



LCDK209CTL1ARH01 & LCDK209NTL1ARH01
Kit to Interface with LCD209 over HDMI and USB

1200*1920

111 Corning Road, Suite 116 • Cary, NC 27518

Approvals

Model Number	LCDK209CTL1ARH01 LCDK209NTL1ARH01
Datasheet Revision	1.1
Drawing Revision	A

Customer Approval

Approved by: _____

Date: _____

Table of Contents

Revision History	4
Document Revision	4
Hardware Revision	4
Ordering Information	5
Product Description.....	6
Compatibility.....	6
General Specification	6
Pictorial.....	7
Driver PCB – 3D Rendering	7
Driver PCB – Mechanical	7
FALD – 3D Rendering	8
FALD – Mechanical	8
Connectors (Driver PCB)	9
Pin Out – S300, USB-C.....	10
Pin Out – S600, HDMI.....	11
Pin Out – S701, Power Jack	11
Pin Out – S700, S702, 2 pin Power	11
Pin Out – S500, MIPI video & Touch I2C	11
Pin Out – S102, Temp & LED CLK and Data	11
Connectors (FALD PCB).....	12
Pin Out – S101, Touch I2C.....	13
Pin Out – S100, Backlight.....	13
EDID	14
10.1" WUXGA.....	14
Absolute Max Ratings.....	15
Electrical Characteristics	15
Note: Driver Power refers to PCB-L0043 and backlight power is PCBL0144.....	15
Use Case.....	16
Warnings.....	16

Revision History

Document Revision

Date	Version #	Description	Created By	Checked By	Approved By
4.2.2024	1.0	Initial release	ST	ZA	JH
4.5.2024	1.1	Removed PCB-L0144, formatting	ST	ZA	JH

Hardware Revision

Date	Version #	Description
4.2.2024	1.0	Production Release

Ordering Information

LTS Part #	Parts in Kit	Name (Description)
LCDK209CTL1ARH01	FPC-L013R1.1	Custom 40 to 39 Pin Flex Cable
	PCB-L0043R2.2	LCD209 Driver PCB
	LCD209-101CTL1ARNTTR1.0	LCD209 (10.1" WUXGA 360 Zone Wide Gamut FALD w/PCAP 1200 x 1920)
	SNT-100-BK-T-H	Jumper to enable 3.3V LCD power
	0151660225	20 Position FFC Cable 0.020" (0.50mm) 12.0" (304.8mm)
	10973	12V CONNECTOR ADAPTER
	SNT-1205	12V 5A WALL POWER
	JVN-24V-2A-BK	24V 2A POWER SUPPLY
LCDK209NTL1ARH01	FPC-L013R1.1 ⁽¹⁾	Custom 40 to 39 Pin Flex Cable
	PCB-L0043R2.2	LCD209 Driver PCB
	LCD209-101NTL1ARNTTR1.0	LCD209 (10.1" WUXGA 360 Zone Wide Gamut FALD 1200 x 1920) No Touch
	SNT-100-BK-T-H	Jumper to enable 3.3V LCD power
	0151660225	20 Position FFC Cable 0.020" (0.50mm) 12.0" (304.8mm)
	10973	12V CONNECTOR ADAPTER
	SNT-1205	12V 5A WALL POWER
	JVN-24V-2A-BK	24V 2A POWER SUPPLY

Note 1: The No Touch version can also use the R1.0 rev of FPC-L013 since it has no touch signals.

