



- 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	500uS
Over voltage protection	3.3V output	3.9V
	5V output	6.2V
	Zener diode clamp	12V output 15V output 18V output
Short circuit protection		Hiccup, automatic recovery
INPUT SPECIFICATIONS		
Input voltage range	12V nominal input	9 – 18VDC
	24V nominal input	18 – 36VDC
	48V nominal input	36 – 75VDC
Input filter		Pi type
Input surge voltage 100mS max	12V input	36VDC
	24V input	50VDC
	48V input	100VDC
Input reflected ripple (Note 3)	Nominal Vin and full load	40mA <sub>p-p</sub>
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



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**

- 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.
- Cross regulation:  
Dual output—Asymmetrical load 25% to 100% full load  
Simulated source impedance of 12uH. 12uH inductor in series with +Vin.
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
- Maximum value at nominal input voltage and full load
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistor load.

**EXTERNAL OUTPUT TRIMMING**

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

