

LCD Unit Specification

FLC29SVC6S

- **Features**

- 1) HIGH RESOLUTION
[800XRGBX600 display pixels, 11.3 in]
- 2) SMALL SIZE, LIGHT WEIGHT
- 3) 262, 144 COLORS

- **Specifications Preliminary**

Specification		Description
Display Type		Active matrix (TFT) TN
LCD panel	Display size	Diagonal 29cm (11.3in)
	Number of pixels	800×RGB(H)×600(V)
	Pixel pitch	0.288(H)×0.288(V) mm
	Display area	230.4(H)×172.8(V) mm
Display function	Number of colors	262, 144 colors (6-bit color)
	Contrast ratio	100:1 Typ. [Black & White]
	Brightness	70 cd/m ² Typ. [White]
Electric function	Interface (I/F)	Digital interface
	Power supply	DC +3.3V
	Power consumption	2.7W (BL:2.0W)
	Back-light (BL)	1 CCFL , Sidelight
Mechanical function	Dimensions (mm ³)	260.5(H)×187.0(W)×8.0(D)(TYP.)
	Weight	530 g Typ.

*: Specifications are subject to change without notice.

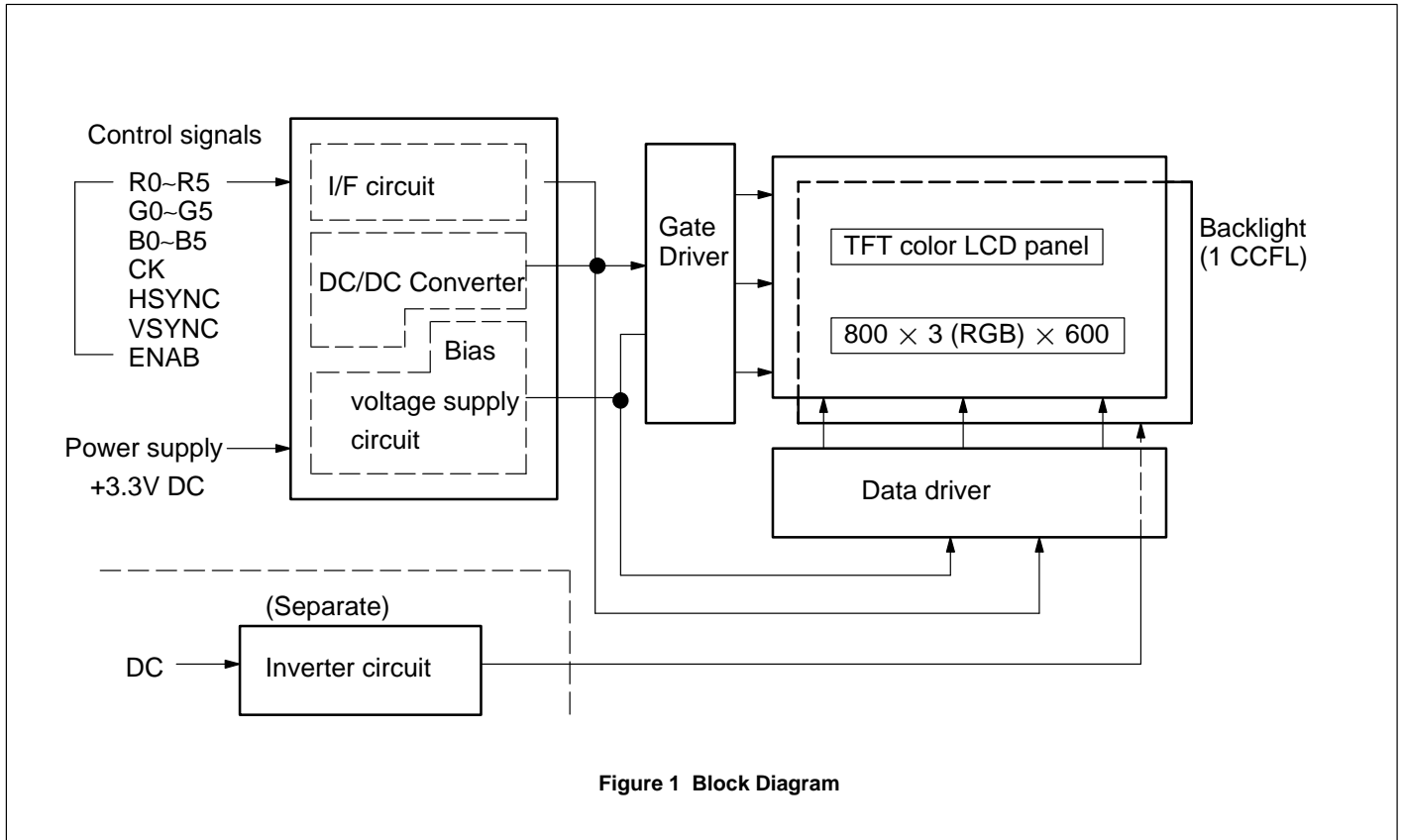


Table 1 Absolute Maximum Rating

Item	Symbol	Condition	Max.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	$T_a=25^{\circ}\text{C}$	-0.3	—	6.0	V
