

# **The Current Status of SPWG**

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## **Discussion Topics**

- **Version 2 SPWG is a Notebook Standard for all Major LCD suppliers**
- **SPWG Version 2, Style A & Style B are both in use**
- **EEDID is being used for panel ID and timing**
- **Thickness and weight are being defined by PC makers**
- **LCDs with inverters attached are included on many panels**
- **SPWG is a “Flexible Standard” – Right or Wrong?**
- **Where does SPWG go next?**

## **Version 2 SPWG is a Notebook Standard for all Major LCD suppliers**

Samsung

LG.Philips

IDT/Chi Mei

Hitachi

Sharp

Toshiba

Tottori-Sanyo

AU Optronics

QDI

HannStar

CPT

## **Style A & Style B are Both in Use**

7.5mm Thickness – 15.0” Style A

6.5mm Thickness – 14.1” Style A

6.5mm Thickness – 15.0” Style B

6.0mm Thickness – 14.1” Style B

# EEDID is Being Used for Panel ID and Timing

VBIOS is not using all the information, unless requested.

- EEDID can be loaded for “Bear” and used.

Vendor / Product ID / EDID Version

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
8	08	EISA manufacture code = 3 Character ID		
9	09	EISA manufacture code (Compressed ASCII)		
10	0A	Panel Supplier Reserved – Product Code		
11	0B	Panel Supplier Reserved – Product Code		
12	0C	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
13	0D	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
14	0E	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
15	0F	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
16	10	Week of manufacture		
17	11	Year of manufacture		
18	12	EDID structure version # = 1	01	00000001
19	13	EDID revision # = 3	03	00000011

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
20	14	Video I/P definition = Digital I/P (80h)	80	10000000
21	15	Max H image size = (Rounded to cm)		
22	16	Max V image size = (Rounded to cm)		
23	17	Display gamma = (gamma ×100)-100 = Example: ( 2.2?100 ) – 100 = 120		
24	18	Feature support ( no DPMS, Active off, RGB, timing BLK 1)	0A	00001010

#### Panel Color Coordinates

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
25	19	Red/Green Low bit (RxRy/GxGy)		
26	1A	Blue/White Low bit (BxBY/WxWy)		
27	1B	Red X Rx = 0.xxx		
28	1C	Red Y Ry = 0.xxx		
29	1D	Green X Gx = 0.xxx		
30	1E	Green Y Gy = 0.xxx		
31	1F	Blue X Bx = 0.xxx		
32	20	Blue Y By = 0.xxx		
33	21	White X Wx = 0.xxx		
34	22	White Y Wy = 0.xxx		

### Timing Descriptor #1

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
54	36	Pixel Clock/10,000 (LSB)		
55	37	Pixel Clock/10,000 (MSB)		
56	38	Horizontal Active = xxxx pixels (lower 8 bits) <b>Note 2</b>		
57	39	Horizontal Blanking (Thbp) = xxxx pixels (lower 8 bits)		
58	3A	Horizontal Active/Horizontal blanking (Thbp) (upper4:4 bits)		
59	3B	Vertical Active = xxxx lines		
60	3C	Vertical Blanking (Tvbp) = xxxx lines (DE Blanking min for DE only panels)		
61	3D	Vertical Active : Vertical Blanking (Tvbp) (upper4:4 bits)		
62	3E	Horizontal Sync, Offset (Thfp) = xxxx pixels		
63	3F	Horizontal Sync, Pulse Width = xxxx pixels		
64	40	Vertical Sync, Offset (Tvfp) = xx lines Sync Width = xx lines		
65	41	Horizontal Vertical Sync Offset/Width upper 2 bits		
66	42	Horizontal Image Size =xxx mm		
67	43	Vertical image Size = xxx mm		
68	44	Horizontal Image Size / Vertical image size		
69	45	Horizontal Border = 0 (Zero for Notebook LCD)	00	00000000
70	46	Vertical Border = 0 (Zero for Notebook LCD)	00	00000000
71	47	Non-interlaced, Normal, no stereo, Separate sync, H/V pol Negatives, DE only note: LSB is set to "1" if panel is DE-timing only. H/V can be ignored.	18 (19)	00011000 00011001

