

TFT LCD Preliminary Specification

MODEL NO.: N156B6-P06

Customer: _____

Approved by: _____

Note: To Be Approved by System.

核准時間	部門	審核	角色	投票
2009-11-20 08:22:42	NB 產品管理處		Director	Accept

1. GENERAL DESCRIPTION

1.1 OVERVIEW

The N156B6-P06 is a 15.6-inch TFT LCD cell with driver ICs and a 40-pin-and-1ch-LVDS circuit board. The product supports 1366 x 768 HD mode and can display up to 262,144 colors. The backlight unit is not built in.

1.2 FEATURES

- HD (1366 x 768 pixels) resolution
- 3.3V LVDS (Low Voltage Differential Signaling) interface
- LED converter embedded

1.3 APPLICATION

- TFT LCD Notebook
- TFT LCD Monitor
- TFT LCD TV

1.4 GENERAL SPECIFICATIONS

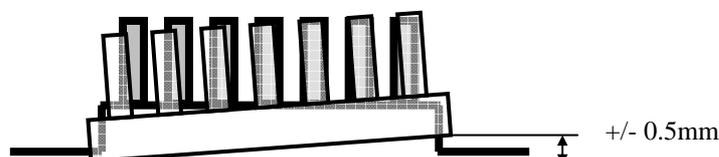
Item	Specification	Unit	Note
Active Area	344.232(H) x 193.536(V) (15.547" diagonal)	mm	(1)
Driver Element	a-si TFT active matrix	-	-
Pixel Number	1366 (H) x 3 (R.G.B.) x 768 (V)	pixel	-
Pixel Pitch	0.252 (H) x 0.252 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	262,144	color	-
Transmissive Mode	Normally White	-	-
Surface Treatment	Glare, N2T (Reflection rate< 0.5%), 3H	-	-

1.5 MECHANICAL SPECIFICATIONS

item		Min.	Typ.	Max.	Unit	Note
Size	Horizontal (H) with PCB	353.532	353.632	353.732	mm	(1) (2)
	Horizontal (H) w/o PCB	353.532	353.632	353.732	mm	
	Vertical (V) with PCB	248.536	249.536	250.536	mm	
	Vertical (V) w/o PCB	202.086	203.086	204.086	mm	
	Thickness (T) with PCB	-	-	1.8	mm	
	Thickness (T) w/o PCB	1.12	1.27	1.42	mm	
Weight		-	215	220	g	
I/F connector mounting position		The mounting inclination of the connector makes the screen center within $\pm 0.5\text{mm}$ as the horizontal.				

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

(2) Connector mounting position



2. ABSOLUTE MAXIMUM RATINGS

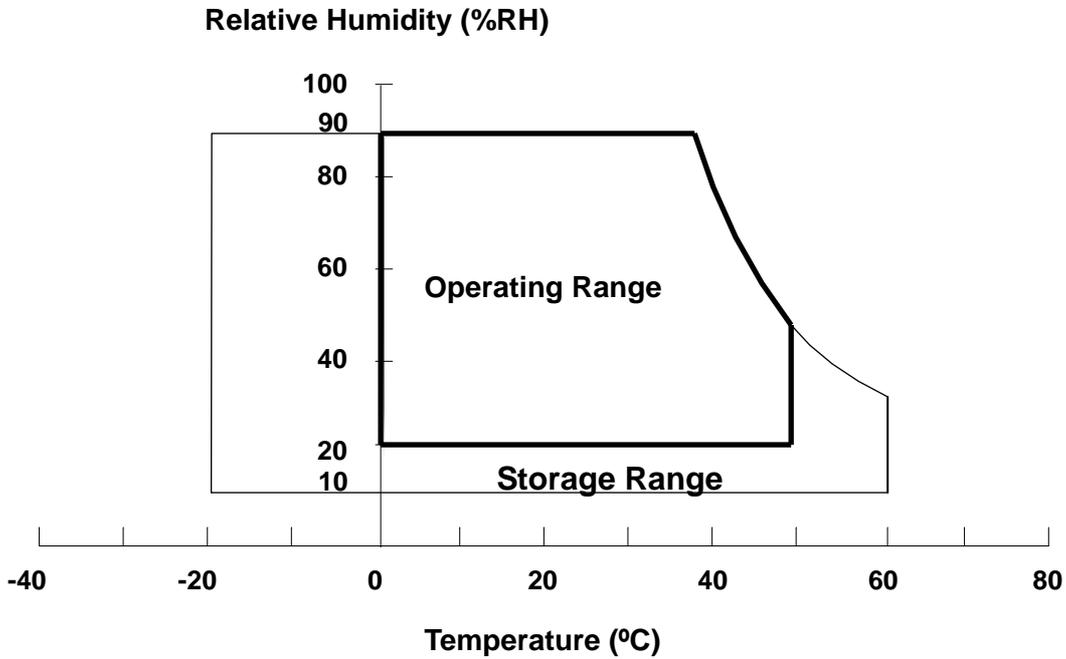
2.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-20	+60	°C	(1)
Operating Ambient Temperature	T _{OP}	0	+50	°C	(1), (2)

Note (1) Temperature and relative humidity range is shown in the figure below.

- (a) 90 %RH Max. (Ta ≤ 40 °C).
- (b) Wet-bulb temperature should be 39 °C Max. (Ta > 40 °C).
- (c) No condensation.

Note (2) The temperature of panel surface should be 0 °C Min. and 60 °C Max.



2.2 ABSOLUTE RATINGS OF ENVIRONMENT (OPEN CELL)

High temperature or humidity may reduce the performance of panel. Please store LCD panel within the specified storage conditions.

Storage Condition: With packing.

Storage temperature range: 25±5 °C.

Storage humidity range: 50±10%RH.

Shelf life: 30days

2.3 ELECTRICAL ABSOLUTE RATINGS (OPEN CELL)

Item	Symbol	Value		Unit	Note
		Min	Max		
Power Supply Voltage	VCCS	-0.3	+4.0	V	(1)
Logic Input Voltage	V _{IN}	-0.3	VCCS+0.3	V	

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

3. ELECTRICAL CHARACTERISTICS

3.1 TFT LCD OPEN CELL

Ta = 25 ± 2 °C

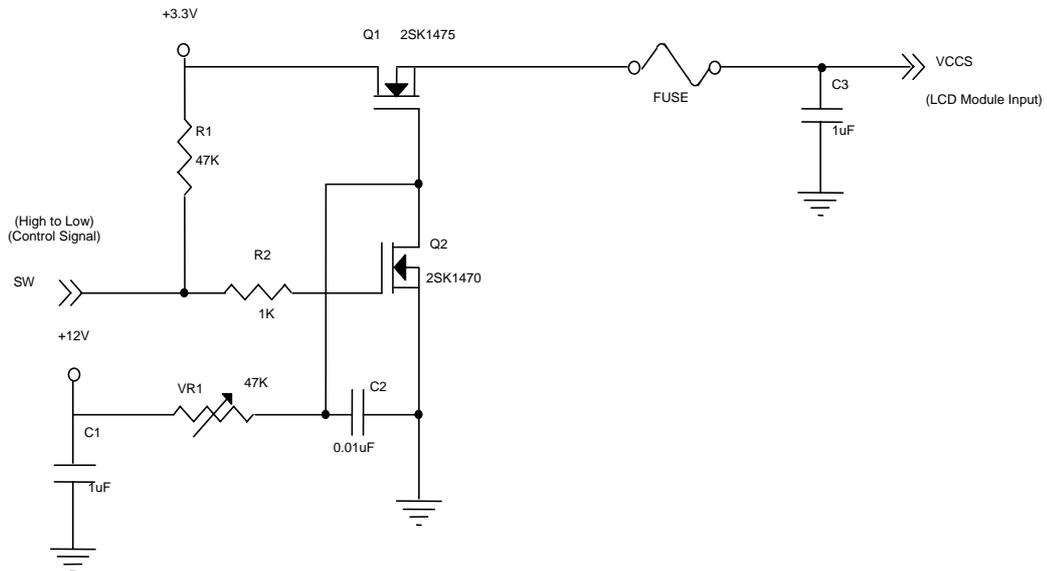
Parameter	Symbol	Value			Unit	Note	
		Min.	Typ.	Max.			
Power Supply Voltage	VCCS	3.0	3.3	3.6	V	-	
Ripple Voltage	V _{RP}	-	50	-	mV	-	
Rush Current	I _{RUSH}	-	-	1.5	A	(2)	
Initial Stage Current	I _{IS}	-	-	1.0	A	(2)	
Power Supply Current	White	I _{CC}	240	260	280	mA	(3)a
	Black		350	380	400	mA	(3)b
LVDS Differential Input High Threshold	V _{TH(LVDS)}	-	-	+100	mV	(5), V _{CM} =1.2V	
LVDS Differential Input Low Threshold	V _{TL(LVDS)}	-100	-	-	mV	(5) V _{CM} =1.2V	
LVDS Common Mode Voltage	V _{CM}	1.125	-	1.375	V	(5)	
LVDS Differential Input Voltage	V _{ID}	100	-	600	mV	(5)	
Terminating Resistor	R _T	-	100	-	Ohm	-	

Note (1) The module should be always operated within above ranges.

