POWER MATE TECHNOLOGY CO., LTD.

FKC05(W) SERIES

5 WATTS DC-DC CONVERTER

FEATURES

- **5 WATTS OUTPUT POWER**
- **OUTPUT CURRENT UP TO 1000mA**
- **STANDARD 1.25 X 0.80 X 0.40 INCH**
- **HIGH EFFICIENCY UP TO 84%**
- **2:1 AND 4:1 WIDE INPUT VOLTAGE RANGE**
- **FIVE-SIDED SHIELD**
- **FIXED SWITCHING FREQUENCY**
- **STANDARD 24 PIN DIP PACKAGE & SMD TYPE PACKAGE**
- **CE MARK MEETS 2006/95/EC, 2011/95/EC AND 2004/108/EC**
- **SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1**
- **ISO9001 CERTIFIED MANUFACTURING FACILITIES**
- **COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU**

OPTIONS

SMD TYPE, M1 TYPE, M2 TYPE

APPLICATIONS

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

DESCRIPTION

The FKC05 series offer 5 watts of output power from a package in an IC compatible 24pin DIP configuration without derating to 71ºC ambient temperature and pin to pin compatible with FKC03 series. FKC05 series have 2:1 wide input voltage of 9~18VDC, 18~36VDC and 36~75VDC. FKC05-W series have 4:1 ultra wide input voltage of 9~36VDC and 18~75VDC.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS

Output power			5 Watts, max.
Voltage accuracy			± 1%
Minimum load			0%
Line regulation	LL to HL at Full Load		± 0.2%
Load regulation	No Load to Full Load	Single Dual	± 0.5% ± 1%
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		200µs
Over load protection	% of FL at nominal input		170%
Short circuit protection			Continuous, automatics recovery

GENERAL SPECIFICATIONS

Efficiency			See table
Isolation voltage	Input to Output		1600VDC, min. 1minute
	Input (Output) to Case	DIP	1600VDC, min. 1minute
		SMD	1000VDC, min. 1minute
Isolation resistance	500VDC		10^9ohms, min.
Isolation capacitance			300pF, max.
Switching frequency			300kHz±10%
Design meet safety standard			IEC60950-1, UL60950-1, EN60950-1
Case material			Nickel-coated copper
Base material			Non-conductive black plastic
Potting material			Epoxy (UL94-V0)
Dimensions			1.25 X 0.80 X 0.40 Inch (31.8 X 20.3 X 10.2 mm)
Weight	DIP		16g (0.55oz)
	SMD		18g (0.62oz)
MTBF (Note 1)	BELLCORE TR-NWT-000332		3.165 x 10^6 hrs
	MIL-HDBK-217F		1.631 x 10^6 hrs

INPUT SPECIFICATIONS

Input voltage range	FKC05	12VDC nominal input	9 ~ 18VDC
		24VDC nominal input	18 ~ 36VDC
		48VDC nominal input	36 ~ 75VDC
	FKC05-W	24VDC nominal input	9 ~ 36VDC
		48VDC nominal input	18 ~ 75VDC
Input filter			Pi type
Input surge voltage		12VDC input	36VDC 100ms, max.
		24VDC input	50VDC 100ms, max.
		48VDC input	100VDC 100ms, max.
Input reflected ripple current			20mAp-p
Start up time	Nominal input and constant resistive load	Power up	450ms, max.

ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature	Standard	-25ºC~+85ºC (with derating)
	M1 (Note 6)	-40ºC~+85ºC (non-derating)
	M2 (W series)	-40ºC~+85ºC (with derating)
Maximum case temperature	Standard	+100ºC
	M1	+105ºC
Storage temperature range		-55ºC ~ +125ºC
Thermal impedance	Natural convection	20ºC/watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH

