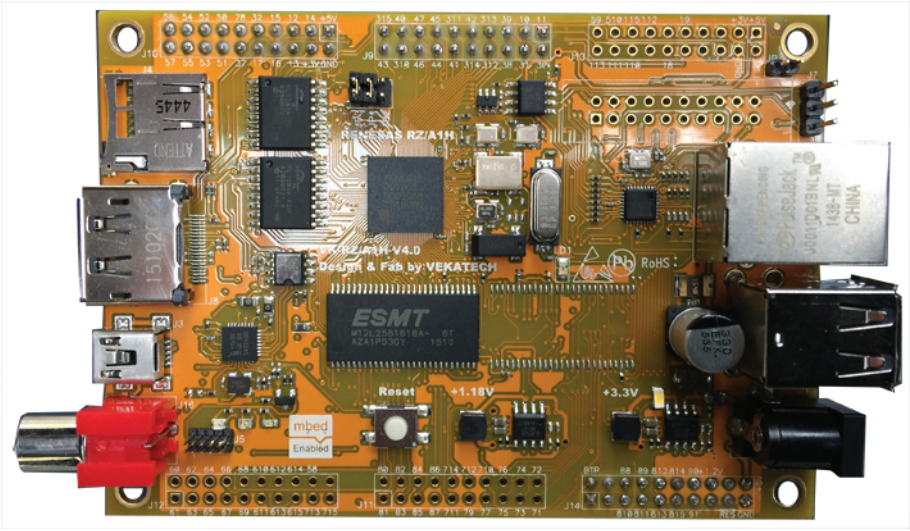
VK-RZ/A1H

Development Board
for Renesas Electronics RZ/A1H ARM Cortex-A9 LSI

ver. 4.0



R7S721000VCBG#YJ0
- 400MHz, 256 BGA, Fanless

10 MByte OnChip RAM
- Can RUN without ext. SDRAM

Up to 128 MByte NOR-Flash
- QSPI, 66MHz, Quad (Burst),8-bit
- Direct fetch is possible

Up to 128 MByte SDRAM
- 66MHz, 16-bit

2 x USB Host/Function
- USB 2.0

Micro SD
- Boot capability

USB Mini-B to UART
- LPC11U35FHI33/501

Ethernet 10/100Base TX
- PHY: LAN8710A-EZK

CAN
- PHY:TJA1040T/VM.118

Atmel CryptoAuthentication:
- ATSHA204A-SSHDA-T

Video In:
- WXGA
- PAL
- NTSC

Video outputs:
- LVDS
- RGB

Exp. Ports:
- RZ/A1 - 97 I/O 3.3V

Debug ports:
- RZ/A1 J-TAG 2x10 pins
- CMSIS DAP SWD interface

DC IN +5V
- Consumption +3.3V @ 450mA max

Operating temperature:
- -40 ... +85°

Dimensions:
- ID-2 105 x 74 mm

Board Support Package for:

- u-boot, Linux - GCC
- FreeRTOS - IAR
- CycloneTCP - IAR
- Express Logic Embedded GUI demo - IAR
- IS2S MicroEJ demos - IAR
- .NET Micro Framework - GCC
- MBED enabled

Utilities:

- SD CARD RAM/Flash Loader

Companion boards:

- VK-LCD50RTA - 5" Parallel(65536 colors) TFT LCD display, 480x272,ressistive touch(STMPE811),8kbits i2C memory and Audio DAC(MAX9850)
- VK-LCD70RT - 7" LVDS (65536 colors) TFT LCD display, 1024x600,ressistive touch(STMPE811),8kbits i2C memory

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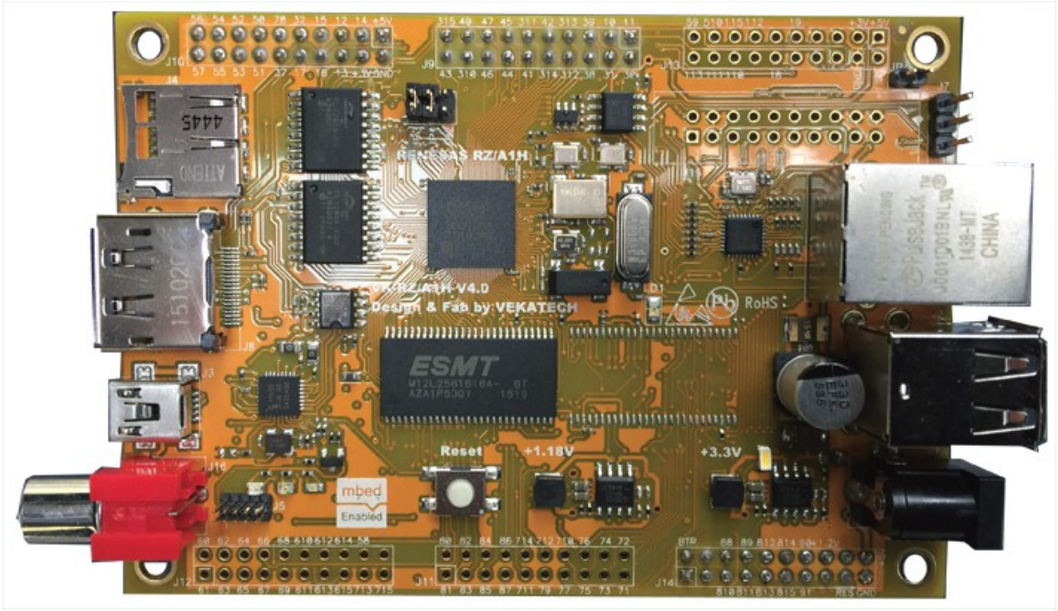
VK-RZ/A1H Development Board
V4.0
User manual



Rev. 4.0, Apr. 1. 2016

INTRODUCTION

VK-RZ/A1 is a starter kit which uses MCU R7S721000VCBG from Renesas Electronics. This powerful MCU is actually LSI, single-chip microcontroller that includes an ARM Cortex™-A9 processor along with the integrated peripheral functions required to configure a system. The core includes:

- 32-KB L1 instruction cache
- 32-KB L1 data cache
- 128-KB L2 cache.

Integrated various on-chip peripheral functions and interfaces such as:

- 10-MB large-capacity RAM (128 KB are shared by the data-retention RAM)
- data-retention RAM
- multi-function timer pulse unit 2, OS timer, realtime clock
- motor control PWM timer
- UART, UART with FIFO, I2C, SPI, SPI multi I/O bus controller, CAN, LIN
- serial sound interface, sound generator, CD-ROM decoder
- A/D converter, SCUX
- media local bus, SD host interface, MMC host interface
- NAND flash memory controller
- IEBus™ controller, Renesas SPDIF interface
- Ethernet controller, EthernetAVB
- USB 2.0 host/function
- digital video decoder, video display controller 5
- dynamic range compression, image renderer, image renderer for display
- display out comparison unit
- Renesas graphics processor for OpenVG™
- JPEG codec unit, capture engine unit, pixel format converter
- interrupt controller modules, general I/O ports

The kit supports:

- CAN
- Ethernet
- LVDS Port (optional)
- up to 128 MB SDRAM
- up to 640 MB SPI Flash
- I^2C RTC, I^2C CryptoAuth (optional)
- Mini SD card connector
- Composite video connector (optional)
- on board debugger
- 2 USB communication channels

All this along with the DC/DC power supply, on board mbed CMSIS-DAP debugger (LPC11U35) and R7S721000VCBG, allow you to build a diversity of powerful applications to be used in a wide range of embedded tasks.

BOARD FEATURES:

- MCU: LPC11U35 - (LPC11U35FHI33/501)
- LSI: RZ/A1H - (R7S721000VCBG)
- USB Mini B device connector (LPC11U35)
- 2xUSB Standard A host connectors (RZ/A1H)
- Micro SD card connector (RZ/A1H)
- Composite video connector (RZ/A1H)
- LVDS Port connector (RZ/A1H)
- CAN connectors (NXP TJA1040) - (RZ/A1H)
- RJ-45 ethernet connector 10/100Mb MAC (PHY SMSC LAN8710A) - (RZ/A1H)
- SDRAM 32 MB (CS2, 64MB per chip select) - (RZ/A1H)
- 4 bit SPI Flash (2x16 Mbits Spansion S25FL128S) - (RZ/A1H)
- I^2C RTC with battery holder (ST M41T82) - (RZ/A1H)
- I^2C CryptoAuthentication (Atmel ATSHA204) - (RZ/A1H)
- 20 pins Debug/programming connector (JTAG ↔ RZ/A1H)
- 10 pins Debug/programming connector (SWD ↔ LPC11U35)
- Power connector for DC/DC (In: 5V → Out: 3V3 & 1V18)

- FR-4, 2.0 mm, Orange/Blue/Red solder mask, component print
- Dimensions: 105.0mm x 74.0mm

ELECTROSTATIC WARNING

The VK-RZ/A1H - R7S721000VCBG board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

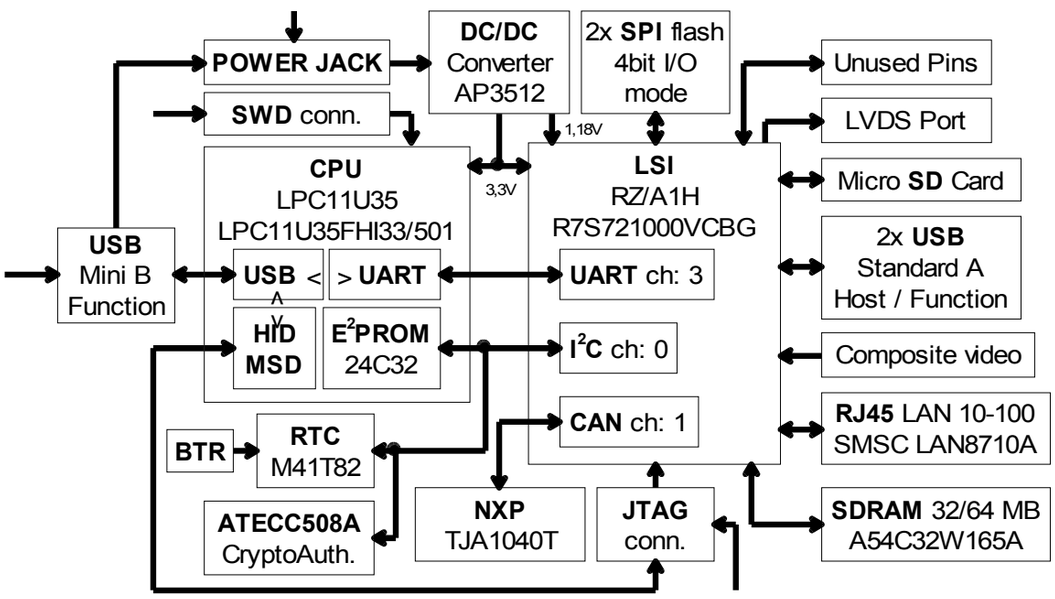
PROCESSOR FEATURES

The VK-RZ/A1H board use MCU R7S721000VCBG from RENESAS ELECTRONICS with these features:

- Power supply voltage: VDD = 3.0 to 3.6 V
- Operating ambient temperature: TA =−40 to +85°C
- Max. CPU clock (Iϕ) = 400 MHz)

For more information please visit www.renesas.eu

BLOCK DIAGRAM



EXTERNAL SDRAM BASE ADDRESSES

```
SDRAM CS2:         ORIGIN = 0x08000000,    LENGTH = 64MB
SDRAM CS3:         ORIGIN = 0x0C000000,    LENGTH = 64MB
SDRAM CS2 mirror: ORIGIN = 0x48000000,    LENGTH = 64MB
SDRAM CS3 mirror: ORIGIN = 0x4C000000,    LENGTH = 64MB
```

⚠ SDRAM is accessed with 16bit data width

⚠ A14 & A15 are used for bank switching

SCHEMATICS

Please refer to CD for high quality pictures.

