

Final Product/Process Change Notification Document #:FPCN25572X30

Document #:FPCN25572X Issue Date: 28 Mar 2024

Title of Change:		572X - To include the reliability data for QFN-16 package Qualification of Assembly related changes for Logic parts.			
Proposed First Ship date:	05 Jul 2024 or earlier	f approved by customer			
Contact Information:	Contact your local ons	nsemi Sales Office or logic.fpcn@onsemi.com			
PCN Samples Contact:	Initial PCN or Final PC	o be submitted no later than 30 days from the date of first notification, N, for this change. ng will be subject to request date, sample quantity and special			
Additional Reliability Data:	Contact your local ons	emi Sales Office or <u>ChangKit.Mok@onsemi.com</u>			
Type of Notification:	issued 90 days prior to onsemi will consider t	Process Change Notification (FPCN) sent to customers. FPCNs are b implementation of the change. his change accepted, unless an inquiry is made in writing within 30 s notice. To do so, contact <u>PCN.Support@onsemi.com</u>			
Marking of Parts/ Traceability of Change:		bel will show TW instead of US/JP to indicate new die source from aterial may be identified by plant code or lot code too.			
Change Category:	Test Change, Assemb	ly Change, Wafer Fab Change			
Change Sub-Category(s):	Datasheet/Product Do	oc change, Manufacturing Site Transfer			
Sites Affected:	·				
onsemi Sites		External Foundry/Subcon Sites			
onsemi Tarlac, Philippines		Vanguard International Semiconductor, Taiwan			

Description and Purpose:

With reference to FPCN25572X, this FPCN presents the information solely for QFN-16 and the pertinent reliability data.

	Fro	m	То
Fab Site	Tower Semiconductor	Diodes Incorporated (Diodes)	Vanguard International Semiconductor (VIS)
Wafer Size	150 mm	200 mm	200 mm

Assembly and test changes as shown in the table below:

QFN16 2.5 x 3.5 Package

	From	То
Assembly Site	Stars Micro	onsemi Tarlac
Test Site	Stars Micro	onsemi Tarlac
Leadframe	PPF	Selective AG Plated
Die Attach	HR5104	CRM-1076WB
Bond Wire	0.8 mil AU	0.8 mil PCC
Mold Compound	G700LTD	G770HMD



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		From		То		
Assembly Site	Han	a Semiconductor		onsemi Tar	lac	
Test Site	Han	a Semiconductor		onsemi Tar	lac	
Leadframe		PPF (HDS)		PPF (AAM	I)	
Die Attach	А	etherm 8600		CRM-1076V	CRM-1076WB	
Bond Wire		1 mil AU	1 mil AU			
Mold Compound	CEL	_9220HF13H HF		G770HMI)	
LCX138BQX wQFN16 only		From		То		
Marking	Week)	LCX138	LCX138 ALYWW A = Assembly Site L = Wafer Lot Traceability Y = Year of Production, Last Number WW = Work Week Number			
VICE NAME : NLV74HC595AMN1TW0 : S89269 / S92696 AGE : QFN-16				k Week Number		
VICE NAME : NLV74HC595AMN1TWG : S89269 / S92696 AGE : QFN-16 Test	Specification	Condition	WW = Worl	k Week Number	Results	
EVICE NAME : NLV74HC595AMN1TWG : S89269 / S92696 AGE : QFN-16 Test High Temperature Operating Life	Specification JESD22-A108	Condition Ta=125°C, 100 % max ra	WW = Worl	k Week Number	Results 0/231	
EVICE NAME : NLV74HC595AMN1TWO : S89269 / S92696 AGE : QFN-16 Test High Temperature Operating Life High Temperature Storage Life	Specification JESD22-A108 JESD22-A103	Condition Ta=125°C, 100 % max ra Ta= 150°C	WW = Work	k Week Number	Results 0/231 0/231	
VICE NAME : NLV74HC595AMN1TWG : S89269 / S92696 AGE : QFN-16 Test High Temperature Operating Life	Specification JESD22-A108 JESD22-A103 JESD22-A108	Condition Ta=125°C, 100 % max ra Ta= 150°C Ta=125°C, 100 % max ra	WW = Work	k Week Number	Results 0/231	
EVICE NAME : NLV74HC595AMN1TWO : S89269 / S92696 AGE : QFN-16 Test High Temperature Operating Life High Temperature Storage Life	Specification JESD22-A108 JESD22-A103	Condition Ta=125°C, 100 % max ra Ta= 150°C	WW = Work	k Week Number	Results 0/231 0/231	
VICE NAME : NLV74HC595AMN1TWG : S89269 / S92696 AGE : QFN-16 Test High Temperature Operating Life High Temperature Storage Life Early Life Failure Rate	Specification JESD22-A108 JESD22-A103 JESD22-A108 J-STD-020	Condition Ta=125°C, 100 % max ra Ta= 150°C Ta=125°C, 100 % max ra MSL 1 @ 260°C, Pre TC, uH	WW = Work	k Week Number	Results 0/231 0/231 0/2400	
AGE : QFN-16 Test High Temperature Operating Life High Temperature Storage Life Early Life Failure Rate Preconditioning	Specification JESD22-A108 JESD22-A103 JESD22-A108 J-STD-020 JESD-A113	Condition Ta=125°C, 100 % max ra Ta= 150°C Ta=125°C, 100 % max ra MSL 1 @ 260°C, Pre TC, uH for surface mount pkg	WW = Work	k Week Number	Results 0/231 0/231 0/2400 0/693	



