

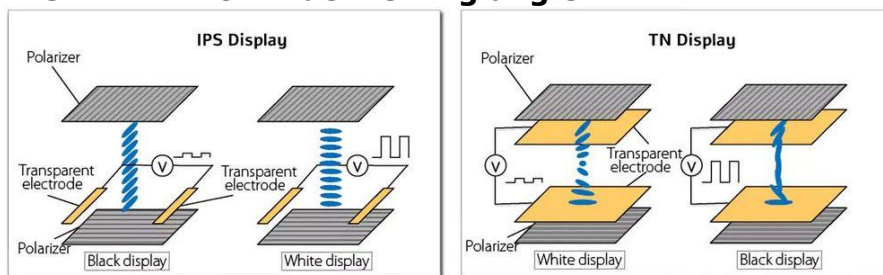
## Which is better, IPS or TFT ?

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).

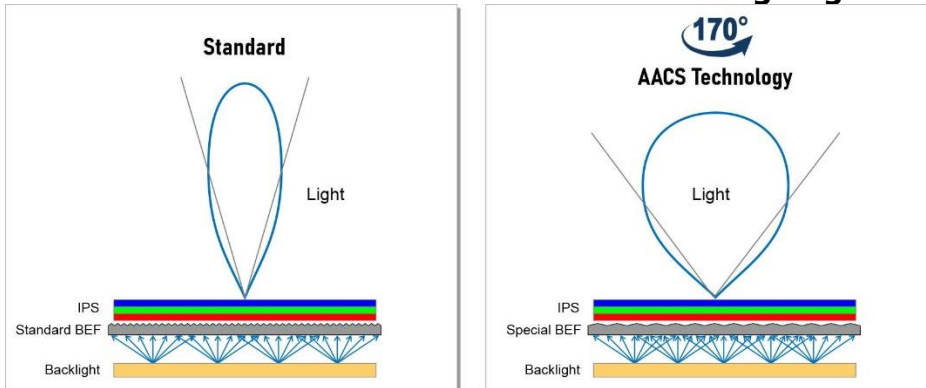
**TFT = 45-55° viewing angle**

**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.

## IPS Displays

IPS Technology - Viewing Angle >170°					
Ordering Code	Size	IPS	Dimension in mm	Resolution	Touchpanel
EA TFT009-81AINN	0.96"	IPS	13.5 x 27.9 x 1.5	80x160	
EA TFT009-81AITC		IPS	18.7 x 31.9 x 2.6		PCAP
EA TFT015-22AINN	1.5"	IPS	32.0 x 35.0 x 3.2	240x240	
EA TFT015-22AINN		IPS	44.0 x 46.0 x 5.3		PCAP
EA TFT020-23AINN	2.0"	IPS	36.0 x 52.0 x 2.2	320x240	
EA TFT020-23AITC		IPS	43.0 x 65.0 x 4.2		PCAP
EA TFT028-23AINN	2.8"	IPS	48.0 x 68.0 x 2.2	320x240	
EA TFT028-23AITC		IPS	58.0 x 84.0 x 4.3		PCAP
EA TFT035-34AINN	3.5"	IPS	54.7 x 82.9 x 2.2	480x320	
EA TFT035-34AITC		IPS	65.0 x 100.0 x 4.4		PCAP
EA TFT043-42BITC	4.3"	IPS	114.0 x 84.0 x 4.8	480x272	PCAP
EA W800X-50AILW	5.0"	IPS	124.0 x 78.5 x 9.1	800x480	
EA R1024X-70BLW	7.0"	IPS	164,9 x 100,0 x 5.7	1024x600	
EA R1024X-70BLWTS		IPS	164,9 x 100,0 x 7.6		PCAP
EA W1280X-101ALW	10.1"	IPS	235 x 161 x 13.1	1280x800	