Are IPS or TFT displays better - difference, readability

Which is better, IPS or TFT ?

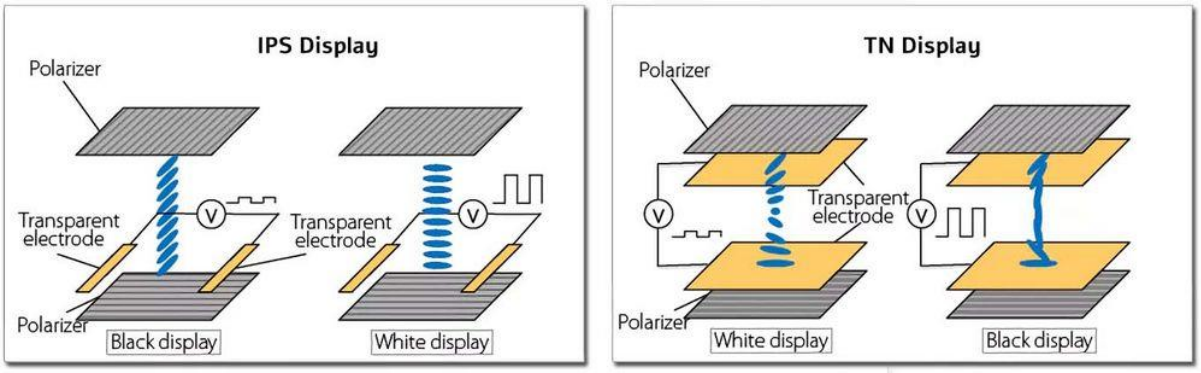
Many wonder about the difference between a TFT and an IPS display. Which of the two is better? IPS or TFT? Where exactly are the differences? And what does it have to do with an LCD?

Basically, both are LC displays; you don't actually say "LCD display", that's "doubled" since the word LCD already contains the "liquid crystal display". Liquid crystal displays (LCD) are available in one color (monochrome) or in full color. The full-color displays are then called TFT displays. TFT = "Thin-Film-Technology". This refers to the driver electronics and not the display technology.

An IPS display describes a special display technology, even if it is a color TFT display.

TFT = color LCD with driver for every single pixel directly on the glass, usually in TN-technology

IPS = TFT with wide viewing angle



The IPS technology is a so-called "in-plane switching" technology. It creates a contrast that is almost independent of the viewing angle. So, no matter if you look at the display directly from the front or rather from the left or top, the contrast remains constant. This means that IPS displays can be read well from all sides. IPS displays achieve a viewing angle of up to 85° in all four directions compared to 45° to 55° for classic TN displays (TFT displays).

TFT = 45-55° viewing angle

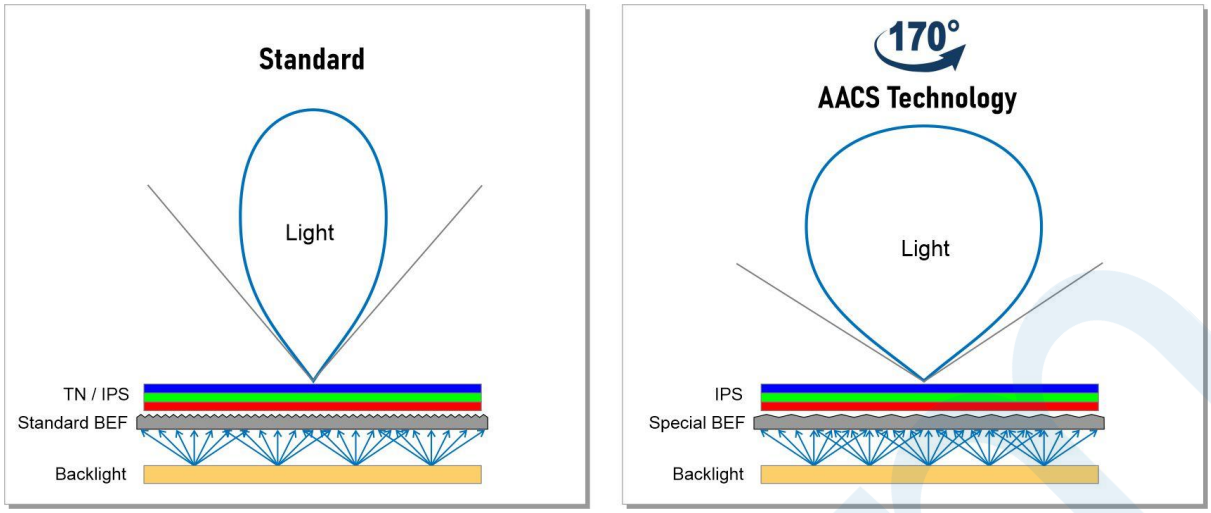
IPS = 85° viewing angle

Furthermore, the color stability is much higher with IPS displays. If you look at a normal TFT display in TN technology from above or below, you will observe the typical gray inversion effect. This refers to a sudden tilt of the colors into a negative display. The colors are lost and the display content turns gray to brown. The content remains somewhat recognizable, but appears in completely wrong colors. IPS technology doesn't know this effect, the colors remain intact.

