

**APPLICATIONS**

- Aircraft Systems
- Automotive Systems
- Robotic Systems
- Farm Equipment
- Industrial Controls
- Marine Applications

**33889 SYSTEM BASIS CHIP (SBC) WITH LOW-SPEED FAULT TOLERANT CAN**

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

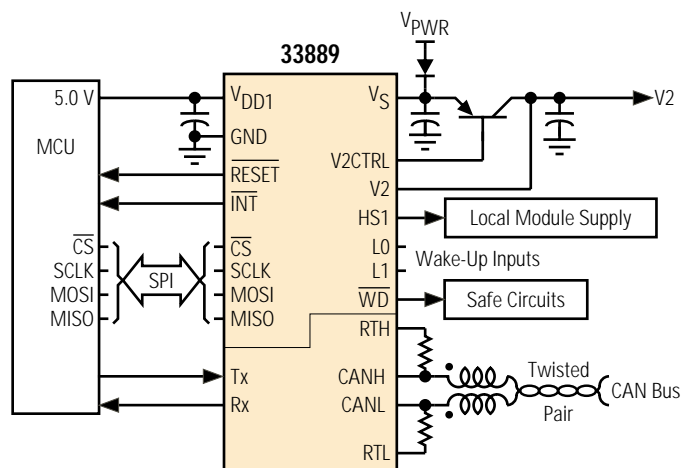
The 33889 is an SBC having a fully protected fixed 5.0 V low drop-out regulator with current limit, over-temperature pre-warning, and reset.

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

The 33889 has Normal, Standby, Stop, and Sleep modes; an internally switched high-side power supply output with two wake-up inputs; programmable window Watch-dog; Interrupt; Reset; SPI input control, and low-speed fault tolerant 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.

Simplified Application Diagram



## FEATURES

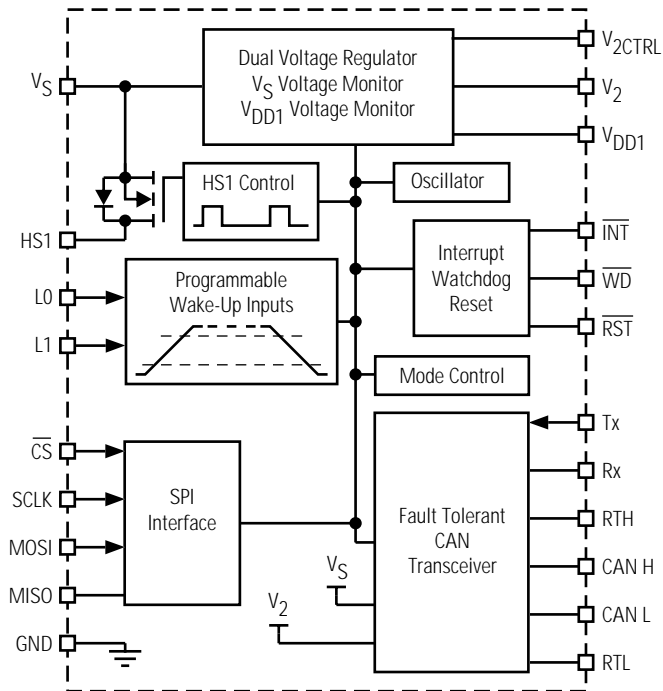
- Low drop-out voltage regulator with current limiting, over temperature pre-warning, and output monitoring with reset
- Adjustable external series pass PNP regulator
- Normal, Standby, Stop and Sleep modes separate from CAN interface modes
- Low-speed 125 kB/s fault tolerant CAN interface, compatible with 33388 stand-alone physical interface
- 150 mA switched  $V_{PWV}$  output for control of external circuitry
- Two external wake-up inputs, associated with switched  $V_{PWV}$
- Low standby and sleep current
- $V_{PWV}$  monitoring and  $V_{PWV}$  failure detection
- 40 V maximum transient voltage
- Software-programmable watchdog window, interrupt, and reset
- Multiple wake-up modes
- SPI interface to MCU
- Additional devices available for comparison in Analog Selector Guide SG1002/D

## CUSTOMER BENEFITS

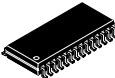
- Provides complete MCU power management solution with few components
- CAN and SPI interface
- Internal wake-up and watchdog function
- Motorola offers a complete line of compatible system basis chips with transceivers
- Simple system design with direct interfacing to a microprocessor
- Reduced PC board 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	125 kB/s
Internal 5.0 V Reg	200 mA
External 5.0 V Series Reg	User Defined
Sleep/Stop Current	60/120 $\mu$ A
Operating Temp	$-40^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$

### 33889 Internal Block Diagram

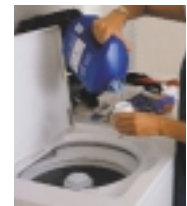
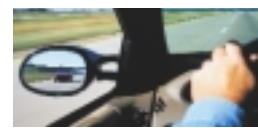


Protection	Detect	Limiting	Shut Down	Auto Retry	Status Reporting
$V_{DD1}$ :					
Under Voltage	•				
Over Current/SC	•	•			
Over Temperature	•		•	•	•
$V_2$ :					
Under Voltage	•				•
HS1:					
Over Current	•	•			
Over Temperature	•		•	•	•
CAN Bus Failure:					
H-wire disconnect	•			•	•
L-wire disconnect	•			•	•
H short-to-battery	•	•		•	•
L short-to-battery	•	•		•	•
H short-to-ground	•	•		•	•
L short-to-ground	•	•		•	•
H-to-L short	•	•		•	•
H short-to- $V_{DD}$	•			•	•
Over Temperature	•		•	•	
Supply Line:					
Under Voltage	•				•
Disconnect	•				•

Ordering Information	Package	Ship Method	Motorola Part Number
	28 SOICW	Rail T/R	**33889DW **33889DWR2
Data Sheet Order Number			MC33889/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-out 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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