




**DOT MATRIX  
LIQUID CRYSTAL DISPLAY  
MODULE**

**COMPANY NAME : 伍豐科技股份有限公司**

**USER 'MANUAL**  
**SGS19232A3LEW20**

<b>PROPOSED BY</b>		<b>APPROVED</b>
Design	Approved	
 <p>The stamp is circular with a blue border. Inside the border, the text 'SDEC TECHNOLOGY CORP.' is written in a circular path. Below this, the contact information is listed: 'Tel: 886-2-2999-2512', 'Fax: 886-2-2999-2510', and 'No. 100 Shing De Rd. Shaochun City, Taipei Hsien, Taiwan, R.O.C.'.</p>		

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# LCM SAMPLE APPROVAL

(液 晶 顯 示 模 組 樣 品 確 認 書)

1 · PART A:

1) COMPANY NAME (客戶名稱) : 伍豐科技股份有限公司

2) ITEM NO. (產品型號) : SGS19232A3LEW20

3) CUSTOMER ITEM NO. (客戶產品型號) : RD9000PH03AS

4) LCM Function (LCM 內容) :

A	LCD TYPE (LCD 種類) : <input type="checkbox"/> TN, <input type="checkbox"/> HTN, <input checked="" type="checkbox"/> STN, <input type="checkbox"/> FSTN ( <input type="checkbox"/> POSITIVE/正向, <input checked="" type="checkbox"/> NEGATIVE/反向, <input type="checkbox"/> BLACK MASK/內黑絲印)
B	VIEWING AREA (視角方向) : <input type="checkbox"/> 3H, <input type="checkbox"/> 6H, <input type="checkbox"/> 9H, <input checked="" type="checkbox"/> 12H
C	POLARIZER COLOR (偏光板顏色) : <input type="checkbox"/> GRAY/灰色, <input type="checkbox"/> YELLOW GREEN/黃綠色, <input checked="" type="checkbox"/> BLUE/藍色, <input type="checkbox"/> BLACK/黑色
D	BACKLIGHT COLOR (背光顏色) : <input type="checkbox"/> YELLOW GREEN/黃綠光, <input type="checkbox"/> ORANGE/橘光, <input type="checkbox"/> RED/紅光, <input type="checkbox"/> BLUE/藍光, <input type="checkbox"/> GREEN/翠綠光, <input checked="" type="checkbox"/> WHITE/白光
E	TEMPERATURE (溫度) : <input type="checkbox"/> NORMAL/常溫, <input checked="" type="checkbox"/> WIDE/廣溫
F	Rom Code CheckSum: 91B43A
G	MTBF:20000HOURS

SAMPLE DELIVERY DATE (出樣日期) : 2015.05.15

2 · PART B: FILLED BY CUSTOMER (請客戶填寫)

CHECK LIST ITEMS (檢查項目) :	OK	NG	REASON (原因)
1).LCM SIZE AND THICKNESS:(LCM 尺寸及厚度):	<input type="checkbox"/>	<input type="checkbox"/>	_____
2).POLARIZER COLOR : (偏光板色澤) :	<input type="checkbox"/>	<input type="checkbox"/>	_____
3).ELECTRO CHARACTERISTIC : (電氣特性) :	<input type="checkbox"/>	<input type="checkbox"/>	_____
4).VIEWING AREA (視角範圍) :	<input type="checkbox"/>	<input type="checkbox"/>	_____
5).BACKLIGHT ILLIMINATION (背光亮度的) :	<input type="checkbox"/>	<input type="checkbox"/>	_____
6).TEMPERATURE RANGE (溫度範圍) :	<input type="checkbox"/>	<input type="checkbox"/>	_____

APPROVED BY (批准) :

DATE OF APPROVAL (批准日期) :

# REVISION RECORD

Revision	Page	Contents
2009.10.05	10	Added PC-1253 font table
2009.10.15		Custom Logo "FG-192R"
2009.10.15	5	Changed Luminance value
2009.10.05	10	Added PC-1253 font table
2009.10.28		Customize Logo First line "WELCOME!!!" Second line "FG-192CPA"
2009.10.28	7	Added language description, Serial No.
2009.10.28	6	Added POWER CONSUMPTION
2009.10.30	11	Corrected PC1253 0XAA character without underline.
2009.11.06	8	Added 8X16 € sign.
2009.11.06	2	Changed Rom checksum code BB486B.
2009.11.18	7	Added 1B 52 n 00h<=n<=0Fh International Font Set (20h-7Fh) function.
2009.11.18	8	Added Font Variations Table 20h-7Fh
2009.11.18		Modified cursor function.
2009.11.18		Changed Rom checksum code B39850.
2009.12.10	6	Added OPTIMSIM CONTRAST VOLTAGE describe. Added PC437,PC858,PC860,PC863,PC865,Russia,Slavonic,PC857-PC862 font table.
2009.12.17		Added function 1F 46 Tune down contrast.1F 47 Tune up contrast. Changed Rom checksum code A82D70 Version 1.0. PCB REV5.
2010.05.07		Added programmable logo and marquee string function. Hex file checksum value change to 9B909E. Default checksum status Ver.1.1 9B8F9F.
2010.12.14	19	Added ISO-8859-8, ISO-8859-9 table Default checksum status Ver.1.2 98DD7D
2011.01.18	20、21	Added PC1275、PC775 table Default checksum status Ver.1.3 94BEBF
2012.04.02	7	Custom number change to RD9000PH03AS-C Code table F change from Reserve to SI 1507 Default checksum status Ver.1.4 93307E
2012.04.09		Custom number change to RD9000PH03AS PCB print mark Add "V1.4"
2013.01.18		Change checksum status Ver.1.5 935283 for improving EEPROM performance.
2015.05.15	7、22	Added PC1252 table, checksum changed from 935283 to 91B43A Ver.1.7

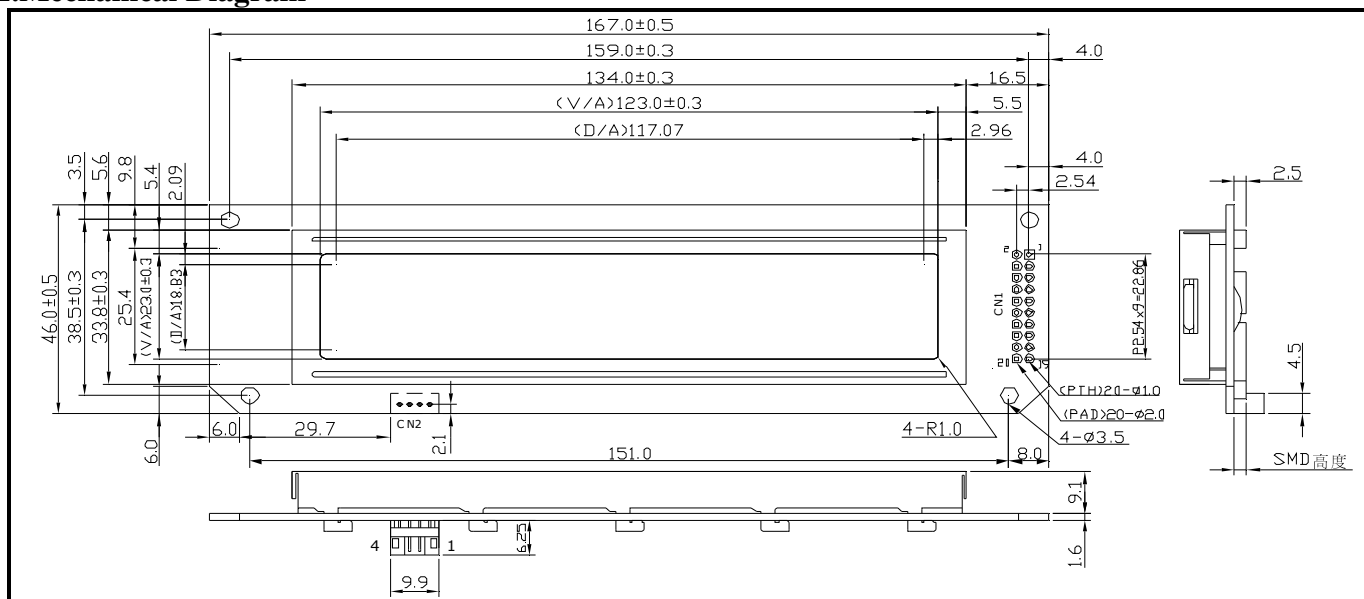
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### 1.Mechanical Specification

