ON Semiconductor®

Final Product/Process Change Notification

Document # : FPCN22038X
Issue Date: 25 May 2018

Title of Change:	MiniGates[tm] Fab, Assembly Material and Test Change (SC88A) and VHC/HC/SZ Datasheet update.
Proposed first ship date:	1 September 2018
Contact information:	Contact your local ON Semiconductor Sales Office or <logic.fpcn22038x@onsemi.com>
Samples:	Contact your local ON Semiconductor Sales Office
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:	Products with date code "N" or greater may be from materials identified in table "After June 1st 2018 Description". Products with date code "1" or greater will have materials from "Post Implementation" in table below.
Change category:	☒ Wafer Fab Change ☒ Assembly Change ☐ Test Change ☐ Other _____

Change Sub-Category(s):

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

Sites Affected:	ON Semiconductor Sites: ON Leshan, China	External Foundry/Subcon Sites: External Foundry Tower, External Foundry TPSCo

Description and Purpose:

Qualify new die source for Minigates to increase capacity and material standardization. This also includes datasheet adjustment of the max operating voltage, alignment to JEDEC specs and clarification of OVT parameters per below datasheet example.

Materials	Before 90 day expiration	After 90 day expiration and before January 1st, 2019	After January 1st, 2019
Die	External Foundry Israel	External Foundry Israel or External Foundry Japan	External Foundry Japan
Die Attach	Eutectic	Eutectic	Eutectic
Wire	Cu	Cu	Cu
Wire*	Au (NL17SZ32DFT2G, NL17VHC1GT50DF1G, NL17SZ126DFT2G)	Au and Cu	Cu
Mold Compound	EME 600 or Henkel	EME 600 or Henkel	Henkel
Assy/test Site	ON Leshan, China	ON Leshan, China	ON Leshan, China
Tape & Reel Volumes	All items 3000 per reel	All items 3000 per reel	All items 3000 per reel

** parts with Gold wire will be available only until inventory is depleted.*

Note that V_{CC} and V_{IN} show NLV prefix parts (automotive) in TSOP-5 and SC-88A that have V_{CC} and V_{IN} from -0.5 to +7.0 and all other devices have V_{CC} and V_{IN} limits from -0.5 to +6.5V.
Note that V_{ESD} now lists HBM, CDM and $I_{Latchup}$ per JEDEC requirements
Note that OVT comments and SPECS are now consistent
Specifications listed as TBD are associated with new products/packages in development

MC74VHC1G125, MC74VHC1GT125

MAXIMUM RATINGS

Symbol	Characteristics		Value	Unit
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
I_{IK}	DC Input Diode Current	V_{IN} < GND	−50	mA
I_{OK}	DC Output Diode Current	V_{OUT} < GND	−50	mA
I_{OUT}	DC Output Source/Sink Current		±50	mA
I_{CC} or I_{GND}	DC Supply Current per Supply Pin or Ground Pin		±100	mA
T_{STG}	Storage Temperature Range		−65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 secs		260	°C
T_J	Junction Temperature Under Bias		+150	°C
θ_{JA}	Thermal Resistance (Note 2)	SC−88A SC−74A TSOP−5 SOT−553 SOT−953 UDFN6	333 TBD 333 TBD TBD TBD	°C/W
P_D	Power Dissipation in Still Air	SC−88A SC−74A TSOP−5 SOT−553 SOT−953 UDFN6	200 TBD 200 TBD TBD TBD	mW
MSL	Moisture Sensitivity		Level 1	−
F_R	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V−0 @ 0.125 in	−
V_{ESD}	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model	2000 1000	V
$I_{Latchup}$	Latchup Performance (Note 4)		± 100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Applicable to devices with outputs that may be tri−stated.
2. Measured with minimum pad spacing on an FR4 board, using 10mm−by−1inch, 2 ounce copper trace no air flow.
3. HBM tested to ANSI/ESDA/JEDEC JS−001−2017. CDM tested to EIA/JESD22−C101−F. JEDEC recommends that ESD qualification to EIA/JESD22−A115−A (Machine Model) be discontinued per JEDEC/JEP172A.
4. Tested to EIA/JESD78 Class II.

