Stick LIN-78K0

Hardware Manual

2008/6 The 2nd edition
TESSERA TECHNOLOGY INC.

[NOTES]

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[CAUTION]

This equipment should be handled like a CMOS semiconductor device. The user must take all precautions to avoid build-up of static electricity while working with this equipment. All test and measurement tool including the workbench must be grounded. The user/operator must be grounded using the wrist strap. The connectors and/or device pins should not be touched with bare hands.

Contents

1 Introduction

μPD78F8020D is the NEC Electronics 8 bit single chip microcomputer. The features and hardware specification of Stick LIN-78K0 are described.

1.1 Features

Features of the Stick LIN-78K0 are as follows.

- The evaluation board used the NEC Electronics 8bit single chip microcontroller μPD78F8020D (The part of 8-bit microcontroller is same as 78K0/KE2). All of the ROM, RAM, circumference circuit and LIN transceiver are efficiently built in one chip on a Stick LIN-78K0.
- High-speed operation is realized via the 20MHz internal clock.
- 128 Kbytes of Flash EEPROM, available on the chip,
- Stick LIN-78K0 is programmable and debuggable from PC via USB connection without any additional hardware tools.
- FT2232L (FTDI) is available on board for USB interface (USB2.0 compatible).
- The size of the module is, 82mm x 23mm.

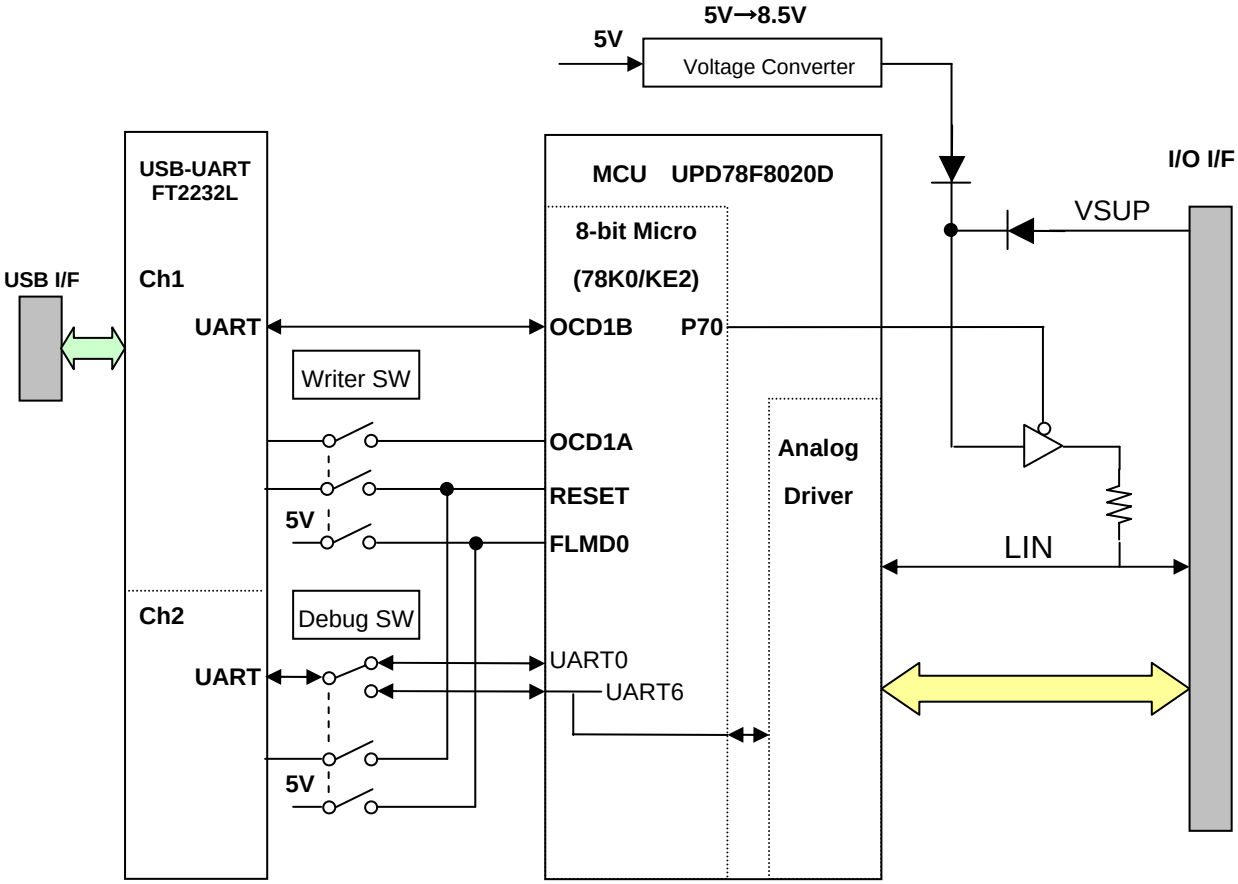
1.2 Hardware Overview

MCU	μPD78F8020DGB
Clock	20MHz main
Interfaces	USB connector (Type A) Expansion interface (J1)
Power supply	5.0V by USB, 7.0V-18.0V by Expansion interface

1.3 Attached goods list

- Stick LIN-78K0
- Development tool／Manual CD-ROM
- Expansion interface cable for LIN (separate cable with clip)