ITEM	STANDARD VALUE	UNIT
NUMBER OF CHARACTERS(ASCII)	24 CHARACTERS X 2 LINES	--
CHARACTER FORMAT	8X16 OR 16X16 DOTS	--
MODULE DIMENSION EDGE LED BACKLIGHT	167.0 (W) X 46.0 (H) X 18.5(Max) (T)	mm
VIEWING DISPLAY AREA	123.0(W) X 23.0 (H)	mm
ACTIVE DISPLAY AREA	117.07(W) X 18.83 (H)	mm
DOT SIZE	0.56(W) X 0.54(H)	mm
DOT PITCH	0.05(W) X 0.05(H)	mm

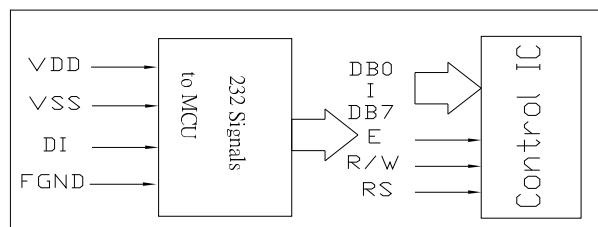
### 2.Mechanical Diagram



### 3. Interface Pin Connections(CN2)

NO	SYMBOL	FUNCTION
1	VDD	DC +5V
2	VSS	GND (0V)
3	DI	Series Data Input
4	FGND	FRAME GND

### 4. Block Diagram



### 5. Backlight Electronic Characteristics

Ta=25°C

ITEM	SYMBOL	Ratings	UNIT
Absolute maximum forward current	IFm	2*40	mA
Peak forward current	IFp	2*80	mA
Reverse Voltage	Vr	4	V
Power Dissipation	Pd	2*160	mW
Operating Temperature Range	Top	+20~+70	°C
Storage Temperature Range	Tst	-30~+80	°C

ITEM	SYMBOL	MIN.	TYPE	MAX.	UNIT	CONDITION	
Forward Voltage	VF	3.8	4.0	4.2	V	IF=2*40mA	
Reverse Current	Ir	--	--	2*200	μA	Vr=4V	
Luminance	LV	90	110	--	cd/m <sup>2</sup>	IF=2*40mA	
Range		X=0.25~0.29, Y=X-0.0135~X+0.0175					IF=2*40mA
Brightness Uniformity	△	75	--	--	%	Min/Max*100%	

## 6. Absolute Maximum Ratings

ITEM	SYMBOL	MIN.	TYPE	MAX.	UNIT
INPUT VOLTAGE	VI	VSS	—	VDD	V
SUPPLY VOLTAGE FOR LOGIC	VDD-VSS	—	5.0	6.0	V
SUPPLY VOLTAGE FOR LCD	VDD-VO	—	—	6.0	V
WIDE TEMPERATURE RANGE	OPERATING	+20~+70	STORAGE	-30~+80	°C
STATIC ELECTRICITY	Be sure that you are grounded when handing LCM.				

## 7. Electrical Characteristics

Baud rate at 9600bps

ITEM	SYN	CONDITION	MIN.	TYPE	MAX.	UNIT
SUPPLY VOLTAGE FOR LOGIC	VDD-VSS	—	4.5	5.0	5.5	V
OPTIMSIM CONTRAST VOLTAGE	VDD-VSS	Ta=+25°C	4.95	5.0	5.05	V
SUPPLY VOLTAGE FOR LCD	VLCD	Ta=0°C	—	6.2	—	V
		Ta=+25°C	5.5	5.8	6.1	V
		Ta=+50°C	—	5.4	—	V
		Ta=+70°C	—	5.0	—	V
INPUT RS232 HIGH VOLTAGE	VIH	—	6	—	12	V
INPUT RS232 LOW VOLTAGE	VIL	—	-6	—	-12	V
OUTPUT HIGH VOLTAGE	VOH	—	—	—	—	V
OUTPUT LOW VOLTAGE	VOL	—	—	—	—	V
SUPPLY CURRENT (Without Backlight)	IDD	VDD=+5V	—	3.0	4.5	mA
POWER CONSUMPTION	IDD	VDD=+5V	—	80	140	mA

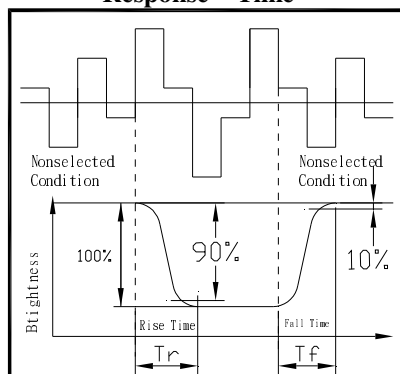
## 8. Optical Characteristics

Ta at 25°C

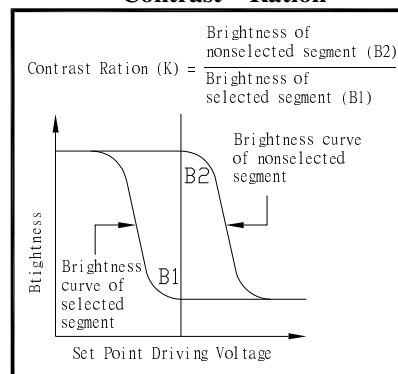
ITEM	SYM	CONDITION	MIN.	TYPE	MAX.	UNIT
VIEW ANGLE (TOP/BOTTOM)	$\theta 1 \sim \theta 2$	CR $\geq 5$	-35°	—	45°	deg.
VIEW ANGLE (LEFT/RIGHT)	$\phi 1 \cdot \phi 2$	CR $\geq 5$	-35°	—	35°	deg.
CONTRAST RATIO	CR	—	—	8	—	—
RESPONSE TIME (RISE)	TON/Tr	—	—	170	—	mS
RESPONSE TIME (DECAY)	TOFF/Tf	—	—	220	—	mS

## 9. Optical Definitions

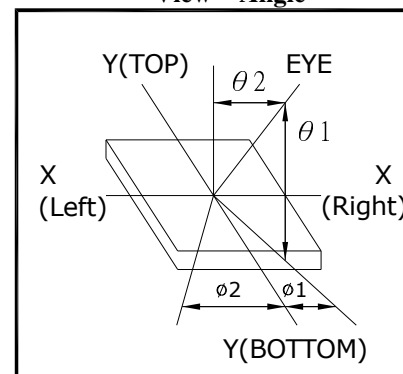
Response Time



Contrast Ration



View Angle



## 10. COMMAND SET

Command	Code (hex)	Description
ESC @	1B 40	Initialize.
CLR	0C	Clear screen.
Us C n	1F 43 n (n=1, 0)	Set/cancel cursor display
ESC - n	1B 5F n (n=1, 0)	Set/cancel cursor display
HT	09	Cursor right.
BS	08	Cursor left.
LF	0A	Cursor down.
Us Lf	1F 0A	Cursor up.
HOM	0B	Cursor home.
CR	0D	Cursor left-end
Us CR	1F 0D	Cursor right-end.
Us B	1F 42	Cursor to the bottom.
Us \$ x y	1F 24 x y (01h<=x<=18h, 01h<=y<=02h)	Cursor to specified position.
ESC l x y	1B 6C x y (01h<=x<=18h, 01h<=y<=02h)	Cursor to specified position.
ESC Q A	1B 51 41 [datax24] 0D	Set string display mode, write string to upper line.
ESC Q B	1B 51 42 [datax24] 0D	Set string display mode, write string to lower line.
ESC R n	1B 52 n 00h<=n<=0Fh	select international character set for character range 20h-7Fh.(Default n = 0)
ESC Q J	1B 51 4A [datax40] 0D	Marquee on upper line with approximate speed of 2 character/sec.
ESC Q K	1B 51 4B [datax40] 0D	Marquee on lower line with approximate speed of 2 character/sec.
Us r n	1F 72 n (n=0,1)	Set/cancel reverse character. (Default n = 0)
Us X n	1F 58 n 01h<=n<=0Ah	Adjust contrast. Command process time 100ms.
Us F	1F 46	Tune down contrast. Command process time 100ms.
Us G	1F 47	Tune up contrast. Command process time 100ms.
ESC t m	1B 73 n x [datax24]	Define custom logo. n = 1 upper line ,n = 2 lower line. x higher byte = 0~C select code table , x lower byte = 0~C select international font. This command will change checksum value.
ESC t n	1B 74 n 00h<=n<=12h	Select code table for character range 80h-FFh. (Default n = 0)
Us A	1F 41 00	Version & Checksum status.

