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Ubique Panel IA208048MC-050ABP Datasheet

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Revision History

Table 1. Revision History

Revision	Description	Release Date
1.00	Initial release	January, 2022

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Contents

1 Introduction 6

1.1 Features 6

2 Interface Description 7

2.1 Connector 10 (CN10) Pin Definition 8

2.2 Connector 9 (CN9) Pin Definition 10

2.3 DC Power Connector Pin Definition 12

2.4 Connector 5 (CN5) Pin Definition 13

3 Absolute Maximum Ratings 14

4 Electrical Characteristics 15

4.1 DC Characteristics 15

5 UART Communication Protocol 16

5.1 Command Format 16

5.2 Data Payload Format 16

6 Mechanical Drawing 17

7 IOT Product Nomenclature 18

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Figure List

Figure 1. Control Board Outline 7

Figure 2. CN10 Pin Definition 8

Figure 3. CN9 Pin Definition 10

Figure 4. DC Power Connector Pin Definition 12

Figure 5. CN5 Pin Definition 13

Figure 6. Mechanical Drawing for IA208048MC-050ABP with LCM 17

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Table List

Table 1. Revision History 2

Table 2. Ubique Panel Product Line 6

Table 3. CN10 Pin Definition 8

Table 4. CN9 Pin Definition 10

Table 5. DC Power Connector Pin Definition 12

Table 6. CN5 Pin Definition 13

Table 7. Absolute Maximum Ratings 14

Table 8. DC Characteristic 15

Table 9. Command Format 16

Table 10. Data Payload Format 16

Table 11. IOT Product Naming Rule 18

Table 12. IOT Product Nomenclature 18

Table 13. Field 12 of IOT Product Nomenclature 19

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1 Introduction

Ubique Panel product line provides total solutions for HMI. These solutions include ADE (Acorn Development Environment), control board and LCM. This datasheet is intended to describe the hardware part of the solutions. This document covers the following product:

Table 2. Ubique Panel Product Line

Part Number	Resolution	Panel Size	Touch Type
IA208048MC-050ABP	800x480	5.0”	CTP

Note: CTP = Capacitive Touch Panel

The product must work with ADE to perform the HMI tasks designed in ADE. The LCMs are sourced from our partners. For more details on the LCMs, please contact sales@iot-hmi.com or our local distributors.

