



FEATURES

- RAILWAY APPLICATION
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE :
9 - 36VDC, 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		± 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%
		Dual (SMD,DIP)	± 1%
	10% Load to 90% Load	Single (DIP)	± 0.3%
		Single (SMD)	± 0.8%
		Dual (SMD,DIP)	± 0.8%
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)	3.3VDC output	3.9VDC	
	5.0VDC output	6.2VDC	
	12VDC output	15VDC	
	15VDC output	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		10 ⁹ ohms, min.	
Isolation capacitance		1500pF, max.	
Switching frequency		300KHz±10%	
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	

INPUT SPECIFICATIONS			
Input voltage range	24VDC nominal input	9 ~ 36VDC	
	48VDC nominal input	18 ~ 75VDC	
	110VDC nominal input	43 ~ 160VDC	
Input filter	Pi type		
Input surge voltage	24VDC input	50VDC 100mS, max.	
	48VDC input	100VDC 100mS, max.	
	110VDC input	170VDC 100mS, max.	
Input reflected ripple current	20mA _{p-p}		
Start up time	Nominal input and constant resistive load	Power up	450mS
Start-up voltage	24VDC input	9VDC	
	48VDC input	18VDC	
	110VDC input	43VDC	
Shutdown voltage	24VDC input	8VDC	
	48VDC input	16VDC	
	110VDC input	42VDC	
Remote ON/OFF (Note 5)			
	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 (Note 6)	Vo:5V,12V,15V	-40°C ~ +78°C (without derating)
	±12V,±15V	+78°C ~ +105°C (with derating)
	Vo:3.3V;±5V	-40°C ~ +70°C (without derating)
		+70°C ~ +105°C (with derating)
Maximum case temperature		+105°C
Storage temperature range		-55°C ~ +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 7)	EN55022, EN55011	Class A	
ESD	EN61000-4-2	Air Contact ± 8KV / ± 6KV	Perf. Criteria A
Radiated immunity	EN61000-4-3	20 V/m	Perf. Criteria A
Fast transient (Note 8)	EN61000-4-4	± 2KV	Perf. Criteria A
Surge (Note 8)	EN61000-4-5	± 2KV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

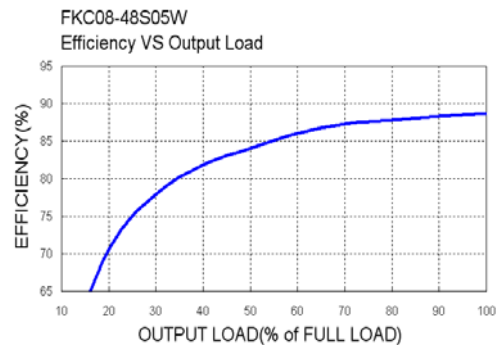
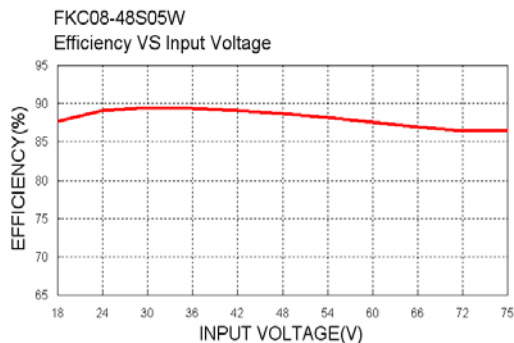


Model Number	Input Range	Output Voltage	Output Current		Output ⁽⁴⁾ Ripple & Noise	No load ⁽²⁾ Input Current	Eff ⁽³⁾ (%)	Capacitor ⁽⁴⁾ Load max
			Min. Load	Max. Load				
FKC08-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	2400mA	50mVp-p	40mA	85	1330μF
FKC08-24S05W	9 ~ 36 VDC	5 VDC	0mA	1600mA	50mVp-p	40mA	87	1330μF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

