MEAN WELL LDD-700H

MEAN WELL LDD-700H DC-DC Constant Current Step-Down LED Driver

Instruction Manual

1. Introduction and Features

The MEAN WELL LDD-700H is a highly efficient DC-DC constant current step-down LED driver designed for various LED lighting applications. This driver offers a wide input voltage range and precise current regulation, ensuring stable and reliable performance for your LED setups.
Key features include:

- DC-DC step-down converter for efficient power delivery.
- Constant current output of 700mA.
- Wide input voltage range: 9 - 56VDC.
- Wide output LED string voltage: 2 - 52VDC.
- High efficiency, typically up to 97%.
- Built-in EMI filter, compliant with EN55015 and FCC part15.
- Integrated PWM dimming and ON/OFF control functionality.
- Comprehensive protections: Short circuit and over temperature.
- Cooling achieved through free air convection.
- Fully encapsulated with IP67 level for pin and wire style models.
- Compact size for easy integration.
- Backed by a 3-year warranty.

2. Safety Information

Please read and understand all instructions before installation and use. Failure to follow these instructions may result in electrical shock, fire, or other hazards.

- **Qualified Personnel:** Installation and servicing should only be performed by qualified personnel.
- **Power Disconnection:** Always disconnect power to the circuit before installing, servicing, or removing the

driver.

- **Input Voltage:** Ensure the input voltage supplied to the driver is within the specified range (9-56VDC). Exceeding this range can damage the unit.
- **Output Load:** Connect the LED load correctly to the output terminals. Do not short-circuit the output during operation.
- **Ventilation:** Ensure adequate air circulation around the driver for proper heat dissipation. Do not cover the unit.
- **Environment:** Avoid installing the driver in areas with excessive moisture, dust, or extreme temperatures outside the specified operating range.
- **Polarity:** Observe correct polarity for input and output connections. Incorrect polarity can damage the driver and connected LEDs.

3. Specifications

Detailed electrical and mechanical specifications for the LDD-700H driver.

Parameter	Specification
Input Voltage Range	9 - 56VDC
Output Current	700mA
Output Voltage Range	2 - 52VDC
Ripple & Noise (Note 2)	150mVp-p
Switching Frequency	400KHz ± 100KHz
Efficiency (Full Load)	Up to 97% (at 36VDC input / 48VDC output)
PWM Dimming Frequency	100 - 1KHz
Quiescent Current (PWM OFF)	1mA at PWM dimming OFF and 24VDC input
Protection	Short Circuit, Over Temperature
Operating Temperature	-40 ~ +85°C (Refer to derating curve)
Working Humidity	20% - 90% RH non-condensing
Storage Temp. / Humidity	-40 ~ +125°C / 10 - 95% RH
Vibration	10 - 500Hz, 2G 10min./1 cycle, period for 60min. each along X, Y, Z axes
Weight (LDD-H)	2.6g
Dimensions (LDD-H)	20.3 x 11.4 x 6.8 mm (L x W x H)

Note 2: Ripple & Noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF capacitor.

Mechanical Specification and Pin Configuration

The following diagrams illustrate the mechanical dimensions and pin assignments for the LDD-H series drivers. Proper understanding of these configurations is crucial for correct installation.

DC-DC Constant Current Step-Down LED driver — LDD-H series

Features :

- DC/DC step-down converter
- Constant current output: 300mA to 1000mA
- Wide input voltage: 9 ~ 56VDC
- Wide output LED string voltage: 2 ~ 52VDC
- High efficiency up to 97%
- Built-in EMI filter, comply with EN55015 and FCC part15 without additional input filter and capacitors
- Built-in PWM and remote ON/OFF control
- Protections: Short circuit / Over temperature
- Cooling by free air convection
- Fully encapsulated with IP67 level for pin and wire style
- Non-potted, optional conformal coating for SMD style (Order No.: LDD-350HSC)
- Compact size
- Low cost, high reliability
- Suitable for driving illumination LED
- 3 years warranty

