TOSHIBA

LIQUID CRYSTAL DISPLAY DIVISION

PRODUCTS INFORMATION

26cm COLOR TFT-LCD MODULE

(10.4 Type)

LTM10C273

TENTATIVE

FEATURES

(1) High Luminance, Twin CCFL Backlight
(2) Low reflection and clear 256k-colors (K=1024)
(3) Thin and light weight design.
(4) Full compatible with LTM10C209(VGA)
(5) 800×600 pixels color display
(6) Lamp replaceable structure
(7) Fast response

APPLICATIONS

(1) FA Equipment.
(2) OA Equipment.
(3) Display Terminals.
(4) Measuring Instrument.
(5) New Media Equipment.

MECHANICAL SPECIFICATIONS

Item	Specifications
Dimensional Outline(typ)	265.0(W) × 188.8(H) × 12max(D) mm
Number of Pixels	800 (W) × 600 (H) Pixels
Active Area	211.2(W) × 158.4(H) mm
Pixel Pitch	0.264(W) × 0.264(H) mm
Weight(Approx.)	(600) g
Backlight	CCFL, Side-light type (Twin Lamps)

ABSOLUTE MAXIMUM RATINGS

Item		Min.	Max.	Unit
Supply Voltage	(V_{DD})	-0.3	7.0	V
	(V_{FL})	0	2000	Vrms
FL Driving Frequency	(f_{FL})	0	100	KHz
Input signal Voltage	(V_{IN})	-0.3	VDD+0.3	V
Operating Temperature		0	50	℃
Storage Temperature		-20	60	℃
Storage Humidity (Max. Wet bulb temp. = 39℃)		10	90	%RH

ELECTRICAL SPECIFICATIONS (Ta=25℃)

Item		Min.	Typ.	Max.	Unit	Remarks
Supply Voltage	(V_{DD})	4.75	5.0	5.25	V	
	(V_{FL})	(500)	(550)	(600)	Vrms	(I_{FL}=6mA)
FL Start Voltage(Ta=0℃)		1500	–	–	Vrms	
High Level Input Voltage	(V_{IH})	3.5	–	VDD	V	
Low Level Input Voltage	(V_{IL})	0	–	1.5	V	
Current Consumption	*1) (I_{DD})	–	(155)	–	mA	
	(I_{FL})	(3.0)	(6.0)	(7.0)	mArms	
*1, *2) Power Consumption		–	(7.4)	–	W	

