



**Application Note**

# **AS7221&AS7211**

## **Luminaire Design Considerations Bluetooth Connected**



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## 1 General Description

This Application Note describes use of the AS7221 and AS7211 Smart Lighting Manager to design a LED Light Panel - Bluetooth/BLE connected True Color Luminaire. The resulting electronics used in the Luminaire is described<sup>1</sup>. Note, a standard panel and small sensor controller board is using to show the fast way to get a luminaries control for cw/ww mixed LED lighting.

Smart Lighting Mgr electronics solutions:

- Single Chip ams AS7221 device with X, Y, Z true color sensing as well as a complete Luminaire color maintenance control loop based on the sensed color and other input control points
- ams TSL4531 external lux sensor as input to the AS7221 for optional Daylighting control
- Single chip Cypress semi device which is a complete Bluetooth/BLE solution for the AS7221

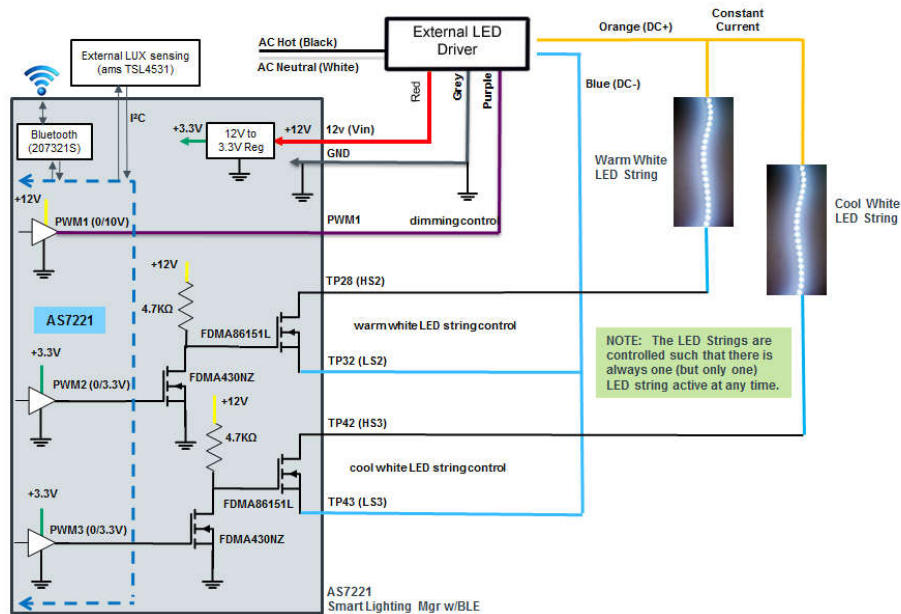
Other features of the Luminaire:

- An Universal Constant Current LED Driver with 1% dimming capability and a 12VDC/100mA auxiliary output supply
- Two strings of LEDs, 24 each. One string is warm white the other cool white, both are controlled by the Smart Lighting Mgr w/BLE assembly to maintain desired customer color temperature (2800K-5500K)
- 1x1 (1 foot by 1 foot) overall Luminaire design

## 2 Design Overview

The three figures in this section show both a high level view of the 1x1 Luminaire Color Tuning electrical design and mechanical mounting of the AS7221 Assembly and CITI LED Driver.

**Figure 1: High Level View of the 1x1 Luminaire LED Color Tuning**



<sup>1</sup> For more details and basics please see also the principal application note, named "AS7211&AS7221 Luminaire Design Considerations".

When selecting an external LED driver, please note. The LED driver must realize that the negative LED driver output is equal to the GND potential of the control input, or at the most corresponds to the voltage drop across the internal shunt of the LED driver. The stroke, negative LED driver output to GND must not exceed 4V, otherwise the output stages of the SLIK will be destroyed.

For external LUX sensing, use an ams TSL4531 Board. Details for the installation refer the guide: AS7221\_Dashboard\_install and operation\_xxx.pdf.

