

MDT090000	1024x600	LVDS Interface	TFT Module
Specification			
Version: 1		Date: 27/03/2022	
Revision			
1	25/03/2022	First issue	

Display Features			
Display Size	9"		
Resolution	1024x600		
Orientation	Landscape		
Appearance	RGB		
Logic Voltage	3.3V		
Interface	LVDS		
Brightness	750cd/m ²		
Touchscreen	---		
Module Size	211.10 x 126.50 x 5.60 mm		
Operating Temperature	-30°C ~ +85°C	Created By	Checked By
Pinout	40 way FFC	CL	TSB
Pitch	0.50 mm	Box Quantity	Weight / Display
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* - For full design functionality, please use this specification in conjunction with the EK73215 + EK79001H display driver specification.(Provided Separately)

Display Accessories	
Part Number	Description
MBID-40FP	40 Way FFC to cable and wires. Driven by any driver board that can be wired to a 1mm pitch SHDR-40V-S-B receptacle.
MCIB14/16	HDMI-to-LVDS interface board, with voltage generation.
MDIB-CC1	Interconnect board for standard pitch pinouts to fine pitch wires. Providing pinouts for 2.54 pinout. 1.27, 1, 0.845, 0.8, 0.7, 0.65, 0.62, 0.6, 0.5 & 0.3 pads.

