How TruView's LED is Superior to Conventional SMD Chip-Based LED Screens

Our new VISIONiQ TruView™ technology changes the landscape of what LED screens can accomplish. The biggest force behind TruView's LED technology is actually its smallest component: the Flip Chip.

This tiny chip completely redefines what an SMD LED chip should be, eliminating many of the factors currently hindering conventional SMD chips. And the results are revolutionary.

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What Makes our Flip Chip Different?

There are a few key design differences that make the Flip Chip superior to conventional SMD chips, but the biggest aspect that enables it to perform on such an optimal level is the lack of a wire bond to the PCB board.

With regular SMD LED chips, a tiny gold wire is needed to connect the chip to the PCB board. The Flip Chip has an innovative LED chip design that allows it to operate without a wire at all. That means no wire bonding is required, eliminating the most significant factor that causes LED chips to fail.

The Flip Chip uses what's called Ball Bonding to connect to a PCB board, giving it significantly more durability and flexibility. This plays out in several ways in terms of both performance and longevity.

Let's dive into the most notable improvements TruView's Flip Chip provides on the following pages.

Image Quality

For viewers, the most important aspect of LED screens is the image quality. With that said, there's not just one aspect that defines image quality, but rather a wide set of different factors that all work together. These determine the overall quality of the images and video being shown on the screen.

- **Contrast Ratio** - Put simply, contrast ratio refers to the brightest and darkest a screen can get — but this does not mean just turning the brightness up or down. The higher the contrast ratio is, the more difference the screen can make between dark and light graphics, which in turn means the colors are more vibrant and a lot sharper.

If the contrast ratio is on the lower end, which is still true for many commercial LED screens, the images and video will have more of a washed out, almost hazy look to them. Higher contrast ratios eliminate this slight haze and allow for extremely sharp resolution.

The TruView Flip Chip has a contrast ratio of 10000:1, which is over 3X the typical LED contrast ratio of 3000:1. The difference this makes in display quality is massive. And your audience will notice it.

- **The Flip Chip design** also enables a higher color consistency for dark images and a higher color uniformity for full white images, both of which combine to create sharper and more vibrant displays.

- **Overall Brightness** - Have you ever been outside in bright, direct sunlight and had trouble seeing the small details on your phone's screen? If you were able to increase the screen's overall brightness past its maximum, you'd be able to see it better. Now imagine this for a large LED screen deployed outdoors. The Flip Chip enables this for LED screens, providing an available 330% increase in brightness over standard SMD chip LED screens, ensuring your displays can be clearly seen in even the brightest scenarios.

Durability

The Flip Chip's wire-free design allows the entire PCBA board to be fully sealed with epoxy resin, which enhances a higher level of protection against humidity, water, dust, physical damage, and static electricity — all of which can wreak havoc with conventional LED screens using traditional SMD chips.

Thanks to the Flip Chip and the epoxy resin coating, repairs are rarely needed and regular maintenance / cleanings are effortless. When repairs are needed, the TruView screen components are easily replaceable on-site, as the modules can quickly be swapped out and replaced in just a few minutes.

Maintenance

Ongoing maintenance and screen failures are a common concern for SMD LED screens, and it's easy to understand why when considering that each screen is made from thousands of SMD chips. With so many individual chips needed to create a screen, there's a lot that can go wrong, especially when microscopic wiring is involved.

TruView's Flip Chip technology is a game-changer in terms of screen durability. Wire failure with conventional SMD chips is the biggest reason behind screen issues. This creates blacked-out spots on the screen that instantly downgrades the overall image and video quality, making the screen look run down and faulty. The Flip Chip contains no wiring internal to the pixel, so there are zero wiring failures—period. This wire-free design also eliminates LED soldering breaks and leakage, another common problem with conventional SMD chips.

The Flip Chip design results in a much lower fail rate: less than 5 PPM per year vs. a minimum of 20 PPM per year with standard SMD chips.

