



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(<100mV)
- With large capacitive loads(1000 μ F)
- 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

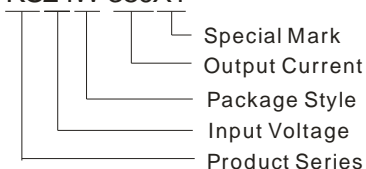
APPLICATIONS

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.

It can be widely used in backlight and 12V, 24V, 36V 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

Model	Input Voltage(VDC)		Output		Dimming control	Efficiency (% ,max)
	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. The types without suffix, such as KC24W-300 are four-wire products without analogue dimming+PWM dimming function.
2. The types with suffix X1, such as KC24W-300X1 are five-wire products with analogue dimming function only.
3. The types with suffix X2, such as KC24W-300X2 are five-wire products with PWM dimming function only.
4. 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(1 μ F)			
Output voltage range	Vin=48V	3.3		36	VDC
Input-Output voltage drop	Vin=5.5~48V, 1~10LEDs	2		4	
Output current range	See the product program				
Output current accuracy			± 2	± 5	%
Output current stability	Vin=48V, Vo=3.3V~36V			± 1	
Internal power dissipation	Vin=24V, 5LEDs			700	mW
Temperature coefficient	-40 °C to+71 °C ambient			± 0.015	%/°C
Efficiency				96	%
Ripple & Noise (Vp-p)	Vin=48V, 1~ 10LEDs			100	mV
Short circuit protection		Continuous, automatic recovery			
Operating temperature range	300mA / 350mA	-40		85	°C
	500mA/ 600mA/ 700mA	-40		71	
Storage temperature range		-55		105	
Lead temperature	≤ 10 seconds			265	
Maximum case temperature				100	
Thermal resistance			60		°C/W
Maximum capacitive Load			1000		μ F
Operating frequency range		320	370	420	kHz
MTBF	MIL-HDBK-217F(+25°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

(The Pin internal 1 μ A constant current source, leave open if not used)

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	μ A
PWM frequency			200	Hz

Analogue dimming (leave open if not used)

Input voltage range	Vin=5.5-48V	0-15V		
Output current range	Vin=5.5-48V	0%-100%		
Control voltage range	Full on	0.2V \pm 50mV		
	Full off	4.5V \pm 200mV		
Driving current	Vc=5V	0.6mA(max)		

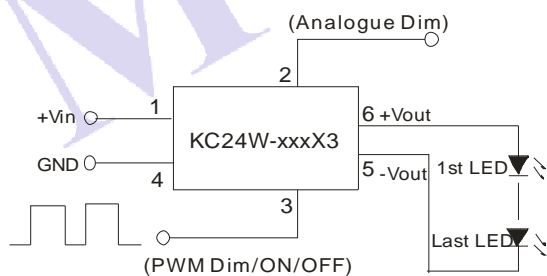
EMC SPECIFICATIONS

EMI conducted		EN55015 CISPR22 class B power port(refer to Figure 5)
RFI conducted		EN55015 CISPR22 class B (refer to Figure 5)
ESD	KC24W-xxxX2/X3	IEC/EN 61000-4-2 contact±2KV perf. Criteria B (contact±6KV refer to Figure 5)
	KC24W-xxx(X1)	IEC/EN 61000-4-2 contact±6KV perf. Criteria B
R/S		IEC/EN 61000-4-3 10V/m perf. Criteria A
EFT		IEC/EN 61000-4-4 ±1KV perf. Criteria B (refer to Figure 5)
Surge		IEC/EN 61000-4-5 ±1KV perf. Criteria B (refer to Figure 5)
C/S		IEC/EN 61000-4-6 10Vr.ms perf. Criteria A