LDD-350H□W	Blank : pin style
	W : wire style
	S : SMD style

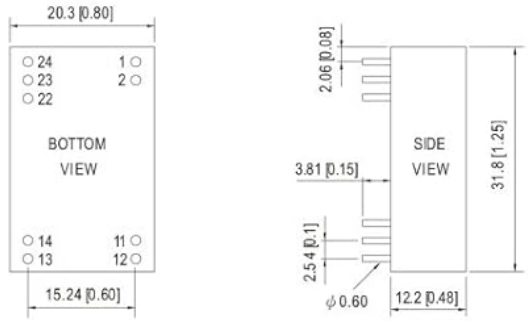
SPECIFICATION

ORDER NO.			LDD-300H□	LDD-350H□	LDD-500H□	LDD-600H□	LDD-700H□	LDD-1000H□
OUTPUT	CURRENT RANGE		300mA	350mA	500mA	600mA	700mA	1000mA
	VOLTAGE RANGE Note.4		2 ~ 52VDC					
	CURRENT ACCURACY (Typ.)		±3% at 24VDC input ; ±4% at 48VDC input for LDD-H/HW ; ±5% for LDD-HS					
	RIPPLE & NOISE(max.) Note.2		150mVp-p	150mVp-p	150mVp-p	200mVp-p	200mVp-p	350mVp-p
	SWITCHING FREQENCY		40KHz ~ 1000KHz					
	EXTERNAL CAPACITANCE LOAD (max.)		2.2uF					
INPUT	VOLTAGE RANGE		9 ~ 56VDC					
	EFFICIENCY (max.)		97% at full load and 36VDC/48VDC input for LDD-H/HW ; 96% at full load and 36VDC/48VDC input for LDD-HS					
	DC CURRENT	Full load Note.3	270mA	320mA	450mA	550mA	650mA	900mA
		No load	5mA					
	FILTER		Capacitor					
PWM DIMMING & ON/OFF CONTROL	REMOTE ON/OFF		Leave open if not use					
			Power ON with dimming: DIM ~ -Vin >2.5 ~ 6VDC or open circuit					
			Power OFF : DIM ~ -Vin < 0.8VDC or short					
	PWM FREQUENCY		100 ~ 1KHz					
	QUIESCENT INPUT CURRENT IN SHUTDOWN MODE(max.)		1mA at PWM dimming OFF and 24VDC input					
PROTECTION	SHORT CIRCUIT		Regulated at rated output current					
			Protection type: Can be continued, recovers automatically after fault condition is removed					
	OVER TEMPERATURE		Tj 150℃ typically(IC1) detect on main control IC					
			Protection type : Shut down, recovers automatically after temperature goes down					
ENVIRONMENT	WORKING TEMP.		-40 ~ + 85℃ (Refer to derating curve)					
	WORKING HUMIDITY		20% ~ 90% RH non-condensing for LDD-H/HW ; 20%~85% RH non-condensing for LDD-HS					
	STORAGE TEMP., HUMIDITY		-55 ~ +125℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT		±0.03% / ℃					
	VIBRATION		10 ~ 500Hz, 2G 10min./1 cycle, period for 60min. each along X, Y, Z axes					
	OPERATING CASE TEMP. (max.)		100℃					
EMC	EMC EMISSION		Compliance to EN55015, FCC part 15 class B					
	EMC IMMUNITY		Compliance to EN61000-4-2,3,4,6,8, light industry level, criteria A					
OTHERS	MTBF		2000Khrs min. MIL-HDBK-217F (25℃)					
	DIMENSION		31.8*20.3*12.2mm or 1.25"*0.8"*0.48" inch (L*W*H) for LDD-H/HW ; 31.8*20.3*11.4mm or 1.25"*0.8"*0.45" inch (L*W*H) for LDD-HS					
	WEIGHT		LDD-H:15.6g ; LDD-HW:18g ; LDD-HS:12.8g					
	POTTING MATERIAL		Expoxy(UL94-V0) for LDD-H/HW ; without potted for LDD-HS					
NOTE	1.All parameters are specified at normal input(48VDC), rated load, 25℃ 70% RH ambient. 2.Ripple & noise are measured at 20MHz by using a 12" twisted pair terminated with a 0.1uf capacitor. 3.Test condition: 48VDC input. 4.Output voltage will always step down by 3 volts from input DC voltage. 5.The output of LDD-H should not be connected to the input of the same unit or output from other sources.							

