

AND104A261F-HB

10.4” VGA Color TFT LCD Module

Features

- High luminance (400cd/m^2)
- Wide viewing angle (Vertical: 100º, Horizontal: 120º)
- Low reflection
- Built-in long life lamps (50,000 h)
- Thin and lightweight design
- Fully mechanically compatible with AND10C210-HB
- 640 x 480 (VGA) pixels color display
- **RoHS compliant**
- Applications: Display Terminals, Scientific Instruments, Medical Instruments, Test and Measurement Instruments, Process Control/Factory Automation Equipment, Office Automation Equipment

Mechanical Specifications

Item	Specification	Unit
Outline Dimensions	265.0 (W) x 188.8 (H) x 11.4 max (D)	mm
Number of Pixels	640 (W) x 480 (H)	Pixels
Active Area	211.2 (W) x 158.4 (H)	mm
Pixel Pitch	0.33 (W) x 0.33 (H)	mm
Weight (approx.)	610	gram
Backlight	Twin CCFLs, sidelight type	–

Absolute Maximum Ratings

Item	Symbol	Min	Max	Unit
Supply Voltage	V_{DD}	-0.3	6.5	V
	V_{FL}	0	2.0	kV(rms)
FL Driving Frequency	f_{FL}	0	100	KHz
Input Signal Voltage	V_{IN}	-0.3	V_{DD} + 0.3	V
Operating Temperature	T_{op}	0	50	°C
Storage Temperature	T_{stg}	-20	60	°C
Humidity (Max. Wet bulb temp = 39°C)	–	10	90	%(RH)

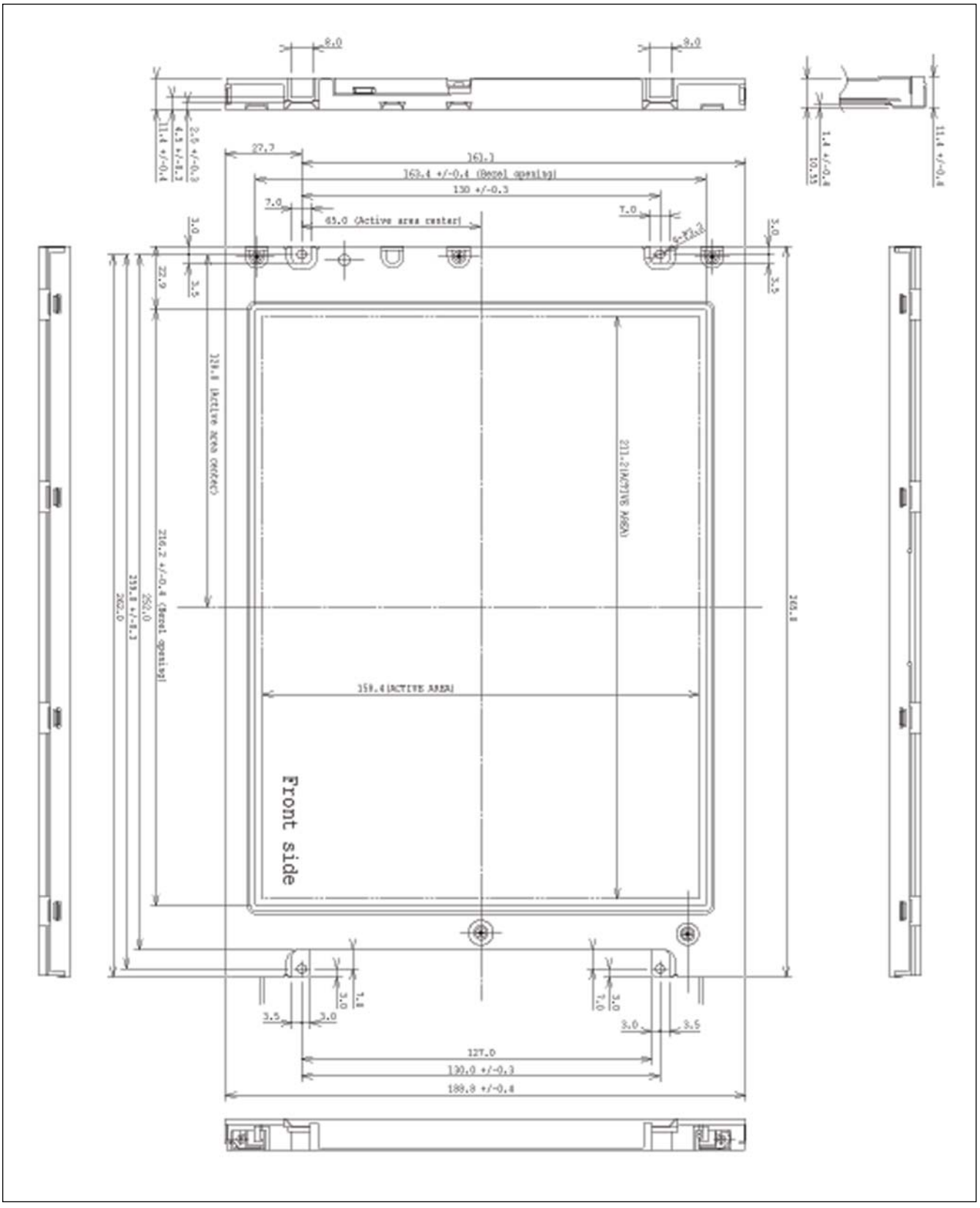
Electrical Specifications (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{DD}	4.75	5.0	5.25	V
	V_{FL}	–	480	–	Vrms
FL Start Voltage (Ta = 0°C)	V_{SFL}	1500	–	–	Vrms
High Level Input Voltage	V_{IH}	3.5	–	V_{DD}	V
Low Level Input Voltage	V_{IL}	0	–	1.5	V
Current Consumption	I_{DD}(*1)	–	150	–	mA
	I_{FL}(*2)	3.0	–	6.5	mA(rms)
Power Consumption I_{FL}=6.0mA9rms	P	–	6.5	–	W

