POWER MATE TECHNOLOGY CO., LTD.

FKC12W SERIES

12 WATTS DC-DC CONVERTER

FEATURES

- **12 WATTS OUTPUT POWER**
- **OUTPUT CURRENT UP TO 3.5A**
- **STANDARD 1.25 X 0.80 X 0.40 INCH**
- **HIGH EFFICIENCY UP TO 88%**
- **4:1 ULTRA WIDE INPUT VOLTAGE RANGE**
- **FIVE-SIDED CONTINUOUS SHIELD**
- **FIXED SWITCHING FREQUENCY (400kHz)**
- **STANDARD 24 PIN DIP 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

APPLICATIONS

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

DESCRIPTION

The FKC12W series offer 12 watts of output power from a package in an IC compatible 24pin DIP configuration. FKC12W series have 4:1 ultra wide input voltage of 9~36 and 18~75VDC. The FKC12W have features 1600VDC of isolation, short circuit protection and as well as five sided shielding.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS

Output power			12 Watts, max.
Voltage accuracy			±1.2%
Minimum load			0%
Line regulation	LL to HL at Full Load		± 0.2%
Load regulation	No load to Full load	Single (DIP) Single (SMD) Dual (SMD,DIP)	± 0.5% ± 1% ± 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	250µs
Over voltage protection (only single)	3.3VDC output 5.1VDC output 12VDC output 15VDC output		3.9VDC 6.2VDC 15VDC 18VDC
Over load protection	% of FL at nominal input		150%
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		10^9 ohms, min.
Isolation capacitance			1500pF, max.
Switching frequency			400kHz±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			18g (0.62oz)
MTBF (Note 1)	BELLCORE-TR-NWT-000332		2.350 x 10^6 hrs
	MIL-HDBK-217F		8.745 x 10^5 hrs

INPUT SPECIFICATIONS

Input voltage range	24VDC nominal input		9 ~ 36VDC
	48VDC nominal input		18 ~ 75VDC
Input filter			Pi type
Input surge voltage	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
Start-up voltage	24VDC input		9VDC
	48VDC input		18VDC
Shutdown voltage	24VDC input		8VDC
	48VDC input		16VDC
Remote ON/OFF (Note 5) (Positive logic)	DC-DC ON		Open or 3.0V < Vr < 12V
	DC-DC OFF		Short or 0V < Vr < 1.2V
Input current of Remote control pin		Nominal input	-0.5mA ~ 0.5mA
Remote off state input current		Nominal input	2.5mA

ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature	Vo:5.1V,12V,15V, ±12V,±15V	-40ºC ~ +69ºC (without derating)
		+69ºC ~ +105ºC (with derating)
	Vo:3.3V,±5V	-40ºC ~ +61ºC (without derating)
		+61ºC ~ +105ºC (with derating)
Maximum case temperature		105ºC
Storage temperature range		-55ºC ~ +125ºC
Thermal impedance	Nature convection	20ºC/Watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH

EMC CHARACTERISTICS

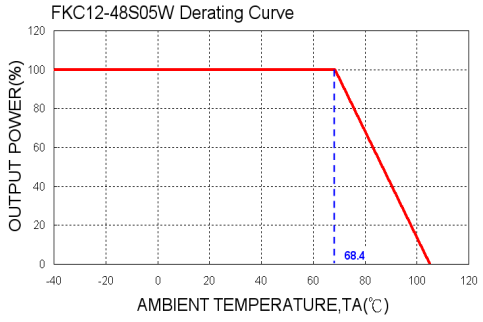
EMI (Note 6)	EN55022		Class A, Class B
ESD	EN61000-4-2	Air ± 8kV Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 7)	EN61000-4-4	± 2kV	Perf. Criteria A
Surge (Note 7)	EN61000-4-5	± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

