SPECIFICATIONS

CUSTOMER	:	
SAMPLE CODE	:	SMA320240T028-ZHC
MASS PRODUCTION CODE	:	HMA320240T028-ZHC
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	LMD- HMA320240T028-ZHC(Ver.002)
PACKAGING NO. (Ver.)	:	PKG- HMA320240T028-ZHC(Ver.001)

Customer Approved

Date:

Approved	Checked	Designer
林裘中 Daniel Lin	呂清溪 Marcs Lu	陳漢霖 Hans Chen

POWERTIP
2022.01.13
TW RD APR

☐ Preliminary specification for design input

■ Specification for sample approval

POWERTIP TECH. CORP.

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1. SPECIFICATIONS

1.1 Features

Hardware

CPU	RISC Processor	STM32H750 480 MHz, ARM Cortex-M7
Memory	RAM	16MB SDRAM
	Flash	32MB QSPI FLASH 8GB eMMC
	External Storage	1 x Micro SD (max. 32G)
Display	Resolution	320 x 240
	Touch Panel	Projected Capacitive Touch
	Interface	Parallel RGB 24 bits
	Viewing Direction	Full Viewing Angle , Normally Black , Transmissive type
I/O	USB	1 x USB2.0 Device
	Serial	1 x UART, 1 x SPI, 1 x I2C, 1 x CAN
	RMII	1 x Ethernet
Power Input	DC	5V

Note:

1. Support Micro USB Power Supply.
2. Support USB Device Full Speed.
3. Support CAN Bus (Compatible with ISO11898-2).
4. Support Ethernet (10BASE-T / 100BASE-T).
5. Support RTC.

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	84.02(W) x 75.36(L) x 14.0(H) MAX	mm
Active Area	70.08(W) x 52.56(L)	mm

1.3 Absolute Maximum Ratings

Ta = 25℃

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply	VIN	—	4.5	6.0	V
Operating Temperature	T_{OP}	—	-20	70	℃
Storage Temperature	T_{ST}	—	-30	80	℃
Humidity	HD	Ta=60 ℃	10	90	%RH

1.4 DC Electrical Characteristics

Ta = 25℃

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage	VIN	-	4.5	5	5.5	V
Power Supply Voltage of RTC	VBAT	-	1.2	-	3.6	V
Power Supply Current	IIN	VIN = 5V	-	480	-	mA
Power Consumption of System	PIN	VIN = 5V	-	2.4	-	W
High-Level voltage of digital input	V_{IH}	-	2.3	-	-	V
Low-Level voltage of digital input	V_{IL}	-	-	-	0.9	V
High level voltage of digital output	V_{OH}	-	2.4	-	-	V
Low level voltage of digital output	V_{OL}	-	-	-	0.4	V

1.5 Optical Characteristics

TFT LCD Module VDD = 3.3 V, Ta=25℃

Item	Symbol		Condition	Min.	Typ.	Max.	unit	
Response time	Tr+Tf		Ta = 25℃ θX, θY = 0°	-	30	40	ms	Note 2
Viewing angle	Top	θY+	CR ≥ 10	-	80	-	Deg.	Note 4
	Bottom	θY-		-	80	-		
	Left	θX-		-	80	-		
	Right	θX+		-	80	-		
Contrast ratio		CR	Ta = 25℃ θX , θY = 0°	650	800	-		Note 3
Color of CIE Coordinate （With B/L & TP）	White	X		0.23	0.28	0.33	-	Note1
		Y		0.27	0.32	0.37		
	Red	X		0.58	0.63	0.68		
		Y		0.31	0.36	0.41		
	Green	X		0.29	0.34	0.39		
		Y		0.55	0.60	0.65		
	Blue	X		0.09	0.14	0.19		
		Y		0.04	0.09	0.14		
Average Brightness Pattern=white display (With TP)*1	IF		VCC=12.0V PWM=”High” (Duty=100%)	650	800	-	cd/m^2	Note1
Uniformity (With TP)*2	△B		VCC=12.0V PWM=”High” (Duty=100%)	70	-	-	%	Note1