Input Voltage	V_{IN}	"	$V_{SS}-0.3$	—	$V_{CC}+0.3$	V

Table 2 Recommended Operating Conditions

Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	3.1	3.3	3.5	V
Ripple Voltage of V_{CC}	V_{RPI}	—	—	100	mV

Table 3 Electrical Specifications

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Current		I_{CC}	$V_{CC}=+3.3V$ $V_{SS}=0V$ $T_a=25^{\circ}C$ $CK=39.0MHz$	—	(330)	()	mA
“H”Level Logic Input Voltage		V_{IH}		$0.7V_{CC}$	—	V_{CC}	V
“L”Level Logic Input Voltage		V_{IL}		V_{SS}	—	$0.3V_{CC}$	V
Supply Rush Current (Note 1)		I_{SDD}		—	—	()	A
Supply Rush Current Duration (I_A excess) (Note 1)		T_{SDD}		—	—	()	ms
Back Light	Lighting Start Voltage	V_S	$f_L = \text{_kHz}, T_a=25^{\circ}C$	—	—	590	Vrms
	Lighting Voltage	V_L	$f_L = \text{_kHz}, I_L=4mA$	—	()		Vrms
	Lighting Frequency	f_L	$V_L = \text{_Vrms}$	()	()	()	kHz
	Tube Current (Note 2)	I_L	$V_L = \text{_Vrms}$ $f_L = \text{_kHz}$	()	3.0	()	mA

(Note 1) Rush Current when internal power supply started to operate is specified.

(Note 2) Current value per tube (1 tube/unit).