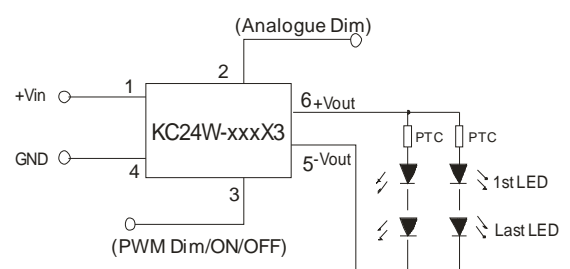
INPUT VS OUTPUT

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



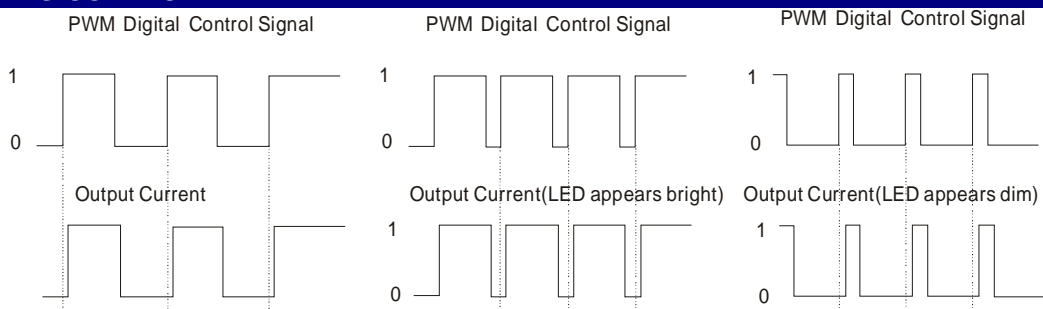
(Figure 1) Series Application



(Figure 2) Parallel-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.

DIGITAL DIMMING CONTROL



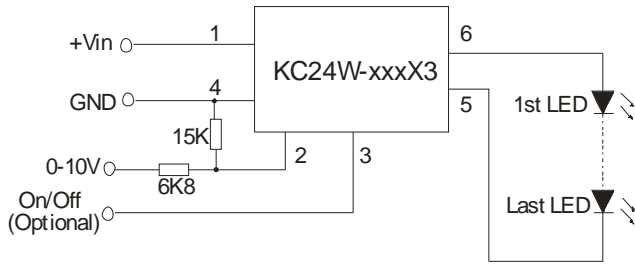
For the rated frequency PWM dimming, the output current of driver matters to the pulse width of the PWM signal, and the numerate please refer to the following formula:

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

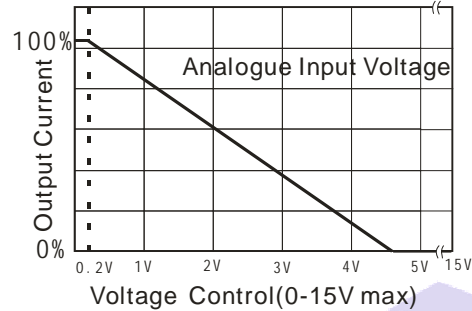
I_{o_set} refers to the expected output current value (mA), I_{o_norm} refers to the rated output current (mA), D refers to the pulse width of the PWM signal (%), T refers to the cycle of the PWM signal (S).

Note: The formula only supplies as a reference, and the output current may be a little deviation with different load. The Ton(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). In order to avoid the human eye can observe the LED flashes, the PWM dimming frequency is recommended to set above 100Hz.

