Winstar Display Co., LTD
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SPECIFICATION

CUSTOMER : _____

MODULE NO.: DEMO_KIT_FSC

APPROVED BY: **(FOR CUSTOMER USE ONLY)**	**PCB VERSION:** **DATA:**

Represented by:

FIRST Components srl Via Cavour 69, 21020 Buguggiate (VA)

T. +39 0332 1888005 web: www.first-components.com

Winstar Display Co., LTD
華凌光電股份有限公司

MODLE NO：

DOC. FIRST ISSUE

RECORDS OF REVISION

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2011.07.25		First issue

1.Module Classification Information

W D ____ — ___ — #__
① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Brand：WINSTAR DISPLAY CORPORATION

② Custom：D

③ Display Type：H→ Character Type ; G→ Graphic Type N → LCD Display ;O → COG Type

④ Model serials no.0000 - ZZZZ

⑤ Backlight Type：

	N→Without backlight	T→LED, White
	B→EL, Blue green	A→LED, Amber
	D→EL, Green	R→LED, Red
	W→EL, White	O→LED, Orange
	F→CCFL, White	G→LED, Green
	Y→LED, Yellow Green	C→LED, Triple color

⑥ LCD Mode：

B→TN Positive, Gray	T→FSTN Negative
N→TN Negative,	
G→STN Positive, Gray	
Y→STN Positive, Yellow Green	
M→STN Negative, Blue	
F→FSTN Positive	

⑦ LCD Polarizer Type/ Temperature range/ View direction

A→Reflective, N.T, 6:00	H→Transflective, W.T,6:00
D→Reflective, N.T, 12:00	K→Transflective, W.T,12:00
G→Reflective, W. T, 6:00	C→Transmissive, N.T,6:00
J→Reflective, W. T, 12:00	F→Transmissive, N.T,12:00
B→Transflective, N.T,6:00	I→Transmissive, W. T, 6:00
E→Transflective, N.T.12:00	L→Transmissive, W.T,12:00

⑧ Special Code

00:Sales Code

#:Fit in with the ROHS Directions and regulations

General Specification

ITEM	STANDARD VALUE	UNIT
Outline dimension	93.0 x 70.0 x 14.4(MAX)	mm
View area	72.0 x 39.3	mm
Active area	68.43 x 36.47	mm
LCD type	FSC LCD (TN) Positive Transmissive (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Drive Method	1/1DUTY,1/1 BIAS	
View direction	12 o'clock	
LED Color	LED, Triple color	

Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T_{OP}	0	—	+50	℃
Storage Temperature	T_{ST}	-30	—	+80	℃
Supply Voltage	V_{DD}	-0.3	—	3.6	V
Input Voltage	V_{IN}	-0.3	—	$V_{DDI+0.5}$	V

The color of B/L only works properly during 0~50 degree.
While the temperature reaches -20 degree, the module will work as a monochrome LCM.
While the temperature reaches 70 degree, color of background will be changed and effected color of B/L.

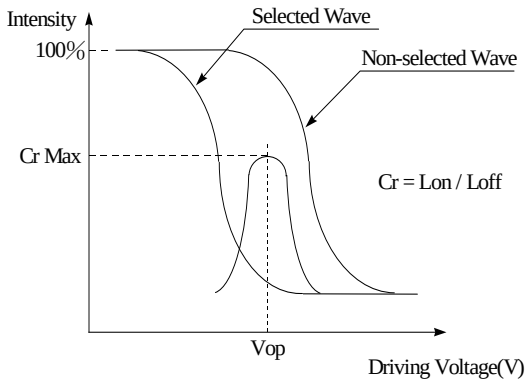
Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	—	3.3	—	V
Supply Voltage For LCD	V_{DD}-V_0	Ta=25℃	7	12	16	V V V
Input High Volt.	V_{IH}	—	0.7 V_{DD}	—	V_{DD}	V
Input Low Volt.	V_{IL}	—	Vss	—	0.3V_{DD}	V
Output High Volt.	V_{OH}	—	0.8 V_{DD}	—	V_{DD}	V
Output Low Volt.	V_{OL}	—	Vss	—	0.2V_{DD}	V
Supply Current	I_{DD}	—	—	0.5	—	mA
Positive/Negative Voltage Output	Vee	Boost	—	16	—	V