POWER SUPPLY CIRCUIT:

VK-RZ/A1H is powered by (5) VDC applied at the power jack.
VK-RZ/A1H could also be powered by USB Mini B connector.
The consumption of VK-RZ/A1H may vary and the maximum is (@3.3V) 450mA.

CLOCK CIRCUITS:

Quartz Generator 13.3333 MHz is connected to **EXTAL,** pin# **AA14**.
Quartz crystal 32.768KHz is connected to **RTC_X1**/**RTC_X2,** pins# **AA7**/**Y7**.
Quartz crystal 4.0000MHz is connected to **RTC_X3/RTC_X4,** pins# **V10/V11**.
Quartz crystal 48.0000MHz is connected to **USB_X1/USB_X2,** pins# **AA13/Y13**.
Quartz crystal 27.0000MHz is connected to **VIDEO_X1/VIDEO_X2,** pins# **W21/V20**.
Quartz crystal 22.5792MHz is connected to **AUDIO_X1/AUDIO_X2,** pins# **V21/U20**.
Quartz crystal 25.0000MHz is connected to Ethernet Phy - **SMSC LAN8710A** – (**XTAL1/XTAL2**, pins# **5/4**).
Quartz crystal 12.0000MHz is connected to **LPC11U35** - (**XTALIN**/**XTALOUT**, pins# **4**/**5**).
Quartz crystal 32.768KHz is connected to RTC – **M41T82** (**XI/XO**, pins# **1**/**2**).

PUSH BUTTONS

Button#	Function	Signal Name	Pin#
SW1	RESET	RESET	U9

JUMPERS CONFIGURATION (■ Connected ☐ Disconnected)

⚠ **MD_BOOT0** input is constantly tied to '1' (3V3), so only **Boot Mode 3/4/5** are available !

⚠ **MD_BOOT1** input is tied to **JP1** and **MD_BOOT2** to **JP2**.

⚠ **MD_CLK** input is constantly tied to '0' (GND), so the LSI is clocked from **EXTAL**.

⚠ **BSCANP** input is constantly tied to '0' (GND), so the LSI is in normal debug interface mode (i.e. JTAG is connected to **CoreSight debug TAP controller**).

BOOT configuration:

BOOT mode#	JP1,	JP2	Description
3	■	☐	Boot from **SPI multi I/O ch0:** [P9_2 - P9_5]
4	☐	■	Boot from **SD card ch0:** [P4_10 - P4_15]
5	☐	☐	Boot from **MMC card ch0:** [P5_10 - P5_15]

Clock settings:

CLK mode#	JP3	Description
MD_CLKS	■	SSCG circuit **OFF**
MD_CLKS	☐	SSCG circuit **ON**

CAN Termination:

CAN mode#	JP4	Description
0	■	CAN line **is** terminated
1	☐	CAN line **isn't** terminated

EXTERNAL CONNECTORS DESCRIPTION

PWR J1			
Pin#	Signal Name	Pin#	Signal Name
1	+5V	2,3	GND

The power input should be +(5VDC)

SWD 10pin connector

SWD J5			
Pin#	Signal Name	Pin#	Signal Name
1	+3V3	2	MBED_SWD
3	GND	4	MBED_SWC
5	GND	6	-
7	GND	8	-
9	GND	10	MBED_RST

JTAG 20pin connector

JTAG J15			
Pin#	Signal Name	Pin#	Signal Name
1	+3V3	2	+3V3
3	TRST	4	GND
5	TDI/JP0_0	6	GND
7	TMS	8	GND
9	TCK	10	GND
11	-	12	GND
13	TDO/JP0_1	14	GND
15	SRST	16	GND
17	-	18	GND
19	-	20	GND

CAN 3pin connector

CAN J7	
Pin#	Signal Name
1	CAN_L
2	GND
3	CAN_H

CTX1 is connected to **P5_10** pin# **A7** of **R7S721000VCBG**.
CRX1 is connected to **P5_9** pin# **B7** of **R7S721000VCBG**.

Termination Jumper **JP4**.

Ethernet connector RJ45 type: J2

Transformer and integrated LEDS are connected to PHY interface **LAN8710A**.

Respective signals from PHY are connected to MII interface of **R7S721000VCBG.**

USB devices

USB mini B J3			
Pin#	Signal Name	Pin#	Signal Name
1	V_USB1	3	D+
2	D-	5	GND

Pin#4 ID is disconnected.
V_USB1 Output USB device power.
D- is connected to **USB_DM,** pin**#13** of **LPC11U35.**
D+ is connected to **USB_DP,** pin**#14** of **LPC11U35.**

USB standard A J6 (lower)					USB standard A J6 (upper)			
Pin#	Signal Name	Pin#	Signal Name		Pin#	Signal Name	Pin#	Signal Name
1	+5V	3	D+		5	+5V	7	D+
2	D-	4	GND		6	D-	8	GND

Both USB are configured as hosts !
lower D- is connected to **DM1,** pin#**AA9** of **R7S721000VCBG**
lower D+ is connected to **DP1,** pin#**Y9** of **R7S721000VCBG**.
upper D- is connected to **DM0,** pin#**AA11** of **R7S721000VCBG**.
upper D+ is connected to **DP0,** pin#**Y11** of **R7S721000VCBG**.

Micro SD card slot:

Micro SD J4			
Pin#	Signal Name	MCU PIN#	MCU PORT
1	DAT2	F18	P4_15/SD_D2_0
2	CD/DAT3	F17	P4_14/SD_D3_0
3	CMD	G20	P4_13/SD_CMD_0
4	VDD	-	-
5	CLK	H21	P4_12/SD_CLK_0
6	GND	-	-
7	DAT0	G18	P4_11/SD_D0_0
8	DAT1	H20	P4_10/SD_D1_0
9	S1	-	-
10	G1	-	-
11	S2	J21	P4_8/SD_CD_0
12	G2	-	-

Composite video

Composite video J16			
Pin#	Signal Name	Pin#	Signal Name
1	VIN1A	2	GND

LVDS port connector: J8

LVDS port J8			
Pin#	Signal Name	MCU PIN#	MCU PORT
1	ML_LANE_0_+	B9	P5_6/TXOUT0P
2	GND	-	-
3	ML_LANE_0_-	A9	P5_7/TXOUT0M
4	ML_LANE_1_+	D10	P5_4/TXOUT1P
5	GND	-	-
6	ML_LANE_1_-	D9	P5_5/TXOUT1M
7	ML_LANE_2_+	B10	P5_2/TXOUT2P
8	GND	-	-
9	ML_LANE_2_-	A10	P5_3/TXOUT2M
10	AUX_CH_+	B11	P5_0/TXCLKOUTP
11	GND	-	-
12	AUX_CH_-	A11	P5_1/TXCLKOUTM
13	-	-	-
14	-	-	-
15	I2C_SCL_3	E13	P1_6/I2C_SCL_3
16	GND	-	-
17	I2C_SDA_3	D13	P1_7/I2C_SDA_3
18	LVDS_HPD	K1	P7_8/IRQ1
19	GND	-	-
20	+3V3	-	-

The signals, that are coming out from the connector, **ARE NOT DISPLAY PORT SIGNALS**, regardless of the fact that the connector is the same as Display port.

CONFIGURABLE REROUTING

There are function and features that can be enabled or disabled by manually soldering or desoldering components, (mostly resistors). Every component, specified with attribute **DNP** is missing by default. If the user wants to enable given Feature, related designator should be soldered and sometimes some other components should be desoldered.

Solder at your own risk, double check & comply with the schematic !			
Designator#	Sheet	Feature	Dependence
R2	Jumper & Pull-Ups	clock the PHY from P5_9	Remove R3 or R179
R6	LAN	Some Oscillator need it	-
R114	LVDS	Lane 0 impedance match	-
R115	LVDS	Lane 1 impedance match	-
R116	LVDS	Lane 2 impedance match	-
R117	LVDS	Lane aux impedance match	-
R126	LVDS	Access LCD EEPROM from I^2C0	Remove R122
R127	LVDS	Access LCD EEPROM from I^2C0	Remove R120
R131	Jumper & Pull-Ups	Drive LD1 from P1_5	Remove R132
R133	Jumper & Pull-Ups	Drive LD1 from P8_10	Remove R132
R145	MCU Control	clock LSI from USB_X1	Remove R152
R147	MCU Control	Set debug mode to boundary scan	Remove R153
R176	mbed-IF	Access RL78 EEPROM from I^2C3	Remove R175
R177	mbed-IF	Access RL78 EEPROM from I^2C3	Remove R174
R194	CAN	Put can transceiver in silent mode	Remove R193
R198	RTC & Crypto	Access RTC & Crypto from I^2C3	Remove R201
R200	RTC & Crypto	Access RTC & Crypto from I^2C3	Remove R199
R210	Memory	Invert SD Card detect signal logic	-
U8	MCU Decoupling	If External Reff. Voltage needed	-

UNUSED PIN HEADERS

LCD extension

J9 (RZ/A1H)			
Pin#	Signal Name	Pin#	Signal Name
1	P1_1/RIIC0SDA	2	P3_0/LCD0_CLK
3	P1_0/RIIC0SCL	4	P3_1/LCD0_TCON0 (DE)
5	P3_9/LCD0_DATA1 (B2)	6	P3_8/LCD0_DATA0 (B1)
7	P3_13/LCD0_DATA5 (G0)	8	P3_12/LCD0_DATA4 (B5)
9	P4_2/LCD0_DATA10 (G5)	10	P3_14/LCD0_DATA6 (G1)
11	P3_11/LCD0_DATA3 (B4)	12	P4_1/LCD0_DATA9 (G4)
13	P4_5/LCD0_DATA13 (R3)	14	P4_4/LCD0_DATA12 (R2)
15	P4_7/LCD0_DATA15 (R5)	16	P4_6/LCD0_DATA14 (R4)
17	P4_0/LCD0_DATA8 (G3)	18	P3_10/LCD0_DATA2 (B3)
19	P3_15/LCD0_DATA7 (G2)	20	P4_3/LCD0_DATA11 (R1)

J10 (RZ/A1H)			
Pin#	Signal Name	Pin#	Signal Name
1	+5V	2	GND
3	P1_4/RIIC2SCL	4	+3V3
5	P1_2/RIIC1SCL	6	P1_3/RIIC1SDA
7	P1_5/RIIC2SDA	8	P1_6/RIIC3SCL
9	P3_2/LCD0_TCON1 (Hsync) On/Off	10	P1_7/RIIC3SDA
11	P7_8/IRQ1	12	P3_7/LCD0_TCON6 (Vsync) (BKL_EN)
13	P5_0/TXCLKOUTP	14	P5_1/TXCLKOUTM
15	P5_2/TXOUT2P	16	P5_3/TXOUT2M
17	P5_4/TXOUT1P	18	P5_5/TXOUT1M
19	P5_6/TXOUT0P	20	P5_7/TXOUT0M

