



APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement
Semiconductor Equipment

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%
- 2:1 WIDE INPUT VOLTAGE RANGE
- FIVE-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY (400KHz)
- STANDARD 24 PIN DIP PACKAGE
- I/O ISOLATION 1600 VDC
- 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

OPTIONS

SMD TYPE

DESCRIPTION

The FKC12 series offer 12 watts of output power from a package in an IC compatible 24pin DIP configuration. FKC12 series have 2:1 wide input voltage of 9-18, 18-36 and 36-75VDC. The FKC12 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	Single Dual	± 0.2% ± 0.5%
Load regulation	No Load to Full Load	Single (DIP)	± 0.5%
		Single (SMD)	± 1%
		Dual (SMD,DIP)	± 1%
		(2.5Vo only)	± 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		250uS
Over voltage protection	2.5V output		3.9V
	3.3V output		3.9V
	5.1V output		6.2V
	12V output		15V
Zener diode clamp (only single)	15V output		18V
Over load protection	% of FL at nominal input		150% typ
Short circuit protection			Continuous, automatics recovery
GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output		1600VDC, min
	Input(Output) to Case	DIP SMD	1600VDC, min 1000VDC, min
Isolation resistance			10 ⁹ ohms, min
Isolation capacitance			1200pF, 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		2.750 x 10 ⁶ hrs
	MIL-HDBK-217F		7.575 x 10 ⁵ hrs

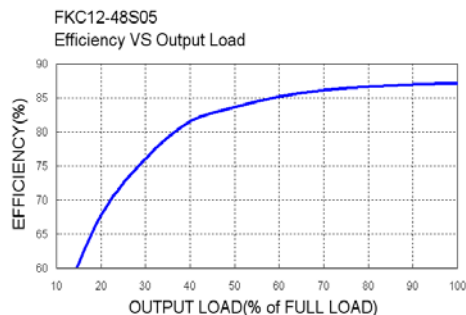
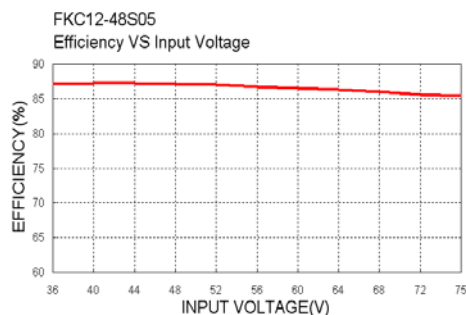
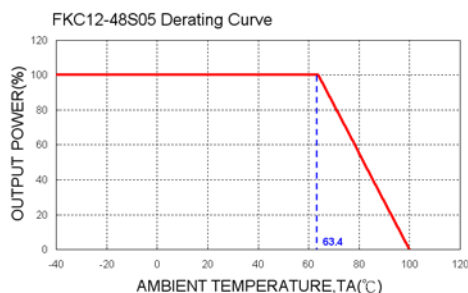
INPUT SPECIFICATIONS			
Input voltage range	12V nominal input		9 – 18VDC
	24V nominal input		18 – 36VDC
	48V nominal input		36 – 75VDC
Input filter			PI type
Input voltage variation	dv/dt		5V/ms,max
			(Complies with ETS300 132 part 4.4)
Input surge voltage	12V input		36VDC
	24V input		50VDC
	48V input		100VDC
100mS max			
Input reflected ripple current	Nominal Vin and full load		20mA _{p-p}
Start up time	Nominal Vin and constant resistive load	Power up	450mS max
Start-up voltage	12V input		9VDC
	24V input		18VDC
	48V input		36VDC
Shutdown voltage	12V input		8VDC
	24V input		16VDC
	48V input		33VDC
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 temperature range			-40°C to +85°C (with derating)
Maximum case temperature			100°C
Storage temperature range			-55°C to +105°C
Thermal impedance	Nature convection		20°C/Watt
Thermal shock			MIL-STD-810F
Vibration			10~55Hz,10G, 30minutes along X,Y and Z
Relative humidity			5% to 95% RH
EMC CHARACTERISTICS			
EMI (Note 7)	EN55022		Class A
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 (Note 8)	EN61000-4-5	± 1KV	Perf. Criteria B
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