EMC CHARACTERISTICS

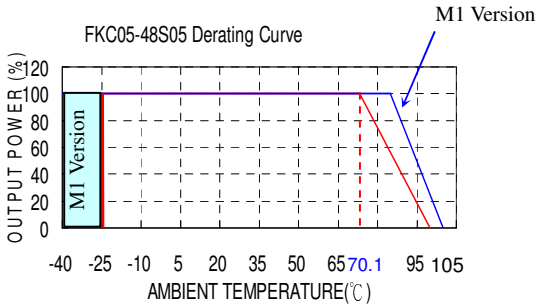
EMI	EN55022			Class A, Class B
ESD	EN61000-4-2	Air	± 8kV	Perf. Criteria A
		Contact	± 6kV	
Radiated immunity	EN61000-4-3	10 V/m		Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV		Perf. Criteria B
Surge	EN61000-4-5	± 1kV		Perf. Criteria B
Conducted immunity	EN61000-4-6	10 Vr.m.s		Perf. Criteria A

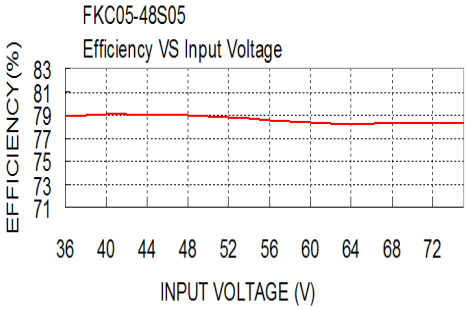
Model Number	Input Range	Output Voltage	Output Current		Output [2] Ripple & Noise	No load [3] Input Current	Eff [4] (%)	Capacitor[5] Load max
			Min. load	Full load				
FKC05-12S33	9 ~ 18 VDC	3.3 VDC	0mA	1000mA	50mVp-p	10mA	76	2200μF
FKC05-12S05	9 ~ 18 VDC	5 VDC	0mA	1000mA	50mVp-p	10mA	78	1000μF
FKC05-12S12	9 ~ 18 VDC	12 VDC	0mA	470mA	50mVp-p	10mA	82	220μF
FKC05-12S15	9 ~ 18 VDC	15 VDC	0mA	400mA	50mVp-p	10mA	81	150μF
FKC05-12D05	9 ~ 18 VDC	± 5 VDC	0mA	± 500mA	50mVp-p	15mA	78	± 680μF
FKC05-12D12	9 ~ 18 VDC	± 12 VDC	0mA	± 230mA	50mVp-p	20mA	81	± 100μF
FKC05-12D15	9 ~ 18 VDC	± 15 VDC	0mA	± 190mA	50mVp-p	15mA	84	± 68μF
FKC05-24S33 (W)	18 ~ 36 (9 ~ 36) VDC	3.3 VDC	0mA	1000mA	50mVp-p	10mA(5mA)	75 (76)	2200μF
FKC05-24S05 (W)	18 ~ 36 (9 ~ 36) VDC	5 VDC	0mA	1000mA	50mVp-p	15mA(10mA)	77 (79)	1000μF
FKC05-24S12 (W)	18 ~ 36 (9 ~ 36) VDC	12 VDC	0mA	470mA	50mVp-p	15mA(5mA)	81 (81)	220μF
FKC05-24S15 (W)	18 ~ 36 (9 ~ 36) VDC	15 VDC	0mA	400mA	50mVp-p	15mA(10mA)	81 (84)	150μF
FKC05-24D05 (W)	18 ~ 36 (9 ~ 36) VDC	± 5 VDC	0mA	± 500mA	50mVp-p	15mA(10mA)	80 (78)	± 680μF
FKC05-24D12 (W)	18 ~ 36 (9 ~ 36) VDC	± 12 VDC	0mA	± 230mA	50mVp-p	20mA(10mA)	84 (82)	± 100μF
FKC05-24D15 (W)	18 ~ 36 (9 ~ 36) VDC	± 15 VDC	0mA	± 190mA	50mVp-p	20mA(10mA)	81 (84)	± 68μF
FKC05-48S33 (W)	36 ~ 75 (18 ~ 75) VDC	3.3 VDC	0mA	1000mA	50mVp-p	10mA(5mA)	74 (73)	2200μF
FKC05-48S05 (W)	36 ~ 75 (18 ~ 75) VDC	5 VDC	0mA	1000mA	50mVp-p	10mA(10mA)	77 (79)	1000μF
FKC05-48S12 (W)	36 ~ 75 (18 ~ 75) VDC	12 VDC	0mA	470mA	50mVp-p	10mA(10mA)	82 (80)	220μF
FKC05-48S15 (W)	36 ~ 75 (18 ~ 75) VDC	15 VDC	0mA	400mA	50mVp-p	10mA(10mA)	81 (82)	150μF
FKC05-48D05 (W)	36 ~ 75 (18 ~ 75) VDC	± 5 VDC	0mA	± 500mA	50mVp-p	10mA(10mA)	78 (76)	± 680μF
FKC05-48D12 (W)	36 ~ 75 (18 ~ 75) VDC	± 12 VDC	0mA	± 230mA	50mVp-p	5mA(10mA)	82 (80)	± 100μF
FKC05-48D15 (W)	36 ~ 75 (18 ~ 75) VDC	± 15 VDC	0mA	± 190mA	50mVp-p	10mA(10mA)	83 (80)	± 68μF

