



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

NO
Min. Load
Required

REMOTE
ON
OFF

OCP

SCP

PART NUMBER STRUCTURE

FKC08 -	48	S	05	-	M3	SMD
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Operating Temp. Options	Mounting Type Options
	12:9~18 24:18~36 48:36~75	S:Single	33:3.3 05:5 12:12 15:15		□: Standard -40~+100°C With derating M3 : M3 Version -55~+100°C With derating	□: DIP type SMD : SMD type
		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
FKC08-12S33	9 ~ 18	3.3	2000	10	80	3300
FKC08-12S05	9 ~ 18	5	1500	15	83	1600
FKC08-12S12	9 ~ 18	12	666	13	88	350
FKC08-12S15	9 ~ 18	15	533	20	87	240
FKC08-12D05	9 ~ 18	±5	±800	15	83	±1000
FKC08-12D12	9 ~ 18	±12	±333	20	87	±160
FKC08-12D15	9 ~ 18	±15	±267	20	85	±100
FKC08-24S33	18 ~ 36	3.3	2000	10	80	3300
FKC08-24S05	18 ~ 36	5	1500	30	83	1600
FKC08-24S12	18 ~ 36	12	666	13	86	350
FKC08-24S15	18 ~ 36	15	533	15	85	240
FKC08-24D05	18 ~ 36	±5	±800	15	82	±1000
FKC08-24D12	18 ~ 36	±12	±333	15	86	±160
FKC08-24D15	18 ~ 36	±15	±267	13	85	±100
FKC08-48S33	36 ~ 75	3.3	2000	7	80	3300
FKC08-48S05	36 ~ 75	5	1500	8	83	1600
FKC08-48S12	36 ~ 75	12	666	10	86	350
FKC08-48S15	36 ~ 75	15	533	10	86	240
FKC08-48D05	36 ~ 75	±5	±800	8	85	±1000
FKC08-48D12	36 ~ 75	±12	±333	8	87	±160
FKC08-48D15	36 ~ 75	±15	±267	7	87	±100

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 time	Constant resistive load	Power up	700			ms
		Remote ON/OFF	5			
Input surge voltage	100 ms, max.	12Vin(nom)	36			VDC
		24Vin(nom)	50			
		48Vin(nom)	100			
Input filter	Pi type					
Remote ON/OFF	Referred to -Vin pin	Positive logic	Open or 3.5 ~ 12VDC			mA
		DC-DC ON	Short or 0 ~ 1.2VDC			
		DC-DC OFF	-0.5	+0.5		
		Input current of Ctrl pin	2.5			mA
		Remote off input current				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		-0.2		+0.2	%
Load regulation	No Load to Full Load	DIP type	Single		+0.5	%
			Dual	-1.0	+1.0	
		SMD type	Single	-1.0	+1.0	
			Dual	-1.0	+1.0	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Ripple and noise	20MHz bandwidth			50		mVp-p
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change			200		μs
Over load protection	% of Iout rated			150		%
Short circuit protection						Continuous, automatics recovery

GENERAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	DIP type	Input to Output	1600		VDC
			Input (Output) to Case	1600		
	SMD type	Input to Output	1600			
		Input (Output) to Case	1000			
Isolation resistance	500VDC		1			GΩ
Isolation capacitance					300	pF
Switching frequency			270	300	330	kHz
Safety approvals	IEC/ EN/ UL62368-1				UL:E193009 CB:UL(Demko)	
Case material					Nickel-coated copper	
Base material					Non-conductive black plastic	
Potting material					Epoxy (UL94 V-0)	
Weight					18g (0.62oz)	
MTBF	MIL-HDBK-217F				3.543 x 10 ⁶ hrs	

