iChip CO2144 with EBI Flash 10/100BaseT LAN and External Modem

Revision History

Version	Date	Description
1.0	June 2008	Initial version
2.0	April 2009	Changed from 1Mb Flash to 2Mb Flash
2.1	Nov. 2009	Updated Schematics

Introduction

This Reference Design demonstrates the iChip™ CO2144 IP Controller™ connected to a host processor via USART, to a flash memory chip via EBI interface, to a 10/100BaseT LAN via RMII, and to an external modem via USART.

Connect One's AT+i™ commands are accepted at baud rates of up to 3Mbps.

Features

- Supports serial host interface speeds of up to 3Mbps (250K, 1M, 1.5M, 3M)
- SSL3/TLS1 security implemented in hardware provides better performance
- Data and Internet connection through a 10/100BaseT Ethernet controller and any cellular or dial-up modem
- Operates at the industrial temperature range
- RoHS-compliant

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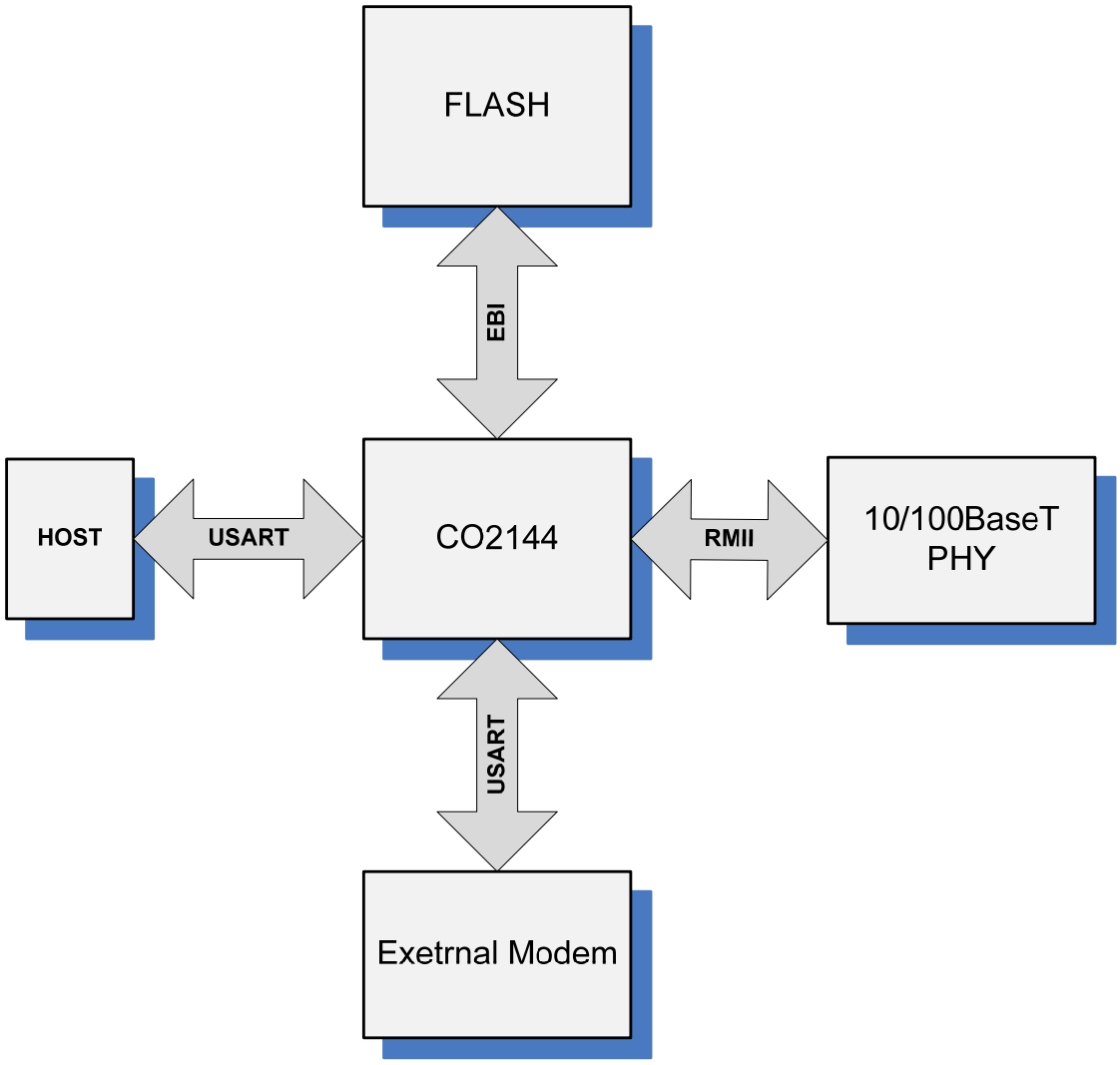
Block Diagram



