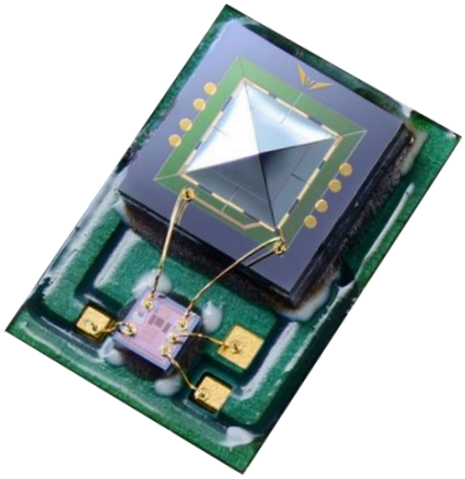
Low-Noise Bottom Port
Piezoelectric MEMS Microphone

Data Sheet	PMM-3738-VM1000-R

PUI Audio, featuring Vesper's exclusive technology, presents the world's first and only piezoelectric MEMS microphone. The PMM-3738-VM1000-R provides superior performance and quality in all environments.

Features:

- Unique piezoelectric MEMS transducer
- Very-low noise floor
- Low part-to-part variation
- High dynamic range
- Stable performance in all conditions
- Dust and water resistant to IP57



The PMM-3738-VM1000-R is a low noise, low part-to-part variation, high dynamic range, single ended analog output piezoelectric MEMS microphone. This microphone consists of a piezoelectric sensor and circuitry to buffer and amplify the output.

The PMM-3738-VM1000-R has a small 3.76 mm X 2.95 mm X 1.1 mm package. This microphone is reflow solder compatible with no sensitivity degradation.

Specifications

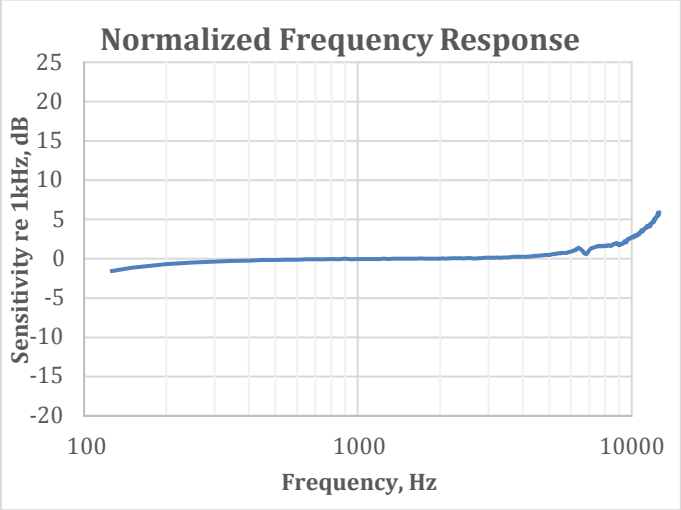
All specifications are at 25°C, V_{Supply} = 1.8 V unless otherwise noted.

