

Description

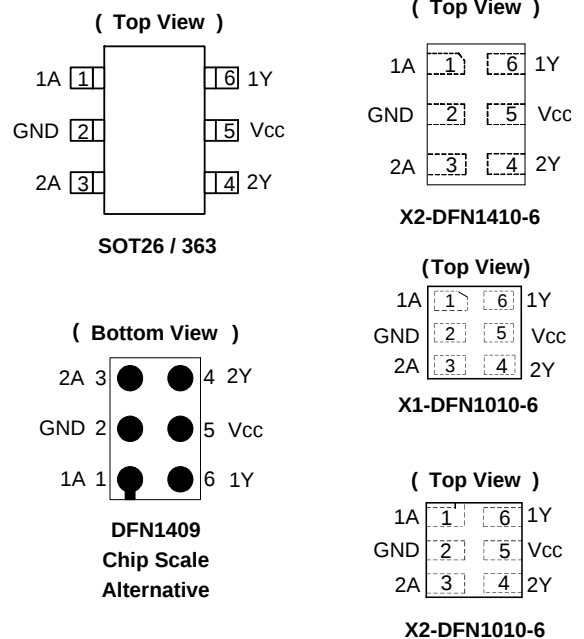
The 74LVC2G07 is a dual buffer gate with open drain outputs. The device is designed for operation with a power supply range of 1.65V to 5.5V. The input is tolerant to 5.5V allowing this device to be used in a mixed voltage environment. The device is fully specified for partial power down applications 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.

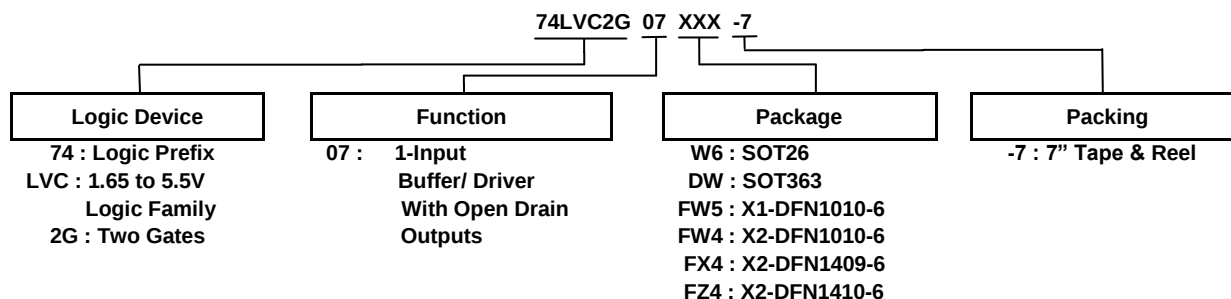
Pin Assignments



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

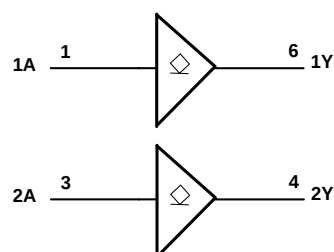
<http://www.diodes.com/datasheets/ap02001.pdf>.

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°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 V _{DD} or GND	±100	mA
T _J	Operating Junction Temperature	-40 to +150	°C
T _{STG}	Storage Temperature	-65 to +150	°C

Notes: 6. 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.
7. 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°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} = 1.65V 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 3.6V	–	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 _{OL}	Low-Level Output Current	V _{CC} = 1.65V	–	4	mA
		V _{CC} = 2.3V	–	8	
		V _{CC} = 3V	–	16	
		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	–	10	
T _A	Operating Free-air Temperature		–	–	°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)

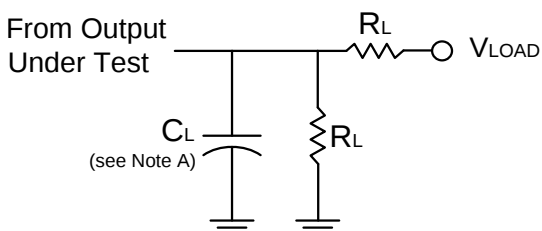
Parameter	From (Input)	To (Output)	V _{CC} = 1.8V ±0.15V		V _{CC} = 2.5V ±0.2V		V _{CC} = 3.3V ±0.3V		V _{CC} = 5V ±0.5V		Unit
			Min	Max	Min	Max	Min	Max	Min	Max	
t _{PD}	A	Y	0.5	8.4	0.5	5.5	0.5	4.7	0.5	3.7	ns

