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PRODUCT/PROCESS CHANGE NOTIFICATION  
Generic Copy

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22-September-2000

SUBJECT: ON Semiconductor Product/Process Change Notification 10272

TITLE: HIGH SPEED CMOS CONVERSION OF ILD TO BPSG  
(BORON PHOSPHOSILICATE GLASS)

EFFECTIVE DATE: 29-Dec-2000

AFFECTED CHANGE CATEGORY(IES)

SUBCONTRACTOR FAB SITE  
WAFER PROCESS

AFFECTED PRODUCT DIVISION(S)

LOGIC PRODUCTS DIV

ADDITIONAL RELIABILITY DATA: Available  
Contact your local ON Semiconductor Sales Office.  
(LYLE STEWART, RJJ930@onsemi.com)

SAMPLES: Contact Below  
Contact your local ON Semiconductor Sales Office.  
(TOM BRUNER, RPP920@onsemi.com)

FOR ANY QUESTIONS CONCERNING THIS NOTIFICATION:  
Contact Sales Office (TOM BRUNER, RPP920@onsemi.com)

DISCLAIMER:

ON Semiconductor will consider this change approved unless specific conditions of acceptance are provided in writing within 30 days of receipt of this notice. To do so, contact your local ON Semiconductor sales office.

DESCRIPTION AND PURPOSE

ON Semiconductor High Speed CMOS Logic devices, processed at Phenitec Semiconductor Inc., will convert the ILD (Interlayer Dielectric) between metal and polysilicon from 9000A, using 5.7 Wtpercent Phosphorous PSG film to 2000A NSG plus 7000A, using 3.0 Wtpercent Boron and 5.0 Wtpercent Phosphorous (BPSG film). The present thermal reflow process will remain unchanged and electrical characteristics of the die will not change. The BPSG film provides superior sidewall coverage between the metal and the polysilicon conductors over the existing PSG film. BPSG processes have been in production at multiple ON Semiconductor wafer fabrication sites since the early 1980's. Boron in the BPSG film reduces stress which provides a more conformal film than PSG. Improved reliability is achieved by reduction in cracking and metal to poly shorts. These changes to HSL products are being made as part of ON Semiconductor's continuous improvement philosophy for product quality and reliability.



QUALIFICATION PLAN

See Reliability Data

RELIABILITY DATA SUMMARY

Reliability qualification consisted of five (5) wafer lots stressed with Operating life testing (Op-life), Temperature cycling, Highly Accelerated Stress Testing (HAST), and Autoclave (AC).

Op-life (@ 145 degC, 5.5 V)

Device	Wafer Lot #	Sample Size	No. of Rejects		
			168	504	1008 Hours
HC595A	OACQ-3222	80	0	0	0
HC595A	OACQ-3220	80	0	0	0
HC595A	OACQ-3207	80	0	0	0
HC4053A	OACQ-3207	80	0	0	0
HC4066A	OACQ-3235	80	0	0	0

Temperature Cycle (-65 to 150 degC)

Device	Sample Size	No. of Rejects		
		100	500	1000 Cycles
HC595A	80	0	0	0
HC595A	80	0	0	0
HC595A	80	0	0	0
HC4053A	80	0	0	0
HC4066A	80	0	0	0

HAST (19PSIG, 85RH and 130 degC)

Device	Sample Size	No. of Rejects
		96 Hours
HC595A	80	0
HC595A	80	0
HC595A	80	0
HC4053A	80	0
HC4066A	80	0

Autoclave (15PSIG, 100RH and 121 deg C)

Device	Sample Size	No. of Rejects
		96 Hours
HC595A	80	0
HC595A	80	0
HC595A	80	0
HC4053A	80	0
HC4066A	80	0

ELECTRICAL CHARACTERISTIC SUMMARY

Electrical characteristics are not affected by this change.

CHANGED PART IDENTIFICATION

Date Codes affected are after 2048.