Schematics

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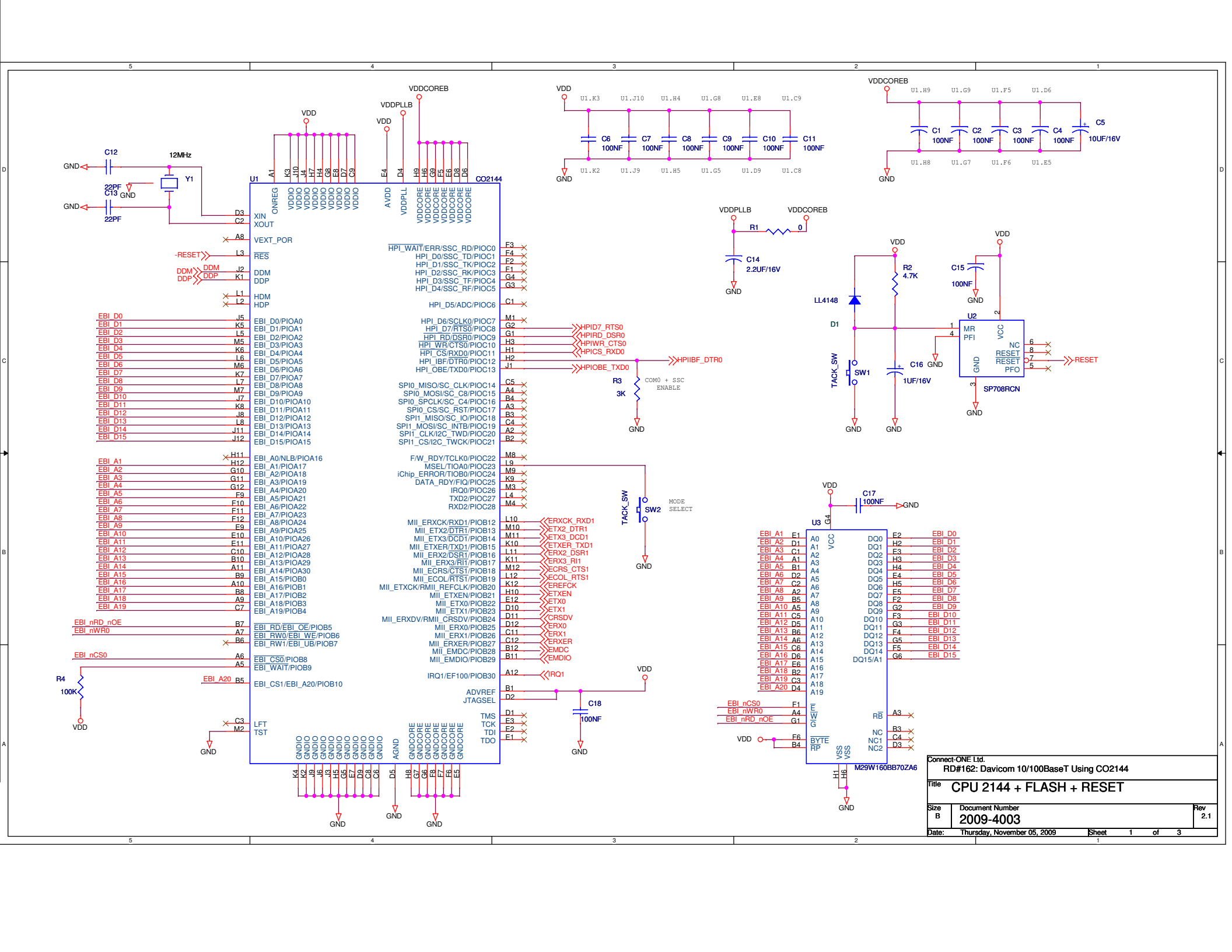
