Target Specification

HITACHI

LIQUID CRYSTAL DISPLAY MODULE
TECHNICAL DATA

MZTX06A

(NOTES)

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3. GENERAL DATA

(1) Part Name	MZTX06A
(2) Module Dimensions	40.1(W)mm x 56.8(H)mm x 2.55(t)mm (Including electronic components)
(3) Active Area Dimensions	33.84(W)mm x 45.12(H)mm
(4) Pixel Pitch	0.141(W)mm x 0.141(H)mm
(5) Resolution	240 x 3(R,G,B)(W) x 320(H) dots
(6) Color Pixel Arrangement	RGB Vertical Stripe
(7) Display Mode	Transmissive Type, Normally Black Mode, In-Plane Switching(IPS) Mode
(8) Number of Colors	65K
(9) Viewing Direction	-
(10) Back Light	Light Emitting Diode (LED), Three LEDs are parallel connection Back light current : 20mA/1LED (typ)
(11) Weight	TBD
(12) Power Supply Voltage	Vci=3.3V (typ)
(13) Interface I/O power supply (Note (1))	VcclO=1.8V to Vci (1.8V ≤ VcclO ≤ Vci) The same voltage as "H" level of a customer's interface signal must be supplied to VcclO.
(14) LCD Driver IC	BD663474 (Source, Gate and Power IC)
(15) Interface	System inte8-bit/16-bit CPU-I/F (80-System)

Note (1) VcclO is reference voltage for adjusting I/O signal level of BD663474.
VcclO voltage must be determined according to the customer's system.

4. ABSOLUTE MAXIMUM RATINGS

4. 1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS OF LCD

VSS=0V Ta=25 deg C

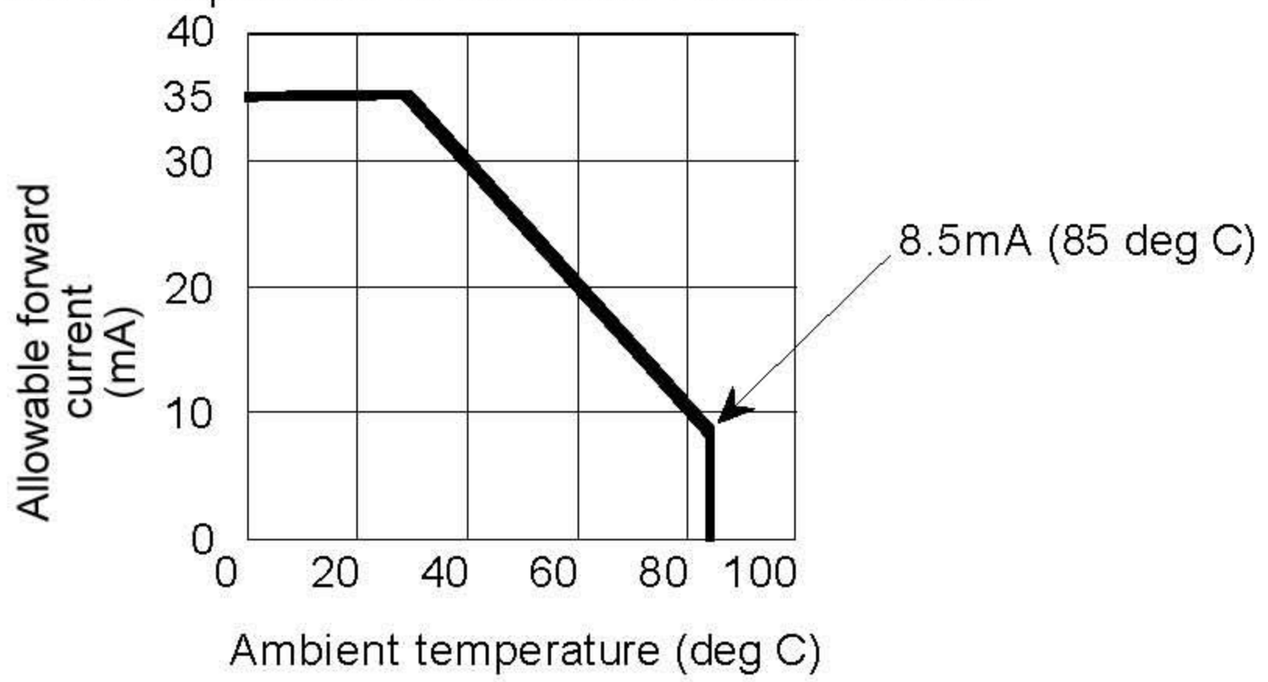
ITEM	SYMBOL	MIN	MAX	UNIT	REMARKS
Power Supply for Interface	VcclO	-0.3	4.0	V	(1), (5)
Power Supply for Logic and Analog	Vci	-0.3	4.0	V	(1)
Input Voltage	Vi	-0.3	VcclO+0.3	V	(2)
Input Current	Ii	0	100	mA	
LED Reverse Voltage	VR	-	5	V	
LED Forward Current	ILED	-	Note (3)	mA	per LED
Static Electricity	-	-	(+/-2)	kV	(4)