Optional Variants	
Appearances	Voltage



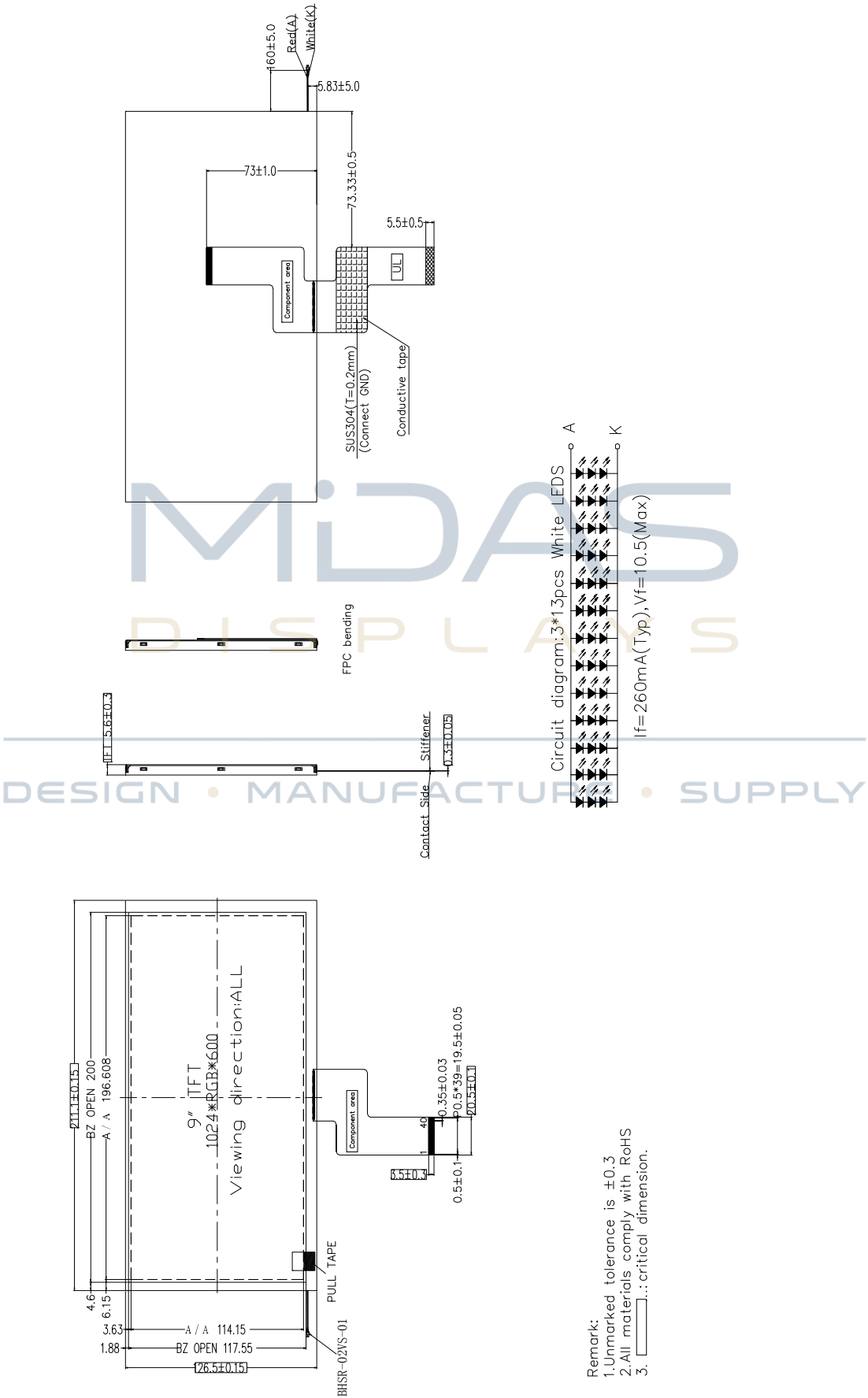
1. GENERAL SPECIFICATIONS

ITEM	STANDARD VALUE	UNIT
LCD TYPE	TFT/IPS/ NORMALLY BLACK/TRANSMISSIVE	
MODULE SIZE	211.10*126.50*5.60	mm
ACTIVE AREA	196.608*114.15	mm
PIXEL PITCH (W*H)	0.192*0.19025	
NUMBER OF PIXELS	1024*3(RGB)*600	
DRIVER IC	EK73215 + EK79001H	
INTERFACE TYPE	LVDS	
RECOMMEND VIEWING DIRECTION	ALL	O'clock
GRAY SCALE INVERSION DIRECTION	-	O'clock
COLORS	16.7 M	
BACKLIGHT TYPE	39-DIES WHITE LED	
TOUCH PANEL TYPE	WITHOUT	

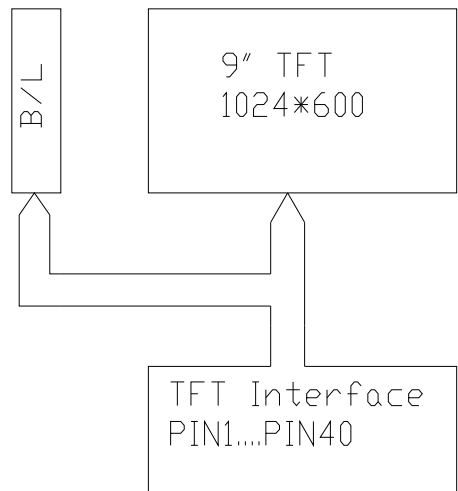
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2. EXTERNAL DIMENSIONS



3. BLOCK DIAGRAM



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4. PIN ASSIGNMENT

PIN NO.	SYMBOL	DESCRIPTION
1	VCOM	Common Voltage
2	VDD	Power supply
3	VDD	Power supply
4	NC	Not connection
5	RESET	Reset pin
6	STBYB	Standby mode, normally pulled high. STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z
7	GND	Power ground
8	RXIN0-	Data lane0 input
9	RXIN0+	Data lane0 input
10	GND	Power ground
11	RXIN1-	Data lane1 input
12	RXIN1+	Data lane1 input
13	GND	Power ground
14	RXIN2-	Data lane2 input
15	RXIN2+	Data lane2 input
16	GND	Power ground
17	RXCLKIN-	CLK input
18	RXCLKIN+	CLK input
19	GND	Power ground
20	RXIN3-	Data lane3 input
21	RXIN3+	Data lane3 input
22	GND	Power ground
23	NC	Not connection
24	NC	Not connection
25	GND	Power ground
26	NC	Not connection
27	NC	Not connection
28	SELB	In LVDS interface connected HSD to FPC for Pin Setting SELB="L":8 bit SELB="H":6 bit
29	AVDD	Power for Analog Circuit
30	GND	Power ground
31	NC	Not connection

