

## \* USB Full-Speed Hub Controller



RENESAS 8Bit Single-chip Microcomputer  
740 Family / 38000 Series



Renesas Technology Corp.



# Advantage of 38K2 group (#2) USB function #2



**Point 1** Using flexibility!  
Can be freely set USB Transfer contents each Endpoint to fit user application.

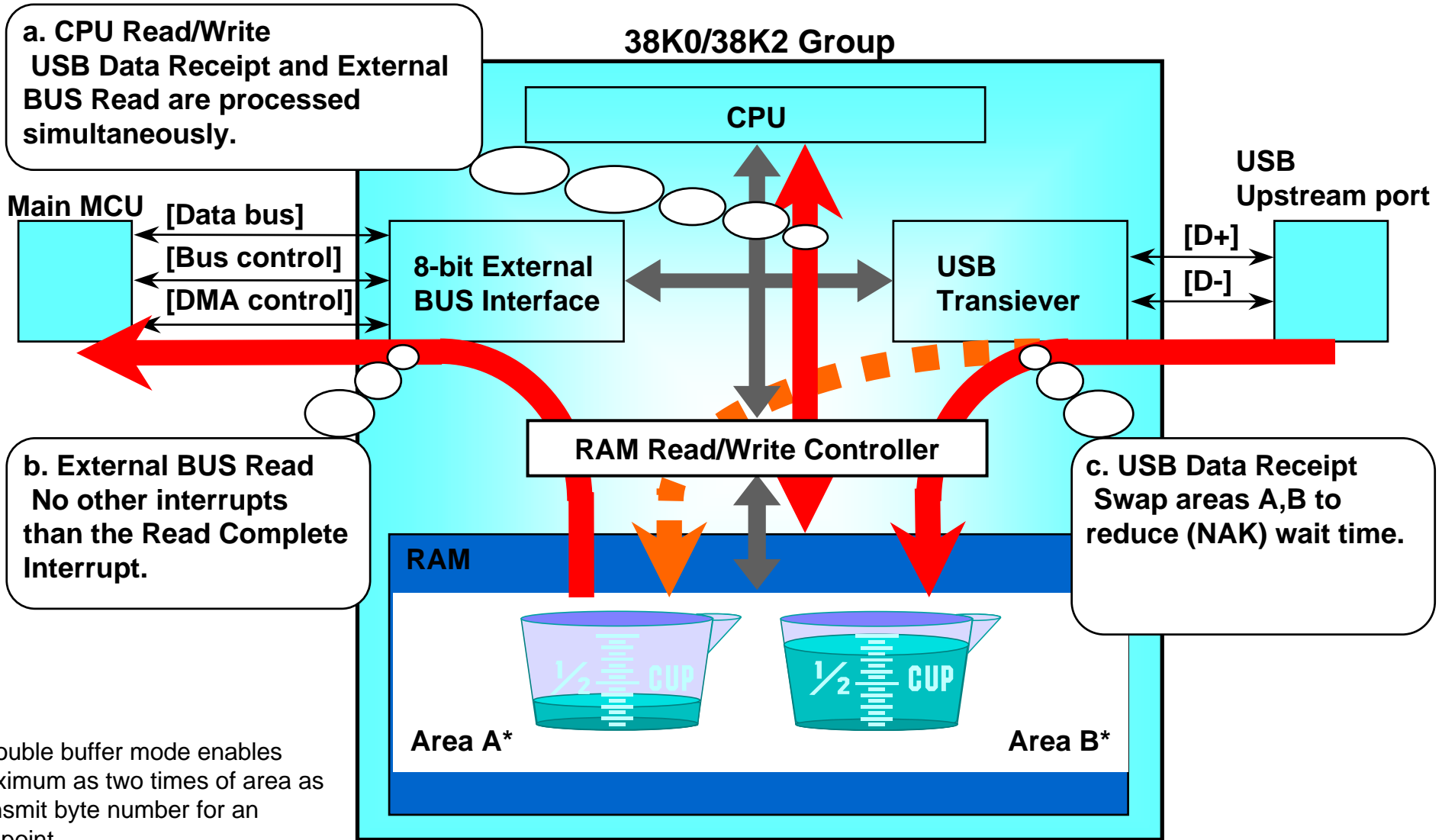
	Transfer type	Transfer direction	Buffer size	Interrupt condition
Endpoint0	Control(Const.)	SETUP,IN,OUT (Const.)	8(Const.)	Completed (Const.)
Endpoint1	Selectable Interrupt, Bulk, Isochronous.	Selectable IN, OUT	Selectable 8,16,32,64	Selectable Completed, Incompleted
Endpoint2				
Endpoint3				



