

T215HVN01.0

AU OPTRONICS CORPORATION

(	)	<b>Preliminary Specification</b>
(	<b>V</b>	Final Specification

Module	21.5" Color TFT-LCD
Model Name	T215HVN01.0

Customer Date	Аррі
	_ Howa
Approved by	Prep
	Euger
Note: This Specification is subject to change without notice.	

Approved by	Date
Howard Lee	
Prepared by	
Eugene Hsu	2012/08/01
AU Optronics	Corporation



### **AU OPTRONICS CORPORATION**

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### **Records of Revision**

Version and Date	Page	Old description	New Description	Remark
0.1 2012/08/15		First Version		
0.2 2012/08/16	6	Physical Size [mm] 556.0 (W) x 323.2 (H) x 9.1 (D) (Typ.)	Update thickness.           Physical Size         [mm]         556.0 (W) x 323.2 (H) x 10.6(D) (Typ.)	
	11	2.3 Mechanical Characteristics	Delete 2.3 Mechanical Characteristics.	
	25	7.1 TFT LCD Module           Connector Name / Designation         Interface Connector / Interface Card           Manufacturer         SIN SHENG           P-TWO           Type Part Number         MSCKT2407P30HB           AL230F-A0G1D-P           Mating Housing Part Number         TBD	7.2 LED Connector on Backlight Unit This connector is mounted on LED light bar.  Connector Name / Designation Light Bar Connector  Manufacturer ENTRY(E&T)  Type Part Number 3707K-S06N-21R	
	29,	10 Mechanical Characteristics  Avoid touching COF position when doing mechanical design	Add mechanical diagram  10 Mechanical Characteristics   To Mechanical Characteristics  To Mec	
0.3 2012/08/17	7	Red x	Define Color / Chromaticity Coordinates (CIE)   Red x	
	12	LED forward Voltage variation (per string variation) $\Delta V f$ - 3.4	Update Max value of LED forward Voltage variation  LED forward Voltage variation (per string variation)	



	17						Add Min	value of	f Light Bar On	oration	
	17	Symbol		Description	1	Min.	Voltage	Add Min value of Light Bar Operation Voltage		FIALIOII	
		IRLED	LED Operation	on Current		-	Symbol		Description	Min.	
		VLB	Light Bar Op	eration Voltag )	е	-	IRLED	LED Operatio	•	-	
							VLB	Light Bar Ope	ration Voltage	54.4	
2012/08/27	6	Physical Size	[mm]	556.0 (W) x 323	J.2 (H) x 10.6(D)	(Typ.)	Modify F	Physical	Size		
								[mm]	495.6 (W) *292.2 (H) *10.6 (D) (TYP.)		
	17	Symbol Description				Min.	Update	ation			
		IRLED	LED Operation	on Current		-	Voltage			T T	
		VLB	Light Bar Op	eration Voltag	e	54.4	Symbol IRLED	LED Operatio	Description n Current	Min.	
							VLB	Light Bar Ope	eration Voltage	51	
	12	LED Forward (	ltem Surrent	Symbol IRLED1 IRLED2	Min 0	Max 90	Update Max of LED forward Voltage variation				
		LED Pulse For		IRLED3 IRLED4 IPLED1 IPLED2 IPLED3	-	150	LED Forward (	<b>Item</b> Current	Symbol   Min	<b>Ma</b> x 90	
		LED forward V (per string	oltage variation variation)	IPLED4 ∆Vf	-	13.6	LED Pulse For		IPLED1 IPLED2 IPLED3 IPLED4	150	
							LED forward V (per string	oltage variation variation)	ΔVf -	3.4	
0.4 2012/09/05	32	11.2 Pallet and Sh    Item	1 1 556(L)m 11 pgs/Box 406(L)m 1 1150(L)	Specification	0.38 mm 0.95 mm 22.1 t)mm 12	Remark  Wote 1  without Panel & cushion  Wote 1  with panel & cushion  Wote 1  Note 1	Packing	97    September   September	0.38 or x 292(V9)mm x 375(H)mm 0.95 or x 291(V9)mm x 651(H)mm 22.1 or x 2910(V9)mm x 132(H)mm 12 No.	Remark  Note 7  thout Panel & cushion te 7  th panel & cushion te 7  the 7  the 7  the 7	
0.5 2012/09/10	9	T <sub>rR</sub> +	- <u>T</u> rE =	5 <u>ms</u>	sec (	(typ.).	Update T		(TBD) msec	(typ.).	
2012/10/03	11		g Type		ype)	(TBD)		g Type 0HL (Lo	: ocked Type)		



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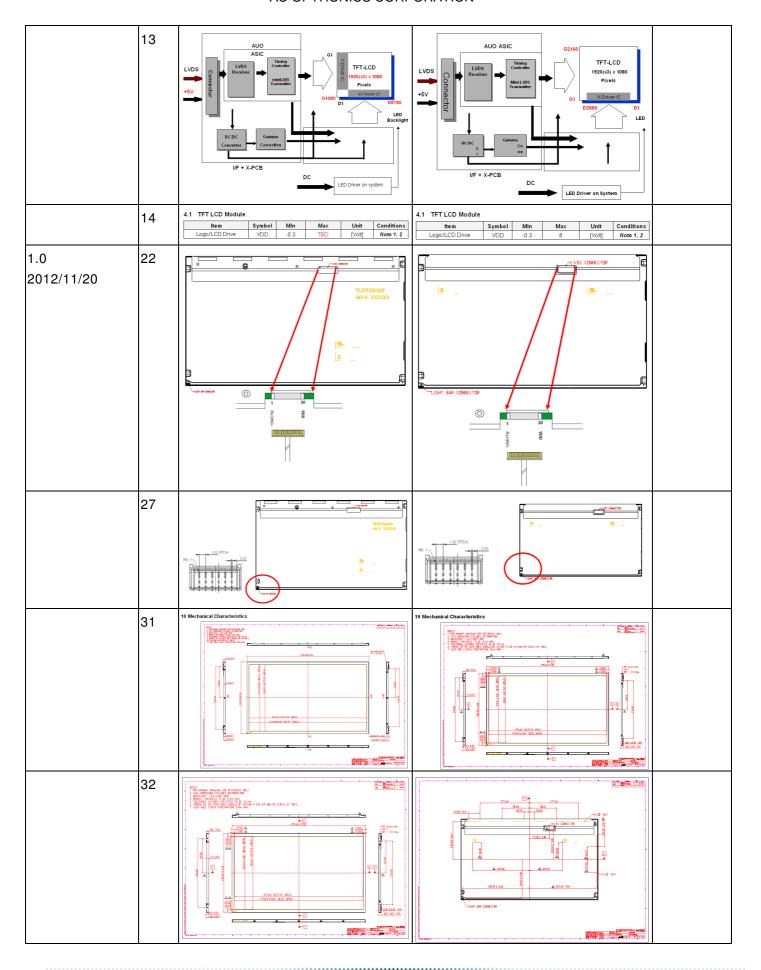
### **AU OPTRONICS CORPORATION**

