

Product List

GRAPHIC TYPE LCM

PART NO.	PIXELS	OUTLINE DIMENSION	VIEWING AREA	DOT SIZE	BUILT-IN
		W×H×T(mm)	W×H(mm)	W×H(mm)	CONTROLLER
IDM-12232AA	122x32	80.0x36.0x14.0(10.0)	60.0x18.5	0.40x0.45	SED1520D0A
IDM-12232BA	122x32	84.0x44.0x14.0(10.0)	60.0x18.5	0.40x0.45	SED1520D0A
IDM-12232CA	122x32	98.0x60.0x14.0(10.0)	76.0x25.2	0.53x0.61	SED1520D0A
IDM-12832BA	128x32	80.0x36.0x14.0	60.5x18.5	0.40x0.40	ST7920
IDM-16032AA	160x32	116.0x37.0x14.0(10.)	86.0x19.5	0.45x0.45	ST7920
IDM-16032BA	160x32	122.0x44.0x14.0(10.0)	99.0x24.0	0.55x0.56	ST7920
IDM-12864AA	128x64	93.0x70.0x14.0(10.0)	72.0x40.0	0.48x0.48	S6B0108
IDM-12864BA	128x64	78.0x70.0x14.0(10.0)	62.0x44.0	0.39x0.55	S6B0108
IDM-12864CA	128x64	113.0x65.0x13.0(10.0)	73.5x39.0	0.48x0.48	S6B0108
IDM-12864DA	128x64	54.0x50.0x6.50	44.5x30.0	0.28x0.35	S6B0108
IDM-12864GA	128x64	78.0x70.0x14.0(10.0)	62.0x44.0	0.39x0.55	ST7920
IDM-12864KA	128x64	78.0x70.0x14.0(10.0)	62.0x44.0	0.39x0.55	T6963C
IDM-128128BA	128x128	85.0x100.0x14.0(10.0)	62.0x62.0	0.39x0.39	S6B0108
IDM-19264AA	192x64	130.0x65.0x14.0(10.0)	104.0x39.0	0.46x0.46	S6B0108
IDM-19264BA	192x64	100.0x60.0x14.0(10.0)	84.0x31.0	0.36x0.36	S6B0108
IDM-19264CA	192x64	120.0x62.0x14.0(10.0)	104.0x39.0	0.46x0.46	S6B0108
IDM-192192AA	192x192	86.0x95.0x14.0(10.0)	67.4x67.4	0.33x0.33	SED1335
IDM-24064BB	240x64	180.0x65.0x14.0(10.0)	132.0x39.0	0.49x0.49	LC7981
IDM-240128AA	240x128	144.0x104.0x14.0(10.0)	114.0x64.0	0.40x0.40	T6963C
IDM-240128BA	240x128	156.3x104.0x14.0(10.0)	114.0x64.0	0.40x0.40	T6963C
IDM-240128CA	240x128	144.0x104.0x14.0(10.0)	114.0x64.0	0.40x0.40	LC7981
IDM-240128DA	240x128	144.0x104.0x14.0(10.0)	114.0x64.0	0.40x0.40	T6963C
IDM-240160AA	240x160	143.0x96.8x12.0	104.0x79.3	0.37x0.40	SED1335

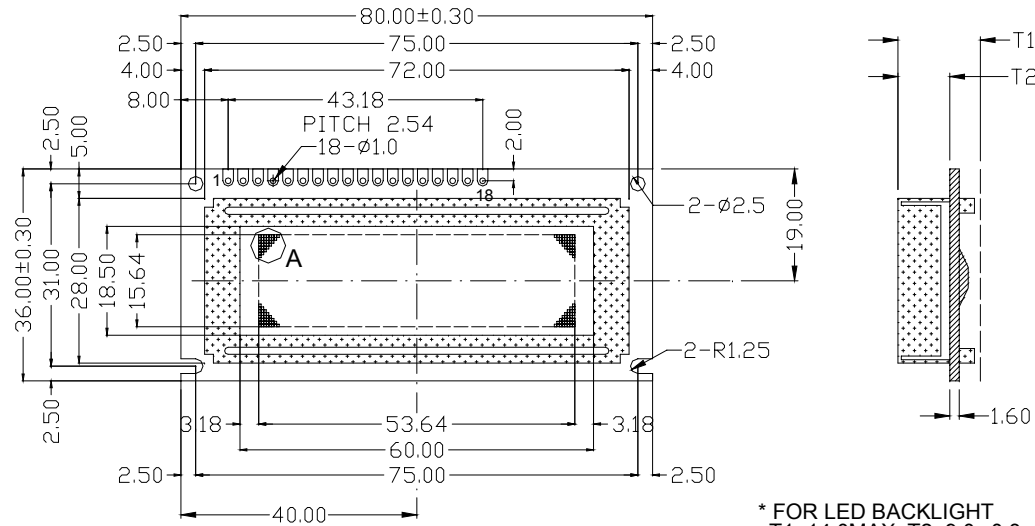
CHARACTER TYPE LCM

PART NO.	CHAR.xLINES	OUTLINE DIMENSION	VIEW AREA	CHAR. SIZE	BUILT-IN
		WxHxT(mm)	WxH(mm)	WxH(mm)	CONTROLLER
IDM-0801AA	8x1	84.0x44.0x14.0(10.0)	61.0x15.8	6.45x10.75	S6A0069 or equiv
IDM-0801BA	8x1	60.0x37.5x14.0(10.0)	45.0x13.5	4.43x7.93	S6A0069 or equiv
IDM-0802AA	8x2	58.0x32.0x14.0(10.0)	38.0x16.0	2.96x5.56	S6A0069 or equiv
IDM-0802BA	8x2	84.0x44.0x14.0(10.0)	63.0x25.0	6.07x11.44	S6A0069 or equiv
IDM-0802DA	8x2	40.0x35.8x7.3	30.5x14.0	2.95x4.75	S6A0069 or equiv
IDM-1601AA	16x1	80.0x36.0x14.0(10.0)	64.5x13.5	3.07x6.56	S6A0069 or equiv
IDM-1601BA	16x1	122.0x33.0x14.0(10.0)	99.0x13.0	4.84x9.66	S6A0069 or equiv
IDM-1601CA	16x1	80.0x36.0x14.0(10.0)	64.5x14.0	3.07x6.56	S6A0069 or equiv
IDM-1602AA	16x2	72.0x36.0x14.0(10.0)	64.5x15.5	2.96x5.56	S6A0069 or equiv
IDM-1602BA	16x2	80.0x36.0x14.0(10.0)	64.5x15.5	2.95x4.35	S6A0069 or equiv
IDM-1602DA	16x2	84.0x44.0x14.0(10.0)	64.5x15.5	2.96x5.56	S6A0069 or equiv
IDM-1602EA	16x2	85.0x36.0x14.0(10.0)	64.5x15.5	2.96x5.56	S6A0069 or equiv
IDM-1602FB	16x2	122.0x44.0x14.0(10.0)	99.0x24.0	4.84x9.66	S6A0069 or equiv
IDM-1602GA	16x2	80.0x36.0x14.0(10.0)	64.5x15.5	2.96x5.56	S6A0069 or equiv
IDM-1602HA	16x2	85.0x30.0x14.0(10.0)	64.5x15.5	2.96x5.56	S6A0069 or equiv
IDM-1602KA	16x2	53.0x20.0x8.0	36.0x10.0	1.85x3.15	S6A0069 or equiv
IDM-1602PA	16x2	100.0x38.8x14.0(10.0)	80.2x20.4	4.07x7.76	S6A0069 or equiv
IDM-1602RA	16x2	57.0x31.0x11.9	51.4x14.8	2.26x4.36	S6A0069 or equiv
IDM-1604AA	16x4	87.0x60.0x14.0(10.0)	62.0x25.6	2.95x4.75	S6A0069 or equiv
IDM-2002AA	20x2	108.0x37.0x14.0(10.0)	83.0x18.6	3.20x5.55	S6A0069 or equiv
IDM-2002BA	20x2	146.0x43.0x14.0(10.0)	123.0x23.0	4.84x9.22	S6A0069 or equiv
IDM-2002CA	20x2	180.0x40.0x14.0(10.0)	149.0x23.0	5.94x9.54	S6A0069 or equiv
IDM-2004AA	20x4	77.0x47.0x14.0(10.0)	60.0x22.0	2.30x4.03	S6A0069 or equiv
IDM-2004BA	20x4	98.0x60.0x14.0(10.0)	76.0x25.2	2.95x4.75	S6A0069 or equiv
IDM-2004CA	20x4	146.0x62.0x14.0(10.0)	123.0x43.0	4.84x9.22	S6A0069 or equiv
IDM-2004EA	20x4	65.0x28.4x9.0	46.4x18.4	1.85x3.15	S6A0069 or equiv
IDM-2402AA	24x2	118.0x36.0x14.0(10.0)	93.5x16.0	3.20x5.55	S6A0069 or equiv
IDM-2402DA	24x2	118.0x36.0x14.0(10.0)	83.0x18.6	2.80x5.55	S6A0069 or equiv
IDM-2402EA	24x2	108.5x34.9x10.0	93.5x15.8	3.15x4.43	S6A0069 or equiv
IDM-4002AA	40x2	182.0x33.5x14.0(10.0)	154.0x16.0	3.20x5.55	S6A0069 or equiv
IDM-4004AA	40x4	190.0x54.0x14.0(10.0)	147.0x29.5	2.78x4.89	S6A0069 or equiv
IDM-4004AB	40x4	190.0x54.0x14.0(10.0)	147.0x29.5	2.78x4.89	S6A0069 or equiv

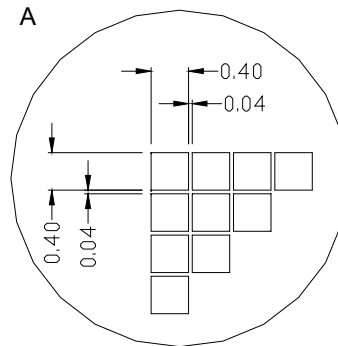
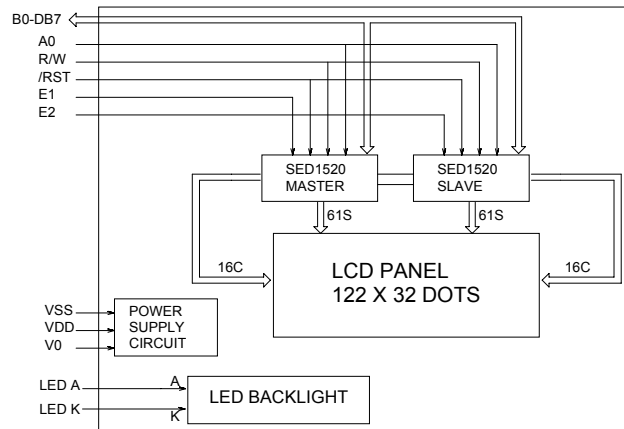
Specifications For Graphic Type LCM

8A !12232AA series

122x32 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	A0	DATA/INSTRUCTION SELECT
5	E1	READ/WRITE ENABLE SIGNAL(MASTER)
6	E2	READ/WRITE ENABLE SIGNAL(SLAVE)
7	R/W	READ/WRITE SELECT
8-15	DB0-DB7	DATA BUS
16	/RST	RESET SIGNAL(LOW EFFECTIVE)
17	A	POWER SUPPLY FOR LED BACKLIGHT(+)
18	K	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	10.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

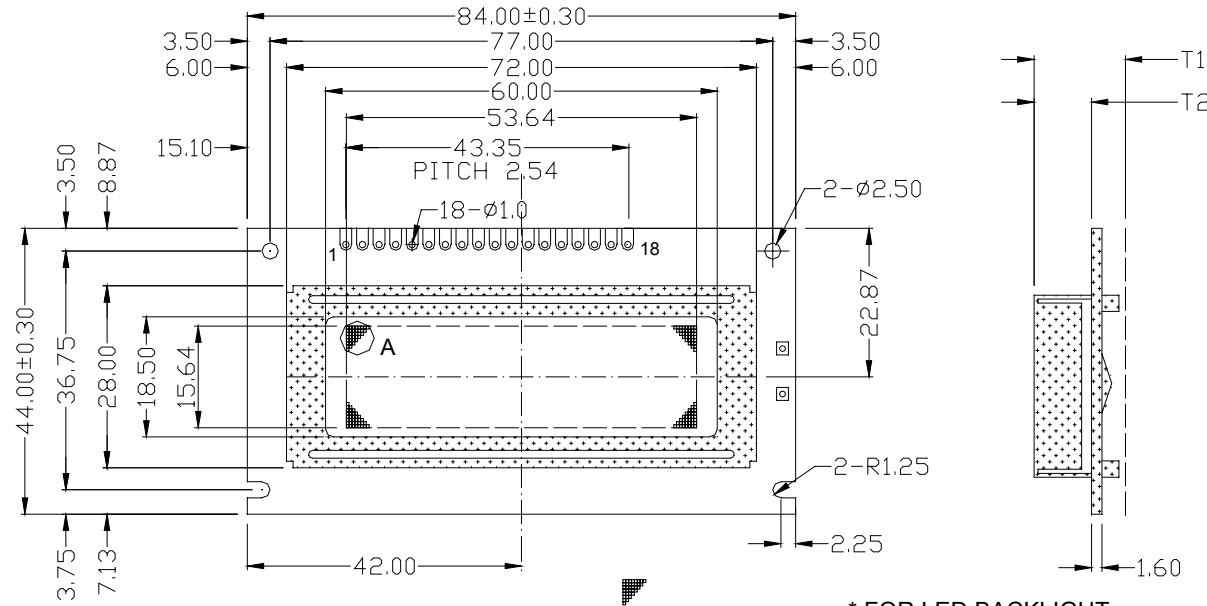
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	300	500	µA
LCD OPERATING VOLTAGE	10C	-	6.2	-	V
	25C	-	5.8	-	V
	40C	-	5.6	-	V
INPUT VOLTAGE	H	V _{IH}	0.8VDD	VDD	V
	L	V _{IL}	0	0.2VDD	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	80.0W x 36.0H x 14.0T(10.0T)	MM
VIEWING AREA	60.0W x 18.5H	MM
DOT NUMBER	122 x 32	DOTS
DOT SIZE	0.40W x 0.45H	MM
DOT PITCH	0.44W x 0.49H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN;
2. BACKLIGHT: WITHOUT BACKLIGHT; LED;
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5. POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -5.0V)
6. VIEWING ANGLE: 6H; 12H

8A !12232BA series

122x32 DOTS

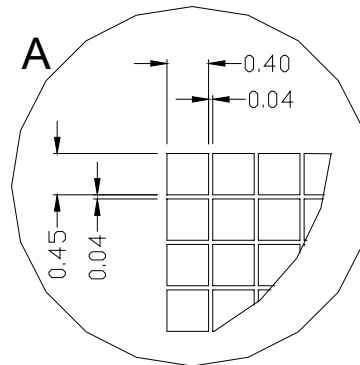
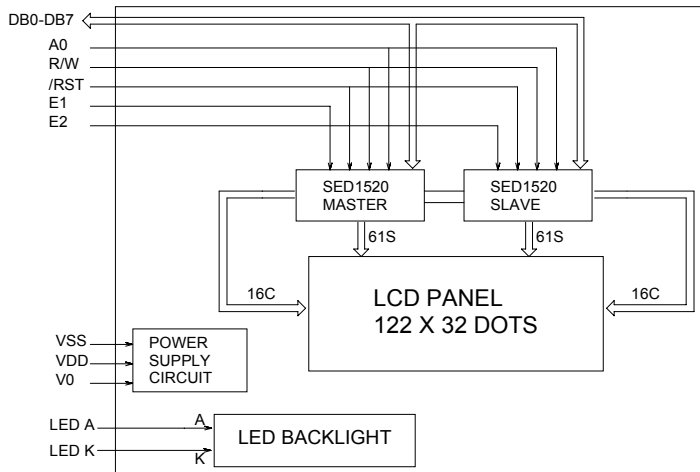


PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	A0	DATA/INSTRUCTION SELECT
5	E1	READ/WRITE ENABLE SIGNAL(MASTER)
6	E2	READ/WRITE ENABLE SIGNAL(SLAVE)
7	R/W	READ/WRITE SELECT
8-15	DB0-DB7	DATA BUS
16	/RST	RESET SIGNAL(LOW EFFECTIVE)
17	A	POWER SUPPLY FOR LED BACKLIGHT(+)
18	K	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	10.0	V
INPUT VOLTAGE	V_i	V_i	VDD	V

ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	300	500	μ A
LCD OPERATING VOLTAGE	0C	-	5.5	-	V
	25C	-	4.8	-	V
	40C	-	4.6	-	V
INPUT VOLTAGE	H V_{iH}	0.8VDD	-	VDD	V
	L V_{iL}	0	-	0.2VDD	V

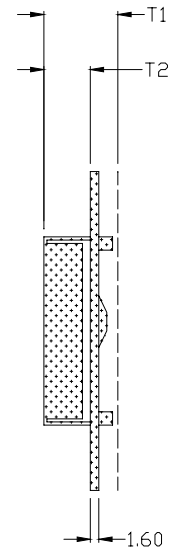
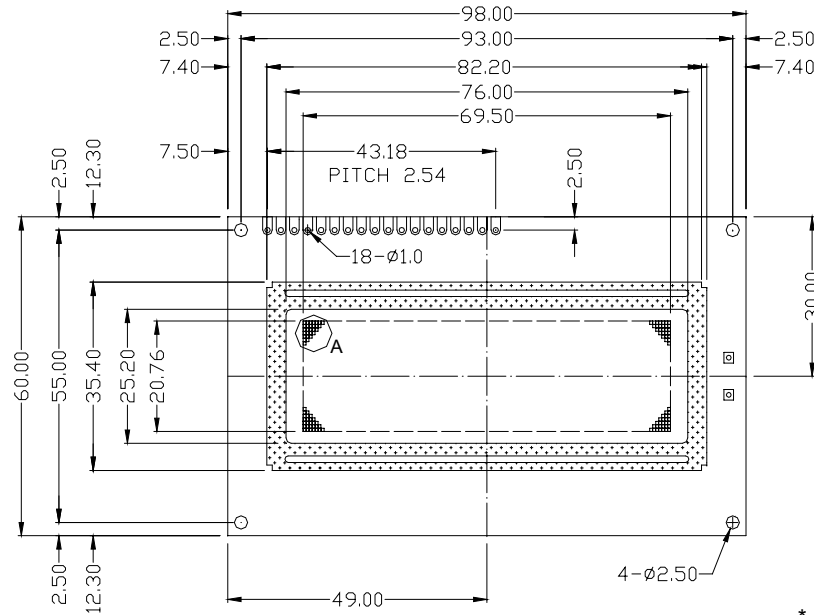
* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0 \pm 0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0 \pm 0.3



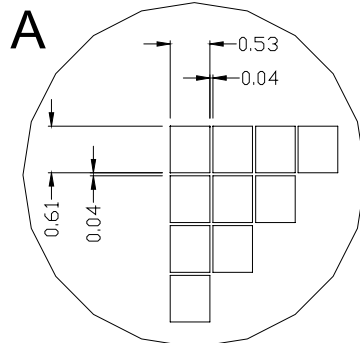
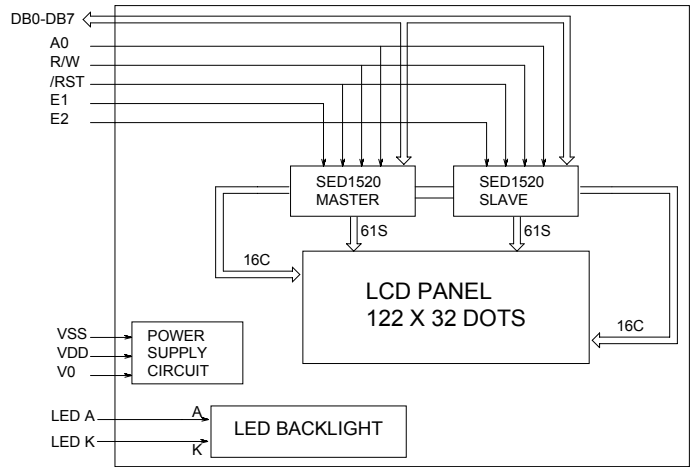
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	84.0W x 44.0H x 14.0T(10.0T)	MM
VIEWING AREA	60.0W x 18.5H	MM
DOT NUMBER	122 x 32	DOTS
DOT SIZE	0.40W x 0.45H	MM
DOT PITCH	0.44W x 0.49H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN;
2. BACKLIGHT: WITHOUT BACKLIGHT; LED;
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5. POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -5.0V)
6. VIEWING ANGLE: 6H; 12H

-8 A ! 12232CA series 122x32 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	A0	DATA/INSTRUCTION SELECT
5	E1	READ/WRITE ENABLE SIGNAL(MASTER)
6	E2	READ/WRITE ENABLE SIGNAL(SLAVE)
7-14	DB0-DB7	DATA BUS
15	A	POWER SUPPLY FOR LED BACKLIGHT(+)
16	K	POWER SUPPLY FOR LED BACKLIGHT(-)
17	R/W	READ/WRITE SELECT
18	/RST	RESET SIGNAL(LOW EFFECTIVE)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	10.0	V
INPUT VOLTAGE	V_i	V_i	VDD	V

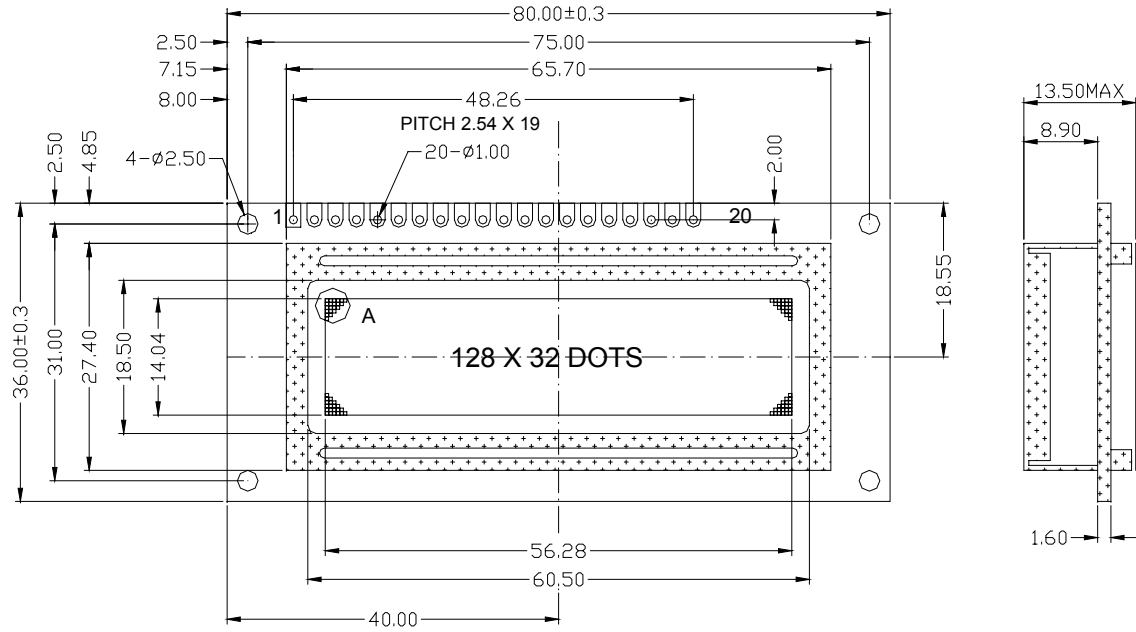
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	300	500	uA
LCD OPERATING VOLTAGE	0C	-	6.2	-	V
	25C	-	5.8	-	V
	40C	-	5.6	-	V
INPUT VOLTAGE	H	V_{IH}	0.8VDD	-	VDD V
	L	V_{IL}	0	-	0.2VDD V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	98.0W x 60.0H x 14.0T(10.0T)	MM
VIEWING AREA	76.0W x 25.2H	MM
DOT NUMBER	122 x 32	DOTS
DOT SIZE	0.53W x 0.61H	MM
DOT PITCH	0.57W x 0.65H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN;
 - BACKLIGHT: WITHOUT BACKLIGHT; LED;
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
 - POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -5.0V)
 - VIEWING ANGLE: 6H; 12H

-8 A ! 12832BA series

128x32 DOTS



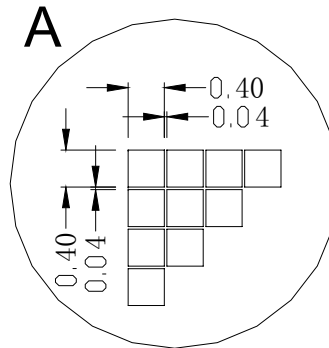
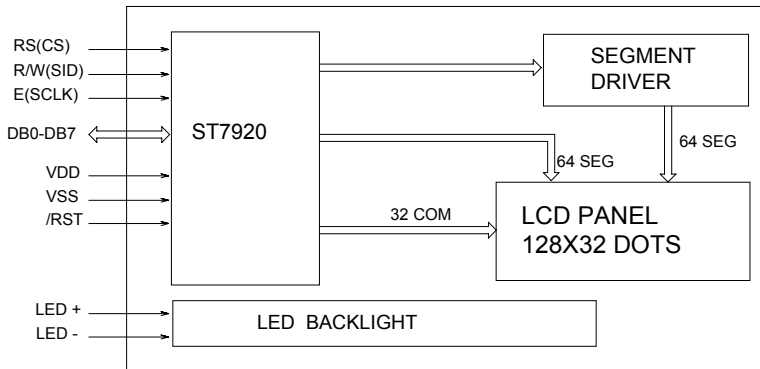
PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	V0	CONTRAST ADJUST
2	VR	CONTRAST ADJUST
3	VSS	POWER SUPPLY
4	VDD	POWER SUPPLY
5	NC	NO CONNECTION
6	RS(CS)	DATA/INSTRUCTION SELECT
		CHIP SELECTION FOR SERIAL MODE
7	R/W(SID)	READ/WRITE CONTROL
		SERIAL DATA INPUT FOR SERIAL MODE
8	E(SCLK)	ENABLE SIGNAL
		SERIAL CLOCK INPUT FOR SERIAL MODE
9-16	DB0-DB7	DATA BUS IN PARALLEL INTERFACE
		NOT USED IN SERIAL MODE,PULL HIGH
17	PSB	PARALLEL/SERIAL SELECT
18	/RST	RESET SIGNAL (LOW EFFECTIVE)
19	K	BACKLIGHT DRIVING -
20	A	BACKLIGHT DRIVING +

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.3	2.2	mA
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD
	L	V _{IL}	-0.3	-	0.6
OUTPUT VOLTAGE	H	V _{oH}	2.4	-	-
	L	V _{oL}	-	-	0.4

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	80.0W x 36.0H x 13.5T	MM
VIEWING AREA	60.5W x 18.5H	MM
DOT NUMBER	128W X 32H	
DOT SIZE	0.40W X 0.40H	MM
DOT PITCH	0.44W x 0.44H	MM

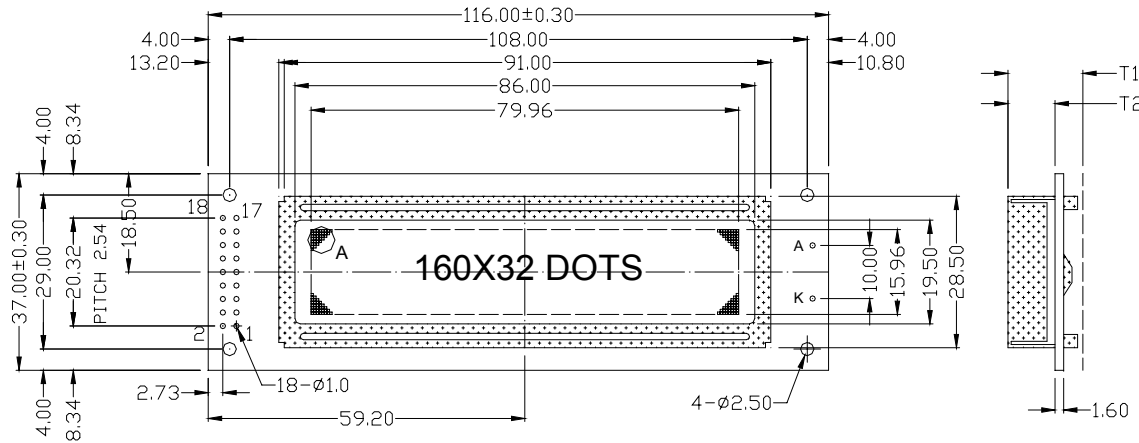
- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN;
 - BACKLIGHT: WITHOUT BACKLIGHT; LED;
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0-50C)
EXTENDED(-20-70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: MADARIN(SIMPLE) CHINESE



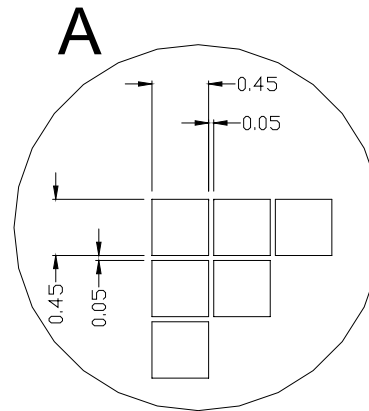
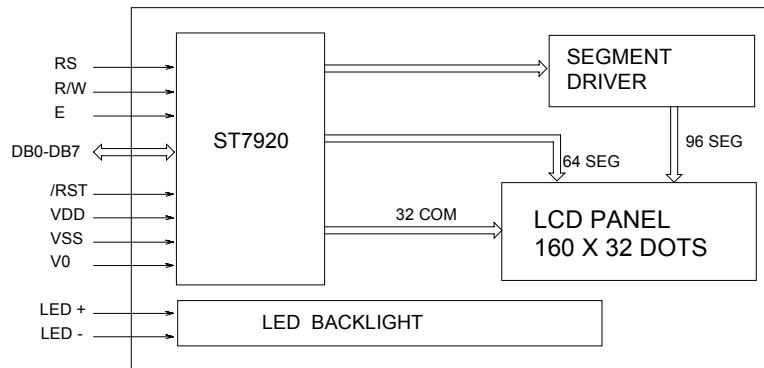
8A !16032AA

series

160x32 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT

NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	/RST	RESET SIGNAL
16	NC	NO CONNECT
17	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
18	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING

ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	5.5	V
POWER SUPPLY(LCD DRV.)	VLCD	-0.3	7.0	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)

ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	0.6	0.8	mA
VOLTAGE FOR LCD	V0-VSS	2.8	3.0	3.2	V
INPUT VOLTAGE	H ViH	2.2	-	VDD	V
	L ViL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V

