



TL52055

A wide-bandwidth 2-input, 1-output, 3-circuit video switch

High-Definition Signal Response With a Wide, Flat Bandwidth up to 40 MHz

Texas Instruments (TI) now offers the TL52055, a wide-bandwidth 2-input, 1-output, 3-circuit video switch for handling high-quality analog video signals. Unlike conventional video switches, the

high-performance TL52055 has a flat frequency response up to 40 MHz with extremely low signal degradation and operates at low voltages (in the 5-V range). The TL52055 is ideal for high-definition TVs, DVD recorders, set-top boxes, car navigation devices and AV amplifiers.

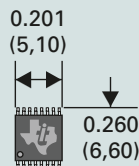
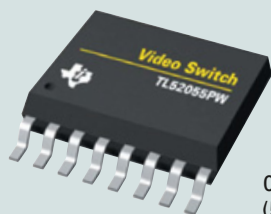
Key Benefits

- Wide, flat bandwidth up to 40 MHz (handles 1080i format)
- Same electrical properties and performance with 5-V or 9-V supply voltage
- No need for externally mounted parts like transistors or resistors, due to the high output drive current and the push-pull circuit
- Small TSSOP
- Conforms to the Lead (Pb)-Free parameters in the J-STD-020B standard

Product Specifications

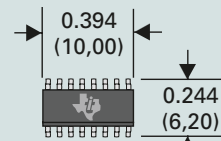
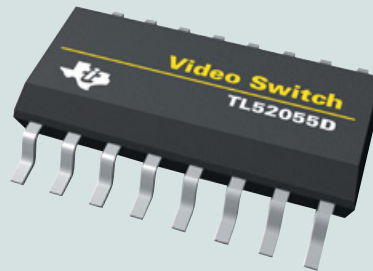
- Operating temperature range: -40°C to 85°C
- Operating supply voltage: 4.5 V to 9.0 V
- Wide-bandwidth characteristics: 0 dB at 40 MHz (typ) ($V_{CC} = 5\text{ V}/9\text{ V}$, $1\text{-}V_{PP}$ input)
- Crosstalk: -75 dB at 4.43 MHz (typ)
- 3-circuit video switch, 2 inputs and 1 output per circuit
- Bias circuit at the input stages of all 3 circuits
- BiCMOS structure
- 16-pin SOIC and TSSOP

Package Details



16-pin TSSOP (PW)

Lead pitch = 0.026 (0,65)
Height = 0.047 (1,20)
Area = 0.052 (34)



16-pin SOIC (D)

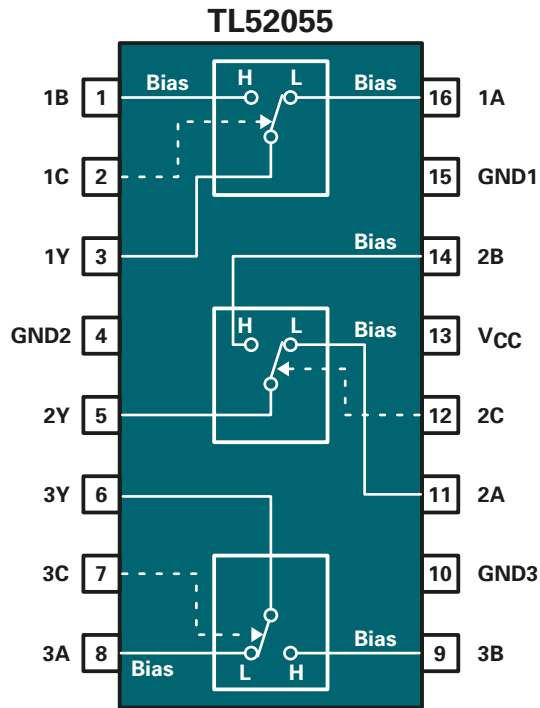
Lead pitch = 0.050 (1,27)
Height = 0.069 (1,75)
Area = 0.096 (62)

Dimensions in inches (millimeters)