Notes

(1) Keep this condition ; Voltage ≥ GND

(2) Applies to the RESET, CS*, SCL, SDI, ENABLE, DOTCLK, HSYNC, VSYNC, ID and DB17-0 pins

(3) Ambient Temperature vs. Allowable Forward Current



(4) 100pF-1.5K ohm/ 25 deg C-70%RH.
Static electricity discharge point is the center of LCD surface.

(5) VcclO ≤ Vci

4. 2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		COMMENT
	MIN	MAX	MIN	MAX	
Ambient Temperature	-20 deg C	70 deg C	-30 deg C	80 deg C	Note 2
Humidity	Note 1		Note 1		No dew condensation
Corrosive Gas	Not Acceptable		Not Acceptable		

Note 1 Ta≤40 deg C : 85%RH max.
Ta>40 deg C : Absolute humidity must be lower than the humidity of 85%RH at 40 deg C.

Note 2 Background color changes slightly depending on ambient temperature.
This phenomenon is reversible.

5. ELECTRICAL CHARACTERISTICS

LCD Module

Ta=25 deg C

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Power Supply Voltage for Logic and Analog	Vci	-	2.7	3.3	3.6	V
Power Supply Voltage for I/O interface	VcclO	-	1.75	-	Vci	V
Input Voltage for Logic Circuits (Note 1)	Vi	"H" level	0.85xVcclO	-	VcclO	V
		"L" level	-0.3	-	0.15xVcclO	
Output Voltage for Logic Circuits	Vo	"H" level	0.75xVcclO	-	-	V
		"L" level	-	-	0.2xVcclO	
Input/Output Leak Current (Note 2)	ILi	-	(-1.0)	-	(1.0)	uA
Power Supply Current (Note 3) (Note 4)	IDD	All White	-	TBD	TBD	mA
		8-color partial	-	TBD	TBD	
		Deep Standby	-	TBD	TBD	uA
Frame Frequency (Note 5)	fFLM	Normal display	-	85	-	Hz
LED Forward Voltage (Note 7)	VLED	-	-	(3.2)	3.5	V
LED Forward Current (Note 7)	ILED	-	-	20	(Note 6)	mA
LED Reverse Current (Note 7)	IR	-	-	-	50	uA

(Note 1) Applies to the RESET, CS*, **RS, WR, RD and DB15-0 pins**

(Note 2) Excepted the current of out driving MOS.

(Note 3) Driving conditions

All White (normal display): Vci=VcclO=2.8V, fFLM=TBD, Frame Reversed AC Drive mode.

8-color partial: Vci=VcclO=2.8V, fFLM=TBD, Frame Reversed AC Drive mode.

(Note 4) Consumption current depends on the conditions such as input voltage or register setting. The value may be changed after final conditions are fixed.

(Note 5) Flicker and ripple vary w ith frame frequency; make sure the value w ith the frame frequency of customer's operating set.

