芯伯乐®
XINBOLE

Product Specification

XBL721/XBL722/XBL724

10MHz, RRIO, CMOS, Op Amps

WEB | www.xinboleic.com

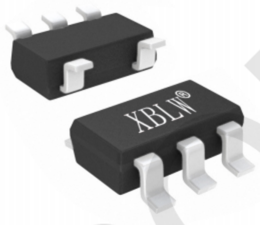
RoHS

DESCRIPTION

The XBL721, XBL722, XBL724 families of products offer low voltage operation and rail-to-rail input and output, as well as excellent speed/power consumption ratio, providing an excellent bandwidth(10MHz) and slew rate (8.5V/us). The operational amplifiers are unity gain stable and feature an ultra-low input bias current.
The XBL721, XBL722, XBL724 has lower offset voltage, which is guaranteed not upper than 0.5mV at 25°C with V_s = 5V, VCM = V_s/2.
The XBL721, XBL722, XBL724 families of operational amplifiers under single supplies of 2.1V to 5.5V or dual power supplies of ±1.05V to ±2.75V. The devices are ideal for sensor interfaces, active filters and portable applications.

FEATURES

- HIGH GAIN BANDWIDTH: 10MHz
- EXCELLENT SLEW RATE: 8.5V/us
- RAIL-TO-RAIL INPUT AND OUTPUT
- LOWER OFFSET VOLTAGE: ±3.0 mV Max
- INPUT VOLTAGE RANGE: -0.2V to +5.7V with V_s = 5.5V
- SUPPLY RANGE: +2.1V to +5.5V
- OPERATING RANGE: -40°C TO +125°C
- Micro SIZE PACKAGES: SOT23-5
- Compatible with LMV721, LMV722, LMV724



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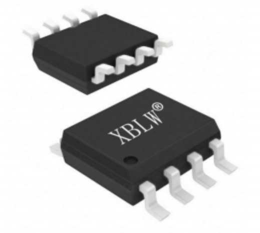

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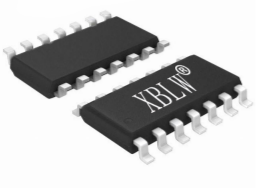
APPLICATIONS

- SENSORS
- ACTIVE FILTERS
- TEST EQUIPMENT
- DRIVING A/D CONVERTERS
- PHOTODIODE AMPLIFICATION



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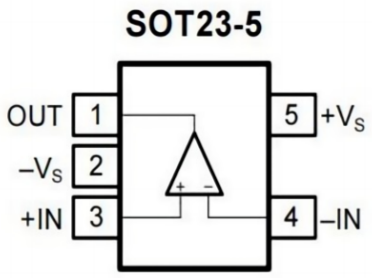
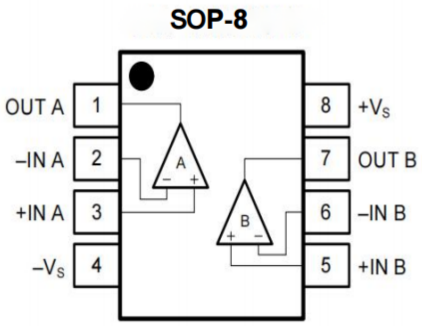
Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBL721S	SOT23-5	721S	Tape	3000Pcs/Reel
XBL722DTR	SOP-8	XBL722	Tape	2500Pcs/Reel
XBL724DTR	SOP-14	XBL724	Tape	2500Pcs/Reel

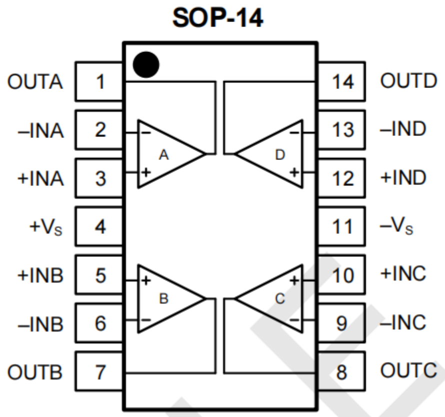
Pin Configuration



LMV721



LMV722



LMV724

Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted) (1)

PARAMETER	MIN	MAX	UNIT
Supply Voltage, Vs=(V+) - (V-)		7	V
Signal Input Voltage(2)	(V-)-0.5	(V+)+0.5	V
Signal Output Voltage(3)	(V-)-0.5	(V+)+0.5	V
Signal Input Current	-10	+10	mA
Signal Output Current	-150	+150	mA
Maximum Junction Temperature		+150	℃
Storage Temperature Range	-65	+150	℃

Note 1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

Note 2: Input terminals are diode-clamped to the power-supply rails. Input signals that can swing more than 0.5V beyond the supply rails should be current-limited to 10mA or less.

