RICHARD WÖHR® GMBH

Erstellt: 27.01.2011
Freigegeben: 04.05.2011

SPECIFICATION

CONTROL CHIP FOR 5-WIRE TOUCH SCREEN (USB)

ITEM NO.:TC-R5-USB-IC01
VERSION:1.2
DATE: 27.01.2011

Unsere Angabe entbinden den Kunden nicht davon, die Eignung für den vorgesehenen Einsatzbereich jeweils zu prüfen.
Technische Änderungen behalten wir uns ohne Vorankündigung jederzeit vor.
Jede Haftung in Verbindung mit anwendungstechnischer Beratung wird ausgeschlossen.
Die Ausgabe dieses Formulars ist nicht registriert und unterliegt somit nicht dem Änderungsdienst.
Bitte prüfen sie daher immer ob die aktuellste Ausgabe vorliegt.

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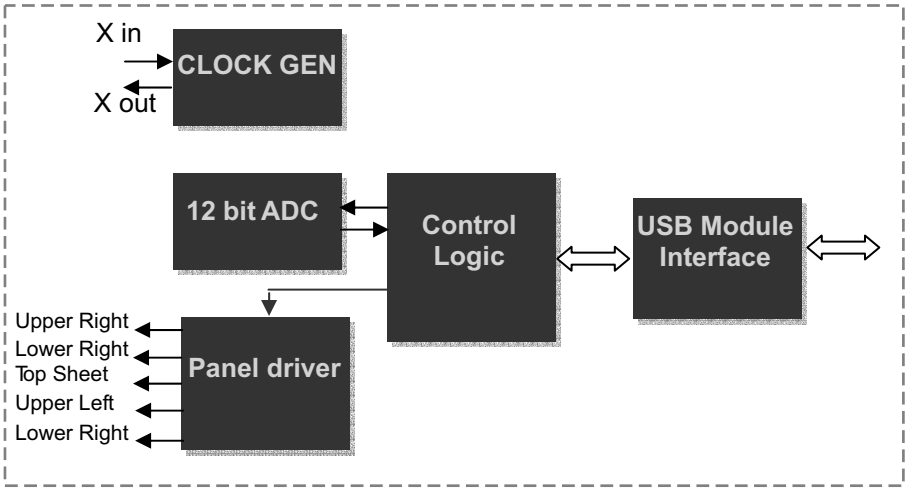
1. GENERAL DESCRIPTION

The control IC is desigened for fully integrated 5-wire touch screen application and supports USB interface. It also provide 12 bit ADC resolution. It is good for pen-touch with low-power application. It can work with standard mouse driver.