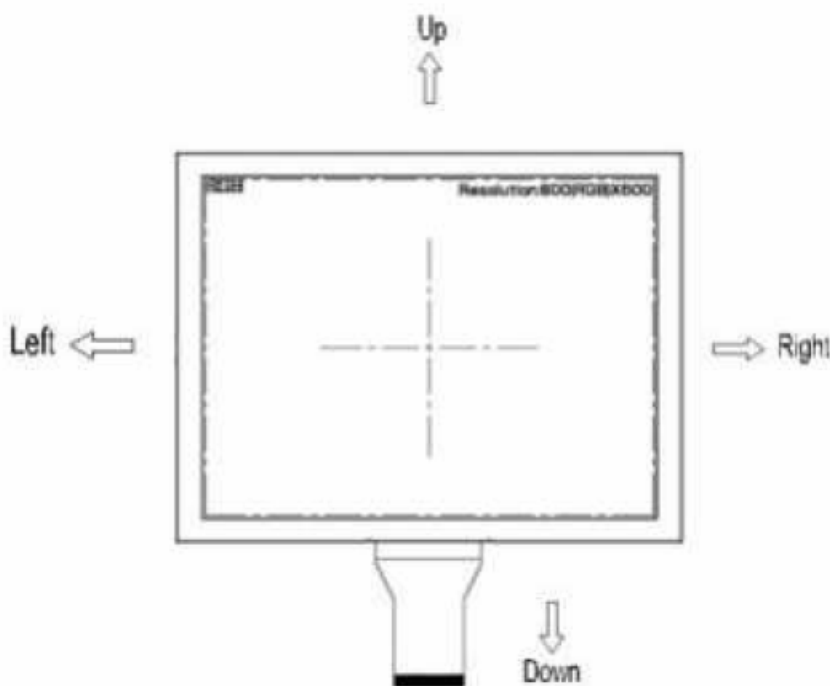


32	NC	Not connection
33	L/R	Source Right or Left sequence control. Normally pull high. L/R = "L", shift left: last data = S1←S2←S3.....←S1200 = first data. L/R = "H", shift right: first data = S1→S2→S3.....→S1200 = last data
34	U/D	Gate Up or Down scan control. Normally pull low. UPDN = "L", STV2 output vertical start pulse and UD pin output logical "0" to Gate driver.(Default) UPDN = "H", STV1 output vertical start pulse and UD pin output logical "1" to Gate driver.
35	VGL	Gate OFF Voltage
36	NC	Not connection
37	NC	Not connection
38	VGH	Gate ON Voltage
39	NC	Not connection
40	NC	Not connection

SELECTION OF SCANNING MODE

SETTING OF SCAN CONTROL INPUT		SCANNING DIRECTION
U/D	L/R	
GND	DVDD	UP TO DOWN, RIGHT TO LEFT
DVDD	GND	DOWN TO UP, LEFT TO RIGHT
GND	GND	UP TO DOWN, LEFT TO RIGHT
DVDD	DVDD	DOWN TO UP, RIGHT TO LEFT

DEFINITION OF SCANNING DIRECTION REFER TO THE FIGURE AS BELOW:

