

MODEL : **TY021WVL02NH**

ISSUED DATE : **2025-4-9**

VERSION : **1.0**

Version Record

Issued Date	Description	Version	Editor	Audit
2025-4-9	Final release	1.0	Pearl	

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1. Hardware Introduction

1.1. Pinout IO Definitions

Number	Pin Name	Reset state	Function	Note
1	VCC	-	POWER-IPUT, 5~15V	All multiplexed functions can be forced to convert to GPIO when not in use
2	VCC	-	POWER-IPUT, 5~15V	
3	PA2	Z	Default function: I2C1-SCL (Need to connect 2~5KΩ pull-up resistor)	
4	PA3	Z	Default function: I2C1-SDA (Need to connect 2~5KΩ pull-up resistor)	
5	PA5	Z	Default function: UART2-RX (Connect to user's TX)	
6	PA4	Z	Default function: UART2-TX (Connect to user's RX)	
7	PB6	Z	Default : AUDIO-PA-EN (High level- no audio output Low level -audio output)	
8	PE13	Z	Default : SPK (Connect to audio amplifier)	
9	GND	-	POWER-GND	
10	GND	-	POWER-GND	

2. Product Specifications

● Product parameter	
Model	TY021WVL02NH
Product serial	MINI board
Core processor	TR230M
Size	2.1 inch
Resolution	480RGB×480
Active area(mm)	53.28(W)×53.28(H)
Product size(mm)	Screen:56.18(W)×86.61(H)×2.30(T) Board: 32.20(W)×48.00(H)×4.16(T)
Color	262K
Storage	Customer available 16 M
Pictures format	JPG/PNG
Download pictures	TF Card (Needs to be combined with a debugging tool)
Firmware update	TF Card (Needs to be combined with a debugging tool)
● LCD screen	
Display type	TFT LCD IPS
Back light	LED
Brightness(cd/m²)	450

Backlight life(hour)	30000
Contrast	1000
Perspective(T/B/L/R)	(85/85/85/85)
● Touch panel	
Touch mode	None
● Environmental electrical parameters	
Voltage	3.4~5.5V, typical 5V DC
Power consumption	5V/106mA(Max brightness) 5V/47mA (Backlight off)
Working temperature	-20℃ ~ 70℃
Storage temperature	-30℃ ~ 80℃
Working humidity	10%~90%RH
Storage humidity	10%~90%RH
● Communication interface parameters	
Communication mode	3.3V TTL
Baud	2400~3Mbps, typical value is 115200
Data frame format	8N1
Communication plug-in specification	10Pin_FPC_1.0mm

3. Reliability Test

3.1. ESD Test

3.1.1. Implementation Standards

Implementation standards	GB/T 17626.2
Performance criteria	A

3.1.2. Test Environment

Test ambient temperature: 25℃

Test environment humidity: 50%

Test process: place the product on the test bench, conduct contact and air discharge in turn around the iron frame of the serial port screen and the display area, and observe whether there is any abnormal reset and restart display.

Test remarks: *The current tests are all bare product tests. On the actual product assembly machine, keep the screen and the machine well grounded, or the touch panel surface is protected by PVC or a cover plate, the ESD performance index of the whole machine will be higher.*



3.1.3. Test Data Results:

Discharge type	Discharge value	Test Results	Performance Criteria
Contact	±6KV	Test Passed	A
Air Discharge	±10KV	Test Passed	A

