LuxSenz power consumption measurements

# LuxSenz Receiver

## Old measurements

In June, power consumption measurements were performed with a 2.2 Ohm resistor:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part | VR | Current | VBAT | Power |
| STM32 Nucleo (32 MHz/10kHz) | 107 mV | 49 mA | 5 V | 250 mW |
| STM32 Nucleo + e-ink | 120-180 mV | 54-82 mA | 5 V |  |
| e-ink display (calculated) |  | 5-32 mA | 5 V | 20-160 mW |
| STM32L031 only (32 MHz/10kHz) | 13 mV | 6 mA | 5 V |  |
| Receiver circuit | 4.4 mV | 2 mA | 5 V | 10 mW |
| STM32 Nucleo (SPI disabled) | 102 mV | 46 mA | 5 V |  |
| SPI Peripheral (calculated) |  | 2.3 mA | 5 V | 11 mW |
| STM32N (16 MHz/1kHz) | 97 mV | 44 mA | 5 V |  |
| STM32L031 only (16 MHz/1kHz) | 7 mV | 3.2 mA | 5 V |  |
| STM32L031 + e-ink (32M/10k) |  | 12-45 mA | 5 V |  |
| STM32L031 (32M/10k) | 12.7 mV | 5.8 mA | 3.3 V | 19 mW (3.3V) |
| *Powered from battery (3.8 V):* |  |  |  |  |
| STM32L031 + e-ink | 32-70 mV | 14.5-32 mA | 3.8 V |  |
| STM32L031 | 17.5 mV | 8 mA | 3.8 V | 30 mW |
| STM32L031 + e-ink + ADC circuit | 62-125 mV | 28-57 mA | 3.8 V | 106-216 mW |
| STM32L031 + ADC circuit | 22.1 mV | 10 mA | 3.8 V | 38 mW |

## Better quality measurements

Measurements performed with lab power supply.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part | Fs | Current | VBAT | Power |
| STM32 Nucleo + Analog + e-ink | 10 kHz | 11.26-11.50 mA | 4.5 V | 50-52 mW |
| Analog part | 10 kHz | 2.603 mA | 4.5 V | 11.7 mW |
| STM32 Nucleo + e-ink | 10 kHz | 8.67-8.99 mA | 4.5 V | 39-40.5 mW |
| STM32 + Analog (no e-ink) | 10 kHz | 9.92-10.09 mA | 4.5 V | 45 mW |
| Analog part | 10 kHz | 2.612 mA | 4.5 V |  |
| STM32 (no e-ink\_) | 10 kHz | 7.28-7.53 mA | 4.5 V |  |
| STM32 Nucleo + Analog + e-ink | 10 kHz | 10.70-11.35 mA | 3.8 V |  |
| Analog part | 10 kHz | 2.5395 mA | 3.8 V |  |
| STM32 Nucleo + e-ink | 10 kHz | 8.28-8.92 mA | 3.8 V |  |
| STM32 + Analog (no e-ink) | 10 kHz | 9.40-9.61 mA | 3.8 V |  |
| Analog part | 10 kHz | 2.547 mA | 3.8 V |  |
| STM32 (no e-ink\_) | 10 kHz | 6.83-7.19 mA | 3.8 V |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

# Transmitter L031

Measurements performed with lab power supply.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part | F1, f2 | Current | VBAT | Power |
| STM32 Nucleo + 2x 3D shutter | 560, 640 Hz | 6.70-6.87 mA | 4.5 V | 30-31 mW |
| STM32 Nucleo + LED | 560, 640 Hz | 10.2-10.4 mA | 4.5 V | 46 mW |
| STM32 Nucleo | 560, 640 Hz | 6.59-6.75mA | 4.5 V | 29.7-30.4 mW |
| 2x 3D Shutter (calculated) | 560, 640 Hz | 0.12 mA | 4.5 V | 0.54 mW |
| LED | 560, 640 Hz |  | 4.5 V | 16 mW |
| STM32 Nucleo + 2x 3D shutter | 560, 640 Hz | 6.82-6.95 mA | 5.0 V | 34.1-34.8 mW |
| STM32 Nucleo + LED | 560, 640 Hz | 10.9-11.1 mA | 5.0 V | 55 mW |
| STM32 Nucleo | 560, 640 Hz | 6.61-6.81 mA | 5.0 V | 33.0-34.1 mW |
| 2x 3D Shutter (calculated) | 560, 640 Hz | 0.14-0.21 mA | 5.0 V | 0.7-1 mW |
| LED | 560, 640 Hz |  | 5.0 V | 21 mW |
| STM32 Nucleo + 2x 3D shutter | 560, 640 Hz | 6.43-6.55 mA | 4.0 V | 25.7-26.2 mW |
| STM32 Nucleo + LED | 560, 640 Hz | 9.24-9.40 mA | 4.0 V | 37 mW |
| STM32 Nucleo | 560, 640 Hz | 6.36-6.48 mA | 4.0 V | 25.4-25.9 mW |
| 2x 3D Shutter (calculated) | 560, 640 Hz | 0.07 mA | 4.0 V | 0.28 mW |
| LED | 560, 640 Hz |  | 4.0 V | 11 mW |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part | F1, f2 | Current | VBAT | Power |
| STM32 Nucleo + 2x 3D shutter | 560, 640 Hz | 6.18-6.33 mA | 3.8 V | 23.5-24.1 mW |
| STM32 Nucleo | 560, 640 Hz | 6.11-6.26 mA | 3.8 V | 23.2-23.8 mW |
| 2x 3D Shutter | 560, 640 Hz | 0.06-0.1 mA | 3.8 V | 0.23-0.38 mW |
| STM32 Nucleo + 2x 3D shutter | 560, 640 Hz | 6.5-6.67 mA | 4.5 V | 30 mW |
| STM32 Nucleo | 560, 640 Hz | 6.45-6.64 mA | 4.5 V | 29-29.9 mW |
| 2x 3D Shutter | 560, 640 Hz | 0.05-0.1 mA | 4.5 V | 0.23-0.45 mW |
| STM32 Nucleo + 2x 3D shutter | 560 Hz | 6.54-6.73 mA | 4.5 V | 29.4-30.9 mW |
| 2x 3D Shutter | 560 Hz | 0.05-0.1 mA | 4.5 V | 0.23-0.45 mW |
| STM32 Nucleo + 2x 3D shutter | 1000 Hz | 6.64-6.83 | 4.5 V | 29.8-30.8 mW |
| 2x 3D Shutter | 1000 Hz | 0.15 mA | 4.5 V | 0.68 mW |
| STM32 Nucleo + 2x 3D shutter | 1500 Hz | 6.82-7.01 mA | 4.5 V | 30.7-31.5 mW |
| 2x 3D Shutter | 1500 Hz | 0.22 mA | 4.5 V | 0.99 mW |
| STM32 Nucleo + 2x 3D shutter | 2000 Hz | 6.80-6.98 mA | 4.5 V | 30.6-31.4 mW |
| 2x 3D Shutter | 2000 Hz | 0.28 mA | 4.5 V | 1.26 mW |
|  |  |  |  |  |