AND Displays

ANDpSi06C310

6.3” XGA Color p-Si TFT LCD Module

The ANDpSi06C310 is 1024 x 768 Color TFT display that utilizes new poly-silicon (p-Si) technology to provide a brighter, thinner and lighter display with high-resolution. The p-Si TFT technology allows the row and column LCD drivers to be fabricated directly on the LCD glass. This eliminates the need for discrete TAB drivers and also reduces the thickness, weight and overall size of the display. The XGA resolution expands applications in such areas as electronics books and personal digital-picture viewers.

Features

- p-Si construction with drivers on glass
- High luminance
- Single CCFL, Sidelight type
- 202 pixels per inch - equivalent to printed materials
- Thin and lightweight design
- XGA (1024 x 768 pixels color display)
- Fast response time
- Applications: electronic books and personal digital-picture viewers

Mechanical Characteristics

Item	Specification	Unit
Outline Dimensions	151.9 (H) x 115.8 (V) x 7.9 max (D)	mm
Number of Pixels	1024 (H) x 768 (V)	pixels
Active Area	129.024 (H) x 96.768 (V)	mm
Pixel Pitch	0.126 (H) x 0.126 (V)	mm
Weight (approx.)	130	gram
Backlight	CCFL, Sidelight type (1 lamp)	–

Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit
Supply Voltage	V_{DD}	-0.3	4.0	V
	V_{FL}	0	2.0	kV(rms)
FL Driving Frequency	f_{FL}	–	100	kHz
Input Signal Voltage	V_{IN}	-0.3	V_{DD} + 0.3	V
Operating Temperature	T_{op}	0	50	°C
Storage Temperature	T_{stg}	-20	60	°C
Humidity (Max. Wet bulb temp = 29°C)	–	10	90	%(RH)

Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage (I_{FL}=2.7mA)	V_{DD}	3.0	3.3	3.6	V
	V_{FL}	(390)	(440)	(490)	V(rms)
FL Start Voltage (Ta = 0°C)	–	(1000)	–	(1400)	V(rms)
Receiver Input Voltage	–	0	–	2.4	V
Differential Input High Threshold	V_{TH}	–	–	V_{OS} +0.1	V
Differential Input Low Threshold	V_{TL}	V_{OS} - 0.1	–	–	V
Current Consumption	I_{DD}	–	(270)	–	mA
	I_{FL}	(2.0)	(2.8)	(6.0)	mA(rms)
Power Consumption (*1)	P	–	(2.1)	–	W