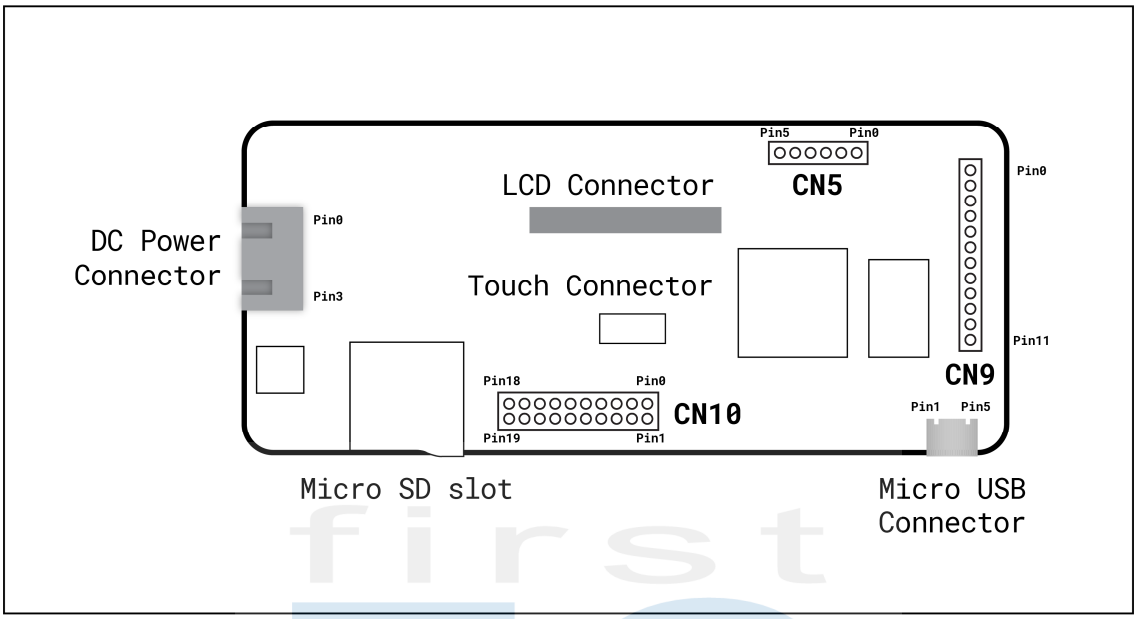
1.1 Features

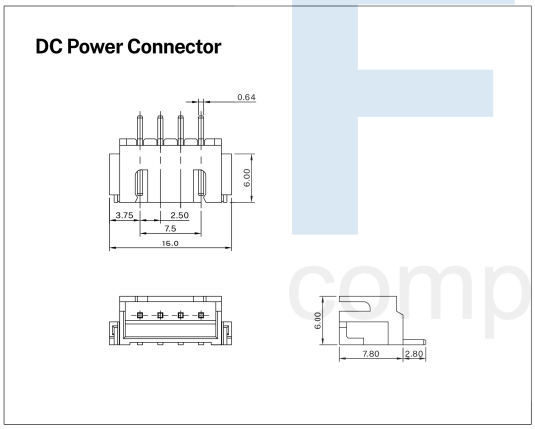
- Work only with ADE for delivering the Smart HMI total solution
- ARM Cortex M7-based MCU @480Mhz with 32MB DRAM
- Built-in 2Gb (256MB) Flash memory for storage
- Support ARGB888 (16,777,216 colors) with 256 levels of transparency
- Support LCM backlight control
- Support touch control (CTP)
- Support GPIO, PWM, Input-Capture and ADC functions
- Support input capture mode for frequency measurement
- Support UART communication interfaces
- Support USB interface for downloading designs from ADE
- Support -30°C~+80°C operating temperature

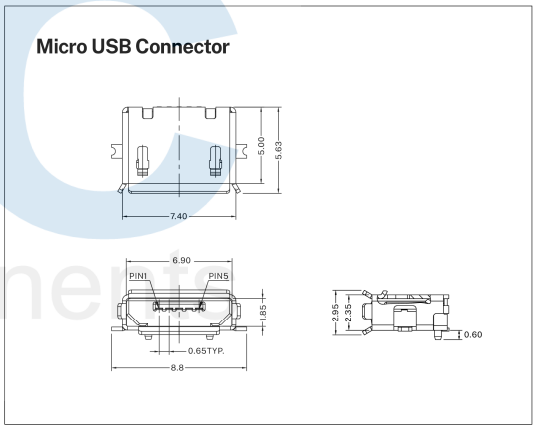
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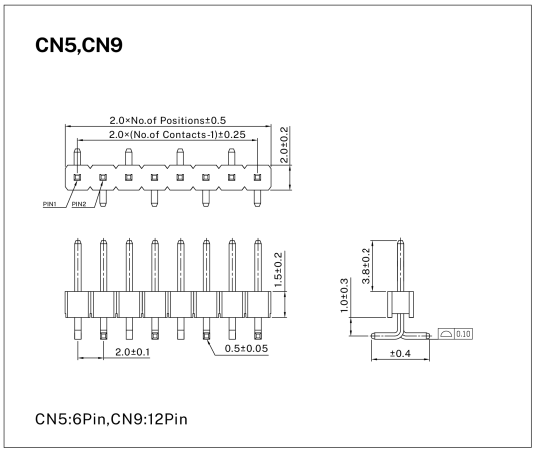
2 Interface Description

