

**LPH-14918-09****LED PRINTHEAD**

1. Description

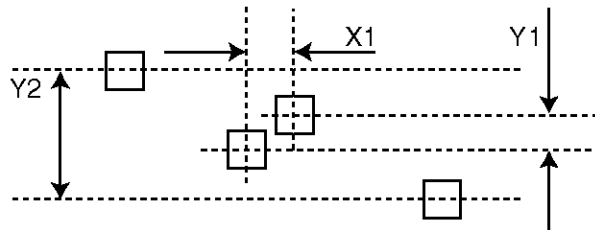
LPH-14918-09 is a printing head for optical printer using one-line LED array of 14464 dots.

It has 128 bit Driver ICs which consist of shift register, latch, strobe and output driver.

It has an effective printing width of 918.4 mm, a resolution of 400 dot/inch and can perform high-speed and high reliable printing.

2. Mechanical Characteristics (refer to Fig. LPH14918090-00010-AA) (Ta=25°C)

No.	Item	Ratings
(1)	Array Length	918.4 mm \pm 0.5 mm
(2)	Number of Emitters	14464 dots
(3)	Emitter Size	35 μ m X 40 μ m \pm 5(with stripe electrode)
(4)	Emitter Pitch	63.5 μ m
(5)	Pitch Error (X1)	\pm 20 μ m (chip to chip) \pm 5 μ m (inside a chip)
(6)	Emitter Y-Direction Error (Y1)	Max. 20 μ m (chip to chip)
	Emitter Linearity (Y2)	Max. 200 μ m (along LED chips)
(7)	1st dot Distance from Origin Point	X2=33.3 \pm 0.3mm Y2=0 \pm 0.2mm Z=1.4 \pm 0.2mm
(8)	Head Dimensions	1015(L) X 38(W) X 38(H)
(9)	Head Weight	T.B.D.



3. Optical Characteristics (Ta=25°C, SLA-20 TC18.0)

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Wavelength	λ_p	665	665	675	nm	
Average Light Output	IO	0.5	—	—	$\mu\text{W}/\text{dot}$	* 1
Uniformity1	ID	—	—	22.5	%	* 2
Uniformity2	IR	—	—	10	%	* 3
MTF		40	—	—	%	* 4, 1 on / 1 off

* 1 Power meter AQ-2105B (ANDO electric co., Ltd.)

* 2 $ID = ((I_{\text{max}} - I_{\text{min}}) / (I_{\text{max}} + I_{\text{min}})) \times 100 \%$

* 3 $IR = ((I_{\text{ave}}(n) - I_{\text{ave}}(n-1)) / I_{\text{ave}}(n-1)) \times 100 \%$

* 4 $MTF = ((a-b) / (a+b)) \times 100 \%$ (at Drum Surface)

4. Electrical Characteristics

4-1 Electrical Circuit

Item	Summary
(1) Equivalent Circuit	Refer to LHP14918090-00020-AA
(2) Timing Chart(Pixel Level)	Refer to LHP14918090-00030-AA
(3) Data Transfer Method	8 inputs serial transfer (ODD / EVEN)
(4) Clock Frequency	Max. 15 MHz
(5) Interface (Pin Assignment)	Refer to LPH14918090-00020-AA

4-2 Absolute Maximum Ratings

Item	Sym	Conditions	Min	Typ	Max	Unit	Remarks
Supply Voltage	V _{DD}	Ta=25°C	- 0.3	—	6.5	V	
Input Voltage	V _I	Ta=25°C	- 0.3	—	V _{DD} +0.3	V	
LED Junction Temp.	T _j		—	—	80	°C	
Head Temp.	T _{head}		—	—	60	°C	Al Base

4-3 Recommended operating Conditions (Ta=25°C, V_{SS}=0V)

Item	Sym.	Conditions	Min	Typ	Max	Unit	Remarks
Supply Voltage	V _{DD}	Ta=25°C	4.75	5.0	5.25	V	
CLOCK Frequency	f _c		—	—	15	MHz	
Supply Current	I _P	Ta=25°C			60	A	

