

KC24W Series

CONSTANT CURRENT GREAT POWER BUCK LED DRIVER



FEATURES

- High efficiency up to 96%
- Ultra wide range voltage input (5.5-48 VDC)
- Drive current: 300/350/500/600/700mA
- Output Power: 10/12/18/21/25W
- Output current accuracy ($\pm 2\%$)
- Output current stability ($\pm 1\%$)
- Low Ripple & Noise ($<100\text{mV}$)
- With large capacitive loads
- PWM dimming & Analogue dimming
- Remote ON/OFF
- Continuous short circuit protection
- AC-DC, EMC recommended circuit
- Lead wire package, simple and convenient
- Waterproof Level: IP67
- RoHS Compliance

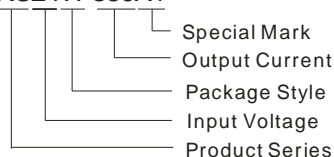
APPLICATIONS

KC24W series is a high-power LED driver design for the step-down constant current source. With high efficiency, wide input voltage range, high-temperature environment, functional and so on. Contains a PWM dimming, analog dimming and remote shutdown capabilities.

Backlight and can be widely used in 12V, 24V, 36V, 48V landscape lighting, special lighting controls, commercial lighting, street lighting, home lighting, automotive lighting and other lighting systems. Use of lead type package, allowing customers to use more convenient.

MODEL SELECTION

KC24W-350X1



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PRODUCT PROGRAM

Part Number	Input Voltage(VDC)		Output		Dimming control	Efficiency (%)
	Normal	Range	Voltage (VDC)	Current (mA)		
*KC24W-300(X1/X2/X3)	24	5.5-48	3.3-36	0-300	PWM+Analogue	96
KC24W-350(X1/X2/X3)	24	5.5-48	3.3-36	0-350	PWM+Analogue	96
KC24W-500(X1/X2/X3)	24	5.5-48	3.3-36	0-500	PWM+Analogue	96
*KC24W-600(X1/X2/X3)	24	5.5-48	3.3-36	0-600	PWM+Analogue	96
KC24W-700(X1/X2/X3)	24	5.5-48	3.3-36	0-700	PWM+Analogue	96

Note:

1. *** Designing.
2. The types without suffix, such as KC24W-300 are four-wire products without analogue dimming+PWM dimming function.
3. The types with suffix X1, such as KC24W-300X1 are five-wire products with analogue dimming function only.
4. The types with suffix X2, such as KC24W-300X2 are five-wire products with PWM dimming function only.
5. The types with suffix X3, such as KC24W-300X3 are six-wire products with analogue dimming+PWM dimming function.

COMMON SPECIFICATIONS

Item	Test condition	Min.	Typ.	Max.	Units
Utmost input voltage	≤ 10 seconds	5		55	VDC
Recommended input voltage		5.5	24	48	
Input filter		Capacitor			
Output voltage range	$V_{in}=48V$	3.3		36	VDC
Input-Output voltage drop	$V_{in}=48V$, 1~10 LEDs	2			
Output current range	See the product program				
Output current accuracy			± 2	± 3	%
Output current stability	$V_{in}=48V$, $V_o=3.3V\sim 36V$			± 1	%
Internal power dissipation	$V_{in}=24V$, 5LEDs			700	mW
Temperature coefficient	$-40^{\circ}C$ to $+71^{\circ}C$ ambient			± 0.015	%/ $^{\circ}C$
Efficiency				96	%
Ripple & Noise (Vp-p)	$V_{in}=48V$, 1~10LEDs			100	mV
Short circuit protection		Continuous, automatic recovery			
Operating temperature range	300mA / 350mA	-40		85	$^{\circ}C$
	500mA / 600mA / 700mA	-40		71	
Storage temperature range		-55		125	
Lead temperature	≤ 10 seconds			265	
Maximum case temperature				100	
Thermal resistance			60		$^{\circ}C/W$
Maximum capacitive Load			1000		μF
Operating frequency range		320	370	420	kHz
MTBF	MIL-HDBK-217F($+25^{\circ}C$)		1,500,000		Hours
Case Material		Plastic (UL94-V0)			
Dimensions		22.10*12.55*9.10			mm
Weight	four-wire products		7.1		g
	five-wire products		7.6		
	six-wire products		8.2		

