

16-BIT MICROCONTROLLER STARTERKIT
SK-16FX-144PMC-USB

FUNCTIONAL LIMITATION
USB FUNCTION INTERFACE

CUSTOMER INFORMATION



Revision History

Date	Issue
2009-01-02	V1.0, HWE, Initial Version
2010-05-05	V1.1, MSc, Transistor Q3

This document contains 8 pages.

Abbreviations:

FME Fujitsu Microelectronics Europe GmbH
 MCU Microcontroller

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Fujitsu does not bear any warranty in the case this handling note is not fully observed.

1 Problem Description

The USB Function interface does not work properly on SK-16FX-144PMC-USB V1.0 or V1.1

- Reverse powering may occur
- Back voltage on D+ may occur
- Problems with device recognition after pressing reset

2 Problem Conditions

- In case that the SK-16FX-144PMC-USB is not self powered but connected to an USB Host, an increased current may be driven via VBUS of the USB Function interface X3 connected to the microcontroller's interrupt input.
- Even when Vbus is not yet detected the D+ pull up resistor is enabled.
- Even when HCONX jumper JP67 is open, D+ pull up resistor is enabled

3 Affected Tools

All SK-16FX-144PMC-USB of revision V1.0 and in parts V1.1

4 Root Cause

The problem is caused by PCB design error.

After patching to V1.1 some boards were assembled with the wrong type of transistor (NPN instead of PNP) for Q3.

5 Workaround

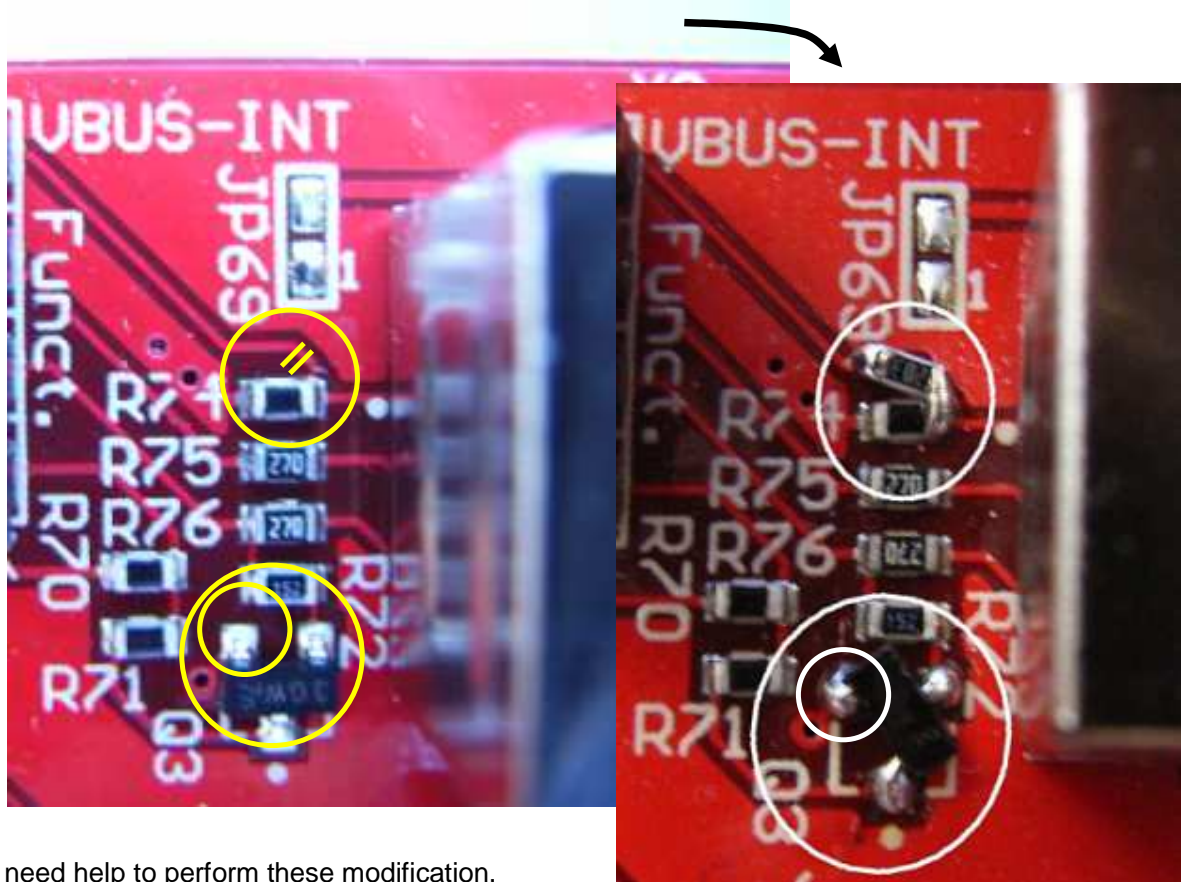
5.1 Do not use the USB function interface

