



# FDC05-SERIES



- 5 WATTS OUTPUT POWER
- 2:1 AND 4:1 WIDE INPUT VOLTAGE RANGE
- INTERNATIONAL SAFETY STANDARD APPROVAL
- SIX-SIDED CONTINUOUS SHIELD
- HIGH EFFICIENCY UP TO 83%
- STANDARD 2" X 1" X 0.4" PACKAGE
- FIXED SWITCHING FREQUENCY

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 9-18, 18-36 and 36-75VDC. FDC05-W series have 4:1 ultra wide input voltage of 9-36 and 18-75VDC. The FDC05 and FDC05-W features 1600VDC of isolation, short-circuit protection, as well as six sided shielding. The safety approve with EN60950 and UL1950. All models are particularly suited to telecommunications, industrial, mobile telecom and test equipment applications. According the extended operation temperature range, there are "M1" and "M2" version for special application.

**UL E193009**  
**TUV R3-50007936**  
**CB JPTUV-003641**  
**CE MARK**

## 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	Full load and nominal Vin		± 2%
Minimum load (Note 1)			10% of FL
Line regulation	LL to HL at Full Load		± 0.2%
Load regulation	10% to 100% FL Single		± 0.2%
	Dual		± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth		50mVp-p
Temperature coefficient			±0.02% / °C, max
Transient response recovery time	25% load step change	Single	200uS
	FL to 1/2 FL ±1% error band	Dual	200uS
Over load protection	% of FL at nominal input		170% typ
Short circuit protection			Continuous, automatic recovery
INPUT SPECIFICATIONS			
Input voltage range	FDC05	12V nominal input	9 – 18VDC
		24V nominal input	18 – 36VDC
		48V nominal input	36 – 75VDC
	FDC05-W	24V nominal input	9 – 36VDC
		48V nominal input	18 – 75VDC
Input filter			Pi type
Input surge voltage 100mS max	12V input		36VDC
	24V input		50VDC
	48V input		100VDC
Input reflected ripple (Note 2)	Nominal Vin and full load		20mAp-p
Start up time	Nominal Vin and constant resistor load		600mS typ
Remote ON/OFF (Note 3) (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	
Remote off input current	Nominal Vin		2.5mA

GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation Voltage	Input to Output to Case		1600VDC, min
Isolation resistance			10 <sup>9</sup> ohms, min
Isolation capacitance			300pF, max
Switching frequency	Standard		300KHz, typ
	"W" series		200KHz, typ
Approvals and standard			IEC60950, UL1950, EN60950
Case material			Nickel-coated copper
Base material			Non-conducted black plastic
Potting material			Epoxy (UL94-V0)
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 4)			3.145 x 10 <sup>6</sup> hrs
ENVIRONMENTAL SPECIFICATIONS			
Operating temperature range (Reference derating curve)	Standard		-25°C ~ +85°C (with derating)
	M1 (Note 5)		-40°C ~ +85°C (non-derating)
	M2 (W series)		-40°C ~ +85°C (with derating)
Maximum case temperature			+100°C
Storage temperature range			-55°C ~ +105°C
Thermal impedance (Note 6)	Nature convection		12°C/watt
	Nature convection with heat-sink		10°C/watt
Thermal shock			MIL-STD-810D
Vibration			10~55Hz, 2G, 30minutes along X,Y and Z
Relative humidity			5% to 95% RH
EMC CHARACTERISTICS			
Conducted emissions	EN55022		Level A
Radiated emissions	EN55022		Level A
ESD	EN61000-4-2		Perf. Criteria2
Radiated immunity	EN61000-4-3		Perf. Criteria2
Fast transient	EN61000-4-4		Perf. Criteria2
Surge	EN61000-4-5		Perf. Criteria2
Conducted immunity	EN61000-4-6		Perf. Criteria2

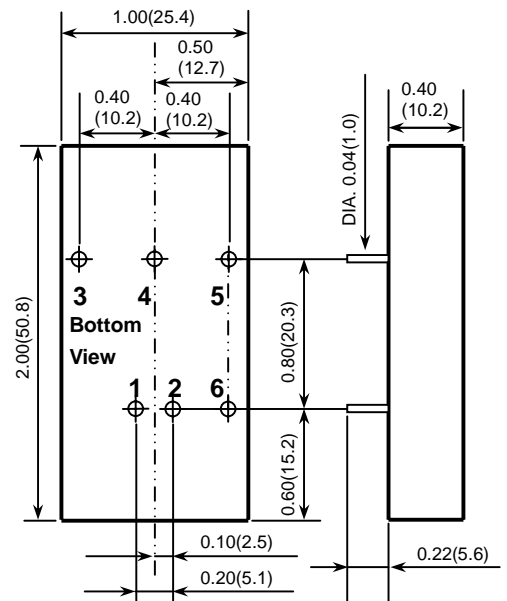
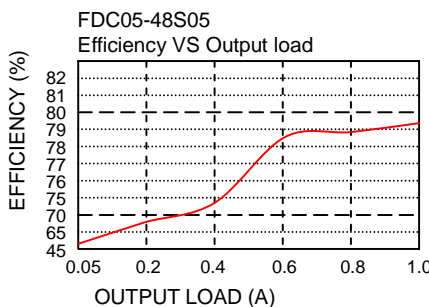
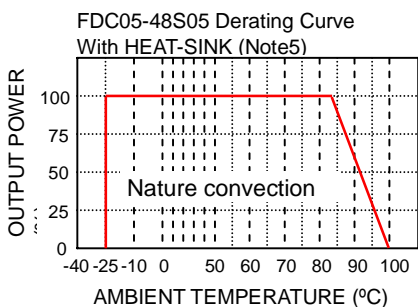
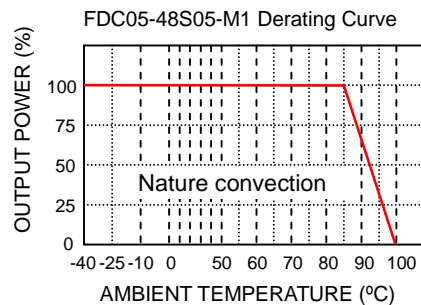
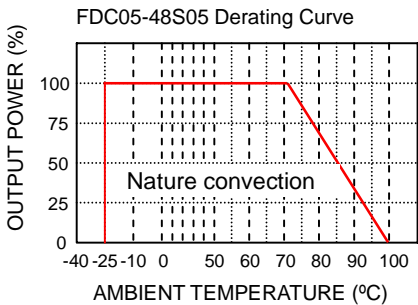


