74LVC1G02

SINGLE 2 INPUT POSITIVE NOR GATE

Description

The 74LVC1G02 is a single 2-input positive NOR gate with a standard push-pull output. The device is designed for operation with a power supply range of 1.65V to 5.5V. The inputs are tolerant to 5.5V allowing this device to be used in a mixed voltage environment. The device is fully specified for partial power down applications using I_{OFF}. The I_{OFF} circuitry disables the output preventing damaging current backflow when the device is powered down.

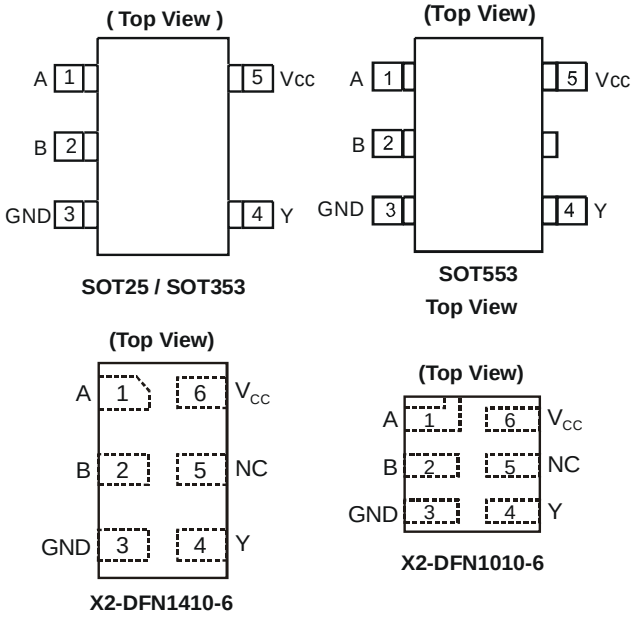
The gate performs the positive Boolean function:

$$Y = \overline{A + B} \text{ or } Y = \overline{A} \bullet \overline{B}$$

Features

- Wide Supply Voltage Range from 1.65 to 5.5V
- ± 24mA Output Drive at 3.3V
- CMOS low power consumption
- I_{OFF} Supports Partial-Power-Down Mode Operation
- Inputs accept up to 5.5V
- ESD Protection Tested per JESD 22
  - Exceeds 200-V Machine Model (A115-A)
  - Exceeds 2000-V Human Body Model (A114-A)
  - Exceeds 1000-V Charged Device Model (C101C)
- Latch-Up Exceeds 100mA per JESD 78, Class II
- Range of Package Options
- Direct Interface with TTL Levels
- All packages Assembled with "Green" Molding Compound (no Br, Sb)
- Lead Free Finish/ RoHS Compliant (Note 1)

Pin Assignments



Applications

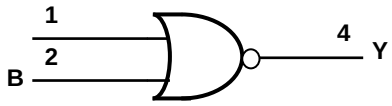
- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, networking, notebooks, netbooks, PDAs
  - Tablet Computers, E-readers
  - Computer peripherals, hard drives, CD/DVD ROM
  - TV, DVD, DVR, set top box
  - Cell Phones, Personal Navigation / GPS
  - MP3 players ,Cameras, Video Recorders

Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. No purposely added lead. Halogen and Antimony free. Please visit our website at http://www.diodes.com/products/lead_free.html

Pin Descriptions

Pin Name	Description
A	Data Input
B	Data Input
GND	Ground
Y	Data Output
V_{CC}	Supply Voltage
NC	No Connection

Logic Diagram



Function Table

Inputs		Output
A	**B**	**Y**
H	X	L
X	H	L
L	L	H

Absolute Maximum Ratings (Note 2)

Symbol	Description	Rating	Unit
ESD HBM	Human Body Model ESD Protection	2	KV
ESD CDM	Charged Device Model ESD Protection	1	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
I_{CC}, I_{GND}	Continuous current through Vcc or GND	±100	mA
T_J	Operating Junction Temperature	-40 to 150	°C
T_{STG}	Storage Temperature	-65 to 150	°C