Note 3: Output terminals are diode-clamped to the power-supply rails. Output signals that can swing more than 0.5V beyond the supply rails should be current-limited to ±150mA or less.

ESD Ratings

SYMBOL	PARAMETER		VALUE	UNIT
V(ESD)	Electrostatic discharge	Human-body model (HBM)	±4500	V

Recommended Operating Conditions

Over operating free-air temperature range (unless otherwise noted)

PARAMETER		MIN	TYP	MAX	UNIT
Supply Voltage, Vs=(V+) - (V-)	Signal-supply	2.1		5.5	V
	Dual-supply	1.05		2.75	V
Operating Temperature Range		-40	+25	+125	℃

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ELECTRICAL CHARACTERISTICS

(At T_A=+25°C, V_S=5V, R_L=10kΩ connected to V_S/2, and V_{OUT}=V_S/2, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	XBL721, XBL722, XBL724			
			MIN	TYP	MAX	UNIT
POWER SUPPLY						
Operating Voltage Range	V_S		2.1		5.5	V
Quiescent Current/Amplifier	I_Q	Vs=5V, IN+=V-, IN-=OUT		0.4		mA
Power-Supply Rejection Ratio	PSRR	V_S=2.5V to 5.5V, V_{CM}=(V-)+0.5V	75			dB
Turn-on Time	t_{ON}			12		µs
INPUT						
Input Offset Voltage	V_{OS}	V_{CM}= V_S/2, XBL721	-3.0	±0.2	+3.0	mV
		V_{CM}= V_S/2, XBL722	-3.0	±0.2	+3.0	mV
		V_{CM}= V_S/2, XBL724	-3.0	±0.3	+3.0	mV
Input Offset Voltage Average Drift	V_{OS} TC	T_A=-40°C~+125°C		±2.6		uV/°C
Input Bias Current	I_B		-10	±1	+10	pA
Input Offset Current	I_{OS}		-10	±1	+10	pA
Common-Mode Voltage Range	V_{CM}	V_S=5.5V	-0.2		5.7	V
Common-Mode Rejection Ratio	CMRR	V_S= 5.5V, V_{CM}=-0.2V to 4V	70			dB
		V_S= 5.5V, V_{CM}=-0.2V to 5.7V	65			dB
OUTPUT						
Open-Loop Voltage Gain	A_{OL}	R_L=2KΩ, V_O=0. 15V to 4.85V	86			dB
		R_L=10KΩ, V_O=0.05V to 4.95V	96			dB
Output Swing From Rail		R_L=2KΩ		50		mV
		R_L=10KΩ		10		mV
Output Current Source	I_{OUT}			140		mA
FREQUENCY RESPONSE						
Slew Rate	SR			8.5		V/µs
Gain-Bandwidth Product	GBP			10		MHz
Phase Margin	PM			62		°
Setting Time,0.1%	ts			0.5		µs
Overload Recovery Time		V_{IN}·Gain≥VS		3.2		µs
NOISE						
Input Voltage Noise Density	en	f = 1KHz		9.5		nV/√Hz
		f = 10KHz		6.5		nV/√Hz

