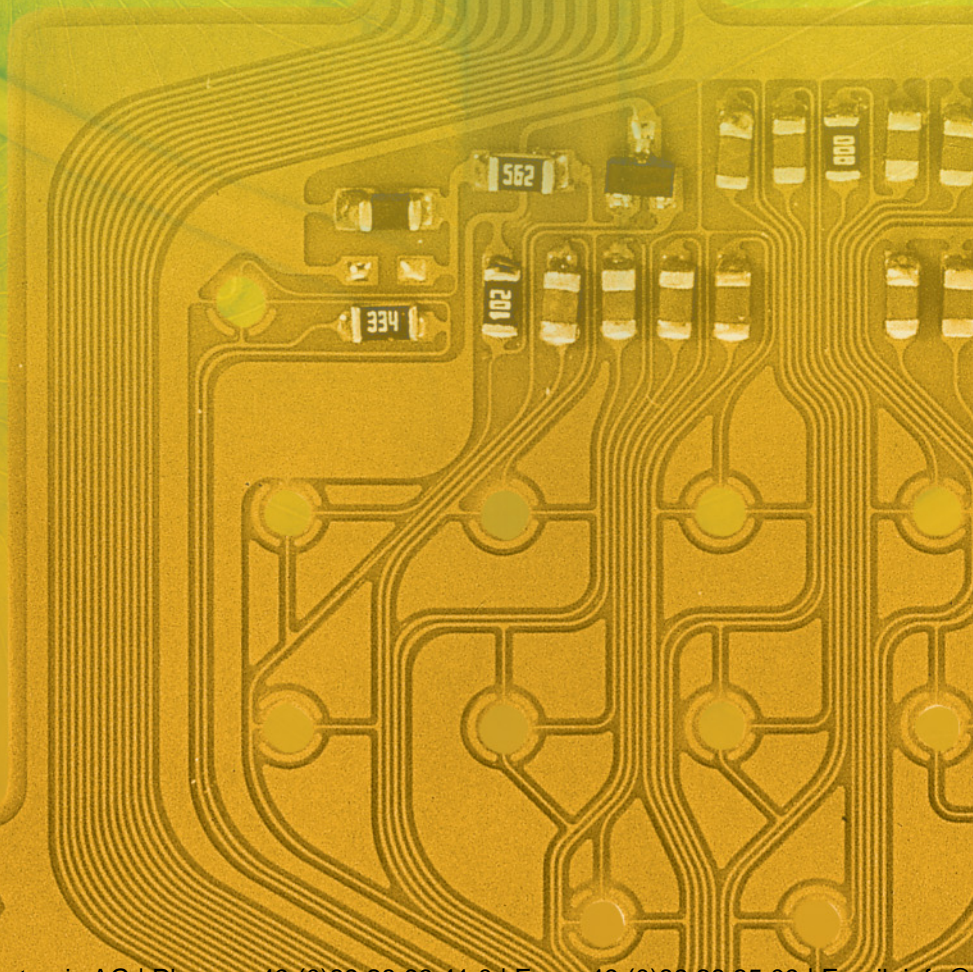


Technology and Life

products guide



Company

Introduction

ORGANIZATION

Ampire is backed by over 10 year's experience in the LCD Industry, and supported by shareholders of public stock companies and semi-conductors manufacturers.

PROFICIENCY & RELIABILITY

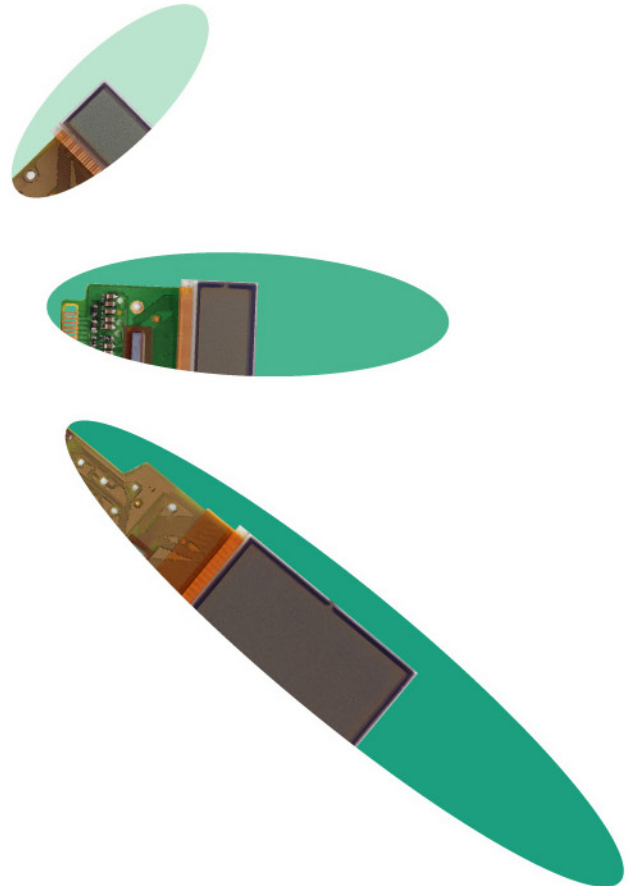
As an ISO 9001 certified company, we have pledged to provide our customers with quality Liquid Crystal Display products in a timely and professional manner. Our commitment to excellence and efficiency guarantees short lead time to Original Equipment Manufacturers looking for a competitive edge. Our aggressive pricing insures that your product will have the best display for the lowest cost !

