

SHENZHEN XINGYUHE CO.,LTD

# SPECIFICATIONS

**CUSTOMER** :

**PRODUCT** : LCD Module

**SAMPLE CODE** : JGG12864A04

**VER** : 1.0

Customer Approved	Confirmed	Designer

# 深圳市兴宇合电子有限公司

\*\*\*\*\*

## 1. Subject and Scope

- 1.1. The specification is made for JGG12864A04 LCD, including technical requirement, test method, inspection rules and parameter specifications.
- 1.2. The STN LCD is blue transmissive type, and uses multi-driven method with 1/65duty, 1/9 bias and operation voltage of Customer samples.

## 2. Reference Standards

Q/IGS 0003-1998 Detailed Specification of STN-LCD for Instruments and Calculator  
GB/T4619-1996 Test Method for LCD  
GB7290 Test Method for Dynamic driving LCD  
GB2828 Sampling Method and Sampling Table for Lots Inspection and Count

## 3. Conditions of Operation Guarantee

### 3.1. Temperature Ranges

Storage Temperature	-30 ...80	[°C]
Operating Temperature	-20 ... 70	[°C]

### 3.2. Relative Air Humidity

Annual Average	= 75	[%RH]
30Days/Year	= 85	[%RH]
Short Time	= 95	[%RH]

### 3.3. Component Life Cycle

Storage Life	= 8	[Years]
Overall Component Life	= 8	[Years]
Operation Life	= 150.000	[h]

### 3.4. Polarizer

No crack or critical light circle in V.A

### 3.5. Display conditions

The LCD should be driven by the specified operation voltage, tested by LCD tester. Electrode shortcut, display of Electrode lines , no display and partial display are not allowed. Contrast ratio should be consistent.

### 3.6 LCD pattern drawing and size

Confirm to the requirement of item 4 .

### 3.7 LCD structural material

3.7.1. Main material for LCD producing supplied by the manufacturers are listed in item

3.7.2. Samples or report will be presented when manufacturer alters.

3.7.3. Manufacturers

# 深圳市兴宇合电子有限公司

\*\*\*\*\*

Polarizer SANLIPU Co., Ltd. (China)  
 ITO Glass TIAN ZE Co., Ltd. (China)  
 Liquid Crystal YONGSHENGHUAQING Co., Ltd (German)

## 3.8.1.Polarizer

3.8.1.1. Polarizer position : Polarizer should be plan ,be not awry ,and be free of bubble, peel and contaminant. Remove the protection film of the upper polarizer before use ,avoid hard object ,fingers or chemicals contacting the LCD surface.

3.8.1.2 The polarizer should cover the whole seal frame area and should not exceed the glass edge and should not cock up.

### Defect specification

Item	Details	Section Dimension [mm]	defects	defect type
non display	no non display is allowed		disallowed	major
irregular operating	no irregular operatings are allowed		disallowed	major
short	no shorts are allowed		disallowed	major
open	any segments or common patterns that don't activate are rejectable		disallowed	major
over current	the total current required to activate all segments should not exceed the limit current in the specifications for approval on the test voltage		disallowed	major
maximum rating	values that don't meet the ratings noted in the specification		disallowed	major
backlight	- no lighting is rejectable - flickering and abnormal lighting is rejectable		disallowed	major
black and white spots	dust, bubbles, dents or defective alignment in the cell or polarizer filter, also dust or dirt between glass and lens	$\varnothing \leq 0,1$ $0,10 < \varnothing \leq 0,20$ $0,20 < \varnothing \leq 0,25$ $0,25 < \varnothing \leq 0,30$ $0,30 < \varnothing$	nc 3 0 0 0	minor
black and white lines	scratches, dust in the orientation of the cell or polarizer filter	$W \leq 0,01$ $W \leq 0,02 \quad L \leq 5,0$ $W \leq 0,03 \quad L \leq 3,0$ $W \leq 0,05 \quad L \leq 2,0$ $W \leq 0,06 \quad L \leq 1,0$	nc 3 2 1 0	minor
<i>SUM of allowable defects</i>			5	
bubbles in the polarizer	bubbles between the polarizer and glass	$\varnothing \leq 0,2$ $0,20 < \varnothing \leq 0,50$ $0,50 < \varnothing \leq 1,00$ $1,00 < \varnothing$	n.c. 2 1 0	minor

