

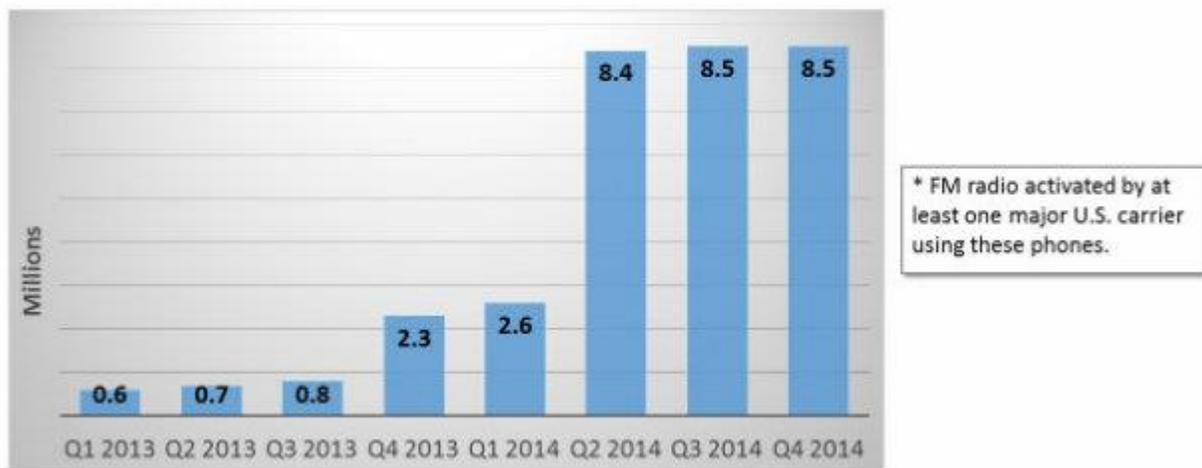


Research Shows Increased Diversity in FM Radio on Smartphones

At the 2015 Broadcast Engineering Conference (BEC), NAB Labs presented a paper on its FM Radio in Smartphones research, which provides a quarterly survey and analysis of the top selling smartphones in the U.S. market. The research is based on sales reports and teardown analysis conducted by or for NAB Labs. The latest results present statistics for the full calendar year 2014, and they indicate that sales of smartphones with FM radio reception fully activated (by at least one U.S. carrier) held steady in the latter half of the year.

Earlier analysis had showed a large increase in sales of FM-enabled smartphones in the second quarter of 2014 (from 2.6 million in Q1 to 8.4 million in Q2). In Q3 and Q4 2014, this number remained flat, with 8.5 million FM-enabled smartphones sold in each quarter, as Figure 1 below illustrates.

Smartphones Sold in U.S. with FM Radio Activated (millions)*



Sources: Strategy Analytics and ABI Research

Figure 1: Top-selling smartphone sales in U.S. with FM radio reception capability activated (in millions of units).

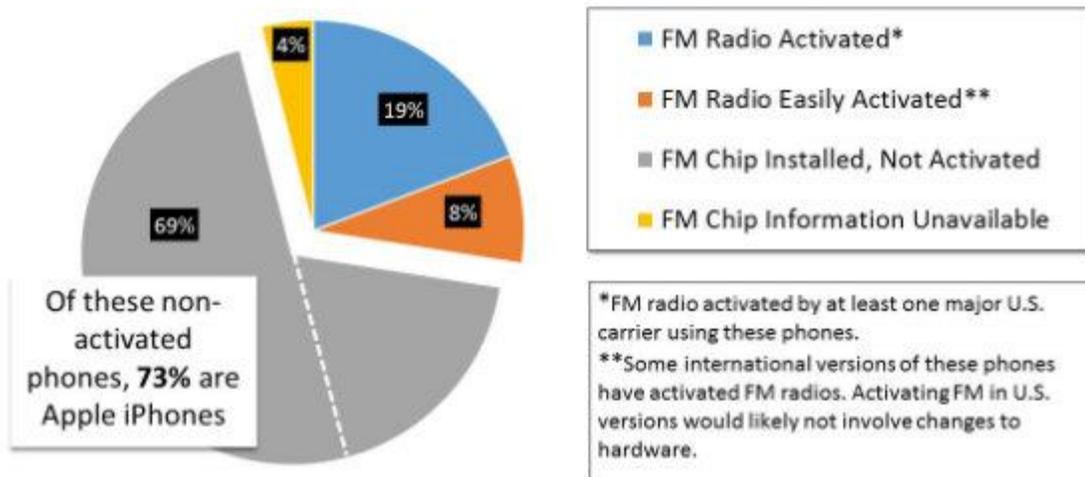
While these sales figures are encouraging to broadcasters, in relative terms they still represent a minority of the 145 million smartphones sold in the U.S. during 2014. Smartphones with FM radio activated by at least one major U.S. carrier totaled only 19% of those sold, as shown in Figure 2 below. The remainder of the top-selling smartphones sold last year had an FM chip installed, but they were either not wired to function, or lacked some necessary software elements required for the FM radio to be accessed by users.

