

PRODUCT INFORMATION

FEATURES

- (1) TFT-LCD for Mobile Phone
- (2) QVGA 240(H) x 320(V) pixels
- (3) VE-Transmissive type Mode
- (4) 262,144 colors (18 bit color depth)
- (5) CPU memory bus I/F(i80:18,16,8bit)
- (6) Cell + FPC + Backlight

TENTATIVE**MECHANICAL SPECIFICATIONS**

Item	Specifications
Dimensional Outline (TYP.)	40.1(W) x 56.8(H) x 2.75(D) mm(Typ.)
Number of Pixels	240(x RGB)(W) x 320 (H) pixels
Active Area	33.84 (W) x 45.12 (H) mm
Pixel Pitch	0.141(W) x 0.141(H)
Weight (approximately)	11.7 g(Typ.)

ABSOLUTE MAXIMUM RATINGS

Item	Min.	Max.	Unit	Remarks
LED Forward Direction Current	-	25	mA	Per piece of LED
LED DC Reverse Withstand Voltage	-	5	V	Per piece of LED
LED Permissible Loss	-	100	mW	Per piece of LED
LED Peak Pulse Forward Direction Current	-	80	mA	Per piece of LED Pulse width ≤ 10ms, Duty ratio ≤ 1/10
Logic Power Supply	-0.3	4.6	V	
Operating Temperature	-20	70	°C	
Storage Temperature	-30	80	°C	
Storage Humidity (Max. wet bulb temp. = 39°C)	10	90	%(RH)	

ELECTRICAL SPECIFICATION

Item	Min.	Typ.	Max.	Unit	Remarks
Supply Voltage(VDD)	2.7	2.8	3.3	V	*1
Supply Voltage(VCI)	2.7	2.8	3.3	V	*1
LED forward Voltage	---	3.0	3.3	V	If=15mA, Per piece of LED
Current Consumption	---	6	12	mA	*1 Normal mode

*1: Final number will be specified with actual LCD samples

OPTICAL SPECIFICATION (Ta=25°C)

Item		Min.	Typ.	Max.	Unit	Remarks
Contrast Ratio (CR)		200	300	---	---	*2 Transmissive mode
Response Time	(t _{ON})	---	35	50	ms	*2
	(t _{OFF})	---	35	50	ms	*2
Luminance ^{*3}		100	160	---	cd/m ²	*2 Transmissive mode
NTSC ratio		---	52	---	%	*2 Transmissive mode
Optimum view angle		---	6 o'clock ^{*4}	---	---	

