USB

GPIB

ISP

Q2 and Q3 are alternatives. Only Q3 is used in the actual design.

Q3
BC808

Q2
BCX51-10

VBUS_SW

R19
330E

D1
GREEN

VBUS

VBUS

VBUS

R18
10k

R17
330E

C2
2u2/6V3

CB5
100n

CB6
100n

C1
2u2/6V3

CB1
100n

CB2
100n

CB3
100n

CB4
100n

R2
330E

VBUS

VBUS

CN1
MISO
VTG
SCK
MOSI
RST
GND
6PIN

1
2
3
4
5
6

R23
10k

PE

IC4
PE
TE
D1
D2
D3
D4
D5
D6
D7
D8
DS75160A

11
1
19
18
17
16
15
14
13
12

B1
B2
B3
B4
B5
B6
B7
B8

2
4
5
6
7
8
9

D8
D7
D6
D5
D4
D3
D2
D1

D1
D2
D3
D4
EOI
DAV
NRFD
NDAC
IFC
SRQ
ATN

J2
DIO1
DIO2
DIO3
DIO4
EOI
DAV
NRFD
NDAC
IFC
SRQ
ATN
SHD
DIO5
DIO6
DIO7
DIO8
REN
TPG
TPG
TPG
TPG
TPG
GND
SHD
SHD

L1
2,2u

3V3

C4
33n

C3
100n

VBUS

VBUS

R4
10E

R5
10E

C9
100n

R3
1k5

IC1
USBDP
USBDM
3V3OUT
XTIN
XTOUT
RSTOUT
RESET
EECS
EESK
EEDATA
TEST
FT245BM

AVCC
VCC
VCCIO

GND
AGND
GND

D0
D1
D2
D3
D4
D5
D6
D7
RD
WR
TXE
RXF
SI/WU
PWREN

IC3
PB0 (T0)
PB1 (T1)
PB2 (AIN0)
PB3 (AIN1)
PB4 (SS)
PB5 (MOSI)
PB6 (MISO)
PB7 (SCK)
PD0 (RXD)
PD1 (TXD)
PD2 (INT0)
PD3 (INT1)
PD4
PD5 (OC1A)
PD6 (WR)
PD7 (RD)
RESET
X1
X2
AT90S8515_TQFP44

VCC
(AD0) PA0
(AD1) PA1
(AD2) PA2
(AD3) PA3
(AD4) PA4
(AD5) PA5
(AD6) PA6
(AD7) PA7
(A8) PC0
(A9) PC1
(A10) PC2
(A11) PC3
(A12) PC4
(A13) PC5
(A14) PC6
(A15) PC7
ALE
OC1B
GND
ICP

PA7
PA6
PA5
PA4
PA3
PA2
PA1
PA0

PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7

IC5
DC
TE
ATN
EOI
SRQ
REN
IFC
DAV
NDAC
NRFD
DS75161A

ATN
EOI
SRQ
REN
IFC
DAV
NDAC
NRFD

ATN
EOI
SRQ
REN
IFC
DAV
NDAC
NRFD

PC6
PC5
PC7
PC0
PC1
PC4
PC2
PC3

VCC
GND

D5
D6
D7
D8
REN

DIO5
DIO6
DIO7
DIO8
REN

BO1
BO2

X1
6M

R6
10E

C6
10p

C5
10p

VBUS

C8
1u/6V3*

RESET2#

X2
8M

C10
10p

C11
10p

PE

PD7
PD6

IC3   AT89x   AT90S   ATmega

C8   in   /   /
R15   in   220nF   220nF *a

*a BOR function can be used instead of the capacitor.

R15
220k*

IC2
CS
SK
DIN
DOUT
93C46

VCC
NC
NC
GND

1
2
3
4

8
7
6
5

VBUS

R12
2k2

R13
10k

EEDATA
EESK
EECS

Title	GPIB <-> USB		
Size A3	Number 11-2003		Revision V1.1
Date:	29-Dec-2005		Sheet 1 of 1
File:	D:\Bostjan Documents\GPIB_USB\gpib_usb.ddb	Drawn By: Bostjan Glazar	

USB <-> GPIB
B. Glazar, FE, LPSO, 2003 V1.1

J1

C9
uBUS
C1
Q2
C2

R19

Q3

CB1

PWR LED
D1

CB6
R18
R17

C8

R5
R4
R3
CB2

IC2
R13
R12
IC4

R2
C3
R6

C4

IC1

X1
C5

CN1

CB4
R15
1

IC3
C6
CB3

IC5

J2

X2

C10
C11

CB5

Bill of material

Type	Position	Case
10E	R5	1206
10E	R4	1206
10E	R6	1206
330E	R2	1206
330E	R17	1206
330E	R19	1206
1k5	R3	1206
1k5	R16	1206
2k2	R12	1206
10k	R13	1206
10k	R18	1206
10p	C5	1206
10p	C6	1206
10p	C10	1206
10p	C11	1206
33n	C4	1206
100n	CB1	1206
100n	CB2	1206
100n	CB3	1206
100n	CB4	1206
100n	CB5	1206
100n	CB6	1206
100n	C3	1206
100n	C9	1206
220n	R15	1206
2u2/6V3	C1	SMD-B
2u2/6V3	C2	SMD-B
2,2u	L1	1210
6M	X1	RAD0.2
8M	X2	RAD0.2
6PIN	CN1	IDC6
6PIN	J1	USB-B
24PIN	J2	Centronics
GREEN 3 mm	D1	LED0/1
BC808	Q3	SOT-23(BEC)
FT245BM	IC1	MQFP32
93C46	IC2	SO-8
AT90S8515_TQFP44 or ATmega8515	IC3	QFP44-2
DS75160A	IC4	DIP20
DS75161A	IC5	DIP20
Conrad 520985 (black)/ 520993 (grey)		housing

Notes:
Q2 is an alternative to Q3.
Some position numbers that are missing from the list (R1, R7-R11, R14, R16, R20, R21, C7, C12 and Q1) belong only to first version of the controller.

FTDI configuration

Property	Value	Notes
Manufacturer	FE	
Vendor ID	0403	FTDI Default
Product ID	6001	FTDI Default
Description	GPIB Controller	
Power	Bus	
Remote Wakeup	No	
Max Power (mA)	320 (mA)	

Notes: Device Description above is required for FTD2XX LabVIEW drivers to find the controller.