

Flex IO Expander – IO Expander LSI

Abstract

Flex IO Expander(TC35893XBG)

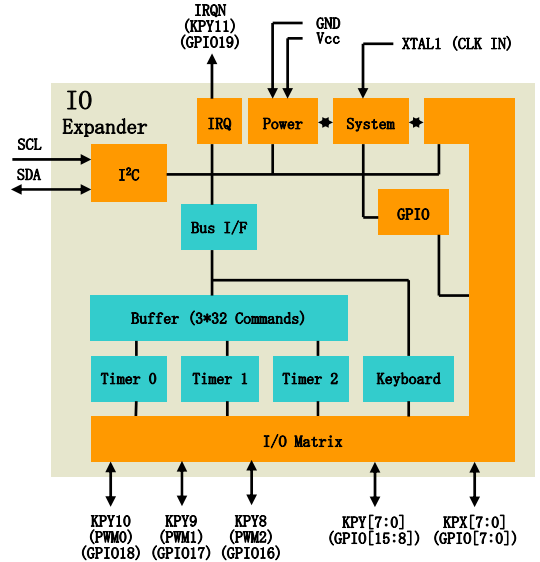
This enhanced Flex IO Expander is a solution for the mechanical and electrical challenges that arise during the design of a modern high-end clam-shell, slider or advanced feature phone.

By conception, typical baseband or application processor LSI packages are kept at a minimum pin count to compromise functionality with respect to the cost.

Moreover, the number of wires being routed over the hinges should be minimised due to the mechanical properties and to reduce EMI noise.

The Flex IO Expander overcomes those limits. It's flexible expansion capabilities makes it particularly useful for entire platform roadmaps with different functional extensions for each member of the platform family.

Block Diagram



Feature

- Reduction of mechanical stress and EMI on hinges in clam shell phones**
 TC35893XBG dramatically reduces the number of wires through hinges. And due to reducing the wires, EMI noise is also reduced.
- Full support of low power operation**
 Internal clock control by an auto-sleep feature sensing the activities of the LSI. Clock-less operation for most operating states.
- I/O expansion of baseband processors**
 Baseband or application processor chip packages are often limited in the amount of balls for peripherals. The TC35893XBG provides up to 20 general purpose input/output pins at the location, where needed.
- Expand your mobile phone with up to 96+8 keys**
 The TC35893XBG provides the full flexibility to handle various keyboard configuration from 2x2 to 8x12. In addition, 8 special function keys are supported. And it is possible to push max. 4 keys simultaneously. The keyboard module has debouncing function which the timing can be controlled by register setting.
- PWM signal generation for LED and vibrator control**
 Three independent versatile timers can be programmed to generate modulated PWM signals without interaction of the host processor during runtime. And the PWM output timing can be controlled by the programmable prescaler setting.

Expander
Flexible IO

Product Features

Low Power Features:

- Power supply: 1.62V to 3.6V.
- Operates from low frequency clock source, 32kHz, optional up to 20MHz.
- Clockless operation is possible for most of features.
- Two modes (operating & sleep), activity controlled.
- Standby current typically 20uA.
- Power watchdog to detect power rail fails

20 configurable Input/Output ports:

- Pseudo Open drain configuration
- Programmable pull up/down resistors
- Programmable drive strength
- Schmitt trigger inputs
- Asynchronous interrupt generation

Three cascadable 32x16 bit timers:

- PWM with programmable aspect ratio
- State-machine to generate PWM ramping without interaction of the host processor
- One-shot/perpetual interrupt generation

I2C slave:

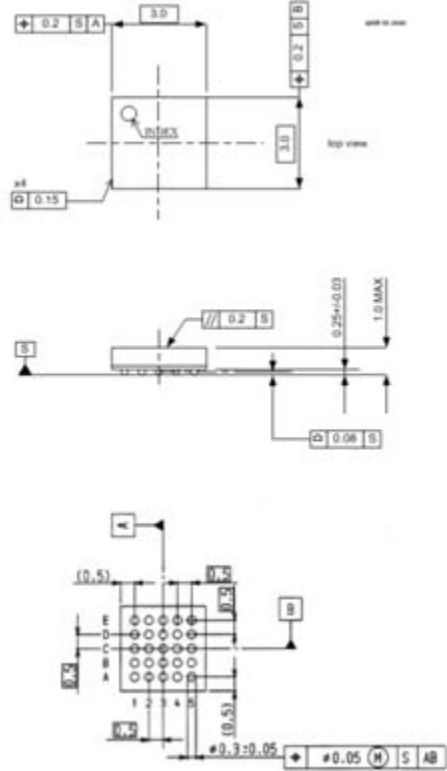
- Transmission speed up to 400KHz
- Configurable slave address

Failsafe operation for:

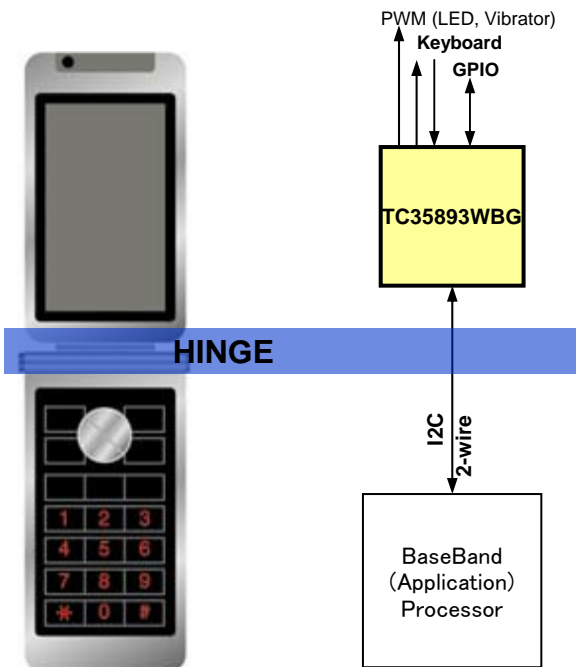
- I2C, interrupt

Package:

- P-VFBGA25-0303-0.50
- 25 pin 0.5mm ball pitch
- Maximum height 1.0mm, Size 3.0x3.0 mm²



Application



Keyboard Function



**I/O extension
Peripheral Device Control**



Functional extension for existing platform

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