STANDARD CHARACTER MODULES

Module Type Series	Module Size, mm	Character, mm	Dot Size, mm	Dot Pitch	V.A., mm	Duty	Backlight						FONT			Page
							TN			STN			Sta.	Euro	Russ.	
	WxHxT (T1)	WxH	WxH	WxH	WxH		None	LED	EL	None	LED	EL				
YMS0801-01	54x37x10	2.9x7.6	0.5x0.6	0.6x0.7	32x16	1/11	▼	▼		▼	▼		▼		▼	9
YMS0802-01	58x32x9/13	2.96x5.56	0.56x0.66	0.6x0.7	38x16	1/16	▼	▼	▼	▼	▼	▼	▼	▼	▼	10
YMS122-01	55.7x32.0x9.8	2.65x5.5	0.45x0.6	0.55x0.7	46.7x17.5	1/16										12-13
YMS161-01	80x36x10/13	3.07x6.56	0.55x0.75	0.63x0.83	64.5x14	1/16	▼	▼		▼	▼		▼		▼	11
YMS161-04	151x40x15	6.0x14.54	1.152x1.765	1.212x1.825	120x23	1/8			▼		▼	▼	▼	▼		14
YMS162-01	80x36x9.5/13	2.95x4.35	0.55x0.5	0.6x0.55	64.5x13.5	1/16	▼	▼		▼	▼		▼	▼	▼	15
YMS162-02	122x44x9.5/14.3	4.84x9.66	0.92x1.1	0.98x1.16	99x24	1/16	▼	▼	▼	▼	▼	▼	▼	▼	▼	16
YMS162-03	67x36x10	2.44x3.94	0.44x0.44	0.49x0.49	52x14	1/16	▼	▼	▼	▼	▼	▼	▼			17
YMS162-04	84x44x10/14.5	2.95x5.55	0.55x0.65	0.6x0.7	61x17	1/16	▼	▼		▼	▼		▼	▼	▼	18
YMS162-10	80x36x9.5/13	2.95x4.35	0.55x0.5	0.6x0.55	64.5x13.5	1/16	▼	▼		▼	▼		▼	▼		19
YMS162-21	53x20x8.5	1.85x3.15	0.33x0.35	0.38x0.4	36x10	1/16		▼		▼	▼		▼			20
YMS162-22	85x36x14.5/9.5	2.96x5.56	0.56x0.66	0.6x0.7	66x16.2	1/16	▼	▼		▼	▼		▼			21
YMS164-01	87x60x9/14	2.95x4.75	0.55x0.55	0.6x0.6	61.8x25.2	1/16	▼	▼	▼	▼	▼		▼			22
YMS202-01	116x37x10/14	3.2x5.55	0.6x0.65	0.65x0.7	83x18.6	1/16	▼	▼		▼	▼		▼	▼	▼	23
YMC202-16	146x43x14/10	4.84x9.22	0.92x1.1	0.98x1.16	123x23	1/16			▼	▼	▼	▼	▼		▼	24
YMS204-01	98x60x9.2/14.2	2.95x4.75	0.55x0.55	0.6x0.6	76x25.2	1/16	▼	▼		▼	▼		▼			25
YMS204-02	146x62.5x13.6/10	4.84x9.22	0.92x1.1	0.98x1.16	123.5x43	1/16	▼	▼		▼	▼		▼	▼		26
YMS242-01	118x36x9.5/14	3.2x5.55	0.6x0.65	0.65x0.7	93.5x15.8	1/16	▼	▼		▼			▼			27
YMS402-01	182x33.5x9.6/13.6	3.2x5.55	0.6x0.65	0.65x0.7	154.4x15.8	1/16	▼	▼		▼			▼			28
YMS404-01	190x54x9.2/14.5	2.8x4.91	0.52x0.57	0.57x0.62	147x29.5	1/16	▼	▼		▼			▼		▼	29

