



APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement Equipment
Semiconductor Equipment

FEATURES

- 3 WATTS REGULATED OUTPUT POWER
- OUTPUT CURRENT UP TO 0.5A
- STANDARD 1.25 X 0.80 X 0.40 INCH
- HIGH EFFICIENCY UP TO 80%
- 2:1 WIDE INPUT VOLTAGE RANGE
- FIVE-SIDED SHIELD
- FIXED SWITCHING FREQUENCY (300kHz)
- STANDARD 24 PIN DIP PACKAGE & SMD TYPE PACKAGE
- OVER CURRENT PROTECTION
- OUTPUT 1 / OUTPUT 2 ISOLATION (DS TYPE)
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

OPTIONS

SMD TYPE, M1 TYPE

DESCRIPTION

The MCK03 series offer 3 watts of output power from a package in an IC compatible 24pin DIP configuration without derating to 82°C ambient temperature. MCK03 series have 2:1 wide input voltage of 9~18, 18~36 and 36~75VDC.

TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS			
Output power			3 Watts, max.
Voltage accuracy			± 1%
Minimum load			0%
Line regulation	LL to HL at Full Load		± 0.2%
Load regulation	No Load to Full Load	Single	± 0.2%
		Dual	± 1%
		DS	± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth		See table
Temperature coefficient			±0.02% / °C, max.
Transient response recovery time	25% load step change		200µs
Over load protection	% of FL at nominal input		180%
Short circuit protection		Continuous, automatic recovery	
GENERAL INPUT SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output	500VDC, min.	1minute
	Input (Output) to Case	500VDC, min.	1minute
Isolation resistance	500VDC	10 ⁹ ohms, min.	
Isolation capacitance		300pF, max.	
Switching frequency		300kHz±10%	
Safety approvals		IEC60950-1, UL60950-1, & EN60950-1	
Case material		Nickel-coated copper	
Base material		Non-conductive black plastic	
Potting material		Epoxy (UL94 V-0)	
Dimensions		1.25 X 0.80 X 0.40 Inch (31.8 X 20.3 X 10.2 mm)	
Weight	DIP	16g (0.55oz)	
	SMD	18g (0.62oz)	
MTBF (Note 1)	MIL-HDBK-217F	7.213 x 10 ⁶ hrs	

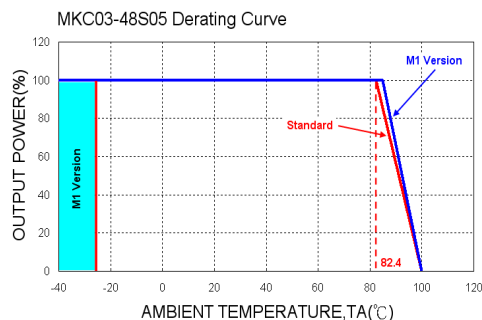
INPUT SPECIFICATIONS			
Input voltage range	12VDC nominal input		9 ~ 18VDC
	24VDC nominal input		18 ~ 36VDC
	48VDC nominal input		36 ~ 75VDC
Input filter			Pi type
Input surge voltage	12VDC input		36VDC 100ms,max.
	24VDC input		50VDC 100ms,max.
	48VDC input		100VDC 100ms,max.
Input reflected ripple current			20mA _{p-p}
Start up time	Nominal Vin and constant resistive load	Power up	350ms,max.
ENVIRONMENTAL SPECIFICATIONS			
Operating ambient temperature	Standard	-25°C ~ +85°C (with derating)	
	M1 (Note 5)	-40°C ~ +85°C (non-derating)	
Maximum case temperature			100°C
Storage temperature range			-55°C ~ +125°C
Thermal impedance	Nature convection		20°C/Watt
Thermal shock			MIL-STD-810F
Vibration			MIL-STD-810F
Relative humidity			5% to 95% RH
EMC CHARACTERISTICS			
EMI	EN55022		Class A
ESD	EN61000-4-2	Air Contact	± 8kV Perf. Criteria A
			± 6kV Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 6)	EN61000-4-4	± 2kV	Perf. Criteria B
Surge (Note 6)	EN61000-4-5	± 1kV	Perf. Criteria B
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A

