



FEATURES

- RAILWAY APPLICATION
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE :
9 - 36VDC AND 18 - 75VDC AND 43 - 160VDC
- 8 WATTS OUTPUT POWER
- OUTPUT CURRENT UP TO 2.4A
- STANDARD 1.25 X 0.80 X 0.40 INCH AND 24 PIN DIP PACKAGE
- HIGH EFFICIENCY UP TO 88%
- FIVE-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY (300KHz)
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- UL60950-1, EN60950-1, IEC60950-1 AND EN50155 SAFETY APPROVALS PENDING
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

APPLICATIONS

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

OPTIONS

SMD TYPE

DESCRIPTION

The FKC08W series offer 8 watts of output power from a package in an IC compatible 24pin DIP configuration. FKC08W series have 4:1 ultra wide input voltage of 9-36, 18-75VDC and 43-160VDC. The FKC08W 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			8 Watts, max.
Voltage accuracy	Full load and nominal Vin		± 1%
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%
	10% Load to 90% Load	Dual (SMD,DIP)	± 1%
		Single (DIP)	± 0.3%
		Single (SMD)	± 0.8%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL	Dual (SMD,DIP)	± 0.8%
			± 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
	5.0V output		6.2VDC
	12V output		15VDC
	15V output		18VDC
Over load protection	% of FL at nominal input		150%, typ.
Short circuit protection		Continuous, automatics recovery	

INPUT SPECIFICATIONS			
Input voltage range	24V nominal input		9 - 36VDC
	48V nominal input		18 - 75VDC
	110V nominal input		43 - 160VDC
Input filter			Pi type
Input surge voltage 100mS max	24V input		50VDC
	48V input		100VDC
	110V input		170VDC
Input reflected ripple current	Nominal Vin and full load		20mA _{p-p}
Start up time	Nominal Vin and constant resistive load	Power up	450mS, typ.
Start-up voltage	24V input		9VDC
	48V input		18VDC
	110V input		43VDC
Shutdown voltage	24V input		8VDC
	48V input		16VDC
	110V input		42VDC
Remote ON/OFF (Note 6)	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	
Remote off state input current	Nominal Vin		2.5mA

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 ⁹ ohms, min.
Isolation capacitance			1500pF, max.
Switching frequency			300KHz, typ.
Safety approvals pending			IEC60950-1, UL60950-1, EN60950-1, EN50155
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		1.078 x 10 ⁶ hrs

ENVIRONMENTAL SPECIFICATIONS			
Operating ambient temperature(Note 7)	Vo:5V,12V,15V		-40°C to +78°C (without derating)
	±12V,±15V		+78°C to +105°C (with derating)
	Vo:3.3V;±5V		-40°C to +70°C (without derating) +70°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			EN61373, MIL-STD-810F
Vibration			EN61373, MIL-STD-810F
Relative humidity			5% to 95% RH

EMC CHARACTERISTICS			
EMI (Note 8)	EN55022, EN55011		Class A
ESD	EN61000-4-2	Air	± 8KV
		Contact	± 6KV
Radiated immunity	EN61000-4-3	20 V/m	Perf. Criteria A
Fast transient (Note 9)	EN61000-4-4	± 2KV	Perf. Criteria A
Surge (Note 9)	EN61000-4-5	± 2KV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

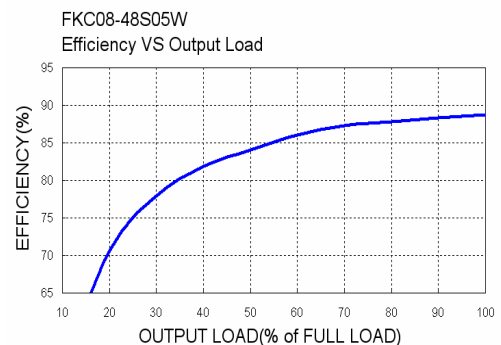
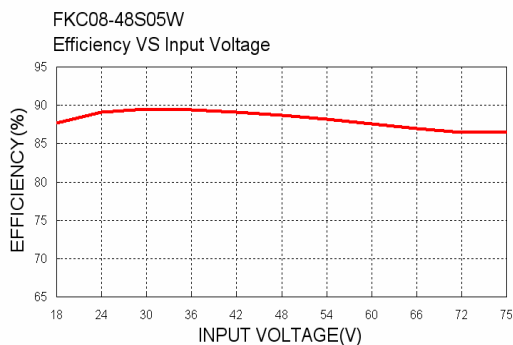


