



ANALOG PRODUCTS

MC33394 FACT SHEET

APPLICATIONS

- Automotive Control Module Supply
- Communications and Networking
- Industrial Control Module Supply
- Set Top Boxes
- xDSL Module Supply

33394 MULTIPLE OUTPUT POWER SUPPLY

The 33394 is a monolithic multi-output power supply IC with a high-speed CAN transceiver. It incorporates a step-up/step-down switching pre-regulator that operates with an input voltage of 4.0 V to 26.5 V. The 33394 tolerates transient voltages of 45 V.

The low drop-out linear regulators provide different output voltages to power the microcontroller core and I/O, FLASH memory, sensors, and other circuitry.

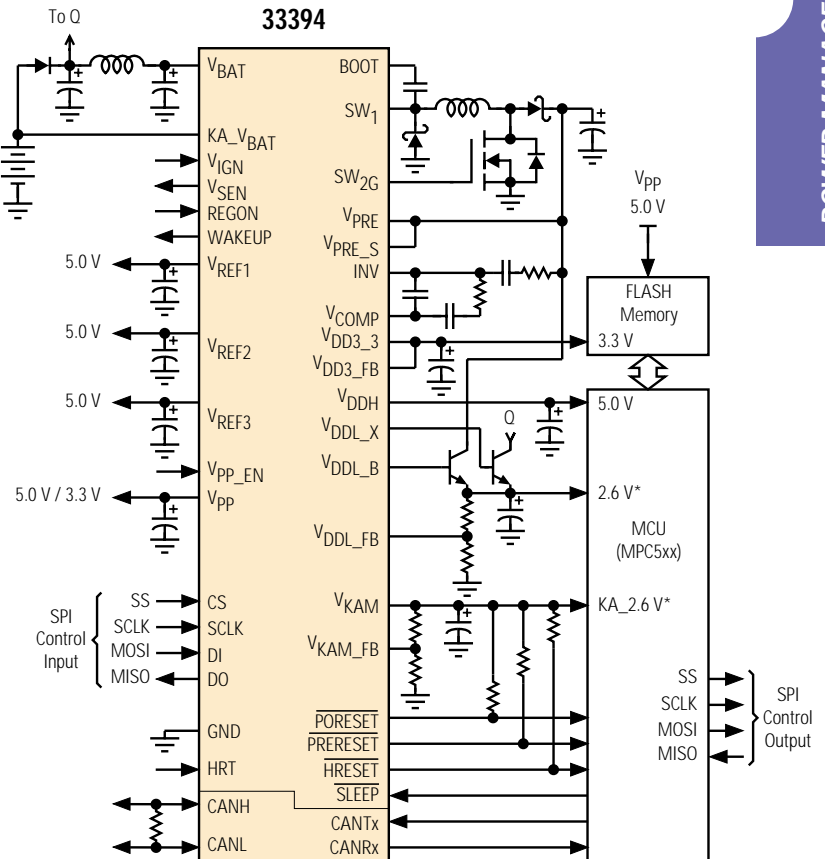
Active reset circuitry protects the data coherency of the microcontroller any time one of the three microcontroller voltages goes out of regulation.

Power sequencing circuitry guarantees core supply voltages to be within limits and polarities during power-up and power-down.

The high-speed CAN physical interface is compatible with microcontroller CMOS outputs. The CAN bus drivers are short circuit protected and tolerant of loss of battery or ground.

The 33394 meets the needs of modules using advanced 32-bit microprocessors like those of the Motorola MPC5xx and MPC824x microcontroller families.

Simplified Application Diagram



NOTE: *The V_{DD1} and V_{KAM} output voltages of the 33394 can be adjusted by changing the external FB resistor ratios.