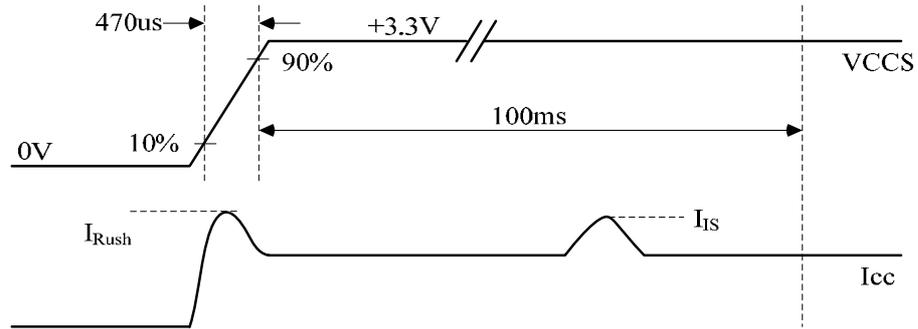
Note (2) I_{RUSH}: the maximum current when VCCS is rising

I_{IS}: the maximum current of the first 100ms after power-on

Measurement Conditions: Shown as the following figure. Test pattern: black.



VCCS rising time is 0.5ms



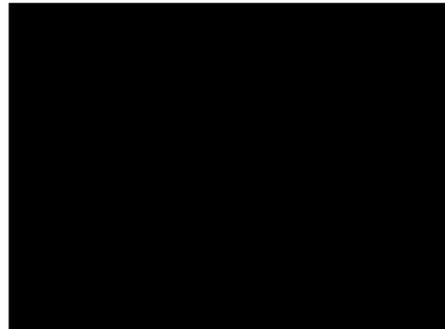
Note (3) The specified power supply current is under the conditions at VCCS = 3.3 V, $T_a = 25 \pm 2 \text{ }^\circ\text{C}$, DC Current and $f_v = 60 \text{ Hz}$, whereas a power dissipation check pattern below is displayed.

a. White Pattern



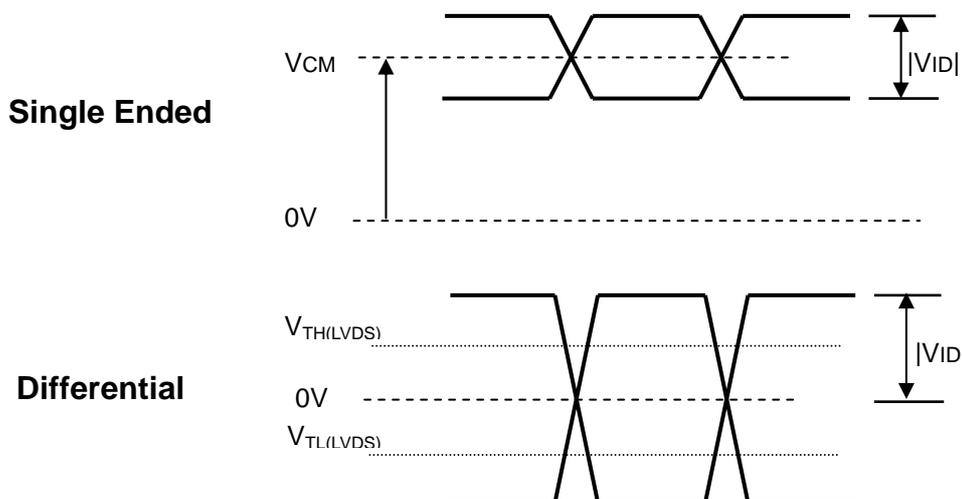
Active Area

b. Black Pattern



Active Area

Note (4) The parameters of LVDS signals are defined as the following figures.



Note (5) The specified power are the sum of LCD panel electronics input power and the converter input power. Test conditions are as follows.

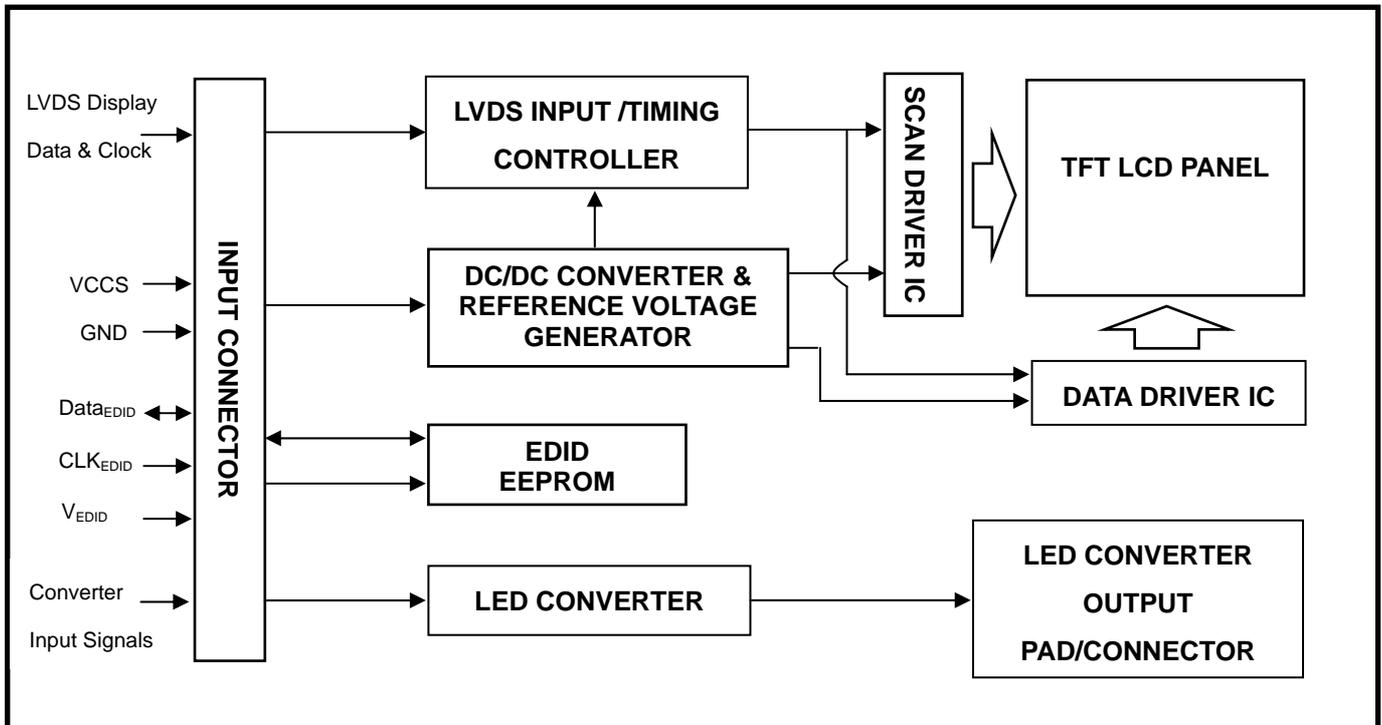
(a) VCCS = 3.3 V, $T_a = 25 \pm 2$ °C, $f_v = 60$ Hz,

(b) The pattern used is a black and white 32 x 36 checkerboard, slide #100 from the VESA file "Flat Panel Display Monitor Setup Patterns", FPDMSU.ppt.

(c) Luminance: 60 nits.