Notes: 2. 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 3)

Symbol	Parameter		Min	Max	Unit
V_{CC}	Operating Voltage	Operating	1.65	5.5	V
		Data retention only	1.5		V
V_{IH}	High-level Input Voltage	V_{CC} = 1.65V to 1.95V	0.65 X V_{CC}		V
		V_{CC} = 2.3V to 2.7V	1.7		
		V_{CC} = 3V to 3.6V	2		
		V_{CC} = 4.5V to 5.5V	0.7 X V_{CC}		
V_{IL}	Low-level input voltage	V_{CC} = 1.65V to 1.95V		0.35 X V_{CC}	V
		V_{CC} = 2.3V to 2.7V		0.7	
		V_{CC} = 3V to 3.6 V		0.8	
		V_{CC} = 4.5V to 5.5V		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	V_{CC} = 1.65V		-4	mA
		V_{CC} = 2.3V		-8	
		V_{CC} = 3V		-16	
				-24	
		V_{CC} = 4.5V		-32	
I_{OL}	Low-level output current	V_{CC} = 1.65V		4	mA
		V_{CC} = 2.3V		8	
		V_{CC} = 3V		16	
				24	
		V_{CC} = 4.5V		32	
Δt/ΔV	Input transition rise or fall rate	V_{CC} = 1.8V ± 0.15V, 2.5V ± 0.2V		20	ns/V
		V_{CC} = 3.3V ± 0.3V		10	
		V_{CC} = 5V ± 0.5V		5	
T_A	Operating free-air temperature		-40	125	ºC

Notes: 3. Unused inputs should be held at V_{CC} or Ground.

Electrical Characteristics (All typical values are at V_{CC} = 3.3V, T_A = 25°C)

Symbol	Parameter	Test Conditions	V_{CC}	-40°C to 85°C			-40°C to 125°C		Unit
				Min	Typ.	Max	Min	Max	
V_{OH}	High Level Output Voltage	I_{OH} = -100µA	1.65V to 5.5V	V_{CC} – 0.1			V_{CC} – 0.1		V
		I_{OH} = -4mA	1.65V	1.2			0.95		
		I_{OH} = -8mA	2.3V	1.9			1.7		
		I_{OH} = -16mA	3V	2.4			2.2		
		I_{OH} = -24mA		2.3			2.0		
		I_{OH} = -32mA	4.5V	3.8			3.4		
V_{OL}	Low Level Output Voltage	I_{OL} = 100µA	1.65V to 5.5V			0.1		0.1	V
		I_{OL} = 4mA	1.65V			0.45		0.7	
		I_{OL} = 8mA	2.3V			0.3		0.45	
		I_{OL} = 16mA	3V			0.4		0.6	
		I_{OL} = 24mA				0.55		0.8	
		I_{OL} = 32mA	4.5V			0.55		.8	
I_I	Input Current	V_I = 5.5 V or GND	0 to 5.5V		± 0.1	±5		± 100	µA
I_{OFF}	Power Down Leakage Current	V_I or V_O = 5.5V	0V			±10		±200	µA
I_{CC}	Supply Current	V_I = 5.5V or GND I_O=0	5.5V		0.1	10		200	µA
ΔI_{CC}	Additional Supply Current	One input at V_{CC} – 0.6V Other inputs at V_{CC} or GND	3V to 5.5V			500		5000	µA
C_i	Input Capacitance	V_i = V_{CC} – or GND	3.3V		5				pF

Package Characteristics (All typical values are at V_{CC} = 3.3V, T_A = 25°C)

Symbol	Parameter	Test Conditions	V_{CC}	Min	Typ.	Max	Unit
θ_{JA}	Thermal Resistance Junction-to-Ambient	SOT25	(Note 4)		204		°C/W
		SOT353			371		
		SOT553			231		
		X2-DFN1010-6			445		
		X2-DFN1410-6			460		
θ_{JC}	Thermal Resistance Junction-to-Case	SOT25	(Note 4)		52		°C/W
		SOT353			143		
		SOT553			105		
		X2-DFN1010-6			250		
		X2-DFN1410-6			265		

Notes: 4. Test condition for SOT25, SOT353, SOT553, X2-DFN1410-6 and X2-DFN1010-6: Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

Switching Characteristics

Figure 1 Typical Values at T_A = 25 ºC and nominal voltages 1.8V, 2.5V, 2.7V, 3.3V, and 5.0V.