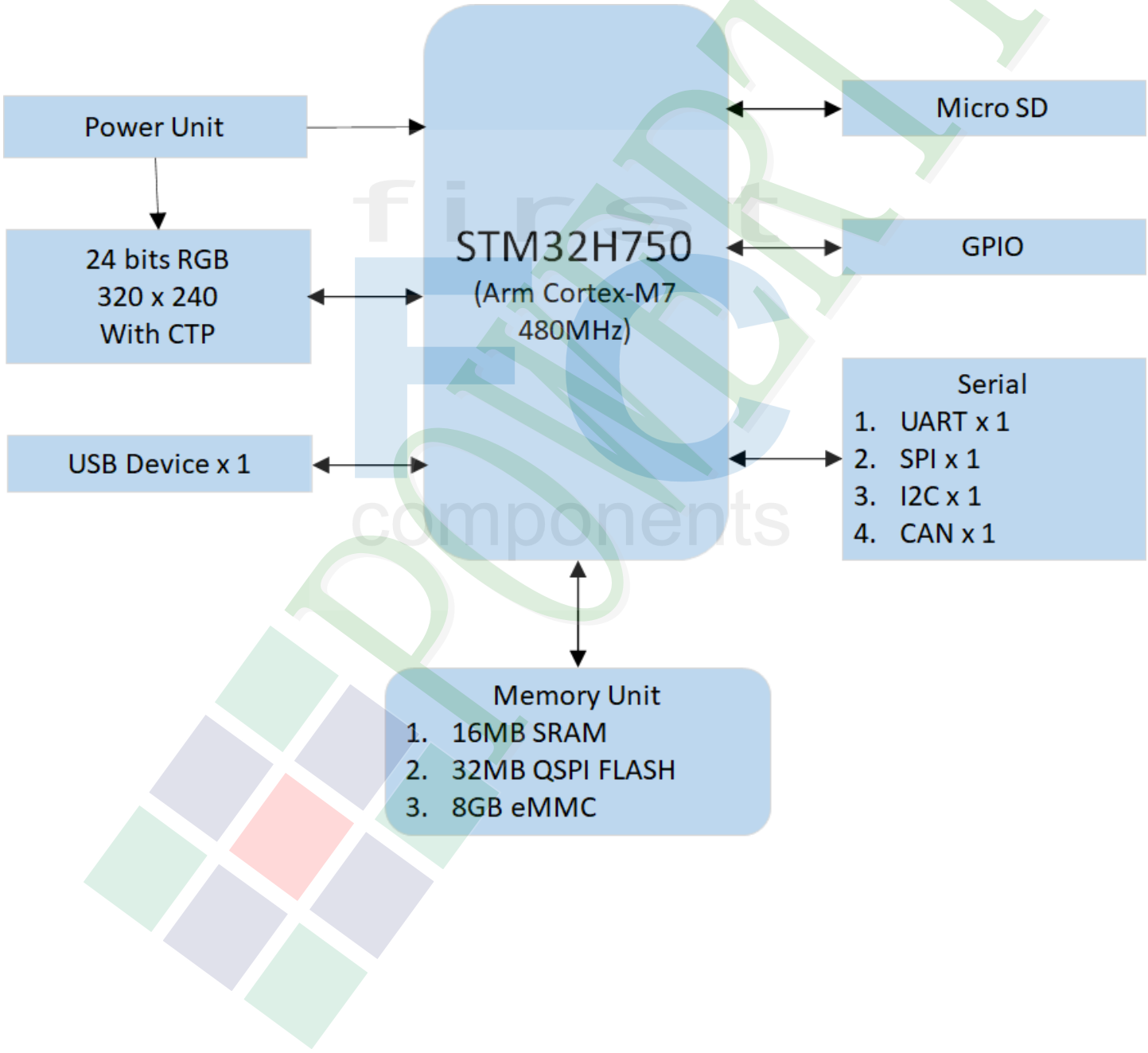
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



2.2 Interface Pin Description

JT1 --- JTAG (Wafer Pitch1.25mm 6pin)

Pin No.	Symbol	Type	DESCRIPTION
1	PA15	IO	General Purpose I/O, Port A [15].
2	PA8	IO	General Purpose I/O, Port A [8].
3	RESETINn	I	JTAG test reset.
4	JTMS/SWDIO	I/O	JTAG test mode select / Serial wire data in/out.
5	JTCK/SWCLK	I	JTAG test clock / Serial wire clock.
6	GND	P	Ground.

