芯伯乐®
XINBOLE

Product Specification

XBLW SN74LVC1G32

Single 2-input OR Gate

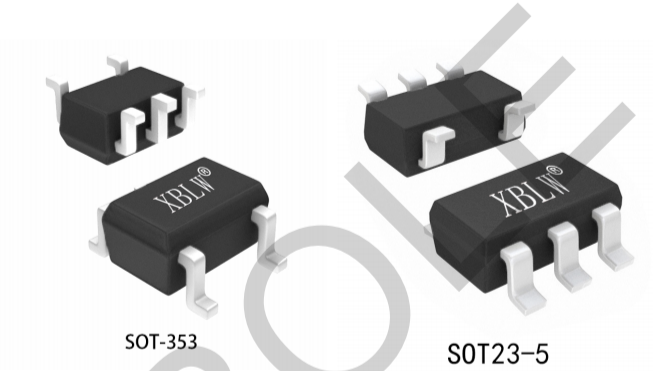
WEB | www.xinboleic.com

Description

The SN74LVC1G32 is a single 2-input OR gate. Inputs can be driven from either 3.3 V or 5 V devices. This feature allows the use of these devices as translators in mixed 3.3 V and 5 V environments. Schmitt-trigger action at all inputs makes the circuit tolerant of slower input rise and fall times.

Features

- Wide supply voltage range from 1.65V to 5.5V
- Specified from -40°C to +125°C
- Input accepts voltages up to 5V
- CMOS low power consumption
- ±24mA output drive (VCC=3.0V)
- Packaging information: SOT23-5/SOT353



Applications

- AV Receiver
- Blu-ray Player and Home Theater
- Digital Picture Frame (DPF)
- Embedded PC
- High-Speed Data Acquisition and Generation
- IP Phone: Wireless
- Motor Control: High-Voltage
- Optical Networking: Video Over Fiber and EPON
- Personal Navigation Device (GPS)
- Portable Media Player
- Private Branch Exchange (PBX)
- Server PSU
- SSD: Internal and External
- TV: LCD/Digital and High-Definition (HDTV)
- Vector Signal Analyzer and Generator
- Wireless Headset, Keyboard, Mouse, and Repeater

Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW SN74LVC1G32T235	SOT-23-5	ALXX	Tape	3000Pcs/Reel
XBLW SN74LVC1G32T353	SOT-353	ALXX	Tape	3000Pcs/Reel

XBLW/XINBOLE

Block Diagram

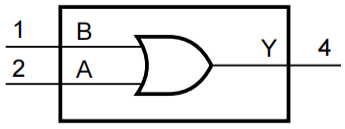


Figure 1. Logic symbol

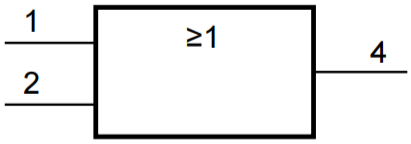


Figure 2. IEC logic symbol

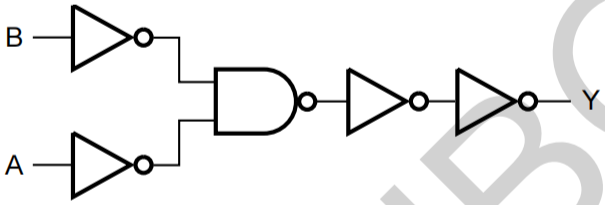
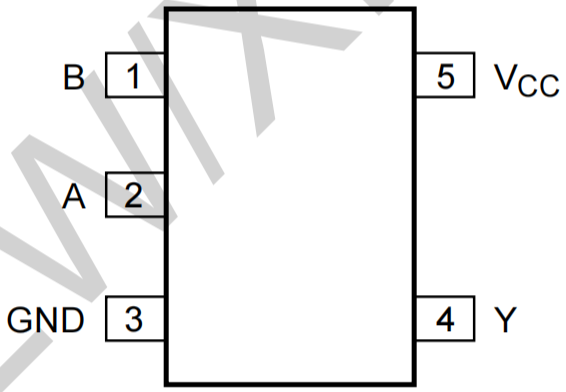


Figure 3. Logic diagram

Pin Configurations



Pin Description

Pin No.	Pin Name	Description
1	B	data input
2	A	data input
3	GND	ground (0V)
4	Y	data output
5	Vcc	supply voltage

XBLW/XINBOLE

Function Table

Input		Output
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	H

Note: H=HIGH voltage level; L=LOW voltage level.

