

Display Products Group
LCD Modules

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Introduction

Hitachi is a leading global developer and manufacturer of liquid crystal displays. Hitachi is justifiably proud of an established LCD heritage. Over 30 years ago, as an early pioneer of LCD technology, Hitachi developed and produced simple character and dot matrix displays. More recently the development and introduction of in-plane switching (IPS) wide viewing angle technology has reiterated Hitachi's commitment to providing display excellence. An annual investment of €130m in research and development will ensure that Hitachi remains at the forefront of evolving and ground breaking LCD technology.

Dedicated manufacturing and production facilities in Mobara, Japan and Kaohsiung, Taiwan ensure that continuity of supply can be maintained during extreme market fluctuations. In house design, production and procurement of key components such as LCD glass, colour filters, LCD drivers and backlights, allows Hitachi to provide continual enhancement to an extensive range of high quality and performance optimised display solutions.

In 2007 Kaohsiung Hitachi Electronics (KHE) proudly celebrated 40 years of electronic components and LCD production. During which 30 years extensive knowledge and experience in designing and manufacturing LCD modules has been acquired.



European Headquarters,
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Kaohsiung,
Hitachi Electronics Co., Ltd.

Continuously evolving LCD technology

Evolution of In-Plane-Switching (IPS)

One of the many areas of innovation that Hitachi has been recognised for during the last 30 years is the evolution of In-Plane-Switching (IPS) technology. Developed and released by Hitachi Displays, Ltd. in 1996, IPS was the first LCD technology to provide outstanding picture quality particularly when viewed at any viewing angle. IPS technology enables exceptional colour saturation, colour stability, contrast and black levels with a 176° wide vertical and horizontal viewing angle.

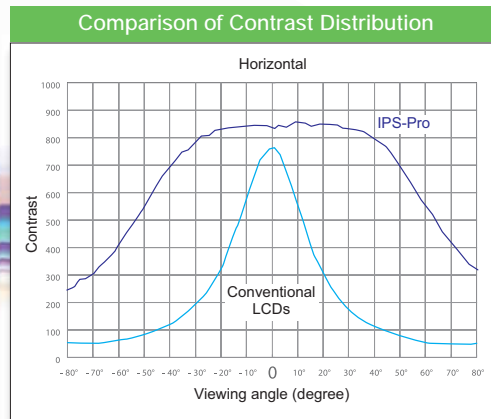
IPS has since evolved into Super-IPS, Advanced-Super IPS and more recently IPS-Pro. Hitachi's continuous improvement of IPS LCD technology now provides the best LCD solution on the market for the requirements of professional, high end and multi-user imaging.

The main benefits of IPS technology:

- wider viewing angles
- deeper black levels
- higher brightness
- excellent contrast

IPS LCDs are now being extensively used by blue chip multinationals in the manufacture of high performance mobile phones, monitors and televisions. Industrial markets and mainstream customers can now also benefit from the features of in-plane-switching technology as further Hitachi IPS displays become more widely available.

The diagram below illustrates the improved viewing angle.



"IPS-Pro has a much higher and more stable image performance over viewing angle than any other TFT technology."

