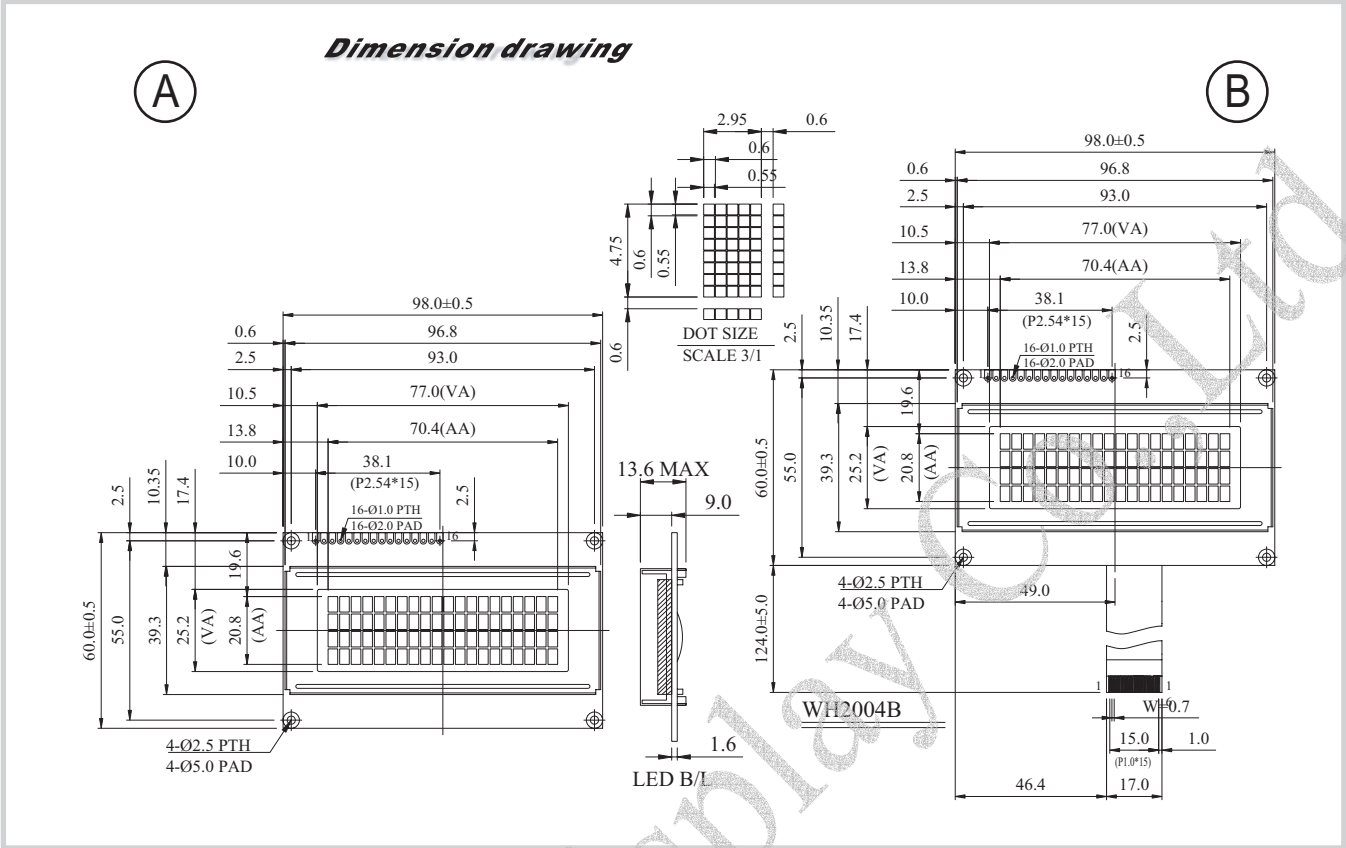


**WH2004A/B** Character20x4

**Dimension drawing**



Character type

**Feature**

1. 5x8 dots includes cursor
2. Built-in controller (KS 0066 or Equivalent)
3. +5V power supply (Also available for +3V)
4. 1/16 duty cycle
5. LED can be driven by pin1,pin2,pin15,pin16 or A and K
6. N.V. optional for +3V power supply
7. FFC and FFC connector is for WH2004B only

