



## Final Product/Process Change Notification

Document #:FPCN25572Z20

Issue Date: 05 Feb 2024

<b>Title of Change:</b>	Update to <b>FPCN25572Z</b> - To include the reliability data of 3V Minigates SC88A for the qualification of Vanguard Fab and Assembly Related Changes for Logic part.	
<b>Proposed Changed Material First Ship Date:</b>	12 Aug 2024 or earlier if approved by customer	
<b>Current Material Last Order Date:</b>	20 Nov 2023 <i>Orders received after the Current Material Last Order Date expiration are to be considered as orders for new changed material as described in this PCN. Orders for current (unchanged) material after this date will be per mutual agreement and current material inventory availability.</i>	
<b>Current Material Last Delivery Date:</b>	N/A <i>The Current Material Last Delivery Date may be subject to change based on build and depletion of the current (unchanged) material inventory</i>	
<b>Product Category:</b>	Active components – Integrated circuits	
<b>Contact information:</b>	Contact your local onsemi Sales Office or <a href="mailto:logic.fpcn@onsemi.com">logic.fpcn@onsemi.com</a>	
<b>PCN Samples Contact:</b>	Contact your local onsemi Sales Office to place sample order. Sample requests are to be submitted no later than 45 days after publication of this change notification. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements.	
<b>Sample Availability Date:</b>	19 Jan 2024	
<b>PPAP Availability Date:</b>	26 Feb 2024	
<b>Additional Reliability Data:</b>	Contact your local onsemi Sales Office or <a href="mailto:ChangKit.Mok@onsemi.com">ChangKit.Mok@onsemi.com</a>	
<b>Type of Notification:</b>	This is a Final Product/Process Change Notification (FPCN) sent to customers. The change will be implemented at 'Proposed Change Material First Ship Date' in compliance to J-STD-46 or ZVEI, or earlier upon customer approval, or per our signed agreements. onsemi will consider this proposed change and it's conditions acceptable, unless an inquiry is made in writing within 45 days of delivery of this notice. To do so, contact <a href="mailto:PCN.Support@onsemi.com">PCN.Support@onsemi.com</a> .	
<b>Change Category</b>		
<b>Category</b>	<b>Type of Change</b>	
Process - Wafer Production	Move of all or part of wafer fab to a different location/site/subcontractor, New wafer diameter	
Equipment	Production from a new equipment/tool which uses a different basic technology or which due to its unique form or function can be expected to influence the integrity of the final product	
Data Sheet	Change of datasheet parameters/electrical specification (min./max./typ. values) and/or AC/DC specification	
Process - Assembly	Change of wire bonding	
<b>Description and Purpose:</b>		
With reference to <b>FPCN25572Z</b> , this FPCN presents the information solely for 3V Minigates in SC88A package.		
	<b>From</b>	<b>To</b>
<b>Fab Site</b>	Tower	Vanguard
<b>Wafer Diameter</b>	6 inch	8 inch
<b>Bond Wire</b>	Au	Cu

### 3V Minigates Datasheet Updates:

#### NLV17SGxx to NLV17SGxx-Q Family

## NLV17SG except for NLV17SGU04 – Max Ratings

### Existing

MAXIMUM RATINGS				
Symbol	Parameter	Value	Unit	
V <sub>CC</sub>	DC Supply Voltage	-0.5 to +5.5	V	
V <sub>IN</sub>	DC Input Voltage	-0.5 to +4.6	V	
V <sub>OUT</sub>	DC Output Voltage Output at High or Low State Power-Down Mode (V <sub>CC</sub> = 0 V)	-0.5 to V <sub>CC</sub> + 0.5 -0.5 to +4.6	V	
I <sub>IK</sub>	DC Input Diode Current V <sub>IN</sub> < GND	-20	mA	
I <sub>OK</sub>	DC Output Diode Current V <sub>OUT</sub> < GND	-20	mA	
I <sub>OUT</sub>	DC Output Source/Sink Current	±20	mA	
I <sub>CC</sub>	DC Supply Current per Supply Pin	±20	mA	
I <sub>GD</sub>	DC Ground Current per Ground Pin	±20	mA	
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C	
T <sub>L</sub>	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C	
T <sub>J</sub>	Junction Temperature Under Bias	+150	°C	
MSL	Moisture Sensitivity	Level 1		
FR	Flammability Rating	Oxygen Index: 28 to 34 UL 94 V-0 @ 0.125 in		
V <sub>ESD</sub>	ESD Withstand Voltage Human Body Model (Note 2) Machine Model (Note 3)	>2000 >100	V	
LATCHUP	Latchup Performance Above V <sub>CC</sub> and Below GND at 125°C (Note 4)	±100	mA	

### New

Table 1. MAXIMUM RATINGS				
Symbol	Parameter	Value	Unit	
V <sub>CC</sub>	DC Supply Voltage	-0.5 to +4.3	V	
V <sub>IN</sub>	DC Input Voltage	-0.5 to +4.3	V	
V <sub>OUT</sub>	DC Output Voltage Active-Mode (High or Low State) Tri-State Mode (Note 1) Power-Down Mode (V <sub>CC</sub> = 0 V)	-0.5 to V <sub>CC</sub> + 0.5 -0.5 to +4.3 -0.5 to +4.3	V	
I <sub>IK</sub>	DC Input Diode Current V <sub>IN</sub> < GND	-20	mA	
I <sub>OK</sub>	DC Output Diode Current V <sub>OUT</sub> < GND	-20	mA	
I <sub>OUT</sub>	DC Output Source/Sink Current	±20	mA	
I <sub>CC</sub> or I <sub>GD</sub>	DC Supply Current Per Supply Pin or Ground Pin	±20	mA	
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C	
T <sub>L</sub>	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C	
T <sub>J</sub>	Junction Temperature Under Bias	+150	°C	
θ <sub>JA</sub>	Thermal Resistance (Note 2)	SC-88A SOT-963 UDFN6	377 254 154	°C/W
P <sub>D</sub>	Power Dissipation in Still Air at 85°C	SC-88A SOT-963 UDFN6	332 491 812	mW
MSL	Moisture Sensitivity	Level 1		
FR	Flammability Rating	Oxygen Index: 28 to 34 UL 94 V-0 @ 0.125 in		
V <sub>ESD</sub>	ESD Withstand Voltage (Note 3) Human Body Model Charged Device Model	2000 1000	V	
LATCHUP	Latchup Performance (Note 4)	±100	mA	