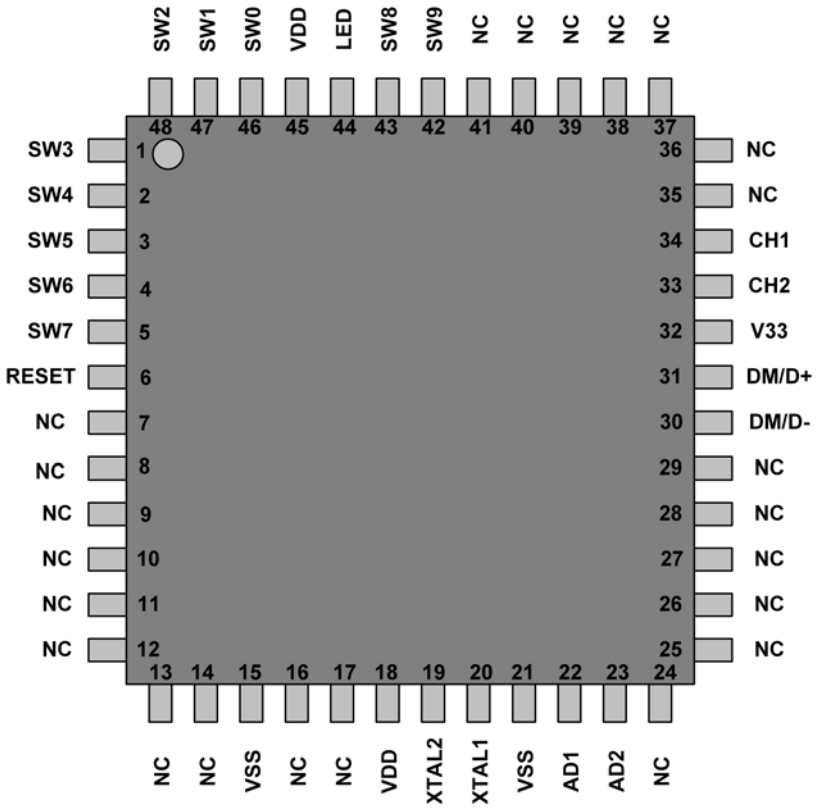
2. FEATURES

- Support USB1.1 interface
- Compatible witch Microsoft mouse driver
- high resolution, excellent accuracy (4096x4096 12 bit ADC)
- wide operation voltage (3.3V to 5.5V)
- single chip design (low power and space saving)
- wide operation temperature (-40 ~ 85 ℃)
- durable and reliable
- cost effective, less component required to build up circuit
- low power consumption (11mA)
- support numbers of OS (DOS, Windows 98/ME/2K/XP/Vista, Linux, Mac OS)
- Package: LQFP 48pin (9.0x9.0x1.4mm)

3. BLOCK DIAGRAM



4. PIN ASSIGNMENT



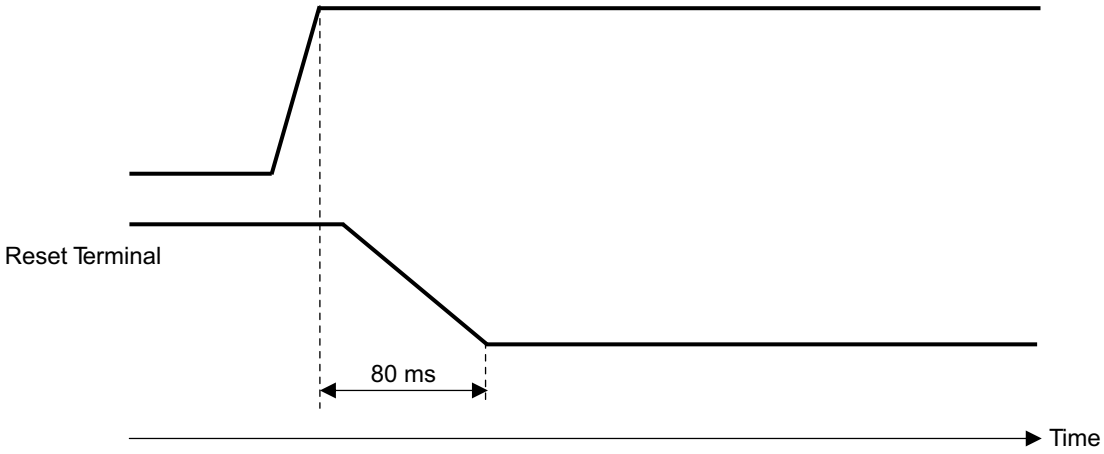
LQFP48

Pin No.	Name	Description
1	SW3	Chip I/O switch pin
2	SW4	Chip I/O switch pin
3	SW5	Chip I/O switch pin
4	SW6	Chip I/O switch pin
5	SW7	Chip I/O switch pin
6	RESET	Chip RESET
7	NC	
8	NC	
9	NC	
10	NC	
11	NC	
12	NC	
13	NC	
14	NC	
15	VSS	Power ground
16	NC	
17	NC	
18	VDD	+5V power supply
19	XTAL2	Crystal output
20	XTAL1	Crystal input
21	VSS	Power ground
22	AD1	Chip A/D input
23	AD2	Chip A/D input
24	NC	
25	NC	
26	NC	
27	NC	
28	NC	
29	NC	
30	D-	USB D- signal
31	D+	USB D+signal
32	V33	3.3V regulation output
33	CH2	Choose Chip mode
34	CH1	Choose Chip mode
35	NC	
36	NC	
37	NC	
38	NC	
39	NC	
40	NC	
41	NC	
42	SW9	Chip I/O switch pin
43	SW8	Chip I/O switch pin
44	LED	LED input
45	VDD	+5V power supply
46	SW0	Chip I/O switch pin
47	SW1	Chip I/O switch pin
48	SW2	Chip I/O switch pin

5. FUNCTION SPECIFICATIONS

5.1 POWER ON RESET

MCU is high level reset for at least 80ms while the Oscillator is running in order to reset the entire MCU.



5.2 TOUCH-PANEL FUNCTION

5.2.1 Coordinate Placement

This board outputs is assumed to be X-Y rectangular coordinate placement. The coordinate placement shows that the corner of the panel is a starting point and the diagonal corner becomes the maximum. Both X and Y maximum values are 12bit=FFFH=4095d.

