

# LC866000 Series

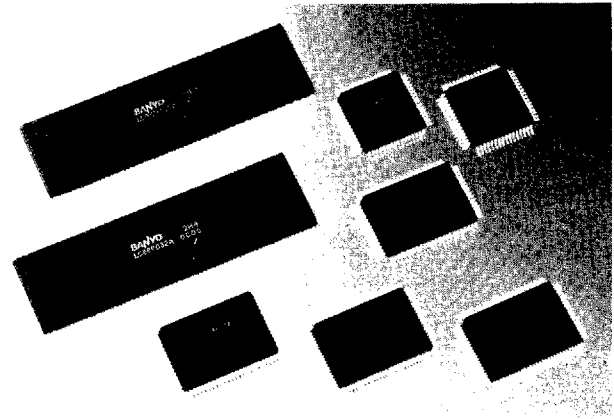
## Overview

The LC866000 Series CMOS 8-bit single-chip microcontrollers are high-speed, advanced function microcontrollers, with on-chip FLT controller/drivers and 8-bit A/D converters. EPROM with window versions and one-time PROM versions have been incorporated into the series, allowing the development time of application systems to be greatly reduced.

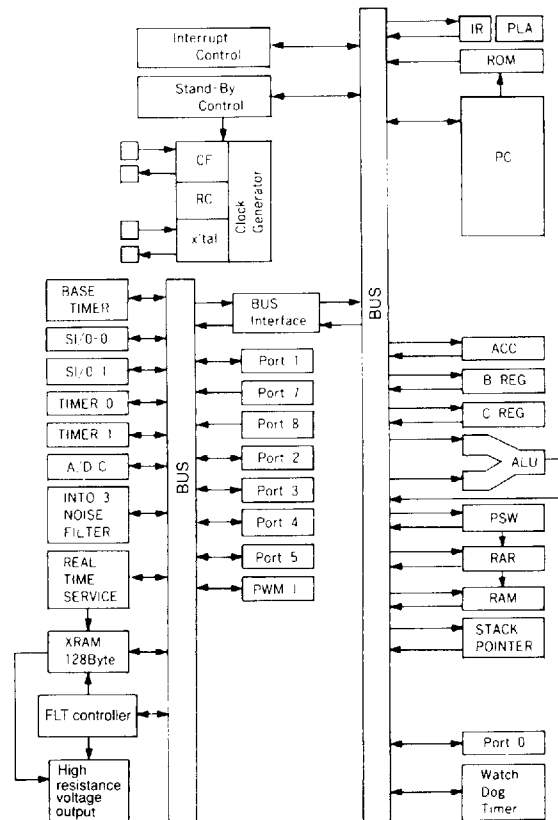
The LC866000 Series microcontrollers integrate many powerful functions on a single chip, optimizing them for device control requiring realtime responses. They are centered around a high-speed CPU core and a realtime service block that can perform its processing independently and in parallel. Also included are 8K to 48K bytes of ROM, 384 to 768 bytes of RAM, FLT controller/drivers, a 4 to 12-channel 8-bit A/D converter, a 16-bit timer/counter, a multiple-use PWM 16-bit timer, a timer for a realtime clock function, a watchdog timer, two channels of 8-bit serial I/O, a remote control signal receive circuit, an 8-bit PWM, I/O ports, numerous interrupts (14 to 17 sources, 10 vectors), and a standby function.

## Features

- 8K to 48K bytes ROM
- 384 to 768 bytes RAM
- FLT controller/drivers
  - Segment key-scan function
  - 26 to 38 outputs (16 digits maximum)
  - Can receive input from the FLT pin (LC8664XX Series)
- 4 to 12-channel 8-bit A/D converter
- 16-bit timer/counter
  - With 8-bit programmable prescaler
  - Can be split into two 8-bit timer/counters
- Multiple-use PWM 16-bit timer (with the following 4 modes)
  - One 16-bit timer
  - Two 8-bit timers
  - 8-bit timer + 8-bit PWM
  - 9 to 16-bit PWM
- 14-bit timer for realtime clock function
- Watchdog timer (with external RC)
- Two 8-bit serial I/O channels
  - With one 8-bit baud rate generator
- Remote control signal receive circuit
- 16 to 49 I/O ports, 8 to 12 input-only ports
- Numerous interrupt functions
  - 14 to 17 sources (5 to 8 external, 9 internal) and 10 vectors
  - Control function for 3 levels of overlapping interrupts
- Standby mode (HALT/HOLD mode)
- High-speed operation
  - Minimum cycle time: 1  $\mu$ s (bus cycle: 0.5  $\mu$ s)
  - High-speed execution of register/RAM bit manipulation instructions: 1  $\mu$ s



LC866232 Block Diagram



- Symmetrical instruction set common with LC860000 Series
  - 68 instructions
- Realtime service function
  - Performs 4-byte data transfer between special-function registers within 5  $\mu$ s of an event being generated