PWM Dimming and ON/OFF Control (leave open if not used)

Remote ON/OFF	ON	Open or $2.8V < V_c < 6V$			
	OFF(shutdown)	$V_c < 0.6V$			
Remote pin current	$V_c=5V$			1	mA
Quiescent input current in shutdown mode	$V_{in}=24V$, $V_c < 0.6V$		400		μA
PWM frequency				200	Hz

Analogue dimming (leave open if not used)

Input voltage range	$V_{in}=5.5-48V$	0-15V			
Output current range	$V_{in}=5.5-48V$	0%-100%			
Control voltage range	Full on	0.2V \pm 50mV			
	Full off	4.5V \pm 200mV			
Driving current	$V_c=5V$	0.2mA(max)			

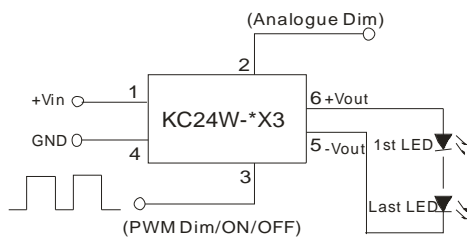
EMC SPECIFICATIONS

EMI/RFI conducted		EN55022, CLASS B(refer to Figure 6)	
ESD	KC24W-*(X1)	IEC/EN 61000-4-2	level 3 (6KV/8KV)
	KC24W-*(X2/X3)	IEC/EN 61000-4-2	level 1 (2KV/4KV)
Radiated Immunity		IEC/EN 61000-4-3	level 3 (10V/m)
EFT		IEC/EN 61000-4-4	level 3 ($\pm 2KV$) (refer to Figure 5)
Surge		IEC/EN 61000-4-5	level 3 ($\pm 1KV$) (refer to Figure 5)
Conducted Immunity		IEC/EN 61000-4-6	level 3 (10Vr.ms)

INPUT VS OUTPUT

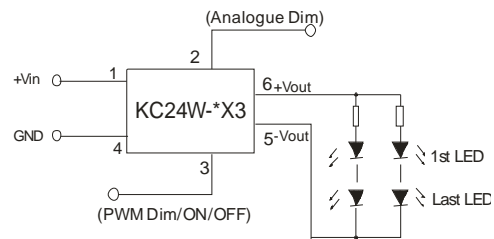
Input voltage(VDC)	Output voltage range(VDC)	Output constant current (mA)	Output power (W Max)	Input voltage (VDC)	Output voltage range(VDC)	Output constant	Output power (W Max)
48	3.3-36.0	300	10.80	48	3.3-36.0	350	12.60
36	3.3-32.0	300	9.60	36	3.3-32.0	350	11.20
24	3.3-21.0	300	6.30	24	3.3-21.0	350	7.35
20	3.3-17.0	300	5.10	20	3.3-17.0	350	5.95
15	3.3-13.2	300	3.96	15	3.3-13.2	350	4.62
12	3.3-10.0	300	3.00	12	3.3-10.0	350	3.50
5.5	3.3-4.0	300	1.20	5.5	3.3-4.0	350	1.40
48	3.3-36.0	500	18.00	48	3.3-36.0	600	21.60
36	3.3-32.0	500	16.00	36	3.3-32.0	600	19.20
24	3.3-21.0	500	10.50	24	3.3-21.0	600	12.60
20	3.3-17.0	500	8.50	20	3.3-17.0	600	10.20
15	3.3-13.2	500	6.60	15	3.3-13.2	600	7.92
12	3.3-10.0	500	5.00	12	3.3-10.0	600	6.00
5.5	3.3-4.0	500	2.00	5.5	3.3-4.0	600	2.40
48	3.3-36.0	700	25.20				
36	3.3-32.0	700	22.40				
24	3.3-21.0	700	14.70				
20	3.3-17.0	700	11.90				
15	3.3-13.2	700	9.24				
12	3.3-10.0	700	7.00				
5.5	3.3-4.0	700	2.80				

