

UC1611s

*Single-Chip, Ultra-Low Power
160COM x 256SEG Matrix
Passive LCD Controller-Driver*

INTRODUCTION

UC1611s is an advanced high-voltage mixed-signal CMOS IC, especially designed for the display needs of ultra-low power hand-held devices.

UC1611s 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 gray shades.

In addition to low power SEG and COM drivers, UC1611s contains all necessary circuits for high-V LCD power supply, bias voltage generation, timing generation, and graphics data memory.

Advanced circuit design techniques are employed to minimize external component counts and reduce connector size while achieving extremely low power consumption.

MAIN APPLICATIONS

- Cellular Phones, Smart Phones, PDA, and other battery-operated palmtop devices and/or portable instruments.

FEATURE HIGHLIGHTS

- Single-chip controller-driver supports 160x256 STN LCD, 16-shade-per-pixel with gamma compensated modulation.
- Soft-ICON: Partial scroll function to support programmable graphics ICON or scroll bar.
- Support both row ordered and column ordered display buffer RAM access

- Support industry standard 4-wire, 3-wire, and 2-wire serial buses (S8, S9, I²C), and 16- /8- /4-bit parallel buses (8080 or 6800).
- Special driver structure and gray shade modulation scheme produce near crosstalk free image, with low power consumption for all display patterns.
- Fully programmable Mux Rate, partial display window, Bias Ratio, and Line Rate allow many flexible power management options.
- 4 software programmable frame rates (25Hz, 30Hz, 35Hz, and 40Hz). Support the use of fast Liquid Crystal material for speedy LCD response.
- 4 software-programmable temperature compensation coefficients.
- On-chip Power-ON Reset and Software RESET command make RST pin optional.
- Self-configuring 11x charge pump with on-chip pumping capacitor requires only 5 external capacitors to operate.
- Flexible data addressing/mapping schemes to support wide ranges of software models and LCD layout placements.
- V_{DD} (digital) range (Typ.): 1.8 V ~ 3.3V
V_{DD} (analog) range (Typ.): 2.8 V ~ 3.3V
LCD V_{OP} range: 5.65V ~ 17.5V
- Available in gold bump dies
Bump pitch: 38 μM (Typ.)
Bump gap: 13 μM (Typ.)
Bump surface: 1887.5 μM²

ORDERING INFORMATION

Product ID	Description
UC1611sGAA	Gold bumped die.

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. There is no post wafer saw/pack testing performed on individual die. Although the latest modern processes are utilized for wafer sawing and die pick-&-place into wafer 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 application 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.

USE OF I²C

The implementation of I²C is already included and tested in all silicon.

MTP LIGHT & ESD SENSITIVITY

The MTP memory cell is sensitive to photon excitation and ESD. Under extended exposure to strong ambient light, or when TST4 pin is exposed to ESD strikes, the MTP cells can lose its content before the specified memory retention time span. The system designer is advised to provide proper light & ESD 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.

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BLOCK DIAGRAM