CUSTOMER SERVICE

Ampire offers you the finest in-house services and technologies...from R&D to full Turn-Key solutions. By putting our heart into every project, we are able to cater to the demands and expectations of our customers. Problem solving is what the engineers at Ampire Displays do best. At Ampire we care about your business !

INNOVATION

Our innovative spirit is what drives us : our technical know-how is what qualifies us to face a competitive marketplace; our willingness to listen to our customers and meet their needs is what makes us successful. We are pleased to offer the following LCD technologies : TN,STN,FSTN,TAB,COF,and COG.Ampire welcomes your custom application. Our engineers will work closely with you to identify all the requirements. We'll help you " fill in the blanks "of your new design or build to your exact specifications.



Content

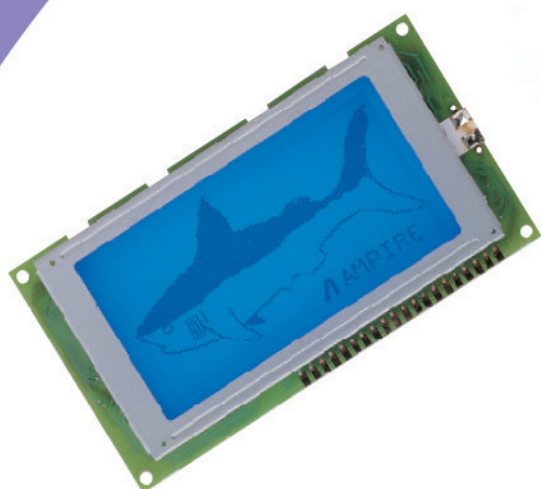
Numbering System	①
Ampire Product List	②
Custom design LCD module	⑧
Product Introduction	①⑥



Numbering System

		Code Value	Description	Remark
Company	A	A	Company name abbreviated	AMPIRE CO., LTD.
		C,G,T,F,O,R	C:Character, G:Graphic, T:TAB	LCM type
LCM type	G	F,O,R	F:COF, O:COG, R:Color STN	
		D,M,L	D:Customer Design M:TFT LCD L:LTPS	
Row dots number	1	122,128,240,320 ...	Row dots number	Graphic
		08,16,20,24,40, ...	Characters per line	Character
Characters per line	2			
Column dots number	8			
Lines	6	32,64,128,240...	Column dots number	Graphic
		1,2,4...	Lines	Character
LCD module serial number	4			
LCD type	A	A~Z	LCD module serial number	
		N	TN type LCD	LCD type
		H	HTN type LCD	
		Y	STN yellow green type LCD	
		G	STN gray type LCD	
		S	STN negative type LCD	
		F	FSTN type LCD	
		P	FSTN type LCD Paper white	
		W	FSTN type LCD Paper white(No Reverse)	
		C	Color STN	
Polarizer & Viewing angle type	Y	T	TFT LCD	
	I	A	Reflective type/6:00view	Polarizer & Viewing angle type
		B	Reflective type/12:00view	
		I	Transflective type/6:00view	
		J	Transflective type/12:00view	
		K	Transmissive type/9:00view	
		L	Transmissive type/3:00view	
		M	Transmissive type/6:00view	
		N	Transmissive type/12:00view	
		T	Negative type/6:00view	
Backlight type	U	U	Negative type/12:00view	
		V	Negative type/3:00view	
	L	None	Without backlight	Backlight type
		L	5V LED	
		O	12V LED	
		P	24V LED	
		Q	Edge light LED	
Backlight color	E	E	EL	
		C	C.C.F.L.	
	Y	None	Without backlight	Backlight color
		A	Amber	
		B	Blue	
		G	Green	
		R	Red	
		Y	Yellow-green	
		W	White	
		D	Double Color(Y-G&R)	
Version code	T	T	R G B	
		P	Lamp	
LCM temp. type	O	OO~ZZ	Version code	
	H	None	Normal temperature type	LCD Temperature type
		H	Extended temperature	
		D	Dual display	

Graphic LCD module series



Graphic LCD module series

Dots (W x H)	Model	Back-light & Touch Panel	Dot size (W x H)	Dot pitch (W x H)	View area (W x H)	Module size (W x H x T)	Built-in Controller	Page
122X32	AG12232A	None / EL	0.40x0.45	0.44x0.49	60.5x18.5	84.0x44.0x10.5	SBN1661G	16
		LED	0.40x0.45	0.44x0.49	60.5x18.5	84.0x44.0x15.5		
	AG12232B	None/EL/LED	0.40x0.45	0.44x0.49	60.5x18.5	65.8x27.1x8.4	SBN1661G	17
128X64	AG12864A	None / EL	0.48x0.48	0.52x0.52	71.7x39.0	93.0x70.0x9.5	SBN6400G /SBN0064G	18
		LED	0.48x0.48	0.52x0.52	71.7x39.0	93.0x70.0x14.5		
	AG12864C	None / EL	0.40x0.56	0.44x0.60	62.0x44.0	78.0x70.0x10.5	SBN6400G /SBN0064G	19
		LED	0.40x0.56	0.44x0.60	62.0x44.0	78.0x70.0x13.0		
	AG12864D	None / EL	0.40x0.56	0.44x0.60	62.0x44.0	78.0x70.0x10.5	T6963C	20
		LED	0.40x0.56	0.44x0.60	62.0x44.0	78.0x70.0x13.0		
	AG12864E	None / EL	0.40x0.40	0.43x0.43	60.0x32.5	75.0x52.7x6.8	SBN6400G /SBN0064G	21
		LED	0.40x0.40	0.43x0.43	60.0x32.5	75.0x52.7x9.0		
160X80	AG16080A	None / EL	0.39x0.39	0.42x0.42	72.3x37.8	100.0x54.0x11.3	T6963C or equivalent	22
		LED	0.39x0.39	0.42x0.42	72.3x37.8	100.0x54.0x15.3		

* Full series of wide temperature.