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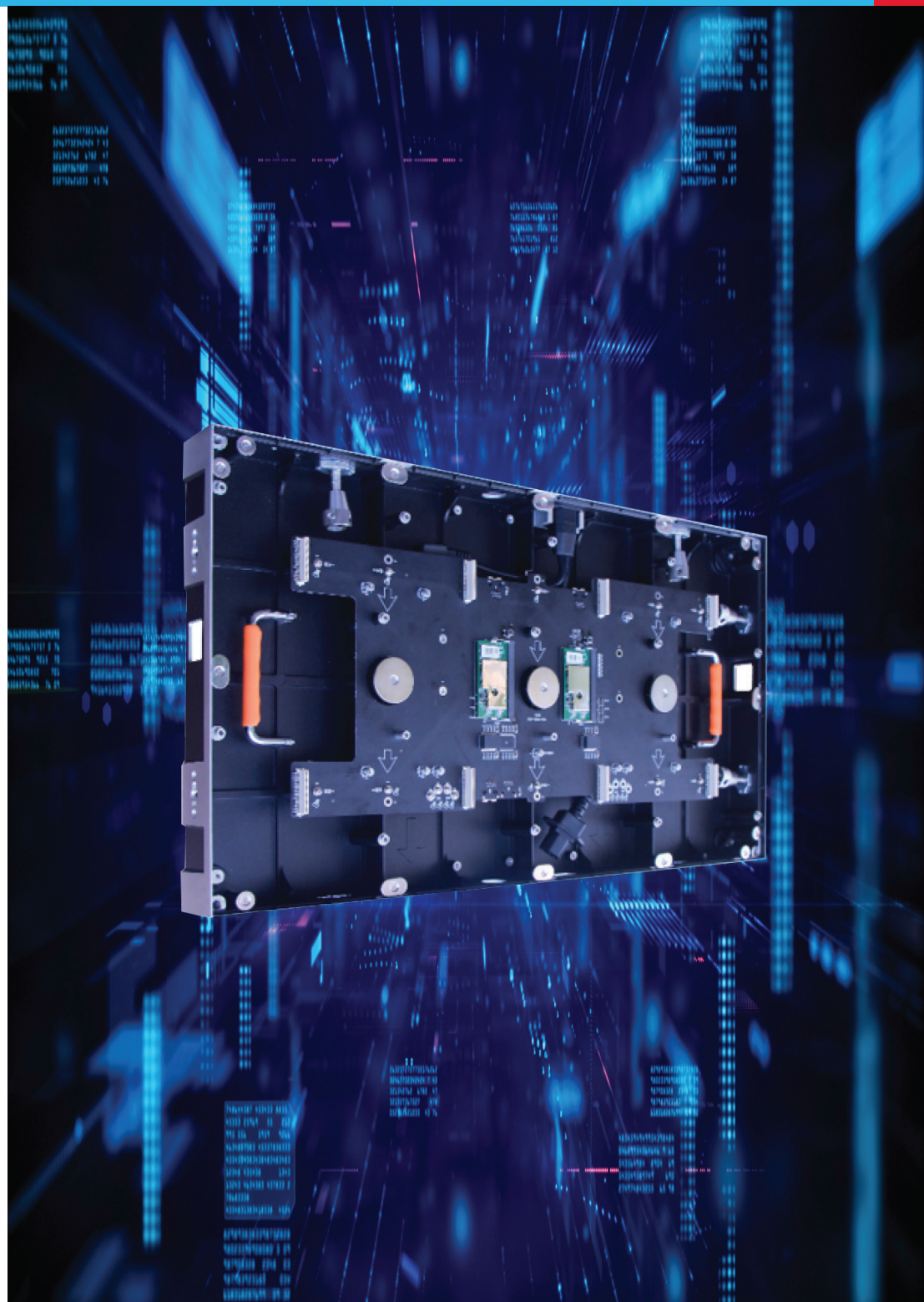
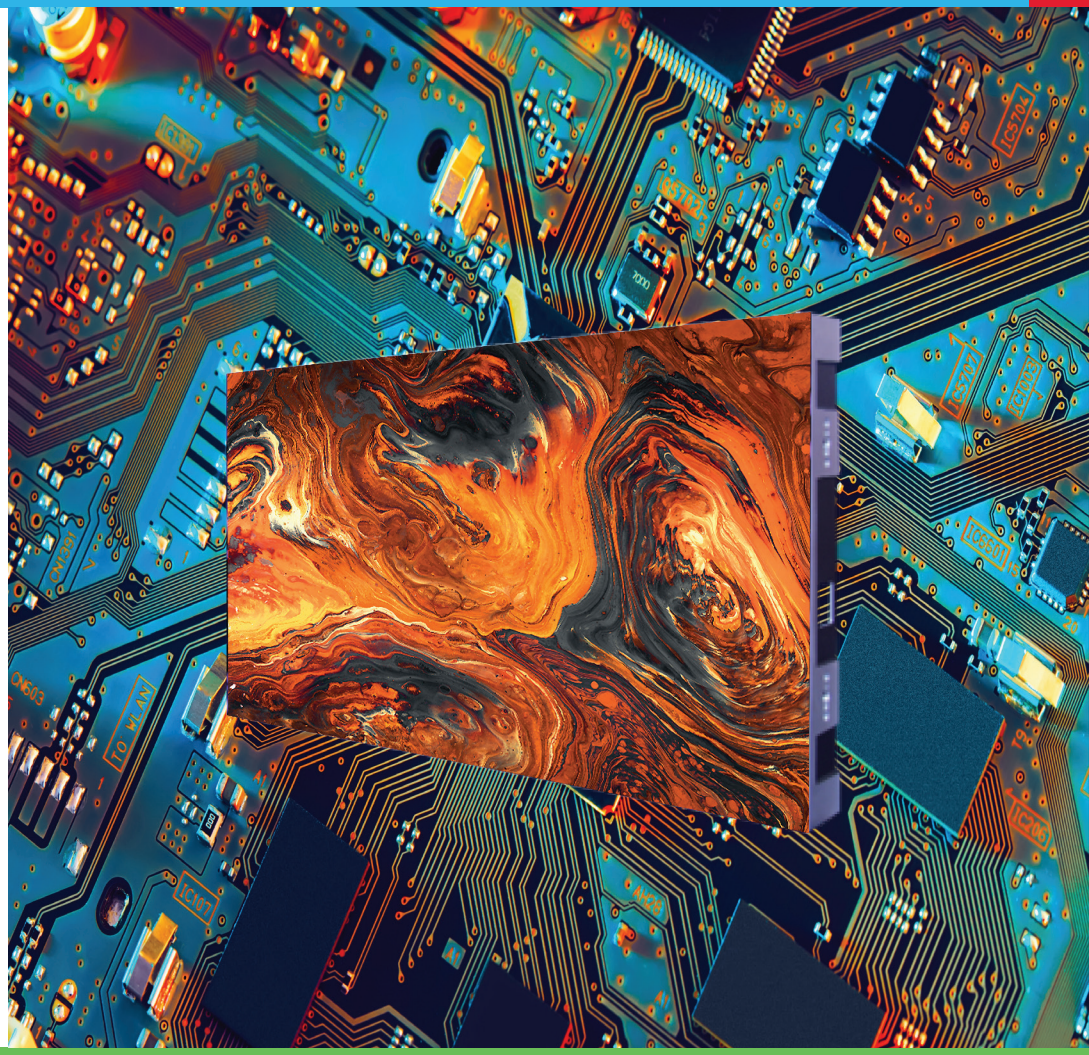