Electrical Parameter

Absolute Maximum Ratings

(Voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions	Min.	Max.	Unit
supply voltage	V_{CC}	-	-0.5	+6.5	V
input voltage	V_I	-	-0.5	+6.5	V
output voltage	V_O	Active mode	-0.5	V_{CC}+0.5	V
		Power-down mode; V_{CC}=0V	-0.5	+6.5	V
input clamping current	I_{IK}	V_I < 0V	-50	-	mA
output clamping current	I_{OK}	V_O > V_{CC} or V_O < 0V	-	±50	mA
output current	I_O	V_O=0V to V_{CC}	-	±50	mA
supply current	I_{CC}	-	-	100	mA
ground current	I_{GND}	-	-100	-	mA
storage temperature	T_{stg}	-	-65	+150	℃
total power dissipation	P_{tot}	-	-	250	mW
soldering temperature	T_L	10s	260		℃

Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	1.65	-	5.5	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	Active mode	0	-	V_{CC}	V
		Power-down mode; V_{CC}=0V	0	-	5.5	V
ambient temperature	T_{amb}	-	-40	-	+125	℃

ESD Ratings

Parameter		Defintion	Vaue	Unit
$V_{(ESD)}$	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins (1)	±2000	V
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins (2)	±1000	

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

XBLW/XINBOLE

Electrical Characteristics

DC Characteristics 1

(Tamb=-40°C to +85°C, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.65V to 1.95V		0.65× V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.7	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7× V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.65V to 1.95V		-	-	0.35× V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.3× V_{CC}	V
HIGH-level output voltage	V_{OH}	V_I = V_{IH} or V_{IL}	I_O=-100uA; V_{CC}=1.65V to 5.5V	V_{CC} - 0.1	-	-	V
			I_O=-4mA; V_{CC}=1.65V	1.2	-	-	V
			I_O=-8mA; V_{CC}=2.3V	1.9	-	-	V
			I_O=-12mA; V_{CC}=2.7V	2.2	-	-	V
			I_O=-24mA; V_{CC}=3.0V	2.3	-	-	V
			I_O=-32mA; V_{CC}=4.5V	3.8	-	-	V
LOW-level output voltage	V_{OL}	V_I = V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.65V to 5.5V	-	-	0.10	V
			I_O=4mA; V_{CC}=1.65V	-	-	0.45	V
			I_O=8mA; V_{CC}=2.3V	-	-	0.30	V
			I_O=12mA; V_{CC}=2.7V	-	-	0.40	V
			I_O=24mA; V_{CC}=3.0V	-	-	0.55	V
			I_O=32mA; V_{CC}=4.5V	-	-	0.55	V
input leakage current	I_I	V_I=5.5V or GND; V_{CC}=0V to 5.5V		-	-	±1	uA
power-off leakage current	I_{OFF}	V_I or V_O=5.5V; V_{CC}=0V		-	-	±2	uA
supply current	I_{CC}	V_I=5.5V or GND; I_O=0A; V_{CC}=1.65V to 5.5V		-	-	4	uA
additional supply current	ΔI_{CC}	per pin; V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=2.3V to 5.5V		-	-	500	uA
input capacitance	C_I	V_{CC}=3.3V; V_I=GND to V_{CC}		-	5	-	pF

Note: All typical values are measured at V_{CC}=3.3V and T_{amb}=25°C.

