em microelectronic

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Extreme Low Power LCD Driver

General Description

The device EM6115 is an extremely flexible, ultra-low power and low voltage LCD segment driver supporting static, Mux2, Mux3 and Mux4 addressing with $\frac{1}{2}$ and $\frac{1}{3}$ biasing.

A stable display contrast over the whole supply voltage range is assured by the integrated LCD supply voltage generator.

The internal segment mapping directory allows display updates with minimal energy by keeping the serial data transfer at a strict minimum.
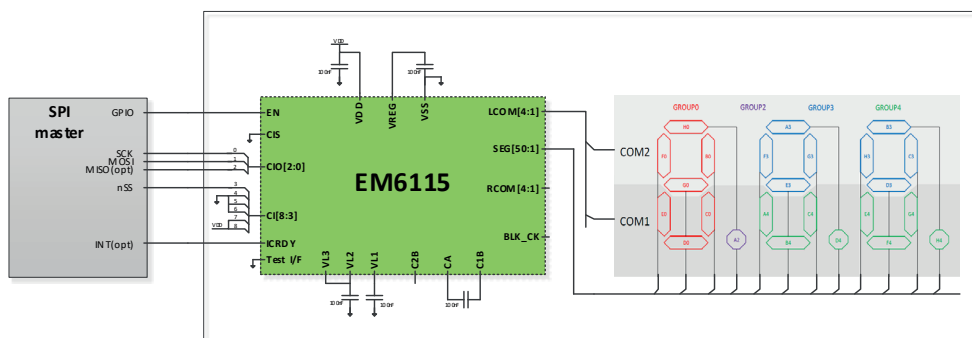
Applications

l Portable, battery operated devices

l Wearables

l IoT devices

l Decentralized sensors

l Always-on Displays

l Weight scales, utility meters

l Home appliances

Features

l Up to 50 SEG and 4 COM physical lines, for a maximum of 200 physical segments.

l A set of COM lines is provided on each side of the SEG lines (LCOM and RCOM) for easier connection.

l The unused SEG and COM outputs can be disabled

l Control of the LCD segments by 32 groups of logical segments (up to 8 bits each), configurable with a mapping dictionary.

l Internal E²PROM for automatic configuration of operating parameters and segment mapping dictionary after reset or power-up.

l Supported Mux rates: static, Mux2, Mux3 and Mux4

l Mux2, Mux3, Mux4 can use either $\frac{1}{2}$ or biasing.

l On-Chip generation of the LCD waveform and frame frequency.

l On-Chip programmable voltage reference for the LCD Bias voltage generation (25mV steps).

l Selectable I2C or SPI interface

l Selectable blink behaviour (global or segment-defined blink) and blink frequency

l Blank function and Inverse function available

l Wide voltage range from 1 V to 3.6 V range

l Ultra-low power operation: 130 nA (at 3 V, Mux2, bias $\frac{1}{2}$ and without LCD)

l Temperature range: -40°C to +85°C

Typical Usage

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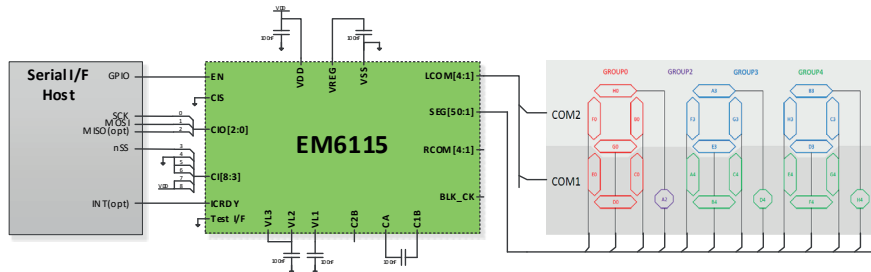
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Block Diagram
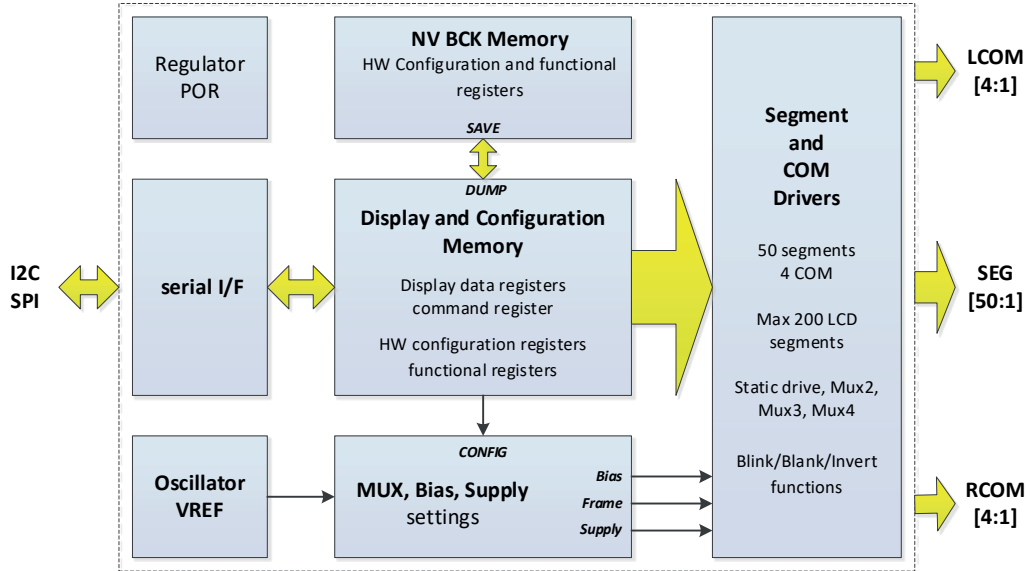
Additional Use Cases (EM Display Modules)

EM Ultra low power Display module add on to Host featuring an I2C or SPI master I/F

Very small form combining the Display and the Driver

«Zero Power» application with always on Display

l RTC or EM energy harvester wakes up periodically the MCU to acquire sensor date and send new data to the display

l BT-SOC (instead of MCU) can send the data once a day to the mobile.