



**APPLICATIONS**

Wireless Network  
Telecom/Datacom  
Industry Control System  
Measurement  
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, 93/68/EEC AND 2004/108/EC
- UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

**OPTIONS**

SMD TYPE, M1 TYPE

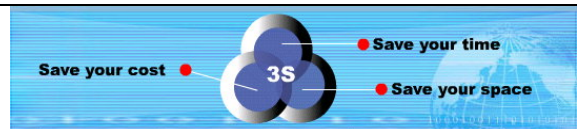
**DESCRIPTION**

The MKC03 series offer 3 watts of output power from a package in an IC compatible 24pin DIP configuration without derating to 71°C ambient temperature. MKC03 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	Full load and nominal Vin		± 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		200uS
Over load protection	% of FL at nominal input		180% typ
Short circuit protection		Continuous, automatics recovery	
GENERAL INPUT SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output to Case		500VDC, min
	DS type, Output to Output		500VDC, min
Isolation resistance			10 <sup>9</sup> ohms, min
Isolation capacitance			300pF, max
Switching frequency			300KHz, typ
Approvals and 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 <sup>6</sup> hrs
	MIL-HDBK-217F		2.003 x 10 <sup>6</sup> hrs

INPUT SPECIFICATIONS			
Input voltage range	12V nominal input		9 – 18VDC
	24V nominal input		18 – 36VDC
	48V nominal input		36 – 75VDC
Input filter			Pi type
Input surge voltage 100mS max	12V input		36VDC
	24V input		50VDC
	48V input		100VDC
Input reflected ripple current	Nominal Vin and full load		20mAp-p
Start up time	Nominal Vin and constant resistive load	Power up	350mS,max
ENVIRONMENTAL SPECIFICATIONS			
Operating temperature range	Standard		-25°C ~ +85°C (with derating)
	M1 (Note 6)		-40°C ~ +85°C (non-derating)
Maximum case temperature			100°C
Storage temperature range			-55°C ~ +105°C
Thermal impedance	Nature convection		20°C/Watt
Thermal shock			MIL-STD-810F
Vibration			10~55Hz, 10G, 30minutes along X,Y and Z
Relative humidity			5% to 95% RH
EMC CHARACTERISTICS			
EMI	EN55022		Class A
ESD	EN61000-4-2	Air	± 8KV
		Contact	± 6KV
Radiated immunity	EN61000-4-3		10 V/m Perf. Criteria A
Fast transient	EN61000-4-4		± 2KV Perf. Criteria B
Surge (Note 7)	EN61000-4-5		± 1KV Perf. Criteria B
Conducted immunity	EN61000-4-6		10 Vr.m.s Perf. Criteria A

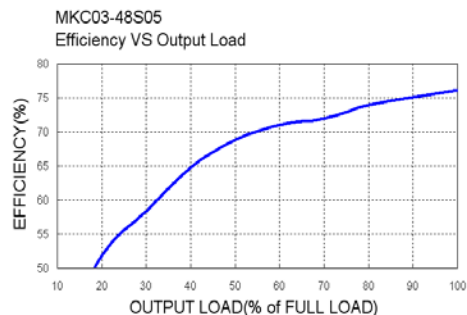
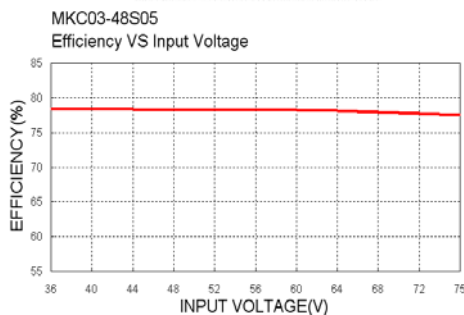
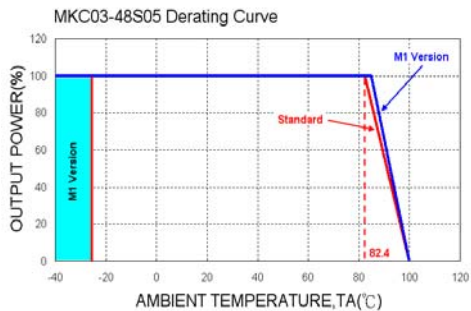




