



DATA SHEET

(DOC No. HX8282-A11-DS)

HX8282-A11
1536CH TFT LCD Source Driver
with LVDS TCON
Version 01 May, 2015

Revision History

May, 2015

Version	Date	Description of changes
01	2013/11/13	New setup.
	2015/05/13	<p>All pages</p> <ol style="list-style-type: none"> 1. Remove 'preliminary' wording. <p>Page 9</p> <ol style="list-style-type: none"> 2. Update Figure 3.1 HX8282-A11 function block diagram, add SCL, SDA and CSB signal. <p>Page 14</p> <ol style="list-style-type: none"> 3. Update application power circuit; change L, 10μH to inductance value: Depend on panel loading and operation voltage, default 10μH. <p>Page 15</p> <ol style="list-style-type: none"> 4. Update HSD pin description, add default setting. <p>Page 17</p> <ol style="list-style-type: none"> 5. Update F_CtrlR/CtrlL pin description, update gate driver pin setting. <p>Page 19</p> <ol style="list-style-type: none"> 6. Update wiring resistance. <ol style="list-style-type: none"> (1)Add VDD_LVDS, AGNDH, AVDDL < 5Ω. (2)Modify CLK \rightarrow DCLK, CLKN \rightarrow NINC. (3)Add COM1_IN < 5Ω. (4)Modify MASL_OC \rightarrow MASLOC. (5)Add DCLKPOL, DUAL < 100Ω. <p>Page 35</p> <ol style="list-style-type: none"> 7. Remove GRB pulse width condition.

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1. General Description

HX8282-A11 is a 1536-channel outputs source driver with LVDS, TCON, and 3-wire Serial Port Interface. This chip integrates 1536ch dual gate mode source driver with LVDS and parallel RGB input interface. The TCON generates the 1024x600, 1024x768, 800x600, 800x480 and 960x540 resolutions and provides horizontal and vertical control timing to source driver and gate driver.

It also supports dithering feature, apply source driver with 6-bit DAC to perform 8-bit resolution 256 gray scales. The source driver receives 6-bit by 3 dots of digital display data per clock from TCON and generates corresponding 64-level gray scale voltage output. Since the output circuit of this source driver incorporates an operational amplifier with low power dissipation, and performs wide voltage supply range and small output deviation. Therefore, a high quality display with less crosstalk can be achieved.

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2. Features

TCON

- Support display resolution 1024RGBx600, 1024RGBx768, 800RGBx600, 800RGBx480 and 960RGBx540.
- Support LVDS/TTL interface
- Support single or dual gate function
- Support cascade function with bidirectional shift control (**CMOS signal**)
- Internal dithering 8-bit data to 6-bit data for Source Driver Circuit (**6-bit DAC + 2-bit FRC or HFRC**)
- Built-In CABC function
- Built-In AUTO pattern
- Only support stripe types of panel group
- Operation frequency: 71MHz max
- Provide source and gate drivers control timing
- Provide flip and mirror scan control
- Operation Voltage Level 2.3V to 3.6V

Source Driver

- 1536-channels outputs source driver for TFT LCD panel
- Embedded gamma table for special custom request
- V1~V14 for adjusting gamma correction
- Dynamic output range: 0.1 to AVDD-0.1V
- Voltage deviation of outputs: $\pm 20\text{mV}$
- Dot inversion and 1+2 Dot inversion driving scheme
- Right and left shift capability
- LCD power: 6.5V to 13.5V

Power

- Built-In PWM controller for AVDD , VGH / VGL , and VCOM buffer
- Support half voltage source driver

Application

- Special designed for low cost UMPC application

Others

- COG package

3. Block Diagram

3.1 Function block diagram

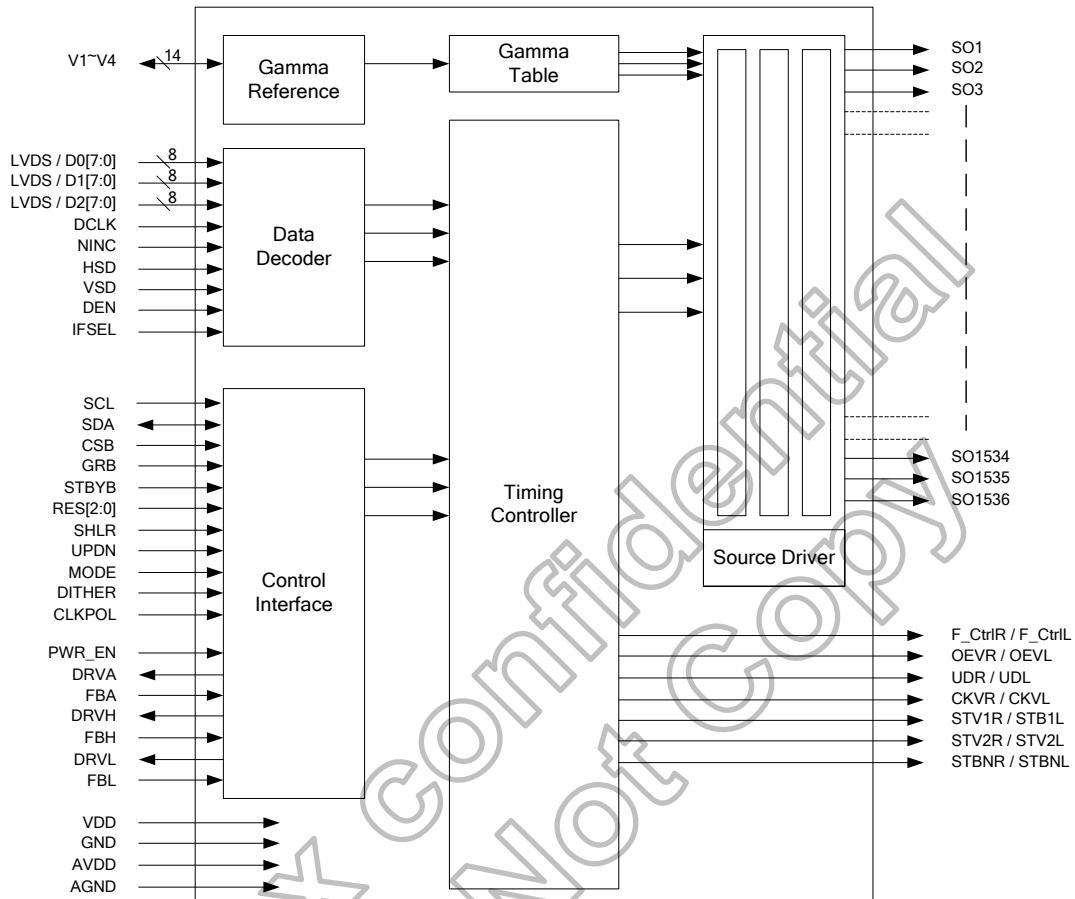


Figure 3.1: HX8282-A11 function block diagram

3.2 Application block diagram

3.2.1 Dual gate (Gate on right side)

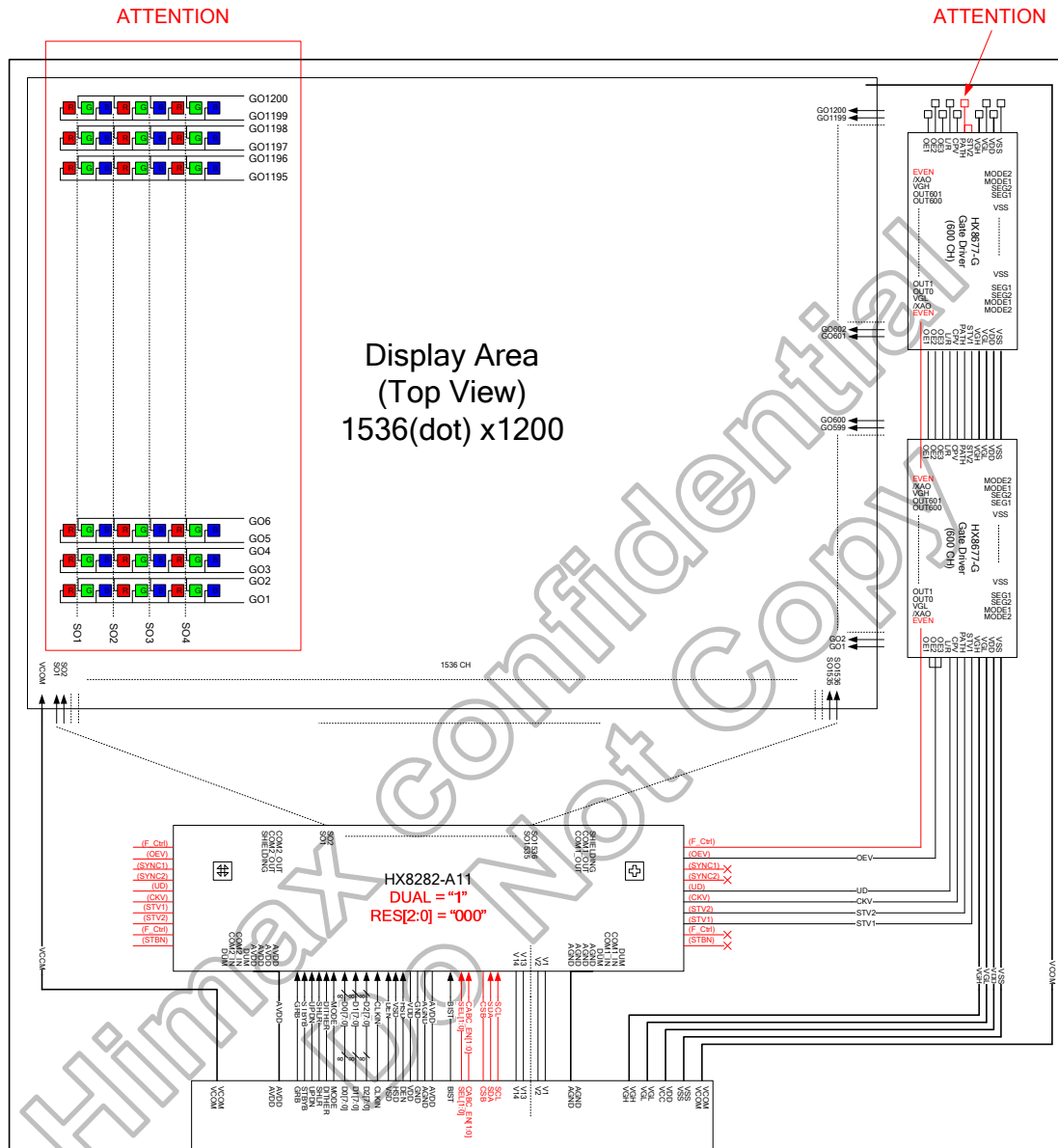


Figure 3.2: Dual gate (Gate on right side)

3.2.4 Cascade with two-FPC (Gate on left side)

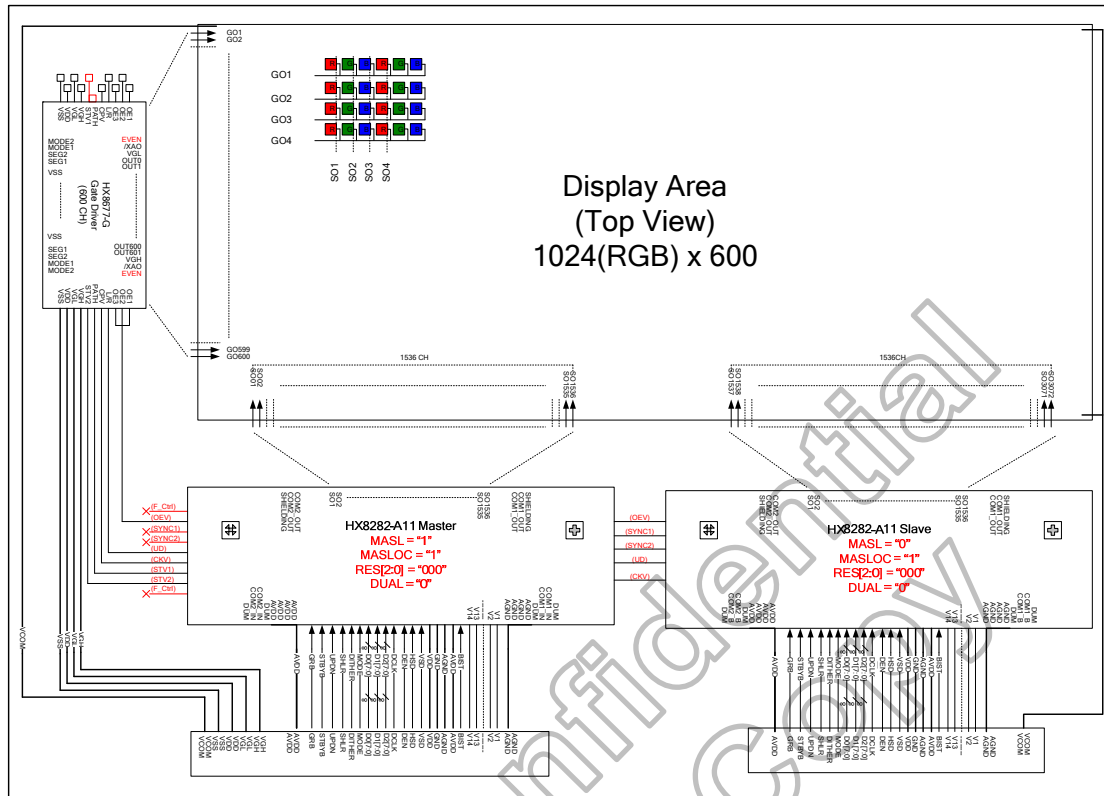


Figure 3.5: Cascade with two-FPC (Gate on left side)

3.3 Application power circuit

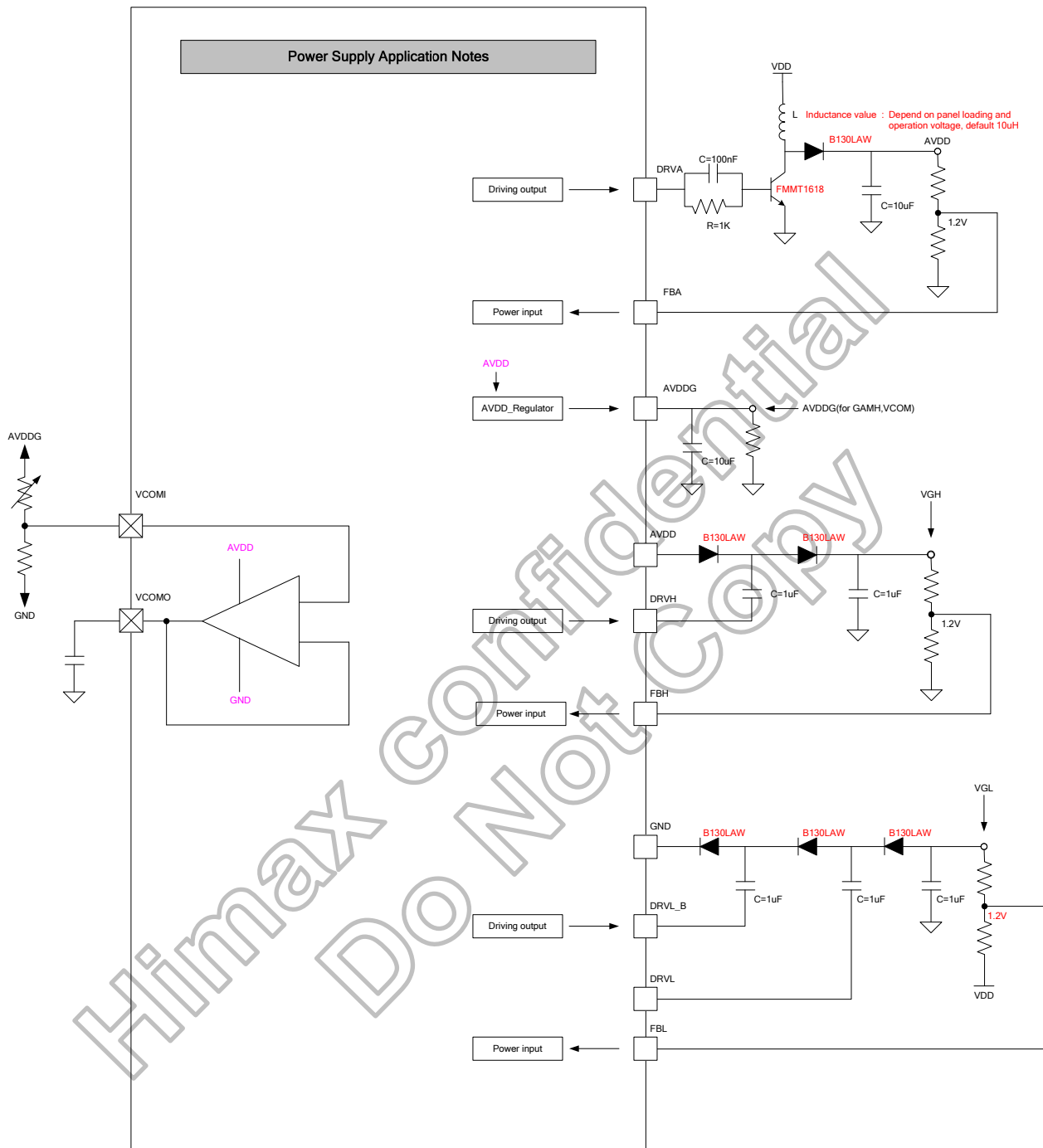


Figure 3.6: Application power circuit

4. Pin Description

4.1 Pin description

Pin types: **I**: Input, **O**: Output, **I/O**: Input/Output, **PI**: Power input, **PO**: Power Output, **T**: Testing, **SH**: Shielding, **D**: Dummy, **S**: Shorted line.

Name	Type	Description																		
D07~D00 D17~D10 D27~D20	I	<p>LVDS or Parallel RGB data input. Select by "IFSEL" pin.</p> <table border="1"> <thead> <tr> <th>Input mode</th> <th>TTL</th> <th>LVDS</th> </tr> </thead> <tbody> <tr> <td>IFSEL</td> <td>L</td> <td>H</td> </tr> <tr> <td>D20,D21</td> <td>B0,B1</td> <td>D0N,D0P</td> </tr> <tr> <td>D22,D23</td> <td>B2,B3</td> <td>D1N,D1P</td> </tr> <tr> <td>D24,D25</td> <td>B4,B5</td> <td>D2N,D2P</td> </tr> <tr> <td>D26,D27</td> <td>B6,B7</td> <td>D3N,D3P</td> </tr> </tbody> </table> <p>LVDS 6-bit data input: PIND[2:0],NIND[2:0]. D07~D00=R7~R0 data; D17~D10=G7~G0 data; D27~20=B7~B0 data. For 18-bit RGB interface, connect two LSB bits of all the R/G/B data buses to GND. Please note the relation between RGB data and Color Filter sequence. (D07~D00: SO1, SO4...SO1531, SO1534. D17~D10: SO2, SO5...SO1532, SO1535. D27~D20: SO3, SO6...SO1533, SO1536.)</p>	Input mode	TTL	LVDS	IFSEL	L	H	D20,D21	B0,B1	D0N,D0P	D22,D23	B2,B3	D1N,D1P	D24,D25	B4,B5	D2N,D2P	D26,D27	B6,B7	D3N,D3P
Input mode	TTL	LVDS																		
IFSEL	L	H																		
D20,D21	B0,B1	D0N,D0P																		
D22,D23	B2,B3	D1N,D1P																		
D24,D25	B4,B5	D2N,D2P																		
D26,D27	B6,B7	D3N,D3P																		
DCLK	I	<p>In TTL mode, DCLK for clock input. In LVDS mode, PINC for Positive LVDS differential clock input.</p> <table border="1"> <thead> <tr> <th>IFSEL</th> <th>Input mode</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>L</td> <td>TTL</td> <td>DCLK</td> </tr> <tr> <td>H</td> <td>LVDS</td> <td>PINC</td> </tr> </tbody> </table>	IFSEL	Input mode	Description	L	TTL	DCLK	H	LVDS	PINC									
IFSEL	Input mode	Description																		
L	TTL	DCLK																		
H	LVDS	PINC																		
NINC	I	Negative LVDS differential clock input.																		
VSD	I	In TTL mode, for Vertical Sync input. Negative polarity. In LVDS mode. Connected to FPC and pull low.																		
HSD	I	In TTL mode, for Horizontal Sync input. Negative polarity. In LVDS mode, used as 6-bit/8-bit input select.	HSD	Bit	L	8-bit	H	6-bit (Default)												
HSD	Bit																			
L	8-bit																			
H	6-bit (Default)																			
DEN	I	Data input enable for TTL mode. Active high to enable the data input. Normally pull low.																		
MODE	I	DE/SYNC mode select. Normally pull high. When MODE=H: DE mode. When MODE=L: SYNC mode.																		
SCL	I	Input reference clock for serial interface. Data is fed at the rising edge of the clock. Normally pull low.																		
SDA	I/O	Input for data of serial interface. Normally pull low.																		
CSB	I	Input the chip select signal for serial interface. Normally pull low. High: Non-select. (Disable) Low: Select. (Enable)																		
IFSEL	I	TTL / LVDS interface selection. Normally pull low. When IFSEL=H: LVDS interface. When IFSEL=L: TTL interface.																		
DITHER	I	Dithering function enable control. Normally pull low. When DITHER=H: Enable internal dithering function. When DITHER=L: Disable internal dithering function.																		

