

KC24RT Series

CONSTANT CURRENT GREAT POWER LED DRIVER



RoHS

FEATURES

- SMD Package, simple and convenient
- High efficiency up to 96%
- Ultra-wide range voltage input and output
- Constant current mode, great power output
- AC-DC, EMC recommended circuit
- PWM dimming & Analogue dimming
- Remote ON/OFF, Short-circuit protection
- RoHS and UL Compliance

SELECTION GUIDE

Part No.	Input Voltage(V)		Output		Dimming Control	Full Load Efficiency(%) Typ.
	Normal	Range	Voltage (VDC)	Current (mA)		
KC24RT-300	24	5.5-48	3.3-36	0-300	PWM+Analogue	96
KC24RT-350	24	5.5-48	3.3-36	0-350	PWM+Analogue	96
KC24RT-500	24	5.5-48	3.3-36	0-500	PWM+Analogue	96
KC24RT-600	24	5.5-48	3.3-36	0-600	PWM+Analogue	96
KC24RT-700	24	5.5-48	3.3-36	0-700	PWM+Analogue	96

PRODUCT SPECIFICATIONS

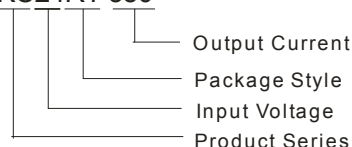
Item	Test condition	Min.	Typ.	Max.	Units
Input Voltage Limit	≤10 seconds	5	--	55	VDC
Recommended Input Voltage		5.5	24	48	
Input Filter		Capacitance filter(1 μ F)			
Output Voltage Range	Vin=48V	3.3	--	36	VDC
Input-Output Voltage Drop	Vin=5.5~48V,1~10LEDs	2	--	4	
Output Current Range	See the product 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℃ to +71℃	--	--	± 0.015	%/℃
Efficiency	At full load	--	--	96	%
Ripple & Noise	Vin=24V, 5LEDS	--	--	120	mV
Short-circuit Protection		Continuous, self-recovery			
Operating Ambient Temperature Range	300mA / 350mA	-40	--	85	℃
	500mA /600mA/ 700mA	-40	--	71	
Storage Temperature		-55	--	125	
Max. Case Temperature		--	--	100	
Capacitive Load Max.		1000			μ F
Operating Frequency		320	370	420	kHz
MTBF	MIL-HDBK-217F(+25℃)	2,000,000			Hours
Case Material		Black Epoxy resin; flame-retardant and heat-resistant (UL94-V0)			
Dimensions		23.86 × 18.10 × 8.00			mm
Weight		6			g
PWM Dimming And ON/OFF Control (leave open if not used)					
Remote ON/OFF	ON	Open or 2.8V<Vc<6V			
	OFF	Vc<0.6V			
Remote Pin Current	Vc=5V	--	--	1	mA
Quiescent Input Current	Vin=24V, Vc <0.6V (shutdown)	--	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%			

APPLICATIONS

The KC24RT is a series of step-down constant current source designed for driving high power LEDs. It features high efficiency, wide input voltage range, high operating temperature, PWM and analogue dimming, remote ON/OFF control, and SMD package which facilitates the installation. It is widely used in LED illumination areas such as decorative light, special control light, backlight, commercial light, streetlight, in-house light and car light, etc.

MODEL SELECTION

KC24RT-350



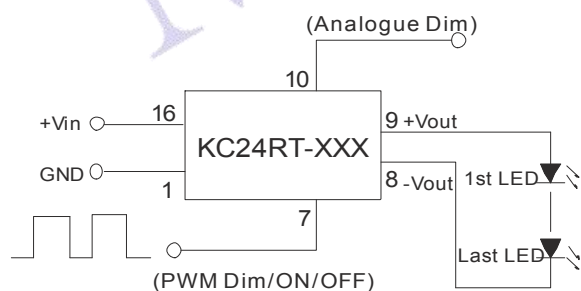
MORNSUN Science & Technology Co.,Ltd.
Address: No. 5, Kehui St. 1, Kehui
development center, Science Ave.,
Guangzhou Science City, Huangpu
district, Guangzhou,P.R.China.
Tel: 86-20-38601850
Fax:86-20-38601272
E-mail: info@mornsun.cn
Http://www.mornsun-power.com

