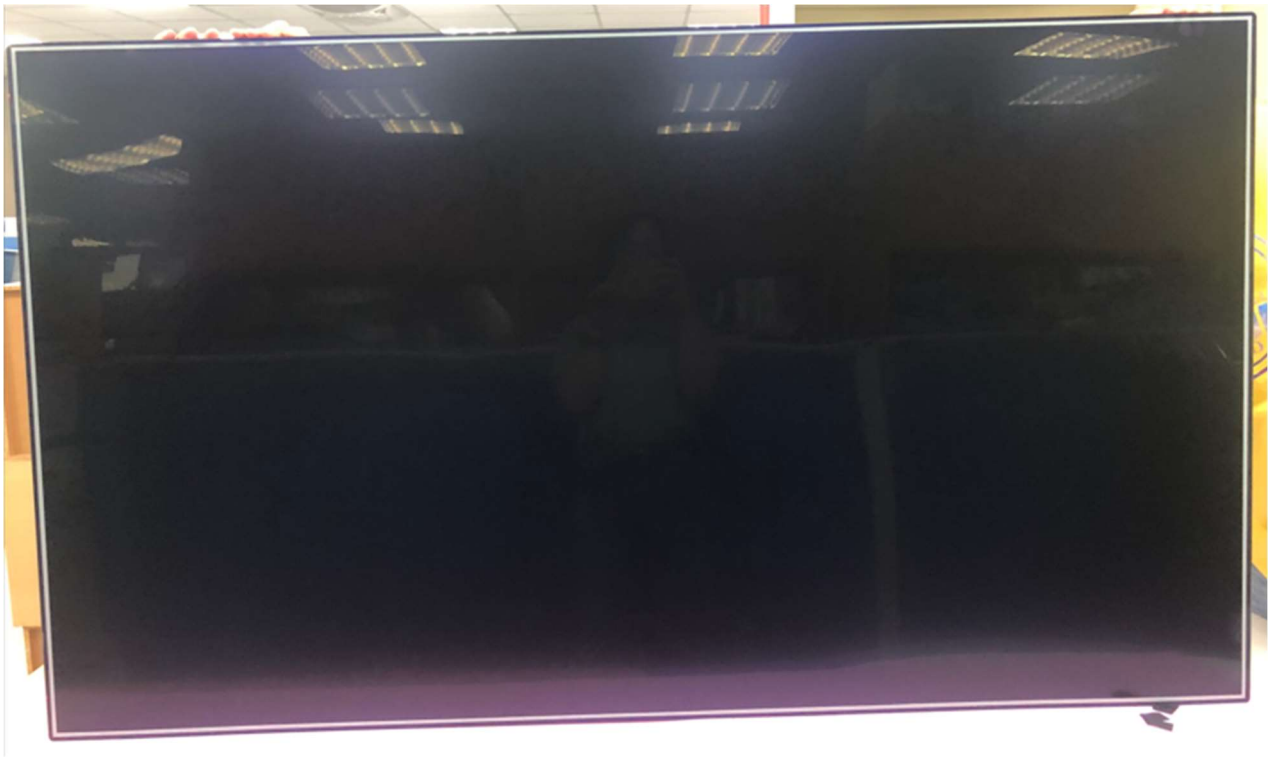



設計驗證
工程課
2024-06-27
發行
廣輝科技開發股份有限公司

Product Specification Sheet
产品规格书

Customer 客户名称	DIVA
Model Name 产品型号	CDSF550-004A
Qisda P/N Qisda 物料号	EM.6ED10.00D
Diva P/N Diva 物料号	2AAD664013T (T0206)
LCM Model LCM 型号	G550ZVN01.0
Date 日期	20240626
Version 版本	V1.5

Customer's Approval		REHEO	
Approved By	Date	Approved By	Date
Approved By	Date	Approved By	Date
Approved By	Date	Approved By	Date

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Revision History

Version	Revise Date	Page	Content	Author
V1.0	2024/03/07	-	Initial Release	June
V1.1	2024/03/14	P9	Connector Model Updated: (JAE)SJ11346-FI-RTE51SZ-HF→P-TWO 187059-5122	June
		P4	Power Consumption updated: 178.5W→157.94W	
		P6	Color Coordinates and View angle updated	
		P9	IDD: Typ 0.92A; Max 1.11A Pc: Typ 11.04W; Max 13.32W	
		P17	PDDB: Typ 146.9W; Max 170.64W Add Note 6: When PWM > 1KHz, DET Function no work.(PWM IC Limitation)	
		P5	Panel Surface Temperature: Max 65℃	
V1.2	2024/04/02	P25	Box Label Diagram Updated	June
		P26	Packing Updated	
V1.3	2024/06/03	P21	Drawing Updated Pixel Highlight Spec Update	June weilong
V1.4	2024/06/12	P21	Visual Inspection Criteria Update	weilong
V1.5	2024/06/21	P21	Visual Inspection Criteria Update (Add LCM studs control spec)	weilong

