Topway Display LMT101DNLFWD-AAD 10.1 Inch Color TFT LCD Module User Manual

Contents

TOPWAY

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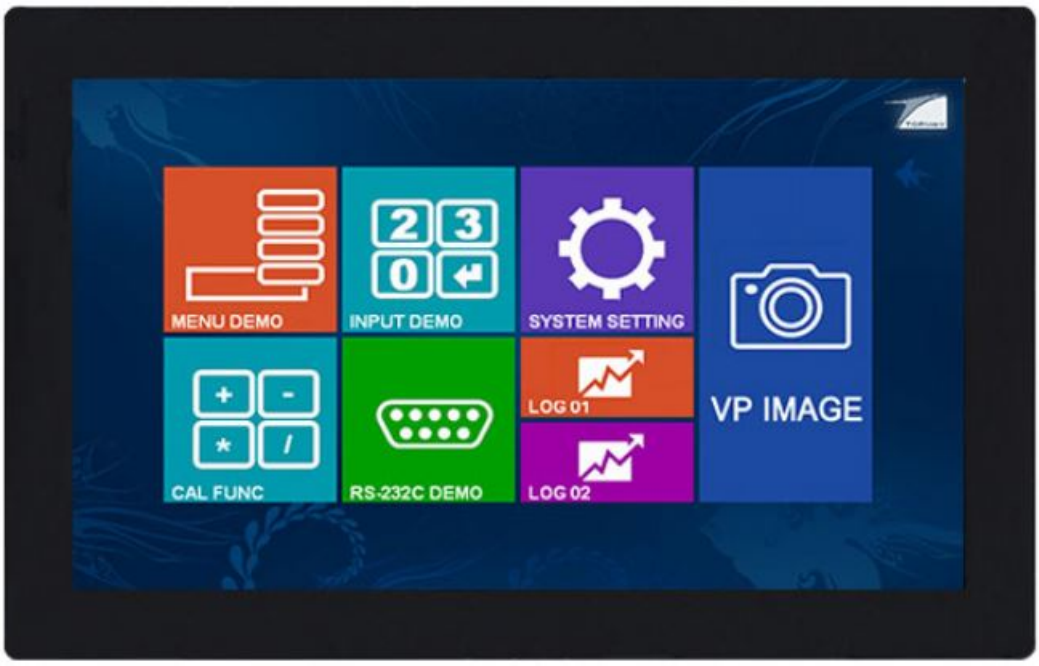


Product Information

The LMT101DNLFWD-AAD is an LCD module with 10.1-inch screen size and a transmissive display mode with normally white. It has a resolution of 1280 x 800 pixels, a dot pitch of 0.178 x 0.178 mm, and a pixel configuration of R.G.B. Vertical Stripe. The module also features a capacitive touch panel type and a white LED backlight. It has an outline dimension of 285.0 x 210.0 x 40.0 (mm) and an active area of 216.96 x 135.6 (mm). The viewing direction is all, and it operates within a temperature range of -20°C to 70°C.

Terminal Functions

K1 Terminal (6.3/2.0MM DC connector Or Equivalent)

Pin No.	Pin Name	I/O Descriptions
1	VCC(12V)	Power Positive power supply(12V)
2	GND	Power Ground

K2 Terminal (HDMI A TYPE)

Pin No.	Pin Name	I/O Descriptions
1	TMDS Data2+	Input HDMI receiver positive signal channel 2
2	TMDS Data2 Shield Power	Signal Ground
3	TMDS Data2-	Input HDMI receiver negative signal channel 2
4	TMDS Data1+	Input HDMI receiver positive signal channel 1
5	TMDS Data1 Shield Power	Signal Ground

Product Usage Instructions

To use the LMT101DNLFWD-AAD LCD module, follow these steps:

1. Connect the power supply for the module to the K1 terminal, with the positive power supply on pin 1 and the power ground on pin 2.
2. Connect the HDMI source to the K2 terminal. Use pins 1, 3, and 4 for the HDMI receiver signal channels, and pins 2 and 5 for the signal ground.
3. The module has a capacitive touch panel type. Use a compatible touchscreen stylus or your finger to operate the touch panel.
4. The viewing direction for the module is all, so it can be viewed from any angle.
5. The module operates within a temperature range of -20°C to 70°C. Do not expose it to temperatures outside of this range.

