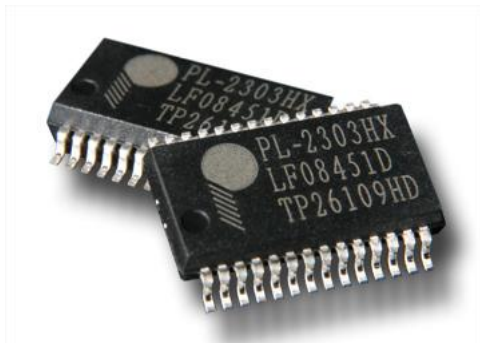




PL-2303HX Edition (Chip Rev D) USB to Serial Bridge Controller Product Datasheet

Document Revision: 1.4

Document Release: March 16, 2012



Prolific Technology Inc.

7F, No. 48, Sec. 3, Nan Kang Rd.

Nan Kang, Taipei 115, Taiwan, R.O.C.

Telephone: +886-2-2654-6363

Fax: +886-2-2654-6161

E-mail: sales@prolific.com.tw

Website: <http://www.prolific.com.tw>



Disclaimer

All the information in this document is subject to change without prior notice. Prolific Technology Inc. does not make any representations or any warranties (implied or otherwise) regarding the accuracy and completeness of this document and shall in no event be liable for any loss of profit or any other commercial damage, including but not limited to special, incidental, consequential, or other damages.

Trademarks

The Prolific logo is a registered trademark of Prolific Technology Inc. All brand names and product names used in this document are trademarks or registered trademarks of their respective holders.

Copyrights

Copyright © 2012 Prolific Technology Inc., All rights reserved.

No part of this document may be reproduced or transmitted in any form by any means without the express written permission of Prolific Technology Inc.

Revision History

Revision	Description	Date
1.4	<ul style="list-style-type: none"> ➤ Added Windows 8 Driver Support ➤ Added OTPROM Configuration Section ➤ Modified BaudRate Support Table ➤ Added Reference Schematic Diagram ➤ Added Chip Marking Information ➤ Added Tube Packing Information ➤ Added Worldwide Distributors Information 	March 16, 2012
1.3	<ul style="list-style-type: none"> ➤ Added Windows 7 Logo Driver Information ➤ Modified Operating Temperature Characteristics ➤ Modified Baud Rate Settings Table 	September 9, 2010
1.2	<ul style="list-style-type: none"> ➤ Sec. 9.0: Modified DC & Temperature Characteristics 	June 27, 2008
1.1	<ul style="list-style-type: none"> ➤ Added Windows Vista and XP Logo Driver information ➤ Added USB-IF Logo TID information 	April 16, 2007
1.0B	<ul style="list-style-type: none"> ➤ Sec. 4.2: Modified QFN diagram to add IC bottom PAD information 	June 30, 2006
1.0A	<ul style="list-style-type: none"> ➤ PL-2303HX (Chip Rev D) Datasheet – Formal Release 	November 23, 2005

Table of Contents

1.0	FEATURES.....	6
2.0	FUNCTIONAL BLOCK DIAGRAM.....	7
3.0	INTRODUCTION	8
4.0	PIN ASSIGNMENT OUTLINE	9
4.1	SSOP28 Package	9
4.2	QFN32 Package.....	10
5.0	PIN ASSIGNMENT & DESCRIPTION.....	11
5.1	SSOP28 Package	11
5.2	QFN32 Package.....	12
6.0	OTPROM CONFIGURATION	13
7.0	DATA FORMATS & PROGRAMMABLE BAUD RATE GENERATOR.....	15
8.0	PL2303HXD REFERENCE SCHEMATIC DIAGRAM	16
9.0	DC & TEMPERATURE CHARACTERISTICS.....	17
9.1	Absolute Maximum Ratings.....	17
9.2	DC Characteristics	17
9.3	Clock Characteristics	18
9.4	Temperature Characteristics	19
9.5	Leakage Current and Capacitance.....	19
9.6	Power-On Reset.....	19
10.0	OUTLINE DIAGRAM	20
10.1	SSOP28 Package	20
10.2	QFN32 Package.....	21
11.0	REEL PACKING INFORMATION	22
11.1	Carrier Tape (SSOP-28)	22
11.2	Reel Dimension.....	23
11.3	Tube Packing	24
12.0	ORDERING AND CHIP MARKING INFORMATION	25
13.0	CONTACT INFORMATION	26

List of Figures

Figure 2-1 Block Diagram of PL-2303HX (Rev D)	7
Figure 4-1 Pin Assignment Outline of PL-2303HX (Rev D) SSOP28	9
Figure 4-2 Pin Assignment Outline of PL-2303HX (Rev D) QFN32	10
Figure 6-1 PL2303 EEPROM Writer Program	13
Figure 8-1 PL2303HX (Chip Rev D) Reference Schematic Diagram	16
Figure 10-1 Power-On Reset Diagram	19
Figure 10-1 Outline Diagram of PL-2303HX (Rev D) SSOP28	20
Figure 10-2 Outline Diagram of PL-2303HX (Rev D) QFN32	21
Figure 11-1 SSOP28 Carrier Tape	22
Figure 11-2 IC Reel Placements	22
Figure 11-3 Reel Dimension	23
Figure 11-4 Tube Packing Dimension	24
Figure 12-1 Chip Part Number Information (SSOP)	25

List of Tables

Table 5-1 Pin Assignment & Description (SSOP28)	11
Table 5-2 Pin Assignment & Description (QFN32)	12
Table 6-1 EEPROM Writer Configuration	13
Table 7-1 Supported Data Formats	15
Table 7-2 Baud Rate Settings (Supported by Driver)	15
Table 9-1 Absolute Maximum Ratings	17
Table 9-2a Operating Voltage and Suspend Current	17
Table 9-2b 3.3V I/O Pins	17
Table 9-2c VDD_325@3.3V Serial I/O Pins	18
Table 9-2d VDD_325@2.5V Serial I/O Pins	18
Table 9-2e VDD_325@1.8V Serial I/O Pins	18
Table 9-3 Clock Characteristics	18
Table 9-4 Temperature Characteristics	19
Table 9-5 Leakage Current and Capacitance	19
Table 9-6 Power-On Reset	19
Table 10-1 Package Dimension	20
Table 11-2 Reel Part Number Information	23
Table 12-1 Ordering Information	25
Table 12-2 Chip Marking Information	25

1.0 Features

- Fully Compliant with USB Specification v2.0 (Full-Speed)
- [USB-IF Logo Compliant with TID 40000100](#)
- UHCI/OHCI (USB1.1), EHCI (USB 2.0), xHCI (USB 3.0) Host Controller Compatible
- On Chip USB 1.1 transceiver, 5V→3.3V regulator
- On-chip 96MHz clock generator
- Supports RS-422/RS-485 like serial interface (TXD, DTR_N, and RTS_N pins should be externally pulled-up to 5V)
- Supports RS232-like Serial Interface
 - Full-duplex transmitter and receiver (TXD and RXD)
 - Six MODEM control pins (RTS, CTS, DTR, DSR, DCD, and RI)
 - 5, 6, 7 or 8 data bits
 - Odd, Even, Mark, Space, or None parity mode
 - One, one and a half, or two stop bits
 - Parity error, frame error, and serial break detection
 - Programmable baud rate from 75 bps to 12M bps
 - External RS232 driver power down control
 - Independent power source for serial interface
- Extensive Flow Control Mechanism
 - Adjustable high/low watermark level
 - Automatic hardware flow control with CTS/RTS or DSR/DTR
 - Automatic software flow control with XON/XOFF
 - Inbound data buffer overflow detection
- Configurable 512-byte bi-directional data buffer
 - 256-byte outbound buffer and 256-byte inbound buffer; or
 - 128-byte outbound buffer and 384-byte inbound buffer
- Supports Remote Wake-up from RS232 input pin signals (RI, RXD, DSR, DCD, CTS)
- Four (4) General Purpose I/O (GP0, GP1, GP2, & GP3) pins & Four (4) Auxiliary General Purpose I/O (RI_N, DSR_N, DCD_N, & CTS_N) pins.
- On-chip OTP (One Time Programming) ROM for startup device configurations
- Hardware backward compatible with PL-2303H
- Provides royalty-free Virtual COM Port (VCP) drivers for:
 - Windows 2000, XP, Vista, and 7 (Microsoft Certified WHQL Drivers)
 - Windows 8
 - Windows Server 2003, 2008, 2008 R2
 - Windows CE 4.2, 5.0, 6.0, and Windows Embedded Compact 7
 - Windows XP Embedded (XPe), Point-of-Service (WEPOS), and POSReady
 - Mac OS 8/9, OS X
 - Linux/Android kernel 2.4.31 and above includes built-in drivers
 - Provides Driver Customization for Customer USB VID/PID and special baud rates
- -40°C to 85°C Operating Temperature
- Small footprint 28-pin SSOP or 32-pin QFN IC package
 - RoHS compliant and Pb-free Green Compound