## 10.1 Code Table for 1B 74 n

n	International Font Set (80h-FFh)
0	PC437: U.S.A., standard Europe
1	Reserved
2	PC858: multilingual
3	PC860: Portuguese
4	PC863: Canadian-French
5	PC865: Nordic
6	Russia
7	Slavonic
8	PC852
9	PC866
A	PC1253
B	PC857
C	PC862
D	ISO8859-8
E	ISO8859-9
F	SI 1507
11	PC1257
12	PC1252

**10.2 International Font Set (20h-7Fh)**

n	International Font Set	n	International Font Set
0	U.S.A.	8	Japan
1	France	9	Norway
2	Germany	A	Denmark II
3	U.K.	B	Slavonic
4	Denmark I	C	Russia
5	Sweden	D	Reserved
6	Italy	E	Reserved
7	Spain	F	Reserved

**10.3 Font Variations Table 20h-7Fh**

n	Country	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	U.S.A.	#	\$	@	[	\	]	^	`	{		}	~
1	France	#	\$	à	°	ç	§	^	`	é	ù	è	¨
2	Germany	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	U.K.	£	\$	@	[	\	]	^	`	{		}	~
4	Denmark I	#	\$	@	Æ	Φ	Å	^	`	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain	Pt	\$	@	ı	Ñ	ı	^	`	¨	ñ	}	~
8	Japan	#	\$	@	[	¥	]	^	`	{		}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11	Slavonic	#	\$	@	[	\	]	^	`	{		}	~
12	Russia	#	\$	@	[	\	]	^	`	{		}	~

**11. Support Language**

Language	Code	Code range(HEX)	Font size
Multi Language	ASCII	80-FF	8X16



## 12.ASCII Font Table

	00	20	30	40	50	60	70
0	Reserved	SPACE	0	@	P	`	p
1	Reserved	!	1	A	Q	a	q
2	Reserved	“	2	B	R	b	r
3	Reserved	#	3	C	S	c	s
4	Reserved	\$	4	D	T	d	t
5	Reserved	%	5	E	U	e	u
6	Reserved	&	6	F	V	f	v
7	€	‘	7	G	W	g	w
8	Command	(	8	H	X	h	x
9	Command	)	9	I	Y	i	y
A	Command		:	J	Z	j	z
B	Command	+	;	K	[	k	{
C	Command	,	<	L	\	l	!
D	Command	-	=	M	]	m	}
E	Command	.	>	N	^	n	~
F	Command	/	?	O	_	o	

13. Interational Font Table

13.1 PC437 Font Set n = 0

	8	9	A	B	C	D	E	F
0	Ɔ	é	á	⊗	Ł	¼	∂	Ξ
1	ü	æ	í	⊗	Ł	Ƴ	ß	±
2	é	Æ	ó	■	Ƴ	π	Γ	≥
3	á	ò	ú	ı	Ƴ	¼	Π	≤
4	ä	ö	ñ	†	—	Ł	Σ	Ƴ
5	á	ò	ñ	†	+	Ƴ	⊗	ı
6	á	ò	á	ı	Ƴ	π	Μ	÷
7	Ɔ	ú	⊗	π	ı	ı	Ƴ	⊗
8	é	ü	ú	Ƴ	Ł	+	⊗	"
9	é	ö	Ƴ	ı	Ƴ	ı	⊗	"
A	é	ü	Ƴ	ı	Ł	Ƴ	⊗	.
B	ı	⊗	⊗	π	Ƴ	■	⊗	Ƴ
C	ı	⊗	⊗	ı	Ƴ	■	⊗	π
D	ı	⊗	ı	Ł	—	■	⊗	⊗
E	Ä	Æ	⊗	ı	+	■	⊗	■
F	Ä	Ƴ	⊗	Ƴ	Ł	■	π	

13.2 PC858 Font Set n = 2

	8	9	A	B	C	D	E	F
0	Ɔ	é	á	⊗	Ł	ú	ó	—
1	ü	æ	í	⊗	Ł	ß	ß	´
2	é	Æ	ó	⊗	Ƴ	é	ò	—
3	á	ò	ú	ı	Ƴ	é	ò	±
4	ä	ö	ñ	†	—	é	ö	—
5	á	ò	⊗	Ä	+	⊗	⊗	⊗
6	á	ò	á	Ä	ı	ı	ı	π
7	Ɔ	ú	⊗	Ä	ı	ı	ı	⊗
8	é	ü	ú	Ƴ	ı	ı	ı	ı
9	é	ö	Ƴ	ı	Ƴ	ı	ı	⊗
A	é	ü	Ƴ	ı	Ł	Ƴ	ı	—
B	ı	⊗	⊗	Ƴ	Ƴ	■	ı	"
C	ı	⊗	⊗	ı	Ƴ	■	ı	ı
D	ı	⊗	ı	⊗	—	ı	ı	⊗
E	Ä	⊗	⊗	⊗	+	ı	—	■
F	Ä	Ƴ	⊗	Ƴ	⊗	■	´	

13.3 PC860 Font Set n = 3

	8	9	A	B	C	D	E	F
0	☪	É	À	☒	⊥	⊥	⊥	☐
1	Ü	À	í	☒	⊥	⊥	⊥	⊥
2	é	É	ó	☐	⊥	⊥	⊥	⊥
3	À	ó	ó	⊥	⊥	⊥	⊥	⊥
4	ä	ö	Ä	⊥	⊥	⊥	⊥	⊥
5	ä	ó	Ä	⊥	⊥	⊥	⊥	⊥
6	Ä	ó	Ä	⊥	⊥	⊥	⊥	⊥
7	☪	ó	☐	⊥	⊥	⊥	⊥	☐
8	é	í	í	⊥	⊥	⊥	⊥	☐
9	é	ó	ó	⊥	⊥	⊥	⊥	☐
A	é	ó	⊥	⊥	⊥	⊥	⊥	⊥
B	í	☪	☐	⊥	⊥	☐	☐	⊥
C	ó	É	☐	⊥	⊥	☐	☐	⊥
D	í	ó	í	⊥	⊥	☐	☐	☐
E	Ä	Ä	☐	⊥	⊥	☐	☐	☐
F	Ä	ó	☐	⊥	⊥	☐	⊥	⊥

13.4 PC863 Font Set n = 4

	8	9	A	B	C	D	E	F
0	☪	É	!	☒	⊥	⊥	⊥	☐
1	Ü	É	í	☒	⊥	⊥	⊥	⊥
2	é	É	'	☐	⊥	⊥	⊥	⊥
3	À	ó	ó	⊥	⊥	⊥	⊥	⊥
4	Ä	É	ó	⊥	⊥	⊥	⊥	⊥
5	ä	í	"	⊥	⊥	⊥	⊥	⊥
6	⊥	ó	☐	⊥	⊥	⊥	⊥	⊥
7	☪	ó	⊥	⊥	⊥	⊥	⊥	☐
8	é	ó	í	⊥	⊥	⊥	⊥	☐
9	é	ó	⊥	⊥	⊥	⊥	⊥	☐
A	é	ó	⊥	⊥	⊥	⊥	⊥	⊥
B	í	☪	☐	⊥	⊥	☐	☐	⊥
C	í	É	☐	⊥	⊥	☐	☐	⊥
D	⊥	ó	☐	⊥	⊥	☐	☐	☐
E	Ä	ó	☐	⊥	⊥	☐	☐	☐
F	É	☪	☐	⊥	⊥	☐	⊥	⊥

13.5 PC865 Font Set n = 5

	8	9	A	B	C	D	E	F
0	☞	☞	☞	☞	☞	☞	☞	☞
1	☞	☞	☞	☞	☞	☞	☞	☞
2	☞	☞	☞	☞	☞	☞	☞	☞
3	☞	☞	☞	☞	☞	☞	☞	☞
4	☞	☞	☞	☞	☞	☞	☞	☞
5	☞	☞	☞	☞	☞	☞	☞	☞
6	☞	☞	☞	☞	☞	☞	☞	☞
7	☞	☞	☞	☞	☞	☞	☞	☞
8	☞	☞	☞	☞	☞	☞	☞	☞
9	☞	☞	☞	☞	☞	☞	☞	☞
A	☞	☞	☞	☞	☞	☞	☞	☞
B	☞	☞	☞	☞	☞	☞	☞	☞
C	☞	☞	☞	☞	☞	☞	☞	☞
D	☞	☞	☞	☞	☞	☞	☞	☞
E	☞	☞	☞	☞	☞	☞	☞	☞
F	☞	☞	☞	☞	☞	☞	☞	☞