J3 --- CAN Bus (Wafer Pitch1.25mm 2pin)

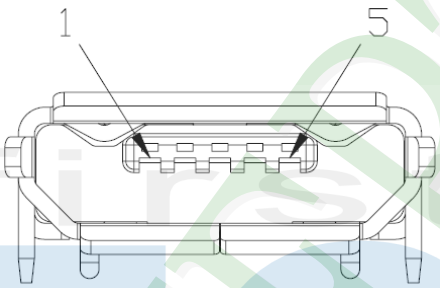
Pin No.	Symbol	Type	DESCRIPTION
1	CAN H	DS	High Level CAN Bus Line.
2	CAN L	DS	Low Level CAN Bus Line.

J8 --- RTC (Wafer Pitch1.25mm 2pin)

Pin No.	Symbol	Type	DESCRIPTION
1	VBAT	P	Power Supply for RTC.
2	GND	P	Ground.

J4 --- USB 2.0 Device MICRO USB

Pin No.	Symbol	Type	DESCRIPTION
1	VBUS5V	P	+5.0V
2	D-	DS	Data – (Data M)
3	D+	DS	Data + (Data P)
4	ID	-	Not Used.
5	GND	P	Ground



J6 --- Ethernet (Wafer Pitch1.25mm 10pin)

Pin No.	Symbol	Type	DESCRIPTION
1	GND	P	Ground.
2	GND	P	Ground.
3	LED_ACK	O	Link Speed LED Indication. (See Note 1)
4	RXD-	DS	Receive Negative.
5	RXD+	DS	Receive Positive.
6	TXD-	DS	Transmit Negative.
7	TXD+	DS	Transmit Positive.
8	LED_LINK	O	Link Activity LED Indication. (See Note 2)
9	GND	P	Ground.
10	VDD3V3	P	Power Supply (+3.3V).

Note 1: This pin is driven active when the operating speed is 100Mbps. It is inactive when the operating speed is 10Mbps or during line isolation.

Note 2: This pin is driven active when a valid link is detected and blinks when activity is detected.

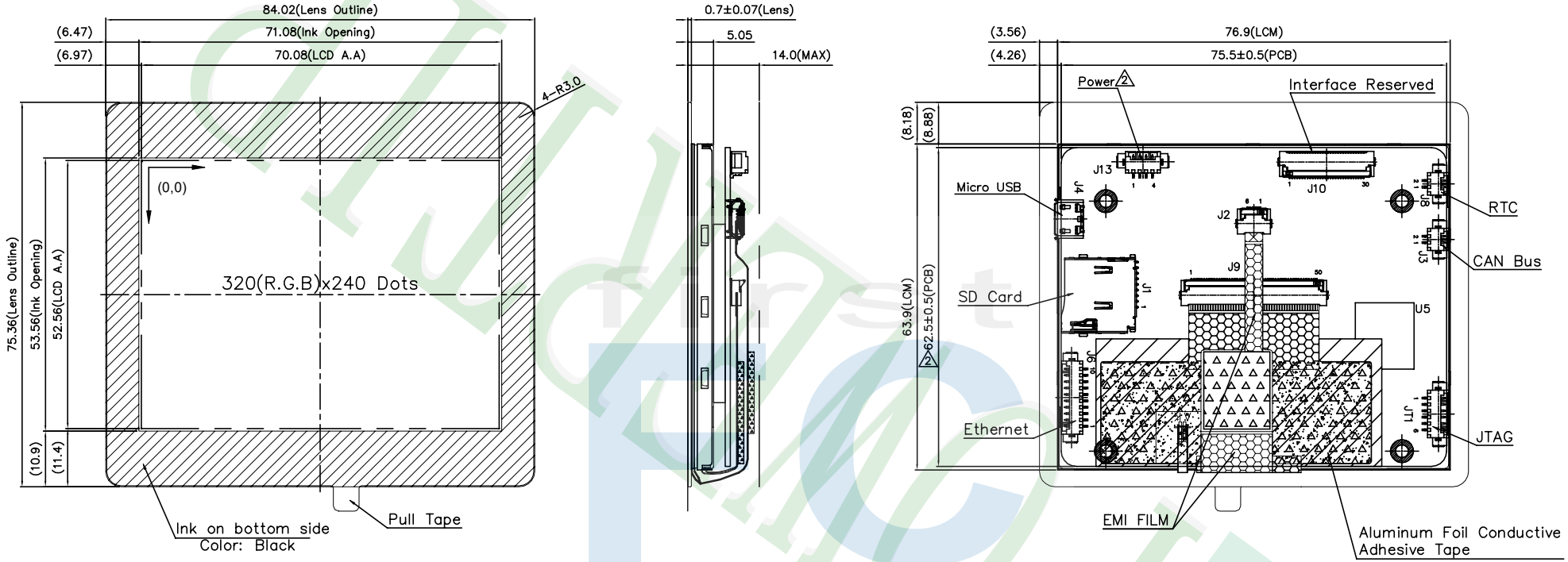
J10 --- P05D00071-01 Interface Reserved (Pitch 0.5mm 30pin Double contact)