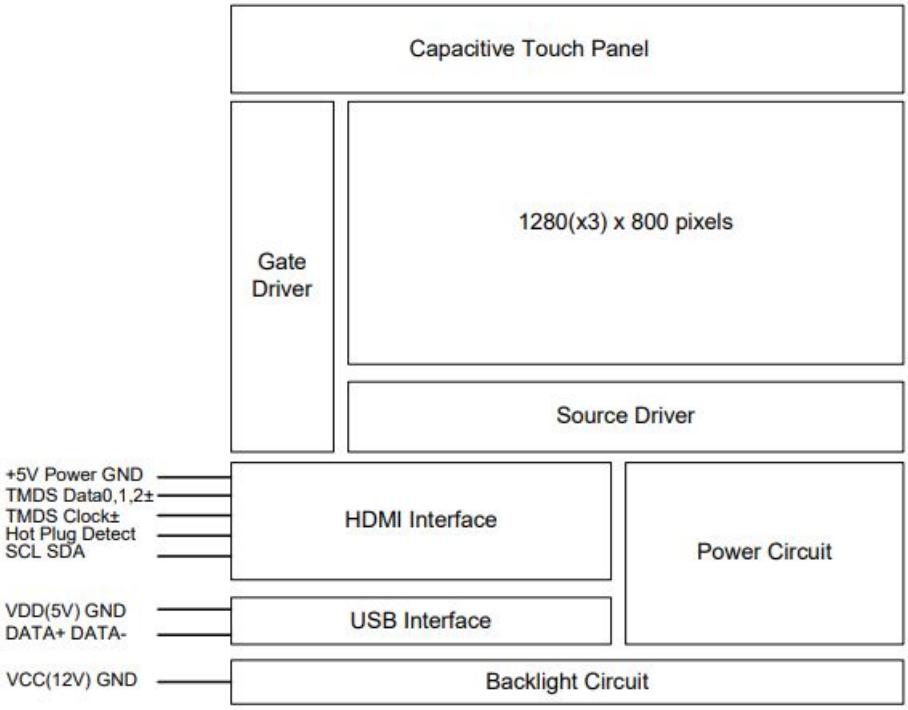
Rev.	Descriptions	Edit	Release Date
0.1	Preliminary	Lixuefeng	2022-03-19
0.2	Minor Update	Lixuefeng	2022-12-05
0.3	Revise Outline Drawing	Heiyichen	2023-02-21

General Specification

- **Signal Interface:** HDMI
- **Display Mode:** Transmissive with Normally White
- **Screen Size**: 10.1 inch
- **Outline Dimension:** 285.0 x 210.0 x 40.0(mm) (see outline drawing for details)
- **Active Area :** 216.96x 135.6(mm)
- **Number of dots:** 1280 x 800
- **Dot Pitch** : 0.178x 0.178(mm)
- **Pixel Configuration:** R.G.B. Vertical Stripe
- **Touch Panel Type:** Capacitive Touch
- **Backlight:** White LED
- **Viewing Direction:** ALL
- **Operating Temperature:** -20 ~ +70°C
- **Storage Temperature:** -30 ~ +80°C

Note: Color tone may slightly change by temperature and driving conditions.

Block Diagram



Terminal Function

K1 Terminal (φ6.3/2.0MM DC connector Or Equivalent)

Pin No.	Pin Name	I/O	Descriptions
1	VCC(12V)	Power	Positive power supply(12V)
2	GND	Power	Ground

K2 Terminal (HDMI A TYPE)

Pin No.	Pin Name	I/O	Descriptions
1	TMDS Data2+	Input	HDMI receiver positive signal channel 2
2	TMDS Data2 Shield	Power	Signal Ground
3	TMDS Data2-	Input	HDMI receiver negative signal channel 2
4	TMDS Data1+	Input	HDMI receiver positive signal channel 1
5	TMDS Data1 Shield	Power	Signal Ground
6	TMDS Data1-	Input	HDMI receiver negative signal channel 1
7	TMDS Data0+	Input	HDMI receiver positive signal channel 0
8	TMDS Data0 Shield	Power	Signal Ground
9	TMDS Data0-	Input	HDMI receiver negative signal channel 0
10	TMDS Clock+	Input	HDMI receiver positive signal clock
11	TMDS Clock Shield	Power	Signal Ground
12	TMDS Clock-	Input	HDMI receiver negative signal clock
13	NC		No connection
14	NC		No connection
15	SCL	Input	Serial data clock
16	SDA	Output	Serial data out
17	GND	Power	Signal Ground
18	+5V Power	Power	Power supply for DDC memory
19	Hot Plug Detect	Output	Hot Plug Detect signal

