

SANYO

No.3641

LC7824**Analog Function Switch**

OVERVIEW

The LC7824 is an analog switch incorporating seven switches into a single chip, making it ideal for audio and video applications in amplifiers, receivers and television equipment.

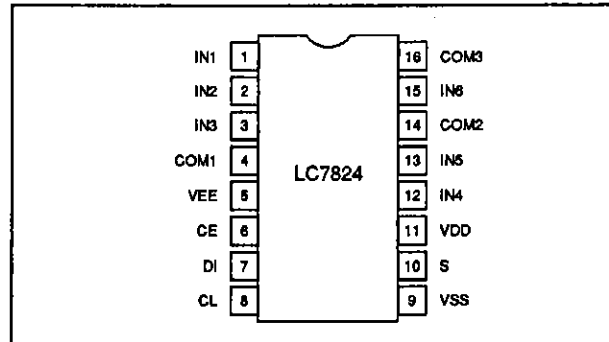
The LC7824 is controlled from a three-wire bus (C²B), allowing for an easy interface with a microcontroller. In addition, a device select pin allows two devices to be connected to the bus.

The LC7824 operates from a ± 9 V supply and is available in 16-pin DIPs.

FEATURES

- Audio and video bandwidth
- Seven analog switches
- Select pin allows two LC7824s to be connected to a common, serial data bus.
- Easy microcontroller interface
- ± 9 V supply
- 16-pin DIP

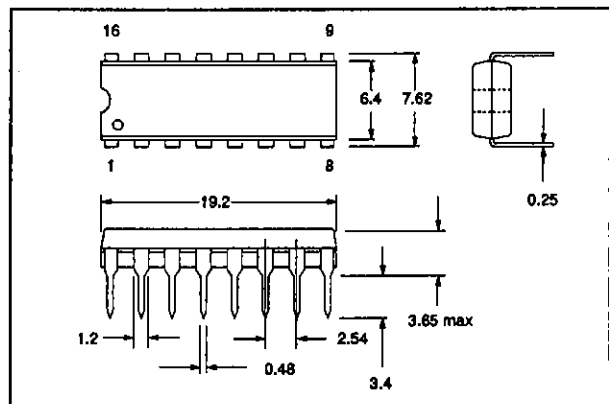
PINOUT



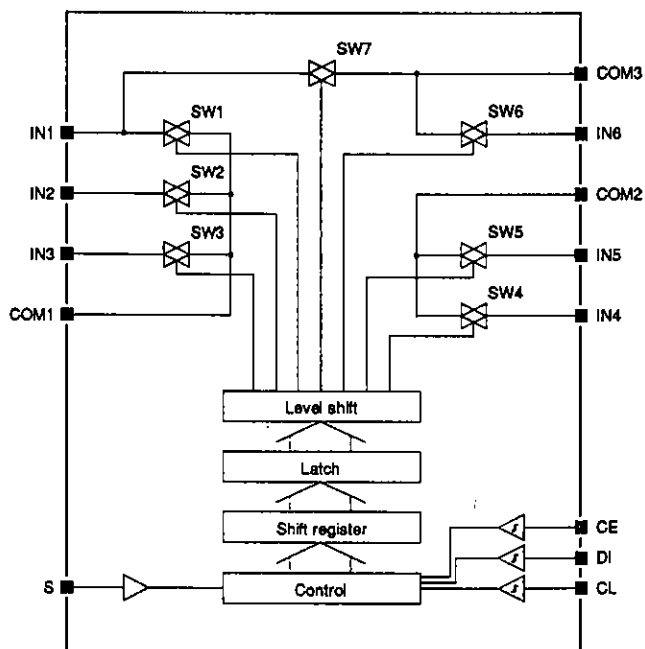
PACKAGE DIMENSIONS

Unit: mm

3006B-DIP16



BLOCK DIAGRAM



PIN DESCRIPTION

Number	Name	Description
1 to 3, 12, 13, 15	IN1 to IN6	Analog switch inputs/outputs
4, 14, 16	COM1 to COM3	Analog switch common inputs/outputs
5	VEE	-4.5 to -9 V supply voltage
6	CE	Schmitt-trigger, chip enable
7	DI	Schmitt-trigger, serial data input
8	CL	Schmitt-trigger, clock input
9	VSS	Ground
10	S	Device select input
11	VDD	4.5 to 9 V supply voltage

SPECIFICATIONS

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage range	$V_{DD \text{ max}}$	-0.3 to 10	V
	$V_{EE \text{ max}}$	-10 to 0.3	V
Logic-level input voltage range	V_{I1}	-0.3 to 10	V
Analog switch input voltage range	V_{I2}	$V_{EE} - 0.3$ to $V_{DD} + 0.3$	V
Voltage differential across switches when closed	ΔV_{ON}	0.5	V
Power dissipation	$P_d \text{ max}$	100	mW
Operating temperature range	T_{opr}	-30 to 75	°C
Storage temperature range	T_{stg}	-40 to 125	°C

