

BRIEF

AR0135 Performance Improvement

AR0135 PERFORMANCE IMPROVEMENT



In this brief we present a short overview of the new Global Shutter sensor AR0135 – the successor of AR0134. The AR0135 sensor has better performance compared with AR0134 due to the improvement of the memory node shield and of the redesign of the reset transistor.

Internal FRAMOS measurements show the improvement in global shutter efficiency. One can see below that the left image below does not really match the reality, as the ventilator blades seem to be transparent. Additionally, the edges of the blades are superimposed on the other blades area creating a ghosting effect. The situation has improved very much for the AR0135 sensor, the latest GS sensor from ON Semiconductor.

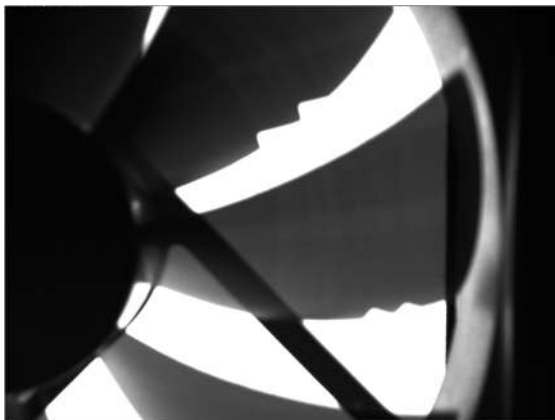


Figure 1: Comparison of global shutter artifacts

AR0134 – 200 μ s



AR0135 – 200 μ s

The OECF chart 10000:1 (ISO14524) has been also imaged with both sensors, under the same illumination conditions. The exposure time has been changed so that the brightest field is in saturation. Gain has been in both cases set to minimum value.

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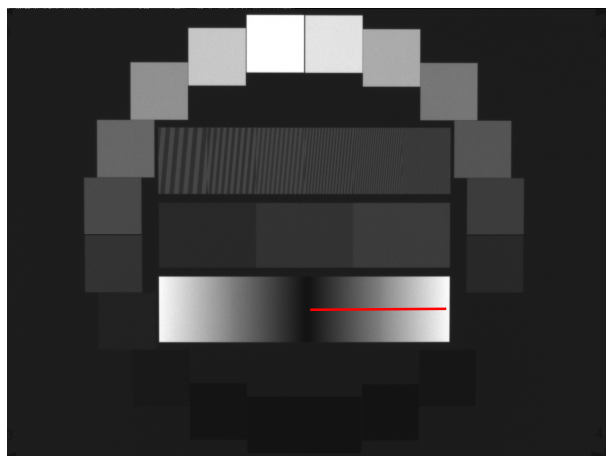
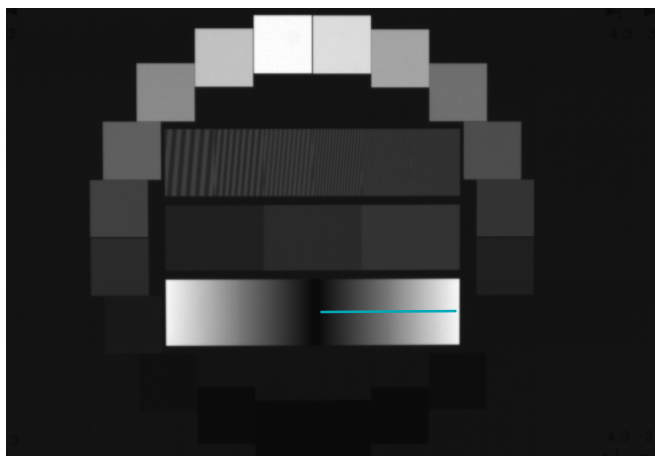


Figure 2: OEFC chart

AR0134 – 1ms



AR0135 – 2ms

The intensity profile in the gradient region of the chart (marked by colored lines) shows the dependence of the signal to the illumination intensity. It has to be noticed that the AR0135 has a lower dark signal floor as well as a better response at low light levels, compared to AR0134. This can be directly related to the improved reset transistor.

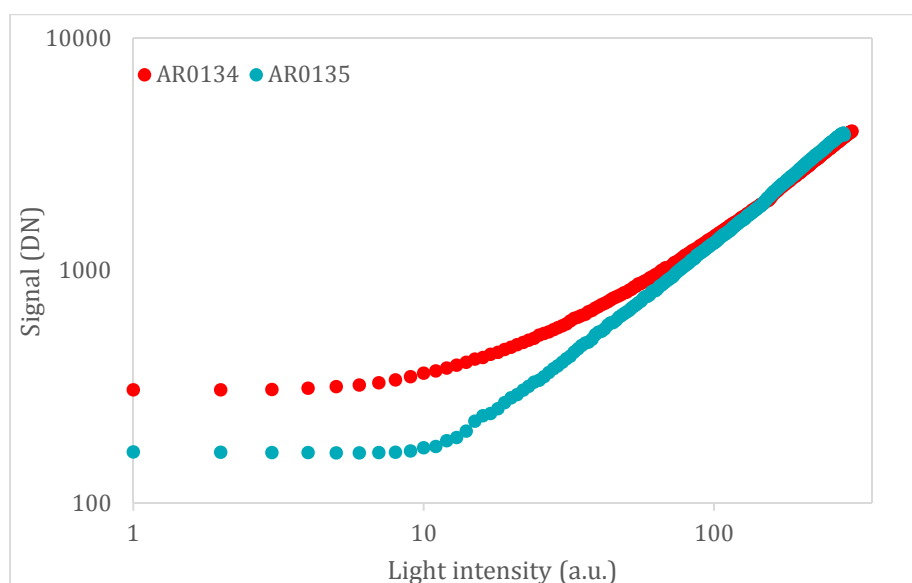


Figure 3: Comparison of signal response AR0134 and AR0135

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Additionally, this will lead to improved signal-to-noise ratio as well as dynamic range. This is also confirmed by the values which can be extracted from the above images:

Table 1: OECF chart sensor parameters

	Dynamic range (dB)	Signal-To-Noise (dB)
AR0134	56	34
AR0135	61	37

In conclusion, the pixel design improvements make the AR0135 suitable also for applications with large and variable amounts of light, like outdoors, where its predecessor AR0134 displayed under certain circumstances serious image artifacts, like ghosting or fixed pattern.