*2: Final number will be specified with actual LCD samples

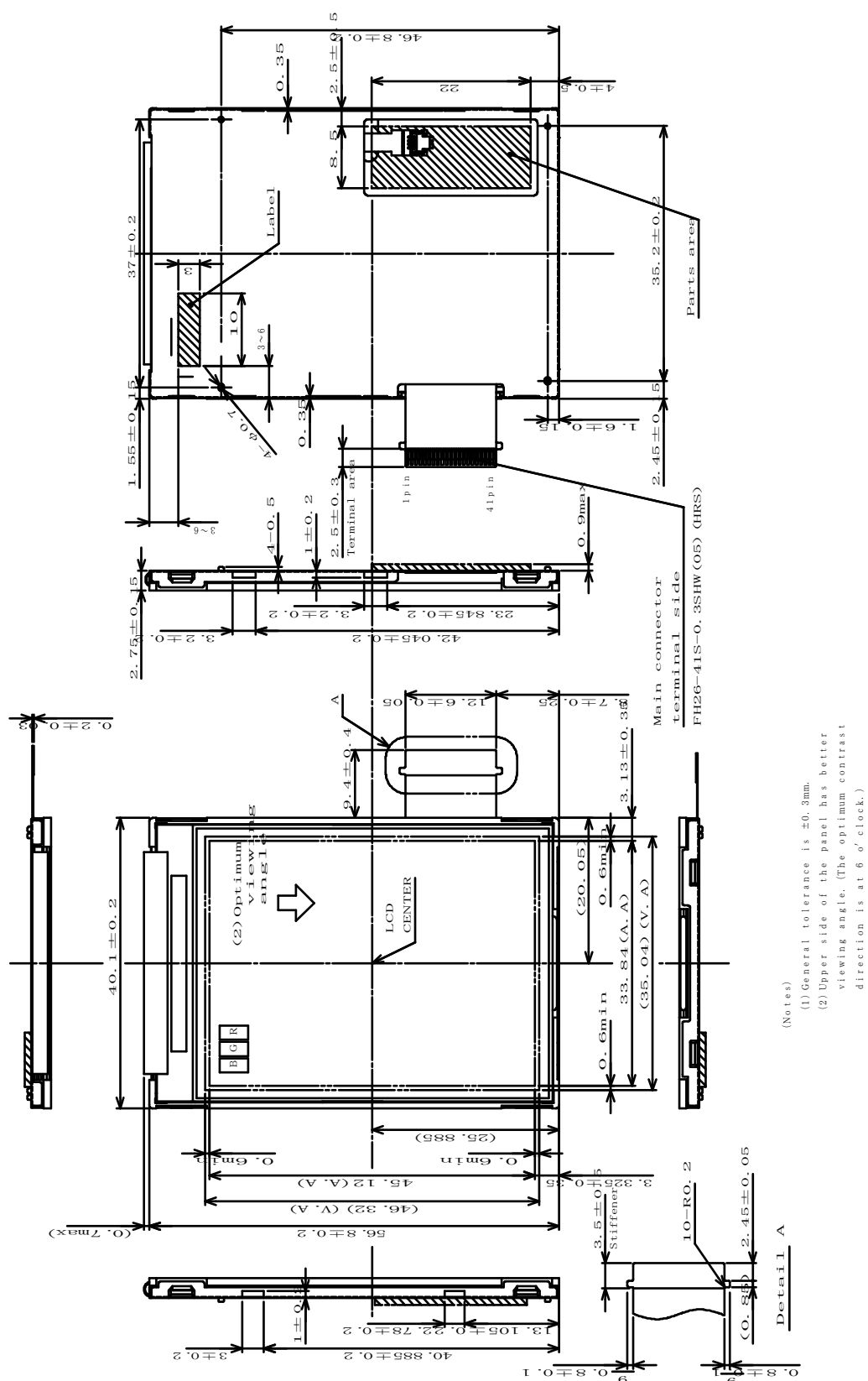
*3 : LED current=15mA × 3LED

*4: Lower side of the panel has better viewing angle. (The optimum contrast direction is at 12 o'clock.)

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*The information contained herein may be changed without prior notice. It is therefore advisable to contact Toshiba Matsushita Display Technology Co.,Ltd. before proceeding with the design of equipment incorporating this product.

