



FEATURES

- 5 WATTS OUTPUT POWER
- OUTPUT CURRENT UP TO 1000mA
- STANDARD 2.00 X 1.00 X 0.40 INCH PACKAGE
- HIGH EFFICIENCY UP TO 83%
- 2:1 AND 4:1 WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- 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 FDC05 and FDC05-W series offer 5 watts of output power from a 2 x 1 x 0.4 inch package without derating to 71°C ambient temperature. FDC05 series have 2:1 wide input voltage of 9~18VDC, 18~36VDC and 36~75VDC. FDC05-W series have 4:1 ultra wide input voltage of 9~36VDC and 18~75VDC.

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

OUTPUT SPECIFICATIONS			
Output power		5 Watts, max.	
Voltage accuracy		± 1%	
Minimum load		0%	
Line regulation	LL to HL at Full Load	± 0.2%	
Load regulation	No load to Full load	Single	± 0.2%
		Dual	± 1%
Cross regulation (Dual) Asymmetrical load 25% / 100% FL		± 5%	
Ripple and noise	20MHz bandwidth	See table	
Temperature coefficient		±0.02% / °C, max.	
Transient response	25% load step change	Single 200µs	
recovery time	FL to 1/2 FL ±1% error band	Dual 200µs	
Over load protection	% of FL at nominal input	170%	
Short circuit protection		Continuous, automatics recovery	
GENERAL SPECIFICATIONS			
Efficiency		See table	
Isolation Voltage	Input to Output	1600VDC, min.1minute	
	Input (Output) to Case	1600VDC, min.1minute	
Isolation resistance	500VDC	10 ⁹ ohms, min.	
Isolation capacitance		300pF, max.	
Switching frequency	Standard	300kHz±10%	
	“W” series	200kHz±10%	
Safety approvals		IEC60950-1, UL60950-1, & EN60950-1	
Case material		Nickel-coated copper	
Base material		Non-conducted 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	7.066 x 10 ⁶ hrs	

INPUT SPECIFICATIONS			
Input voltage range	FDC05	12VDC nominal input	9 ~ 18VDC
		24VDC nominal input	18 ~ 36VDC
		48VDC nominal input	36 ~ 75VDC
	FDC05-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	20mA p-p		
Start up time	Nominal input and Constant resistive load	Power up	450ms, max.
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	2.5mA	
ENVIRONMENTAL SPECIFICATIONS			
Operating ambient temperature	Standard	-25°C ~ +85°C (with derating)	
	M1 (Note 7)	-40°C ~ +85°C (non-derating)	
	(Reference derating curve) M2 (W series)	-40°C ~ +85°C (with derating)	
Maximum case temperature	+100°C		
Storage temperature range	-55°C ~ +125°C		
Thermal impedance (Note 8)	Natural convection	12°C/watt	
	Natural convection with Heat-sink	10°C/watt	
Thermal shock	MIL-STD-810F		
Vibration	MIL-STD-810F		
Relative humidity	5% to 95% RH		
EMC CHARACTERISTICS			
EMI	EN55022	Class A 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 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	



