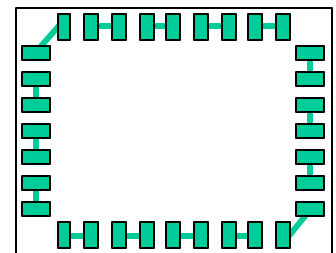
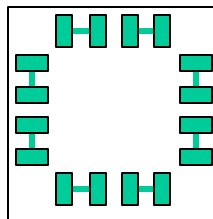
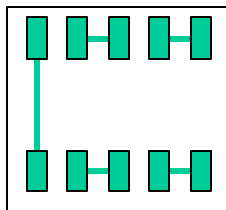
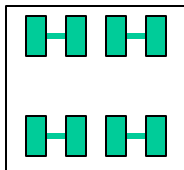
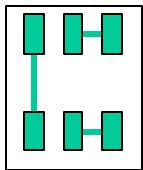


# LLP Daisy Chain Layout

# PACKAGING

LLP  
Daisy Chain Layout

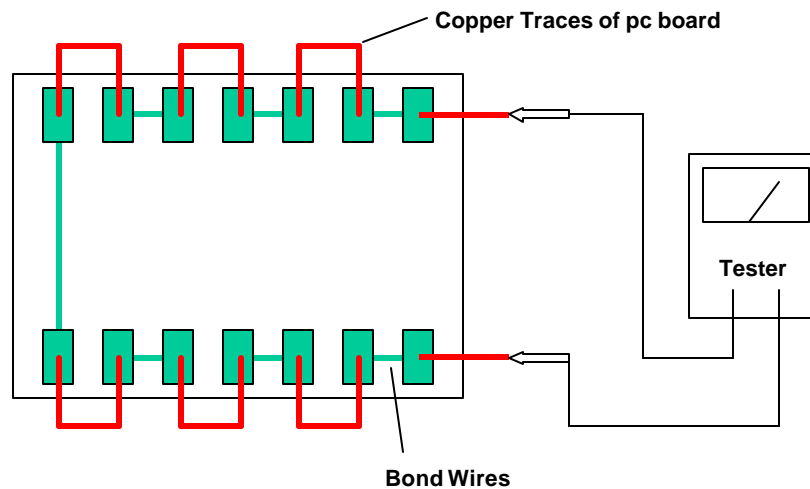


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## Introduction

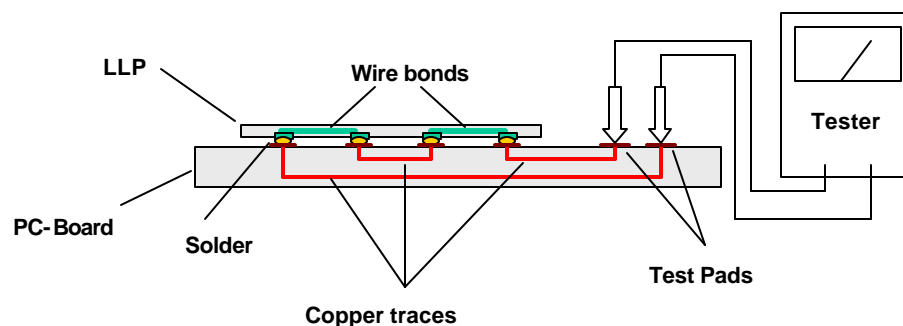
Daisy Chains are non-functional parts with a pattern of interconnected pins. These samples are typically assembled onto a printed circuit board with matching patterns. Once assembled on the matching board, all pins are connected, creating a continuous network.



Daisy Chain samples are primarily requested by customers to perform solder joint resistance testing. This test will help to characterize the assembly process and equipment prior to full production.

Daisy Chains are also used in several board level reliability tests in accordance with NATIONAL's LLP-specific Application Note AN-1187.

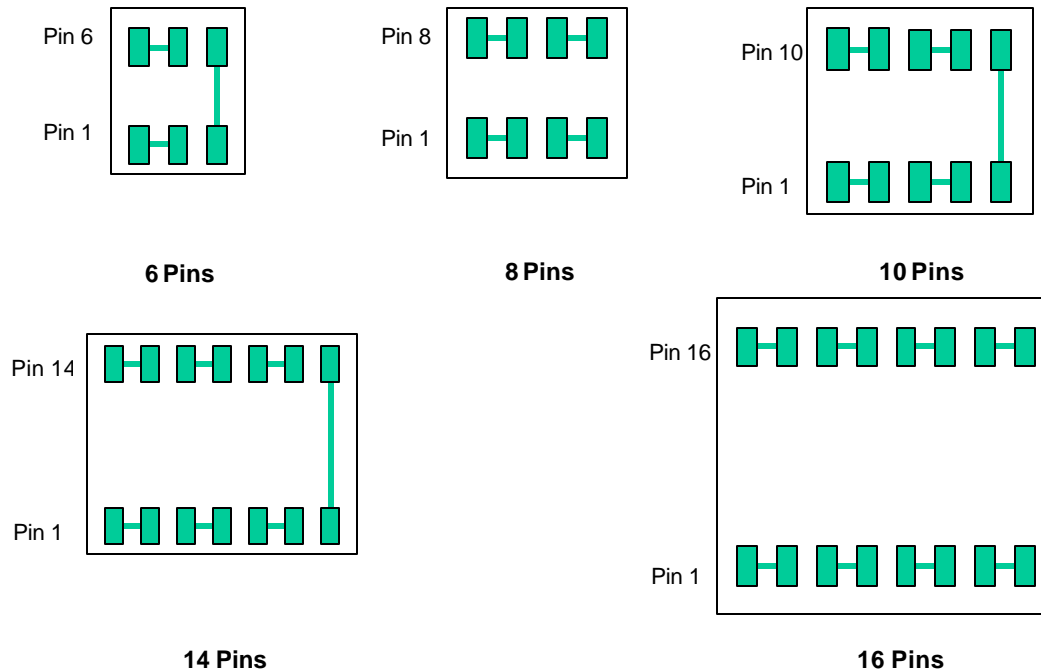
The daisy chains are assembled onto the matching circuit board and subjected to e.g., temperature cycling (TMCL) in an oven, and mechanical stressing.