ANALOGUE DIMMING CONTROL AND APPLICATION EXAMPLE



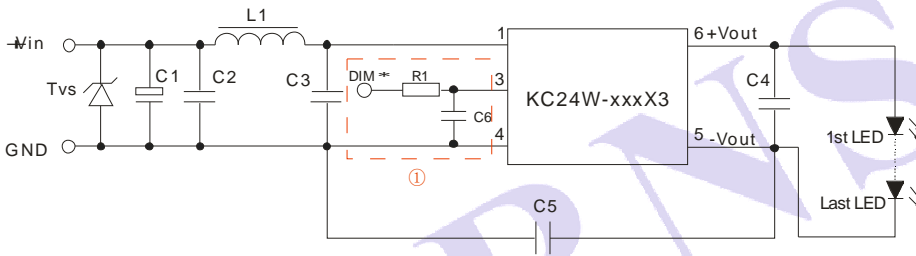
(Figure 3) Analogue dimming circuit



(Figure 4) Analogue input voltage VS output

EMC RECOMMENDED CIRCUIT

RECOMMENDED PARAMETER



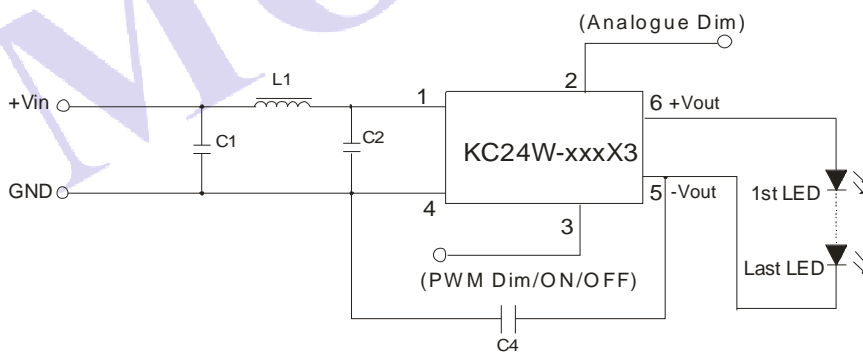
(Figure 5) EMI/EMC recommended circuit

Note: The ESD level of pin 3(PWM dimming pin) is $\pm 2KV$, While adding recommended circuit ①, it can reach to $\pm 6KV$.

Components	Specifications
Tvs	SMC51A,1500W(Bringtking)
L1	CD53-82μH (CEAIYA)
C1	470μF/100V (CapXon)
C2	225K/50V 1210 X7R (TORCH)
C3	104K/50V 0805 X7R (TORCH)
C4	105K/50V 1210 X7R (TORCH)
C5	102K/2000V 1210 (TDK) (choose)
C6	470pF/100V 0805 (TORCH)
R1	680Ω 0805(can replaced by inductance or magnetic bead)

Table 1

(Figure 5) Recommended parameter

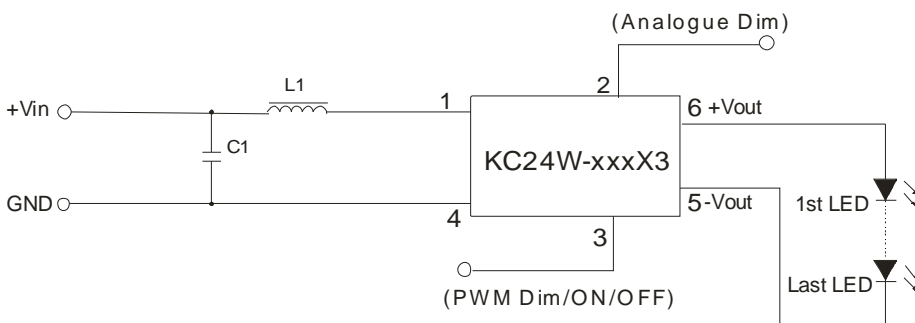


(Figure 6) EMI/RFI conducted EN55022 Class B recommended circuit

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

Table 2

(Figure 6) Recommended parameter



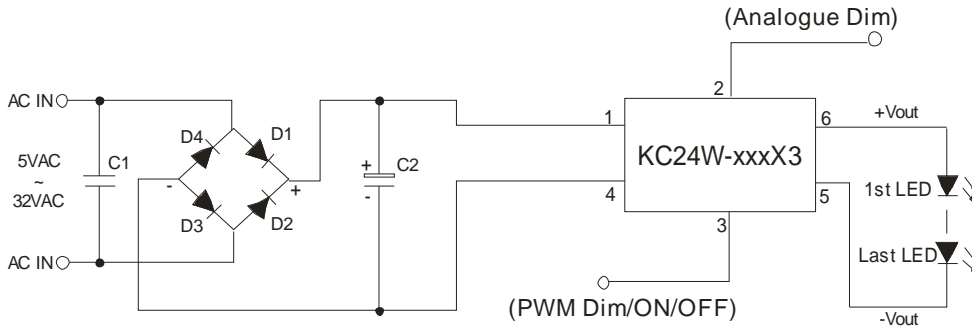
(Figure 7) EMI/RFI conducted EN55022 Class A recommended circuit