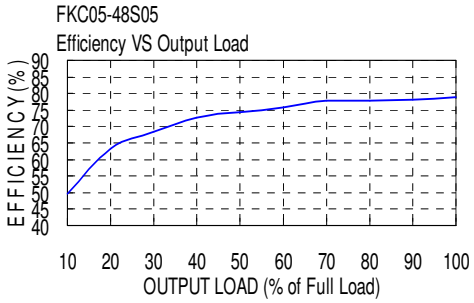
Note

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. Typical value at nominal input and full load. (20MHz BW.)
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. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard and M2 version.
7. 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.
8. There is no pin at PIN10 & PIN15 for FKC05-W series.

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

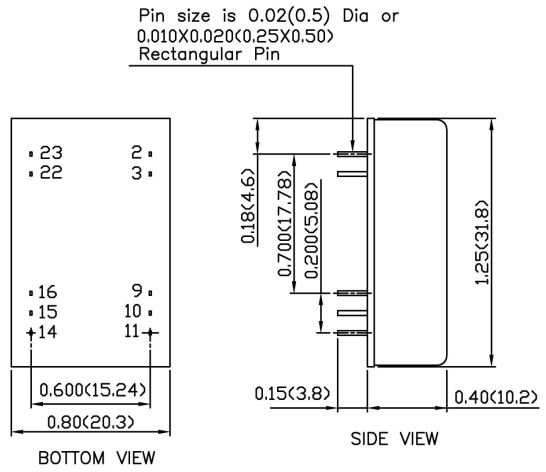




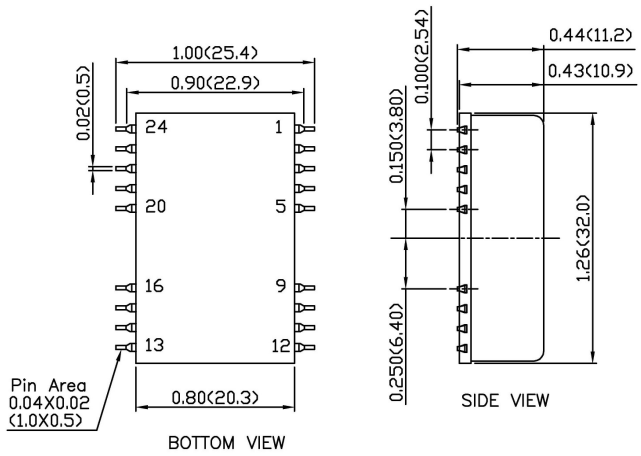


MECHANICAL DRAWING :

DIP TYPE



SMD TYPE



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 (0.5)
3. Pin dimension tolerance ±0.004 (0.1)

DIP PIN CONNECTION					
PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
2	-INPUT	-INPUT	23	+INPUT	+INPUT
3	-INPUT	-INPUT	22	+INPUT	+INPUT
9	NC	COMMON	16	-OUTPUT	COMMON
10	NC(Note 8)	NC(Note 8)	15	NC(Note 8)	NC(Note 8)
11	NC	-OUTPUT	14	+OUTPUT	+OUTPUT

SMD PIN CONNECTION					
PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
2	-INPUT	-INPUT	23	+INPUT	+INPUT
3	-INPUT	-INPUT	22	+INPUT	+INPUT
9	NC	COMMON	16	-OUTPUT	COMMON
10	NC	NC	15	NC	NC
11	NC	-OUTPUT	14	+OUTPUT	+OUTPUT
Others	NC	NC			