



User's Guide

NHD-4.3-480272ZF-ATXI#-T-1 TFT

(Liquid Crystal Display Graphic Module) Touch Panel

4.3" Diagonal 16-bit digital interface 480x272 Resolution White LED Backlight

Please review the driver spec HX8257-A

Tel: (847) 844-8795 Fax: (847) 844-8796

Newhaven Display International 2511 Technology Drive, #101 Elgin, IL 60124 April 3, 2009

STANDAR DOC.	DP	RODUCT SPEC.	MODULE NO.				PAC	ЭE	1	
	RECORDS OF REVISION									
DAT	E	REVISED NO.	REVISE	D DESCRIPTIONS	PREPARED	CHECK	ED A	APPROVED		
FEB.24	2009	01	FIRST ISSUE							
L					1	<u> </u>				

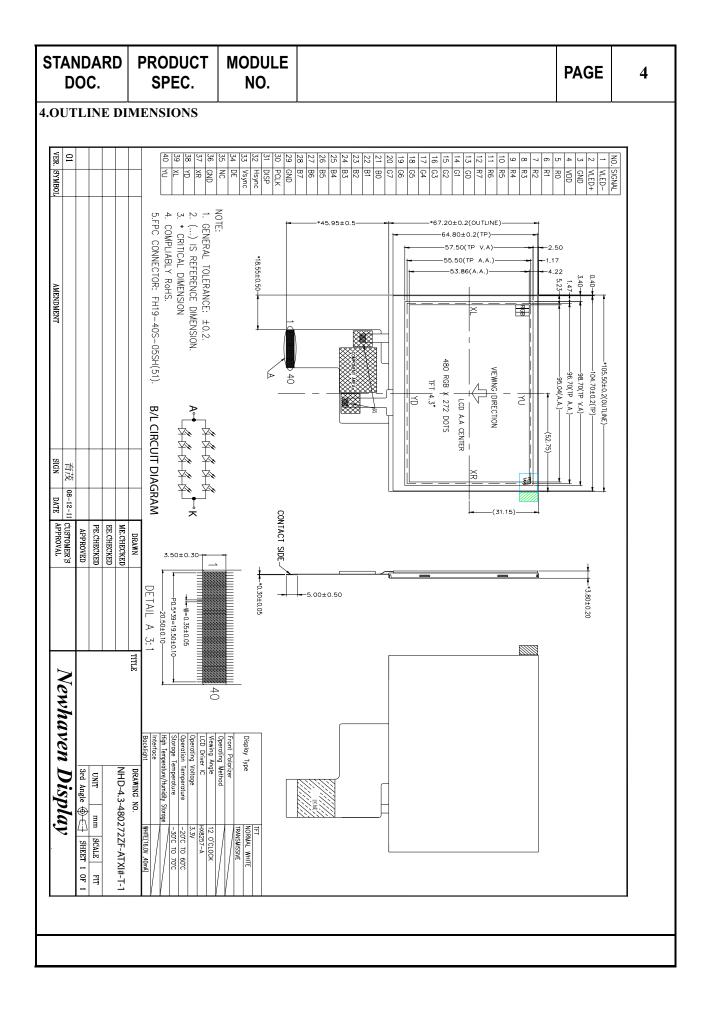
STANDARD DOC.	PRODUCT SPEC.	MODULE NO.		PAGE	2
			CONTENTS		
1.	GENERAL SPE	CIFICATION	s	2	2
2.	FEATURES			2	2
3.	MECHANICAL	SPECIFICA	FIONS	2	2
4.	OUTLINE DIM	ENSIONS		2	l .
5.	INTERFACE AS	SSIGNMENT		4	5
6.	APPLICATION	CIRCUIT		(6
7.	BLOCK DIAGF	RAM		(6
8.	TIMING CHAR	ACTERISTIC	CS	7	7
9.	RESET TIMINO	GCHARACT	ERISTICS	Ģ)
10.	POWER ON/OI	FF SEQUENC	Е	1	0
11.	ABSOLUTE MA	AXIMUM RA'	TINGS	1	1
12.	ELECTRICAL	CHARACTE	RISTICS	1	1
13.	LED BACKLIG	HT CHARAC	CTERISTICS	1	2
14.	OPTICAL CHA	RACTERIST	ICS	1	3
15.	ENVIRONMEN	TAL ABSOLU	UTE MAXIMUM RATINGS	1	6
16.	RELIABILI TY	TEST		1	6
17.	THE STANDAR	RD OF INSPE	CTION	1	7
18.	USING LCD M	ODULES		2	0

STANDARD DOC.	PRODUCT SPEC.	MODULE NO.		PAGE	3
1. GENER	AL SPECIFICA	TIONS			
1-1 SC					
Th	is specification co	vers the delivery	requirements for the liquid crystal display delivered	by Newhav	/en
to	Customer				
1-2 PF	ODUCTS:				
Lio	quid Crystal Display	y Module (LCM)			
1-3 MC	DULE NAME:				
Ν	HD-4.3-480272Z	F-ATXI#-T-1			
2. FEATU	RES				
		a-Si TFT; 480RG	B*272dots; 12 O'clock; transmissive; normally white; ,		
(2)	Driving Method: TF	т			