4.0									1										
19	PIN # SIGNA 1 RXOIP		gative LVDS di		lata input (O	dd data)			PI		SIGNAL NAM Rx00-		S differential	data input (O	dd data)				
	2 RxOIN 3 RxOIN		sitive LVDS dif						2		Rx00+		3 differential d						
	4 RxOII		sitive LVDS dif						4		Rx01- Rx01+		S differential S differential d						
	5 RxOIN 6 RxOIN		gative LVDS di sitive LVDS dif						5		RxO2-		S differential						
	7 GND		wer Ground	rereman au	na inpat (Oa	o data, cor i	mo,		7		Rx02+ GND	Positive LVD: Power Groun	<u>3 differential d</u> d	ata input (Od	d data LU:	SP [MG]			
	8 RxOC 9 RxOC		gative LVDS di						8	_	RxOCLK-	Negative LVD	S differential						
	10 RxOII	N3- Ne	gative LVDS dif						9 10		RxOCLK+ RxO3-		S differential c S differential						
	11 RxOIN		sitive LVDS dif						11		RxO3+		3 differential d						
	12 RXEIN 13 RXEIN		gative LVDS di 'DS differential			ven data)			12		RxE0-		S differential						
	14 GND	Po	wer Ground						13		RxE0+ GND	Power Groun	3 differential d d	ata input (EV	en data)				
	15 RXEIN 16 RXEIN		gative LVDS di sitive LVDS dif						15		RxE1-		S differential						
	17 GND	Po	wer Ground	TOTOT BOT OU	na importitori	or oddy			16		RxE1+ GND	Positive LVD:	S differential d	ata input (Eve	en data)				
	18 RXEIN 19 RXEIN		gative LVDS di						18		RxE2-		S differential	data input (Ev	ven data)				
	20 RXEC		gative LVDS di						19		RxE2+		3 differential d						
	21 RXEC		sitive LVDS dif						20		RXECLK+		S differential S differential c						
	22 RXEIN 23 RXEIN		gative LVDS di sitive LVDS dif						22		RxE3-		S differential						
	24 GND	Po	wer Ground						23		RxE3+		S differential d	ata input (Eve	en data)				
	25 Aging 26 SCL		(for AUO test (for AUO test						24		GND NC	Power Groun No connectio		t only. Do no	t connect	)			
	27 SDA		(for AUO test						26	-	NC	No connectio	n (for AUO tes	t only. Do no	t connect	)			
	28 VDD		wer +5V						27		NC VDD	No connectio Power +5V	n (for AUO tes	t only. Do no	t connect	)			
	29 VDD 30 VDD		wer +5V wer +5V						29		VDD	Power +5V							
									30		VDD	Power +5V							
22	Signal	Item	Syr	nbol	Mi	n Typ	Max	Uni	٦l٣	Sign	nal I	tem	Symbol	M	in 3	Гур	Max	Unit	
4		Period	1 :	Γv	108		2047	Th	╢┈	TT- 1	P	eriod	Ty	10			1793	Th	
	Vertical	Active		sp(v)	108	0 1080	1080	Th	111	Verti	I A	ctive	Tdisp(v)	108	80 1	080	1080	<u>Ih</u>	
	Section	Blanking			Vys 8	50	967	Th	<b>  </b>	Secti	Bla	nking Tbp(v	)+ <u>Tfp(v)+P</u>	<u>Wvs</u> 1:	2	50	713	Jh	
	Horizontal	Period		Γh	100	4 1050	2047	Telk	11-	Foori	Postol P	eriod	Th	10	04 1	050	1100	Telk	
	Section	Active	Tdi	sp(h)	960	960	960	Telk	111	Ioriza Secti	ion A	ctive	Tdisp(h)	96	50 8	960	960	Tclk	
	Dection	Blanking					1087	Telk	]		Bla		)+Tfp(h)+P			90	140	Tclk	
	Clock	Period		'clk	25			ns		Clo	ck	eriod	Telk	11		14	18.2	ns	
		Frequency	F	req	40	72	90	MH	_		Fred	quency	Freq	54		1.2	90	MHz	
	Frame rate	Frame		F	50	60	75	Hz	F			ne rate	F	51	0	60	76	Hz	
		rate							_ اا اـ	Hsy				5:	5	68	90	KHZ	
									F	reque	ency								
25	7.1 TFT LCE	) Module							7.1	TFT	FLCD Modu	le							
25	Connec	tor Name / Des	ignation	Interface	e Connecto	or / Interface	Card			Co	onnector Nar	ne / Designation	Interfac	e Connecto	or / Interl	face Car	d		
	Manufac	cturer		SINSHE	NG					Ma	anufacturer		SINSH						
				P-TWO MSCKT2	2407P30HB								P-TWO MSCKT	2407P30HB					
	Type Pa	art Number			A0G1D-P					Ту	pe Part Numb	er		-A0G1D-P					
	Mating H	Housing Part Nu	mber	TBD					_	Mating Housing Part Number FI-X30HL (Locked Type)									
	7.1.1 Pin As:					I			7.1	_	n Assignme								
	Pin#	Signal Na	me		Pin#	Signal Na PxOIN0+	me		$\exists I$	Pir		jnal Name ○0-		Pin#	Signal RxO0+	l Name			
	3	PxOIN1-			4	RxOIN1+					3 Rx	01-		4	RxO1+	+			
	5	PxOIN2-			6	RxOIN2+			-11			02-		6	RxO2+				
	9	GND RXOCLKIN	l+		10	RxOCLKII RxOIN3-	<u>V</u> -		$\dashv$			OCLKIN+		10	RxOC RxO3-	LP(IN-			
	11	RxOIN3+			12	RxEIN0-						O3+		12	RxE0-				
	13	RxEIN0+			14	GND						E0+ E1-		14	GND RxE1+				
	15	R×EIN1- GND			18	RxEIN1+			$\dashv$		15 Rx 17 GN			16 18	RxE2-				
	19	RxEIN2+			20	RxECLKI	y-					E2+		20	RxECI				
	21	RXECLKIN	+		22	RxEIN3-			-11			ECLKIN+ E3+		22	RxE3- GND				
	23	NC (for AL	O test only. D	o not	24	NC (for Al	JO test onl	/ Do not	$\dashv$		os NO	(for AUO test of	only. Do not	26	NC (fi	or AUO	test only	. Do not	
	25	connect)			26	connect)			_		27 NC	nnect) (for AUO test o	only. Do not	28	VDD	a)			
	27		O test only. D	o not	28	VDD					29 VE	nect)		30	VDD				
	29	vDD VDD			30	VDD				_									
	T		,	7									· +						
7	Contrast f	Ratio		_		3000 (Ty				ont	rast Ratio	)			3	000 (	Тур.)		
	1.1	esponse Tir	me	[m	isec]	25ms (Ty	/p., on/o	ff) (TB	)) c	ptic	al Respo	nse Time		[msec	] 2	5ms (	Тур.,	on/off)	
	Optical R								_		-12.								
	Optical R					Min. 1	ур. Ма	x. Not	lter	n		Unit	Conditions		Min.	Тур.	Max.	Note	
8	Optical R			onditions				- 1					Horizontal CR = 10		75 75	89 89	1		
8			H	orizontal (			89 -						Orx = 10	(world)	10	0.5		2	
8			HI CI [degree]		(Left)	75	89 - 89 -	2	Vie	wing A	angle	[degree]	Vertical		75	89	-	*	
8	Item		[degree] Hi	orizontal ( R = 10	(Left) Up)	75 75	89 -	2	Vie	wing A	Angle	[degree]	Vertical CR = 10	(Up)	75 75	89 89	-		
8	Item		[degree] Hi	orizontal ( R = 10 i ertical (	(Left) (Up) (Dawn)	75 76 75	89 - 89 -	2		wing #		[degree]	CR = 10	(Up) (Dawn)	75		-	3	
8	Item Viewing Angle		[degree] His CI	orizontal ( R = 10   ertical ( R = 10 ([ ormal Direc	(Left) (Up) Dawn)	75 75 75 75 TBD 1	89 - 89 - 89 -	3				(degree)	CR = 10  Normal Dire	(Up) (Dawn) ection		89	-		
8	Item  Viewing Angle  Contrast Ratio		[degree] Hi Ci Ve Ci Ni	orizontal ( R = 10   ertical (  R = 10 (  ormal Directions	(Left) (Up) Dawn) ction (TrR)	75 76 75 TBD 1	89 - 89 - 89 - TBO -	3	Cor	ntrast	Ratio		CR = 10  Normal Dire	(Up) (Down) ection	75	3000	- 25	3	
8	Item Viewing Angle		Hi	orizontal ( R = 10   ertical ( R = 10 ([ ormal Direc	(Left) (Up) Down) ction (TrR) (TrE)	75 76 75 TBD 1	89 - 89 - 89 -	3	Cor	ntrast			CR = 10  Normal Dire  Rising Time  Falling Time	(Up) (Dawn) ection (TrR) e (TrE)	75	3000 20 5	- - 25 10		
8	Item  Viewing Angle  Contrast Ratio		Hi	orizontal ( R = 10     ertical (  R = 10     formal Directions Time ( alling Time   ising + Falli ed ×	(Left) (Up) Down) ction (TrR) (TrE)	75 76 75 75 TBD 1 - 1 - 1 - 1 0.615 0.6	89 - 89 - 89 - 80 - 80 - 80 TE 80 TE 80 TE	3 D 4 D 75	Cor	ntrast	Ratio		CR = 10  Normal Dire	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615	3000 20 5 25 0.645	25 10 35 0.675	3	
8	Item  Viewing Angle  Contrast Ratio  Response Tim	ië	[degree] Hi Ci	orizontal ( R = 10     ertical (  R = 10 (  commal Direction elising Time ( elising + Falli ed x ed y	(Left) (Up) Down) ction (TrR) (TrE)	75 76 77 75 TBD 1 - 1 - 1 0.615 0.6 0.304 0.3	89 - 89 - 89 - 80 - 80 TE 80 TE 80 TE 80 TE 345 0.6 334 0.3	3 D 4 D 75 34	Cor	ntrast	Ratio e Time		Normal Dire Rising Time Falling Time Rising + Fa Red × Red y	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - - 0.615 0.304	3000 20 5 25 0.645 0.334	25 10 35 0.675 0.364	3	
8	Item  Viewing Angle  Contrast Ratio	ie aticity	Hi	orizontal ( R = 10     ertical (  R = 10     formal Directions Time ( alling Time   ising + Falli ed ×	(Left) (Up) Down) ction (TrR) (TrE)	75   75   75   75   75   75   75   75	89 - 89 - 89 - 89 - 80 TE 80 T	3 D 4 D 4 D 75 64 13 66-	Cor	ntrast sponse or / Ci	Ratio e Time hromaticity		CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red y Green ×	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615 0.304 0.283	3000 20 5 25 0.645 0.334 0.313	25 10 35 0.675 0.364	3	
8	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chroma	ie aticity	Hi	orizontal ( R = 10     ertical (  R = 10   (  R = 10   (  E = 10	(Left) (Up) Down) ction (TrR) (TrE)	75   75   75   75   75   75   75   75	B9 - B9 - B9 - B0 TE B0	3 D 4 D 775 634 113 166- 34	Cor	ntrast sponse or / Ci	Ratio e Time		CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red y Green × Green y Blue ×	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615 0.304 0.283 0.606 0.124	99 3000 20 5 25 0.645 0.334 0.313 0.636 0.154	25 10 35 0.675 0.364	3 4	