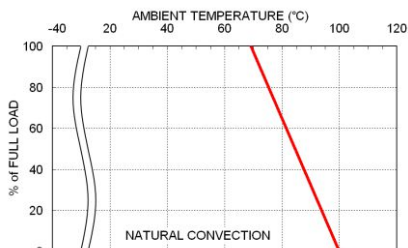
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	Standard M3 Version	With derating	-40		+100	°C
		With derating	-55		+100	
Maximum case temperature					100	°C
Storage temperature range			-55		+125	°C
Thermal impedance				20		°C/W
Thermal shock					MIL-STD-810F	
Vibration					MIL-STD-810F	
Relative humidity					5% to 95% RH	

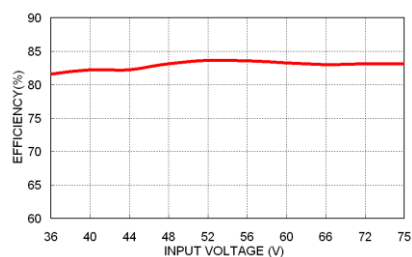
EMC SPECIFICATIONS

Parameter	Conditions		Level
EMI	EN55032	With external components	Class A · Class B
EMS	EN55035		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV	Perf. Criteria A
		With an external input filter capacitor (Nippon chemi-con KY series, 220μF/100V)	
Surge	EN61000-4-5	± 1kV	Perf. Criteria A
		With an external input filter capacitor (Nippon chemi-con KY series, 220μF/100V)	
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

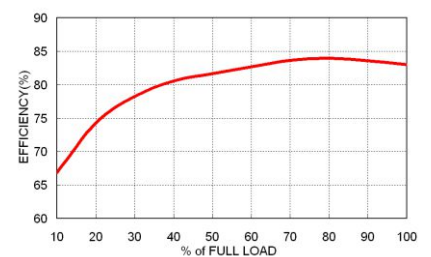
CAUTION: This power module is not internally fused. An input line fuse must always be used.

CHARACTERISTIC CURVE


FKC08-48S05 Derating Curve



FKC08-48S05 Efficiency vs. Input Voltage



FKC08-48S05 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.

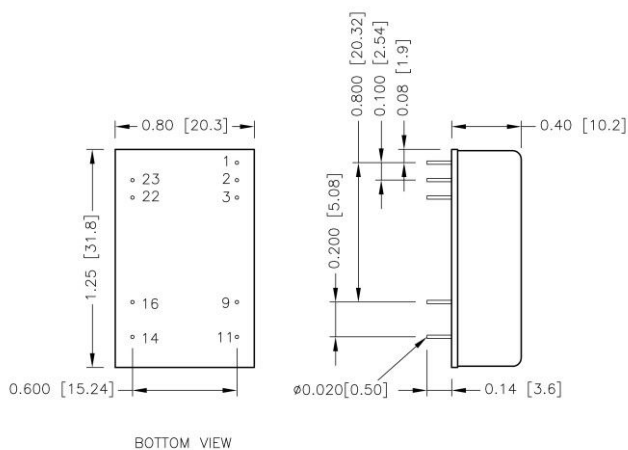
The input line fuse suggest as below :

Model	Fuse Rating (A)	Fuse Type
FKC08-12S□□、FKC08-12D□□	2	Slow-Blow
FKC08-24S□□、FKC08-24D□□	1	Slow-Blow
FKC08-48S□□、FKC08-48D□□	0.5	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

