LTA6321, LTA6358, LTA6324

36V, 1.1MHz Micro-power, RRO Operational Amplifiers

General Description

The LTA6321, LTA6358 and LTA6324 are a family of micro-power, 36 V wide supply voltage, rail-to-rail output operational amplifiers capable of operating on supplies ranging from +4 V to +36 V. LTA6321/LTA6358/LTA6324 offer outstanding dc precision and ac performance, including low offset (±2 mV typically), low offset drift (±5 μV/℃typically), 1.1 MHz bandwidth, Unique features such as differential input-voltage range to the negative supply rail, Short-circuit current (±35 mA), high capacitive load drive of up to 1 nF, and high slew rate (0.8 V/μs) make the LTA6321/LTA6358/LTA6324 high-performance operational amplifiers for high-voltage industrial applications.

The robust design of the LTA6321/LTA6358/LTA6324 family provides ease-of-use to the circuit designer: integrated RF/EMI rejection filter, no phase reversal in overdrive conditions, and high electro-static discharge (ESD) protection. The LTA6321/LTA6358/LTA6324 are optimized for operation at voltages from +4V (±2V) to +36 V (±18 V) over the extended temperature range of -40 ℃ to +125℃.

Features and Benefits

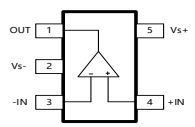
- Wide Supply: ±2 V to ±18 V, 4V to 36 V
- Low Offset Voltage: ±2 mV typically
- Low Offset Voltage Drift: ±5 μV/℃
- High Common-Mode Rejection: 110 dB
- Gain Bandwidth: 1.1 MHz
- Slew Rate: 0.8 V/μs
- Low Noise: 53 nV/√Hz at 1 kHz
- Low Quiescent Current: 260 μA per amplifier
- Rail-to-Rail Output

Applications

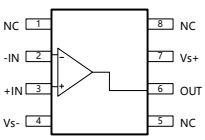
- Tracking Amplifier in Power Modules
- Power Delivery: UPS, Server, and Merchant Network Power
- High-Side and Low-Side Current Sensing
- Transducer Amplifiers
- Battery-Powered Instruments
- Test and Measurement Equipment
- Multiplexed Data-Acquisition Systems
- Programmable Logic Controllers

Pin Configuration (Top View)

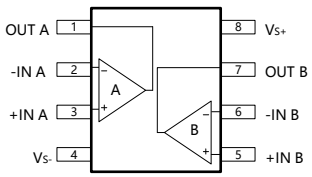
LTA6321
SOT23-5L



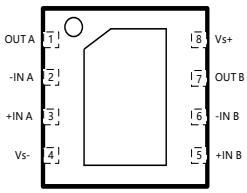
LTA6321
SOIC-8L / MSOP-8L



LTA6358
SOIC-8L/MSOP-8L



LTA6358
DFN3×3-8L



LTA6324
SOIC-14L / TSSOP-14L

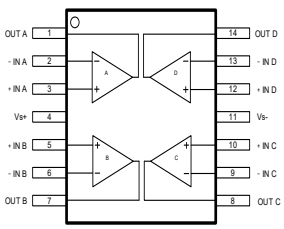


Table of Content

Pin Description

Symbol	Description
–IN	Inverting input of the amplifier. The voltage range is from V_{S-} to V_{S+} – 1.5V.
+IN	Non-inverting input of the amplifier. This pin has the same voltage range as –IN.
V_{S+}	Positive power supply. The voltage is from 4V to 36V. Split supplies are possible as long as the voltage between V_{S+} and V_{S-} is from 4V to 36V.
V_{S-}	Negative power supply. It is normally tied to ground. It can also be tied to a voltage other than ground as long as the voltage between V_{S+} and V_{S-} is from 4V to 36V.
OUT	Amplifier output.
NC	No connection

Ordering Information (1)

