

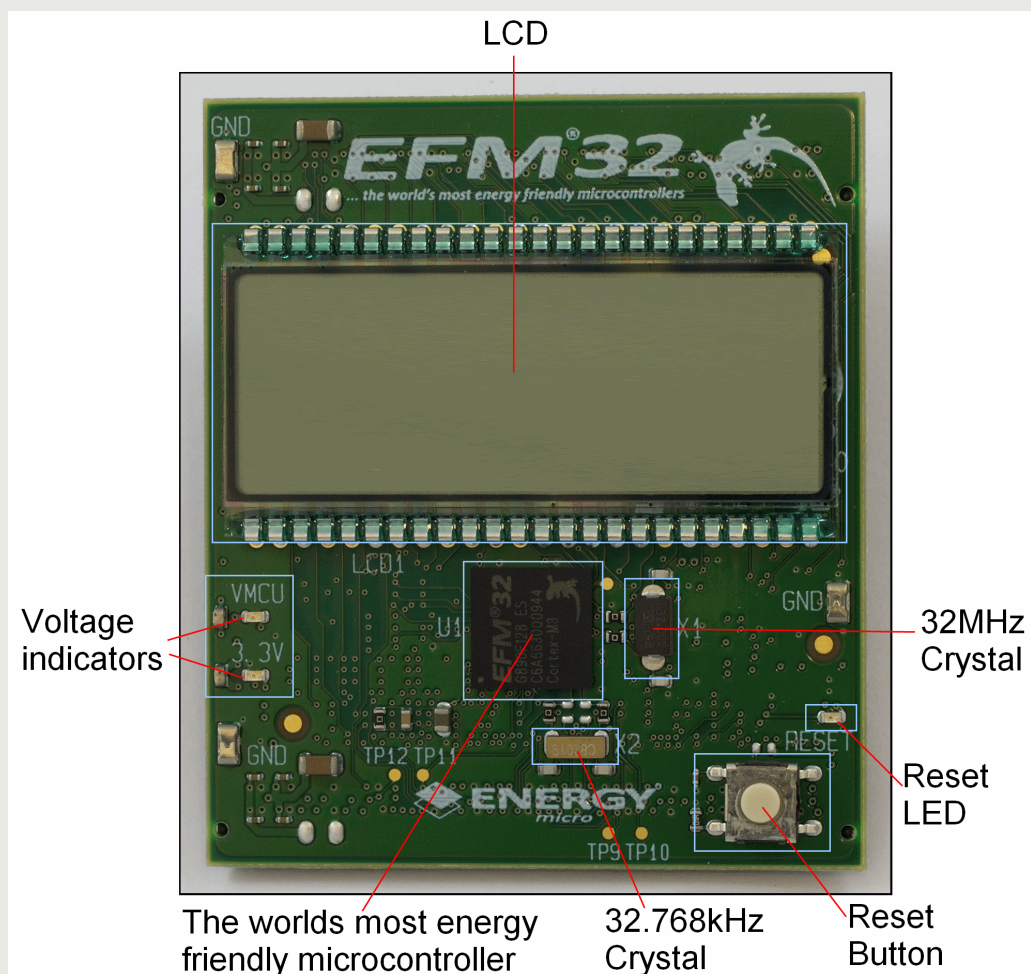
EFM32 G890 MCU Board

Preliminary

The EFM32 G890 MCU Board is a small plugin module for usage with the EFM32 Gecko Development Kit.

Features:

- The world's most energy friendly microcontroller
- Compatible with the Advanced Energy Monitoring (AEM) system of the EFM32 Gecko Development Kit
- Leds indicating power and reset
- 32 MHz crystal
- 32.768 kHz crystal
- Reset button and ground-hooks for easy debugging
- Energy Micro LCD



1 Usage

1.1 Placement

This board is intended for use with the EFM32 Gecko Development Kit.

1.2 Reset Button / Reset LED

When pressed, the reset button resets the EFM32 device. When reset is asserted, a red led next to the button is lit. A filter is connected to the reset line in order to reduce bouncing.

1.3 LEDs Indicating Power

The two green LEDs indicate power on the VMCU and 3.3V nets, respectively.

1.4 Crystal Oscillators

The board features one 32.768kHz and one 32MHz crystal. These are connected through 0-ohm resistors to the respective inputs of the low-frequency and high-frequency crystal oscillators of the EFM32. Using these instead of the internal RC-oscillators will ensure higher frequency accuracy. However, if the reduced accuracy is acceptable, these lines can be used as normal IO-lines instead by removing the 0-ohm resistors. In order to export these IO lines to the Kit mainboard, insert resistors for connection to the EFM32_A bus. See schematic for details.