XBLW XINBOLE

DC Characteristics 2

(Tamb=-40°C to +125°C, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.65V to 1.95V		0.65× V_{CC}	-	-	V
		V_{CC}=2.3V to 2.7V		1.7	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7× V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.65V to 1.95V		-	-	0.35× V_{CC}	V
		V_{CC}=2.3V to 2.7V		-	-	0.7	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.3× V_{CC}	V
HIGH-level output voltage	V_{OH}	V_I = V_{IH} or V_{IL}	I_O=-100uA; V_{CC}=1.65V to 5.5V	V_{CC} - 0.1	-	-	V
			I_O=-4mA; V_{CC}=1.65V	0.95	-	-	V
			I_O=-8mA; V_{CC}=2.3V	1.7	-	-	V
			I_O=-12mA; V_{CC}=2.7V	1.9	-	-	V
			I_O=-24mA; V_{CC}=3.0V	2.0	-	-	V
			I_O=-32mA; V_{CC}=4.5V	3.4	-	-	V
LOW-level output voltage	V_{OL}	V_I = V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.65V to 5.5V	-	-	0.10	V
			I_O=4mA; V_{CC}=1.65V	-	-	0.70	V
			I_O=8mA; V_{CC}=2.3V	-	-	0.45	V
			I_O=12mA; V_{CC}=2.7V	-	-	0.60	V
			I_O=24mA; V_{CC}=3.0V	-	-	0.80	V
			I_O=32mA; V_{CC}=4.5V	-	-	0.80	V
input leakage current	I_I	V_I=5.5V or GND; V_{CC}=0V to 5.5V		-	-	±1	uA
power-off leakage current	I_{OFF}	V_I or V_O=5.5V; V_{CC}=0V		-	-	±2	uA
supply current	I_{CC}	V_I=5.5V or GND; I_O=0A; V_{CC}=1.65V to 5.5V		-	-	4	uA
additional supply current	ΔI_{CC}	per pin; V_I=V_{CC}-0.6V; I_O=0A; V_{CC}=2.3V to 5.5V		-	-	500	uA

XBLW/XINBOLE

AC Characteristics 1

(Tamb=-40°C to +85°C, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.[1]	Max.	Unit
A, B to Y propagation delay	t_{PHL}	see Figure 5	V_{CC}=1.65V to 1.95V	-	12.5	18.8	ns
			V_{CC}=2.3V to 2.7V	-	10.5	15.8	ns
			V_{CC}=2.7V	-	10	15	ns
			V_{CC}=3.0V to 3.6V	-	9.5	14.3	ns
			V_{CC}=4.5V to 5.5V	-	9	13.5	ns
A, B to Y propagation delay	t_{PLH}	see Figure 5	V_{CC}=1.65V to 1.95V	-	14	21	ns
			V_{CC}=2.3V to 2.7V	-	10	15	ns
			V_{CC}=2.7V	-	9.5	14.3	ns
			V_{CC}=3.0V to 3.6V	-	8.5	12.8	ns
			V_{CC}=4.5V to 5.5V	-	7.5	11.3	ns

Note:

[1] Typical values are measured at T_{amb}=25°C and V_{CC}=1.8V, 2.5V, 2.7V, 3.3V and 5.0V respectively.

AC Characteristics 2

(Tamb=-40°C to +125°C, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
A, B to Y propagation delay	t_{PHL}	see Figure 5	V_{CC}=1.65V to 1.95V	-	-	20.8	ns
			V_{CC}=2.3V to 2.7V	-	-	17.8	ns
			V_{CC}=2.7V	-	-	17	ns
			V_{CC}=3.0V to 3.6V	-	-	16.3	ns
			V_{CC}=4.5V to 5.5V	-	-	15.5	ns
A, B to Y propagation delay	t_{PLH}	see Figure 5	V_{CC}=1.65V to 1.95V	-	-	23	ns
			V_{CC}=2.3V to 2.7V	-	-	17	ns
			V_{CC}=2.7V	-	-	16.3	ns
			V_{CC}=3.0V to 3.6V	-	-	14.8	ns
			V_{CC}=4.5V to 5.5V	-	-	13.3	ns

XBLW XINBOLE

Testing Circuit

AC Testing Circuit

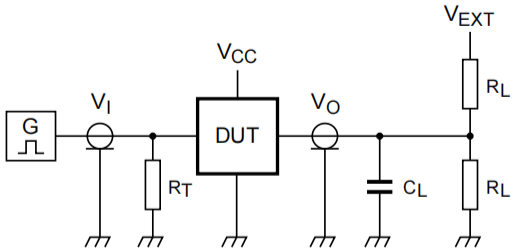


Figure 4. Test circuit for measuring switching times

Definitions for test circuit: R_L=Load resistance.
C_L=Load capacitance including jig and probe capacitance.
R_T=Termination resistance; should be equal to the output impedance Z_o of the pulse generator.
V_{EXT}=External voltage for measuring switching times.

