

Description

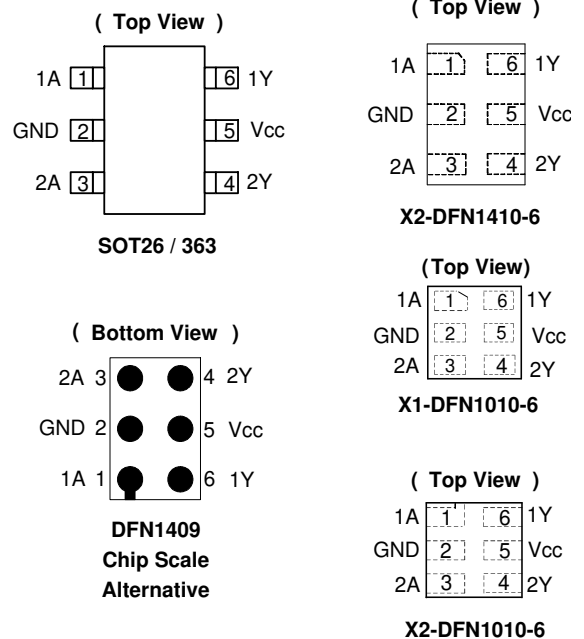
The 74LVC2G07 is a dual buffer gate with open drain outputs. The device is designed for operation with a power supply range of 1.65V to 5.5V. The input is tolerant to 5.5V allowing this device to be used in a mixed voltage environment. The device is fully specified for partial power down applications using I_{OFF}. The I_{OFF} circuitry disables the output preventing damaging current backflow when the device is powered down. The open-drain output can be connected to other open drain outputs to implement active-low wired-OR or active-high wired-AND functions. The maximum sink current is 32mA.

Features

- Wide Supply Voltage Range from 1.65V to 5.5V
- -24mA Output Drive at 3.0V
- 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)
 - Exceeds 2000-V Human Body Model (A114)
 - Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- DFN1409 Package Designed as a Direct Replacement for Chip Scale Packaging
- Range of Package Options SOT26, SOT363, X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6, and X2-DFN1410-6
- Leadless Packages Named per JESD30E
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

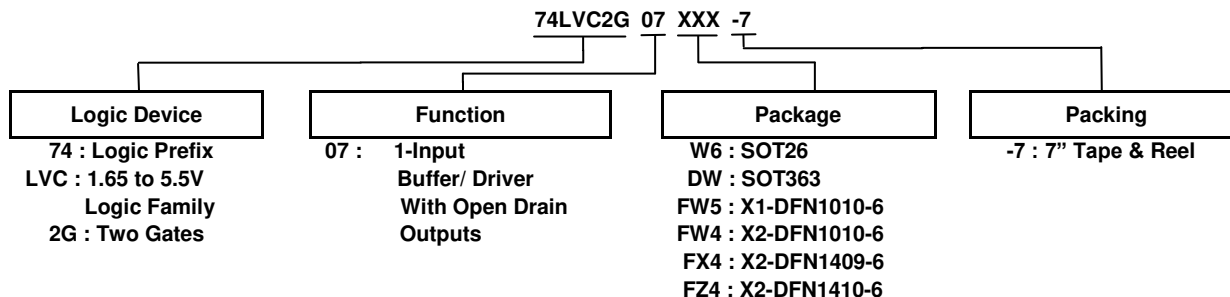
Pin Assignments



Applications

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide Array of Products Such as:
 - PCs, Networking, Notebooks, Netbooks, Tablets
 - Computer Peripherals, Hard Drives, SSD, CD/DVD ROM
 - TV, DVD, DVR, Set Top Box
 - Cell Phones, Personal Navigation / GPS
 - MP3 Players, Cameras, Video Recorders

