

MC22008B6W-BNMLW-V2	2 x 20	8mm Character Height	LCD Module
<b>Specification</b>			
Version: 1		Date: 28/10/2016	
<b>Revision</b>			
1	27/10/2016	First Issue	

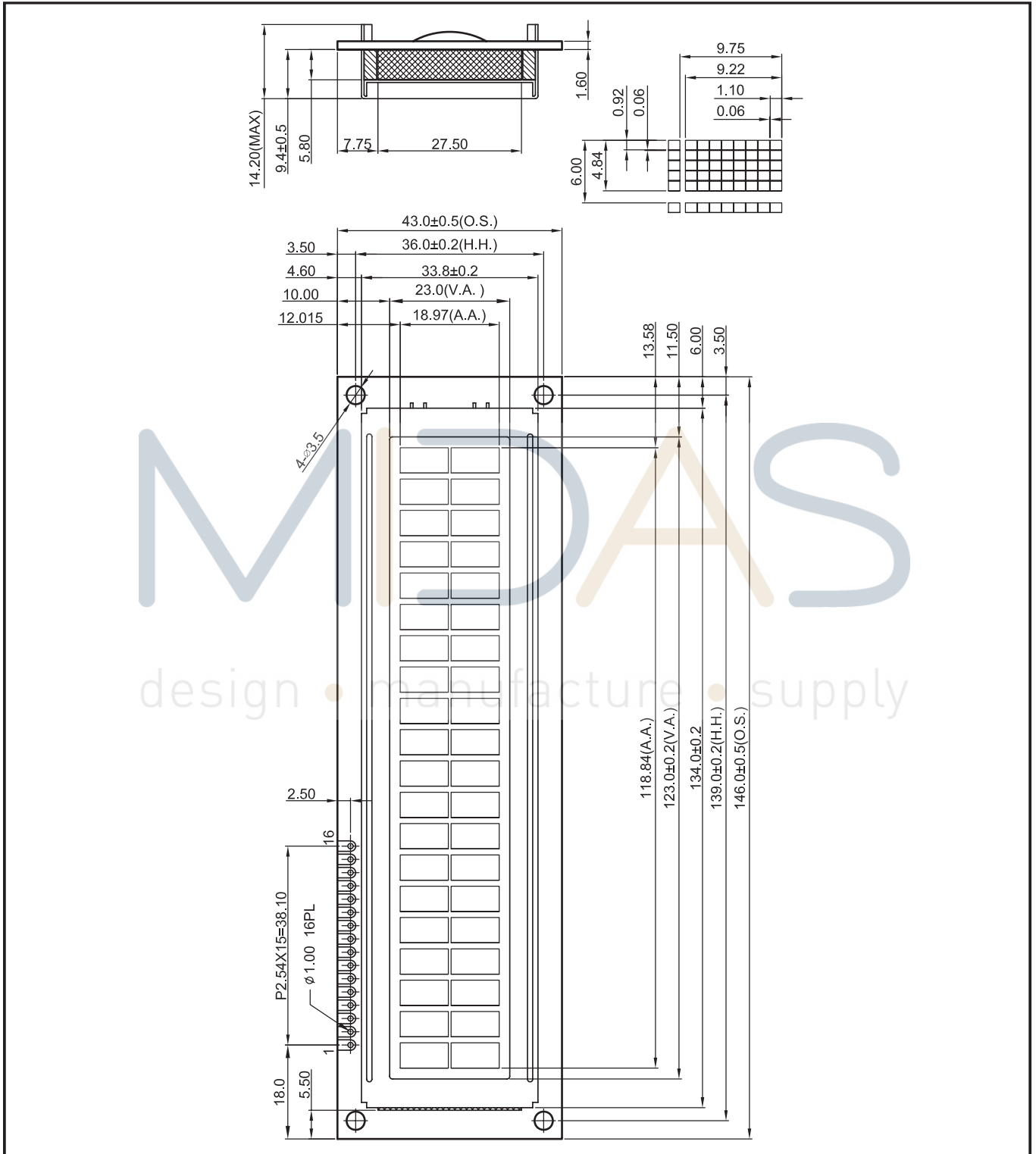
Display Features		Box Quantity	Weight / Display
Character Count	2 x 20		
Appearance	White on Blue		
Logic Voltage	5V		
Interface	Parallel		
Font Set	English / Japanese		
Display Mode	Transmissive		
Character Height	9.22mm		
LC Type	BSTN		
Module Size	146.00 x 43.00 x 14.20 mm		
Operating Temperature	-20°C ~ +70°C		
Construction	COB		
LED Backlight	White		