AFFECTED DEVICE LIST

FMC74HC138ADR2	FZ74HC00ADT	FZ74HC02ADT	FZ74HC04ADT
FZ74HC132ADT	FZ74HC132ADTR2	FZ74HC32ADT	JLC34538AF
JMC74HCU04AW	MC74HC00AD	MC74HC00ADR2	MC74HC00ADT
MC74HC00ADTEL	MC74HC00ADTR2	MC74HC00AF	MC74HC00AFEL
MC74HC00AFL1	MC74HC00AFL2	MC74HC00AFR1	MC74HC00AFR2
MC74HC00AN	MC74HC02AD	MC74HC02ADR2	MC74HC02ADT
MC74HC02ADTEL	MC74HC02ADTR2	MC74HC02AF	MC74HC02AFEL
MC74HC02AFL1	MC74HC02AFL2	MC74HC02AFR1	MC74HC02AFR2
MC74HC02AN	MC74HC03AD	MC74HC03ADR2	MC74HC03ADT
MC74HC03ADTEL	MC74HC03ADTR2	MC74HC03AF	MC74HC03AFEL
MC74HC03AFL1	MC74HC03AFL2	MC74HC03AFR2	MC74HC03AN
MC74HC04AD	MC74HC04ADR2	MC74HC04ADT	MC74HC04ADTEL
MC74HC04ADR2	MC74HC04AF	MC74HC04AFEL	MC74HC04AFL1
MC74HC04AFL2	MC74HC04AFR1	MC74HC04AFR2	MC74HC04AN
MC74HC08AD	MC74HC08ADR2	MC74HC08ADT	MC74HC08ADTEL
MC74HC08ADTR2	MC74HC08AF	MC74HC08AFEL	MC74HC08AFL1
MC74HC08AFL2	MC74HC08AFR1	MC74HC08AFR2	MC74HC08AN
MC74HC125AD	MC74HC125ADR2	MC74HC125ADT	MC74HC125ADTEL
MC74HC125ADTR2	MC74HC125AF	MC74HC125AFEL	MC74HC125AFL1
MC74HC125AFL2	MC74HC125AFR1	MC74HC125AFR2	MC74HC125AN
MC74HC126AD	MC74HC126ADR2	MC74HC126ADT	MC74HC126ADTEL
MC74HC126ADTR2	MC74HC126AF	MC74HC126AFEL	MC74HC126AFL1
MC74HC126AFL2	MC74HC126AFR1	MC74HC126AFR2	MC74HC126AN
MC74HC132AD	MC74HC132ADR2	MC74HC132ADT	MC74HC132ADTEL
MC74HC132ADTR2	MC74HC132AF	MC74HC132AFEL	MC74HC132AFL1
MC74HC132AFL2	MC74HC132AFR1	MC74HC132AFR2	MC74HC132AN
MC74HC138AD	MC74HC138ADR2	MC74HC138ADT	MC74HC138ADTEL
MC74HC138ADTR2	MC74HC138AF	MC74HC138AFEL	MC74HC138AFL1
MC74HC138AFL2	MC74HC138AFR1	MC74HC138AFR2	MC74HC138AN
MC74HC139AD	MC74HC139ADR2	MC74HC139ADT	MC74HC139ADTEL
MC74HC139AF	MC74HC139AFEL	MC74HC139AFL1	MC74HC139AFL2
MC74HC139AFR1	MC74HC139AFR2	MC74HC139AN	MC74HC14AD
MC74HC14ADR2	MC74HC14ADT	MC74HC14ADTEL	MC74HC14ADTR2
MC74HC14AF	MC74HC14AFEL	MC74HC14AFL1	MC74HC14AFL2
MC74HC14AFR1	MC74HC14AFR2	MC74HC14AN	MC74HC157AD
MC74HC157ADR2	MC74HC157ADT	MC74HC157ADTEL	MC74HC157ADTR2
MC74HC157AF	MC74HC157AFEL	MC74HC157AFL1	MC74HC157AFL2
MC74HC157AFR1	MC74HC157AFR2	MC74HC157AN	MC74HC161AD
MC74HC161ADR2	MC74HC161ADT	MC74HC161ADTR2	MC74HC161AF
MC74HC161AFEL	MC74HC161AFL1	MC74HC161AFL2	MC74HC161AFR1
MC74HC161AFR2	MC74HC161AN	MC74HC163AD	MC74HC163ADR2
MC74HC163AF	MC74HC163AFEL	MC74HC163AFL1	MC74HC163AFL2
MC74HC163AFR1	MC74HC163AFR2	MC74HC163AN	MC74HC164AD
MC74HC164ADR2	MC74HC164ADT	MC74HC164ADTEL	MC74HC164ADTR2
MC74HC164AF	MC74HC164AFEL	MC74HC164AFL1	MC74HC164AFL2
MC74HC164AFR1	MC74HC164AFR2	MC74HC164AN	MC74HC164DR2
MC74HC164N	MC74HC165AD	MC74HC165ADR2	MC74HC165ADT
MC74HC165ADTR2	MC74HC165AF	MC74HC165AFEL	MC74HC165AFL1
MC74HC165AFL2	MC74HC165AFR1	MC74HC165AFR2	MC74HC165AN
MC74HC165D	MC74HC165DR2	MC74HC165DTR2	MC74HC165F
MC74HC165FEL	MC74HC165FL1	MC74HC165FR1	MC74HC165N
MC74HC174AD	MC74HC174ADR2	MC74HC174ADT	MC74HC174ADTEL
MC74HC174ADTR2	MC74HC174AF	MC74HC174AFEL	MC74HC174AFL1
MC74HC174AFL2	MC74HC174AFR1	MC74HC174AFR2	MC74HC174AN
MC74HC175AD	MC74HC175ADR2	MC74HC175ADT	MC74HC175ADTEL
MC74HC175ADTR2	MC74HC175AF	MC74HC175AFEL	MC74HC175AFL1
MC74HC175AFL2	MC74HC175AFR1	MC74HC175AFR2	MC74HC175AN
MC74HC175D	MC74HC175DR2	MC74HC175DT	MC74HC175DTR2
MC74HC175F	MC74HC175FEL	MC74HC175FL1	MC74HC175FL2
MC74HC175FR1	MC74HC175FR2	MC74HC175N	MC74HC240ADT