Product Description

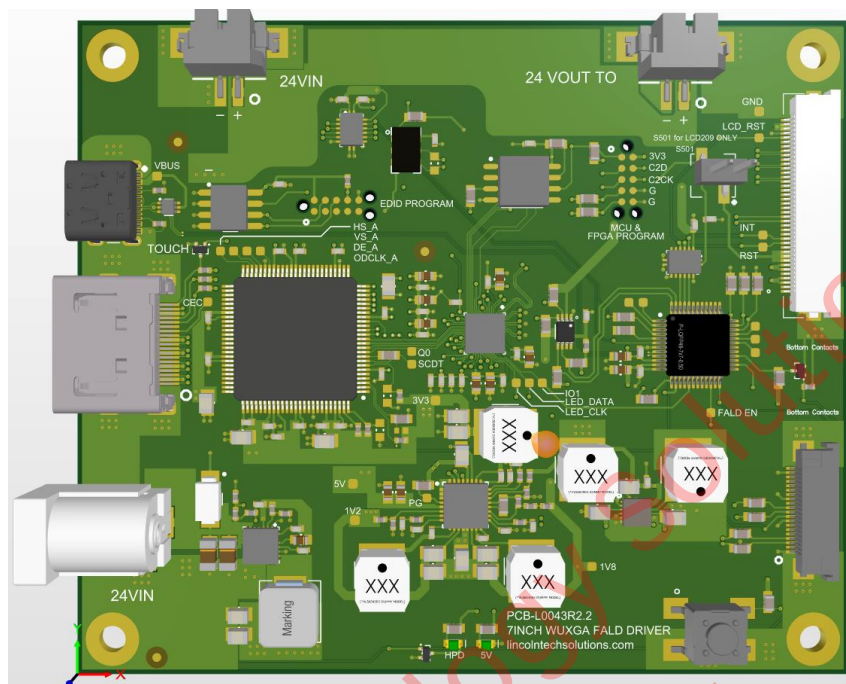
LCD209 requires multiple industry standard interfaces (MIPI, I2C, Backlight Driver, and various regulated voltages) which make it well-suited for a cost-efficient and high-performance product integration. However, the required interfaces may not be well supported in all evaluation and product development environments. To ease the initial evaluation and development effort with LCD209, LCDK209 is offered. LCDK209 only requires HDMI for video, USB for touchscreen data, and power supply for backlight and driver.

Compatibility

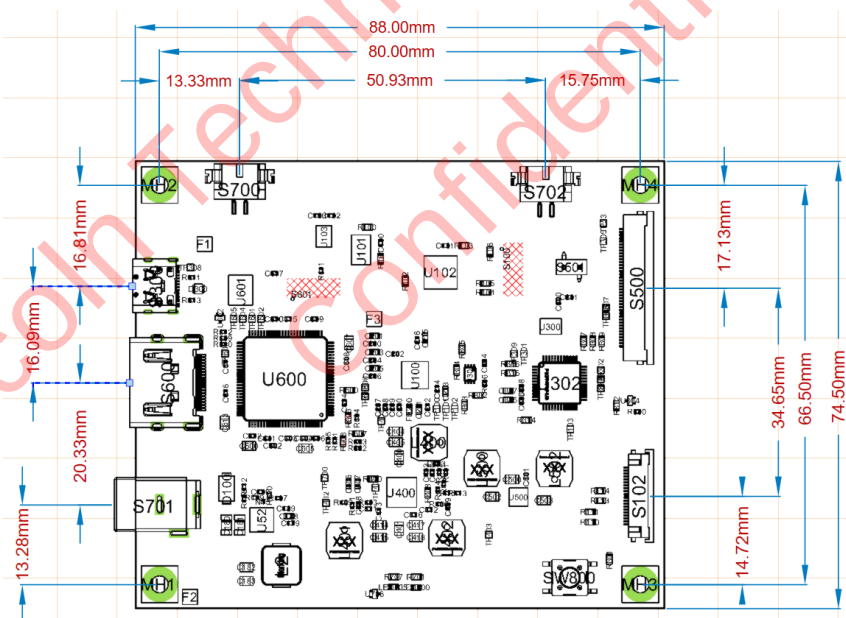
Our high resolution MIPI panels are most commonly native Portrait orientation. The resolution supported by this module is WUXGA (1200x1920). It is expected the host driving HDMI can satisfy the timing requirements as found in the EDID section below. Most Windows OS systems can output the native timing requirements and furthermore are able to rotate and flip the screen. There are dozens of Linux based platforms that are compatible as well.