STANDARD GRAPHIC MODULES

Module Type Series	Module Size, mm	Number of dots or pixel	Dot Size, mm	Dot Pitch	V.A., mm	Duty	Backlight				Built-In Controller	Page
							STN					
	WxHxT (T1)	WxH	WxH	WxH	WxH		None	LED	EL	CCFL		
YMS12232-01	84x44x9/14.2	122x32	0.4x0.4	0.44x0.44	60x18.5	1/32	▼	▼			SBN1661G_M18	30-31
YMC12232-03	65.4x30.25x6	122x32	0.4x0.45	0.44x0.49	60.6x20	1/32		▼			SBN1661G_M18	32-33
YMS12864-01	93x70x12.2	128x64	0.48x0.48	0.52x0.52	70.7x38.8	1/64	▼	▼			NT7107	34-35
YMS12864-04	75x52.7x9	128x64	0.4x0.4	0.43x0.43	60.5x33	1/64	▼	▼			NT7107	36-37
YMS128128-01	75x81.2x8.1	128x128	0.4x0.4	0.43x0.43	60x60.1	1/128	▼				NT7107	38-39
YMC160128-01	100x73.4x14.8	160x128	0.425x0.425	0.455x0.455	77x62	1/128		▼			T6963C	40-41
YMC16080-05	120.8x95.89x14	160x80	0.57x0.625	0.6x0.655	103x80	1/80		▼			HD66421TB0	42-43
YMC192192-01	86x95x9	192x192	0.3x0.3	0.33x0.33	67.4x67.4	1/192		▼			---	44-45
YMS24064-02	180x65x11/13.8	240x64	0.49x0.49	0.53x0.53	134x40.4	1/64	▼	▼	▼		T6963C	46-47
YMS240128-01	144x104x13.8	240x128	0.4x0.4	0.45x0.45	114x64	1/128	▼	▼			T6963C	48-49
YMS240128-02	170x101.5x14	240x128	0.47x0.47	0.5x0.5	128x74	1/128		▼		▼	T6963C	50-51
YMS320240-02	134.5x117x14	320x240	0.27x0.27	0.3x0.3	103x79	1/240	▼	▼			---	52-53
YMS320240-03	144x96.8x12	320x240	0.27x0.27	0.3x0.3	104x79.3	1/240	▼	▼		▼	---	54-55
YMS320240-05	167x109x11	320x240	0.36x0.36	0.33x0.33	122x92	1/240	▼	▼		▼	---	56-58

STANDARD TAB, COG, COF MODULES

Module Type Series	Module Size, mm	Charakter, mm	Number of Dots or Pixel	Dot Size, mm	Dot Pitch	V.A., mm	Duty	Backlight			Built-In Controller	Page
								STN				
	WxHxT (T1)	WxH	WxH	WxH	WxH	WxH		None	LED	EL		
YMS162-08	65x27.7x2.1	2.95x5.15	16x2	0.55x0.6	0.6x0.65	61x15.7	1/16		▼		NT7605H-BD	59
YMS202-04	78.8x27.7x7.8	2.95x5.15	20x2	0.55x0.6	0.6x0.65	74.8x15.7	1/16		▼		NT7605H-BD	60-61
YMS12864-06	70x43x9		128x64	0.39x0.39	0.43x0.43	59x30.5	1/64	▼	▼		ST7565R, NT7538	62-63
YMS12864-15	93.7x53x5.5		128x64	0.48x0.48	0.52x0.52	70.7x38.8	1/65		▼		ST7565R, NT7538	64-65
YMS12864-18	72x90x7		128x64	0.45x0.53	0.465x0.545	66.4x39.4	1/64		▼		SPLC501C	66-67
YMS12864-20	70.2x40.5x5.85		128x64	0.39x0.39	0.43x0.43	59x30.5	1/65		▼		ST7567	68-69
YMS160160-01	54.48x57.9x3.5		160x160	0.245x0.245	0.265x0.265	45.68x45.68	1/160	▼		▼	---	70-71
YMS160160-02	75.5x70.5x10.4		160x160	0.3345x0.3345	0.3545x0.3545	61.5x61.5	1/160		▼		---	72-73
YMC240128-13	98.7x67.7x9.5		240x128	0.325x0.325	0.35x0.35	92x53	1/128		▼		ST7529-G	74-75
YMS320240-10	93.9x71.3x7.9		320x240	0.225x0.2244	0.24x0.2394	79.6x60.5	1/240		▼		---	76-77
YMS320240-11	120.3x69.1x6.5		320x240	0.225x0.225	0.24x0.24	79.8x60.6	1/240		▼		---	78-79
YMS320240-12	158.15x109x7.5		320x240	0.33x0.33	0.36x0.36	121x91.6	1/240		▼		---	80-81
YMC320240-15	60.8x77.3x8.9		320x240	0.185x0.185	0.2x0.2	51.6x67.7	1/240			▼	---	82-83
YMC320240-68	154.6x114.8x9		320x240	0.345x0.345	0.36x0.36	120x90	1/240		▼		IST3225	84-85

