

MCT101HDMI-A	1280 x 800	HDMI Interface	TFT Module
Specification			
Version: 3		Date: 22/03/2018	
Revision			
1	02/01/2018	First issue.	
2	30/01/2018	Modify Contour Drawing.	
3	11/06/2018	Modify PCB & Electrical Characteristics.	

Display Features			
Display Size	10.1"		
Resolution	1280 x 800		
VGA Size	WXGA		
Orientation	Landscape		
Appearance	RGB		
Logic Voltage	5V		
Interface	HDMI		
Brightness	1100 cd/m ²		
Touchscreen	N/A		
Module Size	230.56 x 155.01 x 25.60 mm		
Operating Temperature	-20°C ~ +70°C	Box Quantity	Weight / Display
Pinout	40 - Way	---	---

Display Accessories	
Part Number	Description

Optional Variants	
Appearances	Voltage
Capacitive Touch Panel Resistive Touch Panel	



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2.Summary

TFT 10.1" is a IPS transmissive type color active matrix TFT liquid crystal display . In-Plane Switching (IPS) was one of the first refinements to produce significant gains in the light-transmissive characteristics of TFT panels. It is a technology that addresses the two main issues of a standard twisted nematic (TN) TFT display: colour and viewing angle.

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3.General Specifications

- Screen Diagonal: 10.1 inch
- Number of Pixels: 1280 x 3(RGB) x 800 dots
- Module dimension: 230.56 x 155.01 x 25.6 mm
- Active area: 216.96 (H) x 135.6(V) mm
- Pixel pitch: 0.1695 × 0.1695 mm
- Display Mode: Normally Black
- Pixel Arrangement: R.G.B. Vertical Stripe
- Backlight Type: LED, Normally White
- Aspect Ratio: 16:9
- Electrical Interface (Logic): HDMI
- With /Without TP: Without TP
- Surface: Anti-Glare

*Color tone slight changed by temperature and driving voltage.



4.Interface

4.1. CON4/CON5

Pin No.	Symbol	Function	Remark
1	3.3V	Raspberry Pi:Power 3.3V	
2	5V	Raspberry Pi:Power 5V	
3	SDA	CTP_SDA (For CTP type Reserved)	
4	5V	Raspberry Pi:Power 5V	
5	SCL	CTP_SCL (For CTP type Reserved)	
6	GND	Raspberry Pi:GND	
7	GPIO04	Raspberry Pi:GPIO04	
8	GPIO14	Raspberry Pi:GPIO14	
9	GND	Raspberry Pi:GND	
10	GPIO15	Raspberry Pi:GPIO15	
11	RST	CTP_RST (For CTP type Reserved)	
12	ACTIVE	GPIO	
13	WAKE	CTP_WAKE (For CTP type Reserved)	
14	GND	Raspberry Pi:GND	
15	INT	CTP_INT (For CTP type Reserved)	
16	GPIO23	Raspberry Pi:GPIO23	
17	3.3V	Power Supply	
18	GPIO24	Raspberry Pi:GPIO24	
19	GPIO10	Raspberry Pi:GPIO10	
20	GND	Raspberry Pi:GND	
21	GPIO09	Raspberry Pi:GPIO09	
22	GPIO25	Raspberry Pi:GPIO25	
23	GPIO11	Raspberry Pi:GPIO11	
24	GPIO08	Raspberry Pi:GPIO08	
25	GND	Raspberry Pi:GND	
26	GPIO07	Raspberry Pi:GPIO07	
27	ID_SD	Raspberry Pi:ID_SD	
28	ID_SC	Raspberry Pi:ID_SC	
29	GPIO05	Raspberry Pi:GPIO05	

30	GND	Raspberry Pi:GND	
31	GPIO06	Raspberry Pi:GPIO06	
32	GPIO12	Raspberry Pi:GPIO12	
33	GPIO13	Raspberry Pi:GPIO13	
34	GND	Raspberry Pi:GND	
35	GPIO19	Raspberry Pi:GPIO19	
36	GPIO16	Raspberry Pi:GPIO16	
37	GPIO26	Raspberry Pi:GPIO26	
38	GPIO20	Raspberry Pi:GPIO20	
39	GND	Raspberry Pi:GND	
40	GPIO21	Raspberry Pi:GPIO21	