## All NLV17SG except for NLV17SG07/14/17/U04 – DC Characteristics

### Existing

DC ELECTRICAL CHARACTERISTICS									
Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C		T <sub>A</sub> = -55°C to +125°C		Unit	
				Min	Max	Min	Max		
V <sub>IH</sub>	High-Level Input Voltage		0.9	V <sub>CC</sub>		V <sub>CC</sub>		V	
			1.1 to 1.3	0.7 × V <sub>CC</sub>		0.7 × V <sub>CC</sub>			
			1.4 to 1.6	0.65 × V <sub>CC</sub>		0.65 × V <sub>CC</sub>			
			1.65 to 1.95	0.65 × V <sub>CC</sub>		0.65 × V <sub>CC</sub>			
			2.3 to 2.7	1.7		1.7			
			3.0 to 3.6	2.0		2.0			
V <sub>IL</sub>	Low-Level Input Voltage		0.9		GND		GND	V	
			1.1 to 1.3		0.3 × V <sub>CC</sub>		0.3 × V <sub>CC</sub>		
			1.4 to 1.6		0.35 × V <sub>CC</sub>		0.35 × V <sub>CC</sub>		
			1.65 to 1.95		0.35 × V <sub>CC</sub>		0.35 × V <sub>CC</sub>		
			2.3 to 2.7		0.7		0.7		
			3.0 to 3.6		0.8		0.8		
V <sub>OH</sub>	High-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>						V	
		I <sub>OH</sub> = -20 μA	0.9	0.75		0.75			
		I <sub>OH</sub> = -0.3 mA	1.1 to 1.3	0.75 × V <sub>CC</sub>		0.75 × V <sub>CC</sub>			
		I <sub>OH</sub> = -1.7 mA	1.4 to 1.6	0.75 × V <sub>CC</sub>		0.75 × V <sub>CC</sub>			
		I <sub>OH</sub> = -3.0 mA	1.65 to 1.95	V <sub>CC</sub> - 0.45		V <sub>CC</sub> - 0.45			
		I <sub>OH</sub> = -4.0 mA	2.3 to 2.7	2.0		2.0			
		I <sub>OH</sub> = -8.0 mA	3.0 to 3.6	2.48		2.48			
V <sub>OL</sub>	Low-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>						V	
		I <sub>OL</sub> = 20 μA	0.9		0.1		0.1		
		I <sub>OL</sub> = 0.3 mA	1.1 to 1.3		0.25 × V <sub>CC</sub>		0.25 × V <sub>CC</sub>		
		I <sub>OL</sub> = 1.7 mA	1.4 to 1.6		0.25 × V <sub>CC</sub>		0.25 × V <sub>CC</sub>		
		I <sub>OL</sub> = 3.0 mA	1.65 to 1.95		0.45		0.45		
		I <sub>OL</sub> = 4.0 mA	2.3 to 2.7		0.4		0.4		
		I <sub>OL</sub> = 8.0 mA	3.0 to 3.6		0.4		0.4		
I <sub>IN</sub>	Input Leakage Current	0 ≤ V <sub>IN</sub> ≤ 3.6 V	0 to 3.6		±0.1		±1.0	μA	
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	3.6		0.5		10.0	μA	