Operating Characteristics

$T_A = +25^\circ\text{C}$

Parameter	Test Conditions	$V_{CC} = 1.8\text{V}$	$V_{CC} = 2.5\text{V}$	$V_{CC} = 3.3\text{V}$	$V_{CC} = 5\text{V}$	Unit
		Typ	Typ	Typ	Typ	
C_{PD}	Power Dissipation Capacitance $f = 10\text{MHz}$	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					
$1.8\text{V} \pm 0.15\text{V}$	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	1k Ω	0.15V
$2.5\text{V} \pm 0.2\text{V}$	V_{CC}	$\leq 2\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	30pF	500 Ω	0.15V
$3.3\text{V} \pm 0.3\text{V}$	3V	$\leq 2.5\text{ns}$	1.5V	6V	50pF	500 Ω	0.3V
$5\text{V} \pm 0.5\text{V}$	V_{CC}	$\leq 2.5\text{ns}$	$V_{CC}/2$	$2 \times V_{CC}$	50pF	500 Ω	0.3V

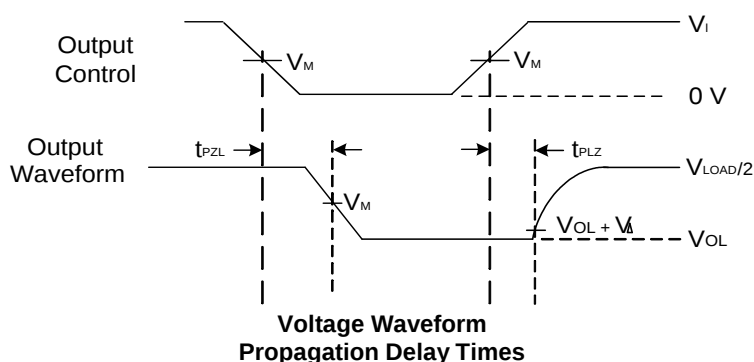
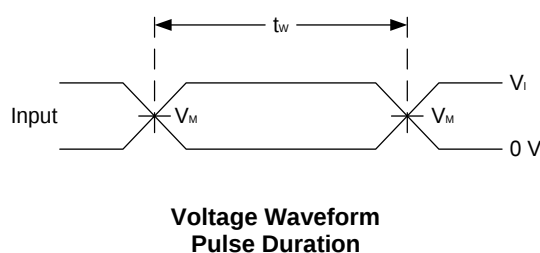
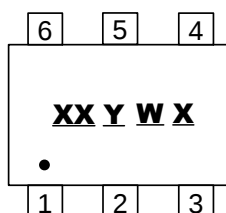


Figure 1. Load Circuit and Voltage Waveforms

- Notes:
- A. Includes test lead and test apparatus capacitance.
 - B. All pulses are supplied at pulse repetition rate $\leq 10\text{ MHz}$
 - 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 $V_{OL} + V_\Delta$.

Marking Information

(1) SOT26, SOT363

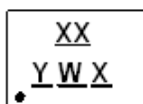


XX : Identification Code
Y : Year 0~9
W : Week : A~Z : 1~26 Week;
 a~z : 27~52 Week; z Represents
 52 and 53 Week
X : A~Z : Internal Code

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)

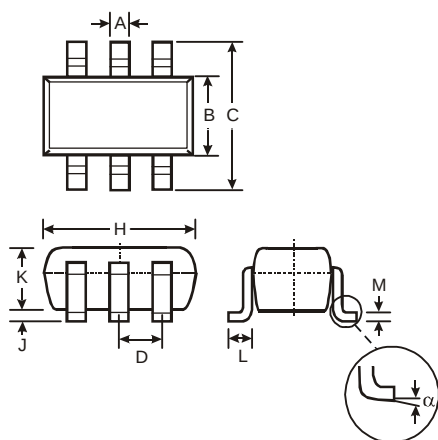


XX : Identification Code
Y : Year 0~9
W : Week : A~Z : 1~26 Week;
 a~z : 27~52 Week; z Represents
 52 and 53 Week
X : A~Z : Internal Code

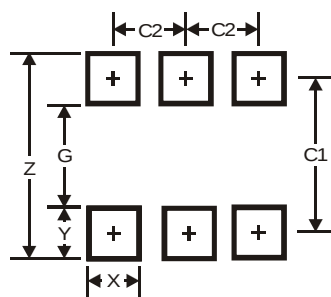
Part Number	Package	Identification Code
74LVC2G07FW4-7	X2-DFN1010-6	Z4
74LVC2G07FW5-7	X1-DFN1010-6	W4
74LVC2G07FX4-7	X2-DFN1409-6	X4
74LVC2G07FZ4-7	X2-DFN1410-6	Z4