13.6 Slavonic Font Set n = 7

	8	9	A	B	C	D	E	F
0	☞	☞	☞	☞	☞	☞	☞	☞
1	☞	☞	☞	☞	☞	☞	☞	☞
2	☞	☞	☞	☞	☞	☞	☞	☞
3	☞	☞	☞	☞	☞	☞	☞	☞
4	☞	☞	☞	☞	☞	☞	☞	☞
5	☞	☞	☞	☞	☞	☞	☞	☞
6	☞	☞	☞	☞	☞	☞	☞	☞
7	☞	☞	☞	☞	☞	☞	☞	☞
8	☞	☞	☞	☞	☞	☞	☞	☞
9	☞	☞	☞	☞	☞	☞	☞	☞
A	☞	☞	☞	☞	☞	☞	☞	☞
B	☞	☞	☞	☞	☞	☞	☞	☞
C	☞	☞	☞	☞	☞	☞	☞	☞
D	☞	☞	☞	☞	☞	☞	☞	☞
E	☞	☞	☞	☞	☞	☞	☞	☞
F	☞	☞	☞	☞	☞	☞	☞	☞

## 13.7 Russia Font Set n = 6

	8	9	A	B	C	D	E	F
0	Р	Р	а				Р	а
1	Б	С	Б				С	Г
2	В	Т	В				Т	К
3	Г	У	Г				У	Н
4	О	Ф	А				Ф	Е
5	Е	Х	е				Х	У
6	Ж	Ч	ж				Ч	У
7	З	Ы	о				Ы	н
8	И	Ш	И				Ш	э
9	Й	Щ	Й				Щ	Г
A	К	б	к				б	к
B	Л	Ы	л				Ы	Н
C	М	б	м				б	е
D	Н	Э	Н				Э	У
E	О	М	о				М	У
F	П	Я	п				Я	

## 13.8 PC852 Font Set n = 8

80	90	A0	B0	C0	D0	E0	F0
Ç 128	É 144	á 160	 176	Ł 192	đ 208	Ó 224	̄ SHY 240
ü 129	Ł 145	í 161	 177	Ł 193	Đ 209	ß 225	˘ 241
é 130	Í 146	ó 162	 178	Т 194	Ď 210	Ô 226	ˆ 242
â 131	ô 147	ú 163	 179	† 195	È 211	Ń 227	ˇ Hacek 243
ä 132	ö 148	Ą 164	† 180	- 196	đ 212	ń 228	˘ Breve 244
û 133	Ł 149	ą 165	Á 181	† 197	Ň 213	ň 229	§ 245
ć 134	ł 150	ž 166	Â 182	Ǻ 198	Í 214	Š 230	÷ 246
ç 135	ś 151	ž 167	Ě 183	ǻ 199	Î 215	š 231	ˆ 247
ł 136	ś 152	Ę 168	Ş 184	Ł 200	ě 216	Ř 232	° 248
ë 137	Ö 153	ę 169	 185	Ɔ 201	Ј 217	Ú 233	ˆˆ 249
Ó 138	Û 154	¬ 170	 186	⌌ 202	Г 218	ř 234	˙ 250
ó 139	Ť 155	ž 171	ŋ 187	π 203	 219	Ú 235	ú 251
î 140	ť 156	Č 172	ŋ 188	ł 204	 220	ý 236	Ř 252
Ž 141	Ł 157	ş 173	Ž 189	= 205	Т 221	Ý 237	ř 253
Ä 142	× 158	« 174	ž 190	ł 206	Û 222	ţ 238	 254
Ć 143	ć 159	» 175	ŋ 191	α 207	 223	˘ 239	NBSP 255

## 13.9 PC866 Font Set n = 9

80	90	A0	B0	C0	D0	E0	F0
А 128	Р 144	а 160	 176	Л 192	Ц 208	р 224	Ё 240
Б 129	С 145	б 161	 177	⊥ 193	Т 209	с 225	ё 241
В 130	Т 146	в 162	 178	т 194	П 210	т 226	€ 242
Г 131	У 147	г 163	 179	† 195	Ц 211	у 227	€ 243
Д 132	Ф 148	д 164	† 180	— 196	Ѓ 212	Ф 228	Ї 244
Е 133	Х 149	е 165	† 181	† 197	Г 213	х 229	ï 245
Ж 134	Ц 150	ж 166	 182	† 198	П 214	ц 230	Ў 246
З 135	Ч 151	з 167	П 183	 199	 215	ч 231	ў 247
И 136	Ш 152	и 168	Г 184	Ц 200	† 216	ш 232	° 248
Й 137	Щ 153	й 169	 185	Г 201	┘ 217	щ 233	• 249
К 138	Ъ 154	к 170	 186	Ц 202	Г 218	ъ 234	• 250
Л 139	Ы 155	л 171	Г 187	Т 203	 219	ы 235	✓ 251
М 140	Ь 156	м 172	 188	 204	 220	ь 236	№ 252
Н 141	Э 157	н 173	Ц 189	= 205	 221	э 237	¤ 253
О 142	Ю 158	о 174	┘ 190	 206	 222	ю 238	 254
П 143	Я 159	п 175	Г 191	⊥ 207	 223	я 239	NBSP 255

## 13.10 PC1253 Font Set n = A

80	90	A0	B0	C0	D0	E0	F0
NOT USED 128	NOT USED 144	NBSP 160	° 176	ï 192	Π 208	Û 224	π 240
NOT USED 129	€ 145	• 161	± 177	Α 193	Ρ 209	α 225	ρ 241
, 130	’ 146	’Α 162	² 178	Β 194	NOT USED 210	β 226	ς 242
f 131	“ 147	£ 163	³ 179	Γ 195	Σ 211	γ 227	σ 243
” 132	” 148	¤ 164	´ 180	Δ 196	Τ 212	δ 228	τ 244
... 133	• 149	¥ 165	μ 181	Ε 197	Υ 213	ε 229	υ 245
† 134	- 150	¡ 166	¶ 182	Ζ 198	Φ 214	ξ 230	φ 246
‡ 135	- 151	§ 167	· 183	Η 199	Χ 215	η 231	χ 247
NOT USED 136	NOT USED 152	¨ 168	’Ε 184	Θ 200	Ψ 216	θ 232	ψ 248
% 137	™ 153	© 169	’Η 185	Ι 201	Ω 217	ι 233	ω 249
NOT USED 138	NOT USED 154	® 170	’Ι 186	Κ 202	Ï 218	κ 234	ï 250
< 139	> 155	« 171	» 187	Λ 203	ÿ 219	λ 235	ÿ 251
NOT USED 140	NOT USED 156	¬ 172	’Ο 188	Μ 204	ά 220	μ 236	ό 252
NOT USED 141	NOT USED 157	SHY 173	½ 189	Ν 205	έ 221	ν 237	ύ 253
NOT USED 142	NOT USED 158	® 174	’Υ 190	Ξ 206	ή 222	ξ 238	ώ 254
NOT USED 143	NOT USED 159	— 175	’Ω 191	Ο 207	ι 223	ο 239	NOT USED 255



## 13.11 PC857 Font Set n = B

80	90	A0	B0	C0	D0	E0	F0
Ç 128	É 144	á 160	 176	Ł 192	Ω 208	Ó 224	̄ SHY 240
ü 129	æ 145	í 161	 177	⊥ 193	Ⓐ 209	β 225	± 241
é 130	Æ 146	ó 162	 178	⊥ 194	Ê 210	Ô 226	̄ NOT USED 242
â 131	ô 147	ú 163	 179	† 195	Ë 211	Ò 227	¾ 243
ä 132	ö 148	ñ 164	† 180	– 196	È 212	õ 228	¶ 244
à 133	ò 149	Ñ 165	Á 181	† 197	̄ NOT USED 213	Õ 229	§ 245
å 134	û 150	Ǧ 166	Â 182	ã 198	Í 214	μ 230	÷ 246
ç 135	ù 151	ǧ 167	À 183	Ã 199	Î 215	̄ NOT USED 231	¼ 247
ê 136	ï 152	¿ 168	© 184	ℓ 200	Ï 216	× 232	° 248
ë 137	Ï 153	® 169	‡ 185	ℓ 201	⋈ 217	Ú 233	•• 249
è 138	Û 154	¬ 170	‖ 186	≡ 202	⌈ 218	Û 234	• 250
ï 139	ø 155	½ 171	¶ 187	¶ 203	 219	Û 235	1 251
î 140	£ 156	¼ 172	⌋ 188	‡ 204	 220	ì 236	3 252
ı 141	∅ 157	ı 173	¢ 189	= 205	ı 221	ÿ 237	2 253
Ä 142	Ş 158	« 174	¥ 190	‡ 206	Ï 222	– 238	 254
Å 143	Ş 159	» 175	⌈ 191	α 207	 223	´ 239	NBSP 255