Type Number	Package Name	Package Quantity	Eco Class (2)	Marking Code (3)
LTA6321XT5/R6	SOT23-5L	Tape and Reel, 3 000	Green (RoHS & no Sb/Br)	F21
LTA6321XS8/R8	SOIC-8L	Tape and Reel, 4 000	Green (RoHS & no Sb/Br)	F6321
LTA6321XV8/R6	MSOP-8L	Tape and Reel, 3 000	Green (RoHS & no Sb/Br)	F6321
LTA6358XS8/R8	SOIC-8L	Tape and Reel, 4 000	Green (RoHS & no Sb/Br)	F6358
LTA6358XV8/R6	MSOP-8L	Tape and Reel, 3 000	Green (RoHS & no Sb/Br)	F6358
LTA6358XF8/R6	DFN3x3-8L	Tape and Reel, 3 000	Green (RoHS & no Sb/Br)	F6358
LTA6324XS14/R5	SOIC-14L	Tape and Reel, 2 500	Green (RoHS & no Sb/Br)	F6324
LTA6324XT14/R6	TSSOP-14L	Tape and Reel, 3 000	Green (RoHS & no Sb/Br)	F6324

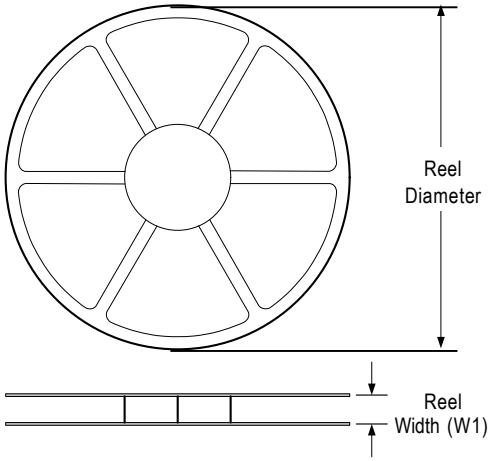
(1) Please contact to your Linearin representative for the latest availability information and product content details.

(2) Eco Class - The planned eco-friendly classification: Pb-Free (RoHS) or Green (RoHS & Halogen Free).

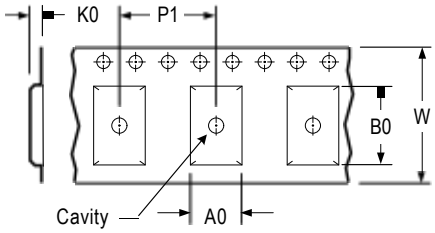
(3) There may be multiple device markings, a varied marking character of "x" , or additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

Tape and Reel Information

REEL DIMENSIONS

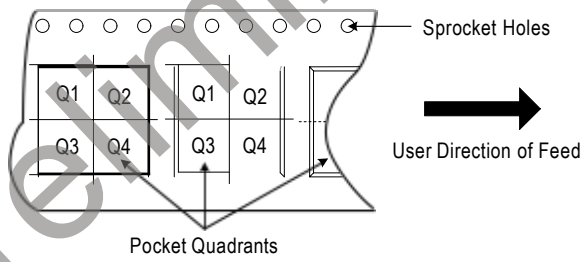


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIETATION IN TAPE

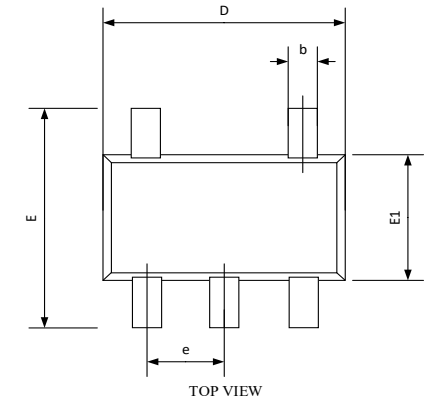


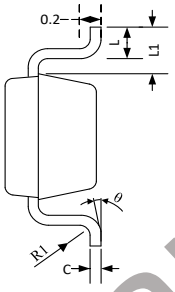
* All dimensions are nominal

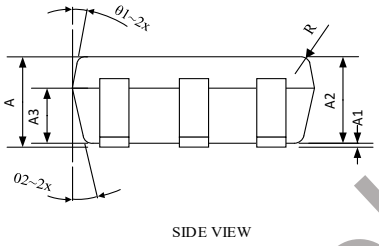
Device	Package Type	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin 1 Quadrant
LTA6321XT5/R6	SOT23	5	3 000	178	9.0	3.3	3.2	1.5	4.0	8.0	Q3
LTA6321XS8/R8	SOIC	8	4 000	330	12.5	6.6	5.3	2.0	8.0	12.0	Q1
LTA6321XV8/R6	MSOP	8	3 000	330	12.5	5.0	3.5	2.0	8.0	12.0	Q1
LTA6358XV8/R6	MSOP	8	3 000	330	12.5	5.0	3.5	2.0	8.0	12.0	Q1
LTA6358XS8/R8	SOIC	8	4 000	330	12.5	6.6	5.3	2.0	8.0	12.0	Q1
LTA6358XF8/R6	DFN3×3	8	3 000	330	12.5	3.3	3.3	1.1	8.0	12.0	Q1
LTA6324XS14/R5	SOIC	14	2 500	330	12.5	6.5	9.5	2.0	8.0	16.0	Q1
LTA6324XT14/R6	TSSOP	14	3 000	330	12.5	6.9	5.5	1.2	8.0	16.0	Q1

