



## **Future Technology Devices International Ltd.**

### **TN\_138 FT221X Errata Technical Note**

**Document Reference No.: FT\_000640**

**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 FT221X devices.

The current revision of the FT221X is **revision D, released November 2012.**

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## 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 11 <sup>th</sup> 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.

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## 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.

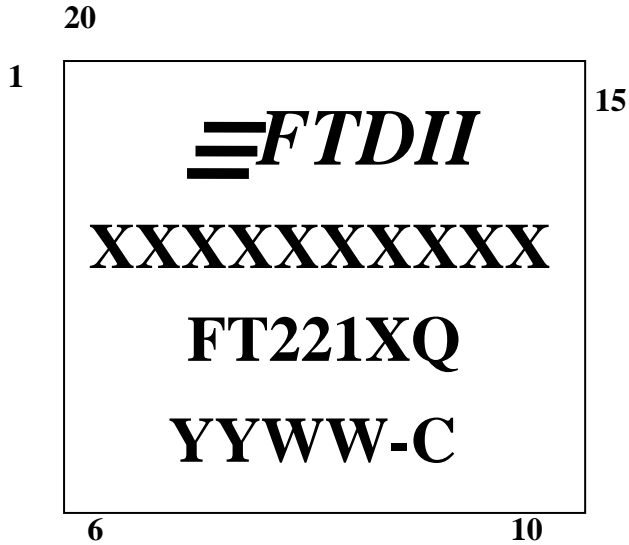


Figure 4-1 Package Markings – FT221XQ

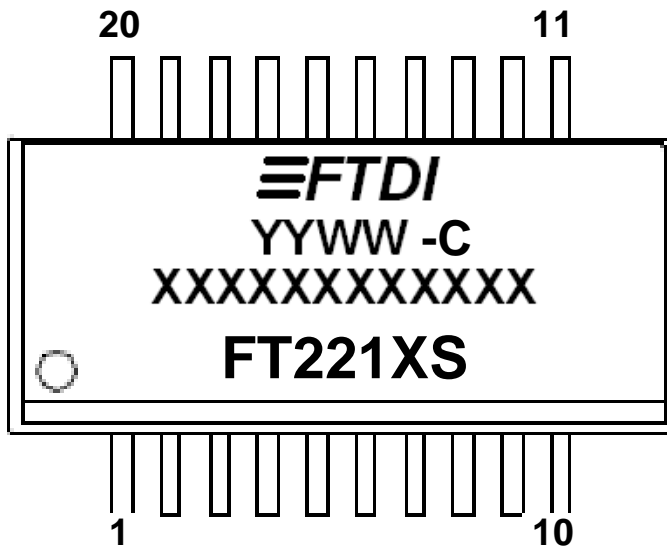


Figure 4-2 Package Markings – FT221XS

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 **XXXXXXXXXX** is the manufacturing LOT code

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### Web Site

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## Appendix C – Revision History

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Document Feedback: [Send Feedback](#)

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