



# DATA SHEET

(DOC No. HX8664-B-DS)

## HX8664-B

960CH TFT LCD Gate Driver

*Preliminary version 03 August, 2010*

**Himax Technologies, Inc.**

<http://www.himax.com.tw>

## 1. General Description

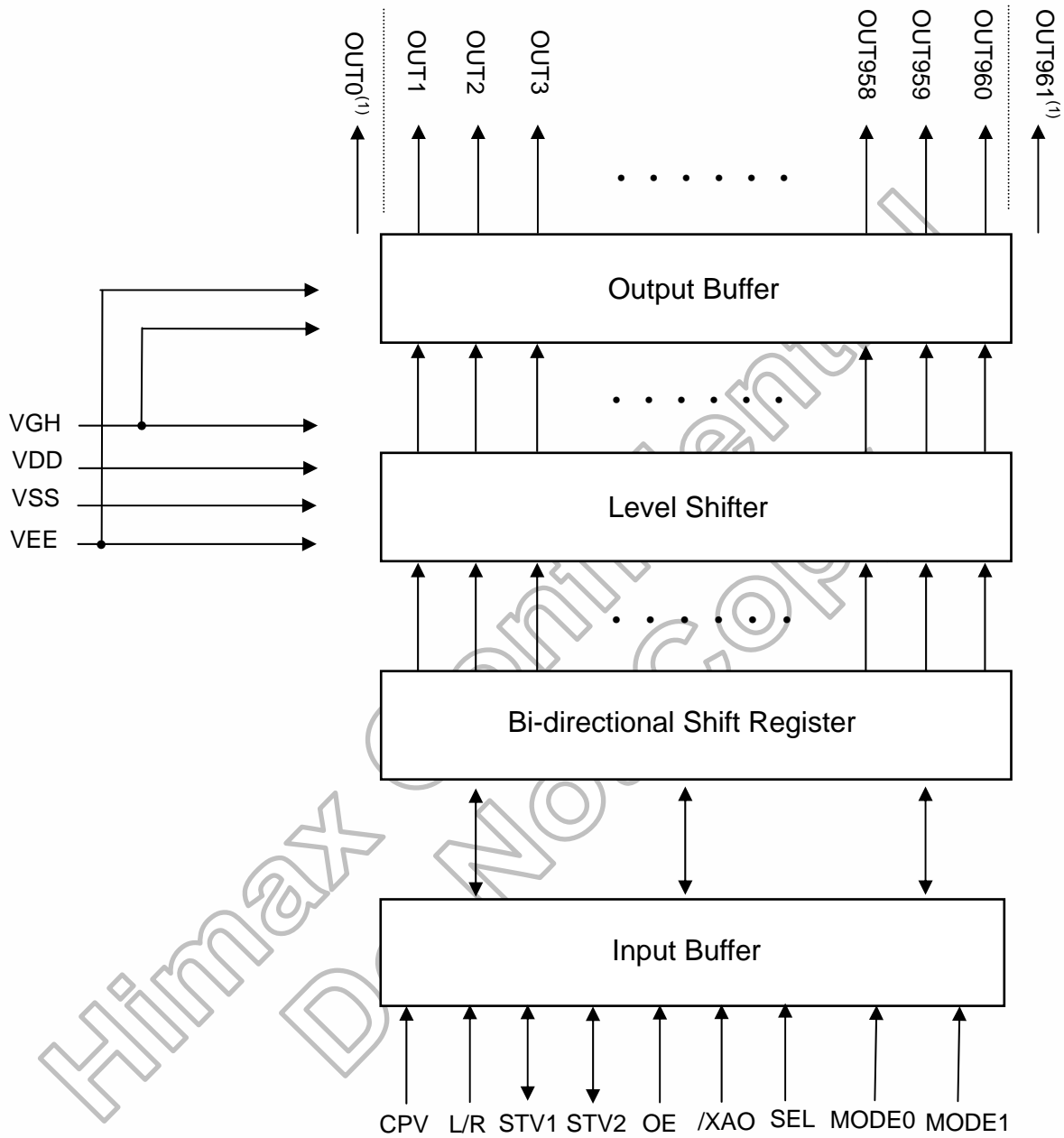
The HX8664-B is a 960-channel outputs gate driver, which is used for driving the gate line of TFT LCD panel. It is designed for 2-level output with 40V LCD driving voltage range.

## 2. Features

- 2-level output
- 960/900/864/816 channel outputs selectable with 2 dummy outputs
- Maximum 200KHz operation frequency
- Digital supply voltage: 2.3V to 3.6V
- LCD driving voltage range: 40V
- Bi-directional data shift capability
- High voltage CMOS process technology
- COG package

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### 3. Block Diagram



**Note:** (1) OUT0 and OUT961 are LCD panel auxiliary pins, these pins always output VEE level.

### 4. Pin Description

Pin name	I/O	Function	Description																				
CPV	In	Shift clock input	The clock for the internal shift registers.																				
L/R	In	Shift direction control pin	The shift direction of device internal shift register is controlled by this pin as shown below: (It should not be floating.) L/R=H:STV1→OUT1→OUT2→...→OUT960→STV2. L/R=L:STV2→OUT960→...→OUT2→OUT1→STV1.																				
SEL	In	Output sequence control	This pin controls the driver output sequence. SEL=H, LR=H: OUT1, 2,3,4,5,6,7,8... SEL=H, LR=L: OUT960, 959,958,957,956,955,954,953... SEL=L, LR=H: OUT1, 2, 4, 3, 5, 6, 8, 7... SEL=L, LR=L: OUT959, 960,958,957,955,956,954,953... SEL is pulled high to VDD internally.																				
STV1 STV2	In/ Out	Start pulse input/output pin	L/R=H: STV1 is used for start pulse input, STV2 is used for start pulse output. L/R=L, STV2 is used for start pulse input, STV1 is used for start pulse output.																				
OE	In	Output enable control	The OE signal controls the output enable. (It should not be floating.) OE=H: All driver outputs are fixed to VEE regardless of CPV. However, the content of shift register is not cleared. OE=L: Normal operation.																				
/XAO	In	Output all-on control	When /XAO is set to L, all outputs are fixed to VGH. Note that this pin has higher priority than OE. However, the content of shift register is not cleared. /XAO is pulled high to VDD internally. When it is not used, connecting to VDD is recommended.																				
MODE0, MODE1	In	Channel mode selection	Channel mode selection, MODE0, MODE1 are pulled high to VDD internally. <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Output channel</th> <th>Disable channel</th> <th>MODE1</th> <th>MODE0</th> </tr> </thead> <tbody> <tr> <td>960</td> <td>-</td> <td>H</td> <td>H</td> </tr> <tr> <td>900</td> <td>453~512 (VEE level)</td> <td>H</td> <td>L</td> </tr> <tr> <td>864</td> <td>433~528 (VEE level)</td> <td>L</td> <td>H</td> </tr> <tr> <td>816</td> <td>409~552 (VEE level)</td> <td>L</td> <td>L</td> </tr> </tbody> </table>	Output channel	Disable channel	MODE1	MODE0	960	-	H	H	900	453~512 (VEE level)	H	L	864	433~528 (VEE level)	L	H	816	409~552 (VEE level)	L	L
Output channel	Disable channel	MODE1	MODE0																				
960	-	H	H																				
900	453~512 (VEE level)	H	L																				
864	433~528 (VEE level)	L	H																				
816	409~552 (VEE level)	L	L																				
OUT1 ~ OUT960	Out	Driver output	The output is either VGH or VEE for driving the gate line of TFT LCD panel.																				
OUT0 OUT961	Out	Auxiliary pins	These two pins always output VEE level.																				
VDD	In	Power supply	Digital power supply.																				
VSS	In	Power supply	Grounding for VDD.																				
VGH	In	Power supply	Power supply for Gate on output.																				
VEE	In	Power supply	Power supply for Gate off output.																				
PATH	In	Internal link	Linked together internal.																				

## 5. Function Description

### 5.1 Device operation

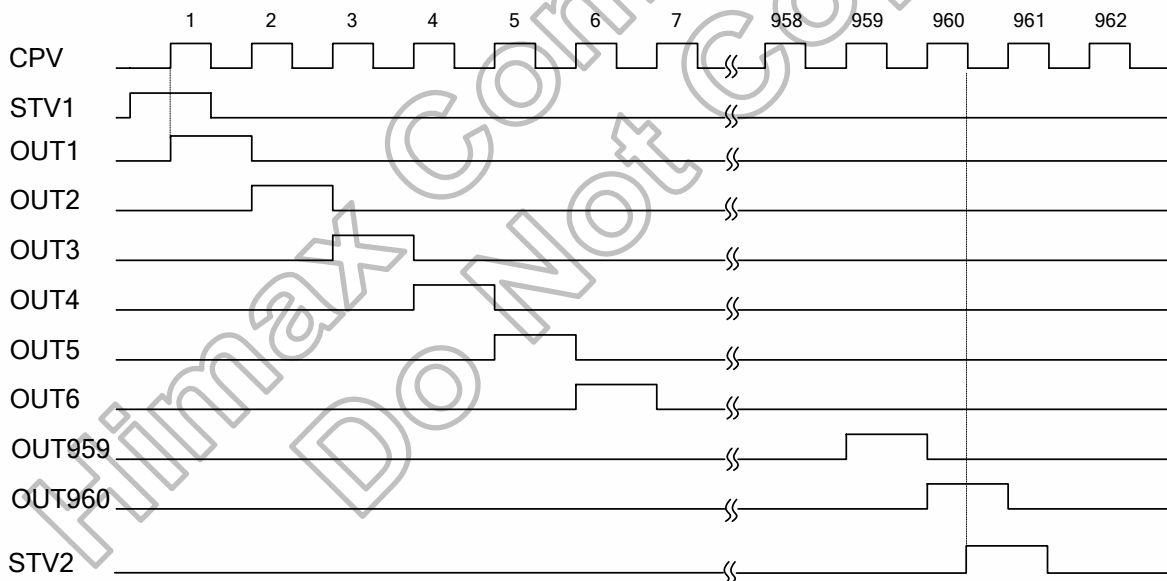
When L/R=H the STV1 start pulse input is sensed on the rising edge of CPV and stored in the first stage of shift register, which makes the first scan signal output from the OUT1 pin. While stored data is transferred to the next stage shift register on the rising edge of next CPV, new data of STV1 is sensed and stored simultaneously.

The output pin (OUT1 to OUT960) supplies VGH voltage or VEE voltage to the LCD panel depending on the data stored in the shift register. For normal operation, a VGH voltage is outputted one by one from OUT1 to OUT960 in synchronization with CPV pulse.

