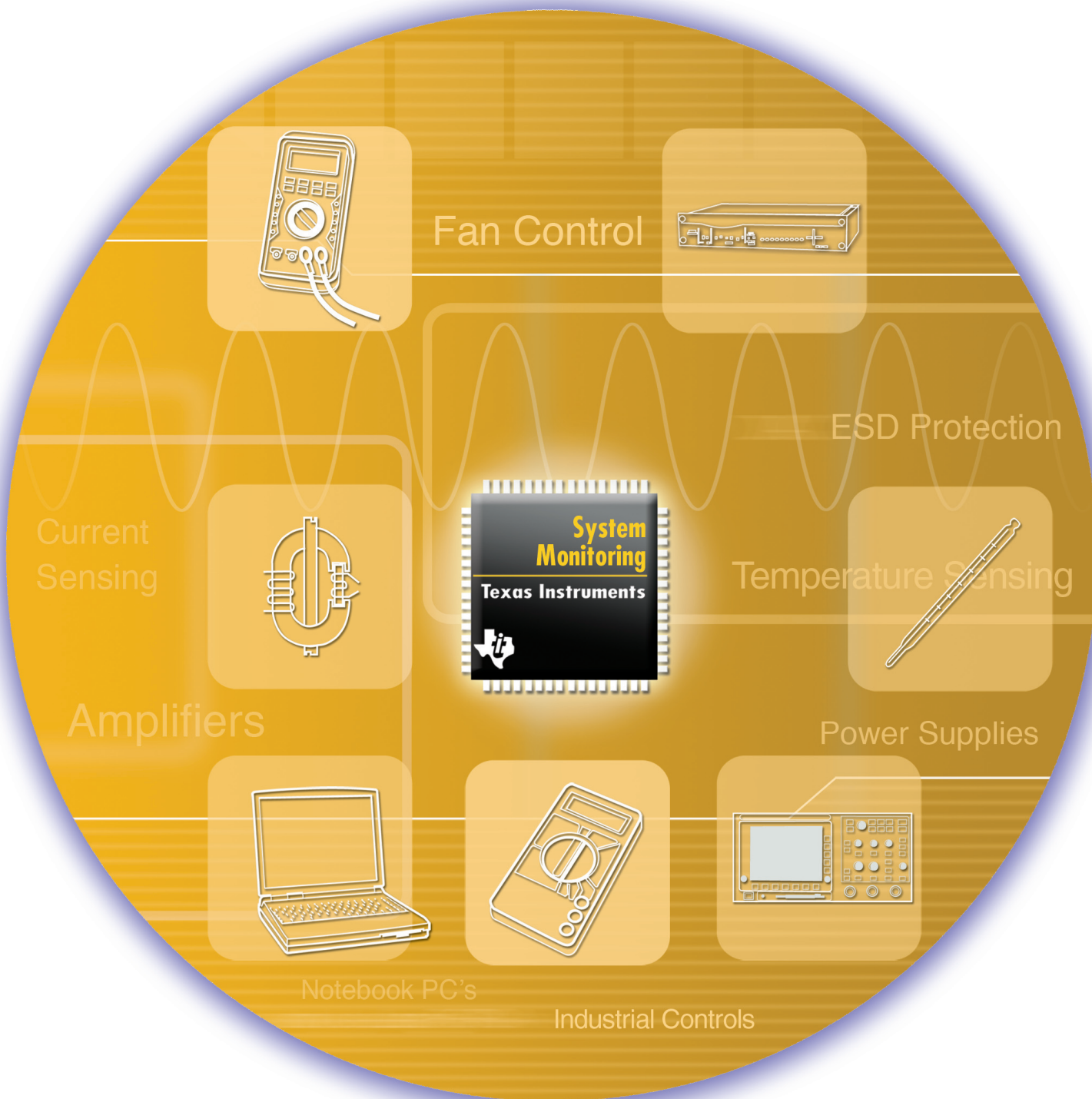


System Monitoring and Protection Solutions Guide

4Q 2007



Overview

As electronic designs trend toward increased functionality, smaller form factors, improved accuracy and lower power, design engineers often face challenging requirements in thermal management and system monitoring for improved precision and performance. Many designs can benefit from the additional diagnostic capability achieved through independent monitoring of power supply outputs. Additionally, remote junction diode temperature measurement and closed-loop fan speed control help solve thermal management problems and improve overall system reliability.