Product Type	Screen Size	Resolution	IPS	TFT	STN	Standard Format (4:3)	Wide Format	CFL Backlight	LED Backlight	CMOS Interface	LVDS Interface	262K Colours	16M Colours	Wide Temperature Range	Transmissive	Transflective	Touchpanel Option
High End TFT																	
TX31D58	12"	800 x 480	■				■	■		■			■		■		
TX43D55	17"	1280 x 768	■				■	■			■		■	■	■		
TX43D57	17"	1280 x 1024	■			■		■			■		■		■		
TX54D13	21.3"	1600 x 1200	■			■		■			■		■		■		
Wide Format TFT																	
TX18	7"	800 x 480		■			■	■		■		■		■	■		■
TX20	8"	800 x 480		■			■	■		■		■		■	■		■
TX23D12	9"	800 x 480	■				■	■		■		■		■	■		■
TX23D55	9"	800 x 480		■			■	■		■		■		■	■		■
TX31D55	12"	800 x 480		■			■	■		■		■		■	■		■
TX31D58	12"	800 x 480	■				■	■		■		■	■	■	■		■
TX39	15.4"	1280 x 800		■			■	■			■		■	■	■		■
TX43D55	17"	1280 x 768	■				■	■			■		■	■	■		■
Standard TFT																	
TX07	2.7"	240 x 320		■				■	■			■		■	■		■
TX09	3.5"	320 x 240		■		■		■	■			■		■	■		■
TX14	5.7"	320 x 240		■		■		■	■			■		■	■		■
TX14D14	5.7"	640 x 480		■		■		■	■			■		■	■		■
TX16	6.2"	640 x 240		■		■		■	■			■		■	■		■
TX26	10.4"	640 x 480		■		■		■	■			■		■	■		■
TX31	12.1"	800 x 600		■		■		■		■		■	■	■	■		■
TX38	15"	1024 x 768		■		■		■		■		■	■	■	■		■
¼ VGA STN																	
SP060	2.6"	320 x 240			■	■			■	■						■	■
SP100	3.8"	320 x 240			■	■			■	■				■	■		■
SP120	4.7"	320 x 240			■	■		■	■	■				■	■		■
SP140	5.7"	320 x 240			■	■		■	■	■				■	■		■
SX140	5.7"	320 x 240			■	■		■	■	■				■	■		■
Standard STN																	
SP12N	4.8"	256 x 64			■		■	■		■							
LMG7420	5.1"	240 x 128			■		■	■		■							
SP14N	5.1"	240 x 128			■		■	■		■				■	■		■
SX16H	6.2"	640 x 240			■		■	■		■				■	■		■
SP24V	9.4"	640 x 480			■	■		■		■				■	■		■
LMG7550	10.4"	640 x 480			■	■		■		■				■	■		■

High End TFT Displays

Migrating the superior performance of IPS technology to industrial LCD displays, IPS-Pro the latest evolution of Hitachi's In-Plane Switching technology, provides a highly stable colour image from any viewing angle. These new display products offer excellent colour saturation with very high contrast ratios. The exceptional black levels combined with improved transmittance helps to provide contrast ratios of up to 1000:1. These characteristics also mean that high brightness can be achieved without increasing the power consumption of the backlight.

Applications

Professional applications and high end systems demand the best possible optical performance. Hitachi's IPS displays can provide the level of display performance demanded by critical monitoring and analysis applications and multi-user environments.

TX43D55VM0BAA

- 17" WXGA 1280 x 768
- IPS-Pro (In-Plane-Switching)
- 176° wide viewing angle

TX43D57VC0CAA

- 17" SXGA 1280 x 1024
- IPS-Pro (In-Plane-Switching)
- 176° wide viewing angle

TX54D13VC0CAA

- 21.3" UXGA 1600 x 1200
- IPS-Pro (In-Plane Switching)
- 176° wide viewing angle



Size	Resolution	Part Number	Technology	Mode	Dimensions	Backlight	Touchscreen Version	Brightness	Contrast	Feature
12"	800 x 480	TX31D58VMOCAA	IPS Pro	Transmissive	312.35 x 185.8 x 13	CFL	n/a	300 cd/m ²	500:1	IPS Pro (176 degree viewing angle)
17"	1280 x 768	TX43D55VMOBAA	IPS Pro	Transmissive	400 x 258 x 22	CFL	n/a	350 cd/m ²	800:1	IPS Pro (176 degree viewing angle)
17"	1280 x 1024	TX43D57VCOCAA	IPS Pro	Transmissive	368 x 306 x 20.3	CFL	n/a	270 cd/m ²	1000:1	IPS Pro (176 degree viewing angle)
21.3"	1600 x 1200	TX54D13VCOCAA	IPS Pro	Transmissive	460.6 x 362 x 25	CFL	n/a	300 cd/m ²	900:1	IPS Pro (176 degree viewing angle)

Applications

- professional monitors
- diagnostic systems
- public information
- medical imaging
- online terminals
- broadcast
- signage



Wide Format TFT Displays

Traditional TFT technology and the continued migration of IPS technology to industrial and commercial displays enables Hitachi to offer an expanding portfolio of wide format TFT display solutions. Market leading optical performance, long term availability and continuity of supply are ensured.