*1):8 Color Bars Pattern
*2):Excepting the efficiency of FL Inverter

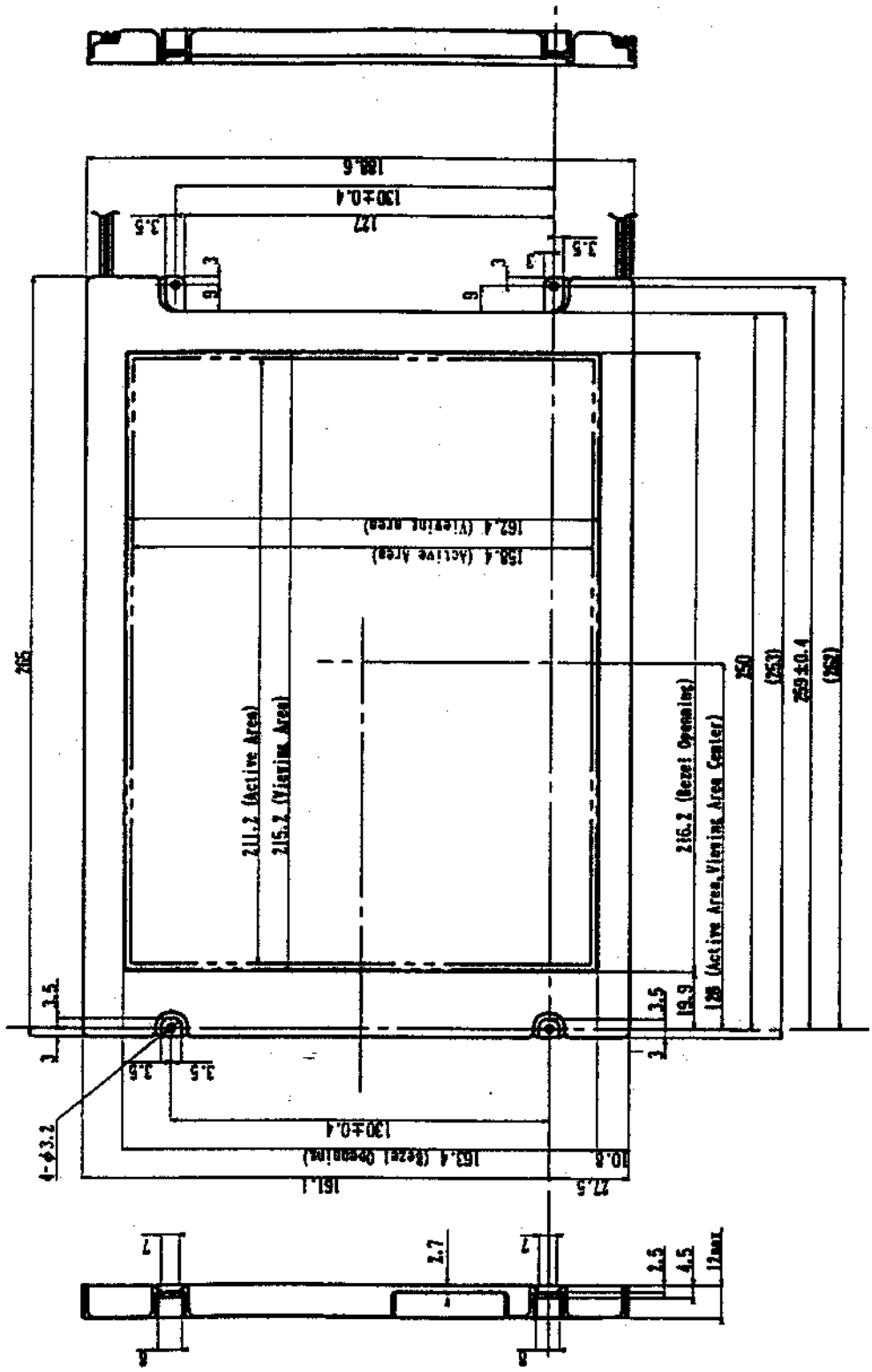
OPTICAL SPECIFICATIONS (Ta=25℃)

Item		Min.	Typ.	Max.	Unit
Contrast Ratio	(CR)	100	–	–	–
Response Time	(t_{on})	–	–	50	ms
	(t_{off})	–	–	50	ms
Luminance	(L)	–	(250)	–	cd/m²

Notice:This product information is tentative, and subject to change without prior notice. Please consult with Toshiba LCD representatives, befor start designing the system using this product.

