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Solomon Systech Image Processor for Car A/V application

This car entertainment system is blooming with added video display capability, evolving from traditional pure audio concentric to a system which now provides video, user manuals and higher-end models with navigation features. Display sizes range from 3" medium-size display to higher-end 7-inch display models. Display content generally consists of both analog (e.g. DVD player output or digital broadcast TV) and digital information (e.g. user multi-media interface and fancy wallpaper). Solomon Systech Image Processor Chip, SSD1922, possesses features which match with these design requirements.

Figure 1 - Examples of Car A/V system with 3" and 7" LCD displays

Figure 2 shows the SSD1922 solution for car A/V application. Video and image content can be processed by SSD1922 and displayed on Delta or stripe type TFT through its digital panel interface. If the video source is conformed to BT656/BT601, system design can be further simplified to bypass the video decoder.
A JPEG screen saver can be saved onto an SD/MMC card through the SD interface. The JPEG file is retrieved back from the SD/MMC card, decoded and displayed on the LCD panel via an LCD interface.

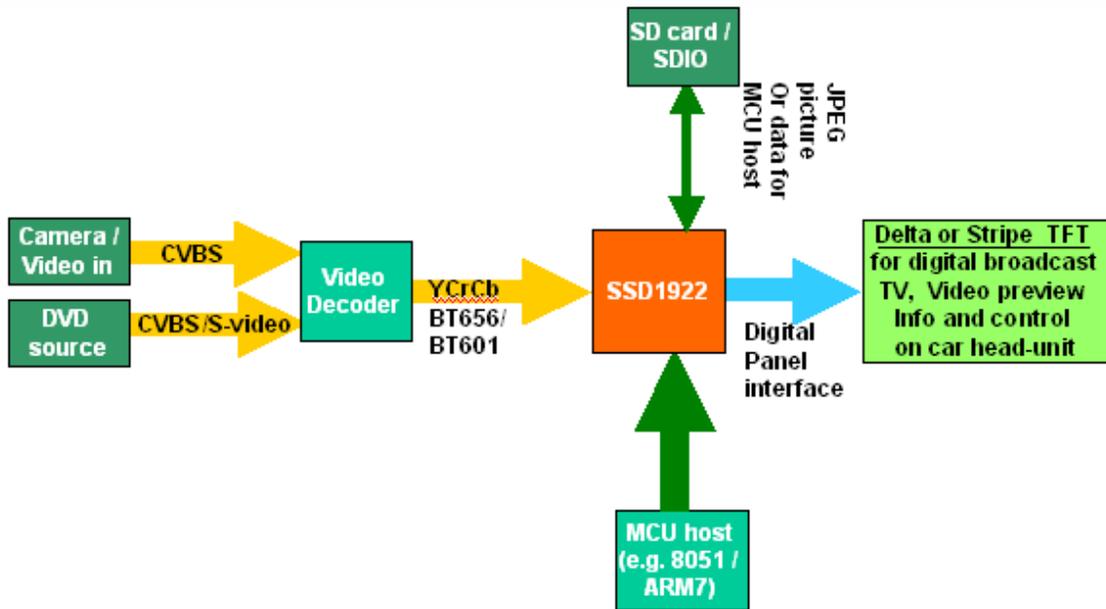Figure 2 – SSD1922 solution in car A/V application
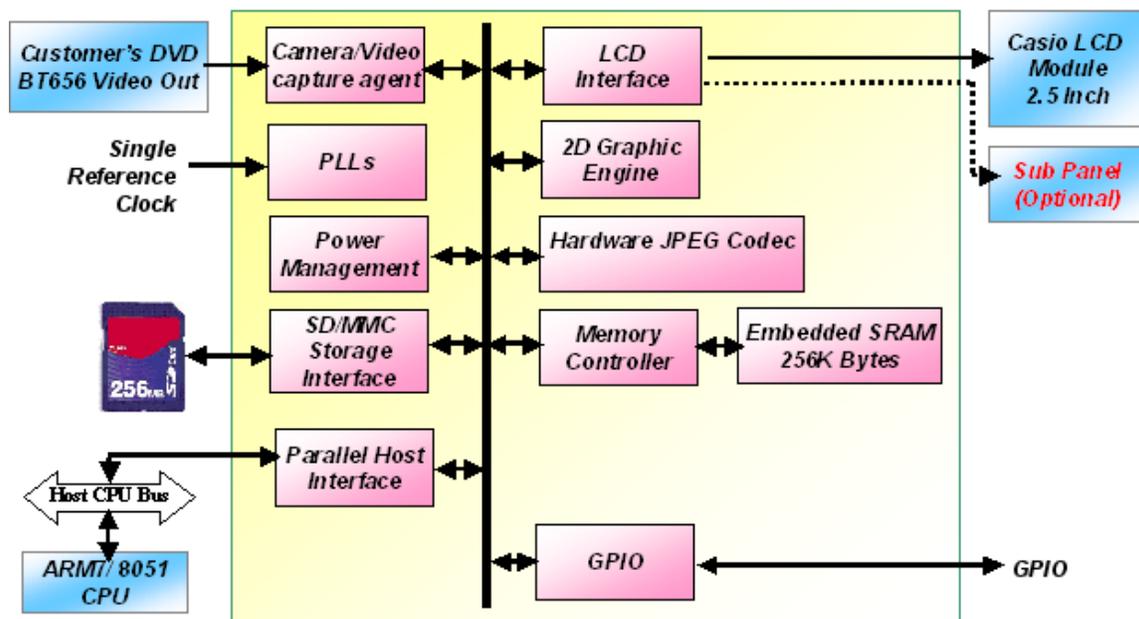

Figure 3 – SSD1922 block diagram

Figure 3 shows the SSD1922 block diagram. A JPEG codec block is used for capturing image from the video source (camera or DVD in). It has the hardware capability to display any JPEG image very fast. The SSD1922 can also support motion-JPEG format. The SD storage interface transfers a stored JPEG picture onto an SD card, and can also store any other data required by the MCU host. Moreover, the SSD1922 provides 2D graphics acceleration features for miscellaneous menu operation such as virtual display, portrait display mode, overlay function, hardware cursor display, line drawing, BitBLT with raster operation, color fill, color expansion and so on. The embedded 256KB SRAM supports animation and JPEG graphic processing. It supports a maximum 640x480 delta arrangement (200KB) and 480xRGBx272 stripe pixel arrangement (255KB).
Video input may not always map to display panel resolution on a 1:1 ratio. The SSD1922 has a "resizer" function that performs trimming and scaling to resize the image before being stored in the embedded SRAM. As a result, NTSC/PAL video source with varied resolution can be displayed onto the LCD panel.

In conclusion, Solomon Systech's SSD1922 is a good part to fit into any car A/V application, and its valuable features and simple system design have allowed us to speed up the product launch.