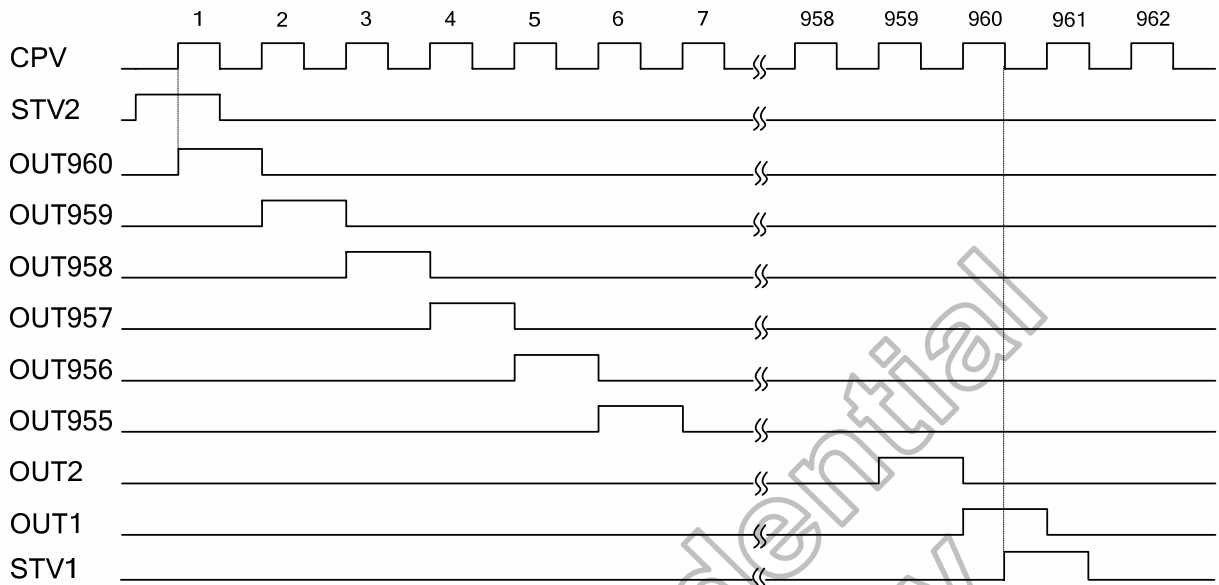
After 960 CPV rising edge, the STV2 goes up to high level on the 960th falling edge of CPV and goes down to low level on the 961st falling edge of CPV. This STV2 output signal becomes the STV1 start pulse input of next cascaded gate driver.

When OE=H, the corresponding output channels are fixed to VEE level regardless of CPV. The channel output returns to normal status as soon as OE goes back to L.

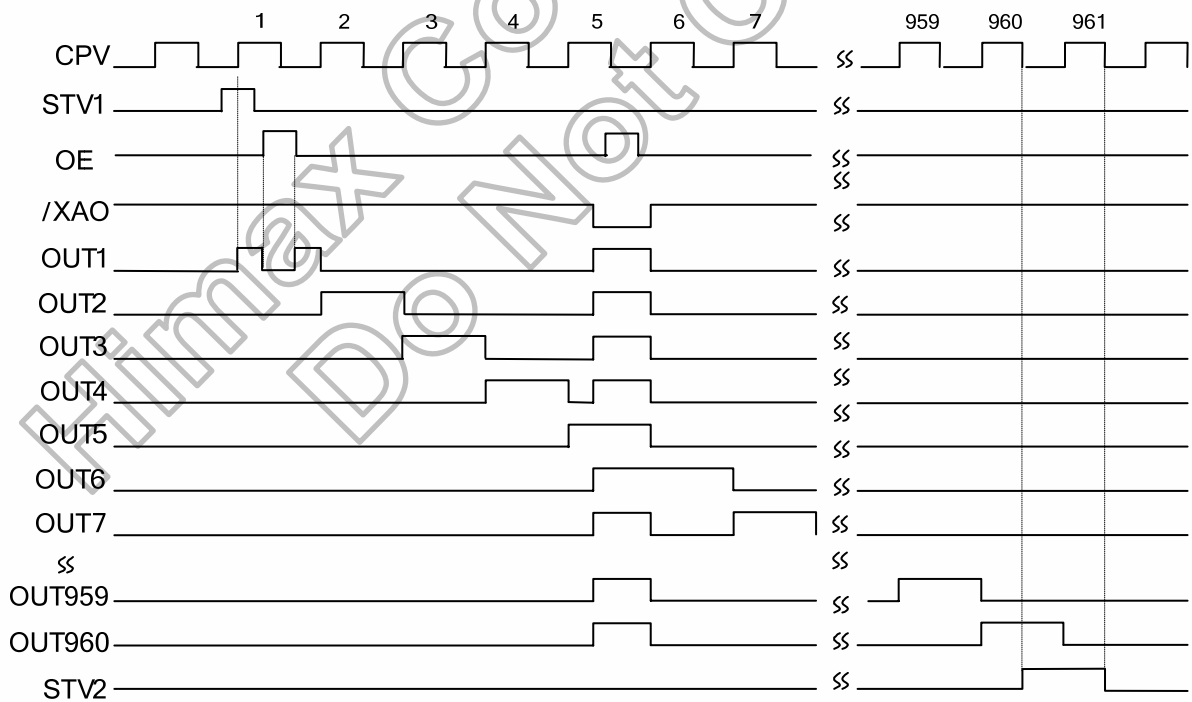
#### Example of input/output timing (MODE0=H, MODE1=H, L/R=H, SEL=H)



Example of input/output timing (MODE0=H, MODE1=H, L/R=L, SEL=H)



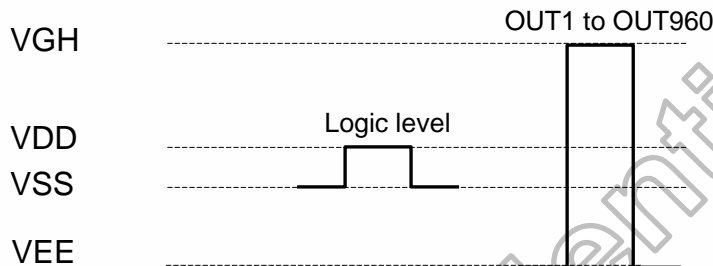
Example of input/output timing (MODE0=H, MODE1=H, L/R=H, SEL=H, with OE & /XAO)



### 5.2 Relationship among L/R, SEL and STV1/STV2

L/R	SEL	Start pulse		Data transfer direction
		Input	Output	
H	H	STV1	STV2	O1→O2→O3→O4 ···→O957→O958→O959→O960
L	H	STV2	STV1	O960→O959→O958→O957 ···→O4→O3→O2→O1

### 5.3 Device power level

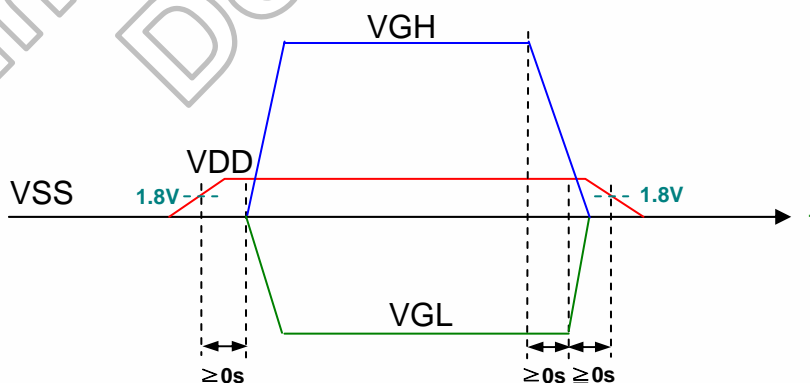


The logic levels of CPV, L/R, OE, /XAO, MODE0, MODE1, SEL, STV1 and STV2 have to swing between VDD for “H” and VSS for “L”.

### 5.4 Power on/off sequence

To prevent device latch up or power on display noise, the power on/off sequence shown below must be followed. After VDD reaches 1.8V, VGH/VGL can start to power on. Before VDD drops to 1.8V, VGH/VGL must start to power down. After VGH/VGL start to power on, CPV and STV should be not floating, and /XAO should be at VDD level or floating. The other control signals have no timing limitation.

When power on: VDD→VGH/VGL  
 When power off: VGH→VGL→VDD



## 6. DC Characteristics

### 6.1 Absolute maximum rating (VSS=0V)

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Power supply voltage 1	VGH	-0.3	-	+42.0	V
Power supply voltage 2	VDD	-0.3	-	+6.0	V
Power supply voltage 3	VEE	VGH-42	-	+0.3	V
Input voltage	V <sub>IN</sub>	-0.3	-	VDD+0.3	V
Storage temperature	T <sub>STG</sub>	-55	-	+125	°C

**Note:** Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

### 6.2 Recommended operating conditions (VSS=0V)

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Power supply voltage 1	VGH	7	25	VEE+40	V
Power supply voltage 2	VDD	2.3	3.3	3.6	V
Power supply voltage 3	VEE	-20	-15	-5	V
Power supply voltage 4	VGH-VEE	12	-	40	V
Operation frequency	F <sub>CPV</sub>	-	50	200	KHz
Operation temperature	T <sub>A</sub>	-40	25	+85	°C



**6.3 Electrical characteristics (VSS=0V)**

Parameter	Symbol	Applicable pin	Condition	Spec.			Unit
				Min.	Typ.	Max.	
Input H voltage	V <sub>IH</sub>	All input pins <sup>(2)</sup>	-	0.7VDD	-	VDD	V
Input L voltage	V <sub>IL</sub>	All input pins <sup>(2)</sup>	-	VSS	-	0.3VDD	
Input H voltage	V <sub>IH</sub>	/XAO		0.8VDD	-	VDD	
Input L voltage	V <sub>IL</sub>	/XAO		VSS	-	0.2VDD	
Output H voltage	V <sub>OH</sub>	STV1,2	I <sub>OH</sub> =40μA	VDD-0.4	-	VDD	
Output L voltage	V <sub>OL</sub>	STV1,2	I <sub>OL</sub> =40μA	VSS	-	VSS+0.4	
Output H resistance	R <sub>OH</sub>	OUT0~ OUT961	V <sub>OUT</sub> = VGH-0.5V	-	-	1000	Ω
Output L resistance	R <sub>OL</sub>	OUT0~ OUT961	V <sub>OUT</sub> = VEE+0.5V	-	-	1000	Ω
Input leakage current	I <sub>IN</sub>	Note <sup>(2)</sup>	-	-5.0	-	+5.0	μA
Pull high resistance	R <sub>PU</sub>	/XAO,MODE, SEL	VDD=3.3V, TA=25C	70	160	400	kΩ
VGH Power consumption	I <sub>VGH</sub>	-	Note <sup>(1)</sup>	-	-	200	μA
VDD Power consumption	I <sub>VDD</sub>	-		-	-	200	

**Note:** (1) Power consumption in the following condition:

Output no load, VGH=20V, VEE=-8V, VDD=3.0V, V<sub>IH</sub>=VDD, V<sub>IL</sub>=VSS, F<sub>CPV</sub>=50KHz, OE=V<sub>IL</sub>, /XAO=V<sub>IH</sub>.