Item	Details	Section	defects	defect type
<i>SUM of allowable defects</i>			3	

# 深圳市兴宇合电子有限公司

Misformed Dots Dents		$\leq 0.15$ mm $> 0.15$ mm	3 0	
Projection without connections to adjacent dots		$\leq 0.05$ mm $> 0.05$ mm	3 0	
Connection to adjacent dot Pin Hole		$(X+Y)/2: \leq 0.2$ mm $(X+Y)/2: > 0.2$ mm.	3 0	
<i>SUM of allowable defects</i>			3	
newton rings rainbow colour	no rainbow colour is allowed in the optimum contrast on state within the active area no newton rings are allowed in the plastic cover		disallowed	minor
chromaticity uniformity	uneven colour caused by uneven gaps between glass		disallowed	minor

(Note: nc = not counted)

## 3.8.2 Glass defect

### 3.8.2.1 Glass defect on ITO layer at ledge area (figure 1)

Defects allowed unit: mm

item	Thickness of defect (a)	Width of defect (b)	Length of defect (c)	Numbers
01	$a \leq 1 / 2 t$	$b \leq 0,5$	$c \leq 2$	$N \leq 2$

### 3.8.2.2 Glass defect at reverse side or non ITO layer ledge (figure2)

Defects allowed unit: mm

item	Thickness of defect (a)	Width of defect (b)	Length of defect (c)	Numbers
01	$a \leq 1 / 2 t$	$b \leq 0,5$	$c \leq 2$	$N \leq 2$

Outside or inside defects out of ledge area

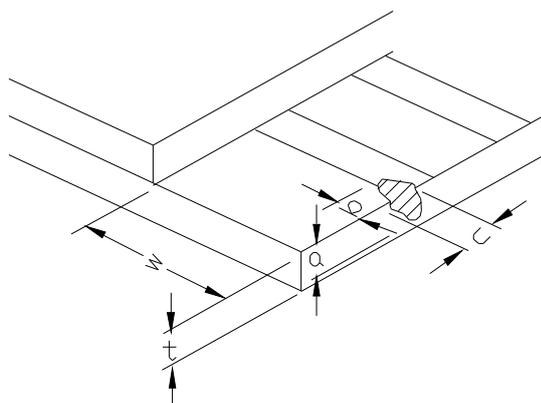


图1

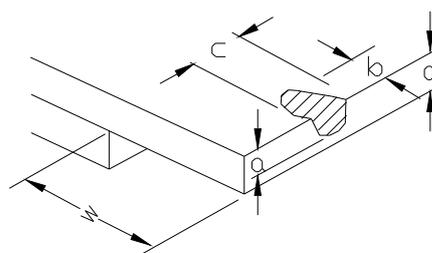


图2

For outside defects out of ledge area (figure3)

unit: mm

# 深圳市兴宇合电子有限公司

item	Thickness of defect (a)	Width of defect (b)	Length of defect (c)	Numbers
01	$a \leq t$	$b \leq S$	$c \leq 1$	
02	$a \leq 1/2 t$	$b \leq S$	$c \leq 3$	$N \leq 3$
03	$a \leq 1/3 t$	$b \leq S$	$c \leq 5$	$N \leq 3$

For inside defects out of the ledge area (figure4) unit mm

item	Thickness of defect (a)	Width of defect (b)	Length of defect (c)	Numbers
01	$a \leq t$	$b \leq h$	$c \leq 1$	
02	$a \leq 1/2 t$	$b \leq h$	$c \leq 3$	$N \leq 3$
03	$a \leq 1/3 t$	$b \leq h$	$c \leq 5$	$N \leq 3$

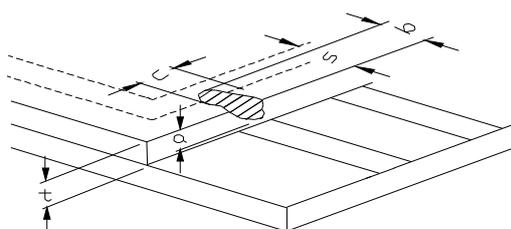


图3

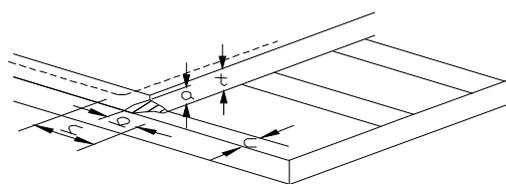


图4

3.8.2.4 Defects at the corner (figure5) unit: mm

item	Thickness of defect (a)	Width of defect (b)	Length of defect (c)	Numbers
01	$a \leq t$	$b \leq 2,0$	$c \leq 2$	$N \leq 3$

3.8.2.5 The flare ( $b < 1/4W, C < 10\text{mm}$ ) at ledge is allowed. For short edge,  $b \leq 1/5W$  should be satisfied.

