

MDT101005	1024 x 600	LVDS Interface	TFT Module
Specification			
Version: 1		Date: 17/05/2019	
Revision			
1	15/05/2019	First issue	

Display Features			
Display Size	10.10"		
Resolution	1024 x 600		
Orientation	Landscape		
Appearance	RGB		
Logic Voltage	3.3V		
Interface	LVDS		
Brightness	600 cd/m ²		
Touchscreen	---		
Module Size	235.00 x 143.00 x 4.60 mm		
Operating Temperature	-20°C ~ +70°C	Created By	Checked By
Pinout	60 way FFC	WE	AB
Pitch	0.5 mm	Box Quantity	Weight / Display
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* - For full design functionality, please use this specification in conjunction with the EK79001H and EK73215BCGA display driver specification. (Provided Separately)

Display Accessories	
Part Number	Description
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



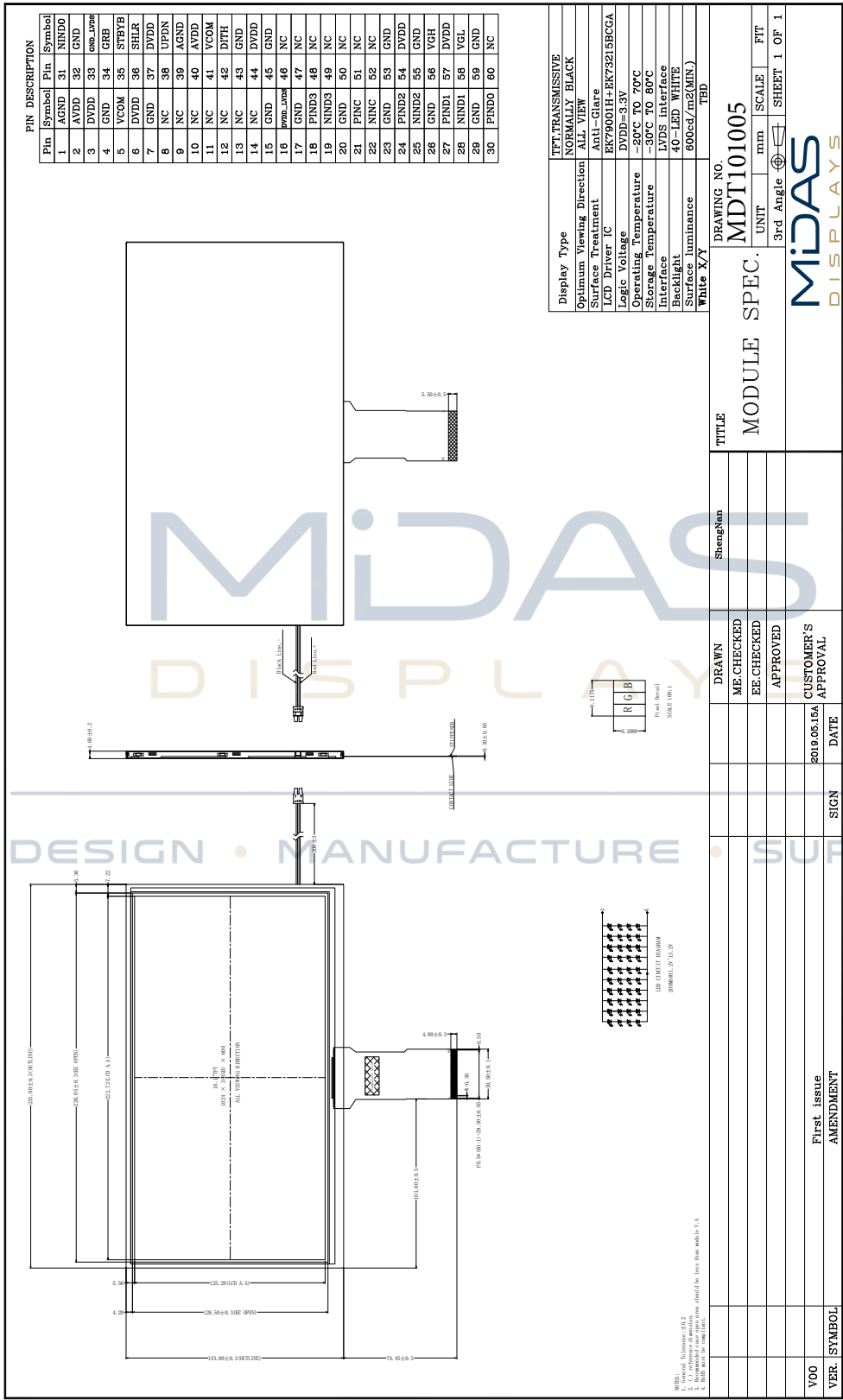
1. General Specification

Item	Contents	Unit
LCD TYPE	TFT/TRANSMISSIVE	
MODULE SIZE (W*H*T)	235.00*143.00*4.60	MM
ACTIVE SIZE (W*H)	222.72*125.28	MM
PIXEL PITCH (W*H)	0.2175*0.2088	MM
NUMBER OF DOTS	1024*600	
DRIVER IC	EK79001H+EK73215BCGA	
INTERFACE TYPE	LVDS	
TOP POLARIZER TYPE	ANTI-GLARE	
RECOMMEND VIEWING DIRECTION	ALL	O'CLOCK
GRAY SCALE INVERSION DIRECTION	-	O'CLOCK
BACKLIGHT TYPE	40-CHIP WHITE LED	
TOUCH PANEL TYPE	WITHOUT	

