

# FutureHorizons



The Global Semiconductor Industry Analysts

## FH MONDAY

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### Mediatek Targets China, Snapdragon

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### RRAM-Based TCAM Shown to Match SRAM Performance

Research institute Leti has demonstrated that RRAM-based ternary content addressable memory (TCAM) circuits can match the performance of CMOS-based SRAM circuits for multicore neuromorphic processor applications despite the performance and reliability tradeoffs.

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### Intel Steps Toward Heterogeneous Integration

Intel demonstrated a new 3D packaging technology for face-to-face stacking of logic, scheduled to be available in the second half of next year. The company also tipped a new processor microarchitecture and a new graphics architecture on a day when its chief architect laid out the company's vision for future computing architectures.

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### TALK TO US



### Anritsu, Qualcomm Connect Using 5G Standalone

While initial 5G connections are likely to be a combination of existing LTE and 5G New Radio (5G NR), work is well underway to produce connections that use 5G NR only.

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### EVENTS

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– 12 Nov 2018 – London UK

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– January 2019 – London UK

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### Arm Releases IoT Predictions for 2019

The end of the year brings predictions galore, and Arm has jumped on this bandwagon with its view on what it thinks will happen in the internet of things (IoT) in 2019. It also carried out a consumer survey to find out what end users think about IoT, machine learning (ML), artificial intelligence (AI), and 5G.

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## Mediatek Targets China, Snapdragon

HONOLULU — Mediatek announced its next-generation smartphone SoC just one week after archrival Qualcomm did the same. The Helio P90 falls short of the Snapdragon 855 in many respects but is likely to provide fierce competition a notch below flagship handsets, especially among China's cost-conscious OEMs.

Made in a 12-nm node, the P90 sports two Cortex-75 cores running at up to 2.2 GHz and six A55 cores at 2.0 GHz. By contrast, the 7-nm Snapdragon 855 uses four large cores, one running up to 2.84 GHz and three at 2.42 GHz, and four of the A55 cores at 1.80 GHz.

Mediatek switched from a 4 × 4 configuration in its former P70, in which it ran A73 and A53 cores at 2.1 and 2.2 GHz, respectively, apparently not wringing much speed gains out of the 12-nm process. The use of a 2 × 6 configuration signals a strategy focused more on power efficiency.

## RRAM-Based TCAM Shown To Match SRAM Performance

LONDON — Research institute Leti has demonstrated that RRAM-based ternary content addressable memory (TCAM) circuits can match the performance of CMOS-based SRAM circuits for multicore neuromorphic processor applications despite the performance and reliability tradeoffs.

TCAM circuits provide a way to search large data sets using masks that indicate ranges. They allow searching for stored information by its content as opposed to classic memory systems in which a memory cell's stored information is retrieved by its physical address. Hence, these circuits are ideal for complex routing and big data applications in which an exact match is rarely necessary. They shorten the search time compared to classic memory-based search algorithms as all of the stored information is compared with the searched data in parallel within a single clock cycle.

## Intel Steps Toward Heterogeneous Integration

LOS ALTOS, Calif. — Intel demonstrated a new 3D packaging technology for face-to-face stacking of logic, scheduled to be available in the second half of next year. The company also tipped a new processor microarchitecture and a new graphics architecture on a day when its chief architect laid out the company's vision for future computing architectures.

The 3D packaging technology, known as Foveros, is the culmination of two decades of research at Intel into stacking die in three-dimensional heterogeneous structures combining logic and memory. Unlike the passive interposer and stacked memory technologies currently available, Foveros extends the 3D packaging concept to include high-performance logic such as CPU, graphics, and AI processors.

## Anritsu, Qualcomm Connect Using 5G Standalone

While initial 5G connections are likely to be a combination of existing LTE and 5G New Radio (5G NR), work is well underway to produce connections that use 5G NR only. To that end, Anritsu and Qualcomm have combined to create a 5G NR standalone connection between an Anritsu MT8000A Radio Communications Test Set and a handheld device that uses a Qualcomm Snapdragon X50 5G modem.

5G standalone connections don't rely on LTE technology such as modulation or protocols. Figure 1 shows the difference between standalone and non-standalone connections. The tests were conducted in both the FR1 band (below 6 GHz) and the FR2 mmWave band (24.25 GHz to 52.6 GHz).

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