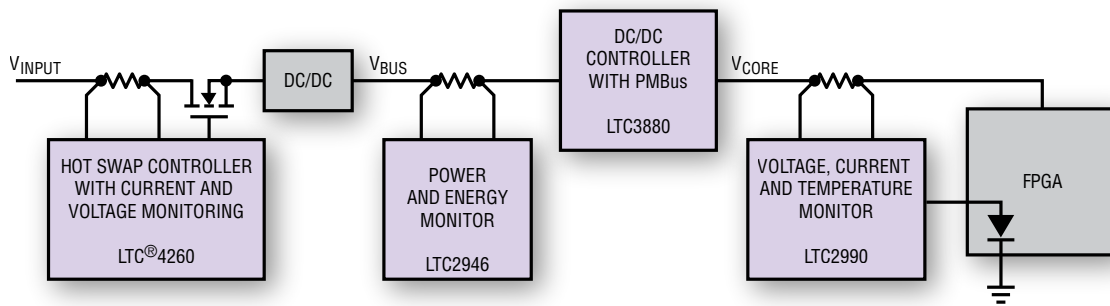


# POWER AND THERMAL MONITORING



## Analog Devices Every Trace of the Way

“Knowledge is power,” which is especially true at the board level of many electronic applications. Knowledge of key system parameters provides valuable feedback and allows users to monitor the health of a system and make intelligent decisions. From input voltage to the temperature of an FPGA, these key metrics help determine whether a system is operating correctly, efficiently or even dangerously. We offer various types of monitoring ICs—from hot swap controllers with built-in monitoring capabilities to dedicated power and temperature monitors.

## Key System Parameters



**Current:** Our current monitoring ICs implement a high side differential current sensing scheme to avoid the pitfalls of low side sensing by using special amplifiers and ADCs, providing users with inrush and operational current insight, improved diagnostic capabilities and maintenance of ground path integrity.



**Voltage:** Our voltage monitoring ICs provide single-ended or differential measurements with up to 0.04% accuracy of voltages ranging from  $-100\text{V}$  to  $80\text{V}$ , allowing users to monitor virtually any input, bus or core voltage in a system and take proactive or reactive measures against drifting or failing rails.



**Power:** Our power monitoring ICs integrate an accurate multiplier to alleviate the host of multiplying current and voltage data, and provide users with average or instantaneous power readings. Features like an analog or digital interface, high voltage capabilities, and up to 1.5% accuracy simplify part selection.



**Temperature:** Our temperature monitoring ICs provide up to  $\pm 0.25^\circ\text{C}$  accurate digital or analog readings of internal (die) or external (diode) temperature, allowing users to easily and cost-effectively implement board or component temperature sensing schemes for system health assessment or application-specific purposes.



**Coulombs:** Our coulomb counting ICs provide 1% accurate charge readings, with optional readings of temperature and voltage, so users are equipped with the fundamental parameters required to implement custom battery profiles and accurately assess the most treasured parameter in battery gas gauging applications – state of charge (SoC).



**Energy:** Our energy monitoring ICs provide 1% accurate energy measurements, with optional readings of voltage, current, temperature, power and coulombs, to alleviate the host of burdensome calculations, while staying “green”.

