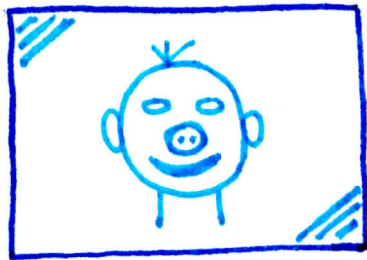# Liquid crystal display (LCD)

LCD

SL = Scan line

DL = Data line

DL DL DL DL

SL

R G B

SL

PX

SL

TFT = Thin film transistor

TFT = Thin film transistor

DL   DL

TFT

PX

D

G

S

SL

SL
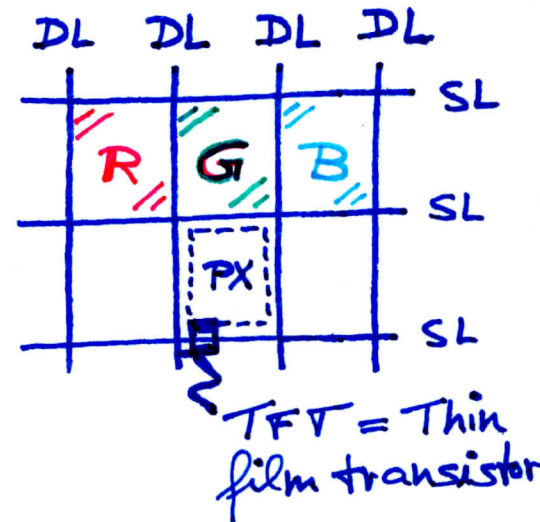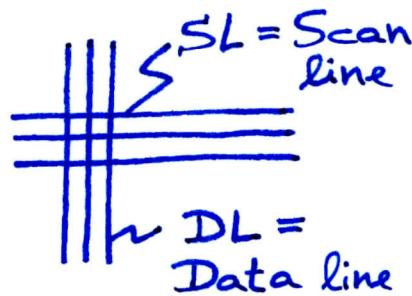
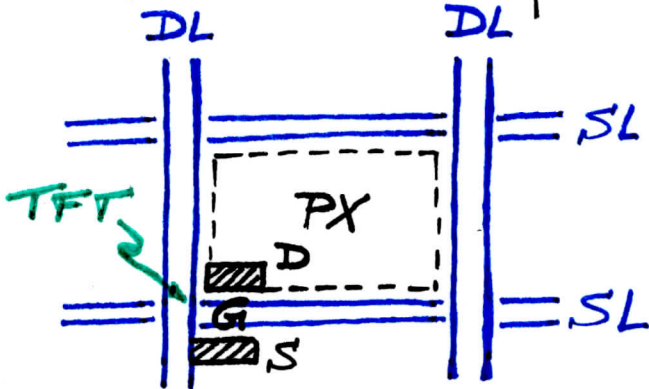Scan line = Gate line
SL   = GL

TFT cross section

S   D

Thin Si film

Gate insulator

G

Gate electrode
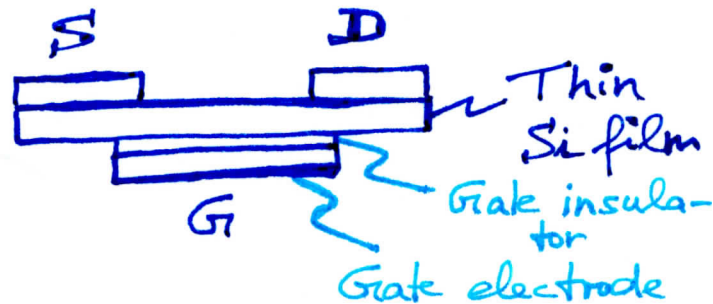
* LCD consists of, e.g., 1280 × 1024 pixels

* Each pixel has 3 (RGB) sub-pixels

* Each sub-pixel is controlled by one TFT

* Scan line (Gate line) can switch TFT ON & OFF

⇒ TFT ON ⇒ Pixel connected to DL

DL = Data line = Image data line

* TFT = FET. Which mode does TFT operate

in ? ⇒ ON & OFF mode

* TFT ON ⇒ PX (pixel) connected to DL (data line)

* R sub-pixel can vary between Black & Red

  G —"—   —"—   —"—   Black & Green

  B —"—   —"—   —"—   Black & Blue

Other components of **LCD**

  * Backlight = White light

  * Color filter = CF ⇒ R G B CF

  * Liquid crystal = LC ⇒ Varies between

      opaque & transparent depending on PX voltage

Cross section of LCD:

Back light

LCD substrate

SL, DL, TFT, PX

LC

CF

} Dark pixel

} White pixel