first meaningful win for its single mode LTE chipset; however, we would warn that until the company is able to design an efficient, multi-mode solution, we do not see them gaining meaningful share. The current, two-chip solution in the S5 SKU will likely be expensive and inefficient, as it uses two ARM licenses and implemented with two discrete elements. Intel is supporting this design win with co-marketing funding. As it stands, we believe that efforts to complete a multimode solution are not going as well as some had hoped, and that there are still be meaningful challenges to overcome as the company struggles to integrate disparate technology acquisitions.

Some of the more encouraging words from our checks were reserved for Broadcom. Heading into the show, the company already had an LTE design win with their Renasas (Nokia) solution in the Samsung Ace 3. And while we did not see the model on the show floor, many indicated that the multi-mode solution was working well and that Broadcom would be announcing an upgraded version of their modem in the near-future (possibly LTE Cat-6). If the company is able follow through on this, we believe they could find small, but relatively meaningful volumes for BRCM, in the mid- to possibly higher-end, exiting the end of the year.

Remember, this is the former very competent Nokia modem design team that has their own fully integrated multimode protocol stack (2G-LTE). Only QCOM, Ericsson (EMP) and BRCM (Nokia) possess their own fully integrated 2G-LTE protocol stack. The protocol stack is the operating system of the modem and having a seamless, fully integrated solution has advantages few outside the modem design world can appreciate. Other players have what one of our contacts referred to as "Frankenstien" protocol stacks (having licensed protocol stacks from four different stack suppliers). And as wireless technology advances, these Frankenstien protocol stacks, like the monster, become increasingly difficult to control and manage, impacting advanced technology implementation and release dates.

Others were mostly left out of the conversation with LTE, given the apparent lack of resources and resulting lack of clout with handset vendors. In other areas, like 2G and 3G, we feel that pricing will continue to be pressured, as handset price points hit new levels of affordability (e.g. $25 smartphones with 1GHz processors, GSM/Edge and wifi)

In short, while we continue to believe Mediatek to be Qualcomm's most credible overall competitor, we think the shift to LTE creates an opportunity for perhaps one other vendor. While we will not venture to guess who this might be, we note that Qualcomm is not standing still and possess massive volume economies of scale much larger than everyone else combined. The company continues to press ahead not just with modem technology, but other areas of the handset BOM, small cell, as well as building out platforms in order to leverage the overarching theme of mobility and the internet of things in general. We reiterate our Buy rating on QCOM.

## Smartphones – High-end commoditizes; Firefox redefines cheap; new technologies to drive data growth; augmented reality and personal encryption buzzes

It is strikingly obvious that differentiating on the high-end is difficult. Every major handset OEM at the show had shiny new handsets (and tablets), as well as a wearable to go along with it. Last year we suggested that most should attempt to differentiate on software, by tweaking Android. The results of this have been mixed at best. Samsung's health and security enhancements have made it no more sticky, just as Sony's content offerings offer little draw to the hardware, which otherwise looked the most impressive at the show. Nokia attempted to go further down market with its first Android handset