



WT50F6

**8-bit μ C with 8KB ISP Flash Memory, 8-CH
12-bit A/D Converter and 16x4 LCD Driver**

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**8-bit μ C with 8KB ISP Flash Memory,
8-CH 12-bit A/D Converter and 16x4 LCD Driver**

E-Tech Electronics Ltd.

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DESCRIPTION

The WT50F6 is a high-performance, low-cost, CMOS 8-bit single-chip micro controller with 8Kbytes in-system-programmable flash memory, an 8-channel 12-bit rail-rail A/D converter and 16x4 LCD driver. This chip is suitable for variable applications, especially where analog signal (sensor output) to digital signal conversion, LCD display and short development cycle are required, including industrial control, consumer, communications, and security products.

This chip has 8-bit CPU, RAM, flash memory, I/Os, dual 16-bit timer/counters; interrupt controller, 16x4 LCD driver and an 8-channel 12-bit A/D converter. To be suitable for portable battery-powered applications, a power saving function is included.

FEATURES

- ◆ 8-bit single chip micro controller with 8K bytes flash memory and 384bytes SRAM
- ◆ Wide voltage operating range from 2.7 V to 5.5 V
- ◆ On-chip RC oscillator runs at 8MHz and crystal oscillator can run up to 8.0 MHz
- ◆ 8 interrupt sources (external:2; internal:6) ; all sources have independent latches each and multiple interrupt control is available
- ◆ I/O port (32 pins)
 - ◆ Port P0 8 pins (shared with analog inputs)
 - ◆ Port P1 8 pins (P10~P13 25 mA source; P10~P17 25mA sink current)
 - ◆ Port P2 8 pins (shared with SEG9~SEG16)
 - ◆ Port P3 8 pins (shared with SEG1~SEG8)
 - ◆ Port P4 1 pins P41 share with EXTINT
- ◆ Interval Timer (Internal time base generator)
- ◆ Operating current 2mA/4MHz@5V; providing standby mode (OSC is stopped and current consumption < 1 μ A@5V) and external pin wake-up mode
- ◆ Watchdog timer
- ◆ Dual PWM
- ◆ Dual 16-bit timer/counters

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- ◆ UART and serial I/O interface
- ◆ A/D converter module
 - ◆ 8 analog inputs multiplexed into one A/D converter
 - ◆ Sample and hold
 - ◆ 20 μ S conversion time/per channel
 - ◆ 12-bit resolution rail to rail with ± 2 LSB accuracy
 - ◆ Selectable reference voltage from external input AD_{VRF} or internal VDD
- ◆ LCD driver
 - ◆ LCD direct drive (max. 64dots LCD display at 1/4 duty)
 - ◆ Selectable LCD bias voltage from external input VLCD or internal VDD
 - ◆ 1/4, 1/3, 1/2 duties and 1/2, 1/3 biases can be selected by programming
- ◆ Programming for flash memory
 - ◆ Programming lock for software security; read/write protection (signature compare)
 - ◆ In-system-programming via two-wire serial control protocol
- ◆ Package:
 - ◆ Die
 - ◆ 48-pin LQFP
 - ◆ 40-pin PDIP
 - ◆ 28-pin PDIP / SOP (300mil) / SSOP (209mil)

