

**BOSCH**

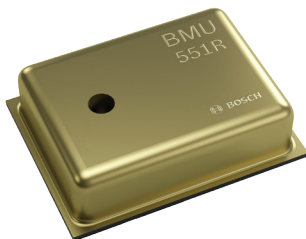
Invented for life

**Akustica, Inc.****BMU551R**

# Analog HD Voice Silicon MEMS Microphone

**General Description**

The BMU551R is an HD voice quality, top-port, single-ended analog-output MEMS microphone. It is a microphone consisting of a MEMS acoustic sensor and an integrated circuit (IC) with a pre-amplifier, charge pump, and supporting circuitry in an industry standard package footprint measuring: 2.65mm x 3.50mm x 1.00mm. The BMU551R is a high-performance microphone, in a metal-lid package with excellent RF immunity, low current consumption, tight sensitivity tolerance, and low THD distortion.

**Product features**

Designed specifically to provide high acoustic performance of direct-port, top-port packages, in a robust metal-can package. The BMU551R is ideal for use in mobile handsets, wearable accessories, and other applications requiring excellent acoustic performance for speech recognition and far-field applications. BMU551R offers 66dB signal-to-noise ratio (SNR) and uniform sensitivity matching of just +/-1dB between microphones. It also provides a flat super wideband frequency response delivering uniform audio capture across a broad audio spectrum.

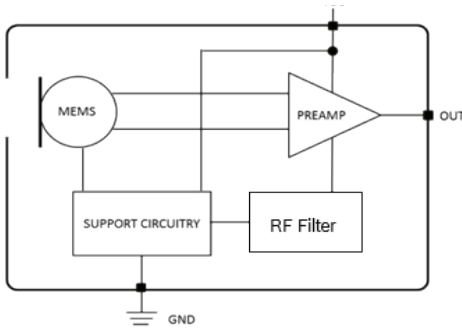
The BMU551R metal-lid package is immune to RF and Electromagnetic (EM) interferences, allowing for easy integration into wireless devices.

TECHNICAL DATA	BMU551R
Package dimension (mm <sup>3</sup> )	3.5 x 2.65 x 1.0
Temperature range	-40°C ...+100°C
Supply voltage (V <sub>DD</sub> )	1.6V ... 3.6V
Directivity	Omni-directional
Signal-to-Noise Ratio (SNR)	66dB
Frequency response	20Hz - 80kHz
Sensitivity	-38dB ± 1dB
Acoustic Overload Point (AOP)	124dB SPL
Power Supply Rejection (PSR)	-97dBV(A)
Current consumption	60µA
Output impedance	400Ω
Part-to-part phase matching	±4°

**BMU551R target applications**

- ▶ Smartphones and mobile phones which require high quality acoustic performance
- ▶ Voice-activated entertainment systems, set-top-boxes, and remote controls
- ▶ Wearable accessories, IoT
- ▶ Gaming consoles and controllers
- ▶ Microphone arrays – multi-mic applications

**Functional block diagram**



**System compatability**

The BMU551R can be easily designed into mobile phones, wearable, and other applications requiring excellent voice capture capability. The direct-port, top-port configuration provides not only the high performance normally associated with bottom port microphones, but also the ease of manufacturing and assembly onto customer PCB that you get only with top-port microphones. BMU551R is also mechanically and electrically robust. The metal-lid package, in combination with the MEMS sensor design, enable the BMU551R to withstand the many mechanical stresses, from handling or dropping that occur during manufacturing and end-use.

The Faraday cage package construction with enhanced filtering provides up to 20dB of additional radiated RF rejection in wireless frequency bands. This added RF immunity reduces the burden of external filtering components and decreases the number of necessary board redesign and testing re-certifications, thereby shortening time-to-market and reducing development as well as overall system costs.

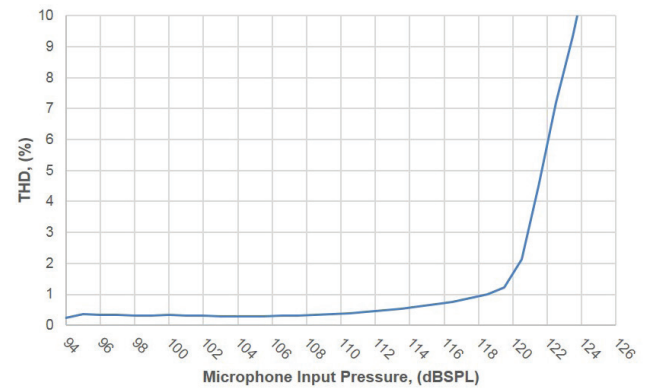
The microphones can also withstand more than twice the state-of-the art level of ESD air discharge, improving both manufacturing and end-user reliability.

The BMU551R delivers superior electro-acoustic performance, featuring a high signal-to-noise ratio (SNR) of 66dB providing at the same time a uniform sensitivity (+/-1dB) and a flat frequency response. Combined with a low total-harmonic-distortion (THD),

the BMU551R can noticeably improve call quality and speech recognition accuracy, especially in far-field and array applications.

Additionally, the BMU551R draws only 60µA in full performance mode, less than half the power consumption of state-of-the art microphones, helping to extend battery life, especially in wearable devices.

**Total harmonic distortion (THD)**



The performance of modern microphone systems are heavily dependent on the overall platform design, including software algorithms, mechanical layout and hardware implementation. As an innovator in the field of MEMS microphones and leveraging significant Consumer Electronics application experience, as part of the Bosch Group, Akustica has a deep understanding of acoustic design requirements and proper analysis methods. To ensure our customers a seamless integration experience and support constrained design cycles, we offer acoustic design and modeling services prior to assembly, and also provide production test services, training, and test equipment to help ensure the quality of both incoming and final assembled products.

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