

# ProductClip

Standard Linear and Logic

## NanoStar™ and NanoFree™ The smallest industry-standard logic package

NanoFree™



The smallest industry-standard logic package with world-class proven reliability designed for today's high-volume manufacturing environments.

### Board-Level Reliability

TI: 1,286 cycles: -40 to 125°C.

Zero failures.

TI: 1,900 cycles: 0 to 100°C.

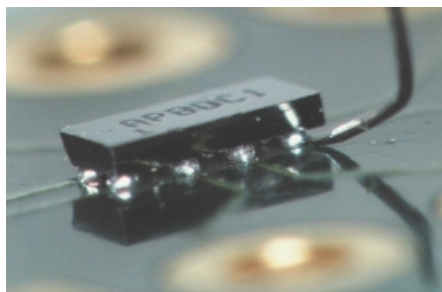
Zero failures. (Modeled at 30-unit sample size.)

For optimal reliability, please review the land-pad design illustrated in the *WCSP Design Summary* available at:

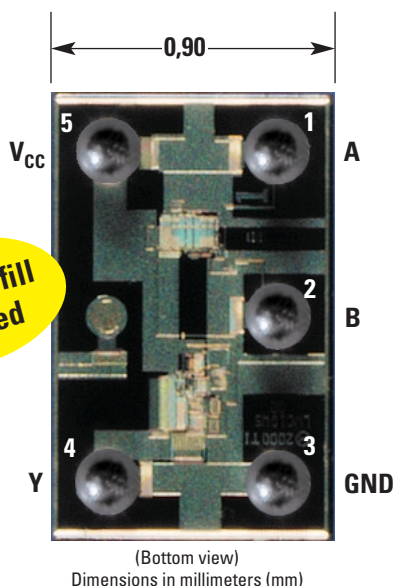
[www.ti.com/nanostar](http://www.ti.com/nanostar)

### Solder Bumps Provide Easy Testability

Due to the ideal placement of the solder bumps along the outside of the package along with sufficient bump height, probe tips can easily create a dedicated contact to the individual pins.



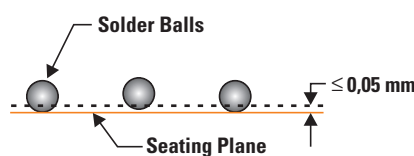
No Underfill Required



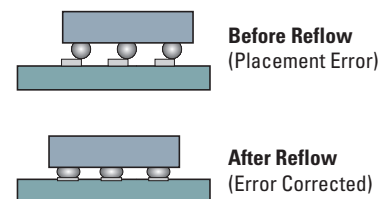
Alternate Source:  
Renesas Technology

### Placeability

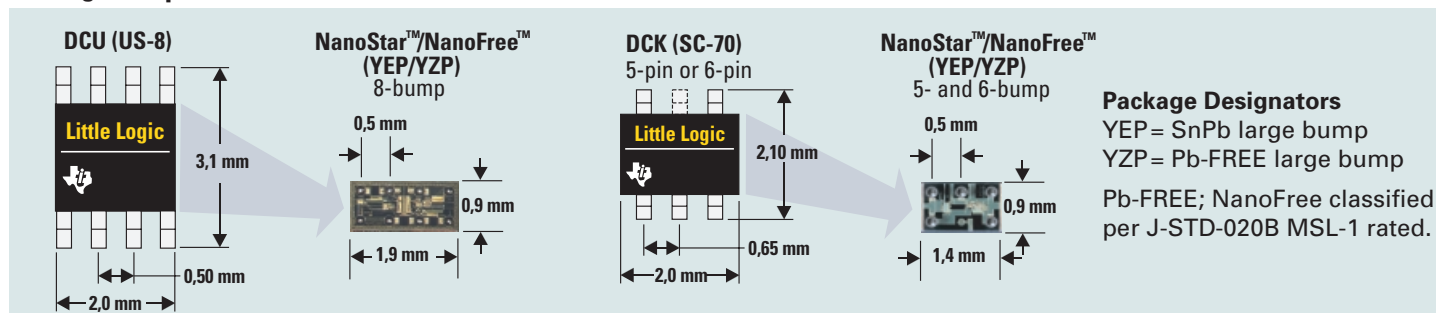
**Coplanarity:** This package meets a coplanarity of 0,05 mm as shown. Coplanarity is defined as a unilateral tolerance zone measured upward from the seating plane.



