



74AUP2G14

DUAL SCHMITT TRIGGER INVERTERS

Description

The Advanced Ultra Low Power (AUP) CMOS logic family is designed for low power and extended battery life in portable applications.

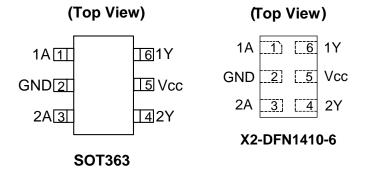
The 74AUP2G14 is composed of two Schmitt trigger inverters with standard push-pull outputs designed for operation over a power supply range of 0.8V to 3.6V. The device is fully specified for partial power down applications using $l_{\rm OFF}$. The $l_{\rm OFF}$ circuitry disables the output preventing damaging current backflow when the device is powered down. The gates perform the positive Boolean function:

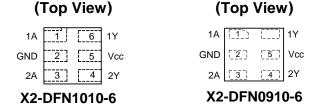
$$Y = \overline{A}$$

Features

- Advanced Ultra Low Power (AUP) CMOS
- Supply Voltage Range from 0.8V to 3.6V
- ± 4mA Output Drive at 3.0V
- Low Static Power Consumption
- Icc < 0.9µA
- Low Dynamic Power Consumption
- C_{PD} = 4pF Typical at 3.6V
- Schmitt trigger action at all Inputs makes the circuit tolerant for slower input rise and fall time.
- I_{OFF} Supports Partial-Power-Down Mode Operation
- ESD Protection 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
- Leadless Packages per JESD30E
 - DFN1410 denoted as X2-DFN1410-6
 - DFN1010 denoted as X2-DFN1010-6
 - DFN0910 denoted as X2-DFN0910-6
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)

Pin Assignments





Applications

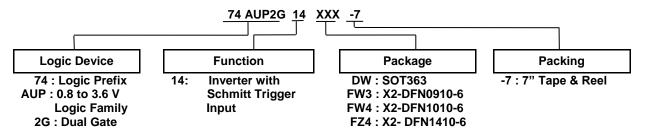
- Suited for Battery and Low Power Needs
- Wide array of products such as:
 - PCs, Networking, Notebooks, Netbooks, PDAs
 - Tablet Computers, E-readers
 - Computer Peripherals, Hard Drives, CD/DVD ROM
 - TV, DVD, DVR, Set-Top Box
 - Cell Phones, Personal Navigation / GPS
 - MP3 players ,Cameras, Video Recorders

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.



Ordering Information



Device	Package Package		Package	7" Tape and Reel			
Device	Code	(Notes 4 & 5)	Size	Quantity	Part Number Suffix		
74AUP2G14DW-7	DW	SOT363	2.0mm X 2.0mm X 1.1mm 0.65 mm lead pitch	3000/Tape & Reel	-7		
74AUP2G14FW3-7	FW3	X2-DFN0910-6	0.9mm X 1.0mm X 0.35mm 0.35 mm pad pitch	5000/Tape & Reel	-7		
74AUP2G14FW4-7	FW4	X2-DFN1010-6	1.0mm X 1.0mm X 0.4mm 0.35 mm pad pitch	5000/Tape & Reel	-7		
74AUP2G14FZ4-7	FZ4	X2-DFN1410-6	1.4mm X 1.0mm X 0.4mm 0.5 mm pad pitch	5000/Tape & Reel	-7		

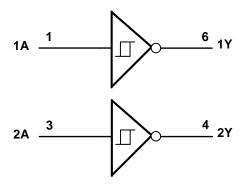
Notes:

- 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 Name	Pin NO	Function
1A	1	Data Input
GND	2	Ground
2A	3	Data Input
2Y	4	Data Output
Vcc	5	Supply Voltage
1Y	6	Data Output

Logic Diagram



Function Table Diagram

Inputs	Output
nA	nY
Н	L
L	Н

Downloaded from **Arrow.com**.