2.0 Functional Block Diagram

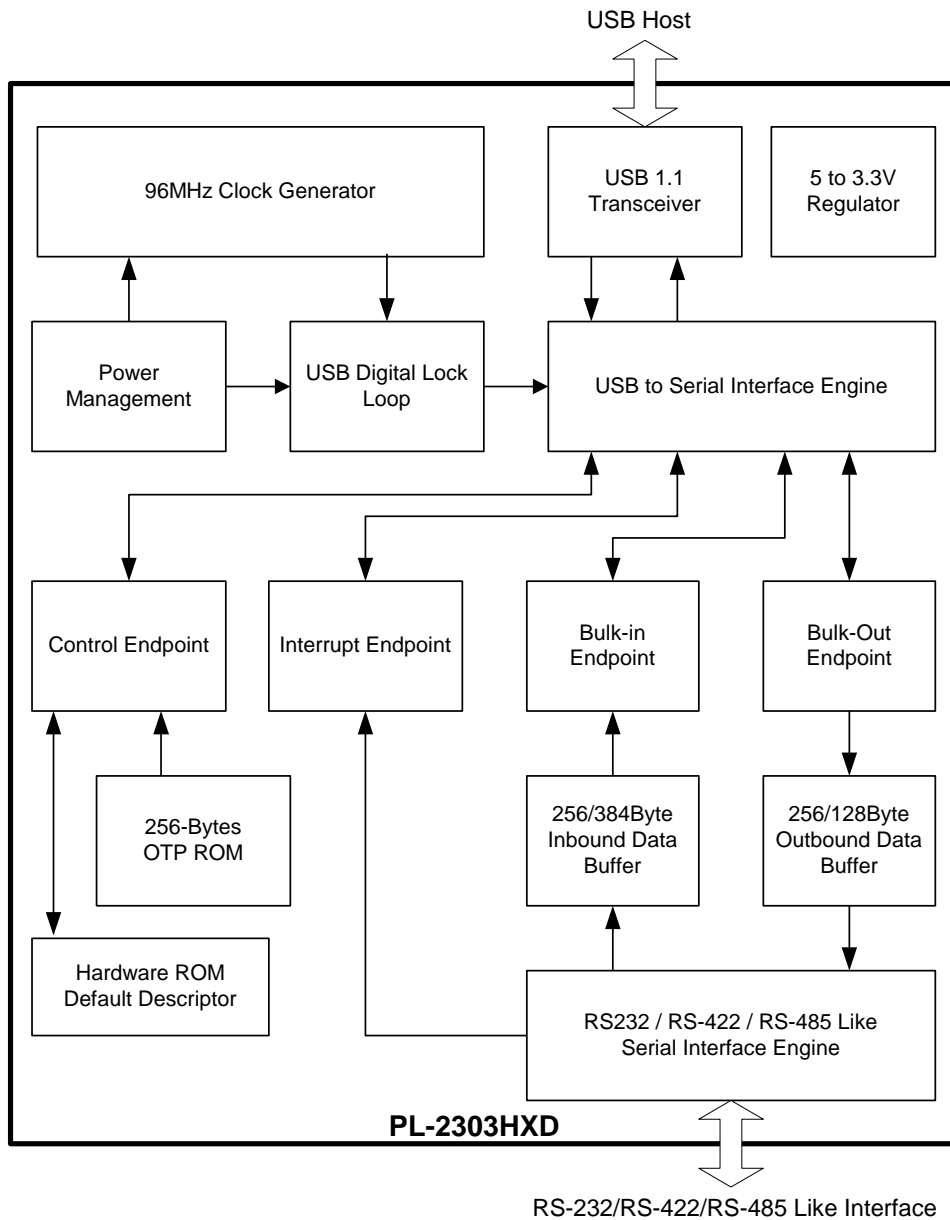


Figure 2-1 Block Diagram of PL-2303HX (Rev D)

3.0 Introduction

PL-2303HX (Chip Rev D) or PL-2303HXD provides a convenient solution for connecting an RS232-like full-duplex asynchronous serial device to any Universal Serial Bus (USB) capable host. PL-2303HXD highly compatible drivers could simulate the traditional COM port on most operating systems allowing the existing applications based on COM port to easily migrate and be made USB ready.

By taking advantage of USB bulk transfer mode, large data buffers, and automatic flow control, PL-2303HXD is capable of achieving higher throughput compared to traditional UART (Universal Asynchronous Receiver Transmitter) ports. When real RS232 signaling is not required, baud rate higher than 115200 bps could be used for even higher performance. The flexible baud rate generator of PL-2303HXD could be programmed to generate any rate between 75 bps to 12M bps.

PL-2303HXD is exclusively designed for mobile and embedded solutions in mind, providing a small footprint that could easily fit in to any connectors and handheld devices. With very small power consumption in either operating or suspend mode, PL-2303HXD is perfect for bus powered operation with plenty of power left for the attached devices. Flexible signal level requirement on the RS232-like serial port side also allows PL-2303HXD to connect directly to any 3.3V~1.8V range devices.

