

## Overview

Multilayer piezoelectric bimorph actuators are ceramic elements used to convert electrical energy into mechanical energy such as displacement or force by utilizing the piezoelectric longitudinal effect.

KEMET's piezoelectric acoustic module use multilayer piezoelectric bimorph actuators which are produced based on our unique element structure design and piezoelectric ceramic materials with high electrostrictive factors.

The piezoelectric acoustic module generates both sound and vibration from the chassis simultaneously.

## Applications

- Smartphone Receiver
- Speaker

## Benefits

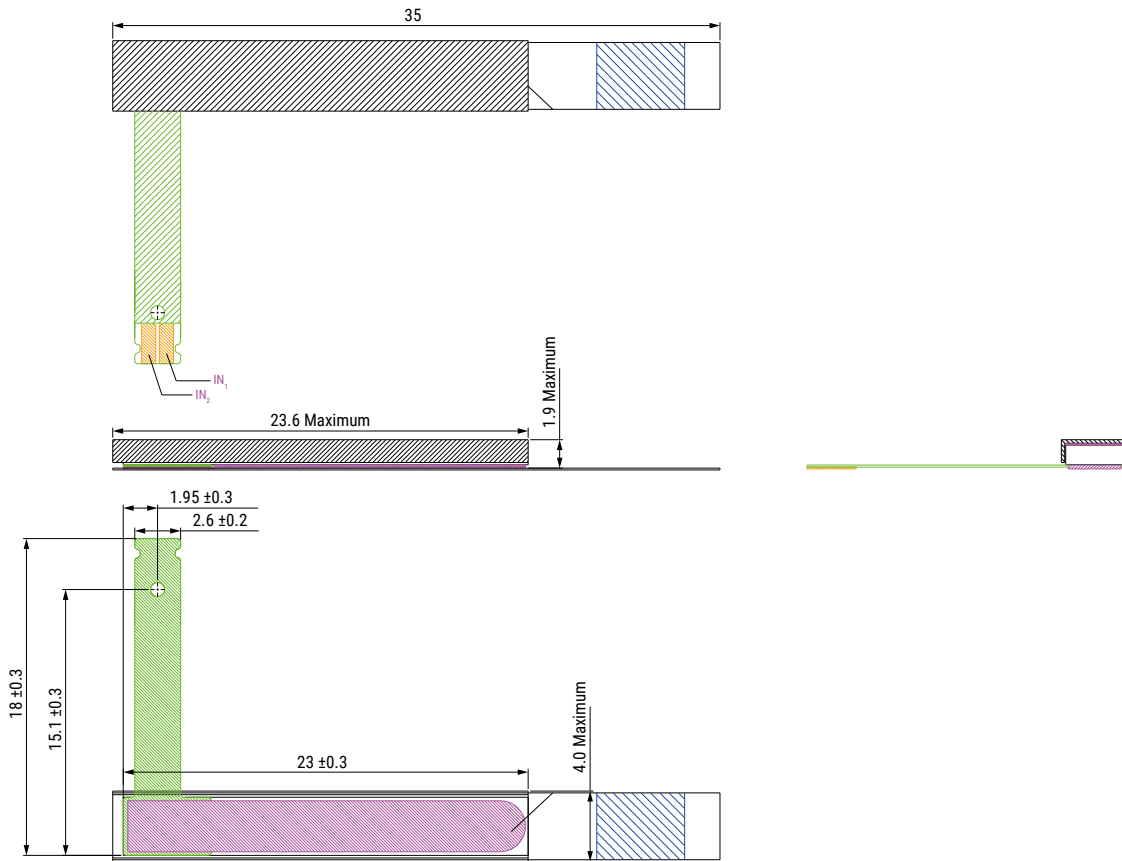
- Sound comes from panel surface
- No sound hole required
- Easy to hear in noisy surrounding
- More design flexibility
- Ideal for waterproof and dust-proofing design
- Fast and easy installation, provided with adhesive tape
- High reliability
- Operating temperature range from  $-25^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- Stable sound pressure through our proprietary ceramic material characterized by high Curie temperature with high d constant
- RoHS/REACH compliant



## Ordering Information

R	11-	24	40	18	-01
Receiver	Type of Design	Length (mm)	Width (mm)	Thickness (mm)	Model Type
R	11	24 = 23.6 mm	40 = 4.0 mm	18 = 1.9 mm	01

## Dimensions in mm



Part Number	Length (mm) Maximum	Width (mm) Maximum	Thickness (mm) Maximum
R11-244018-01	23.6	4.0	1.9

## Environmental Compliance

All KEMET Piezoelectric Acoustic Modules are RoHS and REACH compliant.

Article 33(1) of the REACH Regulation states that manufacturers and importers of articles (products) are required to notify their customers of the presence of any Substances of Very High Concern (SVHC) in their products exceeding 0.1% by weight and provide instructions on safe use of the product.

KEMET Corporation reports regarding the Article 33(1) of REACH Regulation as follows:

1. Applicable Product:

Piezoelectric acoustic modules (R11 Series).