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 +4.6	V	
VI	Input Voltage Range	-0.5 to +4.6	V	
Vo	Voltage Applied to Output in High or Low State	-0.5 to V _{CC} +0.5		
I _{IK}	Input Clamp Current V _I < 0	-50	mA	
lok	Output Clamp Current (V _O < 0)	-50	mA	
lo	Continuous Output Current (V _O = 0 to V _{CC})	±20	mA	
Icc	Continuous Current Through V _{CC}	50	mA	
I _{GND}	Continuous Current Through GND	-50	mA	
TJ	Operating Junction Temperature	-40 to +150	°C	
T _{STG}	Storage Temperature	-65 to +150		

Notes:

Recommended Operating Conditions (Note 8) (@TA = +25°C, unless otherwise specified.)

Symbol	Par	rameter	Min	Max	Unit	
V_{CC}	Operating Voltage		0.8	3.6	V	
VI	Input Voltage		0	3.6	V	
Vo	Output Voltage		0	Vcc	V	
		V _{CC} = 0.8V	_	-20	μΑ	
		V _{CC} = 1.1V	_	-1.1		
	High-Level	V _{CC} = 1.4	_	-1.7		
I _{OH}	Output Current	V _{CC} = 1.65V	_	-1.9	mA	
		V _{CC} = 2.3V	_	-3.1		
		V _{CC} = 3.0	_	-4		
		V _{CC} = 0.8	_	20	μΑ	
		V _{CC} = 1.1V	_	1.1		
	Low-Level	V _{CC} = 1.4V	_	1.7		
loL	Output Current	V _{CC} = 1.65V	_	1.9	mA	
		V _{CC} = 2.3V	_	3.1		
		V _{CC} = 3.0V	_	4		
T _A	Operating Free-Air Temperature	_	-40	+125	°C	

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

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.



Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Cumbal	Devementer	Toot Conditions	V	T _A = -	+25°C	T _A = -40°C	C to +85°C	Unit
Symbol	Parameter	Test Conditions	V _{CC}	Min	Max	Min	Max	
			0.8V	0.3	0.65	0.3	0.65	
			1.1V	0.53	0.9	0.53	0.9	
V_{T+}	Positive-going Input Threshold	_	1.4V	0.74	1.11	0.74	1.11	V
V 1+	Voltage		1.65V	0.91	1.29	0.91	1.29	v
			2.3V	1.37	1.77	1.37	1.77	
			3.0V	1.88	2.29	1.88	2.29	
			0.8V	0.1	0.6	0.1	0.6	
	Negative-going Input Threshold		1.1V	0.26	0.65	0.26	0.65	
V _T -	Voltage	_	1.4V	0.39	0.75	0.39	0.75	V
			1.65V	0.47	0.84	0.47	0.84	
			2.3V	0.69	1.04	0.69	1.04	
			3.0V	0.88	1.24	0.88	1.24	
			0.8V	0.07	0.5	0.07	0.5	
	I bordonos's		1.1V	0.08	0.46	0.08	0.46	
ΔV_T	Hysteresis $(V_{T+} - V_{T-})$	_	1.4V 1.65V	0.18 0.27	0.56 0.66	0.18 0.27	0.56 0.66	V
	(2.3V	0.53	0.00	0.53	0.00	
			3.0V	0.79	1.31	0.79	1.31	
		I _{OH} = -20μA	0.8V to 3.6V	V _{CC} – 0.1	-	V _{CC} – 0.1	—	
		I _{OH} = -1.1mA	1.1V	0.75 X V _{CC}	_	0.7 X V _{CC}	_	
		I _{OH} = -1.7mA	1.4V	1.11	_	1.03	_	V
		I _{OH} = -1.9mA	1.65V	1.32	_	1.30	_	
V _{OH}	High-Level Output Voltage	I _{OH} = -2.3mA		2.05	_	1.97	_	
		I _{OH} = -3.1mA	2.3V	1.9	_	1.85	_	
		I _{OH} = -2.7mA		2.72	_	2.67	_	
		I _{OH} = -4mA	- 3V	2.6	_	2.55	_	
		I _{OL} = 20μA	0.8V to 3.6V	_	0.1	_	0.1	
		I _{OL} = 1.1mA	1.1V	_	0.3 X V _{CC}	_	0.3 X V _{CC}	
		I _{OL} = 1.7mA	1.4V	_	0.31	_	0.37	
\ \	Low Lovel Output Voltage	I _{OL} = 1.9mA	1.65V	_	0.31	_	0.35	V
V_{OL}	Low-Level Output Voltage	$I_{OL} = 2.3 \text{ mA}$	2.3V	_	0.31	_	0.33	V
		$I_{OL} = 3.1 \text{mA}$	2.3 V	_	0.44	_	0.45	
		$I_{OL} = 2.7 \text{mA}$	2)/	_	0.31	_	0.33	
		I _{OL} = 4mA	- 3V	_	0.44	_	0.45	
l _l	Input Current	V _I = GND to 3.6V	0 to 3.6V	_	± 0.1	_	± 0.5	μA
I _{OFF}	Power Down Leakage Current	V_I or $V_O = 0V$ to 3.6V	0	_	± 0.2	_	± 0.5	μΑ
ΔI_{OFF}	Delta Power Down Leakage Current	V_I or $V_O = 0V$ to 3.6V	0V to 0.2V	_	± 0.2	_	± 0.6	μΑ
Icc	Supply Current	$V_I = GND \text{ or } V_{CC},$ $I_O = 0$	0.8V to 3.6V	_	0.5	_	0.9	μΑ
Δl _{CC}	Additional Supply Current	Input at V _{CC} -0.6V	3.3V	_	40	_	50	μA