RMS : \$89440

PACKAGE : QFN-16

Test	Specification	Condition	Interval	Results
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	0/77
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hrs	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 cyc	0/77
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hrs	0/77
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	0/77

Electrical Characteristics Summary:

	From	То
Datasheet	Current Revision	New Revision
Absolute Max Voltage Rating	7 V	6.5 V

> Additional change for only 74LCX138BQX:

	From	То
Recommended Operating Voltage Range	2.0 – 3.6 V	1.65 – 5.5 V
Recommended Operating Temperature Range	-40 – 85 °C	-40 – 125 °C

> Additional change for MC74LVX4051MNTWG only:

Datasheet Existing vs Updated Comparison:

onsemi

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							MAXIMUM	RATINGS (Voltages referenced to GND unle	ss otherwise specified)			
XIMUM	RATINGS						Symbol	Paramete	ər	Va	lue	1
Symbol	Parameter		Valu		Unit		Vcc	Positive DC Supply Voltage		-0.5	0 +6.5	
Vez	Negative DC Supply Voltage		-7.0 to		V		V _{CC} - V _{EE}	DC Supply Voltage		-0.5	0 +6.5	+
Vcc	Positive DC Supply Voltage	(Referenced to GND) (Referenced to V _{EE})			v	- F	VIS	Analog Input Voltage		Vec=0.51	o V _{CC} +0.5	+
V.	Analog Input Voltage	(Relefenced to VIII)	-0.5 to		v		VIN	Digital Input Voltage	(Referenced to V _{FF})	to to	0 +6.5	+
Va		(Referenced to GND)	-0.5 to		v	- F		• • •	(Helefelded to vEE)		50	+
1	DC Current, Into or Out Of Any Pin		±50	D	mA	_ ⊢	1	DC Current, into or out of any pin				+
Tsto	Storage Temperature Range		-65 to -	+150	°C		TSTG	Storage Temperature Range			o +150	\perp
T _L	Lead Temperature, 1 mm from Case for 10 seconds		+26	ю	°C		TL	Lead Temperature, 1 mm from Case for 10 se	ecs	+3	260	
Τ,	Junction Temperature under Bias		+15		*C	_	TJ	Junction Temperature Under Bias		+1	50	Т
θυΑ	Thermal Resistance	SOIC			°C/W		θ _{JA}	Thermal Resistance (Note 1)	SOIC-16	1	26	
0	Power Dissipation in Still Air	TSSOP	16		mild				QFN16		18	
Po	Power Dissipation in Still Air	TSSOP	450		mW				TSSOP-16		59	+
MSL	Moisture Sensitivity	1000	Leve	-	_		PD	Power Dissipation in Still Air at 25°C	SOIC-16	-	95	
	Flammability Rating Oxyg	gen Index: 30% - 35%	UL 94-V0 @	0.405.10					QFN16		062	
FR				8 0.125 IN	°C/W				TSSOP-16	7		
V _{ESD}		n Body Model (Note 1)			°C/W V	- H	MCI	Maletura Canalibuitu	TSSOP-16	7		+
	ESD Withstand Voltage Human	-	> 20	00			MSL	Moisture Sensitivity		Lev	vel 1	
	ESD Withstand Voltage Human Ma Charged E	n Body Model (Note 1) achine Model (Note 2) Device Model (Note 3)	> 20 > 20 > 10	00 00 00	v		FR	Flammability Rating	Oxygen Index: 30% to 35%	Lev UL 94 V-0	vel 1 @ 0.125 in	
	ESD Withstand Voltage Human Ma	n Body Model (Note 1) achine Model (Note 2) Device Model (Note 3)	> 20 > 20 > 10	00 00 00				· · · · · · · · · · · · · · · · · · ·		Lev UL 94 V-0 > 2	vel 1	
Veco Icarceur	ESD Withstand Voitage Human Ma Charged Latchup Performance Above V _{cc} and Below G	n Body Model (Note 1) achine Model (Note 2) Device Model (Note 3)	> 20 > 20 > 10	00 00 00	v		F _R V _{ESD}	Flammability Rating	Oxygen Index: 30% to 35% Human Body Model Charged Device Model	Let UL 94 V-0 > 2 > 1	vel 1 @ 0.125 in 000	
