Purpose :

To define the 200 DPI Contact Image Sensor (CIS) electrical characteristics, maximum rating, and operational conditions.

Scope:

All DYNA IMAGE' s DL100-05AUJT, 200 DPI A4 size contact image sensor specifications.

1. Product Description

Outline	232.0mm×17.5mm×11.15mm
Readable Width	216mm (Effective Width 215 mm)
Number Of Sensor Elements	1728 (1～1720 dots available)
Resolution	8 dots/mm
Scanning speed	5 msec/line
Light Source	Wavelength 570 nm
Data Output	1 Analogue

2. Electrical Characteristics at 25 ℃

Item	Symbol	Note	Min.	Typ.	Max.	Unit
Power Supply	VDD	Ref. To GND	4.75	5.00	5.25	V
	VLED		22.8	24.0	25.2	V
Input CLK Voltage	VIH	SI & CLK	3.2			V
	VIL				0.8	V
Input CLK Current	IIH	SI & CLK			20	uA
	IIL				-0.2	mA
CLK Frequency	Fmax			0.5	0.75	MHz

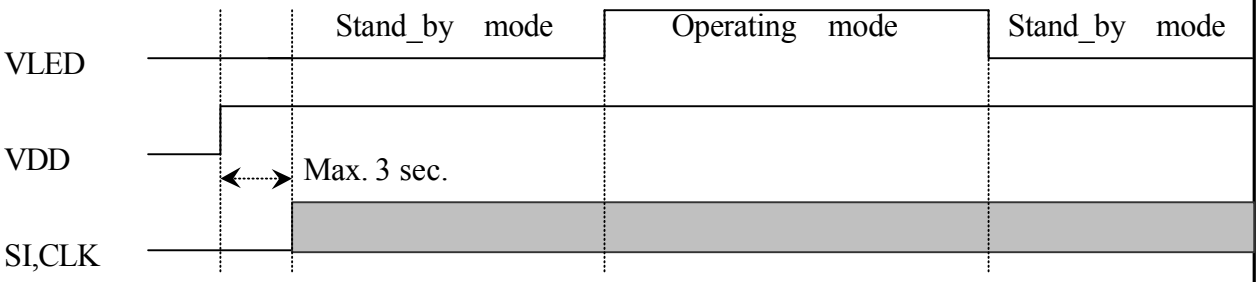
3 Absolute Maximum Rating

Item	Symbol	Maximum Rating	Unit
Power Supply	VDD	6	V
	IDD	40	mA
	VLED	26	V
	ILED	120	mA
Input Signal	VH	VDD+0.5	V
	VL	-0.5	V
Storage Temperature	TSTG	-20 to 60	℃
Storage Humidity	HSTG	10 to 85	%RH
Operating Temperature	TOP	0 to 50	℃
Operating Humidity	HOP	10 to 85	%RH

4. Recommended Operating Conditions at Ta= 25 ℃

Item	Symbol	Spec.	Unit	Note
Power Supply	VDD	+5.0	V	
	VLED	+24.0	V	LED voltage
Bright Output Max	VRmax	2.0±0.3	V	O.D.=0.05～0.09
Bright Output Min	VRmin	>VRmax*0.537	V	O.D.=0.05～0.09
Dark Output	Vd	0～200	mV	LED Off
Dark Output Uniformity	Ud	Max. 200	mV	LED Off
Modulation Transfer Function	MTF	Min. 30	%	4.0 lp/mm
Linearity	γ	0.8 to 1.1		O.D. = 1.2

4.1. Recommended Conditions at "STAND_BY MODE"



1>. The Max. delay time is 3 sec after Power_on.

2>. The CLK & SI need to keep during the "Stand_By mode".

5. Pin functional Description

No.	Signature	Name	Description
1	SIG	Signal Output	Video Output Signal From Amplifier
2	GND	Ground	0 V DC; Reference Point
3	VDD(+5V)	Supply Voltage	+5V DC Supply Voltage Ref. To GND
4	SI	Start Pulse	Adjust Integration Time
5	CLK	Clock	CIS Main Clock
6	GLED	GND for LED	Ground For Light Source
7	VLED(+24)	VLED for LED	Supply Voltage (+24V) For Light Source

6. Definition

(1) Bright output Max. is defined as follows:

VRmax=Max(Vpn-Vdn)

Vp: The Output Value Measured White Paper Of O.D.=0.05～0.09 (reference to GND)

Vd: The Output Value Measured When LEDs Off (reference to GND)

n=1~1720 pixel

(2) Bright output Min. is defined as follows:

VRmin=Min(Vpn-Vdn)

Vp: The Output Value Measured White Paper Of O.D.=0.05～0.09 (reference to GND)

Vd: The Output Value Measured When LEDs Off (reference to GND)

n=1~1720 pixel

(3) Dark output level is defined as the output of the sensor when LEDs is off.

(4) Ud is defined as follows:

Ud= Vd(max) − Vd(min)

(5) MTF is defined as follows:

$$MTF = \frac{V\max - V\min}{V\max + V\min} \times 100(\%)$$

Vmax, Vmin: The output reading of 4.0 lp/mm test chart(reference to Vd).