## 13.12 PC862 Font Set n = C

80	90	A0	B0	C0	D0	E0	F0
ℵ	Ⓝ	á		ℒ	Ⓜ	α	≡
128	144	160	176	192	208	224	240
Ⓝ	Ⓞ	í		Ⓟ	Ⓠ	β	±
129	145	161	177	193	209	225	241
Ⓟ	Ⓠ	ó		Ⓡ	Ⓢ	Γ	≥
130	146	162	178	194	210	226	242
Ⓡ	Ⓢ	ú		Ⓣ	Ⓤ	π	≤
131	147	163	179	195	211	227	243
Ⓢ	Ⓣ	ñ	Ⓥ	Ⓦ	Ⓧ	Σ	∫
132	148	164	180	196	212	228	244
Ⓣ	Ⓤ	Ñ	Ⓨ	Ⓩ	ⓐ	σ	Ⓜ
133	149	165	181	197	213	229	245
Ⓤ	Ⓧ	æ	Ⓛ	Ⓧ	Ⓨ	μ	÷
134	150	166	182	198	214	230	246
Ⓧ	Ⓨ	ø	Ⓩ	ⓐ	ⓑ	τ	≈
135	151	167	183	199	215	231	247
Ⓨ	Ⓩ	¿	Ⓛ	Ⓧ	Ⓨ	Φ	°
136	152	168	184	200	216	232	248
Ⓩ	ⓐ	Ⓛ	Ⓧ	Ⓨ	Ⓩ	ⓐ	•
137	153	169	185	201	217	233	249
ⓐ	ⓑ	Ⓛ	Ⓧ	Ⓨ	Ⓩ	Ω	•
138	154	170	186	202	218	234	250
ⓑ	Ⓨ	½	Ⓛ	Ⓧ		δ	√
139	155	171	187	203	219	235	251
Ⓨ	£	¼	Ⓧ	Ⓨ		∞	n
140	156	172	188	204	220	236	252
Ⓨ	¥	ı	Ⓧ	Ⓨ		∅	²
141	157	173	189	205	221	237	253
Ⓨ	℞ts	«	Ⓧ	Ⓨ		ε	
142	158	174	190	206	222	238	254
Ⓨ	f	»	Ⓛ	Ⓧ		∩	NBSP
143	159	175	191	207	223	239	255

























## 13.13 ISO-8859-8 Font Set n = D

80																
90																
A0	NBSP 00A0	◊ 00A2	£ 00A3	* 00A4	¥ 00A5	 00A6	§ 00A7	¨ 00A8	© 00A9	× 00D7	« 00AB	¬ 00AC	– 00AD	® 00AE	– 203E	
B0	° 00B0	± 00B1	² 00B2	³ 00B3	´ 00B4	µ 00B5	¶ 00B6	· 00B7	¸ 00B8	¹ 00B9	÷ 00F7	» 00BB	¼ 00BC	½ 00BD	¾ 00BE	
C0																
D0															– 2017	
E0	ℵ 05D0	⋈ 05D1	⋉ 05D2	⋊ 05D3	⋋ 05D4	⋌ 05D5	⋍ 05D6	⋎ 05D7	⋏ 05D8	⋐ 05D9	⋑ 05DA	⋒ 05DB	⋓ 05DC	⋔ 05DD	⋕ 05DE	⋖ 05DF
F0	⋗ 05E0	⋘ 05E1	⋙ 05E2	⋚ 05E3	⋛ 05E4	⋜ 05E5	⋝ 05E6	⋞ 05E7	⋟ 05E8	⋠ 05E9	⋡ 05EA					

## 13.14 ISO-8859-9 Font Set n = E

80																
90																
A0	NBSP 00A0	ı 00A1	◊ 00A2	£ 00A3	* 00A4	¥ 00A5	 00A6	§ 00A7	¨ 00A8	© 00A9	ª 00AA	« 00AB	¬ 00AC	– 00AD	® 00AE	– 00AF
B0	° 00B0	± 00B1	² 00B2	³ 00B3	´ 00B4	µ 00B5	¶ 00B6	· 00B7	¸ 00B8	¹ 00B9	º 00BA	» 00BB	¼ 00BC	½ 00BD	¾ 00BE	¿ 00BF
C0	À 00C0	Á 00C1	Â 00C2	Ã 00C3	Ä 00C4	Å 00C5	Æ 00C6	Ç 00C7	È 00C8	É 00C9	Ê 00CA	Ë 00CB	Ì 00CC	Í 00CD	Î 00CE	Ï 00CF
D0	Ğ 011E	Ñ 00D1	Ò 00D2	Ó 00D3	Ô 00D4	Õ 00D5	Ö 00D6	× 00D7	Ø 00D8	Ù 00D9	Ú 00DA	Û 00DB	Ü 00DC	İ 0130	Ş 015E	ß 00DF
E0	à 00E0	á 00E1	â 00E2	ã 00E3	ä 00E4	å 00E5	æ 00E6	ç 00E7	è 00E8	é 00E9	ê 00EA	ë 00EB	ì 00EC	í 00ED	î 00EE	ï 00EF
F0	ğ 011F	ñ 00F1	ò 00F2	ó 00F3	ô 00F4	õ 00F5	ö 00F6	÷ 00F7	ø 00F8	ù 00F9	ú 00FA	û 00FB	ü 00FC	ı 0131	ş 015F	ÿ 00FF

## 13.14 SI 1507

					
Hebrew Letter Alef	80/128		Hebrew Letter Nun	90/144	
					
Hebrew Letter Bet	81/129		Hebrew Letter Samekh	91/145	
					
Hebrew Letter Gimel	82/130		Hebrew Letter Ayin	92/146	
					
Hebrew Letter Dalet	83/131		Hebrew Letter Final Pe	93/147	
					
Hebrew Letter He	84/132		Hebrew Letter Pe	94/148	
					
Hebrew Letter Vav	85/133		Hebrew Letter Final Tsadi	95/149	
					
Hebrew Letter Zayin	86/134		Hebrew Letter Tsadi	96/150	
					
Hebrew Letter Het	87/135		Hebrew Letter Qof	97/151	
					
Hebrew Letter Tet	88/136		Hebrew Letter Resh	98/152	
					
Hebrew Letter Yod	89/137		Hebrew Letter Shin	99/153	
					
Hebrew Letter Final Kaf	8a/138		Hebrew Letter Tav	9a/154	
					
Hebrew Letter Kaf	8b/139		Hebrew Shekel sign	9b/155	

## 13.16 PC1257 Font Set n = 11

80	90	A0	B0	C0	D0	E0	F0
NOT USED 128	NOT USED 144	NBSP 160	° 176	Ą 192	Š 208	ą 224	š 240
NOT USED 129	‘ 145	ˇ Hacek 161	± 177	Į 193	Ń 209	į 225	ń 241
˚ 130	’ 146	˘ Breve 162	ˆ 178	Ā 194	Ņ 210	ā 226	ņ 242
NOT USED 131	“ 147	£ 163	³ 179	Ć 195	Ó 211	ć 227	ó 243
” 132	” 148	α 164	˙ 180	Ä 196	Ō 212	ä 228	ō 244
… 133	• 149	NOT USED 165	μ 181	Å 197	Õ 213	å 229	õ 245
† 134	- 150	! 166	¶ 182	Ę 198	Ö 214	ę 230	ö 246
‡ 135	— 151	§ 167	• 183	Ē 199	× 215	ē 231	÷ 247
NOT USED 136	NOT USED 152	“ 168	˘ 184	Č 200	Ů 216	č 232	ů 248
‰ 137	™ 153	© 169	¹ 185	É 201	Ł 217	é 233	ł 249
NOT USED 138	NOT USED 154	Ŕ 170	ŕ 186	Ž 202	Ś 218	ż 234	ś 250
< 139	> 155	« 171	» 187	È 203	Ū 219	è 235	ū 251
NOT USED 140	NOT USED 156	¬ 172	¼ 188	Ğ 204	Ŭ 220	ğ 236	ü 252
NOT USED 141	NOT USED 157	̄ SHY 173	½ 189	Ķ 205	Ž 221	ķ 237	ž 253
NOT USED 142	NOT USED 158	® 174	¾ 190	Ī 206	Ž 222	ī 238	ž 254
NOT USED 143	NOT USED 159	Æ 175	æ 191	Ł 207	ß 223	ł 239	• 255

