


MD240128A6W-FPTLRGB	240 x 128	LCD Module
Specification		
Version: 1	Date: 12/02/2021	
Revision		
1	10/02/2021	First Issue

Display Features			
Resolution	240 x 128		
Appearance	Black on RGB		
Logic Voltage	5V		
Interface	Parallel		
Font Set	Font Table		
Display Mode	Transflective		
LC Type	FSTN		
Module Size	144.00 x 104.00 x 13.00mm		
Operating Temperature	-20°C ~ +70°C		
Construction	COB		
LED Backlight	RGB

* - For full design functionality, please use this specification in conjunction with the RA6963 +NT7086 specification. (Provided Separately)

Display Accessories	
Part Number	Description

Optional Variants	
Appearances	Voltage



FEATURES

AVAILABLE OPTIONS	CHARACTERISTICS
DISPLAY FORMAT	240 Characters by 128 Lines
POLARIZER OPTIONS	Positive, Transflective
BACKLIGHT TYPE OPTIONS	Edge type (Long life span version)
BACKLIGHT COLOR OPTIONS	RGB color
LCD PANEL OPTIONS	FSTN (Silver-gray color)
VIEWING ANGLE OPTIONS	6:00 (Bottom)
TEMPERATURE RANGE OPTIONS	-20°C ~ 70°C
SUGGESTED DRIVING VOLTAGE	Vlcm = 5.0V Vled = 5.0V
SUGGESTED LED DRIVING MODE	PIN19: LED+, PIN20:K(R),PIN21:K(G),PIN22:K(B)
CONTROLLER	RA6963(RAIO)+NT7086
FONT MAP CODE	NO FONT SET
DRIVING DUTY	1/128
DRIVING BIAS	1/12

MECHANICAL SPECIFICATIONS

OVERALL SIZE	144.0W x 104.0H	mm	THICKNESS	max 13.0	mm
VIEWING AREA	114.0W x 64.0H	mm	HOLE-HOLE	138.0W x 97.0H	mm
CHARACTER SIZE	—	mm	CHARACTER PITCH	—	mm
DOT SIZE	0.40W x 0.40H	mm	DOT PITCH	0.05W x 0.05H	mm

ABSOLUTE MAXIMUM RATINGS

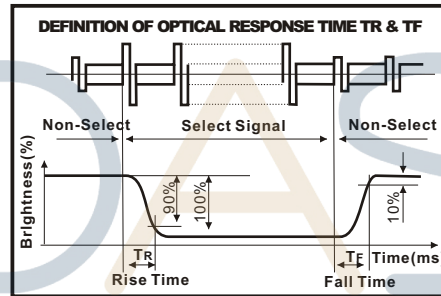
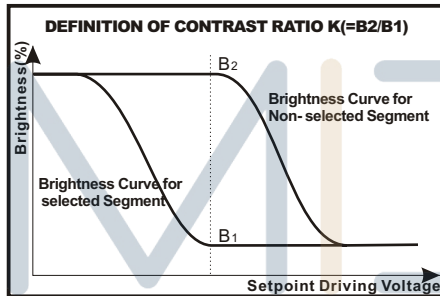
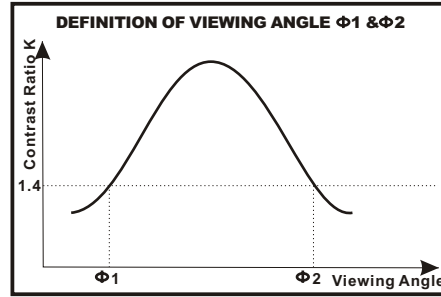
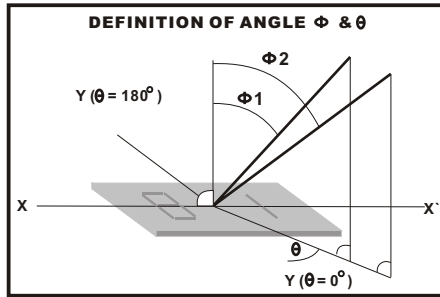
ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
POWER SUPPLY (LOGIC)	Vdd	25°C	-0.3	—	7.0	V
POWER SUPPLY (LCD)	V0	25°C	Vdd -30	—	Vdd +0.3	V
INPUT VOLTAGE	Vin	25°C	-0.3	—	Vdd +0.3	V
OPERATING TEMPERATURE	Vopr	—	-20	—	70	°C
STORAGE TEMPERATURE	Vstg	—	-30	—	80	°C

ELECTRONIC CHARACTERISTICS *

	ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
	INPUT VOLTAGE	Vlcm = Vdd	+5.0	4.7	5.0	5.5	V
	SUPPLY CURRENT	Idd	Vdd=5V	—	29.0	—	mA
	DRIVING VOLTAGE FOR LCD PANEL	Vlcd = (Vdd - V0)	-20°C	17.7	—	18.0	V
			0°C	—	—	—	
			25°C	17.0	17.5	17.7	
50°C			—	—	—		
			70°C	16.3	—	16.5	

LCD CHARACTERISTICS

FOR STN/FSTN TYPE LCD Panel (TA=25 °C, Vdd=5.0V ± 0.25V)							
	ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
	VIEWING ANGLE	$\Phi 2 - \Phi 1$	K=4	40	—	—	deg
		θ		60			
	CONTRAST RATIO	K	—	6	—	—	—
	RESPONSE TIME(RISE)	TR	—	—	150	250	ms
	RESPONSE TIME(FALL)	TF	—	—	150	250	ms