* Temperature range: Normal type: Operating temp: 0~50°C.

Wide temperature type: Operating temp: -20°C~+70°C.

© Optional with pure driver or controller version.

* White LED available for Graphic Module. (Details please contact with sale people.)



Dots (W x H)	Model	Back-light & Touch Panel	Dot size (W x H)	Dot pitch (W x H)	View area (W x H)	Module size (W x H x T)	Built-in Controller	Page
240X64	AG24064B	None / EL	0.49x0.49	0.53x0.53	132.0x39.0	180.0x65.0x10.0	T6963C or equivalent	23
		LED	0.49x0.49	0.53x0.53	132.0x39.0	180.0x65.0x16.0		24
		CCFL	0.49x0.49	0.53x0.53	132.0x39.0	180.0x65.0x20.0		25
	AG24064B5	LED	0.49x0.49	0.53x0.53	132.0x39.0	185.9x65.0x16.0		26
240X128	AG240128B	None / EL / CCFL	0.47x0.47	0.50x0.50	132.0x76.0	170.0x103.2x14.0	RA6963+ SEN639/40	27
	AG240128C	None / EL	0.40x0.40	0.45x0.45	114.0x64.0	144.0x104.0x12.0	©RA6963+ SEN639/40	28
		LED	0.40x0.40	0.45x0.45	114.0x64.0	144.0x104.0x15.0		29
	AG240128G	None / EL	0.40x0.40	0.45x0.45	114.0x64.0	144.0x104.0x12.0		30
		LED/CCFL	0.40x0.40	0.45x0.45	114.0x64.0	144.0x104.0x15.0		31
	AG240128I	None / EL	0.40x0.40	0.45x0.45	114.0x64.0	144.0x104.0x12.0		32
		LED/CCFL	0.40x0.40	0.45x0.45	114.0x64.0	144.0x104.0x15.0		33
320X240	AG320240A4	None / EL / LED	0.345x0.345	0.36x0.36	122.0x92.0	160.0x109.0x14.5	©RA8835	34
		CCFL	0.345x0.345	0.36x0.36	122.0x92.0	167.1x109.0x11.0		35
		Touch Panel	0.345x0.345	0.36x0.36	122.0x92.0	160.0x109.0x12.5		36
640X200	AG640200A	CCFL	0.3x0.3	0.33x0.33	218.0x74.0	259.5x104.0x15.5	*	37
640X480	AG640480C2	CCFL	0.21x0.21	0.23x0.23	153.0x115.4	205.5x141.0x8.7	*	38

* E3V / 5V available by built DC / DC converter.



COF Type LCD

Character & Graphic module

COF type LCD module

Dots (W x H)	Model	Back-light & Touch Panel	Dot size (W x H)	Dot pitch (W x H)	View area (W x H)	Module size (W x H x T)	Built-in Controller	Page
128x128	AF128128C2	None	0.199x0.219	0.213x0.233	30.5x32.0	36.3x83.5x1.4	HD66750S	32
	AF128128K	LED(Y-G)	0.34x0.34	0.35x0.35	54.0x50.0	72.4x112.7x6.5	HD66750S	33
160x128	AF160128A	EL	0.26x0.26	0.28x0.28	51.8x40.4	56.8x74.2x2.1	SED15E06	34
		LED(Y-G,B,W)	0.26x0.26	0.28x0.28	51.8x38.9	57.8x81.0x6.8	SED15E06	
240x160	AF240160E	LED(Y-G/White)	0.23x0.23	0.24x0.24	63.0x42.5	81.0x115.5x6.5	UC1611	35



TAB Type LCD

module series

TAB type LCD module series

Dots (W x H)	Model	Back-light & Touch Panel	Dot size (W x H)	Dot pitch (W x H)	View area (W x H)	Module size (W x H x T)	Built-in Controller	Page
96x32	AT09632J	EL	0.235x0.235	0.25x0.25	30.0x9.5	37.0x33.9x2.2	NT7534	36
	AT09632K3	EL	0.235x0.235	0.25x0.25	25.985x11	33.0x35.9x2.5	NT7534	37
128x64	AT12864I	None	0.34x0.38	0.37x0.41	54.0x31.0	58.0x54.5x1.9	SED1565/ST7565	38
	AT12864M	None	0.39x0.51	0.43x0.55	60.0x39.0	64.0x65.6x5.5	SED1565/ST7565	39
128x128	AT128128H1	None	0.199x0.219	0.213x0.233	30.5x32.0	36.3x82.8x1.4	HD66750S	40
132x48	AT13248A2	EL	0.22x0.25	0.235x0.265	35.0x15.0	39.5x39.8x4.2	NT7532	41
160x160	AT160160A	None	0.33x0.33	0.35x0.35	60.1x60.0	69.0x69.5x6.0	RA8835	42
		EL	0.33x0.33	0.35x0.35	60.1x60.0	69.0x69.5x6.6		
		Touch Panel	0.33x0.33	0.35x0.35	60.1x60.0	69.0x69.5x8.0		
160x240	AT160240B	EL+T/ P	0.31x0.295	0.325x0.31	58.9x77.8	70.0x90.5x4.8	*	43
240x160	AT240160B	None	0.225x0.225	0.24x0.24	67.6x47.5	74.6x54.9x7.0	RA8835	44
		EL	0.225x0.225	0.24x0.24	67.6x47.5	74.6x54.9x7.6		
		Touch Panel	0.225x0.225	0.24x0.24	67.6x47.5	74.6x54.9x8.5		
	AT240160D	None	0.23x0.23	0.24x0.24	61.6x42.5	83.8x56.2x4.0	*	45
		EL	0.23x0.23	0.24x0.24	61.6x42.5	83.8x56.2x5.0		
		Touch Panel	0.23x0.23	0.24x0.24	61.6x42.5	83.8x56.2x5.5		
320x240	AT320240Q4	None/EL	0.225x0.225	0.24x0.24	62.0x81.8	73.0x92.2x7.6	RA8835	46
		Touch Panel	0.225x0.225	0.24x0.24	62.0x81.8	73.0x92.2x9.0		
	AT320240Q5	White LED	0.225x0.225	0.24x0.24	62.0x81.8	73.0x93.3x6.7	RA8835	47
		Touch Panel	0.225x0.225	0.24x0.24	62.0x81.8	73.0x93.3x8.6		
	AT320240Q6	White LED	0.225x0.225	0.24x0.24	62.0x81.8	85.0x99.3x6.7	RA8835	48
		Touch Panel	0.225x0.225	0.24x0.24	62.0x81.8	85.0x99.3x8.6		