MECHANICAL SPECIFICATIONS

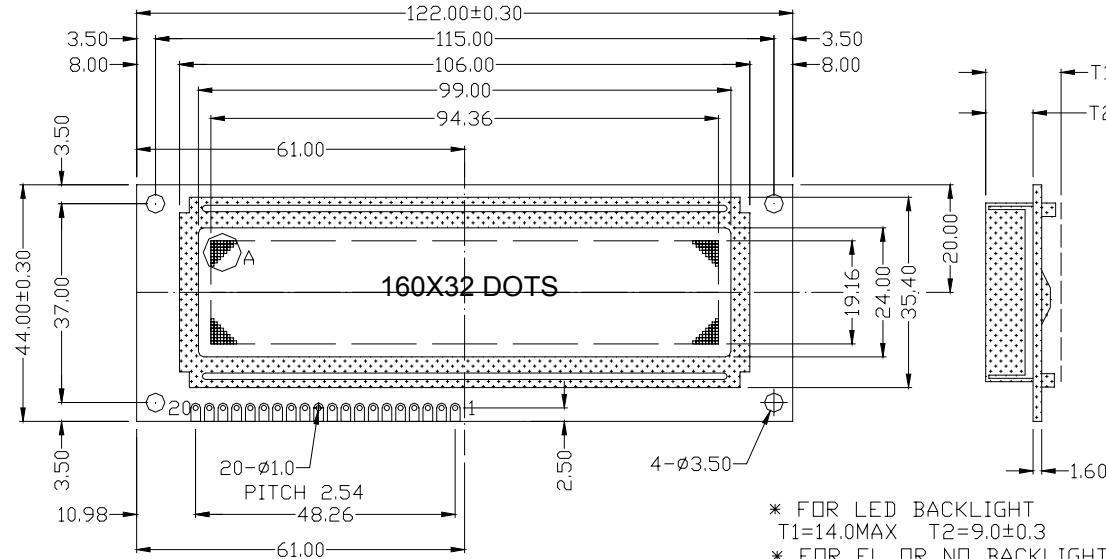
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	116.0W x 37.0H x 14.0T(10.0T)	MM
VIEWING AREA	83.0W x 18.6H	MM
DOTS	160 X 32	
DOT SIZE	0.45W x 0.45H	MM
DOT PITCH	0.50W x 0.50H	MM

OPTIONS

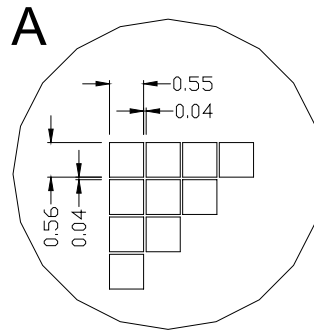
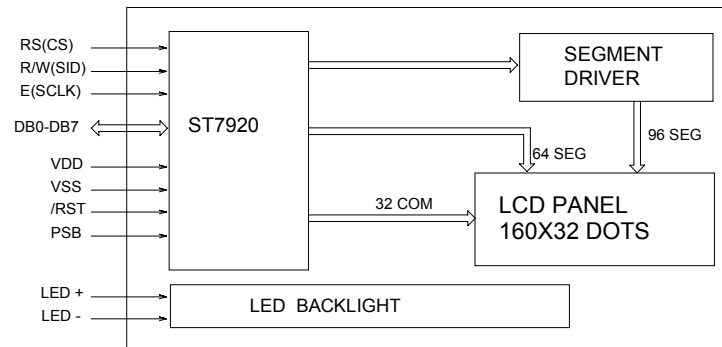
- LCD TYPE: Y/G STN; GRAY STN;
- BACKLIGHT: WITHOUT BACKLIGHT; LED;
- COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
- TEMPERATURE RANGE: NORMAL(0-50C)
EXTENDED(-20-70C)
- POWER SUPPLY: 5.0V; 3.0V
- VIEWING ANGLE: 6H; 12H
- CHARACTER TABLE: CHINESE FONTS(GB2312)

8A !16032BA series

160x32 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	NC	NO CONNECT
4	RS(CS)	DATA/INSTRUCTION SELECT(CHIP SELECTION)
5	R/W(SID)	READ/WRITE CONTROL(SERIAL DATA INPUT/OUTPUT)
6	E(SCLK)	ENABLE SIGNAL(SERIAL CLOCK SIGNAL)
7-14	DB0-DB7	DATA BUS IN PARALLEL INTERFACE
15	PSB	PARALLEL(1)/SERIAL(0) SELECT
16	NC	NO CONNECT
15	/RST	RESET SIGNAL(LOW EFFECTIVE)
16	NC	NO CONNECT
19	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
20	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

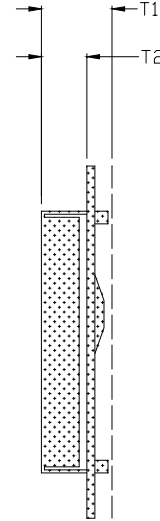
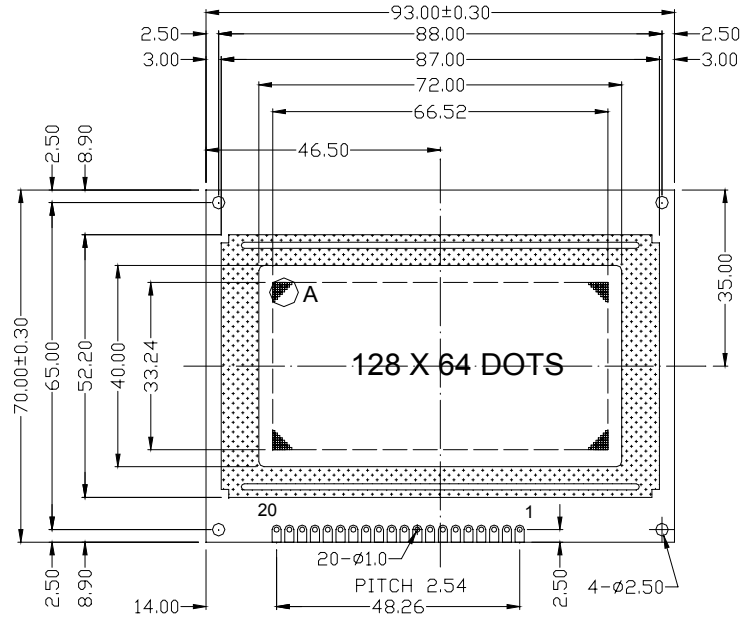
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25C)						
ITEM		SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC		VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT		I _{DD}	-	1.3	2.2	mA
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD	V
	L	V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	-	V
	L	V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	122.0W x 44.0H x 14.0T(10.0T)	MM
VIEWING AREA	99.0W x 24.0H	MM
DOT NUMBER	160W X 32H	
DOT SIZE	0.55W X 0.56H	MM
DOT PITCH	0.59W x 0.60H	MM

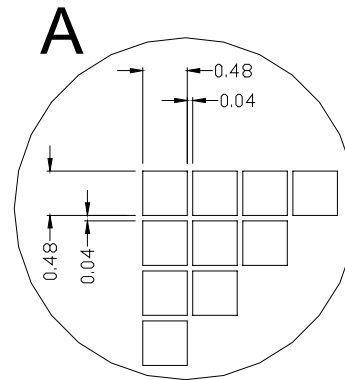
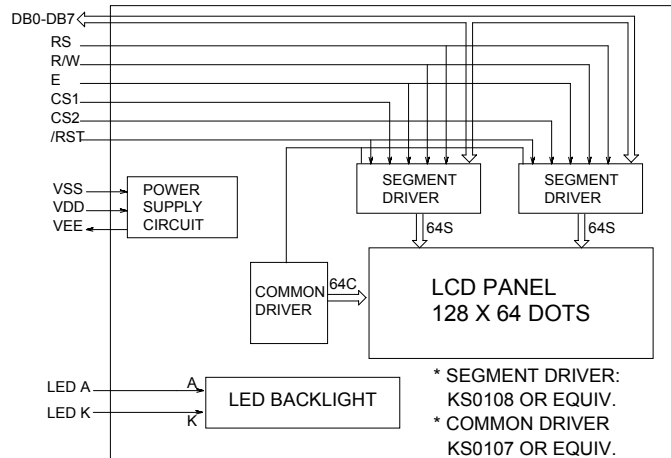
- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN;
 - BACKLIGHT: WITHOUT BACKLIGHT; LED;
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0-50C)
EXTENDED(-20-70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: MADARIN(SIMPLE) CHINESE

8A !12864AA series

128x64 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE SELECT
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	CS1	CHIP SELECT OF IC1 (HIGH EFFECTIVE)
16	CS2	CHIP SELECT OF IC2 (HIGH EFFECTIVE)
17	/RST	RESET SIGNAL (LOW EFFECTIVE)
18	VEE	NEGATIVE VOLTAGE OUTPUT/INPUT
19	A	POWER SUPPLY FOR LED BACKLIGHT(+)
20	K	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY (LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

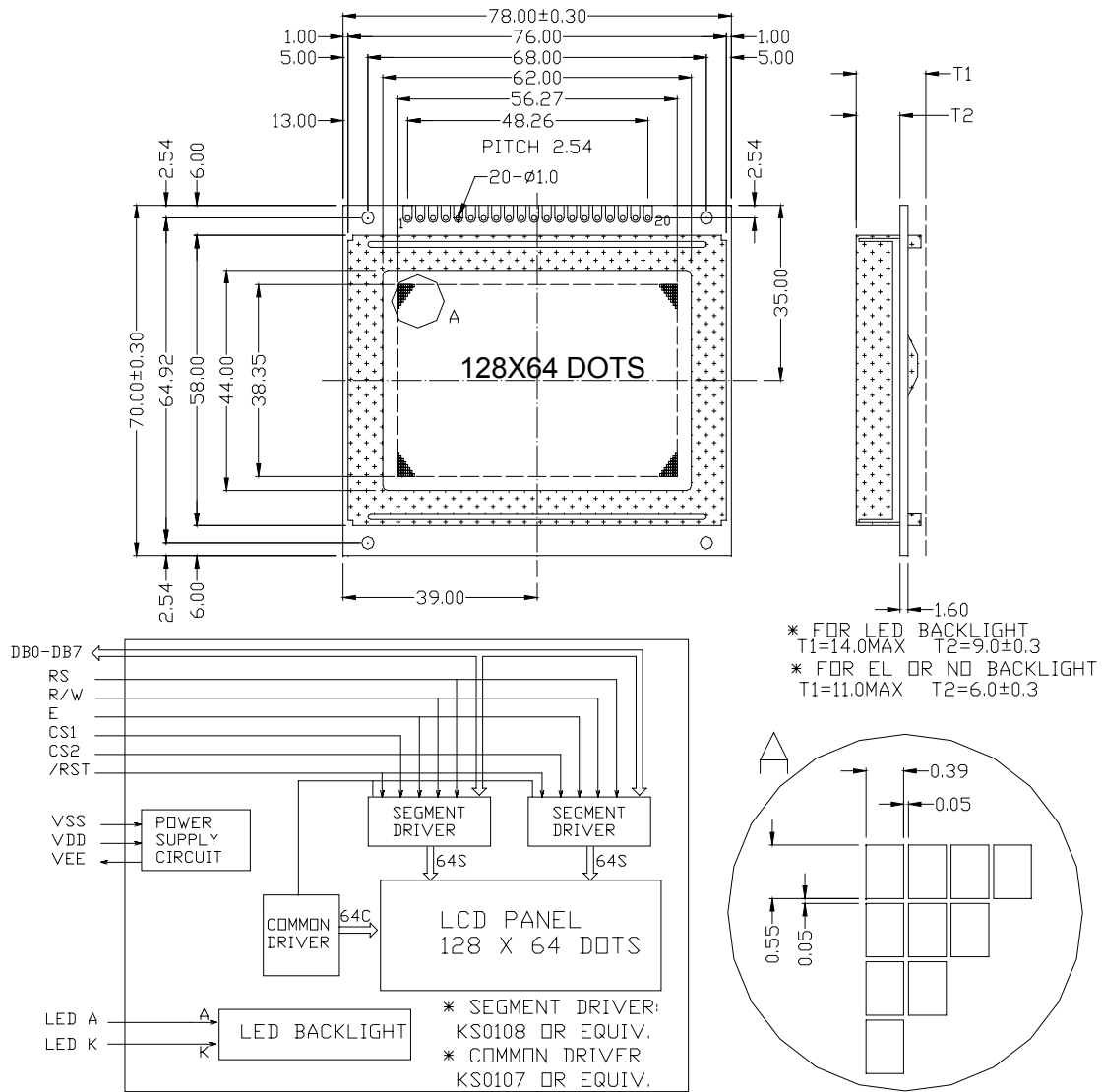
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	8.7	-	mA
LCD OPERATING VOLTAGE	0C	-	12.5	-	V
	25C	-	11.5	-	V
	40C	-	10.5	-	V
INPUT VOLTAGE	H V _{IH}	0.7VDD	-	VDD	V
	L V _{IL}	0	-	0.3VDD	V
WHITE LED VOLTAGE	VLED	-	3.1	3.3	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	93.0W x 70.0H x 14.0T(11.0T)	MM
VIEWING AREA	72.0W x 40.0H	MM
DOT NUMBER	128 x 64	DOTS
DOT SIZE	0.48W x 0.48H	MM
DOT PITCH	0.52W x 0.52H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED;
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
6.	VIEWING ANGLE: 6H; 12H

8 A !12864BA series

128x64 DOTS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE SELECT
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	CS1	CHIP SELECT OF IC1 (HIGH EFFECTIVE)
16	CS2	CHIP SELECT OF IC2 (HIGH EFFECTIVE)
17	/RST	RESET SIGNAL(LOW EFFECTIVE)
18	VEE	DN CHIP DC/DC OUTPUT(-5V)
19	A	POWER SUPPLY FOR LED BACKLIGHT(+)
20	K	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

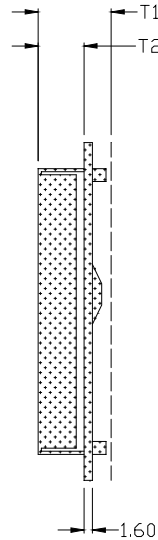
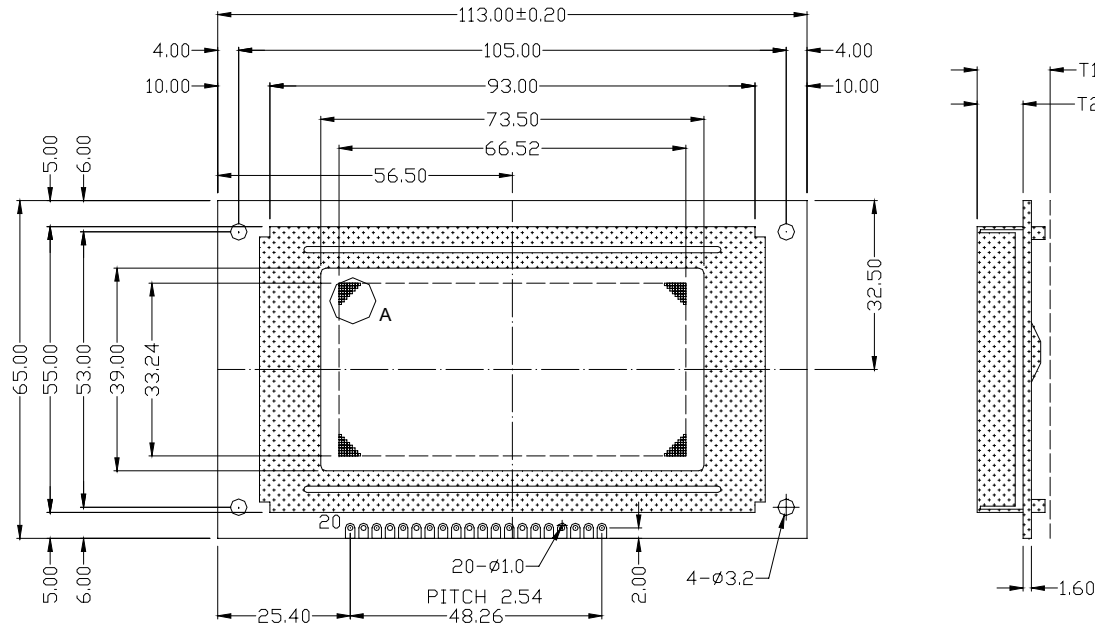
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	5.1	9.8	mA
LCD OPERATING VOLTAGE	0C	-	9.2	-	V
	25C	-	9.0	-	V
	40C	-	8.8	-	V
INPUT VOLTAGE	H	V _{IH}	0.7VDD	VDD	V
	L	V _{IL}	0	0.3VDD	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	78.0W x 70.0H x 14.0T(11.0T)	MM
VIEWING AREA	62.0W x 44.0H	MM
DOT NUMBER	128 x 64	DOTS
DOT SIZE	0.39W x 0.55H	MM
DOT PITCH	0.44W x 0.60H	MM

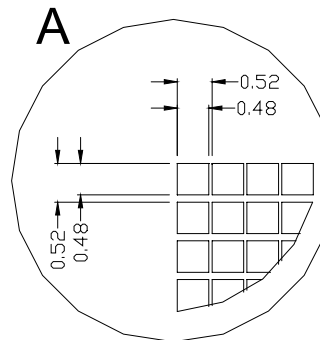
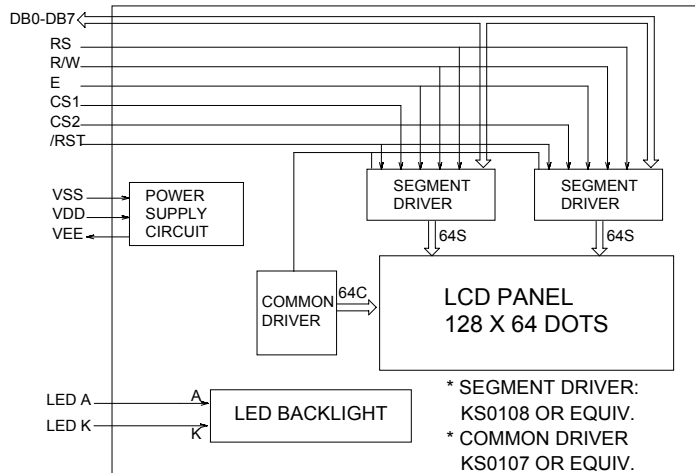
OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C); EXTENDED(-20--70C)
5. POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -5.0V)
6. VIEWING ANGLE: 6H; 12H

-8A !12864CA series

128x64 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE SELECT
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	CS1	CHIP SELECT OF IC1 (HIGH EFFECTIVE)
16	CS2	CHIP SELECT OF IC2 (HIGH EFFECTIVE)
17	/RST	RESET SIGNAL (LOW EFFECTIVE)
18	VEE	ON CHIP DC/DC OUTPUT (-10V)
19	A	POWER SUPPLY FOR LED BACKLIGHT(+)
20	K	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY (LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

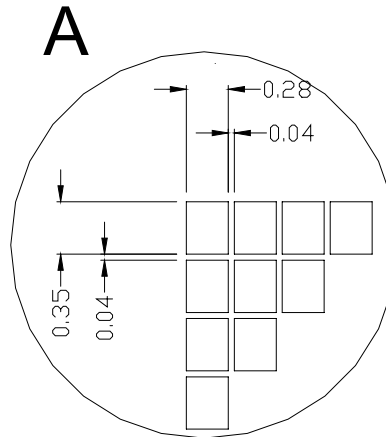
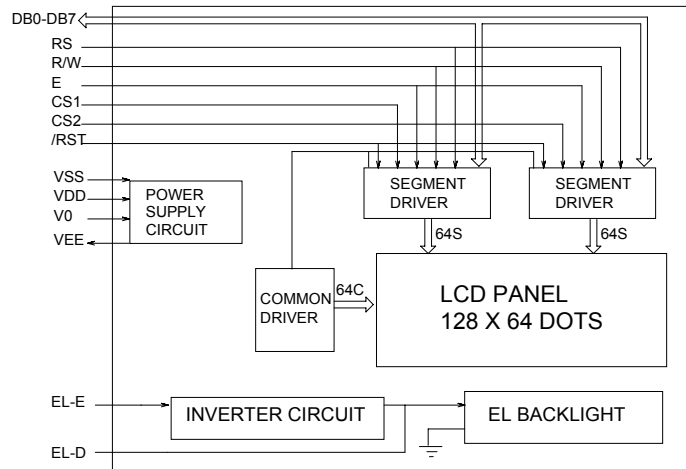
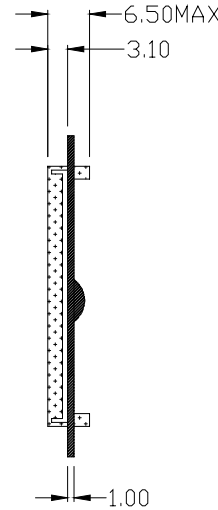
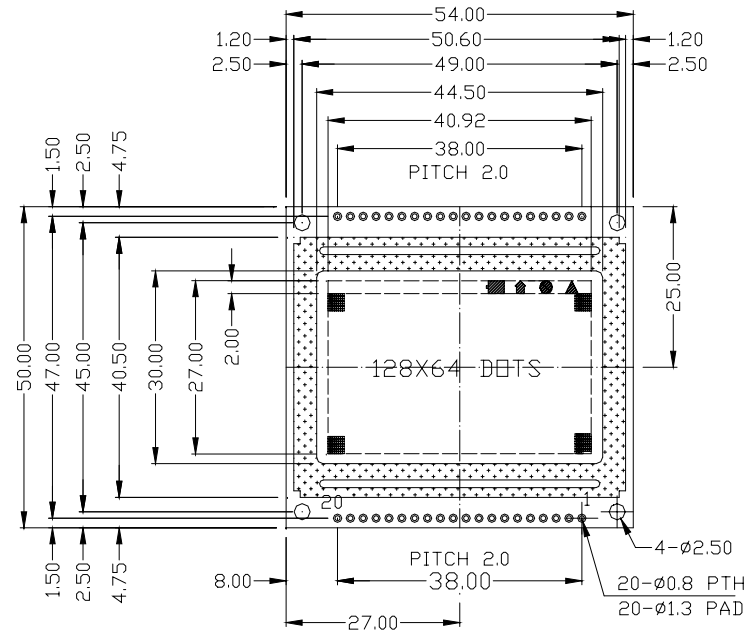
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	5.1	9.8	mA
LCD OPERATING VOLTAGE	0C	-	9.2	-	V
	25C	-	9.0	-	V
	40C	-	8.8	-	V
INPUT VOLTAGE	H V _{iH}	0.7VDD	-	VDD	V
	L V _{iL}	0	-	0.3VDD	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	113.0W x 65.0H x 13.0T	MM
VIEWING AREA	73.5W x 39.0H	MM
DOT NUMBER	128 x 64	DOTS
DOT SIZE	0.48W x 0.48H	MM
DOT PITCH	0.52W x 0.52H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; BW FSTN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED;
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -5.0V)
6.	VIEWING ANGLE: 6H; 12H

8A !12864DA series

128x64 DOTS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE SELECT
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	/CS1	CHIP SELECT OF IC1 (LOW EFFECTIVE)
16	/CS2	CHIP SELECT OF IC2 (LOW EFFECTIVE)
17	/RST	RESET SIGNAL(LOW EFFECTIVE)
18	VEE	NEGATIVE VOLTAGE OUTPUT/INPUT
19	FOR EL: EL-E	EL ON/OFF CONTROL(HIGH ON)
	FOR LED: A	POWER FOR LED BACKLIGHT(5.0V)
20	FOR EL: NC	NO CONNECTION
	FOR LED: K	POWER FOR LED BACKLIGHT(0V)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	Vi	Vi	VDD	V

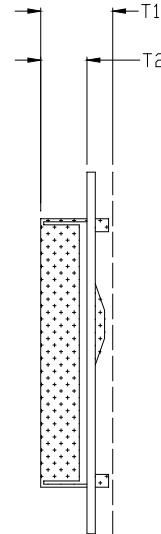
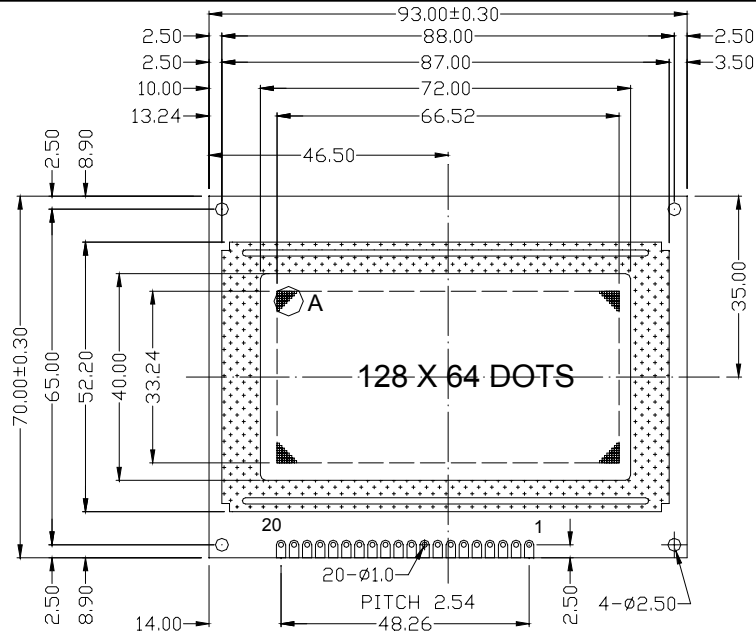
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	5.1	9.8	mA
LCD OPERATING VOLTAGE	0C	-	9.2	-	V
	25C	-	9.0	-	V
	40C	-	8.8	-	V
INPUT VOLTAGE	H	ViH	0.7VDD	-	VDD
	L	ViL	0	0.3VDD	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	54.0W x 50.0H x 6.5T	MM
VIEWING AREA	43.5W x 29.0H	MM
DOT NUMBER	128 x 64	DOTS
DOT SIZE	0.28W x 0.35H	MM
DOT PITCH	0.32W x 0.39H	MM

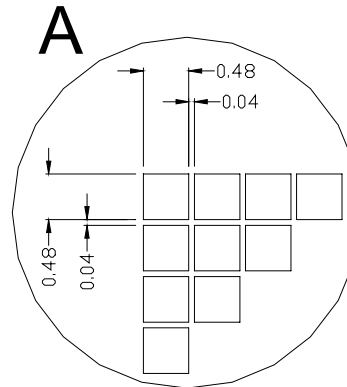
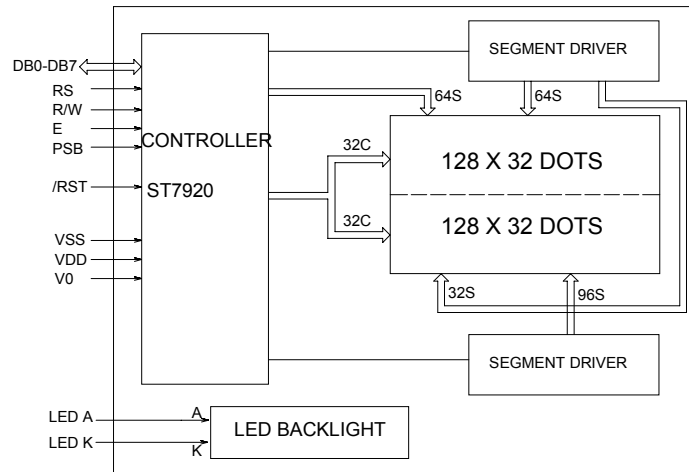
OPTIONS	
1.	LCD TYPE: Y/G STN;
2.	BACKLIGHT: WITHOUT BACKLIGHT;EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
6.	VIEWING ANGLE: 6H;

8A !12864GA series

128x64 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



PINS ASSIGNMENT		
NO.	SYSBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	CONTRAST ADJUST
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE SELECT
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	PSB	PARALLEL/SERIAL INTERFACE SELECTION
16	NC	NO CONNECT
17	/RST	RESET SIGNAL(LOW EFFECTIVE)
18	NC	NO CONNECT
19	A	POWER SUPPLY FOR LED BACKLIGHT(+)
20	K	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _I	V _I	VDD	V

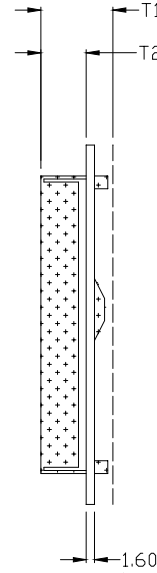
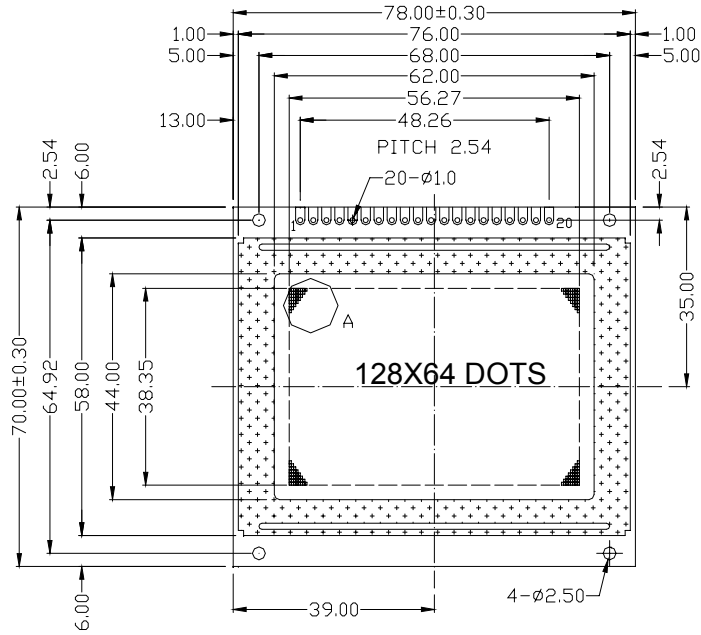
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	8.7	-	mA
LCD OPERATING VOLTAGE	0C	-	-	-	V
	25C	-	4.0	-	V
	40C	-	-	-	V
INPUT VOLTAGE	H	V _{IH}	0.7VDD	-	VDD
	L	V _{IL}	0	-	0.3VDD
WHITE LED VOLTAGE	VLED	-	3.1	3.3	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	93.0W x 70.0H x 14.0T(11.0T)	MM
VIEWING AREA	72.0W x 40.0H	MM
DOT NUMBER	128 x 64	DOTS
DOT SIZE	0.48W x 0.48H	MM
DOT PITCH	0.52W x 0.52H	MM

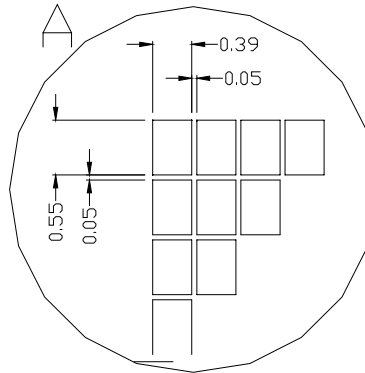
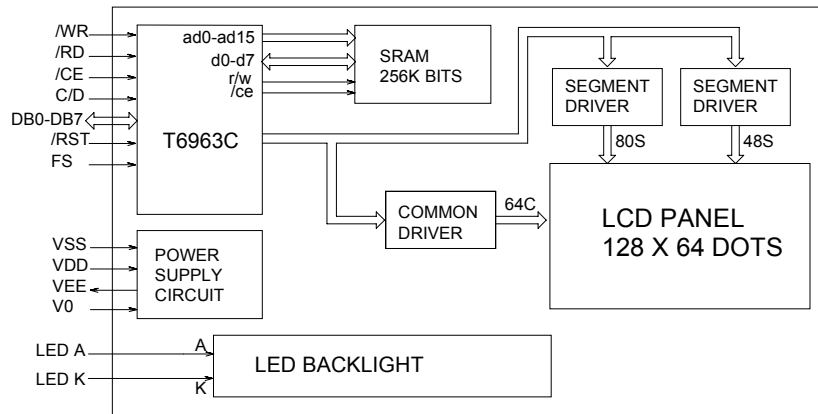
OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED;
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
6.	VIEWING ANGLE: 6H; 12H

8A !12864KA series

128x64 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VEE	NEGATIVE VOLTAGE OUTPUT/INPUT(-10V)
2	VSS	GROUND
3	VDD	POWER SUPPLY
4	V0	OPERATING VOLTAGE FOR LCD
5	/WR	WRITE SIGNAL
6	/RD	READ SIGNAL
7	/CE	CHIP ENABLE SIGNAL
8	C/D	COMMAND/DATA SELECTION
9	/RST	RESET SIGNAL
10-17	DB0-DB7	DATA BUS
18	FS	FONT SELECTION(L:8X8, H:6X8)
19	A	POWER SUPPLY FOR LED BACKLIGHT(+)
20	K	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	Vi	Vi	VDD	V

