HapCoil-One – Datasheet

Our **HapCoil-One** is the first generation of the HapCoil, High Definition[1] Haptic Actuators product line. We bring to the market a very innovative actuator capable of providing a wide variety of touch sensations. We use high quality components to provide the best in class high definition haptic effects for its size.

We see the **HapCoil-One** as the perfect fit for a large variety of devices, game-pads, joysticks, mice, screens and many more. With its inertial drive design, any device can provide vibrations with an easy integration, it is simply vibrating everywhere.

The vibrations could even make you believe you are touching leather or paper on the top of your smartphone screen. Haptics for years have been dull and loud, by using a wide bandwidth of frequencies from 10 Hz to 1000Hz we are able to make anyone feel the digital world in a whole new way.

Forget the basic ''Buzz'' of haptics and discover the possibilities of having any type of button you know and more, very immersive road sensations in games, socialize as never before with Hapmoji's… The Possibilities are endless.

Our **Unitouch platform** is the best way to create these sensations. Allow your designers to create their own haptic interactions using a simple SDK to call our HD Libraries or even let them create directly through our **Unitouch Engine**. We provide our engine and libraries either with our own Tactronik electronics or directly through a portable version of our Unitouch platform.

The **HapCoil-One** provides the best entry into the high definition haptic world. Get a hand on our Kits and try out your new high definition interactions, provide your customers a new way of touching any digital environments, refine your branding by implementing highly recognizable effects and make your own haptic signature.

Figure 1: **HC1212380** - HapCoil-One

Suggested Applications	
• HM interfaces	• Gaming
• Smart wearable	• Industrial devices
• Hedonic devices	• Healthcare

Table 1: **HC1212380** suggested applications

Parameter	Specification
Resonant frequency	65 Hz
Dimensions	11.5 × 12 × 37.7 mm^3
Typical acceleration	11.4 g-pp*

* See section 5, with 100 gr load, at max. impulse voltage

Table 2: **HC1212380** key features

Feature	Benefit
Haptic	• Bandwidth covers the haptic band and most of the audio band • Low resonant frequency • Optimally damped response • Short response-time
Connections	• Standard pin header, pitch 0.05 in • Through hole soldering
Design	• Miniature size • Easy mounting hard point

Table 3: Key benefits of **HC1212380** - HapCoil-One

[1] According Haptics Industry Forum standard

1 Technical description

Haptic characteristics

Parameter	Specification	Grade*	Conditions
Resonant frequency	65 Hz		See section 5, 100 gr load
Acceleration (AC)	8 g-pp	A+	See section 5, 100 gr load, at max. AC voltage
Acceleration (transient)	11.4 g-pp	A+	See section 5, 100 gr load, at max. transient voltage
Lag time	6 ms	A+	Delay to reach 10% of transient acceleration
Rise time	14 ms	A+	Delay to reach 90% of transient acceleration
Fall time		A+	Delay to reach 10% of transient acceleration after max.

* According Haptics Industry Forum standard as specified in "High Definition Inertial Vibration Actuator Performance Specification"

Mechanical characteristics

Parameter	Specification	Conditions
Dimensions	$11.5 \times 12 \times 37.7$ mm^3	
Movement direction	$\vec{X}$	See section 4
Total mass	8.7 gr	
Moving mass	4.4 gr	

Electrical characteristics

Parameter	Specification	Grade*	Conditions
Resistance	4.5 Ω		At 20 °C
Inductance	128 µH		
Rated voltage	1.41 V-rms		
Rated current	147.8 mA-rms		At rated voltage and resonant frequency
Min. voltage	0.25 V-0p		Typical level at sensory threshold
Max. DC voltage	2 V-0p		At 20 °C
Max. AC voltage	9 V-0p	A+	At 20 °C
Max. transient voltage	12 V-0p	A+	At 20 °C

* According Haptics Industry Forum standard as specified in "High Definition Inertial Vibration Actuator Performance Specification"