	ESD Withstand Voltage Human Ma Charged E	n Body Model (Note 1) achine Model (Note 2) Device Model (Note 3)	> 20 > 20 > 10	00 00 00	v		F _R V _{ESD}	Flammability Rating ESD Withstand Voltage (Note 2)	Oxygen Index: 30% to 35% Human Body Model Charged Device Model inges referenced to GND unless otherwise	Let UL 94 V-0 > 2 > 1	vel 1 @ 0.125 in 000	
	ESD Withstand Voitage Human Ma Charged E Latchup Performance Above V _{cc} and Below G DED OPERA TING CONDITIONS Parameter	n Body Model (Note 1) achine Model (Note 2) Device Model (Note 3)	> 20 > 20 > 10 ±30	00	V mA		F _R V _{ESD}	Flammability Rating ESD Withstand Voltage (Note 2) ENDED OPERATING CONDITIONS (Volta	Oxygen Index: 30% to 35% Human Body Model Charged Device Model inges referenced to GND unless otherwise	Len UL 94 V-0 > 2 > 1 ee specified)	vel 1 @ 0.125 in 000 000	
	ESD Withstand Voitage Human Ma Charged D Latchup Performance Above V _{co} and Below G DED OPERATING CONDITIONS Parameter Negative DC Supply Voitage (Re	Body Model (Note 1) achine Model (Note 2) Device Model (Note 3) IND at 125°C (Note 4)	> 20 > 20 > 20 > 10 ±30	00 00 00 00 00 00	V mA Unit		F _R V _{ESD} RECOMMI Symbol	Flammability Rating ESD Withstand Voltage (Note 2) ENDED OPERATING CONDITIONS (Volta Paramet	Oxygen Index: 30% to 35% Human Body Model Charged Device Model inges referenced to GND unless otherwise	Ler UL 94 V-0 > 2 > 1 e specified) Min	vel 1 @ 0.125 in 000 000 Max	
Veso Latosar COMMEN Symbol Ves	ESD Withstand Voitage Human Mage C Charges Latchup Performance Above V _{cc} and Below G DED OPERATING CONDITIONS Parameter Negative DC Supply Voitage (Re Positive DC Supply Voitage (Re	Body Model (Note 1) achine Model (Note 2) Device Model (Note 3) 3ND at 125°C (Note 4)	> 20 > 22 > 10 ± 30 Min -6.0	00 00 00 00 00 00 00 00 00 00 00 00 00	V mA Unit V		F _R V _{ESD} RECOMM Symbol V _{CC} V _{EE}	Flammability Rating ESD Withstand Voltage (Note 2) ENDED OPERATING CONDITIONS (Volta Paramet Positive DC Supply Voltage Negative DC Supply Voltage	Oxygen Index: 30% to 35% Human Body Model Charged Device Model inges referenced to GND unless otherwise	Lev UL 94 V-0 > 2 > 1 we specified) Min 2.5	vel 1 @ 0.125 in 000 000 Max 6.0	
Veco ILANDAUF COMMEN Symbol Vec	ESD Withstand Voitage Human Mage C Charges Latchup Performance Above V _{cc} and Below G DED OPERATING CONDITIONS Parameter Negative DC Supply Voitage (Re Positive DC Supply Voitage (Re	Body Model (Note 1) achine Model (Note 2) Device Model (Note 3) SND at 125°C (Note 4) Interenced to GND) Interenced to GND)	> 20 > 22 > 10 ± 30 Min -6.0 2.5	00 00 00 00 00 00 00 00 00 00 00 00 00	V mA Unit V		FR VESD RECOMM Symbol V _{CC} V _{EE} V _{CC} - V _{EE}	Flammability Rating ESD Withstand Voltage (Note 2) ENDED OPERATING CONDITIONS (Volta Paramet Postilve DC Supply Voltage Negative DC Supply Voltage DC Supply Voltage	Oxygen Index: 30% to 35% Human Body Model Charged Device Model inges referenced to GND unless otherwise	Len UL 94 V-0 > 2 > 1 ie specified) Min 2.5 -3.5 2.5	el 1 @ 0.125 in 000 Max 6.0 GND 6.0	