TFT TRANSMISSIVE LCD MODULES

Module Type Series	Module Size, mm	Active Area (A/A), mm	Color	Resolution	Size	Backlight	Built-In Controller	Page
	WxHxT	WxH				LED		
YTS240DLAC-03-100N	42.72x59.46x3.1	36.72x48.96	262K	240(RGB)x320	2.4"	▼	HX8347-A	86-87
YTS240DLAC-03-100T	42.72x59.46x4.2	36.72x48.96	262K	240(RGB)x320	2.4"	▼	HX8347-A	88-89
YTS240DLAG-01-102N	42.72x60.26x2.55	36.72x48.96	262K	240(RGB)x320	2.4"	▼	ILI9325D	90-91
YTS280DLAC-03-200N	50x69.2x2.85	44.2x58.6	262K	240(RGB)x320	2.8"	▼	HX8347-A01	92-93
YTS350ELAK-01-100T	77.80x64.5x4.1	70.08x52.56	16M	320(RGB)x240	3.5"	▼	HY8238-D	94-95
YTS350ELAK-01-100N	77.8x64.5x3.04	70.08x52.56	16M	320(RGB)x240	3.5"	▼	HX8238-D	96-97
YTS350ELAJ-01-100T	77.8x64.5x4.04	70.08x52.56	262K	320(RGB)x240	3.5"	▼	SSD2119	98-99
YTC430ILAC-01-100T	105.5x67.2x4.9	95.04x53.86	16M	480(RGB)x272	4.3"	▼ High Brightness	HX8257	100-101
YTS570ELAA-01-100T	126x101.55x6.9	115.2x86.4	16M	320(RGB)x240	5.7"	▼	HX8218&HX8615	102-103
YTS700RLAB-01-100N	165x104.44x5.2	152.4x91.44	16M	800(RGB)x480	7"	▼	HX8262&HX8678	104-105
YTS700RLAB-01-100T	165x104.44x6.6	152.4x91.44	16M	800(RGB)x480	7"	▼	HX8262&HX8678	106-107
YTS700RLAB-02-103N	166.6x109.4x10.0	152.4x91.44	16M	800(RGB)x480	7"	▼ High Brightness	HX8262&HX8678	108-109
YTS800SLAA-01-100T	183x141x7	162x121.5	16M	800(RGB)x600	8"	▼	---	110-111

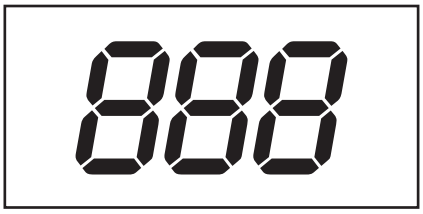
BASIC SPECIFICATION

LCD-PANEL

TYPE OF DISPLAY

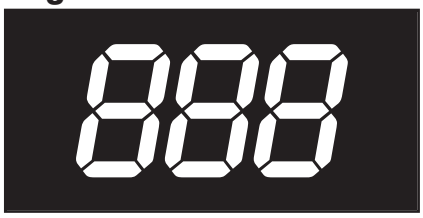
TN Type

Positive mode



It s necessary to use type under ambient light condition.

