Analog, Mixed-Signal and Power Management

MM912_P812

S12P Multifunctional Ignition and Injector Driver

Features

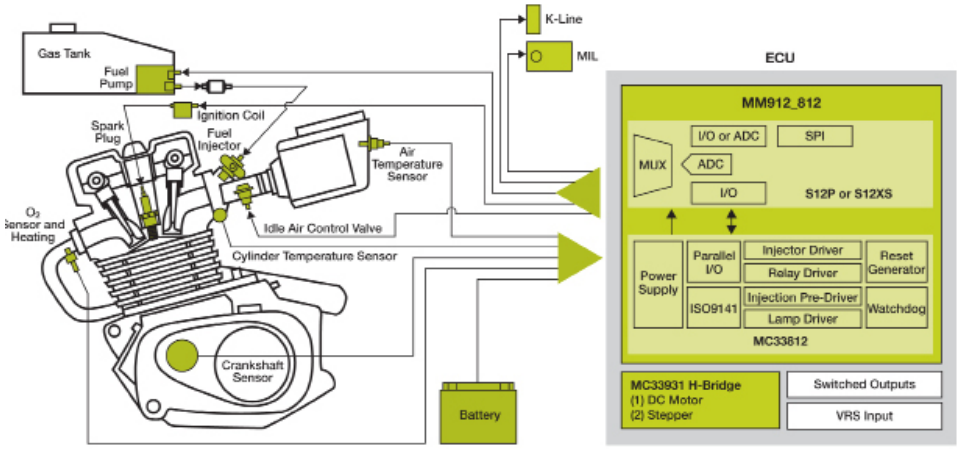
- Small Engine Control
- Lawn Mowers
- Scooters
- Motorcycles
- Lawn Trimmers
- Snow Blowers
- Chain Saws
- Gas-driven Electrical
- Generators
- Outboard Motors

Overview

The MM912_P812 is an analog IC and MCU (S12P) in one package for motorcycle and other single/dual cylinder small engine control applications. The IC reduces design complexity, bill of materials and manufacturing cost while helping to shorten the customer's time to market.

The IC integrates a voltage regulator, fuel injector driver and ignition pre-driver along with relay driver, lamp driver and watchdog timer / reset generator specifically targeted for small engine Engine Control Units (ECUs) and other S12 family MCU applications.

MM912_P812 Small Engine System Controls



Features

- Core: S12P, Flash Memory: 96K/128K
- VCC voltage pre-regulator provides +5.0 V power for the MCU
- MCU Power-On-RESET (RESET) generator, MCU watchdog timer circuit with parallel refresh/time setting line
- Designed to operate over the range of 4.7 V ≤ VPWR ≤ 36 V
- Interfaces directly to MCU using 5.0 V parallel interface
- Fuel injector driver - current limit - 4.0 A typical
- Ignition pre-driver can drive IGBT or Darlington bipolar junction transistor
- Ignition pre-driver has independent high and low side outputs
- Relay/injector/fuel pump driver - current limit - 4.0 A typical
- Lamp driver - current limit - 1.5 A typical
- All external outputs protected against short to battery and over-current
- All drivers protected against over-temperature
- ISO-9141 K-Line transceiver for communicating diagnostic messages
- Independent fault annunciation outputs for ignition, injection and relay
- All signal lines are accessible
- Also available with the MC9S12XEP100 MCU for calibration
- Allows one package ECU for minimum PC Board area

Benefits

- Increased fuel efficiency when converting from a mechanical system to an electrical system
- Improved emissions using electrical system of this IC compared to a mechanical system
- Easiest way to interface a micro controller to DC loads
- Simplified system design
- Reduced board space
- Reduce number of components
- Enhanced reliability

Performance

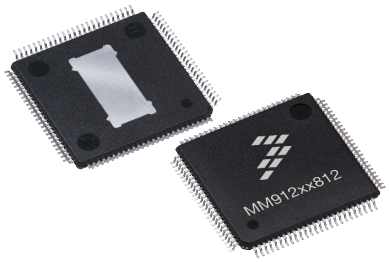
Parametric	Typical Values
Output Type	3 Low-side Drivers, 1 Pre-driver, ISO9141 K-Line Bi-directional
R_{DSON} @ 25 °C	0.2 Ohms
Operating Voltage (fully operational)	4.7 to 36 V
Continuous Current (minimum)	2.0 A for Injector Driver (1.0 A for lamp driver)
Control	Parallel
ESD, Human Body Model	±2000 V
Ambient Operating Temperature (T_A)	40 °C to 125 °C

Protection

Protection	Detect	Limiting	Shut Down	Auto Retry	Status Reporting
Over-voltage	•		•	•	
Over-current/ SC	•	•	•		•
Over-temperature	•		•	•	•
Open Load	•				•

Questions

- Are you designing an application for a small engine?
- Is your local government planning to issue environmental regulations for small engines?
- Are you planning to move from a mechanical to an electrical engine control system?
- Do you need a reference design for a transition from mechanical to an electrical engine control system?
- Is the space limited in your current electronically controlled small engine?
- Do you want to consolidate/integrate multiple functions into a single IC?Independent fault annunciation outputs for ignition, injection and relay
- All signal lines are accessible
- Also available with the MC9S12XEP100 MCU for calibration
- Allows one package ECU for minimum PC Board area



100pin LQFP-EP
98ASA00371D

Orderable Part Numbers

Part Number	Core	Memory	Temp Range (Ambient)	Package
MM912IP812AMAF	S12P	96k	-40 to 125 °C	100 pin LQFP-EP
MM912JP812AMAF		128k		

Documentation

Document Number	Title	Description
MM912_P812	S12P MCU and Multifunctional Ignition and Injector Driver System in a Package (SiP)	Data Sheet
SG1002	Analog, Mixed Signal and Power Management	Selector Guide
SG187	Automotive	Selector Guide

Development Tools

Part Number	Description
KIT912P812ECUEVM	S12P Reference Design with BDM multi-link.
MC9S12XEP100	Calibration Board (Contact Sales for Availability)

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