



# FKC12W SERIES



### 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, 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 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 25°C otherwise noted

OUTPUT SPECIFICATIONS			
Output power			12 Watts, max.
Voltage accuracy	Full load and nominal Vin		±1.2%
Minimum load			0%
Line regulation	LL to HL at Full Load		± 0.2%
Load regulation	No load to Full load	Single (DIP)	± 0.5%
		Single (SMD)	± 1%
		Dual (SMD,DIP)	± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth		See table
Temperature coefficient			±0.02% / °C, max.
Transient response recovery time	25% load step change		250µS
Over voltage protection (only single)	3.3V output		3.9VDC
	5.1V output		6.2VDC
	12V output		15VDC
	15V output		18VDC
Over load protection	% of FL at nominal input		150%, typ.
Short circuit protection		Continuous, automatic recovery	

GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output		1600VDC, min.
	Input(Output) to Case	DIP	1600VDC, min.
		SMD	1000VDC, min.
Isolation resistance			10 <sup>9</sup> ohms, min.
Isolation capacitance			1500pF, max.
Switching frequency			400KHz, typ.
Approvals and 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 <sup>6</sup> hrs
	MIL-HDBK-217F		8.745 x 10 <sup>5</sup> hrs

INPUT SPECIFICATIONS			
Input voltage range	24V nominal input		9 – 36VDC
	48V nominal input		18 – 75VDC
Input filter			Pi type
Input surge voltage	24V input		50VDC
	100mS max	48V input	100VDC
Input reflected ripple current	Nominal Vin and full load		20mA <sub>p-p</sub>
Start up time	Nominal Vin and constant resistive load	Power up	450mS, typ.
Start-up voltage	24V input		9VDC
	48V input		18VDC
Shutdown voltage	24V input		8VDC
	48V input		16VDC
Remote ON/OFF (Note 6) (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 Vin		-0.5mA ~ 0.5mA
Remote off state input current	Nominal Vin		2.5mA

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

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

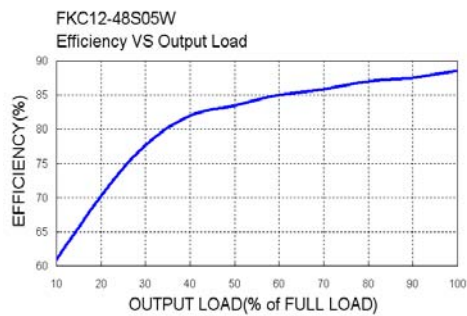
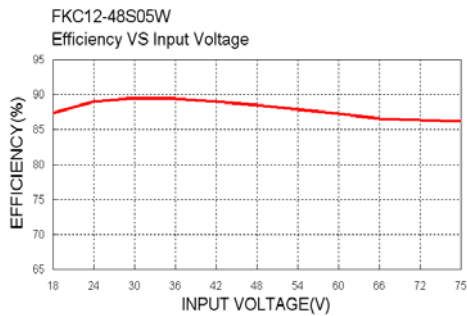
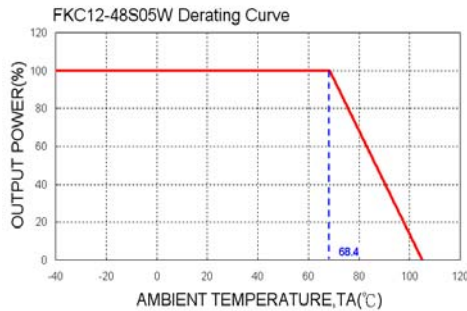


**12WATTS OUTPUT  
DC-DC CONVERTER**

Model Number	Input Range	Output Voltage	Output Current		Output <sup>(4)</sup> Ripple & Noise	Input Current		Eff <sup>(4)</sup> (%)	Capacitor <sup>(5)</sup> Load max
			Min. Load	Max. Load		No load <sup>(3)</sup>	Full Load <sup>(2)</sup>		
FKC12-24S3P3W	9 – 36 VDC	3.3 VDC	0mA	3500mA	85mVp-p	55mA	602mA	84	2000μF
FKC12-24S05W	9 – 36 VDC	5.1 VDC	0mA	2400mA	85mVp-p	55mA	614mA	87	2000μF
FKC12-24S12W	9 – 36 VDC	12 VDC	0mA	1000mA	85mVp-p	13mA	602mA	87	430μF
FKC12-24S15W	9 – 36 VDC	15 VDC	0mA	800mA	85mVp-p	11mA	602mA	87	300μF
FKC12-24D05W	9 – 36 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	15mA	625mA	84	± 1250μF
FKC12-24D12W	9 – 36 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	12mA	602mA	87	± 200μF
FKC12-24D15W	9 – 36 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	20mA	602mA	87	± 120μF
FKC12-48S3P3W	18 – 75 VDC	3.3 VDC	0mA	3500mA	85mVp-p	17mA	301mA	84	2000μF
FKC12-48S05W	18 – 75 VDC	5.1 VDC	0mA	2400mA	85mVp-p	20mA	307mA	87	2000μF
FKC12-48S12W	18 – 75 VDC	12 VDC	0mA	1000mA	85mVp-p	6mA	302mA	87	430μF
FKC12-48S15W	18 – 75 VDC	15 VDC	0mA	800mA	85mVp-p	6mA	298mA	88	300μF
FKC12-48D05W	18 – 75 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	7mA	309mA	85	± 1250μF
FKC12-48D12W	18 – 75 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	7mA	301mA	87	± 200μF
FKC12-48D15W	18 – 75 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	7mA	301mA	87	± 120μF