1.4 Block Diagram



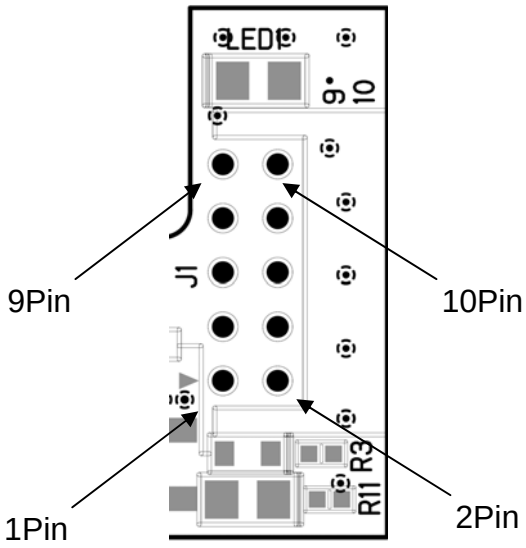
2 Interface Connection

2.1 J1

Expansion Interface: J1

J1: Hirose DF11-10DP-2DS

J1	Name	Connection to MCU	Notes
1	VSUP	(VSUP,HDS)	External Power Supply
2	LIN	LIN	LIN Bus
3	DR1	DR1	Low side Pre driver
4	DR21	DR21	Low side driver for Relay
5	DR22	DR22	Low side driver for Relay
6	DR22_I	DR22_I	Driver 22 control signal input
7	DR4	DR4	Hall sensor power supply driver
8	DR21_I	DR21_I	Driver 21 control signal input
9	GND		
10	SWI	SWI	High voltage SW input



Location of J1: TOP VIEW

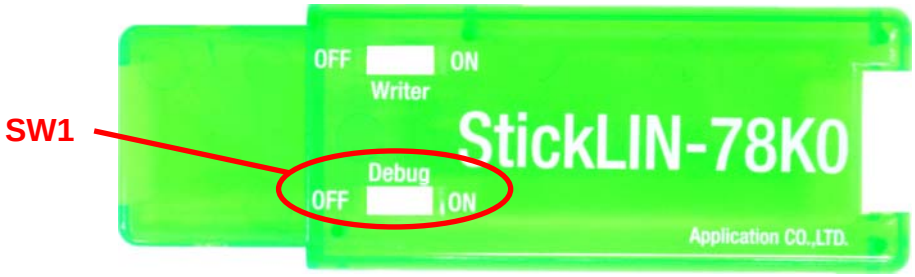
3 Switches and LEDs

3.1 SW1: Debug switch

The mode selection for Debugging with the ID78K0-TK.

Setting of SW1

Normal Mode	OFF
Debugging Mode	ON



SW1: TOP VIEW

3.2 SW2: writer switch

Programming mode selection for Flash EEPROM on the MCU with PG-FPL3.

Setting of SW2

Normal Mode	OFF
Flash Programming Mode	ON

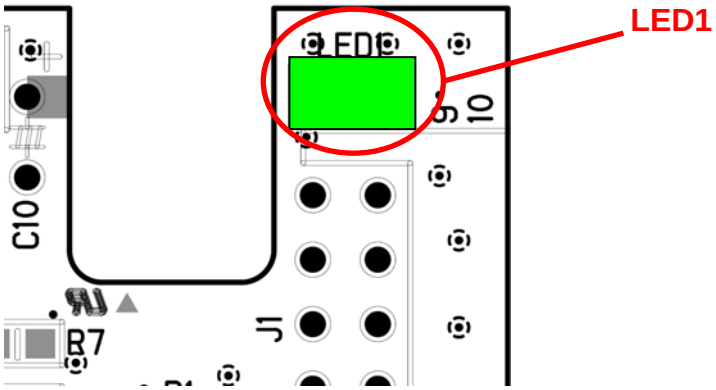
SW2: TOP VIEW

3.3 LED1

LED1 is connected to Low side driver DR3.

LED1 status

P33 Output data	DR3 status	LED
High	ON	Green
Low	OFF	Off



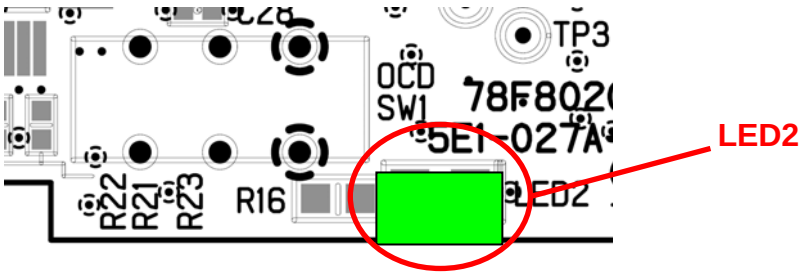
LED1: TOP VIEW

3.4 LED2: Power Indication

LED2 is a green LED to indicate the availability of power.

LED2 status

Status	LED
Power ON	Green
Power OFF	Off



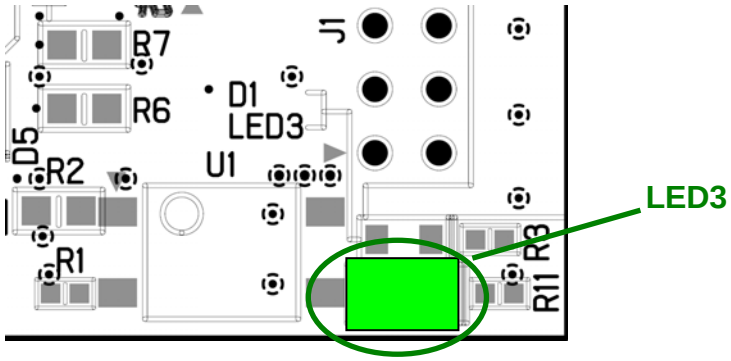
LED2: TOP VIEW

3.5 LED3

LED3 indicate LIN Bus Pull-up.

