NLT Technologies

LCD NEWS

LCD Modules Products Guide

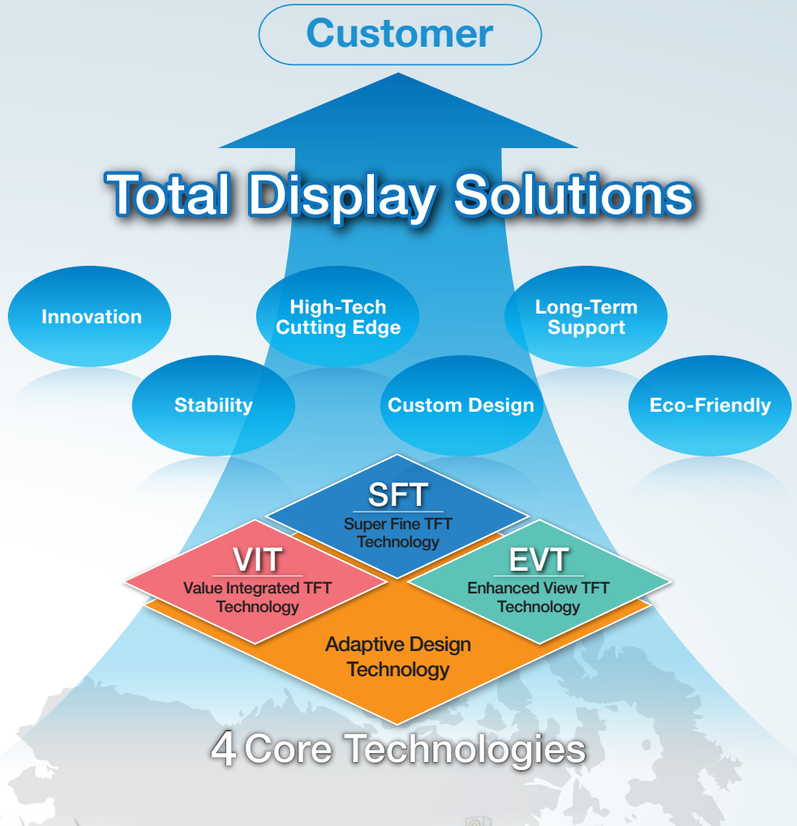
Oct. 2016 vol.23

TIANMA MICRO-ELECTRONICS GROUP

Superior Display Solutions For Customers

NLT Technoloiges, a member of Tianma Micro-electronics Group, has been supplying a variety of high quality display products to customers around the world.
In 1991, NLT Technologies released the first color TFT LCD for laptops in the world.
Since then, as a leading manufacturer of industrial displays, our objective remains the same - to pursue the best possible display solution for our customers.
Keys to our success have been our cutting-edge technologies based upon our four proprietary core technologies and the abundant LCD solutions offered through our global network.

Together with our customers, we create new solutions for new and emerging markets.



NLT QUALITY

NLT Technologies' quality results in superior display solutions

Technology

ONE TO ONE TECHNOLOGY FOR OPTIMAL SOLUTIONS

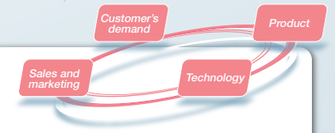
The reliability of NLT's LCD technologies coupled with expertise developed over many years as an LCD supplier, NLT provides optimal LCD solutions to customers. Even post sales, NLT continues to strive to improve the products by carefully reviewing and responding to each technical inquiry they receive.

Support

APPROPRIATE SUPPORT FOR CUSTOMER SUCCESS

NLT Technologies offers a reliable support system, from the design stage to after-sales service.
NLT Technologies responds to various demands required for industrial devices and contributes to the successful deployment of customer's projects.

Possibility



WIDE RANGE OF PRODUCTS FOR GREATER POSSIBILITIES

NLT Technologies continues to enhance its technology through research and development while exploring new display applications with customers. As a result of these activities, various LCD products have been launched.
NLT Technologies introduces LCD products that fulfill customers' demand, for a wide range of products in various environments.

Four Core Technologies

To view sharper and brighter images anytime and anywhere

Super Fine TFT Technology

Continual innovation toward higher image quality.

An outstanding LCD display is characterized by numerous factors: ultra-wide viewing angle, high contrast, high luminance, wide color gamut, high definition. SFT technology improves those factors and enables displays to be viewed from almost any angle.

Proprietary In-Plane Switching Mode
NLT Technologies' improved IPS with unique technology reduces variance in brightness and color when the display is viewed from various angles.

High luminance and wide color gamut
Achieves a wide color gamut that exceeds 70% color gamut of NTSC without sacrificing luminance.

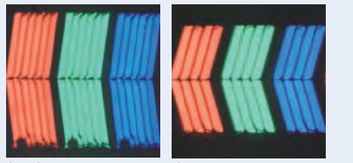
● SFT Liquid Crystal Display ● TN Liquid Crystal Display

*The above images are samples.

For higher image quality — Super Fine TFT2

SFT2 is a new wide viewing angle technology which achieves high aperture ratio of LCD panels developed by NLT Technologies.
By thinning wires on the glass substrate, SFT2 improves aperture ratio over 20% greater than the conventional models. This new technology will be applied to achieve higher LCD performance including lower power consumption, higher density, expansion of color gamut, and so on.

● Comparison of aperture ratio



SFT2 Conventional technology

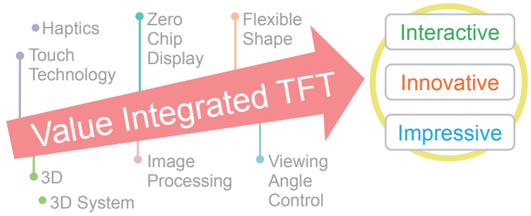
SFT is an abbreviation for Super Fine TFT.
SFT2 is an abbreviation for Super Fine TFT2.

Value Integrated TFT Technology

Higher value-added LCDs open the door to new applications.

The role of the display in today's society is gaining more and more importance. Interactive displays for human machine interface, innovative displays that allow new application designs, impressive displays to catch the eyes …
At NLT Technologies, various display technologies have been developed through extensive product research and development. VIT technology offers novel display options by combining various emerging technologies.

● Image of VIT technology



● High value-added TFT achieved by VIT

PCAP
Quality all-in-one touch panel [P.8]

ColorXcell Technology
Eco-friendly
color reproduction [P.7]

Application Shaped Display
Novel shape of displays [P.7]

HxDP®
Auto-stereoscopic 3D/2D display simultaneously [P.6]

VIT is an abbreviation for Value Integrated TFT.

Enhanced View TFT Technology

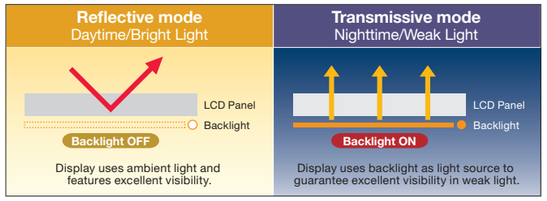
Clear images in any ambient light environment : two technologies available.

Reflective - Enhanced View TFT

Guarantees high-visibility in any ambient light environment.

- In high ambient light the display can be used in reflective mode with the backlight off and uses ambient light as the light source.
- In low-light conditions the display can be used in transmissive mode with the backlight as light source.

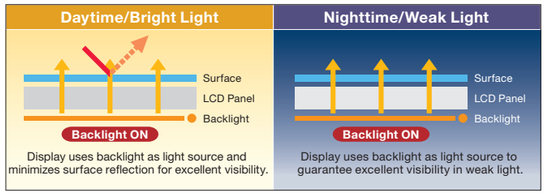
LCDs based on R-EVT are appropriate for use in battery operated applications, used either indoors or outdoors.



Transmissive - Enhanced View TFT

Achieves clear and bright displays even in sunlight.

T-EVT technology uses the backlight as a light source while minimizing the surface reflection of ambient light. LCDs based on T-EVT produce high-contrast images even in bright outdoor light are therefore ideal for use in bright sunlight.

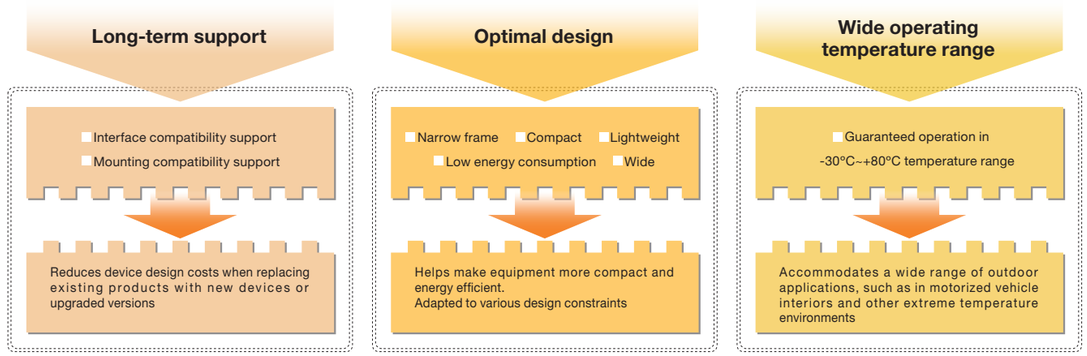


R-EVT is an abbreviation for Reflective-Enhanced View TFT.
T-EVT is an abbreviation for Transmissive-Enhanced View TFT.