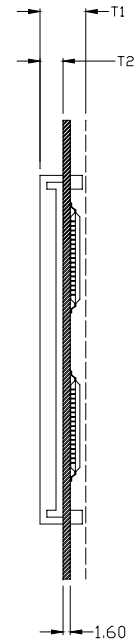
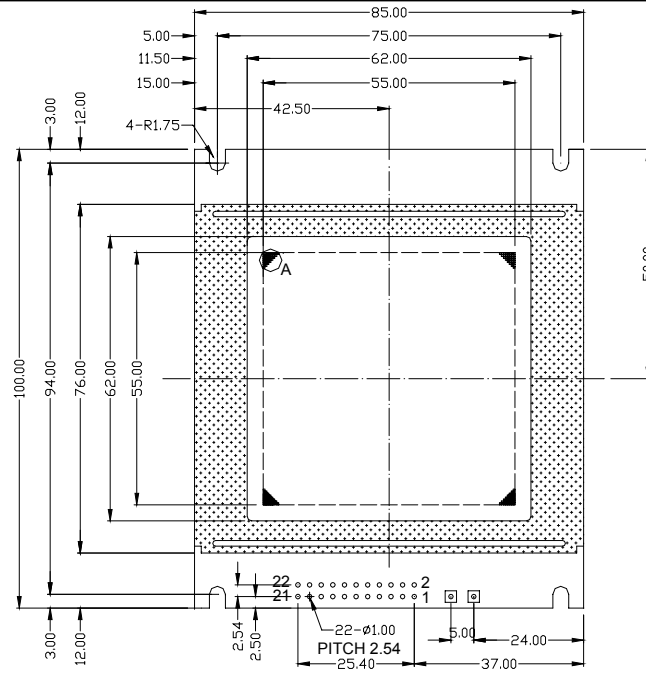
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	5.1	9.8	mA
LCD OPERATING VOLTAGE	0C	-	9.2	-	V
	25C	-	9.0	-	V
	40C	-	8.8	-	V
INPUT VOLTAGE	H	ViH	0.7VDD	-	VDD
	L	ViL	0	0.3VDD	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	78.0W x 70.0H x 14.0T(11.0T)	MM
VIEWING AREA	62.0W x 44.0H	MM
DOT NUMBER	128 x 64	DOTS
DOT SIZE	0.39W x 0.55H	MM
DOT PITCH	0.44W x 0.60H	MM

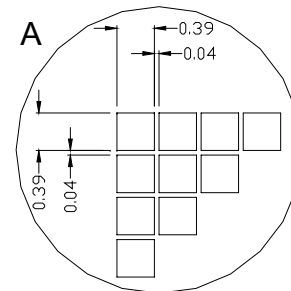
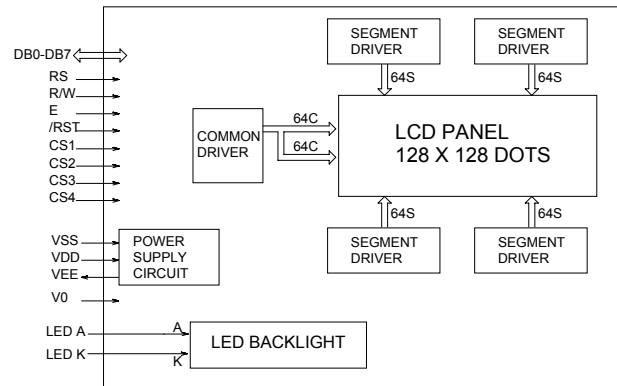
OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0--50C); EXTENDED(-20--70C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -5.0V)
6.	VIEWING ANGLE: 6H; 12H

8 A ! 128128BA series

128x128 DOTS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0MAX
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0MAX



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	CONTRAST ADJUST
4	RS	REGISTER SELECTION
5	R/W	READ/WRITE SELECTION
6	E	ENABLE SIGNAL
7	/RST	RESET SIGNAL
8-15	DB0-DB7	DATA BUS
16	CS1	CHIP1 SELECTION SIGNAL
17	CS2	CHIP2 SELECTION SIGNAL
18	CS3	CHIP3 SELECTION SIGNAL
19	CS4	CHIP4 SELECTION SIGNAL
20	VEE	NEGATIVE VOLTAGE INPUT/OUTPUT
21	BLA	POWER SUPPLY FOR BACKLIGHT (+)
22	BLK	POWER SUPPLY FOR BACKLIGHT (+)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY (LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

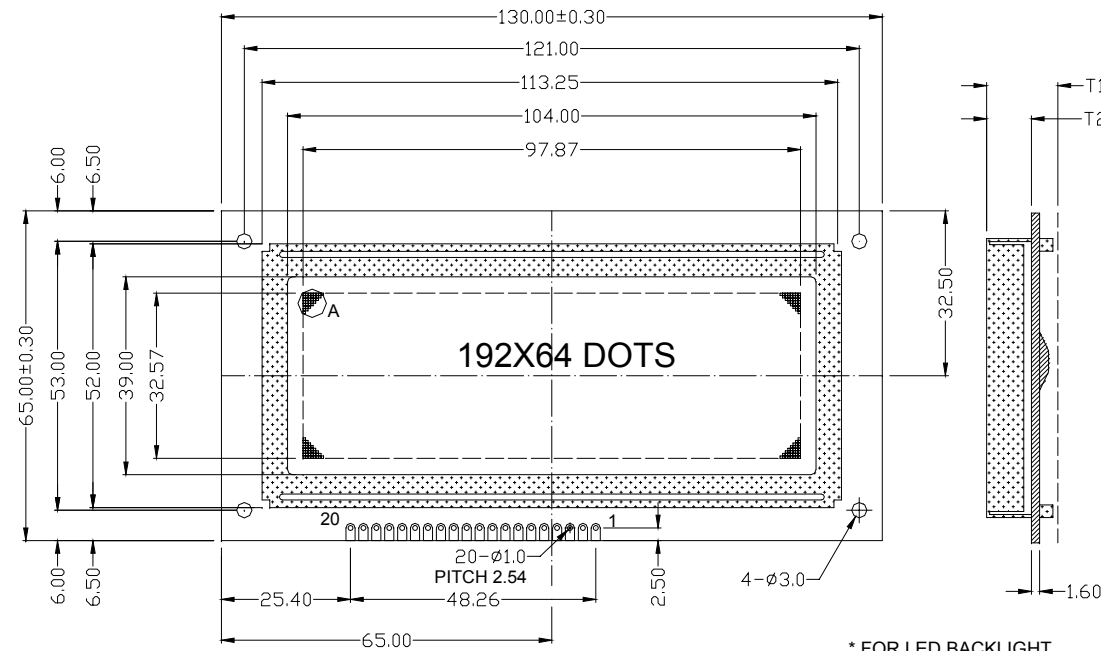
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	12.0	-	mA
LCD OPERATING VOLTAGE	0C	-	16.0	-	V
	25C	-	15.0	-	V
	40C	-	14.0	-	V
INPUT VOLTAGE	H	V _{ih}	0.7VDD	-	VDD
	L	V _{il}	0	-	0.3VDD

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	85.0W x 100.0H x 14.0T(11.0T)	MM
VIEWING AREA	62.0W x 62.0H	MM
DOT NUMBER	128 x 128	DOTS
DOT SIZE	0.39W x 0.39H	MM
DOT PITCH	0.43W x 0.43H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN;
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; ;
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0-50C)
5. POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
6. VIEWING ANGLE: 6H; 12H

8A !19264AA series

192x64 DOTS



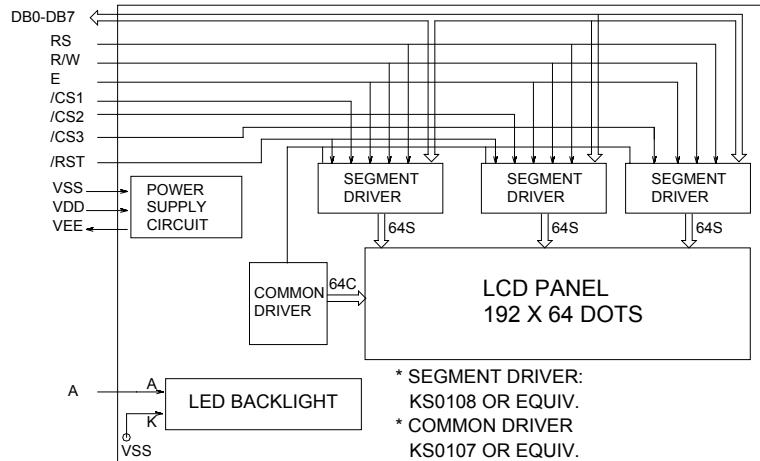
PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE SELECT
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	/CS1	CHIP SELECT OF IC1 (LOW EFFECTIVE)
16	/RST	RESET SIGNAL(LOW EFFECTIVE)
17	/CS2	CHIP SELECT OF IC2 (LOW EFFECTIVE)
18	/CS3	CHIP SELECT OF IC3 (LOW EFFECTIVE)
19	VEE	NEGATIVE VOLTAGE OUTPUT/INPUT(-10V)
20	A	POWER SUPPLY FOR LED B.L.(+5.0V)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

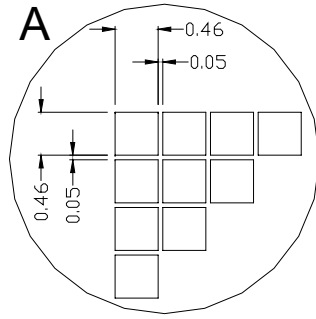
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	5.1	9.8	mA
LCD OPERATING VOLTAGE	0C	-	9.2	-	V
	25C	-	9.0	-	V
	40C	-	8.8	-	V
INPUT VOLTAGE	H	V _{IH}	0.7VDD	-	VDD
	L	V _{IL}	0	0.3VDD	V
VOLTAGE FOR LED BL	V _A -VSS	4.0	4.10	4.40	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	130.0W x 65.0H x 14.0T(10.0T)	MM
VIEWING AREA	104.0W x 39.0H	MM
DOT NUMBER	192 x 64	DOTS
DOT SIZE	0.46W x 0.46H	MM
DOT PITCH	0.51W x 0.51H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED;
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
6.	VIEWING ANGLE: 6H; 12H



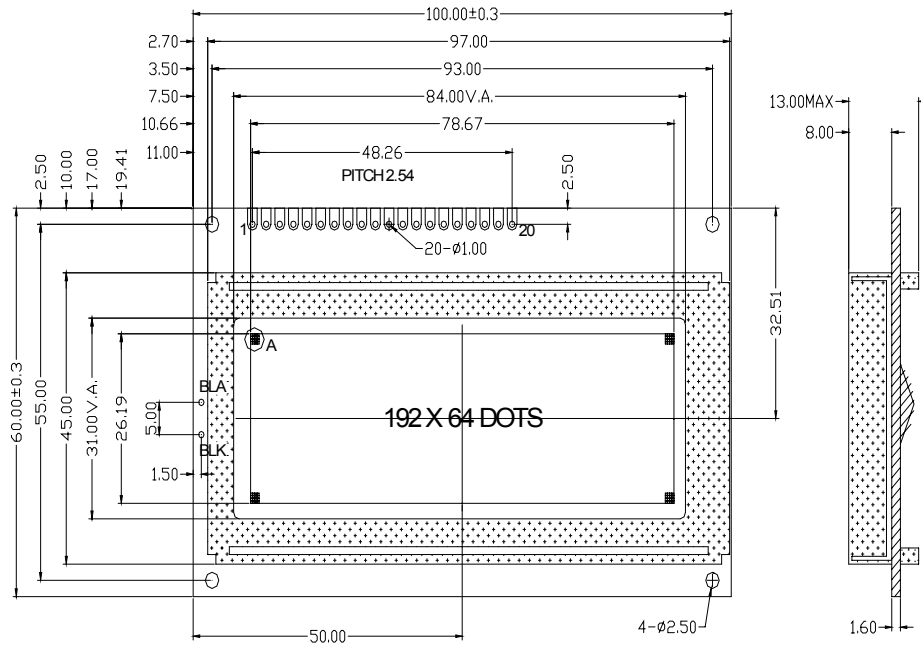
* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



* SEGMENT DRIVER: KS0108 OR EQUIV.
* COMMON DRIVER KS0107 OR EQUIV.

8A !19264BA series

192x64 DOTS

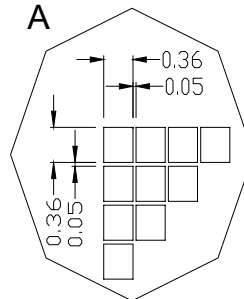
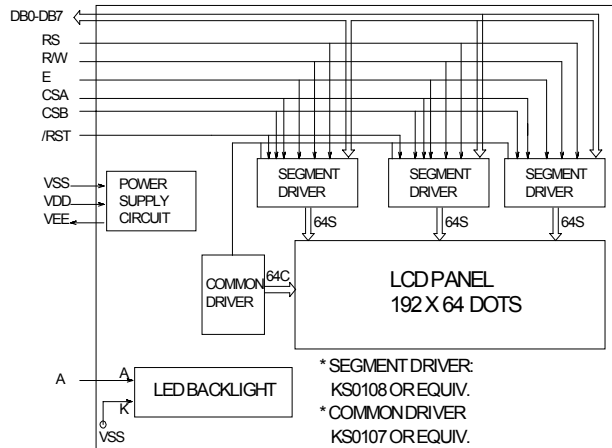


PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1-8	DB7-DB0	DATA BUS
9	E	ENABLE SIGNAL
10	R/W	READ/WRITE SELECT
11	RS	DATA/INSTRUCTION SELECT
12	V0	OPERATING VOLTAGE FOR LCD
13	VDD	POWER SUPPLY FOR LOGIC AND LCD
14	VSS	GROUND
15	CSB	CHIP SELECT SIGNAL B
16	CSA	CHIP SELECT SIGNAL A
17	VEE	NEGATIVE VOLTAGE OUTPUT/INPUT (-10V)
18	/RST	RESET SIGNAL
19	BLA	POWER SUPPLY FOR LED B.L. (+4.2V)
20	BLK	POWER SUPPLY FOR LED B.L. (0V)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY (LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	Vi	Vi	VDD	V

ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	5.1	9.8	mA
LCD OPERATING VOLTAGE	0C	-	9.2	-	V
	25C	-	9.0	-	V
	40C	-	8.8	-	V
INPUT VOLTAGE	H	VH	0.7VDD	-	VDD
	L	VIL	0	-	0.3VDD
VOLTAGE FOR LED B.L.	VA-VSS	4.0	4.10	4.40	V

CHIP SELECT SPEC		
CSA	CSB	FUNCTION
0	0	Enable access to the left part(64 COU)
0	1	Enable access to the middle part(64 COU)
1	0	Enable access to the right part(64 COU)
1	1	Disable all the access to the LCM.

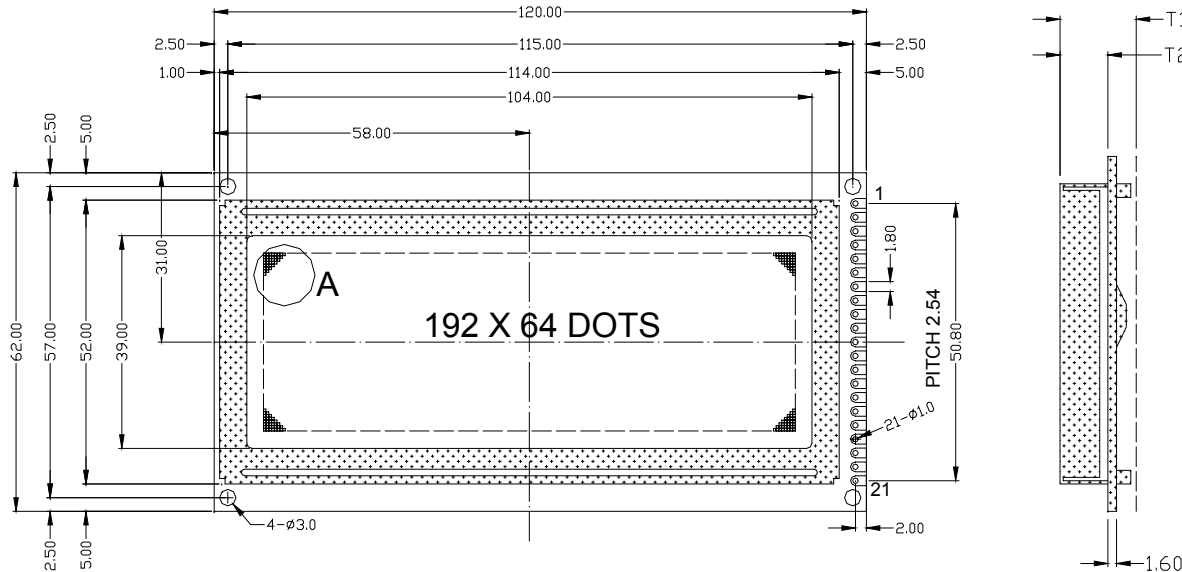


MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	100.0Wx 60.0Hx 13.0T(10.0T)	MM
VIEWING AREA	84.0Wx 31.0H	MM
DOT NUMBER	192 x 64	DOTS
DOT SIZE	0.36Wx 0.36H	MM
DOT PITCH	0.41Wx 0.41H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; B/W/FSTN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED;
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
 - POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
 - VIEWING ANGLE: 6H; 12H

8A ! 19264CA series

192x64 DOTS



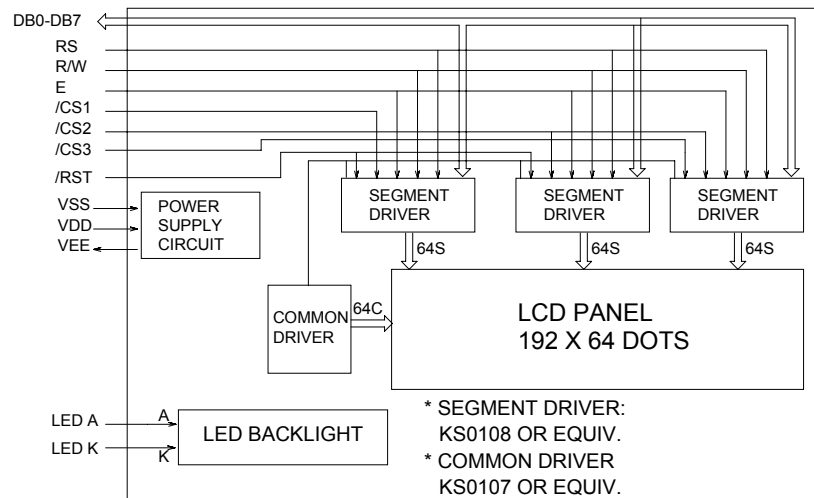
PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	VEE	NEGATIVE VOLTAGE OUTPUT/INPUT(-10V)
5	RS	DATA/INSTRUCTION SELECT
6	R/W	READ/WRITE SELECT
7	E	ENABLE SIGNAL
8-15	DB0-DB7	DATA BUS
16	/CS1	CHIP SELECT OF IC1 (LOW EFFECTIVE)
17	/CS2	CHIP SELECT OF IC2 (LOW EFFECTIVE)
18	/CS3	CHIP SELECT OF IC3 (LOW EFFECTIVE)
19	/RST	RESET SIGNAL (LOW EFFECTIVE)
20	A	POWER SUPPLY FOR LED B.L.(+)
21	K	POWER SUPPLY FOR LED B.L.(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

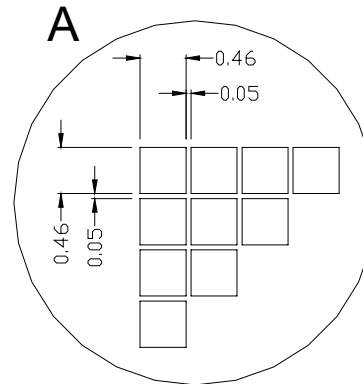
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	5.1	9.8	mA
			9.2	-	V
LCD OPERATING VOLTAGE	0C	VDD-V0	-	9.0	V
	25C		-	9.0	V
	40C		-	8.8	V
INPUT VOLTAGE	H	V _{IH}	0.7VDD	-	VDD
	L	V _{IL}	0	-	0.3VDD

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	120.0W x 62.0H x 14.0T(10.0T)	MM
VIEWING AREA	104.0W x 39.0H	MM
DOT NUMBER	192 x 64	DOTS
DOT SIZE	0.46W x 0.46H	MM
DOT PITCH	0.51W x 0.51H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED;
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C); EXTENDED(-20-70C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
6.	VIEWING ANGLE: 6H; 12H

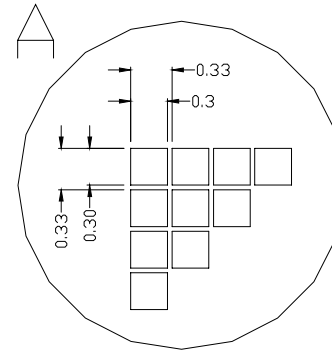
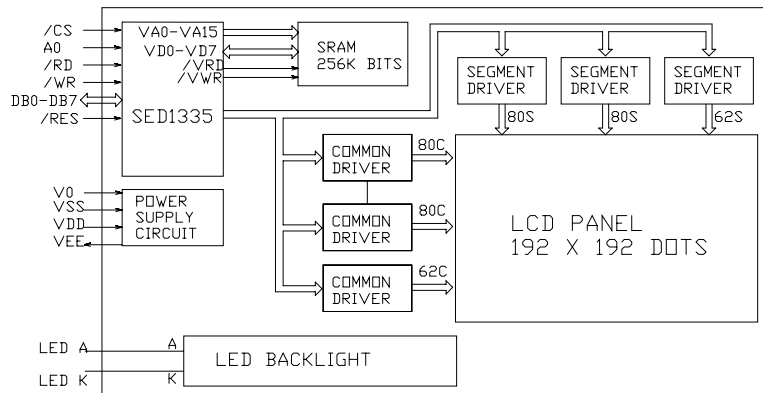
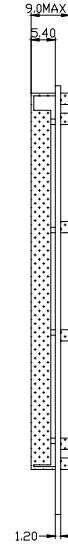
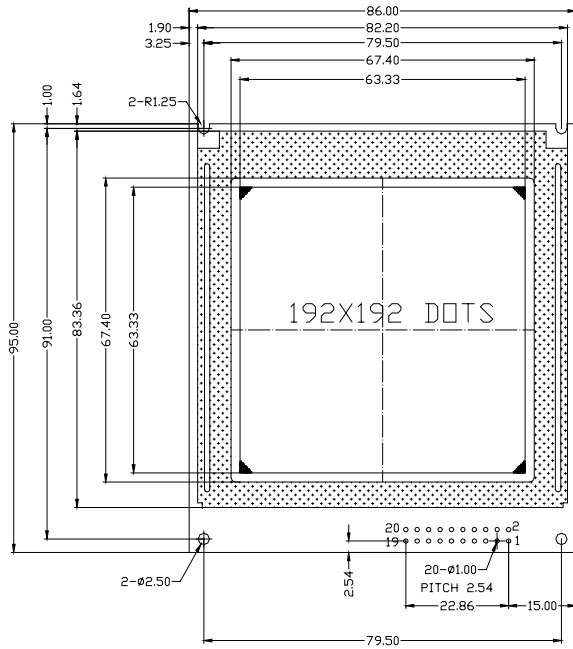


* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=11.0MAX T2=6.0±0.3



8A !192192AA series

192x192 DOTS



PINS ASSIGNMENT		
NO.	SYMBOL	DEFINITION
1	VSS	POWER SUPPLY (GND)
2	VDD	POWER SUPPLY (+5V)
3	V0	CONTRAST ADJUST
4	/WR	WRITE SIGNAL: LOW EFFECTIVE
5	/RD	READ SIGNAL: LOW EFFECTIVE
6	/CS	CHIP SELECTION: LOW EFFECTIVE
7	A0	REGISTER SELECTION
8	/RES	RESET SIGNAL: LOW EFFECTIVE
9-16	DB0--DB7	DATA BUS
17	VEE	NEGATIVE VOLTAGE INPUT/OUTPUT
18	NC	NO CONNECT
19	LED+	POWER SUPPLY FOR LED BACKLIGHT(+)
20	LED-	POWER SUPPLY FOR LED BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	VI	VI	VDD	V

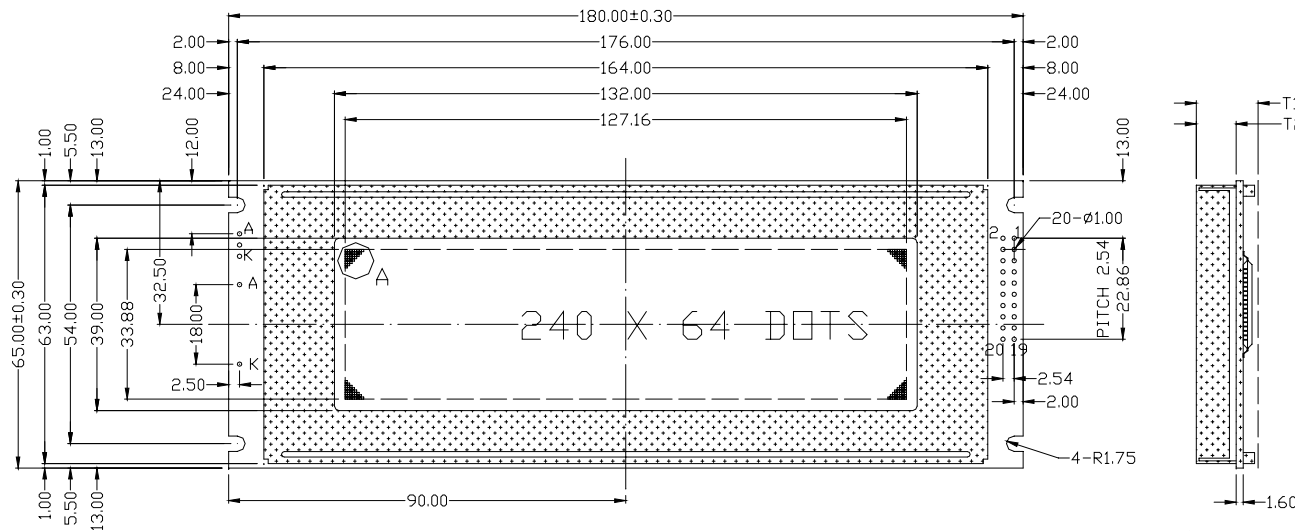
ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	12.0	-	mA
LCD OPERATING VOLTAGE	0C	-	19.0	-	V
	25C	-	18.0	-	V
	40C	-	17.5	-	V
INPUT VOLTAGE	H	VIH	0.7VDD	-	VDD
	L	VIL	0	-	0.3VDD

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	86.0W x 95.0H x 9.0T	MM
VIEWING AREA	67.4W x 67.4H	MM
DOT NUMBER	192 x 192	DOTS
DOT SIZE	0.30W x 0.30H	MM
DOT PITCH	0.33W x 0.33H	MM

OPTIONS	
1.	LCD TYPE: B/W FSTN, POSITIVE
2.	BACKLIGHT: SIDE LED BACKLIGHT
3.	COLOR OF BACKLIGHT: Y/G;
4.	TEMPERATURE RANGE: NORMAL(-50~50C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V);
6.	VIEWING ANGLE: 6H;

8A !24064BB series

240x64 DOTS

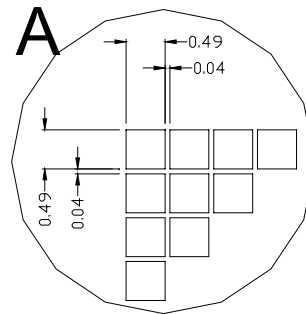
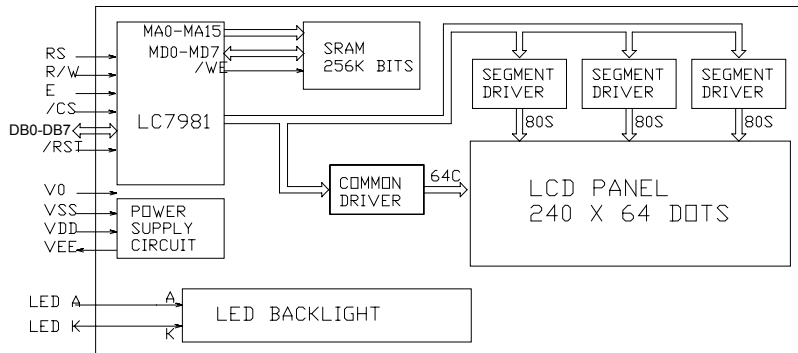


PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY: GROUND
2	VDD	POWER SUPPLY (+)
3	V0	CONTRAST ADJUST
4	RS	COMMAND/DATA SELECT
5	R/W	DATA READ/WRITE
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	/CS	CHIP SELECT: LOW EFFECT
16	/RST	RESET: LOW EFFECT
17	VEE	NEGATIVE VOLTAGE OUTPUT<-10V>
18	NC	NO CONNECTION
19	LEDA	POWER SUPPLY FOR BACKLIGHT(+)
20	LEDK	POWER SUPPLY FOR BACKLIGHT(-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV)	VDD-VEE	0	22.0	V
INPUT VOLTAGE	VI	-0.3	VDD-0.3	V

ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	8.7	-	mA
LCD OPERATING VOLTAGE	25°C	-	14.5	-	V
	40°C	-	13.5	-	V
INPUT VOLTAGE	VIH	0.7VDD	-	VDD	V
	VIL	0	-	0.3VDD	V