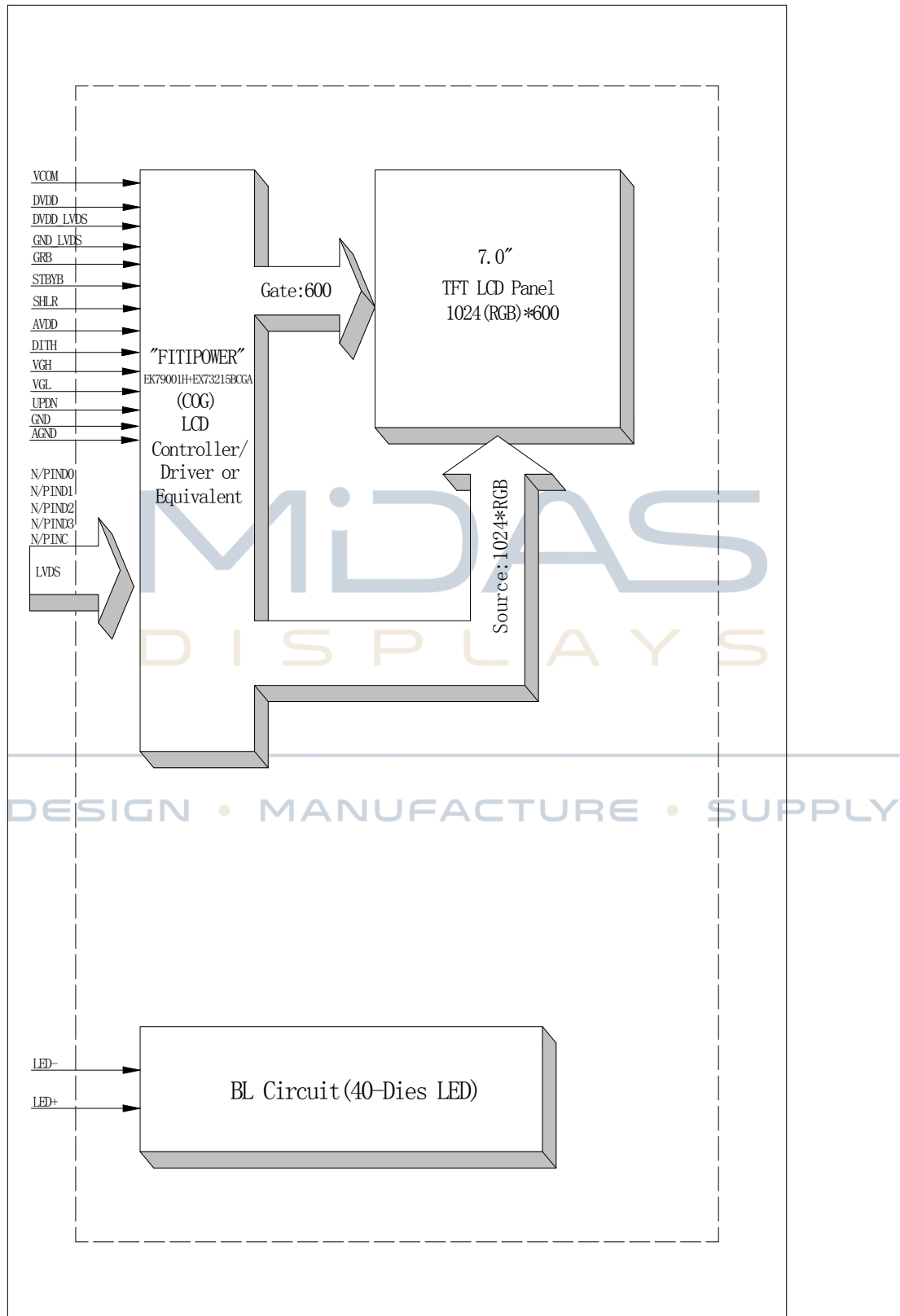
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2. Mechanical Drawing



3. Block Diagram

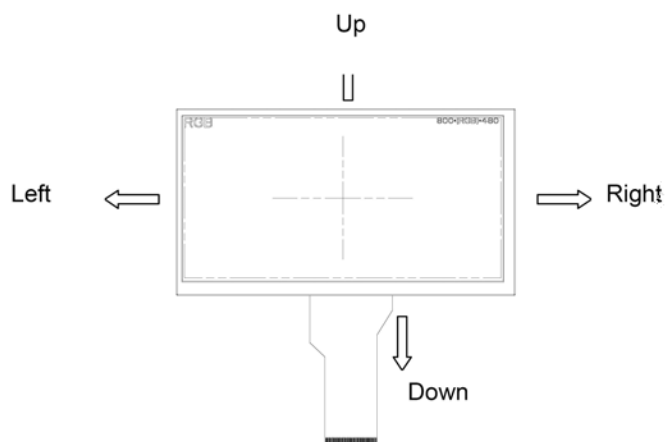


4. Interface Pin Function

Pin No.	Symbol	Description
1	AGND	Analog ground
2	AGND	Analog ground
3	DVDD	Digital power
4	GND	Digital Ground
5	VCOM	Common voltage
6	DVDD	Digital power
7	GND	Digital Ground
8	NC	NO CONNECT
9	NC	NO CONNECT
10	NC	NO CONNECT
11	NC	NO CONNECT
12	NC	NO CONNECT
13	NC	NO CONNECT
14	NC	NO CONNECT
15	GND	Digital Ground
16	DVDD_LVDS	LVDS power
17	GND	Digital Ground
18	PIND3	+ LVDS differential data input
19	NIND3	- LVDS differential data input
20	GND	Digital Ground
21	PINC	+LVDS differential CLOCK input
22	NINC	-LVDS differential CLOCK input
23	GND	Digital Ground
24	PIND2	+ LVDS differential data input
25	NIND2	- LVDS differential data input
26	GND	Digital Ground
27	PIND1	+ LVDS differential data input
28	NIND1	- LVDS differential data input
29	GND	Digital Ground
30	PIND0	+ LVDS differential data input
31	NIND0	- LVDS differential data input
32	GND	Digital Ground
33	GND_LVDS	LVDS Ground
34	GRB	RESET control
35	STBYB	Standby mode, normally pull high STBYB="1", normal operation STBYB="0", timing control, source driver w
36	SHLR	Left or right display control(NOTE)
37	DVDD	Digital power
38	UPDN	Up or down display control(NOTE)
39	AGND	Analog ground
40	AVDD	Analog power



41	VCOM	Common voltage
42	DITH	Dithering function enable control. Normally pull low DITHER="1", Enable internal dithering function
43	GND	Digital ground
44	DVDD	Digital power
45	GND	Digital ground
46	NC	NO CONNECT
47	NC	NO CONNECT
48	NC	NO CONNECT
49	NC	NO CONNECT
50	NC	NO CONNECT
51	NC	NO CONNECT
52	NC	NO CONNECT
53	GND	Digital ground
54	DVDD	Digital power
55	GND	Digital ground
56	VGH	Positive power for TFT
57	DVDD	Digital power
58	VGL	Negative power for TFT
59	GND	Digital ground
60	NC	No Connection



NOTE:

SHLR:Source Right or Left sequence control. Normally pull high.

SHLR = "L", shift left: last data = S1←S2←S3.....←S1536 = first data.

SHLR = "H", shift right: first data = S1→S2→S3.....→S1536 = last data.

UPDN: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.

UPDN = "H", STV1 output vertical start pulse and UD pin output logical "1" to Gate driver.



5. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage for logic	DVDD	-0.3	5.0	V
Supply voltage for analog	AVDD	-0.5	15	V
Power supply	VGH	-0.3	42	V
Power supply	VGL	-20	0.3	V
Power supply	VGH-VGL	-0.3	40	V
Supply current (One LED)	I _{LED}		30	mA
Operating temperature	T _{OP}	-20	+70	°C
Storage temperature	T _{ST}	-30	+80	°C

Note: The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

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6. Electrical Characteristics

6.1 Input Power

Item	Symbol	Min	Typ.	Max	Unit	Applicable terminal
Supply Voltage for Logic	DVDD	3.0	3.3	3.6	V	
Supply Voltage for Analog	AVDD	9.4	9.6	9.8	V	
Power supply	VGH	17	18	19	V	
Power supply	VGL	-6.6	-6.0	-5.4	V	
Power supply	VCOM	4.0	-	4.4	V	
Input Voltage	V _{IL}	GND	-	0.3DVDD	V	
	V _{IH}	0.7 DVDD	-	DVDD		
Input leakage Current	I _{LKG}	-		-	μA	

6.2 Backlight Driving Conditions

Item	Symbol	Value			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED Backlight	V _F	11.2	12.8	13.2	V	I _L =200mA
Current for LED Backlight	I _L		200		mA	
Power Consumption	P		2.56		W	
LED Life Time		30,000	50,000		Hr	Note

Note: Brightness to be decreased to 50% of the initial value at ambient temperature TA=25℃

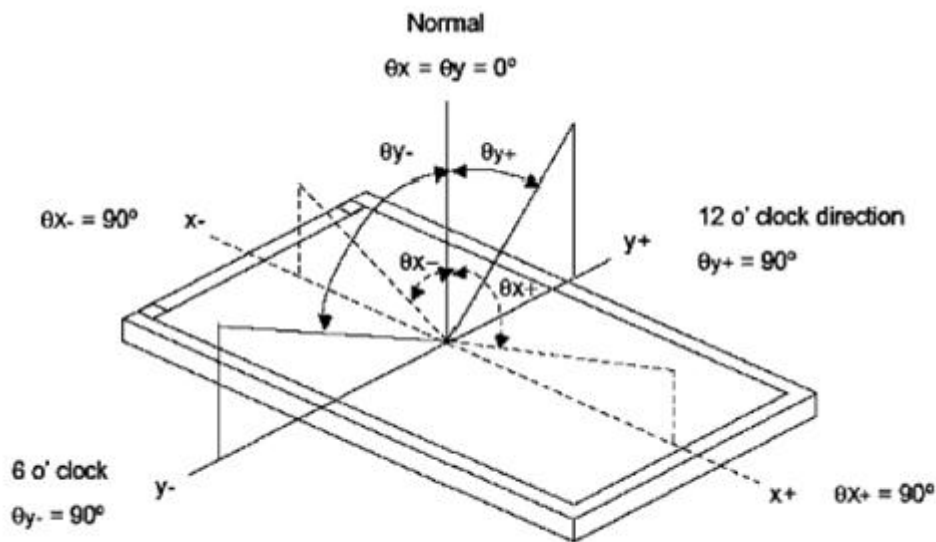


7.Optical Characteristics

ITEM		SYMBOL	CONDITIONS	SPECIFICATIONS			UNIT	NOTE
				MIN	TYP.	MAX		
Luminance		L	$I_L = 200\text{mA}$	600			Cd/m^2	
Contrast Ratio		CR	$\theta = 0^\circ$		800			
Response Time		T_{ON}	25°C		30	40	ms	
		T_{OFF}						
CIE Color Coordinate	Red	X_R	Viewing normal angle					
		Y_R						
	Green	X_G						
		Y_G						
	Blue	X_B						
		Y_B						
	White	X_W						
		Y_W						
Viewing Angle	Hor.	x	$\text{CR} \geq 10$		80		Degree	
		x			80			
	Ver.	y			80			
		y			80			
Uniformity	Un			70	75		%	



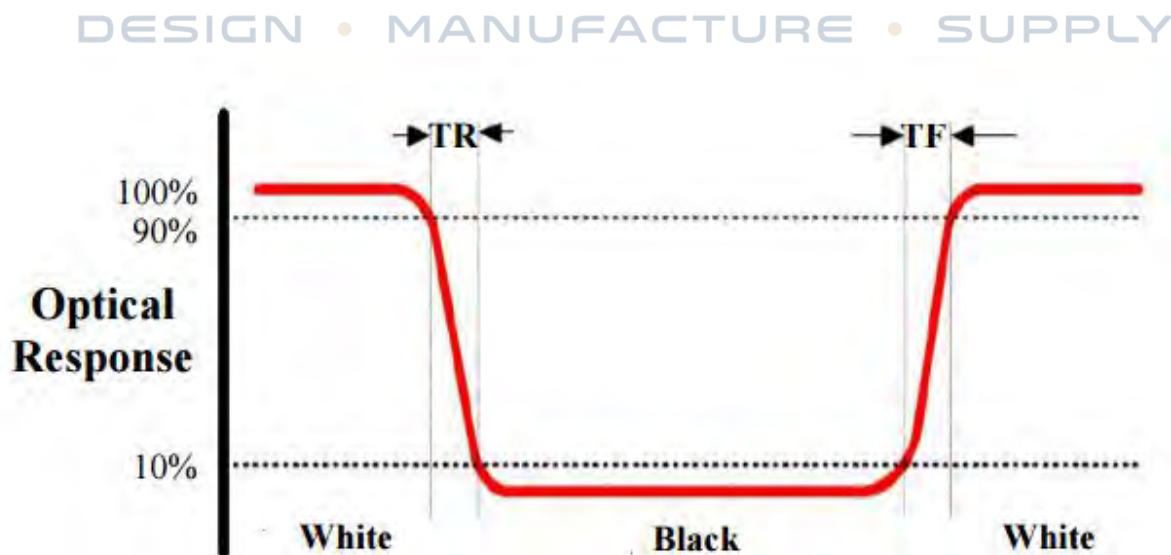
Note 1: Definition of Viewing Angle θ_x and θ_y :