4. BLOCK DIAGRAM

4.1 TFT LCD OPEN CELL



5. INPUT TERMINAL PIN ASSIGNMENT

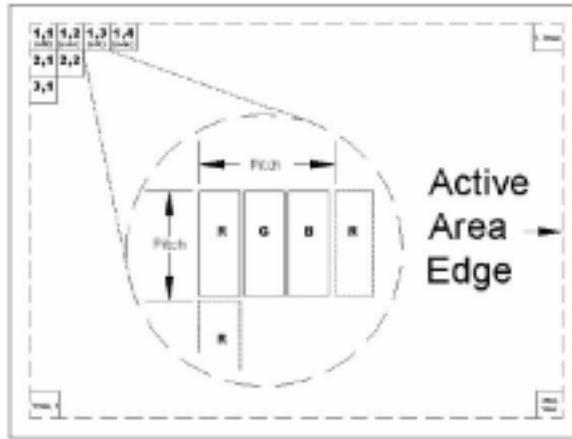
5.1 TFT LCD OPEN CELL

Pin	Symbol	Description	Polarity	Remark
1	Reserve	Non-Connection use by CMO		
2	Vcc	Power Supply +3.3 V (typical)		
3	Vcc	Power Supply +3.3 V (typical)		
4	V _{EDID}	DDC 3.3V Power		DDC 3.3V Power
5	Reserve	Non-Connection use by CMO		
6	CLK _{EDID}	DDC Clock		DDC Clock
7	DATA _{EDID}	DDC Data		DDC Data
8	Rxin0-	LVDS Differential Data Input	Negative	R0~R5,G0
9	Rxin0+	LVDS Differential Data Input	Positive	
10	Vss	Ground		
11	Rxin1-	LVDS Differential Data Input	Negative	G1~G5, B0, B1
12	Rxin1+	LVDS Differential Data Input	Positive	
13	Vss	Ground		
14	Rxin2-	LVDS Differential Data Input	Negative	B2~B5, DE, Hsync, Vsync
15	Rxin2+	LVDS Differential Data Input	Positive	
16	Vss	Ground		
17	CLK-	LVDS Clock Data Input	Negative	LVDS Level Clock
18	CLK+	LVDS Clock Data Input	Positive	
19	Vss	Ground		
20	NC	Non-Connection		
21	NC	Non-Connection		
22	Vss	Ground		
23	NC	Non-Connection		
24	NC	Non-Connection		
25	Vss	Ground		
26	NC	Non-Connection		
27	NC	Non-Connection		
28	Vss	Ground		
29	NC	Non-Connection		
30	NC	Non-Connection		
31	LED_GND	Ground_LED		
32	LED_GND	Ground_LED		
33	LED_GND	Ground_LED		
34	Reserve	Non-Connection use by CMO		
35	LED_PWM	System PWM Signal Input		
36	LED_EN	LED enable pin		
37	Reserve	Non-Connection use by CMO		
38	LED_VCCS	LED Power		
39	LED_VCCS	LED Power		
40	LED_VCCS	LED Power		

Note (1) Connector Part No.: IPEX 20455-040E-12 or equivalent

Note (2) User's connector Part No: IPEX 20453-040T or equivalent

Note (3) The first pixel is odd as shown in the following figure.

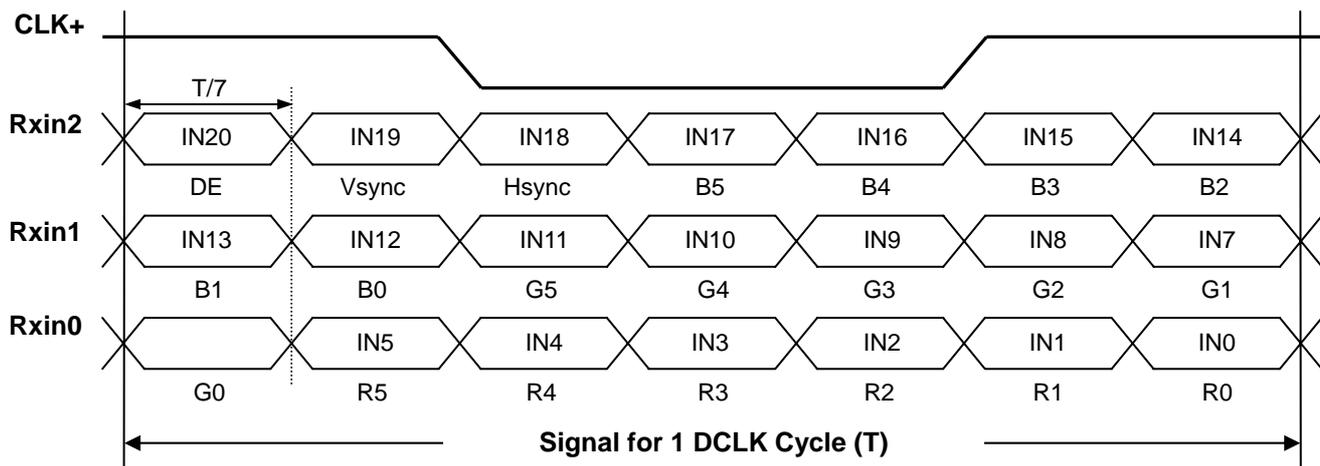


5.2 LED CONVERTER OUTPUT PIN ASSIGNMENT

Pin	Symbol	Description
1	V_L	LED converter output voltage
2	V_L	LED converter output voltage
3	CH1	LED converter feedback channel 1
4	CH2	LED converter feedback channel 2
5	CH3	LED converter feedback channel 3
6	CH4	LED converter feedback channel 4
7	CH5	LED converter feedback channel 5
8	CH6	LED converter feedback channel 6

Note (1) Connector Part No.: ???? or equivalent

5.3 TIMING DIAGRAM OF LVDS INPUT SIGNAL



5.4 COLOR DATA INPUT ASSIGNMENT

The brightness of each primary color (red, green and blue) is based on the 6-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color versus data input.

Color		Data Signal																	
		Red						Green						Blue					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale Of Red	Red(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Red(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Red(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Red(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
Gray Scale Of Green	Green(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Green(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Green(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
Green(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	
Gray Scale Of Blue	Blue(0)/Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	Blue(61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Blue(62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
Blue(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	

Note (1) 0: Low Level Voltage, 1: High Level Voltage

6. CONVERTER SPECIFICATION

6.1 ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings
LED_VCCS	-0.3V~25V
LED_PWM	-0.3~5.0V
LED_EN	-0.3V~5.0V

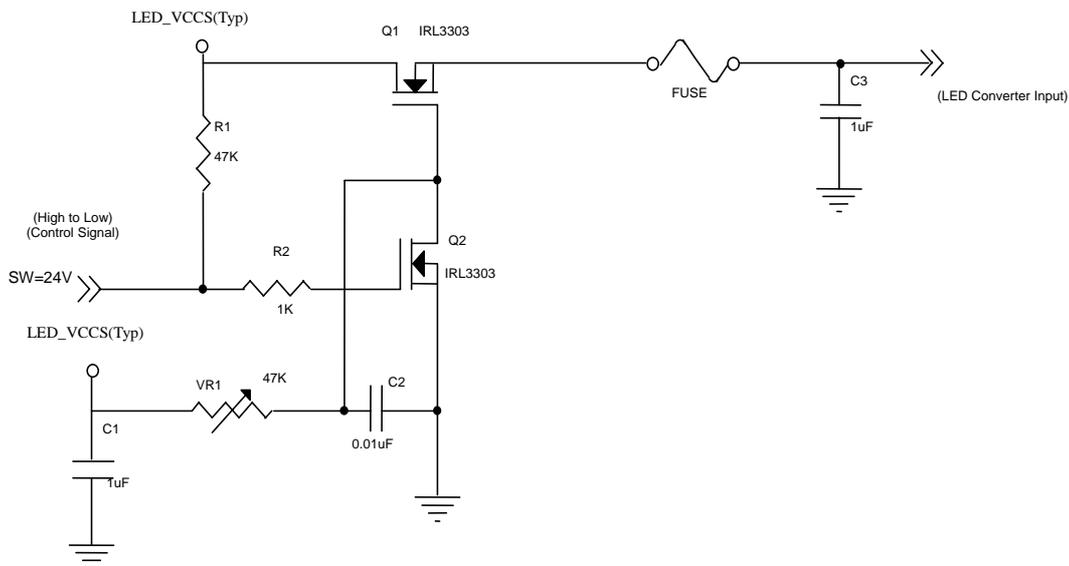
6.2 RECOMMENDED OPERATING RATINGS

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Converter Input power supply voltage	LED_Vccs	6.0	12.0	21.0	V	-
Converter Rush Current	I _{LED_RUSH}	-	-	1.5	A	(1)
Converter Initial Stage Current	I _{LED_IS}	-	-	1.5	A	(1)
EN Control Level	Backlight On	2.3	-	5.0	V	-
	Backlight Off	0.0	-	0.5	V	-
PWM Control Level	PWM High Level	2.3	-	5.0	V	-
	PWM Low Level	0.0	-	0.5	V	-
PWM Control Duty Ratio		10	-	100	%	-
		5	-	100	%	(2)
PWM Control Permissible Ripple Voltage	V _{PWM_pp}	-	-	100	mV	-
PWM Control Frequency	f _{PWM}	190	210	2k	Hz	(3)