Ordering Information



Part Number	Package Code	Package (Note 4)	Package Size	7" Tape and Reel (Note 5)	
				Quantity	Part Number Suffix
74LVC2G07W6-7	W6	SOT26	2.8mm X 2.2mm X 1.1mm 0.95mm lead pitch	3000/Tape & Reel	-7
74LVC2G07DW-7	DW	SOT363	2.0mm X 2.0mm X 1.1mm 0.65mm lead pitch	3000/Tape & Reel	-7
74LVC2G07FW5-7	FW5	X1-DFN1010-6	1.0mm X 1.0mm X 0.5mm 0.35mm pad pitch	5000/Tape & Reel	-7
74LVC2G07FW4-7	FW4	X2-DFN1010-6	1.0mm X 1.0mm X 0.4mm 0.35mm pad pitch	5000/Tape & Reel	-7
74LVC2G07FX4-7	FX4	X2-DFN1409-6 Chip Scale Alternative	1.4mm X 0.9mm X 0.4mm 0.5mm pad pitch	5000/Tape & Reel	-7
74LVC2G07FZ4-7	FZ4	X2-DFN1410-6	1.4mm X 1.0mm X 0.4mm 0.5mm pad pitch	5000/Tape & Reel	-7

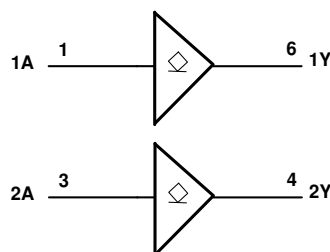
Notes: 4. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

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

Pin Descriptions

Pin Number	Pin Name	Function
1	1A	Data Input
2	GND	Ground
3	2A	Data Input
4	2Y	Data Output Open Drain
5	V _{CC}	Supply Voltage
6	1Y	Data Output Open Drain

Logic Diagram



Function Table

Inputs	Output
A	Y
H	Z
L	L

Absolute Maximum Ratings (Notes 6, 7) (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Symbol	Parameter	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 $V_O < 0$	-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	$^\circ\text{C}$
T_{STG}	Storage Temperature	-65 to +150	$^\circ\text{C}$

- Notes:
- 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.
 - Forcing the maximum allowed voltage could cause a condition exceeding the maximum current or conversely forcing the maximum current could Cause a condition exceeding the maximum voltage. The ratings of both current and voltage must be maintained within the controlled range.

Recommended Operating Conditions (Note 8) (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

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	$V_{CC} = 1.65\text{V to }1.95\text{V}$	$0.65 \times V_{CC}$	–	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	$V_{CC} = 1.65\text{V to }1.95\text{V}$	–	$0.35 \times V_{CC}$	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_{OL}	Low-Level Output Current	$V_{CC} = 1.65\text{V}$	–	4	mA
		$V_{CC} = 2.3\text{V}$	–	8	
		$V_{CC} = 3\text{V}$	–	16	
		$V_{CC} = 4.5\text{V}$	–	24	
$\Delta t/\Delta V$	Input Transition Rise or Fall Rate	$V_{CC} = 1.8\text{V} \pm 0.15\text{V}, 2.5\text{V} \pm 0.2\text{V}$	–	20	ns/V
		$V_{CC} = 3.3\text{V} \pm 0.3\text{V}$	–	10	
		$V_{CC} = 5\text{V} \pm 0.5\text{V}$	–	10	
T_A	Operating Free-air Temperature	–	-40	+125	$^\circ\text{C}$

- Note: 8. Unused inputs should be held at V_{CC} or Ground.

Electrical Characteristics

Symbol	Parameter	Test Conditions	V _{CC}	-40°C to +85°C		-40°C to +125°C		Unit
				Min	Max	Min	Max	
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	–	0.70	
		I _{OL} = 8mA	2.3V	–	0.3	–	0.45	
		I _{OL} = 16mA	3V	–	0.4	–	0.60	
		I _{OL} = 24mA		–	0.55	–	0.80	
		I _{OL} = 32mA	4.5V	–	0.55	–	0.80	
I _I	Input Current	V _I = 5.5V or GND	0 to 5.5V	–	±5	–	±20	µA
I _{OZ}	Z State Leakage Current	V _O = 0 to 5.5V	3.6V	–	±10	–	±10	µA
I _{OFF}	Power Down Leakage Current	V _I or V _O = 5.5V	0V	–	±10	–	±20	µA
I _{CC}	Supply Current	V _I = 5.5V or GND, I _O = 0	1.65V to 5.5V	–	10	–	40	µA
ΔI _{CC}	Additional Supply Current	Input at V _{CC} –0.6V	3V to 5.5V	–	500	–	5000	µA

Package Characteristics (@T_A = +25°C, V_{CC} = 3.3V, unless otherwise specified.)