Figure 2: 1x1 Luminaire Frame w/LEDs – top and bottom view

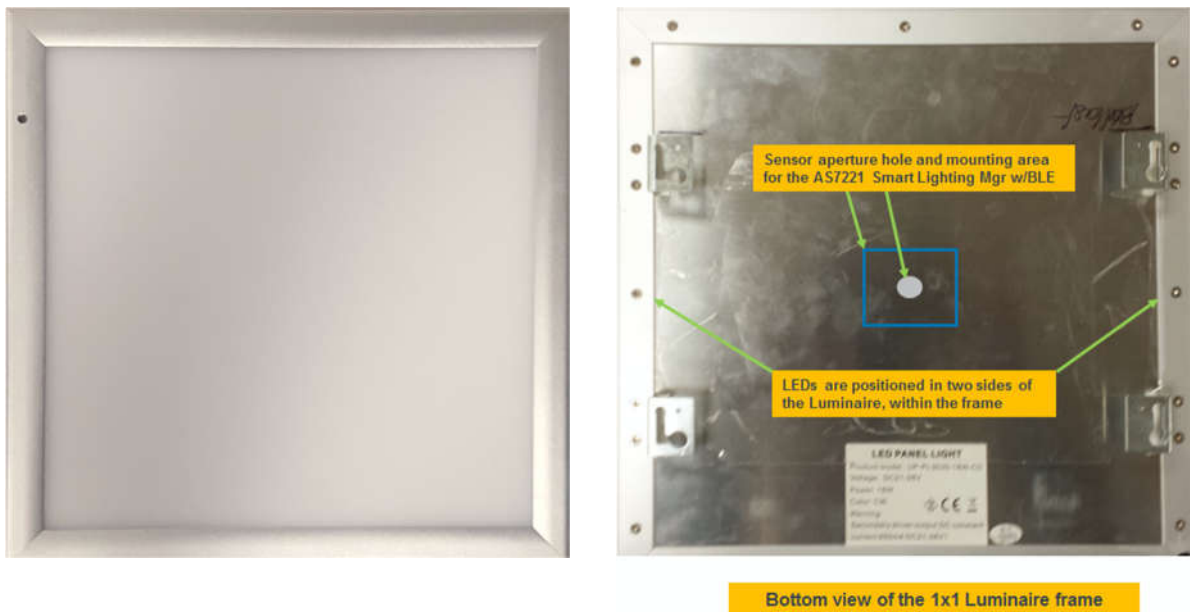
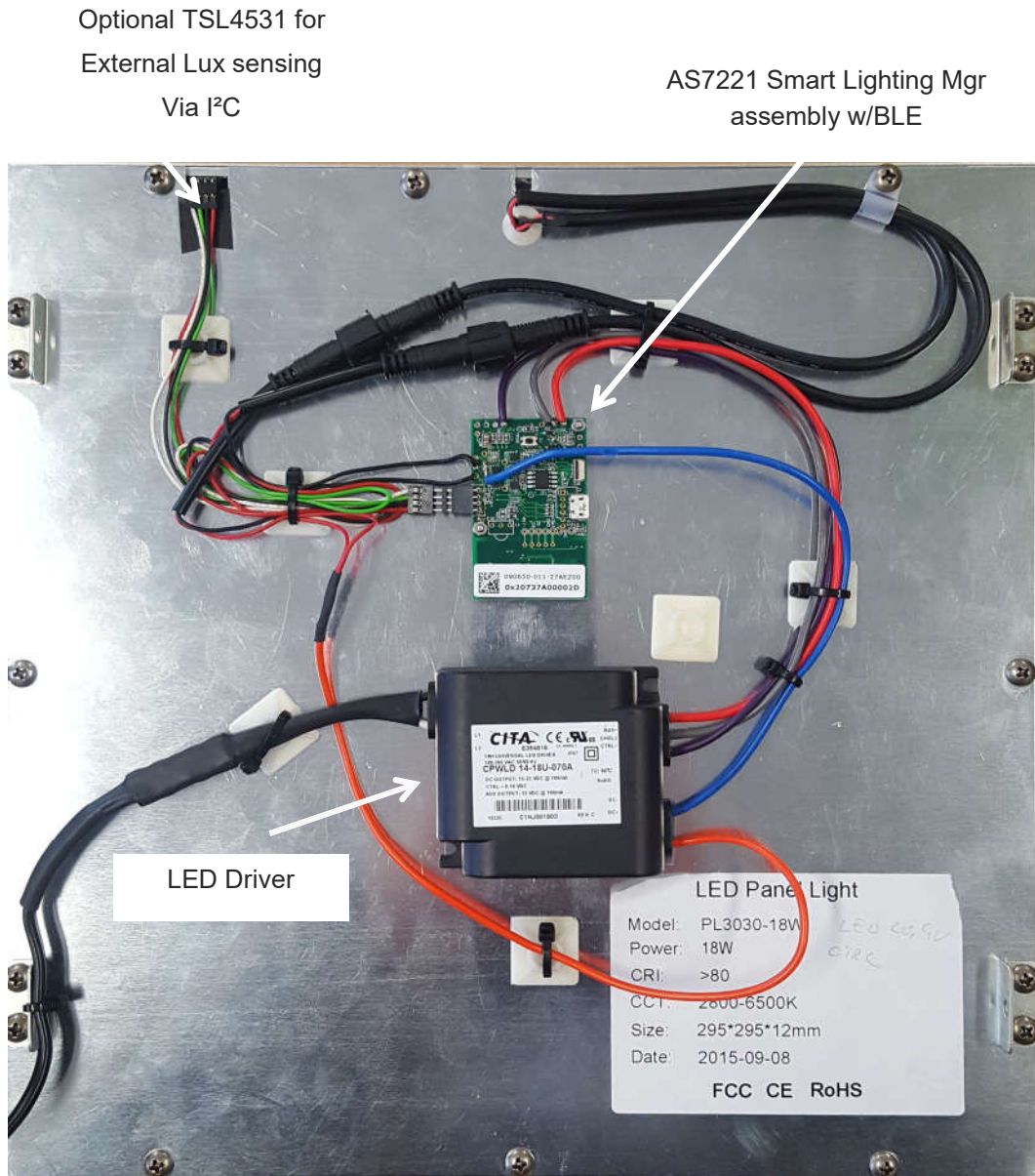


