

AmbiMate SENSOR MODULE

MS4 Series

TE Connectivity (TE)'s AmbiMate sensor module MS4 series provides an application specific set of sensors on a ready to attach PCB assembly for easy integration into a host product. Design resources are freed and time to market accelerated by integrating the MS4 series pre-engineered, four core sensor solution for Motion / Light / Temperature / Humidity into your next product.

Other MS4 series sensor modules include VOC (Volatile Organic Compound), eCO₂ (equivalent carbon dioxide) and sound detection. Add the capability to monitor air quality through the capture of VOC concentrations. Select an MS4 series with a microphone to augment motion detection or to listen for sound events.

All MS4 series sensor modules offer the flexibility of sharing a common seven position connection. This allows the designer to layout a single PCB footprint accommodating all the available sensor configurations at production.



Applications

- Indoor Lighting
- Building Automation
- Connected Home
- Air Quality
- Energy Management
- Work Space Comfort
- Zonal Environmental Controls

Four Core Sense Capability

- Motion (PIR)
- Light
- Temperature
- Humidity

Optional Sense Capability

- VOC
- eCO₂
- Sound (microphone)

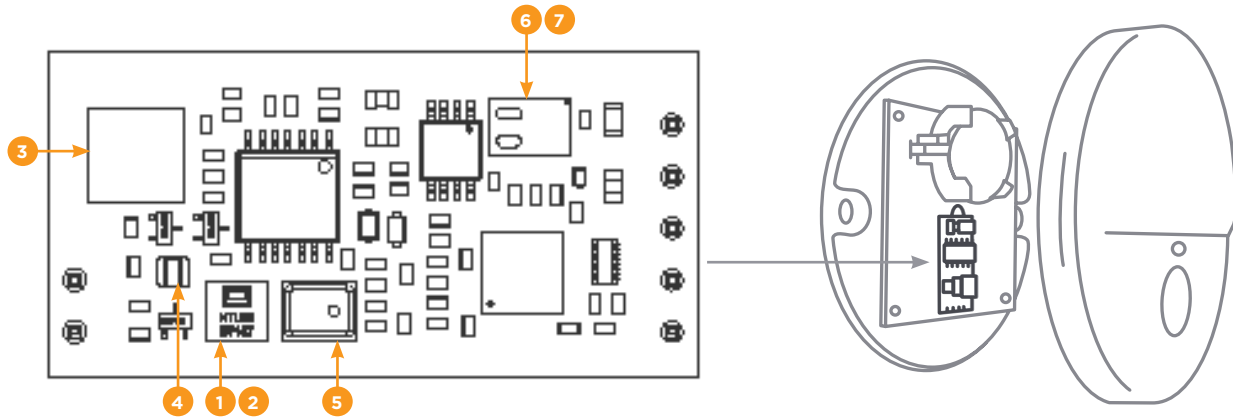
Specifications

- Application Specification: [114-133092/114-133115](#)
- Design Objectives / Specification: [108-133092](#)

Benefits

- Design resources are freed and time to market is accelerated
- Simplicity of popular I²C communication protocol
- Event out pin for real time motion detection
- Space saving compact design
- Multiple attach methods to accommodate your application need
- One footprint allows multiple sensor configurations & flexibility in design

Product Specifications



Item	Sensor	Sensor Performance
1	Temperature	5°C to +50°C ± 1°C Accuracy, 1 second acquisition rate
2	Relative Humidity	5% to 95% RH, 3% accuracy, 1 second acquisition rate
3	Motion	Interrupt driven
4	Ambient Light Level	1 second acquisition rate 0-1024 Lux
5	Microphone	Analog audio and interrupt driven option, response <0.5 seconds
6	VOC	0-1187ppb, 60 second acquisition rate
7	eCO ₂	400-8192ppm, 60 second acquisition rate, (an equivalent eCO ₂ measurement based on total VOC concentrations)

Absolute Maximum Ratings	Symbol	Min	Max	Unit
Storage Temperature	Tstg	-40	85	°C
Power Supply Input Voltage	Vdd	3.1	3.5	VDC
Total System Current Draw	I _d	x	10*	mA*

