CXA3757GF

Ultrasmall High-Efficiency 3ch/4ch Backlight LED Driver for Mobile Equipment Features Built-in Boost-type DC-DC Converter

As the functionality and performance of portable equipment have increased in recent years, the battery drain has also increased.
At the same time, there are also increasing demands for further smaller sizes and even thinner form factors.
Thus there are now demands for reduced power consumption and further small size in the backlight LED driver ICs used in this equipment.
The CXA3757GF uses Sony's unique system to achieve the industry's highest level of efficiency.
Furthermore, by the adoption of an ultrasmall package, Sony has achieved a mounting area so small it can be mounted in the LCD panel module.

- High-efficiency LED drive using a unique Sony system
- Ultrasmall, low-profile package: 1.5 × 2.0 × 0.6 mm (maximum)
- Supports small chip inductors
- Supports low-voltage drive (Operating voltage: 2.0 to 4.8 V)
- Maximum drive current: 20 mA/channel
- Brightness adjustment function based on a PWM input
- Full complement of built-in protection functions (overvoltage protection, UVLO, and thermal protection)

High-Efficiency LED Drive Using a Unique Sony System

There are two reasons for the high efficiency of Sony LED drivers. The first is that the LEDs are driven in parallel.
By driving the LEDs in parallel, the state where the backlight is on is divided into two periods: the period when the battery voltage is high and LEDs can be driven directly (the boost not needed period) and the period when the battery voltage is low and LEDs cannot be driven directly (the boost required period).
Since the power supply can be turned off in the boost not needed period, there is essentially no power loss (power efficiency: 97%). With lithium-ion batteries, the state where the battery voltage is 3.6 V or higher is long, and since this is the boost not needed period, power loss can be reduced significantly by connecting the LEDs in parallel.
The second reason is that the boost required period is made as short as possible. To achieve this, Sony has developed LED drivers that operate at 0.14 V. This means that the boost not needed period extends until the battery voltage drops below (0.14 V + VF for the LEDs).
For these two reasons, the LED can be used without the boost operation for the majority of the battery discharge period, and as a result power consumption waste is completely eliminated and power loss when the LEDs are on is held to an absolute minimum.

Achieves the Industry's Smallest Mounting Area Level: Ultrasmall, Low-Profile Package Supports the Use of Small Chip Inductors

The CXA3757GF is provided in an ultrasmall, low-profile package with 1.5 × 2.0 × 0.6 mm maximum dimensions. To support circuit board miniaturization, not only does the CXA3757GF feature a small package, it also features a design that supports miniaturization of the peripheral components.
Furthermore, to respond to desires for thinner form factors, it supports the construction of systems that only use 0.6 mm or shorter low-profile components.

Low-Voltage Operation

The CXA3757GF supports a wide supply voltage input range (2.0 to 4.8 V) to handle the low-voltage lithium-ion batteries expected in the future.

VOICE

For anyone worrying about how to save space or power in portable equipment, I strongly recommend that you look into this device.
This IC combines the industry's highest levels of efficiency and space savings. I am sure that it can provide results that match your hopes. In the future, in addition to this 3ch/4ch version, we plan to add a 6 channel version to the product lineup.

