

HID & SYSTEM MANAGEMENT PRODUCTS, SYSTEM MANAGEMENT FAMILY PRELIMINARY
DESCRIPTION

The USB-Adapt™ SH3301 is a single IC that converts PS/2 keyboard and mouse data to USB 1.1.

The USB-Adapt™ is ideal for system legacy support, enabling seamless connection of standard PS/2 devices (mice or keyboards) to USB.

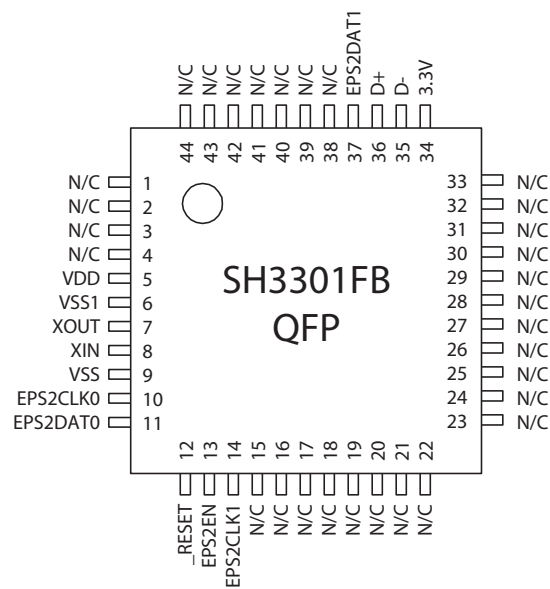
The IC offers two hot-pluggable and hot-swappable PS/2 ports; either port can accept a mouse or a keyboard. In addition, the USB-Adapt™ auto-detects and transparently supports the wheel function of wheel mice.

FEATURES

- Interfaces PS/2 devices to USB
- Complies with USB 1.1 specification
- Provides two PS/2 ports
- PS/2 ports support mouse wheel functionality
- Works with standard Windows keyboard and mouse drivers
- Devices are hot-pluggable
- PS/2 ports are auto-selectable and hot-swappable – a mouse or keyboard can be used in either port
- Easy to implement
- Few external components required

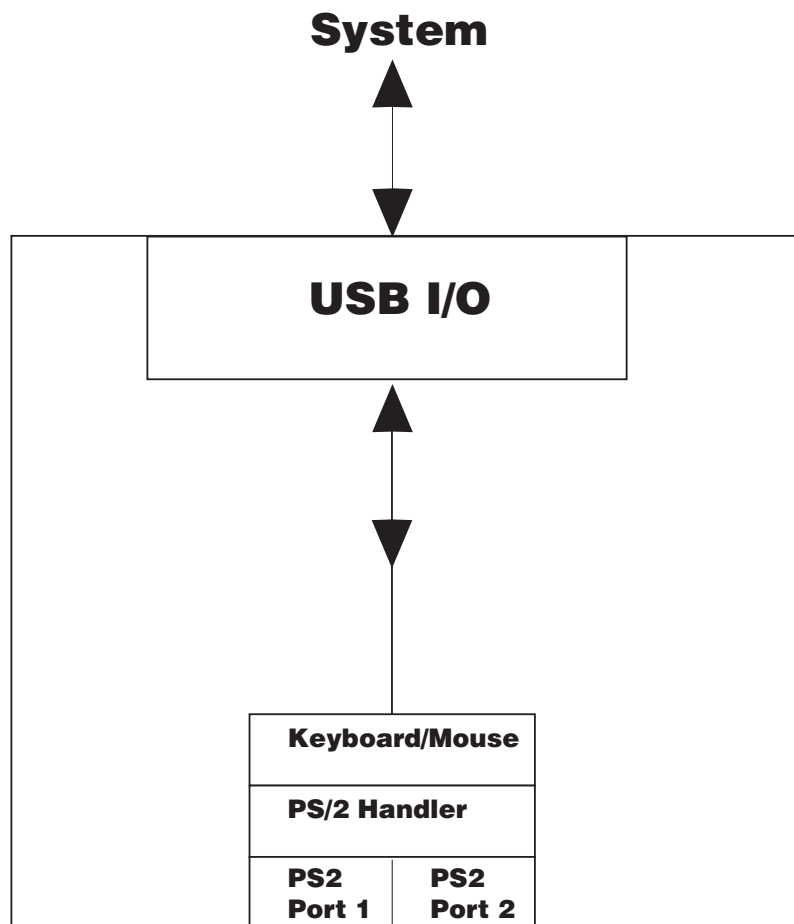
APPLICATIONS

- System legacy support

PIN ASSIGNMENTS


ORDERING CODE

Package options	Pitch	TA = -20°C to +85°C
44-pin QFP	0.8 mm	SH3301FB
Other Materials	Type	Order number
USB-Adapt™ eval. kit	Evaluation kit	EVK-SH3301

BLOCK DIAGRAM




USB FUNCTIONALITY

The USB-Adapt™ is a low-speed composite USB 1.1 device that interfaces PS/2. It supports the USB Human Interface Devices (HID) class specification. It uses two interrupt endpoints for the PS/2 devices.

