

ANALOG PRODUCTS

MC33298 FACT SHEET



POWER ICs
LOW-SIDE SWITCH

APPLICATIONS

- Aircraft Systems
- Marine Systems
- Automotive Systems
- Robotic Systems
- Farm Equipment
- Industrial Actuator Controls
- Fractional Horsepower DC-Motor Controls
- Incandescent Lamp Control
- Applications where Low-Side Switch Control with Diagnostics is Necessary

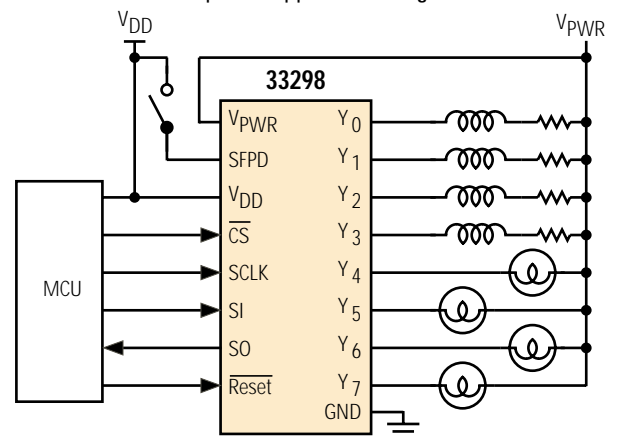
33298 (0.4 Ω $R_{DS(ON)}$) SMART EIGHT-OUTPUT SWITCH WITH SPI

The 33298 is a smart eight-output low-side power switch. It is a versatile device incorporating an 8-bit serial-in shift register to control an 8-bit parallel output latch providing control of eight independent "ON/OFF" output switches. Applications include the control of solenoids, relays, lamps, small DC-motors, and other moderate current loads (1.0 – 3.0 A).

The 33298 interfaces directly with a microcontroller to control various inductive or incandescent loads. Input control is fast. Data rates are guaranteed to 2.0 MHz but the device is capable of rates to 8.5 MHz @ 25°C.

Each output uses high-efficiency MOSFET power transistors configured with open drains. Each low "ON" resistance output (0.4 Ω $R_{DS(ON)}$ @ 25°C) is capable of sinking up to 3.0 A of transient current. On a continuous basis, each output can simultaneously (with all outputs "ON") handle 0.5 A of current when the device is soldered onto a typical PC board. Higher output currents are dependent on the number of outputs simultaneously "ON". The circuit's innovative monitoring and protection features include very low standby current, "cascadable" fault reporting, independent internal 60 V clamping of outputs, output-specific diagnostics, and independent over temperature shutdown of outputs.

Simplified Application Diagram



CUSTOMER BENEFITS


- Low system cost, reduced component count, simplified circuitry, and minimal boardspace
- Simplified system design with direct interfacing to microprocessor
- Directly drives output inductive loads via internally clamped outputs
- Capable of switching capacitive, incandescent, or inductive loads
- Outputs can be operated in parallel for increased output current
- Capable of PWM-ing loads

Performance	Typical Values
Outputs	8
$R_{DS(ON)}$ @ 25°C	0.4 Ω
Operating Voltage	9.0 – 26.5 V
Peak Current	3.0 A each output
Control	SPI
Operating Temp	-40°C $\leq T_A \leq$ 125°C
Junction Operating Temp	-40°C $\leq T_J \leq$ 150°C

FEATURES

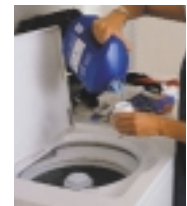
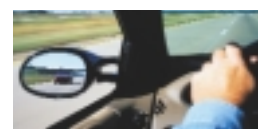
- Outputs clamped when switching inductive loads
- Very low operational bias currents < 2.0 mA
- Sleep mode current < 25 μ A
- CMOS input logic compatible with 5.0 V logic levels
- Load Dump robust (60 V transient at V_{PWR})
- Daisy chain operation of multiple devices possible
- Switch outputs can be paralleled for higher currents
- Additional devices available for comparison in Analog Selector Guide SG1002/D

Protection	Detect	Limiting	Shut Down	Auto Retry	Status Reporting
Over Voltage	•		•		•
Over Current/SC	•	•	•	•	•
Over Temperature	•		•	•	
Open Load	•				•

Ordering Information	Package	Ship Method	Motorola Part Number
	24 SOICW	Rail T/R	**33298DW **33298DWR2
Data Sheet Order Number			MC33298/D
Contact Sales for Evaluation Kit Availability			
**Prefix Index: PC = Eng Samples; XC = In Qual; MC = Production			

QUESTIONS

- Do you need to reduce system complexity when switching multiple loads using a microcontroller?
- Do you need high-efficiency switches to control multiple capacitive, incandescent, or inductive loads over a wide temperature range?
- Are you looking for an easy-to-design-in low-side switch, capable of switching eight different loads?
- Do you require a "smart" switch having internal protection features as well as fault reporting?
- Do you need multiple switches that can be controlled from a microcontroller using SPI protocol?



How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217
1-303-675-2140 or 1-800-441-2447

JAPAN: Motorola Japan Ltd.; SPS, Technical Information Center,
3-20-1, Minami-Azabu, Minato-ku, Tokyo 106-8573 Japan
81-3-3440-3569

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; Silicon Harbour Centre,
2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong
852-26668334

Technical Information Center: 1-800-521-6274

HOME PAGE: <http://www.motorola.com/semiconductors>



MOTOROLA and the Stylized M Logo are registered in the U.S. Patent & Trademark Office. All other product or service names are the property of their respective owners.
© Motorola, Inc. 2002

MC33298FS/D
Rev. 1