# SFP1050-12BG
# AC-DC Power Supply
## 12V Output, 1050 Watts

RoHS Compliant

The Bel Power Solutions SFP1050-12BG is a 1050 W, power factor corrected (PFC) front-end which provides a 12 VDC output for datacom and other distributed power applications. Its compact size enables mounting in both 1U and 2U height racks.

High efficiencies, advanced thermal management techniques, and an internal fan increase reliability over a broad range of operating conditions. Internal ORing FETs facilitate use in hot-swap (plug)*, redundant configurations. Status is provided with front panel LEDs, logic signals, and via the I²C management interface bus.

The SFP1050-12BG meets international safety requirements and is CE marked to the Low Voltage Directive (LVD).

* Proper hot-swap (plug) operation instruction: Power supply is not intended to be inserted into the system with AC cord already applied. Alternatively, if there is an application where power supply insertion with AC cord is required; PS_ON must be toggled or AC recycled after insertion into the system to reset the power supply.

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## Key Features & Benefits

- Ideal server form factor optimizes, space, efficiency, and load variations
- High efficiency maximized between
- 30-80% load conditions
- Unconditionally stable under any load condition
- Wide input voltage range (90-264 VAC) with PFC
- 1U or 2U height configurations
- Active current share with ORing FET
- Incorporate Remote sense
- I²C interface status monitoring
- Primary and secondary voltage and current monitor over I²C
- Standby voltage of 3.3 VDC @ 3 A
- Overtemperature, overload, and overvoltage protection
- Status LEDs: AC OK, POWER GOOD, PS FAIL

## Applications

- Datacom
- Distributed Power Systems

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Please read our datasheet & drawing disclaimer here.

# SFP1050-12BG

## Model Selection

| MODEL | NOMINAL OUTPUT VOLTAGE | ADJUSTMENT RANGE | MAXIMUM OUTPUT CURRENT (Amps) | REGULATION | RIPPLE & NOISE @ 20 MHz BW |
|---|---|---|---|---|---|
| SFP1050-12BG | 12 VDC<br>3.3 VDC (Standby) | N/A<br>N/A | 86.7 A<br>3 A | ±3 %<br>±3 % | 100 mV<br>100 mV |

## Input Specifications

| PARAMETER | CONDITIONS / DESCRIPTION | | MIN | NOM | MAX | UNITS |
|---|---|---|---|---|---|---|
| AC Input Voltage | Single-phase continuous input range. | | 90 | | 264 | VAC |
| Input Frequency | AC input. | | 47 | | 63 | Hz |
| Hold-up Time | After last AC line peak at full power. | At 115 VAC | 20 | | | ms |
| Input Current | At full-rated load. | At 90 VAC | | | 15 | Arms |
| Inrush Surge Current | Excluding Xcap. Vin = 264 VAC, T = 25 ºC | | | | 25 | Apk |
| Power Factor | Per EN61000-3-2 | | > 0.95 | | | W/VA |

## Output Specifications

| PARAMETER | CONDITIONS / DESCRIPTION | | MIN | NOM | MAX | UNITS |
|---|---|---|---|---|---|---|
| Efficiency[1] | With Vin at 110 VAC and 50% to 75% load on V1. | | 87 | | | % |
| | With Vin at 110 AC and 75% to 100% load on V1. | | 85 | | | % |
| | With Vin at 220 VAC and 50% to 75% load on V1. | | 88 | | | % |
| | With Vin at 220 VAC and 75% to 100% load on V1. | | 89 | | | % |
| Minimum Load | Minimum loading required to maintain regulation. | | 0 | | | A |
| Output Power | | | | | 1050 | W |
| Overshoot | Output voltage overshoot at turn-on. | | | | < 5 | % |
| Transient Response | Maximum recovery time to within 1% of initial set point due to a 25% load change, 1A/µs. | 12 V output:<br>Standby output: | | | 5<br>5 | ms<br>ms |
| | Maximum deviation: | 12 V output:<br>Standby output: | | | 3<br>3 | %<br>% |
| Turn-On Delay with PS_ON signal | Time required for initial output voltage stabilization after application of AC input or ON/OFF signal. | | | | 1500 | ms |
| Output Regulation | See Model Selection table above. | | | | | |

## I²C Bus Management Interface[2]

| PARAMETER | CONDITIONS / DESCRIPTION |
|---|---|
| **Static** | Includes static information such as: part number and revision level, output rating, serial number, date code, and manufacturing location. |
| **Status** (Logic 1 or 0) | AC Input OK.<br>DC Output OK.<br>Overtemperature.<br>Overcurrent.<br>Fan OK.<br>Overvoltage Alert<br>Undervoltage Alert |
| **Real-Time Monitoring** | Output voltage (main output). LSB = 20 mV<br>Output current (main output). LSB = 100 mA |

[1] Internal fan is considered part of the load as it is driven from the 12 V output; Vaux load is set to 0.5 A for efficiency measurements.

