Philips Semiconductors Hamburg

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An example of USB implementation in a Smart Card

(Kurt Koenig, Christian Brun)

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Universal Serial Bus Chip Card Contact Considerations
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The simplest USB device printed circuit board (PCB) layout is granted
with the following configuration:
-----------------------------------------------------------------
Chip Card Contact | USB Lead | Remarks
-----------------------------------------------------------------
      C1/VCC      |   VBUS   | for bus-powered operation
      C5/GND      |   GND    | common ground, always required
-----------------------------------------------------------------
        C4        |   D-     | not standardized yet!
        C8        |   D+     | not standardized yet!
-----------------------------------------------------------------

Other Chip Card Contacts which need to be or may be contacted to the PCB:
-----------------------------------------------------------------
Chip Card Contact | USB Lead | Remarks
-----------------------------------------------------------------
      C2/RST      |  (VBUS)  | as VBUS sensing option
      C3/CLK      |    --    | clock generated on the PCB
      C7/I/O      |  (VBUS)  | as alternative VBUS sensing option
-----------------------------------------------------------------
Note:
According to the USB specification it is mandatory for a USB device to sense
VBUS. So either the Chip Card IC or another circuit on the PCB must provide
VBUS sensing and the required reaction upon a loss of contact to VBUS.
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Recommended Chip Card Contact Configuration for ISO 7816 + USB Data I/Os
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================================================================================
BUS-POWERED USB DEVICE WITH
8-CONTACT USB+ISO SMART CARD
================================================================================
ELECTROMECHANICAL PCB INTERFACE EXAMPLE
WITH SIMPLE USB SIGNAL and POWER LINE TRACK LAYOUT WIHOUT CROSSINGS
================================================================================
CHIP CARD/MODULE upside down, card contacts at bottom side of the plastic card:

                      . . . . . . . . . . . . . . . . .  Chip Card
                     .                               ./
                     .                               .
 ....................                               ............................
.                    .                               .              USB   /   .
.                    .                               .              Device    .
.                    .                               .              Case      .
.                    .                               .                        .
.                    .                               .                        .
.                    .                               .                        .
.                    .                               .                        .
.                    .                               .                        .
.                    .                               .                        .
.                    .                               .    I/O                 .
.                    .             .-----------------------<> reserved for    .
.Chip Card Contact   .             |                 .        optional use    .
.  PCB Footprint     .             |                 .                        .
.                    .    .----..----..----..----.   .                        .
.                    .    | C8 || C7 || C6 || C5 |   .                        .
.             .----------|    ||    ||    ||    |------------.               .
.             |      .    | DP ||I/O || NC ||GND |   .        |               .
.             |      .    `----'`----'`----'`----'   .        |               .
.             |      .    .----..----..----..----.   .        |               .
.             |      .    | C4 || C3 || C2 || C1 |   .        |               .
.             |  .------ |    ||    ||    ||    |-------.    |               .
.             |  |  .    | DM ||CLK ||RST ||VCC |   .   |    |               .
.             |  |  .    `----'`----'`----'`----'   .   |    |               .
.             |  |  .            |     |            .   |    |               .
.             |  |   . . . . . . | . . | . . . . . .    |    |               .
.             |  |               |     |                |    |               .
.             |  |               |     |                |    |               .
.             |  |               ^     `----------------*    |               .
.             |  |              CLK                    |    |               .
.             |  |            (6 MHz)                  | || |               .
.             |  |                                     *-||-*               .
.             |  |                                     | || | C_vg          .
.             |  |                              Ferrite  |    |               .
.             |  |                               Bead   [||]   |               .
.             |  |            . . .  . . .  (BLM32A07) |    |               .
.             |  |           .           .            |    |               .
.USB Series "B"|  `--------------(2)    (1)--------------'    |               .
. Receptacle  |               .  D-    VBUS.                 |               .
.             |               .           .                  |               .
.     PCB     `-----------------(3)    (4)-----------------*-'               .
.  Footprint                  .  D+    GND .               |                 .
.                             .            .          ||   |                 .
.                       (Shell).            .(Shell)---||---'                 .
.                        Shield . . .  . . .  Shield   || C_gs                .
`.......................................................................'

Note:
When a detachable cable is interfaced to a USB Device, it is mandatory to
connect it via a USB Series "B" plug.
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USB low-speed vs full speed comparison

Feature	LOW-SPEED	FULL-SPEED
USB bus data rate	1.5Mbit/s	12Mbit/s
Serial Interface Engine Clock	6.00 MHz +- 120kHz	48.00MHz +-460kHz
Pull-Up to notify speed and connection to the USB bus	1.5kOhms (nominal) at D-	1.5kOhms at D+
3.3V internal voltage regulator drive capability	Ca. 10mA	Ca. 22mA
Key characteristics of output drivers	Tr/tf between 75ns and 300ns at Cload b200pF and 600pF	28 to 44 Ohms equiv impedance; tr/tf between 4ns and 20ns at Cload = 50pF