

ILLUMINANT 北極光企業有限公司

PRODUCT SPECIFICATION FOR TFT LCM

CUSTOMER:	
MODEL NO:	I2421-7IBN2432B
ACCEPTED BY:	

APPROVED BY:	CHECKED BY:	ORGANIZED BY:
		

Approval for Specifications Only

Approval for Specifications and Sample

Note: 1. Version of Specifications : 1

2. Others: Rohs Compliment

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CONTENTS

- 1. Mechanical Specification**
- 2. Absolute Maximum Ratings**
- 3. Electrical Characteristics**
- 4. Optical Characteristics**
- 5. Interface**
- 6. Block Diagram**
- 7. Timing Characteristics**
- 8. Backlight**

1. Mechanical Specification:

Item	Standard Value	Unit
Display size	2.4	inch
Module Dimension	42.72(W)*60.26(H)*2.55MAX(D)	mm
Active Area	36.72(W)*48.96(H)	mm
Number of Dots	240RGB*320Dots	Dot
Pixel Pitch	0.153(W)mm*0.153(H)mm	mm
LCD Type	Normally White	-
Viewing Direction	12H	-
Driver	ILI9335	-
Approx. Weight	TBD	g
Various Color Display	262	k
Brightness	200	cd/m2
Backlight Type	4-LED Parallel	
Backlight Color	White	

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NOTE: ILI9335

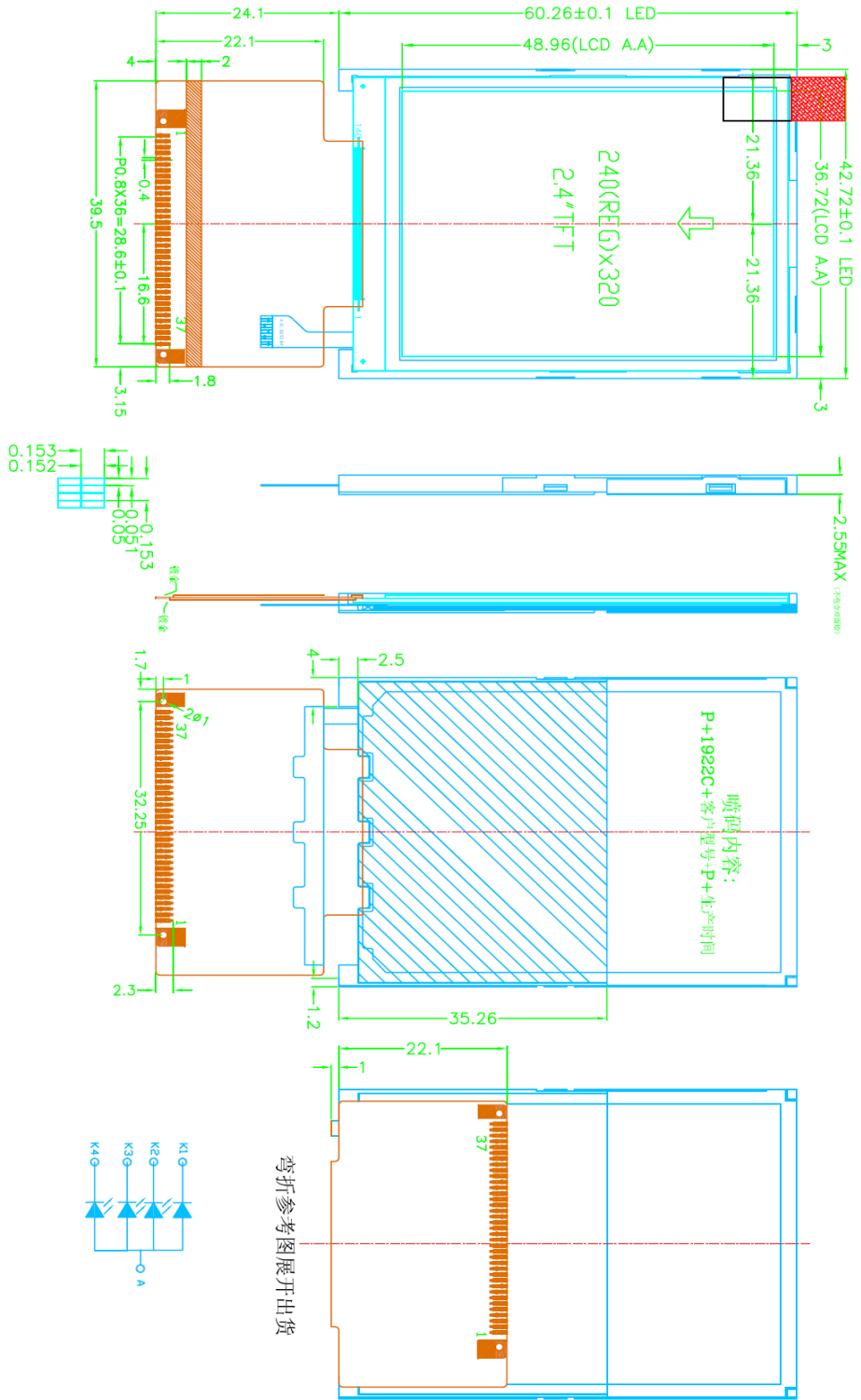
1. DISPLAY TYPE	262K TFT	5. OPERATIVE VOLTAGE	3.0V
2. VIEWING DIRECTION	12 O'CLOCK	6. OPERATIVE TEMP	-20° C ~ 70° C
3. POLARIZER MODE	TRANSMISSIVE	7. STORAGE TEMP	-30° C ~ 80° C
4. BACKLIGHT TAPE	WHITE LED	8. CONNECTOR	TCP

