

APPROVAL SHEET

承認書

Customer 客戶名稱	
Part No. 產品型號	TVL-55737GD030J-LW-G-AAN
Product type 產品內容	Transmissive Type
	Positive mode
	3.0" TFT LCD
	262K color
ZRoHS 綠色產品	<input type="checkbox"/> Non-compliance <input checked="" type="checkbox"/> Compliance
Remarks 備註欄	
<p> <input checked="" type="checkbox"/> Preliminary Specification 暫行規格 <input type="checkbox"/> Final Specification 正式規格 </p> <p>Signature by Customer: 客戶確認簽章:</p>	

Issued by QA	Checked by QA	Checked by PM	Approved By	
			QA	BU

Specification of LCD Module

Product No.: TVL-55737GD030J-LW-G-AAN

Issue date: 2013/02/21

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
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1. GENERAL DESCRIPTION

TVL-55737GD030J-LW-G-AAN is a Transmissive type color active matrix liquid crystal display (LCD), which uses amorphous thin film transistor (TFT) as switching devices. This product is composed of a TFT LCD panel, driver IC, FPC backlight and a bezel unit. The following table described the features of TVL-55737GD030J-LW-G-AAN.

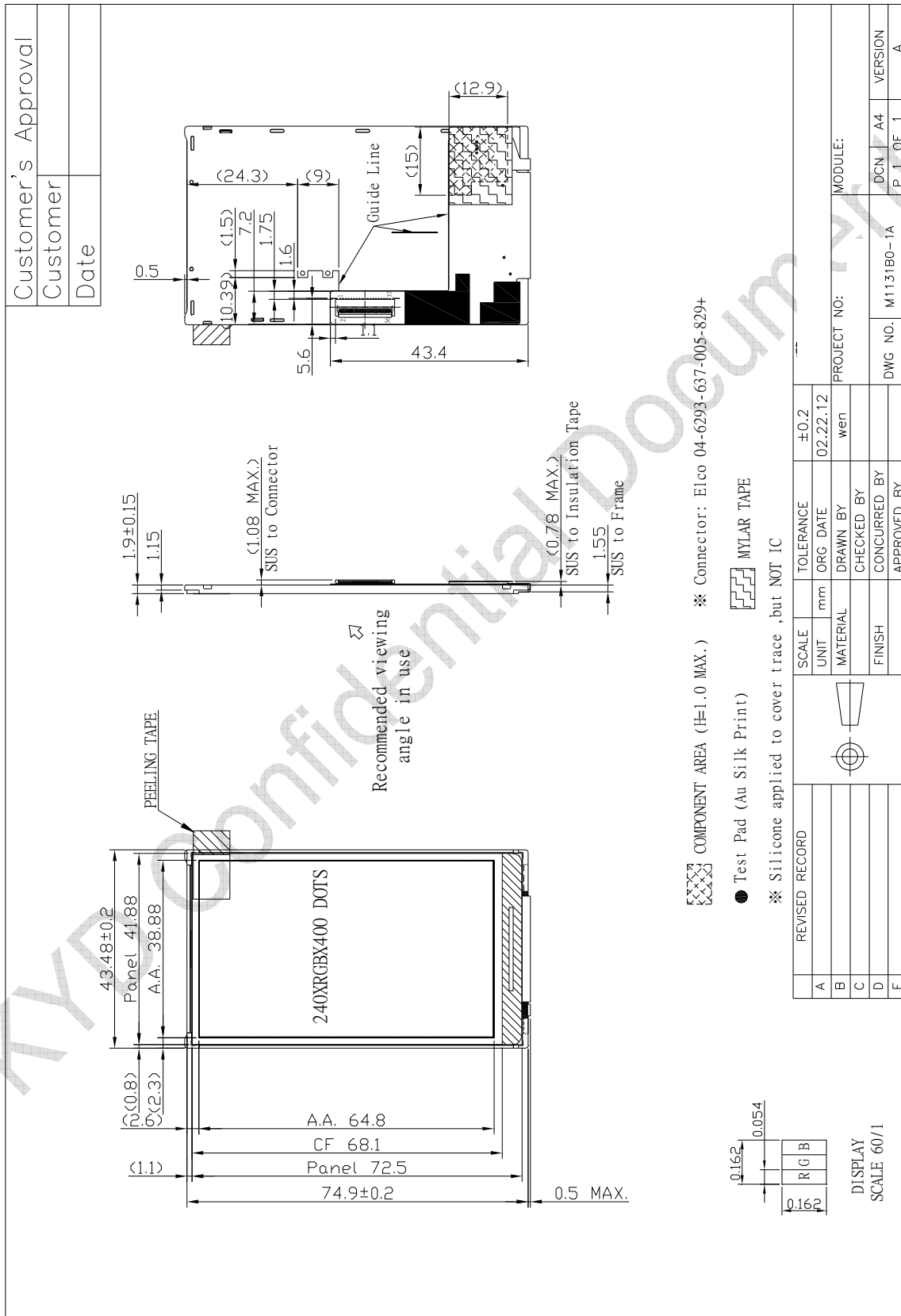
2. FEATURES

Display Mode	Transmissive Type,
Display Format	RGB vertical stripe
Color	262K color
Input Data	MCU Interface : 16 bits 8080-series parallel interface
Viewing Direction	Higher Contrast ratio: 6 o'clock Less gray scale reversal:12 O'clock 
Backlight	White LED
Driver IC	S6D04D3X21

3. MECHANICAL SPECIFICATION

Item	Specifications	Unit
Dimensional outline	43.48(W) × 74.9(H) × 1.9 (D)	mm
Resolution	240 × RGB × 400	dot
Active area	38.88 (W) × 64.8 (H)	mm
Pixel pitch	0.162 (W) × 0.162 (H)	mm

4. MECHANICAL DIMENSION



5. MAXIMUM RATINGS

If the operating condition exceeds the following absolute maximum ratings, the TFT LCD module may be damaged permanently.

