Future Technology Devices International Ltd.

TN_140 FT231X Errata Technical Note

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Version 1.4

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The intention of this errata technical note is to give a detailed description of known functional or electrical issues with the FTDI FT231X devices.
The current revision of the FT231X is **revision D, released November 2012.**

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1 FT231X Revision

FT231X part numbers are listed in **Table 1.** The letter at the end of date code identifies the device revision.

The current revision of the FT231X 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
FT231XQ	20 pin QFN
FT231XS	20 pin SSOP

Table 1 FT231X Part Numbers

This errata technical note covers the revisions of FT231X listed in **Table 2**.

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

Table 2 FT231X 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 – Programming Issues

Functional Problem	Short description	Errata occurs in device revision
FT230X	Default VCP setting is disabled	A, B

Table 4 Programming Errata

2.2 Errata History Table – Electrical and Timming 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 5 Electrical and Timing Errata

3 Functional Problems of FT231X

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 will immediately halt the data transfer and the device will need 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 FT231X 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 6.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 6

3.1.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT231X 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 FT231X 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 7.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 7

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 will immediately halt the data transfer and the device will need 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 FT231X 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 8.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 8

3.2.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT231X 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 FT231X 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 9.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 9

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 will immediately halt the data transfer and the device will need 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 FT231X 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 10.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 10

3.3.2 USB 3.0 Hosts

Introduction:

An issue has been identified where the FT231X 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 FT231X 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 11.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 11

3.4 Revision D

No known issues at revision D.

4 Programming Issues of FT231X

4.1 Revision A

4.1.1 Default VCP Setting is Disabled

Introduction:

The FT230X stores several configuration values in the MTP. The VCP driver is intended to be enabled with the FT230X.

Problem:

An incorrect value for the VCP driver was programmed into the MTP on some production runs.

Workaround:

Use FT_Prog or a custom D2XX program to change the MTP setting to enable loading of the VCP driver.

This setting has been corrected in all Rev C devices.

Package specific:

The effected packages are listed in Table 12.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 12

4.2 Revision B

4.2.1 Default VCP Setting is Disabled

Introduction:

The FT230X stores several configuration values in the MTP. The VCP driver is intended to be enabled with the FT230X.

Problem:

An incorrect value for the VCP driver was programmed into the MTP on some production runs.

Workaround:

Use FT_Prog or a custom D2XX program to change the MTP setting to enable loading of the VCP driver.

This setting has been corrected in all Rev C devices.

Package specific:

The effected packages are listed in Table 13.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 13

4.3 Revision C

No known programming issues at Revision C.

4.4 Revision D

No known issues at revision D.

5 Electrical and Timing specification deviations of FT231X

5.1 Revision A

No known issues at revision A

5.2 Revision B

5.2.1 Internal 3V3 Regulator

Introduction:

The FT231X 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 14.

Package	Applicable (Yes/No)
FT231XQ	Y
FT231XS	Y

Table 14

5.3 Revision C

No known programming issues at Revision C.

5.4 Revision D

No known issues at revision D.

6 FT231X Package Markings

FT231X is available in a RoHS Compliant RoHS Compliant package, 20 pin QFN and 16 pin SSOP. An example of the markings on the package is shown in Figure 5.1.

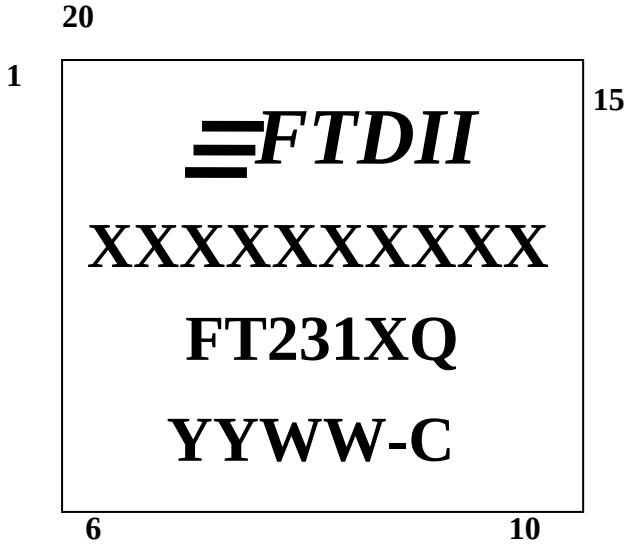

Figure 6-1 Package Markings – FT231XQ

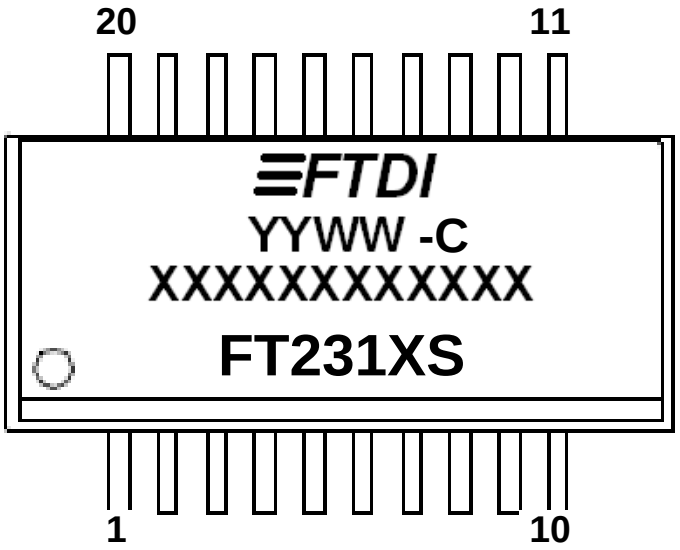

Figure 6-2 Package Markings – FT231XS

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_140 FT231X Errata Technical Note
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Document Feedback:	Send Feedback

Version 1.0	First Release	09/03/2012
Version 1.1	Added VCP MTP setting corrections Updated China address Added Rev C release	11/06/2012
Version 1.2	Added USB data transfer issue and corrected programming issues	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