

# MC33742

## System Basis Chip (SBC) with Enhanced High-Speed CAN Transceiver

Power  
Management

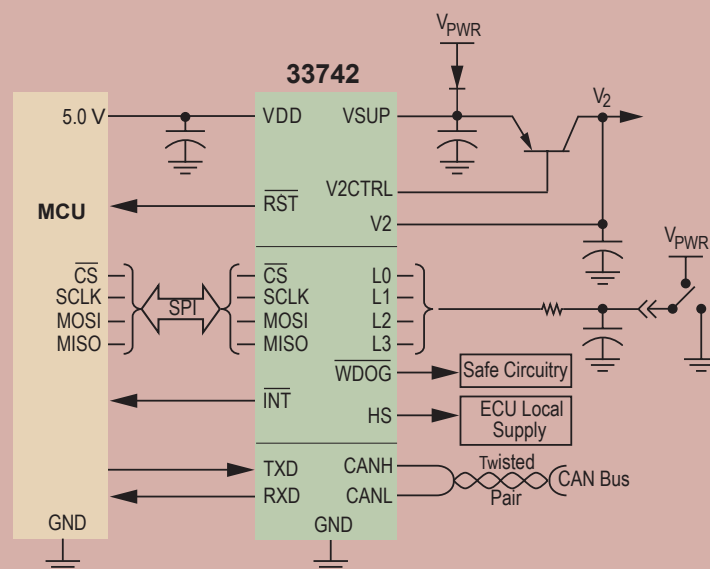
Linear  
Regulators

### DESCRIPTION

The 33742 and the 33742S are SPI-controlled System Basis Chips (SBCs) combining many frequently used functions along with a CAN 2.0-compliant transceiver, used in many automotive electronic control units (ECUs). The 33742 SBC has a fully protected fixed 5.0 V low dropout internal regulator with current limiting, overtemperature pre-warning, and reset. A second 5.0 V regulator can be implemented using external pass PNP bipolar junction pass transistor driven by the SBC's external V2 sense input and V2 output drive terminals.

The SBC has four main operating modes: Normal, Standby, Stop, and Sleep mode. Additionally there is an internally switched high-side power supply output, four wake-up inputs terminals, a programmable window watchdog, interrupt, reset, and a SPI module for communication and control. The High-Speed CAN 2.0 A/B transceiver is available for inter-module communication.

### 33742 SIMPLIFIED APPLICATION DIAGRAM



### APPLICATIONS

- Aircraft Systems
- Automotive Systems
- Robotic Systems
- Industrial Actuator Control
- Marine Applications
- Automotive Electronic Control Units including a High-Speed CAN.

## FEATURES

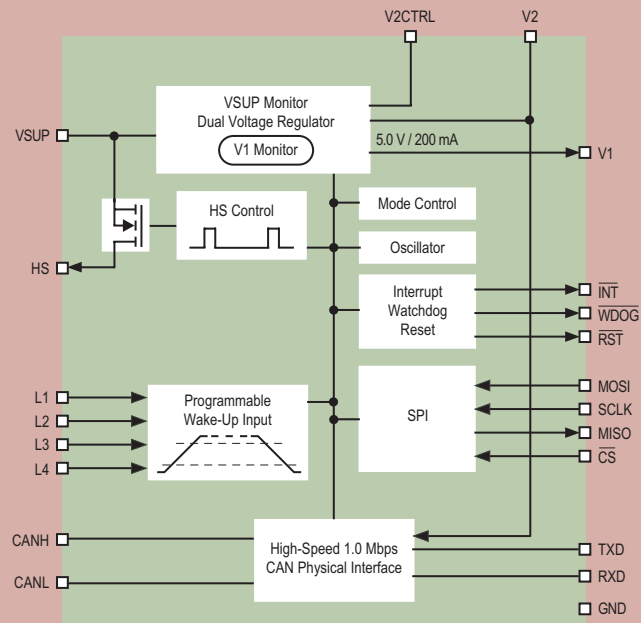
- High-Speed 1.0 Mbps CAN interface with bus diagnostic capability (detection of CANH and CANL short to ground, to V<sub>DD</sub>, and to V<sub>SUP</sub>)
- Low-drop voltage 5.0 V, 200 mA V<sub>DD</sub> Regulator with current-limiting, overtemperature pre-warning, and output monitoring with reset
- Additional 5.0 V regulator with external series pass transistor
- Normal, standby, stop, and sleep modes with low sleep and stop mode current
- 150 mA high-side switch output for control of external circuitry
- Four external wake-up inputs
- Software-programmable watchdog window, interrupt, and reset
- Additional devices available for comparison in Analog Product Selector Guide, SG1002 and the Automotive Product Selector Guide, SG187.