1.5 Kit Connection

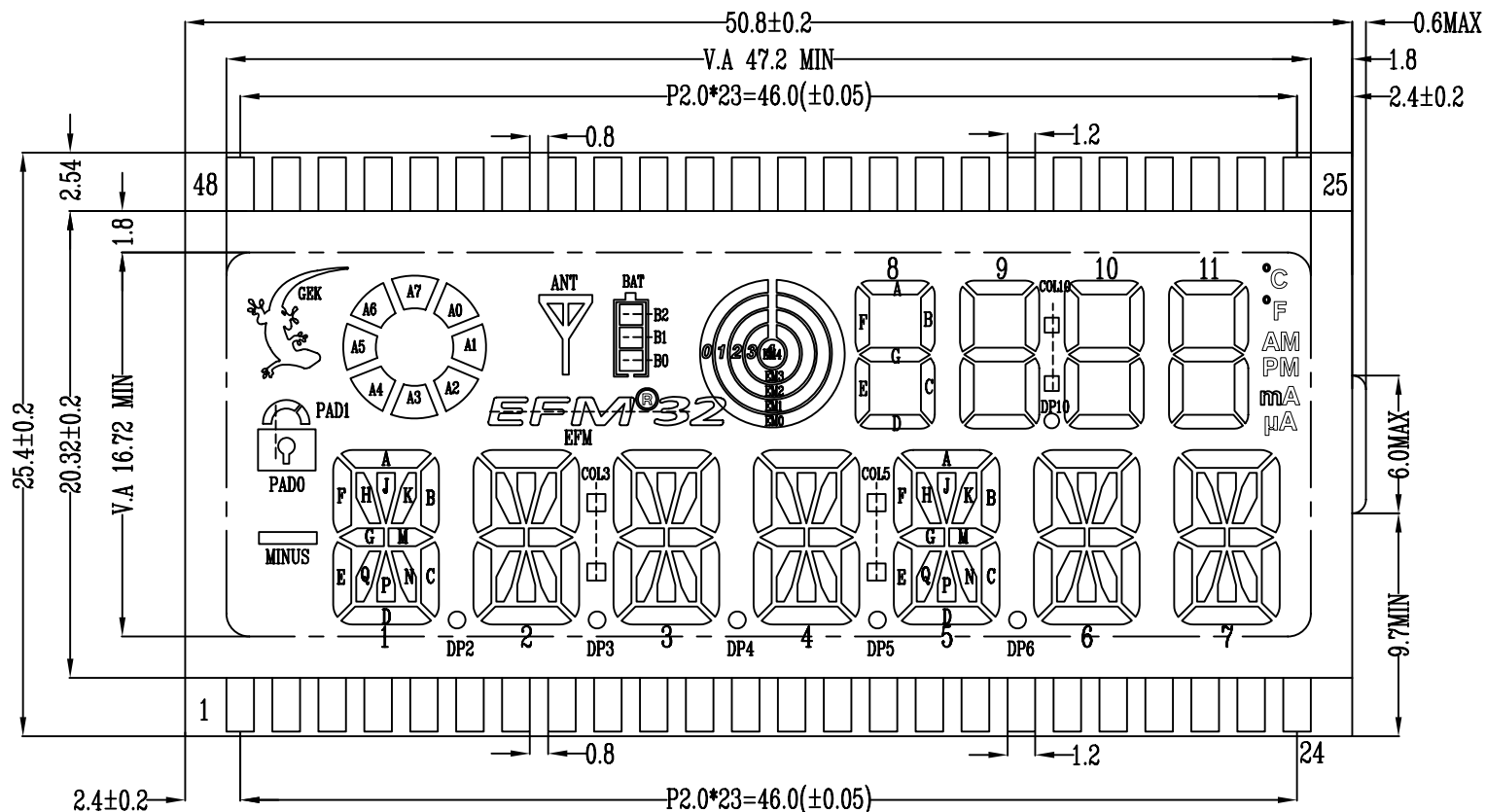
It is possible to access the board controller on the Kit mainboard for example to turn LEDs on or off, read push button status or connecting the EFM32 to specific hardware on the mainboard. The access may either through SPI or the parallel interface (EBI), and the access mode is signaled to the board controller by asserting one of two dedicated signal lines. It is recommended to use the Board Support Package (BSP) for access to the mainboard. Please see the Kit user guide for further description of the BSP.

