MC33880

Configurable Octal Serial Switch with Serial Peripheral Interface I/O

Applications

- Automotive systems
- Multiple relay, solenoid, lamp and small motor driver for industrial and robotic systems
- Load control in boats, RVs and marine systems
- Appliance and white goods electrical actuators
- Electronic gaming machines (casino and arcade)

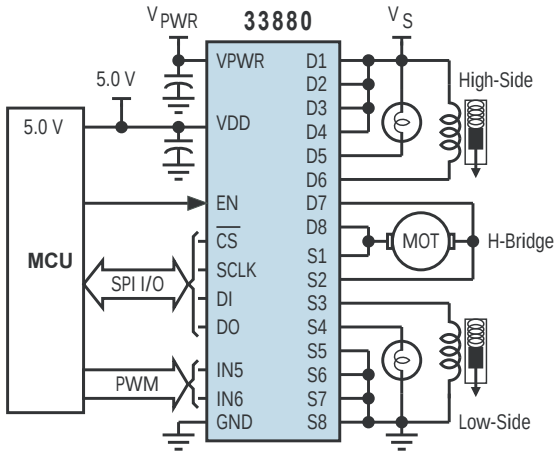
Overview

The 33880 device is an eight-output hardware-configurable high side/low side switch with 8-bit serial input control. Two of the outputs can be controlled directly via microcontroller for pulse-width modulation (PWM) applications.

The 33880 controls various inductive or incandescent loads by directly interfacing with a microcontroller.

The circuit's innovative monitoring and protection features include very low standby currents, “cascadable” fault reporting, internal 40 V output clamping for low-side configurations, internal -20 V output clamping for high side configurations, output specific diagnostics, and independent shutdown of outputs.

MC33880 Simplified Application Drawing



All Output Switches are High- or Low-Side Configurable

Performance	Typical Values
Outputs	8
$R_{DS(ON)}$ at 25 °C	0.55 Ω
Operating Voltage	5.5 to 24.5 V
Peak Current	0.8 A Each 0utput
Control	SPI & Parallel
RMS Current One Output ON All Outputs ON	 0.6 A 0.35 A
ESD (HBM)	±2000 V
Ambient Operating Temperature	-40 °C ≤ T_A ≤ +125 °C
Junction Operating Temperature	-40 °C ≤ T_J ≤ +150 °C

Features

- 8-bit SPI for control and fault reporting, 3.3/5.0 V compatible
- Outputs are current limited (0.8 A to 2.0 A) to drive incandescent lamps
- Output voltage clamp is +45 V (typical) (low side drive) and -20 V (typical) (high side drive) during inductive switching
- Internal reverse battery protection on V_{PWR}
- Loss of ground or supply will not energize loads or damage IC
- Maximum 5.0 µA I_{PWR} standby current at 13 V V_{PWR} up to 95 °C
- $R_{DS(ON)}$ of 0.55 Ω at 25 °C typical
- Short circuit detect and current limit with autoretry
- Independent over-temperature protection
- 32-pin SOICW has pins 8, 9, 24, and 25 grounded for thermal performance

Benefits

- Easiest way to interface a microcontroller to DC loads
- Versatile output control (each output can be used for either high or low side switching)
- Expandable control via daisy-chaining
- Expandable control via paralleling
- Simplified system design
- Reduced board space
- Enhanced reliability

Questions

- Are there multiple DC loads to control via microprocessor?
- Does the MCU have SPI I/O?
- Is expand ability required in future designs?
- Is there a requirement for PWM control of current?
- Is space limited?

Protection

Protection	Detect	Limiting	Shut Down	Auto Retry	Status Reporting
Over-voltage	•		•	•	
Over-current / SC	•	•		•	•
Over-temperature	•		•	•	•
Open Load	•				•

Ordering Information

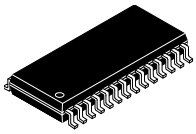
Part Number (for Tape and Reel, add an R2 suffix)	Temperature range (T_A)	Package
MC33880PEG	-40 °C ≤ T_A ≤ 125 °C	28 SOICW
MC33880PEW	-40 °C ≤ T_A ≤ 125 °C	32 SOICW

Development Tools

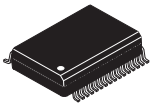
Part Number	Description
KIT33879AEKEVBE	Evaluation Kit - 33879, Configurable Octal Serial Switch with Open Load Detect Current Disable

Documentation

Document Number	Title	Description
MC33880	Data Sheet	Configurable Octal Serial Switch with Serial Peripheral Interface I/O
SG1002	Selector Guide	Analog Product Selector Guide
SG187	Selector Guide	Automotive Product Selector Guide



98ASB42345B
28-PIN SOICW



98ARH99137A
32-PIN SOICW

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