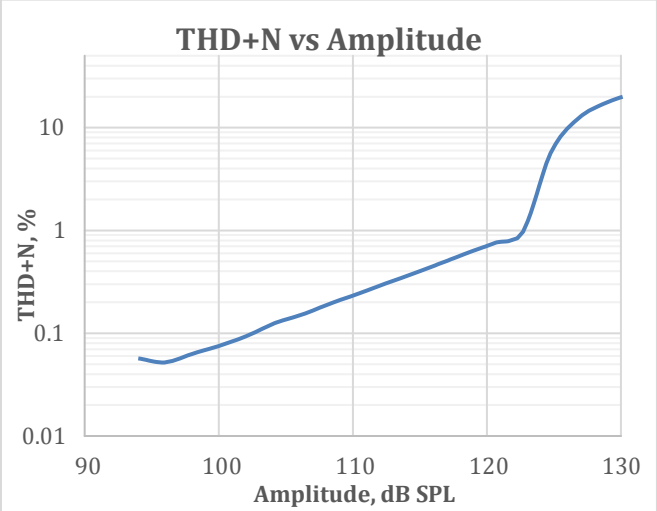
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Acoustic Specifications						
Sensitivity		1 kHz, 94 dB SPL	-41	-38	-35	dBV
Signal-to-Noise Ratio	SNR	94 dB SPL at 1 kHz signal, 20Hz to 20kHz, A-weighted Noise		61		dB(A)
Signal-to-Noise Ratio Voice Band	SNR	94 dB SPL at 1 kHz signal, 20Hz to 8kHz, A-weighted Noise		63		dB(A)
Total Harmonic Distortion	THD	94 dB SPL		0.1		%
Acoustic Overload Point	AOP	10.0% THD		125		dBSPL
Roll Off Frequency		-3db at 1KHz		85		Hz
Directivity			Omni			
Polarity		Increase in sound pressure	Increase in output voltage			
Electrical Specifications						
Supply Voltage			1.6	1.8	3.6	V
Supply Current		$V_{Supply} \leq 3.6$ V (TBR)		165		µA
Power Supply Rejection Ratio	PSRR	VDD = 1.8, 1kHz, 200mV_{PP} Sine wave		55		dB
Power Supply Rejection	PSR	VDD = 1.8, 217Hz, 100mV_{PP} square wave, 20 Hz – 20kHz, A-weighted		-85		dB(A)
Output Impedance	Z_{OUT}			400		Ω
Output DC Offset				0.8		V
Startup Time				100		µS

Absolute Maximum Ratings

Parameter	Rating	Units
Supply Voltage	-0.3 to +3.6	V
Sound Pressure Level	160	dB re 20 µPa
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-55 to +150	°C
Mechanical Shock	10,000g per IEC 60028-2-27:2008	
Vibration	Per MIL-STD 883E, 2007.2	

Typical Performance Characteristics





Environmental Robustness

IP adherence is evaluated by 1 kHz Sensitivity spec post stress

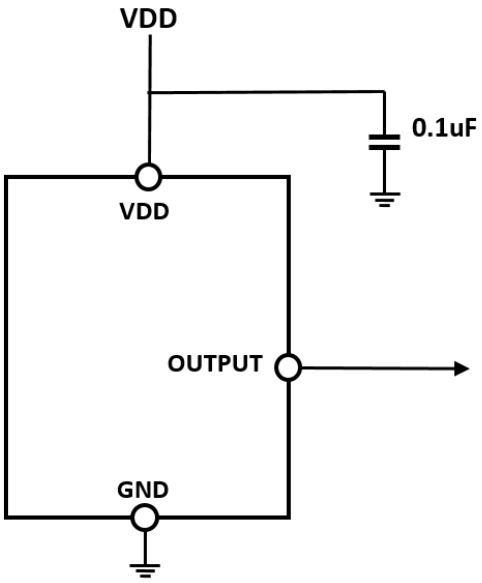
Ingress Protection Type	Description
Dust Resistance	IP5X;
Water Immersion	IPX7; 2 hours drying time, normal dry environment

Reliability Specifications

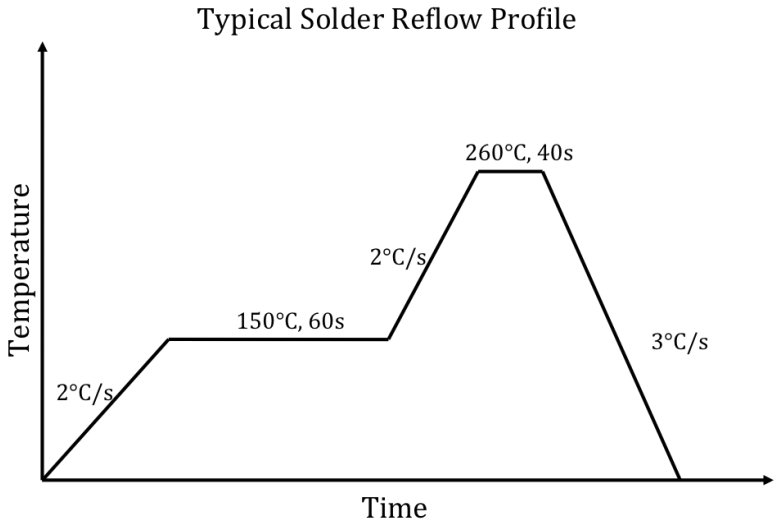
Stress Test	Description
Temperature Cycling Test	-40°C to +125°C, 850 cycles
High Temperature Operating Life	+125°C, 1000 hours, biased
High Temperature Storage	+125°C, 1000 hours, unbiased
Temperature Humidity Bias	+85°C, 85% RH, 1000 hours, biased
Reflow	3 reflow cycles with peak temperature of +260°C
ESD-HBM	3 discharges, all pins, ± 2kV
ESD-CDM	3 discharges, all pins, ± 800V
ESD-LID/GND	3 discharges to lid, ± 8kV
ESD-MM	3 discharges, all pins, ± 200V
ESD-Air Discharge	3 discharges, ± 15kV