4.0 Pin Assignment Outline

4.1 SSOP28 Package

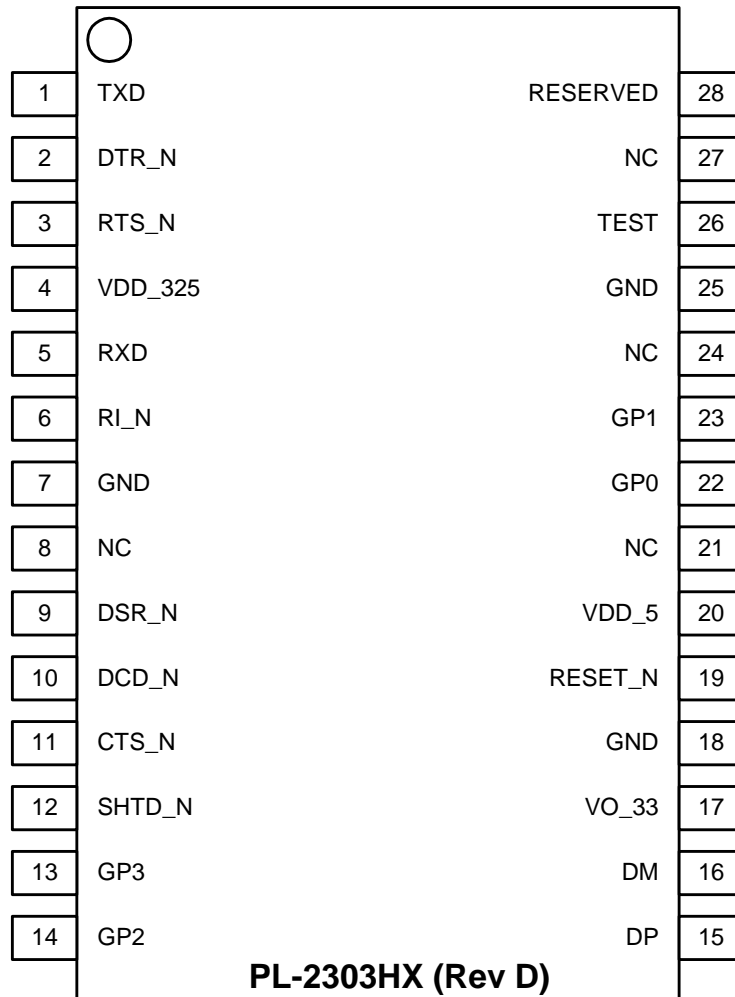


Figure 4-1 Pin Assignment Outline of PL-2303HX (Rev D) SSOP28

4.2 QFN32 Package

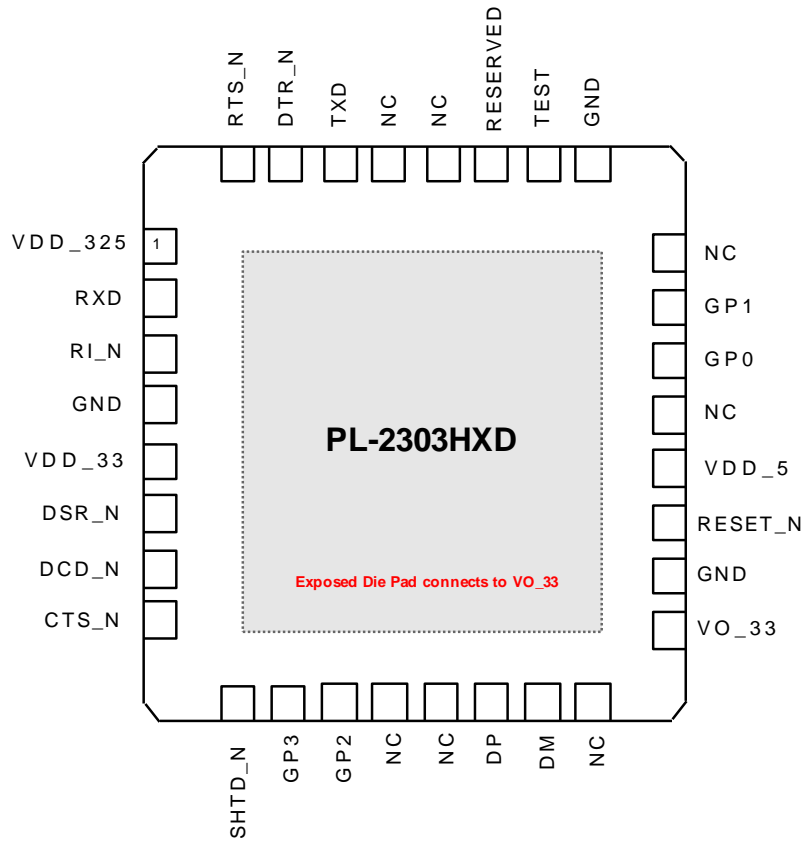
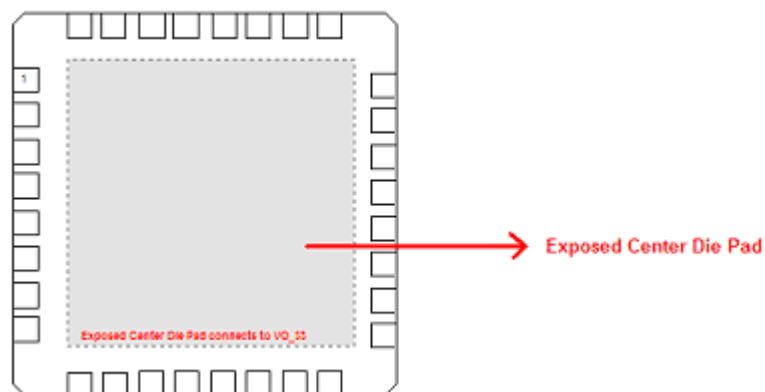


Figure 4-2 Pin Assignment Outline of PL-2303HX (Rev D) QFN32

Warning: The exposed center die pad of the PL-2303HX QFN package is connected (bonded) to the pin VO_33 so it is very important to design the PCB layout wherein this exposed die pad won't get grounded on the PCB when mounted.



5.0 Pin Assignment & Description

Pin Type Abbreviation:

I: Input

O: Output

B: Bidirectional I/O

P: Power/Ground

5.1 SSOP28 Package

Table 5-1 Pin Assignment & Description (SSOP28)

Pin #	Name	Type	Description
1	TXD	O ⁽¹⁾	Serial Port (Transmitted Data)
2	DTR_N	O ⁽¹⁾	Serial Port (Data Terminal Ready)
3	RTS_N	O ⁽¹⁾	Serial Port (Request To Send)
4	VDD_325	P	RS232 VDD. The power pin for the serial port signals. When the serial port is 3.3V, this should be 3.3V. When the serial port is 2.5V, this should be 2.5V. The range can be from 1.8V~3.3V.
5	RXD	I ⁽²⁾	Serial Port (Received Data)
6	RI_N	B ⁽²⁾	Serial Port (Ring Indicator); or Auxiliary General Purpose I/O Port when enabled ⁽⁷⁾ .
7	GND	P	Ground
8	NC	-	No Connection
9	DSR_N	B ⁽²⁾	Serial Port (Data Set Ready); or Auxiliary General Purpose I/O Port when enabled ⁽⁷⁾ .
10	DCD_N	B ⁽²⁾	Serial Port (Data Carrier Detect); or Auxiliary General Purpose I/O Port when enabled ⁽⁷⁾ .
11	CTS_N	B ⁽²⁾	Serial Port (Clear to Send); or Auxiliary General Purpose I/O Port when enabled ⁽⁷⁾ .
12	SHTD_N	O ⁽³⁾	RS232 Transceiver Shut Down Control
13	GP3	I/O	Auxiliary GPIO Pin 3 (Default output high mode) ⁽⁶⁾
14	GP2	I/O	Auxiliary GPIO Pin 2 (Default output high mode) ⁽⁶⁾
15	DP	B	USB Port D+ signal
16	DM	B	USB Port D- signal
17	VO_33	P	Regulator Power Output, 3.3V
18	GND	P	Ground
19	RESET_N	I ⁽⁴⁾	External System Reset (Active Low)
20	VDD_5	P	USB Port V _{BUS} , 5V Power. (6.5V for OTPROM writing voltage).
21	NC	-	No Connection
22	GP0	B ⁽⁵⁾	General Purpose I/O Pin 0
23	GP1	B ⁽⁵⁾	General Purpose I/O Pin 1
24	NC	-	No Connection
25	GND	-	Ground
26	TEST	I	Test mode control
27	NC	-	No Connection
28	Reserved	-	Reserved pin (Must be floating)

Notes:

- (1) – Tri-State, Output Pad. Level and Driving Capability decided by VDD_325.
- (2) – Tri-State, CMOS Input/Output Pad with level shifter. Level and Driving Capability decided by VDD_325.
- (3) – CMOS Output Pad.
- (4) – CMOS Input Pad, 5V tolerant.
- (5) – Tri-State, CMOS Input/Output Pad. (Default mode: Input)
- (6) – Default output high mode; do not connect to ground.
- (7) – Enabling Auxiliary GPIO requires special customized driver.