Optical Characteristics

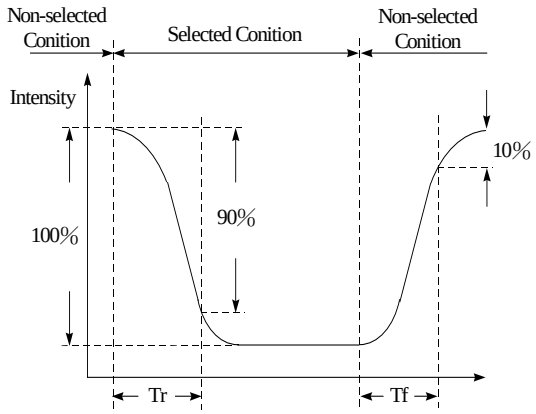
Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	(V) θ	CR≧2	30	—	60	deg
	(H) φ	CR≧2	-45	—	45	deg
Contrast Ratio	CR	—	—	5	—	—

Definition of Operation Voltage (Vop)



[positive type]

Definition of Response Time (Tr , Tf)



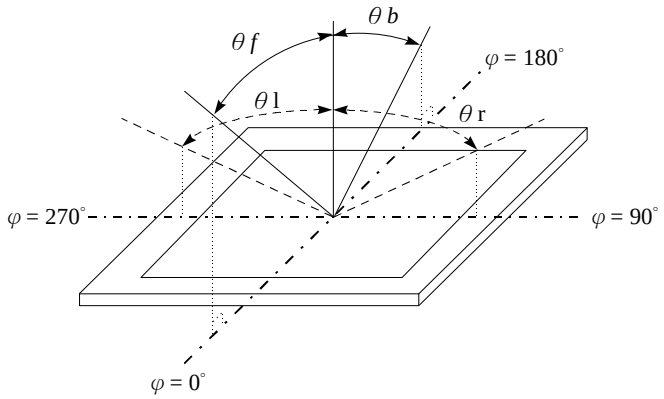
[positive type]

Conditions :

Operating Voltage : Vop Viewing Angle(θ ， φ) : 0˚， 0˚

Frame Frequency : 64 HZ Driving Waveform : 1/N duty , 1/a bias

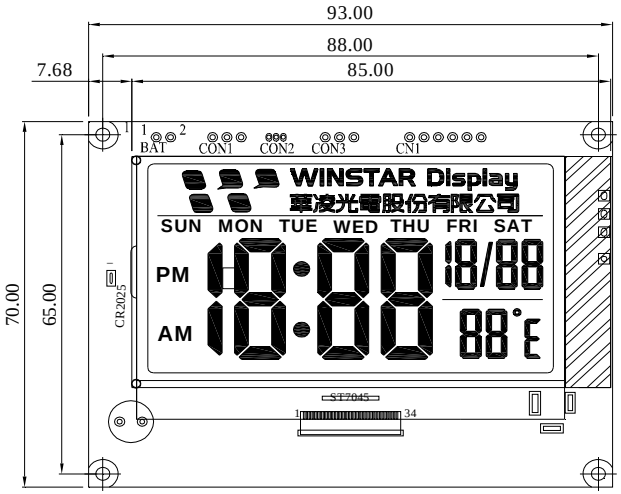
Definition of viewing angle(CR≧2)



Interface Pin Function

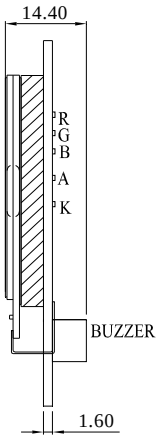
Pin No.	Symbol	I/O	Description
1	Vss		GND
2	Vdd		Power supply for B/L

Drawing



BAT

PIN NO.	SYMBOL
1	Vss
2	Vdd



The non-specified tolerance of dimension is ±0.3mm.