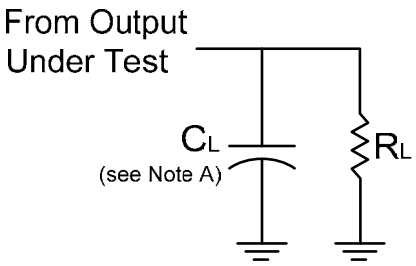
Parameter	From Input	To Output	V_{CC}	T_A = -40ºC to 85ºC			T_A = -40ºC to 125ºC		Unit
				Min	Typ.	Max	Min	Max	
t_{pd}	A or B	Y	1.8V ± 0.15V	1.0	3.2	8.0	1.0	10.5	ns
			2.5V ± 0.2V	0.5	2.2	5.5	0.5	7.0	
			2.7V	0.5	2.5	5.5	0.5	7.0	
			3.3V ± 0.3V	0.5	2.1	4.5	0.5	6.0	
			5.0V ± 0.5V	0.5	1.7	4.0	0.5	5.5	

Operating Characteristics

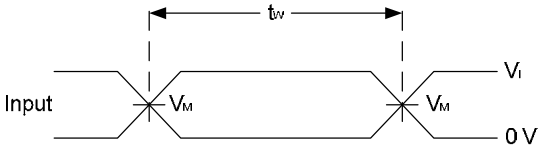
T_A = 25 ºC

Parameter		Test Conditions	V_{CC} = 1.8V	V_{CC} = 2.5V	V_{CC} = 3.3V	V_{CC} = 5V	Unit
			Typ.	Typ.	Typ.	Typ.	
C_{pd}	Power dissipation capacitance	f = 10 MHz	14	14	14	14	pF

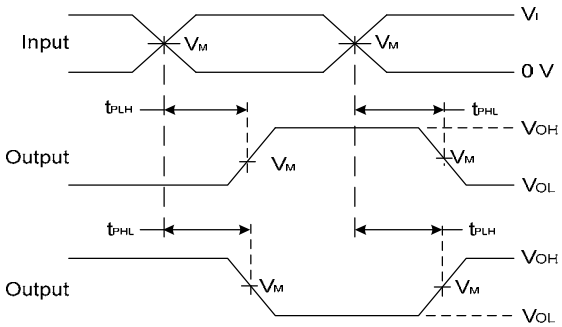
Parameter Measurement Information



V_{CC}	Inputs		V_M	C_L	R_L
	V_I	t_r/t_f			
1.8V ± 0.15V	V_{CC}	≤2ns	$V_{CC}/2$	30 pF	1 KΩ
2.5V ± 0.2V	V_{CC}	≤2ns	$V_{CC}/2$	30 pF	500 Ω
2.7V	V_{CC}	≤2.5ns	1.5V	50 pF	500 Ω
3.3V ± 0.3V	3.0V	≤2.5ns	1.5V	50 pF	500 Ω
5.0V ± 0.5V	V_{CC}	≤2.5ns	$V_{CC}/2$	50 pF	500 Ω



Voltage Waveform Pulse Duration

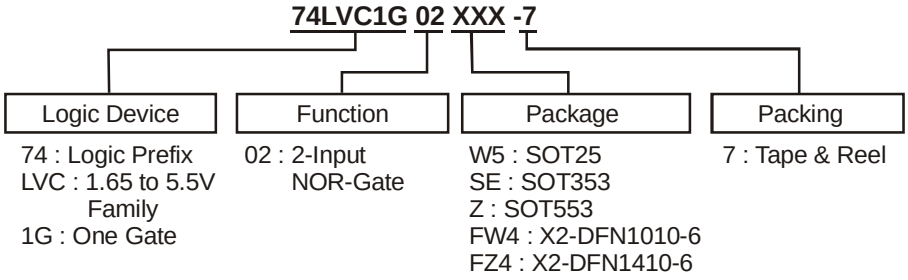


Voltage Waveform Propagation Delay Times Inverting and Non Inverting Outputs

Figure 1. Load Circuit and Voltage Waveforms

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}.