Package Outlines

DIMENSIONS, SOT23-5L

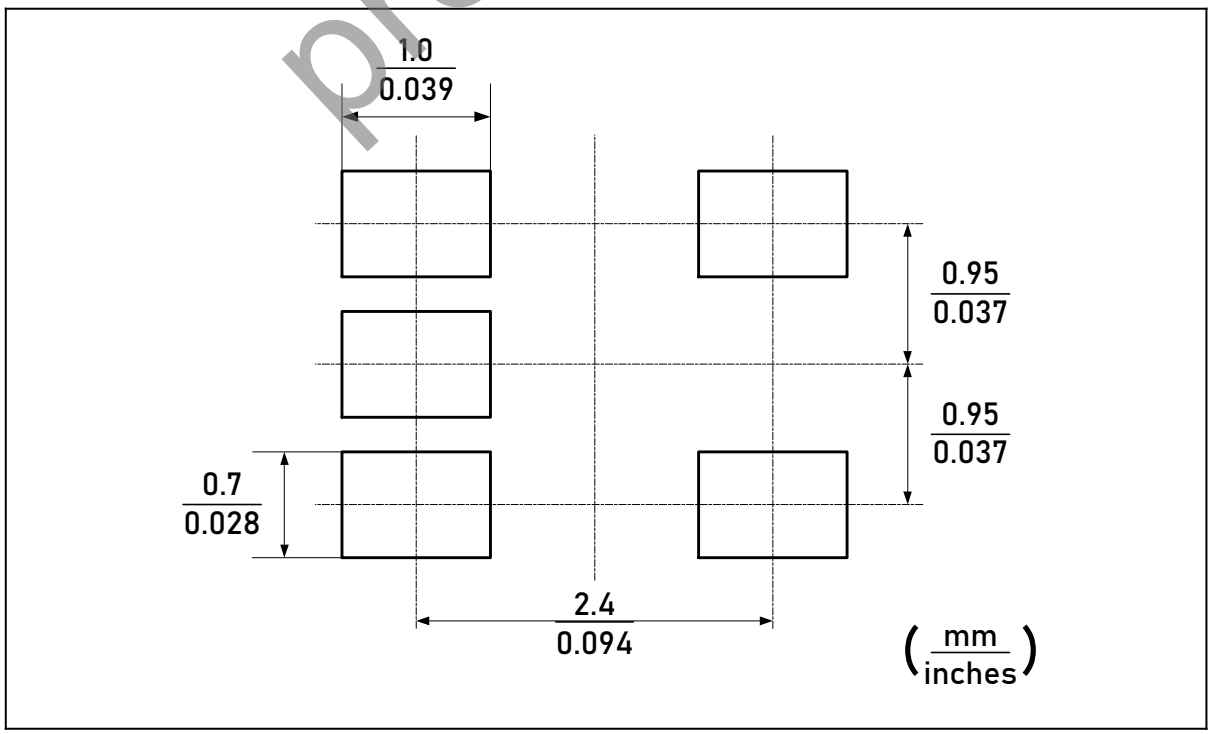






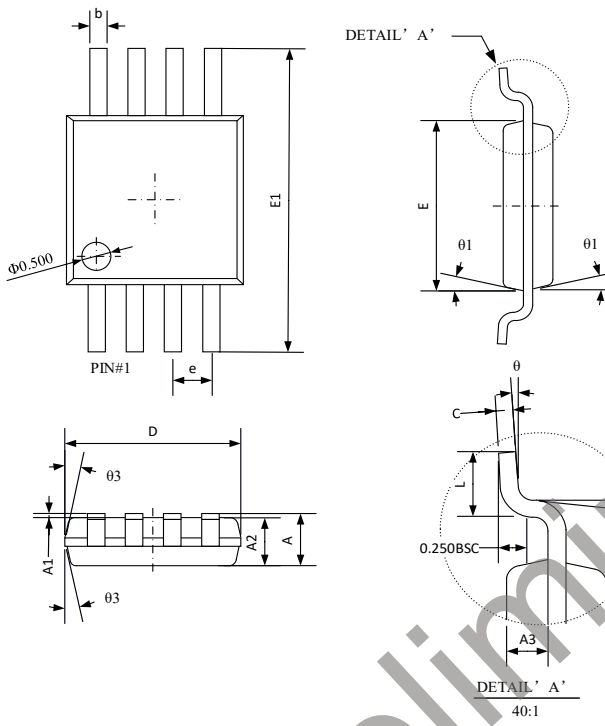
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.06	1.15	1.25
A1	0.01	0.05	0.10
A2	1.00	1.10	1.20
A3	0.65	0.70	0.75
b	0.30	0.35	0.45
c	0.127 REF		
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.95 BSC		
L	0.30	0.40	0.60
L1	0.55	0.60	0.65
R	0.10 REF		
R1	0.12 REF		
θ	0	-	8°
θ1	8°	10°	12°
θ2	10°	12°	14°

RECOMMENDED SOLDERING FOOTPRINT, SOT23-5L