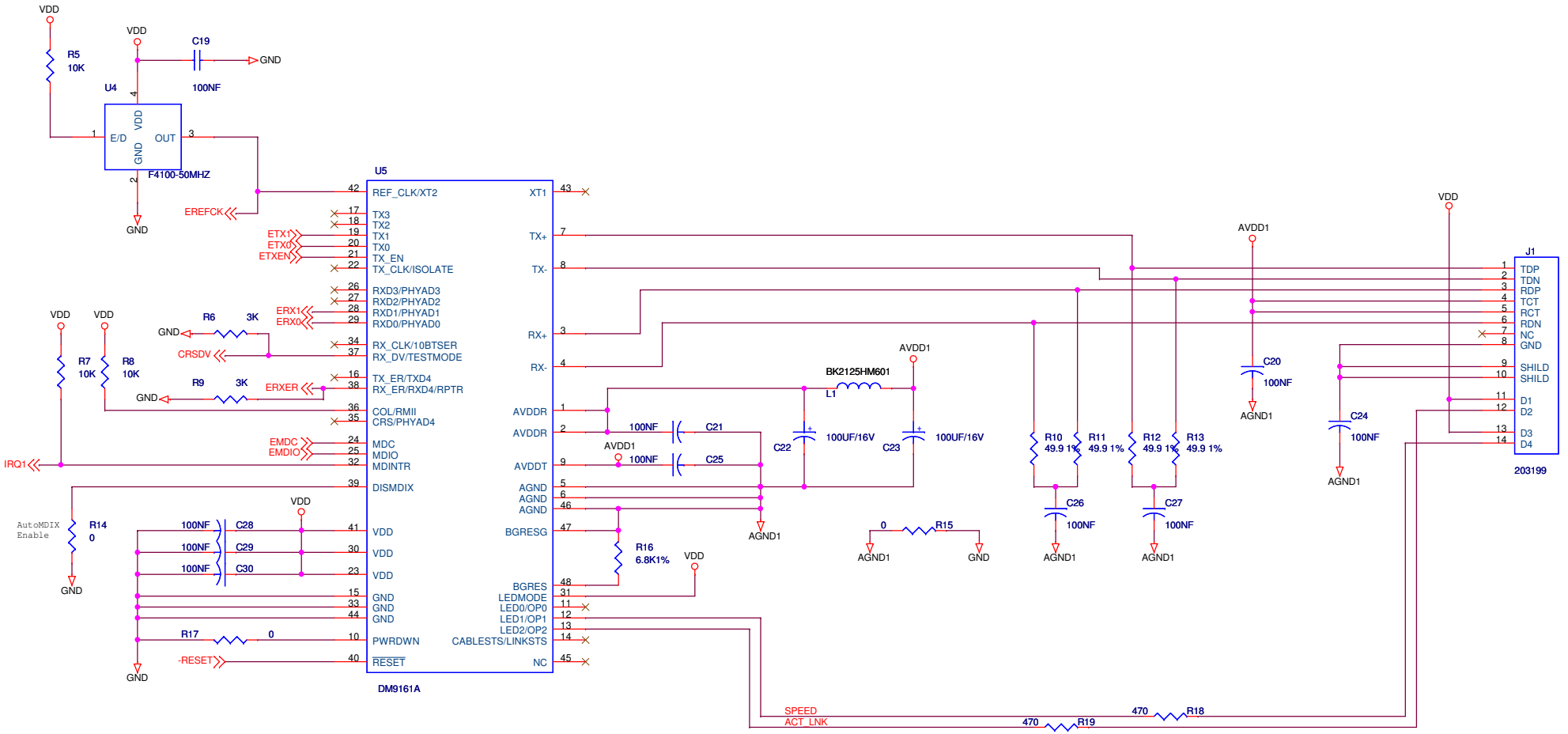
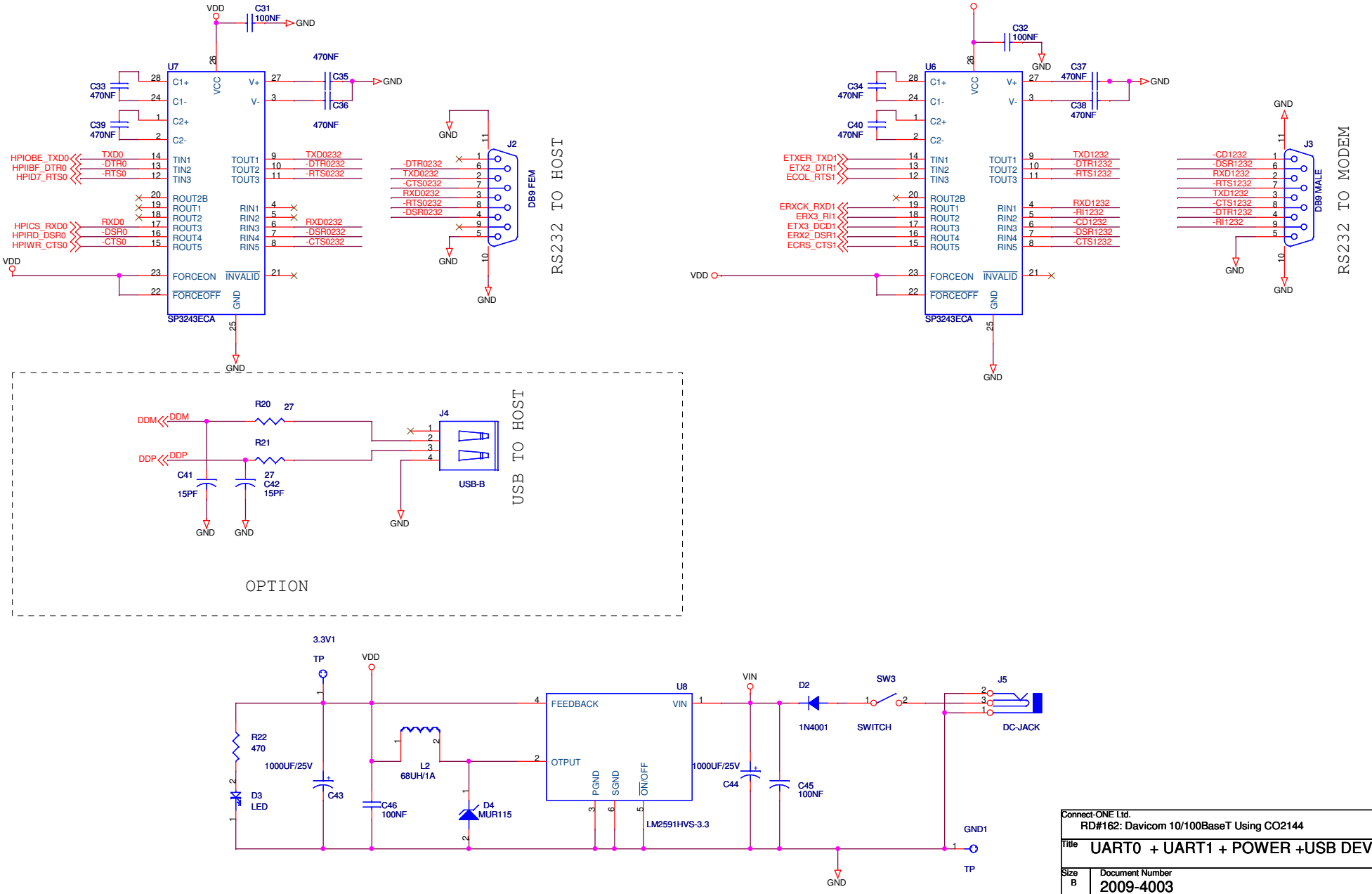