Ordering Information

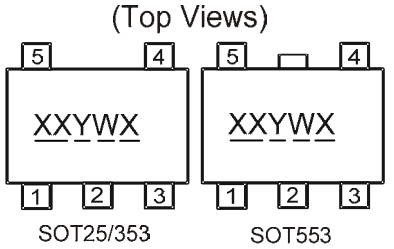


Device	Package Code	Packaging (Note 6)	7" Tape and Reel	
			Quantity	Part Number Suffix
74LVC1G02W5-7	W5	SOT25	3000/Tape & Reel	-7
74LVC1G02SE-7	SE	SOT353	3000/Tape & Reel	-7
74LVC1G02Z-7	Z	SOT553	4000/Tape & Reel	-7
74LVC1G02FW4-7	FW4	X2-DFN1010-6	5000/Tape & Reel	-7
74LVC1G02 FZ4-7	FZ4	X2-DFN1410-6	5000/Tape & Reel	-7

Notes: 5. 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.
6. The taping orientation is located on our website at http://www.diodes.com/datasheets/ap02007.pdf

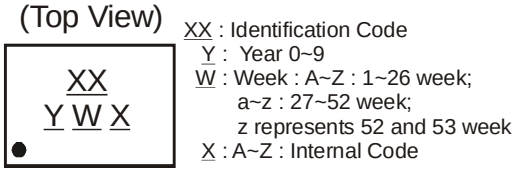
Marking Information

(1) SOT25, SOT353 and SOT553



Part Number	Package	Identification Code
74LVC1G02W5	SOT25	UT
74LVC1G02SE	SOT353	UT
74LVC1G02Z	SOT553	UT

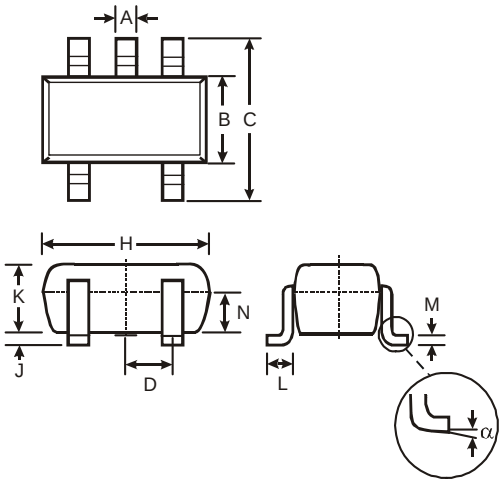
(2) X2-DFN1010-6 and X2-DFN1410-6



Part Number	Package	Identification Code
74LVC1G02FW4	X2-DFN1010-6	UT
74LVC1G02FZ4	X2-DFN1410-6	UT

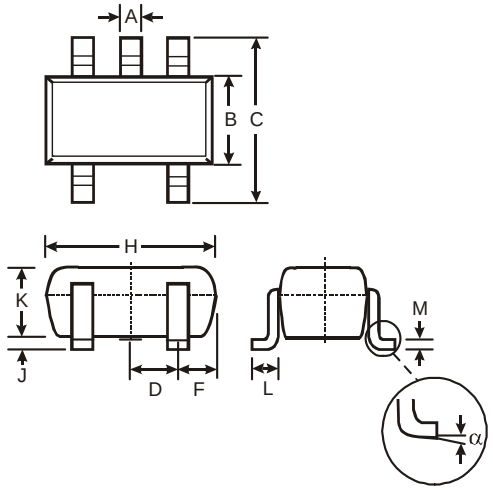
Package Outline Dimensions (All Dimensions in mm)