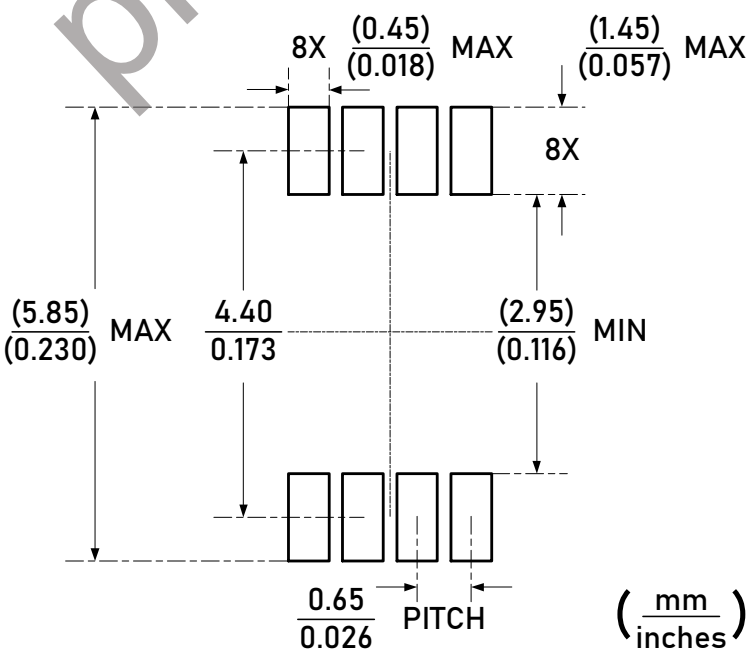
Package Outlines (continued)

DIMENSIONS, MSOP-8L



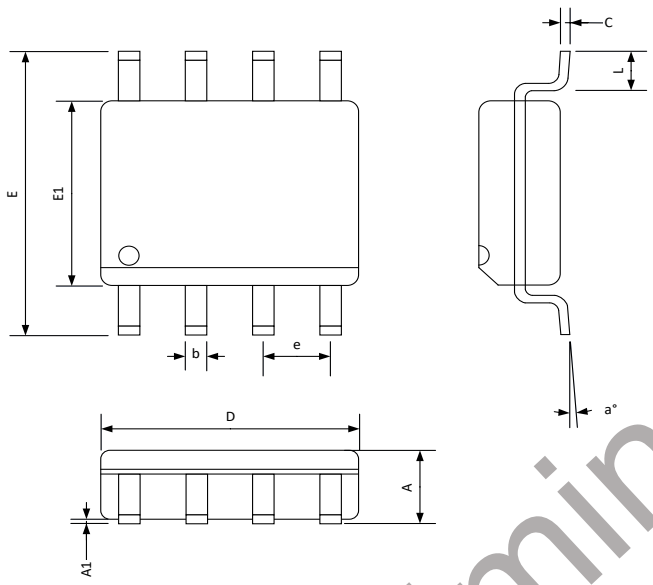
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.800	0.930	1.100
A1	0.020	0.080	0.150
A2	0.750	0.850	0.950
A3	0.249	0.349	0.449
c	0.090	0.152	0.230
E	2.900	3.000	3.100
E1	4.700	4.900	5.100
L	0.400	0.600	0.800
b	0.250	0.300	0.380
D	2.900	3.000	3.100
e	0.650 BSC		
θ	0°	3°	8°
θ1	12° REF		
θ2	4° REF		
θ3	12° REF		