### New

Table 3. DC ELECTRICAL CHARACTERISTICS									
Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C		T <sub>A</sub> = -55°C to +125°C		Unit	
				Min	Max	Min	Max		
V <sub>IH</sub>	High-Level Input Voltage		0.9		V <sub>CC</sub>		V <sub>CC</sub>	V	
			1.1 to 1.3	0.7 × V <sub>CC</sub>		0.7 × V <sub>CC</sub>			
			1.4 to 1.6	0.65 × V <sub>CC</sub>		0.65 × V <sub>CC</sub>			
			1.65 to 1.95	0.65 × V <sub>CC</sub>		0.65 × V <sub>CC</sub>			
			2.3 to 2.7	1.7		1.7			
			3.0 to 3.6	2.0		2.0			
V <sub>IL</sub>	Low-Level Input Voltage		0.9		GND		GND	V	
			1.1 to 1.3		0.3 × V <sub>CC</sub>		0.3 × V <sub>CC</sub>		
			1.4 to 1.6		0.35 × V <sub>CC</sub>		0.35 × V <sub>CC</sub>		
			1.65 to 1.95		0.35 × V <sub>CC</sub>		0.35 × V <sub>CC</sub>		
			2.3 to 2.7		0.7		0.7		
			3.0 to 3.6		0.8		0.8		
V <sub>OH</sub>	High-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>						V	
		I <sub>OH</sub> = -20 μA	0.9		0.75		0.75		
		I <sub>OH</sub> = -0.3 mA	1.1 to 1.3	0.75 × V <sub>CC</sub>		0.75 × V <sub>CC</sub>			
		I <sub>OH</sub> = -1.7 mA	1.4 to 1.6	0.75 × V <sub>CC</sub>		0.75 × V <sub>CC</sub>			
		I <sub>OH</sub> = -3.0 mA	1.65 to 1.95	V <sub>CC</sub> - 0.45		V <sub>CC</sub> - 0.45			
		I <sub>OH</sub> = -4.0 mA	2.3 to 2.7	2.0		2.0			
		I <sub>OH</sub> = -8.0 mA	3.0 to 3.6	2.48		2.48			
V <sub>OL</sub>	Low-Level Output Voltage	V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>						V	
		I <sub>OL</sub> = 20 μA	0.9		0.1		0.1		
		I <sub>OL</sub> = 0.3 mA	1.1 to 1.3		0.25 × V <sub>CC</sub>		0.25 × V <sub>CC</sub>		
		I <sub>OL</sub> = 1.7 mA	1.4 to 1.6		0.25 × V <sub>CC</sub>		0.25 × V <sub>CC</sub>		
		I <sub>OL</sub> = 3.0 mA	1.65 to 1.95		0.45		0.45		
		I <sub>OL</sub> = 4.0 mA	2.3 to 2.7		0.4		0.4		
		I <sub>OL</sub> = 8.0 mA	3.0 to 3.6		0.4		0.4		
I <sub>IN</sub>	Input Leakage Current	V <sub>IN</sub> = 0 V to 3.6 V	0 to 3.6		±0.1		±1.0	μA	
I <sub>OFF</sub>	Power Off Leakage Current	V <sub>IN</sub> = 0 V to 3.6 V V <sub>OUT</sub> = 0 V to 3.6 V	0.9 to 3.6		1.0		10.0	μA	
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IN</sub> = V <sub>CC</sub> or GND	0.9 to 3.6		1.0		10.0	μA	

## NLV17SG08 - AC Characteristics

### Existing

AC ELECTRICAL CHARACTERISTICS (Input  $t_r = t_f = 3.0$  ns)

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25° C			T <sub>A</sub> = -55° C to +125° C		Unit
				Min	Typ	Max	Min	Max	
t <sub>PLH</sub> , t <sub>PLH</sub>	Propagation Delay, A or B to Y	C <sub>L</sub> = 10 pF; R <sub>L</sub> = 1 MΩ	0.9	-	10.0	12.4	-	14.8	ns
			1.1 to 1.3	-	8.0	10.7	-	13.6	
			1.4 to 1.6	-	5.9	9.6	-	11.3	
			1.65 to 1.95	-	4.5	7.0	-	7.5	
			2.3 to 2.7	-	2.9	4.4	-	4.9	
			3.0 to 3.6	-	2.2	3.5	-	4.1	
		C <sub>L</sub> = 15 pF; R <sub>L</sub> = 1 MΩ	0.9	-	11.7	13.5	-	15.0	ns
			1.1 to 1.3	-	8.8	10.2	-	13.7	
			1.4 to 1.6	-	6.5	9.5	-	12.6	
			1.65 to 1.95	-	5.0	7.7	-	8.0	
			2.3 to 2.7	-	3.2	4.9	-	5.6	
			3.0 to 3.6	-	2.5	3.8	-	4.4	
		C <sub>L</sub> = 30 pF; R <sub>L</sub> = 1 MΩ	0.9	-	13.0	16.0	-	19.0	ns
			1.1 to 1.3	-	10.0	12.4	-	17.2	
			1.4 to 1.6	-	8.9	11.8	-	14.9	
			1.65 to 1.95	-	6.9	10.3	-	10.8	
			2.3 to 2.7	-	4.4	6.4	-	6.8	
			3.0 to 3.6	-	3.5	4.9	-	5.4	

### New

Table 4. AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25° C			T <sub>A</sub> = -55° C to +125° C		Unit
				Min	Typ	Max	Min	Max	
t <sub>PLH</sub> , t <sub>PLH</sub>	Propagation Delay, (A or B) to Y (Figures 5 and 6)	C <sub>L</sub> = 10 pF; R <sub>L</sub> = 1 MΩ	0.9	-	46.5	-	-	-	ns
			1.1 to 1.3	-	14.1	26.7	-	31.7	
			1.4 to 1.6	-	5.9	9.6	-	11.3	
			1.65 to 1.95	-	4.5	7.0	-	7.5	
			2.3 to 2.7	-	2.9	4.4	-	4.9	
			3.0 to 3.6	-	2.2	3.5	-	4.1	
		C <sub>L</sub> = 15 pF; R <sub>L</sub> = 1 MΩ	0.9	-	47.9	-	-	-	ns
			1.1 to 1.3	-	14.4	27.3	-	32.4	
			1.4 to 1.6	-	6.5	9.5	-	12.6	
		C <sub>L</sub> = 30 pF; R <sub>L</sub> = 1 MΩ	1.65 to 1.95	-	5.0	7.7	-	8.0	ns
			2.3 to 2.7	-	3.2	4.9	-	5.6	
			3.0 to 3.6	-	2.5	3.8	-	4.4	
			0.9	-	52.5	-	-	-	
			1.1 to 1.3	-	15.3	29.3	-	34.7	
			1.4 to 1.6	-	8.9	11.8	-	14.9	
			1.65 to 1.95	-	6.9	10.3	-	10.8	
			2.3 to 2.7	-	4.4	6.4	-	6.8	
			3.0 to 3.6	-	3.5	4.9	-	5.4	