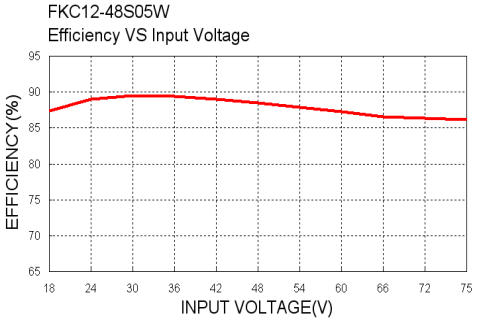
Model Number	Input Range	Output Voltage	Output Current		Output Ripple & Noise	No load[2] Input Current	Eff [3] (%)	Capacitor[4] Load max
			Min. Load	Max. Load				
FKC12-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	3500mA	85mVp-p	55mA	84	2000μF
FKC12-24S05W	9 ~ 36 VDC	5.1 VDC	0mA	2400mA	85mVp-p	55mA	87	2000μF
FKC12-24S12W	9 ~ 36 VDC	12 VDC	0mA	1000mA	85mVp-p	13mA	87	430μF
FKC12-24S15W	9 ~ 36 VDC	15 VDC	0mA	800mA	85mVp-p	11mA	87	300μF
FKC12-24D05W	9 ~ 36 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	15mA	84	± 1250μF
FKC12-24D12W	9 ~ 36 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	12mA	87	± 200μF
FKC12-24D15W	9 ~ 36 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	20mA	87	± 120μF
FKC12-48S3P3W	18 ~ 75 VDC	3.3 VDC	0mA	3500mA	85mVp-p	17mA	84	2000μF
FKC12-48S05W	18 ~ 75 VDC	5.1 VDC	0mA	2400mA	85mVp-p	20mA	87	2000μF
FKC12-48S12W	18 ~ 75 VDC	12 VDC	0mA	1000mA	85mVp-p	6mA	87	430μF
FKC12-48S15W	18 ~ 75 VDC	15 VDC	0mA	800mA	85mVp-p	6mA	88	300μF
FKC12-48D05W	18 ~ 75 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	7mA	85	± 1250μF
FKC12-48D12W	18 ~ 75 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	7mA	87	± 200μF
FKC12-48D15W	18 ~ 75 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	7mA	87	± 120μF

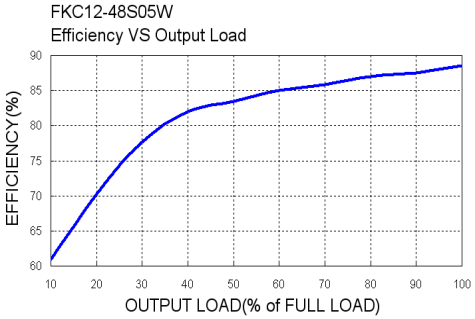
Note

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 voltage and no load.
3. Typical value at nominal input voltage and full load.
4. Test by minimum input and constant resistive load.
5. The ON/OFF control pin voltage is referenced to –INPUT.
6. The FKC12W series standard module meets EN55022 Class A and Class B with external components.
   For more detail information, please contact with P-DUKE.
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.

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

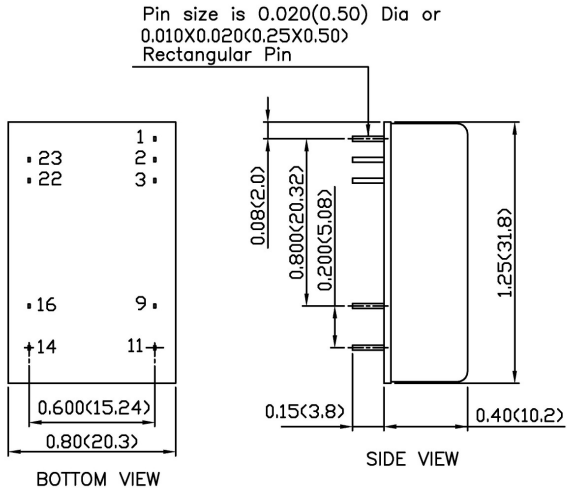




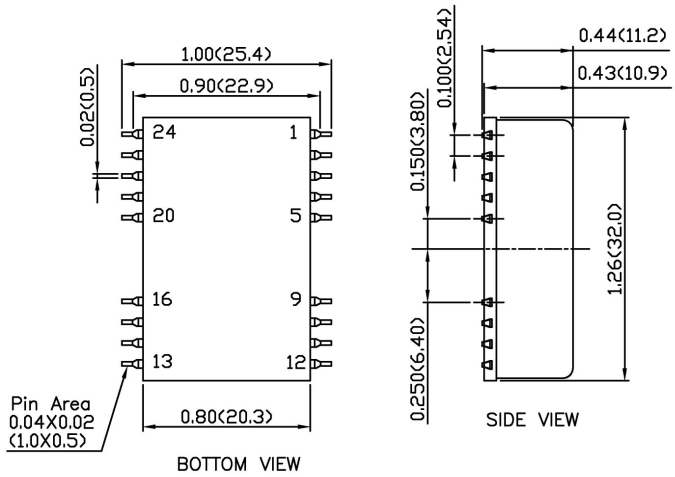


MECHANICAL DRAWING :

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 (0.25)
3. Pin dimension tolerance ±0.004 (0.1)

DIP PIN CONNECTION					
PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
1	CTRL	CTRL			
2	-INPUT	-INPUT	23	+INPUT	+INPUT
3	-INPUT	-INPUT	22	+INPUT	+INPUT
9	NC	COMMON	16	-OUTPUT	COMMON
11	NC	-OUTPUT	14	+OUTPUT	+OUTPUT

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