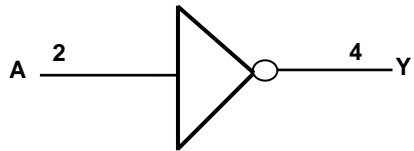


## Pin Descriptions

Pin Name	Description
NC	No connection
A	Data Input
GND	Ground
Y	Data Output
Vcc	Supply Voltage

## Logic Diagram



## Function Table

Inputs	Output
A	Y
H	L
L	H

### Absolute Maximum Ratings (Note 3)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	KV
ESD MM	Machine Model ESD Protection	200	V
$V_{CC}$	Supply Voltage Range	-0.5 to 6.5	V
$V_I$	Input Voltage Range	-0.5 to 6.5	V
$V_O$	Voltage applied to output in high impedance or $I_{OFF}$ state	-0.5 to 6.5	V
$V_O$	Voltage applied to output in high or low state	-0.3 to $V_{CC} + 0.5$	V
$I_{IK}$	Input Clamp Current $V_I < 0$	-50	mA
$I_{OK}$	Output Clamp Current	-50	mA
$I_O$	Continuous output current	$\pm 50$	mA
	Continuous current through Vdd or GND	$\pm 100$	mA
$T_J$	Operating Junction Temperature	-40 to 150	°C
$T_{STG}$	Storage Temperature	-65 to 150	°C

Note: 3. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

### Recommended Operating Conditions (Note 4)

Symbol	Parameter		Min	Max	Unit
$V_{CC}$	Operating Voltage	Operating	1.4	5.5	V
		Data retention only	1.2		V
$V_{IH}$	High-level Input Voltage	$V_{CC} = 1.4 \text{ V to } 1.95 \text{ V}$	$0.65 \times V_{CC}$		V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.7		
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$	2		
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$	$0.7 \times V_{CC}$		
$V_{IL}$	Low-level input voltage	$V_{CC} = 1.4 \text{ V to } 1.95 \text{ V}$		$0.35 \times V_{CC}$	V
		$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		0.7	
		$V_{CC} = 3 \text{ V to } 3.6 \text{ V}$		0.8	
		$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$		$0.3 \times V_{CC}$	
$V_I$	Input Voltage		0	5.5	V
$V_O$	Output Voltage		0	$V_{CC}$	V
$I_{OH}$	High-level output current	$V_{CC}=1.4 \text{ V}$		-3	mA
		$V_{CC} = 1.65 \text{ V}$		-4	
		$V_{CC} = 2.3 \text{ V}$		-8	
		$V_{CC} = 3 \text{ V}$		-16	
				-24	
		$V_{CC} = 4.5 \text{ V}$		-32	
$I_{OL}$	Low-level output current	$V_{CC}=1.4 \text{ V}$		3	mA
		$V_{CC} = 1.65 \text{ V}$		4	
		$V_{CC} = 2.3 \text{ V}$		8	
		$V_{CC} = 3 \text{ V}$		16	
				24	
		$V_{CC} = 4.5 \text{ V}$		32	
$\Delta t/\Delta V$	Input transition rise or fall rate	$V_{CC} = 1.4 \text{ to } 3 \text{ V}$		20	ns/V
		$V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$		10	
		$V_{CC} = 5 \text{ V} \pm 0.5 \text{ V}$		5	
$T_A$	Operating free-air temperature		-40	85	°C

Note: 4. Unused inputs should be held at  $V_{CC}$  or Ground.

### Electrical Characteristics (All typical values are at $V_{CC} = 3.3V$ , $T_A = 25^\circ C$ )

Over recommended free-air temperature range (unless otherwise noted)