## NLV17SG14 / 17 - DC Characteristics

### Existing

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V <sub>CC</sub> (V)	T <sub>a</sub> = 25°C			-55°C ≤ T <sub>a</sub> ≤ 125°C			Unit
				Min	Typ	Max	Min	Max		
V <sub>IH</sub>	Positive-Going Input Threshold Voltage		0.9	0.04	0.7	0.86	0.02	0.97	V	
			1.1	0.73	0.81	0.95	0.71	1		
			1.4	0.86	0.94	1.16	0.84	1.2		
			1.65	0.95	1.06	1.25	0.94	1.3		
			2.3	1.22	1.36	1.6	1.18	1.65		
			3.0	1.51	1.6	2.05	1.38	2.1		
V <sub>IL</sub>	Negative-Going Input Threshold Voltage		0.9	0.09	0.23	0.30	0.08	0.33	V	
			1.1	0.15	0.33	0.39	0.12	0.43		
			1.4	0.3	0.47	0.54	0.25	0.55		
			1.65	0.35	0.6	0.65	0.3	0.65		
			2.3	0.55	0.85	0.88	0.5	0.88		
			3.0	0.65	1.13	1.16	0.9	1.16		
V <sub>IS</sub>	Hysteresis Voltage		0.9	0.15	0.5	0.75	0.2	0.8	V	
			1.1	0.15	0.5	0.75	0.2	0.8		
			1.4	0.15	0.5	0.75	0.2	0.8		
			1.65	0.15	0.5	0.75	0.2	0.8		
			2.3	0.15	0.5	0.75	0.2	0.8		
			3.0	0.25	0.65	0.85	0.3	0.9		
V <sub>OHI</sub>	High-Level Output Voltage	V <sub>IH</sub> = V <sub>IH</sub> or V <sub>IL</sub>  I <sub>OH</sub> = -20 μA I <sub>OL</sub> = -0.3 mA  I <sub>OH</sub> = -1.7 mA I <sub>OL</sub> = -3.0 mA I <sub>OH</sub> = -6.0 mA I <sub>OL</sub> = -9.0 mA	0.9	0.75		0.75		V		
			1.1 to 1.3	0.75 × V <sub>CC</sub>		0.75 × V <sub>CC</sub>				
			1.4 to 1.6	0.75 × V <sub>CC</sub>		0.75 × V <sub>CC</sub>				
			1.65 to 1.95	V <sub>CC</sub> - 0.45		V <sub>CC</sub> - 0.45				
			2.3 to 2.7	2.0		2.0				
			3.0 to 3.6	2.48		2.48				
V <sub>OLI</sub>	Low-Level Output Voltage	V <sub>IH</sub> = V <sub>IH</sub> or V <sub>IL</sub>  I <sub>OH</sub> = 20 μA I <sub>OL</sub> = 0.3 mA  I <sub>OH</sub> = 1.7 mA I <sub>OL</sub> = 3.0 mA I <sub>OH</sub> = 4.0 mA I <sub>OL</sub> = 6.0 mA	0.9		0.1		0.1	V		
			1.1 to 1.3		0.25 × V <sub>CC</sub>		0.25 × V <sub>CC</sub>			
			1.4 to 1.6		0.25V <sub>CC</sub>		0.25 × V <sub>CC</sub>			
			1.65 to 1.95		0.45		0.45			
			2.3 to 2.7		0.4		0.4			
			3.0 to 3.6		0.4		0.4			
I <sub>IS</sub>	Input Leakage Current	0 ≤ V <sub>IH</sub> ≤ 3.6 V 0 to 3.6				±0.1	±1.0	μA		
	Quiescent Supply Current	V <sub>IH</sub> = V <sub>CC</sub> or GND	3.6			0.5		10.0		

Table 3. DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			T <sub>A</sub> = -55°C to +125°C			Unit
				Min	Typ	Max	Min	Max		
V <sub>IH</sub>	Positive Going Input Threshold Voltage		0.9	–	0.7	–	–	–	V	
			1.1	–	0.81	0.95	–	0.95		
			1.4	–	0.94	1.16	–	1.16		
			1.65	–	1.06	1.3	–	1.3		
			2.3	–	1.36	1.73	–	1.73		
			3.0	–	1.8	2.24	–	2.24		
V <sub>IL</sub>	Negative Going Input Threshold Voltage		0.9	–	0.23	–	–	–	V	
			1.1	0.15	0.33	–	0.15	–		
			1.4	0.3	0.47	–	0.3	–		
			1.65	0.35	0.6	–	0.35	–		
			2.3	0.55	0.85	–	0.55	–		
			3.0	0.95	1.13	–	0.95	–		
V <sub>H</sub>	Hysteresis Voltage		0.9	–	0.27	–	–	–	V	
			1.1	0.2	0.35	0.8	0.2	0.8		
			1.4	0.25	0.41	0.86	0.25	0.86		
			1.65	0.30	0.46	0.9	0.30	0.9		
			2.3	0.40	0.56	1.05	0.40	1.05		
			3.0	0.49	0.59	1.1	0.49	1.1		
V <sub>OH</sub>	High-Level Output Voltage V <sub>OH</sub> = V <sub>OH</sub> or V <sub>L</sub>	I <sub>OH</sub> = -20 μA	0.9	–	0.75	–	–	–	V	
		I <sub>OH</sub> = -0.3 mA	1.1 ± 0.3	0.75 × V <sub>CC</sub>	–	–	0.75 × V <sub>CC</sub>	–		
		I <sub>OH</sub> = -1.7 mA	1.4 to 1.6	0.75 × V <sub>CC</sub>	–	–	0.75 × V <sub>CC</sub>	–		
		I <sub>OH</sub> = -3.0 mA	1.65 to 1.95	V <sub>CC</sub> - 0.45	–	–	V <sub>CC</sub> - 0.45	–		
		I <sub>OH</sub> = -4.0 mA	2.3 to 2.7	2.0	–	–	2.0	–		
		I <sub>OH</sub> = -6.0 mA	3.0 to 3.6	2.48	–	–	2.48	–		
V <sub>OL</sub>	Low-Level Output Voltage V <sub>OL</sub> = V <sub>OH</sub> or V <sub>L</sub>	I <sub>OL</sub> = 20 μA	0.9	–	0.1	–	–	–	V	
		I <sub>OL</sub> = 0.3 mA	1.1 ± 0.3	–	–	0.25 × V <sub>CC</sub>	–	0.25 × V <sub>CC</sub>		
		I <sub>OL</sub> = 1.7 mA	1.4 to 1.6	–	–	0.25 × V <sub>CC</sub>	–	0.25 × V <sub>CC</sub>		
		I <sub>OL</sub> = 3.0 mA	1.65 to 1.95	–	–	0.45	–	0.45		
		I <sub>OL</sub> = 4.0 mA	2.3 to 2.7	–	–	0.4	–	0.4		
		I <sub>OL</sub> = 6.0 mA	2.7 to 3.6	–	–	0.4	–	0.4		
I <sub>IN</sub>	Input Leakage Current	V <sub>IN</sub> = 0 V to 3.6 V	0.9 to 3.6	–	–	–	–	10.0	μA	
I <sub>OFF</sub>	Power Off Leakage Current	V <sub>IN</sub> = 0 V to 3.6 V V <sub>OUT</sub> = 0 V to 3.6 V	0	–	–	1.0	–	10.0	μA	
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IN</sub> = CC or GND	0.9 to 3.6	–	–	–	0.5	–	10.0	μA