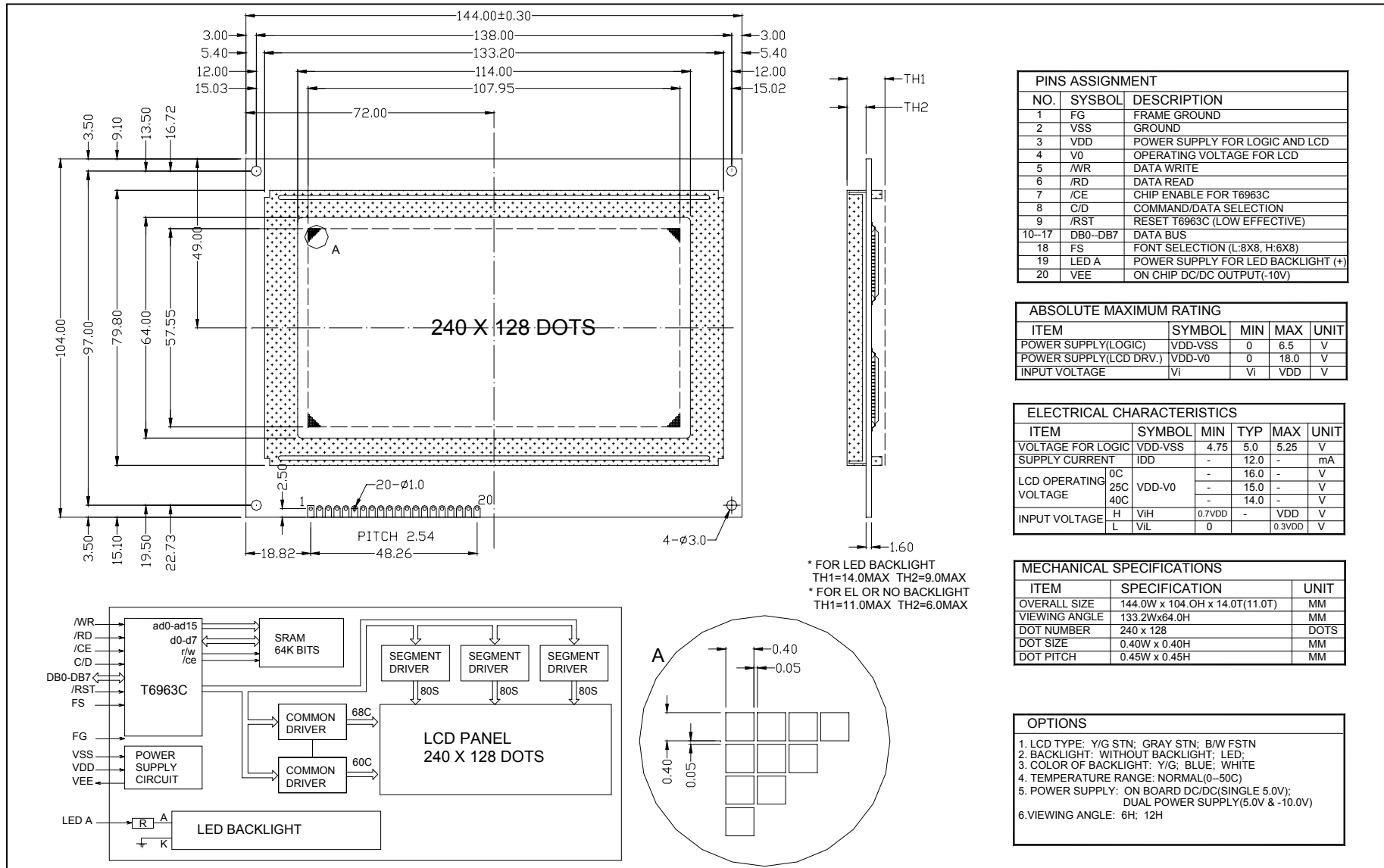
* FOR LED BACKLIGHT
TH1=14.0MAX TH2=9.0MAX
* FOR EL OR NO BACKLIGHT
TH1=11.0MAX TH2=6.0MAX



MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	180.0W x 65.0H x 14.0T(11.0T)	MM
VIEWING AREA	132.0W x 39.0H	MM
DOT NUMBER	240 x 64	DOTS
DOT SIZE	0.49W x 0.49H	MM
DOT PITCH	0.53W x 0.53H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0--50C); EXTENDED(-20--70C)
 - POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
 - VIEWING ANGLE: 6H; 12H

8A !240128AA series 240x128 DOTS



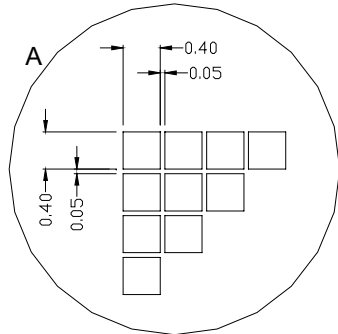
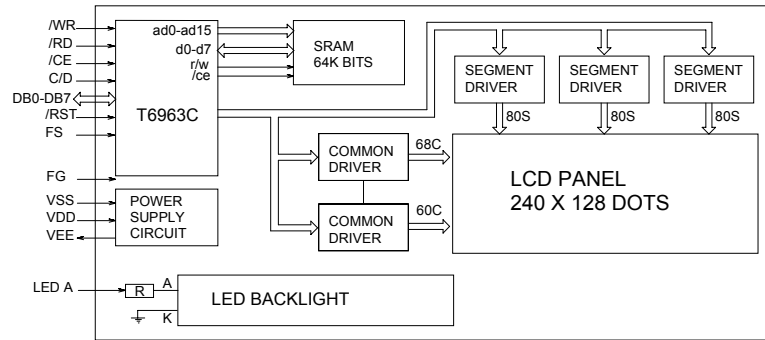
PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	FG	FRAME GROUND
2	VSS	GROUND
3	VDD	POWER SUPPLY FOR LOGIC AND LCD
4	V0	OPERATING VOLTAGE FOR LCD
5	/WR	DATA WRITE
6	/RD	DATA READ
7	/CE	CHIP ENABLE FOR T6963C
8	C/D	COMMAND/DATA SELECTION
9	/RST	RESET T6963C (LOW EFFECTIVE)
10-17	DB0-DB7	DATA BUS
18	FS	FONT SELECTION (L:8X8, H:6X8)
19	LED A	POWER SUPPLY FOR LED BACKLIGHT (+)
20	VEE	ON CHIP DC/DC OUTPUT(-10V)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY(LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	12.0	-	mA
LCD OPERATING VOLTAGE	0C	-	16.0	-	V
	25C	-	15.0	-	V
	40C	-	14.0	-	V
INPUT VOLTAGE	H	V _{IH}	-	VDD	V
	L	V _{IL}	0	0.3VDD	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	144.0W x 104.0H x 14.0T(11.0T)	MM
VIEWING ANGLE	133.2Wx64.0H	MM
DOT NUMBER	240 x 128	DOTS
DOT SIZE	0.40W x 0.40H	MM
DOT PITCH	0.45W x 0.45H	MM

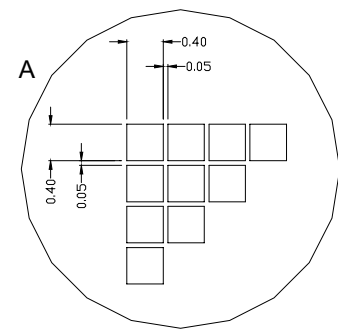
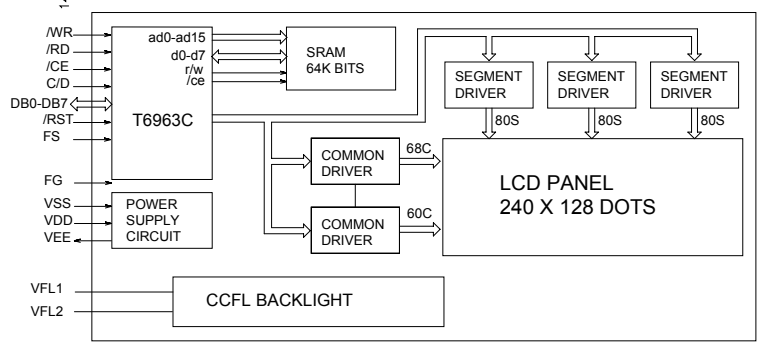
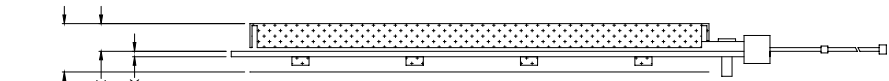
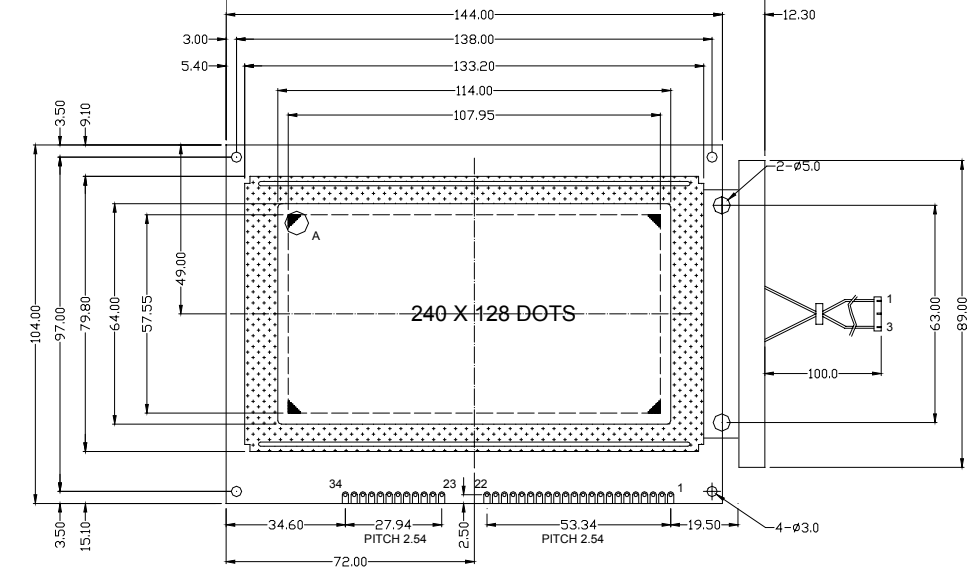
OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED;
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C)
5.	POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
6.	VIEWING ANGLE: 6H; 12H



* FOR LED BACKLIGHT
TH1=14.0MAX TH2=9.0MAX
* FOR EL OR NO BACKLIGHT
TH1=11.0MAX TH2=6.0MAX

8 A !240128BA series

240x128 DOTS



PINS ASSIGNMENT		
NO.	SYSBOL	DESCRIPTION
1	FG	FRAME GROUND
2	VSS	GROUND
3	VDD	POWER SUPPLY FOR LOGIC AND LCD
4	V0	OPERATING VOLTAGE FOR LCD
5	/WR	DATA WRITE
6	/RD	DATA READ
7	/CE	CHIP ENABLE FOR T6963C
8	C/D	COMMAND/DATA SELECTION
9	NC	NO CONNECT
10	/RST	RESET T6963C (LOW EFFECTIVE)
11-18	DB0-DB7	DATA BUS
19	FS	FONT SELECTION (L:8X8, H:6X8)
20	VEE	NEGATIVE VOLTAGE INPUT/OUTPUT
21,22	A,K	LED BACKLIGHT POWER SUPPLY(WHEN USING LED)
23	ED	SERIAL DISPLAY DATA
24	CDATA	COM DATA
25	M	AC SIGNAL
26	LP	LATCH CLOCK
27	HSCP	SHIFT CLOCK
28	NC	NO CONNECT
29	VDD	POWER SUPPLY FOR LOGIC AND LCD
30	VSS	GROUND
31	V0	OPERATING VOLTAGE FOR LCD
32	VEE	NEGATIVE VOLTAGE INPUT/OUTPUT
33,34	A,K	LED BACKLIGHT POWER SUPPLY(WHEN USING LED)

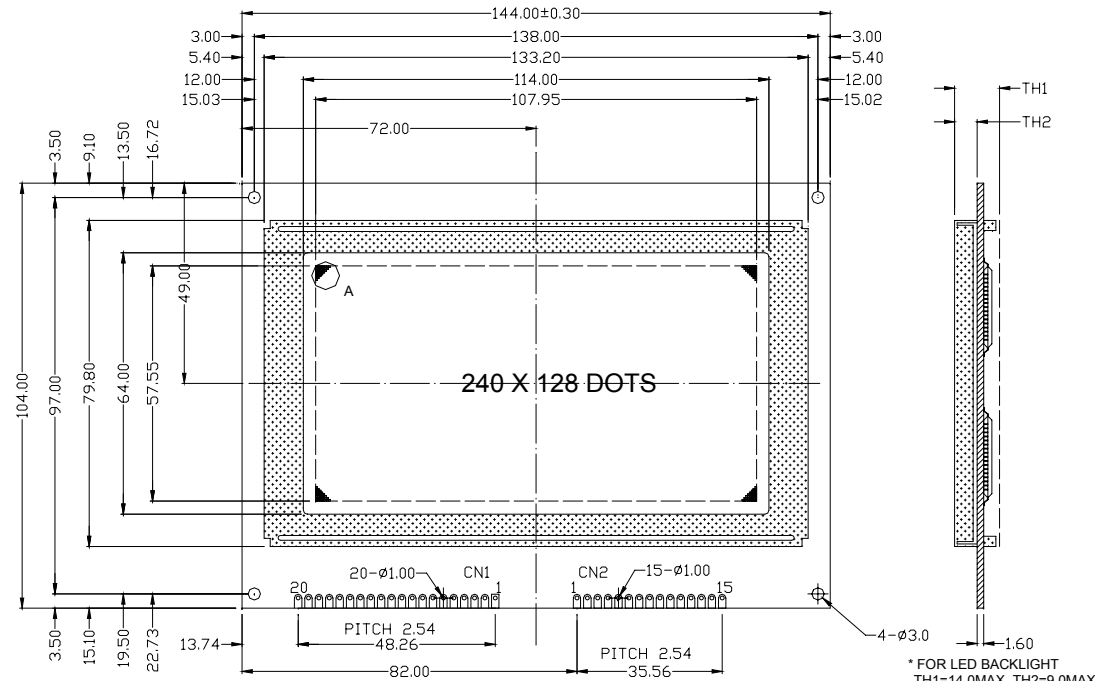
BACKLIGHT PINS		
1	VFL1	CCFL POWER SUPPLY
2	NC	NO CONNECTION
3	VFL2	CCFL POWER SUPPLY

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	156.3W x 104.0H x 14.0T	MM
VIEWING AREA	133.2W x 64.0H	MM
DOT NUMBER	240 x 128	DOTS
DOT SIZE	0.40W x 0.40H	MM
DOT PITCH	0.45W x 0.45H	MM

- NOTES**
- LCD TYPE: B/W FSTN
 - BACKLIGHT: CCFL
 - POLARIZER: TRANSFLECTIVE
 - OPERATING TEMPERATURE: 0-50 C
STORAGE TEMPERATURE: -10-60 C
 - CONTROLLER: T6963C
 - ON-BOARD DC-DC: -15V
 - CUSTOMER P/N: IM240128-04A

8A !240128CA series

240x128 DOTS



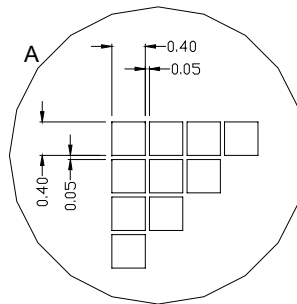
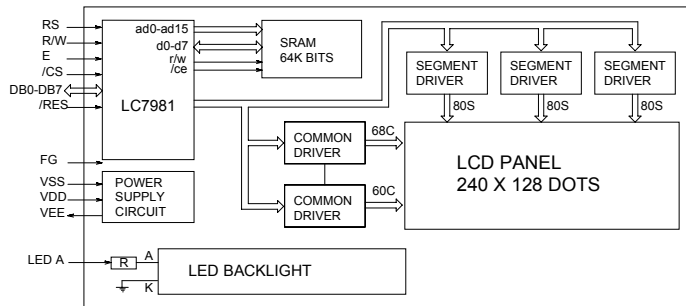
PINS ASSIGNMENT			
CN1 FOR BUILT-IN CONTROLLER		CN2 FOR DRIVER ONLY	
NO.	SYMBOL	NO.	SYMBOL
1	VSS	1	FLM
2	VDD	2	CP
3	V0	3	LP
4	RS	4	M
5	R/W	5	VDD
6	E	6	VSS
7-14	DB0-DB7	7	VEE
15	/CS	8-11	D0-D3
16	/RES	12	V0
17	VEE	13	/DISPOFF
18	NC	14	A
19	A	15	K
20	K		

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	0	6.5	V
POWER SUPPLY (LCD DRV.)	VDD-V0	0	18.0	V
INPUT VOLTAGE	V _i	V _i	VDD	V

ELECTRICAL CHARACTERISTICS					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	12.0	-	mA
LCD OPERATING VOLTAGE	0C	-	16.0	-	V
	25C	-	15.0	-	V
	40C	-	14.0	-	V
INPUT VOLTAGE	H	V _{IH}	0.7VDD	-	VDD
	L	V _{IL}	0	-	0.3VDD

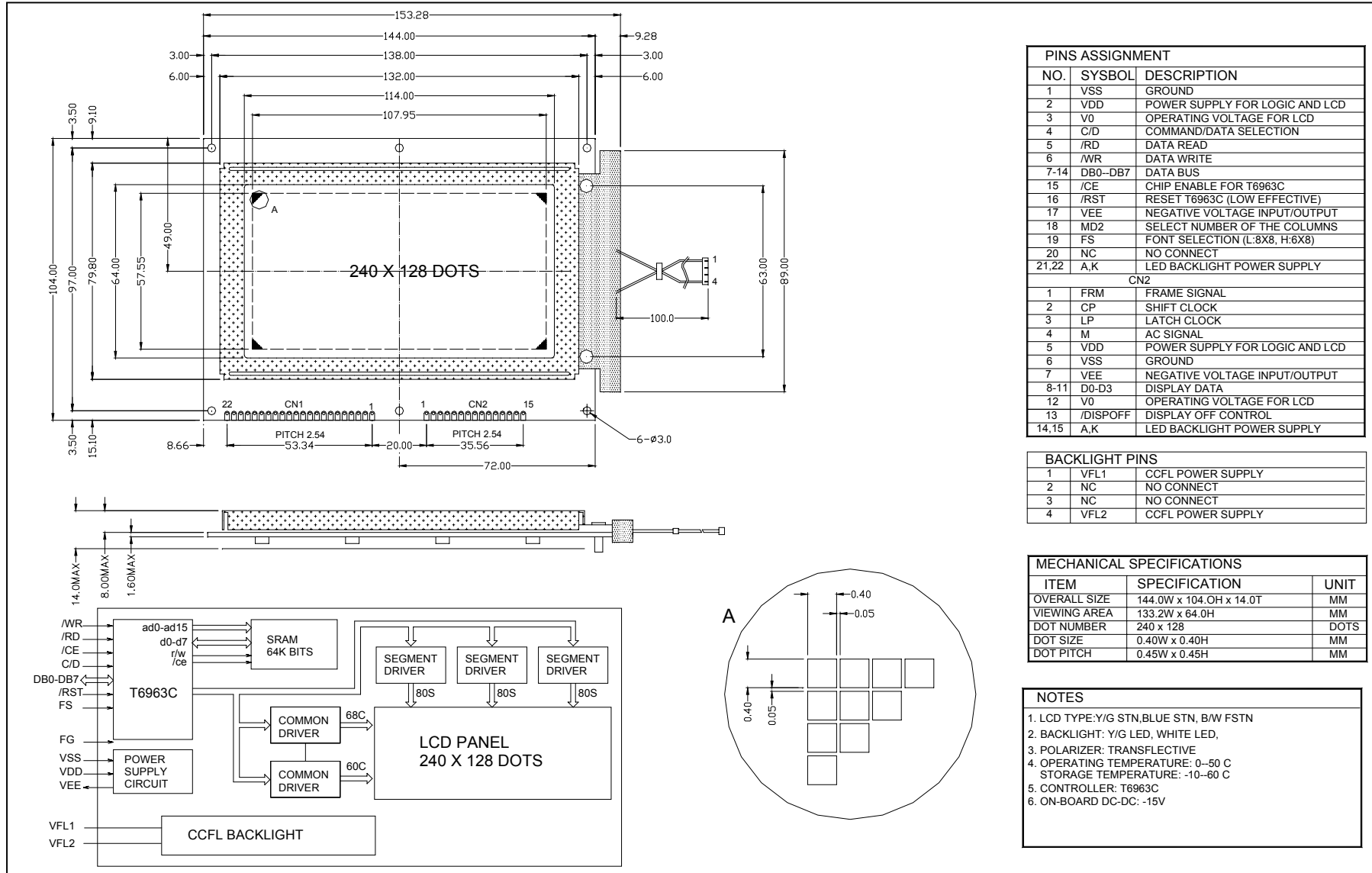
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	144.0W x 104.0H x 14.0T(11.0T)	MM
VIEWING ANGLE	133.2Wx64.0H	MM
DOT NUMBER	240 x 128	DOTS
DOT SIZE	0.40W x 0.40H	MM
DOT PITCH	0.45W x 0.45H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; B/W FSTN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED;
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0-50C)
 - POWER SUPPLY: ON BOARD DC/DC(SINGLE 5.0V); DUAL POWER SUPPLY(5.0V & -10.0V)
 - VIEWING ANGLE: 6H; 12H



* FOR LED BACKLIGHT
TH1=14.0MAX TH2=9.0MAX
* FOR EL OR NO BACKLIGHT
TH1=11.0MAX TH2=6.0MAX

8 A !240128DA series 240x128 DOTS



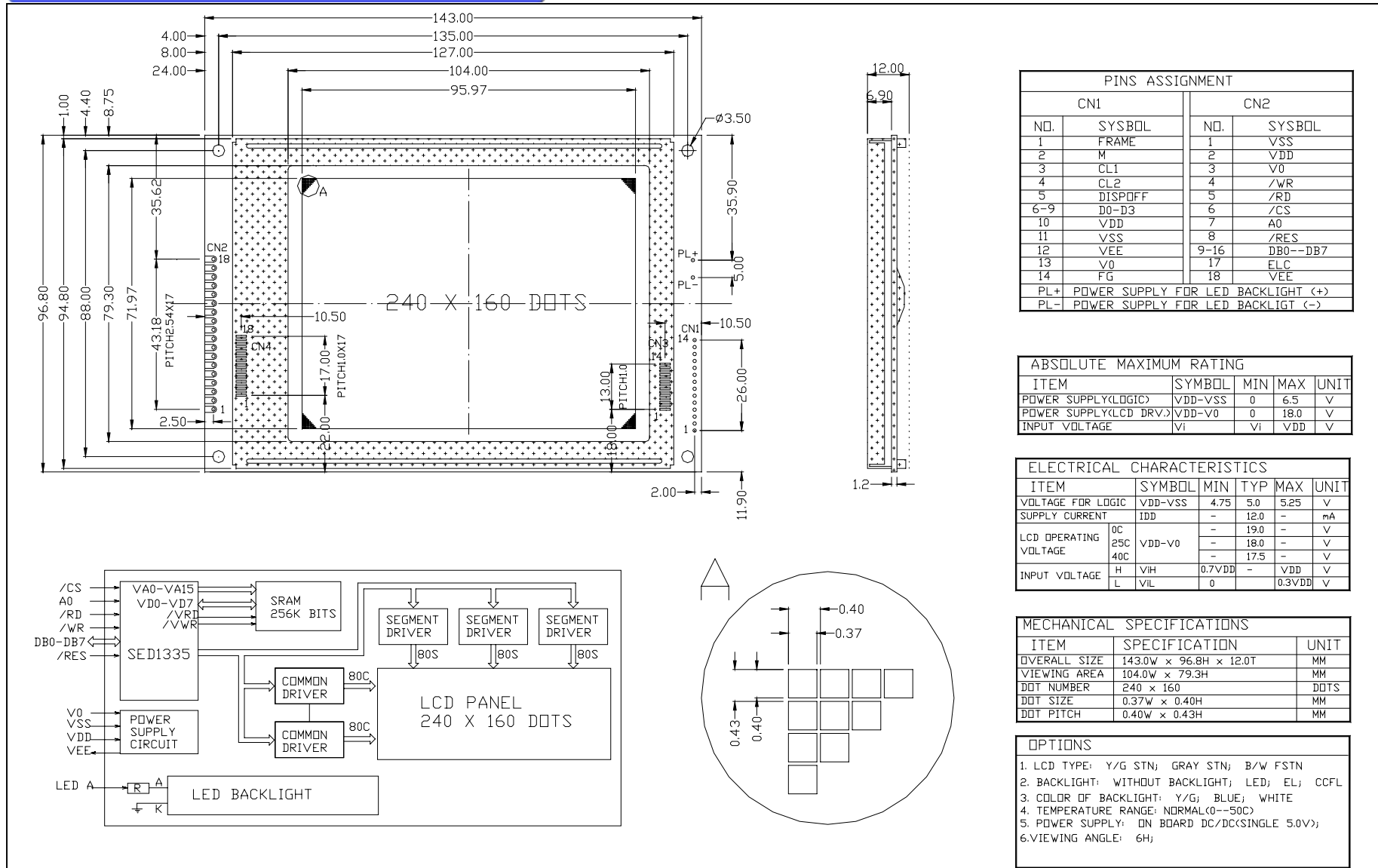
PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC AND LCD
3	V0	OPERATING VOLTAGE FOR LCD
4	C/D	COMMAND/DATA SELECTION
5	/RD	DATA READ
6	/WR	DATA WRITE
7-14	DB0-DB7	DATA BUS
15	/CE	CHIP ENABLE FOR T6963C
16	/RST	RESET T6963C (LOW EFFECTIVE)
17	VEE	NEGATIVE VOLTAGE INPUT/OUTPUT
18	MD2	SELECT NUMBER OF THE COLUMNS
19	FS	FONT SELECTION (L:8X8, H:6X8)
20	NC	NO CONNECT
21,22	A,K	LED BACKLIGHT POWER SUPPLY
CN2		
1	FRM	FRAME SIGNAL
2	CP	SHIFT CLOCK
3	LP	LATCH CLOCK
4	M	AC SIGNAL
5	VDD	POWER SUPPLY FOR LOGIC AND LCD
6	VSS	GROUND
7	VEE	NEGATIVE VOLTAGE INPUT/OUTPUT
8-11	D0-D3	DISPLAY DATA
12	V0	OPERATING VOLTAGE FOR LCD
13	/DISPOFF	DISPLAY OFF CONTROL
14,15	A,K	LED BACKLIGHT POWER SUPPLY

BACKLIGHT PINS		
1	VFL1	CCFL POWER SUPPLY
2	NC	NO CONNECT
3	NC	NO CONNECT
4	VFL2	CCFL POWER SUPPLY

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	144.0W x 104.0H x 14.0T	MM
VIEWING AREA	133.2W x 64.0H	MM
DOT NUMBER	240 x 128	DOTS
DOT SIZE	0.40W x 0.40H	MM
DOT PITCH	0.45W x 0.45H	MM

- NOTES**
- LCD TYPE: Y/G STN, BLUE STN, B/W FSTN
 - BACKLIGHT: Y/G LED, WHITE LED,
 - POLARIZER: TRANSFLECTIVE
 - OPERATING TEMPERATURE: 0-50 C
STORAGE TEMPERATURE: -10-60 C
 - CONTROLLER: T6963C
 - ON-BOARD DC-DC: -15V

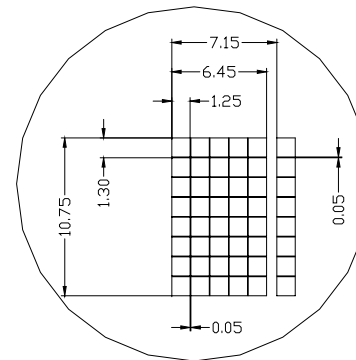
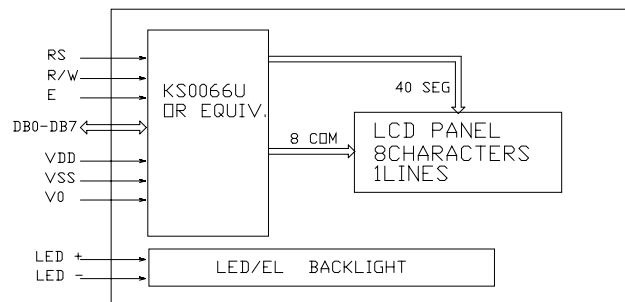
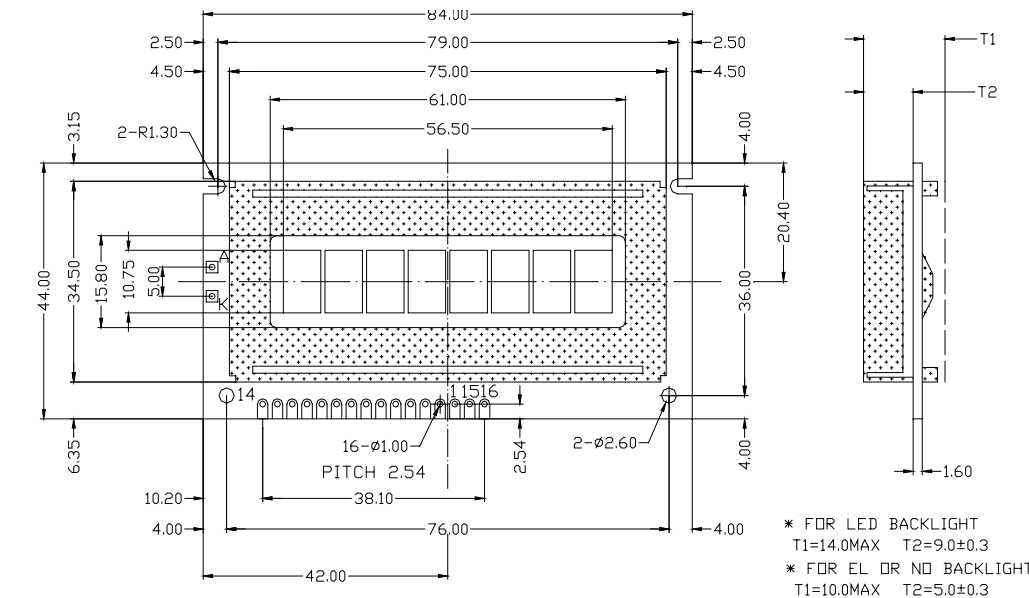
8A !240160AA series 240x160 DOTS



Specifications For Character Type LCM

8A !0801AA series

8x1 CHARACTERS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0--DB7	DATA BUS
15	A	POWER SUPPLY FOR LED BACKLIGHT (+)
16	K	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _I	-0.3	VDD	V

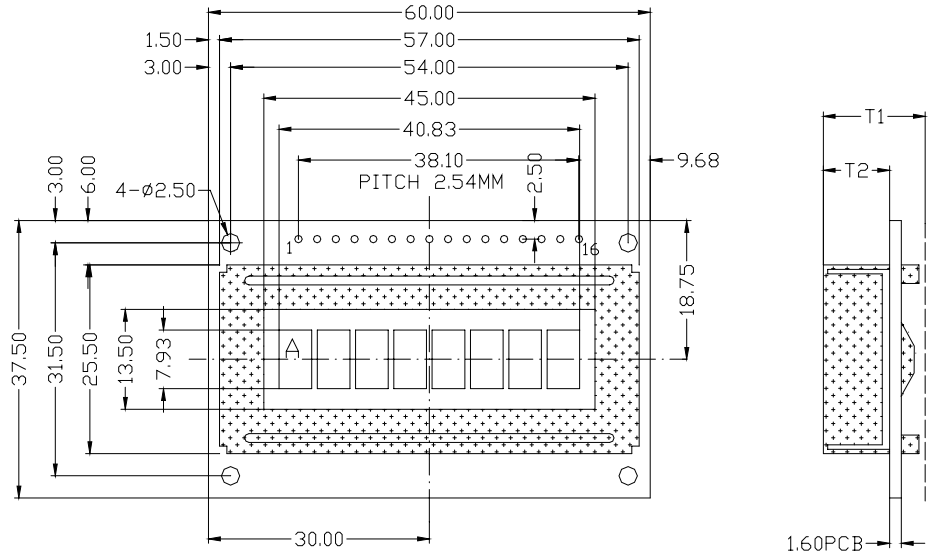
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.0	1.3	mA
VOLTAGE FOR LCD	VDD-V0	-	4.7	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	84.0W × 44.0H × 14.0T(10.0T)	MM
VIEWING AREA	61.0W × 15.8H	MM
CHARACTERS	8 CHARACTERS × 1 LINES	
CHARACTER SIZE	6.45W × 10.75H	MM
CHARACTER PITCH	7.15W × 10.75H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

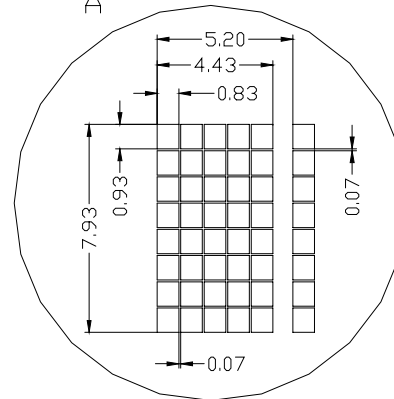
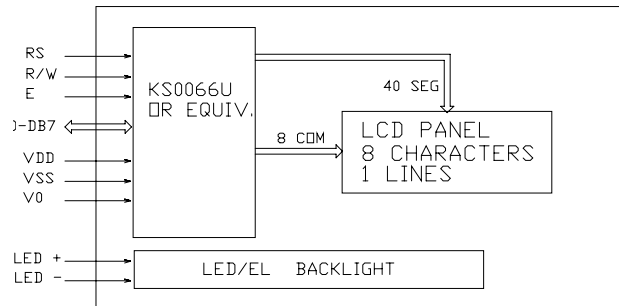
8A!0801BA series