4.2. HDMI

Pin No.	Symbol	I/O	Function	Remark
1	Rx2+	I	+LVDS Differential Data Input	
2	GND	P	Ground	
3	Rx2-	I	-LVDS Differential Data Input	
4	Rx1+	I	+LVDS Differential Data Input	
5	GND	P	Ground	
6	Rx1-	I	-LVDS Differential Data Input	
7	Rx0+	I	+LVDS Differential Data Input	
8	GND	P	Ground	
9	Rx0-	I	-LVDS Differential Data Input	
10	RxC+	I	+LVDS Differential Clock Input	
11	GND	P	Ground	
12	RxC-	I	-LVDS Differential Clock Input	
13-14	NC	-	No connection	
15	SCL	I/O	DDC(Data Display Channel) Clock	
16	SDA	I/O	DDC(Data Display Channel) Data	
17	GND	P	Ground	
18	5V	P	Power Supply	
19	Detect	I/O	Hot plug detect	

I: input, O: output, P: Power



4.3. USB

Pin No.	Symbol	I/O	Function	Remark
1	5V	P	Power Supply	
2	D-	I/O	USB Data -	
3	D+	I/O	USB Data +	
4	NC	-	No connection	
5	GND	P	Ground	

4.4. J2

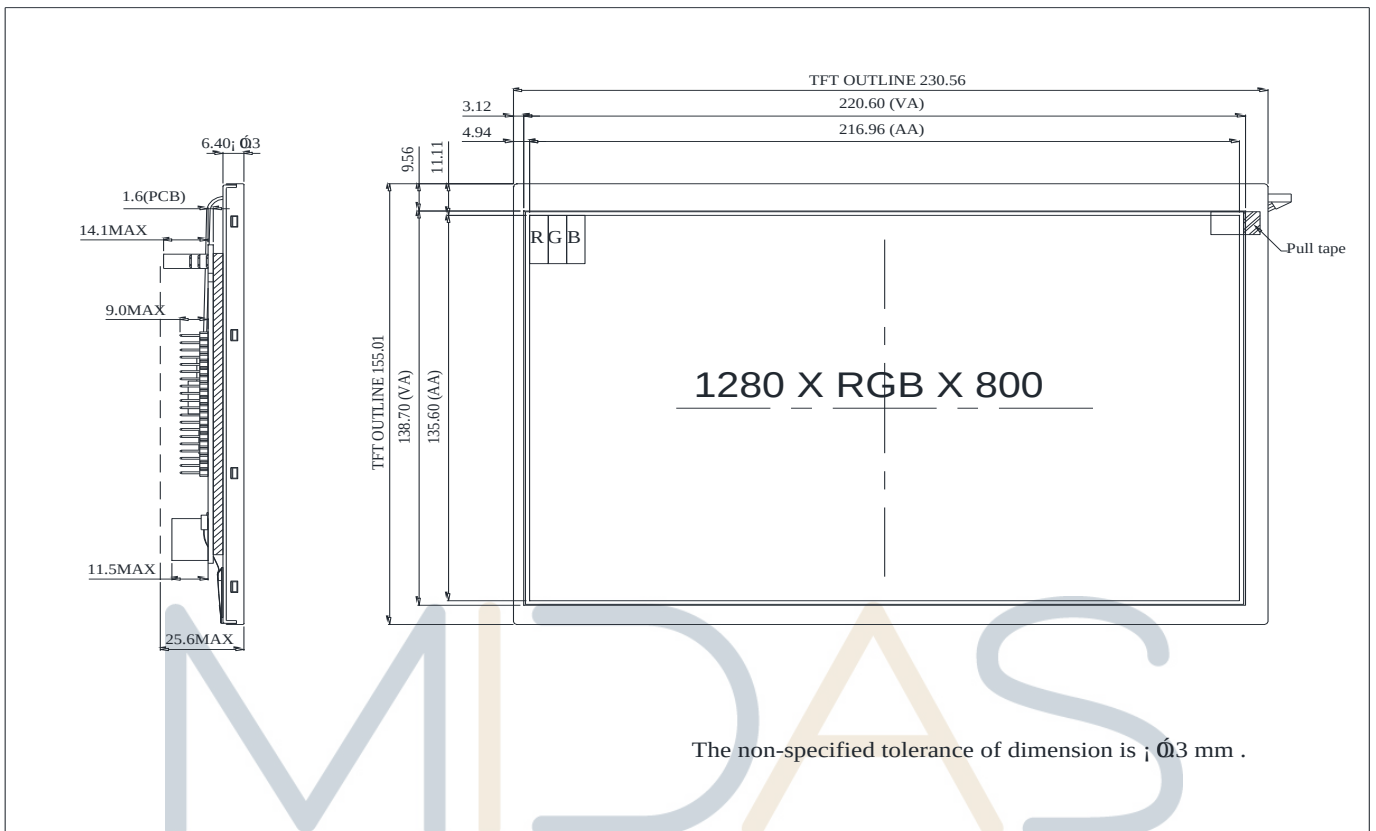
Pin No.	Symbol	I/O	Function	Remark
1	VLED+	P	Power Supply	
2	VLED-	P	Ground	
3	NC		No connection	

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5.Contour Drawing



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6.Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-20	—	+70	°C
Storage Temperature	TST	-20	—	+70	°C

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above

1. Temp. $\leq 60^{\circ}\text{C}$, 90% RH MAX. Temp. $> 60^{\circ}\text{C}$, Absolute humidity shall be less than 90% RH at 60°C



7. Electrical Characteristics

7.1. Typical Operation Conditions

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	MAX.		
Power voltage	VDD	4.5	5.0	5.5	V	Note 2

Note 1: Be sure to apply VDD and VGL to the LCD first, and then apply VGH.