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1. General Description

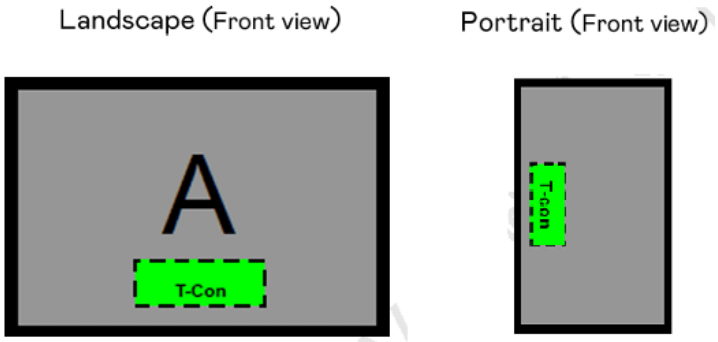
1.1 Introduction

This specification applies to a display module composed of a 55-inch Color TFT-LCD and a piece of cover glass. This LCD module has a TFT active matrix type liquid crystal panel 3840×2160 mode. Each pixel is divided into Red, Green and Blue subpixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 10-bit gray scale signal for each dot. G550ZVN01.0 has been designed to apply the 8 lane V by one interface method. It is intended to support displays where high brightness, wide viewing angle, high color saturation, and high color depth are very important.

1.2 General Information

Items	Unit	Specification	Note
Active Screen Size	inch	55	
Active Area	mm	1209.6(H)×680.4(V)	
Outline Dimension	mm	1235.6(H)×706.4(V)×61.78(D)	
Driver Element		a-Si TFT Active Matrix	
Support Color	color	8bit+FRC(1.07billion)	
Resolution	pixel	3840×2160	
Pixel Pitch	mm	0.315(H)×0.315(W)	
Display Operation Mode		Normally Black, VA	
Nominal Input Voltage VDD	V	12V	
Power Consumption	W	Total=157.94W(typ.)	
Surface Treatment		(HCLR)	
Rotate Function		Unachievable	Note 1
Display Orientation		Portrait/Landscape Enabled	Note2
Frame Rate	Hz	60	See Chapter 5.1
LED Lifetime	hours	(50K)	See Chapter 6.1

Note 1: Rotate Function refers to LCD display could be able to rotate. This function does not work in this model.
Note 2:
(1) Landscape Mode: The default placement is T-Con side on the lower side and the image is shown upright via viewing from the front.
(2) Portrait Mode: The default placement is that T-Con side has to be placed on the left side via viewing angle from the front.



2. Absolute Maximum Ratings

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit.

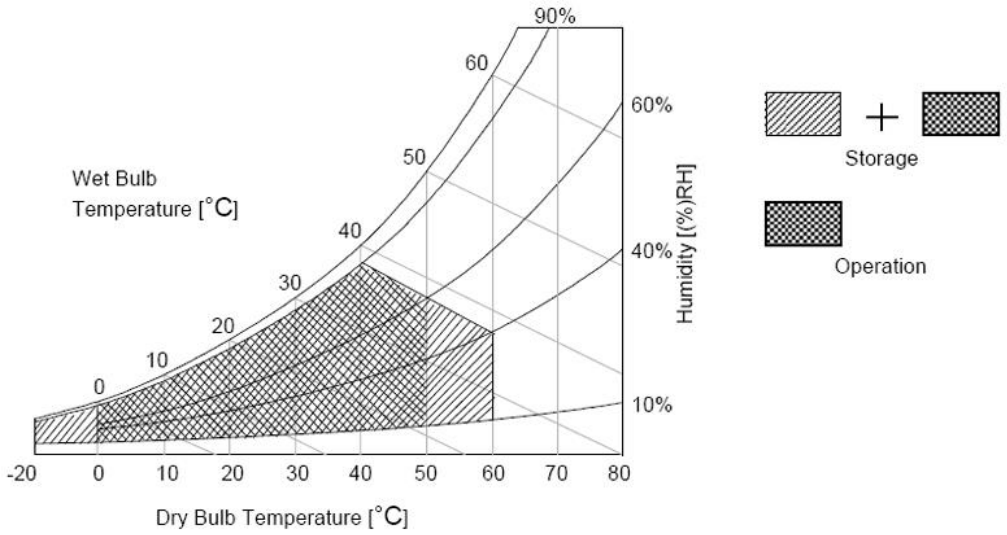
Items	Symbol	Min.	Max.	Unit	Remarks
Logic/LCD Drive Voltage	VDD	-0.3	14	V	Note 1
Input Voltage of Signal	T_{in}	-0.3	4	V	Note 1
Operating Temperature	TOP	0	+50	℃	Note 2
Operating Humidity	HOP	10	90	%RH	Note 2
Storage Temperature	TST	-20	60	℃	Note 2
Storage Humidity	HST	10	90	%RH	Note 2
Panel Surface Temperature	PST		(65)	℃	Note 3