*w/ VOC/eCO₂ with value 33mA

Electrical Characteristics	Min	Max	Unit
Analog Audio Output Sensitivity	-25	-19	dBV
Analog Audio Output Freq Range	100	10k	Hz

Environmental Characteristics	Min	Max	Unit
Operating Temperature	-5	50	°C
Relative Humidity Operating, Non-Condensing Environment	5	95	%

Electrical

- 3.3VDC input
- I²C Output (max. 100 kBaud)
- Interrupt driven event pin for motion detection
- Design optimized for maximum battery life

Design Considerations

- Mounting location: ceiling, wall, corner
- PIR requires use of Fresnel lens
- Enclosure must allow free air movement over sensors
- Use of light pipe recommended to avoid shadowing

For enhanced motion detection, please contact TE.

Note: Refer to Application Spec 114-133092 or contact TE for additional design considerations when integrating with a host product.

Pin Assignment

I²C Signals

Pin	Signal	I/O	Description
1	GND	I/O	Common Connection
2	Event Out	O	Motion detection
3	SCL	O	Clock Signal for I ² C bus
4	SDA	O	Data signal for I ² C bus
5	Vdd	I	3.3VDC Input

Audio Signals

Pin	Signal	I/O	Description
1	Audio Output	O	Analog audio output signal
2	GND	O	Common connection

Product Selection Information

Part Number	AmbiMate Series	Four Core	VOC	eCO ₂	Sound	HOST PRODUCT ATTACH METHOD**		
						Castellation	Vertical w/Header*	Plated Thru Hole
2316851-1	MS4	•				•		
2316851-2	MS4	•			•	•		
2316852-1	MS4	•	•	•		•		
2316852-2	MS4	•	•	•	•	•		
2314277-1	MS4	•					•	
2314277-2	MS4	•			•		•	
2314291-1	MS4	•	•	•			•	
2314291-2	MS4	•	•	•	•		•	
1-2314277-1	MS4	•						•
1-2314277-2	MS4	•			•			•
1-2314291-1	MS4	•	•	•				•
1-2314291-2	MS4	•	•	•	•			•

Four Core Sense Capability

- Motion (PIR)
- Light
- Temperature
- Humidity

Optional Sense Capability

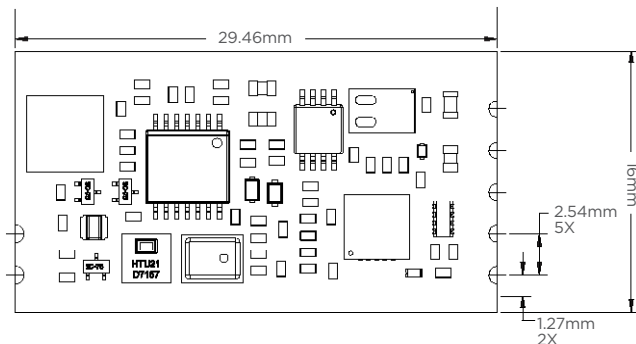
- VOC
- eCO₂
- Sound (microphone)

*.100" unshrouded high temp header for direct solder attach to .062" host PCB.

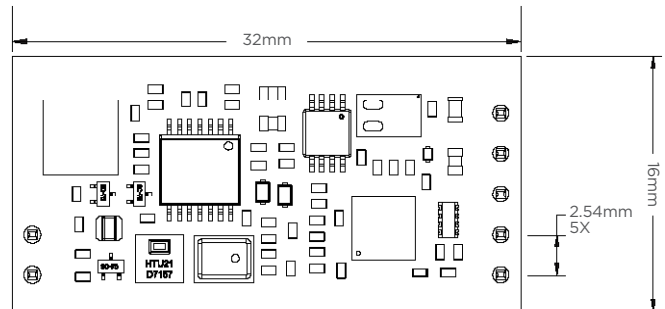
**Other host product attach methods available (i.e. two piece separable or wire attach). Contact TE Sales or Product Management for options.

Dimensions

MS4 Series
Castellation



MS4 Series
Header and Plated Thru Hole



te.com

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