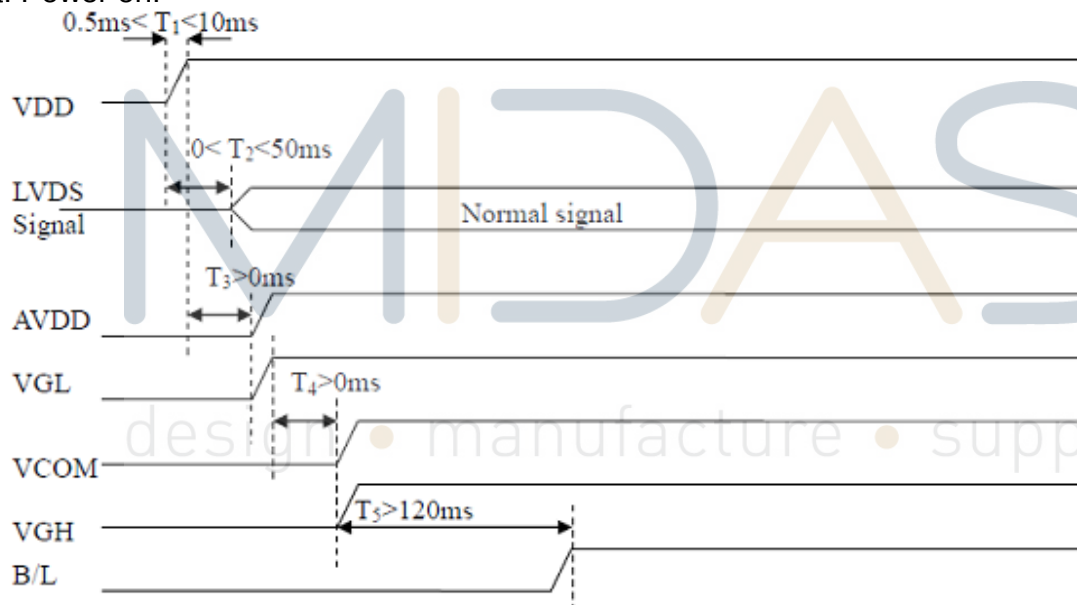
Note 2: VDD setting should match the signals output voltage

7.2. Current Consumption

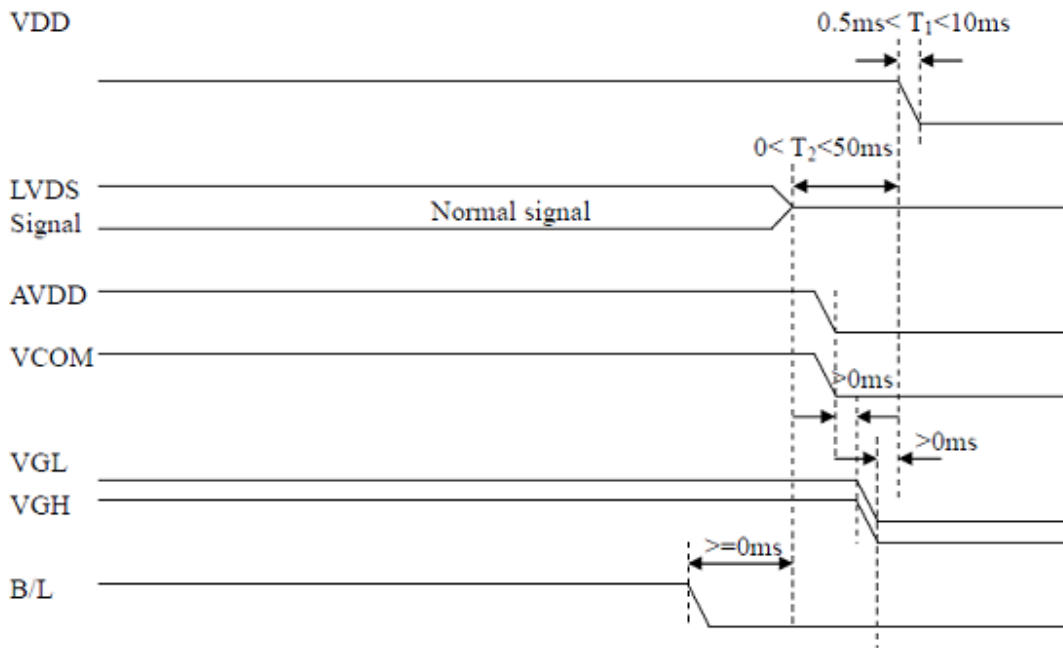
Item	Symbol	Values			Unit	Remark
		Min.	Typ.	MAX.		
	IVDD	-	2153	-	mA	VDD =2.5V
	IVLED(5V)		3		A	VLED=5V