Applications

Wide format TFT displays will find use in many front panel, instrument console and control system designs and applications. The mechanical footprint of the wide format TFT displays is ideally suited for human machine interface applications. Information, data and graphics can be concisely represented and displayed.

TX18D57VM2BAA

- 7.0" WVGA 800 x 480
- high brightness 600cd/m²
- -30° to +80° wide temperature range

TX23D12VM0CAA

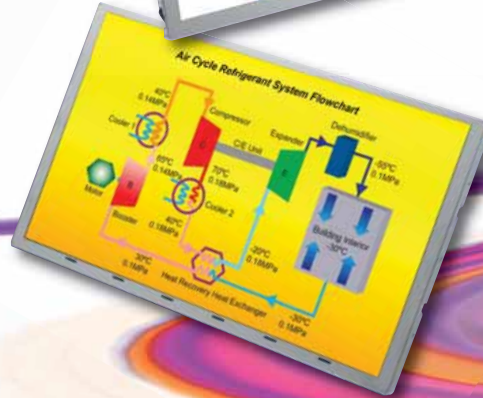
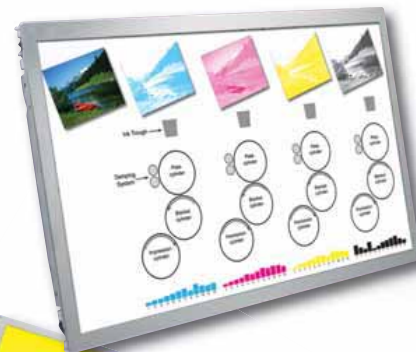
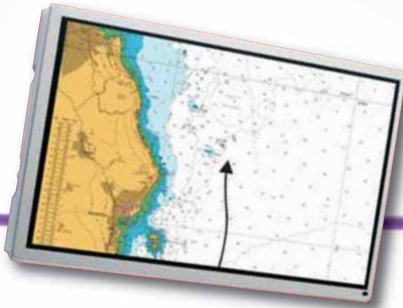
- 9.0" WVGA 800 x 480
- IPS (In-Plane-Switching)
- 176° wide viewing angle