Image: Mechanical specifications and pin configuration for LDD-H and LDD-HW models. This image details the physical dimensions in millimeters and inches, along with the pin assignments for input, output, and dimming control. For LDD-H, pins 1,2,13,14 are -Vout, 11,12 are +Vout, 22 is PWM DIM, and 23,24 are +Vin. For LDD-HW, specific wire colors are assigned to -Vout (Black), +Vout (Blue), LED- (Yellow), ON/OFF and PWM Dimming (White), and +Vin (Red).

■ Mechanical Specification

Blank type(LDD– H): Unit: mm (inch)

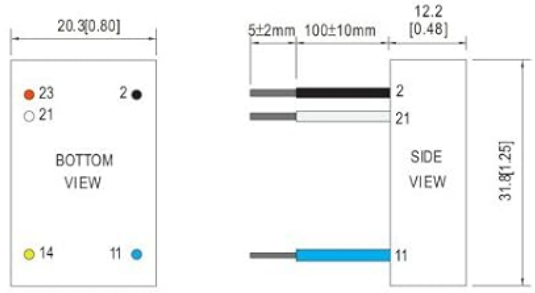


NOTE: Pin tolerance ±0.05mm

■ Pin Configuration

Pin No.		Comment
1,2	-Vin	Don't connect to -Vout
11,12	-Vout	LED - Connection
13,14	+Vout	LED + Connection
22	PWM DIM	ON/OFF and PWM Dimming (Leave open if not used)
23,24	+Vin	DC Supply

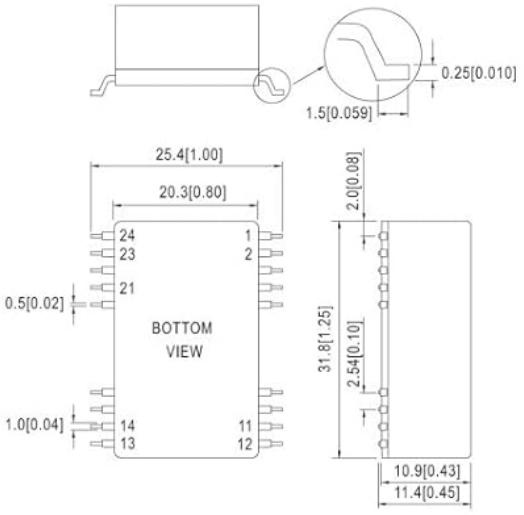
W type(LDD – __ HW):



NOTE: All wires UL3385 22AWG

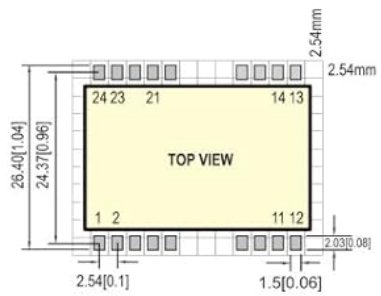
Pin No.		Comment
2	-Vin (Black)	Don't connect to -Vout
11	-Vout (Blue)	LED - Connection
14	+Vout (Yellow)	LED + Connection
21	PWM DIM (White)	ON/OFF and PWM Dimming (Leave open if not used)
23	+Vin (Red)	DC Supply

S type(LDD – __ HS):



Pin No.		Comment
1,2	-Vin	Don't connect to -Vout
11,12	-Vout	LED - Connection
13,14	+Vout	LED + Connection
21	PWM DIM	ON/OFF and PWM Dimming (Leave open if not used)
23,24	+Vin	DC Supply
others	N.C	No connection

■ Recommended PCB layout (for LDD-HS)



File Name:LDD-H-SPEC 2015-08-24

Image: Reflow soldering curve for LDD-HS models and derating curve for LDD-H series. The reflow soldering curve shows temperature profiles for optimal soldering. The derating curve illustrates the maximum permissible load as a function of ambient

temperature, indicating that the driver's load capacity decreases at higher temperatures to prevent overheating.

4. Installation and Setup

Follow these steps for proper installation of your LDD-700H LED driver.