Operational Amplifiers				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
OPA369	Zero-Crossover, RRIO Op Amp	1.8V, 1μA (max) I_Q , 750μV Offset, 1.75°C (max) Offset Drift	SC-70	\$0.80
OPA376	Precision, Low-Noise Op Amp	2.2V to 5.5V, 950μA (max) I_Q , 7.5nV/√Hz at 1kHz Noise	SC-70	\$0.65
OPAy333	μPower, Zero-Drift, CMOS Op Amp	1.8V to 5.5V, 25μA I_Q , 0.35MHz, 0.05μV V_{OS}	SOT-23	\$0.95
OPAy335	μPower, Zero-Drift, CMOS Op Amp	2.7V to 5.5V, 0.35mA I_Q , 2MHz, 5μV V_{OS}	SOT-23	\$1.00
OPAy363	1.8V Zero-Crossover, CMOS Op Amp with Shutdown	1.8V to 5.5V, 0.75mA I_Q , 7MHz, 3μV V_{OS}	SOT-23	\$0.60

Difference Amplifiers				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
INAY133	High-Speed Precision Difference Amplifier	5V to 36V, 0.95mA (typ) I_Q , 80dB CMRR, 1.5MHz	SOIC	\$1.05
INA148	±200V Common-Mode Voltage Difference Amplifier	2.7V to 36V, 0.6mA (typ) I_Q , 70dB CMRR, 100kHz	SOIC	\$2.10
INA152	μPower, Precision, Single-Supply Difference Amplifier	Single 2.7V to 20V, Dual ±1.35V to 10V, 0.5mA (typ) I_Q , 800kHz	MSOP	\$1.20
INA159	High-Speed, Precision Gain of 0.2 Level Translation Diff Amp	1.8V to 5.5V, 1.1mA (typ) I_Q , 86dB CMRR, 1.5MHz, Gain 0.2	MSOP	\$1.60

Current-Output, High-Side Current Shunt Monitors				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
INA138	1 to 100 Gain, I-Output Current Shunt Monitor	2.7V to 36V, 45μA (max) I_Q Per Channel, 120dB CMRR, 800kHz	SOT-23	\$0.95
INA139	High-Speed, 1 to 100 Gain, I-Output, Current Shunt Monitor	2.7V to 40V, 125μA (max) I_Q Per Channel, 115dB CMRR, 440kHz	SOT-23	\$0.99
INA168	1 to 100 Gain, I-Output Current Shunt Monitor	2.7V to 60V, 45μA (max) I_Q Per Channel, 120dB CMRR, 800kHz	SOT-23	\$1.25
INA169	High-Speed, 1 to 100 Gain, I-Output Current Shunt Monitor	2.7V to 60V, 125μA (max) I_Q Per Channel, 115dB CMRR, 440kHz	SOT-23	\$1.25

