Notice: This is not a final specification.
Outline, some parametric limits and figures are subject to change.

CONTACT IMAGE SENSOR

DW3R216NY-130819

Approved by customer		

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REVISION					**Approved**
Rev	Description	Date	Approved	Drawn	
A	---	Aug.19, 2013	WB.Zhang	ZX.Liu	
B	P3: B1 and B2 was 30%. P11: B3 was 13.4; B4 was 3.2.	Sep.02, 2013	WB.Zhang	ZX.Liu	
C	P11: C1 was 15.1. P12- P13: Packing spec. is added.	May.06, 2014	WB.Zhang	ZX.Liu	
D	P11: D1 was φ2.5; D2 was 2.5; D3 was 3.5; D4 was 1.0T-1-12AB.	May.12, 2014	WB.Zhang	ZX.Liu	**Checked**
					Drawn

1. Description

This specification is applied to DW3R216NY-130819 Contact Image Sensor module .

2. Scope

This DW3R216NY-130819 is a CIS consists of a Rod Lens Array, two LED light sources and an array of linear MOS image sensor.

3. Outline

Item	Specification	Note
Scanning width	216 mm	
Sensor element density	300 DPI	CNT=L
Effective number of sensor elements	2,552 elements 21th to 2,572th (Full 2,592 elements)	
Scanning speed	Color: 336 ×3 μsec/line (RGB) Black & White: 336 μsec/line	
Clock speed	8MHz	
Rod lens array	Two rows	L05
Light source	Red λp = 625nm ± 10nm 100mA Green λp = 520nm ± 20nm 100mA Blue λp = 465nm ± 15nm 100mA	LED: at least two LED vendors.
Power supply	+3.3V x 80 mA	
Data output	1 analog output	Synchronous
Block diagram	Figure 5	
Dimensions	Figure 1	

Note: Clock Speed f must satisfy the following status:

$f > (n + 92) / tint$

f : Clock speed

n: sensor elements number

300DPI: 2,592

tint: Scanning speed

4. Image Data Output Characteristics (Ta = 25ºC)

The shipment test in WHEC is done on the condition of this table.

In Color Mode

Item	Symbol	Specification			Note
		Red	Green	Blue	
DC supply voltage	VDD	+3.3V			Detector, Logic
LED supply voltage	VLED	<3.0V	<5.0V	<5.0V	
LED supply current	ILED	50×2mA	50×2mA	50×2mA	
White image target		0.05 ~ 0.09 OD			
Video reference	Vref	800±200 mV			4.1
Dark output minimum	Vdmin	-100 ~ +200mV			4.2
White output maximum	Vpmax	500 ± 100 mV T.B.D			4.3
Dark output uniformity	Ud	Less than Vpmax/2.5			4.4
White output uniformity	UEp	Less than 50%			4.5
MTF B1		T.B.D	T.B.D	T.B.D	4.6 142.697 lppi
Linearity	Gamma	0.95~1.05			

In Black and White Mode

Item	Symbol	Specification			Note
		Red	Green	Blue	
DC supply voltage	VDD	+3.3V			Detector, Logic
LED supply voltage	VLED	-	<5.0V	-	
LED supply current	ILED	-	50×2mA	-	
White image target		0.05 ~ 0.09 OD			
Video reference	Vref	800±200 mV			4.1
Dark output minimum	Vdmin	-100 ~ +200mV			4.2
White output maximum	Vpmax	500 ± 100 mV T.B.D			4.3
Dark output uniformity	Ud	Less than Vpmax/2.5			4.4
White output uniformity	UEp	Less than 50%			4.5
MTF B2		-	T.B.D	-	4.6 142.697 lppi
Linearity	Gamma	0.95~1.05			

The output level of image signal like white and dark and MTF is defined at the point of "ts2" which described in section 7.A test target is set on the read position as outline in Figure 1.

4.1 Vref

Video is the reference output. Vdmin output value is based on Vref. Vref appears from connector pin#4.

4.2 Vdmin

As shown in Figure 2, Vdmin is the minimum in the dark output signal (turning off the LED). Every other parameters are defined by Vdmin as a reference.