SDRAM extension

J11 (RZ/A1H)			
Pin#	Signal Name	Pin#	Signal Name
1	P8_1/A9	2	P8_0/A8
3	P8_3/A11	4	P8_2/A10
5	P8_5/A13	6	P8_4/A12
7	P8_7/A15	8	P8_6/A14
9	P7_11/A3	10	P7_14/A6
11	P7_9/A1	12	P7_12/A4
13	P7_7/WE1/DQMLU	14	P7_10/A2
15	P7_5/RD/WR	16	P7_6/WE0/DQMLL
17	P7_3/CAS	18	P7_4/CKE
19	P7_1/CS3	20	P7_2/RAS

J12 (RZ/A1H)			
Pin#	Signal Name	Pin#	Signal Name
1	P6_1/D1	2	P6_0/D0
3	P6_3/D3	4	P6_2/D2
5	P6_5/D5	6	P6_4/D4
7	P6_7/D7	8	P6_6/D6
9	P6_9/D9	10	P6_8/D8
11	P6_11/D11	12	P6_10/D10
13	P6_13/D13	14	P6_12/D12
15	P6_15/D15	16	P6_14/D14
17	P7_13/A5	18	P5_8/CS2
19	P7_15/A7	20	n.c

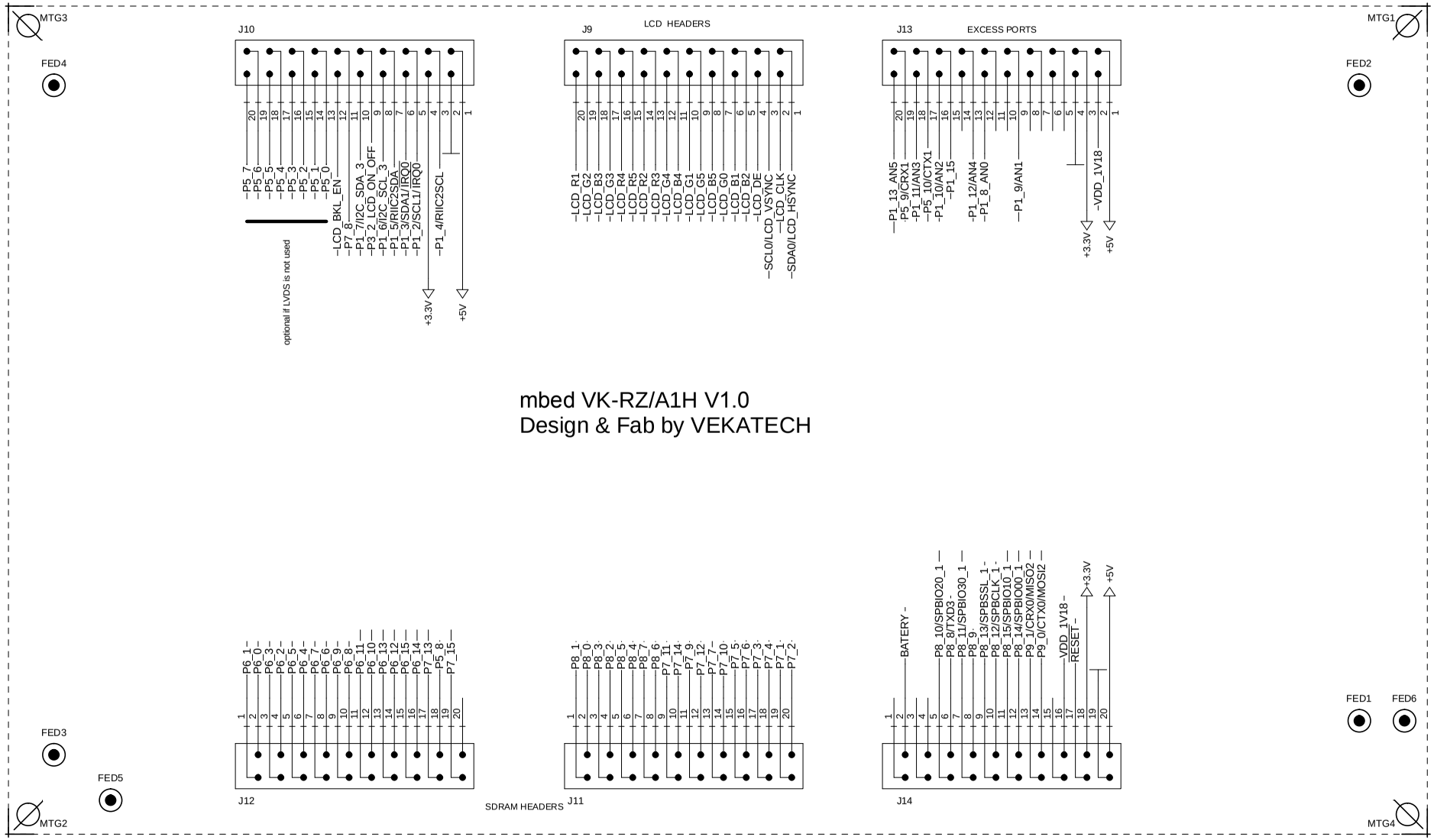
PORT extension

J13 (RZ/A1H)			
Pin#	Signal Name	Pin#	Signal Name
1	+5V	2	+1V18
3	+3V3	4	GND
5	n.c	6	n.c
7	n.c	8	n.c
9	P1_9/AN1	10	n.c
11	n.c	12	P1_8/AN0
13	P1_12/AN4	14	n.c
15	P1_15/AN7	16	P1_10/AN2
17	P5_10/CAN1TX	18	P1_11/AN3
19	P5_9/CAN1RX	20	P1_13/AN5

J14 (RZ/A1H)			
Pin#	Signal Name	Pin#	Signal Name
1	n.c	2	Battery
3	n.c	4	n.c
5	P8_10	6	P8_8/TxD3
7	P8_11	8	P8_9/RxD3
9	P8_13	10	P8_12
11	P8_15	12	P8_14
13	P9_1	14	P9_0
15	n.c	16	+1V18
17	RESET	18	+3V3
19	GND	20	+5V

AVAILABLE DEMO SOFTWARE:

Demos



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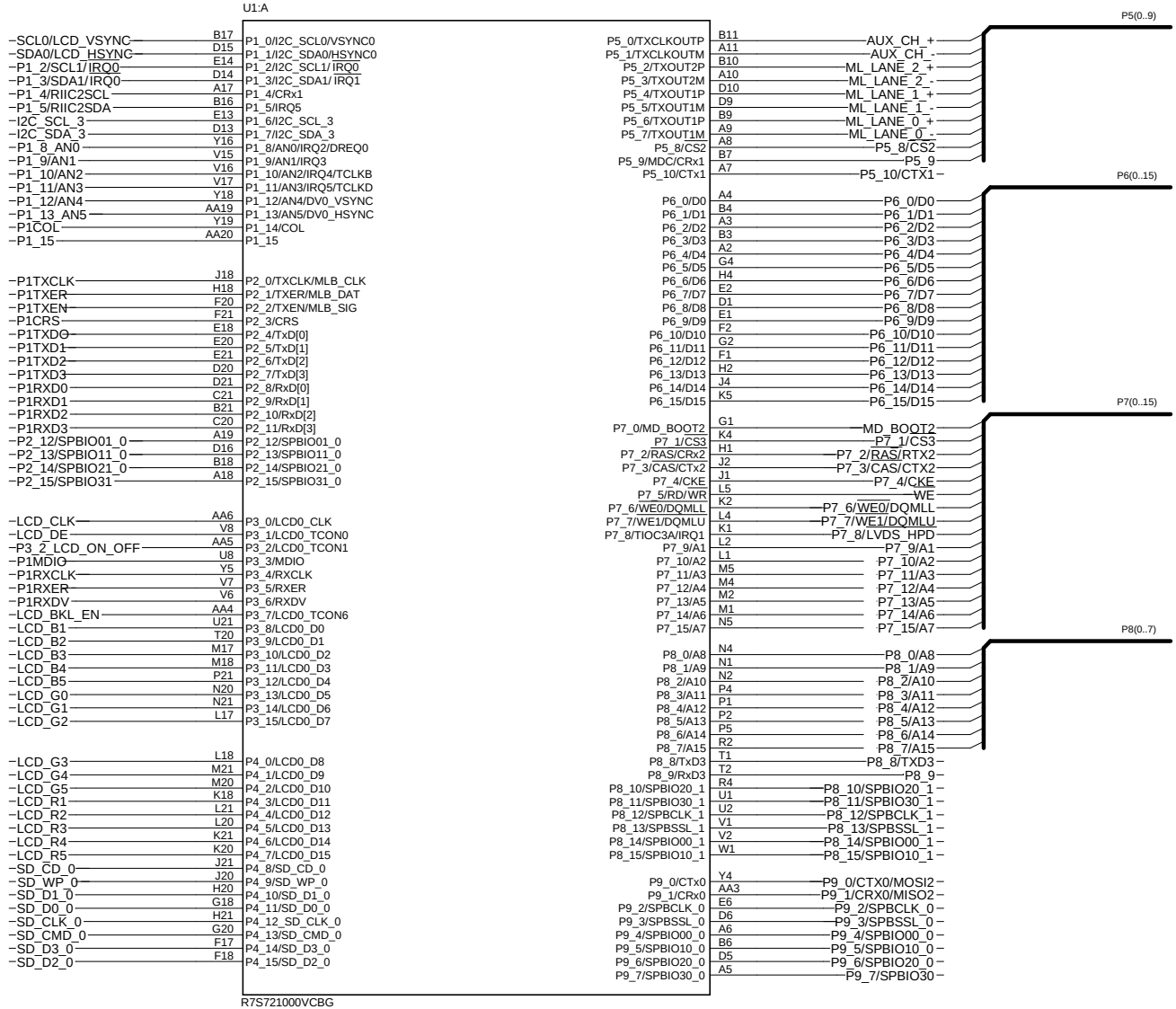
Filename VK-RZA1H_mbed.sch	Sheet 1 of 12	