Item	Symbol	Values		Unit	Condition
		Min.	Max.		
Power Supply for Analog	VCC	-0.3	4.6	V	
Power Supply for Digital	IOVCC	-0.3	4.6	V	
Storage Temperature	T _{ST}	-30	80	°C	
Operating Temperature (Ambient Temperature)	T _{OP}	-20	70	°C	
Humidity	-	-	90	%RH	Note 1

Note1: T_A ≤ 40°C Without dewing

Note2:

- a. All of voltage listed above are with respect to GND=0V.
- b. Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

6. Electrical Characteristic

Typical operating conditions

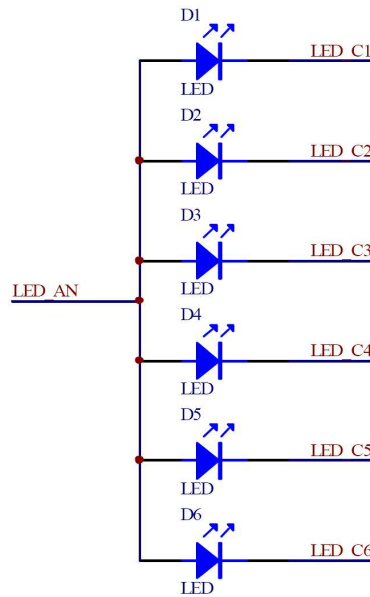
(GND=AVSS=0V)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
LCM Supply Voltage	V _{DD}	25°C	2.6	2.8	3.3	V
	V _{DDIO}		1.7	--	3.3	V
Input Voltage	V _{IH}		0.7V _{DD3}	---	V _{DD3}	V
	V _{IL}		0	---	0.3 V _{DD3}	
Output Voltage	V _{oH}		0.8V _{DD3}	---	V _{DD3}	V
	V _{oL}		0	---	0.2 V _{DD3}	
Power Consumption	I _{DD}	★1	---	---	33	mA
Consumption current of ILED-A	I _{LED}	---	---	20	---	mA LED/Pcs

7. BACKLIGHT CHARACTERISTIC

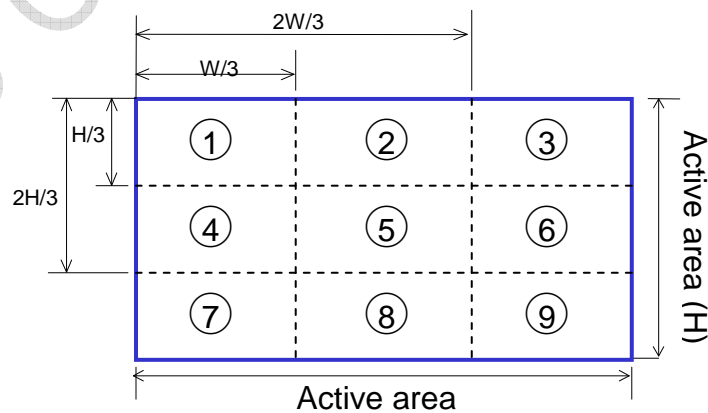
ITEM	SYMBOL	Min	Typ	Max	Units
Surface Luminance	L_S	7300	---		cd/m ²
Surface brightness uniform	L_D	80%	---	---	%
LED voltage	V_{LED}	3.0	---	3.4	V
LED current (Pcs)	I_{LED}	---	20	30	mA

★ 1 Backlight LED Circuit :



★2 Uniform measure condition :

- (a) To Measure 9 point. Measure location is show below :
- (b) Uniform = (Min. brightness / Max. brightness) × 100%
- (c) Best Contrast, Main and sub panel all dots turn ON (White screen)



Notes: V_{LED} is LED chip forward voltage , the voltage for LED chip only.

8. MODULE FUNCTION DESCRIPTION

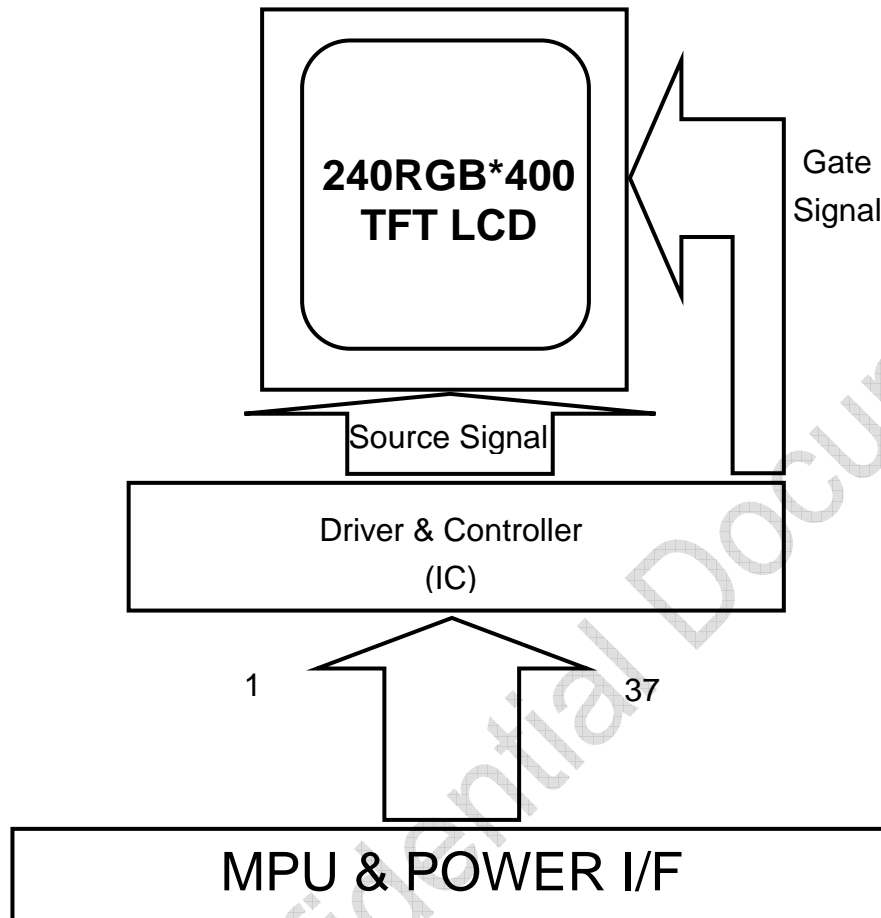
8.1. Pin Description

NO	Pin Name	Description
1	GND	Ground
2	PWM	PWM output for back light control of LED driver.
3	TE	Tearing effect output pad to synchronize MPU to frame writing, activated by S/W command.
4~19	D0~D15	16-bit parallel data bus for 80-system Interface
20	BS1	Select the MPU system interface mode (Note1)
21	/WR	Write signal pin
22	/RD	Read signal pin
23	/RES	Reset pin
24	/CS	Main panel chip select pin
25	RS	Register select signal pin
26	ID_MAKER_HIGH	ID Pin : IOVCC
27	IOVCC	Power supply for Digital
28	VCI	Power supply for Analog
29	GND	Ground
30~35	VLED_Cathode6~1	LED6 (-)~LED1 (-) power input pin
36	VLED_Anode	LED + power input pin
37	GND	Ground