SOT26 Package Outline Dimensions and Suggested Pad Layout

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



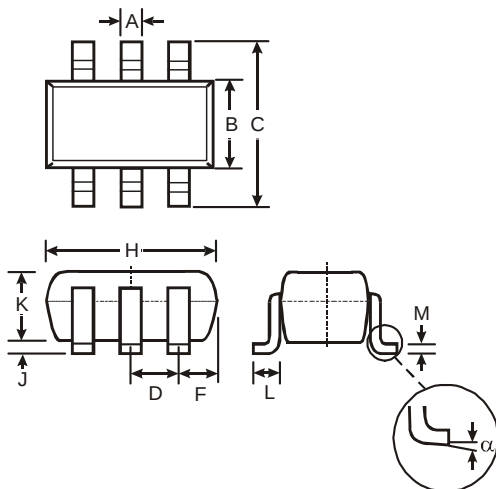
SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			



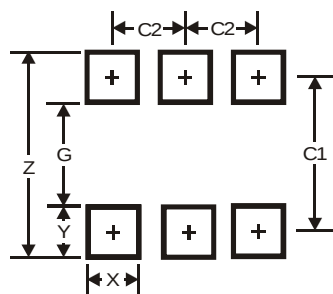
Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

SOT363 Package Outline Dimensions and Suggested Pad Layout

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



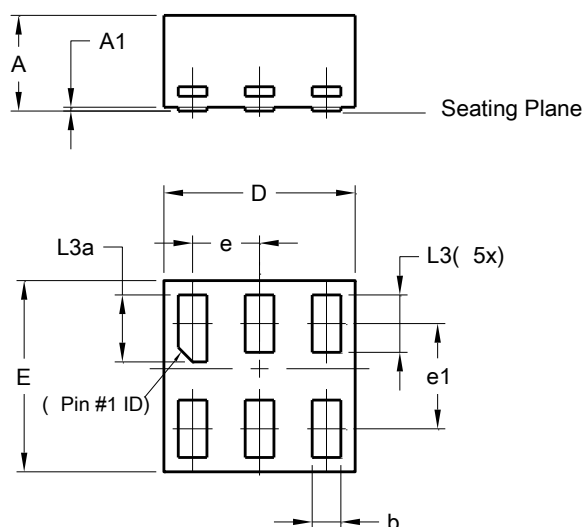
SOT363			
Dim	Min	Max	Typ
A	0.10	0.30	0.25
B	1.15	1.35	1.30
C	2.00	2.20	2.10
D	0.65 Typ		
F	0.40	0.45	0.425
H	1.80	2.20	2.15
J	0	0.10	0.05
K	0.90	1.00	1.00
L	0.25	0.40	0.30
M	0.10	0.22	0.11
α	0°	8°	-
All Dimensions in mm			



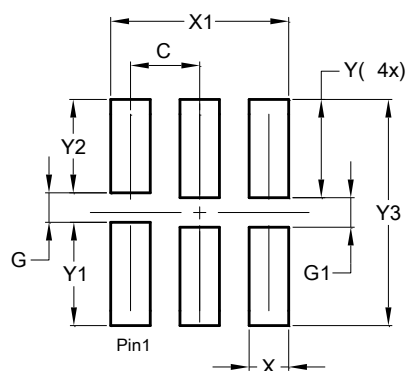
Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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.



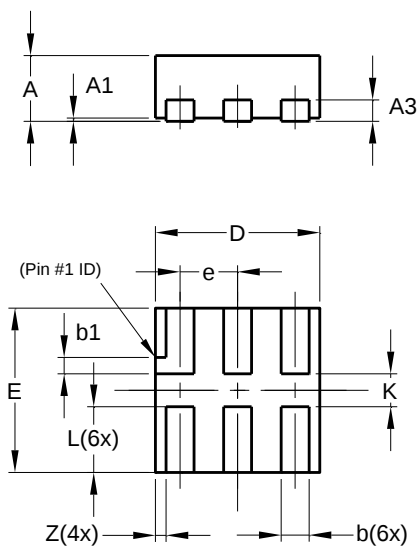
X1-DFN1010-6 (Type B)			
Dim	Min	Max	Typ
A	-	0.50	0.39
A1	-	0.04	-
b	0.12	0.20	0.15
D	0.95	1.050	1.00
E	0.95	1.050	1.00
e	0.35 BSC		
e1	0.55 BSC		
L3	0.27	0.30	0.30
L3a	0.32	0.40	0.35
All Dimensions in mm			



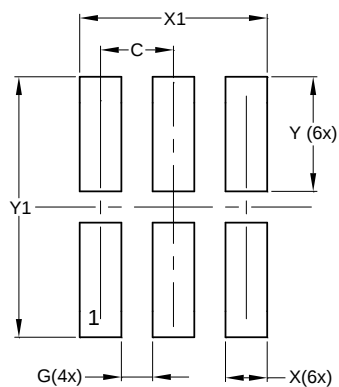
Dimensions	Value (in mm)
C	0.350
G	0.150
G1	0.150
X	0.200
X1	0.900
Y	0.500
Y1	0.525
Y2	0.475
Y3	1.150

