Future Technology Devices International Ltd.

TN_138 FT221X Errata Technical Note

Document Reference No.: FT_000640

Version 1.4

Issue Date: 2013-06-10

The intention of this errata technical note is to give a detailed description of known functional or electrical issues with the FTDI FT221X devices.
The current revision of the FT221X is **revision D, released November 2012.**

Future Technology Devices International Limited (FTDI)

Unit1, 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH United Kingdom
Tel.: +44 (0) 141 429 2777 Fax: + 44 (0) 141 429 2758
E-Mail (Support): **support1@ftdichip.com** Web: http://www.ftdichip.com

TABLE OF CONTENTS

1 FT221X Revision

FT221X part numbers are listed in **Table 1.** The letter at the end of date code identifies the device revision.

The current revision of the FT221X is **revision D, released November 2012.** At the time of releasing this Technical Note there are no known issues with this silicon revision.

Part Number	Package
FT221XQ	20 pin QFN
FT221XS	20 pin SSOP

Table 1 FT221X Part Numbers

This errata technical note covers the revisions of FT221X listed in **Table 2**.

Revision	Notes
A	First device revision. Never sold publicly.
B	Second device revision. Launched 28 February 2012
C	Third device version. Released 11th June 2012
D	Forth device version. Released 6th November 2012

Table 2 FT221X Revisions

2 Errata History Table – Functional Problems

Functional Problem	Short description	Errata occurs in device revision
USB Data Transfer	Transfer of data over USB stops unexpectedly	A, B and C
USB 3.0 Hosts	USB 3.0 Host occasional interoperability	A, B and C

Table 3 Functional Errata

2.1 Errata History Table – Electrical and Timing Specification Deviations.

Deviations	Short description	Errata occurs in device revision
Fault with internal 3V3 regulator.	Device VCC is designed to operate between 3V3 and 5V however with this errata the supply should not be set below 4.3V for correct operation.	B

Table 4 Electrical and Timing Errata

3 Functional Problems of FT221X

3.1 Revision A

3.1.1 USB Data Transfer

Introduction:

An issue has been identified where the transfer of data over USB stops unexpectedly.

Problem:

The device is put into suspend mode during a transfer of certain data patterns most notable with binary zeros. This can halt the data transfer in certain circumstances and will require the device to be re-enumerated to recover.

NB. It is the presence of this data pattern on the USB bus regardless of whether the data is intended for the FT221X or other devices (e.g. a broadcast) on the bus that forces the suspend state.

Workaround:

This issue can be avoided by utilising the keep awake function of the chip. This will disable the USB suspend function of the chip and is therefore an intermediate workaround until revision D silicon is released with a permanent fix.

NB. With the workaround the chip will never enter lower powered suspend. However the keep awake current will be approximately 3mA.

To enable the keep awake function in the EEPROM, one of the CBUS pins needs to be configured as Keep-Awake#. This pin then needs to be tied to ground on the PCB. The FT_Prog utility can be used to configure the CBUS pin.

Package specific:

The effected packages are listed in Table 5.

Package	Applicable (Yes/No)
FT221XQ	Y
FT221XS	Y

Table 5

3.1.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT221X will not enumerate when connected to certain USB 3.0 Hosts. So far FTDI have identified **ONE** such host.

Problem:

Certain USB 3.0 Hosts exhibit reduced reset recovery times after a USB reset, which can at times be faster or close to the USB 2.0 specification limit. The USB 2.0 specification states a USB reset recovery time of 10ms and in general almost all hosts allocate a much longer period than this. The FT221X device may not enumerate if the reset recovery time is reduced.

This issue has been seen on one USB 3.0 Host controller and has not been seen on a USB 2.0 Host controller or other USB 3.0 Host controllers.

Workaround:

Reconnect the device to a USB 2.0 host. This issue has been seen only on one particular USB 3.0 Host controllers.

Package specific:

The effected packages are listed in Table 6.

Package	Applicable (Yes/No)
FT221XQ	Y
FT221XS	Y

Table 6

3.2 Revision B

3.2.1 USB Data Transfer

Introduction:

An issue has been identified where the transfer of data over USB stops unexpectedly.

Problem:

The device is put into suspend mode during a transfer of certain data patterns most notable with binary zeros. This can halt the data transfer in certain circumstances and will require the device to be re-enumerated to recover.

NB. It is the presence of this data pattern on the USB bus regardless of whether the data is intended for the FT221X or other devices (e.g. a broadcast) on the bus that forces the suspend state.

Workaround:

This issue can be avoided by utilising the keep awake function of the chip. This will disable the USB suspend function of the chip and is therefore an intermediate workaround until revision D silicon is released with a permanent fix.