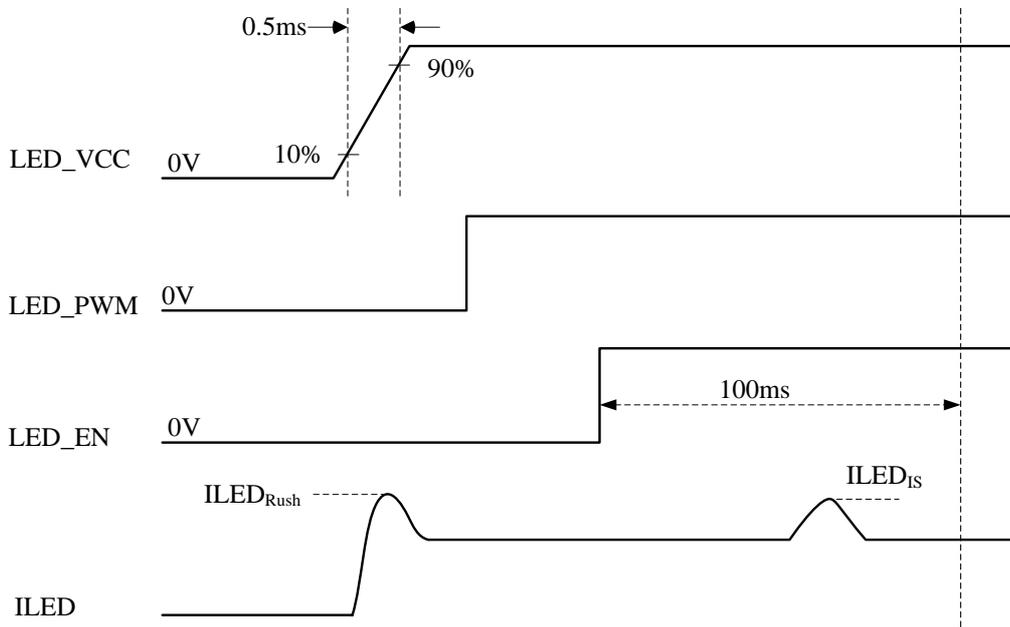
Note (1) I_{LED_RUSH}: the maximum current when LED_VCCS is rising,

I_{LED_IS}: the maximum current of the first 100ms after power-on,

Measurement Conditions: Shown as the following figure. LED_VCCS = Typ, Ta = 25 ± 2 °C, f_{PWM} = 200 Hz, Duty=100%.



VLED rising time is 0.5ms



Note (2) If the PWM control duty ratio is less than 10%, there is some possibility that acoustic noise or backlight flash can be found. And it is also difficult to control the brightness linearity.

Note (3) If PWM control frequency is applied in the range less than 1KHz, the “waterfall” phenomenon on the screen may be found. To avoid the issue, it’s a suggestion that PWM control frequency should follow the criterion as below.

PWM control frequency f_{PWM} should be in the range

$$(N + 0.33) * f \leq f_{PWM} \leq (N + 0.66) * f$$

N : Integer ($N \geq 3$)

f : Frame rate

6.3 LED CONVERTER OUTPUT RATINGS

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Converter output voltage	V_L	22.4	25.6	28	V	
Converter output current	I_L	114	120	126	mA	
Converter feedback channel current	I_{CH}	19	20	21	mA	

7. INTERFACE TIMING

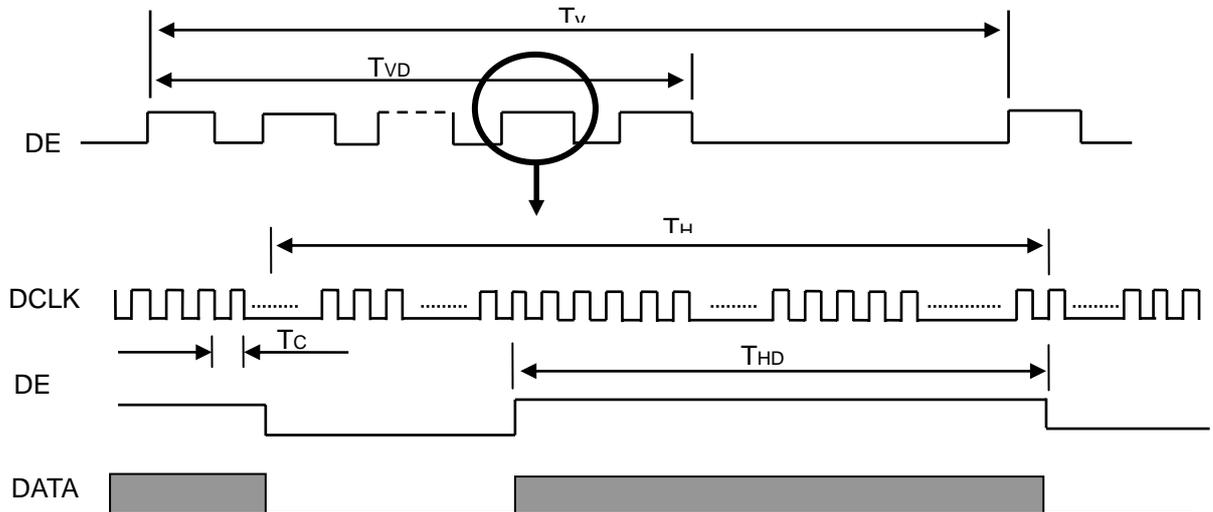
7.1 INPUT SIGNAL TIMING SPECIFICATIONS

The input signal timing specifications are shown as the following table and timing diagram.

