

# Make-Ps<sup>®</sup>

## DC/DC CONVERTER

### Single & Dual Output DC/DC Converter

#### Series FKC12 12Watt | DC-DC Converter



**FEATURES:**

- 12W DIL PACKAGE
- 2:1 WIDE INPUT RANGE
- 100% BURNED IN
- HIGH EFFICIENCY
- UL94V-0 PACKAGE MATERIAL
- CUSTOM SOLUTIONS AVAILABLE
- RoHS COMPLIANT
- Remote Control:On/Off

**APPLICATIONS:**

- Wireless Network
- Telecom/Datacom
- Industry Control System
- Measurement Equipment
- Semiconductor Equipment



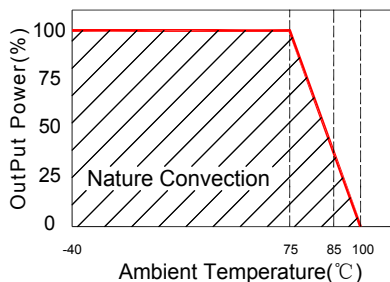
### MODEL SELECTION CHART

| Part Number | Input Voltage Vdc | Input Current    |                    | Output Voltage Vdc | Output Current Full Load (mA) | Efficiency %TYP |
|-------------|-------------------|------------------|--------------------|--------------------|-------------------------------|-----------------|
|             |                   | No-Load (mA TYP) | Full Load (mA TYP) |                    |                               |                 |
| FKC12-12S03 | 9-18              | 30               | 1203               | 3.3                | 3500                          | 80              |
| FKC12-12S05 | 9-18              | 30               | 1220               | 5                  | 2400                          | 82              |
| FKC12-12S12 | 9-18              | 30               | 1205               | 12                 | 1000                          | 83              |
| FKC12-12S15 | 9-18              | 30               | 1205               | 15                 | 800                           | 83              |
| FKC12-12D05 | 9-18              | 30               | 1205               | ±5                 | ±1200                         | 83              |
| FKC12-12D12 | 9-18              | 30               | 1205               | ±12                | ±500                          | 83              |
| FKC12-12D15 | 9-18              | 30               | 1205               | ±15                | ±400                          | 83              |
| FKC12-24S03 | 18-36             | 30               | 602                | 3.3                | 3500                          | 80              |
| FKC12-24S05 | 18-36             | 30               | 610                | 5                  | 2400                          | 82              |
| FKC12-24S12 | 18-36             | 30               | 602                | 12                 | 1000                          | 83              |
| FKC12-24S15 | 18-36             | 30               | 602                | 15                 | 800                           | 83              |
| FKC12-24D05 | 18-36             | 30               | 602                | ±5                 | ±1200                         | 83              |
| FKC12-24D12 | 18-36             | 30               | 602                | ±12                | ±500                          | 83              |
| FKC12-24D15 | 18-36             | 30               | 301                | ±15                | ±400                          | 83              |
| FKC12-24S03 | 18-36             | 20               | 305                | 3.3                | 3500                          | 80              |
| FKC12-24S05 | 36-75             | 20               | 301                | 5                  | 2400                          | 82              |
| FKC12-48S12 | 36-75             | 20               | 301                | 12                 | 1000                          | 83              |
| FKC12-48S15 | 36-75             | 20               | 301                | 15                 | 800                           | 83              |
| FKC12-48D05 | 36-75             | 20               | 301                | ±5                 | ±1200                         | 83              |
| FKC12-48D12 | 36-75             | 20               | 301                | ±12                | ±500                          | 83              |
| FKC12-48D15 | 36-75             | 20               | 301                | ±15                | ±400                          | 83              |

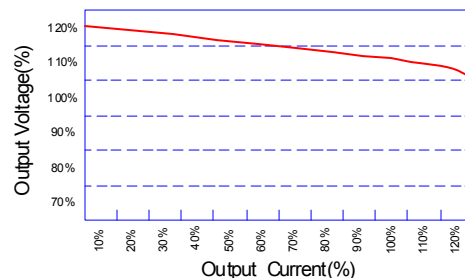
FKC12-12S03/\*\* add Suffix SMD for SMD package