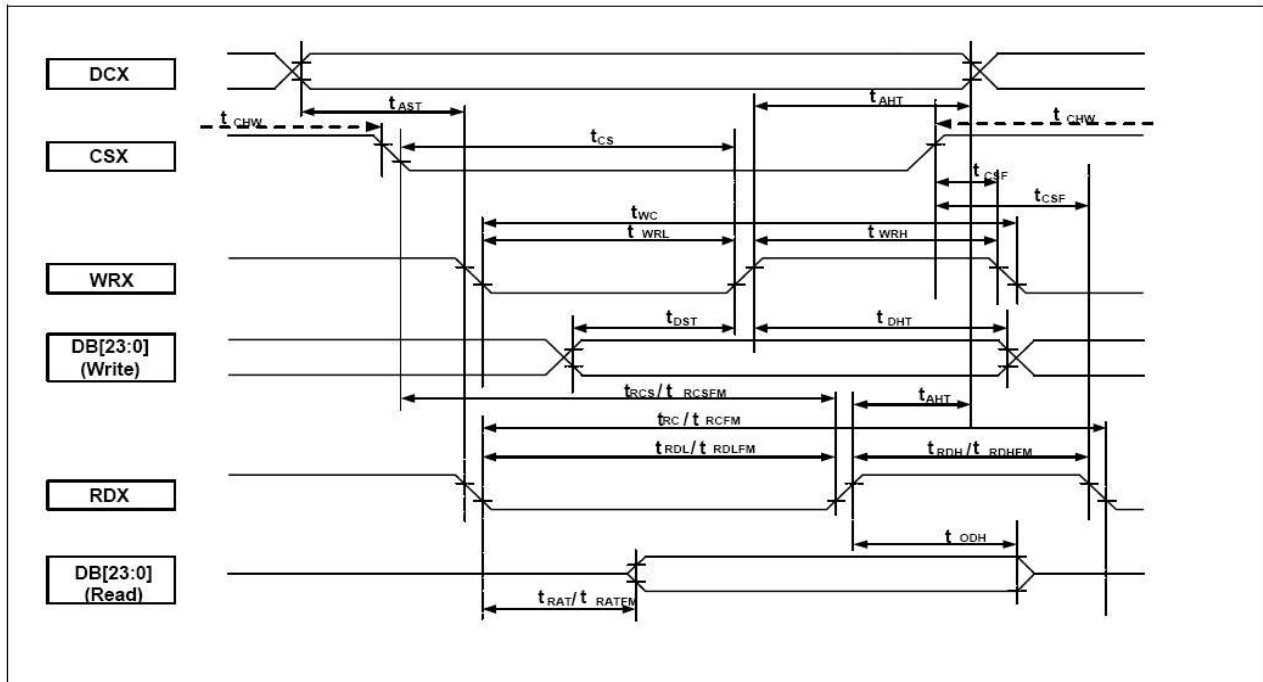
★Note 1 :

BS1	Main panel MPU-Interface Mode	Index	Data
1	16-bit interface	DB[7~0]	DB[15~0]
0	8-bit interface	DB[7~0]	DB[7~0]

8.2. Block diagram of LCD



8.3. Timing Characteristics


Figure 10 MPU 80 Interface AC Characteristics

 (Ta = -30 ~ 70°C, VCI = 2.3 ~ 3.3V, V_{DD3} = 1.65 ~ 3.3V)

Signal	Symbol	Parameter	Min.	Max.	Unit	Description
DCX	t _{AST}	Address setup time	10	-	ns	
	t _{AHT}	Address hold time (Write/Read)	10	-	ns	
CSX	t _{CHW}	Chip select "H" pulse width	0	-	ns	
	t _{CS}	Chip select setup time (Write)	20	-	ns	
	t _{RCS}	Chip select setup time (Read ID)	45	-	ns	
	t _{RCSFM}	Chip select setup time (Read FM)	355	-	ns	
	t _{CSF}	Chip select wait time (Write/Read)	10	-	ns	
WRX	t _{WC}	Write cycle	66	-	ns	
	t _{WRH}	Control pulse "H" duration	30	-	ns	
	t _{WRL}	Control pulse "L" duration	20	-	ns	
RDX(ID)	t _{RC}	Read cycle (ID)	160	-	ns	When read ID data
	t _{RDH}	Control pulse "H" duration (ID)	90	-	ns	
	t _{RDL}	Control pulse "L" duration (ID)	45	-	ns	
RDX(FM)	t _{RCFM}	Read cycle (FM)	450	-	ns	When read from the frame memory
	t _{RDHFM}	Control pulse "H" duration (FM)	90	-	ns	
	t _{RDLFM}	Control pulse "L" duration (FM)	355	-	ns	
DB[23:0]	t _{DST}	Data setup time	15	-	ns	For the maximum CL = 30pF, For the minimum CL = 8pF
	t _{DHT}	Data hold time	25	-	ns	
	t _{RAT}	Read access time (ID)	-	40	ns	
	t _{RATFM}	Read access time (FM)	-	340	ns	
	t _{ODH}	Output disable time	20	80	ns	