Defect part related silver dot:

- (1) Exposure part of the silver dot exceed 1/5 is not allowed.
- (2) The remains smaller than 0.44mm is not allowed.

3.8.2.6 Crack

Any kind of crack is not allowed.

3.8.2.7 Size

Exceeding the size marked in drawing is not allowed.

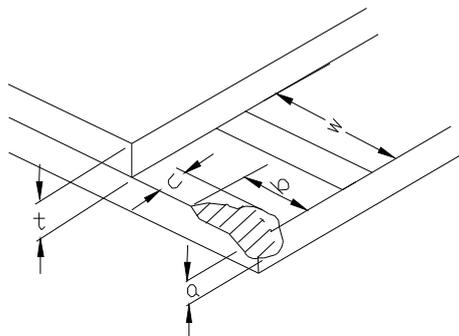


图5

3.8.3 Inside scratches and silk shape contaminant

Inside scratches and silk shape contaminant should not exceed the following regulations

Spec for small size LCD unit: mm

# 深圳市兴宇合电子有限公司

\*\*\*\*\*

Length Numbers	≤1	1<L≤1.5	1.5<L≤2	
Width				
W≤0.02	3	2	1	
0.02<W≤0.06	2	1		
0.06<W≤0.08	1			
Length Numbers	≤1	1<L≤1.5	1.5<L≤2	2<L≤2.5
Width				
W≤0.02	4	3	2	1
0.02<W≤0.04	3	2	1	
0.04<W≤0.06	2	1		
0.06<W≤0.08	1			

Spec for large size  
LCD  
unit mm

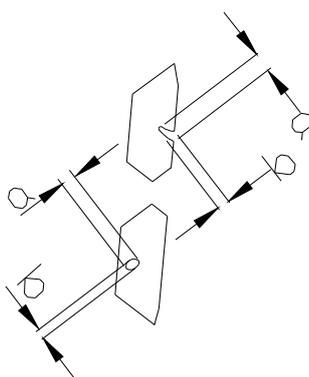
### 3.8.4. Epoxy frame

3.8.4.1 Crack, bubble and contaminant in epoxy frame should not be allowed.

3.8.4.2 The size of protruding and hollow should not exceed 0.3mm.

### 3.8.5 Pinhole

Size (mm)	Inspection requirement
$(a+b)/2 \leq 0.2$	3
$(a+b)/2 \leq 0.15$	neglect

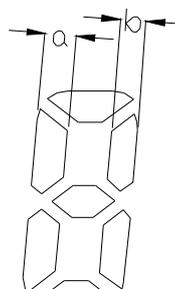
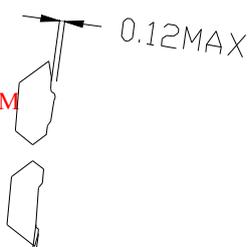


### 3.8.6 . Segment splinter and out of shape

#### 3.8.6.1 Splinter

#### 3.8.6.2. Out of shape $|a-w| \leq 0.12$ $|b-w| \leq 0.12$

Note :w is the standard width of segment.



# 深圳市兴宇合电子有限公司

\*\*\*\*\*

## 3.9 Display characteristics(25°C)

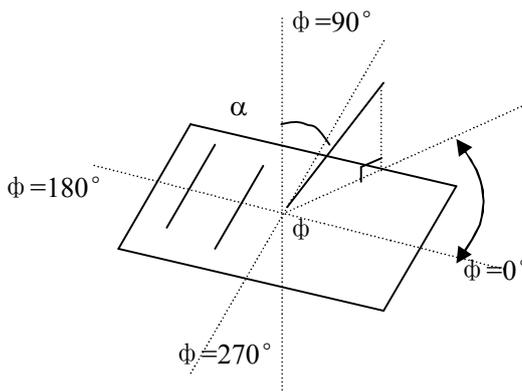
### 3.9.1 ELECTRO --- OPTICAL CHARACTERISTICS

Measuring conditions : Tamb = 25°C , with Temperature Compensation.