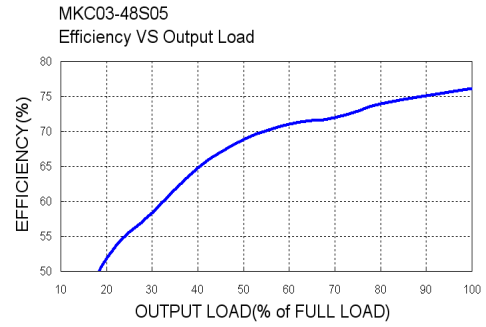
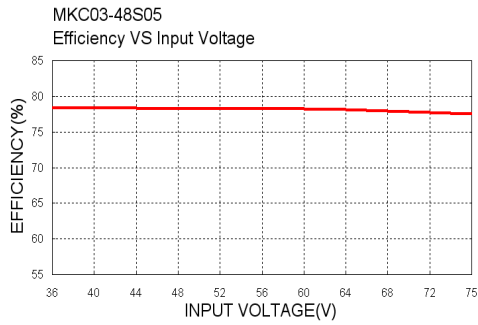
Model Number	Input Range	Output Voltage	Output Current		Output ⁽³⁾ Ripple & Noise	No load ⁽²⁾ Input Current	Eff ⁽³⁾ (%)	Capacitor ⁽⁴⁾ Load max
			Min. load	Full load				
MKC03-12S33	9 ~ 18 VDC	3.3 VDC	0mA	500mA	50mVp-p	8mA	74	2200μF
MKC03-12S05	9 ~ 18 VDC	5 VDC	0mA	500mA	50mVp-p	10mA	77	1000μF
MKC03-12S12	9 ~ 18 VDC	12 VDC	0mA	250mA	50mVp-p	13mA	79	220μF
MKC03-12S15	9 ~ 18 VDC	15 VDC	0mA	200mA	50mVp-p	13mA	80	150μF
MKC03-12D05	9 ~ 18 VDC	± 5 VDC	0mA	± 250mA	50mVp-p	13mA	75	± 470μF
MKC03-12D12	9 ~ 18 VDC	± 12 VDC	0mA	± 125mA	50mVp-p	16mA	80	± 100μF
MKC03-12D15	9 ~ 18 VDC	± 15 VDC	0mA	± 100mA	50mVp-p	16mA	80	± 68μF
MKC03-12DS05	9 ~ 18 VDC	V1:5 VDC;V2:5 VDC	0mA	V1:250mA;v2:250mA	50mVp-p	18mA	75	V1:470μF;V2:470μF
MKC03-12DS12	9 ~ 18 VDC	V1:12 VDC;V2:12 VDC	0mA	V1:125mA;V2:125mA	50mVp-p	18mA	80	V1:100μF;V2:100μF
MKC03-12DS15	9 ~ 18 VDC	V1:15 VDC;V2:15 VDC	0mA	V1:100mA;V2:100mA	50mVp-p	18mA	80	V1:68μF;V2:68μF
MKC03-24S33	18 ~ 36 VDC	3.3 VDC	0mA	500mA	50mVp-p	12mA	72	2200μF
MKC03-24S05	18 ~ 36 VDC	5 VDC	0mA	500mA	50mVp-p	12mA	74	1000μF
MKC03-24S12	18 ~ 36 VDC	12 VDC	0mA	250mA	50mVp-p	16mA	78	220μF
MKC03-24S15	18 ~ 36 VDC	15 VDC	0mA	200mA	50mVp-p	16mA	78	150μF
MKC03-24D05	18 ~ 36 VDC	± 5 VDC	0mA	± 250mA	50mVp-p	18mA	75	± 470μF
MKC03-24D12	18 ~ 36 VDC	± 12 VDC	0mA	± 125mA	50mVp-p	18mA	78	± 100μF
MKC03-24D15	18 ~ 36 VDC	± 15 VDC	0mA	± 100mA	50mVp-p	18mA	78	± 68μF
MKC03-24DS05	18 ~ 36 VDC	V1:5 VDC;V2:5 VDC	0mA	V1:250mA;V2:250mA	50mVp-p	16mA	75	V1:470μF;V2:470μF
MKC03-24DS12	18 ~ 36 VDC	V1:12 VDC;V2:12 VDC	0mA	V1:125mA;V2:125mA	50mVp-p	20mA	78	V1:100μF;V2:100μF
MKC03-24DS15	18 ~ 36 VDC	V1:15 VDC;V2:15 VDC	0mA	V1:100mA;V2:100mA	50mVp-p	20mA	78	V1:68μF;V2:68μF
MKC03-48S33	36 ~ 75 VDC	3.3 VDC	0mA	500mA	50mVp-p	8mA	76	2200μF
MKC03-48S05	36 ~ 75 VDC	5 VDC	0mA	500mA	50mVp-p	10mA	74	1000μF
MKC03-48S12	36 ~ 75 VDC	12 VDC	0mA	250mA	50mVp-p	10mA	79	220μF
MKC03-48S15	36 ~ 75 VDC	15 VDC	0mA	200mA	50mVp-p	10mA	79	150μF
MKC03-48D05	36 ~ 75 VDC	± 5 VDC	0mA	± 250mA	50mVp-p	10mA	74	± 470μF
MKC03-48D12	36 ~ 75 VDC	± 12 VDC	0mA	± 125mA	50mVp-p	12mA	77	± 100μF
MKC03-48D15	36 ~ 75 VDC	± 15 VDC	0mA	± 100mA	50mVp-p	12mA	77	± 68μF
MKC03-48DS05	36 ~ 75 VDC	V1:5 VDC;V2:5 VDC	0mA	V1:250mA;V2:250mA	50mVp-p	18mA	74	V1:470μF;V2:470μF
MKC03-48DS12	36 ~ 75 VDC	V1:12 VDC;V2:12 VDC	0mA	V1:125mA;V2:125mA	50mVp-p	18mA	77	V1:100μF;V2:100μF
MKC03-48DS15	36 ~ 75 VDC	V1:15 VDC;V2:15 VDC	0mA	V1:100mA;V2:100mA	50mVp-p	18mA	77	V1:68μF;V2:68μF