**Point 2** Simple to use!  
Can easily process USB signal and Hub port condition using interrupt routine.

USB RESET, SUSPEND, RESUME	Selectable Completed, Incompleted
Attach/Detach Remote wake-up	Selectable Attach/Detach, Signal detected

# Advantage of 38K2 group (#3) External BUS Interface



\* Double buffer mode enables maximum as two times of area as transmit byte number for an endpoint.

# Advantage of 38K2 group (#4) Overview #1



**Easy  
control!**

USB Hub function and USB Full-Speed function in 1-chip microcomputer!

Can **easily design USB Hub application** only added custom application in USB function because USB Hub is maintenance-free.

**Many USB  
function!**

USB function can select all transfer type (Control(Endpoint0), Interrupt, Bulk, and Isochronous), can select transfer direction (IN, OUT) each Endpoint, and Upstream port has D+ pull-up power supply output port (TrON).

**Trust!**

Including USB SIE uses RENESAS original IP that has already passed USB Implementers Forum **USB Compatibility Workshops (Plug-fest)**!

In addition to 38K2 group, many RENESAS USB devices have already passed USB Plug-fest.

# Advantage of 38K2 group (#5) Overview #2



## **Many other function!**

Valuable functions in addition to USB!  
**External bus interface** can be used as slave, hi resolution **A/D converter** can be used efficient analog control, **serial I/F** can be used communication with other device, **key-on wake up, INT, CNTR** can be used external interrupt detection.

## **Small package!**

Adopted IC package is small!  
Can be used for small product because many function are included **10mm square package** (0.5mm pitch 64-pin LQFP : PLQP0064KB-A(64P6Q-A)).

Also can select Flash version of same package.

## **Good support!**

RENESAS are good supporter for USB devices!  
RENESAS are supporting technical document distribution with internet, FAQ with E-mail, and USB technical seminar (only Japan domestic).

Also development support tool of 38K2 group is prepared USB firmware and evaluation board.

# Feature of 38K2 group

**\*USB Hub Upstream (Hub function)**

**\*USB D+ pull-up voltage output**

**\*USB Hub Downstream: 2ch.**

\*Serial I/F(Clock synchronous/UART): 8bit x 1

\*10bit A/D converter: 8ch.

\*Timer: 8bit x 3 (with 8bit prescaler)

\*Watch-dog timer: 16bit x 1

\*I/O ports: 44

\*INT input function: 2

\*CNTR function: 1

\*Key-on wake up function (Port0)

\*8bit bus I/F: 1ch.

\*0.5mm pitch 64pin LQFP (PLQP0064KB-A)