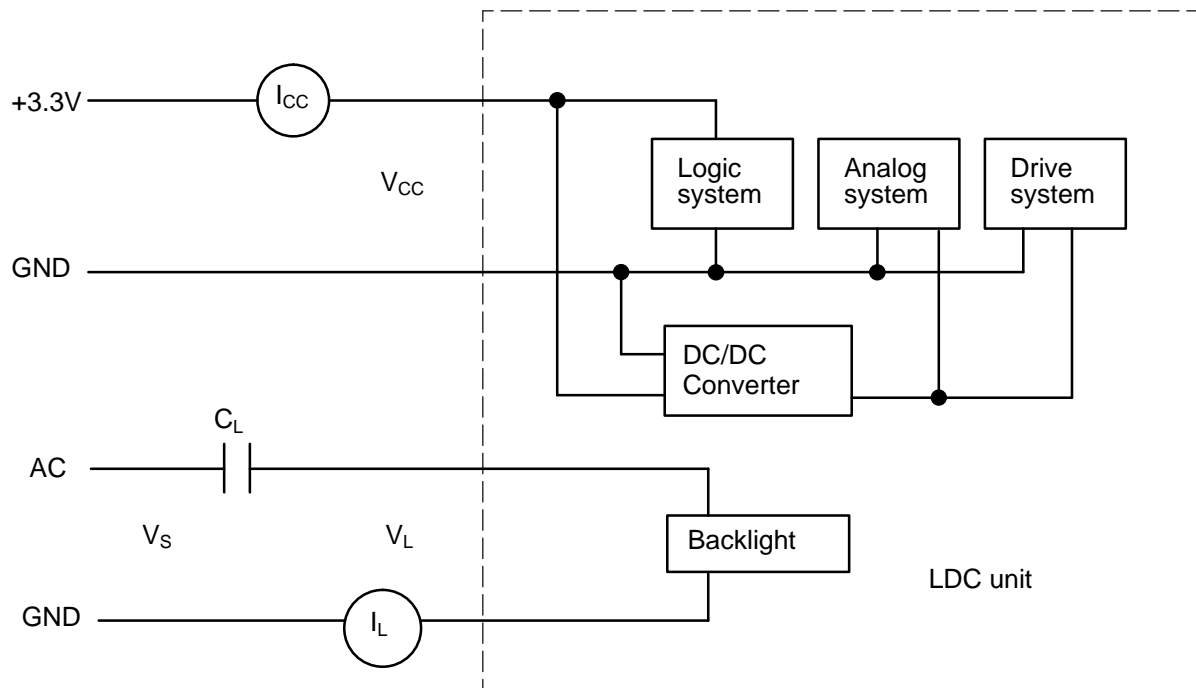


Figure 2 Measurement circuit

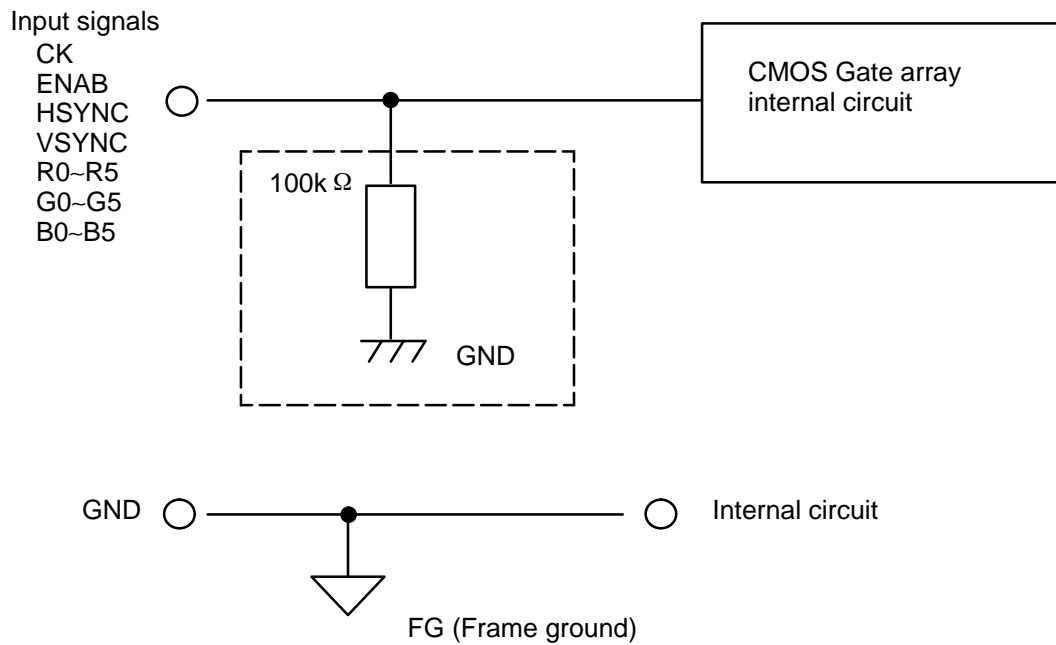


Figure 3 Equivalent circuit of logic signal input and power supply

Table 4 Mechanical Specifications

Item	Specification	Unit	Remark
Dimensions	260.5×187.0 ×8.0 (Typ.)	mm	(Note 1) (Note 2)
Display Capacity	(800×3) ×600	—	
Display Dot Area	230.4 ×172.8	mm	
Dot Pitch	0.288×0.288	mm	
Aspect Ratio	1:1	—	
Weight	530 (Typ.)	g	(Note 1)

(Note 1) Excluding inverter.

