ON Semiconductor

FINAL PRODUCT/PROCESS CHANGE NOTIFICATION
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05-Jan-2010

SUBJECT: ON Semiconductor Final Product/Process Change Notification #16381

TITLE: Fab9 to Fab10 Transfer, A9Q

PROPOSED FIRST SHIP DATE: 05-Apr-2010

AFFECTED CHANGE CATEGORY(S): Wafer Fab

AFFECTED PRODUCT DIVISION(S): A9Q

FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:
Contact your local ON Semiconductor Sales Office or Richard Tan <Richard.Tan@onsemi.com >

SAMPLES: Contact your local ON Semiconductor Sales Office

ADDITIONAL RELIABILITY DATA: Available
Contact your local ON Semiconductor Sales Office

NOTIFICATION TYPE:

Final Product/Process Change Notification (FPCN)

DESCRIPTION AND PURPOSE:

We are closing Fab9. Current ABQ devices of Fab9 will transfer to Fab10 A9Q process.

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RELIABILITY DATA SUMMARY:

A.) Component Level Test Results:

DIE FABRICATION RELIABILITY TESTS									
Test #	**Test**	**Reference**	**Test Conditions**	**Electrical Test Requirements**	**Sample Size per lot**	**Accept Criteria**	**# of Lots**	**Total Parts Required**	**Results**
D1	**Electromigration (EM)**	-	Reference Conditions: Tjref =120°C Use current as defined in Design: M1: 0.6mA/μmW M2: 1.32mA/μmW Contact: 1.2mA/minimum contact Via: 0.75mA/ minimum via	-	-	Cumulative failures after 10 years < 0.01% at reference conditions	-	-	Metals, contacts and vias pass.
D2	**Time Dependent Dielectric Breakdown (TDDB)**	-	Reference Conditions: Tjref =120°C Vgmax	-	-	Cumulative failures after 10 years < 0.01%	-	-	Pass
D3.1	**Hot Carrier Injection (HCI) of CMOS devices**	-	Peak conditions to be evaluated	-	-	Create DC Safe Operating Area for 10% degradation	-	-	Pass
D3.2	**Hot Carrier Injection (HCI) of DMOS devices**	-	Investigate worst case degradation conditions	-	-	Create DC Safe Operating Area for 10% degradation	-	-	Pass
D5	**Stress Migration (SM)**	-	Bake 175 C, 225 C, 275 C for 500hr	-	-	Less than 10% shift in Resistance	-	-	Pass

B.) Product Level Tests Results:

Product Test Vehicle 11971-006 Test Results:

For Accelerated Environment Stress Tests (A0-A4), please refer to PTV 20004-002 below.

ACCELERATED LIFETIME SIMULATION TESTS									
Test #	**Test**	**Reference**	**Test Conditions**	**Electrical Test Requirements**	**Sample Size per lot**	**Accept Criteria**	**# of Lots**	**Total Parts Required**	**Results Fail/SS**
B2	**Early Life Failure Rate (ELFR)**	JESD22-A108	Ta = 150°C for 24 hrs	Test @ 30'C Test @ 125'C	800	0	3	2400	0/2395
B3	**NVM endurance, Data Retention, and Operational Life**	AEC-Q100-005	Ta = 150°C for 500 hrs (HTOL) Vdd=5.5 +/- 0.25 volts (Device Spec 4.25-5.75) Dynamic, with chip internal oscillator. 168 hrs Test @ 30°C 500 hrs Test @ -40°C, 30°C and 125°C	Test @ 30'C Test @ 125'C Test @ -40°C	77 FAB 10 60 FAB 9	0	3 FAB 10 1 FAB 9	3 x 82 FAB 10 1 x 65 FAB 9	0/254
			Ta = 150°C for 1000 hrs (HTSL) After 168 hrs Test @ 30°C After 500 hrs Test @ 30°C and 125°C.	Test @ 30'C Test @ 125'C	45 Fab10 45 Fab9	0	1 Fab10 1 Fab9	1 x 45 FAB 10 1 x 45 FAB 9	0/46