*1: 8 color bars pattern
*2: Except the efficiency of FL inverter

Product specifications contained herein may be changed without prior notice.
It is therefore advisable to contact Purdy Electronics before proceeding with the design of equipment incorporating this product.

Dimensional Outline (Front View)



Timing Specifications

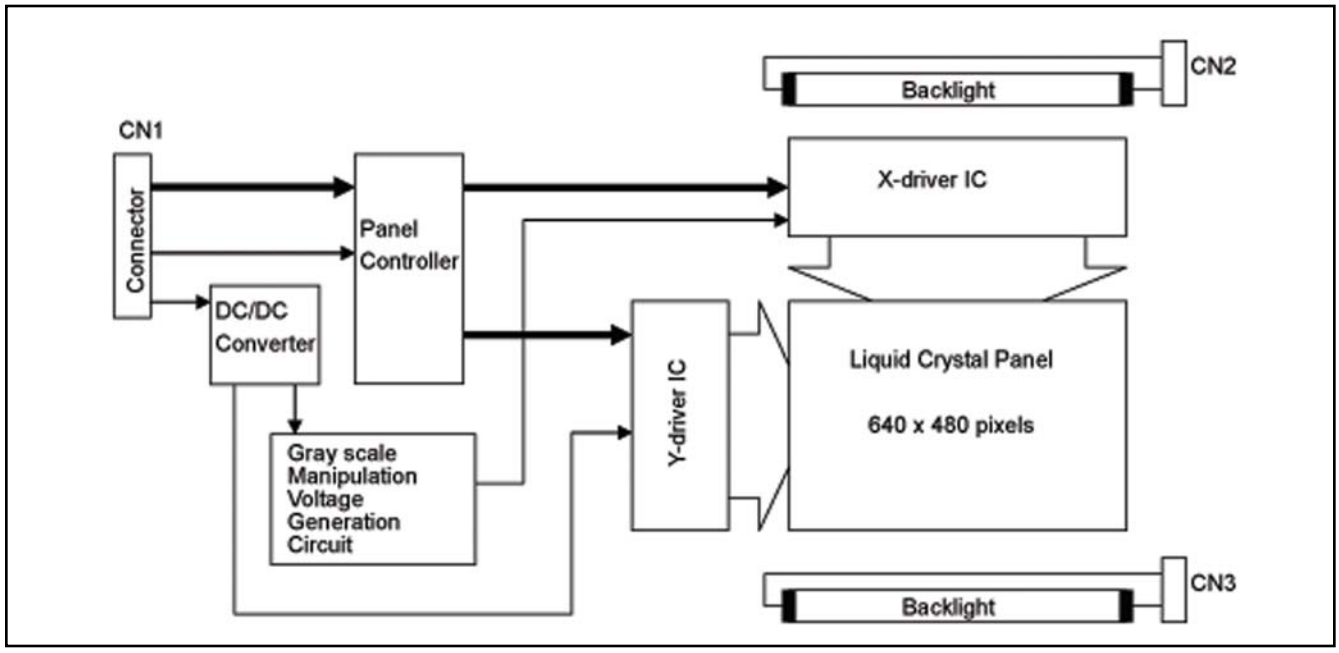
Item	Sym	Min	Typ	Max	Unit
Frame Period	t1	249+N/2 x t3	525 x t3 16.68	525 x t3 17.85	– ms
Vertical Display Term*	t2	480 x t3	480 x t3	480 x t3	–
One Line Scanning Time	t3	684 x t5 31.5	800 x t5 31.78	860 x t5	– μs
Horizontal Display Term	t4	640 x t5	640 x t5	640 x t5	–
Clock Period	t5	35.0	39.72	_	ns
Clock “L” Time	t6	10.0	–	–	ns
Clock “H” Time	t7	7.0	–	–	ns
Set Up Time	t8	5.0	–	–	ns
Hold Time	t9	10.0	–	–	ns