Adaptive Design Technology

Ensures our LCDs will meet a wide variety of customer needs.

Industrial LCDs must meet a wide variety of detailed requirements such as module size, interface, power consumption and other factors related to the display's application, usage environment, temperature range and other circumstances unique to the piece of equipment. Adaptive Design technology maximizes image quality and usability in a wide range of applications.



Technology Trend

High Density 3D Display Technology

HxDP® Horizontally x times Density Pixels

Multi-view, High density, Auto-stereoscopic

HxDP is a unique 3D display technology, developed by NLT Technologies, that achieves high-quality 3D viewing without the use of special glasses. Furthermore, HxDP is a multi-viewable auto-stereoscopic display technology that uses a unique pixel alignment to achieve crisp high density 3D images.

Horizontally aligned pixels achieve high image quality

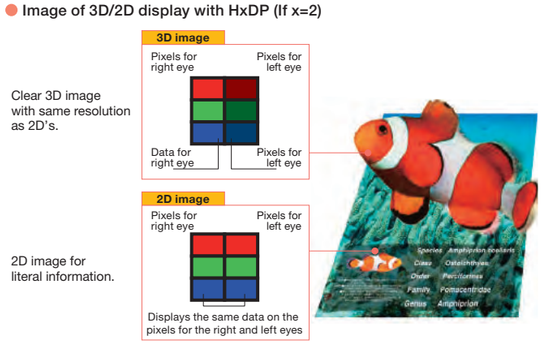
With this technology, pixels are distributed horizontally and divided in plural number(x) as perceptible data for right eye and left eye. As a result, it is possible to provide excellent 3D images without decreasing the resolution.

3D/2D displayed simultaneously

Another significant feature of HxDP technology is its capability to display 3D and 2D images simultaneously on the same screen. With HxDP, more flexible image construction can be achieved because brilliant 3D images and 2D images are displayed simultaneously on the same screen by changing the image-data input.

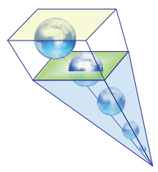
Note: NLT Technologies introduced their proprietary HxDP technology at SID2011

● **Image of 3D/2D display with HxDP (If x=2)**



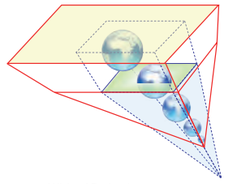
● **Number of view and viewing space**

If x=2



・Deeper and more dynamic 3D image

If x=6



・Wider 3D viewing space
・3D multi-view is available

Caution: If you feel eyestrain or discomfort, please stop using the modules.
※HxDP: Horizontally x times Density Pixels

Innovative Technology

Tactile Display

With NLT Technologies' tactile display, users can perceive displayed information on the display by dragging fingers accross the surface. It allows Multiple-touch so that users can feel different textures such as "rough" or "bumpy" sensations at same time on same display.
Tactile displays are the next-generation interface for displays expanding the possible uses of touch displays in a variety of applications.

ColorXcell Technology

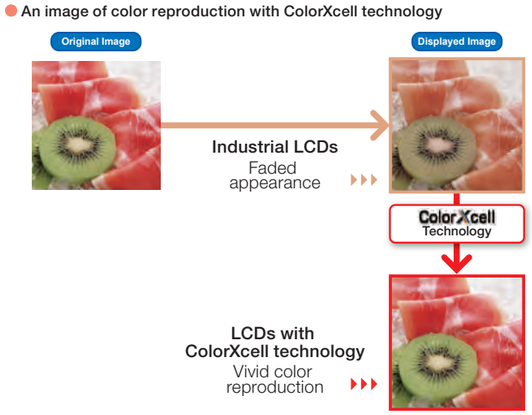
ColorXcell Technology

Achieves high color reproduction with low power

NLT Technologies' proprietary ColorXcell technology enables the reproduction of images that are comparable in color intensity to the original video source without increasing power consumption.
Compared to typical industrial models of NLT Technologies' LCD products, with NLT's ColorXcell technology it is possible to reduce power consumption approximately 30%*1 without loss of image quality. ColorXcell technology is ideal for battery operated portable devices.
ColorXcell technology makes the display more eco-friendly.

*1 Estimate data based on NLT's product 10.4-inch SVGA model.

● **An image of color reproduction with ColorXcell technology**

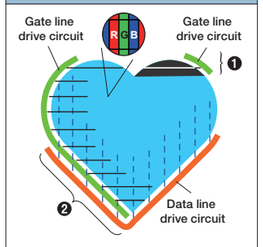


Application Shaped Display Technology

Custom shaped LCD displays Dramatically reduces limitations of display shape design

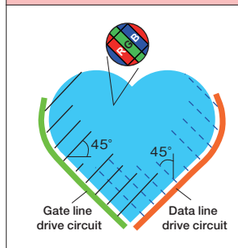
Application Shaped Display technology allows LCD modules to be designed in a wider range of shapes than traditional rectangular LCD modules. The technology minimizes overlaps between gate and data lines, enabling optimal configuration of the pixel array and driver circuitry, allowing flexible display designs for embedded applications.

Conventional Technology



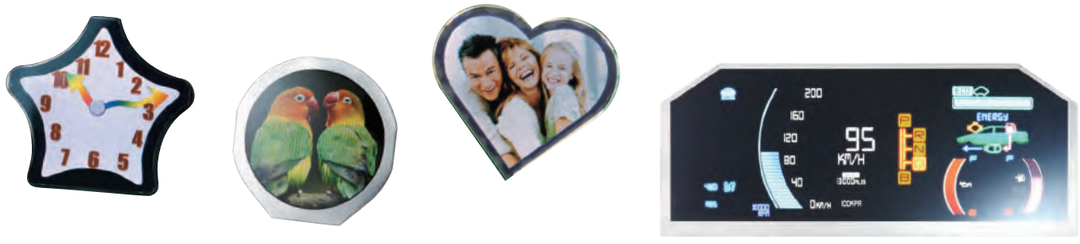
❶ Division of circuit
❷ Overlap of circuit
⇒ The complexity of the circuitry makes it difficult to achieve a narrow frame design.

Application Shaped Display Technology



This technology eliminates the division or overlapping of circuits, simplifying panel structures and making it possible to create narrower frames.

● **Various shaped TFT LCD achieved using Application Shaped Display technology**



Touch Panel Solutions

PCAP display products

View, Touch, and Convey

One-stop solution

NLT Technologies provides factory installed touch panels with touch panel controller included. Thanks to our in-house design and manufacturing capabilities, we are able to offer high quality, integrated PCAP products direct from the factory.

Total support

We provide factory tuned PCAP products, drivers and offer special tuning software as part of total PCAP solutions, in order to simplify adoption of our PCAP products.

Size line-up

NLT Technologies provides LCDs for industrial use in a wide variety of sizes and configurations, with PCAP touch sensors that are designed to specifically and ideally match the base LCD.

What's PCAP?

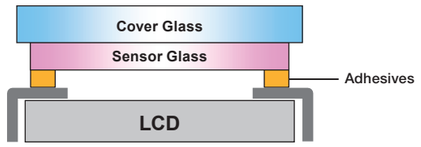
Projected Capacitive

Electrodes are aligned in a grid pattern on the sensor glass. The grid detects the touch point by sensing the change of electrical charges when a finger touches the touch panel.
The PCAP has no air gap inside the touch panel unit, making it ideal for applications used in bright ambient light.

Standard component integration

An LCD module and a touch panel are attached with adhesive via a perimeter bond.

● Standard component

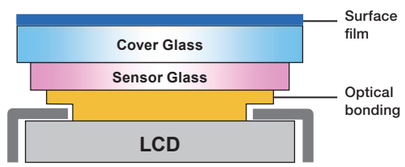


Optional component integration

Our PCAP products offer valuable component and structural options.

- **Surface film**
  Anti-reflective, anti-glare, anti-finger print, and shattering proof surface treatments are available.
- **Optical bonding**
  To adhere an LCD panel and sensor glass, we offer optical bonding as an option. Optical bonding uses an optically clear resin adhesive to fill the air gap between the LCD and sensor glass. This improves readability in high ambient light environments.

● Option component



Custom cover glass component

Custom cover glass options are also available such as chemically strengthened, etching, coating, custom shape, or decorated glass.

PCAP Generation2

Wet & Glove Technology

Wet & Glove PCAP displays are able to be operated even when the screen is wet and the operator is wearing gloves. Furthermore, by tuning the controller, the touch screen can be operated when the operator is using various medical gels on the surface of the screen, or when the operator is wearing thicker, industrial gloves.
With this technology, PCAP touch panels will be available to support high end display devices used in special conditions such as construction, marine or medical equipment.

