

HS8845B

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USB 2.0

HUB Controller

Datasheet

1.0 Description

- Compliant to USB specification Revision 2.0
 - Support 4/3/2 downstream ports by I/O pin configuration
 - Upstream port supports both high-speed (HS) and full-speed (FS) traffic
 - Downstream ports support HS, FS, and low-speed (LS) traffic

- On-chip 8-bit micro-processor
 - RISC-like architecture
 - USB optimized instruction set

- Single Transaction Translator (STT)
 - Single TT shares the same TT control logics for all downstream port devices. This is the most cost effective solution for TT. Multiple TT provides individual TT control logics for each downstream port. This is a performance better choice for USB 2.0 hub

- Integrate USB 2.0 transceiver
- Each downstream port supports two-color status indicator, with automatic and manual modes compliant to USB specification Revision 2.0

- Embed serial resister for USB signals
- Support both individual and gang modes of power management and over-current detection for downstream ports
- Conform to bus power requirements
- Automatic switching between self-powered and bus-powered modes
- Support compound-device (non-removable in downstream ports) by I/O pin configuration
- Configurable non-removable device support

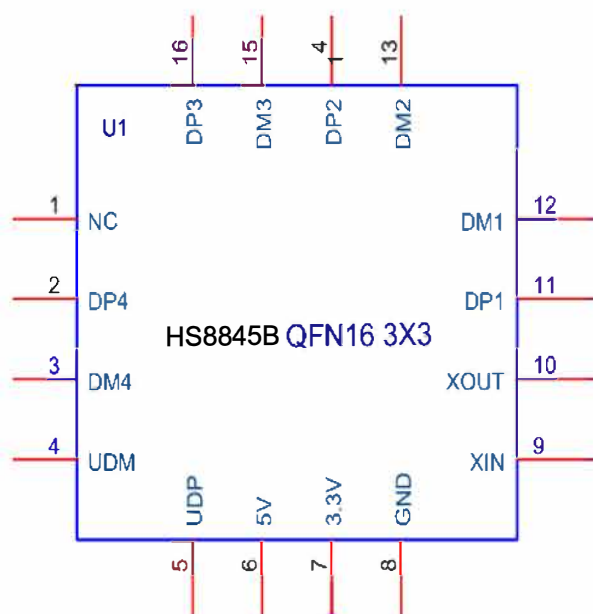
- Embeds 5V to 3.3V regulator

- Improve output drivers with slew-rate control for EMI reduction
- Internal power-fail detection for ESD recovery

- Applications:
 - Stand-alone USB hub
 - PC motherboard USB hub, Docking of notebook
 - LCD monitor hub
 - Any compound device to support USB HUB function

2.1 Pinouts

Packages QFN3*3-16



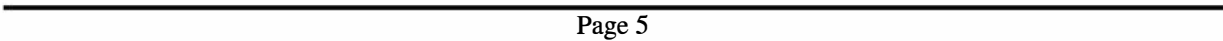
2.2 Pin List

Notation:

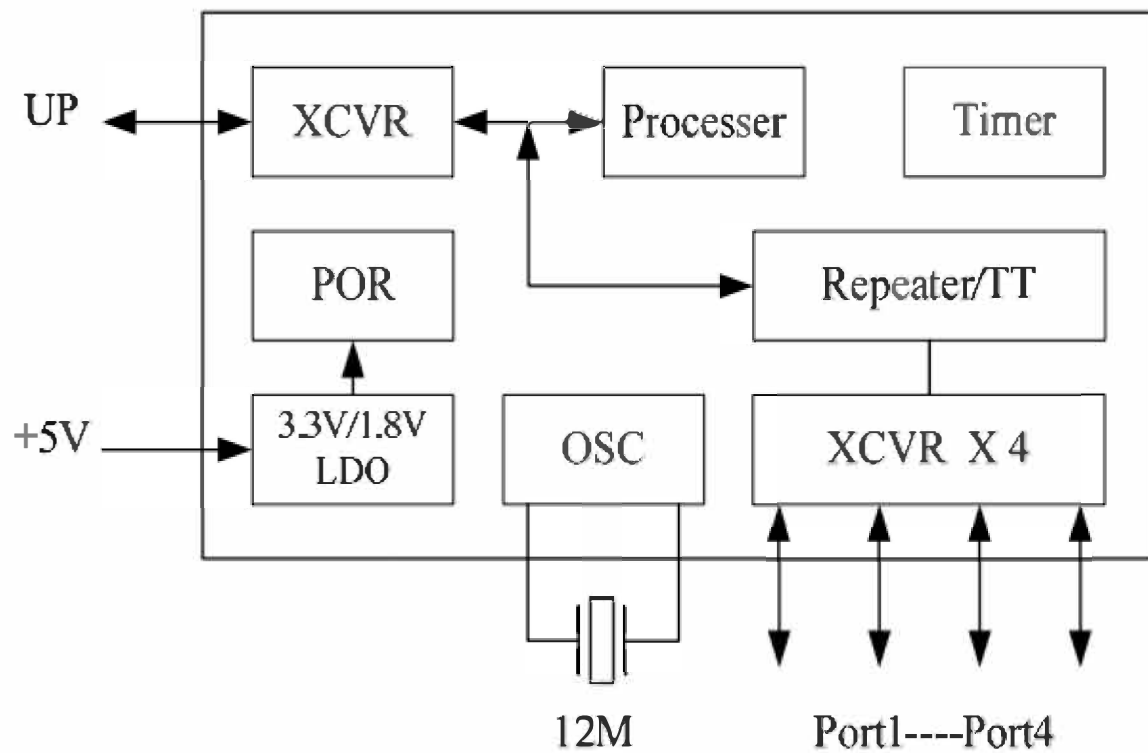
Type	O	Output
	I	Input
	B	Bi-directional
	P	Power / Ground