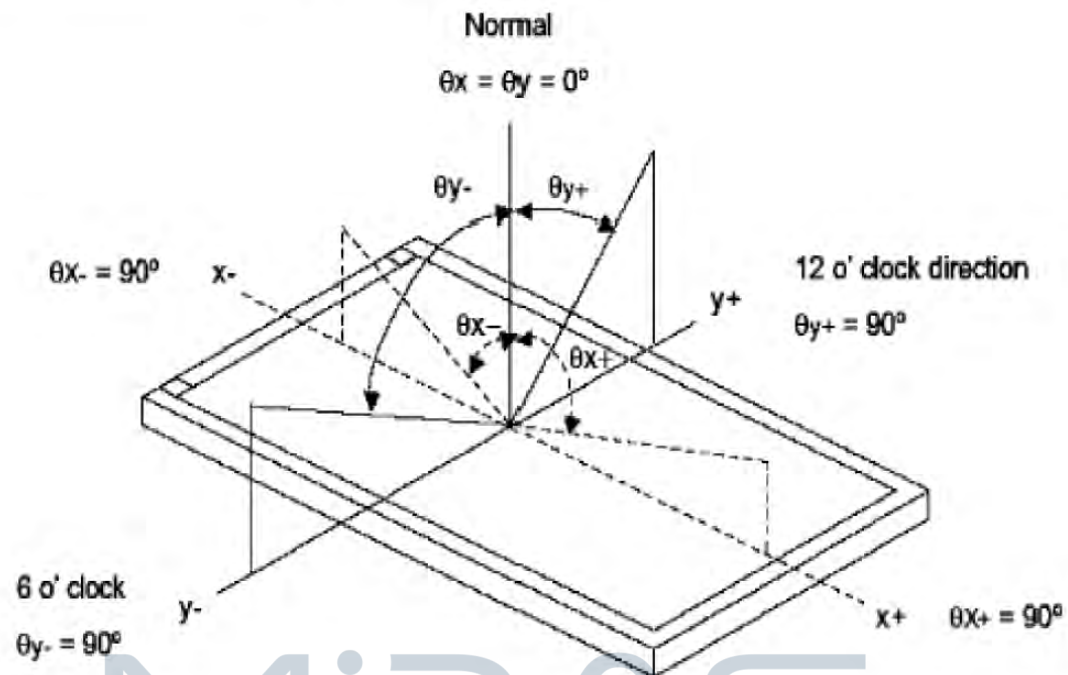


5. OPTICAL CHARACTERISTICS

ITEM		SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE
				MIN	TYP.	MAX		
Luminance		L		600	750	-	Cd/m²	
Contrast ratio		CR	$\theta = 0^\circ$	640	800			
Response time	Rising	T _R	25°C		10	15	ms	
	Falling	T _F			20	25		
CIE COLOUR COORDINATE	RED	XR	VIEWING NORMAL ANGLE	0.570	0.610	0.650		
		YR		0.293	0.333	0.373		
	GREEN	XG		0.241	0.281	0.321		
		YG		0.493	0.533	0.573		
	BLUE	XB		0.106	0.146	0.186		
		YB		0.098	0.138	0.178		
	WHITE	XW		0.261	0.301	0.341		
		YW		0.286	0.326	0.366		
VIEWING ANGLE	Hor.	θ_{x+}	CR ≥ 10		85		Degree	
		θ_{x-}			85			
	Ver.	θ_{y+}			85			
		θ_{y-}			85			