Note 2: Definition of contrast ratio CR:

$$CR = \frac{\text{Luminance of white state}}{\text{Luminance of black state}}$$

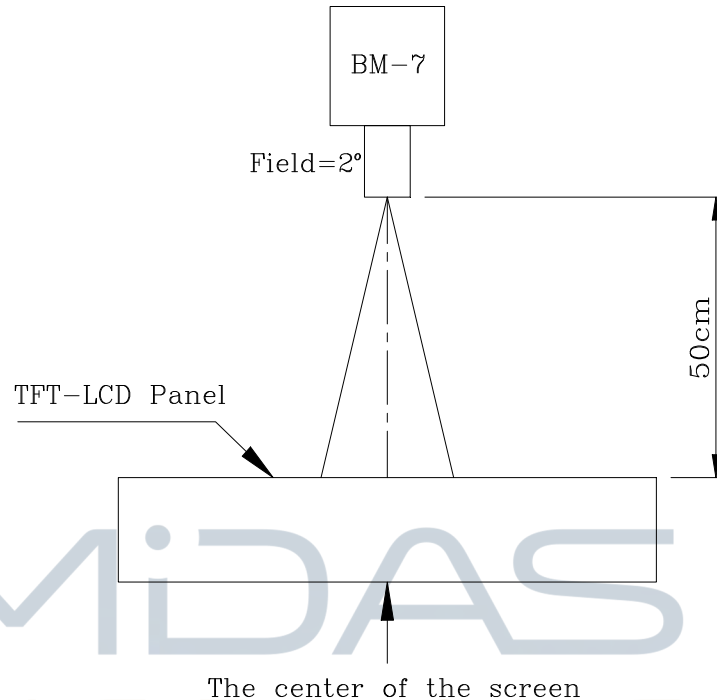
Note 3: Definition of Response Time(T_r, T_f)



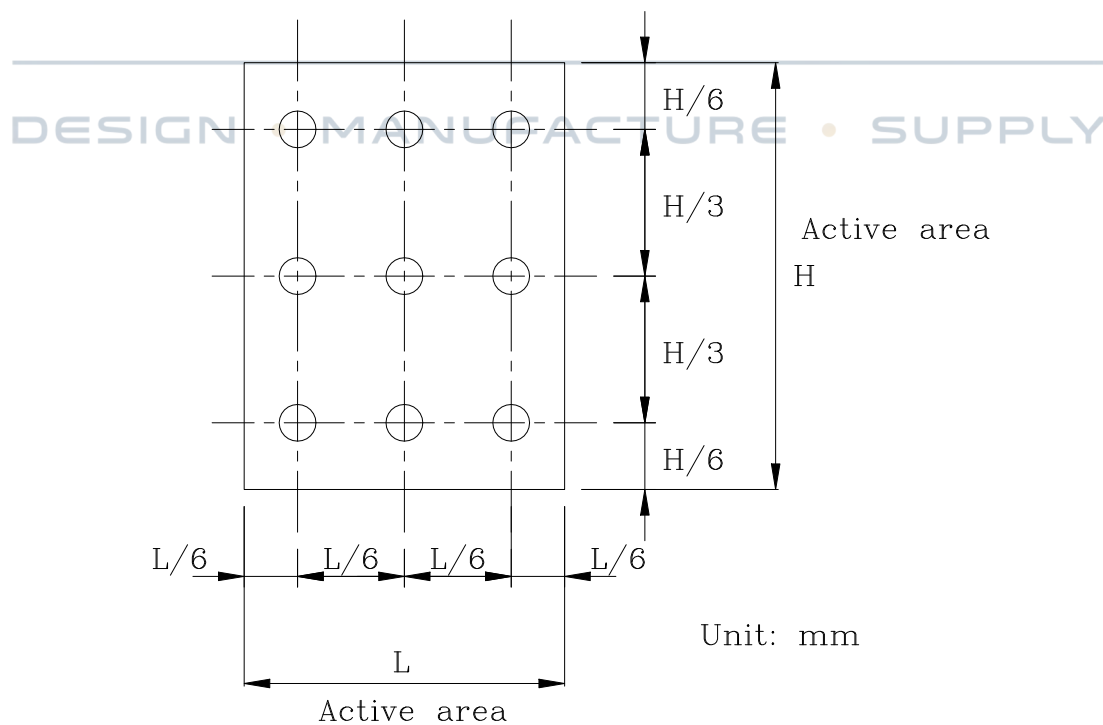
Note 4: Definition of Luminance

①The Brightness Test Equipment Setup

Field=2°(As measuring “black” image, field=2°is the best testing condition)



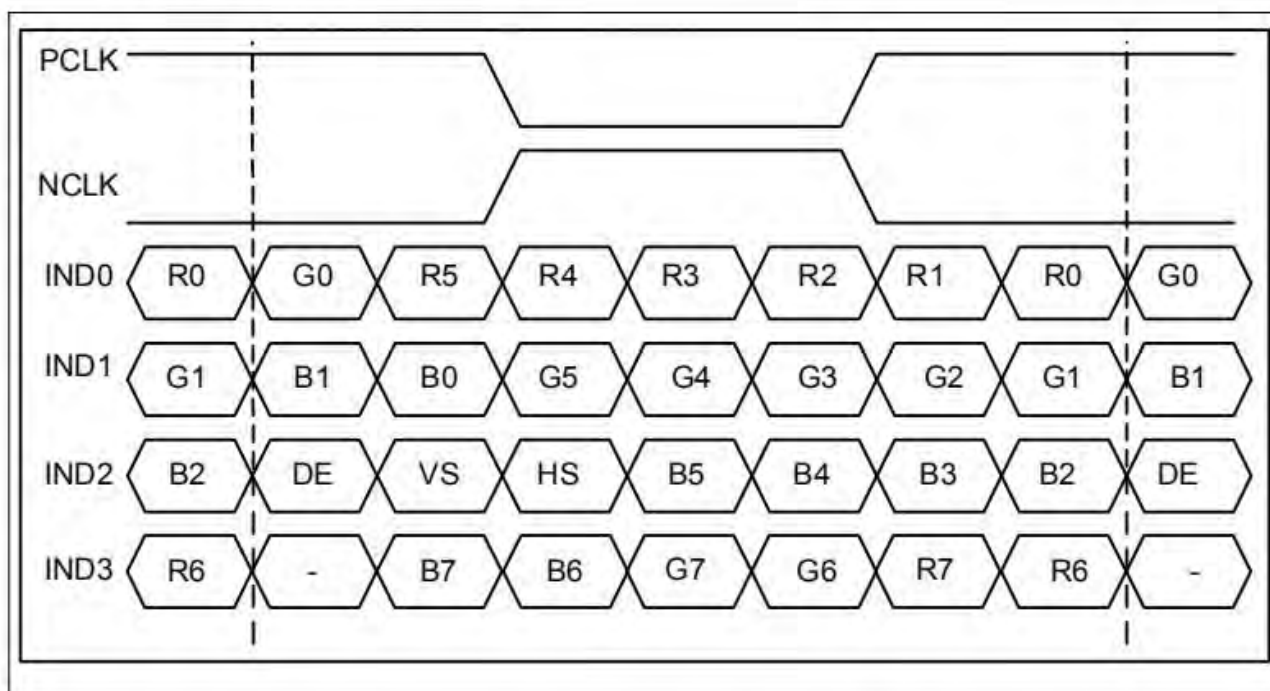
②The Brightness Test Point Setup



8. Timing Characteristics

8.1 LVDS Timing Diagram

6.6.2. 8-bit LVDS input(HSD="L")