REVISED RECORD

A			
B	Drawn		
C	Check	Page: 1 of 5	Unit: mm
D	Approve	Rev: 1.0	Scale: 1/1
E	Dwm.No	Date: 2010-1-28	

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No.	PIN NAME
1	DB0
2	DB1
3	DB2
4	DB3
5	GN01
6	VCL1
7	/CS
8	RS
9	/VR
10	/RD
11	/M0
12	NC
13	NC
14	NC
15	NC
16	LEP-A
17	LEP-K1
18	LEP-K2
19	LEP-K3
20	LEP-K4
21	NC
22	DB4
23	DB9
24	DB8
25	DB0
26	DB1
27	DB2
28	DB3
29	DB4
30	DB5
31	/RESET
32	VCL
33	VCE2
34	GN0
35	DB5
36	DB6
37	DB7



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2. Absolute Maximum Ratings:

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply Voltage for Logic	V _{DD}	-0.3		+4.0	V	
Input voltage	V _{in}	-0.5		V _{DD} +0.5	V	
Operating Temperature	T _{OP}	-20	-	+70	°C	-
Storage Temperature	T _{ST}	-30	-	+80	°C	-

*NOTE: Based on V_{SS}=0V.

3. Electrical Characteristics:

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply Voltage for Logic	V _{DD}	T _a =25°C	2.2	2.8	3.3	V
High-Level Input voltage	V _{IHC}	V _{DD} =3.0V	0.8V _{DD}		V _{DD}	
Low-Level Input voltage	V _{ILC}	V _{DD} =3.0V	-0.3		0.2V _{DD}	
TFT Gate ON Voltage	V _{GH}	V _{DD} =3.0V	--	15	--	-
TFT Gate OFF Voltage	V _{GL}	V _{DD} =3.0V	--	-10	--	V
Power Supply Current for V _{DD}	I _{DD}	V _{DD} =3.0V	-	8.5		mA

4. Optical Characteristics:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Luminance	I	180	200		cd/m	
Contrast Ratio	C/R	200	250			
Response time	Tr+Tf		30	50	ms	Fig.3
*1) Viewing angle	θ_l	-	40	-	Degree	C/R>10 Fig.4
	θ_r	-	40	-		
	θ_u	-	40	-		
	θ_d	-	40	-		

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Notes :

1. Contrast Ratio(CR) is defined mathematically as :

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

2. Surface luminance is the center point across the LCD surface 500mm from the surface with all pixels displaying white. For more information see FIG 1.