PCAP display products main specifications

LCD Screen Size	Resolution	Part Number	Luminance	T/P Surface	Remarks
Generation 1					
6.5 inch	640 × 480	NL6448BC20-30JF	950cd/m²	Clear + AFP	Optical bonding
	1024 × 768	NL10276BC13-01JA	480cd/m²	Clear	Optical bonding
7.0 inch Wide	800 × 480	NL8048AC19-13BD	430cd/m²	AG + AFP	CG t0.7
8.4 inch	800 × 600	NL8060BC21-11KG	750cd/m²	AR	CG t0.7, Optical bonding
10.4 inch	800 × 600	NL8060BC26-35BA	350cd/m²	Clear	CG t0.7
		NL8060BC26-35BD	350cd/m²	AG + AFP	CG t0.7
10.6 inch	1280 × 768	NL12876AC18-07DC	250cd/m²	AR	CG Drogontrail* t1.1
12.1 inch Wide	1280 × 800	NL12880BC20-05BA	400cd/m²	Clear	CG t0.7
		NL12880BC20-05BD	400cd/m²	AG + AFP	CG t0.7
		NEW NL12880BC20-13ND	430cd/m²	AG Etching	CG t0.95, Optical bonding
15.0 inch	1024 × 768	NL10276KC30-43DD	450cd/m²	AG + AFP	CG t1.8 Soda lime+Chem.
15.3 inch Wide	1280 × 768	NL12876BC26-33NA	470cd/m²	Clear	CG t1.1 Soda lime+Chem., Optical bonding
Generation 2 Wet & Glove capable models					
8.4 inch	800 × 600	NEW NL8060AC21-21KD	(370)cd/m²	AG + AFP	CG t0.7, Optical bonding
10.4 inch	1024 × 768	NL10276BC20-18BD	350cd/m²	AG + AFP	CG t0.7
		NL10276BC20-18KD	380cd/m²	AG + AFP	CG t0.7, Optical bonding
		NEW NL10276BC20-18KE	770cd/m²	Clear	CG t0.7, Optical bonding
		NEW NL10276BC20-18KH	760cd/m²	AG + AFP	CG t0.7, Optical bonding
12.1 inch	1024 × 768	NEW NL10276BC24-21KH	(750)cd/m²	AG + AFP	CG t0.7, Optical bonding
		NEW NL10276BC24-36KD	(390)cd/m²	AG + AFP	CG t0.7, Optical bonding

Please see the Data Sheet for detailed specifications.
＊Dragontrail is a registered trade mark of Asahi Glass Co., Ltd.

PCAP controller board

capable I/F	Connector
USB	Wire to Board Connector (Molex 53261)
I²C	

PCAP driver software supported OS

	OS	CPU	I/F	Status
Windows®	Windows 7 / 8 / 8.1 / 10	x86	USB	Microsoft®supported
	Windows Embedded Standard 7	x86	USB	Microsoft®supported
	Windows Embedded 8 / 8.1	x86	USB	Microsoft®supported
	Windows Embedded Compact 7	x86 ARMv5, 6, 7	USB	NLT Technologies supported*
			I²C	IC maker supported*
	Windows Embedded Compact 2013	x86 ARMv7	USB	NLT Technologies supported*
			I²C	IC maker supported*
Linux®	Ubuntu Rev.12.10 / Kernel 3.5.7	x86 ARMv7	USB	NLT Technologies supported*
	Ubuntu Rev.12.04 / Kernel 3.2.14			
	Ubuntu Rev.11.10 / Kernel 3.2.1		I²C	IC maker supported*
	Android 4.3 / Kernel 3.10.2			

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Medical Use

Product Map

Please see the Data Sheet for detailed specifications. All values are typical values (excluding the depth for module size). Values in brackets are tentative.
Mounting compatibility: Module size (except depth), position of mounting holes, and relative position of mounting holes to screen center.



	30 inch	21.3 inch	
	Color model	Color model	Monochrome model
6 Mega Pixels 3280×2048 eDP	NEW NL328204AC19-01 SFT2 +Dr 10bit 72% (1000)cd/m², (1500:1), (25)ms		
5 Mega Pixels 2560×2048 LVDS			NEW NL256204AM16-02A SFT2 LED +Dr 10bit (2000)cd/m², (1400:1) Mass production in 2017
3 Mega Pixels 2048×1536 LVDS		NL204153AC21-17 SFT LED +Dr 10bit 72% 800cd/m², 1400:1, 40ms NL204153AC21-25 SFT LED +Dr 72% 800cd/m², 1400:1, 40ms	NL204153AM21-18A SFT LED +Dr MONO 10bit 1700cd/m², 1400:1, 40ms
2 Mega Pixels 1600×1200 LVDS		NL160120AC27-32 SFT LED +Dr 72% 900cd/m², 1400:1, 40ms	NL160120AM27-33A SFT LED +Dr MONO 1900cd/m², 1400:1, 40ms

Mounting Compatibility

Product Specifications

LED … Long-life LED　+Dr … LED driver　MONO … Monochrome model　Multi-bit driver　NTSC ratio … Wide color gamut

Screen Size	30 inch	21.3 inch	
Part Number	NL328204AC19-01 NEW	NL204153AM21-18A	NL204153AC21-17
Resolution	3280 × 2048	2048 × 1536	2048 × 1536
Display Area (mm)	645.504 × 403.046	433.152 × 324.864	433.152 × 324.864
Display Color	1073M	3072 gray scales/pixel 1024 gray scales/sub-pixel	1073M
Pixel Pitch (mm)	0.1968 × 0.1968	0.2115 × 0.2115	0.2115 × 0.2115
Luminance	(1000)cd/m²	1700cd/m²	800cd/m²
Contrast	(1500 : 1)	1400 : 1	1400 : 1
Viewing Angle (U/D/L/R) Contrast ≧ 10 : 1	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°
Response Time*1	(25)ms	40ms	40ms
Interface	4lanes eDP RGB 10 bits 5.4G bit/sec	4port LVDS LCR 10 bits	4port LVDS RGB 10 bits
Power Supply Voltage	Signal : 12.0V Backlight : 24.0V	Signal : 12.0V Backlight : 12.0V	Signal : 12.0V Backlight : 12.0V
Power Consumption	(126)W	37.0W	58.0W
Operating Temperature	0˚C ~ +60˚C	0˚C ~ +60˚C	0˚C ~ +60˚C
Storage Temperature	–20˚C ~ +60˚C	–20˚C ~ +60˚C	–20˚C ~ +60˚C
Polarizer Surface	AG	AG	AG
Module Size W × H × D(mm) (D : max)	670.0 × 427.0 × 30.5	457.0 × 350.0 × 23.0	457.0 × 350.0 × 23.0
Weight	(5500)g	2700g	2700g
LED driver board	Built in	Built in	Built in
Remarks	SFT2 +Dr 10bit 72%	SFT LED +Dr MONO 10bit	SFT LED +Dr 72%

Screen Size	21.3 inch		
Part Number	NL204153AC21-25	NL160120AM27-33A	NL160120AC27-32
Resolution	2048 × 1536	1600 × 1200	1600 × 1200
Display Area (mm)	433.152 × 324.864	432.0 × 324.0	432.0 × 324.0
Display Color	16.77M	766 gray scales/pixel 256 gray scales/sub-pixel	16.77M
Pixel Pitch (mm)	0.2115 × 0.2115	0.27 × 0.27	0.27 × 0.27
Luminance	800cd/m²	1900cd/m²	900cd/m²
Contrast	1400 : 1	1400 : 1	1400 : 1
Viewing Angle (U/D/L/R) Contrast ≧ 10 : 1	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°
Response Time*1	40ms	40ms	40ms
Interface	4port LVDS RGB 8 bits	2port LVDS LCR 8 bits	2port LVDS RGB 8 bits
Power Supply Voltage	Signal : 12.0V Backlight : 12.0V / 18.0V	Signal : 12.0V Backlight : 12.0V	Signal : 12.0V Backlight : 12.0V
Power Consumption	58.2W	36.0W	52.8W
Operating Temperature	0˚C ~ +60˚C	0˚C ~ +60˚C	0˚C ~ +60˚C
Storage Temperature	–20˚C ~ +60˚C	–20˚C ~ +60˚C	–20˚C ~ +60˚C
Polarizer Surface	AG	AG	AG
Module Size W × H × D(mm) (D : max)	457.0 × 350.0 × 23.0	457.0 × 350.0 × 23.0	457.0 × 350.0 × 23.0
Weight	2700g	2700g	2800g
LED driver board	Built in	Built in	Built in
Remarks	SFT LED +Dr 72%	SFT LED +Dr MONO	SFT LED +Dr 72%

*1 Values equal Ton + Toff (10%←→90%). ◆ SFT : Super Fine TFT, SFT2 : Super Fine TFT2

Industrial Use

Product Map

Please see the Data Sheet for detailed specifications. All values are typical values. Values in brackets are tentative.
Mounting compatibility: Module size (except depth), position of mounting holes, and relative position of mounting holes to screen center.
Interface compatibility: Interface connector and pin assignment.

