	TLCS-870 Family TLCS-870/C1 Series

8bit

TMP89FH42UG

TMP89FM42UG

FLASH

44pin

8-bit microcontrollers delivering high functionality and performance in low-pin-count packages

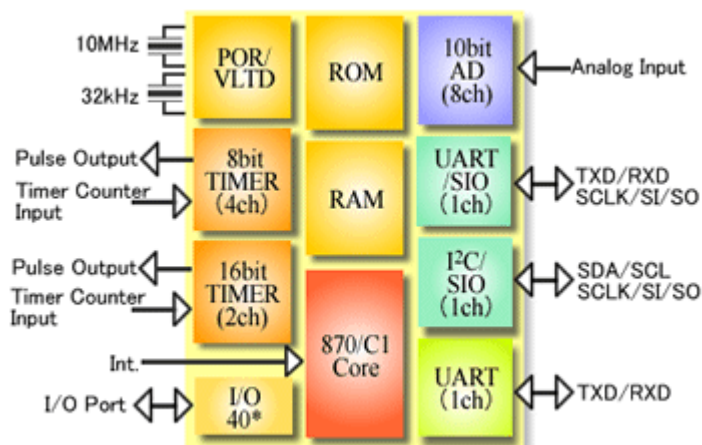## Features

● TLCS-870/C1 CPU Core

· Operating voltage

4.3 to 5.5 V at 10 MHz

2.7 to 5.5 V at 4.2 MHz

2.2 to 5.5 V at 2 MHz

· Clock gear

1/4, 1/2, 1/1

● Built-in Functions

· Voltage detecting circuit

(Two voltage levels detectable, reset or interrupt selectable)

· Power-on reset circuit

· 10-bit AD converter   : 8 channels

· 8-bit timer   : 4 channels

· 16-bit timer   : 2 channels

· UART/SIO   : 1 channel

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· I^2C/SIO   : 1 channel

(One SIO channel can be used at a time.)

· Built-in pull-up resistors

· On-chip debug function (Flash version only)

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

● Flash Memory Size

Part number	ROM(Flash)	RAM
TMP89FH42UG	16 Kbytes	2 Kbytes
TMP89FM42UG	32 Kbytes	2 Kbytes

● Product Lineup

Part number	ROM	RAM
TMP89CH42UG	16 Kbytes	2 Kbytes
TMP89CM42UG	32 Kbytes	2 Kbytes

