

POWER MATE
P-DUKE **TECHNOLOGY CO., LTD.**
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	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	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	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load
	VDC	VDC	mA	mA	%	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

FKC05 - 48 S 05 - M1 SMD						
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	□: Standard type -25~+85°C With derating M1 : -40~+85°C Without derating	□: DIP type SMD : SMD type
		D: Dual	05: ±5 12: ±12 15: ±15			

FKC05 - 48 S 05 W - M2 SMD						
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	□: Standard type -25~+85°C With derating M2 : -40~+85°C With derating	□: DIP type SMD : 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) 24Vin(nom) 48Vin(nom)	9	12	18	VDC
		18	24	36	
		36	48	75	
Start up time	Constant resistive load Power up			450	ms
Input surge voltage	100 ms, max. 12Vin(nom) 24Vin(nom) 48Vin(nom)			36	VDC
				50	
				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	-0.5		+0.5	%
		-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 lout 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 ⁶ hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions			Min.	Typ.	Max.	Unit
Operating ambient temperature ⁽¹⁾		Standard	With derating	-25		+85	°C
		M1 Version	Without derating	-40		+85	
		M2 Version	With derating	-40		+85	
Maximum case temperature			Standard type			100	°C
			M2 Version			100	
			M1 Version			105	
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

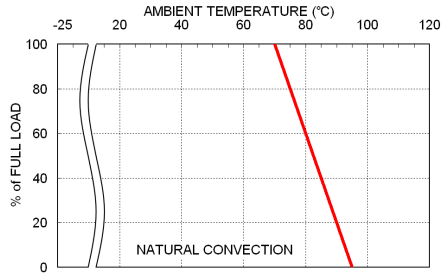
Parameter	Conditions	Level
EMI ⁽²⁾	EN55022	Class A · Class B
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient ⁽³⁾	EN61000-4-4 ± 2kV	Perf. Criteria B
Surge ⁽³⁾	EN61000-4-5 ± 1kV	Perf. Criteria B
Conducted immunity	EN61000-4-6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

Note:

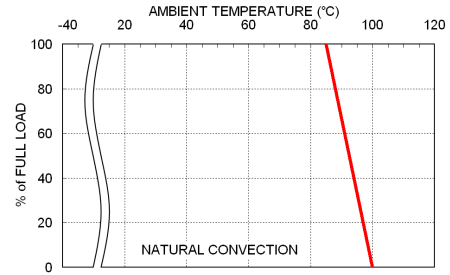
1. It's higher efficiency for M1 version. Therefore, it can be operated in a more extensive temperature range than standard and M2 version.
2. The standard modules meet EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
3. An external input filter capacitor 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.

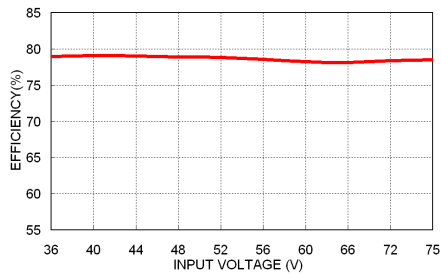
CHARACTERISTIC CURVE



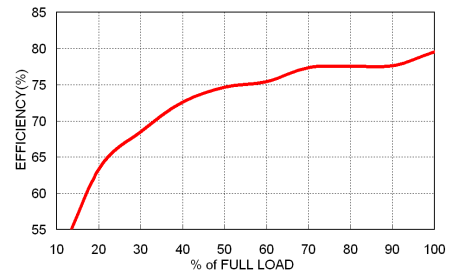
FKC05-48S05 Derating Curve



FKC05-48S05-M1 Derating Curve



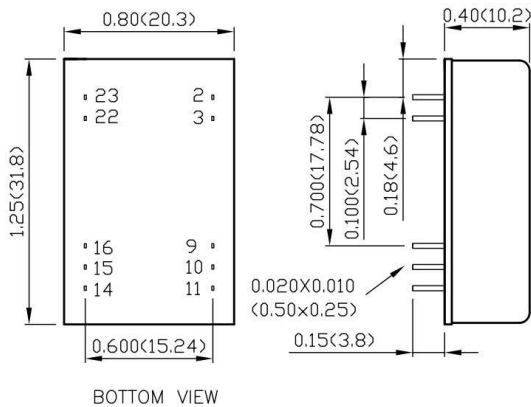
FKC05-48S05 Efficiency vs. Input Voltage



FKC05-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING

DIP type

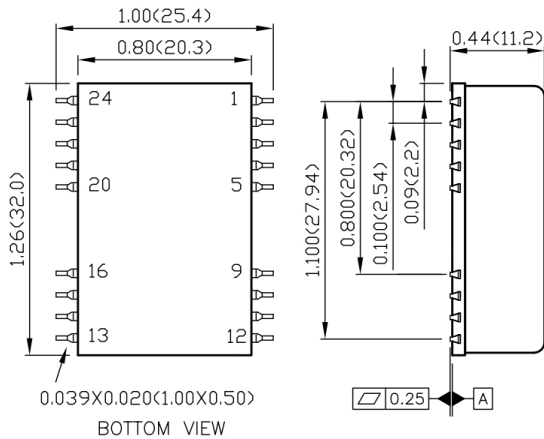


PIN CONNECTION

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			

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