5.2.2 Output Data

MCU on this board notifies the host side data by the HID report descriptor of the Mouse collection in accordance with HID spec 1.1.

MCU on this board generates 12bit coordinates by using built-in ADC.

The output data format is as following

Byte	Definition	Explanation
Byte 0	Touch ON/OFF	Touch ON/OFF Fixation
Byte 2~ Byte 1	X Coordinates	The Data Numerical Value is 0~4095(Max)
Byte 4 ~ Byte 3	Y Coordinates	The Data Numerical Value is 0~4095(Max)

5.3 ELECTRICAL CHARACTERISTICS

5.3.1 Absolute Maximum Rating

Item	Description
DC Supply Voltage	-0.3 to 7.0
Input / Output Voltage	GND -0.3 to VCC +0.3
Operating Ambient Temperature (℃)	-40 to 85
Storage Temperature (℃)	-50 to 125
Operating Voltage (VCC)	+3.3 to 5.5

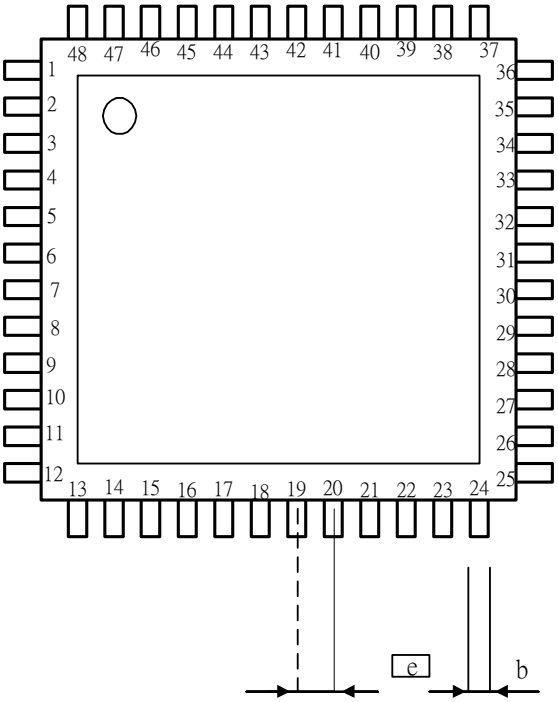
5.3.2 DC Electrical Characteristics

(VCC=5V±5%, GND=0V, TA=0~70℃ ,Fosc=6MHz, Unless Otherwise Noted)

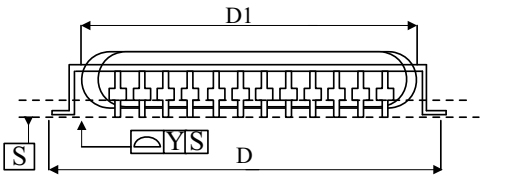
Symbol	Parameter	Condition	Min	Type	Max	Units
VDD	Supply Voltage		3.0	-	5.5	V
VIH	Inpuy High Voltage		0.7VDD	-	VDD+0.3	V
VIL	Inpuy Low Voltage		-0.3	-	0.3VDD	V
VOH	Output High Voltage (port 2)	Ioh=-25mA	VDD-2.0	-	VDD	V
VOH	Output High Voltage (port 0,1,3)	Ioh=-80μA	2.4	-	-	V
VOL	Output Low Voltage (port 2)	IoL=25mA	0	-	0.4	V
VOL	Output Low Voltage (port 0,1,3)	IoL=1.6mA	-	-	0.45	V
IiL	Input Leakage Current	0V<VIN<VDD	-1	-	1	uA
RPH	Pull High Resistance		-	25	-	Kohm
IDD,OPT	Operting Mode Current	Fosc=6MHz, No load	-	11	-	mA
IDD,IDL	Idel Mode Current	Fosc=6MHz, No load V3.3 regulator and 1.5K register turn off	-	-	200	uA
IDD,PD	Power Down Mode Current	Oscillator disabled, No load, V3.3 regulator and 1.5K register turn off	-	-	1	uA
V33	3.3 Regulator Output		3.0	3.3	3.6	V
Vrest	Reset Voltage Note		3.5	3.6	3.7	V
						V

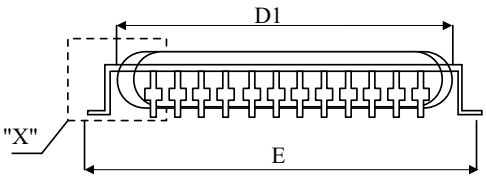
Note: reset voltage only valid when USB function is used