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TYPICAL CHARACTERISTICS

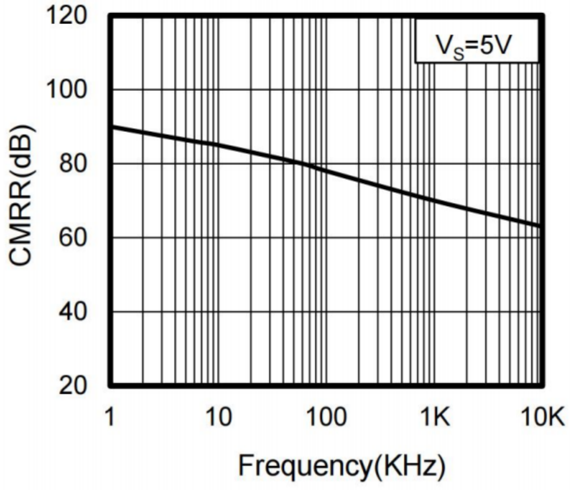

Figure 1. Common-Mode Rejection Ratio vs Frequency

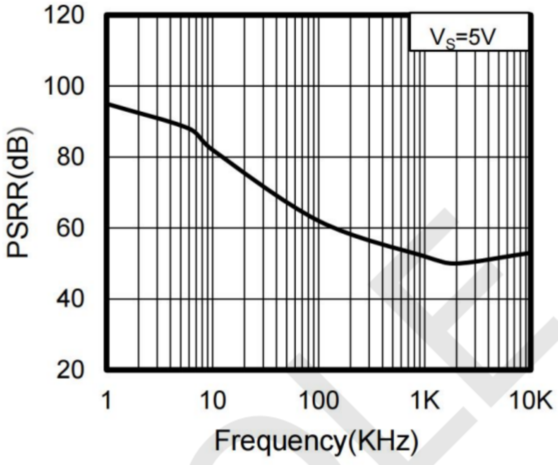

Figure 2. Power-Supply Rejection Ratio vs Frequency

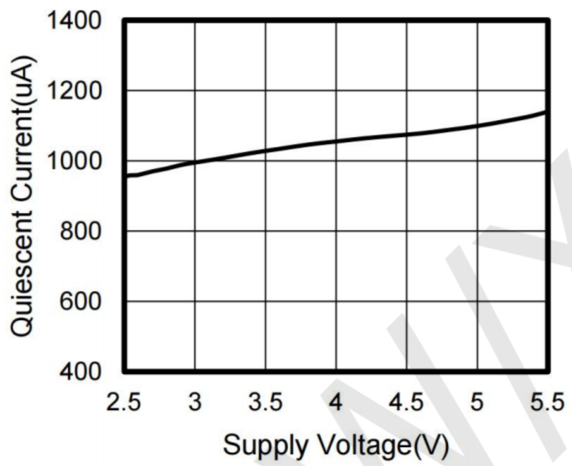

Figure 3. Quiescent Current vs Supply Voltage

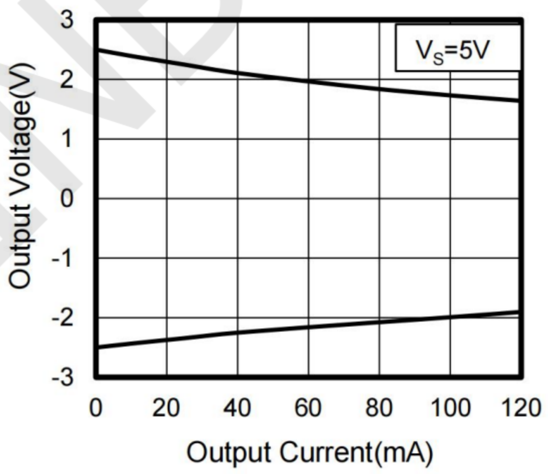

Figure 4. Output Voltage vs Output Current

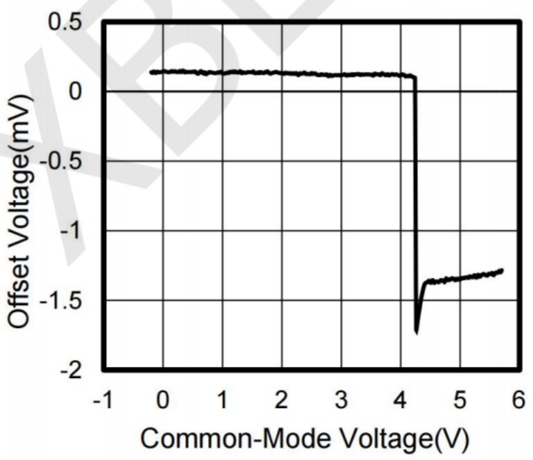

Figure 5. Offset Voltage vs Common-Mode Voltage

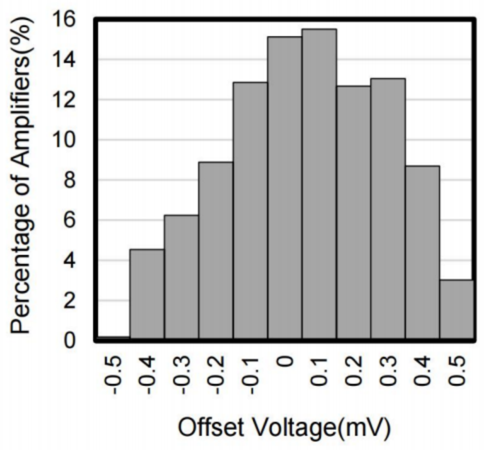

Figure 6. Offset Voltage Production Distribution

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LAYOUT

Layout Guideline