(2) All input pins except /XAO, MODE, SEL

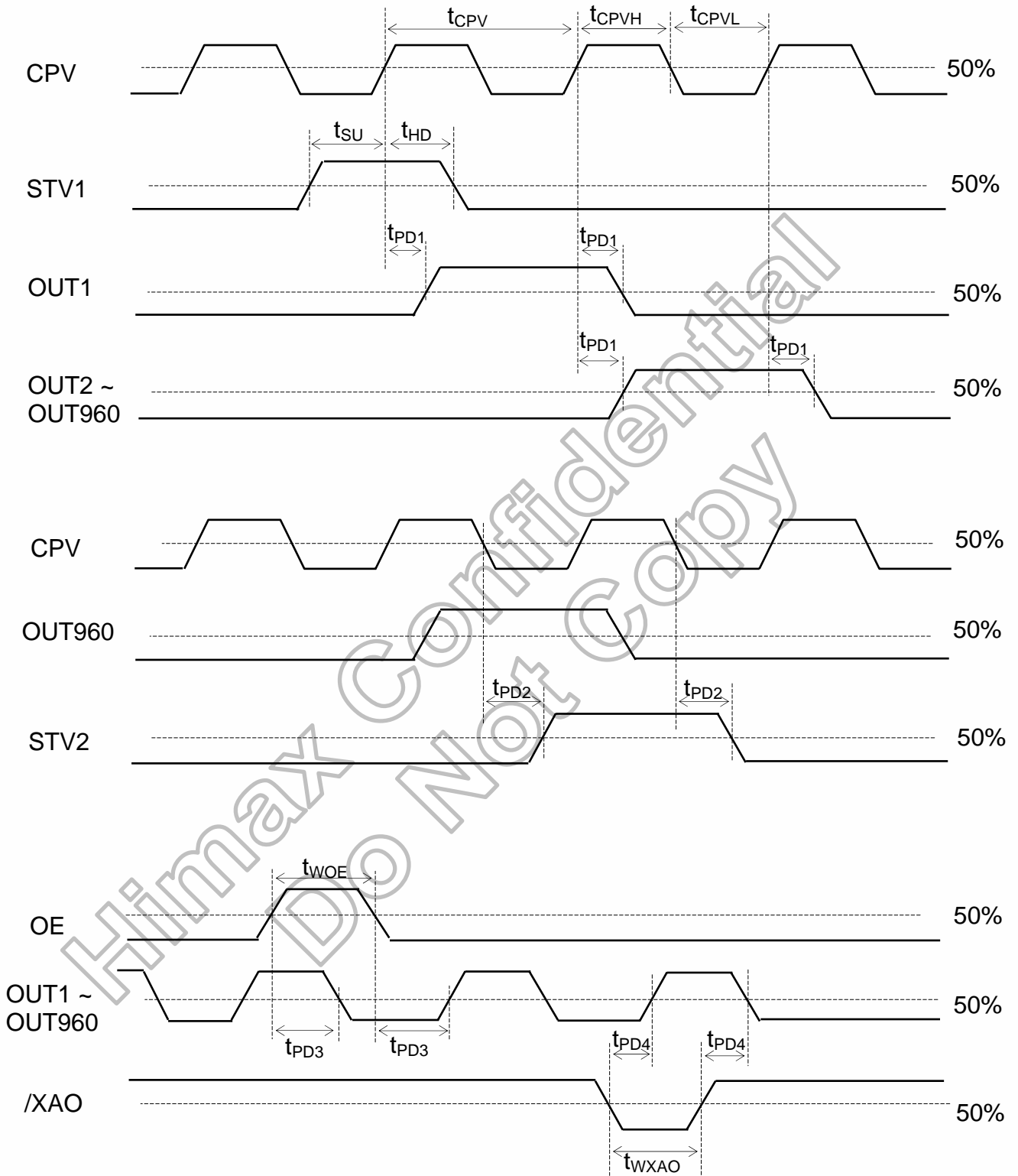
## 7. AC Characteristics

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
CPV period	$t_{CPV}$	-	5	-	-	μs
CPV pulse width	$t_{CPVH}, t_{CPVL}$	50% duty cycle	2.5	-	-	
OE pulse width	$t_{WOE}$	-	1	-	-	
/XAO pulse width	$t_{WXAO}$	-	30	-	-	
Data setup time	$t_{SU}$	-	0.3	-	-	
Data hold time	$t_{HD}$	-	0.3	-	-	
CPV to output delay time	$t_{PD1}$	CL=200pF	-	-	0.9	
Start pulse output delay time	$t_{PD2}$	Loading=20pF	-	-	0.5	
OE to output delay time	$t_{PD3}$	CL=200pF	-	-	0.9	
/XAO to output delay time	$t_{PD4}$	CL=200pF	-	-	50	

**Note:** The measurement point for all of above signals is at 50% of input/output amplitude under Typical condition.

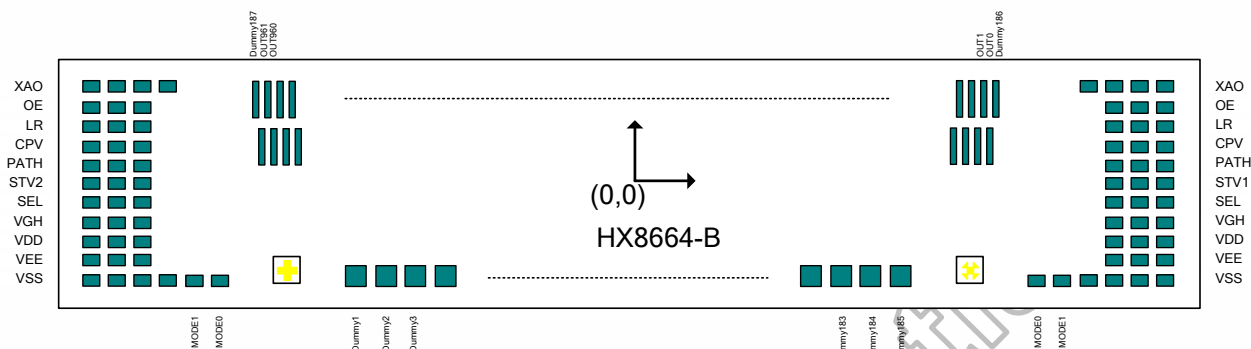
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### 8. Waveform



## 9. Pad Coordinates

### 9.1 HX8664-B gate driver bump location



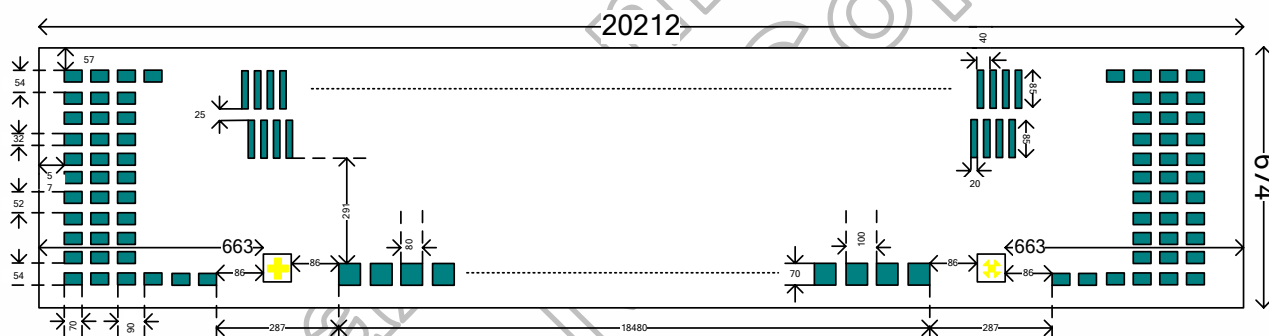
Chip size: 20212  $\mu\text{m}$  x 674 $\mu\text{m}$  (scribe line included)

Scribe line: 80 $\mu\text{m}$

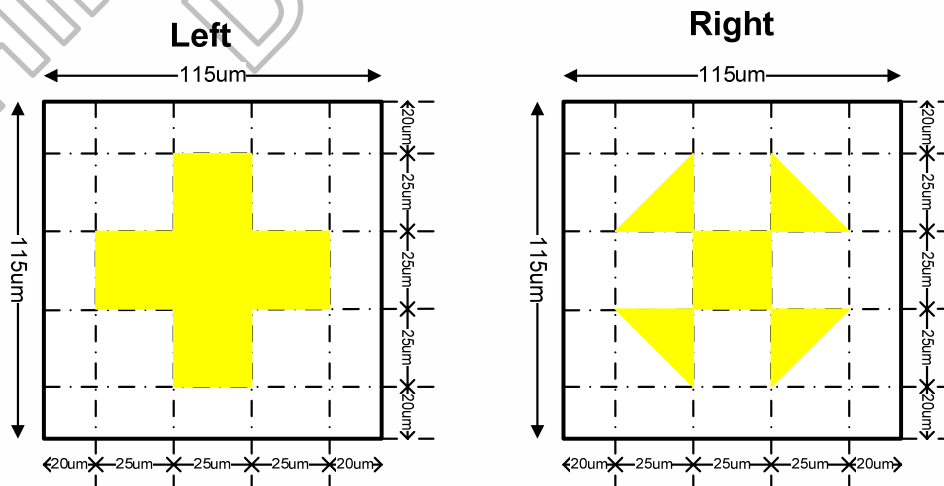
Bump height:  $15 \pm 3\mu\text{m}$

Total area of IC bump: 2840560 $\mu\text{m}^2$

### 9.2 Bump outline dimensions (unit: $\mu\text{m}$ )



### 9.3 Alignment mark



**9.4 Bump center coordinates**

No.	Name	X	Y	Bump size(μm)
1	VSS	-10012	-262	70 X 32
2	VSS	-9922	-262	70 X 32
3	VSS	-9832	-262	70 X 32
4	VSS	-9742	-262	70 X 32
5	MODE1	-9652	-262	70 X 32
6	MODE0	-9562	-262	70 X 32
7	Dummy1	-9200	-243	80 X 70
8	Dummy2	-9100	-243	80 X 70
9	Dummy3	-9000	-243	80 X 70
10	Dummy4	-8900	-243	80 X 70
11	Dummy5	-8800	-243	80 X 70
12	Dummy6	-8700	-243	80 X 70
13	Dummy7	-8600	-243	80 X 70
14	Dummy8	-8500	-243	80 X 70
15	Dummy9	-8400	-243	80 X 70
16	Dummy10	-8300	-243	80 X 70
17	Dummy11	-8200	-243	80 X 70
18	Dummy12	-8100	-243	80 X 70
19	Dummy13	-8000	-243	80 X 70
20	Dummy14	-7900	-243	80 X 70
21	Dummy15	-7800	-243	80 X 70
22	Dummy16	-7700	-243	80 X 70
23	Dummy17	-7600	-243	80 X 70
24	Dummy18	-7500	-243	80 X 70
25	Dummy19	-7400	-243	80 X 70
26	Dummy20	-7300	-243	80 X 70
27	Dummy21	-7200	-243	80 X 70
28	Dummy22	-7100	-243	80 X 70
29	Dummy23	-7000	-243	80 X 70
30	Dummy24	-6900	-243	80 X 70
31	Dummy25	-6800	-243	80 X 70
32	Dummy26	-6700	-243	80 X 70
33	Dummy27	-6600	-243	80 X 70
34	Dummy28	-6500	-243	80 X 70
35	Dummy29	-6400	-243	80 X 70
36	Dummy30	-6300	-243	80 X 70
37	Dummy31	-6200	-243	80 X 70
38	Dummy32	-6100	-243	80 X 70
39	Dummy33	-6000	-243	80 X 70
40	Dummy34	-5900	-243	80 X 70
41	Dummy35	-5800	-243	80 X 70
42	Dummy36	-5700	-243	80 X 70
43	Dummy37	-5600	-243	80 X 70
44	Dummy38	-5500	-243	80 X 70
45	Dummy39	-5400	-243	80 X 70
46	Dummy40	-5300	-243	80 X 70
47	Dummy41	-5200	-243	80 X 70
48	Dummy42	-5100	-243	80 X 70
49	Dummy43	-5000	-243	80 X 70
50	Dummy44	-4900	-243	80 X 70
51	Dummy45	-4800	-243	80 X 70
52	Dummy46	-4700	-243	80 X 70
53	Dummy47	-4600	-243	80 X 70
54	Dummy48	-4500	-243	80 X 70
55	Dummy49	-4400	-243	80 X 70
56	Dummy50	-4300	-243	80 X 70
57	Dummy51	-4200	-243	80 X 70
58	Dummy52	-4100	-243	80 X 70
59	Dummy53	-4000	-243	80 X 70
60	Dummy54	-3900	-243	80 X 70

