HOT DISPLAY
LCM Finished product inspection standards-Level A

1.0 Purpose:

To ensure that the products produced by the company meet the requirements of the final design and customers, provide a basis for product testing, and ensure product quality.

2.0 Scope:

This standard applies to the appearance and electrical inspection process of LCM finished products produced by the company, including production self-inspection, IPQC and QA sampling
inspection.

3.0 Responsibilities and authorities:

3.1 Self-inspector: Responsible for conducting a full inspection of LCM finished products according to this standard and distinguishing qualified products from unqualified products, and clearly marking bad phenomena.

3.2 IPQC: Responsible for sampling and confirming semi-finished products and finished products (qualified products, unqualified products) in the manufacturing process according to this standard.

3.3 QA: Responsible for sampling and checking the LCM finished products before warehousing and shipment according to this standard and determining the results.

4.0 Definition:

4.1 Major defects (MA): Defects that affect product functions and characteristics, or affect customer assembly, such as high current, no display, no conversion, missing strokes, multiple strokes, ghosting, chaotic program, uneven background color, double images, missing processing and other undesirable phenomena.

4.2 Minor defects (MI): Defects that have a certain impact on product appearance but do not affect product functions and characteristics and customer assembly,
such as scratches, top injuries, internal contamination, fingerprints, bubbles, rainbows, black spots, creases and other undesirable phenomena.

5.0 Inspection standards:

5.1 Inspection conditions:

5.1.1 Under a 40W fluorescent lamp, maintain a visual distance of 30cm for inspection.

5.1.2 Select and prepare supporting testing equipment according to different models of LCM finished products, such as electric measuring machines, test racks, etc.

5.1.3 Adjust the corresponding test parameters according to the LCM product finalization data.

5.2 Basic inspection principles:

5.2.1 The appearance size, specifications and models of the module shall comply with the requirements of the finalized data. In principle, no defects are allowed in the LCM finished product.

5.2.2 Defects that cannot be described in words shall be judged based on the samples accepted by the customer.

5.2.3 The defects of material parts on the finished product shall be judged based on the "Incoming Material Inspection Standard".

5.2.4 This standard may be appropriately supplemented or modified according to customer requirements.

6.0 Inspection procedure: According to different requirements, it is divided into three levels of inspection standards: A, B, and C. This standard is the A-level inspection standard.

NO	Material	Test items
6.1	**LCD screen**	For details, please refer to "LCD Defective Phenomenon Detection Details (Grade A)"
6.2	**Metal frame**	**6.2.1** The iron frame surface must not have rust, and the surface burrs must be less than 0.1mm. **6.2.2** If the coating falls off or the leakage is greater than 0.3mm2, it will be rejected. **6.2.3** Point defects within 1.0mm of the front display area: φ≤0.2mm, scratch length ≤2.0mm, width ≤0.02mm. **6.2.4** Point defects outside the front display area 1.0mm: φ≤0.5mm, scratch length ≤2.0mm, width ≤0.1mm. **6.2.5** Point defects on the side of the frame: φ≤0.8mm, scratch length ≤3.0mm, width ≤0.2mm. **6.2.6** The maximum length of the plating solution residue is less than 0.5mm, and the indentation before plating is not felt by hand. **6.2.7** The iron frame twist feet should be tightly buckled on the COB board, with a gap of ≤0.2mm, and the twist angle should be 450 ~500 degrees with the COB edge, and the copper foil of the COB board positioning hole should not be damaged by more than 1/3.
		6.3.1 COB sealant shall not expose gold or bond wire, and the sealant height shall not exceed the height specified in the "Standardized Data". The sealant shall not exceed 1.0mm outside the silk screen circle, and the shape shall be smooth, and it is not allowed to cover the vias; the maximum length of defects and indentations is ≤0.5mm, and no sand holes are allowed.

6.3	**COB**	**6.3.2** COB sealant shall not be stained on the welding area, conductive electrode, vias and gold fingers, and the maximum length of other areas is ≤0.5mm, and only one place. **6.3.3** The welding of sheet (plug-in) components must be neat, and the silk screen may be slightly defective, but it can be identified and accepted. The components are not damaged, and the surface paint is allowed to be slightly damaged and fall off, not exceeding 1/5 of itself, and the silk screen is still clearly recognizable. The welding slope of sheet components shall not exceed 1/4 of the pad. **6.3.4** The components on the COB shall not be missed, under-soldered, wrongly soldered, or over-soldered; there shall be no poor soldering such as false soldering, false soldering, or cold soldering. The solder joints shall be uniform and bright, and no tin beads, tin tips, pores, tin slag, residues, etc. are allowed. The vias shall not be blocked by tin slag. **6.3.5** The exposed gold finger (pad) where no soldering is required shall have a uniform gold plating layer, bright color, no missed plating, and no oxidation. Solder and scratches are not allowed on the gold fingers at the mounting holes and interfaces. The scratches on other exposed gold places shall not exceed 3.0mm, and only one line is acceptable. **6.3.6** There shall be no patching on the bonding IC surface, and one patching is allowed on the LCD surface (metal frame shielding area). The electrical test is normal. The trace loss shall not exceed 1/4 of the line width, and the length shall be ≤ the line width, which is acceptable. **6.3.7** The green oil coating is uniform and smooth. Not on the routing, the maximum length of green oil shedding is ≤2.0mm, and no more than one on each side of the COB; the maximum length of shedding on the routing is ≤1.0mm, 2 places are allowed, and the distance between the two points is ≥5mm. 6.3.8 The green oil scratches do not expose the copper wire, the maximum length is ≤5.0mm, the width is <0.05mm, and no more than two on each side of the COB. Single-sided boards have no routing surface, and there are slight scratches with a depth of ≤0.05mm, which is acceptable.
6.4	**Backlight**	**6.4.1** The backlight should be close to the COB, with a gap of ≤0.2mm. After power is turned on, the backlight should emit light evenly without any different colors (distinguishable by the naked eye at 20cm). The current should meet the requirements of the standard data, and the welding quality should meet the welding standards.
6.5	**PIN**	**6.5.1** The shape and size of the pins are consistent with the "Standardized Data", the pins are arranged neatly, without deviation, looseness, bending, deformation, and the plastic body has no cracks, melting, falling off, and no poor welding. **6.5.2** The surface of the pins is uneven and oxidation or other attachments are not allowed. The drop size between the pins is ±0.2mm, and the inclination angle should be <20°.