(Note 6) Refer to item 4.1

(Note 7) Per LED

6. OPTICAL CHARACTERISTICS

6.1 OPTICAL CHARACTERISTICS OF LCD (BACKLIGHT ON)

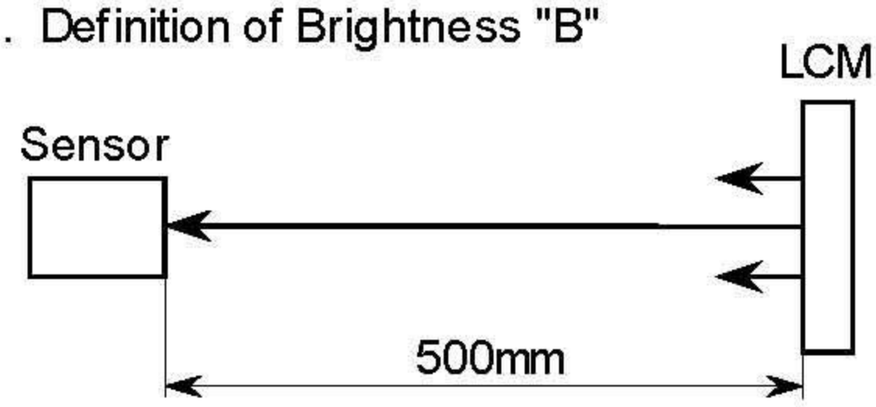
Ta=25 degrees C, Vci=VccIO=2.8V, Backlight current=80mA

ITEM		SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	NOTE
Brightness		B	f=0 deg, q=0 deg	(200)	(250)	-	cd/m^2	1)
Uniformity		-	f=0 deg, q=0 deg	(70)	(80)	-	%	2),4)
Viewing angle		f1+f2	q=0 deg, K≥10	-	(170)	-	deg	3),5),6)
			q=90 deg, K≥10	-	(170)	-		
Contrast ratio		K	f=0 deg, q=0 deg	(200)	(300)	-	-	5)
Response time (rise+fall)		tr+tf	f=0 deg, q=0 deg Ta=25 deg C	-	(35)	(60)	ms	7)
Color tone (Primary Color)	Red	x	f=0 deg q=0 deg	(0.57)	(0.62)	(0.67)	-	
		y		(0.30)	(0.35)	(0.40)		
	Green	x		(0.27)	(0.32)	(0.37)		
		y		(0.56)	(0.61)	(0.66)		
	Blue	x		(0.10)	(0.15)	(0.20)		
		y		(0.07)	(0.12)	(0.17)		
	White	x		(0.27)	(0.32)	(0.37)		
		y		(0.30)	(0.35)	(0.40)		

Common conditions for measurement

Measurement environment : Darkroom
Ambient temperature : Ta=25 degrees C
Sequence : Follow "8.5.2 SEQUENCE "
Power supply voltage : Vci=VccIO=2.8V
Back light current : 60mA (20mA/1LED x 3LEDs)

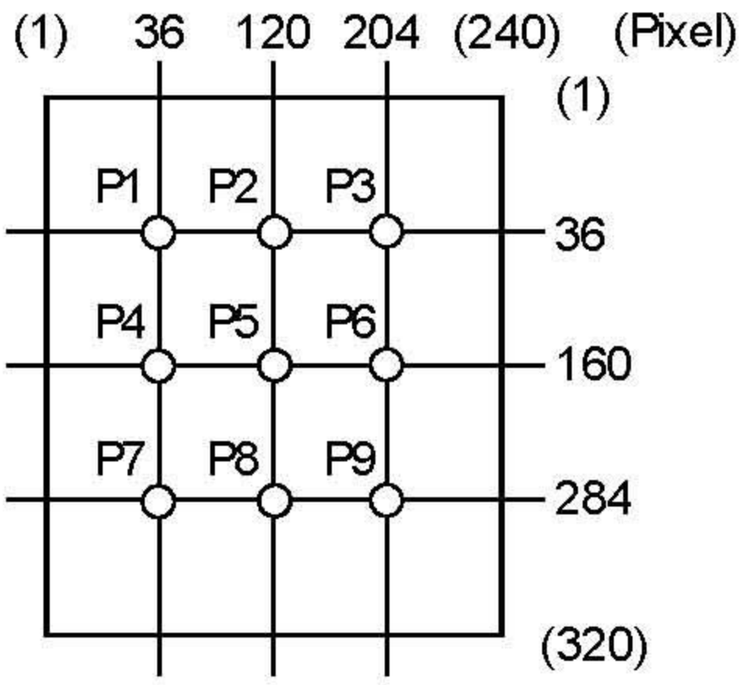
Note 1. Definition of Brightness "B"