General Specification

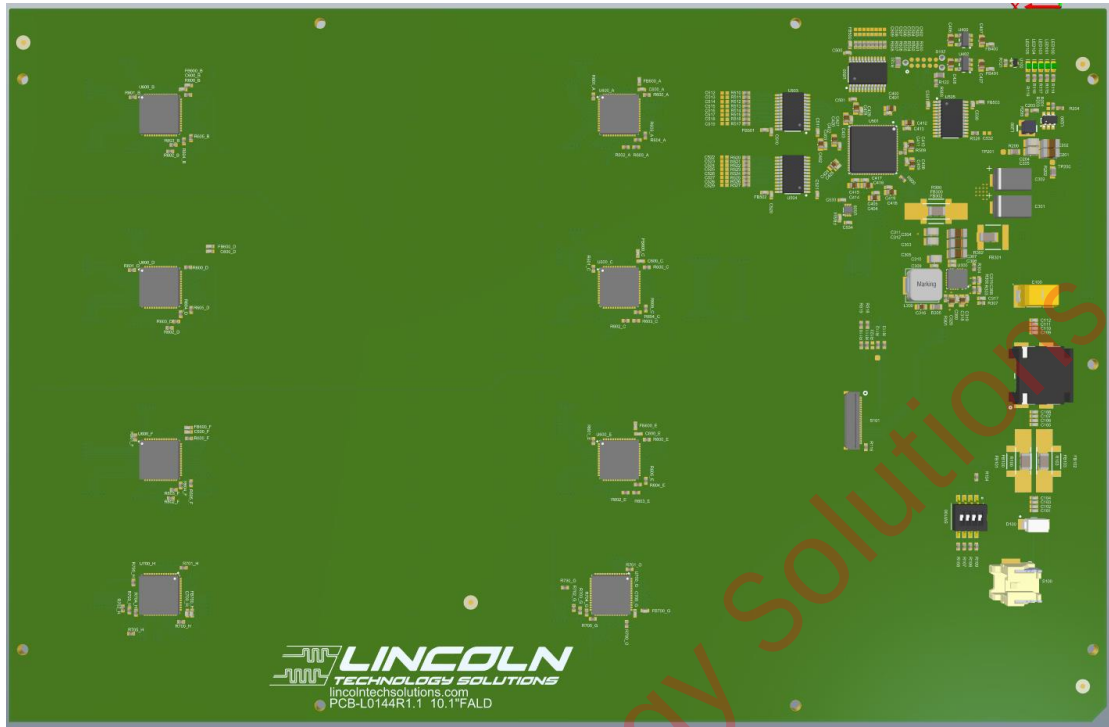
Item	Specification	Unit
LCD Size (diagonal)	10.1	inches
Active Area	135.36(H) x 216.58(V)	mm
Resolution	1200 X 1920	pixels
Backlight Type	360 zone full array local dimming	-



