



- 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 Zener diode clamp | 3.3V output | 3.9V |
| | 5V output | 6.2V |
| | 12V output | 15V |
| | 15V output | 18V |
| Short circuit protection | Hiccup, automatics 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 | 40mAp-p |
| Start up time | Nominal Vin and constant resistor load | 25mS typ |
| Remote ON/OFF | DC-DC ON | Open or 3.5V < Vr < 12V |
| | DC-DC OFF | 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 ⁹ 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 ⁶ 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 |



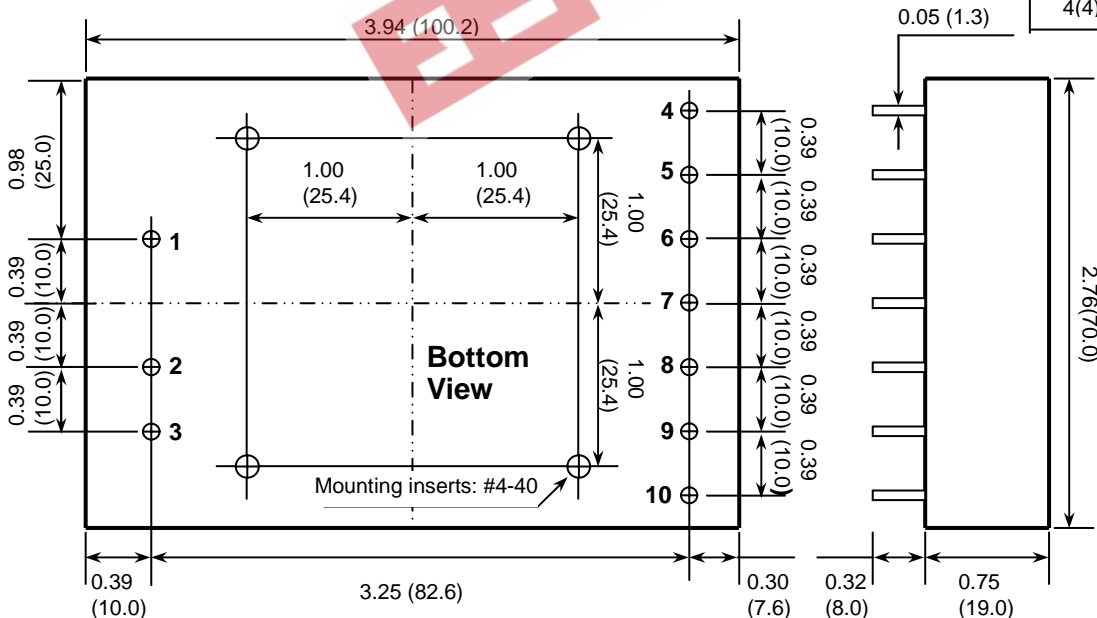
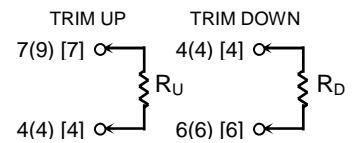
| Model Number | Input Range | Output Voltage | Output Current | Input Current ⁽⁵⁾ | Eff ⁽⁶⁾ (%) | Capacitor ⁽⁷⁾ Load max |
|---------------|-------------|----------------|----------------|------------------------------|------------------------|-----------------------------------|
| FDC60-12S33 | 9 – 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



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

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 |