3. Response time is the time required for the display to transition from to black(Rise Time, TrR) and from black to white(Decay Time, TrD). For additional information see FIG 3.

4. Viewing angle is the angle at which the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which

is normal to the LCD surface. For more information see FIG 5.

5. Optimum contrast is obtained by adjusting the LCD Threshold voltage(Vth & Vsat)

FIG. 1 Optical Characteristic Measurement Equipment and Method

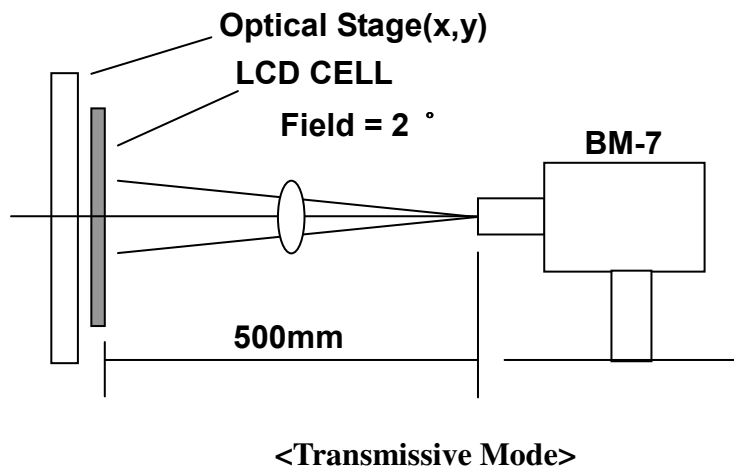


FIG. 2 The definition of V_{th} and V_{sat}

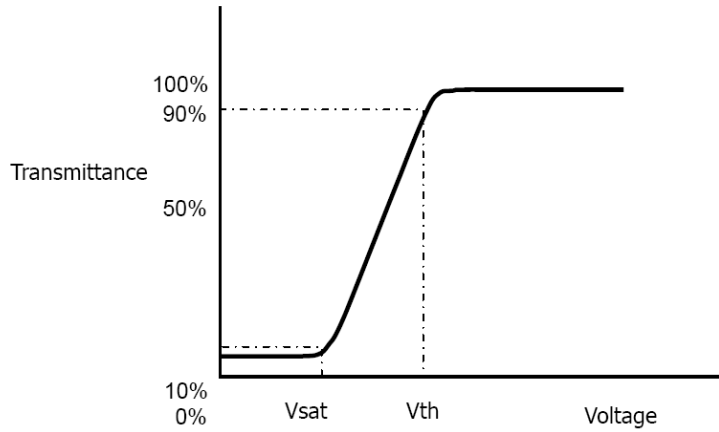
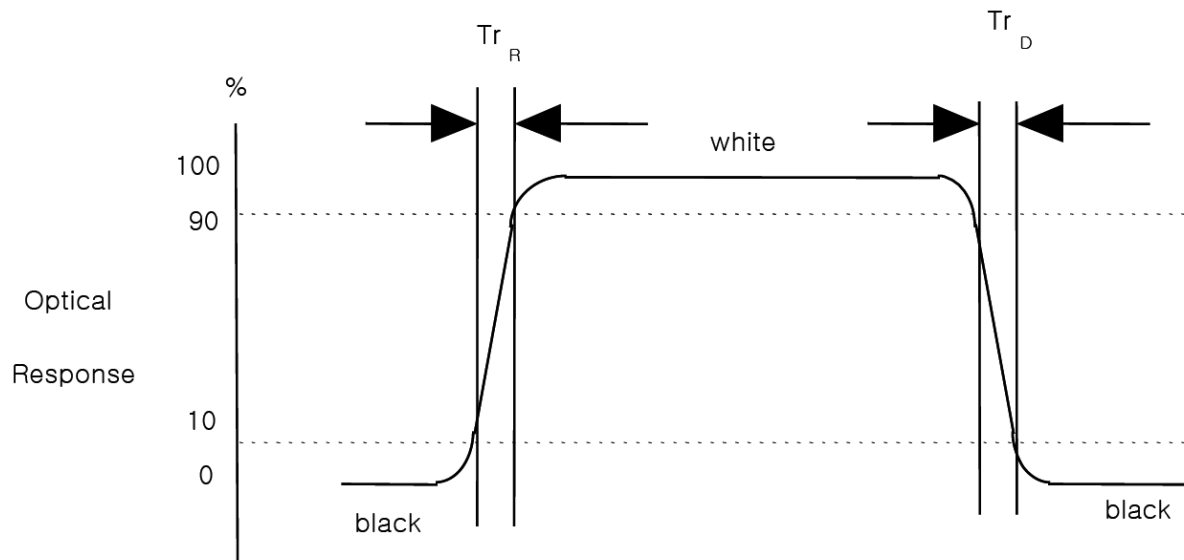


