CUI INC®

SERIES: VLD25-DIP | **DESCRIPTION:** LED DRIVER

FEATURES

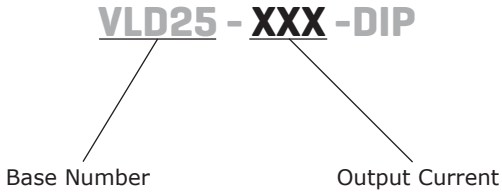
- power LED driver
- wide input and output voltage range
- DIP package
- constant current output
- PWM dimming and analog dimming
- short circuit protection
- high efficiency up to 95%

CE

MODEL

MODEL	input voltage range (Vdc)	output voltage range (Vdc)	output current range (mA)	ripple and noise max (mVp-p)	dimming control	efficiency typ (%)
VLD25-300-DIP	5.5 ~ 46	3.3 ~ 36	0 ~ 300	120	PWM+analog	95
VLD25-350-DIP	5.5 ~ 46	3.3 ~ 36	0 ~ 350	120	PWM+analog	95
VLD25-500-DIP	5.5 ~ 46	3.3 ~ 36	0 ~ 500	120	PWM+analog	95
VLD25-600-DIP	5.5 ~ 46	3.3 ~ 36	0 ~ 600	120	PWM+analog	95
VLD25-700-DIP	5.5 ~ 46	3.3 ~ 36	0 ~ 700	120	PWM+analog	95

PART NUMBER KEY



INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage	absolute max before device failure operating input range	5 5.5	 24	55 46	Vdc Vdc
quiescent input current in off mode	Vin = 24 V, Vc < 0.6 V		400		µA
filter	capacitor		1		µF
remote on/off	dc-dc ON dc-dc OFF		open or 2.8 V < Vc < 6V Vc < 0.6 V		
remote pin current	Vc = 5V			1	mA
PWM frequency				0.2	kHz
input voltage - analog dimming	Vin = 5.5 ~ 4.6 V	0		15	V
control voltage - analog dimming	full on full off	0.15 4.3	0.20 4.5	0.25 4.7	V V
driving current - analog dimming	Vc = 5 V			0.2	A

OUTPUT

parameter	conditions/description	min	typ	max	units
voltage range	Vin = 46 V , Vo = 3.3 V ~ 36 V	3.3		36	Vdc
voltage drop	Vin = 5.5 ~ 46 V, 1 ~ 10 LED	2	3	4	Vdc
current accuracy	300~600 mA 700 mA		±3 ±5	±5 ±7	% %
output current range - analog dimming	Vin = 5.5 ~ 46 V, 1 ~ 10 LED	0		100	%
current stability	Vin = 46 V, Vo = 3.3 V ~ 36 V			±1	%
temperature coefficient	-40 ~ 71°C ambient			±0.015	%/°C
capacitive load				1,000	µF

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous automatic recovery				

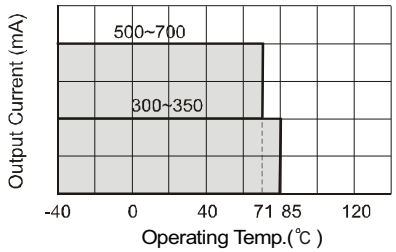
SAFETY AND COMPLIANCE

parameter	conditions/description
EMI/EMC	EN 55015 power port, CISPR22 Class B, IEC/EN 61000-4-(2, 3, 4, 5, 6)
RoHS compliant	yes

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	300/350 mA 500/600/700 mA	-40 -40		85 71	°C °C
storage temperature		-55		125	°C
maximum case temperature				100	°C

