




EFM32 Giant Gecko STK	
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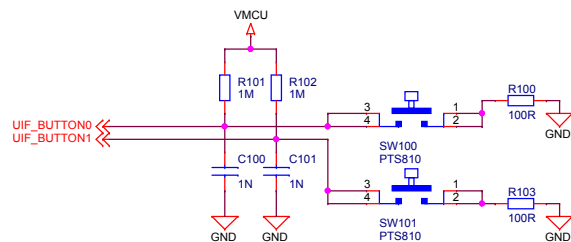
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Revision History	
Rev.	Description
B00	Updated to new STK platform

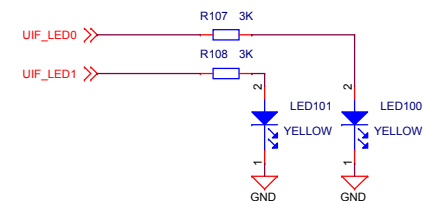
 SILICON LABS		Schematic Title	
		EFM32 Leopard Gecko Starter Kit	
Page Title		Title Page	
Designed: HEL Approved: JSH			
Size A3	BOM Doc No:	Document number BRD2201A	Revision B03
Design Created Date: Tuesday, December 06, 2016		Sheet Created Date Tuesday, December 06, 2016	Sheet Modified Date Monday, December 16, 2019
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User Pushbuttons



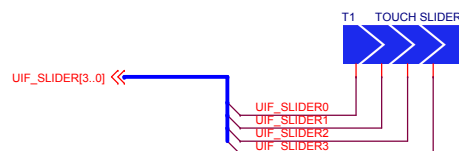
User LEDs

User LEDs

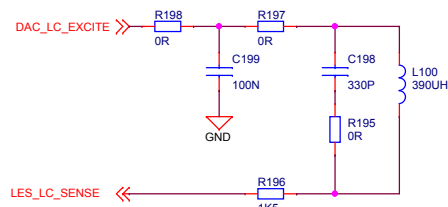


Touch Pads

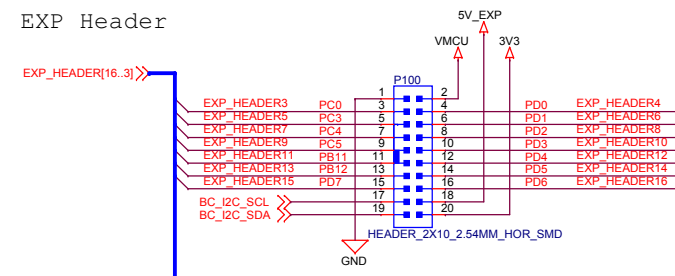
Touch slider



LESENSE LC-Sensor

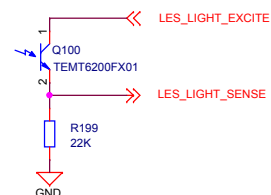


EXP Header

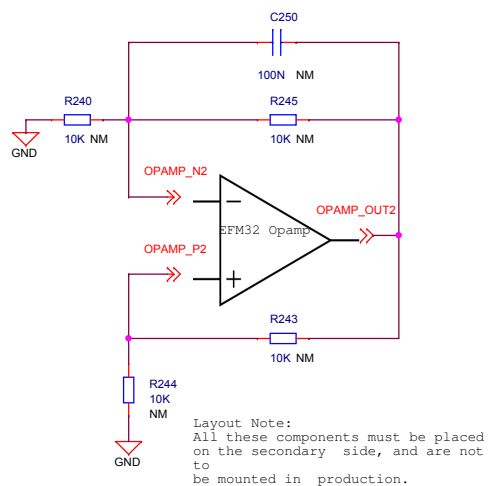


EXP-Header Functionality

		GND	1			2	VMCU		
ACMP0_CH4		PC0	3			4	P00	US1_TX	ADC0_CH0
ACMP0_CH5		PC3	5			6	PD1	US1_RX	ADC0_CH1
ACMP1_CH4		PC4	7			8	PD2	US1_CLK	ADC0_CH2
ACMP0_CH6		PC5	9			10	PD3	US1_CS	ADC0_CH3
DAC0_OUT0		PB11	11			12	PD4	LEU0_TX	ADC0_CH4
DAC0_OUT1		PB12	13			14	PD5	LEU0_RX	ADC0_CH5
		I2C0_SCL#1	PD7	15		16	PD6	I2C0_SDA#1	
Reserved for EXP Board identification				17		18	SV		
Reserved for EXP Board identification				19		20	LV3		