*1: Before the efficiency loss of CCFL inverter, I_{FL} =2.8mA

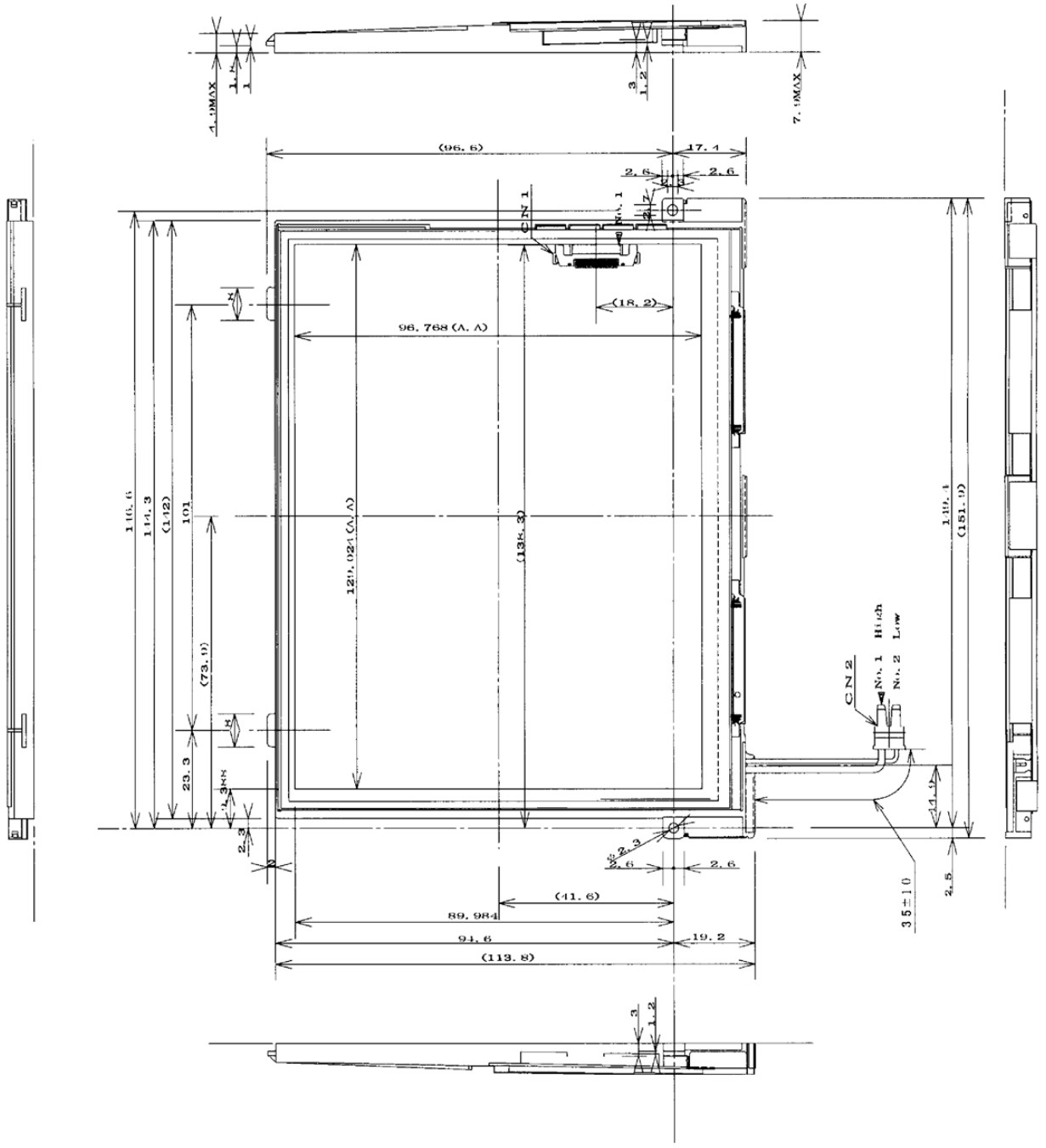
Optical Characteristics (Ta = 25°C)

Item	Symbol	Condition		Min.	Typ.	Max.	Unit
Viewing Angle	θ	CR ≥ 10	ϕ = 180°	35	–	–	deg.
			ϕ = 0°	65	–	–	
			ϕ = 90°	60	–	–	
			ϕ = -90°	60	–	–	
Contrast Ratio	CR	ϕ = 0°, θ = 0°		100	250		–
Response Time	t_{on}	ϕ = 0°, θ = 0°		–	–	50	ms
	t_{off}			–	–	50	ms
Luminance	L	ϕ = 0°, θ = 0°		–	150	–	cd/m^2
Luminance Uniformity	TUNF	ϕ = 0°, θ = 0°		55	–	–	%