[2] Reference "I²C Management Interface" and "EEPROM Table of Contents" documents for SFP1050-12BG (consult factory).

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## Interface Signals & Internal Protection[3]

| PARAMETER | CONDITIONS/DESCRIPTION | | MIN | NOM | MAX | UNITS |
|---|---|---|---|---|---|---|
| Overvoltage Protection | Latch-style overvoltage protection. | | | | 15<br>4.3 | V |
| Overcurrent Protection | Current limit (Latching Mode). | 12V output:<br>Standby output: | 91<br>3.2 | | 112.7<br>6 | A |
| Short-Circuit Protection | Latching Mode. | | | | | |
| Overtemperature/ Fan Failure Warning | 12 V output will shut down in the event of an overtemperature condition or blocked fan rotor.<br>OT setpoint is 55 ±3 ºC.<br>Supply's fan and Vaux are active.<br>Power supply will recover when OT condition is removed.<br>Amber OT LED will turn ON to indicate fault condition. | | | | | |
| PS_ON | Output enable. Pulled low allows V1 to be activated. | | | | | |
| +12V Current Share | 0 to 8 V signal used for active current sharing. | | | | | |
| Write Protect | For factory use only. | | | | | |
| PS A0, PS A1 | I²C Address. | | | | | |
| SDA | I²C Data line (3.3 V). | | | | | |
| SCL | I²C Clock line (3.3 V). | | | | | |
| Tach_1 | Two pulses per fan revolution. | | | | | |
| AC_OK/H | High signal indicates AC is within PSU limits. | | | | | |
| Present/L | 100 Ohm resistor internally connected to RTN allowing the PSU to be detected on insertion. | | | | | |
| Alert/L | Low signal indicates PSU fan is running below speed or an overtemperature limit was exceeded. | | | | | |
| PWROK/H | High signal indicates both outputs are within regulation limits. | | | | | |

## Safety, Regulatory and EMI Specifications

| PARAMETER | CONDITIONS / DESCRIPTION | | MIN | NOM | MAX | UNITS |
|---|---|---|---|---|---|---|
| Agency Approvals | Approved to the latest edition of the following standards:<br>UL/CSA60950-1, IEC60950-1 and EN60950-1.<br>CE Mark for LVD | | | | | |
| Electromagnetic Interference | FCC CFR title 47 Part 15 Sub-Part B,<br>EN 55022/CISPR 22. | Conducted:<br>Radiated: | A<br>A | | | Class |
| Harmonics | Per IEC 61000-3-2. | | A | | | Class |
| Voltage Fluctuation and Flicker | Per IEC 61000-3-3. | | Pass | | | |
| ESD Susceptibility | Per EN 61000-4-2, Level 4,<br>Performance criteria A | Contact Discharge:<br>Air Discharge: | ±8<br>±15 | | . | kV |
| Radiated Susceptibility | Per EN 61000-4-3, Level 3,<br>Performance criteria A | | 10 | | . | V/m |
| EFT/Burst | Per EN 61000-4-4, Level 4,<br>Performance criteria A | | ±4 | | . | kV |
| Input Transient Protection | Per EN 61000-4-5, Class 4,<br>Performance criteria A | Line-to-Line:<br>Line-to-Ground: | 2<br>4 | | . | kV |
| RF Conducted Disturbances | Per EN 61000-4-6, Level 2.,<br>Performance criteria A | | 3 | | . | V |
| Voltage Interruptions | Per EN 61000-4-11, performance criterion B 30%.<br>Per EN 61000-4-11, performance criterion C 60%.<br>Per EN 61000-4-11, performance criterion C 95%. | | 10<br>100<br>5 | | .<br><br> | ms<br>ms<br>Sec |
| Leakage Current | Per EN 60950, 264 VAC @ 60Hz: | | | | 1.75 | mA |

[3] Refer to product specification for internal pull up impedances and timing of these signals.