* Full series of wide temperature.

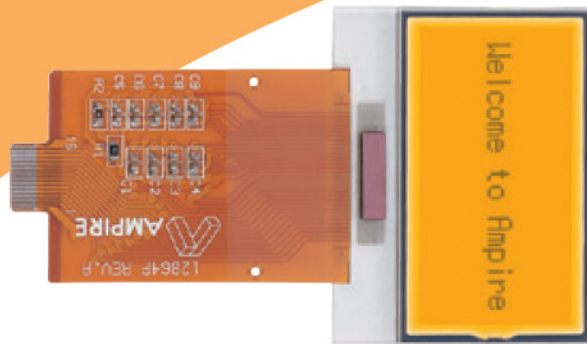
* Temperature range: Normal type: Operating temp: 0~50°C.

Wide temperature type: Operating temp: -20°C~+70°C.

© Optional with pure driver or controller version.

* White LED available for Graphic Module. (Details please contact with sale people.)

* E3V / 5V available by built DC / DC converter.



0100010001000

010001000

0100100010001

Character LCD

module series

Character LCD module series

Display Char x line	Model	Back-light Type	Dot size (W x H)	Dot pitch (W x H)	Character (W x H)	View area (W x H x T)	Module size (W x H x T Max)	Page
08x2	AC082A	None	0.545x0.645	0.6x0.70	2.945x5.545	35.0x15.0	58.0x32.0x10.0	49
		LED	0.545x0.645	0.6x0.70	2.945x5.545	35.0x15.0	58.0x32.0x13.8	
16x1	AC161A	None / EL	0.55x0.75	0.63x0.83	3.07x6.56	65.0x14.0	80.0x36.0x10.0	50
		LED	0.55x0.75	0.63x0.83	3.07x6.56	65.0x14.0	80.0x36.0x14.5	
	AC161B	None	0.92x1.10	0.98x1.16	4.84x8.06	99.0x13.0	122.0x33.0x10.5	50
		LED	0.92x1.10	0.98x1.16	4.84x8.06	99.0x13.0	122.0x33.0x15.0	
	AC161J	LED	1.152x1.765	1.212x1.825	6.0x14.54	120.0x23.0	151.0x40.0x14.7	51
16x2	AC162A	None / EL	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	85.0x29.5x10.0	51
		Edge LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	85.0x29.5x11.0	
		LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	85.0x29.5x14.5	
	AC162B	None / EL	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	80.0x36.0x10.0	52
		Edge LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	80.0x36.0x11.0	
		LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	80.0x36.0x14.5	
	AC162C	None / EL	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	85.0x36.0x10.0	52
		Edge LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	85.0x36.0x11.0	
		LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	85.0x36.0x14.5	
	AC162D	None / EL	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	84.0x44.0x10.0	53
		Edge LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	84.0x44.0x11.0	
		LED	0.55x0.65	0.60x0.70	2.95x5.55	64.0x17.2	84.0x44.0x14.5	
	AC162E	None / EL	0.92x1.10	0.98x1.16	4.84x8.06	99.0x24.0	122.0x44.0x10.5	53
		LED	0.92x1.10	0.98x1.16	4.84x8.06	99.0x24.0	122.0x44.0x14.5	
16x4	AC164A	None / EL	0.55x0.55	0.60x0.60	2.95x4.75	61.4x25.0	87.0x60.0x11.0	54
		LED	0.55x0.55	0.60x0.60	2.95x4.75	61.4x25.0	87.0x60.0x14.0	
20x2	AC202A	None / EL	0.60x0.65	0.65x0.70	3.20x5.55	83.0x18.5	116.0x37.0x10.0	54
		LED	0.60x0.65	0.65x0.70	3.20x5.55	83.0x18.5	116.0x37.0x14.5	
	AC202B	None / EL	1.12x1.12	1.22x1.22	6.00x9.66	149.0x23.0	180.0x40.0x9.5	55
		LED	1.12x1.12	1.22x1.22	6.00x9.66	149.0x23.0	180.0x40.0x15.0	
	AC202D	LED	1.10x1.50	1.20x1.60	5.9x12.7	147.0x35.2	182.0x60.0x14.0	55