Pin No.	Symbol	Type	DESCRIPTION
1	GND	P	Ground.
2	PG3	IO	General Purpose I/O, Port G [3].
3	PB2	IO	General Purpose I/O, Port B [2].
4	NC	-	Not Used.
5	GND	P	Ground.
6	I2C_CLK	IO	I2C2 CLK.
7	GND	P	Ground.
8	I2C_DAT	IO	I2C2 DAT.
9	GND	P	Ground.
10	SPI_CLK	IO	SPI1 CLK.
11	GND	P	Ground.
12	SPI_MISO	IO	SPI1 MISO.
13	SPI_MOSI	IO	SPI1 MOSI.
14	GND	P	Ground.
15	SPI_CS0	IO	SPI1 CS0.
16	GND	P	Ground.
17	PH6	IO	General Purpose I/O, Port H [6].
18	PH7	IO	General Purpose I/O, Port H [7].
19	PH4	IO	General Purpose I/O, Port H [4].
20	PB1	IO	General Purpose I/O, Port B [1].
21	GND	P	Ground.
22	RESETINn	I	System Reset, Active Low.
23	UART_RXD	IO	USART2 RX.
24	UART_TXD	IO	USART2 TX.
25	GND	P	Ground.
26	VIN	P	Power Supply (+5.0V).
27	VIN	P	Power Supply (+5.0V).
28	UART_CTS	IO	USART2 CTS.
29	UART_RTS	IO	USART2 RTS.
30	GND	P	Ground.

J13 --- Power Input (Wafer Pitch1.25mm 4pin)

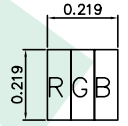
Pin No.	Symbol	Type	DESCRIPTION
1	VBUS5V	P	+5.0V
2	VBUS5V	P	+5.0V
3	GND	P	Ground
4	GND	P	Ground

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NOTES:

1. LCD TYPE: TFT LCD
2. LCD DISPLAY: Normally Black/TRANSMISSIVE
3. VIEW DIRECTION: Full Viewing Angle
4. JT1: Molex 532610671 or Compatible
5. J3 , J8: Molex 532610271 or Compatible
6. J6: Molex 532611071 or Compatible
7. J10: OMRON XF2M-3015-1A or Compatible
8. J13: Molex 532610471 or Compatible
9. The tolerance unless classified ±0.3mm



Dots Detali
Scale 50X

REV	REV BY	REVISER	DATE
007			
006			
005			
004			
003			
002	MODIFY BOARD SIZE & ADD J13	Nini	2021/12/02
001	NEW DRAWING	Nini	2021/03/31

FIRST Components Srl

PART NO: HMA320240T028-ZHC

DRAWING NAME : LMD-HMA320240T028-ZHC

TITLE: LCD MODULE DRAWING

久正光電股份有限公司
POWERTIP TECHNOLOGY CORPORATION

Design	Nini Chen	(3)	Surface		
Check	Marcs Lu	Unit	MM	Material	
Approve	Daniel Lin	Scale	FIT	Thickness	
		Page	1/1	Quantity	

Length(Min) (mm) \ Tolerance / Precision	Level
1 ~ 4	-
4 ~ 16	-
16 ~ 63	-
63 ~ 250	-
250 ~ 1000	-

PT-A-054-01