

HD74LV2GT53A

2-channel Analog Multiplexer / Demultiplexer

HITACHI

ADE-205-697 (Z)

Rev.0
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Description

The HD74LV2GT53A has 2-channel analog multiplexer / demultiplexer in a 8 pin package. Applications include signal gating, chopping, modulation or demodulation (modem), and signal multiplexing for analog to digital and digital to analog conversion systems. Low voltage and high speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

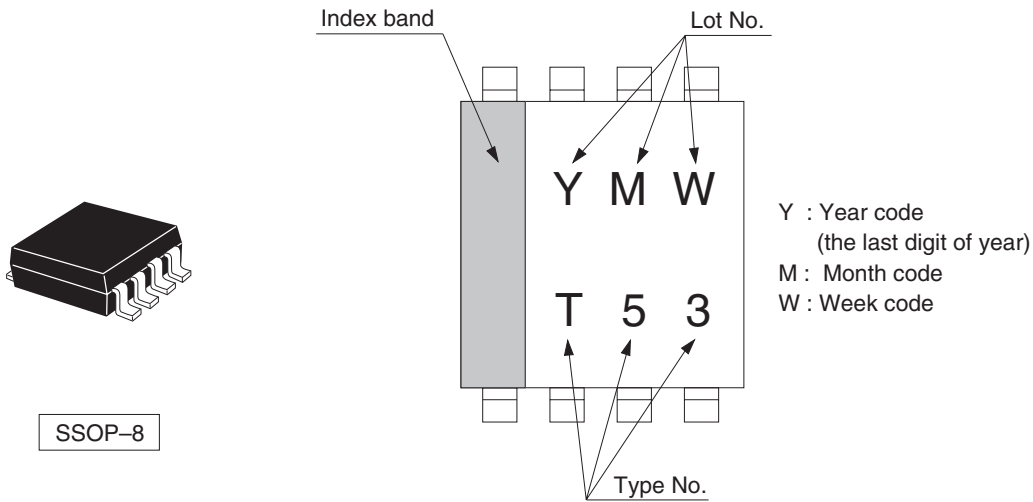
Features

- The basic gate function is lined up as hitachi uni logic series.
- Supplied on emboss taping for high speed automatic mounting.
- Control input is TTL compatible input level.
Supply voltage range : 4.5 to 5.5 V
Operating temperature range : -40 to +85°C
- Control inputs V_{IH} (Max.) = 5.5 V (@ V_{CC} = 0 V to 5.5 V)
- Control inputs have hysteresis voltage for the slow transition.
- Package type

Package type	Package code	Package suffix	Taping code
SSOP-8 pin	TTP-8DBV	US	E (3,000 pcs / Reel)

Outline and Article Indication

• HD74LV2GT53A



Function Table

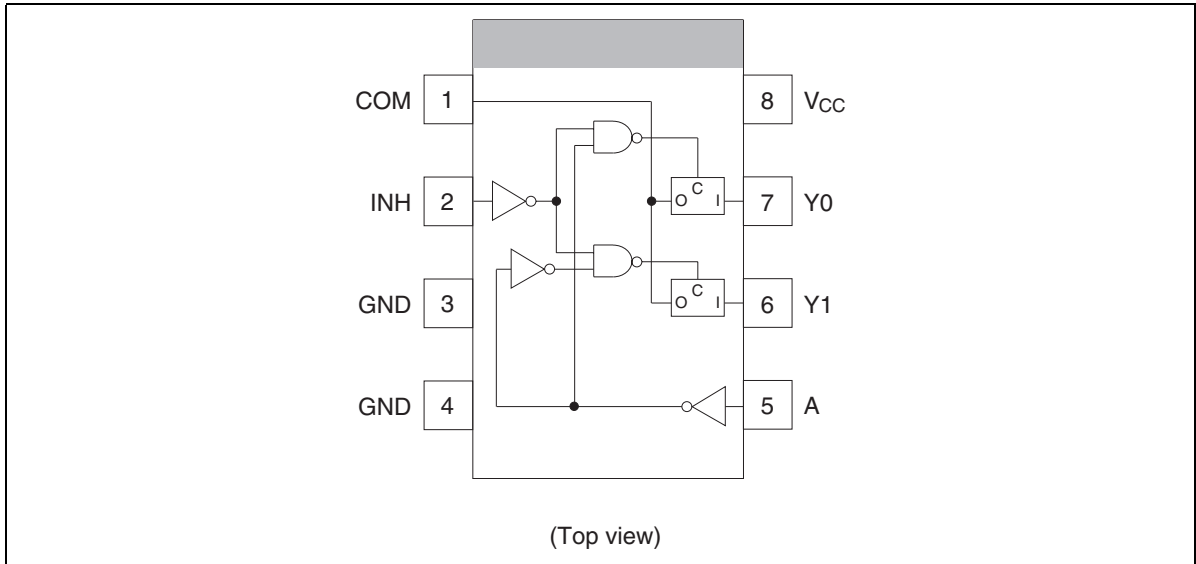
Control inputs		On channel
INH	A	
H	X	None
L	H	Y1
L	L	Y0