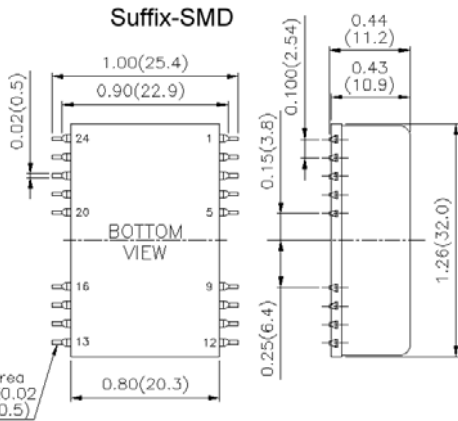
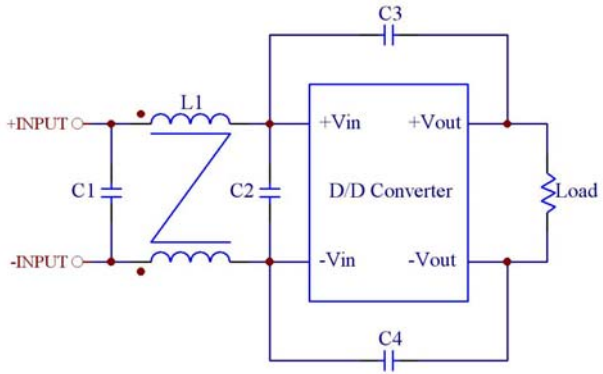
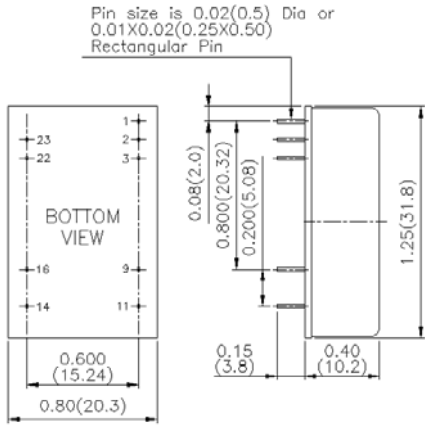
**Note**

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.  
MIL-HDBK-217F Notice2 @Ta=25 °C, Full load (Ground, Benign, controlled environment)
- Maximum value at nominal input voltage.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.
- The ON/OFF control pin voltage is referenced to negative input.
- The FKC12W series can meet EN55022 Class A with parallel an external capacitor to the input pins.  
Recommend : 24Vin : 3.3μF/50V 1812 MLCC.  
48Vin : 1.5μF/100V 1812 MLCC.
- An externa 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.





**12WATTS OUTPUT  
DC-DC CONVERTER**



1. All dimensions in Inches (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)

**Recommended Filter for EN55022 Class B Compliance**

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

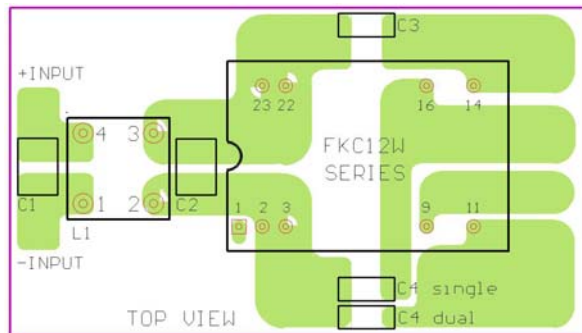
	C1	C2	C3	C4	L1
FKC12-24xxxW	3.3µF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325µH Common Choke PMT-050
FKC12-48xxxW	2.2µF/100V 1812 MLCC	2.2µF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	145µH Common Choke PMT-051

**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	Others	NC	NC



**Recommended EN55022 Class B Filter Circuit Layout**