Control Voltage Range	Full On	0.2V±50mV
	Full Off	4.5V±200mV
Driving Current	Vc=5V	0.6mA(max)
EMC		
Emissions	EN55015 power port (Refer to Figure 6)	
Immunity	EN55015 CISPR32 class B (Refer to Figure 6)	
ESD	IEC/EN 61000-4-2 level 2 contact ±4KV perf. Criteria B (Refer to Figure 6)	
R/S	IEC/EN 61000-4-3 level 3 (10V/m) perf. Criteria A	
EFT	IEC/EN 61000-4-4 level 2 (±1KV) perf. Criteria B (Refer to Figure 6)	
Surge	IEC/EN 61000-4-5 level 2 (±1KV) perf. Criteria B (Refer to Figure 6)	
CS	IEC/EN 61000-4-6 level 3 (10Vr.ms) perf. Criteria A	

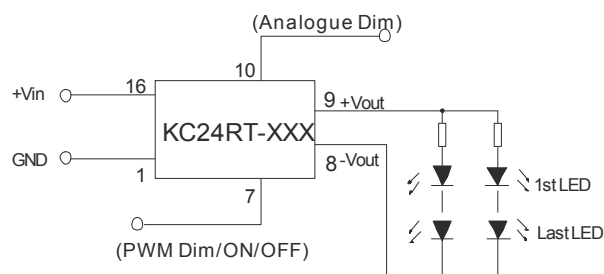
INPUT VS OUTPUT

Input voltage	Output voltage	Output constant	Output power	Input voltag	Output voltage range(VDC)	Output constant current (mA)	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

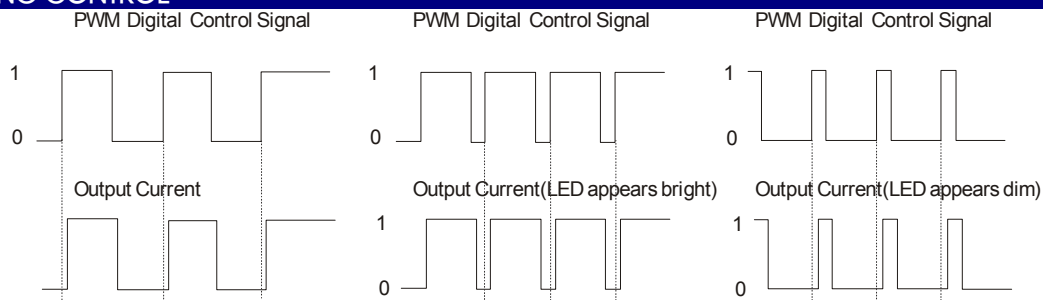


(Figure 2) Parallel-series Application

1. It is recommended adding a PTC(positive) before each channel to protect LED as shown in Figure 2

Note: The negative output cannot be grounded, otherwise the module will be damaged.

DIGITAL DIMMING CONTROL



For a certain frequency of PWM dimming, there is an connection between the output current of the driver and the duty cycle of the PWM signal, please refer to the following formula for calculation:

$$I_{o_set} = \frac{(DT-0.6)}{T} I_{o_norm}$$

I_{o_set} refers to the expected output current value.

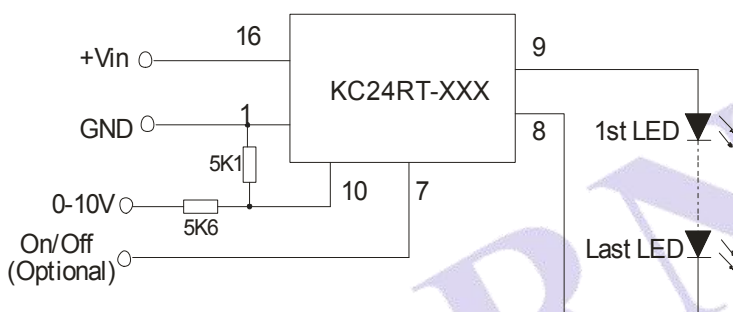
I_{o_norm} refers to the rated output current