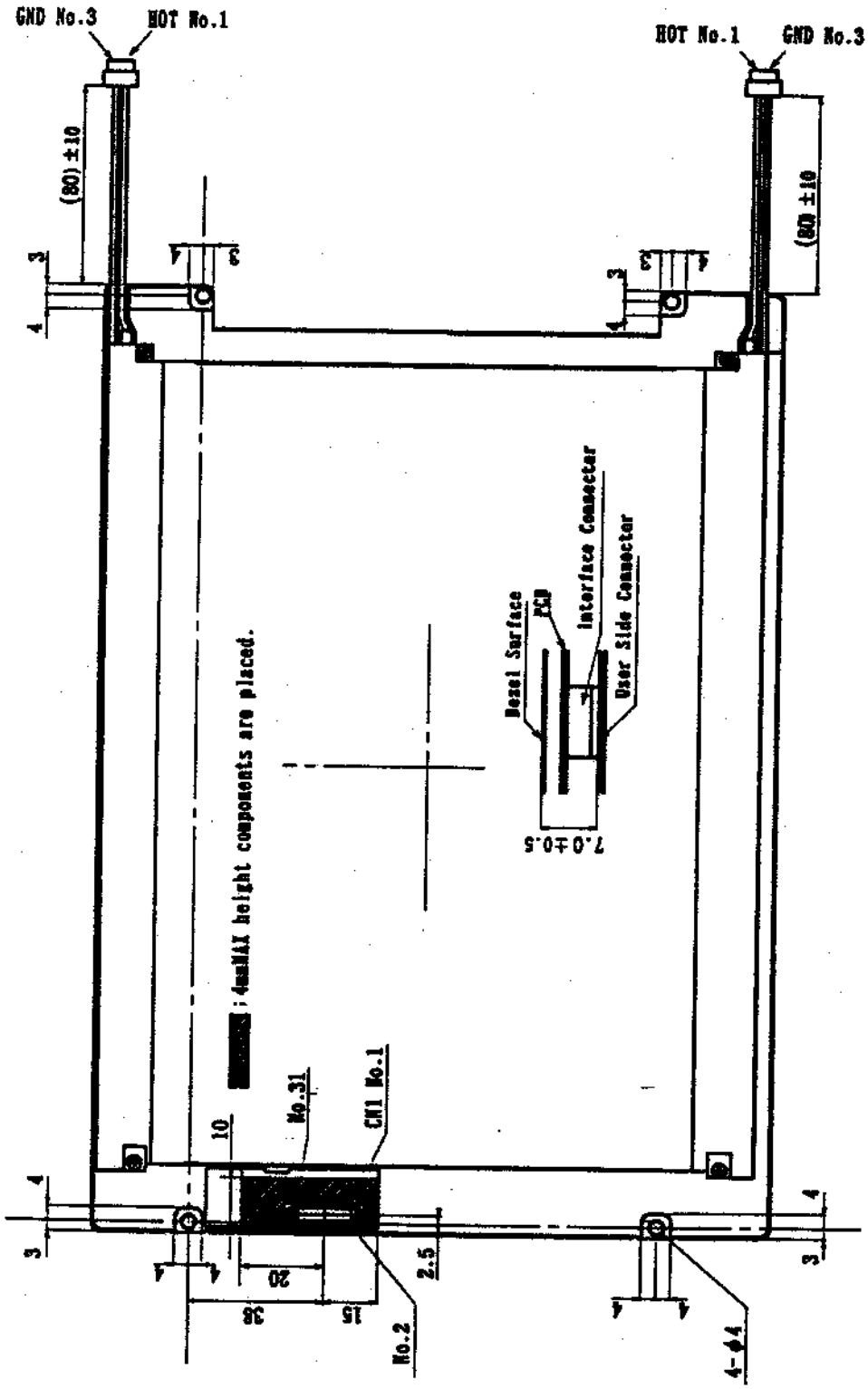
DIMENSIONAL OUTLINE (Front figure)