(Note 2) For details on dimensions, see external view.

Table 5 Optical Specifications

Item	Sym- bol	Condition	Specifications			Unit	Remark
			Min.	Typ.	Max.		
Visual Angle	Θ_V	CR \geq 10 Ta=25°C	50	—	—	deg	Vertical
	Θ_H		80	—	—	deg	Horizontal
Contrast Ratio	CR	Ta=25°C	50	100	—	—	(Note 1)
Response Time (ON)	t _{on}	Ta=25°C	—	—	50	ms	White ⇄ Black
		Ta=0°C	—	50	150	ms	
Response Time (OFF)	t _{of}	Ta=25°C	—	—	50	ms	Black ⇄ White
		Ta=0°C		100	150	ms	
Brightness	L	Ta=25°C V _{CC} = 3.3v, V _L =_Vrms f _L =_kHz, I _L =3mA	(60)	(70)	—	cd/m ²	White (Note 2)
Brightness Uniformity	Δ L		—	—	75	%	
Chromaticity (White)	x		—	()	—	—	
	y		—	()	—	—	
LCD Panel Type			TFT Color				
Display Mode			Normally White				
Display colors			262,144 (6-bit color)				
Surface Treatment			Anti-glare (Haze value:___%)				
Visual Angle Direction			6 O'clock				

(Note 1) Contrast ratio is measured with a $\phi 20$ spot diameter.

(Note 2) Value at 30 minutes after lighting starts.

Table 6 Interface signal array (CN1)

Pin No.	Signal name	I/O	Logic	Function
1	GND	—	—	Ground
2	CK	I	↓	Dot clock signal
3	GND	—	—	Ground
4	HSYNC	I	Negative	Horizontal Synchronizing signal
5	VSYNC	I	Negative	Vertical Synchronizing signal
6	GND	—	—	Ground
7	GND	—	—	Ground
8	GND	—	—	Ground
9	R0	I	Positive	Red data 0 (LSB)
10	R1	I	Positive	Red data 1
11	R2	I	Positive	Red data 2
12	GND	—	—	Ground
13	R3	I	Positive	Red data 3
14	R4	I	Positive	Red data 4
15	R5	I	Positive	Red data 5 (MSB)
16	GND	—	—	Ground
17	GND	—	—	Ground
18	GND	—	—	Ground
19	G0	I	Positive	Green data 0 (LSB)
20	G1	I	Positive	Green data 1
21	G2	I	Positive	Green data 2
22	GND	—	—	Ground
23	G3	I	Positive	Green data 3
24	G4	I	Positive	Green data 4
25	G5	I	Positive	Green data 5 (MSB)
26	GND	—	—	Ground
27	GND	—	—	Ground
28	GND	—	—	Ground
29	B0	I	Positive	Blue data 0 (LSB)
30	B1	I	Positive	Blue data 1

(Continued)

Table 6 Interface signal array (CN1) (Continued)

Pin No.	Signal name	I/O	Logic	Function
31	B2	I	Positive	Blue data 2
32	GND	—	—	Ground
33	B3	I	Positive	Blue data 3
34	B4	I	Positive	Blue data 4
35	B5	I	Positive	Blue data 5 (MSB)
36	GND	—	—	Ground
37	ENAB	I	Positive	Data enable signal
38	V _{CC}	—	—	+3.3 V Power supply
39	V _{CC}	—	—	+3.3 V Power supply
40	V _{CC}	—	—	+3.3 V Power supply
41	NC	—	—	NC

Connector used: DF9BA-41P-1V (Hirose)
Adaptive Connector: DF9-41S-1V (Hirose)