Photo
Transistor

OPAMP Connection Footprint



	Schematic Title
1	Diagram illustrating the process of water filtration through a membrane.
2	Flowchart showing the steps involved in the synthesis of a polymer.
3	Diagram of a mechanical system showing energy transfer between components.
4	Diagram illustrating the relationship between variables X and Y.
5	Diagram showing the interaction between two systems over time.
6	Diagram illustrating the concept of equilibrium in a thermodynamic system.
7	Diagram showing the distribution of particles in a container under different conditions.
8	Diagram illustrating the effect of temperature on reaction rate.
9	Diagram showing the change in volume of a gas under varying pressure.
10	Diagram illustrating the principle of conservation of mass in a closed system.
11	Diagram showing the effect of concentration on the rate of a chemical reaction.
12	Diagram illustrating the concept of entropy in a thermodynamic process.
13	Diagram showing the relationship between pH and the concentration of ions in a solution.
14	Diagram illustrating the effect of catalysts on the activation energy of a reaction.
15	Diagram showing the change in Gibbs free energy during a phase transition.
16	Diagram illustrating the concept of Le Chatelier's principle in a chemical equilibrium.
17	Diagram showing the effect of pressure on the boiling point of a liquid.
18	Diagram illustrating the concept of half-life in radioactive decay.
19	Diagram showing the relationship between wavelength and frequency of electromagnetic radiation.
20	Diagram illustrating the concept of quantum numbers in atomic physics.
21	Diagram showing the effect of magnetic field strength on the spin of a particle.
22	Diagram illustrating the concept of wave-particle duality in quantum mechanics.
23	Diagram showing the relationship between Planck's constant and the energy of a photon.
24	Diagram illustrating the concept of tunneling in solid-state physics.
25	Diagram showing the effect of temperature on the conductivity of a semiconductor.
26	Diagram illustrating the concept of band gap in semiconductors.
27	Diagram showing the relationship between carrier concentration and resistivity in a material.
28	Diagram illustrating the concept of drift velocity in a conductor.
29	Diagram showing the effect of electric field strength on the current density in a wire.
30	Diagram illustrating the concept of capacitance in an electrical circuit.
31	Diagram showing the relationship between voltage and charge stored in a capacitor.
32	Diagram illustrating the concept of inductance in an AC circuit.
33	Diagram showing the effect of frequency on the impedance of an inductor.
34	Diagram illustrating the concept of resonance in a series RLC circuit.
35	Diagram showing the relationship between power factor and efficiency in a transformer.
36	Diagram illustrating the concept of mutual inductance between two coils.
37	Diagram showing the effect of core material on the magnetic flux in a solenoid.
38	Diagram illustrating the concept of self-inductance in a coil.
39	Diagram showing the relationship between current and magnetic field strength in a wire.
40	Diagram illustrating the concept of Lorentz force acting on a moving charge.
41	Diagram showing the effect of magnetic field direction on the deflection of a cathode ray.
42	Diagram illustrating the concept of induced EMF in a rotating coil.
43	Diagram showing the relationship between angular velocity and induced voltage in a generator.
44	Diagram illustrating the concept of back EMF in a motor.
45	Diagram showing the effect of load resistance on the speed of a DC motor.
46	Diagram illustrating the concept of torque in a rotating system.
47	Diagram showing the relationship between moment of inertia and angular acceleration.
48	Diagram illustrating the concept of rotational kinetic energy.
49	Diagram showing the effect of radius on the linear velocity of a point on a rotating disk.
50	Diagram illustrating the concept of centripetal force in circular motion.
51	Diagram showing the relationship between orbital radius and period in a planetary system.
52	Diagram illustrating the concept of escape velocity from a celestial body.
53	Diagram showing the effect of gravitational field strength on the weight of an object.
54	Diagram illustrating the concept of potential energy in a conservative field.
55	Diagram showing the relationship between height and potential energy in a vertical throw.
56	Diagram illustrating the concept of work done by a force.
57	Diagram showing the effect of displacement on the work done by a constant force.
58	Diagram illustrating the concept of power in a mechanical system.
59	Diagram showing the relationship between torque and angular momentum.
60	Diagram illustrating the concept of conservation of angular momentum.
61	Diagram showing the effect of moment arm on the torque produced by a force.
62	Diagram illustrating the concept of static equilibrium in a rigid body.
63	Diagram showing the relationship between forces and moments in a truss structure.
64	Diagram illustrating the concept of stress and strain in a material under load.
65	Diagram showing the effect of cross-sectional area on the stress in a tensile member.
66	Diagram illustrating the concept of Young's modulus in a uniaxial stress-strain test.
67	Diagram showing the relationship between elongation and load in a spring.
68	Diagram illustrating the concept of Poisson's ratio in a material under tension.
69	Diagram showing the effect of lateral contraction on the volume of a material under stress.
70	Diagram illustrating the concept of shear stress and shear strain.
71	Diagram showing the relationship between shear modulus and shear deformation.
72	Diagram illustrating the concept of bulk modulus in a fluid under compression.
73	Diagram showing the effect of volume change on the pressure in a gas.
74	Diagram illustrating the concept of compressibility in a material.
75	Diagram showing the relationship between pressure and depth in a fluid at rest.
76	Diagram illustrating the concept of buoyant force on a submerged object.
77	Diagram showing the effect of fluid density on the buoyancy of an object.
78	Diagram illustrating the concept of viscosity in a fluid flowing through a pipe.
79	Diagram showing the relationship between flow rate and pressure drop in a pipe.
80	Diagram illustrating the concept of Reynolds number in fluid dynamics.
81	Diagram showing the effect of fluid properties on the nature of flow (laminar or turbulent).
82	Diagram illustrating the concept of boundary layer formation on a flat plate.
83	Diagram showing the relationship between distance from leading edge and boundary layer thickness.
84	Diagram illustrating the concept of drag coefficient in aerodynamics.
85	Diagram showing the effect of shape on the drag experienced by an object in a fluid.
86	Diagram illustrating the concept of lift force on an airfoil.
87	Diagram showing the relationship between angle of attack and lift coefficient.
88	Diagram illustrating the concept of stall in an aircraft wing.
89	Diagram showing the effect of surface roughness on the friction coefficient.
90	Diagram illustrating the concept of heat conduction through a wall.
91	Diagram showing the relationship between thermal conductivity and heat flux.
92	Diagram illustrating the concept of thermal expansion in a solid material.
93	Diagram showing the effect of temperature change on the length of a rod.
94	Diagram illustrating the concept of specific heat capacity in a substance.
95	Diagram showing the relationship between mass and heat added in a calorimetry experiment.
96	Diagram illustrating the concept of latent heat during a phase change.
97	Diagram showing the effect of surface area on the rate of evaporation.
98	Diagram illustrating the concept of Stefan-Boltzmann law for blackbody radiation.
99	Diagram showing the relationship between temperature and radiative power emitted by a black body.
100	Diagram illustrating the concept of Wien's displacement law.