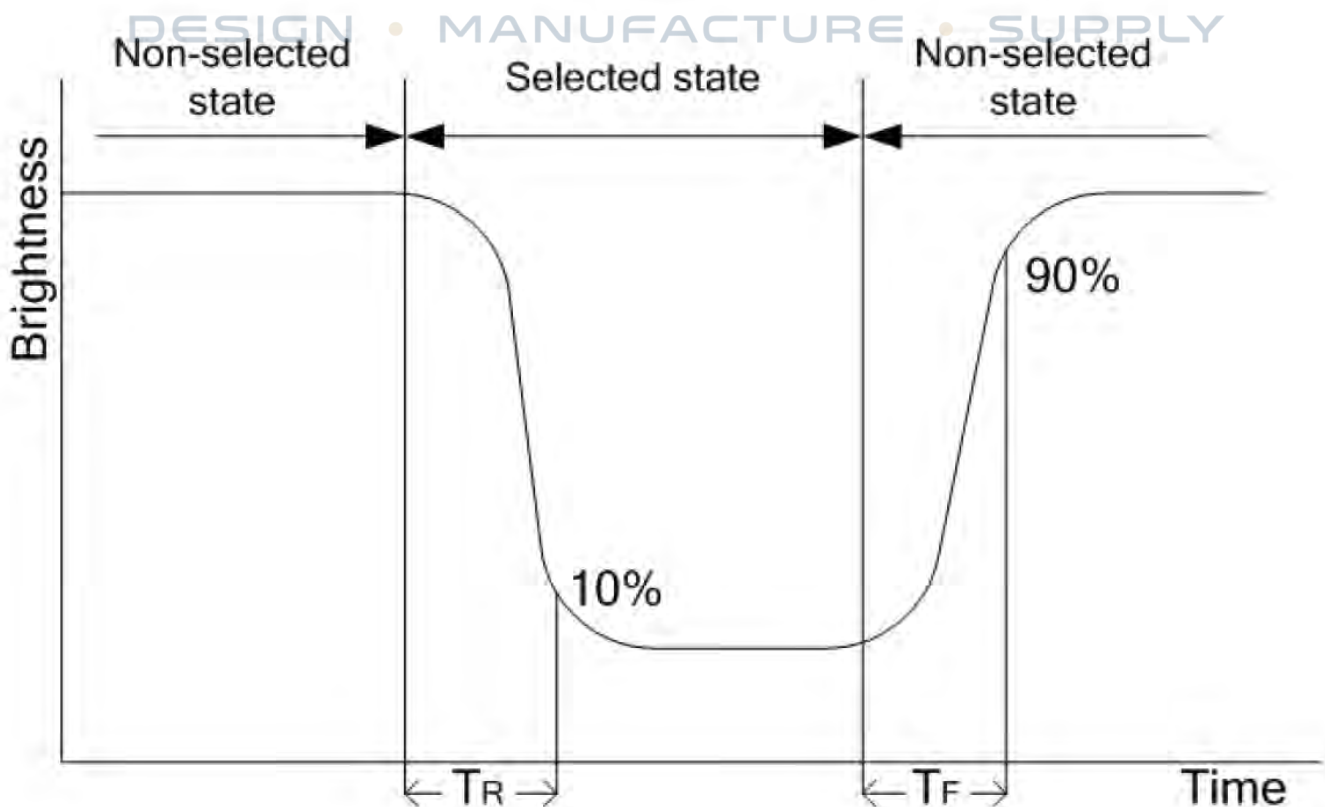
Note 1 : Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Brightness of non-selected dots (white)}}{\text{Brightness of selected dots (black)}}$$

Note 3: Definition of response time (T_R , T_F)



6. ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Power Supply Voltage	VDD	-0.5	5.0	V
Operating temperature	Top	-30	+85	°C
Storage temperature	Tst	-30	+85	°C

7. ELECTRICAL CHARACTERISTICS

7.1 BLACKLIGHT DRIVING CONDITIONS

ITEM	SYMBOL	SPECIFICATIONS			UNIT	REMARK
		MIN	TYP.	MAX		
Supply Voltage	Vf			10.5	V	
Supply Current	IL		260		mA	
Power consumption	P			2.73	W	
LED lifetime			50,000		H _r	

