Final Product/Process Change Notification

Document #:FPCN25572Z24
Issue Date:19 Feb 2024

Title of Change:	Update to **FPCN25572Z** - To include the reliability data of uDFN8 package for the Qualification of Vanguard Fab and Some Assembly Related Changes for Logic parts
Proposed Changed Material First Ship Date:	26 Aug 2024 or earlier if approved by customer
Current Material Last Order Date:	20 Nov 2023 *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*.
Current Material Last Delivery Date:	N/A *The Current Material Last Delivery Date may be subject to change based on build and depletion of the current (unchanged) material inventory*
Product Category:	Active components – Integrated circuits
Contact information:	Contact your local onsemi Sales Office or logic.fpcn@onsemi.com
PCN Samples Contact:	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.
Sample Availability Date:	16 Feb 2024
PPAP Availability Date:	16 Mar 2024
Additional Reliability Data:	Contact your local onsemi Sales Office or ChangKit.Mok@onsemi.com
Type of Notification:	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 PCN.Support@onsemi.com.

Change Category

Category	**Type of Change**
Test Flow	Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor
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	Move of all or part of assembly to a different location/site/subcontractor., Change of leadframe base material, Change of wire bonding

Description and Purpose:

With reference to **FPCN25572Z**, this FPCN presents the information solely for uDFN8 package.

- **uQFN8 1.6*1.6:**

	From	To
Fab Site	Tower	Vanguard
Wafer Diameter	6 inch	8 inch
Assembly Site	onsemi Seremban	onsemi Tarlac
Test Site	onsemi Seremban	onsemi Tarlac
Wire Type	Au	PCC
Lead Frame	PPF	LF PPF PLATED (C7025)

NLVX1G74MUTCG to NL17SZ74MQ1TCG-Q

Absolute Maximum Ratings and Recommended Operating Conditions

Existing

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	−0.5 to +7.0	V
V_I	DC Input Voltage	−0.5 to +7.0	V
V_O	DC Output Voltage − Output in High or Low State (Note 1)	−0.5 to V_{CC} +0.5	V

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Max	Unit
V_{CC}	Supply Voltage	Operating Data Retention Only	1.65 1.5	5.5 5.5	V
V_I	Input Voltage	(Note 6)	0	5.5	V
V_O	Output Voltage	(HIGH or LOW State)	0	V_{CC}	V
T_A	Operating Free−Air Temperature		−40	+85	°C
$\Delta t/\Delta V$	Input Transition Rise or Fall Rate	V_{CC} = 2.5 V ±0.2 V V_{CC} = 3.0 V ±0.3 V V_{CC} = 5.0 V ±0.5 V	0 0 0	20 10 5.0	ns/V

New

MAXIMUM RATINGS

Symbol	Characteristics		Value	Unit
V_{CC}	DC Supply Voltage		−0.5 to +6.5	V
V_{IN}	DC Input Voltage		−0.5 to +6.5	V
V_{OUT}	DC Output Voltage	Active−Mode (High or Low State) Tri−State Mode (Note 1) Power−Down Mode (V_{CC} = 0 V)	−0.5 to V_{CC} + 0.5 −0.5 to +6.5 −0.5 to +6.5	V

RECOMMENDED OPERATING CONDITIONS

Symbol	Characteristics		Min	Max	Unit
V_{CC}	Positive DC Supply Voltage		1.65	5.5	V
V_{IN}	DC Input Voltage		0	5.5	V
V_{OUT}	DC Output Voltage	Active−Mode (High or Low State) Tri−State Mode (Note 1) Power−Down Mode (V_{CC} = 0 V)	0 0 0	V_{CC} 5.5 5.5	V
T_A	Operating Temperature Range		−55	+125	°C
t_R, t_F	Input Rise and Fall Rate	V_{CC} = 1.65 V to 1.95 V V_{CC} = 2.3 V to 2.7 V V_{CC} = 3.0 V to 3.6 V V_{CC} = 4.5 V to 5.5 V	0 0 0 0	20 20 10 5	ns/V

DC Input Characteristics

Existing

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	−40°C ≤ T_A ≤ 85°C Min	−40°C ≤ T_A ≤ 85°C Max	Unit
V_{IH}	High−Level Input Voltage		1.65	0.75 V_{CC}			0.75 V_{CC}		V
			2.3 to 5.5	0.7 V_{CC}			0.7 V_{CC}		
V_{IL}	Low−Level Input Voltage		1.65			0.25 V_{CC}		0.25 V_{CC}	V
			2.3 to 5.5			0.3 V_{CC}		0.3 V_{CC}	

New

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	−55°C ≤ T_A ≤ 125°C Min	−55°C ≤ T_A ≤ 125°C Max	Units
V_{IH}	High−Level Input Voltage		1.65 to 1.95	0.65 x V_{CC}			0.65 x V_{CC}		V
			2.3 to 5.5	0.70 x V_{CC}			0.70 x V_{CC}		
V_{IL}	Low−Level Input Voltage		1.65 to 1.95			0.35 x V_{CC}		0.35 x V_{CC}	V
			2.3 to 5.5			0.30 x V_{CC}		0.30 x V_{CC}	