4-4 Electrical Characteristics (Ta=25°C, VDD=5 ± 0.25V)

Item	Symbol	Conditions	Min.	Typ.	Max.	Units	Remarks
"H"Level Input Voltage	V _{IH}		0.7V _{DD}	—	V _{DD}	V	DATA,CLOCK,LOAD,STB
"L"Level Input Voltage	V _{IL}		0	—	0.3V _{DD}	V	DATA,CLOCK,LOAD,STB
"H"Level Input Current	I _{IH}	V _I =V _{DD} =5.25V	—	—	150	μA	DATA,CLOCK,LOAD
"L"Level Input Current	I _{IL}	V _{DD} =5.25V V _I =0V	—	—	-150	μA	DATA,CLOCK,LOAD
		V _{DD} =5V V _I =0V	- 0.9	- 2.8	- 5.7	mA	STB
Supply Current	I _{ON}	V _{DD} =5.25V ALL ON f _c =15MHz	—	18	27	A	V _{DD} , V _{SS} 1/4BLOCK ON
	I _{DD}	V _{DD} =5.25V ALL ON f _c =15MHz	—	2.8	3.6	A	V _{DD} , V _{SS}

5. Environmental Performance

Item	Guarantee Range
(1) Operating Temperature	5→45°C
(2) Operating Humidity	10→90 % RH (No Condensation)
(3) Storage Temperature	-10→65°C
(4) Storage Humidity	10→90 %RH (No Condensation)

6. Life

- (1) Operating Conditions
 - (a) The number of lighting dots is 10 % of all dots on an average.
 - (b) Electrical Opetation Ratings are typical values. (LED Duty Cycle / line ; 50 % max.)