RECOMMENDED SOLDERING FOOTPRINT, MSOP-8L



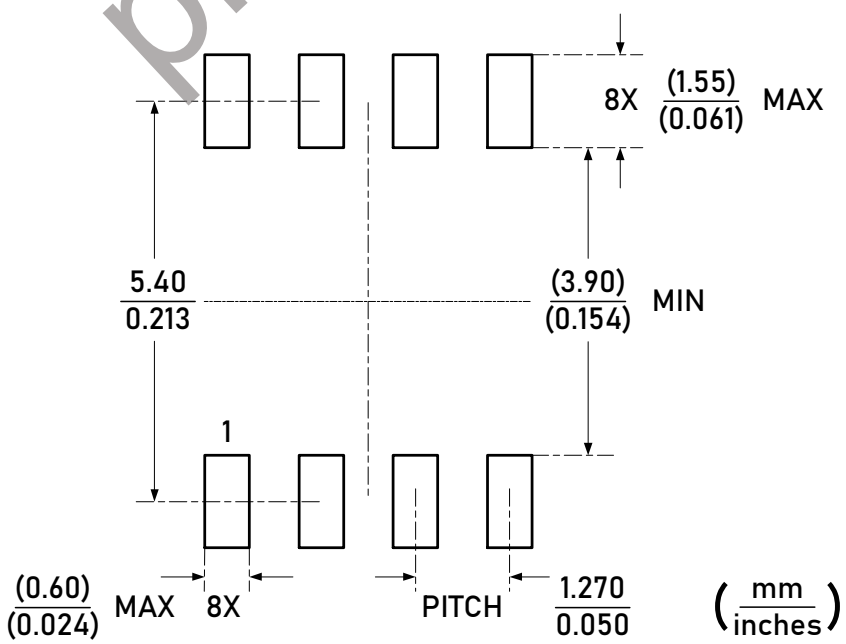
Package Outlines (continued)

DIMENSIONS, SOIC-8L



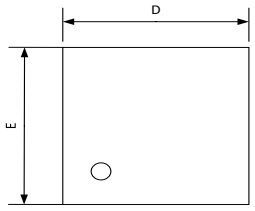
SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.750
A1	0.070	--	0.230
b	0.306	--	0.506
c	0.190	--	0.250
D	4.700	4.900	5.100
E	5.800	6.000	6.200
E1	3.700	3.900	4.100
e	1.270TYP		
L	0.450	--	0.800
a°	0°	--	8°

RECOMMENDED SOLDERING FOOTPRINT, SOIC-8L

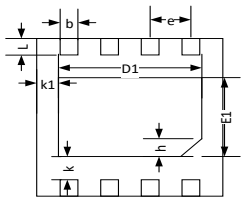


Package Outlines (continued)

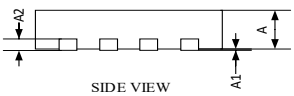
DIMENSIONS, DFN3x3-8L



TOP VIEW



BOTTOM VIEW

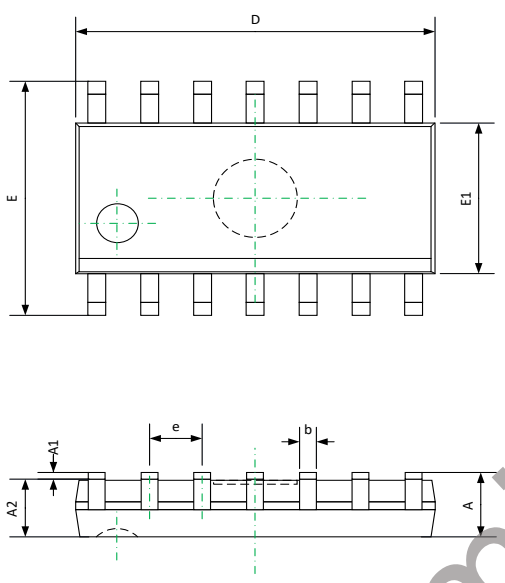


SIDE VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
b	0.25	0.28	0.31
A2		0.21 BSC	
D	2.90	3.00	3.10
E	2.90	3.00	3.10
E1	1.45	1.50	1.55
D1	2.25	2.30	2.35
e		0.65 REF	
L	0.25	0.30	0.35
h		0.49 REF	
k1	0.30	0.35	0.40
k	0.40	0.45	0.50