Dimensional Outline

Front View

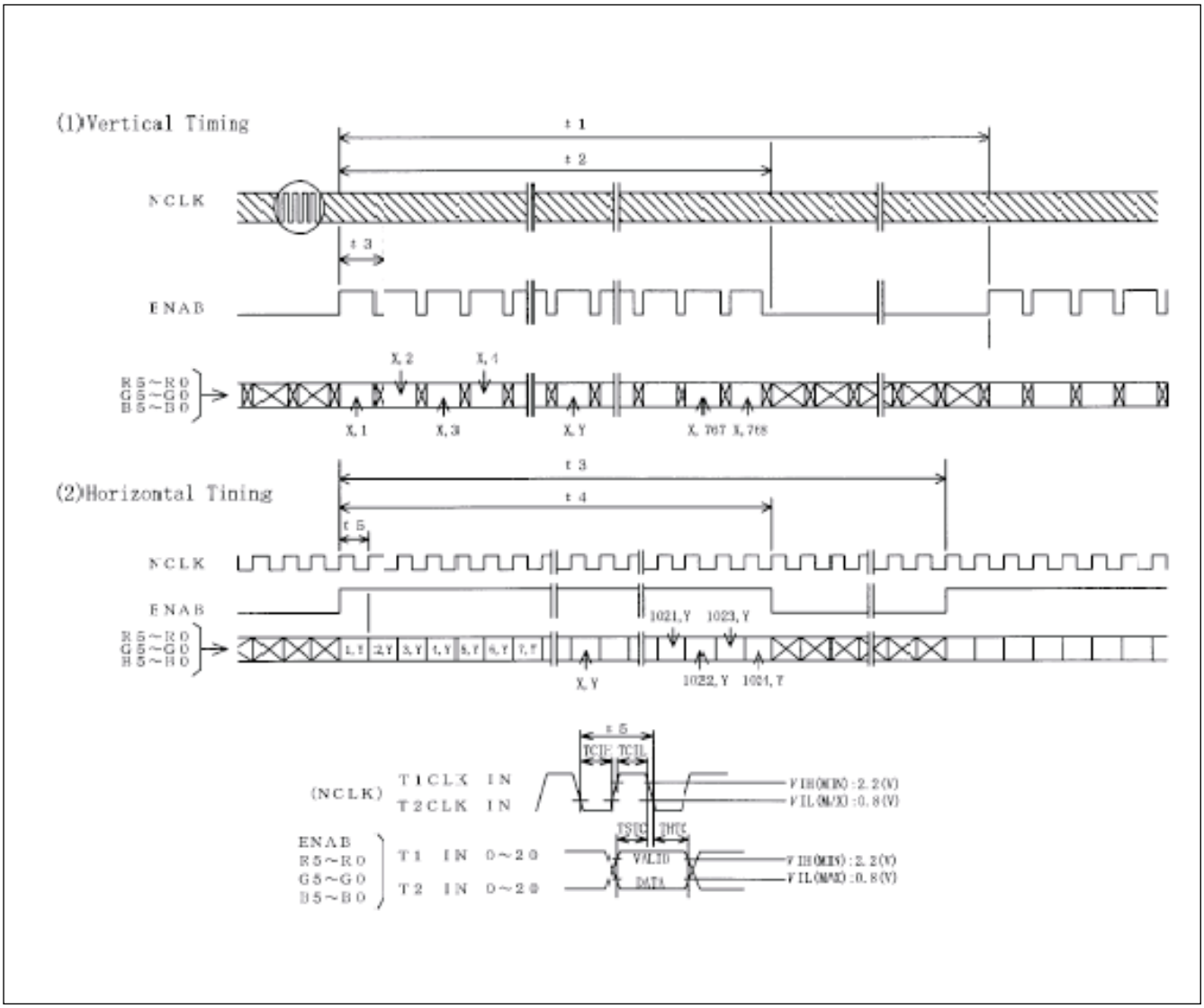
Unit: mm
Standard Tolerance: 0.5mm

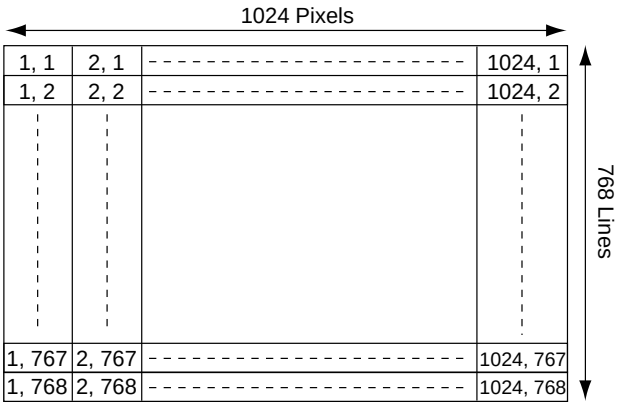


Timing Specifications

Item	Symbol	Min	Typ	Max	Unit
Frame Period	t1	778 x t3 –	806 x t3 16.67	860 x t3 17.25	– ms
Vertical Display Term	t2	768 x t3	768 x t3	768 x t3	–
One Line Scanning Time	t3	1319 x t5 20.04	1344 x t5 20.68	1462 x t5	– µs
Horizontal Display Period	t4	1024 x t5	1024 x t5	1024 x t5	–
Clock Period	t5	15.0	15.38	–	ns

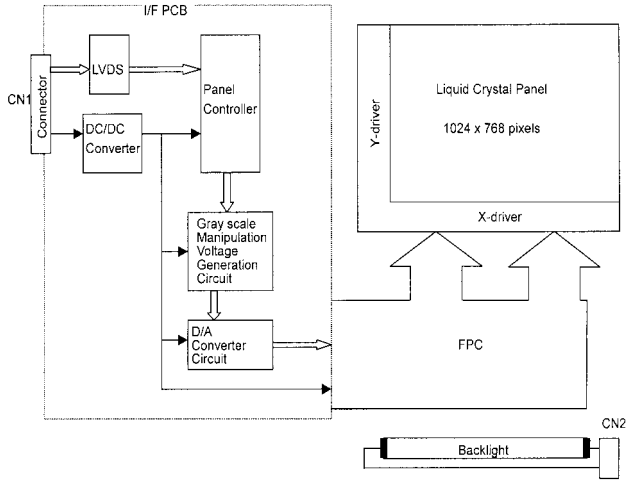
Timing Chart





Recommended Inverter:

Block Diagram



1) Drivers are fabricated on the LCD glass

2) Connectors

CN1: SL00-20L2 / KEL Corp.
Mating Connector - SL20-20S / KEL Corp.

CN2: BHSR-02VS-1/Japan Solderless Terminal Mfg. Co., Ltd
Mating Connector - SM02B-BHSS-1 / JST

