The digital core of the LED driver

Modern LED technology offers many advanced possibilities for lighting applications. These applications require LED drivers to drive the LEDs in order to adjust and supply a constant voltage and current with flexibility, and to limit the power. The following is the Infineon's XDPL8220 LED driver IC. We will see the kinds of features and functions it provides.

The simple and innovative entry point to smart lighting

The XDPL8220 LED driver IC from Infineon featured digital and configuration functions that allows for the lighting industry to make smart lighting possible and bring advantages to the end users and the manufacturers. The digital core of the XDPL8220 supports different systems based on the same device. Its advanced control algorithms makes Electronic Control Gear (ECG) for lighting under constant current or voltage in the same circuit possible. The power limitation mode stays lit while the components perform their optimal functions. This device is applicable to full-range parametric settings for adjusting targeted application with limitation in

operation. The flexible functions of the XDPL8220 can help manufacturers to save on resources and cost.

The modern two-stage architecture of the XDPL8220 significantly simplifies the forth coming flicker standards by eliminating the low frequency variation from the mains supply and guaranteeing a stable output. Supporting a standby power of less than 70 mW, the XDPL8220 significantly reduces non-active power consumption while still reacting to external events or user requests. The low stand-by power mode of the XDPL8220 facilitates permanent operation of the ECG.

Any over temperature of external components, measured via an external NTC resistor. Smart management could be accomplished through the reduction of the output current until the problem of overheating is resolved. As the last resort when the temperature still exceeds the limit, the device will shut down. The XDPL8220 is featured with smart temperature management for the durability of lighting devices.

The primary side control saves extra components especially an optocoupler, thus reducing the cost and work as well as enhancing reliability. The digital control loop requires less parts and effort for the external loop compensation. With its integrated function, the XDPL8220 can perform its function without the support of external parts and components. With the use of the XDPL8220, BoM costs could be saved due to the integration and primary side control.

The XDPL8220 features a number of solutions for Constant Voltage (CV), Constant Current (CC) and Limited Power (LP) functions. The XDPL8220 converts power from an input source (typically the Alternating Current (AC) grid) to an output sink. The sink is referred to as the load of the XDPL8220. The amount of power transferred can be regulated according to different solutions. It is suitable for a typical power supply such as a Universal Serial Bus (USB) device or a notebook that ensures a CV in loading. The power flow is continuously adapted to maintain the output voltage within a certain range. Some LED loads include a linear regulator and are also supplied by CV.

A typical power supply for simple LED strings (without regulator) ensures a CC to the load. The power flow is constantly adapted to maintain the output current within a certain range. To avoid overloading the power converter, but still continue the power transfer, a power converter can also enter a third solution to ensure an LP to the load, regardless of the conditions of the voltage or current.

As dictated by its application, a power converter typically works in one of the three solutions under the condition that the current/voltage is controlled within the limit which triggers a protection. The XDPL8220 is an integration of CV, CC and LP into one product.

The output of the XDPL8220 consists of three different parts. The first part is the driver which transmits power to the output. The second one is an output capacitor, and the third is the Load which draws power from the output. Operation at a steady state (assuming a quasi-constant energy in the capacitor) is only possible if the power transmitted to the output capacitor at the same point of time, is exactly the same time as the power driven by the load (law of conservation of energy).

The concept of I/V characteristic curves for the output of XDPL8220 helps to understand the possibility of steady-state operating conditions, both driver and load have to be considered simultaneously. The operation features of both driver and load can be depicted in I/V characteristic curves. Any point on any curve is a possible operation point for either driver or load. Only points which are available on both curves (intersections) are stable conditions for both the driver and load.

The XDPL8220 is highly flexible with diverse functions, and is the best choice of LED lighting. It is worthwhile to take a closer look at the functions of this product.