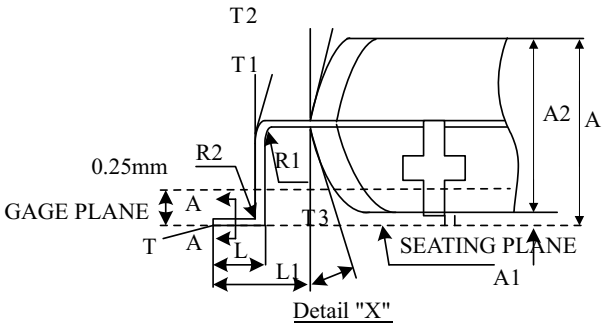
6. EXTERNAL DIAGRAM



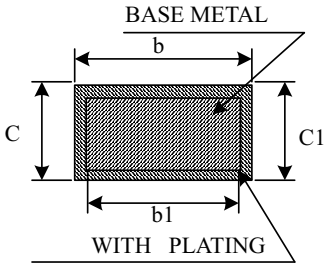
SYMBOL	DIMENSION(MM)			DIMENSION(MIL)		
	MIN	NON	MAX	MIN	NON	MAX
A		1.60	63			
A1	0.05		0.15	2		6
A2	1.35	1.40	1.45	53	55	57
b	0.17	0.22	0.27	7	9	11
b1	0.17	0.20	0.23	7	8	12
c	0.09		0.20	4		8
c1	0.09	0.16	4	6		
D		9.00 BSC			354 BSC	
D1		7.00 BSC			276 BSC	
E		9.00 BSC			354 BSC	
E1		7.00 BSC			276 BSC	
e		0.50 BSC			20 BSC	
L	0.45	0.60	0.75	18	24	30
L1		1.00 REF			39 REF	
R1	0.08		3	8		
R2	0.08		0.20	3		3
Y		0.075				7◦
⊖	0◦	3.5◦	7◦	0◦	3.5◦	
⊖1	0◦			0◦		
⊖2	11°	12°	13°	11°	12°	13°
⊖3	11°	12°	13°	11°	12°	13°