Name	Type	Description																								
HFRC	I	H-FRC selection. Normally pull low. When HFRC=H: H-FRC enable. When HFRC=L: FRC enable. If DITHER=L, disable dithering function. (HFRC and FRC disable)																								
RESL[2:0]	I	Display resolution selection. <table border="1"> <thead> <tr> <th>RESL2</th> <th>RESL1</th> <th>RESL0</th> <th>Resolution</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> <td>1024 (RGB) x 600 (Default)</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>1024 (RGB) x 768</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>800 (RGB) x 600 (601~936 disable)</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> <td>800 (RGB) x 480 (601~936 disable)</td> </tr> <tr> <td>1</td> <td>x</td> <td>x</td> <td>960 (RGB) x 540 (721~816 disable)</td> </tr> </tbody> </table>	RESL2	RESL1	RESL0	Resolution	0	0	0	1024 (RGB) x 600 (Default)	0	0	1	1024 (RGB) x 768	0	1	0	800 (RGB) x 600 (601~936 disable)	0	1	1	800 (RGB) x 480 (601~936 disable)	1	x	x	960 (RGB) x 540 (721~816 disable)
RESL2	RESL1	RESL0	Resolution																							
0	0	0	1024 (RGB) x 600 (Default)																							
0	0	1	1024 (RGB) x 768																							
0	1	0	800 (RGB) x 600 (601~936 disable)																							
0	1	1	800 (RGB) x 480 (601~936 disable)																							
1	x	x	960 (RGB) x 540 (721~816 disable)																							
GRB	I	Global reset. Keep VDD during operation. Normally pull high.																								
DCLKPOL	I	Define input clock polarity. Normally pull low. When DCLKPOL=H: Latch data by rising edge of CLK. When DCLKPOL=L: Latch data by falling edge of CLK. In LVDS mode, please connect to L.																								
DUAL	I	Dual gate function enables control. Normally pull high. DUAL=H: Enable dual gate function. DUAL=L: Disable dual gate function. (Cascade function will be disabled under "dual gate" mode!)																								
V1~V14	I	When internal gamma table is used. GAMH tied to AVDDG via resistor for PWR_EN=H enable PWM, or tied to AVDD for PWR_EN=L disable PWM. When using external gamma voltage, GAMH and GAML are floating, and V1~V14 are the external gamma correction points. The voltage of these pins must be: AGND<V14<V13<V12<V11<V10<V9<V8; V7<V6<V5<V4<V3<V2<V1< AVDD.																								
GAMH	I	When using internal gamma table, GAMH tied to AVDDG via resistor for PWR_EN=H enable PWM, or tied to AVDD for PWR_EN=L disable PWM. Otherwise floating.																								
GAML	I	When using internal gamma table, tied to GND. Otherwise floating.																								
STBYB	I	Standby mode control. Normally pull High. When STB=H: All the functions are on. (Default pulls high) When STB=L: TCON and source driver are off and all output are GND.																								
MASL	I	Master and slave mode selection in cascade mode. Normally pull high. MASL=H: For Master mode. (Default) MASL=L: For Slave mode. Only the Master chip will issue the Gate and Cascade control signal.																								
MASLOC	I	Master location definition pin. Normally pull low. MASLOC=H: Master locates on left side. (Panel top view) MASLOC=L: Master locates on right side. (Panel top view) (Default)																								
SHLR	I	Source Driver internal shift register is controlled by this pin as shown below: Normally pull high. SHLR=H: SO1→ SO2→ SO3→...→SO1536. (Default) SHLR=L: SO1536→ SO1535→ SO1534→...→SO1.																								
UPDN	I	Gate driver Up/down scan setting. Normally pull low. When UPDN=H: Reverse scan. STV1 output vertical start pulse and UD pin output "H" to Gate driver. When UPDN=L, normal scan. (Default) STV2 output vertical start pulse and UD pin output "L" to Gate driver.																								
BIST	I	Normal operation/BIST pattern select. Normally pull low. When BIST=H: BIST. (CLK input is not needed.) When BIST=L: Normal operation. (Default)																								
NBW	I	Normally black or normally white setting. Normally pull low. When NBW=H: Normally black. When NBW=L: Normally white. (Default)																								

Name	Type	Description															
REV	I	Controls whether the data of D00~D27 are inverted or not. Normally pull low. When REV=H, the data will be inverted. EX. "00"→"3F", "07"→ "38", "15"→"2A", and so on.															
FRAME	I	Frame inverse or not select. Normally pull low. When FRAME=H: Uniform. When FRAME=L: Frame inverse. (Default)															
SEL[1:0]	I	Gate on sequence select. Normally pull low.															
		<table border="1"> <thead> <tr> <th>SEL[1]</th> <th>SEL[0]</th> <th>Pin control function</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>Z</td> </tr> <tr> <td>0</td> <td>1</td> <td>弓</td> </tr> <tr> <td>1</td> <td>0</td> <td>Σ</td> </tr> <tr> <td>1</td> <td>1</td> <td>Z+弓</td> </tr> </tbody> </table>	SEL[1]	SEL[0]	Pin control function	0	0	Z	0	1	弓	1	0	Σ	1	1	Z+弓
		SEL[1]	SEL[0]	Pin control function													
		0	0	Z													
		0	1	弓													
1	0	Σ															
1	1	Z+弓															
OEVR/OEVL	O	Gate driver control signal. Please keep floating if not use.															
SYNC1R/SYNC1L	O	Gate driver control signal. (CABC and BIST sync control) Please keep floating if not use.															
SYNC2R/SYNC2L	O	Gate driver control signal. (CABC and BIST sync control) Please keep floating if not use.															
UDR/UDL	O	Gate driver control signal. Please keep floating if not use.															
CKVR/CKVL	O	Gate driver control signal. Please keep floating if not use.															
STV1R/STV1L	O	Gate driver control signal. Please keep floating if not use.															
STV2R/STV2L	O	Gate driver control signal. Please keep floating if not use.															
STBNR/STBNL	O	Gate driver control signal. Please keep floating if not use.															
F_CtrlR/F_CtrlL	O	Gate driver control signal. (For special Gate on sequence) In cascade, let this pin floating. In dual gate, connect the pin to gate driver's EVEN and setting gate driver's SEG[2:1]=00. Please keep floating if not use.															
CABC_EN[1:0]	I	CABC H/W enable pin. Normally pull low. When CABC_EN="00": CABC off. (Default mode) When CABC_EN="01": User interface Image. When CABC_EN="10": Still Picture. When CABC_EN="11": Moving Image.															
DIMI	I	Brightness control signal. Normally pull high.															
DIMO	O	Backlight dimmer signal for external controller. DIMO=H: Logical control signal to turn on external backlight controller. DIMO=L: Turn off external backlight controller. Please keep floating if not use. (If CABC off, DIMO=DIMI. Else DIMO is controlled by CABC.)															
PINCTL	I	Enable pin control function. Normally pull high. When PINCTL=H: Enable pin control function. When PINCTL=L: Disable pin control function. (The related 3-wire control register bit control will be disabled under PINCTL=H.)															
OPDRV	I	Source OP driving selection. Normally pull low. OPDRV=H: 140%. OPDRV=L: Normal.															
AVDD	PI	Analog power.															
AGND	PI	Analog ground.															
VDD	PI	Digital power.															
GND	PI	Digital ground.															

Name	Type	Description
VDD_LVDS	PI	LVDS power.
GND_LVDS	PI	LVDS ground.
AVDDL	PI	Power supply for Half AVDD application. Connected to AVDD when full range. Connected to Half AVDD when Half AVDD application.
AGNDH	PI	Power supply for Half AVDD application. Connected to AGND when full range. Connected to Half AVDD when Half AVDD application.
PWR_EN	I	POWER enable. Normally pull low. PWR_EN=H: Enable PWM, charge pump and VCOM buffer. PWR_EN=L: Disable PWM, charge pump and VCOM buffer.
FBA	I	PWM controller feedback input. (For AVDD)
DRVA	O	PWM output driver signal for the boost converter. (For AVDD) Please keep floating if not use.
FBH	I	PWM controller feedback input. (For VGH)
DRVH	O	PWM output driver signal for the boost converter. (For VGH) Please keep floating if not use.
FBL	I	PWM controller feedback input. (For VGL)
DRVL	O	PWM output driver signal for the boost converter. (For VGL) Please keep floating if not use.
DRVL_B	O	Inverse of DRVL. (For VGL) Please keep floating if not use.
VCOMI	I	VCOM buffer in.
VCOMO	O	VCOM buffer out. Please keep floating if not use.
AVDDG	O	AVDD regulate output. Please keep floating if not use.
SO1~SO1536	O	Output driver signal. Please keep floating if not use.
COM1_IN COM1_OUT	S	Internal link together between input side and output side.
COM2_IN COM2_OUT	S	Internal link together between input side and output side.
TP	T	Test pins. They must be open.
SHIELDING	SH	IC Shielding pads. Those pins are internally connected to the AGND. Do not connect to any WOA on the panel.
DASHD	SH	Data Bus Shielding pad. Those pins are internally connected to the GND. Recommend to add shielding lines on the FPC to reduce EMI.
DUM	D	Dummy pads. Those pins are floating pads.

Table 4.1: Pad description

4.2 HX8282-A11 passes line description

Pass line no.	Pin name	
1	COM1_IN	COM1_OUT
2	COM2_IN	COM2_OUT

Table 4.2: HX8282-A11 passes line description

4.3 Value of wiring resistance to each pin

The input wiring resistance values affect power or signal integrity and the display quality. So be sure to design using values that do not exceed those recommendations as below.

Pin name	Wiring resistance value(Ω)
VDD, GND, AVDD, AGND, AVDDG, VDD_LVDS, GND_LVDS, AGNDH, AVDDL	<5
V1~V14	<5
FBA, FBH, FBL	<5
DRVA, DRVH, DRVL, DRVL_B	<5
GAMH, GAML	<5
Dx7 ~ Dx0, DCLK, NINC	<5
VCOMI, VCOMO, COM1_IN, COM2_IN	<5
SYNC1R/SYNC1L, SYNC2R/SYNC2L	<5 Ω , and <20pF
CSB, SDA, SCL	<10
HSD, VSD, DEN	<20
SHIELDING, DASHD	<50
GRB, STBYB, DITHER, RES, LR, UD, BIST, MODE, EDGSL, DIMO, IFSEL, DIMI, NBW, PINCTL, HFRC, FRAME, SEL0, SEL1, MASL, MASLOC, CAB_C_EN0, CAB_C_EN1, OPDRV, PWR_EN, REV, DCLKPOL, DUAL	<100
OEVR, OEVL, UDR, UDL, CKVR, CKVL, STV1R, STV1L, STV2R, STV2L, STBNR, STBNL, F_CtrlR, F_CtrlL	<500

Table 4.3: Wiring resistance values

5. The BIST Pattern For Aging Mode Test

5.1 The BIST pattern for aging mode test

HX8282-A11 supports BIST pattern for aging mode test automatically. When external BIST pin set to “H” level, then HX8282-A11 will leave normal operation mode and starts to generate the BIST pattern to LCD panel without external clock signal. The BIST pattern is illustrated as below:

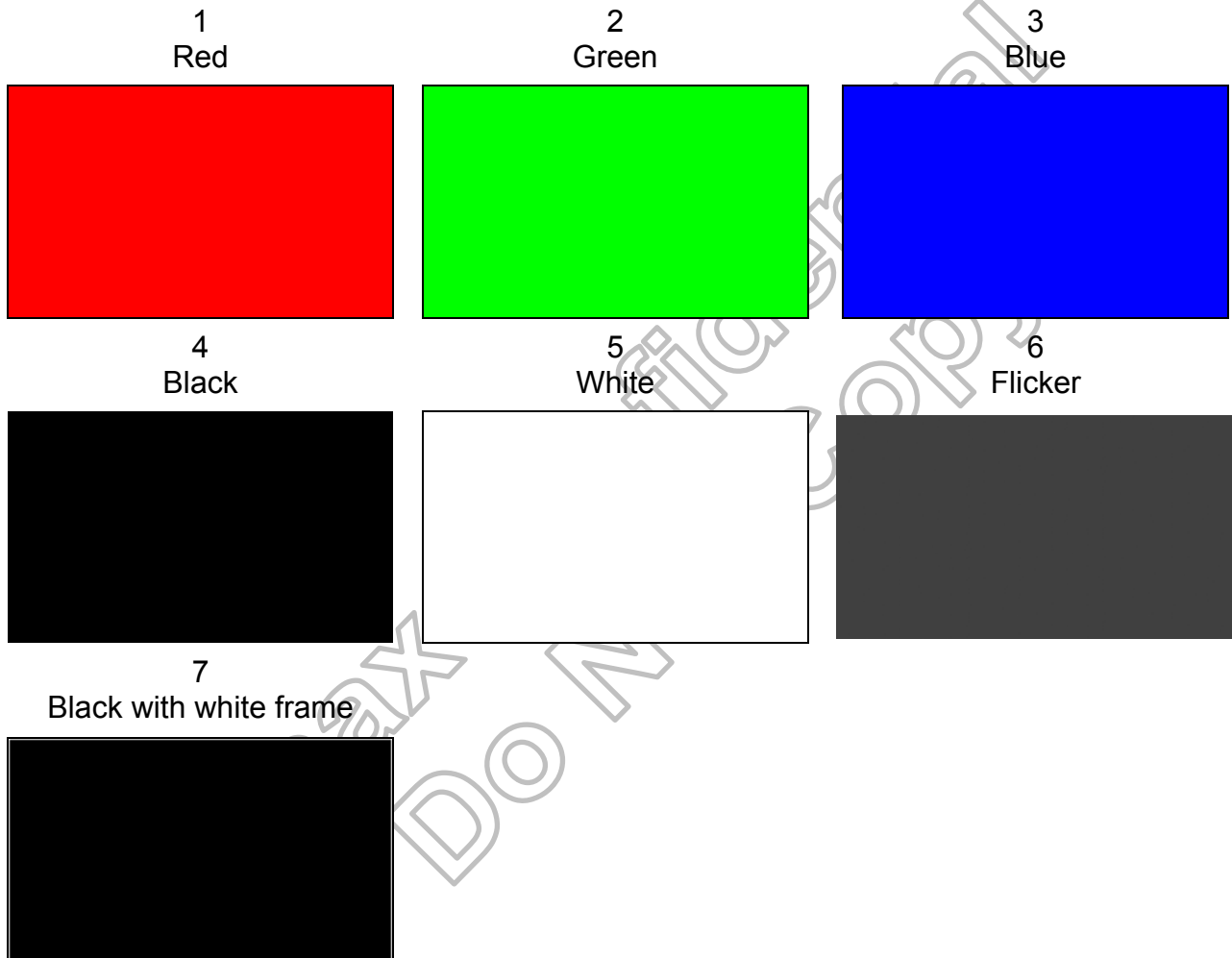


Table 5.1: BIST mode pattern

6. Gamma Adjustment Function

6.1 Gamma table

The output voltage is determined by the 6-bit digital input data and the 6 γ correction reference voltage.

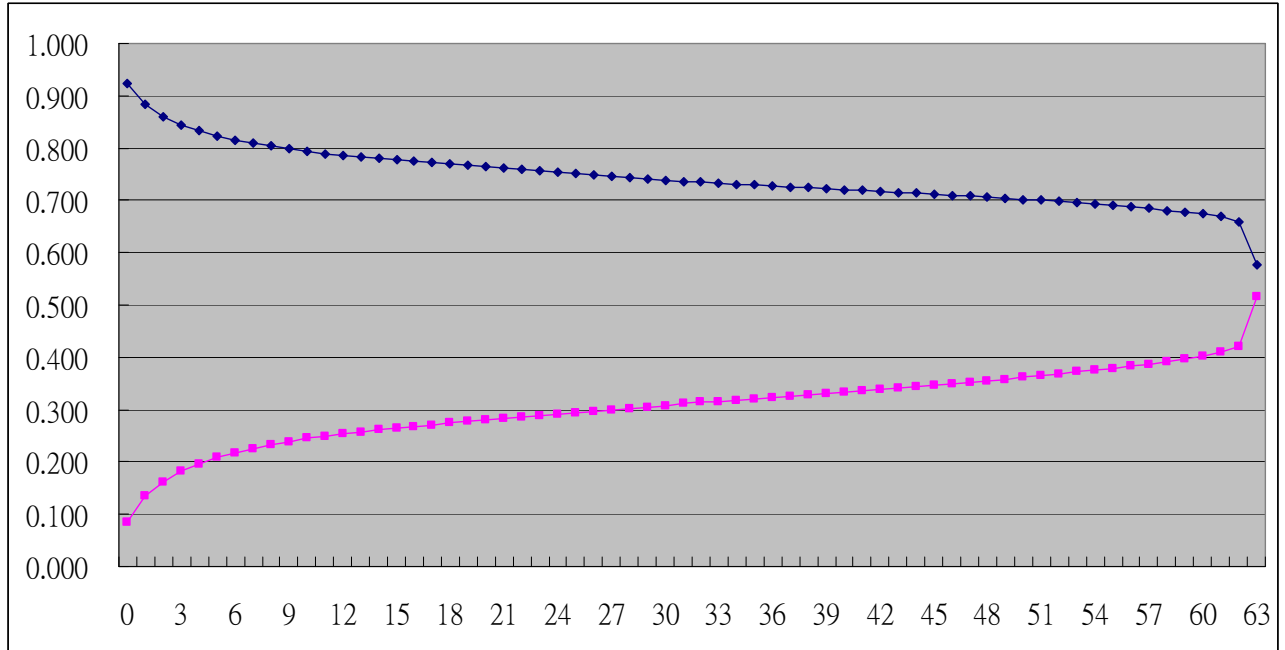


Figure 6.1: Gamma curve

The actual output voltages for all 64 input data at positive and negative polarity is as shown on the following page.

6.2 Positive polarity and negative polarity

AVDD=9.6V

V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	Unit
8.86	8.49	7.43	7.05	6.78	6.33	5.53	4.96	4.05	3.41	3.01	2.56	1.29	0.81	V

Note: (1) Gamma table vary for each customer.

• Positive polarity

Gray level	Positive polarity		
0	AVDD	X	0.923
1	AVDD	X	0.884
2	AVDD	X	0.860
3	AVDD	X	0.844
4	AVDD	X	0.833
5	AVDD	X	0.823
6	AVDD	X	0.815
7	AVDD	X	0.809
8	AVDD	X	0.803
9	AVDD	X	0.798
0A	AVDD	X	0.793
0B	AVDD	X	0.789
0C	AVDD	X	0.786
0D	AVDD	X	0.782
0E	AVDD	X	0.780
0F	AVDD	X	0.777
10	AVDD	X	0.774
11	AVDD	X	0.772
12	AVDD	X	0.769
13	AVDD	X	0.766
14	AVDD	X	0.764
15	AVDD	X	0.761
16	AVDD	X	0.759
17	AVDD	X	0.756
18	AVDD	X	0.753
19	AVDD	X	0.751
1A	AVDD	X	0.748
1B	AVDD	X	0.745
1C	AVDD	X	0.743
1D	AVDD	X	0.741
1E	AVDD	X	0.739
1F	AVDD	X	0.737

Gray level	Positive polarity		
20	AVDD	X	0.735
21	AVDD	X	0.733
22	AVDD	X	0.731
23	AVDD	X	0.729
24	AVDD	X	0.727
25	AVDD	X	0.726
26	AVDD	X	0.724
27	AVDD	X	0.722
28	AVDD	X	0.720
29	AVDD	X	0.719
2A	AVDD	X	0.717
2B	AVDD	X	0.715
2C	AVDD	X	0.713
2D	AVDD	X	0.712
2E	AVDD	X	0.710
2F	AVDD	X	0.708
30	AVDD	X	0.706
31	AVDD	X	0.704
32	AVDD	X	0.702
33	AVDD	X	0.700
34	AVDD	X	0.697
35	AVDD	X	0.695
36	AVDD	X	0.692
37	AVDD	X	0.690
38	AVDD	X	0.687
39	AVDD	X	0.684
3A	AVDD	X	0.681
3B	AVDD	X	0.678
3C	AVDD	X	0.674
3D	AVDD	X	0.669
3E	AVDD	X	0.660
3F	AVDD	X	0.576

Table 6.1: Positive polarity

• Negative polarity

Gray level	Negative polarity		
0	AVDD	X	0.084
1	AVDD	X	0.134
2	AVDD	X	0.163
3	AVDD	X	0.183
4	AVDD	X	0.196
5	AVDD	X	0.208
6	AVDD	X	0.218
7	AVDD	X	0.226
8	AVDD	X	0.233
9	AVDD	X	0.239
0A	AVDD	X	0.245
0B	AVDD	X	0.250
0C	AVDD	X	0.254
0D	AVDD	X	0.258
0E	AVDD	X	0.261
0F	AVDD	X	0.264
10	AVDD	X	0.267
11	AVDD	X	0.270
12	AVDD	X	0.274
13	AVDD	X	0.277
14	AVDD	X	0.281
15	AVDD	X	0.284
16	AVDD	X	0.286
17	AVDD	X	0.289
18	AVDD	X	0.292
19	AVDD	X	0.295
1A	AVDD	X	0.297
1B	AVDD	X	0.300
1C	AVDD	X	0.303
1D	AVDD	X	0.305
1E	AVDD	X	0.308
1F	AVDD	X	0.311

Gray level	Negative polarity		
20	AVDD	X	0.314
21	AVDD	X	0.316
22	AVDD	X	0.319
23	AVDD	X	0.321
24	AVDD	X	0.324
25	AVDD	X	0.326
26	AVDD	X	0.329
27	AVDD	X	0.332
28	AVDD	X	0.334
29	AVDD	X	0.337
2A	AVDD	X	0.339
2B	AVDD	X	0.342
2C	AVDD	X	0.345
2D	AVDD	X	0.347
2E	AVDD	X	0.350
2F	AVDD	X	0.352
30	AVDD	X	0.355
31	AVDD	X	0.358
32	AVDD	X	0.361
33	AVDD	X	0.365
34	AVDD	X	0.368
35	AVDD	X	0.372
36	AVDD	X	0.376
37	AVDD	X	0.379
38	AVDD	X	0.383
39	AVDD	X	0.387
3A	AVDD	X	0.391
3B	AVDD	X	0.396
3C	AVDD	X	0.402
3D	AVDD	X	0.409
3E	AVDD	X	0.422
3F	AVDD	X	0.517

Table 6.2: Negative polarity

7. 3-wire Serial Peripheral Interface (SPI)

7.1 SPI format

The HX8282-A11 supports the 3-pin serial peripheral interface (SPI) to set internal register. The data is written to the register of assigned address when “End of transfer” is detected after the 16th SCL rising cycles.

Data is not accepted if there are less or more than 16 cycles for one transaction. Only when SCL is input 16 times and CSB is in the "Low" period simultaneously, SDA is accepted. It needs DCLK input for SDA setting.

The first 6 bits (A5 to A0) specify the address of the register. The 7th bit means Read/Write command. “0” is WRITE. “1” is READ. The 8th bit means “Don’t care or Hi-Z”. It is “Don’t care” in write format, and “Hi-Z” in read format. And the last 8 bits are for Data setting (D7 to D0). The address and data are transferred from the MSB to LSB sequentially. And next cycle is turn-round cycle.

Setting of all the SPI will take effect at the coming falling edge of VSD except GRB and STB bit.

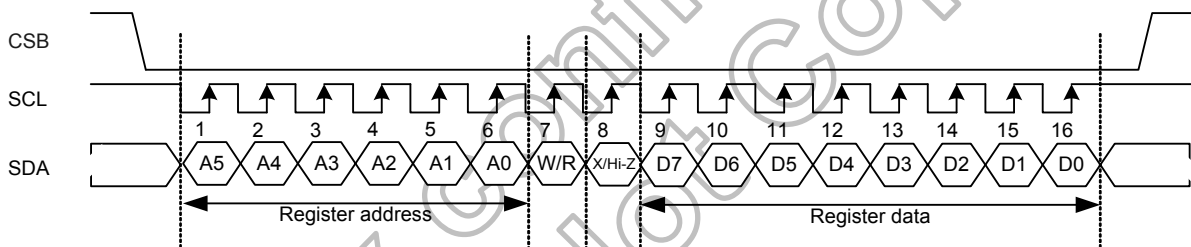


Figure 7.1: SPI format

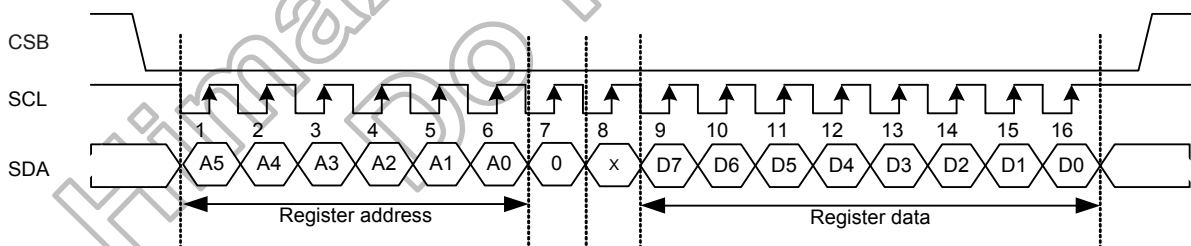


Figure 7.2: Write format

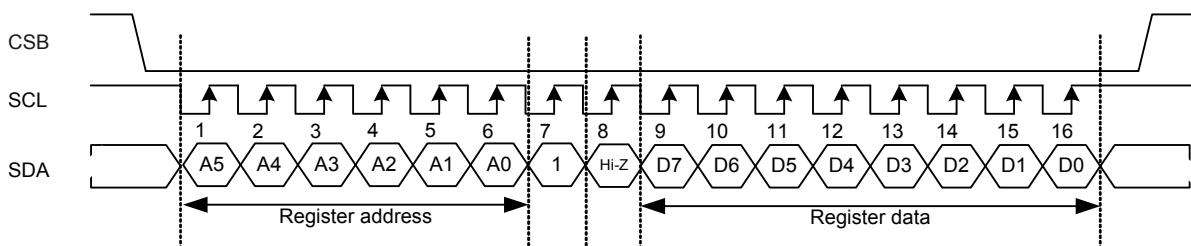


Figure 7.3: Read format

7.1.1 SPI AC timing

(Test condition: VDD=2.3V to 3.6V, TA=-20°C to +85°C)

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
CSB setup time	tS3	-	20	-	-	ns
SDA setup time	tS2	-	20	-	-	ns
CSB hold time	th3	-	20	-	-	ns
SDA hold time	th2	-	20	-	-	ns
SCL low level pulse	tWL1	-	50	-	-	ns
SCL high level pulse	tWH1	-	50	-	-	ns
CSB high level pulse	tw3	-	25	-	-	ns

Table 7.1: SPI AC timing for write command

(Test condition: VDD=2.3V to 3.6V, TA=-20°C to +85°C)

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
CSB setup time	tS3	-	20	-	-	ns
SDA setup time	tS2	-	20	-	-	ns
CSB hold time	th3	-	20	-	-	ns
SDA hold time	th2	-	20	-	-	ns
SCL low level pulse	tWL1	-	100	-	-	ns
SCL high level pulse	tWH1	-	100	-	-	ns
CSB high level pulse	tw3	-	25	-	-	ns

