Application Note

MLX75030 for Rain/Light sensing

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1. Scope

This application note describes how the MLX75030 ActiveLight Sensor Interface can be used for Rain/Light sensing applications.

2. Applications

The MLX75030 is suited for a broad range of applications including Rain/Light sensing.

- Optical proximity sensing & display dimming
- Touch-less gestures recognition
- Driver/passenger discrimination
- Touch Screen Wake-up on proximity
- Rain/Light sensing

3. Description

The principle for measuring distance with the MLX75030 is similar to the way rain can be detected on a windshield. When measuring distance the reflected light received from an object is used to calculate the distance. In a rain sensing application the emitted infrared light is reflected back on the windshield. In case of rain on the windshield only a part of the emitted light is reflected back. Figure 1 illustrates the principle of rain sensing.

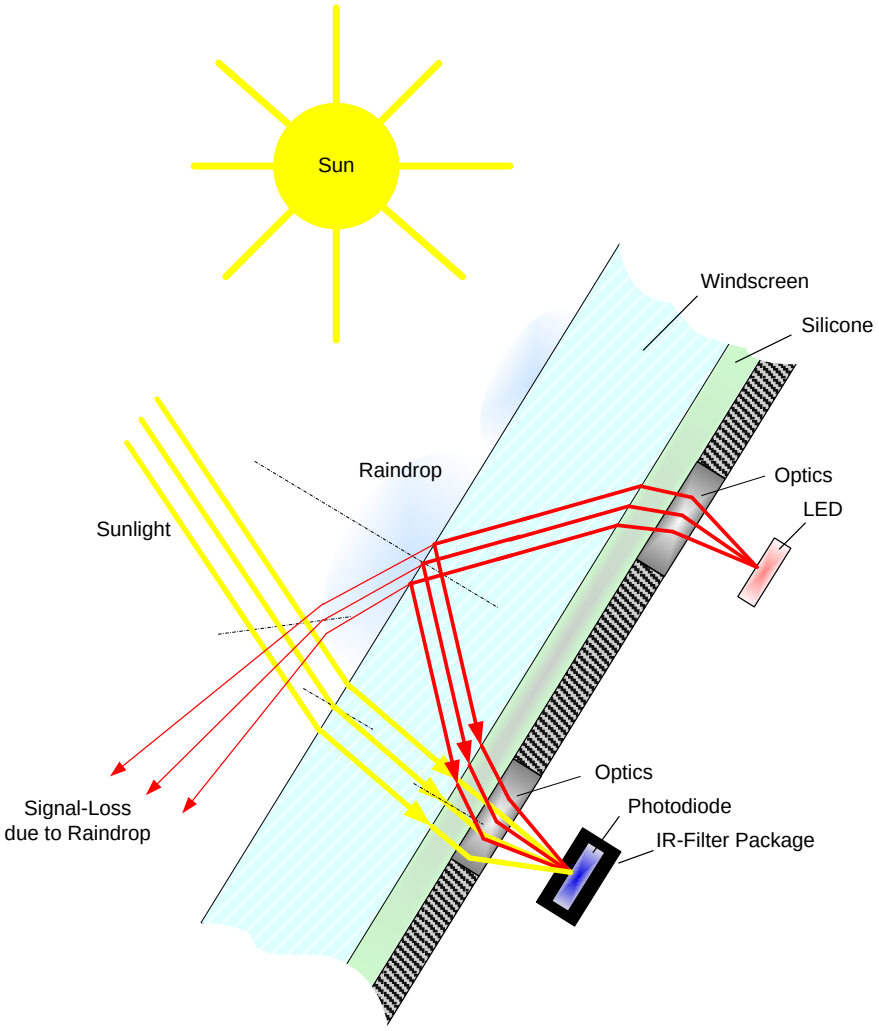

Figure 1: Rain sensing principle

4. Typical Circuit

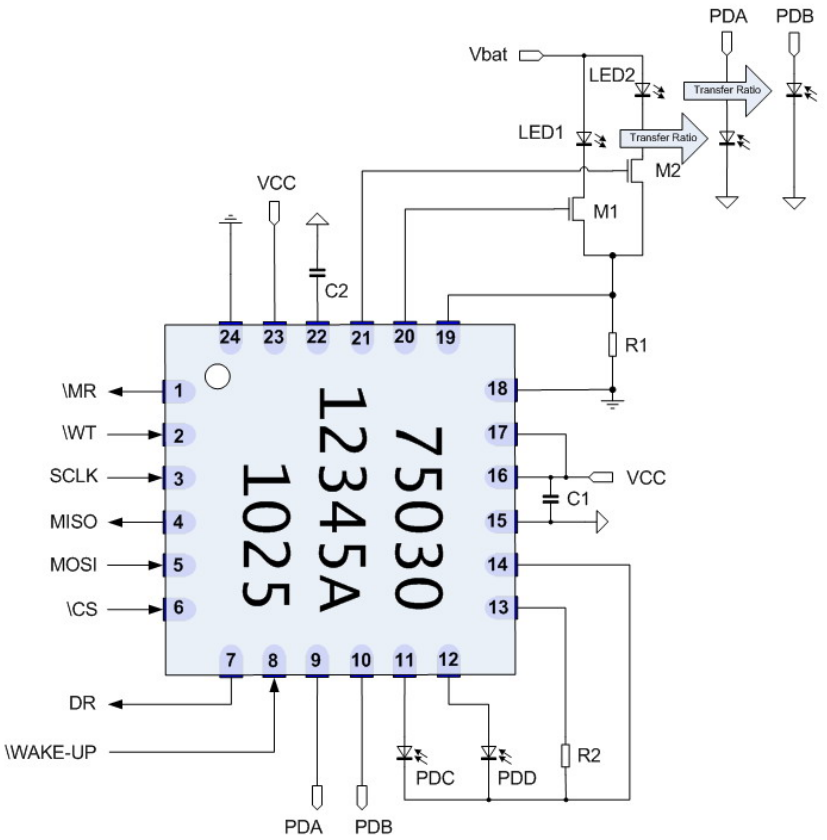

Figure 2: Typical application diagram for rain sensing applications

Component	Value	Description
C1	47nF	Blocking capacitor, connected to analog GND
C2	68nF	Blocking capacitor for int. voltage regulator, connected to analog GND
R1	6.4 Ohms	Shunt Resistor
R2	56k Ohms	Ambient Light Diagnostic termination resistor
M1		LED driver MOSFET
M2		LED driver MOSFET
LED1/2		Active light channel Infrared LED
PDA / PDB		Active light channel infrared photodiode, daylight blocking mold
PDC		V-lambda photodiode
PDD		Photodiode

5. Measurement Principle

Figure 2 shows the typical application diagram when using the MLX75030 in a rain sensing application. Infrared light emitted by the LEDs will be reflected by the windshield and detected by the PDs.

The measurement commands used for an Activelight measurement should be used to get the Rain value. The value received from an Activelight command is a measure for the amount of light received on the photodiode. In case of RainLight sensing it is in function of the amount of light reflected back on the windshield. No rain on the windshield will reflect all emitted light, while rain will decrease the amount of light reflected back.

The 2 ambient channels can be used to control the headlights. PDC is typically used with a V-lambda photodiode looking upwards to sense the amount of ambient light. PDD is typically looking more forward to detect upcoming tunnels. This allows the headlights to be turned on before the vehicle enters the tunnel.

As with an Activelight application, the external sunlight will influence the rain detection. The integrated DC compensation algorithm is perfectly suitable for reducing/compensating external ambient light. It should be used in the same way it is used in Activelight applications. A separate application not is available on the DC compensation

6. Conclusion

The measurement principles between Activelight and RainLight sensing applications are similar. Therefor the MLX75030 is also suited for RainLight sensing applications. The important blocks needed for a RainLight sensing application are present inside the MLX75030.

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