Table 7 Relationship between input data and display color

<div><div>Data signal</div><div>Colors</div><div>GS</div></div>			Red Data						Green Data						Blue Data					
			R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
			MSB					LSB	MSB					LSB	MSB					LSB
Basic colors	Black	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Red		1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
	Green		0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	
	Blue		0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	
	Cyan		0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	
	Magenta		1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	
	Yellow		1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	
	White	63	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Red Gray-scale	Black	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Bright ↓	01	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		02	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮		
		61	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
		62	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
	Red	63	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0		
Green Gray-scale	Black	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Bright ↓	01	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
		02	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
			⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮		
		61	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	
		62	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	
	Green	63	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0		
Blue Gray-scale	Black	00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Bright ↓	01	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
		02	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
			⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮		
		61	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	
		62	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	
	Blue	63	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1		

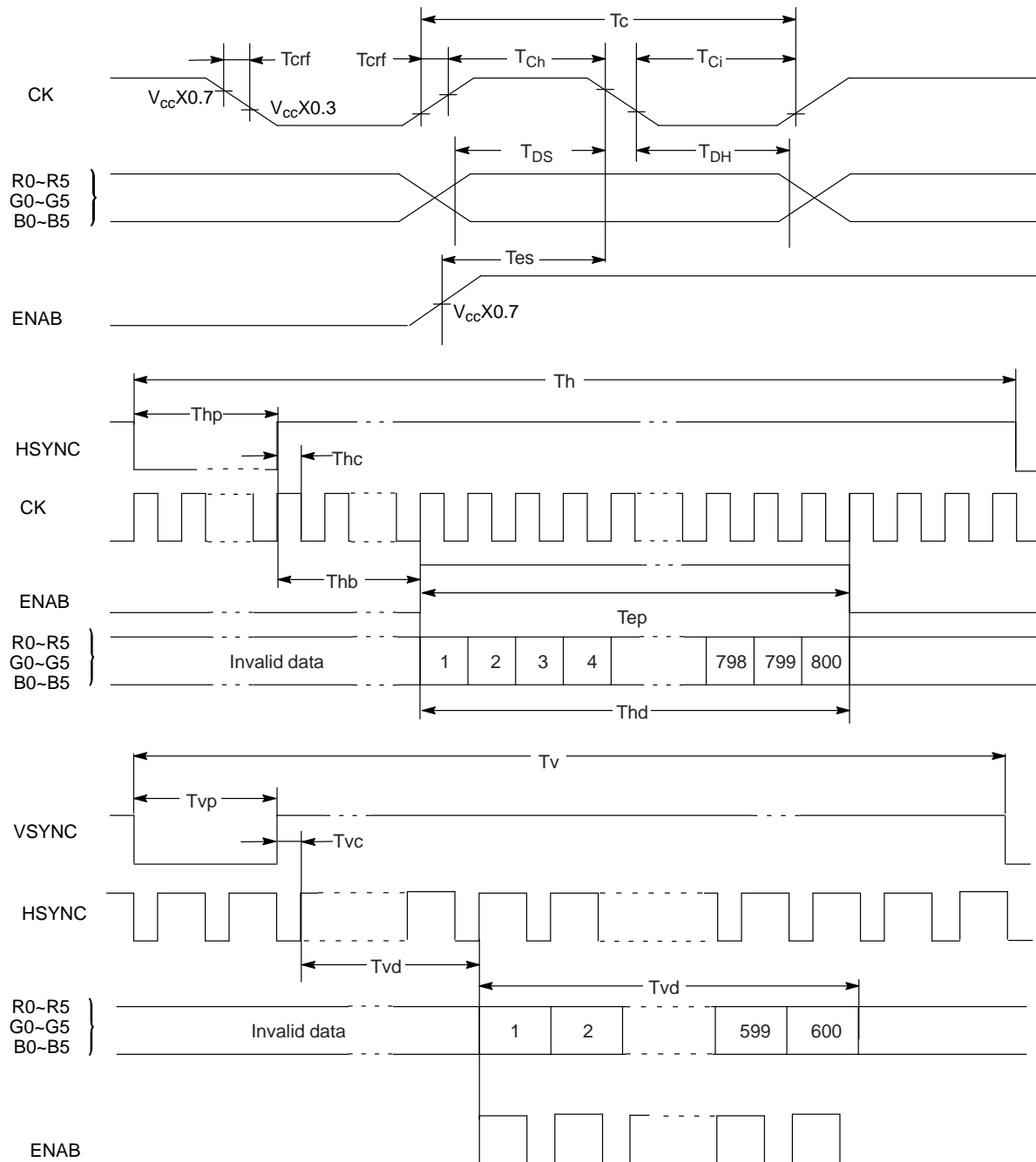


Figure 4 Interface timing

Table 8 Switching characteristics (Ta=0-50 °C, V_{CC}= 3.3 ± 5%)