Table 7.2: SPI AC timing for read command

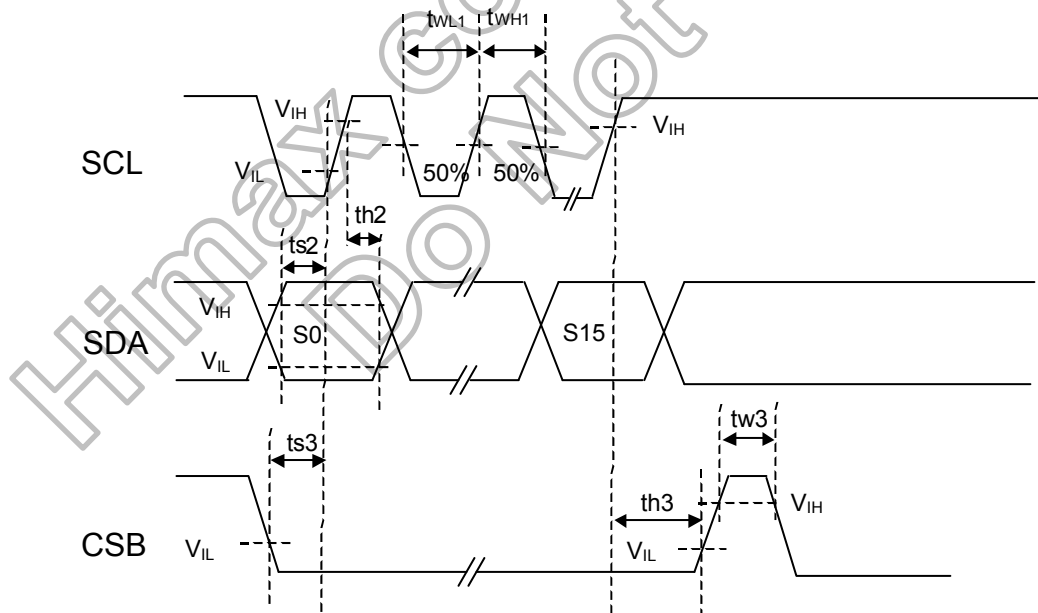


Figure 7.4: SPI AC timing

7.2 SPI register list

		A5	A4	A3	A2	A1	A0	W/R	X/Hi-z	D7	D6	D5	D4	D3	D2	D1	D0
R00	Function control 1	0	0	0	0	0	0	0	X	PWR_EN	-	LR	UD	STB	GRB	CLKPOL	MODE
		0	0	0	0	0	0	0	0	0	-	1	0	1	1	0	1
R01	Function control 2	0	0	0	0	0	1	0	X	CABC1	CABC0	HFRC	DIT	BIST	RESL1	RESL0	RESL2
		0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

Table 7.3: Register map

7.3 Function control 1 (R00h)

Bit	Name	Function	Description
D7	PWR_EN	POWER enable	0: Disable PWM, charge pump and VCOM buffer. (Default) 1: Enable PWM, charge pump and VCOM buffer.
D6	-	-	-
D5	LR	Right/left shift control	0: Right to left 1: Left to Right. (Default)
D4	UD	Up/down scan control	0: Normal. (Default) 1: Up/down reverse.
D3	STB	Standby mode control	0: Standby mode=Stop all circuits except SPI. 1: Normal mode. (Default)
D2	GRB	Global reset	0: Reset mode, all SPI registers return to default values. 1: Normal mode. (Default)
D1	CLKPOL	DCLK polarity change	0: Falling edge latch data. (Default) 1: Rising edge latch data.
D0	MODE	DE/SYNC mode	0: SYNC mode. 1: DE mode. (Default)

Table 7.4: Function control 1 register

7.4 Function control 2 (R01h)

Bit	Name	Function	Description				
D7	CABC	CABC operation mode	CABC		CABC state		
			D7	D6			
			0	0	CABC off (Default)		
			0	1	UI mode		
			1	0	Still mode		
	1	1	Moving mode				
D5	HFRC	HFRC selection	0: FRC enable. (Default) 1: HFRC enable. If DIT="0", disable dither. (HFRC and FRC disable)				
D4	DIT	Dithering function on/off	0: Dithering function disable. (Default) 1: Dithering function enables.				
D3	BIST	Normal Operation or BIST pattern select	0: Normal operation. (Default) 1: BIST pattern.				
D2	RESL	Display resolution selection	RESL			Resolution	Note
			D2	D1	D0		
			0	0	0	1024 (RGB) x600	Default
			0	1	0	1024 (RGB) x768	-
			1	0	0	800 (RGB) x600	601~936 channel disable
	1	1	0	800 (RGB) x480	601~936 channel disable		
D0	x	x	1	960 (RGB) x540	-		

Table 7.5: Function control 2 register

8. Power On/Off Sequence

To prevent the device damage from latch up, the power on/off sequence shown below must be followed.

Power on: VDD, GND → AVDD, AGND → V1 to V14

Power off: V1 to V14 → AVDD, AGND → VDD, GND

8.1 Power on/off control

HX8282-A01 has a power on/off sequence control function. In order to prevent IC from power on reset fail, the rising time (T_{POR}) of the digital power supply VDD should be maintained within the given specifications. Please refer to “AC Characteristics” for more detail on timing.

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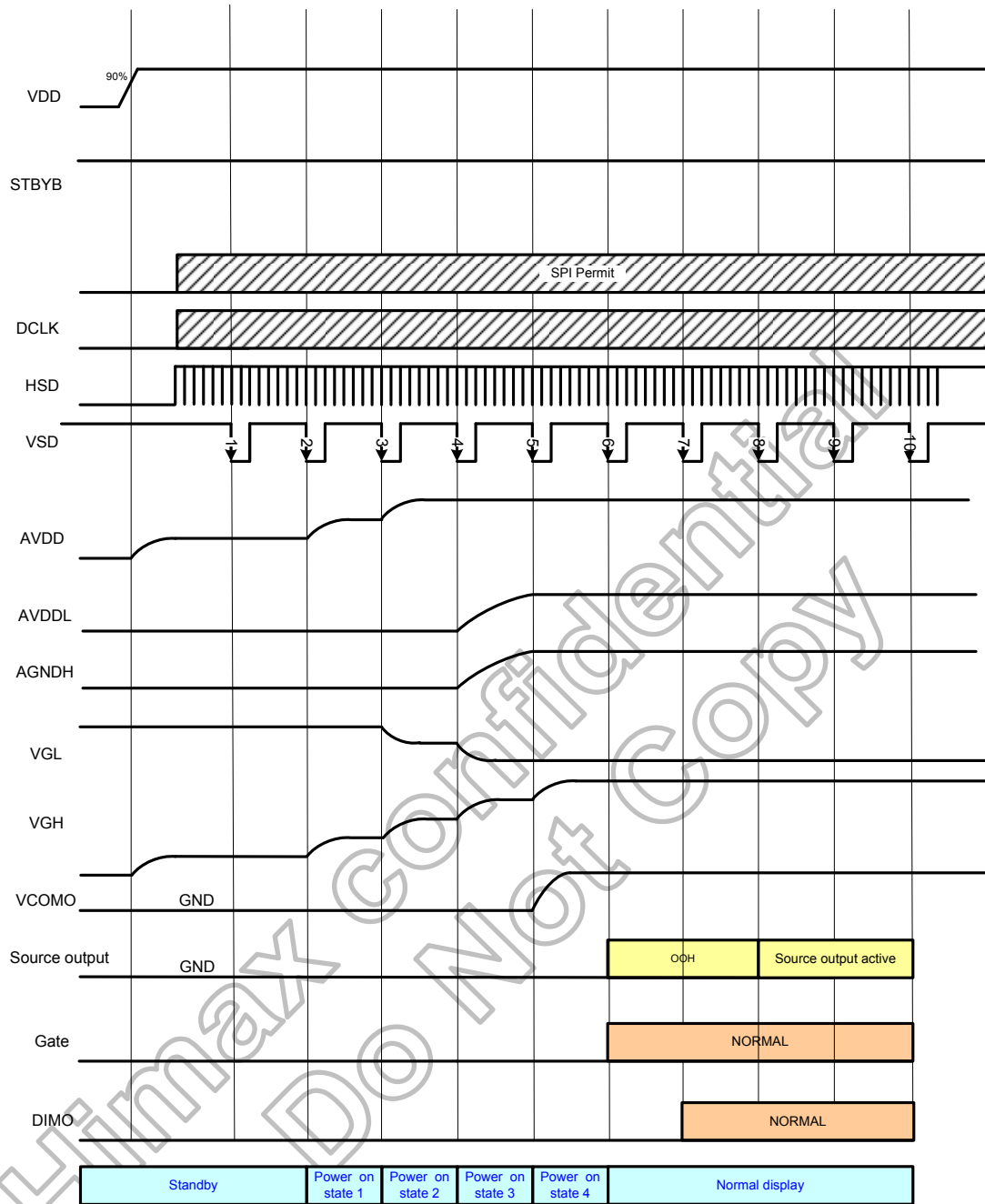
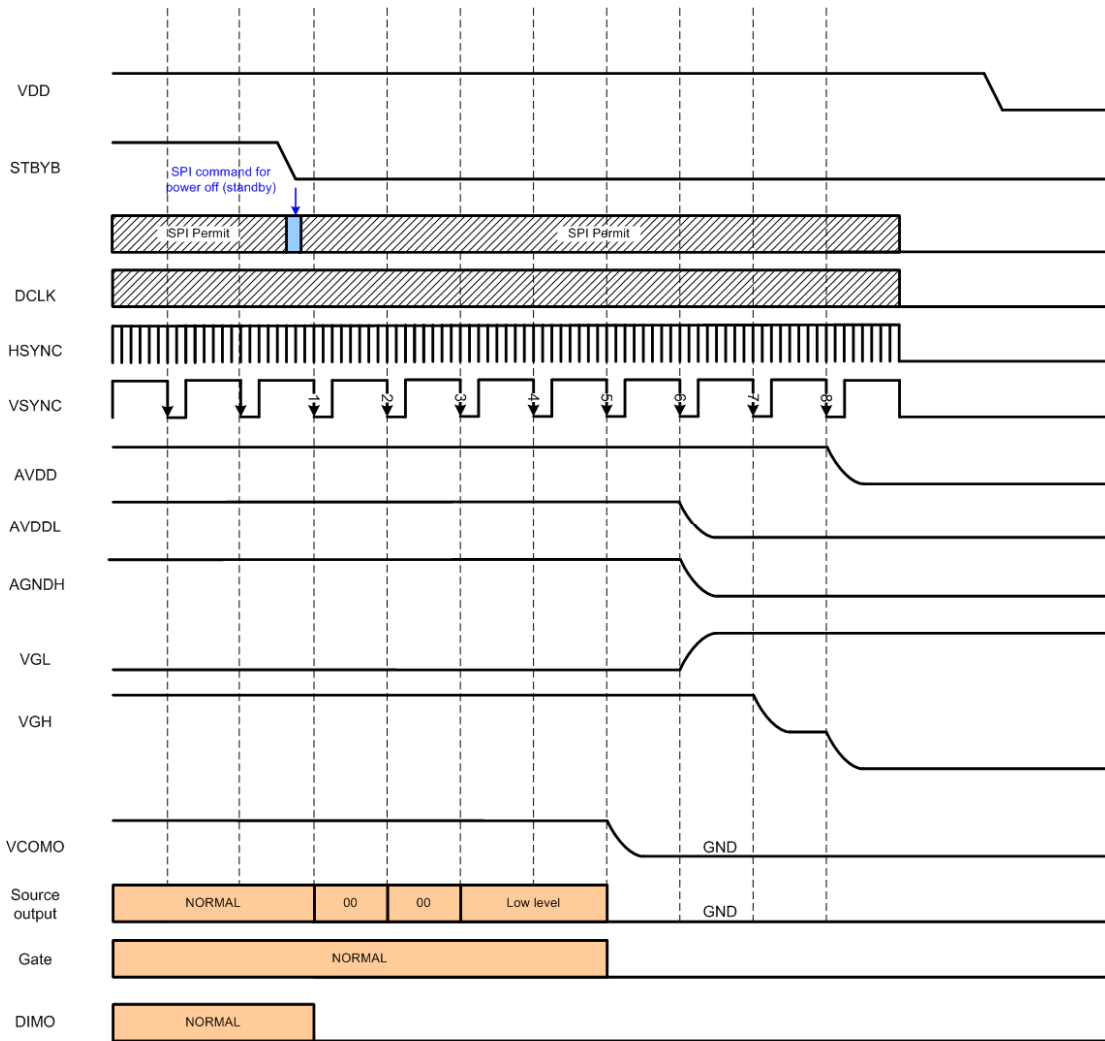


Figure 8.1: Power on timing sequence



Note: (1) Low level=3FH, when NBW=L. (Normally white)
 (2) Low level=00H, when NBW=H. (Normally black)

Figure 8.2: Power off timing sequence

9. DC Characteristics

9.1 Absolute maximum rating (GND=AGND=0V)

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Power supply voltage 1	VDD	-0.5	-	+3.96	V
Power supply voltage 2	AVDD	-0.5	-	+14.85	V
Logic output voltage	V _{OUT}	-0.5	-	+5.0	V
Input voltage	V _{IN}	-0.5	-	AVDD+0.5	V
Operation temperature	T _{OPR}	-20	-	+85	°C
Storage temperature	T _{STG}	-55	-	+125	°C

Note: (1) All of the voltages listed above are with respective to GND=0V.

(2) Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

Table 9.1: Absolute maximum rating

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9.2 DC electrical characteristics

9.2.1 TTL mode DC electrical characteristics

(VDD=2.3 to 3.6V, AVDD=6.5 to 13.5V, GND=AGND=0V, TA=-20°C to +85°C)

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Power supply voltage	VDD	-	2.3	-	3.6	V
Power supply voltage	AVDD	-	6.5	-	13.5	V
Power supply voltage	AVDDL	Full range application	6.5	-	13.5	V
		Half AVDD application	-	V8+0.1	-	V
Power supply voltage	AGNDH	Full range application	0			V
		Half AVDD application	-	V7-0.1	-	V
Low level input voltage	V _{IL}	For digital circuit	0	-	0.3VDD	V
High level input voltage	V _{IH}	For digital circuit	0.7VDD	-	VDD	V
Output low voltage	V _{OL}	I _{OL} =400μA	-	-	GND+0.4	V
Output high voltage	V _{OH}	I _{OH} =-400μA	VDD-0.4	-	-	V
Pull low/high resistance	R _i	For the digital input pin @VDD=3.3V	200	250	300	KΩ
Input leakage current	I _i	For digital circuit	-	-	±1	μA
Digital operation current	I _{dd}	Fclk=50MHz, LD=48KHz, VDD=3.3V, No load	-	12	20	mA
Digital stand-by current	I _{st1}	Clock & all functions are stopped	-	10	50	μA
Analog operating current	I _{dda}	No load, Fclk=50MHz, LD=48KHz @ AVDD=10V, V1=8V, V14=0.4V	-	8	10	mA
Analog stand-by current	I _{st2}	No load, clock & all functions are stopped	-	10	50	μA
Input level of V1~V7	V _{ref1}	Gamma correction voltage input	0.4AVDD	-	AVDD-0.1	V
Input level of V8~V14	V _{ref2}	Gamma correction voltage input	0.1	-	0.6AVDD	V
Output voltage deviation	V _{od1}	Vo=AGND+0.1V~AGND+0.5V &	-	±20	±35	mV
		Vo=AVDD-0.5V~AVDD-0.1V	-	±15	±20	mV
Output voltage deviation	V _{od2}	Vo=AGND+0.5V~AVDD-0.5V	-	±15	±20	mV
Output voltage offset between chips	V _{oc}	Vo=AGND+0.5V~AVDD-0.5V	-	-	±20	mV
Dynamic range of output	V _{dr}	SO1~SO1200	0.1	-	AVDD-0.1	V
Sinking current of outputs	I _{OLy}	SO1~SO1200; Vo=0.1V vs. 1.0V, AVDD=13.5V	80	-	-	μA
Driving current of outputs	I _{OHy}	SO1~SO1200; Vo=0.1V vs. 12.5V, AVDD=13.5V	80	-	-	μA
Resistance of gamma table	R _g	R _n : Internal gamma resistor	0.7xR _n	1.0xR _n	1.3xR _n	Ω

Table 9.2: DC electrical characteristics

9.2.2 LVDS mode DC electrical characteristics

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Differential input high Threshold voltage	R_{XVTH}	$R_{XVCM}=1.2V$	-	-	+0.1	V
Differential input low threshold voltage	R_{XVTL}		-0.1	-	-	V
Input voltage range (Singled-end)	R_{XVIN}	-	0	-	$VDD-1.2+ V_{ID} /2$	V
Differential input common mode voltage	R_{XVCM}	-	$ V_{ID} /2$	-	$VDD-1.2$	V
Differential input voltage	$ V_{ID} $	-	0.2	-	0.6	V
Differential input leakage Current	$R_{V_{Xliz}}$	-	-10	-	+10	μA
LVDS digital operating Current	I_{ddlvds}	Fclk=65MHz, VDD=3.3V	-	15	30	mA
LVDS digital stand-by Current	I_{stlvds}	Clock & all functions are stopped	-	10	50	μA

Table 9.3: LVDS mode DC electrical characteristics

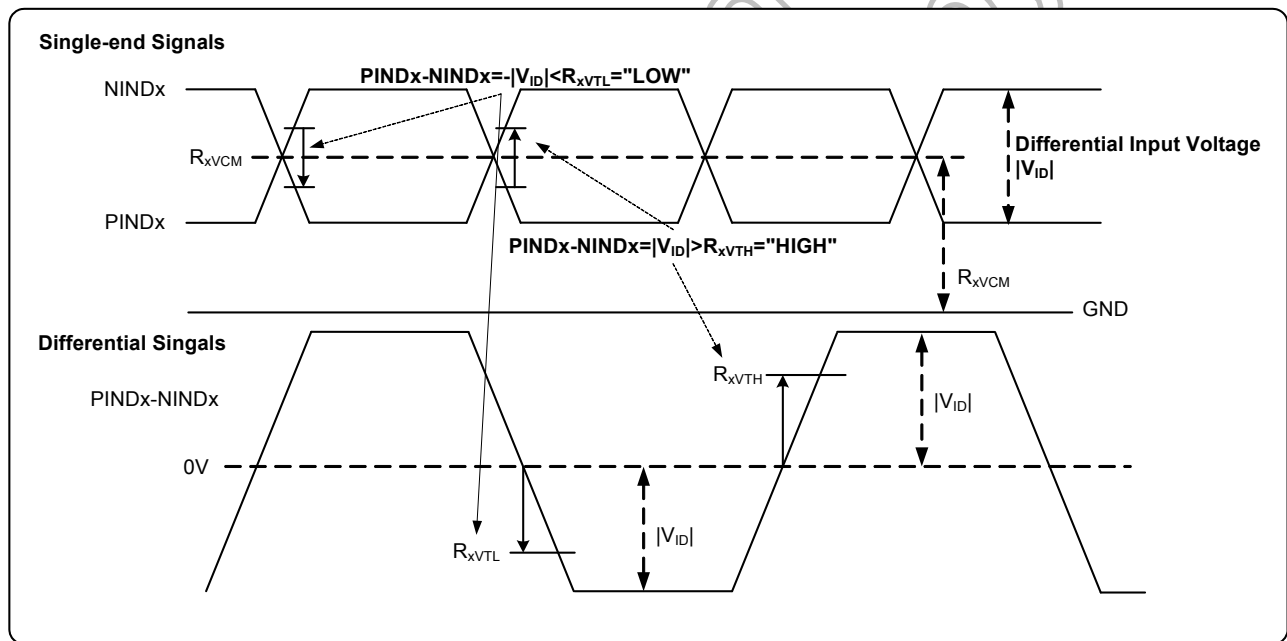


Figure 9.1: Single-end signals

9.2.3 PWM power table

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Base drive current for PWM	IDRV	DRVA=0.7V	-	-	60	mA
DRV output voltage for PWM	VDRV	-	0	-	VDD	V
Feed back voltage for PWM	VFB	-	1.15	1.2	1.25	V
Duty cycle maximum	Dmax	-	-	-	76.5	%
VCOM buffer input voltage	VCOMI	-	1	-	AVDD	V
VCOM buffer output voltage	VCOMO	-	VCOMI-0.2	VCOMI	VCOMI+0.2	V
VCOM buffer output current	IVCOM	Fclk=65MHz, VDD=3.3V	-	-	10	mA

Table 9.4: Power table

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9.3 Half voltage

Half-voltage source driver can save 50% current by reducing DC current path

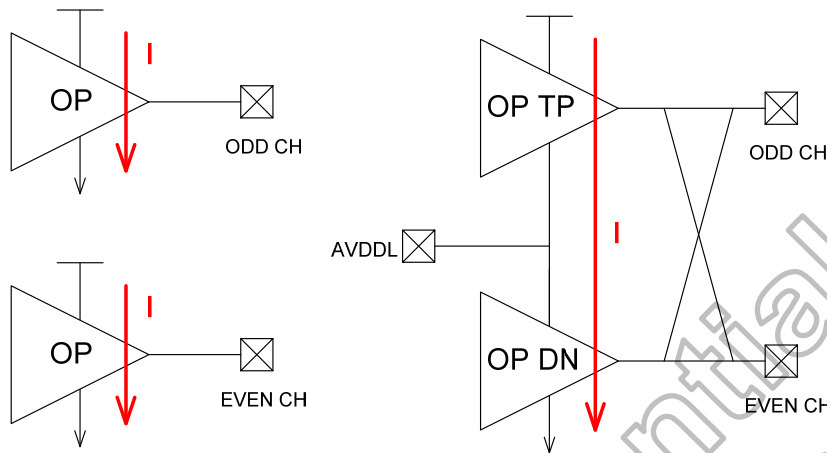
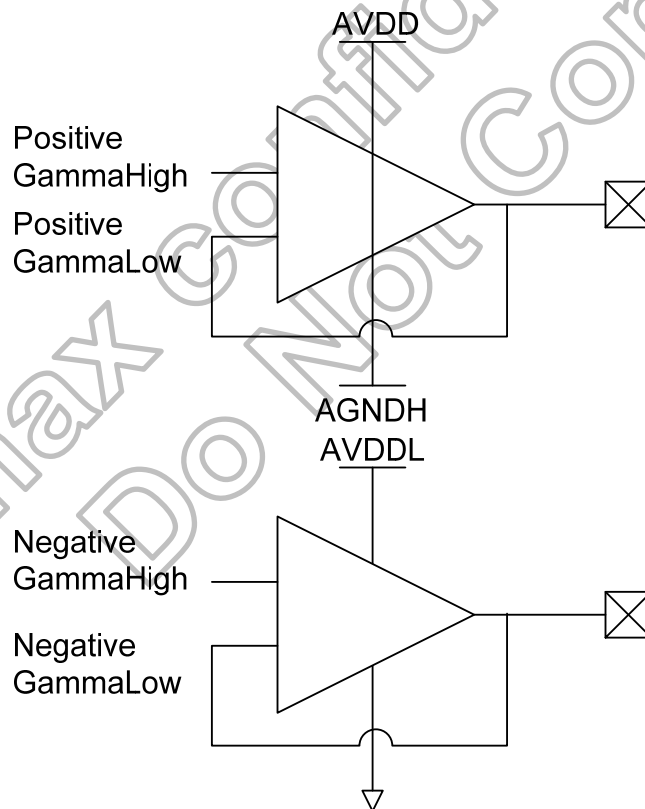


Figure 9.2: Traditional SD and half-voltage SD



- Note:** (1) AGNDH: Connected to AGND when Full Range application.
 Connected to Half AVDD when Half AVDD application.
 (2) AVDDL: Connected to AVDD when Full Range application.
 Connected to Half AVDD when Half AVDD application.
 (3) Positive Gamma High > AGNDH+0.1.
 (4) Negative Gamma High < AVDDL-0.1.

