

SYSTEM SOFTWARE		
1	Proteus Ver 2.231 Bld 3	
2	QNX Ver 4.71 Bld 3	
3	UIP r o t e u s	
4	ControllerM C 1	
5	ISIOC Ver 4.69	
HARDWARE		
1. CIP and Upgrades (over the years)		
6	Ta chamber process kit	SST process kit upgrade
7	Ta HCM target	Single coil Ta
8	Damaclean dome shield	Single piece
9	HCM Cu target	3/4" HCM Cu thickwall target
10	ESC chuck	Rev2 No SEMCO layer (Ta/Cu)
11	Degas stn leak chk port (for front end)	Installed
12	Degas flexline	Upgraded bellow
13	PVD chamber flexline (Ta/Cu)	Upgraded bellow
14	PVD chamber HCM (Ta/Cu)	Metal strain relief
15	PVD chamber RGA port	NA
16	LoadLock Ion gauge port extension	NA
17	PVD Chamber Condensation Control (Ta/Cu)	NA
2. SMIF LOADERS		
18	Type/ Model	LPT 2200
3. DUAL LOADLOCKS		
19	4-axis Trust Cntrl	Ver 3.4
20	Chord Mapping	Installed
21	Cryo Baffle Plate	Installed
22	Cryo Pumps	CTI Cryogenic 8" F
23	Cryo pumps Compressor	Helix CTI9 6 0 0
24	Convectron gauge	Granville Philips 275821 Mini-Convectron
25	Ion gauge	Granville Philips 354001-YG-T Micro-ion Mod
26	LL Short Light Curtain	Installed

27	PEC cassette nests	Installed
28	Gate Valve Shield Assy	VAT Rectangular Gate Valve MONOVAT Classic with Gate Compl. (Gate Aluminum with Viton Seal)
4. WAFER HANDLER/ FRONTEND CHM		
30	Robot Arm	Ceramic
31	Cryo pumps	CTI Cryogenic 8" F and 4"
32	Cryo pumps Compressor	Helix CTI9 6 0 0
33	Convectron gauge	Granville Philips 275821 Mini-Convectron
34	Ion gauge	Granville Philips 354001-YG-T Micro-ion Mod
5. DEGAS STATION		
35	Degas Station	4pt Mechanical Clamp
36	Aera FC-7800CD MFC 4 Argon	1.0/20
6. COOL STATION		
37	Cool Station	Standard
38	Aera FC-7800CD MFC 3 Argon	1.0/100
39	Stage O-ring groove size	0.121-0.124"
7. TRANSFER MODULE		
40	Cryo Pump	CTI Cryogenic 8" F
41	Cryo pumps Compressor	Helix CTI9 6 0 0
42	Robot	AWC installed Brooks Mag 7
43	Robot end effector	Ceramic
44	Lid Cover	Clear Lid
45	Gate Valve Shield Assy	VAT Rectangular Gate Valve MONOVAT Classic with Gate Compl. (Gate Aluminum with Viton Seal)
46	Convectron gauge	Granville Philips 275821 Mini-Convectron
47	Ion gauge	Granville Philips 354001-YG-T Micro-ion Mod
8. DAMACLEAN MODULE		
48	Cylinder Source	Ceramic
49	Gas Box	3 Gas

50	RF p/s	Advance Energy RF 10s & LF 10WC
51	Plasma Shield	Stationary
52	Pump	Varian V 701 VT
53	Stage	Non-ESC
54	Shield Kit	Standard DMC non ESC
55	Gate Valve Shield Assy	VAT Rectangular Gate Valve MONOVAT Classic with Gate Compl. (Gate Aluminum with Viton Seal)
56	Convectron gauge	Granville Philips 275821 Mini-Convectron
57	Ion gauge	Granville Philips 354001-YG-T Micro-ion Mod
58	Manometer gauge	MKS inst 627B.1TBD1B 100mT/0.1
59	Aera F-7800CD MFC 4 H2	1.0/50
60	Aera F-7800CDMFC 1 Ar	1.0/50
9. Ta(N) CHAMBER		
61	Cryo Pump	CTI Cryogenic 8" F
62	Cryo pumps Compressor	Helix CTI 9600
63	Ar MFC	Installed
64	N2 MFC	Installed
65	Convectron gauge	Granville Philips 275821 Mini-Convectron
66	Ion gauge	Granville Philips 354001-YG-T Micro-ion Mod
67	Manometer gauge	MKS inst 627B.1TBD1B 100mT/0.1
68	Argon BSG manometer gauge	MKS inst 750B11TCB2GA
69	Aera FC-7800CD MFC 3 N2	1.0/200
70	Aera FC-7800CD MFC 1 Ar	1.4/100
71	MKS UPC 1 Ar	1.0/10
SHIELD KIT		
72	Assy, Anode, HCM	Arc Sprayed SST
73	Shield Adapter	Arc Sprayed SST
74	Shield Support Ring, RF FF	Ceramic
75	Deposition Shield	Arc Sprayed
76	ESC table shield	Arc Sprayed