**Self-Correction:** Self-correction during reflow reduces the need for accurate placement. About 50% of ball-to-paste overlap is sufficient for the self-correction process.



### Package Comparisons



## NanoStar/NanoFree Typical Characteristics

Family	Operating Voltage Range (V)	Optimized Voltage (V)	Propagation Delay (typ) (ns)	Output Drive (mA)	Input Tolerance (V)	I <sub>OFF</sub> Protection
AUC	0.8 to 2.7	1.8	2.0	8	3.6	Yes
LVC	1.65 to 5.5	3.3	3.5	24	5.5	Yes

## Products Available by Function

Description	3.3-V LVC			1.8-V AUC	
	Single-Gate	Dual-Gate	Triple-Gate	Single-Gate	Dual-Gate
<b>Gates</b>					
2-input NAND gate	LVC1G00	LVC2G00		AUC1G00	AUC2G00
2-input NOR gate	LVC1G02	LVC2G02		AUC1G02	AUC2G02
2-input AND gate	LVC1G08	LVC2G08		AUC1G08	AUC2G08
2-input OR gate	LVC1G32	LVC2G32		AUC1G32	AUC2G32
2-input exclusive OR gate	LVC1G86	LVC2G86		AUC1G86	
3-input exclusive OR gate	LVC1G386				
<b>Configurable Logic</b>					
Configurable multi-function gate	LVC1G57				
Configurable multi-function gate	LVC1G58				
Configurable multi-function gate	LVC1G97				
Configurable multi-function gate	LVC1G98				
<b>Buffers</b>					
Buffer driver w/open drain output	LVC1G07	LVC2G07	LVC3G07	AUC1G07	AUC2G07
Schmitt-trigger buffer	LVC1G17	LVC2G17		AUC1G17	
Bus buffer gate	LVC1G125	LVC2G125		AUC1G125	
Bus buffer gate	LVC1G126	LVC2G126			
Buffer driver w/3-state outputs	LVC1G240	LVC2G240		AUC1G240	
Buffer gate		LVC2G34	LVC3G34		
<b>Inverters</b>					
Inverter gate	LVC1G04	LVC2G04	LVC3G04	AUC1G04	AUC2G04
Inverter unbuffered gate	LVC1GU04	LVC2GU04		AUC1GU04	
Inverter buffer/driver	LVC1G06	LVC2G06	LVC3G06	AUC1G06	AUC2G06
Schmitt-trigger inverter	LVC1G14	LVC2G14	LVC3G14	AUC1G14	
<b>Analog Switches</b>					
Analog switch	LVC1G66	LVC2G66		AUC1G66	
Analog MUX/deMUX		LVC2G53			
Single-pole, double-throw analog switch	LVC1G3157				
<b>Flip-Flops</b>					
Positive-edge-triggered D-type flip-flop	LVC1G79			AUC1G79	
Positive-edge-triggered D-type flip-flop	LVC1G80			AUC1G80	
Positive-edge-triggered D-type flip-flop w/clear and preset		LVC2G74			
<b>Multiplexers</b>					
Single 2-line to 1-line data selector/multiplexer		LVC2G157			
1-of-2 noninverting demultiplexer with 3-state deselected output	LVC1G18				
1-of-2 decoder/demultiplexer	LVC1G19				

## For More Information About NanoStar and NanoFree

Visit the NanoStar home page for application reports, product samples and the *NanoStar Design Summary*:

[www.ti.com/nanostar](http://www.ti.com/nanostar)  
[www.ti.com/littlelogic](http://www.ti.com/littlelogic)

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