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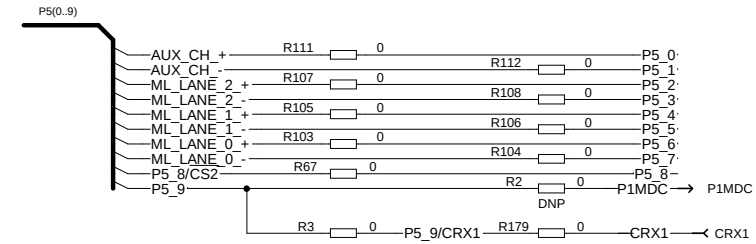
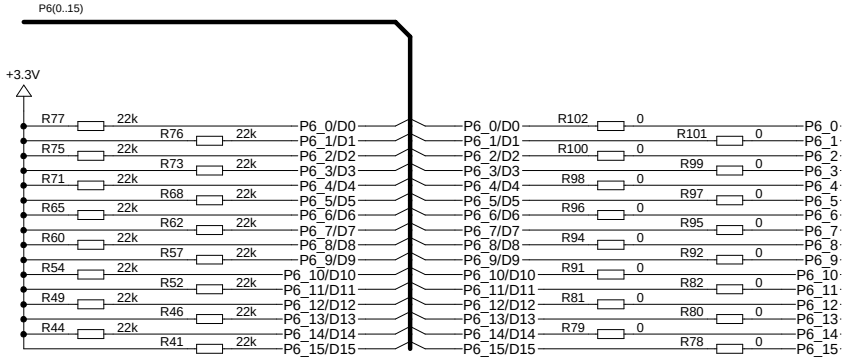
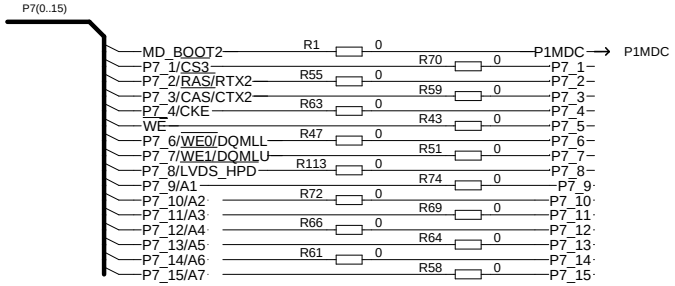
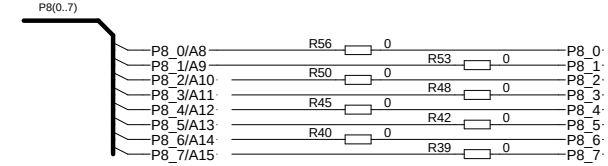
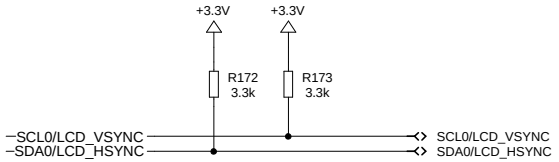
Date 27.10.2015		Drawn by D.Todorov
Filename VK-RZA1H_mbed.sch		Sheet 2 of 12

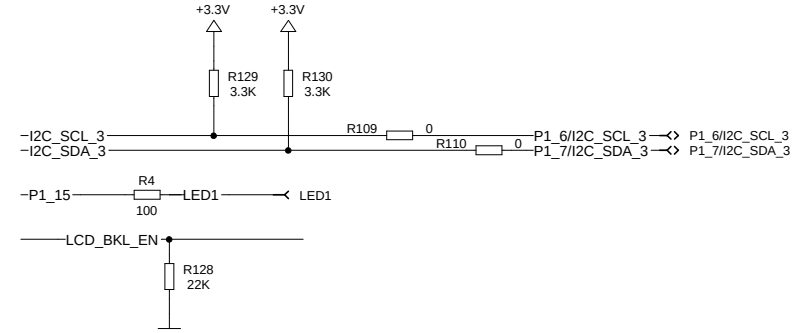


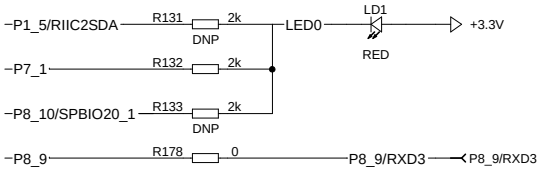












Title	Jumpers & Pull-Ups	
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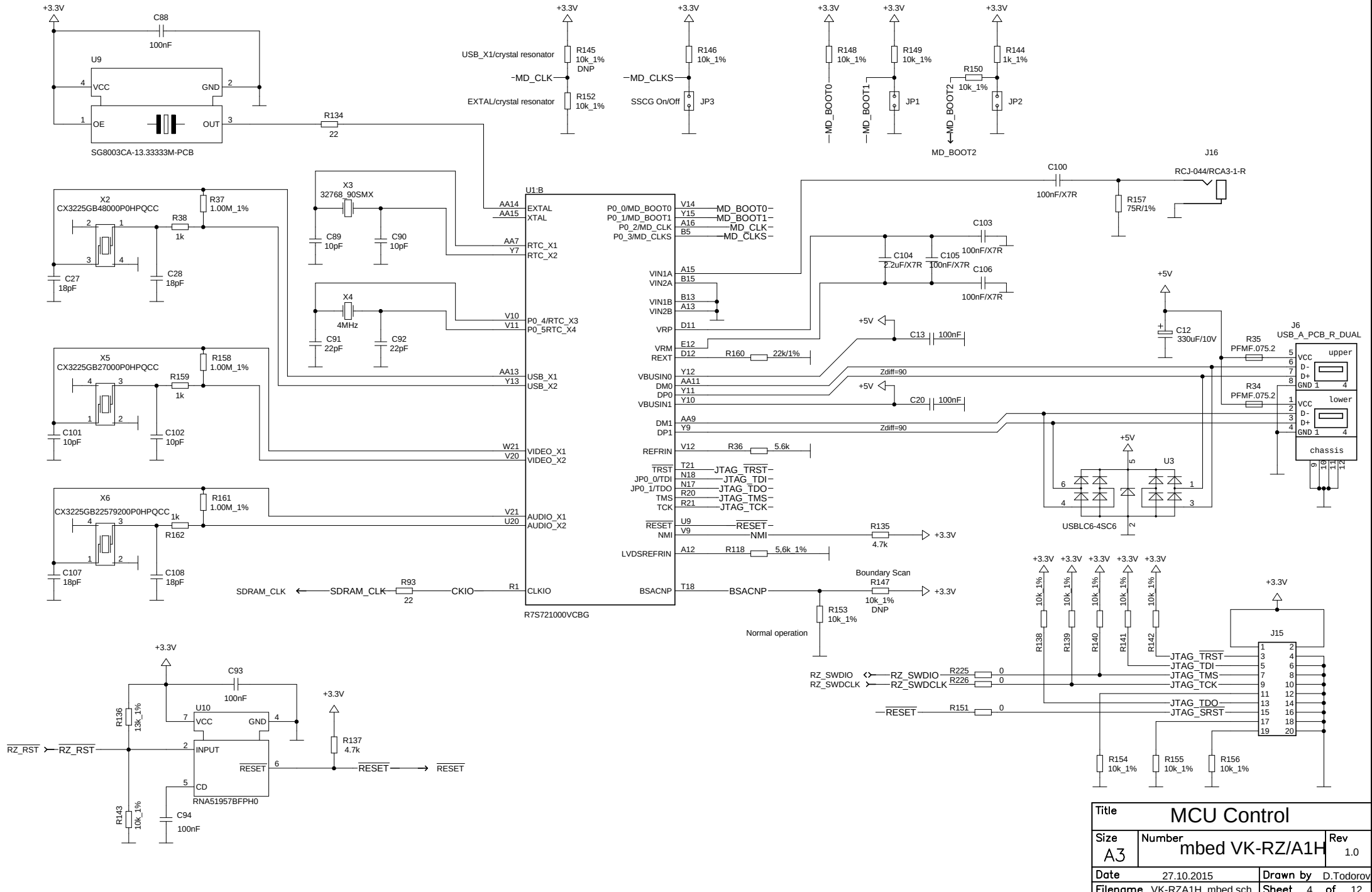
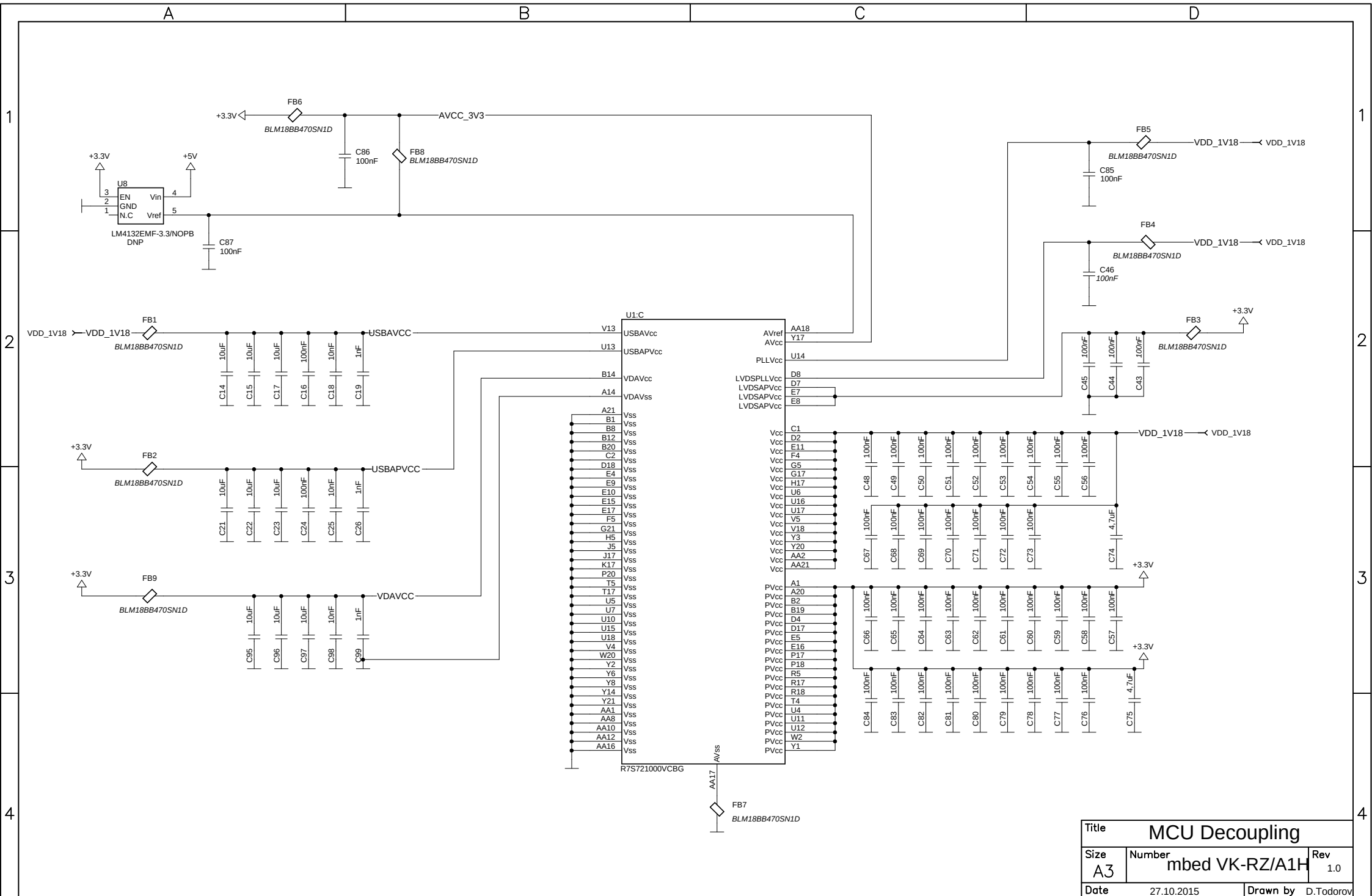
Date 27.10.2015		Drawn by D.Todorov
Filename VK-RZA1H_mbed.sch		Sheet 3 of 12



Title	MCU Control
Size	A3
Number	mbed VK-RZ/A1H
Rev	1.0
Date	27.10.2015
Drawn by	D.Todorov
Filename	VK-RZA1H_mbed.sch
Sheet	4 of 12