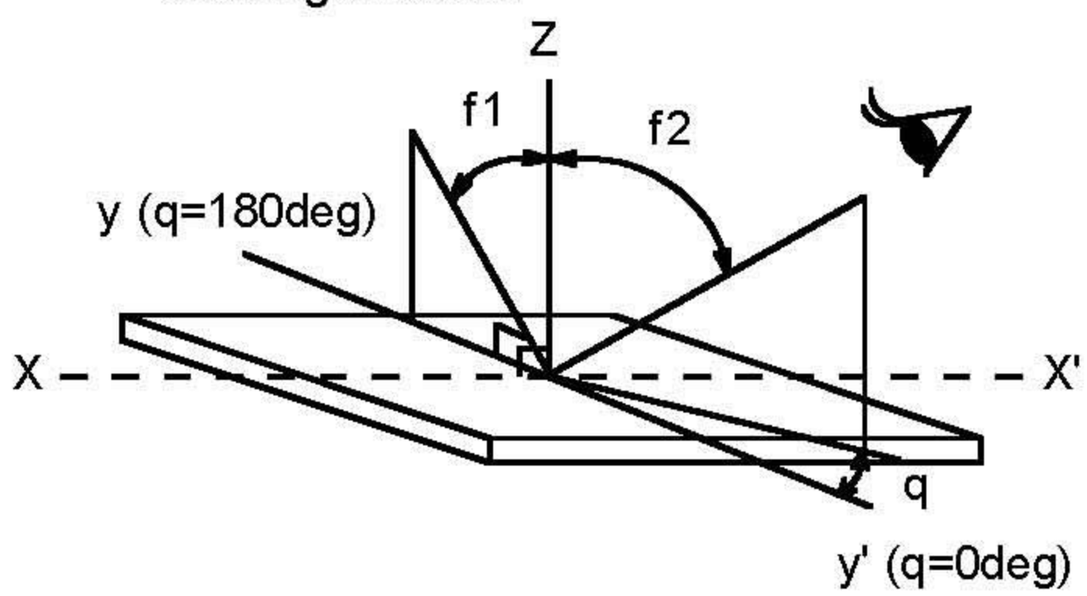
Sensor : TOPCON/BM-5A
or same level equipment