## NLV17SG14 - AC Characteristics

Existing

New

AC ELECTRICAL CHARACTERISTICS (input  $t_r = t_f = 3.0$  ns)

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25 °C			T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay, A or Y	C <sub>L</sub> = 10 pF, R <sub>L</sub> = 1 MΩ	0.9	–	27.3	–	–	–	ns
			1.1 to 1.3	–	13.0	22.6	1.0	35.9	
			1.4 to 1.6	–	7.5	10.5	1.0	11.3	
			1.65 to 1.95	–	6.0	7.8	1.0	8.2	
			2.3 to 2.7	–	4.3	5.4	1.0	5.8	
			3.0 to 3.6	–	3.5	4.4	1.0	4.6	
	C <sub>L</sub> = 15 pF, R <sub>L</sub> = 1 MΩ	0.9	–	29.5	–	–	–	ns	
		1.1 to 1.3	–	14.3	25.1	1.0	41.6		
		1.4 to 1.6	–	8.0	11.5	1.0	12.6		
		1.65 to 1.95	–	6.3	8.4	1.0	8.7		
		2.3 to 2.7	–	4.6	5.7	1.0	6.1		
		3.0 to 3.6	–	3.7	4.6	1.0	5.0		
	C <sub>L</sub> = 30 pF, R <sub>L</sub> = 1 MΩ	0.9	–	40.5	–	–	–	ns	
		1.1 to 1.3	–	19.6	35.7	1.0	58.1		
		1.4 to 1.6	–	10.7	15.8	1.0	17.6		
		1.65 to 1.95	–	7.8	10.7	1.0	11.7		
		2.3 to 2.7	–	5.4	6.9	1.0	8.1		
		3.0 to 3.6	–	4.3	5.2	1.0	6.1		

Table 4. AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Typ	Max	Min	Max	
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay, A to Y (Figures 5 and 6)	C <sub>L</sub> = 10 pF; R <sub>L</sub> = 1 MΩ	0.9	–	38.0	–	–	–	–
			1.1 to 1.3	–	9.7	24.1	–	35.9	–
			1.4 to 1.6	–	5.4	10.5	–	11.3	–
			1.65 to 1.96	–	3.9	7.8	–	8.2	–
			2.3 to 2.7	–	2.8	5.4	–	5.8	–
			3.0 to 3.6	–	2.3	4.4	–	4.6	–
		C <sub>L</sub> = 15 pF; R <sub>L</sub> = 1 MΩ	0.9	–	38.4	–	–	–	–
			1.1 to 1.3	–	9.9	25.1	–	41.6	–
			1.4 to 1.6	–	5.6	11.5	–	12.6	–
			1.65 to 1.95	–	4.1	8.4	–	8.7	–
			2.3 to 2.7	–	2.9	5.7	–	6.1	–
			3.0 to 3.6	–	2.4	4.6	–	5.0	–
		C <sub>L</sub> = 30 pF; R <sub>L</sub> = 1 MΩ	0.9	–	39.6	–	–	–	–
			1.1 to 1.3	–	10.5	35.7	–	58.1	–
			1.4 to 1.6	–	6.0	15.8	–	17.6	–
			1.65 to 1.95	–	4.7	10.7	–	11.7	–
			2.3 to 2.7	–	3.2	6.9	–	8.1	–
			3.0 to 3.6	–	2.6	5.2	–	6.1	–