D refers to the pulse width of the PWM signal

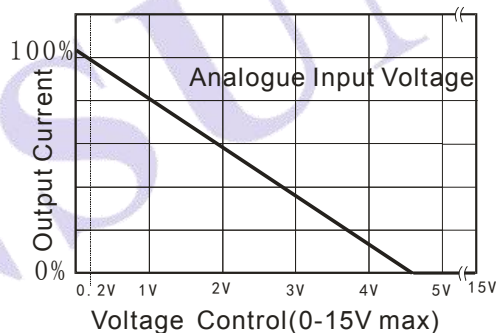
T refers to the cycle of the PWM signal

Note: The above formula for reference only. The output current may vary due to the load. The minimum Ton of the PWM signal cannot be less than 0.7ms, otherwise the product will not work properly. It is normal if hears a slight sound during PWM dimming. This is because the PWM dimming frequency is within the human ear's auditory frequency range (typically 20Hz-20KHz). In order to prevent the LED from being observed by the human eye, it is recommended to set the PWM dimming frequency above 100Hz.

ANALOGUE DIMMING CONTROL AND APPLICATION EXAMPLE

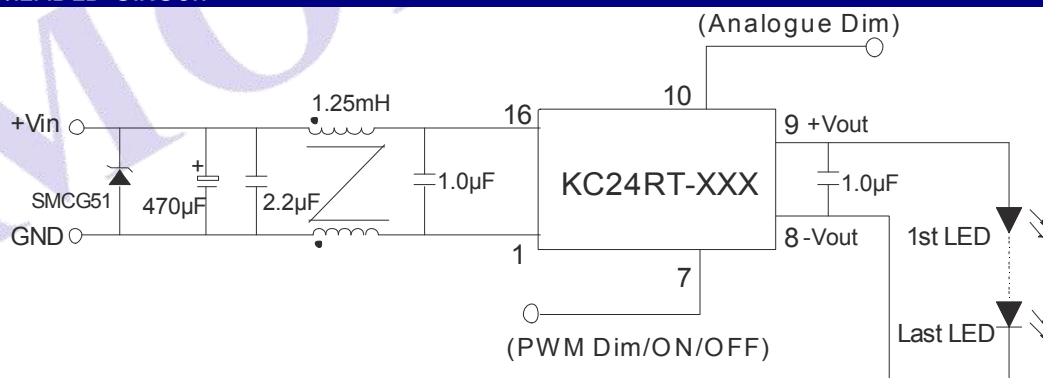


(Figure 3) Analogue dimming circuit

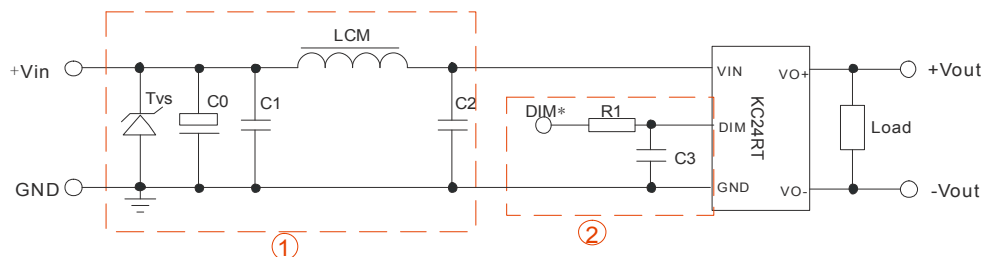


(Figure 4) Analogue input voltage VS output

EMC RECOMMENDED CIRCUIT



(Figure 5) EN55032(emissions) recommended circuit



(Figure 6) EMC recommended circuit

Note:

1. DIM pin is the module's PWM dimming pin as shown in Figure 6.

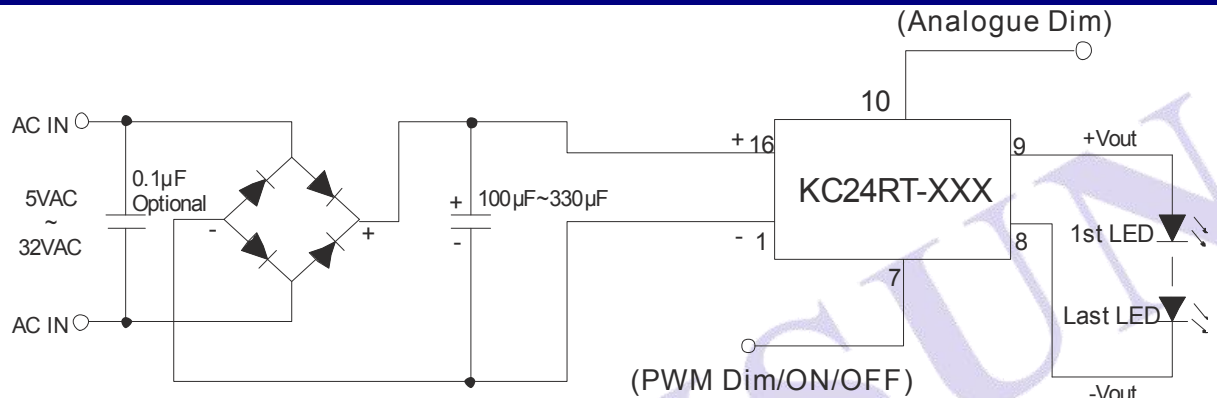
EMI/EMC standard :

Item	Standard	Level	Predicate	Remark
Emissions	EN 55032	Power port	Qualification	Add external circuit ①
ESD	IEC 61000-4-2:2001	Level 2	B	±4KV Add external circuit ②
Surge	IEC 61000-4-5:2004	Level 2	B	±1KV Add external circuit ①
EFT	IEC 61000-4-4:2004	Level 2	B	±1KV Add external circuit ①

Recommended parameter:

Components	Specifications
Tvs	SMCJ48A,1500W (Bringtking)
LCM	6.8 μ H CD43 (CEAIYA)
C0	470 μ F/50V (CapXon)
C1	4.7 μ F/50V 1210 (TORCH)
C2	2.2 μ F/50V 1210 (TORCH)
C3	470pF/100V 0805 (TORCH)
R1	680 Ω 0805(can replaced by inductance or magnetic bead)

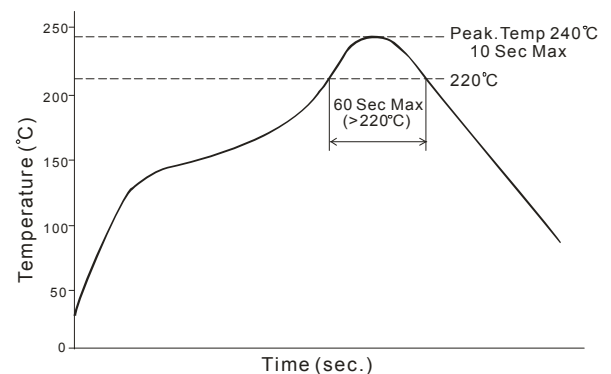
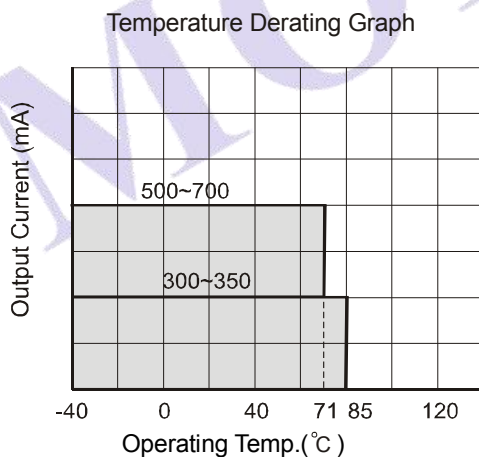
AC INPUT RECOMMENDED CIRCUIT



