



WT65F4
USB uC with 8KB ISP Flash Memory
and 12-bit A/D Converter

WT65F4
USB uC with 8KB ISP Flash Memory
12-bit A/D Converter

Data Sheet

REV. 1.00

Nov.18, 2001

The information in this document is subject to change without notice.

©Waltrend Semiconductor, Inc. All Rights Reserved.



WT65F4

USB uC with 8KB ISP Flash Memory and 12-bit A/D Converter

Preliminary

1. General Description

The WT65F4 is single chip Micro-controller with low speed Universal Serial Bus (USB) and A/D functions. It includes an 8-bit 8051 CPU core, 256 bytes SRAM, 8K Bytes Flash memories, 4K boot/ICE ROM, and 32 Programmable I/O. Build-in USB and A/D function suitable for UPS, touch pad, joystick & digital board application.

2. Features

- 8051 CPU core
 - Internal Oscillator circuit for crystal from 0.5MHz, 1MHz, 2MHz, 4MHz, 6MHz, 8MHz to 12MHz
 - 256 bytes SRAM
 - 4K byte Internal ROM for ISP and software ICE function use
 - 8K bytes Flash Memory
 - 4 flash programming modes: parallel, 2-wire ISP, ICE, and normal mode (USB download and RS232 download).
 - 32 programmable I/O pins
 - 8-pin key wake up function
 - Full duplex serial bus for synchronous or asynchronous
 - Embedded USB function with three endpoints (one control Endpoint0, two Interrupt IN endpoint)
 - Watchdog timer (2^{22} clock cycles time)
 - Two 16-bit programmable timers
 - Two-channel 8-bit programmable PWM
 - ADPCM push-pull DA
 - Seven-channel 12-bits rail-to-rail A/D converters
 - Low VDD reset at 3.5V ~ 3.7V
 - Power on reset
 - Support power down/idle power management
 - Integrated 3.3V power regulator for USB use
 - CMOS technology for low power consumption
 - Total 4 ports with 25mA Source Current and 8 ports with 25mA Sink Current
 - DIP-40, LQFP-48, SDIP-28 or SOP-28 package
-



WT65F4

USB uC with 8KB ISP Flash Memory and 12-bit A/D Converter

Preliminary

3. Package information

Table 1. WT65F4 Package Types

| Package Type | Part Number |
|--------------|-------------|
| LQFP 48 | WT65F4 -Q48 |
| DIP 28 | WT65F4 -N28 |
| DIP 40 | WT65F4 -N40 |
| SOP 28 | WT65F4 -S28 |



WT65F4

USB uC with 8KB ISP Flash Memory and 12-bit A/D Converter

Preliminary

4. Pin Assignment and Description

Table 2. Pin Descriptions

| Pin No. | | | Pin Name | I/O | Description |
|---------|----|----|----------|-----|--|
| 48 | 40 | 28 | | | |
| 46 | 1 | | P1.0 | I/O | General purpose I/O with pull-up resistor |
| 47 | 2 | | P1.1 | I/O | General purpose I/O with pull-up resistor |
| 48 | 3 | | P1.2 | I/O | General purpose I/O with pull-up resistor |
| 1 | 4 | | P1.3 | I/O | General purpose I/O with pull-up resistor |
| 2 | 5 | | P1.4 | I/O | General purpose I/O with pull-up resistor |
| 3 | 6 | | P1.5 | I/O | General purpose I/O with pull-up resistor |
| 4 | 7 | | P1.6 | I/O | General purpose I/O with pull-up resistor |
| 5 | 8 | | P1.7 | I/O | General purpose I/O with pull-up resistor |
| 6 | 9 | 25 | RESET | I | Active High external Reset input |
| 7 | 10 | 26 | P30/RXD | I/O | General purpose I/O with pull-up resistor/serial bus receive port |
| 8 | 11 | 27 | P31/TXD | I/O | General purpose I/O with pull-up resistor/serial bus transmit port |
| 9 | 12 | 28 | P32/INT0 | I/O | General purpose I/O with pull-up resistor/external interrupt 0 |
| 10 | 13 | 1 | P33/INT1 | I/O | General purpose I/O with pull-up resistor/external interrupt 1 |
| 11 | 14 | 2 | P34/T0 | I/O | General purpose I/O with pull-up resistor/Timer 0 external input |
| 12 | 15 | 3 | P35/T1 | I/O | General purpose I/O with pull-up resistor/Timer 1 external input |
| 13 | 16 | 4 | P36/PWM0 | I/O | General purpose I/O with pull-up resistor/PWM0 output |
| 14 | 17 | 5 | P37/PWM1 | I/O | General purpose I/O with pull-up resistor/PWM1 output |
| 15 | | | VSS | I | Power Ground for DAC |
| 16 | | | DAOUT0 | O | DAC output 0 |
| 17 | | | DAOUT1 | O | DAC output 1 |
| 18 | | | VDD | I | Power Source for DAC |
| 19 | 18 | 6 | XTAL2 | O | Oscillator output |
| 20 | 19 | 7 | XTAL1 | I | Oscillator input |
| 21 | 20 | 8 | VSS | P | Power ground |