Recommended Operating Conditions

$T_a = 25 \text{ deg. C}$

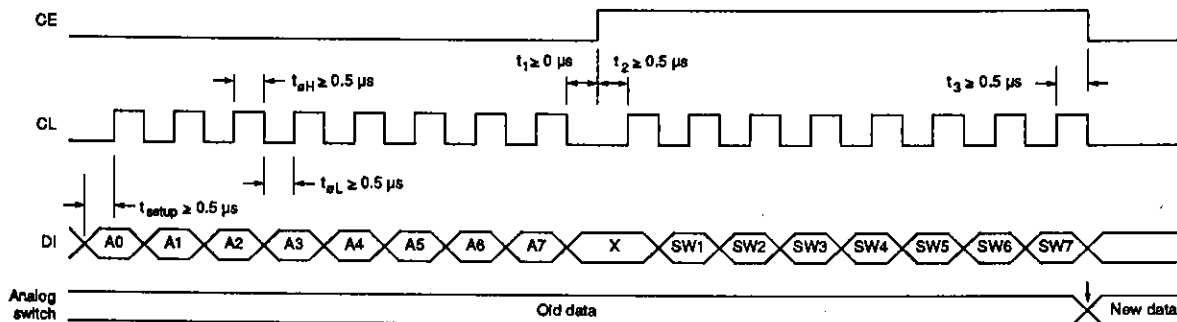
Parameter	Symbol	Rating	Unit
Supply voltage range	V_{DD}	4.5 to 9	V
	V_{EE}	-9 to 0	V

Electrical Characteristics

$V_{DD} = 4.5 \text{ to } 9 \text{ V}$, $T_a = -30 \text{ to } 75 \text{ deg. C}$

Parameter	Symbol	Condition	Rating			Unit
			min	typ	max	
Supply current	I_{DD}	$V_{DD} = 9 \text{ V}$, $V_{EE} = -9 \text{ V}$	-	-	1	mA
C ² B LOW-level input voltage	V_{IL1}		V_{SS}	-	1	V
C ² B HIGH-level input voltage	V_{IH1}		4.2	-	9	V
Select pin LOW-level input voltage	V_{IL2}		V_{SS}	-	$0.3V_{DD}$	V
Select pin HIGH-level input voltage	V_{IH2}		$0.7V_{DD}$	-	V_{DD}	V
Analog switch ON resistance	R_{ON}	$V_{DD} = 5 \text{ V}$, $V_{EE} = -5 \text{ V}$	-	150	-	Ω
		$V_{DD} = 9 \text{ V}$, $V_{EE} = -9 \text{ V}$	-	110	-	
Passband	f_T	$V_{IN} = 1 \text{ V}$, -1 dB down	0	-	5	MHz
		$V_{IN} = 1 \text{ V}$, -3 dB down	0	-	10	
Second and third order harmonic distortion	H2, H3	$V_{IN} = 1 \text{ V}$, $f = 5 \text{ MHz}$	-	60	-	dB
Total harmonic distortion	THD	$V_{IN} = 1 \text{ V}$, $f = 1 \text{ kHz}$	-	0.01	-	%
		$V_{IN} = 0.1 \text{ V}$, $f = 1 \text{ kHz}$	-	0.05	-	
Feedthrough	F_{TH}	$V_{IN} = 1 \text{ V}$, $f = 5 \text{ MHz}$	-	50	-	dB
Crosstalk	C_T	$V_{IN} = 1 \text{ V}$, $f = 5 \text{ MHz}$	-	50	-	dB
LOW-level input current	I_{IL}	$V_{DD} = 9 \text{ V}$, $V_{EE} = -9 \text{ V}$, $V_I = 0 \text{ V}$	-10	-	-	μA
HIGH-level input current	I_{IH}	$V_{DD} = 9 \text{ V}$, $V_{EE} = -9 \text{ V}$, $V_I = 9 \text{ V}$	-	-	10	μA
Switch leakage current	I_{OFF}	$V_{DD} = 9 \text{ V}$, $V_{EE} = -9 \text{ V}$, $V_I = -9 \text{ to } 9 \text{ V}$	-10	-	10	μA
Analog switch input voltage	V_{IN}		V_{EE}	-	V_{DD}	V
C ² B input hysteresis width	V_H		0.3	-	-	V

