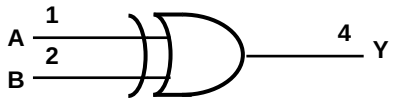
NEW PRODUCT

Pin Descriptions

Pin Name	Description
A	Data Input
B	Data Input
GND	Ground
Y	Data Output
Vcc	Supply Voltage

Logic Diagram



Function Table

Inputs		Output
A	B	Y
H	H	L
L	H	H
H	L	H
L	L	L

NEW PRODUCT

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	±50	mA
	Continuous current through Vdd or GND	±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.

NEW PRODUCT

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 V to 1.95 V	0.65 X V_{CC}		V
		V_{CC} = 2.3 V to 2.7 V	1.7		
		V_{CC} = 3 V to 3.6 V	2		
		V_{CC} = 4.5 V to 5.5 V	0.7 X V_{CC}		
V_{IL}	Low-level input voltage	V_{CC} = 1.4 V to 1.95 V		0.35 X V_{CC}	V
		V_{CC} = 2.3 V to 2.7 V		0.7	
		V_{CC} = 3 V to 3.6 V		0.8	
		V_{CC} = 4.5 V to 5.5 V		0.3 X V_{CC}	
V_I	Input Voltage		0	5.5	V
V_O	Output Voltage		0	V_{CC}	V
I_{OH}	High-level output current	Vcc=1.4 V		-3	mA
		V_{CC} = 1.65 V		-4	
		V_{CC} = 2.3 V		-8	
		V_{CC} = 3 V		-16	
				-24	
		V_{CC} = 4.5 V		-32	
I_{OL}	Low-level output current	Vcc=1.4 V		3	mA
		V_{CC} = 1.65 V		4	
		V_{CC} = 2.3 V		8	
		V_{CC} = 3 V		16	
				24	
		V_{CC} = 4.5 V		32	
Δt/ΔV	Input transition rise or fall rate	V_{CC} = 1.4 to 3V		20	ns/V
		V_{CC} = 3.3 V ± 0.3 V		10	
		V_{CC} = 5 V ± 0.5 V		5	
T_A	Operating free-air temperature		-40	85	ºC

Note: 4. Unused inputs should be held at Vcc or Ground.

NEW PRODUCT

Electrical Characteristics (All typical values are at Vcc = 3.3V, T_A = 25°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} = -100µA	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} = 100µA	1.4 V to 5.5V			0.1	V
		I_{OL} = 3mA	1.4 V			.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			± 5	µA
I_{OFF}	Power Down Leakage Current	V_I or V_O = 5.5V	0			± 10	µA
I_{CC}	Supply Current	V_I = 5.5V of GND I_O=0	1.4 V to 5.5V			10	µA
ΔI_{CC}	Additional Supply Current	One input at V_{CC} – 0.6 V Other inputs at V_{CC} or GND	3 V to 5.5V			500	µA
C_i	Input Capacitance	V_i = V_{CC} – or GND	3.3		3.5		pF
θ_{JA}	Thermal Resistance Junction-to-Ambient	SOT25	(Note 5)		204		°C/W
		SOT353	(Note 5)		371		
		DFN1410	(Note 5)		430		
θ_{JC}	Thermal Resistance Junction-to-Case	SOT25	(Note 5)		52		°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.

NEW PRODUCT

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_{pd}	A or B	Y	2.1	9.1	1.4	6.3	0.8	3.6	0.6	3.2	0.7	2.9	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_{pd}	A or B	Y	3.5	9.9	2.4	6.9	1.4	4.4	1	4.1	0.9	3.6	ns

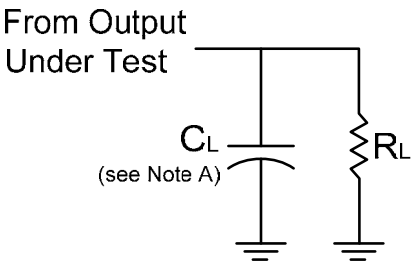
Operating Characteristics

T_A = 25 ºC

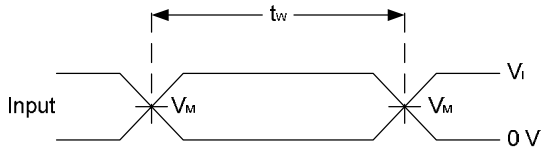
Parameter		Test Conditions	Vcc = 1.5 V	Vcc = 1.8 V	Vcc = 2.5 V	Vcc = 3.3 V	Vcc = 5 V	Unit
			TYP	TYP	TYP	TYP	TYP	
C_{pd}	Power dissipation capacitance	f = 10 MHz	22	22	22	22	24	pF