DERATING CURVE

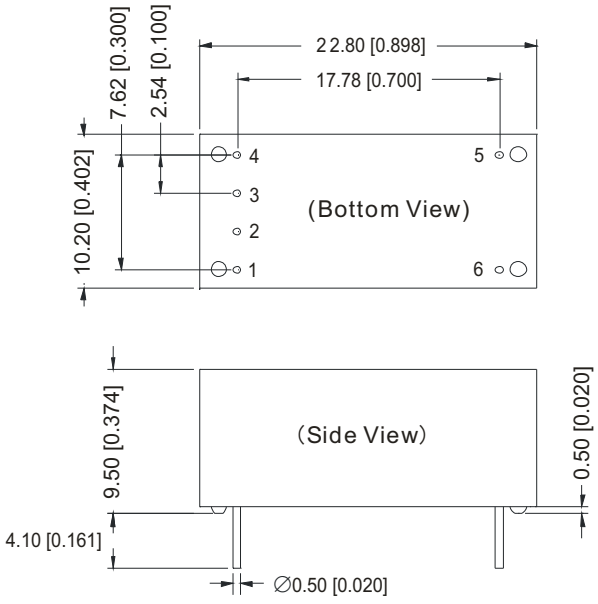


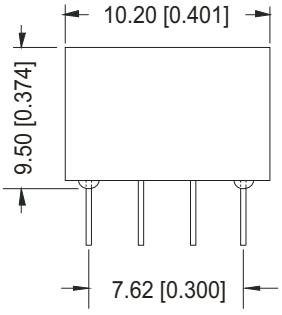
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	0.898 x 0.402 x 0.535 inch (22.80 x 10.20 x 13.60 mm)				
case material	epoxy resin (UL94-V0)				
weight			4.3		g

MECHANICAL DRAWING

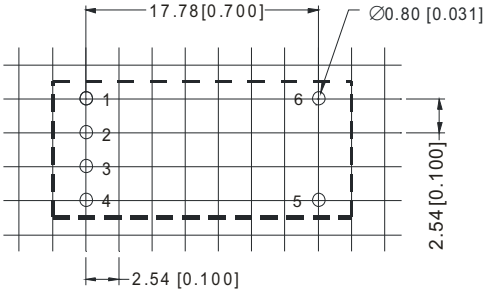
unit: mm(inch)
Pin tolerances: ±0.10mm(±0.039inch)
General tolerances: ±0.25mm(±0.010inch)





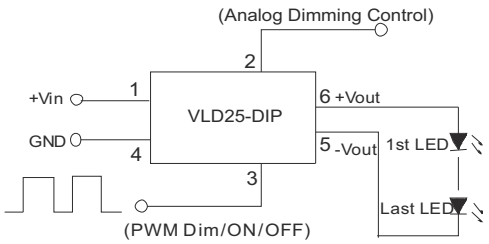
PIN CONNECTIONS	
Pin	Function
1	Vin
2	analog dimming
3	ON/OFF/PWM
4	GND
5	-Vout
6	+Vout

RECOMMENDED FOOTPRINT (TOP VIEW)

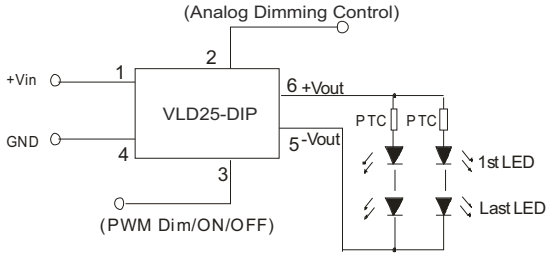


APPLICATION NOTES

1. **Typical Application Circuits**



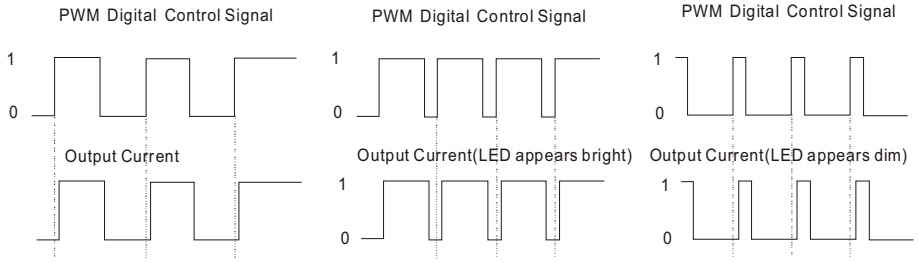
Series Application



Parallel-series Application

To protect the LED(s), you could connect a PTC to input of all channels as shown in application circuit.
Note: Negative output terminal should not conneted to GND. Module may be damaged.