## Timing Descriptor #2 Manufacturer's Specified Range Timing

### Descriptor

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
72	48	Flag	00	00000000
73	49	Flag	00	00000000
74	4A	Flag	00	00000000
75	4B	Data Type Tag: <b>Descriptor Defined by Manufacturer</b>	0F	00001111
76	4C	Flag	00	00000000
77	4D	Value = $HSPW_{min} / 2$ (pixel clks)		Value
78	4E	Value = $HSPW_{max} / 2$ (pixel clks)		Value
79	4F	Value = $Thbp_{min} / 2$ (pixel clks)		Value
80	50	Value = $Thbp_{max} / 2$ (pixel clks)		Value
81	51	Value = $VSPW_{min} / 2$ (line pulses)		Value
82	52	Value = $VSPW_{max} / 2$ (line pulses)		Value
83	53	Value = $Tvbp_{min} / 2$ (line pulses)		Value
84	54	Value = $Tvbp_{max} / 2$ (line pulses)		Value
85	55	$Thp_{min} = value * 2 + HA_{pixel\ clks}$ (pixel clks) <b>Note 2</b>		Value
86	56	$Thp_{max} = value * 2 + HA_{pixel\ clks}$ (pixel clks) <b>Note 2</b>		Value
87	57	$Tvp_{min} = value * 2 + VA_{lines}$ (line pulses)		Value
88	58	$Tvp_{max} = value * 2 + VA_{lines}$ (line pulses)		Value
89	59	Module "A" Revision = Example: 00, 01, 02, 03, etc.		

### Timing Descriptor #3

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
90	5A	Flag	00	00000000
91	5B	Flag	00	00000000
92	5C	Flag	00	00000000
93	5D	Dummy Descriptor	FE	11111110
94	5E	Flag	00	00000000
95	5F	Dell P/N 1 <sup>st</sup> Character		
96	60	Dell P/N 2 <sup>nd</sup> Character		
97	61	Dell P/N 3 <sup>rd</sup> Character		
98	62	Dell P/N 4 <sup>th</sup> Character		
99	63	Dell P/N 5 <sup>th</sup> Character		
100	64	LCD Supplier EEDID Revision #		
101	65	Manufacturer P/N		
102	66	Manufacturer P/N		
103	67	Manufacturer P/N		
104	68	Manufacturer P/N		
105	69	Manufacturer P/N		
106	6A	Manufacturer P/N		
107	6B	Manufacturer P/N (If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)		

### Timing Descriptor #4

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
108	6C	Flag	00	00000000
109	6D	Flag	00	00000000
110	6E	Flag	00	00000000
111	6F	Data Type Tag: ASCII String	FE	11111110
112	70	Flag	00	00000000
113	71	SMBUS Value = 20 nits		
114	72	SMBUS Value = 40 nits		
115	73	SMBUS Value = 55 nits		
116	74	SMBUS Value = 70 nits		
117	75	SMBUS Value = 95nits		
118	76	SMBUS Value = 120 nits		
119	77	SMBUS Value = 155 nits		
120	78	SMBUS Value = max nits (Typically = 00h)		
121	79	Number of LVDS receiver chips = 1 or 2		
122	7A	(If <13 char, then terminate with ASCII code 0Ah)	0A	00001010
123	7B	(If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)	20	00100000
124	7C	(If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)	20	00100000
125	7D	(If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)	20	00100000

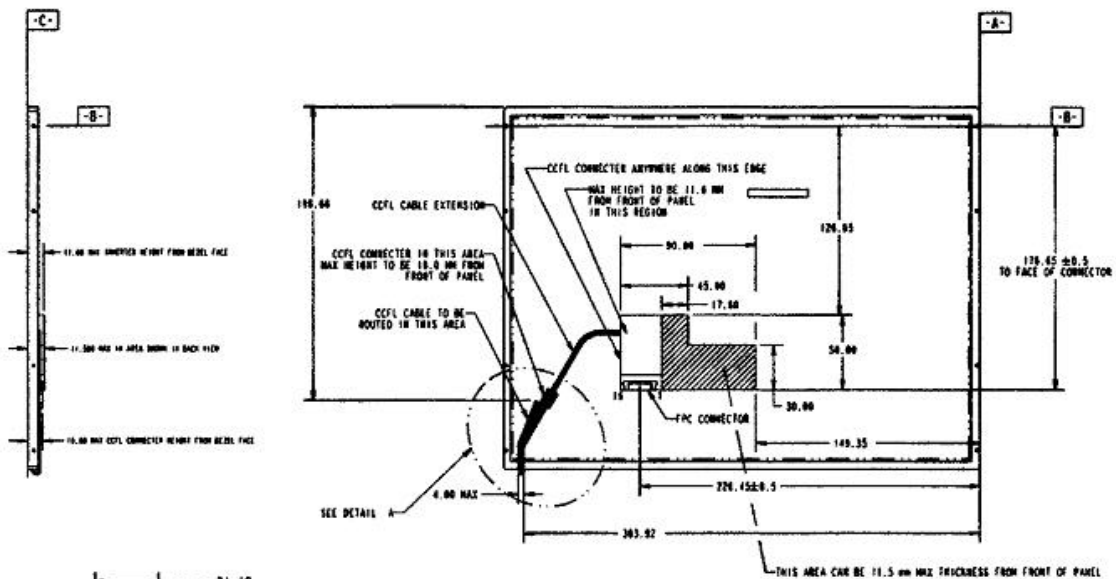
  

Byte (dec)	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
126	7E	Extension flag (# of optional 128 EDID extension blocks to follow, Typ = 0)	00	00000000
127	7F	Checksum (The 1-byte sum of all 128 bytes in this EDID block shall = 0)		