Development Systems

● Software Products

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

● Hardware Products

**: Under development

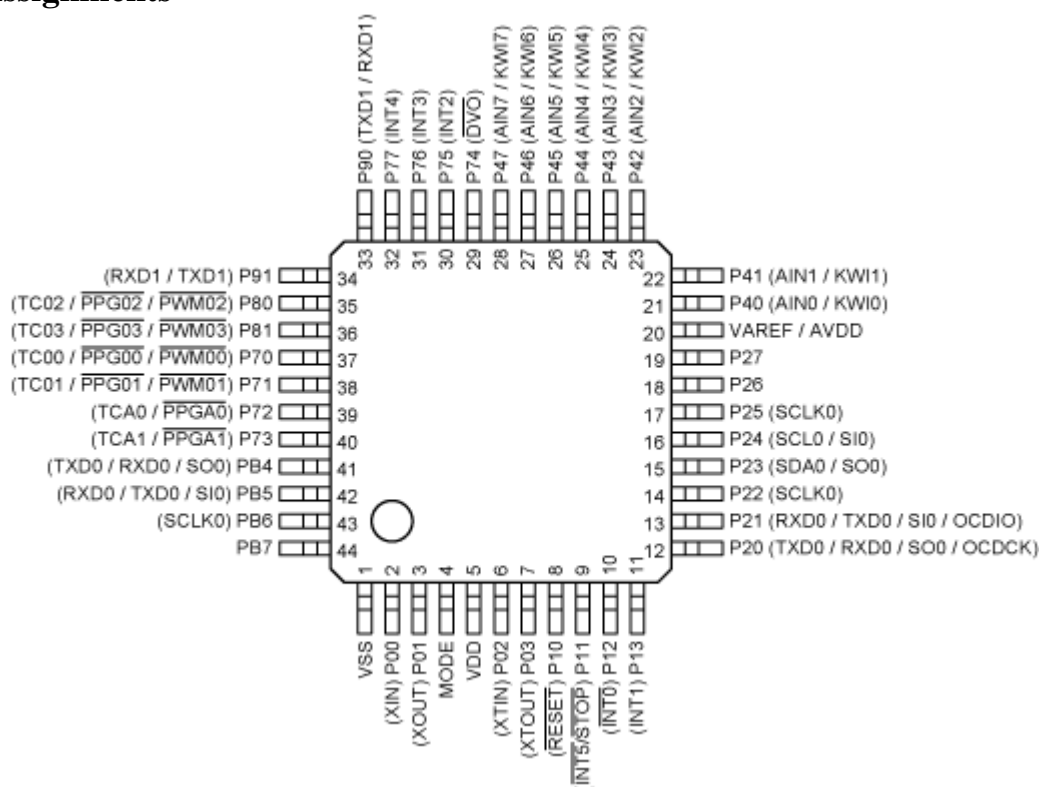|		
On-Chip Debug Emulator	Emulator	BMP89A400010A-G
In-Circuit Emulator	Emulator	BMP89A300010A-G
	Emulation chip	TMP89C900XBG**

› Use either an On-Chip Debug Emulator or an In-Circuit Emulator.

› 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

» Contact the Toshiba sales representative for information about RoHS compliance before you purchase any components.

● Pin Assignments

Top pins (left to right, 33→23): P90 (TXD1 / RXD1), P77 (INT4), P76 (INT3), P75 (INT2), P74 ($\overline{\text{DVO}}$), P47 (AIN7 / KWI7), P46 (AIN6 / KWI6), P45 (AIN5 / KWI5), P44 (AIN4 / KWI4), P43 (AIN3 / KWI3), P42 (AIN2 / KWI2)

Left pins (top to bottom, 34→44):
- 34 (RXD1 / TXD1) P91
- 35 (TC02 / $\overline{\text{PPG02}}$ / $\overline{\text{PWM02}}$) P80
- 36 (TC03 / $\overline{\text{PPG03}}$ / $\overline{\text{PWM03}}$) P81
- 37 (TC00 / $\overline{\text{PPG00}}$ / $\overline{\text{PWM00}}$) P70
- 38 (TC01 / $\overline{\text{PPG01}}$ / $\overline{\text{PWM01}}$) P71
- 39 (TCA0 / $\overline{\text{PPGA0}}$) P72
- 40 (TCA1 / $\overline{\text{PPGA1}}$) P73
- 41 (TXD0 / RXD0 / SO0) PB4
- 42 (RXD0 / TXD0 / SI0) PB5
- 43 (SCLK0) PB6
- 44 PB7

Right pins (top to bottom, 22→12):
- 22 P41 (AIN1 / KWI1)
- 21 P40 (AIN0 / KWI0)
- 20 VAREF / AVDD
- 19 P27
- 18 P26
- 17 P25 (SCLK0)
- 16 P24 (SCL0 / SI0)
- 15 P23 (SDA0 / SO0)
- 14 P22 (SCLK0)
- 13 P21 (RXD0 / TXD0 / SI0 / OCDIO)
- 12 P20 (TXD0 / RXD0 / SO0 / OCDCK)

Bottom pins (left to right, 1→11): VSS, (XIN) P00, (XOUT) P01, MODE, VDD, (XTIN) P02, (XTOUT) P03, ($\overline{\text{RESET}}$) P10, ($\overline{\text{INT5/STOP}}$) P11, (INT0) P12, (INT1) P13

Package name: LQFP44-P-1010-0.80B

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