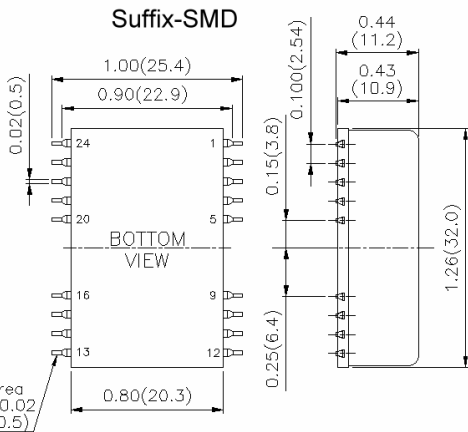
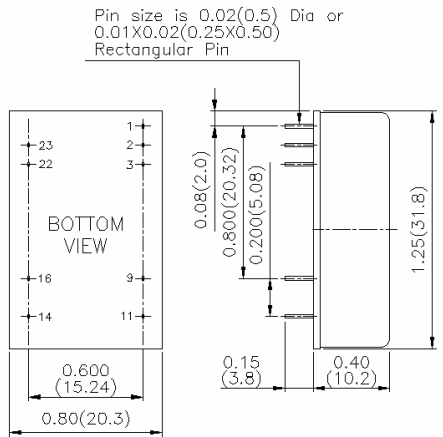
Model Number	Input Range	Output Voltage	Output Current		Output ⁽⁴⁾ Ripple & Noise	Input Current		Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min. Load	Max. Load		No load ⁽³⁾	Full Load ⁽²⁾		
FKC08-24S3P3W	9 – 36 VDC	3.3 VDC	0mA	2400mA	50mVp-p	40mA	407mA	85	1330µF
FKC08-24S05W	9 – 36 VDC	5 VDC	0mA	1600mA	50mVp-p	40mA	402mA	87	1330µF
FKC08-24S12W	9 – 36 VDC	12 VDC	0mA	666mA	50mVp-p	25mA	407mA	86	288µF
FKC08-24S15W	9 – 36 VDC	15 VDC	0mA	533mA	50mVp-p	25mA	407mA	86	200µF
FKC08-24D05W	9 – 36 VDC	± 5 VDC	0mA	± 800mA	50mVp-p	20mA	417mA	84	± 900µF
FKC08-24D12W	9 – 36 VDC	± 12 VDC	0mA	± 333mA	50mVp-p	25mA	407mA	86	± 133µF
FKC08-24D15W	9 – 36 VDC	± 15 VDC	0mA	± 267mA	50mVp-p	25mA	407mA	86	± 90µF
FKC08-48S3P3W	18 – 75 VDC	3.3 VDC	0mA	2400mA	50mVp-p	20mA	204mA	85	1330µF
FKC08-48S05W	18 – 75 VDC	5 VDC	0mA	1600mA	50mVp-p	20mA	201mA	87	1330µF
FKC08-48S12W	18 – 75 VDC	12 VDC	0mA	666mA	50mVp-p	13mA	201mA	87	288µF
FKC08-48S15W	18 – 75 VDC	15 VDC	0mA	533mA	50mVp-p	13mA	198mA	88	200µF
FKC08-48D05W	18 – 75 VDC	± 5 VDC	0mA	± 800mA	50mVp-p	10mA	208mA	84	± 900µF
FKC08-48D12W	18 – 75 VDC	± 12 VDC	0mA	± 333mA	50mVp-p	13mA	201mA	87	± 133µF
FKC08-48D15W	18 – 75 VDC	± 15 VDC	0mA	± 267mA	50mVp-p	13mA	201mA	87	± 90µF
FKC08-110S3P3W	43 – 160 VDC	3.3 VDC	0mA	2400mA	75mVp-p	8mA	82mA	84	1330µF
FKC08-110S05W	43 – 160 VDC	5 VDC	0mA	1600mA	75mVp-p	8mA	90mA	85	1330µF
FKC08-110S12W	43 – 160 VDC	12 VDC	0mA	666mA	75mVp-p	4mA	88mA	86	288µF
FKC08-110S15W	43 – 160 VDC	15 VDC	0mA	533mA	75mVp-p	4mA	88mA	86	200µF
FKC08-110D05W	43 – 160 VDC	± 5 VDC	0mA	± 800mA	75mVp-p	5mA	93mA	82	± 900µF
FKC08-110D12W	43 – 160 VDC	± 12 VDC	0mA	± 333mA	75mVp-p	5mA	90mA	85	± 133µF
FKC08-110D15W	43 – 160 VDC	± 15 VDC	0mA	± 267mA	75mVp-p	5mA	90mA	85	± 90µF

