

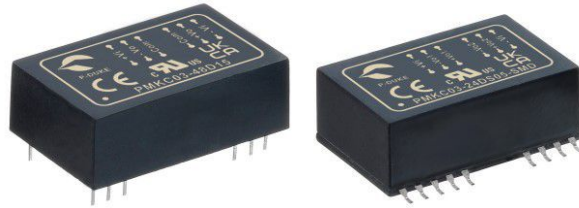


3

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

SCP

PART NUMBER STRUCTURE

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Package Options
PMKC03 - 48	05: 4.5~6 12: 9~18 24: 18~36 48: 36~75	S: Single D: Dual DS: Dual Positive	33: 3.3 05: 5 12: 12 15: 15 05: ±5 12: ±12 15: ±15 05: 5 / 5 12: 12 / 12 15: 15 / 15	□: DIP type SMD: SMD type

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

Model Number	Input Range VDC	Output Voltage VDC	Output Current @ Full Load		Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
			Min. Load mA	Full Load mA			
PMKC03-05S33	4.5 ~ 6	3.3	60	600	15	69	2200
PMKC03-05S05	4.5 ~ 6	5	60	600	15	74	1000
PMKC03-05S12	4.5 ~ 6	12	25	250	30	75	170
PMKC03-05S15	4.5 ~ 6	15	20	200	25	75	110
PMKC03-05D05	4.5 ~ 6	±5	±30	± 300	15	73	± 500
PMKC03-05D12	4.5 ~ 6	±12	±12	± 125	20	75	± 96
PMKC03-05D15	4.5 ~ 6	±15	±10	± 100	50	75	± 47
PMKC03-05DS05	4.5 ~ 6	5 / 5	30 / 30	300 / 300	30	73	500 / 500
PMKC03-05DS12	4.5 ~ 6	12 / 12	12 / 12	125 / 125	40	75	96 / 96
PMKC03-05DS15	4.5 ~ 6	15 / 15	10 / 10	100 / 100	40	73	47 / 47
PMKC03-12S33	9 ~ 18	3.3	60	600	20	70	2200
PMKC03-12S05	9 ~ 18	5	60	600	20	75	1000
PMKC03-12S12	9 ~ 18	12	25	250	20	79	170
PMKC03-12S15	9 ~ 18	15	20	200	30	79	110
PMKC03-12D05	9 ~ 18	±5	±30	± 300	20	74	± 500
PMKC03-12D12	9 ~ 18	±12	±12	± 125	35	79	± 96
PMKC03-12D15	9 ~ 18	±15	±10	± 100	45	79	± 47
PMKC03-12DS05	9 ~ 18	5 / 5	30 / 30	300 / 300	10	74	500 / 500
PMKC03-12DS12	9 ~ 18	12 / 12	12 / 12	125 / 125	15	79	96 / 96
PMKC03-12DS15	9 ~ 18	15 / 15	10 / 10	100 / 100	30	79	47 / 47
PMKC03-24S33	18 ~ 36	3.3	60	600	10	70	2200
PMKC03-24S05	18 ~ 36	5	60	600	10	76	1000
PMKC03-24S12	18 ~ 36	12	25	250	20	80	170
PMKC03-24S15	18 ~ 36	15	20	200	20	80	110
PMKC03-24D05	18 ~ 36	±5	±30	± 300	20	76	± 500
PMKC03-24D12	18 ~ 36	±12	±12	± 125	20	79	± 96
PMKC03-24D15	18 ~ 36	±15	±10	± 100	20	80	± 47
PMKC03-24DS05	18 ~ 36	5 / 5	30 / 30	300 / 300	20	76	500 / 500
PMKC03-24DS12	18 ~ 36	12 / 12	12 / 12	125 / 125	20	79	96 / 96
PMKC03-24DS15	18 ~ 36	15 / 15	10 / 10	100 / 100	20	80	47 / 47
PMKC03-48S33	36 ~ 75	3.3	60	600	10	72	2200
PMKC03-48S05	36 ~ 75	5	60	600	10	75	1000
PMKC03-48S12	36 ~ 75	12	25	250	10	79	170
PMKC03-48S15	36 ~ 75	15	20	200	10	79	110
PMKC03-48D05	36 ~ 75	±5	±30	± 300	10	77	± 500
PMKC03-48D12	36 ~ 75	±12	±12	± 125	10	79	± 96
PMKC03-48D15	36 ~ 75	±15	±10	± 100	10	79	± 47
PMKC03-48DS05	36 ~ 75	5 / 5	30 / 30	300 / 300	10	77	500 / 500
PMKC03-48DS12	36 ~ 75	12 / 12	12 / 12	125 / 125	10	79	96 / 96
PMKC03-48DS15	36 ~ 75	15 / 15	10 / 10	100 / 100	10	79	47 / 47