(6) Gamma is tested as follows:

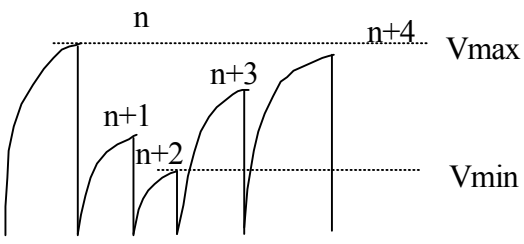
1>. Test Vp(avg) by PC_TESTER, when Vled = + 24.0 V and O.D. chart = 0.08 (Reflection = R1)

2>. Test Vp(gray) by PC_TESTER, change LED voltage and O.D. chart = 0.08 to simulate O.D. = 1.20 (Reflection = R2)

3>.Vp(avg) , Vp(gray) = $\frac{\sum Vp(i)}{1720}$

4>.Gamma = $\frac{Log\ (\ Vp(avg)/Vp(gray))}{Log\ (\ R1/R2)}$

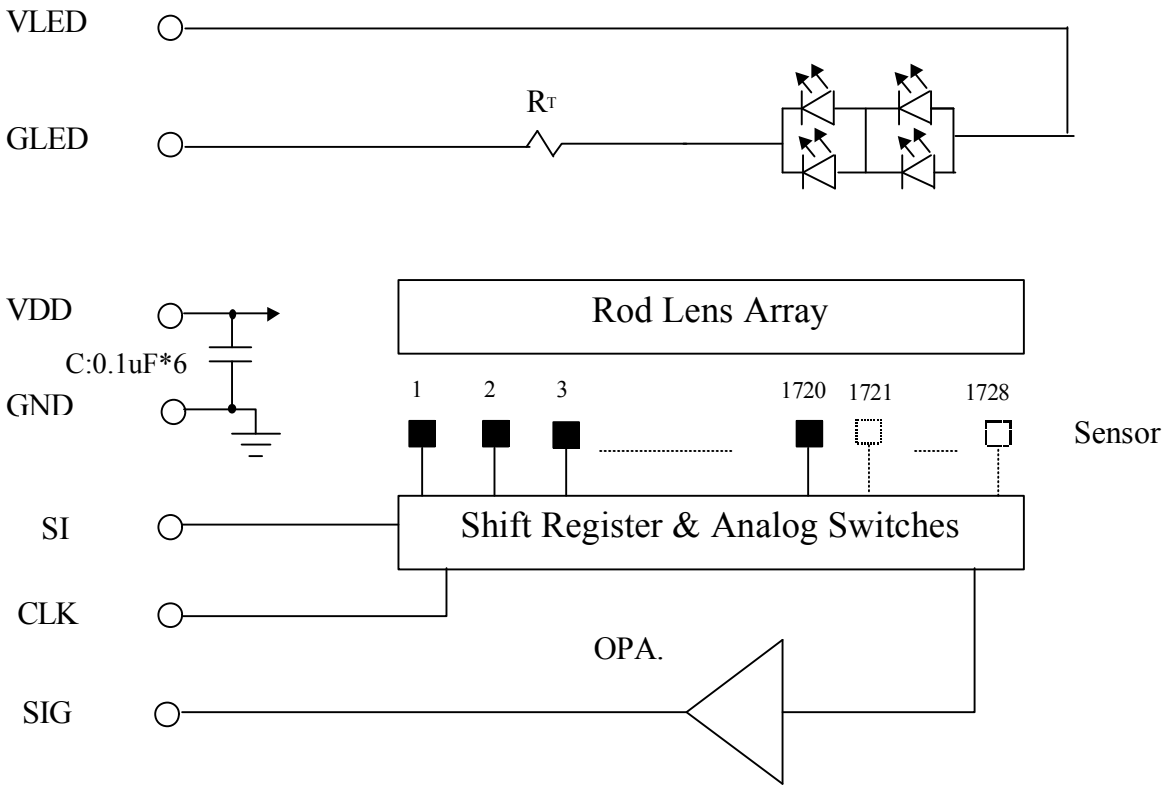
(7). Particle testing method:



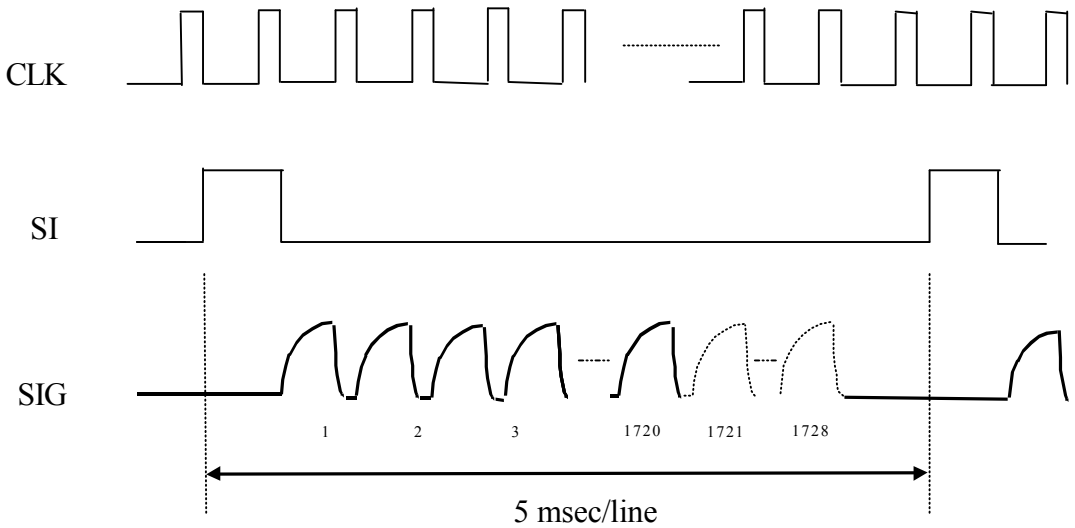
Vgap = Vmax – Vmin <= 0.5 V

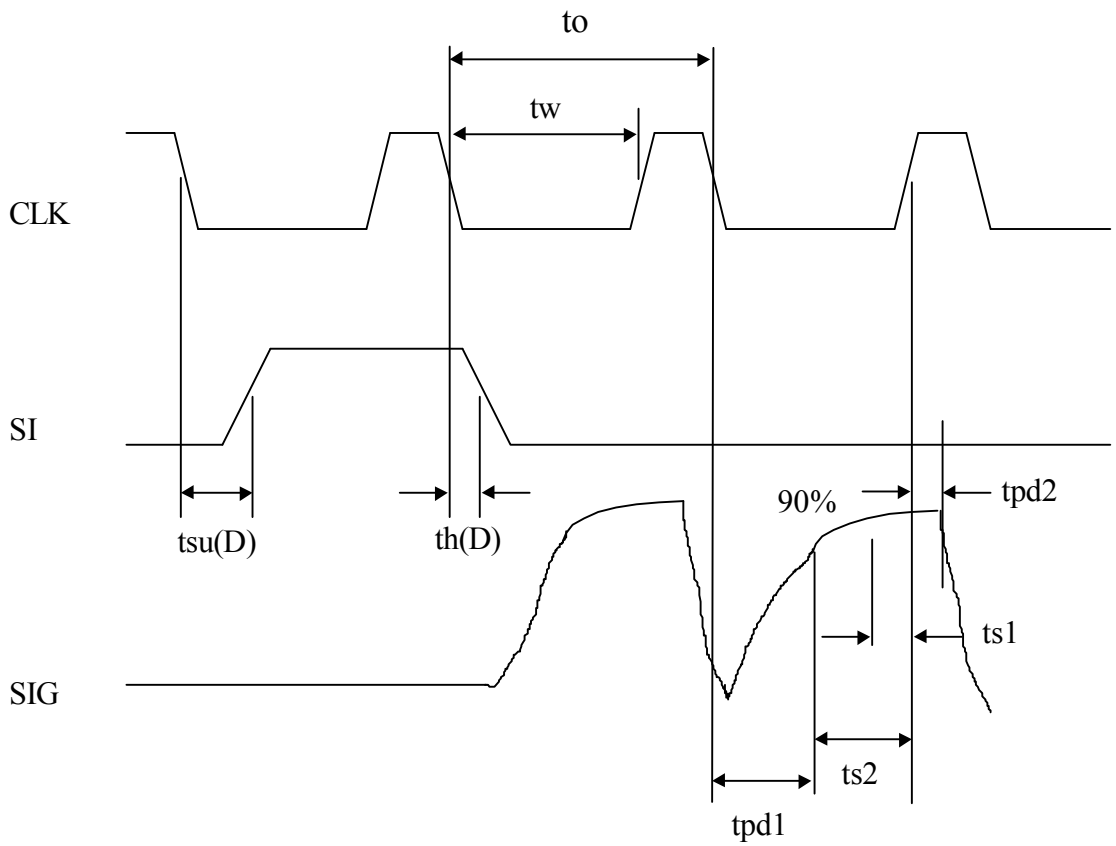
Each 5 pixels n = 1 -- 1716

7. Block Diagram



8. Timing Chart CLK=500 KHz (High Duty Cycle 25%)





Item	Symbol	Min.	Typ.	Max.	Unit
Clock Frequency	Fmax= 1/to		500	750	KHz
Clock Duty	tw/to		75		%
Setup Time	tsu(D)	5		tw	ns
Hold Time	th(D)	5		tw	ns
SIG Delay Time	tpd1	0		1100	ns
	tpd2	0		300	ns
SIG Stable Time	ts1(*note1)	50			ns
	ts2(*note2)			250	ns

*note1: We recommend user to sample signal in this region.

*note2: ts2 is the time period which output signal is during its 90%~100%.