3.2. Electrical fast transient group pulse testing (EFT)

3.2.1. Implementation standards

Implementation standards	GB/T 17626.4

3.2.2. Test Environment

Test ambient temperature: 25℃

Test environment humidity: 50%

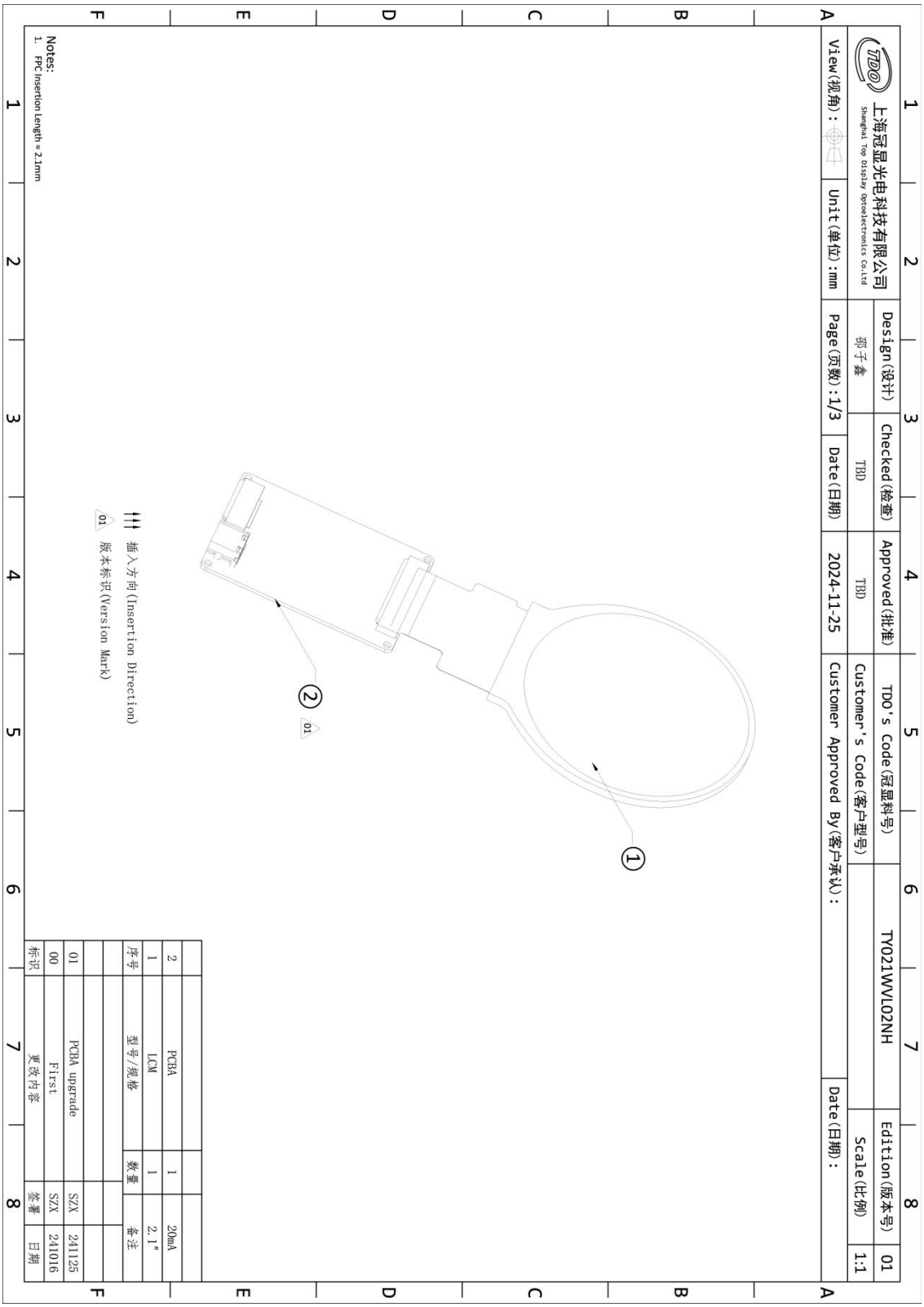
Test process: place the product in the high and low temperature test box, and power the screen through the power supply after the pulse group is coupled by the group pulse generator, and observe whether there is abnormal reset and restart display and other phenomena**.**