Vop = Voptyp , f = 100 Hz

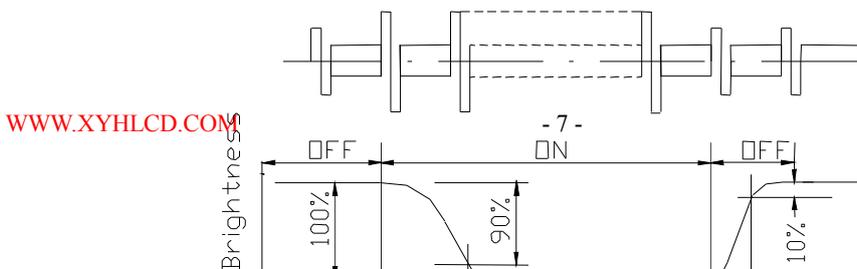
Item	Condition		Symbol	Min.*	type	max	Unit
Viewing Reflective	Cr > 3	$\phi = 0^\circ$	$\alpha$	30	45		deg.
		$\phi = 90^\circ$	$\alpha$	10	20		deg.
		$\phi = 180^\circ$	$\alpha$	30	45		deg.
		$\phi = 270^\circ$	$\alpha$	30	45		deg.
Contrast	$\alpha = 0^\circ$	$\phi = 0^\circ$	Cr		5		-

\* Zijing provide reference samples



ITEM	SYMBOL	CONDITIONS	TYP	MAX	UNIT	REMARKS
Response time	Ton	Tamb = + 25°C 0°C -10°C	220 730 1900	400 1400 3700	ms	$\alpha = 10^\circ$ , $\phi = \phi_{opt}$
	Toff	Tamb = + 25°C 0°C -10°C	100 210 600	170 750 1300	ms	

### 3.10.3. Response time



# 深圳市兴宇合电子有限公司

\*\*\*\*\*

## 4 .PD drawing of LCD

See attached drawings.

## 5. Quality guarantee system and inspection regulations

5.1 To guarantee the LCD quality meet requirements of products standard, LCD should go through the following process of quality management, inspection and test, or regulations.

### 5.2 Material management

5.2.1 Main material should purchasing from decided manufacturer according to item 3.7.2.

5.2.2 The material of each lot should be confirmed by the approval of sampling test and process test. Sampling test should be employed for cosmetic character and some electric optical character testing. Process test for lot production including test in aspect of electric character , optical character, process character, reliability and conformity.

### 5.3 Process quality management

5.3.1 Process management conditions: To guarantee process quality of product-in-process, strict administration should be applied to process control according to process conditions stipulated by the process flow.

#### 5.3.2 Process quality management of semi-finished product

5.3.2.1 Semi-finished product inspection within photo etching line: Carry out sampling test according to inspection standard of photo-etching line.

5.3.2.2 Cell assembly quality inspection : Carry out 100% visual inspection according to cell assembly test standard. AQL=2.5% ; test by CANON cell gap meter .

5.3.2.3 Cutting. quality inspection : Carry out 100% visual inspection according to product size and cutting inspection standard.

5.3.2.4 Electric test: For filled-cells ,carry out 100% inspection in aspect of switch-on, switch-off and power consumption characters according display quality requirement and inspection standard.

# 深圳市兴宇合电子有限公司

\*\*\*\*\*

## 5.4 Finished product quality management:

- 5.4.1 Finished product inspection: Only after carrying out inspection by manufacture Dept., can the LCD be submitted to quality control Dept. For inspection. The finished product inspection should be carried out based on production lot. The products lot of the same model should be manufactured in almost the same time and process, and from almost the same material .
- 5.4.2 Finished product inspections include: electric inspections, optical-electric inspections, mechanic inspections and cosmetic inspections. (see table 5.4.3)
- 5.4.3 When any defect in table 5.4.3 occurs , the LCD should be treated as off-spec product.
- 5.4.4 Finished products sampling regulations and judgement procedure: according to the inspection II and one time sampling scheme of GB2828. Make the judgement of on/off spec according to the lot quantity and AQL value specified.
- 5.4.5 The off-spec lot should be returned to manufacturing Dept. for inspection, being repaired or selected according to the defects and record be established.
- 5.4.6 The above lot LCD been processed may be judged according to the AQL value stipulated in terms 5.4.1, 5.4.2 and 5.4.3.