5.2 QFN32 Package

Table 5-2 Pin Assignment & Description (QFN32)

Pin #	Name	Type	Description
1	VDD_325	P	RS232 VDD. The power pin for the serial port signals. When the serial port is 3.3V, this should be 3.3V. When the serial port is 2.5V, this should be 2.5V. The range can be from 1.8V~3.3V.
2	RXD	I ⁽²⁾	Serial Port (Received Data)
3	RI_N	B ⁽²⁾	Serial Port (Ring Indicator); or Auxiliary General Purpose I/O Port when enabled ⁽⁶⁾ .
4	GND	P	Ground
5	VDD_33	P	Primary Power (3.3V)
6	DSR_N	B ⁽²⁾	Serial Port (Data Set Ready); or Auxiliary General Purpose I/O Port when enabled ⁽⁶⁾ .
7	DCD_N	B ⁽²⁾	Serial Port (Data Carrier Detect); or Auxiliary General Purpose I/O Port when enabled ⁽⁶⁾ .
8	CTS_N	B ⁽²⁾	Serial Port (Clear to Send); or Auxiliary General Purpose I/O Port when enabled ⁽⁶⁾ .
9	SHTD_N	O ⁽³⁾	RS232 Transceiver Shut Down Control
10	GP3	I/O	Auxiliary GPIO Pin 3 (Default output high mode) ⁽⁵⁾
11	GP2	I/O	Auxiliary GPIO Pin 2 (Default output high mode) ⁽⁵⁾
12	NC	-	No Connection
13	NC	-	No Connection
14	DP	B	USB Port D+ signal
15	DM	B	USB Port D- signal
16	NC	-	No Connection
17	VO_33	P	Regulator Power Output, 3.3V
18	GND	P	Ground
19	RESET_N	I	External System Reset (Active Low)
20	VDD_5	P	USB Port V _{BUS} , 5V Power.
21	NC	-	No Connection
22	GP0	B ⁽⁴⁾	General Purpose I/O Pin 0
23	GP1	B ⁽⁴⁾	General Purpose I/O Pin 1
24	NC	-	No Connection
25	GND	P	Ground
26	TEST	I	Test mode control
27	Reserved	-	Reserved pin (Must be floating)
28	NC	-	No Connection
29	NC	-	No Connection
30	TXD	O ⁽¹⁾	Serial Port (Transmitted Data)
31	DTR_N	O ⁽¹⁾	Serial Port (Data Terminal Ready)
32	RTS_N	O ⁽¹⁾	Serial Port (Request To Send)
IC Bottom PAD		P	Connects to VO_33 (Regulator Power Output, 3.3V)

Notes:

- (1) – Tri-State, Output Pad. Level and Driving Capability decided by VDD_325.
- (2) – Tri-State, CMOS Input/Output Pad with level shifter. Level and Driving Capability decided by VDD_325.
- (3) – CMOS Output Pad.
- (4) – Tri-State, CMOS Input/Output Pad. (Default mode: Input)
- (5) – Default output high mode; do not connect to ground.
- (6) – Enabling Auxiliary GPIO requires special customized driver.

6.0 OTPROM Configuration

The default configuration descriptors are stored in the chip internally which will be loaded during power-on reset or USB bus reset whenever OTPROM (One-Time Programmable ROM) is empty. Several of the USB descriptors could be modified and stored to the PL2303HXD OTPROM during device startup like Vendor ID (VID), Product ID (PID), Serial Number, Product String, and other configuration descriptors. The OTPROM can be programmed twice using the Prolific PL2303 EEPROM Writer utility software which can be requested from Prolific or authorized distributors.

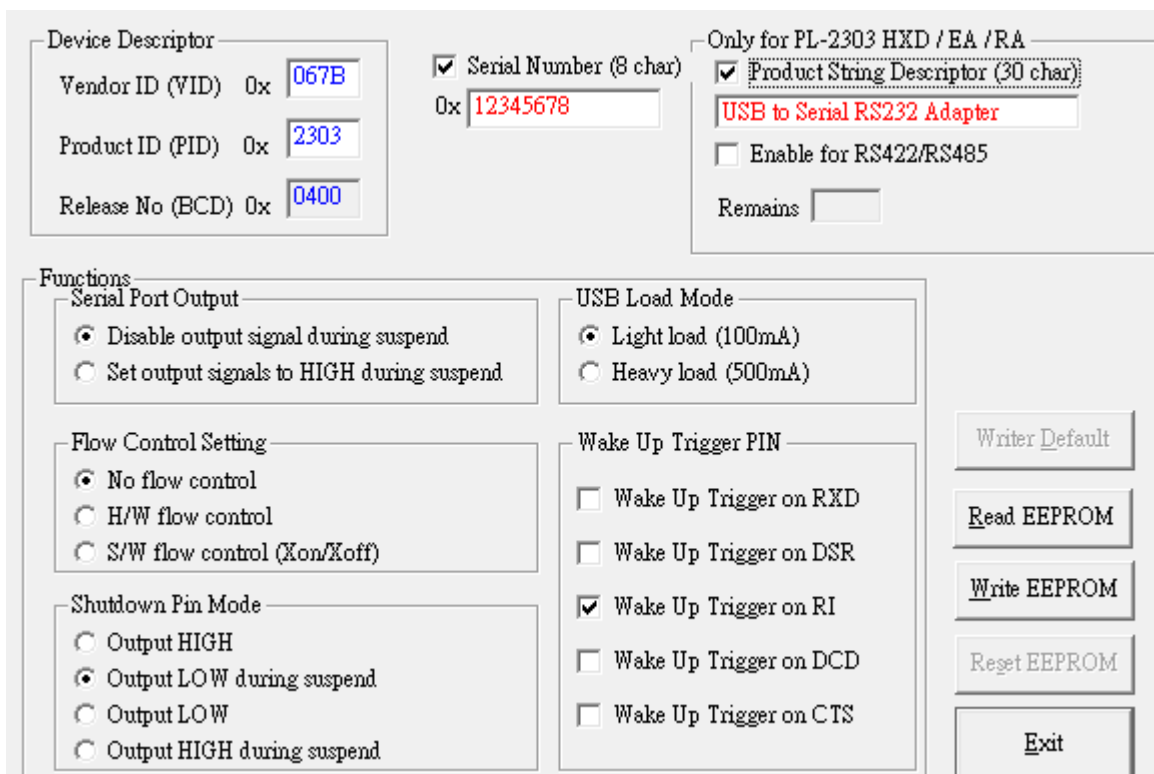


Figure 6-1 PL2303 EEPROM Writer Program

Table 6-1 EEPROM Writer Configuration

Descriptors	Default Value	Description
Vendor ID (VID)	067B (hex)	USB unique Vendor ID of Company or Manufacturer. This ID is applied and registered from USB-IF. Refer to this website for applying VID: http://www.usb.org/developers/vendor/
Product ID (PID)	2303 (hex)	USB Product ID assigned by Company or Manufacturer.
Rel. No. (BCD)	0400	This field reports the release number of USB the device. This item is fixed and cannot be modified.

Serial No. (8 hex characters)	Disabled	This field sets the product USB serial number. Entering a unique serial number allows the device to be assigned the same COM Port number even when plug to other USB ports of the same PC.
Product String Descriptor	None	This field when entered will be the string displayed by Windows and other OS when device is first detected and before driver is loaded or driver not installed.
Enable for RS422/RS485	Disabled	Enable this for RS422 or RS485 support.
Remains	2	PL2303HXD has an integrated OTPROM which allows to write EEPROM settings without the use of an external one. However, the OTPROM can only be written twice and cannot be erased. PL2303HXD does not support external EEPROM.

Functions	Default Value	Description
Serial Port Output	Disable	This option allows setting the serial port output pin signals (TXD, RTS, DTR) to HIGH during suspend mode.
USB Load Mode	Light Load (100mA)	This option sets the USB device maximum power if 100mA (low-power) or 500mA (high power).
Flow Control Setting	No Flow Control	This option allows to set the flow control initial setting to none, H/W, or S/W control. Note: H/W and S/W flow control can also be set and configured on customer/user serial communication software.
Wakeup Trigger Pin	Wakeup trigger on RI	This option allows setting the trigger pin for remote wakeup function. When in suspend mode, changes on the enabled serial port input signals could trigger a wakeup event.
Shutdown Pin Mode	Output LOW during suspend	This option allows setting the Shutdown pin mode to Output HIGH or LOW on normal mode or Suspend mode.

7.0 Data Formats & Programmable Baud Rate Generator

The PL-2303HXD controller supports versatile data formats and has a programmable baud rate generator. The supported data formats are shown on Table 7-1. The programmable baud rate generator supports baud rates up to 12M bps and standard driver already supports several baud rate settings as shown in Table 7-2.