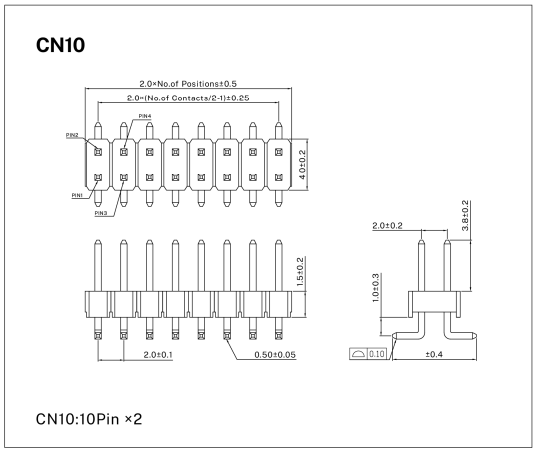
Figure 1. Control Board Outline











2.1 Connector 10 (CN10) Pin Definition

Figure 2. CN10 Pin Definition

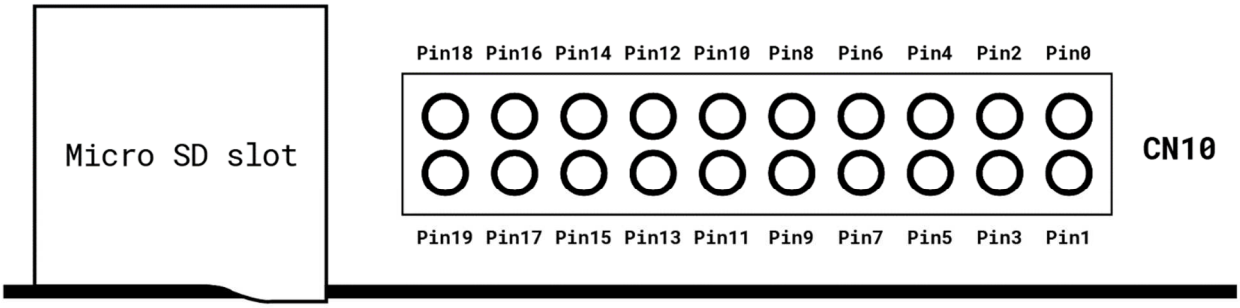


Table 3. CN10 Pin Definition

Pin Number	Name	I/O	Description
0	DC5V	P	DC 5V output.
1	GND	P	Supply Ground.
2	DC3.3V	P	DC 3.3V output.
3	GPIO1	I/O	General Purpose Input/Output, 3.3V Level - 5V Tolerant.
4	Reserved	N/A	Reserved.
5	GPIO2	I/O	General Purpose Input/Output, 3.3V Level - 5V Tolerant.
6	PWM4	I/O	This pin offers two different functions: GPIO and PWM. Users can select which function to be assigned to this pin inside ADE. For PWM, this pin generates digital pulses based on the parameters including frequency and duration set in the ADE.
7	GPIO3	I/O	General Purpose Input/Output, 3.3V Level - 5V Tolerant.
8	PWM5	I/O	This pin shares the same functionality as that of PWM4. Please refer to PWM4 description for details.
9	GPIO4	I/O	General Purpose Input/Output, 3.3V Level - 5V Tolerant.
10	PWM6	I/O	This pin shares the same functionality as that of PWM4. Please refer to PWM4 description for details.
11	GPIO5	I/O	General Purpose Input/Output, 3.3V Level - 5V Tolerant.
12	GND	P	Supply Ground.
13			

Pin Number	Name	I/O	Description
14	ADC0	I/O	General Purpose I/O pin with Analog Capability. This pin has a range of 0-3.3V when used as an Analog Input, and is 3.3V tolerant only.
15	ADC1	I/O	General Purpose I/O pin with Analog Capability. This pin has a range of 0-3.3V when used as an Analog Input, and is 3.3V tolerant only.
16	ADC2	I/O	General Purpose I/O pin with Analog Capability. This pin has a range of 0-3.3V when used as an Analog Input, and is 3.3V tolerant only.
17	ADC3	I/O	General Purpose I/O pin with Analog Capability. This pin has a range of 0-3.3V when used as an Analog Input, and is 3.3V tolerant only.
18	ADC4	I/O	General Purpose I/O pin with Analog Capability. This pin has a range of 0-3.3V when used as an Analog Input, and is 3.3V tolerant only.
19	ADC5	I/O	General Purpose I/O pin with Analog Capability. This pin has a range of 0-3.3V when used as an Analog Input, and is 3.3V tolerant only.