TX31D58VM0CAA

- 12.0" WVGA 800 x 480
- IPS-Pro (In-Plane-Switching)
- 176° wide viewing angle

TX43D55VM0BAA

- 17.0" WXGA 1280 x 768
- IPS-Pro (In-Plane-Switching)
- 176° wide viewing angle



Size	Resolution	Part Number	Technology	Mode	Dimensions	Backlight	Touchscreen Version	Brightness	Contrast	Features
7.0"	800 x 480	TX18D16VM1CAA	TFT	Transmissive	165 x 106 x 10.5	CFL	TX18D16VM1CBA	350 cd/m ²	200:1	High brightness, wide viewing angle
7.0"	800 x 480	TX18D16VM1CAB	TFT	Transmissive	165 x 106 x 10.5	CFL	TX18D16VM1CBB	600 cd/m ²	200:1	Wide viewing angle, super high brightness
7.0"	800 x 480	TX18D57VM2BAA	TFT	Transmissive	167.8 x 108.6 x 15.6	CFL	n/a	600 cd/m ²	450:1	Wide temp range (-30 to +80 degrees)
8.0"	800 x 480	TX20D16VM2BAA	TFT	Transmissive	189 x 120 x 10.5	CFL	TX20D16VM2BBA	350 cd/m ²	200:1	High brightness, wide viewing angle
9.0"	800 x 480	TX23D12VM0CAA	IPS	Transmissive	236 x 135 x 12.5	CFL	TX23D12VM0CBA	300 cd/m ²	400:1	IPS (176 degree view angle)
9.0"	800 x 480	TX23D55VM2BAA	TFT	Transmissive	216.5 x 135 x 14.5	CFL	TX23D55VM2BPA	450 cd/m ²	350:1	Wide temp range (-20 to +70 degrees)
12"	800 x 480	TX31D55VM2BAA	TFT	Transmissive	283 x 173.8 x 12.4	CFL	TX31D55VM2BPA	350 cd/m ²	350:1	Extended temperature range
12"	800 x 480	TX31D58VM0CAA	IPS Pro	Transmissive	312.35 x 185.8 x 13	CFL	n/a	300 cd/m ²	500:1	IPS Pro (176 degree viewing angle)
15.4"	1280 x 800	TX39D55VM1BAA	TFT	transmissive	356.8 x 238 x 15	CFL	n/a	450 cd/m ²	500:1	High brightness, LVDS interface, WTR
17"	1280 x 768	TX43D55VM0BAA	IPS Pro	Transmissive	400 x 258 x 22	CFL	n/a	350 cd/m ²	800:1	IPS Pro (176 degree viewing angle)

Applications

- passenger infotainment terminals
- building management systems
- measurement and monitoring
- industrial control
- instrumentation
- industrial PC
- automotive
- gaming
- marine



Display Excellence
www.hitachi-displays-eu.com

Standard Format TFT Displays

As a proven TFT technology leader Hitachi has been a major developer and manufacturer of colour TFT displays for almost 20 years. A wide range of standard colour TFTs from 2.7" to 15" provide inherent quality and exceptional optical performance. Specifications and interfaces are optimised for industrial markets and ease of integration.

Applications

A vast and wide range of applications are particularly suited to the use of Hitachi colour TFT displays. Small, low power displays are particularly suitable for compact, portable, battery powered equipment, media players and mobile navigation systems. Medium size colour TFTs provide ideal choices for security monitoring, portable terminals and process control while larger sizes are particularly suited for online terminals, monitors and epos applications.

TX07D09VM1CBB

- 2.7" ¼ VGA 240 x 320
- White LED backlight
- -20° to +70° operating temperature range

TX09D40VM3CBA

- 3.5" ¼ VGA 320 x 240
- White LED backlight
- TMR (transmissive with micro-reflectance)

TX14D14VM1BAA

- 5.7" VGA 640 x 480
- Image rotation feature
- Compact mechanical footprint
- Mechanically compatible with 5.7" ¼ VGA



