

## Application Report

# Mobileye EyeQ5 – High Core Rail Power-Supply Design Using TPS59632-Q1 and TPS59603-Q1



Rama Venkatraman, Meir Battan

### ABSTRACT

This document is an Abstract of the complete Application Report, *Mobileye EyeQ5 – High Core Rail Power-Supply Design Using TPS59632-Q1 and TPS59603-Q1*. Please contact your local Texas Instruments representative to access the complete Application Report.

Automotive applications such as Autonomous Driving Assist Systems (ADAS) use ADAS Domain Controller processors such as Mobileye EyeQ5<sup>®</sup>. These are sophisticated processors which require a very high amount of current at very low voltages. These processors also require very fast transient response of the output voltage for step changes in processor load current. Texas Instruments solution for the VCORE Power supply meets this high-current requirement and fast transient response in an efficient, cost-effective manner using the TPS59632-Q1 and TPS59603-Q1 devices.

The TPS59632-Q1 is a three-phase driverless step-down controller with advanced features such as DCAP+<sup>®</sup> control architecture providing very fast transient response, lowest output capacitance, and high efficiency. The device supports I2C for dynamic control of the output voltage, phase management for optimized efficiency and current monitor telemetry. The TPS59632-Q1 controller device is packaged in a 5-mm by 5-mm space saving, thermally-enhanced 32-pin, 0.5-mm pitch QFN with wettable flanks and is rated to operate at a range between –40°C and 125°C. For more information about the TPS59632-Q1 device, see the [TPS59632-Q1 2.5-V to 24-V, 3-, 2-, and 1-Phase Step-Down Driverless Controller for Automotive ADAS Applications Data Sheet](#).

The TPS59603-Q1 MOSFET gate driver is designed specifically to accompany this controller to drive the synchronous buck converter power stage MOSFETs. The TPS59603-Q1 MOSFET gate driver is packaged in a 2-mm × 2-mm, 8-P with WSON Thermal Pad Package and wettable flanks and operates in a temperature range between –40°C to 125°C. For more information about the TPS59603-Q1 device, see the [TPS59632-Q1 2.5-V to 24-V, 3-, 2-, and 1-Phase Step-Down Driverless Controller for Automotive ADAS Applications Data Sheet](#).

Both the TPS59632-Q1 and TPS59603-Q1 devices are AEC Q-100 qualified to support the automotive applications.

The Application Report provides an overview of the D-CAP+<sup>®</sup> Technology, a detailed Design Procedure, a Reference Design, and Bill of Material (BOM), test results and layout guidelines to easily develop a solution to meet the VCORE power needs of the Mobileye EyeQ5<sup>®</sup> High processor so that the Texas Instruments solution can be adapted for any particular requirements as demanded by the end-user.

Please contact your local Texas Instruments representative to access the complete Application Report.

---

### Trademarks

EyeQ5<sup>®</sup> are registered trademarks of Mobileye.

DCAP+<sup>®</sup> and D-CAP+<sup>®</sup> are registered trademarks of Texas Instruments.

All other trademarks are the property of their respective owners.

## IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on [ti.com](http://ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2022, Texas Instruments Incorporated