Device Type	Part Number	Monitored Parameters				Supply Range	Interface	Description
		Voltage	Current	Temp	Power			
Hot Swap Controllers	ADM1075	•	•		•	-55V to ≥80V	I <sup>2</sup> C/PMBus	-48V Hot Swap Controller with 12-Bit Monitoring
	ADM1272	•	•		•	16V to 80V	I <sup>2</sup> C/PMBus	Hot Swap Controller with 12-Bit Monitoring
	ADM1278	•	•		•	4.5 to 20	I <sup>2</sup> C/PMBus	Hot Swap Controller with 12-Bit Monitoring
	LTC4215	•	•			2.9V to 15V	I <sup>2</sup> C	Hot Swap Controller with 8-Bit Monitoring
	LTC4217	•	•			2.9V to 26.5V	Current	2A Hot Swap Controller
	LTC4218	•	•			2.9V to 26.5V	Current	Hot Swap Controller
	LTC4222	•	•			2.9V to 29V	I <sup>2</sup> C	Dual Hot Swap Controller with 10-Bit Monitoring
	LTC4232	•	•			2.9V to 15V	Current	5A Hot Swap Controller
	LTC4233	•	•			2.9V to 15V	Current	10A Hot Swap Controller
	LTC4234	•	•			2.9V to 15V	Current	20A Hot Swap Controller
	LTC4260	•	•			8.5V to 80V	I <sup>2</sup> C	Hot Swap Controller with 8-Bit Monitoring
	LTC4261	•	•			-12V to -100V	I <sup>2</sup> C	Hot Swap Controller with 10-Bit Monitoring
LTC4281	•	•		•	2.9V to 33V	I <sup>2</sup> C	Hot Swap Controller with 12/16-Bit Monitoring	
LTC4282	•	•		•	2.9V to 33V	I <sup>2</sup> C	SOA Sharing Hot Swap Controller with 12/16-Bit Monitoring	
LTM9100	•	•			-1000V to 1000V	I <sup>2</sup> C/PMBus	Isolated Switch Controller with I <sup>2</sup> C and Telemetry	
ADM1293	•	•		•	2.95 to 20V	I <sup>2</sup> C/PMBus	Low Voltage High-Side Power Monitor	
ADM1294	•	•		•	2.95V to VSHUNT	I <sup>2</sup> C/PMBus	Wide Range Low-Side Power Monitor	
LTC2945	•	•		•	0V to 80V	I <sup>2</sup> C	High Voltage Rail-to-Rail Current and Power Monitor	
LTC2946	•	†		•	0V to 100V	I <sup>2</sup> C	High Voltage Rail-to-Rail Power and Energy Monitor	
LTC2947	•	†		•	0V to 15V	I <sup>2</sup> C/SPI	30A Rail-to-Rail Power and Energy Monitor	
LTC4151	•	•		•	7V to 80V	I <sup>2</sup> C	High Voltage Current and Voltage Monitor	
LTC2940	•	†		•	4V to 80V	Current	500kHz Power and Current Monitor	
LTC2990	•	•		•	3V to 5.5V	I <sup>2</sup> C	Quad Voltage, Current and Temperature Monitor	
LTC2991	•	•		•	3V to 5.5V	I <sup>2</sup> C	Octal Voltage, Current and Temperature Monitor	
LTC2995	•	•		•	2.25V to 5.5V	Voltage	Temperature Sensor and Dual Voltage Monitor	
LTC2996	•	•		•	2.25V to 5.5V	Voltage	Temperature Sensor with Alerts	
LTC2997	•	•		•	2.5V to 5.5V	Voltage	Temperature Sensor	
LTC2970	•	†		•	4.5V to 15V	I <sup>2</sup> C	2-Channel Power System Manager	
LTC2974	•	†		•	3.13V to 15V	I <sup>2</sup> C/PMBus	4-Channel Power System Manager with EEPROM	
LTC2975	•	†		•	3.13V to 15V	I <sup>2</sup> C/PMBus	4-Channel Power System Manager with EEPROM	
LTC2977	•	†		•	3.13V to 15V	I <sup>2</sup> C/PMBus	8-Channel Power System Manager with EEPROM	
LTC2980	•	†		•	3.13V to 15V	I <sup>2</sup> C/PMBus	16-Channel Power System Manager with EEPROM	
LTM2987	•	†		•	3.13V to 15V	I <sup>2</sup> C/PMBus	16-Channel μModule Power System Manager with EEPROM	
LTC3882	•	•		•	3V to 38V	I <sup>2</sup> C/PMBus	Dual Voltage Mode DC/DC Controller with EEPROM	
LTC3883	•	•		•	4.5V to 24V	I <sup>2</sup> C/PMBus	Single DC/DC Controller with EEPROM	
LTC3884	•	•		•	4.5V TO 38V	I <sup>2</sup> C/PMBus	Dual Output Mode DC/DC Controller with EEPROM and SubMilliohm DCR Sensing	
LTC3815	•	•		•	2.25V to 5.5V	I <sup>2</sup> C/PMBus	6A Monolithic DC/DC Step-Down	
LTC3887	•	•		•	4.5V to 24V	I <sup>2</sup> C/PMBus	Dual Current Mode DC/DC Controller with EEPROM	
LTC3886	•	•		•	4.5V to 60V	I <sup>2</sup> C/PMBus	Dual Current Mode DC/DC Controller with EEPROM	
LTC2941	•			•	2.7V to 5.5V	I <sup>2</sup> C	Battery Gas Gauge	
LTC2942	•			•	2.7V to 5.5V	I <sup>2</sup> C	Battery Gas Gauge with Temperature & Voltage Measurement	
LTC2943	•	†		•	3.6V to 20V	I <sup>2</sup> C	Multicell Battery Gas Gauge	
LTC2944	•	†		•	3.6V to 60V	I <sup>2</sup> C	Multicell Battery Gas Gauge	
LTC4150	•	†		•	2.7V to 8.5V	Logic	Battery Gas Gauge	
LTC6801	•	•		•	10V to 50V	Logic	Multicell Battery Stack Fault Monitor	
LTC6803	•	•		•	10V to 55V	SPI	Multicell Battery Stack Monitor with 0.25% Accuracy	
LTC6804	•	•		•	11V to 55V	SPI/isoSPI	Multicell Battery Stack Monitor with 0.067% Accuracy	
LTC6811	•	•		•	11V to 55V	SPI/isoSPI™	Multicell Battery Stack Monitor with 0.067% Accuracy	
LTC4015	•	•		•	4.5V to 35V	I <sup>2</sup> C	Multi-Chemistry Buck with Digital Telemetry System	

† This parameter can be measured bidirectionally. Refer to data sheet for more details.

**Analog Devices, Inc.**  
Worldwide Headquarters

Analog Devices, Inc.  
One Technology Way  
P.O. Box 9106  
Norwood, MA 02062-9106  
U.S.A.  
Tel: 781.329.4700  
(800.262.5643, U.S.A. only)  
Fax: 781.461.3113

**Analog Devices, Inc.**  
Europe Headquarters

Analog Devices GmbH  
Ott-Aicher-Str. 60-64  
80807 München  
Germany  
Tel: 49.89.76903.0  
Fax: 49.89.76903.157

**Analog Devices, Inc.**  
Japan Headquarters

Analog Devices, KK  
New Pier Takeshiba  
South Tower Building  
1-16-1 Kaigan, Minato-ku,  
Tokyo, 105-6891  
Japan  
Tel: 813.5402.8200  
Fax: 813.5402.1064

**Analog Devices, Inc.**  
Asia Pacific Headquarters

Analog Devices  
5F Sandhill Plaza  
2290 Zuchongzhi Road  
Zhangjiang Hi-Tech Park  
Pudong New District  
Shanghai, China 201203  
Tel: 86.21.2320.8000  
Fax: 86.21.2320.8222

©2018 Analog Devices, Inc. All rights reserved. Trademarks and registered trademarks are the property of their respective owners. Ahead of What's Possible is a trademark of Analog Devices. PHPowermonitors-2/18-(D)

[analog.com](http://analog.com) and [linear.com](http://linear.com)



AHEAD OF WHAT'S POSSIBLE™