7.3. Power Sequence

a. Power on:



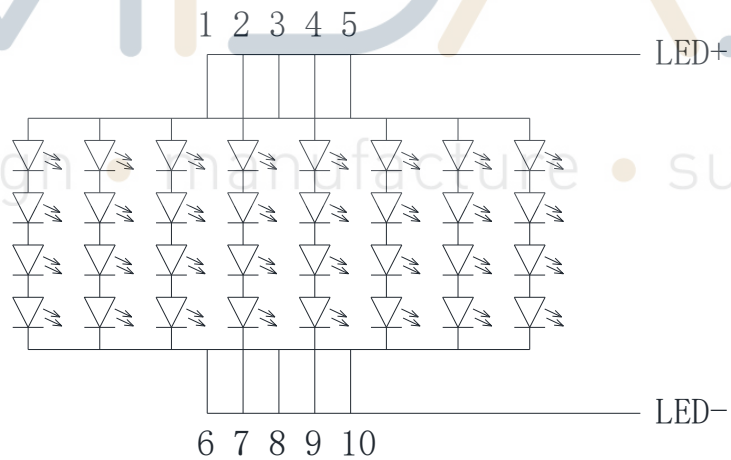
b. Power off:



7.4. Backlight Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply voltage of white LED backlight	VL	—	12.8	13.6	V	Note 1
Current for LED backlight	IL	—	480	—	mA	
LED life time	-	50000	-	-	Hr	Note 1

Note 1 : There are 1 Groups LED



Note 2 : $T_a = 25^\circ\text{C}$

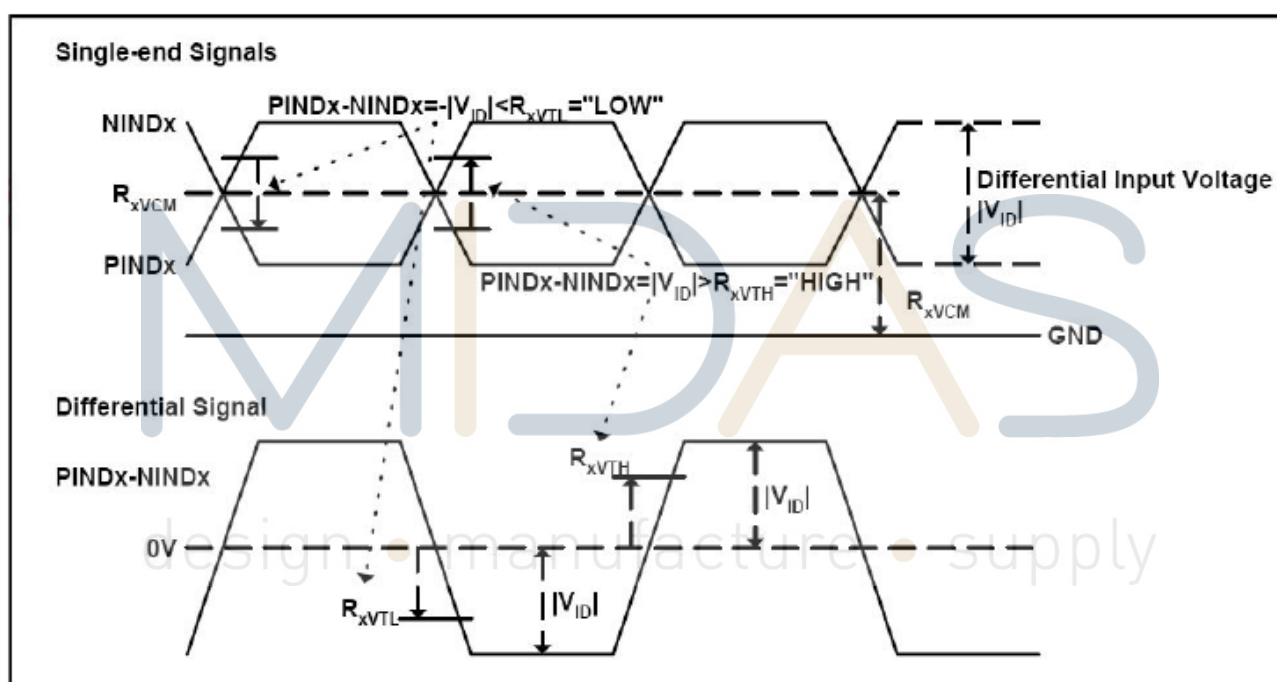
Note 3 : Brightness to be decreased to 50% of the initial value

