All specifications are subject to change without notice.
Typical for 25 °C unless otherwise specified.
Specifications in *italic* text are guaranteed by design.

Analog input

Table 1. General analog input specifications

Parameter	Conditions	Specification
A/D converter type		Successive approximation
ADC resolution		12 bits
Number of channels		8 single-ended
Input voltage range		±10 V
Absolute maximum input voltage	*CHx relative to AGND*	*±25 V max (power on)* *±25 V max (power off)*
Input impedance		*1 MΩ (power on)* *1 MΩ (power off)*
Input bias current	*10 V input*	*–12 µA*
	0 V input	*2 µA*
	–10 V input	*12 µA*
Monotonicity		*Guaranteed*
Input bandwidth	Small signal (–3 dB)	150 kHz
Maximum working voltage	Input range relative to AGND	±10.1 V max
Crosstalk	Adjacent channels, DC to 10 kHz	–75 dB
Input coupling		DC
Recommended warm-up time		1 minute min
Sampling rate, hardware paced	Internal scan clock	0.004 S/s to 100 kS/s, software-selectable
	External scan clock	100 kS/s max
Sampling mode		One A/D conversion for each configured channel per clock
Conversion time	Per channel	8 µs
Scan clock source		Internal scan clock External scan clock input on terminal CLK
Channel queue		Up to eight unique, ascending channels
Throughput, Raspberry Pi® 2 / 3 / 4	Single board	100 kS/s max
	Multiple boards	Up to 320 kS/s aggregate (Note 1)
Throughput, Raspberry Pi A+ / B+	Single board	Up to 100 kS/s (Note 1)
	Multiple boards	Up to 100 kS/s aggregate (Note 1)

Note 1: Depends on the load on the Raspberry Pi processor. The highest throughput may be achieved by using a Raspberry Pi 3 B+.

Accuracy

Analog input DC voltage measurement accuracy

Table 2. DC Accuracy components and specifications. All values are (±)

Range	Gain error, max (% of reading)	Offset error, max (mV)	Absolute accuracy at Full Scale (mV)	Gain temperature coefficient (% reading/°C)	Offset temperature coefficient (mV/°C)
±10V	0.098	11	20.8	0.016	0.87

Noise performance

For the peak to peak noise distribution test, the input channel is connected to AGND at the input terminal block, and 12,000 samples are acquired at the maximum throughput.

Table 3. Noise performance specifications

Range	Counts	LSBrms
±10 V	5	0.76

External digital trigger

Table 4. External digital trigger specifications

Parameter	Conditions	Specification
Trigger source		TRIG input
Trigger mode		Software configurable for rising or falling edge, or high or low level
Trigger latency	Internal scan clock	1 µs max
	External scan clock	1 µs + 1 scan clock cycle max
Trigger pulse width		125 ns min
Input type		Schmitt trigger, weak pull-down to ground (approximately 10 K)
Input high voltage threshold		2.64 V min
Input low voltage threshold		0.66 V max
Input voltage limits		5.5 V absolute max –0.5 V absolute min 0 V recommended min

External scan clock input/output

Table 5. External scan clock I/O specifications

Parameter	Specification
Terminal name	CLK
Terminal types	Bidirectional, defaults to input when not sampling analog channels
Direction (software-selectable)	Output: Outputs internal scan clock; active on rising edge Input: Receives scan clock from external source; active on rising edge
Input clock rate	100 kHz max
Input clock pulse width	400 ns min
Input type	Schmitt trigger, weak pull-down to ground in input mode (approximately 10 K), protected with 150 Ω series resistor
Input high voltage threshold	2.64 V min
Input low voltage threshold	0.66 V max
Input voltage limits	5.5 V absolute max -0.5 V absolute min 0 V recommended min
Output high voltage	3.0 V min (IOH = -50 µA) 2.65 V min (IOH = –3 mA)
Output low voltage	0.1 V max (IOL = 50 µA) 0.8 V max (IOL = 3 mA)
Output current	±3 mA max

Memory

Table 6. Memory specifications

Parameter	Specification
Data FIFO	7 K (7,168) analog input samples
Non-volatile memory	4 KB (ID and calibration storage, no user-modifiable memory)

Power

Table 7. Power specifications

Parameter	Conditions	Specification
Supply current, 3.3V supply	Typical	35 mA
	Maximum	55 mA

Interface specifications

Table 8. Interface specifications

Parameter	Specification
Raspberry Pi ™ GPIO pins used	GPIO 8, GPIO 9, GPIO 10, GPIO 11 (SPI interface) ID_SD, ID_SC (ID EEPROM) GPIO 12, GPIO 13, GPIO 26, (Board address)
Data interface type	SPI slave device, CE0 chip select
SPI mode	1
SPI clock rate	10 MHz, max

Environmental

Table 9. Environmental specifications

Parameter	Specification
Operating temperature range	0 °C to 55 °C
Storage temperature range	–40 °C to 85 °C
Humidity	0% to 90% non-condensing

Mechanical

Table 10. Mechanical specifications

Parameter	Specification
Dimensions (L × W × H)	65 × 56.5 × 12 mm (2.56 × 2.22 × 0.47 in.) max

User connectors

Table 11. Screw terminal connector specifications

Parameter	Specification
Connector type	Screw terminal
Wire gauge range	16 AWG to 30 AWG

Table 12. Optional header connector (MCC 118-OEM) specifications

Parameter	Specification
Connector type	User supplied and user installed header
W5 header footprint	1×6, 0.1" spacing
W4 header footprint	1×10, 0.1" spacing

Table 13. Connector pinout

Connector J2 or W5 (OEM version)		
Pin	**Signal name**	**Pin description**
1	CH0	Channel 0
2	CH1	Channel 1
3	GND	Analog ground
4	CH2	Channel 2
5	CH3	Channel 3
6	GND	Analog ground
Connector J3 or W4 (OEM version)		
Pin	**Signal name**	**Pin description**
7	CH4	Channel 4
8	CH5	Channel 5
9	GND	Analog ground
10	CH6	Channel 6
11	CH7	Channel 7
12	GND	Analog ground
13	CLK	Scan clock input / output
14	GND	Digital ground
15	TRIG	Digital trigger input
16	GND	Digital ground