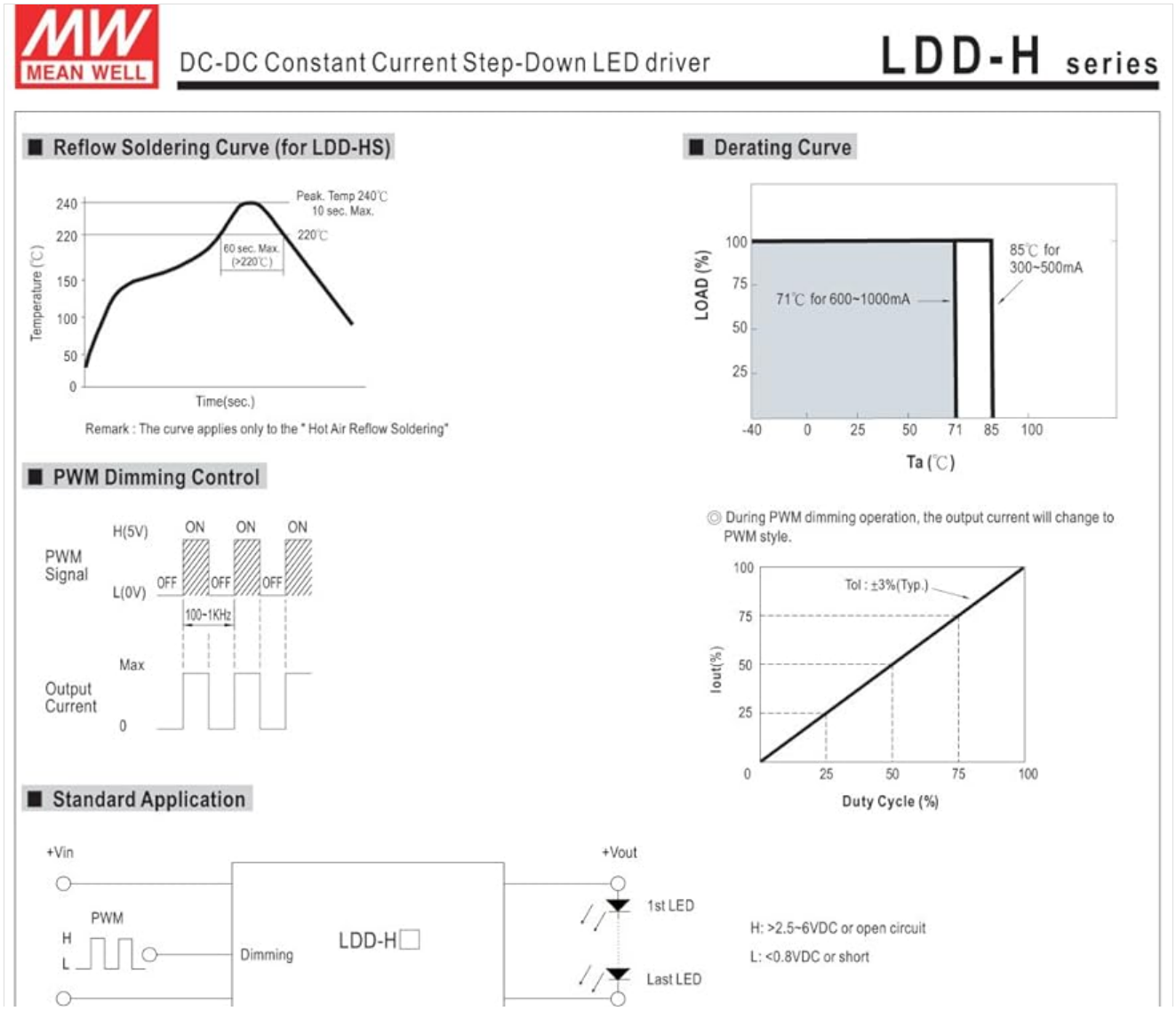
4.1 Wiring Connections

Refer to the pin configuration diagram in Section 3 for precise pin assignments. Ensure all connections are secure and observe correct polarity.

