



## KC24AH Series

### PWM DIM CONSTANT CURRENT OUTPUT LED DRIVER

RoHS

#### FEATURES

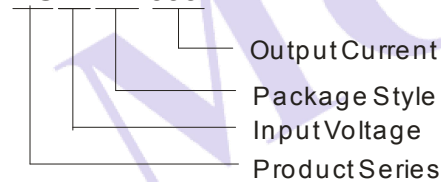
- High efficiency up to 96%
- Constant current output
- Power LED driver
- Wide input voltage range
- PWM dimming
- Remote ON/OFF
- Short circuit protection

#### APPLICATIONS

The KC24AH Series is a step-down constant current source designed for driving high power LEDs. The output currents available is 600mA. The KC24AH series is fully featured with very high efficiency, wide input voltage range, high ambient operating temperature, PWM dimming and Remote ON/OFF.

#### MODEL SELECTION

KC24AH-600



#### PRODUCT PROGRAM

Part Number	Input Voltage(V)		Output		Dimming control	Efficiency (% ,max)
	Nominal	Range	Voltage (VDC)	Current (mA)		
KC24AH-600	24	6.5-36	2-30	0-600	PWM	96

#### COMMON SPECIFICATIONS

Item	Test condition	Min.	Typ.	Max.	Units
Utmost input voltage	≤10 seconds	5.5		40	VDC
Recommended input voltage		6.5	24	36	
Input filter		Capacitor(2μF)			
Output voltage range	Vin=36V	2		30	VDC
Input-output voltage drop		4.5		6.5	
Output current range	See the selection guide ,while Vin-Vout>4.5V				
Output current accuracy	Vin=24V, 5 LEDs		±7	±12	%
Output current stability	Vin=24V, 1LED to 5 LEDs		±8	±15	
Temperature coefficient	-40 °C to+71 °C ambient			± 0.03	%/°C
Efficiency at full load				96	%
Short circuit protection	Continuous				
Operating temperature range		-40		71	°C
Storage temperature range		-55		125	
Maximum case temperature				100	
Maximum capacitive Load		470			μF
MTBF	MIL-HDBK-217F(+25°C)	2,000,000			Hours
Case Material	Plastic (UL94-V0)				
Dimensions		22.8*10.2*9.5			mm
Weight		3.5			g

#### PWM Dimming and ON/OFF Control (let it open if not use)

Remote ON/OFF	ON	Open or 2.8V<Vc<6V			
	OFF(shutdown)	Vc<0.6V			
Remote pin current	Vc=5V			1	mA
Quiescent input current in Shutdown mode	Vin=24V, Vc <0.6V			400	μA
PWM frequency			0.2	10	KHz

#### MORNSUN Science & Technology Co.,Ltd.

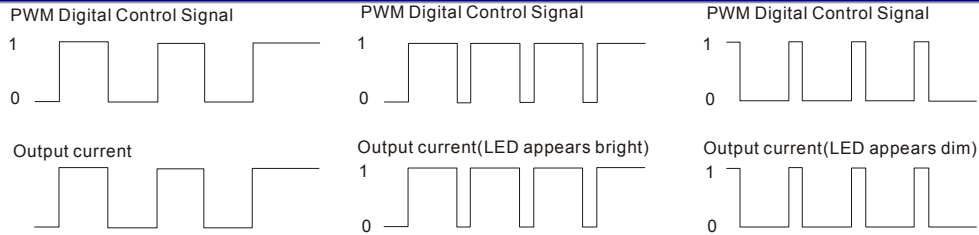
Address: No. 5, Kehui St. 1, Kehui development center, Science Ave., Guangzhou Science City, Luogang district, Guangzhou, P.R.China.

Tel: 86-20-38601850

Fax: 86-20-38601272

[Http://www.mornsun-power.com](http://www.mornsun-power.com)

## DIGITAL DIMMING CONTROL



This is a PWM type digital dimming, which you can control the output current by adjusting the pulse width of the PWM signal.

$$I_{o\_set} = I_{o\_nom} \times D$$

$I_{o\_set}$  refers to the wanted output current value.

$I_{o\_nom}$  refers to the rated output current

$D$  refers to the pulse width of the PWM signal

For example: we assume the rated output current is 600mA and wanted output current is 300mA, then the pulse width should be 0.5 from the equation above. That is say if we keep the pulse width of PWM signal at 0.5, the output current will be kept at 300mA. It is natural for the driver to generate a audibly noise in dimming process, because the frequency of the control circuit is within human audibly range (20Hz~20KHz). In order to avoid the human eye can observe the LED flashes, the PWM dimming frequency is recommended to set above 100Hz.

## TYPICAL APPLICATION CIRCUITS

### PWM Dimming control circuit

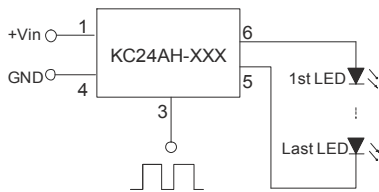


Figure 1

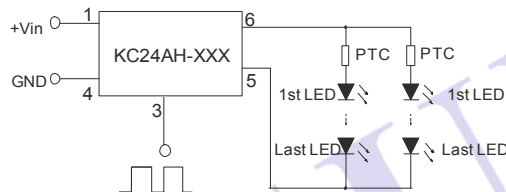
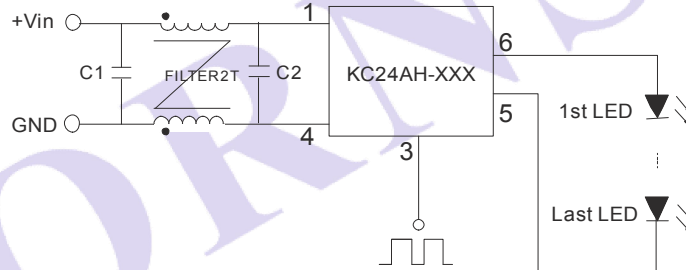