(1) Package Type: SOT25



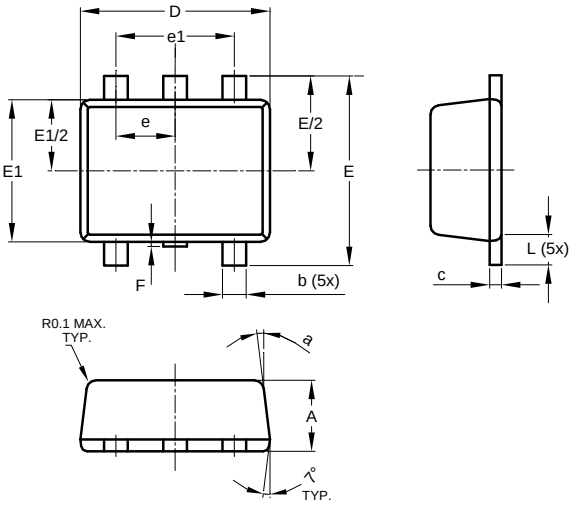
SOT25			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
N	0.70	0.80	0.75
α	0°	8°	—
All Dimensions in mm			

(2) Package Type: SOT353



SOT353		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
H	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		

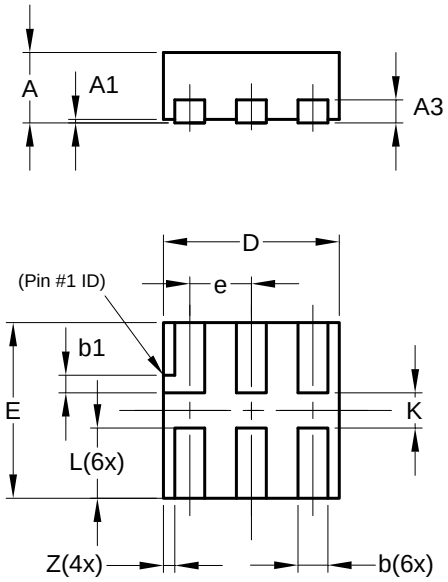
(3) Package Type: SOT553



SOT553			
Dim	Min	Max	Typ
A	0.55	0.62	0.60
b	0.15	0.30	0.20
c	0.10	0.18	0.15
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	0.50 BSC		
e1	1.00 BSC		
F	0.00	0.10	—
L	0.10	0.30	0.20
a	6°	8°	7°
All Dimensions in mm			

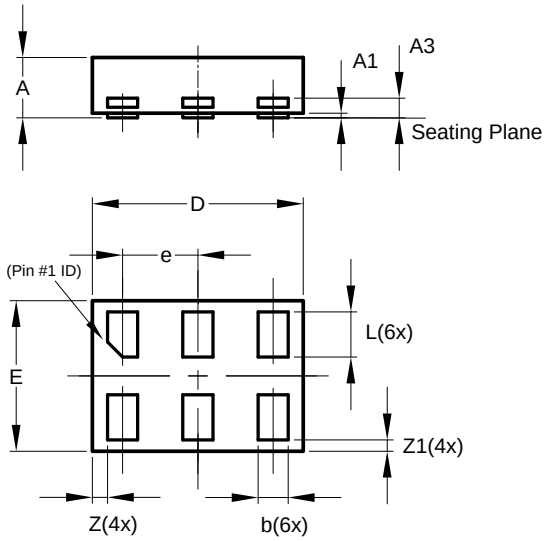
Package Outline Dimensions (cont.)