EFM32 Leopard Gecko Starter Kit

Page Title

User Interfaces

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BRD2201A

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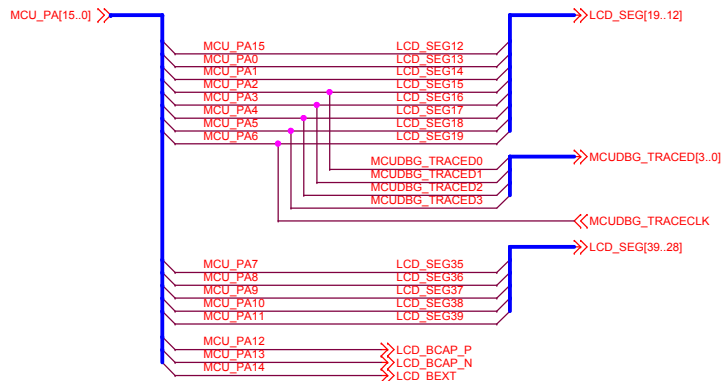
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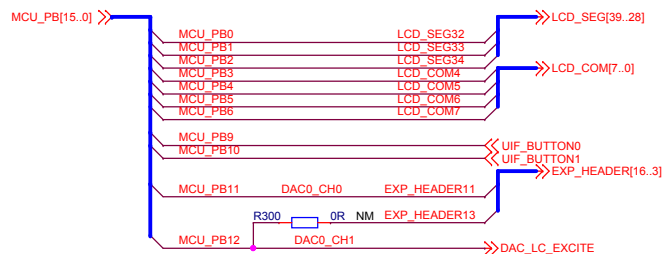
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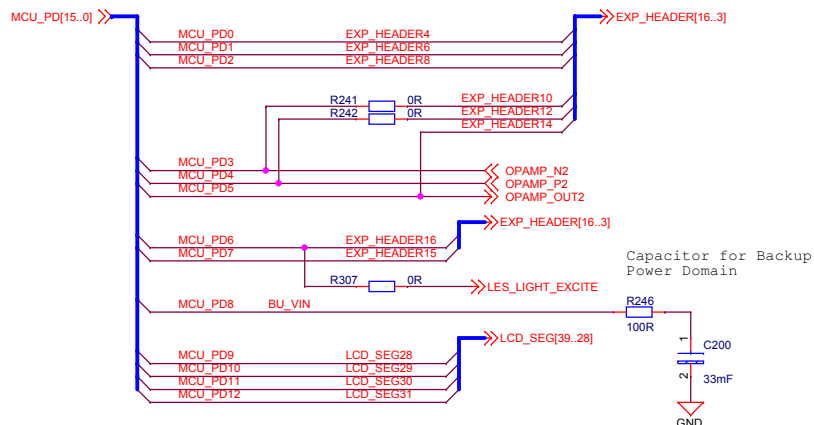
PA Connections