Symbol	Parameter	Test Conditions	Vcc	Min	Typ.	Max	Unit
$V_{OH}$	High Level Output Voltage	$I_{OH} = -100\mu A$	1.4 V to 5.5V	$V_{CC} - 0.1$			V
		$I_{OH} = -3mA$	1.4 V	1.05			
		$I_{OH} = -4mA$	1.65 V	1.2			
		$I_{OH} = -8mA$	2.3V	1.9			
		$I_{OH} = -16mA$	3 V	2.4			
		$I_{OH} = -24mA$		2.3			
		$I_{OH} = -32mA$	4.5 V	3.8			
$V_{OL}$	High-level Input Voltage	$I_{OL} = 100\mu A$	1.4 V to 5.5V			0.1	V
		$I_{OL} = 3mA$	1.4V			.4	
		$I_{OL} = 4mA$	1.65 V			0.45	
		$I_{OL} = 8mA$	2.3V			0.3	
		$I_{OL} = 16mA$	3 V			0.4	
		$I_{OL} = 24mA$				0.55	
		$I_{OL} = 32mA$	4.5			0.55	
$I_I$	Input Current	$V_I = 5.5 V$ or GND	0 to 5.5 V			$\pm 5$	$\mu A$
$I_{OFF}$	Power Down Leakage Current	$V_I$ or $V_O = 5.5V$	0			$\pm 10$	$\mu A$
$I_{CC}$	Supply Current	$V_I = 5.5V$ of GND $I_O = 0$	1.4 V to 5.5V			10	$\mu A$
$C_i$	Input Capacitance	$V_i = V_{CC} -$ or GND	3.3		3.5		pF
$\theta_{JA}$	Thermal Resistance Junction-to-Ambient	SOT25	(Note 5)		204		$^\circ C/W$
		SOT353	(Note 5)		371		
		DFN1410	(Note 5)		430		
$\theta_{JC}$	Thermal Resistance Junction-to-Case	SOT25	(Note 5)		52		$^\circ C/W$
		SOT353	(Note 5)		143		
		DFN1410	(Note 5)		190		

Note: 5. Test condition for SOT25, SOT353, and DFN1410: Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

## Switching Characteristics

Over recommended free-air temperature range, CL = 15pF (see Figure 1)

Parameter	From (Input)	TO (OUTPUT)	Vcc = 1.5 V ± 0.1V		Vcc = 1.8 V ± 0.15V		Vcc = 2.5 V ± 0.2V		Vcc = 3.3 V ± 0.3V		Vcc = 5 V ± 0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t <sub>pd</sub>	A	Y	2	6.4	1.4	4.4	0.8	3.3	0.5	2.7	0.5	2.7	ns

Over recommended free-air temperature range, CL = 30 or 50pF as noted (see Figure 2)

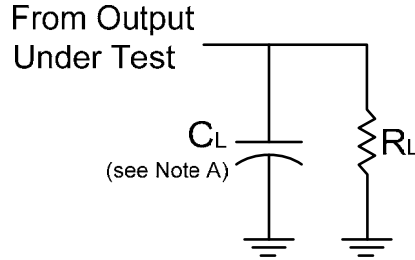
Parameter	From (Input)	TO (OUTPUT)	Vcc = 1.5 V ± 0.1V		Vcc = 1.8 V ± 0.15V		Vcc = 2.5 V ± 0.2V		Vcc = 3.3 V ± 0.3V		Vcc = 5 V ± 0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
t <sub>pd</sub>	A	Y	3	7.5	2.1	5.2	1.1	4.1	0.8	3.4	0.9	3.3	ns

## Operating Characteristics

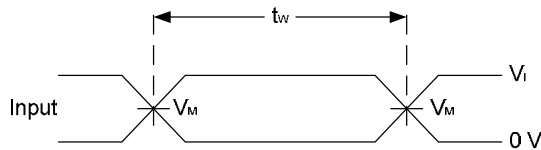
T<sub>A</sub> = 25 °C

Parameter		Test Conditions	Vcc = 1.5 V	Vcc = 1.8 V	Vcc = 2.5 V	Vcc = 3.3 V	Vcc = 5 V	Unit
			TYP	TYP	TYP	TYP	TYP	
C <sub>pd</sub>	Power dissipation capacitance	f = 10 MHz	16	16	18	18	20	pF

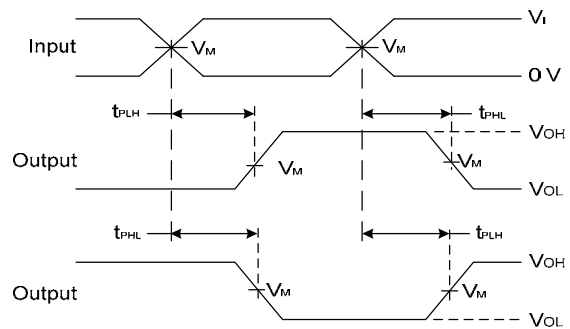
## Parameter Measurement Information



$V_{CC}$	Inputs		$V_M$	$C_L$	$R_L$
	$V_I$	$t_r/t_f$			
$1.5V \pm 0.1V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	15pF	1M $\Omega$
$1.8V \pm 0.15V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	15pF	1M $\Omega$
$2.5V \pm 0.2V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	15pF	1M $\Omega$
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	15pF	1M $\Omega$
$5V \pm 0.5V$	$V_{CC}$	$\leq 2.5ns$	$V_{CC}/2$	15pF	1M $\Omega$



