ON Semiconductor®

Final Product/Process Change Notification

Document # : FPCN22087XA
Issue Date: 31 January 2019

Title of Change:	Minigates Fab, Assembly Material, and Datasheet Change (SOT553).
Proposed first ship date:	7 May 2019
Contact information:	Contact your local ON Semiconductor Sales Office or <logic.fpcn@onsemi.com>
Samples:	Contact your local ON Semiconductor Sales Office or <PCN.samples@onsemi.com> Sample requests are to be submitted no later than 30 days from the date of first notification, Initial PCN or Final PCN, for this change.
Additional Reliability Data:	Contact your local ON Semiconductor Sales Office or <Joe.Chapple@onsemi.com>
Type of notification:	This is a Final Product/Process Change Notification (FPCN) sent to customers. FPCNs are issued 90 days prior to implementation of the change. ON Semiconductor will consider this change accepted, unless an inquiry is made in writing within 30 days of delivery of this notice. To do so, contact <PCN.Support@onsemi.com>
Change Part Identification:	Location code on the marking will be different.
Change Category:	☑ Wafer Fab Change ☑ Assembly Change ☑ Test Change ☐ Other _____

Change Sub-Category(s):

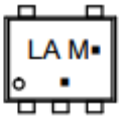
☑ Manufacturing Site Addition	☑ Material Change	☑ Datasheet/Product Doc change
☑ Manufacturing Site Transfer	☐ Product specific change	☑ Shipping/Packaging/Marking
☑ Manufacturing Process Change		☐ Other: _____

Sites Affected:	ON Semiconductor Sites: ON Seremban, Malaysia ON Leshan, China	External Foundry/Subcon Sites: External Foundry Japan External Foundry Israel

Description and Purpose:

Qualify new die source for Minigates to increase capacity and material standardization.

Material to be changed	Before Change	After Change
Wire	Au	Cu
Die Source	Subcon Israel	Subcon Japan
Assy Site	ON Seremban, Malaysia	ON Leshan, China

	From	To
Product marking change	 LA =Device Code, M = Date Code (orientation at 0 degree), Dot (.)=Lead Free Package	 LA =Device Code, M = Date Code (orientation at 90 degree), Dot (.)=Lead Free Package

This also includes datasheet adjustment of the max operating voltage, alignment to JEDEC specs and clarification of OVT parameters per below datasheet example.

Existing datasheet

MAXIMUM RATINGS

Symbol	Characteristics		Value	Unit
V_{CC}	DC Supply Voltage		−0.5 to +7.0	V
V_I	DC Input Voltage		−0.5 ≤ V_I ≤ +7.0	V
V_O	DC Output Voltage (SOT−953 Package)	(Note 1)	−0.5 to V_{CC} + 0.5	V
	DC Output Voltage (SOT−353 / SOT−553 Packages)	Active Mode, LOW State (Note 1) Tri−State Mode Power−Down Mode (V_{CC} = 0 V)	−0.5 to V_{CC} + 0.5 −0.5 to +7.0 −0.5 to +7.0	

ESD	ESD Classification	Human Body Model (Note 3) Machine Model (Note 4) Charged Device Model (Note 5)	2000 200 N/A	V V

New

V_{CC}	DC Supply Voltage	TSOP−5, SC−88A (NLV) SC−74A, SC−88A, UDFN6, SOT−553, SOT−953	−0.5 to +7.0 −0.5 to +6.5	V
V_{IN}	DC Input Voltage	TSOP−5, SC−88A (NLV) SC−74A, SC−88A, UDFN6, SOT−553, SOT−953	−0.5 to +7.0 −0.5 to +6.5	V
V_{OUT}	DC Output Voltage TSOP−5, SC−88A (NLV)	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 +7.0 −0.5 to +7.0	V
	DC Output Voltage SC−74A, SC−88A, UDFN6, SOT−553, SOT−953	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

V_{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model	2000 1000	V
$I_{Latchup}$	Latchup Performance (Note 4)		±100	mA