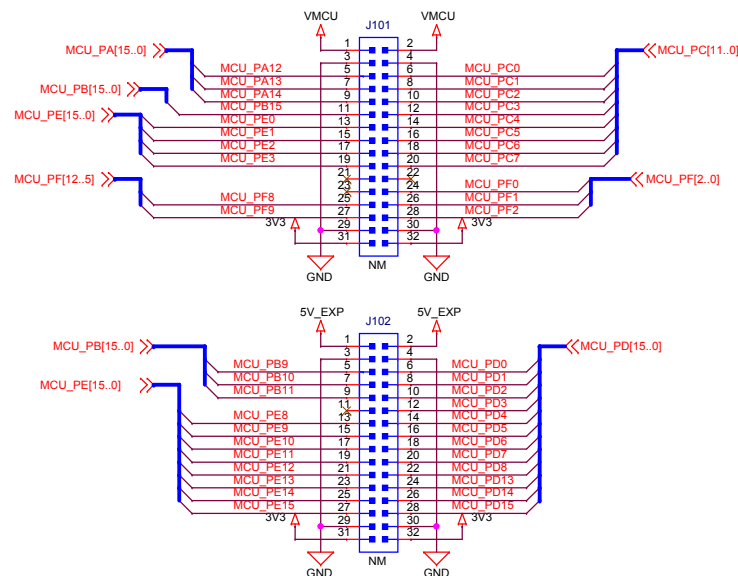
PB Connections



PD Connections



Breakout connections

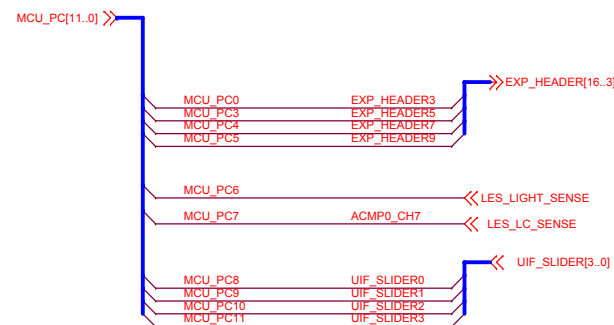


Breakout header labels:

VMCU	VMCU
GND	GND
A12	C0
A13	C1
A14	C2
B15	C3
E0	C4
E1	C5
E2	C6
E3	C7
NC	NC
NC	F0
F8	F1
F9	F2
GND	GND
3V3	3V3

5V	5V
GND	GND
B9	D0
B10	D1
B11	D2
NC	D3
E8	D4
E9	D5
E10	D6
E11	D7
E12	D8
E13	D13
E14	D14
E15	D15
GND	GND
3V3	3V3

PC Connections



Designed: HEL
Size: A3
Design Created Date: Tuesday, December 06, 2016

Approved: JSH

Schematic Title

EFM32 Leopard Gecko Starter Kit

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Signal Assignments

Document number

BRD2201A

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Sheet Created Date

Tuesday, December 06, 2016

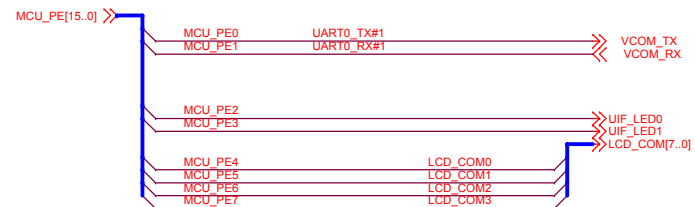
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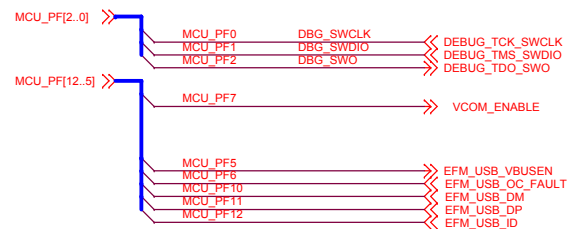
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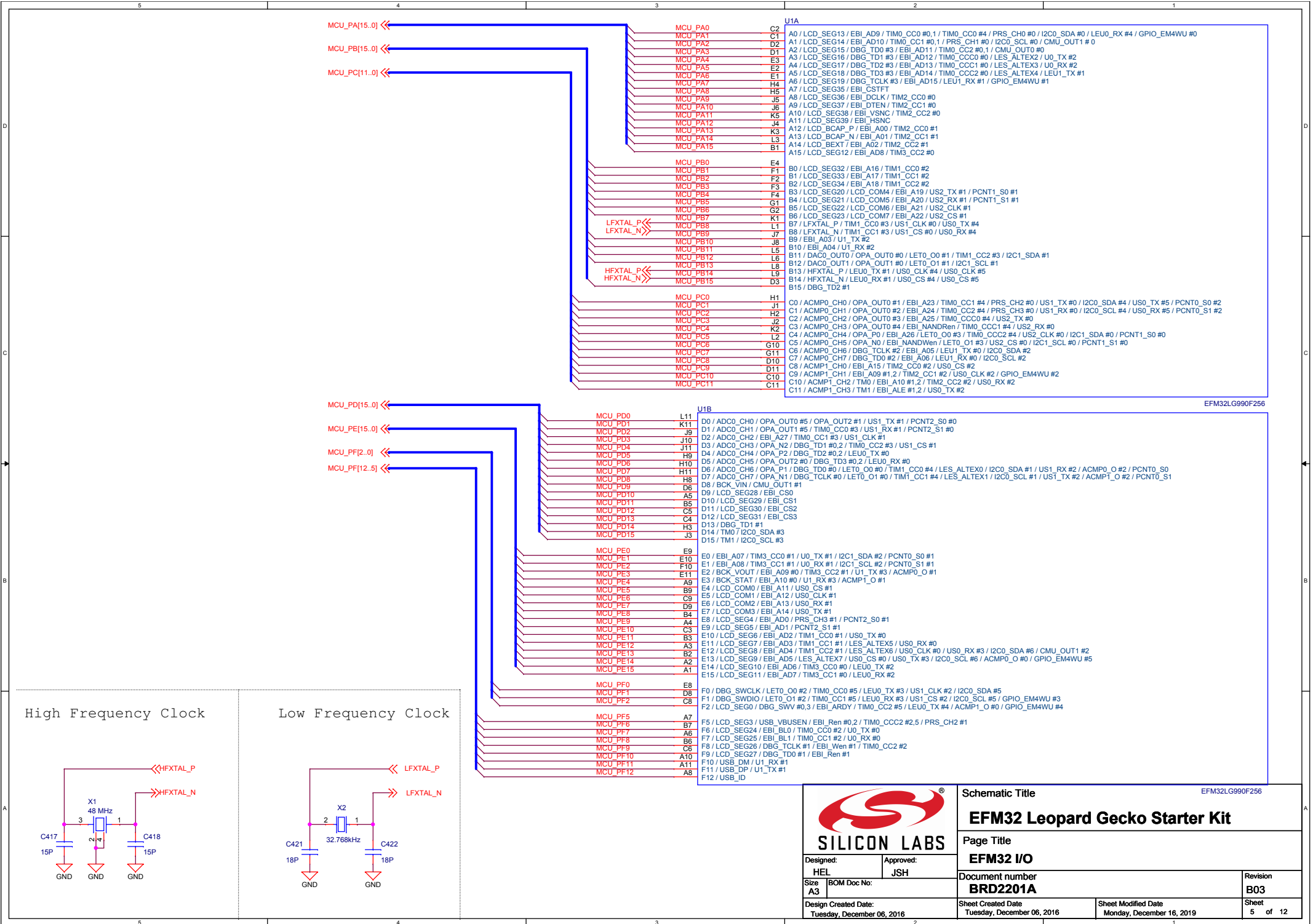
PE Connections



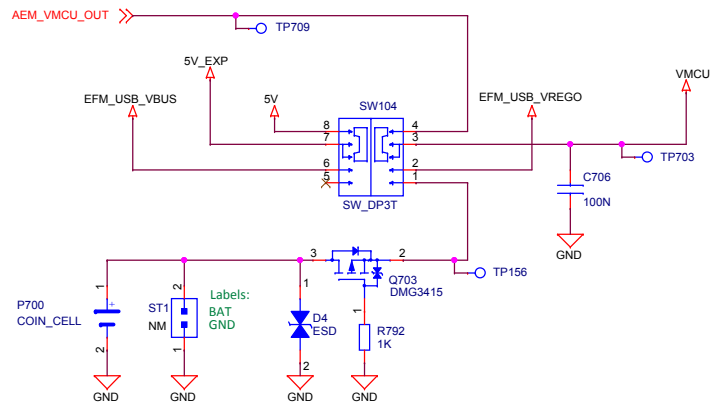
PF Connections



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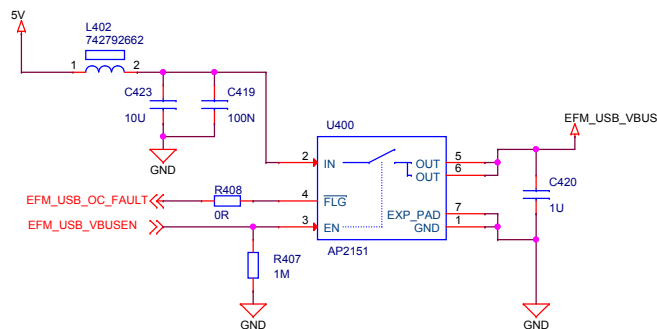


