

## Product Brief 2019

# PowerHap – Piezo Actuators for Active Haptic Feedback

PowerHap™ is a family of powerful actuators for active haptic feedback in a very compact design. They are available in different sizes and designs and are therefore suitable for many applications from lightweight mobile devices to heavy industrial or automotive displays. The PowerHap piezo actuators are based on PZT piezo ceramics. Additional mechanical elements are used to amplify the feedback. In addition PowerHap can be also used as a sensor that provides an output voltage on its terminals when external force is applied.

### Sample applications

- Multifunctional automotive HMIs
- Displays
- Medical appliances
- Household appliances

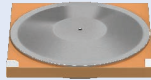
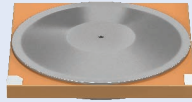
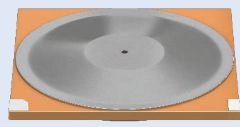
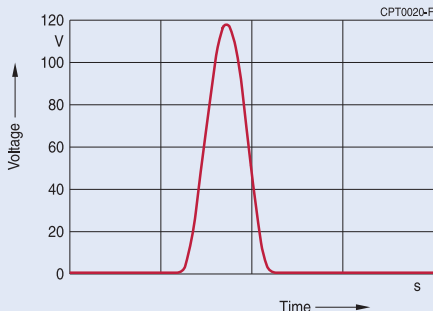
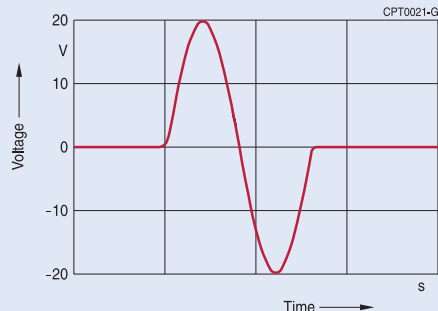
- Smartphones
- ATM's and vending machines
- Industrial equipment
- Game controllers

### Key benefits and features

- Compact design
- Low insertion height down to 1.1 mm
- Multilayer structure enables high acceleration  $\geq 50\text{ g}$  and high force  $\geq 50\text{ N}$
- Large displacement  $\geq 280\text{ }\mu\text{m}$
- Fast response time  $< 1\text{ ms}$
- Low power consumption
- Flexible and programmable waveforms
- Integrated sensor functionality
- Qualified based on AEC-Q200
- Bipolar driving mode allows low operating voltage (e.g.  $\pm 10\text{ V}$ )



# PowerHap – Piezo Actuators for Active Haptic Feedback

| Specifications                                                                      |                                                                                   |                                                                                      |                                                                                     |    |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----|
|                                                                                     |  |    |  |    |
| Type                                                                                | 0909H011V060                                                                      | 1313H018V120                                                                         | 2626H023V120                                                                        |    |
| Size l × w × h                                                                      | 9 × 9 × 1.1                                                                       | 12.7 × 12.7 × 1.8                                                                    | 26 × 26 × 2.3                                                                       | mm |
| Ordering code                                                                       | B54103H2020A001                                                                   | B54102H1020A001                                                                      | B54101H1020A001                                                                     |    |
| Operating temperature (powered)                                                     | −40 ... +85                                                                       |                                                                                      |                                                                                     | °C |
| Custom waveforms                                                                    | Yes                                                                               |                                                                                      |                                                                                     |    |
| Force sensing                                                                       | Yes                                                                               |                                                                                      |                                                                                     |    |
| Unipolar driving mode                                                               |                                                                                   |                                                                                      |                                                                                     |    |
| Voltage                                                                             | 0 ... 60                                                                          | 0 ... 120                                                                            | 0 ... 120                                                                           | V  |
| Acceleration<br>(20 g mass @ single pulse,<br>sine wave 200 Hz)                     | 2.5 (pk)<br>5 (pk-pk)                                                             | 7 (pk)<br>17 (pk-pk)                                                                 |                                                                                     | g  |
| Acceleration<br>(100 g mass @ single pulse,<br>sine wave 200 Hz)                    | 2.5 (pk)<br>5.2 (pk-pk)                                                           | 7 (pk)<br>13 (pk-pk)                                                                 | 35 (pk)<br>87 (pk-pk)                                                               | g  |
| Acceleration<br>(500 g mass @ single pulse,<br>sine wave 200 Hz)                    |                                                                                   |                                                                                      | 6 (pk)<br>18 (pk-pk)                                                                | g  |
| Displacement                                                                        | 35                                                                                | 65                                                                                   | 230                                                                                 | μm |
| Loading charge                                                                      | 0.09                                                                              | 0.19                                                                                 | 0.8                                                                                 | mC |
| Bipolar driving mode                                                                |                                                                                   |                                                                                      |                                                                                     |    |
| Voltage                                                                             | −10 ... 10                                                                        | −20 ... 20                                                                           | −20 ... 20                                                                          | V  |
| Acceleration<br>(20 g mass @ single pulse,<br>sine wave 200 Hz)                     | 2 (pk)<br>4.5 (pk-pk)                                                             | 5.5 (pk)<br>11 (pk-pk)                                                               | 14 (pk)<br>28 (pk-pk)                                                               | g  |
| Acceleration<br>(100 g mass @ single pulse,<br>sine wave 200 Hz)                    | 0.8 (pk)<br>1.5 (pk-pk)                                                           | 0.8 (pk)<br>1.5 (pk-pk)                                                              | 16 (pk)<br>32 (pk-pk)                                                               | g  |
| Unipolar driving mode (example)                                                     |                                                                                   | Bipolar driving mode (example)                                                       |                                                                                     |    |
|  |                                                                                   |  |                                                                                     |    |