8	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chromic  Coordinates (C	aticity	(degree) Ci	orizontal ( R = 10     ertical (  R = 10     ertical (  R = 10   ( Ertical (  Ertical (	(Left) (Up) Down) ction (TrR) (TrE)	75   75   75   75   75   75   75   75	89 - 89 - 89 - 89 - 80 TE 80 T	3 D 4 D 775 64 113 166- 174	Cor	ntrast sponse or / Ci	Ratio e Time hromaticity		CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red y Green × Green y Blue × Blue y	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615 0.304 0.283 0.806 0.124 0.014	99 3000 20 5 25 0.645 0.334 0.313 0.636 0.154	25 10 35 0.675 0.364 0.343 0.666 0.184 0.074	3	
8	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chrome Coordinates (C	aticity DIE) ates (CIE) White	(degree) Ciderate (ciderate) Ciderate (ciderat	orizontal ( R = 10     ertical (  R = 10   (  R = 10   (  formal Directions   formal D	(Left) (Up) Down) ction (TrR) (TrE)	75 75 75 75 75 75 76 77 78 78 78 78 78 78 78 78 78 78 78 78	88 - 89 - 89 - 80 TEBD TEBD TEBD TEBD TEBD TEBD TEBD TEBD	3 D 4 D 75 34 43 36 6- 34 74 13 59	Cor	sponse or / Ct	Ratio e Time hromaticity	[msec]	Vertical CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red × Red y Green × Green y Blue × Blue y  White ×	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615 0.304 0.283 0.606 0.124 0.014 0.283	99 3000 20 5 25 0.645 0.334 0.313 0.636 0.154 0.044 0.313	25 10 35 0.675 0.364 0.343 0.666- 0.184 0.074	3	
8	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chromat  Coordinates (C	abicity CIE) stes (CIE) White	Hidden	orizontal ( R = 10 retical ( R = 10 ( R	(Left) (Up) Down) ction (TrR) (TrE)	75 75 75 75 75 76 78 78 78 78 78 78 78 78 78 78 78 78 78	BB - BB - BB - BB - BB TE BB T	3 D 4 D 75 34 4 13 86- 34 74 13 59	Cor Res	sponse or / Cl ordinar	Ratio e Time hromaticity tes (CIE)	[msec]	CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red y Green × Green y Blue × Blue y	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615 0.304 0.283 0.806 0.124 0.014	99 3000 20 5 25 0.645 0.334 0.313 0.636 0.154 0.044 0.313	25 10 35 0.675 0.364 0.343 0.666- 0.184 0.074	3	
8	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chrome Coordinates (C	e atticity IE) attes (CIE) White ance iformity	(degree) Ciderate (ciderate) Ciderate (ciderat	orizontal ( R = 10 retical ( R = 10 ( R	(Left) (Up) Down) ction (TrR) (TrE)	75 75 75 75 75 76 78 78 78 78 78 78 78 78 78 78 78 78 78	88 - 89 - 89 - 80 TEBD TEBD TEBD TEBD TEBD TEBD TEBD TEBD	3 D 4 D 75 34 13 18 6- 34 13 59 6- 7	Cor Res Col Cor Col	sponse or / Cl ordinar or Coo	Ratio e Time hromaticity tes (CIE) ordinates (CIE uminance	[msec]  ) White  [cd/m2]  [%]	Vertical CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red × Red y Green × Green y Blue × Blue y  White ×	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.815 0.304 0.283 0.606 0.124 0.014 0.283 0.299	99 3000 20 5 26 0.645 0.334 0.313 0.636 0.154 0.044 0.313 0.329	25 10 35 0.675 0.364 0.343 0.666 0.184 0.074 0.343	3 4 5 5	
8	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chroma Coordinates (C	e atticity IE) attes (CIE) White ance iformity	High	orizontal ( R = 10 retical ( R = 10 ( R	(Left) (Up) Down) ction (TrR) (TrE)	75 75 75 75 75 76 78 78 78 78 78 78 78 78 78 78 78 78 78	88 - 88 89 89 89 89 89 89 89 89 89 89 89 89	3 D 4 D 4 D 775 344 133 166- 374 133 59 67 774 133 59	Cor Res Col Cor Col	sponse or / Cl ordinar or Coo	Ratio  Time  hromaticity tes (CIE)  ordinates (CIE	[msec]  ] White  [cd/m2]  [96]	Vertical CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red × Red y Green × Green y Blue × Blue y  White ×	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615 0.304 0.283 0.606 0.124 0.014 0.283 0.299 200	99 3000 20 5 25 0.645 0.334 0.313 0.636 0.154 0.044 0.313 0.329 250	25 10 35 0.675 0.364 0.368 0.184 0.074 0.343 0.359	3 4 4 5 6 7 8	
	Response Tim  Color / Chroms Coordinates (C	e atticity IE) attes (CIE) White ance iformity	High	orizontal ( R = 10 retical ( R = 10 ( R	(Left) (Up) Down) ction (TrR) (TrE)	75 75 75 75 75 76 78 78 78 78 78 78 78 78 78 78 78 78 78	BB	3 D 4 D 4 D 775 344 133 168- 344 133 59 674 133 59	Cor Res Col Cor Col	sponse or / Cl ordinar or Coo	Ratio e Time hromaticity tes (CIE) ordinates (CIE uminance	[msec]  ) White  [cd/m2]  [%]	Vertical CR = 10  Normal Dire  Rising Time Falling Time Rising + Fa Red × Red × Red y Green × Green y Blue × Blue y  White ×	(Up) (Dawn) ection (TrR) e (TrE)	75 2000 - - - 0.615 0.304 0.283 0.606 0.124 0.014 0.283 0.299 200	99 3000 20 5 25 0.645 0.334 0.313 0.636 0.154 0.044 0.313 0.329 250	25 10 35 0.675 0.364 0.343 0.666 0.184 0.074 0.343	3 4 5 5	
8	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chromi Coordinates (C	aticity IE)  ates (CIE) White ance accomity OHz)	[degree]	orizontal ( R = 10   i R = 10   i R = 10   i R = 10   i Ormal Directising Time ( sising Time ( sising + Falli ed x ed x een x reen y ue x ue x hitte y	(Left) (Up) (Down)  ction (TrR) (TrE) ing	75 75 75 75 78 78 78 79 78 78 78 78 78 78 78 78 78 78 78 78 78	89 89 89 89 80	3 D 4 D 775 344 133 6-34 774 413 599 6 7 7 8 8 D 9	Cor Res Col Cor Cor Cor Cer Lun Cro Flic	or / Ct ordinar or Coo or co or or or co or or o	Ratio e Time hromaticity tes (CIE) ordinates (CIE) uminance te Uniformity ((in 60Hz)	[mssc] ) White [cdim2] [94] [94] [95]	Vertical CR = 10 Normal Dire Rising Time Falling Time Falling Time Rising + Fa Red y Red y Green y Green x Blue x Blue y White y	(Up) (Down) ction (TrR) e (TrE) ling	75 2000	89 3000 20 5 26 0.645 0.334 0.313 0.636 0.154 0.044 0.313 0.329 250 80	25 10 36 0.675 0.364 0.343 0.666 0.184 0.074 0.343 0.359	3 4 4 5 6 7 8	
	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chromi Coordinates (C	e atticity IE) attes (CIE) White ance iformity	[degree]	orizontal ( R = 10   i R = 10   i R = 10   i R = 10   i Ormal Directising Time ( sising Time ( sising + Falli ed x ed x een x reen y ue x ue x hitte y	(Left) (Up) (Down)  ction (TrR) (TrE) ing	75 75 75 75 78 78 78 79 78 78 78 78 78 78 78 78 78 78 78 78 78	89 89 89 89 80	3 D 4 D 775 344 133 6-34 774 413 599 6 7 7 8 8 D 9	Cor Res Col Cor Cor Cor Cer Lun Cro Flic	or / Ct ordinar or Coo or co or or or co or or o	Ratio e Time hromaticity tes (CIE) ordinates (CIE) uminance te Uniformity ((in 60Hz)	[msec]  ] White  [cd/m2]  [96]	Vertical CR = 10 Normal Dire Rising Time Falling Time Falling Time Rising + Fa Red y Red y Green y Green x Blue x Blue y White y	(Up) (Down) ction (TrR) e (TrE) ling	75 2000	89 3000 20 5 26 0.645 0.334 0.313 0.636 0.154 0.044 0.313 0.329 250 80	25 10 36 0.675 0.364 0.343 0.666 0.184 0.074 0.343 0.359	3 4 4 5 6 7 8	
	Item  Viewing Angle  Contrast Ratio  Response Tim  Color / Chromi Coordinates (C	aticity IE)  ates (CIE) White ance accomity OHz)	[degree]	orizontal ( R = 10   i R = 10   i R = 10   i R = 10   i Ormal Directising Time ( sising Time ( sising + Falli ed x ed x een x reen y ue x ue x hitte y	(Left) (Up) (Down)  ction (TrR) (TrE) ing	75 75 75 75 78 78 78 79 78 78 78 78 78 78 78 78 78 78 78 78 78	89 89 89 89 80	3 D 4 D 775 344 133 6-34 774 413 599 6 7 7 8 8 D 9	Cor Res Col Cor Cor Cor Cer Lun Cro Flic	or / Ct ordinar or Coo or co or or or co or or o	Ratio e Time hromaticity tes (CIE) ordinates (CIE) uminance te Uniformity ((in 60Hz)	[mssc] ) White [cdim2] [94] [94] [95]	Vertical CR = 10 Normal Dire Rising Time Falling Time Falling Time Rising + Fa Red y Red y Green y Green x Blue x Blue y White y	(Up) (Down) ction (TrR) e (TrE) ling	75 2000	89 3000 20 5 26 0.645 0.334 0.313 0.636 0.154 0.044 0.313 0.329 250 80	25 10 36 0.675 0.364 0.343 0.666 0.184 0.074 0.343 0.359	3 4 4 5 6 7 8	