No.	Name	X	Y	Bump size(μm)
61	Dummy55	-3800	-243	80 X 70
62	Dummy56	-3700	-243	80 X 70
63	Dummy57	-3600	-243	80 X 70
64	Dummy58	-3500	-243	80 X 70
65	Dummy59	-3400	-243	80 X 70
66	Dummy60	-3300	-243	80 X 70
67	Dummy61	-3200	-243	80 X 70
68	Dummy62	-3100	-243	80 X 70
69	Dummy63	-3000	-243	80 X 70
70	Dummy64	-2900	-243	80 X 70
71	Dummy65	-2800	-243	80 X 70
72	Dummy66	-2700	-243	80 X 70
73	Dummy67	-2600	-243	80 X 70
74	Dummy68	-2500	-243	80 X 70
75	Dummy69	-2400	-243	80 X 70
76	Dummy70	-2300	-243	80 X 70
77	Dummy71	-2200	-243	80 X 70
78	Dummy72	-2100	-243	80 X 70
79	Dummy73	-2000	-243	80 X 70
80	Dummy74	-1900	-243	80 X 70
81	Dummy75	-1800	-243	80 X 70
82	Dummy76	-1700	-243	80 X 70
83	Dummy77	-1600	-243	80 X 70
84	Dummy78	-1500	-243	80 X 70
85	Dummy79	-1400	-243	80 X 70
86	Dummy80	-1300	-243	80 X 70
87	Dummy81	-1200	-243	80 X 70
88	Dummy82	-1100	-243	80 X 70
89	Dummy83	-1000	-243	80 X 70
90	Dummy84	-900	-243	80 X 70
91	Dummy85	-800	-243	80 X 70
92	Dummy86	-700	-243	80 X 70
93	Dummy87	-600	-243	80 X 70
94	Dummy88	-500	-243	80 X 70
95	Dummy89	-400	-243	80 X 70
96	Dummy90	-300	-243	80 X 70
97	Dummy91	-200	-243	80 X 70
98	Dummy92	-100	-243	80 X 70
99	Dummy93	0	-243	80 X 70
100	Dummy94	100	-243	80 X 70
101	Dummy95	200	-243	80 X 70
102	Dummy96	300	-243	80 X 70
103	Dummy97	400	-243	80 X 70
104	Dummy98	500	-243	80 X 70
105	Dummy99	600	-243	80 X 70
106	Dummy100	700	-243	80 X 70
107	Dummy101	800	-243	80 X 70
108	Dummy102	900	-243	80 X 70
109	Dummy103	1000	-243	80 X 70
110	Dummy104	1100	-243	80 X 70
111	Dummy105	1200	-243	80 X 70
112	Dummy106	1300	-243	80 X 70
113	Dummy107	1400	-243	80 X 70
114	Dummy108	1500	-243	80 X 70
115	Dummy109	1600	-243	80 X 70
116	Dummy110	1700	-243	80 X 70
117	Dummy111	1800	-243	80 X 70
118	Dummy112	1900	-243	80 X 70
119	Dummy113	2000	-243	80 X 70
120	Dummy114	2100	-243	80 X 70

No.	Name	X	Y	Bump size(μm)
121	Dummy115	2200	-243	80 X 70
122	Dummy116	2300	-243	80 X 70
123	Dummy117	2400	-243	80 X 70
124	Dummy118	2500	-243	80 X 70
125	Dummy119	2600	-243	80 X 70
126	Dummy120	2700	-243	80 X 70
127	Dummy121	2800	-243	80 X 70
128	Dummy122	2900	-243	80 X 70
129	Dummy123	3000	-243	80 X 70
130	Dummy124	3100	-243	80 X 70
131	Dummy125	3200	-243	80 X 70
132	Dummy126	3300	-243	80 X 70
133	Dummy127	3400	-243	80 X 70
134	Dummy128	3500	-243	80 X 70
135	Dummy129	3600	-243	80 X 70
136	Dummy130	3700	-243	80 X 70
137	Dummy131	3800	-243	80 X 70
138	Dummy132	3900	-243	80 X 70
139	Dummy133	4000	-243	80 X 70
140	Dummy134	4100	-243	80 X 70
141	Dummy135	4200	-243	80 X 70
142	Dummy136	4300	-243	80 X 70
143	Dummy137	4400	-243	80 X 70
144	Dummy138	4500	-243	80 X 70
145	Dummy139	4600	-243	80 X 70
146	Dummy140	4700	-243	80 X 70
147	Dummy141	4800	-243	80 X 70
148	Dummy142	4900	-243	80 X 70
149	Dummy143	5000	-243	80 X 70
150	Dummy144	5100	-243	80 X 70
151	Dummy145	5200	-243	80 X 70
152	Dummy146	5300	-243	80 X 70
153	Dummy147	5400	-243	80 X 70
154	Dummy148	5500	-243	80 X 70
155	Dummy149	5600	-243	80 X 70
156	Dummy150	5700	-243	80 X 70
157	Dummy151	5800	-243	80 X 70
158	Dummy152	5900	-243	80 X 70
159	Dummy153	6000	-243	80 X 70
160	Dummy154	6100	-243	80 X 70
161	Dummy155	6200	-243	80 X 70
162	Dummy156	6300	-243	80 X 70
163	Dummy157	6400	-243	80 X 70
164	Dummy158	6500	-243	80 X 70
165	Dummy159	6600	-243	80 X 70
166	Dummy160	6700	-243	80 X 70
167	Dummy161	6800	-243	80 X 70
168	Dummy162	6900	-243	80 X 70
169	Dummy163	7000	-243	80 X 70
170	Dummy164	7100	-243	80 X 70
171	Dummy165	7200	-243	80 X 70
172	Dummy166	7300	-243	80 X 70
173	Dummy167	7400	-243	80 X 70
174	Dummy168	7500	-243	80 X 70
175	Dummy169	7600	-243	80 X 70
176	Dummy170	7700	-243	80 X 70
177	Dummy171	7800	-243	80 X 70
178	Dummy172	7900	-243	80 X 70
179	Dummy173	8000	-243	80 X 70
180	Dummy174	8100	-243	80 X 70