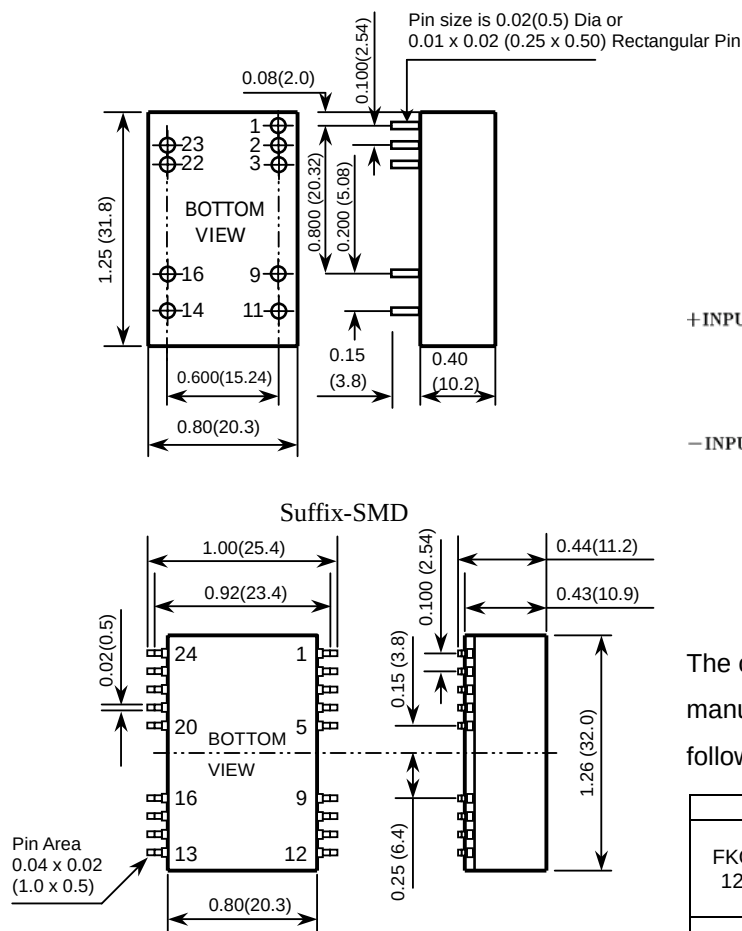


Model Number	Input Range	Output Voltage	Output Current		Output ⁽⁴⁾ Ripple & Noise	Input Current		Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min. load	Full load		No load ⁽³⁾	Full load ⁽²⁾		
FKC12-12S2P5	9 – 18 VDC	2.5 VDC	0mA	3500mA	85mVp-p	50mA	935mA	82	2000uF
FKC12-12S3P3	9 – 18 VDC	3.3 VDC	0mA	3500mA	85mVp-p	60mA	1203mA	84	2000uF
FKC12-12S05	9 – 18 VDC	5.1 VDC	0mA	2400mA	85mVp-p	53mA	1244mA	86	2000uF
FKC12-12S12	9 – 18 VDC	12 VDC	0mA	1000mA	85mVp-p	15mA	1219mA	86	430uF
FKC12-12S15	9 – 18 VDC	15 VDC	0mA	800mA	85mVp-p	17mA	1219mA	86	300uF
FKC12-12D05	9 – 18 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	24mA	1282mA	82	± 1250uF
FKC12-12D12	9 – 18 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	19mA	1205mA	87	± 200uF
FKC12-12D15	9 – 18 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	24mA	1205mA	87	± 120uF
FKC12-24S2P5	18 – 36 VDC	2.5 VDC	0mA	3500mA	85mVp-p	36mA	461mA	83	2000uF
FKC12-24S3P3	18 – 36 VDC	3.3 VDC	0mA	3500mA	85mVp-p	36mA	594mA	85	2000uF
FKC12-24S05	18 – 36 VDC	5.1 VDC	0mA	2400mA	85mVp-p	35mA	614mA	87	2000uF
FKC12-24S12	18 – 36 VDC	12 VDC	0mA	1000mA	85mVp-p	16mA	602mA	87	430uF
FKC12-24S15	18 – 36 VDC	15 VDC	0mA	800mA	85mVp-p	17mA	602mA	87	300uF
FKC12-24D05	18 – 36 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	15mA	633mA	83	± 1250uF
FKC12-24D12	18 – 36 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	15mA	595mA	88	± 200uF
FKC12-24D15	18 – 36 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	18mA	595mA	88	± 120uF
FKC12-48S2P5	36 – 75 VDC	2.5 VDC	0mA	3500mA	85mVp-p	10mA	231mA	83	2000uF
FKC12-48S3P3	36 – 75 VDC	3.3 VDC	0mA	3500mA	85mVp-p	14mA	297mA	85	2000uF
FKC12-48S05	36 – 75 VDC	5.1 VDC	0mA	2400mA	85mVp-p	23mA	307mA	87	2000uF
FKC12-48S12	36 – 75 VDC	12 VDC	0mA	1000mA	85mVp-p	11mA	301mA	87	430uF
FKC12-48S15	36 – 75 VDC	15 VDC	0mA	800mA	85mVp-p	5mA	301mA	87	300uF
FKC12-48D05	36 – 75 VDC	± 5 VDC	0mA	± 1200mA	85mVp-p	6mA	316mA	83	± 1250uF
FKC12-48D12	36 – 75 VDC	± 12 VDC	0mA	± 500mA	85mVp-p	6mA	297mA	88	± 200uF
FKC12-48D15	36 – 75 VDC	± 15 VDC	0mA	± 400mA	85mVp-p	6mA	297mA	88	± 120uF