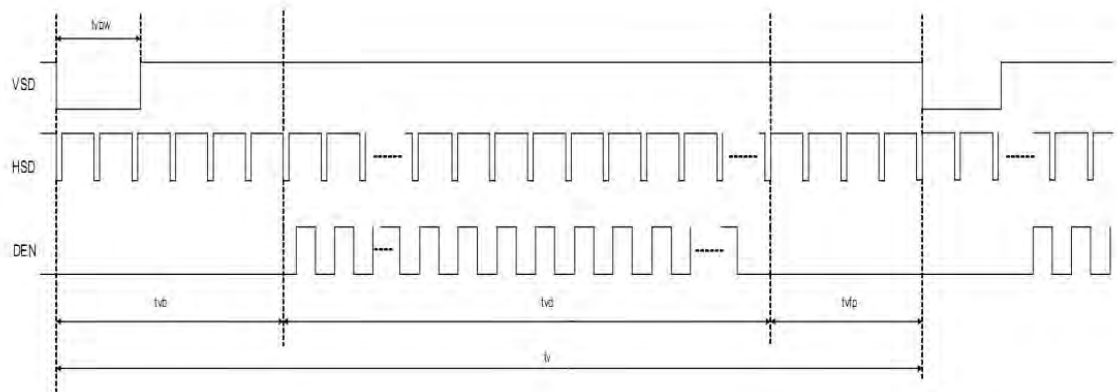
7.2 ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN	TYP.	MAX	UNIT
Power Supply	VDD	3.0	3.3	3.6	V
	AVDD	12.4	12.5	12.6	V
	VGH	22	23	24	V
	VGL	-9	-10	-11	V
	VCOM	5.6	5.8	6	V
Input voltage	Vil	GND	-	0.3VDD	V
	Vih	0.7VDD	-	VDD	V

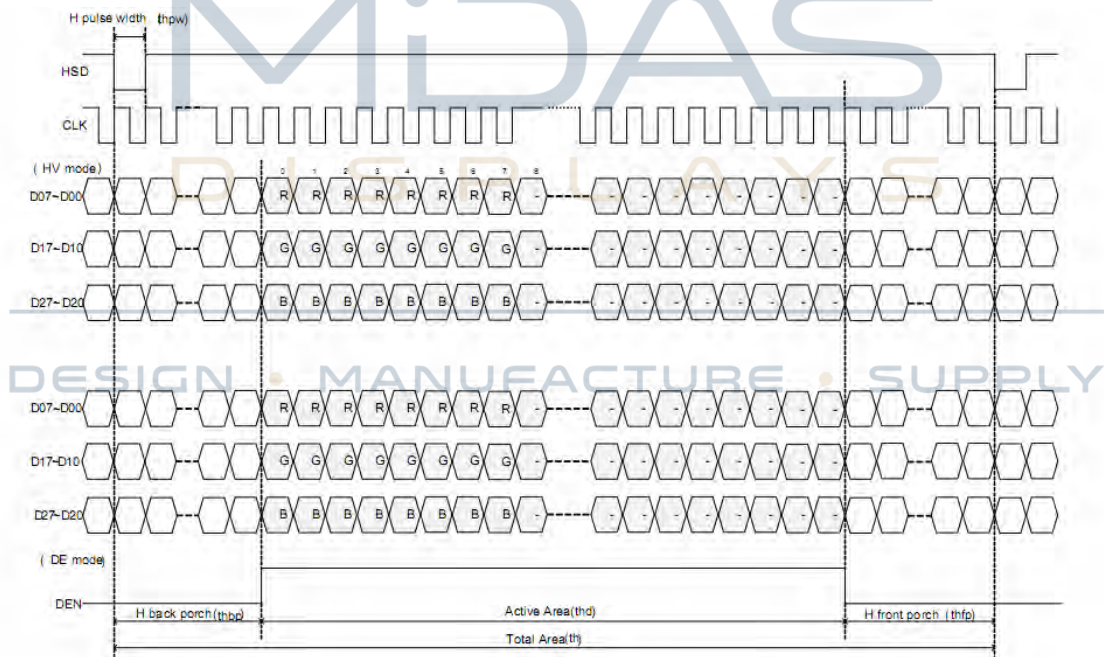


7.3 TIMING CHARACTERISTICS

7.3.1 Vertical input timing



7.3.2 Horizontal input timing



DE mode

DE mode

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	600			H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