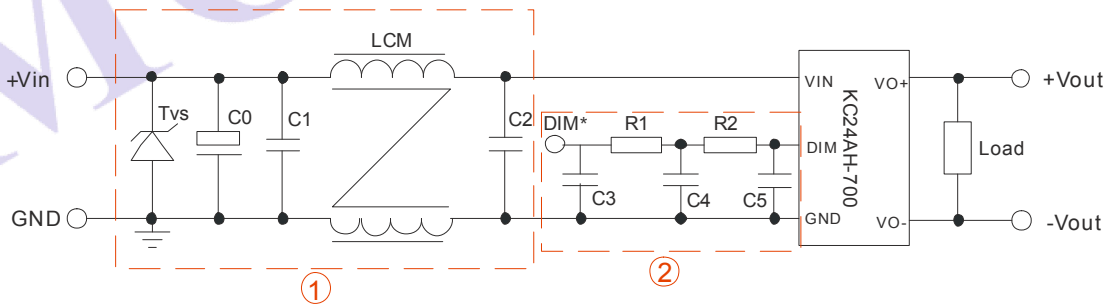
Figure 2

In actual use, if necessary to protect LED, a PTC of positive temperature coefficient may be connect to the input end of every channel or all channels, as shown in Figure 2.

## EMC RECOMMENDED CIRCUIT



(Figure 3) EMI filter circuit



(Figure 4) EMI/RFI conducted EN55015 recommended circuit

Note: 1. DIM pin is the module's PWM dimming pin as shown in Figure 4.

2. While adding circuit ②, it may extend the PWM dimming output reaction time.

EMC level:

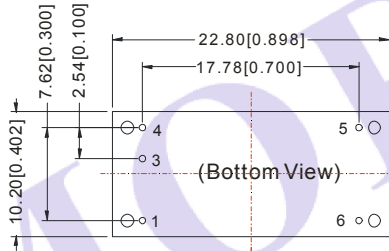
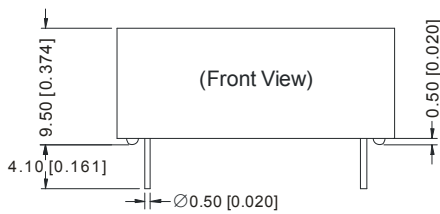
Item	Standard	Level	Predicate	Remark
EMI conducted	EN 55015	Power port	Qualification	Add external circuit ①
ESD	IEC61000-4-2:2001	Level 2	perf. Criteria B	±4KV Add external circuit ②
Surge	IEC61000-4-5:2004	Level 2	perf. Criteria B	±1KV Add external circuit ①
EFT	IEC61000-4-4:2004	Level 2	perf. Criteria B	±1KV Add external circuit ①

Recommended parameter:

Components	Specifications
Tvs	SMCJ48A,1500W (Bringtking)
LCM	UU9.8P4M15-00 (15mH) (Emei)
C0	470µF/50V (CapXon)
C1	4.7µF/50V 1210 (TORCH)
C2	1.0µF/50V 1210 (TORCH)
C3	470pF/100V 0805 (TORCH)
C4	270pF/100V 0805 (TORCH)
C5	100pF/100V 0805 (TORCH)
R1、R2	680Ω 0805(can replaced by inductance or magnetic bead)

**OUTLINE DIMENSIONS & PIN CONNECTIONS**

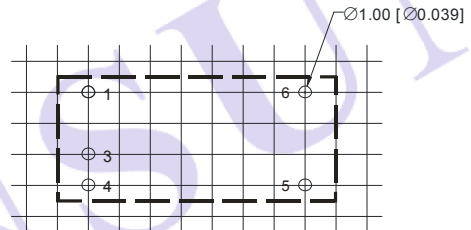
MECHANICAL DIMENSIONS



FOOTPRINT DETAILS		
Pin	Function	Comments
1	Vin	DC Supply
3	ON/OFF/PWM	Leave open if not use
4	GND	Do not connect to -Vout
5	-Vout	LED Cathode connection
6	+Vout	LED Anode connection

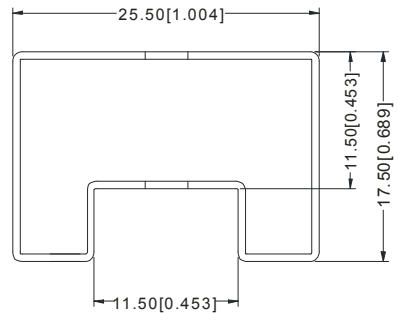
Note:  
Unit: mm[inch]  
Pin diameter tolerances: ±0.10mm[±0.004inch]  
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT



Note:  
grid: 2.54\*2.54mm.

TUBE OUTLINE DIMENSIONS



Note:  
Unit: mm[inch]  
General tolerances:±0.5mm[±0.020inch]  
L=530mm[20.866inch] Devices per tube quantity: 50pcs  
L=220mm[8.661inch] Devices per tube quantity: 20pcs  
Short tube inner packaging dimensions: L\*W\*H=255\*170\*80mm  
Short tube outer packaging dimensions(with six inner packaging boxes): L\*W\*H=375\*280\*270mm  
Long tube inner packaging dimensions: L\*W\*H=580\*200\*100mm  
Long tube outer packaging dimensions(with two inner packaging boxes): L\*W\*H=600\*215\*220mm  
Long tube outer packaging dimensions(with three inner packaging boxes): L\*W\*H=600\*215\*325mm

Note:

1. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. In this datasheet, all the test methods of indications are based on corporate standards.