(4) Package Type X2-DFN1010-6



X2-DFN1010-6			
Dim	**Min**	**Max**	**Typ**
A	—	0.40	0.39
A1	0.00	0.05	0.02
A3	—	—	0.13
b	0.14	0.20	0.17
b1	0.05	0.15	0.10
D	0.95	1.05	1.00
E	0.95	1.05	1.00
e	—	—	0.35
L	0.35	0.45	0.40
K	0.15	—	—
Z	—	—	0.065
All Dimensions in mm			

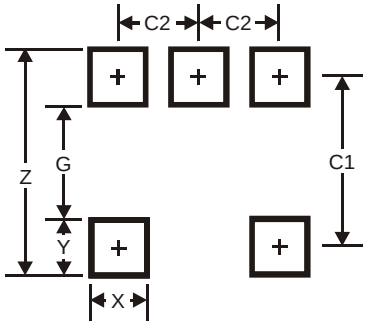
(5) Package Type: X2-DFN1410-6



X2-DFN1410-6			
Dim	**Min**	**Max**	**Typ**
A	—	0.40	0.39
A1	0.00	0.05	0.02
A3	—	—	0.13
b	0.15	0.25	0.20
D	1.35	1.45	1.40
E	0.95	1.05	1.00
e	—	—	0.50
L	0.25	0.35	0.30
Z	—	—	0.10
Z1	0.045	0.105	0.075
All Dimensions in mm			

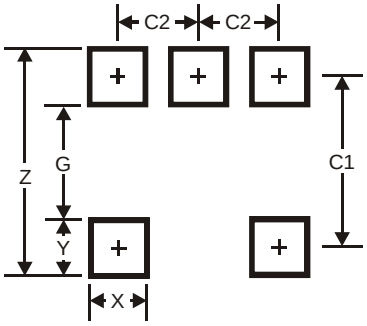
Suggested Pad Layout

(1) Package Type: SOT25



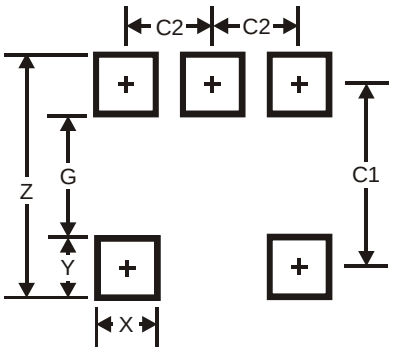
Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

(2) Package Type: SOT353



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

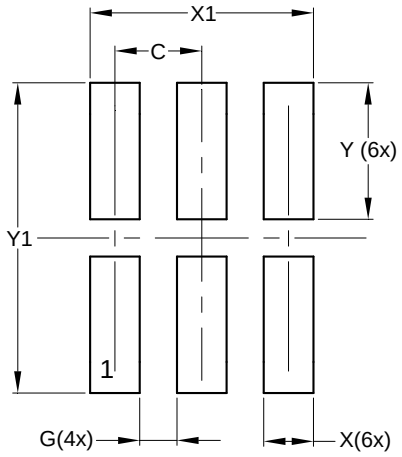
(3) Package Type: SOT553



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

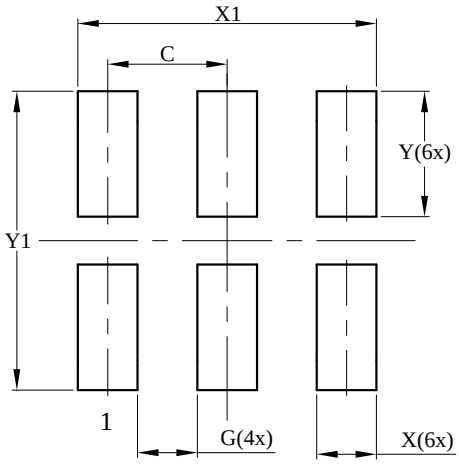
Suggested Pad Layout (cont.)

(4) Package Type X2-DFN1010-6



Dimensions	Value (in mm)
C	0.350
G	0.150
X	0.200
X1	0.900
Y	0.550
Y1	1.250

(5) Package Type: X2-DFN1410-6



Dimensions	Value (in mm)
C	0.500
G	0.250
X	0.250
X1	1.250
Y	0.525
Y1	1.250

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Поставка электронных компонентов

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Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

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Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А