# Product Specification T215HVN01.0

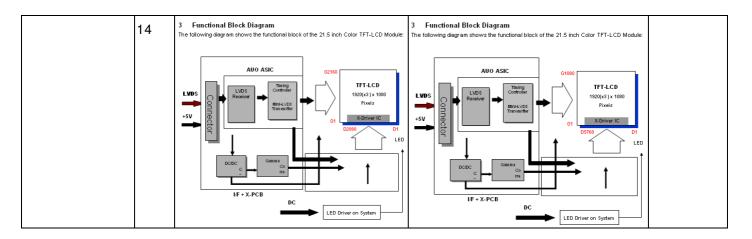
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### 1 Handling Precautions

- 1) Since front polarizer is easily damaged, pay attention not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
- 6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
- 7) Do not open or modify the Module Assembly.
- 8) Do not press the reflector sheet at the back of the module to any directions.
- 9) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, do not press the center of LED light bar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged.
- 10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 11) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
- 12) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
- 13) Avoid touching COF position while doing mechanical design.
- 14) While storing modules as spares for a long time, the following precautions are necessary:
  - Store modules in a dark place. Do not expose them to sunlight or fluorescent light.
  - $\triangleright$  Keep the temperature between 5°C and 35°C at normal humidity.



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### 2 General Description

This specification applies to the 21.5 inch-FHD color a-Si TFT-LCD Module T215HVN01.0. The display supports the FHD - 1920(H) x 1080(V) screen format and 16.7M colors (RGB 8-bit data). The light source of this TFT-LCD module is W-LED. All input signals are 2-channel LVDS interface and this module doesn't contain a driver for backlight.

### 2.1 Display Characteristics

The following items are characteristics summary on the table under 25 °C condition:

Items	Unit	Specification							
Screen Diagonal	[mm]	546.865(21.53")							
Active Area	[mm]	476.64 (H) x 268.11 (V)							
Pixels H x V		1920(x3) x 1080							
Pixel Pitch	[um]	248.25 (per one triad) ×248.25							
Pixel Arrangement		R.G.B. Vertical Stripe							
Display Mode		VA Mode, Normally Black							
White Luminance ( Center )	[cd/m2]	250 cd/m2 (Typ.)							
Contrast Ratio		3000 (Typ.)							
Optical Response Time	[msec]	25ms (Typ., on/off)							
Nominal Input Voltage VDD	[Volt]	+ 5.0 V							
Power Consumption (VDD line + LED line)	[Watt]	16.55 watt (VDD line : PDD (typ), All white pattern at 60Hz = 3.45W LED line : PBLU (typ) = 13.1W)							
Weight	[g]	1,800 gram (Typ.)							
Physical Size	[mm]	495.6 (W) * 292.2 (H) *10.6 (D) (TYP.)							
Electrical Interface		Dual channel LVDS							
Support Color		16.7M colors (RGB 8-bit)							
Surface Treatment		Anti-Glare, 3H							
Temperature Range									
Operating	[℃]	0 to +50							
Storage (Shipping)	[℃]	-20 to +60							
RoHS Compliance		RoHS Compliance							
TCO Compliance		TCO 6.0 Compliance							



### 2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25 °C:

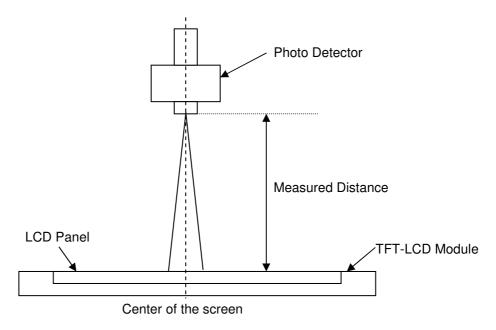
Item	Unit	Conditions	Min.	Тур.	Max.	Note	
		Horizontal (Right)	75	89	-		
Minusing Angle		CR = 10 (Left)	75	89	-	0	
Viewing Angle	[degree]	Vertical (Up)	75	89	-	2	
		CR = 10 (Down)	75	89	-		
Contrast Ratio		Normal Direction	2000	3000	-	3	
		Rising Time (TrR)	-	20	25		
Response Time	[msec]	Falling Time (TrF)	-	5	10	4	
		Rising + Falling	-	25	35		
		Red x	0.615	0.645	0.675		
		Red y	0.304	0.334	0.364		
Color / Chromaticity		Green x	0.283	0.313	0.343		
Coordinates (CIE)		Green y	0.606	0.636	0.666-	5	
		Blue x	0.124	0.154	0.184	5	
		Blue y	0.014	0.044	0.074		
Color Coordinates (CIE) Milita		White x	0.283	0.313	0.343		
Color Coordinates (CIE) White		White y	0.299	0.329	0.359		
Central Luminance	[cd/m2]		200	250	-	6	
Luminance Uniformity	[%]		75	80	-	7	
Crosstalk (in 60Hz)	[%]		-	-	1.5	8	
Flicker	dB		-	-	-20	9	



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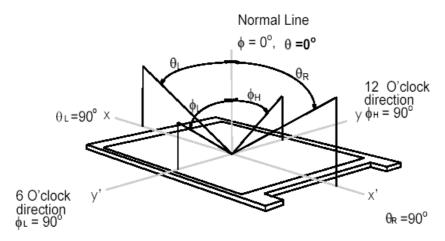
### Note 1: Measurement Method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring (at surface 35 °C). In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.