FIG. 3 The definition of Response Time

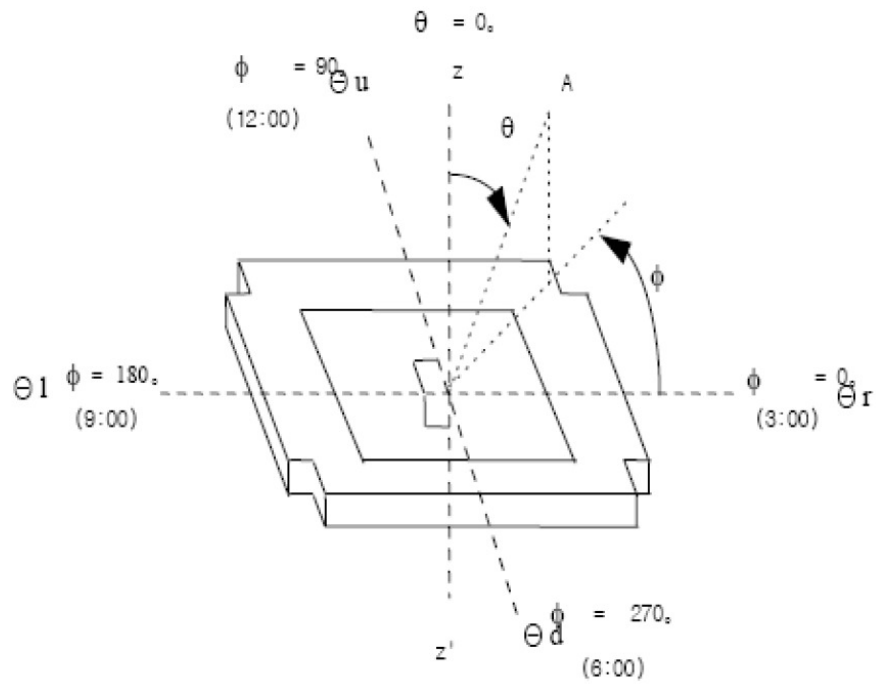
The response time is defined as the following figure and shall be measured by switching the input signal for “black” and “white”.



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FIG. 4 The definition of viewing angle