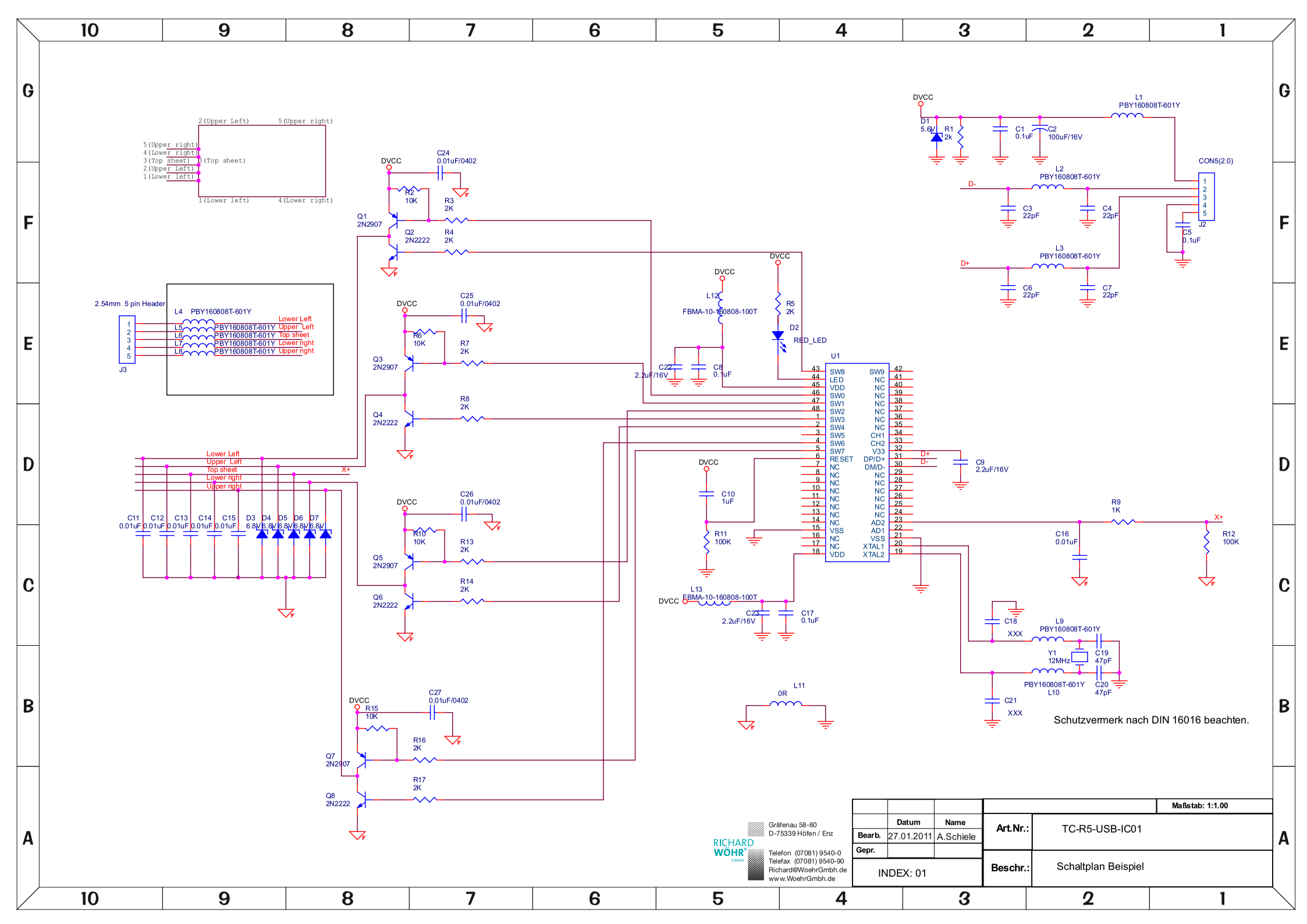




Detail "X"



SECTION A-A


2(Upper Left)
5(Upper right)
5(Upper right)
4(Lower right)
3(Top sheet)
3(Top sheet)
2(Upper Left)
1(Lower left)
1(Lower left)
4(Lower right)
2.54mm 5 pin Header
J3
L4 PBY160808T-601Y
L5 PBY160808T-601Y Upper Left
L6 PBY160808T-601Y Top sheet
L7 PBY160808T-601Y Lower right
L8 PBY160808T-601Y Upper right
Lower Left
Upper Left
Top sheet
Lower right
Upper right
X+
DVCC
C24 0.01uF/0402
R2 10K
R3 2K
Q1 2N2907
Q2 2N2222
R4 2K
C25 0.01uF/0402
R6 10K
R7 2K
Q3 2N2907
R8 2K
Q4 2N2222
C26 0.01uF/0402
R10 10K
R13 2K
Q5 2N2907
R14 2K
Q6 2N2222
C27 0.01uF/0402
R15 10K
R16 2K
Q7 2N2907
R17 2K
Q8 2N2222
C11 0.01uF
C12 0.01uF
C13 0.01uF
C14 0.01uF
C15 0.01uF
D3 6.8V
D4 6.8V
D5 6.8V
D6 6.8V
D7 6.8V
L12 FBMA-10-160808-100T
C22 2.2uF/16V
C8 0.1uF
R5 2K
D2 RED_LED
U1
SW8 SW9 LED VDD SW0 SW1 SW2 SW3 SW4 SW5 SW6 SW7 RESET NC NC NC NC NC NC NC NC VSS NC NC VDD
NC NC NC NC NC NC NC NC NC NC NC NC NC NC NC NC CH1 CH2 V33 DP/D+ DM/D- NC NC NC NC NC NC AD2 AD1 VSS XTAL1 XTAL2
C10 1uF
R11 100K
L13 FBMA-10-160808-100T
C23 2.2uF/16V
C17 0.1uF
L11 0R
D+
D-
C9 2.2uF/16V
R9 1K
R12 100K
C16 0.01uF
C18 XXX
L9 PBY160808T-601Y
Y1 12MHz
C19 47pF
C20 47pF
PBY160808T-601Y L10
C21 XXX
L1 PBY160808T-601Y
D1 5.6V
R1 2k
C1 0.1uF
C2 100uF/16V
CON5(2.0)
L2 PBY160808T-601Y
C3 22pF
C4 22pF
J2
C5 0.1uF
L3 PBY160808T-601Y
C6 22pF
C7 22pF
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INDEX: 01
Maßstab: 1:1.00
Art.Nr.: TC-R5-USB-IC01
Beschr.: Schaltplan Beispiel