TYPICAL APPLICATION CIRCUITS



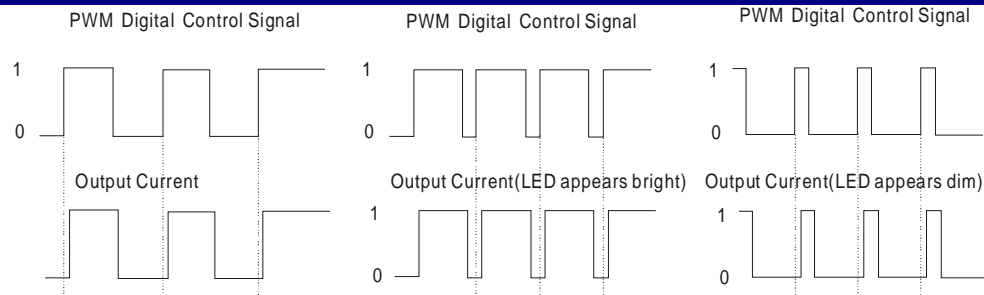
(Figure 1) Series Application

If it is necessary to protect LED in actual application, you could connect a PTC to the input of every channel or all channels, as shown in Figure 2.
Note: The negative output terminal can't connect GND, or the module may be damaged.



(Figure 2) Parallel-series Application

DIGITAL DIMMING CONTROL



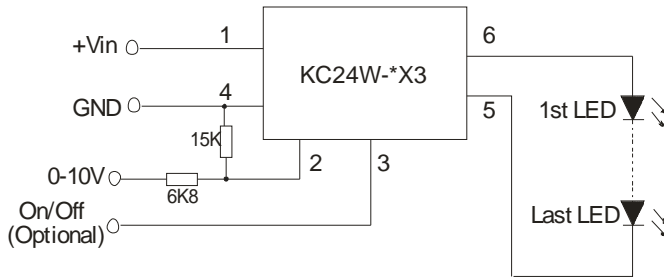
For the rated frequency PWM dimming, the output current of driver matters to the pulse width of the PWM signal, and the numerate please refer to the following formula:

$$I_{o_set} = \frac{(DT-0.8)}{T} I_{o_norm}$$

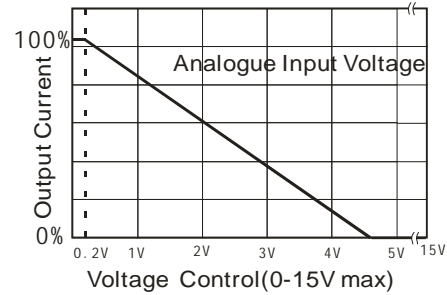
I_{o_set} refers to the expected output current value (mA), I_{o_norm} refers to the rated output current (mA),
D refers to the pulse width of the PWM signal (%), T refers to the cycle of the PWM signal (S).

Note: The formula only supplies as a reference, and the output current may be a little deviation with different load. The $T_{on(min)}$ of PWM signal must be greater than 0.8ms, or the driver can't be operated normally. It is natural for the driver to generate an audibly noise in dimming process, because the frequency of the control circuit is within human audibly range (20Hz~20KHz).