If the SK-16FX-144PMC-USB V1.0 or in parts V1.1 is not connected by the USB Function interface X3 to an USB Host, then no problem will occur.

5.2 Design modification V1.1

The problem can be fixed manually as follows:

1. Cut the trace from X3-1 to JP64-1 (VBUS) as shown close to R74
2. Solder an additional resistor R99=20kOhm between X3-1 and JP64-1 (VBUS)
3. Remove (desolder) Q3 carefully
4. Put Q3 backward on top and solder Q3 again as shown
Keep the position of the marked pin close to R71 (Emitter)



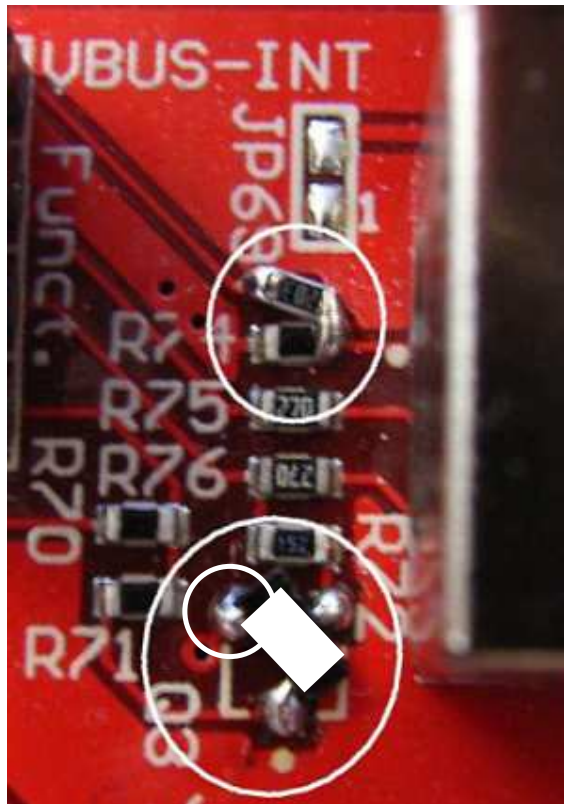
If you need help to perform these modification, then please contact micro_info@fme.fujitsu.com.

5.3 Use SK-16FX-144PMC-USB V1.1 or newer

The SK-16FX-144PMC-USB revision V1.1 or newer have the bug fix already included. On some boards the wrong type of transistors were assembled. If the function mode has problems after resetting the MCU to be recognized by the host, this can be an indication for the wrong type of transistor. Repaired boards have a white mark on the transistor.

The problem can be fixed manually as follows:

1. Remove (desolder) Q3 carefully
2. Put a new BC857C **PNP** transistor backward on top and solder it as shown
Keep the position of the marked pin close to R71 (Emitter)
3. Mark the transistor Q3 to discover that the board was fixed.



6 Corrective action by Fujitsu

Fujitsu will produce SK-16FX-144PMC-USB V1.1 or newer in the future. If a customer has a defective board, Fujitsu will repair it.