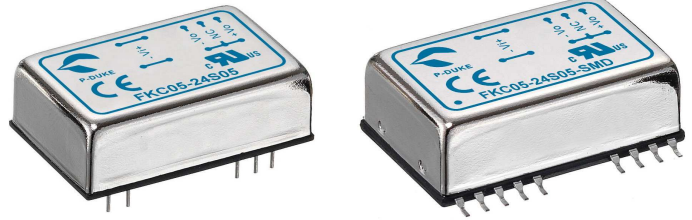


# FKC05 FKC05W SERIES

DC-DC CONVERTER



4:1 AND 2:1 WIDE INPUT RANGE  
UP TO 5 Watts



## FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 1.25 X 0.80 X 0.40 INCH 24 PIN DIP AND SMD PACKAGE
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

**1600VDC ISOLATION**    **OCP**    **SCP**

## TECHNICAL SPECIFICATION

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

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
FKC05-12S33	9 ~ 18	3.3	1000	10	76	2200
FKC05-12S05	9 ~ 18	5	1000	10	78	1000
FKC05-12S12	9 ~ 18	12	470	10	82	220
FKC05-12S15	9 ~ 18	15	400	10	81	150
FKC05-12D05	9 ~ 18	±5	±500	15	78	±680
FKC05-12D12	9 ~ 18	±12	±230	20	81	±100
FKC05-12D15	9 ~ 18	±15	±190	15	84	±68
FKC05-24S33	18 ~ 36	3.3	1000	10	75	2200
FKC05-24S05	18 ~ 36	5	1000	15	77	1000
FKC05-24S12	18 ~ 36	12	470	15	81	220
FKC05-24S15	18 ~ 36	15	400	15	81	150
FKC05-24D05	18 ~ 36	±5	±500	15	80	±680
FKC05-24D12	18 ~ 36	±12	±230	20	84	±100
FKC05-24D15	18 ~ 36	±15	±190	20	81	±68
FKC05-48S33	36 ~ 75	3.3	1000	10	74	2200
FKC05-48S05	36 ~ 75	5	1000	10	77	1000
FKC05-48S12	36 ~ 75	12	470	10	82	220
FKC05-48S15	36 ~ 75	15	400	10	81	150
FKC05-48D05	36 ~ 75	±5	±500	10	78	±680
FKC05-48D12	36 ~ 75	±12	±230	5	82	±100
FKC05-48D15	36 ~ 75	±15	±190	10	83	±68

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
FKC05-24S33W	9 ~ 36	3.3	1000	10	76	2200
FKC05-24S05W	9 ~ 36	5	1000	15	79	1000
FKC05-24S12W	9 ~ 36	12	470	15	81	220
FKC05-24S15W	9 ~ 36	15	400	15	84	150
FKC05-24D05W	9 ~ 36	±5	±500	15	78	±680
FKC05-24D12W	9 ~ 36	±12	±230	20	82	±100
FKC05-24D15W	9 ~ 36	±15	±190	20	84	±68
FKC05-48S33W	18 ~ 75	3.3	1000	10	73	2200
FKC05-48S05W	18 ~ 75	5	1000	10	79	1000
FKC05-48S12W	18 ~ 75	12	470	10	80	220
FKC05-48S15W	18 ~ 75	15	400	10	82	150
FKC05-48D05W	18 ~ 75	±5	±500	10	76	±680
FKC05-48D12W	18 ~ 75	±12	±230	5	80	±100
FKC05-48D15W	18 ~ 75	±15	±190	10	80	±68

**PART NUMBER STRUCTURE**

<b>FKC05</b>	-	<b>48</b>	<b>S</b>	<b>05</b>	-	<b>M1</b>	<b>SMD</b>
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range	Operating Temp. Option	Mounting Type Option	
	12: 9~18 24: 18~36 48: 36~75	S: Single	33: 3.3 05: 5 12: 12 15: 15	2:1	<input type="checkbox"/> Standard type -25~+85°C With derating <b>M1</b> : -40~+85°C Without derating	<input type="checkbox"/> DIP type <b>SMD</b> : SMD type	
		D: Dual	05: ±5 12: ±12 15: ±15				

<b>FKC05</b>	-	<b>48</b>	<b>S</b>	<b>05</b>	<b>W</b>	-	<b>M2</b>	<b>SMD</b>
Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range	Operating Temp. Option	Mounting Type Option		
	24: 9~36 48: 18~75	S: Single	33: 3.3 05: 5 12: 12 15: 15	4:1	<input type="checkbox"/> Standard type -25~+85°C With derating <b>M2</b> : -40~+85°C With derating	<input type="checkbox"/> DIP type <b>SMD</b> : SMD type		
		D: Dual	05: ±5 12: ±12 15: ±15					

**INPUT SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	FKC05	12Vin(nom)	9	12	18
		24Vin(nom)	18	24	36
		48Vin(nom)	36	48	75
	FKC05W	24Vin(nom)	9	24	36
		48Vin(nom)	18	48	75
Start up time	Constant resistive load			450	ms
Input surge voltage	100 ms, max.	12Vin(nom)		36	VDC
		24Vin(nom)		50	
		48Vin(nom)		100	
Input reflected ripple current			20		mAp-p
Input filter			Pi type		

**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	Single	-0.5	+0.5	%
		Dual	-1.0	+1.0	
Cross regulation	Asymmetrical load 25%/100% FL	-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		170		%
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							UL60950-1 EN60950-1 IEC60950-1
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						5.831 x 10 <sup>6</sup> hrs

