ANDpSiTFT10C306L-HB

10.4” XGA Color p-Si TFT LCD Module

The ANDpSiTFT10C306L-HB 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. This reduces the thickness, weight and overall size of the display. The LVDS interface allows fast data transfer for 6-bit or 8-bit operation. The single tube CCFL backlight offers a very thin, low power, and bright display that can be dimmed to save power. This makes the display ideal for portable, battery-operated applications.

Features

- p-Si construction with drivers on glass
- High luminance
- Single CCFL backlight
- 6-bit (256K) or 8-bit (16.7M)
- Thin and lightweight design
- XGA (1024 x 768 pixels color display)
- LVDS Interface (TIA/EIA-644)
- Applications: Display Terminals; Scientific, Medical, Test & Measurement Instruments; Office Automation Equipment

Mechanical Characteristics

Item	Specification	Unit
Outline Dimensions	241.5 (H) x 171.9 (V) x 5.5 max (D)	mm
Number of Pixels	1024 (H) x 768 (V)	pixels
Active Area	210.4 (H) x 157.8 (V)	mm
Pixel Pitch	0.2055 (H) x 0.2055 (V)	mm
Weight (approx.)	265	gram
Backlight	CCFL, Side-light type (1 lamp)	–

Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit
Supply Voltage	V_{DD}	-0.3	4.5	4.0 V
	V_{FL}	0	2000	Vrms
FL Driving Frequency	f_{FL}	0	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	λ 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}	–	650	–	Vrms
FL Start Voltage (Ta = 0°C)	–	1200	–	1600	Vrms
High Level Input Voltage	V_{IH}	0.8	_	V_{DD}	V
Low Level Input Voltage	V_{IL}	0	–	0.2	V
Receiver Input Voltage	–	0	–	2.4	V
Differential Input High Threshold (*2)	V_{TH}	–	–	V_{CM} +0.1	V
Differential Input Low Threshold (*2)	V_{TL}	V_{CM} -0.1	–	–	V
Current Consumption	I_{DD}	–	360	–	mA
	I_{FL}	2.0	2.5	5.0	mArms
Power Consumption (*1)	P	–	2.8	–	W

*1: Before the efficiency loss of CCFL inverter, I_{FL} =2.5mA

*2: V_{CM} = +1.2V

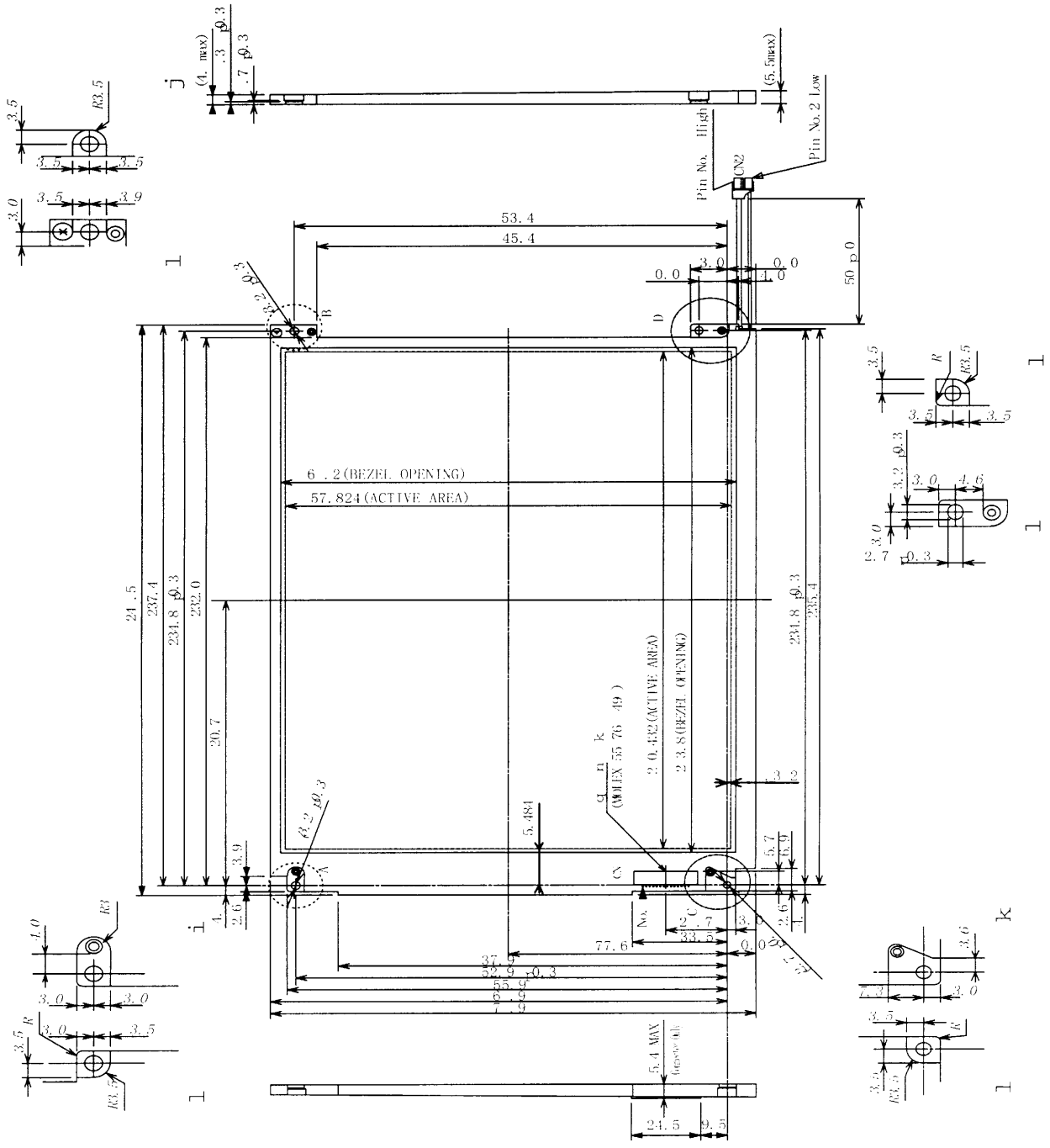
Optical Characteristics (Ta = 25˚C)

