POWER MATE TECHNOLOGY CO.,LTD.

# PMKC03-SERIES


## FEATURES

- 3 WATTS REGULATED OUTPUT POWER
- OUTPUT CURRENT UP TO 600mA
- STANDARD 1.25 X 0.80X 0.40 INCH
- HIGH EFFICIENCY UP TO 80%
- 2:1 WIDE INPUT VOLTAGE RANGE
- SWITCHING FREQUENCY (100KHz, MIN)
- INCLUDE 3.3VDC OUTPUT
- STANDARD 24 PIN DIP PACKAGE & SMD TYPE PACKAGE
- DUAL SEPARATE OUTPUT
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

## APPLICATIONS

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

## OPTIONS

SMD TYPE

## DESCRIPTION

The PMKC03 series offer 3 watts of output power from a package in an IC compatible 24pin DIP configuration without derating to 71ºC ambient temperature. PMKC03 series have 2:1 wide input voltage of 4.5~6, 9~18, 18~36 and 36~75VDC.

## TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25ºC otherwise noted

### OUTPUT SPECIFICATIONS

| | | | | |
|---|---|---|---|---|
| Output power | | | | 3 Watts, max. |
| Voltage accuracy | | | | ± 1% |
| Minimum load (Note 7) | | | | See table |
| Line regulation | LL to HL at Full Load | DS | | ± 0.2%<br>± 0.5% |
| Load regulation | Min Load to Full Load | Single | 3.3Vout<br>Others | ± 0.3%<br>± 0.2% |
| | | Dual<br>DS | | ± 2%<br>± 2% |
| Cross regulation (Dual) | Asymmetrical load 25% / 100% FL | | | ± 5% |
| Ripple and noise | 20MHz bandwidth | | | See table |
| Temperature coefficient | | | | ±0.02% / ºC, max. |
| Transient response recovery time | 25% load step change | | | 500µS |
| Over load protection | % of FL at nominal input | | | 180% |
| Short circuit protection | Continuous, automatics recovery | | | |

### GENERAL SPECIFICATIONS

| | | |
|---|---|---|
| Efficiency | | See table |
| Isolation voltage | Input to Output<br>DS Type, Output to Output | 1600VDC, min. 1minute<br>500VDC, min. 1minute |
| Isolation resistance | | $10^9$ohms, min. |
| Isolation capacitance | | 300pF, max. |
| Switching frequency | | 100KHz, min. |
| Approvals and standard | | IEC60950-1, UL60950-1, EN60950-1 |
| Case material | | Non-conductive black plastic |
| Base material | | Non-conductive black plastic |
| Potting material | | Epoxy (UL94-V0) |
| Dimensions | | 1.25 X 0.80 X 0.40 Inch<br>(31.8 X 20.3 X 10.2 mm) |
| Weight | DIP<br>SMD | 14g (0.48oz)<br>15g (0.52oz) |
| MTBF (Note 1) | BELLCORE TR-NWT-000332<br>MIL-HDBK-217F | 3.706 x $10^5$ hrs<br>3.018 x $10^6$ hrs |

### INPUT SPECIFICATIONS

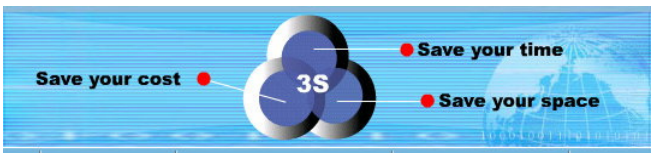
| | | |
|---|---|---|
| Input voltage range | 5VDC nominal input<br>12VDC nominal input<br>24VDC nominal input<br>48VDC nominal input | 4.5 ~ 6VDC<br>9 ~ 18VDC<br>18~ 36VDC<br>36 ~75VDC |
| Input filter | | Pi type |
| Input surge voltage | 5VDC input<br>12VDC input<br>24VDC input<br>48VDC input | 18VDC 100mS, max.<br>36VDC 100mS, max.<br>50VDC 100mS, max.<br>100VDC 100mS, max. |
| Input reflected ripple current | | 120mAp-p |
| Start up time | Nominal input and constant resistive load, Power up | 30mS |