<Outline dimension>



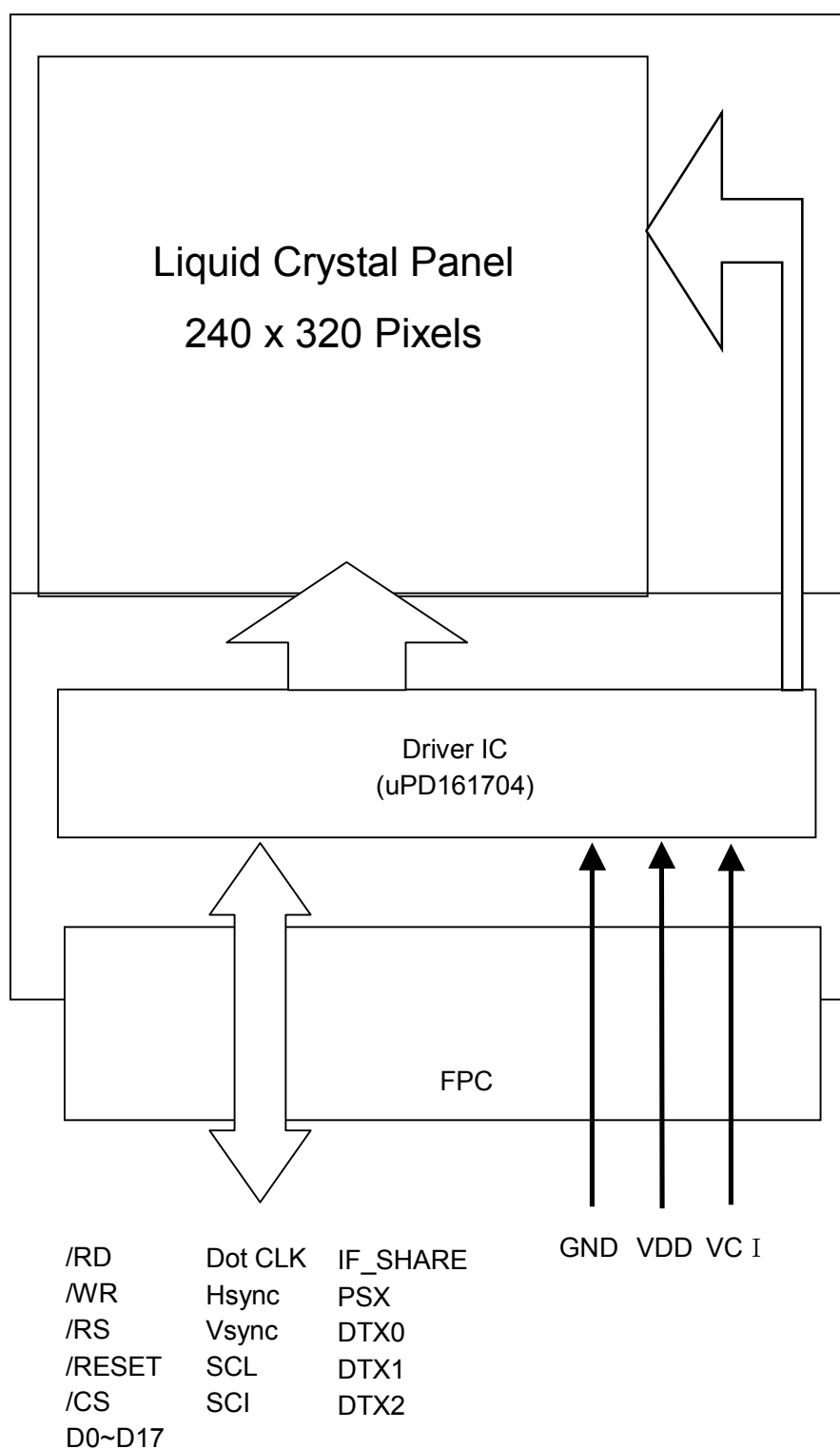
(Notes)
(1) Ger
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(1) General tolerance is ± 0.3 mm.

(2) Upper side of the panel has better viewing angle. (The optimum contrast direction is at 6 o' clock.)