Negative mode



Negative type is most applicable for backlighting system and is capable of multi-color displaying.

STN Type

Yellow Mode: Dark blue segment on yellow-green background.

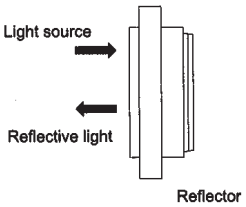
Blue Mode: White segment on blue background.

Grey Mode: Nearly black and white display with the combination of yellow mode STN and polarizer.

B/W Mode: Film compensated STN, black and white display

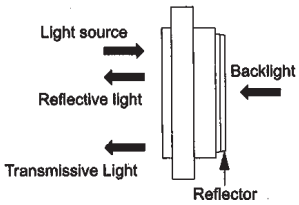
LIGHTING METHODS

Reflective Type



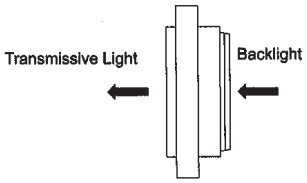
.It is necessary to use type under ambient light condition.

Transflective Type



.Ambient light is taken the outside during day and a back-light is used in the dark.

Transmissive Type

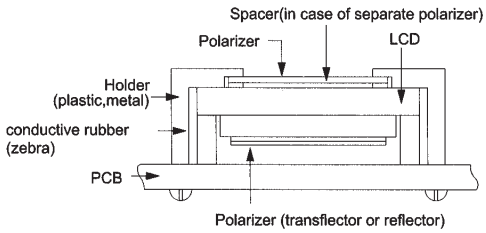


A back light is always used.

CONNECTOR AND LCD MOUNTING METHODS

The following connectors are available for connecting LCD to the drive circuit.

Rubber Connector



- Structure: Altemate lamination of conductive rubber and insulating rubber.
- Connecting method: Mechanical compression.
- Pitch: min. 0.3 mm

- Easy to assembly.
- Adopted for many years.
- Apllicable even to narrow pads.
- Printed circuit boards need gold plating or graphite coating.

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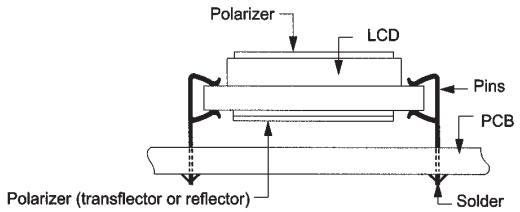
All specifications subject to change without notice.

BASIC SPECIFICATION

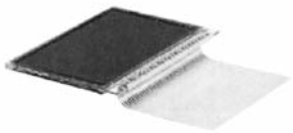
Pin Connector

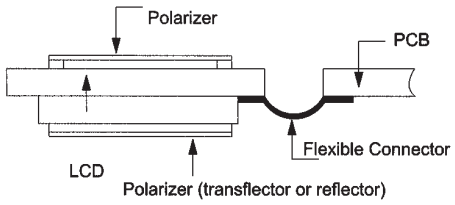


- Structure: Metal pins fit onto the panel terminal pad.
- Connecting method: Soldering.
- Pitch: 1.5, 1.8, 2.0, 2.54 mm

- Suitable for small production runs.

Flexible Connector





- Structure: Film with electroconductive thin film or printed graphite.
- Connecting method: Heat and pressure fitting, soldering or machanical compression.
- Pitch: Heat Seal: min. 0.4 mm; Soldering: min. 0.8 mm.