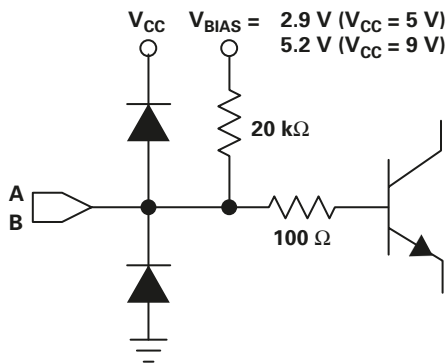
TL52055 Description

The TL52055 contains 3 SPDT circuits, each with 2 inputs and 1 output. Bias circuits have been built into the A and B inputs, so no external bias circuit is required. In addition, it is possible to control the 3 circuits independently by means of their respective control pins.

Functional Diagram



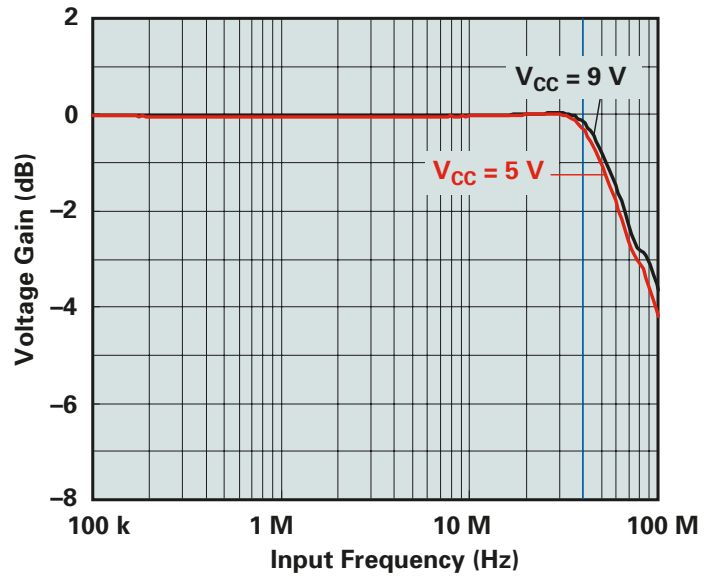
Input Circuit Diagram



Frequency Characteristics

The TL52055 makes it possible to reproduce input signals without any attenuation up to a frequency bandwidth of 40 MHz, and its voltage gain is not dependent on supply voltage.

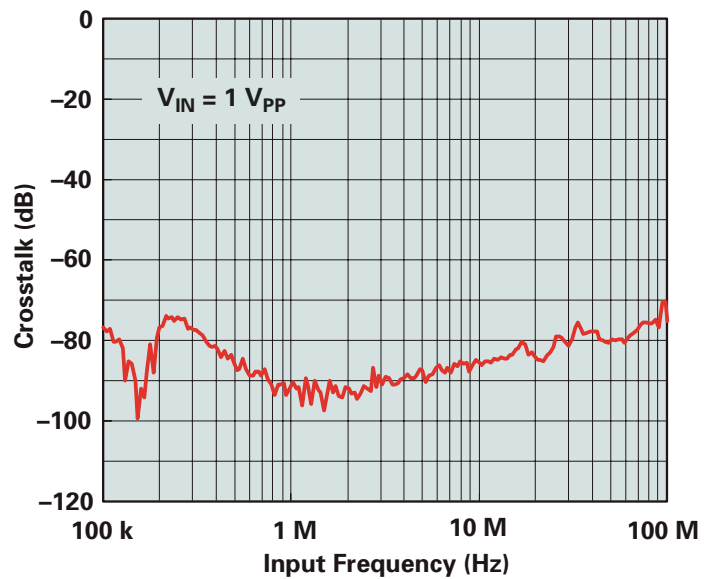
Input Frequency vs. Voltage Gain Characteristics



Crosstalk Characteristics

A video switch must maintain a low crosstalk level between circuits or channels to prevent image degradation. The TL52055 has very good crosstalk characteristics, with -75 dB (typ) at a frequency of 4.43 MHz and an input amplitude of 1 V_{PP} .

