UC1682s

Single-Chip, Ultra-Low Power
80COM x 312SEG Matrix
Passive Color LCD Controller-Driver
with VSTN Support

INTRODUCTION

UC1682s is an advanced high-voltage mixed-signal CMOS IC, specially designed for the display needs of low power hand-held devices.

In addition to low power COM and SEG drivers, UC1682s contains all necessary circuits for high-V LCD power supply, bias voltage generation, temperature compensation, timing generation and graphics data memory.

UC1682s employs UltraChip's unique DCC (Direct Capacitor Coupling) driver architecture and LRM (Line Rate Modulation) gray-shade modulation scheme to achieve near crosstalk free images, with well balanced shading, vivid colors, and natural-looking images while supporting very fast Liquid Crystal material for video applications.

With UC1682s LCD makers can now achieve TFT-like image quality, support video applications while maintaining the same STN advantages in power consumption, unit cost, ease of customization and production flexibility.

MAIN APPLICATIONS

- Cellular Phones and other battery operated palm top devices or portable Instruments

FEATURE HIGHLIGHTS

- Single chip controller-driver for 80x104 matrix C-STN LCD with comprehensive support for input format and color depth:
  12-bit RGB: 4K color
  16-bit RGB: 60.5K color (dithering)
- Support video rate CSTN applications.
- Two software-readable ID pins and two MTP programmable ID bits to support configurable vender identification.
- Partial scroll function and programmable data update window to support flexible manipulation of screen data.
- Support both row ordered and column ordered display buffer RAM access.
- Support industry standard 3-wire, 4-wire serial bus (S9, S8, S8uc) and 8-bit/4-bit parallel bus (8080 or 6800).
- Special driver structure and gray shade modulation scheme. Ultra-low power consumption under all display patterns.
- No power consumption or image quality penalty when used with video rate CSTN
- Fully programmable Mux Rate, partial display window, Bias Ratio and Line Rate allow many flexible power management options.
- Software programmable, self-configuring 10x charge pump.
- Flexible data addressing/mapping schemes to support wide ranges of software models and LCD layout placements.
- Pad layouts support COG applications
- V_{DD} (digital) range: 1.8V ~ 3.3V
  V_{DD} (analog) range: 2.5V ~ 3.3V
  LCD V_{OP} range: 5.3V ~ 14.5V (25^{o}C)
- Available MTP trimming support precise LCD contrast matching
- Available in gold bump dies:
  Bump pitch(COM/SEG): 38μM
  Bump gap: 15μM
  Bump surface: 2,415μM^2

ORDERING INFORMATION

GOLD BUMPED DIE

Part Number	MTP	Description
UC1682sGAC	Yes	Gold bumped die with MTP function, no I^2C mode

General Notes

APPLICATION INFORMATION

For improved readability, the specification contains many application data points. When application information is given, it is advisory and does not form part of the specification for the device.

BARE DIE DISCLAIMER

All die are tested and are guaranteed to comply with all data sheet limits up to the point of wafer sawing for a period of ninety (90) days from the date of UltraChip's delivery. There is no post waffle saw/pack testing performed on individual die. Although the latest processes are utilized for wafer sawing and die pick-&-place into waffle pack carriers, UltraChip has no control of third party procedures in the handling, packing or assembly of the die. Accordingly, it is the responsibility of the customer to test and qualify their applications in which the die is to be used. UltraChip assumes no liability for device functionality or performance of the die or systems after handling, packing or assembly of the die.

MTP LIGHT SENSITIVITY

The MTP memory cell is sensitive to photon excitation. Under extended exposure to strong ambient light, the MTP cells can lose its content before the specified memory retention time span. The system designer is advised to provide proper light shields to realize full MTP content retention performance.

LIFE SUPPORT APPLICATIONS

These devices are not designed for use in life support appliances, or systems where malfunction of these products can reasonably be expected to result in personal injuries. Customer using or selling these products for use in such applications do so at their own risk.

CONTENT DISCLAIMER

CONTACT INFORMATION

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BLOCK DIAGRAM