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|                        |  |            |      |
| TITLE: SEGplug         |  |            |      |
| Document Number:       |  |            | REV: |
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DO NOT EVER PLUG IN ANYTHING TO THE PROGRAMMING OR SERIAL INTERFACES WHILE THE 240  
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/T0-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  | 754-1131-1-ND              |
| R1: PDV-P8103 (CdS LDR)  | PDV-P8103-ND               |
| IC5: ATmega328-AU  | ATMEGA328-AU-ND            |
| Q2: 8 MHz crystal, 4-SMD   | 535-9720-1-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)<br>(rated for at least 3W)                                  | 989-1096-ND                |
| RY1: G5Q-1A4DC12   | Z223-ND                    |
| 240VAC 10A, 12V coil, 720 ohm (16.7 mA)  |                            |
| C6: 470 uF 25V<br>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<br>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<br>Large through-hole, X2 class polyester<br>Change to 6.3 uF for 120VAC use | 495-4138-ND<br>495-4134-ND |

AT MAINS POTENTIAL.  
ATING POWER SUPPLY

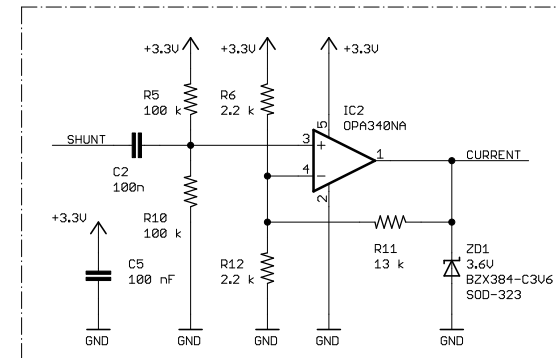


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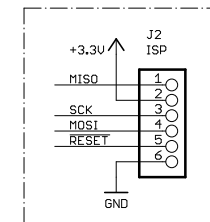
VAC SUPPLY IS CONNECTED.