6.6	**PFC**	**6.6.1** FPC and FFC must not have the wrong model, oxidation, solder beads, adhesives, ACF and other adhesive foreign matter at the welding or plug-in places. **6.6.2** FPC, FFC and COB electrodes must be aligned neatly without short circuits, and the misalignment should be within 1/4 of the electrode spacing. The welding should be tight and not warped, and the cable should not be burned, damaged, creased or other defects. **6.6.3** TCP/FPC/COF silicone should cover the LCD steps, be full and uniform, and should not exceed the LCD edge 1.0mm **6.6.4** FPC and FFC gold (zinc) plated parts should be ≤0.2mm for crushing, particles, and debris, and the welding end should not be scorched; There should be no defects such as cracking of the wiring and the substrate. **6.6.5** FPC wiring is acceptable if the loss and burr are ≤1/4 of the line width, and the length is less than the line width. FPC wiring should not have short circuits or open circuits
6.7	**Conductive tape**	**6.7.1** The conductive rubber strip must not be used with the wrong model, and must not fall over after assembly. Its skew angle is less than 100, and it must not be exposed outside the iron frame.
6.8	**Label**	**6.8.1** The size, position, text, date, and batch number of the label on the back of the LCM must be correct, and the handwriting must be clear and evenly thick and thin. If the handwriting (of some words) is unclear or fuzzy, it will be rejected. No labeling should be missed.

7.0 Electrical test of finished module

7.1 Determination of qualified products

When the full display and sub-display are in progress, the characters are complete and clear, without any display defects; the current value, LCD viewing angle direction and display program
must meet the requirements of the standard data, and there should be no mixed colors or foreign objects in the display window.

7.2 Determination of non-conformity

Any defective phenomenon such as large current, no display, no conversion, missing strokes, extra strokes, disordered program, uneven background color, too bright backlight, too dark backlight,
poor etching, ghosting, short circuit, open circuit, etc. or exceeding customer requirements and sample requirements shall be judged as defective products and rejected.

8.0 Finished product packaging standards:

8.1 Single product packaging shall be strictly packaged according to the finalized data or specified requirements. When packaging the product, its protective film shall not be lifted, skewed, or
fall off.

8.2 Foam boxes and foam board blister trays shall not be damaged, dirty, deformed or have serious yellow spots. The quantity of each turn or each box, each layer,
each box shall be uniform, and no more or less shall be put in (except for the last number of boxes).

8.3 The packaging cartons shall not be seriously damaged, and the surface printed patterns and handwriting shall be beautiful and clear, and shall not be blurred. The specifications and models of the packaging cartons of each product
shall be uniform, and the printed patterns and materials shall be uniform. When sealing the carton, use the sealing tape as required. The tape cannot cover the printed pattern and handwriting on the carton. The seal should be neat, tight, reliable and beautiful.

8.4 For the packaging of LCD products with hot-pressed paper, the LCDs should be placed in the same order in the foam box. The hot-pressed paper should not be bent by the foam strips. Each box should be squeezed tightly after packing. There should be no looseness. After packaging, it should be checked by patting it upside down. When the customer has requirements for packaging, it should be packaged according to the customer's requirements and actual conditions.

9.0 Reliability test standard:

All or part of the qualified products that have passed the finished product inspection will be tested for reliability. The reliability test conditions can be determined according to the characteristic parameters of each module. If the customer has special requirements, it will be determined according to the customer's requirements.

10.0 QA shipment sampling inspection standard:

10.1 This standard is based on the national standard GB2828-87 "Batch Inspection Counting Sampling Procedure and Sampling Table", and adopts a normal one-time sampling plan to inspect the finished product shipment of the module. The inspection level is usually the general level II, unless the customer has special requirements.
Definition of acceptable quality level AQL value.

Module Level	AQL	
	MA	MI
Level A	0.4	1.0
Level B	0.65	1.5
Level C	1.0	2.5

*The sample size is determined based on the batch size and inspection level, and the sample size code is determined through the "sample size code table".

10.2 Sampling plan: According to the sample size code and AQL value, the sampling plan is found through the "normal inspection one-time sampling plan" That is (n/AC Re)

n——sample size number AC——qualified judgment number Re——unqualified judgment number

According to the sampling plan and the sampling inspection results, the batch of products is compared to determine whether it is qualified. If it is qualified, it will be shipped. If it is unqualified, it will be returned to the production line for rework.