



Beetle™ – Piezo Haptic Engine

(Patent pending)



Product data sheet (May 2023)

Beetle™ is a highly durable piezo haptic engine / actuator that has been carefully engineered with protective layers to ensure exceptional reliability. Its purpose is to deliver powerful and customizable haptic feedback across a wide range of applications.

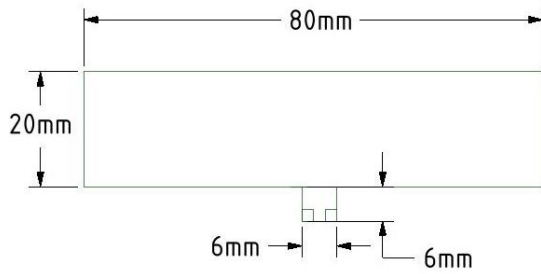
Key advantages

- Powerful and reliable. Designed to be able to operate at resonance with no reliability issues.
- Easy integration. Come with pre-applied 3M VHB double-sided tape.
- High bandwidth. As wide as 100-400 Hz.
- Low power consumption. High efficiency especially at resonance.
- Fast start-up time, as low as 15 ms.

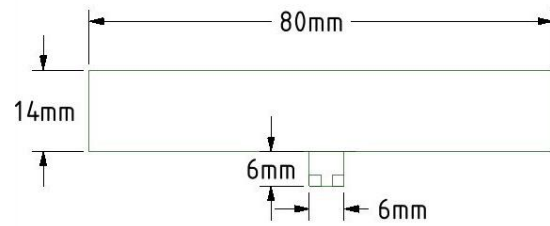
Applications

- Automotive (control panels, touchscreens, steering wheels)
- Consumer (smartphones, tablets, touch sensitive devices)
- Others (gaming, wearable, robotics...)