Note: I = Input, O = Output, P = Power

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2.2 Connector 9 (CN9) Pin Definition

Figure 3. CN9 Pin Definition

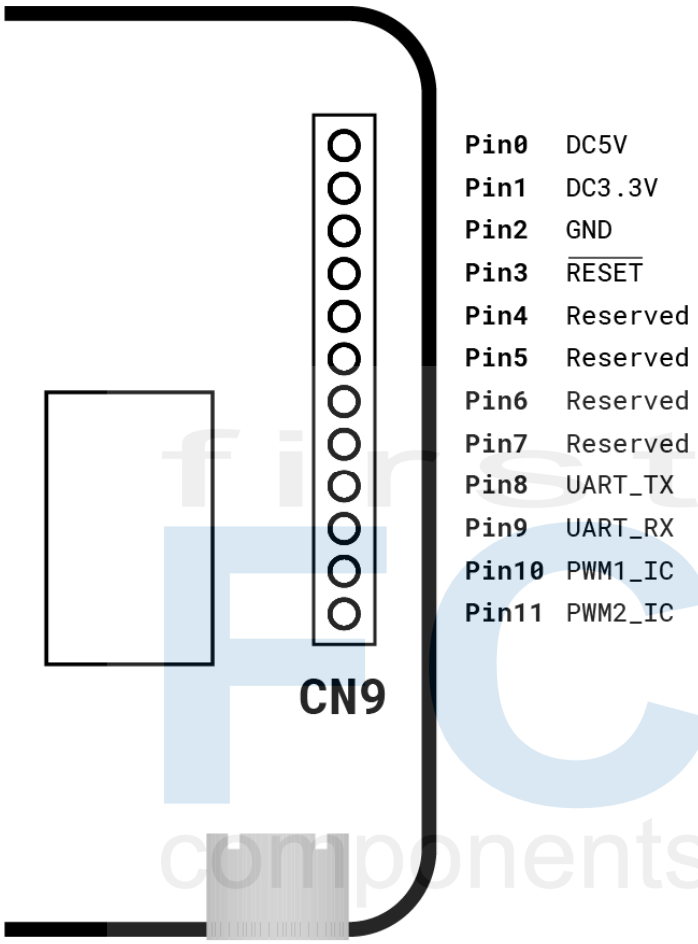


Table 4. CN9 Pin Definition

Pin Number	Name	I/O	Description
0	DC5V	P	DC 5V output.
1	DC3.3V	P	DC 3.3V output.
2	GND	P	Supply Ground.
3	$\overline{\text{RESET}}$	I	Reset signal. Active low.
4	Reserved	N/A	Reserved.
5	Reserved	N/A	Reserved.
6	Reserved	N/A	Reserved.
7	Reserved	N/A	Reserved.

Pin Number	Name	I/O	Description
8	UART_TX	I/O	TX for UART Asynchronous Serial Transmit pin, TTL level. Connect this pin to the Receive (Rx) signal of other serial devices. Used in conjunction with the UART_RX pin for communication with external MCU by UART Communication Protocol (The communication protocol is described in chapter UART Communication Protocol). This pin is tolerant up to 5.0V levels.
9	UART_RX	I/O	RX for UART Asynchronous Serial Receive pin, TTL level. Connect this pin to the Transmit (Tx) signal of other serial devices. Used in conjunction with the UART_TX pin for communication with external MCU by UART Communication Protocol (The communication protocol is described in chapter UART Communication Protocol). This pin is tolerant up to 5.0V levels.
10	PWM1_IC	I/O	This pin offers three different functions: GPIO, PWM and Input-capture. Users can select which function to be assigned to this pin inside ADE. For PWM, this pin generates digital pulses based on the parameters including frequency and duration set in the ADE. For the input-capture, the capture mode and the corresponding behavior are all set inside ADE.
11	PWM2_IC	I/O	This pin shares the same functionality as that of PWM1_IC. Please refer to PWM1_IC description for details.