LED3

LIN Bus Pull-up	LED
Pull-up enable	Green
Pull-up disable	Off



LED3: TOP VIEW

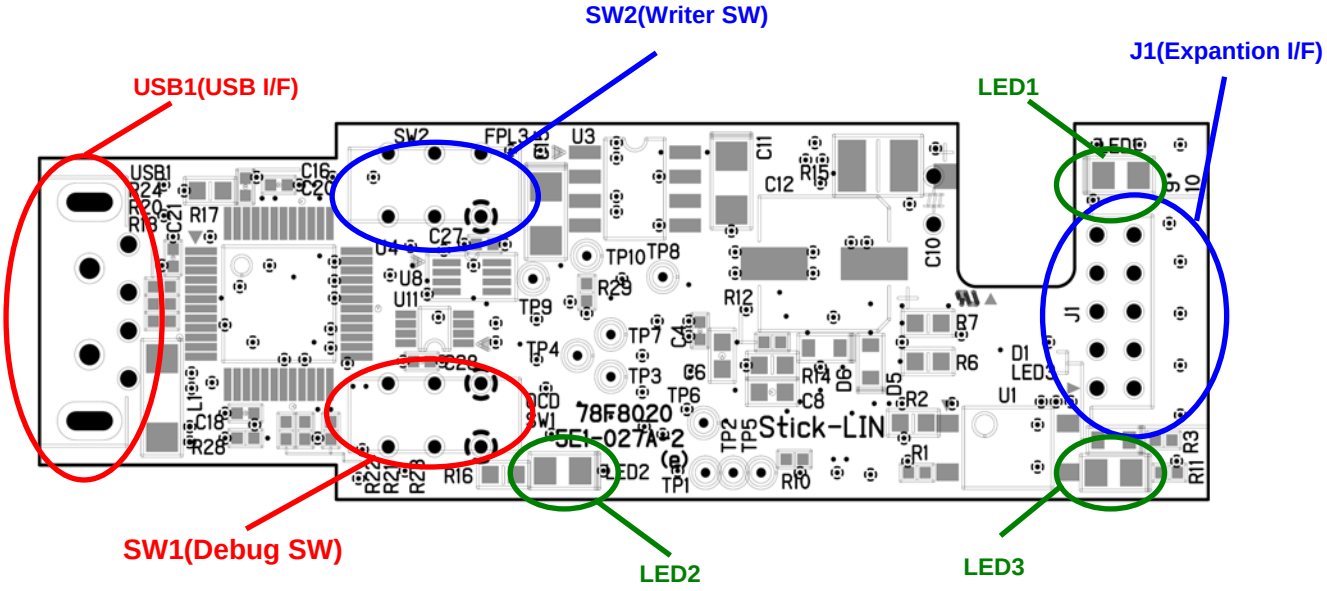
4 Power Source

Stick LIN-78K0 are able to choice two ways of power source.
MCU power(VDD) and driver module power(VSUP) are both supplied when power source are supplied from either USB or expansion interface(VSUP).

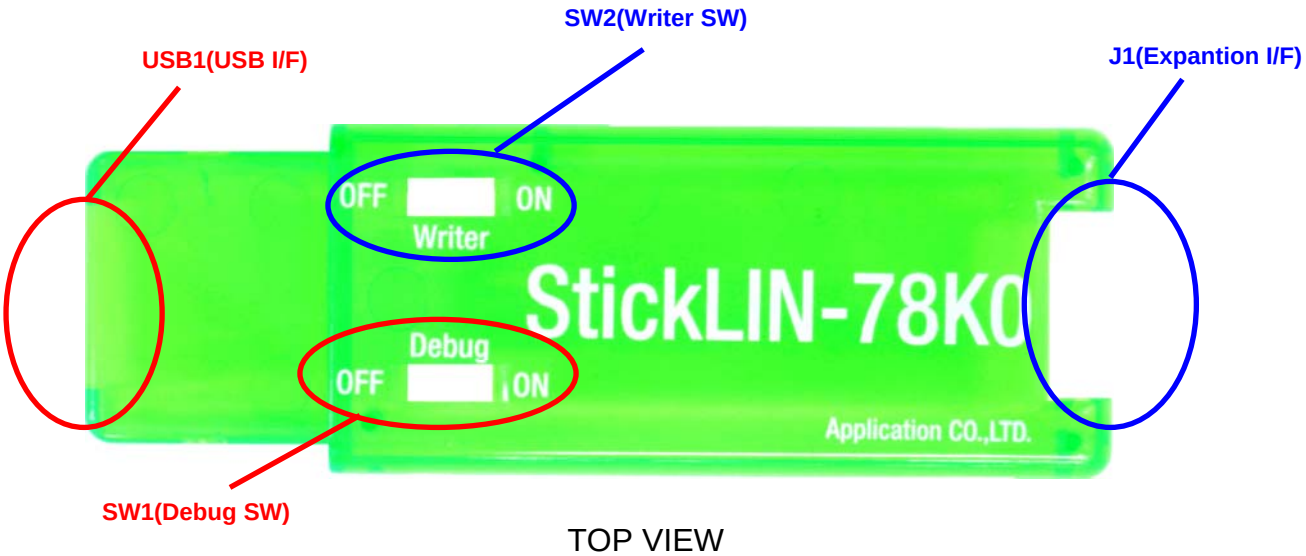
If you supply power using the expansion interface(VSUP), then keep power source voltage DC7.0V-DC18.0V.