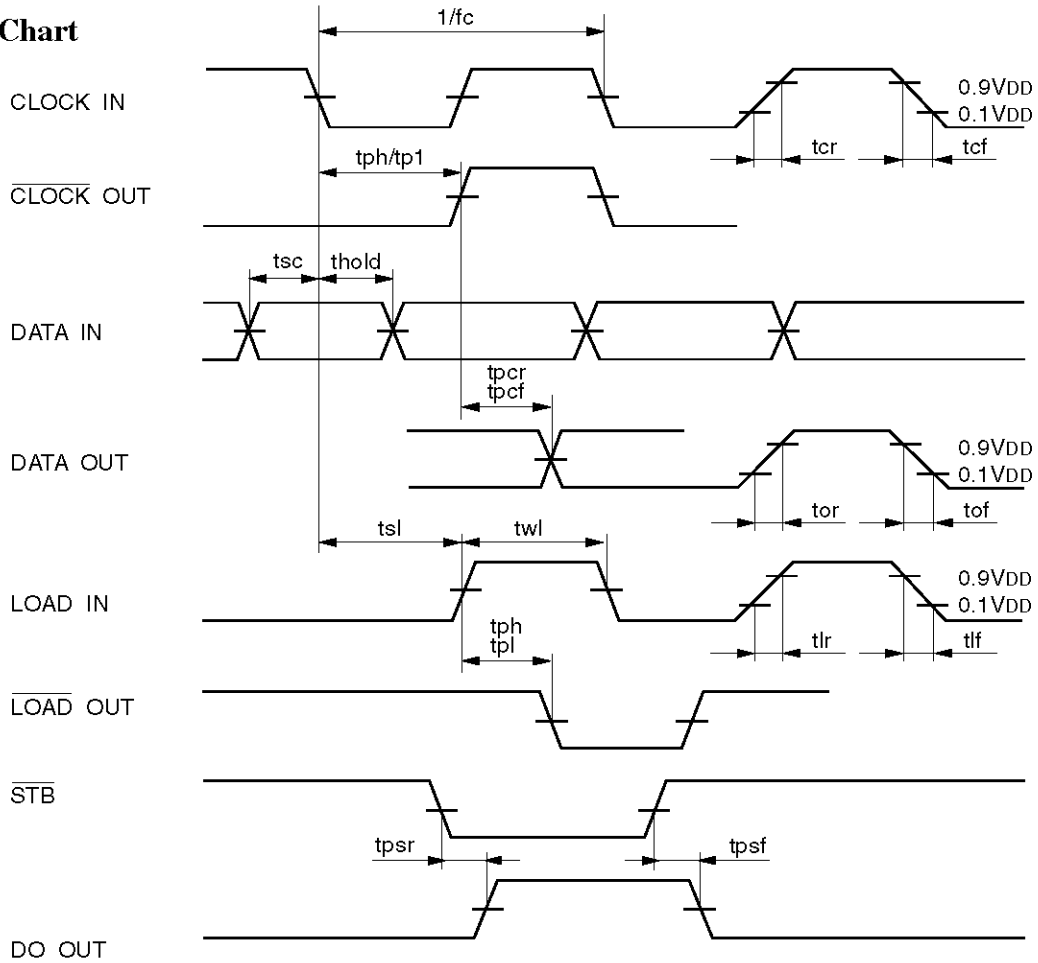
- (2) Judgement Criteria

The point where the average light output declines 30 % from the initial value or the point where the minimum light output declines 50 % from the initial value.

- (3) Life (LED on time)

Min. 1000 hrs.

Timing Chart

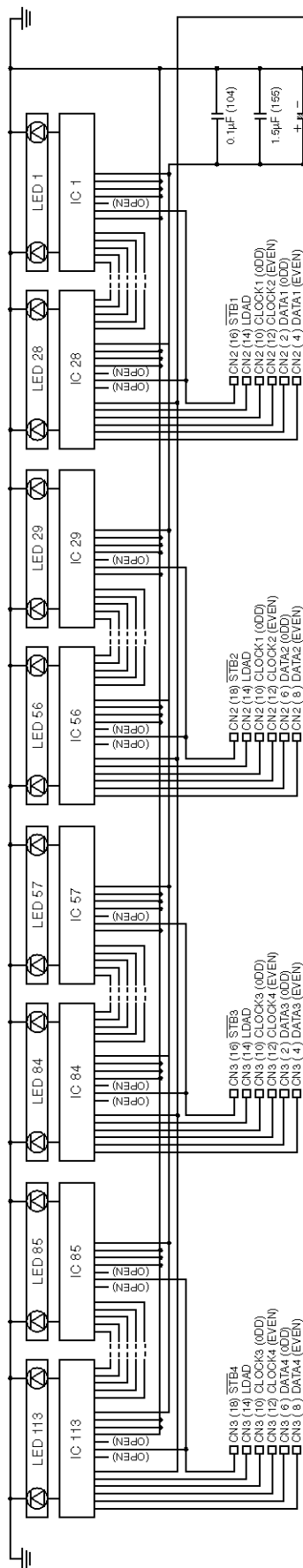


Switching Character

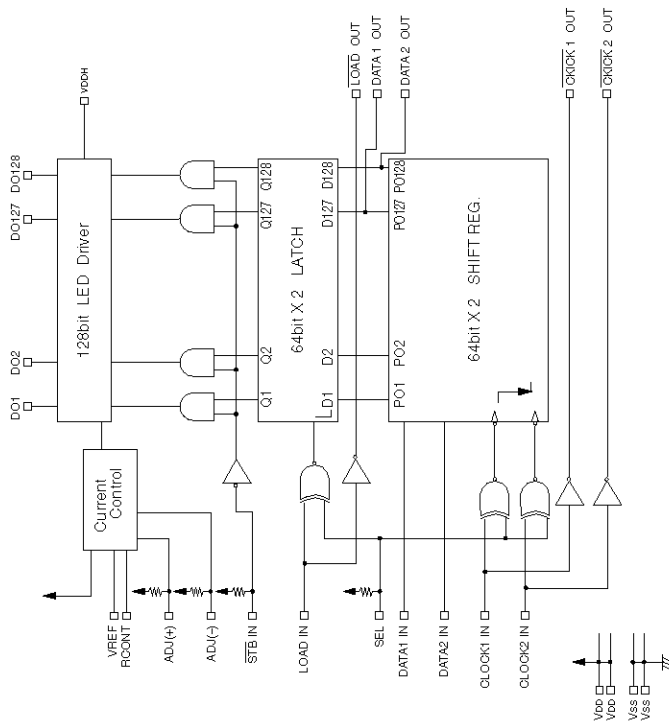
(VDD=4.5 to 5.5V, Tj=0 to 100°C. CL=10pF)

