



HIGHNESSTM

One of a kind

HM215FH311OE

21.5" Color TFT-LCD

Release Date
04th Jun 2025

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HIGHNESS MICROELECTRONICS LTD

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1.General Specifications

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

Items	Unit	Specifications
Screen Diagonal	[mm]	546.86(21.53")
Active Area	[mm]	476.64 (H) ×268.11 (V)
Pixels H x V	-	1920 x 1080
Pixels Pitch	[um]	248.25 × 248.25
Pixels Arrangement	-	R.G.B. Vertical Stripe
Display Mode	-	VA Mode, Normally Black
White Luminance (Center)	[cd/m ²]	1000 (Typ.)
Contrast Ratio	-	5000:1 (Typ.)
Response Time	[msec]	18ms (Typ. on/off)
Viewing Angle	[degree]	89/89/89/89
Outline Dimension	[mm]	495.6(H) x 292.4(V) x 10.5(D) (Typ.)
Electrical Interface	-	Dual Channel LVDS
Support Color		16.7M colors (RGB 6 - bits +Hi - FRC data)
Surface Treatment		Anti - glare type, Hardness 3H
Operating Temperature Range	[°C]	-10 to +60 °C
Storage Temperature Range	[°C]	-20 to +60 °C

2. Absolute Maximum Rating of Environment

Permanent damage may occur if exceeding the following maximum rating.

Symbol	Description	Min.	Max.	Unit	Remark
TOP	Operating Temperature	-10	+60	[°C]	
TGS	Glass surface temperature	-10	+65	[°C]	Function judged only
HOP	Operation Humidity	5	90	[%RH]	
TST	Storage Temperature	-20	+60	[°C]	
HST	Storage Humidity	5	90	[%RH]	

2.1 Optical Characteristics

The optical characteristics are measured on the following test condition.

Test Condition:

VDD=5.0V, Fv=60Hz, Is=60mA, Ta=25℃

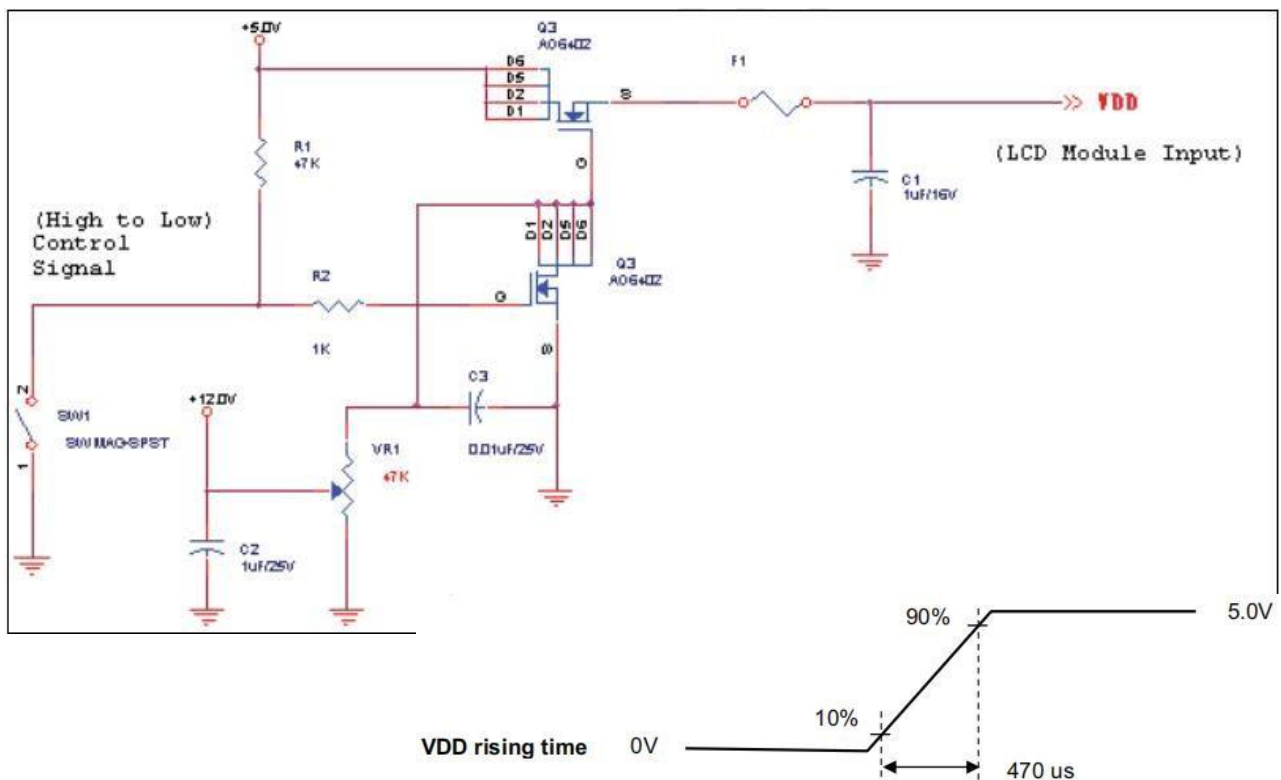
Symbol	Description		Min.	Typ.	Max.	Unit
Lw	White Luminance (Center of screen)		800	1000	-	[cd/m2]
Luni	Luminance Uniformity (9 points)		75	80	-	%
Crr	Contrast Ratio (Center of screen)		4000	5000	-	-
θR	Horizontal Viewing Angle (CR=10)	Right	75	89	-	[degree]
θL		Left	75	89	-	
ΦH	Vertical Viewing Angle(CR=10)	Up	75	89	-	
ΦL		Down	75	89	-	
θR	Horizontal Viewing Angle (CR=5)	Right	75	89	-	
θL		Left	75	89	-	
ΦH	Vertical Viewing Angle (CR=5)	Up	75	89	-	
ΦL		Down	75	89	-	
TR	Response Time	Rising Time	-	13	28	[msec]
TF		Falling Time	-	5	8	
-		Rising + Falling	-	18	36	
Rx	Color Coordinates (CIE 1931)	Red x	0.610	0.640	0.670	-
Ry		Red y	0.314	0.344	0.374	
Gx		Green x	0.266	0.296	0.326	
Gy		Green y	0.619	0.649	0.679	
Bx		Blue x	0.112	0.142	0.172	
By		Blue y	0.051	0.081	0.111	
Wx		White x	0.250	0.280	0.310	
Wy		White y	0.326	0.356	0.386	
NTSC Area Ratio				72		[%]
CT	Crosstalk		-	-	1.5	[%]
FdB	Flicker (Center of screen)		-	-	-20	[dB]

3.LVDS Pin Assignment

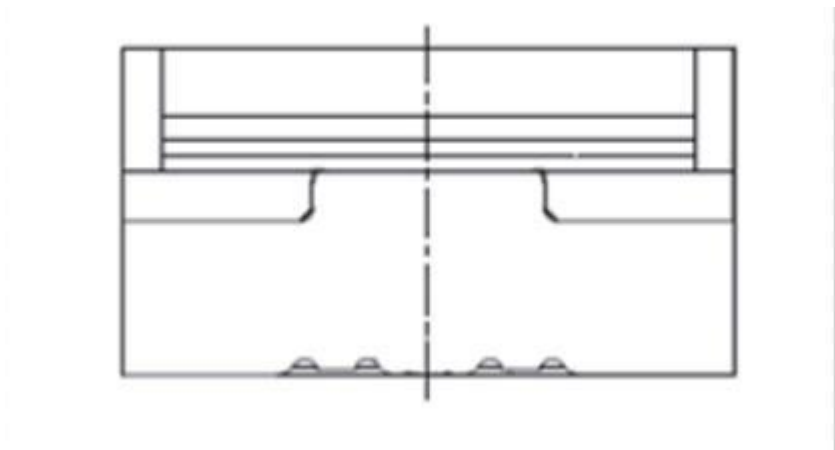
3.1 TFT-LCD Connector P/N. AL230F-A0G1D-P (P-TWO) MSCKT2407P30HB (STM)