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PACKAGE ASSEMBLY INTEGRITY TESTS									
Test #	**Test**	**Reference**	**Test Conditions**	**Electrical Test Requirements**	**Sample Size per lot**	**Accept Criteria**	**# of Lots**	**Total Parts Required**	**Results Fail/SS**
C1	**Wire Bond Shear (WBS)**	AEC-Q100-001	34 gram for ball dia=3.6 mils	N.A.	150 balls	Cpk > 1.33 Ppk > 1.67	1	8	0/150 CPK>1.33
C2	**Wire Bond Pull Strength (WBP)**	MIL- STD883 Method 2011	3 grams minimum for Au wire >1 mil.	N.A.	150 wires	Cpk > 1.33 Ppk > 1.66	1	8	0/150 CPK>1.33

ELECTRICAL VERIFICATION TESTS									
Test #	**Test**	**Reference**	**Test Conditions**	**Electrical Test Requirements**	**Sample Size per lot**	**Accept Criteria**	**# of Lots**	**Total Parts Required**	**Results Fail/SS**
E2	**ESD - Human Body Model (HBM)**	AEC-Q100-002/003	500V, 1000V, 1500V, 2000V, 2500V		3 per voltage	0	1	15	Passed 2.5kv
	ESD - Machine Model (MM)	AEC-Q100-003	50, 100, 150, 200V		3 per voltage	0	1	12	Passed 250v
E4	**Latch-up (LU)**	AEC Q100-004	Test temperature 125°C	Test before and after LU @ 30°C and @ 125°C	6	0	1	6	Passed 125'C @ 120ma
E5	**Electrical Distributions (ED)**	AEC-Q100-009	For parameter monitoring see end of document.	Test @ 30°C Test @ 125°C Test @ -40°C	30	Will guarantee product specs	3	90	Passed 30 pieces X 3 lots, @ 30'C, 125'C, -40'C
E7	**Characterization (CHAR)**	AEC-Q003	For parameter monitoring see end of document.	Temp sweep -40°C to 140°C	5	Will guarantee product specs	3	15	Passed 5 pieces X 3 lots

C.) Product Test Vehicle 20004-002 Test Results:

AEC#	STRESS	REF. STD	STRESS CONDITION	TEST TEMP	TEST SW	TEST WINDOW	# OF LOTS	SAMPLE SIZE	SPARES /LOT	LOT ID/ REL ID	RESULTS[(1)]	Remarks
TEST GROUP A - ACCELERATED ENVIRONMENT STRESS TESTS												
A1	PC	J-STD-020 & JESD22-A113	Moisture Soak (MSL = 3) Reflow Peak Temp = (225C)	R	3	96	3	236	9	TQ091802/1	0/157	
										TQ091803/1	0/157	
										TQ091804/1	0/155	
A0	SAT	J-STD-020	Acoustic Microscopy	NA	NA	NA	3	5	0	B72374.1	COMPLETED	
										B72741.1		
										B72578.1		
A2	HAST	JESD22-A110	130°C /85% RH for 96 hours	R, H	3	96	3	77	3	B78203.1	0/80	20004 doesn't have HAST board. Use C5 20429 HAST data. C5 has the same fab backend metal process.
										B77639.1	0/80	
										B66419.2	0/80	
A3	UHAST (AC)	JESD22-A102	130°C /85% RH for 96 hours (121°C /100% RH for 96 hours)	R	3	48	3	77	3	TQ091802/3	0/79	
										TQ091803/3	0/79	
										TQ091804/3	0/78	
A4	TC	JESD22-A104	-65°C to 150°C for 500 cycles	H	3	96	3	77	3	TQ091802/4	0/78	
										TQ091803/4	0/78	
										TQ091804/4	0/77	
A6	HTSL	JESD22-A103	Ta= 150°C for 180 hours, biased	R,H	3	96	3	77	3	TQ091802/5/1	0/80	
										TQ091803/5/1	0/79	
										TQ091804/5/1	0/79	
			Ta= 150°C for 500 hours, biased	R,H	3	96	3	77	3	TQ091802/5/2	0/80	
										TQ091803/5/2	0/79	
										TQ091804/5/2	0/79	
			Ta= 150°C for 1000 hours, biased	R,H	3	96	3	77	3	TQ091802/5/3	0/80	
										TQ091803/5/3	0/79	
										TQ091804/5/3	0/79	
Note 1: Invalid failures yielded off.												

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ELECTRICAL CHARACTERISTIC SUMMARY: NA

CHANGED PART IDENTIFICATION: NA

AFFECTED DEVICE LIST:

11971-003-XDW
14083-003-XTD
06673-002-XTD