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METHOD TO REGULATE SYSTEM PERFORMANCE BASED ON THERMAL AND POWER CONSTRAINT

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Method to Regulate System Performance Based on Thermal and Power Constraint

Abstract: Operation of an electronic system is adjusted based on voltage and current inputs of components to maintain the system within defined power and thermal constraints.

This disclosure relates to the field of power control of electronic systems.

A technique is disclosed that controls operation of an electronic system to maximize performance within power and thermal constraints.

System performance often requires regulation based on power and thermal limitations of the system. Thermal constraints and power constraints are typically defined separately. However, there is typically an interaction between thermal and power constraint that is not properly accounted for, and as a result a system may be over-designed in order to compensate.

According to the present disclosure, a method intelligently maximizes performance of a system based on thermal and power constraints according to one or more defined scenarios.

The system monitors the voltage and current inputs of components and calculates the impact to power and thermal. The data for all components is then accumulated and used to constrain the performance of the system.

Here is the schema:

Component	**Energy Consumption**	**Device Thermal**	**Device Power**
1	Sensor 1 reading	% of Sensor 1 Reading	% of Sensor 1 Reading
2	Sensor 2 reading	% of Sensor 2 Reading	% of Sensor 2 Reading
…	…	…	…
N	Sensor N reading	% of Sensor N Reading	% of Sensor N Reading

Consider an example of a notebook computer with the following components and power and thermal impact during operation:

Component	**Sensor Reading**	**Power**	**Thermal**
Built-in Display	5W	5W	0W
Processor	5W	5W	4.5W
Chipset	5W	1.2W	1.2W
Total	15W	11.2W	5.7W

This information, once accumulated, is and sent to a framework that regulates system performance. System performance for is then adjusted according to the framework. Consider different example scenarios for the above notebook computer:

Scenario	**Power Constraint**	**Thermal Constraint**	**Action**
1	15W	6W	No Action

2	15W	4W	Lower to 5W due to thermal constraints
3	10W	8W	Lower to 10W due to power constraint

The disclosed solution advantageously provides a method to intelligently maximize performance, while minimizing the need to overdesign a system.

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