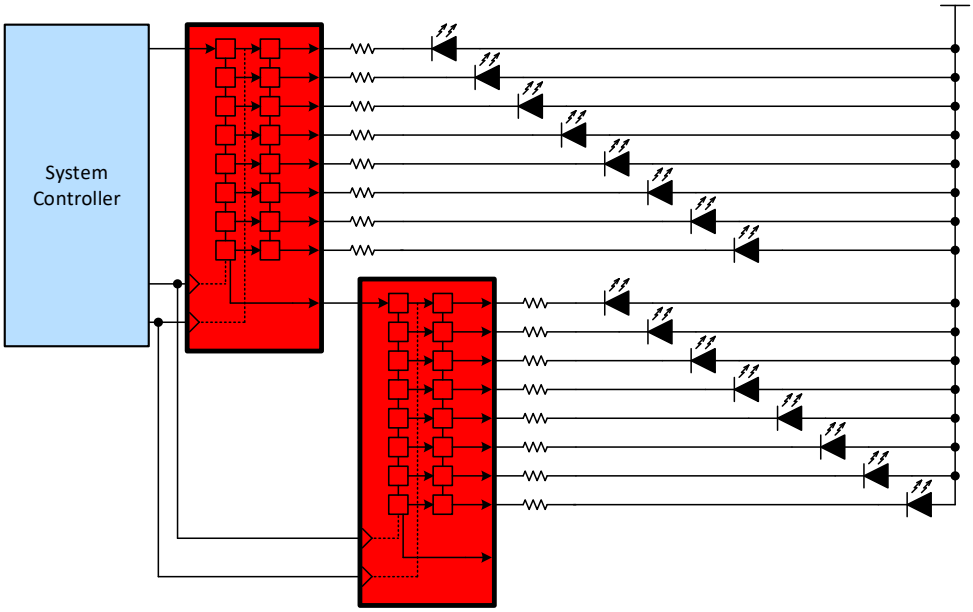
Product Overview

Increase the Number of Outputs on a Microcontroller

Microcontrollers often have a very limited number of GPIO pins. Serial-in parallel-out shift registers can be used to output to a large number devices while only utilizing a few GPIO pins from the controller.



See more about this use case in the *Logic Minute* video *Increase the Number of Outputs on a Microcontroller*.

Design Considerations

- Serial input data (BR_{in}) must be faster than the desired output data rate (BR_{out}) based on the number of output bits (N) by this equation: BR_{in} (Mbps) = BR_{out} (Mbps) × N
- The clock input controls the rate at which data is loaded into the shift register, F_{clk} (MHz) = BR_{in} (Mbps)
- For more outputs, shift registers can be daisy-chained together
- *[FAQ] What is the default output of a latched device? (Flip-Flop, latch, register)*
- Ask a question on our *Engineer-to-Engineer (E2E™) forum*

Recommended Parts

Part Number	Automotive Qualified	V_{CC} Range	Bits	Features
SN74HCS595		2 V to 6 V	8	Schmitt-trigger inputs, 3-State outputs Asynchronous clear input for internal registers
SN74HCS595-Q1	✓			
SN74HC595B		2 V to 6 V	8	X1QFN package (2.50 mm × 2.50 mm)

For more devices, browse through the *online parametric tool* where you can sort by desired voltage, channel numbers, and other features.

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