Environmental characteristics

Parameter	Specification	Conditions
Operating temp.	[−20 °C, 40 °C]	
Storage temp.	[−40 °C, 70 °C]	

2 Acceleration bandwidth measurement

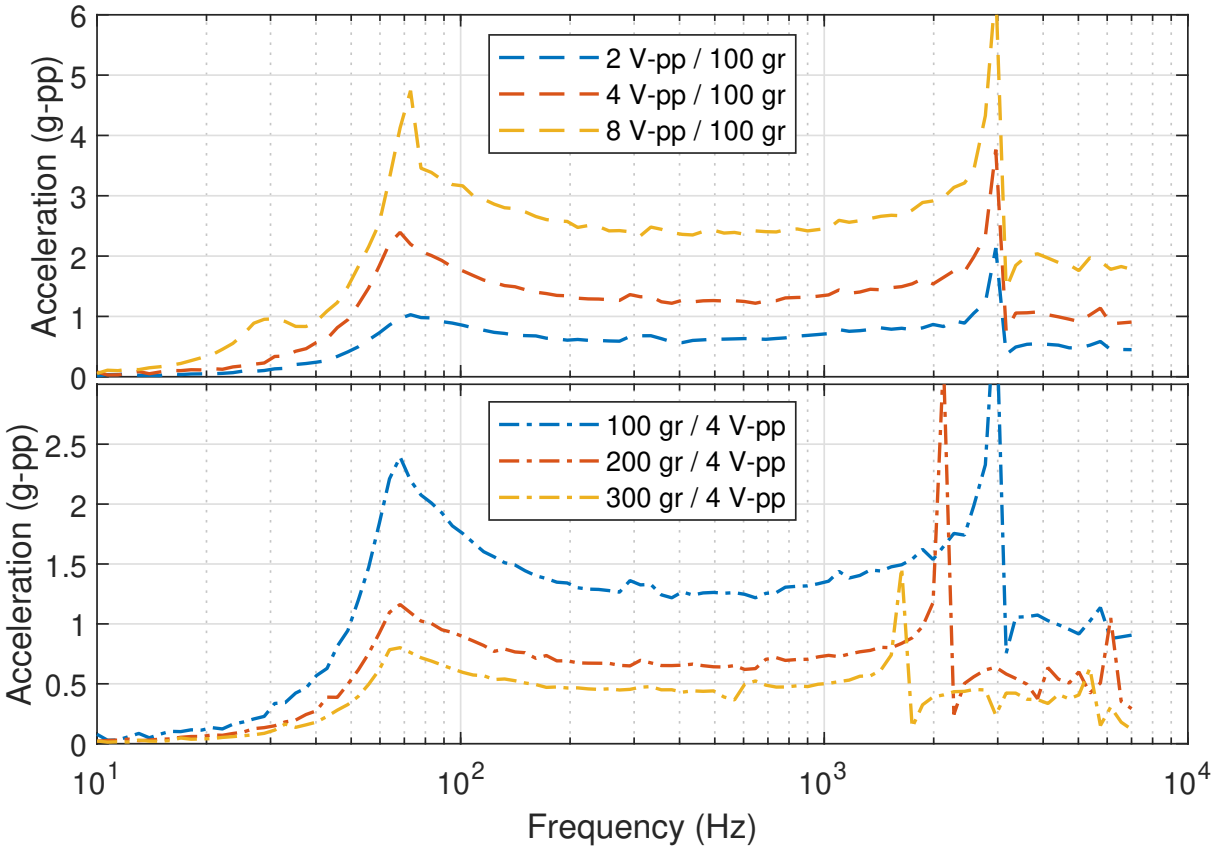


Figure 2: Acceleration bandwidth of **HC1212380** actuator loaded as in section 5. Top panel: different input voltage. Bottom panel: different loads