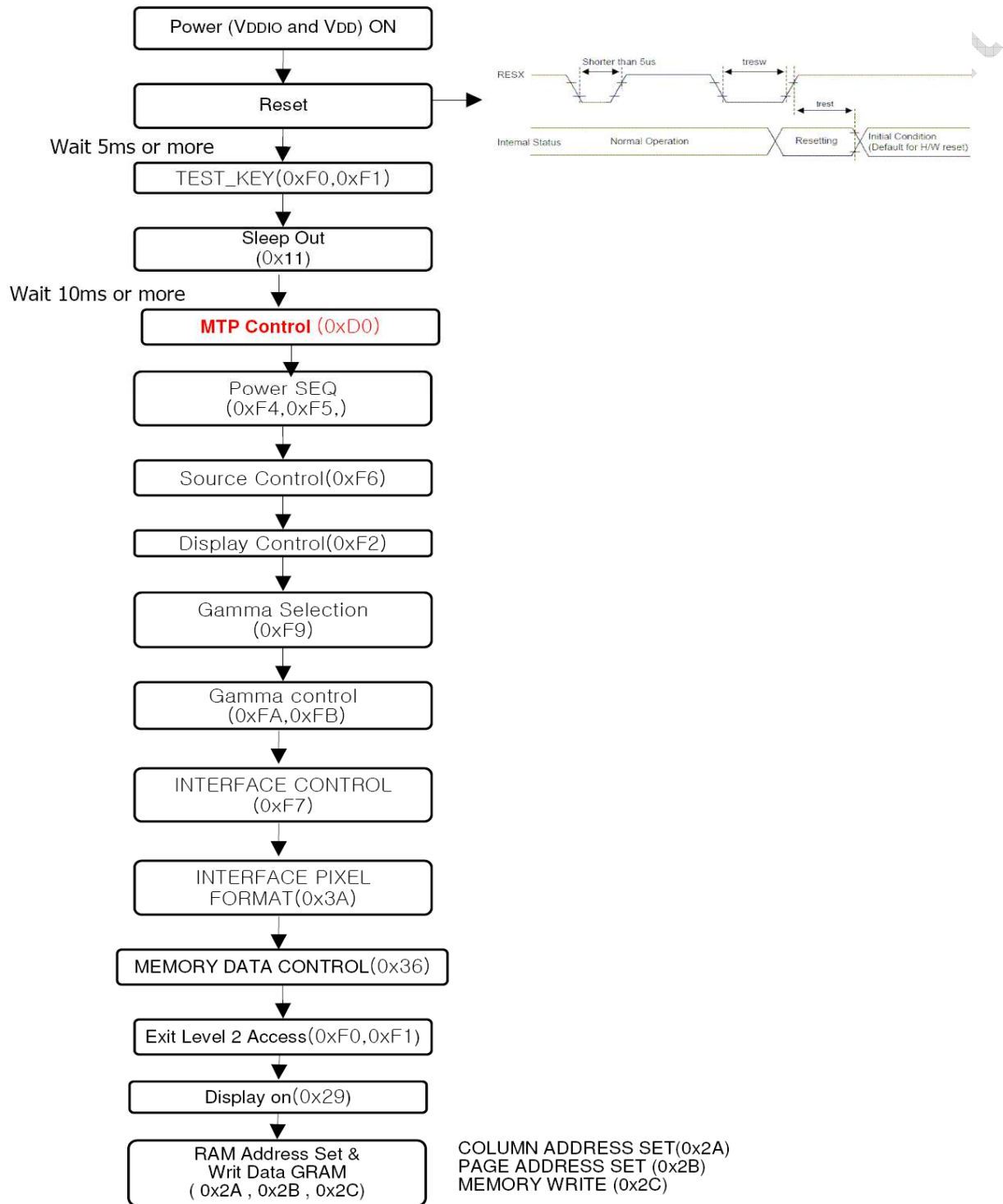


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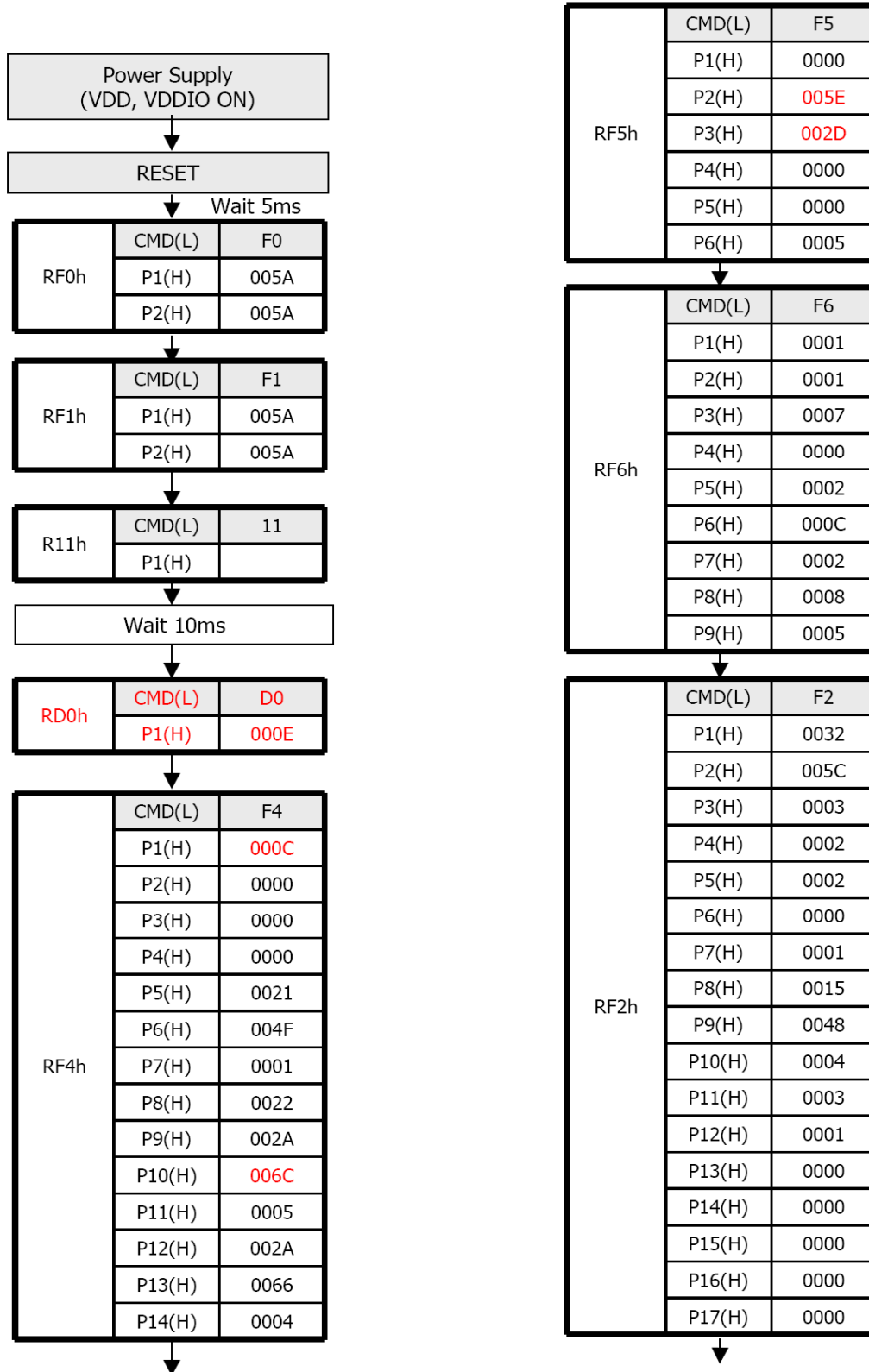
NOTE:

1. Above table's values are values of when $s_{upposed}$ t_r & t_f by 7ns. If t_r & t_f change, above table's values can change.
2. t_{RAT} and t_{ODH} timings are based on 20% to 80% of $V_{DD3}-V_{SS3}$.
3. Other timings are based on 30% to 70% of $V_{DD3}-V_{SS3}$.
4. t_{WRL} and t_{RDL} are related with an interval in which CSX = L and WRX, RDX = L overlap.
5. DCX timing is related with an interval in which CSX = L and WRX, RDX = L overlap.