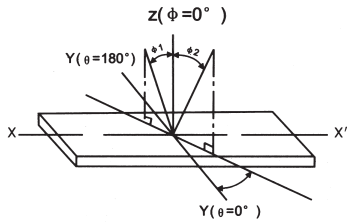
- Resin on connecting point.
- Thin structure can be achieved.
- Possible to bend.
- Free trimming possible.

ELECTRO-OPTICAL CHARACTERISTICS

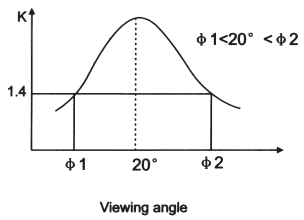
STN TYPE

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Viewing angle	Φ2−Φ1	K=2.0	60	-	-	deg.	1.2
Contrast ratio	K	Φ = 20° Θ = 0	3	10	-	-	3
Response time (rise)	t_r	Φ = 20° Θ = 0	-	200	250	ms	4 4
Response time (fall)	t_f	Φ = 20° Θ = 0	-	200	250	ms	4 4

NOTE 1. Definition of Angle Θ and Φ

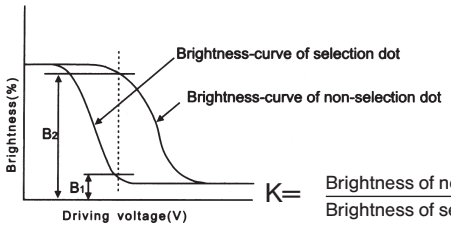


NOTE 2. Definition of Viewing Angle Θ1 and Φ2



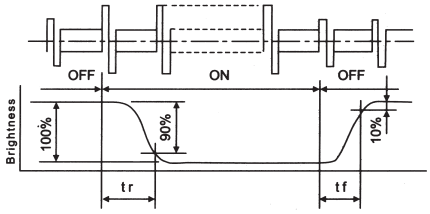
BASIC SPECIFICATION

NOTE 3. Definition of Contrast 'K'



$$K = \frac{\text{Brightness of non-selection dot } (B_2)}{\text{Brightness of selection dot } (B_1)}$$

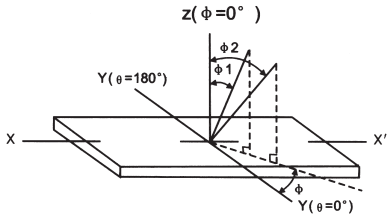
NOTE 4. Definition of Optical Response



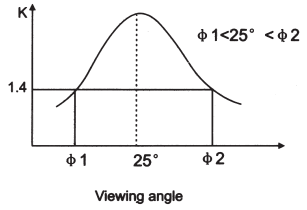
TN TYPE

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Viewing angle	Φ2−Φ1	K=1.4	20	-	-	deg.	1.2
Contrast ratio	K	Φ = 25° Θ = 0	-	3	-	-	3
Response time (rise)	t_r	Φ = 25° Θ = 0	-	150	250	ms	4
Response time (fall)	t_f	Φ = 25° Θ = 0	-	150	250	ms	4

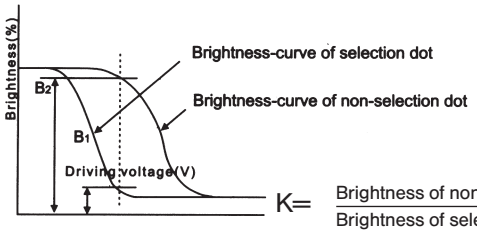
NOTE 1. Definition of Angle Θ and Φ



NOTE 2. Definition of Viewing Angle Θ1 and Φ2

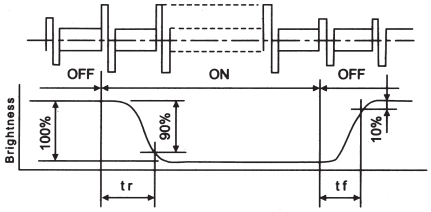


NOTE 3. Definition of Contrast 'K'



$$K = \frac{\text{Brightness of non-selection dot } (B_2)}{\text{Brightness of selection dot } (B_1)}$$

