TEXAS INSTRUMENTS

Haptic Solutions for Wearable Devices

Keep your smartphone in your pocket; receive all of your notifications on your wrist

Wearable Device Trends

Interconnectivity is becoming very popular in the world today. Everyone wants to connect their gadgets to their smartphone, tablet, or computer. Wearable devices are one such gadget, and they can range from simple pedometers to fully integrated smartwatches. The most popular type of wearable device is smartwatches. They have the ability to wirelessly connect to your smartphone; thus eliminating the need to take your phone out of your pocket, bag, or purse.

Where does TI come in?

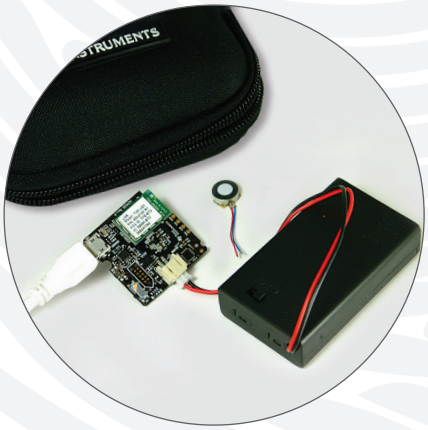
The wearable market is full of devices that require notifications, especially differentiated ones. By creating a variety of alerts and alarms, you will be able to determine if you are receiving a text message, phone call, appointment reminder, email, etc. This differentiation between the types of notifications can be done with haptics. Haptics, by definition, refers to the sense of touch and is a technology that adds tactile feedback to electronic devices through the use of vibrations. Since you are wearing the device on your wrist, you will be able to get a strong feeling for the differences in the types of vibrations that are output from the haptic actuators.

Texas Instruments offers a complete line of haptic drivers which have the ability to drive eccentric rotating mass (ERM), linear resonant actuator (LRA), and piezoelectric actuators. TI's haptic drivers have the ability to intelligently amplify the haptic waveform to achieve the maximum voltage an actuator can operate at. This allows for maximum impact to the user. Within TI's haptic drivers is the ability to store software that can generate customized waveform to provide a differentiated notification system to your wearable device.

Visit www.ti.com/haptics for more information.

Haptic Bluetooth Kit

- Fully functional development tool: wearable haptic kit for personalized fitness tracker and watches.
- iOS app for integrated library with sample “heart-beat” and “breathe” patterns along with 123 waveforms.
- iOS 7 and 8 compatible.
- Complete design available through TI Designs.
- Can be ordered through TI eStore.



Haptic Bluetooth Kit as supplied by Texas Instruments.

**Kit shown with user supplied watch band and case.*

Haptic Drivers

Device	Description	V_{OUT} (Max) (V)	Input Signal	I_Q (Typ) (mA)	Startup Time (ms)	Haptic Actuator Type	V_S (Max) (V)	V_S (Min) (V)	Operating Temp Range (°C)	Package	Price*
DRV2605L	Haptic Driver for ERM/LRA with Built-In Library and Smart Loop Architecture	5.5	I²C, PWM, Analog	0.5	0.7	ERM, LRA	5.2	2	-40 to 85	10VSSOP, 9DSBGA	1.65
DRV2604L	Low Voltage Haptic Driver for ERM and LRA with Internal Memory and Smart Loop Architecture	5.5	I²C, PWM, Analog	0.5	0.7	ERM, LRA	5.2	2	-40 to 85	10VSSOP, 9DSBGA	1.2
DRV2605	Haptic Driver for ERM/LRA with Built-In Library and Smart Loop Architecture	5.5	I²C, PWM, Analog	—	0.7	ERM, LRA	5.5	2.5	–40 to 85	9DSBGA	1.60
DRV2603	Haptic Driver with Auto Resonance Tracking for LRA and Optimized Drive for ERM	—	PWM, Analog	1.5	1.3	ERM, LRA	5.2	2.5	–40 to 85	QFN-10	0.70
DRV2667	Piezo Haptic Driver with Boost, Digital Front End, and Internal Waveform Memory	200	I²C, PWM, Analog	0.13	2	Piezo	5.5	3	–40 to 85	QFN-20	2.95

**Suggested resale price in U.S. dollars in quantities of 1,000.*

Visit www.ti.com/haptics for more information.

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