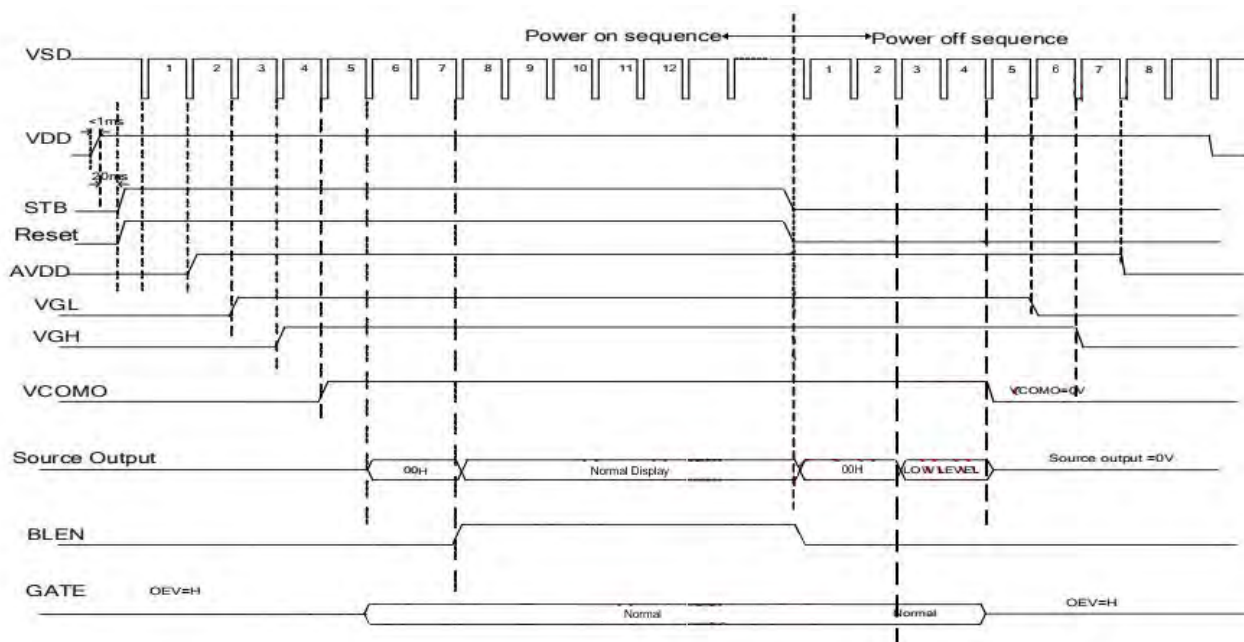


8-bit LVDS Input Timing chart

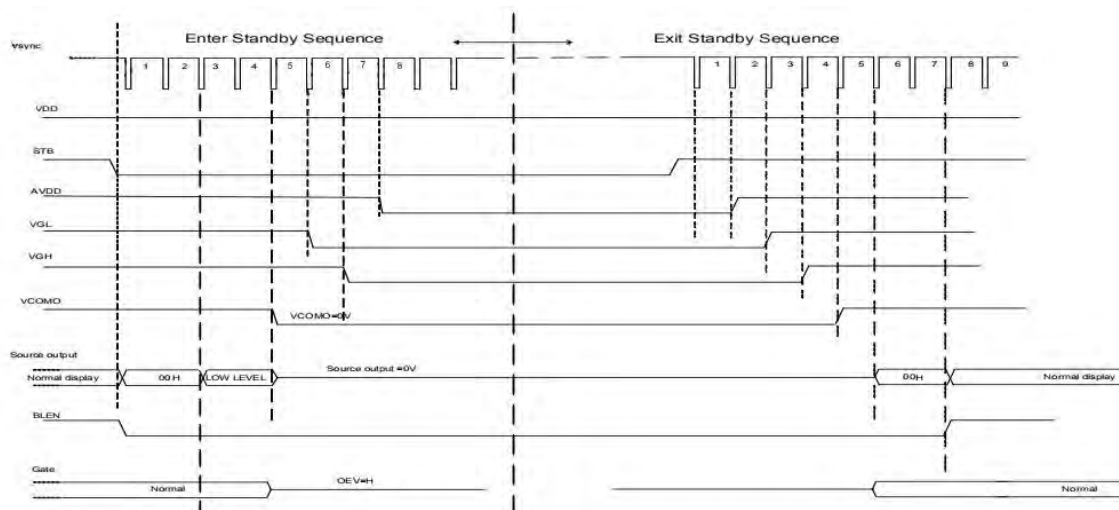
LVDS mode

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Clock Frequency	RxFCLK		20	-	71	MHz
Input data skew margin	TRSKM	$ V_{ID} =400\text{mV}$ $R_{xVCM}=1.2\text{V}$ $R_{xFCLK}=71\text{MHz}$	500			ps
Clock High Time	TLVCH			$4/(7 \cdot R_{xFCLK})$		ns
Clock Low Time	TLVCL			$3/(7 \cdot R_{xFCLK})$		ns
PLL wake-up-time	TenPLL				150	us

8.2 Power on/off



Power On/Off timing chart



Enter and Exit Standby Mode timing chart

Note: Low level=3Fh,when NBW=L(Normally white)
Low level=00h,when NBW=H(Normally black)