LED … Long-life LED
+Dr … LED driver
NTSC ratio … Wide color gamut
ColorXcell technology
Vibration proof design
Portrait view compatible

		19.0／17.0 inch	15.0 inch	12.1 inch	10.4 inch	8.4 inch	6.5 inch	5.7 inch
SXGA 1280×1024	Super Fine TFT LVDS	19.0型 NL128102AC29-17 SFT 800cd/m² LED +Dr 72%						
		NEW 17.0型 NL128102AC26-01 +Dr 90% 400cd/m²						
XGA 1024×768	Super Fine TFT LVDS		XGA Interface Compatibility (LVDS)*1	XGA Interface Compatibility (LVDS)*2	NL10276BC20-47 SFT 300cd/m² LED	NL10276BC16-06/06D SFT 600cd/m² LED 72%		
	Enhanced View TFT LVDS		NEW NL10276AC30-48D SFT (350)cd/m² +Dr 72%					
			NL10276BC30-39 SFT 330cd/m² LED 72%					
			NEW NL10276AC30-52C T-EVT 1600cd/m² +Dr		NL10276BC20-18C T-EVT 800cd/m² LED		NL10276BC13-01C T-EVT 650cd/m²	
			NL10276AC30-42C*3 T-EVT 600cd/m² LED +Dr					
		NEW NL10276AC30-53D (500)cd/m² +Dr	NEW NL10276AC30-42D 600cd/m² LED +Dr	NL10276BC24-21F 800cd/m² LED	NL10276BC20-18F 800cd/m² LED		NL10276BC13-01 500cd/m²	
			NL10276AC30-45D*3 400cd/m² LED +Dr	NL10276BC24-21 450cd/m² LED	NL10276BC20-18/18D 400cd/m² LED			
			NL10276BC30-34D 500cd/m² LED	NL10276BC24-21L*4 450cd/m² LED				
			NL10276BC30-34R 400cd/m² LED	NL10276BC24-19D*5 650cd/m²	NL10276BC20-12*5 150cd/m²			
SVGA 800×600	Enhanced View TFT LVDS		SVGA Interface Compatibility (LVDS)*2					
				NL8060BC31-51C T-EVT 900cd/m² LED	NL8060BC26-35C T-EVT 800cd/m² LED	NL8060BC21-11C T-EVT 800cd/m² LED		
				NL8060BC31-47/47D 450cd/m² LED	NL8060BC26-35F 800cd/m² LED	NL8060BC21-11F 800cd/m² LED		
					NL8060BC26-35/35D 400cd/m² LED	NL8060BC21-11/11D 400cd/m² LED		
					NL8060BC26-35E*4 400cd/m² LED			
					NL8060AC26-54D 450cd/m² LED +Dr	NL8060AC26-52D 400cd/m² LED +Dr	NL8060AC21-21D 400cd/m² LED +Dr	
	CMOS			NL8060BC31-50F 900cd/m² LED				
VGA 640×480	Enhanced View TFT LVDS			VGA Interface Compatibility (LVDS)*2				
					NL6448BC33-71C T-EVT 900cd/m² LED	NL6448BC26-27C T-EVT 900cd/m² LED	NL6448BC20-30C T-EVT 1000cd/m² LED	
					NL6448BC33-71F 900cd/m² LED	NL6448BC26-27F 900cd/m² LED	NL6448BC20-30F 1000cd/m² LED	NEW NL6448AC18-11D 550cd/m² +Dr
					NL6448BC33-71/71D 450cd/m² LED	NL6448BC26-27/27D 500cd/m² LED	NL6448BC20-30/30D 600cd/m² LED	
	Enhanced View TFT CMOS			VGA Interface Compatibility (CMOS)				VGA Interface Compatibility (CMOS)*6
					NL6448BC33-70C T-EVT 900cd/m² LED	NL6448BC26-26C T-EVT 900cd/m² LED	NL6448BC20-35C T-EVT 1000cd/m² LED	NEW NL6448AC18-12F*4 800cd/m² +Dr
					NL6448BC33-70F 900cd/m² LED	NL6448BC26-26F 900cd/m² LED	NL6448BC20-35F 1000cd/m² LED	NEW NL6448AC18-08F 800cd/m² +Dr
					NEW NL6448AC33-A0D 500cd/m² LED +Dr	NL6448BC26-26/26D 500cd/m² LED	NL6448BC20-35/35D 600cd/m² LED	NEW NL6448AC18-08D 550cd/m² +Dr
					NL6448BC33-70/70D 450cd/m² LED			NL6448BC18-07 300cd/m²
QVGA 320×240	CMOS							QVGA Interface Compatibility (CMOS)
								NEW NL3224AC36-01F 800cd/m² +Dr
								NEW NL3224AC36-01D 500cd/m² +Dr
		Mounting Compatibility	Mounting Compatibility	Mounting Compatibility	Mounting Compatibility	Mounting Compatibility	Mounting Compatibility	Mounting Compatibility

◆ SFT : Super Fine TFT, T-EVT : Transmissive-Enhanced View TFT

*1 LVDS interface of 15.0-inch and larger size is not compatible with 12.1-inch and smaller size. *2 Connector types and connector pin alignments are compatible. Control signal is upwardly compatible. *3 Only interface connector is compatible with other displays in same size.
*4 Portrait view signals are to be prepared by a customer. *5 LVDS interface of NL10276BC24-19D and NL10276BC20-12 is not compatible with other displays. *6 CMOS interface of 5.7-inch and smaller size displays is not compatible with 6.5-inch and larger size dispays.

Product Specifications

LED … Long-life LED　Dr … LED driver　NTSC ratio … Wide color gamut　ColorXcell … ColorXcell technology　Vibration proof design … Vibration proof design　Portrait view compatible … Portrait view compatible

Screen Size	19.0 inch	17.0 inch	15.0 inch						Screen Size
Part Number	NL128102AC29-17	NL128102AC26-01 NEW	NL10276AC30-53D NEW	NL10276AC30-52C NEW	NL10276AC30-48D NEW	NL10276AC30-45D	NL10276AC30-42C	NL10276AC30-42D NEW	**Part Number**
Resolution	1280 × 1024	1280 × 1024	1024 × 768	1024 × 768	1024 × 768	1024 × 768	1024 × 768	1024 × 768	Resolution
Display Area (mm)	376.32 × 301.056	337.92 × 270.336	304.128 × 228.096	304.128 × 228.096	304.128 × 228.096	304.128 × 228.096	304.128 × 228.096	304.128 × 228.096	Display Area (mm)
Display Color	16.77M	16.77M	16.19M / 262K	16.19M / 262K	16.19M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	Display Color
Pixel Pitch (mm)	0.294 × 0.294	0.264 × 0.264	0.297 × 0.297	0.297 × 0.297	0.297 × 0.297	0.297 × 0.297	0.297 × 0.297	0.297 × 0.297	Pixel Pitch (mm)
Luminance	800cd/m^2	400cd/m^2	(500)cd/m^2	1600cd/m^2	(350)cd/m^2	400cd/m^2	600cd/m^2	600cd/m^2	Luminance
Contrast	1000 : 1	(1000 : 1)	(600 : 1)	(1000 : 1)	(900 : 1)	600 : 1	600 : 1	600 : 1	Contrast
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	Viewing Angle (U/D/L/R) Contrast ≧10 : 1
Response Time*1	25ms	(20)ms	8ms	8ms	25ms	8ms	8ms	8ms	Response Time*1
Interface	2port LVDS RGB 8 bits	2port LVDS RGB 8 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	Interface
Power Supply Voltage	Signal : 5.0V Backlight : 12.0V	Signal : 5.0V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Power Supply Voltage
Power Consumption	45.0W	(12.2)W	TBD	(24.1) W	(9.5)W	7.8W	11.9W	11.9W	Power Consumption
Operating Temperature	−20˚C ~ +70˚C	−20˚C ~ +70˚C	−20˚C ~ +70˚C	−30˚C ~ +70˚C	−20˚C ~ +70˚C	−20˚C ~ +70˚C	−20˚C ~ +70˚C	−20˚C ~ +70˚C	Operating Temperature
Storage Temperature	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−20˚C ~ +70˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	Storage Temperature
Polarizer Surface	AG	AG	AG	Clear+AR	AG	AG	Clear+AR	AG	Polarizer Surface
Module Size W×H×D(mm) (D : max)	396.0 × 324.0 × 18.5	358.5 × 296.5 × (13.5)	326.5 × 253.5 × 6.8	326.5 × 253.5 × (13.5)	326.5 × 253.5 × 12.3	326.5 × 253.5 × 12.1	326.5 × 253.5 × 12.1	326.5 × 253.5 × 12.1	Module Size W×H×D(mm) (D : max)
Weight	2100g	(1900)g	TBD	(1150)g	870g	1050g	1050g	1050g	Weight
Reverse Scan	—	—	○	○	○	—	—	—	Reverse Scan
Recommended LED driver board <Suitable cable>	Built in	Built in	Built in	Built in	Built in	Built in	Built in	Built in	Recommended LED driver board <Suitable cable>
Remarks	SFT LED Dr 72%	Dr 90%	Dr	T-EVT Dr	SFT Dr 72%	LED Dr	T-EVT LED Dr	LED Dr	Remarks