Note	Symbol	Condition	Standard			Unit
			Min	Typ	Max	
FREQUENCY	fc	—	—	—	15	MHz
CLOCK Duty	Delk	—	45	50	55	%
DATA IN → CLOCK Setup time	tsc	—	20	—	—	ns
DATA Hold time	thold	—	10	—	—	ns
CLOCK OUT → DATA OUT Delay Time	tpcr tpcf	—	10	—	46	ns
CLOCK IN → LOAD IN Setup Time	ts;	—	30	—	—	ns
LOAD Pulse width	tw;	—	30	—	—	ns
STB → LED ON Delay Time	tps	—	—	—	250	ns
	tps	(10kΩ)	—	—	250	ns
CLOCK IN → CLOCK OUT LOAD IN → LOAD OUT Delay Time	tph tpl	—	—	—	35	ns
CLOCK Rise / Fall Time	tr lrf	—	—	—	30	ns
LOAD Rise / Fall Time	tr lrf	—	—	—	30	ns
DATA Rise / Fall Time	tor tof	—	—	—	35	ns

LED Print Head



Block Diagram



Pin Assignment (CN1 ~ 4)

Power	CN1/4	Power	CN1/4
No.	Assign.	No.	Assign.
1	VDD	6	GND
2	VDD	7	GND
3	VDD	8	GND
4	VDD	9	VCC
5	GND	10	VSS

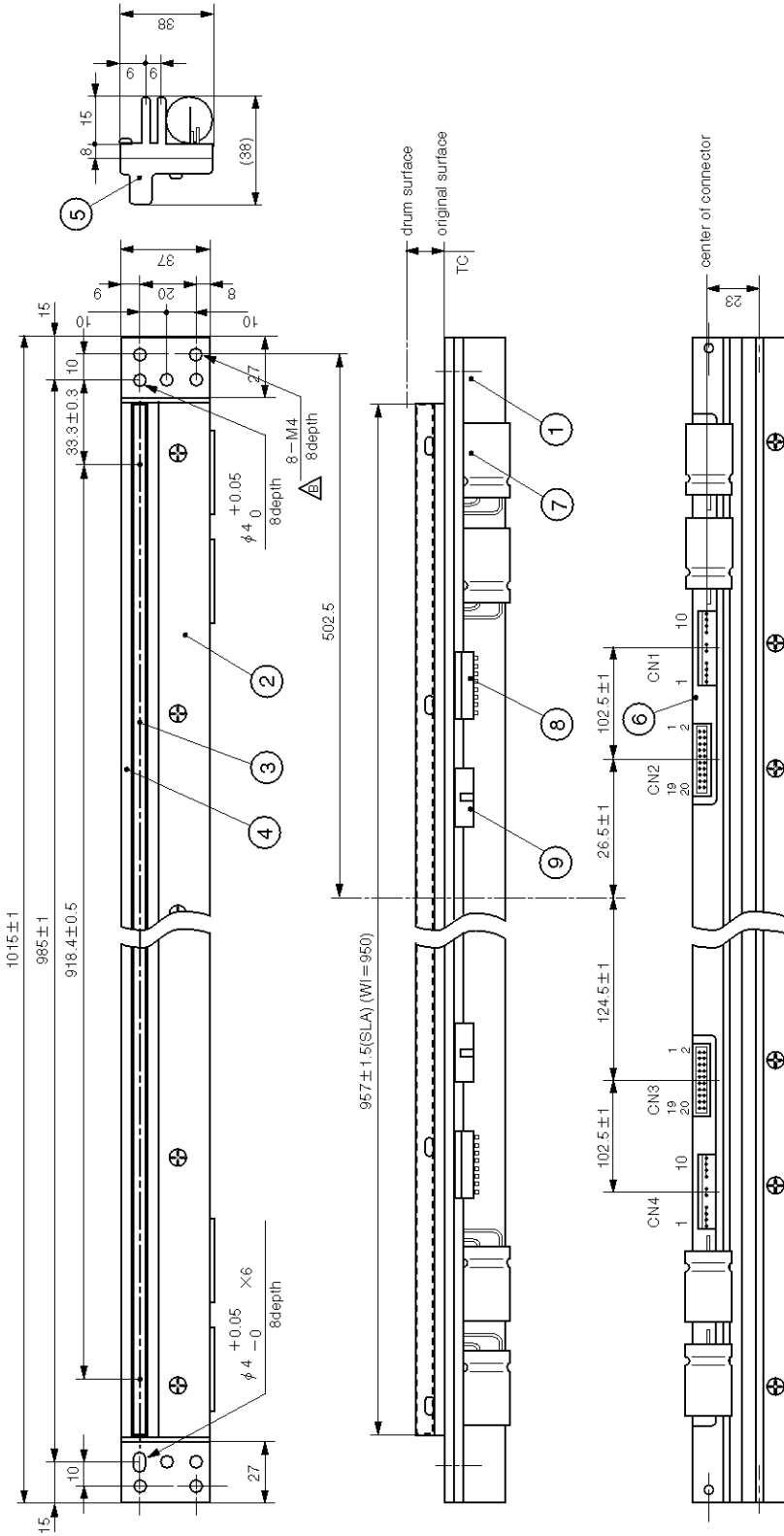
Logic	CN1/4	Logic	CN1/4
No.	Assign.	No.	Assign.
1	DATA1	11	VSS
2	CLOCK1	12	CLK 4 (EVEN)
3	DATA2	13	VSS
4	CLOCK2	14	LOAD
5	DATA3	15	VSS
6	CLOCK3	16	STB 3
7	DATA4	17	VSS
8	CLOCK4	18	STB 4
9	VSS	19	VSS
10	CLK 3 (ODD)	20	VSS