Electrical Characteristics (Continued) (@T_A = +25°C, unless otherwise specified.)

Symbol	Parameter	Test Conditions	Vcc	$T_A = -40$ °C	to +125°C	Unit	
Syllibol	Farameter	rest Conditions	VCC	Min	Max		
			0.8V	0.3	0.67		
			1.1V	0.53	0.92		
V_{T+}	Positive-going Input Threshold	_	1.4V	0.74	1.13	V	
V I +	Voltage	_	1.65V	0.91	1.31	V	
	Positive-going Input Threshold Voltage Negative-going Input Threshold Voltage Hysteresis (V _{T+} - V _{T-}) IoH =		2.3V	1.37	1.80		
			3.0V	1.88	2.32		
			0.8V	0.1	0.6		
	Nonetice seign langet Threehold		1.1V	0.26	0.65		
V_{T-}		_	1.4V	0.39	0.75	V	
V -	Voltago	_	1.65V	0.47	0.84	V	
			2.3V	0.69	1.04		
			3.0V	0.88	1.24		
			0.8V	0.07	0.5		
			1.1V	0.08	0.46		
ΔV_{T}		_	1.4V	0.18	0.56	V	
ΔνΙ	(V _{T+} - V _{T-)}	_	1.65V	0.27	0.66	V	
			2.3V	0.53	0.92		
			3.0V	0.79	1.31		
		$I_{OH} = -20\mu A$	0.8V to 3.6V	V _{CC} – 0.11	_		
		I _{OH} = -1.1mA	1.1V	0.6 X V _{CC}	_		
		I _{OH} = -1.7mA	1.4V	0.93	_		
	High-Level Output Voltage	I _{OH} = -1.9mA		1.17	_	.,	
VoH		I _{OH} = -2.3mA		1.77	_	V	
		I _{OH} = -3.1mA	2.3V	1.67	_		
		I _{OH} = -2.7mA		2.40	_		
		I _{OH} = -4mA	3V	2.30			
		I _{OL} = 20μA	0.8V to 3.6V		0.11		
		I _{OL} = 1.1mA	1.1V	<u> </u>	0.33 X V _{CC}		
			1.4V		0.33 X VCC 0.41		
		$I_{OL} = 1.7 \text{mA}$					
V_{OL}	Low-Level Output Voltage	I _{OL} = 1.9mA	1.65V	_	0.39	V	
		$I_{OL} = 2.3 \text{mA}$	2.3V		0.36		
		I _{OL} = 3.1mA		_	0.50		
		$I_{OL} = 2.7 \text{mA}$	3V	_	0.36		
		$I_{OL} = 4mA$	0.	_	0.50		
II	Input Current	$V_I = GND \text{ to } 3.6V$	0 to 3.6V	_	± 0.75	μΑ	
I _{OFF}	Power Down Leakage Current	V_I or $V_O = 0V$ to 3.6V	0V	_	± 1.0	μA	
ΔI_{OFF}	Delta Power Down Leakage Current	V_I or $V_O = 0V$ to 3.6V	0V to 0.2V	_	± 2.5	μΑ	
Icc	Supply Current	$V_I = GND \text{ or } V_{CC}, I_O = 0$	0.8V to 3.6V	_	1.4	μA	
Δl _{CC}	Additional Supply Current	Input at V _{CC} -0.6V	3.3V	 	75	μA	



