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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# NHD-1.8-128160ZF-CTXL#

## TFT (Thin-Film Transistor) Liquid Crystal Display Module

NHD-	Newhaven Display
1.8-	1.8" diagonal
128160-	128 x 160 pixels (portrait mode)
ZF-	Model
C-	Built-in Controller
T-	White LED backlight
X-	Transmissive TFT
L-	Wide Temp, 12:00 view direction
#-	<b>RoHS Compliant</b>

**Newhaven Display International, Inc.**

2511 Technology Drive, Suite 101

Elgin IL, 60124

Ph: 847-844-8795

Fax: 847-844-8796

[www.newhavendisplay.com](http://www.newhavendisplay.com)

[nhtech@newhavendisplay.com](mailto:nhtech@newhavendisplay.com)

[nhsales@newhavendisplay.com](mailto:nhsales@newhavendisplay.com)

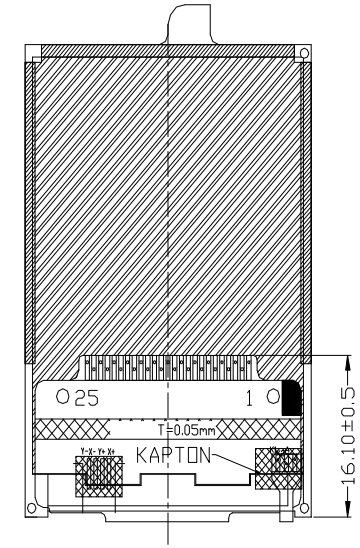
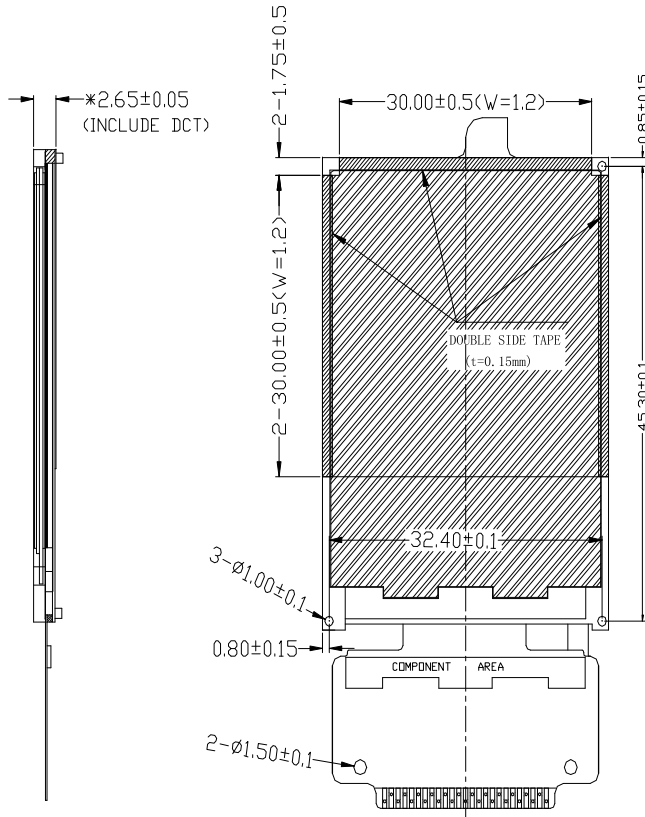
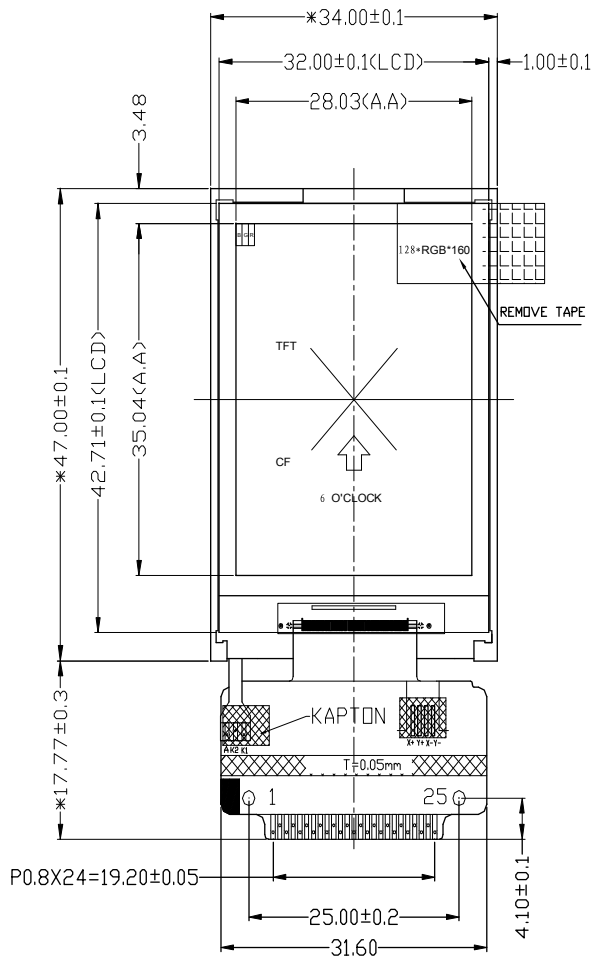
## Document Revision History