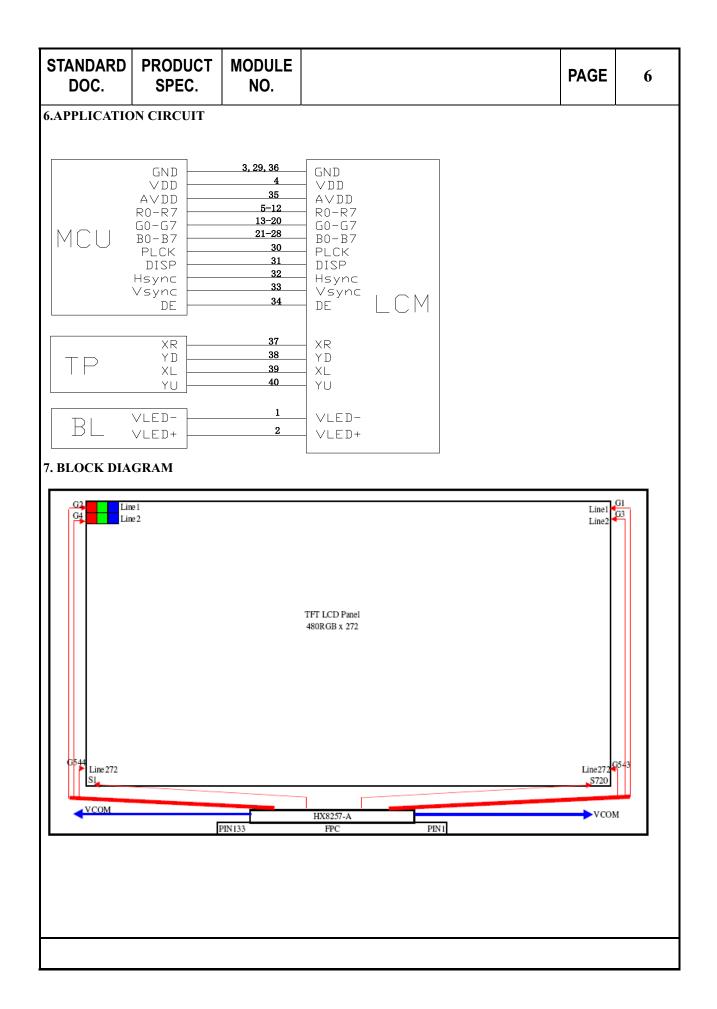
- (2) Driving Method: TFT(3) Built-in driver:HX8257-A
- (4) With WHITE LED Backlight