### ENVIRONMENTAL SPECIFICATIONS

| | |
|---|---|
| Operating ambient temperature | -25ºC ~ +71ºC(non derating) |
| Storage temperature range | -55ºC ~ +125ºC |
| Thermal shock | MIL-STD-810F |
| Vibration | MIL-STD-810F |
| Relative humidity | 5% to 95% RH |

### EMC CHARACTERISTICS

| | | | |
|---|---|---|---|
| EMI | EN55022 | | Class A |
| ESD | EN61000-4-2 | Air ± 8KV<br>Contact ± 6KV | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 | 10 V/m | Perf. Criteria A |
| Fast transient (Note 6) | EN61000-4-4 | ± 2KV | Perf. Criteria B |
| Surge (Note 6) | EN61000-4-5 | ± 1KV | Perf. Criteria B |
| Conducted immunity | EN61000-4-6 | 10 Vr.m.s | Perf. Criteria A |



# 3 WATTS DC-DC CONVERTER

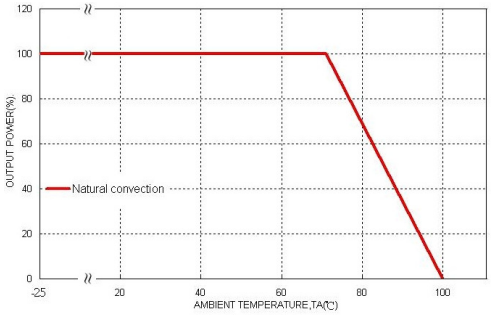
| Model Number | Input Range | Output Voltage | Output Current | | Output[4] Ripple&Noise | Input Current | | Eff[4] (%) | Capacitor[5] Load max |
|---|---|---|---|---|---|---|---|---|---|
| | | | Min. load | Full load | | No load[3] | Full load[2] | | |
| PMKC03-05S33 | 4.5 ~ 6 VDC | 3.3 VDC | 60mA | 600mA | 75mVp-p | 15mA | 609mA | 69 | 2200μF |
| PMKC03-05S05 | 4.5 ~ 6 VDC | 5 VDC | 60mA | 600mA | 75mVp-p | 15mA | 857mA | 74 | 1000μF |
| PMKC03-05S12 | 4.5 ~ 6 VDC | 12 VDC | 25mA | 250mA | 120mVp-p | 30mA | 845mA | 75 | 170μF |
| PMKC03-05S15 | 4.5 ~ 6 VDC | 15 VDC | 20mA | 200mA | 150mVp-p | 25mA | 845mA | 75 | 110μF |
| PMKC03-05D05 | 4.5 ~6 VDC | ± 5 VDC | ±30mA | ± 300mA | 75mVp-p | 15mA | 870mA | 73 | ± 500μF |
| PMKC03-05D12 | 4.5 ~ 6 VDC | ± 12 VDC | ±12mA | ± 125mA | 120mVp-p | 20mA | 845mA | 75 | ± 96μF |
| PMKC03-05D15 | 4.5 ~6 VDC | ± 15 VDC | ±10mA | ± 100mA | 150mVp-p | 50mA | 845mA | 75 | ± 47μF |
| PMKC03-05DS05 | 4.5 ~ 6 VDC | V1:5VDC;V2:5VDC | V1: 30mA;V2: 30mA | V1:300mA;V2:300mA | 75mVp-p | 30mA | 870mA | 73 | V1:500μF;V2:500μF |