77	Weight Clamp, RF	Arc Sprayed
78	RF Plug	Ceramic
79	Bottom Shield	Arc Sprayed
80	Gate Valve Shield Kit	Not Installed
SOURCE		
81	DC p/s	CPI 36KW
82	D-coil	Not Active
83	M-coil	Active
84	Source Magnet	Array
85	Top Magnet	Rotating No YY
86	Target	Ta
87	ESC power supply	Trek 684-I
TABLE		
88	Assy, Table, HCM	Installed
89	Polycold N2 cooling lines	Vacuum-jacketed
90	MKS UPC	Installed
91	Stage	ESC w Active Cooling
92	Heat Exchanger for Chilled N2 exhaust	Not installed
93	Z-table	Ver 2.41
94	RF Ready	Yes
95	Gate Valve Shield Assy	VAT Rectangular Gate Valve MONOVAT Classic with Gate Compl. (Gate Aluminum with Viton Seal)
10. Cu CHAMBER		
96	Cryo Pump	CTI Cryogenic 8" F
97	Cryo pumps Compressor	Helix CTI 9600
98	Ar MFC	Installed
99	Convectron gauge	Granville Philips 275821 Mini-Convectron
100	Ion gauge	Granville Philips 354001-YG-T Micro-ion Mod
101	Manometer gauge	MKS inst 627B.1TBD1B 100mT/0.1
102	Argon BSG manometer gauge	MKS inst 750B11TCB2GA

MFC		
103	Aera FC-7800CD MFC 3 N2	1.0/200
104	Aera FC-7800CD MFC 1 Ar	1.4/100
105	MKS UPC 1 Ar	1.0/10
SHIELD KIT		
106	Assy, Anode, HCM	Grit Blasted SST
107	Shield Adapter	Grit Blasted SST
108	Deposition Shield	Grit Blasted, non RF
109	ESC table shield	Grit Blasted, non RF
110	ESC Clamp	Notch, Grit Blasted
111	Bottom Shield	Grit Blasted, non RF
112	Gate Valve Shield Kit	Not Installed
SOURCE		
113	DC p/s	CPI 36KW
114	D-coil	Active
115	M-coil	Active
116	Source Magnet	Array
117	Top Magnet	Rotating
118	Target	Cu
119	ESC power supply	Trek 684-I
TABLE		
120	Mydax fluid cooling line	Vacuum-jacketed
121	MKS UPC	Installed
122	RF ready	No
123	Stage	ESC w Active Cooling
124	Z-table	Ver 2.51
125	Gate Valve Shield Assy	VAT Rectangular Gate Valve MONOVAT Classic with Gate Compl. (Gate Aluminum with Viton Seal)
12. AUXILIARY SUBFAB EQUIPMENT		
126	Cu Chamber Chiller	MYDAX 1-VLH7-WB
127	Ta Chamber Chiller	POLYCOLD 152-WC-CE/S2
128	System DI water Chiller	Affinity E series chiller EWA-15DK-