Model Number	Input Range	Output Voltage	Output Current	Input Current <sup>(7)</sup>	Eff <sup>(8)</sup> (%)	Capacitor Load max <sup>(9)</sup>
FDC05-12S33	9 – 18 VDC	3.3 VDC	1000mA	387mA	75	3700uF
FDC05-12S05	9 – 18 VDC	5 VDC	1000mA	556mA	79	1700uF
FDC05-12S12	9 – 18 VDC	12 VDC	470mA	610mA	81	290uF
FDC05-12S15	9 – 18 VDC	15 VDC	400mA	658mA	80	188uF
FDC05-12D05	9 – 18 VDC	± 5 VDC	± 500mA	595mA	74	± 850uF
FDC05-12D12	9 – 18 VDC	± 12 VDC	± 230mA	597mA	81	± 140uF
FDC05-12D15	9 – 18 VDC	± 15 VDC	± 190mA	609mA	82	± 47uF
FDC05-24S33 (W)	18 – 36 (9 – 36) VDC	3.3 VDC	1000mA	199 (196mA)	73 (74)	3700uF
FDC05-24S05 (W)	18 – 36 (9 – 36) VDC	5 VDC	1000mA	282 (274mA)	78 (80)	1700uF
FDC05-24S12 (W)	18 – 36 (9 – 36) VDC	12 VDC	470mA	305 (301mA)	81 (82)	290uF
FDC05-24S15 (W)	18 – 36 (9 – 36) VDC	15 VDC	400mA	325 (325mA)	81 (81)	188uF
FDC05-24D05 (W)	18 – 36 (9 – 36) VDC	± 5 VDC	± 500mA	289 (289mA)	76 (76)	± 850uF
FDC05-24D12 (W)	18 – 36 (9 – 36) VDC	± 12 VDC	± 230mA	295 (295mA)	82 (82)	± 140uF
FDC05-24D15 (W)	18 – 36 (9 – 36) VDC	± 15 VDC	± 190mA	308 (301mA)	81 (83)	± 47uF
FDC05-48S33 (W)	36 – 75 (18 – 75) VDC	3.3 VDC	1000mA	100 (100mA)	73 (73)	3700uF
FDC05-48S05 (W)	36 – 75 (18 – 75) VDC	5 VDC	1000mA	145 (149mA)	76 (74)	1700uF
FDC05-48S12 (W)	36 – 75 (18 – 75) VDC	12 VDC	470mA	151 (151mA)	82 (82)	290uF
FDC05-48S15 (W)	36 – 75 (18 – 75) VDC	15 VDC	400mA	160 (163mA)	82 (81)	188uF
FDC05-48D05 (W)	36 – 75 (18 – 75) VDC	± 5 VDC	± 500mA	149 (149mA)	74 (74)	± 850uF
FDC05-48D12 (W)	36 – 75 (18 – 75) VDC	± 12 VDC	± 230mA	149 (149mA)	81 (81)	± 140uF
FDC05-48D15 (W)	36 – 75 (18 – 75) VDC	± 15 VDC	± 190mA	154 (154mA)	81 (81)	± 47uF

**Note**

- The FDC05 (W) series required a minimum 10% 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
- Simulated source impedance of 12uH. 12uH inductor on series with + Vin.
- The ON/OFF control is option function. There are positive logic and negative logic. The pin voltage is referenced to negative input  
To order positive logic ON-OFF control add the suffix-P (Ex: FDC05-24S05-P)  
To order negative logic ON-OFF control add the suffix-N (Ex: FDC05-24S05-N)
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C.  
(Ground fixed and controlled environment)
- M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard and M2 version.
- Heat sink is optional and P/N: 7G-0020A.
- Maximum value at nominal input voltage and full load of standard type.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistor load.

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



- All dimensions in Inches (mm)
- Pin Pitch tolerance ±0.014(0.35)