Power Select Switch: AEM/USB/BAT

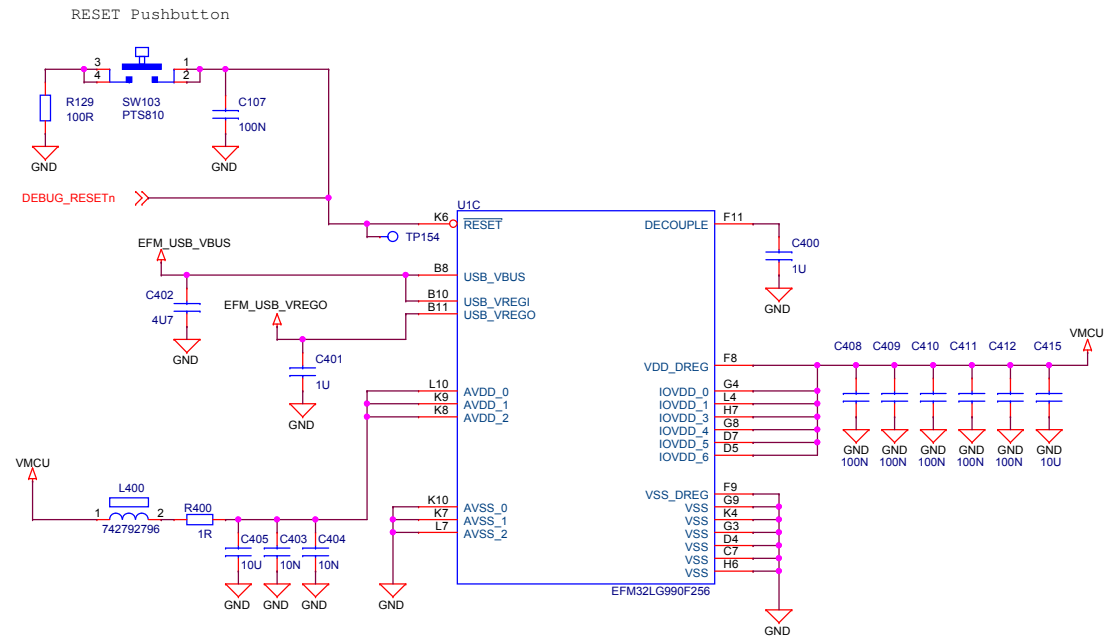


SWITCH POS	MODE DESCRIPTION
AEM	AEM Enabled, VMCU sourced from external 3.3V LDO powered by BC USB 5V supply, EXP header and breakout 5V sourced from BC USB 5V supply
USB	AEM Disabled, VMCU sourced from internal 3.3V LDO powered by MCU USB 5V supply, EXP header and breakout 5V sourced from MCU USB 5V supply
BAT	AEM Disabled, VMCU sourced from coin-cell battery or external power supply