4.3 Vpmax

As shown in Figure 2, Vpmax is the maximum white output signal and is defined by:

Vpmax=MAX[Vp(n)]

Vp(n) is the output signal of the n-th pixel using a white image target.

4.4 Ud

As shown in Figure 2, Ud is the output signal in the dark (turning off the LED) and is defined by:

Ud=Vdmax-Vdmin

Vdmax is the maximum output signal of the n-th pixel in the dark

Vdmin is the minimum output signal of the n-th pixel in the dark

4.5 UEp

UEp is the white output non-uniformity with dark signal subtracted and is defined by:

UEp = ((VEpmax – VEpmin) / (VEpmax)) x 100%

VEpmax = MAX[VEp(n)]; is the maximum effective output signal

VEpmin = MIN[VEp(n)]; is the minimum effective output signal

VEp(n) is the effective output signal of every pixel and is defined by:

VEp(n) = Vp(n) – Vd(n)

4.6 MTF

MTF is defined by:

MTF = MIN{ [(Vmax-Vmin) / VEp] } x 100%

Vmax is the maximum output signal using the MTF image target

Vmin is the minimum output signal using the MTF image target

VEp is the effective output signal .

4.7 Correction of Dark and White uniformity

For the best performance two points correction (dark and white) is strongly recommended.

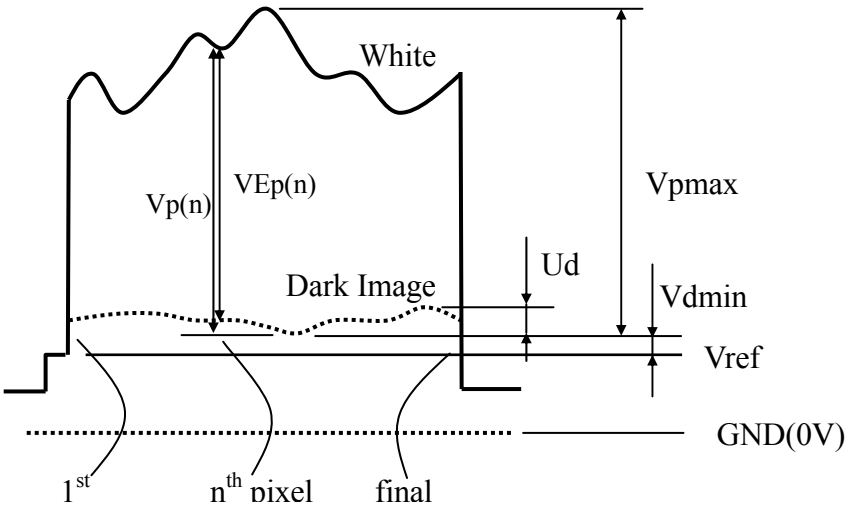


Figure 2. Output Signals Waveform

5. Maximum Rating

Item	Symbol	Specification	Note
DC supply voltage	VDD	+3.3V ± 0.165V	
Input voltage	VIN	0 ~ VDD+0.3V	SI, CLK
Ambient temperature	Ta	0 ~ +50 ºC	Operating
		-20 ~ +60 ºC	Non-operating
Ambient humidity		10 ~ 90%RH	Avoid a build up condensation
Maximum operating Temperature		65 ºC 30minuts MAX	

LED

Parameter	Symbol	Red	Green	Blue
DC Forward Current	IF	60 mA	60 mA	60 mA
Pulse Forward Current	IFP	60 mA	60 mA	60 mA
DC Reverse Voltage	VR	5.0 V	5.0V	5.0V