Figure 9.3: Half-voltage SD and gamma voltage relation

10. AC Characteristics

10.1 AC electrical characteristics

10.1.1 TTL mode AC electrical characteristics

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
VDD power on slew rate	T_{POR}	From 0V to 90% VDD	-	-	20	ms
GRB pulse width	T_{GRB}	-	50	-	-	μ s
DCLK cycle time	T_{cph}	-	14	-	-	ns
DCLK pulse duty	T_{cwh}	-	40	50	60	%
VSD setup time	T_{vst}	-	5	-	-	ns
VSD hold time	T_{vhd}	-	5	-	-	ns
HSD setup time	T_{hst}	-	5	-	-	ns
HSD hold time	T_{hhd}	-	5	-	-	ns
Data setup time	T_{dsu}	D0[7:0], D1[7:0], D2[7:0] to DCLK	5	-	-	ns
Data hold time	T_{dhd}	D0[7:0], D1[7:0], D2[7:0] to DCLK	5	-	-	ns
DE setup time	T_{esu}	-	5	-	-	ns
DE hold time	T_{ehd}	-	5	-	-	ns
Output stable time	T_{sst}	10% to 90% target voltage. CL=90pF, R=10K Ω (Cascade)	-	-	6	μ s
		Dual gate	-	-	3	

Table 10.1: TTL mode AC electrical characteristics

10.1.2 LVDS mode AC electrical characteristics

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Clock frequency	R_{XFCLK}	-	20	-	71	MHz
Input data skew margin	T_{RSKM}	$ V_{ID} =400mV$ $R_{XVCM}=1.2V$ $R_{XFCLK}=71MHz$	500	-	-	pS
Clock high time	T_{LVCH}	-	-	$4/(7 \times R_{XFCLK})$	-	ns
Clock low time	T_{LVCL}	-	-	$3/(7 \times R_{XFCLK})$	-	ns
PLL wake-up time	T_{enPLL}	-	-	-	150	μ s

Table 10.2: LVDS mode AC electrical characteristics

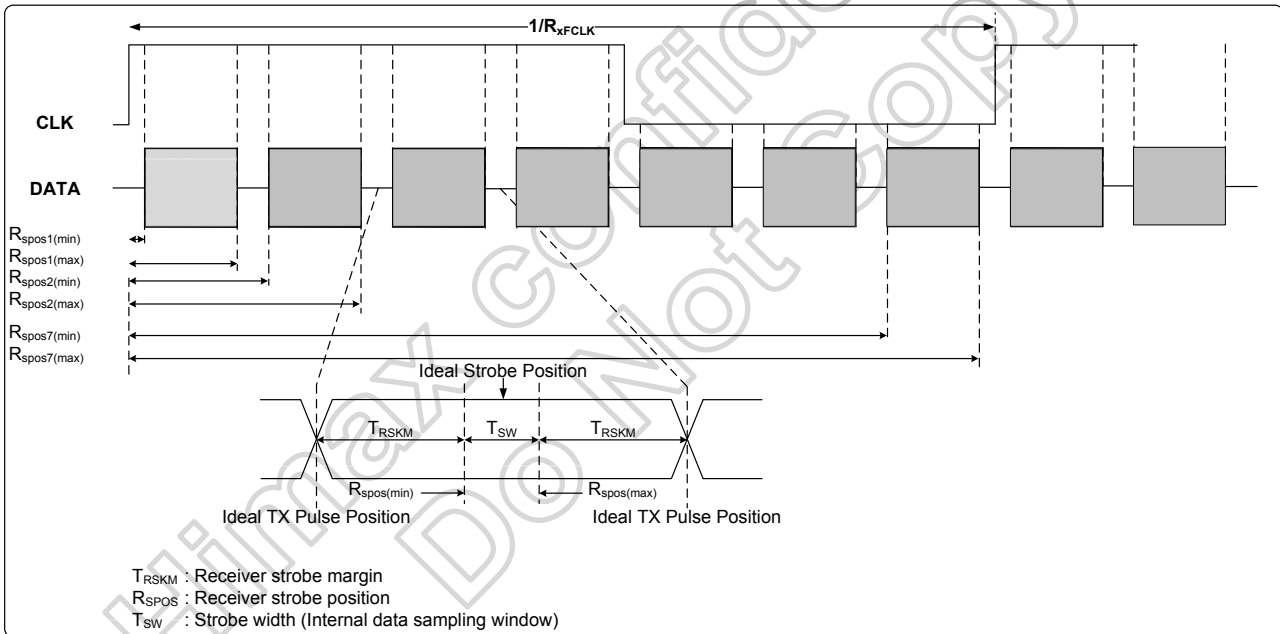
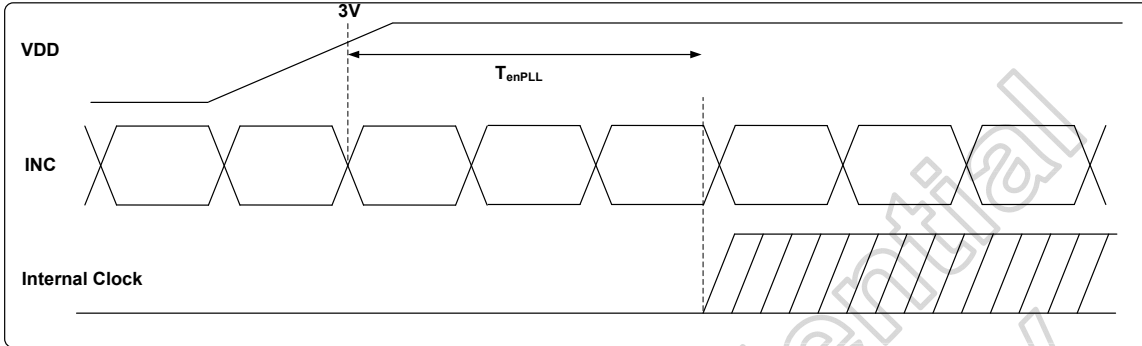
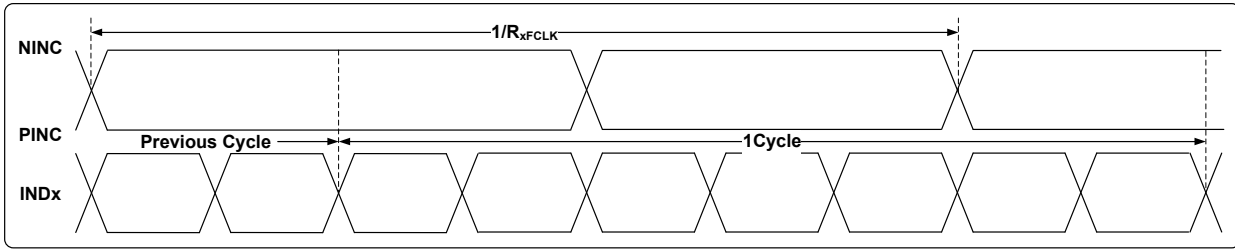


Figure 10.1: LVDS figure

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Modulation frequency	SSC_{MF}	-	23	-	93	KHz
Modulation rate	SSC_{MR}	LVDS clock=71MHz center spread	-	-	± 3	%

Table 10.3: SSC table

10.2 Data input format

10.2.1 TTL mode data input format

- Vertical timing

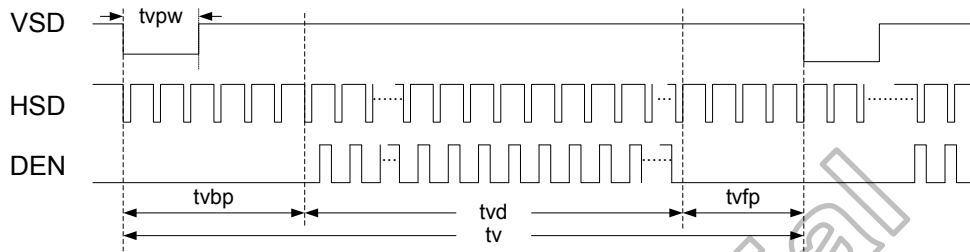


Figure 10.2: Vertical input timing diagram

- Horizontal timing

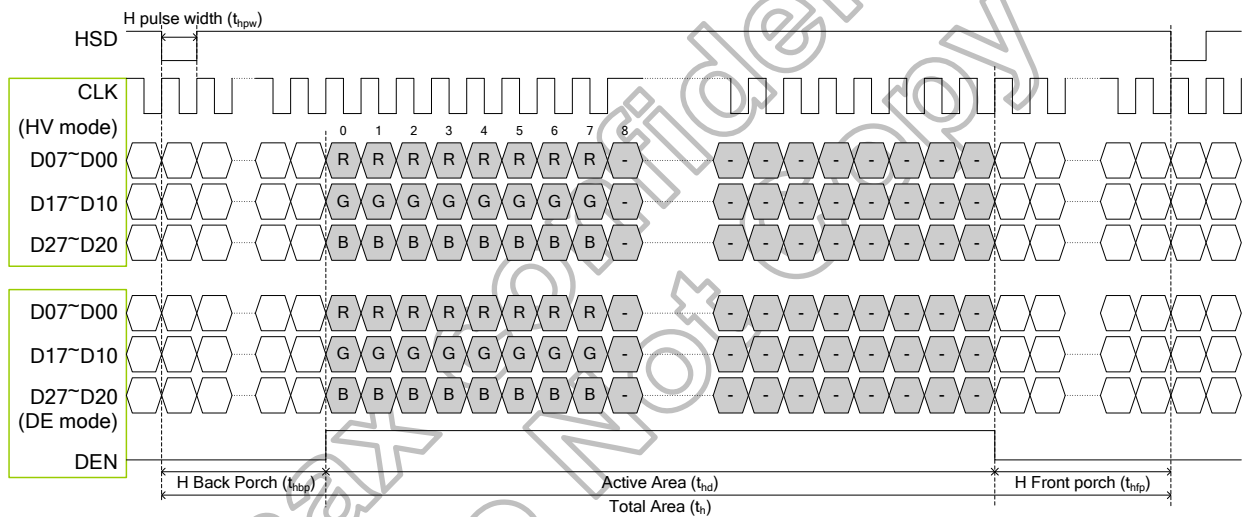


Figure 10.3: Horizontal input timing diagram

10.2.2 LVDS mode data input format

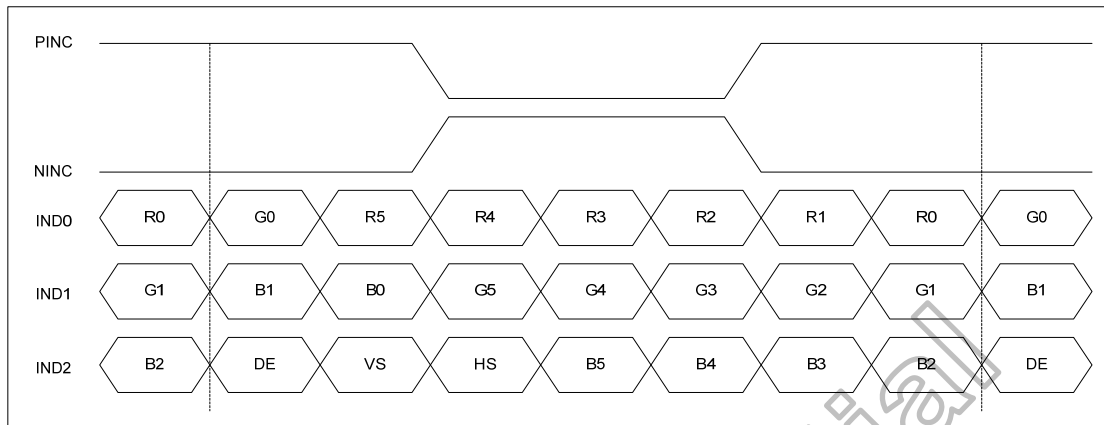


Figure 10.4: 6-bit LVDS input

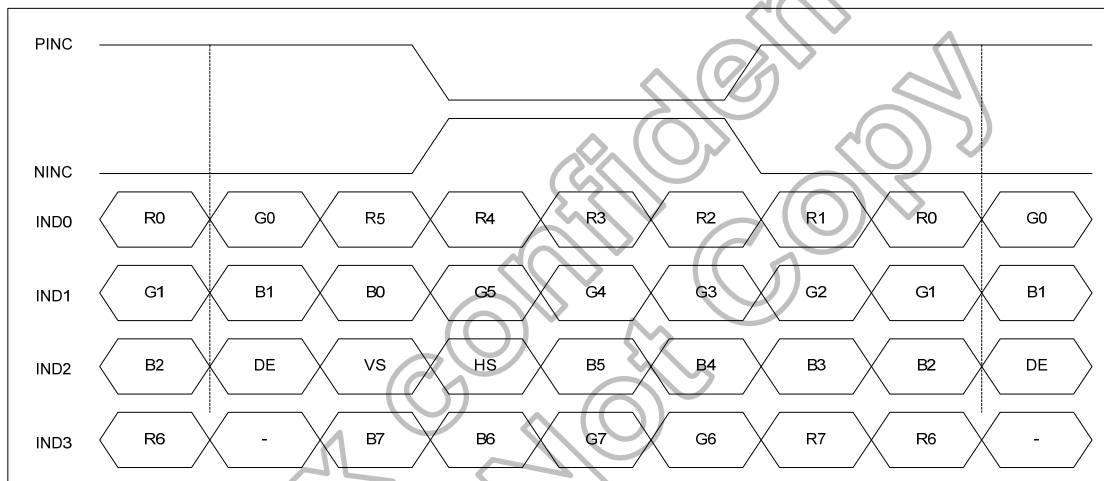


Figure 10.5: 8-bit LVDS input

10.3 Parallel RGB input timing table

10.3.1 Resolution: 1024x600

DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	40.8	51.2	67.2	MHz
Horizontal display area	thd	1024			DCLK
HSD period	th	1114	1344	1400	DCLK
HSD blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	600			T _H
VSD period	tv	610	635	800	T _H
VSD blanking	tvbp+tvfp	10	35	200	T _H

Table 10.4: DE mode (1024x600)

HV mode

- Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	44.9	51.2	63	MHz
Horizontal display area	thd	1024			DCLK
HSD period	th	1200	1344	1400	DCLK
HSD pulse Width	thpw	1	-	140	DCLK
HSD back porch	thbp	160			DCLK
HSD front porch	thfp	16	160	216	DCLK

Table 10.5: HV mode horizontal timing (1024x600)

- Vertical timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			T _H
VSD period	tv	624	635	750	T _H
VSD pulse width	tvpw	1	-	20	T _H
VSD back porch	tvbp	23			T _H
VSD front porch	tvfp	1	12	127	T _H

Table 10.6: HV mode vertical timing (1024x600)

10.3.2 Resolution: 1024x768

DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	52	65	71	MHz
Horizontal display area	thd	1024			DCLK
HSD period	th	1114	1344	1400	DCLK
HSD blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	768			T _H
VSD period	tv	778	806	845	T _H
VSD blanking	tvbp+tvfp	10	38	77	T _H

Table 10.7: DE mode (1024x768)

HV mode

- Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	57	65	70.5	MHz
Horizontal display area	thd	1024			DCLK
HSD period	th	1200	1344	1400	DCLK
HSD pulse width	thpw	1	-	140	DCLK
HSD back porch	thbp	160			DCLK
HSD front porch	thfp	16	160	216	DCLK

Table 10.8: HV mode horizontal timing (1024x768)

- Vertical timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	768			T _H
VSD period	tv	792	806	840	T _H
VSD pulse width	tvpw	1	-	20	T _H
VSD back porch	tvbp	23			T _H
VSD front porch	tvfp	1	15	49	T _H

Table 10.9: HV mode vertical timing (1024x768)

10.3.3 Resolution: 800x600

DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	32.6	39.6	62.4	MHz
Horizontal display area	thd	800			DCLK
HSD period	th	890	1000	1300	DCLK
HSD blanking	thb+thfp	90	200	500	DCLK
Vertical display area	tvd	600			T _H
VSD period	tv	610	660	800	T _H
VSD blanking	tvbp+tvfp	10	60	200	T _H

Table 10.10: DE mode (800x600)

HV mode

- Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	34.5	39.6	50.4	MHz
Horizontal display area	thd	800			DCLK
HSD period	th	900	1000	1200	DCLK
HSD pulse Width	thpw	1	-	40	DCLK
HSD back porch	thbp	88			DCLK
HSD front porch	thfp	12	112	312	DCLK

Table 10.11: HV mode horizontal timing (800x600)

- Vertical timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	600			T _H
VSD period	tv	640	660	700	T _H
VSD pulse width	tvpw	1	-	20	T _H
VSD back porch	tvbp	39			T _H
VSD front porch	tvfp	1	21	61	T _H

Table 10.12: HV mode vertical timing (800x600)

10.3.4 Resolution: 800 x480

DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	26.2	29.2	54.6	MHz
Horizontal display area	thd	800			DCLK
HSD period	th	890	928	1300	DCLK
HSD blanking	thb+thfp	90	128	500	DCLK
Vertical display area	tvd	480			T _H
VSD period	tv	490	525	700	T _H
VSD blanking	tvbp+tvfp	10	45	220	T _H

Table 10.13: DE mode (800x480)

HV mode

- Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	27.7	29.2	39.6	MHz
Horizontal display area	thd	800			DCLK
HSD period	th	900	928	1100	DCLK
HSD pulse Width	thpw	1	-	40	DCLK
HSD back porch	thbp	88			DCLK
HSD front porch	thfp	12	40	212	DCLK

Table 10.14: HV mode horizontal timing (800x480)

- Vertical timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	480			T _H
VSD period	tv	513	525	600	T _H
VSD pulse width	tvpw	1	-	3	T _H
VSD back porch	tvbp	32			T _H
VSD front porch	tvfp	1	13	88	T _H

Table 10.15: HV mode vertical timing (800x480)

10.3.5 Resolution: 960 x540

DE mode

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	36.4	38.6	43.2	MHz
Horizontal display area	thd	960			DCLK
HSD period	th	1060	1100	1200	DCLK
HSD blanking	thb+thfp	100	140	240	DCLK
Vertical display area	tvd	540			T _H
VSD period	tv	573	585	600	T _H
VSD blanking	tvbp+tvfp	33	45	60	T _H

Table 10.16: DE mode (960x540)

HV mode

- Horizontal timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
DCLK frequency	fclk	36.4	38.6	43.2	MHz
Horizontal display area	thd	960			DCLK
HSD period	th	1060	1100	1200	DCLK
HSD pulse width	thpw	1	-	20	DCLK
HSD back porch	thbp	88			DCLK
HSD front porch	thfp	12	52	152	DCLK

Table 10.17: HV mode horizontal timing (960x540)

- Vertical timing

Parameter	Symbol	Spec.			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd	540			T _H
VSD period	tv	573	585	600	T _H
VSD pulse width	tvpw	1	-	3	T _H
VSD back porch	tvbp	32			T _H
VSD front porch	tvfp	1	13	28	T _H

Table 10.18: HV mode vertical timing (960x540)

11. Timing

11.1 Output timing table

Parameter	Symbol	Conditions	Spec.			Unit
			Min.	Typ.	Max.	
CLKIN frequency	Fclk	VDD=3.0V~3.6V	-	65	71	MHz
CLKIN cycle time	Tclk	-	14.1	15.4	-	ns
CLKIN pulse duty	Tcwh	Tclk	40	50	60	%
Time from HSD to source output	Thso	-	64			CLKIN
Time from HSD to LD	Thld	-	64			CLKIN
Time from HSD to STV	Thstv	-	2			CLKIN
Time from HSD to CKV	Thckv	-	20			CLKIN
Time from HSD to OEV	Thoev	-	4			CLKIN
LD pulse width	Twld	-	10			CLKIN
CKV pulse width	Twckv	-	66			CLKIN
OEV pulse width	Twoev	-	74			CLKIN

Table 11.1: Parallel 24-bit RGB mode

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11.2 Timing diagram

11.2.1 Input clock and data timing diagram

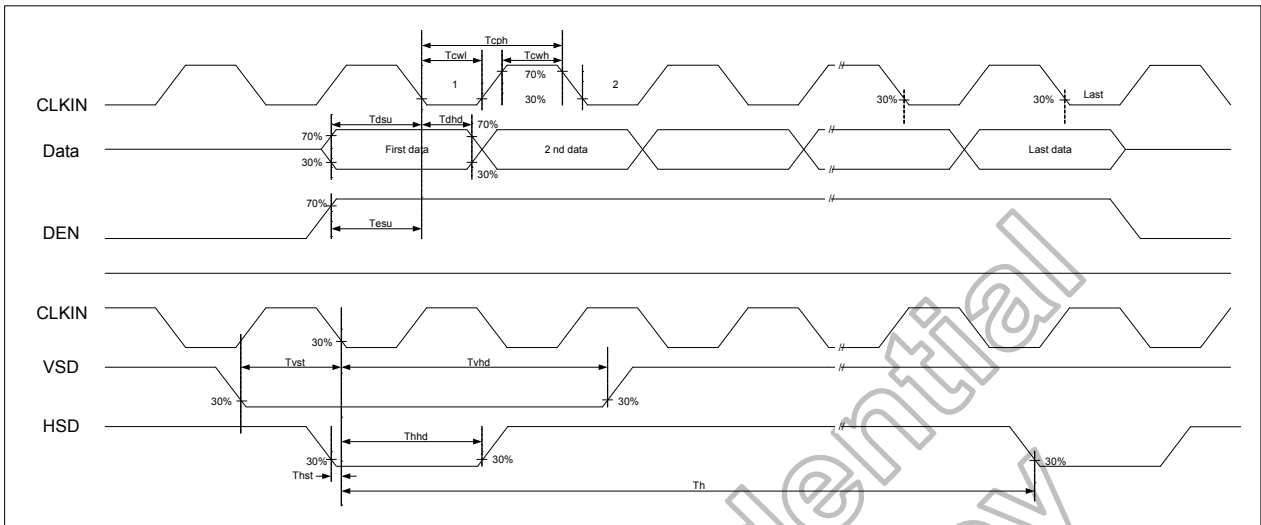


Figure 11.1: Input clock and data timing diagram

11.2.2 Source output timing diagram (Cascade)

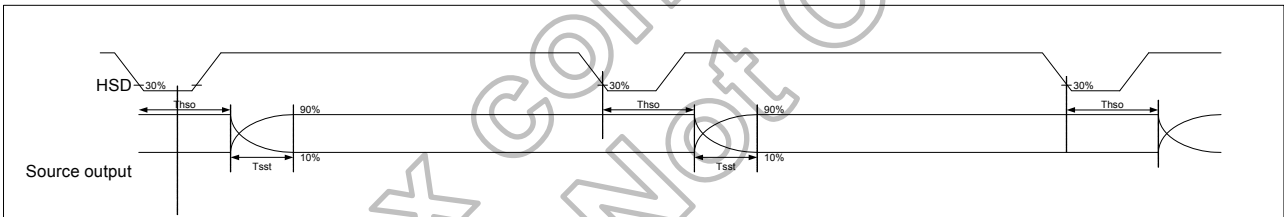


Figure 11.2: Source output timing diagram

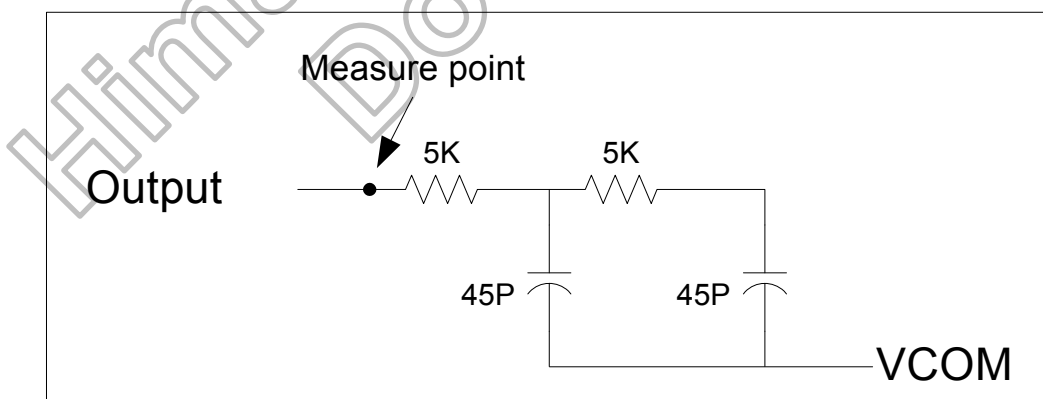


Figure 11.3: Output load condition

11.2.3 Vertical timing diagram HV (Cascade)

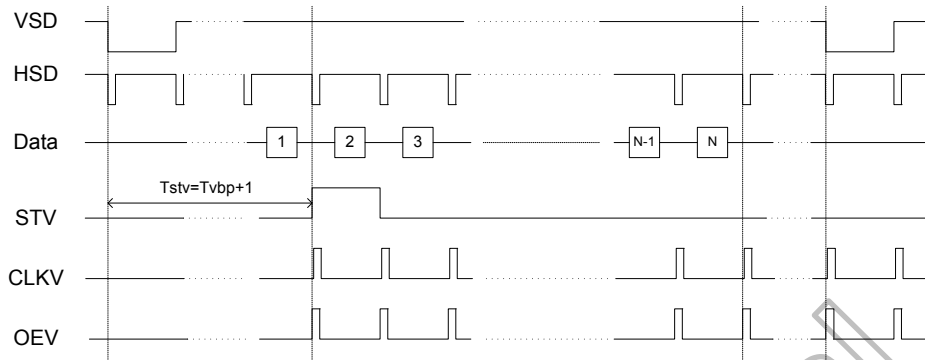


Figure 11.4: Vertical timing diagram HV (Cascade)

11.2.4 Vertical timing diagram DE (Cascade)

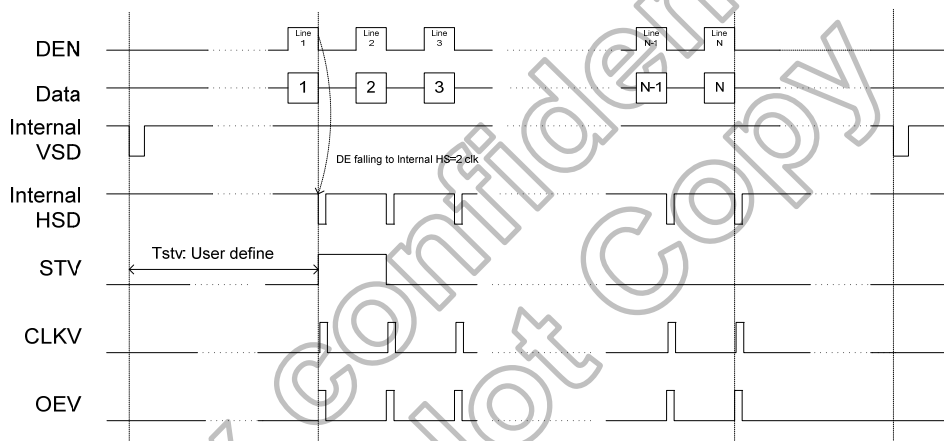


Figure 11.5: Vertical timing diagram DE (Cascade)