Switching Characteristics

C_L=5pF, See Figure 1

Parameter	From	TO OUTPUT	V	T _A = +25°C		$T_A = -40^{\circ}C \text{ to } +85^{\circ}C$		$T_A = -40^{\circ}C \text{ to } +125^{\circ}C$		Unit	
	Input		Vcc	Min	Тур	Max	Min	Max	Min	Max	Offic
			V8.0	_	19.9	_	_	_	_	_	
		Y	1.2V ± 0.1V	2.7	5.9	11.0	2.4	11.1	2.4	11.2	ns
	۸		1.5V ± 0.1V	2.6	4.3	6.6	2.4	7.1	2.4	7.4	
t _{PD}	Α		1.8V ± 0.15V	2.1	3.7	5.4	2.0	6.0	2.0	6.2	
			2.5V ± 0.2V	1.2	2.4	3.9	1.1	4.5	1.1	5.0	
			3.3V ± 0.3V	1.1	2.1	3.2	1.0	3.9	1.0	4.3	

C_L=10pF See Figure 1

Parameter From Input	From	TO OUTPUT	V	-	Γ _A = +25°C	;	$T_A = -40^{\circ}C \text{ to } +85^{\circ}C$		$T_A = -40^{\circ}C \text{ to } +125^{\circ}C$		Unit
	Input		Vcc	Min	Тур	Max	Min	Max	Min	Max	Oill
			V8.0	_	23.4	_	_	_	_	-	
		Y	1.2V ± 0.1V	2.9	6.8	12.7	2.8	12.8	2.8	12.9	ns
	۸		1.5V ± 0.1V	2.8	5.0	7.7	2.6	8.2	2.6	8.6	
t _{PD}	Α		1.8V ± 0.15V	2.7	4.2	6.2	2.5	6.7	2.5	7.1	
			2.5V ± 0.2V	1.6	2.9	4.6	1.5	5.4	1.5	6.0	
			3.3V ± 0.3V	1.5	2.7	3.8	1.4	4.5	1.4	5.0	

C_L=15pF, See Figure 1

Parameter	From	TO OUTPUT	V _{CC}	T _A = +25°C		$T_A = -40$ °C to +85°C		$T_A = -40^{\circ}C \text{ to } +125^{\circ}C$		Unit	
	Input		V CC	Min	Тур	Max	Min	Max	Min	Max	Ollit
			V8.0	_	26.9	_	_	_	_	_	
		Y	1.2V ± 0.1V	3.3	7.6	14.3	3.0	17.3	3.0	18.5	ns
4	Α		1.5V ± 0.1V	3.3	5.5	8.6	2.9	9.4	2.9	9.8	
t _{PD}	A		1.8V ± 0.15V	2.8	4.7	7.0	2.8	7.7	2.8	8.1	
			2.5V ± 0.2V	2.1	3.3	5.1	1.8	6.1	1.8	6.8	
			$3.3V \pm 0.3V$	2.0	3.1	4.2	1.8	5.0	1.8	5.5	

