



LCD Pixel Defect Specification Sheet

OVERVIEW

This document states the inspection criteria for Motion® displays regarding pixel illumination and defects visible prior to image clarity checks.

BACKGROUND

Liquid crystal display (LCD) is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (LCs). Today's LCD displays are quickly replacing cathode ray tube (CRT) monitors due to their numerous benefits, such as cost effectiveness, energy efficiency, lighter weight, improved image quality and contrast and fewer harmful chemicals. However, as with any technology, some LCD displays may come with defects, which often occur during the manufacturing process.

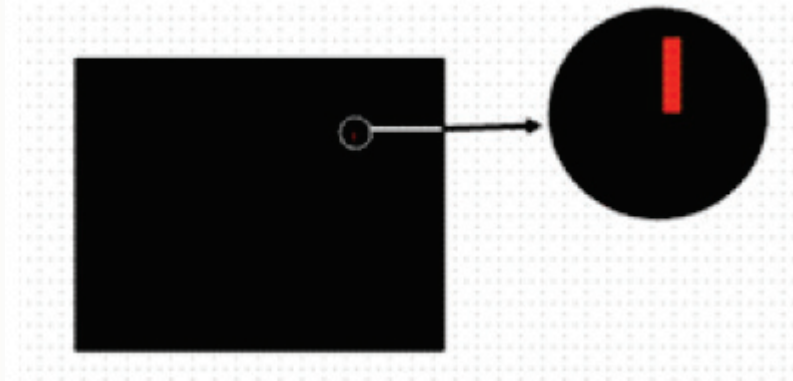
Motion's high-resolution LCD displays use an active matrix structure consisting of thin-film transistors (TFTs), which create brighter and sharper displays with quicker response times, producing much better images than passive-matrix displays.

A color-based LCD is comprised of three sub-pixels with red, green and blue color filters, which create each color pixel. Colors are manipulated by controlling and varying the voltage applied to each sub-pixel. The colors consist of a large amount of TFTs, and any problem with the TFTs results in a defective pixel on the display. During the manufacturing process, extremely small particles of dirt or debris, or microscopic defects may infiltrate the display, which may affect the TFTs, creating a defect. These defects may take the form of a dark dot, bright dot, or a stuck sub-pixel, which will stay red, blue, or green and will not change when attempting to display an image. These pixels may only show up using certain applications, or they may be on all of the time.

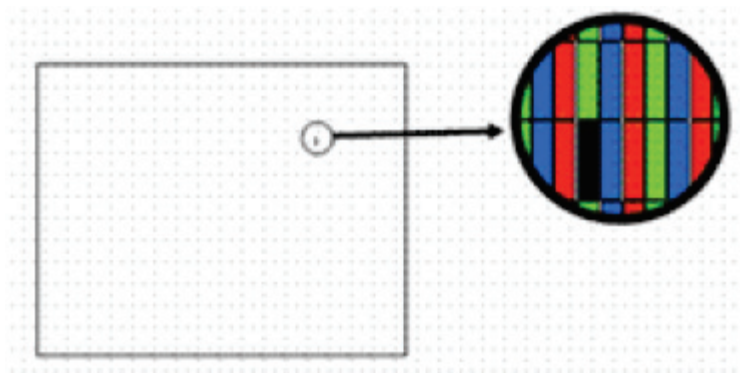
COSMETIC CRITERIA

The display is inspected with the brightness and contrast set to maximum. For this inspection, screen colors red, green, blue and white are used. The different screen colors are necessary because sub-pixels are so small that a defect can only be viewed against a background that contrasts with the defective pixel hue. The following is a list of the minimum requirements for this particular inspection.

1. Sub-Pixel defects
 - a. “Stuck on” sub pixel (incorrect hue pixel illuminated)



- b. Dead sub-pixel (pixel does not illuminate)



2. LCD defects
 - a. Dark / bright spot (internal debris)
 - b. Leakage (silicone or alcohol) into the stack causing a bright spot



Table of Criteria

Your display is subject to replacement if it meets the below criteria.

Item	Symptom	Criteria
Sub Pixel Defects	Bright Defect	2 Max
	Dark defect	4 max
	Total defects	4 max