Note: I = Input, O = Output, P = Power

2.3 DC Power Connector Pin Definition

Figure 4. DC Power Connector Pin Definition

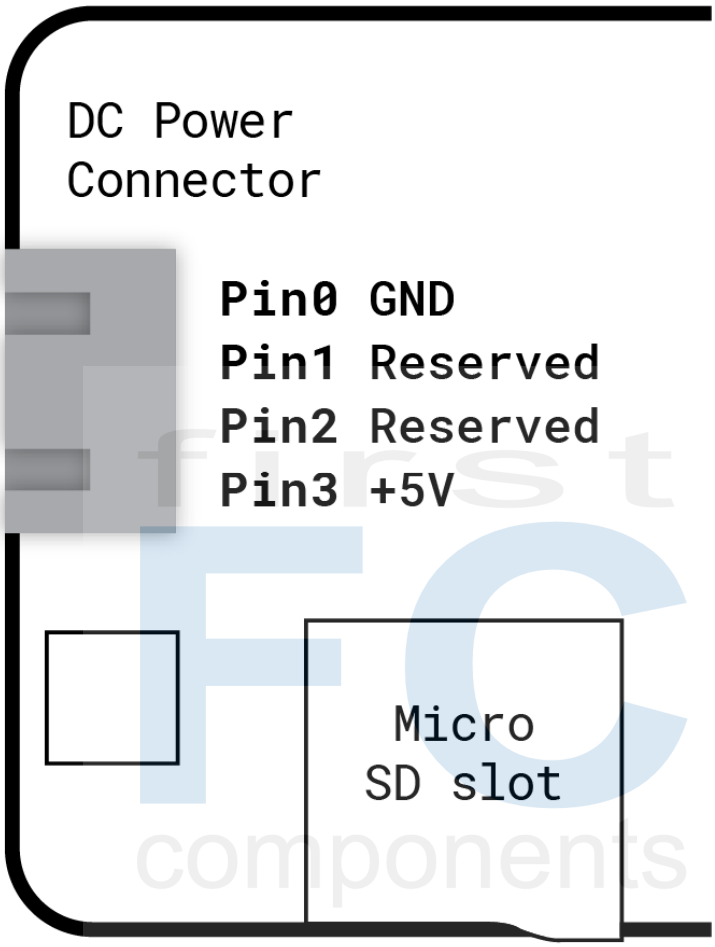


Table 5. DC Power Connector Pin Definition

Pin	Name	I/O	Description
0	GND	P	Supply Ground.
1	Reserved	N/A	Reserved.
2	Reserved	N/A	Reserved.
3	+5V	P	DC 5V input.