NEW PRODUCT

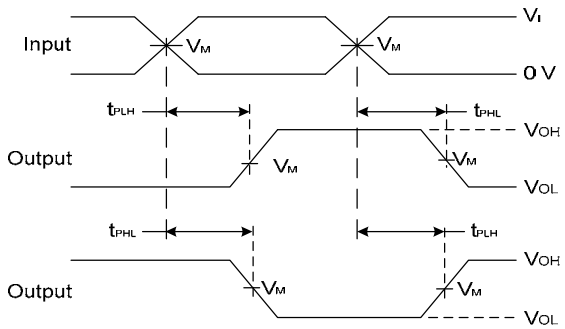
Parameter Measurement Information



Vcc	Inputs		V_M	C_L	R_L
	V_I	t_r/t_f			
1.5V±0.1V	V_{CC}	≤2ns	$V_{CC}/2$	15pF	1MΩ
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	15pF	1MΩ
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	15pF	1MΩ
3.3V±0.3V	3V	≤2.5ns	1.5V	15pF	1MΩ
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	15pF	1MΩ



Voltage Waveform
Pulse Duration



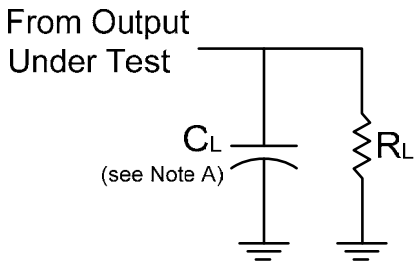
Voltage Waveform
Propagation Delay Times
Inverting and Non Inverting Outputs

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

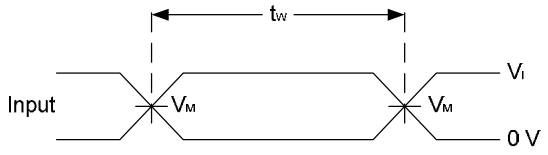
Figure 1. Load Circuit and Voltage Waveforms

NEW PRODUCT

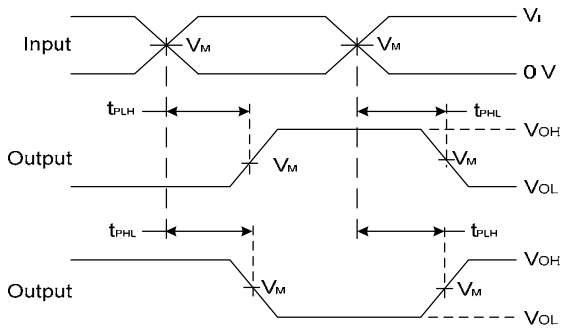
Parameter Measurement Information (Continued)



Vcc	Inputs		V_M	C_L	R_L
	V_I	t_r/t_f			
1.5V±0.15	V_{CC}	≤2ns	$V_{CC}/2$	30pF	1KΩ
1.8V±0.15V	V_{CC}	≤2ns	$V_{CC}/2$	30pF	1KΩ
2.5V±0.2V	V_{CC}	≤2ns	$V_{CC}/2$	30pF	500Ω
3.3V±0.3V	3V	≤2.5ns	1.5V	50pF	500Ω
5V±0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	50pF	500Ω



Voltage Waveform
Pulse Duration



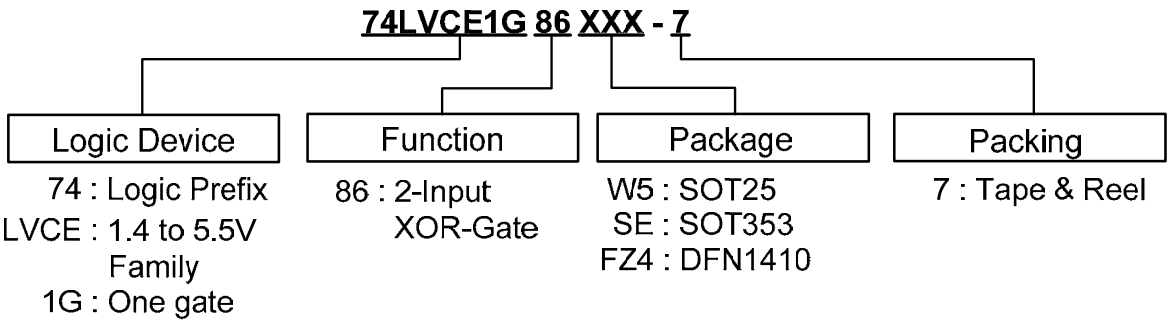
Voltage Waveform
Propagation Delay Times
Inverting and Non Inverting Outputs

