

Reflex™ HIC Slide Actuator

HIC-104M Series

GENERAL DESCRIPTION

The HIC-104M series Slide Actuator with EPAM™ Technology allows strong haptic touch feedback in the preferred sensitivity spectrum (50-300 Hz) with rapid response times (5-10 ms). The HIC has been designed to mount to the back of a display and/or touch sensor to provide direct haptic feedback to the finger for touch devices. The HIC enhances the user experience of mobile devices by synchronizing haptic feedback with the sight and sound in applications. The HIC enables infinite combinations of haptic sensations due to the rapid response time and wide frequency operating range.



FEATURES

- Thin profile bonds as layer directly to LCD or touch sensor
- Scalable to various sized mobile devices
- Low input voltage: 0-3.7V
- Multiple control methods: triggered, PWM, analog
- Low power Consumption
- Lifetime: >10 million activations
- Operating range: -20° C to 60° C

APPLICATIONS

- Mobile Phones
- Mobile Internet Devices (MID)
- Portable Gaming Systems

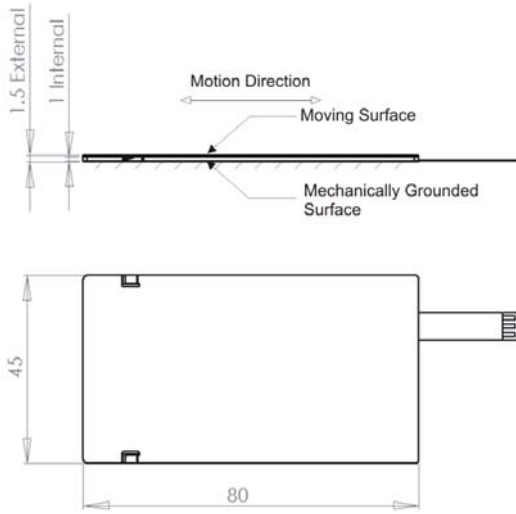
TYPICAL SPECIFICATIONS

SYMBOL	PARAMETER	CONDITION	MIN	TYP	MAX	Unit
Package Dimensions						
H _s	Actuator Solution Height	Actuator thickness without housing		1.2		mm
H	Package Height	Measured dimensions of actuator in housing		1.7		mm
L	Package Length			80		mm
W	Package Width			45		mm
Electrical Performance						
V _{in}	Input Voltage	Using AMI APA-1000 amplifier circuit		3.7	5.0	V
I _{max}	Input Current			80.0	400.0	mA
t _e	Wake-Up Time (Enable)			2		
f	Actuation Frequency		50		300	Hz
Dynamic Performance						
A _r	Acceleration At Resonance	IDV module with 5g moving mass attached to 100g passive mass. Acceleration measured as felt in hand.	2	4		g
f _r	Resonance Frequency		50	75	90	Hz
t _r	Rise Time			5	10	ms
t _f	Fall Time			5	10	ms
A _{50hz}	Acceleration at 50Hz			2		g
A _{200hz}	Acceleration at 200Hz			1		g

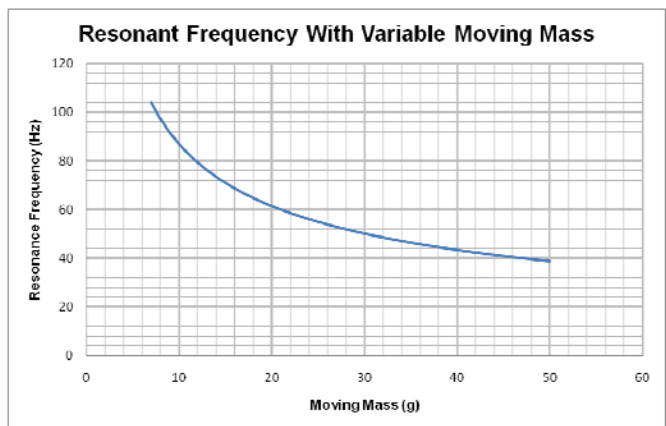
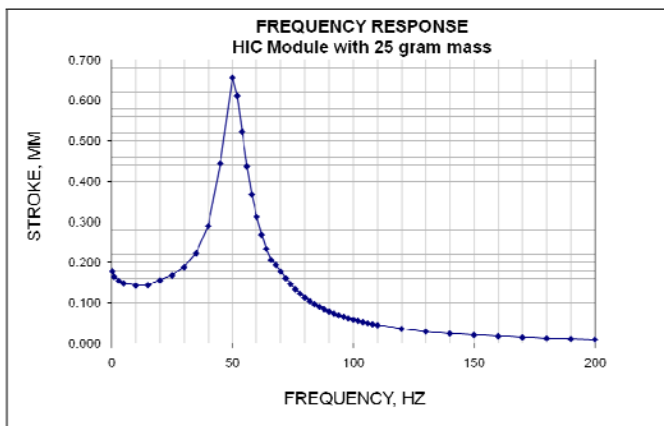
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MECHANICAL DRAWING



PERFORMANCE DATA



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APPLICATION EXAMPLES

The following section shows a reference integration of the HIC actuator. This design shows the HIC bonded to the back of the display in order to move the touch sensor and display as a unit. The HIC module contains the required travel stops and bearings to allow free motion, but is necessary to allow the touch sensor and display to move. The recommended allow-able travel distance is at least +/- 0.25mm. If a seal is required, it is important to minimize the stiffness of the seal to have minimal impact on the system performance.

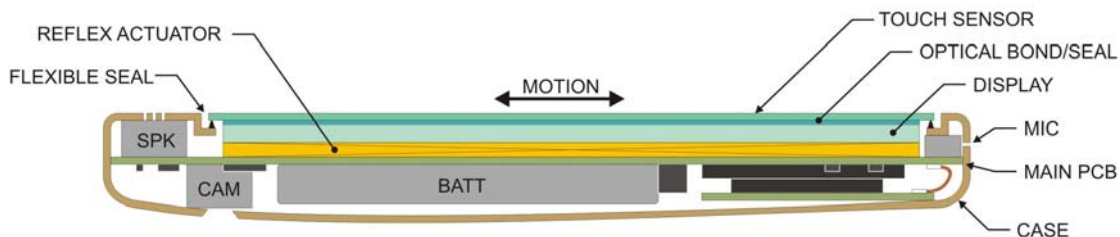


Figure 1: Mobile Phone Integration Example

Alternative integration options are possible including designs that only move the touch sensor. For displays larger than 5" it is recommended to move the touch screen only. It is possible to mount the actuators under the bezel for direct mounting to the touch screen or the actuators can be mounted under or behind the display or other components and utilize a connector bracket to mount the touch sensor.

DATA SHEET STATUS

Data Sheet Status	Product Status	Definitions
Objective data	Development	This data sheet contains data from the objective specification for product development. Artificial Muscle, Inc. reserves the right to change the specification in any manner without notice.
Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Artificial Muscle, Inc. reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
Product data	Production	This data sheet contains data from the product specification. Artificial Muscle, Inc. reserves the right to make changes at any time in order to improve the design, manufacturing and supply.

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CONTACT INFORMATION

For additional information, please contact info2009@artificialmuscle.com or (408) 215-7350

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Reflex Technology

Rediscover the sense of TOUCH