Note: I = Input, O = Output, P = Power

2.4 Connector 5 (CN5) Pin Definition

Figure 5. CN5 Pin Definition

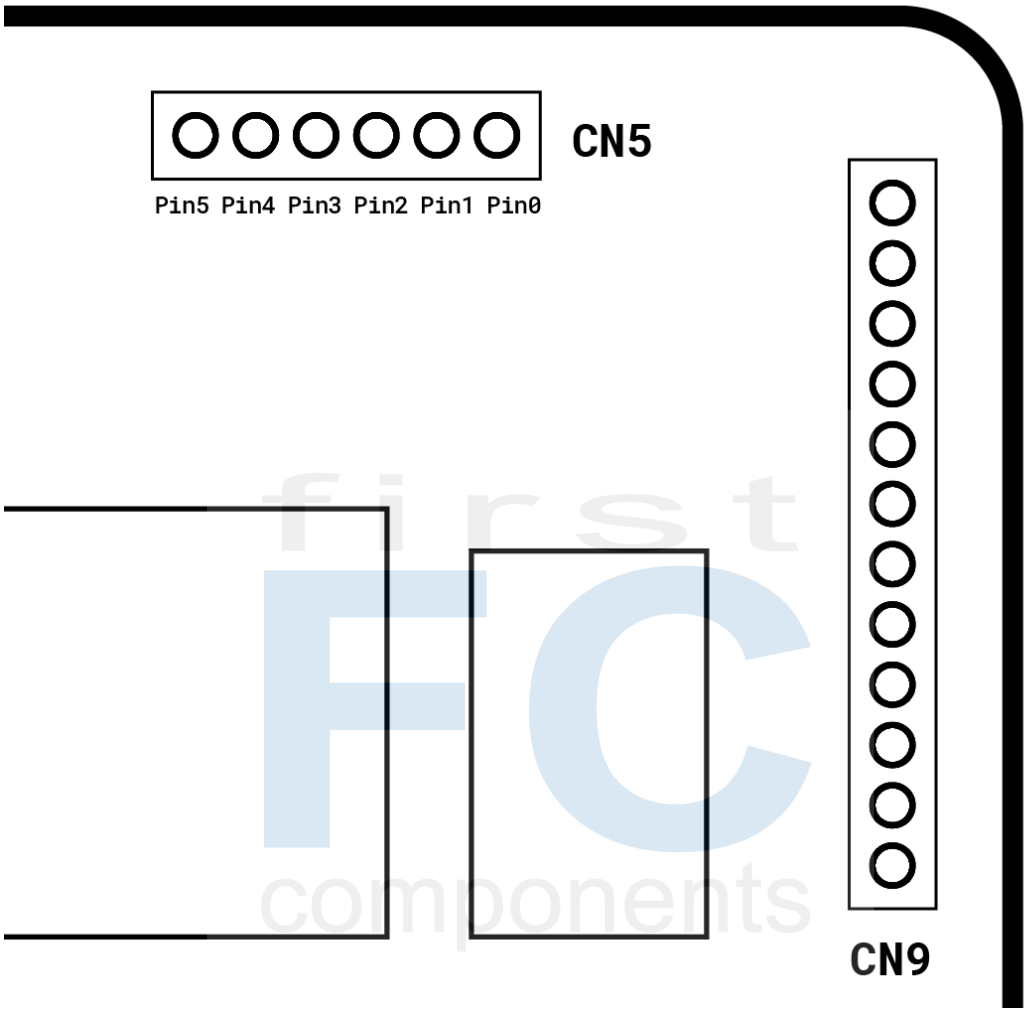


Table 6. CN5 Pin Definition

Pin	Name	I/O	Description
0	Reserved	N/A	Reserved.
1	Reserved	N/A	Reserved.
2	Reserved	N/A	Reserved.
3	Reserved	N/A	Reserved.
4	Reserved	N/A	Reserved.
5	Reserved	N/A	Reserved.

Note: I = Input, O = Output, P = Power

3 Absolute Maximum Ratings

Table 7. Absolute Maximum Ratings

Item	Minimum	Maximum	Unit
Storage temperature	-30	+80	°C
Operating ambient temperature	-30	+80	°C
Input supply voltage with respect to GND	+4.75	+5.5	V
IO voltage with respect to GND	+3.3V (± 10%)	+5.0	V

Note: IO Voltage is specified under the no-pull configuration.

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4 Electrical Characteristics

4.1 DC Characteristics

The following table is measured when the control board is driving a 5" LCM @1100cd/m^2.

