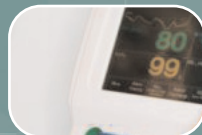


# Medical Devices



**anglia**

[www.anglia.com](http://www.anglia.com)

Microchip Technology Inc. is recognised throughout the world as a leading provider of microcontroller and analog semiconductors. Within their diverse product portfolio are various analog/interface devices that are ideally suited to medical applications and these have been conveniently compiled within this brochure by functionality under five main headings.

## POWER MANAGEMENT

### Low Dropout Linear Regulators

Part Number	Max. Input Voltage (V)	Output Voltage (V)	Output Current (mA)	Junction Temperature Range (°C)	Typical Active Current (μA)	Typical Dropout Voltage @ Max. I <sub>OUT</sub> (mV)	Typical Output Voltage Accuracy (%)	Features	Packages
MCP1700	6	1.2, 1.8, 2.5, 3.0, 3.3, 5.0	250	-40 to +125	1	300	±0.4	1.0μF ceramic cap stable, Short-circuit protection	3-Pin TO-92, 3-Pin SOT-23A, 3-Pin SOT-89
MCP1702	12	1.2, 1.5, 1.8, 2.5, 2.8, 3.0, 3.5, 4.0, 5.0	250	-40 to +125	2	650	±0.4	Ultra-low ground current, 12V V <sub>IN</sub> max.	3-Pin SOT-23A, 3-Pin SOT-89, 3-Pin TO-92
MCP1726	6	Fixed: 5, 3.3, 3, 2.5, 1.8, 1.2, 0.8 Adjustable: 0.8 to 5.0	1000	-40 to +125	140	300	±0.4	Ceramic output capacitor stable, Shutdown, Cdelay, Power Good	8-Pin 3x3 DFN, 8-Pin SOIC
MCP1727	6	Fixed: 5, 3.3, 3, 2.5, 1.8, 1.2, 0.8 Adjustable: 0.8 to 5.0	1500	-40 to +125	140	330	±0.5	Ceramic output capacitor stable, Shutdown, Cdelay, Power Good	8-Pin 3x3 DFN, 8-Pin SOIC

### Switching Regulators

Part Number	Description	Input Voltage Range (V)	Output Voltage (V)	Operating Temp. Range (°C)	Control Scheme	Switching Frequency (kHz)	Typical Active Current (μA)	Output Current (mA)	Features	Packages
MCP1612	Synchronous Buck DC/DC Regulator	2.7 to V <sub>IN</sub>	0.8 to 5.5	-40 to +85	Constant frequency PWM	1400	10,000	1000	Overall efficiency >94% soft start, over-temperature and over-current protection	8-Pin MSOP, 8-Pin 3x3 DFN
MCP1650	Step-up DC/DC Controller	2.7 to 5.5	2.5 to ext. tx limited	-40 to +125	Constant frequency, 2 fixed DC	750	120	560/440	2 duty cycles for min. and max. loads, shutdown control, UVLO, soft start	8-Pin MSOP

### Regulated Charge Pump DC to DC Converters

Part Number	Input Voltage Range (V)	Output Voltage (V)	Operating Temperature Range (°C)	Maximum Input Current * (μA)	Typical Active Output Current (mA)	Features	Packages
MCP1252	2.1/2.7 to 5.5	Selectable 3.3V or 5.0V or Adjustable 1.5V to 5.5V	-40 to +85	120	120mA for V <sub>IN</sub> > 3.0V	Power Good output, 650kHz oscillator	8-Pin MSOP
MCP1253	2.1/2.7 to 5.5	Selectable 3.3V or 5.0V or Adjustable 1.5V to 5.5V	-40 to +85	120	120mA for V <sub>IN</sub> > 3.0V	Power Good output, 1MHz oscillator	8-Pin MSOP
MCP1256	1.8 to 3.6	3.3	-40 to +85	100	100	Power Good, Sleep mode	10-Pin MSOP, 10-Pin 3x3 DFN
MCP1257	1.8 to 3.6	3.3	-40 to +85	100	100	Sleep mode, low battery indication	10-Pin MSOP, 10-Pin 3x3 DFN
MCP1258	1.8 to 3.6	3.3	-40 to +85	100	100	Power Good output, input/output bypass	10-Pin MSOP, 10-Pin 3x3 DFN
MCP1259	1.8 to 3.6	3.3	-40 to +85	100	100	Low battery indication, input/output bypass	10-Pin MSOP, 10-Pin 3x3 DFN

