DO NOT EVER PLUG IN ANYTHING TO THE PROGRAMMING OR SERIAL INTERFACES WHILE THE 240VAC SUPPLY IS CONNECTED.
Use standard XBee module. XBee Pro or other high-power models probably won't work.

For 110VAC use (USA etc.) change C13 from 3.3 uF to 6.3 uF

All resistors and capacitors are 0805 SMD unless otherwise noted.

IC2: OPA340NA Rail-rail opamp	OPA340NACT-ND
IC3: MCP9701A Temperature sensor	MCP9701A-E/TO-ND
ZD1, ZD3: BZX384-C3V6 3.6V Zener	568-8044-1-ND
Q1, Q3: 2N7002P N-Ch MOSFET	568-5818-1-ND
LED1: Red LED, 0805	475-1278-1-ND
LED2: Yellow LED, 0805	754-1135-1-ND
LED3: Green LED, 0805	475-1410-1-ND
R1: PDV-P8103 (CdS LDR)	PDV-P8103-ND
IC5: ATmega328-AU	ATMEGA328-AU-ND
Q2: 8 MHz crystal, 4-SMD	887-1452-1-ND
All 100 nF 50V SMD 0805 ceramic caps	311-1361-1-ND
C8, C9: 27 pF 50V SMD 0805	311-1104-1-ND
C7: 22 uF 6.3V SMD 1206 ceramic	490-1824-1-ND
IC4: LD1117S33 voltage regulator	497-1241-1-ND
D2: PMLL4148L (SOD80C)	568-1749-1-ND
R20: 5 milliohm shunt (through-hole) (rated for at least 2W)	989-1097-ND
RY1: G5Q-1A4DC12 240VAC 10A, 12V coil, 720 ohm (16.7 mA)	Z223-ND
C6: 470 uF 25V Through-hole alu, 8mm dia, 3.5mm pitch.	565-1678-ND
D1: CGRM4004-G, SOD-123	641-1329-1-ND
ZD2: 3SMAJ5928B, 13V Zener, DO-214AC Power rating of at least 3W	3SMAJ5928B-TPMSCT-ND
R14a/b: 2 x 220 ohm 5W (large wirewound)	UB5C-220-ND
R16-R18: 680k, 1/4W 1% SMD 1206	311-680KFRCT-ND
C13: 3.3 uF 250+VAC Large through-hole, X2 class polyester	495-4138-ND
Change to 6.3 uF for 120VAC use	495-4134-ND

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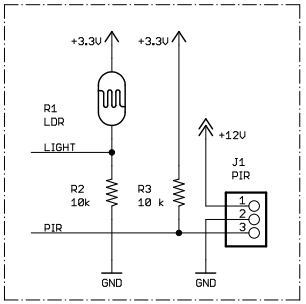
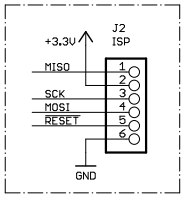
REMOVE XBEE MODULE BEFORE CONNECTING PROGRAMMING INTERFACE.
Supported PIR module: Sparkfun SEN-08630

LDR and PIR connector

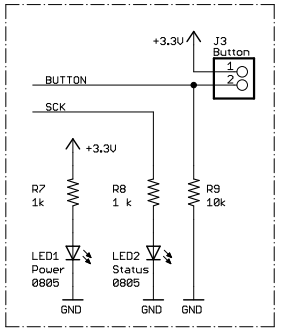


ISP interface

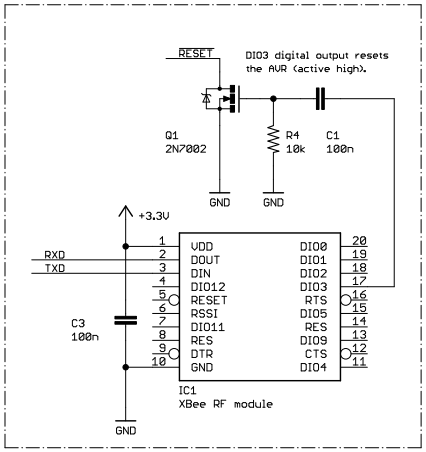


Button and LEDs

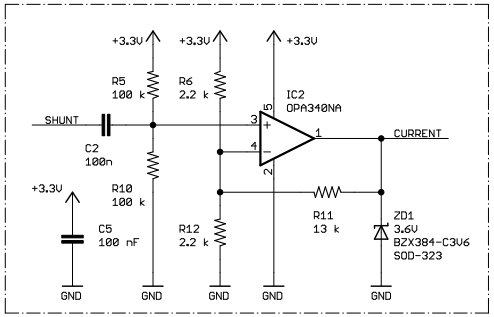
J3 = 4-pin header for ext. button and LED.