Voltage-Output, High-Side Current Shunt Monitors				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
INA19x	–16V to +80V Common-Mode Range	2.7V to 18V, 0.9mA I_Q , 100dB CMRR	SO, TSSOP	\$0.80
INA200/1/2	20/50/100V/V Gain, Single Comparator and V_{REF}	2.7V to 18V, 2.2mA (max) I_Q , 100dB CMRR, 2.5mV I_{OS}	SO, TSSOP	\$0.90
INA203/4/5	20/50/100V/V Gain, Dual Comparator and V_{REF}	2.7V to 18V, 2.2mA (max) I_Q , 100dB CMRR, 2.5mV I_{OS}	SO, TSSOP	\$1.25
INA206/7/8	20/50/100V/V Gain, with Reversed Comparator 2 Polarity	2.7V to 18V, 2.2mA (max) I_Q , 100dB CMRR, 2.5mV I_{OS}	SO, TSSOP	\$1.25
INA27x	–16 to +18V CMV with Filtering Provisions	2.7V to 18V, 0.9mA (max) I_Q , 120dB CMRR, 2mV V_{OS}	SO, TSSOP	\$1.25

Bi-Directional Current Shunt Monitor				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
INA170	1 to 100 Gain, High-Side Bi-Directional Current Shunt Monitor	2.7V to 60V, 75μA (typ) I_Q , 100dB CMRR, 400kHz	MSOP	\$1.25
INA209	Measures Current, Voltage and Power over I ² C Bus	3V to 5.5V, 40mV FSR, 0V to +26V CMV, 1% Accuracy Over Temp.	TSSOP	\$3.50

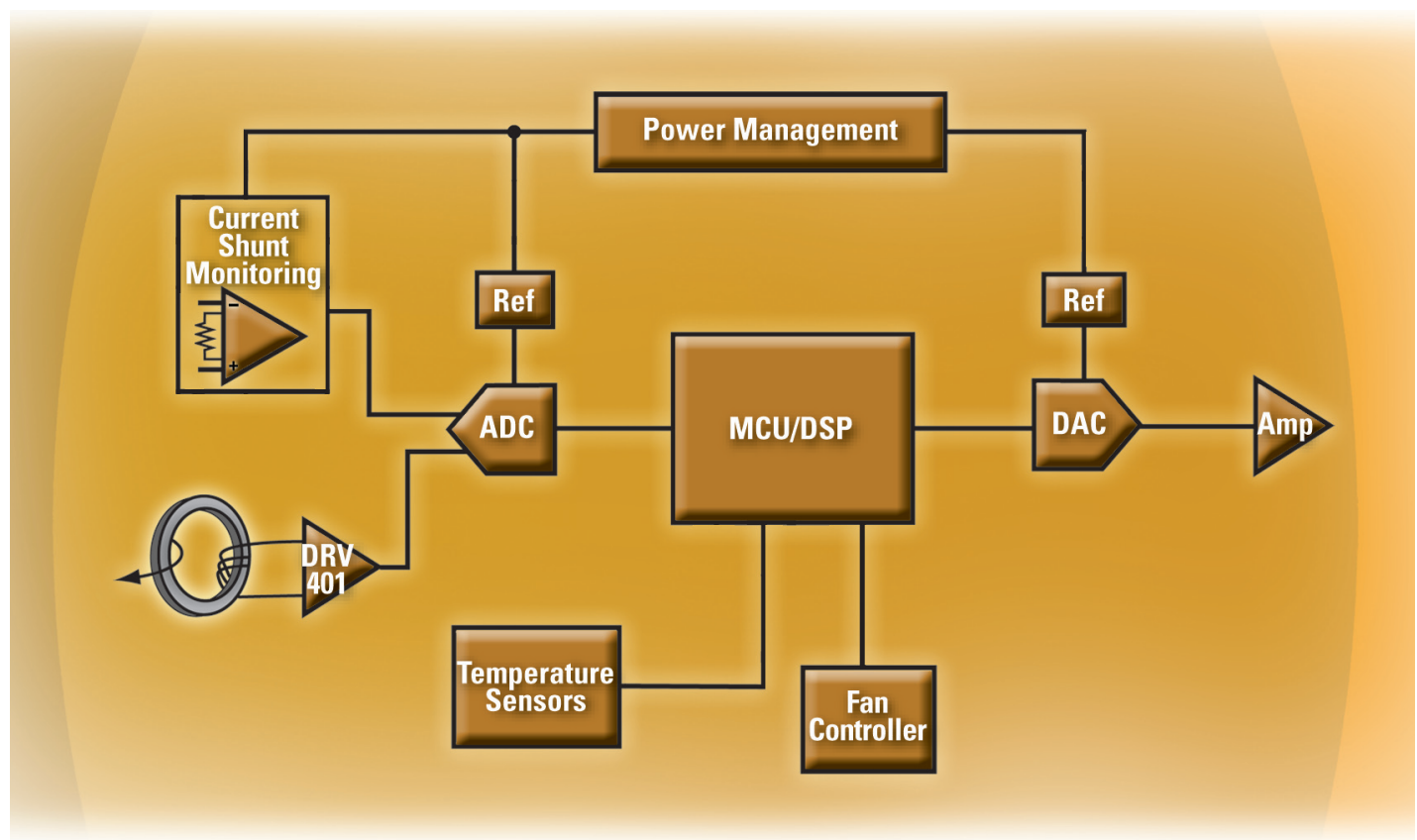
¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in **bold red**. Preview products are listed in **bold blue**.

