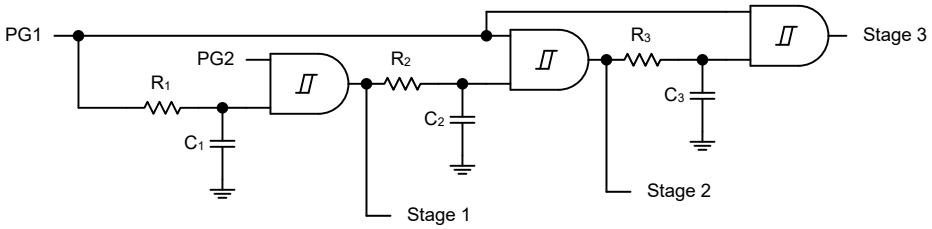
Product Overview

Sequence Supplies With Simple Timers and Logic

In many modern systems, multiple power supplies must be turned on in a pre-defined sequence before the system controller can be started. Often the exact timing of this is not as important as the order of operations. For these applications, logic gates with Schmitt-trigger inputs provide a fast and easy way to provide a reliable power-up sequence with minimum added power consumption.



Example: Using Logic to Provide a Power-Up Sequence

Design Considerations

- Schmitt-trigger inputs are a requirement for applying slow signals to a CMOS device; these can come from an individual Schmitt-trigger buffers such as the SN74LVC1G17, or be integrated as with the SN74LVC1G57 and the SN74HCS08
- Power the start-up logic directly from the system supply when possible; when not possible, a dedicated regulator can be used without much power loss due to the extremely low power consumption of CMOS logic gates
- Tying one PG signal directly to each AND gate can prevent later stages from ramping if the first PG signal goes LOW
- Expect a delay of approximately 2 × R × C for each RC circuit. For an example, a 10-kΩ resistor and 0.1-µF capacitor is expected to provide approximately 2 ms of delay
- If any input is larger than V_{CC}, verify in the data sheet for your selected logic gate, if this is supported
- [FAQ] How do I determine the output voltage or output current of a CMOS logic device?
- Need additional assistance? Ask our engineers a question on the *TI E2E™ logic support forum*

Recommended Parts

Part Number	Automotive Qualified	V_{CC} Range	Type	Features
SN74HCS08-Q1	✓	2 V – 6 V	Quad AND gate	Schmitt-trigger inputs Positive input clamp diodes on all pins; add series resistors if input voltage exceeds V_{CC}
SN74HCS08				
SN74LVC1G17-Q1	✓	1.65 V – 5.5 V	Schmitt-trigger buffer	Schmitt-trigger inputs Inputs are overvoltage tolerant; signals can exceed V_{CC}
SN74LVC1G17				
SN74LVC1G57		1.65 V – 5.5 V	Configurable Logic Gate	Schmitt-trigger inputs Between the '1G57 and '1G58, all 2-input logic gate functions can be produced. See data sheets for details.
SN74LVC1G58				

For more devices, browse the *online parametric tool* where products can be sorted by desired voltage, channel numbers, and other features.

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