NOTE 4. Definition of Optical Response



HANDLING LCD PANEL AND MODULE

LCD PANELS are composed of glass and polarizer. Pay attention for:

- Please keep the temperture within specified range for use and storage. Polarization degradation, buble generation or polarizer peel-off may occur with high temperature and high humidity.
- Don´t touch, push or rub the exposed polarizers with anything harder than an HB pencil lead.
- When the display surface becomes dusty, wipe gently with absorbent cotton or other soft material soaked in alcohol. Don´t scrub hard in order to avoid damaging the display surface.
- Wipe off saliva or water drops immediately. Contacting water over a long period of time may cause deformation or color fading.
- After products are tested at low temperatures they must be warmed up in container before they contact room temperature air.
- Don´t put or attach anything on the display area in order to avoid leaving marks on.
- As glass is fragile, it tends to become chipped during handling especially on the edges. Please avoid dropping or jarring.

Storage of LCDs for some years:

- Store them in a dark place, don´t expose to sunlight or fluorescent light. Keep the temperature between 0°C and +35°C.
- The polarizer surface shouldn´t contact any other objects. Please store LCDs in the container in which they were shipped.

Environmental conditions:

- **Humidity** - observe the following conditions both in storage and operation:
  - Ta < +40°C 85%RH or less (Ta - ambient temperature)
  - Ta ≥ +40°C below max. absolute humidity of +40°C 85%RH
- **Exposure to high humidity and temperature:**
  - Don´t leave them for more than 160 hrs. at +60°C
  - Shouldn´t be left for more than 48 hrs. at -20°C.

LCD MODULES Handling:

- Don´t after modify or change the shape of the tab on the metal frame.
- Don´t make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- Don´t damage or modify the pattern wiring on the printed circuit board.
- Absolutely don´t modify the zebra strip (conductive rubber) or touch it with another object.
- Expect for soldering the interface, don´t make any alterations or modifications with a soldering iron.
- Don´t drop, bend or twist LCD Module.

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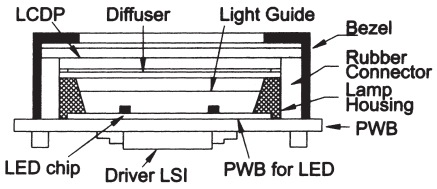
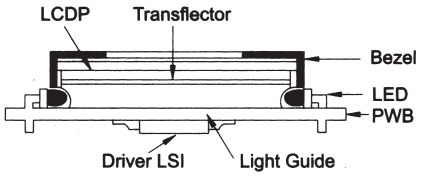
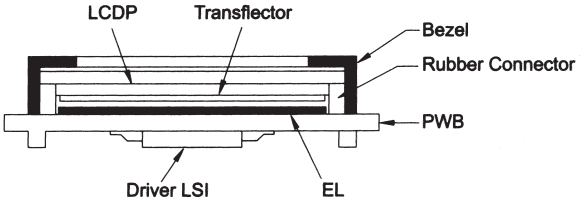
BASIC SPECIFICATION

BACKLIGHT CHARACTERISTICS

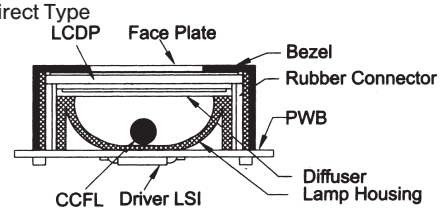
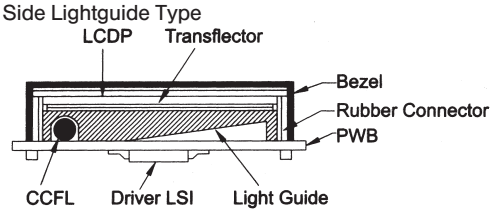
LED BACKLIGHT