Logic	CN2	Logic	CN2
No.	Assign.	No.	Assign.
1	VSS	11	VSS
2	DATA 3 (ODD)	12	CLK 4 (EVEN)
3	VSS	13	VSS
4	DATA 3 (EVEN)	14	LOAD
5	VSS	15	VSS
6	DATA 4 (ODD)	16	STB 1
7	VSS	17	VSS
8	DATA 4 (EVEN)	18	STB 2
9	VSS	19	VSS
10	CLK 3 (ODD)	20	VSS

Logic	CN3	Logic	CN3
No.	Assign.	No.	Assign.
1	VSS	11	VSS
2	DATA 1 (ODD)	12	CLK 2 (EVEN)
3	VSS	13	VSS
4	DATA 1 (EVEN)	14	LOAD
5	VSS	15	VSS
6	DATA 2 (ODD)	16	STB 1
7	VSS	17	VSS
8	DATA 2 (EVEN)	18	STB 2
9	VSS	19	VSS
10	CLK 1 (ODD)	20	VSS

1. "SEL" terminal ... open (odd IC), Vss (even IC)

Part Name



No.	PART CODE	BR	PART NAME	PCS	SUMMARY	NOTE
1	*		heat sink	1	A6063-T5	
2	*		cover	1	A6063-T5	
3	*		S.L.A.	1	SLA-20	
4	*		S.L.A. holder	1	A6063-T5	
5	*		side cover	2		
6	*		substrate	1	FR4	
7	*		condenser	4	15000µF / 10V	*
8	*		CN1,4	2	B10P-VH	(JST)
9	*		CN2,3	2	HIF3BA-20PA-2.54DSA	(HIROSE)



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Precautionary instructions in handling gallium arsenic products

Special precautions must be taken in handling this product because it contains, gallium arsenic, which is designated as a toxic substance by law. Be sure to adhere strictly to all applicable laws and regulations enacted for this substance, particularly when it comes to disposal.

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