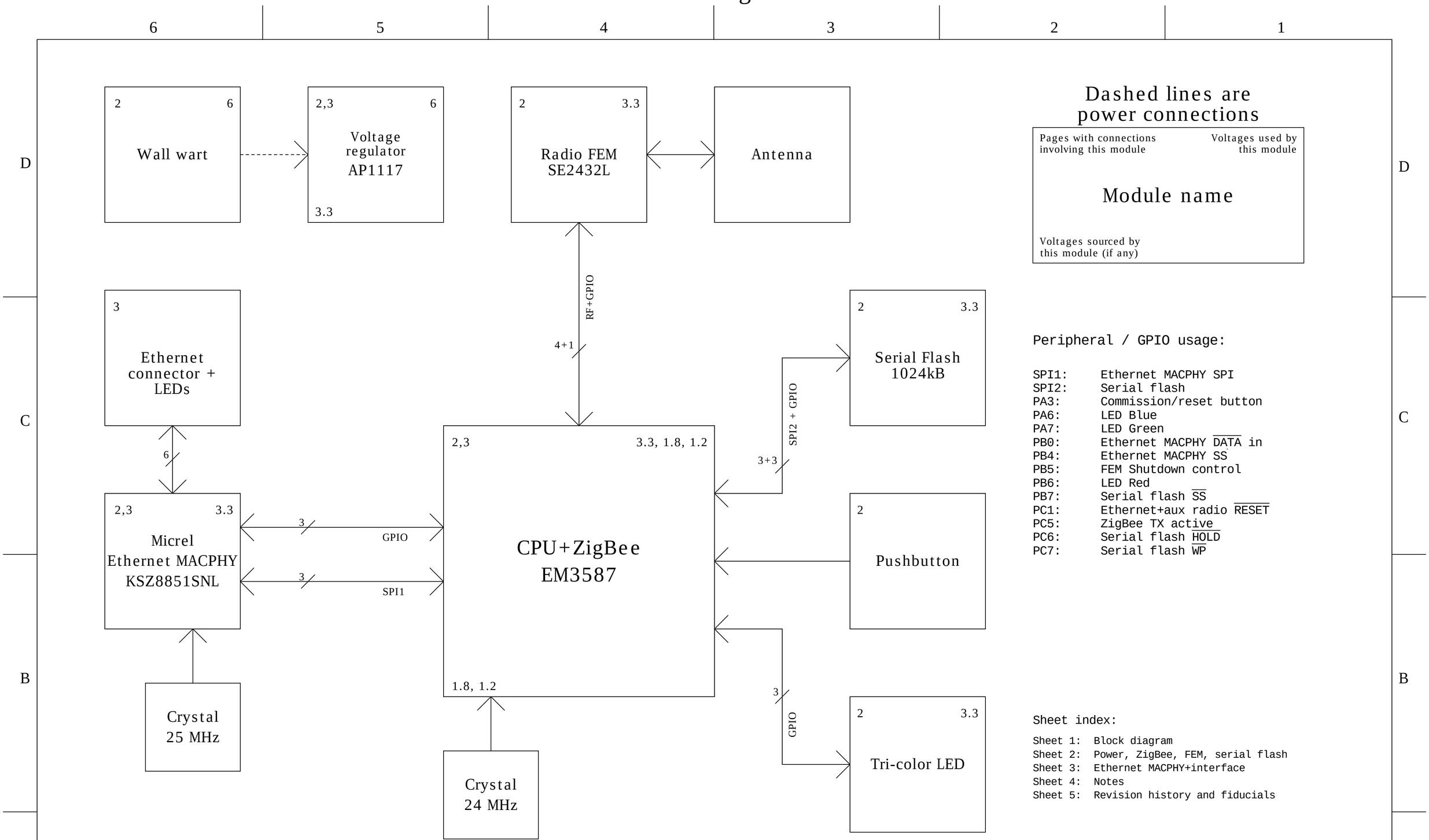
Block diagram



Dashed lines are power connections

Pages with connections involving this module

Voltages used by this module

Module name

Voltages sourced by this module (if any)