Detail A

<Block diagram>

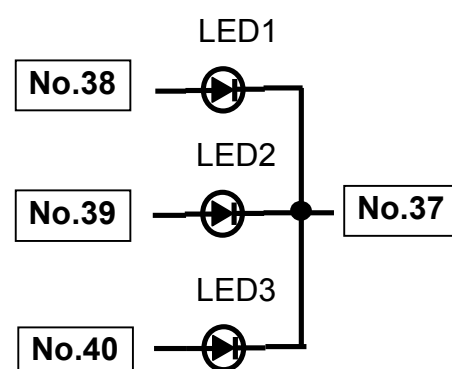


<Table of Pin Assignment (CPU I/F)>

I/F FPC

0.3mm Pitch

Pin No	Symbol	I/O	Function
1	GND	—	Ground pin
2	IF_SHARE	I	Selects the interface mode
3	VDD	—	I/O Power Supply (System I/F)
4	DTX0	I	Selects the interface mode
5	DTX1	I	Selects the interface mode
6	DTX2	I	Selects the interface mode
7	PSX	I	Selects the interface mode
8	DOTCLK	I	("L")
9	HSYNC	I	("L")
10	VSYNC	I	("L")
11	/RD	I	Read enable signal
12	/WR	I	Write enable signal
13	/RS	I	Selects data or command
14	/CS	I	Chip selection pin
15	SCL	I	Serial clock input
16	SCI	I	Serial data input
17	D17	I/O	18-bit bi-directional data bus
18	D16	I/O	18-bit bi-directional data bus
19	D15	I/O	18-bit bi-directional data bus
20	D14	I/O	18-bit bi-directional data bus
21	D13	I/O	18-bit bi-directional data bus
22	D12	I/O	18-bit bi-directional data bus
23	D11	I/O	18-bit bi-directional data bus
24	D10	I/O	18-bit bi-directional data bus
25	D9	I/O	18-bit bi-directional data bus
26	D8	I/O	18-bit bi-directional data bus
27	D7	I/O	18-bit bi-directional data bus
28	D6	I/O	18-bit bi-directional data bus
29	D5	I/O	18-bit bi-directional data bus
30	D4	I/O	18-bit bi-directional data bus
31	D3	I/O	18-bit bi-directional data bus
32	D2	I/O	18-bit bi-directional data bus
33	D1	I/O	18-bit bi-directional data bus
34	D0	I/O	18-bit bi-directional data bus
35	/RESET	I	Initializes internally ("L")
36	VCI	—	Power Supply for gate IC
37	VLED	—	LED Cathode
38	LED1	—	LED Anode1
39	LED2	—	LED Anode2
40	LED3	—	LED Anode3
41	GND	—	Ground pin



CPU Interface Mode

CPU Interface Mode	IF_SHARE	PSX	DTX0	DTX1	DTX2	D17-D16	D15-D10	D9	D8	D7-D1	D0	Mode of Tranferring 1-Pixel Data
18bit	L	L	L	L	L	D17-D16	D15-D10	D9	D8	D7-D1	D0	18bit Tranfer
16bit	L	L	H	L	L	Hi-Z	D15-D10	D9	D8	D7-D1	D0	16bit Transfer
16bit	L	L	H	H	H	Hi-Z	D15-D10	D9	D8	D7-D1	D0	Tranferring 16+2 bit two times
16bit	L	L	H	H	L	Hi-Z	D15-D10	D9	D8	D7-D1	D0	Tranferring 9+9 bit two times
16bit	L	L	H	L	H	D17-D16	D15-D10	Hi-Z	D8	D7-D1	Hi-Z	16bit Transfer
8bit	L	L	L	L	H	Hi-Z	Hi-Z	Hi-Z	Hi-Z	D7-D1	D0	Tranferring 8+8 bit two times
8bit	L	L	L	H	L	Hi-Z	Hi-Z	Hi-Z	Hi-Z	D7-D1	D0	Tranferring 6+6+6 bit three times
8bit	L	L	L	H	H	Hi-Z	Hi-Z	Hi-Z	Hi-Z	D7-D1	D0	Tranferring 8+8+2 bit three times

<Mating Connector>

FH26-41S-0.3SHW(05) (HRS)

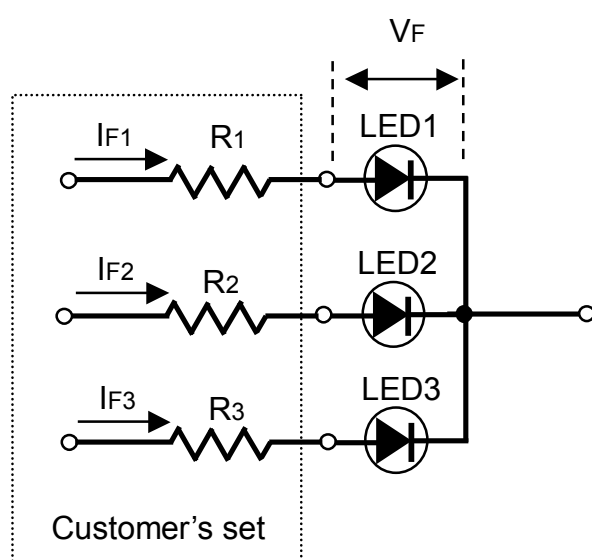
<Command/AC Timing>

Detail technical information of “command/data”, or “AC timing” can be available with following documents:

-IC specification of driver IC : uPD161704 (NEC)

<Recommended LED circuit>

If you don't have constant current circuit to drive LEDs, we recommend to put resistor for protection as the following figure.



