ams Ambient Light Sensor (ALS) - Complete Tear-Down Analysis

Description: ams has adopted through-silicon via (TSV) packaging technology for advanced light sensor technology. TSV technology, with the advantage of having in-house wafer fabrication expertise, eliminates the use of wire bonds and provides a direct connection from the device I/Os to a solder ball.

The TSL2584TSV ALS is only 1.14 x 1.66mm footprint and 0.32mm height. The small size of the TSV package technology addresses the small form factor requirement in wearable products (watch, glasses...). ams uses for this device an untraditional and elegant tungsten TSV-last process compared to copper filled TSV used by many other players.

For the light sensing, a very sensitive analog front-end (AFE) is used with a patented dual-diode architecture to transform light intensity into a digital count value. A broadband photodiode responsive to visible and infrared is used in conjunction with an infrared-only responsive photodiode and the two photodiodes channel responses are mathematically subtracted via a lux equation on a micro-controller through the digital I²C interface.

The TSL2584TSV includes an on-chip photopic infrared-blocking interference filter that rejects unwanted UV and IR producing a near-photopic response.

The report also includes a comparison with ams Ambient Light Sensor featured in the iPhone 6s.

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