Table 7-1 Supported Data Formats

	Description
Stop bits	1 1.5 2
Parity type	None Odd Even Mark Space
Data bits	5, 6, 7, 8

Table 7-2 Baud Rate Settings (Supported by Driver)

Baud Rates (bps)	Baud Rates (bps)	Baud Rates (bps)	Baud Rates (bps)	Baud Rates (bps)
12000000				
6000000	460800	134400	19200	1800
3000000	403200	128000	14400	1200
2457600	268800	115200	9600	600
1228800	256000	57600	7200	300
921600	230400	56000	4800	150
806400	201600	38400	3600	110
614400	161280	28800	2400	75

Note: For special baud rate requirements, please contact Prolific FAE for driver customization support.

8.0 PL2303HXD Reference Schematic Diagram

Below is an example of using the PL-2303HX (Chip Rev D) as a USB to RS232 converter (with RS485 option) where a RS232 transceiver (Sipex SP213EHCA) is used to convert the TTL levels serial interface of the PL2303TA to RS232 levels as well as converting the +5V nominal VCC to the $\pm 9V$ required by RS232. The SP213EHCA transceiver provides up to 500Kbps data rate transmission which is ideal for many designs requiring high speed performance. Contact Prolific FAE for more PCB design support.

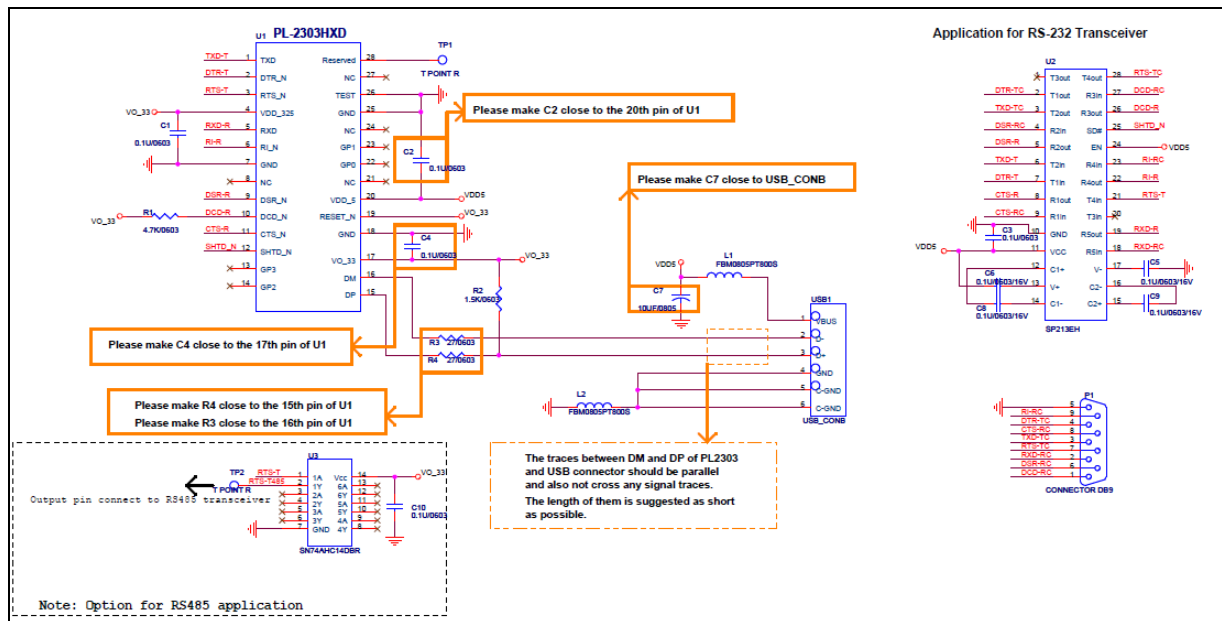


Figure 8-1 PL2303HX (Chip Rev D) Reference Schematic Diagram

9.0 DC & Temperature Characteristics

9.1 Absolute Maximum Ratings

Table 9-1 Absolute Maximum Ratings

Items	Ratings
Power Supply Voltage - VDD_5	-0.3 to 6.5 V
Input Voltage of 3.3V I/O	-0.3 to VO_33+0.3 V
Input Voltage of 3.3V I/O with 5V Tolerance I/O	-0.3 to VDD_5+0.3V
Output Voltage of 3.3V I/O	-0.3 to VDD_5 +0.3 V
Storage Temperature	-40 to 150 °C

9.2 DC Characteristics

9.2.1 Operating Voltage and Suspend Current

Table 9-2a Operating Voltage and Suspend Current

Parameter	Symbol	Min	Typ	Max	Unit
Operating Voltage Range	VDD_5	4.5	5	6.5	V
Output Voltage of Regulator	VO_33	2.97	3.3	3.63	V
Operating Current ⁽¹⁾ (Power Consumption)	I _{DD}	-	20	25	mA
Suspend Current	I _{SUS}	-	260	450	μA

Note: (1) – No device connected.

9.2.2 3.3V I/O Pins

Table 9-2b 3.3V I/O Pins

Parameter	Symbol	Min	Typ	Max	Unit
Output Driving Capability	I _{DD}		4		mA
Power Supply for 3.3V I/O Pins	VO_33	2.97	3.3	3.63	V
Input Voltage (CMOS)					
Low	V _{IL}	--	--	0.3* VO_33	V
High	V _{IH}	0.7* VO_33	--	--	V
Input Voltage (LVTTL)					
Low	V _{IL}	--	--	0.8	V
High	V _{IH}	2.0	--	--	V
Output Voltage, 3.3V					
Low	V _{OL}	--	--	0.4	V
High	V _{OH}	2.4	--	--	V

9.2.3 Serial I/O Pins

Table 9-2c VDD_325@3.3V Serial I/O Pins

Parameter	Symbol	Min	Typ	Max	Unit
Output Driving Capability	I _{DD}		8		mA
Power Supply for Serial I/O Pins	VDD_325	2.97	3.3	3.63	V
Input Voltage					
Low	V _{IL}	--	--	0.25* VDD_325	V
High	V _{IH}	0.7* VDD_325	--	--	V
Output Voltage					
Low	V _{OL}	--	--	0.4	V
High	V _{OH}	2.4	--	--	V

Table 9-2d VDD_325@2.5V Serial I/O Pins

Parameter	Symbol	Min	Typ	Max	Unit
Output Driving Capability	I _{DD}		5.2		mA
Power Supply for Serial I/O Pins	VDD_325	2.25	2.5	2.75	V
Input Voltage					
Low	V _{IL}	--	--	0.25* VDD_325	V
High	V _{IH}	0.7* VDD_325	--	--	V
Output Voltage					
Low	V _{OL}	--	--	0.4	V
High	V _{OH}	1.85	--	--	V

Table 9-2e VDD_325@1.8V Serial I/O Pins

Parameter	Symbol	Min	Typ	Max	Unit
Output Driving Capability	I _{DD}		4.4		mA
Power Supply for Serial I/O Pins	VDD_325	1.65	1.8	1.95	V
Input Voltage					
Low	V _{IL}	--	--	0.25* VDD_325	V
High	V _{IH}	0.7* VDD_325	--	--	V
Output Voltage					
Low	V _{OL}	--	--	0.4	V
High	V _{OH}	1.25	--	--	V

9.3 Clock Characteristics

Table 9-3 Clock Characteristics

Parameter	Min	Typ	Max	Units
Frequency of Operation	11.97	12.0	12.03	MHz
Clock Period	83.1	83.3	83.5	ns
Duty Cycle	45	50	55	%

9.4 Temperature Characteristics

Table 9-4 Temperature Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature	--	-40	--	85	°C
Junction Operation Temperature	T _J	-40	25	105	°C

9.5 Leakage Current and Capacitance

Table 9-5 Leakage Current and Capacitance

Parameter	Symbol	Min	Typ	Max	Unit
Input Leakage Current*1	I _L	-10	±1	10	μA
Tri-state Leakage Current	I _{oz}	-10	±1	10	μA
Input Capacitance	C _{IN}	--	2.8	--	pF
Output Capacitance	C _{OUT}	2.7	--	4.9	pF
Bi-directional Buffer Capacitance	C _{BID}	2.7	--	4.9	pF

*1. No pull-up or pull-down resistor.