Note

1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. Typical value at nominal input and no load.
3. Typical value at nominal input and full load.
4. Test by minimum input and constant resistive load.
5. M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard.
6. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF/100V.

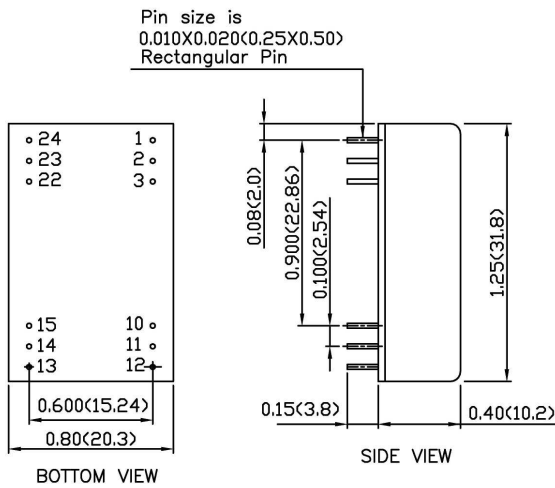
CAUTION: This power module is not internally fused. An input line fuse must always be used.



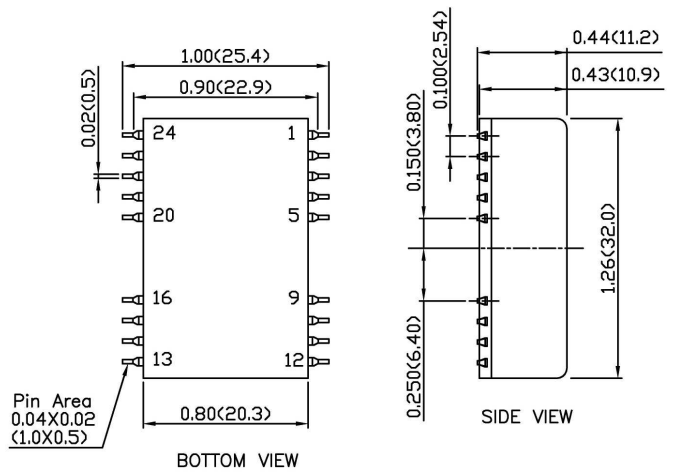


MECHANICAL DRAWING :

DIP TYPE



SMD TYPE



- All dimensions in Inch (mm)
Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
- Pin pitch tolerance ±0.01 (0.25)
- Pin dimension tolerance ±0.004 (0.1)

DIP PIN CONNECTION							
PIN	SINGLE	DUAL	DS	PIN	SINGLE	DUAL	DS
1	+INPUT	+INPUT	+INPUT	24	+INPUT	+INPUT	+INPUT
2	NC	-OUTPUT	- V1 out	23	NC	-OUTPUT	- V1 out
3	NC	COMMON	+ V1 out	22	NC	COMMON	+ V1 out
10	-OUTPUT	COMMON	- V2 out	15	-OUTPUT	COMMON	- V2 out
11	+OUTPUT	+OUTPUT	+ V2 out	14	+OUTPUT	+OUTPUT	+ V2 out
12	-INPUT	-INPUT	-INPUT	13	-INPUT	-INPUT	-INPUT

SMD PIN CONNECTION							
PIN	SINGLE	DUAL	DS	PIN	SINGLE	DUAL	DS
1	+INPUT	+INPUT	+INPUT	24	+INPUT	+INPUT	+INPUT
2	NC	-OUTPUT	- V1 out	23	NC	-OUTPUT	- V1 out
3	NC	COMMON	+ V1 out	22	NC	COMMON	+ V1 out
10	-OUTPUT	COMMON	- V2 out	15	-OUTPUT	COMMON	- V2 out
11	+OUTPUT	+OUTPUT	+ V2 out	14	+OUTPUT	+OUTPUT	+ V2 out
12	-INPUT	-INPUT	-INPUT	13	-INPUT	-INPUT	-INPUT
Others	NC	NC	NC				