8x1 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3

A



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0--DB7	DATA BUS
15	A	POWER SUPPLY FOR LED BACKLIGHT (+)
16	K	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRIVE)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	VI	-0.3	VDD	V

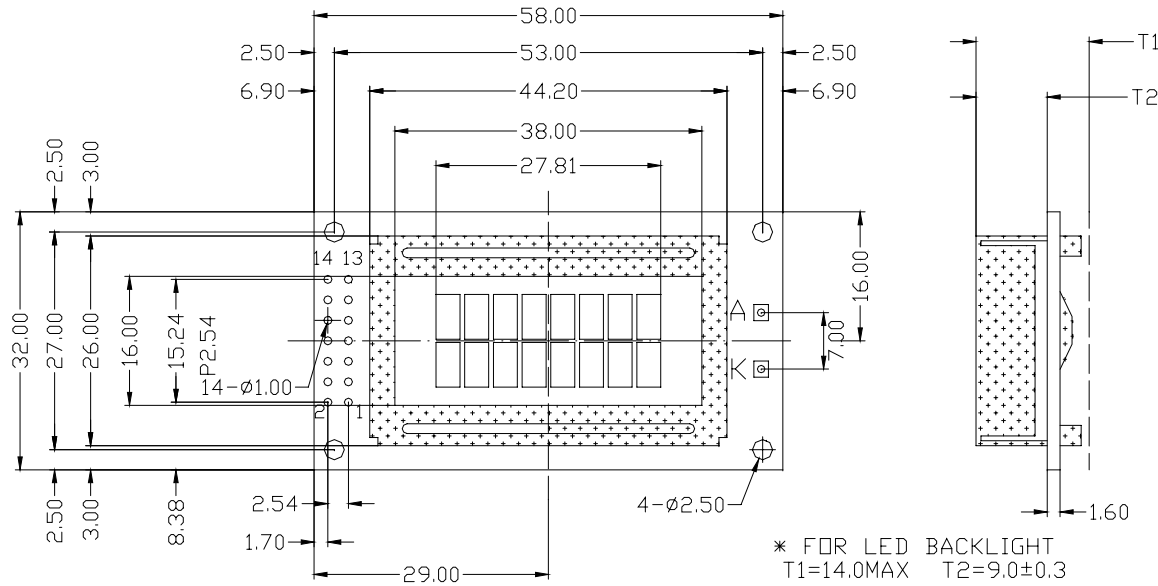
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.0	1.3	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H VIH	2.2	-	VDD	V
	L VIL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	60.0W x 37.5H x 14.0T(10.0T)	MM
VIEWING AREA	45.0W x 13.5H	MM
CHARACTERS	8 CHARACTERS x 1 LINES	
CHARACTER SIZE	4.43W x 7.93H	MM
CHARACTER PITCH	5.20W x 7.93H	MM

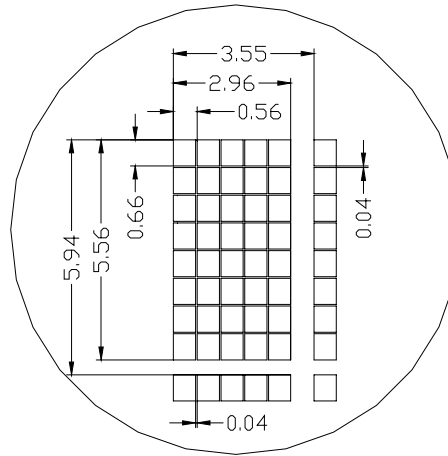
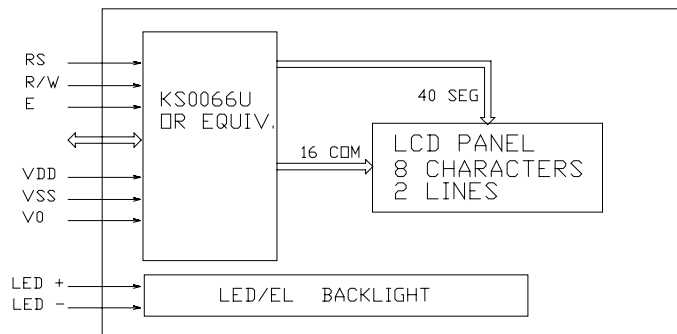
OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !0802AA series

8x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
	A	POWER SUPPLY FOR LED BACKLIGHT (+)
	K	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRW)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

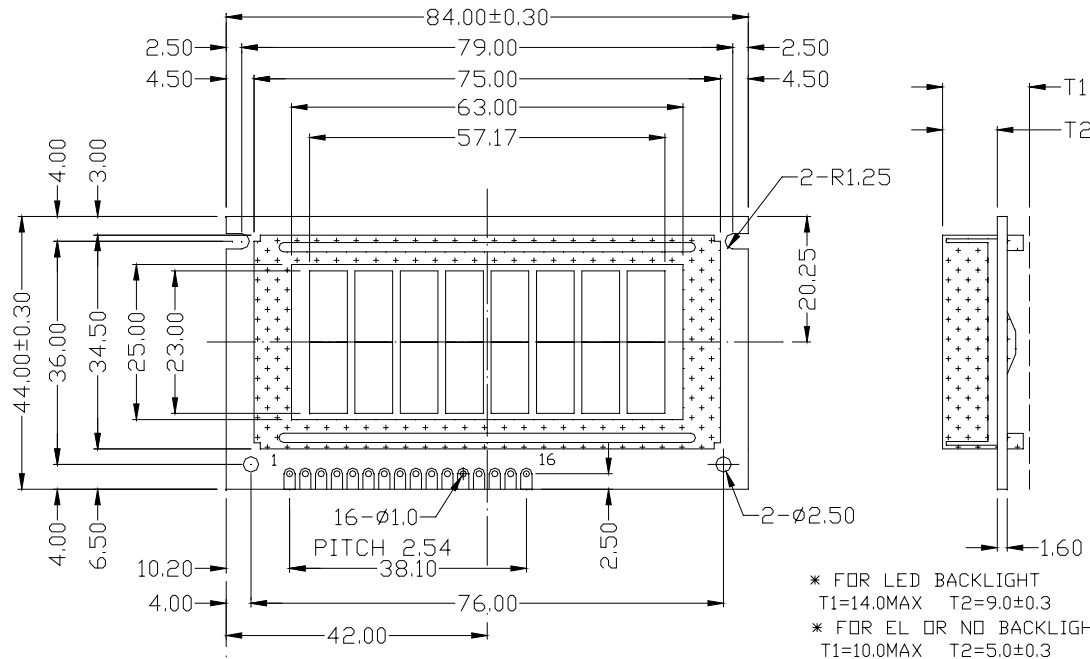
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.0	1.3	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	58.0W x 32.0H x 14.0T(10.0T)	MM
VIEWING AREA	38.0W x 16.0H	MM
CHARACTERS	8 CHARACTERS x 2 LINES	
CHARACTER SIZE	2.96W x 5.56H	MM
CHARACTER PITCH	3.55W x 5.94H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(-20--50°C) EXTENDED(-20--70°C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !0802BA series

8x2 CHARACTERS



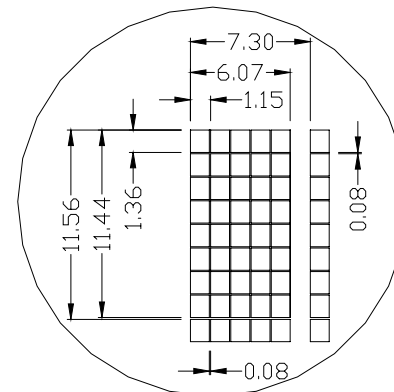
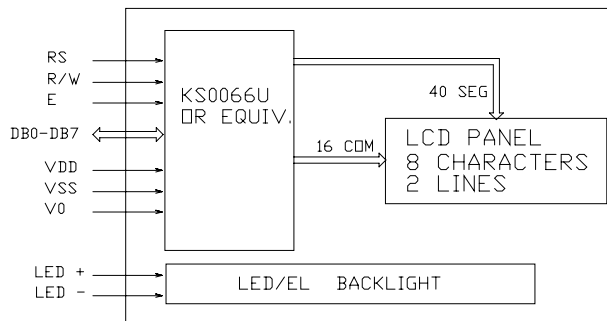
PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0--DB7	DATA BUS
15	LED+	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED-	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25C)						
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V	
SUPPLY CURRENT	IDD	-	1.0	1.3	mA	
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V	
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD	V
	L	V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	-	V
	L	V _{OL}	-	-	0.4	V

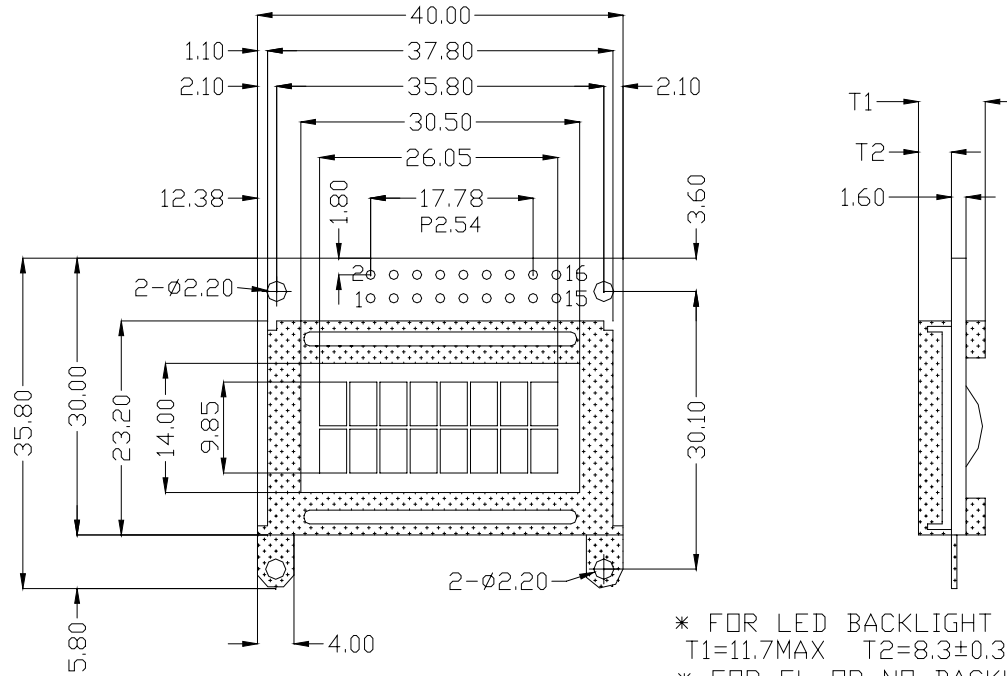
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	84.0W x 44.0H x 14.0T(10.0T)	MM
VIEWING AREA	63.0W x 25.0H	MM
CHARACTERS	8 CHARACTERS x 2 LINES	
CHARACTER SIZE	6.07W x 11.44H	MM
CHARACTER PITCH	7.30W x 11.56H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(-50C)
EXTENDED(-20--70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

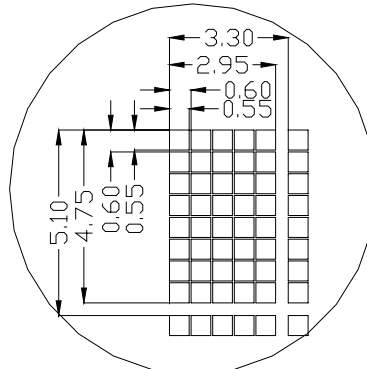
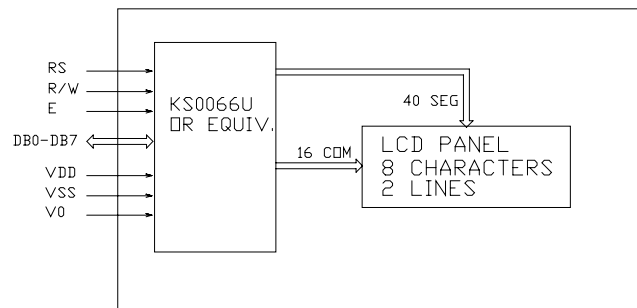


8 A !0802DA series

8x2 CHARACTERS



* FOR LED BACKLIGHT
T1=11.7MAX T2=8.3±0.3
* FOR EL OR NO BACKLIGHT
T1=7.30MAX T2=3.60±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS

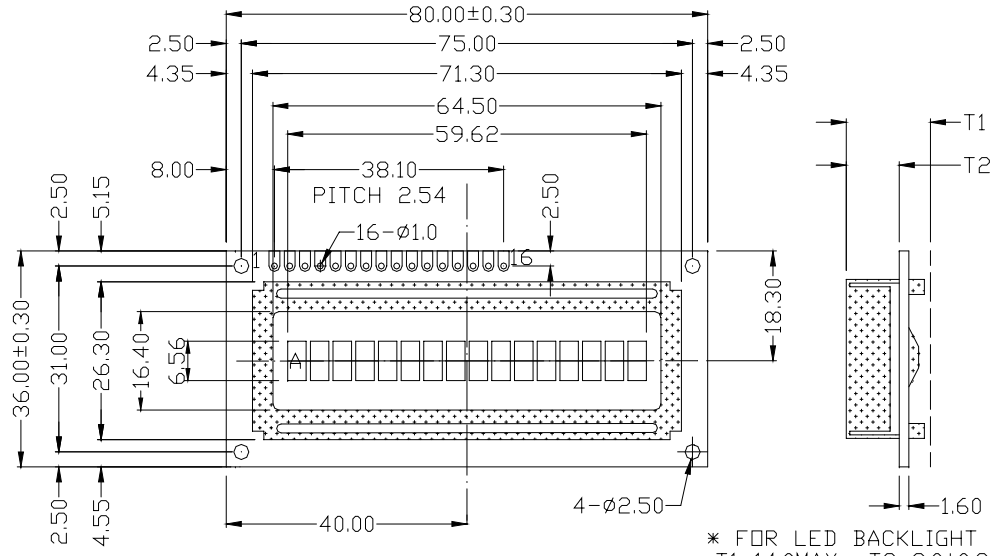
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY (LCD DRIVE)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.0	1.3	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

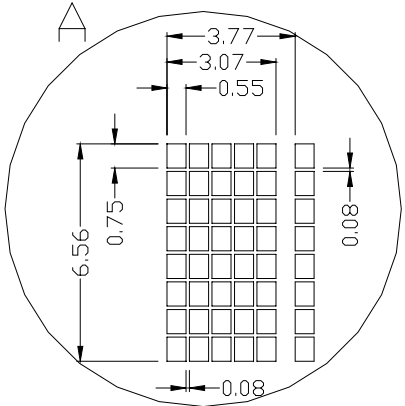
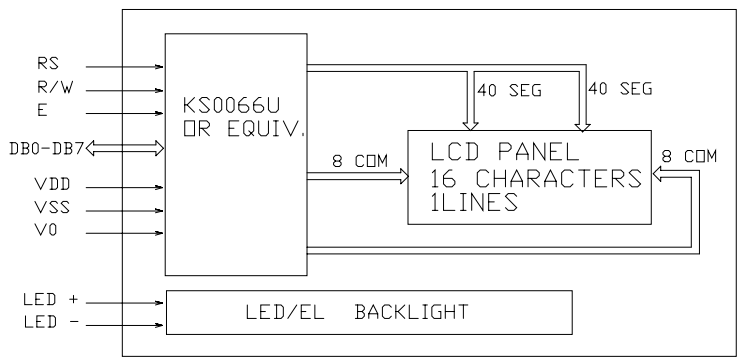
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	40.0W × 35.8H × 7.3T	MM
VIEWING AREA	30.5W × 14.0H	MM
CHARACTERS	8 CHARACTERS × 2 LINES	
CHARACTER SIZE	2.95W × 4.75H	MM
CHARACTER PITCH	3.30W × 5.10H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1601AA series 16x1 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY (LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

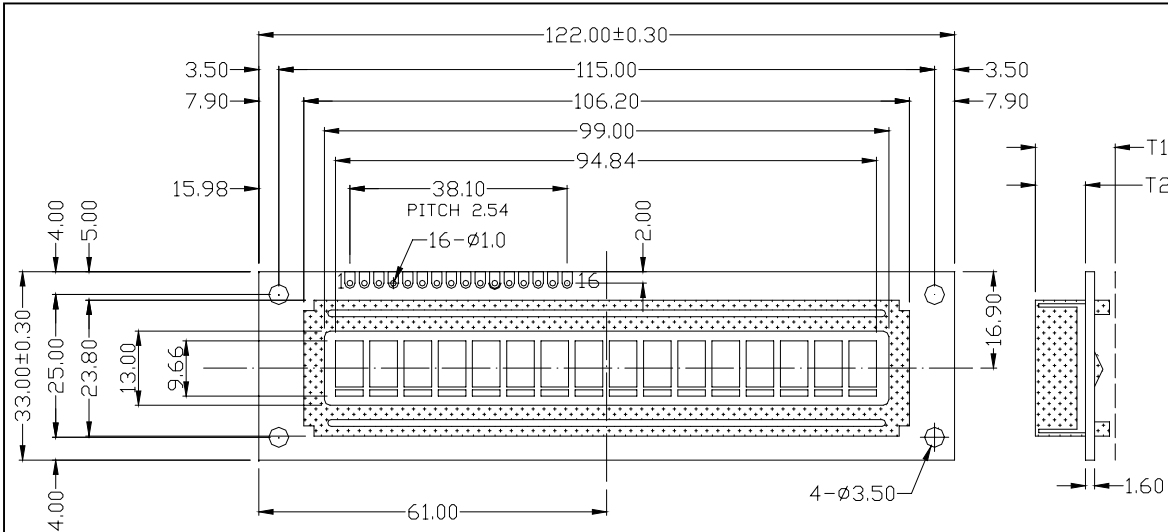
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.0	1.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD
	L	V _{IL}	-0.3	-	0.6
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	V
	L	V _{OL}	-	-	0.4

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	80.0W x 36.0H x 14.0T(10.0T)	MM
VIEWING AREA	64.5W x 16.4H	MM
CHARACTERS	16 CHARACTERS x 1 LINES	
CHARACTER SIZE	3.07W x 6.56H	MM
CHARACTER PITCH	3.77W x 6.56H	MM

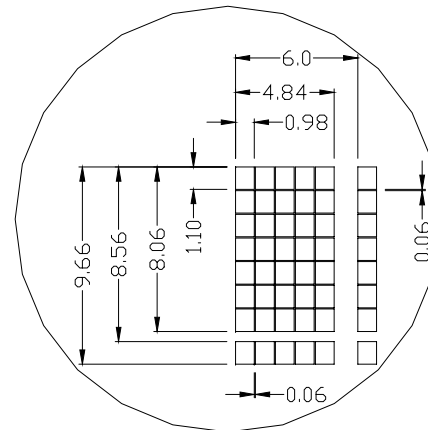
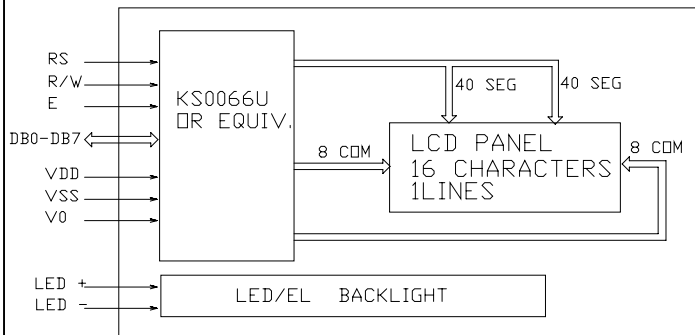
- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0--50C)
EXTENDED(-20--70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1601BA series

16x1 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

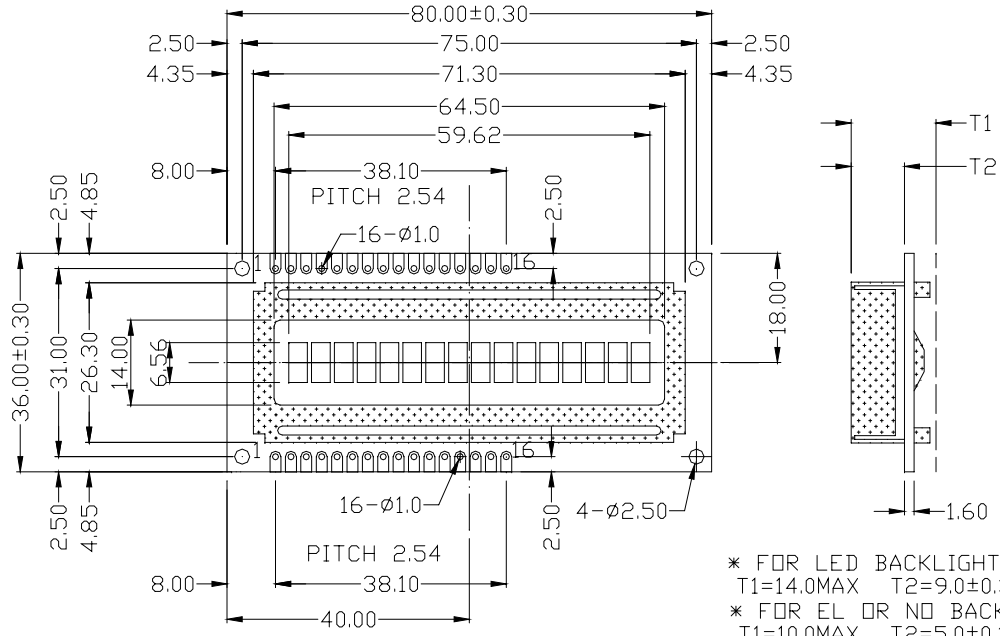
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.0	1.3	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H ViH	2.2	-	VDD	V
	L ViL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	122.0W x 33.0H x 14.0T(10.0T)	MM
VIEWING AREA	99.0W x 13.0H	MM
CHARACTERS	16 CHARACTERS x 1 LINES	
CHARACTER SIZE	4.84W x 9.66H	MM
CHARACTER PITCH	6.0W x 9.66H	MM

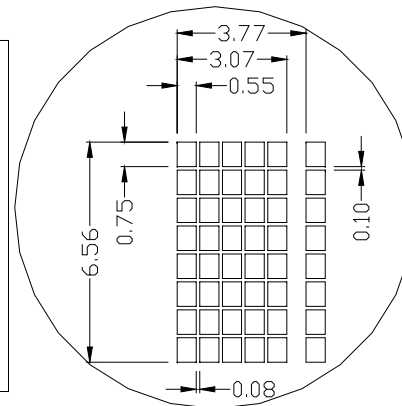
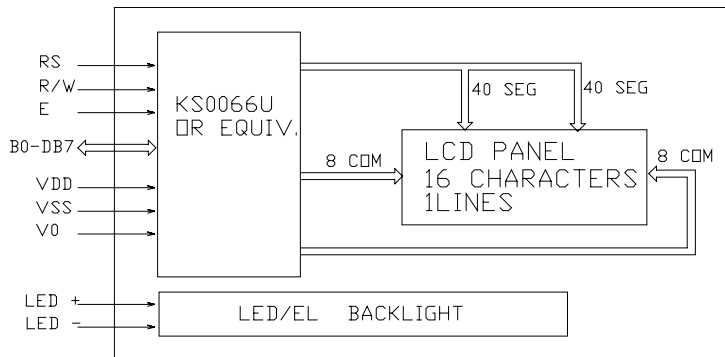
OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; TN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5.	POWER SUPPLY: 5.0V; 3.0V
6.	VIEWING ANGLE: 6H; 12H
7.	CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1601CA series

16x1 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

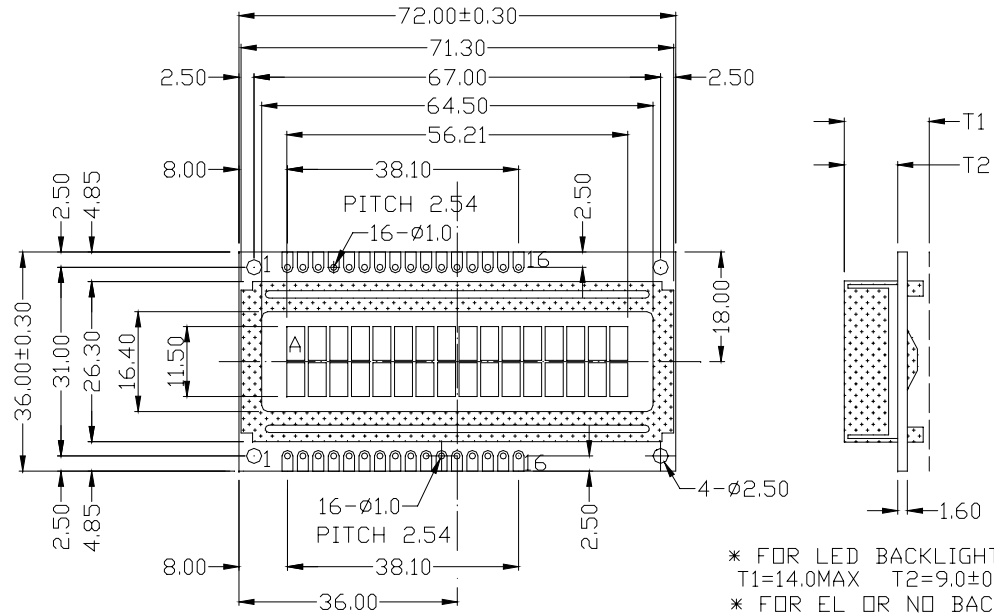
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)						
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V	
SUPPLY CURRENT	IDD	-	1.0	1.2	mA	
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V	
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD	V
	L	V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	V _{oH}	2.4	-	-	V
	L	V _{oL}	-	-	0.4	V

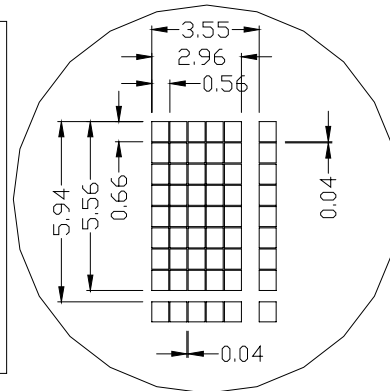
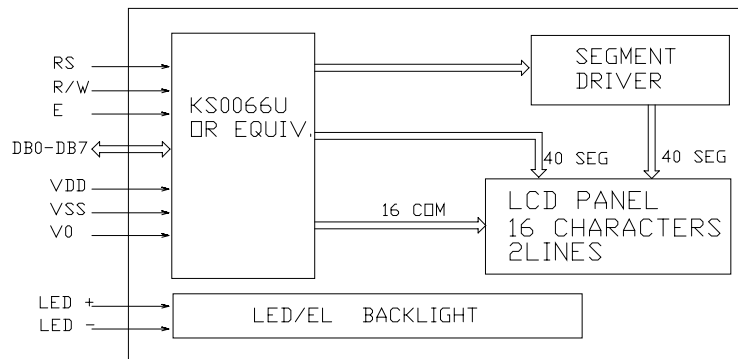
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	80.0W × 36.0H × 14.0T(10.0T)	MM
VIEWING AREA	64.5W × 14.4H	MM
CHARACTERS	16 CHARACTERS × 1 LINES	
CHARACTER SIZE	3.07W × 6.56H	MM
CHARACTER PITCH	3.70W × 6.56H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0--50C)
EXTENDED(-20--70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1602AA series 16x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

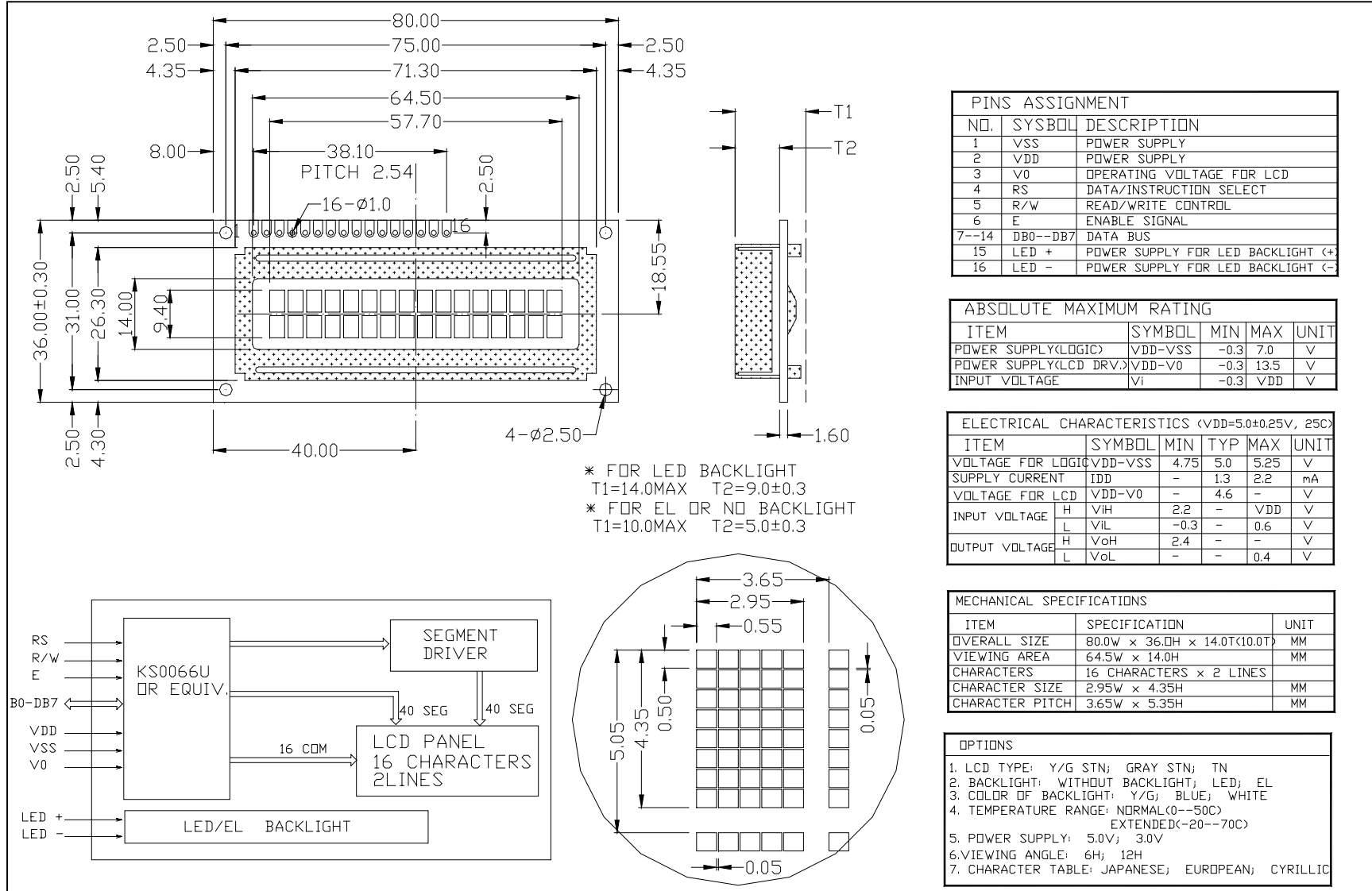
ELECTRICAL CHARACTERISTICS(VDD=5.0±0.25V, 25°C)						
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V	
SUPPLY CURRENT	IDD	-	1.3	2.2	mA	
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V	
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD	V
	L	V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	V	V
	L	V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	72.0W x 36.0H x 14.0T(10.0T)	MM
VIEWING AREA	64.5W x 16.4H	MM
CHARACTERS	16 CHARACTERS x 2 LINES	
CHARACTER SIZE	2.96W x 5.56H	MM
CHARACTER PITCH	3.55W x 5.94H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; TN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0--50°C) EXTENDED(-20--70°C)
5.	POWER SUPPLY: 5.0V; 3.0V
6.	VIEWING ANGLE: 6H; 12H
7.	CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1602BA series