AC Testing Waveforms

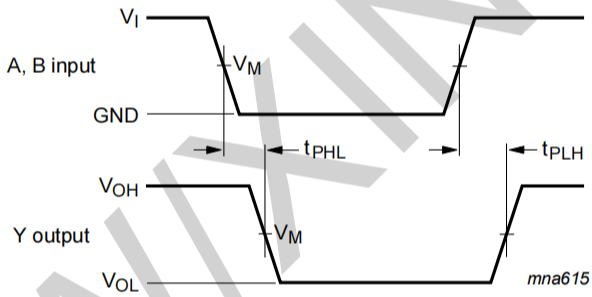


Figure 5. The input A, B to output Y propagation delays

Measurement Points

Supply voltage	Input	Output
V_{CC}	V_M	V_M
1.65V to 1.95V	0.5×V_{CC}	0.5×V_{CC}
2.3V to 2.7V	0.5×V_{CC}	0.5×V_{CC}
2.7V	1.5V	1.5V
3.0V to 3.6V	1.5V	1.5V
4.5V to 5.5V	0.5×V_{CC}	0.5×V_{CC}

Test Data

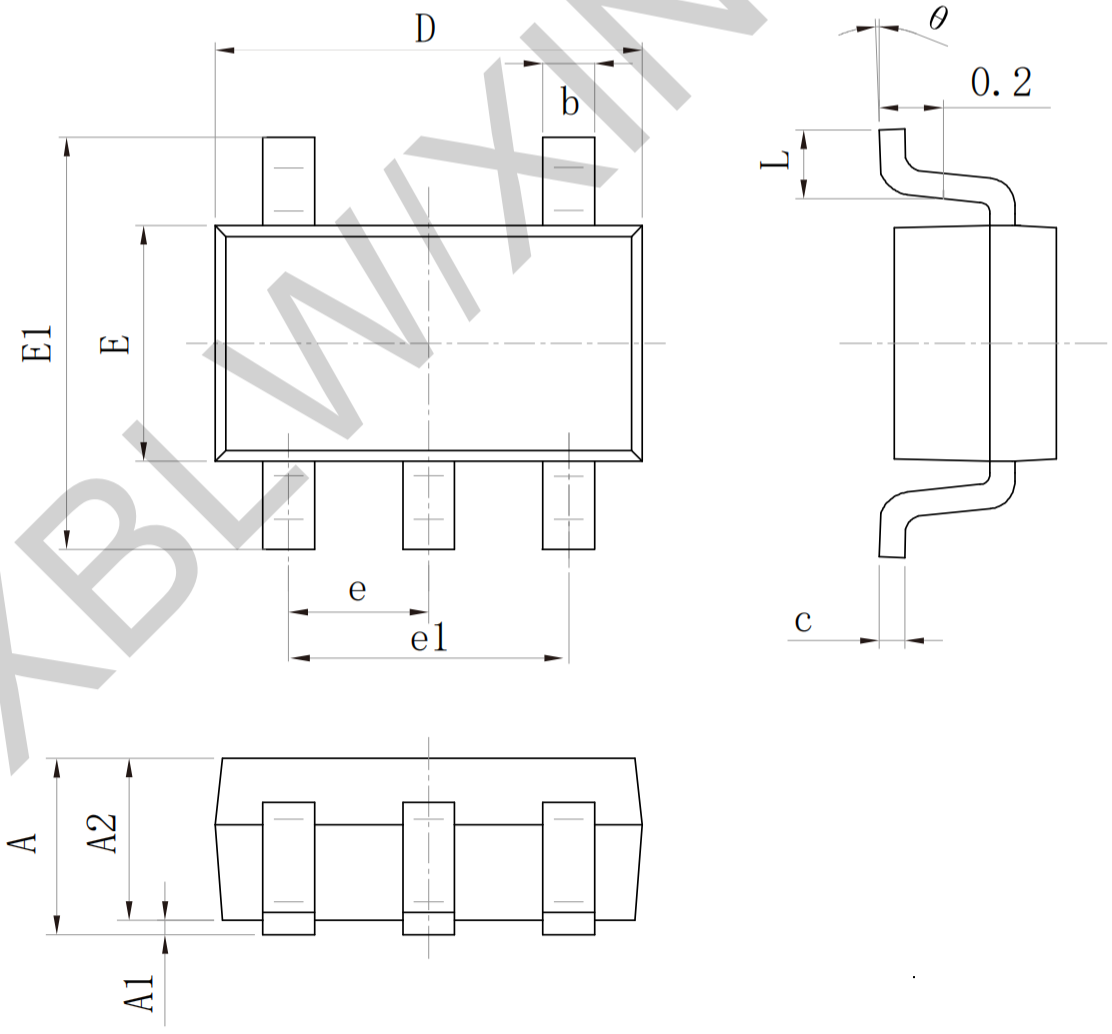
Supply voltage	Input		Load		V_{EXT}
V_{CC}	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}, t_{PHL}
1.65V to 1.95V	V_{CC}	≤ 3ns	30pF	1kΩ	open
2.3V to 2.7V	V_{CC}	≤ 3ns	30pF	500Ω	open
2.7V	2.7V	≤ 3ns	50pF	500Ω	open
3.0V to 3.6V	2.7V	≤ 3ns	50pF	500Ω	open
4.5V to 5.5V	V_{CC}	≤ 3ns	50pF	500Ω	open