Symbol	Parameter	Package	Conditions	Min	Typ	Max	Unit
C _I	Input Capacitance	Typical of All Packages	V _{CC} = 3.3V V _I = V _{CC} or GND	–	3.5	–	pF
θ _{JA}	Thermal Resistance Junction-to-Ambient	SOT26	(Note 9)	–	204	–	°C/W
		SOT363		–	371	–	
		X2-DFN1410-6		–	430	–	
		X2-DFN1409-6		–	450	–	
		X1-DFN1010-6		–	495	–	
		X2-DFN1010-6		–	510	–	
θ _{JC}	Thermal Resistance Junction-to-Case	SOT26	(Note 9)	–	52	–	°C/W
		SOT363		–	143	–	
		X2-DFN1410-6		–	190	–	
		X2-DFN1409-6		–	225	–	
		X1-DFN1010-6		–	245	–	
		X2-DFN1010-6		–	250	–	

Note: 9. Test condition for all packages: Device mounted on FR-4 substrate PC board, 2oz copper with minimum recommended pad layout.

Switching Characteristics

T_A = -40°C to +85°C, C_L = 30 or 50pF (see Figure 1)

Parameter	From (Input)	To (Output)	V _{CC} = 1.8V ±0.15V		V _{CC} = 2.5V ±0.2V		V _{CC} = 3.3V ±0.3V		V _{CC} = 5V ±0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	
t _{PD}	A	Y	0.5	6.7	0.5	4.3	0.5	3.7	0.5	2.9	ns

T_A = -40°C to +125°C, C_L = 30 or 50pF (see Figure 1)

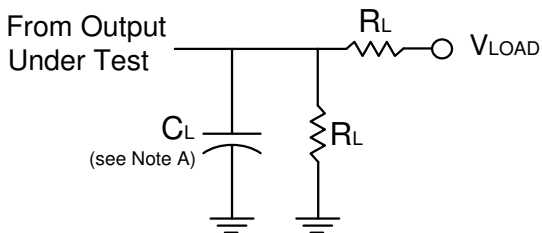
Parameter	From (Input)	To (Output)	V _{CC} = 1.8V ±0.15V		V _{CC} = 2.5V ±0.2V		V _{CC} = 3.3V ±0.3V		V _{CC} = 5V ±0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	
t _{PD}	A	Y	0.5	8.4	0.5	5.5	0.5	4.7	0.5	3.7	ns

Operating Characteristics

T_A = +25°C

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 = 10MHz	3	3	4	6	pF

Parameter Measurement Information



TEST	Condition
t _{PLZ} (see Notes D and E)	V _{LOAD}
t _{PZL} (see Notes D and F)	V _{LOAD}

V _{CC}	Inputs		V _M	V _{LOAD}	C _L	R _L	V _Δ
	V _I	t _r /t _f					
1.8V±0.15V	V _{CC}	≤2ns	V _{CC} /2	2 X V _{CC}	30pF	1kΩ	0.15V
2.5V±0.2V	V _{CC}	≤2ns	V _{CC} /2	2 X V _{CC}	30pF	500Ω	0.15V
3.3V±0.3V	3V	≤2.5ns	1.5V	6V	50pF	500Ω	0.3V
5V±0.5V	V _{CC}	≤2.5ns	V _{CC} /2	2 X V _{CC}	50pF	500Ω	0.3V

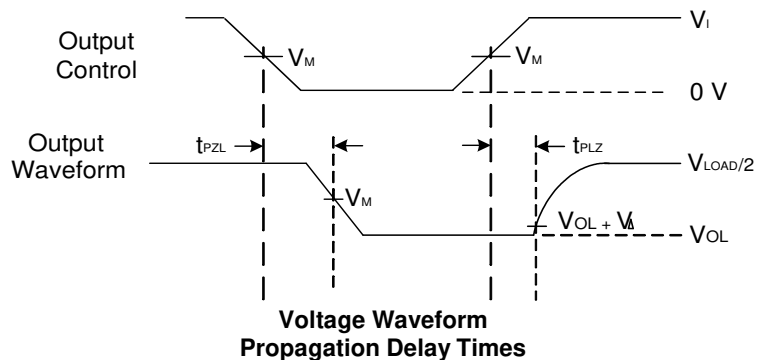
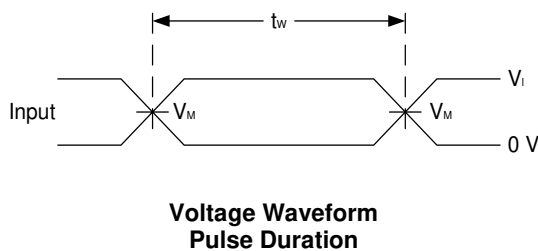
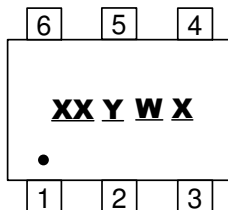


