Low Power Analog Solutions

Microchip offers a broad portfolio of stand-alone analog and interface solutions that address the thermal management, power management, mixed-signal, linear, interface and safety and security markets.

In addition to using low power CMOS technology, Microchip's analog products are designed to optimize performance while minimizing power consumption. Non-volatile expertise is leveraged to achieve high accuracy specifications without additional manufacturing steps and cost. Chip select/ shutdown/sleep features on many of our analog and interface parts enable systems to be selectively shut down to further reduce power consumption.

Low operating voltages combined with small form factors such as SC70, DFN and SOT-23 make Microchip's analog and interface portfolio well-suited for applications with tight power budgets.

Typical Applications
- Battery powered/Handheld
- Consumer
- PC Peripherals
- Telecommunication
- Automotive
- Industrial

Design Tools
- Mindi Circuit Designer & Simulator
  www.microchip.com/mindi
- CAD/CAE Schematic Symbols and Footprints
  www.microchip.com/cad

Product Selection Tools
- Microchip's Advanced Product Selector
  www.microchip.com/MAPS
- Treelink presentation
  www.microchip.com/treelink

Stand-Alone Analog and Interface Portfolio

Thermal Management	Power Management	Linear	Mixed-Signal	Interface
Temperature Sensors	LDO & Switching Regulators	Op Amps	A/D Converter Families	CAN Peripherals
Fan Speed Controllers/ Fan Fault Detectors	Charge Pump DC/DC Converters	Programmable Gain Amplifiers	Digital Potentiometers	Infrared Peripherals
	Power MOSFET Drivers	Comparators	D/A Converters	LIN Transceivers
	PWM Controllers		V/F and F/V Converters	Serial Peripherals
	System Supervisors	**Safety & Security**	Energy Measurement ICs	Ethernet Controllers
	Voltage Detectors	Photoelectric Smoke Detectors		USB Peripheral
	Voltage References	Ionization Smoke Detectors		
	Li-Ion/Li-Polymer Battery Chargers	Ionization Smoke Detector Front Ends		
		Piezoelectric Horn Drivers		

Op Amps/Comparators
MCP604X, MCP614X, MCP654X
 – 600 nA quiescent current

Battery Chargers
 – Typical Shutdown currents <1 µA
 – Load-Sharing (**MCP73871**)
 – Over-Voltage Protection

Switching Regulators
MCP1603 Buck Regulator
 – 45 µA quiescent current
MCP1640 Sync Boost Regulator
 – 0.65V start-up voltage
 – 19 µA quiescent current

ADCs
MCP342X Delta Sigma
 – 145 µA supply current
MCP3551 Delta Sigma
 – 120 µA supply current

Safety & Security
RE46C107/117 Horn Drivers
 – 2V to 5V Operating Voltage

Supervisors
MCP1(02/03/11/12/21/31), MCP13(16-22)
 – 1 µA quiescent current

LDOs
MCP1700
 – 1.6 µA quiescent current
MCP1703
 – 2 µA quiescent current

MICROCHIP

M i c r o c h i p   T e c h n o l o g y   I n c o r p o r a t e d

Low Power Analog & Interface Products

Operational Amplifiers

Part #	# per Package	GBWP	IQ Typical (µA)	VOS Max (mV)	Typical Input Bias Current (pA)	Input Voltage Noise Density (nV/rtHz)	Vcc Range (V)	Temperature Range (°C)	Features	Packages
MCP6041	1	14 kHz	0.6	3	1	170[1]	1.4 to 6.0	-40 to +125	Rail-to-Rail Input/Output	PDIP, SOIC, MSOP, SOT-23
MCP6141	1	100 kHz	0.6	3	1	170[1]	1.4 to 6.0	-40 to +125	Rail-to-Rail Input/Output, G>10 stable	PDIP, SOIC, MSOP, SOT-23

Comparators

Part #	# per Package	Typical Propagation Delay (µs)	IQ Typical (µA)	Vos Max (mV)	Vcc Range (V)	Temperature Range (°C)	Features	Packages
MCP654(1-9)	1/2/4	4	1	5	1.6 to 5.5	-40 to +125	Push-Pull/Open-Drain, Rail-to-Rail Input/Output	PDIP, SOIC, MSOP, TSSOP, SOT-23, SC-70

ADC

Part #	Resolution (bits)	Max. Sampling Rate (samples/sec)	# of Input Channels	Interface	Vcc Range (V)	Typical Supply Current (µA)	Typical INL (ppm)	Temperature Range (°C)	Features	Packages
MCP3421	18 to 12	4 to 240	1 Diff	I²C™	2.7 to 5.5	155	10	-40 to +125	PGA, VREF	SOT-23
MCP3551	22	14	1 Diff	SPI	2.7 to 5.5	120	2	-40 to +125	Simultaneous 50/60 Hz rejection	SOIC, MSOP

DACs

Part #	Resolution (bits)	DACs per Package	Interface	VREF	Output Settling Time (µs)	DNL (LSB)	Typical Standby Current (µA)	Typical Operating Current (µA)	Temperature Range (°C)	Packages
MCP4728	12	4	I²C™	VDD/Int	6	0.75	0.04	800	-40 to +125	MSOP