FB6
+3.3V
BLM18BB470SN1D
AVCC_3V3
C86
100nF
FB8
BLM18BB470SN1D
+3.3V
+5V
U8
EN
GND
N.C
Vin
Vref
LM4132EMF-3.3/NOPB
DNP
C87
100nF
FB5
VDD_1V18
BLM18BB470SN1D
C85
100nF
FB4
C46
100nF
FB1
FB2
FB9
FB3
C14
C15
C17
C16
C18
C19
C21
C22
C23
C24
C25
C26
C95
C96
C97
C98
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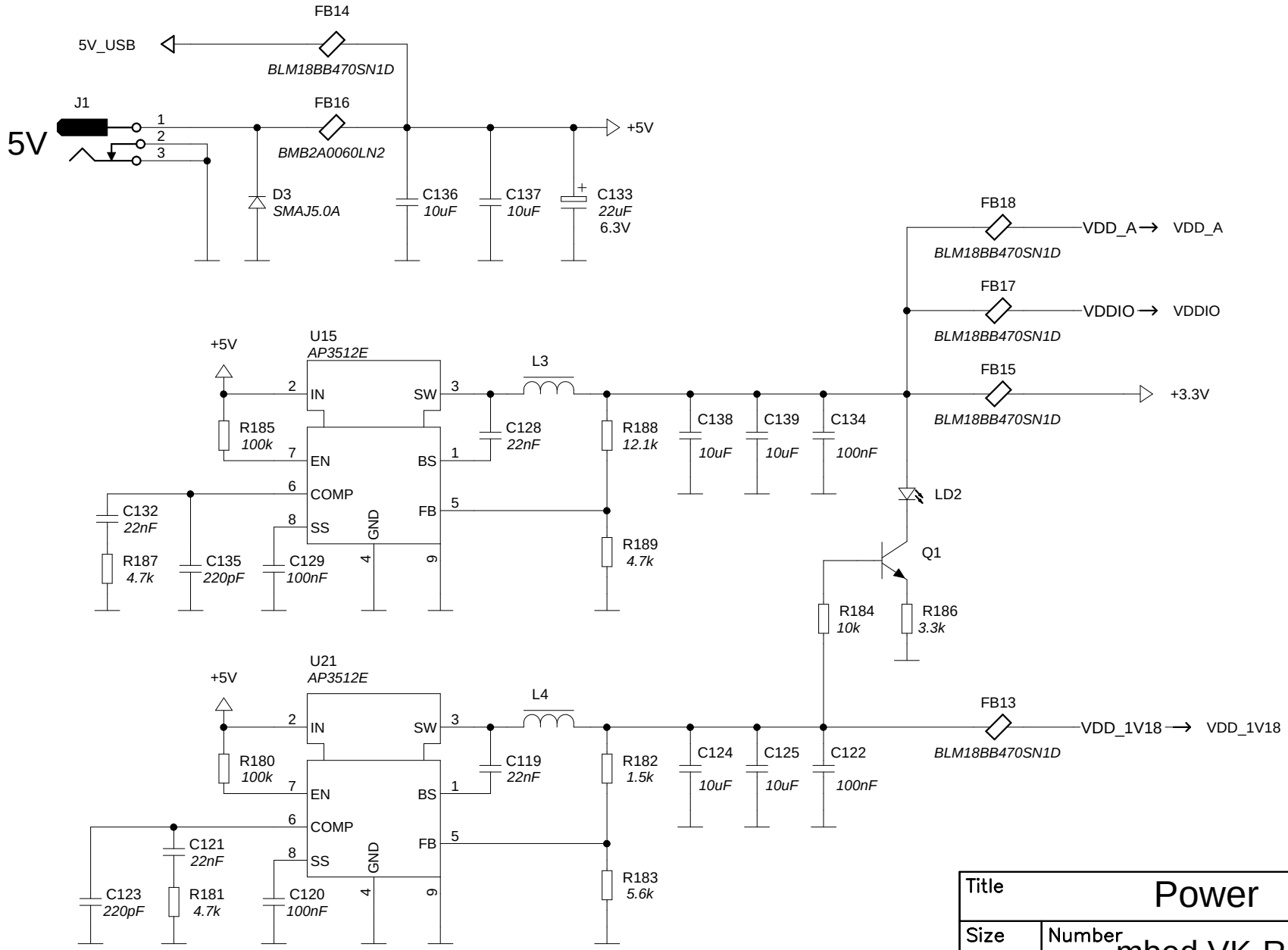
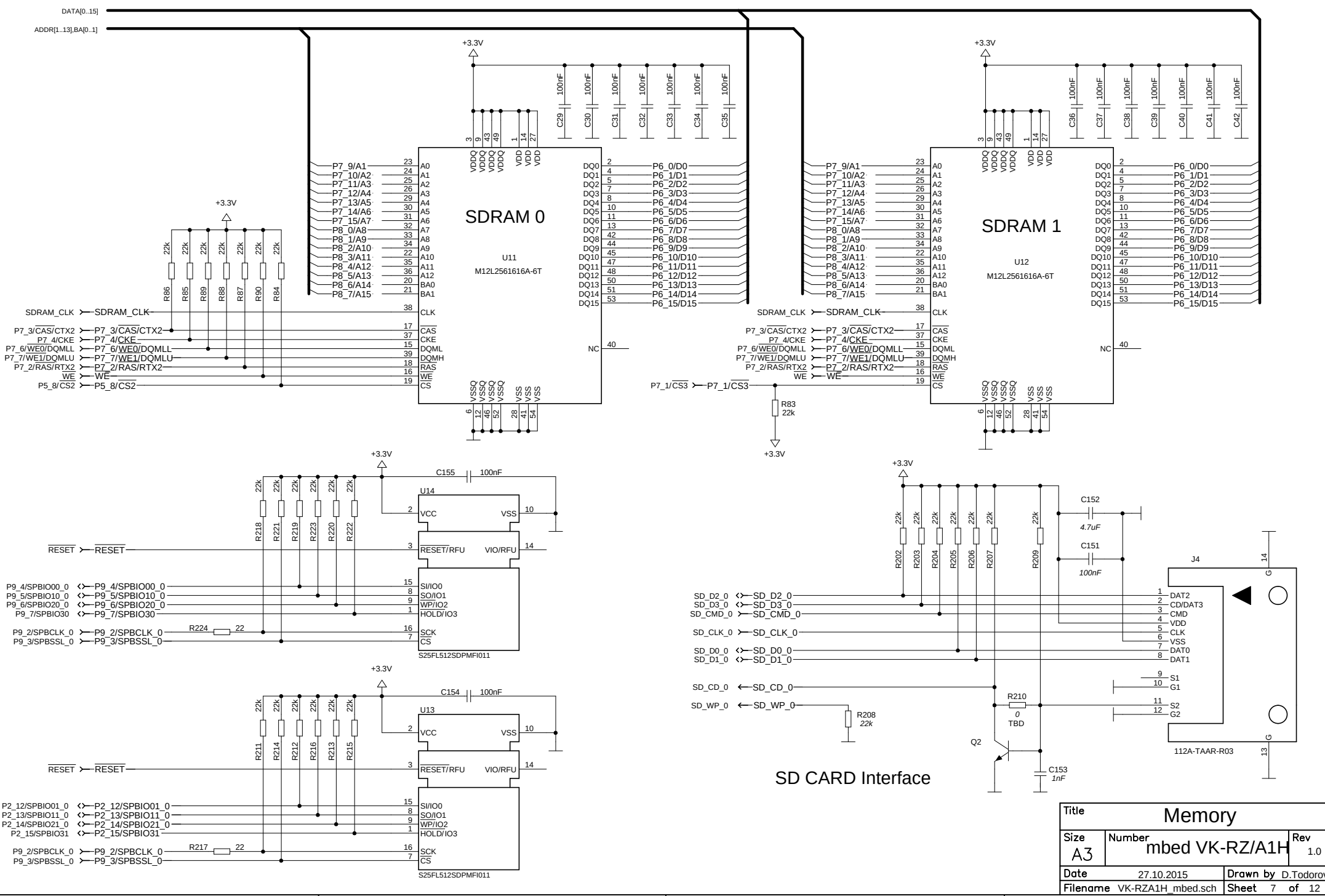
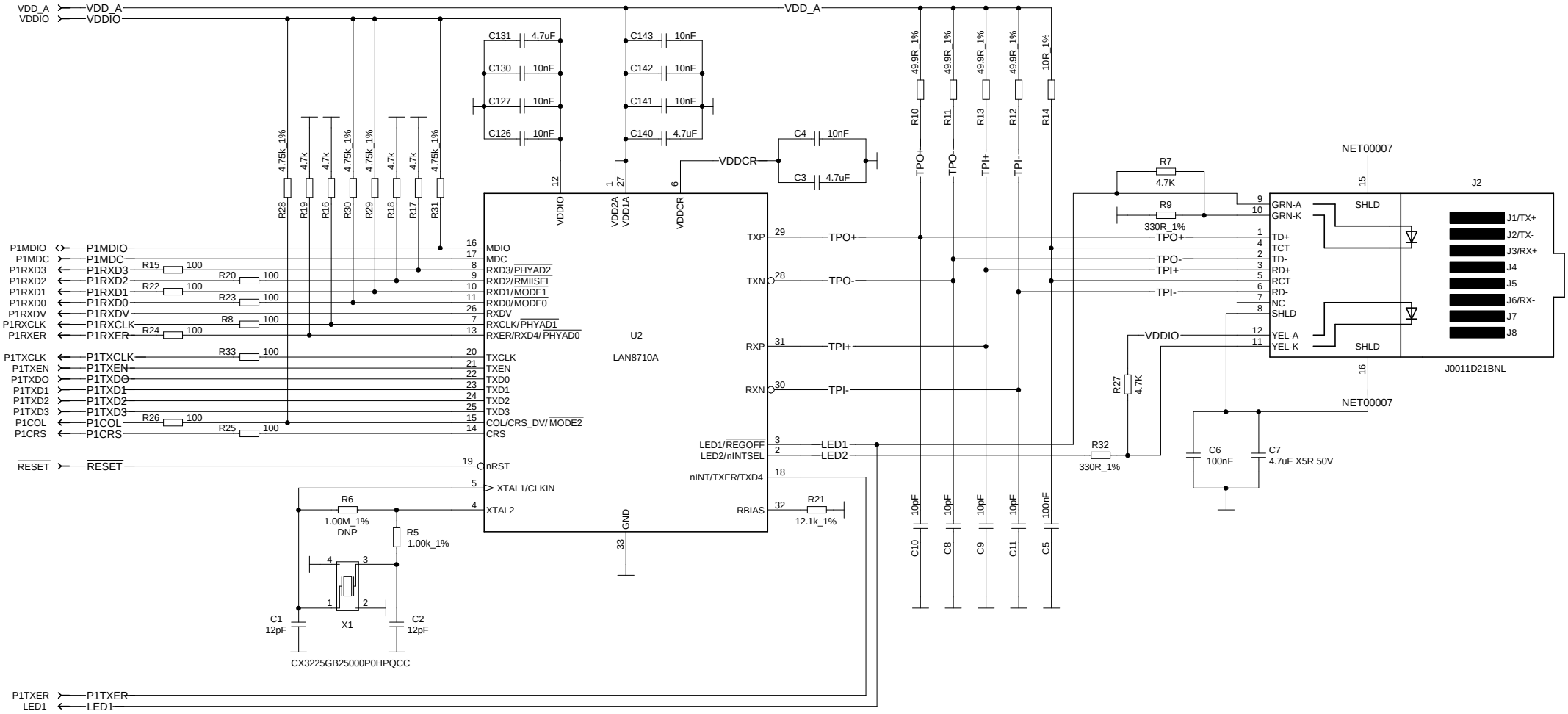
C57
C84
C83
C82
C81
C80
C79
C78
C77
C76
C75
USBAVCC
USBAPVCC
VDAVCC
U1:C
R7S721000VCBG
FB7
BLM18BB470SN1D
Title
MCU Decoupling
Size
A3
Number
mbed VK-RZ/A1H
Rev
1.0
Date
27.10.2015
Drawn by
D.Todorov
Filename
VK-RZA1H_mbed.sch
Sheet
5
of
12