PERFORMANCE	TYPICAL VALUES
Operating Voltage	5.5 V – 18 V
Data Rate	1.0 Mbps
Internal 5.0 V Regulator	200 mA
External 5.0 V Series Regulator	200 mA
Supply Current with CAN Wake-Up Enabled	
Supply Current in Sleep Mode, CAN in Sleep State with CAN Wake-Up Enabled	53 + 12 = 65 $\mu$ A
Supply Current in Stop Mode, CAN in Sleep State with CAN Wake-Up Enabled	80 + 12 = 92 $\mu$ A
Operating Temperature	– 40°C $\leq$ T <sub>A</sub> $\leq$ 125°C

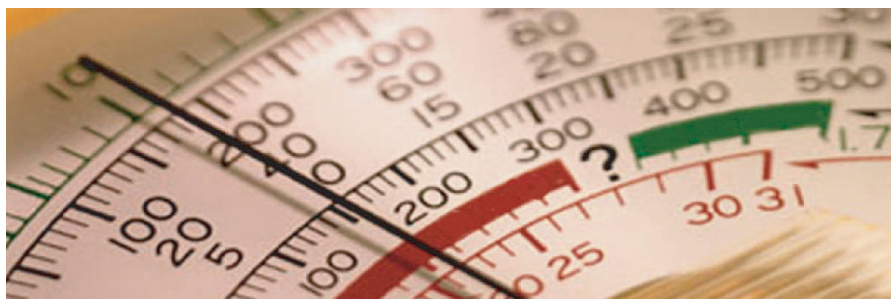
## CUSTOMER BENEFITS

- Standby current consumption reduced
- Flexible wake-up conditions and watchdog function
- Innovative CAN high-speed diagnostic with failure mode sent to the MCU through SPI interface
- Simple system design with direct interfacing to a microprocessor
- Reduced PC board space resulting in enhanced application reliability
- Economical solution with an optimized performance/cost ratio
- Simplified MCU power supply design with internal safety features and output voltage supervisory circuits
- Freescale offers a complete line of compatible system basis chips with transceivers.

## 33742 INTERNAL BLOCK DIAGRAM



PROTECTION	DETECT	SHUT DOWN	LIMITING	AUTO RETRY	STATUS REPORTING
VDD					
Undervoltage	●				
Overtemperature	●		●	●	●
Overcurrent	●	●			●
Short Circuit	●	●			
V2			●		
Undervoltage	●				
HS					
Overtemperature	●		●		●
Overcurrent		●			
CAN Bus Fail Detection					
CANH/L Short-to-Battery	●	●		●	●
CANH/L Short-to-Ground	●	●		●	●
CANH/L Short-to-V <sub>DD</sub>	●	●		●	●
Battery Line					
Undervoltage	●				●
Battery Disconnect	●				●



## QUESTIONS

- Are you looking for a complete, easy-to-design power supply solution for your embedded system?
- Do you need an advanced microcontroller power supply with power sequencing and supervisory functions?
- What voltage (5.0 V or 3.3 V) does your microcontroller need?
- What type of CAN (high/low speed) do you need?
- Do you need several power supplies?
- Do you need a fully protected low drop series pass regulator?
- Would you like to monitor BUS failure during a high-speed CAN communication?
- Do you want to reduce your application current consumption in standby mode?
- How many wake-up inputs do you need?
- Do you need a watchdog with independent reset/interrupt capability?

## ORDERING INFORMATION

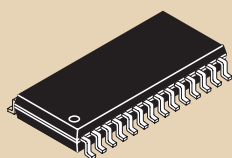
Device	Temperature Range (T <sub>A</sub> )	Package
**33742DW/R2	- 40°C to 125°C	28 SOICW
**33742SDW/R2		

Data Sheet Order Number MC33742

\*\*Prefix Index:

PC = Engineering Samples; MC = Production

Contact Sales for Evaluation and Kit Availability



28 SOICW  
1.27 mm Pitch  
18.0 mm x 7.5 mm Body

*Communicating*

*Protecting*

*Controlling*