Size	Resolution	Part Number	Technology	Mode	Dimensions	Backlight	Touchscreen Version	Brightness	Contrast	Feature
2.7"	240 x 320	TX07D09VM1CBB	TFT	Transmissive	50.5 x 68.6 x 2.6	White LED	TX07D09VM1CAB	420 cd/m ²	300:1	built in timing controller, high brightness
3.5"	240 x 320	TX09D70VM1CBA	TFT	Transmissive	64 x 86 x 4	White LED	TX09D70VM1CEA	400 cd/m ²	300:1	high brightness, TMR
3.5"	240 x 320	TX09D70VM1CDA	TFT	Transmissive	64 x 86 x 6.5	White LED	TX09D70VM1CCA	400 cd/m ²	300:1	high brightness, built in timing controller, TMR
3.5"	320 x 240	TX09D40VM3CBA	TFT	Transmissive	86 x 64 x 4	White LED	TX09D40VM3CAA	430 cd/m ²	300:1	High brightness, TMR, built in timing controller
5.7"	320 x 240	TX14D11VM1CBA	TFT	Transmissive	167 x 109 x 10	CFL	TX14D11VM1CAA	350 cd/m ²	350:1	50K hour CFL, DC/DC, SP/SX14Q compatible
5.7"	320 x 240	TX14D11VM1CBB	TFT	Transmissive	167 x 109 x 9.2	CFL	TX14D11VM1CAB	600 cd/m ²	350:1	Super high brightness
5.7"	320 x 240	TX14D12VM1CBA	TFT	Transmissive	131 x 102 x 10	CFL	TX14D12VM1CAA	350 cd/m ²	350:1	Compact mechanical outline
5.7"	320 x 240	TX14D12VM1CBB	TFT	Transmissive	131 x 102 x 10	CFL	TX14D12VM1CAB	600 cd/m ²	350:1	Compact mechanical outline, super high brightness
5.7"	640 x 480	TX14D14VM1BAA	TFT	Transmissive	131 x 102 x 12	CFL	TX14D14VM1BBA	350 cd/m ²	350:1	Compact outline
6.2"	640 x 240	TX16D11VM2CBA	TFT	Transmissive	173 x 70 x 7	CFL	TX16D11VM2CAA	350 cd/m ²	200:1	High brightness, DC/DC, SX16 compatible
10.4"	640 x 480	TX26D55VM1CAA	TFT	Transmissive	243 x 181.6 x 12.5	CFL	n/a	350 cd/m ²	500:1	High brightness, Wide temperature range
12.1"	800 x 600	TX31D56VM2AAA	TFT	Transmissive	280 x 210 x 13	CFL	n/a	400 cd/m ²	500:1	High brightness, LVDS interface, WTR
15"	1024 x 768	TX38D55VM1AAA	TFT	Transmissive	330 x 260 x 17	CFL	n/a	350 cd/m ²	500:1	LVDS interface, Wide temperature range

Applications

- navigation systems
- portable terminals
- home automation
- security systems
- online terminals
- process control
- feature phones
- media players
- epos

1/4 VGA STN Displays

Hitachi's 1/4 VGA product families have been designed, developed and manufactured for over 20 years. Now a de-facto industry standard the 1/4 VGA product line up is comprehensive and varied. Continuous and ongoing product enhancement ensures full backward compatibility, improved optical performance and reduced power requirements. Hitachi is also in the enviable position of being able to supply monochrome STN, colour STN and colour TFT displays with the same mechanical footprint.

Applications

Products and applications can be designed and developed with the knowledge and confidence that a Hitachi 1/4 VGA display will be available for the entire product lifetime. An extensive product family providing exceptional optical performance ensure a wide range of varied applications can use a Hitachi 1/4 VGA display solution.

SP14Q011-A1

- 5.7" 1/4 VGA 320 x 240
- Monochrome STN
- White LED backlight
- 'Compact' mechanical footprint
- Mechanically compatible with colour TFT

SP14Q003-A

- 5.7" 1/4 VGA 320 x 240
- Blue mode STN
- White LED backlight
- 'Classic' mechanical footprint
- Mechanically compatible with colour STN and colour TFT

SX14Q009

- 5.7" 1/4 VGA 320 x 240
- Colour STN
- White LED backlight
- 'Classic' mechanical footprint
- Mechanically compatible with monochrome STN and colour TFT