(Figure 7) AC input recommended circuit

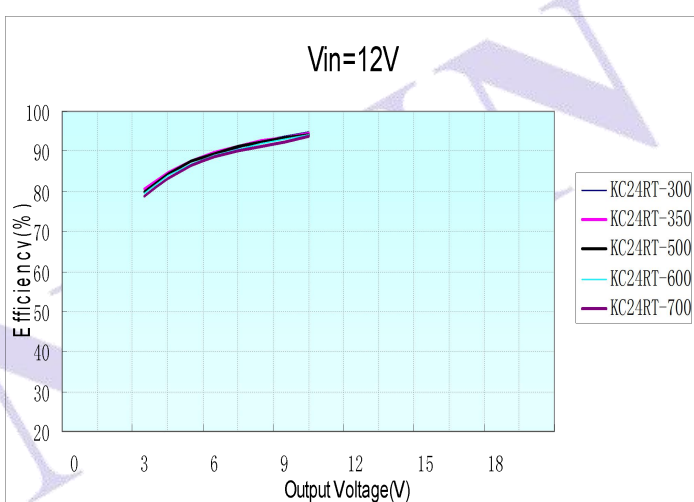
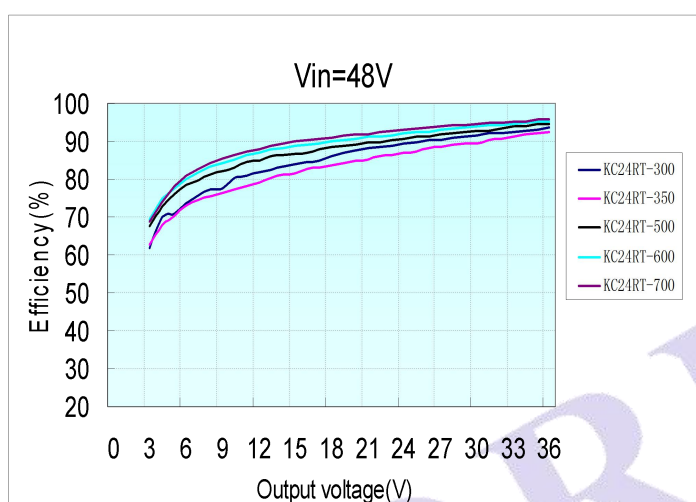
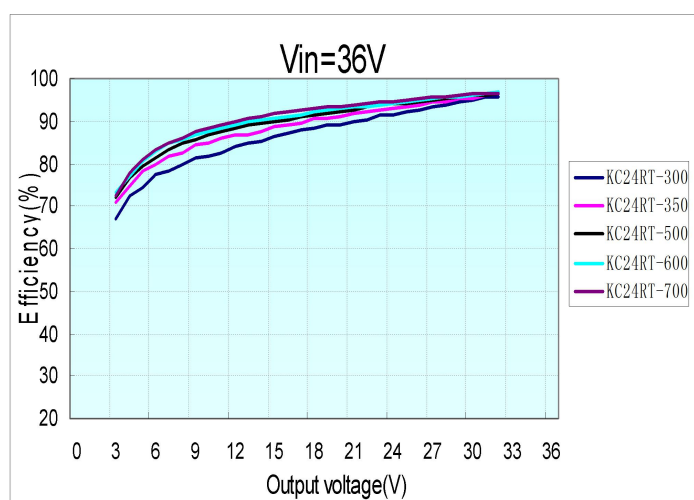
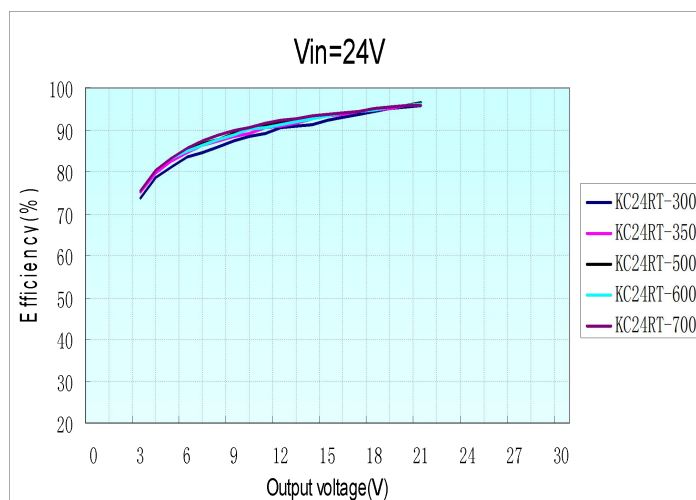
TYPICAL TEMPERATURE CURVE