2. **Digital Dimming Control**



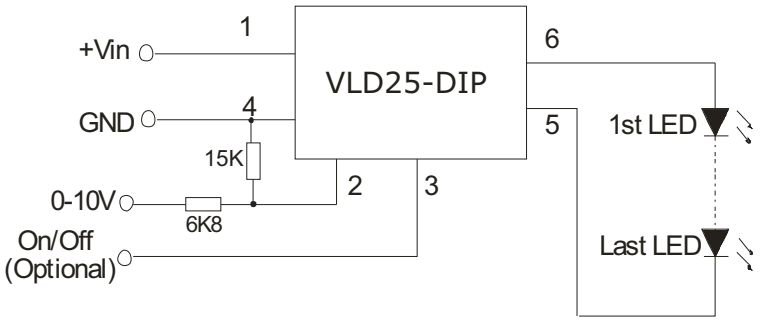
Formula for output current:

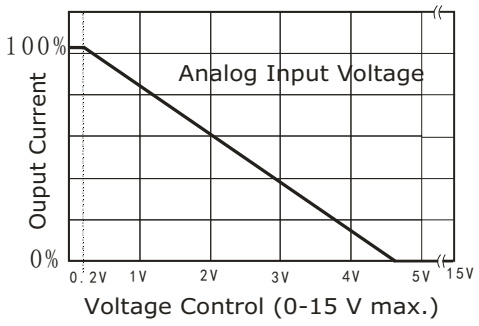
$$I_{o,set} = \frac{(DT-0.8)}{T} I_{o,nom}$$

$I_{o,set}$ 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: This formula is only supplied as a reference and the output current may be deviated from for different load conditions. The Ton(min) of PWM signal must be greater than 0.8ms, otherwise the driver cannot be operated normally. It is natural for the driver to generate audible noise during dimming process because the frequency of the control circuit is within human audible range (20Hz~20kHz). In order to make the LED flashes not visible to human eye, the PWM dimming frequency is recommended to be set above 100Hz. PWM curve (Vin=24 V, 5 LEDs)

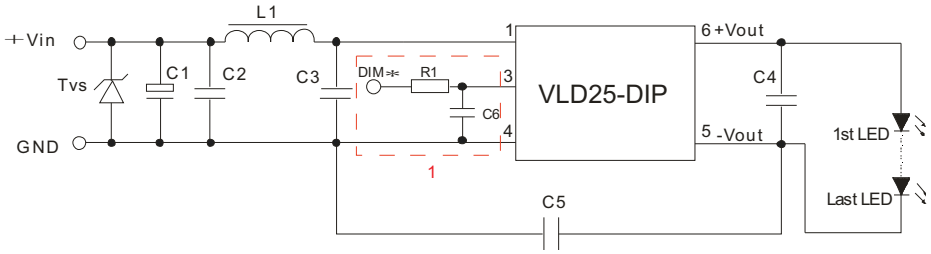
3. **Analog Dimming Control and Application Example**





4. **EMC Recommended Circuit**

EMI/EMC recommended circuit



RECOMMENDED PARAMETERS	
COMPONENTS	**SPECIFICATIONS**
Tvs	SMC51A, 1500 W (ON)
L1	CD53-82μH (CEAIYA)
C1	470μF/100V (NCC)
C2	225K/50V 1210 X7R (TORCH)
C3	104K/50V 0805 X7R (TORCH)
C4	105K/50V 0805 X7R (TORCH)
C5	102K/2000V 1210 (TDK)
C6	470pF/100V 0805 (TORCH)
R1	680Ω 0805 (can be replaced by inductance or magnetic bead)

REVISION HISTORY

rev.	description	date
1.0	initial release	10/15/2012
1.01	misc. updates	11/02/2012
1.02	added product photo	11/28/2012

The revision history provided is for informational purposes only and is believed to be accurate.

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