H : High level

L : Low level

X : Immaterial

Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	V_{CC}	−0.5 to 7.0	V	
Input voltage range ^{*1}	V_I	−0.5 to 7.0	V	
Output voltage range ^{*1,2}	V_O	−0.5 to $V_{CC} + 0.5$	V	Output : H or L
Input clamp current	I_{IK}	−20	mA	$V_I < 0$
Output clamp current	I_{OK}	±50	mA	$V_O < 0$ or $V_O > V_{CC}$
Continuous output current	I_O	±25	mA	$V_O = 0$ to V_{CC}
Continuous current through V_{CC} or GND	I_{CC} or I_{GND}	±50	mA	
Maximum power dissipation at $T_a = 25^{\circ}\text{C}$ (in still air) ^{*3}	P_T	200	mW	
Storage temperature	T_{stg}	−65 to 150	°C	

- Notes: The absolute maximum ratings are values which must not individually be exceeded, and furthermore no two of which may be realized at the same time.
1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
 2. This value is limited to 5.5 V maximum.
 3. The maximum package power dissipation was calculated using a junction temperature of 150°C.

Recommended Operating Conditions

Item	Symbol	Min	Max	Unit	Conditions
Supply voltage range	V_{CC}	4.5	5.5	V	
Input voltage range	V_I	0	5.5	V	
Input / output voltage range	$V_{I/O}$	0	V_{CC}	V	
Input transition rise or fall rate	$\Delta t / \Delta v$	0	20	ns / V	$V_{CC} = 4.5$ to 5.5 V
Operating free-air temperature	T_a	−40	85	°C	

Note: Unused or floating control inputs must be held high or low.

Electrical Characteristics

Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } 85^\circ\text{C}$			Unit	Test Conditions
			Min	Typ	Max	Min	Typ	Max		
Input voltage	V_{IH}	4.5 to 5.5	—	—	—	2.0	—	—	V	Control input only
	V_{IL}	4.5 to 5.5	—	—	—	—	—	0.8		
Hysteresis voltage	V_H	5.0	—	—	—	—	0.15	—	V	$V_T^+ - V_T^-$
On-state switch resistance	R_{ON}	4.5	—	40	75	—	—	100	Ω	$V_{IN} = V_{CC}$ or GND $V_C = V_{IH}$ $I_T = 2 \text{ mA}$
Peak on resistance	$R_{ON(P)}$	4.5	—	50	100	—	—	125	Ω	$V_{IN} = V_{CC}$ to GND $V_C = V_{IH}$ $I_T = 2 \text{ mA}$
Difference of on-state resistance between switches	ΔR_{ON}	4.5	—	7	15	—	—	20	Ω	$V_{IN} = V_{CC}$ to GND $V_{INH} = V_{IL}$ $I_T = 2 \text{ mA}$
Off-state switch leakage current	$I_{S(OFF)}$	5.5	—	—	± 0.1	—	—	± 1.0	μA	$V_{IN} = V_{CC}$, $V_{OUT} = \text{GND}$ or $V_{IN} = \text{GND}$, $V_O = V_{CC}$, $V_{INH} = V_{IH}$
On-state switch leakage current	$I_{S(ON)}$	5.5	—	—	± 0.1	—	—	± 1.0	μA	$V_{IN} = V_{CC}$ or GND $V_{INH} = V_{IL}$
Input current	I_{IN}	0 to 5.5	—	—	± 0.1	—	—	± 1.0	μA	$V_{IN} = 5.5 \text{ V}$ or GND
Quiescent supply current	I_{CC}	5.5	—	—	—	—	—	10	μA	$V_{IN} = V_{CC}$ or GND
	ΔI_{CC}	5.5	—	—	—	—	—	1.5	mA	$V_{IN} = 3.4 \text{ V}$
Control input capacitance	C_{IC}	—	—	3.5	—	—	—	—	pF	
Switch terminal capacitance	$C_{IN/OUT}$	—	—	6.0	—	—	—	—	pF	
Feed through capacitance	C_{IN-OUT}	—	—	0.5	—	—	—	—	pF	