8.4. Power ON flow chart



8.5. Display ON sequence



RF9h	CMD(L)	F9
	P1(H)	0007

RFAh	CMD(L)	FA
	P1(H)	0000
	P2(H)	0000
	P3(H)	0002
	P4(H)	0011
	P5(H)	0018
	P6(H)	0032
	P7(H)	0034
	P8(H)	002F
	P9(H)	000B
	P10(H)	000F
	P11(H)	0018
	P12(H)	000A
	P13(H)	0004
	P14(H)	0000
	P15(H)	0000
P16(H)	0000	

RFBh	CMD(L)	FA
	P1(H)	0000
	P2(H)	0000
	P3(H)	0002
	P4(H)	0011
	P5(H)	0036
	P6(H)	000D
	P7(H)	0008
	P8(H)	0008
	P9(H)	002B
	P10(H)	0018
	P11(H)	0000
	P12(H)	0000
	P13(H)	0000
	P14(H)	0000
	P15(H)	0000
P16(H)	0001	

RF1h	CMD(L)	F1
	P1(H)	00A5
	P2(H)	00A5

R29h	CMD(L)	29
	P1(H)	

R2Ah	CMD(L)	2A
	P1(H)	0000

R2Bh	CMD(L)	2B
	P1(H)	0000

R2Ch	CMD(L)	2C
	P1(H)	

RF7h	CMD(L)	F7
	P1(H)	0001
	P2(H)	0018
	P3(H)	0000
	P4(H)	0000

R3Ah	CMD(L)	3A
	P1(H)	0006

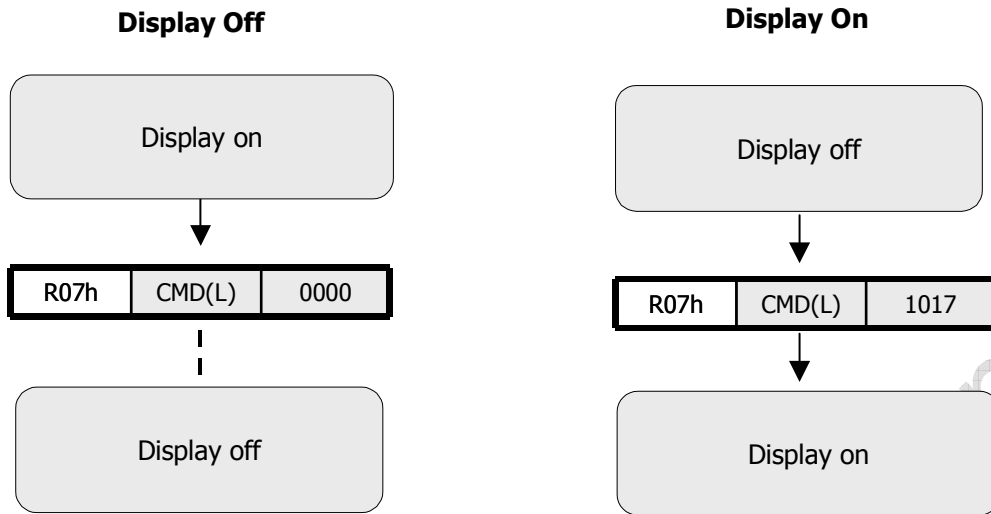
R36h	CMD(L)	36
	P1(H)	0048

RF0h	CMD(L)	F0
	P1(H)	00A5
	P2(H)	00A5

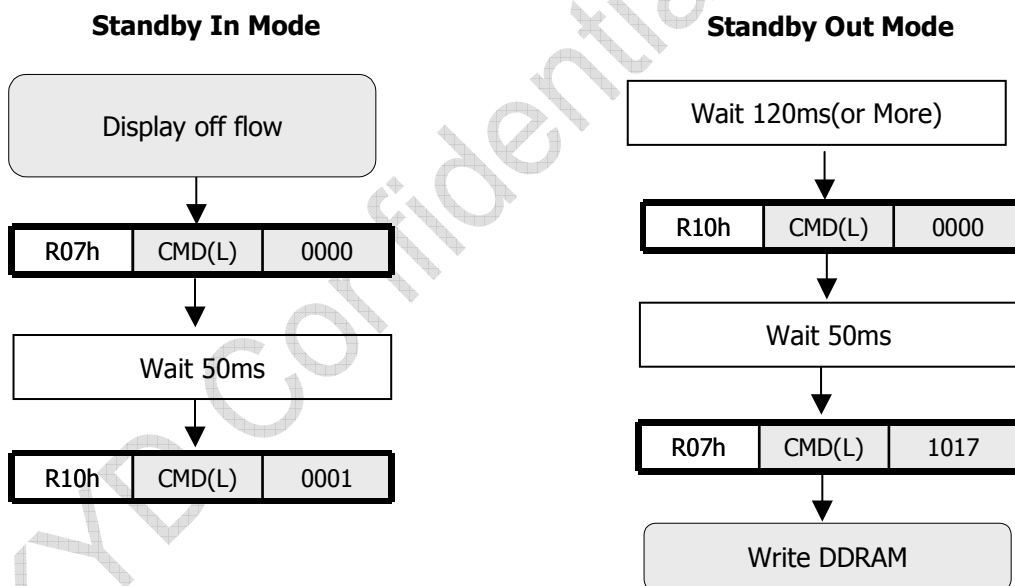


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8.6. Display On/Off flow



8.7. Standby Mode sequence



9. Optical characteristics

LED backlight transmissive module: (Normal Polarizer)

Item	Symbol	Temp.	Min.	Typ.	Max.	Unit	Conditions
Response time	Tf	25°C	--	10	15	ms	$\theta = 0^\circ$, $\phi = 0^\circ$ (Note 2)
	Tr	25°C	--	20	30	ms	
Contrast ratio	CR	25°C	300	400	--	--	$\theta = 0^\circ$, $\phi = 0^\circ$ (Note1) LED:ON,LIGHT:OFF
Uniformity	--	--	80	--	--	%	--
Color Temperature	--	--	5000	7000	9000	°K	--
Luminance of White	--	--	300	--	--	Cd/m ²	I _{LED} =20mA/LED
Transmittance	T	25°C	--	5.5	--	%	--
Visual angle range front and rear	θf	25°C	20			Degree	$\phi = 0^\circ$, CR \geq 10 LED:ON, LIGHT:OFF (Note 3)
	θb	25°C	50				
Visual angle range left and right	θl	25°C	40			Degree	$\phi = 90^\circ$, CR \geq 10 LED:ON, LIGHT:OFF (Note 3)
	θr	25°C	40				
Visual angle direction priority	--	--	12"				Gray scale inversion (Note4)

- CIE(x, y) chromaticity

Item	Symbol	Transmissive			Conditions
		Min.	Typ.	Max.	
Red	X	0.58	0.63	0.68	$\theta = 0^\circ$, $\phi = 0^\circ$ BM-5A 1° angle
	y	0.29	0.34	0.39	
Green	X	0.34	0.39	0.44	
	y	0.51	0.56	0.61	
Blue	X	0.10	0.15	0.20	
	y	0.00	0.05	0.10	
White	X	0.28	0.33	0.38	
	y	0.28	0.33	0.38	
NTSC	%	49%	54%	--	



