

**NEW** **TMP89FS28LFG**

**FLASH**

**8-bit microcontroller with 2560 dot matrix LCD driver  
(built-in voltage booster circuit)**

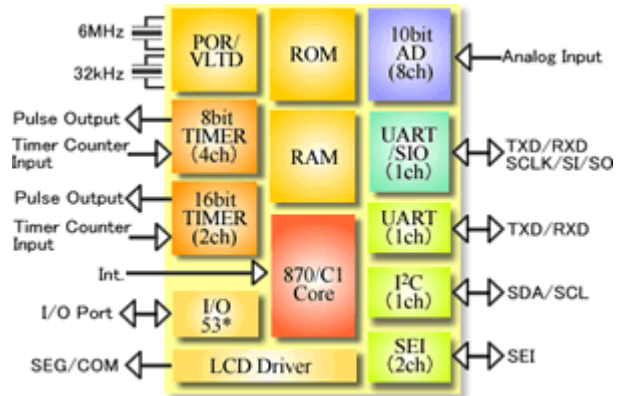
**Features**

**TLCS-870/C1 CPU Core**

- ▶ Operating voltage
  - 3.2 to 3.6 V at 6 MHz (erase/write)
  - 3.2 to 3.6 V at 6 MHz (read)
  - 2.7 to 3.6 V at 4.2 MHz (read)
  - 2.2 to 3.6 V at 2 MHz (read)
  - 2.2 to 3.6 V at 32 kHz (read)
- ▶ Clock gear 1/4, 1/2, 1/1

**Built-in Functions**

- ▶ Dot matrix LCD driver (Voltage booster type)  
80 seg × 32 com
- ▶ Power on reset circuit (POR)
- ▶ Voltage detection circuit (VLTD)
- ▶ On-chip debug function
- ▶ I/O ports : 53 pins \*
- ▶ 16-bit timer : 2 channels
- ▶ 8-bit timer : 4 channels
- ▶ UART/SIO : 1 channel
- ▶ UART : 1 channel
- ▶ I<sup>2</sup>C : 1 channel
- ▶ SEI : 2 channels
- ▶ 10-bit AD converter : 8 channels
- ▶ Built-in programmable pull-up resistors



\*:Two pins are used for high-frequency oscillation and cannot be used as input/output ports.

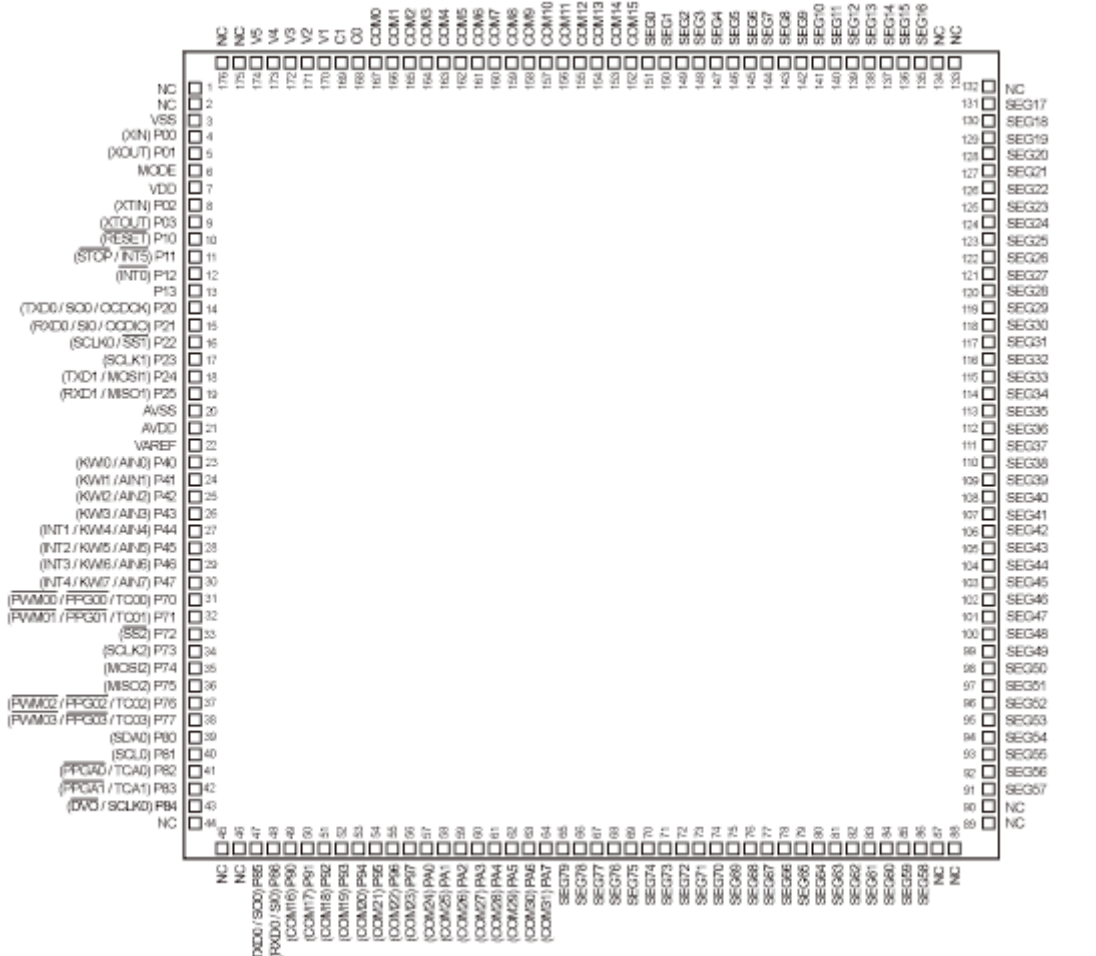
**Memory Size**

Part number	ROM (Flash)	RAM
TMP89FS28LFG	60 Kbytes	3 Kbytes

\* This product uses the SuperFlash® technology under license of Silicon Storage Technology, Inc. Super Flash® is a registered trademark of Silicon Storage Technology, Inc.

# Package Information

## Pin Assignments



Package : LQFP176 (20 × 20 mm / 0.4 mm pitch)

# Development Systems

## Software Products

<b>Toshiba Integrated Development Environment</b>	<b>C Compiler</b>	SW89CN0-ZCC: 1 license SW89CN3-ZCC: 10 licenses
	<b>Integrated Development Environment</b>	SW00MN0-ZCC: 1 license SW00MN3-ZCC: 10 licenses The emulator comes with a single-seat download license.

## Hardware Products

<b>On-Chip Debug Emulator</b>	<b>Emulator</b>	BMP89A400010A-G
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\* As to hardware products, additional accessories are also needed.

» For further information about Toshiba microcomputers and Toshiba microcomputer development systems, please visit <http://www.semicon.toshiba.co.jp/eng/product/micro/index.html>

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