- **Input Voltage (+Vin, -Vin):** Connect your DC power source (9-56VDC) to the +Vin and -Vin terminals. For LDD-H, these are pins 23,24 (+Vin) and pins 1,2,13,14 (-Vin). For LDD-HW, the Red wire is +Vin and Black wire is -Vout (which also serves as the negative input).
- **Output to LEDs (+Vout, -Vout):** Connect your LED string to the +Vout and -Vout terminals. For LDD-H, pins 11,12 are +Vout and pins 1,2,13,14 are -Vout. For LDD-HW, the Blue wire is +Vout and Yellow wire is LED-.
- **PWM Dimming (PWM DIM):** Connect your PWM control signal to the PWM DIM pin (pin 22 for LDD-H, White wire for LDD-HW). If dimming is not used, this pin can be left open.

4.2 Mounting

The LDD-700H is designed for free air convection cooling. Ensure that the driver is mounted in a location that allows for adequate airflow. Avoid enclosing the driver in a sealed compartment without proper ventilation. For PCB mounting, refer to the recommended PCB layout provided in the mechanical specification image for optimal thermal performance and signal integrity.



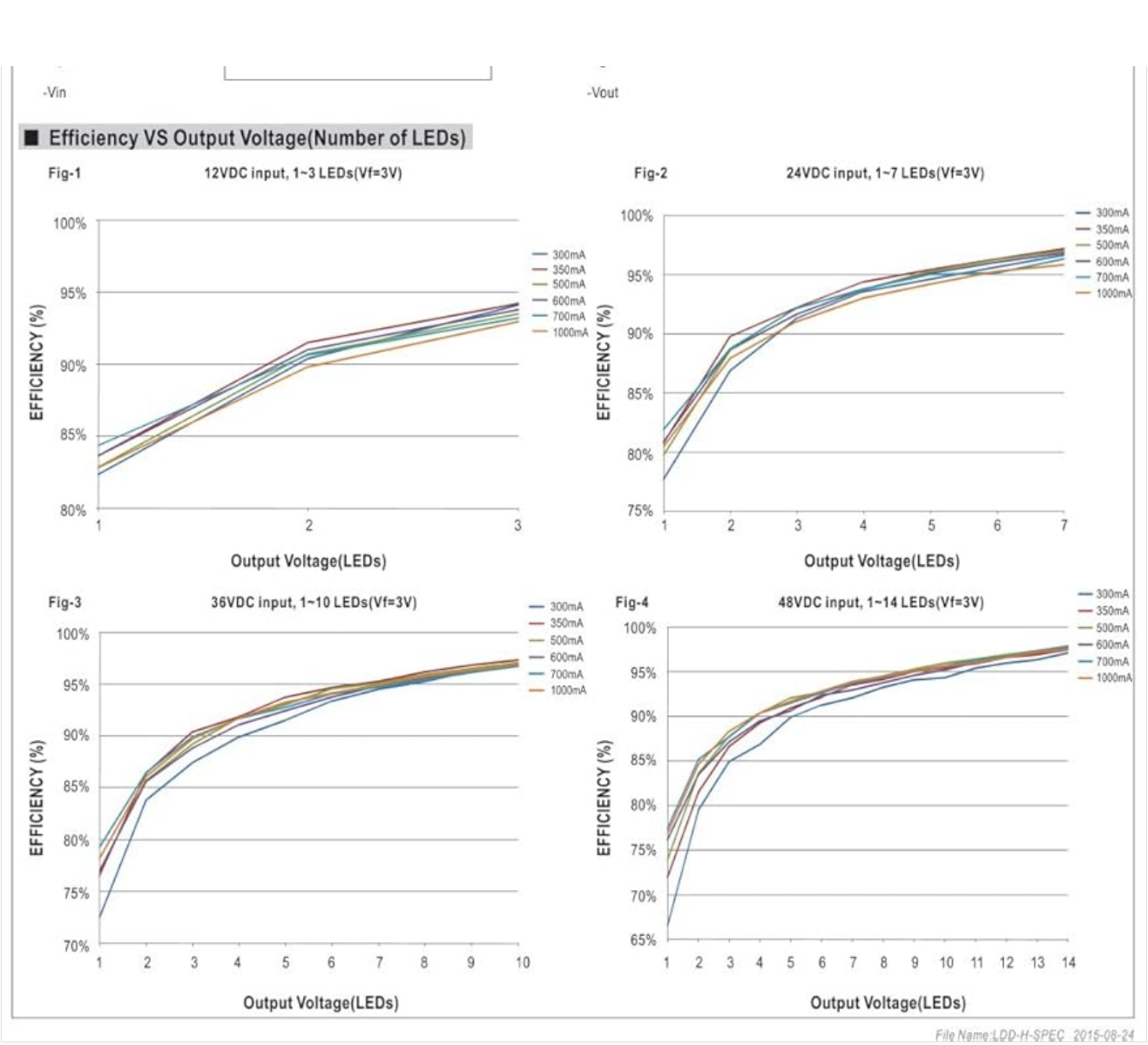


Image: Standard application wiring diagram and efficiency vs. output voltage curves. The standard application diagram shows a typical connection setup for the LDD-H driver with input, output, and dimming connections. The efficiency curves (Fig-1 to Fig-4) illustrate the driver's efficiency across different input voltages and number of LEDs, demonstrating high efficiency across various operating conditions.

5. Operating Instructions

5.1 Powering On

Once all connections are securely made and verified, apply the specified DC input voltage (9-56VDC) to the driver. The connected LEDs should illuminate.

5.2 PWM Dimming Control

The LDD-700H supports PWM dimming for adjusting the brightness of the connected LEDs. Connect a PWM signal source to the PWM DIM pin.

- **PWM Signal:** A high signal (H) of approximately 5V will turn the output ON, while a low signal (L) of 0V will turn the output OFF.
- **Frequency:** The recommended PWM dimming frequency range is 100Hz to 1KHz.
- **Duty Cycle:** The output current is directly proportional to the PWM duty cycle. A 100% duty cycle will result in maximum output current (700mA), while a 0% duty cycle will result in no output current (LEDs off).
- **ON/OFF Control:** If the PWM DIM pin is left open, the driver will operate at full output. To turn off the output, apply a 0V signal to the PWM DIM pin.

6. Maintenance

The LDD-700H LED driver is designed for long-term, reliable operation with minimal maintenance. However, following these guidelines can help ensure optimal performance:

- **Keep Clean:** Periodically inspect the driver for any accumulation of dust or debris, especially around ventilation areas. Clean gently with a soft, dry cloth if necessary.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature and humidity ranges. Avoid exposure to corrosive gases or excessive vibration.
- **Connection Integrity:** Occasionally check all wiring connections to ensure they remain tight and free from corrosion.
- **No User-Serviceable Parts:** The driver contains no user-serviceable parts. Do not attempt to open or repair the unit, as this will void the warranty.

7. Troubleshooting

If you encounter issues with your LDD-700H driver, refer to the following troubleshooting steps:

- **No LED Output:**
  - Verify the input voltage is within the 9-56VDC range and correctly connected (+Vin, -Vin).
  - Check all output connections to the LEDs for correct polarity and secure contact.
  - Ensure the LED string voltage is within the 2-52VDC range.
  - If using PWM dimming, ensure the PWM DIM pin is not held at 0V (OFF state) or left floating if ON/OFF control is desired.
  - Check for any short circuits in the LED string or wiring. The driver has short circuit protection, which will shut down the output.
- **LEDs Dim or Flicker:**
  - If using PWM dimming, verify the PWM signal's frequency (100-1KHz) and duty cycle. An unstable or incorrect PWM signal can cause flickering.
  - Ensure the input voltage is stable and free from excessive ripple.
  - Check for loose connections.
- **Driver Overheating:**
  - Ensure adequate ventilation around the driver. Remove any obstructions to airflow.
  - Verify that the ambient temperature is within the specified operating range (-40 ~ +85°C).
  - Check the load. While the driver has over-temperature protection, continuous operation at the edge of its thermal limits can reduce lifespan.

If the problem persists after performing these checks, contact MEAN WELL technical support or your local distributor for assistance.

8. Warranty and Support

The MEAN WELL LDD-700H DC-DC Constant Current Step-Down LED Driver comes with a **3-year warranty** from the date of purchase. This warranty covers defects in materials and workmanship under normal use and service. The warranty does not cover damages resulting from:

- Improper installation or wiring.

- Misuse, abuse, or unauthorized modifications.
- Operation outside the specified electrical or environmental limits.
- Natural disasters or other external causes.

For warranty claims, technical support, or further inquiries, please contact your authorized MEAN WELL distributor or visit the official MEAN WELL website for contact information.