### Note 2: Definition of Viewing Angle measured by ELDIM (EZContrast 88)

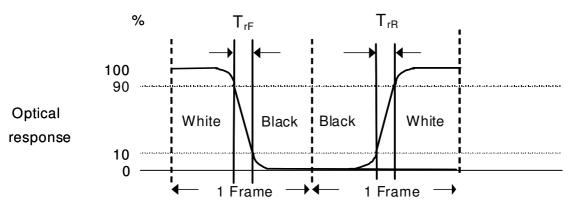
Viewing angle is the measurement of contrast ratio  $\geq$ 10, at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° ( $\theta$ ) horizontal left and right and 90° ( $\Phi$ ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



### Note 3: Contrast Ratio measured by TOPCON SR-3

### Note 4: Definition of Response time measured by Westar TRD-100A

The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full White" (rising time,  $T_{rR}$ ), and from "Full White" to "Full Black" (falling time,  $T_{rF}$ ), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.

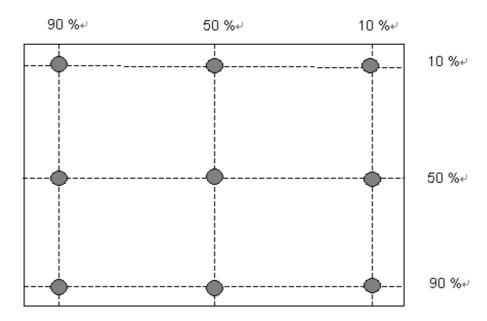


 $T_{rR} + T_{rF} = 25 \text{ msec (typ.)}.$ 

### Note 5: Color Chromaticity and Coordinates (CIE) measured by TOPCON SR-3

### Note 6: Central Luminance measured by TOPCON SR-3

# Note 7: Luminance Uniformity of these 9 points defined as below and measured by TOPCON SR-3



Uniformity = 
$$\frac{\text{Minimum Luminance in 9 points (1-9)}}{\text{Maximum Luminance in 9 Points (1-9)}}$$



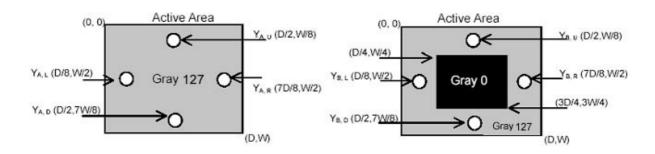
### Note 8: Crosstalk defined as below and measured by TOPCON SR-3

 $CT = | YB - YA | / YA \times 100 (\%)$ 

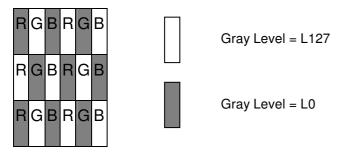
Where

YA = Luminance of measured location without gray level 0 pattern (cd/m2)

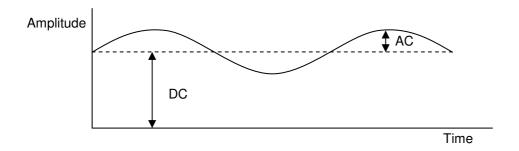
YB = Luminance of measured location with gray level 0 pattern (cd/m2)



### Note 9: Test Pattern Sub-checker Pattern measured by TOPCON SR-3



Method: Record dBV & DC value with TRD-100

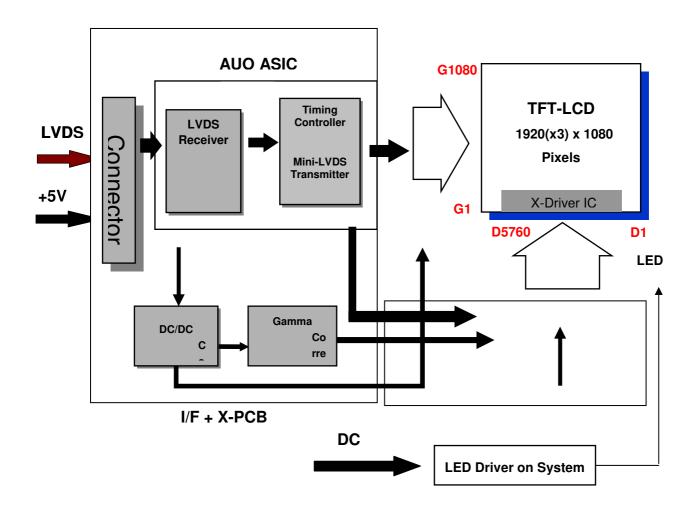


Flicker (dB) = 
$$20 \log \frac{AC \text{ Level(at } 30 \text{ Hz)}}{DC \text{ Level}}$$



### **Functional Block Diagram**

The following diagram shows the functional block of the 21.5 inch Color TFT-LCD Module:



I/F PCB Interface: MSCKT2407P30HB

AL230F-A0G1D-P

**Mating Type:** 

FI-X30HL (Locked Type)



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### 4 Absolute Maximum Ratings

Absolute maximum ratings of the module are listed as follows:

### 4.1 TFT LCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive	VDD	-0.3	6	[Volt]	Note 1, 2

### 4.2 Backlight Unit

Item	Symbol	Min	Max	Unit	Conditions
	IRLED1				
LED Forward Current	IRLED2	0	90	[mA]	Note 1,2,5
LED Forward Ourient	IRLED3	· ·	00	[11173]	100% duty
	IRLED4				
	IPLED1				
LED Pulse Forward Current	IPLED2	_	150	[m A]	Note 1,2,5
LED Pulse Forward Current	IPLED3	-	130	[mA]	10% duty @100Hz
	IPLED4				
LED forward Voltage variation (per string variation)	$\Delta$ Vf	-	3.4	[Volt]	Note 1,2

### 4.3 Absolute Ratings of Environment

Item	Symbol	Min.	Max.	Unit	Conditions
Operating Temperature	TOP	0	+50	[℃]	Note 3
Glass Surface Temperature (Operation)	TGS	0	+65	[℃]	Note3 Note4
Operation Humidity	HOP	5	90	[%RH]	
Storage Temperature	TST	-20	+60	[℃]	Note 3
Storage Humidity	HST	5	90	[%RH]	

Note 1: With in Ta (25 ℃)

Note 2: Permanent damage to the device may occur if exceeding maximum values

Note 3: Temperature and relative humidity range are shown as the below figure.

1. 90% RH Max (Ta ≤39°C)

2. Max wet-bulb temperature at 39  $^{\circ}$ C or less. (Ta  $\leq$  39  $^{\circ}$ C)

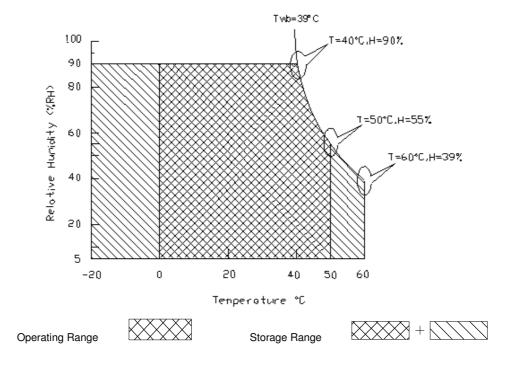
3. No condensation

Note 4: Function Judged only

Note 5: IRLED1,2,3,4 and IPLED1,2,3,4 define as per strings LED current.