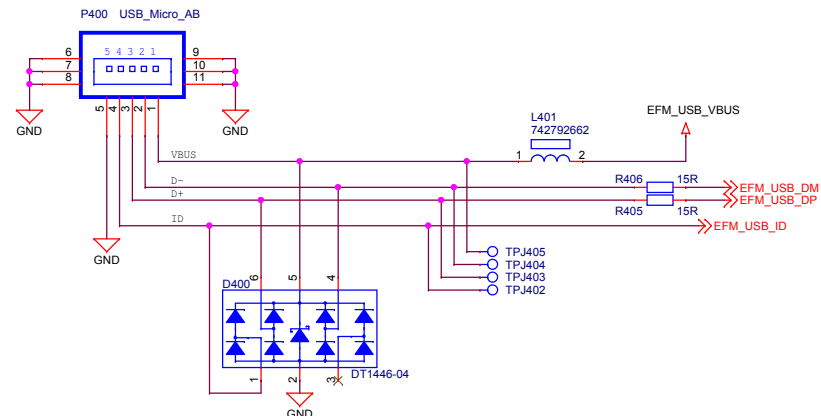
USB Host Power enable




EFM32 Power & Reset



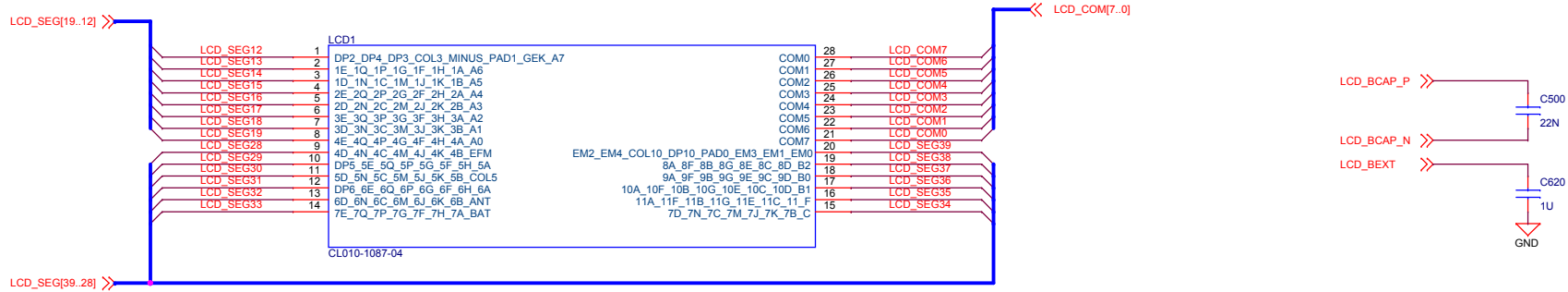
USB Connection and ESD protection



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LCD signal connections

LCD Boost

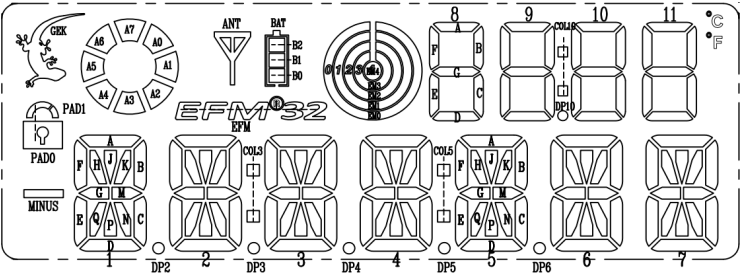


Segment names

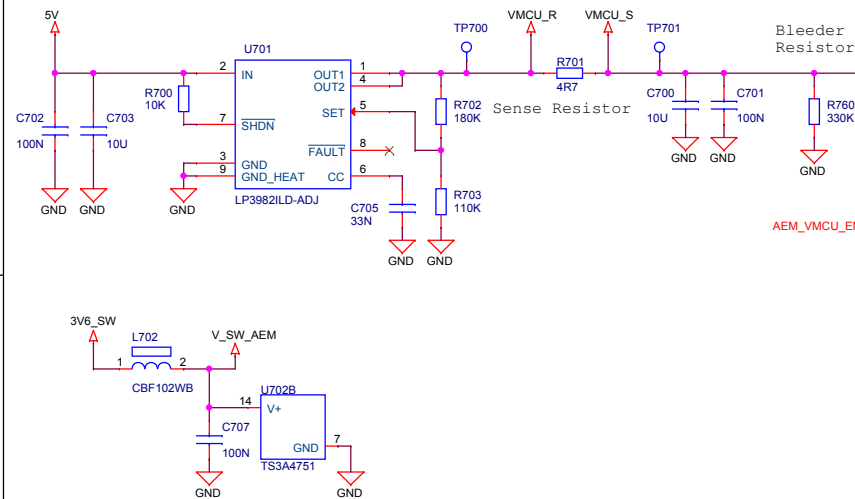
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---	S0	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
COM0	DP2	1 E	1 D	2 E	2 D	3 E	3 D	4 E	4 D	DP5	5 D	DP6	6 D	7 E
COM1	DP4	1 Q	1 N	2 Q	2 N	3 Q	3 N	4 Q	4 N	5 E	5 N	6 E	6 N	7 Q
COM2	DP3	1 P	1 C	2 P	2 C	3 P	3 C	4 P	4 C	5 Q	5 C	6 Q	6 C	7 P
COM3	COL3	1 G	1 M	2 G	2 M	3 G	3 M	4 G	4 M	5 P	5 M	6 P	6 M	7 G
COM4	MINUS	1 F	1 J	2 F	2 J	3 F	3 J	4 F	4 J	5 G	5 J	6 G	6 J	7 F
COM5	PAD1	1 H	1 K	2 H	2 K	3 H	3 K	4 H	4 K	5 F	5 K	6 F	6 K	7 H
COM6	GEK	1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 H	5 B	6 H	6 B	7 A
COM7	A7	A6	A5	A4	A3	A2	A1	A0	EFM	5 A	COL5	6 A	ANT	BAT

PIN	15	16	17	18	19	20	21	22	23	24	25	26	27	28
---	S14	S15	S16	S17	S18	S19	COM7	COM6	COM5	COM4	COM3	COM2	COM1	COM0
COM0	7 D	11 A	10 A	9 A	8 A	EM2							COM1	COM0
COM1	7 N	11 F	10 F	9 F	8 F	EM4								
COM2	7 C	11 B	10 B	9 B	8 B	COL10						COM2		
COM3	7 M	11 G	10 G	9 G	8 G	DP10					COM3			
COM4	7 J	11 E	10 E	9 E	8 E	PAD0				COM4				
COM5	7 K	11 C	10 C	9 C	8 C	EM3			COM5					
COM6	7 B	11 D	10 D	9 D	8 D	EM1		COM6						
COM7	°C	°F	B1	B0	B2	EM0	COM7							