9. Standard Specification for Reliability

9.1 Standard Specification for Reliability of LCD Module

No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts = +70℃, 240 hours	IEC60068-21:2007 GB2423.2-2008
2	Low Temperature Operation	Ta = -20℃, 240 hours	IEC60068-2-1:2007 GB/2423.1-2008
3	High Temperature Storage	Ta = +80℃, 240 hours	IEC60068-21:2007 GB/2423.2-2008
4	Low Temperature Storage	Ta = -30℃, 240 hours	IEC60068-21:2007 GB/2423.1-2008
5	Storage at High Temperature and Humidity	Ta = +60℃, 90% RH max, 240 hours	IEC60068-2-78 :2001 GB/T2423.3—2006
6	Thermal Shock (non-operation)	-30℃ 30 min~+80℃ 30 min, Change time: 5min, 20 Cycle	Start with cold temperature, End with high temperature, IEC60068-214:1984, GB/2423.22-2002
7	ESD	C=150pF, R=330Ω, 5 point/panel Air: ±8Kv, 5 times; Contact: ±4Kv, 5 times (Environment: 15℃~35℃, 30%~60% RH, 86Kpa~106Kpa)	IEC61000-42:2001 GB/T17626.2-2006
8	Vibration Test	Frequency range: 10~55Hz Stroke: 1.5mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X.Y.Z (6 hours for total)	IEC60068-2-6:1982 GB/T2423.10-1995
9	Mechanical Shock (Non Op)	Half Sine Wave 60G 6ms, ±X, ±Y, ±Z 3 times for each direction	IEC60068-2-27:1987 GB/T2423.5—1995
10	Package Drop Test	Height: 80cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32:1990 GB/T2423.8—1995

Note1: Ts is the temperature of panel's surface.

Note2: Ta is the ambient temperature of sample.

9.2 Testing Conditions and Inspection Criteria

For the final test, the testing sample must be stored at room temperature for 24 hours. After the tests listed in Table 9.2, standard specifications for reliability will be executed in order to ensure stability.

No.	Item	Test Model	In section Criteria
01	Current Consumption	Refer To Specification	The current consumption should conform to the product specification.
02	Contrast	Refer To Specification	After the tests have been executed, the contrast must be larger than half of its initial value prior to the tests.
03	Appearance	Visual inspection	Defect free.

9.3 MTBF

MTBF	Functions, performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature ($25\pm5^{\circ}\text{C}$), normal humidity ($50\pm10\%$ RH), and in area not exposed to direct sun light.
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10. Specification of Quality Assurance

This standard of Quality Assurance confirms to the quality of LCD module products supplied by Midas.

10.1 Quality Test

Before delivering, the supplier should conduct the following tests to confirm the quality of products.

- Electrical-Optical Characteristics: According to the individual specification to test the product.
- Appearance Characteristics: According to the individual specification to test the product.
- Reliability Characteristics: According to the definition of reliability on the specification for testing products.

10.2 Delivery Test

Before delivering, the supplier should conduct the delivery test.

- Test method: According to MIL-STD105E.General Inspection Level II take a single Time.
- The defects classify of AQL as following:
Major defect: AQL = 0.65
Minor defect: AQL = 1.5
Total defects: AQL = 1.5

10.3 Non-conforming Analysis & Feedback

10.3.1 Non-conforming Analysis

- Purchaser should provide the data detail of non-conforming sample and the non-conforming.
- After receiving the data detail from purchaser, the analysis of non-conforming should be finished within two weeks.
- If the analysis can't be finished on time, supplier must notice purchaser 3 days in advance.

10.3.2 Disposition of non-conforming

- If any product defect be found during assembling, supplier must change the good for every defect after confirmation.
- Both supplier and customer should analyze the reason and discuss the disposition of non-conforming when the reason of nonconforming is not sure.



10.4 Agreement items

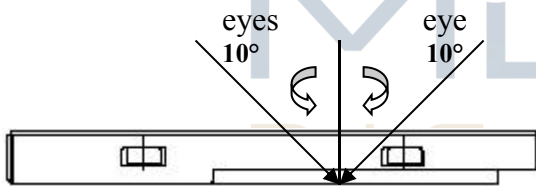
Both parties should negotiate together when the following problems happen.

- There is any problem of standard of quality assurance, and both sides should agree that it must be modified.
- There is any argument item which does not record in the standard of quality assurance.
- Any other special problem.

10.5 Standard of The Product Appearance Test

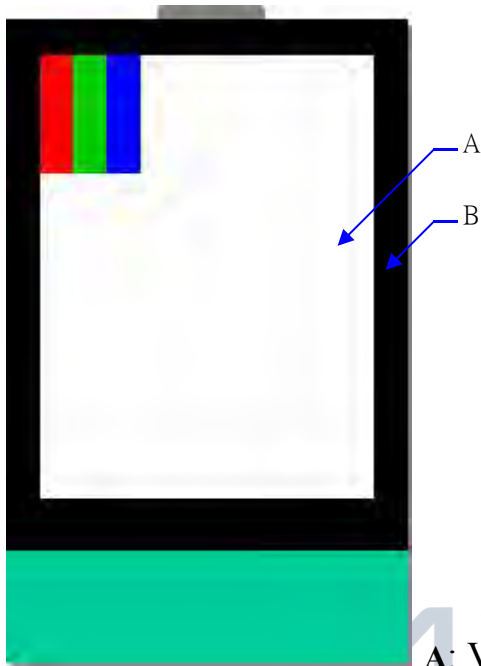
10.5.1 Manner of appearance test

- The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30 ± 5 cm.
- When test the model of transmissive product must add the reflective plate.
- The test direction is base on around 10° of vertical line.
- Temperature: $25 \pm 5^\circ\text{C}$ Humidity: $60 \pm 10\%\text{RH}$



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- Definition of area:



A: Viewing area B: Outside viewing area

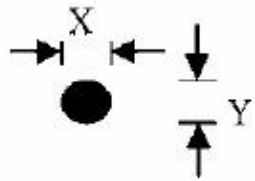
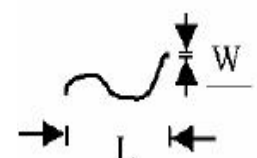
10.5.2 Basic principle

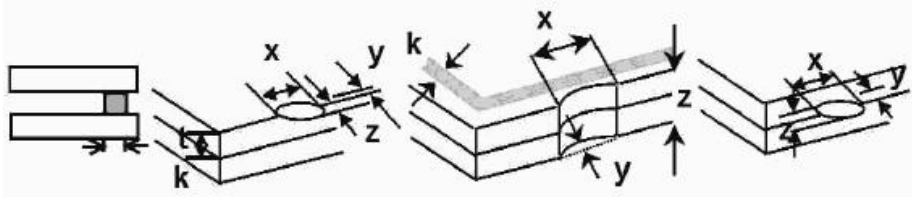
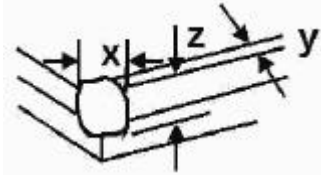
- When the standard can not be described, AQL will be applied.
- The sample of the lowest acceptable quality level must be negotiated by both supplier and customer when any dispute happened.