No.	Name	X	Y	Bump size(μm)
181	Dummy175	8200	-243	80 X 70
182	Dummy176	8300	-243	80 X 70
183	Dummy177	8400	-243	80 X 70
184	Dummy178	8500	-243	80 X 70
185	Dummy179	8600	-243	80 X 70
186	Dummy180	8700	-243	80 X 70
187	Dummy181	8800	-243	80 X 70
188	Dummy182	8900	-243	80 X 70
189	Dummy183	9000	-243	80 X 70
190	Dummy184	9100	-243	80 X 70
191	Dummy185	9200	-243	80 X 70
192	MODE0	9562	-262	70 X 32
193	MODE1	9652	-262	70 X 32
194	VSS	9742	-262	70 X 32
195	VSS	9832	-262	70 X 32
196	VSS	9922	-262	70 X 32
197	VSS	10012	-262	70 X 32
198	VEE	9832	-208	70 X 32
199	VEE	9922	-208	70 X 32
200	VEE	10012	-208	70 X 32
201	VDD	9832	-156	70 X 32
202	VDD	9922	-156	70 X 32
203	VDD	10012	-156	70 X 32
204	VGH	9832	-104	70 X 32
205	VGH	9922	-104	70 X 32
206	VGH	10012	-104	70 X 32
207	SEL	9832	-52	70 X 32
208	SEL	9922	-52	70 X 32
209	SEL	10012	-52	70 X 32
210	STV1	9832	0	70 X 32
211	STV1	9922	0	70 X 32
212	STV1	10012	0	70 X 32
213	PATH	9832	52	70 X 32
214	PATH	9922	52	70 X 32
215	PATH	10012	52	70 X 32
216	CPV	9832	104	70 X 32
217	CPV	9922	104	70 X 32
218	CPV	10012	104	70 X 32
219	LR	9832	156	70 X 32
220	LR	9922	156	70 X 32
221	LR	10012	156	70 X 32
222	OE	9832	208	70 X 32
223	OE	9922	208	70 X 32
224	OE	10012	208	70 X 32
225	XAO	9742	262	70 X 32
226	XAO	9832	262	70 X 32
227	XAO	9922	262	70 X 32
228	XAO	10012	262	70 X 32
229	Dummy186	9640	235.5	20 X 85
230	OUT0	9600	235.5	20 X 85
231	OUT1	9580	125.5	20 X 85
232	OUT2	9560	235.5	20 X 85
233	OUT3	9540	125.5	20 X 85
234	OUT4	9520	235.5	20 X 85
235	OUT5	9500	125.5	20 X 85
236	OUT6	9480	235.5	20 X 85
237	OUT7	9460	125.5	20 X 85
238	OUT8	9440	235.5	20 X 85
239	OUT9	9420	125.5	20 X 85
240	OUT10	9400	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
241	OUT11	9380	125.5	20 X 85
242	OUT12	9360	235.5	20 X 85
243	OUT13	9340	125.5	20 X 85
244	OUT14	9320	235.5	20 X 85
245	OUT15	9300	125.5	20 X 85
246	OUT16	9280	235.5	20 X 85
247	OUT17	9260	125.5	20 X 85
248	OUT18	9240	235.5	20 X 85
249	OUT19	9220	125.5	20 X 85
250	OUT20	9200	235.5	20 X 85
251	OUT21	9180	125.5	20 X 85
252	OUT22	9160	235.5	20 X 85
253	OUT23	9140	125.5	20 X 85
254	OUT24	9120	235.5	20 X 85
255	OUT25	9100	125.5	20 X 85
256	OUT26	9080	235.5	20 X 85
257	OUT27	9060	125.5	20 X 85
258	OUT28	9040	235.5	20 X 85
259	OUT29	9020	125.5	20 X 85
260	OUT30	9000	235.5	20 X 85
261	OUT31	8980	125.5	20 X 85
262	OUT32	8960	235.5	20 X 85
263	OUT33	8940	125.5	20 X 85
264	OUT34	8920	235.5	20 X 85
265	OUT35	8900	125.5	20 X 85
266	OUT36	8880	235.5	20 X 85
267	OUT37	8860	125.5	20 X 85
268	OUT38	8840	235.5	20 X 85
269	OUT39	8820	125.5	20 X 85
270	OUT40	8800	235.5	20 X 85
271	OUT41	8780	125.5	20 X 85
272	OUT42	8760	235.5	20 X 85
273	OUT43	8740	125.5	20 X 85
274	OUT44	8720	235.5	20 X 85
275	OUT45	8700	125.5	20 X 85
276	OUT46	8680	235.5	20 X 85
277	OUT47	8660	125.5	20 X 85
278	OUT48	8640	235.5	20 X 85
279	OUT49	8620	125.5	20 X 85
280	OUT50	8600	235.5	20 X 85
281	OUT51	8580	125.5	20 X 85
282	OUT52	8560	235.5	20 X 85
283	OUT53	8540	125.5	20 X 85
284	OUT54	8520	235.5	20 X 85
285	OUT55	8500	125.5	20 X 85
286	OUT56	8480	235.5	20 X 85
287	OUT57	8460	125.5	20 X 85
288	OUT58	8440	235.5	20 X 85
289	OUT59	8420	125.5	20 X 85
290	OUT60	8400	235.5	20 X 85
291	OUT61	8380	125.5	20 X 85
292	OUT62	8360	235.5	20 X 85
293	OUT63	8340	125.5	20 X 85
294	OUT64	8320	235.5	20 X 85
295	OUT65	8300	125.5	20 X 85
296	OUT66	8280	235.5	20 X 85
297	OUT67	8260	125.5	20 X 85
298	OUT68	8240	235.5	20 X 85
299	OUT69	8220	125.5	20 X 85
300	OUT70	8200	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
301	OUT71	8180	125.5	20 X 85
302	OUT72	8160	235.5	20 X 85
303	OUT73	8140	125.5	20 X 85
304	OUT74	8120	235.5	20 X 85
305	OUT75	8100	125.5	20 X 85
306	OUT76	8080	235.5	20 X 85
307	OUT77	8060	125.5	20 X 85
308	OUT78	8040	235.5	20 X 85
309	OUT79	8020	125.5	20 X 85
310	OUT80	8000	235.5	20 X 85
311	OUT81	7980	125.5	20 X 85
312	OUT82	7960	235.5	20 X 85
313	OUT83	7940	125.5	20 X 85
314	OUT84	7920	235.5	20 X 85
315	OUT85	7900	125.5	20 X 85
316	OUT86	7880	235.5	20 X 85
317	OUT87	7860	125.5	20 X 85
318	OUT88	7840	235.5	20 X 85
319	OUT89	7820	125.5	20 X 85
320	OUT90	7800	235.5	20 X 85
321	OUT91	7780	125.5	20 X 85
322	OUT92	7760	235.5	20 X 85
323	OUT93	7740	125.5	20 X 85
324	OUT94	7720	235.5	20 X 85
325	OUT95	7700	125.5	20 X 85
326	OUT96	7680	235.5	20 X 85
327	OUT97	7660	125.5	20 X 85
328	OUT98	7640	235.5	20 X 85
329	OUT99	7620	125.5	20 X 85
330	OUT100	7600	235.5	20 X 85
331	OUT101	7580	125.5	20 X 85
332	OUT102	7560	235.5	20 X 85
333	OUT103	7540	125.5	20 X 85
334	OUT104	7520	235.5	20 X 85
335	OUT105	7500	125.5	20 X 85
336	OUT106	7480	235.5	20 X 85
337	OUT107	7460	125.5	20 X 85
338	OUT108	7440	235.5	20 X 85
339	OUT109	7420	125.5	20 X 85
340	OUT110	7400	235.5	20 X 85
341	OUT111	7380	125.5	20 X 85
342	OUT112	7360	235.5	20 X 85
343	OUT113	7340	125.5	20 X 85
344	OUT114	7320	235.5	20 X 85
345	OUT115	7300	125.5	20 X 85
346	OUT116	7280	235.5	20 X 85
347	OUT117	7260	125.5	20 X 85
348	OUT118	7240	235.5	20 X 85
349	OUT119	7220	125.5	20 X 85
350	OUT120	7200	235.5	20 X 85
351	OUT121	7180	125.5	20 X 85
352	OUT122	7160	235.5	20 X 85
353	OUT123	7140	125.5	20 X 85
354	OUT124	7120	235.5	20 X 85
355	OUT125	7100	125.5	20 X 85
356	OUT126	7080	235.5	20 X 85
357	OUT127	7060	125.5	20 X 85
358	OUT128	7040	235.5	20 X 85
359	OUT129	7020	125.5	20 X 85
360	OUT130	7000	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
361	OUT131	6980	125.5	20 X 85
362	OUT132	6960	235.5	20 X 85
363	OUT133	6940	125.5	20 X 85
364	OUT134	6920	235.5	20 X 85
365	OUT135	6900	125.5	20 X 85
366	OUT136	6880	235.5	20 X 85
367	OUT137	6860	125.5	20 X 85
368	OUT138	6840	235.5	20 X 85
369	OUT139	6820	125.5	20 X 85
370	OUT140	6800	235.5	20 X 85
371	OUT141	6780	125.5	20 X 85
372	OUT142	6760	235.5	20 X 85
373	OUT143	6740	125.5	20 X 85
374	OUT144	6720	235.5	20 X 85
375	OUT145	6700	125.5	20 X 85
376	OUT146	6680	235.5	20 X 85
377	OUT147	6660	125.5	20 X 85
378	OUT148	6640	235.5	20 X 85
379	OUT149	6620	125.5	20 X 85
380	OUT150	6600	235.5	20 X 85
381	OUT151	6580	125.5	20 X 85
382	OUT152	6560	235.5	20 X 85
383	OUT153	6540	125.5	20 X 85
384	OUT154	6520	235.5	20 X 85
385	OUT155	6500	125.5	20 X 85
386	OUT156	6480	235.5	20 X 85
387	OUT157	6460	125.5	20 X 85
388	OUT158	6440	235.5	20 X 85
389	OUT159	6420	125.5	20 X 85
390	OUT160	6400	235.5	20 X 85
391	OUT161	6380	125.5	20 X 85
392	OUT162	6360	235.5	20 X 85
393	OUT163	6340	125.5	20 X 85
394	OUT164	6320	235.5	20 X 85
395	OUT165	6300	125.5	20 X 85
396	OUT166	6280	235.5	20 X 85
397	OUT167	6260	125.5	20 X 85
398	OUT168	6240	235.5	20 X 85
399	OUT169	6220	125.5	20 X 85
400	OUT170	6200	235.5	20 X 85
401	OUT171	6180	125.5	20 X 85
402	OUT172	6160	235.5	20 X 85
403	OUT173	6140	125.5	20 X 85
404	OUT174	6120	235.5	20 X 85
405	OUT175	6100	125.5	20 X 85
406	OUT176	6080	235.5	20 X 85
407	OUT177	6060	125.5	20 X 85
408	OUT178	6040	235.5	20 X 85
409	OUT179	6020	125.5	20 X 85
410	OUT180	6000	235.5	20 X 85
411	OUT181	5980	125.5	20 X 85
412	OUT182	5960	235.5	20 X 85
413	OUT183	5940	125.5	20 X 85
414	OUT184	5920	235.5	20 X 85
415	OUT185	5900	125.5	20 X 85
416	OUT186	5880	235.5	20 X 85
417	OUT187	5860	125.5	20 X 85
418	OUT188	5840	235.5	20 X 85
419	OUT189	5820	125.5	20 X 85
420	OUT190	5800	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
421	OUT191	5780	125.5	20 X 85
422	OUT192	5760	235.5	20 X 85
423	OUT193	5740	125.5	20 X 85
424	OUT194	5720	235.5	20 X 85
425	OUT195	5700	125.5	20 X 85
426	OUT196	5680	235.5	20 X 85
427	OUT197	5660	125.5	20 X 85
428	OUT198	5640	235.5	20 X 85
429	OUT199	5620	125.5	20 X 85
430	OUT200	5600	235.5	20 X 85
431	OUT201	5580	125.5	20 X 85
432	OUT202	5560	235.5	20 X 85
433	OUT203	5540	125.5	20 X 85
434	OUT204	5520	235.5	20 X 85
435	OUT205	5500	125.5	20 X 85
436	OUT206	5480	235.5	20 X 85
437	OUT207	5460	125.5	20 X 85
438	OUT208	5440	235.5	20 X 85
439	OUT209	5420	125.5	20 X 85
440	OUT210	5400	235.5	20 X 85
441	OUT211	5380	125.5	20 X 85
442	OUT212	5360	235.5	20 X 85
443	OUT213	5340	125.5	20 X 85
444	OUT214	5320	235.5	20 X 85
445	OUT215	5300	125.5	20 X 85
446	OUT216	5280	235.5	20 X 85
447	OUT217	5260	125.5	20 X 85
448	OUT218	5240	235.5	20 X 85
449	OUT219	5220	125.5	20 X 85
450	OUT220	5200	235.5	20 X 85
451	OUT221	5180	125.5	20 X 85
452	OUT222	5160	235.5	20 X 85
453	OUT223	5140	125.5	20 X 85
454	OUT224	5120	235.5	20 X 85
455	OUT225	5100	125.5	20 X 85
456	OUT226	5080	235.5	20 X 85
457	OUT227	5060	125.5	20 X 85
458	OUT228	5040	235.5	20 X 85
459	OUT229	5020	125.5	20 X 85
460	OUT230	5000	235.5	20 X 85
461	OUT231	4980	125.5	20 X 85
462	OUT232	4960	235.5	20 X 85
463	OUT233	4940	125.5	20 X 85
464	OUT234	4920	235.5	20 X 85
465	OUT235	4900	125.5	20 X 85
466	OUT236	4880	235.5	20 X 85
467	OUT237	4860	125.5	20 X 85
468	OUT238	4840	235.5	20 X 85
469	OUT239	4820	125.5	20 X 85
470	OUT240	4800	235.5	20 X 85
471	OUT241	4780	125.5	20 X 85
472	OUT242	4760	235.5	20 X 85
473	OUT243	4740	125.5	20 X 85
474	OUT244	4720	235.5	20 X 85
475	OUT245	4700	125.5	20 X 85
476	OUT246	4680	235.5	20 X 85
477	OUT247	4660	125.5	20 X 85
478	OUT248	4640	235.5	20 X 85
479	OUT249	4620	125.5	20 X 85
480	OUT250	4600	235.5	20 X 85