Magnetic Current Sensing				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
DRV401	Sensor Signal Conditioning IC for Closed-Loop Magnetic I Sensing	4.5V to 5.5V, 6.8mA (typ) I _Q , Built-in Degauss System, 2MHz	QFN	\$1.90

Digital Current-Shunt Monitors				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
ADS1203/4	16-Bit, 2nd-Order, Precision $\Delta\Sigma$ Modulators	1 SE/1 Diff, 4SE/4Diff Input, Optimized for Magnetic-Based Current Sensors	QFN	\$2.70
ADS1205	16-Bit, 2nd-Order, Precision $\Delta\Sigma$ Modulator	2 SE/2Diff Inputs, Optimized for Magnetic-Based Current Sensors	QFN	\$3.95
ADS1208	16-Bit, 2nd-Order, Precision $\Delta\Sigma$ Modulator	1SE/1Diff Inputs, Optimized for Hall Effect Sensors	TSSOP	\$2.95
AMC1203	16-Bit, 2nd-Order, Precision $\Delta\Sigma$ Modulator	Isolated (4kV) Version of ADS1203	Gullwing	TBD
AMC1210	Quad, Digital Filter for 2nd-Order $\Delta\Sigma$ Modulator	4 Digital Filters, Serial/P4 Interface, 90MHz Clock w/Interrupt System	QFN	\$1.55

Analog-to-Digital Converters				
Device	Description	Key Specifications	Smallest Package(s)	Price ¹
ADS7823	12-Bit, Low-Power, I ² C Serial Sampling ADC	50kSPS (max), 1SE, 2.7V to 5.25V Operation, Supports All I ² C Modes	MSOP	\$2.85
ADS7828	12-Bit, Low-Power, I ² C Serial Sampling ADC	50kSPS (max), 8SE, 2.7V to 5.25V Operation, Supports All I ² C Modes	TSSOP	\$3.35
ADS7830	8-Bit, 8-Channel, I ² C Interface Sampling ADC	70kHz Sample Rate, 2.7V to 5.25V Operation, Supports All I ² C Modes	TSSOP	\$1.40
AMC7823	12-Bit, Analog Monitoring and Control Circuit	200kSPS, 8 Analog Inputs and Outputs at 12-Bit Resolution	QFN	\$9.75



¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in **bold red**. Preview products are listed in **bold blue**.

