Next Vision Display
Brighten The Future

NEXT VISION DISPLAY

SPECIFICATION

CUSTOMER : _____

MODULE NO.: NT032-N001ER

Version	1.0
Engineer	
Date	Jul-07-2021

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Customer:
Approved by

NEXT VISION DISPLAY CO., LTD.

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www.first-components.com
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SPECIFICATION

Display Specification

Item	Standard Value	Unit
Display Format	240x320	Pixels
Display Connector	FPC	--
FPC Connector	40 Pin 0.5mm Pitch Top Contact ZIF Connector	--
Operating Temperature	-20 ~ +70	℃
Storage Temperature	-30 ~ +80	℃
Touch Panel Optional	Yes	--
Sunlight Readable	No	--

Mechanical Specification

Item	Standard Value	Unit
Diagonal Size	3.2	Inch
Outline Dimension with FPC Folded	55.04(W)x77.50(H)x2.65(T)	mm
Visual Area	50.20(W)x66.40(H)	mm
Active Area	48.60(W)x64.80(H)	mm
Dot Pitch	0.2025x0.2025	mm

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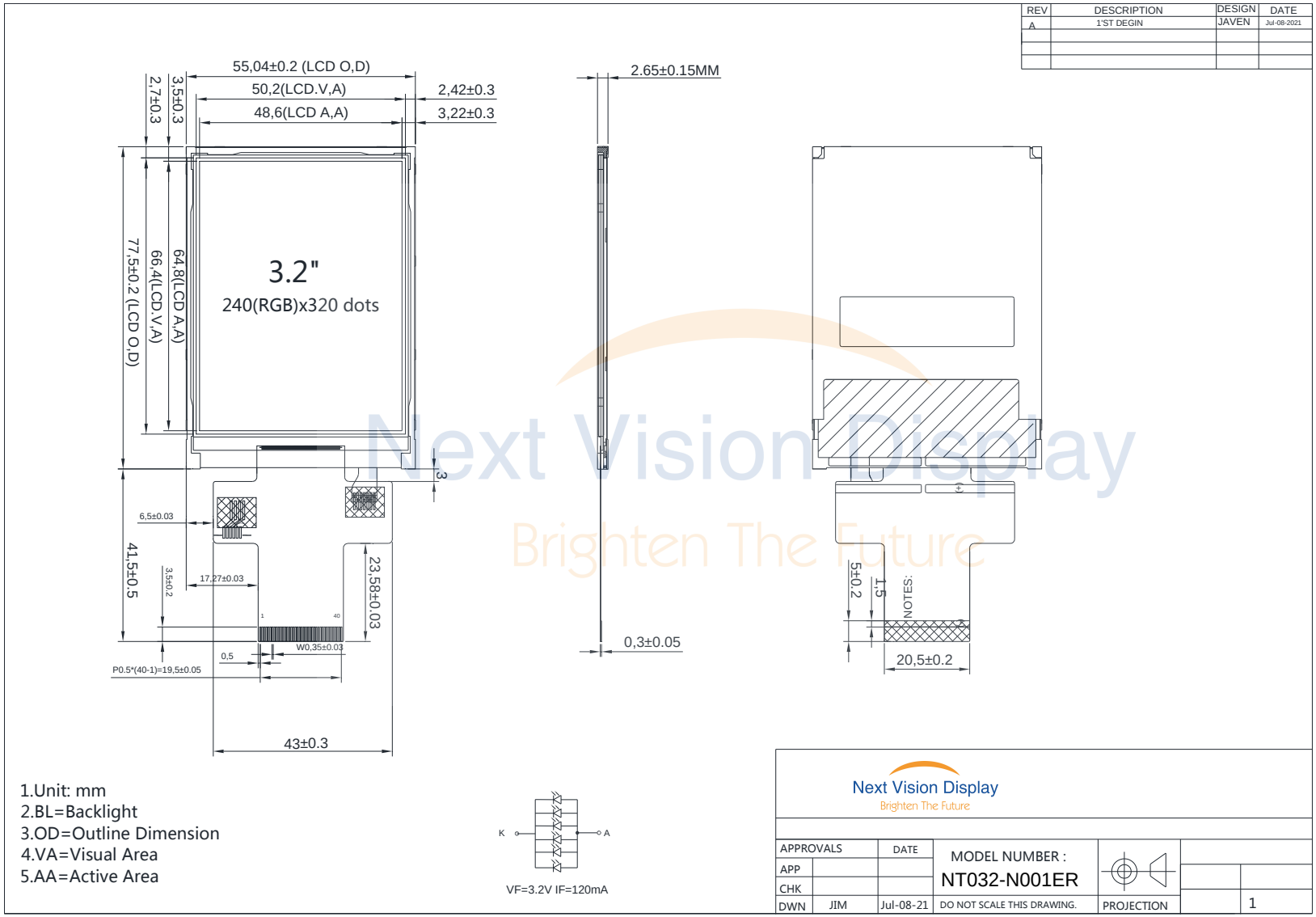
Electrical Specification