## **5.5 Reliability test**

### **5.5.1 Standard Test Conditions**

Unless specified, the following test conditions apply:

Temperature:	18 .. 28	[°C]
Air Pressure:	860 ... 1060	[mbar]
Relative Humidity:	45 ... 75	[%RH]

### **5.5.2 Air Pressure**

Air pressure	150 ... 3100	[mbar]
--------------	--------------	--------

### **5.5.3 Dry Heat**

(Test in accordance with DIN IEC 68-2-2)

Temperature	45°C/55°C
Duration	16h
Result:	100% functionality, no change to equipment.

### **5.5.4 Constant cold**

(Test in accordance with DIN IEC 68-2-1)

Temperature	-5°C/-10°C
Duration	16h
Result:	100% functionality, no change to equipment.

# 深圳市兴宇合电子有限公司

\*\*\*\*\*

## 5.5.5 Moist Heat Cyclic

(Test in accordance with DIN IEC 68-2-30 Var. 1)

Relative humidity	95%
Cycle time	9h + 9h
Upper temperature	40 ± 3°C/90 – 96%r.h.
Lower temperature	25 ± 3°C/95 – 100%r.h.
# of cycles	2

Result: 100% functionality, no change to equipment.

## 5.5.6 Moist Heat Constant

(Test in accordance with DIN IEC 68-2-3)

Relative humidity	93 +2-3%
Upper temperature	40 +-2°C
Duration	4d

Result: 100% functionality, no change to equipment.

## 5.5.7 Temperature Change

(Test in accordance with DIN IEC 26-2-14)

Lower temperature	-25°C
Upper temperature	+55°C
Temperature change	1°C/min +- 0.2°C/min
# of cycles	5
Sustaining time	3h

Result: 100% functionality, no change to equipment.

## 5.5.8 Shock

(Test in accordance with DIN IEC 68-2-27)

Pulse duration	6 ms
Acceleration	1500 m/s <sup>2</sup>
No. of shocks	3 each axis

The shock acceleration will be performed by Siemens at the complete set.

## 5.5.9 Mixed gas test

(Test in accordance with SN 29065 Part 8)

Gas concentrations		
SO <sub>2</sub>	10 cm <sup>3</sup> /m <sup>3</sup>	Subtest1
H <sub>2</sub> S	1 cm <sup>3</sup> /m <sup>3</sup>	Subtest2
Mixed gas:		Subtest3
SO <sub>2</sub>	0.2 cm <sup>3</sup> /m <sup>3</sup>	
H <sub>2</sub> S	0.01 cm <sup>3</sup> /m <sup>3</sup>	
NO <sub>2</sub>	0.2 cm <sup>3</sup> /m <sup>3</sup>	
CL <sub>2</sub>	0.01 cm <sup>3</sup> /m <sup>3</sup>	
Test climate	25°C/75%RH	

# 深圳市兴宇合电子有限公司

\*\*\*\*\*

Duration            Subtest1:     4d (in this order!)  
 Subtest2:                             4d  
 Subtest3:                             10d  
 Result: 100% Functionality, no material ageing observed.

### 5.5.10 Heat with sunshine

(Test in accordance with DIN IEC 68-2-5, Test Sa, Procedure C)

Ambient temperature                 55°C  
 Radiation                                1120W/m<sup>2</sup>  
 Duration                                  8h

Result: 100% Functionality, no material ageing observed. Contrast reduction must not exceed 20%.