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## Environmental Specifications

| PARAMETER | CONDITIONS / DESCRIPTION | | MIN | NOM | MAX | UNITS |
|---|---|---|---|---|---|---|
| Altitude | Operating.<br>Non-Operating. | | | | 10K<br>40K | ASL ft |
| Operating Temperature | Internal DC fan for cooling. | At 100% load: | 0 | | 50 | ºC |
| Storage Temperature | | | -40 | | 85 | ºC |
| Temperature Coefficient | 0 ºC to 45 ºC (after 15-minute warm-up). | | | | 0.02 | %/ºC |
| Relative Humidity | Non-condensing. @ 40 °C | | 5 | | 93 | %RH |
| Shock | Operating: half-sine, 11 ms, 10 shock per face, 6 faces<br>Non-Operating: half-sine, 11 ms, 10 shock per face, 6 faces | | | | 7<br>30 | G |
| Vibration | Operating: 3 axis swept sine 5-500 Hz, 1 octave/min, 5 sweep cycles per axis<br>Non-operating: random 10-500 Hz. | | | | 1<br>3.5 | G<br>Grms |
| Reliability MTBF | (Calculated) Bellcore Ground Benign @ 25 °C.<br>Demonstrated | | 100 000<br>300 000 | | | hrs |

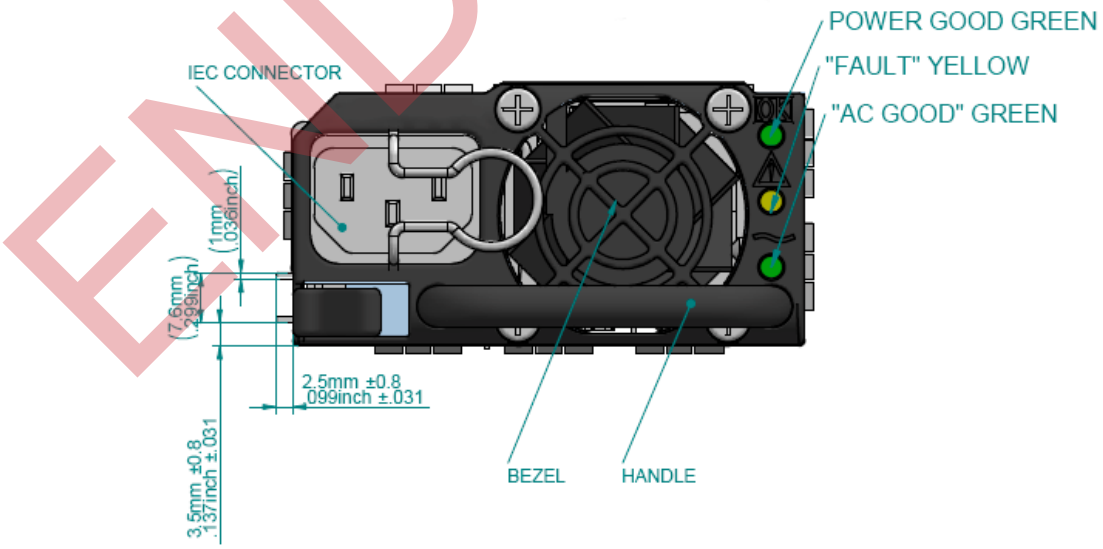
## LED Indicators

| Indicator | LED Color |
|---|---|
| Power Good | GREEN |
| AC OK | GREEN |
| PS FAIL | AMBER |

## Mechanical Specifications

| PARAMETER | CONDITIONS / DESCRIPTION |
|---|---|
| Dimensions | 78 x 40 x 340.5 mm |
| Weight | 1.62 kg (3.57 lb) |