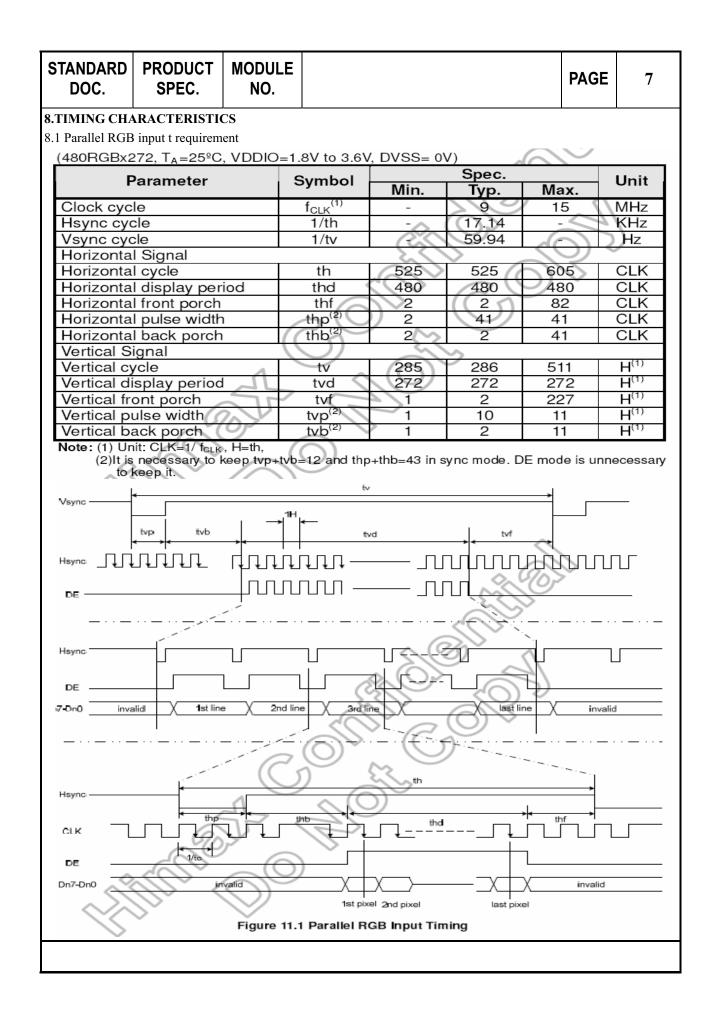
3. MECHANICAL SPECIFICATIONS

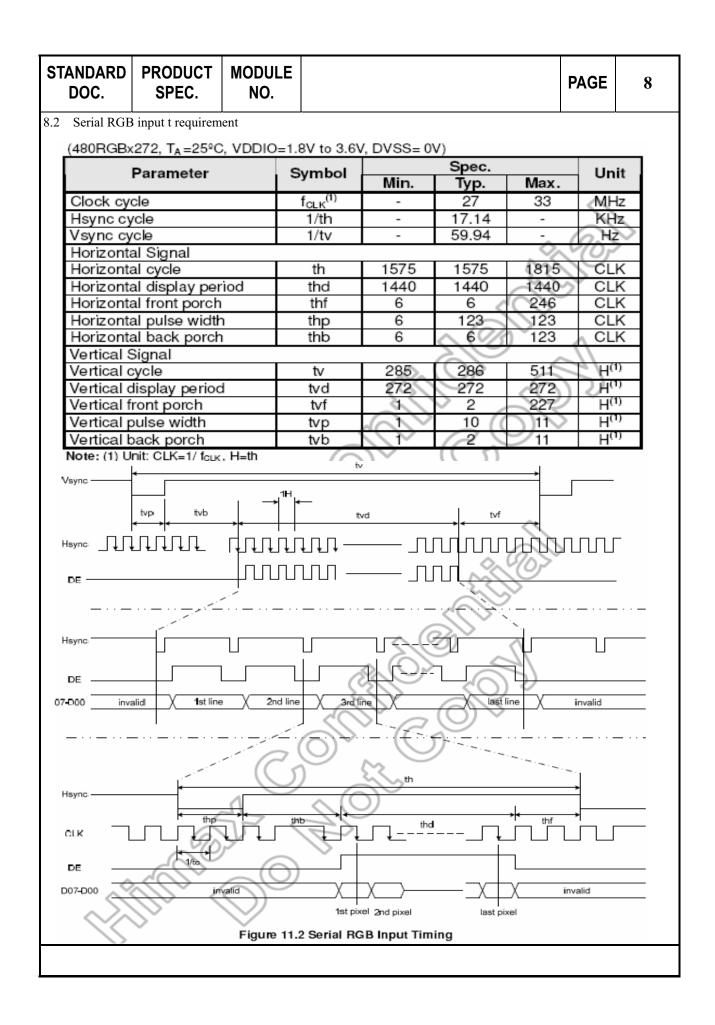
ITEM	SPECIFICATIONS	UNIT
OUTLINE DIMEMSIONS	105.5(W) x67.2(H) x3.8(T)	mm
ACTIVE AREA	95.04 (W) x53.86(H)	mm
DISP.CONSTRUCTION	480(RGB) x272 s t o D	
DOT PITCH	0.198 X 0.198	mm
ASSY.TYPE	COG+FPC+BL+TP	
BACKLIGHT	WHITE LED	
WEIGHT	TBD	g