Figure 1. Load Circuit and Voltage Waveforms

- Notes:
- A. Includes test lead and test apparatus capacitance.
 - B. All pulses are supplied at pulse repetition rate ≤ 10 MHz
 - C. The inputs are measured one at a time with one transition per measurement.
 - D. For the open drain device t_{PLZ} and t_{PZL} are the same as t_{PD}.
 - E. t_{PZL} is measured at V_M.
 - F. t_{PLZ} is measured at V_{OL} + V_Δ.

Marking Information

(1) SOT26, SOT363

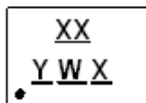


XX : Identification Code
Y : Year 0~9
W : Week : A~Z : 1~26 Week;
 a~z : 27~52 Week; z Represents
 52 and 53 Week
X : A~Z : Internal Code

Part Number	Package	Identification Code
74LVC2G07W6-7	SOT26	Z4
74LVC2G07DW-7	SOT363	Z4

(2) X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6, X2-DFN1410-6

(Top View)

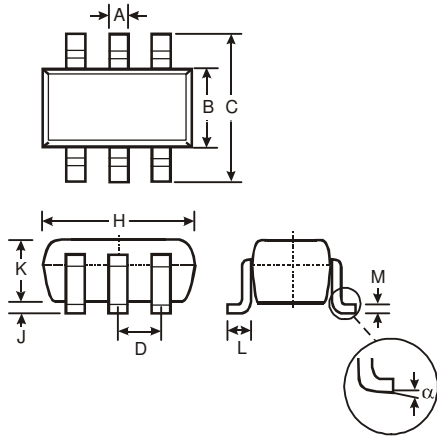


XX : Identification Code
Y : Year 0~9
W : Week : A~Z : 1~26 Week;
 a~z : 27~52 Week; z Represents
 52 and 53 Week
X : A~Z : Internal Code

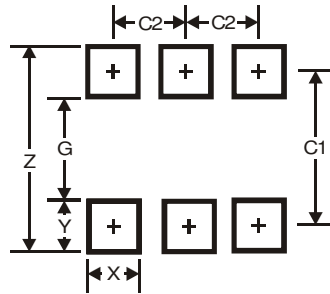
Part Number	Package	Identification Code
74LVC2G07FW4-7	X2-DFN1010-6	Z4
74LVC2G07FW5-7	X1-DFN1010-6	W4
74LVC2G07FX4-7	X2-DFN1409-6	X4
74LVC2G07FZ4-7	X2-DFN1410-6	Z4

SOT26 Package Outline Dimensions and Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



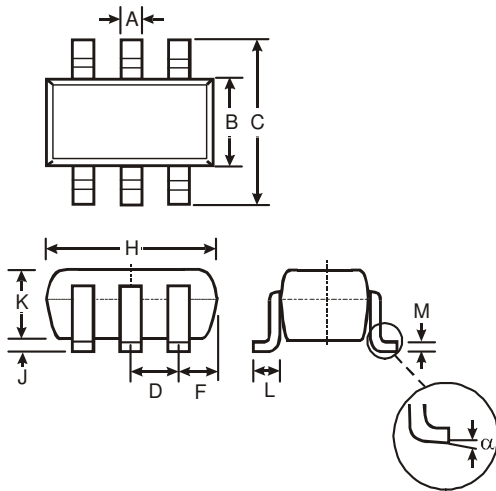
SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			



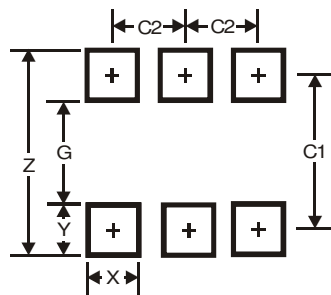
Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