## NLV17SGU04 – Max Ratings

Existing

New

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V <sub>CC</sub>	DC Supply Voltage		-0.5 to +4.6	V
V <sub>IN</sub>	DC Input Voltage		-0.5 to +4.6	V
V <sub>OUT</sub>	DC Output Voltage	Output at High or Low State Power-Down Mode (V <sub>CC</sub> = 0 V)	-0.5 to V <sub>CC</sub> + 0.5 -0.5 to +4.6	V
I <sub>IK</sub>	DC Input Diode Current	V <sub>IN</sub> < GND	-20	mA
I <sub>OK</sub>	DC Output Diode Current	V <sub>OUT</sub> < GND	-20	mA
I <sub>OUT</sub>	DC Output Source/Sink Current		±20	mA
I <sub>CC</sub>	DC Supply Current per Supply Pin		±20	mA
I <sub>GND</sub>	DC Ground Current per Ground Pin		±20	mA
T <sub>STG</sub>	Storage Temperature Range		-65 to +150	°C
T <sub>L</sub>	Lead Temperature, 1 mm from Case for 10 Seconds		260	°C
T <sub>J</sub>	Junction Temperature Under Bias		+150	°C
MSL	Moisture Sensitivity		Level 1	
F <sub>R</sub>	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	
V <sub>ESD</sub>	ESD Withstand Voltage	Human Body Model (Note 2) Machine Model (Note 3)	>2000 >150	V
t <sub>LATCHUP</sub>	Latchup Performance	Above V <sub>CC</sub> and Below GND at 125°C (Note 4)	±100	mA

Table 1. MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	DC Supply Voltage	-0.5 to +4.3	V
V <sub>IN</sub>	DC Input Voltage	-0.5 to +4.3	V
V <sub>OUT</sub>	DC Output Voltage	-0.5 to V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	DC Input Diode Current V <sub>IN</sub> < GND	-20	mA
I <sub>OK</sub>	DC Output Diode Current	±20	mA
I <sub>OUT</sub>	DC Output Source/Sink Current	±20	mA
I <sub>CC</sub> or I <sub>GND</sub>	DC Supply Current Per Supply Pin or Ground Pin	±20	mA
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C
T <sub>L</sub>	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C
T <sub>J</sub>	Junction Temperature Under Bias	+150	°C
θ <sub>JA</sub>	Thermal Resistance (Note 2)	SC-88A SOT-963 UDFN6	377 254 154 °C/W
P <sub>D</sub>	Power Dissipation in Still Air at 85°C	SC-88A SOT-963 UDFN6	332 491 812 mW
MSL	Moisture Sensitivity	Level 1	
F <sub>R</sub>	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in
V <sub>ESD</sub>	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model	2000 1000 V
t <sub>LATCHUP</sub>	Latchup Performance (Note 4)		±100 mA

RECOMMENDED OPERATING CONDITIONS

Symbol	Characteristics		Min	Max	Unit
V <sub>CC</sub>	Positive DC Supply Voltage		0.9	3.6	V
V <sub>IN</sub>	Digital Input Voltage		0.0	3.6	V
V <sub>OUT</sub>	Output Voltage	Output at High or Low State Power-Down Mode (V <sub>CC</sub> = 0 V)	0.0	V <sub>CC</sub> 3.6	V
T <sub>A</sub>	Operating Temperature Range		-55	+125	°C
Δt / ΔV	Input Transition Rise or Fall Rate		V <sub>CC</sub> = 3.3 V ± 0.3 V		0 10 ns/V

RECOMMENDED OPERATING CONDITIONS

Symbol	Characteristics	Min	Max	Unit	
V <sub>CC</sub>	Positive DC Supply Voltage	0.9	3.6	V	
V <sub>IN</sub>	Digital Input Voltage	0.0	3.6	V	
V <sub>OUT</sub>	Output Voltage	0.0	V <sub>CC</sub>	V	
T <sub>A</sub>	Operating Temperature Range	-55	+125	°C	
Δt / ΔV	Input Transition Rise or Fall Rate	V <sub>CC</sub> = 3.3 V ± 0.3 V	0	10	ns/V



## NLV17SGU04 – DC Characteristics

### Existing

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C		T <sub>A</sub> = -55°C to +125°C		Unit
				Min	Max	Min	Max	
V <sub>IH</sub>	High-Level Input Voltage		0.9	V <sub>CC</sub>		V <sub>CC</sub>		V
			1.1 to 1.3	0.7V <sub>CC</sub>		0.7V <sub>CC</sub>		
			1.4 to 1.6	0.65V <sub>CC</sub>		0.65V <sub>CC</sub>		
			1.65 to 1.95	0.65V <sub>CC</sub>		0.65V <sub>CC</sub>		
			2.3 to 2.7	1.7		1.7		
			3.0 to 3.6	2.0		2.0		
V <sub>IL</sub>	Low-Level Input Voltage		0.9		GND		GND	V
			1.1 to 1.3		0.3V <sub>CC</sub>		0.3V <sub>CC</sub>	
			1.4 to 1.6		0.35V <sub>CC</sub>		0.35V <sub>CC</sub>	
			1.65 to 1.95		0.35V <sub>CC</sub>		0.35V <sub>CC</sub>	
			2.3 to 2.7		0.7		0.7	
			3.0 to 3.6		0.8		0.8	
V <sub>OH</sub>	High-Level Output Voltage	V <sub>IH</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OH</sub> = -20 µA I <sub>OH</sub> = -0.3 mA I <sub>OH</sub> = -1.7 mA I <sub>OH</sub> = -3.0 mA I <sub>OH</sub> = -4.0 mA I <sub>OH</sub> = -8.0 mA	0.9	0.75		0.75		V
			1.1 to 1.3	0.75V <sub>CC</sub>		0.75V <sub>CC</sub>		
			1.4 to 1.6	0.75V <sub>CC</sub>		0.75V <sub>CC</sub>		
			1.65 to 1.95	V <sub>CC</sub> -0.45		V <sub>CC</sub> -0.45		
			2.3 to 2.7	2.0		2.0		
			3.0 to 3.6	2.48		2.48		
					0.1		0.1	V
					0.1		0.1	V
V <sub>OL</sub>	Low-Level Output Voltage	V <sub>IL</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OL</sub> = 20 µA I <sub>OL</sub> = 0.3 mA I <sub>OL</sub> = 1.7 mA I <sub>OL</sub> = 3.0 mA I <sub>OL</sub> = 4.0 mA I <sub>OL</sub> = 8.0 mA	0.9		0.1		0.1	V
			1.1 to 1.3		0.25V <sub>CC</sub>		0.25V <sub>CC</sub>	
			1.4 to 1.6		0.25V <sub>CC</sub>		0.25V <sub>CC</sub>	
			1.65 to 1.95		0.45		0.45	
			2.3 to 2.7		0.4		0.4	
			3.0 to 3.6		0.4		0.4	
I <sub>IN</sub>	Input Leakage Current	0 ≤ V <sub>IH</sub> ≤ 3.6 V	0 to 3.6		±0.1		±1.0	µA
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IH</sub> = V <sub>CC</sub> or GND	3.6		0.5		10.0	µA