For board layout recommendations, please refer to our AN-1187 and our package drawings [[www.national.com/packaging](http://www.national.com/packaging)].

## LLP Daisy Chain Layout (Dual Packages)

(The pin assignment for the device is shown with pads facing down)

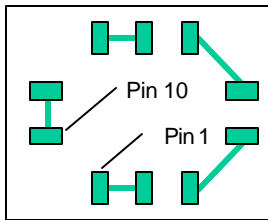


### Dual LLP Daisy Chains

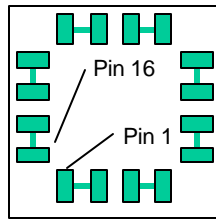
Pin Count	Package size (mm)	Pitch (mm)	Ordering Instruction / NSID	Marketing Outline Drawing
6	3.0 x 4.0	0.8	DCDC06AE	LDC06D
6	2.92 x 3.29	0.95	DCDE06AA	LDE06A
8	2.5 x 2.5	0.5	DCDA08AC	LDA08B
8	2.5 x 3.0	0.5	DCDA08AD	LDA08C
8	3.0 x 3.0	0.5	DCDA08AA	LDA08A
8	4.0 x 4.0	0.8	DCDC08AA	LDC08A
10	3.0 x 3.0	0.5	DCDA10AA	LDA10A
10	3.0 x 4.0	0.5	DCDA10AB	LDA10B
14	4.0 x 4.0	0.5	DCDA14AA	LDA14A
14	4.0 x 5.0	0.5	DCDA14AB	LDA14B
16	5.0 x 5.0	0.5	DCDA16AB	LDA16A

## LLP Daisy Chain Layout (Quad Packages)

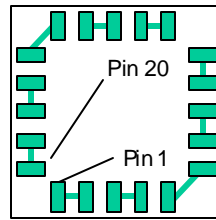
(The pin assignment for the device is shown with pads facing down)



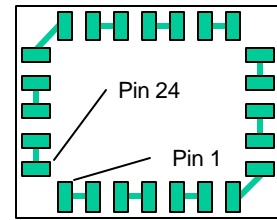
**10 pins**



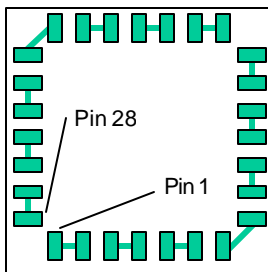
**16 pins**



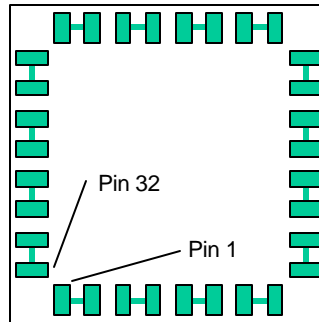
**20 pins**



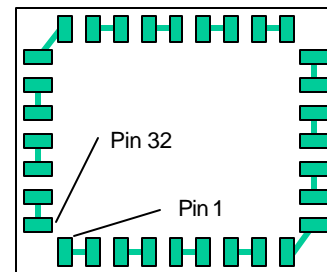
**24 pins**



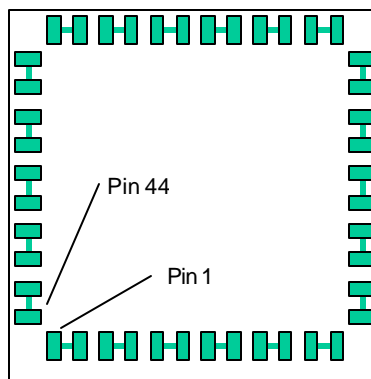
**28 pins**



**32 pins  
(LQA32A)**



**32 pins  
(LQA32B)**



**44 pins**

### Quad LLP Daisy Chains

Pin Count	Package size (mm)	Pitch (mm)	Ordering Instruction / NSID	Marketing Outline Drawing
10	5.0 x 4.0	0.8	DCQC10AA	LQC10A
16	4.0 x 4.0	0.5	DCQA16AB	LQA16A
20	4.0 x 4.0	0.5	DCQA20AB	LQA20A
24	5.0 x 4.0	0.5	DCQA24AA	LQA24A
28	5.0 x 5.0	0.5	DCQA28AA	LQA28A
32	6.0 x 6.0	0.5	DCQA32AA	LQA32A
32	5.0 x 6.0	0.5	DCQA32AB	LQA32B
44	7.0 x 7.0	0.5	DCQA44AC	LQA44A

Note: Shipping quantity for Daisy Chains is generally 250 units per 7-inch reel.