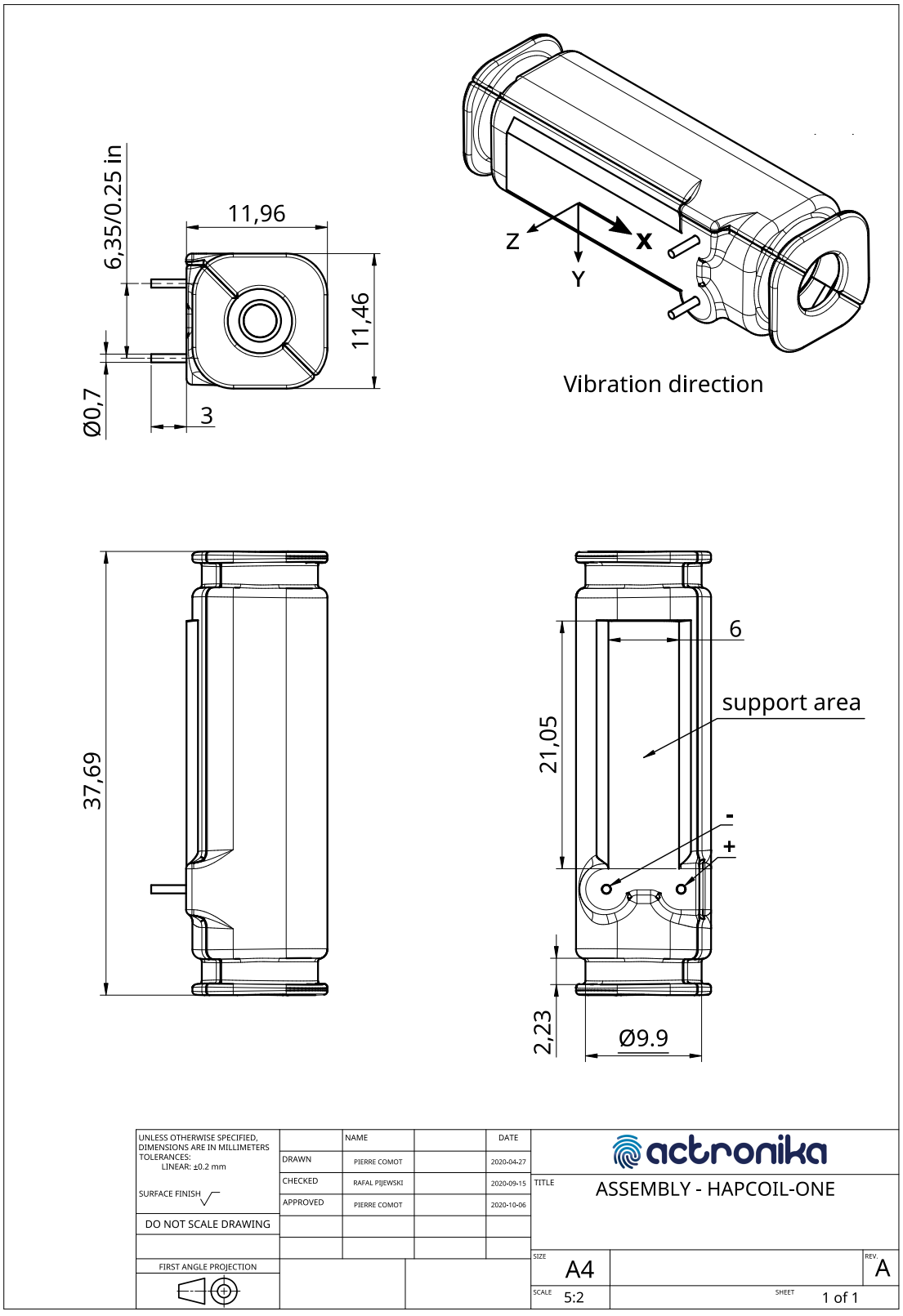
3 Typical energy consumption

Effect	Typical duration (ms)	Norm. mean current (mA/V)[1]	Norm. peak current (mA/V)[1]
Standard UI (e.g. click)	30	0.5[2]	250
Advanced UI (e.g. scroll)	30	10[3]	200
Standard gaming (e.g. shotgun)	300	1.5[4]	250
Advanced gaming (e.g. fire)	> 500	5[5]	250

[1] Current normalized according voltage input
[2] Single effect played every 5 s
[3] Multiple effect repetition (duration > 500 ms) every 5 s
[4] Single effect played every 1 s
[5] Effect played continuously

Average current values are provided for consumption calculation, wiring design and heat dissipation calculation. Maximum current values are given for electronic components selection.

