Technology Insights..

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Research, Analysis, Strategy, Insight

Qualcomm Expands the Market for 5G Solutions with the First 5G NR Light Modem

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Qualcomm has been a leader in producing highly capable 5G modems and RF subsystems that are used by a majority of the world's premium 5G enabled smartphone devices (e.g., their X65/X70 devices). But full scale, high end 5G modems, are not right for all markets due to power requirements and cost to implement. Indeed, the 5G standards make room for lower performance products for devices that need less bandwidth and/or are more power sensitive, while also potentially lowering the Bill of Materials (BOM) costs of implementation. To supply this market, Qualcomm is introducing the 5G NR-Light Modem-RF system, the X35.

"...Since this device is from Qualcomm, we expect it to be a very important and highly deployed product, and expect to see products in the market in the first half of 2024... We expect other players (e.g., MediaTek) to quickly follow Qualcomm to market with an NR Light modem. But being first to market and leveraging its extensive relationships should put Qualcomm in a good position to capture an extensive share of this market....."

Why 5G NR Light

This is the first 5G NR light modem to come to market, and it is a big deal. It will be attractive to many lower power needs for small sensors and IoT products that require lower data speeds (the X35 offers 220MB downlink and 100MB uplink). And it has the potential to reduce the BOM costs of implementation by 50% compared to the full scale 5G modems, enabling use in cost sensitive as well as space sensitive solutions. Most IoT cellular implementations today use lower performance LTE modems due to the availability and BOM costs advantages, as well as lower power requirements. The X35 changes that dynamic.

Going Beyond IoT

But the X35 is not just attractive for IoT. There are many appliances and even PC devices that could utilize this modem, both from a cost perspective, but perhaps more importantly a power efficiency perspective. Many battery powered devices can't use a full 5G modem very well due to the amount of power it requires when transferring a lot of data continuously, for example higher end compute devices like laptops that need the battery capacity for powering the processor. But this is also an issue with smallish monitoring and security devices that need near full time connectivity and are power and space constrained.

Including 5G in many devices has had major cost implications that negated the advantages. This device can make it much more cost effective to include a 5G modem in a device (e.g., 5G modem options in laptops can run upwards of $400). And it's fast enough for most uses at 200 MB uplink (that's faster than many people have on their cable modems). So the appeal of the X35 may reach far beyond the intended sweet spot of IoT, and help reduce the entry cost for 5G connected devices of all sorts.

Backwards Compatibility is Critical

The X35 also includes an important feature - it includes an ability to connect to 4G LTE networks. Without that capability, many products would lose connectivity as they move about (5G is still not universal). It also makes it highly attractive to 5G module builders that produce modules that plug into a variety of products, while also potentially making the modules backward compatible with existing cellular installations. This makes it useful to upgrade LTE connected devices with the potential to go 5G without further HW changes when 5G is available.

"…The market for 5G NR Light is ultimately a large marketplace that will require multiple solutions targeted at different speeds, differing cost targets, and different power requirements. Indeed, the NR Light market may ultimately have more diversity than the traditional 5G modem market... we expect a major expansion of 5G connectivity that will make 5G NR Light a critical component of the 5G world....."

Even with the X35's focus on lower 5G connectivity needs, we expect that lower end products will also be forthcoming quickly from Qualcomm (and perhaps others) that take the speed and BOM costs down even further. They will enable a variety of very low power devices, like sensors, that require modest performance but must meet minimal power and low space requirements. The market for 5G NR Light is ultimately a large marketplace that will require multiple solutions targeted at different speeds, differing cost targets, and different power requirements. Indeed, the NR Light market may ultimately have more diversity than the traditional 5G modem market.

Bottom Line: Since this device is from Qualcomm, we expect it to be a very important and highly deployed product, and expect to see products in the market in the first half of 2024. They already have a large number of relationships with device makers of all sorts (who often use their Snapdragons to power their solutions), so they have a competitive advantage in getting into the market. That's not to say that Qualcomm will be alone in this market. We expect other players (e.g., MediaTek) to quickly follow Qualcomm to market with an NR Light modem. But being first to market and leveraging its extensive relationships should put Qualcomm in a good position to capture an extensive share of this market. Finally, we expect a major expansion of 5G connectivity that will make 5G NR Light a critical component of the 5G world.

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