5 Design Data

5.1 Parts Layout

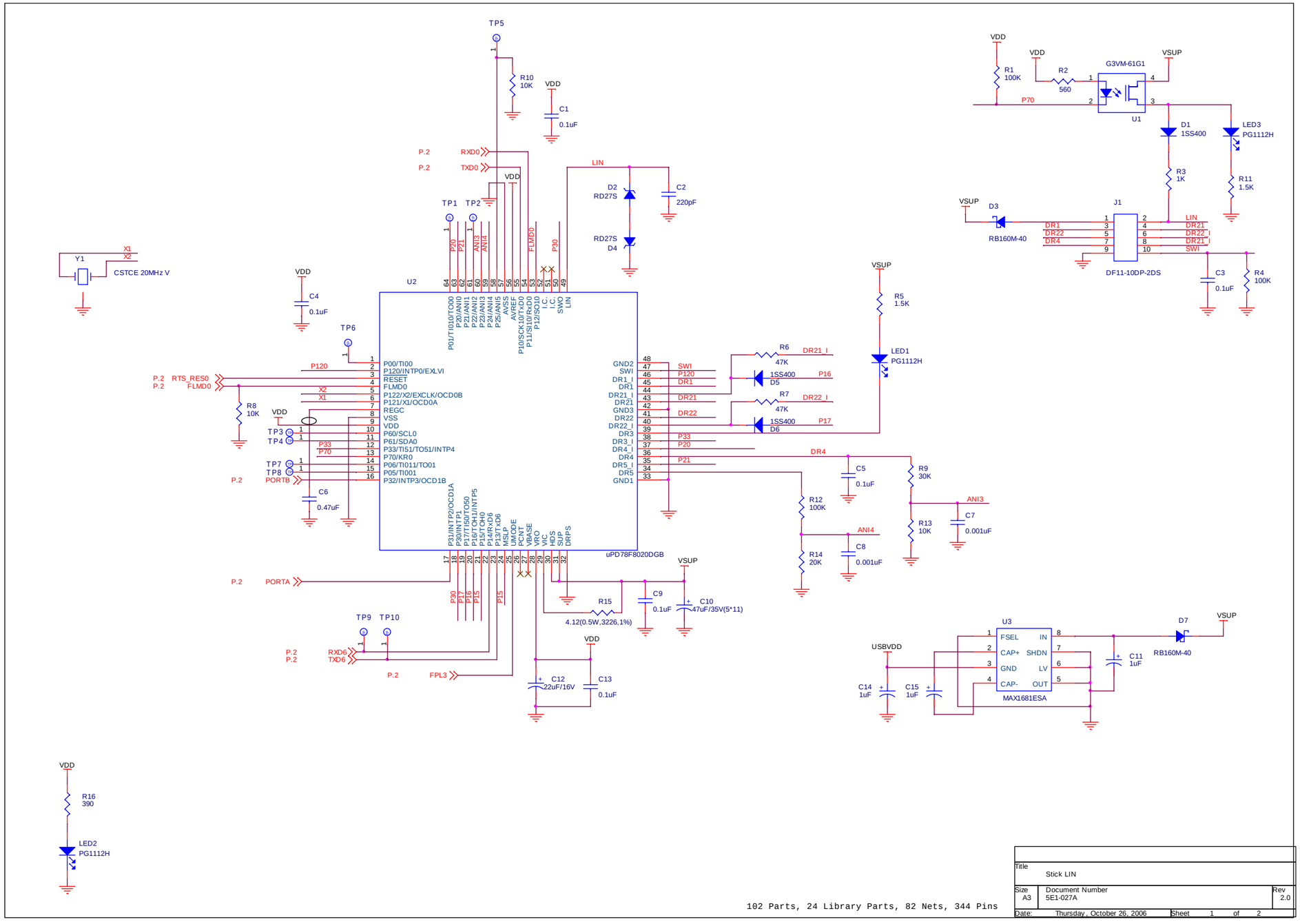


TOP VIEW



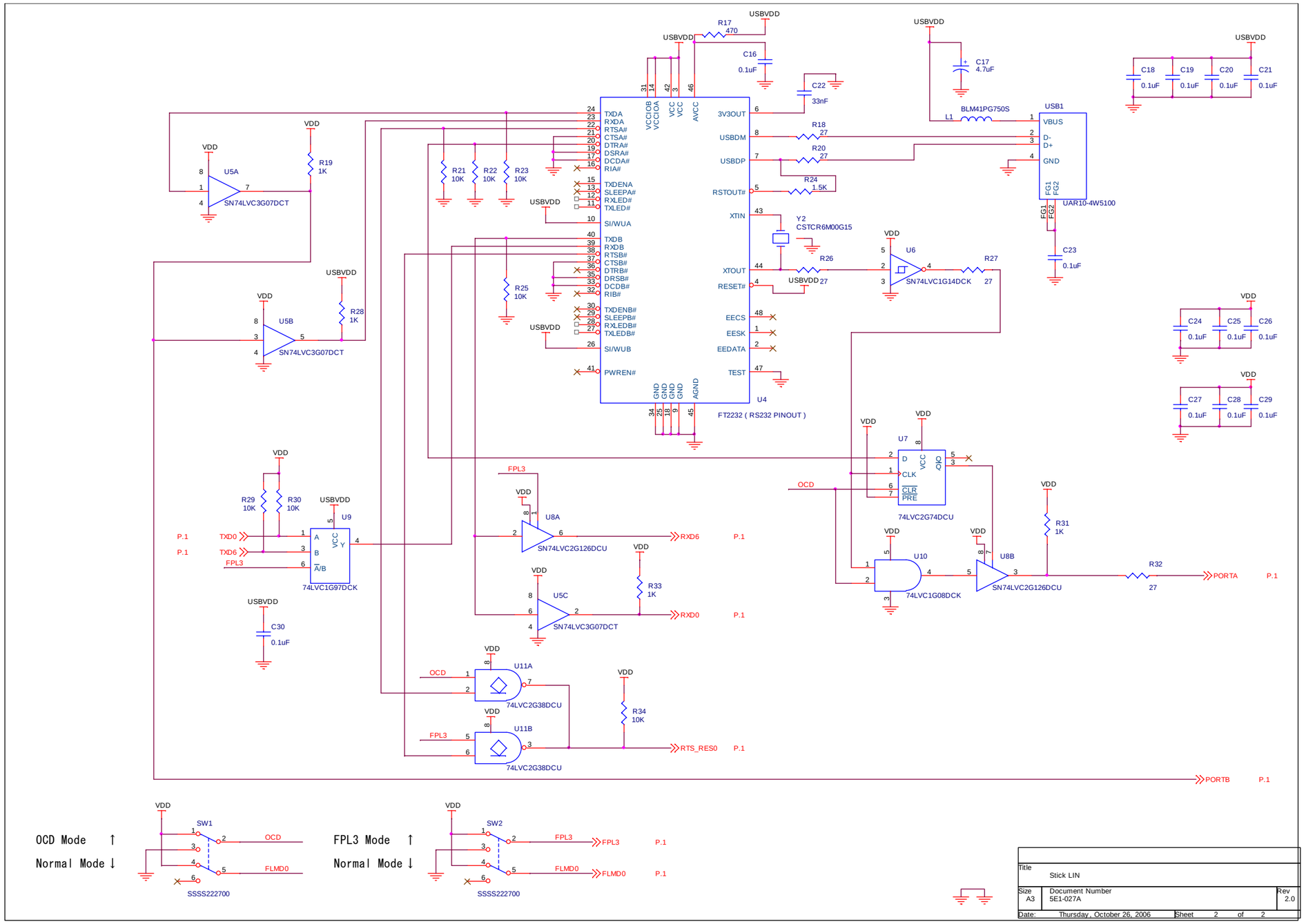
TOP VIEW

5.2 Circuit Schematics

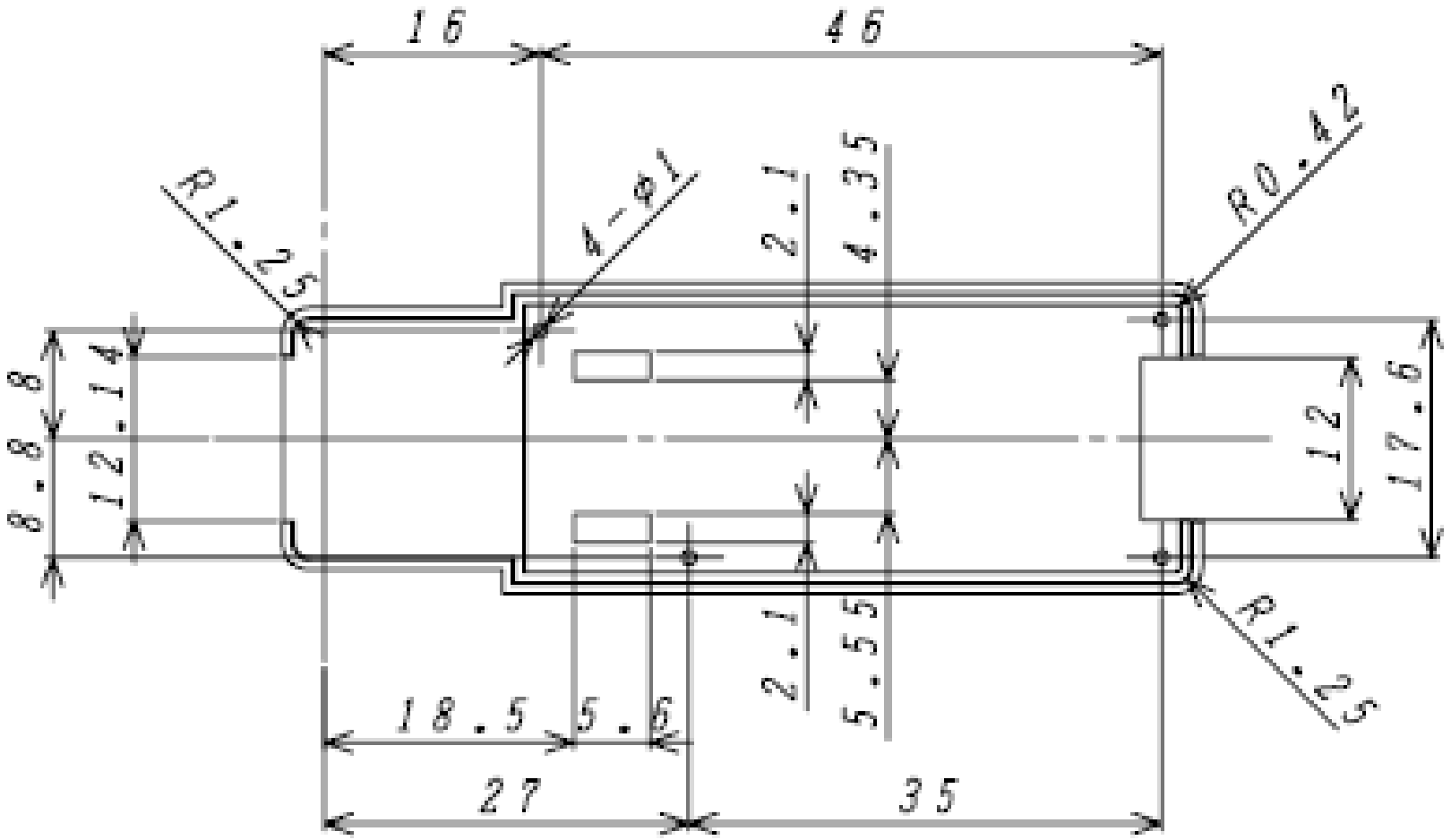


102 Parts, 24 Library Parts, 82 Nets, 344 Pins

