Multi-Chip Voltage Feedback Technique for Driving LEDs

The voltage feedback method provides a single voltage to be used in regulating the LED power supply voltage. The LED string with the largest composite forward voltage defines the common feedback voltage. The voltage information of this LED string is the feedback input to the voltage regulator supplying the common LED supply voltage.

Figure 1: Conceptual Diagram.

Figure 2: Multiple Input Buffer Diagram.

Figure 3: LED String with a Current Sink.
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$V_{CS}$ must be large enough for the current sink to operate properly. The lowest $V_{CS}$ of all LED strings represents the LED string with the largest composite forward voltage.

A multiple input buffer is used to provide a regulation voltage to the voltage regulator. The multiple input buffer has an output equal to the lowest $V_{CS}$ input voltage.

One of the inputs of the multiple input buffer can be the output of a multiple input buffer from another integrated circuit. In this manner, the lowest $V_{CS}$ is transferred to the voltage regulator.

The IC at the end of the series must have its input tied to a higher voltage bias than any other LED string.