1.6 LCD

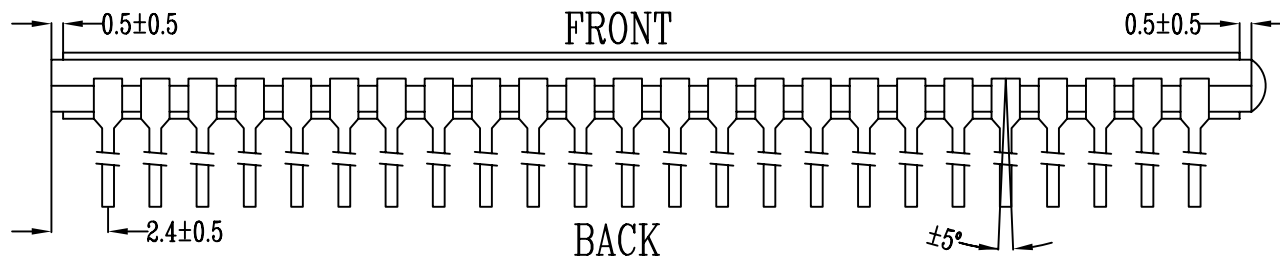
The LCD is a 164 segment display designed for 1/4 Duty, 1/3 bias. The operating voltage is 3.0V and the frame frequency is 64 Hz. Since the EFM32 only supports 160 segments, the Celsius and Fahrenheit along with uA and mA segments are not connected. However, they may be made available by moving a 0-ohm resistor. See schematic for details. Please see the LCD software example project for details on how to use the LCD. For details on segment connections see the attached mapping table and LCD illustration.

1.7 EBI / LCD Configuration

Since many of the IO lines used by the EBI are also used by the LCD, the board is either configured to route the IO lines to the LCD connector or to the Kit mainboard. The configuration is determined by a set of 0-ohm resistor arrays. This configuration may be altered by moving the arrays. See schematic for details.



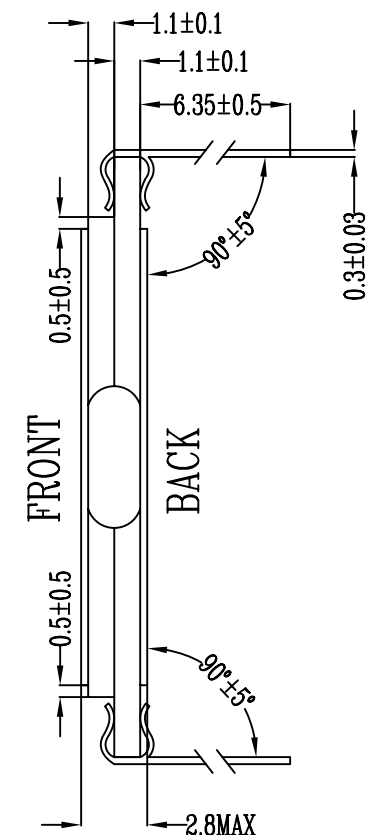
↑ 6 O'CLOCK VIEWING DIRECTION



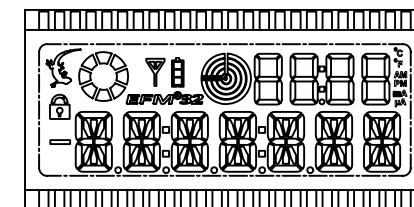
NOTE:

- 1 DISPLAY TYPE : TN
- 2 VIEWING DIRECTION : 6 O'CLOCK
- 3 POLARIZER MODE : REFLECTIVE/POSITIVE
- 4 DRIVE METHOD : 1/4 DUTY 1/3 BIAS
- 5 OPERATING VOLTAGE : 3.0V(FOR REFERENCE VOLTAGE)
- 6 OPERATING TEMP : 0°C--+50°C
- 7 STORAGE TEMP : -10°C--+60°C
- 8 CONNECTION : PIN
- 9 FRAME FREQUENCY : 64Hz

REVISION RECORD				NAME	DATE	TRI-T COMPANY LIMITED					
1						VERSION	C	UNIT	MM	NO. 1/6	CL010-1087-01
2						APPROVED		CHECKED		DRAWN	
3											
4											