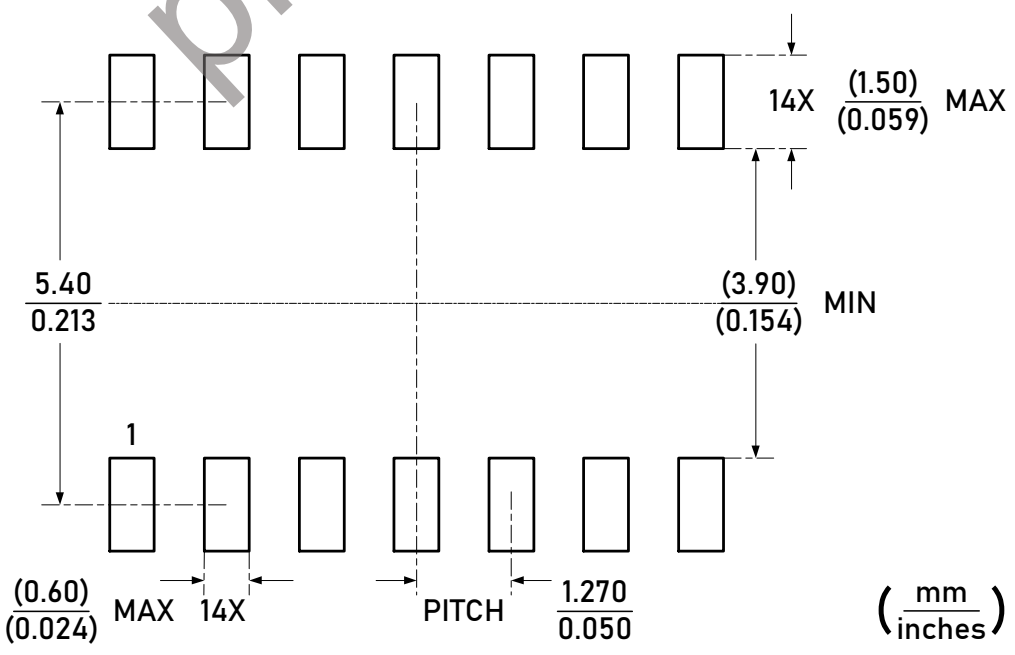
Package Outlines (continued)

DIMENSIONS, SOIC-14L



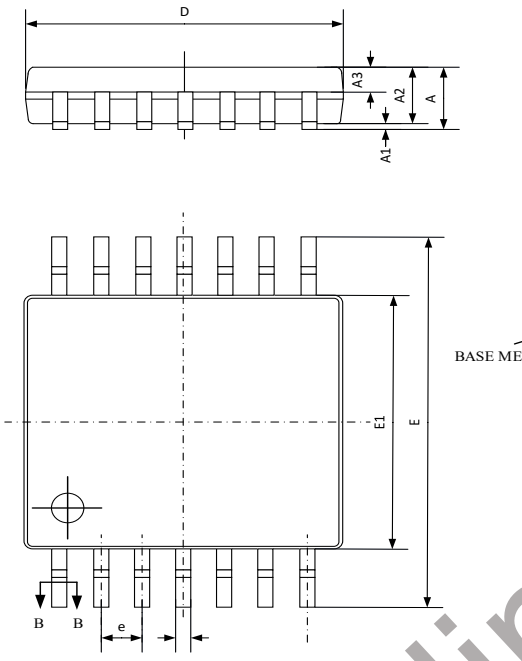
Symbol	Dimensions in Millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	1.450	1.850	0.057	0.073
A1	0.100	0.300	0.004	0.012
A2	1.350	1.550	0.053	0.061
b	0.406TYP.		0.016TYP.	
C	0.203TYP.		0.008TYP.	
D	8.630	8.830	0.340	0.336
E	5.840	6.240	0.230	0.246
E1	3.850	4.050	0.152	0.159
e	1.270(TYP)		0.050(TYP)	
L	0.350	0.750	0.014	0.030
θ	2°	8°	2°	8°