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

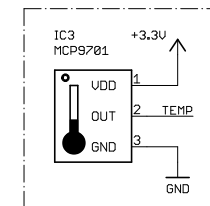
Current waveform amplifier



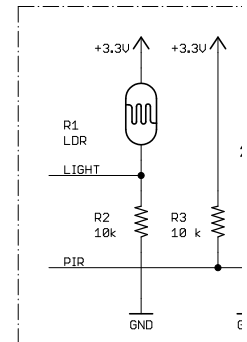
ISP interface



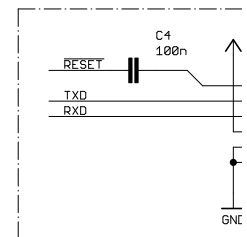
Temp. sensor



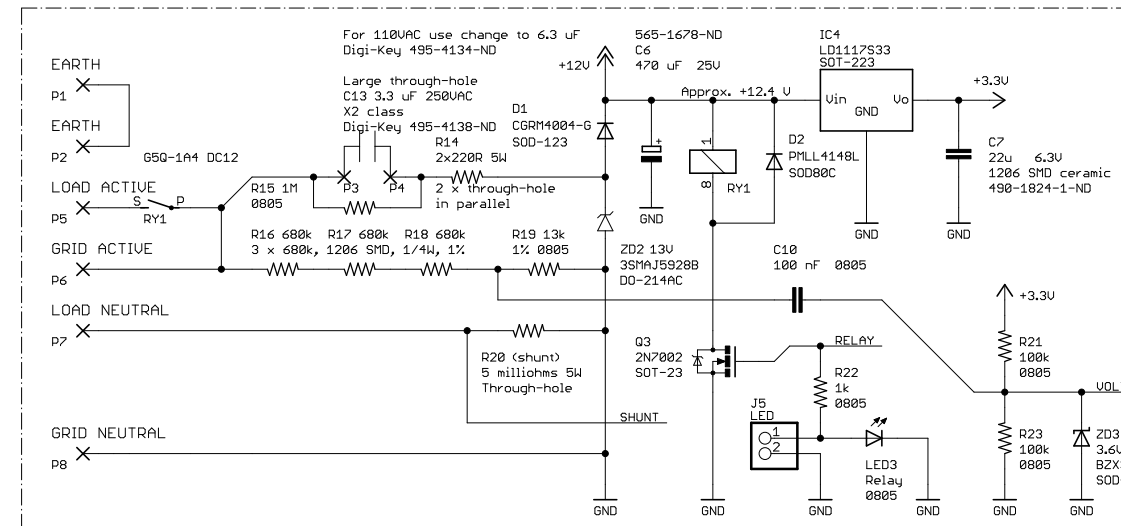
LDR and PIR connection



NON-isolated serial interface



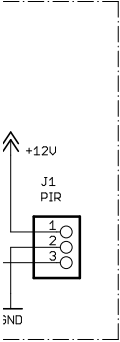
Transformerless power supply and voltage/current interfaces



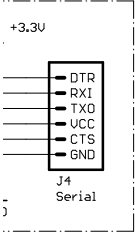
UNTESTED PRELIMINARY EXPERIMENTAL HARDWARE. THIS IS NOT SUPPORTED  
Single-channel, single-phase plug-in smart energy appliance  
smartenergygroups.com

FOR YOUR SAFETY PLEASE READ ALL INSTRUCTIONS

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al interface



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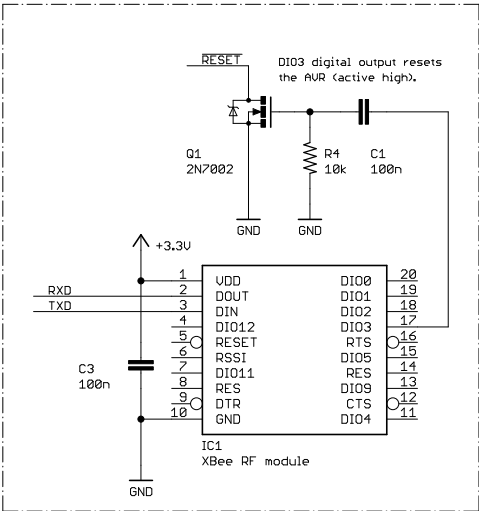
4



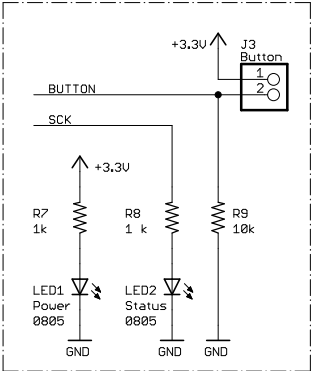
TAGE

J  
384-C3U6  
-323

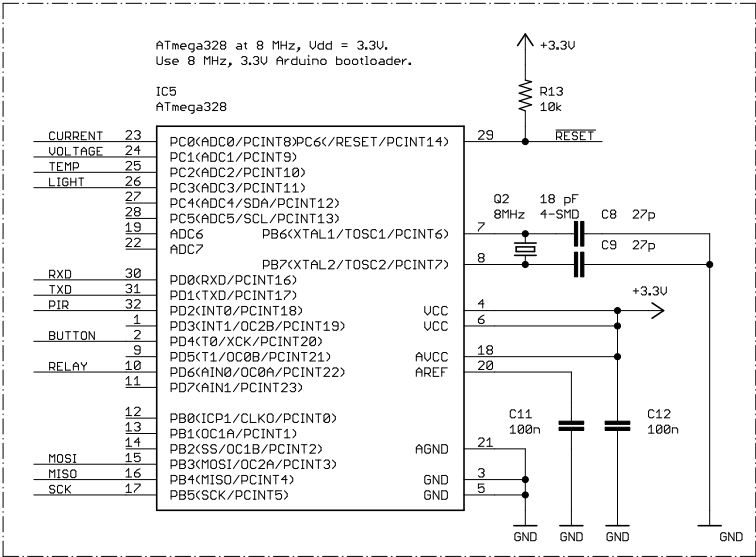
XBee 802.15.4 module



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



Microcontroller



PORTED IN ANY WAY BY ANY PERSON. IT MIGHT FAIL SPECTACULARLY.

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DOCUMENTATION WELL BEFORE USE.