ANALOGUE DIMMING CONTROL AND APPLICATION EXAMPLE



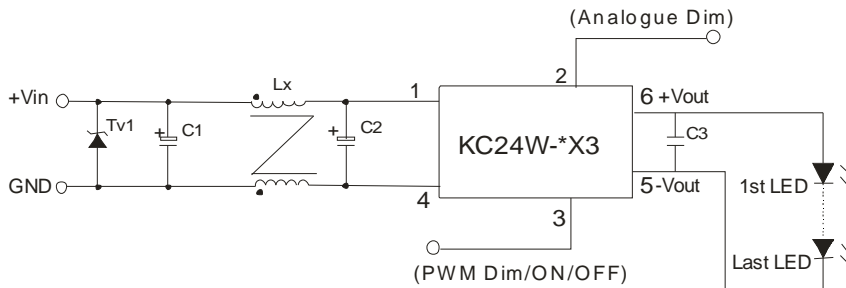
(Figure 3) Analogue dimming circuit



(Figure 4) Analogue input voltage VS output

EMC RECOMMENDED CIRCUIT

RECOMMENDED PARAMETER

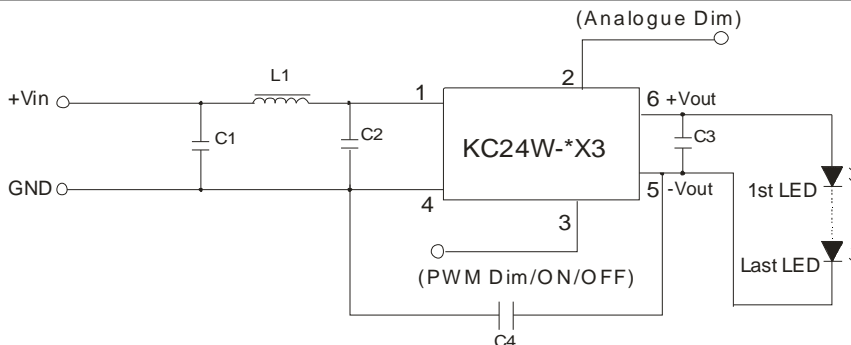


(Figure 5) EFT& Surge recommended circuit

Components	Specifications
Lx	9.6mH, Work mode choke, 40T, Emei
C1	1000μF, Electrolytic capacitor, KF102M0351250, CapXon
C2	1000μF, Electrolytic capacitor, KF102M0351250, CapXon
C3	GRM21BR71C105KA01 (MURATA)
Tv1	SMC51A, 1500W, Bringtking

Table 1

(Figure 5) Recommended parameter

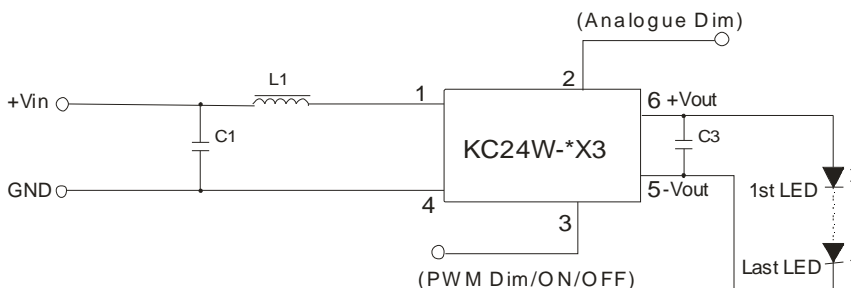


(Figure 6) EMI/RFI conducted EN55022 Class B recommended circuit

Components	Specifications
C1	225K/50V, capacitor 1210 × 7R, TORCH
C2, C4	104K/50V, capacitor 1210 × 7R, TORCH
L1	PI043-131MT Inductance, SHENZHEN CEAIYA
C3	GRM21BR71C105KA01 (MURATA)

Table 2

(Figure 6) Recommended parameter



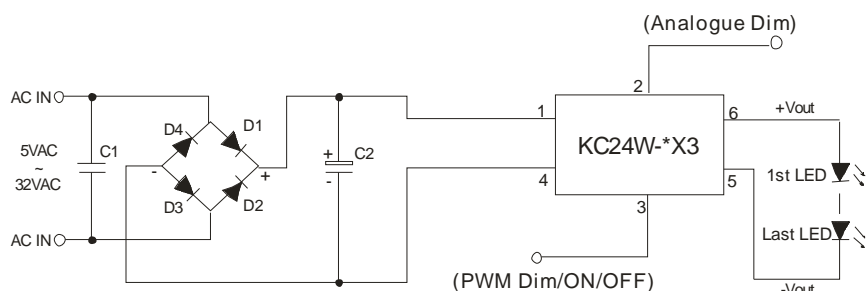
(Figure 7) EMI/RFI conducted EN55022 Class A recommended circuit

