Freescale programmable solenoid controller reduces emissions, improves engine efficiency

January 15 2014

Governments worldwide have issued regulations requiring automakers to improve fuel efficiency and meet new emissions standards over the next five to ten years. To help automakers and their suppliers comply with these requirements, Freescale Semiconductor today announced the MC33816 programmable solenoid controller, designed to reduce emissions and improve fuel efficiency for both gasoline and diesel direct fuel injection engines. The flexible architecture is also applicable for driving dual clutch transmissions, as well as precision solenoids in factory automation applications.

The MC33816 programmable solenoid controller embeds intelligence with four integrated μCores, enabling four parallel tasks to run independently of the main system microcontroller. The result is a response time up to 16x faster than traditional architectures, thereby improving engine efficiency with precise fuel delivery that reduces unnecessary fuel use.

The device's functional integration enables substantial bill-of-materials reductions, and provides the flexibility and scalability necessary to be easily integrated into virtually any engine system, including gasoline, diesel, flex-fuel and even LNG engines, regardless of the number of cylinders.

"Increasingly stringent fuel efficiency standards require highly advanced analog technologies like the intelligent MC33816 device," said James Bates, senior vice president and general manager for Freescale's Analog

and Sensors business. "This new programmable solenoid controller can help automotive OEMs and their suppliers meet efficiency and emissions goals, while providing a reliable, high-performance system solution that supports advanced diagnostic functionality, faster response times, and optimal programmability."

The intelligent MC33816 controller additionally provides embedded encryption and microcode protection to inhibit reverse engineering and help safeguard system IP and software.

Additional features include:

- 9-32 V continuous supply, 5.5-58 V transient
- Up to 72 V pre-driver operating range
- Precision peak and hold drive capability
- Integrated DC-DC boost converter control circuitry
- Choice of four programmable slew rates 12.5 V/uS – 300 V/uS
- 10 x 10 mm 64-pin LQFP-EP package

Freescale provides hardware and software to support the MC33816 programmable solenoid controller. The KIT33816AEEVM evaluation board allows utilization of the controller's functions and is available now at www.freescale.com/KITMC33816 for a price of $216 (USD). To demonstrate the embedded functions of the MC33816 programmable solenoid controller, software with SPI generator (SPIGen) can be downloaded at www.freescale.com/analogtools.

The MC33816 programmable solenoid controller is available now at www.freescale.com/psc for a suggested resale price starting at $3.06 (USD) in 100K quantities. Please contact Freescale Sales for additional quantities.

Freescale will demonstrate several automotive solutions in booth # West

1-19 at the CAR-ELE Japan 2014 event in Tokyo, January 15-17. The MC33816 programmable solenoid controller demo will show the intelligent pre-driver IC for the direct injection engine.

Provided by Freescale Semiconductor