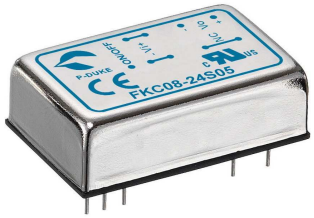
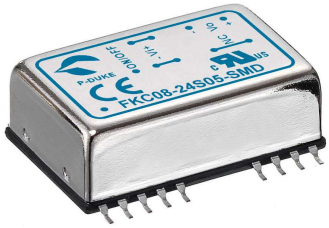
POWER MATE TECHNOLOGY CO., LTD.

# FKC08 SERIES

**DC-DC CONVERTER**

**2:1 WIDE INPUT RANGE**
**UP TO 8 Watts**




## FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 1.25 X 0.80 X 0.40 INCH 24 PIN DIP AND SMD PACKAGE
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

| 1600VDC ISOLATION | REMOTE CONTROL | OCP | SCP |
|---|---|---|---|

## TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25℃ otherwise noted

| Model Number | Input Range VDC | Output Voltage VDC | Output Current @Full Load mA | Input Current @ No Load mA | Efficiency % | Maximum Capacitor Load µF |
|---|---|---|---|---|---|---|
| FKC08-12S33 | 9 ~ 18 | 3.3 | 2000 | 10 | 80 | 3300 |
| FKC08-12S05 | 9 ~ 18 | 5 | 1500 | 15 | 83 | 1600 |
| FKC08-12S12 | 9 ~ 18 | 12 | 666 | 13 | 88 | 350 |
| FKC08-12S15 | 9 ~ 18 | 15 | 533 | 20 | 87 | 240 |
| FKC08-12D05 | 9 ~ 18 | ±5 | ±800 | 15 | 83 | ±1000 |
| FKC08-12D12 | 9 ~ 18 | ±12 | ±333 | 20 | 87 | ±160 |
| FKC08-12D15 | 9 ~ 18 | ±15 | ±267 | 20 | 85 | ±100 |
| FKC08-24S33 | 18 ~ 36 | 3.3 | 2000 | 10 | 80 | 3300 |
| FKC08-24S05 | 18 ~ 36 | 5 | 1500 | 30 | 83 | 1600 |
| FKC08-24S12 | 18 ~ 36 | 12 | 666 | 13 | 86 | 350 |
| FKC08-24S15 | 18 ~ 36 | 15 | 533 | 15 | 85 | 240 |
| FKC08-24D05 | 18 ~ 36 | ±5 | ±800 | 15 | 82 | ±1000 |
| FKC08-24D12 | 18 ~ 36 | ±12 | ±333 | 15 | 86 | ±160 |
| FKC08-24D15 | 18 ~ 36 | ±15 | ±267 | 13 | 85 | ±100 |
| FKC08-48S33 | 36 ~ 75 | 3.3 | 2000 | 7 | 80 | 3300 |
| FKC08-48S05 | 36 ~ 75 | 5 | 1500 | 8 | 83 | 1600 |
| FKC08-48S12 | 36 ~ 75 | 12 | 666 | 10 | 86 | 350 |
| FKC08-48S15 | 36 ~ 75 | 15 | 533 | 10 | 86 | 240 |
| FKC08-48D05 | 36 ~ 75 | ±5 | ±800 | 8 | 85 | ±1000 |
| FKC08-48D12 | 36 ~ 75 | ±12 | ±333 | 8 | 87 | ±160 |
| FKC08-48D15 | 36 ~ 75 | ±15 | ±267 | 7 | 87 | ±100 |

## PART NUMBER STRUCTURE

FKC08 - 48 S 05 - SMD

| Series Name | Input Voltage (VDC) | Output Quantity | Output Voltage (VDC) | Mounting Type Option |
|---|---|---|---|---|
| | **12:** 9~18<br>**24:**18~36<br>**48:**36~75 | **S:**Single | **33:** 3.3<br>**05:** 5<br>**12:**12<br>**15:**15 | □: DIP type<br>**SMD:** SMD type |
| | | **D:** Dual | **05:**± 5<br>**12:**±12<br>**15:**±15 | |