HV mode(1)

HV mode

Horizontal input timing

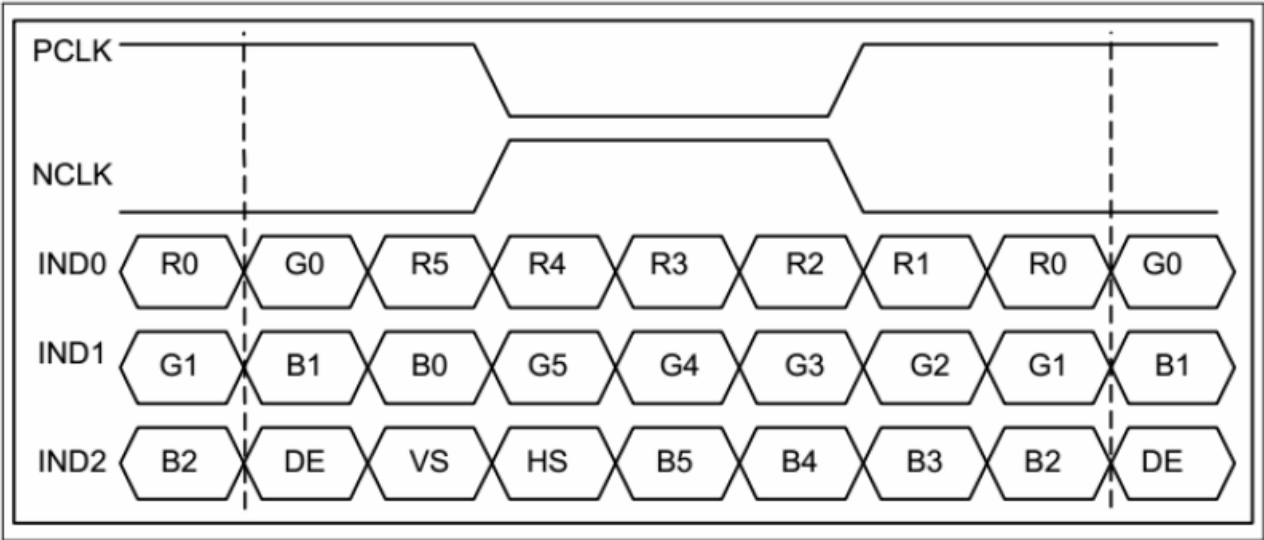
Parameter		Symbol	Value			Unit
Horizontal display area		thd	1024			DCLK
DCLK frequency@ Frame rate=60hz		fclk	Min.	Typ.	Max.	Mhz
			44.9	51.2	63	
1 Horizontal Line		th	1200	1344	1400	DCLK
HSYNC pulse width	Min.	thpw	1			
	Typ.		—			
	Max.		140			
HSYNC back porch		thbp	160	160	160	
HSYNC front porch		thfp	16	160	216	

HV mode(2)