Attention to good layout practices is always recommended. Keep traces short. When possible, use a PCB ground plane with surface-mount components placed as close to the device pins as possible. Place a 0.1uF capacitor closely across the supply pins.

These guidelines should be applied throughout the analog circuit to improve performance and provide benefits such as reducing the EMI susceptibility.

Layout Example

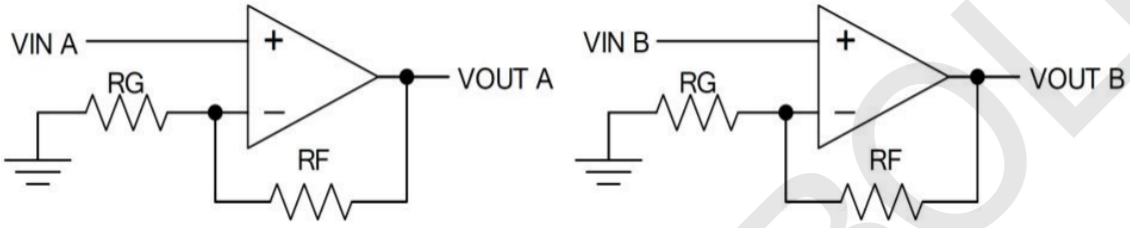
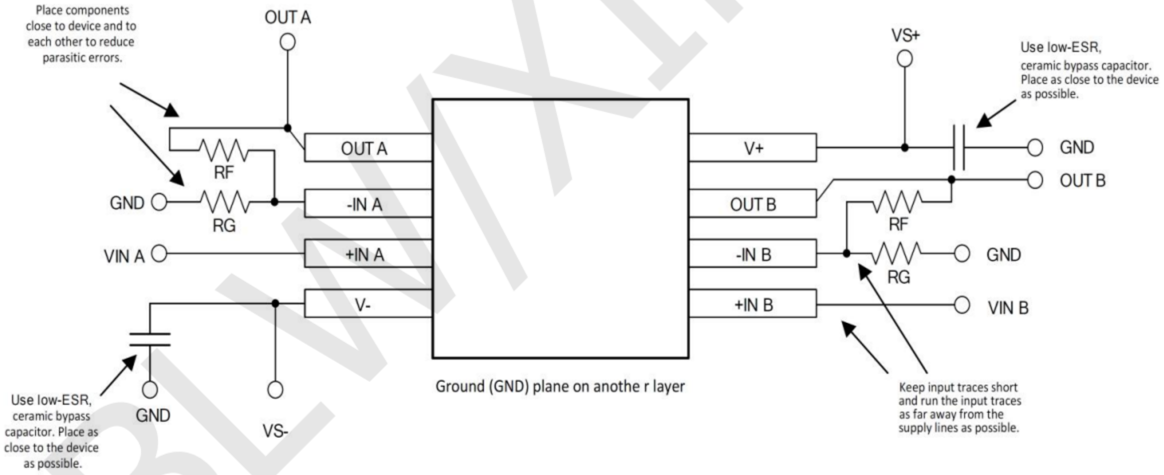


Figure 7. Schematic Representation



Place components close to device and to each other to reduce parasitic errors.

Use low-ESR, ceramic bypass capacitor. Place as close to the device as possible.

Use low-ESR, ceramic bypass capacitor. Place as close to the device as possible.

Ground (GND) plane on anothe r layer

Keep input traces short and run the input traces as far away from the supply lines as possible.