Revision	Date	Description	Changed by
0	5/15/2008	Initial Release	
1	7/30/2009	User guide reformat	CL
2	8/26/2009	Viewing Angle Adjustment	MC
3	2/23/2011	Pin description updated	BE

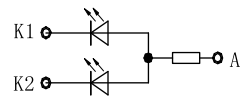
## Functions and Features

- 128 x 160 pixels (portrait mode)
- LED backlight
- 2.8V power supply
- 8-bit Parallel interface
- Built-in ILI9163 controller

# Mechanical Drawing



No.	PIN NAME
1	GND
2	NC
3	NC
4	NC
5	NC
6	GND
7	VDD
8	/CS
9	RS
10	/WR
11	/RD
12	D0
13	D1
14	D2
15	D3
16	D4
17	D5
18	D6
19	D7
20	/RST
21	GND
22	LED1-
23	LED2-
24	NC
25	LED+



BACKLIGHT LED CIRCUIT

- NOTE:
1. GENERAL TOLERANCE:  $\pm 0.2$ .
  2. \* CRITICAL DIMENSION
  3. RoHS.

<h2>NEWHAVEN DISPLAY</h2>				DRAWING NO.	
				NHD-1.8-128160ZF-CTXL#	
UNIT	mm	SCALE	FIT		
3rd Angle			SHEET 1 OF 1		

## Pin Description

Pin No.	Symbol	External Connection	Function Description
1	GND	Power Supply	Ground
2	NC	-	No Connect
3	NC	-	No Connect
4	NC	-	No Connect
5	NC	-	No Connect
6	GND	Power Supply	Ground
7	VDD	Power Supply	Power Supply for LCD and logic (2.8V)
8	/CS	MPU	Active LOW Chip Select signal
9	RS	MPU	Register Select: 0= write command, 1= write data
10	/WR	MPU	Active low Write signal
11	/RD	MPU	Active low Read signal
12	D0	MPU	Bi-directional data bus lines
13	D1	MPU	
14	D2	MPU	
15	D3	MPU	
16	D4	MPU	
17	D5	MPU	
18	D6	MPU	
19	D7	MPU	
20	/RST	MPU	Active LOW Reset signal
21	GND	Power Supply	Ground
22	LED1-	MPU/Switch	Backlight Cathode
23	LED2-	MPU/Switch	Backlight Cathode
24	NC	-	No Connect
25	LED+	Power Supply	Power Supply for Backlight

**LCD connector:** Hot-bar solder directly to PCB

## Electrical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Temperature Range	Top	Absolute Max	-20	25	+70	°C
Storage Temperature Range	Tst	Absolute Max	-30	25	+80	°C
Supply Voltage	VDD		-	2.8	-	V
Supply Current	IDD	VCC=2.8V		25.5		mA
"H" Level input	Vih		0.8VDD		VDD	V
"L" Level input	Vil		0		0.2VDD	V
"H" Level output	Voh		0.8VDD		VDD	V
"L" Level output	Vol		0		0.2VDD	V
Backlight Supply Voltage	Vled		3.0	3.2	3.4	V
Backlight Supply Current	Iled			30		mA
Brightness		Iled=30mA	100	120	180	cd/m2

**Backlight circuit is 2 parallel LEDs, common Anode.**

## Optical Characteristics

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle –Top		Cr ≥ 10	-	15	-	°
Viewing Angle –Bottom		Cr ≥ 10	-	35	-	°
Viewing Angle – Left		Cr ≥ 10	-	45	-	°
Viewing Angle –Right		Cr ≥ 10	-	45	-	°
Contrast Ratio	Cr		150	250	-	-
Response Time (rise)	Tr		-	15	30	ms
Response Time (fall)	Tr		-	35	50	ms