Existing datasheet

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Unit
V_{IH}	High−Level Input Voltage		1.65 to 1.95 2.3 to 5.5	0.75 V_{CC} 0.7 V_{CC}			0.75 V_{CC} 0.7 V_{CC}		V
V_{IL}	Low−Level Input Voltage		1.65 to 1.95 2.3 to 5.5			0.25 V_{CC} 0.3 V_{CC}		0.25 V_{CC} 0.3 V_{CC}	V
I_{LKG}	Z−State Output Leakage Current	V_{IN} = V_{IH} V_{OUT} = V_{CC} or GND	2.3 to 5.5			±5.0		±10.0	μA
V_{OL}	Low−Level Output Voltage V_{IN} = V_{IL}	I_{OL} = 100 μA	1.65 to 5.5		0.0	0.1		0.1	V
		I_{OL} = 4 mA	1.65		0.08	0.24		0.24	
		I_{OL} = 8 mA	2.3		0.20	0.3		0.3	
		I_{OL} = 12 mA	2.7		0.22	0.4		0.4	
		I_{OL} = 16 mA	3.0		0.28	0.4		0.4	
		I_{OL} = 24 mA	3.0		0.38	0.55		0.55	
		I_{OL} = 32 mA	4.5		0.42	0.55		0.55	
I_{IN}	Input Leakage Current	V_{IN} = 5.5 V or GND	0 to 5.5			±0.1		±1.0	μA
I_{OFF}	Power Off Leakage Current (SOT−353/ SOT−553 Packages)	V_{IN} = 5.5 V or V_{OUT} = 5.5 V	0			1		10	μA
I_{CC}	Quiescent Supply Current	V_{IN} = 5.5 V or GND	5.5			1		10	μA
I_{CCT}	Quiescent Supply Current	V_{IN} = 3.0 V	3.6			10		100	μA

New

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Units
V_{IH}	High−Level Input Voltage		1.65 to 1.95	0.65 V_{CC}			0.65 V_{CC}		V
			2.3 to 5.5	0.70 V_{CC}			0.70 V_{CC}		
V_{IL}	Low−Level Input Voltage		1.65 to 1.95			0.35 V_{CC}		0.35 V_{CC}	V
			2.3 to 5.5			0.30 V_{CC}		0.30 V_{CC}	
V_{OH}	High−Level Output Voltage	V_{IN} = V_{IH} or V_{IL} I_{OH} = −100 μA I_{OH} = −4 mA I_{OH} = −8 mA I_{OH} = −12 mA I_{OH} = −16 mA I_{OH} = −24 mA I_{OH} = −32 mA	1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5	V_{CC} − 1 1.29 1.9 2.2 2.4 2.3 3.8	V_{CC} 1.4 2.1 2.4 2.7 2.5 4.0		V_{CC} − 1 1.29 1.9 2.2 2.4 2.3 3.8		V
V_{OL}	Low−Level Output Voltage	V_{IN} = V_{IH} or V_{IL} I_{OL} = 100 μA I_{OL} = 4 mA I_{OL} = 8 mA I_{OL} = 12 mA I_{OL} = 16 mA I_{OL} = 24 mA I_{OL} = 32 mA	1.65 to 5.5 1.65 2.3 2.7 3.0 3.0 4.5		0.08 0.2 0.22 0.28 0.38 0.42	0.1 0.24 0.3 0.4 0.4 0.55 0.55		0.1 0.24 0.3 0.4 0.4 0.55 0.55	V
I_{IN}	Input Leakage Current	V_{IN} = 5.5 V or GND	1.65 to 5.5			±0.1		±1.0	μA
I_{OZ}	3−State Output Leakage Current	V_{OUT} = 0 V to 5.5 V	1.65 to 5.5			±0.5		±5.0	μA
I_{OFF}	Power Off Leakage Current	V_{IN} = 5.5 V or V_{OUT} = 5.5 V	0			1.0		10	μA
I_{CC}	Quiescent Supply Current	V_{IN} = V_{CC} or GND	5.5			1.0		10	μA

Existing datasheet

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Units
V_{T+}	Positive Input Threshold Voltage		1.65	0.6	1.0	1.4	0.6	1.4	V
			2.3	1.0	1.5	1.8	1.0	1.8	
			2.7	1.2	1.7	2.0	1.2	2.0	
			3.0	1.3	1.9	2.2	1.3	2.2	
			4.5	1.9	2.7	3.1	1.9	3.1	
			5.5	2.2	3.3	3.6	2.2	3.6	
V_{T-}	Negative Input Threshold Voltage		1.65	0.2	0.5	0.8	0.2	0.8	V
			2.3	0.4	0.75	1.15	0.4	1.15	
			2.7	0.5	0.87	1.4	0.5	1.4	
			3.0	0.6	1.0	1.5	0.6	1.5	
			4.5	1.0	1.5	2.0	1.0	2.0	
			5.5	1.2	1.9	2.3	1.2	2.3	