RECOMMENDED REFLOW SOLDERING PROFILE

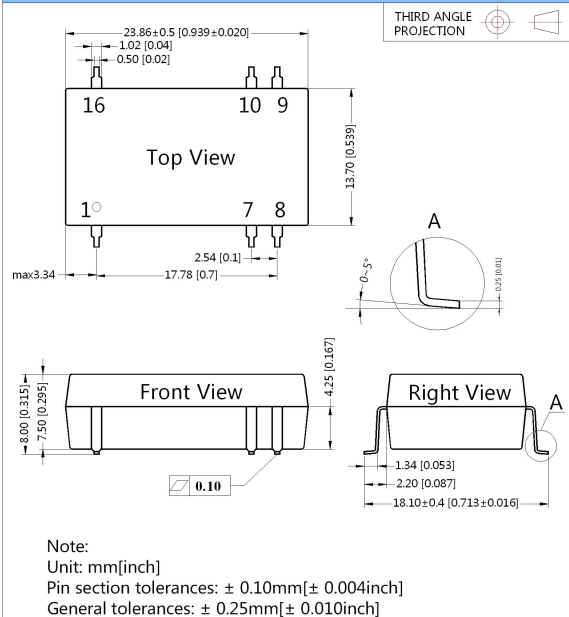


Note: This curve only apply to the hot air reflow soldering

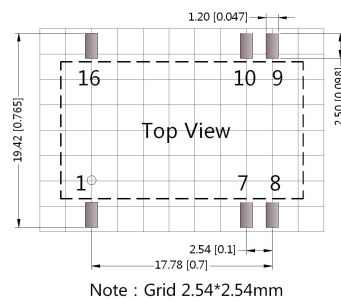
TYPICAL CHARACTERSTIC CURVES



MECHANICAL DIMENSIONS



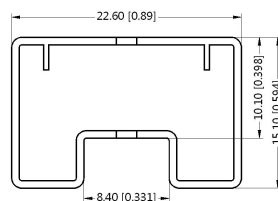
RECOMMENDED FOOTPRINT DETAILS



PIN CONNECTION	
Pin	Function
1	GND
7	ON/OFF/PWM
8	-Vout
9	+Vout
10	ANALOGUE DIMMING
16	Vin

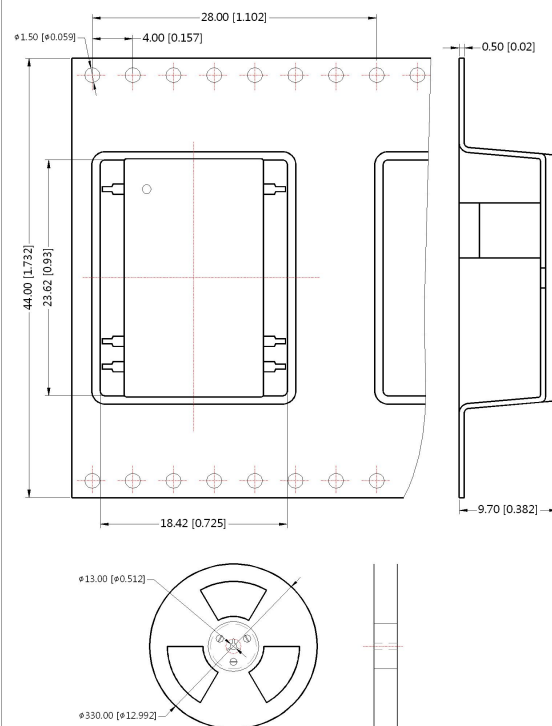
NC:No Connection

TUBE PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances: ±0.50mm[±0.020inch]
L=530mm[20.866inch] Quantity:21pcs;
L=220mm[8.661inch] Quantity:8pcs;
Inner carton(S): L*W*H=255*170*80mm;
Outer carton(S): L*W*H=375*280*270mm;
Inner carton(L): L*W*H=580*200*100mm;
Outer carton(L): L*W*H=600*215*220mm, 2 inner cartons(L);
Outer carton(L): L*W*H=600*215*325mm, 3 inner cartons(L).

REEL PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances: ±0.50mm[±0.020inch]
Per reel of packing quantity: 200pcs;
Inner carton: L*W*H=365*350*105mm
Quantity:400pcs;
Outer carton: L*W*H=390*360*245 mm
Quantity:800pcs;

Note:

- The module will not be damaged if works below the minimum output voltage, but it is not guaranteed to meet all the parameters in datasheet;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
- The above are the parameters of the product models listed in datasheet. Some parameters of non-standard models will exceed the above requirements. For details, please contact our technical staff;
- All index testing methods in this datasheet are based on company corporate standards.