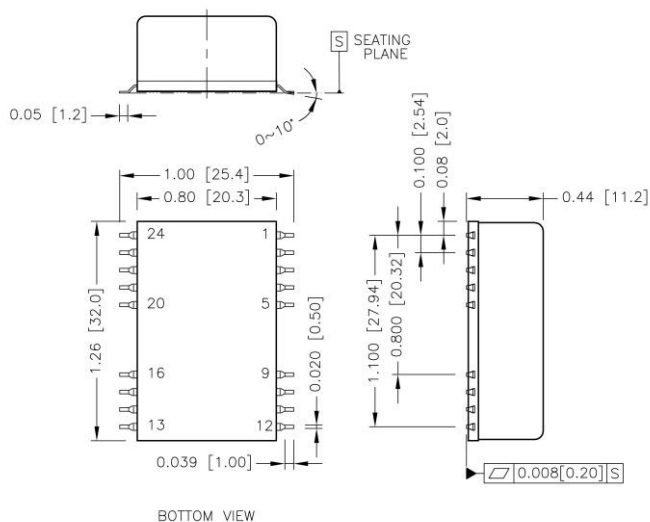
DIP type



PIN CONNECTION

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

SMD type



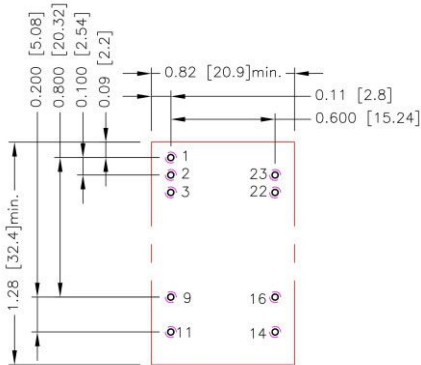
PIN CONNECTION

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
Others	NC	NC			

- All dimensions in inch [mm]
- Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
- Pin dimension tolerance ±0.004[0.10]

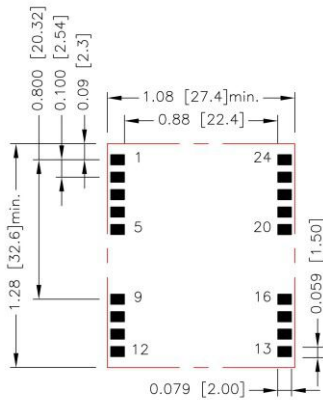
RECOMMENDED PAD LAYOUT

DIP type



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: $\Phi 0.063[1.60]$

SMD type

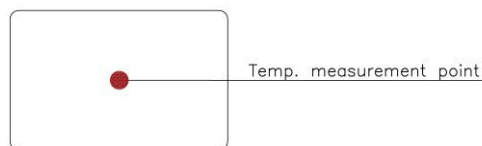


All dimensions in inch[mm]
 Pad size(lead free recommended)
 Top view pad: 0.079x0.059[2.00x1.50]

THERMAL CONSIDERATIONS

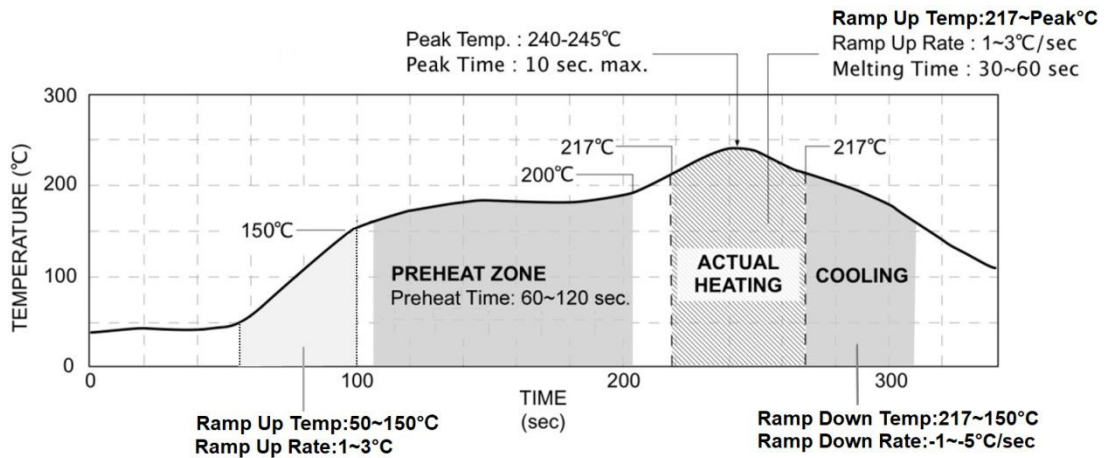
The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point 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

LEAD FREE REFLOW PROFILE For SMD Type



*The curves define the maximum peak reflow temperature permissible measured on pin1 or Vin pin.