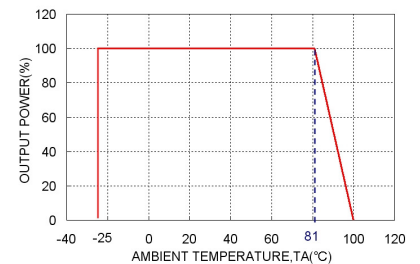
Model Number	Input Range	Output Voltage	Output Current		Output ⁽²⁾ Ripple & Noise	No load ⁽³⁾ Input Current	Eff ⁽⁴⁾ (%)	Capacitor Load max ⁽⁵⁾
			Min. load	Full load				
FDC05-12S33	9 ~ 18 VDC	3.3 VDC	0mA	1000mA	50mVp-p	10mA	76	3700μF
FDC05-12S05	9 ~ 18 VDC	5 VDC	0mA	1000mA	50mVp-p	10mA	79	1700μF
FDC05-12S12	9 ~ 18 VDC	12 VDC	0mA	470mA	50mVp-p	10mA	81	290μF
FDC05-12S15	9 ~ 18 VDC	15 VDC	0mA	400mA	50mVp-p	15mA	80	188μF
FDC05-12D05	9 ~ 18 VDC	± 5 VDC	0mA	± 500mA	50mVp-p	20mA	79	± 850μF
FDC05-12D12	9 ~ 18 VDC	± 12 VDC	0mA	± 230mA	50mVp-p	15mA	81	± 140μF
FDC05-12D15	9 ~ 18 VDC	± 15 VDC	0mA	± 190mA	50mVp-p	20mA	82	± 47μF
FDC05-24S33 (W)	18 ~ 36 (9 ~ 36) VDC	3.3 VDC	0mA	1000mA	50mVp-p	15(5mA)	73 (77)	3700μF
FDC05-24S05 (W)	18 ~ 36 (9 ~ 36) VDC	5 VDC	0mA	1000mA	50mVp-p	15(5mA)	78 (80)	1700μF
FDC05-24S12 (W)	18 ~ 36 (9 ~ 36) VDC	12 VDC	0mA	470mA	50mVp-p	10(5mA)	81 (82)	290μF
FDC05-24S15 (W)	18 ~ 36 (9 ~ 36) VDC	15 VDC	0mA	400mA	50mVp-p	20(5mA)	81 (81)	188μF
FDC05-24D05 (W)	18 ~ 36 (9 ~ 36) VDC	± 5 VDC	0mA	± 500mA	50mVp-p	15(5mA)	79 (80)	± 850μF
FDC05-24D12 (W)	18 ~ 36 (9 ~ 36) VDC	± 12 VDC	0mA	± 230mA	50mVp-p	20(5mA)	82 (82)	± 140μF
FDC05-24D15 (W)	18 ~ 36 (9 ~ 36) VDC	± 15 VDC	0mA	± 190mA	50mVp-p	20(10mA)	81 (83)	± 47μF
FDC05-48S33 (W)	36 ~ 75 (18 ~ 75) VDC	3.3 VDC	0mA	1000mA	50mVp-p	5(5mA)	73 (73)	3700μF
FDC05-48S05 (W)	36 ~ 75 (18 ~ 75) VDC	5 VDC	0mA	1000mA	50mVp-p	10(10mA)	76 (76)	1700μF
FDC05-48S12 (W)	36 ~ 75 (18 ~ 75) VDC	12 VDC	0mA	470mA	50mVp-p	10(10mA)	82 (82)	290μF
FDC05-48S15 (W)	36 ~ 75 (18 ~ 75) VDC	15 VDC	0mA	400mA	50mVp-p	10(10mA)	82 (81)	188μF
FDC05-48D05 (W)	36 ~ 75 (18 ~ 75) VDC	± 5 VDC	0mA	± 500mA	50mVp-p	10(5mA)	78 (78)	± 850μF
FDC05-48D12 (W)	36 ~ 75 (18 ~ 75) VDC	± 12 VDC	0mA	± 230mA	50mVp-p	10(10mA)	81 (81)	± 140μF
FDC05-48D15 (W)	36 ~ 75 (18 ~ 75) VDC	± 15 VDC	0mA	± 190mA	50mVp-p	10(10mA)	81 (81)	± 47μF

Note

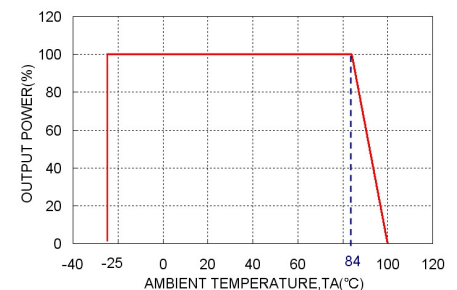
1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. Typical value at nominal input and full load. (20MHz BW.)
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. The CTRL pin voltage is referenced to -INPUT
To order positive logic ON/OFF control add the suffix-P (Ex: FDC05-48S05-P)
To order negative logic ON/OFF control add the suffix-N (Ex: FDC05-48S05-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. 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.

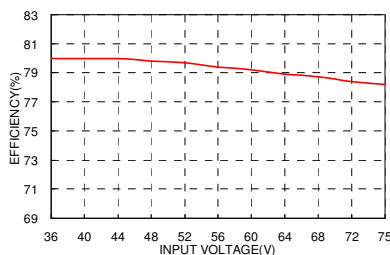
FDC05-48S05 Derating Curve



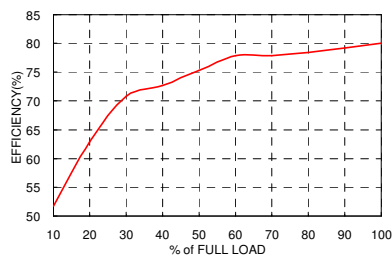
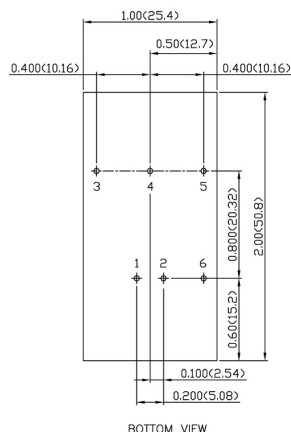
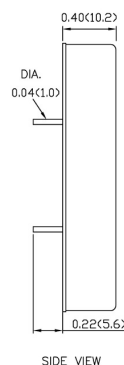
FDC05-48S05 Derating Curve With Heat-sink (Note 8)



FDC05-48S05 Efficiency VS Input Voltage



FDC05-48S05 Efficiency VS Output Load



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)

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)