Components	Specifications
L1	CD53-33 μH Inductance, SHENZHEN CEAIYA
C1	105K/50V, capacitor 1210 × 7R, TORCH
C3	GRM21BR71C105KA01 (MURATA)

Table 3

(Figure 7) Recommended parameter

AC INPUT RECOMMENDED CIRCUIT



(Figure 8)

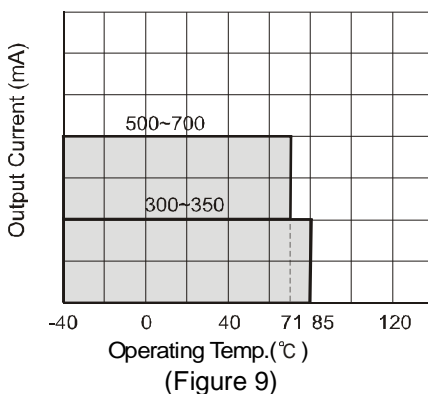
Components	Specifications
C1	X1 Safety capacitor, 0.1μF /300VAC, X1 104K/3000VAC(QIYA)
C2	100μF /63V Electrolytic capacitor, Φ10×16 (Flat surface), KF101M063G160A, CapXon
D1, D2, D3, D4	Rectifier diode IN4007 1A/1000V D0-41(PANJIT)

Table 4

(Figure 8) Recommended parameter

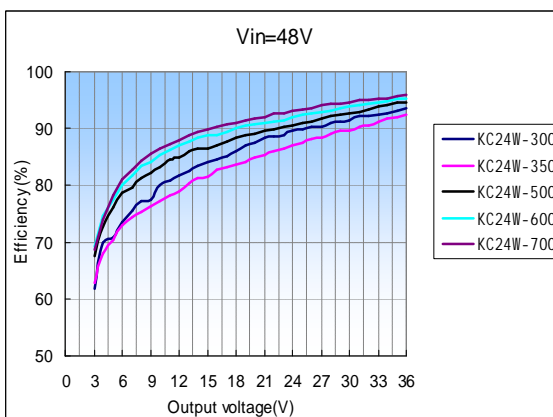
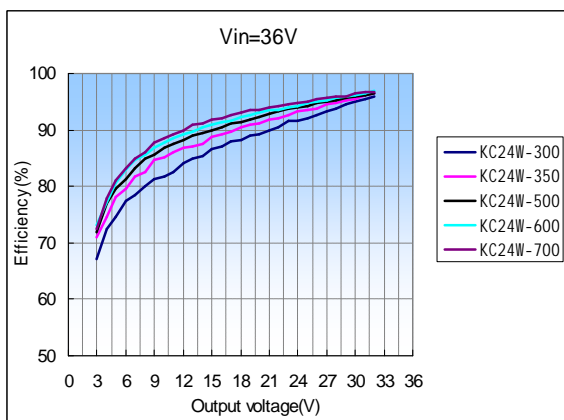
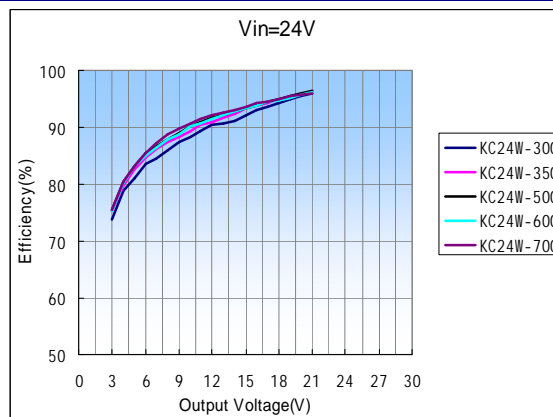
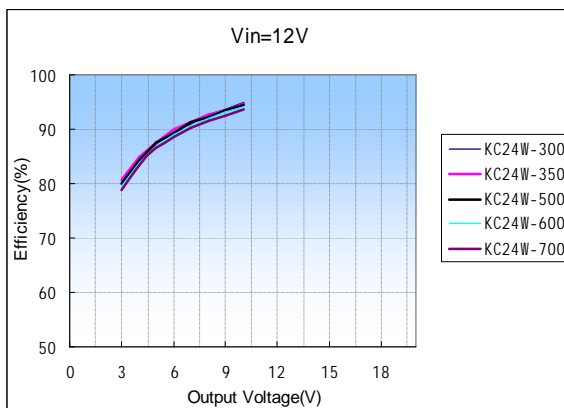
TYPICAL TEMPERATURE CURVE

