



**POWER MATE  
TECHNOLOGY CO., LTD.**



# FDC60-SERIES

- 60 WATTS OUTPUT POWER
- 2:1 WIDE INPUT VOLTAGE RANGE
- DESIGN MEET SAFETY STANDARD
- SIX-SIDED CONTINUOUS SHIELD
- HIGH EFFICIENCY UP TO 90%
- 3.94" X 2.76" X 0.75" PACKAGE
- FIXED SWITCHING FREQUENCY

The FDC60 series offer 60 watts of output power from a 3.94 x 2.76 x 0.75 inch package. The FDC60 series have 2:1 wide input voltage of 9-18, 18-36 and 36-75VDC. The FDC60 features 1600VDC of isolation, short-circuit and over-voltage protection, as well as six sided shielding. Designed meets the safety of EN60950 and UL1950. All models are particularly suited to telecommunications, industrial, mobile telecom and test equipment applications.

## TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS		
Output power	60 Watts max	
Voltage accuracy	Full load and nominal Vin	± 2%
Voltage adjustability		± 10%
Minimum load (Note 1)	FDC60-XXD3305 3.3V output Others	800mA, min 10% of FL
Line regulation	LL to HL at Full Load	± 0.5%
Load regulation	10% to 100% FL	± 0.5%
Cross regulation (Note 2)		± 5%
Ripple and noise	20MHz bandwidth	1%/p-p of Vout max
Temperature coefficient		±0.02% / °C, max
Transient response recovery time	25% load step change	500µS
Over voltage protection	3.3V output 5V output	3.9V 6.2V
Zener diode clamp	12V output 15V output	15V 18V
Short circuit protection		Hiccup, automatics recovery
INPUT SPECIFICATIONS		
Input voltage range	12V nominal input 24V nominal input 48V nominal input	9 – 18VDC 18 – 36VDC 36 – 75VDC
Input filter		Pi type
Input surge voltage	12V input 24V input 48V input	36VDC 50VDC 100VDC
100mS max		
Input reflected ripple (Note 3)	Nominal Vin and full load	40mAp-p
Start up time	Nominal Vin and constant resistor load	25mS typ
Remote ON/OFF	DC-DC ON DC-DC OFF	Open or 3.5V < Vr < 12V Short or 0V < Vr < 1.2V
Remote off input current	Nominal input	30mA

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage		1600VDC, min
Isolation resistance		10 <sup>9</sup> ohms, min
Isolation capacitance		1000pF, max
Switching frequency		200KHz, typ
Design meet safety standard		UL1950, EN60950
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
Potting material		Epoxy (UL94-V0)
Dimensions		3.94 X 2.76 X 0.75 Inches (100.2 X 70.0 X 19.0 mm)
Weight		280g (9.86oz)
MTBF (Note 4)		1.533 x 10 <sup>6</sup> hrs
ENVIRONMENTAL SPECIFICATIONS		
Operating temperature range		-25°C ~ +71°C (with derating)
Maximum case temperature		+95°C
Storage temperature range		-25°C ~ +100°C
Thermal impedance		5.2°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
Conducted immunity	EN61000-4-6	Perf. Criteria2
Radiated immunity	EN61000-4-3	Perf. Criteria2
Surge	EN61000-4-5	Perf. Criteria2
Fast transient	EN61000-4-4	Perf. Criteria2
ESD	EN61000-4-2	Perf. Criteria2



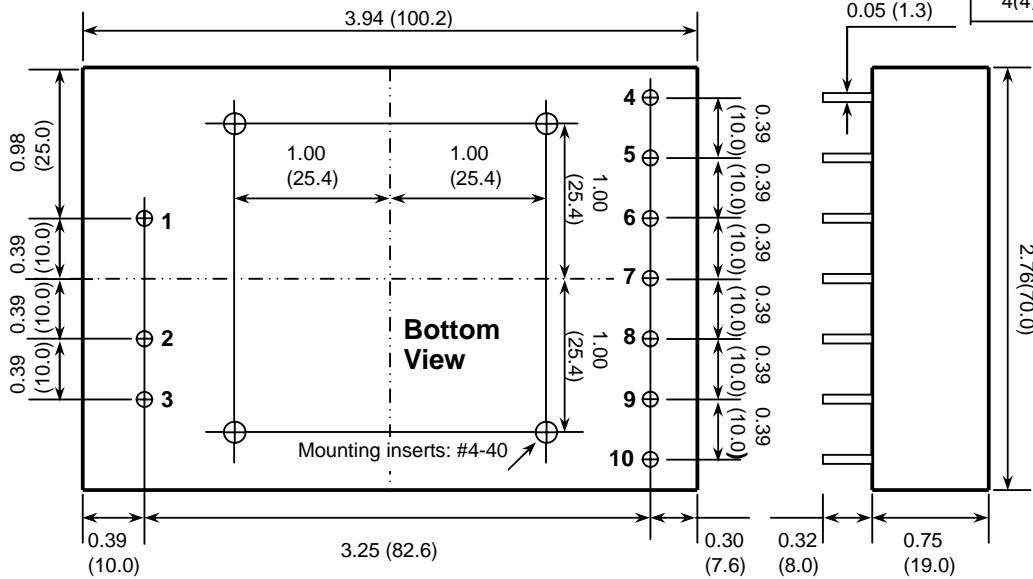
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# 60 WATTS DC-DC CONVERTER