U1
CO2144
C12
12MHz
Y1
22PF
C13
22PF
GND
VDD
VDDCOREB
VDDPLLB
XIN
XOUT
VEXT_POR
RES
DDM
DDP
HDM
HDP
-RESET
EBI_D0
EBI_D1
EBI_D2
EBI_D3
EBI_D4
EBI_D5
EBI_D6
EBI_D7
EBI_D8
EBI_D9
EBI_D10
EBI_D11
EBI_D12
EBI_D13
EBI_D14
EBI_D15
EBI_A0
EBI_A1
EBI_A2
EBI_A3
EBI_A4
EBI_A5
EBI_A6
EBI_A7
EBI_A8
EBI_A9
EBI_A10
EBI_A11
EBI_A12
EBI_A13
EBI_A14
EBI_A15
EBI_A16
EBI_A17
EBI_A18
EBI_A19
EBI_A20
EBI_nRD_nOE
EBI_nWR0
EBI_nCS0
R4
100K
LFT
TST
HPI_WAIT/ERR/SSC_RD/PIOC0
HPI_D0/SSC_TD/PIOC1
HPI_D1/SSC_TK/PIOC2
HPI_D2/SSC_RK/PIOC3
HPI_D3/SSC_TF/PIOC4
HPI_D4/SSC_RF/PIOC5
HPI_D5/ADC/PIOC6
HPI_D6/SCLK0/PIOC7
HPI_D7/RTS0/PIOC8
HPI_RD/DSR0/PIOC9
HPI_WR/CTS0/PIOC10
HPI_CS/RXD0/PIOC11
HPI_IBF/DTR0/PIOC12
HPI_OBE/TXD0/PIOC13
HPID7_RTS0
HPIRD_DSR0
HPIWR_CTS0
HPICS_RXD0
HPIIBF_DTR0
HPIOBE_TXD0
R3
3K
COM0 + SSC ENABLE
SPI0_MISO/SC_CLK/PIOC14
SPI0_MOSI/SC_C8/PIOC15
SPI0_SPCLK/SC_C4/PIOC16
SPI0_CS/SC_RST/PIOC17
SPI1_MISO/SC_IO/PIOC18
SPI1_MOSI/SC_INTB/PIOC19
SPI1_CLK/I2C_TWD/PIOC20
SPI1_CS/I2C_TWCK/PIOC21
F/W_RDY/TCLK0/PIOC22
MSEL/TIOA0/PIOC23
iChip_ERROR/TIOB0/PIOC24
DATA_RDY/FIQ/PIOC25
IRQ0/PIOC26
TXD2/PIOC27
RXD2/PIOC28
MII_ERXCK/RXD1/PIOB12
MII_ETX2/DTR1/PIOB13
MII_ETX3/DCD1/PIOB14
MII_ETXER/TXD1/PIOB15
MII_ERX2/DSR1/PIOB16
MII_ERX3/RI1/PIOB17
MII_ECRS/CTS1/PIOB18
MII_ECOL/RTS1/PIOB19
MII_ETXCK/RMII_REFCLK/PIOB20
MII_ETXEN/PIOB21
MII_ETX0/PIOB22
MII_ETX1/PIOB23
MII_ERXDV/RMII_CRSDV/PIOB24
MII_ERX0/PIOB25
MII_ERX1/PIOB26
MII_ERXER/PIOB27
MII_EMDC/PIOB28
MII_EMDIO/PIOB29
IRQ1/EF100/PIOB30
ERXCK_RXD1
ETX2_DTR1
ETX3_DCD1
ETXER_TXD1
ERX2_DSR1
ERX3_RI1
ECRS_CTS1
ECOL_RTS1
EREFCK
ETXEN
ETX0
ETX1
CRSDV
ERX0
ERX1
ERXER
EMDC
EMDIO
IRQ1
ADVREF
JTAGSEL
TMS
TCK
TDI
TDO
TACK_SW
SW2
MODE SELECT
C18
100NF
C6 100NF
C7 100NF
C8 100NF
C9 100NF
C10 100NF
C11 100NF
C1 100NF
C2 100NF
C3 100NF
C4 100NF
C5 10UF/16V
R1 0
C14 2.2UF/16V
LL4148
D1
R2 4.7K
C15 100NF
C16 1UF/16V
SW1
U2
SP708RCN
MR
PFI
VCC
NC
RESET
PFO
U3
M29W160BB70ZA6
C17 100NF
Connect-ONE Ltd.
RD#162: Davicom 10/100BaseT Using CO2144
Title
CPU 2144 + FLASH + RESET
Size
B
Document Number
2009-4003
Rev
2.1
Date:
Thursday, November 05, 2009
Sheet
1
of
3