Temperature Derating Graph

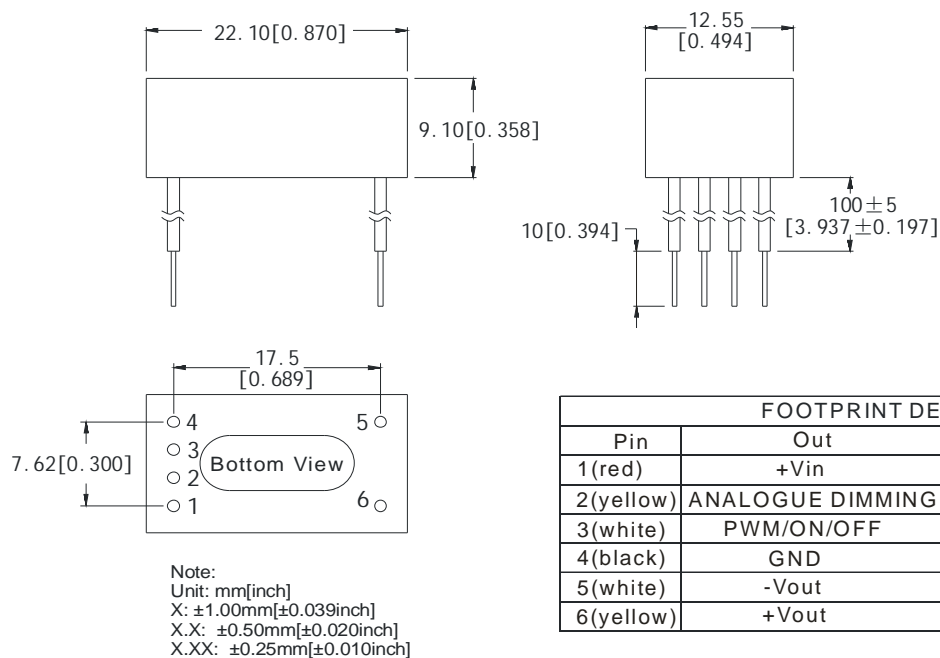


(Figure 9)

CHARACTERISTICS CURVE

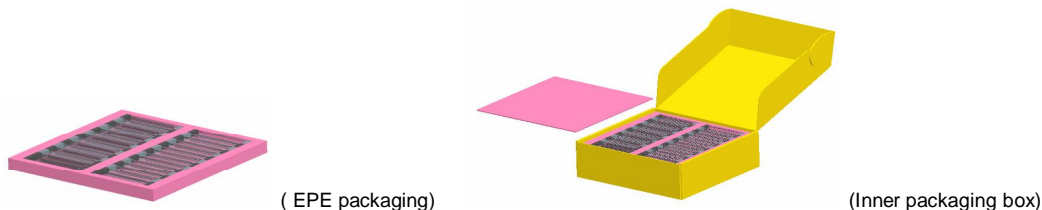


OUTLINE DIMENSIONS & PIN CONNECTIONS



Note:
Lead internal diameter: 0.76mm;
Lead external diameter: 1.60mm;
Lead dimensions: UL1569 300V 105 °C

PACKAGE DIAGRAM



EPE packaging dimensions: L*W*H=340*340*22.5 mm
Packaging quantity: 56pcs
Inner packaging box dimensions: L*W*H=365*350*105mm
Packaging quantity: 224pcs
Outer packaging box dimensions: L*W*H=390*360*245 mm
Packaging quantity: 448pcs

Note:

1. Operation under minimum output voltage will not damage the converter; However, they may not meet all specification listed.
2. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. Only typical models listed, other models may be different, please contact our technical person for more details.
4. In this datasheet, all the test methods of indications are based on corporate standards.