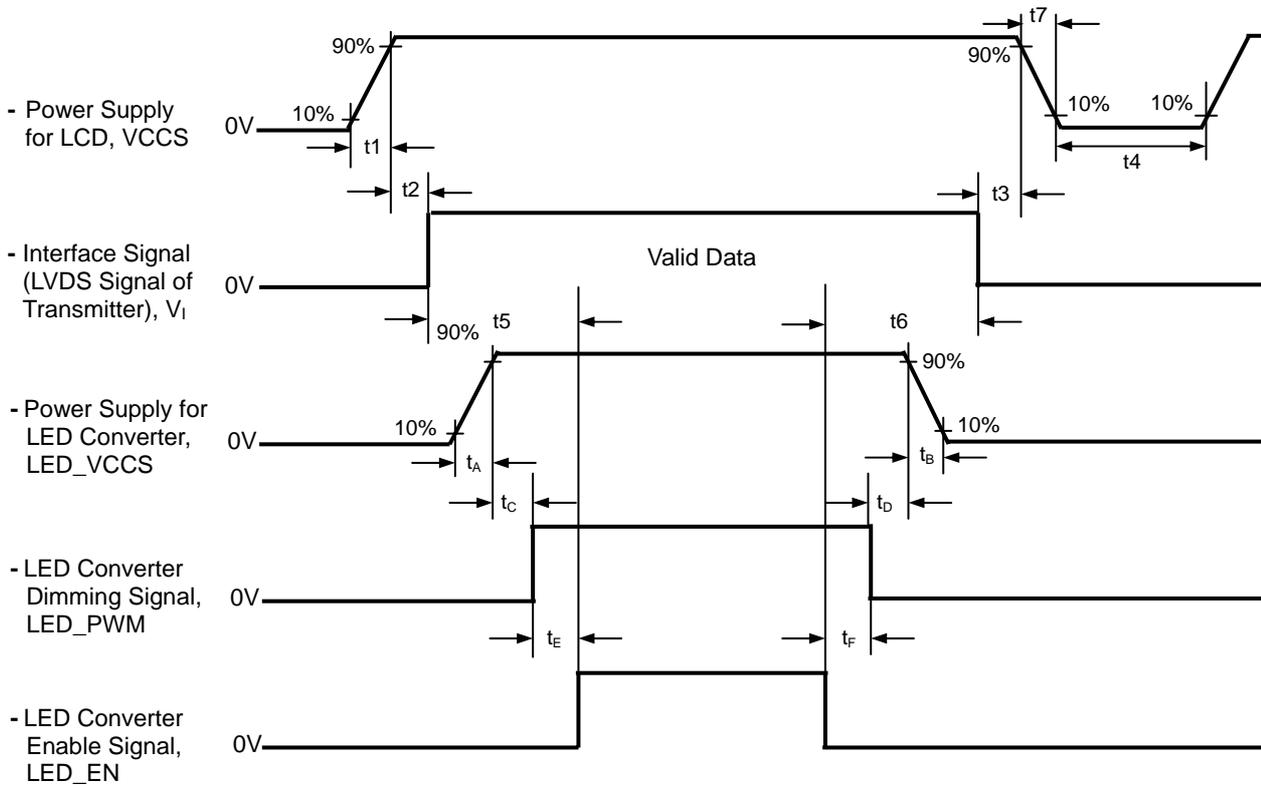
Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
DCLK	Frequency	1/Tc	67.9	75.5	80	MHz	(2)
DE	Vertical Total Time	TV	778	806	888	TH	-
	Vertical Active Display Period	TVD	768	768	768	TH	-
	Vertical Active Blanking Period	TVB	TV-TVD	38	TV-TVD	TH	-
	Horizontal Total Time	TH	1446	1560	1950	Tc	(2)
	Horizontal Active Display Period	THD	1366	1366	1366	Tc	(2)
	Horizontal Active Blanking Period	THB	TH-THD	194	TH-THD	Tc	(2)

Note (1) Because this module is operated by DE only mode, Hsync and Vsync are ignored.

INPUT SIGNAL TIMING DIAGRAM



7.2 POWER ON/OFF SEQUENCE



Timing Specifications:

0.5	t1	10 ms
0	t2	50 ms
0	t3	50 ms
	t4	500 ms
	t5	200 ms
	t6	200 ms
0.5	t7	10 ms
0.5	tA	10 ms
0 <	tB	10 ms
	tC	10 ms
	tD	10 ms
	tE	10 ms
	tF	10 ms

Note (1) Please follow the power on/off sequence described above. Otherwise, the LCD module might be damaged.

Note (2) Please avoid floating state of interface signal at invalid period. When the interface signal is invalid, be sure to pull down the power supply of LCD VCCS to 0 V.

Note (3) The backlight must be turned on after the power supply for the logic and the interface signal is valid. The backlight must be turned off before the power supply for the logic and the interface signal is invalid.

Note (4) Please follow the LED converter power sequence as above. If the customer could not follow, it might cause backlight flash issue during display ON/OFF or damage the LED backlight controller

8. OPTICAL CHARACTERISTICS

8.1 TEST CONDITIONS

Item	Symbol	Value	Unit
Ambient Temperature	Ta	25±2	°C
Ambient Humidity	Ha	50±10	%RH
Supply Voltage	V _{CC}	3.3	V
Input Signal	According to typical value in "3. ELECTRICAL CHARACTERISTICS"		

8.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown as below. The following items should be measured under the test conditions described in 7.1 and stable environment shown in Note (6).

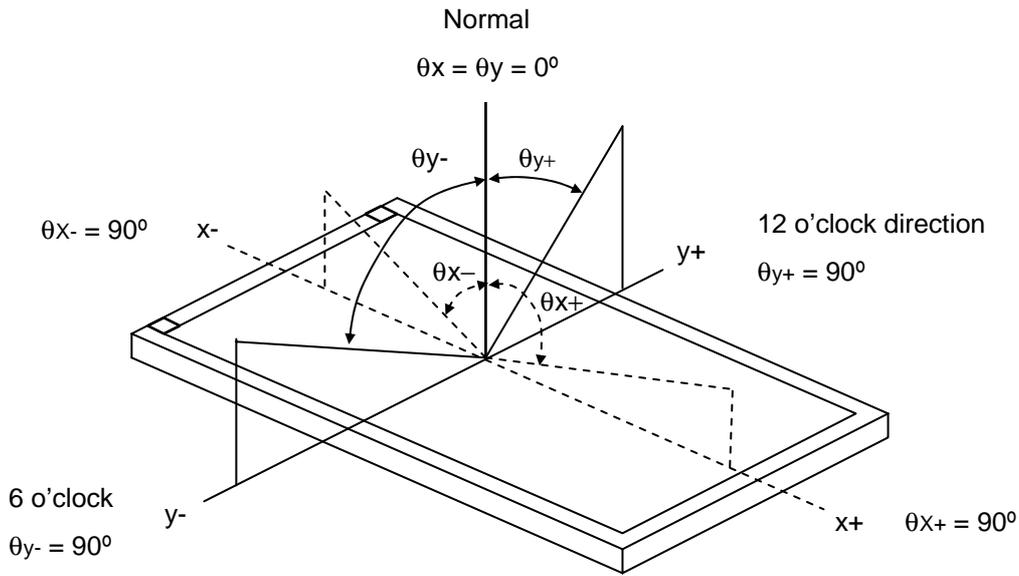
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note					
Color Chromaticity	Red	Rcx	$\theta_x=0^\circ, \theta_y=0^\circ$ CS-1000T Standard light source "C"	Typ - 0.03	0.630	Typ + 0.03	-	(0),(6)					
		Rcy			0.329		-						
	Green	Gcx			0.284		-						
		Gcy			0.564		-						
	Blue	Bcx			0.156		-						
		Bcy			0.122		-						
	White	Wcx			0.314		-						
		Wcy			0.347		-						
	Center Transmittance				T%		$\theta_x=0^\circ, \theta_y=0^\circ$		5.5	6.5			(1), (8)
	Contrast Ratio				CR		CS-1000T, CMO BLU		500	650		-	(1), (3)
Response Time		T _R	$\theta_x=0^\circ, \theta_y=0^\circ$		3	8	ms	(4)					
		T _F			7	12	ms						
Transmittance uniformity		ΔT%	$\theta_x=0^\circ, \theta_y=0^\circ$ BM-5A			1.25	-	(1), (7)					
Viewing Angle	Horizontal	θ _{x+}	CR≥10 BM-5A	40	45		Deg.	(1), (3) (6)					
		θ _{x-}		40	45								
	Vertical	θ _{y+}		15	20								
		θ _{y-}		40	45								

Note (0) Light source is the standard light source "C" which is defined by CIE and driving voltages are based on suitable gamma voltages. The calculating method is as following :

1. Measure Module's and BLU's spectrums. White is without signal input and R, G, B are with signal input. BLU is supplied by CMO.
2. Calculate cell's spectrum.
3. Calculate cell's chromaticity by using the spectrum of standard light source "C"

Note (1) Light source is the BLU which is supplied by CMO and driving voltages are based on suitable gamma voltages. White is without signal input and R, G, B are with signal input. SPEC is judged by CMO's golden sample.