Screen Size	15.0 inch			12.1 inch					Screen Size
Part Number	NL10276BC30-39	NL10276BC30-34R	NL10276BC30-34D	NL10276BC24-21L*3	NL10276BC24-21F	NL10276BC24-21	NL10276BC24-19D	NL8060BC31-47/47D	**Part Number**
Resolution	1024 × 768	1024 × 768	1024 × 768	1024 × 768	1024 × 768	1024 × 768	1024 × 768	800 × 600	Resolution
Display Area (mm)	304.128 × 228.096	304.128 × 228.096	304.128 × 228.096	245.76 × 184.32	245.76 × 184.32	245.76 × 184.32	245.76 × 184.32	246.0 × 184.5	Display Area (mm)
Display Color	16.77M	262K	16.77M	16.77M / 262K	16.77M / 262K	16.77M / 262K	262K	16.77M / 262K	Display Color
Pixel Pitch (mm)	0.297 × 0.297	0.297 × 0.297	0.297 × 0.297	0.24 × 0.24	0.24 × 0.24	0.24 × 0.24	0.24 × 0.24	0.3075 × 0.3075	Pixel Pitch (mm)
Luminance	330cd/m^2	400cd/m^2	500cd/m^2	450cd/m^2	800cd/m^2	450cd/m^2	650cd/m^2	450cd/m^2	Luminance
Contrast	900 : 1	600 : 1	600 : 1	900 : 1	900 : 1	900 : 1	600 : 1	900 : 1	Contrast
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	60°, 60°, 70°, 70°	80°, 80°, 80°, 80°	Viewing Angle (U/D/L/R) Contrast ≧10 : 1
Response Time*1	25ms	18ms	18ms	18ms	18ms	18ms	25ms	18ms	Response Time*1
Interface	LVDS RGB 8 bits	LVDS RGB 6 bits	LVDS RGB 8 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 6 bits	LVDS RGB 8 bits / 6 bits	Interface
Power Supply Voltage	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	3.3V	Power Supply Voltage
Power Consumption	9.8W*2	9.8W*2	9.8W*2	5.2W*2	7.5W*2	5.2W*2	4.3W*2	4.9W*2	Power Consumption
Operating Temperature	−20˚C ~ +70˚C	−20˚C ~ +70˚C	−20˚C ~ +70˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−20˚C ~ +60˚C	−30˚C ~ +80˚C	Operating Temperature
Storage Temperature	−20˚C ~ +80˚C	−20˚C ~ +80˚C	−20˚C ~ +80˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−30˚C ~ +80˚C	−20˚C ~ +60˚C	−30˚C ~ +80˚C	Storage Temperature
Polarizer Surface	AG	AG	AG	Clear	Clear	Clear	AG	-47 : Clear / -47D : AG	Polarizer Surface
Module Size W×H×D(mm) (D : max)	326.5 × 253.5 × 12.2	326.5 × 253.5 × 12.0	326.5 × 253.5 × 12.0	260.5 × 203.0 × 9.2	260.5 × 203.0 × 9.2	260.5 × 203.0 × 9.2	260.0 × 200.0 × 7.4	280.0 × 210.0 × 9.6	Module Size W×H×D(mm) (D : max)
Weight	970g	970g	970g	490g	490g	490g	305g	580g	Weight
Reverse Scan	—	○	○	○	○	○	○	○	Reverse Scan
Recommended LED driver board <Suitable cable>	150PW02F <150CBL02>	150PW02F <150CBL02>	150PW02F <150CBL02>	104PW03F <121CBL02>	104PW03F <121CBL03>	104PW03F <121CBL02>	Not provided	121PW02F <121CBL02>	Recommended LED driver board <Suitable cable>
Remarks	SFT LED 72%	LED	LED	LED	LED	LED	—	LED	Remarks

Please see the Data Sheet for detailed specifications. All values are typical values (excluding the depth for module size). Values in brackets are tentative.

*1 Values equal Ton + Toff (10%←→90%). *2 Values do not include LED driver board power dissipation. *3 Portrait view signals are to be prepared by a customer.
◆ SFT : Super Fine TFT, T-EVT : Transmissive-Enhanced View TFT

Product Specifications

LED … Long-life LED　Dr … LED driver　NTSC ratio … Wide color gamut　ColorXcell technology　Vibration proof design　Portrait view compatible

Screen Size	12.1 inch		10.4 inch						Screen Size
Part Number	NL8060BC31-51C	NL8060BC31-50F	NL10276BC20-47	NL10276BC20-18C/18F	NL10276BC20-18/18D	NL10276BC20-12	NL8060AC26-54D	NL8060AC26-52D	Part Number
Resolution	800 × 600	800 × 600	1024 × 768	1024 × 768	1024 × 768	1024 × 768	800 × 600	800 × 600	Resolution
Display Area (mm)	246.0 × 184.5	246.0 × 184.5	210.432 × 157.824	210.432×157.824	210.432 × 157.824	210.432 × 157.824	211.2 × 158.4	211.2 × 158.4	Display Area (mm)
Display Color	16.77M / 262K	262K	262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	Display Color
Pixel Pitch (mm)	0.3075 × 0.3075	0.3075 × 0.3075	0.2055 × 0.2055	0.2055 × 0.2055	0.2055 × 0.2055	0.2055 × 0.2055	0.264 × 0.264	0.264 × 0.264	Pixel Pitch (mm)
Luminance	900cd/m^2	900cd/m^2	300cd/m^2	800cd/m^2	400cd/m^2	150cd/m^2	450cd/m^2	400cd/m^2	Luminance
Contrast	1000 : 1	1000 : 1	700 : 1	900 : 1	900 : 1	400 : 1	900 : 1	900 : 1	Contrast
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	40°, 20°, 45°, 45°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	Viewing Angle (U/D/L/R) Contrast ≧10 : 1
Response Time*1	18ms	18ms	25ms	18ms	18ms	18ms	18ms	18ms	Response Time*1
Interface	LVDS RGB 8 bits / 6 bits	CMOS RGB 6 bits	LVDS RGB 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	Interface
Power Supply Voltage	3.3V	3.3V / 5.0V	3.3V	3.3V	3.3V	3.3V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Power Supply Voltage
Power Consumption	TBD	7.1W*2	3.9W*2	7.5W*2	4.8W*2	3.4W*2	5.1W	4.7W	Power Consumption
Operating Temperature	−30°C ～ +80°C	−30°C ～ +80°C	0°C ～ +55°C	−30°C ～ +80°C	−30°C ～ +80°C	−20°C ～ +70°C	−30°C ～ +80°C	−30°C ～ +80°C	Operating Temperature
Storage Temperature	−30°C ～ +80°C	−30°C ～ +80°C	−20°C ～ +60°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	Storage Temperature
Polarizer Surface	Clear+AR	Clear	Clear	-18C : Clear+AR / -18F : Clear	-18 : Clear / -18D : AG	Clear	AG	AG	Polarizer Surface
Module Size W×H×D(mm) (D : max)	260.5 × 203.0 × 9.2	260.5 × 203.0 × 9.2	227.0 × 175.4 × 9.2	228.0 × 178.5 × 9.2	228.0 × 178.5 × 9.2	231.2 × 174.6 × 5.8	227.3 × 177.5 × 9.8	243.0 × 185.1 × 11.0	Module Size W×H×D(mm) (D : max)
Weight	490g	490g	360g	380g	380g	160g	375g	430g	Weight
Reverse Scan	○	○	○	○	○	○	○	○	Reverse Scan
Recommended LED driver board <Suitable cable>	104PW03F <121CBL02>	104PW03F <121CBL03>	Not provided	104PW03F <121CBL03>	104PW02F <104CBL01>	Not provided	Built in	Built in	Recommended LED driver board <Suitable cable>
Remarks	T-EVT LED X	LED	SFT LED	T-EVT (-18C) LED	LED	—	LED Dr	LED Dr X	Remarks