Measuring point : Center of LCD's active area

Note 2. Measuring point



Note 3. Definition of q and f



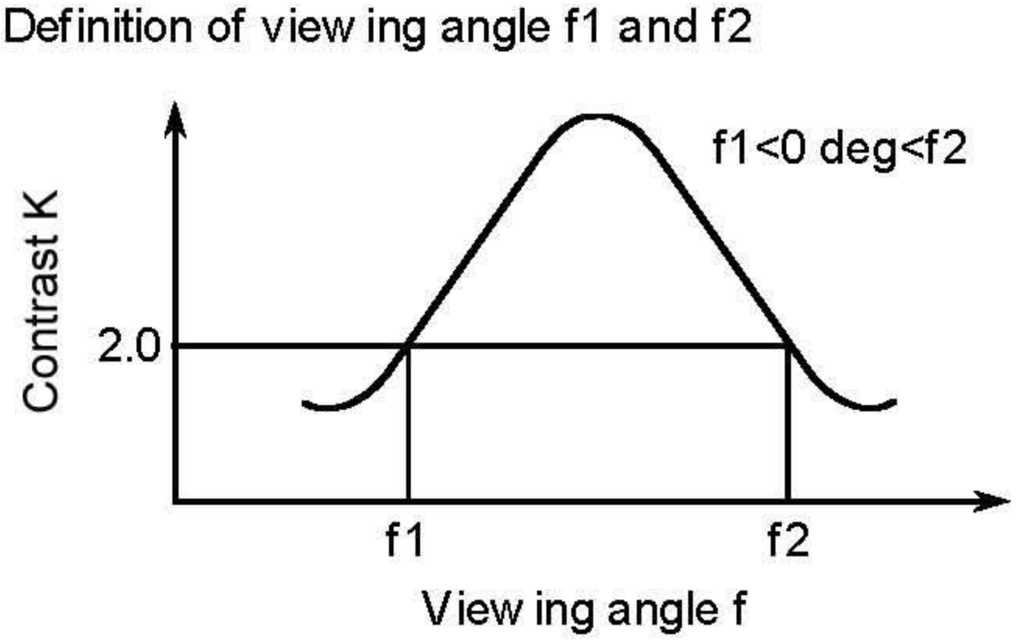
Note 4. Definition of the brightness uniformity

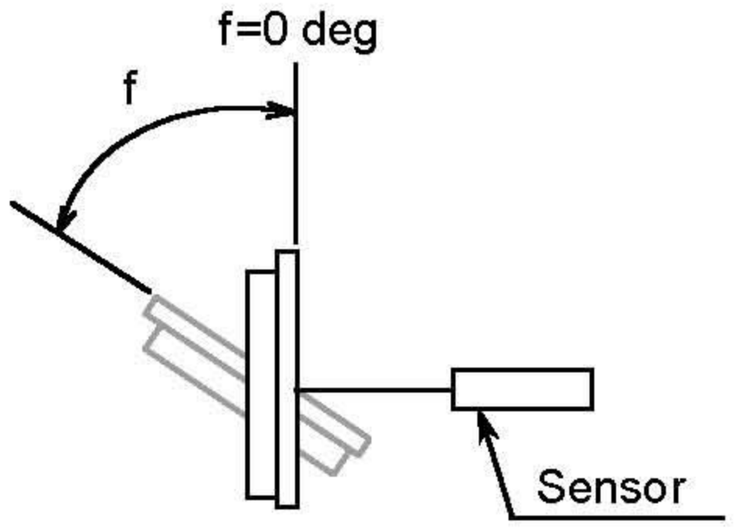
Uniformity = Brightness(min.) / Brightness(max.) x 100(%)

Note 5. Definition of Contrast "K"

$$K = \frac{\text{Brightness when displaying White raster}}{\text{Brightness when displaying Black raster}}$$