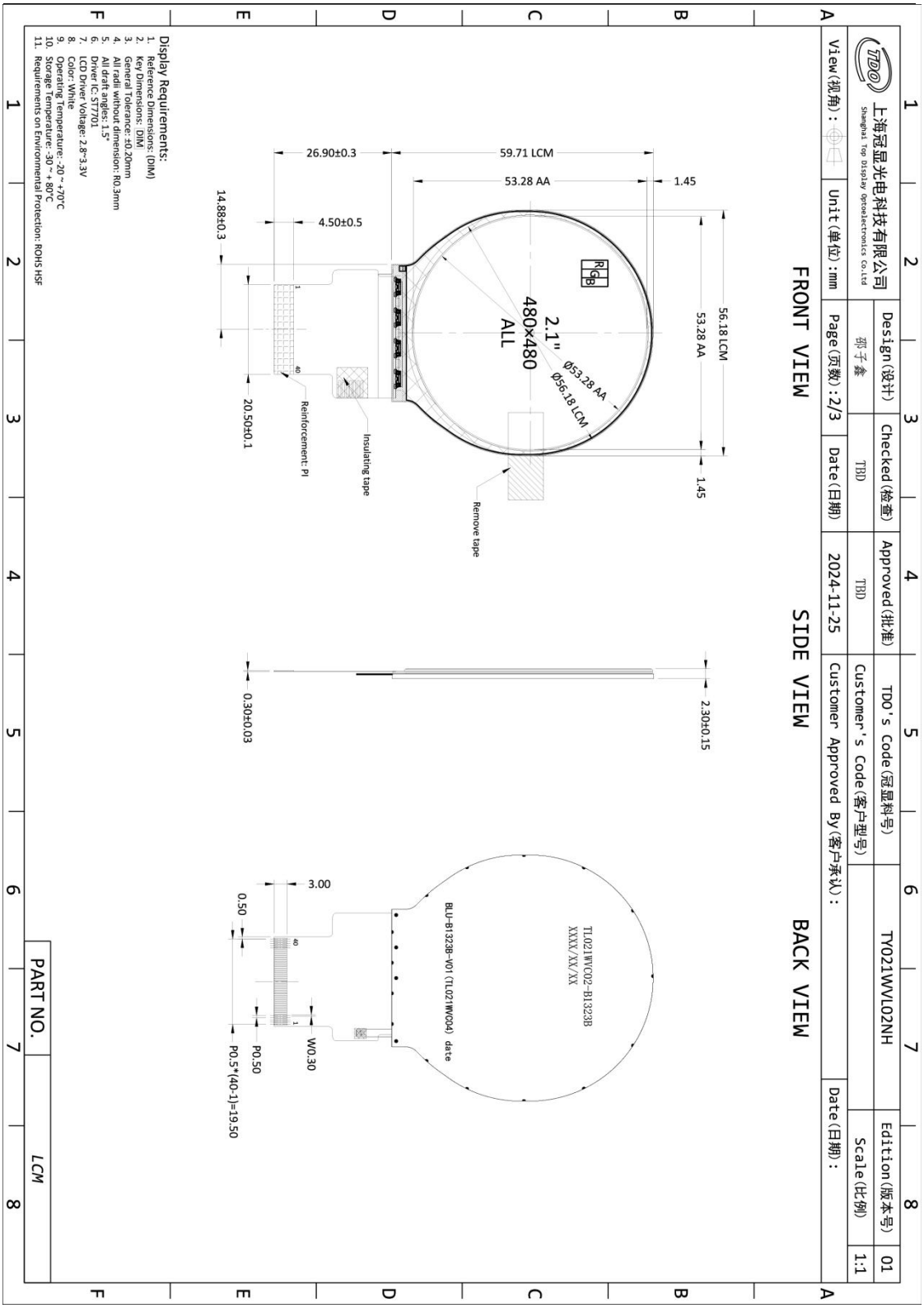