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 and full load of standard type.
- 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 -Vin.
- The FKC12 series can meet EN55022 Class A with parallel an external capacitor to the input pins.
Recommend: 12Vin : 6.8μF/50V 1812 MLCC .
24Vin : 4.7μF/50V 1812 MLCC .
48Vin : 2.2μF/100V 1812 MLCC.
- An external filter capacitor is required if the module has to meet EN61000-4-5.
The filter capacitor Power Mate suggest: Ninnon chemi-con KY series 220 // F/100V ESR 48mΩ





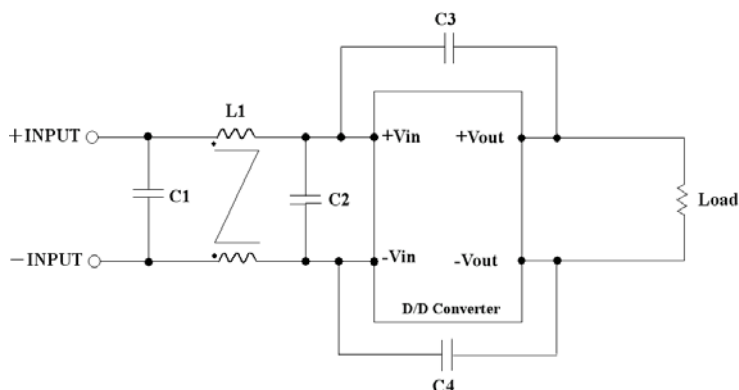
- All dimensions in Inches (mm)
Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
- Pin pitch tolerance ±0.01(0.25)
- Pin dimension tolerance ±0.004 (0.1)

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

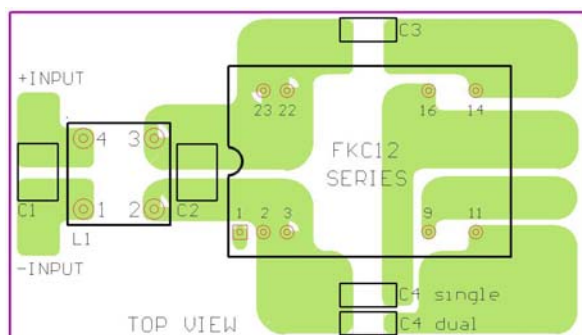
PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
1	CTRL	CTRL			
2	- INPUT	- INPUT	23	+ INPUT	+ INPUT
3	- INPUT	- INPUT	22	+ INPUT	+ INPUT
9	NC	COMMON	16	- OUTPUT	COMMON
11	NC	- OUTPUT	14	+ OUTPUT	+ OUTPUT
Others	NC	NC	Others	NC	NC



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
FKC12-12xxx	3.3uF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke PMT-050
FKC12-24xxx	4.7uF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke PMT-050
FKC12-48xxx	2.2uF/100V 1812 MLCC	2.2uF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke PMT-050



Recommended EN55022 Class B Filter Circuit Layout