* The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range	5Vin(nom)		4.5	5	6	VDC
	12Vin(nom)		9	12	18	
	24Vin(nom)		18	24	36	
	48Vin(nom)		36	48	75	
Start up time	Constant resistive load	Power up			30	ms
Input surge voltage	100 ms, max.	5Vin(nom)			18	VDC
		12Vin(nom)			36	
		24Vin(nom)			50	
		48Vin(nom)			100	
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	Single / Dual	-0.2		+0.2	%
		Dual Positive	-0.5		+0.5	
Load regulation	Min. Load to Full Load	Single	-0.3		+0.3	%
		3.3Vout Others	-0.2		+0.2	
		Dual / Dual Positive All	-2.0		+2.0	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Ripple and noise	Measured by 20MHz bandwidth	3.3Vout, 5Vout		75		mVp-p
		12Vout		120		
		15Vout		150		
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change			500		µs
Short circuit protection			Continuous, automatics recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600			VDC
		V1out to V2out (Dual Positive)	500			
Isolation resistance	500VDC		1			GΩ
Isolation capacitance					300	pF
Switching frequency			100			kHz
Safety approvals	IEC /EN /UL 62368-1				UL:E193009 CB:UL(Demko)	
Case material					Non-conductive black plastic	
Base material					Non-conductive black plastic	
Potting material					Epoxy (UL94 V-0)	
Weight		DIP Type			14g (0.48oz)	
		SMD Type			15g (0.52oz)	
MTBF	MIL-HDBK-217F, Full load				7.942 x 10 ⁵ hrs	

ENVIRONMENTAL SPECIFICATIONS

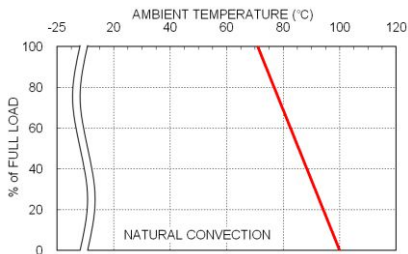
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating		-25		+71	°C
Maximum case temperature					100	°C
Storage temperature range			-55		+125	°C
Thermal shock					MIL-STD-810F	
Vibration					MIL-STD-810F	
Relative humidity					5% to 95% RH	
Lead-free reflow solder process	Only for SMD type		The time above 217°C 30~60sec. Peak temperature 245°C max. Time above 240°C 10sec. max.			

EMC SPECIFICATIONS

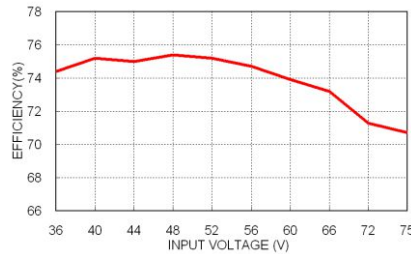
Parameter	Conditions		Level
EMI	EN55032		Class A
EMS	EN55035		
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4	± 2kV With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V)	Perf. Criteria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

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

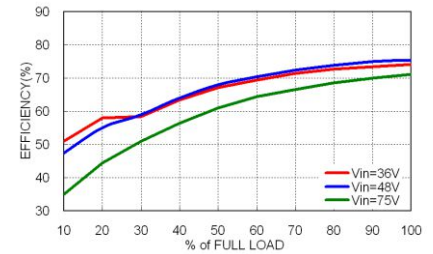
CHARACTERISTIC CURVE



PMKC03-48S05 Derating Curve



PMKC03-48S05 Efficiency vs. Input Voltage



PMKC03-48S05 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.

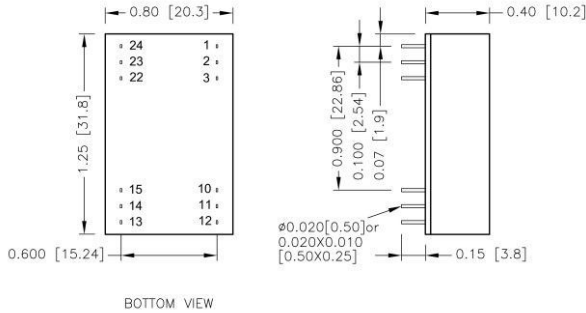
The input line fuse suggest as below :

Model	Fuse Rating (A)	Fuse Type
PMKC03-05□□□	1.6	Slow-Blow
PMKC03-12□□□	0.8	Slow-Blow
PMKC03-24□□□	0.5	Slow-Blow
PMKC03-48□□□	0.315	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



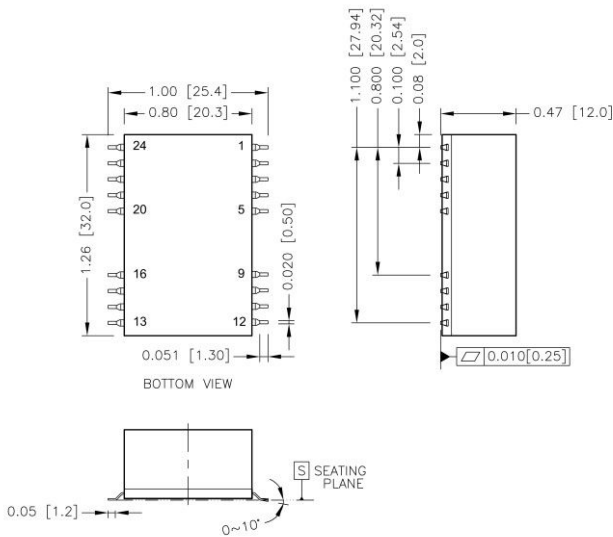
PIN CONNECTION

PIN	SINGLE	DUAL	DS	PIN	SINGLE	DUAL	DS
1	+Vin	+Vin	+Vin	24	+Vin	+Vin	+Vin
2	NC	-Vout	-V1out	23	NC	-Vout	-V1out
3	NC	Common	+V1out	22	NC	Common	+V1out
10	-Vout	Common	-V2out	15	-Vout	Common	-V2out
11	+Vout	+Vout	+V2out	14	+Vout	+Vout	+V2out
12	-Vin	-Vin	-Vin	13	-Vin	-Vin	-Vin