Note (2) Definition of Viewing Angle (θ_x, θ_y):



Note (3) Definition of Contrast Ratio (CR):

$$CR_{AVE} = [CR(1) + CR(2) + CR(3) + CR(4) + CR(5)] / 5$$

CR_{max} = Max value of CR at whole Viewing Angle

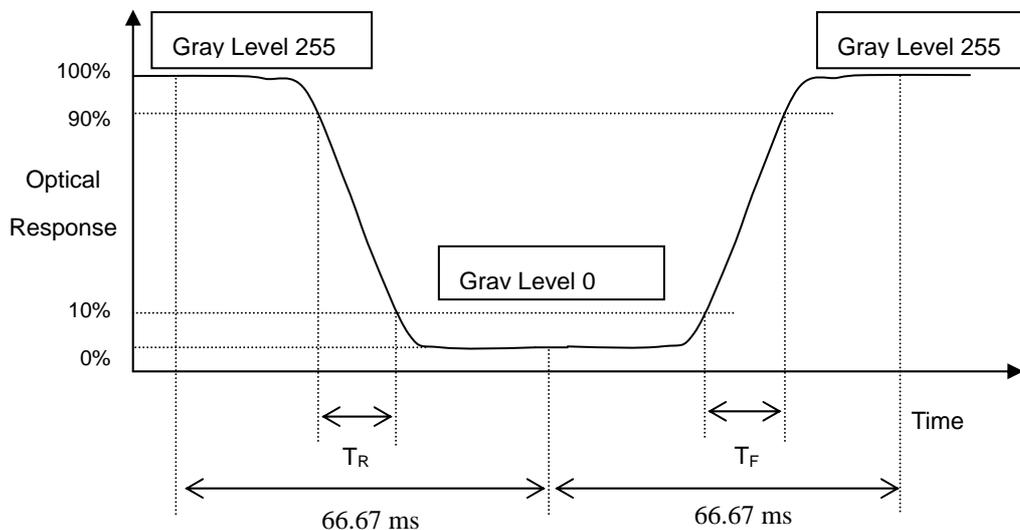
CR (X) is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

$$CR = \frac{\text{Luminance with all pixel white (Gmax)}}{\text{Luminance with all pixel black (Gmin)}}$$

Gmax: Luminance of gray max at the center point of panel.

Gmin: Luminance of gray min at the center point of panel.

Note (4) Definition of Response Time (T_R , T_F):



Note (5) Definition of Luminance of White (L_C):

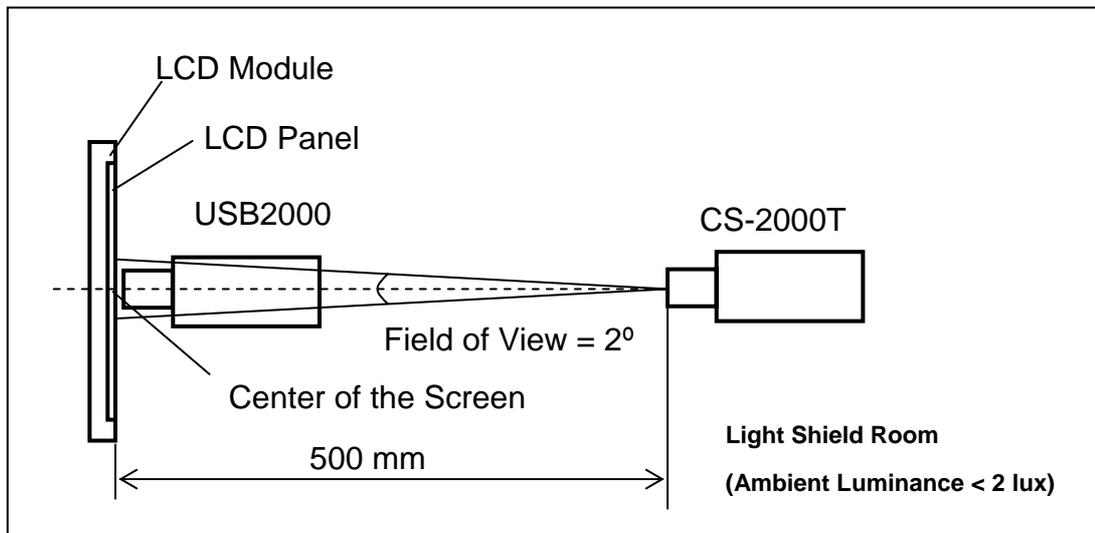
Measure the luminance of gray level 255 at center point

$$L_C = L(5)$$

$L(x)$ is corresponding to the luminance of the point X at Figure in Note (7).

Note (6) Measurement Setup:

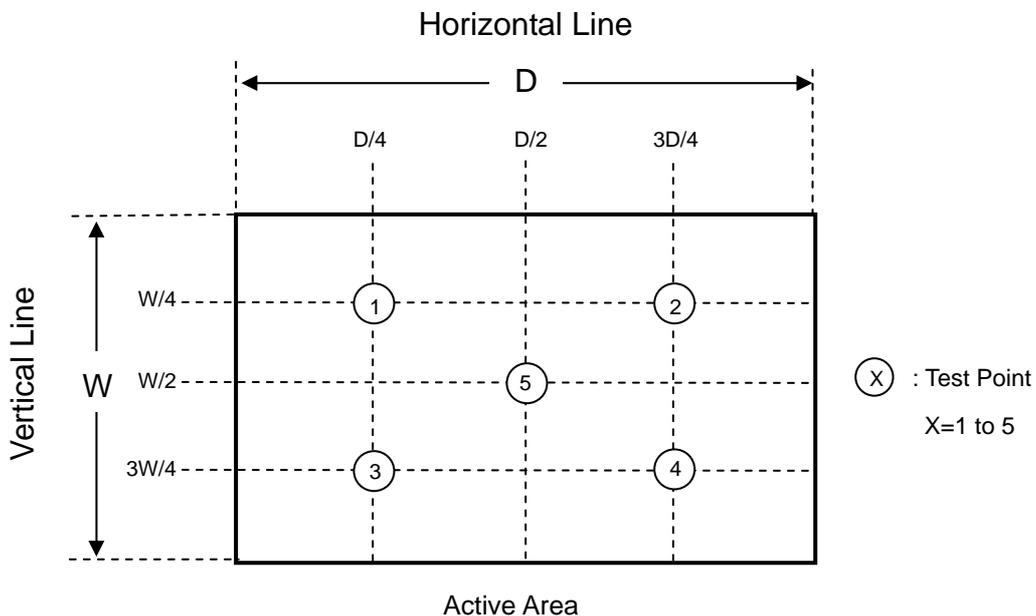
The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note (7) Definition of Transmittance Variation ($\delta T\%$):

Measure the transmittance at 5 points

$$T\% = \frac{\text{Maximum } [T\%(1), T\%(2), \dots T\%(5)]}{\text{Minimum } [T\%(1), T\%(2), \dots T\%(5)]}$$



Note (8) Definition of Transmittance (T%):

Module is without signal input.

BLU is supplied by CMO.

$$\text{Transmittance} = \frac{\text{Luminance of LCD module}}{\text{Luminance of backlight}} * 100\%$$

8.3 Flicker Adjustment

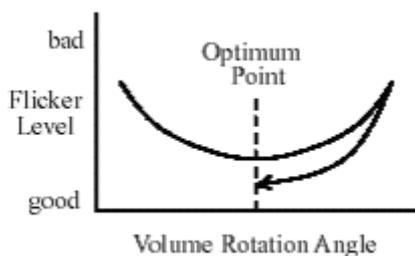
(1) Adjustment Pattern: 2H1V checker pattern as follows.

R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B
R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B	R	G	B



(2) Adjustment Method:

Flicker should be adjusted by turning the volume for flicker adjustment by the ceramic driver. It is adjusted to the point with least flickering of the whole screen. After making it surely overrun at once, it should be adjusted to the optimum point.



