

FDC10 FDC10W SERIES

DC-DC CONVERTER

2:1 & 4:1 WIDE INPUT RANGE
UP TO 10 WATTS



FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.00 X 0.40 INCH
- SIX-SIDED CONTINUOUS SHIELD
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

1600VDC
ISOLATION

REMOTE
CONTROL

OCP

SCP

OVP

TECHNICAL SPECIFICATION

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

Model Number	Input Range	Output Voltage	Output Current @ Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load (1)
	VDC	VDC	mA	mA	%	µF
FDC10-12S33	9 ~ 18	3.3	2000	17	80	6800
FDC10-12S05	9 ~ 18	5	2000	21	81	4700
FDC10-12S12	9 ~ 18	12	830	38	84	690
FDC10-12S15	9 ~ 18	15	670	36	84	470
FDC10-12D05	9 ~ 18	±5	±1000	39	84	±680
FDC10-12D12	9 ~ 18	±12	±416	47	83	±330
FDC10-12D15	9 ~ 18	±15	±333	45	84	±110
FDC10-24S33	18 ~ 36	3.3	2000	15	80	6800
FDC10-24S05	18 ~ 36	5	2000	22	82	4700
FDC10-24S12	18 ~ 36	12	830	18	84	690
FDC10-24S15	18 ~ 36	15	670	36	84	470
FDC10-24D05	18 ~ 36	±5	±1000	28	83	±680
FDC10-24D12	18 ~ 36	±12	±416	24	85	±330
FDC10-24D15	18 ~ 36	±15	±333	31	84	±110
FDC10-48S33	36 ~ 75	3.3	2000	11	80	6800
FDC10-48S05	36 ~ 75	5	2000	14	84	4700
FDC10-48S12	36 ~ 75	12	830	14	86	690
FDC10-48S15	36 ~ 75	15	670	10	87	470
FDC10-48D05	36 ~ 75	±5	±1000	16	84	±680
FDC10-48D12	36 ~ 75	±12	±416	19	86	±330
FDC10-48D15	36 ~ 75	±15	±333	16	85	±110

Model Number	Input Range	Output Voltage	Output Current @ Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load (1)
	VDC	VDC	mA	mA	%	µF
FDC10-24S33W	9 ~ 36	3.3	2500	13	78	6800
FDC10-24S05W	9 ~ 36	5	2000	11	80	4700
FDC10-24S12W	9 ~ 36	12	830	16	84	690
FDC10-24S15W	9 ~ 36	15	670	26	81	470
FDC10-24D05W	9 ~ 36	±5	416	15	82	±680
FDC10-24D12W	9 ~ 36	±12	±1000	15	80	±330
FDC10-24D15W	9 ~ 36	±15	±416	22	80	±110
FDC10-48S33W	18 ~ 75	3.3	±333	10	76	6800
FDC10-48S05W	18 ~ 75	5	2500	9	81	4700
FDC10-48S12W	18 ~ 75	12	2000	9	84	690
FDC10-48S15W	18 ~ 75	15	830	11	84	470
FDC10-48D05W	18 ~ 75	±5	670	12	82	±680
FDC10-48D12W	18 ~ 75	±12	416	20	78	±330
FDC10-48D15W	18 ~ 75	±15	±1000	20	81	±110

PART NUMBER STRUCTURE

FDC10	-	48	S	05	-	M1	P	HS
Series name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Version Code	Remote On/Off Option	Assembly Option
		12: 9~18 24: 18~36 48: 36~75	S: Single	33: 3.3 05: 5 12: 12 15: 15		□: Standard Version M1: M1 Version M2: M2 Version	P: Positive logic N: Negative logic	□: None HS: Heat-sink HC: Heat-sink with Clamp
			D: Dual	05: ±5 12: ±12 15: ±15				

FDC10	-	48	S	05	W	-	P	HS
Series name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range		Remote On/Off Option	Assembly Option
		24: 9~36 48: 18~75	S: Single	33: 3.3 05: 5 12: 12 15: 15	4:1		P: Positive logic N: Negative logic	□: None HS: Heat-sink HC: Heat-sink with Clamp
			D: Dual	05: ±5 12: ±12 15: ±15				

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range	FDC10 series	12Vin(nom)	9	12	18	VDC
		24Vin(nom)	18	24	36	
		48Vin(nom)	36	48	75	
Input reflected ripple current	FDC10W series	24Vin(nom)	9	24	36	VDC
		48Vin(nom)	18	48	75	
Input surge voltage	100 ms, max.	12Vin(nom) 24Vin(nom) 48Vin(nom)			36 50 100	VDC
Start up time	Constant resistive load	Power up		20		ms
Input filter				Pi type		
Remote ON/OFF (Option)	Referred to -Vin pin	Positive logic DC-DC ON	Open or 3.5 ~ 12VDC			
		Negative logic DC-DC OFF	Short or 0 ~ 1.2VDC			
		Positive logic DC-DC ON	Short or 0 ~ 1.2VDC			
		Negative logic DC-DC OFF	Open or 3.5 ~ 12VDC			
		Input current of Ctrl pin	-0.5		+1.0	mA
		Remote off input current		20		mA

