2

FRONT PANEL CONTROLLER (FPC) WITH ON-CHIP ONE TIME PROM
*μ*PD17P106
4-BIT SINGLE-CHIP MICROCONTROLLER

The μPD17P106 is a 4-bit single-chip CMOS microcontroller with on-chip ONE TIME PROM, for use in front panel control.

The CPU uses the μPD17000 architecture, which allows direct data memory manipulation and various operations with a single instructionand peripheral hardware control. Moreover, all instructions are one 16-bit word in lenght.

In addition to a wide range of input/output ports, serial interface, and clock generator port, on chip peripheral hardware includes, for front panel control, an LCD driver, key source decoder, and remote control decoding timer, enabling high-performance front panel systems of various kinds to be configured.

As the μPD17P106 includes on-chip ONE TIME PROM,it is ideal for system evaluation in program development for the μPD17106* mask ROM version, or for small-volume production.

An easy-to-use in-circuit emulator (IE-17K) and assembler (AS17K) are available as μPD17P106 system development tools.
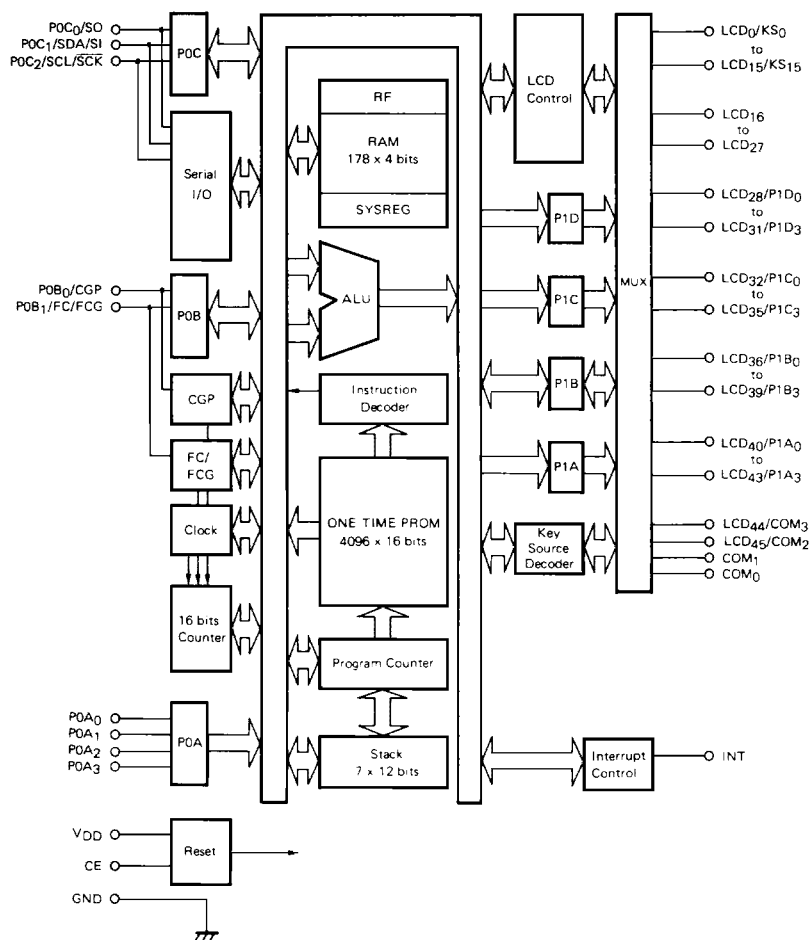
*:under development

Features

- 4-bit microcontroller for front panel controller use
- Program memory (ONE TIME PROM):
  8K bytes (4096 steps x 16bits)
- General-purpose data memory (RAM):
  178 nibbles (178 nibbles x 4 bits)
- Instruction executionn time:
  4.44μs (using a 4.5MHz crystal oscillator)
- Stack levels: 7
- Easy-to-understand instructiion set (46 instructions)
- Decimal operation capability
- Table reference capability
- On-chip LCD driver
  Static   : 46 x 1= 46 segments
  1/2 duty, 1/2 bias : 46 x 2= 92 segments
  1/3 duty, 132 bias: 45 x 3= 135 segments
  1/4 duty, 1/4 bias : 44 x 4= 176 segments
- On-chip key source decoder
- 16 lines (Output by time-division multiplexing with LCD segment signal)
- On-chip 16-bit counter with 4 functions:
  Timer modulo
  Frequency count
  Pulse width count
  CGP (clock generator port)
- On-chip 8-bit serial interface
  1 system 2 channels (2-wire and 3-wire)
- Variety of interrupts
  External interrupts   : 1 channel (INT pin)
  Internal interrupts   : 2 channels
                           (timer, serial interface)
- General input/output ports
  • Input/output ports : 5 lines (+4: Segment pins)
  • Input ports   : 4 lines (with internal pull-up
                           resistor)
  • Output ports   : 0 (+12: segment pins, 8 with
                           LED direct drive capability.)
- Power-on reset, CE reset, and power failure detection circuit on chip
- Low-power consumption CMOS
- Supply voltage   : 5 V ±10%
- 64-pin plastic QFP
- Mask ROM version   : μPD17106

