

## Assessment of faulty pixels on LCDs

For all Fujitsu Computer Systems LifeBook<sup>®</sup> and Stylistic<sup>®</sup> products

General information:

Production techniques today cannot guarantee an absolutely fault-free display. In some instances a few isolated constant lit or unlit pixels may be present. Should this occur, the maximum permitted number of pixel faults is stipulated in the stringent international standard ISO 13406-2 (Class II).

- For example: a 15" flat-screen with a resolution of 1024 x 768 has  $1024 \times 768 = 786423$  pixels. Each pixel consists of three dots or sub-pixels (red, green and blue), so there are almost 2.4 million dots in total. According to ISO 13406-2 (Class II), a maximum of 4 pixels and 5 sub pixels may be defective, i.e. a total of 17 faulty dots. This corresponds to approximately 0.002% of the entire screen surface.

## Assessment of Faulty Pixels on LCDs

The manufacturing processes for LCDs almost invariably results in a small number of the pixels on LCD screens to be defective. This phenomenon is not confined to Fujitsu and is common throughout the industry. Fujitsu has established a standard acceptance criterion for the number of defective pixels allowed.

A pixel is considered defective if one or more of the sub-pixels cannot be controlled, i.e. the sub-pixel stays the same color rather than the desired color, and it is visible from a distance of one foot from the LCD panel surface. Typically such defects can be seen as bright spots on a dark

background. The bright spot can be seen as bright white, red, blue or green.

### Fujitsu Computer Systems Criteria

The general criteria for an acceptable number of defective pixels are defined in the table below:

	Defect Type	
Failure Type	Colored spot (green, red or blue)	White spot*
Maximum Allowable	4	1

A “White Spot” is defined as a pixel with no control of all three dots where all three dots are turned on. Please note that on some backgrounds 2 dots being turned on can cause the pixel to appear white.

LCDs should only be considered for warranty replacement if the number of defective pixels exceeds the stated criteria above.