Connector Pin Assignment for Interface

CN1 Input Signal (SL00-20L2/KEL Corp.)

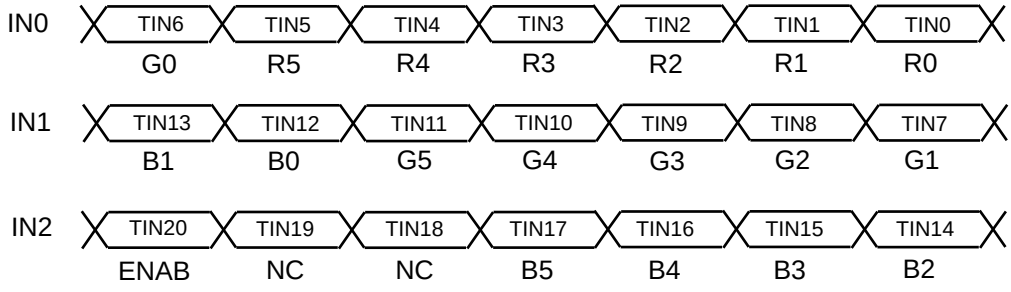
Terminal No.		Symbol	Function
1		V_{DD}	Power Supply: +3.3V
	2	V_{DD}	Power Supply: +3.3V
3		V_{DD}	Power Supply: +3.3V
	4	V_{DD}	Power Supply: +3.3V
5		GND	Ground
	6	GND	Ground
7		GND	Ground
	8	CK+	Sampling Clock (Positive: +)
9		CK-	Sampling Clock (Negative: -)
	10	GND	Ground
11		IN2+	Transmission Data of Pixels 2 (Positive: +)
	12	IN2-	Transmission Data of Pixels 2 (Negative: -)
13		GND	Ground
	14	IN1+	Transmission Data of Pixels 1 (Positive: +)
15		IN1-	Transmission Data of Pixels 1 (Negative: -)
	16	GND	Ground
17		IN0+	Transmission Data of Pixels 0 (Negative: -)
	18	IN0-	Transmission Data of Pixels 0 (Negative: -)
19		GND	Ground
	20	GND	Ground