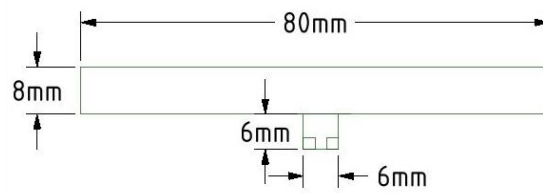
Mechanical dimensions



HAP6020-5H200



HAP6014-5H200



HAP6008-5H200

Specifications

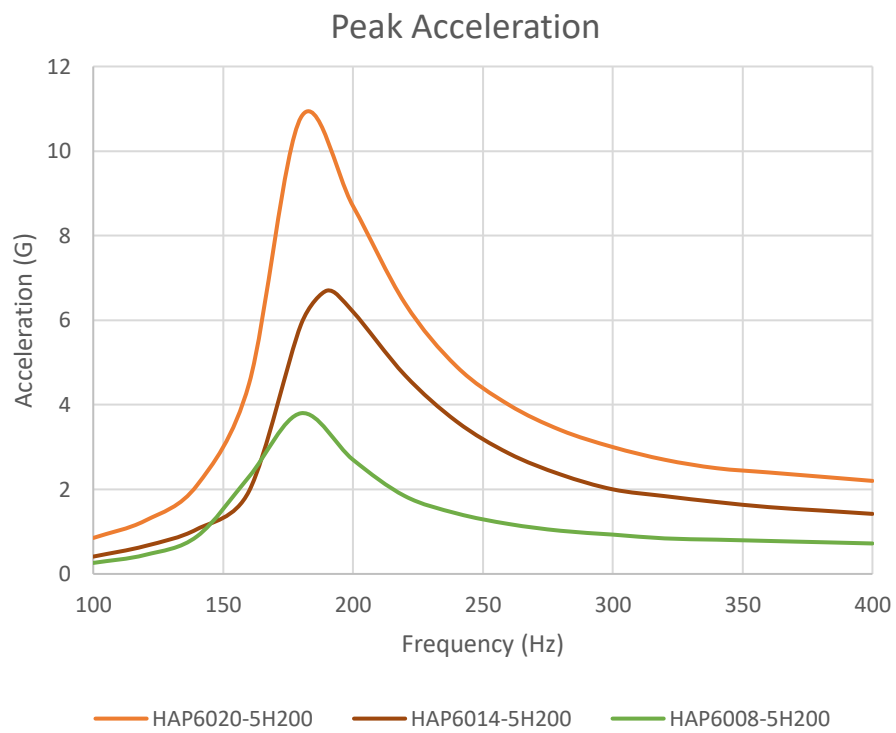
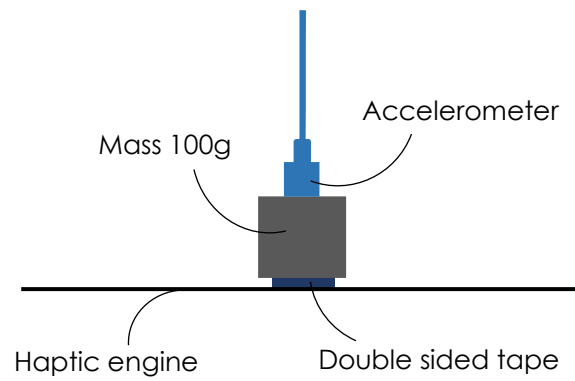
	Unit	Tolerance	HAP6008-5H200	HAP6014-5H200	HAP6020-5H200
Total length	mm	±0.5	80	80	80
PCB size	mm ²	±0.2	6x6	6x6	6x6
Width	mm	±0.5	8	14	20
Thickness	mm	±0.1	0.75	0.75	0.75
Mass	g	±0.2	1.9	3.5	5.1
Max ACC*	G	±15%	3.8	6.7	11
Resonance	Hz	±15%	180	190	190
Response time	ms	±15%	<5	<5	<5
Capacitance	nF	±15%	130	235	335
Operating volt	V	-	-90 to +90	-90 to +90	-90 to +90
Operating T	C	-	-20 to 65	-20 to 65	-20 to 65

*Maximum acceleration was measured using the setup shown in the "haptics characteristics" section below.

Haptics characteristics

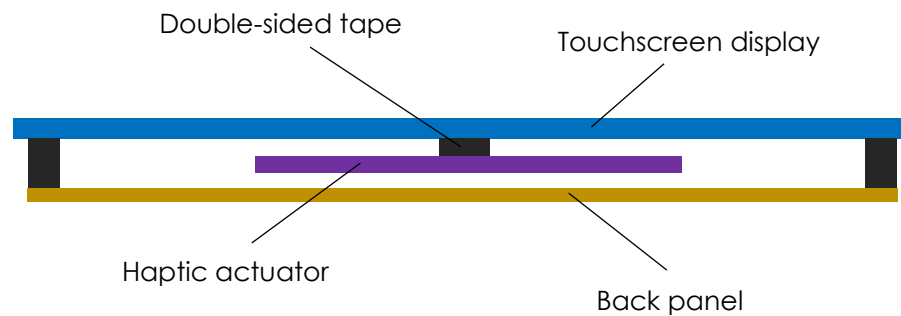
The haptics characterization setup is as follows.

- A 100g mass is attached to the haptic actuator's center using double-sided tape.
- A mini accelerometer is securely glued to the mass.
- The mass and actuator are suspended on the accelerometer cable, allowing free vibration.
- A 140Vp-p sine wave serves as the input signal for the actuator, with varying frequencies from 100 to 400 Hz.



Mounting instructions

The haptic actuator can be easily mounted onto the backside of a touchscreen using a strip of double-sided tape (pre-applied) at its center. It is important to leave adequate gaps between the actuator and the touchscreen, as well as between the actuator and the back panel. This precaution ensures that there is no interference or interaction between the actuator and the surrounding components during operation, avoiding rattling noise issues.



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