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy		-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load	Single		+0.5	%
		Dual		+1.0	
Cross regulation	Asymmetrical load 25%/100% FL	-5.0		+5.0	%
Ripple and noise	Measured by 20MHz bandwidth	Single	50		mVp-p
		Dual	75		
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		250		µs
Over voltage protection	Zener diode clamp	3.3Vout	3.9		VDC
		5Vout	6.2		
		12Vout	15		
		15Vout	18		
Over load protection	% of Iout rated			150	%
Short circuit protection				Continuous, automatic recovery	

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600		VDC
		Input (Output) to Case	1600		
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				300	pF
Switching frequency		270	300	330	kHz
Safety approvals					UL60950-1 EN60950-1 IEC60950-1
Case material					Nickel-coated copper
Base material					Non-conductive black plastic
Potting material					Epoxy (UL94 V-0)
Weight					27g (0.95oz)
MTBF	MIL-HDBK-217F, Full load				3.342 x 10 ⁶ hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Standard M1 (2) M2, W series	With derating	-25	+85	°C
		Without derating	-40	+85	
		With derating	-40	+85	
Maximum case temperature				+105	°C
Storage temperature range		-55		+125	°C
Thermal impedance	Vertical direction by natural convection (20LFM)	Without heat-sink	12		°C/W
		With heat-sink	10		
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

EMC SPECIFICATIONS

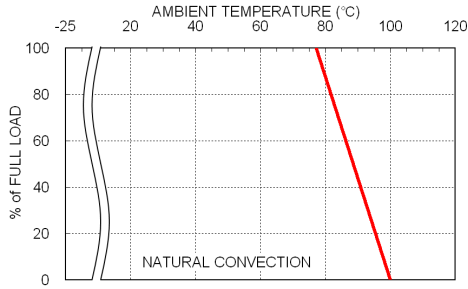
Parameter	Conditions	Level
EMI (3)	EN55022	Class B
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria B
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient (4)	EN61000-4-4 ± 2kV	Perf. Criteria B
Surge (4)	EN61000-4-5 ± 2kV	Perf. Criteria B
Conducted immunity	EN61000-4-6 10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8 100A/m continuous; 1000A/m 1 second	Perf. Criteria A

Note:

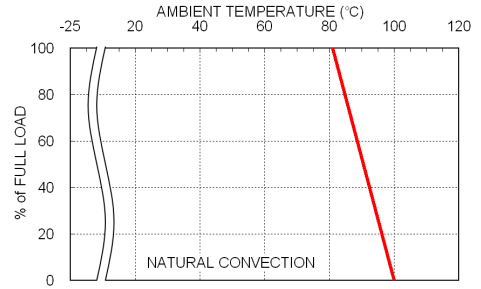
- Test by minimum input and constant resistive load.
- M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard and M2 version.
- The standard module meets EN55022 Class A and Class B with external components. For further information, please contact with P-DUKE.
- 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.

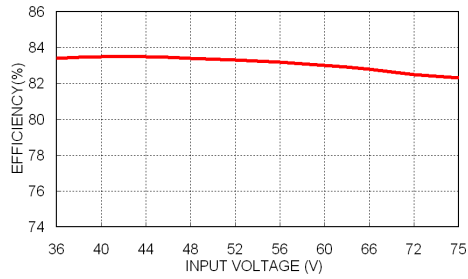
CHARACTERISTIC CURVE



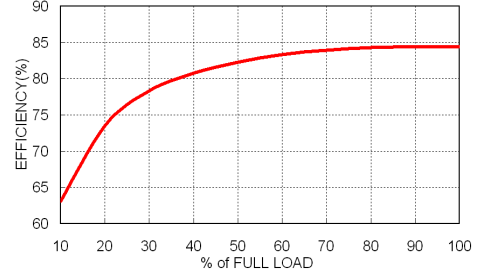
FDC10-48S05 Derating Curve



FDC10-48S05 Derating Curve With Heat-sink

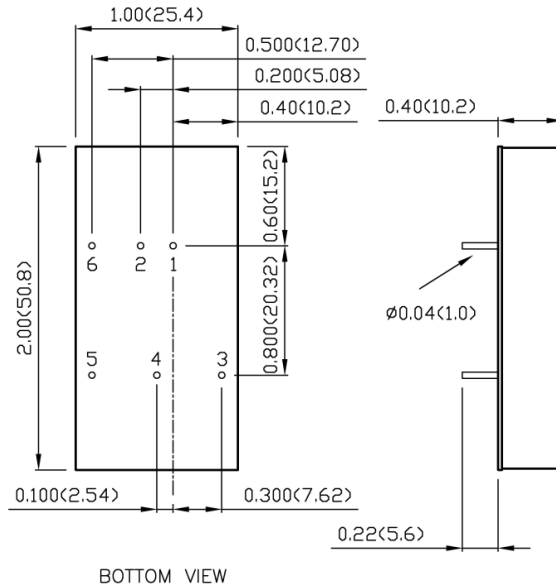


FDC10-48S05 Efficiency vs. Input Voltage



FDC10-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING



PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No pin	Common
5	-Vout	-Vout
6	Ctrl(Optional)	Ctrl(Optional)

- All dimensions in inch (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)