Notes: A. Includes test lead and test apparatus capacitance.
B. All pulses are supplied at pulse repetition rate ≤ 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

NEW PRODUCT

Ordering Information



Device	Package Code	Packaging (Note 5)	7" Tape and Reel	
			Quantity	Part Number Suffix
74LVCE1G86W5-7	W6	SOT25	3000/Tape & Reel	-7
74LVCE1G86SE-7	SE	SOT353	3000/Tape & Reel	-7
74LVCE1G86FZ4-7	FZ4	DFN1410	5000/Tape & Reel	-7

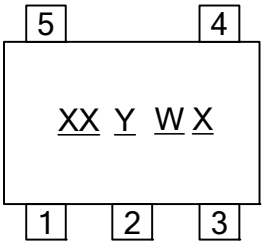
Note: 6. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

NEW PRODUCT

Marking Information

(1) SOT25 and SOT353

(Top View)

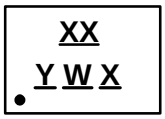


XX : Identification code
Y : Year 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : A~Z : Internal code

Part Number	Package	Identification Code
74LVCE1G86W5	SOT25	PX
74LVCE1G86SE	SOT353	PX

(2) DFN1410

(Top View)



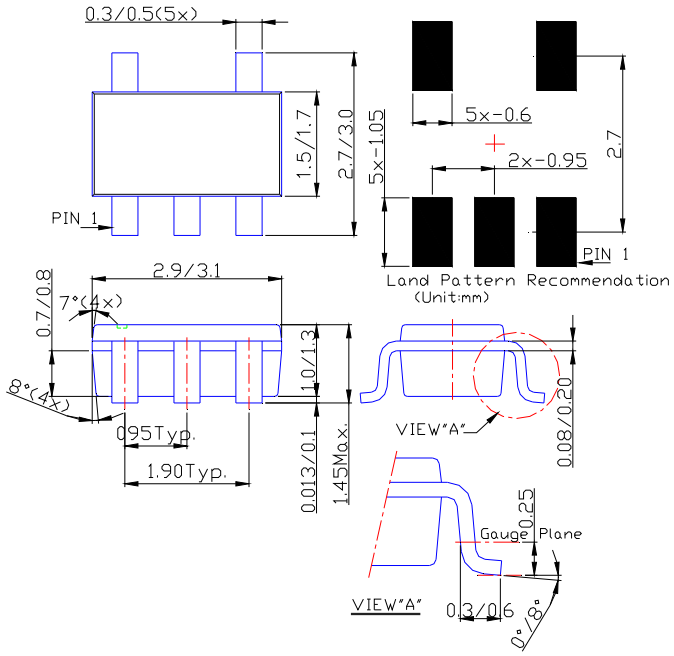
XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : A~Z : Internal code

