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HAPTIC-TO-FUTURE

An insight to the Apple Haptic Technology
and Taptic Engine



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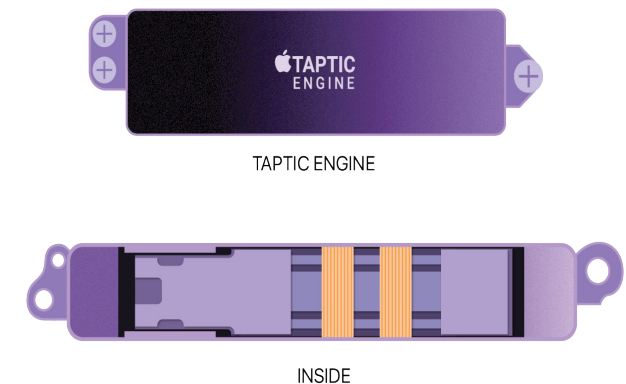
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The years since the 2000s have been described as the most powerful creation and development of Touch technology for mobile devices as well as other electronic devices. The year 2007 was the birth of the first iPhone and marked an important turning point in the history of global mobile manufacturing market. Consequently, in the following years, the success of the first iPhone also led to the advancement in Apple's Touch technology, from the introduction of 3D Touch to the Haptic technology together with the Taptic Engine.

Haptic technology refers to any technology that can create an experience of touch by applying forces, vibrations, or motions to the users. So how does Apple's Haptic Touch work? To begin with, 3D Touch is a feature developed and integrated from the iPhone 6s and Plus generations, which allows the phone to respond in two different ways, depending on the force of your touch on the screen. Likewise, Haptic Touch uses Taptic Engine technology to provide touch

feedback when the user presses a finger on the screen. Users can use it by tapping on an area of the screen until the area under the hand vibrates slightly and a second content menu appears on the screen, which changes depending on where you use this feature. However, there are some slightly differences in how the two functions works. For example, with 3D Touch, you can press anywhere on the keyboard to turn the keyboard into a pointer above the text. While using Haptic Touch, you can use this gesture on the space bar. Overall, Apple's Haptic Technology has demonstrated their consideration in providing users with a truly immersive touch experience and showcasing its convenience compared to the previous 3D Touch feature.

Since the iPhone 6s, Apple began to equip a new component for the iPhone called "Taptic Engine", and it also has brought Apple success in bringing an extremely authentic experience to the users when using Apple devices. The Taptic Engine is a vibration response motor that helps



reproduce the feeling of touching, pressing, like on a trackpad or regular hard keys. The Taptic Engine haptic feedback vibrator and software work together to mimic the sensation of touching or moving objects on the screen or as little like pressing on a key or a trackpad. Taptic Engine technology consists of a vibrating block that emits soft resonant oscillations when you press or touch them.

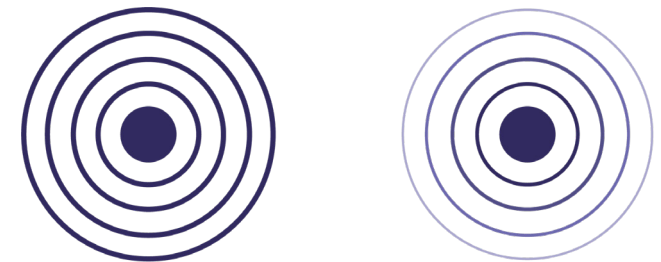
Alternatively, you can use Core Haptics to design fully custom haptic patterns with synchronized audio. Core Haptics provide two basics building blocks that generate custom haptic patterns and you can also control its sharpness and intensity regardless of the building block chosen to produce a custom haptic:

1. Transient events: brief and compact experiences that feels like taps or impulses, such as the experience of tapping a flashlight button or on the home screen.

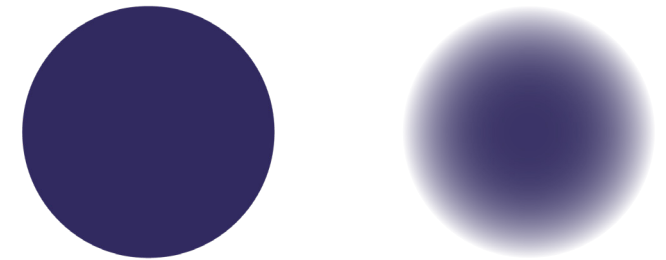
2. Continuous events: constant vibrations, such as the experience of the laser effects in a message.

By combining transient and continuous events, varying sharpness and intensity, and including optional audio content, you can create a wide range of different haptic experiences.

In conclusion, Apple has succeeded in creating the Taptic Engine together with the Haptic Touch and 3D Touch to deliver a genuine user experience and response that no other company can provide. Its Haptic technology has successfully engaged people's sense of touch to improve interaction with screen interfaces.



Intensity



Sharpness

References:

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(1) Cover glass: The topmost layer of display which the user interacts. Tempered glass is glued directly to the matrix with transparent glue. This removes the air gap and reduces the thickness of the display.

(2) Display/Touch: Displaying the image.

(3) Capacitive pressure sensors: Designed to measure microscopic changes in pressure. Capacitive sensors are located at the very back of the display panel. The plates measure the distance to your finger, thus determining the pressure of your gesture against pliable glass.

(4) Taptic Engine : Gives you real feedback both on screen and in the form of subtle taps from Taptic Engine. These responses correspond to how deeply you're pressing the display, and they let you know what actions you're performing and what you can expect to happen.