Character LCD module series

Display Char x line	Model	Back-light Type	Dot size (W x H)	Dot pitch (W x H)	Character (W x H)	View area (W x H x T)	Module size (W x H x T Max)	Page
20x4	AC204A	None / EL	0.55x0.55	0.60x0.60	2.95x4.75	76.0x25.2	98.0x60.0x10.5	56
		LED	0.55x0.55	0.60x0.60	2.95x4.75	76.0x25.2	98.0x60.0x14.5	
	AC204B	None	0.92x1.10	0.98x1.16	4.84x9.22	123.0x42.5	146.0x62.5x10.5	56
		LED	0.92x1.10	0.98x1.16	4.84x9.22	123.0x42.5	146.0x62.5x14.5	
24x2	AC242A	None / EL	0.60x0.65	0.65x0.70	3.20x5.55	94.5x18.0	118.0x36.0x9.5	57
		LED	0.60x0.65	0.65x0.70	3.20x5.55	94.5x18.0	118.0x36.0x14.7	
	AC242C	None	0.82x0.82	0.86x0.86	4.26x6.84	133.0x20.3	154.0x39.0x12.0	57
40x1	AC401A	None	0.60x0.70	0.65x0.75	3.20x8.20	154.0x16.5	182.0x33.5x10.5	58
40x2	AC402A	None / EL	0.60x0.65	0.65x0.70	3.20x5.55	154.0x16.5	182.0x33.5x10.5	58
		LED	0.60x0.65	0.65x0.70	3.20x5.55	154.0x16.5	182.0x33.5x14.0	
40x4	AC404A	None / EL	0.50x0.55	0.57x0.62	2.78x4.89	147.0x29.5	190.0x54.0x10.5	59
		LED	0.50x0.55	0.57x0.62	2.78x4.89	147.0x29.5	190.0x54.0x14.0	

* Full series of wide temperature.

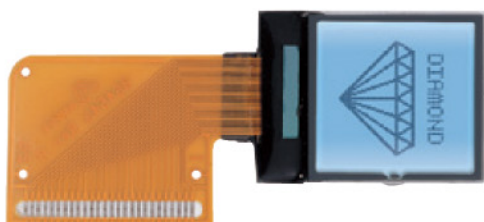
* Temperature range: Normal type: Operating temp: 0~50°C.

Wide temperature type: Operating temp: -20°C~+70°C.

◎ Optional with pure driver or controller version.

* White LED available for Graphic Module. (Details please contact with sale people.)

* E3V / 5V available by built DC / DC converter.



COG type LCD module

COG type LCD module

Display Char x line	Model	Back-light Type	Dot size (W x H)	Dot pitch (W x H)	View area (W x H x T)	Module size (W x H x T Max)	Built Controller	Page
128x64	AO12864T	None	0.355x0.355	0.38x0.38	52.6x27.5	57.0x64.4x1.9	ST7565	60
	AO12864Z	None	0.42x0.44	0.46x0.48	63.84x35.68	68.0x82.0x1.9	S6B1713	61
	AO12864B1	LED light-guide	0.349x0.418	0.364x0.433	49.6x31.0	54.6x92.2x5.8	SED1565	62
132x32	AO13232A	LED light-guide	0.67x0.56	0.71x0.60	98.0x23.0	113.0x34.0x17.6	ST7588	63
132x64	AO13264A	LED light-guide	0.64x0.55	0.68x0.59	95.0x40.0	110.0x59.0x17.6	ST7588	64

Custom Design LCD Module



For worldwide demand, Ampire provides client-oriented Custom Design LCD Modules with consistent support from the planning stage through the stages of specification proposal, development and right up to production. Now we'd like to introduce some of the key components for designing a LCD module in the following pages.

I. Display format

Character or Graphic type?

How many characters /dots for each row and column? With Icons?



Character type



Graphic type

II. Module Construction (P.9)

COB / TAB / COG / COF...Introduced behind.

III. Touch Panel : Analog / Digital type (P.10)

...Introduced behind.

IV. LCD panel Thickness and Type (P.11)

Glass thickness : 0.4 / 0.55 / 0.7 / 1.1 ;

LCD panel overall Thickness : 1.4 / 1.7 / 2.0 / 2.8 ;

LCD Type : TN / HTN / STN / FSTN / Paper White

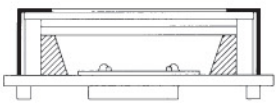
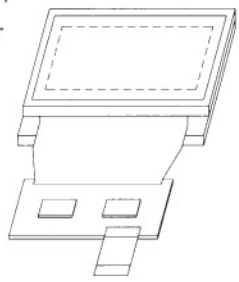
...Introduced behind.

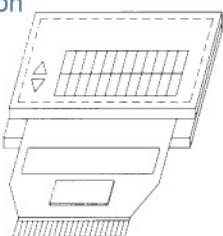
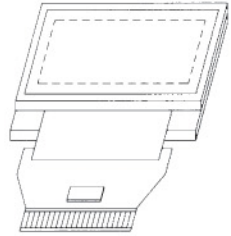
V. Back-Light (P.12~P.13)

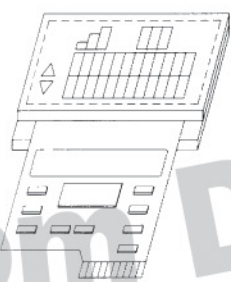
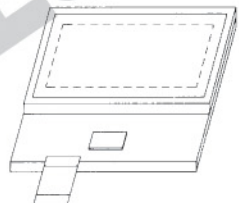
LED / EL / CCFL ...Introduced behind.