## INPUT SPECIFICATIONS

| Parameter | Conditions | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Operating input voltage range | | 12Vin(nom) | | 9 | 12 | 18 | VDC |
| | | 24Vin(nom) | | 18 | 24 | 36 | |
| | | 48Vin(nom) | | 36 | 48 | 75 | |
| Start up time | Constant resistive load | Power up | | | 700 | | ms |
| | | Remote ON/OFF | | | 5 | | |
| Input surge voltage | 100 ms, max. | 12Vin(nom) | | | | 36 | VDC |
| | | 24Vin(nom) | | | | 50 | |
| | | 48Vin(nom) | | | | 100 | |
| Input reflected ripple current | | | | | 20 | | mAp-p |
| Input filter | | | | | Pi type | | |
| Remote ON/OFF | Referred to –Vin pin | Positive logic | DC-DC ON | | Open or 3.5 ~ 12VDC | | |
| | | | DC-DC OFF | | Short or 0 ~ 1.2VDC | | |
| | | Input current of Ctrl pin | | -0.5 | | +0.5 | mA |
| | | Remote off input current | | | 2.5 | | mA |

## OUTPUT SPECIFICATIONS

| Parameter | Conditions | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Voltage accuracy | | | | -1.0 | | +1.0 | % |
| Line regulation | Low Line to High Line at Full Load | | | -0.2 | | +0.2 | % |
| Load regulation | No Load to Full Load | DIP type | Single | -0.5 | | +0.5 | % |
| | | | Dual | -1.0 | | +1.0 | |
| | | SMD type | Single | -1.0 | | +1.0 | |
| | | | Dual | -1.0 | | +1.0 | |
| Cross regulation | Asymmetrical load 25%/100% FL | | Dual | -5.0 | | +5.0 | % |
| Ripple and noise | 20MHz bandwidth | | | | 50 | | mVp-p |
| Temperature coefficient | | | | -0.02 | | +0.02 | %/℃ |
| Transient response recovery time | 25% load step change | | | | 200 | | μs |
| Over load protection | % of Iout rated | | | | 150 | | % |
| Short circuit protection | | | | | Continuous, automatics recovery | | |

## GENERAL SPECIFICATIONS

| Parameter | Conditions | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Isolation voltage | 1 minute | DIP type | Input to Output | 1600 | | | VDC |
| | | | Input (Output) to Case | 1600 | | | |
| | | SMD type | Input to Output | 1600 | | | |
| | | | Input (Output) to Case | 1000 | | | |
| Isolation resistance | 500VDC | | | 1 | | | GΩ |
| Isolation capacitance | | | | | | 300 | pF |
| Switching frequency | | | | 270 | 300 | 330 | kHz |
| Safety approvals | | | | | | | UL60950-1<br>EN60950-1<br>IEC60950-1 |
| Case material | | | | | | | Nickel-coated copper |
| Base material | | | | | | | Non-conductive black plastic |
| Potting material | | | | | | | Epoxy (UL94 V-0) |
| Weight | | | | | | | 18g (0.62oz) |
| MTBF | MIL-HDBK-217F | | | | | | 3.543 x $10^6$ hrs |

## ENVIRONMENTAL SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Operating ambient temperature | | Without derating | -40 | | +70 | ℃ |
| | | With derating | +70 | | +100 | |
| Maximum case temperature | | | | | 100 | ℃ |
| Storage temperature range | | | -55 | | +125 | ℃ |
| Thermal impedance | Natural convection | | | 20 | | ℃/W |
| Thermal shock | | | | | | MIL-STD-810F |
| Vibration | | | | | | MIL-STD-810F |
| Relative humidity | | | | | | 5% to 95% RH |

## EMC SPECIFICATIONS

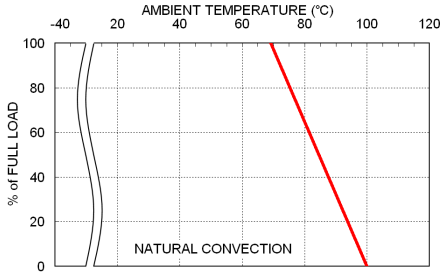
| Parameter | Conditions | | Level |
|---|---|---|---|
| EMI(1) | EN55022 | | Class A，Class B |
| ESD | EN61000-4-2 | Air ± 8kV and Contact ± 6kV | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 | 10 V/m | Perf. Criteria A |
| Fast transient (2) | EN61000-4-4 | ± 2kV | Perf. Criteria A |
| Surge (2) | EN61000-4-5 | ± 1kV | Perf. Criteria A |
| Conducted immunity | EN61000-4-6 | 10 Vr.m.s | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 | 100A/m continuous; 1000A/m 1 second | Perf. Criteria A |