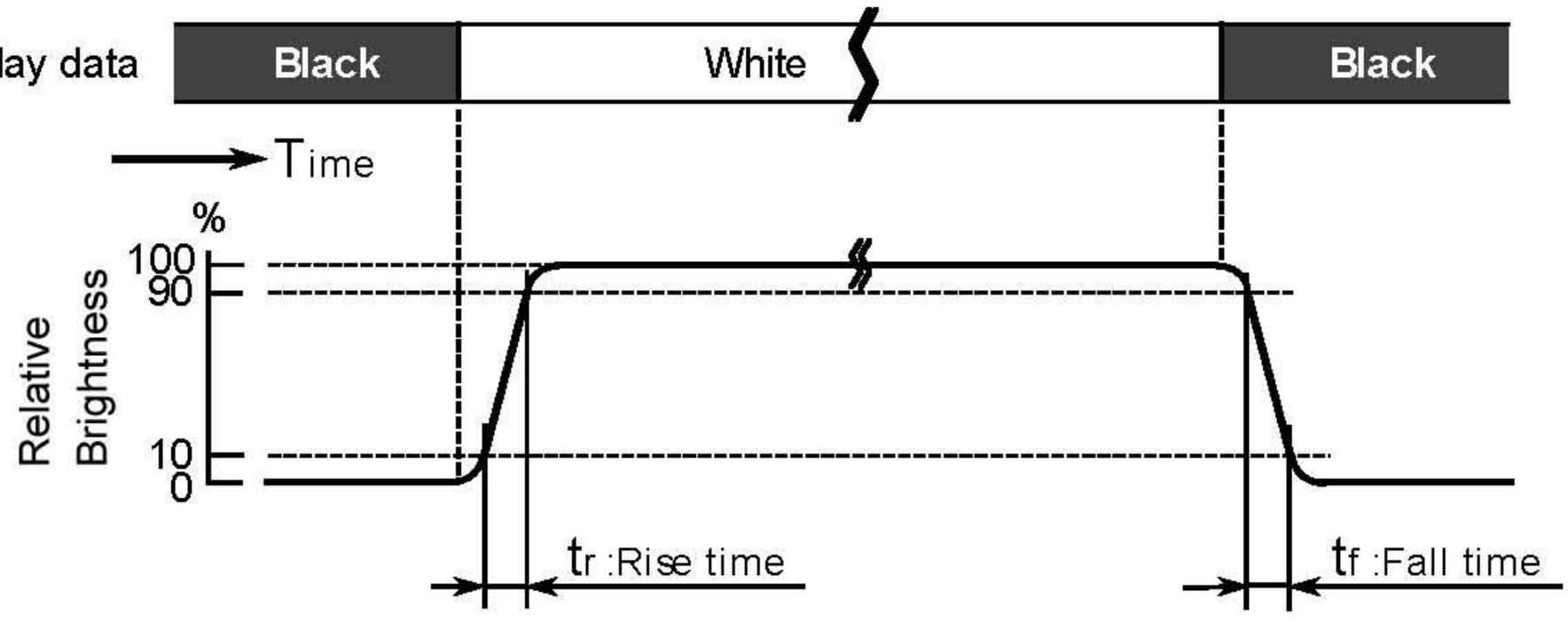
Note 6. Definition of view ing angle f1 and f2