Power Management ICs				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
UCD9080	8-Ch. Power Supply Sequencer and Monitor	3V to 3.6V, 300µA Supply Current, > 20kHz Sample Rate	QFN	\$2.95
TPS3808	Low I _Q , Programmable-Delay Supervisory Circuit	1.8V to 6.5V, 1.25ms to 10s Delay Time, 2.4µA (typ) I _Q	SOT-23	\$0.70
TPS2061	Single 1A Current-Limited, Power Distribution Switch	2.7V to 5.5V, 1A Continuous Current, 1.5A Current Limit	SOIC	\$0.60
TPS2410	Full-Featured N+1 and O-Ring Power Rail Controller	0.8V to 18V, Internal Charge Pump, Input Voltage Monitoring	TSSOP	\$1.70
TPS2490	Latchable Positive High-Voltage Power-Limiting Hotswap Controller	9V to 80V, Power and Current Limiting, Programmable Fault Timer	MSOP	\$1.70
bq20z90	SBS 1.1 Compliant Gas Gauge Enabled w/Impedance Track	800mAh to 15KmAh, Better than 1% Accuracy, Supports Smart Batteries	SM-8	\$3.30
bq26100	SHA-1/HMAC-Based Security and Authentication IC w/ SDQ Interface	2.5V to 5V, < 50µA I _Q , 160 Bytes OPT, 16 Bytes EEPROM	SON	\$1.30
bq29330	2-, 3- and 4-Cell Lithium or Lithium Polymer Battery Protection	4.5V to 28V, Individual Cell V and Battery V, 100µA (typ) I _Q	SM-8	\$1.45

ESD Protection				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
TPD4E001	4-Ch, ESD Protection Array for High-Speed Data Converters	±15kV ESD Protection, 1nA I _Q , 0.9V to 5.5V, 1.5pF Input Capacitance	DRL, QFN	\$0.42
TPD6E001	6-Ch, ESD Protection Array for High-Speed Data Converters	±15kV ESD Protection, 1nA I _Q , 0.9V to 5.5V, 1.5pF Input Capacitance	RSE, RSF	\$0.38

I ² C Digital Interface				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
TCA6408	Low-Voltage, I ² C Controlled I/O Expander with Reset and Interrupt	1.65V to 5.5V, 1 Address Pin, 400kHz Clock Frequency	QFN	\$2.66
PCA9539	16-Bit, I ² C and SMBus, Low-Power I/O Expander	2.3V to 5.5V, Interrupt Output, Reset and Config Resistors, 400MHz f _{SCLK}	TSSOP	\$1.10
PCA9545A	4-Ch, I ² C and SMBus, Multiplexer w/Interrupt Logic and Reset	2.3V to 5.5V, 400MHz f _{SCLK} , ±20mA I _{IN} , ±25mA I _{OUT} , 400MHz f _{SCLK}	BGA	\$0.95

Isolation Analog Amplifiers				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
ISO122	Precision, Lowest Cost Isolation Amplifier	1500Vrms, 140dB at 60Hz IMR, ±4.5V to ±18V Supply Range	SO	\$10.85
ISO124	Precision, Lowest Cost Isolation Amplifier	Isolation V _{PEAK} 2121V, 2400V Isolation V _{PULSE} , 140dB at 60Hz IMR	SO	\$8.30

Digital Capacitive Isolators				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
ISO150	Dual, Isolated, Bi-Directional Digital Coupler	80M Baud (typ), 2400Vrms Partial Discharge, V _{ISO} 500kV/µs	SO	\$8.10
ISO721	High-Speed Digital Isolator	3.3V/5V Operation, 4000V Peak Isolation, 50kV/µs Transient Immunity	SOIC	\$1.65
ISO722	High-Speed Digital Isolator with Enable	3.3V/5V Operation, 4000V Peak Isolation, 50kV/µs Transient Immunity	SOIC	\$1.75
ISO7220	Dual, Digital Isolator	3.3V/5V Operation, 4000V Peak Isolation, 50kV/µs Transient Immunity	SOIC	\$0.95
ISO7221	Dual, Digital Isolator	3.3V/5V Operation, 4000V Peak Isolation, 50kV/µs Transient Immunity	SOIC	\$0.95

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in **bold red**. Preview products are listed in **bold blue**