* t2 = Nx t3

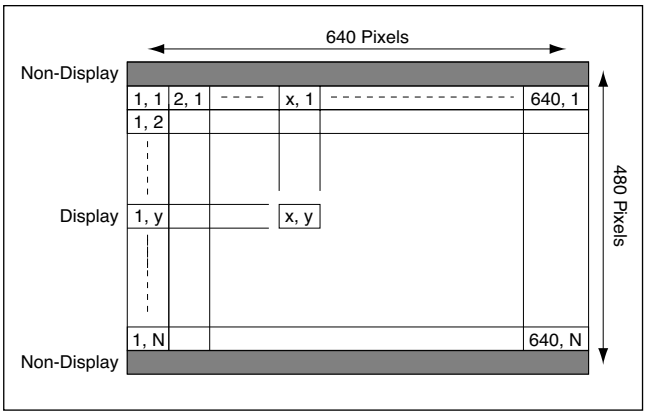
Optical Specification (Ta=25ºC)

Item		Min.	Typ.	Max.	Unit	Remarkds
Contrast Ratio	(CR)	100	250	–	–	
Viewing Angle (CR ≥ 10)	(Upper + Lower)	–	100	–	º	
	(Left + Right)	–	120	–	º	
Response Time	(T_{ON})	–	–	50	ms	
	(T_{OFF})	–	–	50	ms	
Luminance	(L)	–	400	–	cd/m^2	I_{FL}=6.0mS(rms)
Lamp Life Time (MTBF)			50,000		h	

Block Diagram



Note: When the vertical display period (N) is shorter than 480, the actual display area is shifted to the center. The non-display area becomes dark as follows:



Connector Pin Assignment for Interface

CN2 & CN3 CCFL Power Source

Connector: BHR-03VS-1 / Japan Solderless Terminal MFG Co., Ltd.
Mating Connector: SM02(8.0)B-BHS-1 / Japan Solderless

CN2/CN3		
Pin	**Symbol**	**Function**
1	V_{FLH1}	CCFL Power Supply (High Voltage)
2	NC (note 1)	Non Connection (open)
3	V_{FLL1}	CCFL Power Supply (Low Voltage)

Note 1: NC terminal should be open.

CN1 Input Signal

Connector: DF9B-31P-1V / Hirose Electric Co., Ltd.
Mating Connector: DF9*-31S-1V / Hirose Electric (*:option mark)

Terminal No.	Symbol	Function
1	GND	Ground
2	NCLK	Sampling Clock
3	GND	Ground
4	R0	Red Display Data (LSB)
5	R1	Red Display Data
6	R2	Red Display Data
7	GND	Ground
8	R3	Red Display Data
9	R4	Red Display Data
10	R5	Red Display Data (MSB)
11	GND	Ground
12	G0	Green Display Data (LSB)
13	G1	Green Display Data
14	G2	Green Display Data
15	GND	Ground
16	G3	Green Display Data
17	G4	Green Display Data
18	G5	Green Display Data (MSB)
19	GND	Ground
20	ENAB	Compound Synchronization Signal
21	GND	Ground
22	B0	Blue Display Data (LSB)
23	B1	Blue Display Data
24	B2	Blue Display Data
25	GND	Ground
26	B3	Blue Display Data
27	B4	Blue Display Data
28	B5	Blue Display Data (MSB)
29	GND	Ground
30	V_{DD}	+5V Power Supply
31	V_{DD}	+5V Power Supply

256k (k=1024) Colors Combination Table

	Display	R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0	Gray Scale Level
Basic Color	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	–
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	–
	Green	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	–
	Lt. Blue	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	–
	Red	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	–
	Purple	H	H	H	H	H	H	L	L	L	L	L	L	H	H	H	H	H	H	–
	Yellow	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	L	L	–
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	–
Gray Scale of Red	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L1
		L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L60
		H	H	H	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L61
	Light	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L62
	Red	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	Red L63
Gray Scale of Green	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L1
		L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L60
		L	L	L	L	L	L	H	H	H	H	L	H	L	L	L	L	L	L	L61
	Light	L	L	L	L	L	L	H	H	H	H	H	L	L	L	L	L	L	L	L62
	Green	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	Green L63
Gray Scale of Blue	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L1
		L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L60
		L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	L	H	L61
	Light	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	L	L62
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	Blue L63
Gray Scale of White & Black	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L1
		L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L	L2
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L3~
		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	L60
		H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	H	L61
	Light	H	H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	L62
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	White L63