Outline

- Long Range Proximity Application
- Gesture Detection Application
- UV Index Application
Long Range Proximity Applications

- **Usage Case**
  - Turn equipment on or off when a person or object approaches
  - Extend detection distance to 2m with lens

- **Pros**
  - Reference design on Si1153 EVB
  - Lens and holder can be ordered from manufacturer
  - Tiny 2 x 2 x 0.65 mm QFN w/ minimal BOM saves cost and area
  - Lowest power consumption (~0.7mA at 10Hz)

- **System Design Considerations**
  - +/-5 degree view angle with lens
  - Fit mechanical design into the system
  - Black surface absorbs IR
Long Range Proximity Reference Design

- 115XOPT-EXP-EVB
- UG163
Select the “Long Range Prox/ALS” demo and click “Launch LONGRANGE” button in the Si115x Main Panel

The Waveform Viewer will display the real-time raw data
The Long Range Prox/ALS demo also includes an Activity Detection demo.

When the object is detected by the proximity sensor, it will flash the “Activity Detected” picture and display the computer ON state.
Gesture Detection Applications

- Usage Case
  - Touchless control application in IoT, consumer and industrial products
  - 2D or 3D gesture detection within 20~30cm

- Pros
  - Drive 3 LEDs
  - High sampling frequency
  - Low power consumption
  - Sunlight immune
  - Simple algorithm example code

- Detection Reliability
  - Sensor to LED distance
  - Sampling frequency
  - False detection vs Failed detection
Gesture Detection Reference Design

- 115XOPT-EXP-EVB
- UG163

Si1153 QFN Version (without 940nm filter) drives widely spaced LEDs for Gesture Recognition
Select the “Gesture/ALS” demo and click “Launch GESTURE_DEMO” button in the Si115x Main Panel

- The Waveform Viewer will display the real-time raw data
- Detected gestures will be displayed on the panel
Si1153 Collaterals

- Si1153 Datasheet
- AN950 (Design Guide)
- SI1153/33 Software Tools (GUI)
- 115xOPT-EXP-EVB Kit
UV index Applications

- Usage Case
  - Calculate UV index in consumer electronic products

- Pros
  - The ONLY digital UV sensor in the market
  - Responsive to both UVA & UVB
  - Diffuser design to improve the accuracy
  - Low power consumption
  - Example code is provided with default configuration & coefficients

- Cons
  - Customer calibration is required
  - Accuracy is very dependent on implementation
UV Reference Design

- 115XOPT-EXP-EVB
- UG163
Select the “UV/ALS” demo and click “Launch UV_ALS_DEMO” button in the Si115x Main Panel

The Waveform Viewer will display the real-time raw data

Calculated UV index will be displayed on the panel
Si1133 UV Calibration

- Optical design is finalized on the prototype
- Use sunlight or solar simulator to calibrate the sensor
- Compare the UVI result against a commercial UV index meter
- UV index = k(m × Input² + Input)
- Silicon Labs provides limited calibration support
Si1133 Collaterals

- Si1133 Datasheet

- AN968 (Design Guide)

- SI1153/33 Software Tools (GUI)

- 115xOPT-EXP-EVB Kit
Thank you!

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