MC74VHC1G125, MC74VHC1GT125

DC ELECTRICAL CHARACTERISTICS (MC74VHC1G125)

Symbol	Parameter	Test Conditions	V_{CC} (V)	T_A = 25°C			$T_A \le 85°C$		$-55 \le T_A \le 125°C$		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V_{IH}	High−Level Input Voltage		2.0	1.5			1.5		1.5		V
			3.0	2.1			2.1		2.1		
			4.5	3.15			3.15		3.15		
			5.5	3.85			3.85		3.85		
V_{IL}	Low−Level Input Voltage		2.0			0.5		0.5		0.5	V
			3.0			0.9		0.9		0.9	
			4.5			1.35		1.35		1.35	
			5.5			1.65		1.65		1.65	
V_{OH}	High−Level Output Voltage	$V_{IN} = V_{IH}$ or V_{IL} $I_{OH} = -50$ μA $I_{OH} = -50$ μA $I_{OH} = -50$ μA $I_{OH} = -4$ mA $I_{OH} = -8$ mA	 2.0 3.0 4.5 3.0 4.5	 1.9 2.9 4.4 2.58 3.94	 2.0 3.0 4.5		 1.9 2.9 4.4 2.48 3.80		 1.9 2.9 4.4 2.34 3.66		V
V_{OL}	Low−Level Output Voltage	$V_{IN} = V_{IH}$ or V_{IL} $I_{OL} = 50$ μA $I_{OL} = 50$ μA $I_{OL} = 50$ μA $I_{OL} = 4$ mA $I_{OL} = 8$ mA	 2.0 3.0 4.5 3.0 4.5		 0.0 0.0 0.0	 0.1 0.1 0.1 0.36 0.36		 0.1 0.1 0.1 0.44 0.44		 0.1 0.1 0.1 0.52 0.52	V
I_{IN}	Input Leakage Current	V_{IN} = 5.5 V or GND	1.65 to 5.5			±0.1		±1.0		±1.0	μA
I_{OZ}	3−State Output Leakage Current	V_{OUT} = 0 V to 5.5 V	5.5			±0.25		±2.5		±2.5	μA
I_{OFF}	Power Off Leakage Current	V_{IN} = 5.5 V or V_{OUT} = 5.5 V	0			1.0		10		10	μA
I_{CC}	Quiescent Supply Current	$V_{IN} = V_{CC}$ or GND	5.5			1.0		20		40	μA

MC74VHC1G125, MC74VHC1GT125

DC ELECTRICAL CHARACTERISTICS (MC74VHC1GT125)

Symbol	Parameter	Test Conditions	V_{CC} (V)	T_A = 25°C			$T_A \le 85°C$		$-55 \le T_A \le 125°C$		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V_{IH}	High−Level Input Voltage		2.0	1.0			1.0		1.0		V
			3.0	1.4			1.4		1.4		
			4.5	2.0			2.0		2.0		
			5.5	2.0			2.0		2.0		
V_{IL}	Low−Level Input Voltage		2.0			0.28		0.28		0.28	V
			3.0			0.45		0.45		0.45	
			4.5			0.8		0.8		0.8	
			5.5			0.8		0.8		0.8	
V_{OH}	High−Level Output Voltage	$V_{IN} = V_{IH}$ or V_{IL} $I_{OH} = -50$ μA $I_{OH} = -50$ μA $I_{OH} = -50$ μA $I_{OH} = -4$ mA $I_{OH} = -8$ mA	 2.0 3.0 4.5 3.0 4.5	 1.9 2.9 4.4 2.58 3.94	 2.0 3.0 4.5		 1.9 2.9 4.4 2.48 3.80		 1.9 2.9 4.4 2.34 3.66		V
V_{OL}	Low−Level Output Voltage	$V_{IN} = V_{IH}$ or V_{IL} $I_{OL} = 50$ μA $I_{OL} = 50$ μA $I_{OL} = 50$ μA $I_{OL} = 4$ mA $I_{OL} = 8$ mA	 2.0 3.0 4.5 3.0 4.5		 0.0 0.0 0.0	 0.1 0.1 0.1 0.36 0.36		 0.1 0.1 0.1 0.44 0.44		 0.1 0.1 0.1 0.52 0.52	V
I_{IN}	Input Leakage Current	V_{IN} = 5.5 V or GND	1.65 to 5.5			±0.1		±1.0		±1.0	μA
I_{OZ}	3−State Output Leakage Current	V_{OUT} = 0 V to 5.5 V	5.5			±0.25		±2.5		±2.5	μA
I_{OFF}	Power Off Leakage Current	V_{IN} = 5.5 V or V_{OUT} = 5.5 V	0			1.0		10		10	μA
I_{CC}	Quiescent Supply Current	$V_{IN} = V_{CC}$ or GND	5.5			1.0		20		40	μA
I_{CCT}	Increase in Quiescent Supply Current per Input Pin	One Input: V_{IN} = 3.4 V; Other Input at V_{CC} or GND	5.5			1.35		1.5		1.65	mA

