3:1 Hybrid Sensor Combines IR LED Emitter with Proximity and Ambient Light Sensors

The new "3 in 1" SFH 7773 digital sensor from OSRAM Opto Semiconductors makes it easier than ever to install both proximity and ambient light sensing in smart phones and similar devices by combining the functions of a digital ambient light sensor and a digital proximity sensor in a single compact unit. It also simplifies the elimination of crosstalk by combining the emitter and detector chips together – 3 devices in all – eliminating the design requirements that are usually necessary to suppress crosstalk. Now, designers no longer have to install a separate IR emitter to enable the proximity sensor function.

The SFH 7773 detects objects up to a distance of 15 cm (5.9 in.) while simultaneously measuring the intensity of the ambient light. Its black package, measuring only 5.3 x 2.5 x 1.2 mm, is barely noticeable behind the transparent covers of smart phones. Thanks to highly efficient OSRAM chip technologies, its power consumption is low – a maximum of 5 ?A flows in stand-by mode, 300 ?A in operational mode – making it ideally suited for portable devices.

Anti-Reflective Design
Proximity sensors detect objects by receiving the reflection of an emitted light signal. But the cover of a smart phone, e.g., also reflects light back to the sensor. This so-called crosstalk is usually intercepted by installing an optical barrier or placing the emitter at a sufficient distance from the cover to prevent the cover reflections from reaching the detector. However, both methods are rather complex and cumbersome. With the SFH 7773, designers do not have to worry about crosstalk because, inside the device, the emitter and the detector chip are located sufficiently far apart from each other and apertures are integrated into the package to prevent crosstalk or, at minimum, significantly reduce it.

User-definable sensitivity
Now, to a large extent, designers are free to select the integration time of the detector and, thus, the detection range of the proximity sensor via the I²C interface. That way, they can also adjust the ambient light sensor to the transparency of the smart phone cover. A variety of sensitivity levels is available, ranging from 3 to approximately 65.500 lux and 0.03 to 655 lux.

"This means that now, for the first time, our customers can optimize the device for their respective application – from the operating distance to the sensitivity of the ambient light sensor," noted Bianka Schnabel, Product Marketing Manager for the SFH 7773 sensor. "Due to this considerably simplified design and flexibility of use, combined ambient light and proximity functions become more attractive for the mid-price segment of smart phones and other portable devices."

For more information on the use of SFH 7773 and the topic of crosstalk, please refer to application note http://www.osram-os.com/Appnote_SFH_7773 [1].

Edited by Janine E. Mooney, Associate Editor

Source URL (retrieved on *03/14/2014 - 7:59pm*):
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[1] http://www.osram-os.com/Appnote_SFH_7773