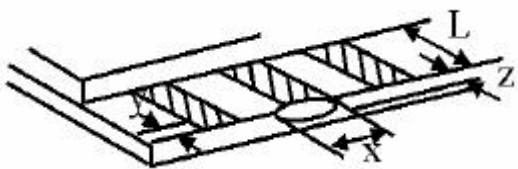
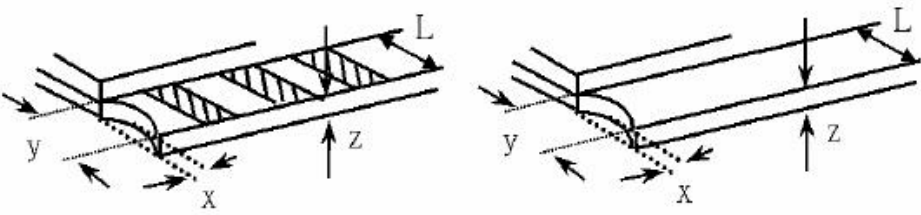
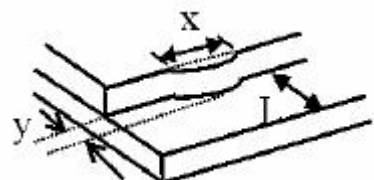
New item must be added on time when it is necessary



10.6 Inspection Specification

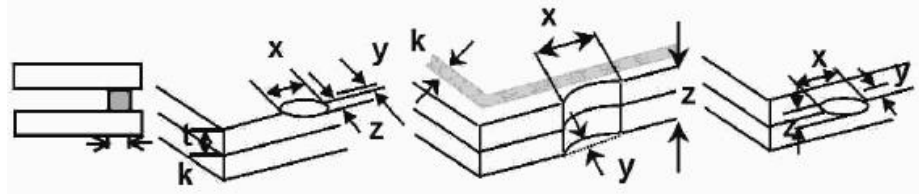
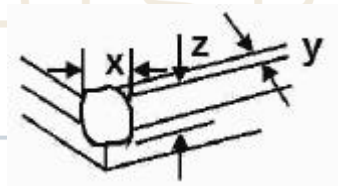
NO.	Item	Criterion	AQL														
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character, dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Flicker	0.65														
02	Black or White spots or Bright spots or Color spots on LCD (Display only)	2.1 White and black or color spots on display $\cong 0.25\text{mm}$, no more than Five spots. 2.2 Densely spaced: No more than three spots within 3mm.	1.5														
03	LCD and Touch Panel black spots, white spots, contamination (non – display)	3.1 Round type: As following drawing $\Phi = (X+Y) / 2$  <table><thead><tr><th>Size(mm)</th><th>Acceptable Q'ty</th></tr></thead><tbody><tr><td>$\Phi \cong 0.10$</td><td>Accept no dense</td></tr><tr><td>$0.10 < \Phi \cong 0.20$</td><td>2</td></tr><tr><td>$0.20 < \Phi \cong 0.25$</td><td>2</td></tr><tr><td>$0.25 < \Phi \cong 0.30$</td><td>1</td></tr><tr><td>$0.30 < \Phi$</td><td>0</td></tr></tbody></table> * Densely spaced: No more than two spots within 3mm.	Size(mm)	Acceptable Q'ty	$\Phi \cong 0.10$	Accept no dense	$0.10 < \Phi \cong 0.20$	2	$0.20 < \Phi \cong 0.25$	2	$0.25 < \Phi \cong 0.30$	1	$0.30 < \Phi$	0	1.5		
		Size(mm)	Acceptable Q'ty														
$\Phi \cong 0.10$	Accept no dense																
$0.10 < \Phi \cong 0.20$	2																
$0.20 < \Phi \cong 0.25$	2																
$0.25 < \Phi \cong 0.30$	1																
$0.30 < \Phi$	0																
		3.2 Line type: (As following drawing)  <table><thead><tr><th>Length(mm)</th><th>Width(mm)</th><th>Acceptable Q'ty</th></tr></thead><tbody><tr><td>---</td><td>$W \cong 0.02$</td><td>Accept no dense</td></tr><tr><td>$L \cong 3.0$</td><td>$0.02 < W \cong 0.05$</td><td rowspan="2">2</td></tr><tr><td>$L \cong 2.5$</td><td>$0.03 < W \cong 0.08$</td></tr><tr><td>---</td><td>$0.08 < W$</td><td>Rejection</td></tr></tbody></table> * Densely spaced: No more than two lines within 3mm.	Length(mm)	Width(mm)	Acceptable Q'ty	---	$W \cong 0.02$	Accept no dense	$L \cong 3.0$	$0.02 < W \cong 0.05$	2	$L \cong 2.5$	$0.03 < W \cong 0.08$	---	$0.08 < W$	Rejection	1.5
Length(mm)	Width(mm)	Acceptable Q'ty															
---	$W \cong 0.02$	Accept no dense															
$L \cong 3.0$	$0.02 < W \cong 0.05$	2															
$L \cong 2.5$	$0.03 < W \cong 0.08$																
---	$0.08 < W$	Rejection															

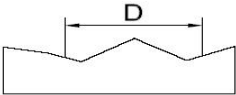
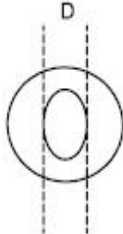
NO.	Item	Criterion			AQL
04	Polarizer bubbles	If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction	Size Φ (mm)	Acceptable Q'ty	1.5
			$\Phi \leq 0.20$	Accept no dense	
			$0.20 < \Phi \leq 0.50$	3	
			$0.50 < \Phi \leq 1.00$	2	
			$1.00 < \Phi$	0	
			Total Q'ty	3	
05	Scratches	Follow NO.3 -2 Line Type.			
06	Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 6.1 General glass chip: 6.1.1 Chip on panel surface and crack between panels:			1.5
					
		z: Chip thickness	y: Chip width	x: Chip length	
		$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	
		$1/2t < z \leq 2t$	Not exceed $1/3k$	$x \leq 1/8a$	
		⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 6.1.2 Corner crack:			
					
		z: Chip thickness	y: Chip width	x: Chip length	
		$Z \leq 1/2t$	Not over viewing area	$x \leq 1/8a$	
		$1/2t < z \leq 2t$	Not exceed $1/3k$	$x \leq 1/8a$	
		⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip			