Digipots

Part #	# of Taps	Memory	# per Package	Interface	Resistance (kΩ)	INL (max)	DNL (max)	Temperature Range (°C)	Features	Packages
MCP434X/6X	129/257	Volatile/Non Volatile	4	I²C™	5, 10, 50, 100	0.8/1	0.375/0.5	-40 to +125	7/8- bit V/NV Rheostat/Potentiometer	TSSOP, QFN
MCP4011/2/3/4	64	Volatile	1	Up/Down	2.1, 5,10, 50	0.5	0.5	-40 to +125	Potentiometer/Rheostat	SOIC, MSOP, DFN, SOT
MCP4017/8/9	128	Volatile	1	I²C	5, 10, 50, 100	0.5	0.25	-40 to +125	7-bit, Volatile, I²C	SC-70
MCP4021/2/3/4	64	Non Volatile	1	Up/Down	2.1, 5,10, 50	0.5	0.5	-40 to +125	Potentiometer/Rheostat, Shutdown, WiperLock™ Technology	SOIC, MSOP, DFN, SOT

LDO

Part #	Max. Input Voltage	Output Voltage (V)	Output Current (mA)	Temperature Range (°C)	Typical Active Current (µA)	Typ. Dropout Voltage @ Max. IOUT (mV)	Typical Output Voltage Accuracy (%)	Features	Packages
MCP1700	6.0	1.2, 1.8, 2.5, 3.0, 3.3, 5.0	250	-40 to +125	1.6	300	±0.4	1.0 µF ceramic cap stable, Short-circuit protection	TO-92, SOT-23, SOT-89
MCP1703	16	1.2, 1.5, 1.8, 2.5, 2.8, 3.0, 3.3, 4.0, 5.0	250	-40 to +125	2	650	±0.4	Ceramic output capacitor stable, Ultra-low ground current, 16V VIN max.	SOT-23, SOT-89, SOT-223

Supervisors

Part #	Vcc Range (V)	Temperature Range (°C)	Nominal Reset Voltage (V)	Reset Type	Output	Typical Reset Pulse Width (ms)	Typical Supply Current (µA)	Features	Packages
MCP1(02/03/11/12/21/31)	1.0 to 5.5	-40 to +125	4.63, 4.38, 3.08, 2.93, 2.63, 2.32, 1.9	Active-Low/High	CMOS Push-Pull, Open-Drain	120	1	Internal/External Output Pull-up Resistor options	SOT-23, SC-70, TO-92
MCP13(16-22)	1.0 to 5.5	-40 to +125	4.6, 2.9	Active-Low/High	CMOS Push-Pull, Open-Drain	200	1	Manual Reset, Two Reset outputs, Watchdog Input, Custom Voltages/Pulse-widths Available	SOT-23

Battery Management ICs

Part #	Mode	Cell Type	# of Cells	Vcc Range (V)	Cell Voltage (V)	Maximum Charging Current (mA)	Max. Voltage Regulation (%)	Int/Ext FET	Features	Packages
MCP73871	Linear	Li-Ion/Li-Polymer	1	3.75 to 6.0	4.2, 4.35, 4.4, 4.5	1500 (A/C Adapter) 500 (USB)	±0.5	Int	Simultaneous charging of load and battery, Load-dependent charging, Multiple programmable charge currents	SSOP, 4x4 QFN
MCP73113/114/123/213/214/223	Linear	Li-Ion/Li-Polymer/ LiFePO4	1, 2	4 to 16	3.6, 4.1, 4.2, 4.35, 4.4, 8.2, 8.4, 8.7, 8.8	1100	±0.5 (MCP731XX), ±0.6 (MCP732XX)	Int/Ext	Overvoltage protection	DFN

Switching Regulators

Part #	Input Voltage Range (V)	Output Voltage (V)	Temperature Range (°C)	Control Scheme	Switching Frequency (kHz)	Typical Active Current (µA)	Output Current (mA)	Features	Packages
MCP1603, Synchronous Buck Regulator	2.7 to 5.5	0.8 to 4.0	-40 to +85	PFM/PWM	2000	45	500	Over-temperature and Over-current protection	DFN, SOT-23
MCP1640/B/C, Step-up DC/DC Regulator	0.65 to 6	2.0 to 5.5	-40 to +85	PWM or PFM/PWM	500	19	350	Integrated synchronous boost regulator, 0.65V start-up voltage, Soft-start, True load disconnect or input-to-output bypass option	DFN, SOT-23

Charge Pumps

Part #	Input Voltage Range (V)	Output Voltage (V)	Temperature Range (°C)	Maximum Input Current[1] (µA)	Typical Active Output Current (mA)	Features	Packages
MCP1256/7/8/9	1.8 to 3.6	3.3	-40 to +85	100	100	Power Good, Sleep mode	MSOP, DFN

Safety and Security

Part #	Vcc Range (V)	Piezoelectric Horn Driver	LED Driver	Voltage Regulator (V)	Low Battery Detection	Temperature Range (°C)	Packages
RE46C107	2 to 5	Yes	Yes	3 or 3.3	Yes	0 to +50	PDIP, SOIC
RE46C117	2 to 5	Yes	–	–	–	0 to +50	PDIP, SOIC

www.microchip.com/analog

Visit our web site for additional product information and to locate your local sales office.

Microchip Technology Inc. · 2355 W. Chandler Blvd. · Chandler, AZ 85224-6199

Microcontrollers · Digital Signal Controllers · Analog · Memory · Wireless

DS22247A