Item	Standard Value	Unit
IC Package	COG	--
Controller	ST7789V	--
Interface	8080 8-bit/16-bit Parall,3/4-Wire SPI Serial	--
Response Time (Typ)	25	MS

Optical Specification

Item	Standard Value	Unit
LCD Type	TFT-LCD / Transmissive / TN	--
Viewing Angle Range	Left:70 , Right:70 , Up:50 , Down:57	Deg
Colors	65k/262k	--
Contrast Ratio (Typ)	500:1	--
Brightness (Typ)	280	cd/m2

OUTLINE DRAWING



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ELECTRICAL SPEC

Pin Configuration

Pin No	Pin Name	Descriptions
1	XL(X-)/IRQ	Resistive touch panel output /Capacitive touch pen interrupt signal when low.
2	YU(Y-)/RST	Resistive touch panel output/ Capacitive touch reset signal when low.
3	XR(X+)/SCL	Resistive touch panel output/ Capacitive touch SCL signal,I2C interface.
4	YD(Y+)/SDA	Resistive touch panel output/ Capacitive touch SDA signal, I2C interface
5	GND	Ground
6	IOVCC	Logic power ,provide with 1.8/2.8V
7	VCI	Power Supply ,provide with 2.8V
8	FMARK	Tearing effect out pin synchronize MPU to frame writing
9	CS/SPI CS	Chip Select Signal
10	DC/SCL SPI	Register select signal; Serial Interface Clock Signal input
11	WR/SPI D/C	Write execution control pin ; Serial Interface Register select s Signal
12	RD	Read execution control pin
13	SDI SPI/SDA	Serial Data Input Signal
14	SDO SPI	Serial Data Output Signal
15	RESET	Reset input when low.
16	GND	Ground
17-32	DB0-DB15	Data Bus.
33	LEDA	Anode for LED backlighting
34	LEDK	Cathode for LED backlighting
35	LEDK	Cathode for LED backlighting
36	LEDK	Cathode for LED backlighting
37	GND	Ground
38	IM0	Select Interface Mode ;Note1
39	IM1	
40	IM2	

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Note 1: Select the MCU interface Mode

IM2 0	IM1 0	IM0 0	Interface Mode 8080 MCU 16-bit Bus Interface II	Pin in Use	
				Register/content	GRAM
0	0	1	8080 MCU 8-bit Bus Interface II	D[7:0]	D[15:8],D[7:0],WRX,RDX,CSX,D/CX
1	0	1	3-wire 9-bit data Serial Interface II	D[15:8]	D[15:8],WRX,RDX,CSX,D/CX
1	1	0	4-wire 8-bit data Serial Interface II	SCL,SDI,SDO,CSX	
IM2	IM1	IM0	Interface Mode	SCL,SDI,D/CX,SDO,CSX	

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Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	VCI	-0.3	-	+4.6	V
Logic Signal Voltage	VDDI	-0.3	-	+4.6	V
Humidity	RH	-		90%(Max60°C)	RH

Electrical Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
Power Supply Voltage	VCI	2.5	2.8	3.3	V
Power Supply for Logic	VDDI	1.65	2.8	3.3	V
Input Voltage 'H' Level	VIH	0.7VDDI	-	VDDI	V
Input Voltage 'L' Level	VIL	VSS	-	0.3VDDI	V
Output Voltage 'H' Level	VOH	0.8VDDI	-	VDDI	V
Output Voltage 'L' Level	VCL	VSS0	-	0.2VDDI	V

Backlight Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage		Vf	Lf=100mA	-	3.2	3.4	V
Supply Current		-	-	-	-	-	MA
Reverse Voltage		Vf	-	-	-	-	V
Forward Current	Normal	Ipn	5-chip Parallel	-	90	100	MA
	Dimming	Ipd		-			

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INSPECTION CRITERIA

Acceptable Quality Level

Each lot should satisfy the quality level defined as follows

Partition	AQL	Definition
A. Major	0.4%	Functional defective as product
B. Minor	1.5%	Satisfy all functions as product but not satisfy cosmetic standard

Definition of Lot

One lot means the delivery quantity to customer at one time.