Module Construction

Process	
LCD+SMT(COB)+Rubber+Bezel	LCD+SMT(COB)+HeatSeal
Construction	
Features <ul style="list-style-type: none">1.Suitable pitch : Above 400μm2.Traditional assembly Tech.3.Reworkable 	Features <ul style="list-style-type: none">1. Suitable pitch : 200μm,min2.Thick and flexible application3.Interface : FPC or connector 

Process	
LCD+TCP+ACF	LCD+TCP+Heatseal
Construction	
Features <ul style="list-style-type: none">1.Applicable pitch : 70 ~ 300μm2.Simple Construction3.TAB process4.Suitable for high Duty application5.High assembly efficiency6.External PCB for other components 	Features <ul style="list-style-type: none">1.Normal pitch : Around 200μm2.Easy to rework than TAB with ACF process3.Let TCP be folding back to LCD panel 

Process	
LCD+COF	LCD+COG
Construction	
Features <ul style="list-style-type: none">1.Alternative solution for TAB2.Directly mount LSI and other components on FPC3.Lower cost than TAB4.Thin and flexible 	Features <ul style="list-style-type: none">1.Applicable pitch : 50 ~300μm2.Employee COG process3.Low Cost is possible4.Not Reworkable 



Touch Panel

Description

Touch panels are input devices that apply the film processing technologies the company has acquired while working on plastic film panels (PEP). Since the keyboards themselves are transparent, the touch panels can be placed directly on top of a display device. They are space-saving, graphical input devices that can be used for a wide variety of applications.

Feature

- ① Transparent touch key panels have a combination film and glass structure that offers high transmissivity and rigidity.
- ② The film is situated on the uppermost surface, making input possible with a light touch.
- ③ A safe design helps prevent glass from scattering if the unit should be dropped or subjected to strong mechanical shocks.
- ④ Transparent touch key panels can be placed directly on top of display devices.
- ⑤ In line with your application needs, you have option of choosing either a digital touch panel that has the necessary keypad patterned on it or an analog touch panel that can perform continuous recognition.

* Specifications

Item	Digital touch panel	Analog touch panel
Operating force	10~100g	100~200g
Transparency	70%	80%
Logic Voltage	5V	3~6.5V
Insulation Resistance	DC100V, 100 Ω [DC100V, 100 Ω [
Operating Temp	-10~+50°C	-10~+50°C
Storage Temp	-20~+60°C	-20~+60°C
Average Life	1,000,000 times	100,000 times

* Application of analog touch panel

- ① The analog touch panel is an input device employing a resistive film system.
- ② Analog touch panels are suited to uses where :
 - 1) There are a large number of keypads.
 - 2) Character recognition, line input and other continuous coordinate input is necessary.

* Operation principle of analog touch panel

- ① A transparent electrode is formed uniformly over the entire effective surface of the film and glass of an analog touch panel.
- ② Information can be input by fingertip, stylus or other pen device. The upper and lower electrodes short-circuit when they are pressed with a pen. During this time the X and Y coordinates detect by turns. (Please refer to the conceptual drawing of X and Y coordinate detection.)
- ③ To locate the X and Y coordinates, voltage V_x taken from the Y electrode and voltage V_y taken from the X electrode are converted into digital data and assigned coordinates.
- ④ An analog touch panel only needs four signal terminals, but it also has to be equipped with an IC chip with a built-in analog-digital converter such as that shown in the circuit configuration example. The driver MK715 is recommended and built-in some of the Ampire Product.

* Application of digital touch panel

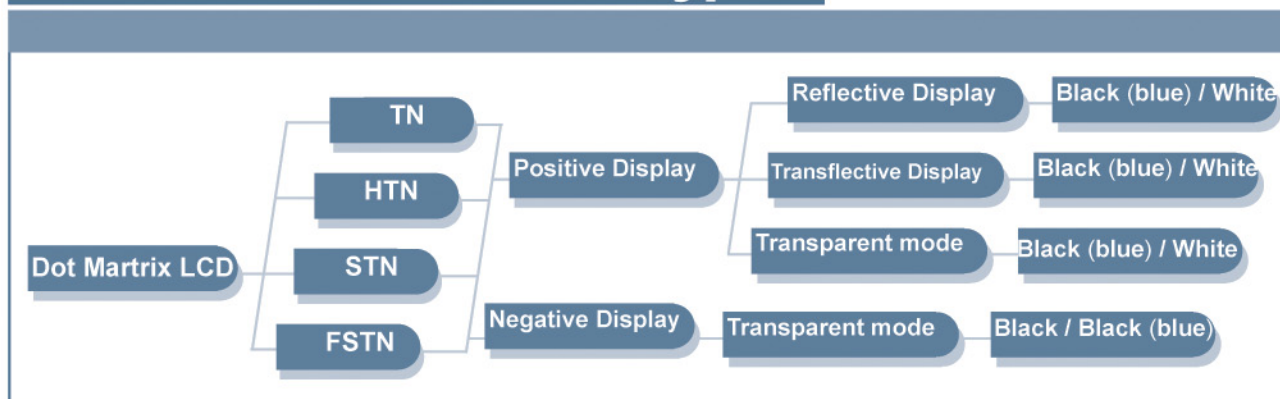
- ① The digital touch panel is short-circuiting key switch.
- ② Digital touch panels are suited to uses where :
 - 1) There are relatively few touch pads and you wish to use key encoders and other exiting circuit.
 - 2) The keypad is large and input is by fingertip.