Unit : mm (typ)
Standard Tolerance : ± 0. 5

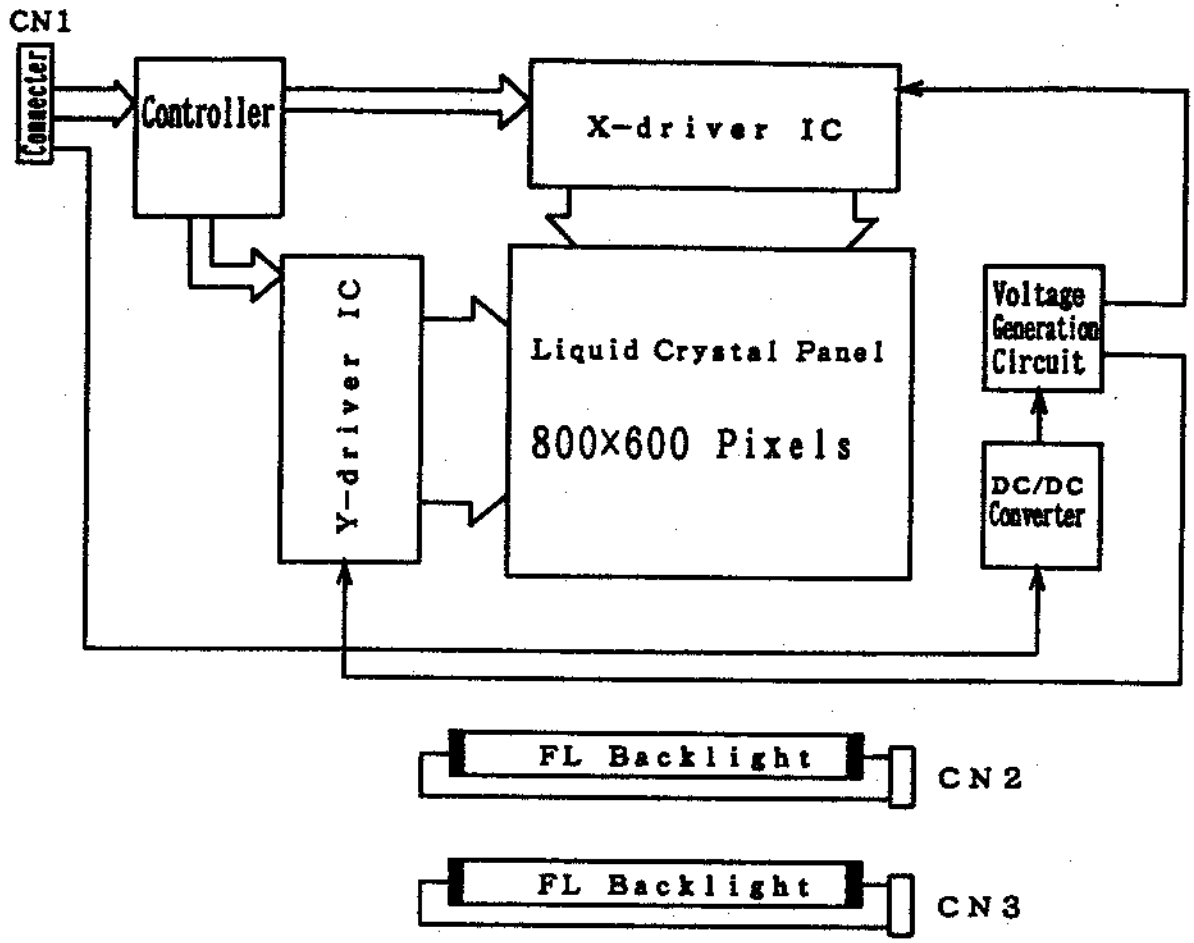


(Back figure)

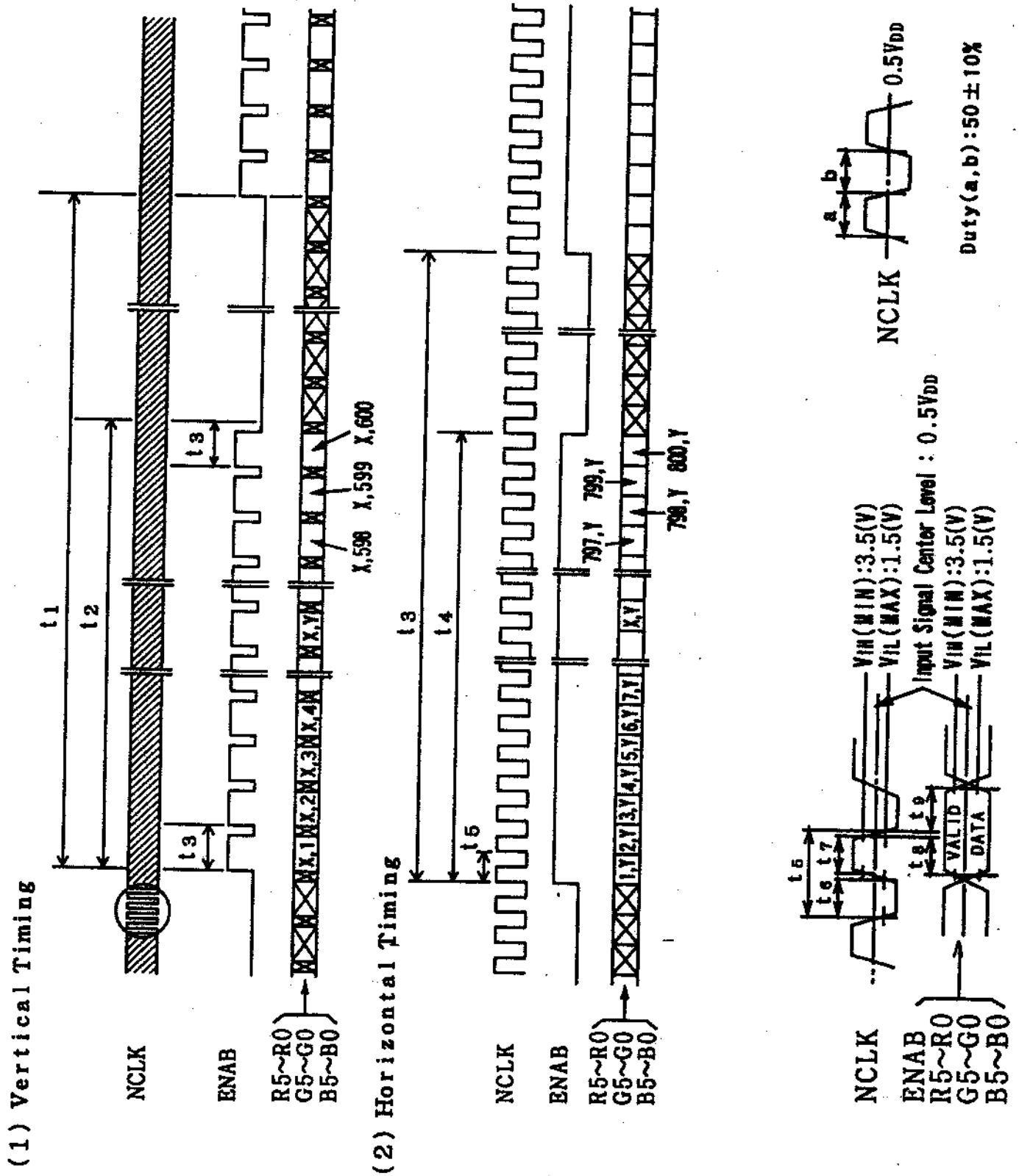
Unit : mm (typ)
Standard Tolerance : ±0.5