**Note:**

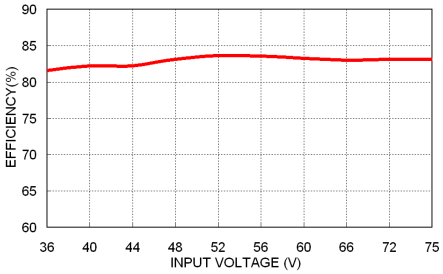
1. The standard modules meet EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
2. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
   The filter Power Mate suggests: Nippon chemi-con KY series, 220μF/100V.

**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

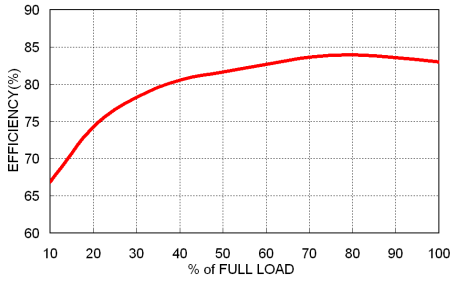
## CHARACTERISTIC CURVE




FKC08-48S05 Derating Curve



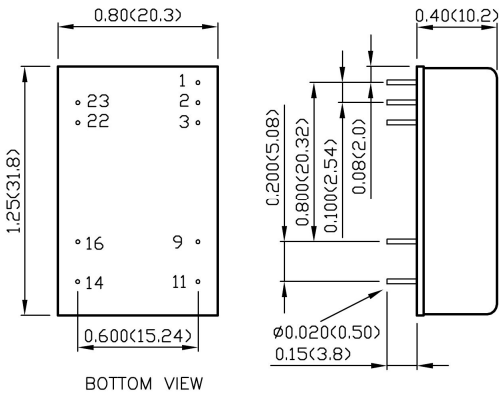

FKC08-48S05 Efficiency vs. Input Voltage




FKC08-48S05 Efficiency vs. Output Load

## MECHANICAL DRAWING

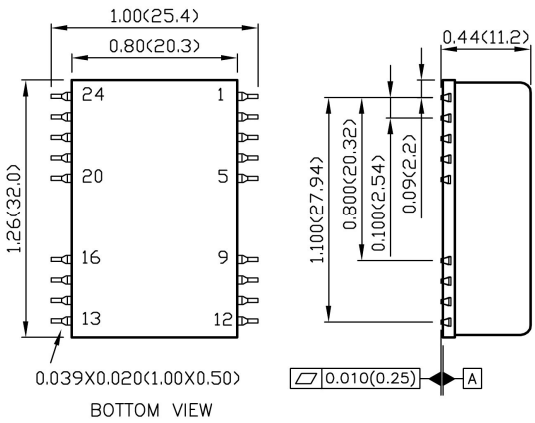
**DIP type**




**PIN CONNECTION**

| PIN | SINGLE | DUAL | PIN | SINGLE | DUAL |
|---|---|---|---|---|---|
| 1 | Ctrl | Ctrl | | | |
| 2 | -Vin | -Vin | 23 | +Vin | +Vin |
| 3 | -Vin | -Vin | 22 | +Vin | +Vin |
| | | | | | |
| 9 | NC | Common | 16 | -Vout | Common |
| 11 | NC | -Vout | 14 | +Vout | +Vout |

**SMD type**




**PIN CONNECTION**

| PIN | SINGLE | DUAL | PIN | SINGLE | DUAL |
|---|---|---|---|---|---|
| 1 | Ctrl | Ctrl | | | |
| 2 | -Vin | -Vin | 23 | +Vin | +Vin |
| 3 | -Vin | -Vin | 22 | +Vin | +Vin |
| | | | | | |
| 9 | NC | Common | 16 | -Vout | Common |
| 11 | NC | -Vout | 14 | +Vout | +Vout |
| Others | NC | NC | | | |

1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)
   x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)