MC74HC240ADTEL	MC74HC240ADTR2	MC74HC240ADW	MC74HC240ADWR2
MC74HC240AF	MC74HC240AFEL	MC74HC240AFL1	MC74HC240AFL2
MC74HC240AFR1	MC74HC240AFR2	MC74HC240AH	MC74HC240AN
MC74HC241AFL2	MC74HC242FEL	MC74HC244ADT	MC74HC244ADTEL
MC74HC244ADTR2	MC74HC244ADW	MC74HC244ADWR2	MC74HC244AF
MC74HC244AFEL	MC74HC244AFL1	MC74HC244AFL2	MC74HC244AFR1
MC74HC244AFR2	MC74HC244AH	MC74HC244AN	MC74HC245ADT
MC74HC245ADTEL	MC74HC245ADTR2	MC74HC245ADW	MC74HC245ADWR2
MC74HC245AF	MC74HC245AFEL	MC74HC245AFL1	MC74HC245AFL2
MC74HC245AFR1	MC74HC245AFR2	MC74HC245AH	MC74HC245AN
MC74HC251FR1	MC74HC273ADT	MC74HC273ADTR2	MC74HC273ADW
MC74HC273ADWR2	MC74HC273AF	MC74HC273AFEL	MC74HC273AFL1
MC74HC273AFR1	MC74HC273AFR2	MC74HC273AH	MC74HC273AN
MC74HC32AD	MC74HC32ADR2	MC74HC32ADT	MC74HC32ADTEL
MC74HC32ADTR2	MC74HC32AF	MC74HC32AFEL	MC74HC32AFL1
MC74HC32AFL2	MC74HC32AFR1	MC74HC32AFR2	MC74HC32AN
MC74HC365DT	MC74HC365DTR2	MC74HC365FEL	MC74HC365FL1
MC74HC365FL2	MC74HC365FR1	MC74HC365FR2	MC74HC365N
MC74HC367ADTEL	MC74HC367FEL	MC74HC367FL1	MC74HC367FL2
MC74HC367FR1	MC74HC367FR2	MC74HC367N	MC74HC373ADT
MC74HC373ADTEL	MC74HC373ADTR2	MC74HC373ADW	MC74HC373ADWR2
MC74HC373AF	MC74HC373AFEL	MC74HC373AFL1	MC74HC373AFR1
MC74HC373AFR2	MC74HC373AH	MC74HC373AN	MC74HC374ADT
MC74HC374ADTEL	MC74HC374ADTR2	MC74HC374ADW	MC74HC374ADWR2
MC74HC374AF	MC74HC374AFEL	MC74HC374AFL1	MC74HC374AFL2
MC74HC374AFR1	MC74HC374AFR2	MC74HC374AH	MC74HC374AN
MC74HC390AD	MC74HC390ADR2	MC74HC390ADT	MC74HC390ADTEL
MC74HC390ADTR2	MC74HC390AF	MC74HC390AFEL	MC74HC390AFL1
MC74HC390AFL2	MC74HC390AFR1	MC74HC390AFR2	MC74HC390AN
MC74HC390D	MC74HC390DR2	MC74HC390F	MC74HC390FEL
MC74HC390FR1	MC74HC390N	MC74HC393AD	MC74HC393ADR2
MC74HC393ADT	MC74HC393ADTEL	MC74HC393ADTR2	MC74HC393AF
MC74HC393AFEL	MC74HC393AFL1	MC74HC393AFL2	MC74HC393AFR1
MC74HC393AFR2	MC74HC393AN	MC74HC393D	MC74HC393DR2
MC74HC393F	MC74HC393FEL	MC74HC393FL1	MC74HC393FR1
MC74HC393N	MC74HC4020AD	MC74HC4020ADR2	MC74HC4020ADT
MC74HC4020ADTR2	MC74HC4020AF	MC74HC4020AFEL	MC74HC4020AFL1
MC74HC4020AFL2	MC74HC4020AFR1	MC74HC4020AN	MC74HC4020N
MC74HC4040AD	MC74HC4040ADR2	MC74HC4040ADT	MC74HC4040ADTEL
MC74HC4040AF	MC74HC4040AFEL	MC74HC4040AFL1	MC74HC4040AFR1
MC74HC4040AFR2	MC74HC4040AN	MC74HC4040N	MC74HC4046AD
MC74HC4046ADR2	MC74HC4046ADT	MC74HC4046ADTEL	MC74HC4046ADTR2
MC74HC4046AF	MC74HC4046AFEL	MC74HC4046AFL1	MC74HC4046AFR1
MC74HC4046AFR2	MC74HC4046AN	MC74HC4051AD	MC74HC4051ADR2
MC74HC4051ADT	MC74HC4051ADTEL	MC74HC4051ADTR2	MC74HC4051ADW
MC74HC4051ADWR2	MC74HC4051AF	MC74HC4051AFEL	MC74HC4051AFL1
MC74HC4051AFL2	MC74HC4051AFR1	MC74HC4051AFR2	MC74HC4051AN
MC74HC4051D	MC74HC4051DR2	MC74HC4051DT	MC74HC4051DTEL
MC74HC4051DTR2	MC74HC4051DW	MC74HC4051DWR2	MC74HC4051F
MC74HC4051FEL	MC74HC4051FL1	MC74HC4051FL2	MC74HC4051FR1
MC74HC4051FR2	MC74HC4051N	MC74HC4052AD	MC74HC4052ADR2
MC74HC4052ADT	MC74HC4052ADTR2	MC74HC4052ADW	MC74HC4052ADWR2
MC74HC4052AF	MC74HC4052AFEL	MC74HC4052AFL1	MC74HC4052AFL2
MC74HC4052AFR1	MC74HC4052AFR2	MC74HC4052AN	MC74HC4052D
MC74HC4052DR2	MC74HC4052DT	MC74HC4052DTR2	MC74HC4052DW
MC74HC4052F	MC74HC4052FEL	MC74HC4052FL1	MC74HC4052FL2
MC74HC4052FR1	MC74HC4052FR2	MC74HC4052N	MC74HC4053AD
MC74HC4053ADR2	MC74HC4053ADT	MC74HC4053ADTEL	MC74HC4053ADTR2
MC74HC4053ADW	MC74HC4053ADWR2	MC74HC4053AF	MC74HC4053AFEL
MC74HC4053AFL1	MC74HC4053AFL2	MC74HC4053AFR1	MC74HC4053AFR2
MC74HC4053AN	MC74HC4053D	MC74HC4053DR2	MC74HC4053DT
MC74HC4053DTR2	MC74HC4053DW	MC74HC4053DWR2	MC74HC4053F
MC74HC4053FEL	MC74HC4053FL1	MC74HC4053FR1	MC74HC4053FR2