Part Number	Package	Identification Code
74LVCE1G86FZ4	DFN1410	PX

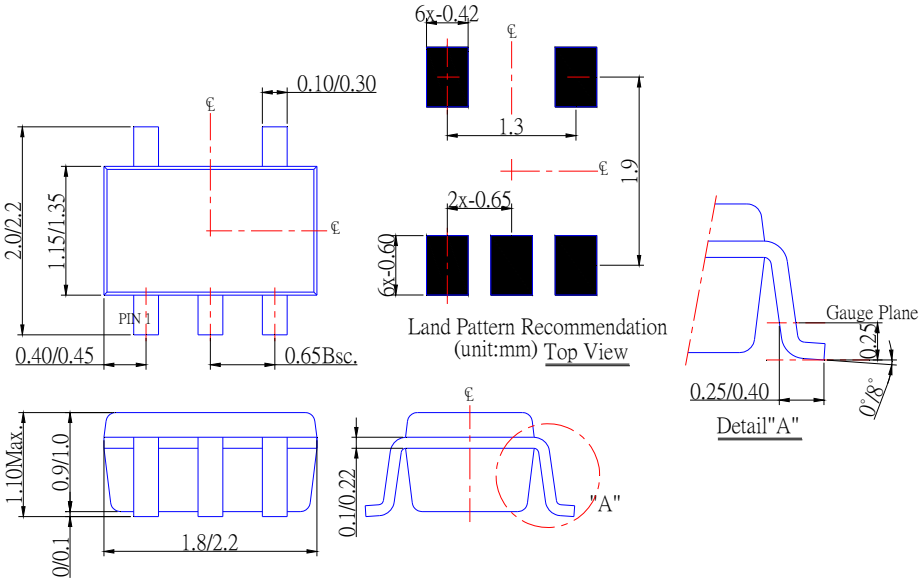
NEW PRODUCT

Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT25



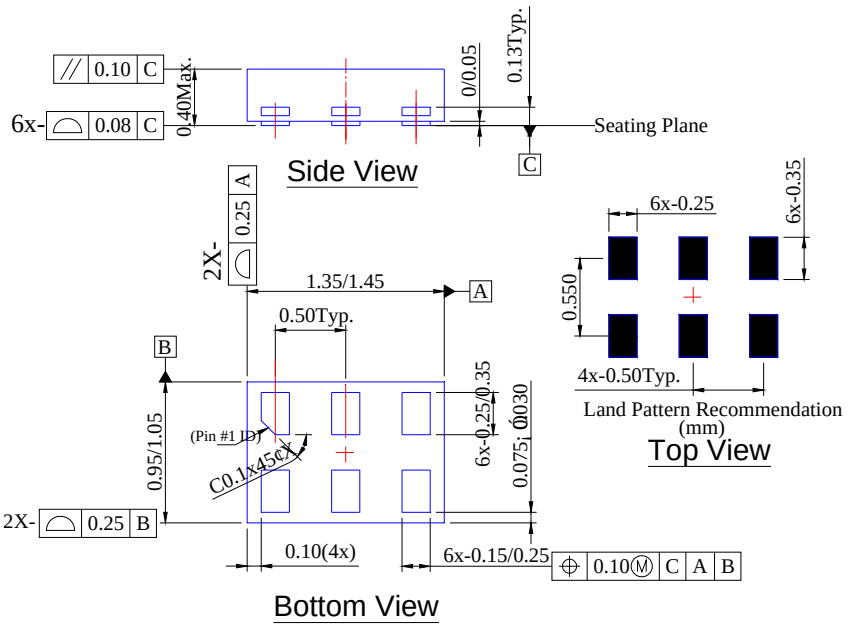
(2) Package Type: SOT353



NEW PRODUCT

Package Outline Dimensions (All Dimensions in mm)

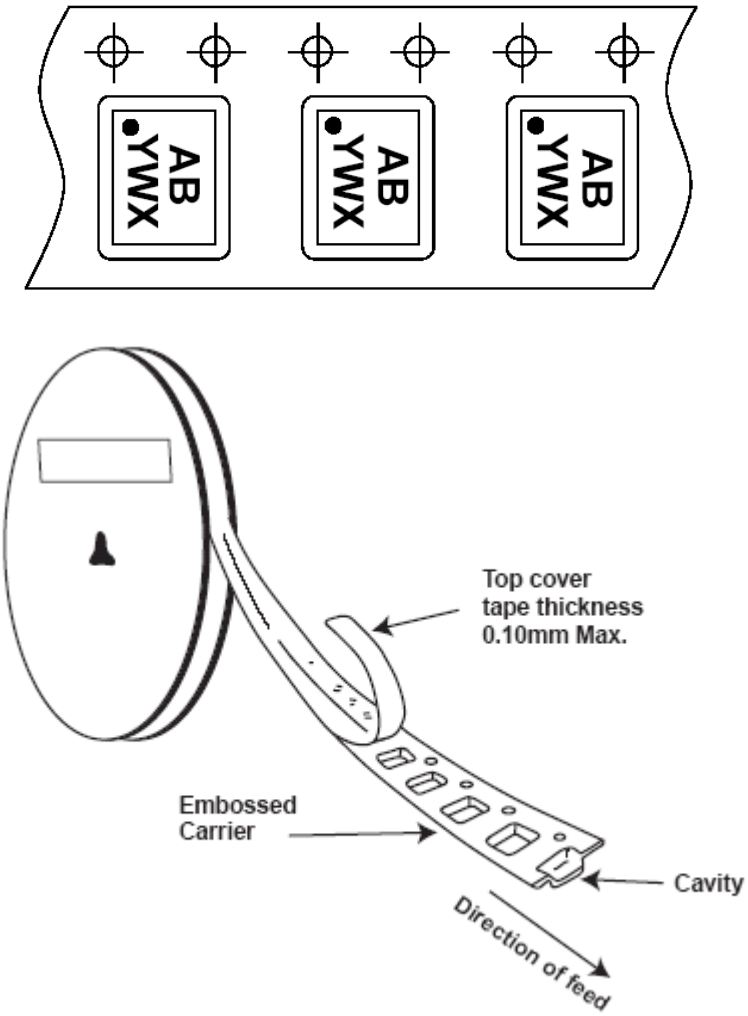
(3) Package Type: DFN1410



NEW PRODUCT

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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