Note:
HDMI terminal should be well connected before power on (hot-plug is not allowed)
K3 Terminal (USB A TYPE)

Pin No.	Pin Name	I/O	Descriptions
1	VDD(5V)	Power	USB power supply(5V)
2	DATA-	I/O	USB data negative signal
3	DATA+	I/O	USB data positive signal
4	GND	Power	Ground

Absolute Maximum Ratings

Items	Symbol	Min.	Max.	Unit	Condition
Power Supply voltage	VDD(5V)	-0.3	5.5	V	
Power Supply voltage	VCC(12V)	-0.3	12.5	V	
Operating Temperature	TOP	-20	70	℃	No Condensation
Storage Temperature	TST	-30	80	℃	No Condensation
Relative humidity	HR	5%	95%		No Condensation

Note:

1. This rating applies to all parts of the module. And should not be exceeded.
2. The operating temperature only guarantees operation of the circuit. The contrast, response speed, and the other specification related to electro-optical display quality is determined at the room temperature, TOP=25℃
3. Any Stresses exceeding the Absolute Maximum Ratings may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Electrical Characteristics

DC Characteristics

Items	Symbol	MIN.	TYP.	MAX.	Unit	Note
Supply Voltage	VDD(5V)	4.7	5.0	5.3	V	
Supply Voltage	VCC(12V)	11.5	12.0	12.5	V	
VCC Power Consumption	IVCC	570	635	720	mA	*1
Backlight Life	–		50000		Hrs	
VLED_PWM frequency	FPWM	200	–	5K	HZ	
VLED_PWM duty	D	5	–	100	%	

Note*1: Backlight brightness is 100%.

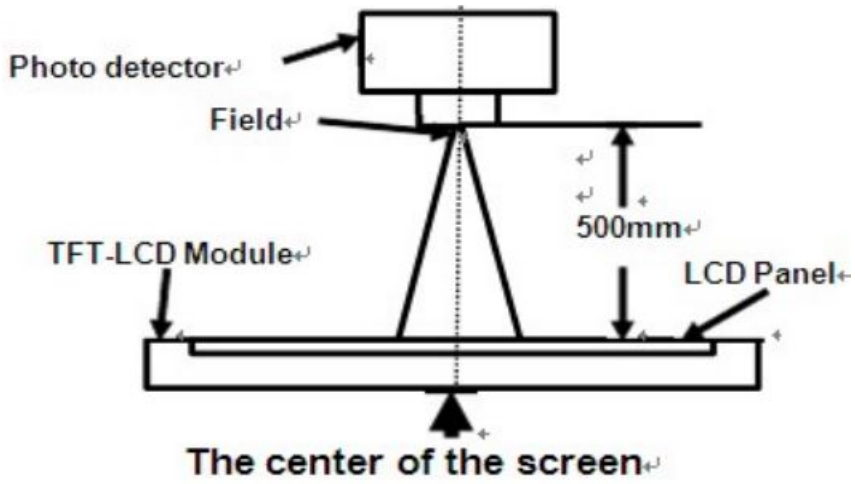
Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
View Angles		θT	CR≧10	75	85	–	Degree	Note 2
		θB		75	85	–		
		θL		75	85	–		
		θR		75	85	–		
Contrast Ratio		CR	θ=0°	600	800	–	–	Note1 Note3
Response Time		TON+TOFF	25℃	–	25	40	ms	Note1 Note4
Chromaticity	White	x	Backlight is on	0.252	0.302	0.352	–	Note5 Note1
		y		0.277	0.327	0.377		
	Red	x		0.532	0.582	0.632		
		y		0.274	0.324	0.374		
	Green	x		0.300	0.350	0.400		
		y		0.532	0.582	0.632		
	Blue	x		0.104	0.154	0.204		
		y		0.044	0.094	0.144		
Uniformity		U	–	75	80	–	%	Note1 Note6
NTSC		–	–	45	50	–	%	Note 5
Luminance		L			850	–	cd/m2	Note1 Note7