C_L=30pF, See Figure 1

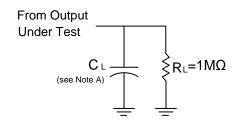
Parameter	From	_	v	$T_A = +25^{\circ}C$			$T_A = -40^{\circ}C \text{ to } +85^{\circ}C$		$T_A = -40^{\circ}C \text{ to } +125^{\circ}C$		Unit
	Input		V _{CC}	Min	Тур	Max	Min	Max	Min	Max	Oilit
			V8.0	_	37.3	_	_	_	_	_	
		Y	1.2V ± 0.1V	4.0	9.8	18.7	3.9	19.6	3.9	20.0	ns
	^		1.5V ± 0.1V	3.7	7.1	11.2	3.8	12.3	3.8	12.9	
t _{PD}	Α		1.8V ± 0.15V	3.6	6.0	9.1	3.5	10.0	3.5	10.6	
			2.5V ± 0.2V	2.4	4.5	6.5	2.3	7.6	2.3	8.4	
			3.3V ± 0.3V	2.2	4.2	5.4	2.1	6.2	2.1	6.9	



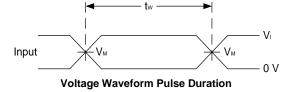
Operating and Package Characteristics (@T_A = +25°C, unless otherwise specified.)

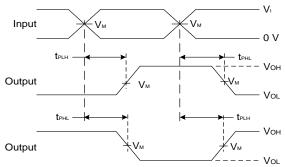
	Parameter	Test Conditions	V _{CC}	Тур	Unit
	Power Dissipation Capacitance		0.8V	5.1	
			1.2V ± 0.1V	5.2	
_		f = 1MHz	1.5V ± 0.1V	5.2	,r
CPD		No Load	1.8V ± 0.15V	5.5	pF
			2.5V ± 0.2V	5.7	
			3.3V ± 0.3V	6.0	
Cı	Input Capacitance	$V_I = V_{CC}$ or GND	0V or 3.3V	2.0	pF
Co	Output Capacitance	V _O = V _{CC} or GND	0V	2.0	pF

Parameter Measurement Information



V	Inputs		V	
V _{CC}	VI	t _R /t _F	V _M	CL
0.8V	V _{CC}	≤3ns	V _{CC} /2	5, 10, 15, 30pF
1.2V ± 0.1V	V _{CC}	≤3ns	V _{CC} /2	5, 10, 15, 30pF
1.5V ± 0.1V	Vcc	≤3ns	V _{CC} /2	5, 10, 15, 30pF
1.8V ± 0.15V	Vcc	≤3ns	V _{CC} /2	5, 10, 15, 30pF
2.5V ± 0.2V	V _{CC}	≤3ns	V _{CC} /2	5, 10, 15, 30pF
3.3V ± 0.3V	Vcc	≤3ns	V _{CC} /2	5, 10, 15, 30pF





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 \leq 10MHz.
- C. Inputs are measured separately one transition per measurement.
- D. t_{PLH} and t_{PHL} are the same as t_{PD} .



Marking Information

(1) SOT363

5 XXYWX

2

XX: Identification code Y: Year 0~9

<u>W</u>: 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
74AUP2G14DW-7	SOT363	SR

(2) X2-DFN1410-6, X2-DFN1010-6, X2-DFN0910-6

(Top View)

3

 XX: Identification Code

Ÿ : Year : 0~9

<u>W</u>: Week: A~Z: 1~26 week; a~z: 27~52 week; z represents

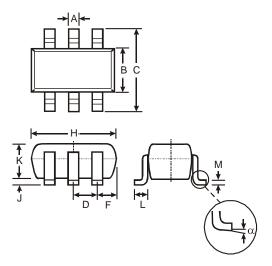
52 and 53 week X: A~Z: Internal code

Part Number	Package	Identification Code
74AUP2G14FZ4	X2-DFN1410-6	RR
74AUP2G14FW4	X2-DFN1010-6	SR
74AUP2G14FW3	X2-DFN0910-6	MR

