**AP1400**

2 cell, Multi-channel System Power Control IC

### 1. General Description

The AP1400 is a multichannel system power supply IC that has a 4ch DC-DC converter and a 2ch LDO, supporting input voltage up to 12V. It integrates a start sequence circuit, a current sense circuit, an external load switch control circuit, and various protection functions. A power supply system can be simply designed with the AP1400. In addition, the standby current is very low at 19 μA. The AP1400 is housed in a small 65-pin WLCSP package, making it ideal for portable equipment such as digital single lens reflex cameras and mirrorless cameras.

### 2. Features

- **Operation Input Voltage**: 4.0 to 12.0 V
- **Startup Sequence**: The AP1400 can set the startup sequence and start time of each regulator by register settings.
- **Protection Function**: Pre-start Abnormal Voltage Detection, Short-circuit Protection, Overvoltage Protection, Thermal Protection, Undervoltage Protection.
- **Standby Current**: 19 μA (max)
- **Operation Current**: 10 mA (max)
- **DC-DC Converter**: Soft Start, Output Discharge Function
  - Buck-boost 1ch DDC1: 5.3V / 700mA(max), Built-in FET
  - Buck 3ch DDC2: 4.25V / 2300mA(max), Built-in FET
  - DDC3: 3.3V / 4000mA(max), External FET
  - DDC4: 4.0V / 600mA(max), Built-in FET
- **Switching Frequency**: Selectable from 1 to 2.57 MHz
- **External CLK Synchronization**: From 1.5 to 2.5 MHz
- **Internal Oscillation Frequency Accuracy**: ±3% (max) Ta=25°C, ±7% (max) -20 to 60°C
- **Load Switch**: 2ch LDSW1: Ronmax=200mΩ Constant Current Control, Output Discharge Function
  - LDSW2: Ronmax=200mΩ
- **LDO**: 2ch Always-On
  - LDO5: 5.0V / 50mA(max) EN= “L”, 250mA(max) EN= “H”
  - LDO3: 3.3V / 50mA(max)
- **Current Sense**: 3ch Sense Current Range: 0 to 6.4A
  - External Load Switch Control (with latch function)
  - CS1: Gain x20, x40, x100 Analog Output
  - (Maximum Output Voltage: 3.2V, Settling Time: 20μs)
  - CS2: Gain x20, x40
  - CS3: Gain x20, x40
- **Power Good Output**: Start Detection Function for 4ch DC-DC Converter and External 2ch LDO
• External Power Supply Voltage for Communication: 3.3 V or 1.8 V
• Interface: i²C Interface (400kHz max)
• Operating Temperature: -30 to 70 °C
• Package: 65-pin WLCSP (0.4 mm pitch, 2.9 mm x 4.1 mm)

3. Block Diagram

Figure 1. Block Diagram
4. Pin Configurations

- Top View

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Figure 2. Pin Configurations
5. Package

- Outline Dimensions
  - 65-pin WLCSP (0.4mm pitch)

Figure 3. Outline Dimensions

- Marking

Figure 4. Marking

1400 : Product name (number part only)
Y : Year of manufacture
WW : Production week
Z : Management code
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