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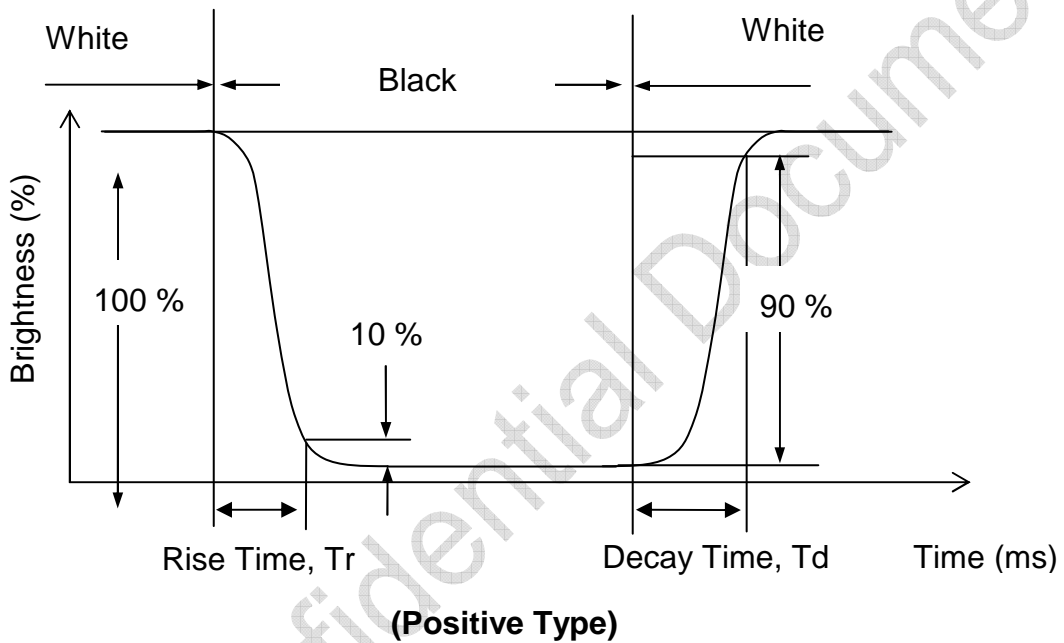
●FOR LCM

NOTE 1: Definition of Contrast Ratio (CR).

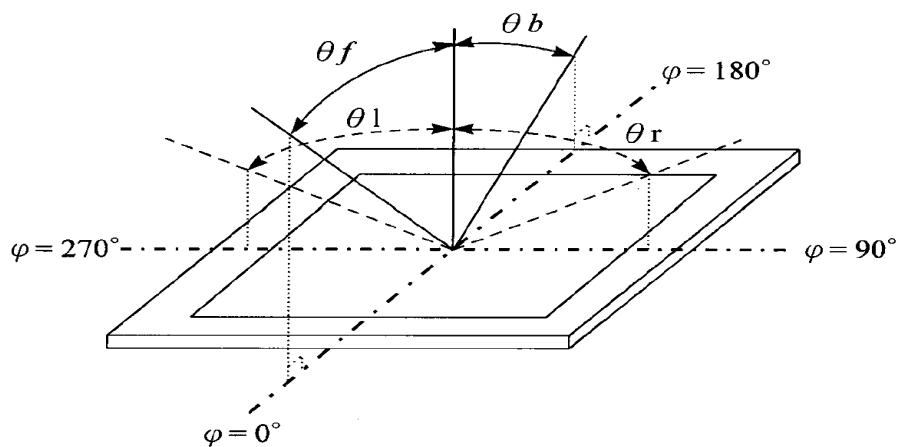
Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

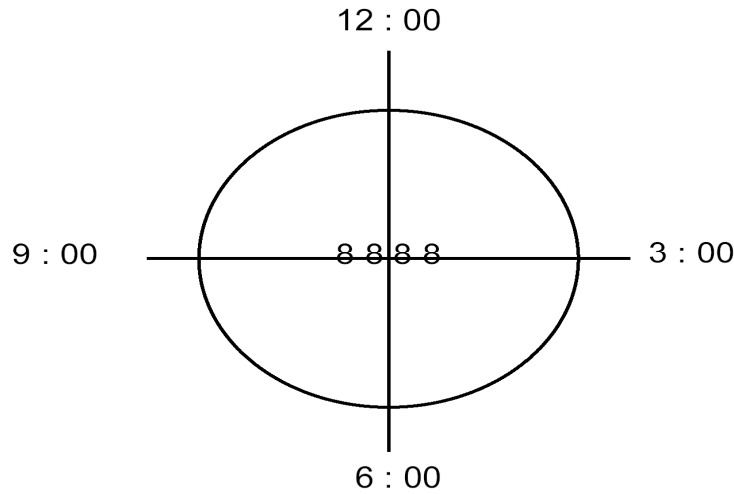
NOTE 2: Response time definition



NOTE 3 : ϕ 、 θ definition



NOTE 4: Visual angle direction priority



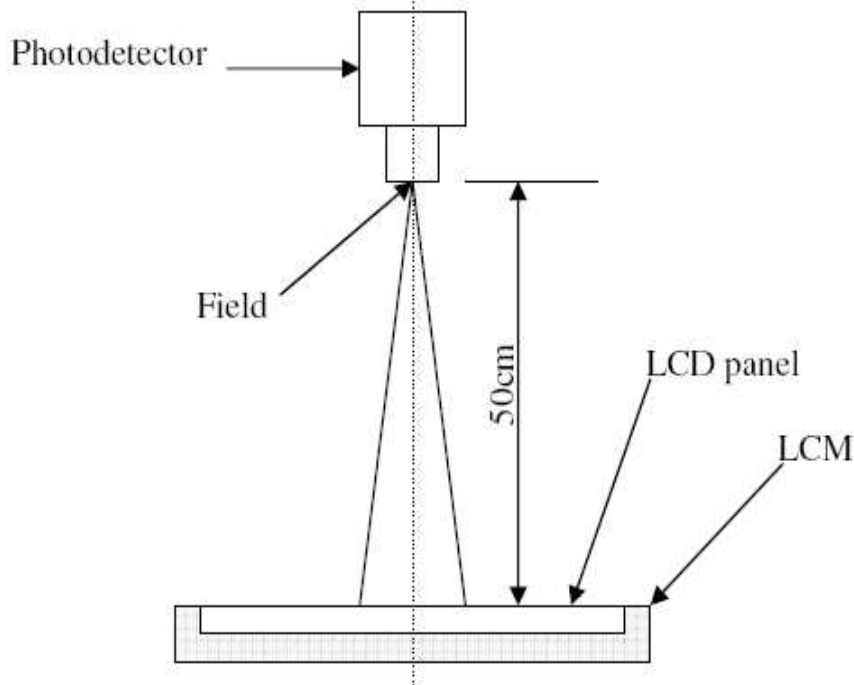
NOTE 5: Optical measurement equipment setup

-Measurement should be executed in a stable, windless, and dark room(under 10 Lux). After lighting the backlight for 30mins.