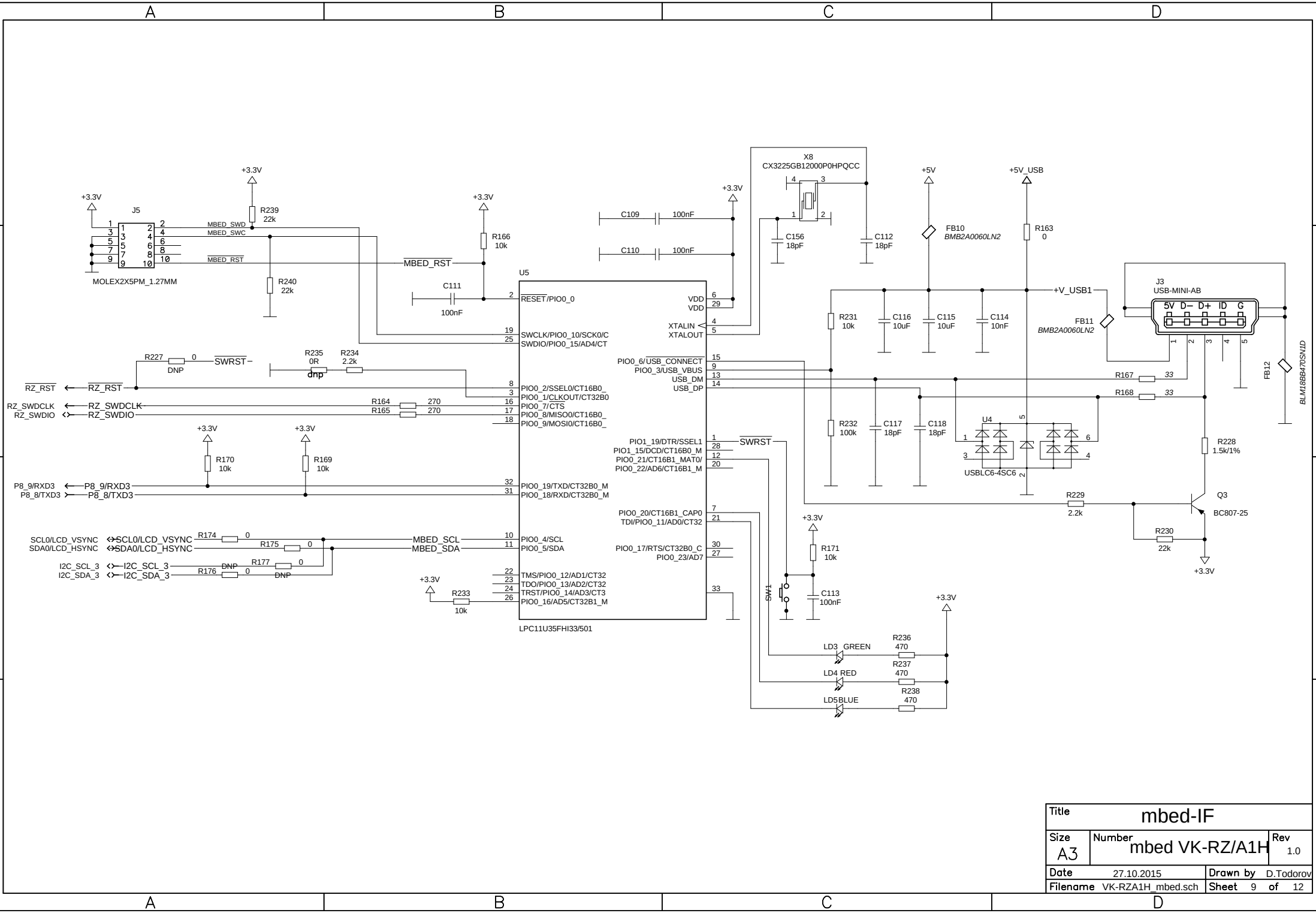
Title	Power	
Size A4	Number mbed VK-RZ/A1H	Rev 1.0
Date 27.10.2015		Drawn by D.Todorov
Filename VK-RZA1H_mbed.sch		Sheet 6 of 12



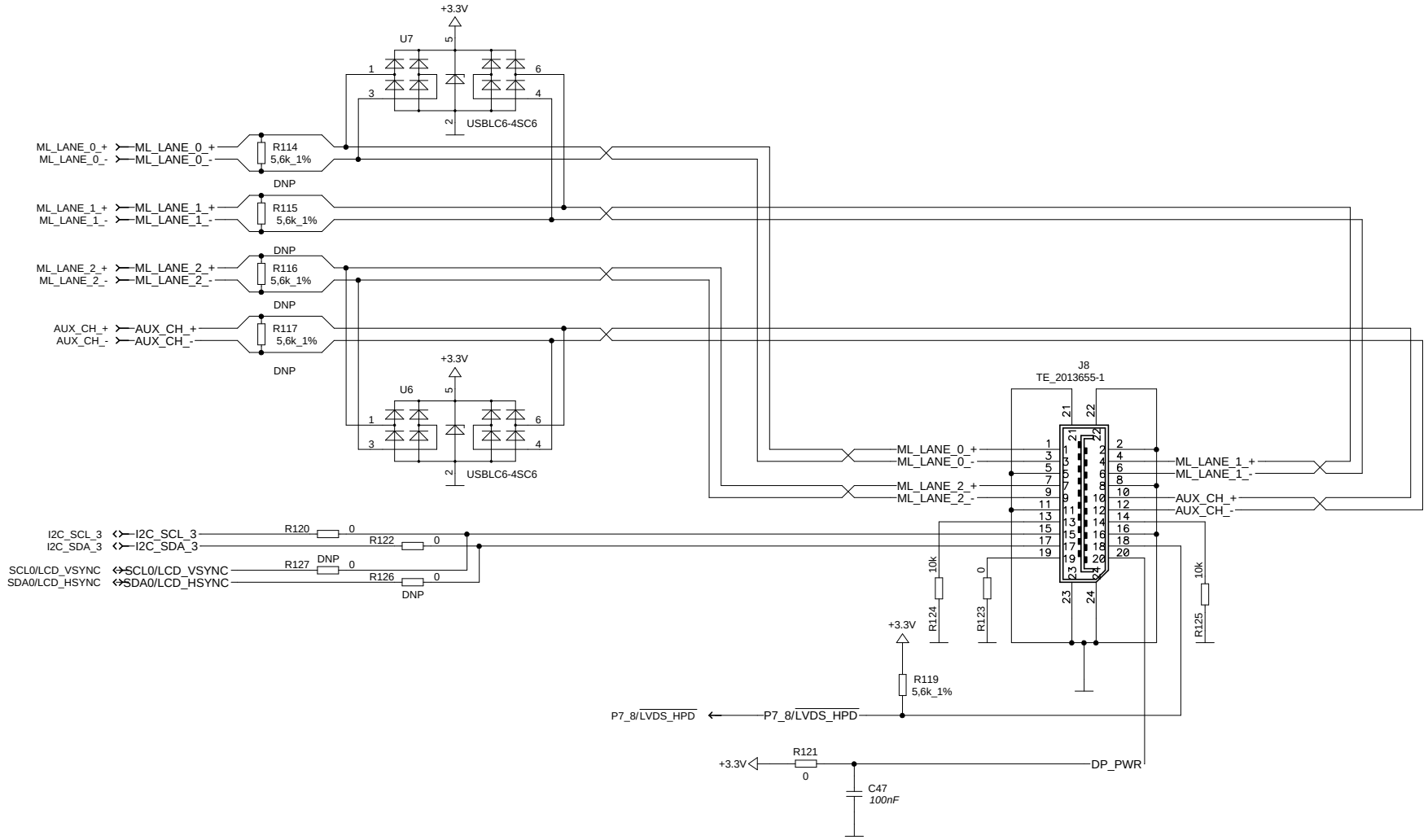
Title	Memory		
Size A3	Number mbed VK-RZ/A1H		Rev 1.0
Date 27.10.2015		Drawn by D.Todorov	
Filename VK-RZA1H_mbed.sch		Sheet 7 of 12	



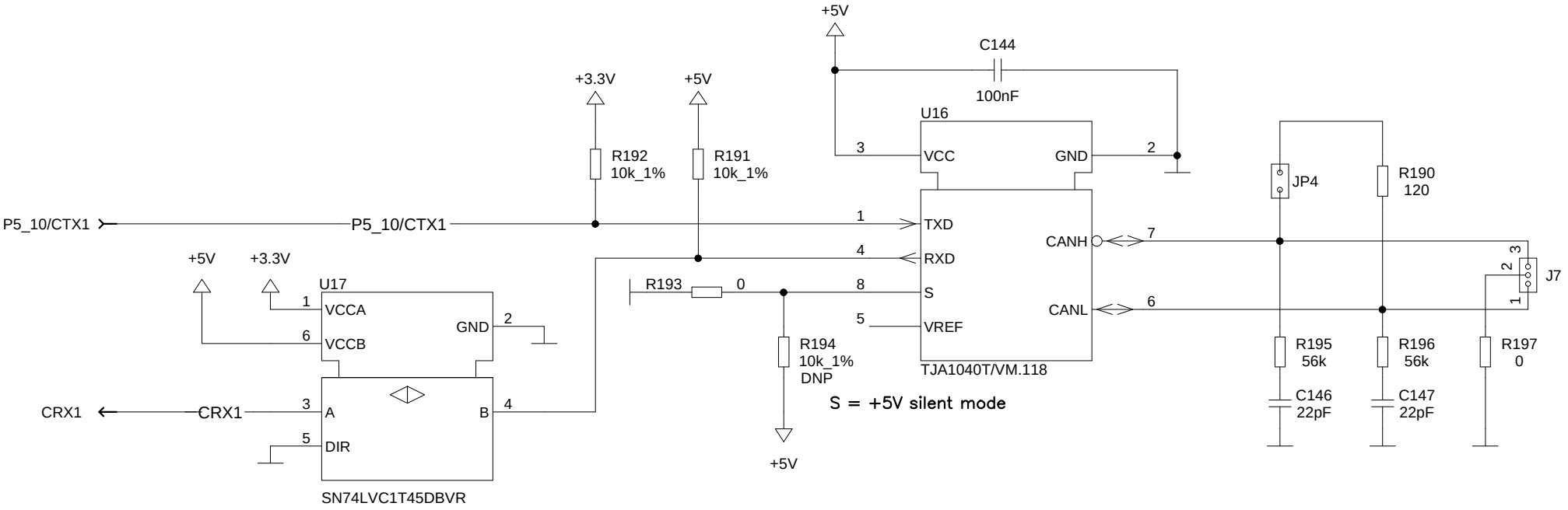
Title	LAN		
Size A3	Number mbed VK-RZ/A1H		Rev 1.0
Date 27.10.2015		Drawn by D.Todorov	
Filename VK-RZA1H_mbed.sch		Sheet 8 of 12	