Condition of Cosmetic Inspection

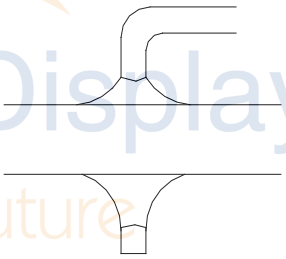
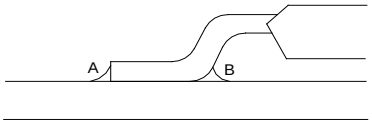
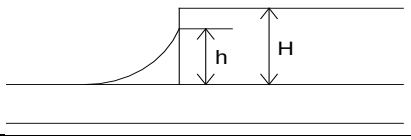
◆ INSPECTION AND TEST
-FUNCTION TEST
-APPEARANCE INSPECTION
-PACKING SPECIFICTION

◆ INSPECTION CONDITION
- Put under the lamp (20W) at a distance 100mm from
- Tilt upright 45 degree by the front (back) to inspect LCD appearance.

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◆ AQL INSPECTION LEVEL
- SAMPLING METHOD: MIL-STD-105D
- SAMPLING PLAN: SINGLE
- MAJOR DEFECT: 0.4% (MAJOR)
- MINOR DEFECT: 1.5% (MINOR)
- GENERAL LEVEL: II/NORMAL

Module Cosmetic Criteria

No.	Item	Judgment Criterion	Partition
1	Difference in Spec.	None allowed	Major
2	Pattern Peeling	No substrate pattern peeling and floating	Major
3	Soldering Defects	No soldering missing	Major
		No soldering bridge	Major
		No cold soldering	Minor
4	Resist Flaw on Substrate	Invisible copper foil(¢ 0.5mm or more)on substrate pattern	Minor
5	Accretion of Metallic Foreign Matter	No soldering dust	Minor
		No accretion of metallic foreign matters(Not exceed ¢ 0.2mm)	
6	Stain	No stain to spoil cosmetic badly	Minor
7	Plate Discoloring	No plate fading, rusting and discoloring	Minor
8	Solder Amount 1.Lead Parts	a. Soldering side of PCB Solder to form a' Filet' all around t Solder should not hide the lead form b.Components side (In case of 'Through Hole PCB') Solder to reach the Components side of PCB 	Minor
	2.Flat Packages	Either 'toe' (A) or 'heal' (B) of the lead to be covered by Filet' Lead form to be assume over solder. 	Minor
	3.Chips	(3/2) H≧h≧(1/2)H 	Minor

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9	Backlight Defects	1.Light fails or flickers.(Major) 2. Color and luminance do not correspond to specifications. (Major) 3.Exceeds standards for display' s blemishes, foreign matter, dark lines or scratches.(Minor)	See list ←
10	PCB Defects	Oxidation or contamination on connectors.* 2. Wrong parts, missing parts, or parts not in specification.* 3.Jumpers set incorrectly.(Minor) 4.Solder(if any)on bezel, LED pad, zebra pad, or screw hole pad is not smooth.(Minor) *Minor if display functions correctly. Major if the display fails.	See list ←
11	Soldering Defects	1. Unmelted solder paste. 2. Cold solder joints, missing solder connections, or oxidation.* 3. Solder bridges causing short circuits.* 4. Residue or solder balls. 5. Solder flux is black or brown. *Minor if display functions correctly. Major if the display fails.	Minor

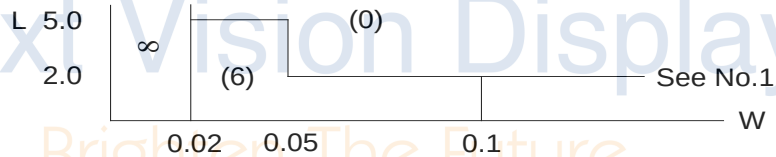
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Screen Cosmetic Criteria (Non-Operating)

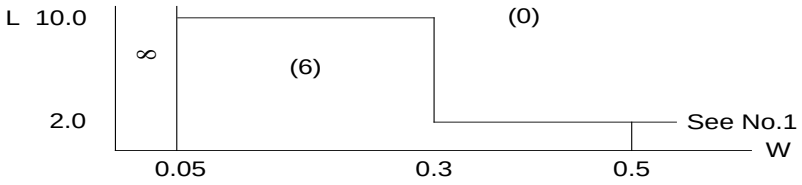
<table>
<tr><th>No.</th><th>Defect</th><th>Judgment Criterion</th><th>Partition</th></tr>
<tr><td>1</td><td>Spots</td><td>In accordance with Screen Cosmetic Criteria (Operating) No.1.</td><td>Minor</td></tr>
<tr><td>2</td><td>Lines</td><td>In accordance with Screen Cosmetic Criteria (Operation) No.2.</td><td>Minor</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Bubbles in Polarizer</td><td></td><td rowspan="3">Minor</td></tr>
<tr><td><table><tr><td>Size: d mm</td><td>Acceptable Qty in active area</td></tr><tr><td>d≦0.3
0.3<d≦1.0
1.0<d≦1.5
1.5<d</td><td>Disregard
3
1
0</td></tr></table></td></tr>
<tr><td></td></tr>
<tr><td>4</td><td>Scratch</td><td>In accordance with spots and lines operating cosmetic criteria, When the light reflects on the panel surface, the scratches are not to be remarkable.</td><td>Minor</td></tr>
<tr><td>5</td><td>Allowable density</td><td>Above defects should be separated more than 30mm each other.</td><td>Minor</td></tr>
<tr><td>6</td><td>Coloration</td><td>Not to be noticeable coloration in the viewing area of the LCD panels.
Back-lit type should be judged with back-lit on state only.</td><td>Minor</td></tr>
<tr><td>7</td><td>Contamination</td><td>Not to be noticeable.</td><td>Minor</td></tr>
</table>