SOT363 Package Outline Dimensions and Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



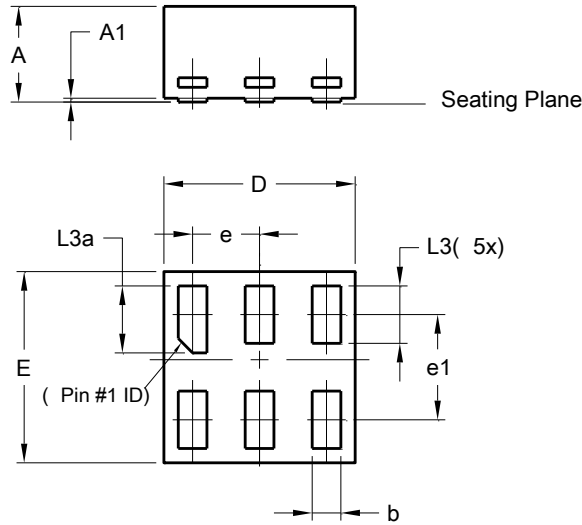
SOT363			
Dim	Min	Max	Typ
A	0.10	0.30	0.25
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	0.65 Typ		
F	0.40	0.45	0.425
H	1.80	2.20	2.15
J	0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.22	0.11
α	0°	8°	-
All Dimensions in mm			



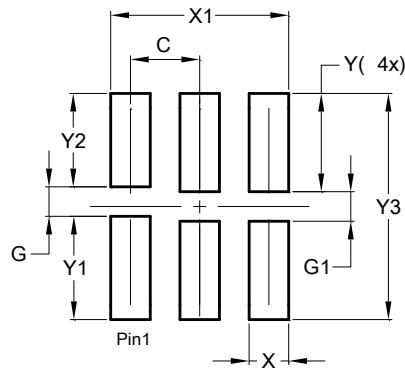
Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

X1-DFN1010-6 (Type B) Package Outline Dimensions and Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



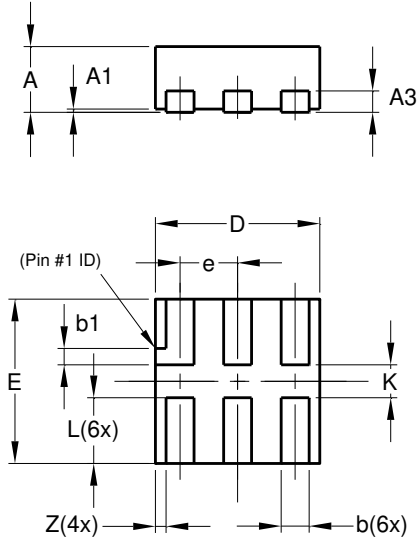
X1-DFN1010-6 (Type B)			
Dim	Min	Max	Typ
A	-	0.50	0.39
A1	-	0.04	-
b	0.12	0.20	0.15
D	0.95	1.050	1.00
E	0.95	1.050	1.00
e	0.35 BSC		
e1	0.55 BSC		
L3	0.27	0.30	0.30
L3a	0.32	0.40	0.35
All Dimensions in mm			



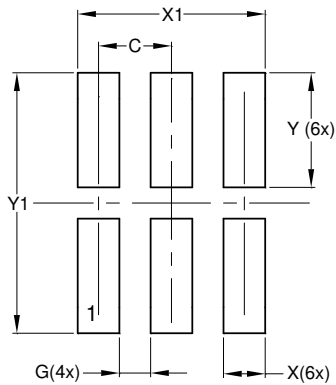
Dimensions	Value (in mm)
C	0.350
G	0.150
G1	0.150
X	0.200
X1	0.900
Y	0.500
Y1	0.525
Y2	0.475
Y3	1.150

X2-DFN1010-6 Package Outline Dimensions and Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