Components	Specifications
L1	CD53-33μH (SHENZHEN CEAIYA)
C1	105K/50V 1210 ×7R (TORCH)

Table 3

(Figure 7) Recommended parameter

AC INPUT RECOMMENDED CIRCUIT

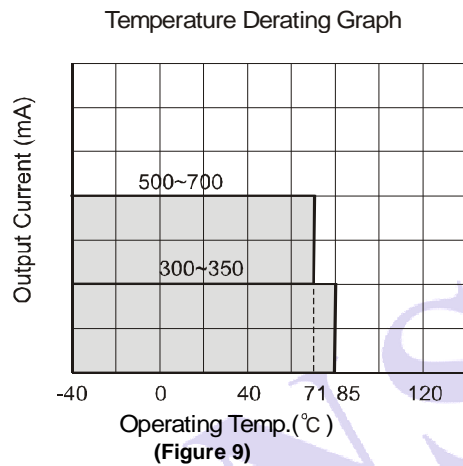


(Figure 8) AC input recommended circuit

Components	Specifications
C1	X1 Safety capacitor, 0.1 μ F /300VAC (QIYA)
C2	100 μ F /63V Electrolytic capacitor (CapXon)
D1, D2, D3, D4	Rectifier diode 1N4007 1A/1000V D0-41(PANJIT)