SCALE 1:1



PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
—	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23
COM0	A0	A1	A2	A3	A4	A5	A6	A7	EFM	MINUS	1 D	1 N	BAT	B2	2 D	2 N	COL3	B0	3 D	3 N	B1	DP6	4 D	4 N
COM1	EM2	EM0	7 C	7 E	6 C	6 E	5 C	5 E	PAD0	1 E	1 Q	1 P	1 C	2 E	2 Q	2 P	2 C	3 E	3 Q	3 P	3 C	4 E	4 Q	4 P
COM2	EM3	EM1	7 M	7 G	6 M	6 G	5 M	5 G	PAD1	1 G	1 H	1 J	1 M	2 G	2 H	2 J	2 M	3 G	3 H	3 J	3 M	4 G	4 H	4 J
COM3	EM4	ANT	7 B	7 F	6 B	6 F	5 B	5 F	GEK	1 F	1 A	1 K	1 B	2 F	2 A	2 K	2 B	3 F	3 A	3 K	3 B	4 F	4 A	4 K

PIN	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
—	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	NC	NC	S37	S38	NC	S39	S40	COM0	COM1	COM2	COM3
COM0	COL5	5 D	5 N	6 D	6 N	7 D	7 N	11 D	AM	10 D	°C	PM	DP2	NC	NC	9 D	DP10	NC	8 D	COL10	COM0			
COM1	4 C	5 Q	5 P	6 Q	6 P	7 Q	7 P	11 C	11 E	10 C	°F	10 E	DP3	NC	NC	9 C	9 E	NC	8 C	8 E		COM1		
COM2	4 M	5 H	5 J	6 H	6 J	7 H	7 J	11 B	11 G	10 B	μA	10 G	DP4	NC	NC	9 B	9 G	NC	8 B	8 G			COM2	
COM3	4 B	5 A	5 K	6 A	6 K	7 A	7 K	11 A	11 F	10 A	mA	10 F	DP5	NC	NC	9 A	9 F	NC	8 A	8 F				COM3



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EFM32 Microcontroller Board

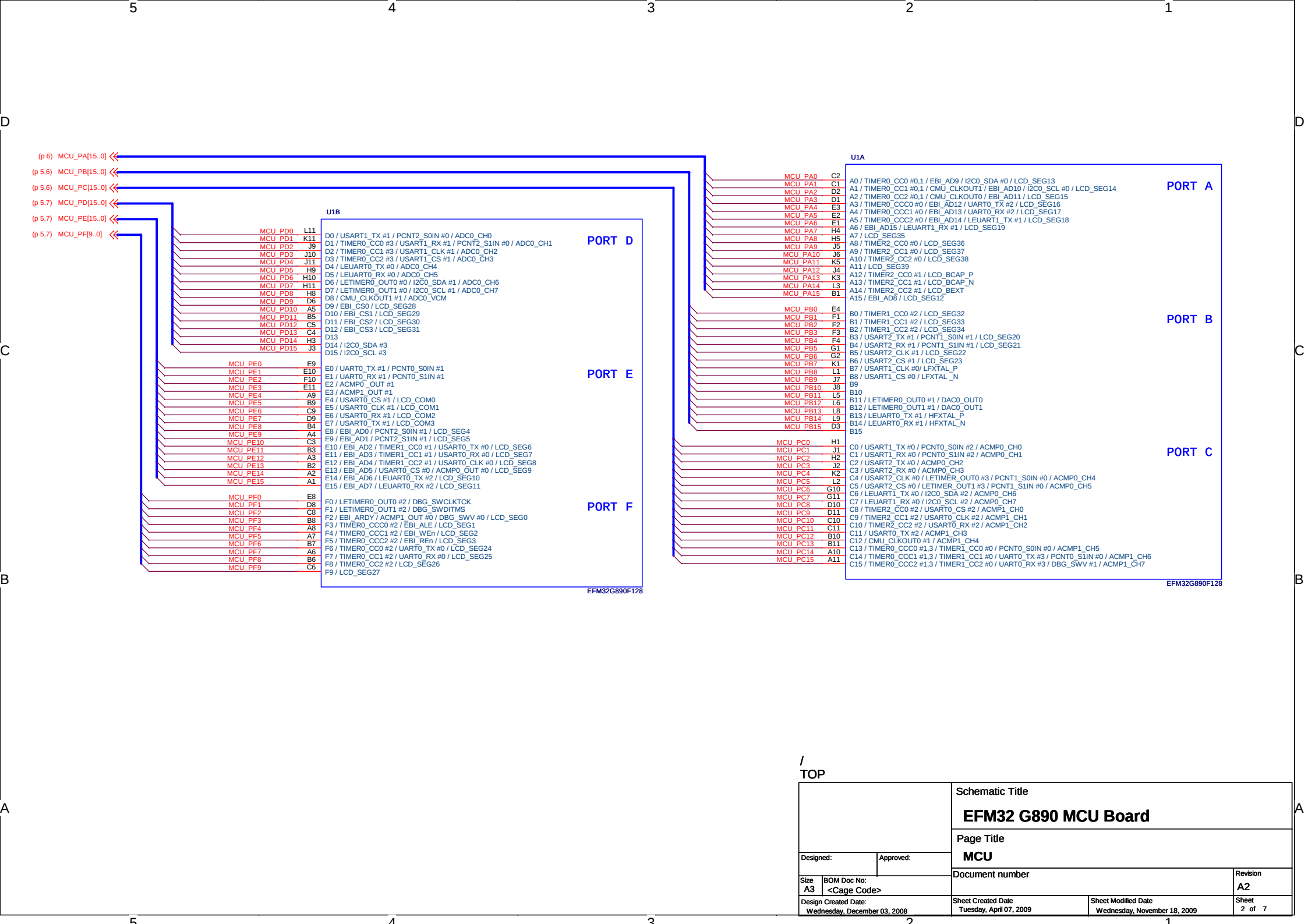
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Revision History