<dimension of viewing angle range>

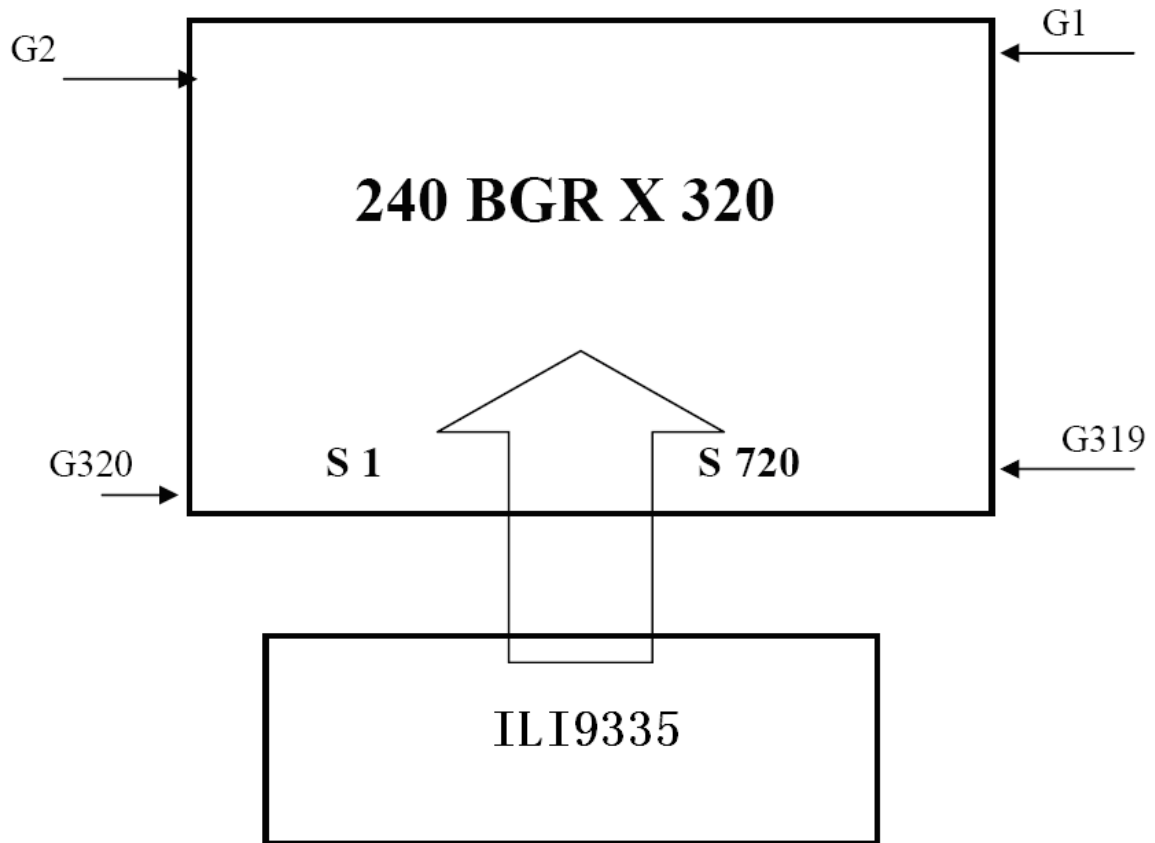


5. Interface:

Pin No.	Symbol	Function
1	DB0	DATA BUS
2	DB1	DATA BUS
3	DB2	DATA BUS
4	DB3	DATA BUS
5	GND1	GROUND
6	VCC1	POWER SUPPLY
7	/CS	CHIP SELECTION
8	RS	COMMAND / DISPLAY DATA SELECT PIN
9	/WR	WRITE ENABLE CLOCK INPUT PIN
10	/RD	READ ENABLE CLOCK INPUT PIN
11	IM0	8/16 BIT SELECT PIN
12	NC	NC
13	NC	NC
14	NC	NC
15	NC	NC
16	LEDA	LED POWER SUPPLY (+)
17	LEDK1	LED POWER SUPPLY(-)
18	LEDK2	LED POWER SUPPLY(-)
19	LEDK3	LED POWER SUPPLY(-)
20	LEDK4	LED POWER SUPPLY(-)
21	NC	NC
22	DB4	DATA BUS
23	DB8	DATA BUS
24	DB9	DATA BUS
25	DB10	DATA BUS
26	DB11	DATA BUS
27	DB12	DATA BUS
28	DB13	DATA BUS
29	DB14	DATA BUS
30	DB15	DATA BUS
31	/RESET	RESET PIN
32	VCI	POWER SUPPLY
33	VCC2	POWER SUPPLY
34	GND	GROUND
35	DB5	DATA BUS
36	DB6	DATA BUS
37	DB7	DATA BUS