*Front View*

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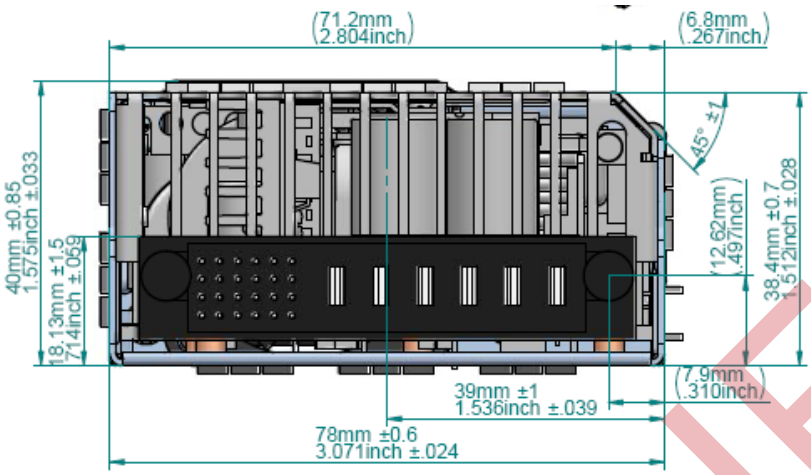
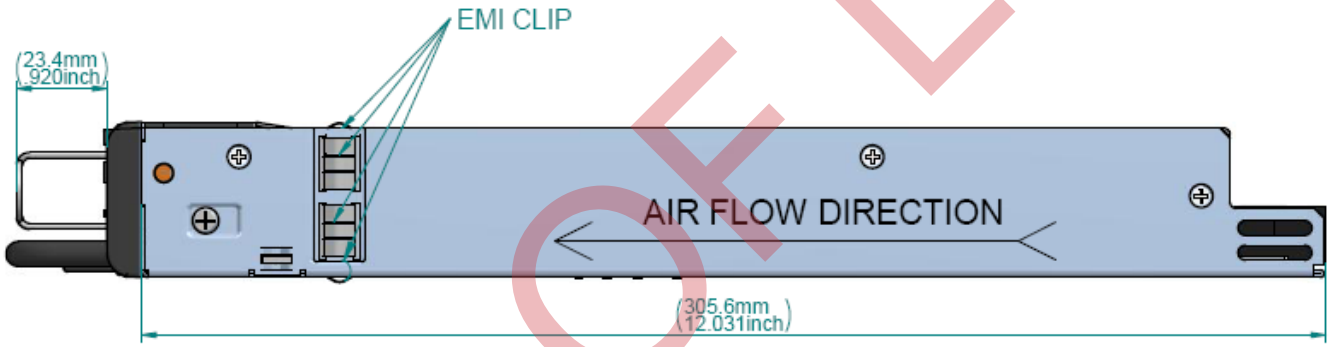
# SFP1050-12BG