		GE06CBC0	
129	Dry Pumps	Ebara AA-20N (High Efficiency pump)	
130	Main Power Distribution	Cutler Hammer cabinet C2/Inova	
131	ECR	C2/Inova ECR 208VAC 3 rack	
SYSTEM PERFORMANCE SPECIFICATION			
132	Equipment Uptime	85%	
133	Mean Time Between Failure (MTBF)	200 Hours	
134	Mean Time to Repair (MTTR)	4 Hours	
135	Mean Wafer Between Interrupt (MWBI)	6,500 wafers	
136	Mean Wafer Between Wafer Breakage	15,000 wafers	
PROCESS SPECIFICATION			
1. PRE-CLEAN SPECIFICATON			
SPUTTER CLEAN			
137	Film Thickness Removal Thermal Oxide	100	
138	Test Diameter	194 mm	
139	Within Wafer Non-uniformity, Etch	3 %, 1	
140	Wafer-to-Wafer Repeatability, Etch	1.7 %, 1	
141	Etch Rate	>400 /min	
142	Mechanical Particle Adders (average)	10 #>0.16 m	
143	In-Film Particle Adders (average)	25 #>0.16 m	
REACTIVE CLEAN			
144	Film Thickness Removal Thermal Oxide	0	
145	Test Diameter	194 mm	
146	Cu2O Reduction Rate at 50C	>2 /min	
147	Mechanical Particle Adders (average)	10, #>0.16 m	
148	In-Film Particle Adders (average)	30, #>0.16 m	
2. HCM TA and TA (N) SPECIFICATON			
149	Film Thickness	200	
150	Test Diameter	194 mm	
151	Within Wafer Non-uniformity,	5 %, 1	

	Sheet Resistance		
152	Wafer-to-Wafer Repeatability, Sheet Resistance	1.7 %, 1	
153	Within Wafer Non-uniformity, Thickness	5 %, 1	
154	Wafer-to-Wafer Repeatability, Thickness	1.7 %, 1	
155	Ta Bulk Resistivity at 300	170-190 -cm	
156	TaN Bulk Resistivity at 300	210-240 -cm	
157	Deposition Rate (at 10KW)	730-840 /min	
158	Bottom Coverage (0.2 m,A/R=5:1)	>30%	
159	Sidewall Coverage (0.2 m,A/R=5:1)	>10%	
160	Film Mechanical Stress	>-3800 MPa	
161	Phase (Ta only)	-Ta	
162	Mechanical Particle Adders (Average)	10, #>0.16 m	
163	In-Film Particle Adders (Average)	30, #>0.16 m	

3. HCM RF TA and TA (N) SPECIFICATON

166	Film Thickness	172-195	
167	Test Diameter	194 mm	
168	Within Wafer Non-uniformity, Sheet Resistance	8 %, 1	
169	Wafer-to-Wafer Repeatability, Sheet Resistance	1.7 %, 1	
170	Within Wafer Non-uniformity, Thickness	8 %, 1	
171	Wafer-to-Wafer Repeatability, Thickness	1.7 %, 1	
172	Ta Bulk Resistivity at 190	175-195 -cm	
173	TaN Bulk Resistivity at 190	220-250 -cm	
174	Deposition Rate (1st step at 18KW)	730-840 /min	
175	Bottom Coverage (0.18 m via,A/R=3:1)	<20%	
176	Sidewall Coverage (0.18 m via,A/R=3:1)	>20%	
177	Bottom Coverage (0.2 m,A/R=5:1)	<10%	
178	Sidewall Coverage (0.2 m,A/R=5:1)	>12%	

179	Film Mechanical Stress	>-3500 MPa	
180	Phase (Ta only)	-Ta	
181	Mechanical Particle Adders (Average)	10, #>0.16 m	

182	In-Film Particle Adders (Average)	30, #>0.2 m	
183	Etch/ Deposition Ratio	1.25-1.55	
4. HCM Cu SPECIFICATON			
184	Film Thickness	1000	
185	Test Diameter	194 mm	
186	Within Wafer Non-uniformity, Sheet Resistance	4 %, 1	
187	Wafer-to-Wafer Repeatability, Sheet Resistance	1.7 %, 1	
188	Within Wafer Non-uniformity, Thickness	4 %, 1	
189	Wafer-to-Wafer Repeatability, Thickness	1.7 %, 1	
190	Bulk Resistivity	2.1-2.5 -cm	
191	Deposition Rate	1800-2250 /min	
192	Bottom Coverage (0.2 m,A/R=5:1)	>30 %	
193	Sidewall Coverage (0.2 m,A/ R=5:1)	>10 %	
194	Film Mechanical Stress	<200 MPa	
195	Texture	<111>	
196	Mechanical Particle Adders (Average)	10, #>0.16 m	
197	In-Film Particle Adders (Average)	12, #>0.2 m	