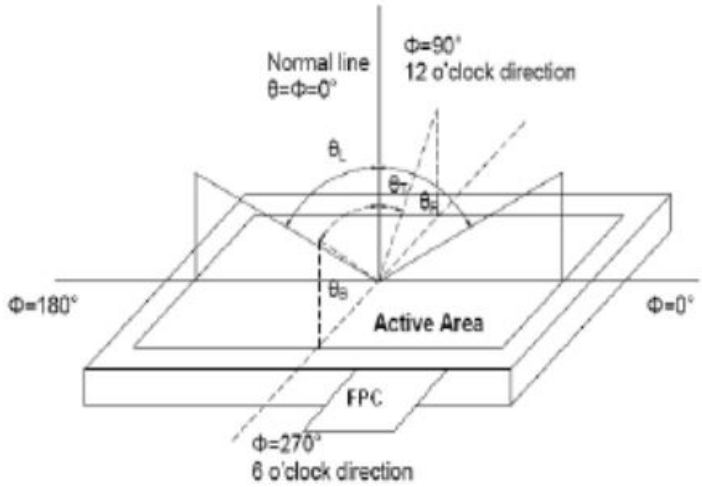
Test Conditions:

1. The ambient temperature is 25±2℃.humidity is 65±7%
2. The test systems refer to Note 1 and Note 2.

- **Note** 1: Definition of optical measurement system.
- The optical characteristics should be measured in dark room. After 5 Minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.

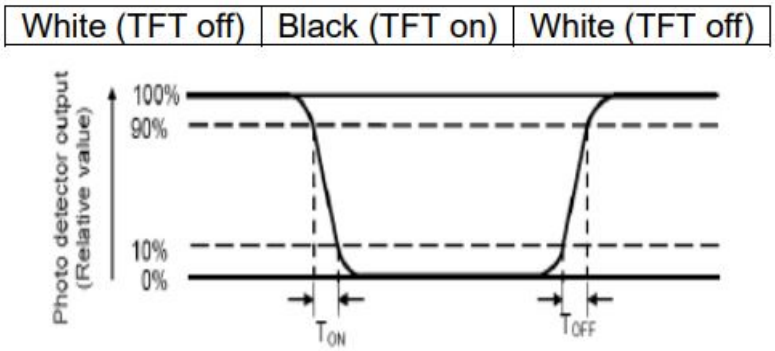


viewing angle is measured at the center point of the LCD.

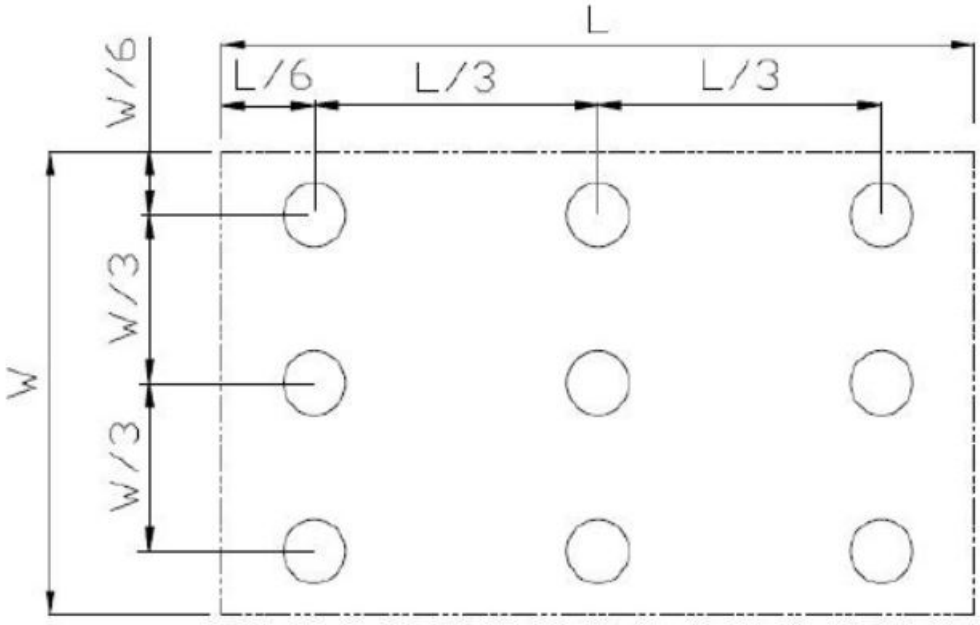


Note 3: Definition of contrast ratio

- **Contrast ratio (CR)=** Luminance measured when LCD is in the “White” state
  - Luminance is measured when LCD is in the “Black” state
- White state”: The state is that the LCD should be driven by Vwhite.
- **Black state”**: The state is that the LCD should be driven by Vblack.
- **Vwhite:** To be determined Vblack: To be determined.
- **Note 4:**Definition of Response time
- The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time
  (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



- **Note 5:** Definition of color chromaticity (CIE1931)
- Color coordinates measured at center point of LCD.
- **Note 6:** Definition of Luminance Uniformity
- Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.
- **L——**-Active area length W—— Active area width
    - Luminance Uniformity (U) = Lmin/ Lmax



- **Lmax:** The measured Maximum luminance of all measurement position.
- **Lmin:** The measured Minimum luminance of all measurement position.
- **Note** 7: Definition of Luminance:
- Measure the luminance of white state at center point.