Item	Symbol	Min.	Typ.	Max.	Unit
Contrast	CR	100	250	–	–
Response	t_{on}	–	–	50	ms
	t_{off}	–	–	50	ms
Luminance (I_{FL} =2.5mA)	L	50	70	–	cd/m^2
Luminance (I_{FL} =5mA)	L	90	200	–	cd/m^2

Dimensional Outline

Front View

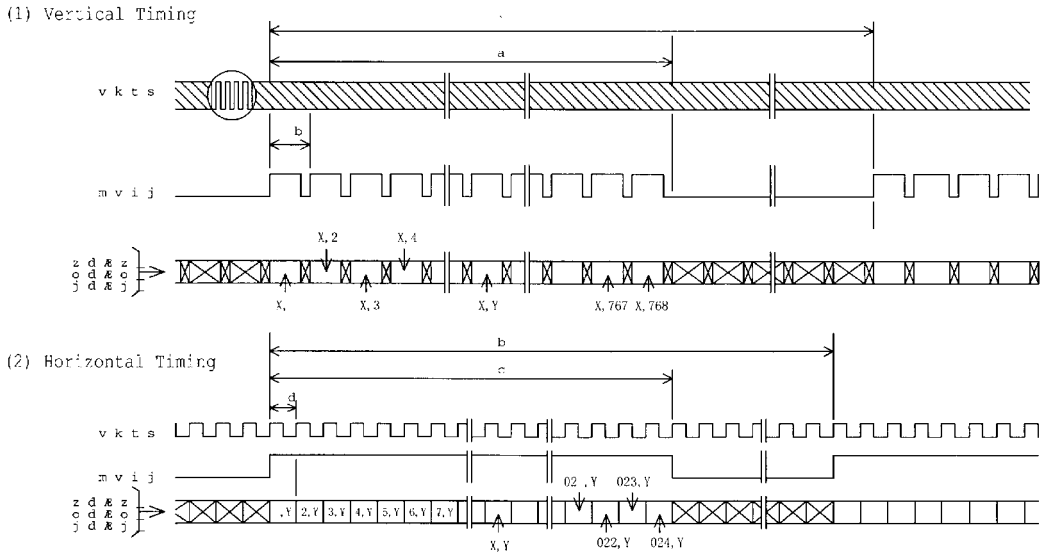
Unit: mm
Standard Tolerance: 0.5mm

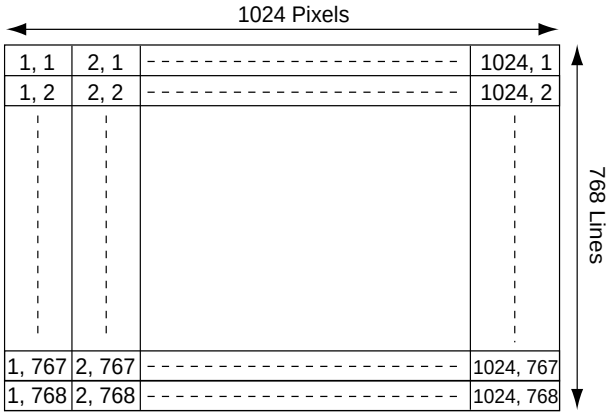


Timing Specifications

Item	Symbol	Min	Typ	Max	Unit
Frame Period	t1	778 x t3 –	806 x t3 16.67	860 x t3 17.78	– ms
Vertical Display Term	t2	768 x t3	768 x t3	768 x t3	t2 = N •t3
One Line Scanning Time	t3	1319 x t5 (19.79)	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
Clock “L” Time	t6	9.0	–	–	ns
Clock “H” Time	t7	9.0	–	–	ns
Set Up Time	t8	4.0	–	–	ns
Hold Time	t9	6.0	–	–	ns