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

#### Temperature Derating Graph

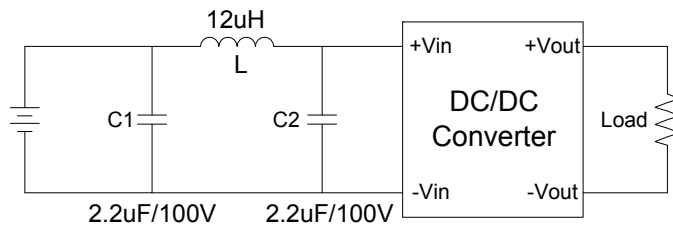


#### Tolerance Envelope Graph

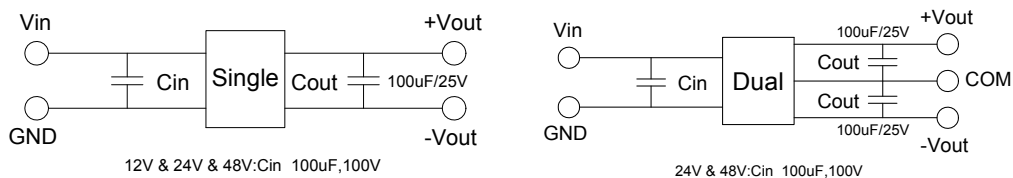


| Input Specifications              |                                     |                       |                |      |       |
|-----------------------------------|-------------------------------------|-----------------------|----------------|------|-------|
| Parameters                        | Conditions                          | Min                   | Typ            | Max  | Units |
| Voltage Types                     |                                     |                       |                | 2:1  |       |
| Filter                            | Pi Network                          |                       |                |      |       |
| Protection                        | Fuse Recommended                    |                       |                |      |       |
| Output Specifications             |                                     |                       |                |      |       |
| Temperature Coefficient:±0.05%/°C |                                     |                       |                |      |       |
| Parameters                        | Conditions                          | Min                   | Typ            | Max  | Units |
| Voltage Tolerance                 | Single/Dual                         |                       |                | ±2   | %     |
| Short Circuit/ Restart            | Continuous/ Automatic               |                       |                |      |       |
| Over Load Protection              |                                     |                       | 150            |      | %     |
| Line Regulation                   | High Line to Low Line               |                       |                | ±0.5 | %     |
| Load Regulation                   | Single & Dual (F.L-25%F.L)          |                       |                | ±0.5 | %     |
| Minimum Load                      | 10% of Full Load                    |                       |                |      |       |
| Ripple & Noise                    | BW=DC To 20MHz (with 1uF Cap.)      |                       |                | 100  | mVp-p |
| Transient response setting time   | current change from 25% to 100%     |                       |                | 350  | us    |
| General Specifications            |                                     |                       |                |      |       |
| Parameters                        | Conditions                          | Min                   | Typ            | Max  | Units |
| Isolation Resistance              | 500Vdc                              | 1000                  |                |      | MΩ    |
| Switching Frequency               |                                     |                       | 400            |      | KHz   |
| Operating Temperature             |                                     | -40                   |                | 100  | °C    |
| Humidity                          | Non Condensing                      |                       |                | 95   | %     |
| Cooling                           | Free air Convection                 |                       |                |      |       |
| Case material                     | Five-Side Shielded Case             |                       |                |      |       |
| Weight                            |                                     |                       | 17.5           |      | g     |
| Dimensions                        | Appearance size                     |                       | 31.6X20.1X10.0 |      | mm    |
| Potting Material                  |                                     | Epoxy (UL94V-0 rated) |                |      |       |
| Radiated Emissions                | EN55022                             | CLASS A               |                |      |       |
| Conducted Emissions               | EN55022                             | CLASS A               |                |      |       |
| Efficiency                        |                                     | 80                    |                |      | %     |
| Isolation Voltage                 | For 10 seconds                      |                       |                | 1500 | VDC   |
| MTBF                              | MIL-HDBK-217F @25°C , Ground Benign | 900000                |                |      | Hours |
| Storage Temperature               |                                     | -55                   |                | +125 | °C    |
| Case Temperature                  |                                     |                       |                | +95  | °C    |

Suggest adding input external filter(C1,C2,L)to meet conducted emissions (En55022 class A)