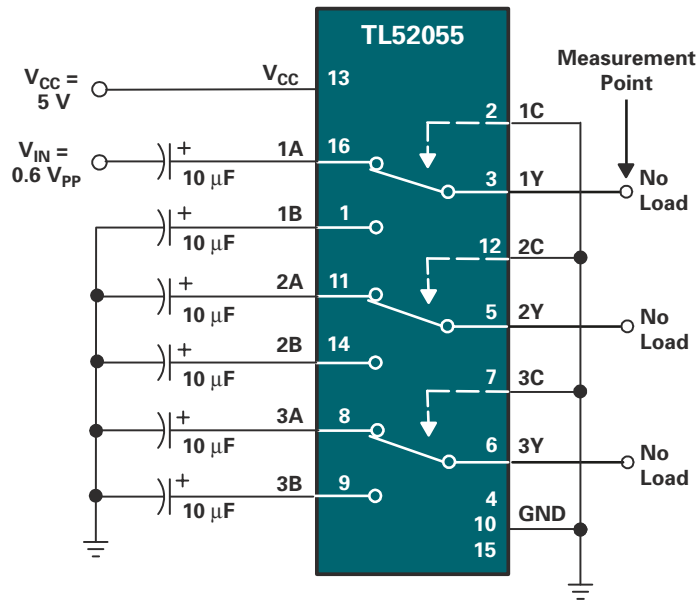
Input Frequency vs. Crosstalk Characteristics



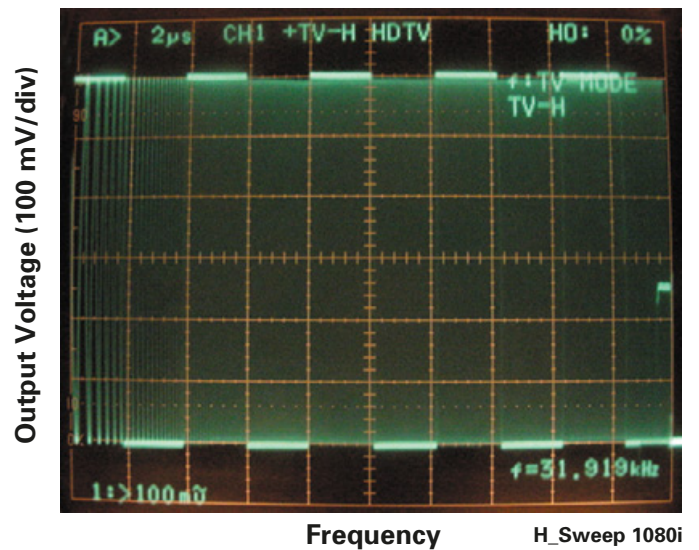
Output-Drive Capability

The TL52055 employs push-pull high-drive outputs, so externally mounted parts like transistors and resistors are not required in many applications. The waveforms at the right show the differences in output, based on frequency characteristics, of the TL52055 and a conventional product with insufficient drive current.

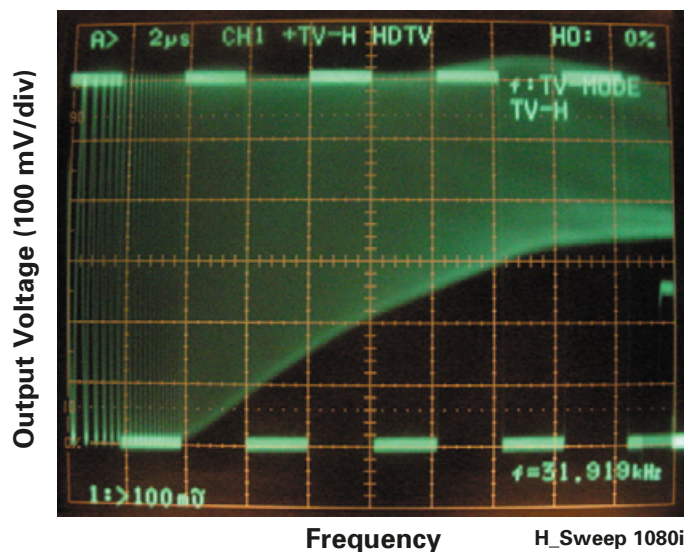
Measurement Circuit Diagram



TL52055 Output



Conventional Product Output



Performance Comparison

The following table compares the TL52055 and other manufacturers' products that have the same functions and pin arrangement as the TL52055. The TL52055 is clearly superior when it comes to

