

MULTI-IO/51
Single Board Computer
& Input/Output Expander

Technical Manual

Document Revision: 1.03

Date: 28 July, 2010



BiPOM Electronics, Inc.

16301 Blue Ridge Road, Missouri City, Texas 77489
Telephone: 1-713-283-9970 Fax: 1-281-416-2806
E-mail: info@bipom.com
Web: www.bipom.com

TABLE OF CONTENTS

1. OVERVIEW	3
2. SPECIFICATIONS	3
3. SOFTWARE	3
4. FUNCTIONAL BLOCKS	4
5. BOARD LAYOUT	7
6. SCHEMATICS	8

WARRANTY:

BiPOM Electronics warrants MULTI-IO/51 for a period of 1 year. If the board becomes defective during this period, BiPOM Electronics will at its option, replace or repair the board. This warranty is voided if the product is subjected to physical abuse or operated outside stated electrical limits. BiPOM Electronics will not be responsible for damage to any external devices connected to MINI-MAX/51-E. BiPOM Electronics disclaims all warranties express or implied warranties of merchantability and fitness for a particular purpose. In no event shall BiPOM Electronics be liable for any indirect, special, incidental or consequential damages in connection with or arising from the use of this product. BiPOM's liability is limited to the purchase price of this product.

© 2007-2010 by BiPOM Electronics. All rights reserved.

MULTI-IO/51 Single Board Computer Technical Manual. No part of this work may be reproduced in any manner without written permission of BiPOM Electronics.

All trademarked names in this manual are the property of respective owners.

1. Overview

MULTI-IO/51 is a microcontroller system with a large number of digital inputs and output. MULTI-IO/51 is based on the ATMEL AT89C51ED2 8051-compatible single-chip Flash micro-controller. The Flash micro-controller can be serially programmed while in the target application circuit. This function of the FLASH micro-controller simplifies new program development and debugging. Downloading of a program to the micro-controller typically takes few seconds.

[Micro-IDE](#) Integrated Development Environment from BiPOM Electronics fully supports in-system programming and debugging on the MULTI-IO/51 board using the serial port. A Windows-based program [WinLoad](#) is also available to download programs to the board.

MULTI-IO/51 has connectors for a total of 120 digital inputs and outputs and an additional expansion bus. A wide range of peripheral boards and accessories are provided by BiPOM Electronics.

MULTI-IO/51 should be powered from a 5 Volt DC regulated power source.

2. Specifications

MULTI-IO/51-A board has the following configuration:

- ATMEL AT89C51ED2 micro-controller with
 - 64 Kbytes on-chip Flash program/data Memory,
 - 2 Kbytes RAM (XRAM)
 - 2 Kbytes EEPROM
- Five 82C55 Input/Output Expanders with three 8-bit ports (Ports A,B,C) each
- 8-pin socket to install serial EEPROM
- Secondary micro-controller (PIC16) to support In-circuit Programming of the main Flash micro-controller and debugging through the RS232 Serial Port
- RS232 Serial Port connector for In-circuit Programming and for data communications
- 20-pin Expansion connector for a variety of peripheral boards (<http://www.bipom.com/periph1.htm>)
- Three 80-pin I/O connectors for digital inputs and outputs
- Single operating voltage: Regulated 5 Volts DC
- Dimensions are 9.46 X 7.96 inches (24.03 X 20.22 centimeters).
- Mounting holes of 0.138 inches (3.5 millimeters) are on four corners and the middle.
- 0° - 70° C operating, -40° - +85° C storage temperature range.