\* Measured at V<sub>IN</sub> = 5.0V, 25°C and no load

### Battery Chargers

Part Number	Mode	Cell Type	No. of Cells	V <sub>CC</sub> Range (V)	Cell Voltage (V)	Max. Charging Current (mA)	Max. Voltage Regulation (%)	Int/Ext FET	Features	Packages
MCP73831	Linear	Li-ion/Li-Polymer	1	3.7 to 6.0	4.2, 4.35, 4.4, 4.5	500	±0.75	Int	UVLO, Thermal regulation, Programmable charge current, tri-state STAT pin	5-Pin SOT-23, 8-Pin 2x3 DFN

## INTERFACE

### Infra-red Products

Part Number	Operating Voltage (V)	Operating Temperature Range (°C)	Max. Baud Rate (Kbaud)	Unique Features	Packages
MCP2120	2.5 to 5.5	-40 to +85	325	UART to IR encoder/decoder with both hardware and software baud rate selection	14-Pin PDIP, 14-Pin SOIC
MCP2140	2.7 to 5.5	-40 to +85	9.6	IrDA® Standard protocol handler plus bit encoder/decoder, Fixed baud rate, Low-cost	18-Pin PDIP, 18-Pin SOIC, 20-Pin SSOP
MCP2150	3.0 to 5.5	-40 to +85	115.2	IrDA® Standard protocol handler plus bit encoder/decoder on one chip for DTE applications, Programmable ID	18-Pin PDIP, 18-Pin SOIC, 20-Pin SSOP

## LINEAR

### Operational Amplifiers

Part Number	No. per Package	GBWP	I <sub>Q</sub> Typical (μA)	V <sub>OS</sub> Max (mV)	Typical Input Leakage Current (pA)	Input Voltage Noise Density (nV/√Hz)	Operating Voltage (V)	Temperature Range (°C)	Features	Packages
MCP6001	1	1MHz	140	4.5	1	28*	1.8 to 5.5	-40 to +125	Rail-to-Rail Input/Output	5-Pin SOT-23(S,R,U), 5-Pin SC-70(R,U)
MCP6002	2	1MHz	140	4.5	1	28*	1.8 to 5.5	-40 to +125	Rail-to-Rail Input/Output	8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP
MCP6004	4	1MHz	140	4.5	1	28*	1.8 to 5.5	-40 to +125	Rail-to-Rail Input/Output	14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP
MCP6041	1	14kHz	0.6	3	1	170*	1.4 to 5.5	-40 to +85	Rail-to-Rail Input/Output	8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP, 5-Pin SOT-23(S)
MCP6141	1	100kHz	0.6	3	1	170*	1.4 to 5.5	-40 to +85	Rail-to-Rail Input/Output, G>10 stable	5-Pin SOT-23(S), 8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP

\* Typical values at 1kHz

Pinout Codes: (S) = Standard, (R) = Reverse, (U) = Alternative

### Programmable Gain Amplifiers (PGA)

Part Number	Channels	-3dB Bandwidth (MHz)	I <sub>Q</sub> Typical (mA)	V <sub>OS</sub> (μV)	Operating Voltage (V)	Temperature Range (°C)	Features	Packages
MCP6S21	1	2 to 12	1.1	275	2.5 to 5.5	-40 to +85	SPI, 8 Gain Steps, Software Shutdown	8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP
MCP6S22	2	2 to 12	1.1	275	2.5 to 5.5	-40 to +85	SPI, 8 Gain Steps, Software Shutdown	8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP
MCP6S26	6	2 to 12	1.1	275	2.5 to 5.5	-40 to +85	SPI, 8 Gain Steps, Software Shutdown	14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP
MCP6S28	8	2 to 12	1.1	275	2.5 to 5.5	-40 to +85	SPI, 8 Gain Steps, Software Shutdown	16-Pin PDIP, 16-Pin SOIC

### Comparators

Part Number	No. per Package	Typical Propagation Delay (μs)	I <sub>Q</sub> Typical (mA)	V <sub>OS</sub> Max (mV)	Operating Voltage (V)	Temperature Range (°C)	Features	Packages
MCP6547	2	4	1	5	1.6 to 5.5	-40 to +85	Open-drain, 9V, Rail-to-Rail Input/Output	8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP

### Linear Gain Blocks

Part Number	Channels	-3dB Bandwidth (kHz)	I <sub>Q</sub> Typical (μA)	V <sub>OS</sub> (mV)	Operating Voltage (V)	Temperature Range (°C)	Gain Steps (V/V)	Features	Packages
MCP6601	1	1000	120	3	1.8 to 5.5	-40 to +125	1, 10, 50	Tri-State Control Pin	8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP
MCP6602	2	1000	120	3	1.8 to 5.5	-40 to +125	1, 10, 50	Tri-State Control Pin	8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP

## MIXED SIGNAL

### Successive Approximation Register (SAR) A/D Converters

Part Number	Resolution (bits)	Maximum Sampling Rate (ksamples/sec)	Number of Input Channels	Input Type	Interface	Input Voltage Range (V)	Max. Supply Current (μA)	Max. INL	Temp. Range (°C)	Packages
MCP3201	12	100	1	Single-ended	SPI	2.7 to 5.5	400	±1 LSB	-40 to +85	8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP
MCP3202	12	100	2	Single-ended	SPI	2.7 to 5.5	550	±1 LSB	-40 to +85	8-Pin PDIP, 8-Pin SOIC, 8-Pin TSSOP
MCP3204	12	100	4	Single-ended	SPI	2.7 to 5.5	400	±1 LSB	-40 to +85	14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP
MCP3208	12	100	8	Single-ended	SPI	2.7 to 5.5	400	±1 LSB	-40 to +85	16-Pin PDIP, 16-Pin SOIC
MCP3301	13	100	1	Differential	SPI	2.7 to 5.5	450	±1 LSB	-40 to +85	8-Pin PDIP, 8-Pin SOIC, 8-Pin MSOP
MCP3302	13	100	2	Differential	SPI	2.7 to 5.5	450	±1 LSB	-40 to +85	14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP
MCP3304	13	100	4	Differential	SPI	2.7 to 5.5	450	±1 LSB	-40 to +85	16-Pin PDIP, 16-Pin SOIC

### Delta Sigma A/D Converters

Part Number	Resolution (bits)	Maximum Sampling Rate (samples/sec)	No. of Input Channels	Interface	Supply Voltage Range (V)	Typical Supply Current (μA)	Typical INL (ppm)	Temp. Range (°C)	Features	Packages
MCP3421	18	4	1 Diff	I <sup>2</sup> C™	2.7 to 5.0	155	10	-40 to +125	On-board oscillator & reference	6-Pin SOT-23
MCP3551	22	14	1 Diff	SPI	2.7 to 5.5	120	2	-40 to +125	Simultaneous 50/60Hz rejection	8-Pin SOIC, 8-Pin MSOP

### Digital Potentiometers

Part Number	Number of Taps	Memory	Number per Package	Interface	Resistance (kOhms)	INL (max.)	DNL (max.)	Temperature Range (°C)	Comments	Packages
MCP41010	256	Volatile	1	SPI	10	1	1	-40 to +85	Potentiometer mode, Shutdown	8-Pin PDIP, 8-Pin SOIC
MCP41050	256	Volatile	1	SPI	50	1	1	-40 to +85	Potentiometer mode, Shutdown	8-Pin PDIP, 8-Pin SOIC
MCP41100	256	Volatile	1	SPI	100	1	1	-40 to +85	Potentiometer mode, Shutdown	8-Pin PDIP, 8-Pin SOIC
MCP42010	256	Volatile	2	SPI	10	1	1	-40 to +85	Potentiometer mode, Shutdown	14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP
MCP42050	256	Volatile	2	SPI	50	1	1	-40 to +85	Potentiometer mode, Shutdown	14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP
MCP42100	256	Volatile	2	SPI	100	1	1	-40 to +85	Potentiometer mode, Shutdown	14-Pin PDIP, 14-Pin SOIC, 14-Pin TSSOP

## THERMAL MANAGEMENT

### Voltage Output Temperature Sensors

Part Number	Typical Accuracy (°C)	Maximum Accuracy @ 25°C (°C)	Max. Temperature Range (°C)	V <sub>CC</sub> Range (V)	Maximum Supply Current (μA)	Features	Packages
MCP9700A	±1	±2	-40 to +125	+2.3 to +5.5	12	Linear Active Thermistor™ IC, Temperature slope: 10mV/°C	3-pin TO-92, 5-pin SC-70

### Serial Output Temperature Sensors

Part Number	Typical Accuracy (°C)	Maximum Accuracy @ 25°C (°C)	Max. Temperature Range (°C)	V <sub>CC</sub> Range (V)	Maximum Supply Current (μA)	Features	Packages
MCP9800	±0.5	±1	-55 to +125	+2.7 to +5.5	400	SMBus/I <sup>2</sup> C™ compatible interface, 0.0625°C to 0.5°C adj. resolution, power-saving one-shot temp. measurement	5-Pin SOT-23

It should be noted that the products listed in this brochure are not intended for safety critical applications.



**anglia**

For further information, technical data or application advice  
on any of the Microchip products please contact Anglia

By telephone: **+44 (0)1945 47 47 47**

By email: **[microchip@anglia.com](mailto:microchip@anglia.com)**

or visit the Microchip section of our website at: **[www.anglia.com/microchip](http://www.anglia.com/microchip)**