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### 5 Electrical Characteristics

### 5.1 TFT LCD Module

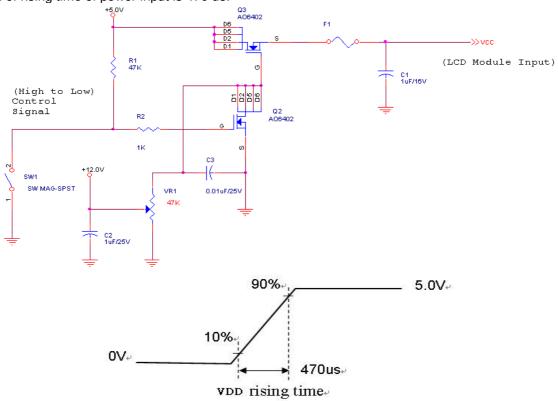
### 5.1.1 Power Specification

Input power specifications are listed as follows:

Symbol	Description	Min	Тур.	Max	Unit	Conditions
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	+/-10%
1004		1	0.69	0.83	[A]	VDD= 5.0V, All White Pattern at 60 Hz
IDD1	1 Input Current		0.8	0.96	[A]	VDD= 5.0V, All White Pattern at 75 Hz
555		-	3.45	4.15	[Watt]	VDD= 5.0V, All White Pattern at 60 Hz
PDD1	D1 VDD Power		4	4.8	[Watt]	VDD= 5.0V, All White Pattern at 75 Hz
IRush	Inrush Current	-	-	3	[A]	Note 1
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-		500	[mV] p-p	VDD= 5.0V, All White Pattern at 75 Hz

### Note 1: Measurement Conditions:

The duration of rising time of power input is 470 us.





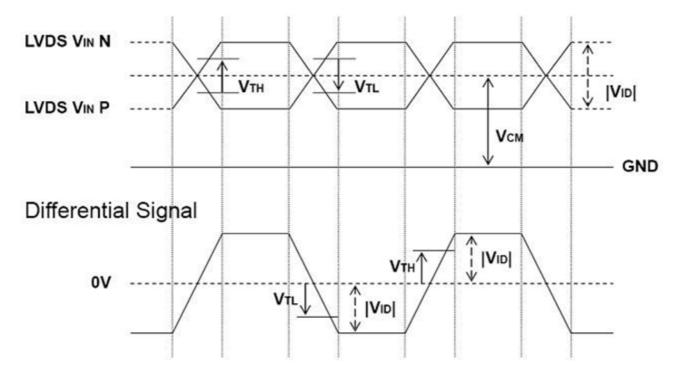
### 5.1.2 Signal Electrical Characteristics

### (1) DC Characteristics of each signal are as following:

Symbol	Description	Min	Тур	Max	Units	Conditions
$V_{TH}$	Differential Input High Threshold	-	-	+100	[mV]	V <sub>CM</sub> = 1.2V <b>Note 1</b>
$V_{TL}$	Differential Input Low Threshold	-100	-	-	[mV]	V <sub>CM</sub> = 1.2V <b>Note 1</b>
V <sub>ID</sub>	Input Differential Voltage	100	-	600	[mV]	Note 1
V <sub>CM</sub>	Differential Input Common Mode Voltage	+1.0	+1.2	+1.5	[V]	$V_{TH}-V_{TL} = 200MV \text{ (max)}$ <b>Note 1</b>

Note 1: LVDS Signal Waveform

### Single-End



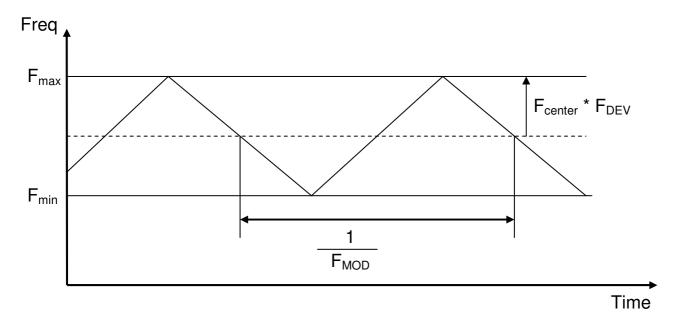


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### (2) AC Characteristics

Symbol	Description	Min	Max	Units	Conditions
F <sub>DEV</sub>	Maximum deviation of input clock frequency during SSC	-	± 3	%	
F <sub>MOD</sub>	Maximum modulation frequency of input clock during SSC	-	200	KHz	



< Spread Spectrum>



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### 5.2 Backlight Unit

Parameter guideline for LED driving is under stable conditions at 25 ℃ (Room Temperature):

Symbol	Description	Min.	Тур.	Max.	Unit	Note
IRLED	LED Operation Current	-	60	63	[mA]	Note 1
VLB	Light Bar Operation Voltage (for reference)	51	54.4	57.8	[Volt]	Note 2
PBLU	BLU Power Consumption (for reference)	-	13.1	14.6	[Watt]	Note 3
LTLED	LED Life Time (Typical)	30,000	-	-	[Hour]	Note 4

Each module consists of 68 pcs LED ( 4 strings x 17 pcs / string )

**Note 1:** The specified current is 100% duty of LED chip input current, IRLED1,2,3,4 define as per strings LED current.

*Note 2:* The value showed is one string operation voltage.

**Note 3:** PBLU = VLED \*( IRLED1+IRLED2+IRLED3+IRLED4)

**Note 4:** Definition of life time: Brightness becomes to 50% of its original value. The minimum life time of LED unit is on the condition of IRLED = 60mA and 25±2°C (Room Temperature).



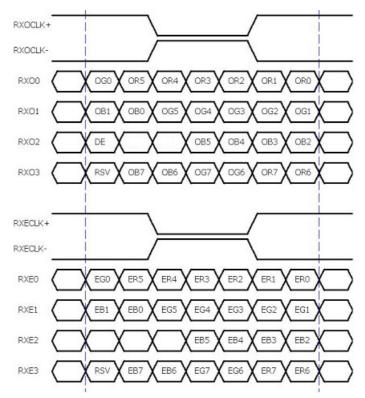
### 6 Signal Characteristics

### 6.1 Pixel Format Definition

Following figure shows the relationship between the input signals and LCD pixel format.

	1	2		1919	9	192	0
1st Line	R G B	R G B		R G	В	R G	В
			:	•		•	
	•		•	•		•	
	:		•	:		•	
	•	.	•	•		•	
	:	:	:			:	
	•	•	•	•		•	
	:	:	:	:		:	
	•	•	•	•		•	
1080 Line	R G B	R G B		R G	В	R G	В

### 6.2 Input Data Format Definition



Note 1: R/G/B data 7:MSB, R/G/B data 0:LSB O = "Odd Pixel Data" E = "Even Pixel Data"



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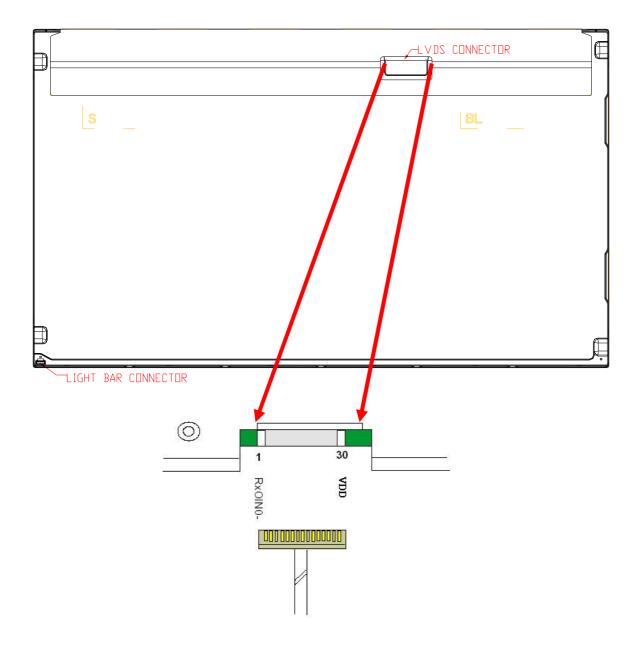
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### 6.3 Signal Description