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

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



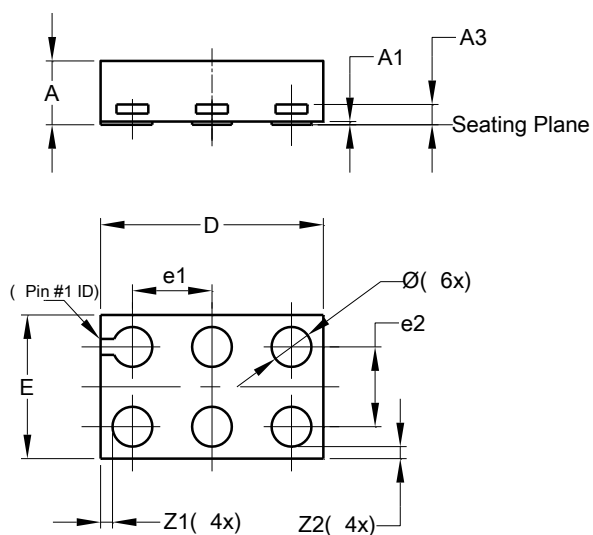
X2-DFN1010-6			
Dim	Min	Max	Typ
A	—	0.40	0.39
A1	0.00	0.05	0.02
A3	—	—	0.13
b	0.14	0.20	0.17
b1	0.05	0.15	0.10
D	0.95	1.05	1.00
E	0.95	1.05	1.00
e	—	—	0.35
L	0.35	0.45	0.40
K	0.15	—	—
Z	—	—	0.065
All Dimensions in mm			



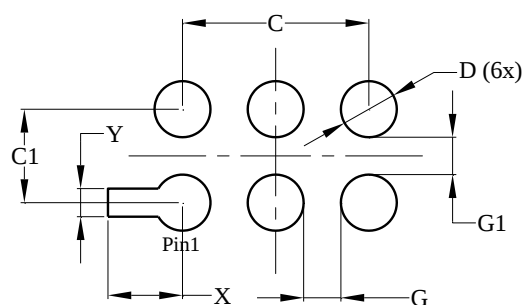
Dimensions	Value (in mm)
C	0.350
G	0.150
X	0.200
X1	0.900
Y	0.550
Y1	1.250

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.



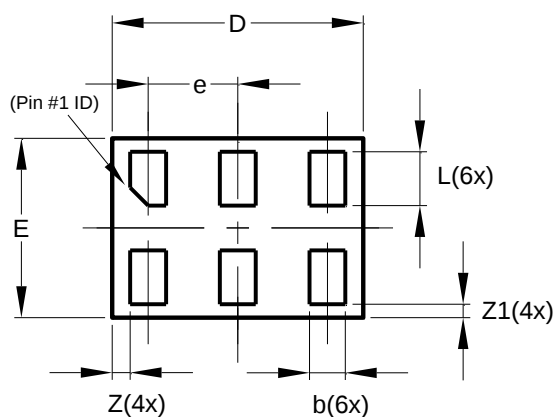
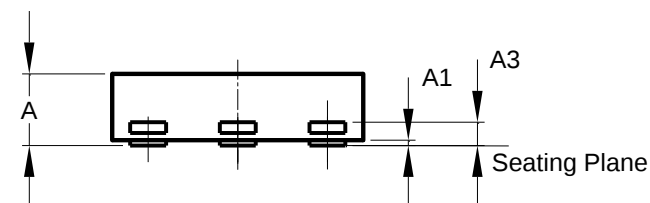
X2-DFN1409-6			
Dim	Min	Max	Typ
A	—	0.40	0.39
A1	0	0.05	0.02
A3	—	—	0.13
Ø	0.20	0.30	0.25
D	1.35	1.45	1.40
E	0.85	0.95	0.90
e1	—	—	0.50
e2	—	—	0.50
Z1	—	—	0.075
Z2	—	—	0.075
All Dimensions in mm			



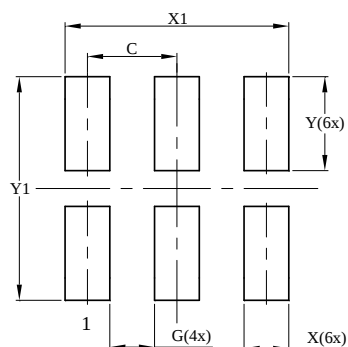
Dimensions	Value (in mm)
C	1.000
C1	0.500
D	0.300
G	0.200
G1	0.200
X	0.400
Y	0.150

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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