LED CHARACTERISTICS

	ITEM	SYMBOL	CONDITION	MIN			TYP			MAX			UNIT
				R	G	B	R	G	B	R	G	B	
	LED FORWARD VOLTAGE	Vf	25 °C	1.8	2.9	2.9	—	—	—	2.3	3.4	3.4	V
	LED FORWARD CURRENT ▲2	If	25 °C	—	—	—	50	100	100	—	—	—	mA
	LED REVERSE CURRENT	Ir	25 °C	—	—	—	—	—	—	10	10	10	μA
	LED PEAK WAVE LENGTH	λ_p	25 °C	620	520	465	—	—	—	630	530	475	nm
	LED BRIGHTNESS (WITHOUT LCD)	Lv	25 °C	—	—	—	25	210	53	—	—	—	cd/m ²
	LED BRIGHTNESS UNIFORMITY	Lvmin/Lvmax	25 °C	70			—			—			Ratio
	LED LIFE TIME	—	25 °C	20K			—	—	—	—	—	—	Hours

▲2 请注意, 驱动背光考虑的是恒流而不是恒压. 所以, 这个数值非常重要!

Please notice that it is constant current (not constant voltage) that should be applied when driving LED backlight. Therefore, this data is very important!

* 当工作温度高于25°C时, Ifm, Ifp和Pd必须降低; 电流降低率是 -0.36*14mA/°C (直流驱动), 或-0.86*14 mA/°C (脉冲驱动), 功率降低率是-75*14mW/°C. 产品工作电流不能大于对应的工作条件温度Ifm或Ifpr的60%.

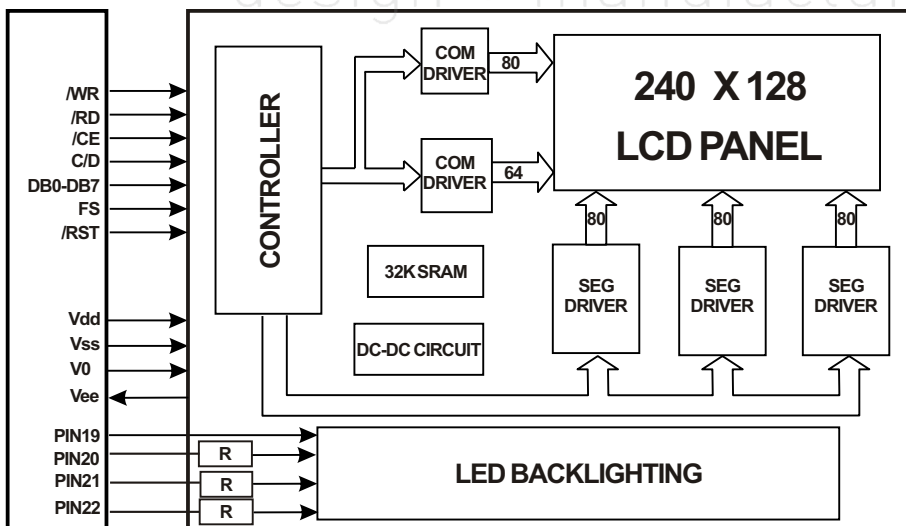
For operation above 25°C, The Ifm Ifp & Pd must be derated, the Current derating is -0.36*14mA/°C for DC drive and -0.86*14 mA/°C for Pulse drive, the power dissipation is -75*14 mW/°C The product working current must not be more than 60% of the Ifm or Ifp according to the working temperature.



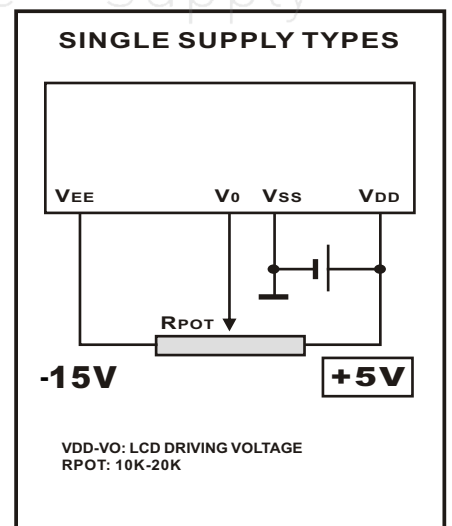
PIN ASSIGNMENT

PIN	SYMBOL	DESCRIPTION	REMARKS
1	Vee	Operating voltage for LCD	
2	Vss	Power supply for LCM	0V
3	Vdd	Power supply for LCM	5.0V
4	V0	Contrast Adjust	
5	WR	Data Write	
6	RD	Data Read	
7	CE	Chip Enable	
8	C/D	Command/Data Select	
9	RST	Reset Signal	
10	DB0	Data bus line	
11	DB1	Data bus line	
12	DB2	Data bus line	
13	DB3	Data bus line	
14	DB4	Data bus line	
15	DB5	Data bus line	
16	DB6	Data bus line	
17	DB7	Data bus line	
18	FS	Font Selection	
19	LED+	Power supply for BKL	5.0V
20	K(R)	Power supply for BKL	0V
21	K(G)	Power supply for BKL	0V
22	K(B)	Power supply for BKL	0V

BLOCK DIAGRAM



POWER SUPPLY DIAGRAM



ROM Code 0101

MSB \ LSB	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
1	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
2	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
3	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
4	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
5	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
6	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]
7	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]	[Pattern]

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