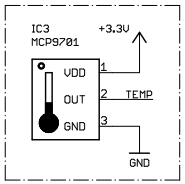
XBee 802.15.4 module



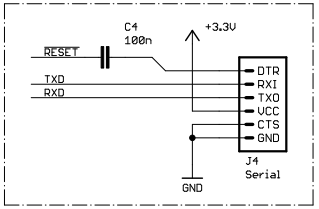
Current waveform amplifier



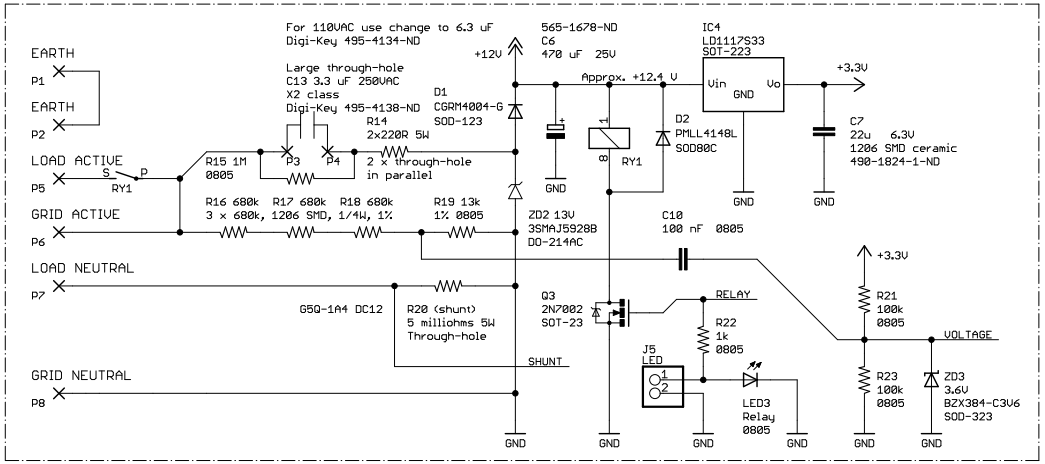
Temp. sensor



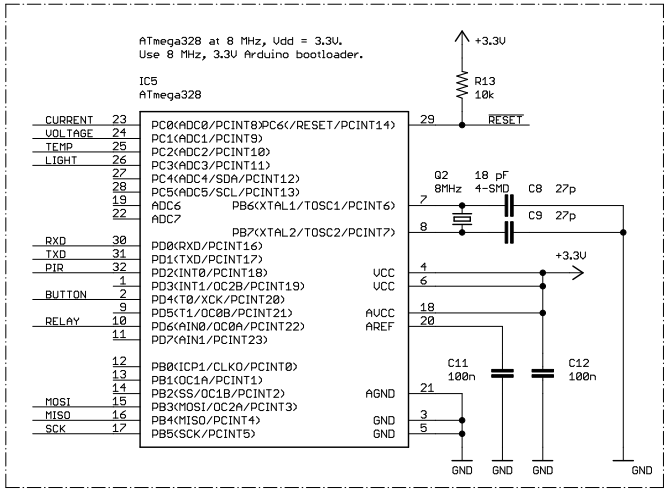
NON-isolated serial interface



Transformerless power supply and voltage/current interfaces



Microcontroller



UNTESTED PRELIMINARY EXPERIMENTAL HARDWARE. THIS IS NOT SUPPORTED IN ANY WAY BY ANY PERSON. IT MIGHT FAIL SPECTACULARLY.

Single-channel, single-phase plug-in smart energy appliance

smartenergygroups.com

Hardware design by Luke Weston, 2011-2012

github.com/lukeweston/SEGplug

FOR YOUR SAFETY PLEASE READ ALL DOCUMENTATION WELL BEFORE USE.
DANGER - ALL PARTS OF CIRCUIT ARE AT MAINS POTENTIAL.
TRANSFORMERLESS NON-ISOLATED, FLOATING POWER SUPPLY
MAXIMUM LOAD CURRENT = 10 A

open hardware

SEGPlug v0.5 Preliminary	
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