* Operation principle of digital

- ① Digital touch panels have transparent electrodes patterned on the film and glass in a matrix array.
- ② The upper and lower electrodes operate as switches, short-circuiting when subjected to finger pressure.

IV LCD Type

Classification of LCD types



LCD type features

The following LCD display types are available.

Display Type	DUTY	Color(On/Off)	Remark
TN	1/16 max	Black/White	Low Duty
HTN	1/16 max	Black/White	Low Duty
STN	1/350 max	Blue/White	High Duty, Yellow/Gray mode.
FSTN	1/350 max	Black/White	STN monochrome display

- **Note** : Standard corresponding display formats
TN, HTN : 7-Segment display - character display (up to 1/16 duty)
- **STN** : character display (1/16 duty) up to graphic display.
- **FSTN** : character display (1/16 duty) up to graphic display.
- **Paper White** : FSTN with 3M DBEF film to get excellent contrast
(Special Feature : Become to Negative Display while back-light ON)

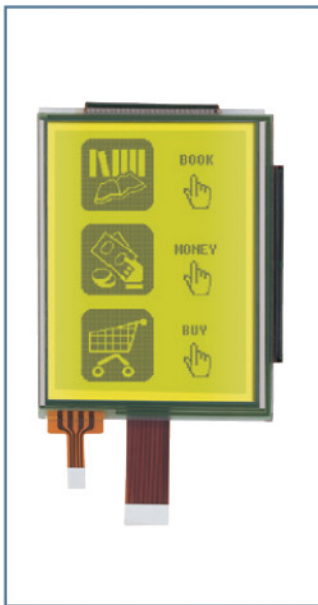
LCD structure

The following LCD display types are available.

Display Type	Positive /Negative	Color of the nonil-luminated portions	Backlight Required	Remark
Reflective	Positive	White	No	can not use in dark place
Transflective Transparent	Positive	White	Yes (illuminated if necessary)	In bright location, backlight can be turned off.
Transparent	Negative	Black	Yes (always illuminated)	Always turn on the backlight.

- **Note** : The display type depends on customer's application. If power consumption is the key issue, transflective display type is more suitable.

Back-Light



Note 1 :

A Backlight is required for transfective or transparent display mode.

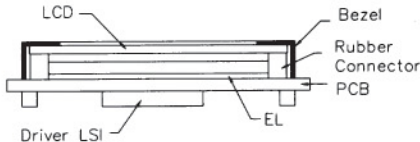
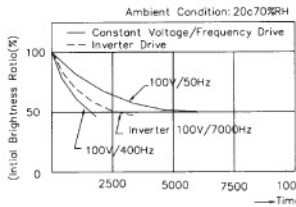
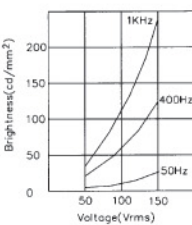
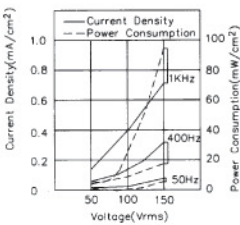
Broadly, there are three types of backlight - LED, EL and CCFL.

Note 2 :

For small size LCM, we recommend the LED type of backlight, because it does not require any inverter and has a long lifetime.

Note 3 :

To select EL Driver or EL/CCFL inverter module, please contact with ampire to choose suitable one and detail specification.

Type	EL
Feature	<ol style="list-style-type: none"> 1. Even illumination of brightness 2. low heat by low current and power consumption 3. Thin and light
Structure	
Lifetime	2,000H-5,000H
Inverter	Required*
Operating temp	-20°C~60°C
Backlight Color	Blue green / White
Power consumption	Low power consumption
Drive voltage	AC 60 ~ 100V / 400 Hz
Brightness	20 ~ 50(cd/m2)
Remark	<p>*It is necessary to use inverter when you need operate EL with battery or a DC power supply.</p> <div>    </div>

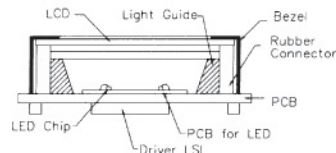


Selecting the Backlight

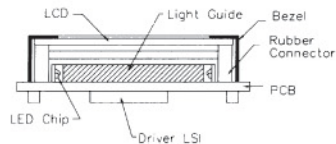
LED

1. Inverter not required
2. Long life

□ Direct Type



□ Side Light Type



20,000H - 100,000H

Not required

-20°C ~ 70°C

Yellow green / Amber / Red / White / Blue

*Increasing power consumption and heat generation caused by quantity of LED

2 ~ 24 V DC

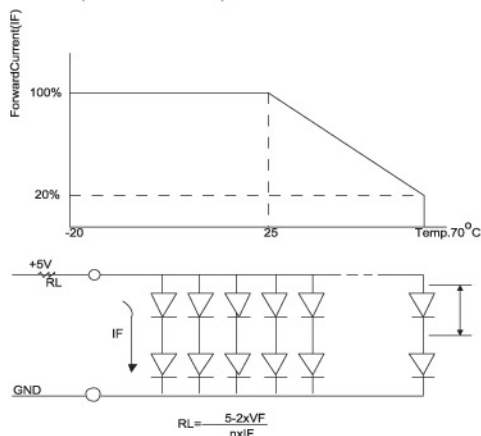
20 ~ 40 (cd/m²)

*Direct type (Bottom)

High brightness & applicable to middle sized LCM

*Side light type (Edge)