Note

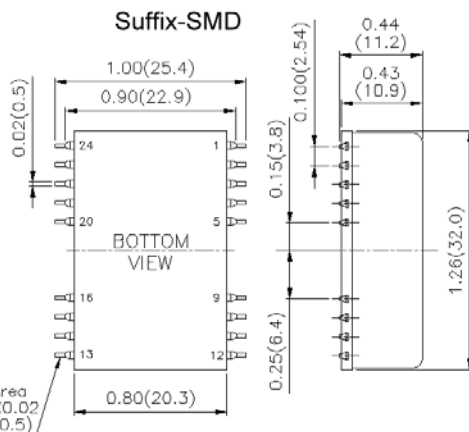
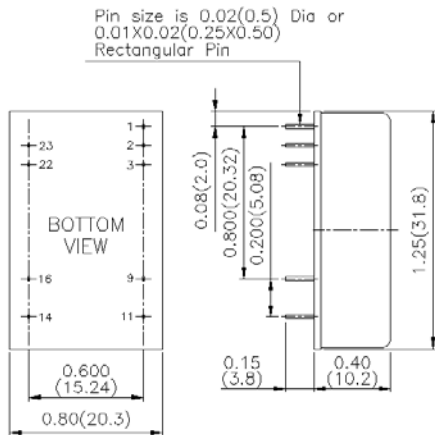
- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment)
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum input and constant resistive load.
- The ON/OFF control pin voltage is referenced to -INPUT.
- 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.





Mechanical Drawing:



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)

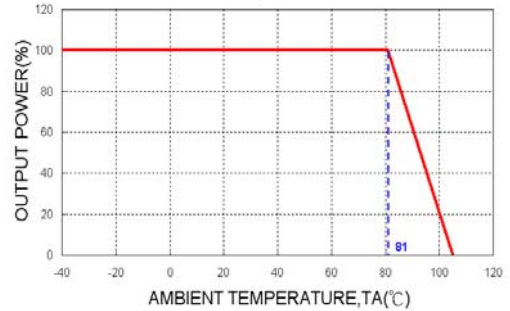
DIP PIN CONNECTION

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

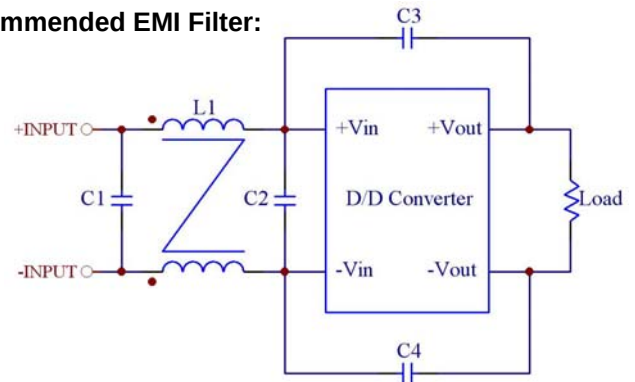
SMD PIN CONNECTION

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	Others	NC	NC

FKC08-48S05W Derating Curve



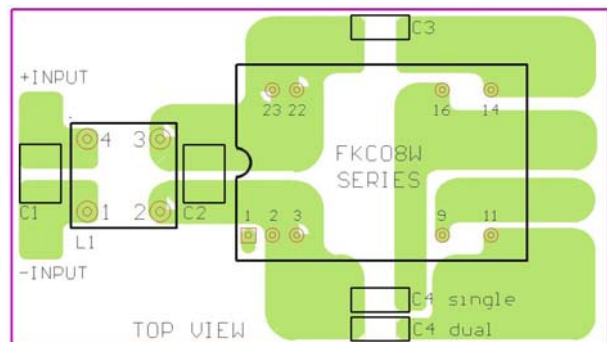
Recommended EMI Filter:



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
FKC08-24xxxW	4.7μF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325μH Common Choke PMT-050
FKC08-48xxxW	1.5μF/100V 1812 MLCC	1.5μF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325μH Common Choke PMT-050
FKC08-110xxxW	0.47μF/250V 1812 MLCC	0.47μF/250V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325μH Common Choke PMT-050



Recommended EN55022 Class B Filter Circuit Layout