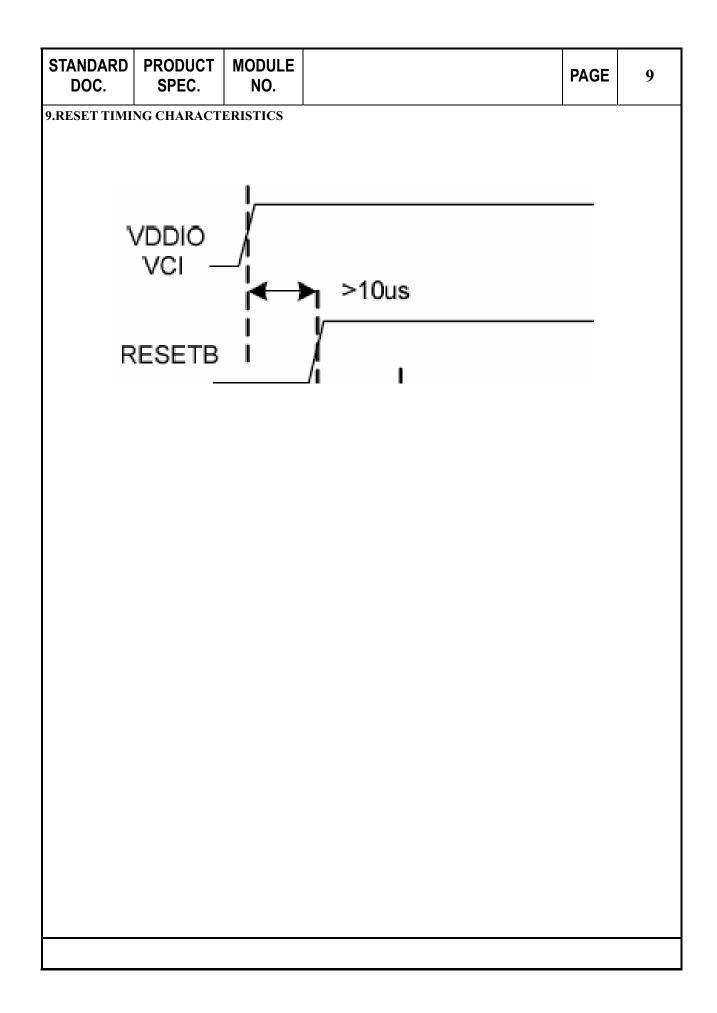


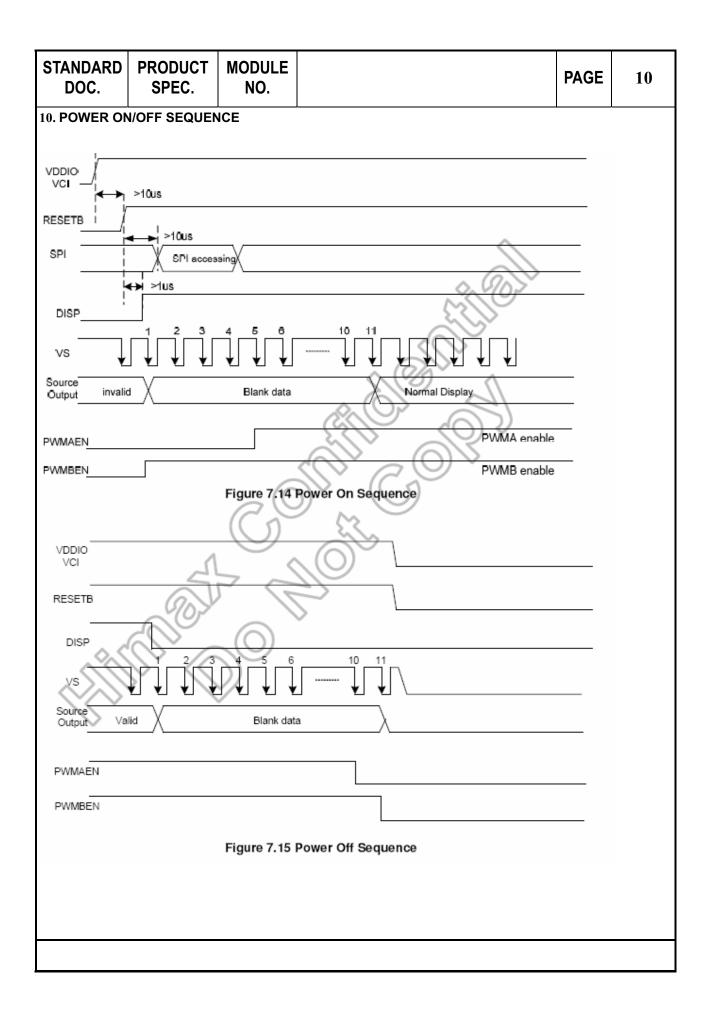
STANDARD DOC.	PRODUCT SPEC.	MODULE NO.		PAGE	5
INTERFACE	ASSIGNMEN'	Γ	Į	I	
PIN N	0.	F	UNCTION DESCRIPTIONS	S	YMBOL
1	Backlight C				ED-
2	Backlight	Anode		VLE	ED+
3	GROUND			GI	ND
4	Supply Vol	tage = 3.3V			۷D
5	Red data s				R0
6	Red data s				1
7	Red data s				2
8	Red data s				3
<u>9</u> 10	Red data si Red data si				84 85
10	Red data s			i	86
11	Red data si	0			R7
13		signal(LSB)		i	60 60
14	Green data				61
15	Green data	signal		i	62
16	Green data	signal		Ģ	63
17	Green data	signal		G	64
18	Green data	signal		G	65
19	Green data				6
20		signal(MSB)			67
21	Blue data s				80
22	Blue data s				31
23	Blue data s				32
24	Blue data s	<u>u</u>			3
25 26	Blue data s Blue data s			i	34 35
20	Blue data s				86
28		ignal(MSB)			37
29	GROUND	ignal(mob)		i	ND
30	1	al to sample each	data	i	LK
31			is pulled high in internally)	1 I	SP
32	Horizontal	synchronizing sig	nal	HS	YNC
33	Vertical syr	chronizing signal		VSY	YNC
34	Input data	enable control. In	ernally pulled low.		E
35	No Conne	ct			A
36	GROUND				ND
37	1	NEL INTERFACE			R
38	1	NEL INTERFACE			D
39		NEL INTERFACE		- i	(L
40	TOUCH PA	NEL INTERFACE	E FOR YU	Y	U











STANDARD DOC.	PRODUCT SPEC.	MODULE NO.		PAGE	11
------------------	------------------	---------------	--	------	----

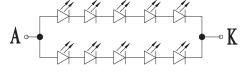
11. ABSOLUTE MAXIMUM RATING

ITEM	SYMBOL	CONDITION	ST	UNIT			
IT EIVI	STNIDOL	CONDITION	MIN	TYP	MAX	UNIT	
POWER SUPPLY FOR LOGIC	IOVCC	Ta=25⊠	-0.3		+3.6	V	
INPUT VOLTAGE	VIN	Ta=25⊠	-0.3		VCI+0.3	V	
OPERATION TEMPERATURE	TOPR		-20		+60		
STORAGE TEMPERATURE	TSTG		-30		+70		

12. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITIONS	STAN	UNIT			
	STNDOL	CONDITIONS	MIN	TYP	MAX	UNIT	
POWER SUPPLY VOLTAGE	VDD-VSS	Ta= +25⊠	-	3.3	-	V	
INPUT VOLTAGE "H" LEVEL	VIH	_	0.8VDD	_	VDD	V	
INPUT VOLTAGE "L" LEVEL	VIL	_	VSS	_	0.2VDD	V	
OUTPUT VOLTAGE "H" LEVEL	VOH	IOH=200uA	VDD-0.3	_	VDD	V	
OUTPUT VOLTAGE "L" LEVEL	VOL	IOL=200uA	VSS	_	VSS+0.3	V	

