

**ANALOG  
PRODUCTS**

**MC33990  
FACT SHEET**



**33990 SERIAL LINK J-1850 BUS TRANSCEIVER**

The 33990 provides bi-directional half-duplex communication meeting the automotive SAE Standard J-1850 Class B Data Communication Network Interface specification. It interfaces directly to microcontrollers, serves to transmit and receive single-wire bus data at 10.4 kB/s using variable pulse width modulation, operates from vehicle's 12 V battery or board level DC power source, and shifts microcontroller's 5.0 V CMOS logic level signals to 0 to 7.0 V reduced radiated EMI wavelshaped signals. A tristateable 4X/Loop pin invokes Normal or Disabled Waveshaping, or Looped-Back Tx output to Rx signal after being waveshaped but not transmitted over the bus to check bus integrity.

The 33990 is designed to enhance robustness to a double fault condition. (Loss and reconnection of module battery while module ground is lost.)

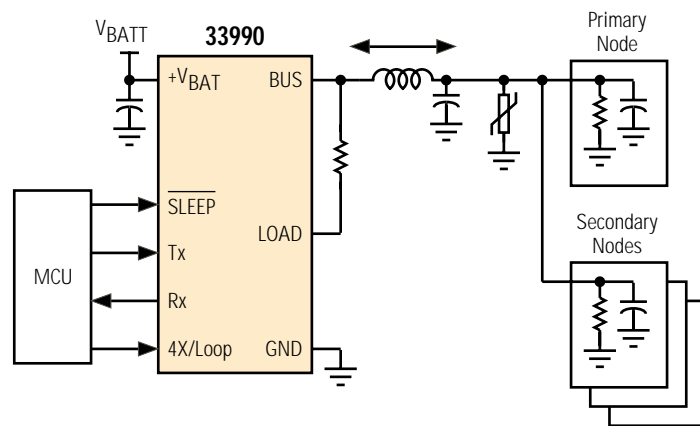
**APPLICATIONS**

- Farm Equipment
- Industrial Equipment
- Robotic Systems
- Automotive Systems
- Applications where Module-to-Module Communication is Required
- Marine and Aircraft Networks

**CUSTOMER BENEFITS**

- Lower system cost with reduced part count with simple external hook up
- Industry standard communication protocol
- Smaller system (reduced component count)
- Faster design cycle time

**Simplified Application Diagram**




Performance	Typical Values
Bus Output	J-1850 V <sub>PWM</sub>
Data Rate	to 20 kB/s
Operating Voltage	9.0 – 16 V
Sleep/Stdby Current	20 μA
ESD	± 2000 V
Operating Temp	-40°C ≤ T <sub>A</sub> ≤ 125°C

**COMMUNICATION**  
LIN, ISO-9141, J-1850

## FEATURES

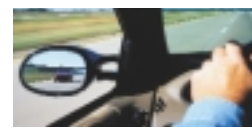
- Enhanced loss of ground protection
- Interfaces directly to standard 5.0 V CMOS microcontroller
- Off-bus loopback diagnostic mode
- Controlled voltage and current waveshaping of bus drive (for radiated EMI reduction)
- Waveshaping can be disabled
- Additional devices available for comparison in Analog Selector Guide SG1002/D

Protection	Detect	Limiting	Shut Down	Auto Retry
Over Current/SC	•	•		
Over Temperature	•		•	•
Open GND	•		•	•

Ordering Information	Package	Ship Method	Motorola Part Number
	8 SOICN	Rail T/R	**33990D **33990DR2
Data Sheet Order Number			MC33990/D
Contact Sales for Evaluation Kit Availability			
**Prefix Index: PC = Eng Samples; XC = In Qual; MC = Production			

## QUESTIONS

- What type of module communication protocol are you using?
- Do you need a robust half-duplex bi-directional communication between two modules?
- Do you need a communication bus with signal waveshaping for radiated noise reduction?
- Do you need a communication device that translates low-level microcontroller logic signals to and from a high-level communication bus?
- Do you need a communication system that meets the automotive SAE J-1850 Class B  $V_{pWMM}$  Standard?



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