11.2.5 Gate output timing diagram (Cascade)

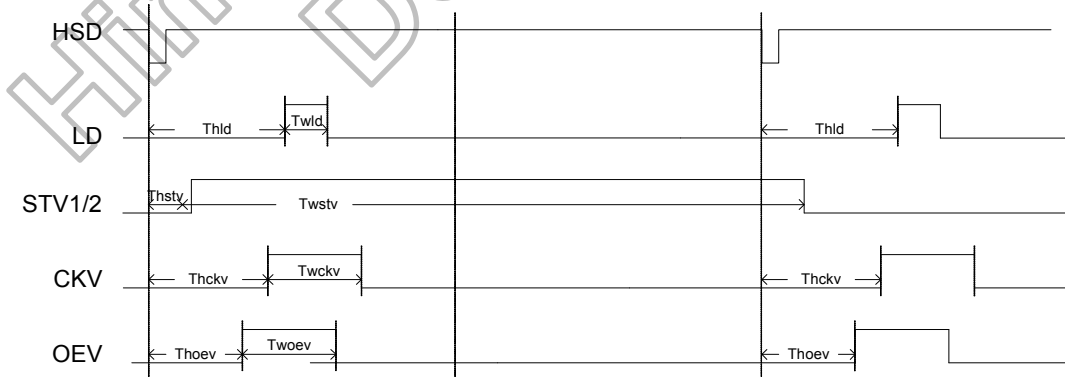


Figure 11.6: Gate output timing diagram (Cascade)

11.2.6 Vertical timing diagram HV (Dual gate)

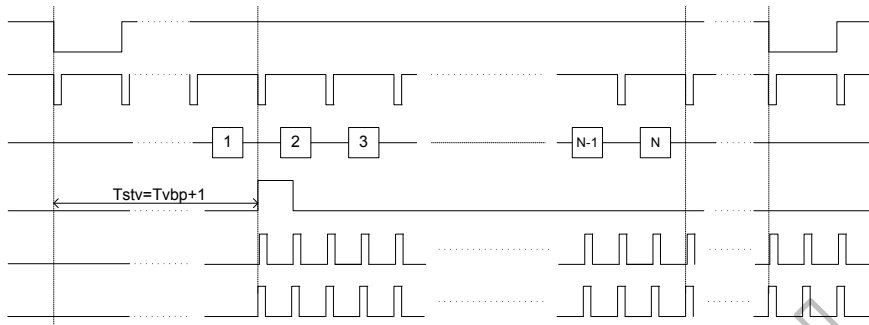


Figure 11.7: Vertical timing diagram HV (Dual gate)

11.2.7 Vertical timing diagram DE (Dual gate)

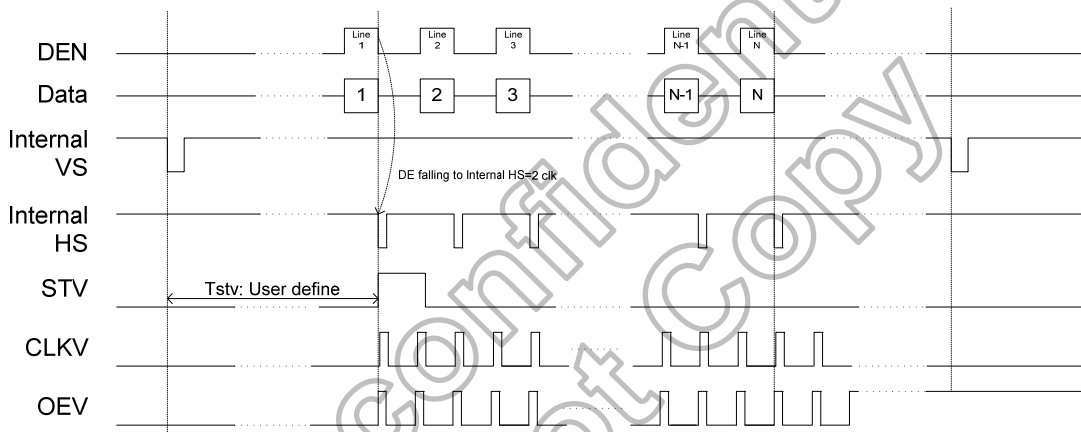


Figure 11.8: Vertical timing diagram DE (Dual gate)

11.2.8 Gate output timing diagram (Dual gate)

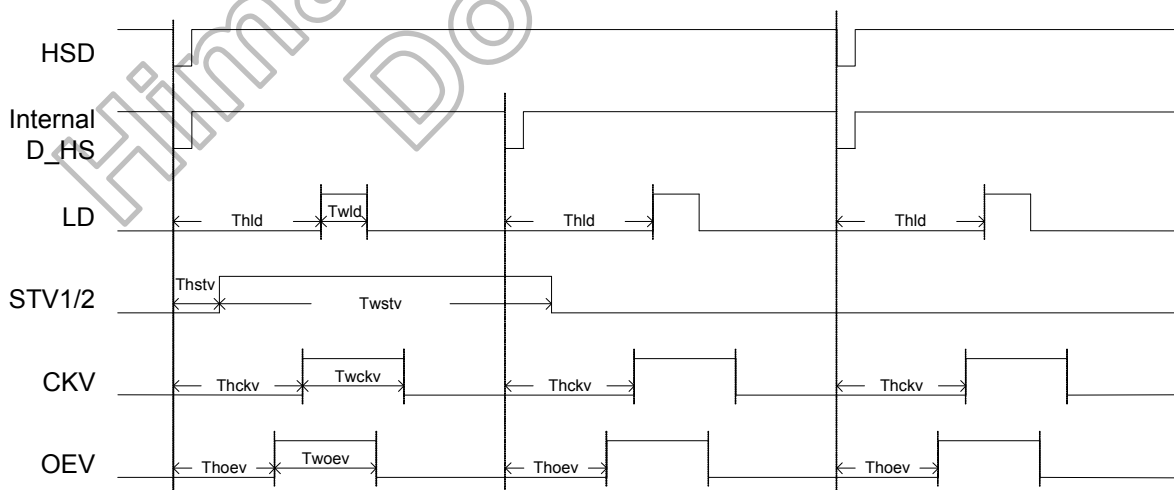


Figure 11.9: Gate output timing diagram (Dual gate)

12.2 Bump information

12.2.1 Chip outline dimensions

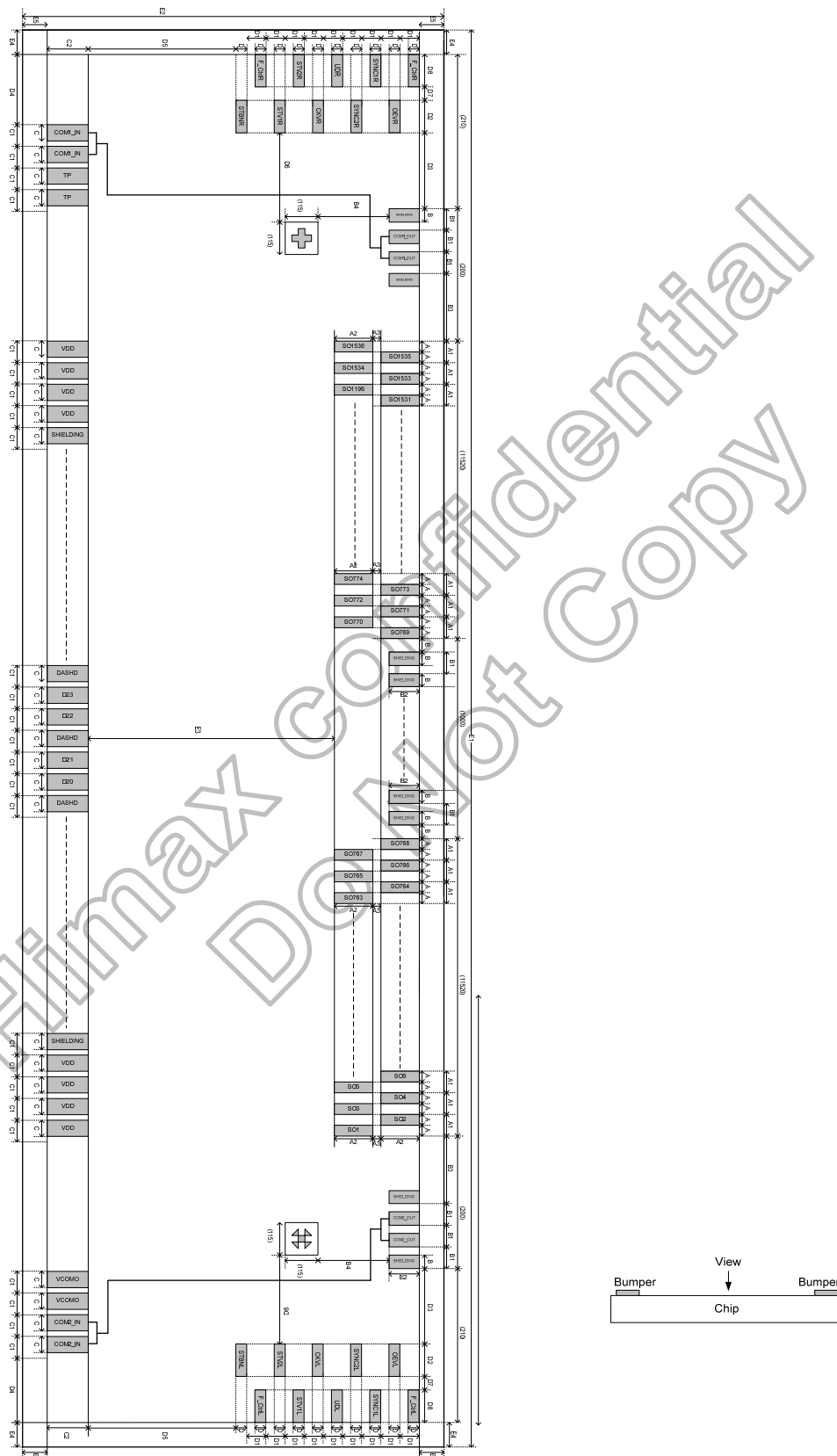


Figure 12.2: Chip outline dimensions

12.2.2 Alignment mark

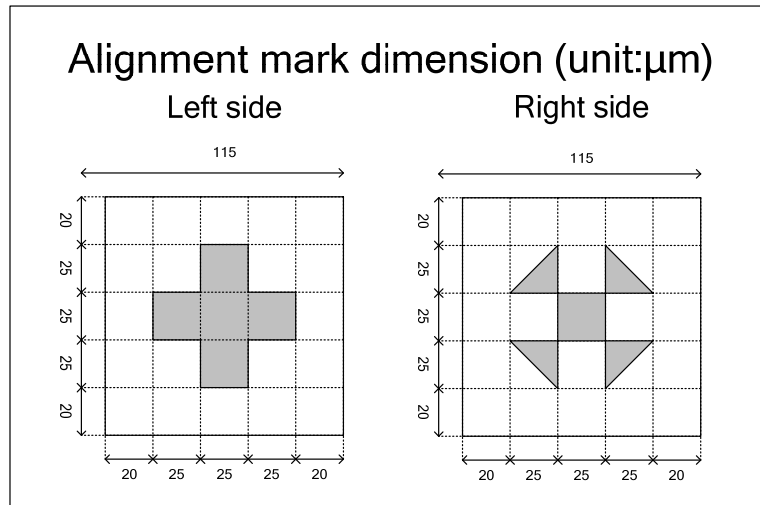


Figure 12.3: Alignment mark

12.2.3 Pad information

Bump height: $12\mu\text{m} \pm 3\mu\text{m}$ or $9\mu\text{m} \pm 2\mu\text{m}$

Co-planarity within Die: $< 2\mu\text{m}$

Hardness: $60 \pm 15\text{Hv}$

Shear stress: $> 4.5\text{g}/\text{mil}^2$

Symbol	Dimension (μm)
A	15
A1	30
A2	100
A3	30
B	30
B1	50
B2	70
B3	50
B4	50
C	65
C1	85
C2	100

Symbol	Dimension (μm)
D	30
D1	40
D2	80
D3	43
D4	20
D5	96
D6	74
D7	20
D8	67
E1	24876
E2	620
E3	256
E4	8
E5	17

Table 12.1: Pad information

12.3 Pad coordinates

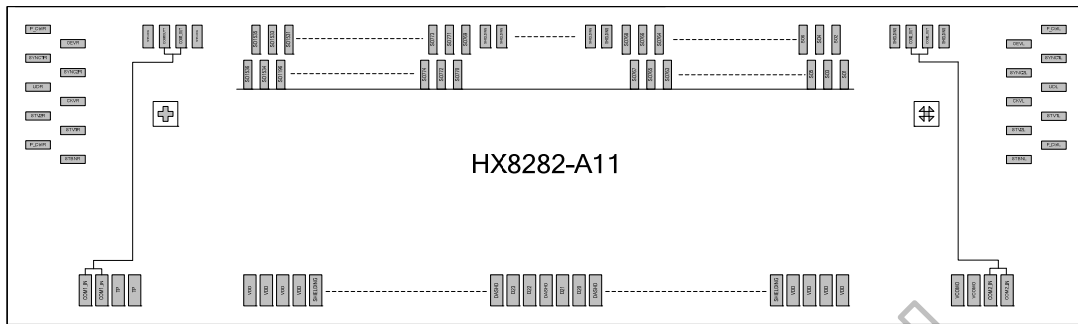


Figure 12.4: Pad coordinate

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No.	Name	X	Y	Bump Size
1	COM1_IN	-12377.5	-243	65x100
2	COM1_IN	-12292.5	-243	65x100
3	TP	-12207.5	-243	65x100
4	TP	-12122.5	-243	65x100
5	TP	-12037.5	-243	65x100
6	TP	-11952.5	-243	65x100
7	SHIELDING	-11867.5	-243	65x100
8	AGND	-11782.5	-243	65x100
9	AGND	-11697.5	-243	65x100
10	AGND	-11612.5	-243	65x100
11	AGND	-11527.5	-243	65x100
12	SHIELDING	-11442.5	-243	65x100
13	AVDD	-11357.5	-243	65x100
14	AVDD	-11272.5	-243	65x100
15	AVDD	-11187.5	-243	65x100
16	AVDD	-11102.5	-243	65x100
17	SHIELDING	-11017.5	-243	65x100
18	GND	-10932.5	-243	65x100
19	GND	-10847.5	-243	65x100
20	GND	-10762.5	-243	65x100
21	GND	-10677.5	-243	65x100
22	SHIELDING	-10592.5	-243	65x100
23	VDD	-10507.5	-243	65x100
24	VDD	-10422.5	-243	65x100
25	VDD	-10337.5	-243	65x100
26	VDD	-10252.5	-243	65x100
27	SHIELDING	-10167.5	-243	65x100
28	TP	-10082.5	-243	65x100
29	TP	-9997.5	-243	65x100
30	TP	-9912.5	-243	65x100
31	TP	-9827.5	-243	65x100
32	TP	-9742.5	-243	65x100
33	TP	-9657.5	-243	65x100
34	TP	-9572.5	-243	65x100
35	TP	-9487.5	-243	65x100
36	TP	-9402.5	-243	65x100
37	TP	-9317.5	-243	65x100
38	SHIELDING	-9232.5	-243	65x100
39	DIMI	-9147.5	-243	65x100
40	DIMI	-9062.5	-243	65x100
41	NBW	-8977.5	-243	65x100
42	NBW	-8892.5	-243	65x100
43	PINCTL	-8807.5	-243	65x100
44	PINCTL	-8722.5	-243	65x100
45	SHIELDING	-8637.5	-243	65x100
46	DIMO	-8552.5	-243	65x100
47	DIMO	-8467.5	-243	65x100
48	SHIELDING	-8382.5	-243	65x100
49	DITHER	-8297.5	-243	65x100
50	DITHER	-8212.5	-243	65x100

No.	Name	X	Y	Bump Size
51	HFRC	-8127.5	-243	65x100
52	HFRC	-8042.5	-243	65x100
53	TP	-7957.5	-243	65x100
54	TP	-7872.5	-243	65x100
55	FRAME	-7787.5	-243	65x100
56	FRAME	-7702.5	-243	65x100
57	SEL[0]	-7617.5	-243	65x100
58	SEL[0]	-7532.5	-243	65x100
59	SEL[1]	-7447.5	-243	65x100
60	SEL[1]	-7362.5	-243	65x100
61	CSB	-7277.5	-243	65x100
62	CSB	-7192.5	-243	65x100
63	SHIELDING	-7107.5	-243	65x100
64	SDA	-7022.5	-243	65x100
65	SDA	-6937.5	-243	65x100
66	SHIELDING	-6852.5	-243	65x100
67	SCL	-6767.5	-243	65x100
68	SCL	-6682.5	-243	65x100
69	SHIELDING	-6597.5	-243	65x100
70	VDD	-6512.5	-243	65x100
71	VDD	-6427.5	-243	65x100
72	VDD	-6342.5	-243	65x100
73	VDD	-6257.5	-243	65x100
74	SHIELDING	-6172.5	-243	65x100
75	GND	-6087.5	-243	65x100
76	GND	-6002.5	-243	65x100
77	GND	-5917.5	-243	65x100
78	GND	-5832.5	-243	65x100
79	SHIELDING	-5747.5	-243	65x100
80	AVDDL	-5662.5	-243	65x100
81	AVDDL	-5577.5	-243	65x100
82	AVDDL	-5492.5	-243	65x100
83	AVDDL	-5407.5	-243	65x100
84	SHIELDING	-5322.5	-243	65x100
85	AGNDH	-5237.5	-243	65x100
86	AGNDH	-5152.5	-243	65x100
87	AGNDH	-5067.5	-243	65x100
88	AGNDH	-4982.5	-243	65x100
89	SHIELDING	-4897.5	-243	65x100
90	V1	-4812.5	-243	65x100
91	V1	-4727.5	-243	65x100
92	V2	-4642.5	-243	65x100
93	V2	-4557.5	-243	65x100
94	V3	-4472.5	-243	65x100
95	V3	-4387.5	-243	65x100
96	V4	-4302.5	-243	65x100
97	V4	-4217.5	-243	65x100
98	V5	-4132.5	-243	65x100
99	V5	-4047.5	-243	65x100
100	V6	-3962.5	-243	65x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
101	V6	-3877.5	-243	65x100	151	D06	372.5	-243	65x100
102	V7	-3792.5	-243	65x100	152	DASHD	457.5	-243	65x100
103	V7	-3707.5	-243	65x100	153	D05	542.5	-243	65x100
104	GAMH	-3622.5	-243	65x100	154	D04	627.5	-243	65x100
105	GAMH	-3537.5	-243	65x100	155	DASHD	712.5	-243	65x100
106	SHIELDING	-3452.5	-243	65x100	156	D03	797.5	-243	65x100
107	DASHD	-3367.5	-243	65x100	157	D02	882.5	-243	65x100
108	VSD	-3282.5	-243	65x100	158	DASHD	967.5	-243	65x100
109	DASHD	-3197.5	-243	65x100	159	D01	1052.5	-243	65x100
110	HSD	-3112.5	-243	65x100	160	D00	1137.5	-243	65x100
111	DASHD	-3027.5	-243	65x100	161	DASHD	1222.5	-243	65x100
112	DEN	-2942.5	-243	65x100	162	SHIELDING	1307.5	-243	65x100
113	GND LVDS	-2857.5	-243	65x100	163	GAML	1392.5	-243	65x100
114	GND LVDS	-2772.5	-243	65x100	164	GAML	1477.5	-243	65x100
115	GND LVDS	-2687.5	-243	65x100	165	V8	1562.5	-243	65x100
116	GND LVDS	-2602.5	-243	65x100	166	V8	1647.5	-243	65x100
117	D27	-2517.5	-243	65x100	167	V9	1732.5	-243	65x100
118	D26	-2432.5	-243	65x100	168	V9	1817.5	-243	65x100
119	DASHD	-2347.5	-243	65x100	169	V10	1902.5	-243	65x100
120	D25	-2262.5	-243	65x100	170	V10	1987.5	-243	65x100
121	D24	-2177.5	-243	65x100	171	V11	2072.5	-243	65x100
122	DASHD	-2092.5	-243	65x100	172	V11	2157.5	-243	65x100
123	D23	-2007.5	-243	65x100	173	V12	2242.5	-243	65x100
124	D22	-1922.5	-243	65x100	174	V12	2327.5	-243	65x100
125	DASHD	-1837.5	-243	65x100	175	V13	2412.5	-243	65x100
126	D21	-1752.5	-243	65x100	176	V13	2497.5	-243	65x100
127	D20	-1667.5	-243	65x100	177	V14	2582.5	-243	65x100
128	DASHD	-1582.5	-243	65x100	178	V14	2667.5	-243	65x100
129	DCLK	-1497.5	-243	65x100	179	SHIELDING	2752.5	-243	65x100
130	NINC	-1412.5	-243	65x100	180	AGND	2837.5	-243	65x100
131	DASHD	-1327.5	-243	65x100	181	AGND	2922.5	-243	65x100
132	VDD LVDS	-1242.5	-243	65x100	182	AGND	3007.5	-243	65x100
133	VDD LVDS	-1157.5	-243	65x100	183	AGND	3092.5	-243	65x100
134	VDD LVDS	-1072.5	-243	65x100	184	SHIELDING	3177.5	-243	65x100
135	VDD LVDS	-987.5	-243	65x100	185	AVDD	3262.5	-243	65x100
136	REV	-902.5	-243	65x100	186	AVDD	3347.5	-243	65x100
137	DASHD	-817.5	-243	65x100	187	AVDD	3432.5	-243	65x100
138	D17	-732.5	-243	65x100	188	AVDD	3517.5	-243	65x100
139	D16	-647.5	-243	65x100	189	SHIELDING	3602.5	-243	65x100
140	DASHD	-562.5	-243	65x100	190	GND	3687.5	-243	65x100
141	D15	-477.5	-243	65x100	191	GND	3772.5	-243	65x100
142	D14	-392.5	-243	65x100	192	GND	3857.5	-243	65x100
143	DASHD	-307.5	-243	65x100	193	GND	3942.5	-243	65x100
144	D13	-222.5	-243	65x100	194	SHIELDING	4027.5	-243	65x100
145	D12	-137.5	-243	65x100	195	VDD	4112.5	-243	65x100
146	DASHD	-52.5	-243	65x100	196	VDD	4197.5	-243	65x100
147	D11	32.5	-243	65x100	197	VDD	4282.5	-243	65x100
148	D10	117.5	-243	65x100	198	VDD	4367.5	-243	65x100
149	DASHD	202.5	-243	65x100	199	SHIELDING	4452.5	-243	65x100
150	D07	287.5	-243	65x100	200	DUAL	4537.5	-243	65x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
201	DUAL	4622.5	-243	65x100	251	VDD	8872.5	-243	65x100
202	MASL	4707.5	-243	65x100	252	SHIELDING	8957.5	-243	65x100
203	MASL	4792.5	-243	65x100	253	GND	9042.5	-243	65x100
204	MASLOC	4877.5	-243	65x100	254	GND	9127.5	-243	65x100
205	MASLOC	4962.5	-243	65x100	255	GND	9212.5	-243	65x100
206	CABC_EN[0]	5047.5	-243	65x100	256	GND	9297.5	-243	65x100
207	CABC_EN[0]	5132.5	-243	65x100	257	SHIELDING	9382.5	-243	65x100
208	CABC_EN[1]	5217.5	-243	65x100	258	AVDDL	9467.5	-243	65x100
209	CABC_EN[1]	5302.5	-243	65x100	259	AVDDL	9552.5	-243	65x100
210	OPDRV	5387.5	-243	65x100	260	AVDDL	9637.5	-243	65x100
211	OPDRV	5472.5	-243	65x100	261	AVDDL	9722.5	-243	65x100
212	MODE	5557.5	-243	65x100	262	SHIELDING	9807.5	-243	65x100
213	MODE	5642.5	-243	65x100	263	AGNDH	9892.5	-243	65x100
214	IFSEL	5727.5	-243	65x100	264	AGNDH	9977.5	-243	65x100
215	IFSEL	5812.5	-243	65x100	265	AGNDH	10062.5	-243	65x100
216	BIST	5897.5	-243	65x100	266	AGNDH	10147.5	-243	65x100
217	BIST	5982.5	-243	65x100	267	SHIELDING	10232.5	-243	65x100
218	RES[0]	6067.5	-243	65x100	268	TP	10317.5	-243	65x100
219	RES[0]	6152.5	-243	65x100	269	VCOMI	10402.5	-243	65x100
220	RES[1]	6237.5	-243	65x100	270	VCOMI	10487.5	-243	65x100
221	RES[1]	6322.5	-243	65x100	271	PWR_EN	10572.5	-243	65x100
222	DCLKPOL	6407.5	-243	65x100	272	PWR_EN	10657.5	-243	65x100
223	DCLKPOL	6492.5	-243	65x100	273	FBL	10742.5	-243	65x100
224	STBYB	6577.5	-243	65x100	274	FBL	10827.5	-243	65x100
225	STBYB	6662.5	-243	65x100	275	FBH	10912.5	-243	65x100
226	GRB	6747.5	-243	65x100	276	FBH	10997.5	-243	65x100
227	GRB	6832.5	-243	65x100	277	FBA	11082.5	-243	65x100
228	SHLR	6917.5	-243	65x100	278	FBA	11167.5	-243	65x100
229	SHLR	7002.5	-243	65x100	279	AVDDG	11252.5	-243	65x100
230	UPDN	7087.5	-243	65x100	280	AVDDG	11337.5	-243	65x100
231	UPDN	7172.5	-243	65x100	281	DRVA	11422.5	-243	65x100
232	RES[2]	7257.5	-243	65x100	282	DRVA	11507.5	-243	65x100
233	TP	7342.5	-243	65x100	283	DRVH	11592.5	-243	65x100
234	TP	7427.5	-243	65x100	284	DRVH	11677.5	-243	65x100
235	TP	7512.5	-243	65x100	285	DRVL	11762.5	-243	65x100
236	TP	7597.5	-243	65x100	286	DRVL	11847.5	-243	65x100
237	TP	7682.5	-243	65x100	287	DRVL_B	11932.5	-243	65x100
238	TP	7767.5	-243	65x100	288	DRVL_B	12017.5	-243	65x100
239	TP	7852.5	-243	65x100	289	VCOMO	12102.5	-243	65x100
240	TP	7937.5	-243	65x100	290	VCOMO	12187.5	-243	65x100
241	TP	8022.5	-243	65x100	291	COM2_IN	12272.5	-243	65x100
242	TP	8107.5	-243	65x100	292	COM2_IN	12357.5	-243	65x100
243	TP	8192.5	-243	65x100	293	STBNL	12303	-82	80x30
244	TP	8277.5	-243	65x100	294	F_CtrlL	12396.5	-42	67x30
245	TP	8362.5	-243	65x100	295	STV2L	12303	-2	80x30
246	TP	8447.5	-243	65x100	296	STV1L	12396.5	38	67x30
247	SHIELDING	8532.5	-243	65x100	297	CKVL	12303	78	80x30
248	VDD	8617.5	-243	65x100	298	UDL	12396.5	118	67x30
249	VDD	8702.5	-243	65x100	299	SYN2L	12303	158	80x30
250	VDD	8787.5	-243	65x100	300	SYN1L	12396.5	198	67x30

