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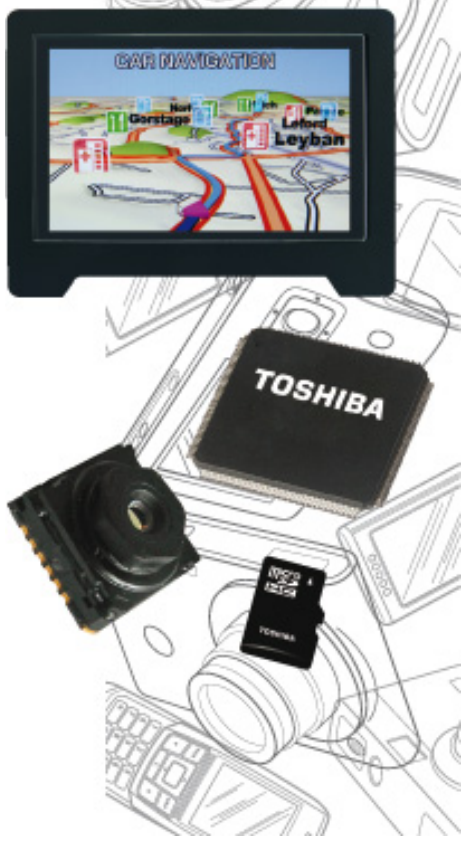
Mobile Peripheral Devices

IO Expander

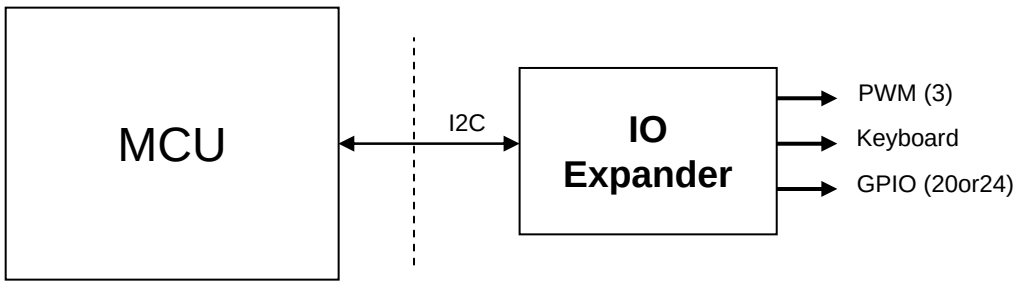
TC35892XBG
TC35893XBG
TC35894XBG



- Enhance system IO functionality
- Enable easy keyboard control
- PWM and timer functions
- Easy system integration via I2C

IO Expander - Applications

- The TC3589X product family simplifies the extention of systems which suffer from IO contraints or need remote IO. All IOs can generate interrupts.
- Furthermore it enables a safe decoding of a keyboard or single keys without additional software overhead.
- Timer triggered PWM outputs are useful for simple D/A conversion or creation of any pulse pattern e.g. for a simple motor control.
- The system integration happens via a 2-wire I2C connection
- Different power save modes (stand-by 20uA)



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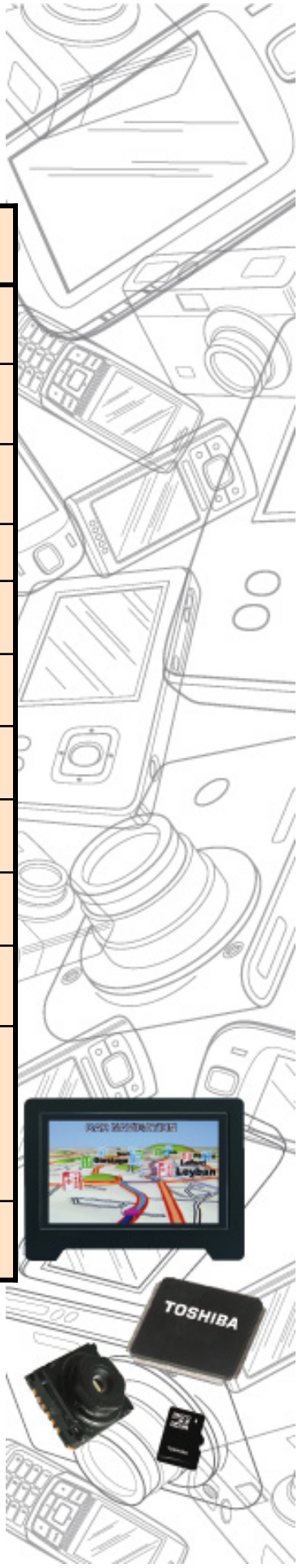
IO Expander - Features