Humidity=60±15%

-Distance : 50cm

-Photodetector : BM-5 (Field 1°)



10. RELIABILITY

10.1. Tests

NO.	ITEM	CONDITION		CRITERION
1	High Temperature Operating	70°C	96 hrs	◦ No defect of Operational function in room temperature are allowable(23±5°C). ◦ Leakage current should be below double of initial value.
2	Low Temperature Operating	-20°C	96 hrs	
3	High Temperature Non-Operating	80°C	96 hrs	
4	Low Temperature Non-Operating	-30°C	96 hrs	
5	High Temperature/ Humidity Non-Operating	60°C, 90%RH	96 hrs	
6	Temperature Shock Non-Operating	-30°C ← (30min) ↔ (5min) → 80°C (30min) 24 CYCLES		
7	Electro-static Discharge	HBM: ±2kv		

Note 1: Test after 24 hours in room temperature(23±5°C).

Note 2: The sampling above is individually for each reliability testing condition.

Note 3: The color fading of polarizing filter should not care.

Note 4: All of the reliability testing chamber above, is using D.I. water.(Min value: 1.0 MΩ -cm)

Note 5: In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

10.2. Color performance

No.	ITEM	Criterion (initial)
1	Luminance	>50%
2	NTSC	>70%
3	Contrast Ratio	>50%

11. INSPECTION CRITERIA

11.1. Inspection Conditions

11.1.1. Environmental conditions

The environmental conditions for inspection shall be as follows

Room temperature: $23\pm 5^{\circ}\text{C}$

Humidity: $50\pm 20\%RH$

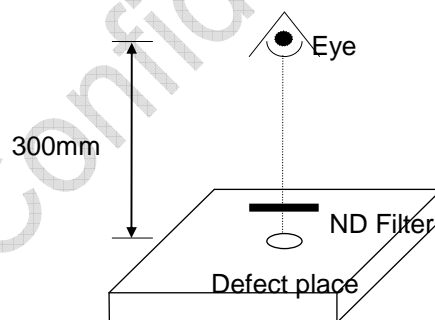
11.1.2. The external visual inspection

With a single 1000 ± 200 lux fluorescent lamp as the light source, the inspection was in the distance of 30cm or more from the LCD to the inspector's eyes.

11.2. Light Method

11.2.1. Environment lamp under 1000 ± 200 lux, Viewing direction for inspection over 30cm

11.2.2. The distance from eye to defect around 300mm, the distance from ND Filter to defect around 25~30mm





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11.3. Classification Of Defects

11.3.1. Major defect

A major defect refers to a defect that may substantially degrade usability for product applications.

11.3.2. Minor defect

A minor defect refers to a defect which is not considered to be able substantially degrade the product application or a defect that deviates from existing standards almost unrelated to the effective use of the product or its operation.

Notes: If the LCD/LCM 's cosmetic and display performance do not specify in "inspection criterion", it should be based on these delivered samples.

11.4. Sampling & Acceptable Quality Level

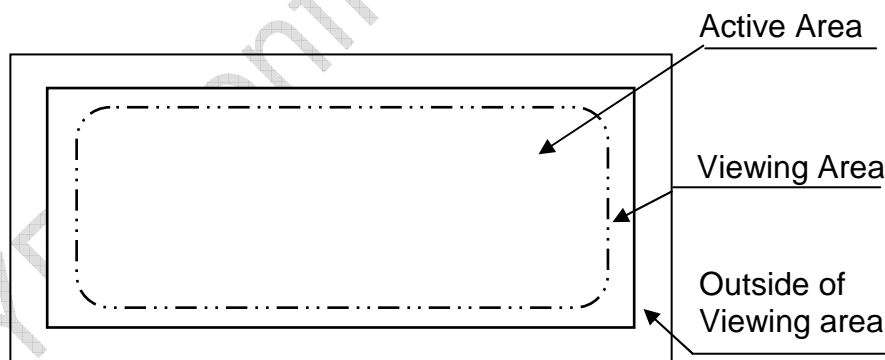
Level II, MIL-STD-105E

	Major	Minor
Cosmetic	1.0 %	1.5 %
Electrical-display	0.4%	0.65 %

11.5. Definition Of Inspection Area

V.A: Viewing Area

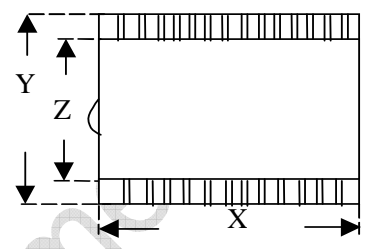
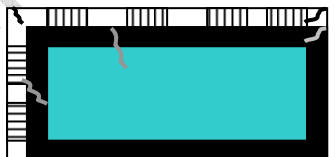
A.A: Active Area



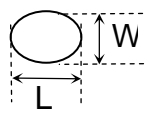
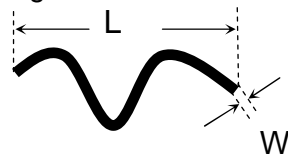
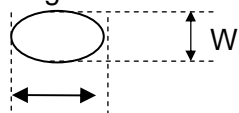
11.6. Items and Criteria

11.6.1. Visual inspection criterion in cosmetic

(1) Glass defect

No	Defect	Criteria	Remark
1	Dimension (Minor)	By engineering diagram	
2	Cracks (Major)	Extensive crack 【Reject】	

(2) LCM appearance defect within A.A

No	Defect	Criteria	Remark	
1	Round type (Minor)	Spec.	Permissible Qty	1. $\psi = (L+W)/2$, L: Length, W: Width 2. Disregard if out of A.A. 
		$\psi \leq 0.10\text{mm}$	Disregard	
		$0.10\text{mm} < \psi \leq 0.20\text{mm}$	3	
		$0.20\text{mm} < \psi$	0	
2	Line type (Minor)	Spec.	Permissible Qty	1. L: Length, W: Width 2. Disregard if out of A.A. 
		$W \leq 0.03\text{mm}$	Disregard	
		$L \leq 3.0\text{mm}$ and $0.03\text{mm} < W \leq 0.05\text{mm}$	2	
		$L \leq 3.0\text{mm}$ and $0.05\text{mm} < W \leq 0.10\text{mm}$	1	
		$W > 0.10\text{mm}$ or $L > 3.0\text{mm}$	0	
3	Polarizer Bubble/dent (Minor)	Spec.	Permissible Qty	1. $\psi = (L+W)/2$, L: Length, W: Width 2. Disregard if out of A.A. 
		$\psi \leq 0.20\text{mm}$	Disregard	
		$0.20\text{mm} < \psi \leq 0.30\text{mm}$	2	
		$0.30\text{mm} < \psi \leq 0.50\text{mm}$	1	



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		0.50mm< ψ	0	
--	--	----------------	---	--

(3) FPC

No	Defect	Criteria	Remark
1	Copper peeling (Minor)	Copper peeling 【Reject】	

(4) Black tape

No	Defect	Criteria	Remark
1	Shift (Minor)	IC exposed 【Reject】	
2	No black tape (Minor)	No black tape 【Reject】	