Note 4 : The single LED lamp case

8.LVDS Signal Timing Characteristics

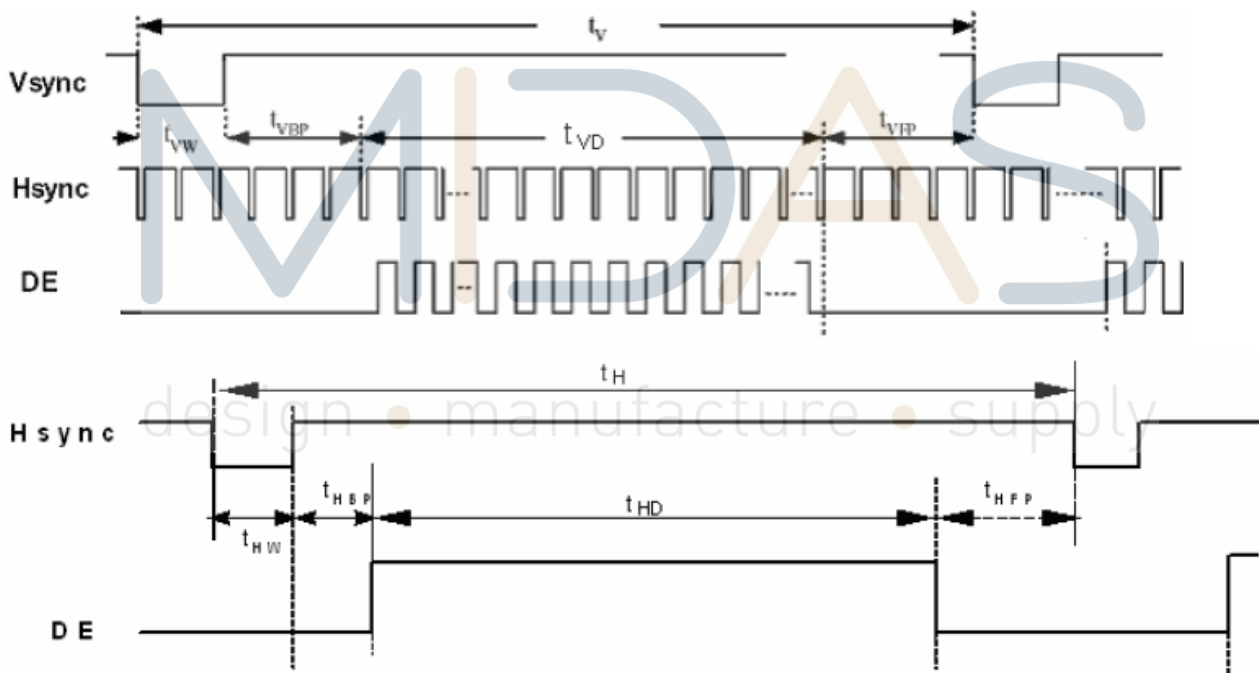
8.1. AC Electrical Characteristics

Parameter	Symbol	Values			Unit	Remark
		Min.	Typ.	MAX.		
LVDS Differential input high Threshold voltage	RxVTH	-	-	+100	mV	RXVCM=1.2 V
LVDS Differential input low Threshold voltage	RxVTL	-100	-	-	mV	
LVDS Differential input common mode voltage	RxVCM	0.7	-	1.6	V	
LVDS Differential voltage	VID	200	-	600	mV	