	ESD Withstand Voitage Human Ma Charged D Latchup Performance Above V _{cc} and Below G DED OPERATING CONDITIONS Parameter Negative DC Supply Voitage (Re Positive DC Supply Voitage (Re Analog Input Voitage	Body Model (Note 1) achine Model (Note 2) Device Model (Note 3) SND at 125°C (Note 4) Interenced to GND) Interenced to GND)	→ 20 → 20 → 10 ±30 Min -6.0 2.5 2.5	Max GND 6.0	V mA Unit V V	-	FR VESD RECOMMI Symbol V _{CC} V _{EE} V _{CC} - V _{EE} V _{IS}	Flammability Rating ESD Withstand Voltage (Note 2) ENDED OPERATING CONDITIONS (Volta Positive DC Supply Voltage Negative DC Supply Voltage DC Supply Voltage Analog Input Voltage	Oxygen Index: 30% to 35% Human Body Model Charged Device Model ages referenced to GND unless otherwis er	Len UL 94 V-0 > 2 > 1 e specified) Min 2.5 -3.5 2.5 VEE	Max 6.0 GND 6.0 V _{CC}	
Veso Rarcour COMMEN Symbol Ves Vec Vs	ESD Withstand Voitage Human Ma Charged E Latchup Performance Above V _{cc} and Below G DED OPERATING CONDITIONS Parameter Negative DC Supply Voitage (Re Positive DC Supply Voitage (Re Analog Input Voitage	Body Model (Note 1) achine Model (Note 2) Device Model (Note 3) SND at 125°C (Note 4) Interenced to GND) Interenced to GND) Referenced to GND) Referenced to V _{in})	> 20 > 22 > 10 ± 30 Min -6.0 2.5 2.5 V ₅₈	Max GND 6.0 6.0 V _{CC}	V mA Unit V V	-	FR VESD RECOMMI Symbol V _{CC} V _{EE} V _{CC} - V _{EE} V _{IS} V _{IN} V _{IN}	Flammability Rating ESD Withstand Voltage (Note 2) ENDED OPERATING CONDITIONS (Volta Paramet Positive DC Supply Voltage Negative DC Supply Voltage DC Supply Voltage Analog Input Voltage Digital Input Voltage	Oxygen Index: 30% to 35% Human Body Model Charged Device Model inges referenced to GND unless otherwise	Lee UL 94 V-0 > 2 > 1 especified) Min 2.5 -3.5 2.5 VEE 0	el 1 @ 0.125 in 000 000 Max 6.0 GND 6.0 V _{CC} 6.0	
Veso Latosar COMMEN Symbol Ves Ves Ves Ves Ves	ESD Withstand Voitage Human Made Charged Latchup Performance Above V _{cc} and Below G DED OPERATING CONDITIONS Parameter Negative DC Supply Voitage (Re Positive DC Supply Voitage (Re Analog Input Voitage (Note 5) (Ref Operating Temperature Range	Body Model (Note 1) achine Model (Note 2) Device Model (Note 3) SND at 125°C (Note 4) Interenced to GND) Interenced to GND) Referenced to GND) Referenced to V _{in})	> 20 > 20 > 10 ± 30 Min -6.0 2.5 2.5 V _{in} 0	00 00 00 00 00 00 00 00 00 00 00 00 00	v mA Unit V V V V	-	FR VESD RECOMMI Symbol V _{CC} V _{EE} V _{CC} - V _{EE} V _{IS}	Flammability Rating ESD Withstand Voltage (Note 2) ENDED OPERATING CONDITIONS (Volta Positive DC Supply Voltage Negative DC Supply Voltage DC Supply Voltage Analog Input Voltage	Oxygen Index: 30% to 35% Human Body Model Charged Device Model ages referenced to GND unless otherwis er	Len UL 94 V-0 > 2 > 1 e specified) Min 2.5 -3.5 2.5 VEE	Max 6.0 GND 6.0 V _{CC}	

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 <u>PCN Customized Portal</u>.

Part Number	Qualification Vehicle
74LCX138BQX	NLV74HC595AMN1TWG
MC74LVX4051MNTWG	MC74LVX4051MNTWG
MC74HC165AMN2TWG	NLV74HC595AMN1TWG
MC74HC165AMNTWG	NLV74HC595AMN1TWG