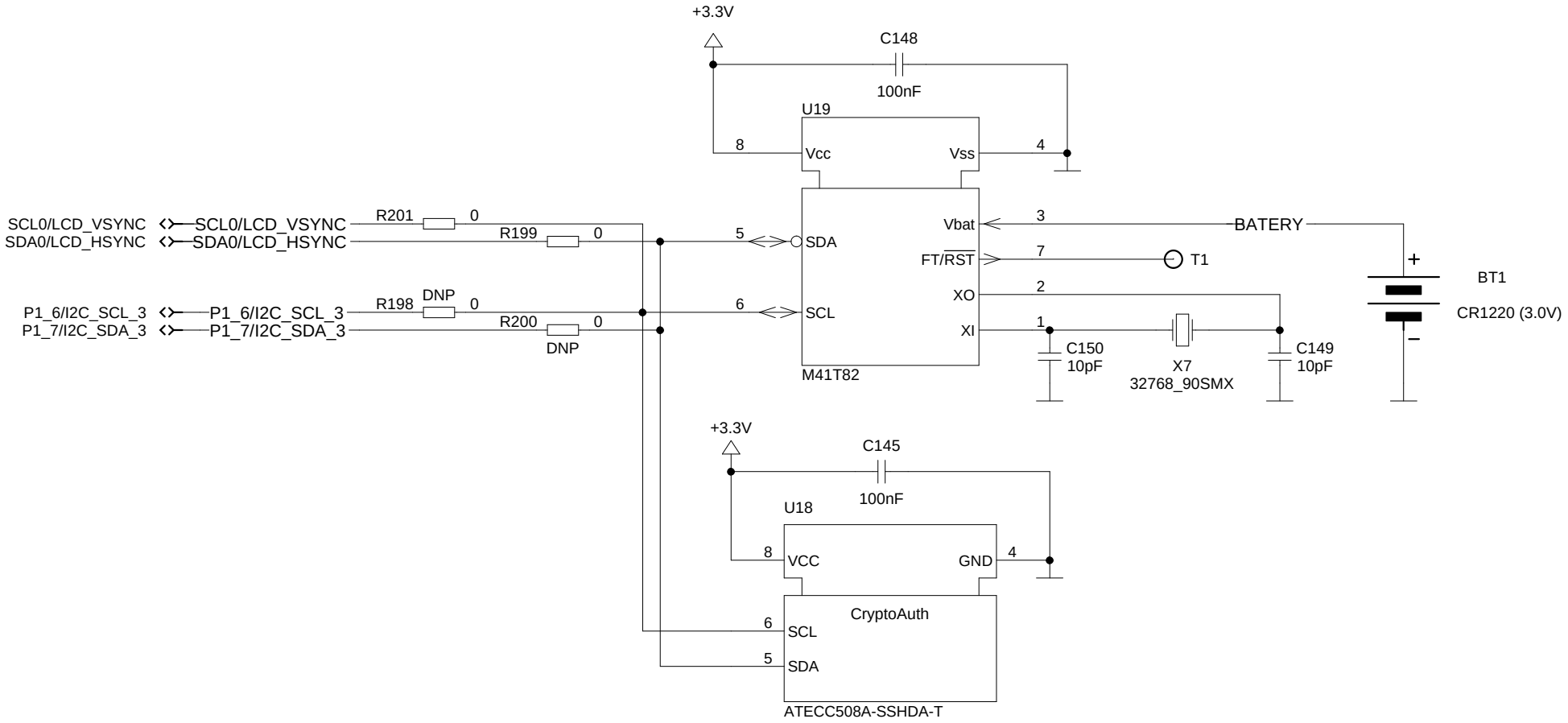
Title	mbed-IF		
Size A3	Number mbed VK-RZ/A1H		Rev 1.0
Date	27.10.2015	Drawn by	D.Todorov
Filename	VK-RZA1H_mbed.sch	Sheet	9 of 12



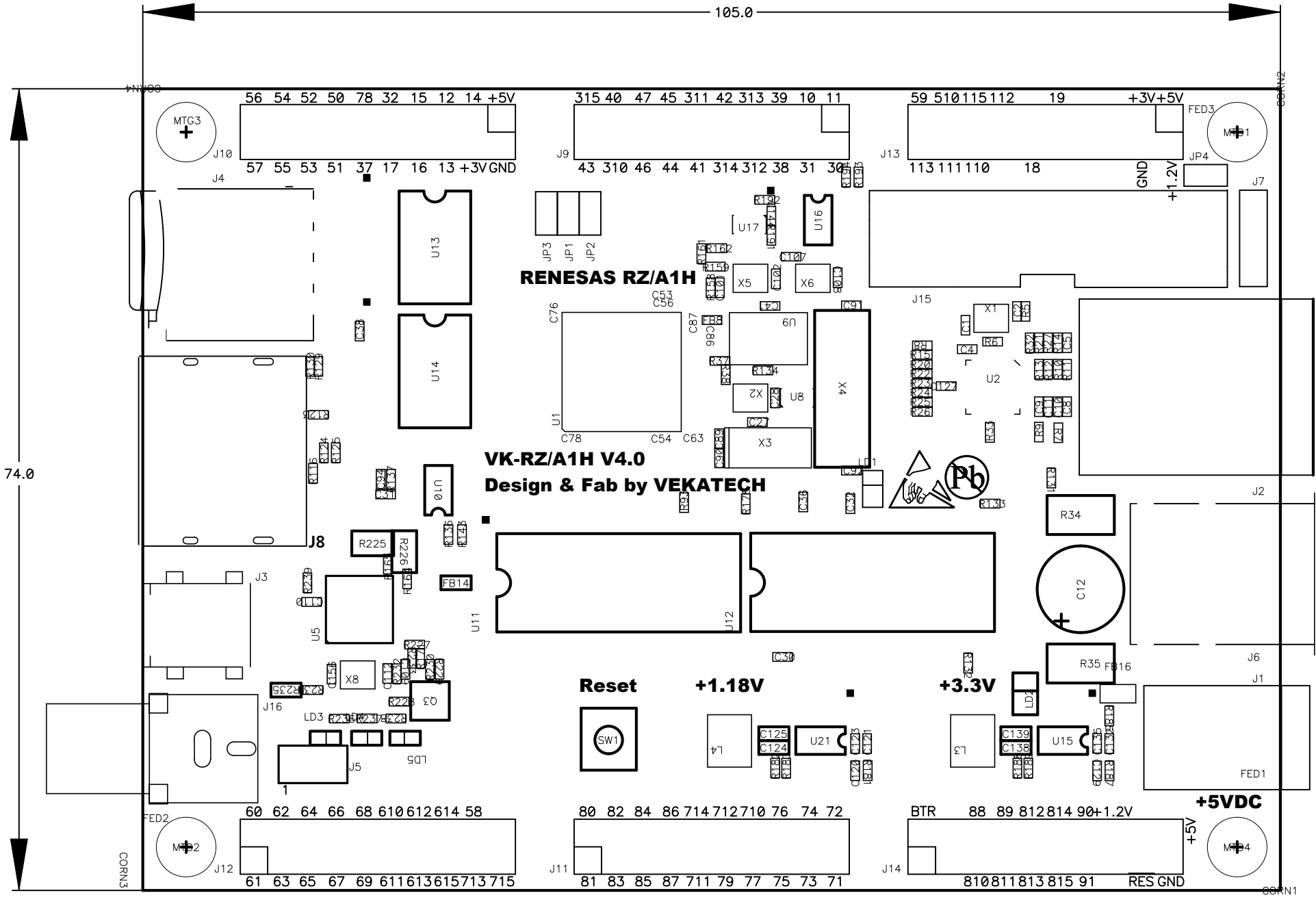
Title	LVDS	
Size A3	Number mbed VK-RZ/A1H	Rev 1.0
Date 27.10.2015	Drawn by D.Todorov	
Filename VK-RZA1H_mbed.sch	Sheet 10 of 12	