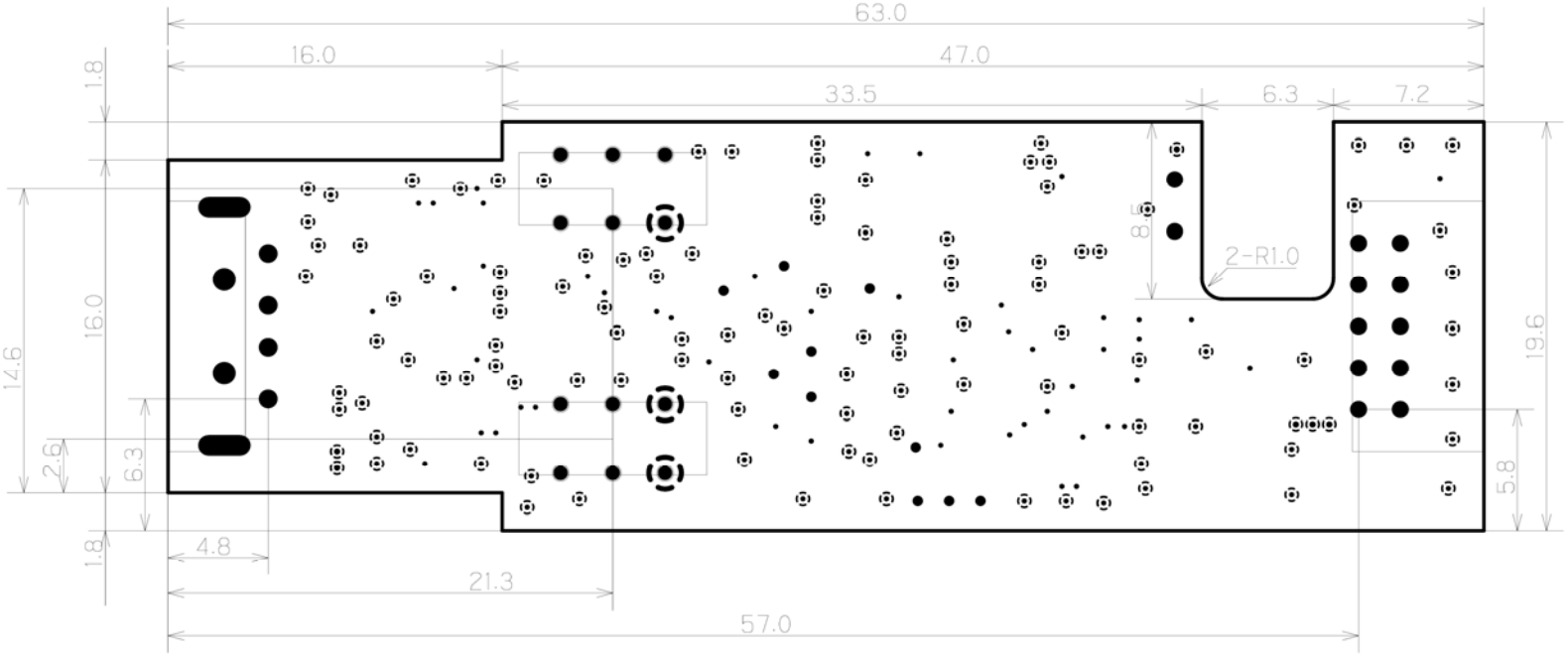
Title: Stick LIN		
Size: A3	Document Number: 5E1-027A	Rev: 2.0
Date: Thursday, October 26, 2006	Sheet 1 of 2	


U4
FT2232 (RS232 PINOUT)
SN74LVC3G07DCT
SN74LVC1G14DCK
SN74LVC2G126DCU
74LVC2G74DCU
74LVC1G08DCK
74LVC1G97DCK
74LVC2G38DCU
SSSS222700
UAR10-4W5100
CSTCR6M00G15
BLM41PG750S
OCD Mode ↑
Normal Mode ↓
FPL3 Mode ↑
Normal Mode ↓
Stick LIN
Document Number 5E1-027A
Rev 2.0
Thursday, October 26, 2006
Sheet 2 of 2