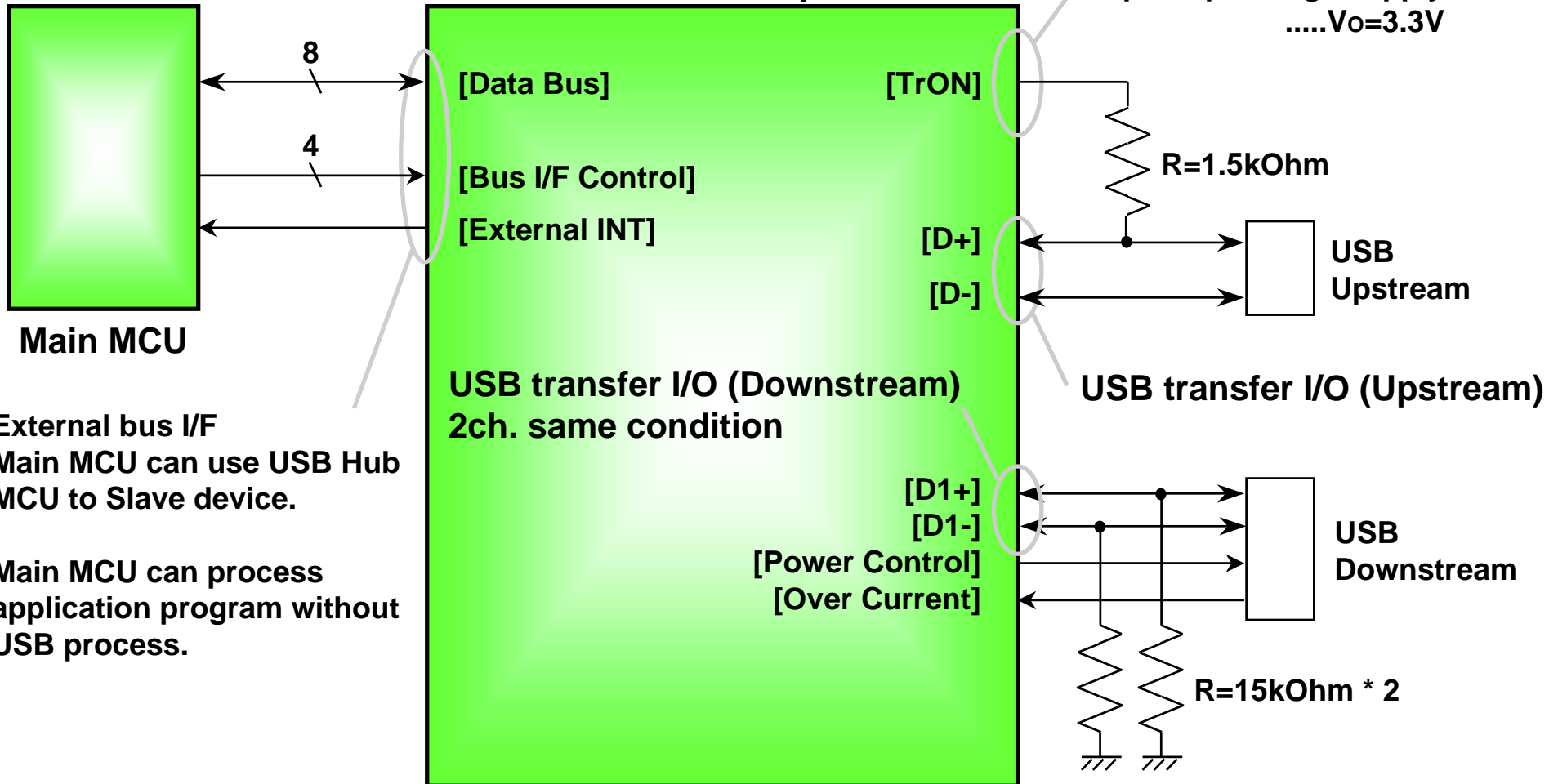
\*0.8mm pitch 64pin LQFP (PLQP0064GA-A)

\*Flash version supported

# 38K2 group application (#1)

## Others : USB Hub slave device

### 38K2 Group



64pin LQFP(0.5mm pitch) / LQFP(0.8 mm pitch)