System Monitoring and Protection

Local Temperature Sensors with I ² C/SMBus Interface				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
TMP100/101	Digital Temp Sensor w/Programmable Thermostat/Alarm Function	2.7V to 5.5V, 9- to 12-Bits User Selectable, 45µA I _Q	SOT-23	\$0.75
TMP102	Digital Temp Sensor w/Programmable Thermostat/Alarm Function	2.7V to 5.5V, 9- to 12-Bits User Selectable, 45µA I _Q	SOT-23	\$0.75
TMP105	Chipscale Digital Temperature Sensor	2.6V to 3.3V, Supports 1.8V I ² C Bus, 9- to 12-Bits, 50µA I _Q	DSBGA	\$0.85
TMP106	Chipscale Digital Temperature Sensor	2.7V to 5.5V, 9- to 12-Bits User Selectable, 50µA I _Q	DSBGA	\$0.85
TMP75	Industry Standard Sensor w/ 2-Wire Interface, 8 Addresses	2.7V to 5.5V, 9- to 12-Bits, 50µA I _Q , 1µA Standby, 7 Addresses	SOIC	\$0.70
TMP175	Digital Temperature Sensor w/2-Wire Interface, 27 Addresses	2.7V to 5.5V, 9- to 12-Bits, 50µA I _Q , 1µA Standby, 27 Addresses	SOIC	\$0.85
TMP275	Ultra-High Accuracy Digital Temperature Sensor	2.7V to 5.5V, 9- to 12-Bits, 50µA I _Q , 1µA Standby, 8 Addresses	SOIC	\$1.25

Local Temperature Sensors with SPI Interface				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
TMP121	1.5°C Accurate Digital Temperature Sensor w/SPI Interface	2.7V to 5.5V, Digital Output: SPI Compatible, 12-Bit + Sign, 35µA I _Q	SOT-23	\$0.90
TMP122	1.5°C Accurate Programmable Temperature Sensor w/SPI Interface	2.7V to 5.5V, Digital Output: SPI Compatible, 9- to 12-Bit + Sign, 50µA I _Q	SOT-23	\$0.99
TMP123	1.5°C Accurate Digital Temperature Sensor w/SPI Interface	2.7V to 5.5V, Digital Output: SPI Compatible, 12-Bit + Sign, 35µA I _Q	SOT-23	\$0.90
TMP124	1.5°C Accurate Programmable Temperature Sensor w/SPI Interface	2.7V to 5.5V, Digital Output: SPI Compatible, 9- to 12-Bit + Sign, 50µA I _Q	SOIC	\$0.70
TMP125	2°C Accurate Digital Temperature Sensor w/SPI Interface	2.7V to 5.5V, Digital Output: SPI Compatible, 10-Bit, 36µA I _Q	SOT-23	\$0.80

Local Temperature Sensors with Single-Wire SensorPath Interface				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
TMP141	Digital Temperature Sensor w/ Single-Wire Sensor Path Bus	2.7V to 5.5V, SensorPath™ Interface, 4 Addresses, 10-Bit, 110µA I _Q	SOT-23	\$0.65

Temperature Switch				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
TMP300	Comparator Output Temperature Switch w/ Additional Analog Logic	1.8V to 18V, 10mV/°C Analog Output, -40°C to +150°C Temp. Range	SC-70	\$0.70

Fan Controller				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
AMC6821	±1°C Remote and Local Temperature Sensor w/ Integrated Fan Control	3V to 5.5V, 2 Temperature Sensors, 8-Bit, Automatic Fan Speed Control Loops	QFN	\$1.95