So while the arrangement with Sprint to pre-load the *NextRadio* app and activate FM reception on its Android smartphones has had a significant effect on the number of fully FM-enabled smartphones in the market (as evidenced by the spike in Q2 2014 shown in Figure 1), there is still much room for improvement.

A substantial portion of the non-FM activated smartphone market stems from Apple's iPhones, none of which have their FM chips enabled. The various models of the iPhone accounted for fully half of the top-selling smartphones sold in the U.S. in 2014, which implies that they represent nearly 3 out of every 4 phones with non-activated FM chips onboard.

Another segment of the market as analyzed by NAB Labs shows that a number of non-FM activated smartphone models sold in the U.S. are shipped in foreign markets as FM-activated phones. NAB Labs labels these as "easily activated," given that the difference is purely in the software versions installed on the domestic vs. international units.

FM Radio Capability in Top-selling U.S. Smartphones (% of total sold), CY 2014



Source: ABI Research

Figure 2: FM radio capability in top-selling U.S. smartphones (% of total sold) in CY 2014.

Given that the reasons why smartphones are or are not FM-activated may vary, the NAB Labs BEC paper categorizes devices into four classifications of "FM readiness," detailed in Table 1 below. Apple's iPhones are a prime example of Class 1 smartphones—those that have an FM chip onboard

that is not activated. These represent the majority of smartphones currently being sold in the U.S. market. Class 2 smartphones are characterized by operative FM receiver hardware and software at the driver and OS levels, but without an FM app (or a missing API), precluding the user's access to the device's FM capability. Class 3 phones have their FM radio reception capability fully enabled and exposed to the user, while Class 4 phones have hybrid FM radio enabled.

Class	Description	Examples
1	FM receiver hardware ("FM Chip") is onboard but not wired to function, and/or required software is not installed	Apple <i>iPhones</i> ; Samsung <i>Galaxy S5</i> and <i>S6</i> (AT&T, Verizon, T-Mobile); HTC <i>One M9</i> (Verizon)
2	FM chip is onboard with its RF input connected to an antenna and its audio output enabled, but FM User Interface (UI) is not exposed	HTC <i>One M8</i> (Verizon)
3	FM Chip is onboard, connected and FM UI is exposed	HTC <i>One M8</i> and <i>M9</i> (AT&T); Samsung <i>Galaxy S3</i> (international)
4	FM chip onboard, connected, UI is exposed, and hybrid FM software stack is installed	HTC <i>One M8</i> and <i>M9</i> (Sprint); Samsung <i>Galaxy S5</i> and <i>S6</i> (Sprint)

Table 1: Four classes of smartphone "FM readiness."

The NAB Labs research also presents a recent trend of "differential deployment" in the U.S., in that the same phone model may be supplied with different FM capabilities depending on the carrier. While this was noted previously on an international basis, such differences among carriers within the United States is a new development, largely arising since the 2013 Sprint-NextRadio agreement. Today, a growing number of smartphones in the U.S. have FM radio activated when purchased through one or more of the major U.S. carriers, while other carriers may sell the same phones without FM activated. Examples include the Samsung *Galaxy S5* and *S6*, which are both Class 4 phones when supplied through Sprint, whereas Verizon, AT&T and T-Mobile sell them as Class 1 smartphones (i.e., without FM activated).

A further example is the HTC *One*. The *M8* version of this smartphone has the FM radio enabled across all major U.S. carriers, but with different apps on different carriers: Sprint ships it with NextRadio pre-installed, AT&T and T-Mobile provide a native HTC-supplied FM tuner app (without hybrid radio capability), and Verizon ships it with no FM app (and no mention in the manual that the phone has FM capability). However, on any version of the phone, the NextRadio app (or other similar apps) can be downloaded and the phone instantly attains hybrid FM capability.

It has recently been determined that the newly released successor model, the HTC *One M9*, is being shipped by Verizon with a different software load, which purposefully blocks the user accessing the

device's FM radio capability via a downloaded app. Contrary to the Verizon version of the *M8*, where the FM radio was functional although not readily available to the consumer, this new version of the Verizon *HTC One* cannot be activated by downloading an Android FM radio app. (Meanwhile, other carriers' versions of the *M9* mirror their provisioning of the *M8*.)

NAB Labs' full evaluation of FM radio in smartphones, including a discussion of the merits of FM radio on smartphones and further teardown analysis of smartphone hardware, can be found in the Broadcast Engineering Conference Proceedings available at the [NAB Store](#). Frequent summary updates are also posted at the [NAB Labs website](#).

Important Dates and Upcoming Events

[RDS Forum Meeting](#)

June 8 - 9, 2015

Glion sur Montreaux, Switzerland

[Radio Show](#)

September 30 - October 2, 2015

Atlanta, GA

[2015 IEEE Broadcast Symposium](#)

October 14 - 16, 2015

Orlando, FL

[Audio Engineering Society 139 International Convention](#)

October 29 - November 1, 2015

New York, NY