



**3**  
YEARS  
WARRANTY

ROHS  
COMPLIANT

REACH  
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway

UL US CB CE UK CA

**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 <b>M3</b> : M3 Version -55~+100°C With derating	□: DIP type <b>SMD</b> : 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, automatic 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 <sup>6</sup> hrs	

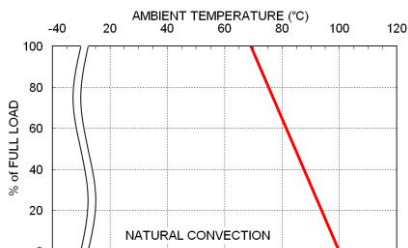
**ENVIRONMENTAL SPECIFICATIONS**

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	

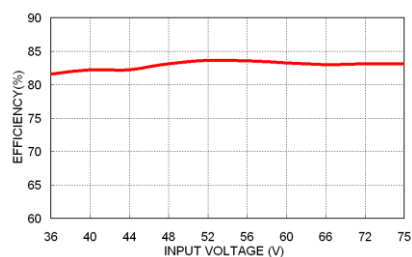
**EMC SPECIFICATIONS**

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

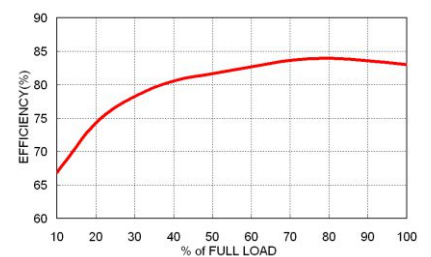
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

**CHARACTERISTIC CURVE**


FKC08-48S05 Derating Curve



FKC08-48S05 Efficiency vs. Input Voltage

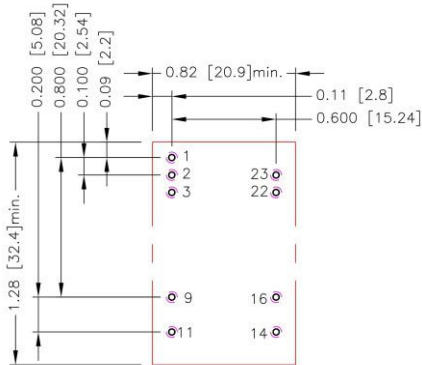


FKC08-48S05 Efficiency vs. Output Load



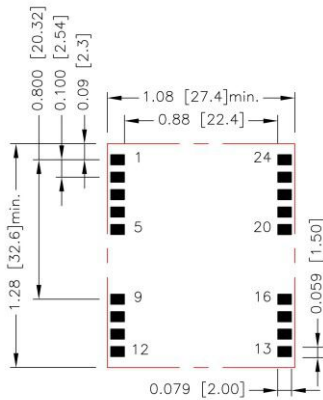
**RECOMMENDED PAD LAYOUT**

**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**

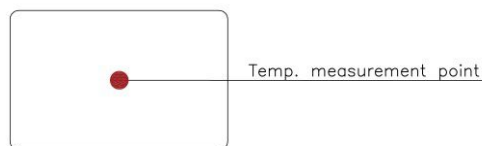


All dimensions in inch[mm]  
 Pad size(lead free recommended)  
 Top view pad: 0.079x0.059[2.00x1.50]

**THERMAL CONSIDERATIONS**

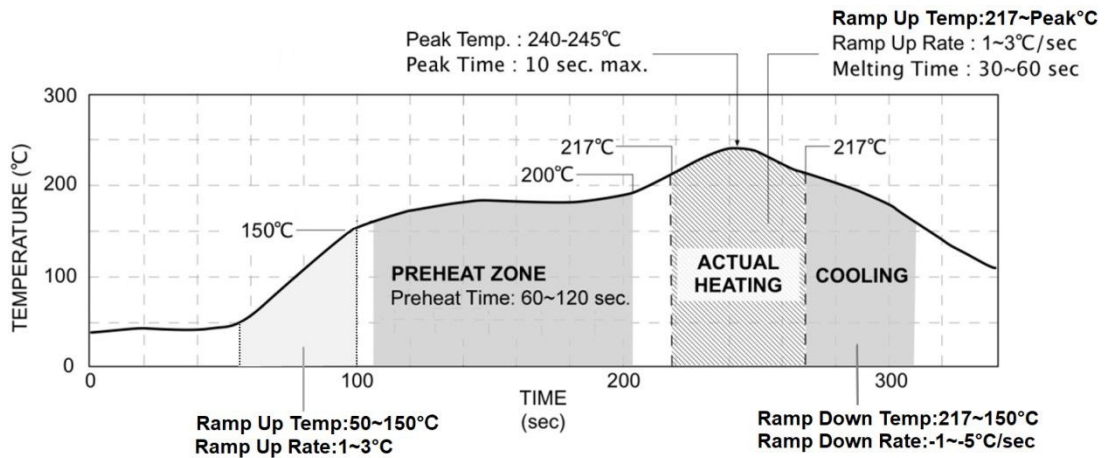
The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point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