Figure 8. Layout Example

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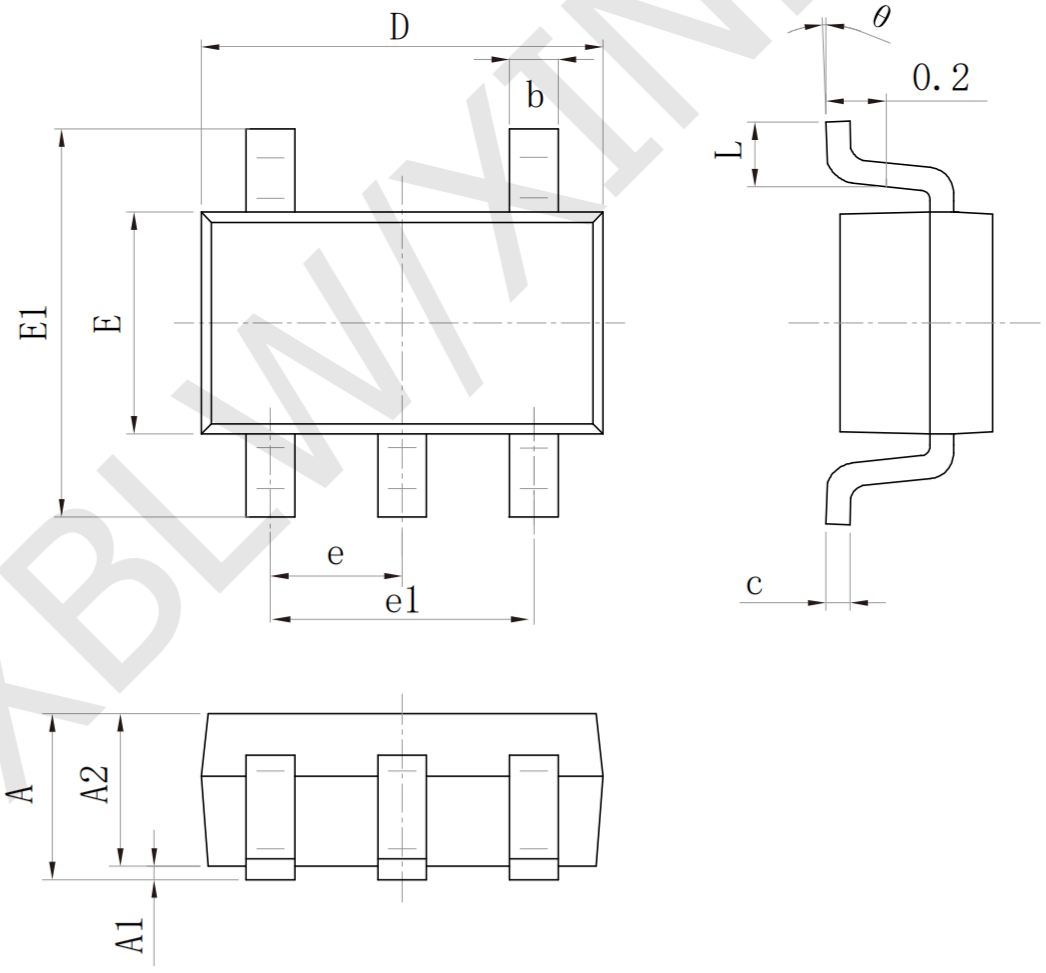
Package Information

- 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	D	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°



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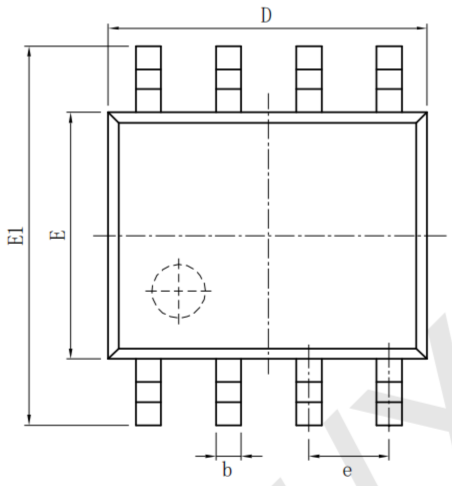
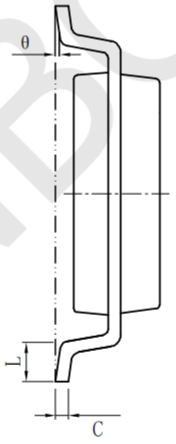
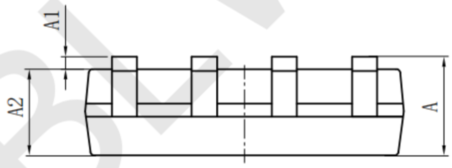
Size / Symbol	Dimensions In Millimeters		Size / Symbol	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	1. 350	1. 750	A	0. 053	0. 069
A1	0. 100	0. 250	A1	0. 004	0. 010
A2	1. 350	1. 550	A2	0. 053	0. 061
b	0. 330	0. 510	b	0. 013	0. 020
c	0. 170	0. 250	c	0. 006	0. 010
D	4. 700	5. 100	D	0. 185	0. 200
E	3. 800	4. 000	E	0. 150	0. 157
E1	5. 800	6. 200	E1	0. 228	0. 224
e	1. 270(BSC)		e	0. 050(BSC)	
L	0. 400	1. 270	L	0. 016	0. 050
θ	0°	8°	θ	0°	8°