AC Characteristics

Existing

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

Symbol	Parameter	V_{CC} (V)	Test Conditions	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = −40 to 85°C Min	T_A = −40 to 85°C Max	Unit
t_{PLH}, t_{PHL}	Propagation Delay, CP to Q or $\overline{Q}$ (Waveform 1)	1.8 ± 0.15	C_L = 15 pF, R_D = 1 MΩ, S_1 = Open	2.5	6.5	12.5	2.5	13	ns
		2.5 ± 0.2		1.5	3.8	7.5	1.5	8.0	
		3.3 ± 0.3		1.0	2.8	6.5	1.0	7.0	
		5.0 ± 0.5		0.8	2.2	4.5	0.8	5.0	
		3.3 ± 0.3	C_L = 50 pF, R_D = 500 Ω, S_1 = Open	1.0	3.4	7.0	1.0	7.5	
		5.0 ± 0.5		1.0	2.6	5.0	1.0	5.5	
t_{PLH}, t_{PHL}	Propagation Delay, $\overline{PR}$ or $\overline{CLR}$ to Q or $\overline{Q}$ (Waveform 2)	1.8 ± 0.15	C_L = 15 pF, R_D = 1 MΩ, S_1 = Open	2.5	6.5	14	2.5	14.5	ns
		2.5 ± 0.2		1.5	3.8	9.0	1.5	9.5	
		3.3 ± 0.3		1.0	2.8	6.5	1.0	7.0	
		5.0 ± 0.5		0.8	2.2	5.0	0.8	5.5	
		3.3 ± 0.3	C_L = 50 pF, R_D = 500 Ω, S_1 = Open	1.0	3.4	7.0	1.0	7.5	
		5.0 ± 0.5		1.0	2.6	5.0	1.0	5.5	

New

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	V_{CC} (V)	Test Conditions	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = −55 to 125°C Min	T_A = −55 to 125°C Max	Units
t_{PLH}, t_{PHL}	Propagation Delay, CP to Q or $\overline{Q}$ (Figures 3 and 4)	1.65 to 1.95	C_L = 15 pF, R_L = 1 MΩ, S_1 = Open	−	6.5	12.5	−	13	ns
		2.3 to 2.7		−	3.8	7.5	−	8.0	
		3.0 to 3.6		−	2.8	6.5	−	7.0	
		4.5 to 5.5		−	2.2	4.5	−	5.0	
		3.0 to 3.6	C_L = 50 pF, R_D = 500 Ω, S_1 = Open	−	3.4	7.0	−	7.5	
		4.5 to 5.5		−	2.6	5.0	−	5.5	
t_{PLH}, t_{PHL}	Propagation Delay, $\overline{PR}$ or $\overline{CLR}$ to Q or $\overline{Q}$ (Figures 3 and 4)	1.65 to 1.95	C_L = 15 pF, R_L = 1 MΩ, S_1 = Open	−	6.5	14	−	14.5	ns
		2.3 to 2.7		−	3.8	9.0	−	9.5	
		3.0 to 3.6		−	2.8	6.5	−	7.0	
		4.5 to 5.5		−	2.2	5.0	−	5.5	
		3.0 to 3.6	C_L = 50 pF, R_L = 500 Ω, S_1 = Open	−	3.4	7.0	−	7.5	
		4.5 to 5.5		−	2.6	5.0	−	5.5	

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.

Sites Affected:

onsemi Sites	**External Foundry/Subcon Sites**
onsemi Tarlac, Philippines	Vanguard International Semiconductor, Taiwan

Marking of Parts/ Traceability of Change:	Custom source on label will show TW instead of US/JP 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: NL17SZ08MU1TCG
RMS: S87094 / S87719
PACKAGE: uDFN6

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

QV DEVICE NAME: NL27WZ17MU1TCG
RMS: S87316
PACKAGE: uDFN6

Test	Specification	Condition	Interval	Results
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hours	0/77
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hours	0/77
Preconditioning	J-STD-020 JESD-A113	MSL 1 @ 260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	0/231
Temperature Cycling	JESD22-A104	Ta= -65°C to +150°C	500 cycles	0/77
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hours	0/77
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hours	0/77
Resistance to Solder Heat	JESD22- B106	Ta = 265°C, 10 sec	-	0/10

QV DEVICE NAME: MC74VHC3G14MU3TCG
RMS: S87889
PACKAGE: uDFN8

Test	Specification	Condition	Interval	Results
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hours	0/77
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hours	0/77
Preconditioning	J-STD-020 JESD-A113	MSL 1 @ 260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	0/231
Temperature Cycling	JESD22-A104	Ta= -65°C to +150°C	500 cycles	0/77
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hours	0/77
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hours	0/77
Resistance to Solder Heat	JESD22- B106	Ta = 265°C, 10 sec	-	0/10

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
NLVX1G74MUTCG	NL17SZ74MQ1TCG-Q	NL17SZ08MU1TCG, NL27WZ17MU1TCG, MC74VHC3G14MU3TCG