

ANALOG PRODUCTS

MC33996 FACT SHEET



33996 16-OUTPUT SWITCH WITH SPI CONTROL

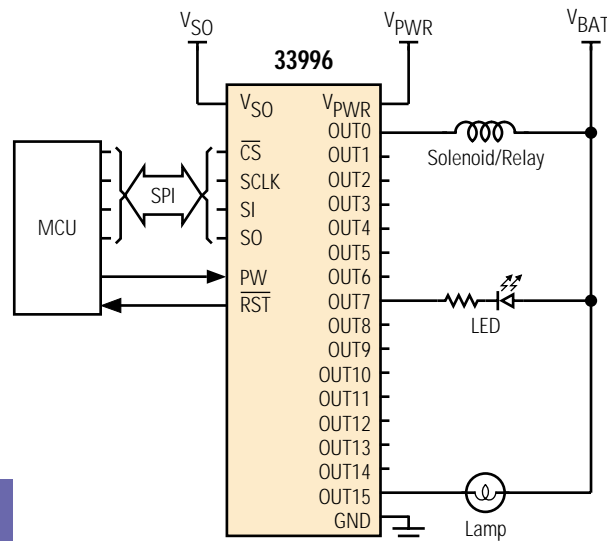
The 33996 is a 16-output low-side switch with 24-bit Serial Peripheral Interface (SPI). It is used in a variety of applications to control inductive, incandescent, and LED loads. The SPI provides both input control and diagnostic readout. A Pulse Width Modulation (PWM) control input is also provided. A dedicated Reset input provides the ability to clear all internal registers and turn all outputs OFF.

The 33996 directly interfaces with microcontrollers and is compatible with both 3.3 and 5.0 V CMOS logic levels. The 33996, in effect, serves as a bus expander and buffer with fault management features that reduce the MCU's fault management burden.

APPLICATIONS

- Aircraft Systems
- Automotive Systems
- Marine Applications
- Robotic Systems
- Farm Equipment
- Actuator Control
- Small DC-Motor Control
- LED and Incandescent Lamp Control
- Other Applications where Low-Side Switch Control is Required

Simplified Application Diagram



CUSTOMER BENEFITS


- Control of up to 16 loads using a single IC and few external components
- Simple to hook up
- Can directly interface with either 3.3 or 5.0 V micro-controllers using SPI
- Reduced PC board space resulting in enhanced application reliability and lower costs
- Outputs controlled via SPI and able to be pulse width modulated
- Diagnostic capability making for easy system troubleshooting

Performance	Typical Values
Outputs	16
$R_{DS(on)}$ @ 25°C	0.45 Ω
Operating Voltage, V_{PWR}	9.0 – 26.5 V
Operating Voltage, V_{SO}	3.3 – 5.0 V
Peak Current	1.0 A each output
Control	SPI with PWM
Operating Temp	-40°C $\leq T_A \leq$ 125°C
Junction Operating Temp	-40°C $\leq T_J \leq$ 150°C

FEATURES

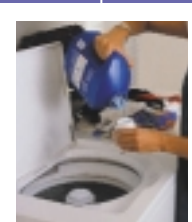
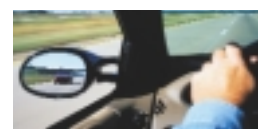
- Outputs current limited 1.0 A and voltage clamped 45 V for switching incandescent and inductive loads
- Output-independent over temperature shutdown
- PWM-programmable outputs
- Output ON Short-to- V_{BAT} and OFF Short-to-Ground/Open Detection
- OFF open load detect current can be disabled for sensitive LED applications
- SPI diagnostic reporting
- Additional devices available for comparison in Analog Selector Guide SG1002/D

Protection	Detect	Limiting	Shut Down	Auto Retry	Status Reporting
Over Voltage	•		•	Program	•
Under Voltage	•		V_{SO}		
Over Current/SC	•	•	•	•	•
Over Temperature	•		•	•	•
Open Load	•			•	•

Ordering Information	Package	Ship Method	Motorola Part Number
	32 SOICW	Rail T/R	**33996DWB **33996DWBR2
Data Sheet Order Number			MC33996/D
Contact Sales for Evaluation Kit Availability			
**Prefix Index: PC = Eng Samples; XC = In Qual; MC = Production			

QUESTIONS

- Need to reduce the complexity of controlling multiple loads?
- Need a single IC that can switch up to 16 incandescent lamp or inductive loads?
- Do you require a "smart" switch with internal protection features and fault diagnostic reporting?
- Do some or all of your multiple loads need PWM control?
- Do you need an IC that supports 3.3 and 5.0 V microcontrollers?



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Rev. 0