Screen Size	10.4 inch								8.4 inch	Screen Size
Part Number	NL8060BC26-35C/35F	NL8060BC26-35/35D	NL8060BC26-35E*3	NL6448AC33-A0D NEW	NL6448BC33-71C/71F	NL6448BC33-71/71D	NL6448BC33-70C/70F	NL6448BC33-70/70D	NL10276BC16-06/06D	Part Number
Resolution	800 × 600	800 × 600	800 × 600	640 × 480	640 × 480	640 × 480	640 × 480	640 × 480	1024 × 768	Resolution
Display Area (mm)	211.2 × 158.4	211.2 × 158.4	211.2 × 158.4	211.2 × 158.4	211.2 × 158.4	211.2 × 158.4	211.2 × 158.4	211.2 × 158.4	170.496 × 127.872	Display Area (mm)
Display Color	16.77M / 262K	16.77M / 262K	16.77M / 262K	262K	16.77M / 262K	16.77M / 262K	262K	262K	16.77M / 262K	Display Color
Pixel Pitch (mm)	0.264 × 0.264	0.264 × 0.264	0.264 × 0.264	0.33 × 0.33	0.33 × 0.33	0.33 × 0.33	0.33 × 0.33	0.33 × 0.33	0.1665 × 0.1665	Pixel Pitch (mm)
Luminance	800cd/m^2	400cd/m^2	400cd/m^2	500cd/m^2	900cd/m^2	450cd/m^2	900cd/m^2	450cd/m^2	600cd/m^2	Luminance
Contrast	900 : 1	900 : 1	900 : 1	900 : 1	900 : 1	900 : 1	900 : 1	900 : 1	1000 : 1	Contrast
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	88°,88°, 88°, 88°	Viewing Angle (U/D/L/R) Contrast ≧10 : 1
Response Time*1	18ms	18ms	18ms	18ms	18ms	18ms	18ms	18ms	25ms	Response Time*1
Interface	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	CMOS RGB 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	LVDS RGB 8 bits / 6 bits	Interface
Power Supply Voltage	3.3V	3.3V	3.3V	Signal : 3.3V / 5.0V Backlight : 12.0V	3.3V	3.3V	3.3V / 5.0V	3.3V / 5.0V	3.3V	Power Supply Voltage
Power Consumption	6.3W*2	3.6W*2	3.6W*2	(5.0)W	6.2W*2	3.5W*2	6.4W*2	3.7W*2	5.6W*2	Power Consumption
Operating Temperature	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−20°C ～ +70°C	Operating Temperature
Storage Temperature	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	−30°C ～ +80°C	Storage Temperature
Polarizer Surface	-35C : Clear+AR / -35F : Clear	-35 : Clear / -35D : AG	Clear	AG	-71C : Clear+AR/ -71F : Clear	-71 : Clear / -71D : AG	-70C : Clear+AR / -70F : Clear	-70 : Clear / -70D : AG	-06 : Clear / -06D : AG	Polarizer Surface
Module Size W×H×D(mm) (D : max)	243.0 × 185.1 × 11.0	243.0 × 185.1 × 11.0	243.0 × 185.1 × 11.0	246.5 × 179.4 × 10.0	243.0 × 185.1 × 11.0	243.0 × 185.1 × 11.0	243.0 × 185.1 × 11.0	243.0 × 185.1 × 11.0	200.0 × 152.0 × 8.7	Module Size W×H×D(mm) (D : max)
Weight	475g	475g	475g	(370)g	475g	475g	475g	475g	260g	Weight
Reverse Scan	○	○	○	○	○	○	○	○	○	Reverse Scan
Recommended LED driver board <Suitable cable>	104PW01F <121CBL02>	104PW03F <121CBL02>	104PW03F <121CBL02>	Built in	104PW01F <121CBL02>	104PW03F <121CBL02>	104PW01F <121CBL02>	104PW03F <121CBL02>	104PW03F <121CBL02>	Recommended LED driver board <Suitable cable>
Remarks	T-EVT (-35C) LED X	LED X	LED X	LED Dr	T-EVT (-71C) LED X	LED X	T-EVT (-70C) LED	LED	SFT LED 72%	Remarks

Please see the Data Sheet for detailed specifications.　All values are typical values (excluding the depth for module size).　Values in brackets are tentative.

*1 Values equal Ton + Toff (10%←→90%).　*2 Values do not include LED driver board power dissipation.　*3 Portrait view signals are to be prepared by a customer.
◆ SFT : Super Fine TFT, T-EVT : Transmissive-Enhanced View TFT

Product Specifications

LED … Long-life LED　Dr … LED driver　NTSC ratio … Wide color gamut　ColorXcell technology　Vibration proof design　Portrait view compatible

Screen Size	8.4 inch							6.5 inch			Screen Size
Part Number	NL8060AC21-21D	NL8060BC21-11C/11F	NL8060BC21-11/11D	NL6448BC26-27C/27F	NL6448BC26-27/27D	NL6448BC26-26C/26F	NL6448BC26-26/26D	NL10276BC13-01C	NL10276BC13-01	NL6448BC20-30C/30F	Part Number
Resolution	800 × 600	800 × 600	800 × 600	640 × 480	640 × 480	640 × 480	640 × 480	1024 × 768	1024 × 768	640 × 480	Resolution
Display Area (mm)	170.4 × 127.8	170.4 × 127.8	170.4 × 127.8	170.88 × 128.16	170.88 × 128.16	170.88 × 128.16	170.88 × 128.16	132.096 × 99.072	132.096 × 99.072	132.48 × 99.36	Display Area (mm)
Display Color	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	262K	262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	Display Color
Pixel Pitch (mm)	0.213 × 0.213	0.213 × 0.213	0.213 × 0.213	0.267 × 0.267	0.267 × 0.267	0.267 × 0.267	0.267 × 0.267	0.129 × 0.129	0.129 × 0.129	0.207 × 0.207	Pixel Pitch (mm)
Luminance	400cd/m^2	800cd/m^2	400cd/m^2	900cd/m^2	500cd/m^2	900cd/m^2	500cd/m^2	650cd/m^2	500cd/m^2	1000cd/m^2	Luminance
Contrast	800 : 1	800 : 1	800 : 1	1000 : 1	1000 : 1	1000 : 1	1000 : 1	500 : 1	500 : 1	800 : 1	Contrast
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 60°, 80°, 80°	80°, 60°, 80°, 80°	80°, 80°, 80°, 80°	Viewing Angle (U/D/L/R) Contrast ≧10 : 1
Response Time*1	18ms	18ms	18ms	18ms	18ms	18ms	18ms	25ms	25ms	18ms	Response Time*1
Interface	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	Interface
Power Supply Voltage	Signal : 3.3V Backlight : 12.0V	3.3V	3.3V	3.3V	3.3V	3.3V / 5.0V	3.3V / 5.0V	3.3V	3.3V	3.3V	Power Supply Voltage
Power Consumption	3.3W	5.0W*2	3.0W*2	5.0W*2	3.1W*2	5.1W*2	3.2W*2	3.9W*2	3.9W*2	3.8W*2	Power Consumption
Operating Temperature	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–20˚C ~ +70˚C	–20˚C ~ +70˚C	–30˚C ~ +80˚C	Operating Temperature
Storage Temperature	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	Storage Temperature
Polarizer Surface	AG	-11C : Clear+AR / -11F : Clear	-11 : Clear / -11D : AG	-27C : Clear+AR / -27F : Clear	-27 : Clear / -27D : AG	-26C : Clear+AR/ -26F : Clear	-26 : Clear / -26D : AG	Clear+AR	Clear	-30C : Clear+AR / -30F : Clear	Polarizer Surface
Module Size W×H×D(mm) (D : max)	200.0 × 152.0 × 8.7	200.0 × 152.0 × 8.7	200.0 × 152.0 × 8.7	200.0 × 152.0 × 8.7	200.0 × 152.0 × 8.7	200.0 × 152.0 × 8.7	200.0 × 152.0 × 8.7	153.0 × 118.0 × 9.5	153.0 × 118.0 × 9.5	153.0 × 118.0 × 8.7	Module Size W×H×D(mm) (D : max)
Weight	260g	260g	260g	260g	260g	260g	260g	170g	165g	-30C : 155g / -30F : 150g	Weight
Reverse Scan	○	○	○	○	○	○	○	○	○	○	Reverse Scan
Recommended LED driver board <Suitable cable>	Built in	104PW03F <121CBL02>	104PW03F <121CBL02>	104PW03F <121CBL02>	104PW03F <121CBL02>	104PW03F <121CBL02>	104PW03F <121CBL02>	Not provided	Not provided	104PW03F <121CBL02>	Recommended LED driver board <Suitable cable>
Remarks	LED Dr X	T-EVT (-11C) LED X	LED X	T-EVT (-27C) LED X	LED X	T-EVT (-26C) LED	LED	T-EVT	—	T-EVT (-30C) LED X	Remarks