**Voltage Waveform  
Pulse Duration**

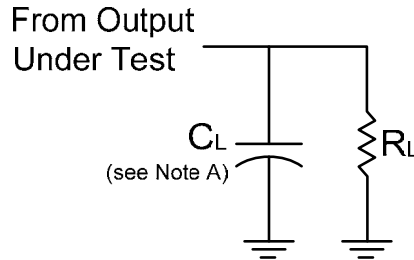


**Voltage Waveform  
Propagation Delay Times  
Inverting and Non Inverting Outputs**

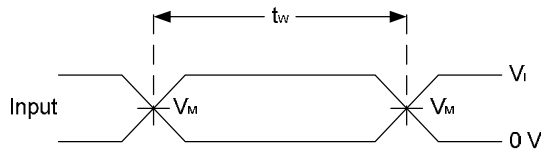
- Notes:
- A. Includes test lead and test apparatus capacitance.
  - B. All pulses are supplied at pulse repetition rate  $\leq 10$  MHz.
  - C. Inputs are measured separately one transition per measurement.
  - D.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .

**Figure 1. Load Circuit and Voltage Waveforms**

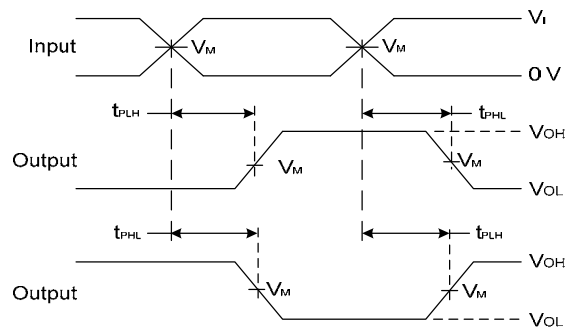
**Parameter Measurement Information (Continued)**



$V_{CC}$	Inputs		$V_M$	$C_L$	$R_L$
	$V_I$	$t_r/t_f$			
$1.5V \pm 0.1V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	30pF	1K $\Omega$
$1.8V \pm 0.15V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	30pF	1K $\Omega$
$2.5V \pm 0.2V$	$V_{CC}$	$\leq 2ns$	$V_{CC}/2$	30pF	500 $\Omega$
$3.3V \pm 0.3V$	3V	$\leq 2.5ns$	1.5V	50pF	500 $\Omega$
$5V \pm 0.5V$	$V_{CC}$	$\leq 2.5ns$	$V_{CC}/2$	50pF	500 $\Omega$



**Voltage Waveform  
Pulse Duration**

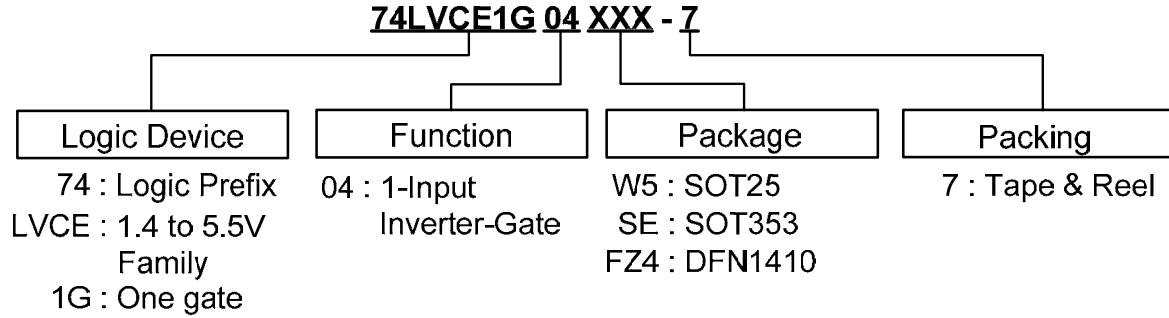





**Voltage Waveform  
Propagation Delay Times  
Inverting and Non Inverting Outputs**

- Notes:
- A. Includes test lead and test apparatus capacitance.
  - B. All pulses are supplied at pulse repetition rate  $\leq 10$  MHz.
  - C. Inputs are measured separately one transition per measurement.
  - D.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .

**Figure 2. Load Circuit and Voltage Waveforms**

## Ordering Information



Device	Package Code	Packaging (Note 5)	7" Tape and Reel	
			Quantity	Part Number Suffix
 74LVCE1G04W5-7	W6	SOT25	3000/Tape & Reel	-7
 74LVCE1G04SE-7	SE	SOT353	3000/Tape & Reel	-7
 74LVCE1G04FZ4-7	FZ4	DFN1410	5000/Tape & Reel	-7

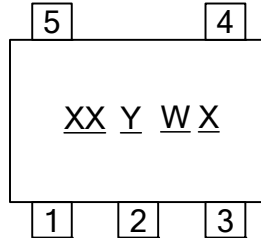
Note: 6. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.