## 13.17 PC1252 Font Set n = 12

80:€	90:	A0:	B0:°	C0:à	D0:Ð	E0:à	F0:ð
81:	91:´	A1:i	B1:±	C1:Á	D1:Ñ	E1:á	F1:ñ
82:,	92:´	A2:ó	B2:²	C2:Â	D2:Ò	E2:â	F2:ò
83:f	93:“	A3:£	B3:³	C3:Ã	D3:Ó	E3:ã	F3:ó
84:„	94:”	A4:¤	B4:´	C4:Ä	D4:Ô	E4:ä	F4:ô
85:…	95:•	A5:¥	B5:µ	C5:Å	D5:Õ	E5:å	F5:ö
86:†	96:-	A6:¡	B6:¶	C6:æ	D6:Ö	E6:æ	F6:ö
87:#	97:-	A7:\$	B7:·	C7:ç	D7:×	E7:ç	F7:÷
88:ˆ	98:~	A8:¨	B8:¸	C8:È	D8:Ø	E8:è	F8:ø
89:%	99:™	A9:©	B9:¹	C9:É	D9:Ù	E9:é	F9:ù
8A:Š	9A:š	AA:ª	BA:º	CA:Ê	DA:Ú	EA:ê	FA:ú
8B:<	9B:>	AB:«	BB:»	CB:Ë	DB:Û	EB:ë	FB:û
8C:Œ	9C:œ	AC:¬	BC:¼	CC:Ì	DC:Ü	EC:ì	FC:ü
8D:	9D:	AD:	BD:½	CD:Í	DD:Ý	ED:í	FD:ý
8E:Ž	9E:ž	AE:®	BE:¾	CE:Î	DE:þ	EE:î	FE:þ
8F:	9F:ÿ	AF:¯	BF:¿	CF:Ï	DF:ß	EF:ï	FF:ÿ

## 14. Reliability Condition

		TN Type		STN/FSTN Type		
		Normal Temp.	Wide Temp.	Normal Temp.	Wide Temp.	
Viewing Angle	Horizontal ( $\Phi 1/\Phi 2$ )	$\pm 30^\circ$	$\pm 30^\circ$	$\pm 40^\circ$	$\pm 40^\circ$	
	Vertical ( $\Theta 2/\Theta 1$ )	15° to 35°	15° to 35°	35° to 55°	35° to 55°	
Operating Temperature		0 to 50°C	-20 to 70°C	0 to 50°C	*-20 to 70°C	
Storage Temperature		-10 to 60°C	-30 to 80°C	-10 to 60°C	*-30 to 80°C	
High Temperature (Power Off)		240 Hours @60°C	240 Hours @80°C	240 Hours @60°C	240 Hours @80°C	
Low Temperature (Power Off)		240 Hours @-10°C	240 Hours @-30°C	240 Hours @-10°C	240 Hours @-30°C	
High Temperature (Power On)		240 Hours @50°C	240 Hours @70°C	240 Hours @50°C	240 Hours @70°C	
Low Temperature (Power On)		240 Hours @0°C	240 Hours @-20°C	240 Hours @0°C	240 Hours @-20°C	
High Temperature & High Humidity (Power Off)		40°C/90%RH 240 Hours	40°C/90%RH 240 Hours	40°C/90%RH 240 Hours	40°C/90%RH 240 Hours	
Thermal Shock 5 Cycle		A	60min@0°C	60min@-20°C	60min@0°C	60min@-20°C
		B	5min@25°C	5min@25°C	5min@25°C	5min@25°C
		C	60min@50°C	60min@70°C	60min@50°C	60min@70°C
LCD Lift (25°C/ 45%RH)		50,000 Hours	50,000 Hours	50,000 Hours	50,000 Hours	

\*Wide temp. version may not available for some products, Please consult our sales engineer or representatives.

## 15. Functional Test & Inspection Criteria

### 15.1 Sample plan

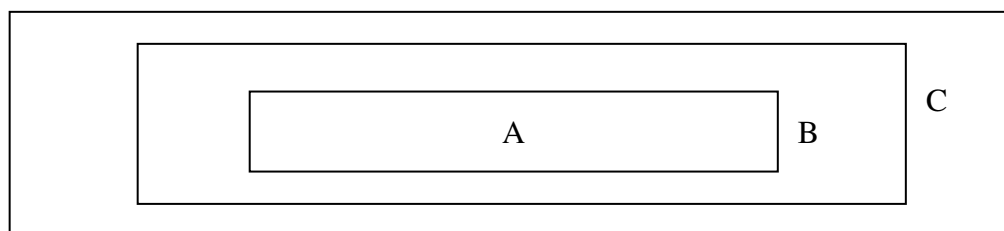
Sample plan according to MIL-STD-105D level 2, and acceptance/rejection criteria is.

Base on: Major defect: AQL 0.65 Minor defect: AQL 2.5

### 15.2 Inspection condition

Viewing distance for cosmetic inspection is 30cm with bare eyes, and under an environment of 800 lus (20W) light intensity. All direction for inspecting the sample should be within 45° against perpendicular line.

### 15.3 Definition of Inspection Zone in LCD



Zone A: Character / Digit area

Zone B: Viewing area except Zone A (Zone A + Zone B = minimum Viewing area)

Zone C: Outside viewing area (invisible area after assembly in customer's product)

Note: As a general rule, visual defects in Zone C are permissible, when it is no trouble for quality and assembly of customer's product.

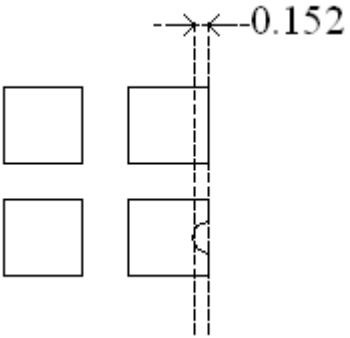
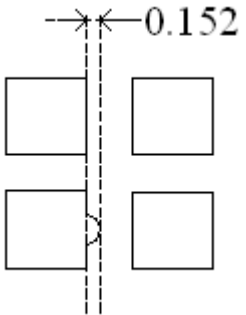
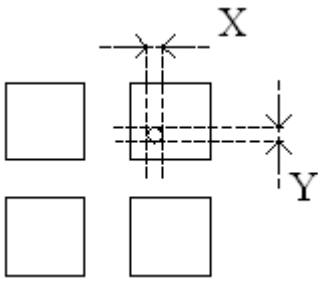
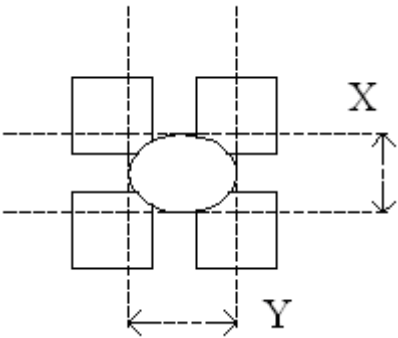
### 15.4 Major Defect

All functional defects such as open (or missing segment), short, contrast differential, excess power consumption, smearing, leakage, etc. and overall outline dimension beyond the drawing. Are classified as major defects.

NO	Polarizer(偏光板)	Criteria																		
1	Black or White spots And Piercing (黑/白點和刺孔)	<table border="1"> <thead> <tr> <th data-bbox="592 264 860 416">Dimension (面積)</th> <th data-bbox="860 264 1187 416">Acceptable number (可接受數量)</th> </tr> </thead> <tbody> <tr> <td data-bbox="592 416 860 465">D &lt; 0.15</td> <td data-bbox="860 416 1187 465">*</td> </tr> <tr> <td data-bbox="592 465 860 515">0.15 ≤ D ≤ 0.2</td> <td data-bbox="860 465 1187 515">4</td> </tr> <tr> <td data-bbox="592 515 860 564">0.2 ≤ D ≤ 0.25</td> <td data-bbox="860 515 1187 564">2</td> </tr> <tr> <td data-bbox="592 564 860 613">D ≤ 0.3</td> <td data-bbox="860 564 1187 613">0</td> </tr> </tbody> </table>		Dimension (面積)	Acceptable number (可接受數量)	D < 0.15	*	0.15 ≤ D ≤ 0.2	4	0.2 ≤ D ≤ 0.25	2	D ≤ 0.3	0							
Dimension (面積)	Acceptable number (可接受數量)																			
D < 0.15	*																			
0.15 ≤ D ≤ 0.2	4																			
0.2 ≤ D ≤ 0.25	2																			
D ≤ 0.3	0																			
D/面積=(Length/長度+Width/寬度)/2 => * : Disregard(忽略)																				
2	Scratch (刮傷)	<table border="1"> <thead> <tr> <th data-bbox="592 707 740 831">X(mm)</th> <th data-bbox="740 707 879 831">Y(mm)</th> <th data-bbox="879 707 1187 831">Acceptable number (可接受數量)</th> </tr> </thead> <tbody> <tr> <td data-bbox="592 831 740 880">*</td> <td data-bbox="740 831 879 880">0.04 ≥ W</td> <td data-bbox="879 831 1187 880">*</td> </tr> <tr> <td data-bbox="592 880 740 929">3.0 ≥ L</td> <td data-bbox="740 880 879 929">0.06 ≥ W</td> <td data-bbox="879 880 1187 929">4</td> </tr> <tr> <td data-bbox="592 929 740 978">2.0 ≥ L</td> <td data-bbox="740 929 879 978">0.08 ≥ W</td> <td data-bbox="879 929 1187 978">2</td> </tr> <tr> <td data-bbox="592 978 740 1028">—</td> <td data-bbox="740 978 879 1028">0.1 ≥ W</td> <td data-bbox="879 978 1187 1028">0</td> </tr> </tbody> </table>		X(mm)	Y(mm)	Acceptable number (可接受數量)	*	0.04 ≥ W	*	3.0 ≥ L	0.06 ≥ W	4	2.0 ≥ L	0.08 ≥ W	2	—	0.1 ≥ W	0		
X(mm)	Y(mm)	Acceptable number (可接受數量)																		
*	0.04 ≥ W	*																		
3.0 ≥ L	0.06 ≥ W	4																		
2.0 ≥ L	0.08 ≥ W	2																		
—	0.1 ≥ W	0																		
X : Length(長度)    Y : Width(寬度)    * : Disregard(忽略)																				
3	Air Bubbles (between glass & polarizer) 氣泡(玻璃跟偏光板之間)	<table border="1"> <thead> <tr> <th data-bbox="592 1099 860 1240">Dimension (面積)</th> <th data-bbox="860 1099 1187 1240">Acceptable number (可接受數量)</th> </tr> </thead> <tbody> <tr> <td data-bbox="592 1240 860 1290">D ≤ 0.15</td> <td data-bbox="860 1240 1187 1290">*</td> </tr> <tr> <td data-bbox="592 1290 860 1339">0.15 &lt; D ≤ 0.25</td> <td data-bbox="860 1290 1187 1339">2</td> </tr> <tr> <td data-bbox="592 1339 860 1391">0.25 &lt; D</td> <td data-bbox="860 1339 1187 1391">0</td> </tr> </tbody> </table>		Dimension (面積)	Acceptable number (可接受數量)	D ≤ 0.15	*	0.15 < D ≤ 0.25	2	0.25 < D	0									
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* : Disregard (忽略)																				