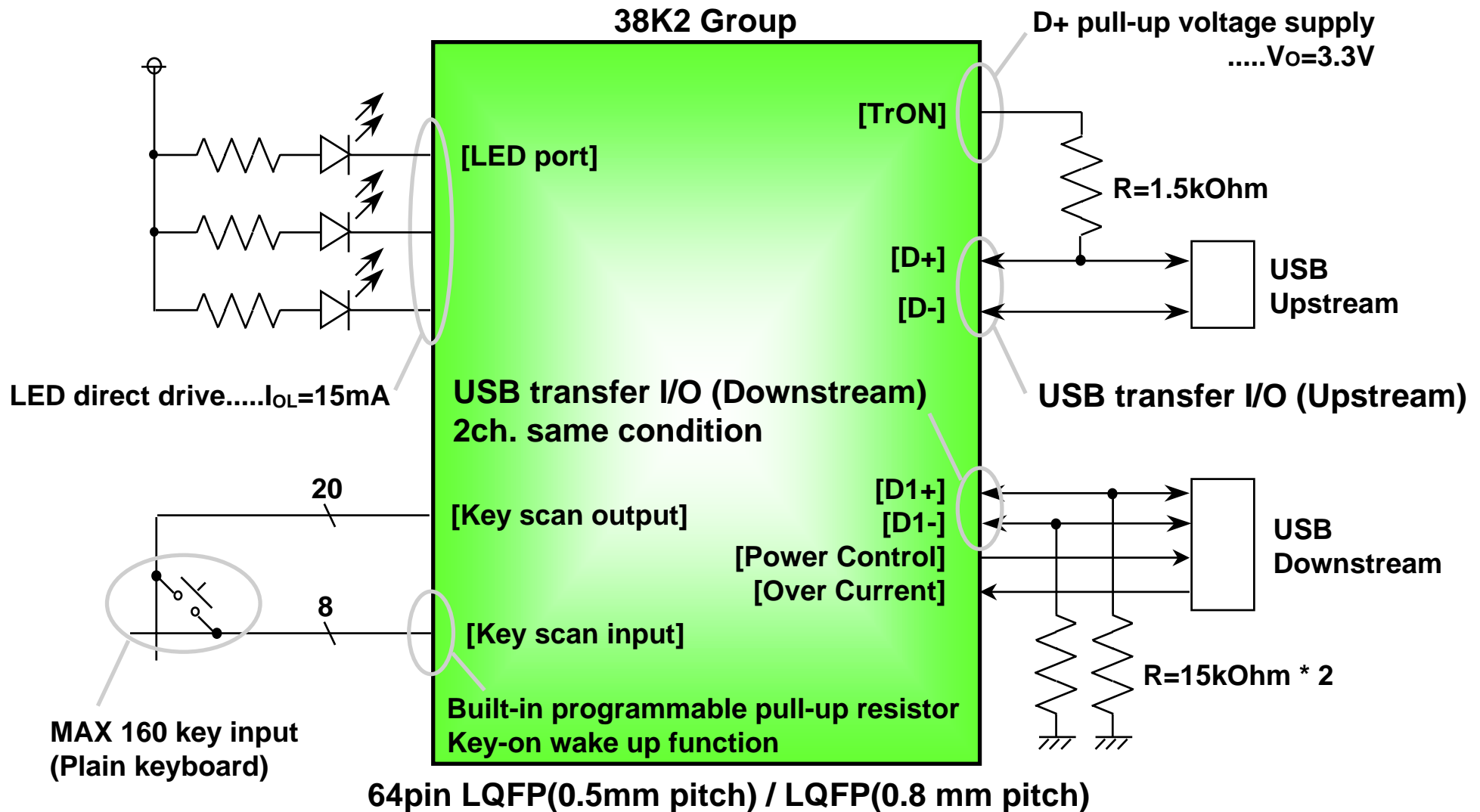
External bus I/F  
Main MCU can use USB Hub  
MCU to Slave device.

Main MCU can process  
application program without  
USB process.



# 38K2 group application (#2)

## HID : USB Hub keyboard



# 38K2 group Application Development Tools

## H/W (Evaluation, Development Board)

### M3A-8K02

Evaluation/development board for the 38K0 Group and 38K2 Group. Embedded with circuits needed for USB function and USB hub, application of the external circuit use universal board (G04) facilitates simple development and evaluation of USB systems. Replacing the two-board set upper surface boards (G02,G03) makes it possible to conduct inspection with both flash-chips and debuggers. Since it is possible to exchange  $V_{cc}=5V/3.3V$ , and USB rewriting/serial rewriting of flash memory with an easy switch, changes in peripheral setup can be performed in a short time.