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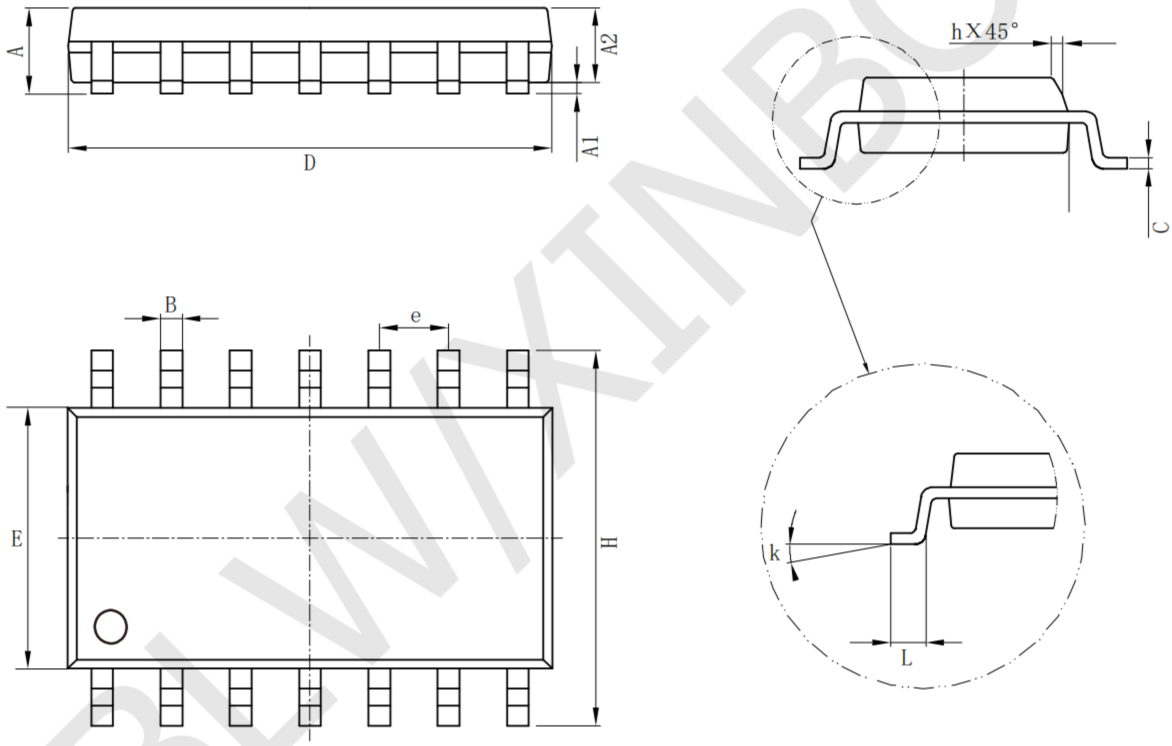
Symbol \ Size	Dimensions In Millimeters		Symbol \ Size	Dimensions In Inches	
	Min(mm)	Max(mm)		Min(in)	Max(in)
A	1.350	1.750	A	0.050	0.068
A1	0.100	0.250	A1	0.004	0.009
A2	1.100	1.650	A2	0.040	0.060
B	0.330	0.510	B	0.010	0.020
C	0.190	0.250	C	0.007	0.009
D	8.550	8.750	D	0.330	0.340
E	3.800	4.000	E	0.150	0.150
e	1.27		e	0.05	
H	5.800	6.200	H	0.220	0.240
h	0.250	0.500	h	0.009	0.020
L	0.400	1.270	L	0.015	0.050
k	8° (max)		k	8° (max)	



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