**Mechanical Data**

Item	Standard Value	Unit
Module Dimension	98.0x60.0x13.6	mm
Viewing Area	77.0x25.2	mm
Mounting hole	93.0x55.0	mm
Character Size	2.95x4.75	mm

Pin NO.	Symbol	Function
1	Vss	Ground
2	Vdd	Supply voltage for logic
3	Vc	Contrast Adjustment
4	RS	H: Data L: Instruction
5	R/W	H: read data L: write data
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	A	+4.2V for LED
16	K	Power supply for B/L(-)

**Absolute Maximum Rating**

Item	Symbol	Standard Value			Unit
		min.	typ.	max.	
Power Supply	VDD-VSS	-0.3	---	7.0	V
Input Voltage	VI	-0.3	---	VDD	V

Note : VSS=0 Volt, VDD=5.0 Volt.

**Electronical Characteristics**

Item	Symbol	Conditio	Standard Value			Unit	
			min.	typ.	max.		
Input Voltage	VDD	VDD=+5V	2.7	---	5.3	V	
Supply Current	IDD	VDD=5V	---	1.0	1.2	mA	
Recommended LC Driving Voltage for Normal Temp. Version module	VDD-VO	-20°C	5.0	5.1	5.7	V	
		25°C	4.1	4.5	4.7		
		70°C	3.7	3.9	4.3		
LED Forward Voltage	VF	25°C	---	4.2	4.6	V	
LED Forward Current	IF	25°C	Array	---	280	560	mA
			Edge	---	---	---	mA
EL Power Supply Current	IEF	Val=110VAC;400Hz	---	---	5.0	mA	

**Display Character Address Code :**

Display position	1	2	3	4	5	6	7	8	9	10	11	12	13	---	20
DD RAM Address	00	01	02												13
DD RAM Address	40	41	42												53
DD RAM Address	14	15	16												27
DD RAM Address	54	55	56												67

	<b>2</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>10</b>						
<b>W</b>	<b>H</b>	<b>16</b>	<b>02</b>	<b>B</b>	<b>—</b>	<b>Y</b>	<b>G</b>	<b>B</b>	<b>—</b>	<b>JP</b>	<b>**</b>
<b>1</b>		<b>3</b>		<b>5</b>			<b>7</b>			<b>9</b>	

NO	Code value	Description	Remark							
1	W	WINSTAR products	Winstar Display							
2	H,G,X,O	H:Character ; G: Graphic ; X:TAB;O:COG	LCM type							
3	08,16,20,24... 122,128,240...	Words per line Row dots	Character Graphic							
	01,02,04,... 32,64,128...	Lines Column dots	Character Graphic							
5	A~Z	Serials number	Model name							
6	N	Without backlight	Backlight type							
	B	EL backlight , Blue								
	D	EL backlight , Green								
	W	EL backlight , White								
	Y	LED backlight , Yellow-Green								
	A	LED backlight , Amber								
	R	LED backlight , Red								
	G	LED backlight , Green								
	T	LED backlight , White								
	P	LED backlight , Blue								
	F	CCFL backlight , White								
7	B	STN positive , Gray	LCD type							
	N	TN negative , Black								
	G	STN positive , Gray								
	Y	STN positive Yellow-Green								
	M	STN negative , Blue								
	F	FSTN positive White								
	T	FSTN negative , Black								
	E	ISTN negative								
8	Temperature	Normal temp,				Wide temp,				Polarizer type/ Temperature range/ View direction
	View angle	6:00	12:00	3:00	9:00	6:00	12:00	3:00	9:00	
	Reflective	A	D	M	P	G	J	S	V	
	Transflective	B	E	N	Q	H	K	T	W	
	Transmissive	C	F	O	R	I	L	U	X	
9	Character						Graphic			
	English/ Japanese European	English/ Japanese	English/ Europe	English/ Europe	English/ Cyrillic	English/ Hebrew	Negative Voltage	Without Negative Voltage	Temperature Compensation	
	JW	JP, JT	EP,ET	EC,ES	CP,CT	H2	V	N	T	
10	**	Special Code							Touch panel, Backlight	