

MC33810

Eight Channel Ignition and Injector Driver

Applications

Engine control applications for:

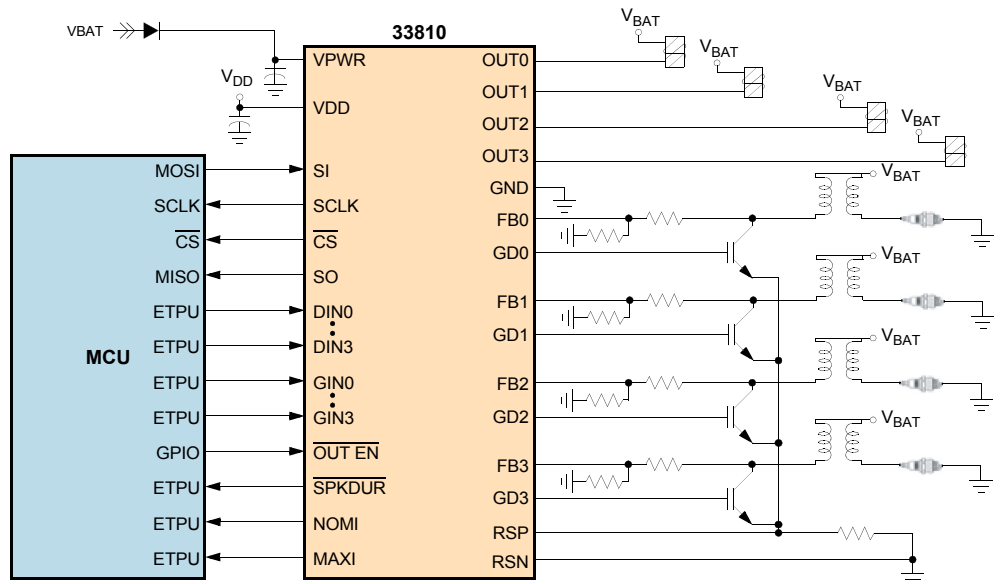
- Automobiles
- Motorcycles
- Industrial engines
- Generators
- Marine systems
- Recreational vehicles

Overview

Every new car that is produced requires an ignition and injector control module. Freescale's eight channel ignition and injector driver integrated circuit (IC) is one of the major components for this module. The MC33810 is one of the first combinational ICs to offer both injection and ignition spark control in one tiny package. This solution significantly reduces the number of parts in a modern engine control unit, thus reducing the size, inventory costs and the complexity of the engine controller. The end result is a decrease in manufacturing costs, while helping to protect against common failure conditions for reliability.

The MC33810 is a four channel low side driver and a four channel Insulated Gate Bipolar Transistor/Metal Oxide Semiconductor Field Effect Transistor (IGBT/MOSFET) pre-driver. The low side drivers are designed to drive fuel injectors directly. The pre-drivers can drive IGBTs to drive individual ignition spark coils or serve as general purpose MOSFET pre-drivers with PWM capability. The MC33810 provides an interface between the MCU and the ignition and injection functions of a typical four cylinder gasoline engine. It can be used in applications such as automobiles, motorcycles, industrial engines, generators, marine and other recreational vehicles.

MC33810 Simplified Application Drawing



Performance	Typical Values
Low side outputs (Injectopr)	4
IGBT/General Purpose FET Driver	4
Low side $R_{\text{DS(on) max}}$	0.2 Ω
Operating voltage	4.5 to 36 V
Control/communication	SPI and parallel

Features

- Four injector low side drivers
- Pre-drivers with three different modes:
 - Ignition
 - General purpose gate drive
 - Ten cylinders
- Ignition current and spark detection with programmable thresholds
- MCU SPI and parallel interface
- Power supply/oscillator/band gap reference/POR
- Diagnostic and error detection logic
- Self protection for:
 - Shorts to battery
 - Overcurrent
 - Overtemperature
- Low power (30 μ A) “sleep mode”

Benefits

- Highly integrated solution minimizes need for additional external discrete components
- Reduced parts count
- Reduced manufacturing and test cost
- Reduced current consumption lowers battery drain during key off
- Small footprint, reduces printed circuit board area
- Simple MCU interface
- Helps to protect against common failure conditions

Questions

- What number of cylinders need to be controlled?
- What is the current/power requirement of the injectors?
- What type of driver is to be used with the four predrivers, IGBT or MOSFET?
- What is the required input control method for each load, parallel or serial?
- What type of fault detection and annunciation is required?
- Do any of the loads require Pulse Width Modulation (PWM)?
- Is overlapping dwell times a requirement?
- Are there any specific overcurrent requirements for each load?
- For each load is shutdown a requirement for overvoltage, overcurrent or overtemperature?

Protection

Protection	Detect	Limiting	Shutdown	Status Reporting
VPWR Overvoltage	•		•	
VPWR Undervoltage	•		•	
Coil Overcurrent	•	•		•
Output SC	•	•	•	•
Open Load	•			•
Overtemperature	•	•	•	•

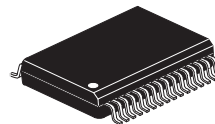
Device	Temperature range (TA)	Package
MCZ33810EK/R2	-40 °C \leq T _A \leq 125 °C	32 SOICW-EP

Development Tools

Part Number	Description
KIT33810EKEVME	Evaluation board to demonstrate the key features of MC33810

Documentation

Document Number	Title	Description
MC33810	Data Sheet	Eight Channel Ignition and Injector Driver
SG1002	Selector Guide	Analog Product Selector Guide
SG187	Selector Guide	Automotive Product Selector Guide
AN2409	Application Note	Small Outline Integrated Circuit - Fine Pitch Package (SOIC)



**EK SUFFIX (Pb-FREE)
98ASA10774D
32 PIN SOICW EP**

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