### New

Table 3. DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			T <sub>A</sub> = -55°C to +125°C			Unit
				Min	Typ	Max	Min	Max		
V <sub>IH</sub>	High-Level Input Voltage		0.9	-	V <sub>CC</sub>	-	-	-	-	V
			1.1 to 1.3	0.8 × V <sub>CC</sub>	-	-	0.8 × V <sub>CC</sub>	-	-	
			1.4 to 1.6	0.8 × V <sub>CC</sub>	-	-	0.8 × V <sub>CC</sub>	-	-	
			1.65 to 1.95	0.8 × V <sub>CC</sub>	-	-	0.8 × V <sub>CC</sub>	-	-	
			2.3 to 2.7	0.8 × V <sub>CC</sub>	-	-	0.8 × V <sub>CC</sub>	-	-	
			3.0 to 3.6	0.8 × V <sub>CC</sub>	-	-	0.8 × V <sub>CC</sub>	-	-	
V <sub>IL</sub>	Low-Level Input Voltage		0.9	-	GND	-	-	-	-	V
			1.1 to 1.3	-	0.2 × V <sub>CC</sub>	-	-	0.2 × V <sub>CC</sub>	-	
			1.4 to 1.6	-	0.2 × V <sub>CC</sub>	-	-	0.2 × V <sub>CC</sub>	-	
			1.65 to 1.95	-	0.2 × V <sub>CC</sub>	-	-	0.2 × V <sub>CC</sub>	-	
			2.3 to 2.7	-	0.2 × V <sub>CC</sub>	-	-	0.2 × V <sub>CC</sub>	-	
			3.0 to 3.6	-	0.2 × V <sub>CC</sub>	-	-	0.2 × V <sub>CC</sub>	-	
V <sub>OH</sub>	High-Level Output Voltage	V <sub>IH</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OH</sub> = -20 µA I <sub>OH</sub> = -0.3 mA I <sub>OH</sub> = -1.7 mA I <sub>OH</sub> = -3.0 mA I <sub>OH</sub> = -4.0 mA I <sub>OH</sub> = -8.0 mA	0.9	-	0.75	-	-	-	-	V
			1.1 to 1.3	0.75 × V <sub>CC</sub>	-	-	0.75 × V <sub>CC</sub>	-	-	
			1.4 to 1.6	0.75 × V <sub>CC</sub>	-	-	0.75 × V <sub>CC</sub>	-	-	
			1.65 to 1.95	V <sub>CC</sub> - 0.45	-	-	V <sub>CC</sub> - 0.45	-	-	
			2.3 to 2.7	2.0	-	-	2.0	-	-	
			3.0 to 3.6	2.48	-	-	2.48	-	-	
				-	0.1	-	-	-	-	V
				-	0.1	-	-	-	-	V
V <sub>OL</sub>	Low-Level Output Voltage	V <sub>IL</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OL</sub> = 20 µA I <sub>OL</sub> = 0.3 mA I <sub>OL</sub> = 1.7 mA I <sub>OL</sub> = 3.0 mA I <sub>OL</sub> = 4.0 mA I <sub>OL</sub> = 8.0 mA	0.9	-	0.1	-	-	-	-	V
			1.1 to 1.3	-	0.25 × V <sub>CC</sub>	-	-	0.25 × V <sub>CC</sub>	-	
			1.4 to 1.6	-	0.25 × V <sub>CC</sub>	-	-	0.25 × V <sub>CC</sub>	-	
			1.65 to 1.95	-	0.45	-	-	0.45	-	
			2.3 to 2.7	-	0.4	-	-	0.4	-	
			3.0 to 3.6	-	0.4	-	-	0.4	-	
I <sub>IN</sub>	Input Leakage Current	V <sub>IH</sub> = 0 V to 3.6 V	0.9 to 3.6	-	-	-	±0.1	-	±1.0	µA
I <sub>OFF</sub>	Power Off Leakage Current	V <sub>IH</sub> = 0 V to 3.6 V	0	-	-	1.0	-	10.0	-	µA
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IH</sub> = V <sub>CC</sub> or GND	0.9 to 3.6	-	-	1.0	-	10.0	-	µA