NOTES: (UNLESS OTHERWISE SPECIFIED):

1. Inverter to have good electrical ground connection with panel frame.
2. Inverter to be easily removable after assembly.
3. Backlight bulb wires to be well constrained to avoid pinching upon assembly.
4. No changes shall be made to panels which make the panel a dell custom part.
5. Inverter must be well insulated to prevent shorting to rear by display shielding.

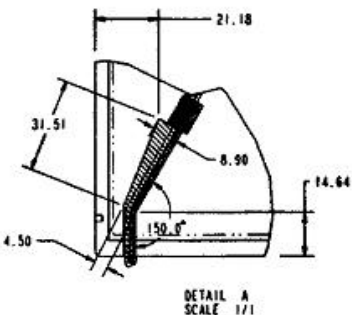


FPC Connector: MOLEX, 52207-1690

Pin #	Function
1	INV_SRC
2	INV_SRC
3	INV_SRC
4	GND
5	GND
6	GND
7	SVSUS
8	SVSWLW
9	SMB_DAT
10	SMB_CLK
11	FPVCE
12	NC
13	PANEL-ID3
14	PANEL-ID2
15	PANEL-ID1
16	PANEL-ID0

### BACK VIEW OF LCD PANEL

MAXIMUM ALLOWABLE SIZE OF INVERTER SHOWN



DETAIL A  
SCALE 1/1

ITEM	QTY	DESCRIPTION	VENDOR	PART NO.	REFERENCE		
BILL OF MATERIALS							
DRAWING IDENTIFIER NO. USED		A CURRENT ISSUE OF THIS DRAWING MUST INCLUDE A COPY OF THE FOLLOWING ECO'S:		PART J. BROSTROM 57270			
INVENTORY IDENTIFIER NO. NOT USED		UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN: MILLIMETERS (INCHES).		TITLE:			
ECO..... DATE.....		TOLERANCES		L2 SPWG 15.0 INVERTER SPEC			
ECO..... DATE.....		X, XX (XXX) : ±0.10 (0.041)		SIZE			
ECO..... DATE.....		ANGULAR $\angle$ ±30°		C			
ECO..... DATE.....		HOLE DIMENSER		REV. X03			
ECO..... DATE.....		6.10 (240) 6.30 (251) 6.50 (256) 6.75 (268) 7.00 (275) 7.25 (286) 7.50 (295) 7.75 (305) 8.00 (315) 8.25 (325) 8.50 (335) 8.75 (345) 9.00 (355) 9.25 (365) 9.50 (375) 9.75 (385) 10.00 (395) 10.25 (405) 10.50 (415) 10.75 (425) 11.00 (435) 11.25 (445) 11.50 (455) 11.75 (465) 12.00 (475) 12.25 (485) 12.50 (495) 12.75 (505) 13.00 (515) 13.25 (525) 13.50 (535) 13.75 (545) 14.00 (555) 14.25 (565) 14.50 (575) 14.75 (585) 15.00 (595) 15.25 (605) 15.50 (615) 15.75 (625) 16.00 (635) 16.25 (645) 16.50 (655) 16.75 (665) 17.00 (675) 17.25 (685) 17.50 (695) 17.75 (705) 18.00 (715) 18.25 (725) 18.50 (735) 18.75 (745) 19.00 (755) 19.25 (765) 19.50 (775) 19.75 (785) 20.00 (795) 20.25 (805) 20.50 (815) 20.75 (825) 21.00 (835) 21.25 (845) 21.50 (855) 21.75 (865) 22.00 (875) 22.25 (885) 22.50 (895) 22.75 (905) 23.00 (915) 23.25 (925) 23.50 (935) 23.75 (945) 24.00 (955) 24.25 (965) 24.50 (975) 24.75 (985) 25.00 (995)		SCALE 1/2		SHEET 1 OF 1	

## **SPWG is a “Flexible Standard” – Right or Wrong?**

- Allows Feature Set to be Defined by the LCD Supplier
- Makes Multiple Standards for SPWG
- Restricting the SPWG Standard is Good for LCD Suppliers
- How Long should SPWG Style A Live? EOL Plans
- Can LCDs get Too Thin – Beyond SPWG Style B

## **Where does SPWG go Next?**

- LCD Suppliers keep Standards Updated/Constant?
- SPWG Continues As Is?
- SPWG Transferred to 3<sup>rd</sup> Party, DisplaySearch?

**What is Right for Your Business?**