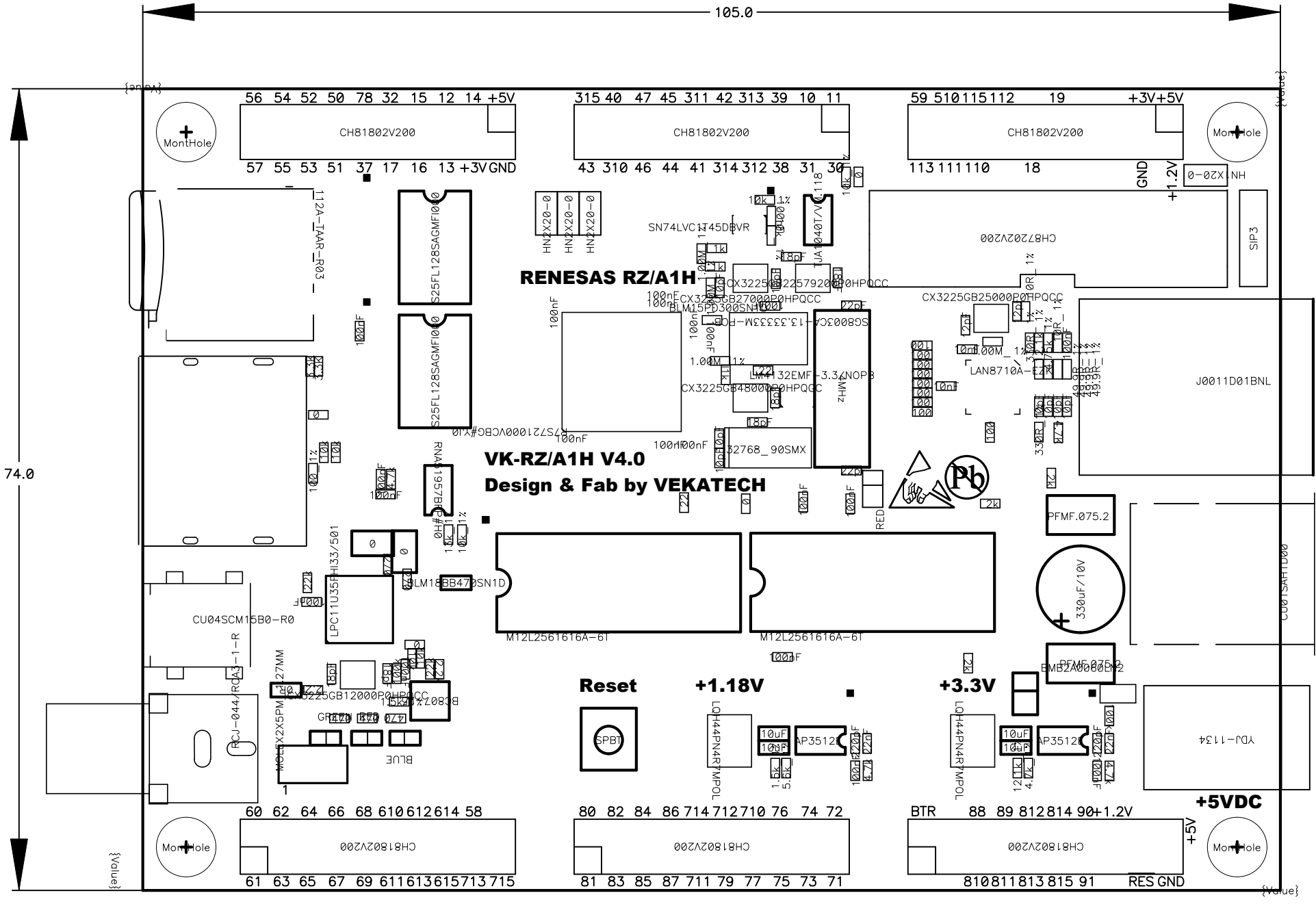


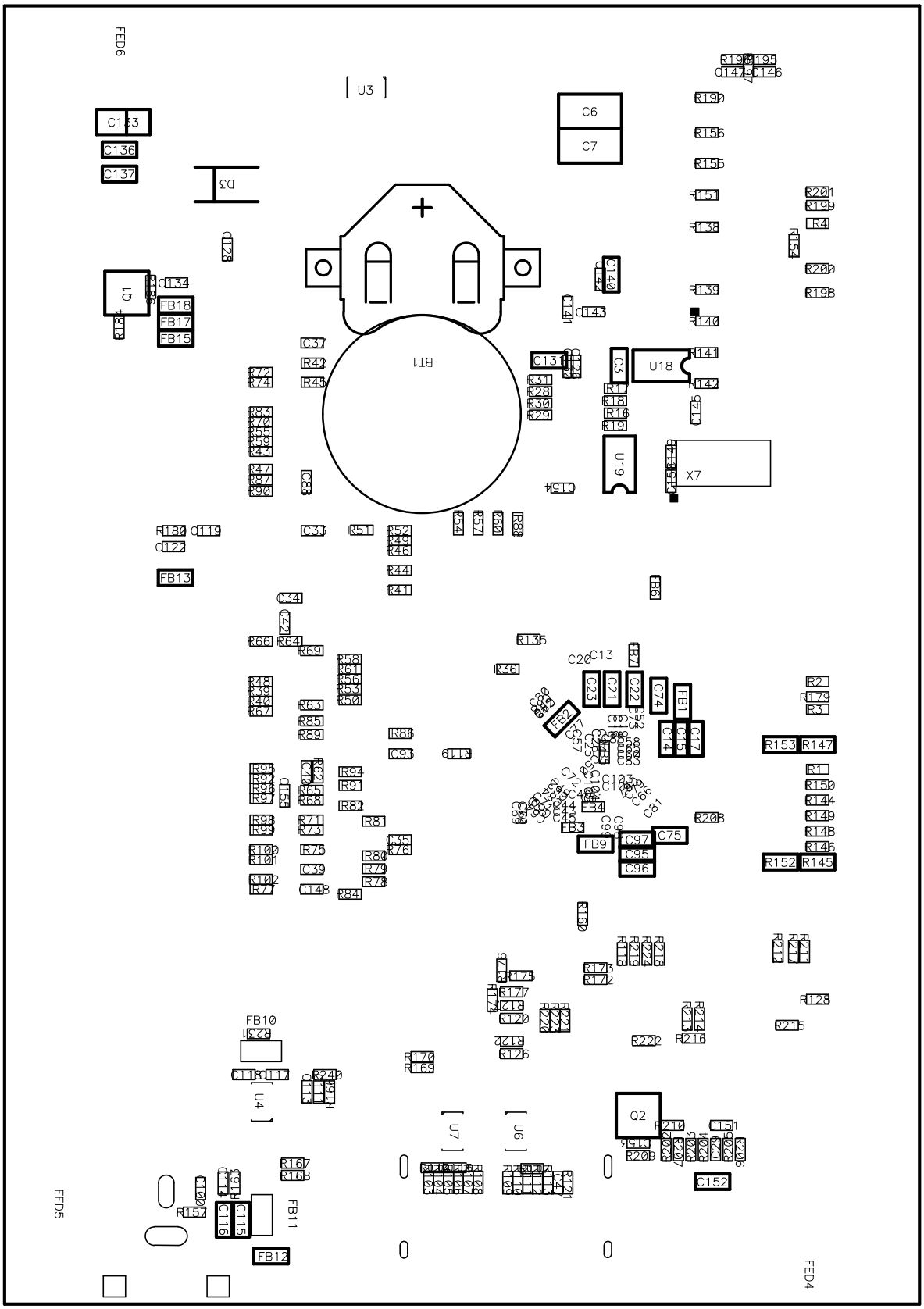
Title	CAN	
Size A4	Number mbed VK-RZ/A1H	Rev 1.0
Date 27.10.2015		Drawn by D.Todorov
Filename VK-RZA1H_mbed.sch		Sheet 11 of 12

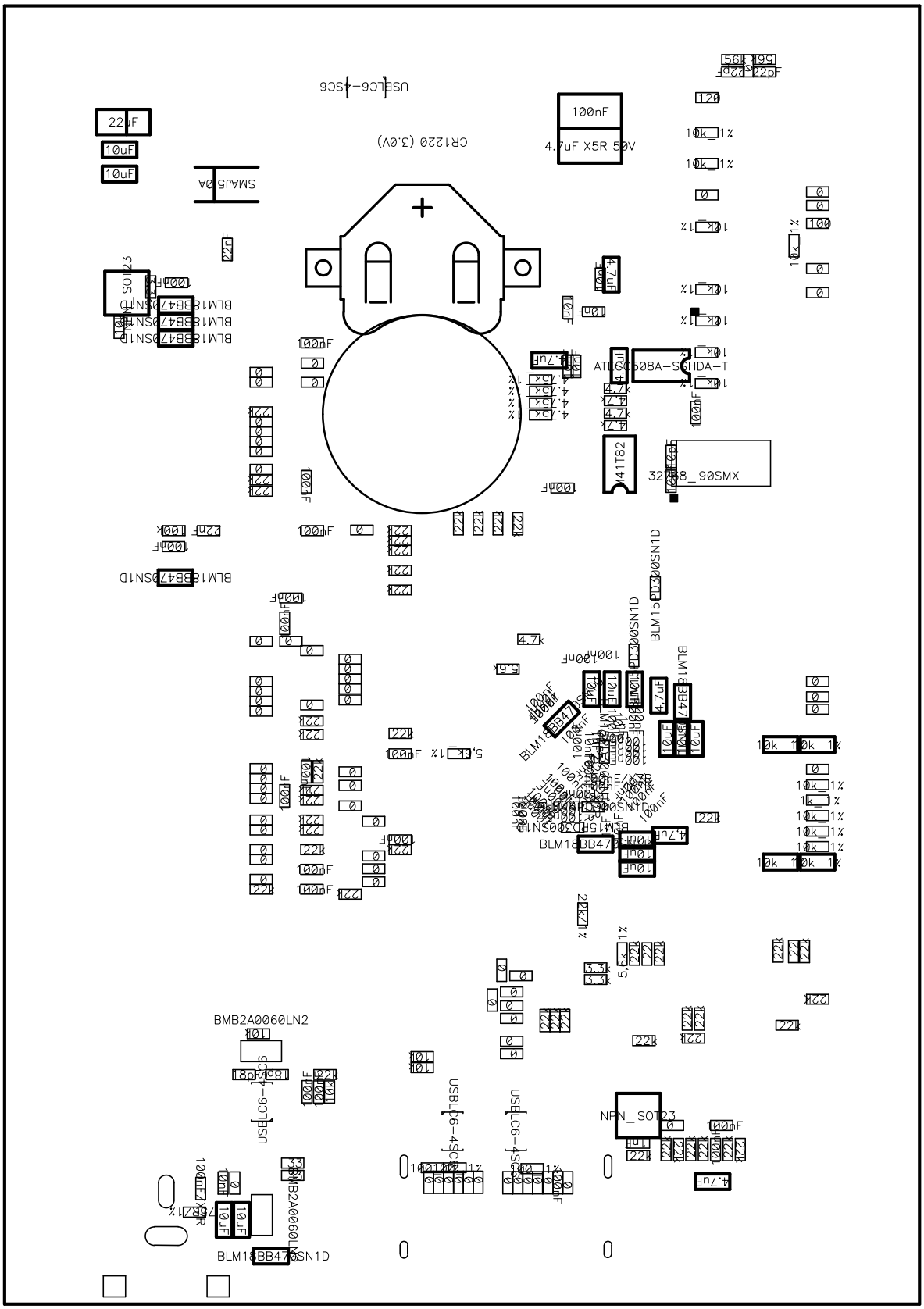


Title	RTC&Crypto	
Size A4	Number mbed VK-RZ/A1H	Rev 1.0
Date 27.10.2015		Drawn by D.Todorov
Filename VK-RZA1H_mbed.sch		Sheet 12 of 12


105.0
74.0
RENESAS RZ/A1H
VK-RZ/A1H V4.0
Design & Fab by VEKATECH
Reset
+1.18V
+3.3V
+5VDC
J8
J10
J9
J13
J12
J11
J14
J15
J16
J4
J3
J5
J2
J6
J1
J7
JP4
FED1
FED2
FED3
MTG1
MTG2
MTG3
MTG4
CORN1
CORN2
CORN3
CORN4
56 54 52 50 78 32 15 12 14 +5V
57 55 53 51 37 17 16 13 +3V GND
315 40 47 45 311 42 313 39 10 11
43 310 46 44 41 314 312 38 31 30
59 510 115 112 19 +3V +5V
113 111 110 18 GND +1.2V
60 62 64 66 68 610 612 614 58
61 63 65 67 69 611 613 615 713 715
80 82 84 86 714 712 710 76 74 72
81 83 85 87 711 79 77 75 73 71
BTR 88 89 812 814 90 +1.2V
810 811 813 815 91 RES GND
+5V


105.0
74.0
RENESAS RZ/A1H
VK-RZ/A1H V4.0
Design & Fab by VEKATECH
Reset
+1.18V
+3.3V
+5VDC
MontHole
CH81802V200
SN74LVC1T45DBVR
S25FL128SAGMFI000
M12L2561616A-6T
LAN8710A-EZK
J0011D01BNL
PFMF.075.2
330uF/10V
SPBT
AP3512L
LQH44PN4R7MP0L
CU04SCM15B0-R0
LPC11U35FHI33/501
RCJ-044/RCA3-1-R
YDJ-1134
SIP3


FED6
[U3]
C6
C7
C133
C136
C137
D3
Q1
C134
FB18
FB17
FB15
BT1
C140
C142
C143
C131
U18
X7
U19
C37
R42
R45
R72
R74
R83
R43
R47
R87
R90
C38
R180
C119
C122
FB13
C36
R51
R52
R49
R46
R44
R41
C34
R66
R64
R69
R48
R39
R40
R67
R63
R85
R89
R86
C93
R94
R91
R82
R81
C35
R76
R75
R80
R79
R78
C39
C148
R84
R135
C20
C13
R36
C23
C21
C22
C74
FB1
FB2
C14
C15
C17
R153
R147
R2
R179
R3
R1
R150
R144
R149
R148
R146
R152
R145
C97
C75
C95
C96
FB9
FB3
FB4
R203
R160
R174
R177
R120
R126
R175
R172
R222
R216
R128
R215
FB10
R170
R169
C118
C117
U4
U7
U6
Q2
R210
C151
C152
R167
R168
R157
C114
C116
C115
FB11
FB12
FED5
FED4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4.7uF X5R 50V
CR1220 (3.0V)
SMAJ5.0A
SOT23
ATMC508A-SCHDA-T
32768_90SMX
NPN_SOT23
BMB2A0060LN2
BLM18BB470SN1D
BLM15BD300SN1D
USBLC6-4SC6