STANDARD DOC.	PRODUCT SPEC.	MODULE NO.	PAGE	12
13. LED BACK	LIGHT			
13-1 POWER S	UPPLY FOR LED	BACKLIGHT		



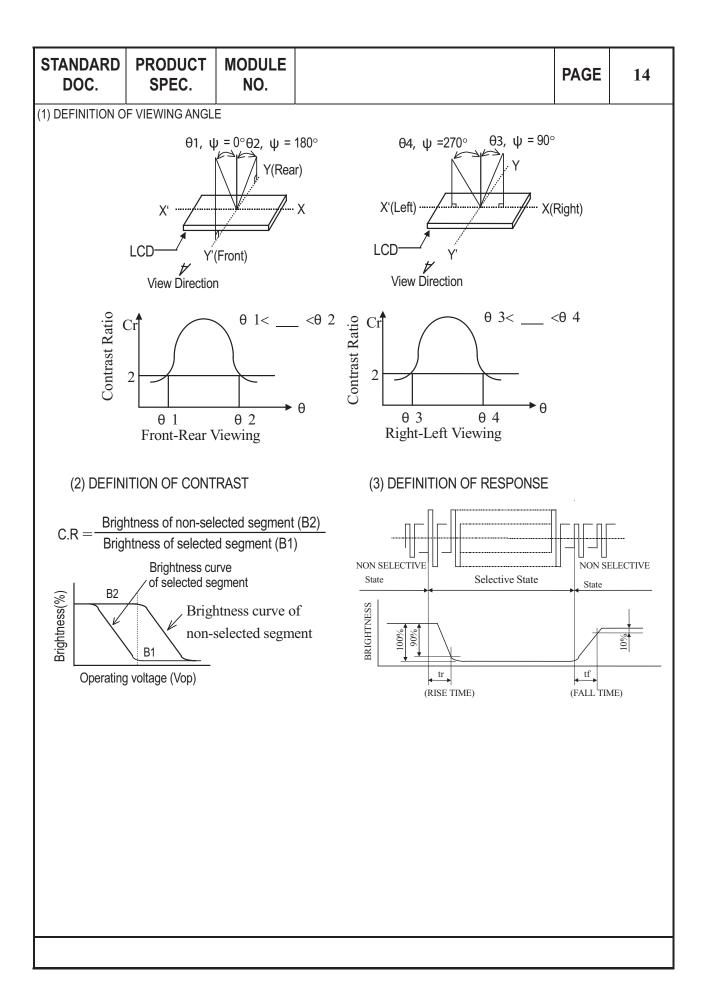
13-2 ABSOLUTE MAXIMUN RATING

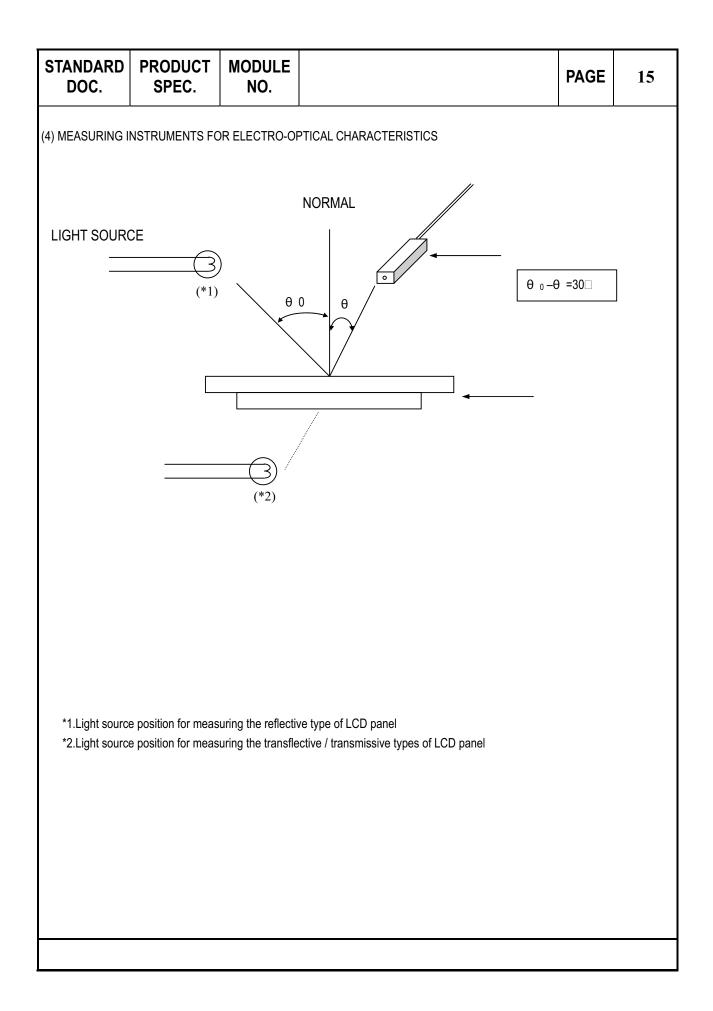
PARAMETER	SYMBOL	SPECIFICATIONS	UNIT
POWER DISSIPATION	PD	850	mW
FORWARD CURRENT	IFm	50	mA
REVERSE VOLTAGE	VF	5/LED	V
OPERATION TEMPERATURE	TOPR	-20🛛 ~ +70🖾	
STORAGE TEMPERATURE	TSTG	-30🛛 ~ +80🖾	