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



## Mechanical Specifications

Module Size	146.00 x 43.00 x 14.20 ( With Backlight)				W x H x D mm
Viewing Area	123.00 x 23.00	W x H mm	Hole-to-Hole	139.00 x 36.00	W x H mm
Character Size	4.84 x 9.22	W x H mm	Character Pitch	1.16 x 0.53	W x H mm
Dot Size	0.92 x 1.10	W x H mm	Dot Pitch	0.06 x 0.06	W x H mm



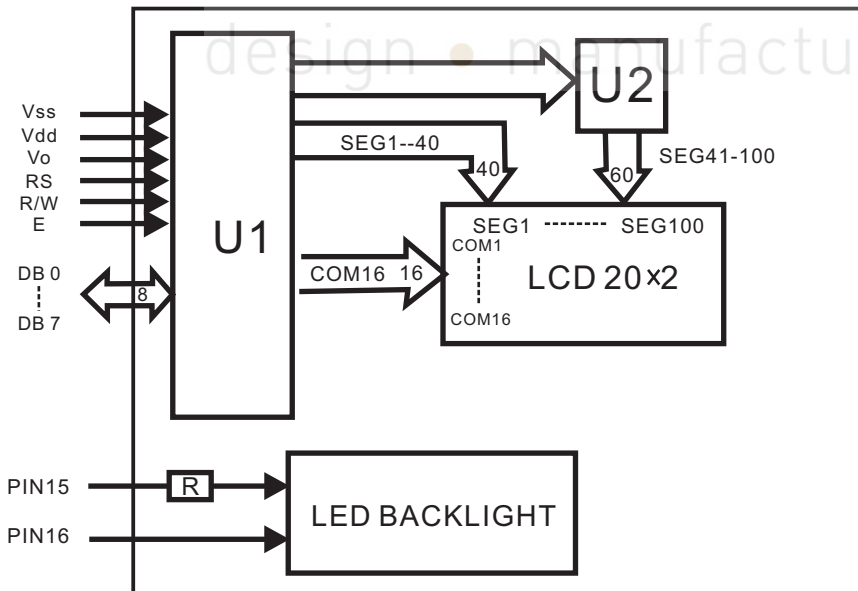
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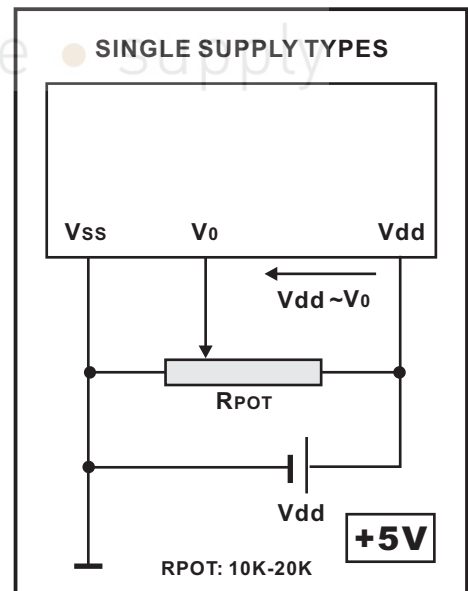
# Pin Layout

PI	SYMBOL	DESCRIPTION	REMARKS
1	Vss	GND	
2	Vdd	Power supply for LCM	5.0V
3	Vo	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	5.0V
16	LED-	Power supply for BKL	

**Block Diagram**



**Power Supply Diagram**



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# Font Map

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)															

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## 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 -13.5	---	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	---	4.7	5.0	5.5	v
Supply Current	Idd	Vdd=5V	---	1.4	---	mA
Driving Voltage for LCD Panel	Vlcd = (Vdd - V0)	-20°C	4.50	---	5.10	v
		0°C	4.40	---	4.90	
		25°C	4.35	4.50	4.80	
		50°C	4.25	---	4.70	
		70°C	4.10	---	4.55	

## LCD Characteristics

For STN/FSTN LCD Panel Types						
Item	Symbol	Condition	Min	Typ	Max	Unit
Viewing Angle	$\Phi 2 - \Phi 1$	K = 4	40°	---	---	Deg
	$\Theta$		60°			
Contrast Ratio	K	---	---	10	---	---
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=HmA	2.1	---	3.1	V
LED Forward Current*	If	25°C	---	H	---	mA
LED Reverse Current	Ir	25°C Vr=5.0V	---	---	G	µA
LED Colour Range	X Coordinate	25°C If=HmA	0.26	---	0.30	---
	Y Coordinate		0.27	---	0.31	---
LED Brightness (Without LCD)	Lv	25°C If=HmA	---	G	---	cd/m <sup>2</sup>
LED Brightness Uniformity	Lvmin/Lvmax	25°C If=HmA	70	---	---	Ratio
LED Life Time	---	25°C If=HmA	9K	---	---	Hours

**Attention:** It is constant current, not constant voltage, which should be applied when driving the LED backlight, please ensure you adhere to this rule.

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