LED Products Name (Maker): NESW008B (NICHIA)

 V_F : Forward voltage of LED(In case of I_{F1} , I_{F2} , I_{F3} = 15mA: V_F = 3.62V) I_{F1} , I_{F2} , I_{F3} : Forward current of LED R_1 , R_2 , R_3 : Resistance for Limiting current

For Safety

LCD module is generally designed with precise parts to achieve light weighted 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 MATSUSHITA DISPLAY TECHNOLOGY CO.,LTD. LCD MODULES".

Refer to individual specifications and TECHNICAL DATA sheets (hereinafter called "TD") for more detailed technical information.



Warning

1) SPECIAL PURPOSES

- a) Toshiba Matsushita Display Technology's Standard LCD modules have not been customized for operation in extreme environments or for use in applications where performance failures could be life-threatening or otherwise catastrophic.
- b) Since they have not been designed for operation in extreme environments, they must never be used in devices that will be exposed to temperatures above 50 degrees Celsius or below 0 degrees Celsius, to X-ray or Gamma-ray radiation, or to abnormally high levels of vibration or shock which exceed Toshiba Matsushita Display Technology's specification limits.
- c) In addition, since Toshiba Matsushita Display Technology's Standard LCD modules have not been designed for use in applications where performance failures could be life-threatening or catastrophic, they must never be installed in aircraft navigation control systems (such as, but not limited to Traffic Collision Avoidance System and Air Traffic Indicator), in military defense or weapons systems, in critical industrial process-control systems (e.g., those involved in the production of nuclear energy), or in critical medical device or patient life-support systems.



Caution

* 1) DISASSEMBLING OR MODIFICATION

DO NOT DISASSEMBLE OR MODIFY the modules.

Sensitive parts inside LCD module may be damaged, and dusts or scratches may mar the displays. Toshiba Matsushita Display Technology does not warrant the modules, if customer disassembled or modified them.

* 2) BREAKAGE OF LCD PANEL

DO NOT INGEST liquid crystal material, DO NOT INHALE this material, and DO NOT PERMIT this material to contact the skin, if glass of LCD panel is broken. If liquid crystal material contacts the skin, mouth or clothing, take the following actions immediately. In case contact to the eye or mouth, rinse with large amount of running water for more than 15 minutes. In case contact to the skin or clothing, wipe it off immediately and wash with soap and large amount of running water for more than 15 minutes. The skin or clothing may be damaged if liquid crystal material is left adhered. In case ingestion, rinse out the mouth well with water. After spewing up by drinking large amount of water, get medical treatment.

* 3) GLASS OF LCD PANEL

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

4) ABSOLUTE MAXIMUM RATINGS

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.

5) POWER PROTECTION CIRCUIT

Employ protection circuit for power supply, whenever the specification specifies it. A suitable protection circuit should be applied, based on each system design. A fuse is not fitted to this module. Therefore, without a suitable power-supply protection device, dust or partial circuit failure may cause overheating and/or burning, which may lead to injury.

6) DISPOSAL

Always comply with all applicable environmental regulations, when disposing of the LCD.

7) EDGES OF PARTS

Be careful with edges of glass parts, it may cause injuring.

For designing the system, give special consideration that the wiring and parts do not touch those edges.

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<Revision History>

Date	Rev	Page (New)	Item	Old	New	Reason
2005-07-27	0.1					
2005-08-31	0.2	P1	Supply Voltage(VDD)	Min:1.7, Typ: -, Max:3.1	Min:2.7, Typ:2.8, Max:2.9	Correction
		P1	OPTICAL SPECIFICATION	Min. Typ. Max.	Min. Typ. Max.	
			Contrast	TBD (200)	200 300	
			Response Time (Ton)	- (50)	35 50	
			(Toff)	- (50)	35 50	
			Luminance	TBD (160)	100 160	
			NTSC ratio	(52)	52	
		P2	Outline dimension	-	-	
2005-10-21	0.3	P1	Weight	TBD(Typ)	11.7g(Typ)	Add
			Supply Voltage(VDD)	3.1V(Max)	2.9V(Max)	
			Current Consumption	TBD(Typ)	6mA(Typ)	Add
				TBD(Max)	10mA(Max)	
		P5	CPU interface mode			Add
2005-11-07	0.4	P1	Current Consumption	10mA(Max)	12mA(Max)	Typo

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