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), eCO_2 (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**
- **eCO_2**
- **Sound (microphone)**

Specifications

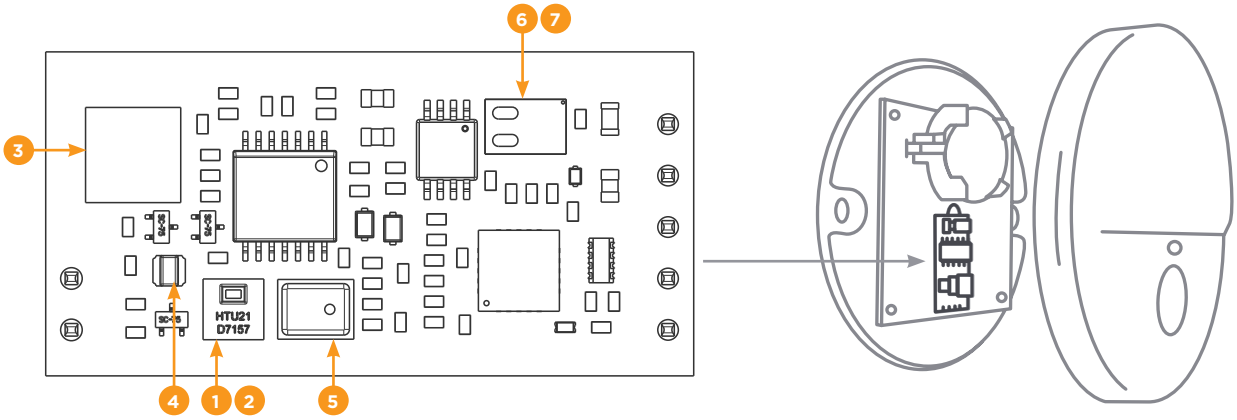
- **Application Specification:** 114-133092
- **Design Objectives / Specification:** 108-133092

Benefits

- Design resources are freed and time to market is accelerated
- Simplicity of popular I^2C communication protocol
- Space saving compact design
- Multiple attach methods to accommodate your application need
- One footprint allows multiple sensor configurations & flexibility in design

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Product Specifications



Item	Sensor	Sensor Performance
1	Temperature	5˚C to +50˚C ± 0.3˚C Accuracy, 1 second acquisition rate
2	Relative Humidity	5% to 95% RH, 2% accuracy, 1 second acquisition rate
3	Motion	Interrupt driven, response <0.5 seconds
4	Ambient Light Level	1 second acquisition rate
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	Id	x	10*	mA*

*w/ VOC/eCO_2 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
- I^2C Output (100 kBaud)
- Interrupt driven event pin for motion and sound level detection
- Design optimized for maximum battery life

Design Considerations

- Mounting location: ceiling, wall, corner
- PIR requires use of Fresnel lens (not TE supplied)
- Enclosure must allow free air movement over sensors
- Use of light pipe recommended to avoid shadowing

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

Pin Assignment

I^2C Signals

Pin	Signal	I/O	Description
1	GND	I/O	Common Connection
2	Event Out	O	Motion or sound level detected in environment
3	SCL	O	Clock Signal for I^2C bus
4	SDA	O	Data signal for I^2C 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

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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	●	●	●	●			●

*.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.

Four Core Sense Capability

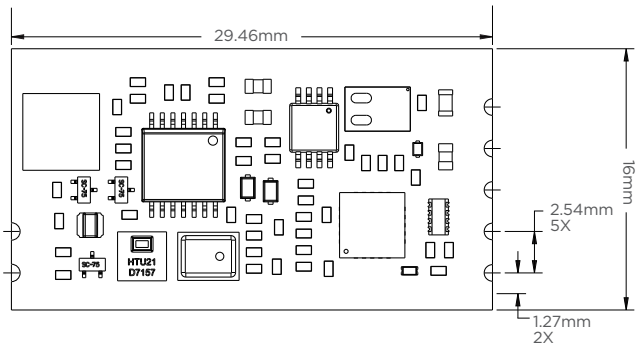
- Motion (PIR)
- Light
- Temperature
- Humidity

Optional Sense Capability

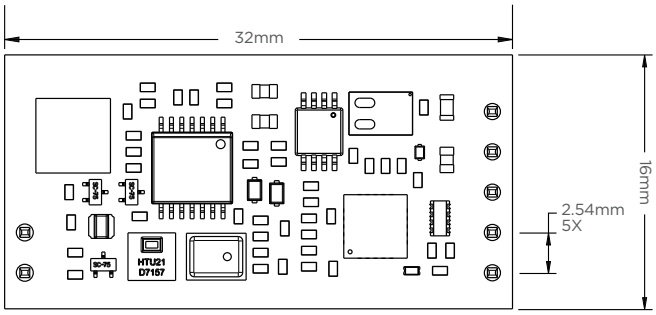
- VOC
- eCO_2
- Sound (microphone)

Dimensions

MS4 Series Castellation



MS4 Series Header and Plated Thru Hole



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