Note1: Duration: 50ms

Note2: Maximum Wet Bulb should be 39℃ and No Condensation.

The relative humidity must not exceed 90% non-condensing at temperatures of 40 or less. At temperatures greater than 40℃,the wet bulb temperature must not exceed 39℃.

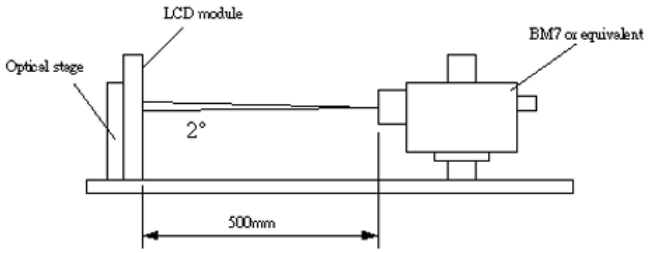
Note3: The surface temperature of any single point in active area when operating in 50℃ Dry condition.



3. Optical Characteristics

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 45 minutes in dark environment at 25℃. The value specified are at an approximate distance 500mm from the LCD surface at a viewing angle of phi and theta equal to 0°

Fig.1 Presents additional information concerning the measurement equipment and method



Parameter	Symbol	Values			Unit	Note
		Min	Typ	Max		
Contrast ratio	CR	(2100)	3000			1
Luminance(White)	L_{WH}	(650)	(800)		Nit	2
Luminance Variation	Δ_{white}(9P)			1.33		3
Response Time(G2G)	TY		8.5	16	Ms	4
Color Gamut	NTSC		72		%	
Color Coordinates						
Red	Rx	Typ-0.03	0.655	Typ +0.03		
	Ry		0.336			
Green	Gx		0.307			
	Gy		0.609			
Blue	Bx		0.147			
	By		0.063			
White	Wx		0.28			
	Wy		0.29			
View Angle(CR⩾20:1)						6
x axis, right(phi=0°)	θr		88		Degree	
x axis, left(phi=0°)	θr		88		Degree	
y axis, up(phi=90°)	θr		88		Degree	
y axis, down(phi=270°)	θr		88		Degree	

Note:

1. Contrast Ratio(CR) is defined mathematically as below:

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance of } L_{on5}}{\text{Surface Luminance of } L_{off5}}$$

2. Surface Luminance is a luminance value at point 5 across the LCD surface 50cm from the surface with all pixels displaying white. From more information see Fig 2. LED current I_F=typical value (without driver board), LED input V_{DDB}=24V, I_{DDB}=typical value (with driver board), LWH=Lon5 where Lon5 is the luminance with all pixels displaying white at center 5 location.

3. The variation in surface luminance, Δ_{white} is defined(center of screen) as below:

$$\delta WHITE(9P) = Maximum(L_{on1}, L_{on2},...,L_{on9}) / Minimum(L_{on1}, L_{on2},...L_{on9})$$

4. Response time Ty is the average time required for display transition by switching the input signal for five luminance ratio (0%,25%,50%,75%,100% brightness matrix) and is based on Frame rate=60Hz to optimize

Measured Response Time		Target				
		0%	25%	50%	75%	100%
Start	0%					
	25%	25% to 0%				
	50%	50% to 0%	50% to 25%		50% to 75%	50% to 100%
	75%	75% to 0%	75% to 25%	75% to 50%		75% to 100%
	100%	100% to 0%	100% to 25%	100% to 50%	100% to 75%	

Ty is determined by 10% to90% brightness difference of rising or falling period. (As illustrated). The response time is defined as the following figure and shall be measured by switching the input signal for “any level of gray (bright)” and “any level of gray (dark)”.

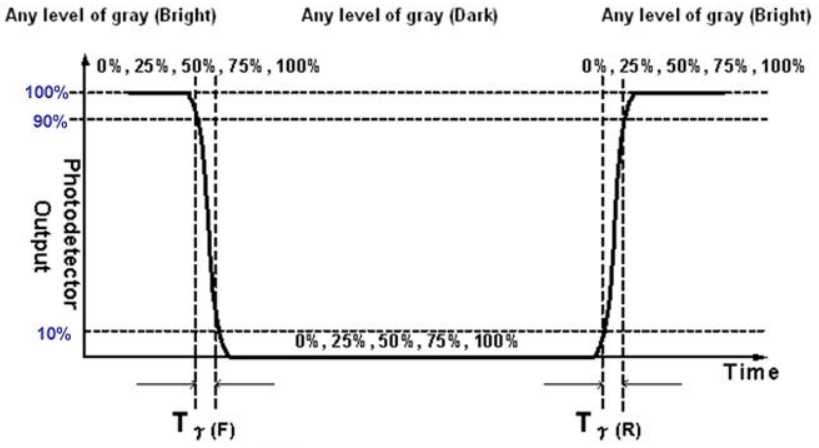
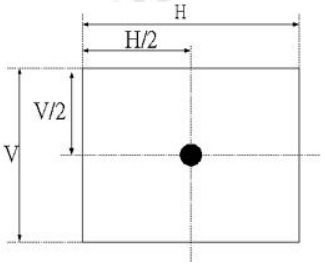
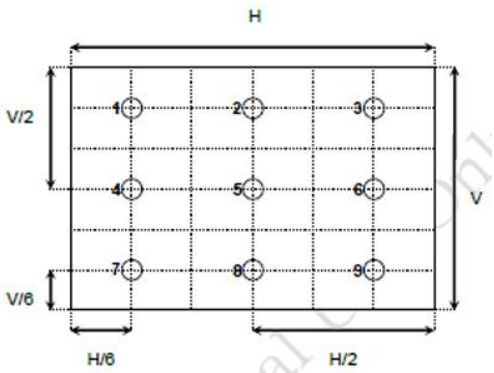


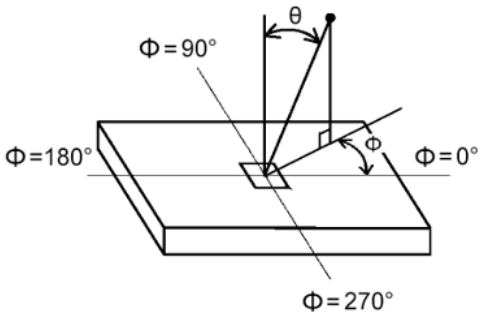
FIG. 2 Luminance





5. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information, see Fig.3.

FIG.3 Viewing Angle



6. Contrast Ratio (Specifications based on design values and measurement data for 1 piece.)

   (@viewing angle of 40°)⩾700:1

   (@viewing angle of 20°)⩾1800:1

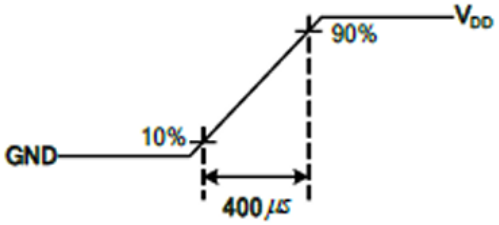
4. Interface Specification

4.1 Input Power

This module requires 1 power input (14-pin) which is employed to power the LCD electronics and to drive the TFT array and liquid crystal.

Item		Symbol	Min.	Typ.	Max	Unit	Note
Power Supply Input Voltage		V_{DD}	10.8	12	13.2	V	1
Power Supply Input Current	White pattern	I_{DD}	-	0.92	1.11	A	2
Power Consumption	White pattern	P_C	-	11.04	13.32	Watt	
Inrush Current		I_{RUSH}	--	--	5	A	3

Note 1: The ripple voltages should be fewer than 5% of V_{DD}.
Note 2: Test condition: (1) VDD=12.0V,(2) Fv=60Hz, (3Fclk=74.25MHz), (4) Temperature = 25℃
Note 3: Measurement condition: Rising time = 400us