16x2 CHARACTERS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

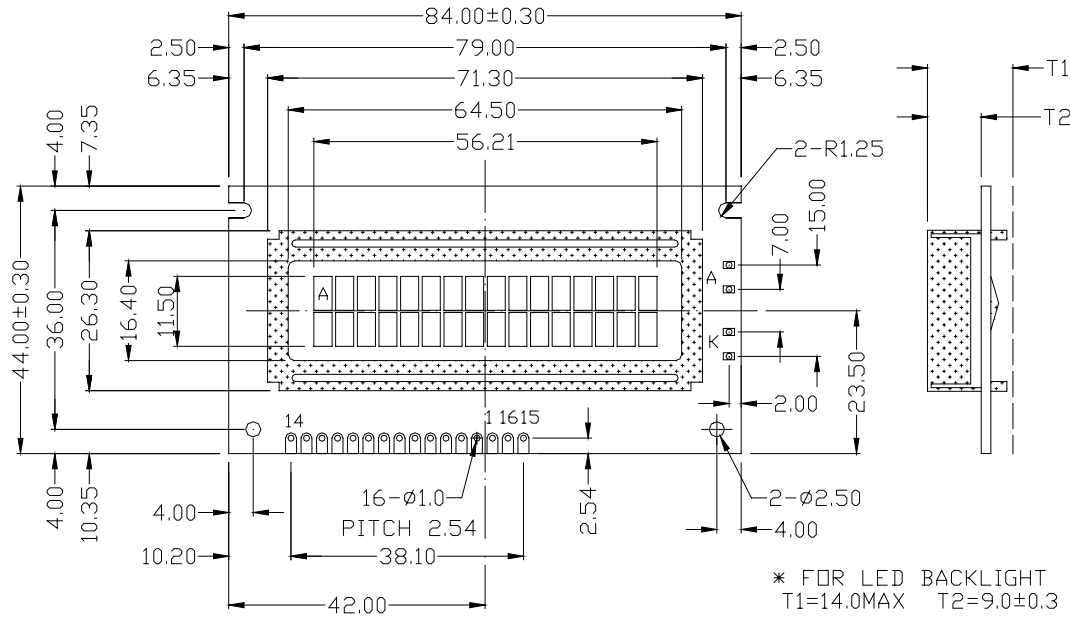
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	80.0W × 36.0H × 14.0T(10.0T)	MM
VIEWING AREA	64.5W × 14.0H	MM
CHARACTERS	16 CHARACTERS × 2 LINES	
CHARACTER SIZE	2.95W × 4.35H	MM
CHARACTER PITCH	3.65W × 5.35H	MM

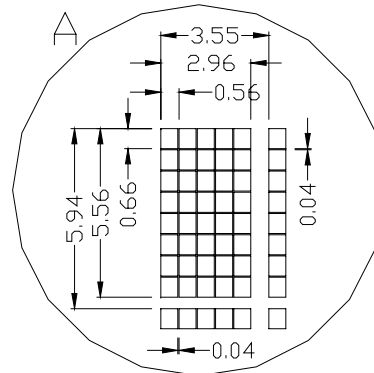
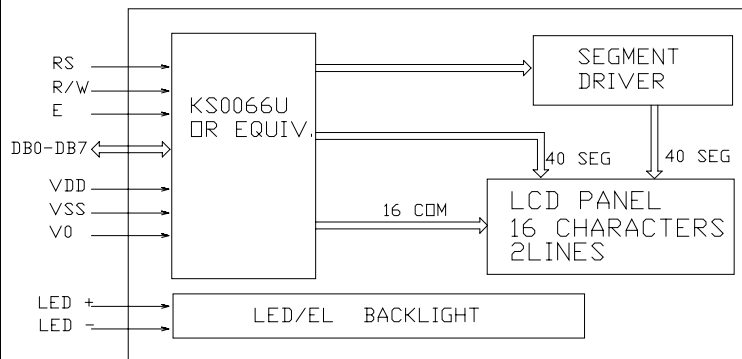
OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; TN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0--50°C) EXTENDED(-20--70°C)
5.	POWER SUPPLY: 5.0V; 3.0V
6.	VIEWING ANGLE: 6H; 12H
7.	CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8 A ! 1602DA series

16x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

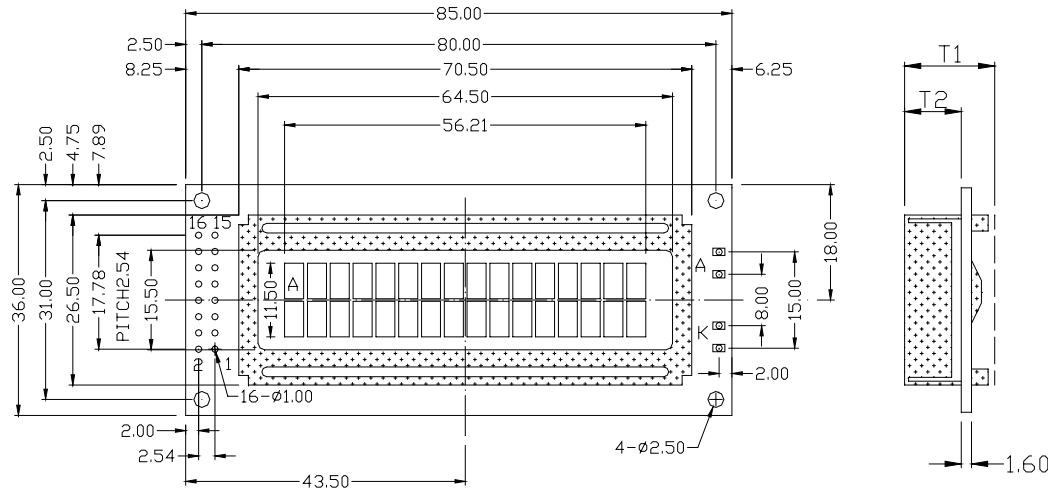
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _I	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)						
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	
VOLTAGE FOR LOGIC SUPPLY	VDD-VSS	4.75	5.0	5.25	V	
SUPPLY CURRENT	IDD	-	1.3	2.2	mA	
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V	
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD	V
	L	V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	V	V
	L	V _{OL}	-	-	0.4	V

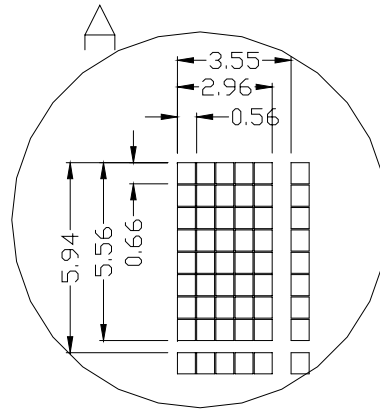
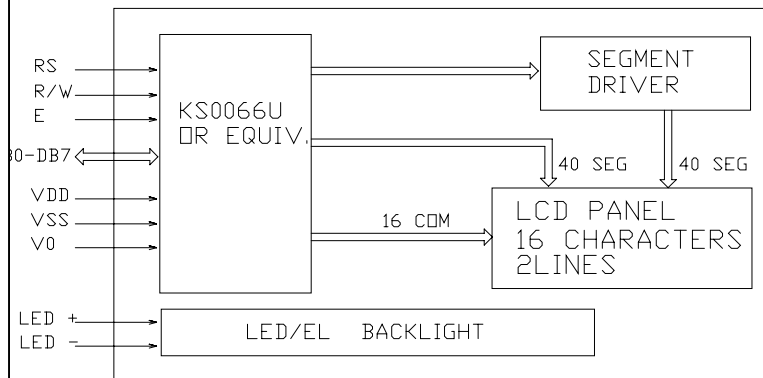
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	84.0W × 44.0H × 14.0T(10.0T)	MM
VIEWING AREA	64.5W × 16.4H	MM
CHARACTERS	16 CHARACTERS × 2 LINES	
CHARACTER SIZE	2.96W × 5.56H	MM
CHARACTER PITCH	3.55W × 5.94H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; TN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5.	POWER SUPPLY: 5.0V; 3.0V
6.	VIEWING ANGLE: 6H; 12H
7.	CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1602EA series 16x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

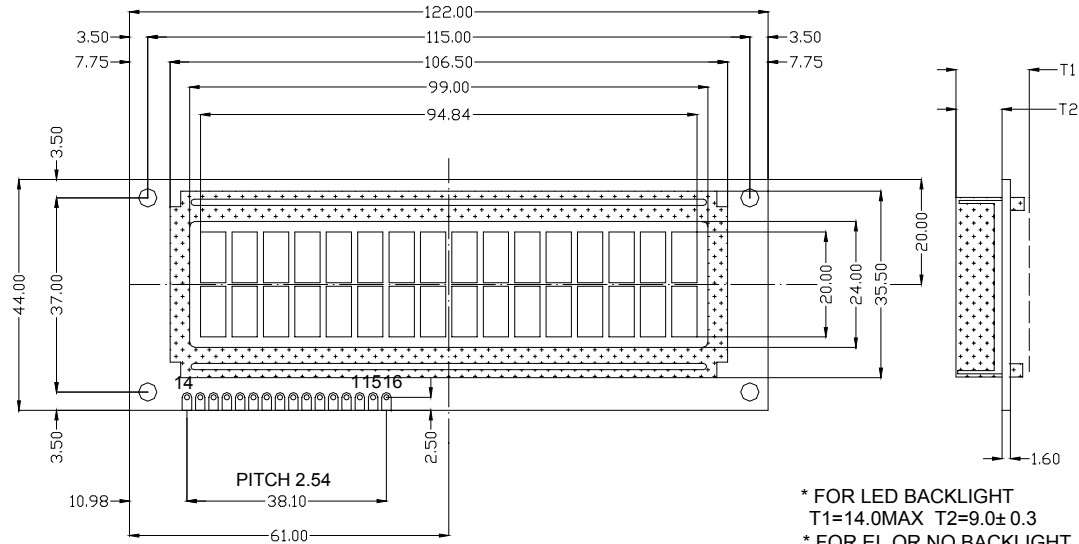
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	VI	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H VIH	2.2	-	VDD	V
	L VIL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V

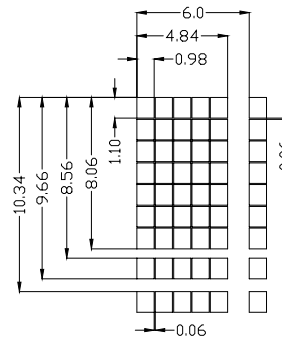
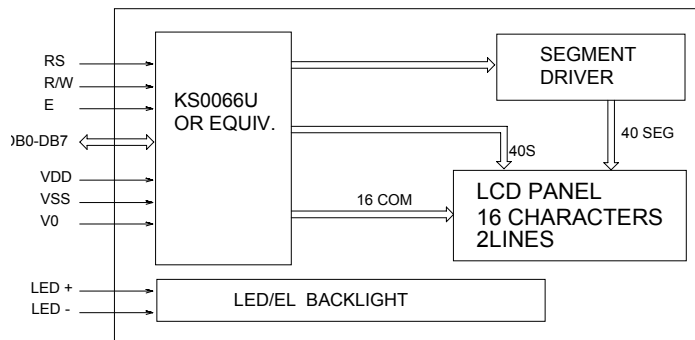
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	85.0W × 36.0H × 14.0T(10.0T)	MM
VIEWING AREA	64.5W × 15.5H	MM
CHARACTERS	16 CHARACTERS × 2 LINES	
CHARACTER SIZE	2.96W × 5.56H	MM
CHARACTER PITCH	3.55W × 5.94H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0--50C)
EXTENDED(-20--70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1602FB series 16x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0± 0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0± 0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0-DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

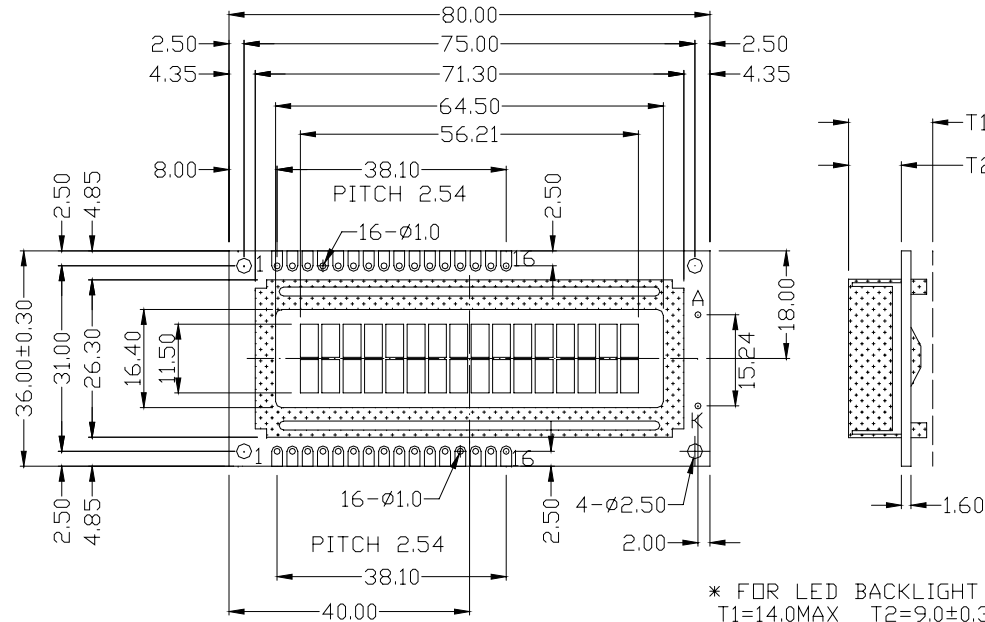
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0± 0.25V, 25C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	4.7	4.9	5.1	V
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD
	L	V _{IL}	-0.3	-	0.6
OUTPUT VOLTAGE	H	V _{oH}	2.4	-	-
	L	V _{oL}	-	-	0.4

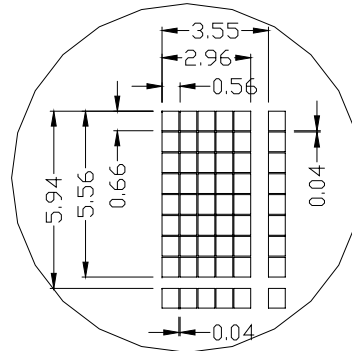
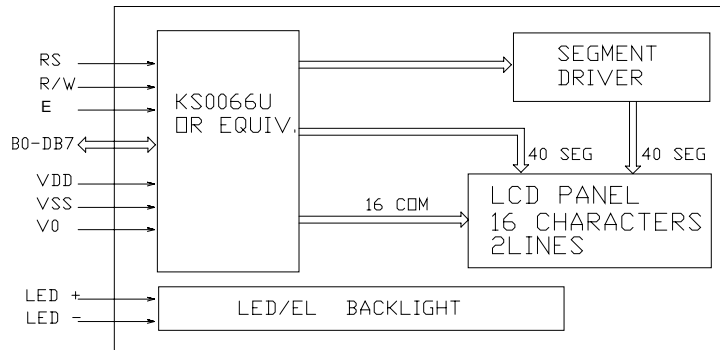
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	122.0W x 44.0H x 14.0T(10.0T)	MM
VIEWING AREA	99.0W x 24.0H	MM
CHARACTERS	16 CHARACTERS x 2 LINES	
CHARACTER SIZE	4.84W x 9.66H	MM
CHARACTER PITCH	6.0W x 10.34H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; TN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0-50C) EXTENDED(-20-70C)
5.	POWER SUPPLY: 5.0V; 3.0V
6.	VIEWING ANGLE: 6H; 12H
7.	CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1602GA series 16x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY (LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

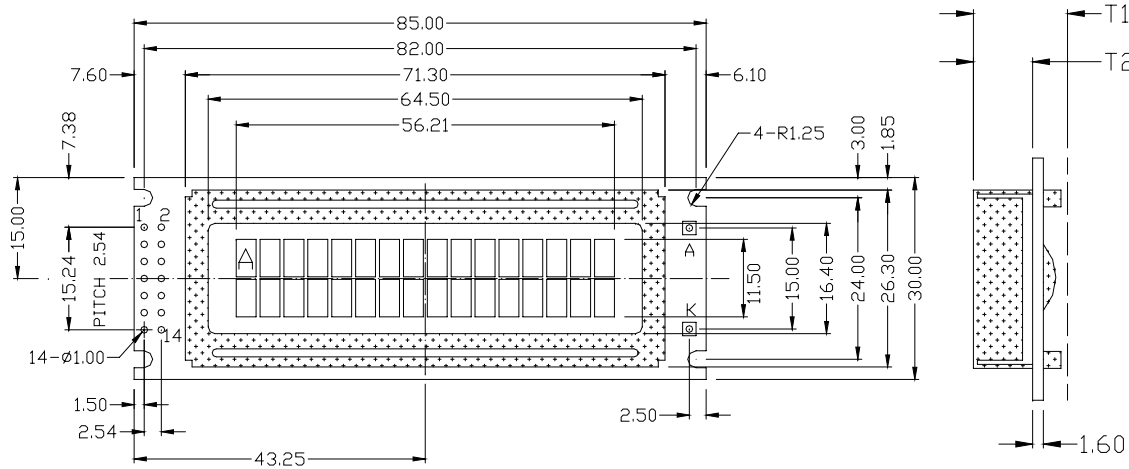
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H ViH	2.2	-	VDD	V
	L ViL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	80.0W x 36.0H x 14.0T(10.0T)	MM
VIEWING AREA	64.5W x 14.0H	MM
CHARACTERS	16 CHARACTERS x 2 LINES	
CHARACTER SIZE	2.96W x 5.56H	MM
CHARACTER PITCH	3.55W x 5.94H	MM

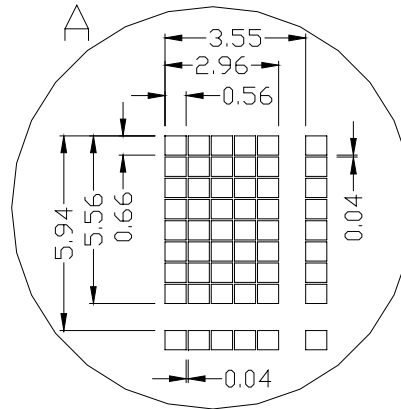
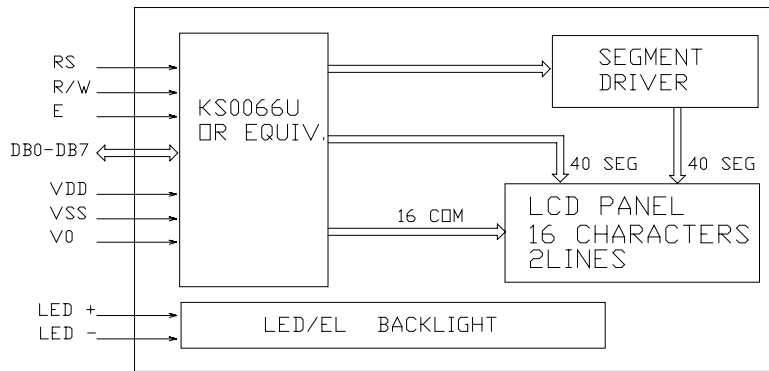
OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; TN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5.	POWER SUPPLY: 5.0V; 3.0V
6.	VIEWING ANGLE: 6H; 12H
7.	CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8 A ! 1602HA series

16x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1--8	DB7--DB0	DATA BUS 1-DB7...8-DB0
9	E	ENABLE SIGNAL
10	R/W	READ/WRITE CONTROL
11	RS	DATA/INSTRUCTION SELECT
12	V0	OPERATING VOLTAGE FOR LCD
13	VSS	POWER SUPPLY
14	VDD	POWER SUPPLY
	A	POWER SUPPLY FOR LED BACKLIGHT (+)
	K	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

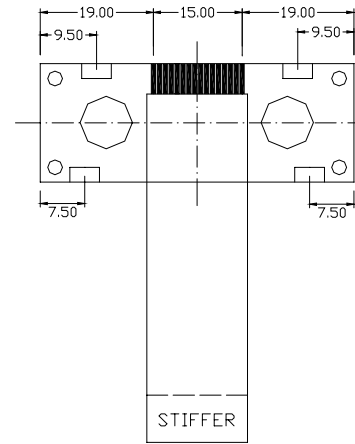
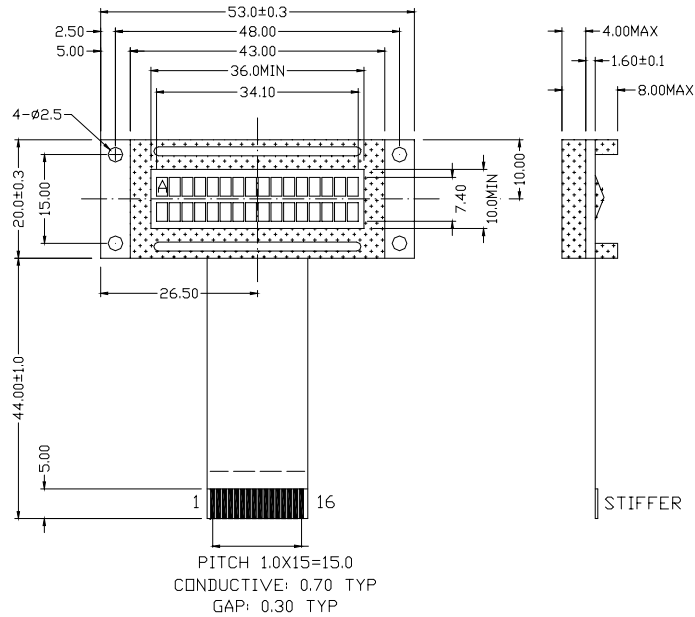
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.7	-	V
INPUT VOLTAGE	H ViH	2.2	-	VDD	V
	L ViL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V
BACKLIGHT VOLTAGE	VA-VK	-	4.1	4.3	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	85.0W x 30.0H x 14.0T(10.0T)	MM
VIEWING AREA	64.5W x 16.4H	MM
CHARACTERS	16 CHARACTERS x 2 LINES	
CHARACTER SIZE	2.96W x 5.56H	MM
CHARACTER PITCH	3.55W x 5.94H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(-50°C) EXTENDED(-20°C--70°C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

-8 A ! 1602KA series

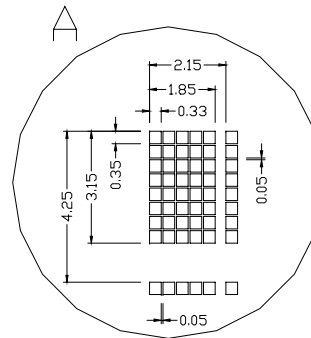
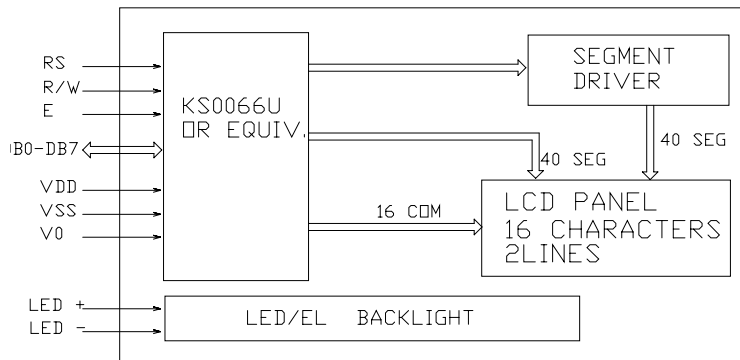
16x2 CHARACTERS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

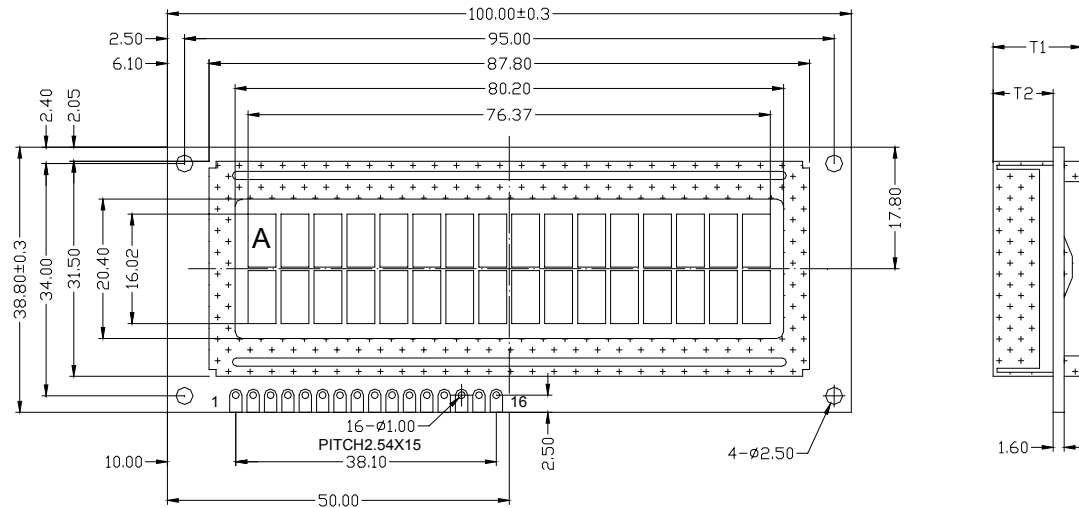
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.8	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{oH}	2.4	-	-	V
	L V _{oL}	-	-	0.4	V



MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	53.0W x 20.0H x 8.0	MM
VIEWING AREA	36.0W x 10.0H	MM
CHARACTERS	16 CHARACTERS x 2 LINES	
CHARACTER SIZE	1.85W x 3.15H	MM
CHARACTER PITCH	2.15W x 4.25H	MM

- OPTIONS
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0--50C)
EXTENDED(-20--70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !1602PA series 16x2 CHARACTERS

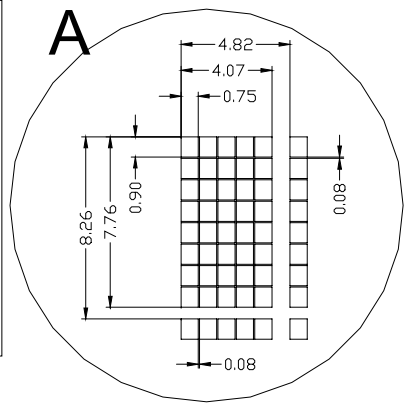
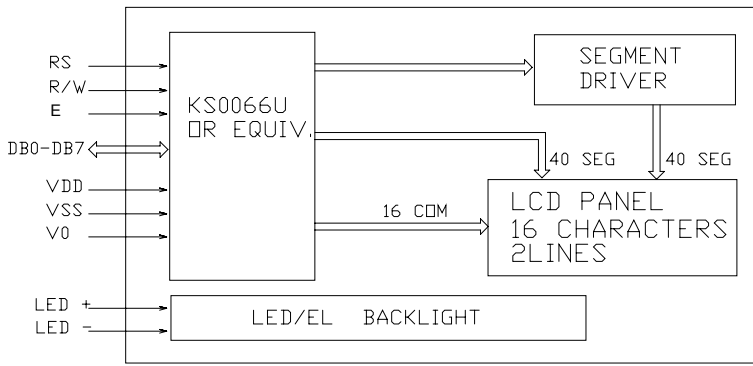


PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0--DB7	DATA BUS
15	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)
16	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H	ViH	2.2	-	VDD
	L	ViL	-0.3	-	0.6
OUTPUT VOLTAGE	H	VoH	2.4	-	V
	L	VoL	-	-	0.4

* FOR LED BACKLIGHT
 T1=14.0MAX T2=9.0±0.3
 * FOR EL OR NO BACKLIGHT
 T1=10.0MAX T2=5.0±0.3

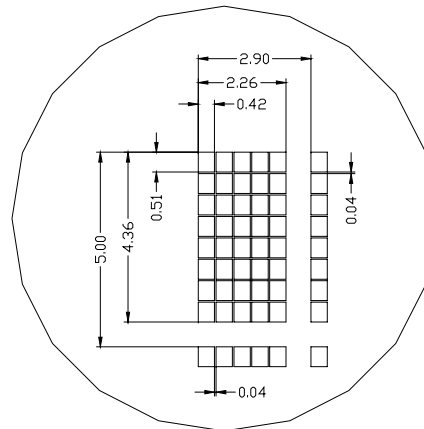
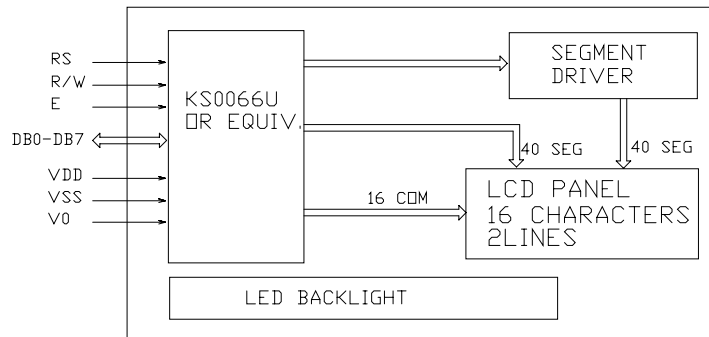
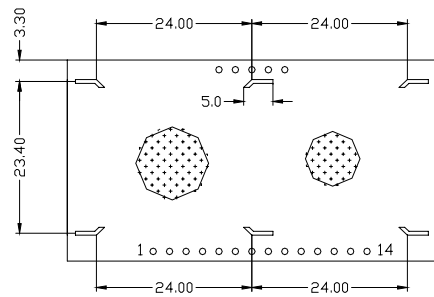
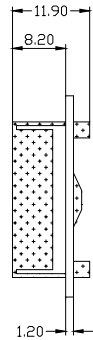
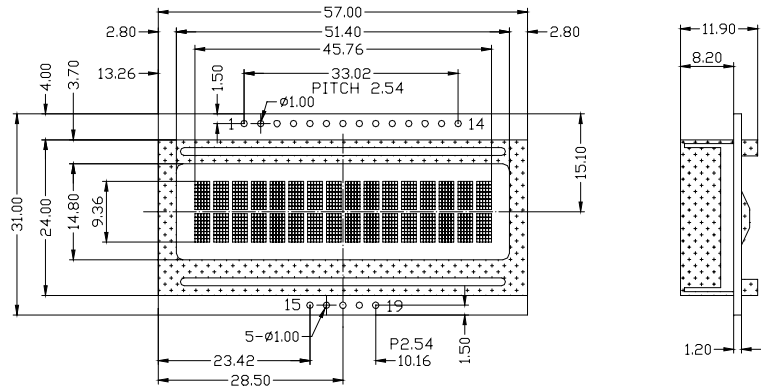


MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	100.0W x 38.8H x 14.0T(10.0T)	MM
VIEWING AREA	80.2W x 20.4H	MM
CHARACTERS	16 CHARACTERS x 2 LINES	
CHARACTER SIZE	4.07W x 7.76H	MM
CHARACTER PITCH	4.82W x 8.26H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(-50C) EXTENDED(-20--70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