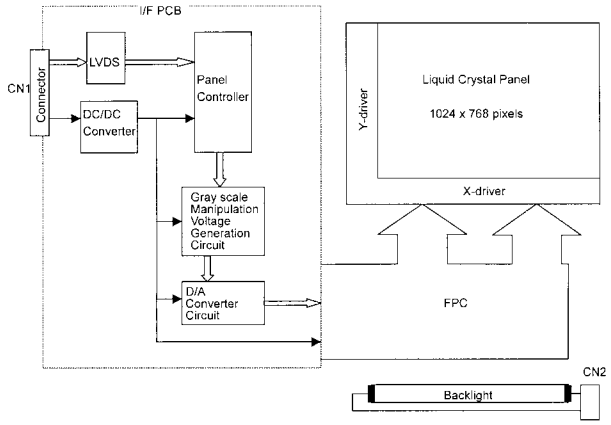
Timing Chart





Recommended Inverter:

Block Diagram



1) Drivers are fabricated on the LCD glass

2) Connectors
55176-1491/Japan Molex Co.
Mating Connector - 51146-1400/Molex

HV-25-C1C3/Japan Aviation Electronics
Mating COnnector - HV-2PHF

Connector Pin Assignment for Interface

CN1 Input Signal (1)
(SD-53885-0301/Japan Molex Co.)

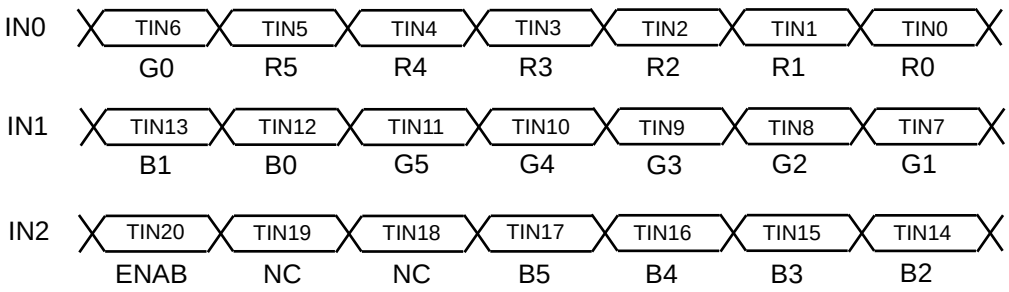
Terminal No.		Symbol	Function
1		VDD	+3.3V Power Supply
	2	GND	+3.3V Power Supply
3		GND	Ground
	4	GND	Ground
5		CK+	Sampling Clock (Positive : +)
	6	CK-	Sampling Clock (Negative : -)
7		IN2+	Trans Data of Pixels 2 (Positive : +)
	8	IN2-	Trans Data of Pixels 2 (Negative : -)
9		IN1+	Trans Data of Pixels 1 (Positive : +)
	10	IN1-	Trans Data of Pixels 1 (Negative : -)
11		IN0+	Trans Data of Pixels 0 (Positive : +)
	12	IN0-	Trans Data of Pixels 0 (Negative : -)
13		GND	Ground
	14	GND	Ground

CN2 CCFL Power Source
(HV-25-C1C3/Japan Aviation Electronics)

Terminal No.	Symbol	Function
1	V_{FLH}	CCFL Power Supply (High Voltage)
2	V_{FLL}	CCFL Power Supply (Low Voltage)

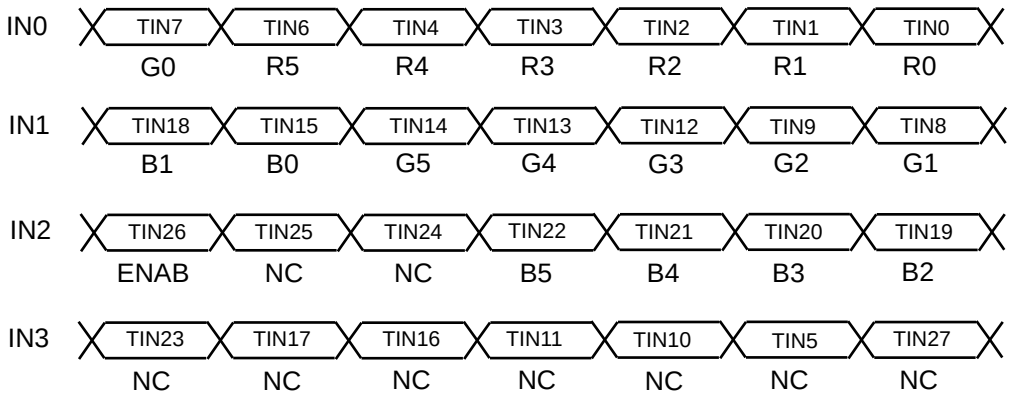
Recommended Transmitter (DS90CF363) to AND10C306L Interface Assignment: 6-bit Transmitter

DS90CF363					AND10C306L	
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 AND10C306L Interface Assignment: 6-bit Transmitter

DS90CF363					AND10C306L	
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