9. PACKAGING

9.1 PACKING SPECIFICATIONS

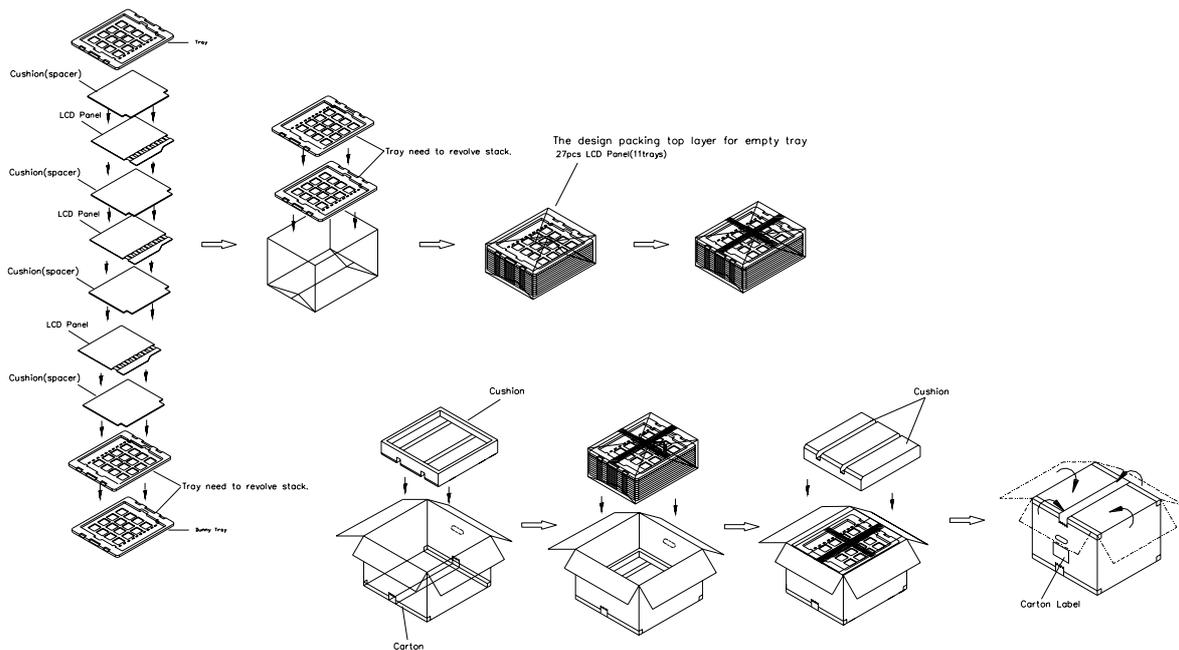
- (1) 27 open cells / 1 Box
- (2) Box dimensions: 475mm(L) X 390mm(W) X 320mm(H)
- (3) Weight: approximately 16.5Kg (27 open cells per box)

9.2 PACKING METHOD

- (1) Carton Packing should have no failure in the following reliability test items

Test Item	Test Conditions	Note
Packing Vibration	ISTA STANDARD Random, Frequency Range: 1 – 200 Hz Top & Bottom: 30 minutes (+Z), 10 min (-Z), Right & Left: 10 minutes (X) Back & Forth 10 minutes (Y)	Non Operation

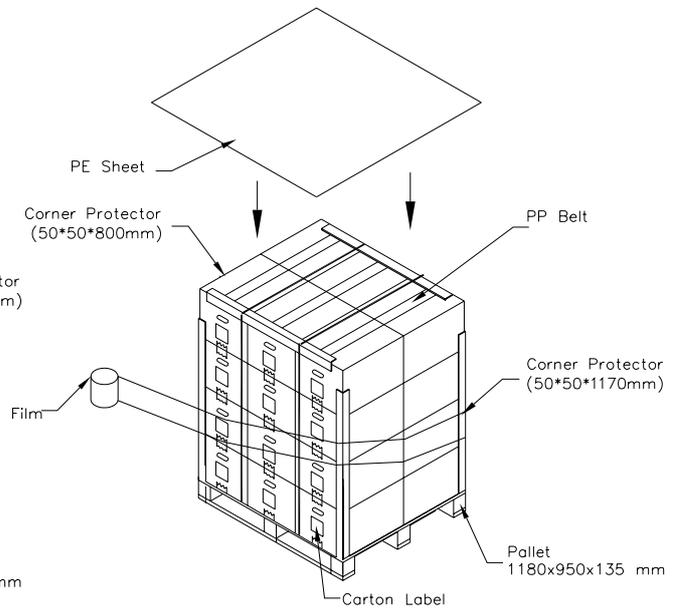
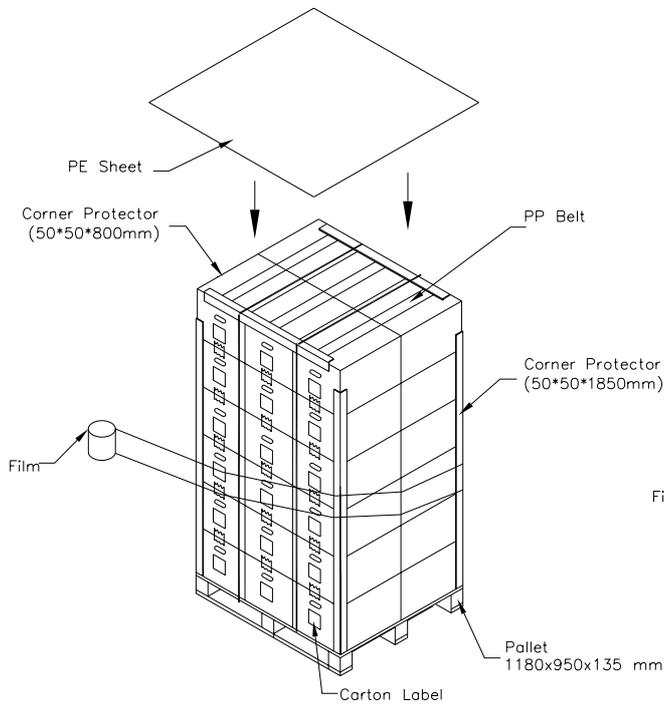
- (2) Packing method.



- (1) 27 LCD Cells+PCB/1 box
- (2) Carton dimensions : 475(L)x390(W)x320(H)mm
- (3) Weight : approximately 16.5kg(27 Cells per Carton).

Sea and Land Transportation

Air Transportation



10. DEFINITION OF LABELS

10.1 CMO OPEN CELL LABEL

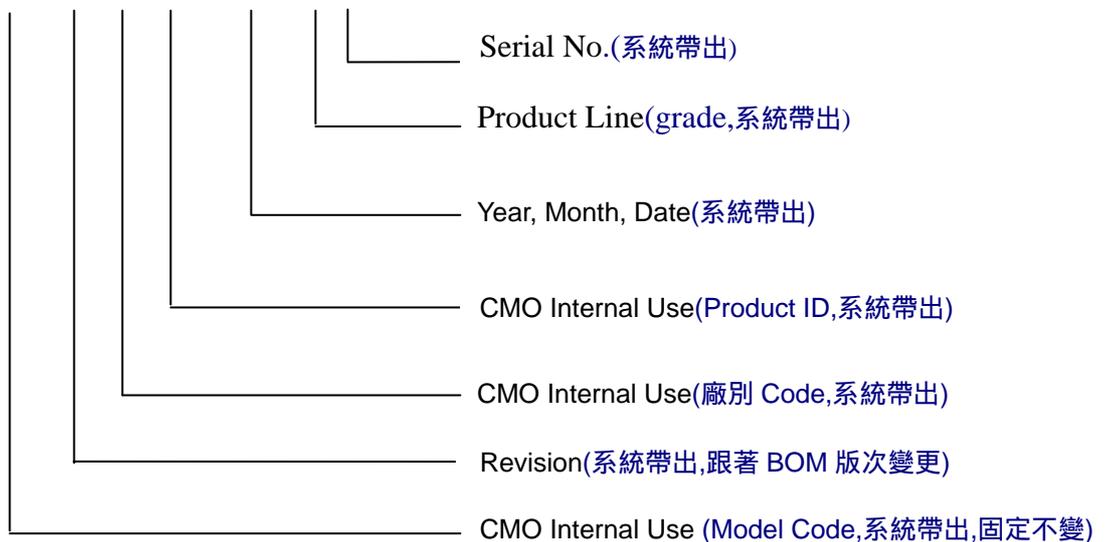
The barcode nameplate is pasted on each OPEN CELL as illustration for CMO internal control.



(a) Model Name: N156B6-P06

(b) Revision: Rev. XX, for example: C1, C2 ...etc.