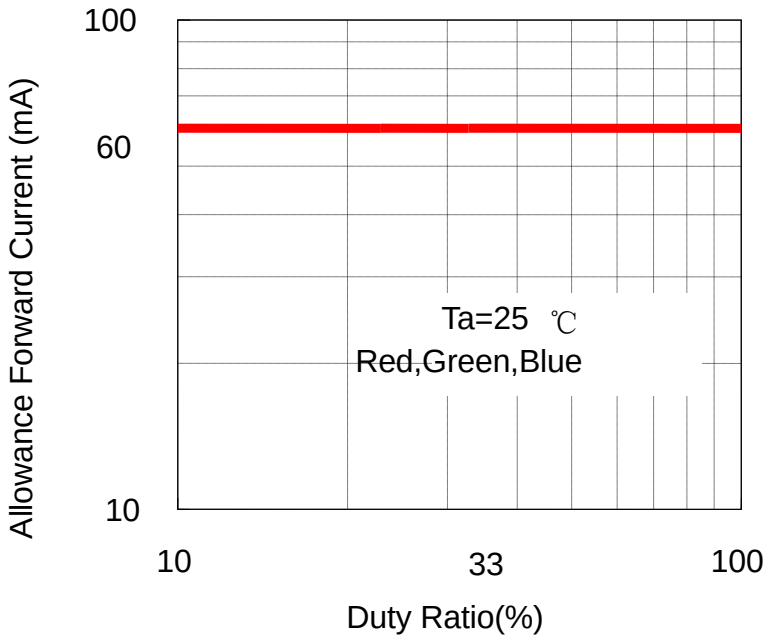


Figure 3. Duty Ratio vs Allowance Forward Current

6. Electrical Characteristics (Ta = 25 ºC)

Item	Symbol	Condition	Specification			Unit
			Min.	Typ.	Max.	
DC Supply Voltage	VDD	GND reference	3.135	3.3	3.465	V
DC Supply Current	IDD	VDD = 3.3V		80		mA
LED Forward Voltage	VFred	IF=30mA IF=40mA IF=60mA	2.1 2.1 2.3	2.3 2.4 2.5	2.5 2.6 2.7	V V V
	VFgreen	IF=30mA IF=40mA IF=60mA	3.3 3.4 3.6	3.6 3.8 4.0	4.0 4.1 4.4	V V V
	VFblue	IF=30mA IF=40mA IF=60mA	3.3 3.4 3.6	3.7 3.8 4.0	4.1 4.2 4.3	V V V
Input voltage (Note)	VIH	SI,CLK	2.4			V
	VIL				0.5	V
Input Current (Note)	IIH	SI,CLK			5	mA
	IIL		-0.5			µA
Clock frequency	f	CLK		8		MHz
Clock pulse duty		tw(T)/to; to=1/f	48	50	52	%
SI setup time	tsu	SI-CLK	60		to	ns
SI hold time	Th	SI-CLK	60		5×to	ns
Data output stability time	ts2	CLK-SIG	20	30	40	ns

Note: 74HC244 or equivalent is recommended for input signal.

7. recautions before use:

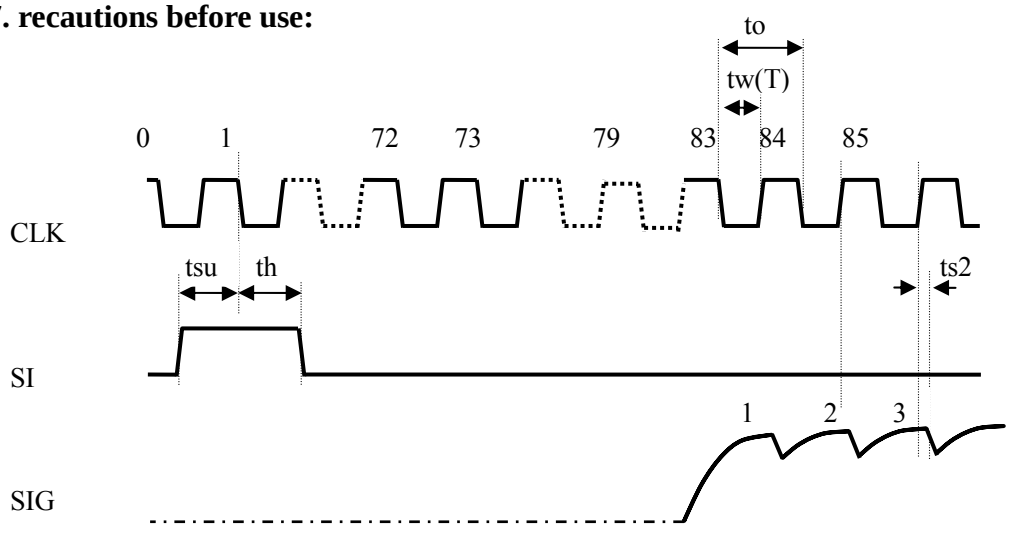


Figure 4. Timing Diagram

8. Reliability

The following table satisfies the reliability when the CIS is operated continuously under standard operating conditions as specified in section 4.