## 14.5 Inspection Parameters And Glass Pixel(偏光板和玻璃圖像檢驗)



4	Glass of Pixel (玻璃的圖像)	<p>(1) Pixel shape (with Dent) / 圖像凹度</p>  <p>● Less than 0.152 mm is no counted (小於 0.152mm 者不計)</p>
		<p>(2) Pixel shape (with Projection) / 圖像凸度</p>  <p>Should not be connected next pixel (點與點間不可先連接)</p>
		<p>(3) Deformation / 變形</p>  <p><math>(X + Y) / 2 \leq 0.15\text{mm}</math> ● Less than 0.1 mm is no counted (小於 0.15mm 者不計)</p>
		<p>(4) Deformation / 變形</p>  <p><math>(X + Y) / 2 \leq 0.3\text{mm}</math> ● Less than 0.3 mm is no counted (小於 0.3mm 者不計)</p>

## 16. Test (測試條件) – Normal Temperature (常溫)

No change no display and in operation under the following text condition.

(在不改變原先顯示下進行以下測試操作)

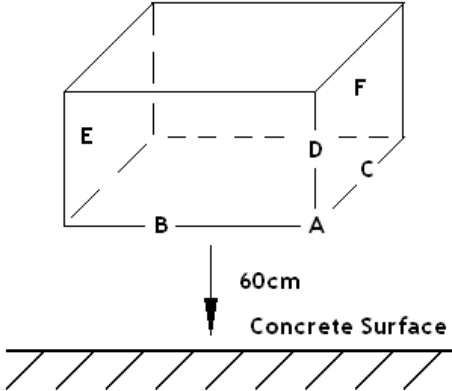
Conditions : Unless otherwise specified, test will be conducted under the following condition.

Temperature :  $20\pm 5\text{ }^{\circ}\text{C}$

Humidity :  $40\pm 5\%RH$

Tests will be not conducted under functioning state.

(條件：除非其他特殊情況，否則測試將以溫度： $20\pm 5\text{ }^{\circ}\text{C}$ ，濕度： $40\pm 5\%RH$ 為主)

NO	Parameter	Conditions	Notes
1	High Temperature Operating	$50^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ , 96 hrs (operation state) (96 小時，溫度 $50^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ 電源開啟的操作情況下)	
2	Low Temperature Operating	$0^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ , 96 hrs (operation state) (96 小時，溫度 $0^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ 電源開啟的操作情況下)	1
3	High Temperature Storage	$60^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ , 96 hrs (96 小時，溫度 $60^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ 電源關閉靜態操作下)	2
4	Low Temperature Storage	$-10^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ , 96 hrs (96 小時，溫度 $-10^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ 電源關閉靜態操作下)	1, 2
5	Damp Proof Test	$40^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ , 85 ~ 90%RH , 96hr (96 小時，溫度： $40^{\circ}\text{C}\pm 2\text{ }^{\circ}\text{C}$ ，濕度： $85\sim 90\%RH$ 電源關閉靜態操作下)	1, 2
6	Vibration Test	Total fixed amplitude : 1.5 mm (完全固定輻射：1.5mm) Vibration Frequency : 10 ~ 55 Hz (震動頻率：10~55 Hz) One cycle 60 seconds to 3 directions of X, Y, Z for each 15 minutes (每一個循環 X, Y, Z 軸方向各做 60 秒，連續做 5 次，共計 15 分鐘)	3
7	Shock Test	To be measured after dropping from 60cm high on the concrete surface in packing state. (包裝材從 60 公分高的地方向地面落下)  Dropping method comer dropping (角落落下方式) A comer : once Edge dropping (側邊落下) B, C, D edge : once Face dropping (表面落下) E, F, G face : once	

Note 1 : No dew condensation to be observed. (不要在“水氣凝結點”下觀察)

Note 2 : The function test shall be conducted after 4 hours storage at the normal

Temperature and humidity after removed from the test chamber

(從實驗室移出後，放在一般常溫 (溫度： $25^{\circ}\text{C}$ ，濕度： $45\%RH$ )，

且四小時後通電流或電壓，看它是否能正常動作)

Note 3 : Vibration test will be conducted to the product itself without putting it in a container.

(在震動測試下，產品本身不需容器即能自行傳導)

### 17. Test (測試條件) – Wide Temperature (廣溫)

No change no display and in operation under the following text condition.

(在不改變原先顯示下進行以下測試操作)

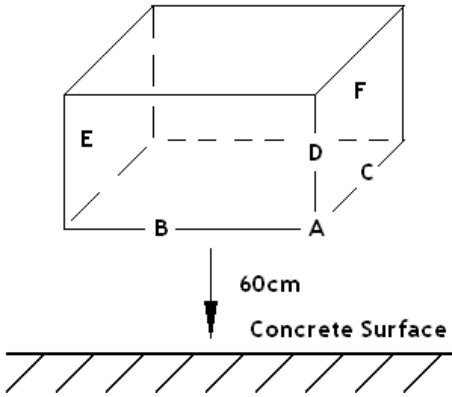
Conditions : Unless otherwise specified, test will be conducted under the following condition.

Temperature :  $20 \pm 5 \text{ }^\circ\text{C}$

Humidity :  $40 \pm 5\% \text{RH}$

Tests will be not conducted under functioning state.

(條件：除非其他特殊情況，否則測試將以溫度： $20 \pm 5 \text{ }^\circ\text{C}$ ，濕度： $40 \pm 5\% \text{RH}$  為主)

NO	Parameter	Conditions	Notes
1	High Temperature Operating	$70^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ , 96 hrs (operation state) (96 小時，溫度 $70^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ 電源開啟的操作情況下)	
2	Low Temperature Operating	$-20^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ , 96 hrs (operation state) (96 小時，溫度 $-20^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ 電源開啟的操作情況下)	1
3	High Temperature Storage	$80^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ , 96 hrs (96 小時，溫度 $80^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ 電源關閉靜態操作下)	2
4	Low Temperature Storage	$-30^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ , 96 hrs (96 小時，溫度 $-30^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ 電源關閉靜態操作下)	1, 2
5	Damp Proof Test	$40^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ , 85 ~ 90%RH , 96hr (96 小時，溫度： $40^\circ\text{C} \pm 2 \text{ }^\circ\text{C}$ ，濕度： $85 \sim 90\% \text{RH}$ 電源關閉靜態操作下)	1, 2
6	Vibration Test	Total fixed amplitude : 1.5 mm (完全固定輻射：1.5mm) Vibration Frequency : 10 ~ 55 Hz (震動頻率：10~55 Hz) One cycle 60 seconds to 3 directions of X, Y, Z for each 15 minutes (每一個循環 X, Y, Z 軸方向各做 60 秒，連續做 5 次，共計 15 分鐘)	3
7	Shock Test	To be measured after dropping from 60cm high on the concrete surface in packing state. (包裝材從 60 公分高的地方向地面落下)  Dropping method comer dropping (角落落下方式) A comer : once Edge dropping (側邊落下) B, C, D edge : once Face dropping (表面落下) E, F, G face : once	

Note 1 : No dew condensation to be observed. (不要在”水氣凝結點”下觀察)

Note 2 : The function test shall be conducted after 4 hours storage at the normal

Temperature and humidity after removed from the test chamber

(從實驗室移出後，放在一般常溫 (溫度： $25^\circ\text{C}$ ，濕度： $45\% \text{RH}$ )，

且四小時後通電流或電壓，看它是否能正常動作)

Note 3 : Vibration test will be conducted to the product itself without putting it in a container.