Model Number	Input Range	Output Voltage	Output Current		Output (4) Ripple & Noise	Input Current		Eff (4) (%)	Capacitor(5) Load max
			Min. load	Full load		No load(3)	Full load(2)		
MKC03-12S33	9 – 18 VDC	3.3 VDC	0mA	500mA	50mVp-p	8mA	196mA	74	2200uF
MKC03-12S05	9 – 18 VDC	5 VDC	0mA	500mA	50mVp-p	10mA	286mA	77	1000uF
MKC03-12S12	9 – 18 VDC	12 VDC	0mA	250mA	50mVp-p	13mA	333mA	79	220uF
MKC03-12S15	9 – 18 VDC	15 VDC	0mA	200mA	50mVp-p	13mA	329mA	80	150uF
MKC03-12D05	9 – 18 VDC	± 5 VDC	0mA	± 250mA	50mVp-p	13mA	293mA	75	± 470uF
MKC03-12D12	9 – 18 VDC	± 12 VDC	0mA	± 125mA	50mVp-p	16mA	329mA	80	± 100uF
MKC03-12D15	9 – 18 VDC	± 15 VDC	0mA	± 100mA	50mVp-p	16mA	329mA	80	± 68uF
MKC03-12DS05	9 – 18 VDC	V1:5 VDC;V2:5 VDC	0mA	V1:250mA;V2:250mA	50mVp-p	18mA	293mA	75	V1:470uF;V2:470uF
MKC03-12DS12	9 – 18 VDC	V1:12 VDC;V2:12 VDC	0mA	V1:125mA;V2:125mA	50mVp-p	18mA	329mA	80	V1:100uF;V2:100uF
MKC03-12DS15	9 – 18 VDC	V1:15 VDC;V2:15 VDC	0mA	V1:100mA;V2:100mA	50mVp-p	18mA	329mA	80	V1:68uF;V2:68uF
MKC03-24S33	18 – 36 VDC	3.3 VDC	0mA	500mA	50mVp-p	12mA	101mA	72	2200uF
MKC03-24S05	18 – 36 VDC	5 VDC	0mA	500mA	50mVp-p	12mA	149mA	74	1000uF
MKC03-24S12	18 – 36 VDC	12 VDC	0mA	250mA	50mVp-p	16mA	169mA	78	220uF
MKC03-24S15	18 – 36 VDC	15 VDC	0mA	200mA	50mVp-p	16mA	169mA	78	150uF
MKC03-24D05	18 – 36 VDC	± 5 VDC	0mA	± 250mA	50mVp-p	18mA	147mA	75	± 470uF
MKC03-24D12	18 – 36 VDC	± 12 VDC	0mA	± 125mA	50mVp-p	18mA	169mA	78	± 100uF
MKC03-24D15	18 – 36 VDC	± 15 VDC	0mA	± 100mA	50mVp-p	18mA	169mA	78	± 68uF
MKC03-24DS05	18 – 36 VDC	V1:5 VDC;V2:5 VDC	0mA	V1:250mA;V2:250mA	50mVp-p	16mA	147mA	75	V1:470uF;V2:470uF
MKC03-24DS12	18 – 36 VDC	V1:12 VDC;V2:12 VDC	0mA	V1:125mA;V2:125mA	50mVp-p	20mA	169mA	78	V1:100uF;V2:100uF
MKC03-24DS15	18 – 36 VDC	V1:15 VDC;V2:15 VDC	0mA	V1:100mA;V2:100mA	50mVp-p	20mA	169mA	78	V1:68uF;V2:68uF
MKC03-48S33	36 – 75 VDC	3.3 VDC	0mA	500mA	50mVp-p	8mA	48mA	76	2200uF
MKC03-48S05	36 – 75 VDC	5 VDC	0mA	500mA	50mVp-p	10mA	75mA	74	1000uF
MKC03-48S12	36 – 75 VDC	12 VDC	0mA	250mA	50mVp-p	10mA	84mA	79	220uF
MKC03-48S15	36 – 75 VDC	15 VDC	0mA	200mA	50mVp-p	10mA	84mA	79	150uF
MKC03-48D05	36 – 75 VDC	± 5 VDC	0mA	± 250mA	50mVp-p	10mA	75mA	74	± 470uF
MKC03-48D12	36 – 75 VDC	± 12 VDC	0mA	± 125mA	50mVp-p	12mA	86mA	77	± 100uF
MKC03-48D15	36 – 75 VDC	± 15 VDC	0mA	± 100mA	50mVp-p	12mA	86mA	77	± 68uF
MKC03-48DS05	36 – 75 VDC	V1:5 VDC;V2:5 VDC	0mA	V1:250mA;V2:250mA	50mVp-p	18mA	75mA	74	V1:470uF;V2:470uF
MKC03-48DS12	36 – 75 VDC	V1:12 VDC;V2:12 VDC	0mA	V1:125mA;V2:125mA	50mVp-p	18mA	86mA	77	V1:100uF;V2:100uF
MKC03-48DS15	36 – 75 VDC	V1:15 VDC;V2:15 VDC	0mA	V1:100mA;V2:100mA	50mVp-p	18mA	86mA	77	V1:68uF;V2:68uF