Table 2.2 - Pin Descriptions

USB Interface			
Pin Name	HS8845B	I/O Type	Description
	QFN3*3-16		
UDM,UDP	4,5	I/B	USB signals for USPORT
DM1,DP1	12,11	O/B	USB signals for DSPORT1
DM2,DP2	13,14	O/B	USB signals for DSPORT2
DM3,DP3	15,16	O/B	USB signals for DSPORT3
DM4,DP4	3,2	O/B	USB signals for DSPORT4
GND	8	B	ground (AGND)
V33	7	P	5V-to-3.3V regulator Vin
VCC	6	P	5V VIN
XOUT,XIN	10,9	P	CRYSTAL

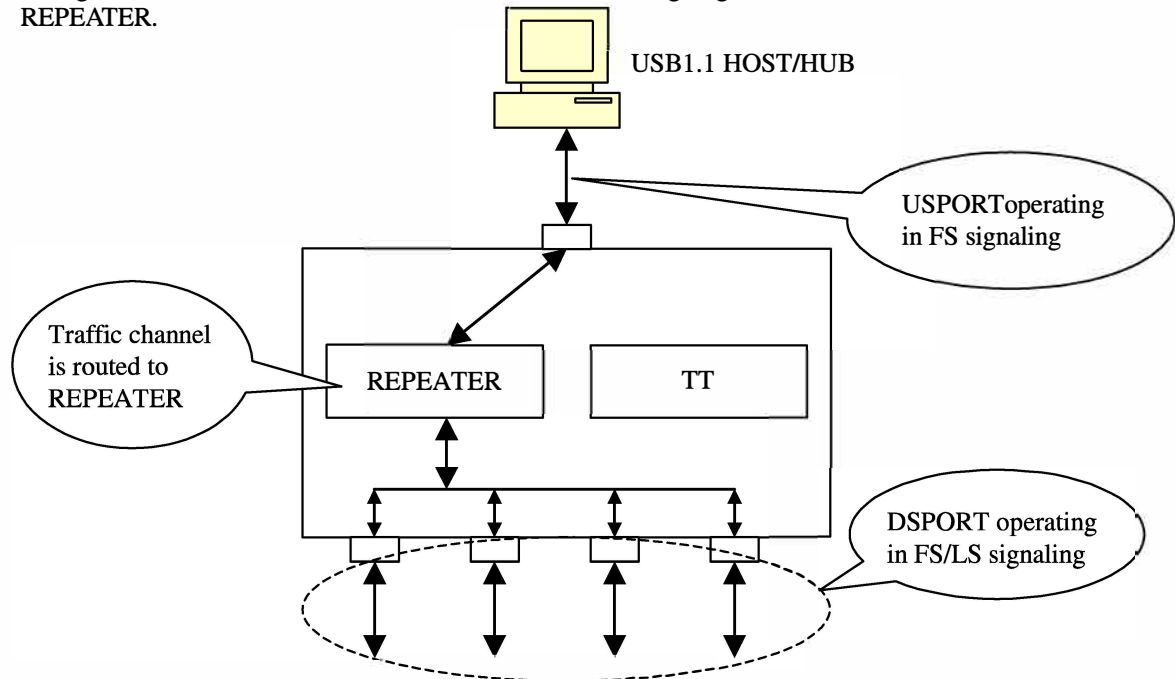


4.0 BLOCK DIAGRAM



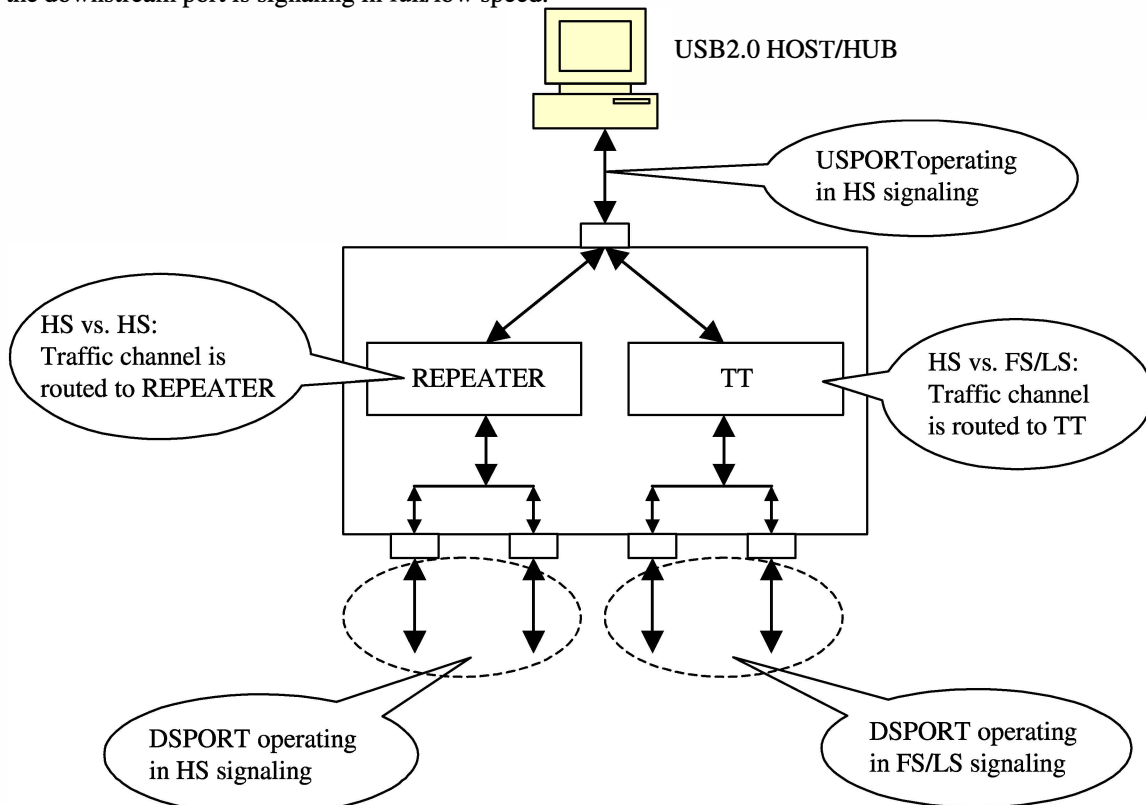
5.1 Connected to 1.1 Host/Hub

If an USB 2.0 hub is connected to the downstream port of an USB 1.1 host/hub, it will operate in USB 1.1 mode. For an USB 1.1 hub, both upstream direction traffic and downstream direction traffic are passing through REPEATER. That is, the REPEATER/TT routing logic will route the traffic channel to the REPEATER.



5.2 Connected to USB 2.0 Host/Hub

If an USB 2.0 hub is connected to an USB 2.0 host/hub, it will operate in USB 2.0 mode. The upstream port signaling is in high speed with bandwidth of 480 Mbps under this environment. The traffic channel will then be routed to the REPEATER when the device connected to the downstream port is signaling also in high speed. On the other hand, the traffic channel will then be routed to TT when the device connected to the downstream port is signaling in full/low speed.