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
301	F_CtrlL	12396.5	278	67x30	351	SO45	11352.5	113	15x100
302	OEVL	12303	238	80x30	352	SO46	11337.5	243	15x100
303	SHIELDING	12205	258	30x70	353	SO47	11322.5	113	15x100
304	COM2_OUT	12155	258	30x70	354	SO48	11307.5	243	15x100
305	COM2_OUT	12105	258	30x70	355	SO49	11292.5	113	15x100
306	SHIELDING	12055	258	30x70	356	SO50	11277.5	243	15x100
307	SO1	12012.5	113	15x100	357	SO51	11262.5	113	15x100
308	SO2	11997.5	243	15x100	358	SO52	11247.5	243	15x100
309	SO3	11982.5	113	15x100	359	SO53	11232.5	113	15x100
310	SO4	11967.5	243	15x100	360	SO54	11217.5	243	15x100
311	SO5	11952.5	113	15x100	361	SO55	11202.5	113	15x100
312	SO6	11937.5	243	15x100	362	SO56	11187.5	243	15x100
313	SO7	11922.5	113	15x100	363	SO57	11172.5	113	15x100
314	SO8	11907.5	243	15x100	364	SO58	11157.5	243	15x100
315	SO9	11892.5	113	15x100	365	SO59	11142.5	113	15x100
316	SO10	11877.5	243	15x100	366	SO60	11127.5	243	15x100
317	SO11	11862.5	113	15x100	367	SO61	11112.5	113	15x100
318	SO12	11847.5	243	15x100	368	SO62	11097.5	243	15x100
319	SO13	11832.5	113	15x100	369	SO63	11082.5	113	15x100
320	SO14	11817.5	243	15x100	370	SO64	11067.5	243	15x100
321	SO15	11802.5	113	15x100	371	SO65	11052.5	113	15x100
322	SO16	11787.5	243	15x100	372	SO66	11037.5	243	15x100
323	SO17	11772.5	113	15x100	373	SO67	11022.5	113	15x100
324	SO18	11757.5	243	15x100	374	SO68	11007.5	243	15x100
325	SO19	11742.5	113	15x100	375	SO69	10992.5	113	15x100
326	SO20	11727.5	243	15x100	376	SO70	10977.5	243	15x100
327	SO21	11712.5	113	15x100	377	SO71	10962.5	113	15x100
328	SO22	11697.5	243	15x100	378	SO72	10947.5	243	15x100
329	SO23	11682.5	113	15x100	379	SO73	10932.5	113	15x100
330	SO24	11667.5	243	15x100	380	SO74	10917.5	243	15x100
331	SO25	11652.5	113	15x100	381	SO75	10902.5	113	15x100
332	SO26	11637.5	243	15x100	382	SO76	10887.5	243	15x100
333	SO27	11622.5	113	15x100	383	SO77	10872.5	113	15x100
334	SO28	11607.5	243	15x100	384	SO78	10857.5	243	15x100
335	SO29	11592.5	113	15x100	385	SO79	10842.5	113	15x100
336	SO30	11577.5	243	15x100	386	SO80	10827.5	243	15x100
337	SO31	11562.5	113	15x100	387	SO81	10812.5	113	15x100
338	SO32	11547.5	243	15x100	388	SO82	10797.5	243	15x100
339	SO33	11532.5	113	15x100	389	SO83	10782.5	113	15x100
340	SO34	11517.5	243	15x100	390	SO84	10767.5	243	15x100
341	SO35	11502.5	113	15x100	391	SO85	10752.5	113	15x100
342	SO36	11487.5	243	15x100	392	SO86	10737.5	243	15x100
343	SO37	11472.5	113	15x100	393	SO87	10722.5	113	15x100
344	SO38	11457.5	243	15x100	394	SO88	10707.5	243	15x100
345	SO39	11442.5	113	15x100	395	SO89	10692.5	113	15x100
346	SO40	11427.5	243	15x100	396	SO90	10677.5	243	15x100
347	SO41	11412.5	113	15x100	397	SO91	10662.5	113	15x100
348	SO42	11397.5	243	15x100	398	SO92	10647.5	243	15x100
349	SO43	11382.5	113	15x100	399	SO93	10632.5	113	15x100
350	SO44	11367.5	243	15x100	400	SO94	10617.5	243	15x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
401	SO95	10602.5	113	15x100	451	SO145	9852.5	113	15x100
402	SO96	10587.5	243	15x100	452	SO146	9837.5	243	15x100
403	SO97	10572.5	113	15x100	453	SO147	9822.5	113	15x100
404	SO98	10557.5	243	15x100	454	SO148	9807.5	243	15x100
405	SO99	10542.5	113	15x100	455	SO149	9792.5	113	15x100
406	SO100	10527.5	243	15x100	456	SO150	9777.5	243	15x100
407	SO101	10512.5	113	15x100	457	SO151	9762.5	113	15x100
408	SO102	10497.5	243	15x100	458	SO152	9747.5	243	15x100
409	SO103	10482.5	113	15x100	459	SO153	9732.5	113	15x100
410	SO104	10467.5	243	15x100	460	SO154	9717.5	243	15x100
411	SO105	10452.5	113	15x100	461	SO155	9702.5	113	15x100
412	SO106	10437.5	243	15x100	462	SO156	9687.5	243	15x100
413	SO107	10422.5	113	15x100	463	SO157	9672.5	113	15x100
414	SO108	10407.5	243	15x100	464	SO158	9657.5	243	15x100
415	SO109	10392.5	113	15x100	465	SO159	9642.5	113	15x100
416	SO110	10377.5	243	15x100	466	SO160	9627.5	243	15x100
417	SO111	10362.5	113	15x100	467	SO161	9612.5	113	15x100
418	SO112	10347.5	243	15x100	468	SO162	9597.5	243	15x100
419	SO113	10332.5	113	15x100	469	SO163	9582.5	113	15x100
420	SO114	10317.5	243	15x100	470	SO164	9567.5	243	15x100
421	SO115	10302.5	113	15x100	471	SO165	9552.5	113	15x100
422	SO116	10287.5	243	15x100	472	SO166	9537.5	243	15x100
423	SO117	10272.5	113	15x100	473	SO167	9522.5	113	15x100
424	SO118	10257.5	243	15x100	474	SO168	9507.5	243	15x100
425	SO119	10242.5	113	15x100	475	SO169	9492.5	113	15x100
426	SO120	10227.5	243	15x100	476	SO170	9477.5	243	15x100
427	SO121	10212.5	113	15x100	477	SO171	9462.5	113	15x100
428	SO122	10197.5	243	15x100	478	SO172	9447.5	243	15x100
429	SO123	10182.5	113	15x100	479	SO173	9432.5	113	15x100
430	SO124	10167.5	243	15x100	480	SO174	9417.5	243	15x100
431	SO125	10152.5	113	15x100	481	SO175	9402.5	113	15x100
432	SO126	10137.5	243	15x100	482	SO176	9387.5	243	15x100
433	SO127	10122.5	113	15x100	483	SO177	9372.5	113	15x100
434	SO128	10107.5	243	15x100	484	SO178	9357.5	243	15x100
435	SO129	10092.5	113	15x100	485	SO179	9342.5	113	15x100
436	SO130	10077.5	243	15x100	486	SO180	9327.5	243	15x100
437	SO131	10062.5	113	15x100	487	SO181	9312.5	113	15x100
438	SO132	10047.5	243	15x100	488	SO182	9297.5	243	15x100
439	SO133	10032.5	113	15x100	489	SO183	9282.5	113	15x100
440	SO134	10017.5	243	15x100	490	SO184	9267.5	243	15x100
441	SO135	10002.5	113	15x100	491	SO185	9252.5	113	15x100
442	SO136	9987.5	243	15x100	492	SO186	9237.5	243	15x100
443	SO137	9972.5	113	15x100	493	SO187	9222.5	113	15x100
444	SO138	9957.5	243	15x100	494	SO188	9207.5	243	15x100
445	SO139	9942.5	113	15x100	495	SO189	9192.5	113	15x100
446	SO140	9927.5	243	15x100	496	SO190	9177.5	243	15x100
447	SO141	9912.5	113	15x100	497	SO191	9162.5	113	15x100
448	SO142	9897.5	243	15x100	498	SO192	9147.5	243	15x100
449	SO143	9882.5	113	15x100	499	SO193	9132.5	113	15x100
450	SO144	9867.5	243	15x100	500	SO194	9117.5	243	15x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
501	SO195	9102.5	113	15x100	551	SO245	8352.5	113	15x100
502	SO196	9087.5	243	15x100	552	SO246	8337.5	243	15x100
503	SO197	9072.5	113	15x100	553	SO247	8322.5	113	15x100
504	SO198	9057.5	243	15x100	554	SO248	8307.5	243	15x100
505	SO199	9042.5	113	15x100	555	SO249	8292.5	113	15x100
506	SO200	9027.5	243	15x100	556	SO250	8277.5	243	15x100
507	SO201	9012.5	113	15x100	557	SO251	8262.5	113	15x100
508	SO202	8997.5	243	15x100	558	SO252	8247.5	243	15x100
509	SO203	8982.5	113	15x100	559	SO253	8232.5	113	15x100
510	SO204	8967.5	243	15x100	560	SO254	8217.5	243	15x100
511	SO205	8952.5	113	15x100	561	SO255	8202.5	113	15x100
512	SO206	8937.5	243	15x100	562	SO256	8187.5	243	15x100
513	SO207	8922.5	113	15x100	563	SO257	8172.5	113	15x100
514	SO208	8907.5	243	15x100	564	SO258	8157.5	243	15x100
515	SO209	8892.5	113	15x100	565	SO259	8142.5	113	15x100
516	SO210	8877.5	243	15x100	566	SO260	8127.5	243	15x100
517	SO211	8862.5	113	15x100	567	SO261	8112.5	113	15x100
518	SO212	8847.5	243	15x100	568	SO262	8097.5	243	15x100
519	SO213	8832.5	113	15x100	569	SO263	8082.5	113	15x100
520	SO214	8817.5	243	15x100	570	SO264	8067.5	243	15x100
521	SO215	8802.5	113	15x100	571	SO265	8052.5	113	15x100
522	SO216	8787.5	243	15x100	572	SO266	8037.5	243	15x100
523	SO217	8772.5	113	15x100	573	SO267	8022.5	113	15x100
524	SO218	8757.5	243	15x100	574	SO268	8007.5	243	15x100
525	SO219	8742.5	113	15x100	575	SO269	7992.5	113	15x100
526	SO220	8727.5	243	15x100	576	SO270	7977.5	243	15x100
527	SO221	8712.5	113	15x100	577	SO271	7962.5	113	15x100
528	SO222	8697.5	243	15x100	578	SO272	7947.5	243	15x100
529	SO223	8682.5	113	15x100	579	SO273	7932.5	113	15x100
530	SO224	8667.5	243	15x100	580	SO274	7917.5	243	15x100
531	SO225	8652.5	113	15x100	581	SO275	7902.5	113	15x100
532	SO226	8637.5	243	15x100	582	SO276	7887.5	243	15x100
533	SO227	8622.5	113	15x100	583	SO277	7872.5	113	15x100
534	SO228	8607.5	243	15x100	584	SO278	7857.5	243	15x100
535	SO229	8592.5	113	15x100	585	SO279	7842.5	113	15x100
536	SO230	8577.5	243	15x100	586	SO280	7827.5	243	15x100
537	SO231	8562.5	113	15x100	587	SO281	7812.5	113	15x100
538	SO232	8547.5	243	15x100	588	SO282	7797.5	243	15x100
539	SO233	8532.5	113	15x100	589	SO283	7782.5	113	15x100
540	SO234	8517.5	243	15x100	590	SO284	7767.5	243	15x100
541	SO235	8502.5	113	15x100	591	SO285	7752.5	113	15x100
542	SO236	8487.5	243	15x100	592	SO286	7737.5	243	15x100
543	SO237	8472.5	113	15x100	593	SO287	7722.5	113	15x100
544	SO238	8457.5	243	15x100	594	SO288	7707.5	243	15x100
545	SO239	8442.5	113	15x100	595	SO289	7692.5	113	15x100
546	SO240	8427.5	243	15x100	596	SO290	7677.5	243	15x100
547	SO241	8412.5	113	15x100	597	SO291	7662.5	113	15x100
548	SO242	8397.5	243	15x100	598	SO292	7647.5	243	15x100
549	SO243	8382.5	113	15x100	599	SO293	7632.5	113	15x100
550	SO244	8367.5	243	15x100	600	SO294	7617.5	243	15x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
601	SO295	7602.5	113	15x100	651	SO345	6852.5	113	15x100
602	SO296	7587.5	243	15x100	652	SO346	6837.5	243	15x100
603	SO297	7572.5	113	15x100	653	SO347	6822.5	113	15x100
604	SO298	7557.5	243	15x100	654	SO348	6807.5	243	15x100
605	SO299	7542.5	113	15x100	655	SO349	6792.5	113	15x100
606	SO300	7527.5	243	15x100	656	SO350	6777.5	243	15x100
607	SO301	7512.5	113	15x100	657	SO351	6762.5	113	15x100
608	SO302	7497.5	243	15x100	658	SO352	6747.5	243	15x100
609	SO303	7482.5	113	15x100	659	SO353	6732.5	113	15x100
610	SO304	7467.5	243	15x100	660	SO354	6717.5	243	15x100
611	SO305	7452.5	113	15x100	661	SO355	6702.5	113	15x100
612	SO306	7437.5	243	15x100	662	SO356	6687.5	243	15x100
613	SO307	7422.5	113	15x100	663	SO357	6672.5	113	15x100
614	SO308	7407.5	243	15x100	664	SO358	6657.5	243	15x100
615	SO309	7392.5	113	15x100	665	SO359	6642.5	113	15x100
616	SO310	7377.5	243	15x100	666	SO360	6627.5	243	15x100
617	SO311	7362.5	113	15x100	667	SO361	6612.5	113	15x100
618	SO312	7347.5	243	15x100	668	SO362	6597.5	243	15x100
619	SO313	7332.5	113	15x100	669	SO363	6582.5	113	15x100
620	SO314	7317.5	243	15x100	670	SO364	6567.5	243	15x100
621	SO315	7302.5	113	15x100	671	SO365	6552.5	113	15x100
622	SO316	7287.5	243	15x100	672	SO366	6537.5	243	15x100
623	SO317	7272.5	113	15x100	673	SO367	6522.5	113	15x100
624	SO318	7257.5	243	15x100	674	SO368	6507.5	243	15x100
625	SO319	7242.5	113	15x100	675	SO369	6492.5	113	15x100
626	SO320	7227.5	243	15x100	676	SO370	6477.5	243	15x100
627	SO321	7212.5	113	15x100	677	SO371	6462.5	113	15x100
628	SO322	7197.5	243	15x100	678	SO372	6447.5	243	15x100
629	SO323	7182.5	113	15x100	679	SO373	6432.5	113	15x100
630	SO324	7167.5	243	15x100	680	SO374	6417.5	243	15x100
631	SO325	7152.5	113	15x100	681	SO375	6402.5	113	15x100
632	SO326	7137.5	243	15x100	682	SO376	6387.5	243	15x100
633	SO327	7122.5	113	15x100	683	SO377	6372.5	113	15x100
634	SO328	7107.5	243	15x100	684	SO378	6357.5	243	15x100
635	SO329	7092.5	113	15x100	685	SO379	6342.5	113	15x100
636	SO330	7077.5	243	15x100	686	SO380	6327.5	243	15x100
637	SO331	7062.5	113	15x100	687	SO381	6312.5	113	15x100
638	SO332	7047.5	243	15x100	688	SO382	6297.5	243	15x100
639	SO333	7032.5	113	15x100	689	SO383	6282.5	113	15x100
640	SO334	7017.5	243	15x100	690	SO384	6267.5	243	15x100
641	SO335	7002.5	113	15x100	691	SO385	6252.5	113	15x100
642	SO336	6987.5	243	15x100	692	SO386	6237.5	243	15x100
643	SO337	6972.5	113	15x100	693	SO387	6222.5	113	15x100
644	SO338	6957.5	243	15x100	694	SO388	6207.5	243	15x100
645	SO339	6942.5	113	15x100	695	SO389	6192.5	113	15x100
646	SO340	6927.5	243	15x100	696	SO390	6177.5	243	15x100
647	SO341	6912.5	113	15x100	697	SO391	6162.5	113	15x100
648	SO342	6897.5	243	15x100	698	SO392	6147.5	243	15x100
649	SO343	6882.5	113	15x100	699	SO393	6132.5	113	15x100
650	SO344	6867.5	243	15x100	700	SO394	6117.5	243	15x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
701	SO395	6102.5	113	15x100	751	SO445	5352.5	113	15x100
702	SO396	6087.5	243	15x100	752	SO446	5337.5	243	15x100
703	SO397	6072.5	113	15x100	753	SO447	5322.5	113	15x100
704	SO398	6057.5	243	15x100	754	SO448	5307.5	243	15x100
705	SO399	6042.5	113	15x100	755	SO449	5292.5	113	15x100
706	SO400	6027.5	243	15x100	756	SO450	5277.5	243	15x100
707	SO401	6012.5	113	15x100	757	SO451	5262.5	113	15x100
708	SO402	5997.5	243	15x100	758	SO452	5247.5	243	15x100
709	SO403	5982.5	113	15x100	759	SO453	5232.5	113	15x100
710	SO404	5967.5	243	15x100	760	SO454	5217.5	243	15x100
711	SO405	5952.5	113	15x100	761	SO455	5202.5	113	15x100
712	SO406	5937.5	243	15x100	762	SO456	5187.5	243	15x100
713	SO407	5922.5	113	15x100	763	SO457	5172.5	113	15x100
714	SO408	5907.5	243	15x100	764	SO458	5157.5	243	15x100
715	SO409	5892.5	113	15x100	765	SO459	5142.5	113	15x100
716	SO410	5877.5	243	15x100	766	SO460	5127.5	243	15x100
717	SO411	5862.5	113	15x100	767	SO461	5112.5	113	15x100
718	SO412	5847.5	243	15x100	768	SO462	5097.5	243	15x100
719	SO413	5832.5	113	15x100	769	SO463	5082.5	113	15x100
720	SO414	5817.5	243	15x100	770	SO464	5067.5	243	15x100
721	SO415	5802.5	113	15x100	771	SO465	5052.5	113	15x100
722	SO416	5787.5	243	15x100	772	SO466	5037.5	243	15x100
723	SO417	5772.5	113	15x100	773	SO467	5022.5	113	15x100
724	SO418	5757.5	243	15x100	774	SO468	5007.5	243	15x100
725	SO419	5742.5	113	15x100	775	SO469	4992.5	113	15x100
726	SO420	5727.5	243	15x100	776	SO470	4977.5	243	15x100
727	SO421	5712.5	113	15x100	777	SO471	4962.5	113	15x100
728	SO422	5697.5	243	15x100	778	SO472	4947.5	243	15x100
729	SO423	5682.5	113	15x100	779	SO473	4932.5	113	15x100
730	SO424	5667.5	243	15x100	780	SO474	4917.5	243	15x100
731	SO425	5652.5	113	15x100	781	SO475	4902.5	113	15x100
732	SO426	5637.5	243	15x100	782	SO476	4887.5	243	15x100
733	SO427	5622.5	113	15x100	783	SO477	4872.5	113	15x100
734	SO428	5607.5	243	15x100	784	SO478	4857.5	243	15x100
735	SO429	5592.5	113	15x100	785	SO479	4842.5	113	15x100
736	SO430	5577.5	243	15x100	786	SO480	4827.5	243	15x100
737	SO431	5562.5	113	15x100	787	SO481	4812.5	113	15x100
738	SO432	5547.5	243	15x100	788	SO482	4797.5	243	15x100
739	SO433	5532.5	113	15x100	789	SO483	4782.5	113	15x100
740	SO434	5517.5	243	15x100	790	SO484	4767.5	243	15x100
741	SO435	5502.5	113	15x100	791	SO485	4752.5	113	15x100
742	SO436	5487.5	243	15x100	792	SO486	4737.5	243	15x100
743	SO437	5472.5	113	15x100	793	SO487	4722.5	113	15x100
744	SO438	5457.5	243	15x100	794	SO488	4707.5	243	15x100
745	SO439	5442.5	113	15x100	795	SO489	4692.5	113	15x100
746	SO440	5427.5	243	15x100	796	SO490	4677.5	243	15x100
747	SO441	5412.5	113	15x100	797	SO491	4662.5	113	15x100
748	SO442	5397.5	243	15x100	798	SO492	4647.5	243	15x100
749	SO443	5382.5	113	15x100	799	SO493	4632.5	113	15x100
750	SO444	5367.5	243	15x100	800	SO494	4617.5	243	15x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
801	SO495	4602.5	113	15x100	851	SO545	3852.5	113	15x100
802	SO496	4587.5	243	15x100	852	SO546	3837.5	243	15x100
803	SO497	4572.5	113	15x100	853	SO547	3822.5	113	15x100
804	SO498	4557.5	243	15x100	854	SO548	3807.5	243	15x100
805	SO499	4542.5	113	15x100	855	SO549	3792.5	113	15x100
806	SO500	4527.5	243	15x100	856	SO550	3777.5	243	15x100
807	SO501	4512.5	113	15x100	857	SO551	3762.5	113	15x100
808	SO502	4497.5	243	15x100	858	SO552	3747.5	243	15x100
809	SO503	4482.5	113	15x100	859	SO553	3732.5	113	15x100
810	SO504	4467.5	243	15x100	860	SO554	3717.5	243	15x100
811	SO505	4452.5	113	15x100	861	SO555	3702.5	113	15x100
812	SO506	4437.5	243	15x100	862	SO556	3687.5	243	15x100
813	SO507	4422.5	113	15x100	863	SO557	3672.5	113	15x100
814	SO508	4407.5	243	15x100	864	SO558	3657.5	243	15x100
815	SO509	4392.5	113	15x100	865	SO559	3642.5	113	15x100
816	SO510	4377.5	243	15x100	866	SO560	3627.5	243	15x100
817	SO511	4362.5	113	15x100	867	SO561	3612.5	113	15x100
818	SO512	4347.5	243	15x100	868	SO562	3597.5	243	15x100
819	SO513	4332.5	113	15x100	869	SO563	3582.5	113	15x100
820	SO514	4317.5	243	15x100	870	SO564	3567.5	243	15x100
821	SO515	4302.5	113	15x100	871	SO565	3552.5	113	15x100
822	SO516	4287.5	243	15x100	872	SO566	3537.5	243	15x100
823	SO517	4272.5	113	15x100	873	SO567	3522.5	113	15x100
824	SO518	4257.5	243	15x100	874	SO568	3507.5	243	15x100
825	SO519	4242.5	113	15x100	875	SO569	3492.5	113	15x100
826	SO520	4227.5	243	15x100	876	SO570	3477.5	243	15x100
827	SO521	4212.5	113	15x100	877	SO571	3462.5	113	15x100
828	SO522	4197.5	243	15x100	878	SO572	3447.5	243	15x100
829	SO523	4182.5	113	15x100	879	SO573	3432.5	113	15x100
830	SO524	4167.5	243	15x100	880	SO574	3417.5	243	15x100
831	SO525	4152.5	113	15x100	881	SO575	3402.5	113	15x100
832	SO526	4137.5	243	15x100	882	SO576	3387.5	243	15x100
833	SO527	4122.5	113	15x100	883	SO577	3372.5	113	15x100
834	SO528	4107.5	243	15x100	884	SO578	3357.5	243	15x100
835	SO529	4092.5	113	15x100	885	SO579	3342.5	113	15x100
836	SO530	4077.5	243	15x100	886	SO580	3327.5	243	15x100
837	SO531	4062.5	113	15x100	887	SO581	3312.5	113	15x100
838	SO532	4047.5	243	15x100	888	SO582	3297.5	243	15x100
839	SO533	4032.5	113	15x100	889	SO583	3282.5	113	15x100
840	SO534	4017.5	243	15x100	890	SO584	3267.5	243	15x100
841	SO535	4002.5	113	15x100	891	SO585	3252.5	113	15x100
842	SO536	3987.5	243	15x100	892	SO586	3237.5	243	15x100
843	SO537	3972.5	113	15x100	893	SO587	3222.5	113	15x100
844	SO538	3957.5	243	15x100	894	SO588	3207.5	243	15x100
845	SO539	3942.5	113	15x100	895	SO589	3192.5	113	15x100
846	SO540	3927.5	243	15x100	896	SO590	3177.5	243	15x100
847	SO541	3912.5	113	15x100	897	SO591	3162.5	113	15x100
848	SO542	3897.5	243	15x100	898	SO592	3147.5	243	15x100
849	SO543	3882.5	113	15x100	899	SO593	3132.5	113	15x100
850	SO544	3867.5	243	15x100	900	SO594	3117.5	243	15x100