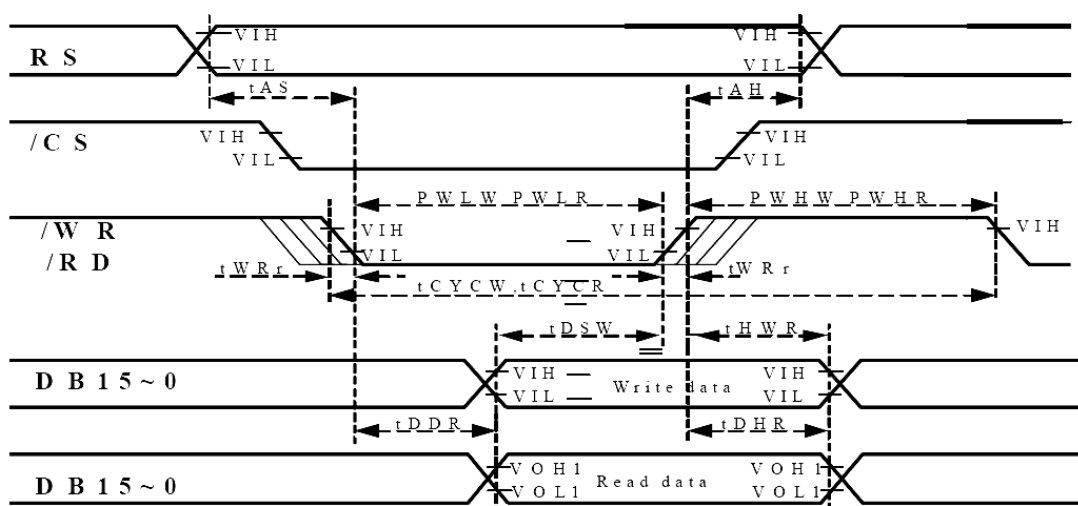
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6. Block Diagram:



7. Timing Control:

Item	Symbol	Values			Unit	Remark
		Min	Typ	Max.		
Bus cycle time	Write	t_{CYCW}	100	-	-	ns
	Read	t_{CYCR}	300	-	-	ns
Write low-level pulse width	$PWLW$	50	-	500		ns
Read low-level pulse width	$PWLR$	150	-	-		ns
Write high-level pulse width	$PWHW$	50	-	-		ns
Read high-level pulse width	$PWHR$	150	-	-		ns
Write/Read rise/fall time	$t_{WRr,WRf}$	-	-	25		ns
RS,CS and WR Setup time	t_{AS}	5	-	-		ns
Address hold time	t_{AH}	5	-	-		ns
Write data setup time	t_{DSW}	10	-	-		ns
Write data hold time	t_{HWR}	15	-	-		ns
Read data delay time	t_{DDR}	-	-	100		ns
Read data hold time	t_{DHR}	5	-	-		ns



8.Backlight:

8.1 Standard Lamp Styles (Edge Lighting Type):

The LED chips are distributed over the edge light area of the illumination unit, which gives the less power consumption:

8.2 The Main Advantages of the LED Backlight are as Following:

The brightness of the backlight can simply be adjusted.

By a resistor or a potentiometer.

8.3 Data About LED Backlight:

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	Vf	If =72	-	3.2	3.5	V
Forward Current	If		-	72		mA
Uniformity	-	If=72	80%	-	-	-
Luminous Color	-	White				
Chip Connection	-	4-LED parallel connection				

NOTE:

- 1.Backlight Only
- 2.Average Luminous Intensity of P1-P9
- 3.Uniformity = $\text{Min}(P1\sim P9)/\text{Max}(P1\sim P9) * 100\% > 80\%$

8.4 Measured Method:

P1 ○	P2 ○	P3 ○
P4 ○	P5 ○	P6 ○
P7 ○	P8 ○	P9 ○

(Effective spatial Distribution)

Hole Diameter $\pm 1\phi$; 1 to 9per Position Measured Luminous