Remote Temperature Sensors				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
TMP401	Remote and Local Temperature Sensor	3V to 5.5V, ±1°C Remote Diode Sensor, 9- to 12-Bit, 250µA I _Q	MSOP	\$1.50
TMP411	Remote and Local Temperature Sensor w/ Programmable Non-Ideality Factor	3V to 5.5V, ±1°C Remote and Local Sensors, 9- to 12-Bit, 400µA I _Q	MSOP	\$1.75
TMP421	Remote and Local Temperature Sensor w/n-Factor and Series Resistance Correction	2.7V to 5.5V, ±1°C Remote Diode Sensor, ±1.5°C Local Temp Sensor	SOT-23	\$1.25

Microcontrollers				
Device	Product Description	Key Specifications	Smallest Package(s)	Price ¹
MSP430F2001	Ultra-Low-Power, 16-Bit RISC, Mixed-Signal Processor	1.8V to 3.6V Operation, 1KB/128B/16 MIPS, COMP_A+, 10 I/O	QFN	\$0.55
MSP430F2232	Ultra-Low-Power, 16-Bit RISC, Mixed-Signal Processor	1.8V to 3.6V Operation, 8KB/512B/16 MIPS, USCIP, 32 I/O, Timer A3, B3	QFN	\$2.40

¹Suggested resale price in U.S. dollars in quantities of 1,000.

New products are listed in **bold red**. Preview products are listed in **bold blue**.

TI Worldwide Technical Support

Internet

TI Semiconductor Product Information Center Home Page

support.ti.com

TI Semiconductor KnowledgeBase Home Page

support.ti.com/sc/knowledgebase

Product Information Centers

Americas

Phone +1(972) 644-5580
Fax +1(972) 927-6377
Internet/Email support.ti.com/sc/pic/americas.htm

Europe, Middle East, and Africa

Phone
Belgium (English) +32 (0) 27 45 54 32
Finland (English) +358 (0) 9 25173948
France +33 (0) 1 30 70 11 64
Germany +49 (0) 8161 80 33 11
Israel (English) 180 949 0107
Italy 800 79 11 37
Netherlands (English) +31 (0) 546 87 95 45
Russia +7 (4) 95 98 10 701
Spain +34 902 35 40 28
Sweden (English) +46 (0) 8587 555 22
United Kingdom +44 (0) 1604 66 33 99
Fax +(49) (0) 8161 80 2045
Internet support.ti.com/sc/pic/euro.htm

Japan

Fax
Internet/Email
International +81-3-3344-5317
Domestic 0120-81-0036
International support.ti.com/sc/pic/japan.htm
Domestic www.tij.co.jp/pic

Asia

Phone
International +886-2-23786800
Domestic Toll-Free Number
Australia 1-800-999-084
China 800-820-8682
Hong Kong 800-96-5941
India +91-80-41381665 (Toll)
Indonesia 001-803-8861-1006
Korea 080-551-2804
Malaysia 1-800-80-3973
New Zealand 0800-446-934
Philippines 1-800-765-7404
Singapore 800-886-1028
Taiwan 0800-006800
Thailand 001-800-886-0010
Fax +886-2-2378-6808
Email tiasia@ti.com
ti-china@ti.com
Internet support.ti.com/sc/pic/asia.htm

Important Notice: The products and services of Texas Instruments Incorporated and its subsidiaries described herein are sold subject to TI's standard terms and conditions of sale. Customers are advised to obtain the most current and complete information about TI products and services before placing orders. TI assumes no liability for applications assistance, customer's applications or product designs, software performance, or infringement of patents. The publication of information regarding any other company's products or services does not constitute TI's approval, warranty or endorsement thereof.

Technology for Innovators and the black/red banner are trademarks of Texas Instruments.

All other trademarks are the property of their respective owners.

© 2007 Texas Instruments Incorporated

Printed in U.S.A. by (AZ Litho, Tucson, Arizona)

♻️ Printed on recycled paper



B010307

SLYB132

Texas Instruments Incorporated

14950 FAA Blvd.
Fort Worth, Texas 76155-9951

Address service requested

PRSRT STD
U.S. POSTAGE
PAID
DALLAS, TEXAS
PERMIT NO. 2758