Model Number	Input Range	Output Voltage	Output Current	Input Current <sup>(5)</sup>	Eff <sup>(6)</sup> (%)	Capacitor <sup>(7)</sup> Load max
FDC60-12S33	9 – 18 VDC	3.3 VDC	15A	5430mA	80	38700uF
FDC60-12S05	9 – 18 VDC	5 VDC	12A	6330mA	83	20400uF
FDC60-12S12	9 – 18 VDC	12 VDC	5A	6250mA	84	3550uF
FDC60-12S15	9 – 18 VDC	15 VDC	4A	6250mA	84	2300uF
FDC60-12D05	9 – 18 VDC	± 5 VDC	+10 / -2A	6500mA	81	17000 / 3400uF
FDC60-12D12	9 – 18 VDC	± 12 VDC	± 2.5A	6250mA	84	± 900uF
FDC60-12D15	9 – 18 VDC	± 15 VDC	± 2A	6250mA	84	± 600uF
FDC60-12D3305	9 – 18 VDC	3.3 / 5VDC	6 / 6A	5770mA	76	16000 / 10200uF
FDC60-24S33	18 – 36 VDC	3.3 VDC	15A	2750mA	79	38700uF
FDC60-24S05	18 – 36 VDC	5 VDC	12A	3090mA	85	20400uF
FDC60-24S12	18 – 36 VDC	12 VDC	5A	2980mA	88	3550uF
FDC60-24S15	18 – 36 VDC	15 VDC	4A	2940mA	89	2300uF
FDC60-24D05	18 – 36 VDC	± 5 VDC	+10 / -2A	3130mA	84	17000 / 3400uF
FDC60-24D12	18 – 36 VDC	± 12 VDC	± 2.5A	3050mA	86	± 900uF
FDC60-24D15	18 – 36 VDC	± 15 VDC	± 2A	3010mA	87	± 600uF
FDC60-24D3305	18 – 36 VDC	3.3 / 5VDC	6 / 6A	2700mA	81	16000 / 10200uF
FDC60-48S33	36 – 75 VDC	3.3 VDC	15A	1310mA	83	38700uF
FDC60-48S05	36 – 75 VDC	5 VDC	12A	1520mA	86	20400uF
FDC60-48S12	36 – 75 VDC	12 VDC	5A	1470mA	89	3550uF
FDC60-48S15	36 – 75 VDC	15 VDC	4A	1450mA	90	2300uF
FDC60-48D05	36 – 75 VDC	± 5 VDC	+10 / -2A	1540mA	85	17000 / 3400uF
FDC60-48D12	36 – 75 VDC	± 12 VDC	± 2.5A	1450mA	90	± 900uF
FDC60-48D15	36 – 75 VDC	± 15 VDC	± 2A	1450mA	90	± 600uF
FDC60-48D3305	36 – 75 VDC	3.3 / 5VDC	6 / 6A	1310mA	83	16000 / 10200uF

Note

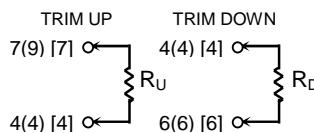
1. The FDC60 series required a minimum 10% loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
2. Cross regulation:  
Dual output—Asymmetrical load 25% to 100% full load
3. Simulated source impedance of 12uH. 12uH inductor in series with +Vin.
4. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
5. Maximum value at nominal input voltage and full load
6. Typical value at nominal input voltage and full load.
7. Test by minimum Vin and constant resistor load.



1. All dimensions in Inches (mm)  
2. Pin Pitch tolerance ±0.014(0.35)

### EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.  
( ) for dual output trim  
[ ] XXD3305 only trim 3.3V



PIN CONNECTION							
PIN	SINGLE	DUAL	D3305	PIN	SINGLE	DUAL	D3305
1	+ INPUT	+ INPUT	+ INPUT	6	+OUTPUT	+OUTPUT	+3.3V
2	- INPUT	- INPUT	- INPUT	7	- OUTPUT	COM	COM
3	CTRL	CTRL	CTRL	8	- OUTPUT	COM	COM
4	TRIM	TRIM	TRIM	9	NO PIN	- OUTPUT	+ 5V
5	+OUTPUT	+OUTPUT	+3.3V	10	NO PIN	- OUTPUT	+ 5V