Table 8. DC Characteristic

Symbol	Item	Minimum	Typical	Maximum	Unit
V_{IN}	Input power voltage	4.75	5.0	5.5	V
V_{DD}	Internal working voltage	3.0	3.3	3.5	V
	Operating current @100% backlight	530	560	–	mA
	Operating current @50% backlight	370	390	–	mA
	Operating current with backlight turned off	235	250	–	mA
V_{IH}	I/O input high level	$0.7V_{DD}$	–	5.0	V
V_{IL}	I/O input low level	0	–	$0.3V_{DD}$	V
V_{OH}	I/O output high level	V_{DD}-0.4	–	V_{DD}	V
V_{OL}	I/O output low level	0	–	$0.3V_{DD}$	V

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5 UART Communication Protocol

The default UART communication protocol will be described in this section. However, we do allow customization of the protocol. Please contact us for the customization service.

5.1 Command Format

Table 9. Command Format

Command	Lead Byte	Type Byte	Register ID Low Byte	Register ID High Byte	Tailing Bytes
Set Register	0x11	0x00	0x00~0xFF	0x00~0xFF	Data Payload
Read Register	0x11	0x01	0x00~0xFF	0x00~0xFF	N/A

5.2 Data Payload Format

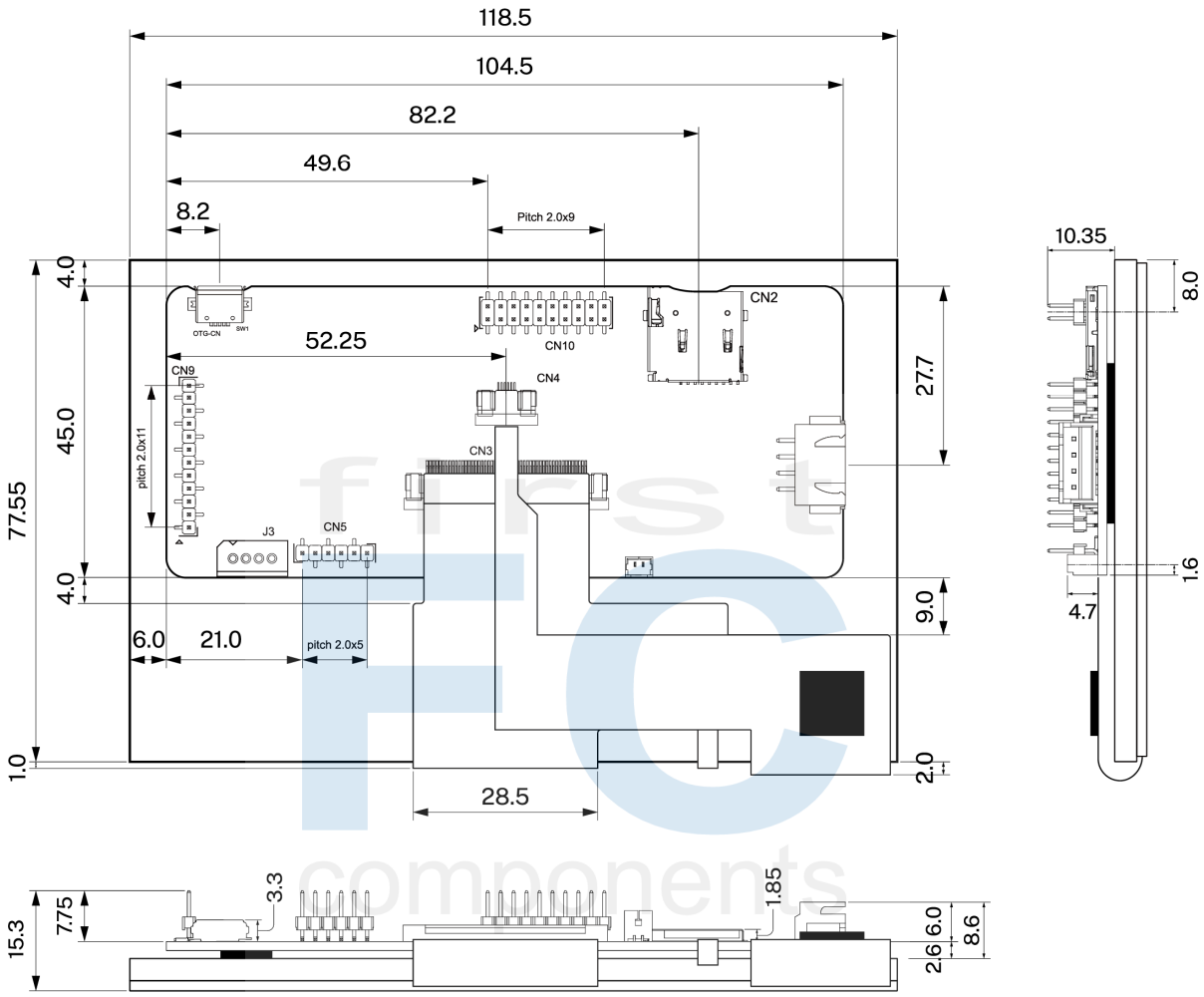
Table 10. Data Payload Format

Payload Type	ID Byte	Length Low Byte	Length High Byte	Tailing Bytes
Boolean	0x00	0x01	0x00	Data Bytes
String	0x01	0x01~0xFF	0x00~0xFF	Date Bytes
Integer	0x02	0x01/02/04/08	0x00	Data Bytes
Unsigned Integer	0x03	0x01/02/04/08	0x00	Data Bytes
Floating Point	0x04	0x04/08	0x00	Data Bytes

Note: Data bytes are of the Little-Endian format.

6 Mechanical Drawing

Figure 6. Mechanical Drawing for IA208048MC-050ABP with LCM



7 IOT Product Nomenclature

This section describes IOT's product naming rule.

Table 11. IOT Product Naming Rule

Field	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# of digits	1	2	3	2	1	1	1	1	3	1	1	1	1	1