*NC:No Connection

1. All dimensions in inch [mm]
2. Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]
3. Pin dimension tolerance ±0.004[0.10]

SMD type



PIN CONNECTION

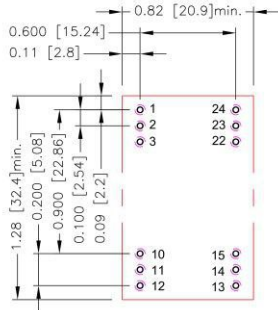
PIN	SINGLE	DUAL	DS	PIN	SINGLE	DUAL	DS
1	+Vin	+Vin	+Vin	24	+Vin	+Vin	+Vin
2	NC	-Vout	-V1out	23	NC	-Vout	-V1out
3	NC	Common	+V1out	22	NC	Common	+V1out
10	-Vout	Common	-V2out	15	-Vout	Common	-V2out
11	+Vout	+Vout	+V2out	14	+Vout	+Vout	+V2out
12	-Vin	-Vin	-Vin	13	-Vin	-Vin	-Vin
Others	NC	NC	NC				

*NC:No Connection

1. All dimensions in inch [mm]
2. Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]
3. Pin dimension tolerance ±0.004[0.10]

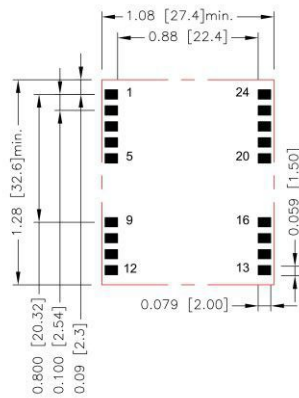
RECOMMENDED PAD LAYOUT

DIP type



All dimensions in inch[mm]
 Pad size(lead free recommended)
 Through hole 1.2.3.10.11.12.13.14.15.22.23.24: $\Phi 0.031[0.80]$
 Top view pad 1.2.3.10.11.12.13.14.15.22.23.24: $\Phi 0.039[1.00]$
 Bottom view pad 1.2.3.10.11.12.13.14.15.22.23.24: $\Phi 0.063[1.60]$

SMD type

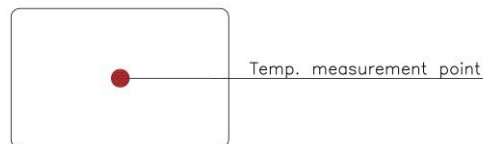


All dimensions in inch[mm]
 Pad size(lead free recommended)
 Top view pad: $0.079 \times 0.059 [2.00 \times 1.50]$

THERMAL CONSIDERATIONS

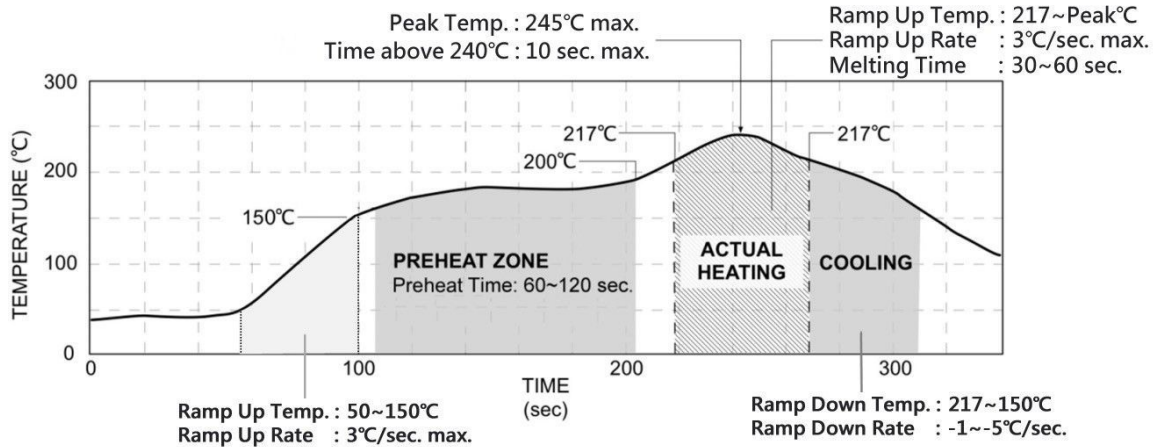
The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point as the figure below. The case temperature (T_c) should be measured at the position 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.