5.3 Body Dimensions

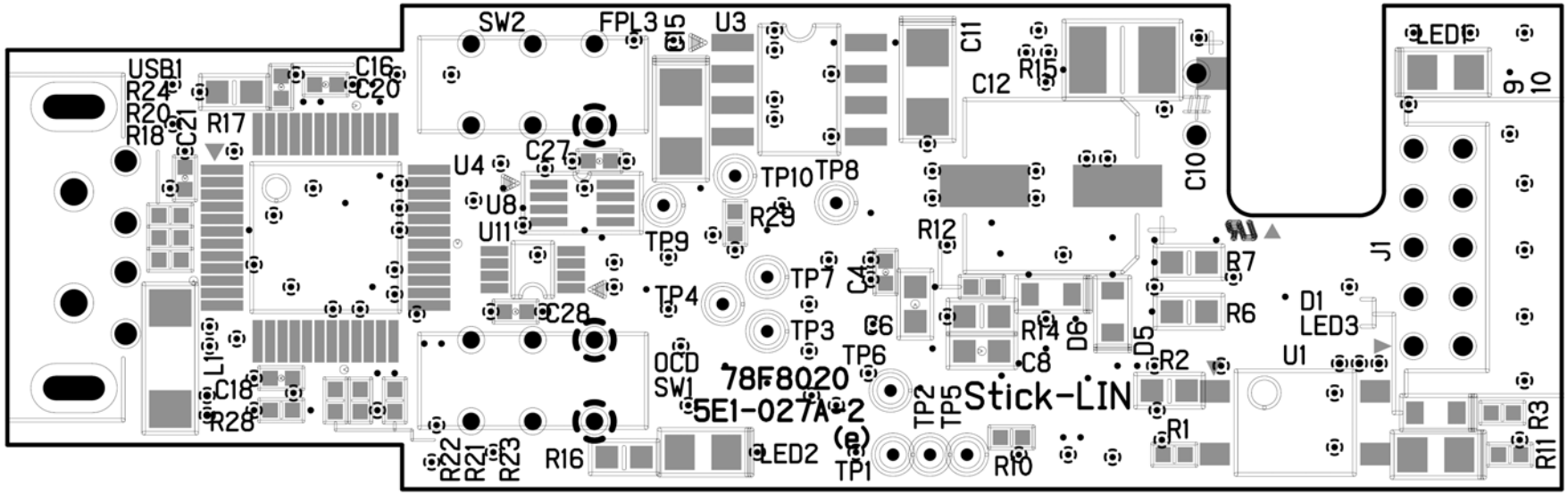


5.4 Board dimensions

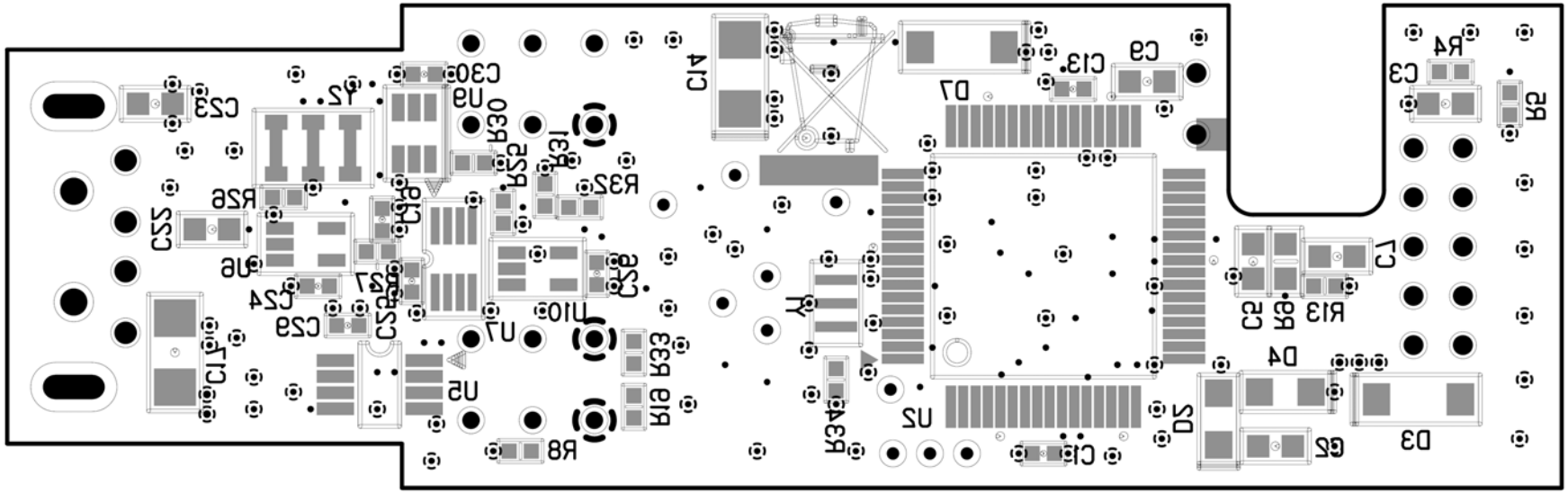


5.5 PCB Layout

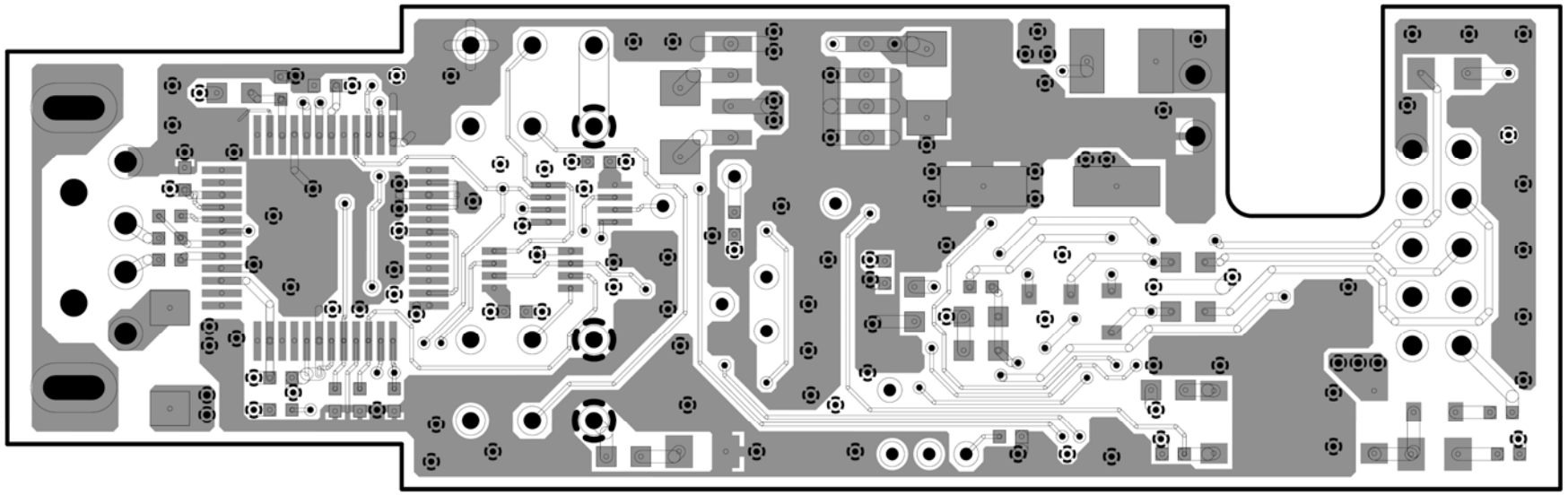
5.5.1 Silk of the top side



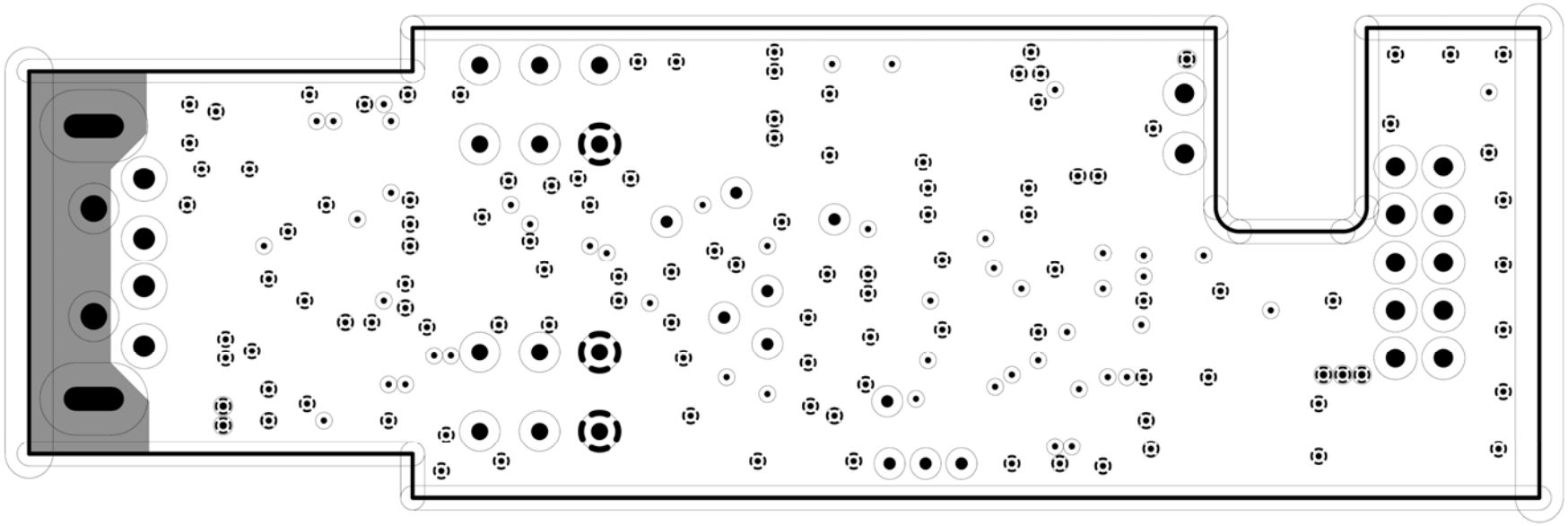