## Applications

- VCR (control/display/electronic tuning/remote control unit)
- CD (control/display/remote control unit)

- Amplifier (control/display)
- Tuner (control/display/electronic tuning)
- Home electronics (control/display/remote control unit)
- Communications equipment (control/display)
- Automobile devices (control/display)

## ■ LC866000 Series

Type No.	ROM (bits)	RAM (bits)	Cycle time	FLT outputs	Ports	S/I/O	Timers	A/D converter	Package	Evaluation chip	Notes							
LC866032B	32K × 8																	
LC866028B	28K × 8	512 × 8																
LC866024B	24K × 8				8 inputs 16 I/Os													
LC866020C	20K × 8			14 segment-only	CMOS/N ch open drain selection possible													
LC866016C	16K × 8	384 × 8	1 μs (bus cycle) 0.5 μs	16 common segment/digit		8 bits × 2	16 bits × 2 (can be split into 8-bit timers + 14-bit timer for realtime clock)	8 bits × 4 ch	DIP-64S QFP-64E	LC86E6032	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> </ul>							
LC866012C	12K × 8																	
LC866008C	8K × 8																	
LC86P6032	32K × 8	512 × 8								DIP-64S QFP-64E	—	One-time PROM version of LC8660XX Series						
LC86E6032	32K × 8	512 × 8							DIP-64S QFP-64E	—	EPROM with window version of LC8660XX Series							
LC866132A	32K × 8																	
LC866128A	28K × 8	640 × 8			12 inputs 1 output 24 I/Os													
LC866124A	24K × 8			16 segment-only	CMOS/N ch open drain selection possible													
LC866120A	20K × 8	512 × 8	1 μs (bus cycle) 0.5 μs	16 common segment/digit		8 bits × 2	16 bits × 2 (can be split into 8-bit timers + 14-bit timer for realtime clock)	8 bits × 8 ch	QFP-80E	LC86E6132	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> <li>• 8-bit PWM output</li> </ul>							
LC866116A	16K × 8																	
LC866112A	12K × 8	384 × 8																
LC866108A	8K × 8																	
LC86P6132	32K × 8	640 × 8							QFP-80E	—	One-time PROM version of LC8661XX Series							
LC86E6132	32K × 8	640 × 8						QFP-80E	—	EPROM with window version of LC8661XX Series								
*LC866432A	32K × 8																	
*LC866428A	28K × 8	768 × 8		22 segment-only	14 inputs 8 normal withstand voltage I/Os													
*LC866424A	24K × 8			6 can double as I/O ports, 16 can double as input ports	CMOS/N ch open drain selection is possible 12 intermediate withstand voltage I/Os	8 bits × 2 (can be used for bus and 16-bit communication)	16 bits × 2 (can be split into 8-bit timers + 14-bit timer for realtime clock)	8 bits × 8 ch	QFP-80E	LC86E6448	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> </ul>							
*LC866420A	20K × 8	640 × 8																
*LC866416A	16K × 8																	
*LC866412A	12K × 8	512 × 8																
*LC866408A	8K × 8											16 common segment/digit	CMOS/N ch open drain selection is possible However, CMOS output selection port is normally withstand voltage.					
*LC86P6448	48K × 8	768 × 8						QFP-80E	—	One-time PROM version of LC8664XX Series								
*LC86E6448	48K × 8	768 × 8						QFP-80E	—	EPROM with window version of LC8664XX Series								
LC866232A	32K × 8																	
LC866228A	28K × 8	640 × 8		16 segment-only	12 inputs 1 output 43 I/Os													
LC866224A	24K × 8			16 common segment/digit	CMOS/N ch open drain selection is possible	8 bits × 2	16 bits × 2 (can be split into 8-bit timers + 14-bit timer for realtime clock)	8 bits × 8 ch	QFP-100E	LC86E6232	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> <li>• 8-bit PWM output</li> </ul>							
LC866220A	20K × 8	640 × 8																
LC866216A	16K × 8																	
LC86P6232	32K × 8	640 × 8														QFP-100E	—	One-time PROM version of LC8662XX Series
LC86E6232	32K × 8	640 × 8														QFP-100E	—	EPROM with window version of LC8662XX Series
LC866648A	48K × 8																	
LC866644A	44K × 8	768 × 8		16 segment-only	12 inputs 1 output 49 I/Os													
LC866640A	40K × 8			10 common segment/digit	CMOS/N ch open drain selection is possible for 43 pins	8 bits × 2 (can be used for bus)	16 bits × 2 (can be split into 8-bit timers + 14-bit timer for realtime clock)	8 bits × 12 ch	QFP-100E	LC86E6648	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• 2-channel realtime service function</li> <li>• 8-bit PWM output</li> </ul>							
LC866636A	36K × 8	768 × 8																
*LC86P6648	48K × 8															QFP-100E	—	One-time PROM version of LC8666XX Series
LC86E6648	48K × 8	768 × 8														QFP-100E	—	EPROM with window version of LC8666XX Series

\*: Under development