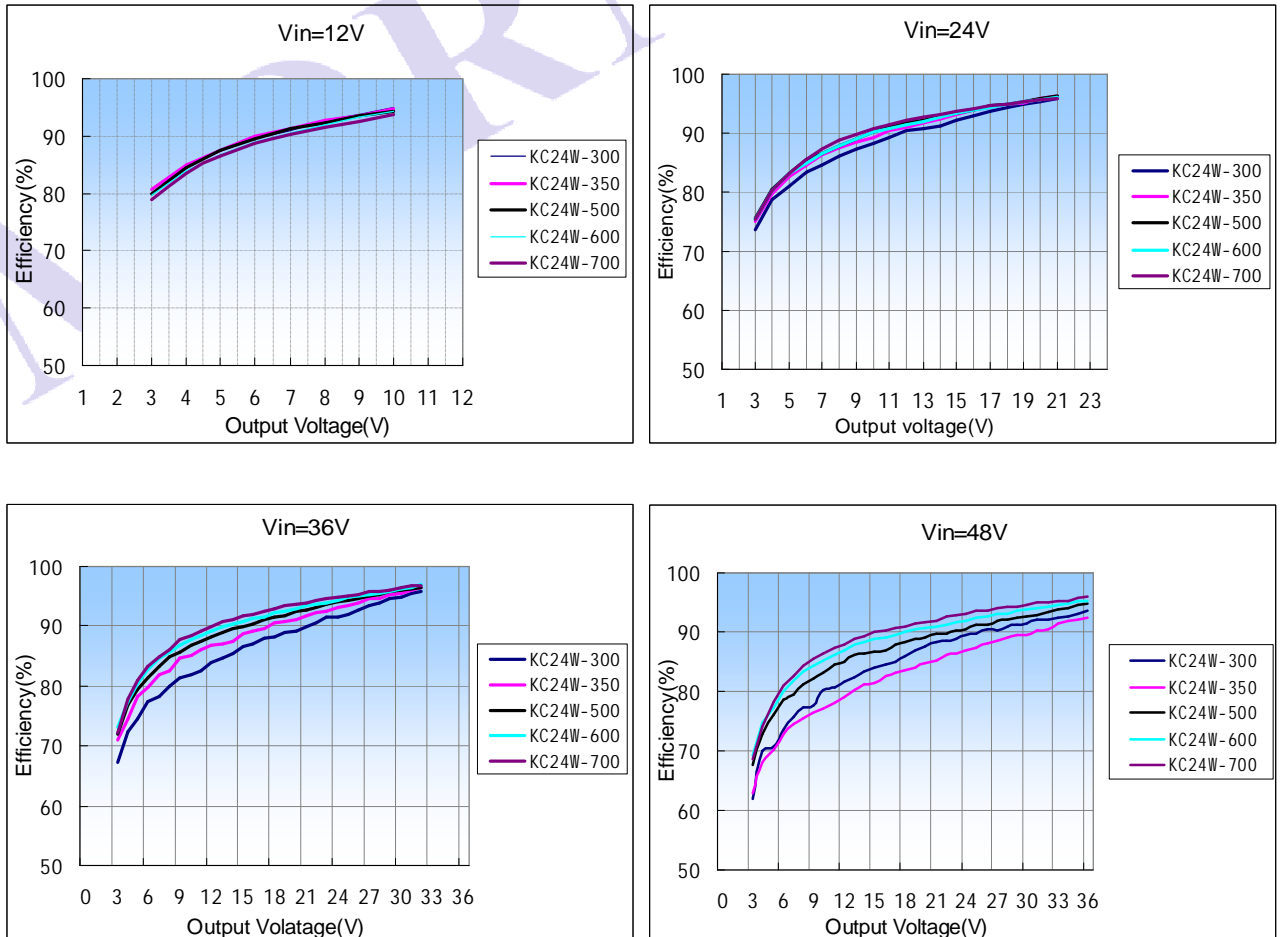
(Figure 8) Recommended parameter

TYPICAL TEMPERATURE CURVE

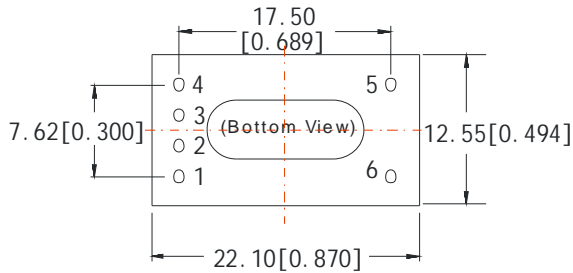
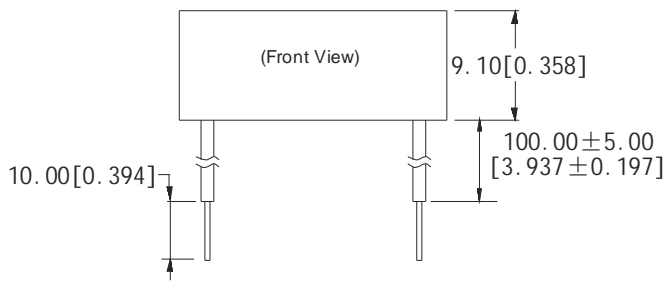


(Figure 9)

CHARACTERISTICS CURVE



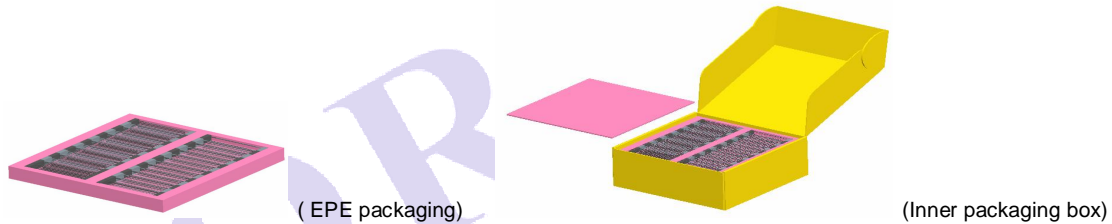
OUTLINE DIMENSIONS & PIN CONNECTIONS



FOOTPRINT DETAILS		
Pin	Out	Comments
1 (red)	+Vin	DC Supply
2 (yellow)	ANALOGUE DIMMING	Leave open if not used
3 (white)	PWM/ON/OFF	Leave open if not used
4 (black)	GND	Do not connect to -Vout
5 (white)	-Vout	LED Cathode Connection
6 (yellow)	+Vout	LED Anode Connection

Note:
 Unit: mm[inch]
 Lead internal diameter: 0.76mm
 Lead external diameter: 1.60mm
 Lead dimensions: UL1569 300V 10⁵
 General tolerances: ±0.25mm [±0.010inch]

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.