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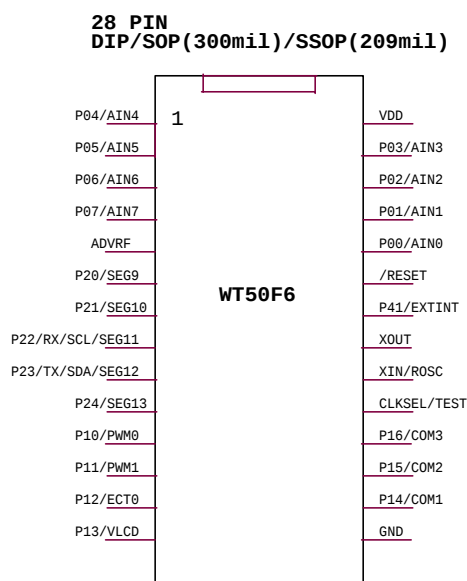
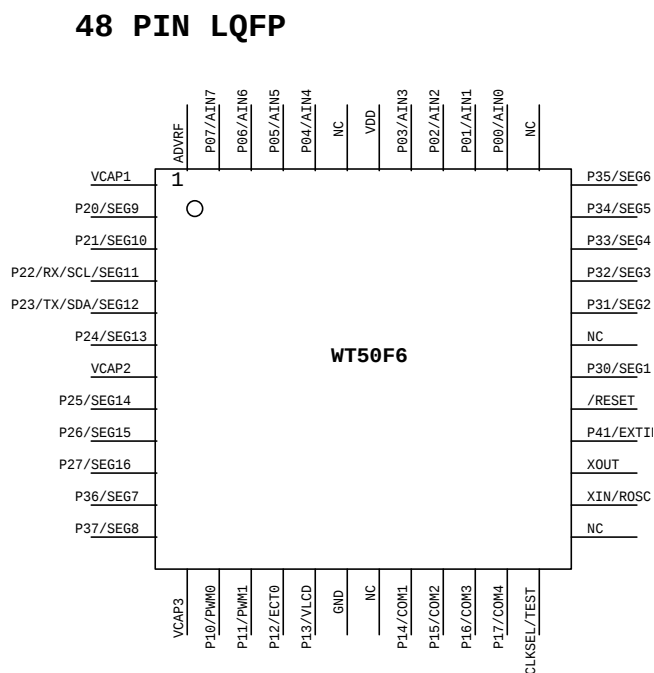
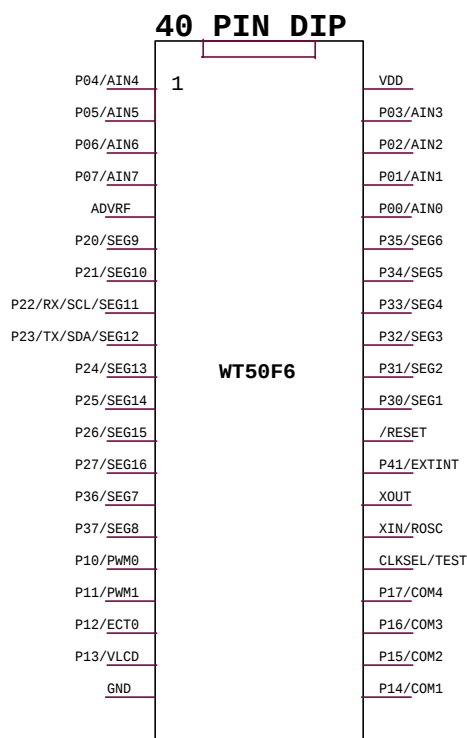
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PACKAGE PIN ASSIGNMENT



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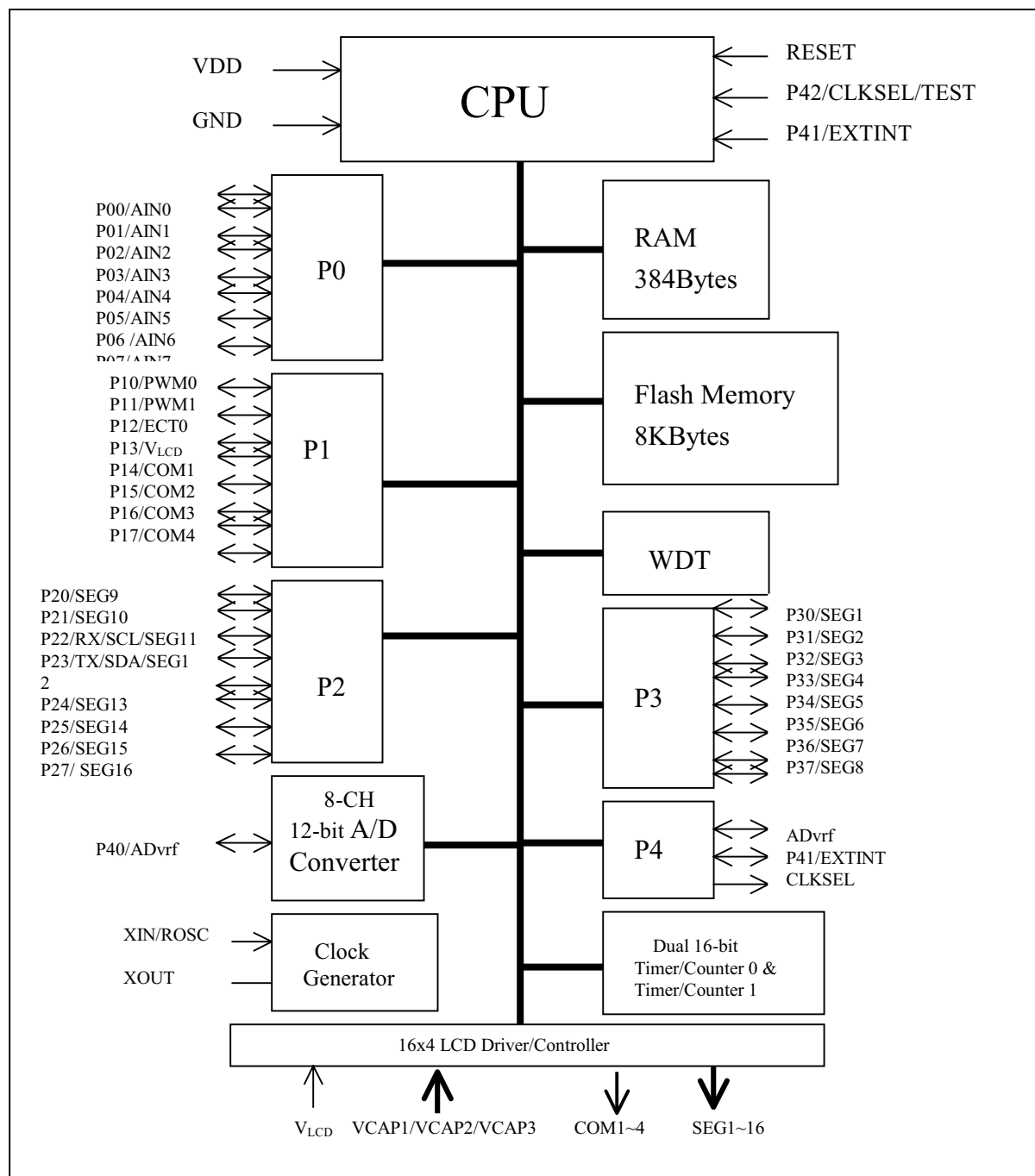
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BLOCK DIAGRAM