Figure 1 Block Diagram

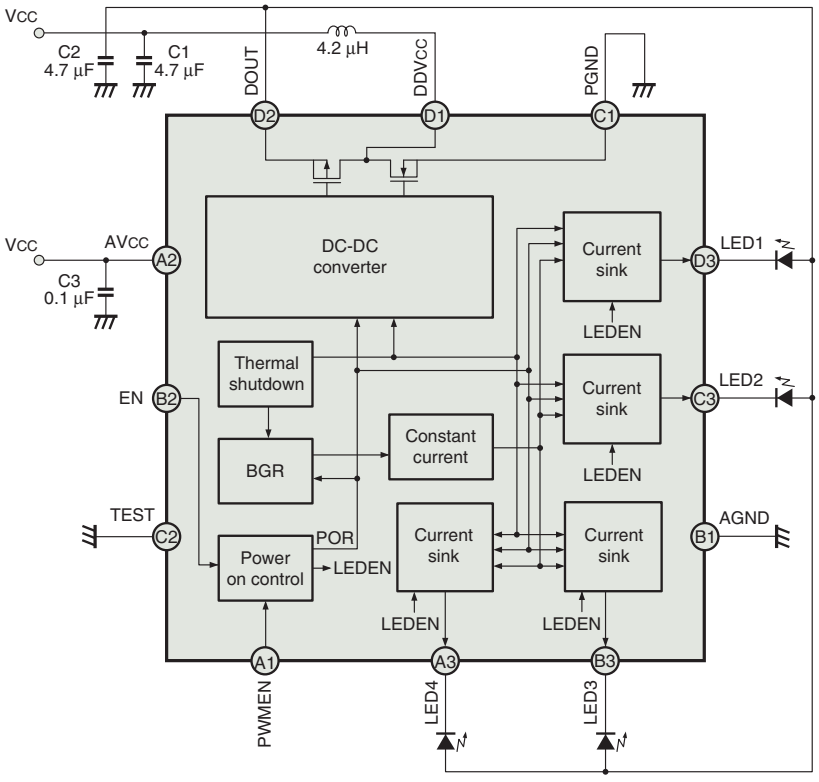
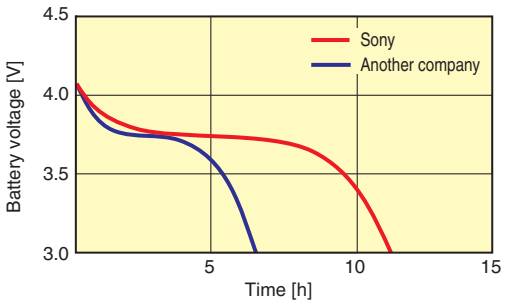


Figure 2 Battery Discharge Characteristics

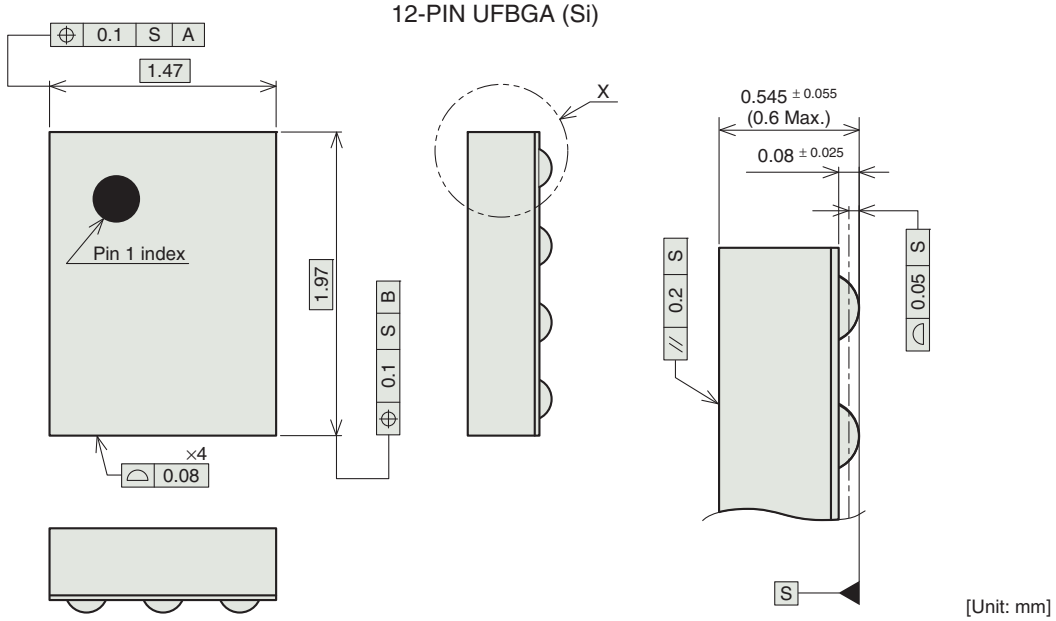


Test conditions:
4 LEDs (Set to 18 mA/channel)
Other company IC: The LEDs are connected in series and the boost output is held at a fixed level.
Sony IC: The LEDs are connected in parallel.

Table 1 Electrical Characteristics

Item	Conditions	Min.	Typ.	Max.	Unit
Standby mode current consumption	A_{VCC} = 3.6 V, EN = L	—	0	1	µA
Conversion efficiency in normal mode	I_{DCOUT} = 80 mA, A_{VCC} = 3.6 V	—	97	—	%
Conversion efficiency in boost mode	I_{DCOUT} = 80 mA, A_{VCC} = 3 V	80	90	—	%
LED pin voltage in boost mode	A_{VCC} = 3 V	—	0.14	0.28	V
Maximum drive current	Per individual channel	19	20	21	mA

Figure 3 Package Dimensions



[Unit: mm]