Peripheral / GPIO usage:

```
SPI1:     Ethernet MACPHY SPI
SPI2:     Serial flash
PA3:      Commission/reset button
PA6:      LED Blue
PA7:      LED Green
PB0:      Ethernet MACPHY DATA in
PB4:      Ethernet MACPHY SS
PB5:      FEM Shutdown control
PB6:      LED Red
PB7:      Serial flash SS
PC1:      Ethernet+aux radio RESET
PC5:      ZigBee TX active
PC6:      Serial flash HOLD
PC7:      Serial flash WP
```

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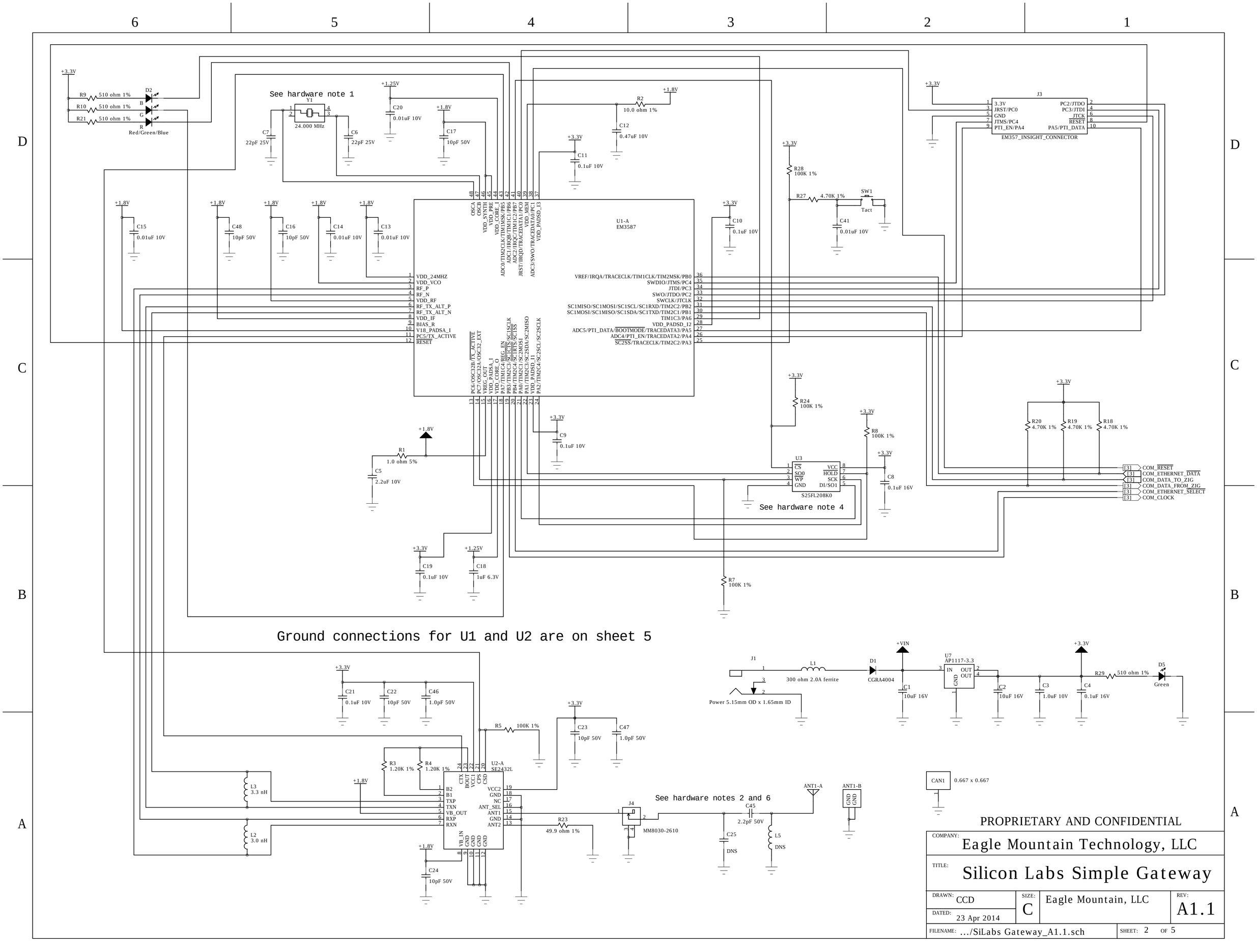
ZigBee + Power