New

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Units
V_{T+}	Positive Input Threshold Voltage		1.65		1.0	1.4		1.4	V
			2.3		1.5	1.8		1.8	
			2.7		1.7	2.0		2.0	
			3.0		1.9	2.2		2.2	
			4.5		2.7	3.1		3.1	
			5.5		3.3	3.6		3.6	
V_{T-}	Negative Input Threshold Voltage		1.65	0.2	0.5		0.2		V
			2.3	0.4	0.75		0.4		
			2.7	0.5	0.87		0.5		
			3.0	0.6	1.0		0.6		
			4.5	1.0	1.5		1.0		
			5.5	1.2	1.9		1.2		

Existing datasheet

AC ELECTRICAL CHARACTERISTICS (t_R = t_F = 3.0 ns)

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Units
t_{PLH} t_{PHL}	Propagation Delay AN to YN (Figures 4 and 5, Table 1)	R_L = 1 MΩ C_L = 15 pF	1.8 ± 0.15	2.0	9.0	10	2.0	10.5	ns
		R_L = 1 MΩ C_L = 15 pF	2.5 ± 0.2	1.0		7.5	1.0	8.0	
		R_L = 1 MΩ C_L = 15 pF R_L = 500 Ω C_L = 50 pF	3.3 ± 0.3	0.8 1.2		5.2 5.7	0.8 1.2	5.5 6.0	
		R_L = 1 MΩ C_L = 15 pF R_L = 500 Ω C_L = 50 pF	5.0 ± 0.5	0.5 0.8		4.5 5.0	0.5 0.8	4.8 5.3	
t_{PZH} t_{PZL}	Output Enable Time (Figures 6, 7and 8, Table 1)	R_L = 250 Ω C_L = 50 pF	1.8 ± 0.15	2.0	7.6	9.5	2.0	10	ns
			2.5 ± 0.2	1.8		8.5	1.8	9.0	
			3.3 ± 0.3	1.2		6.2	1.2	6.5	
			5.0 ± 0.5	0.8		5.5	0.8	5.8	
t_{PHZ} t_{PLZ}	Output Disable Time (Figures 6, 7and 8, Table 1)	R_L and R_T = 500 Ω C_L = 50 pF	1.8 ± 0.15	2.0	8.0	10	2.0	10.5	ns
			2.5 ± 0.2	1.5		8.0	1.5	8.5	
			3.3 ± 0.3	0.8		5.7	0.8	6.0	
			5.0 ± 0.5	0.3		4.7	0.3	5.0	

New

AC ELECTRICAL CHARACTERISTICS (t_R = t_F = 3.0 ns)

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Units
t_{PLH} t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	1.65 to 1.95		9.0	10		10.5	ns
		R_L = 1 MΩ, C_L = 15 pF	2.3 to 2.7			7.5		8.0	
		R_L = 1 MΩ, C_L = 15 pF	3.0 to 3.6			5.2		5.5	
		R_L = 500 Ω, C_L = 50 pF				5.7		6.0	
		R_L = 1 MΩ, C_L = 15 pF	4.5 to 5.5			4.5		4.8	
		R_L = 500 Ω, C_L = 50 pF				5.0		5.3	
t_{PZH} t_{PZL}	Output Enable Time, OE to Y (Figures 3 and 4)		1.65 to 1.95			9.5		10	ns
			2.3 to 2.7			8.5		9.0	
			3.0 to 3.6			6.2		6.5	
			4.5 to 5.5			5.5		5.8	
t_{PHZ} t_{PLZ}	Output Disable Time, OE to Y (Figures 3 and 4)		1.65 to 1.95			10		10.5	ns
			2.3 to 2.7			8.0		8.5	
			3.0 to 3.6			5.7		6.0	
			4.5 to 5.5			4.7		5.0	

Reliability Data Summary:

QV DEVICE NAME: **NL17SZ14XV5T2G**
RMS: **S40806**
PACKAGE: **SOT553**

Test	Specification	Condition	Interval	Results
HTOL	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	0/252
HTSL	JESD22-A103	Ta= 150°C	1008 hrs	0/252
TC	JESD22-A104	Ta= -65°C to +150°C	500 cyc	0/252
HAST	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hrs	0/323
uHAST	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	0/252
PC	J-STD-020 JESD-A113	MSL 1 @ 260 °C		0/827
RSH	JESD22- B106	Ta = 265C, 10 sec		0/90
SD	JTSD002	Ta = 245C, 10 sec		0/45

Electrical Characteristic 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**.

Part Number	Qualification Vehicle
NL17SZ00XV5T2G	NL17SZ14XV5T2G