Item	Variable Amount (%)	Note
White output	Initial level +10% -20%	1000Hr
	Initial level +10% -30%	5000Hr

9. Precautions before use:

9.1 Extracting / Inserting the connector

The maximum number of times that the connector should be extracted and connected is 10. If the connector is inserted / extracted more than 10 times, the connector 'burrs' will be eroded, thereby making the connector ineffective.

9.2 Stable operation

(1) The connector pins should not be touched by bare hand or electrostatic charge materials.

(2) Noise

a. Insert a low frequency noise suppressing capacitor(100uF) between VDD(+3.3V) and GND. A high frequency noise suppressing capacitor is already integrated into the circuit.

b. Ensure that the sensor connecting cables are 30cm or less in length. The CLK and GND, SIG and GND and VLED and LEDr, LEDg, LEDb respectively from form twisted cable pairs.

(3) Latch up

When the supply voltage is higher than the absolute maximum, latch up will cause the sensor to break, even if the voltage is caused by a surge. If the current varies rapidly in the external in the external circuit, or when the power is turned on an off very frequently, ensure that the voltage o each terminal does not exceed the values indecated in below.

(4) LED circuit

As shown in Figure 5 LED circuit have 2Ω resistance. Be careful no to connect the LED circuit to power supply directory without current limit resisters.

(5) Absolute maximum ratio

Item	Symbol	Condition	Specification		Unit
			Min	Max	
Supply Voltage	VDD	GND reference	-0.3	+4.5	V
Input voltage	Vin	SI,CLK	GND-0.3	VDD+0.3	V

10.The place of origin :

Weihai City, Shandong, CHINA "Weihai Hualing Opto-Electronics Co.,Ltd."