9.6 Power-On Reset

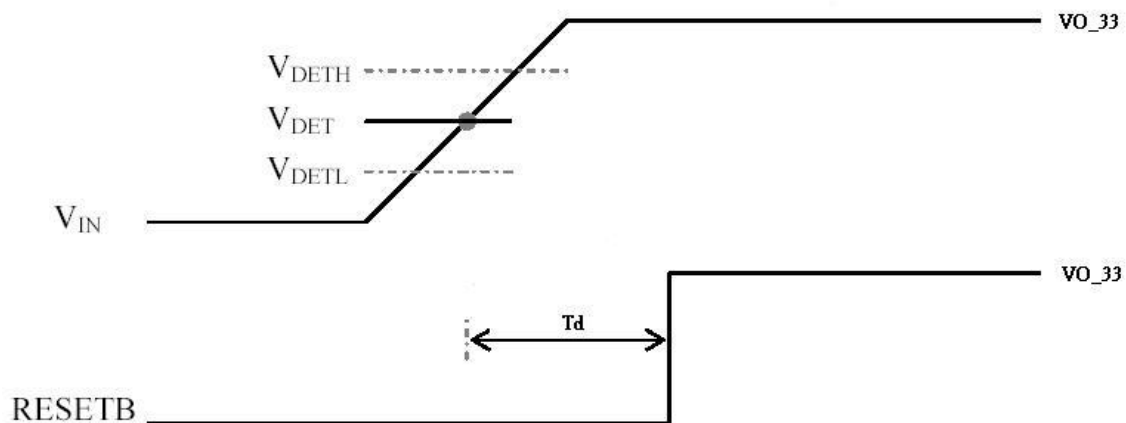


Figure 10-1 Power-On Reset Diagram

Table 9-6 Power-On Reset

Parameter	Symbol	FF@70°C VO_33=3.63V	TT@25°C VO_33=3.3V	SS@0°C VO_33=2.97V	Unit
Output Delay Time	Td	1.18	2.68	182.5	μsec

Note: The delay time is simulated with VIN ramp of 1V/μsec.

10.0 Outline Diagram

10.1 SSOP28 Package

Table 10-1 Package Dimension

Symbol	Millimeter			Inch		
	Min	Nom	Max	Min	Nom	Max
b	0.22		0.38	0.009		0.015
E	7.40	7.80	8.20	0.291	0.307	0.323
E1	5.00	5.30	5.60	0.197	0.209	0.220
L	0.55	0.75	0.95	0.021	0.030	0.037
R1	0.09			0.004		
D	9.9	10.2	10.5	0.390	0.402	0.413
A			2.0			0.079
e		0.65			0.0256	
L1		1.25			0.050	
A1	0.05			0.020		
A2	1.65	1.75	1.85	0.065	0.069	0.073