Switching Characteristics

- $V_{CC} = 5.0 \pm 0.5 \text{ V}$

Item	Symbol	T _a = 25°C			T _a = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{PLH}	—	1.5	4.0	—	7.0	ns	C _L = 15 pF	COM or Yn	Yn or COM
	t _{PHL}	—	3.0	6.0	—	8.0		C _L = 50 pF		
Enable time	t _{ZH}	—	4.0	8.0	—	10.0	ns	C _L = 15 pF	INH	COM or Yn
	t _{ZL}	—	5.0	14.0	—	18.0		C _L = 50 pF		
Disable time	t _{HZ}	—	5.0	8.0	—	10.0	ns	C _L = 15 pF	INH	COM or Yn
	t _{LZ}	—	8.0	14.0	—	18.0		C _L = 50 pF		

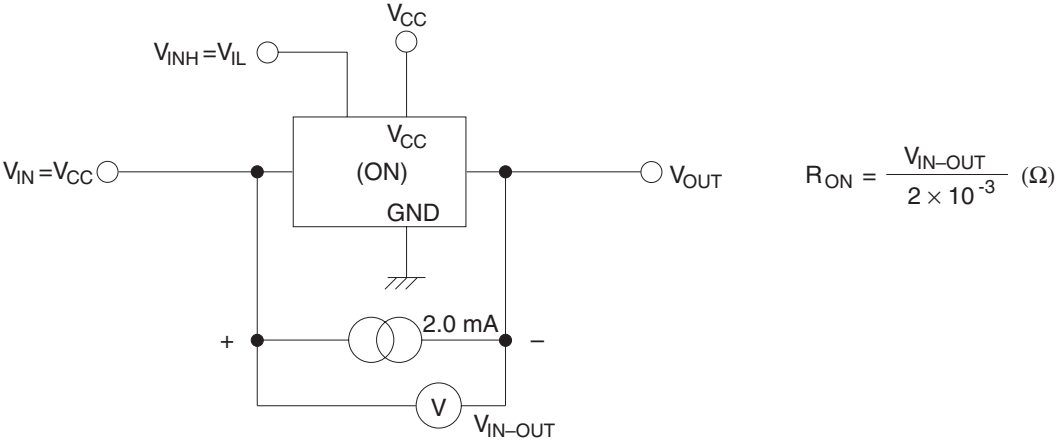
Operating Characteristics

- $C_L = 50 \text{ pF}$

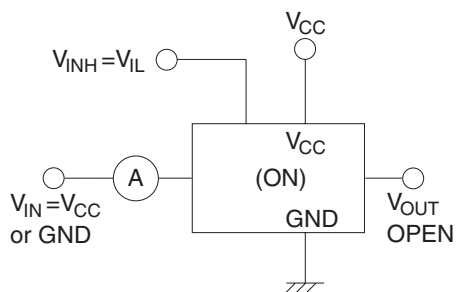
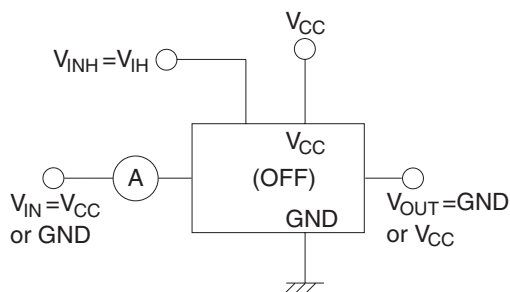
Item	Symbol	V _{cc} (V)	T _a = 25°C			Unit	Test Conditions
			Min	Typ	Max		
Power dissipation capacitance	C _{PD}	5.0	—	8.0	—	pF	f = 10 MHz

Test Circuit

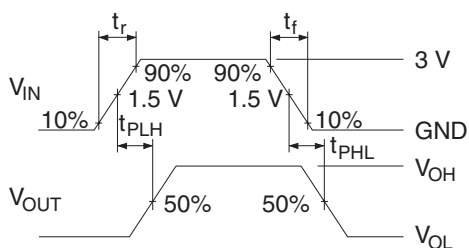
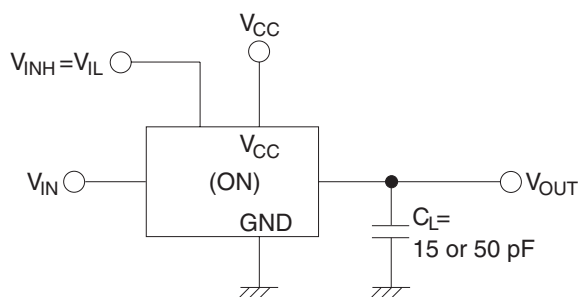
- R_{ON}



• I_S (off), I_S (on)



• t_{PLH} , t_{PHL}

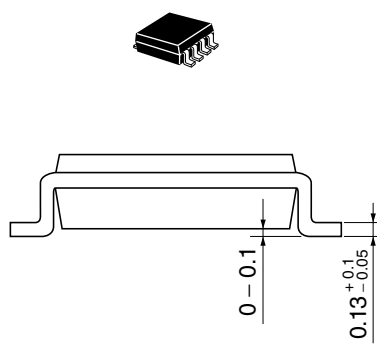
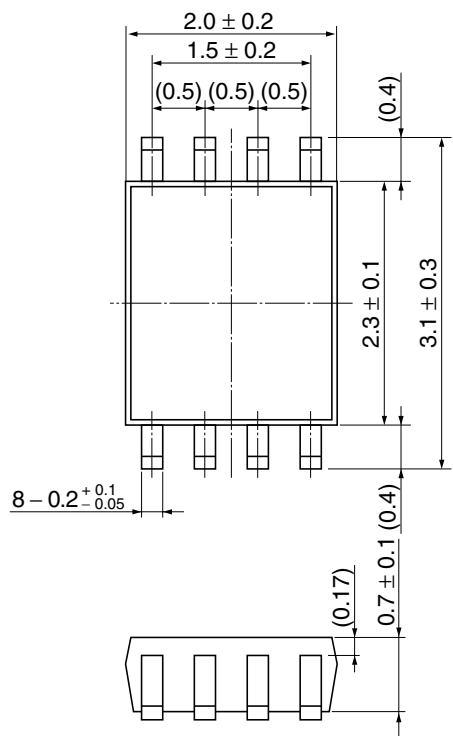


Notes: 1. Input waveform : $PRR \leq 1$ MHz, $Z_o = 50 \Omega$, $t_r \leq 3$ ns, $t_f \leq 3$ ns.

2. The output are measured one at a time with one transition per measurement.

Package Dimensions

Unit: mm



Hitachi Code	TTP-8DBV
JEDEC	—
JEITA	—
Mass (reference value)	0.010 g

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Sales Offices

HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: (03) 3270-2111 Fax: (03) 3270-5109

URL <http://www.hitachisemiconductor.com/>

For further information write to:

Hitachi Semiconductor (America) Inc. 179 East Tasman Drive San Jose, CA 95134 Tel: <1> (408) 433-1990 Fax: <1> (408) 433-0223	Hitachi Europe Ltd. Electronic Components Group Whitebrook Park Lower Cookham Road Maidenhead Berkshire SL6 8YA, United Kingdom Tel: <44> (1628) 585000 Fax: <44> (1628) 585200
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Hitachi Europe GmbH Electronic Components Group Dornacher Straße 3 D-85622 Feldkirchen Postfach 201, D-85619 Feldkirchen Germany Tel: <49> (89) 9 9180-0 Fax: <49> (89) 9 29 30 00

Hitachi Asia Ltd. Hitachi Tower 16 Collyer Quay #20-00 Singapore 049318 Tel : <65>-6538-6533/6538-8577 Fax : <65>-6538-6933/6538-3877 URL : http://semiconductor.hitachi.com.sg

Hitachi Asia Ltd. (Taipei Branch Office) 4/F, No. 167, Tun Hwa North Road Hung-Kuo Building Taipei (105), Taiwan Tel : <886>-(2)-2718-3666 Fax : <886>-(2)-2718-8180 Telex : 23222 HAS-TP URL : http://www.hitachi.com.tw

Hitachi Asia (Hong Kong) Ltd. Group III (Electronic Components) 7/F., North Tower World Finance Centre, Harbour City, Canton Road Tsim Sha Tsui, Kowloon Hong Kong Tel : <852>-2735-9218 Fax : <852>-2730-0281 URL : http://semiconductor.hitachi.com.hk
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