Keywords: Secure, security, sha, sha3, game, phone, gaming, low power, micro, mcu, microcontroller, ADC, watchdog, LED, fan, controller, symmetric, cryptography, authenticate, authenticator, cooling, monitor, i2c

APPLICATION NOTE 6992

HOW TO IMPROVE GAME PHONE PERFORMANCE WITH THE MAX28200

Abstract: In this application note, we provide an overview of how the MAX28200 low-power secure microcontroller can be used in smartphones designed for gaming purposes, including security, fan control, and LED control applications.

Introduction

As smartphones become an increasingly larger part of daily life, it is no surprise that people are customizing these devices to cater to their specific needs and interests. As more use-specific smartphone options arise, coupled with the rise of video game industry, it is easy to see why smartphones specifically created for gaming purposes have become so popular.

Smartphones designed for gaming purposes face a unique set of challenges. The importance of processing power, battery life, and high-quality graphics all reach new levels of demand that can be difficult to meet with such a small size constraint. Fortunately, Maxim has developed a low-cost, low-power solution to improve gaming phone performance and enhance the user's gaming experience – the MAX28200.

Security Applications in Gaming Phones with the MAX28200

The MAX28200 is a secure microcontroller equipped with the latest symmetric key cryptographic algorithm, SHA-3, which can be used to protect any device from counterfeit parts operating within the host system and can be used for secure feature control and enablement. As the gaming phone market continues to mature, many manufacturers are moving towards add-on devices that can be plugged in, such as joysticks or controllers. If authentication with SHA-3 is the sole concern, it is recommended that a standalone secure authenticator, such as the DS28E50, is used.

Fan Speed Control with the MAX28200

With the high-level of processing power required for gaming applications, overheating is a top concern in gaming phones. As seen in **Figure 1**, the MAX28200 can act as a fan controller and monitor to make sure the cooling system is operating as efficiently as possible. In this application, one of the MAX28200 GPIO pins is used to send a PWM signal from the MAX28200 to the fan to control its speed. The second port pin receives a feedback signal, giving the fan speed count. Additionally, an NTC is used to measure the temperature of the device and provides an analog input to the MAX28200, which is used to adjust the fan speed accordingly.
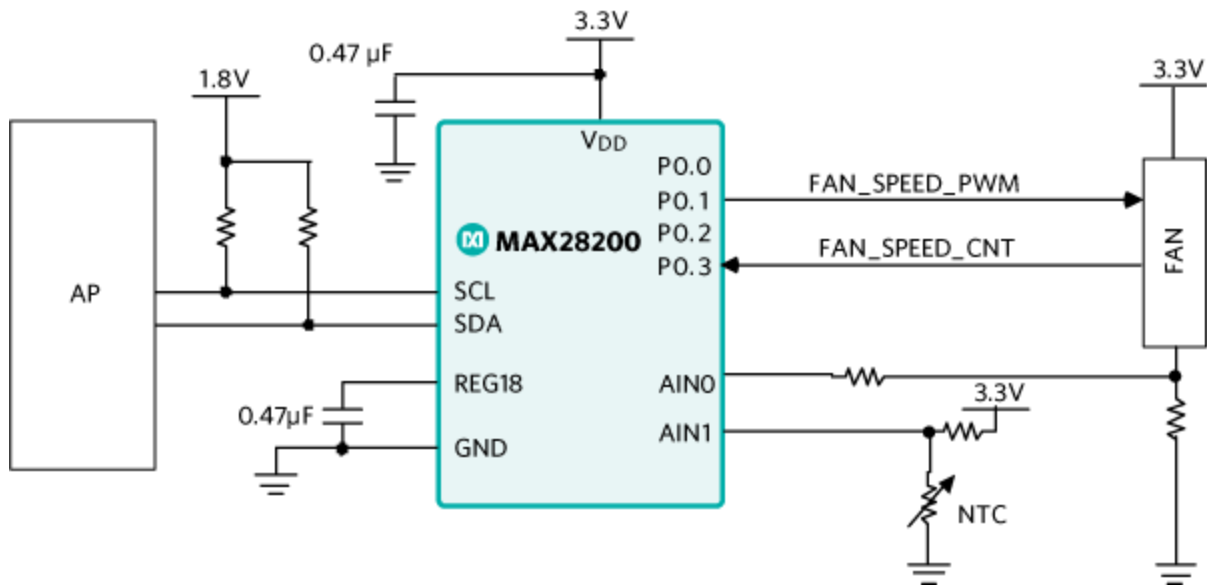
Figure 1. MAX28200 as a fan controller.

LED Control with the MAX28200

Another unique aspect that makes a gaming phone stand out among its competition is its powerful ability to enhance the user experience with added visuals and effects that immerse users in their games. One popular example of this is LEDs that can respond to events within a game, such as explosions or crashes. In **Figure 2**, you can see an example of the MAX28200 in which the audio output from a game is used as an analog input to generate a corresponding response from the LEDs. These LED adjustments can also be done using the logo's lighting elements on the back of the phone.
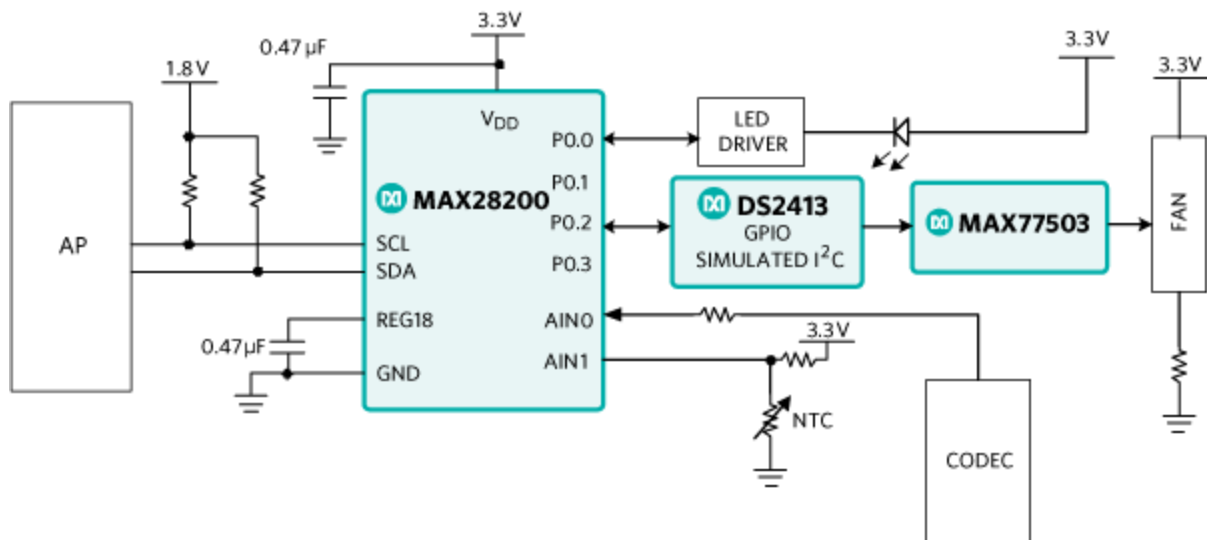

Figure 2. MAX28200 as an LED driver using an analog input.

Related Parts

MAX28200	16-Bit Microcontroller with ADC and I²C	Samples

More Information

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