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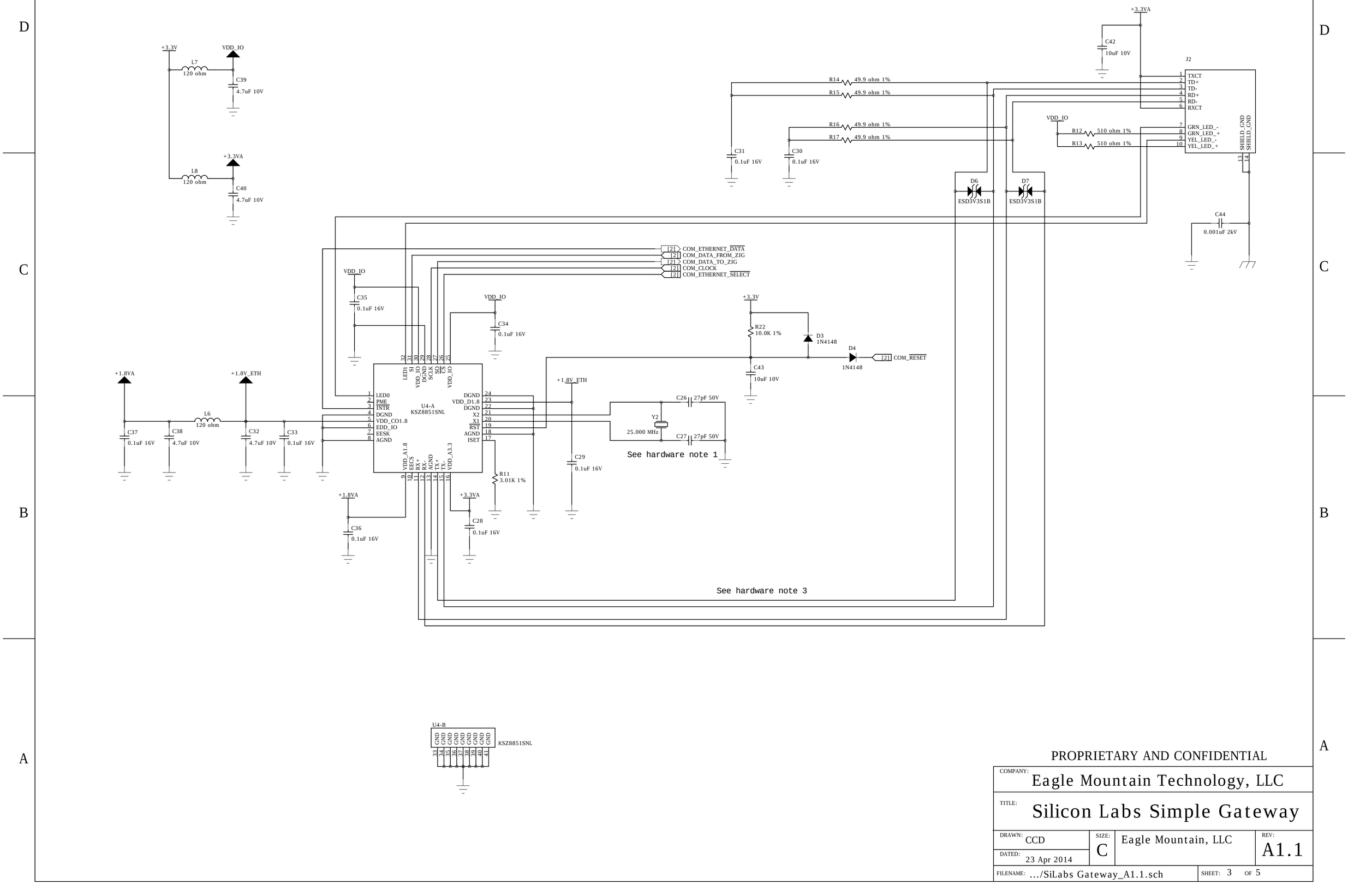
Ethernet