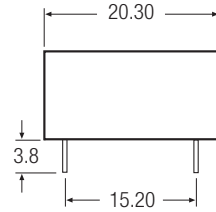
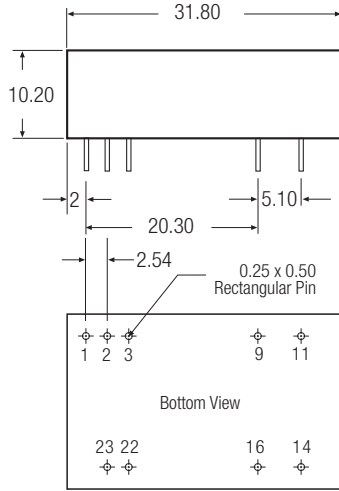


Recommended Test Circuit



OUTLINE DRAWING

Package Style and Pinning (mm)



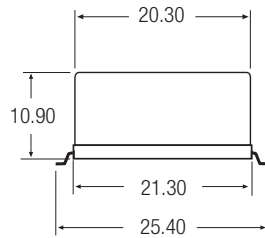
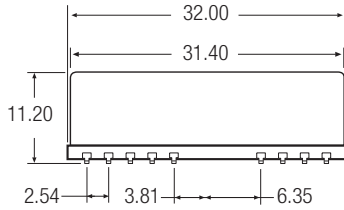
DIP24 Package Style

Pin Connections

| Pin # | Single | Dual   |
|-------|--------|--------|
| 1     | ON/OFF | ON/OFF |
| 2     | -Vin   | -Vin   |
| 3     | -Vin   | -Vin   |
| 9     | NC     | Com    |
| 11    | NC     | -Vout  |
| 14    | +Vout  | +Vout  |
| 16    | -Vout  | Com    |
| 22    | +Vin   | +Vin   |
| 23    | +Vin   | +Vin   |

NC = No Connection  
Pin Pitch Tolerance ±0.35 mm

SMD Package Style



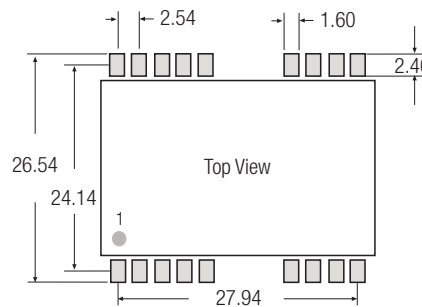
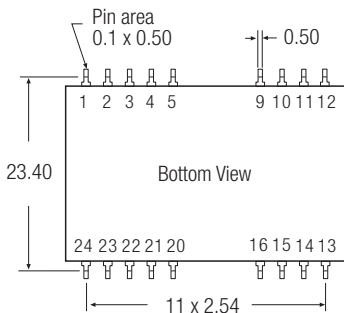
SMD Package Style

Same spec. as the original DIP spec. and pin definition, excl. of the SMD type pin.

Pin Connections

| Pin #  | Single | Dual   |
|--------|--------|--------|
| 1      | ON/OFF | ON/OFF |
| 2      | -Vin   | -Vin   |
| 3      | -Vin   | -Vin   |
| 9      | NC     | Com    |
| 11     | NC     | -Vout  |
| 14     | +Vout  | +Vout  |
| 16     | -Vout  | Com    |
| 22     | +Vin   | +Vin   |
| 23     | +Vin   | +Vin   |
| Others | NC     | NC     |

NC = No Connection  
Pin Pitch Tolerance ±0.35 mm



All specifications are typical at nominal input, nominal load and 25° C unless otherwise specified.  
External, low ESR, 10 microfarad (minimum) capacitor across output is recommended for operation.

Make Power world-class design, development and manufacturing team stands ready to work with you to deliver the exact power converter you need for your demanding, large volume, OEM applications. And ... we'll do it on time and within budget

Our experienced applications and design staffs; quick-turn prototype capability; highly automated, SMT assembly facilities; and in-line SPC quality-control techniques combine to give us the unique ability to design and deliver any quantity of power converters to the highest standards of quality and reliability.

We have compiled a large library of DC/DC designs that are currently used in a variety of telecom, medical, computer, railway, aerospace and industrial applications. We may already have the converter you need.

Contact us. Our goal is to provide you the highest-quality, most cost-effective power converters available.

CUSTOM CAPABILITIES