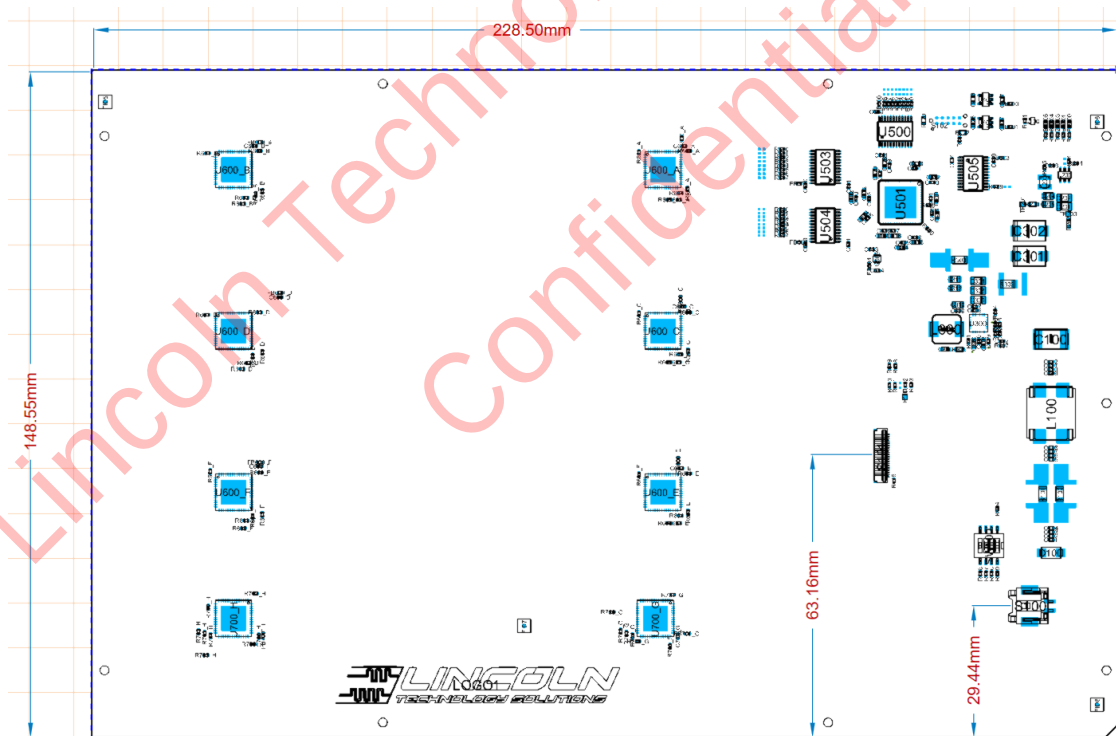
88.00mm



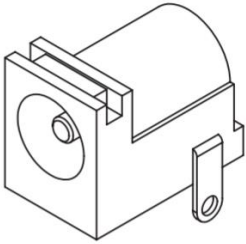
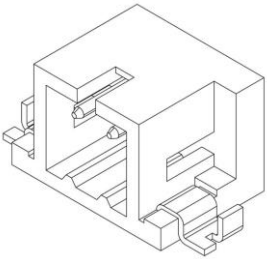
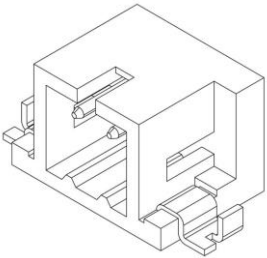
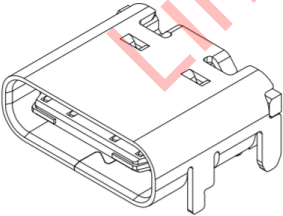
FALD – 3D Rendering

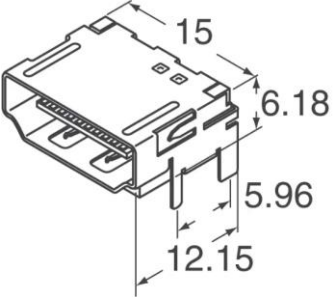
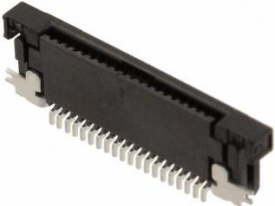


FALD – Mechanical



Connectors (Driver PCB)

Connector Type	MPN	Description
Power Jack S701 	54-00166	Power input (VCC) 2.10mm ID (0.083") 5.50mm OD (0.217") 24V/2A input
2 POS Power Connector S700 	DF3EA-2P-2H(21)	Wired directly to power jack Alternate power input (VCC) 24V/2A input Do not use to power backlight
2 POS Power Connector S702 	DF3EA-2P-2H(21)	Wired directly to power jack Power output 24V/2A output Do not use to power backlight
USB Type C S300 	TYPE-C-31-M-12	Touch interface USB-C 16 position

HDMI S600 	0471510001	Graphic input Standard Type A 19 position
S500 	62684-401100ALF	MIPI video & Touch I2C 40 position 0.020" (0.50mm) pitch
S102 	SFV20R-1STE1HLF	Temp & LED CLK and Data 20 position 0.020" (0.50mm) pitch

Pin Out – S300, USB-C

The USB-C is a standard connector supporting USB connection between the Carrier PCB and a USB Host (i.e. PC). The Carrier PCB translates the touchscreen data from I2C to USB-HID at full speed data rates.

Pin Out – S600, HDMI

The HDMI connector is a standardized type A. It is plug and play with standard equipment. The graphical input must be capable of providing WUGXA portrait (1200x1920). There is an onboard EDID that communicates with user equipment specifying timing and display size.

Pin Out – S701, Power Jack

Number	Pin Name	Description
1	VCC_24	24V power supply
2	GND	Ground
3	GND	Ground

Pin Out – S700, S702, 2 pin Power

Number	Pin Name	Description
1	VCC_24	24V power supply, do not use to power backlight
2	GND	Ground

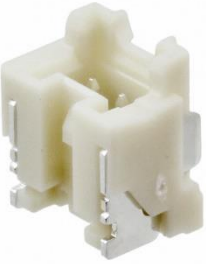
Pin Out – S500, MIPI video & Touch I2C

A 0.5mm pitch 40 position FFC connector to carry MIPI video, I2C touch signals, and LCD power from the Driver PCB (PCB-L0043) to the LCD FOG using the provided flex cable (FPC-L013R1.1).

Pin Out – S102, Temp & LED CLK and Data

A 0.5mm pitch 20 position FFC connector to carry Temperature & LED clock and data signals from the Driver PCB (PCB-L0043) to the FALD (PCB-L0144).