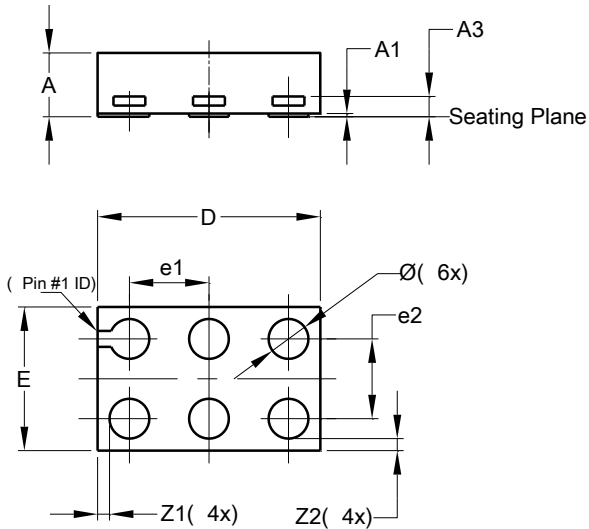
X2-DFN1010-6			
Dim	Min	Max	Typ
A	—	0.40	0.39
A1	0.00	0.05	0.02
A3	—	—	0.13
b	0.14	0.20	0.17
b1	0.05	0.15	0.10
D	0.95	1.05	1.00
E	0.95	1.05	1.00
e	—	—	0.35
L	0.35	0.45	0.40
K	0.15	—	—
Z	—	—	0.065
All Dimensions in mm			



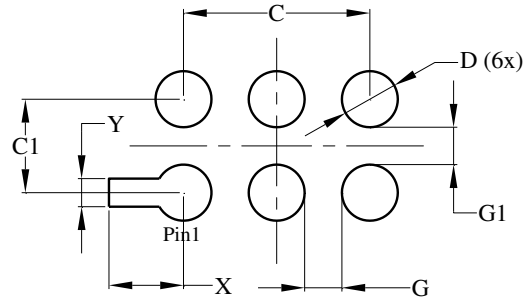
Dimensions	Value (in mm)
C	0.350
G	0.150
X	0.200
X1	0.900
Y	0.550
Y1	1.250

X2-DFN1409-6 Package Outline Dimensions and Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



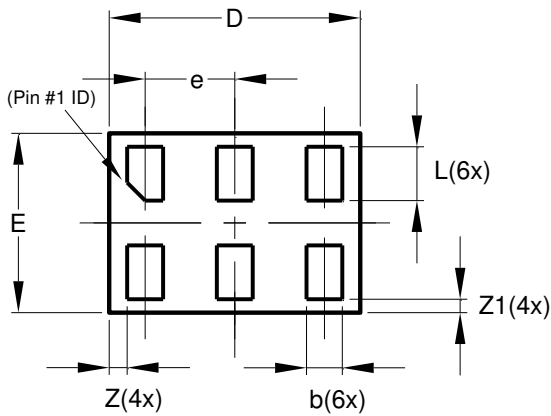
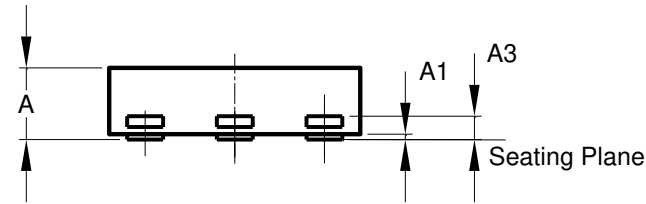
X2-DFN1409-6			
Dim	Min	Max	Typ
A	—	0.40	0.39
A1	0	0.05	0.02
A3	—	—	0.13
\varnothing	0.20	0.30	0.25
D	1.35	1.45	1.40
E	0.85	0.95	0.90
e1	—	—	0.50
e2	—	—	0.50
Z1	—	—	0.075
Z2	—	—	0.075
All Dimensions in mm			



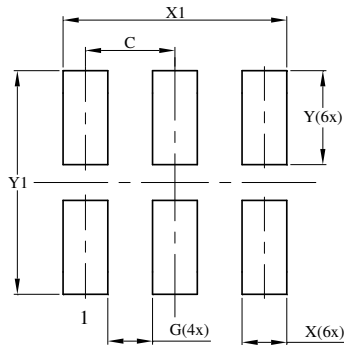
Dimensions	Value (in mm)
C	1.000
C1	0.500
D	0.300
G	0.200
G1	0.200
X	0.400
Y	0.150

X2-DFN1410-6 Package Outline Dimensions and Suggested Pad Layout

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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			



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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