WT65F4

USB uC with 8KB ISP Flash Memory and 12-bit A/D Converter

Preliminary

| | | | | | |
|----|----|----|------------|-----|---|
| 22 | 21 | 9 | P20/AD0 | I/O | General Purpose I/O with pull-up resistor/ADC channel 0 (25mA Source/Sink current) |
| 23 | 22 | 10 | P21/AD1 | I/O | General Purpose I/O with pull-up resistor/ADC channel 1 (25mA Source/Sink current) |
| 24 | 23 | 11 | P22/AD2 | I/O | General Purpose I/O with pull-up resistor/ADC channel 2 (25mA Sink current) |
| 25 | 24 | 12 | P23/AD3 | I/O | General Purpose I/O with pull-up resistor/ADC channel 3 (25mA Sink current) |
| 26 | 25 | 13 | P24/AD4 | I/O | General Purpose I/O with pull-up resistor/ADC channel 4 (25mA Source/Sink current) |
| 27 | 26 | 14 | P25/AD5 | I/O | General Purpose I/O with pull-up resistor/ADC channel 5 (25mA Source/Sink current) |
| 28 | 27 | 15 | P26/AD6 | I/O | General Purpose I/O with pull-up resistor/ADC channel 6 (25mA Sink current) |
| 29 | 28 | 16 | P27/Advref | I/O | General Purpose I/O with pull-up resistor/ADC reference voltage (25mA Sink current) |
| 30 | 29 | 17 | DM | I/O | USB D- signal |
| 31 | 30 | 18 | DP | I/O | USB D+ signal |
| 32 | 31 | 19 | V33 | P | 3.3V power regulation output |
| 33 | 32 | | P07/KI7 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 34 | 33 | | P06/KI6 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 35 | 34 | | P05/KI5 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 36 | 35 | | P04/KI4 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 37 | | | ICE_N | I | ICE mode input with internal pull-up. Active low. |
| 38 | | | ICESTOP_N | I | Run interrupt in ICE mode with pull-up resistor. Active low |
| 39 | | | P41 | I/O | General Purpose I/O with pull-up resistor. |
| 40 | | | P40 | I/O | General Purpose I/O with pull-up resistor. |
| 41 | 36 | 20 | P03/KI3 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 42 | 37 | 21 | P02/KI2 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 43 | 38 | 22 | P01/KI1 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 44 | 39 | 23 | P00/KI0 | I/O | General Purpose IO with pull-up resistor/key interrupt. |
| 45 | 40 | 24 | VDD | I | +5V power supply. |



WT65F4

USB uC with 8KB ISP Flash Memory and 12-bit A/D Converter

Preliminary

4.1 Pin Configuration

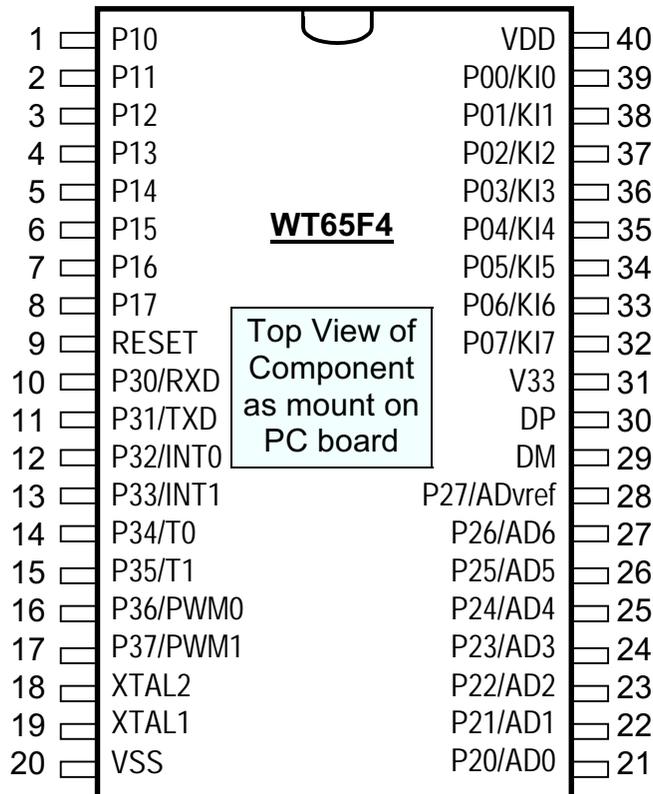
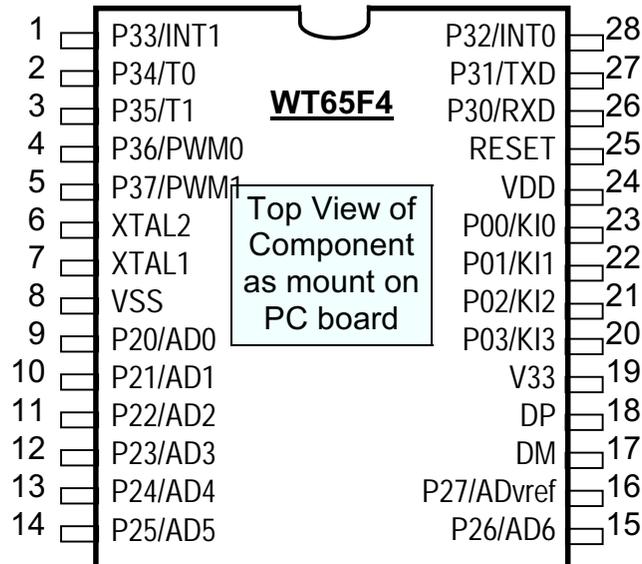


