VDC
		48VDC nominal input	18 ~ 75VDC
Input filter			Pi type
Input surge voltage		12VDC input	36VDC 100ms, max.
		24VDC input	50VDC 100ms, max.
		48VDC input	100VDC 100ms, max.
Input reflected ripple current			30mAp-p
Start up time	Nominal input and Constant resistive load	Power up	20ms
Remote ON/OFF (Option) (Note 6)			
(Positive logic)	DC-DC ON		Open or 3.5V < Vr < 12V
	DC-DC OFF		Short or 0V < Vr < 1.2V
(Negative logic)	DC-DC ON		Short or 0V < Vr < 1.2V
	DC-DC OFF		Open or 3.5V < Vr < 12V
Input current of remote control pin		Nominal input	-0.5mA ~ +1mA
Remote off state input current		Nominal input	20mA

ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature (Reference derating curve)	Standard	-25ºC ~ +85ºC (with derating)
	M1 (Note 7)	-40ºC ~ +85ºC (non-derating)
	M2 (W series)	-40ºC ~ +85ºC (with derating)
Maximum case temperature		+105ºC
Storage temperature range		-55ºC ~ +125ºC
Thermal impedance (Note 8)	Nature convection	12ºC/watt
	Nature convection with heat-sink	10ºC/watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH

EMC CHARACTERISTICS

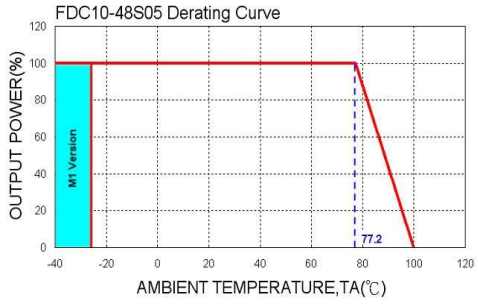
EMI (Note 9)	EN55022			Class B
ESD	EN61000-4-2	Air Contact	± 8kV ± 6kV	Perf. Criteria B
Radiated immunity	EN61000-4-3		10 V/m	Perf. Criteria A
Fast transient (Note 10)	EN61000-4-4		± 2kV	Perf. Criteria B
Surge (Note 10)	EN61000-4-5		± 1kV	Perf. Criteria B
Conducted immunity	EN61000-4-6		10 Vr.m.s	Perf.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

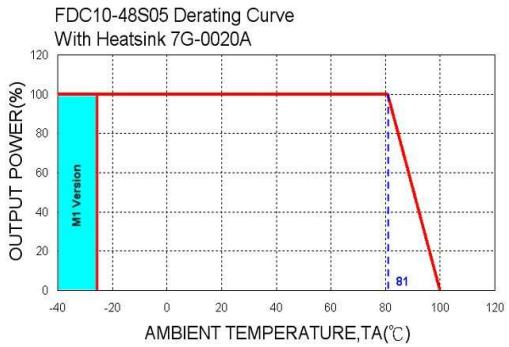
Model Number	Input Range	Output Voltage	Output Current		Output [2] Ripple & Noise	No load[3] Input Current	Eff [4] (%)	Capacitor[5] Load max
			Min. load	Full load				
FDC10-12S33	9 ~ 18 VDC	3.3 VDC	0mA	2000mA	50mVp-p	17mA	80	6800μF
FDC10-12S05	9 ~ 18 VDC	5 VDC	0mA	2000mA	50mVp-p	21mA	81	4700μF
FDC10-12S12	9 ~ 18 VDC	12 VDC	0mA	830mA	50mVp-p	38mA	84	690μF
FDC10-12S15	9 ~ 18 VDC	15 VDC	0mA	670mA	50mVp-p	36mA	84	470μF
FDC10-12D05	9 ~ 18 VDC	± 5 VDC	0mA	± 1000mA	75mVp-p	39mA	84	± 680μF
FDC10-12D12	9 ~ 18 VDC	± 12 VDC	0mA	± 416mA	75mVp-p	47mA	83	± 330μF
FDC10-12D15	9 ~ 18 VDC	± 15 VDC	0mA	± 333mA	75mVp-p	45mA	84	± 110μF
FDC10-24S33 (W)	18 ~ 36 (9 ~ 36) VDC	3.3 VDC	0mA	2000(2500mA)	50mVp-p	15(13mA)	80(78)	6800μF
FDC10-24S05 (W)	18 ~ 36 (9 ~ 36) VDC	5 VDC	0mA	2000mA	50mVp-p	22(11mA)	82 (80)	4700μF
FDC10-24S12 (W)	18 ~ 36 (9 ~ 36) VDC	12 VDC	0mA	830mA	50mVp-p	18(16mA)	84 (84)	690μF
FDC10-24S15 (W)	18 ~ 36 (9 ~ 36) VDC	15 VDC	0mA	670mA	50mVp-p	36(26mA)	84 (81)	470μF
FDC10-24D05 (W)	18 ~ 36 (9 ~ 36) VDC	± 5 VDC	0mA	± 1000mA	75mVp-p	28(15mA)	83 (82)	± 680μF
FDC10-24D12 (W)	18 ~ 36 (9 ~ 36) VDC	± 12 VDC	0mA	± 416mA	75mVp-p	24(15mA)	85 (80)	± 330μF
FDC10-24D15 (W)	18 ~ 36 (9 ~ 36) VDC	± 15 VDC	0mA	± 333mA	75mVp-p	31(22mA)	84 (80)	± 110μF
FDC10-48S33 (W)	36 ~ 75 (18 ~ 75) VDC	3.3 VDC	0mA	2000(2500mA)	50mVp-p	11(10mA)	80(76)	6800μF
FDC10-48S05 (W)	36 ~ 75 (18 ~ 75) VDC	5 VDC	0mA	2000mA	50mVp-p	14(9mA)	84 (81)	4700μF
FDC10-48S12 (W)	36 ~ 75 (18 ~ 75) VDC	12 VDC	0mA	830mA	50mVp-p	14(9mA)	86 (84)	690μF
FDC10-48S15 (W)	36 ~ 75 (18 ~ 75) VDC	15 VDC	0mA	670mA	50mVp-p	10(11mA)	87 (84)	470μF
FDC10-48D05 (W)	36 ~ 75 (18 ~ 75) VDC	± 5 VDC	0mA	± 1000mA	75mVp-p	16(12mA)	84 (82)	± 680μF
FDC10-48D12 (W)	36 ~ 75 (18 ~ 75) VDC	± 12 VDC	0mA	± 416mA	75mVp-p	19(20mA)	86 (78)	± 330μF
FDC10-48D15 (W)	36 ~ 75 (18 ~ 75) VDC	± 15 VDC	0mA	± 333mA	75mVp-p	16(20mA)	85 (81)	± 110μF