POWER MANAGEMENT SWITCHING

FEATURES

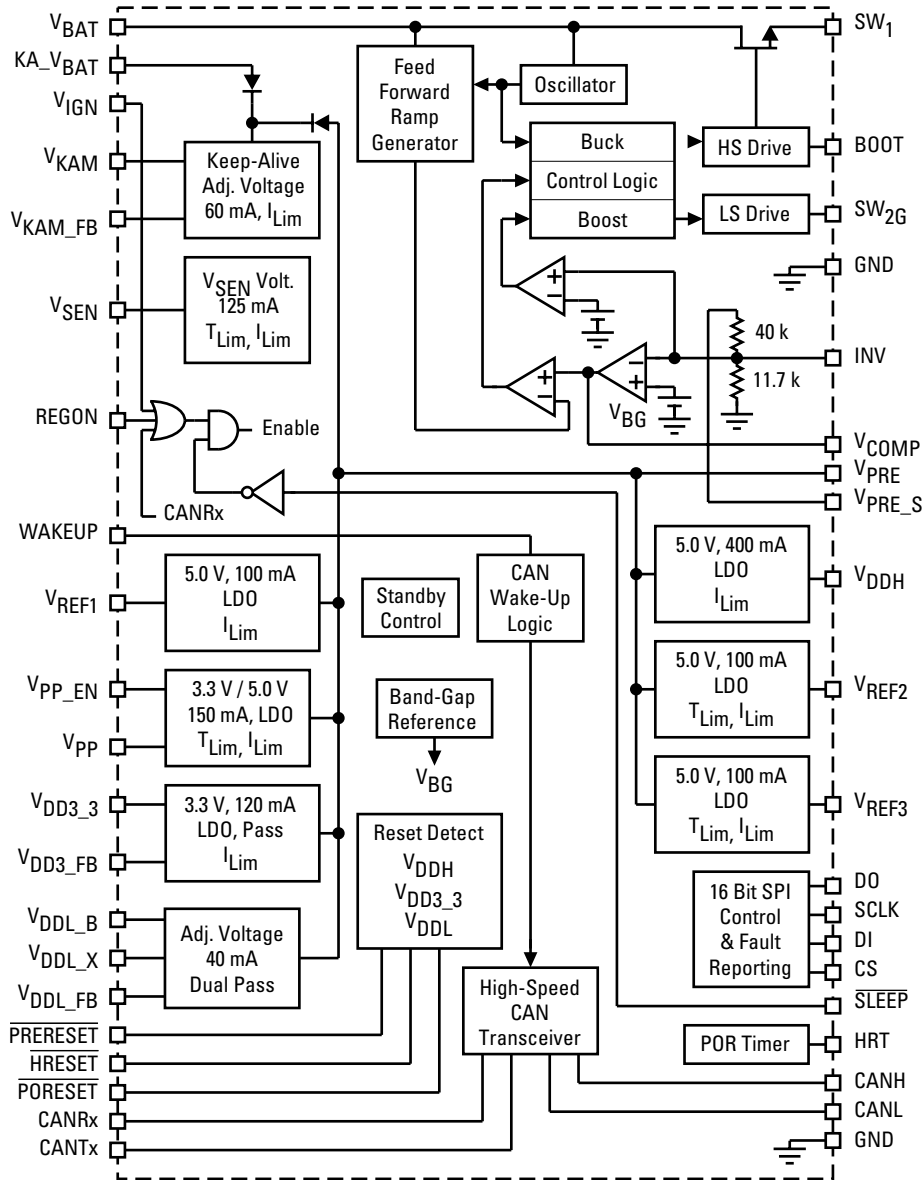
- Step-up/step-down switching pre-regulator
- Multiple linear regulators with current limiting
- Adjustable low-voltage linear regulator with external pass transistor
- Adjustable low-power keep-alive linear regulator
- Three sensor supplies (short-to-battery and ground protected)
- $\overline{\text{SLEEP}}$ and REGON control pins
- Reset and Power-ON reset signals
- Serial peripheral interface for control and diagnostic
- High-speed CAN transceiver with wakeup capability
- Accurate power sequencing for advanced microprocessors
- Additional devices available for comparison in Analog Selector Guide SG1002/D

CUSTOMER BENEFITS




- Low overall system cost, optimized performance/cost ratio
- Provides complete system supply solution
- Simplified microprocessor power supply design due to proper power sequencing
- Easily used in non-microprocessor applications
- High-frequency switching converter improves power efficiency and eliminates need for heat sinking
- Internal safety features with output voltage supervisory circuits

Performance	Typical Values
Operating Voltage	4.0 V to 26.5 V
Output Voltages:	
Buck Converter	
V_{DDH}	5.0 V ($\pm 2\%$) @ 400 mA
$V_{\text{DD3.3}}$	3.3 V ($\pm 2\%$) @ 120 mA
Linear Regulator	
V_{DDL} (Adjustable)	2.6 V ($\pm 2\%$) @ 400 mA
Standby	
V_{KAM} (Adjustable)	2.6 V ($\pm 2\%$) @ 50 mA
FLASH Programming	
V_{pp} SPI Programmed	3.3 V ($\pm 0.8\%$) @ 150 mA
V_{DD} Tracked (Default Mode)	5.0 V ($\pm 0.8\%$) @ 150 mA
Sensor Supply	
$V_{\text{REF1, 2, 3}}$	5.0 V ($\pm 0.8\%$) @ 100 mA
Switched Battery	
V_{SEN}	$V_{\text{BAT}} - 0.2 \text{ V}$ @ 125 mA
PWM Frequency	200 kHz
Operating Temp	$-40^\circ\text{C} \leq T_{\text{A}} \leq 125^\circ\text{C}$

33394 Internal Block Diagram

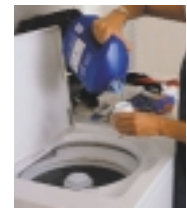
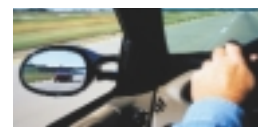


Protection	Detect	Limiting	Shut Down	Auto Retry	Status Reporting
Input Under Voltage	•		•	•	•
Output Over Voltage	•		•	•	•
Output Under Voltage	•		•	•	•
Over Current/SC	•	•		•	•
Short to Battery	•	•		•	•
Over Temperature	•		•	•	•

Ordering Information	Package	Ship Method	Motorola Part Number
	44 HSOP	Rail T/R	**33394DH **33394DHR2
	44 QFN	Rail T/R	**33394FC **33394FCR2
	54 SOICW	Rail T/R	**33394DWB **33394DWBR2
Data Sheet Order Number			MC33394/D
Contact Sales for Evaluation Kit Availability			
**Prefix Index: PC = Eng Samples; XC = In Qual; MC = Production			

QUESTIONS

- Do you have a need to reduce system costs of your design?
- Are you looking for a complete, easy-to-design power supply solution for your embedded system?
- Do you have to design an advanced microcontroller power supply with proper power sequencing and supervisory functions?



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MC33394FS/D
Rev. 0

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