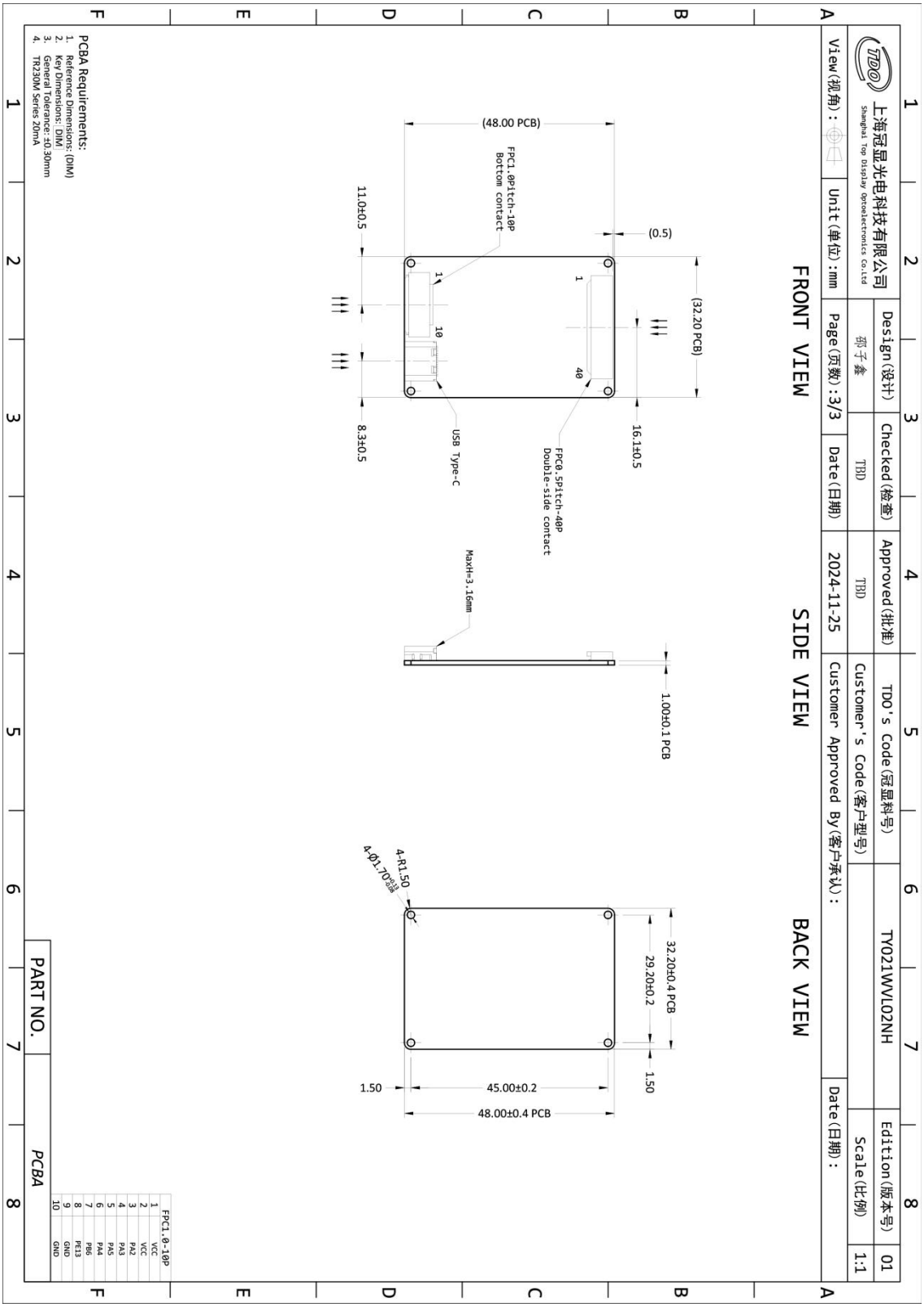
3.2.3. Test Data Results:

Implementation standards	GB/T 17626.4
Performance criteria	A
Test environment	4.0KV ; 100KHZ ; 120S

4. Product Size

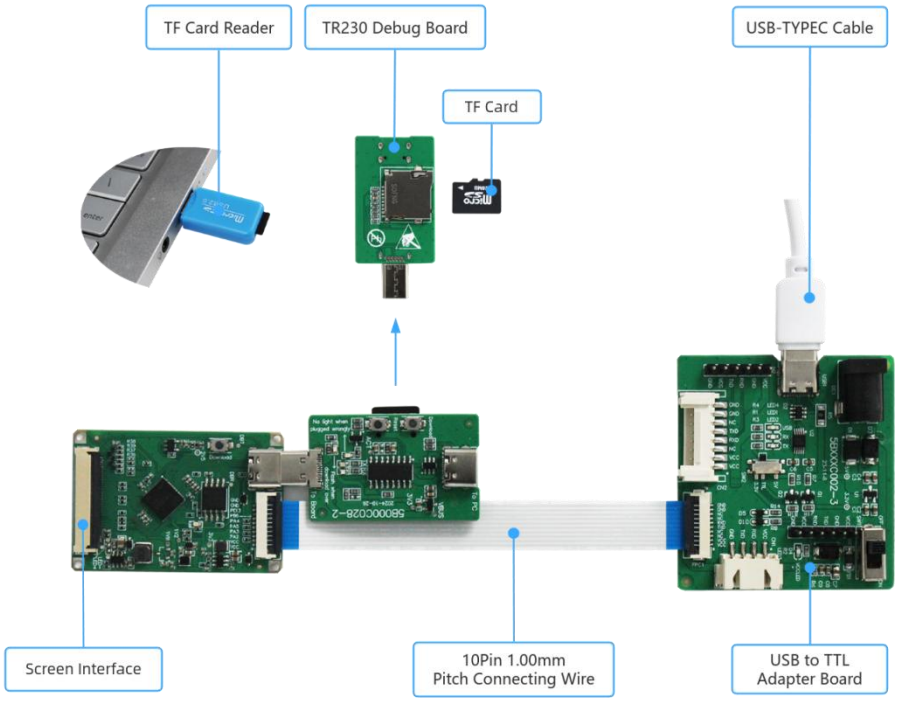



上海冠显光电科技有限公司
Shanghai Top Display Optoelectronics Co.Ltd
Design(设计)
Checked(检查)
Approved(批准)
TDO's Code(冠显料号)
TY021WVL02NH
Edition(版本号)
01
View(视角):
Unit(单位):mm
Page(页数):2/3
Date(日期)
2024-11-25
Customer's Code(客户型号)
Customer Approved By(客户承认):
Date(日期):
Scale(比例)
1:1
FRONT VIEW
SIDE VIEW
BACK VIEW
26.90±0.3
59.71 LCM
53.28 AA
1.45
4.50±0.5
14.88±0.3
56.18 LCM
53.28 AA
1.45
2.1"
480×480
ALL
Ø53.28 AA
Ø56.18 LCM
RGB
Reinforcement: PI
Insulating tape
Remove tape
20.50±0.1
0.30±0.03
2.30±0.15
3.00
0.50
W0.30
P0.50
P0.5*(40-1)=19.50
TLO21WVC02-B1323B
XXXX/XX/XX
BLU-B1323B-V01 (TLO21WVC04) date
Display Requirements:
1. Reference Dimensions: (DIM)
2. Key Dimensions: DIM
3. General Tolerance: ±0.20mm
4. All radii without dimension: R0.3mm
5. All dimensions in millimeters
6. Driver IC: ST7701
7. LCD Driver Voltage: 2.8~3.3V
8. Color: White
9. Operating Temperature: -20~+70°C
10. Storage Temperature: -30~+80°C
11. Requirements on Environmental Protection: ROHS HSF
PART NO.
LCM


上海冠显光电科技有限公司
Shanghai Top Display Optoelectronics Co.Ltd
View(视角):
Unit(单位):mm
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邓子鑫
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TY021WVL02NH
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Customer Approved By(客户承认):
Date(日期):
Edition(版本号)
01
Scale(比例)
1:1
FRONT VIEW
SIDE VIEW
BACK VIEW
(48.00 PCB)
(32.20 PCB)
(0.5)
FPC1.0Pitch-10P
Bottom contact
11.0±0.5
8.3±0.5
16.1±0.5
USB Type-C
FPC0.5Pitch-40P
Double-side contact
MaxH=3.16mm
1.00±0.1 PCB
4-R1.50
4-Ø1.70通孔
32.20±0.4 PCB
29.20±0.2
1.50
45.00±0.2
48.00±0.4 PCB
PCBA Requirements:
1. Reference Dimensions: (DIM)
2. Key Dimensions: DIM±0.
3. General Tolerance: ±0.30mm
4. TR230M Series 20mA
PART NO.
PCBA
FPC1.0-10P
1 VCC
2 VCC
3 PA2
4 PA3
5 PA5
6 PA4
7 PB6
8 PE13
9 GND
10 GND

5. Debugging Tools

It is recommended for new users of TDO smart LCMs to purchase official accessories. For more details, please refer to customer service center.



6. Model Definition

T Y 021 WV L 02 N H

1 2 3 4 5 6 7 8

① : 1 position--TDO abbreviation, fixed。

② : 1 position--U(U series serial port)/P(parallel port)/Y(Y series serial port)/H(HDMI interface type)/S(adapter board)/L

③ : 3 position--size,eg.021->2.1 inch

④ : 2 position--resolution abbreviation

⑤ : 1 position--H (standard series)/C (basic series)/L (MINI board series)/P (with housing series)/M (medical series)/A (AV series)

⑥ : 2 position---serial number

⑦ : 1 position---CT (with capacitive touch panel)/RT (with resistive touch panel)

⑧ : 1 position-----Platform: F-TR660 / G-TR540 / H-TR230M /J -TR240 / K-TR661 / DTR670 / 0-Android / 1-Linux

Note: There is no key structural process modification or major layout adjustment, only changes in product process or reliability. The company will not initiate changes to the outside world. The specific items are subject to the received items.

7. Packaging and Physical Dimensions

Single product weight					
Net weight (G)	TBD				
Packaging standard and total weight					
Packing box model	Packing box size (length*width*height, unit: mm)	Layers	Quantity (PCS)/layer	Total quantity (pieces)	Total weight (KG)

8. Sale and Service



TEL:021-6429098

FAX:021-6429089

EMAIL:sales@shtdo.com

WEB:www.shtdo.com

ADDR:Shanghai, Minhang district, Xinjunhuan Road 88, Building13A, 4th floor

Online shop:http://shtdo.en.alibaba.com/

9. Disclaimer

This document provides product information about Shanghai Top Display Optoelectronics Technology Co., Ltd. (hereinafter referred to as Shanghai Top Display), which aims to assist customers to speed up product development progress, short development cycles, any routine programs provided in the service process or other channels , technical documents, data manuals, product drawings and other materials and information are for reference only, and customers have the right not to use or to modify and use for their own reference. The company does not provide any guarantee of completeness and reliability. If the customer causes special, incidental or indirect losses for any reason during the use process, the company does not assume any responsibility.