No.	Name	X	Y	Bump size(μm)
481	OUT251	4580	125.5	20 X 85
482	OUT252	4560	235.5	20 X 85
483	OUT253	4540	125.5	20 X 85
484	OUT254	4520	235.5	20 X 85
485	OUT255	4500	125.5	20 X 85
486	OUT256	4480	235.5	20 X 85
487	OUT257	4460	125.5	20 X 85
488	OUT258	4440	235.5	20 X 85
489	OUT259	4420	125.5	20 X 85
490	OUT260	4400	235.5	20 X 85
491	OUT261	4380	125.5	20 X 85
492	OUT262	4360	235.5	20 X 85
493	OUT263	4340	125.5	20 X 85
494	OUT264	4320	235.5	20 X 85
495	OUT265	4300	125.5	20 X 85
496	OUT266	4280	235.5	20 X 85
497	OUT267	4260	125.5	20 X 85
498	OUT268	4240	235.5	20 X 85
499	OUT269	4220	125.5	20 X 85
500	OUT270	4200	235.5	20 X 85
501	OUT271	4180	125.5	20 X 85
502	OUT272	4160	235.5	20 X 85
503	OUT273	4140	125.5	20 X 85
504	OUT274	4120	235.5	20 X 85
505	OUT275	4100	125.5	20 X 85
506	OUT276	4080	235.5	20 X 85
507	OUT277	4060	125.5	20 X 85
508	OUT278	4040	235.5	20 X 85
509	OUT279	4020	125.5	20 X 85
510	OUT280	4000	235.5	20 X 85
511	OUT281	3980	125.5	20 X 85
512	OUT282	3960	235.5	20 X 85
513	OUT283	3940	125.5	20 X 85
514	OUT284	3920	235.5	20 X 85
515	OUT285	3900	125.5	20 X 85
516	OUT286	3880	235.5	20 X 85
517	OUT287	3860	125.5	20 X 85
518	OUT288	3840	235.5	20 X 85
519	OUT289	3820	125.5	20 X 85
520	OUT290	3800	235.5	20 X 85
521	OUT291	3780	125.5	20 X 85
522	OUT292	3760	235.5	20 X 85
523	OUT293	3740	125.5	20 X 85
524	OUT294	3720	235.5	20 X 85
525	OUT295	3700	125.5	20 X 85
526	OUT296	3680	235.5	20 X 85
527	OUT297	3660	125.5	20 X 85
528	OUT298	3640	235.5	20 X 85
529	OUT299	3620	125.5	20 X 85
530	OUT300	3600	235.5	20 X 85
531	OUT301	3580	125.5	20 X 85
532	OUT302	3560	235.5	20 X 85
533	OUT303	3540	125.5	20 X 85
534	OUT304	3520	235.5	20 X 85
535	OUT305	3500	125.5	20 X 85
536	OUT306	3480	235.5	20 X 85
537	OUT307	3460	125.5	20 X 85
538	OUT308	3440	235.5	20 X 85
539	OUT309	3420	125.5	20 X 85
540	OUT310	3400	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
541	OUT311	3380	125.5	20 X 85
542	OUT312	3360	235.5	20 X 85
543	OUT313	3340	125.5	20 X 85
544	OUT314	3320	235.5	20 X 85
545	OUT315	3300	125.5	20 X 85
546	OUT316	3280	235.5	20 X 85
547	OUT317	3260	125.5	20 X 85
548	OUT318	3240	235.5	20 X 85
549	OUT319	3220	125.5	20 X 85
550	OUT320	3200	235.5	20 X 85
551	OUT321	3180	125.5	20 X 85
552	OUT322	3160	235.5	20 X 85
553	OUT323	3140	125.5	20 X 85
554	OUT324	3120	235.5	20 X 85
555	OUT325	3100	125.5	20 X 85
556	OUT326	3080	235.5	20 X 85
557	OUT327	3060	125.5	20 X 85
558	OUT328	3040	235.5	20 X 85
559	OUT329	3020	125.5	20 X 85
560	OUT330	3000	235.5	20 X 85
561	OUT331	2980	125.5	20 X 85
562	OUT332	2960	235.5	20 X 85
563	OUT333	2940	125.5	20 X 85
564	OUT334	2920	235.5	20 X 85
565	OUT335	2900	125.5	20 X 85
566	OUT336	2880	235.5	20 X 85
567	OUT337	2860	125.5	20 X 85
568	OUT338	2840	235.5	20 X 85
569	OUT339	2820	125.5	20 X 85
570	OUT340	2800	235.5	20 X 85
571	OUT341	2780	125.5	20 X 85
572	OUT342	2760	235.5	20 X 85
573	OUT343	2740	125.5	20 X 85
574	OUT344	2720	235.5	20 X 85
575	OUT345	2700	125.5	20 X 85
576	OUT346	2680	235.5	20 X 85
577	OUT347	2660	125.5	20 X 85
578	OUT348	2640	235.5	20 X 85
579	OUT349	2620	125.5	20 X 85
580	OUT350	2600	235.5	20 X 85
581	OUT351	2580	125.5	20 X 85
582	OUT352	2560	235.5	20 X 85
583	OUT353	2540	125.5	20 X 85
584	OUT354	2520	235.5	20 X 85
585	OUT355	2500	125.5	20 X 85
586	OUT356	2480	235.5	20 X 85
587	OUT357	2460	125.5	20 X 85
588	OUT358	2440	235.5	20 X 85
589	OUT359	2420	125.5	20 X 85
590	OUT360	2400	235.5	20 X 85
591	OUT361	2380	125.5	20 X 85
592	OUT362	2360	235.5	20 X 85
593	OUT363	2340	125.5	20 X 85
594	OUT364	2320	235.5	20 X 85
595	OUT365	2300	125.5	20 X 85
596	OUT366	2280	235.5	20 X 85
597	OUT367	2260	125.5	20 X 85
598	OUT368	2240	235.5	20 X 85
599	OUT369	2220	125.5	20 X 85
600	OUT370	2200	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
601	OUT371	2180	125.5	20 X 85
602	OUT372	2160	235.5	20 X 85
603	OUT373	2140	125.5	20 X 85
604	OUT374	2120	235.5	20 X 85
605	OUT375	2100	125.5	20 X 85
606	OUT376	2080	235.5	20 X 85
607	OUT377	2060	125.5	20 X 85
608	OUT378	2040	235.5	20 X 85
609	OUT379	2020	125.5	20 X 85
610	OUT380	2000	235.5	20 X 85
611	OUT381	1980	125.5	20 X 85
612	OUT382	1960	235.5	20 X 85
613	OUT383	1940	125.5	20 X 85
614	OUT384	1920	235.5	20 X 85
615	OUT385	1900	125.5	20 X 85
616	OUT386	1880	235.5	20 X 85
617	OUT387	1860	125.5	20 X 85
618	OUT388	1840	235.5	20 X 85
619	OUT389	1820	125.5	20 X 85
620	OUT390	1800	235.5	20 X 85
621	OUT391	1780	125.5	20 X 85
622	OUT392	1760	235.5	20 X 85
623	OUT393	1740	125.5	20 X 85
624	OUT394	1720	235.5	20 X 85
625	OUT395	1700	125.5	20 X 85
626	OUT396	1680	235.5	20 X 85
627	OUT397	1660	125.5	20 X 85
628	OUT398	1640	235.5	20 X 85
629	OUT399	1620	125.5	20 X 85
630	OUT400	1600	235.5	20 X 85
631	OUT401	1580	125.5	20 X 85
632	OUT402	1560	235.5	20 X 85
633	OUT403	1540	125.5	20 X 85
634	OUT404	1520	235.5	20 X 85
635	OUT405	1500	125.5	20 X 85
636	OUT406	1480	235.5	20 X 85
637	OUT407	1460	125.5	20 X 85
638	OUT408	1440	235.5	20 X 85
639	OUT409	1420	125.5	20 X 85
640	OUT410	1400	235.5	20 X 85
641	OUT411	1380	125.5	20 X 85
642	OUT412	1360	235.5	20 X 85
643	OUT413	1340	125.5	20 X 85
644	OUT414	1320	235.5	20 X 85
645	OUT415	1300	125.5	20 X 85
646	OUT416	1280	235.5	20 X 85
647	OUT417	1260	125.5	20 X 85
648	OUT418	1240	235.5	20 X 85
649	OUT419	1220	125.5	20 X 85
650	OUT420	1200	235.5	20 X 85
651	OUT421	1180	125.5	20 X 85
652	OUT422	1160	235.5	20 X 85
653	OUT423	1140	125.5	20 X 85
654	OUT424	1120	235.5	20 X 85
655	OUT425	1100	125.5	20 X 85
656	OUT426	1080	235.5	20 X 85
657	OUT427	1060	125.5	20 X 85
658	OUT428	1040	235.5	20 X 85
659	OUT429	1020	125.5	20 X 85
660	OUT430	1000	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
661	OUT431	980	125.5	20 X 85
662	OUT432	960	235.5	20 X 85
663	OUT433	940	125.5	20 X 85
664	OUT434	920	235.5	20 X 85
665	OUT435	900	125.5	20 X 85
666	OUT436	880	235.5	20 X 85
667	OUT437	860	125.5	20 X 85
668	OUT438	840	235.5	20 X 85
669	OUT439	820	125.5	20 X 85
670	OUT440	800	235.5	20 X 85
671	OUT441	780	125.5	20 X 85
672	OUT442	760	235.5	20 X 85
673	OUT443	740	125.5	20 X 85
674	OUT444	720	235.5	20 X 85
675	OUT445	700	125.5	20 X 85
676	OUT446	680	235.5	20 X 85
677	OUT447	660	125.5	20 X 85
678	OUT448	640	235.5	20 X 85
679	OUT449	620	125.5	20 X 85
680	OUT450	600	235.5	20 X 85
681	OUT451	580	125.5	20 X 85
682	OUT452	560	235.5	20 X 85
683	OUT453	540	125.5	20 X 85
684	OUT454	520	235.5	20 X 85
685	OUT455	500	125.5	20 X 85
686	OUT456	480	235.5	20 X 85
687	OUT457	460	125.5	20 X 85
688	OUT458	440	235.5	20 X 85
689	OUT459	420	125.5	20 X 85
690	OUT460	400	235.5	20 X 85
691	OUT461	380	125.5	20 X 85
692	OUT462	360	235.5	20 X 85
693	OUT463	340	125.5	20 X 85
694	OUT464	320	235.5	20 X 85
695	OUT465	300	125.5	20 X 85
696	OUT466	280	235.5	20 X 85
697	OUT467	260	125.5	20 X 85
698	OUT468	240	235.5	20 X 85
699	OUT469	220	125.5	20 X 85
700	OUT470	200	235.5	20 X 85
701	OUT471	180	125.5	20 X 85
702	OUT472	160	235.5	20 X 85
703	OUT473	140	125.5	20 X 85
704	OUT474	120	235.5	20 X 85
705	OUT475	100	125.5	20 X 85
706	OUT476	80	235.5	20 X 85
707	OUT477	60	125.5	20 X 85
708	OUT478	40	235.5	20 X 85
709	OUT479	20	125.5	20 X 85
710	OUT480	0	235.5	20 X 85
711	OUT481	-20	125.5	20 X 85
712	OUT482	-40	235.5	20 X 85
713	OUT483	-60	125.5	20 X 85
714	OUT484	-80	235.5	20 X 85
715	OUT485	-100	125.5	20 X 85
716	OUT486	-120	235.5	20 X 85
717	OUT487	-140	125.5	20 X 85
718	OUT488	-160	235.5	20 X 85
719	OUT489	-180	125.5	20 X 85
720	OUT490	-200	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
721	OUT491	-220	125.5	20 X 85
722	OUT492	-240	235.5	20 X 85
723	OUT493	-260	125.5	20 X 85
724	OUT494	-280	235.5	20 X 85
725	OUT495	-300	125.5	20 X 85
726	OUT496	-320	235.5	20 X 85
727	OUT497	-340	125.5	20 X 85
728	OUT498	-360	235.5	20 X 85
729	OUT499	-380	125.5	20 X 85
730	OUT500	-400	235.5	20 X 85
731	OUT501	-420	125.5	20 X 85
732	OUT502	-440	235.5	20 X 85
733	OUT503	-460	125.5	20 X 85
734	OUT504	-480	235.5	20 X 85
735	OUT505	-500	125.5	20 X 85
736	OUT506	-520	235.5	20 X 85
737	OUT507	-540	125.5	20 X 85
738	OUT508	-560	235.5	20 X 85
739	OUT509	-580	125.5	20 X 85
740	OUT510	-600	235.5	20 X 85
741	OUT511	-620	125.5	20 X 85
742	OUT512	-640	235.5	20 X 85
743	OUT513	-660	125.5	20 X 85
744	OUT514	-680	235.5	20 X 85
745	OUT515	-700	125.5	20 X 85
746	OUT516	-720	235.5	20 X 85
747	OUT517	-740	125.5	20 X 85
748	OUT518	-760	235.5	20 X 85
749	OUT519	-780	125.5	20 X 85
750	OUT520	-800	235.5	20 X 85
751	OUT521	-820	125.5	20 X 85
752	OUT522	-840	235.5	20 X 85
753	OUT523	-860	125.5	20 X 85
754	OUT524	-880	235.5	20 X 85
755	OUT525	-900	125.5	20 X 85
756	OUT526	-920	235.5	20 X 85
757	OUT527	-940	125.5	20 X 85
758	OUT528	-960	235.5	20 X 85
759	OUT529	-980	125.5	20 X 85
760	OUT530	-1000	235.5	20 X 85
761	OUT531	-1020	125.5	20 X 85
762	OUT532	-1040	235.5	20 X 85
763	OUT533	-1060	125.5	20 X 85
764	OUT534	-1080	235.5	20 X 85
765	OUT535	-1100	125.5	20 X 85
766	OUT536	-1120	235.5	20 X 85
767	OUT537	-1140	125.5	20 X 85
768	OUT538	-1160	235.5	20 X 85
769	OUT539	-1180	125.5	20 X 85
770	OUT540	-1200	235.5	20 X 85
771	OUT541	-1220	125.5	20 X 85
772	OUT542	-1240	235.5	20 X 85
773	OUT543	-1260	125.5	20 X 85
774	OUT544	-1280	235.5	20 X 85
775	OUT545	-1300	125.5	20 X 85
776	OUT546	-1320	235.5	20 X 85
777	OUT547	-1340	125.5	20 X 85
778	OUT548	-1360	235.5	20 X 85
779	OUT549	-1380	125.5	20 X 85
780	OUT550	-1400	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
781	OUT551	-1420	125.5	20 X 85
782	OUT552	-1440	235.5	20 X 85
783	OUT553	-1460	125.5	20 X 85
784	OUT554	-1480	235.5	20 X 85
785	OUT555	-1500	125.5	20 X 85
786	OUT556	-1520	235.5	20 X 85
787	OUT557	-1540	125.5	20 X 85
788	OUT558	-1560	235.5	20 X 85
789	OUT559	-1580	125.5	20 X 85
790	OUT560	-1600	235.5	20 X 85
791	OUT561	-1620	125.5	20 X 85
792	OUT562	-1640	235.5	20 X 85
793	OUT563	-1660	125.5	20 X 85
794	OUT564	-1680	235.5	20 X 85
795	OUT565	-1700	125.5	20 X 85
796	OUT566	-1720	235.5	20 X 85
797	OUT567	-1740	125.5	20 X 85
798	OUT568	-1760	235.5	20 X 85
799	OUT569	-1780	125.5	20 X 85
800	OUT570	-1800	235.5	20 X 85
801	OUT571	-1820	125.5	20 X 85
802	OUT572	-1840	235.5	20 X 85
803	OUT573	-1860	125.5	20 X 85
804	OUT574	-1880	235.5	20 X 85
805	OUT575	-1900	125.5	20 X 85
806	OUT576	-1920	235.5	20 X 85
807	OUT577	-1940	125.5	20 X 85
808	OUT578	-1960	235.5	20 X 85
809	OUT579	-1980	125.5	20 X 85
810	OUT580	-2000	235.5	20 X 85
811	OUT581	-2020	125.5	20 X 85
812	OUT582	-2040	235.5	20 X 85
813	OUT583	-2060	125.5	20 X 85
814	OUT584	-2080	235.5	20 X 85
815	OUT585	-2100	125.5	20 X 85
816	OUT586	-2120	235.5	20 X 85
817	OUT587	-2140	125.5	20 X 85
818	OUT588	-2160	235.5	20 X 85
819	OUT589	-2180	125.5	20 X 85
820	OUT590	-2200	235.5	20 X 85
821	OUT591	-2220	125.5	20 X 85
822	OUT592	-2240	235.5	20 X 85
823	OUT593	-2260	125.5	20 X 85
824	OUT594	-2280	235.5	20 X 85
825	OUT595	-2300	125.5	20 X 85
826	OUT596	-2320	235.5	20 X 85
827	OUT597	-2340	125.5	20 X 85
828	OUT598	-2360	235.5	20 X 85
829	OUT599	-2380	125.5	20 X 85
830	OUT600	-2400	235.5	20 X 85
831	OUT601	-2420	125.5	20 X 85
832	OUT602	-2440	235.5	20 X 85
833	OUT603	-2460	125.5	20 X 85
834	OUT604	-2480	235.5	20 X 85
835	OUT605	-2500	125.5	20 X 85
836	OUT606	-2520	235.5	20 X 85
837	OUT607	-2540	125.5	20 X 85
838	OUT608	-2560	235.5	20 X 85
839	OUT609	-2580	125.5	20 X 85
840	OUT610	-2600	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
841	OUT611	-2620	125.5	20 X 85
842	OUT612	-2640	235.5	20 X 85
843	OUT613	-2660	125.5	20 X 85
844	OUT614	-2680	235.5	20 X 85
845	OUT615	-2700	125.5	20 X 85
846	OUT616	-2720	235.5	20 X 85
847	OUT617	-2740	125.5	20 X 85
848	OUT618	-2760	235.5	20 X 85
849	OUT619	-2780	125.5	20 X 85
850	OUT620	-2800	235.5	20 X 85
851	OUT621	-2820	125.5	20 X 85
852	OUT622	-2840	235.5	20 X 85
853	OUT623	-2860	125.5	20 X 85
854	OUT624	-2880	235.5	20 X 85
855	OUT625	-2900	125.5	20 X 85
856	OUT626	-2920	235.5	20 X 85
857	OUT627	-2940	125.5	20 X 85
858	OUT628	-2960	235.5	20 X 85
859	OUT629	-2980	125.5	20 X 85
860	OUT630	-3000	235.5	20 X 85
861	OUT631	-3020	125.5	20 X 85
862	OUT632	-3040	235.5	20 X 85
863	OUT633	-3060	125.5	20 X 85
864	OUT634	-3080	235.5	20 X 85
865	OUT635	-3100	125.5	20 X 85
866	OUT636	-3120	235.5	20 X 85
867	OUT637	-3140	125.5	20 X 85
868	OUT638	-3160	235.5	20 X 85
869	OUT639	-3180	125.5	20 X 85
870	OUT640	-3200	235.5	20 X 85
871	OUT641	-3220	125.5	20 X 85
872	OUT642	-3240	235.5	20 X 85
873	OUT643	-3260	125.5	20 X 85
874	OUT644	-3280	235.5	20 X 85
875	OUT645	-3300	125.5	20 X 85
876	OUT646	-3320	235.5	20 X 85
877	OUT647	-3340	125.5	20 X 85
878	OUT648	-3360	235.5	20 X 85
879	OUT649	-3380	125.5	20 X 85
880	OUT650	-3400	235.5	20 X 85
881	OUT651	-3420	125.5	20 X 85
882	OUT652	-3440	235.5	20 X 85
883	OUT653	-3460	125.5	20 X 85
884	OUT654	-3480	235.5	20 X 85
885	OUT655	-3500	125.5	20 X 85
886	OUT656	-3520	235.5	20 X 85
887	OUT657	-3540	125.5	20 X 85
888	OUT658	-3560	235.5	20 X 85
889	OUT659	-3580	125.5	20 X 85
890	OUT660	-3600	235.5	20 X 85
891	OUT661	-3620	125.5	20 X 85
892	OUT662	-3640	235.5	20 X 85
893	OUT663	-3660	125.5	20 X 85
894	OUT664	-3680	235.5	20 X 85
895	OUT665	-3700	125.5	20 X 85
896	OUT666	-3720	235.5	20 X 85
897	OUT667	-3740	125.5	20 X 85
898	OUT668	-3760	235.5	20 X 85
899	OUT669	-3780	125.5	20 X 85
900	OUT670	-3800	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
901	OUT671	-3820	125.5	20 X 85
902	OUT672	-3840	235.5	20 X 85
903	OUT673	-3860	125.5	20 X 85
904	OUT674	-3880	235.5	20 X 85
905	OUT675	-3900	125.5	20 X 85
906	OUT676	-3920	235.5	20 X 85
907	OUT677	-3940	125.5	20 X 85
908	OUT678	-3960	235.5	20 X 85
909	OUT679	-3980	125.5	20 X 85
910	OUT680	-4000	235.5	20 X 85
911	OUT681	-4020	125.5	20 X 85
912	OUT682	-4040	235.5	20 X 85
913	OUT683	-4060	125.5	20 X 85
914	OUT684	-4080	235.5	20 X 85
915	OUT685	-4100	125.5	20 X 85
916	OUT686	-4120	235.5	20 X 85
917	OUT687	-4140	125.5	20 X 85
918	OUT688	-4160	235.5	20 X 85
919	OUT689	-4180	125.5	20 X 85
920	OUT690	-4200	235.5	20 X 85
921	OUT691	-4220	125.5	20 X 85
922	OUT692	-4240	235.5	20 X 85
923	OUT693	-4260	125.5	20 X 85
924	OUT694	-4280	235.5	20 X 85
925	OUT695	-4300	125.5	20 X 85
926	OUT696	-4320	235.5	20 X 85
927	OUT697	-4340	125.5	20 X 85
928	OUT698	-4360	235.5	20 X 85
929	OUT699	-4380	125.5	20 X 85
930	OUT700	-4400	235.5	20 X 85
931	OUT701	-4420	125.5	20 X 85
932	OUT702	-4440	235.5	20 X 85
933	OUT703	-4460	125.5	20 X 85
934	OUT704	-4480	235.5	20 X 85
935	OUT705	-4500	125.5	20 X 85
936	OUT706	-4520	235.5	20 X 85
937	OUT707	-4540	125.5	20 X 85
938	OUT708	-4560	235.5	20 X 85
939	OUT709	-4580	125.5	20 X 85
940	OUT710	-4600	235.5	20 X 85
941	OUT711	-4620	125.5	20 X 85
942	OUT712	-4640	235.5	20 X 85
943	OUT713	-4660	125.5	20 X 85
944	OUT714	-4680	235.5	20 X 85
945	OUT715	-4700	125.5	20 X 85
946	OUT716	-4720	235.5	20 X 85
947	OUT717	-4740	125.5	20 X 85
948	OUT718	-4760	235.5	20 X 85
949	OUT719	-4780	125.5	20 X 85
950	OUT720	-4800	235.5	20 X 85
951	OUT721	-4820	125.5	20 X 85
952	OUT722	-4840	235.5	20 X 85
953	OUT723	-4860	125.5	20 X 85
954	OUT724	-4880	235.5	20 X 85
955	OUT725	-4900	125.5	20 X 85
956	OUT726	-4920	235.5	20 X 85
957	OUT727	-4940	125.5	20 X 85
958	OUT728	-4960	235.5	20 X 85
959	OUT729	-4980	125.5	20 X 85
960	OUT730	-5000	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
961	OUT731	-5020	125.5	20 X 85
962	OUT732	-5040	235.5	20 X 85
963	OUT733	-5060	125.5	20 X 85
964	OUT734	-5080	235.5	20 X 85
965	OUT735	-5100	125.5	20 X 85
966	OUT736	-5120	235.5	20 X 85
967	OUT737	-5140	125.5	20 X 85
968	OUT738	-5160	235.5	20 X 85
969	OUT739	-5180	125.5	20 X 85
970	OUT740	-5200	235.5	20 X 85
971	OUT741	-5220	125.5	20 X 85
972	OUT742	-5240	235.5	20 X 85
973	OUT743	-5260	125.5	20 X 85
974	OUT744	-5280	235.5	20 X 85
975	OUT745	-5300	125.5	20 X 85
976	OUT746	-5320	235.5	20 X 85
977	OUT747	-5340	125.5	20 X 85
978	OUT748	-5360	235.5	20 X 85
979	OUT749	-5380	125.5	20 X 85
980	OUT750	-5400	235.5	20 X 85
981	OUT751	-5420	125.5	20 X 85
982	OUT752	-5440	235.5	20 X 85
983	OUT753	-5460	125.5	20 X 85
984	OUT754	-5480	235.5	20 X 85
985	OUT755	-5500	125.5	20 X 85
986	OUT756	-5520	235.5	20 X 85
987	OUT757	-5540	125.5	20 X 85
988	OUT758	-5560	235.5	20 X 85
989	OUT759	-5580	125.5	20 X 85
990	OUT760	-5600	235.5	20 X 85
991	OUT761	-5620	125.5	20 X 85
992	OUT762	-5640	235.5	20 X 85
993	OUT763	-5660	125.5	20 X 85
994	OUT764	-5680	235.5	20 X 85
995	OUT765	-5700	125.5	20 X 85
996	OUT766	-5720	235.5	20 X 85
997	OUT767	-5740	125.5	20 X 85
998	OUT768	-5760	235.5	20 X 85
999	OUT769	-5780	125.5	20 X 85
1000	OUT770	-5800	235.5	20 X 85
1001	OUT771	-5820	125.5	20 X 85
1002	OUT772	-5840	235.5	20 X 85
1003	OUT773	-5860	125.5	20 X 85
1004	OUT774	-5880	235.5	20 X 85
1005	OUT775	-5900	125.5	20 X 85
1006	OUT776	-5920	235.5	20 X 85
1007	OUT777	-5940	125.5	20 X 85
1008	OUT778	-5960	235.5	20 X 85
1009	OUT779	-5980	125.5	20 X 85
1010	OUT780	-6000	235.5	20 X 85
1011	OUT781	-6020	125.5	20 X 85
1012	OUT782	-6040	235.5	20 X 85
1013	OUT783	-6060	125.5	20 X 85
1014	OUT784	-6080	235.5	20 X 85
1015	OUT785	-6100	125.5	20 X 85
1016	OUT786	-6120	235.5	20 X 85
1017	OUT787	-6140	125.5	20 X 85
1018	OUT788	-6160	235.5	20 X 85
1019	OUT789	-6180	125.5	20 X 85
1020	OUT790	-6200	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
1021	OUT791	-6220	125.5	20 X 85
1022	OUT792	-6240	235.5	20 X 85
1023	OUT793	-6260	125.5	20 X 85
1024	OUT794	-6280	235.5	20 X 85
1025	OUT795	-6300	125.5	20 X 85
1026	OUT796	-6320	235.5	20 X 85
1027	OUT797	-6340	125.5	20 X 85
1028	OUT798	-6360	235.5	20 X 85
1029	OUT799	-6380	125.5	20 X 85
1030	OUT800	-6400	235.5	20 X 85
1031	OUT801	-6420	125.5	20 X 85
1032	OUT802	-6440	235.5	20 X 85
1033	OUT803	-6460	125.5	20 X 85
1034	OUT804	-6480	235.5	20 X 85
1035	OUT805	-6500	125.5	20 X 85
1036	OUT806	-6520	235.5	20 X 85
1037	OUT807	-6540	125.5	20 X 85
1038	OUT808	-6560	235.5	20 X 85
1039	OUT809	-6580	125.5	20 X 85
1040	OUT810	-6600	235.5	20 X 85
1041	OUT811	-6620	125.5	20 X 85
1042	OUT812	-6640	235.5	20 X 85
1043	OUT813	-6660	125.5	20 X 85
1044	OUT814	-6680	235.5	20 X 85
1045	OUT815	-6700	125.5	20 X 85
1046	OUT816	-6720	235.5	20 X 85
1047	OUT817	-6740	125.5	20 X 85
1048	OUT818	-6760	235.5	20 X 85
1049	OUT819	-6780	125.5	20 X 85
1050	OUT820	-6800	235.5	20 X 85
1051	OUT821	-6820	125.5	20 X 85
1052	OUT822	-6840	235.5	20 X 85
1053	OUT823	-6860	125.5	20 X 85
1054	OUT824	-6880	235.5	20 X 85
1055	OUT825	-6900	125.5	20 X 85
1056	OUT826	-6920	235.5	20 X 85
1057	OUT827	-6940	125.5	20 X 85
1058	OUT828	-6960	235.5	20 X 85
1059	OUT829	-6980	125.5	20 X 85
1060	OUT830	-7000	235.5	20 X 85
1061	OUT831	-7020	125.5	20 X 85
1062	OUT832	-7040	235.5	20 X 85
1063	OUT833	-7060	125.5	20 X 85
1064	OUT834	-7080	235.5	20 X 85
1065	OUT835	-7100	125.5	20 X 85
1066	OUT836	-7120	235.5	20 X 85
1067	OUT837	-7140	125.5	20 X 85
1068	OUT838	-7160	235.5	20 X 85
1069	OUT839	-7180	125.5	20 X 85
1070	OUT840	-7200	235.5	20 X 85
1071	OUT841	-7220	125.5	20 X 85
1072	OUT842	-7240	235.5	20 X 85
1073	OUT843	-7260	125.5	20 X 85
1074	OUT844	-7280	235.5	20 X 85
1075	OUT845	-7300	125.5	20 X 85
1076	OUT846	-7320	235.5	20 X 85
1077	OUT847	-7340	125.5	20 X 85
1078	OUT848	-7360	235.5	20 X 85
1079	OUT849	-7380	125.5	20 X 85
1080	OUT850	-7400	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
1081	OUT851	-7420	125.5	20 X 85
1082	OUT852	-7440	235.5	20 X 85
1083	OUT853	-7460	125.5	20 X 85
1084	OUT854	-7480	235.5	20 X 85
1085	OUT855	-7500	125.5	20 X 85
1086	OUT856	-7520	235.5	20 X 85
1087	OUT857	-7540	125.5	20 X 85
1088	OUT858	-7560	235.5	20 X 85
1089	OUT859	-7580	125.5	20 X 85
1090	OUT860	-7600	235.5	20 X 85
1091	OUT861	-7620	125.5	20 X 85
1092	OUT862	-7640	235.5	20 X 85
1093	OUT863	-7660	125.5	20 X 85
1094	OUT864	-7680	235.5	20 X 85
1095	OUT865	-7700	125.5	20 X 85
1096	OUT866	-7720	235.5	20 X 85
1097	OUT867	-7740	125.5	20 X 85
1098	OUT868	-7760	235.5	20 X 85
1099	OUT869	-7780	125.5	20 X 85
1100	OUT870	-7800	235.5	20 X 85
1101	OUT871	-7820	125.5	20 X 85
1102	OUT872	-7840	235.5	20 X 85
1103	OUT873	-7860	125.5	20 X 85
1104	OUT874	-7880	235.5	20 X 85
1105	OUT875	-7900	125.5	20 X 85
1106	OUT876	-7920	235.5	20 X 85
1107	OUT877	-7940	125.5	20 X 85
1108	OUT878	-7960	235.5	20 X 85
1109	OUT879	-7980	125.5	20 X 85
1110	OUT880	-8000	235.5	20 X 85
1111	OUT881	-8020	125.5	20 X 85
1112	OUT882	-8040	235.5	20 X 85
1113	OUT883	-8060	125.5	20 X 85
1114	OUT884	-8080	235.5	20 X 85
1115	OUT885	-8100	125.5	20 X 85
1116	OUT886	-8120	235.5	20 X 85
1117	OUT887	-8140	125.5	20 X 85
1118	OUT888	-8160	235.5	20 X 85
1119	OUT889	-8180	125.5	20 X 85
1120	OUT890	-8200	235.5	20 X 85
1121	OUT891	-8220	125.5	20 X 85
1122	OUT892	-8240	235.5	20 X 85
1123	OUT893	-8260	125.5	20 X 85
1124	OUT894	-8280	235.5	20 X 85
1125	OUT895	-8300	125.5	20 X 85
1126	OUT896	-8320	235.5	20 X 85
1127	OUT897	-8340	125.5	20 X 85
1128	OUT898	-8360	235.5	20 X 85
1129	OUT899	-8380	125.5	20 X 85
1130	OUT900	-8400	235.5	20 X 85
1131	OUT901	-8420	125.5	20 X 85
1132	OUT902	-8440	235.5	20 X 85
1133	OUT903	-8460	125.5	20 X 85
1134	OUT904	-8480	235.5	20 X 85
1135	OUT905	-8500	125.5	20 X 85
1136	OUT906	-8520	235.5	20 X 85
1137	OUT907	-8540	125.5	20 X 85
1138	OUT908	-8560	235.5	20 X 85
1139	OUT909	-8580	125.5	20 X 85
1140	OUT910	-8600	235.5	20 X 85