LCD Module Design and Handling Precautions

- Please ensure V0, VCOM is adjustable, to enable LCD module get the best contrast ratio under different temperatures, view angles and positions.
- Normally display quality should be judged under the best contrast ratio within viewable area. Unexpected display pattern may com out under abnormal contrast ratio.
- Never operate the LCD module exceed the absolute maximum ratings.
- Never apply signal to the LCD module without power supply.
- Keep signal line as short as possible to reduce external noise interference.
- IC chip (e.g. TAB or COG) is sensitive to light. Strong light might cause malfunction. Light sealing structure casing is recommended.
- Make sure there is enough space (with cushion) between case and LCD panel, to prevent external force passed on to the panel; otherwise that may cause damage to the LCD and degrade its display result.
- Avoid showing a display pattern on screen for a long time (continuous ON segment).
- LCD module reliability may be reduced by temperature shock.
- When storing and operating LCD module, avoids exposure to direct sunlight, high humidity, high or low temperature. They may damage or degrade the LCD module.
- Never leave LCD module in extreme condition (max./min storage/operate temperature) for more than 48hr.

- Recommend LCD module storage conditions is 0 C~40 C <80%RH.
- LCD module should be stored in the room without acid, alkali and harmful gas.
- Avoid dropping & violent shocking during transportation, and no excessive pressure press, moisture and sunlight.
- LCD module can be easily damaged by static electricity. Please maintain an optimum anti-static working environment to protect the LCD module. (eg. ground the soldering irons properly)
- Be sure to ground the body when handling LCD module.
- Only hold LCD module by its sides. Never hold LCD module by applying force on the heat seal or TAB.
- When soldering, control the temperature and duration avoid damaging the backlight guide or diffuser which might degrade the display result such as uneven display.
- Never let LCD module contact with corrosive liquids, which might cause damage to the backlight guide or the electric circuit of LCD module.
- Only clean LCD with a soft dry cloth, Isopropyl Alcohol or Ethyl Alcohol. Other solvents (e.g. water) may damage the LCD.
- Never add force to components of LCD module. It may cause invisible damage or degrade the module's reliability.
- When mounting LCD module, please make sure it is free from twisting, warping and bending.
- Do not add excessive force on surface of LCD, which may cause the display color change abnormally.
- LCD panel is made with glass. Any mechanical shock (e.g. dropping from high place) will damage the LCD module.
- Protective film is attached on LCD screen. Be careful when peeling off this protective film, since static electricity may be generated.
- Polarizer on LCD gets scratched easily. If possible, do not remove LCD protective film until the last step of installation.
- When peeling off protective film from LCD, static charge may cause abnormal display pattern. The symptom is normal, and it will turn back to normal in a short while.
- LCD panel has sharp edges, please handle with care.
- Never attempt to disassemble or rework LCD module.
- If display panel is damaged and liquid crystal substance leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes promptly wash it off using soap and water.