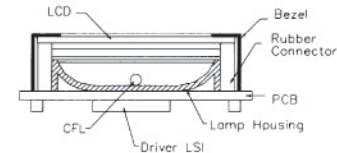
Thin structure & low power consumption



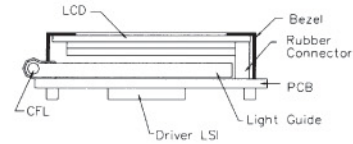
CCFL

1. High brightness
2. High heat generation
3. Long life time
4. Low power consumption

□ Direct Type



□ Side Light Type



10,000-20,000H

Required*

0°C~50°C

White

Power consumption 1.8~3W

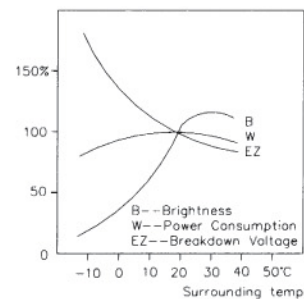
AC600~1000V 30KHz

(DC-AC inverter)

40~200(cd/m²)

Inverter of CCFL uses output high Voltage AC current.

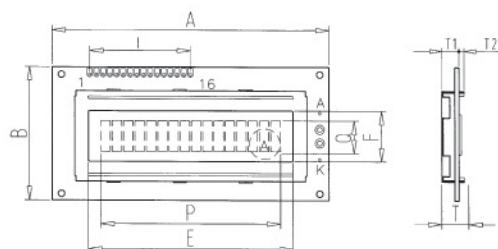
Therefore, please pay attention when handling inverter and power supply cable of LCD back light.



1.Customer : _____

2.LCM Type : ☐ COB ☐ SMT ☐ COG ☐ TAB ☐ COF ☐ Heat Seal ☐ Others _____

3.Dimensions :



AxB : Module size _____ x _____ mm T : Total thickness _____ x _____ mm

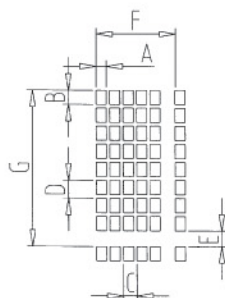
ExF : Viewing area _____ x _____ mm T1: Upper thickness _____ x _____ mm

PxO : Active area _____ x _____ mm T2 : Lower thickness _____ x _____ mm

Interface side _____ I : _____ Pitch x _____ Pin

4.Display Resolution :

☐ (a)Character Type :



1. Character Type : _____ Characters x _____ Lines.

2. Character Font : ☐ 5x7dot ☐ 5x8dots ☐ 5x7+cursor

3. Dot Size (A x B) : _____ x _____ mm

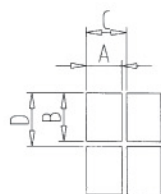
4. Dot Pitch (C x D) : _____ x _____ mm

5. Cursor Space (E) : _____ x _____ mm

6. Character Pitch (F x G) : _____ x _____ mm

7. Others : _____

☐ (b)Graphic Type:



1. Number Of Dots : _____ x _____ Dots

2. Dot Size (A x B) : _____ x _____ mm

3. Dot Pitch (C x D) : _____ x _____ mm

4. Others : _____

5.LCD Spec:

a. View Angle: ☐ 6 O'clock ☐ 12 O'clock ☐ _____ O'clock

b. LCD Type: ☐ TN ☐ HTN ☐ STN Yellow ☐ STN Gray

☐ STN Blue ☐ FSTN B/W ☐ OTHER _____

c. Rear Polarizer Type: ☐ Reflective ☐ Transflective ☐ Transmissive

d. Display Type: ☐ Positive Type ☐ Negative Type

e. Visual Spec: ☐ Normal ☐ Anti-Glare ☐ _____

F. Temperature Range:

a. Operating Temp: ☐ 0°C~50°C ☐ _____°C~_____°C

b. Storage Temp: ☐ -10°C~70°C ☐ _____°C~_____°C

6.Backlight :

a.☐ Without

b.☐ With

1.Backlight Type : ☐ LED ☐ Edge ☐ Array ☐ 5V ☐ 12V ☐ 24V ☐ Other
☐ EL ☐ CCFL ☐ Other_____

2. Backlight Color : ☐ Yellow ☐ Green ☐ Amber ☐ Red
☐ Blue ☐ White ☐ Other_____

3. Power Consumption for Backlight ☐ _____mA(Max) ☐ By AMPIRE

4. Inverter : ☐ Required Model No._____ ☐ No

7.Connector

☐ Without ☐ With Model No._____ ☐ Built-in ☐ External

8.Bezel : ☐ Black ☐ Zinc ☐ White

9. IC :

a. Common Driver : _____ Segment Driver_____

b. Controller : _____ ☐ Built-in ☐ External

c. Others : _____

d. ☐ Recommend by AMPIRE

10.Power Source :

a. Supply Voltage For Logic : ☐ 5V ☐ 3V ☐ _____V

b. Supply Voltage For LCD : _____V

c. ☐ Dual Power ☐ Single Power ☐ Recommend by AMPIRE

11.Driving Method :

☐ STATIC

☐ MULTIPLEXING DUTY : _____ Bias:_____

12.Contrast Adjustment

*Method : _____ ☐ Built-in ☐ External

13.Temperature Compensation Circuit

*Compensation range : ☐ 0°C ~ 50°C ☐ ____°C~____°C

15.Special Requirement : _____

14.Touch Panel : ☐ Glare ☐ Anti-Glare

16.APPLICATION : _____

17.Schedule :

a. Sample :

Delivery : _____ Quantity: _____ pcs

b. Mass Production :

Delivery : _____ Quantity Per Month : _____ pcs

Total Quantity : _____ pcs