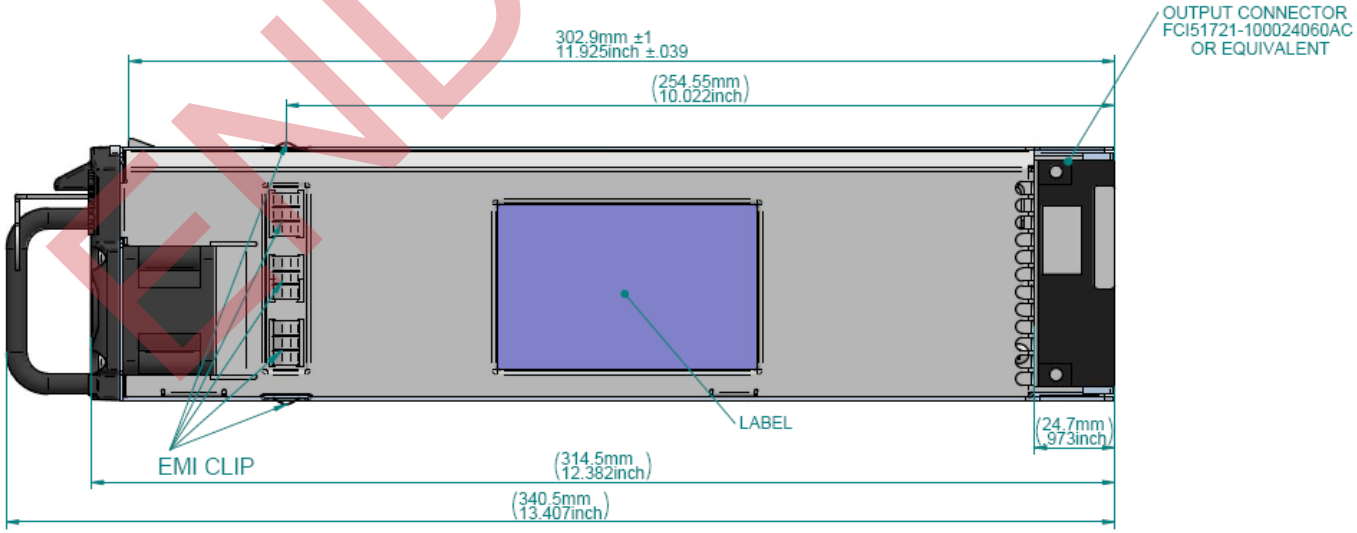
*Rear View*




*Side View*




*Top View*

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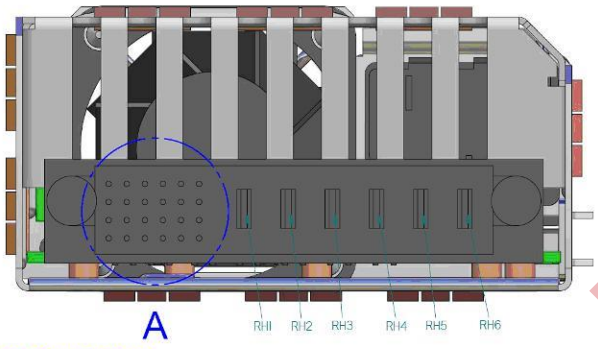
## Connector Information

| | | |
|---|---|---|
| **Power Supply:** | Input - IEC 320 input (Male) standard line cord connection<br>Output - P/N FCI 51721-10002406AA or equivalent | |
| **Mating Connections:** | Input - IEC 320 output (Socket) Standard line cord (15A)<br>Output - P/N: FCI 51741-10002406CC | |
| **Input IEC Connector:** | **Input** | **Location** |
| | Chassis (Safety) Ground | Ground |
| | Line 1 (Line) | L |
| | Line 2 (Neutral) | N |

*Output Connector Details*




**OUTPUT CONNECTOR:**

**FCI ( POWER BLADE )**
**51721-10002406AC OR EQUIVALENT**

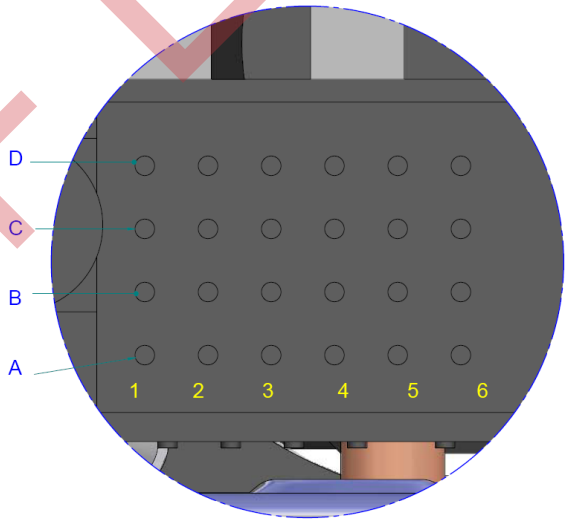
**WILL MATE WITH SYSTEM BOARD CONNECTOR:**

**FCI ( POWER BLADE )**
**5174-10002406AA**
**5174-10002406BA**
**5174-10002406CB**
**STRAIGHT IN CONNECTOR**

**FCI ( POWER BLADE )**
**51761-10002406AA**
**51761-10002406BA**
**51761-10002406CB**
**RIGHT ANGLE CONNECTOR**

NOTES: UNLESS OTHERWISE SPECIFIED.

| PIN | SIGNAL NAME |
|---|---|
| RH1 | +12V Return |
| Rh2 | +12v Return |
| Rh3 | +12v Return |
| Rh4 | +12v |
| Rh5 | +12v |
| Rh6 | +12v |
| A1 | PS A1 |
| A2 | +12v Current Share |
| A3 | RETURN |
| A4 | WRITE PROTECT |
| A5 | PS A0 |
| A6 | +3.3V SB |
| B1 | RETURN |
| B2 | SENSE +12V Return |
| B3 | RETURN |
| B4 | +3.3v SB |
| B5 | SDA |
| B6 | PSON/L |
| C1 | RETURN |
| C2 | Tach 1 |
| C3 | RETURN |
| C4 | +3.3v SB |
| C5 | SCL |
| C6 | ACOK/H |
| D1 | Present/L |
| D2 | SENSE +12V |
| D3 | RETURN |
| D4 | +3.3V SB |
| D5 | Alert/L |
| D6 | PWROK/H |




DETAIL A

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## For more information on these products consult: tech.support@psbel.com

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