Timing Characteristics



$V_{DD} = 4.5$ to 9 V, $T_a = -30$ to 75 deg. C

Parameter	Symbol	Rating			Unit
		min	typ	max	
LOW-level clock pulsewidth	t_{oL}	0.5	—	—	μs
HIGH-level clock pulsewidth	t_{oH}	0.5	—	—	μs
Setup time	t_{setup}	0.5	—	—	μs
Serial data input timing	t_1	0	—	—	μs
	t_2	0.5	—	—	μs
	t_3	0.5	—	—	μs

FUNCTIONAL DESCRIPTION

The LC7824 analog switch is controlled from a three-wire bus, which comprises chip-enable, clock and serial data inputs. The 16-bit serial input code comprises

eight address bits and eight control bits as shown in figure 1.

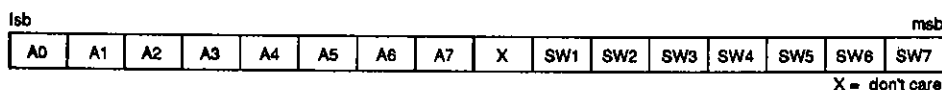


Figure 1. Data input

The address data is latched on the rising edge of CE, and the input data, on the falling edge as shown in figure 2.

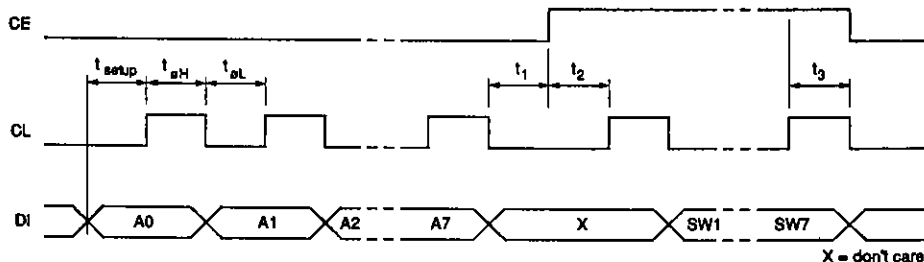


Figure 2. Input timing

When S (pin 10) is LOW, the device address is 01101110 (6EH), and when HIGH, 01101111 (6FH).

Each switch is turned ON if the corresponding control bit is 1, and OFF, if 0. The X bit is ignored.

TYPICAL APPLICATIONS

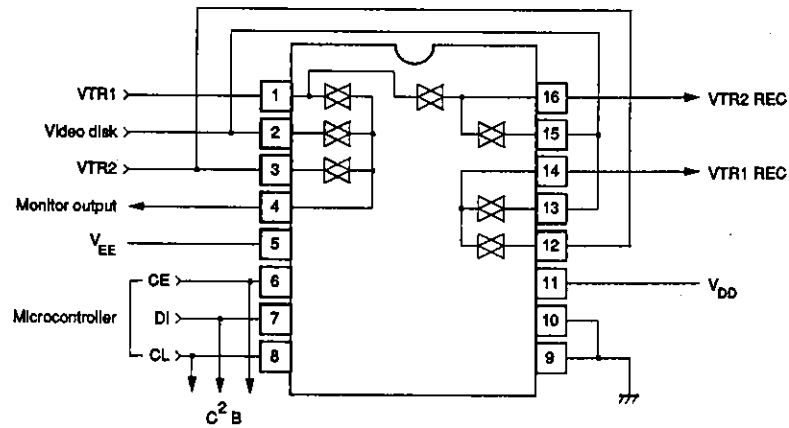


Figure 3. Video switching (1)

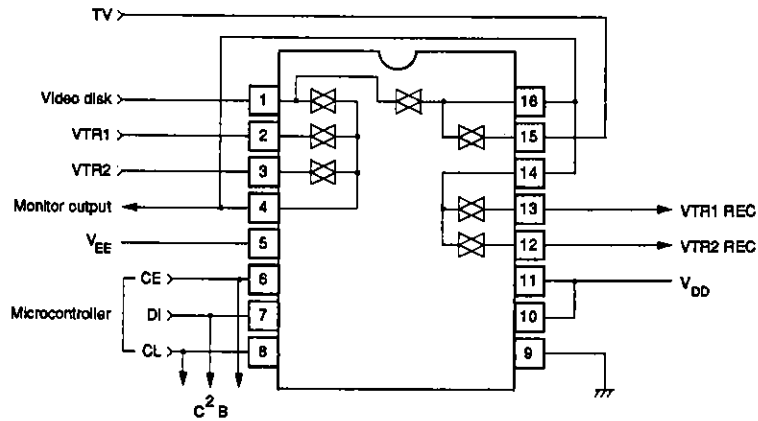


Figure 4. Video switching (2)

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