



P-DUKE POWER

FKC15 Series

DC-DC Converter
Up to 15 Watts

3

YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway



1600
VDC
Isolation
Voltage

2 : 1
Input
Range

Internal
EN55032
Class
Filter **A**

LOW
Standby
Power

NO
Min. Load
Required

REMOTE
ON
OFF

OCP

SCP

UVP

PART NUMBER STRUCTURE

FKC15 - 48 S 05

Series Name

Input
Voltage
(VDC)

Output
Quantity

Output
Voltage
(VDC)

12:9~18
24:18~36
48:36~75

S:Single

3P3:3.3
05:5.1
12:12
15:15

D: Dual

05:±5
12:±12
15:±15

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C unless otherwise noted

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	μF
FKC15-12S3P3	9 ~ 18	3.3	4000	10	87	4700
FKC15-12S05	9 ~ 18	5.1	3000	10	90	3300
FKC15-12S12	9 ~ 18	12	1250	5	90	600
FKC15-12S15	9 ~ 18	15	1000	10	90	400
FKC15-12D05	9 ~ 18	±5	±1500	10	86	±1500
FKC15-12D12	9 ~ 18	±12	±625	6	90	±288
FKC15-12D15	9 ~ 18	±15	±500	10	90	±200
FKC15-24S3P3	18 ~ 36	3.3	4000	6	88	4700
FKC15-24S05	18 ~ 36	5.1	3000	6	90	3300
FKC15-24S12	18 ~ 36	12	1250	4	91	600
FKC15-24S15	18 ~ 36	15	1000	6	91	400
FKC15-24D05	18 ~ 36	±5	±1500	4	87	±1500
FKC15-24D12	18 ~ 36	±12	±625	6	90	±288
FKC15-24D15	18 ~ 36	±15	±500	6	90	±200
FKC15-48S3P3	36 ~ 75	3.3	4000	4	88	4700
FKC15-48S05	36 ~ 75	5.1	3000	4	90	3300
FKC15-48S12	36 ~ 75	12	1250	4	90	600
FKC15-48S15	36 ~ 75	15	1000	4	91	400
FKC15-48D05	36 ~ 75	±5	±1500	4	87	±1500
FKC15-48D12	36 ~ 75	±12	±625	4	90	±288
FKC15-48D15	36 ~ 75	±15	±500	4	90	±200

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range	12Vin(nom)		9	12	18	VDC
	24Vin(nom)		18	24	36	
	48Vin(nom)		36	48	75	
Start up voltage	12Vin(nom)				9	VDC
	24Vin(nom)				18	
	48Vin(nom)				36	
Shutdown voltage	12Vin(nom)		7	8	8.8	VDC
	24Vin(nom)		15	16	17.5	
	48Vin(nom)		32	33.5	35	
Start up time	Constant resistive load	Power up Remote ON/OFF			60 60	ms
Input surge voltage	1 second, max.	12Vin(nom) 24Vin(nom) 48Vin(nom)			36 50 100	VDC
Input filter					Pi type	
Remote ON/OFF	Referred to -Vin pin	Positive logic Input current of Ctrl pin Remote off input current		DC-DC ON DC-DC OFF	Open or 3.0 ~ 12VDC Short or 0 ~ 1.2VDC	-0.5 +0.5 2.5 mA mA

OUTPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy			-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	Single	-0.2		+0.2	%
		Dual	-0.5		+0.5	
Load regulation	No Load to Full Load	Single	-0.5		+0.5	%
		Dual	-1.0		+1.0	
	10% Load to 90% Load	Single	-0.3		+0.3	
		Dual	-0.8		+0.8	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Ripple and noise	20MHz bandwidth With a 1 μ F/25V X7R MLCC			60		mVp-p
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change			250		μ s
Over voltage protection				3.9		VDC
	3.3Vout			6.2		
	5.1Vout			15		
	12Vout			18		
Over load protection	% of Iout rated; Hiccup mode			150		%
Short circuit protection			Continuous, automatic recovery			

GENERAL SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600			VDC
		Input (Output) to Case	1600			
Isolation resistance	500VDC		1			G Ω
Isolation capacitance					2000	pF
Switching frequency			297	330	363	kHz
Safety approvals	IEC/ EN/ UL62368-1				UL:E193009 CB:UL(Demco)	
Case material			Nickel-coated copper			
Base material			FR4 PCB			
Potting material			Silicone (UL94 V-0)			
Weight			16.2g (0.57oz)			
MTBF	MIL-HDBK-217F		1.797 x 10 ⁶ hrs			