Revision	Comment
	PA5 Updated after feedback from Contec
	PA6 Moved the location of the VMCU R0 resistors
	PA7 BOM changes
	PA8 BOM changes
A	Some BOM changes. Final version
A1	Removed pullup on reset. Added transistors to control the reset LED
A2	BOM change - removed pullup on reset button and removed some caps

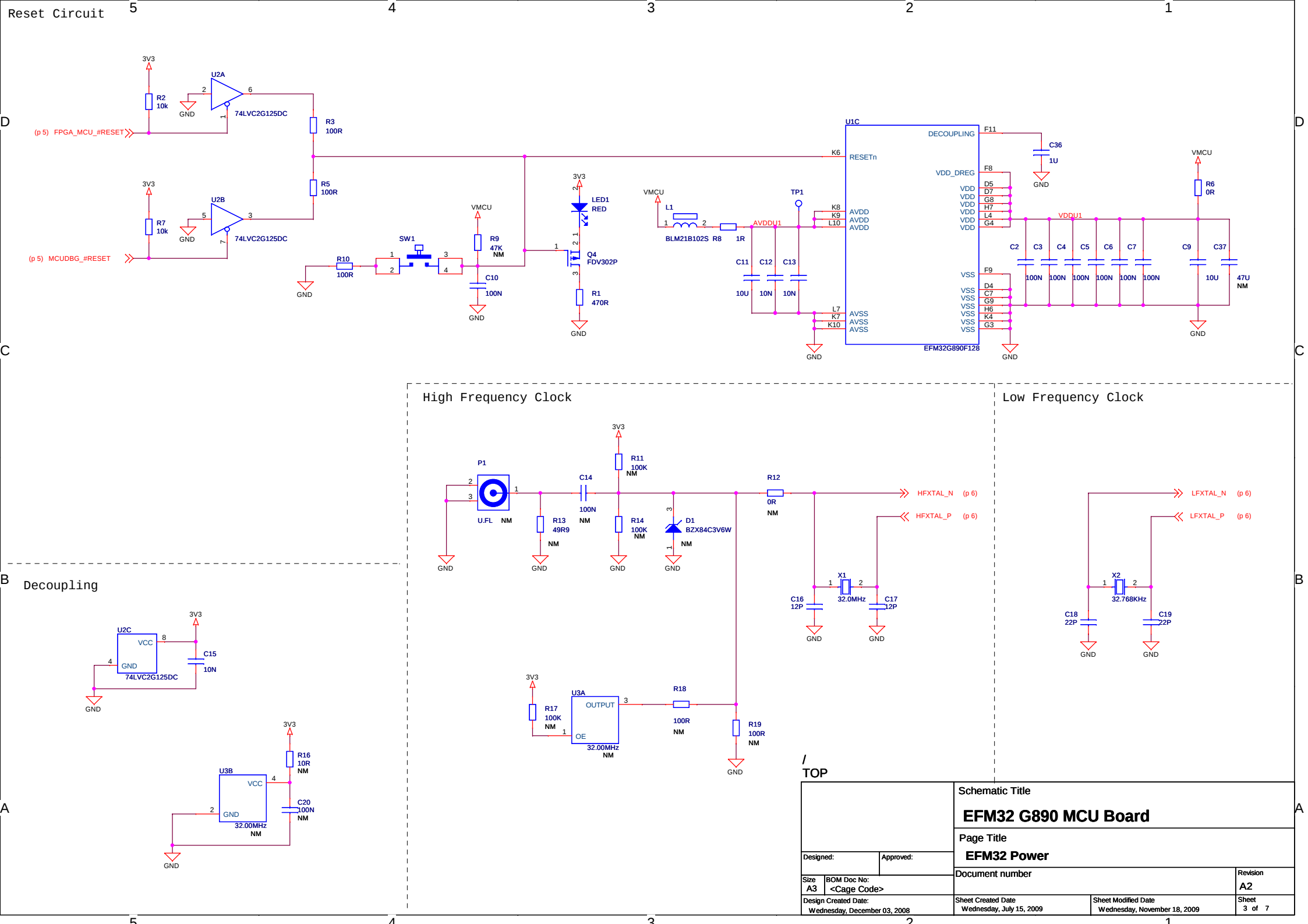
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		Document number	Revision
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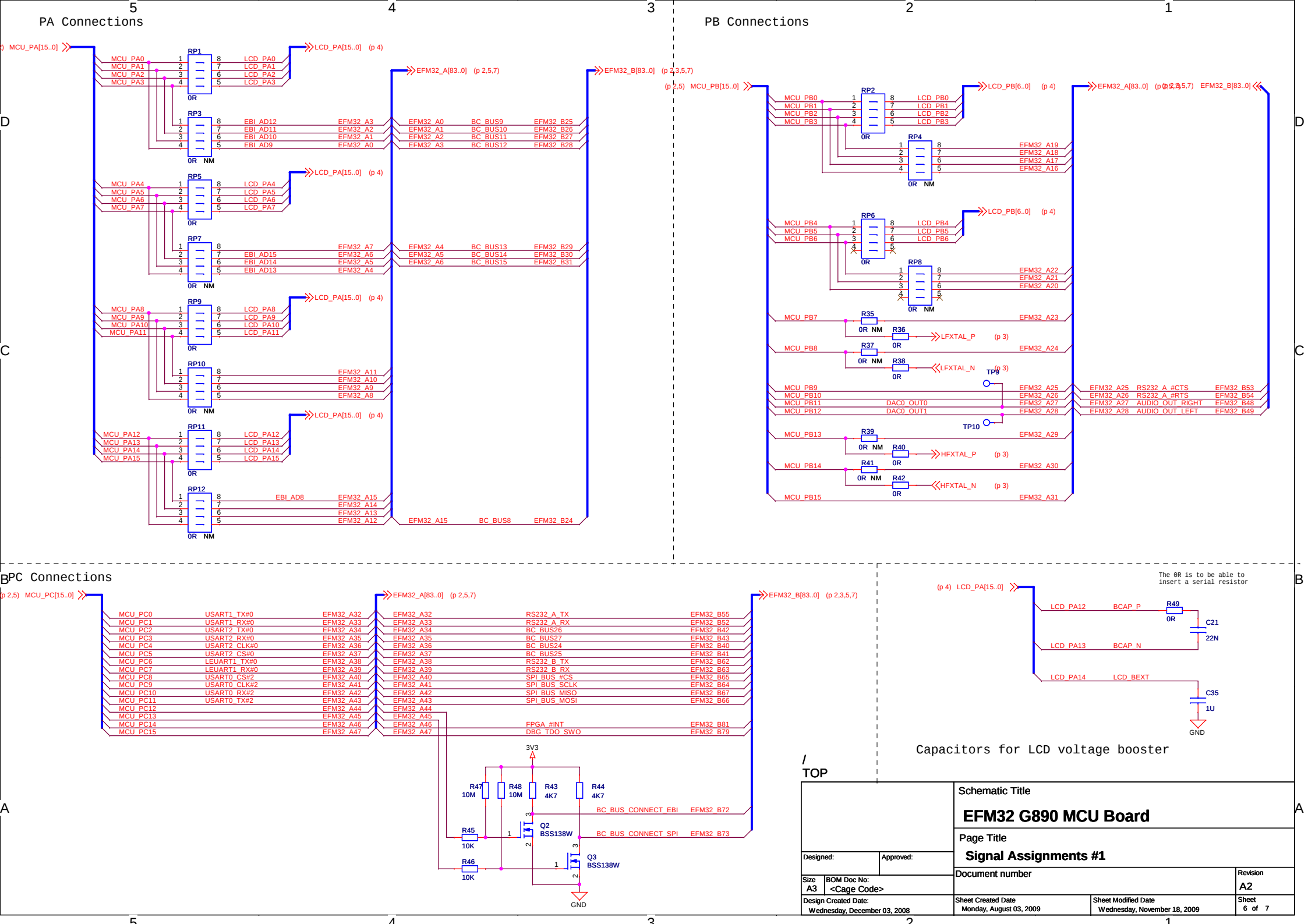