PIN#	SIGNAL NAME	DESCRIPTION
1	RxO0-	Negative LVDS differential data input (Odd data)
2	RxO0+	Positive LVDS differential data input (Odd data)
3	RxO1-	Negative LVDS differential data input (Odd data)
4	RxO1+	Positive LVDS differential data input (Odd data)
5	RxO2-	Negative LVDS differential data input (Odd data,DSPTMG)
6	RxO2+	Positive LVDS differential data input (Odd data, DSPTMG)
7	GND	Power Ground
8	RxOCLK-	Negative LVDS differential clock input (Odd clock)
9	RxOCLK+	Positive LVDS differential clock input (Odd clock)
10	RxO3-	Negative LVDS differential data input (Odd data)
11	RxO3+	Positive LVDS differential data input (Odd data)
12	RxE0-	Negative LVDS differential data input (Even data)
13	RxE0+	Positive LVDS differential data input (Even data)
14	GND	Power Ground
15	RxE1-	Negative LVDS differential data input (Even data)
16	RxE1+	Positive LVDS differential data input (Even data)
17	GND	Power Ground
18	RxE2-	Negative LVDS differential data input (Even data)
19	RxE2+	Positive LVDS differential data input (Even data)
20	RxECLK-	Negative LVDS differential clock input (Even clock)
21	RxECLK+	Positive LVDS differential clock input (Even clock)
22	RxE3-	Negative LVDS differential data input (Even data)
23	RxE3+	Positive LVDS differential data input (Even data)
24	GND	Power Ground
25	NC	No connection (for AUO test only. Do not connect)
26	NC	No connection (for AUO test only. Do not connect)
27	NC	No connection (for AUO test only. Do not connect)
28	VDD	Power +5V
29	VDD	Power +5V
30	VDD	Power +5V

Note 1: Input signals of odd and even clock shall be the same timing.





**Timing Characteristics** 

The input signal timing specifications are shown as the following table

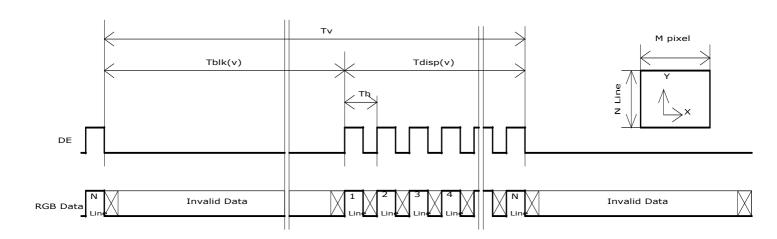
Signal	Item	Symbol	Min	Тур	Max	Unit
Vertical	Period	Tv	1092	1130	1793	Th
Section	Active	Tdisp(v)	1080	1080	1080	Th
Section	Blanking	Tbp(v)+Tfp(v)+PWvs	12	50	713	Th
Horizontal	Period	Th	1004	1050	1100	Tclk
Section	Active	Tdisp(h)	960	960	960	Tclk
Section	Blanking	Tbp(h) + Tfp(h) + PWhs	44	90	140	Tclk
Clock	Period	Telk	11.1	14	18.2	ns
210 <b>0</b> H	Frequency	Freq	54.8	71.2	90	MHz
Frame rate	Frame rate	F	50	60	76	Hz
Hsync Frequency			55	68	90	KHZ

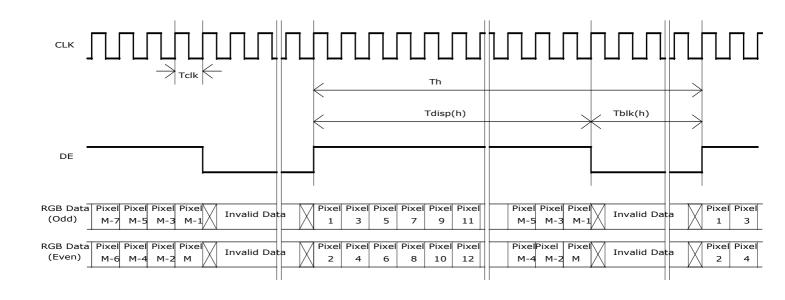
**Note 1:** DE mode only

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### 6.4 Timing Diagram

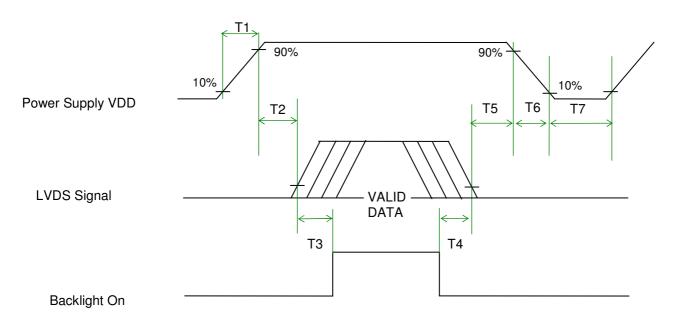






### 6.5 Power ON/OFF Sequence

VDD power and lamp on/off sequence are as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state when VDD is off.



### **Power Sequence Timing**

Parameter		Value	Unit	
Parameter	Min.	Тур.	Max.	Onit
T1	0.5	-	10	[ms]
T2	0	-	50	[ms]
Т3	500	-	-	[ms]
T4	100	-	-	[ms]
T5	0	-	50	[ms] Note1,2
T6	5	-	100	[ms] Note1,2
T7	1000	-	-	[ms]

**Note1**: Recommend setting T5 = 0ms to avoid electronic noise when VDD is off.

Note2: During T5 and T6 period, please keep the level of input LVDS signals with Hi-Z state.



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### 7 Connector and Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

### 7.1 TFT LCD Module

Connector Name / Designation	Interface Connector / Interface Card		
Manufacturer	SIN SHENG		
Manufacturer	P-TWO		
T. B. M. I	MSCKT2407P30HB		
Type Part Number	AL230F-A0G1D-P		
Mating Housing Part Number	FI-X30HL (Locked Type)		

### 7.1.1 Pin Assignment

Pin#	Signal Name	Pin#	Signal Name
1	RxO0-	2	RxO0+
3	RxO1-	4	RxO1+
5	RxO2-	6	RxO2+
7	GND	8	RxOCLKIN-
9	RxOCLKIN+	10	RxO3-
11	RxO3+	12	RxE0-
13	RxE0+	14	GND
15	RxE1-	16	RxE1+
17	GND	18	RxE2-
19	RxE2+	20	RxECLKIN-
21	RxECLKIN+	22	RxE3-
23	RxE3+	24	GND
25	NC (for AUO test only. Do not connect)	26	NC (for AUO test only. Do not connect)
27	NC (for AUO test only. Do not connect)	28	VDD
29	VDD	30	VDD



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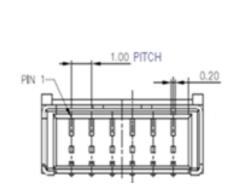
### 7.2 LED Connector on Backlight Unit

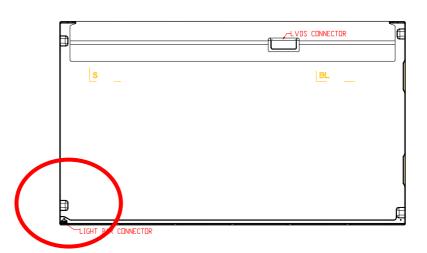
This connector is mounted on LED light bar.

Connector Name / Designation	Light Bar Connector
Manufacturer	ENTRY(E&T)
Type Part Number	3707K-S06N-21R

### 7.2.1 LED Pin assignment

Pin#	Signal Name
1	IRLED1 (current out)
2	IRLED2 (current out)
3	VLED (voltage in)
4	VLED (voltage in)
5	IRLED3 (current out)
6	IRLED4 (current out)

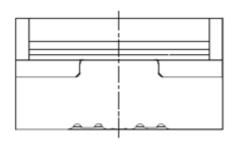


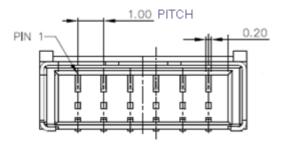




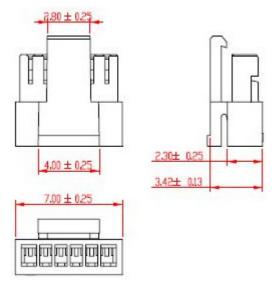
### 7.2.2 LED Connector Dimension

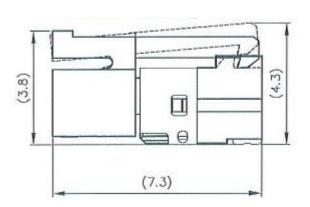
 $H \times V \times D = 13.9 \times 3.00 \times 4.25$ , Pitch = 1.0(unit = mm)





### 7.2.3 LED Mating housing dimension







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### 8 Reliability Test

Environment test conditions are listed as following table.