| PMKC03-05DS12 | 4.5 ~ 6 VDC | V1:12VDC;V2:12VDC | V1:12mA;V2:12mA | V1:125mA;V2:125mA | 120mVp-p | 40mA | 845mA | 75 | V1:96μF;V2:96μF |
| PMKC03-05DS15 | 4.5 ~ 6 VDC | V1:15VDC;V2:15VDC | V1:10mA;V2:10mA | V1:100mA;V2:100mA | 150mVp-p | 40mA | 870mA | 73 | V1:47μF;V2:47μF |
| PMKC03-12S33 | 9 ~ 18 VDC | 3.3 VDC | 60mA | 600mA | 75mVp-p | 20mA | 252mA | 70 | 2200μF |
| PMKC03-12S05 | 9 ~ 18 VDC | 5 VDC | 60mA | 600mA | 75mVp-p | 20mA | 352mA | 75 | 1000μF |
| PMKC03-12S12 | 9 ~ 18 VDC | 12 VDC | 25mA | 250mA | 120mVp-p | 20mA | 334mA | 79 | 170μF |
| PMKC03-12S15 | 9 ~ 18 VDC | 15 VDC | 20mA | 200mA | 150mVp-p | 30mA | 334mA | 79 | 110μF |
| PMKC03-12D05 | 9 ~ 18 VDC | ± 5 VDC | ±30mA | ± 300mA | 75mVp-p | 20mA | 357mA | 74 | ± 500μF |
| PMKC03-12D12 | 9 ~ 18 VDC | ± 12 VDC | ±12mA | ± 125mA | 120mVp-p | 35mA | 334mA | 79 | ± 96μF |
| PMKC03-12D15 | 9 ~ 18 VDC | ± 15 VDC | ±10mA | ± 100mA | 150mVp-p | 45mA | 334mA | 79 | ± 47μF |
| PMKC03-12DS05 | 9 ~ 18 VDC | V1:5VDC;V2:5VDC | V1: 30mA;V2: 30mA | V1:300mA;V2:300mA | 75mVp-p | 10mA | 357mA | 74 | V1:500μF;V2:500μF |
| PMKC03-12DS12 | 9 ~18 VDC | V1:12VDC;V2:12VDC | V1:12mA;V2:12mA | V1:125mA;V2:125mA | 120mVp-p | 15mA | 334mA | 79 | V1:96μF;V2:96μF |
| PMKC03-12DS15 | 9 ~18 VDC | V1:15VDC;V2:15VDC | V1:10mA;V2:10mA | V1:100mA;V2:100mA | 150mVp-p | 30mA | 334mA | 79 | V1:47μF;V2:47μF |
| PMKC03-24S33 | 18 ~ 36 VDC | 3.3 VDC | 60mA | 600mA | 75mVp-p | 10mA | 126mA | 70 | 2200μF |
| PMKC03-24S05 | 18 ~ 36 VDC | 5 VDC | 60mA | 600mA | 75mVp-p | 10mA | 174mA | 76 | 1000μF |
| PMKC03-24S12 | 18 ~ 36 VDC | 12 VDC | 25mA | 250mA | 120mVp-p | 20mA | 165mA | 80 | 170μF |
| PMKC03-24S15 | 18 ~ 36 VDC | 15 VDC | 20mA | 200mA | 150mVp-p | 20mA | 165mA | 80 | 110μF |