BLOCK DIAGRAM

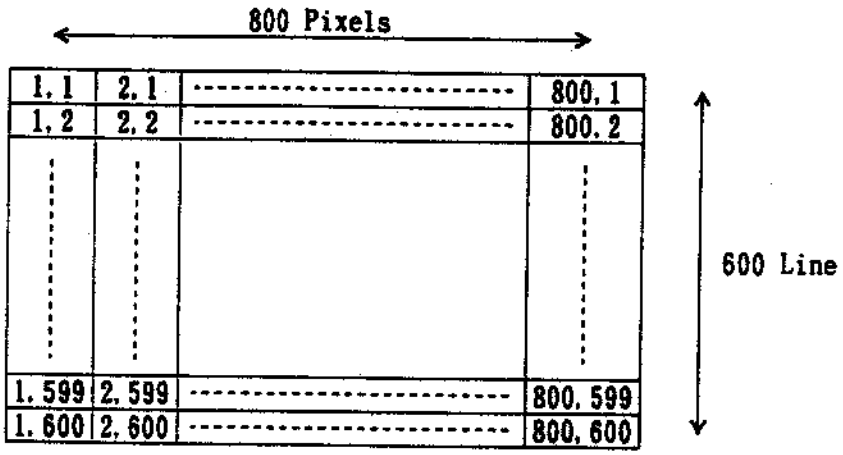


TIMING CHART



TIMING SPECIFICATION

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Frame Period	t1	604×t3 –	625×t3 17.78	628×t3 17.86	– ms	
Vertical Display Term	t2	600×t3	600×t3	600×t3	–	t2=N•t3
One Line Scanning Time	t3	844×t5 (26.4)	1024×t5 28.44	1056×t5 –	– μs	
Horizontal Display Term	t4	800×t5	800×t5	800×t5	–	
Clock Period	t5	25.0	27.78	–	ns	
Clock "L" Time	t6	9.0	–	–	ns	
Clock "H" Time	t7	9.0	–	–	ns	
Set Up Time	t8	4.0	–	–	ns	
Hold Time	t9	5.0	–	–	ns	



CONNECTOR PIN ASSIGNMENT FOR INTERFACE

CN1 INPUT SIGNAL (DF9-31P-1V/HIROSE ELECTRIC CO.,LTD.)

Terminal No.	Symbol	Function
1	GND	
2	NCLK	SAMPLING CLOCK
3	GND	
4	R0 [2]	RED DISPLAY DATA (LSB)
5	R1 [2]	RED DISPLAY DATA
6	R2 [2]	RED DISPLAY DATA
7	GND	
8	R3 [2]	RED DISPLAY DATA
9	R4 [2]	RED DISPLAY DATA
10	R5 [2]	RED DISPLAY DATA (MSB)
11	GND	
12	G0 [2]	GREEN DISPLAY DATA (LSB)
13	G1 [2]	GREEN DISPLAY DATA
14	G2 [2]	GREEN DISPLAY DATA
15	GND	
16	G3 [2]	GREEN DISPLAY DATA
17	G4 [2]	GREEN DISPLAY DATA
18	G5 [2]	GREEN DISPLAY DATA (MSB)
19	GND	
20	ENAB	COMPOUND SYNCHRONIZATION SIGNAL
21	GND	
22	B0 [2]	BLUE DISPLAY DATA (LSB)
23	B1 [2]	BLUE DISPLAY DATA
24	B2 [2]	BLUE DISPLAY DATA
25	GND	
26	B3 [2]	BLUE DISPLAY DATA
27	B4 [2]	BLUE DISPLAY DATA
28	B5 [2]	BLUE DISPLAY DATA (MSB)
29	GND	
30	VDD	+5V POWER SUPPLY
31	VDD	+5V POWER SUPPLY

CN2 CCFL POWER SOURCE (BHR-03VS-1/JAPAN SOLDERLESS TERMINAL MFG CO.,LTD.)

