



ANALOG PRODUCTS

MC33989 FACT SHEET

APPLICATIONS

- Aircraft Systems
- Automotive Systems
- Robotic Systems
- Farm Equipment
- Industrial Actuator Control
- Marine Applications

33989 SYSTEM BASIS CHIP (SBC) WITH HIGH-SPEED CAN

An SBC device is a monolithic IC combining many functions repeatedly found in standard microcontroller based systems; e.g., protection, diagnostics, communication, and power.

The 33989 is an SBC having a fully protected fixed 5.0 V low-drop regulator with current limit, over-temperature pre-warning, and reset.

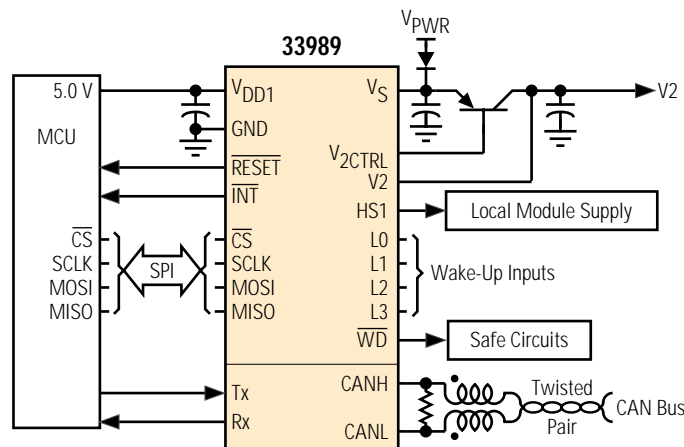
An output drive with sense input is also provided to implement a second 5.0 V regulator, using an external PNP transistor, that is external-resistor-ratio-adjustable to meet peripheral needs.

The 33989 has normal, standby, stop, and sleep modes, an internally switched high-side power supply output with four wake-up inputs, programmable window watchdog, interrupt, reset, SPI input control, and a high-speed CAN transceiver compatible with CAN 2.0 A and B protocols for module-to-module communication.

The combination is an economical solution for power management, high-speed communication, and control in MCU-based systems.

POWER MANAGEMENT
LINEAR REGULATOR

Simplified Application Diagram



FEATURES

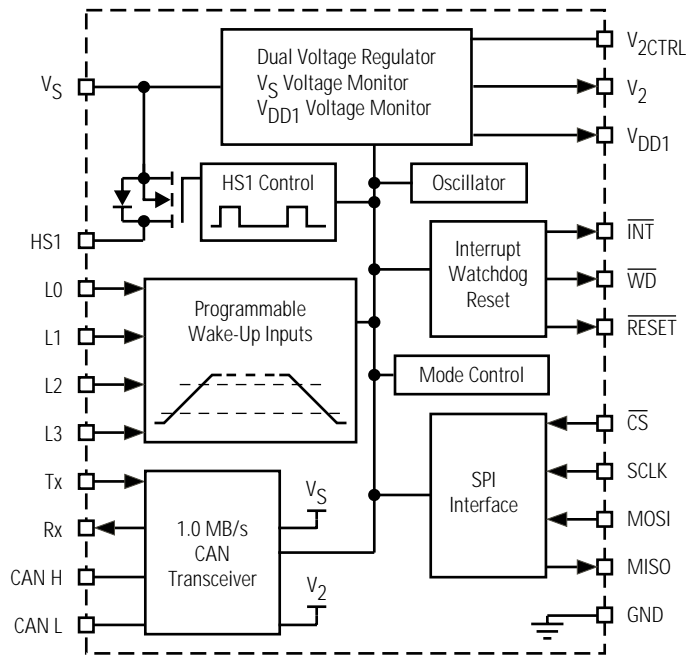
- Low-drop voltage regulator with current-limiting, over-temperature pre-warning, and output monitoring with reset
- Adjustable external series pass PNP regulator
- Normal, standby, stop, and sleep modes with 60 to 130 μA sleep and stop mode current (configuration dependent)
- High-speed 1.0 MB/s CAN interface compatible with CAN 2.0 A and B protocols, with specific CAN pattern wake-up
- 150 mA switched V_{BAT} output for control of external circuitry
- Four external wake-up inputs, associated with VBAT
- V_{BAT} monitoring and failure detection
- 40 V transient survivability
- Software programmable watchdog window, interrupt, and reset
- Multiple wake-up modes: CAN, wake-up inputs, internal device timer, and CSB (stop mode) via MCU
- Additional devices available for comparison in Analog Selector Guide SG1002/D

CUSTOMER BENEFITS

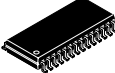
- Provides complete MCU power management solution with few components
- CAN and SPI interface
- Internal wake-up and watchdog function
- Motorola offers a complete line of compatible system basis chips with transceivers
- Simple system design with direct interfacing to a microprocessor
- Reduced PC board 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

Performance	Typical Values
Operating Voltage	5.5 – 27 V
Data Rate	1.0 MB/s
Internal 5.0 V Reg	200 mA
External 5.0 V Series Reg	User Defined
Sleep & Stop Current	60/120 μA
Operating Temp	$-40^{\circ}\text{C} \leq T_{\text{A}} \leq 125^{\circ}\text{C}$

33989 Internal Block Diagram

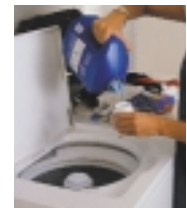
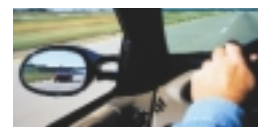


Protection	Detect	Limiting	Shut Down	Status Reporting
V1:				
Under Voltage	•		•	
Over Temperature	•		•	•
Over Current	•	•		
Short Circuit	•	•		
V2:				
Under Voltage	•			•
HS1:				
Over Temperature	•		•	•
Over Current		•		
CAN Bus Failure:				
H&L Over Current	•	•		•
H&L Over Temperature	•	•		•
Supply Line:				
Under Voltage	•			•
Disconnect	•			•

Ordering Information	Package	Ship Method	Motorola Part Number
	28 SOICW	Rail T/R	**33989DW **33989DWR2
Data Sheet Order Number			MC33989/D
Contact Sales for Evaluation Kit Availability			
**Prefix Index: PC = Eng Samples; XC = In Qual; MC = Production			

QUESTIONS

- 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?
- How many wake-up inputs do you need?
- Do you need a watchdog with independent reset/interrupt capability?
- 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?



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MC33989FS/D
Rev. 1

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