13-3 ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	LIGHT	CONDITIONS	STAN	- UNIT		
	STWDOL	SOURCE	CONDITIONS	MIN	TYP	MAX	UNIT
PARAMETER	VF	WHITE	IF =40mA	15	16	17	V
LUMINOUS INTENSITY	lv	WHITE		230	250	1	cd/m ₂
Color of CIE/(1021) coordinate	Х	WHITE	IF =40mA	0.26	1	0.31	nm
Color of CIE(1931) coordinate	Y	WHITE		0.26	1	0.31	nm

STANDARD DOC.	PRODI SPE		ODULE NO.					PAGE	13
14.OPTICAL CI	HARACI	TERISTIC	S					-	
Item		Symbol	Conditions	Spe	ecificatio	ons	Unit	No	to
Item	item Symbo		Conditions	Min.	Тур.	Max.	Unit	Note	
Transmittanc	e	T%			7.1		%		
Contrast Rati	0	CR			250		-		
Response Time		T _B			TBD		ms		
nesponse m	lie	T _F			TBD		ms	All left si	
	Red	X _R			TBD		-		
	neu	Y _R	Viewing norma	ıl	TBD		-	condition	
	Green	X _G	angle $\theta_X = \theta_Y$		TBD		-	6 o'c	
Chromaticity	Green	Y _G	=0°		TBD		-	NTSC	
Chromaticity	Blue	Хв			TBD		-	LC:	
	Dine	Υ _B			TBD		-	Light :	
	White	Xw]		TBD		-	(Machine	
	white	Yw	1		TBD		-	Normal F	
	11	θ χ +			45			Reference Only	
Viewing	Hor.	θ χ .	Center		45				
Angle	Mar	θ _{Y+}	CR≥10		15		deg.		
0	Ver.	θ _{Y-}	1		35				





DOC.	PRODUCT SPEC.	MODULE NO.	Ξ			PAGE	1
ENVIRONMI	ENTAL ABSO	LUTE MAX	IMUM	I RATINGS			
	ITEM	SYI	MBOL	CONDITIONS	CRITER	NION	
OPERATING 1	TEMPERATURE	T	OPR	-20⊠~ +60⊠	NO DEFECT IN DISPL OPERATIONAL FUNC		
STORAGE TE	MPERATURE	T	STG	-30⊠~ +70⊠	NO DEFECT IN DISPL OPERATIONAL FUNC		
HUMIDITY				See Note	WITHOUT CONDENS	ATION	
(2) OPERATIN	NG STATE: SAMPLES SUBJECT TO T	HE TESTS SHALL BE IN ' OPE	ATING" CONDITIO	ON (2) OPERATING STATE: SAMPLES SU	IBJECT TO THE TESTS SHALL BE IN ' OPERATING' CONDIT	ICN	
(2) OPERATIN ELIA BILITY		HE TESTS SHALL BE IN' OPE	KATING' (CONDITIK	CN (2) OPERATING STATE SAMPLES SU 	IRJECT TO THE TESTS SHALL BE IN " OPERATING" CONDIT	ICN	
			ang (anti Ditions		RECITOTHETESTS SHALL EE IN "OPERATING" CONJT		
ELIABILITY	Y TEST		DITIONS	3		ON	
ELIABILITY	Y TEST	CON	DITIONS JRE +70	S 122 72HRS	CRITERI	ON PLAYING AND	
ELIABILITY ITEM OPERATING	Y TEST	CON H TEMPERTU	DITIONS JRE +70 JRE - 20	S DØ 72HRS DØ 72HRS	CRITERI NO DEFECT IN DISI	ON PLAYING AND ON	
ITEM OPERATING TEMPERATUR	Y TEST HIG RE LO HIG	CON H TEMPERT	DITIONS JRE +70 JRE - 20 JRE +80	S DØ 72HRS DØ 72HRS DØ 120HRS	CRITERIO NO DEFECT IN DISI OPERATIONAL FUNCTIO	ON PLAYING AND ON PLAYING AND	
ITEM OPERATING TEMPERATUR STORAGE	Y TEST HIG RE LO HIG	CON SH TEMPERTU SH TEMPERTU SH TEMPERTU W TEMPERTU	DITIONS JRE +70 JRE - 20 JRE +80	S NM 72HRS NM 72HRS NM 120HRS NM 120HRS	CRITERI NO DEFECT IN DISI OPERATIONAL FUNCTIONAL FUNCTIFICAL FUNCTIONAL FUNCTIFICAL F	ON PLAYING AND ON PLAYING AND ON PLAYING AND	
ITEM OPERATING TEMPERATUF STORAGE TEMPERATUF	Y TEST HIG RE LO RE LO RE LO MIG RE LO MIG Sweep	CON H TEMPERT W TEMPERT H TEMPERT W TEMPERT 40 90% ing Time: thirty	DITIONS JRE +70 JRE - 20 JRE - 30 JRE - 20 JRE -	S NM 72HRS NM 72HRS NM 120HRS NM 120HRS 2HRS s exposure for n (X,Y,Z)	CRITERIO NO DEFECT IN DISP OPERATIONAL FUNCTION NO DEFECT IN DISP OPERATIONAL FUNCTION NO DEFECT IN DISP	ON PLAYING AND DN PLAYING AND DN PLAYING AND DN	

NOTE: The samples must be free from defect before test, must be restore at room condition at least for 2 hour after reliability test before any inspection.