PIN CONFIGURATION (Top View)
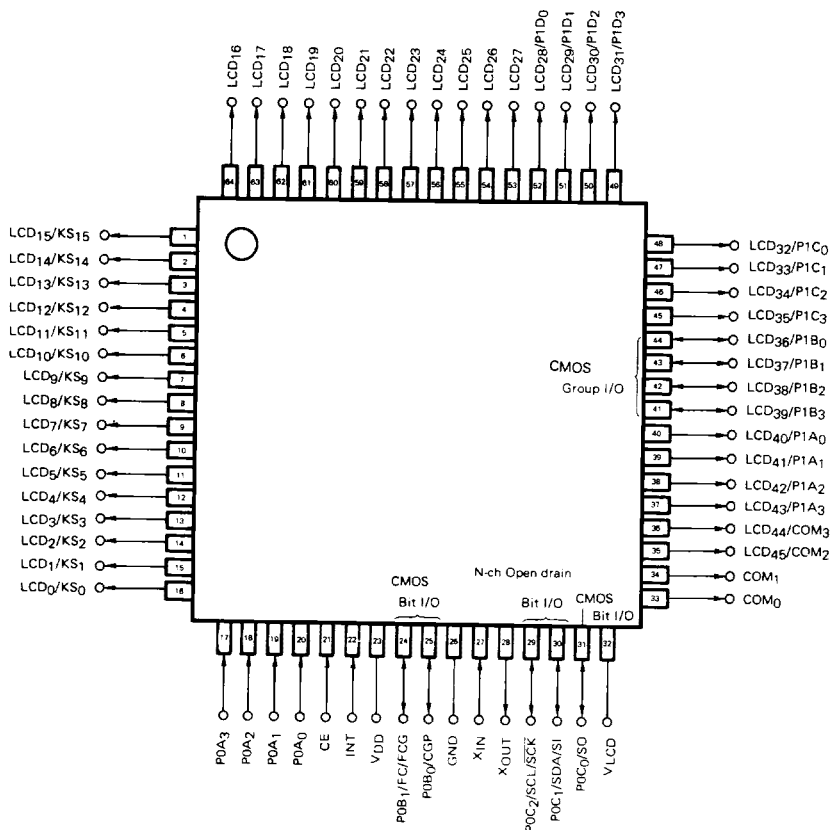
BLOCK DIAGRAM

DEVELOPMENT SUPPORT TOOLS

The following support tools are available for system development using the μPD17P106.

Hardware	
Name	**Description**
In-circuit emulator (IE-17K)	The IE-17K is an in-circuit emulator which can be used with all models in the μPD17000 series. For μPD17P106 program development, the IE-17K is used in conjunction with the SE-17106 system evaluation board. As the IE-17K features RAM-based operation, immediate program additions and amendments can be made by connecting a console to the IE-17K. Moreover, use of the "SIMPLEHOST" support software provides a higher-level development environment.
SE board* (SE-17106)	The SE-17106 is a μPD17P106 system evaluation board used either alone or together with the IE-17K.
Probe* (EP-17106GC)	The EP-17106GC is a probe for connection of the target system to the SE-17106.
Receptacle* (EV-9200GC-64)	The EV-9200GC-64 is a socket for connection of the target system to the EP-17106.
EPROM programmer (Manuf. by Ando Electric Co., Ltd.) — AF-9703	EPROM programmer. For the μPD17P106, the programmer is used in conjunction with the special μPD17P106 adapter (Ver. 5 or later should be used).
EPROM programmer (Manuf. by Ando Electric Co., Ltd.) — Special adapter for μPD17P106*	Adapter used in conjunction with the AF-9703.

Software					
Name		**Description**	**Host Machine**	**OS**	**Ordering Code**
Assembler	Assembler (AS17K)	AS17K is the assembler for use with the entire μPD17000 series. AS17K is used in conjunction with the device file (AS17106).	PC-9801 series IBM PC-AT™	MS-DOS™ Ver. 2.11 Ver. 3.1 PC DOS™ Ver. 3.1	MS-DOS version μS5A1AS17K (8-inch 2D) μS5A10AS17K (5-inch 2HD) PC DOS version μS7B11AS17K (5-inch 2D)
	Device file* (AS17106)	AS17106 is used together with AS17K to assemble μPD17P106 programs.			MS-DOS version μS5A1AS17106 (8-inch 2D) μS5A10AS17106 (5-inch 2HD) PC DOS version μS7B11AS17106 (5-inch 2D)
Support software* (SIMPLEHOST)		SIMPLEHOST is software which implements the man-machine interface under MS-WINDOWS™ during program development using the IE-17K and a personal computer.		MS-WINDOWS™	——

Remarks: For details of the EPROM programmer, please consult Ando Electric Co., Ltd.

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