

# UC1601

*Single-Chip, Ultra-Low Power*

*65COM by 132SEG*

*Passive Matrix LCD Controller-Driver*

## INTRODUCTION

UC1601 is an advanced high-voltage mixed-signal CMOS IC, especially designed for the display needs of ultra-low power hand-held devices.

This chip employs UltraChip's unique DCC (Direct Capacitor Coupling) driver architecture to achieve near crosstalk free images, with well-balanced gray shades and vivid color images.

In addition to low power column and row drivers, the IC 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.

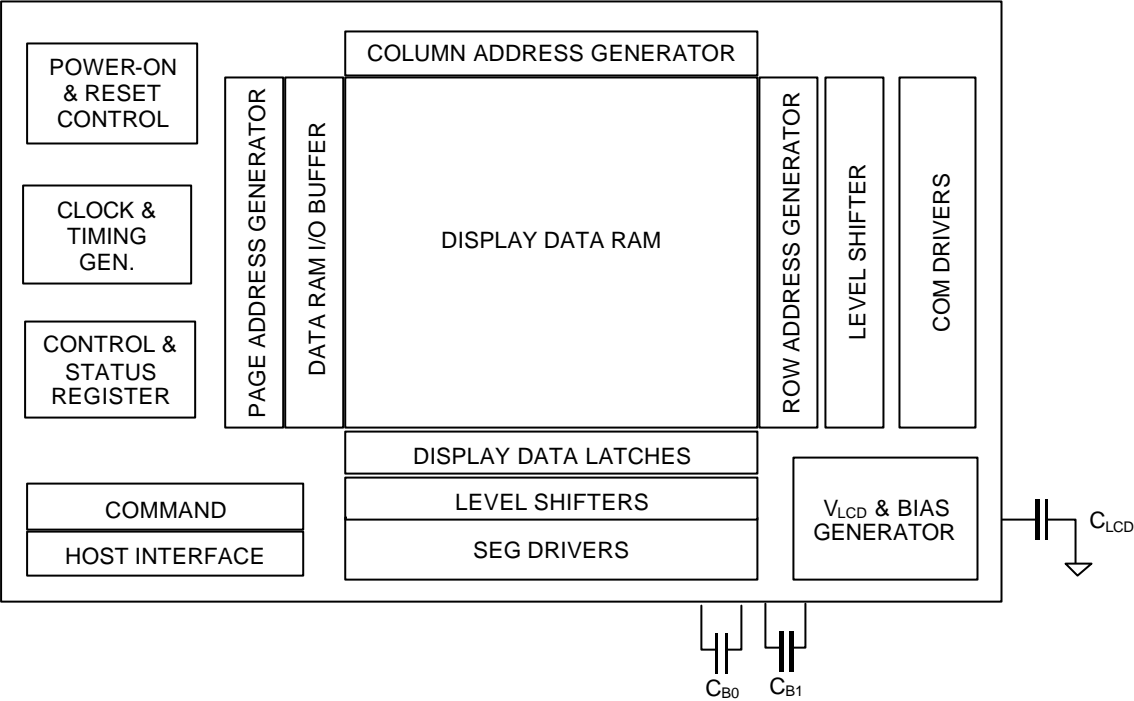
## MAIN APPLICATIONS

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

## FEATURE HIGHLIGHTS

- Single chip controller-driver support 65x132 graphics STN LCD panels.
- One software readable ID pin to support *on-the-fly* vender identification.
- Support both row ordered and column ordered display buffer RAM access
- Support industry standard 2-wire, 3-wire and 4-wire serial bus (I<sup>2</sup>C, S9 and S8), and 8-bit parallel bus (8080 or 6800 mode).
- Special driver structure and gray shade modulation scheme. Ultra-low power consumption under all display patterns. Typically under 100uA (for V<sub>DD</sub>=2.4V~3.0V) for cell phone applications, including LCD panel loading.
- Support four multiplexing rates at 65, 49, 33, and 25.
- Software programmable frame rates at 80, 100 Hz.
- 6-x internal charge pump with on-chip pumping capacitor requires only 3 external capacitors to operate.
- On-chip bypass capacitor for V<sub>LCD</sub> makes V<sub>LCD</sub> bypass capacitor optional.
- On-chip Power-ON Reset and Software RESET commands, make RST pin optional.
- Very low pin count (9-pin, with I<sup>2</sup>C) allows exceptional image quality in COG format on conventional ITO glass.
- Flexible data addressing/mapping schemes to support wide ranges of software models and LCD layout placements.
- V<sub>DD</sub> (analog) range: 2.4V ~ 3.3V  
V<sub>DD</sub> (digital) range: 1.8V ~ 3.3V  
LCD V<sub>OP</sub> range: 5.0V ~ 11.5V
- Software programmable 4 temperature compensation coefficients.
- Available in gold bump dies  
Bump pitch: 50uM min.  
Bump gap: 18uM min.

**BLOCK DIAGRAM**



1601 v0.1 Pre (B)