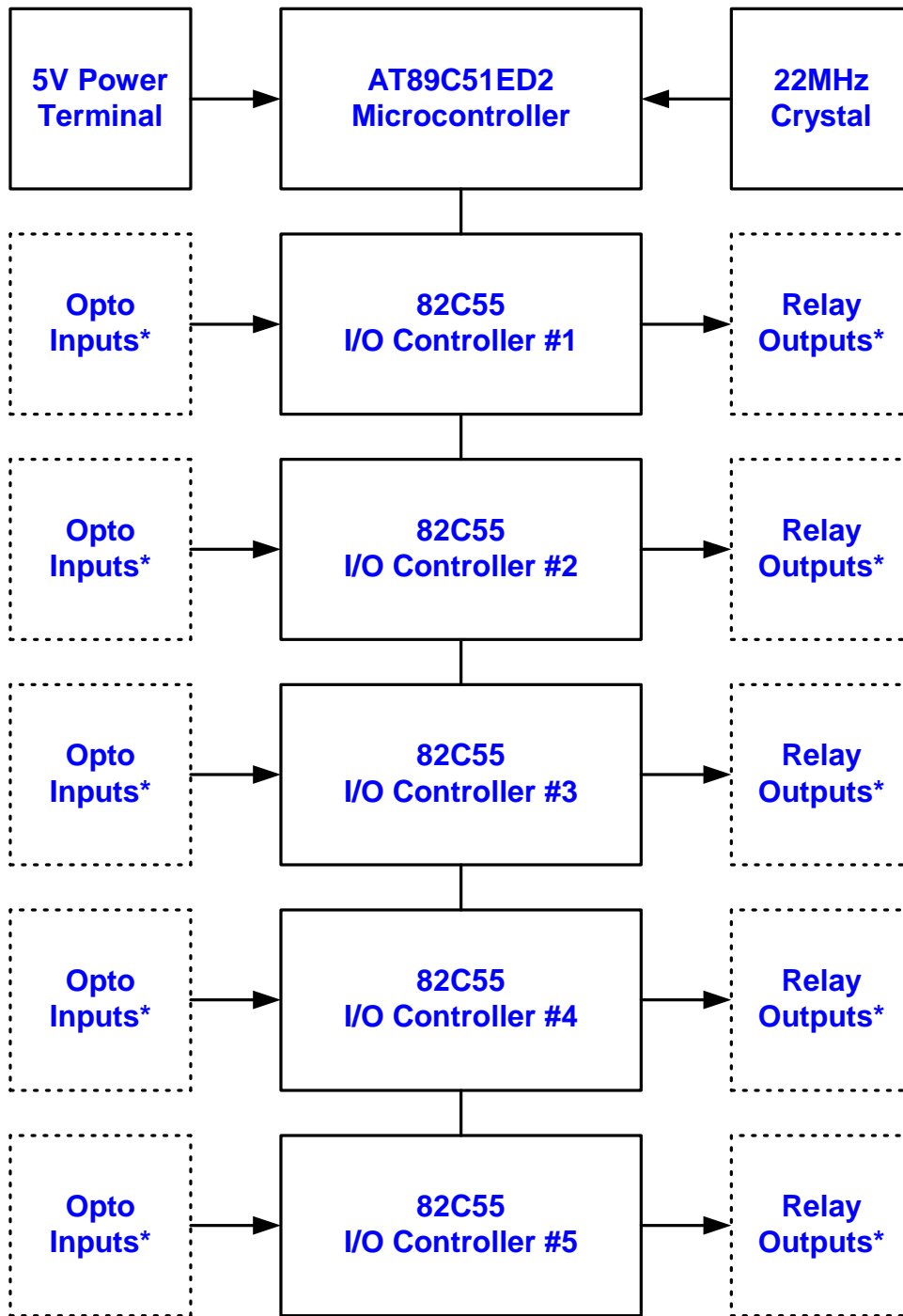
3. Software

Software examples for MULTI-IO/51 and BiPOM Peripheral boards are available from the link below:

<http://www.bipom.com/multiio51.php>

4. Functional Blocks

Figure 1 shows the block diagram of the MULTI-IO/51 board:



*** Opto Inputs and Relay Outputs available only on MULTIO/51-B**

Figure 1

Asynchronous Serial Port

One asynchronous RS232 serial port is available on a 9-pin male D connector J2. The RS232 port can be used by both a PC for In-circuit Programming of the AT89C51ED2 through the PIC16 microcontroller and by AT89C51ED2 for data communications.

Table 2 shows the pin assignments for the RS232 serial port connector

Serial Port Connector (J1)

Name	Signal	Pin
-	Not Connected (NC)	1
TXD	Input	2
RXD	Output	3
DTR	NC or Vcc	4
GND	GND	5
-	NC	6
RTS	RTS (Output)	7
CTS	CTS (Input)	8
-	NC	9

Table 2

Expansion bus

The 16 control pins and 5 Volt power supply pins are available on the 20-pin connector (J1) for interfacing to existing peripheral boards. A peripheral board can be connected to the MULTI-IO/51 either as a piggyback daughter-board using standoffs or can be placed away from the MULTI-IO/51 board using a 20-wire ribbon cable (Part #: EXPCABLE-6). Table 5 shows the pin assignments for the connector.