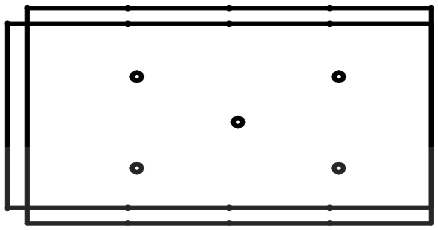
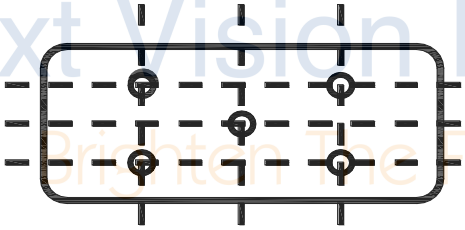
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Screen Cosmetic Criteria (Operating)

<table>
<tr><th>No.</th><th>Defect</th><th>Judgment Criterion</th><th>Partition</th></tr>
<tr><td rowspan="5">1</td><td rowspan="5">Spots</td><td>A) Clear</td><td rowspan="5">Minor</td></tr>
<tr><td>
<table>
<tr><th>Size:d mm</th><th>Acceptable Qty in active area</th></tr>
<tr><td>d≦0.1</td><td>Disregard</td></tr>
<tr><td>0.1<d≦0.2</td><td>6</td></tr>
<tr><td>0.2<d≦0.3</td><td>2</td></tr>
<tr><td>0.3<d</td><td>0</td></tr>
</table>
</td></tr>
<tr><td>Note: Including pin holes and defective dots which must be within one pixel Size.
Unclear</td></tr>
<tr><td>
<table>
<tr><th>Size:d mm</th><th>Acceptable Qty in active area</th></tr>
<tr><td>d≦0.2</td><td>Disregard</td></tr>
<tr><td>0.2<d≦0.5</td><td>6</td></tr>
<tr><td>0.5<d≦0.7</td><td>2</td></tr>
<tr><td>0.7<d</td><td>0</td></tr>
</table>
</td></tr>
<tr><td></td></tr>
<tr><td>2</td><td>Lines</td><td>A) Clear


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Note: () – Acceptable Qty in active area
L - Length (mm)
W -Width(mm)
∞-Disregard
B) Unclear

</td><td>Minor</td></tr>
<tr><td colspan="4">Clear’ = The shade and size are not changed by Vo.
Unclear’ = The shade and size are changed by Vo.</td></tr>
</table>

No.	Defect	Judgment Criterion	Partition
3	Rubbing line	Not to be noticeable.	Minor
4	Allowable density	Above defects should be separated more than 10mm each other.	Minor
5	Rainbow	Not to be noticeable.	Minor
6	Dot size	To be 95%~105%of the dot size (Typ.) in drawing. Partial defects of each dot (ex.pin-hole) should be treated as spot. (see Screen Cosmetic Criteria (Operating) No.1)	Minor
7	Brightness (only back-lit Module)	Brightness Uniformity must be BMAX/BMIN≦2 - BMAX : Max.value by measure in 5 points - BMIN : Min.value by measure in 5 points Divide active area into 4 vertically and horizontally. Measure 5 points shown in the following figure. 	Minor
8	Contrast Uniformity	Contrast Uniformity must be BmAX/BMIN≦2 Measure 5 points shown in the following figure. Dashed lines divide active area into 4 vertically and horizontally. Measuring points are located at the inter-sections of dashed line.  Note: BMAX – Max.value by measure in 5 points. BMIN – Min.value by measure in 5 points. O – Measuring points in ¢10mm.	Minor

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Note:

(1) Size: d=(long length + short length)/2

(2) The limit samples for each item have priority.

(3) Complexed defects are defined item by item, but if the number of defects is defined in above table, the total number should not exceed 10.

(4) In case of ‘concentration’, even the spots or the lines of ‘disregarded’ size should not be allowed. Following three situations should be treated as ‘concentration’.

-7 or over defects in circle of ¢5mm.

-10 or over defects in circle of ¢10mm

-20 or over defects in circle of ¢20mm