Screen Size	6.5 inch			5.7 inch							Screen Size
Part Number	NL6448BC20-30/30D	NL6448BC20-35C/35F	NL6448BC20-35/35D	NL6448AC18-12F*3 NEW	NL6448AC18-11D NEW	NL6448AC18-08F NEW	NL6448AC18-08D NEW	NL6448BC18-07	NL3224AC36-01F NEW	NL3224AC36-01D NEW	Part Number
Resolution	640 × 480	640 × 480	640 × 480	640 × 480	640 × 480	640 × 480	640 × 480	640 × 480	320 × 240	320 × 240	Resolution
Display Area (mm)	132.48 × 99.36	132.48 × 99.36	132.48 × 99.36	115.2 × 86.4	115.2 × 86.4	115.2 × 86.4	115.2 × 86.4	115.2 × 86.4	115.2 × 86.4	115.2 × 86.4	Display Area (mm)
Display Color	16.77M / 262K	262K	262K	262K	16.19M	262K	262K	262K	262K	262K	Display Color
Pixel Pitch (mm)	0.207 × 0.207	0.207 × 0.207	0.207 × 0.207	0.18 × 0.18	0.18 × 0.18	0.18 × 0.18	0.18 × 0.18	0.18 × 0.18	0.36 × 0.36	0.36 × 0.36	Pixel Pitch (mm)
Luminance	600cd/m^2	1000cd/m^2	600cd/m^2	800cd/m^2	550cd/m^2	800cd/m^2	550cd/m^2	300cd/m^2	800cd/m^2	500cd/m^2	Luminance
Contrast	800 : 1	800 : 1	800 : 1	900 : 1	900 : 1	900 : 1	900 : 1	900 : 1	900 : 1	900 : 1	Contrast
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	Viewing Angle (U/D/L/R) Contrast ≧10 : 1
Response Time*1	18ms	18ms	18ms	18ms	18ms	18ms	18ms	18ms	18ms	18ms	Response Time*1
Interface	LVDS RGB 8 bits / 6 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	LVDS RGB 8 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	CMOS RGB 6 bits	Interface
Power Supply Voltage	3.3V	3.3V / 5.0V	3.3V / 5.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	3.3V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Power Supply Voltage
Power Consumption	2.6W*2	3.9W*2	2.7W*2	3.6W	2.4W	3.6W	2.3W	1.4W*2	2.7W	1.6W	Power Consumption
Operating Temperature	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–20˚C ~ +70˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	Operating Temperature
Storage Temperature	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	–30˚C ~ +80˚C	Storage Temperature
Polarizer Surface	-30 : Clear / -30D : AG	-35C : Clear+AR / -35F : Clear	-35 : Clear / -35D : AG	AG	AG	AG	AG	Clear	AG	AG	Polarizer Surface
Module Size W×H×D(mm) (D : max)	153.0 × 118.0 × 8.7	153.0 × 118.0 × 8.7	153.0 × 118.0 × 8.7	144.0 × 104.6 × 12.8	144.0 × 104.6 × 12.8	144.0 × 104.6 × 12.8	144.0 × 104.6 × 12.8	127.2 × 100.4 × 6.1	144.0 × 104.6 × 12.8	144.0 × 104.6 × 12.8	Module Size W×H×D(mm) (D : max)
Weight	150g	-35C : 155g / -35F : 150g	150g	150g	150g	150g	150g	110g	150g	150g	Weight
Reverse Scan	○	○	○	○	○	○	○	○	○	○	Reverse Scan
Recommended LED driver board <Suitable cable>	65PW01F <121CBL02>	104PW03F <121CBL02>	65PW01F <121CBL02>	Built in	Built in	Built in	Built in	Not provided	Built in	Built in	Recommended LED driver board <Suitable cable>
Remarks	LED X	T-EVT (-35C) LED	LED	Dr	Dr	Dr	Dr	—	Dr	Dr	Remarks

Please see the Data Sheet for detailed specifications.　All values are typical values (excluding the depth for module size).　Values in brackets are tentative.

*1 Values equal Ton + Toff (10%←→90%).　*2 Values do not include LED driver board power dissipation.　*3 Portrait view signals are to be prepared by a customer.
◆ T-EVT : Transmissive-Enhanced View TFT

Industrial Use [Wide Format]

Product Map

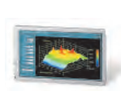
Please see the Data Sheet for detailed specifications. All values are typical values (excluding the depth for module size). Values in brackets are tentative.
Mounting compatibility: Module size (except depth), position of mounting holes, and relative position of mounting holes to screen center.
Interface compatibility: Interface connector and pin assignment.

LED … Long-life LED / +Dr … LED driver / NTSC ratio … Wide color gamut / ColorXcell technology / Portrait view compatible







	18.5 inch Wide	15 inch Wide	12.1 inch Wide	11.6 inch Wide	10 inch Wide	9.0 inch Wide	8.0 inch Wide	7.0 inch Wide
Full HD 1920×1080 (16 : 9) — eDP — Super Fine TFT	NEW NL192108AC21-01 SFT 400cd/m² +Dr 72%	Full HD Interface Compatibility(eDP)*1: NEW 15.6 inch Wide NL192108BC18-06F SFT (1500) cd/m²		NEW NL192108AC13-02D SFT 450cd/m² LED +Dr 70%				
		NEW 15.6 inch Wide NL192108AC18-01D SFT 400cd/m² +Dr 72%						
Full HD 1920×1080 (16 : 9) — LVDS — Super Fine TFT	NEW NL192108AC21-04 SFT 400cd/m² +Dr 72%	NEW 15.6 inch Wide NL192108AC18-02D SFT 400cd/m² +Dr 72%				NL192108AC10-01D SFT 400cd/m² LED +Dr 72%		
WXGA 1366×768 (16 : 9) — LVDS		WXGA Interface Compatibility(LVDS)*1: 15.6 inch Wide NL13676BC25-03F 1100cd/m² LED						
		15.6 inch Wide NL13676AC25-01D 400cd/m² LED +Dr						
		NEW 15.6 inch Wide NL13676AC25-05D 400cd/m² +Dr						
1280×800 (16 : 10) — LVDS			NL12880BC20-07F 1800cd/m²					
			NEW NL12880AC20-14D 450cd/m² LED +Dr					
			NEW NL12880AC20-20D SFT 400cd/m² +Dr		NEW 10.1 inch Wide NL12880AC16-01D SFT 400cd/m² LED +Dr			
			NL12880BC20-05/05D SFT 450cd/m² LED					
1280×768 (15 : 9) — LVDS — Super Fine TFT		15.3 inch Wide NL12876BC26-32D SFT 470cd/m² LED			10.6 inch Wide NL12876AC18-03/03D SFT 300cd/m² +Dr			
WVGA 800×480 (15 : 9) — LVDS — Super Fine TFT						WVGA Interface Compatibility(LVDS)*1: NL8048BC24-09/09D SFT 400cd/m² LED		
WVGA 800×480 (15 : 9) — LVDS — Enhanced View TFT								NL8048BC19-02C T-EVT 550cd/m²
						NL8048BC24-12/12D 450cd/m² LED	NL8048AC21-01F*3 1000cd/m² LED +Dr 70%	NL8048AC19-14F*3 1000cd/m² LED +Dr
								NL8048AC19-13*3 500cd/m² LED +Dr
								NL8048BC19-02 400cd/m²
								NL8048BC19-03*2 400cd/m²
	Mounting Compatibility	Mounting Compatibility / Mounting Compatibility	Mounting Compatibility			Mounting Compatibility		Mounting Compatibility

◆ SFT : Super Fine TFT, T-EVT : Transmissive-Enhanced View TFT

*1 Connector types and connector pin alignments are compatible. Control signal is upwardly compatible. *2 Portrait view signals are to be prepared by a customer. *3 Interface is compatible only with 6bits.

Product Specifications

LED … Long-life LED　Dr … LED driver　NTSC ratio … Wide color gamut　X … ColorXcell technology　Portrait … Portrait view compatible