Expansion Bus Connector (J1)

Signal	Pin	Pin	Signal
P3.0	20	19	P3.1
P3.2	18	17	P3.3
P3.4	16	15	P3.5
P3.6	14	13	P3.7
P1.0	12	11	P1.1
P1.2	10	9	P1.3
P1.6	8	7	P1.5
P1.6	6	5	P1.7
VCC (+5V)	4	3	GND
VCC (+5V)	2	1	GND

Table5

Power Supply Unit

MULTI-IO/51 requires a 5 Volts DC regulated DC power supply at minimum 200mA current (more if peripheral boards are used). 5 Volts DC should be applied to PX1 terminal block.

WARNING: Correct polarity should be observed when applying external DC supply to Power connector.

5. Board Layout

Figure 2 shows positions of major components, connectors and terminals on the MULTI-IO/51 board.

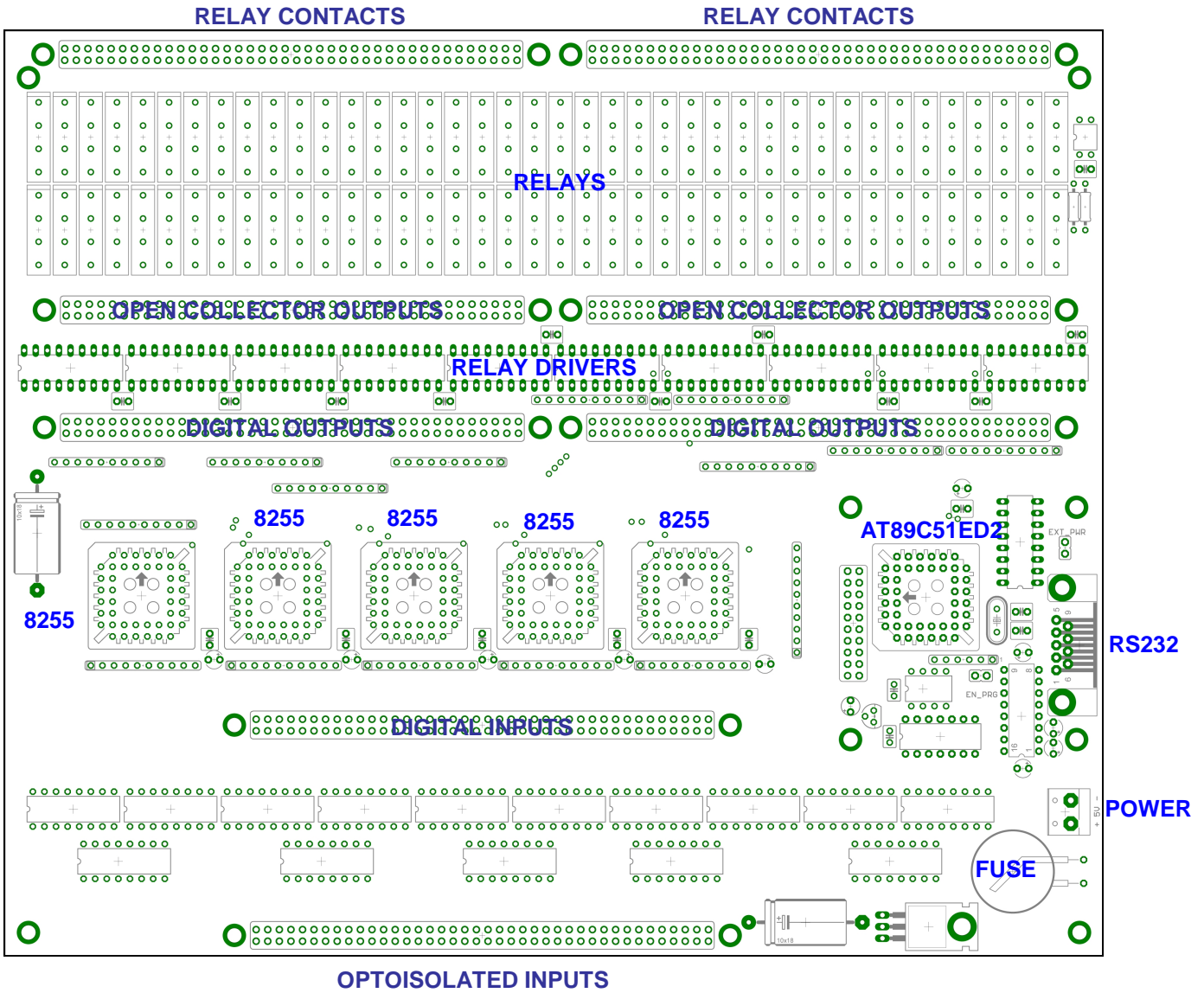
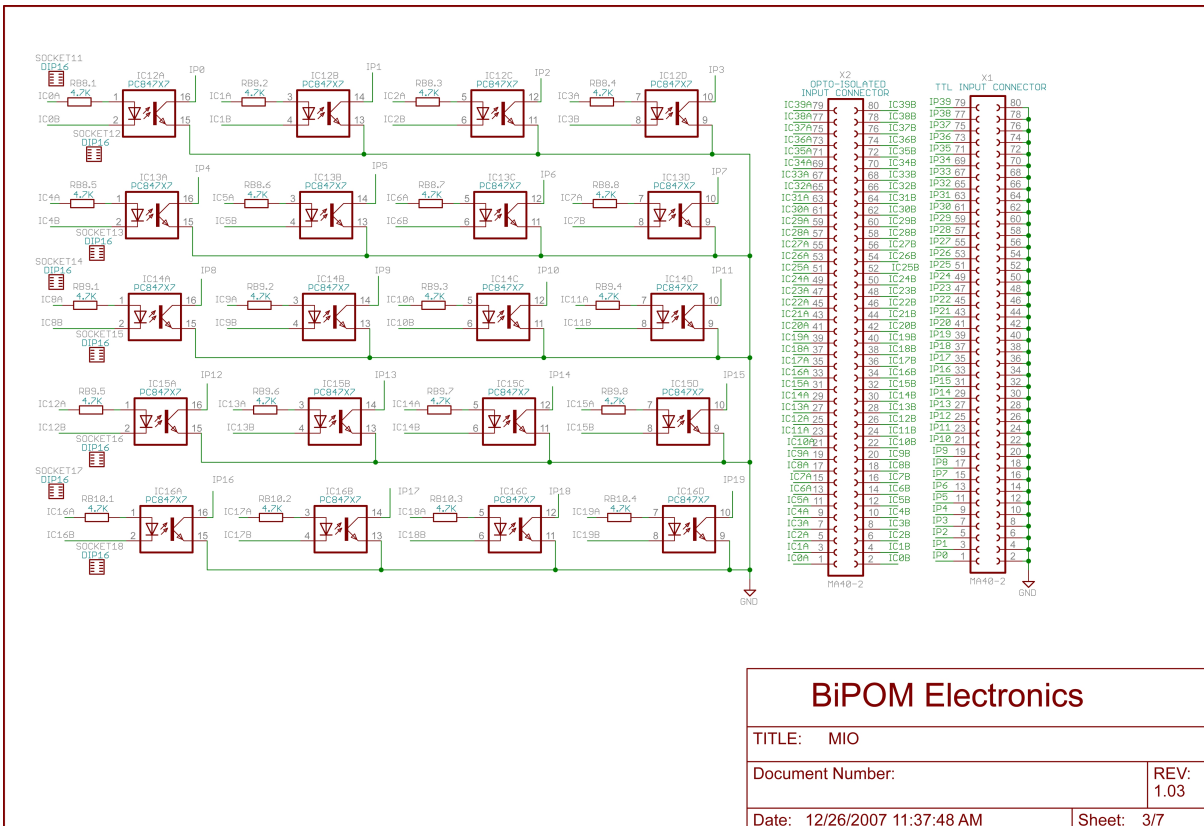
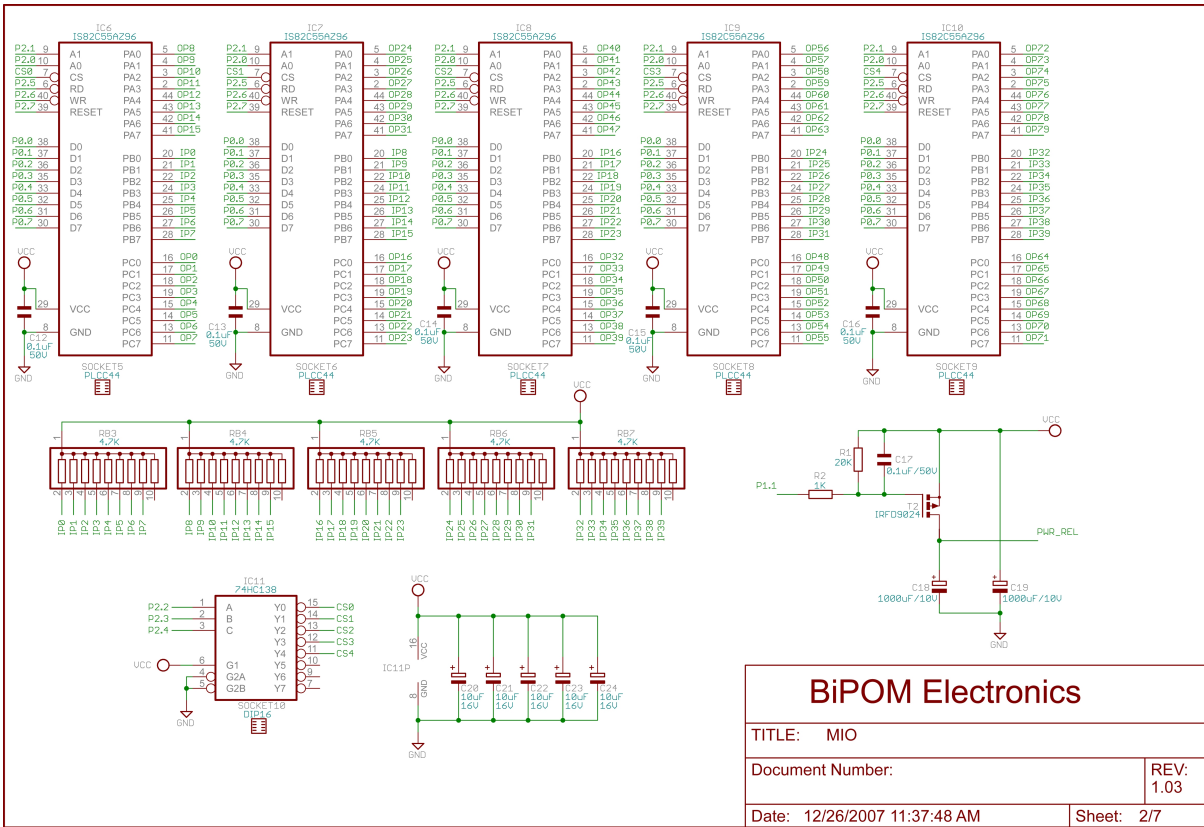
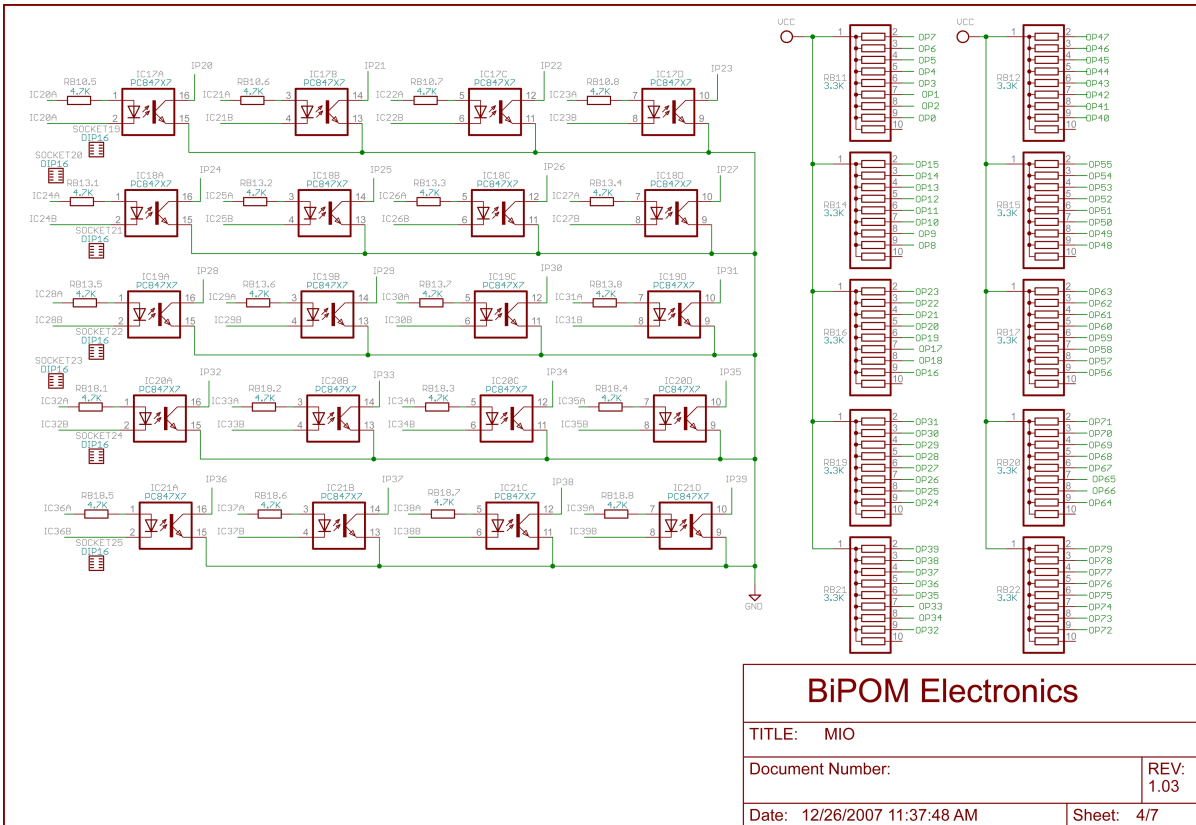