Connectors (FALD PCB)

Connector Type	MPN	Description
S100 	SM02B-PASS-TB(LF)(SN)	2 positions Right Angle 2 position 0.039" (1.00mm) 3A per pin
S101 	F3311A7H121020E200	20 position 0.020" (0.50mm) pitch

Pin Out – S101, Touch I2C

A 0.5mm pitch 20 position FFC connector to carry Temperature & LED clock and data signals from the Driver PCB (PCB-L0043) to the FALD (PCB-L0144).

Pin Out – S100, Backlight

See LCD209 datasheet

Note: Mating connector is PAP-02V-S.

Number	Pin Name	Description
1	VCC_12V	12V power supply
2	GND	Ground

EDID

Below is the EDID stored on the driver PCB. This is communicated over the DDC bus to the host. The host must be capable of generating timing based on these parameters. In the absence of EDID communication, it is expected the host is outputting per these timing specs.

10.1" WUXGA

Native Portrait 1200x1920

EDID BYTES:

0x 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

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00 | 00 FF FF FF FF FF FF 00 32 93 00 05 00 00 00 00
01 | 24 1E 01 04 80 58 32 78 22 EE 91 A3 54 4C 99 26
02 | 0F 50 54 00 00 00 01 01 01 01 01 01 01 01 01
03 | 01 01 01 01 01 01 98 3C 80 A0 70 B0 2B 40 80 14
04 | 34 00 D9 88 00 00 00 1E 00 00 00 10 00 00 00 00
05 | 00 00 00 00 00 00 00 00 00 00 00 00 00 10 00 00
06 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FC
07 | 00 4C 54 53 2D 44 53 49 44 72 69 76 65 72 00 BF
08 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
09 | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0A | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0B | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0C | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0D | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0E | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0F | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

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Block 1

Preferred Timing Block

Pixel Clock: 155.12

☐ Interlaced

H. Active Pixels: 1920

V. Active Lines: 1200

H. Blank: 160

V. Blank: 43

H. Front Porch: 128

V. Front Porch: 3

H. Sync Width: 20

V. Sync Width: 4

H. Image Size: 217

V. Image Size: 136

H. Border: 0

V. Border: 0

H. Clock: 74.58 kHz

V. Clock: 60.00 Hz

CVT 1.2 Wizard

Stereo Viewing Support

☐ No Stereo

☒ FS, R on sync
 ☐ 2Way, R on even

☐ FS, L on sync
 ☐ 2Way, L on even

☐ Side-By-Side
 ☐ 4Way

Sync Signal Definition

☒ Analog
 ☐ Bipolar Analog
 ☐ Digital Composite
 ☐ Digital Separate
 ☒ V. Sync Polarity
 ☒ H. Sync Polarity

Absolute Max Ratings

Item	Symbol	Value		Unit
		Min	Max	
Power Supply Voltage-Backlight	VCC_12V	-0.3	13	V
Power Supply Voltage-Driver	VCC_24V	-0.3	28	V
Operating Temperature	T _{OPR}	-10	60	°C
Storage Temperature	T _{STG}	-20	70	°C

Electrical Characteristics

Item	Symbol	Value			Unit	Note
		Min	Typ	Max		
Supply Voltage-Backlight	VCC_12V	11.4	12.0	12.6	V	Ta = 25°C
Supply Voltage-Driver	VCC_24V	8	24	26	V	Ta = 25°C
Driver Power	P _{DRV}	1.5	2	2.5	W	Ta = 25°C
Backlight Power	P _{BL}	2.64	-	39	W	Ta = 25°C

Note: Driver Power refers to PCB-L0043 and backlight power is PCBL0144.

Use Case

1. Plug FPC-L013 into the connector on the display flex of LCD209, contacts down.
2. Plug the 20-pin FPC into the back LCD209, contacts up.
3. Install the adapter cable 10973 into the connector on the back of LCD209.
4. Plug the opposite end of FPC-L013 into the connector on PCB-L0043, contacts down.
5. Plug the opposite end of the 20-pin FPC into PCB-L0043, contacts down.
6. Connect HDMI (and USB-C for touch-enabled panel) into a PC and PCB-L0043.
7. Plug in 12V barrel jack power supply into the adapter cable 10973.
8. Plug in the 24V barrel jack power supply into PCB-L0043.
9. Plug both power supplies into a 120V wall outlet to complete panel power-on sequence.

Warnings

1. Disconnect power prior to removing or inserting flex cables.
2. Do not put 24V on S100 for the FALD (PCB-L0144)

