

## Ultra Low Power Enhanced LCD & LED Controller and Driver with Multi Format Character Generation

### General Description

EM6127 is a controller and driver for graphic or character monochrome TN – Twisted Nematic, STN – Super-Twisted Nematic and Filtered STN LCD displays. Several EM6127 integrated functions save system power needs. The enhanced EM6127 driver displays different character or bitmap formats. Various effects are available such as scrolling, reverse, blinking and more are available. In addition, the controller is able to display ROM-defined or RAM custom-made messages. EM6127 can start in user-defined modes and configurations.

The EM6127 is an extremely low power LCD controller and driver product. The typical current consumption is typically 20  $\mu$ A in MUX 32 configuration with internally generated VLCD and external capacitors.

The one character line, active addressing mode is an important feature of the EM6127. It provides significant improvement in current consumption. The typical current consumption in this mode is only 5  $\mu$ A.

The 5x7 character format can be zoomed 2 or 3 times (10x14 and 15x21), such that a large date can be displayed, for example.

### Features

- | Max. addressable matrix: 32 rows x 101 columns
- | Slim IC for Chip-On-Film, Glass or Plastic technologies (COF, COG, COP)
- | VDD supply voltage:
  - Low voltage configuration: 1.2V to 2V
  - Standard configuration: 2V to 3.6 V
- | Power consumption:
  - Full matrix mode, 20  $\mu$ A with internally generated VLCD and external capacitors
  - One character line mode, 5  $\mu$ A with internally generated VLCD and external capacitors
- | I2C interface and Serial bus interface
- | R/W Internal Display Data RAM for characters
- | Character Generator RAM: 16 characters or bitmap
- | Character Generator ROM: 240 characters or bitmap
- | Programmable characters or bitmap font format:
  - 5x7, 6x8, 5x10, 10x16, 15x24
- | Personalization of ROM – define your own characters
- | Programmable Multiplex rates:
  - static, 2, 3, 4, 8,10,16, 20, 24, 32

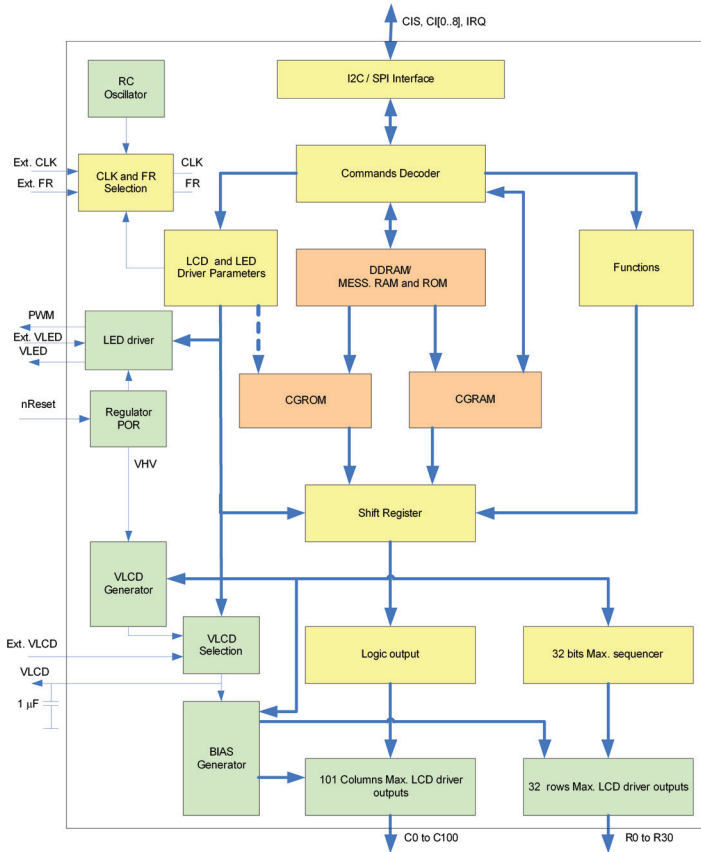
- | 16 different predefined display modes in ROM
- | Full bitmap mode
- | Horizontal and vertical scrolling by dot with four selectable speeds of scrolling
- | Full and partial scrolling
- | Reverse mode display
- | Inverse mode for character or line
- | Blink (four frequencies and four duty cycles) for character or line
- | Programmable cursor: XOR, OR, AND operations
- | Characters superposition function
- | Four sequences of sixteen characters max. available
- | 64 predefined messages in ROM and 16 messages in RAM
- | Partial display mode and one character line mode
- | LCD supply voltage VLCD internally generated and digitally programmable in 127 steps from 1.25V to 7.6V; external VLCD possible
- | Selectable 1, 2, 3, 4, 5 voltage multiplier factor for VLCD
- | Selectable bias voltages generation
- | Oscillator for LCD refresh
- | LED driver for back or front light illumination, with two independent outputs and external adjustable current limitation
- | LED supply voltage internally generated and digitally programmable by 31 steps from 3.7V to 5.25V; external VLED possible
- | Selectable temperature coefficient for LCD thermal compensation
- | High noise immunity on inputs
- | Operation temperature range: -40°C to +85°C

### Applications

- | Battery powered devices
- | Printers and Fax
- | Weigh scale, utility meters
- | Point-of-sale terminals
- | Home appliances



## Block Diagram



## Bump Location Diagram

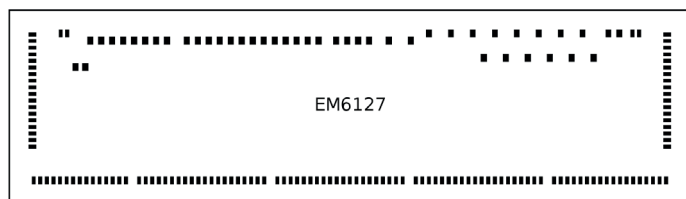
Standard delivery includes gold bumps on all bumps with following dimensions:

80 μm x 40 μm - LCD bumps (rows, columns)

80 μm x 60 μm - communication and other bumps

Minimum bump pitch is 60 μm.

Chip size: 1531 μm x 5976 μm.



## Ordering Information

A single version if the EM6127 is available

Ordering Code	Description	Packaging	Container
EM6127V01WP8E	Ultra Low Power LCD Driver with Character Generator Memories	Bare die with Gold bumps	Waffle Pack