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Notes

Hardware notes

1. For capacitors C6+C7 and C26+C27, have the caps located close to one another and share a single VIA to ground. This reduces coupling of oscillator currents to ground and improves RF performance
2. C27, C45, and L4 are for impedance matching.
3. Ethernet signals are 100 ohm differential pairs
4. Serial flash footprint will accomodate 150mil or 209mil SOIC. Other capacity parts are available: S25FL204K0 = 4 megabits, S25FL216K0 = 16 megabits. These parts are code and footprint compatible compatible with S25FL208K0.
5. For mounting purposes, it is preferable not to use metal screws, as they may cause unintended loading of the antenna. Instead, plastic screws or clips are recommended.
6. J4 for RF testing purposes only. FCC certification does not cover external antennae connected here as part of normal operation. When no plug is attached, J4 passes ANT1 through to capacitor C25.

Firmware notes

1. IRQA = Ethernet $\overline{\text{DATA}}$
2. Pull COM_$\overline{\text{RESET}}$ low to reset all slaves at the same time, float to let them run. This assumes slaves have individual pull-ups.
3. Program PHY_CONFIG manufacturing token to 0xFFFD.

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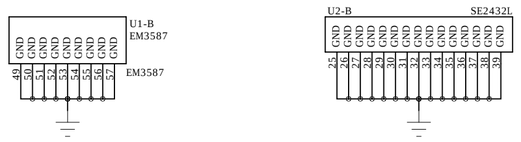
Rev history / Fiducials

Revision history

25 Feb 2014	Changed MCU from EM3588 to EM3587 since no plan to use USB Changed LED current limit resistors from 180 ohm to 510 ohm Moved green LED control from PB5 to PA7 Added 0-ohm jumper to ground to SE2432 ANT2 pin Added 100k pullup to serial flash $\overline{CS}$ Changed pullups on SE2432 CPS and CSD signals to pulldowns Added MCU control of SE2432 CPS and CSD signals on PB5 Changed net name "1.2V" to "1.25V" for clarity Added series resistor, shunt cap, and pullup to pushbutton input Moved C12 to MCU side of R2 Changed pullup on serial flash $\overline{WP}$ to a pulldown Fixed net names for "COM_DATA_TO_ZIG" and "COM_DATA_FROM_ZIG" Separated EM3587 and KS8851SNL +1.8V nets Changed C24 value from 8pF to 10pF Updated block diagram and GPIO usage sheet
25 Feb 2014	Added power LED D5 Removed all references to "back side" components; all components are now mounted on the top side of the board **Note: No boards built prior to above changes**
5 Mar 2014	Changed C16 and C17 value from 8pF to 10pF Changed R23 value from 0 ohms to 49.9 ohms Removed R25 and R26 Added ESD protection diodes D6 and D7 Changed antenna to Silicon Labs inverted F reference design **Note: No boards built prior to above changes**
9 Mar 2014	Added ESD protection cap C44 **Note: No boards built prior to above changes**
13 Mar 2014	Added Silicon Labs logo to top silkscreen **Note: No boards built prior to above changes**
15 Mar 2014	Added mounting holes **Note: No boards built prior to above changes**
20 Mar 2014	Fixed direction of some off-page connectors Corrected note about location of ground connections for U1 and U2 Corrected GPIO usage chart **Note: These changes only affect the schematic**
23 Apr 2013	Changed serial flash to 1 megabit part Added RF test connector J4 and associated note. Changed L2 and L3 size from 0201 to 0402. Revision level changed to rev 2
4 Jun 2014	Replaced L4 with C45 for antenna matching Added filter caps C46 and C47 to U2 Added filter cap C48 to U1 Corrected incorrect serial flash size on block diagram Schematic and board rev level changed to A1
23 Jul 2014	Updated PCB footprints for C1 and C2 Changed D6 and D7 to Diodes, Inc. parts - original Infineon part was end of life.

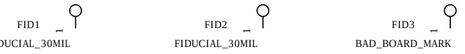
RF chip grounds



Mounting holes

See hardware note 5

Fiducials



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