Figure 3: Final Assembly of the 1x1 Luminaire



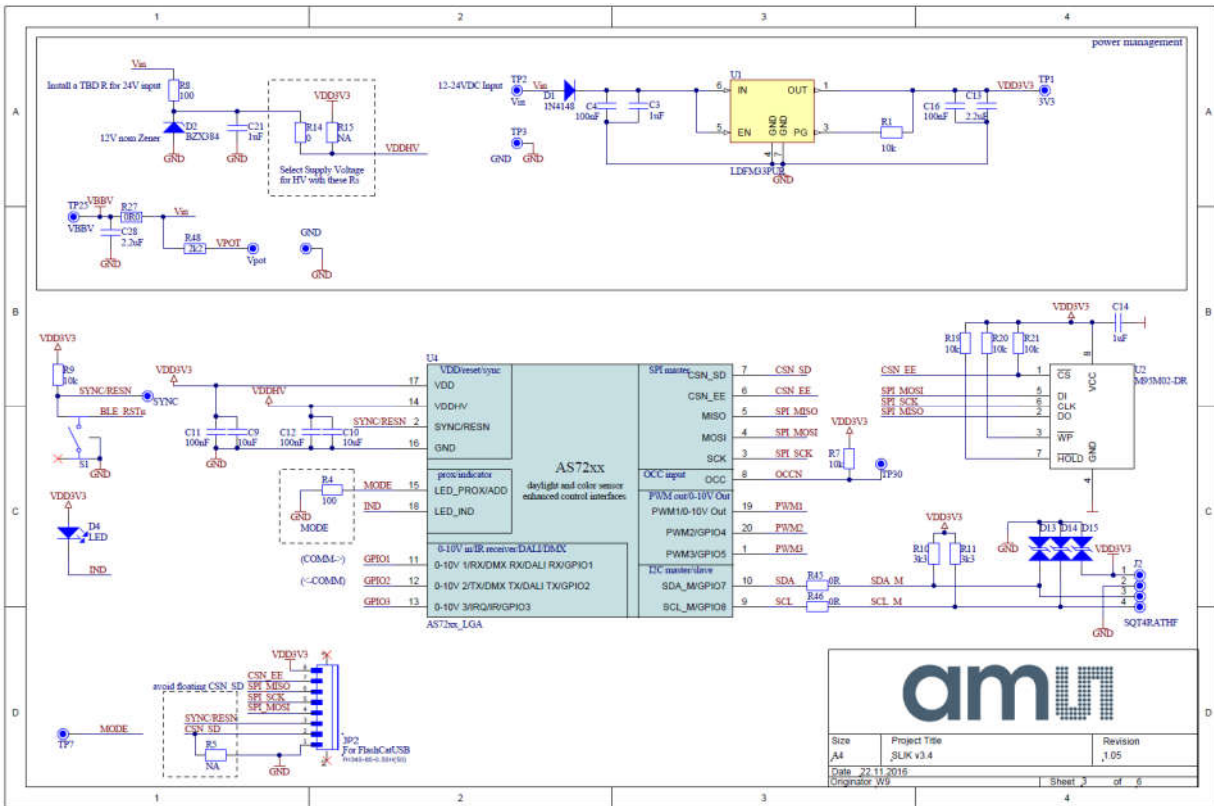
Bottom view of the assembled 1x1 Luminaire;  
includes AS7221 SmartLighting;Manager w/ BLE,  
Daylighting and AC/DC LED Driver