CN2 CCFL Power Source (BHSR-02VS-1/Japan Solderless Terminal Mfg Co., Ltd.)

Terminal No.	Symbol	Function
1	VFLH	CCFL Power Supply (High Voltage)
2	VFLL	CCFL Power Supply (Low Voltage)

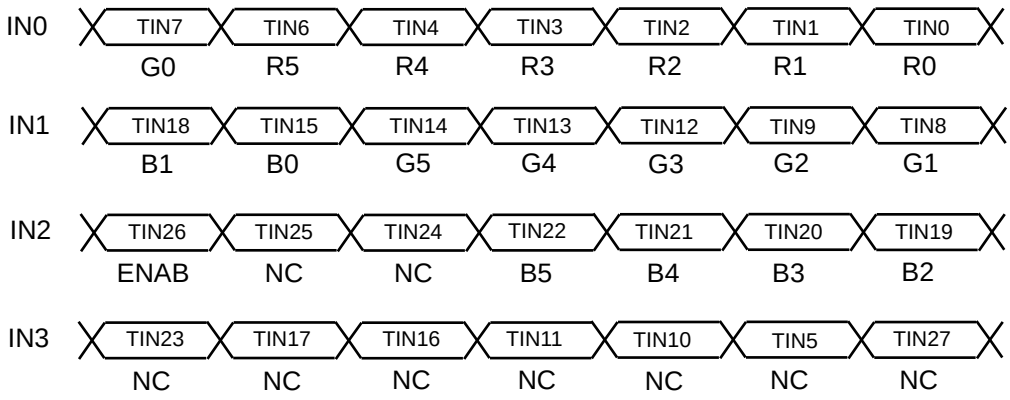
Recommended Transmitter (DS90CF363) to ANDpSiC310 Interface Assignment: 6-bit Transmitter

DS90CF363					ANDpSi06C310	
Input Terminal No.		Input Signal (Graphics controller output signal)		Output Signal Symbol	Interface (CN1)	
Symbol	DS90CF363	Symbol	Function		Terminal	Symbol
TIN0	44	R0	Red Pixels Display Data (LSB)	TOUT0- TOUT0+	No.12 No.11	IN0- IN0+
TIN1	45	R1	Red Pixels Display Data			
TIN2	47	R2	Red Pixels Display Data			
TIN3	48	R3	Red Pixels Display Data			
TIN4	1	R4	Red Pixels Display Data			
TIN5	3	R5	Red Pixels Display Data (MSB)			
TIN6	4	G0	Green Pixels Display Data (LSB)			
TIN7	6	G1	Green Pixels Display Data	TOUT0- TOUT0+	No.10 No.9	IN1- IN1+
TIN8	7	G2	Green Pixels Display Data			
TIN9	9	G3	Green Pixels Display Data			
TIN10	10	G4	Green Pixels Display Data			
TIN11	12	G5	Green Pixels Display Data (MSB)			
TIN12	13	B0	Blue Pixels Display Data (LSB)			
TIN13	15	B1	Blue Pixels Display Data			
TIN14	16	B2	Blue Pixels Display Data	TOUT0- TOUT0+	No.8 No.7	IN2- IN2+
TIN15	18	B3	Blue Pixels Display Data			
TIN16	19	B4	Blue Pixels Display Data			
TIN17	20	B5	Blue Pixels Display Data (MSB)			
TIN18	22	NC	Non Connection (open)			
TIN19	23	NC	Non Connection (open)			
TIN20	25	ENAB	Compound Synchronization Signal			
CLK IN	26	NCLK	Data Sampling Clock	TCLK OUT- TCLK OUT+	No.6 No.5	CLK IN- CLK IN+