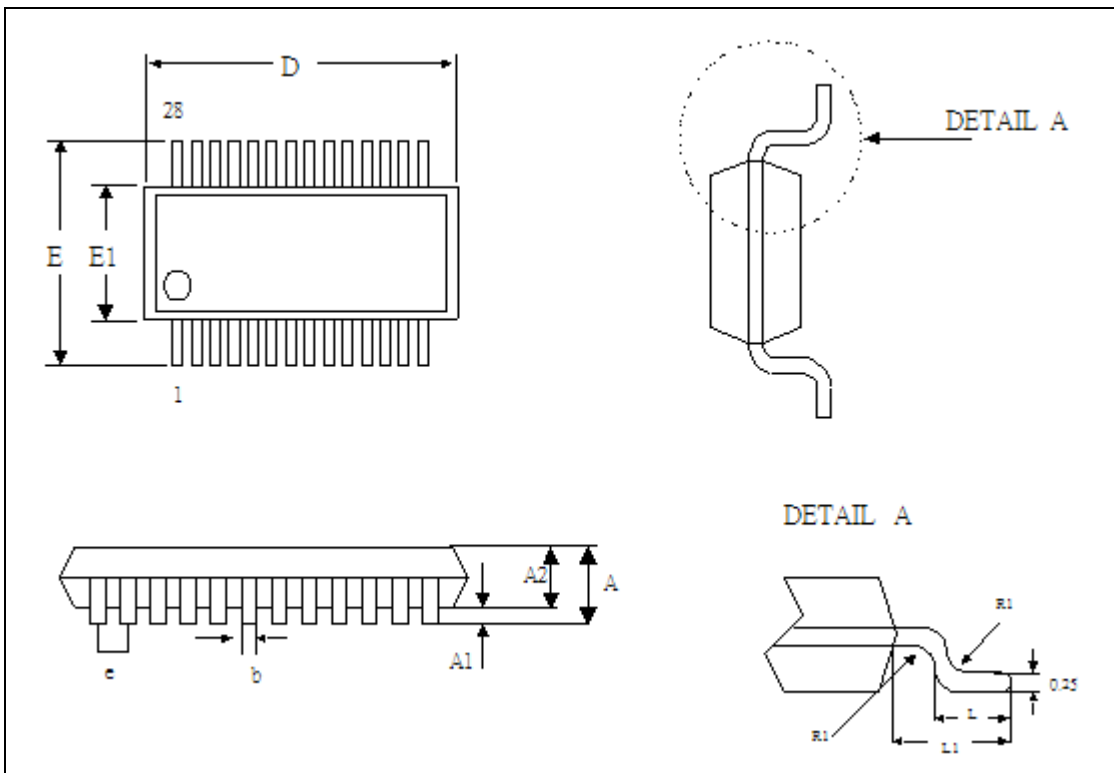


Figure 10-1 Outline Diagram of PL-2303HX (Rev D) SSOP28

10.2 QFN32 Package

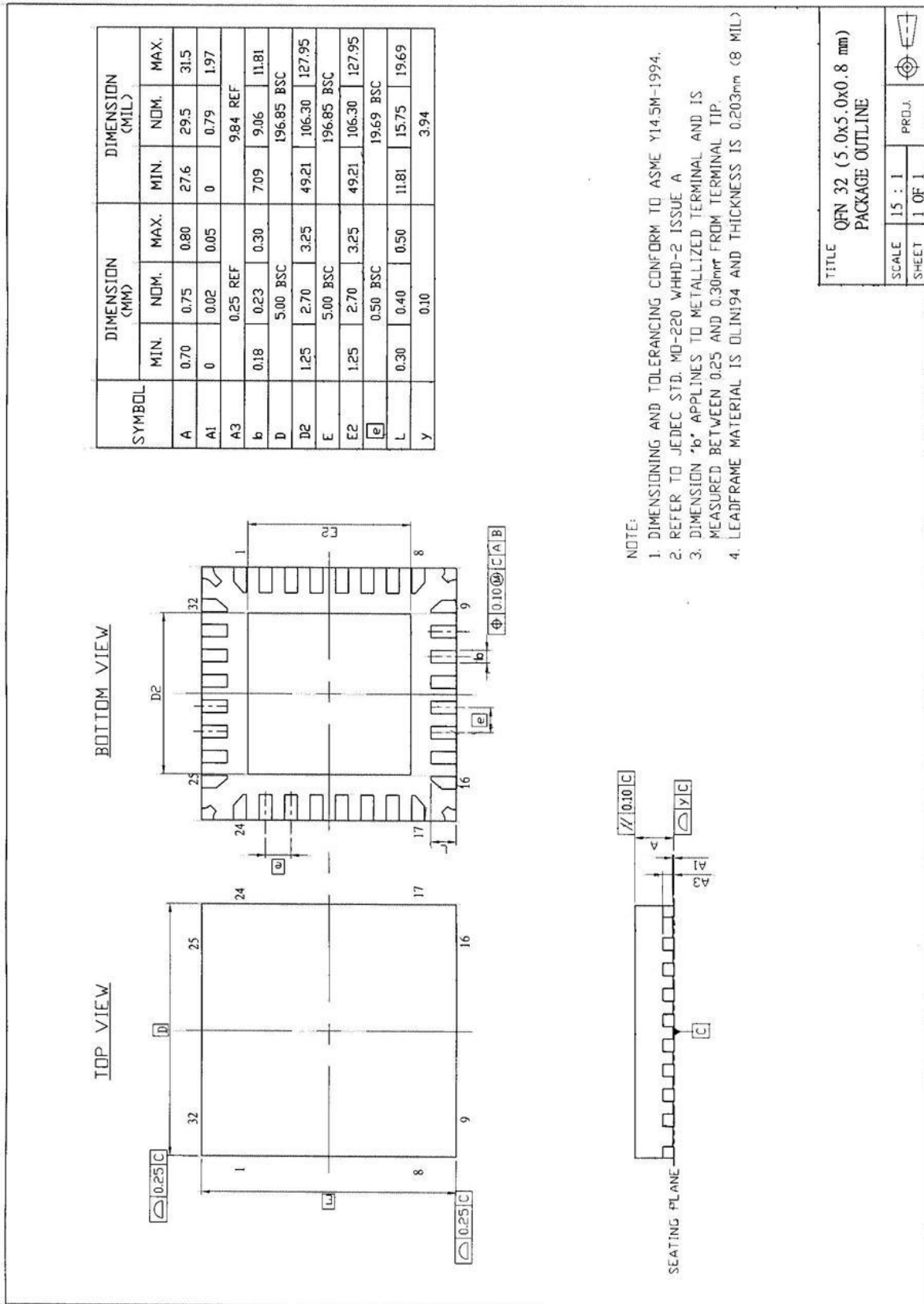


Figure 10-2 Outline Diagram of PL-2303HX (Rev D) QFN32

11.0 Reel Packing Information

11.1 Carrier Tape (SSOP-28)

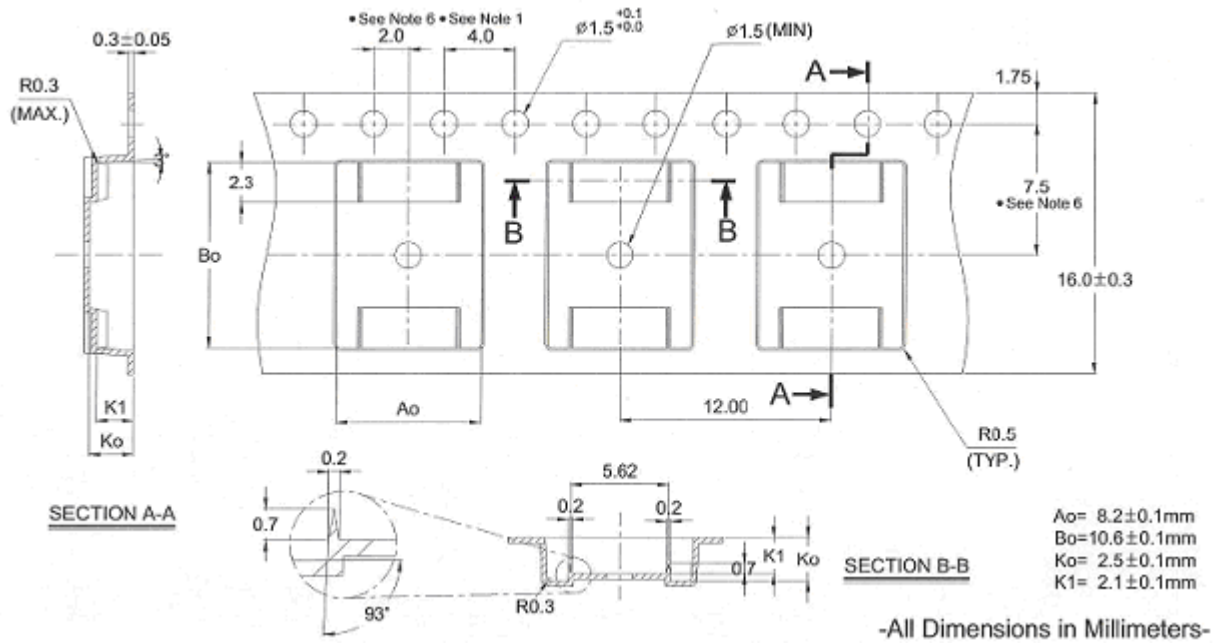


Figure 11-1 SSOP28 Carrier Tape

Notes:

1. 10 sprocket hole pitch cumulative tolerance ±0.2
2. Camber not to exceed 1mm in 100mm.
3. Material: Black Polystyrene.
4. Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.
7. IC quantity per one reel: 1,000 (min) ~ 2,000 (max)

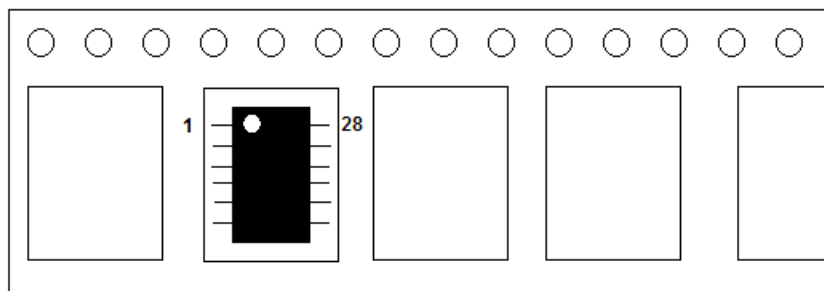


Figure 11-2 IC Reel Placements

11.2 Reel Dimension

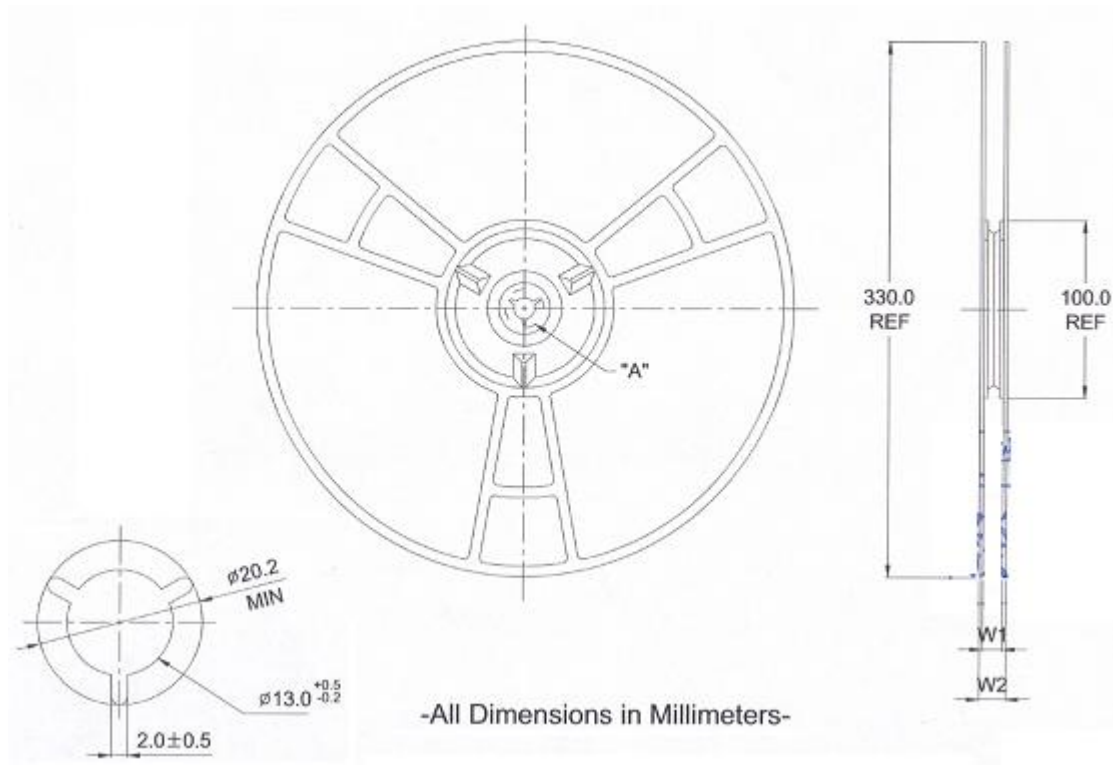


Figure 11-3 Reel Dimension

Table 11-2 Reel Part Number Information

Part Number	Normal Hub Width	W1 +0.3mm -0.2mm	W2 Max
RD33008SW-T + RD33008SW-T	16mm	16.8mm	22.2mm