	DIRECT TYPE	SIDE LIGHTGUIDE TYPE
ADVANTAGE	■ DC Signal Operating ■ Long Life Time ■ Wide Useful Driving Temperature ■ Various Color ■ High Brightness	■ DC Signal Operating ■ Long Life Time ■ Wide Useful Driving Temperature ■ Compactness (Thin & Flat)
STRUCTURE	Direct Type 	Side Lightguide Type 
LUMINOUS COLOR	Yellow/Green, Red, Amber	
DRIVING VOLTAGE	DC 4V ~ 8	
THICKNESS OF HOUSING UNIT MIN.	Direct Type: 5.0 mm	Side Type: 1.0 mm
LIFE TIME	50.000 hours	

EL BACKLIGHT

ADVANTAGE	■ Compactness (Thin & Flat) ■ High Uniformity	■ High Uniformity ■ Easy to Design
STRUCTURE		
LUMINOUS COLOR	White, Blue/Green	
DRIVING VOLTAGE	AC 100V ~ 130V, 400 Hz ~ 1 KHz, (DC/AC Inverter is necessary)	
THICKNESS OF HOUSING UNIT MIN.	0.3 mm	
LIFE TIME	2.000 ~ 50.000 hours	

CCFL BACKLIGHT

ADVANTAGE	■ High Brightness ■ High Uniformity	■ Easy to Design Large Size ■ Useful to Color LCD
STRUCTURE	Direct Type 	Side Lightguide Type 
LUMINOUS COLOR	White	
DRIVING VOLTAGE	AC 200V ~ 400V, 30 Hz ~ 50 Hz, (DC/AC Inverter is necessary)	
THICKNESS OF HOUSING UNIT MIN.	Direct Type: 10.0 mm	Side Type: 3.5 mm
LIFE TIME	10.000 ~ 20.000 hours	

BASIC SPECIFICATION

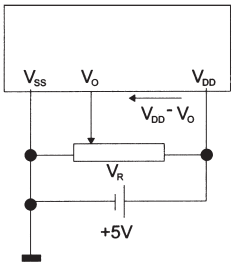
TEMPERATURE CHARACTERISTICS

MODEL		OPERATING TEMP.	STORAGE TEMP.
TN	STANDARD	0 °C ~ + 50 °C	- 10 °C ~ + 60 °C
	HIGH RELIABILITY	- 10 °C ~ + 60 °C	- 30 °C ~ + 85 °C
STN	STANDARD	0 °C ~ + 50 °C	- 10 °C ~ + 60 °C
	HIGH RELIABILITY	- 10 °C ~ + 60 °C	- 30 °C ~ + 85 °C
FSTN (BLACK & WHITE)	STANDARD	0 °C ~ + 50 °C	- 10 °C ~ + 60 °C
	HIGH RELIABILITY	- 10 °C ~ + 60 °C	- 30 °C ~ + 85 °C

Except Backlight Unit.

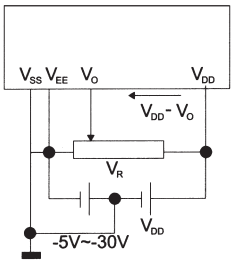
POWER SUPPLY SCHEMATICS

SINGLE SOURCE



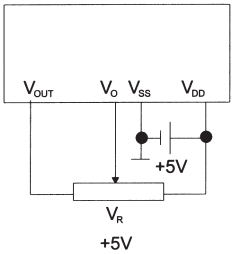
V_{DD} - V_O: LCD Driving Voltage
V_R: 10k - 20k

DOUBLE SOURCE



V_{DD} - V_O: LCD Driving Voltage
V_R: 10k - 20k

NEGATIVE POWER SUPPLIER INCLUDED



V_{DD} - V_O: LCD Driving Voltage
V_R: 10k - 20k

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