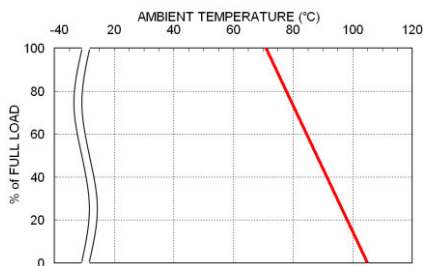
ENVIRONMENTAL SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating		-40		+105	°C
Maximum case temperature					105	°C
Storage temperature range			-55		+125	°C
Thermal impedance	Natural convection			20		°C/W
Thermal shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
Relative humidity			5% to 95% RH			

EMC SPECIFICATIONS

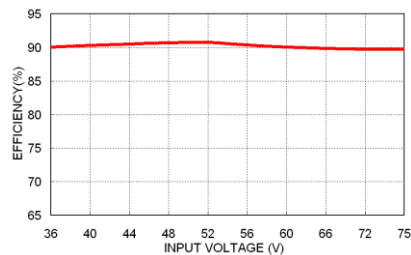
Parameter	Conditions		Level
EMI	EN55032	Without external components	Class A
		With external components	Class B
EMS	EN55035		
ESD	EN61000-4-2	Air $\pm 8\text{kV}$ and Contact $\pm 6\text{kV}$	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	$\pm 2\text{kV}$	Perf. Criteria A
Surge	EN61000-4-5	With an external input filter capacitor (Nippon chemi-con KY series, 220 $\mu\text{F}/100\text{V}$.)	Perf. Criteria A
		With an external input filter capacitor (Nippon chemi-con KY series, 220 $\mu\text{F}/100\text{V}$.)	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

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

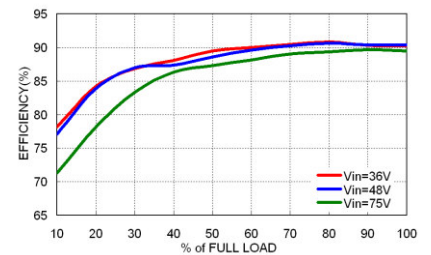
CHARACTERISTIC CURVE



FKC15-48S05 Derating Curve



FKC15-48S05 Efficiency vs. Input Voltage



FKC15-48S05 Efficiency vs. Output Load

FUSE CONSIDERATION

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

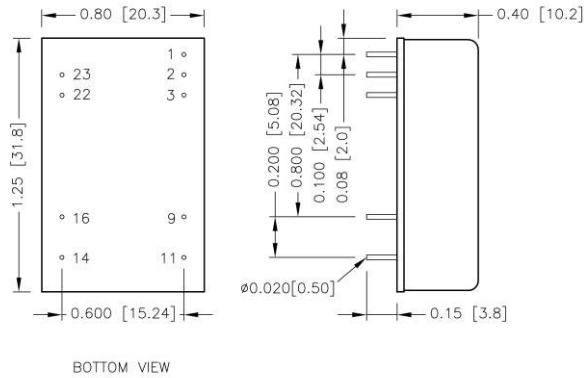
This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture.

To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

The input line fuse suggest as below :

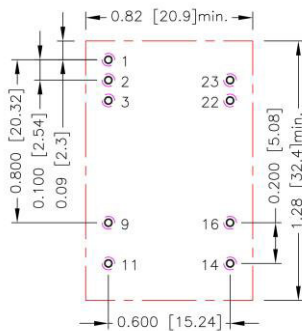
Model	Fuse Rating (A)	Fuse Type
FKC15-12S□□、FKC15-12D□□	3.15	Slow-Blow
FKC15-24S□□、FKC15-24D□□	1.6	Slow-Blow
FKC15-48S□□、FKC15-48D□□	1	Slow-Blow

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

MECHANICAL DRAWING


PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
1	Ctrl	Ctrl			
2	-Vin	-Vin	23	+Vin	+Vin
3	-Vin	-Vin	22	+Vin	+Vin
9	NC	Common	16	-Vout	Common
11	NC	-Vout	14	+Vout	+Vout

- All dimensions in inch [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[0.10]

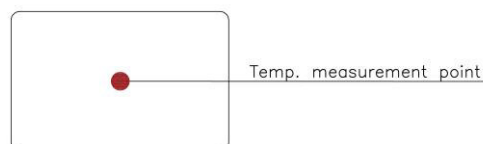
RECOMMENDED PAD LAYOUT


- All dimensions in inch[mm]
 Pad size(lead free recommended)
 Through hole 1.2.3.9.11.14.16.22.23: $\phi 0.031 [0.80]$
 Top view pad 1.2.3.9.11.14.16.22.23: $\phi 0.039 [1.00]$
 Bottom view pad 1.2.3.9.11.14.16.22.23: $\phi 0.063 [1.60]$

THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point as the figure below. The temperature at this location should not exceed "Maximum case temperature". When operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature". You can limit this temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM).



TOP VIEW