Mating Connector P/N. FI-X30HL (JAE)

PIN#	SIGNAL NAME	DESCRIPTION
1	RxOIN0-	Negative LDVS differential data input (Odd data)
2	RxOIN0+	Positive LDVS differential data input (Odd data)
3	RxOIN1-	Negative LDVS differential data input (Odd data)
4	RxOIN1+	Positive LDVS differential data input (Odd data)
5	RxOIN2-	Negative LDVS differential data input (Odd data)
6	RxOIN2+	Positive LDVS differential data input (Odd data)
7	GND	Power Ground
8	RxOCLKIN-	Negative LDVS differential data input (Odd clock)
9	RxOCLKIN+	Positive LDVS differential data input (Odd clock)
10	RxOIN3-	Negative LDVS differential data input (Odd data)
11	RxOIN3+	Positive LDVS differential data input (Odd data)
12	RxEIN0-	Negative LDVS differential data input (Even data)
13	RxEIN0+	Positive LDVS differential data input (Even data)
14	GND	Power Ground
15	RxEIN1-	Negative LDVS differential data input (Even data)
16	RxEIN1+	Positive LDVS differential data input (Even data)
17	GND	Power Ground
18	RxEIN2-	Negative LDVS differential data input (Even data)
19	RxEIN2+	Positive LDVS differential data input (Even data)
20	RXECLKIN-	Negative LDVS differential data input (Even clock)
21	RXECLKIN+	Positive LDVS differential data input (Even clock)
22	RxEIN3-	Negative LDVS differential data input (Even data)
23	RxEIN3+	Positive LDVS differential data input (Even data)
24	GND	Power Ground
25	NC	No connection (For test only. Do not connect)
26	NC	No connection (For test only. Do not connect)
27	NC	No connection (For test only. Do not connect)
28	VDD	Power Supply Input Voltage
29	VDD	Power Supply Input Voltage
30	VDD	Power Supply Input Voltage



4 Backlight Unit



it includes 60(7020) pcs LED in the LED light bar. (6 strings and 10 pcs LED of one string)

connector CN2 : PH- 2P *1

Pin#	Signal Name
1	Positive Pole
2	Negative Pole



4.1 Electrical Characteristics

4.1.1 Recommended Operating Condition

(Ta=25℃)

Item	Symbol	Min.	Typ.	Max.	Unit
LED operation Voltage	V led	59	-	68	V
LED operation Current	I led	-	480	-	mA
Backlight Power	P _{BL}	28.32	-	32.64	W
Luminance	L	800	1000		nit
LED Life Time		50000			Hrs
Luminance uniformity	△L	75	80		%

5 Reliability Test

Reliability test items are listed ad following table.

Items	Condition
Temperature Humidity Bias (THB)	Ta= 60℃ , 80%RH, 300hrs
High Operation Temperature (HTO)	Ta= 60℃ , 50%RH, 300hrs
Low Temperature Operation (LTO)	Ta= -10℃ , 300hrs
High Temperature Storage (HTS)	Ta= 60℃ , 300hrs
Low Temperature Storage (LTS)	Ta= -20℃ , 300hrs
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency:10-200 Hz Sweep:30 Minutes each Axis (X,Y,Z)
Shock Test (Non-operation)	Acceleration: 50Grms Wave: Half-sine Active TIMIE: 20ms Direction: ±X,±Y,±Z(one time for each Axis)
Thermal Shock Test (TST)	-20℃/30min, 60℃/30min,100 cycles
On/Off Test	On/10sec, Off/10sec,30,000 cycles
ESD (Elector Static Discharge)	Contact Discharge:± 15KV , 150pF(330Ω) 1sec, 8 points, 25 times/point
	Air Discharge:± 15KV, 150pF(330Ω) 1sec, 8points, 25 times/point
Altitude Test	Operation:18,000 ft Non-Operation:40,000ft

6 Mechanical Drawing