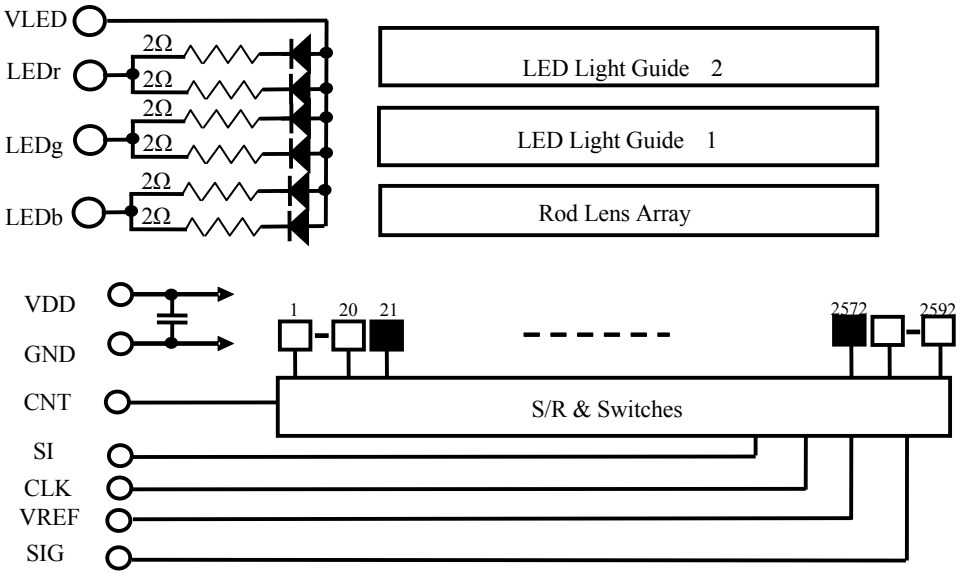
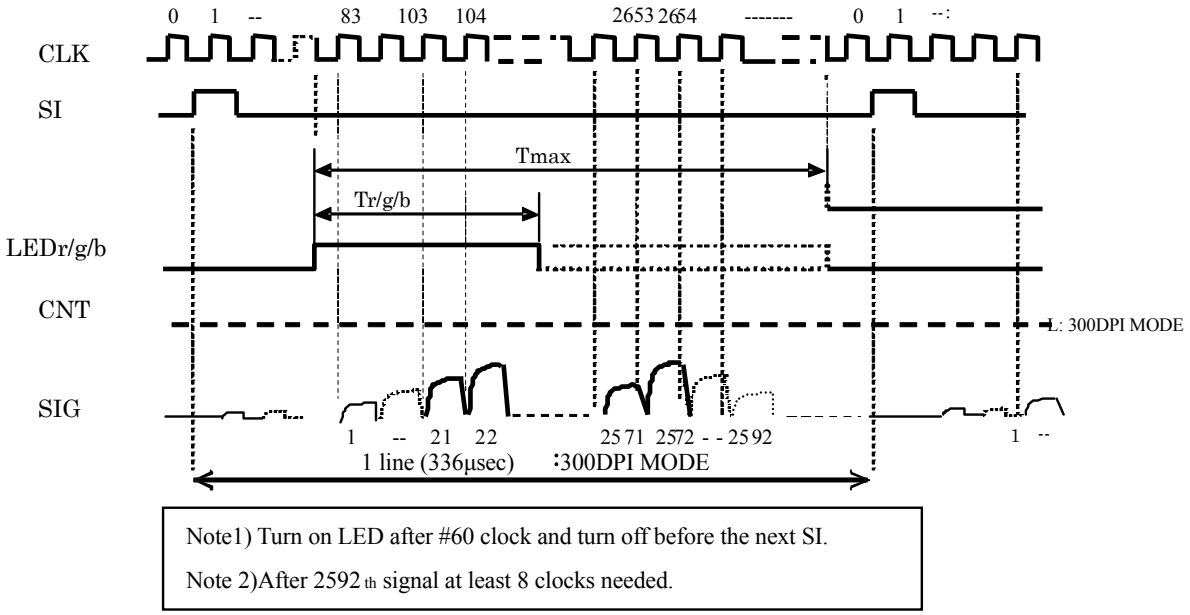


Figure 5. Block Diagram

CLK: 8MHz (L:duty 50%)

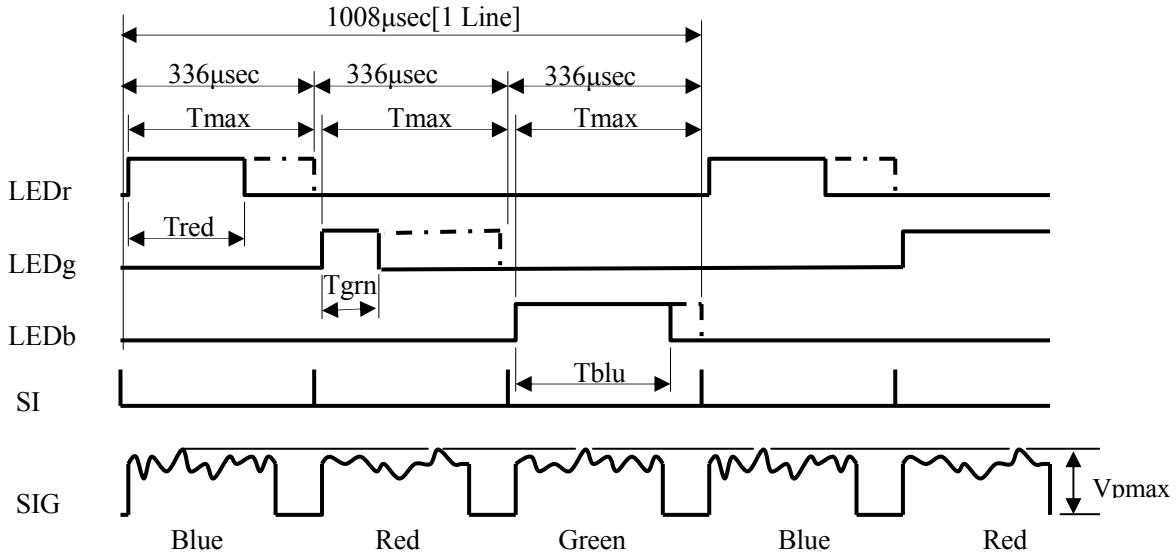
This is the WHEC shipping test condition.