No.	Name	X	Y	Bump size(μm)
1141	OUT911	-8620	125.5	20 X 85
1142	OUT912	-8640	235.5	20 X 85
1143	OUT913	-8660	125.5	20 X 85
1144	OUT914	-8680	235.5	20 X 85
1145	OUT915	-8700	125.5	20 X 85
1146	OUT916	-8720	235.5	20 X 85
1147	OUT917	-8740	125.5	20 X 85
1148	OUT918	-8760	235.5	20 X 85
1149	OUT919	-8780	125.5	20 X 85
1150	OUT920	-8800	235.5	20 X 85
1151	OUT921	-8820	125.5	20 X 85
1152	OUT922	-8840	235.5	20 X 85
1153	OUT923	-8860	125.5	20 X 85
1154	OUT924	-8880	235.5	20 X 85
1155	OUT925	-8900	125.5	20 X 85
1156	OUT926	-8920	235.5	20 X 85
1157	OUT927	-8940	125.5	20 X 85
1158	OUT928	-8960	235.5	20 X 85
1159	OUT929	-8980	125.5	20 X 85
1160	OUT930	-9000	235.5	20 X 85
1161	OUT931	-9020	125.5	20 X 85
1162	OUT932	-9040	235.5	20 X 85
1163	OUT933	-9060	125.5	20 X 85
1164	OUT934	-9080	235.5	20 X 85
1165	OUT935	-9100	125.5	20 X 85
1166	OUT936	-9120	235.5	20 X 85
1167	OUT937	-9140	125.5	20 X 85
1168	OUT938	-9160	235.5	20 X 85
1169	OUT939	-9180	125.5	20 X 85
1170	OUT940	-9200	235.5	20 X 85
1171	OUT941	-9220	125.5	20 X 85
1172	OUT942	-9240	235.5	20 X 85
1173	OUT943	-9260	125.5	20 X 85
1174	OUT944	-9280	235.5	20 X 85
1175	OUT945	-9300	125.5	20 X 85
1176	OUT946	-9320	235.5	20 X 85
1177	OUT947	-9340	125.5	20 X 85
1178	OUT948	-9360	235.5	20 X 85
1179	OUT949	-9380	125.5	20 X 85
1180	OUT950	-9400	235.5	20 X 85
1181	OUT951	-9420	125.5	20 X 85
1182	OUT952	-9440	235.5	20 X 85
1183	OUT953	-9460	125.5	20 X 85
1184	OUT954	-9480	235.5	20 X 85
1185	OUT955	-9500	125.5	20 X 85
1186	OUT956	-9520	235.5	20 X 85
1187	OUT957	-9540	125.5	20 X 85
1188	OUT958	-9560	235.5	20 X 85
1189	OUT959	-9580	125.5	20 X 85
1190	OUT960	-9600	235.5	20 X 85
1191	OUT961	-9620	125.5	20 X 85
1192	Dummy187	-9640	235.5	20 X 85
1193	XAO	-9742	262	70 X 32
1194	XAO	-9832	262	70 X 32
1195	XAO	-9922	262	70 X 32
1196	XAO	-10012	262	70 X 32
1197	OE	-9832	208	70 X 32
1198	OE	-9922	208	70 X 32
1199	OE	-10012	208	70 X 32
1200	LR	-9832	156	70 X 32