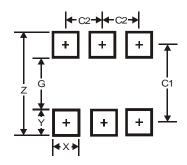


SOT363 Package Outline Dimensions and Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



	SOT363				
Dim	Min	Max	Тур		
Α	0.10	0.30	0.25		
В	1.15	1.35	1.30		
C	2.00	2.20	2.10		
D		0.65 Ty	р		
F	0.40	0.45	0.425		
Н	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		
М	0.10	0.22	0.11		
α	0°	8°	-		
All Dimensions in mm					



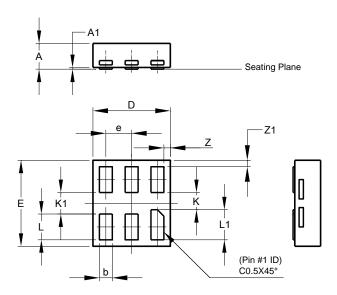
Dimensions	Value (in mm)
Z	2.5
G	1.3
Х	0.42
Y	0.6
C1	1.9
C2	0.65

Downloaded from **Arrow.com.**

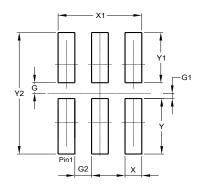


X2-DFN0910-6 Package Outline Dimensions and Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



X2-DFN0910-6				
Dim	Min	Max	Тур	
Α	-	0.35	0.30	
A1	0	0.03	0.02	
b	0.10	0.20	0.15	
D	0.85	0.95	0.90	
Е	0.95	1.05	1.00	
е	-	-	0.30	
K	0.20	-	-	
K 1	0.25	-	-	
L	0.25	0.35	0.30	
L1	0.30	0.40	0.35	
Z	-	-	0.075	
Z 1	-	-	0.075	
All Dimensions in mm				

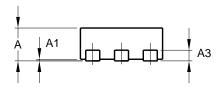


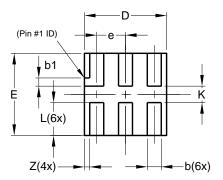
Dimensions	Value (in mm)
G	0.100
G1	0.050
G2	0.150
X	0.150
X1	0.750
Y	0.525
Y1	0.475
Y2	1.150



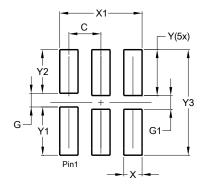
X2-DFN1010-6 Package Outline Dimensions and Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.





X2-DFN1010-6			
Dim	Min	Max	Тур
Α	_	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
Е	0.95	1.05	1.00
е	_	_	0.35
L	0.35	0.45	0.40
K	0.15		
Z			0.065
All Dimensions in mm			

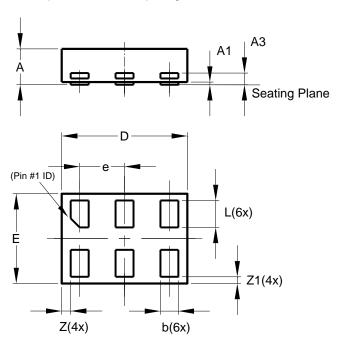


Dimensions	Value (in mm)
С	0.350
G	0.150
G1	0.150
Х	0.200
X1	0.900
Y	0.500
Y1	0.525
Y2	0.475
Y3	1.150

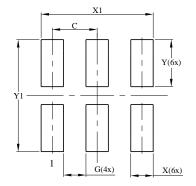


X2-DFN1410-6 Package Outline Dimensions and Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



	X2-DFN1410-6				
Dim	Min	Max	Тур		
Α		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		
Е	0.95	1.05	1.00		
е			0.50		
L	0.25	0.35	0.30		
Z			0.10		
Z 1	0.045	0.105	0.075		
All Dimensions in mm					



Dimensions	Value (in mm)
С	0.500
G	0.250
Х	0.250
X1	1.250
Y	0.525
Y1	1.250

May 2017



IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

- A. Life support devices or systems are devices or systems which:
 - 1. are intended to implant into the body, or
 - 2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.
- B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or

Copyright © 2017, Diodes Incorporated

www.diodes.com