6.0 ELECTRICAL CHARACTERISTICS

6.1 Maximum Ratings

Table 6.1 – Maximum Ratings

Symbol	Parameter	Min.	Max.	Unit
V _{CC}	5V Power Supply	-0.5	+5.5	V
V _{DD}	3.3V Power Supply	-0.5	+3.6	V
V _{IN}	Input Voltage for digital I/O pins	-0.5	+3.6	V
V _{INOD}	Open-drain input pins(Ovcur1~4#,Pself,Reset)	-0.5	+5.5	V
V _{INUSB}	Input Voltage for USB signal (DP, DM) pins	-0.5	+3.6	V
T _S	Storage Temperature under bias	-55	+100	°C
F _{OSC}	Frequency	12 MHz		

6.2 Operating Ranges

Table 6.2 – Operating Ranges

Symbol	Parameter	Min.	Typ.	Max.	Unit
V _{CC}	5V Power Supply	4.0	5.0	5.25	V
V _{DD}	3.3V Power Supply	3.1	3.3	3.5	V
V _{IND}	Input Voltage for digital I/O pins	-0.5		3.6	V
V _{INOD}	Open-drain input pins	-0.5		5.0	V
V _{INUSB}	Input Voltage for USB signal (DP, DM) pins	0.5		3.6	V
T _A	Ambient Temperature	0		70	°C

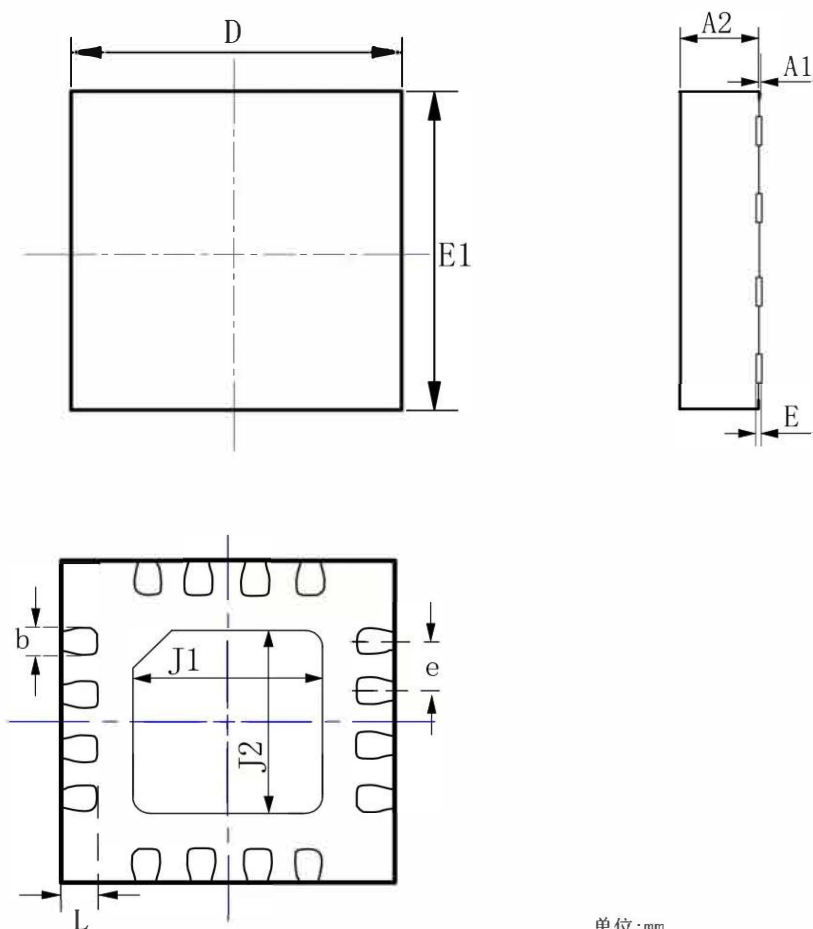
6.3 DC Characteristics

Table 6.3 – DC Characteristics Except USB Signals

Symbol	Parameter	Min.	Typ.	Max.	Unit
P _D	Power Dissipation	50	-	120	mA
V ₃₃	5V to 3.3V regulator output with 200mA load	2.9	3.3	3.52	V
V _{IL}	LOW level input voltage	-	-	0.8	V
V _{IH}	HIGH level input voltage	2.0	-	-	V

6.4 PACKAGE DIMENSION (Unit:mm)

QFN3*3-16L封装外形图



单位:mm	MIN	NOM	MAX
A1(站高)	-	-	0.050
A2(厚度)	0.700	0.750	0.800
E	0.150	0.200	0.250
b	0.150	0.200	0.250
e(脚间距)	0.450	0.500	0.550
D(长度)	2.900	3.000	3.100
E1(宽度)	2.900	3.000	3.100
J1	1.650	1.700	1.750
J2	1.650	1.700	1.750
L	0.200	0.300	0.400
生效日期			