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MC74HC4053N	MC74HC4060AD	MC74HC4060ADR2	MC74HC4060ADT
MC74HC4060ADTEL	MC74HC4060ADTR2	MC74HC4060AF	MC74HC4060AFEL
MC74HC4060AFL1	MC74HC4060AN	MC74HC4066AD	MC74HC4066ADR2
MC74HC4066ADT	MC74HC4066ADTEL	MC74HC4066ADTR2	MC74HC4066AF
MC74HC4066AFEL	MC74HC4066AFL1	MC74HC4066AFL2	MC74HC4066AFR1
MC74HC4066AFR2	MC74HC4066AN	MC74HC4066D	MC74HC4066DR2
MC74HC4066DT	MC74HC4066DTEL	MC74HC4066DTR2	MC74HC4066F
MC74HC4066FEL	MC74HC4066FL1	MC74HC4066FL2	MC74HC4066FR1
MC74HC4066FR2	MC74HC4066N	MC74HC42FL2	MC74HC4316AD
MC74HC4316ADR2	MC74HC4316ADT	MC74HC4316ADTR2	MC74HC4316ADW
MC74HC4316ADWR2	MC74HC4316AF	MC74HC4316AFEL	MC74HC4316AFL1
MC74HC4316AFR1	MC74HC4316AN	MC74HC4316D	MC74HC4316DR2
MC74HC4316F	MC74HC4316FEL	MC74HC4316FL1	MC74HC4316FR1
MC74HC4316N	MC74HC4538AD	MC74HC4538ADR2	MC74HC4538ADT
MC74HC4538ADTEL	MC74HC4538ADTR2	MC74HC4538AF	MC74HC4538AFEL
MC74HC4538AFL1	MC74HC4538AFL2	MC74HC4538AFR1	MC74HC4538AFR2
MC74HC4538AN	MC74HC4851AD	MC74HC4851ADR2	MC74HC4851ADT
MC74HC4851ADTR2	MC74HC4851ADW	MC74HC4851ADWR2	MC74HC4851AN
MC74HC4852AD	MC74HC4852ADR2	MC74HC4852ADT	MC74HC4852ADT