## Marking Information

### (1) SOT25 and SOT353

(Top View)

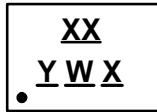


XX : Identification code  
Y : Year 0~9  
W : Week : A~Z : 1~26 week;  
a~z : 27~52 week; z represents  
52 and 53 week  
X : A~Z : Internal code

Part Number	Package	Identification Code
74LVCE1G04W5	SOT25	PU
74LVCE1G04SE	SOT353	PV

### (2) DFN1410H4-6

(Top View)

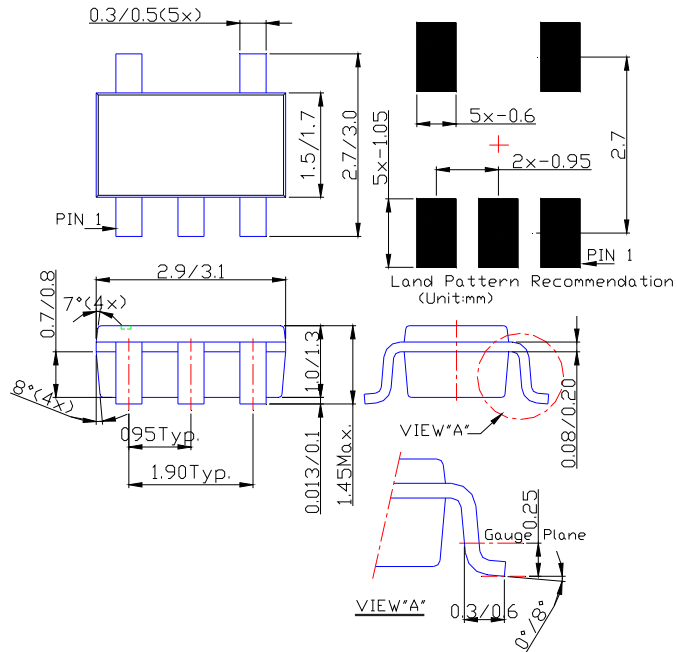


XX : Identification Code  
Y : Year : 0~9  
W : Week : A~Z : 1~26 week;  
a~z : 27~52 week; z represents  
52 and 53 week  
X : A~Z : Internal code

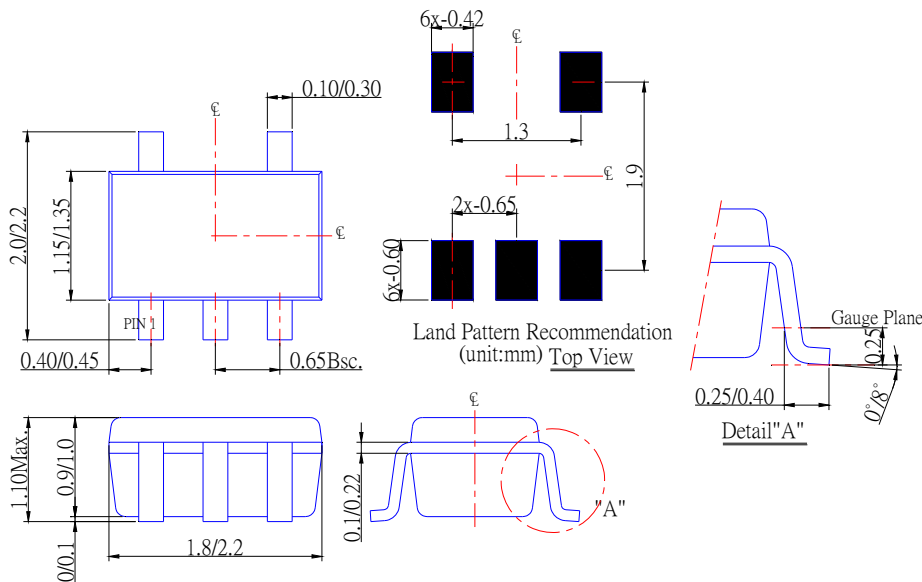
Part Number	Package	Identification Code
74LVCE1G04FZ4	DFN1410	PU