Item		Symbol	Min.	Typ.	Max.	Unit	Remark
Clock (CK)	Frequency	1/Tc	—	39.0	40.0	MHz	
	Rise, fall time	Tcrf	—	—	5	ns	
	Clock pulse (H level)	Tch	5	—	—	ns	
	Clock pulse (L level)	Tcl	5	—	—	ns	
Horizontal synchronus signal (HSYNC)	Cycle	Th	20.8	26.4	—	μs	
			832	1056	—	Clock	
	Pulse width	Thp	2	128	200	Clock	
	HSYNC-CK phase difference	Thc	10	—	Tc-10	ns	
	Back porch	Thb	15	88	Th-Thp-800	Clock	Note 1, 2
Verticle synchronus signal (VSYNC)	Display cycle	Thd	—	800	—	Clock	
	Cycle	Tv	628	666	798	Line	
	HSYNC-VSYNC phase difference	Tvh	0	Thp	Th-Thp	μs	
	Pulse width	Tvp	2	4	6	Line	
	Back porch	Tvb	1	23	Tv-Tvp-600	Line	Note 1, 2
Enable signal (ENAB)	Display cycle	Tvd	—	600	—	Line	Note 3
	Setup time	Tes	5	—	Tc-10	ns	Note 4
Data	Pulse width	Tep	—	800	—	Clock	
	Setup time	Tds	3	—	—	ns	Note 4
Data	Hold time	Tdh	10	—	—	ns	Note 4

- (Note 1) The horizontal and vertical display position are specified by the rise of the enable signal (ENAB).
- (Note 2) If the enable signal (ENAB) is always "L" or "H", the back porch is fixed automatically. The horizontal back porch is 88 clocks, and the vertical back porch is 23 lines.
- (Note 3) If the numbers of the enable signal (ENAB) don't reach 600 and the enable signal (ENAB) is "L", the rest lines are automatically displayed black.
- (Note 4) If the effective display data and the enable signal (ENAB) don't synchronize, the screen position is deviated from a normal display.

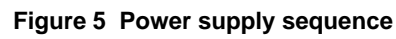


Figure 6 Correspondence between data and display position

Table 9 Power supply for Backlight (CN-A)

Pin. No	Signal	Function	Cable color
1	V _{FL}	Power supply for CCFT (High voltage)	Pink
2	NC	—	
3	V _{FL}	Power supply for CCFT (Low voltage)	White

Connector : BHR-03VS-1 (Japan Solderless Terminal)

User Connector : SM03(4.0)B-BHS-1-TB (Japan Solderless Terminal)

Table 10 Indications

(1) Product name	:	LCD unit
(2) Product model	:	FLC29SVC6S
(3) Product drawing No.	:	NA19016-C351
(4) Manufacturing No.		<div style="display: flex; align-items: center;"> <div style="text-align: center; margin-right: 10px;"> <div style="display: flex; justify-content: space-around; width: 100px;"> 5900001 </div> <div style="display: flex; justify-content: space-around; width: 100px;"> <div style="text-align: center;">↑</div> <div style="text-align: center;">↑</div> <div style="text-align: center;">↑</div> </div> </div> <div> <p>(Example)</p> <p>Last digit of manufacturing year</p> <p>manufacturing month Oct. - - - - X Nov. - - - - Y Dec. - - - - Z</p> <p>Serial No.</p> </div> </div>
(5) Revision No.	:	01A (Example)
(6) Manufactured country name	:	MADE IN JAPAN
(7) Company name	:	FUJITSU LIMITED
(8) Disposal method of cold-cathode-florescent tube		

Figure 7 Outline dimensions—Next page

