Document Level: (For Engineering & Quality Document/工程暨品质文件专用)

☐ Level 1 - Manual ☑ Level 2 – Procedure/SPEC/Report ☐ Level 3 - Operation Instruction

Security Level:

☐ Security 1 - SMIC Confidential ☑ Security 2 - SMIC Restricted ☐ Security 3 - SMIC Internal

Document Change History

Doc. Rev.	Tech Dev. Rev.	Effective Date	Author	Change Description
0T		2002-3-20	Allen Fan	Initiate
0.1T	0.1	2003-06-10	JianHua_Ju	Add Technology Develop Revision:0.1

1. Title:

   0.18µm Logic 1P6M Salicide 1.8V/3.3V Process Flow

2. Purpose:

   Process flow highlights.

3. Scope:

   All SMIC Fabs.

4. Nomenclature: NA

5. Reference: NA

6. Responsibility:

   TD is responsible before wafer yield and E1 is responsible after wafer yield.

7. Subject Content:

7.1	Wafer Start	P-Type Substrate, 8 ~ 12 Ohm -Cm
7.2	Pad Oxidation	110A
7.3	SiN Deposition	1625A
7.4	Shallow Trench Isolation	Minimum Space = 0.24µm Depth = 3500A Liner Oxide = 110A HDP Gap Fill
7.5	P-well Patterning	Litho/Well Implant
7.6	N-Channel Implant	1.8V/3.3V VTN Implant
7.7	N-well Patterning	Litho/Well Implant
7.8	P-Channel Implant	1.8V/3.3V VTP Implant
7.9	Gate Pre-Clean	SPM+HF/APM+HPM
7.10	Gate Oxidation 1	

7.11	Dual Gate Etching	
7.12	Gate Oxidation 2	32A Thin Gate Oxide
		70A Thick Gate Oxide
7.13	Poly Deposition	2000A
7.14	Poly Patterning	Litho/Etch
7.15	Poly Oxidation	
7.16	NLDD1 Patterning	Litho/1.8V NLDD Implant
7.17	PLDD1 Patterning	Litho/1.8V PLDD Implant
7.18	PLDD2 Patterning	Litho/3.3V PLDD Implant
7.19	NLDD2 Patterning	Litho/3.3V NLDD Implant
7.20	Spacer Deposition	Oxide/Nitride/Oxide
7.21	Spacer Etch	Width = 900A
7.22	N+ S/D Patterning	Litho/Implant
7.23	P+ S/D Patterning	Litho/Implant
7.24	ESD Patterning	Litho/Implant
7.25	SAB Deposition	350A
7.26	S/D Anneal	RTA
7.27	SAB Patterning	Litho/Etch
7.28	Co Salicide Formation	$CoSi_2$ Thickness = 300A
		Sheet Resistance (Diffusion) = 6 ohm/sq
		Sheet Resistance (Poly) = 8 ohm/sq
7.29	ILD Deposition	TEOS
7.30	ILD CMP	7500A Remaining
7.31	Contact Patterning	Litho/Etch
7.32	Glue Layer Deposition	Ti/TiN
7.33	Plug Formation	Tungsten
7.34	M1 Sputtering	Ti/AlCu/TiN
		AlCu Thickness = 4000A
7.35	M1 Patterning	Litho/Etch
7.36	IMD Deposition 1, 2, 3, 4, 5	

7.37	Via 1, 2, 3, 4, Patterning	Litho/Etch
7.38	Metal 2, 3, 4, 5 Deposition	Ti/AlCu/TiN AlCu Thickness: M2 = 4000A M3 = 4000A, M4 = 4000A M5 = 4000A
7.39	Metal 2, 3, 4, 5 Patterning	Litho/Etch
7.40	Top Via Patterning	Litho/Etch
7.41	Top Metal Deposition	Thickness = 8,000A
7.42	Top Metal Patterning	Litho/Etch
7.43	Passivation Deposition	10,000A Oxide/6000A SiN
7.44	Passivation Patterning	Litho/Etch
7.45	Alloy	
7.46	Tape Mount (Optional)	
7.47	Backside Grinding (Optional)	
7.48	DI Megasonic Clean	

8. Attachment: NA