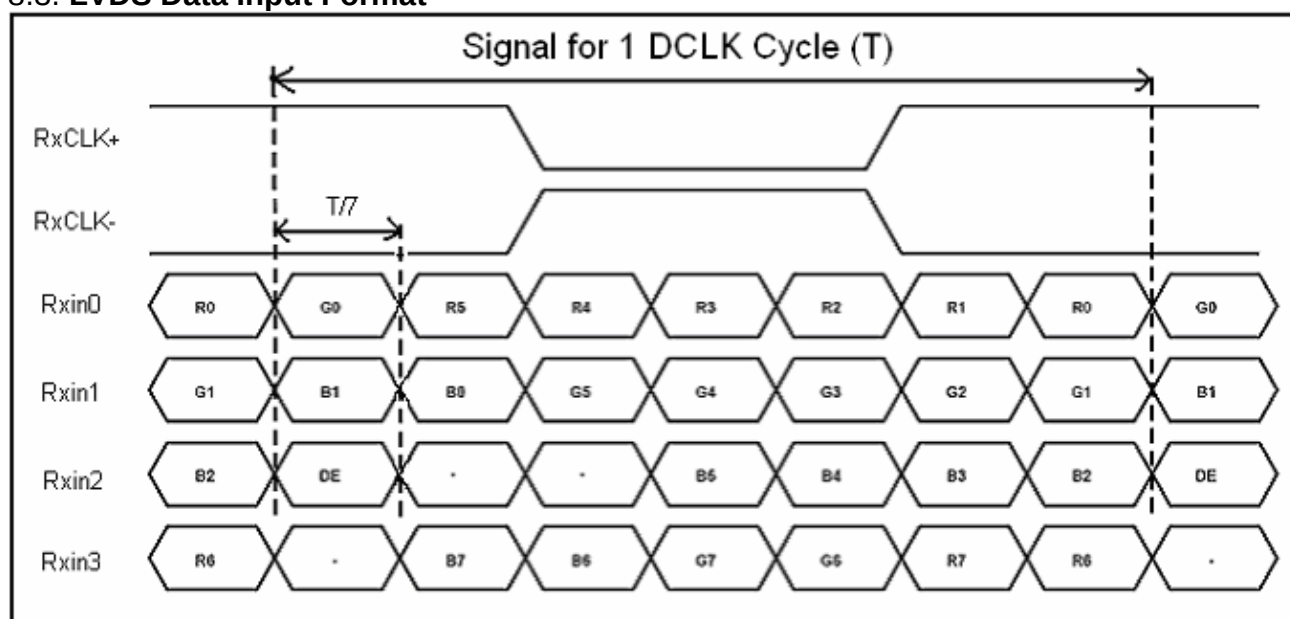


8.2. Timing Table

Parameter	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Clock Frequency	1/Tc	68.9	71.1	73.4	Mhz	Frame rate =60Hz
Horizontal display area	thd	1280			Tc	
HS period time	th	1410	1440	1470	Tc	
HS Width +Back Porch +Front Porch	t _{HW} + t _{HBP} +t _{HFP}	60	160	190	Tc	
Vertical display area	tvd	800			tH	
VS period time	tv	815	823	833	tH	
VS Width +Back Porch +Front Porch	t _{VW} + t _{VBP} +t _{VFP}	15	23	33	tH	



8.3. LVDS Data Input Format



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9.Optical Characteristics

Item	Symbol	Condition.	Min	Typ.	Max.	Unit	Remark
Response time	Tr	$\theta=0^\circ$ 、 $\phi=0^\circ$	-	10	20	.ms	Note 3
	Tf		-	15	30		
Contrast ratio	CR	At optimized viewing angle	600	800	-	-	Note 4
Color Chromaticity	White	$\theta=0^\circ$ 、 $\phi=0^\circ$	0.26	0.31	0.36	-	Note 2,5
	Wy		0.28	0.33	0.38	-	
Viewing angle (Gray Scale Inversion Direction)	Hor.	θ_R	75	85	-	Deg.	Note 1
		θ_L	75	85	-		
	Ver.	ϕ_T	75	85	-		
		ϕ_B	75	85	-		
Brightness	-	-	1000	1100	-	cd/m ²	Center of display

Ta=25±2℃

Note 1: Definition of viewing angle range

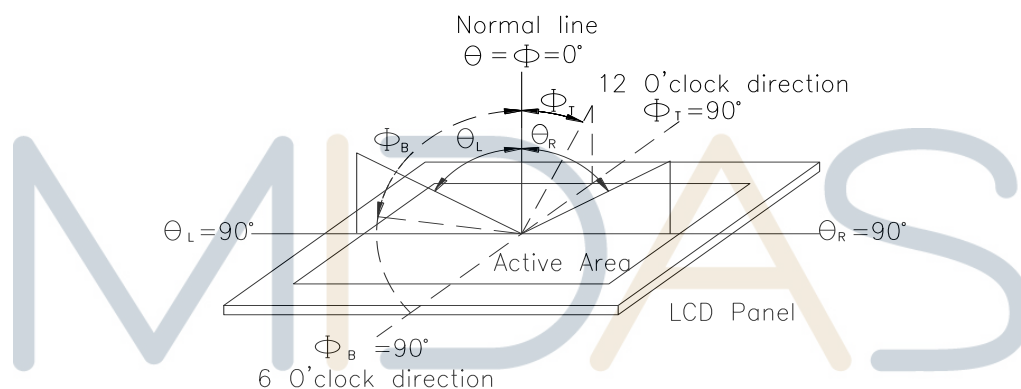


Fig. 9.1. Definition of viewing angle

Note 2: Test equipment setup:

After stabilizing and leaving the panel alone at a driven temperature for 10 minutes, the measurement should be executed. Measurement should be executed in a stable, windless, and dark room. Optical specifications are measured by Topcon BM-7 or BM-5 luminance meter 1.0° field of view at a distance of 50cm and normal direction.