Figure 1. WT65F4 40-pin DIP & 28-pin SOP/DIP package

WT65F4

USB uC with 8KB ISP Flash Memory and 12-bit A/D Converter

Preliminary

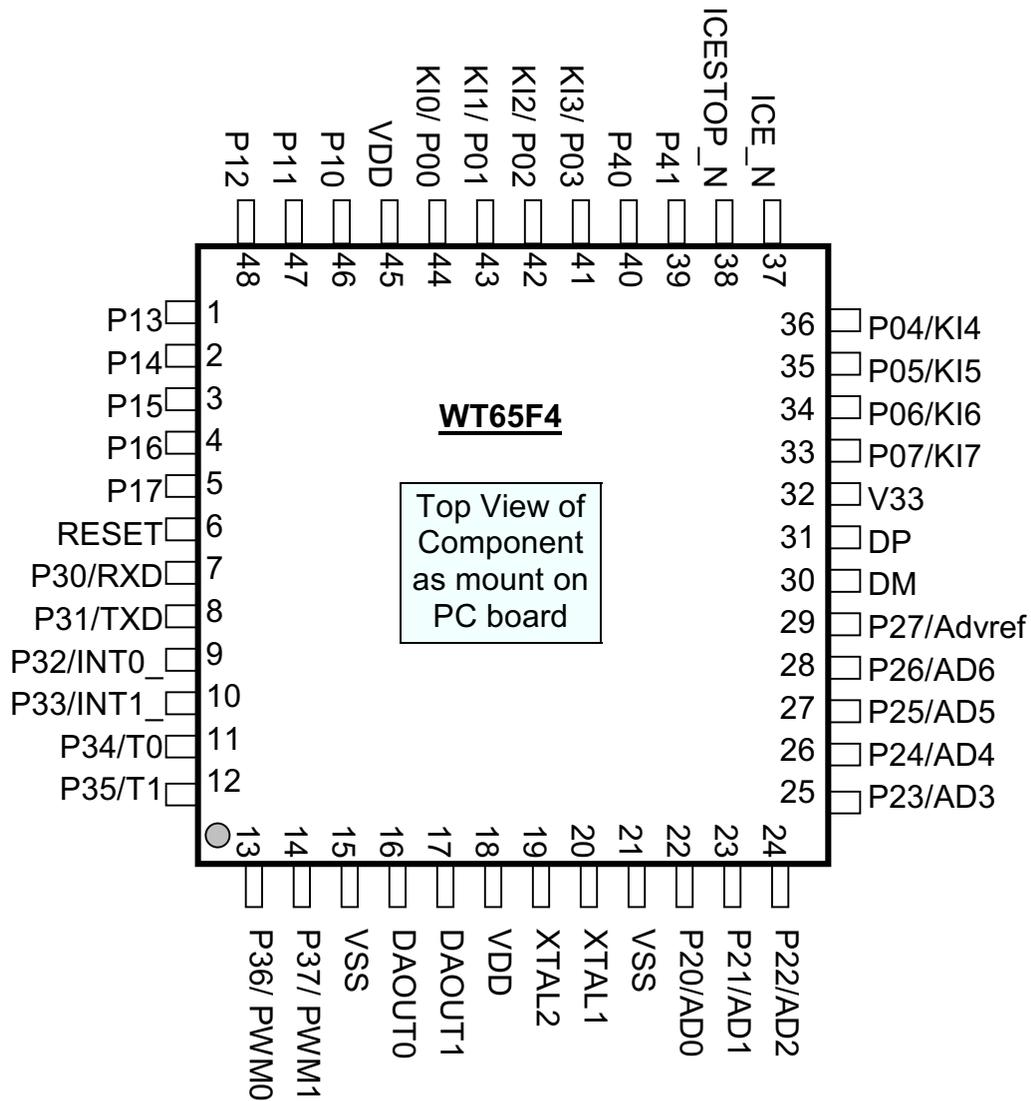


Figure 2. WT65F4 48-pin QFP package