11.3 Tube Packing

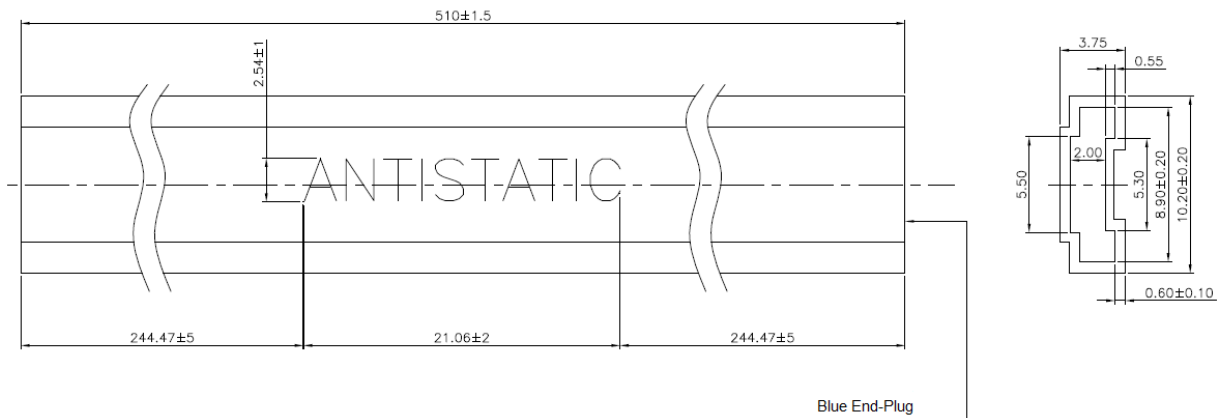


Figure 11-4 Tube Packing Dimension

REMARK :

- 1.TUBE MT'L : PVC,COATING WITH ANTISTATIE LIQUID.
- 2.COLOR : TUBE - TRANSPARENT ; MARK - BLUE
- 3.SURFACE RESISTANCE : $10^8 \sim 10^{11} \cdot / \square$
- 4.NO BURR AT CUTTING AREA.
- 5.THE TUBE SHALL WITH BLUE END-PLUG(3088-060-01681) FROM VENDOR, TAIL DOWNWARD AND THE OTHER ONE ENCLOSE TOGETHER WITH SHIPMENT.

12.0 Ordering and Chip Marking Information

Table 12-1 Ordering Information

Part Number	Package Type
PL-2303HXD SSOP LF	28-pin SSOP (Lead Free or Pb-Free)
PL-2303HXD QFN LF	32-pin QFN (Lead Free or Pb-Free)

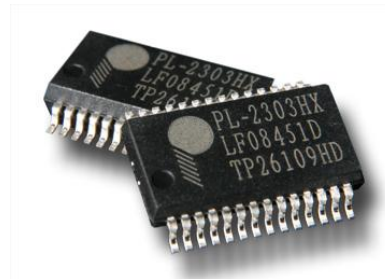
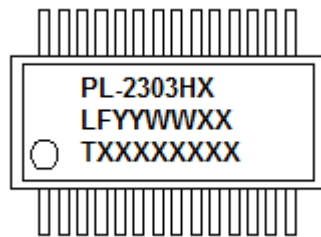


Figure 12-1 Chip Part Number Information (SSOP)

Table 12-2 Chip Marking Information

Line	Marking	Description
First Line	PL-2303HX	Chip Product Name
Second Line (LFYYWWXX)	LF	Lead-Free (Pb-free) packing material
	YY	Last two digits of the manufacturing year
	WW	Week number of the manufacturing year
	XX	HX Chip Version (Rev D)
Third Line	TXXXXXXXX	Manufacturing LOT code

Example: "LF08451D" – means Lead-Free packing + Year 2008 + Week no. 45 + 1D chip version.

13.0 Contact Information

Taiwan Headquarter

7F, No.48, Sec. 3, Nan Kang Rd.,
Nan Kang, Taipei, Taiwan 115, R.O.C.
Tel: +886-2-2654-6363 Fax: +886-2-2654-6161
Website: www.prolific.com.tw
E-mail: sales@prolific.com.tw

Shenzhen Office

Room 1908, Building, No.A, jiaehuaqiang Building,
Shennanzhong Rd. Futian District, Shenzhen, China
Tel: +86-1350-285-4191
E-mail: alexyang@prolific.com.tw

Distributors Contact: <http://www.prolific.com.tw/eng/contact-distributors.asp>

Taiwan Distributors

Maxtek Technology Co., Ltd.

5F, No. 13-20, Sec. 6, Ming-Chuang E.RD., Nei-Hu, Taipei, Taiwan, R.O.C.
Tel: +886-2-2794-6060 Ext.662
Fax: +886-2-8792-8921
Website: <http://www.maxtek-icrep.com.tw>
E-mail: sales@maxtek.icrep.com.tw

Morrihan International Corp.

4F, No. 3-2, YuanCyu Street, NanKang District, Taipei 115, Taiwan, R.O.C.
Tel: +886-2-2788-5511
Fax: +886-2-2788-9366
Website: <http://www.morrihan.com>

U-CHEER Company Co., Ltd.

4F, No. 48, Chow-Tze ST., Nei-Hu, Taipei, Taiwan, R.O.C.
Tel: +886-2-8797-6789
Fax: +886-2-8797-3388
E-mail: arthur.lu36@ucbeer.com.tw

USA and Canada

ProlificUSA.com / Tectona Electronics Inc.

250 Wyecroft Road, Unit 6, Oakville, Ontario, Canada L6K 3T7
Tel: +905-827-2206
Fax: +905-847-9412
Corporate Website: <http://www.tectona.com>
Product Website: <http://www.prolificUSA.com>

Japan

Hitachi High-Tech Trading Corporation

1-24-14, Nishi-Shimbashi, Minato-ku, Tokyo, 105-8418 Japan
Dept.: Electronic Devices 4th Dept., Electronic Devices Sales Div
Tel: +81-3-3504-3859
Fax: +81-3-3504-7903
Website: <http://www.hitachi-hitec-trading.com>

China

Lacewood International Corp.

Hong Kong Office

Unit B1-B3, 21/F, Block B, Kong Nam Industrial Building, 603-609 Castle peak Road,
Tsuen Wan N.T, Hong Kong

Tel: +852-2690-9898

Fax: +852-2690-9300

Shenzhen Office

Room401-3,East, CEC Information Building, No.1 Xin Wen Road, Shenzhen, P.R.C.,
518034

Tel:+86-755-8296-7018

Fax: +86-775-8330-7119

Shanghai Office

Rm 208,District B, Building 3,NO.7,Guiqin Rd, Xuhui Area, Shanghai

Tel : +86-21-5426-2182 ~6

Fax: +86-21-5426-2180

China Fremlink Asia Limited

Room 307, 3F Block6, AnHua Industrial Zone, Tairan 8th Road,
CheGongMiao, Futian District, Shenzhen, China

Tel: +86-755-8302-0469

China Shenzhen Shiqixinji Science and Technology Co., Ltd.

Room 1908, Building NO.A, Jiahehuaqiang Building,
Shennanzhong Rd., Futian District, Shenzhen, China

Tel: +86-755-8329-5310

Korea

Nevora Technology

Rm 502, Citylife, 441, Amsa-Dong, Kangdong-Gu, Seoul, 134-855, Korea

Tel: +82-2-3426-0050

Fax: +82-2-3426-0070

Website: <http://www.nevora.co.kr>

T&C Semitech Co.,LTD

#703 J-dong, Gongku-sangga, 636-62, Kuro-dong, Kuro-ku, Seoul. Korea

Tel: +82-2-2672-9531

Fax: +82-2-2672-9532

Website: <http://www.tncsemi.co.kr>