Segment placement

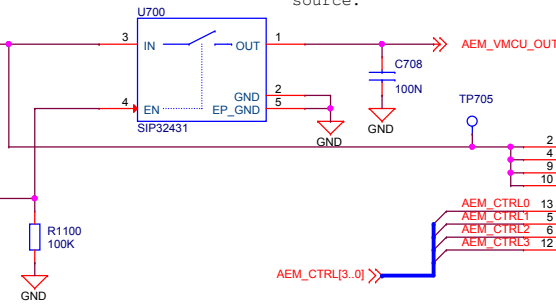


MCU power regulator

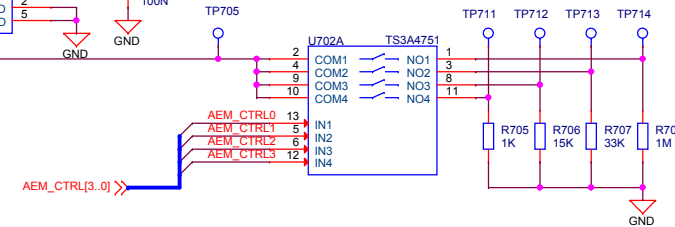


Isolation switch

This goes to the slide switch, where it can be selected as the power source.

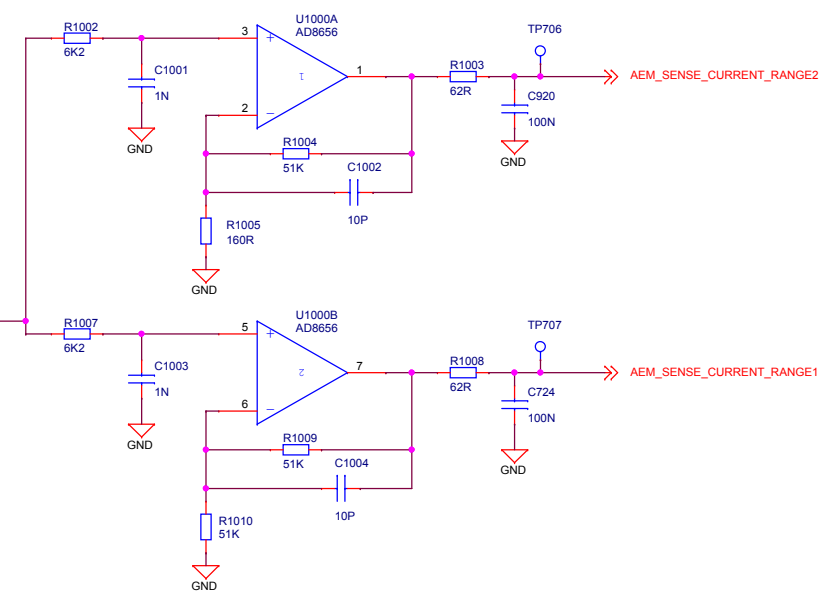
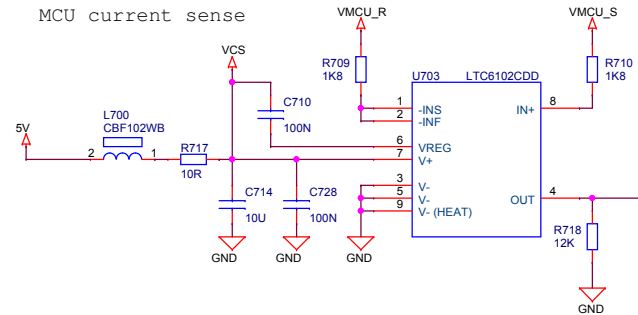


AEM Calibration

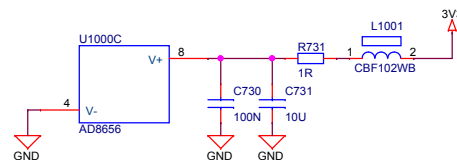
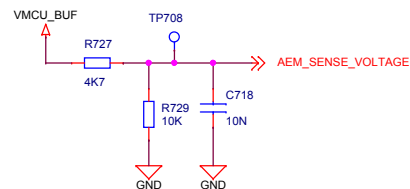


AEM_CTRL	Calibration Current
0x1	3.30 uA
0x2	100 uA
0x4	220 uA
0x6	320 uA
0x8	3.30 mA

MCU current sense



MCU Voltage Sense



Designed: HEL
Size: A3
Design Created Date: Tuesday, December 06, 2016

Approved: JSH
BOM Doc No:
Sheet Created Date: Tuesday, December 06, 2016

Schematic Title

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Advanced Energy Monitor

Document number

BRD2201A

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