Terminal No.	Symbol	Function
1	VL	CCFL POWER SUPPLY (HIGH VOLTAGE)
2	NC [1]	
3	GL	CCFL POWER SUPPLY (GND SIDE)

Note 1) NC Terminal is open. (Don't use)

Note 2) 256K colors are displayed by the combinations of 18 bits data.

	Display	R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0	Gray Scale Level
Basic Color	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	–
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	–
	Green	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	–
	Light Blue	L	L	L	L	L	L	H	H	H	H	H	H	H	H	H	H	H	H	–
	Red	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	–
	Purple	H	H	H	H	H	H	L	L	L	L	L	L	H	H	H	H	H	H	–
	Yellow	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	L	L	–
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	–
Gray Scale of Red	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L 0
	Dark ↑ ↓ Light	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L 1
		L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L 2
					:						:						:			L 3～ L 60
		H	H	H	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L 61
		H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L 62
	Red	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	Red L 63
Gray Scale of Green	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L 0
	Dark ↑ ↓ Light	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L 1
		L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L 2
					:						:						:			L 3～ L 60
		L	L	L	L	L	L	H	H	H	H	L	H	L	L	L	L	L	L	L 61
		L	L	L	L	L	L	H	H	H	H	H	L	L	L	L	L	L	L	L 62
	Green	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	Green L 63
Gray Scale of Blue	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L 0
	Dark ↑ ↓ Light	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L 1
		L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L 2
					:						:						:			L 3～ L 60
		L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	L	H	L 61
		L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	L	L 62
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	Blue L 63
Gray Scale of White & Black	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L 0
	Dark ↑ ↓ Light	L	L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L 1
		L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L	L 2
					:						:						:			L 3～ L 60
		H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	H	L 61
		H	H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	L 62
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	White L 63

FOR SAFETY

LCD module is generally designed with precise parts to achieve light weight and thin mechanical dimensions.
In using our Modules, make certain that you fully understand and put into practice the warnings and safety precautions detailed in Engineering Information No. EE-N001, "CAUTIONS AND INSTRUCTIONS FOR TOSHIBA LCD MODULES".
Refer to individual specifications and TECHNICAL DATA sheets (hereinafter called "TD") for more detailed technical information.

1) SPECIAL PURPOSES
Please inform and contact Toshiba when LCD Module is used for the equipment that relates to the safety of human body or human life.

2) DISASSEMBLING OR MODIFICATION
DO NOT DISASSEMBLE OR MODIFY the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display.
Toshiba dose not warrant the module, if customer disassembled or modified it.

3) BREAKAGE OF LCD PANEL
DO NOT INGEST liquid crystal material, DO NOT INHALE this material, and DO NOT CONTACT the material with skin, if LCD panel is broken and liquid crystal material spills out.
If liquid crystal material comes into mouth or eyes, rinse mouth or eyes out with water immediately.
If this material contact with skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.

4) GLASS OF LCD PANEL
BE CAREFUL WITH CHIPS OF GRASS that may cause injuring fingers or skin, when the glass is broken.

5) ELECTRIC SHOCK
DISCONNECT POWER SUPPLY before handling LCD module.
DO NOT TOUCH the parts inside LCD module and the fluorescent lamp's connector or cables in order to prevent electric shock, because high voltage is supplied to these parts from the inverter unit while power supply is turned on.

6) ABSOLUTE MAXIMUM RATINGS AND POWER PROTECTION CIRCUIT
DO NOT EXCEED the absolute maximum rating values under the worst probable conditions caused by the supply voltage variation, input voltage variation, variation in parts' constants, environmental temperature, etc., otherwise LCD module may be damaged.
Employ protection circuit for power supply, whenever the specification or TD specifies it.
Suitable protection circuit should be applied for each system design.

7) DISPOSAL
When dispose LCD module, obey to the applicable environmental regulations.