XBLW/XINBOLE

Package Information

- SOT23-5

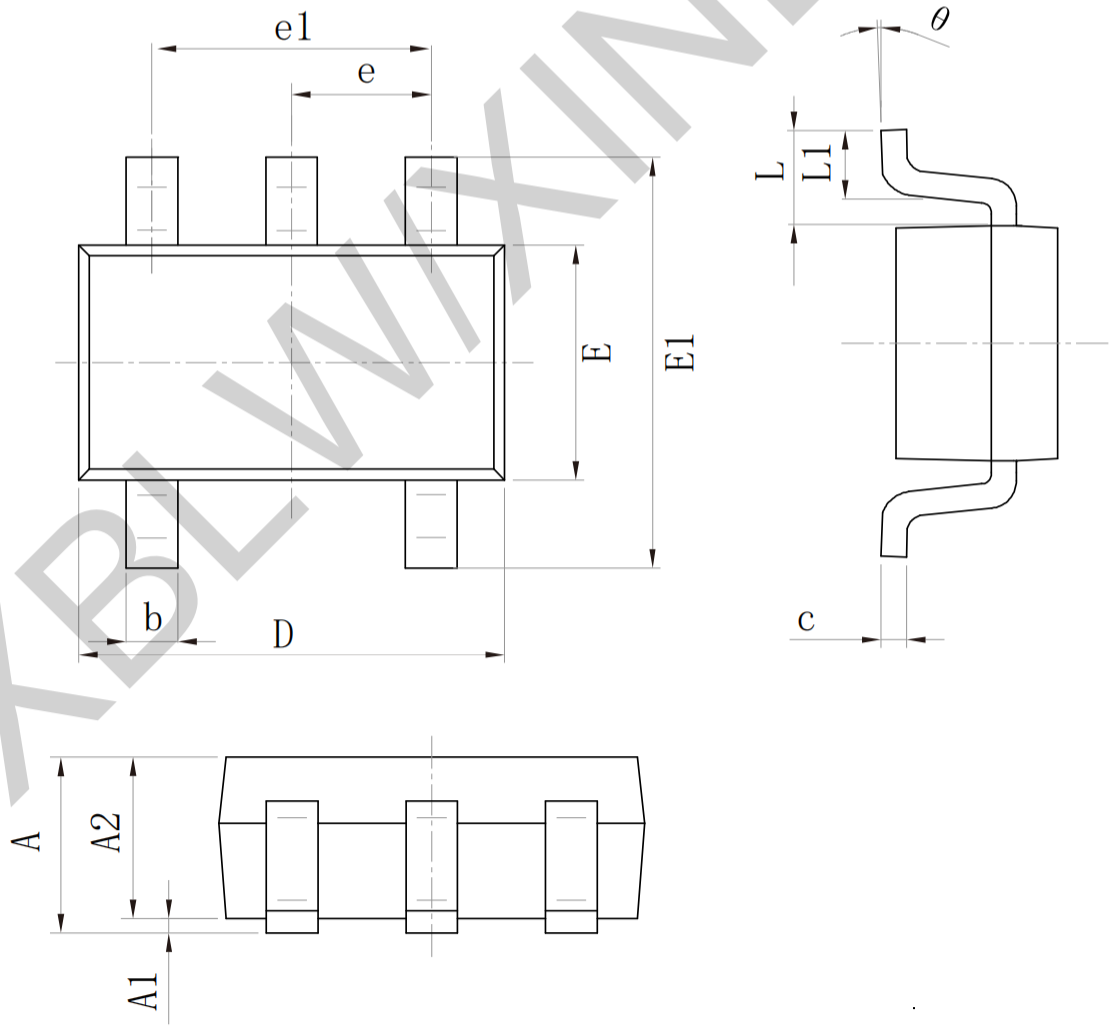
SIZE / SYMBOL	Dimensions In Millimeters		SIZE / SYMBOL	Dimensions In Inches	
	MIN(mm)	MAX(mm)		MIN(in)	MAX(in)
A	1.050	1.250	A	0.041	0.049
A1	0.000	0.100	A1	0.000	0.004
A2	1.050	1.150	A2	0.041	0.045
b	0.300	0.500	b	0.012	0.020
c	0.100	0.200	c	0.004	0.008
D	2.820	3.020	D1	0.111	0.119
E	1.500	1.700	E	0.059	0.067
E1	2.650	2.950	E1	0.104	0.116
e	0.95(BSC)		e	0.037(BSC)	
E1	1.800	2.000	E1	0.071	0.079
L	0.300	0.600	L	0.012	0.024
θ	0°	8°	θ	0°	8°



