PMIC For Automotive Surround View Camera Systems

Renesas Electronics' ISL78083 is a highly integrated power management IC (PMIC) that simplifies power supply design for use in multiple HD camera modules, reducing development cycles, bill of materials (BOM) cost and supply chain risks. The automotive camera PMIC accepts direct-from-battery (36-V to 42-V) or power-over-coax (15-V to 18-V) supply sources and supports output currents up to 750 mA per output. This power level offers ample headroom for existing image sensors up to 7-megapixel and future sensors with even higher resolution.

"The innovative ISL78083 PMIC expands Renesas' support for automotive surround view camera systems beyond the image processing capabilities of the R-Car SoC and into the design of the HD satellite cameras," said Niall Lyne, senior director, Automotive Business Unit at Renesas. "Cameras designed with the ISL78083 are smaller and can be conveniently mounted in vehicle locations that provide the desired surround view camera angles without negatively impacting style or aerodynamics."

The feature-rich four-channel ISL78083 automotive camera PMIC includes a primary high-voltage synchronous buck regulator, two secondary low-voltage synchronous buck regulators, and a low-dropout (LDO) voltage regulator. The three buck regulators provide programmable output ranges from 1 V to 5.05 V, and the LDO supports 2.8 V to 3.4 V. With integrated feedback and integrated compensation, all that is left to complete the high efficiency power supply is the output inductor and capacitors (see the figures).

The ISL78083 minimizes BOM cost, requiring seven to ten fewer external components compared to competing solutions. The ISL78083 also features four overvoltage (OV) and four undervoltage (UV) monitors, three power-good indicators and a reset output/fault indicator. A second reference is supplied for the OV/UV monitors.

A 2.2-MHz switching frequency avoids AM band interference and shrinks the required output capacitance and inductance. In addition, an optional spread spectrum feature further addresses EMC/EMI challenges. Other automotive-oriented features include a wettable flank package that improves reliability of solder connections and enables optical inspection of solder joints for lower cost manufacturing; and the part's AEC-Q100 Grade-1 qualification for ambient operation from -40°C to +125°C, and junction temperature operation from -40°C to +150°C.

Mass production quantities of the ISL78083 are available now in a 4-mm x 4-mm, 24-lead SCQFN. For more information on the IC and for an evaluation board, visit the website.

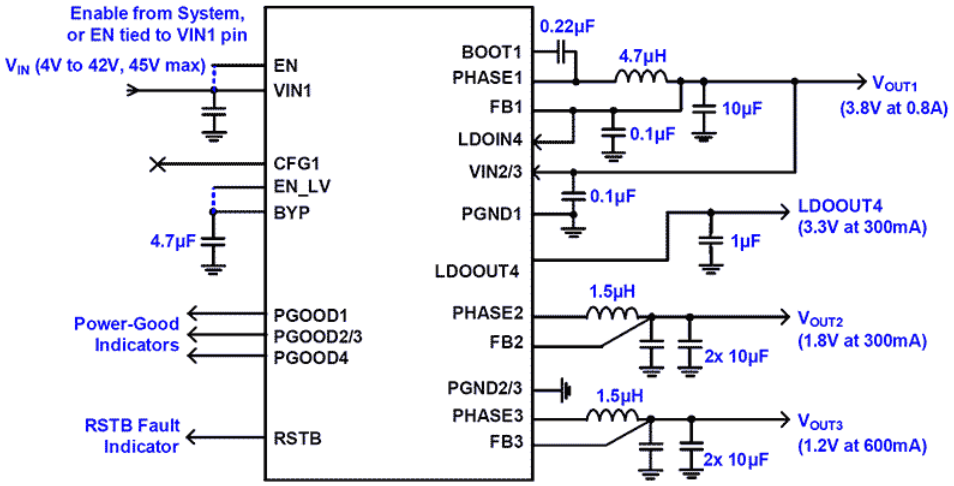

Figure. The highly integrated ISL78083 automotive camera PMIC accepts direct-from-battery (36-V to 42-V) or power-over-coax (15-V to 18-V) supply sources and generates multiple supply rails with up to 750 mA per output. This power level offers ample headroom for existing image sensors up to 7-megapixel and future sensors with even higher resolution.