| PMKC03-24D05 | 18 ~ 36 VDC | ± 5 VDC | ±30mA | ± 300mA | 75mVp-p | 20mA | 174mA | 76 | ± 500μF |
| PMKC03-24D12 | 18 ~ 36 VDC | ± 12 VDC | ±12mA | ± 125mA | 120mVp-p | 20mA | 167mA | 79 | ± 96μF |
| PMKC03-24D15 | 18 ~ 36 VDC | ± 15 VDC | ±10mA | ± 100mA | 150mVp-p | 20mA | 164mA | 80 | ± 47μF |
| PMKC03-24DS05 | 18 ~ 36 VDC | V1:5VDC;V2:5VDC | V1: 30mA;V2: 30mA | V1:300mA;V2:300mA | 75mVp-p | 20mA | 174mA | 76 | V1:500μF;V2:500μF |
| PMKC03-24DS12 | 18 ~ 36 VDC | V1:12VDC;V2:12VDC | V1:12mA;V2:12mA | V1:125mA;V2:125mA | 120mVp-p | 20mA | 167mA | 79 | V1:96μF;V2:96μF |
| PMKC03-24DS15 | 18 ~ 36 VDC | V1:15VDC;V2:15VDC | V1:10mA;V2:10mA | V1:100mA;V2:100mA | 150mVp-p | 20mA | 164mA | 80 | V1:47μF;V2:47μF |
| PMKC03-48S33 | 36 ~ 75 VDC | 3.3 VDC | 60mA | 600mA | 75mVp-p | 10mA | 61mA | 72 | 2200μF |
| PMKC03-48S05 | 36 ~ 75 VDC | 5 VDC | 60mA | 600mA | 75mVp-p | 10mA | 88mA | 75 | 1000μF |
| PMKC03-48S12 | 36 ~ 75 VDC | 12 VDC | 25mA | 250mA | 120mVp-p | 10mA | 84mA | 79 | 170μF |
| PMKC03-48S15 | 36 ~ 75 VDC | 15 VDC | 20mA | 200mA | 150mVp-p | 10mA | 84mA | 79 | 110μF |
| PMKC03-48D05 | 36 ~ 75 VDC | ± 5 VDC | ±30mA | ± 300mA | 75mVp-p | 10mA | 86mA | 77 | ± 500μF |
| PMKC03-48D12 | 36 ~ 75 VDC | ± 12 VDC | ±12mA | ± 125mA | 120mVp-p | 10mA | 84mA | 79 | ± 96μF |
| PMKC03-48D15 | 36 ~ 75 VDC | ± 15 VDC | ±10mA | ± 100mA | 150mVp-p | 10mA | 84mA | 79 | ± 47μF |
| PMKC03-48DS05 | 36 ~ 75 VDC | V1:5VDC;V2:5VDC | V1: 30mA;V2: 30mA | V1:300mA;V2:300mA | 75mVp-p | 10mA | 86mA | 77 | V1:500μF;V2:500μF |
| PMKC03-48DS12 | 36 ~ 75 VDC | V1:12VDC;V2:12VDC | V1:12mA;V2:12mA | V1:125mA;V2:125mA | 120mVp-p | 10mA | 84mA | 79 | V1:96μF;V2:96μF |
| PMKC03-48DS15 | 36 ~ 75 VDC | V1:15VDC;V2:15VDC | V1:10mA;V2:10mA | V1:100mA;V2:100mA | 150mVp-p | 10mA | 84mA | 79 | V1:47μF;V2:47μF |

