Applications on Redundancy Function of LED Display Power Supply

Date: 2020.3.30
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With the continuous development of the LED display, the market share of full-color LED displays has been increasing in recent years. The characteristics of its high-brightness and high-resolution are widely favored by most advertisers and real estate developers. For a better watching experience, people require higher demands on clarity and resolution. As a result, the small-pitch LED display has become a trend.

As full-color small-pitch LED display can achieve better graphics images and videos displaying effects on smaller screens, the range of the applications are gradually expanding, especially in some special applications, such as theaters, live large-scale performances, concerts, and video conferences, etc, (as shown in Fig. 1). Furthermore, its high reliability and low maintenance fee traits are highly recognized.

Fig.1 Full-color Small-pitch LED display Application
The current display usually uses only one power supply. Once the power supply breaks down, the screen fails simultaneously. However, on-site power replacement and maintenance affect ongoing activities. To enhance the reliability, most power and signal backup system adopt a "1 + 1" parallel redundant design.

Following is a brief description of the redundant applications:

The traditional connection method of redundant is to connect two or more power sources in series to the diodes in parallel to the output power buses in parallel, as shown in Figure 2. A single power supply can work alone, or multiple power supplies work at the same time. When one of the power supplies fails, the output of the power bus will not be affected due to the unidirectional conduction characteristics of the diode.

The new redundant power supply configuration uses high-power MOSFETs to replace the diodes in the circuit (shown as Fig. 2). Due to the low turn-on resistance of the MOSFET, only several mΩ, it greatly reduces the conduction loss. With the MOSFETs being implemented, not only is a more efficient solution realized, but also minimized heat sink design, saving the total cost of the system.
The new LSP-160 series launched by MEAN WELL adopts MOSFET to replace the diode in the traditional circuit design. With an integrated circuit, redundancy and active current sharing (optional) functions are achieved. Also, featuring small volume and high efficiency, the LSP-160 series meets the requirements of redundant applications in the small-pitch full-color LED display market.

Moreover, the LSP-160 series is a low profile semi-potted product, which enables to reduce power failures caused by environmental issues, such as pollution, vibration, and humidity. LSP series is highly recommended for railway information equipment, and intelligent equipment for the urban rail system, or equipment with limited space.

Fig.3 LSP-160 Redundancy and Parallel Connection