



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)
- CE MARK MEETS 2006/95/EC, 2011/95/EC AND 2004/108/EC
- SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

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, automatics recovery	
GENERRALINPUT 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%	
Design meet safety standard		IEC60950-1, UL60950-1, EN60950-1	
Case material		Nickel-coated copper	
Base material		Non-conductive black plastic	
Potting material		Epoxy (UL94-V0)	
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)	BELLCORE TR-NWT-000332	3.069 x 10 ⁶ hrs	
	MIL-HDBK-217F	2.003 x 10 ⁶ hrs	

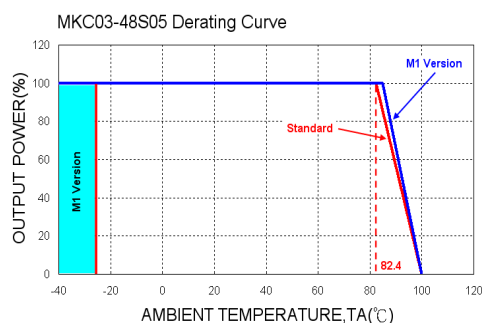
INPUT SPECIFICATIONS			
Input voltage range	12VDC nominal input	9 ~ 18VDC	
	24VDC nominal input	18 ~ 36VDC	
	48VDCnominal input	36 ~ 75VDC	
Input filter		Pi type	
Input surge voltage	12VDC input	36VDC	100ms,max.
	24VDC input	50VDC	100ms,max.
	48VDC input	100VDC	100ms,max.
Input reflected ripple current		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 ± 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

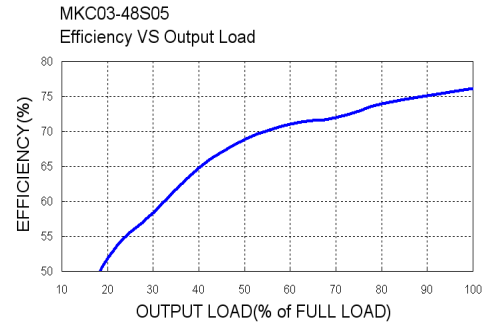
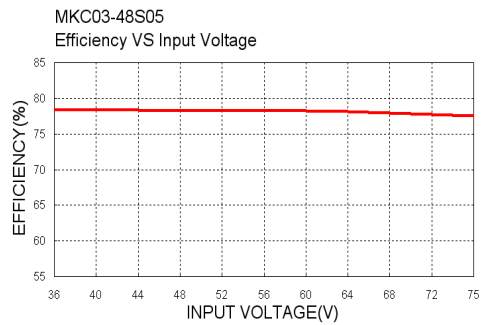
Model Number	Input Range	Output Voltage	Output Current		Output ⁽³⁾ Ripple & Noise	No load ⁽²⁾ Input Current	Eff ⁽³⁾ (%)	Capacitor ⁽⁴⁾ Load max
			Min. load	Full load				
MKC03-12S33	9 ~ 18 VDC	3.3 VDC	0mA	500mA	50mVp-p	8mA	74	2200μF
MKC03-12S05	9 ~ 18 VDC	5 VDC	0mA	500mA	50mVp-p	10mA	77	1000μF
MKC03-12S12	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

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment).
- Typical value at nominal input and no load.
- Typical value at nominal input and full load.
- Test by minimum input and constant resistive load.
- M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard.
- 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.

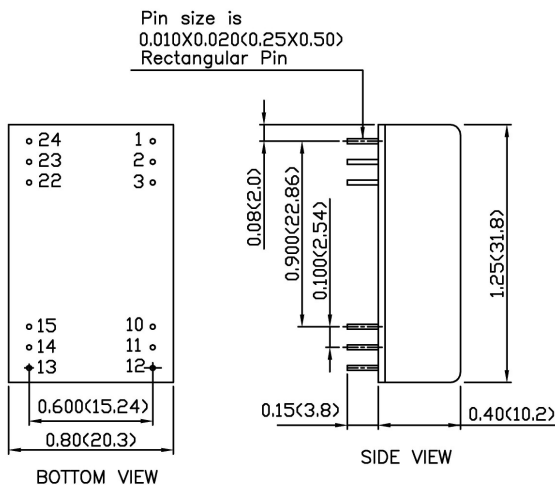
CAUTION: This power module is not internally fused. An input line fuse must always be used.



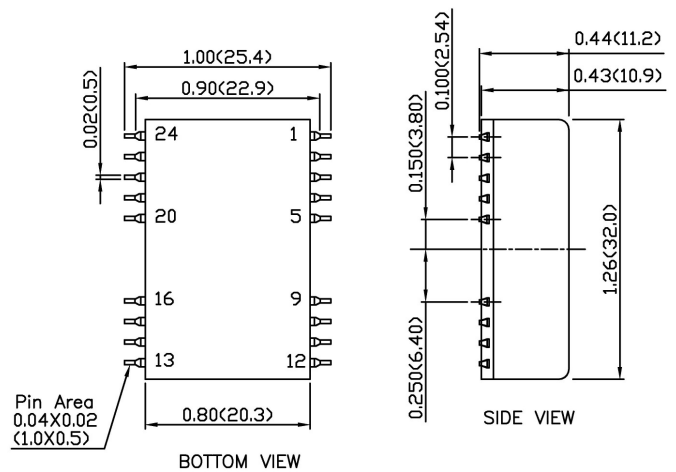


MECHANICAL DRAWING :

DIP TYPE



SMD TYPE



1. All dimensions in Inch (mm)
Tolerance: X.XX $\pm$ 0.02 (X.X $\pm$ 0.5)
X.XXX $\pm$ 0.01 (X.XX $\pm$ 0.25)
2. Pin pitch tolerance $\pm$ 0.01 (0.25)
3. Pin dimension tolerance $\pm$ 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				