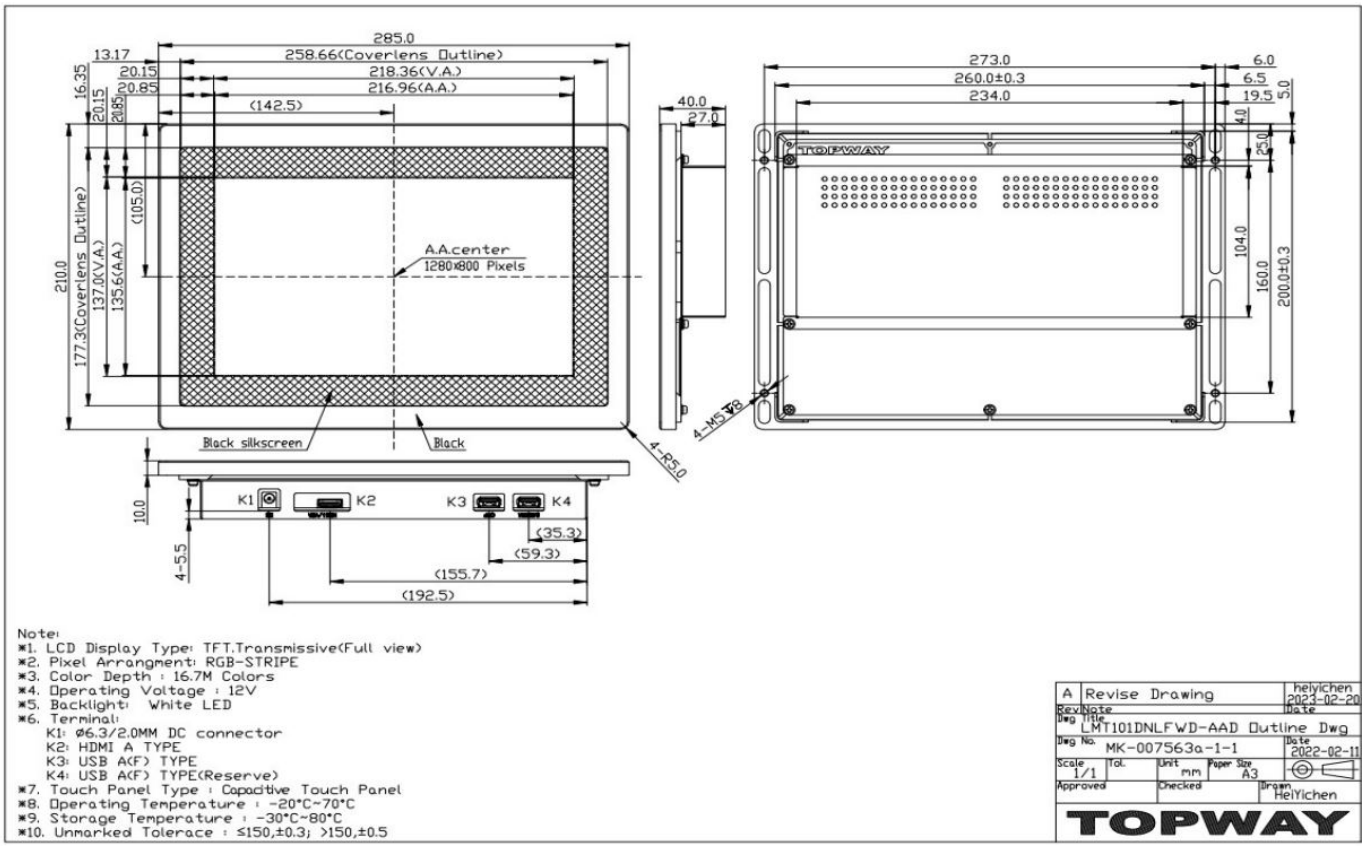
Warranty

- This product has been manufactured to our company's specifications as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we cannot take responsibility if the product is used in medical devices, nuclear power control equipment, aerospace equipment, fire and security systems, or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required. If the product is to be used in any of the above applications, we will need to enter into a separate product liability agreement.
- We cannot accept responsibility for any defect, which may arise form additional manufacturing of the product (including disassembly and reassembly), after product delivery.
- We cannot accept responsibility for any defect, which may arise after the application of strong external force to

the product.

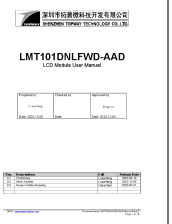
- We cannot accept responsibility for any defect, which may arise due to the application of static electricity after the product has passed our company's acceptance inspection procedures.
- When the product is in CCFL models, CCFL service life and brightness will vary according to the performance of the inverter used, leaks, etc. We cannot accept responsibility for product performance, reliability, or defect, which may arise.
- We cannot accept responsibility for intellectual property of a third part, which may arise through the application of our product to our assembly with exception to those issues relating directly to the structure or method of manufacturing of our product.

Outline Drawing



NURL: www.topwaydisplay.com

Documents / Resources

	Topway Display LMT101DNLFWD-AAD 10.1 Inch Color TFT LCD Module [pdf] User Manual LMT101DNLFWD-AAD 10.1 Inch Color TFT LCD Module, LMT101DNLFWD-AAD, 10.1 Inch Color TFT LCD Module, Color TFT LCD Module, TFT LCD Module, LCD Module, Module

References

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