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Three New Tiny Switches Facilitate Video Switching

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APPLICATION NOTE

ON Semiconductor has just introduced four switches to facilitate many switching functions including composite video switching. One of the issues with today's consumer products is they are getting so small, there is no room for traditional switches or extra sets of jacks needed for various functions. One solution is to permit one set of jacks to perform two functions, an input and an output. In this example, we show a Digital Video Camera with analog input/output requirements. Many consumers require the ability to transfer their old analog tapes to digital format, but this requires analog inputs on the camera. The size of today's camera is so small that providing both input jacks and output jacks, requires too much space. One solution is to have an A/V jack which functions as either input or output. The onboard MCU can instruct the switch to be either an input or output.

Any one of the four switches may be used for this application, and they are the NLAS4599, the NLAST4599, the NLASB3157, and the NLAS1053. The first two devices are essentially the same, however the "T" version permits interface to "TTL" level signals, without any additional components. The third device is the same function as the first two, with a slightly different pin arrangement to meet certain customer requirements. The first two devices are available in SOT-23 size 6-pin packages, while all three are available in the tiny SC70 footprint, only 2 × 2 mm.

The circuitry couldn't be simpler. These switches are all Single Pole Double Throw (SPDT). Essentially the common side of the part is connected to the jack center pin, while the signal pins are connected to either the input or the output of the camera. The resistance of the switch is low enough not to cause much insertion loss or distortion to the waveform. Although this application shows switching a composite video signal, the same switch can switch the higher bandwidth component video signals or digital signals beyond 50 MHz as well. It is assumed that the internal video amplifiers have their own 75 Ω matching resistors appropriately placed. The output Video amplifier needs to have a series 75 Ω resistor and its dc level is ≅ 2.5 V. The input is assumed to be 75 Ω with a dc path to ground. Since these switches are single supply, the signals passing through them need to be between 0 and 5 Volts with white level near mid-voltage. The dc blocking capacitor keeps undesired dc off the input or output.

Figure 2 shows the use of these parts as described. Select pin is connected to an MCU, the inputs and output are connected to pins 4, 6 (4599) or 1, 3 (3157) and the jack is either connected to 5 (4599) or 3 (4599). Vcc is assumed to be +5 V. If a low voltage MCU is used as a controller, the NLAST4599 can be directly interfaced to it, as long as the supply voltage is greater than 2.3 V.

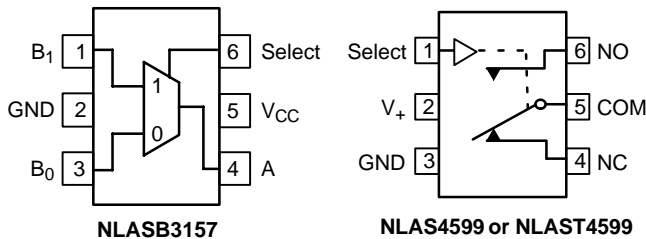


Figure 1.

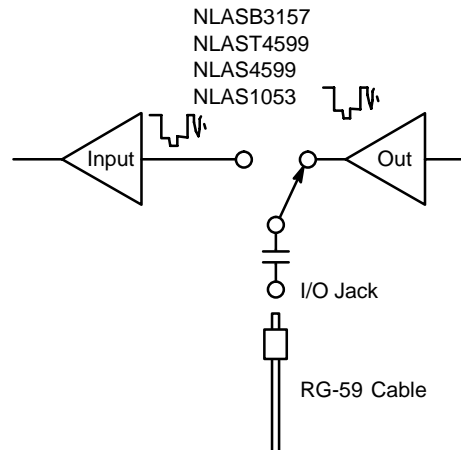



Figure 2.

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