**Package Outline Dimensions (All Dimensions in mm)**

**(1) Package Type: SOT25**

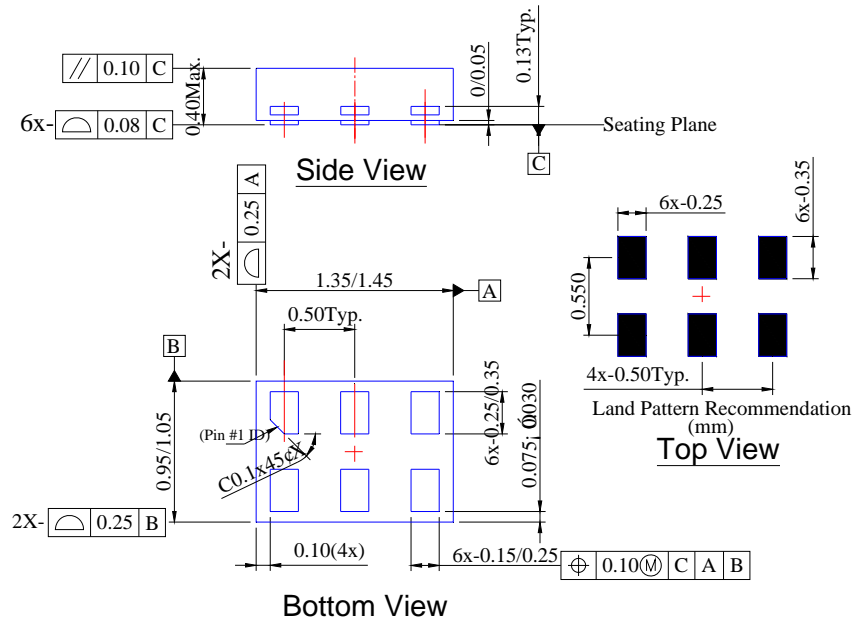


**(2) Package Type: SOT353**



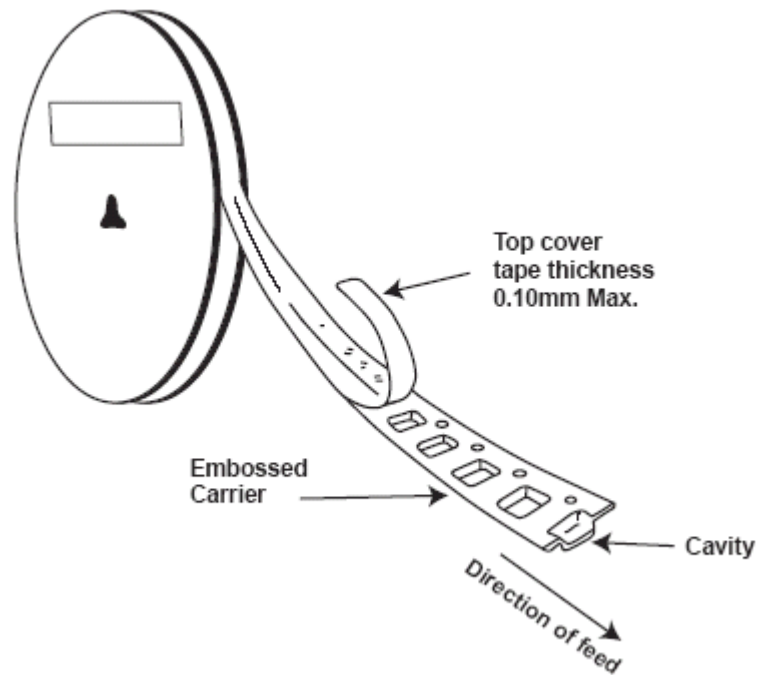
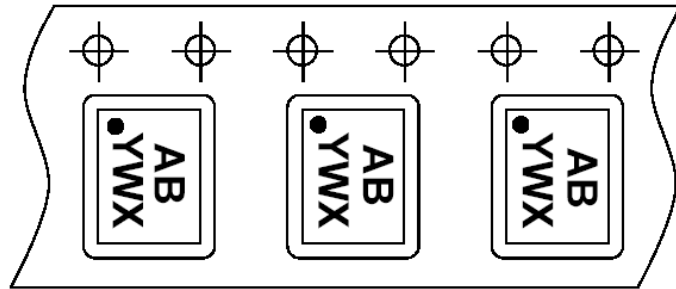
**Package Outline Dimensions (All Dimensions in mm)**

**(3) Package Type: DFN1410**



## Taping Orientation (Note 7)

For DFN1410



Note: 7. The taping orientation of the other package type can be found on our website at <http://www.diodes.com/datasheets/ap02007.pdf>

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