NB. With the workaround the chip will never enter lower powered suspend. However the keep awake current will be approximately 3mA.

To enable the keep awake function in the EEPROM, one of the CBUS pins needs to be configured as Keep-Awake#. This pin then needs to be tied to ground on the PCB. The FT_Prog utility can be used to configure the CBUS pin.

Package specific:

The effected packages are listed in Table 7.

Package	Applicable (Yes/No)
FT221XQ	Y
FT221XS	Y

Table 7

3.2.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT221X will not enumerate when connected to certain USB 3.0 Hosts. So far FTDI have identified **ONE** such host.

Problem:

Certain USB 3.0 Hosts exhibit reduced reset recovery times after a USB reset, which can at times be faster or close to the USB 2.0 specification limit. The USB 2.0 specification states a USB reset recovery time of 10ms and in general almost all hosts allocate a much longer period than this. The FT221X device may not enumerate if the reset recovery time is reduced.

This issue has been seen on one USB 3.0 Host controller and has not been seen on a USB 2.0 Host controller or other USB 3.0 Host controllers.

Workaround:

Reconnect the device to a USB 2.0 host. This issue has been seen only on one particular USB 3.0 Host controllers.

Package specific:

The effected packages are listed in Table 8.

Package	Applicable (Yes/No)
FT221XQ	Y
FT221XS	Y

Table 8

3.3 Revision C

3.3.1 USB Data Transfer

Introduction:

An issue has been identified where the transfer of data over USB stops unexpectedly.

Problem:

The device is put into suspend mode during a transfer of certain data patterns most notable with binary zeros. This can halt the data transfer in certain circumstances and will require the device to be re-enumerated to recover.

NB. It is the presence of this data pattern on the USB bus regardless of whether the data is intended for the FT221X or other devices (e.g. a broadcast) on the bus that forces the suspend state.

Workaround:

This issue can be avoided by utilising the keep awake function of the chip. This will disable the USB suspend function of the chip and is therefore an intermediate workaround until revision D silicon is released with a permanent fix.

NB. With the workaround the chip will never enter lower powered suspend. However the keep awake current will be approximately 3mA.

To enable the keep awake function in the EEPROM, one of the CBUS pins needs to be configured as Keep-Awake#. This pin then needs to be tied to ground on the PCB. The FT_Prog utility can be used to configure the CBUS pin.

Package specific:

The effected packages are listed in Table 9.

Package	Applicable (Yes/No)
FT221XQ	Y
FT221XS	Y

Table 9

3.3.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT221X will not enumerate when connected to certain USB 3.0 Hosts. So far FTDI have identified **ONE** such host.

Problem:

Certain USB 3.0 Hosts exhibit reduced reset recovery times after a USB reset, which can at times be faster or close to the USB 2.0 specification limit. The USB 2.0 specification states a USB reset recovery time of 10ms and in general almost all hosts allocate a much longer period than this. The FT221X device may not enumerate if the reset recovery time is reduced.

This issue has been seen on one USB 3.0 Host controller and has not been seen on a USB 2.0 Host controller or other USB 3.0 Host controllers.

Workaround:

Reconnect the device to a USB 2.0 host. This issue has been seen only on one particular USB 3.0 Host controllers.

Package specific:

The effected packages are listed in Table 10.

Package	Applicable (Yes/No)
FT221XQ	Y
FT221XS	Y

Table 10

3.4 Revision D

No known issues at revision D.

Electrical and Timing specification deviations of FT221X

3.5 Revision A

No known issues at revision A

3.6 Revision B

3.6.1 Internal 3V3 Regulator

Introduction:

The FT221X uses an internal regulator to generate 3V3 from a 5V source (VCC). The source should be variable from 3V3 to 5V.

Problem:

The VCC supply to the regulator must not drop below 4.3V for the correct 3V3 regulated output to be produced.

Workaround:

VCC must not be supplied below 4.3V.

Package specific:

The effected packages are listed in Table 11.

Package	Applicable (Yes/No)
FT221XQ	Y
FT221XS	Y

Table 11

3.7 Revision C

No known issues at revision C

3.8 Revision D

No known issues at revision D.

4 FT221X Package Markings

FT221X is available in a RoHS Compliant, 20 pin QFN and 16 pin SSOP. An example of the markings on the package is shown in Figure 5.1.