17.THE STANDARD OF INSPECTION 17.THE STANDARD OF INSPECTION Criterion No. Item Criterion AQL 1 Dimension Dimension out of the specification 1.0 1. General crack X Y Z 2. corner X Y Z 2. corner X Y Z 3. contact pad crack 2.50 4. Substrate protuberance and internal crack 2.50 4. Substrate protuberance and internal crack X Y Z Image: Constrained and provide		DUCT MODULE EC. NO.			PAGE	17
No. Item Criterion AQL 1 Dimension Dimension out of the specification 1.0 1. General crack X Y Z 7 Y X Y Z 2 , corner X Y Z X Y Z , corner X Y Z Z Z 3 , contact pad crack X Y Z Z 4 . Substrate protuberance and internal crack X Y Z 4 . Substrate protuberance and internal crack X Y Z					·	
1 Dimension Dimension out of the specification 1.0 1 General crack X Y Z 7 Y X Y Z 7 Y X Y Z 2 , corner X Y Z 2 , corner X Y Z Z X Y Z <t< td=""><td></td><td>and specification for ap</td><td></td><td></td><td></td><td></td></t<>		and specification for ap				
2 Glass crack 3. contact pad crack X Y Z Y Z $Z K/8 area \leq T$ X Y Z Z K/8 Not over A No $area checkX Y ZZ K/8 Not over A No area checkZ Z ZZ Z Z ZZ Z Z ZZ Z Z Z ZZ Z Z Z Z ZZ Z Z Z Z Z Z ZZ Z Z Z Z Z Z Z Z Z $					1	
2 Glass crack Glass crack 3, contact pad crack 4, Substrate protuberance and internal crack $\frac{X Y Z}{ z / x }$ $\frac{X Y Z}{ z / x }$	1 Dimension		pecification			1.0
	2 Glass crack	 z, corner x, v z, contact pad crack x, contact pad crack x, substrate protube x, substrate protube 	$\ge K/8$ x $\ge K/8$ $K/8$ $K/8$ $K/8$ $K/8$ $K/8$ $K/8$ $K/8$	Not over A areaYYNot over A areaY2Y2Y2Y2Y	≤T No heck Z No	2.50

DO	DARD C.	PROD SPE		MODULE NO.						PAG	ε	18
					Ī	D		ceptable of				
			X I	Ξ	202		A/B Area	C Are	ea			
					-	D<0.2 ≤D<0.3	IN	o check 2				
	Black dot	dot \				≦D < 0.5 ≦D≤0.5		1	— No c	heck		
3		te dot	Ĩ	<u> </u>		D≥0.5 D>0.5		0			4	2.50
			Y: sho	g diameter t diameter erage of diame	eter D=(X-	+Y)/2						
				1				Accortoblo	of dofo	-		
				L	Length	Whidth		Acceptable A/B Area	of defe			
				•	accont	W≤0.02		A/B Area No check	CAR	:d		
				₩	accept L≤3	W≤0.02 W≤0.05		2		heck		
		Line defect	7			W≤0.05 W≤0.05		2				
	4 Line				L≤2.5	W≥0.05		As round type			-	2.50
4	Line			gth W: Width								2.50
4				t of polarizer			cordi	ng to the lim	it			
4			Defect	t of polarizer			cordi	ng to the lim	it f defect			
4			Defect	t of polarizer	(Scratches	、Spot):Ac D	cordi	ng to the lim cceptable of /B Area	it			
5	Pola	arizer	Defect specin	t of polarizer	(Scratches	、Spot):Ac	cordi	ng to the lim cceptable of /B Area check	it defect C Area	3		2.50
	Pola		Defect	t of polarizer	(Scratches	、Spot):Ac D ≤0.2	cordi A No	ng to the lim cceptable of /B Area check 3	it f defect	3		
	Pola	arizer	Defect specin	t of polarizer	(Scratches 	、 Spot): Ac D ≤0.2 D≤0.5	cordi Aa No	ng to the lim cceptable of /B Area check 3	it defect C Area	3		
	Pola	arizer		t of polarizer nen	(Scratches 	、 Spot): Ac D ≤0.2 D≤1.0 >1.0	Ad Ad No 2	ng to the lim cceptable of /B Area check 3 2 0	it defect C Area	3		
	Pola Bu	arizer bble nal print	Defect specin	t of polarizer	(Scratches D 0.2≤I 0.5≤I D	Spot) : Ac D ≤0.2 D≤0.5 D≤1.0 >1.0 me as segment	Ad A	ng to the lim cceptable of /B Area check 3 2 0	it C Area No ch	3		
5	Pola Bu	arizer bble nal print el	Defect specin Y 1, Tr 2, Pr	ransfigure、 pi	(Scratches D $0.2 \le 1$ $0.5 \le 1$ D in hole : sa nt width ≥ 1	Spot) : Ac D ≤0.2 D≤0.5 D≤1.0 >1.0 me as segment I/2 standard	Ad A	ng to the lim cceptable of /B Area check 3 2 0 sfinguer n is acceptab	it C Area No ch	3		2.50