Screen Size	18.5 inch Wide		15.6 inch Wide						15.3 inch Wide	12.1 inch Wide			
Part Number	NL192108AC21-01 NEW	NL192108AC21-04 NEW	NL192108BC18-06F NEW	NL192108AC18-01D NEW	NL192108AC18-02D NEW	NL13676AC25-05D NEW	NL13676BC25-03F	NL13676AC25-01D	NL12876BC26-32D	NL12880AC20-20D NEW	NL12880AC20-14D NEW	NL12880BC20-07F	NL12880BC20-05/05D
Resolution	1920 × 1080	1920 × 1080	1920 × 1080	1920 × 1080	1920 × 1080	1366 × 768	1366 × 768	1366 × 768	1280 × 768	1280 × 800	1280 × 800	1280 × 800	1280 × 800
Display Area (mm)	408.96 × 230.4	408.96 × 230.4	344.16 × 193.59	344.16 × 193.59	344.16 × 193.59	344.232 × 193.536	344.232 × 193.536	344.232 × 193.536	334.08 × 200.45	261.12 × 163.2	261.12 × 163.2	261.12 × 163.2	261.12 × 163.2
Display Color	16.77M	16.77M	16.77M	16.77M	16.77M	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M	16.77M / 262K	16.77M / 262K	16.77M / 262K
Pixel Pitch (mm)	0.213 × 0.213	0.213 × 0.213	0.17925 × 0.17925	0.17925 × 0.17925	0.17925 × 0.17925	0.252 × 0.252	0.252 × 0.252	0.252 × 0.252	0.261 × 0.261	0.204 × 0.204	0.204 × 0.204	0.204 × 0.204	0.204 × 0.204
Luminance	400cd/m^2	400cd/m^2	(1500)cd/m^2	400cd/m^2	400cd/m^2	400cd/m^2	1100cd/m^2	400cd/m^2	470cd/m^2	400cd/m^2	450cd/m^2	1800cd/m^2	450cd/m^2
Contrast	(1000 : 1)	(1000 : 1)	750 : 1	1000 : 1	1000 : 1	900 : 1	900 : 1	900 : 1	700 : 1	1000 : 1	800 : 1	800 : 1	1000 : 1
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	88°, 88°, 88°, 88°
Response Time*1	(25)ms	(25)ms	(30)ms	25ms	25ms	18ms	18ms	18ms	25ms	(25) ms	15ms	15ms	25ms
Interface	2lanes eDP RGB 8 bits	2port LVDS RGB 8 bits	2lanes eDP RGB 8 bits	2lanes eDP RGB 8 bits	2port LVDS RGB 8 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits
Power Supply Voltage	Signal : 5.0V Backlight : 12.0V	Signal : 5.0V Backlight : 12.0V	3.3V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	3.3V	Signal : 3.3V Backlight : 12.0V	3.3V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	3.3V	3.3V
Power Consumption	TBD	TBD	(24.4)W*2	(13.9)W	TBD	(9.5)W	16W*2	10.6W	9.8W*2	(7.1) W	5.6W	16.7W*2	6.5W*2
Operating Temperature	−20˚C ～ +70˚C	−20˚C ～ +70˚C	(−30)˚C ～ (+85)˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−30˚C ～ +80˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C
Storage Temperature	−20˚C ～ +80˚C	−20˚C ～ +80˚C	(−40)˚C ～ (+85)˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +80˚C	−30˚C ～ +80˚C	−20˚C ～ +80˚C	−20˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C
Polarizer Surface	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	AG	-05 : Clear / -05D : AG
Module Size W×H×D(mm) (D : max)	430.4 × 254.6 × (14.0)	430.4 × 254.6 × (14.0)	363.8 × 215.9 × (15.7)	363.8 × 215.9 × 6.8	363.8 × 215.9 × 6.8	363.8 × 215.9 × 10.8	363.8 × 215.9 × 13.1	363.8 × 215.9 × 10.8	358.0 × 226.0 × 14.8	277.7 × 180.6 × 9.2	277.7 × 180.6 × 9.2	277.7 × 180.6 × 9.2	277.7 × 180.6 × 9.2
Weight	TBD	TBD	(1300)g	(610)g	(610)g	(800)g	1070g	800g	1100g	(470) g	470g	470g	460g
Reverse Scan	—	—	—	—	—	—	—	—	—	—	○	○	○
Recommended LED driver board <Suitable cable>	Built in	Built in	Not provided	Built in	Built in	Built in	Not provided	Built in	Not provided	Built in	Built in	Not provided	104PW03F <121CBL02>
Remarks	SFT Dr 72%	SFT Dr 72%	SFT	SFT Dr 72%	SFT Dr 72%	Dr	LED	LED Dr	SFT LED X	SFT Dr	LED Dr X	X	SFT LED X

Screen Size	11.6 inch Wide	10.6 inch Wide	10.1 inch Wide	9.0 inch Wide			8.0 inch Wide	7.0 inch Wide					
Part Number	NL192108AC13-02D NEW	NL12876AC18-03/03D	NL12880AC16-01D NEW	NL192108AC10-01D	NL8048BC24-12/12D	NL8048BC24-09/09D	NL8048AC21-01F	NL8048AC19-14F	NL8048AC19-13	NL8048BC19-02C	NL8048BC19-02	NL8048BC19-03*3
Resolution	1920 × 1080	1280 × 768	1280 × 800	1920 × 1080	800 × 480	800 × 480	800 × 480	800 × 480	800 × 480	800 × 480	800 × 480	800 × 480
Display Area (mm)	256.32 × 144.18	230.4 × 138.24	216.96 × 135.6	198.72 × 111.78	196.8 × 118.08	196.8 × 118.08	174.0 × 104.4	152.4 × 91.44	152.4 × 91.44	152.4 × 91.44	152.4 × 91.44	152.4 × 91.44
Display Color	16.77M	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	16.77M / 262K	262K	262K	262K	16.77M / 262K	16.77M / 262K	16.77M / 262K
Pixel Pitch (mm)	0.1335 × 0.1335	0.18 × 0.18	0.1695 × 0.1695	0.1035 × 0.1035	0.246 × 0.246	0.246 × 0.246	0.2175 × 0.2175	0.1905 × 0.1905	0.1905 × 0.1905	0.1905 × 0.1905	0.1905 × 0.1905	0.1905 × 0.1905
Luminance	450cd/m^2	300cd/m^2	400cd/m^2	400cd/m^2	450cd/m^2	400cd/m^2	1000cd/m^2	1000cd/m^2	500cd/m^2	550cd/m^2	400cd/m^2	400cd/m^2
Contrast	1000 : 1	1000 : 1	(800 : 1)	700 : 1	900 : 1	800 : 1	800 : 1	800 : 1	800 : 1	800 : 1	1000 : 1	1000 : 1
Viewing Angle (U/D/L/R) Contrast ≧10 : 1	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	88°, 88°, 88°, 88°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°	80°, 80°, 80°, 80°
Response Time*1	20ms	25ms	(25)ms	25ms	18ms	25ms	8ms	8ms	8ms	18ms	18ms	18ms
Interface	2lanes eDP 8 bit	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	2port LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 6 bits	LVDS RGB 6 bits	LVDS RGB 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits	LVDS RGB 8 bits / 6 bits
Power Supply Voltage	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 5.0～12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	3.3V	3.3V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	Signal : 3.3V Backlight : 12.0V	3.3V	3.3V	3.3V
Power Consumption	8.5W	3.3W	(5.3) W	11.4W	4.1W*2	4.4W*2	5.7W	5.4W	3.0W	3.4W*2	3.4W*2	3.4W*2
Operating Temperature	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−30˚C ～ +80˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C	−20˚C ～ +70˚C
Storage Temperature	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−40˚C ～ +80˚C	−40˚C ～ +80˚C	−40˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C	−30˚C ～ +80˚C
Polarizer Surface	AG	-03 : Clear / -03D : AG	AG	AG	-12 : Clear / -12D : AG	-09 : Clear / -09D : AG	AG	AG	Clear	Clear+AR	Clear	Clear
Module Size W×H×D(mm) (D : max)	276.5 × 165.6 × 6.0	248.8 × 155.8 × 7.0	235.4 × 148.8 × (9.7)	214.6 × 130.0 × 9.6	220.5 × 136.5 × 8.7	220.5 × 136.5 × 8.7	192.0 × 122.0 × 9.4	170.0 × 111.0 × 9.0	170.0 × 111.0 × 9.0	170.0 × 111.0 × 9.0	170.0 × 111.0 × 9.0	170.0 × 111.0 × 9.0
Weight	355g	270g	(330)g	270g	275g	275g	230g	185g	185g	170g	165g	165g
Reverse Scan	—	○	○	—	○	○	○	○	○	○	○	○
Recommended LED driver board <Suitable cable>	Built in	Built in	Built in	Built in	104PW03F <121CBL02>	104PW03F <121CBL02>	Built in	Built in	Built in	Not provided	Not provided	Not provided
Remarks	SFT Dr 70%	SFT Dr X	SFT LED Dr	SFT LED Dr 72%	LED	SFT LED	LED Dr 72%	LED Dr	LED Dr	T-EVT	—	

Please see the Data Sheet for detailed specifications.　All values are typical values (excluding the depth for module size).　Values in brackets are tentative.

*1 Values equal Ton + Toff (10%←→90%).　*2 Values do not include LED driver board power dissipation.　*3 Portrait view signals are to be prepared by a customer.

◆ SFT : Super Fine TFT, T-EVT : Transmissive-Enhanced View TFT

Environmental Initiatives

We are actively engaged in global environment preservation activities, and aim to create a prosperous and sustainable society.

We seek to help build a prosperous, sustainable society that encourages the fulfillment of human potential.
For this purpose, we are well aware of the effects of corporate activities on the environment and pursue eco-friendly products and eco-friendly production.
In addition, alongside affiliated and partner companies, we seek to implement global environmental preservation activities throughout our corporate activities.

Eco-friendly products

•Promote reduction of power consumption in new product designs
- Optimize product designs with improved optical characteristics
- Work with suppliers to select optimal components and materials

•Reduce and manage the use of chemical substances in our products
- Comply with various regulations such as the RoHS directive
- Promote green procurement program

•Promote resource-saving products
- Promote product design that encourages resource recycling
- Reduce material usage by improving efficiency

Eco-friendly production

•Promote energy-saving production
- High energy utilization efficiency using a co-generation system
- Reduce energy consumption with fewer process steps and higher operational efficiency

•Reduce and manage emissions in production processes
- Balance management of chemical substances subjected to PRTR act
- Reduce green house gas emissions such as CO_2 and PFC

•Promote resource saving and resource recycling in production process
- Maintain Zero emission with promoting 4R*activity

* 4R: Reduce, Reuse, Recycle, Replace

Document No.: NLT-PP-6145
Publication Date: October 2016

VEGETABLE OIL INK

This brochure is produced using an environment-friendly printing method.

NLT Technologies, Ltd.

Shin-Kawasaki Mitsui Building West Tower 28F
1-1-2 Kashimada, Saiwai-ku, Kawasaki, Kanagawa 212-0058 Japan

http://www.nlt-technologies.co.jp/en/