Sensor : BM-5 or similar equipment

Note 7. Definition of optical response time



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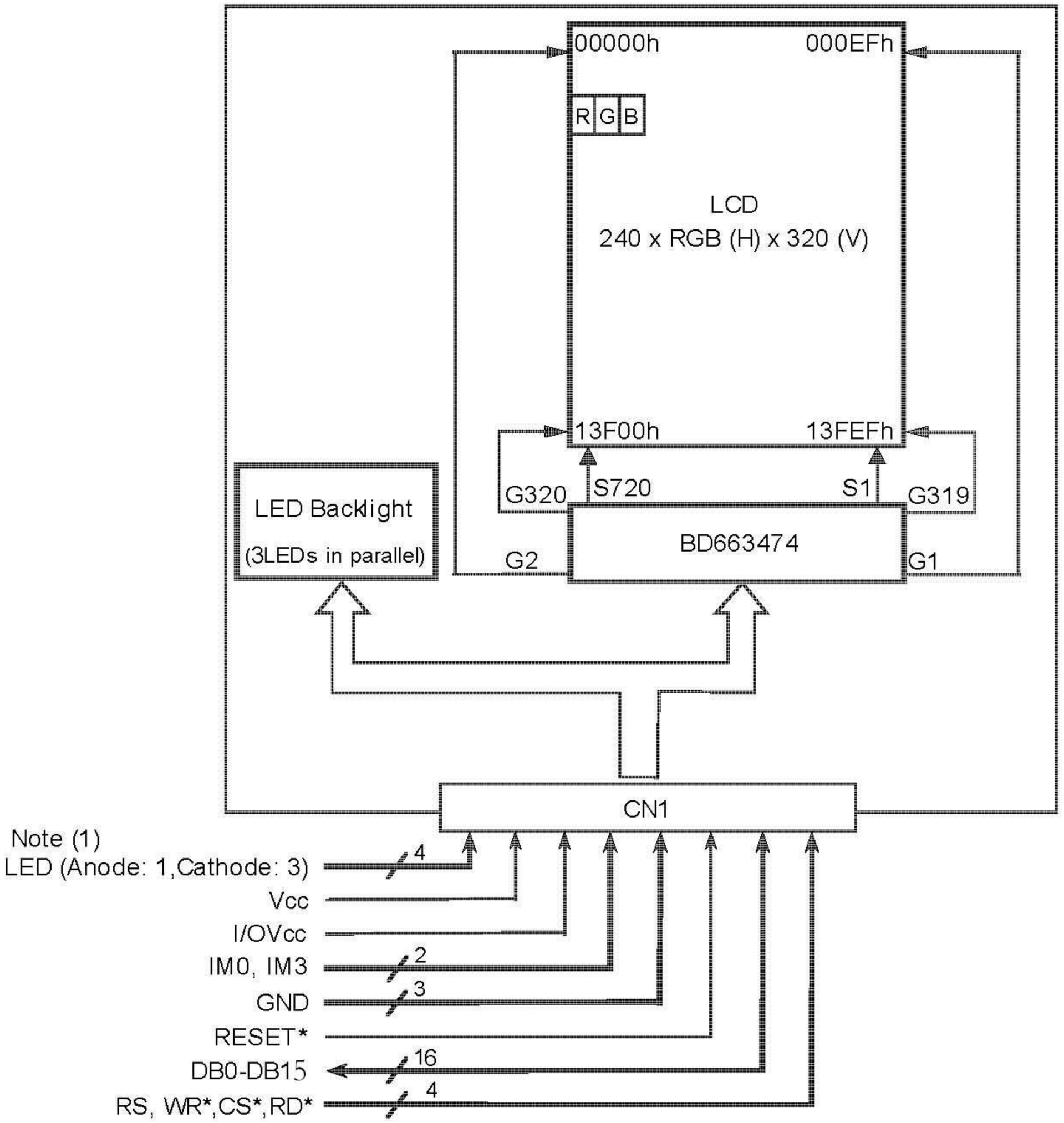
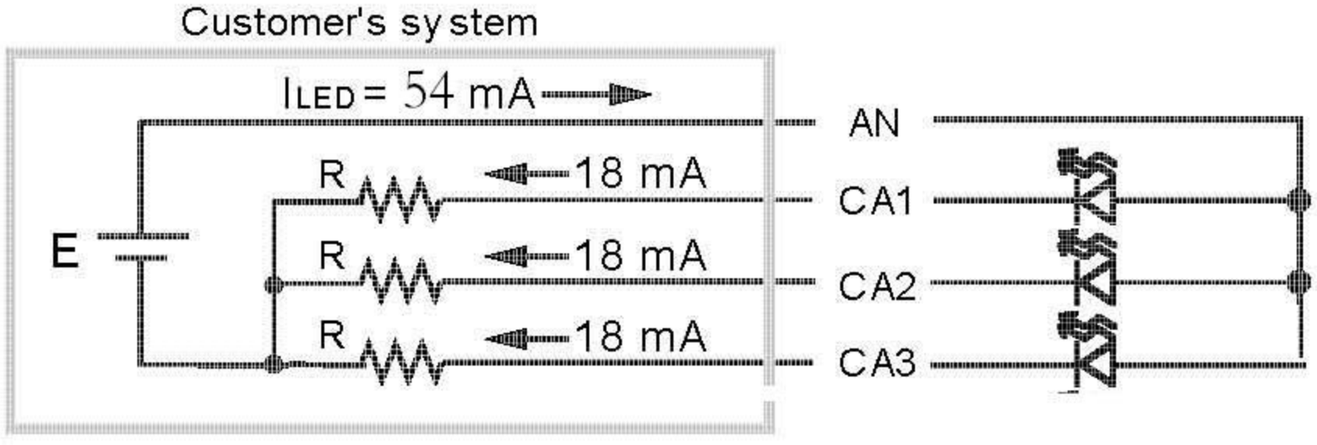
7. BLOCK DIAGRAM



Note (1) Please connect the resistor (R = 200Ω) for current control between LED (cathode) and GND in the customer's system.



<Outline dimension>