XBLW/XINBOLE

• SOT-353

Size / Symbol	Dimensions In Millimeters		Size / Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	0.900	1.100	A	0.035	0.043
A1	0.000	0.100	A1	0.000	0.004
A2	0.900	1.000	A2	0.035	0.039
b	0.150	0.350	b	0.006	0.014
c	0.080	0.150	C	0.003	0.006
D	2.000	2.200	D	0.079	0.087
E	1.150	1.350	E	0.045	0.053
E1	2.150	2.450	E1	0.085	0.096
e	0.650(TYP)		e	0.026(TYP)	
e1	1.200	1.400	e1	0.047	0.055
L	0.525(REF)		L	0.021(REF)	
L1	0.260	0.460	L1	0.010	0.018
θ	0°	8°	θ	0°	8°



XBLW/XINBOLE

Statement:

- XBLW reserves the right to modify the product manual without prior notice! Before placing an order, customers need to confirm whether the obtained information is the latest version and verify the completeness of the relevant information.

- Any semi-guide product is subject to failure or malfunction under specified conditions. It is the buyer's responsibility to comply with safety standards when using XBLW products for system design and whole machine manufacturing. And take the appropriate safety measures to avoid the potential in the risk of loss of personal injury or loss of property situation!

- XBLW products have not been licensed for life support, military,and aerospace applications, and therefore XBLW is not responsible for any consequences arising from the use of this product in these areas.

- If any or all XBLW products (including technical data, services) described or contained in this document are subject to any applicable local export control laws and regulations, they may not be exported without an export license from the relevant authorities in accordance with such laws.

- The specifications of any and all XBLW products described or contained in this document specify the performance, characteristics, and functionality of said products in their standalone state, but do not guarantee the performance, characteristics, and functionality of said products installed in Customer's products or equipment. In order to verify symptoms and conditions that cannot be evaluated in a standalone device, the Customer should ultimately evaluate and test the device installed in the Customer's product device.

- XBLW documentation is only allowed to be copied without any alteration of the content and with the relevant authorization. XBLW assumes no responsibility or liability for altered documents.

- XBLW is committed to becoming the preferred semiconductor brand for customers, and XBLW will strive to provide customers with better performance and better quality products.

XBLW XINBOLE