Size	Resolution	Part Number	Technology	Mode	Dimensions	Backlight	Touchscreen Version	Brightness	Contrast	Features
2.6"	320 x 240	SP06Q002-T	Black/White Film STN	Transflective	67.1 x 55.8 x 3.8	Amber LED	SP06Q002-TZA	7 cd/m ²	5:1	Sunlight readable, Compact mechanical outline
3.8"	240 x 320	SP10Q003-T	Black/White Film STN	Transflective	71.5 x 92.1 x 7.9	White LED	n/a	5 cd/m ²	12:1	Touchscreen, Portrait mode
3.8"	240 x 320	SP10Q005-T	Black/White Film STN	Transflective	71.5 x 92.1 x 7.9	White LED	n/a	5 cd/m ²	12:1	Portrait mode
3.8"	320 x 240	SP10Q010	Black/White Film STN	Transmissive	94.7 x 73.3 x 5.5	White LED	SP10Q010-ZZA	110 cd/m ²	20:1	White LED, High brightness, WTR,
3.8"	320 x 240	SP10Q010-T	Black/White Film STN	Transflective	94.7 x 73.3 x 5.5	White LED	SP10Q010-TZA	60 cd/m ²	5:1	White LED, Sunlight readable, WTR
4.7"	320 x 240	LMG7520RPFC	Black/White Film STN	Transmissive	129.6 x 92.6 x 7.5	CFL	n/a	100 cd/m ²	20:1	
4.7"	320 x 240	LMG7525RPFF	Black/White Film STN	Transflective	129.6 x 92.6 x 7.5	CFL	n/a	25 cd/m ²	5:1	Sunlight readable
4.7"	320 x 240	SP12001L6ALZZ	Black/White Film STN	Transmissive	129.6 x 92.6 x 7.5	White LED	On request	60 cd/m ²	20:1	LMG7520RPFC compatible
4.7"	320 x 240	ST12001L6ALZZ	Black/White Film STN	Transflective	129.6 x 92.6 x 7.5	White LED	On request	60 cd/m ²	5:1	Sunlight readable, LMG7525RPFF compatible
5.7"	320 x 240	SP14Q002-T	Black/White Film STN	Transflective	167 x 109 x 10	CFL	On request	60 cd/m ²	5:1	Sunlight readable
5.7"	320 x 240	SP14Q003-A	Blue/White STN	Transmissive	167 x 109 x 10	White LED	SP14Q003-AZA	200 cd/m ²	6:1	WTR
5.7"	320 x 240	SP14Q003-C1	Blue/White STN	Transmissive	167 x 109 x 10	CFL	SP14Q003-C1A	100 cd/m ²	6:1	50K hour CFL, Blue mode, WTR
5.7"	320 x 240	SP14Q005	Black/White Film STN	Transmissive	167 x 109 x 10	CFL	SP14Q005-ZZA	220 cd/m ²	25:1	50K hour CFL, High brightness, WTR
5.7"	320 x 240	SP14Q006	Black/White Film STN	Transmissive	167 x 109 x 10	White LED	SP14Q006-ZZA	150 cd/m ²	25:1	White LED, High brightness, WTR
5.7"	320 x 240	SP14Q006-T	Black/White Film STN	Transflective	167 x 109 x 10	White LED	SP14Q006-TZA	60 cd/m ²	5:1	White LED, Sunlight readable, WTR
5.7"	320 x 240	SP14Q011-A1	Black/White Film STN	Transmissive	131 x 102 x 10	White LED	SP14Q011-A1A	220 cd/m ²	25:1	Compact outline, high brightness
5.7"	320 x 240	SP14Q011-T	Black/White Film STN	Transflective	131 x 102 x 10	White LED	SP14Q011-T1A	60 cd/m ²	5:1	White LED, Sunlight readable
5.7"	320 x 240	SX14Q004	Colour STN	Transmissive	167 x 109 x 10	CFL	SX14Q004-ZZA	200 cd/m ²	40:1	50K hour CFL, DC/DC, wide viewing angle

Applications

- industrial process control
- measurement equipment
- building automation
- domestic appliance
- epos



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Standard STN

Hitachi's LCD heritage has been established on the foundations of providing displays that provide high quality, exceptional reliability and longevity. These traditional values are as true today and they were 30 years ago when the first Hitachi STN displays were designed and manufactured. Hitachi STN LCDs can provide simple, easy to use and cost effective display solutions.

Applications

The Hitachi range of standard STN displays is effective and simple to use. Simple graphical user interfaces for instrumentation, process control, security systems and measurement equipment can be designed and implemented. Some displays feature integrated display controllers and memory which allow 8-bit microcontrollers to be used to enable cost effective user interfaces and systems to be designed.