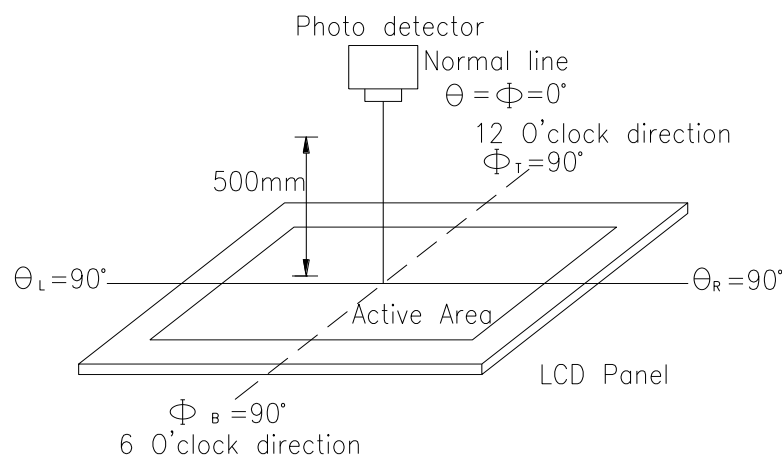
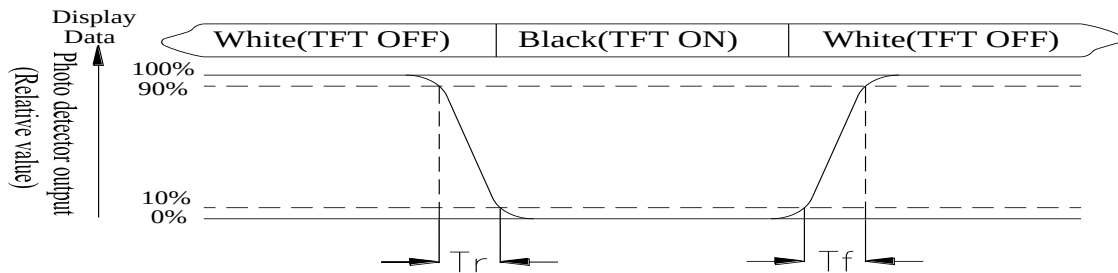


Fig. 9.2. Optical measurement system setup

Note 3: Definition of Response time:

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time, T_r , is the time between photo detector output intensity changed from 90% to 10%. And fall time, T_f , is the time between photo detector output intensity changed from 10% to 90%.



Note 4: Definition of contrast ratio:

The contrast ratio is defined as the following expression.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: White $V_i = V_{i50} \pm 1.5V$

Black $V_i = V_{i50} \pm 2.0V$

" $\pm$ " means that the analog input signal swings in phase with VCOM signal.

" $\pm$ " means that the analog input signal swings out of phase with VCOM signal.

The 100% transmission is defined as the transmission of LCD panel when all the input terminals of module are electrically opened.

Note 6: Definition of color chromaticity (CIE 1931)

Color coordinates measured at the center point of LCD

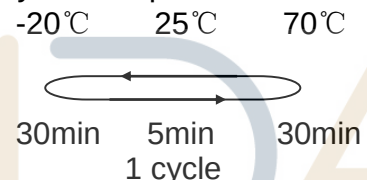
Note 7: Measured at the center area of the panel when all the input terminals of LCD panel are electrically opened.

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10. Reliability

Content of Reliability Test (Wide temperature, -20°C~70°C)

Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	70°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-20°C 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70°C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60°C, 90%RH max	60°C, 90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation 	-20°C/70°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±600V(contact) , ±800v(air), RS=330Ω CS=150pF 10 times	—

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.

Note3: The packing have to including into the vibration testing.