Items	TC35892XBG	TC35893XBG	TC35894XBG
Host interface	**I2C**	**I2C**	**I2C**
GPIO (max number)	**24 Port**	**20 Port**	**24 Port**
De-bouncing	**Configurable**	**Configurable**	**Configurable**
Key Matrix	**Max. 96(8 x 12)**	**Max. 96(8 x 12)**	**Max. 96 (8 x 12)**
Direct Key support	**-**	**-**	**Available**
PWM	**3ch**	**3ch**	**3ch**
I2C address definition	**By pin setting**	**Programmable**	**Programmable**
Oscillator	**Internal or External**	**Internal**	**Internal**
Interrupt Output	**1**	**1**	**1**
Power Supply	**1.62V~2.70V**	**1.62V~3.6V**	**1.62V~3.6V**
Package*	**3.5mm x 3.5mm 36pin BGA, 0.5pitch**	**3.0mm x 3.0mm 25pin BGA, 0.5pitch**	**3.5mm x 3.5mm 36pin BGA, 0.5pitch**
Status	**MP**	**MP**	**MP**



*: additional package options are under development

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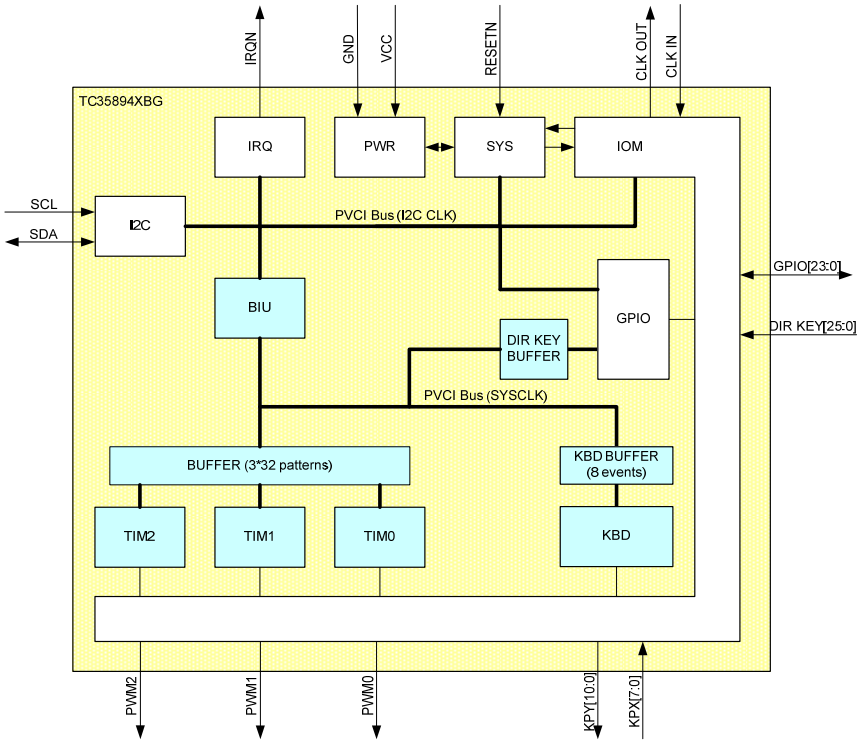
IO Expander – Technical

- Technical Data:
  - Operating Voltage: 1.62V to 3.6V
  - Stand-by current: 20uA
  - Clock: from 32KHz up to 20 MHz
  - Power fail watchdog
  - Configurable IO (OD, Pup/Pdown, Schmitt Trigger, Drive Strength)
  - Interrupt function to MCU
  - Three 16bit timer, cascadable
  - PWM output with programmable duty cycle
    - Programming by internal state machine
  - I2C slave up to 400KHz
  - Package: BGA, QON*, QFN*



*: additional package options are under development

*: under preparation

General Information

- Other Mobile Peripheral Devices
  - TV out controller
  - HDMI out controller
  - MIPI® and MDDI® display controller and interface chips

- You can find further information about Toshiba Mobile Peripheral Devices on http://www.toshiba-components.com/applications/mobilehandsets/Index.htm

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