No.	Name	X	Y	Bump Size	No.	Name	X	Y	Bump Size
901	SO595	3102.5	113	15x100	951	SO645	2352.5	113	15x100
902	SO596	3087.5	243	15x100	952	SO646	2337.5	243	15x100
903	SO597	3072.5	113	15x100	953	SO647	2322.5	113	15x100
904	SO598	3057.5	243	15x100	954	SO648	2307.5	243	15x100
905	SO599	3042.5	113	15x100	955	SO649	2292.5	113	15x100
906	SO600	3027.5	243	15x100	956	SO650	2277.5	243	15x100
907	SO601	3012.5	113	15x100	957	SO651	2262.5	113	15x100
908	SO602	2997.5	243	15x100	958	SO652	2247.5	243	15x100
909	SO603	2982.5	113	15x100	959	SO653	2232.5	113	15x100
910	SO604	2967.5	243	15x100	960	SO654	2217.5	243	15x100
911	SO605	2952.5	113	15x100	961	SO655	2202.5	113	15x100
912	SO606	2937.5	243	15x100	962	SO656	2187.5	243	15x100
913	SO607	2922.5	113	15x100	963	SO657	2172.5	113	15x100
914	SO608	2907.5	243	15x100	964	SO658	2157.5	243	15x100
915	SO609	2892.5	113	15x100	965	SO659	2142.5	113	15x100
916	SO610	2877.5	243	15x100	966	SO660	2127.5	243	15x100
917	SO611	2862.5	113	15x100	967	SO661	2112.5	113	15x100
918	SO612	2847.5	243	15x100	968	SO662	2097.5	243	15x100
919	SO613	2832.5	113	15x100	969	SO663	2082.5	113	15x100
920	SO614	2817.5	243	15x100	970	SO664	2067.5	243	15x100
921	SO615	2802.5	113	15x100	971	SO665	2052.5	113	15x100
922	SO616	2787.5	243	15x100	972	SO666	2037.5	243	15x100
923	SO617	2772.5	113	15x100	973	SO667	2022.5	113	15x100
924	SO618	2757.5	243	15x100	974	SO668	2007.5	243	15x100
925	SO619	2742.5	113	15x100	975	SO669	1992.5	113	15x100
926	SO620	2727.5	243	15x100	976	SO670	1977.5	243	15x100
927	SO621	2712.5	113	15x100	977	SO671	1962.5	113	15x100
928	SO622	2697.5	243	15x100	978	SO672	1947.5	243	15x100
929	SO623	2682.5	113	15x100	979	SO673	1932.5	113	15x100
930	SO624	2667.5	243	15x100	980	SO674	1917.5	243	15x100
931	SO625	2652.5	113	15x100	981	SO675	1902.5	113	15x100
932	SO626	2637.5	243	15x100	982	SO676	1887.5	243	15x100
933	SO627	2622.5	113	15x100	983	SO677	1872.5	113	15x100
934	SO628	2607.5	243	15x100	984	SO678	1857.5	243	15x100
935	SO629	2592.5	113	15x100	985	SO679	1842.5	113	15x100
936	SO630	2577.5	243	15x100	986	SO680	1827.5	243	15x100
937	SO631	2562.5	113	15x100	987	SO681	1812.5	113	15x100
938	SO632	2547.5	243	15x100	988	SO682	1797.5	243	15x100
939	SO633	2532.5	113	15x100	989	SO683	1782.5	113	15x100
940	SO634	2517.5	243	15x100	990	SO684	1767.5	243	15x100
941	SO635	2502.5	113	15x100	991	SO685	1752.5	113	15x100
942	SO636	2487.5	243	15x100	992	SO686	1737.5	243	15x100
943	SO637	2472.5	113	15x100	993	SO687	1722.5	113	15x100
944	SO638	2457.5	243	15x100	994	SO688	1707.5	243	15x100
945	SO639	2442.5	113	15x100	995	SO689	1692.5	113	15x100
946	SO640	2427.5	243	15x100	996	SO690	1677.5	243	15x100
947	SO641	2412.5	113	15x100	997	SO691	1662.5	113	15x100
948	SO642	2397.5	243	15x100	998	SO692	1647.5	243	15x100
949	SO643	2382.5	113	15x100	999	SO693	1632.5	113	15x100
950	SO644	2367.5	243	15x100	1000	SO694	1617.5	243	15x100

No.	Name	X	Y	Bump size (µm)
1001	SO695	1602.5	113	15x100
1002	SO696	1587.5	243	15x100
1003	SO697	1572.5	113	15x100
1004	SO698	1557.5	243	15x100
1005	SO699	1542.5	113	15x100
1006	SO700	1527.5	243	15x100
1007	SO701	1512.5	113	15x100
1008	SO702	1497.5	243	15x100
1009	SO703	1482.5	113	15x100
1010	SO704	1467.5	243	15x100
1011	SO705	1452.5	113	15x100
1012	SO706	1437.5	243	15x100
1013	SO707	1422.5	113	15x100
1014	SO708	1407.5	243	15x100
1015	SO709	1392.5	113	15x100
1016	SO710	1377.5	243	15x100
1017	SO711	1362.5	113	15x100
1018	SO712	1347.5	243	15x100
1019	SO713	1332.5	113	15x100
1020	SO714	1317.5	243	15x100
1021	SO715	1302.5	113	15x100
1022	SO716	1287.5	243	15x100
1023	SO717	1272.5	113	15x100
1024	SO718	1257.5	243	15x100
1025	SO719	1242.5	113	15x100
1026	SO720	1227.5	243	15x100
1027	SO721	1212.5	113	15x100
1028	SO722	1197.5	243	15x100
1029	SO723	1182.5	113	15x100
1030	SO724	1167.5	243	15x100
1031	SO725	1152.5	113	15x100
1032	SO726	1137.5	243	15x100
1033	SO727	1122.5	113	15x100
1034	SO728	1107.5	243	15x100
1035	SO729	1092.5	113	15x100
1036	SO730	1077.5	243	15x100
1037	SO731	1062.5	113	15x100
1038	SO732	1047.5	243	15x100
1039	SO733	1032.5	113	15x100
1040	SO734	1017.5	243	15x100
1041	SO735	1002.5	113	15x100
1042	SO736	987.5	243	15x100
1043	SO737	972.5	113	15x100
1044	SO738	957.5	243	15x100
1045	SO739	942.5	113	15x100
1046	SO740	927.5	243	15x100
1047	SO741	912.5	113	15x100
1048	SO742	897.5	243	15x100
1049	SO743	882.5	113	15x100
1050	SO744	867.5	243	15x100

No.	Name	X	Y	Bump size (µm)
1051	SO745	852.5	113	15x100
1052	SO746	837.5	243	15x100
1053	SO747	822.5	113	15x100
1054	SO748	807.5	243	15x100
1055	SO749	792.5	113	15x100
1056	SO750	777.5	243	15x100
1057	SO751	762.5	113	15x100
1058	SO752	747.5	243	15x100
1059	SO753	732.5	113	15x100
1060	SO754	717.5	243	15x100
1061	SO755	702.5	113	15x100
1062	SO756	687.5	243	15x100
1063	SO757	672.5	113	15x100
1064	SO758	657.5	243	15x100
1065	SO759	642.5	113	15x100
1066	SO760	627.5	243	15x100
1067	SO761	612.5	113	15x100
1068	SO762	597.5	243	15x100
1069	SO763	582.5	113	15x100
1070	SO764	567.5	243	15x100
1071	SO765	552.5	113	15x100
1072	SO766	537.5	243	15x100
1073	SO767	522.5	113	15x100
1074	SO768	507.5	243	15x100
1075	SHIELDING	455	258	30x70
1076	SHIELDING	405	258	30x70
1077	SHIELDING	355	258	30x70
1078	SHIELDING	50	258	30x70
1079	SHIELDING	0	258	30x70
1080	SHIELDING	-50	258	30x70
1081	SHIELDING	-355	258	30x70
1082	SHIELDING	-405	258	30x70
1083	SHIELDING	-455	258	30x70
1084	SO769	-507.5	243	15x100
1085	SO770	-522.5	113	15x100
1086	SO771	-537.5	243	15x100
1087	SO772	-552.5	113	15x100
1088	SO773	-567.5	243	15x100
1089	SO774	-582.5	113	15x100
1090	SO775	-597.5	243	15x100
1091	SO776	-612.5	113	15x100
1092	SO777	-627.5	243	15x100
1093	SO778	-642.5	113	15x100
1094	SO779	-657.5	243	15x100
1095	SO780	-672.5	113	15x100
1096	SO781	-687.5	243	15x100
1097	SO782	-702.5	113	15x100
1098	SO783	-717.5	243	15x100
1099	SO784	-732.5	113	15x100
1100	SO785	-747.5	243	15x100

No.	Name	X	Y	Bump size (µm)	No.	Name	X	Y	Bump size (µm)
1101	SO786	-762.5	113	15x100	1151	SO836	-1512.5	113	15x100
1102	SO787	-777.5	243	15x100	1152	SO837	-1527.5	243	15x100
1103	SO788	-792.5	113	15x100	1153	SO838	-1542.5	113	15x100
1104	SO789	-807.5	243	15x100	1154	SO839	-1557.5	243	15x100
1105	SO790	-822.5	113	15x100	1155	SO840	-1572.5	113	15x100
1106	SO791	-837.5	243	15x100	1156	SO841	-1587.5	243	15x100
1107	SO792	-852.5	113	15x100	1157	SO842	-1602.5	113	15x100
1108	SO793	-867.5	243	15x100	1158	SO843	-1617.5	243	15x100
1109	SO794	-882.5	113	15x100	1159	SO844	-1632.5	113	15x100
1110	SO795	-897.5	243	15x100	1160	SO845	-1647.5	243	15x100
1111	SO796	-912.5	113	15x100	1161	SO846	-1662.5	113	15x100
1112	SO797	-927.5	243	15x100	1162	SO847	-1677.5	243	15x100
1113	SO798	-942.5	113	15x100	1163	SO848	-1692.5	113	15x100
1114	SO799	-957.5	243	15x100	1164	SO849	-1707.5	243	15x100
1115	SO800	-972.5	113	15x100	1165	SO850	-1722.5	113	15x100
1116	SO801	-987.5	243	15x100	1166	SO851	-1737.5	243	15x100
1117	SO802	-1002.5	113	15x100	1167	SO852	-1752.5	113	15x100
1118	SO803	-1017.5	243	15x100	1168	SO853	-1767.5	243	15x100
1119	SO804	-1032.5	113	15x100	1169	SO854	-1782.5	113	15x100
1120	SO805	-1047.5	243	15x100	1170	SO855	-1797.5	243	15x100
1121	SO806	-1062.5	113	15x100	1171	SO856	-1812.5	113	15x100
1122	SO807	-1077.5	243	15x100	1172	SO857	-1827.5	243	15x100
1123	SO808	-1092.5	113	15x100	1173	SO858	-1842.5	113	15x100
1124	SO809	-1107.5	243	15x100	1174	SO859	-1857.5	243	15x100
1125	SO810	-1122.5	113	15x100	1175	SO860	-1872.5	113	15x100
1126	SO811	-1137.5	243	15x100	1176	SO861	-1887.5	243	15x100
1127	SO812	-1152.5	113	15x100	1177	SO862	-1902.5	113	15x100
1128	SO813	-1167.5	243	15x100	1178	SO863	-1917.5	243	15x100
1129	SO814	-1182.5	113	15x100	1179	SO864	-1932.5	113	15x100
1130	SO815	-1197.5	243	15x100	1180	SO865	-1947.5	243	15x100
1131	SO816	-1212.5	113	15x100	1181	SO866	-1962.5	113	15x100
1132	SO817	-1227.5	243	15x100	1182	SO867	-1977.5	243	15x100
1133	SO818	-1242.5	113	15x100	1183	SO868	-1992.5	113	15x100
1134	SO819	-1257.5	243	15x100	1184	SO869	-2007.5	243	15x100
1135	SO820	-1272.5	113	15x100	1185	SO870	-2022.5	113	15x100
1136	SO821	-1287.5	243	15x100	1186	SO871	-2037.5	243	15x100
1137	SO822	-1302.5	113	15x100	1187	SO872	-2052.5	113	15x100
1138	SO823	-1317.5	243	15x100	1188	SO873	-2067.5	243	15x100
1139	SO824	-1332.5	113	15x100	1189	SO874	-2082.5	113	15x100
1140	SO825	-1347.5	243	15x100	1190	SO875	-2097.5	243	15x100
1141	SO826	-1362.5	113	15x100	1191	SO876	-2112.5	113	15x100
1142	SO827	-1377.5	243	15x100	1192	SO877	-2127.5	243	15x100
1143	SO828	-1392.5	113	15x100	1193	SO878	-2142.5	113	15x100
1144	SO829	-1407.5	243	15x100	1194	SO879	-2157.5	243	15x100
1145	SO830	-1422.5	113	15x100	1195	SO880	-2172.5	113	15x100
1146	SO831	-1437.5	243	15x100	1196	SO881	-2187.5	243	15x100
1147	SO832	-1452.5	113	15x100	1197	SO882	-2202.5	113	15x100
1148	SO833	-1467.5	243	15x100	1198	SO883	-2217.5	243	15x100
1149	SO834	-1482.5	113	15x100	1199	SO884	-2232.5	113	15x100
1150	SO835	-1497.5	243	15x100	1200	SO885	-2247.5	243	15x100

No.	Name	X	Y	Bump size (µm)	No.	Name	X	Y	Bump size (µm)
1201	SO886	-2262.5	113	15x100	1251	SO936	-3012.5	113	15x100
1202	SO887	-2277.5	243	15x100	1252	SO937	-3027.5	243	15x100
1203	SO888	-2292.5	113	15x100	1253	SO938	-3042.5	113	15x100
1204	SO889	-2307.5	243	15x100	1254	SO939	-3057.5	243	15x100
1205	SO890	-2322.5	113	15x100	1255	SO940	-3072.5	113	15x100
1206	SO891	-2337.5	243	15x100	1256	SO941	-3087.5	243	15x100
1207	SO892	-2352.5	113	15x100	1257	SO942	-3102.5	113	15x100
1208	SO893	-2367.5	243	15x100	1258	SO943	-3117.5	243	15x100
1209	SO894	-2382.5	113	15x100	1259	SO944	-3132.5	113	15x100
1210	SO895	-2397.5	243	15x100	1260	SO945	-3147.5	243	15x100
1211	SO896	-2412.5	113	15x100	1261	SO946	-3162.5	113	15x100
1212	SO897	-2427.5	243	15x100	1262	SO947	-3177.5	243	15x100
1213	SO898	-2442.5	113	15x100	1263	SO948	-3192.5	113	15x100
1214	SO899	-2457.5	243	15x100	1264	SO949	-3207.5	243	15x100
1215	SO900	-2472.5	113	15x100	1265	SO950	-3222.5	113	15x100
1216	SO901	-2487.5	243	15x100	1266	SO951	-3237.5	243	15x100
1217	SO902	-2502.5	113	15x100	1267	SO952	-3252.5	113	15x100
1218	SO903	-2517.5	243	15x100	1268	SO953	-3267.5	243	15x100
1219	SO904	-2532.5	113	15x100	1269	SO954	-3282.5	113	15x100
1220	SO905	-2547.5	243	15x100	1270	SO955	-3297.5	243	15x100
1221	SO906	-2562.5	113	15x100	1271	SO956	-3312.5	113	15x100
1222	SO907	-2577.5	243	15x100	1272	SO957	-3327.5	243	15x100
1223	SO908	-2592.5	113	15x100	1273	SO958	-3342.5	113	15x100
1224	SO909	-2607.5	243	15x100	1274	SO959	-3357.5	243	15x100
1225	SO910	-2622.5	113	15x100	1275	SO960	-3372.5	113	15x100
1226	SO911	-2637.5	243	15x100	1276	SO961	-3387.5	243	15x100
1227	SO912	-2652.5	113	15x100	1277	SO962	-3402.5	113	15x100
1228	SO913	-2667.5	243	15x100	1278	SO963	-3417.5	243	15x100
1229	SO914	-2682.5	113	15x100	1279	SO964	-3432.5	113	15x100
1230	SO915	-2697.5	243	15x100	1280	SO965	-3447.5	243	15x100
1231	SO916	-2712.5	113	15x100	1281	SO966	-3462.5	113	15x100
1232	SO917	-2727.5	243	15x100	1282	SO967	-3477.5	243	15x100
1233	SO918	-2742.5	113	15x100	1283	SO968	-3492.5	113	15x100
1234	SO919	-2757.5	243	15x100	1284	SO969	-3507.5	243	15x100
1235	SO920	-2772.5	113	15x100	1285	SO970	-3522.5	113	15x100
1236	SO921	-2787.5	243	15x100	1286	SO971	-3537.5	243	15x100
1237	SO922	-2802.5	113	15x100	1287	SO972	-3552.5	113	15x100
1238	SO923	-2817.5	243	15x100	1288	SO973	-3567.5	243	15x100
1239	SO924	-2832.5	113	15x100	1289	SO974	-3582.5	113	15x100
1240	SO925	-2847.5	243	15x100	1290	SO975	-3597.5	243	15x100
1241	SO926	-2862.5	113	15x100	1291	SO976	-3612.5	113	15x100
1242	SO927	-2877.5	243	15x100	1292	SO977	-3627.5	243	15x100
1243	SO928	-2892.5	113	15x100	1293	SO978	-3642.5	113	15x100
1244	SO929	-2907.5	243	15x100	1294	SO979	-3657.5	243	15x100
1245	SO930	-2922.5	113	15x100	1295	SO980	-3672.5	113	15x100
1246	SO931	-2937.5	243	15x100	1296	SO981	-3687.5	243	15x100
1247	SO932	-2952.5	113	15x100	1297	SO982	-3702.5	113	15x100
1248	SO933	-2967.5	243	15x100	1298	SO983	-3717.5	243	15x100
1249	SO934	-2982.5	113	15x100	1299	SO984	-3732.5	113	15x100
1250	SO935	-2997.5	243	15x100	1300	SO985	-3747.5	243	15x100

No.	Name	X	Y	Bump size (µm)	No.	Name	X	Y	Bump size (µm)
1301	SO986	-3762.5	113	15x100	1351	SO1036	-4512.5	113	15x100
1302	SO987	-3777.5	243	15x100	1352	SO1037	-4527.5	243	15x100
1303	SO988	-3792.5	113	15x100	1353	SO1038	-4542.5	113	15x100
1304	SO989	-3807.5	243	15x100	1354	SO1039	-4557.5	243	15x100
1305	SO990	-3822.5	113	15x100	1355	SO1040	-4572.5	113	15x100
1306	SO991	-3837.5	243	15x100	1356	SO1041	-4587.5	243	15x100
1307	SO992	-3852.5	113	15x100	1357	SO1042	-4602.5	113	15x100
1308	SO993	-3867.5	243	15x100	1358	SO1043	-4617.5	243	15x100
1309	SO994	-3882.5	113	15x100	1359	SO1044	-4632.5	113	15x100
1310	SO995	-3897.5	243	15x100	1360	SO1045	-4647.5	243	15x100
1311	SO996	-3912.5	113	15x100	1361	SO1046	-4662.5	113	15x100
1312	SO997	-3927.5	243	15x100	1362	SO1047	-4677.5	243	15x100
1313	SO998	-3942.5	113	15x100	1363	SO1048	-4692.5	113	15x100
1314	SO999	-3957.5	243	15x100	1364	SO1049	-4707.5	243	15x100
1315	SO1000	-3972.5	113	15x100	1365	SO1050	-4722.5	113	15x100
1316	SO1001	-3987.5	243	15x100	1366	SO1051	-4737.5	243	15x100
1317	SO1002	-4002.5	113	15x100	1367	SO1052	-4752.5	113	15x100
1318	SO1003	-4017.5	243	15x100	1368	SO1053	-4767.5	243	15x100
1319	SO1004	-4032.5	113	15x100	1369	SO1054	-4782.5	113	15x100
1320	SO1005	-4047.5	243	15x100	1370	SO1055	-4797.5	243	15x100
1321	SO1006	-4062.5	113	15x100	1371	SO1056	-4812.5	113	15x100
1322	SO1007	-4077.5	243	15x100	1372	SO1057	-4827.5	243	15x100
1323	SO1008	-4092.5	113	15x100	1373	SO1058	-4842.5	113	15x100
1324	SO1009	-4107.5	243	15x100	1374	SO1059	-4857.5	243	15x100
1325	SO1010	-4122.5	113	15x100	1375	SO1060	-4872.5	113	15x100
1326	SO1011	-4137.5	243	15x100	1376	SO1061	-4887.5	243	15x100
1327	SO1012	-4152.5	113	15x100	1377	SO1062	-4902.5	113	15x100
1328	SO1013	-4167.5	243	15x100	1378	SO1063	-4917.5	243	15x100
1329	SO1014	-4182.5	113	15x100	1379	SO1064	-4932.5	113	15x100
1330	SO1015	-4197.5	243	15x100	1380	SO1065	-4947.5	243	15x100
1331	SO1016	-4212.5	113	15x100	1381	SO1066	-4962.5	113	15x100
1332	SO1017	-4227.5	243	15x100	1382	SO1067	-4977.5	243	15x100
1333	SO1018	-4242.5	113	15x100	1383	SO1068	-4992.5	113	15x100
1334	SO1019	-4257.5	243	15x100	1384	SO1069	-5007.5	243	15x100
1335	SO1020	-4272.5	113	15x100	1385	SO1070	-5022.5	113	15x100
1336	SO1021	-4287.5	243	15x100	1386	SO1071	-5037.5	243	15x100
1337	SO1022	-4302.5	113	15x100	1387	SO1072	-5052.5	113	15x100
1338	SO1023	-4317.5	243	15x100	1388	SO1073	-5067.5	243	15x100
1339	SO1024	-4332.5	113	15x100	1389	SO1074	-5082.5	113	15x100
1340	SO1025	-4347.5	243	15x100	1390	SO1075	-5097.5	243	15x100
1341	SO1026	-4362.5	113	15x100	1391	SO1076	-5112.5	113	15x100
1342	SO1027	-4377.5	243	15x100	1392	SO1077	-5127.5	243	15x100
1343	SO1028	-4392.5	113	15x100	1393	SO1078	-5142.5	113	15x100
1344	SO1029	-4407.5	243	15x100	1394	SO1079	-5157.5	243	15x100
1345	SO1030	-4422.5	113	15x100	1395	SO1080	-5172.5	113	15x100
1346	SO1031	-4437.5	243	15x100	1396	SO1081	-5187.5	243	15x100
1347	SO1032	-4452.5	113	15x100	1397	SO1082	-5202.5	113	15x100
1348	SO1033	-4467.5	243	15x100	1398	SO1083	-5217.5	243	15x100
1349	SO1034	-4482.5	113	15x100	1399	SO1084	-5232.5	113	15x100
1350	SO1035	-4497.5	243	15x100	1400	SO1085	-5247.5	243	15x100