(c) Serial ID: X X X X X X Y M D L N N N N

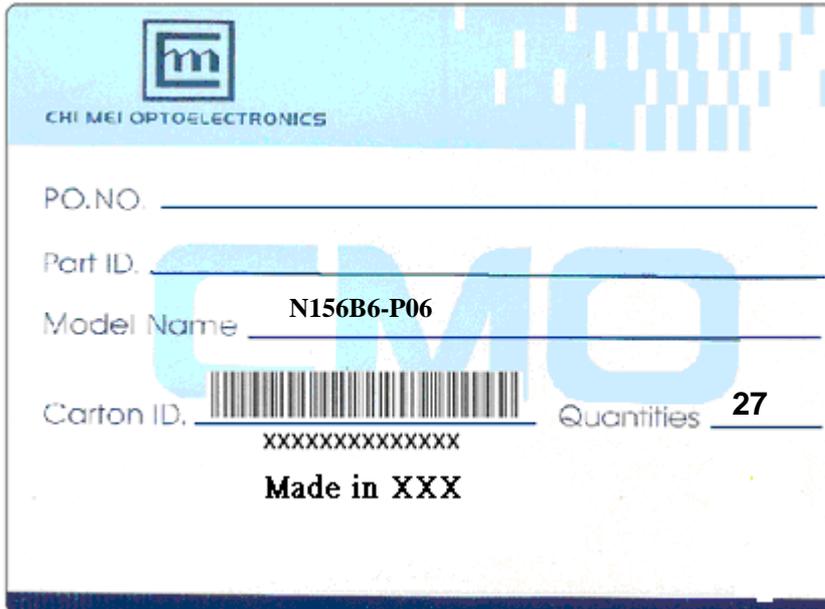


(d) Production Location: MADE IN XXXX. XXXX stands for production location.

10.2 CARTON LABEL

The barcode nameplate is pasted on each box as illustration, and its definitions are as following explanation

- (a) Model Name: N156B6 –P06
- (b) Carton ID: CMO internal control
- (c) Quantities: 27



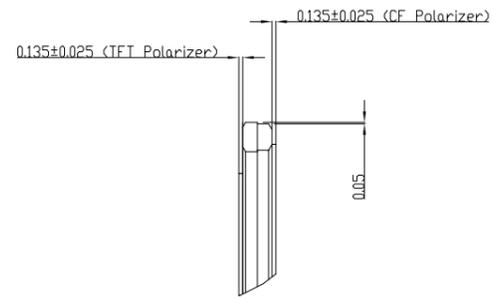
11. PRECAUTIONS

11.1 ASSEMBLY AND HANDLING PRECAUTIONS

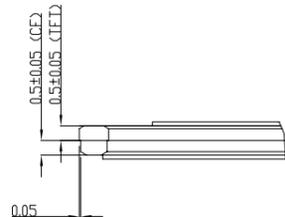
- (1) Do not apply rough force such as bending or twisting to the product during assembly.
- (2) To assemble backlight or install module into user's system can be only in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) It's not permitted to have pressure or impulse on the module because the LCD panel will be damaged.
- (4) Always follow the correct power sequence when the product is connecting and operating. This can prevent damage to the CMOS LSI chips during latch-up.
- (5) Do not pull the I/F connector in or out while the module is operating.
- (6) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (7) It is dangerous that moisture come into or contacted the product, because moisture may damage the product when it is operating.
- (8) High temperature or humidity may reduce the performance of module. Please store this product within the specified storage conditions.
- (9) When ambient temperature is lower than 10°C may reduce the display quality. For example, the response time will become slowly.

11.2 SAFETY PRECAUTIONS

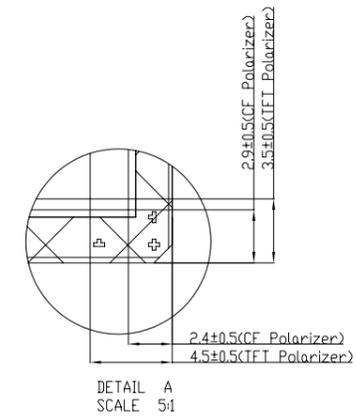
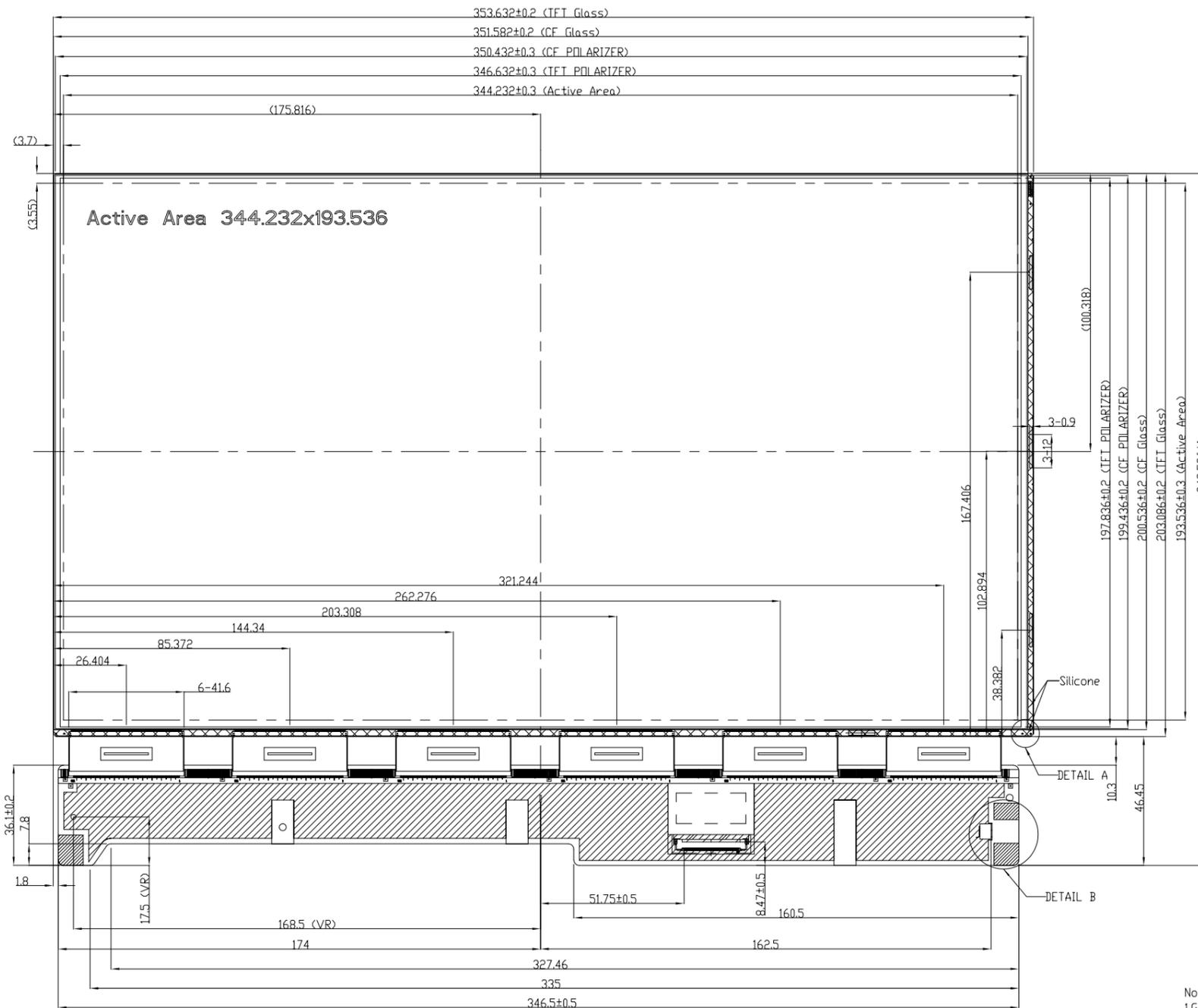
- (1) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (2) After the product's end of life, it is not harmful in case of normal operation and storage.



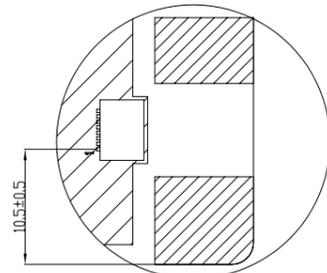
SCALE 8:1



SCALE 8:1



DETAIL A
SCALE 5:1



DETAIL B
SCALE 3:1

Note:
1.General Tolerance=±0.2mm
2.LVDS Connector : IPEX 20455-040E-12 or Equivalent.
3.LED Connector : FCI-59453-082110EDHLF or Equivalent

TITLE	OUTLINE DRAWING NI56B6-P06			2D REV. A
Approved	CK Hung	Drawing No.	NI5634113A	3D REV. I
Checked	Chaney Chen	Part No.	NA	
Drawer	Yehh	Material	NA	Sheet 1 / 1 A1
Designer	Julie_Lien	Date	2-Nov-2009	Scale 1:1 Unitmm

Mark	Description	Date	Changed_By	Approved_By	ECN No.	Remark