Example	I	A2	080	48	M	C	X	-	050	A	B	P	-	X

Table 12. IOT Product Nomenclature

Field	# of digits	Description
1	1	I: Representing Immense Oak Technologies' company name.
2	2	A#: Product Line Name. The first digit is an alphabet and the second is a number.
3	3	Supported horizontal resolution with ones digit dropped.
4	2	The higher two digits of the supported vertical resolution.
5	1	Product offering type. M: PCB + TFT LCM P: PCB C: Chipset
6	1	Touch panel type. R: RTP C: CTP N: No touch control.
7	1	Reserved functional identifier. Can be omitted if not needed.
8	1	Separation hyphen.
9	3	TFT LCM dimensional information. 3 digits represent the tens, ones and tenths digit of the LCM diagonal domination in inches. For examples, 10.1" => 101, 4.7" => 047
10	1	Reserved for product serial number or functional identifier.
11	1	Backlight type. S: Viewable under the sun (> 1000cd/m^2) B: Bright backlight (< 1000cd/m^2, > 600cd/m^2) W: Regular backlight (< 600cd/m^2, > 300cd/m^2)
12	1	LCD type and its characteristics. Please refer to Table 12 for details.
13	1	Separation hyphen.
14	1	Reserved.

Note: For the control board part number, Field 7 and beyond are omitted.

Table 13. Field 12 of IOT Product Nomenclature

Transmissive	Panel Type and View Angle		Working Temperature
A	TN	6H	Commercial Grade -10°C ~ 60°C
B		12H	
C		O-film	
D	IPS		
E	VA		
F	TN	6H	Industrial Grade -20°C ~ 70°C
G		12H	
H		O-film	
J	IPS		
K	VA		
L	TN	6H	Automobile Grade -30°C ~ 80°C
M		12H	
N		O-film	
P	IPS		
Q	VA		

Note: TN = Twisted Nematic Panel, IPS = In-Plane Switching Panel, VA = Vertical Alignment Panel

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