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PIN FUNCTION

PIN NAME	Die	40-pin	48-pin	28-pin	In/Out	FUNCTIONS
P00/AIN0~ P03/AIN3 P04/AIN4~P07/AIN7	39 ~ 42 1~4	36 ~ 39 1~4	38~41 44~47	24~27 1~4	I/O	8-bit I/O port; internal pull-up; ; i/p: external pull-low (Shared with analog inputs)
P10/PWM0 P11/PWM1 P12/ECT0 P13/V _{LCD} P14/COM1 P15/COM2 P16/COM3 P17/COM4	19 20 21 22 24 25 26 27	16 17 18 19 21 22 23 24	14 15 16 17 20 21 22 23	11 12 13 14 16 17 18 *	I/O	(Shared with PWM output); 8-bit I/O port; internal pull-up; o/p: 4-pin source 25mA; 8-pin sink 25mA i/p: external pull-low (External counter) (External bias voltage to LCD) (LCD common output) (LCD common output) (LCD common output) (LCD common output)
P20/SEG9 P21/SEG10 P22/Rx/SCL/SEG11 P23/Tx/SDA/SEG12 P24/SEG13 P25/SEG14 P26/SEG15 P27/SEG16	7 8 9 10 11 13 14 15	6 7 8 9 10 11 12 13	2 3 4 5 6 8 9 10	6 7 8 9 10 * * *	I/O	8-bit I/O port; internal pull-up; i/p: external pull-low (Shared with LCD segment output) P20~P23 support key wake-up & interrupt function P22 shared with serial interface Rx (asyc.)/SCL (sync.) P23 shared with serial interface Tx (asyc.)/SDA (sync.)
P30/SEG1 P31/SEG2 P32/SEG3 P33/SEG4 P34/SEG5 P35/SEG6 P36/SEG7 P37/SEG8	33 34 35 36 37 38 16 17	30 31 32 33 34 35 14 15	30 32 33 34 35 36 11 12	* * * * * * * *	I/O	8-bit I/O port; internal pull-up; i/p: external pull-low (Shared with LCD segment output)
XIN/ROSC	29	26	26	20	Input	Crystal input/ROSC input
XOUT	30	27	27	21	Output	Crystal output
/RESET	32	29	29	23	Input	System reset signal input; low active
VDD	43	40	42	28	Input	Power source
GND	23	20	18	15	Input	Ground
AD _{VREF}	5	5	48	48	Input	A/D Reference voltage input
P41/EXTINT	31	28	28	5	I/O	I/O pin or External interrupt input
CLKSEL/TEST	28	25	24	19	Input	In the initial state use for Clock sources select, connected to pull-up Resistor for ROSC or to pull-down resistor for Crystal (Test Pin)
VCAP1, VCAP2, VCAP3	6,12,1 8	*	1,7,13	*	Input	LCD capacitor for power saving use *40-pin don't support this function