No.	Name	X	Y	Bump size (µm)	No.	Name	X	Y	Bump size (µm)
1401	SO1086	-5262.5	113	15x100	1451	SO1136	-6012.5	113	15x100
1402	SO1087	-5277.5	243	15x100	1452	SO1137	-6027.5	243	15x100
1403	SO1088	-5292.5	113	15x100	1453	SO1138	-6042.5	113	15x100
1404	SO1089	-5307.5	243	15x100	1454	SO1139	-6057.5	243	15x100
1405	SO1090	-5322.5	113	15x100	1455	SO1140	-6072.5	113	15x100
1406	SO1091	-5337.5	243	15x100	1456	SO1141	-6087.5	243	15x100
1407	SO1092	-5352.5	113	15x100	1457	SO1142	-6102.5	113	15x100
1408	SO1093	-5367.5	243	15x100	1458	SO1143	-6117.5	243	15x100
1409	SO1094	-5382.5	113	15x100	1459	SO1144	-6132.5	113	15x100
1410	SO1095	-5397.5	243	15x100	1460	SO1145	-6147.5	243	15x100
1411	SO1096	-5412.5	113	15x100	1461	SO1146	-6162.5	113	15x100
1412	SO1097	-5427.5	243	15x100	1462	SO1147	-6177.5	243	15x100
1413	SO1098	-5442.5	113	15x100	1463	SO1148	-6192.5	113	15x100
1414	SO1099	-5457.5	243	15x100	1464	SO1149	-6207.5	243	15x100
1415	SO1100	-5472.5	113	15x100	1465	SO1150	-6222.5	113	15x100
1416	SO1101	-5487.5	243	15x100	1466	SO1151	-6237.5	243	15x100
1417	SO1102	-5502.5	113	15x100	1467	SO1152	-6252.5	113	15x100
1418	SO1103	-5517.5	243	15x100	1468	SO1153	-6267.5	243	15x100
1419	SO1104	-5532.5	113	15x100	1469	SO1154	-6282.5	113	15x100
1420	SO1105	-5547.5	243	15x100	1470	SO1155	-6297.5	243	15x100
1421	SO1106	-5562.5	113	15x100	1471	SO1156	-6312.5	113	15x100
1422	SO1107	-5577.5	243	15x100	1472	SO1157	-6327.5	243	15x100
1423	SO1108	-5592.5	113	15x100	1473	SO1158	-6342.5	113	15x100
1424	SO1109	-5607.5	243	15x100	1474	SO1159	-6357.5	243	15x100
1425	SO1110	-5622.5	113	15x100	1475	SO1160	-6372.5	113	15x100
1426	SO1111	-5637.5	243	15x100	1476	SO1161	-6387.5	243	15x100
1427	SO1112	-5652.5	113	15x100	1477	SO1162	-6402.5	113	15x100
1428	SO1113	-5667.5	243	15x100	1478	SO1163	-6417.5	243	15x100
1429	SO1114	-5682.5	113	15x100	1479	SO1164	-6432.5	113	15x100
1430	SO1115	-5697.5	243	15x100	1480	SO1165	-6447.5	243	15x100
1431	SO1116	-5712.5	113	15x100	1481	SO1166	-6462.5	113	15x100
1432	SO1117	-5727.5	243	15x100	1482	SO1167	-6477.5	243	15x100
1433	SO1118	-5742.5	113	15x100	1483	SO1168	-6492.5	113	15x100
1434	SO1119	-5757.5	243	15x100	1484	SO1169	-6507.5	243	15x100
1435	SO1120	-5772.5	113	15x100	1485	SO1170	-6522.5	113	15x100
1436	SO1121	-5787.5	243	15x100	1486	SO1171	-6537.5	243	15x100
1437	SO1122	-5802.5	113	15x100	1487	SO1172	-6552.5	113	15x100
1438	SO1123	-5817.5	243	15x100	1488	SO1173	-6567.5	243	15x100
1439	SO1124	-5832.5	113	15x100	1489	SO1174	-6582.5	113	15x100
1440	SO1125	-5847.5	243	15x100	1490	SO1175	-6597.5	243	15x100
1441	SO1126	-5862.5	113	15x100	1491	SO1176	-6612.5	113	15x100
1442	SO1127	-5877.5	243	15x100	1492	SO1177	-6627.5	243	15x100
1443	SO1128	-5892.5	113	15x100	1493	SO1178	-6642.5	113	15x100
1444	SO1129	-5907.5	243	15x100	1494	SO1179	-6657.5	243	15x100
1445	SO1130	-5922.5	113	15x100	1495	SO1180	-6672.5	113	15x100
1446	SO1131	-5937.5	243	15x100	1496	SO1181	-6687.5	243	15x100
1447	SO1132	-5952.5	113	15x100	1497	SO1182	-6702.5	113	15x100
1448	SO1133	-5967.5	243	15x100	1498	SO1183	-6717.5	243	15x100
1449	SO1134	-5982.5	113	15x100	1499	SO1184	-6732.5	113	15x100
1450	SO1135	-5997.5	243	15x100	1500	SO1185	-6747.5	243	15x100

No.	Name	X	Y	Bump size (µm)	No.	Name	X	Y	Bump size (µm)
1501	SO1186	-6762.5	113	15x100	1551	SO1236	-7512.5	113	15x100
1502	SO1187	-6777.5	243	15x100	1552	SO1237	-7527.5	243	15x100
1503	SO1188	-6792.5	113	15x100	1553	SO1238	-7542.5	113	15x100
1504	SO1189	-6807.5	243	15x100	1554	SO1239	-7557.5	243	15x100
1505	SO1190	-6822.5	113	15x100	1555	SO1240	-7572.5	113	15x100
1506	SO1191	-6837.5	243	15x100	1556	SO1241	-7587.5	243	15x100
1507	SO1192	-6852.5	113	15x100	1557	SO1242	-7602.5	113	15x100
1508	SO1193	-6867.5	243	15x100	1558	SO1243	-7617.5	243	15x100
1509	SO1194	-6882.5	113	15x100	1559	SO1244	-7632.5	113	15x100
1510	SO1195	-6897.5	243	15x100	1560	SO1245	-7647.5	243	15x100
1511	SO1196	-6912.5	113	15x100	1561	SO1246	-7662.5	113	15x100
1512	SO1197	-6927.5	243	15x100	1562	SO1247	-7677.5	243	15x100
1513	SO1198	-6942.5	113	15x100	1563	SO1248	-7692.5	113	15x100
1514	SO1199	-6957.5	243	15x100	1564	SO1249	-7707.5	243	15x100
1515	SO1200	-6972.5	113	15x100	1565	SO1250	-7722.5	113	15x100
1516	SO1201	-6987.5	243	15x100	1566	SO1251	-7737.5	243	15x100
1517	SO1202	-7002.5	113	15x100	1567	SO1252	-7752.5	113	15x100
1518	SO1203	-7017.5	243	15x100	1568	SO1253	-7767.5	243	15x100
1519	SO1204	-7032.5	113	15x100	1569	SO1254	-7782.5	113	15x100
1520	SO1205	-7047.5	243	15x100	1570	SO1255	-7797.5	243	15x100
1521	SO1206	-7062.5	113	15x100	1571	SO1256	-7812.5	113	15x100
1522	SO1207	-7077.5	243	15x100	1572	SO1257	-7827.5	243	15x100
1523	SO1208	-7092.5	113	15x100	1573	SO1258	-7842.5	113	15x100
1524	SO1209	-7107.5	243	15x100	1574	SO1259	-7857.5	243	15x100
1525	SO1210	-7122.5	113	15x100	1575	SO1260	-7872.5	113	15x100
1526	SO1211	-7137.5	243	15x100	1576	SO1261	-7887.5	243	15x100
1527	SO1212	-7152.5	113	15x100	1577	SO1262	-7902.5	113	15x100
1528	SO1213	-7167.5	243	15x100	1578	SO1263	-7917.5	243	15x100
1529	SO1214	-7182.5	113	15x100	1579	SO1264	-7932.5	113	15x100
1530	SO1215	-7197.5	243	15x100	1580	SO1265	-7947.5	243	15x100
1531	SO1216	-7212.5	113	15x100	1581	SO1266	-7962.5	113	15x100
1532	SO1217	-7227.5	243	15x100	1582	SO1267	-7977.5	243	15x100
1533	SO1218	-7242.5	113	15x100	1583	SO1268	-7992.5	113	15x100
1534	SO1219	-7257.5	243	15x100	1584	SO1269	-8007.5	243	15x100
1535	SO1220	-7272.5	113	15x100	1585	SO1270	-8022.5	113	15x100
1536	SO1221	-7287.5	243	15x100	1586	SO1271	-8037.5	243	15x100
1537	SO1222	-7302.5	113	15x100	1587	SO1272	-8052.5	113	15x100
1538	SO1223	-7317.5	243	15x100	1588	SO1273	-8067.5	243	15x100
1539	SO1224	-7332.5	113	15x100	1589	SO1274	-8082.5	113	15x100
1540	SO1225	-7347.5	243	15x100	1590	SO1275	-8097.5	243	15x100
1541	SO1226	-7362.5	113	15x100	1591	SO1276	-8112.5	113	15x100
1542	SO1227	-7377.5	243	15x100	1592	SO1277	-8127.5	243	15x100
1543	SO1228	-7392.5	113	15x100	1593	SO1278	-8142.5	113	15x100
1544	SO1229	-7407.5	243	15x100	1594	SO1279	-8157.5	243	15x100
1545	SO1230	-7422.5	113	15x100	1595	SO1280	-8172.5	113	15x100
1546	SO1231	-7437.5	243	15x100	1596	SO1281	-8187.5	243	15x100
1547	SO1232	-7452.5	113	15x100	1597	SO1282	-8202.5	113	15x100
1548	SO1233	-7467.5	243	15x100	1598	SO1283	-8217.5	243	15x100
1549	SO1234	-7482.5	113	15x100	1599	SO1284	-8232.5	113	15x100
1550	SO1235	-7497.5	243	15x100	1600	SO1285	-8247.5	243	15x100

No.	Name	X	Y	Bump size (µm)	No.	Name	X	Y	Bump size (µm)
1601	SO1286	-8262.5	113	15x100	1651	SO1336	-9012.5	113	15x100
1602	SO1287	-8277.5	243	15x100	1652	SO1337	-9027.5	243	15x100
1603	SO1288	-8292.5	113	15x100	1653	SO1338	-9042.5	113	15x100
1604	SO1289	-8307.5	243	15x100	1654	SO1339	-9057.5	243	15x100
1605	SO1290	-8322.5	113	15x100	1655	SO1340	-9072.5	113	15x100
1606	SO1291	-8337.5	243	15x100	1656	SO1341	-9087.5	243	15x100
1607	SO1292	-8352.5	113	15x100	1657	SO1342	-9102.5	113	15x100
1608	SO1293	-8367.5	243	15x100	1658	SO1343	-9117.5	243	15x100
1609	SO1294	-8382.5	113	15x100	1659	SO1344	-9132.5	113	15x100
1610	SO1295	-8397.5	243	15x100	1660	SO1345	-9147.5	243	15x100
1611	SO1296	-8412.5	113	15x100	1661	SO1346	-9162.5	113	15x100
1612	SO1297	-8427.5	243	15x100	1662	SO1347	-9177.5	243	15x100
1613	SO1298	-8442.5	113	15x100	1663	SO1348	-9192.5	113	15x100
1614	SO1299	-8457.5	243	15x100	1664	SO1349	-9207.5	243	15x100
1615	SO1300	-8472.5	113	15x100	1665	SO1350	-9222.5	113	15x100
1616	SO1301	-8487.5	243	15x100	1666	SO1351	-9237.5	243	15x100
1617	SO1302	-8502.5	113	15x100	1667	SO1352	-9252.5	113	15x100
1618	SO1303	-8517.5	243	15x100	1668	SO1353	-9267.5	243	15x100
1619	SO1304	-8532.5	113	15x100	1669	SO1354	-9282.5	113	15x100
1620	SO1305	-8547.5	243	15x100	1670	SO1355	-9297.5	243	15x100
1621	SO1306	-8562.5	113	15x100	1671	SO1356	-9312.5	113	15x100
1622	SO1307	-8577.5	243	15x100	1672	SO1357	-9327.5	243	15x100
1623	SO1308	-8592.5	113	15x100	1673	SO1358	-9342.5	113	15x100
1624	SO1309	-8607.5	243	15x100	1674	SO1359	-9357.5	243	15x100
1625	SO1310	-8622.5	113	15x100	1675	SO1360	-9372.5	113	15x100
1626	SO1311	-8637.5	243	15x100	1676	SO1361	-9387.5	243	15x100
1627	SO1312	-8652.5	113	15x100	1677	SO1362	-9402.5	113	15x100
1628	SO1313	-8667.5	243	15x100	1678	SO1363	-9417.5	243	15x100
1629	SO1314	-8682.5	113	15x100	1679	SO1364	-9432.5	113	15x100
1630	SO1315	-8697.5	243	15x100	1680	SO1365	-9447.5	243	15x100
1631	SO1316	-8712.5	113	15x100	1681	SO1366	-9462.5	113	15x100
1632	SO1317	-8727.5	243	15x100	1682	SO1367	-9477.5	243	15x100
1633	SO1318	-8742.5	113	15x100	1683	SO1368	-9492.5	113	15x100
1634	SO1319	-8757.5	243	15x100	1684	SO1369	-9507.5	243	15x100
1635	SO1320	-8772.5	113	15x100	1685	SO1370	-9522.5	113	15x100
1636	SO1321	-8787.5	243	15x100	1686	SO1371	-9537.5	243	15x100
1637	SO1322	-8802.5	113	15x100	1687	SO1372	-9552.5	113	15x100
1638	SO1323	-8817.5	243	15x100	1688	SO1373	-9567.5	243	15x100
1639	SO1324	-8832.5	113	15x100	1689	SO1374	-9582.5	113	15x100
1640	SO1325	-8847.5	243	15x100	1690	SO1375	-9597.5	243	15x100
1641	SO1326	-8862.5	113	15x100	1691	SO1376	-9612.5	113	15x100
1642	SO1327	-8877.5	243	15x100	1692	SO1377	-9627.5	243	15x100
1643	SO1328	-8892.5	113	15x100	1693	SO1378	-9642.5	113	15x100
1644	SO1329	-8907.5	243	15x100	1694	SO1379	-9657.5	243	15x100
1645	SO1330	-8922.5	113	15x100	1695	SO1380	-9672.5	113	15x100
1646	SO1331	-8937.5	243	15x100	1696	SO1381	-9687.5	243	15x100
1647	SO1332	-8952.5	113	15x100	1697	SO1382	-9702.5	113	15x100
1648	SO1333	-8967.5	243	15x100	1698	SO1383	-9717.5	243	15x100
1649	SO1334	-8982.5	113	15x100	1699	SO1384	-9732.5	113	15x100
1650	SO1335	-8997.5	243	15x100	1700	SO1385	-9747.5	243	15x100

No.	Name	X	Y	Bump size (µm)	No.	Name	X	Y	Bump size (µm)
1701	SO1386	-9762.5	113	15x100	1751	SO1436	-10512.5	113	15x100
1702	SO1387	-9777.5	243	15x100	1752	SO1437	-10527.5	243	15x100
1703	SO1388	-9792.5	113	15x100	1753	SO1438	-10542.5	113	15x100
1704	SO1389	-9807.5	243	15x100	1754	SO1439	-10557.5	243	15x100
1705	SO1390	-9822.5	113	15x100	1755	SO1440	-10572.5	113	15x100
1706	SO1391	-9837.5	243	15x100	1756	SO1441	-10587.5	243	15x100
1707	SO1392	-9852.5	113	15x100	1757	SO1442	-10602.5	113	15x100
1708	SO1393	-9867.5	243	15x100	1758	SO1443	-10617.5	243	15x100
1709	SO1394	-9882.5	113	15x100	1759	SO1444	-10632.5	113	15x100
1710	SO1395	-9897.5	243	15x100	1760	SO1445	-10647.5	243	15x100
1711	SO1396	-9912.5	113	15x100	1761	SO1446	-10662.5	113	15x100
1712	SO1397	-9927.5	243	15x100	1762	SO1447	-10677.5	243	15x100
1713	SO1398	-9942.5	113	15x100	1763	SO1448	-10692.5	113	15x100
1714	SO1399	-9957.5	243	15x100	1764	SO1449	-10707.5	243	15x100
1715	SO1400	-9972.5	113	15x100	1765	SO1450	-10722.5	113	15x100
1716	SO1401	-9987.5	243	15x100	1766	SO1451	-10737.5	243	15x100
1717	SO1402	-10002.5	113	15x100	1767	SO1452	-10752.5	113	15x100
1718	SO1403	-10017.5	243	15x100	1768	SO1453	-10767.5	243	15x100
1719	SO1404	-10032.5	113	15x100	1769	SO1454	-10782.5	113	15x100
1720	SO1405	-10047.5	243	15x100	1770	SO1455	-10797.5	243	15x100
1721	SO1406	-10062.5	113	15x100	1771	SO1456	-10812.5	113	15x100
1722	SO1407	-10077.5	243	15x100	1772	SO1457	-10827.5	243	15x100
1723	SO1408	-10092.5	113	15x100	1773	SO1458	-10842.5	113	15x100
1724	SO1409	-10107.5	243	15x100	1774	SO1459	-10857.5	243	15x100
1725	SO1410	-10122.5	113	15x100	1775	SO1460	-10872.5	113	15x100
1726	SO1411	-10137.5	243	15x100	1776	SO1461	-10887.5	243	15x100
1727	SO1412	-10152.5	113	15x100	1777	SO1462	-10902.5	113	15x100
1728	SO1413	-10167.5	243	15x100	1778	SO1463	-10917.5	243	15x100
1729	SO1414	-10182.5	113	15x100	1779	SO1464	-10932.5	113	15x100
1730	SO1415	-10197.5	243	15x100	1780	SO1465	-10947.5	243	15x100
1731	SO1416	-10212.5	113	15x100	1781	SO1466	-10962.5	113	15x100
1732	SO1417	-10227.5	243	15x100	1782	SO1467	-10977.5	243	15x100
1733	SO1418	-10242.5	113	15x100	1783	SO1468	-10992.5	113	15x100
1734	SO1419	-10257.5	243	15x100	1784	SO1469	-11007.5	243	15x100
1735	SO1420	-10272.5	113	15x100	1785	SO1470	-11022.5	113	15x100
1736	SO1421	-10287.5	243	15x100	1786	SO1471	-11037.5	243	15x100
1737	SO1422	-10302.5	113	15x100	1787	SO1472	-11052.5	113	15x100
1738	SO1423	-10317.5	243	15x100	1788	SO1473	-11067.5	243	15x100
1739	SO1424	-10332.5	113	15x100	1789	SO1474	-11082.5	113	15x100
1740	SO1425	-10347.5	243	15x100	1790	SO1475	-11097.5	243	15x100
1741	SO1426	-10362.5	113	15x100	1791	SO1476	-11112.5	113	15x100
1742	SO1427	-10377.5	243	15x100	1792	SO1477	-11127.5	243	15x100
1743	SO1428	-10392.5	113	15x100	1793	SO1478	-11142.5	113	15x100
1744	SO1429	-10407.5	243	15x100	1794	SO1479	-11157.5	243	15x100
1745	SO1430	-10422.5	113	15x100	1795	SO1480	-11172.5	113	15x100
1746	SO1431	-10437.5	243	15x100	1796	SO1481	-11187.5	243	15x100
1747	SO1432	-10452.5	113	15x100	1797	SO1482	-11202.5	113	15x100
1748	SO1433	-10467.5	243	15x100	1798	SO1483	-11217.5	243	15x100
1749	SO1434	-10482.5	113	15x100	1799	SO1484	-11232.5	113	15x100
1750	SO1435	-10497.5	243	15x100	1800	SO1485	-11247.5	243	15x100

No.	Name	X	Y	Bump size (µm)
1801	SO1486	-11262.5	113	15x100
1802	SO1487	-11277.5	243	15x100
1803	SO1488	-11292.5	113	15x100
1804	SO1489	-11307.5	243	15x100
1805	SO1490	-11322.5	113	15x100
1806	SO1491	-11337.5	243	15x100
1807	SO1492	-11352.5	113	15x100
1808	SO1493	-11367.5	243	15x100
1809	SO1494	-11382.5	113	15x100
1810	SO1495	-11397.5	243	15x100
1811	SO1496	-11412.5	113	15x100
1812	SO1497	-11427.5	243	15x100
1813	SO1498	-11442.5	113	15x100
1814	SO1499	-11457.5	243	15x100
1815	SO1500	-11472.5	113	15x100
1816	SO1501	-11487.5	243	15x100
1817	SO1502	-11502.5	113	15x100
1818	SO1503	-11517.5	243	15x100
1819	SO1504	-11532.5	113	15x100
1820	SO1505	-11547.5	243	15x100
1821	SO1506	-11562.5	113	15x100
1822	SO1507	-11577.5	243	15x100
1823	SO1508	-11592.5	113	15x100
1824	SO1509	-11607.5	243	15x100
1825	SO1510	-11622.5	113	15x100
1826	SO1511	-11637.5	243	15x100
1827	SO1512	-11652.5	113	15x100
1828	SO1513	-11667.5	243	15x100
1829	SO1514	-11682.5	113	15x100
1830	SO1515	-11697.5	243	15x100
1831	SO1516	-11712.5	113	15x100
1832	SO1517	-11727.5	243	15x100
1833	SO1518	-11742.5	113	15x100
1834	SO1519	-11757.5	243	15x100
1835	SO1520	-11772.5	113	15x100
1836	SO1521	-11787.5	243	15x100
1837	SO1522	-11802.5	113	15x100
1838	SO1523	-11817.5	243	15x100
1839	SO1524	-11832.5	113	15x100
1840	SO1525	-11847.5	243	15x100
1841	SO1526	-11862.5	113	15x100
1842	SO1527	-11877.5	243	15x100
1843	SO1528	-11892.5	113	15x100
1844	SO1529	-11907.5	243	15x100
1845	SO1530	-11922.5	113	15x100
1846	SO1531	-11937.5	243	15x100
1847	SO1532	-11952.5	113	15x100
1848	SO1533	-11967.5	243	15x100
1849	SO1534	-11982.5	113	15x100
1850	SO1535	-11997.5	243	15x100

No.	Name	X	Y	Bump size (µm)
1851	SO1536	-12012.5	113	15x100
1852	SHIELDING	-12055	258	30x70
1853	COM1_OUT	-12105	258	30x70
1854	COM1_OUT	-12155	258	30x70
1855	SHIELDING	-12205	258	30x70
1856	OEVR	-12303	238	80x30
1857	F_CtrlR	-12396.5	278	67x30
1858	SYNC1R	-12396.5	198	67x30
1859	SYNC2R	-12303	158	80x30
1860	UDR	-12396.5	118	67x30
1861	CKVR	-12303	78	80x30
1862	STV2R	-12396.5	38	67x30
1863	STV1R	-12303	-2	80x30
1864	F_CtrlR	-12396.5	-42	67x30
1865	STBNR	-12303	-82	80x30

Align mark	ARK_L	-12131.5	115.5
Align mark	ARK_R	12131.5	115.5

Table 12.2: Pad coordinate

13. Ordering Information

Part no.	Package
HX8282-A11XPDxxx	X: mean fab code PD: mean COG xxx: mean chip thickness (μm), default 300μm

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