RECOMMENDED SOLDERING FOOTPRINT, SOIC-14L



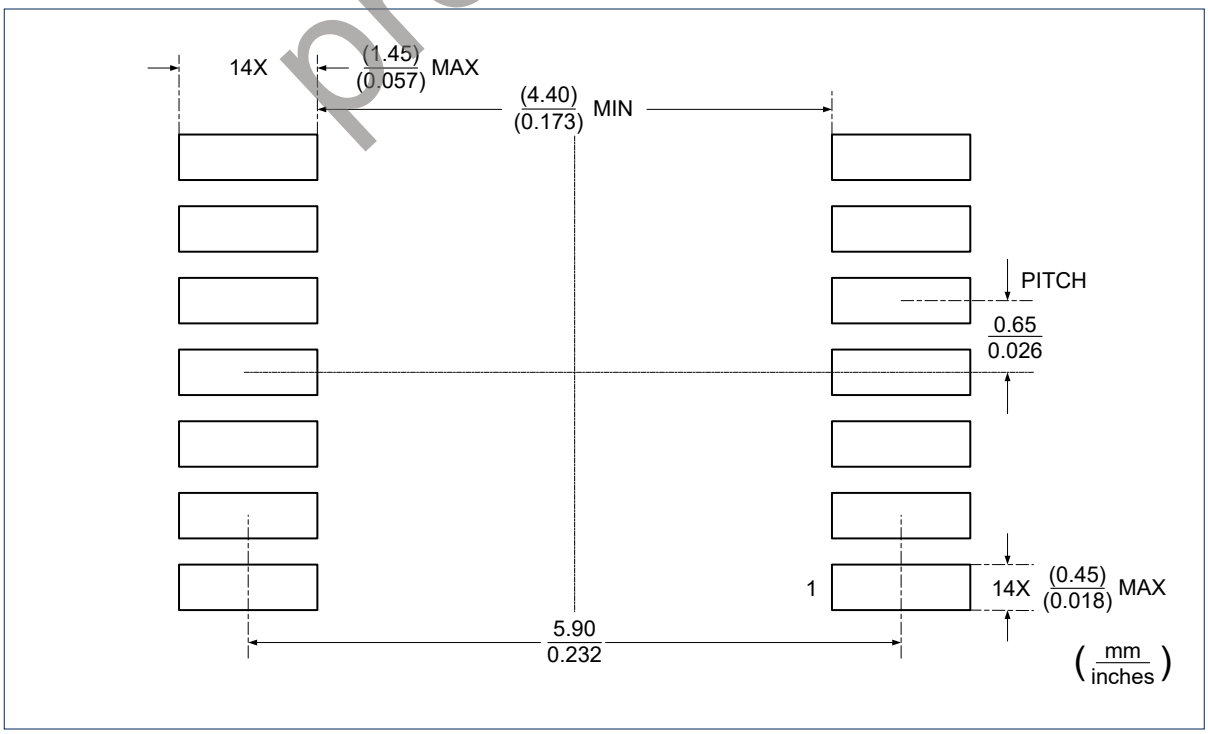
Package Outlines (continued)

DIMENSIONS, TSSOP-14L



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	-	-	1.200
A1	0.050	-	0.150
A2	0.900	1.000	1.050
A3	0.390	0.440	0.490
b	0.200	-	0.280
b1	0.190	0.220	0.250
c	0.130	-	0.170
c1	0.120	0.130	0.140
D	4.860	5.000	5.100
E1	4.300	4.400	4.500
E	6.200	6.400	6.600
e	0.65 BSC		
L	0.450	0.600	0.750
L1	1.00 BSC		
θ	0	-	8°

RECOMMENDED SOLDERING FOOTPRINT, TSSOP-14L



Important Notice

Linearin is a global fabless semiconductor company specializing in advanced high-performance high-quality analog/mixed-signal IC products and sensor solutions. The company is devoted to the innovation of high performance, analog-intensive sensor front-end products and modular sensor solutions, applied in multi-market of medical & wearable devices, smart home, sensing of IoT, intelligent industrial & smart factory (industrie 4.0), and automotives. Linearin's product families include widely-used standard catalog products, solution-based application specific standard products (ASSPs) and sensor modules that help customers achieve faster time-to-market products. Go to http://www.linearin.com for a complete list of Linearin product families.

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