2. Report for content of REACH SVHC list:

The product(s) above contain a substance by more than 0.1wt% per product weight that was published in the 8th update of the REACH SVHC substances (December 19, 2012).

3. Regarding safety of the piezoelectric acoustic modules (Piezoceramic products):

The Piezoceramic that is used in this product becomes ceramic by sintering powder containing PZT as a main ingredient. It is chemically stable, with minimum risks toward the human body or environment within the intended use of the product. Please note that risks could occur in the case of inhalation or accidental oral uptake of powder ceramics.

4. Technical product information on the piezoelectric acoustic modules (Piezoceramic products):

The manufacturing technique of the “piezoceramic products” whose main ingredient is Lead Titanium Zirconium Oxide (PZT) has been established, and there is no alternative material that can exhibit superior performance than PZT at this moment. Please note that the piezoceramic is listed as an exempt on RoHS (2011/65/EU) Annex III (7c.1).

5. Responsibility of piezoceramic manufacturers:

Piezoceramic manufacturers report information regarding PZT containment in their products to the customers to obey the article 33 of the REACH regulation.



## Performance Characteristics

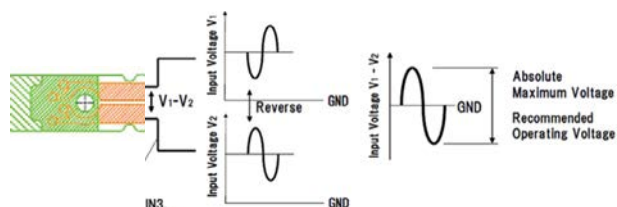
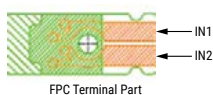
Item	Performance Characteristics	Remarks
Rating Driving Voltage	20 V Peak-Peak	IEC268–5 Compliant
Maximum Driving Voltage	25 V Peak-Peak	IEC268–5 Compliant
Operating Temperature Range	-25°C to +70°C	
Operating Humidity Range	≤ 70%	
Storage Temperature Range	-25°C to +85°C	
Storage Humidity	≤ 70%	

## Structure

Composition	Remarks
Molding Material	Siloxane content shall be less than 50 ppm
Piezoelectric Ceramics	
Double-sided Adhesive Tape	
FPC	

## Input Pin Assignment

Mark	Function
IN1	Input Terminal V1
IN2	Input Terminal V2



## Table 1 – Ratings & Part Number Reference

Part Number	Sound Pressure Level <sup>1</sup> (dBspl)	Static Capacitance <sup>2</sup> (nF)	Capacitance Tolerance (nF)	Self Resonance Frequency (kHz)	Weight (g)
R11-244018-01	107 ±3	1,000	±200	6	1.2

<sup>1</sup> Measurement conditions: 100 Hz, 1 V<sub>rms</sub>

<sup>2</sup> Measurement frequency: 1,000 Hz; Input voltage: 10 V peak-peak; Measurement distance: 10 mm by KEMET Jig

## Packaging

Part Number	Packaging Type	Pieces per Tray	Pieces per Box	Weight (g)
R11-244018-01	Tray	50	1,000	1.2

## Handling Precautions

### Precautions to be taken when using piezoelectric acoustic modules (Please read these precautions before using our products)

Material selection, installation and activation of piezoelectric ceramics should be decided upon by users according to the applications. For proper evaluation and decision, products should be tested repeatedly in both realistic and abnormal operating conditions.

- Do NOT use near flammable gas or solvent as alcohol, thinner, benzene, gasoline, propane gas due to risk of explosion or fire.
- Do NOT clean with flammable solvent such as alcohol, thinner and benzene due to risk of explosion or fire.
- R11 Receivers are breakable if bending stress is applied or in case of strong shocks due to drop.
- Do NOT drop, apply bending or other mechanical stress as it may change the performance characteristics.
- Do NOT apply bending stress during product handling or assembling process.
- Do NOT remodel R11 Receivers to fit into the design.
- Do NOT remove R11 Receivers after having applied to the application.
- Do NOT operate or store in dusty high temperature environment, near fire, under strong light or sunshine, in the air containing salt or oil.
- KEMET recommends that maximum storage temperature not exceed 85°C and maximum storage humidity not exceed 70% relative humidity and atmospheres should be free of chlorine and sulfur bearing compounds. Temperature fluctuations should be minimized to avoid condensation on the parts.
- Handle products properly as industrial waste. When disposing, please contact your local waste disposal service and make sure the disposal methods meet all legal requirements.
- Acoustic Modules' stock should be used promptly, preferably within 1 year of receipt.

## Export Control

### For customers in Japan

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

### For customers outside Japan

Piezoelectric Acoustic Modules should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

## KEMET Electronics Corporation Sales Offices

For a complete list of our global sales offices, please visit [www.kemet.com/sales](http://www.kemet.com/sales).

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### Disclaimer

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

When providing KEMET products and technologies contained herein to other countries, the customer must abide by the procedures and provisions stipulated in all applicable export laws and regulations, including without limitation the International Traffic in Arms Regulations (ITAR), the US Export Administration Regulations (EAR) and the Japan Foreign Exchange and Foreign Trade Act.

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