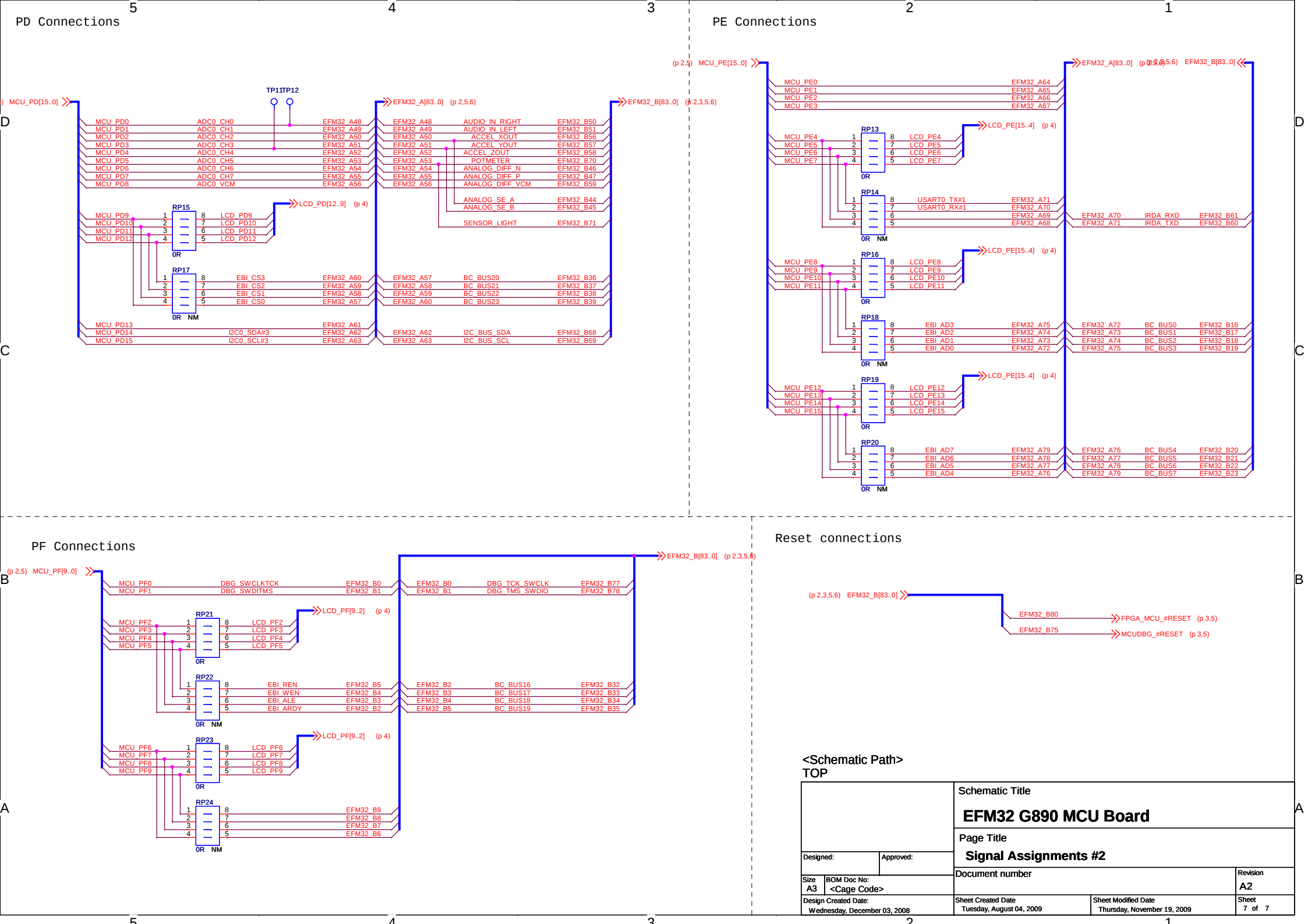


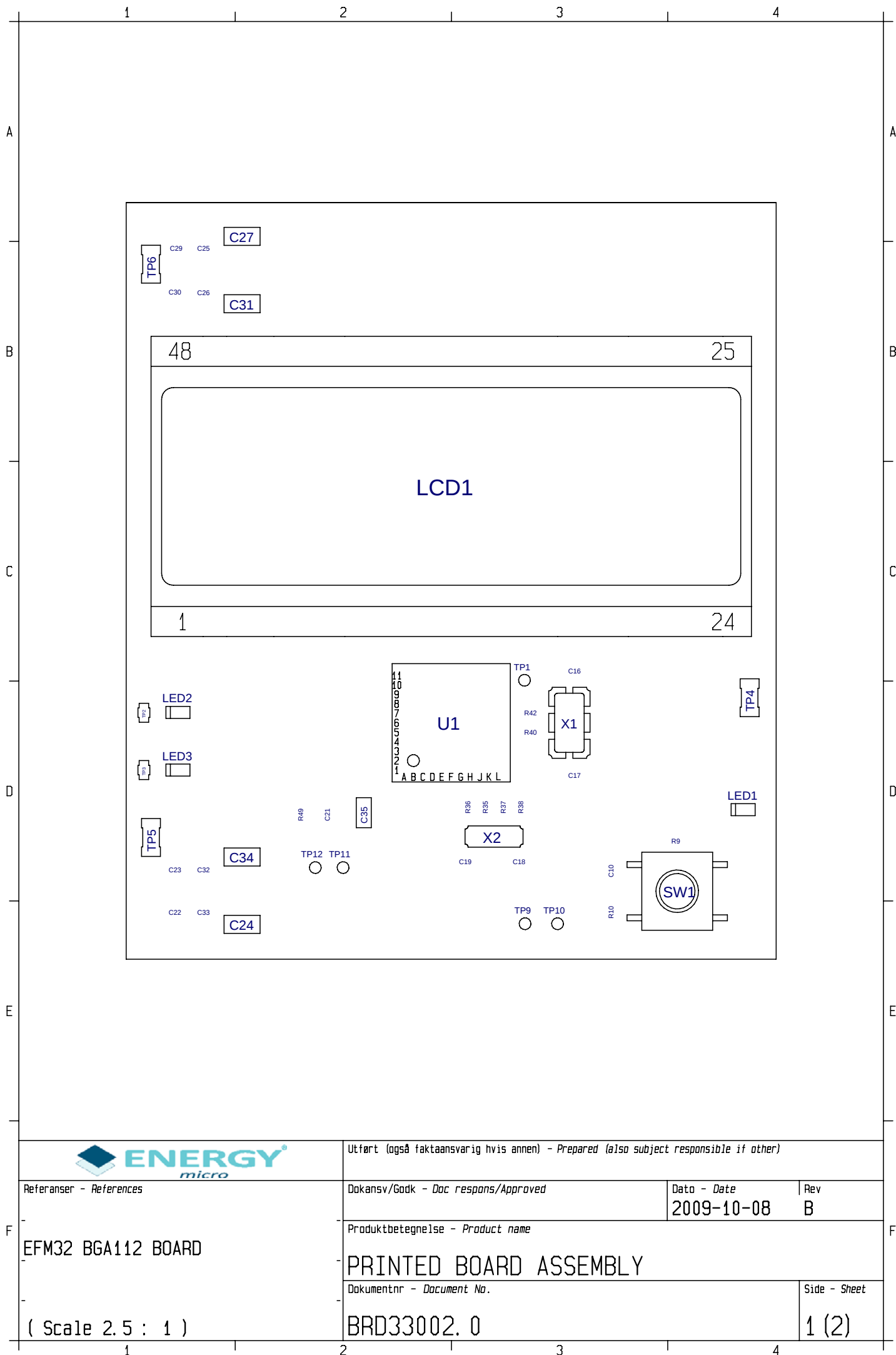
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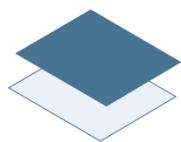


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