No.	Name	X	Y	Bump size(μm)
1201	LR	-9922	156	70 X 32
1202	LR	-10012	156	70 X 32
1203	CPV	-9832	104	70 X 32
1204	CPV	-9922	104	70 X 32
1205	CPV	-10012	104	70 X 32
1206	PATH	-9832	52	70 X 32
1207	PATH	-9922	52	70 X 32
1208	PATH	-10012	52	70 X 32
1209	STV2	-9832	0	70 X 32
1210	STV2	-9922	0	70 X 32
1211	STV2	-10012	0	70 X 32
1212	SEL	-9832	-52	70 X 32
1213	SEL	-9922	-52	70 X 32
1214	SEL	-10012	-52	70 X 32
1215	VGH	-9832	-104	70 X 32
1216	VGH	-9922	-104	70 X 32
1217	VGH	-10012	-104	70 X 32
1218	VDD	-9832	-156	70 X 32
1219	VDD	-9922	-156	70 X 32
1220	VDD	-10012	-156	70 X 32
1221	VEE	-9832	-208	70 X 32
1222	VEE	-9922	-208	70 X 32
1223	VEE	-10012	-208	70 X 32

**9.5 Alignment mark center coordinates**

Name	X	Y
L_AMK	-9383.5	-220.5
R_AMK	9383.5	-220.5

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## 10. Ordering Information

Part NO.	Package
HX8664-B000PDxxx	PD: mean COG xxx: mean chip thickness (µm) , (default 400 µm)

## 11. Revision History

Version	Date	Description of Changes
01	2009/06/23	New setup
02	2010/04/19	Page 4 Add SEL=L pin description. Page 7 Modify section 5.4 power on/off sequence.
03	2010/08/18	Page 7 Modify section 5.4 power on/off sequence.

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