NO.	Item	Criterion	AQL																
07	Glass crack	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length 7.2 Protrusion over terminal: 7.2.1 Chip on electrode pad:  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq 0.5\text{mm}$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> 7.2.2 Non-conductive portion:  <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>$y \leq L$</td><td>$x \leq 1/8a$</td><td>$0 < z \leq t$</td></tr></table> ⊙ If there chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙ If the product will be heat sealed by the customer, the alignment mark must not be damaged. 7.2.3 Substrate protuberance and internal crack  <table><tr><td>y: width</td><td>x: length</td></tr><tr><td>$y \leq 1/3L$</td><td>$X \leq a$</td></tr></table>	y: Chip width	x: Chip length	z: Chip thickness	$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$	y: Chip width	x: Chip length	z: Chip thickness	$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$	y: width	x: length	$y \leq 1/3L$	$X \leq a$	1.5
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq 0.5\text{mm}$	$x \leq 1/8a$	$0 < z \leq t$																	
y: Chip width	x: Chip length	z: Chip thickness																	
$y \leq L$	$x \leq 1/8a$	$0 < z \leq t$																	
y: width	x: length																		
$y \leq 1/3L$	$X \leq a$																		

NO.	Item	Criterion	AQL
08	Cracked glass	The LCD with extensive crack is not acceptable.	1.5
09	Backlight elements	9.1 Illumination source flickers when lit. 9.2 Spots or scratches that appear when lit must be judged. Using LCD spot, lines and contamination standards. 9.3 Backlight doesn't light or color is wrong.	1.5 1.5 0.65
10	Bezel	Bezel must comply with product specifications.	1.5
11	PCB、COB	11.1 COB seal may not have pinholes larger than 0.2mm or contamination. 11.2 COB seal surface may not have pinholes through to the IC. 11.3 The height of the COB should not exceed the height indicated in the assembly diagram. 11.4 There may not be more than 2mm of sealant outside the seal area on PCB. And there should be no more than three places. 11.5 Parts on PCB must be the same as on the production characteristic chart, There should be no wrong parts, missing parts or excess parts. 11.6 The jumper on the PCB should conform to the product characteristic chart.	1.5 1.5 1.5 1.5 0.65 0.65
12	FPC	12.1 FPC terminal damage $\leq$ 1/2 FPC terminal width and can not affect the function , we judge accept. 12.2 FPC alignment hole damage $\leq$ 1/2 alignment area and can not affect the function , we judge accept.	1.5 1.5
13	Soldering	13.1 No cold solder joints, missing solder connections, oxidation or icicle. 13.2 No short circuits in components on PCB or FPC.	1.5 0.65



NO.	Item	Criterion	AQL												
14	Touch Panel Chipped glass	Symbols: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Touch Panel Total thickness a: LCD side length L: Electrode pad length 14.1 General glass chip: 14.1.1 Chip on panel surface and crack between panels:  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$Z \leq t$</td> <td>$\cong 1/2\ k$ and not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> </table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip 14.1.2 Corner crack:  <table> <tr> <td>z: Chip thickness</td> <td>y: Chip width</td> <td>x: Chip length</td> </tr> <tr> <td>$z \leq t$</td> <td>$\cong 1/2\ k$ and not over viewing area</td> <td>$x \leq 1/8a$</td> </tr> </table> ⊙ Unit: mm ⊙ If there are 2 or more chips, x is the total length of each chip	z: Chip thickness	y: Chip width	x: Chip length	$Z \leq t$	$\cong 1/2\ k$ and not over viewing area	$x \leq 1/8a$	z: Chip thickness	y: Chip width	x: Chip length	$z \leq t$	$\cong 1/2\ k$ and not over viewing area	$x \leq 1/8a$	1.5
z: Chip thickness	y: Chip width	x: Chip length													
$Z \leq t$	$\cong 1/2\ k$ and not over viewing area	$x \leq 1/8a$													
z: Chip thickness	y: Chip width	x: Chip length													
$z \leq t$	$\cong 1/2\ k$ and not over viewing area	$x \leq 1/8a$													

NO.	Item	Criterion	AQL										
15	Touch Panel(Fish eye、dent and bubble on film)	<table> <tr> <th>SIZE(mm)</th> <th>Acceptable Q'ty</th> </tr> <tr> <td>$\Phi \leq 0.2$</td> <td>Accept no dense</td> </tr> <tr> <td>$0.2 < D \leq 0.4$</td> <td>5</td> </tr> <tr> <td>$0.4 < D \leq 0.5$</td> <td>2</td> </tr> <tr> <td>$0.5 < D$</td> <td>0</td> </tr> </table>  	SIZE(mm)	Acceptable Q'ty	$\Phi \leq 0.2$	Accept no dense	$0.2 < D \leq 0.4$	5	$0.4 < D \leq 0.5$	2	$0.5 < D$	0	1.5
SIZE(mm)	Acceptable Q'ty												
$\Phi \leq 0.2$	Accept no dense												
$0.2 < D \leq 0.4$	5												
$0.4 < D \leq 0.5$	2												
$0.5 < D$	0												
16	Touch Panel Newton ring	Newton ring dimension $\leq 1/2$ touch panel area and not affect font and line distortion($\leq 2.5\%$) , it is acceptable.	1.5										
17	Touch Panel Linearity	Less than 2.5% is acceptable.	1.5										
18	LCD Ripple	Touch the touch panel , can not see the LCD ripple. Pen: R 1.0mm silicon rubber. Operation Force: 80g	1.5										
19	General appearance	19.1 Pin type must match type in specification sheet. 19.2 LCD pin loose or missing pins. 19.3 Product packaging must the same as specified on packaging specification sheet. 19.4 Product dimension and structure must conform to product specification sheet.	0.65 0.65 0.65 0.65										

11. Handling Precaution

11.1 Handling of LCM

- Avoid external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance, do not lick or swallow. When the liquid makes contact with your hand, skin, cloth, etc., wash it thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.
- The operators should wear protections whenever he/she comes into contact with the module. Never touch any of the conductive parts such as the LSI pads, the copper leads on the PCB and the interface terminals with any parts of the human body.
- The modules should be kept in antistatic bags or other containers resistant to static for storage.
- The module is coated with a film to protect the display surface, be careful when peeling off this protective film since static electricity may be generated.

11.2 Storage

- Store it in an ambient temperature of $25\pm 10^{\circ}\text{C}$, and in a relative humidity of $50\pm 10\%\text{RH}$. Don't expose to sunlight or fluorescent light.
- Store it in a clean environment, free from dust, active gas, and solvent.
- Store it in anti-static electricity container.
- Store it without any physical load.

11.3 Soldering

- Use only soldering irons with proper grounding and no leakage.
- Iron: no higher than $280\pm 10^{\circ}\text{C}$ and less than 3 sec during hand soldering.
- Rewiring: no more than 2 times.