Note1) Turn on LED after #60 clock and turn off before the next SI.

Note 2)After 2592 th signal at least 8 clocks needed.

Figure 6. Timing Diagram



Vpmax and the mean of Vep(n) of all color have to be adjusted to nearly equal. Refer the adjustment flow at Figure 8

Figure 7. Color Mode Timing Diagram
(This is the WHEC shipping test condition)

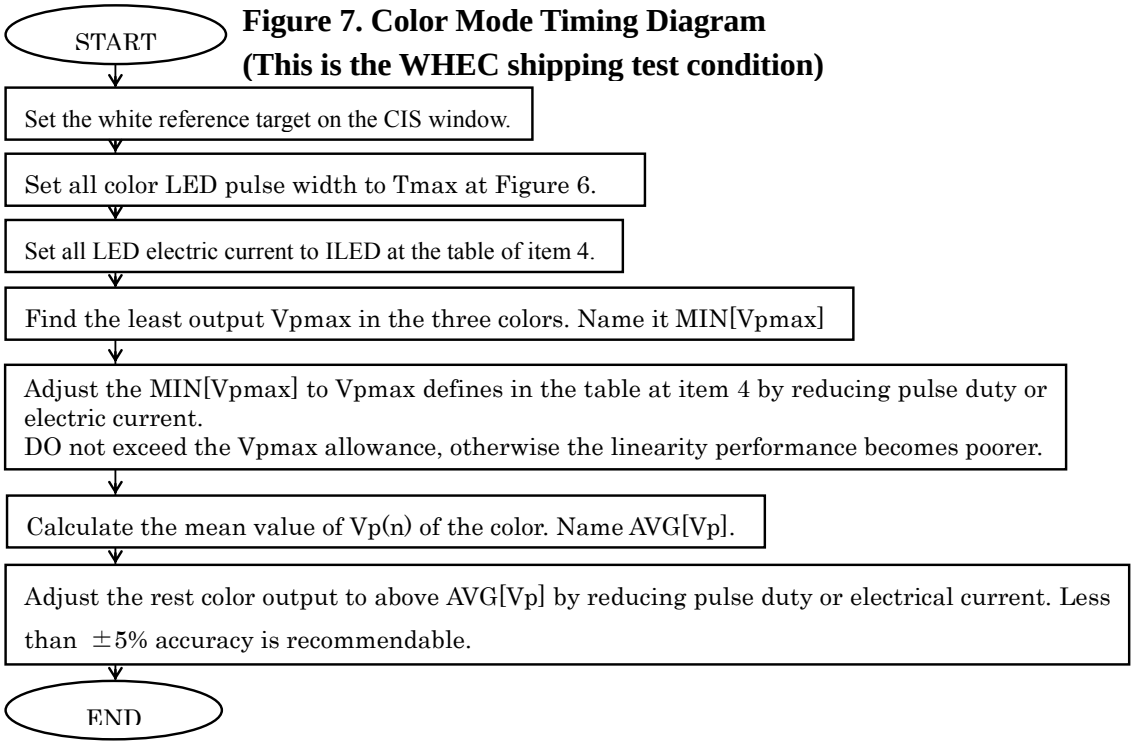
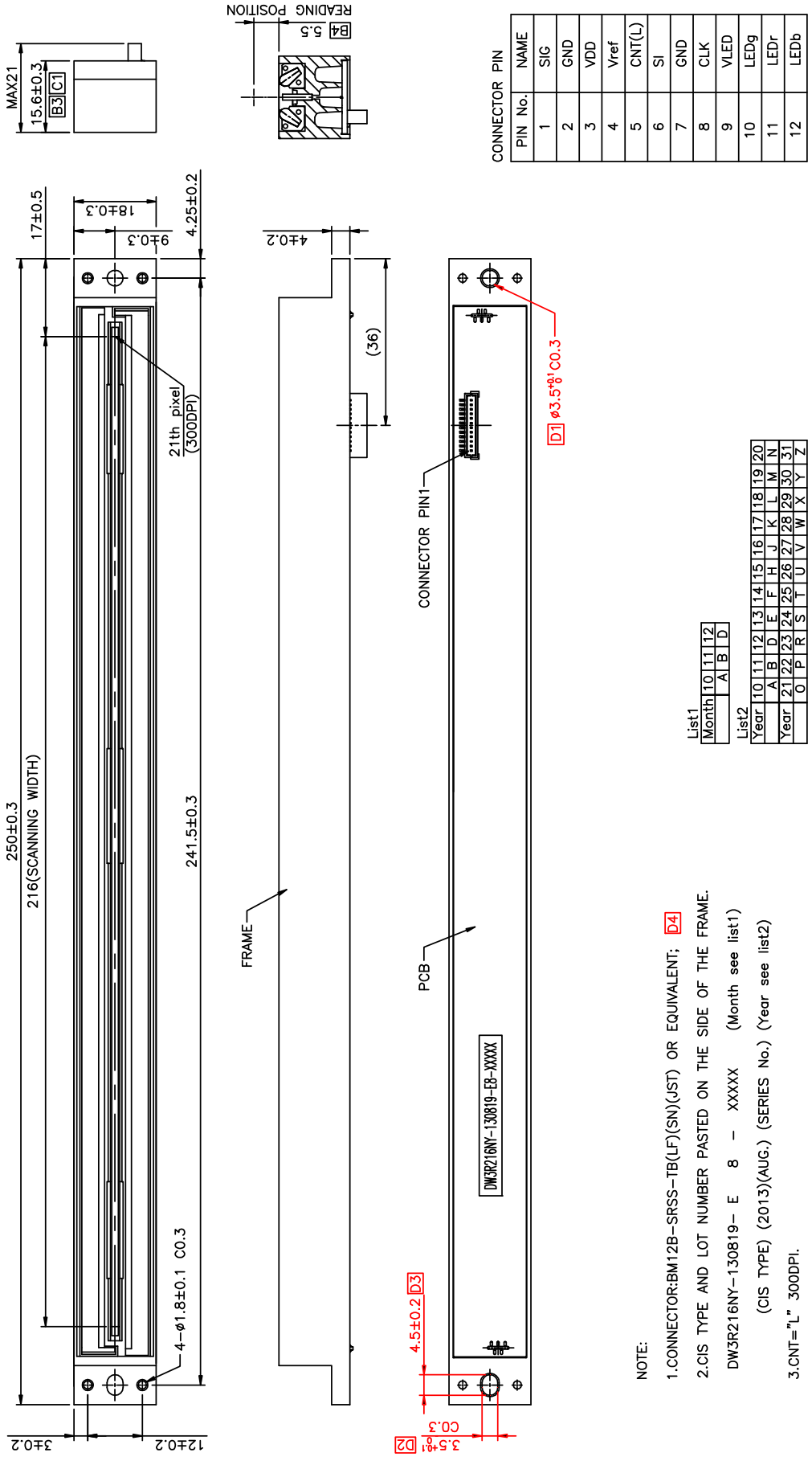


Figure 8. Flow Chart of Color mode Adjustment (This is the WHEC shipping test condition)

F igure 9. Typical Performance Curve
Unless otherwise specified,Ta=25ºC

T.B.D

Figure 1. Dimensions



CASE STYLE OF IMAGE SENSOR

TYPE: DW3R216NY-130819

This directions is made according to the specification of CIS.

1.Packing
According to the packing drawing.

2.Material of packing

1)	TRAY	Cardboard
2)	CASE	Paper Box

3.Size & Weight

1) CIS				57g/pc
2) CIS	10Pcs	TRAY	L425×W345×H35	1.21Kg
3) CIS	100PCS	CASE	L455×W375×H360	12.84Kg

4.Case Mark

WHEC

5.Notice of maintain and transport
Fragile
Keep top side up
Keep dry

Figure 10. Packing Form