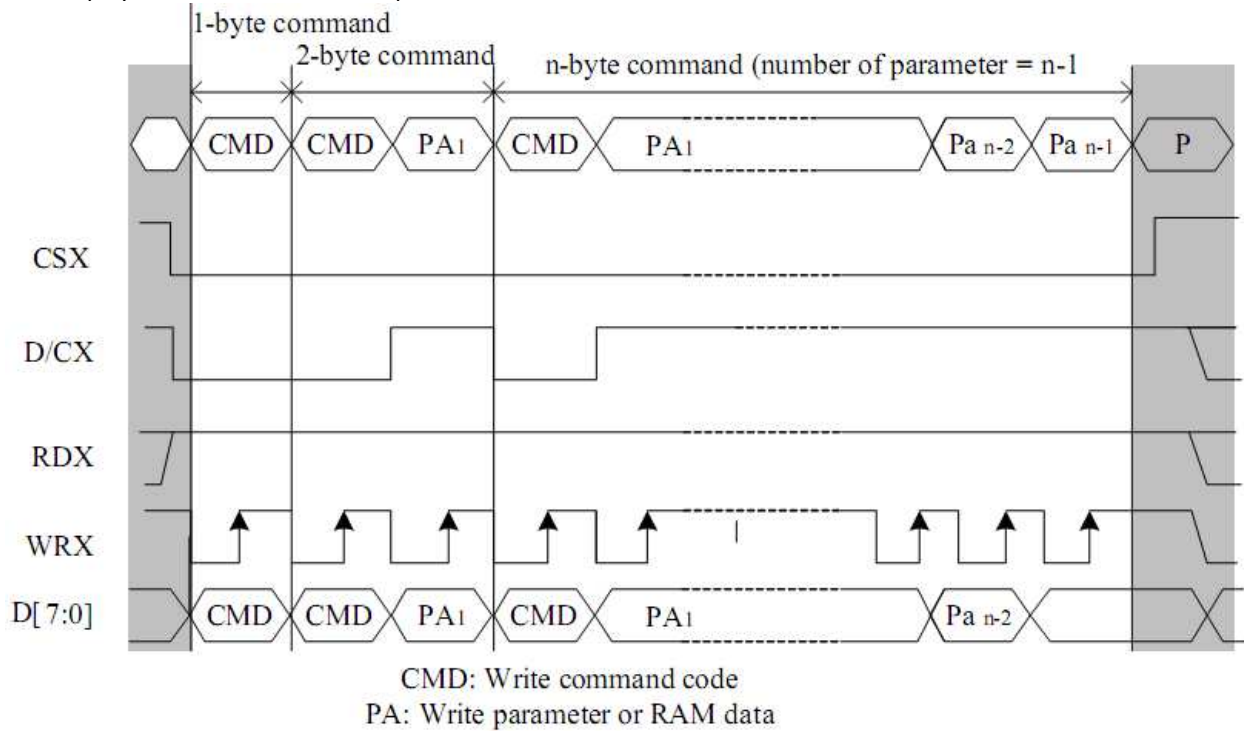
# Driver Information

Built-in ILI9163 controller.

Download specification at [http://www.newhavendisplay.com/app\\_notes/ILI9163.pdf](http://www.newhavendisplay.com/app_notes/ILI9163.pdf)

## 8080 MPU Parallel Interface:

The /CS signal (active LOW) enables and disables the controller. The LCD controller latches in data at the rising edge of /WR signal. When D/C is LOW, the data is latched in as commands. When D/C is HIGH, the data is latched in as display RAM data or command parameters.



## Quality Information

Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	+70°C , 120hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30°C , 120hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (voltage & current) and the high thermal stress for a long time.	+60°C , 72hrs	2
Low Temperature Operation	Endurance test applying the electric stress (voltage & current) and the low thermal stress for a long time.	-20°C , 72hrs	1,2
High Temperature / Humidity Operation	Endurance test applying the electric stress (voltage & current) and the high thermal with high humidity stress for a long time.	+50°C , 90% RH , 72hrs	1,2
Thermal Shock resistance	Endurance test applying the electric stress (voltage & current) during a cycle of low and high thermal stress.	-20°C,30min -> 25°C,5min -> 60°C,30min = 1 cycle 100 cycles	
Vibration test	Endurance test applying vibration to simulate transportation and use.	10-150Hz , 15mm amplitude. 60 sec in each of 3 directions X,Y,Z For 15 minutes	3
Static electricity test	Endurance test applying electric static discharge.	VS=4KV, RS=330kΩ, CS=150pF Five times	

**Note 1:** No condensation to be observed.

**Note 2:** Conducted after 4 hours of storage at 25°C, 0%RH.

**Note 3:** Test performed on product itself, not inside a container.

## Precautions for using LCDs/LCMs

See Precautions at [www.newhavendisplay.com/specs/precautions.pdf](http://www.newhavendisplay.com/specs/precautions.pdf)

## Warranty Information

See Terms & Conditions at [http://www.newhavendisplay.com/index.php?main\\_page=terms](http://www.newhavendisplay.com/index.php?main_page=terms)