Note

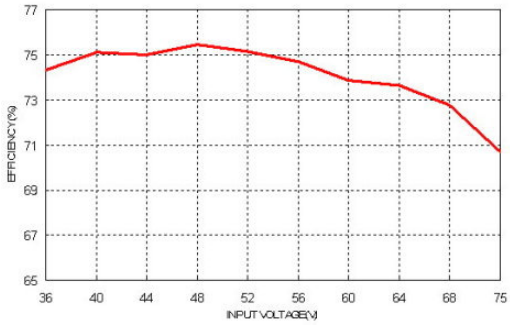
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment).
2. Maximum value at nominal input and full load.
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
   The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF/100V, ESR 48mΩ.
7. The output requires a minimum 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.

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

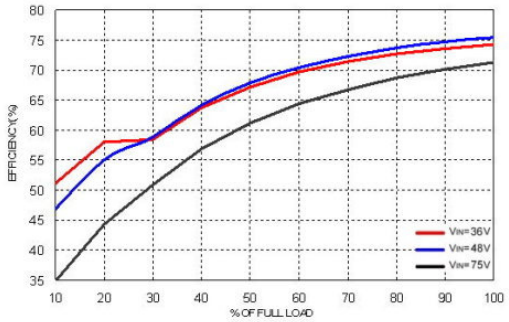
PMKC03-48S05 Derating Curve




PMKC03-48S05 Efficiency VS Input Voltage

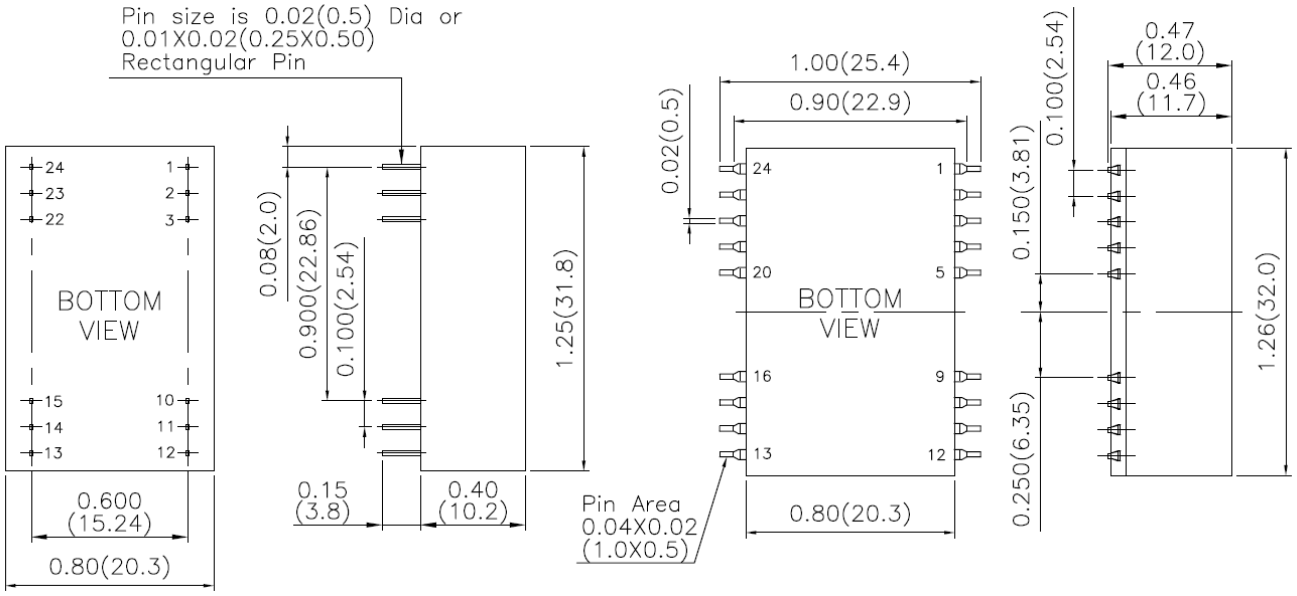



PMKC03-48S05 Efficiency VS Output Current




## Mechanical Drawing:

Suffix-SMD




1. All dimensions in Inch (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

**DIP PIN CONNECTION**

| PIN | SINGLE | DUAL | DS | PIN | SINGLE | DUAL | DS |
|---|---|---|---|---|---|---|---|
| 1 | + INPUT | + INPUT | + INPUT | 24 | + INPUT | + INPUT | + INPUT |
| 2 | NC | - OUTPUT | - V1 out | 23 | NC | - OUTPUT | - V1 out |
| 3 | NC | COMMON | + V1 out | 22 | NC | COMMON | + V1 out |
| 10 | -OUTPUT | COMMON | - V2 out | 15 | - OUTPUT | COMMON | - V2 out |
| 11 | +OUTPUT | +OUTPUT | + V2 out | 14 | +OUTPUT | +OUTPUT | + V2 out |
| 12 | - INPUT | - INPUT | - INPUT | 13 | - INPUT | - INPUT | - INPUT |

**SMD PIN CONNECTION**

| PIN | SINGLE | DUAL | DS | PIN | SINGLE | DUAL | DS |
|---|---|---|---|---|---|---|---|
| 1 | + INPUT | + INPUT | + INPUT | 24 | + INPUT | + INPUT | + INPUT |
| 2 | NC | - OUTPUT | - V1 out | 23 | NC | - OUTPUT | - V1 out |
| 3 | NC | COMMON | + V1 out | 22 | NC | COMMON | + V1 out |
| 10 | -OUTPUT | COMMON | - V2 out | 15 | -OUTPUT | COMMON | - V2 out |
| 11 | +OUTPUT | +OUTPUT | + V2 out | 14 | +OUTPUT | +OUTPUT | + V2 out |
| 12 | - INPUT | - INPUT | - INPUT | 13 | - INPUT | - INPUT | - INPUT |
| Others | NC | NC | NC | Others | NC | NC | NC |