M3A-8K02 (with M3A-8K02G03)



M3A-8K02G02



M3A-8K02G03



M3A-8K02G04 (with M3A-8K02G01)

## S/W (Firmware)

Standard F/W    Standard Requests / Descriptors

Com. F/W        Communication Device Class Descriptors included

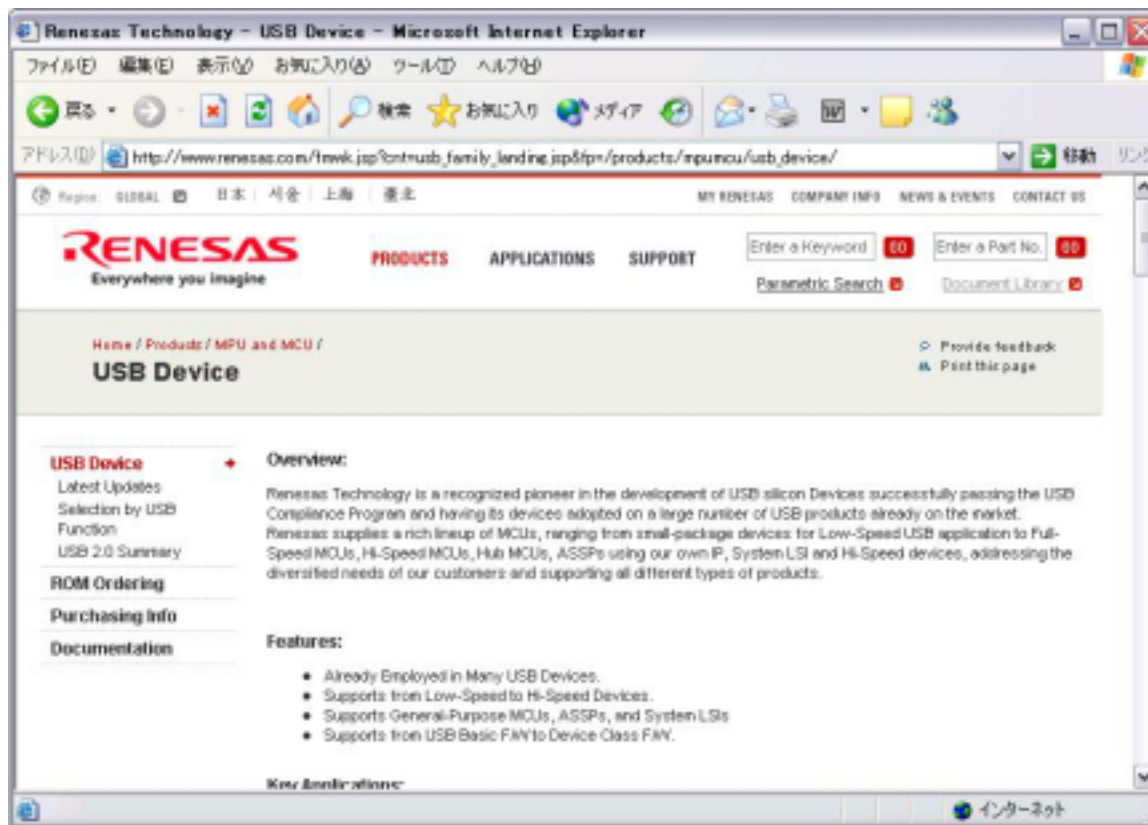
HID F/W         HID Device Class Descriptors (Keyboard) included \*under development

# RENESAS USB devices information

38000  
740 Series

For RENESAS USB devices information (Users' manuals, tools, etc.), please refer to the following Home Page.