STAND DO		PROD SPE		MODULE NO.		PAGE	19
9	SMT	organ	2、 Ti 3、 D	rying to keep do	ponent $\leq 1/3$ width of component of of soldering tin orbicular < < < < < < < < < < < < < < < < < < <	e for	2.50
10	Steel I	Frame	2、If al		0	, we	2.50

17-2 Inspection items and specification for display defect (power on)

	Electrical		Segment miss	-	Not allow			
1	Defect		Segment sho		Not allow	/		1.0
			Non-display	/ N	ot allow			
		1、Pin hole		widt	h	Acceptable	ofdefect	
				W<0).4	D≤0.2 & [0≤1/2W	
		★ B	∃ (F B	W≥0.	4	D≤0.25 & D	≤1/3W	
2	2 Pin hole		A	* D=(A+B)/	2 D	≤0.1 accepta	ible	2.50
				Widt	h	Acceptable	ofdefect	
		Display		W<0).4	C、D、	G≤1/2W	
2	Display			W≥0.	4	C, D,	G≤0.2	1.0
5	3 pattern	W: Design di	mension C ₂	D: discrepa	nt dimens	sion G= E-F	:	1.0
						Acceptak		
				D	-	A/B Area	C Area	
		X	E I	D<0.	1	No check		
	Black/white			0.1≤D<().2	2	┨	
4	dot	2	7	0.2≤D≤0.	25	1	No check	2.50
		- <u>-</u>	<u></u>	D>0.2	5	0	1	
		X: long diam						
		Y: shot diame						
		D: average di	iameter D=(X-	+Y)/2				

STAND DO		PROD SPE		MODULE NO.					PAG	ε	20)
			1		Length	Width	Accepta	ble QT	Υ			
				T	Length	width	A/B Area	C Are	a			
				\↓ ¯	不	W≤0.02	No check					
				← w	L≤3	W≤0.03	2	No cł	neck			
			- 1	- vv	L≤2.5	0.03 <w≤0.05< td=""><td>2</td><td></td><td></td><td colspan="2"></td><td></td></w≤0.05<>	2					
5	Line defect		Line defect		L≥2.3	W>0.05	Sa round	d type		2	2.50	
			L: leng	J ↓ L gth W: width								

18.USING LCD MODULES

18-1 LIQUID CRYSTAL DISPLAY MODULES

LCD is composed of glass and polarizer. Pay attention to the following items when handling.

- (1) Please keep the temperature within specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high humidity.
- (2) Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.).
- (3) N-hexane is recommended for cleaning the adhesives used to attach front/rear polarizers and reflectors made of organic substances which will be damaged by chemicals such as acetone, toluene, ethanol and isopropylalcohol.
- (4) If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, wipe gently with absorbent cotton or other soft material like chamois soaked in Isopropyl alcohol or Ethyl alcohol. Do not scrub hard to avoid damaging the display surface.
- (5) Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading.
- (6) Avoid contacting oil and fats.
- (7) Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizers. After products are tested at low temperature they must be warmed up in a container before coming is contacting with room temperature air.
- (8) Do not put or attach anything on the display area to avoid leaving marks on.
- (9) Do not touch the display with bare hands. This will stain the display area and degradate insulation between terminals (some cosmetics are determinated to the polarizers).
- (10) Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
- (11) As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring.

18-2 PRECAUTION FOR HANDING LCD MODULES

Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.

STANDARD DOC.	PRODUCT SPEC.	MODULE NO.	PAGE	21
------------------	------------------	---------------	------	----

(1) Do not alter, modify or change the the shape of the tab on the metal frame.

(2) Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.

(3) Do not damage or modify the pattern writing on the printed circuit board.

(4) Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.

(5) Except for soldering the interface, do not make any alterations or modifications with a soldering iron.

(6) Do not drop, bend or twist LCM. In particular, do not forcibly pull or bend the IIO cable or the backlight cable.

(7) In order to avoid the cracking of the FPC, you should to pay attention to the area of FPC where the FPC was bent .the edge

of coverlay; the area of surface of Ni-Au plating, the area of soldering land, the area of through hole.

18-3 ELECTRO-STATIC DISCHARGE CONTROL

Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC.

- Make certain that you are grounded when handing LCM. To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules. - Exposed area of the printed circuit board. - Terminal electrode sections.
- (2) Before remove LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential.
- (3) When soldering the terminal of LCM, make certain the AC power source for the soldering iron does not leak.
- (4) When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.
- (5) As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.
- (6) To reduce the generation of static electricity be careful that the air in the work is not too dried. A relative humidity of 50%-60% is recommended.

18-4 PRECAUTIONS FOR OPERATION

(1) Viewing angle varies with the change of liquid crystal driving voltage (VO). Adjust VO to show the best contrast.

- (2) Driving the LCD in the voltage above the limit shortens its life.
- (3) If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
- (4) Response time is greatly delayed at temperature below the operating temperature range. However, this does not mean the LCD will be out of the order. It will recover when it returns to the specified temperature range.
- (5) If the display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and then back on.

(6) Condensation on terminals can cause an electrochemical reaction disrupting the terminal circuit. Therefore, it must be used under the relative condition of 40 □C , 50% RH.

(7) When turning the power on, input each signal after the positive/negative voltage becomes stable.