4.2 Input Connection

LCD Connector: P-TWO 187059-5122

PIN	Symbol	Description	Note	PIN	Symbol	Description	Note
1	V_{DD}	12Vin		26	LOCKN	Vx1 LOCK	
2	V_{DD}	12Vin		27	GND	Ground	
3	V_{DD}	12Vin		28	RX0N	Vx1 lane 0	
4	V_{DD}	12Vin		29	RX0P	Vx1 lane 0	
5	V_{DD}	12Vin		30	GND	Ground	
6	V_{DD}	12Vin		31	RX1N	Vx1 lane 1	
7	V_{DD}	12Vin		32	RX1P	Vx1 lane 1	
8	V_{DD}	12Vin		33	GND	Ground	
9	N.C.	No connection	2	34	RX2N	Vx1 lane 2	
10	GND	Ground		35	RX2P	Vx1 lane 2	
11	GND	Ground		36	GND	Ground	
12	GND	Ground		37	RX3N	Vx1 lane 3	
13	GND	Ground		38	RX3P	Vx1 lane 3	
14	GND	Ground		39	GND	Ground	
15	N.C.	No connection		40	RX4N	Vx1 lane 4	
16	N.C.	No connection		41	RX4P	Vx1 lane 4	
17	N.C.	No connection	2	42	GND	Ground	
18	N.C.	No connection	2	43	RX5N	Vx1 lane 5	
19	N.C.	No connection	2	44	RX5P	Vx1 lane 5	
20	N.C.	No connection	2	45	GND	Ground	

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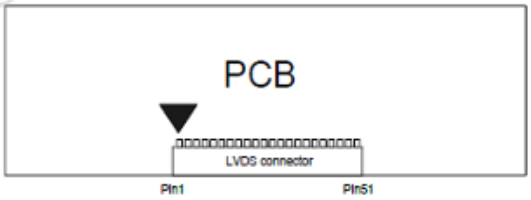
21	N.C.	No connection	2	46	RX6N	Vx1 lane 6	
22	N.C.	No connection	2	47	RX6P	Vx1 lane 6	
23	N.C.	No connection	2	48	GND	Ground	
24	GND	Ground		49	RX7N	Vx1 lane 7	
25	HTPDN	Vx1 HTPDN		50	RX7P	Vx1 lane 7	
				51	GND	Ground	

Note 1. Pin number start from the left side as shown in the following figure.



Note 2. Please leave this pin unoccupied. It cannot be connected with any signal (Low/GND/High)

4.3 Input Data Format

4.3.1 V by one Data Mapping

Mode	Packer input & Unpacker output		30bpp RGB / YcbCr444 (10bit)
4 byte mode	Byte0	D[0]	R/Cr[2]
		D[1]	R/Cr[3]
		D[2]	R/Cr[4]
		D[3]	R/Cr[5]
		D[4]	R/Cr[6]
		D[5]	R/Cr[7]
		D[6]	R/Cr[8]
		D[7]	R/Cr[9]
	Byte1	D[8]	G/Y[2]
		D[9]	G/Y[3]
		D[10]	G/Y[4]
		D[11]	G/Y[5]
		D[12]	G/Y[6]
		D[13]	G/Y[7]
		D[14]	G/Y[8]
		D[15]	G/Y[9]
	Byte2	D[16]	B/Cb[2]
		D[]17	B/Cb[3]
		D[18]	B/Cb[4]
		D[19]	B/Cb[5]
		D[20]	B/Cb[6]

		D[21]	B/Cb[7]
		D[22]	B/Cb[8]
		D[23]	B/Cb[9]
	Byte3	D[24]	--
		D[25]	--
		D[26]	B/Cb[0]
		D[27]	B/Cb[1]
		D[28]	G/Y[0]
		D[29]	G/Y[1]
		D[30]	R/Cr[0]
		D[31]	R/Cr[1]

4.3.2 Color Input Data Reference

The brightness of each primary color (Red, Green and Blue) is based on the 10-bit gray scale data input for the color: the higher the binary input, the brighter the color. The table below provides a reference for color versus data input.

Color		Input Color Data																													
		RED										GREEN										BLUE									
		MSB									LSB	MSB									LSB	MSB									LSB
		R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	G9	G8	G7	G6	G5	G4	G3	G2	G1	G0	B9	B8	B7	B6	B5	B4	B3	B2	B1	B0
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1023)	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1023)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	Blue(1023)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
R	RED(000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(001)	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	RED(1022)	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(1023)	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
G	GREEN(000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(001)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

	GREEN(1022)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
	GREEN(1023)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
B	BLUE(000)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE(001)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

	BLUE(1022)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0
	BLUE(1023)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1