Figure 2

6. Schematics



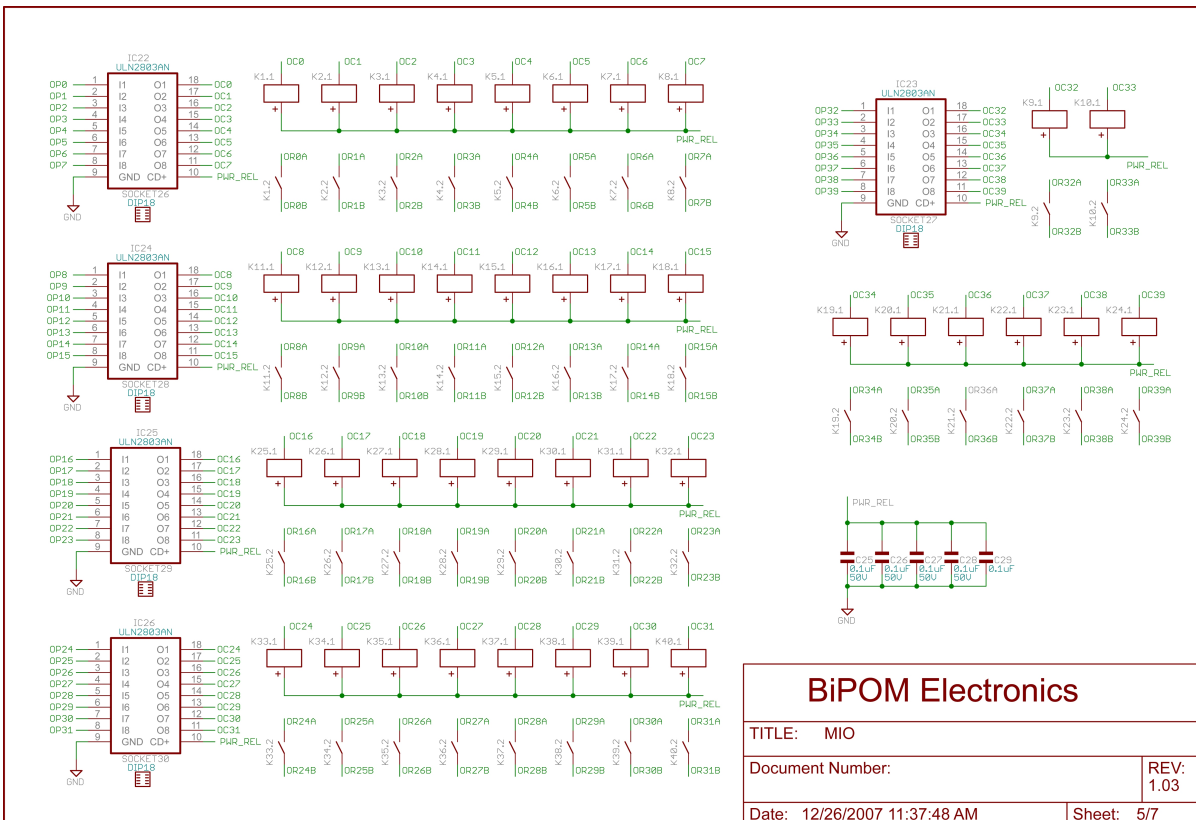


BiPOM Electronics

TITLE: MIO

Document Number: REV: 1.03

Date: 12/26/2007 11:37:48 AM Sheet: 4/7



BiPOM Electronics

TITLE: MIO

Document Number: REV: 1.03

Date: 12/26/2007 11:37:48 AM Sheet: 5/7