## NLV17SGU04 - AC Characteristics

### Existing

AC ELECTRICAL CHARACTERISTICS Input t<sub>r</sub> = t<sub>f</sub> = 3.0 ns

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			T <sub>A</sub> = -55°C to +125°C			Unit
				Min	Typ	Max	Min	Max		
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay, A to Y	C <sub>L</sub> = 10 pF R <sub>L</sub> = 1 MΩ	0.9	-	8.0	10.3	-	13.3	-	ns
			1.1 to 1.3	-	6.0	9.4	-	12.2	-	
			1.4 to 1.6	-	3.2	8.5	-	10.0	-	
			1.65 to 1.95	-	2.6	6.2	-	6.7	-	
			2.3 to 2.7	-	2.0	3.9	-	4.4	-	
			3.0 to 3.6	-	1.7	3.1	-	3.7	-	
		C <sub>L</sub> = 15 pF R <sub>L</sub> = 1 MΩ	0.9	-	19.5	11.7	-	14.5	-	ns
			1.1 to 1.3	-	7.0	9.2	-	12.2	-	
			1.4 to 1.6	-	3.5	6.3	-	10.2	-	
			1.65 to 1.95	-	3.0	5.9	-	7.1	-	
			2.3 to 2.7	-	2.3	4.4	-	5.0	-	
			3.0 to 3.6	-	1.9	3.4	-	3.9	-	
		C <sub>L</sub> = 30 pF R <sub>L</sub> = 1 MΩ	0.9	-	10.0	12.5	-	15.6	-	ns
			1.1 to 1.3	-	9.0	11.6	-	13.8	-	
			1.4 to 1.6	-	6.0	9.1	-	12.9	-	
			1.65 to 1.95	-	4.5	8.2	-	9.6	-	
			2.3 to 2.7	-	3.2	5.7	-	6.1	-	
			3.0 to 3.6	-	2.5	4.4	-	4.8	-	

### New

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Condition	V <sub>CC</sub> (V)	T <sub>A</sub> = 25°C			T <sub>A</sub> = -55°C to +125°C			Unit
				Min	Typ	Max	Min	Max		
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation Delay, A to Y	C <sub>L</sub> = 10 pF R <sub>L</sub> = 1 MΩ	0.9	-	12.7	-	-	-	-	ns
			1.1 to 1.3	-	6.0	9.2	-	12.2	-	
			1.4 to 1.6	-	3.2	8.5	-	10.0	-	
			1.65 to 1.95	-	2.6	6.2	-	6.7	-	
			2.3 to 2.7	-	2.0	3.9	-	4.4	-	
			3.0 to 3.6	-	1.7	3.1	-	3.7	-	
		C <sub>L</sub> = 15 pF R <sub>L</sub> = 1 MΩ	0.9	-	13.0	-	-	-	-	ns
			1.1 to 1.3	-	7.0	9.4	-	12.2	-	
			1.4 to 1.6	-	3.5	6.3	-	10.2	-	
			1.65 to 1.95	-	3.0	5.9	-	7.1	-	
			2.3 to 2.7	-	2.3	4.4	-	5.0	-	
			3.0 to 3.6	-	1.9	3.4	-	3.9	-	
		C <sub>L</sub> = 30 pF R <sub>L</sub> = 1 MΩ	0.9	-	14.1	-	-	-	-	ns
			1.1 to 1.3	-	9.0	11.6	-	13.8	-	
			1.4 to 1.6	-	6.0	9.1	-	12.9	-	
			1.65 to 1.95	-	4.5	8.2	-	9.6	-	
			2.3 to 2.7	-	3.2	5.7	-	6.1	-	
			3.0 to 3.6	-	2.5	4.4	-	4.8	-	

Reason / Motivation for Change:

Supply disruption

Anticipated impact on fit, form, function, reliability, product safety or manufacturability:

The device has been qualified and validated based on the same Product Specification. The device has successfully passed the qualification tests. Potential impacts can be identified, but due to testing performed by onsemi in relation to the PCN, associated risks are verified and excluded.

No anticipated impacts.



## Final Product/Process Change Notification

Document #:FPCN25572Z20

Issue Date: 05 Feb 2024

### Sites Affected:

#### onsemi Sites

onsemi Leshan, China

#### External Foundry/Subcon Sites

Vanguard International Semiconductor, Taiwan

### Marking of Parts/ Traceability of Change:

Custom source on label will show TW instead of US to indicate new die source from Vanguard. Changed material may be identified by plant code or lot code too.

### Reliability Data Summary:

QV DEVICE NAME: NC7SP14P5X

RMS: S88008 / S88413

PACKAGE: SC88A

Test	Specification	Condition	Interval	Results
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hours	0/231
Earlier Life Failure Rate	JESD22-A108	Ta=125°C, 100 % max rated Vcc	48 hours	0/2400
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hours	0/231
Preconditioning	J-STD-020 JESD-A113	MSL 1 @ 260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	0/693
Temperature Cycling	JESD22-A104	Ta= -65°C to +150°C	500 cycles	0/231
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hours	0/231
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hours	0/231
Resistance to Solder Heat	JESD22- B106	Ta = 265°C, 10 sec	-	0/30

**Note: AEC-1pager is attached.**

To view attachments:

1. Download pdf copy of the PCN to your computer
2. Open the downloaded pdf copy of the PCN
3. Click on the paper clip icon available on the menu provided in the left/bottom portion of the screen to reveal the Attachment field
4. Then click on the attached file.

### Electrical Characteristics Summary:

Electrical characteristics available upon request.

### List of Affected Parts:

**Note:** Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the [\*\*PCN Customized Portal\*\*](#).

Current Part Number	New Part Number	Qualification Vehicle
NLV17SG14DFT2G	NL17SG14DFT2G-Q	NC7SP14P5X
NLV17SG08DFT2G	NL17SG08DFT2G-Q	NC7SP14P5X
NLV17SGU04DFT2G	NL17SGU04DFT2G-Q	NC7SP14P5X