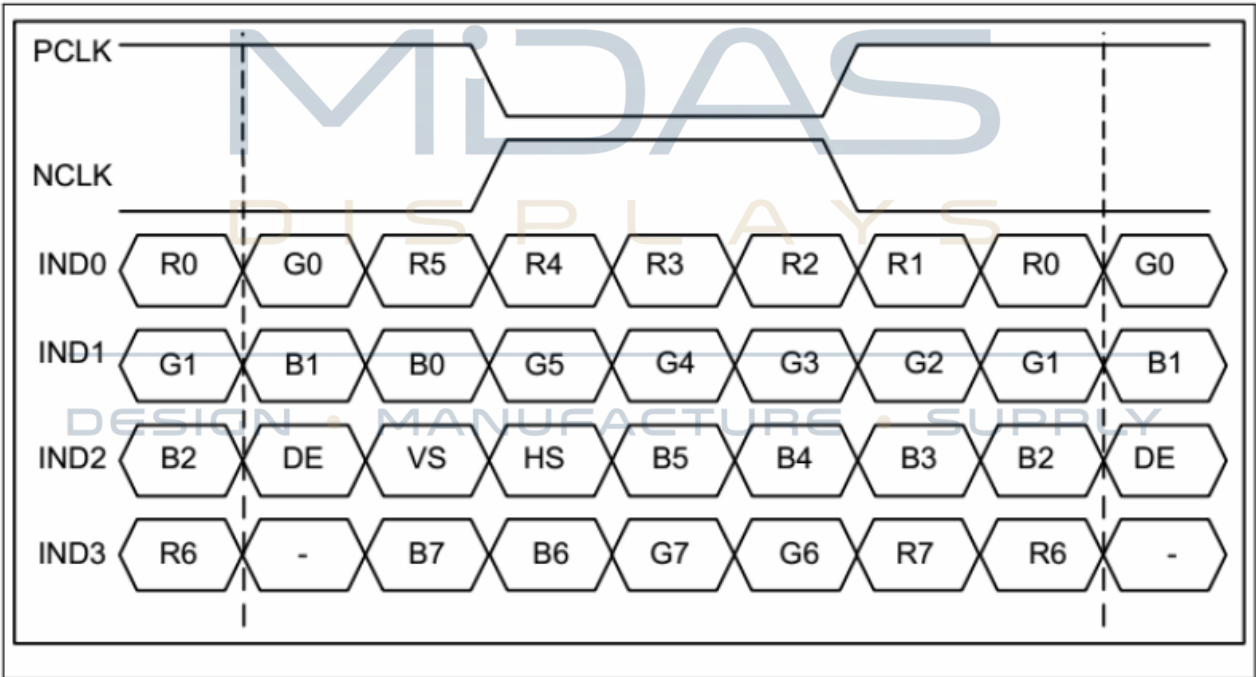
Vertical input timing

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	—	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

DATE INPUT FORMAT



6-bit LVDS Input Timing chart



8-bit LVDS Input Timing chart

8. RELIABILITY TEST

NO.	TEST ITEM	CONDITIONS	
1	HIGH TEMPERATURE STORAGE	TA=85℃	96H
2	LOW TEMPERATURE STORAGE	TA=-30℃	96H
3	HIGH TEMPERATURE OPERATION	TA=85℃	96H
4	LOW TEMPERATURE OPERATION	TA=-30℃	96H
5	HIGH TEMPERATURE AND HIGH HUMIDITY OPERATION	+60℃, 90%RH	96H
6	THERMAL SHOCK	-30℃ → +80℃,	0. 5H:5CYCLES



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9. LCD MODULES HANDLING PRECAUTIONS

- The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- If the display panel is damaged and the liquid crystal substance inside it leaks out, do not get any in your mouth. If the substance come into contact with your skin or clothes promptly wash it off using soap and water.
- Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarize carefully.
- To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
 - Be sure to ground the body when handling the LCD module.
 - Tools required for assembly, such as soldering irons, must be properly grounded.
 - To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.
 - The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- Storage precautions
When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps. Keep the modules in bags designed to prevent static electricity charging under low temperature / normal humidity conditions (avoid high temperature / high humidity and low temperatures below 0°C). Whenever possible, the LCD modules should be stored in the same conditions in which they were shipped from our company.

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10. OTHERS

- Liquid crystals solidify at low temperature (below the storage temperature range) leading to defective orientation of liquid crystal or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subjected to a strong shock at a low temperature.
- If the LCD modules have been operating for a long time showing the same display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. Abnormal operating status can be resumed to be normal condition by suspending use for some time. It should be noted that this phenomena does not adversely affect performance reliability.
- To minimize the performance degradation of the LCD modules resulting from caused by static electricity, etc. exercise care to avoid holding the following sections when handling the modules:
 - Exposed area of the printed circuit board
 - Terminal electrode sections.