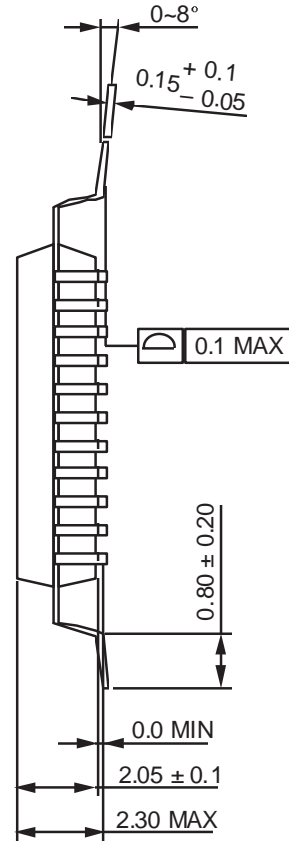
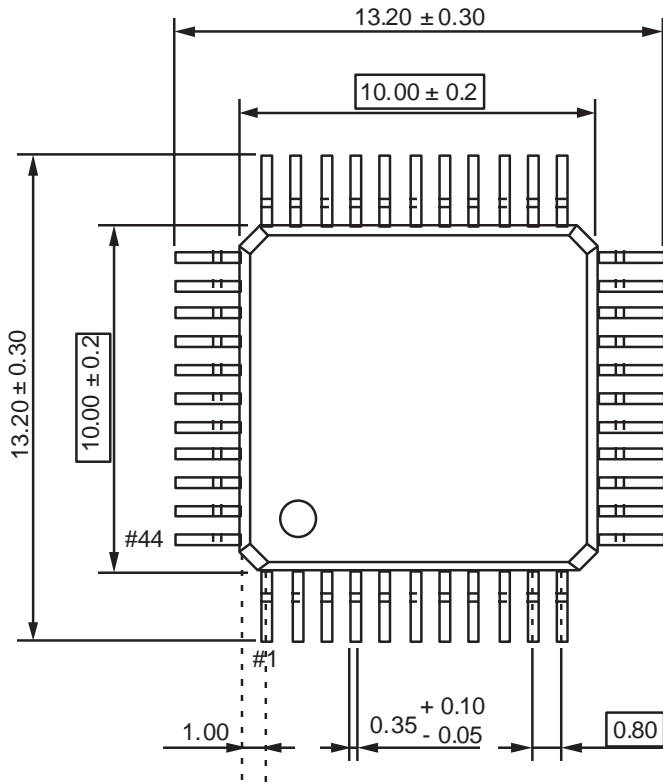
The USB-Adapt™ handles the merging of all this data, and sends the data to the host system.

PS/2 PORTS

The two PS/2 ports allow the user to connect legacy PS/2 devices to the USB host system. Standard 104-key keyboards and PS/2 mice, with support for MouseWheel functionality, can be hot-plugged at either of the PS/2 ports and immediately begin communicating with the host.

PIN DEFINITIONS

Mnemonic	QFP	Type	Name and Function
Power Supply			
VDD	5	PWR	Positive supply voltage
VSS	9	PWR	Ground: negative supply voltage
VSS1	6	PWR	Ground: negative supply voltage
Reset			
_RESET	12	I	Controller hardware reset pin: Active-low reset line
Oscillator pins			
XIN	8	I	Oscillator input: input signal from oscillator
XOUT	7	O	Oscillator output: output signal to oscillator
USB			
3.3V	34	O	USB reference voltage
D+	36	I/O	USB D+ line
D-	35	I/O	USB D- line
PS/2			
EPS2CLK0	10	I/O	Clock line for external PS/2 port 0
EPS2DAT0	11	I/O	Data line for external PS/2 port 0
EPS2CLK1	14	I/O	Clock line for external PS/2 port 1
EPS2DAT1	37	I/O	Data line for external PS/2 port 1
EPS2EN	13	O	Enable external PS/2 ports
Not connected			
	1-4, 15-33, 38-44		Not used

MECHANICAL INFORMATION FOR THE SH3301FB PACKAGE




ELECTRICAL SPECIFICATIONS

Absolute Maximum Ratings

Ratings	Symbol	Value	Unit
Supply voltage	V _{DD}	-0.3 to 6.5	V
Input and output voltage	V _{IN} , V _{OUT}	-0.3 to V _{DD} +0.3	V
Current Drain per Pin (not including V _{SS} or V _{DD})	I	20	mA
Operating Temperature SH3301	T _A	T low to T high -40 to +85	°C
Storage Temperature Range	T _{STG}	-65 to +150	°C
ESD rating (human body model)	V _{ESD}	2.0	KV

DC Electrical Characteristics (T_A = -40°C to +85°C, V_{DD} = 4.0 V to 5.25V)

Characteristic	Symbol	Min	Typ	Max	Unit
Supply voltage	V _{DD}	4.0	5.0	5.25	V
Input high voltage					
■ high	V _{IH}	0.8 x V _{DD}		V _{DD}	V
■ low	V _{IL}	V _{SS}		0.2 x V _{DD}	V
Output voltage (except D-, D+)					
■ high (I _{OH} =-200µa)	V _{OH}	V _{DD} -1.0			V
■ low (I _{OL} =1ma)	V _{OL}			0.4	
Output low current (V _{OL} =3V, only pins38, 39, 67)	I _{OL}	8	15	23	mA
Input leakage current					
■ high (all inputs except XIN, XOUT, RESET, D+, D-)	I _{LIH1}			3	µA
■ high (XIN, XOUT, RESET)	I _{LIH2}			20	µA
■ low (all inputs except XIN, XOUT, RESET, D+, D-)	I _{LIL1}			-3	µA
■ low (XIN, XOUT, RESET)	I _{LIL2}			-20	µA
Output leakage current (all I/O pins and output pins except D+, D-)					
■ high	I _{LOH1}			3	µA
■ low	I _{LOL}			-3	µA
Supply current					
■ Normal operation mode	I _{DD1}		5.5	12	mA
■ Idle mode	I _{DD2}		2.2	5	mA
■ Stop mode	I _{DD3}		180	300	µA

Control Timing (T_A = -40°C to +85°C, V_{DD} = 4.0 V to 5.25V)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency of Operation					
■ Crystal Option	f _{osc}		6.0		MHz
■ External Clock Option	f _{osc}		6.0		MHz



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