Items	Required Condition	Note	
Temperature Humidity Bias (THB)	Ta= 50 ℃, 80%RH, 300 hours		
High Temperature Operation (HTO)	Ta= 50 ℃, 50%RH, 300 hours		
Low Temperature Operation (LTO)	Ta= 0 ℃, 300 hours		
High Temperature Storage (HTS)	Ta= 60 °C, 300 hours		
Low Temperature Storage (LTS)	Ta= -20 ℃, 300 hours		
	Acceleration: 1.5 Grms		
Vibration Test	Wave: Random		
(Non-operation)	Frequency: 10 - 200 Hz		
	Duration: 30 Minutes each Axis (X, Y, Z)		
	Acceleration: 50 G		
Shock Test	Wave: Half-sine		
(Non-operation)	Active Time: 20 ms		
	Direction: ±X, ±Y, ±Z (one time for each Axis)		
Drop Test	Height: 46 cm, package test		
Thermal Shock Test (TST)	-20 °C/30min, 60 °C/30min, 100 cycles	Note 1	
On/Off Test	On/10sec, Off/10sec, 30,000 cycles		
	Contact Discharge: ± 8KV, 150pF(330Ω) 1sec,		
50D (51	15 points, 25 times/ point	Note 0	
ESD (Electro Static Discharge)	Air Discharge: ± 15KV, 150pF(330Ω) 1sec	Note 2	
	15 points, 25 times/ point		
Altitudo Toot	Operation: 18,000 ft		
Altitude Test	Non-Operation: 40,000 ft		

**Note 1:** The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20 °C to 60 °C, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

Note 2: EN61000-4-2, ESD class B: Certain performance degradation allowed:

- No data lost
- Self-recoverable
- No hardware failures

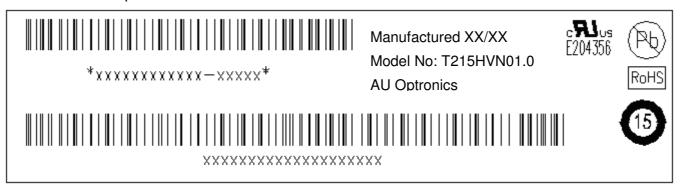


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### 9 Shipping Label

The label on the panel is shown as below:

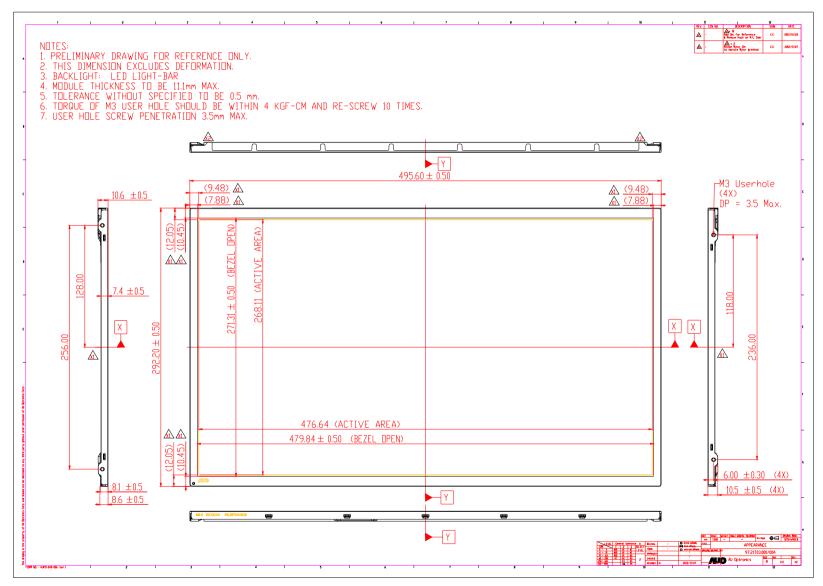


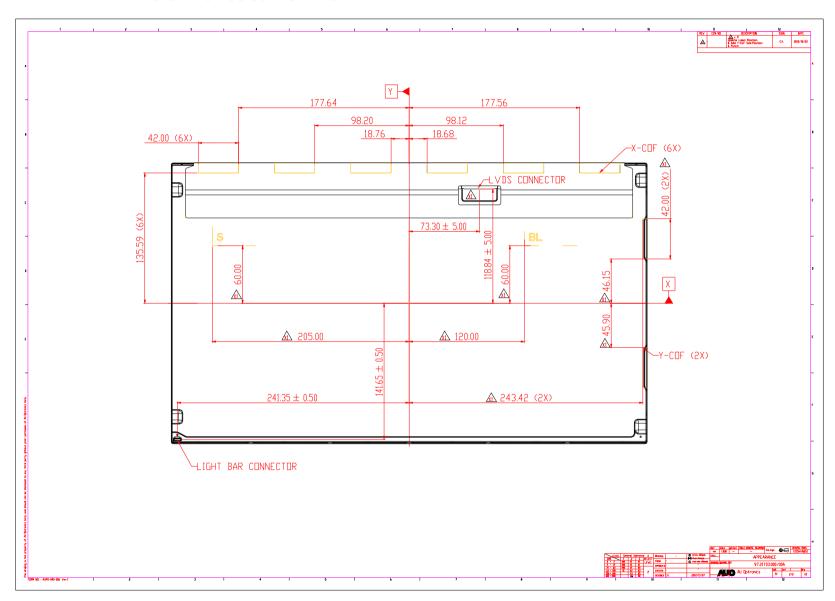
- Note 1: For Pb Free products, AUO will add for identification.
- Note 2: For RoHS compatible products, AUO will add RoHS for identification.
- Note 3: For China RoHS compatible products, AUO will add of for identification.
- **Note 4:** The Green Mark will be presented only when the green documents have been ready by AUO Internal Green Team.

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### 10 Mechanical Characteristics

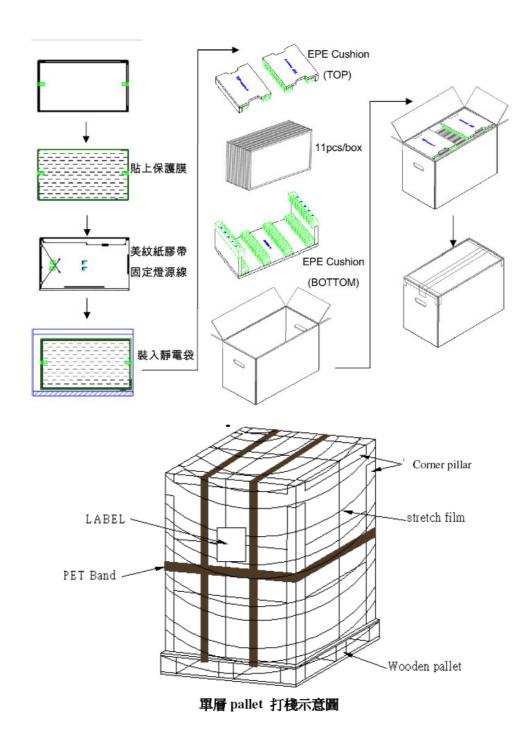






# 11 Packing Specification

### 11.1 Packing Flow





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### 11.2 Pallet and Shipment Information

	Item	Specification			Remark
		Q'ty	Dimension	Weight(kg)	nemark
1	Panel	1	556(H)mm x 323.2(V)mm x 9.08(D)mm	1.9	Note 1
2	Cushion	1		0.38	
3	Box	1	556(L)mm x 292(W)mm x 375(H)mm	0.05	without Panel & cushion  Note 1
4	Packing Box	11 pcs/Box	406(L)mm x 281(W)mm x 651(H)mm	00.1	with panel & cushion  Note 1
5	Pallet	1	1150(L)mm x 910(W)mm x 132(H)mm	12	Note 1
6	Pallet after Packing	18boxes/pallet	1150(L)mm x 910(W)mm x 1125(H)mm	390	Note 1

Note 1: Estimated value which is subject to change based on real measured data.