Connect-ONE Ltd.	RD#162: Davicom 10/100BaseT Using CO2144	
Title	RMII INTERFACE	
Size: B	Document Number: 2009-4003	Rev: 2.1
Date: Thursday, November 05, 2009	Sheet 2 of 3	



Connect-ONE Ltd.	RD#162: Davicom 10/100BaseT Using CO2144
Title	UART0 + UART1 + POWER +USB DEVICE
Size B	Document Number 2009-4003
Rev	2.1
Date:	Thursday, November 05, 2009
Sheet	3 of 3

Bill of Materials

Item	Qty	Reference	Part	Manufacturer
1	27	C1, C2, C3, C4, C6, C7, C8, C9, C10, C11, C15, C17, C18, C19, C20, C21, C24, C25, C26, C27, C28, C29, C30, C31, C32, C45, C46	100nF	Any
2	1	C5	10µF/16V	Any
3	2	C12, C13	22pF	Any
4	1	C14	2.2µF/16V	Any
5	1	C16	1µF/16V	Any
6	2	C22, C23	100µF/16V	Any
7	8	C33, C34, C35, C36, C37, C38, C39, C40	470nF	Any
8	2	C41, C42	15pF	Any
9	2	C43, C44	1000µF/25V	Any
10	1	D1	LL4148	Any
11	1	D2	1N4001	Any
12	1	D3	LED	Any
13	1	D4	MUR115	Any
14	2	GND1, 3.3V1	TP	Any
15	1	J1	203199	Erni
16	1	J2	DB9 FEM	Any
17	1	J3	DB9 MALE	Any
18	1	J4	USB-B	Any
19	1	J5	DC-JACK	Any
20	1	L1	BK2125HM601	Taiyo Yuden
21	1	L2	68µH/1A	Any
22	4	R1, R14, R15, R17	0Ω	Any
23	1	R2	4.7K Ω	Any
24	3	R3, R6, R9	3KΩ	Any
25	1	R4	100KΩ	Any
26	3	R5, R7, R8	10KΩ	Any
27	4	R10, R11, R12, R13	49.9Ω 1%	Any
28	1	R16	6.8KΩ 1%	Any
29	3	R18, R19, R22	470Ω	Any
30	2	R20, R21	27Ω	Any
31	2	SW1, SW2	TACK_SW	Any
32	1	SW3	SWITCH	Any

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33	1	U1	CO2144	Connect One
34	1	U2	SP708RCN	Sipex
35	1	U3	M29W160BB70ZA6	ST Microelectronics
36	1	U4	F4100-50MHz	Fox
37	1	U5	DM9161A	Davicom
38	2	U6, U7	SP3243ECA	Sipex
39	1	U8	LM2591HVS-3.3	National Semiconductor
40	1	Y1	12MHz	Any 50 ppm

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