-8 A ! 1602RA series

16x2 CHARACTERS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15--19	NC	NO CONNECTION, FOR FIXING

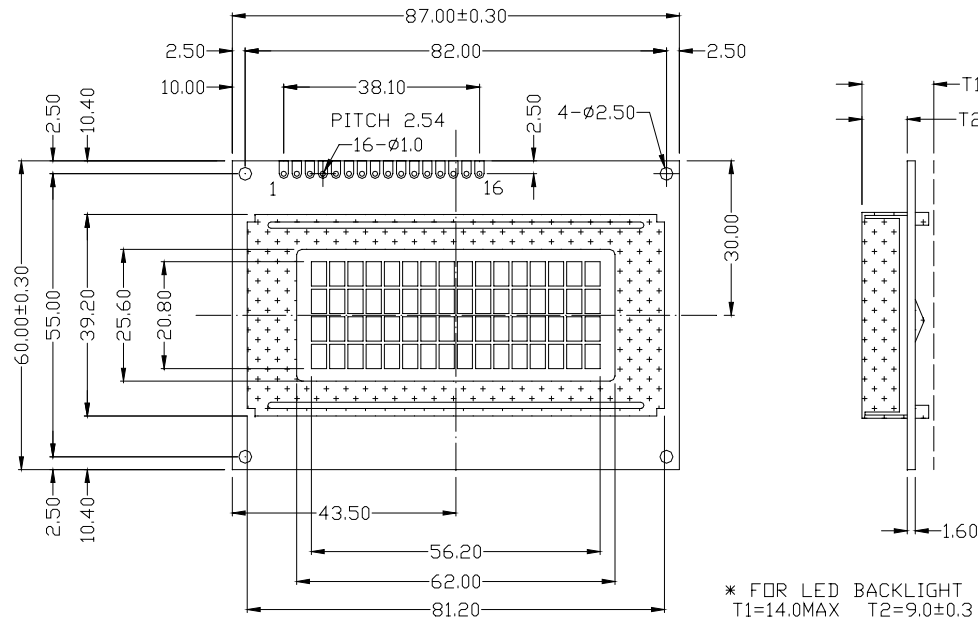
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H V _{iH}	2.2	-	VDD	V
	L V _{iL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{oH}	2.4	-	-	V
	L V _{oL}	-	-	0.4	V

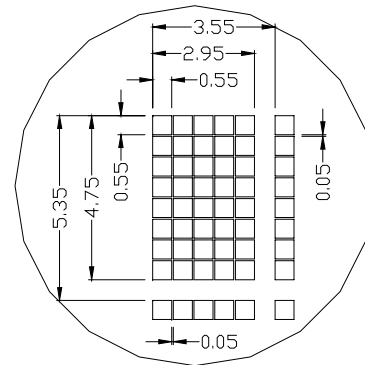
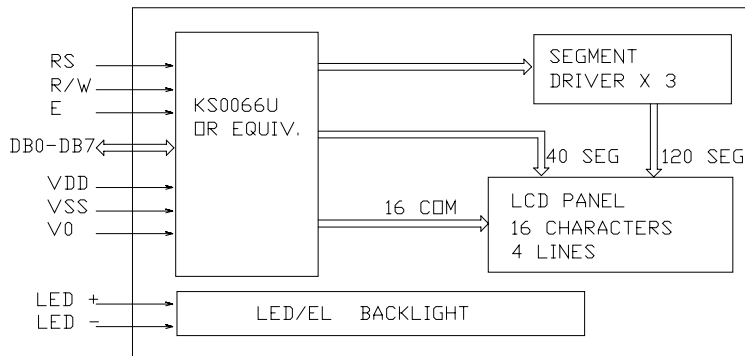
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	57.0W × 31.0H × 12.0T	MM
VIEWING AREA	51.4W × 14.8H	MM
CHARACTERS	16 CHARACTERS × 2 LINES	
CHARACTER SIZE	2.26W × 4.36H	MM
CHARACTER PITCH	2.90W × 5.00H	MM

- OPTIONS**
- LCD TYPE: STN, YELLOW/GREEN
 - BACKLIGHT: BOTTOM LED
 - COLOR OF BACKLIGHT: YELLOW/GREEN
 - TEMPERATURE RANGE: EXTENDED(-20--+70C)
 - POWER SUPPLY: 5.0V;
 - VIEWING ANGLE: 6H;

8A !1604AA series 16x4 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

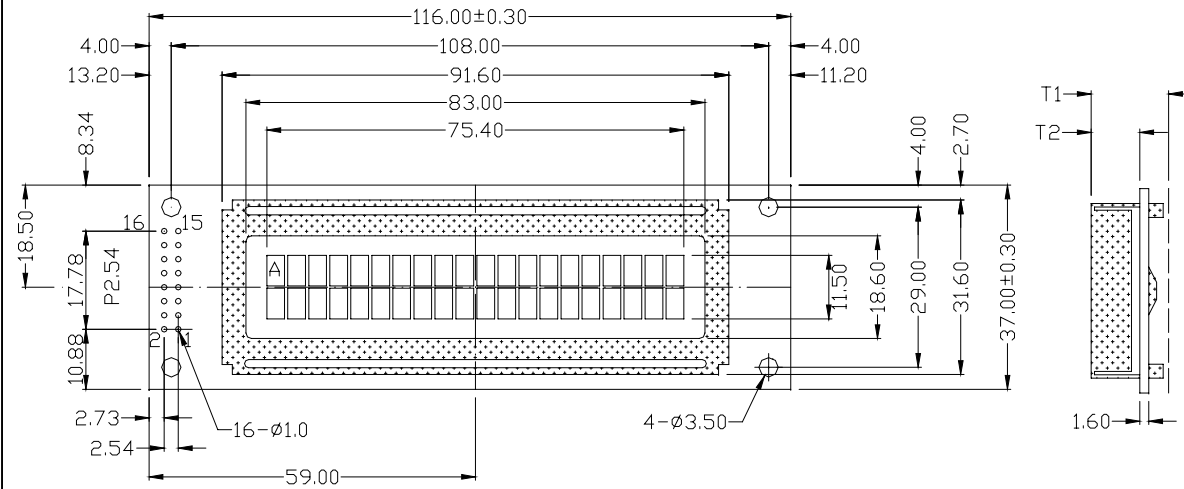
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	2.0	3.0	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD
	L	V _{IL}	-0.3	-	0.6
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	V
	L	V _{OL}	-	-	0.4

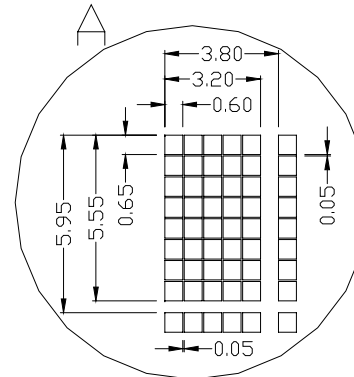
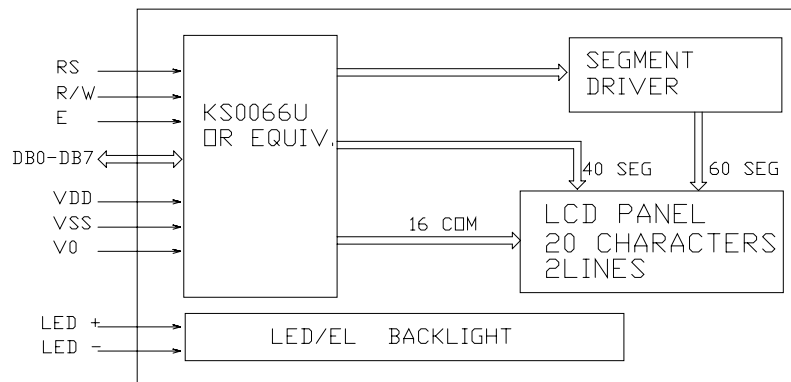
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	87.0W x 60.0H x 14.0T(10.0T)	MM
VIEWING AREA	62.0W x 25.6H	MM
CHARACTERS	16 CHARACTERS x 4 LINES	
CHARACTER SIZE	2.95W x 4.75H	MM
CHARACTER PITCH	3.55W x 5.35H	MM

OPTIONS	
1.	LCD TYPE: Y/G STN; GRAY STN; TN
2.	BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3.	COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4.	TEMPERATURE RANGE: NORMAL(-50C) EXTENDED(-20--70C)
5.	POWER SUPPLY: 5.0V; 3.0V
6.	VIEWING ANGLE: 6H; 12H
7.	CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !2002AA series 20x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7-14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

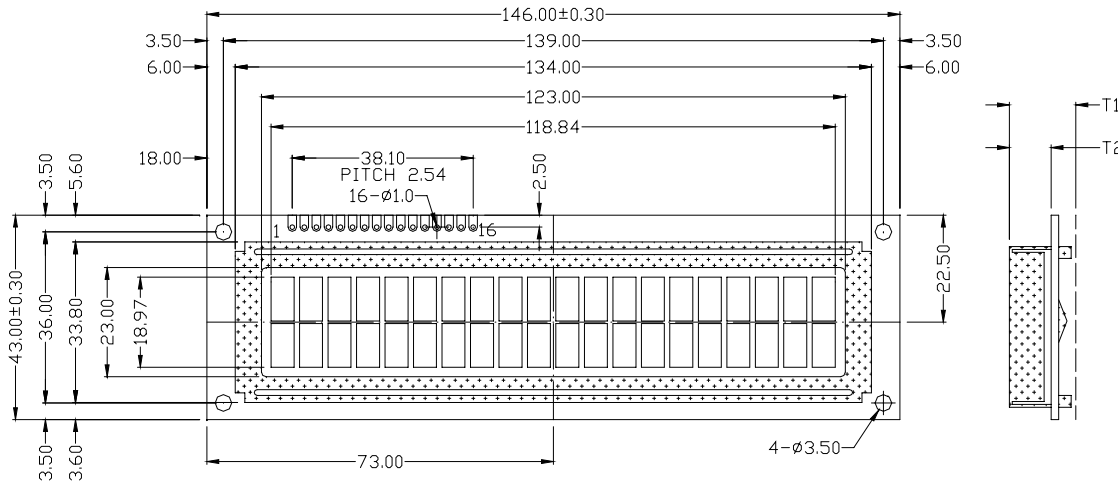
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.0	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H ViH	2.2	-	VDD	V
	L ViL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	116.0W × 37.0H × 14.0T(10.0T)	MM
VIEWING AREA	83.0W × 18.6H	MM
CHARACTERS	20 CHARACTERS × 2 LINES	
CHARACTER SIZE	3.20W × 5.55H	MM
CHARACTER PITCH	3.80W × 5.95H	MM

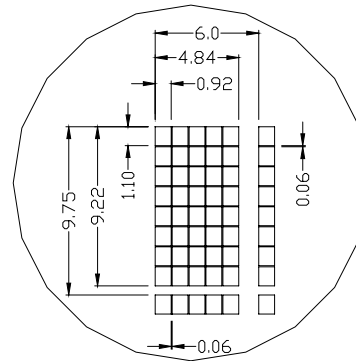
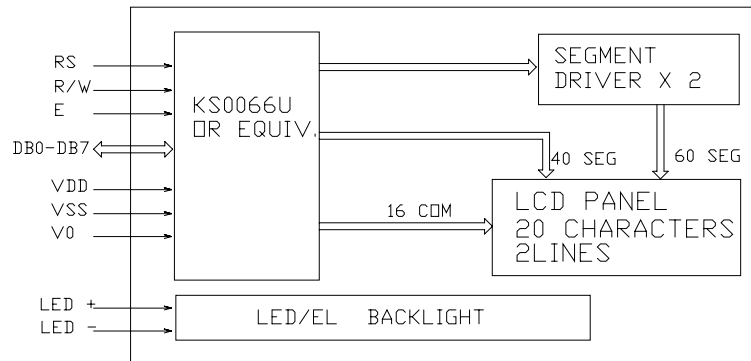
- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(-50C) EXTENDED(-20--70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8 A ! 2002BA series

20x2 CHARACTERS



* FOR LED BACKLIGHT
 T1=14.0MAX T2=9.0±0.3
 * FOR EL OR NO BACKLIGHT
 T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

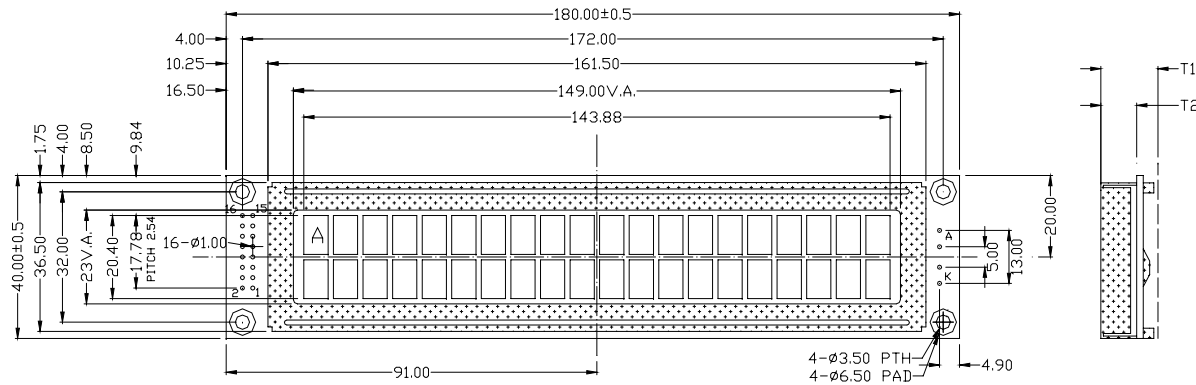
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY (LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	2.0	3.5	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	146.0W x 43.0H x 14.0T(10.0T)	MM
VIEWING AREA	123.W x 23.0H	MM
CHARACTERS	20 CHARACTERS x 2 LINES	
CHARACTER SIZE	4.84W x 9.22H	MM
CHARACTER PITCH	6.0W x 9.75H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A!2002CA series 20x2 CHARACTERS

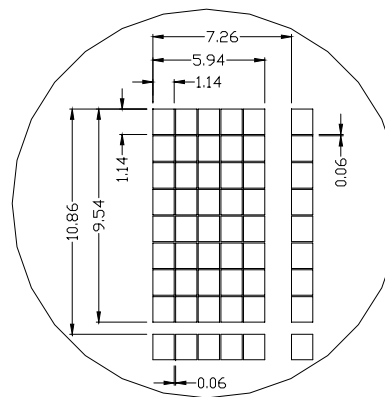
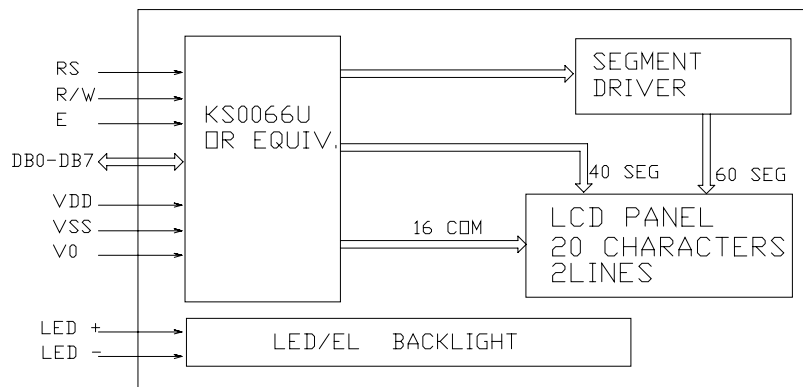


* FOR LED BACKLIGHT
T1=14.5MAX T2=10.5±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3

PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	2.0	3.5	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H ViH	2.2	-	VDD	V
	L ViL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H VoH	2.4	-	-	V
	L VoL	-	-	0.4	V

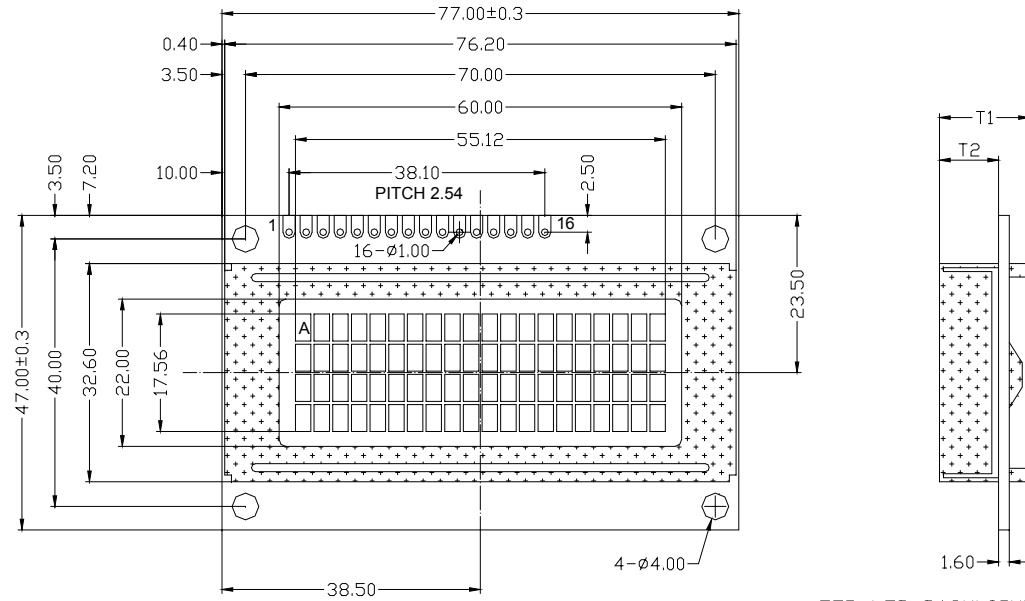


MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	180.0W x 40.0H x 14.0T(10.0T)	MM
VIEWING AREA	149.0W x 23.0H	MM
CHARACTERS	20 CHARACTERS x 2 LINES	
CHARACTER SIZE	5.94W x 9.54H	MM
CHARACTER PITCH	7.26W x 10.86H	MM

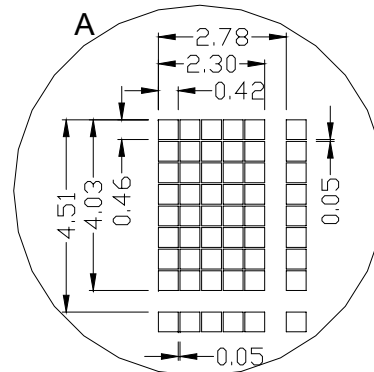
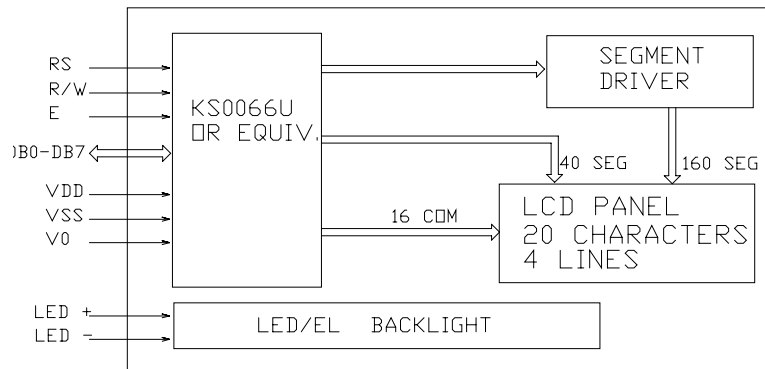
OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(-50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !2004AA series

20x4 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

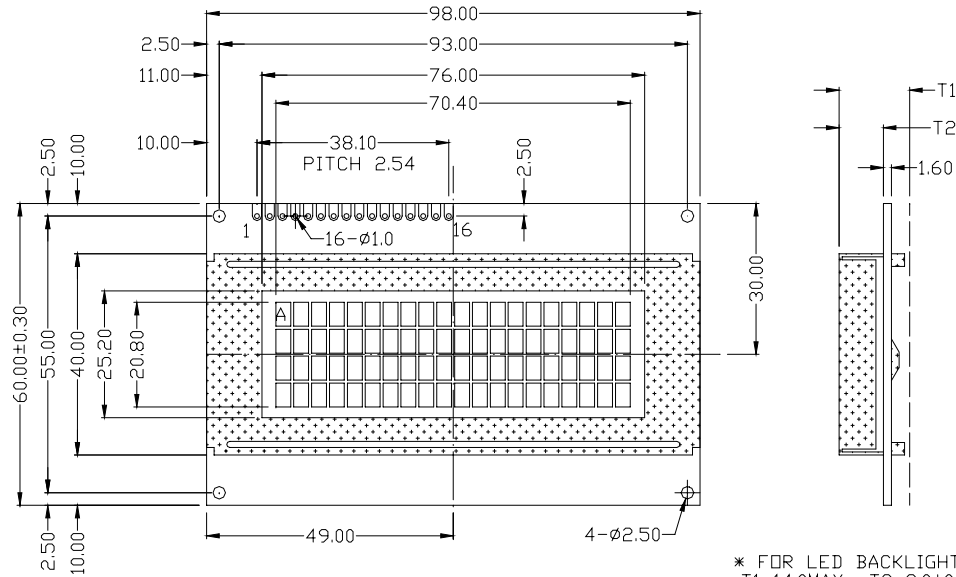
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.0	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.8	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	77.0W x 47.0H x 13.5T(10.0T)	MM
VIEWING AREA	60.0W x 22.0H	MM
CHARACTERS	20 CHARACTERS x 4 LINES	
CHARACTER SIZE	2.30W x 4.03H	MM
CHARACTER PITCH	2.78W x 4.51H	MM

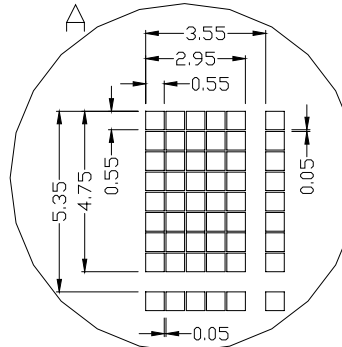
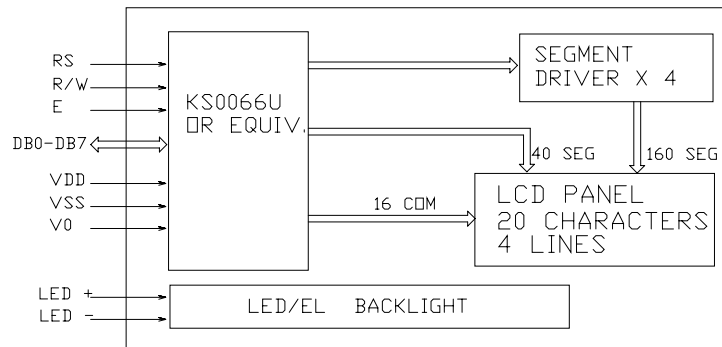
OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !2004BA series

20x4 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

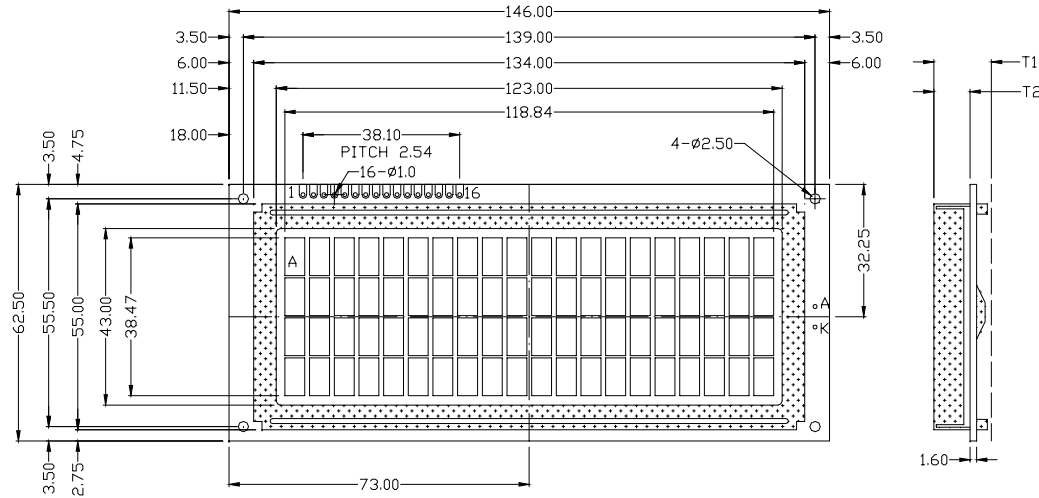
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.0	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.9	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	98.0H x 60.0H x 14.0T(10.0T)	MM
VIEWING AREA	76.0H x 25.2H	MM
CHARACTERS	20 CHARACTERS x 4 LINES	
CHARACTER SIZE	2.95W x 4.75H	MM
CHARACTER PITCH	3.55W x 5.35H	MM

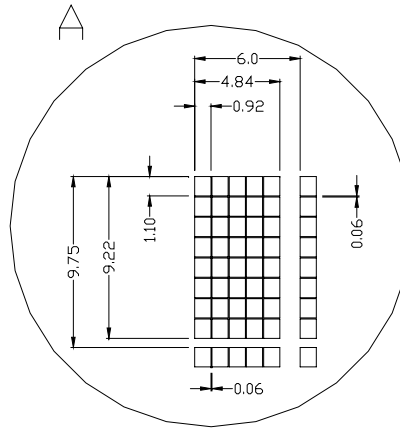
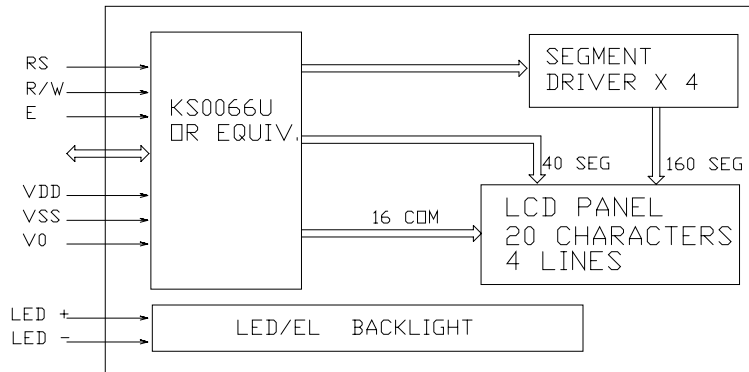
OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8 A !2004CA series

20x4 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

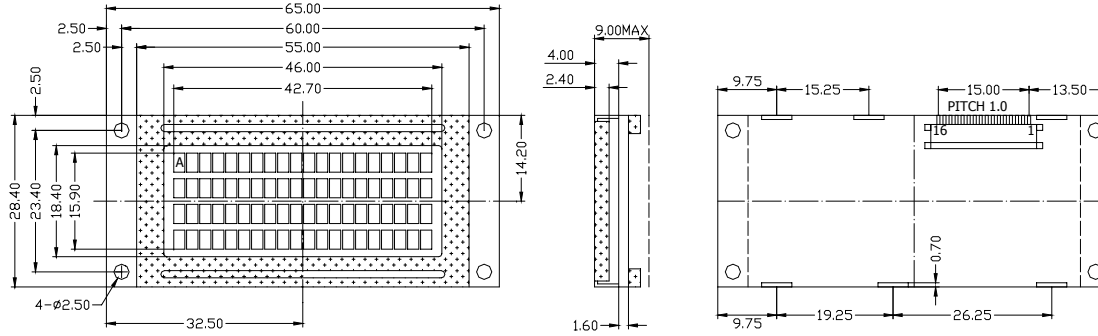
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)						
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V	
SUPPLY CURRENT	I _{DD}	-	1.0	2.2	mA	
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V	
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD	V
	L	V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	-	V
	L	V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	146.0W x 62.5H x 14.0T(10.0T)	MM
VIEWING AREA	123.5W x 43.0H	MM
CHARACTERS	20 CHARACTERS x 4 LINES	
CHARACTER SIZE	4.84W x 9.22H	MM
CHARACTER PITCH	6.0W x 9.75H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

S A ! 2004EA series

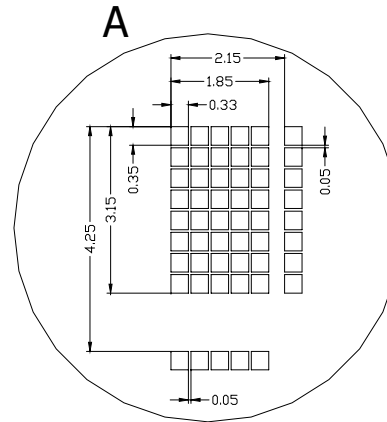
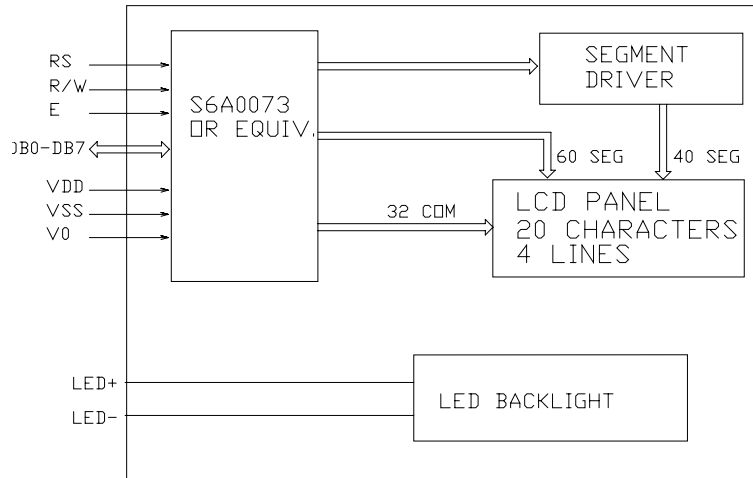
20x4 CHARACTERS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY (GROUND)
2	VDD	POWER SUPPLY FOR LOGIC
3	V0	INPUT VOLTAGE TO THE BOOSTER
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED+	ANODE OF LED BACKLIGHT
16	LED-	CATHODE OF LED BACKLIGHT

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	0	6.0	V
POWER SUPPLY (LCD DRV.)	VDD-V0	0	5.0	V
INPUT VOLTAGE	V _i	0	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
LOGIC SUPPLY CURRENT	I _{DD}	-	1.5	1.6	mA
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V
LED DRIVING VOLTAGE	V _{LED}	3.9	4.1	4.3	V

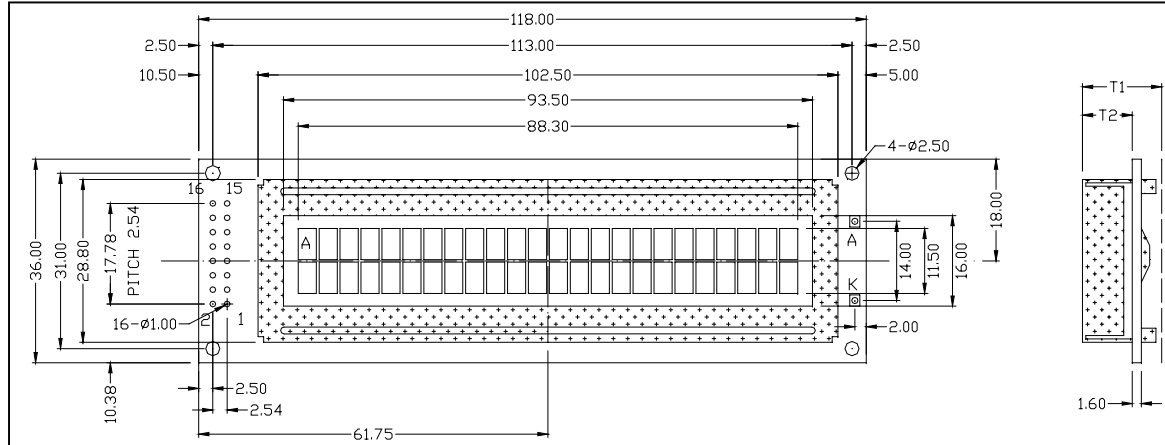


MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	65.0W × 28.4H × 9.0T	MM
VIEWING AREA	46.0W × 18.4H	MM
CHARACTERS	20 CHARACTERS × 4 LINES	
CHARACTER SIZE	1.85W × 3.15H	MM
CHARACTER PITCH	2.15W × 4.25H	MM