5.5.2 Silk of the bottom side



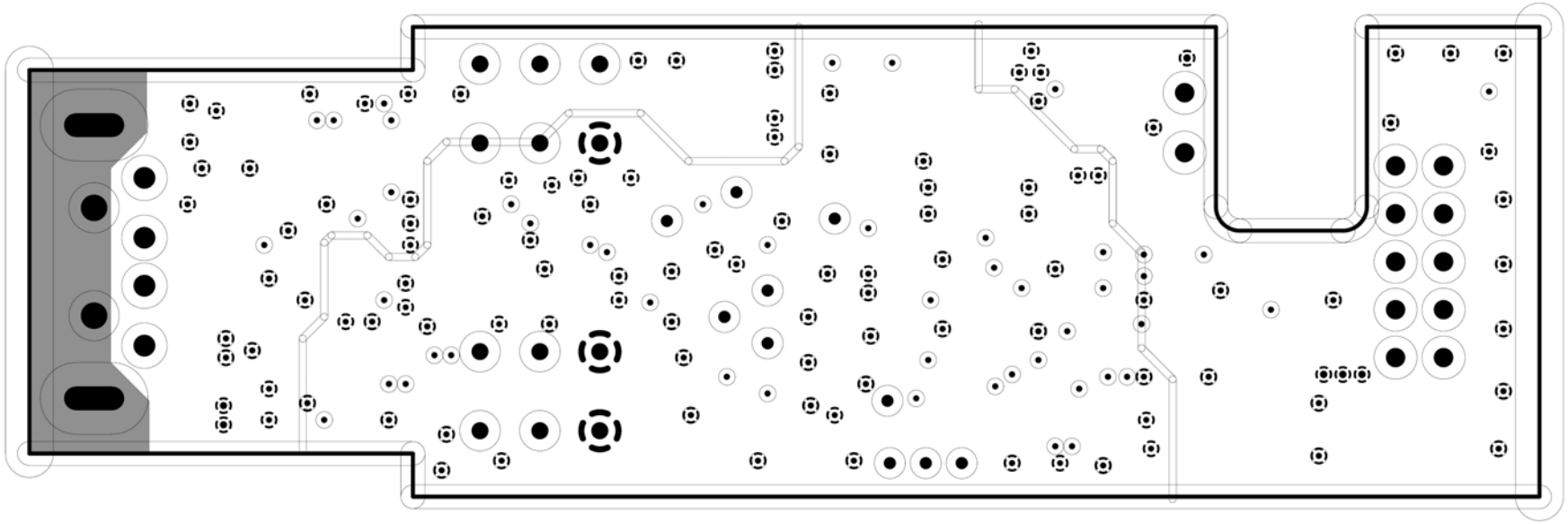
5.5.3 PCB Layout: The first layer



5.5.4 PCB Layout: The second layer



5.5.5 PCB Layout: The third layer



5.5.6 PCB Layout: The fourth layer