Recommended Transmitter (DS90CF383) to ANDpSi06C310 Interface Assignment: 8-bit Transmitter

DS90CF383					ANDpSi06C310	
Input Terminal No.		Input Signal (Graphics controller output signal)		Output Signal Symbol	Interface (CN1)	
Symbol	DS90CF383	Symbol	Function		Terminal	Symbol
TIN0	51	R0	Red Pixels Display Data (LSB)	TOUT0- TOUT0+	No.12 No.11	IN0- IN0+
TIN1	52	R1	Red Pixels Display Data			
TIN2	54	R2	Red Pixels Display Data			
TIN3	55	R3	Red Pixels Display Data			
TIN4	56	R4	Red Pixels Display Data			
TIN6	3	R5	Red Pixels Display Data (MSB)			
TIN7	4	G0	Green Pixels Display Data (LSB)			
TIN8	6	G1	Green Pixels Display Data	TOUT0- TOUT0+	No.10 No.9	IN1- IN1+
TIN9	7	G2	Green Pixels Display Data			
TIN12	11	G3	Green Pixels Display Data			
TIN13	12	G4	Green Pixels Display Data			
TIN14	14	G5	Green Pixels Display Data (MSB)			
TIN15	15	B0	Blue Pixels Display Data (LSB)			
TIN18	19	B1	Blue Pixels Display Data			
TIN19	20	B2	Blue Pixels Display Data	TOUT0- TOUT0+	No.8 No.7	IN2- IN2+
TIN20	22	B3	Blue Pixels Display Data			
TIN21	23	B4	Blue Pixels Display Data			
TIN22	24	B5	Blue Pixels Display Data (MSB)			
TIN24	27	NC	Non Connection (open)			
TIN25	28	NC	Non Connection (open)			
TIN26	30	ENAB	Compound Synchronization Signal			
TIN27	50	NC	Non Connection (open)	TOUT3- TOUT3+	–	–
TIN5	2	NC	Non Connection (open)			
TIN10	8	NC	Non Connection (open)			
TIN11	10	NC	Non Connection (open)			
TIN16	16	NC	Non Connection (open)			
TIN17	18	NC	Non Connection (open)			
TIN23	25	NC	Non Connection (open)			
CLK IN	31	NCLK	Data Sampling Clock	TCLK OUT- TCLK OUT+	No.6 No.5	CLK IN- CLK IN+



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

	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	–
	Lt. 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		–
Gray Scale of Red	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L1
		L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L2
					:						:						:			L3~L60
					:						:						:			
		H	H	H	H	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L61
	Light	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L62
	Red	H	H	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	Green L63
Gray Scale of Green	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L1
		L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L2
					:						:						:			L3~L60
					:						:						:			
		L	L	L	L	L	L	H	H	H	H	L	H	L	L	L	L	L	L	L61
	Light	L	L	L	L	L	L	H	H	H	H	H	L	L	L	L	L	L	L	L62
	Green	L	L	L	L	L	L	H	H	H	H	H	H	L	L	L	L	L	L	Green L63
Gray Scale of Blue	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L1
		L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L2
					:						:						:			L3~L60
					:						:						:			
		L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	L	H	L61
	Light	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	L	L62
	Blue	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H	Blue L63
Gray Scale of White & Black	Black	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L0
	Dark	L	L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L1
		L	L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	H	L	L2
					:						:						:			L3~L60
					:						:						:			
		H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	H	L61
	Light	H	H	H	H	H	L	H	H	H	H	H	L	H	H	H	H	H	L	L62
	White	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	White L63