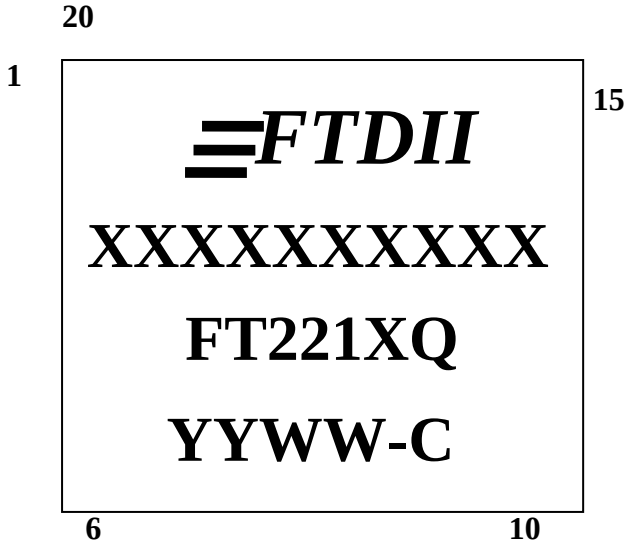

Figure 4-1 Package Markings – FT221XQ

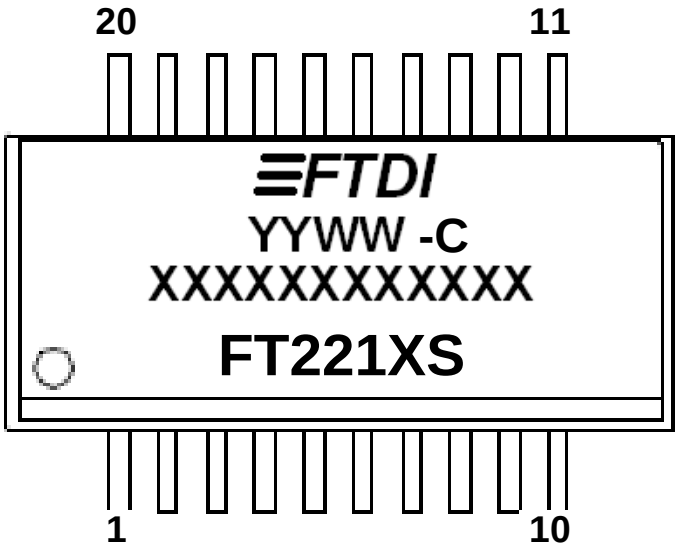

Figure 4-2 Package Markings – FT221XS

The date code format is **YYWW** where WW = 2 digit week number, YY = 2 digit year number. This is followed by the revision number.
The code **XXXXXXXXXXX** is the manufacturing LOT code

5 Contact Information

Head Office – Glasgow, UK

Unit 1, 2 Seaward Place, Centurion Business Park
Glasgow G41 1HH
United Kingdom
Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-mail (Sales) sales1@ftdichip.com
E-mail (Support) support1@ftdichip.com
E-mail (General Enquiries) admin1@ftdichip.com

Branch Office – Taipei, Taiwan

2F, No. 516, Sec. 1, NeiHu Road
Taipei 114
Taiwan , R.O.C.
Tel: +886 (0) 2 8797 1330
Fax: +886 (0) 2 8751 9737

E-mail (Sales) tw.sales1@ftdichip.com
E-mail (Support) tw.support1@ftdichip.com
E-mail (General Enquiries) tw.admin1@ftdichip.com

Branch Office – Oregon, USA

7130 Fir Loop,
Tigard, OR 97223-8160
USA
Tel: +1 (503) 547 0988
Fax: +1 (503) 547 0987

E-Mail (Sales) us.sales@ftdichip.com
E-Mail (Support) us.support@ftdichip.com
E-Mail (General Enquiries) us.admin@ftdichip.com

Branch Office – Shanghai, China

Room 1103, No. 666 West Huaihai Road,

Shanghai, 200052
China
Tel: +86 21 62351596
Fax: +86 21 62351595

E-mail (Sales) cn.sales@ftdichip.com
E-mail (Support) cn.support@ftdichip.com
E-mail (General Enquiries) cn.admin@ftdichip.com

Web Site

http://ftdichip.com

Appendix C – Revision History

Document Title:	TN_138 FT221X Errata Technical Note
Document Reference No.:	FT_000640
Clearance No.:	FTDI# 284
Product Page:	http://www.ftdichip.com/FT-X.htm
Document Feedback:	Send Feedback

Version 1.0	First Release	09/03/2012
Version 1.1	Added rev C and Updated China address	11/06/2012
Version 1.2	Added USB data transfer issue	12/07/2012
Version 1.3	Added USB 3.0 hosts and note to Problem section of USB data transfer	14/08/2012
Version 1.4	Added revision D – no known issues, updated contact information	10/06/2013