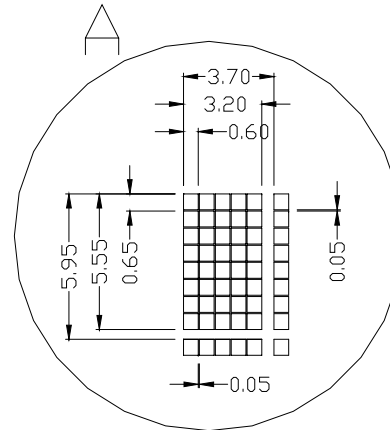
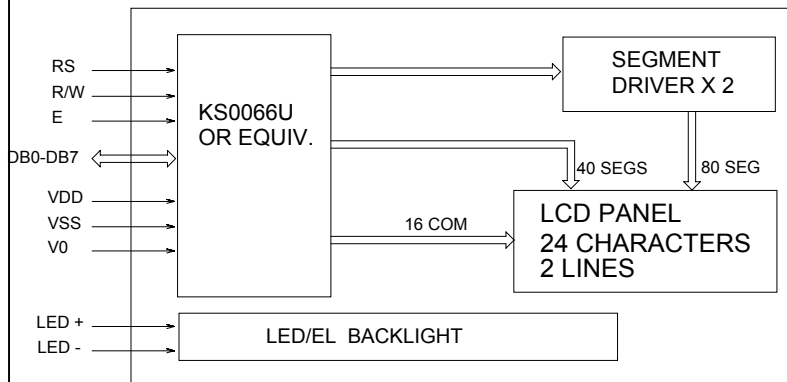
OPTIONS
1. LCD TYPE: Y/G STN;
2. BACKLIGHT: LED BACKLIGHT, SIDE-LIT
3. COLOR OF BACKLIGHT: GREEN
4. TEMPERATURE RANGE: EXTENDED(-20--70°C)
5. POWER SUPPLY: 5.0V;
6. VIEWING ANGLE: 6H;
7. CHARACTER TABLE: JAPANESE;

8A!2402AA series

24x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (←)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (←)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	VI	-0.3	VDD	V

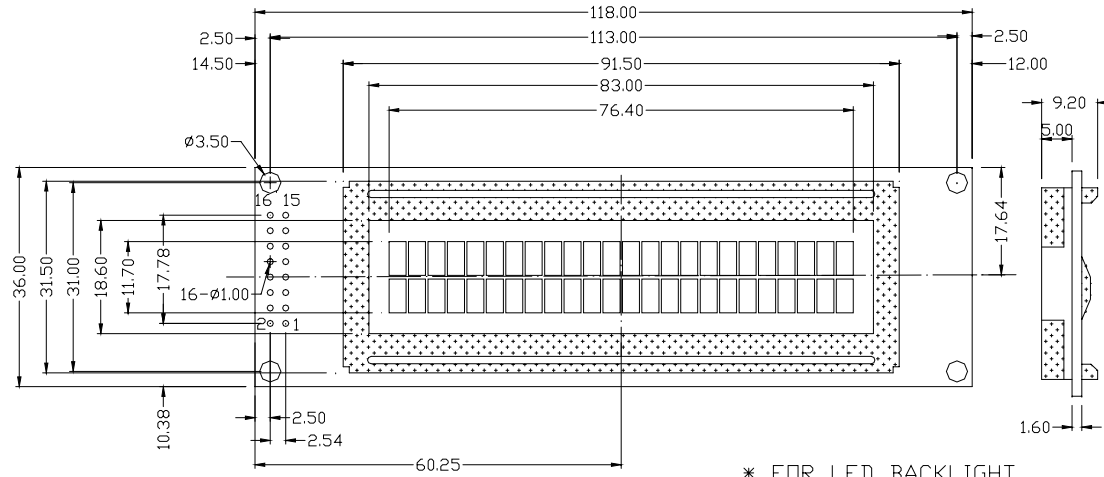
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)						
ITEM	SYMBOL	MIN	TYP	MAX	UNIT	
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V	
SUPPLY CURRENT	IDD	-	2.0	2.8	mA	
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V	
INPUT VOLTAGE	H	VIH	2.2	-	VDD	V
	L	VIL	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	VoH	2.4	-	-	V
	L	VoL	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	118.0W × 36.0H × 14.0T(10.0T)	MM
VIEWING AREA	93.5W × 16.0H	MM
CHARACTERS	24 CHARACTERS × 2 LINES	
CHARACTER SIZE	3.20W × 5.55H	MM
CHARACTER PITCH	3.70W × 5.95H	MM

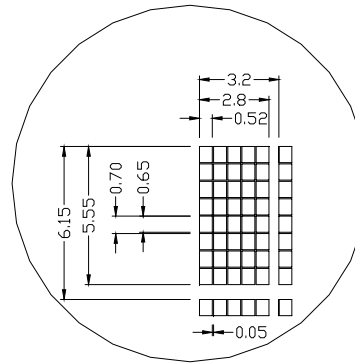
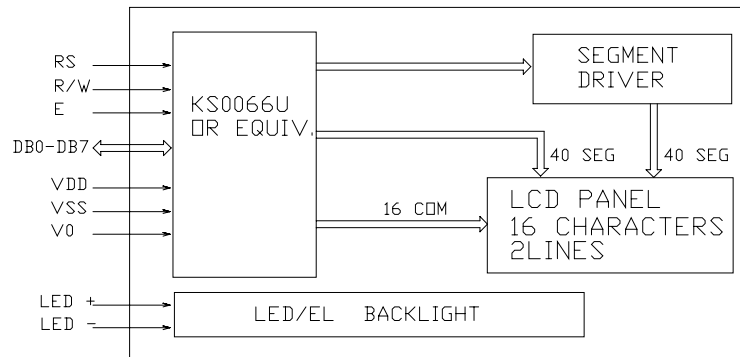
- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0--50°C)
EXTENDED(-20--70°C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !2402DA series

24x2 CHARACTERS



* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

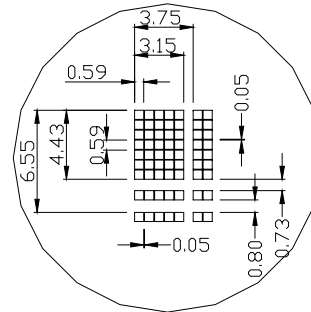
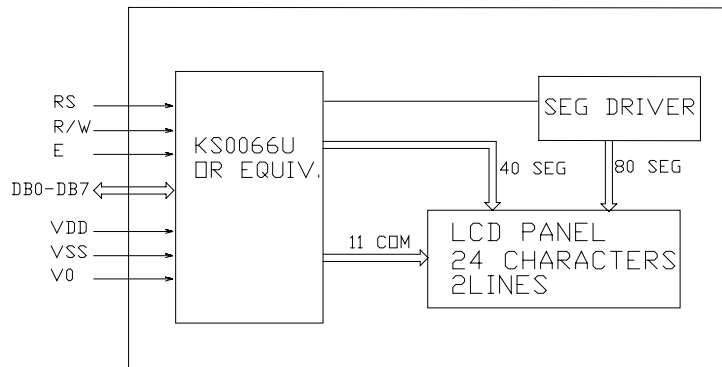
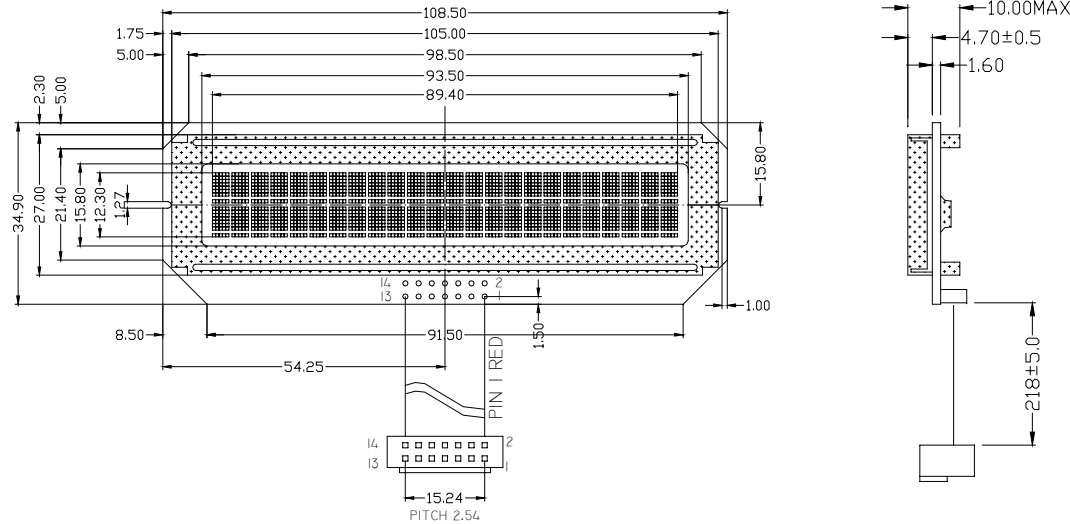
ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.3	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{oH}	2.4	-	-	V
	L V _{oL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	85.0W × 36.0H × 14.0T(10.0T)	MM
VIEWING AREA	64.5W × 15.5H	MM
CHARACTERS	16 CHARACTERS × 2 LINES	
CHARACTER SIZE	2.96W × 5.56H	MM
CHARACTER PITCH	3.55W × 5.94H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(0--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A !2402EA series 24x2 CHARACTERS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY (LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY (LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

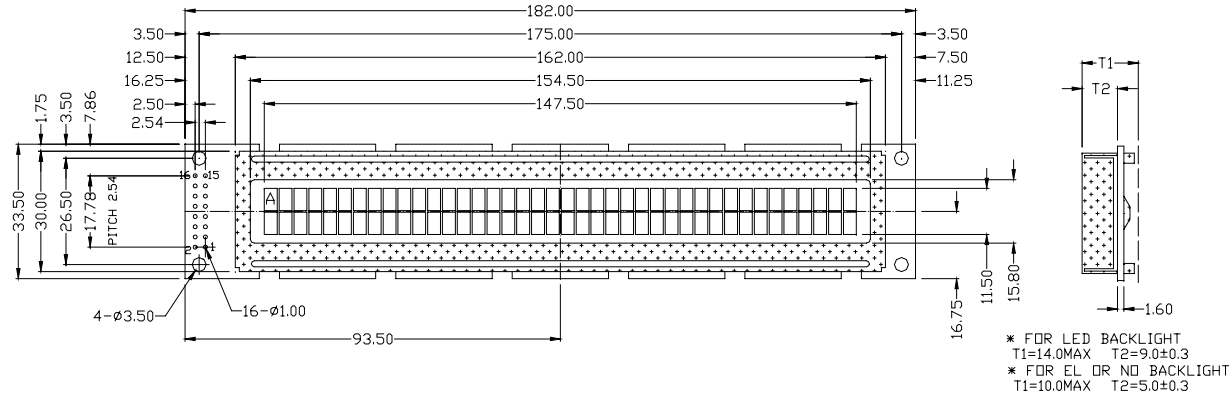
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	I _{DD}	-	1.0	1.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.7	-	V
INPUT VOLTAGE	H V _{IH}	2.2	-	VDD	V
	L V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H V _{OH}	2.4	-	-	V
	L V _{OL}	-	-	0.4	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	108.5W x 34.9H x 10.0T	MM
VIEWING AREA	93.5W x 15.8H	MM
CHARACTERS	24 CHARACTERS x 2 LINES	
CHARACTER SIZE	3.15W x 4.43H	MM
CHARACTER PITCH	3.75W x 6.55H	MM

OPTIONS
1. LCD TYPE: GRAY STN
2. BACKLIGHT: WITHOUT BACKLIGHT;
3. TEMPERATURE RANGE: NORMAL(0--50C)
4. POWER SUPPLY: 5.0V;
5. VIEWING ANGLE: 6H;
6. CHARACTER TABLE: EUROPEAN;

8A ! 4002AA series

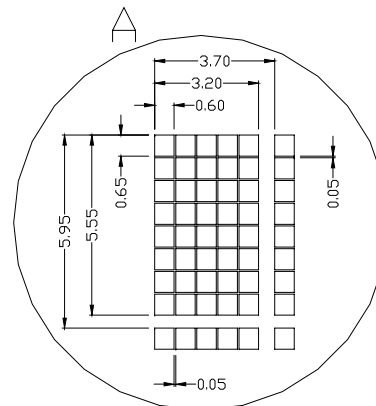
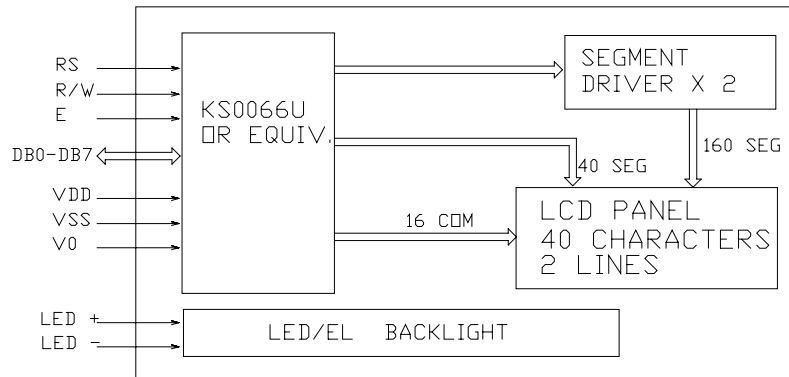
40x2 CHARACTERS



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1	VSS	POWER SUPPLY
2	VDD	POWER SUPPLY
3	V0	OPERATING VOLTAGE FOR LCD
4	RS	DATA/INSTRUCTION SELECT
5	R/W	READ/WRITE CONTROL
6	E	ENABLE SIGNAL
7--14	DB0--DB7	DATA BUS
15	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)
16	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	Vi	-0.3	VDD	V

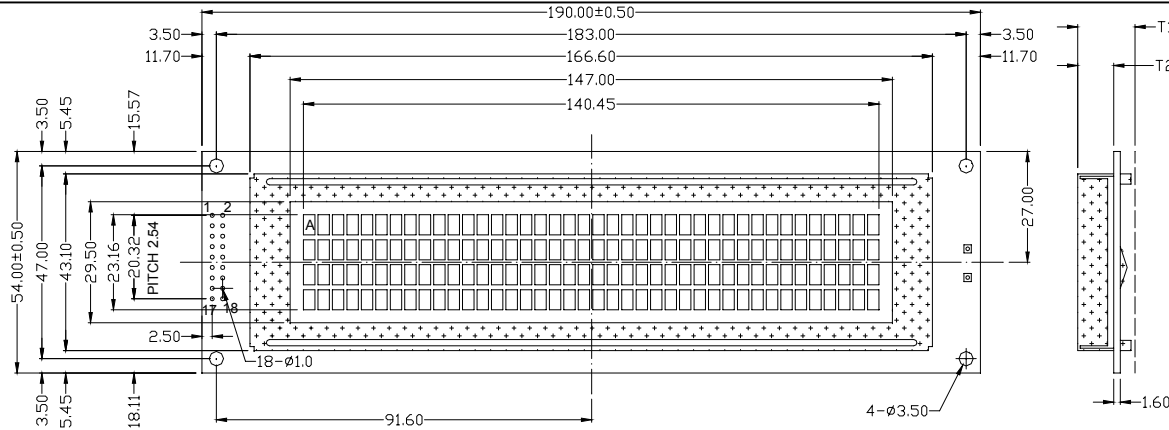
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25°C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	1.0	2.2	mA
VOLTAGE FOR LCD	VDD-V0	-	4.6	-	V
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD
	L	V _{IL}	-0.3	-	0.6
OUTPUT VOLTAGE	H	V _{OH}	2.4	-	V
	L	V _{OL}	-	-	0.4



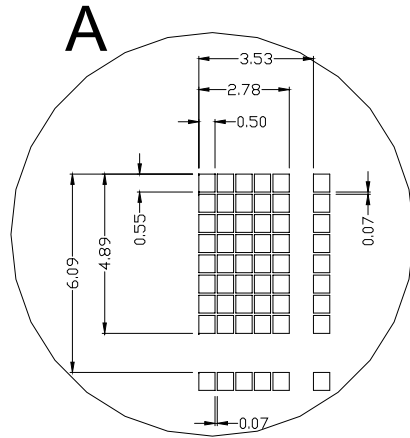
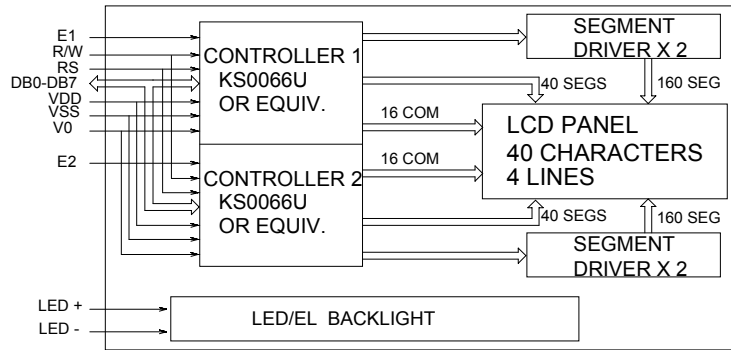
MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	182.0W x 33.5H x 14.0T(10.0T)	MM
VIEWING AREA	154.5W x 15.8H	MM
CHARACTERS	40 CHARACTERS x 2 LINES	
CHARACTER SIZE	3.20W x 5.55H	MM
CHARACTER PITCH	3.70W x 5.95H	MM

OPTIONS
1. LCD TYPE: Y/G STN; GRAY STN; TN
2. BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
3. COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
4. TEMPERATURE RANGE: NORMAL(-20--50C) EXTENDED(-20--70C)
5. POWER SUPPLY: 5.0V; 3.0V
6. VIEWING ANGLE: 6H; 12H
7. CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A ! 4004AA series 40x4 CHARACTERS



* FOR LED BACKLIGHT
 T1=14.0MAX T2=9.0±0.3
 * FOR EL OR NO BACKLIGHT
 T1=10.0MAX T2=5.0±0.3



PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1-8	DB7-DB0	DATA BUS
9	E1	ENABLE SIGNAL FOR CONTROLLER 1
10	R/W	READ/WRITE CONTROL
11	RS	DATA/INSTRUCTION SELECT
12	V0	OPERATING VOLTAGE FOR LCD
13	VSS	POWER SUPPLY
14	VDD	POWER SUPPLY
15	E2	ENABLE SIGNAL FOR CONTROLLER 2
16	NC	NO CONNECT
17	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)
18	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

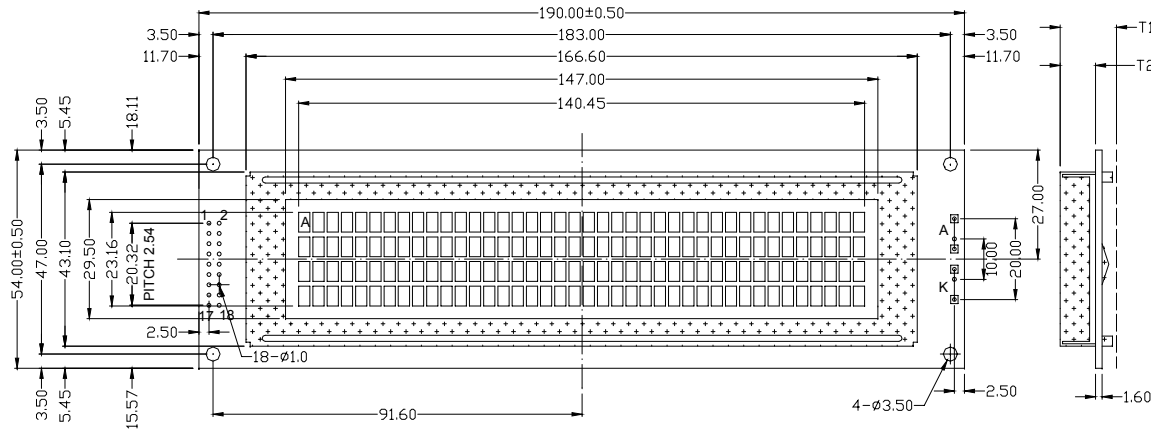
ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25C)						
ITEM		SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC		VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT		IDD	-	6.0	7.5	mA
VOLTAGE FOR LCD		VDD-V0	4.7	4.9	5.1	V
INPUT VOLTAGE	H	V _{IH}	2.2	-	VDD	V
	L	V _{IL}	-0.3	-	0.6	V
OUTPUT VOLTAGE	H	V _{oH}	2.4	-	-	V
	L	V _{oL}	-	-	0.4	V
VOLTAGE FOR BACKLIGHT		VA-VK	-	4.1	4.3	V

MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	190.0W x 54.0H x 14.0T(10.0T)	MM
VIEWING AREA	147.0W x 29.5H	MM
CHARACTERS	40 CHARACTERS x 4 LINES	
CHARACTER SIZE	2.78W x 4.89H	MM
CHARACTER PITCH	3.53W x 6.09H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0-50C)
EXTENDED(-20-70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

8A ! 4004AB series

40x4 CHARACTERS

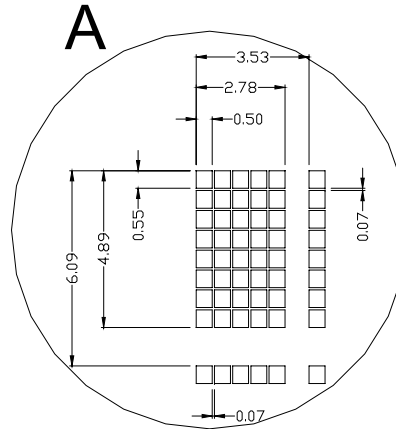
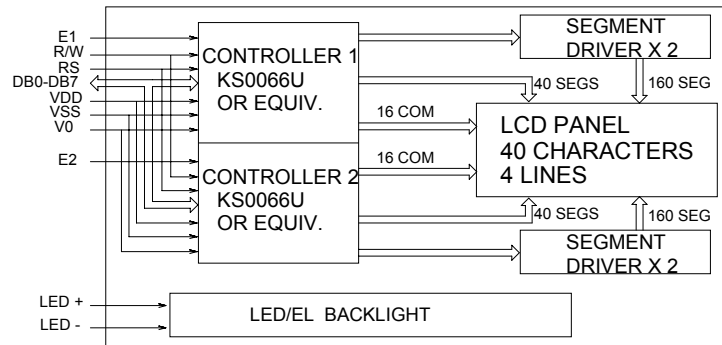


PINS ASSIGNMENT		
NO.	SYMBOL	DESCRIPTION
1-8	DB7-DB0	DATA BUS
9	E1	ENABLE SIGNAL FOR CONTROLLER 1
10	R/W	READ/WRITE CONTROL
11	RS	DATA/INSTRUCTION SELECT
12	V0	OPERATING VOLTAGE FOR LCD
13	VSS	POWER SUPPLY
14	VDD	POWER SUPPLY
15	E2	ENABLE SIGNAL FOR CONTROLLER 2
16	NC	NO CONNECT
17	LED -	POWER SUPPLY FOR LED BACKLIGHT (-)
18	LED +	POWER SUPPLY FOR LED BACKLIGHT (+)

ABSOLUTE MAXIMUM RATING				
ITEM	SYMBOL	MIN	MAX	UNIT
POWER SUPPLY(LOGIC)	VDD-VSS	-0.3	7.0	V
POWER SUPPLY(LCD DRV.)	VDD-V0	-0.3	13.5	V
INPUT VOLTAGE	V _i	-0.3	VDD	V

ELECTRICAL CHARACTERISTICS (VDD=5.0±0.25V, 25C)					
ITEM	SYMBOL	MIN	TYP	MAX	UNIT
VOLTAGE FOR LOGIC	VDD-VSS	4.75	5.0	5.25	V
SUPPLY CURRENT	IDD	-	6.0	7.5	mA
VOLTAGE FOR LCD	VDD-V0	4.7	4.9	5.1	V
INPUT VOLTAGE	H	V _{iH}	2.2	-	VDD
	L	V _{iL}	-0.3	-	0.6
OUTPUT VOLTAGE	H	V _{oH}	2.4	-	V
	L	V _{oL}	-	-	0.4

* FOR LED BACKLIGHT
T1=14.0MAX T2=9.0±0.3
* FOR EL OR NO BACKLIGHT
T1=10.0MAX T2=5.0±0.3

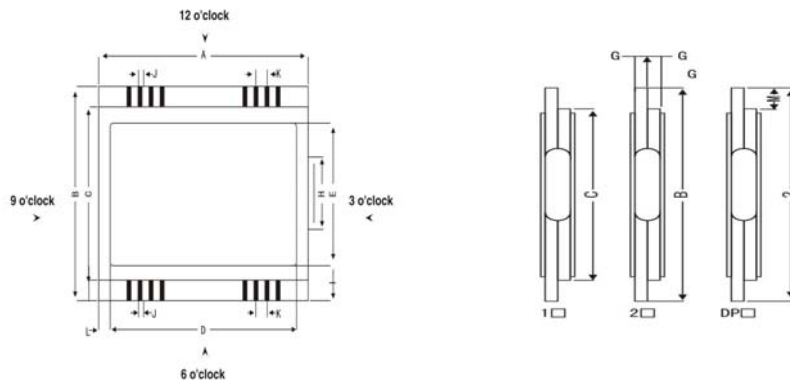


MECHANICAL SPECIFICATIONS		
ITEM	SPECIFICATION	UNIT
OVERALL SIZE	190.0W x 54.0H x 14.0T(10.0T)	MM
VIEWING AREA	147.0W x 29.5H	MM
CHARACTERS	40 CHARACTERS x 4 LINES	
CHARACTER SIZE	2.78W x 4.89H	MM
CHARACTER PITCH	3.53W x 6.09H	MM

- OPTIONS**
- LCD TYPE: Y/G STN; GRAY STN; TN
 - BACKLIGHT: WITHOUT BACKLIGHT; LED; EL
 - COLOR OF BACKLIGHT: Y/G; BLUE; WHITE
 - TEMPERATURE RANGE: NORMAL(0-50C)
EXTENDED(-20-70C)
 - POWER SUPPLY: 5.0V; 3.0V
 - VIEWING ANGLE: 6H; 12H
 - CHARACTER TABLE: JAPANESE; EUROPEAN; CYRILLIC

LCD INQUIRING FORM

1. PROJECT NAME:
2. APPLICATION:
3. EAU:
4. REMARK:



1. DIMENSIONS

- | | |
|---------------------------|------------------------|
| A. Length of glass | F. Character height |
| B. Width of glass (Front) | G Character width |
| C. Width of glass (Rear) | H Contact pad pitch |
| D. Length of viewing area | I. Glass thickness |
| E. Width of viewing area | J. First pad from edge |

2. VIEW ANGLE

- 3 O'clock
 6 O'clock
 9 O'clock
 12 O'clock Others

3. LCD Type

- TN
 STN (Yellow green Blue Gray)
 FSTN

4. DISPLAY MODE

Positive Negative

5. POLARIZER

Reflective Transflective Transmissive

6. DRIVING METHOD

Static Dynamic _____ Duty _____ Bias

Driving Voltage: Vop _____ V. Frequency: _____ Hz

7. TEMPERATURE RANGE

Operating Temperature _____ °C to _____ °C

Storage Temperature _____ °C to _____ °C

8. CONNECTOR TYPE

Rubber connector Flexible connector Pin connector

9. SCHEDULE

For Sample: _____ Quantity _____ pcs ; for Mass production _____ Quantity _____ pcs

Mass Production: Delivery _____

LCM INQUIRING FORM

1. PROJECT NAME:

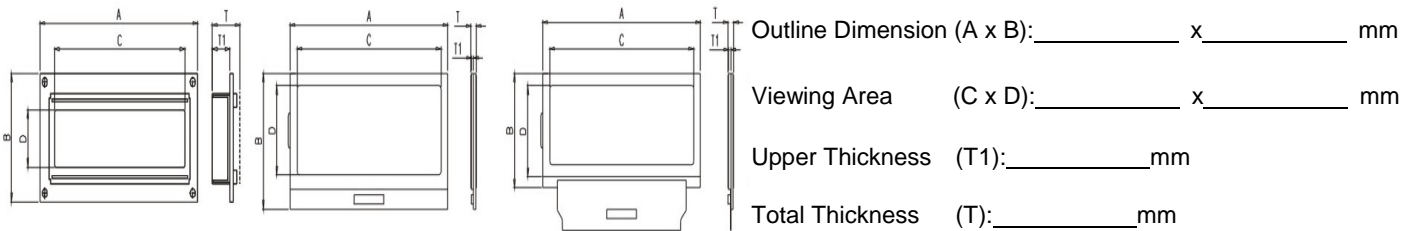
2. APPLICATION:

3. EAU:

4. REMARK:

5. LCM TYPE COB SMT COG TAB COF Other: _____

* LCM DIMENSIONS



7. DISPLAY SPEC:

(1) CHARACTER TYPE

(2) GRAPHIC TYPE

Character Type: _____ x _____ Dots, with /without Cursor

Dot Size(AxB): _____ Characters x _____ mm

Dot Pitch(CxD): _____ x _____ mm

Cursor Space(E): _____ mm

Character Pitch(FxG): _____ mm

Other: _____

Number Of Dots: _____ x Dots, with/without Icons

Dot Size(AxB): _____ x _____ mm

Dot Pitch(CxD): _____ x _____ mm

Others: _____

(3) Segment Type: _____

(4) Others _____

8. LCD SPEC: _____

(1) Viewing Angle: 6H 9H 12H 3H Other _____

(2) LCD Type: TN HTN STN Gray STN Yellow STN Blue FSTN B/W Others _____

(3) Rear Polarizer Type: Reflective Transflective Transmissive

(4) Display Type: Positive Negative

(5) Visual Spec : Normal Anti-Glare _____

9. DRIVING METHOD

Static

Multiplexing Duty: _____ Bias: _____

10. IC

(1) Common Driver: _____

(2) Segment Driver: _____

(3) Controller: _____ Built-in External

(4) Others: _____

(5) Recommend by Genda

11. POWER SOURCE:

(1) Supply Voltage for Logic(VDD) : 5V 3V Others _____ V

(2) Supply Voltage for LCD (VLCD/ Vop): _____ V

(3) Dual Power Single Power Recommend by Genda

12. BACKLIGHT

(1) No Backlight

(2) Backlight Type: LED(Bottom Type) LED(Edge Type) CCFL(Bottom Type) CCFL(Edge Type) EL

LAMP

(3) Backlight Color: Yellow-Green Yellow Green Blue White Red Amber Orange

13. EXTERNAL CONNECTION METHOD:

Pattern Terminal Connector: _____ Other: _____

14. TEMPERATURE RANGE:

(1) Operating Temperature: 0°C~50°C _____°C- _____°C

(2) Storage Temperature: -20°C~70°C _____°C- _____°C

15. SCHEDULE:

(1) Specification

Delivery: _____

(2) Sample

Delivery: _____ Quantity: _____ Pcs

(3) Mass Production:

Delivery: _____ Quantity Per Month: _____ Pcs Total Quantity: _____ Pcs

16. OTHER CONDITIONS:
