HD74UH4066

Analog Switch

REJ03D0204–0400Z
(Previous ADE-205-022B (Z))
Rev.4.00
Feb.02.2004

Description

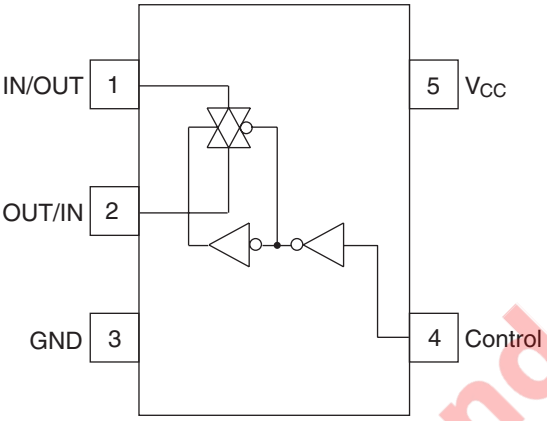
The HD74UH4066 is high-speed CMOS analog switch using silicon gate CMOS process. With CMOS low power dissipation, it provides high speed. The device has low ON resistance for good transfer characteristics and can take wide range of input voltage.

Features

- Encapsulated in very small 5pins package of 2.9 × 1.6 × 1.1 mm, the efficiency to mount on substrate is significantly improved.
- The basic gate function is lined up as Renesas uni logic series.
- Supplied on emboss taping for high-speed automatic mounting.
- Electrical characteristics equivalent to the HD74HC4066
  Supply voltage range: 2 to 6 V
  Operating temperature range: –40 to +85°C
- $| I_{OH} | = I_{OL}$ = 2 mA (min)
- Ordering Information

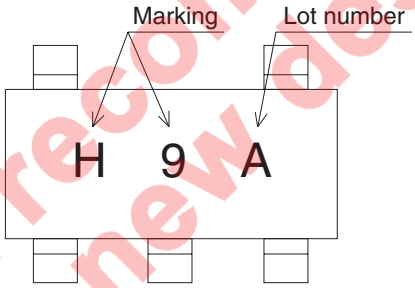
Part Name	Package Type	Package Code	Package Abbreviation	Taping Abbreviation (Quantity)
HD74UH4066EL	MPAK-5 pin	MPAK-5V	–	EL (3,000 pcs/reel)

Pin Arrangement



(Top view)

Article Indication



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	–0.5 to +7.0	V
Input voltage	V_{IN}	–0.5 to V_{CC} +0.5	V
Output voltage	V_{OUT}	–0.5 to V_{CC} +0.5	V
Input diode current	I_{IK}	±20	mA
Output diode current	I_{OK}	±20	mA
Output current	I_{OUT}	±25	mA
V_{CC}/GND current	I_{CC}, I_{GND}	±25	mA
Power dissipation	P_T	200	mW
Storage temperature	Tstg	–65 to +150	°C

Recommended Operating Conditions

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	2 to 6	V
Input voltage	V_{IN}	0 to V_{CC}	V
Output voltage	V_{OUT}	0 to V_{CC}	V
Operating temperature	Topr	–40 to +85	°C
Input rise/fall time	t_r, t_f	0 to 1000 (V_{CC} = 2.0 V)	ns
		0 to 500 (V_{CC} = 4.5 V)	
		0 to 400 (V_{CC} = 6.0 V)	

Electrical Characteristics

		V_{CC}	Ta = 25°C			Ta = –40 to 85°C			
Item	Symbol	(V)	Min	Typ	Max	Min	Max	Unit	Test Conditions
Input voltage	V_{IH}	2.0	1.5	—	—	1.5	—	V	
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	V_{IL}	2.0	—	—	0.5	—	0.5	V	
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—	1.8		
On resistance	R_{ON}	2.0	—	2000	5000	—	6250	Ω	V_C = V_{IH}
		4.5	—	100	200	—	250		V_{IN} = 0 to V_{CC}
		6.0	—	60	170	—	210		$I_{IN/OUT}$ = 1 mA
Leak current	I_S (off)	6.0	—	—	±0.1	—	±1.0	µA	V_C = V_{IL} V_{IN} = V_{CC}, V_{OUT} = GND or V_{IN} = GND, V_{OUT} = V_{CC}
	I_S (on)	6.0	—	—	±0.1	—	±1.0	µA	V_C = V_{IH} V_{IN} = V_{CC} or GND
Input current	I_{IN}	6.0	—	—	±0.1	—	±1.0	µA	V_{IN} = V_{CC} or GND
Operating current	I_{CC}	6.0	—	—	1.0	—	10.0	µA	V_{IN} = V_{CC} or GND

Switching Characteristics

Item	Symbol	V_{CC}	Ta = 25°C			Ta = –40 to 85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Propagation delay time	t_{PLH} t_{PHL}	2.0	—	—	50	—	65	ns	R_L = 10 KΩ
		4.5	—	4	10	—	13		
		6.0	—	—	9	—	11		
Output enable time	t_{PZL} t_{PZH}	2.0	—	—	115	—	145	ns	R_L = 1 KΩ
		4.5	—	10	23	—	29		
		6.0	—	—	20	—	25		
Output disable time	t_{LZ} t_{HZ}	2.0	—	—	115	—	145	ns	R_L = 1 KΩ
		4.5	—	14	23	—	29		
		6.0	—	—	20	—	25		
Maximum control frequency	t_{max}	2.0	—	20	—	—	—	MHz	
		4.5	—	30	—	—	—		
		6.0	—	30	—	—	—		
Control input capacitance	C_{IN}	—	—	5	10	—	10	pF	
Switch I/O capacitance	$C_{IN/OUT}$	—	—	6	—	—	—	pF	
Feed through capacitance	C_{IN-OUT}	—	—	0.5	—	—	—	pF	
Power dissipation capacitance	C_{PD}	—	—	13	—	—	—	pF	

Test Circuit

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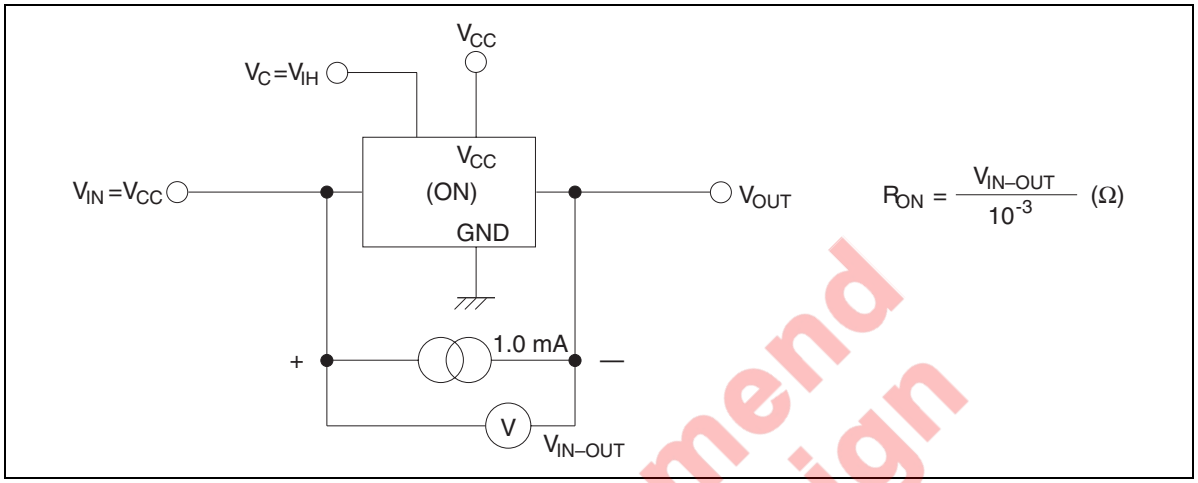
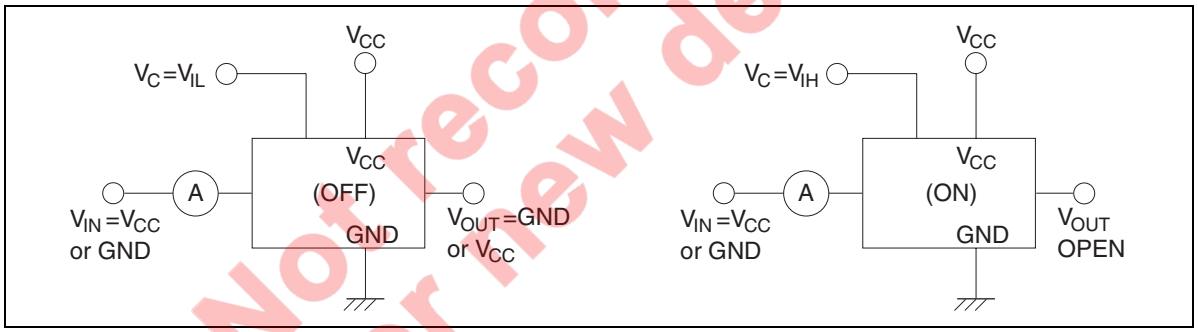
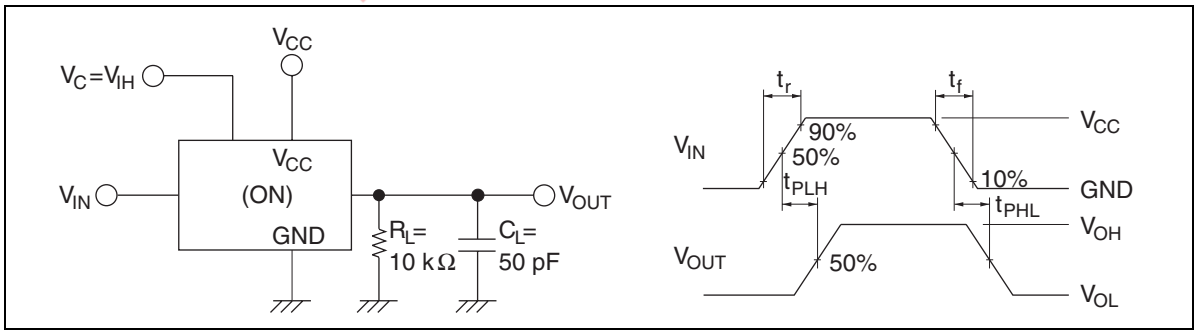


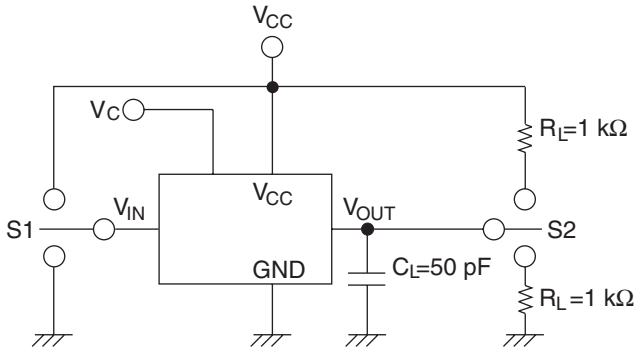
$I_{S\,(OFF)}$, $I_{S\,(ON)}$

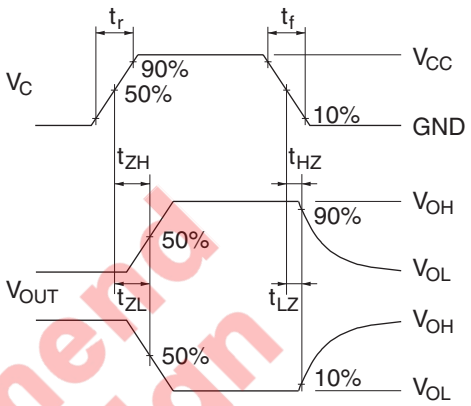


t_{PLH}, t_{PHL}



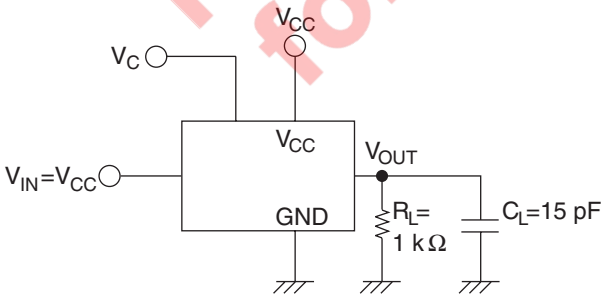
t_{ZH}, t_{ZL} / t_{HZ}, t_{LZ}

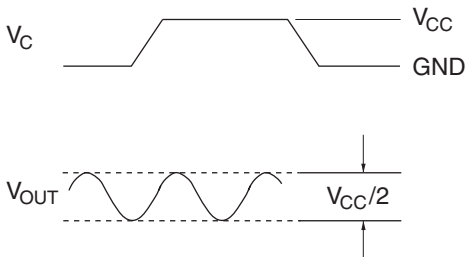




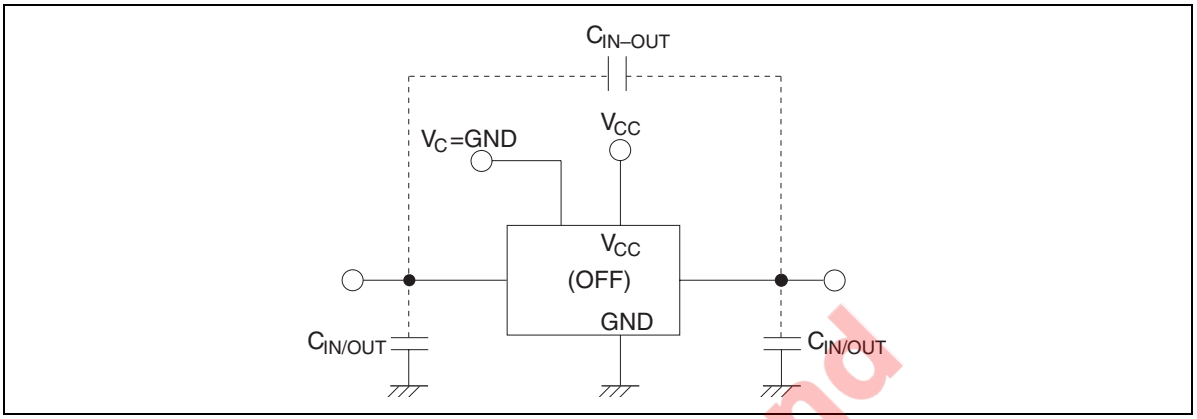
Item	S1	S2
t_{ZH}	V_{CC}	GND
t_{ZL}	GND	V_{CC}
t_{HZ}	V_{CC}	GND
t_{LZ}	GND	V_{CC}

Maximum control frequency



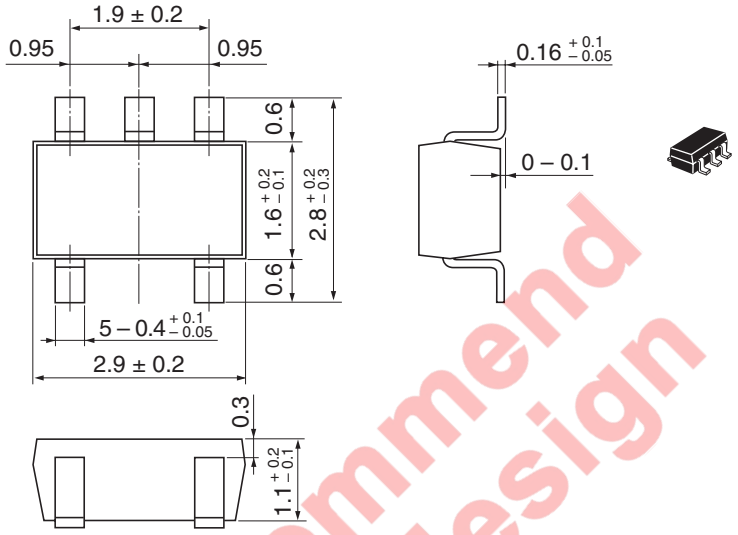


$C_{IN/OUT}$, C_{IN-OUT}



Package Dimensions

Unit: mm



Package Code	MPAK–5V
JEDEC	—
JEITA	—
Mass (reference value)	0.015 g

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