Together with a good backlight, as used in all DISPLAY VISIONS displays, you can still achieve high brightness even when looking at the display from an angle.

TFT = Gray Inversion Effect

IPS = colors remain stable even when viewing angle changes



The AACS technology (All-Angle-Color-Stability) brings another technology advantage.

Due to their low transmission rates, TFT displays require very bright backlighting. This is achieved using so-called BEF films (Brightness Enhancer Film). They focus the light of the backlight to a small angle. In this way, a bright display can be created with a few LEDs (inexpensively). However, if you move your head outside the normal, the display quickly becomes much darker.

Not so with the AACS technology, because here the wide viewing angle of the IPS display is supported by a illumination with wide angle: thus we achieve a brilliant and bright display even at extreme viewing angles. With a much wider viewing angle than normal TFT displays, color stable and also incomparably brighter from the side.

TFT and IPS Displays from 1" to 10"

You will find a large selection of professional displays for industry and medical technology here. Inexpensive and high quality. Plus support, tools, initialization examples etc.

TFT displays in TN, IPS and AACS - with and without touch panel

IPS Technology - Viewing angle near 360°					
Ordering code	**Size**	**IPS / AACS**	**Dimension in mm**	**Resolution**	**Touchpanel**
EA TFT009-81AINN	1"	IPS	13.5 x 27.9 x 1.5	80x160	
EA TFT009-81AITC			18.7 x 31.9 x 2.6		PCAP
EA TFT015-22AINN	1.5"	IPS+AACS	32.0 x 35.0 x 3.2	240x240	
EA TFT015-22AITC			44.0 x 46.0 x 5.3		PCAP
EA TFT020-23AINN	2"	IPS+AACS	36.0 x 52.0 x 2.2	320x240	
EA TFT020-23AITC			43.0 x 65.0 x 4.2		PCAP
EA TFT028-23AINN	2.8"	IPS+AACS	48.0 x 68.0 x 2.2	320x240	
EA TFT028-23AITC			58.0 x 84.0 x 4.3		PCAP
EA TFT035-32ANN	3.5"		76.9 x 63.9 x 3.3	320x240	
EA TFT035-32BTS			76.9 x 63.9 x 4.5		PCAP
EA TFT035-32ATP			76.9 x 63.9 x 4.4		Resistive
EA TFT035-34AINN	3.5"	IPS+AACS	54.7 x 82.9 x 2.2	480x320	
EA TFT035-34AITC		IPS+AACS	65.0 x 100.0 x 4.4		PCAP
EA TFT043-42ANN	4.3"		105.5 x 67.2 x 3.0	480x272	
EA TFT043-42ATS			105.5 x 67.2 x 4.6		PCAP
EA TFT043-42ATP			105.5 x 67.2 x 4.1		Resistive
EA TFT043-42BITC	4.3"	IPS	114.0 x 84.0 x 4.8	480x272	PCAP
EA TFT050-84ANN	5"		120.7 x 75.8 x 2.8	800x480	
EA TFT050-84BTS			120.7 x 75.8 x 4.5		PCAP
EA TFT050-84ATP			120.7 x 75.8 x 4.3		Resistive

EA W800X-50AILW	5"	IPS+AACS	124.0 x 78.5 x 9.1	800x480	
EA TFT052-41ANN	5.2"		140.4 x 49.9 x 3.0	480x128	
EA TFT052-41ATS			140.4 x 49.9 x 5.0		PCAP
EA TFT052-41ATP			140.4 x 49.9 x 4.5		Resistive
EA TFT057-32ANN	5.7"		141.1 x 101.6 x 6.5	320x240	
EA TFT057-32BTS			141.1 x 101.6 x 8.2		PCAP
EA TFT057-32ATP			141.1 x 101.6 x 8.0		Resistive
EA TFT070-84ANN	7"		165.0 x 100.0 x 5.8	800x480	
EA TFT070-84BTS			165.0 x 100.0 x 7.4		PCAP
EA TFT070-84ATP			165.0 x 100.0 x 7.0		Resistive
EA R1024X-70BLW	7"	IPS+AACS	164.9 x 100.0 x 5.7	1024x600	
EA R1024X-70BLWTS			164.9 x 100.0 x 7.6		PCAP
EA R1024X-70CLWTC			190.0 x 125.0 x 7.5		PCAP
EA W1280X-101ALW	10.1"	IPS	235 x 161 x 13,1	1280x800	