(5) Silicon

No	Defect	Criteria	Remark
1	Amount of silicon (Minor)	ITO exposed 【Reject】	

(6) Bezel


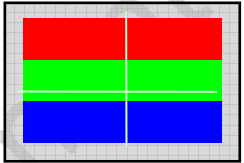
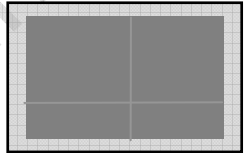
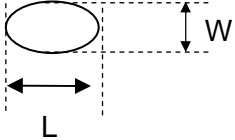
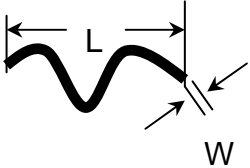
No	Defect	Criteria	Remark
1	Oxidized spot (Minor)	Oxidized spot, rust 【Reject】	
2	Outline deformation (Minor)	By engineering diagram	
3	Greasiness (Minor)	Greasiness 【Reject】	
4	Spots, round Type (Minor)	$H \leq$ By engineering diagram 【Disregard】	H=Total height (thickness)
5	Plating (Minor)	Bubble, peeling 【Reject】	

(7) Power cord

No	Defect	Criteria	Remark
1	Power cord (Minor)	Power core loose	

11.6.2. Visual inspection criterion in electrical display

LCM electrical criterion

No	Defect	Criteria		Remark
1	No display (Major)	Not allowed		
2	Missing line (Major)	Not allowed		
3	Darker or lighter line (Major)	Not allowed		
4	Bright / Dark point (Minor)	Spec.	Permissible Qty	1:1sub-pixel: 1R or 1G or 1B 2:Point defect area \geq 1/2 sub pixel.
		Bright point	1	
		Dark point	2	
5	Round type (Minor)	Spec.	Permissible Qty	1. $\psi = (L+W)/2$, L: Length, W: Width 2. Disregard if out of A.A. 
		$\psi \leq 0.10\text{mm}$	Disregard	
		$0.10\text{mm} < \psi \leq 0.20\text{mm}$	3	
		$0.20\text{mm} < \psi$	0	
6	Line type (Minor)	Spec.	Permissible Qty	1. L: Length, W: Width 2. Disregard if out of A.A. 
		$W \leq 0.03\text{mm}$	Disregard	
		$L \leq 3.0\text{mm}$ and $0.03\text{mm} < W \leq 0.05\text{mm}$	2	
		$L \leq 3.0\text{mm}$ and $0.05\text{mm} < W \leq 0.10\text{mm}$	1	
		$W > 0.10\text{mm}$ or $L > 3.0\text{mm}$	0	
7	Mura (Minor)	By 5% ND filter invisible		

Note1 : Issues that are not defined in this document shall be discussed and agreed with both parties. (Customer and supplier)



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Note2 : Unless otherwise agreed upon in writing, the criteria shall be applied to both parties. (Customer and supplier)

12. PRECAUTIONS FOR USE

12.1. Safety

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

12.2. Storage Conditions

- (1) Store the panel or module in a dark place where the temperature is $23\pm 5^{\circ}\text{C}$ and the humidity is below $50\pm 20\%\text{RH}$.
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.
- (6) Do not exposed to direct sun light of fluorescent lamps.

12.3. Installing LCD Module

Attend to the following items when installing the LCM.

- (1) Cover the surface with a transparent protective plate or touch panel to protect the polarizer and LC cell.

12.4. Precautions For Operation

- (1) Viewing angle varies with the change of liquid crystal driving voltage (V_o). Adjust V_o to show the best contrast.
- (2) Driving the LCD in the voltage above the limit will shorten its lifetime.
- (3) Response time is greatly delayed at temperature below the operating temperature range. However, this does not mean the LCD will be out of the order. It will recover when it returns to the specified temperature range.
- (4) When turning the power on, input each signal after the positive/negative voltage becomes stable.
- (5) Do not apply mater or any liquid on product, which composed of T/P.

12.5. Handling Precautions

- (1) Avoid static electricity that can damage the CMOS LSI; please wear the wrist strap when handling.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface; it may cause display abnormal.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.

Do not apply mater or any liquid on product, which composed of T/P.

13. ILLUSTRATION OF LCD DATE CODE(KYOCERA DISPLAY) (TBD)

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14. RoHS COMPLIANT WARRANTY

RoHS Hazardous substances including:

- Cd < 100 ppm
- Pb < 1000 ppm
- Hg < 1000 ppm
- Cr +6 < 1000 ppm
- PBDE < 1000 ppm
- PBB < 1000 ppm

15. PRECAUTIONS FOR USE

15.1. Safety

- (4) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (5) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (6) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

15.2. Storage Conditions

- (7) Store the panel or module in a dark place where the temperature is $23\pm 5^{\circ}\text{C}$ and the humidity is below $50\pm 20\%\text{RH}$.
- (8) Store in anti-static electricity container.
- (9) Store in clean environment, free from dust, active gas, and solvent.
- (10) Do not tear off the vacuum treatment package before assembling.
- (11) Do not place the module near organics solvents or corrosive gases.
- (12) Do not crush, shake, or jolt the panel or module.
- (13) Do not exposed to direct sun light of fluorescent lamps.

15.3. Installing LCD Module

Attend to the following items when installing the LCM.

- (2) Cover the surface with a transparent protective plate or touch panel to protect the polarizer and LC cell.
- (3) When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the



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module surface, refer to the individual specifications for measurements. The measurement tolerance should be ± 0.1 mm.

15.4. Precautions For Operation

- (6) Viewing angle varies with the change of liquid crystal driving voltage (V_0). Adjust V_0 to show the best contrast.
- (7) Driving the LCD in the voltage above the limit will shorten its lifetime.
- (8) Response time is greatly delayed at temperature below the operating temperature range. However, this does not mean the LCD will be out of the order. It will recover when it returns to the specified temperature range.
- (9) When turning the power on, input each signal after the positive/negative voltage becomes stable.
- (10) Do not apply mater or any liquid on product, which composed of T/P.

15.5. Handling Precautions

- (9) Avoid static electricity that can damage the CMOS LSI; please wear the wrist strap when handling.
- (10) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (11) Do not give external shock.
- (12) Do not apply excessive force on the surface; it may cause display abnormal.
- (13) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- (14) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (15) Do not operate it above the absolute maximum rating.
- (16) Do not remove the panel or frame from the module.
- (17) Do not apply mater or any liquid on product, which composed of T/P.

15.6. Guarantee

15.6.1. The period is within 12 months since the date of shipping out under normal using and storage conditions.

15.6.2. Any defect not caused by KYOCERA DISPLAY is not guaranteed to the customer. The defect phenomenon should be agreed by both parties.

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16. REVISION HISTORY

Version	Revise record	Date
A	New version	2012/03/07
B	Viewing Direction Remark	2012/04/24

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