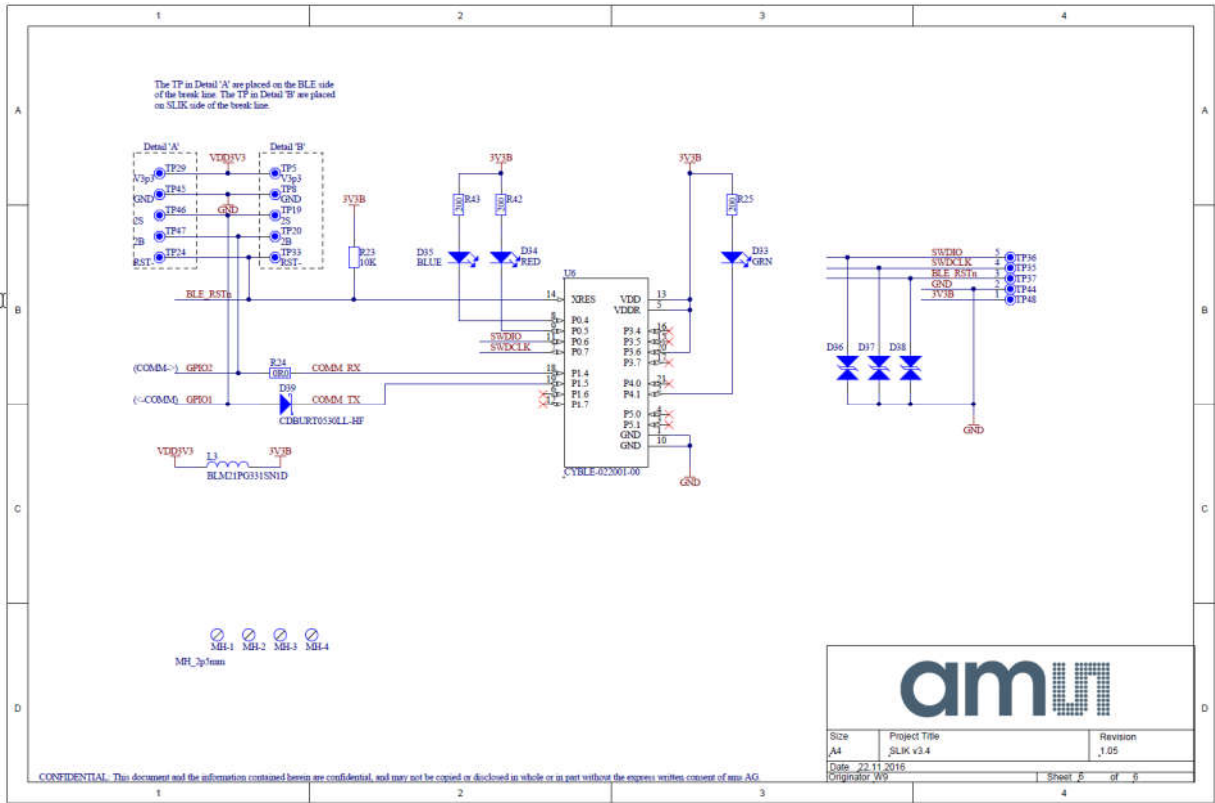
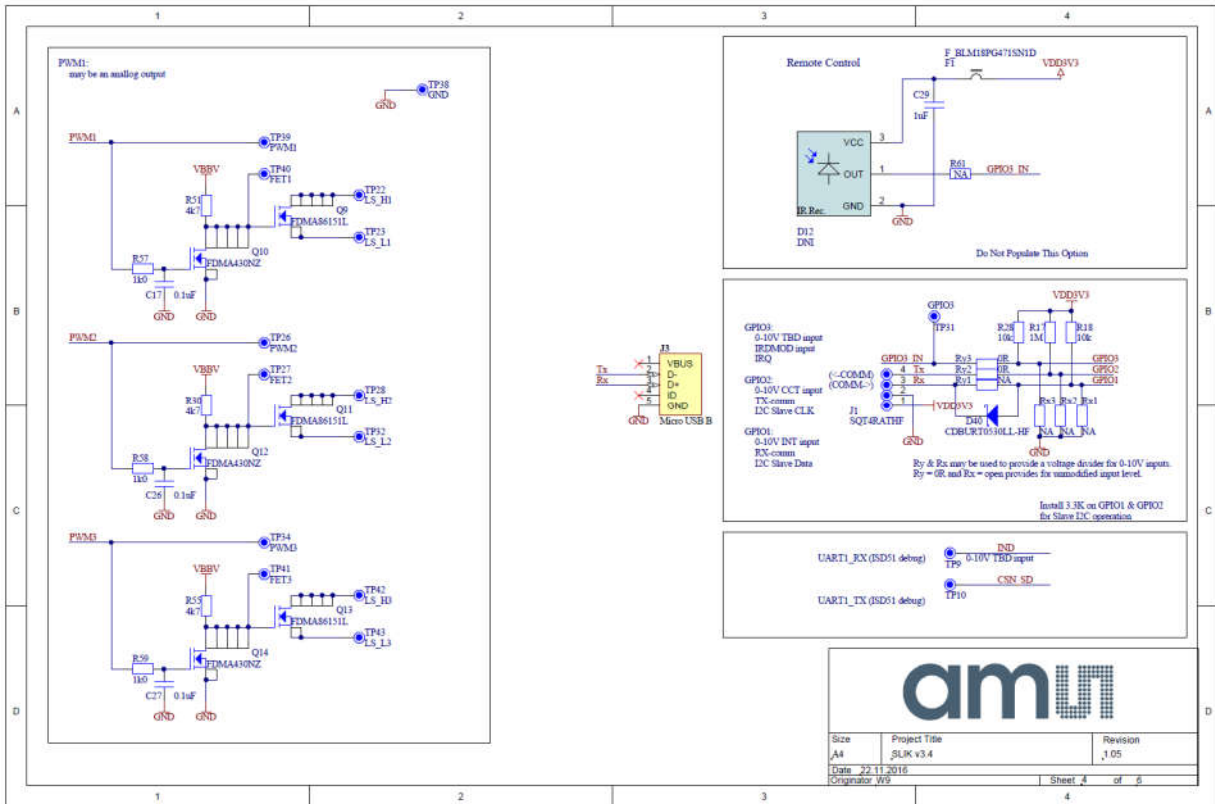
### 3 Schematic Details for the AS7221 Smart Lighting Mgr w/BLE Assembly

Below is the schematic for the AS7221 Smart Lighting Mgr w/BLE Assembly.

1. Sheet 1 includes the AS7221 device as well as 3.3V generation from the external AC/DC LED Driver's 12V supply. The AS7221's I<sup>2</sup>C interface for external slave devices such as the ams TSL4531 is also shown.
2. Sheet 2 shows typical MOSFETs for interfacing AS7221 PWMs to high voltage LED environments.
3. Sheet 3 shows the single chip BLE/Bluetooth solution.

Figure 4: AS7221 Smart Lighting Mgr w/BLE Assembly Schematic 3.4





## 4 Ordering & Contact Information

Ordering Code	Description
	AS7221 Smart Lighting Integration Kit (does not include the Luminaire itself)

For further information and requests, e-mail us at:

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## 6 Revision Information

- Version v1-02...initial document
- Version v1-03...updated to include the AS7221 supported ams TLS4531 external LUX sensor for Daylighting
- Version v1-04...updated Figure 1 for SLIK v3.2 schematic connections