<http://www.renesas.com/en/usb>



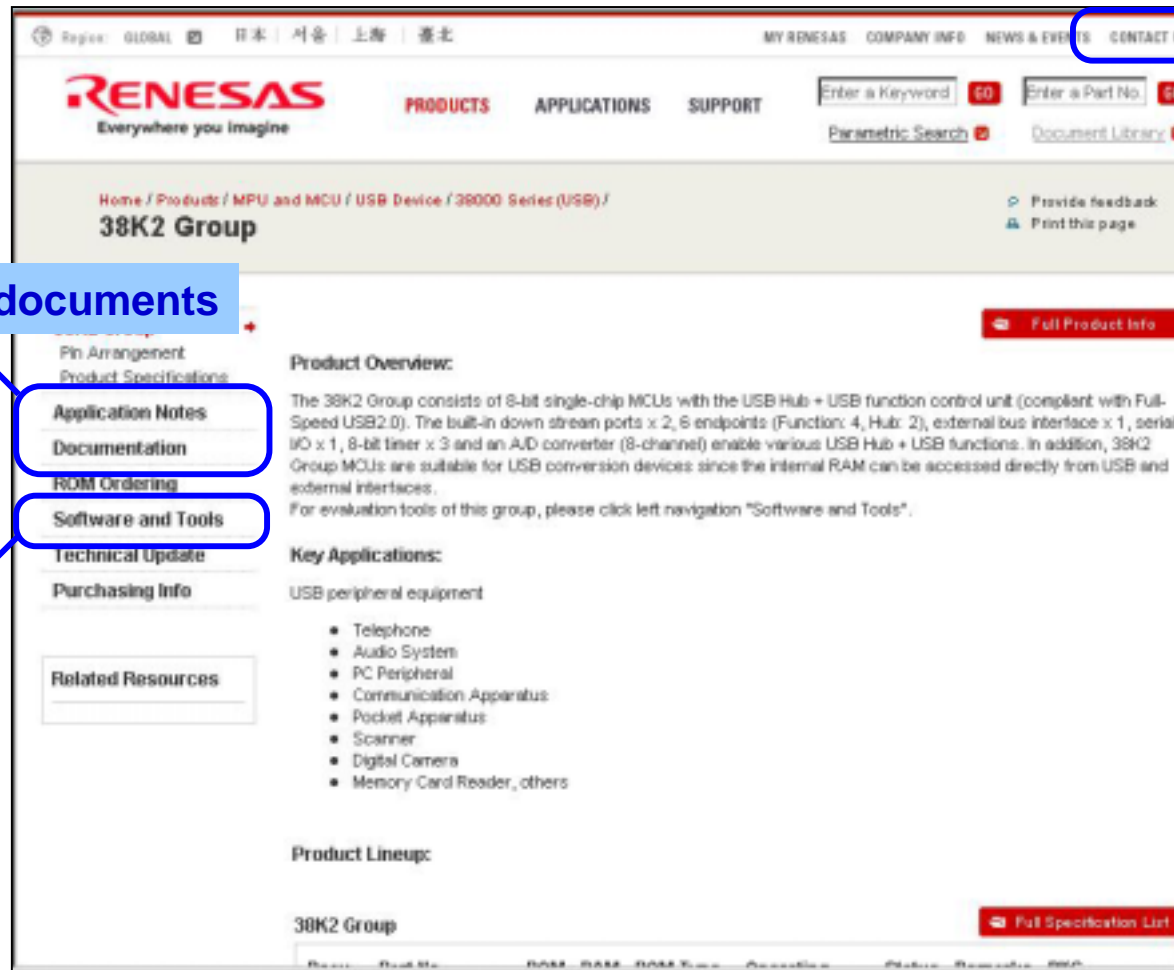
\* Final update: October 3 2006.

\* Please note that the version of specifications etc. can be revised in the future.

# 38K2 group information



Click “38K2 group” on RENESAS USB devices site ahead one page, can be take 38K2 group relation information.



Relation documents

Tools

FAQ



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