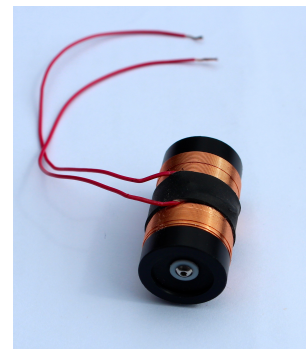


## Haptuator Redesign

### High-Bandwidth Vibrotactile Transducer

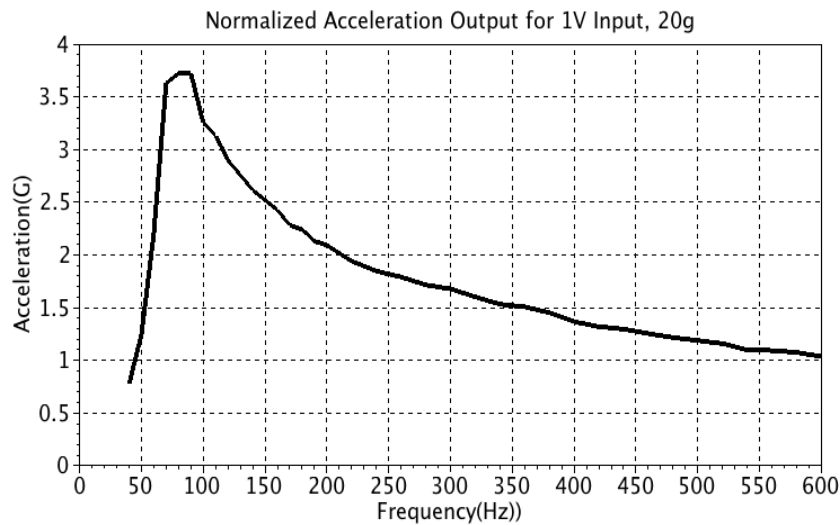
This is a redesign of the original Haptuator. Compare to the original version, the redesigned version can output twice as much the acceleration for the same input. It has the same high bandwidth and same impedance as the original haptuator, hence compatible with similar common audio amplifiers designed for loud speakers..

Model Number	TL002-14R	
Dimension (diameter x length)	16 x 29	mm
Net Weight	11	grams
Acceleration @ 1V input, 150 Hz with 9g extra load (20g total)	2.5	G m/s <sup>2</sup>
Rated Bandwidth	50 - 500	Hz
Typical Impedance	6.0	Ω
Maximum Input Voltage	3.0	V
Maximum Input Current	0.5	A



TL002-1R

### Output Acceleration



To calculate the output acceleration for a given input voltage of  $V_i$  (rms):

1. For the desired operating frequency, find the normalized acceleration value  $A_n$  from the above figure. For example, at 300 Hz,  $A_n = 0.8$ ;
2. Perform the following calculation:

$$Acceleration(G) = V_i \times A_n$$

**Notes:**

1. The Haptuator can be driven as a 4-8  $\Omega$  loudspeaker by most audio amplifiers if the input current and voltage are within the recommended operating conditions. The Haptuator should be AC-coupled to avoid driving a DC current into the unit.
2. It is not recommended to drive the Haptuator under 50Hz: the output acceleration would not be optimal. Driving at a minimum of 10 Hz or above 500 Hz should not damage the actuator. However, for frequencies above 500 Hz, the signal output becomes audible, hence not as optimal for haptic applications.

**Mechanical Dimensions**