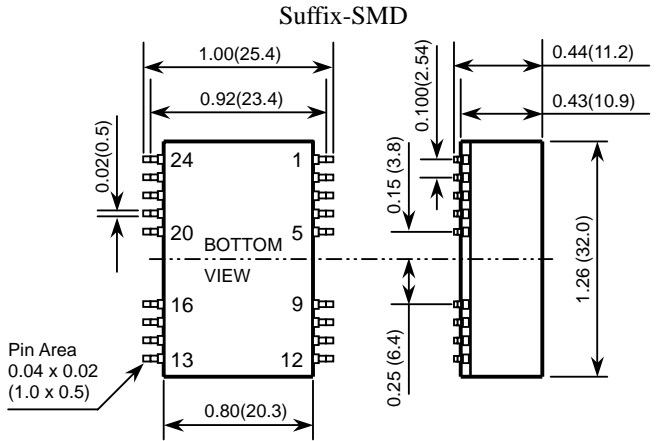
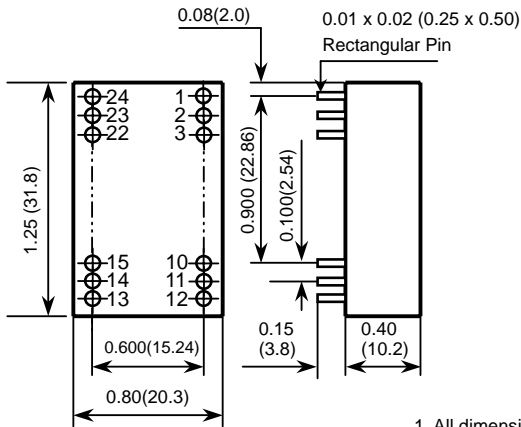
**Note**

- 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).
- Maximum value at nominal input voltage and full load of standard type.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.
- M1 version is more efficient, therefore, it can be operated in a more extensive temperature range than standard.
- An external filter capacitor is required if the module has to meet EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220 μ F/100V, ESR 48mΩ.





**3 WATTS  
DC-DC CONVERTER**



1. All dimensions in Inches (mm)  
Tolerance: X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

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

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	Others	NC	NC	NC