#### Acceptance level table

Defect types	Sampling procedures	AQL (first 6 month after production start)	AQL (after 6 month of production start)	AQL (after 12 month of production start)
Major defect	ISO2859, single sampling plan (normal inspection)	0.25	0.1	0.065
Minor defect	ISO2859, single sampling plan (normal inspection)	1.0	0.65	0.25

## 6. Electrical Characteristics

### 6.1 Absolute maximum rating

AC – Voltage: <12v V<sub>rms</sub>

DC – Voltage: <=50mv V<sub>dc</sub>

### 6.2 Operating Conditions (T<sub>amb</sub>: +25°C)

Frame frequency: f = 100Hz

Operating Voltage: V<sub>op</sub> = Customer samples

### 6.3 Current Consumption

Drawing label

### 6.4 Temperature Compensation of Contrast

TC: 4.0mV/°C

# 深圳市兴宇合电子有限公司

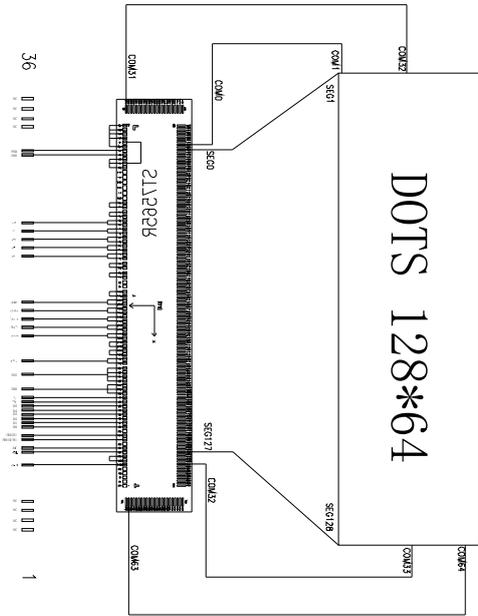
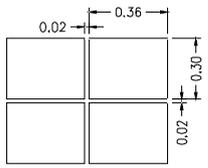
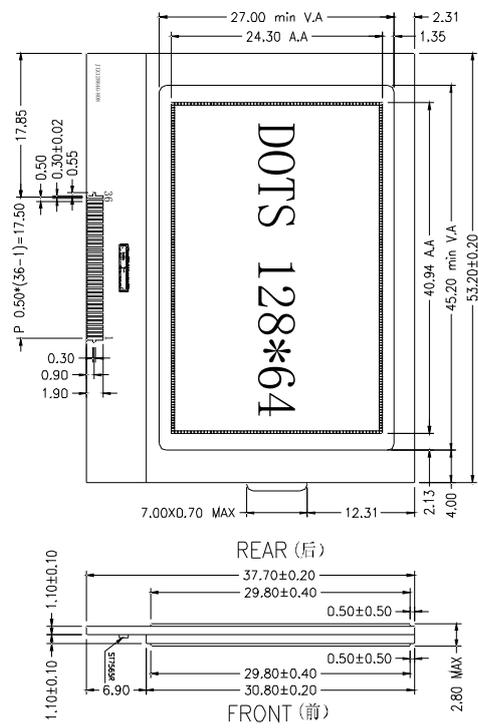
\*\*\*\*\*

请客户签字回传:

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
SW/BOL	NC	NC	NC	NC	NC	RST	RST	AO	WM(M)	MB(S)	D0	D1	D2	D3	D4	D5	D6	D7	VDD
PIN NO.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
SW/BOL	VSS	VOUT	C2P	C1N	C1P	C2P	C2N	V4	V3	V2	V1	V0	CB6	CB5	CB4	CB3	CB2	CB1	NC

## SPECIFICATIONS:

DISPLAY TYPE: FSTN/POSITIVE  
 POLARIZER: TRANSMISSIVE 白片  
 VIEWING DIRECTION: 6:00-CLOCK  
 DRIVE METHOD: 1/65DUTY,1/9BIAS  
 OPERATING VOLTAGE: 按样品  
 OPERATING TEMP: -20 TO 70 Deg.C  
 STORAGE TEMP: -30 TO 80 Deg.C  
 CONNECTOR: COG  
 UNSIGNED TOLERANCE: ±0.20



版本	更改内容:	设计日期:	签名
00	FIRST ISSUE	2014.05.26	



深圳市兴宇合电子有限公司

## LCM工程图纸

SCALE: HTT	MODEL NUMBER:		<b>C/D</b>
页数: 1 OF N	JGG12864A04		
允许公差: 0.3mm	比例: 1:1		
单位: mm	日期:		
制表:	日期:		
初审:	日期:		
设计人: ZOS	日期: 2014.05.26		

DO NOT SCALE THIS DRAWING PROJECTION