

MC21609AB6WM-FPTLW-V2	2 x 16	9mm Character Height	LCD Module
Specification			
Version: 1		Date: 05/08/2021	
Revision			
1	03/08/2021	First Issue	

Display Features			
Character Count	2 x 16		
Appearance	Black on White		
Logic Voltage	5V		
Interface	Parallel		
Font Set	English / Scandinavian		
Display Mode	Transflective		
Character Height	9.66mm		
LC Type	FSTN		
Module Size	122.00 x 44.00 x 13.50 mm		
Operating Temperature	-20°C ~ +70°C		
Construction	COB		
LED Backlight	White	Box Quantity	Weight / Display

* - For full design functionality, please use this specification in conjunction with the ST7066U + ST7065C specification. (Provided Separately)

Display Accessories	
Part Number	Description
MCCMDB-16SIL	LCD Interconnect board, can be driven from either a PC or a single Board computer with a USB output.
MCCBL1A16SLIP-16DILS-150	16 Way, Single in-line to Dual In-line connector Cable.
MCCBL1A16SLIP-16SILS-150	16 Way, Single in-line to Single In-line connector Cable.

Optional Variants		
Fonts	Appearances	Voltage
English/Japanese English/Euro English/Cyrillic	Black on Yellow/ Green White on Blue Black on RGB	3V 3.3V 5V

FEATURES

AVAILABLE OPTIONS	CHARACTERISTICS
DISPLAY FORMAT	16 Characters by 4 Lines
POLARIZER OPTIONS	Positive Transflective
BACKLIGHT TYPE OPTIONS	Edge Type LED Backlight (Standard version)
BACKLIGHT COLOR OPTIONS	White color
LCD PANEL OPTIONS	FSTN
VIEWING ANGLE OPTIONS	6:00 (Bottom)
TEMPERATURE RANGE OPTIONS	-20°C ~ 70°C, Positive Voltage Driving Only
SUGGESTED DRIVING VOLTAGE	V_{lcm} = 5.0V V_{led} = 5.0V
SUGGESTED LED DRIVING MODE	PIN15: LED-, PIN16:LED+
CONTROLLER	ST7066U + ST7065C
FONT MAP CODE	M Version
DRIVING DUTY	1/16
DRIVING BIAS	1/5

MECHANICAL SPECIFICATIONS

OVERALL SIZE	122.0W x 44.0H	mm	THICKNESS	max 13.5	mm
VIEWING AREA	99.0W x 24.0H	mm	HOLE-HOLE	115.0W x 37.0H	mm
CHARACTER SIZE	4.84W x 9.66H	mm	CHARACTER PITCH	1.16W x 0.68H	mm
DOT SIZE	0.92W x 1.10H	mm	DOT PITCH	0.06W x 0.06H	mm

ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
POWER SUPPLY (LOGIC)	V _{dd}	25°C	-0.3	—	7.0	V
POWER SUPPLY (LCD)	V ₀	25°C	V_{dd} -13.5	—	V_{dd} +0.3	V
INPUT VOLTAGE	V _{in}	25°C	-0.3	—	V_{dd} +0.3	V
OPERATING TEMPERATURE	V _{opr}	—	-20	—	70	°C
STORAGE TEMPERATURE	V _{stg}	—	-30	—	80	°C

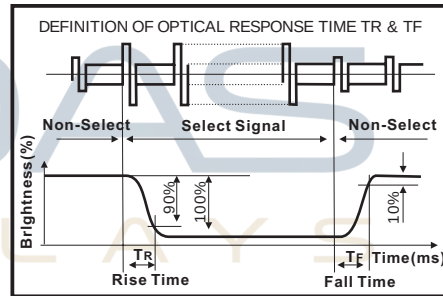
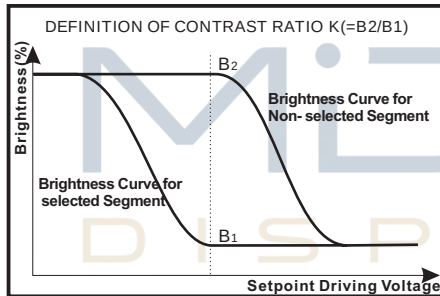
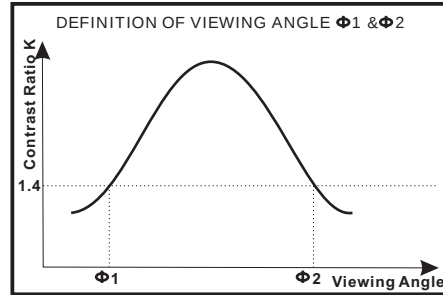
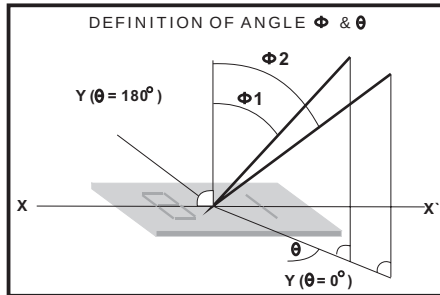
ELECTRONIC CHARACTERISTICS *

	ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
	INPUT VOLTAGE	V _{lcm} = V _{dd}	—	—	5.0	—	V
	SUPPLY CURRENT	I _{dd}	V_{dd}=3V	—	1.5	—	mA
	DRIVING VOLTAGE FOR LCD PANEL	V _{lcd} = (V _{dd} - V ₀)	-20°C	4.20	—	4.60	V
			0°C	4.25	—	4.65	
			25°C	4.25	4.50	4.75	
			50°C	4.15	—	4.70	
			70°C	4.10	—	4.70	

LCD CHARACTERISTICS

FOR STN/FSTN TYPE LCD Panel (TA=25°C, Vlcd=5.0V ± 0.5V)

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



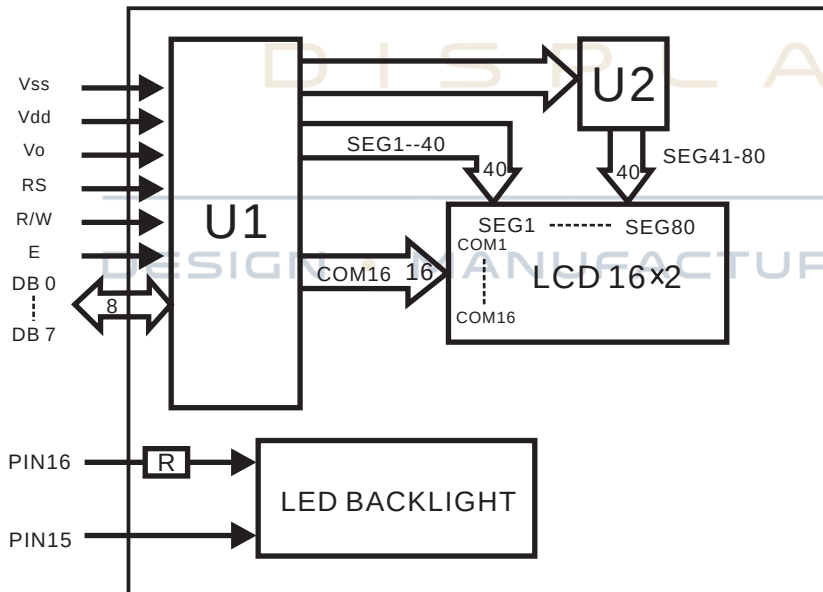
LED CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
LED FORWARD VOLTAGE	Vf	25°C If = 30mA	—	3.0	—	V
LED FORWARD CURRENT	If	25°C	—	30	—	mA
LED REVERSE CURRENT	Ir	25°C Vr=5.0V	—	—	20	μA
LED COLOR RANGE	X coordinate	25°C If = 30mA	0.26	—	0.30	—
	Y coordinate		0.27	—	0.31	—
LED BRIGHTNESS (WITHOUT LCD)	Lv	25°C If = 30mA	—	440	—	cd/m ²
LED BRIGHTNESS UNIFORMITY	Lvmin/Lvmax	25°C If = 30mA	70	—	—	Ratio
LED LIFE TIME	—	25°C If = 30mA	9K	—	—	Hours

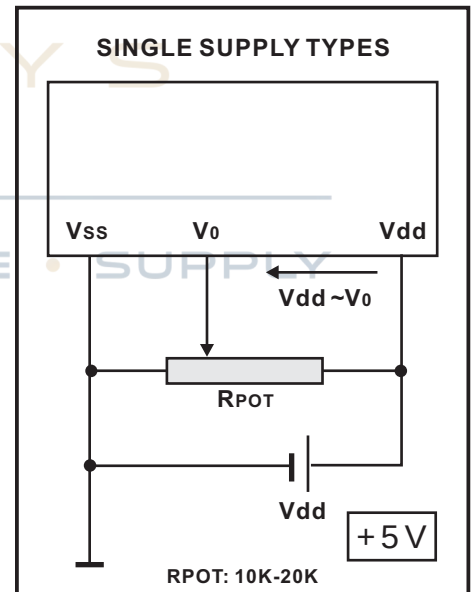
PIN ASSIGNMENT

PIN	SYMBOL	DESCRIPTION	REMARKS
1	Vss	GND	
2	Vdd	Power supply for LCM	5.0V
3	V0	Contrast Adjust	
4	RS	Register Select Signal	
5	R/W	Data Read / Write	
6	E	Enable Signal	
7	DB0	Data bus line	
8	DB1	Data bus line	
9	DB2	Data bus line	
10	DB3	Data bus line	
11	DB4	Data bus line	
12	DB5	Data bus line	
13	DB6	Data bus line	
14	DB7	Data bus line	
15	LED-	Power supply for BKL	
16	LED+	Power supply for BKL	5.0V

BLOCK DIAGRAM



POWER SUPPLY DIAGRAM



Upper 4bit Lower 4bit		LLLL	LLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	HHHH
LLLL	CG RAM (1)																
LLH	(2)																
LLHL	(3)																
LLHH	(4)																
LHLL	(5)																
LHLH	(6)																
LHHL	(7)																
LHHH	(8)																
HLLL	(1)																
HLLH	(2)																
HLHL	(3)																
HLHH	(4)																
HHLL	(5)																
HHLH	(6)																
HHHL	(7)																
HHHH	(8)																