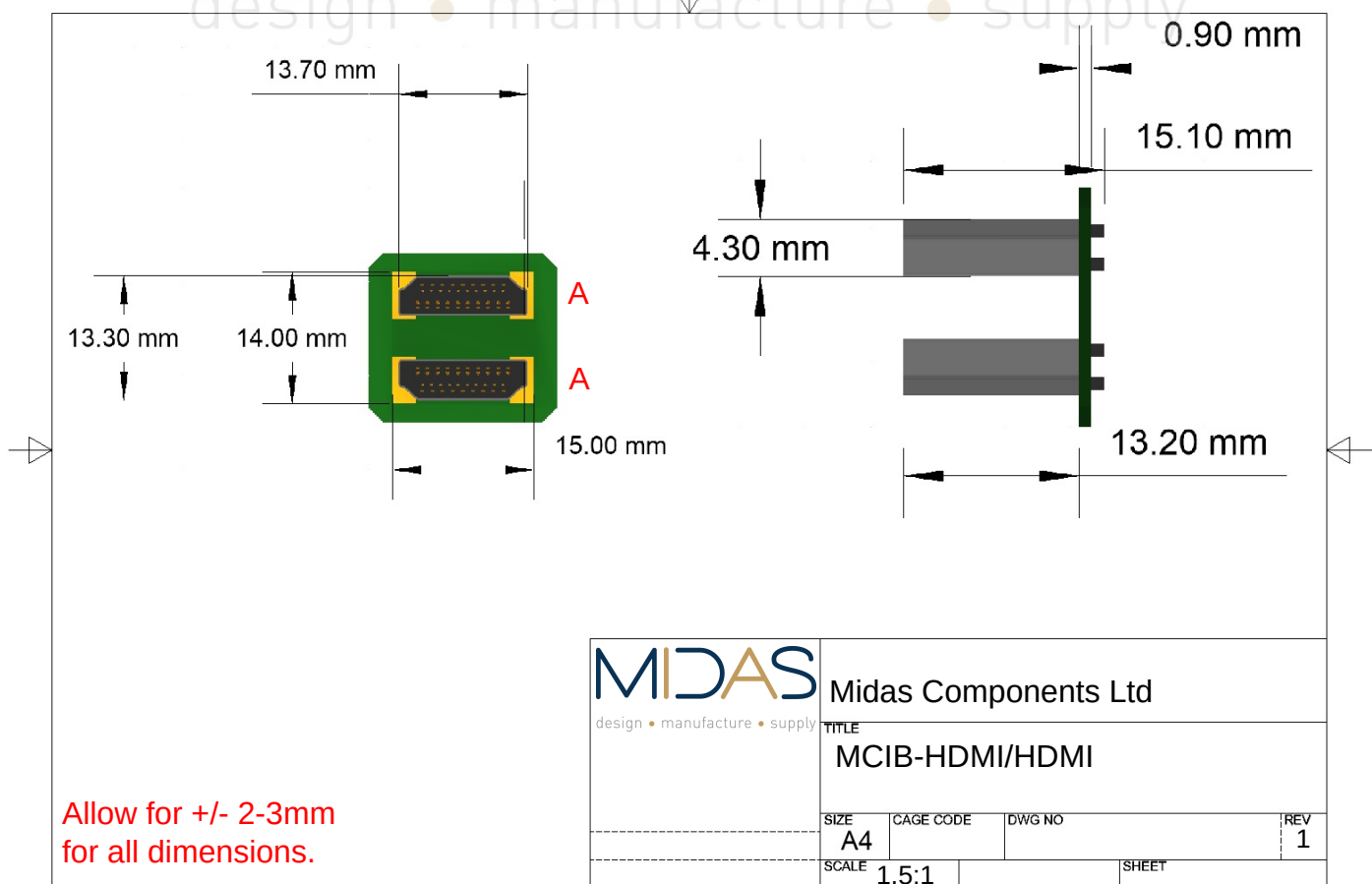
MCIB-HDMI/HDMI		Interconnect Board
Specification		
Version: 1		Date: 16/04/2018
Revision		
1	16/04/2018	First Release.

Compatible Displays	
Part Number	Description
MCT050HDMI-A-RTP	5" HDMI TFT. Resistive and Capacitive touch, respectively.
MCT050HDMI-A-CTP	
MCT070HDMI-B-RTP	7" HDMI TFT. Resistive and Capacitive touch, respectively.
MCT070HDMI-B-CTP	
MCT101HDMI-A-RTP	10.1" HDMI TFT. Resistive and Capacitive touch, respectively.
MCT101HDMI-A-CTP	

Interconnect Board Description	
	Description
A	Male HDMI Connector

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MCIC-USB		Interconnect Cable
Specification		
Version: 1		Date: 16/04/2018
Revision		
1	16/04/2018	First Release.

Compatible Displays	
Part Number	Description
MCT050HDMI-A-RTP MCT050HDMI-A-CTP	5" HDMI TFT. Resistive and Capacitive touch, respectively.
MCT070HDMI-B-RTP MCT070HDMI-B-CTP	7" HDMI TFT. Resistive and Capacitive touch, respectively.
MCT101HDMI-A-RTP MCT101HDMI-A-CTP	10.1" HDMI TFT. Resistive and Capacitive touch, respectively.

Cable Descriptions	
	Description
A	Type-A USB Connector.
B	Micro-B USB Connector.

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*Allow for +/- 2/3mm
for all dimensions.