Reliability Data Summary:

QV DEVICE NAME: MC74VHC1G14DFT2G
RMS: L40690
PACKAGE: SC88A (5ld)

Test	Specification	Condition	Interval	Results
HTOL	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	0/288
HTSL	JESD22-A103	Ta= 150°C	1008 hrs	0/252
TC	JESD22-A104	Ta= -65°C to +150°C	500 cyc	0/297
HAST	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hrs	0/273
uHAST	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	0/234
PC	J-STD-020 JESD-A113	MSL 1 @ 260 °C		0/804
RSH	JESD22- B106	Ta = 265C, 10 sec		0/30

Electrical Characteristic Summary:

Electrical characteristics Available upon request.

List of Affected Parts:

Part Number	Qualification Vehicle
M74VHC1G125DFT1G	MC74VHC1G14DFT2G
M74VHC1G125DFT2G	
M74VHC1G126DFT1G	
M74VHC1G126DFT2G	
M74VHC1G132DFT1G	
M74VHC1G132DFT2G	
M74VHC1G135DFT1G	
M74VHC1G135DFT2G	
M74VHC1GT00DFT1G	
M74VHC1GT00DFT2G	
M74VHC1GT02DFT1G	
M74VHC1GT02DFT2G	
M74VHC1GT04DFT1G	
M74VHC1GT04DFT2G	
M74VHC1GT04DFT3G	
M74VHC1GT08DFT1G	
M74VHC1GT08DFT2G	
M74VHC1GT125DF1G	
M74VHC1GT125DF2G	

M74VHC1GT126DF1G	MC74VHC1G14DFT2G
M74VHC1GT126DF2G	
M74VHC1GT14DFT1G	
M74VHC1GT14DFT2G	
M74VHC1GT32DFT1G	
M74VHC1GT32DFT2G	
M74VHC1GT50DFT1G	
M74VHC1GT50DFT2G	
M74VHC1GT86DFT1G	
M74VHC1GT86DFT2G	
M74VHC1GU04DFT1G	
M74VHC1GU04DFT2G	
MC74HC1G00DFT1G	
MC74HC1G00DFT2G	
MC74HC1G02DFT2G	
MC74HC1G04DFT1G	
MC74HC1G04DFT2G	
MC74HC1G08DFT1G	
MC74HC1G08DFT2G	
MC74HC1G14DFT1G	
MC74HC1G14DFT2G	
MC74HC1G32DFT1G	
MC74HC1G32DFT2G	
MC74HC1GU04DFT1G	
MC74HC1GU04DFT2G	
MC74VHC1G00DFT1G	
MC74VHC1G00DFT2G	
MC74VHC1G01DFT1G	
MC74VHC1G01DFT2G	
MC74VHC1G02DFT1G	
MC74VHC1G02DFT2G	
MC74VHC1G03DFT1G	
MC74VHC1G03DFT2G	
MC74VHC1G04DFT1G	
MC74VHC1G04DFT2G	
MC74VHC1G05DFT1G	
MC74VHC1G05DFT2G	

MC74VHC1G07DFT1G	MC74VHC1G14DFT2G
MC74VHC1G07DFT2G	
MC74VHC1G08DFT1G	
MC74VHC1G08DFT2G	
MC74VHC1G09DFT1G	
MC74VHC1G09DFT2G	
MC74VHC1G125DFT1G	
MC74VHC1G14DFT1G	
MC74VHC1G14DFT2G	
MC74VHC1G32DFT1G	
MC74VHC1G32DFT2G	
MC74VHC1G50DFT1G	
MC74VHC1G50DFT2G	
MC74VHC1G86DFT1G	
MC74VHC1G86DFT2G	
MC74VHC1GU04DF1G	
NL17SZ00DFT2G	
NL17SZ02DFT2G	
NL17SZ04DFT2G	
NL17SZ06DFT2G	
NL17SZ07DFT2G	
NL17SZ08DFT2G	
NL17SZ125DFT2G	
NL17SZ126DFT2G	
NL17SZ14DFT2G	
NL17SZ16DFT2G	
NL17SZ17DFT2G	
NL17SZ32DFT2G	
NL17SZ86DFT2G	
NL17SZU04DFT2G	
NL17VHC1GT50DF1G	
NL18SZ125DFT2G	

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