

MC21605C6WK-BNMLW3.3-V2	2 x 16	5mm Character Height	LCD Module
Specification			
Version: 1		Date: 07/06/2017	
Revision			
1	05/06/2017	First Issue	

Display Features			
Character Count	2 x 16		
Appearance	White on Blue		
Logic Voltage	3.3V		
Interface	Parallel		
Font Set	English / European		
Display Mode	Transmissive		
Character Height	4.75mm		
LC Type	Blue STN		
Module Size	80.00 x 36.00 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.
MDIB-CC1	The MDIB-CC1 is a interconnect board for standard pitch pinouts to fine pitch wires. Ideal for prototyping of TFT and COG LCDs.

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

FEATURES

AVAILABLE OPTIONS	CHARACTERISTICS
DISPLAY FORMAT	16 Characters by 2 Lines
POLARIZER OPTIONS	Negative Transmissive
BACKLIGHT TYPE OPTIONS	Edge Type LED Backlight (Long life span version)
BACKLIGHT COLOR OPTIONS	White color
LCD PANEL OPTIONS	Blue STN
VIEWING ANGLE OPTIONS	6:00 (Bottom)
TEMPERATURE RANGE OPTIONS	-20°C ~ 70°C, Single Supply Voltage
SUGGESTED DRIVING VOLTAGE	V_{lcm} = 3.3V V_{led} = 3.3V
SUGGESTED LED DRIVING MODE	PIN15: LED+, PIN16: LED-
CONTROLLER	ST7066U+ST7065C
FONT MAP CODE	K Version
DRIVING DUTY	1/16
DRIVING BIAS	1/5

MECHANICAL SPECIFICATIONS

OVERALL SIZE	80.0W x 36.0H	mm	THICKNESS	max 13.5	mm
VIEWING AREA	64.5W x 13.8H	mm	HOLE-HOLE	75.0W x 31.0H	mm
CHARACTER SIZE	2.95W x 4.35H	mm	CHARACTER PITCH	0.7W x 0.7H	mm
DOT SIZE	0.55W x 0.50H	mm	DOT PITCH	0.05W x 0.05H	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

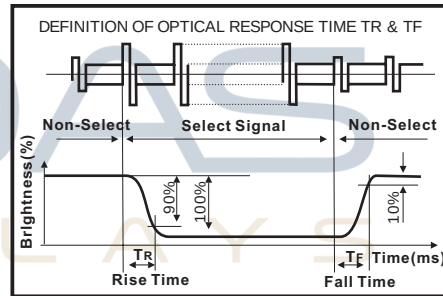
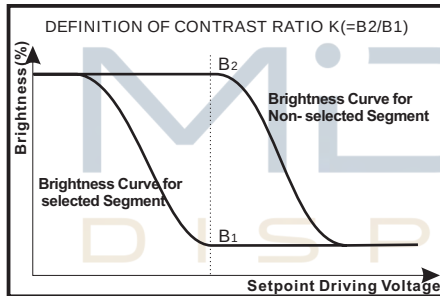
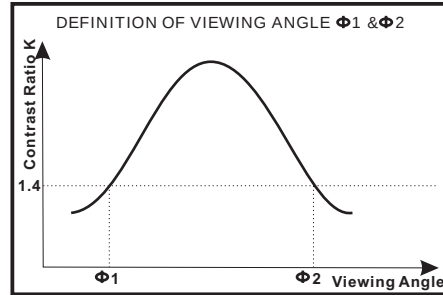
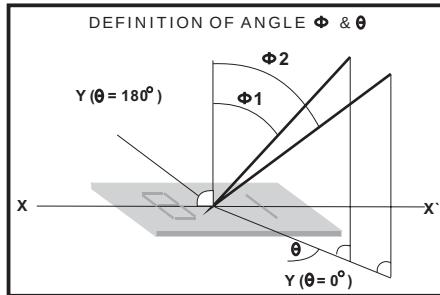
ELECTRONIC CHARACTERISTICS

	ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
	INPUT VOLTAGE	V _{lcm} = V _{dd}	—	—	3.3	—	V
	SUPPLY CURRENT	I _{dd}	V_{dd}=3.3V	—	1.5	—	mA
	DRIVING VOLTAGE FOR LCD PANEL	V _{lcd} = (V _{dd} - V ₀)	-20°C	—	—	—	V
			0°C	—	—	—	
			25°C	—	—	—	
			50°C	—	—	—	
			70°C	—	—	—	

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 = 15mA	—	3.0	—	V
LED FORWARD CURRENT	If	25 °C	—	15	—	mA
LED REVERSE CURRENT	Ir	25 °C Vr=5.0V	—	—	30	μA
LED COLOR RANGE	X coordinate	25 °C If = 15mA	0.26	—	0.30	—
	Y coordinate		0.27	—	0.31	—
LED BRIGHTNESS (WITHOUT LCD)	Lv	25 °C If = 15mA	—	380	—	cd/m ²
LED BRIGHTNESS UNIFORMITY	Lvmin/Lvmax	25 °C If = 15mA	70	—	—	Ratio
LED LIFE TIME	—	25 °C If = 15mA	20K	—	—	Hours

PIN	SYMBOL	DESCRIPTION	REMARKS
1	Vss	GND	
2	Vdd	Power supply for LCM	3.3V
3	NC	No connection	
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	3.3V
16	LED-	Power supply for BKL	

The block diagram illustrates the connections for the LCD module. On the left, the microcontroller's pins are connected to the LCD module (U1): Vss, Vdd, RS, R/W, E, DB 0, and DB 7. The LCD module (U1) is connected to the LCD (U2) via a 40-pin bus (SEG1--40 to SEG41-80). The LCD (U2) is connected to the LCD 16x2 display via a 16-pin bus (COM1 to COM16). The LCD 16x2 display is connected to the DC-DC converter. The DC-DC converter is connected to the LED BACKLIGHT via a resistor (R) and the LED BACKLIGHT is connected to the microcontroller's PIN15 and PIN16.

SINGLE SUPPLY TYPES

The diagram shows a single supply configuration. The device's V_{ss} pin is connected to ground, and the V_{dd} pin is connected to a $+3.3V$ supply.

Upper 4bit Lower 4bit	LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	HHHH
LLLL	CG RAM (1)															
LLLH	(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)															