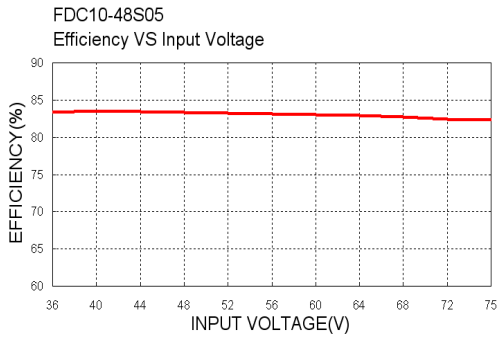
Note

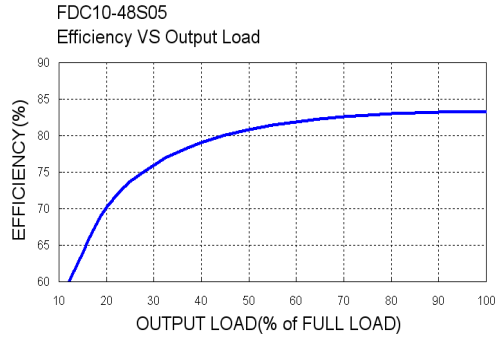
1. MIL-HDBK-217F @Ta=25 ºC, Full load.
2. Typical value at nominal input and full load. (20MHz BW.)
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum input and constant resistive load.
6. The ON/OFF control pin voltage is referenced to -INPUT
   To order positive logic ON/OFF control add the suffix-P (Ex: FDC10-12S05-P);
   To order negative logic ON-OFF control add the suffix-N (Ex: FDC10-12S05-N)
7. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard and M2 version.
8. Heat-sink is optional and P/N: 7G-0020C-F.
9. The FDC10 series standard module meets EN55022 Class A and Class B with external components.
   For more detail information, please contact with P-DUKE.
10. 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.

CAUTION: This power module is not internally fused. An input line fuse must always be used.

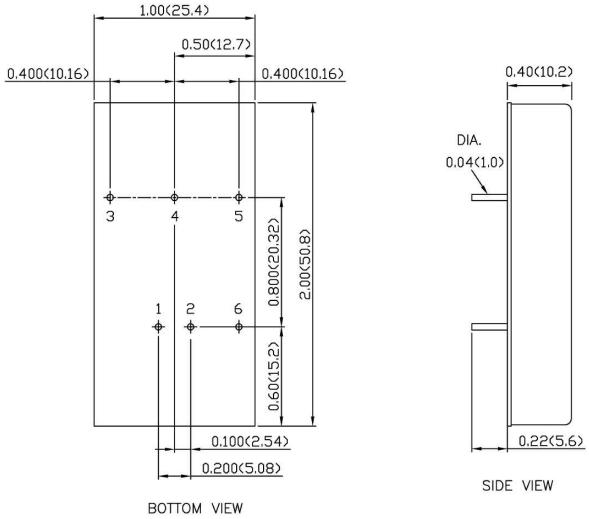








MECHANICAL DRAWING :



PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	NO PIN	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL(Option)	CTRL(Option)

1. All dimensions in Inch (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)