**ENVIRONMENTAL SPECIFICATIONS**

Parameter	Conditions			Min.	Typ.	Max.	Unit
Operating ambient temperature <sup>(1)</sup>		Standard	With derating	-25		+85	°C
			M1 Version	Without derating	-40		
		M2 Version	With derating	-40		+85	
			Standard type				
Maximum case temperature							100 °C
							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**

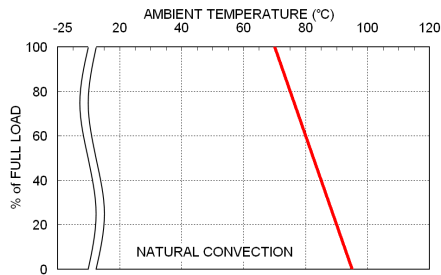
Parameter	Conditions		Level
EMI <sup>(2)</sup>	EN55022		Class A · Class B
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient <sup>(3)</sup>	EN61000-4-4	± 2kV	Perf. Criteria B
Surge <sup>(3)</sup>	EN61000-4-5	± 1kV	Perf. Criteria B
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

**Note:**

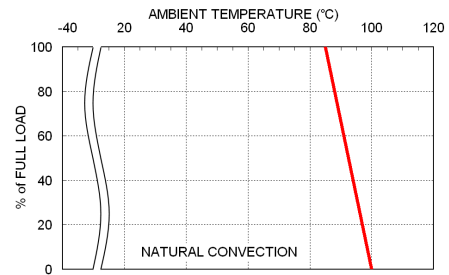
- It's higher efficiency for M1 version. Therefore, it can be operated in a more extensive temperature range than standard and M2 version.
- The standard module meets EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.  
The filter Power Mate suggests: Nippon chemi-con KY series, 220μF/100V.

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

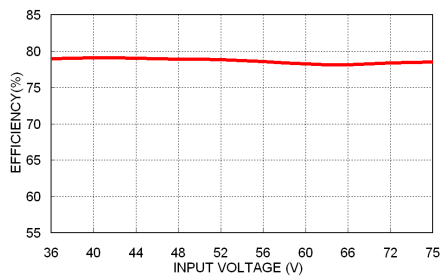
## CHARACTERISTIC CURVE



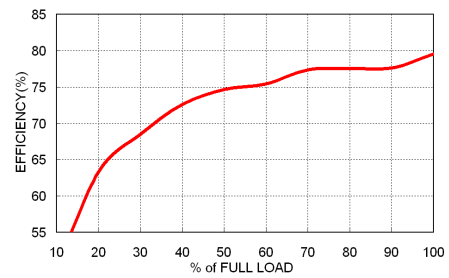
FKC05-48S05 Derating Curve



FKC05-48S05-M1 Derating Curve



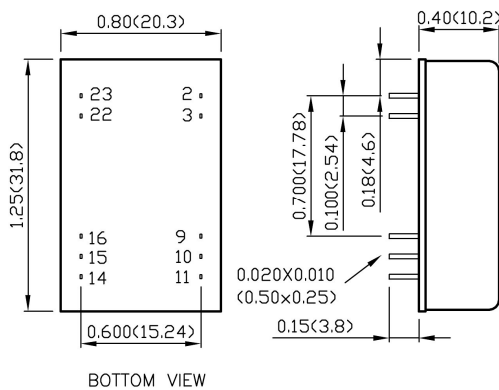
FKC05-48S05 Efficiency vs. Input Voltage



FKC05-48S05 Efficiency vs. Output Load

## MECHANICAL DRAWING

### DIP type

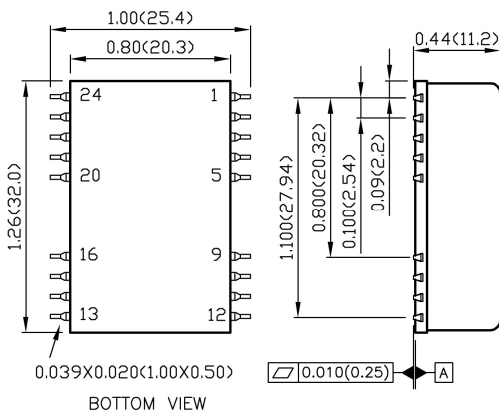


### PIN CONNECTION

PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
2	-Vin	-Vin	23	+Vin	+Vin
3	-Vin	-Vin	22	+Vin	+Vin
9	NC	Common	16	-Vout	Common
10	NC/*No Pin		15	NC/*No Pin	
11	NC	-Vout	14	+Vout	+Vout

\* There is no pin at Pin10 & Pin15 for FKC05-W DIP type.

### SMD type



### PIN CONNECTION

PIN	SINGLE	DUAL	PIN	SINGLE	DUAL
2	-Vin	-Vin	23	+Vin	+Vin
3	-Vin	-Vin	22	+Vin	+Vin
9	NC	Common	16	-Vout	Common
10	NC	NC	15	NC	NC
11	NC	-Vout	14	+Vout	+Vout
Others	NC	NC			

- All dimensions in inch (mm)
- Tolerance :x.xx±0.02 (x.xx±0.5)  
x.xxx±0.01 (x.xx±0.25)
- Pin pitch tolerance ±0.01 (0.25)
- Pin dimension tolerance ±0.004(0.1)