Applications Information

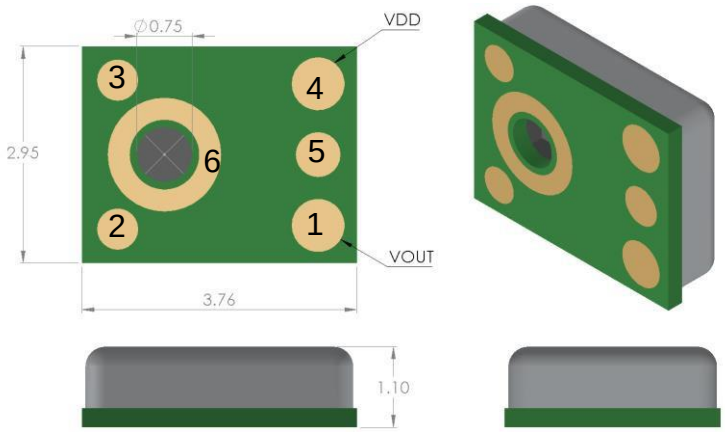
Recommended drive circuit and external components.



Solder Reflow Profile

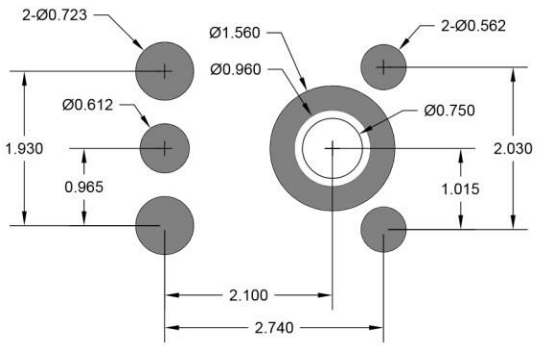


Dimensions and Pin Layout

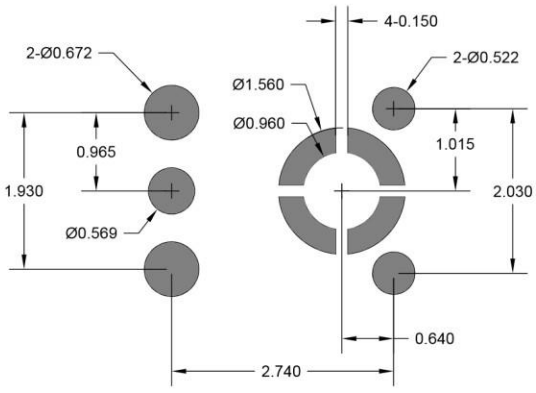


Pin Number	Pin Name	Description
1	V_{OUT}	Analog Output Voltage
2	GND	Ground
3	GND	Ground
4	V_{DD}	Power Supply
5	GND	Ground
6	GND	Ground

PCB Design and Land Pattern Layout



PCB Land Pattern



Solder Stencil Pattern

Note:
1. All dimensions are in millimeters.
2. Specifications subject to change or withdrawal without notice.
3. This part is RoHS 2011/65/EU Compliant.

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