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.
- 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.
- Operating ambient temperature :
Converter can meet the railway T2 and TX temperature requirement.
T2 : -40 °C ~ +70 °C as all models, TX : -40 °C ~ +85 °C as power derating to 55% output power.
- The FKC08W series can meet EN55022 and EN55011 Class A with parallel an external capacitor to the input pins.
Recommend : 24Vin : 1µF/50V 1210 MLCC .
48Vin : 0.47µF/100V 1812 MLCC.
110Vin : 1µF/250V * 2pcs 1812 MLCC.
- 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: : 24Vin/48Vin Nippon chemi-con KY series, 220µF/100V, ESR 48MΩ
: 110 Vin Nippon chemi-con KXJ series, 150µF/200V, ESR

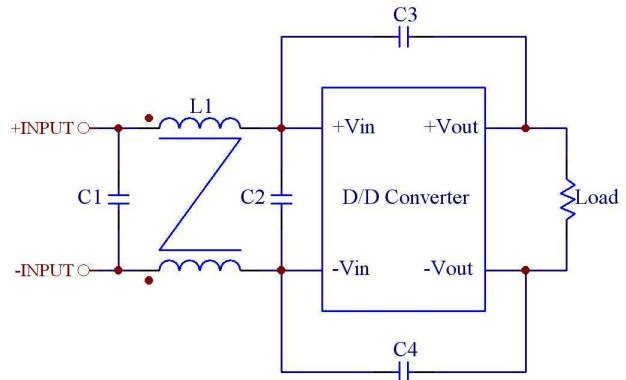
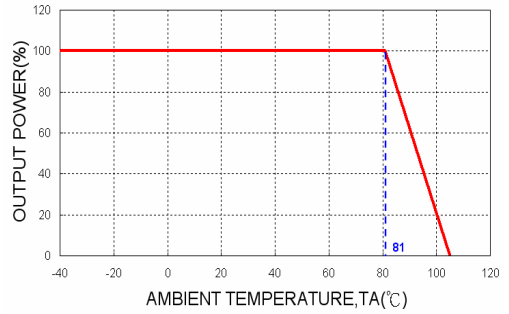
CAUTION: This power module is not internally fused. An input line fuse must always be used.





- 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)

FKCO8-48S05W Derating Curve



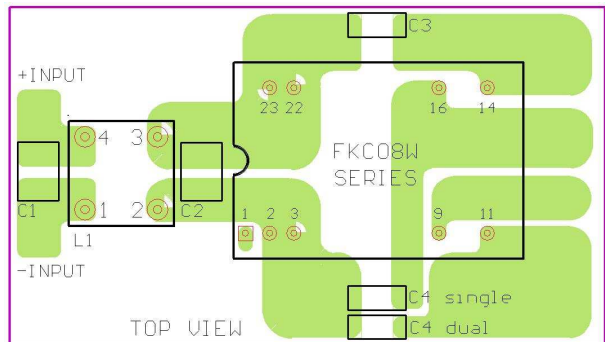
Recommended Filter for EN55022 Class B Compliance

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

	C1	C2	C3	C4	L1
FKCO8-24xxxW	4.7µF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325µH Common Choke PMT-050
FKCO8-48xxxW	1.5µF/100V 1812 MLCC	1.5µF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325µH Common Choke PMT-050
FKCO8-110xxxW	0.47µF/250V 1812 MLCC	0.47µF/250V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325µH Common Choke PMT-050

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

