ANALOG PRODUCTS

PC33689 FACT SHEET

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POWER MANAGEMENT
LINEAR REGULATOR

PC33689 SYSTEM BASE CHIP WITH LIN TRANSCEIVER

A System Base Chip (SBC) is a monolithic IC combining many functions found in standard microcontroller based systems. i.e., power management, communication interface, system protection, diagnostics, etc.

APPLICATIONS

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

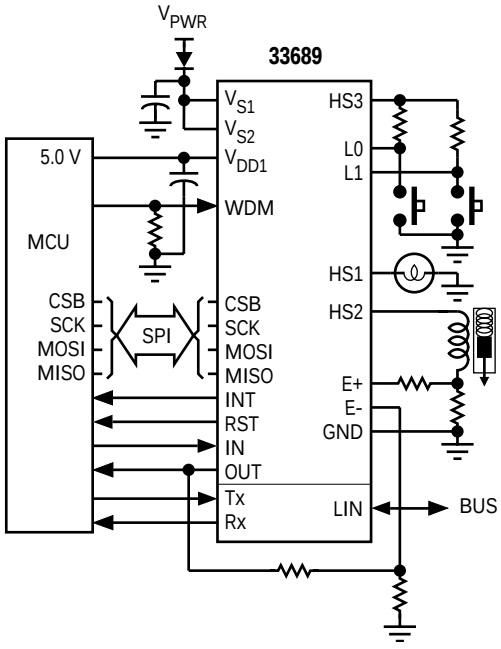
The PC33689 is a SPI controlled SBC combining many functions with a LIN transceiver for slave node applications. The PC33689 has a 5.0 V, 60 mA regulator with under voltage reset, output current limiting, over temperature pre-warning, and thermal shutdown. An externally selectable timing Window Watchdog is also included.

The LIN transceiver has wave shaping that can be disabled when high data rates are warranted.

A single 50 mA and two 150 mA fully protected, high side switches with output clamping are available for switching inductive or resistive loads. The 150 mA switches are PWM capable.

Two high voltage inputs can be used to monitor switches or provide external wake-up. An internal sense amplifier is available for load current monitoring.

Simplified Application Diagram



The PC33689 has three operational modes:

- Normal (all functions available)
- Sleep (V_{DD} OFF, Wake-up via LIN Bus or Wake-up inputs)
- Stop (V_{DD} ON allowing Wake-up via MCU, LIN Bus, or Wake-up inputs)

PERFORMANCE	TYPICAL VALUES
Operating Voltage	5.5 – 27 V
Data Rate	10 kB/s to 100 kB/s
Internal 5.0 V Regulator	80 mA
Max HS1 & HS2 Current	150 mA
Sleep/Stop Current	60/120 µA
Operating Temp	-40°C ≤ T_A ≤ 125°C

FEATURES

- 5.0 V Output with Reset and Over Temperature Pre-Warning and Shutdown
- SPI Control at Frequencies up to 4.0 MHz
- Selectable Timing Window Watchdog
- Normal, Sleep, and Stop Operating Modes
- Wake-up via MCU/SPI, LIN, or Wake-Up Inputs
- Interrupt Output for Over Temperature, Over Voltage, and Stop Mode Wake-Up Reporting
- One 50 mA Fully Protected, High Side Switch with Output Clamping
- Two 150 mA, PWM Capable, Fully Protected, High Side Switches with Output Clamping
- Internal Current Sense Amplifier
- LIN Transceiver capable of up to 100 kB/s with Waveshaping Disabled
- LIN Bus Pin Capable of 4.0 kV ESD

Protection	Detect	Shut Down	Limiting	Status Reporting
V_{PWR}:				
Over Voltage	•			SPI
Under Voltage	•			SPI & INT
V_{DD}:				
Under Voltage	•			Reset
Over Current Limiting	•		•	
Over Temperature Pre-warning	•			SPI & INT
Over Temperature Shutdown	•	•		
HS1, HS2, and HS3:				
Over Current	•		•	
Over Temperature	•	•		SPI & INT
LIN Interface:				
Over Temperature	•	•		
Bus Short	•		•	

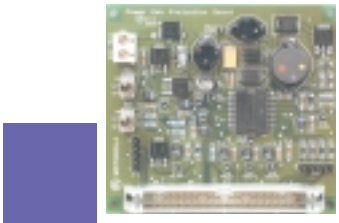
CUSTOMER BENEFITS

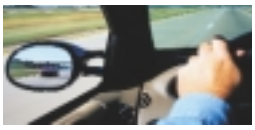
- Provides complete MCU power management solution with few components
- Low power stop mode regulator with monitoring
- Supports operation with input supply voltage down to 4.5 V
- Low power mode flexibility and wake up options
- LIN and SPI interfaces
- Software watchdog function and external safe circuitry for automatic activation
- Two wake up inputs for system use
- Reduced PC board space resulting in enhanced application reliability
- Motorola offers a complete line of compatible System Basis Chips with transceivers

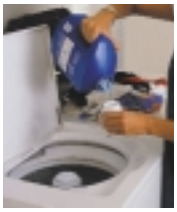
Ordering Information	Package	Ship Method	Motorola Part Number
	32SOICW	Rail	PC33689DW
	Fine Pitch	T/R	PC33689DWR2
	Data Sheet Order Number		MC33689/D

QUESTIONS

- Are you using a LIN communication system?
- Do you need a LIN transceiver with microcontroller support features in a single package?
- Do you need a design solution for a LIN node capable of high-side PWM controlling loads in addition to providing power management functions for the microcontroller?
- Do you need a LIN transceiver, with watchdog and wake-up inputs in support of the microcontroller?







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