(在震動測試下，產品本身不需容器即能自行傳導)

## 18. Precautions Against Product Handling [產品使用注意事項] :

The following precautions will guide you in handling our product correctly.

[下列警戒引導正確地使用產品]

### 18.1 Care of the LCD module against static electricity discharge. [LCD 模組靜電注意事項]

18.1.1 When working with the module, be sure to ground your body and any electrical equipment you may be using. We strongly recommend the use of anti static mats (made of rubber), to protect work tables against the hazards of electrical shock.

[操作模組時，避免操作者身體接地及任何造成靜電的設備同時使用，強烈建議(橡膠製)抗靜電墊的使用，以免工作台面遭受到電氣干擾]

18.1.2 Slowly and carefully remove the protective film from the LCD module, since this operation can generate static electricity.

[緩慢小心地移除 LCD 模組上的保護膜，以防靜電產生]

18.1.3 Avoid the use of work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.

[避免穿著人造合成的工作服，建議棉質或是有傳導性的纖維質料]

### 18.2 Liquid crystal display devices (LCD devices) [液晶螢幕顯示器的組成]

18.2.1 The polarizer adhering to the surface of the LCD is made of a soft material.

Guard against scratching it. [偏光板是軟性原料製成，請勿刮傷]

18.2.2 The LCD device panel used in the LCM is made of plate glass. Avoid any strong mechanical shock. Should the glass break handle it with care.

[模組使用的玻璃為平面玻璃，避免任何強烈的機械撞擊，且觸碰時請小心]

### 18.3 When the LCD module alone must be stored form long periods of time

[當 LCD 模組須長時間存放時]

18.3.1 Protect the modules from excessive external forces. [避免外力壓迫]

18.3.2 Protect the modules from high temperature and humidity. [避免處於高溫高濕下]

18.3.3 Keep the modules out of direct sunlight or direct exposure to ultraviolet rays.

[遠離陽光曝曬或直接曝露在紫外線下]

18.4 Use the module with a power supply that is equipped with an overcurrent protector circuit, since the module is not provided with this protective feature.

[因為模組本身沒有防護，所以模組的供應器應配有過高電流的保護迴路]

18.5 Do not ingest the LCD fluid itself should it leak out of a damaged LCD module. Should hands or clothing come in contact with LCD fluid, wash immediately with soap.

[LCD 破裂液晶外漏時，切勿食下液晶；若手或衣服接觸到液晶，請立刻用肥皂清洗]

18.6 Conductivity is not guaranteed for models that use metal holders where solder connections between the metal holder and the PCB are not used. Please contact us to discuss appropriate ways to assure conductivity.

[當金屬框並沒焊接於 PCB 板上時，無法保證使用金屬框是具有傳導性，請連絡我們商討適當方式傳導]

### 18.7 For models which use CCFL [CCFL 的模組]:

18.7.1 High voltage of 1000V or greater is applied to the CCFL cable connector area.

[CCFL 排線連接器用於 1000V 以上的高電壓]

18.7.2 Protect CCFL cables from rubbing against the unit and thus causing the wire jacket to become worn. [CCFL 排線必須有保護 CCFL 與模組磨擦，以防 CCFL 外殼受到損害]

18.7.3 The use of CCFLs for extended periods of time at low temperatures will significantly shorten their service life. [長時間低溫使用 CCFL 會明顯縮減其使用壽命]

18.8 For models which use touch panels [觸控式面板模組]:

18.8.1 Do not stack up modules since they can be damaged by components on neighboring modules.

[勿堆疊模組以防損壞]

18.8.2 Do not place heavy objects on top of the product. This could cause glass breakage.

[勿將重物放置在產品上，會導致玻璃破損]

18.9 For models which use COG & TAB [COG 及 TAB 模組]:

18.9.1 The mechanical strength of the product is low since the IC chip is faces out unprotected from the rear. Be sure to protect the rear of the IC chip from external forces.

[由於 IC 晶片表面無防護，所以抗壓力有限，須加強保護以防外力]

18.9.2 Given the fact that the rear of the IC chip is left exposed, in order to protect the unit from electrical damage, avoid installation configurations in which the rear of the IC chip runs the risk of making any electrical contact.

[勿暴露 IC 晶片以防電氣干擾，且避免安裝 IC 時有任何電子接觸]

18.10 Models which use flexible cable, heat seal, or TAB [加有軟排線、熱封條或 TAB 的模組]:

18.10.1 In order to maintain reliability, do not touch or hold by the connector area.

[以維持產品信賴度，請勿觸碰或握住連接器]

18.10.2 Avoid any bending, pulling, or other excessive force, which can result in broken connections. [避免彎曲、拉扯或過度力量，會造成連接器損壞]

18.11 In case of acrylic plate is attached to front side of LCD panel, cloudiness (very small cracks) can occur on acrylic plate, being influenced by some components generated from polarizer film.

Please check and evaluate those acrylic materials carefully before use.

[貼在 LCD 玻璃前面的壓克力板若有模糊情況(微小裂縫)，即會影響偏光板；使用前請仔細確認壓克力材質]

18.12 In case of buffer material such as cushion/gasket is assembled into LCD module, it may have an adverse effect on connecting parts (LCD panel-TCP/ HEAT SEAL/ FPC, PCB-TCP/HEAT SEAL/FPC, TCP-HEAT SEAL, TCP-FPC, HEAT SEAL-FPC) depending on its materials.

Please check and evaluate these materials carefully before use.

[緩衝原料像是減震墊/襯墊，或許會對連接器(LCD panel-TCP/ HEAT SEAL/ FPC, PCB-TCP/HEAT SEAL/FPC, TCP-HEAT SEAL, TCP-FPC, HEAT SEAL-FPC)造成反效果，使用前請仔細確認材料]

## 19. Warranty [保證]:

This product has been manufactured to your company's specifications as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment, we cannot take responsibility if the product is used in medical devices, nuclear power control equipment, aerospace equipment, fire and security systems, or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required. If the product is to be used in any of the above applications, we will need to enter into a separate product liability agreement.

[此產品的製造是依照客戶的規格，被使用於客戶的一般電子產品上，保證產品製作根據出貨的規格，若產品的使用不是在一般電子設備，而組裝於下列產品上則無法受理（如醫療產品、核心電源控制設備、航空設備、防火及保全系統，或任何相關儀器會直接影響人類生命等），若模組使用於上述的儀器，則需商討各別產品責任義務的協定]

19.1 We cannot accept responsibility for any defect, which may arise after the application of strong external force to the product.

[不受理因強大外力衝擊造成產品的缺陷]

19.2 We cannot accept responsibility for any defect, which may arise from additional manufacturing of the product (including disassembly and reassembly), after product delivery.

[不受理產品出貨後，因額外加工(包含拆裝及重新封包)造成的缺陷]

19.3 We cannot accept responsibility for any defect, which may arise due to the application of static electricity after the product, has passed your company's acceptance inspection procedures.

[不受理通過貴公司檢驗流程後，由於靜電造成產品的缺陷]

19.4 We cannot accept responsibility for intellectual property of a third party, which may arise through the application of our product to your assembly with exception to those issues relating directly to the structure or method of manufacturing of our product.

[不受理因在客戶產品生產線端所產生的第三人智慧財產權責任，除非與我司生產製造方法有直接關係的問題]

19.5 When the product is in CCFL models, CCFL service life and brightness will vary according to the performance of the inverter used, leaks, etc. We cannot accept responsibility for product performance, reliability, or defect, which may arise.

[產品是 CCFL 模組時，CCFL 的壽命及亮度將取決於連接器的性能、漏電量等；無法受理因 CCFL 造成產品性能的缺陷]

19.6 It will not be held responsible for any quality guarantee issue for defect products longer than 1(one) year from our production which ever comes later.

[出廠超過一年的瑕疵品，任何品質擔保則不受理]