SP12N002

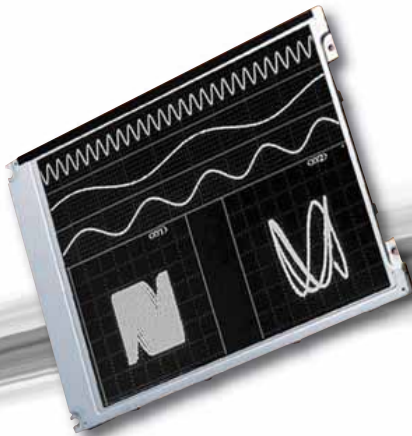
- 4.8" 256 x 64
- Monochrome STN
- Integrated Toshiba T6963C display controller

SP14N01L6VLCZ

- 5.1" 240 x 128
- White LED backlight
- DC/DC converter on board
- Integrated Toshiba T6963C display controller

SP24V001

- 9.4" VGA 640 x 480
- Monochrome STN
- 50K hour CFL
- Industry standard footprint



Size	Resolution	Part Number	Technology	Mode	Dimensions	Backlight	Touchscreen Version	Brightness	Contrast	Features
4.8"	256 x 64	SP12N001-T	Blue/Grey STN	Transflective	160 x 68 x 9.5	EL	n/a	10 cd/m ²	3:1	Sanyo LC7981, LMG6381QHGE replacement
4.8"	256 x 64	SP12N002	Black/White Film STN	Transmissive	160 x 68 x 12	CFL	n/a	90 cd/m ²	20:1	Toshiba T6963C, LMG7380QHFC replacement
5.1"	240 x 128	LMG7420PLFC-X	Black/White Film STN	Transmissive	159.4 x 101 x 11	CFL	n/a	90 cd/m ²	20:1	Toshiba T6963C, 50K hour CFL
5.1"	240 x 128	SP14N001	Black/White Film STN	Transmissive	159.4 x 101 x 11	CFL	SP14N001-ZZA	150 cd/m ²	20:1	Toshiba T6963C, 50K hour CFL, DC/DC
5.1"	240 x 128	SP14N001-Z1	Black/White Film STN	Transmissive	159.4 x 101 x 11	CFL	SP14N001-Z1A	150 cd/m ²	20:1	Toshiba T6963C, 50K hour CFL
5.1"	240 x 128	SP14N002	Black/White Film STN	Transmissive	159.4 x 101 x 11	CFL	n/a	150 cd/m ²	20:1	Sanyo LC7981, LMG7400PLFC replacement
5.1"	240 x 128	SP14N003	Blue/White STN	Transmissive	159.4 x 101 x 11	CFL	n/a	90 cd/m ²	7:1	Sanyo LC7981, LMG7401PLBC replacement
5.1"	240 x 128	SP14N01L6ALCZ	Black/White Film STN	Transmissive	159.4 x 101 x 11	White LED	SP14N01L6ALCA	150 cd/m ²	20:1	Toshiba T6963C, LMG740PLFC-X compatible
5.1"	240 x 128	SP14N01L6VLCZ	Black/White Film STN	Transmissive	159.4 x 101 x 11	White LED	SP14N01L6VLCA	150 cd/m ²	20:1	Toshiba T6963, DC/DC
6.2"	640 x 240	SX16H006	Colour STN	Transmissive	173 x 70 x 7	CFL	SX16H006-ZZA	110 cd/m ²	30:1	wide viewing angle, DC/DC
9.4"	640 x 480	SP24V001	Black/White Film STN	Transmissive	257.5 x 174 x 7	CFL	SP24V001-ZZA	110 cd/m ²	20:1	50K hour CFL, LMG5278XUFC compatible
9.4"	640 x 480	SP24V001-A	Black/White Film STN	Transmissive	257.5 x 174 x 7	CFL	n/a	110 cd/m ²	20:1	50K hour CFL, Sharp LM64P83L compatible
10.4"	640 x 480	LMG7550XUFC	Black/White Film STN	Transmissive	264 x 183 x 9	CFL	n/a	100 cd/m ²	18:1	

Applications

- graphical user interface
- information terminals
- ticketing systems
- security systems
- instrumentation
- process control
- data loggers
- front panels
- epos

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