such characteristics as operating supply voltage, frequency bandwidth and crosstalk. The excellent overall performance is achieved in a small package that contributes to board space reduction.

Item	TL52055	M52055	NJM2283	MM1231	BA7602
	V _{CC} = 5 or 9 V	V _{CC} = 9 V	V _{CC} = 5 V	V _{CC} = 5 V	V _{CC} = 5 V
Frequency Characteristics (0 dB)	40 MHz (1 V _{PP})	40 MHz (0.5 V _{PP})	10 MHz (2 V _{PP})	10 MHz (2 V _{PP})	10 MHz (1 V _{PP})
Crosstalk (4.43 MHz)	-75 dB (1 V _{PP})	-70 dB (0.5 V _{PP})	-75 dB (2 V _{PP})	-70 dB (2 V _{PP})	-65 dB (1 V _{PP})
Absolute Maximum Rating	12 V	14 V	14 V	15 V	9 V
Supply Voltage	4.5 V to 9.0 V	4.5 V to 9.0 V	4.75 V to 13.0 V	4.6 V to 13.0 V	4.5 V to 5.5 V
Process	BiCMOS	Bipolar	Bipolar	Bipolar	Bipolar
Package	SOIC/TSSOP	DIP/SOIC	DIP/DMP/TSSOP	DIP/SOIC	DIP/SOIC
Temperature Range	-40°C to 85°C	-20°C to 75°C	-40°C to 85°C	-20°C to 75°C	-40°C to 85°C

Circuit Application

The low-frequency-range characteristics depend on the value of the coupling capacitor on the input side. TI recommends a 10- μ F input capacitor for optimum performance. Output capacitors may be required for some applications.

For More Information

Signal Switch Home Page:

www.ti.com/signalswitches

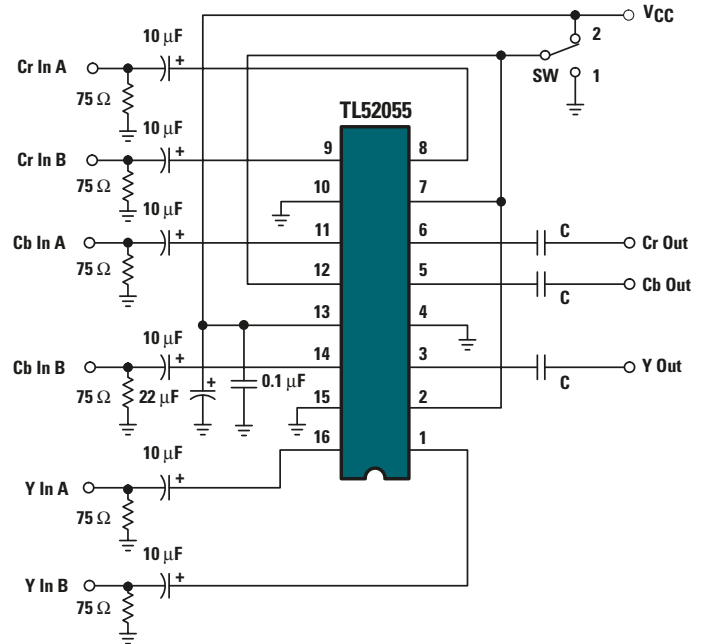
Product Folder:

www.ti.com/sc/device/tl52055

Datasheet:

<http://focus.ti.com/lit/ds/symlink/tl52055.pdf>

TL52055 Circuit Example



TI Worldwide Technical Support

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