Future Technology Devices International Ltd.

TN_137 FT220X Errata Technical Note

Document Reference No.: FT_000639

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 FT220X devices.
The current revision of the FT220X is **revision D, released November 2012.**

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1 FT220X Revision

FT220X part numbers are listed in **Table 1.** The letter at the end of date code identifies the device revision.

The current revision of the FT220X 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
FT220XQ	16 pin QFN
FT220XS	16 pin SSOP

Table 1 FT220X Part Numbers

This errata technical note covers the revisions of FT220X 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 FT220X 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 FT220X

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 FT220X 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)
FT220XQ	Y
FT220XS	Y

Table 5

3.1.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT220X 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 FT220X 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)
FT220XQ	Y
FT220XS	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 FT220X 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)
FT220XQ	Y
FT220XS	Y

Table 7

3.2.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT220X 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 FT220X 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)
FT220XQ	Y
FT220XS	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 FT220X 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)
FT220XQ	Y
FT220XS	Y

Table 9

3.3.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT220X 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 FT220X 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)
FT220XQ	Y
FT220XS	Y

Table 10

3.4 Revision D

No known issues at revision D.

4 Electrical and Timing specification deviations of FT220X

4.1 Revision A

No known issues at revision A

4.2 Revision B

4.2.1 Internal 3V3 Regulator

Introduction:

The FT220X 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)
FT220XQ	Y
FT220XS	Y

Table 11

4.3 Revision C

No known issues at revision C

4.4 Revision D

No known issues at revision D.

5 FT220X Package Markings

FT220X is available in a RoHS Compliant RoHS Compliant package, 16 pin QFN and 16 pin SSOP. An example of the markings on the package is shown in Figure 5.1.

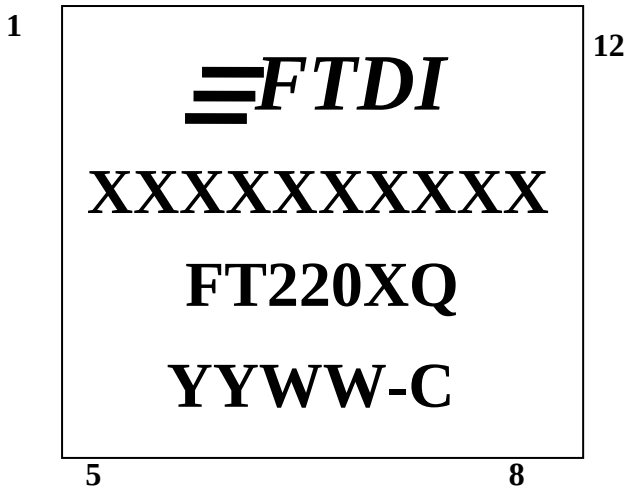

Figure 5-1 Package Markings – FT220XQ

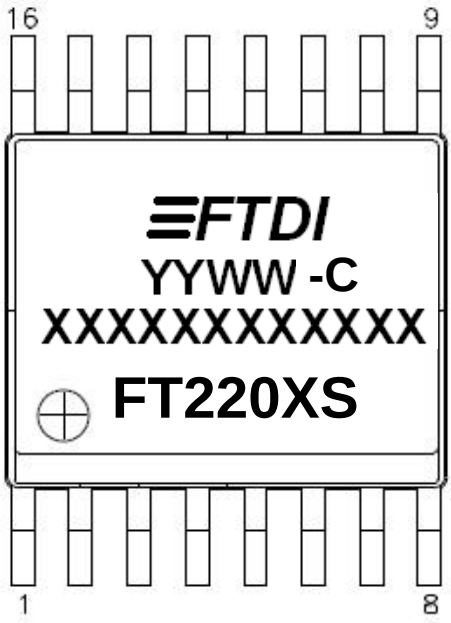

Figure 5-2 Package Markings – FT220XS

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

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Appendix C – Revision History

Document Title:	TN_137 FT220X Errata Technical Note
Document Reference No.:	FT_000639
Clearance No.:	FTDI# 283
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