4 Dimensional description



5 Measurement method description

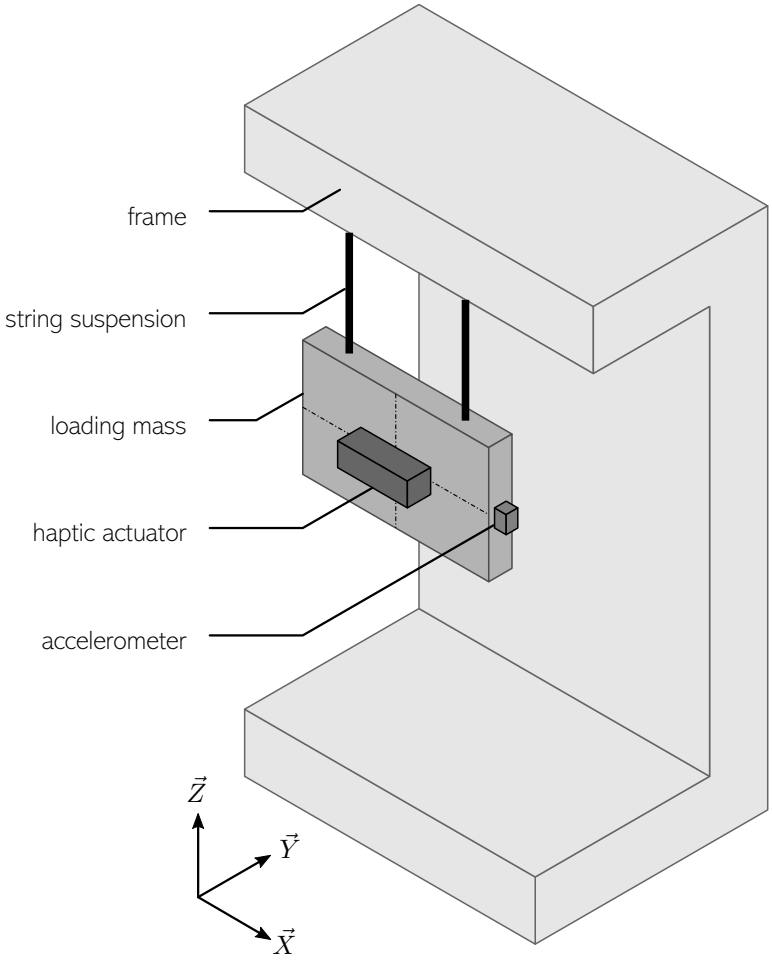


Figure 3: Actuator test bench description

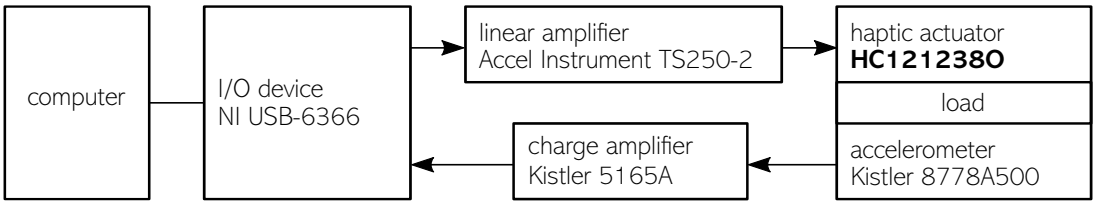


Figure 4: Actuator test bench architecture

6 Disclaimer

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