Image Retention

If you've ever left a computer screen or television paused on the same image for a long period of time, you've probably noticed how the image remains for a small amount of time even after you've unpaused the image or pulled up a different window. In some unfortunate cases with older screens, a faint imprint of the image remains permanently. Some people call this "burning" the image into a screen.

This same problem can occur with LED screens, and the image doesn't even have to be on the screen for very long to create a retention effect. This causes a drop in the overall quality of the screen, as some images will remain faintly overlapped with others in certain situations. The main culprit behind this unwanted phenomenon is the heat put out by the SMD LED chips in the screen.



The Flip Chip sidesteps image retention completely. Thanks to its revolutionary design and wireless connection to the board, the chip operates at a drastically lower temperature, so you'll never have to worry about ghost images lingering on top of others — no matter how long a still image remains on the screen.

Design Flexibility

The durable and low-heat design of the Flip Chip provides a substantial amount of design flexibility. This means a much lower chance of needing repairs or replacement parts. Its structure supports durability in ways never accomplished before.

With TruView, there are no bevels or gaps in the screen, so you can create screens with convex or concave curves or a screen with sharp right angles. In fact, you can create LED screens with multiple bends and curves, giving you infinite options for screens that can fit into most any scenario you might envision.

This is especially useful for commercial and retail settings when you're looking to incorporate image and video screens in innovative and eye-catching ways that don't conform to the typical flat rectangle or square shapes.

Conclusion & Takeaways

Conventional SMDs served the public well for years. But now there's a far better technology available. In the digital age, there's no reason to buy an outdated design. And at this point, that's just what conventional SMDs are.

Our TruView system offers a superior Flip Chip design that guarantees better performance and an exponentially more durable product. When it comes to digital signage, TruView is the way of the future.

Interested in learning more about TruView? We'd love to talk.

Reach out to us anytime.

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