

Methods

Mouser's technology & solutions eZine



**THE FUTURE
WITH 5G**

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JESD204B and AD9176 DAC 16-bit 12GSPS RF DAC w/3GSPS per channel. Analog Devices' ADF5356 microwave wideband synthesizers are phase locked loops (PLLs)/voltage controlled oscillators (VCOs). HMC8191/HMC8192 mixers support intermediate frequency designs. The ADMV1013 / ADMV1014 are up/down converters. The ADRF5024/5 SPDT switches offer high isolation and low insertion loss, while the ADL5920 RF detector provides forward and reverse power and return loss measurements.



Intel stands committed to making possible the most amazing experiences of the future. If a technology is smart and connected, then Intel's focus is to deliver the future needs for this technology within

a growing world of connectivity—from networks, to the cloud, and to devices. The organization is investing in the promise of “always-on” 5G connectivity. Intel also offers field-programmable gate arrays (FPGAs), systems-on-chips (SoCs), complex programmable logic devices (CPLDs), and complementary technologies, such as power solutions, to provide high-value solutions to customers worldwide. Intel has become a recognized leader in the creation of 5G standards as it transforms purpose-built networks to become more agile, flexible, and scalable with Software Defined Networks (SDN) and Network Function Virtualization (NFV)—setting the stage for 5G expansion. The company is collaborating with an assortment of ecosystem and vertical industry partners to define, prototype, test, and deliver 5G standards and

solutions now. From connected

cars to AR/VR, smart homes, industrial applications, and cities, Intel delivers unmatched scale, innovation, and expertise to enable next-generation wireless products and services.



Micron Technology (Micron) is an industry leader

in innovative memory and storage solutions.

The company's broad portfolio of high-performance memory and

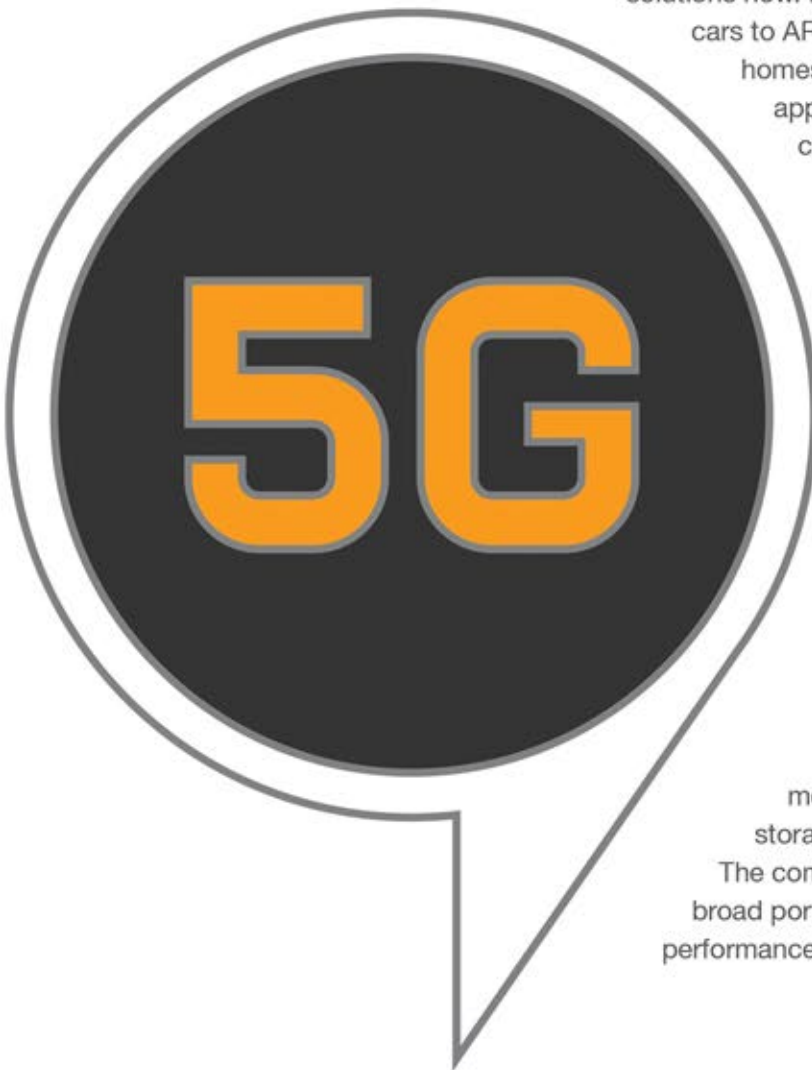
storage technologies—including dynamic random access memory (DRAM), negative-AND (NAND) and negative-OR (NOR) flash memory, and 3D XPoint™ memory—is transforming how the world uses information to enrich lives. Micron's memory and storage solutions enable innovative trends including artificial intelligence (AI), machine learning, and autonomous vehicles across key market segments involving cloud, data center, networking, and mobile access. Micron's 3D-NAND-gate technology is expected to be an asset for data centers. This technology is expected to provide necessary and supporting increases in data storage density, allowing data centers to increase throughput and lower costs. Faster access times also allow the lower latency and high speed of 5G to be more easily realized.



NXP Semiconductors enables secure connections and infrastructure for a smarter world, advancing solutions that make lives easier, better, and safer. As the world leader in secure connectivity solutions for embedded applications, NXP is driving innovation in the secure connected vehicle, end-to-end security and privacy, and smart connected solutions markets. The company is a leading provider of the cellular enablement chipsets and is a founder in many areas of this technology. It will soon be developing and providing a wide variety of digital networking processors, secure interface and system management products, high-performance RF (HPRF) power amplifiers, and smart antenna solutions.



Qorvo is ready today with next-generation RF smarts and solutions to connect people, places, and



without issues, fueling a dynamic explosion in the IoT. Plans are in place to support a reality that has >1M (>10⁶) devices per square kilometer (km²).

Speed

With much greater connection speeds, 5G potentially promises data rates of 1–10Gbps in contrast to current connection speeds of 50Mbps. Download speeds will also improve.

Latency

Latency, the time delay before a transfer of data begins, will be improved. Reliable, low-latency communications will drop to under 1ms, an improvement at least in an order of magnitude of >10¹ = >10. Because of low-latency, fast-moving, real-time devices, applications such

as self-driving vehicles will have the capacity to locally process, decide, and respond with faster than human reflexes.

Spectrum Efficiency

5G's greater spectrum efficiency, through novel multiple-input and multiple-output (MIMO) antenna and associated technologies, will enable more bits of data to be transferred at specified frequencies.

Power Efficiency

5G's powerful network processing and control will realize significant gains in its network power efficiencies, enabling more data transfers while lowering energy consumption per data bit transferred. It is expected, despite the high device density coupled with high data streams, that overall 5G network power will be lower than today. This lower power

consumption will also extend battery life for devices in the field, ensuring that field replacement issues do not overwhelm users after initial installation.

Throughput

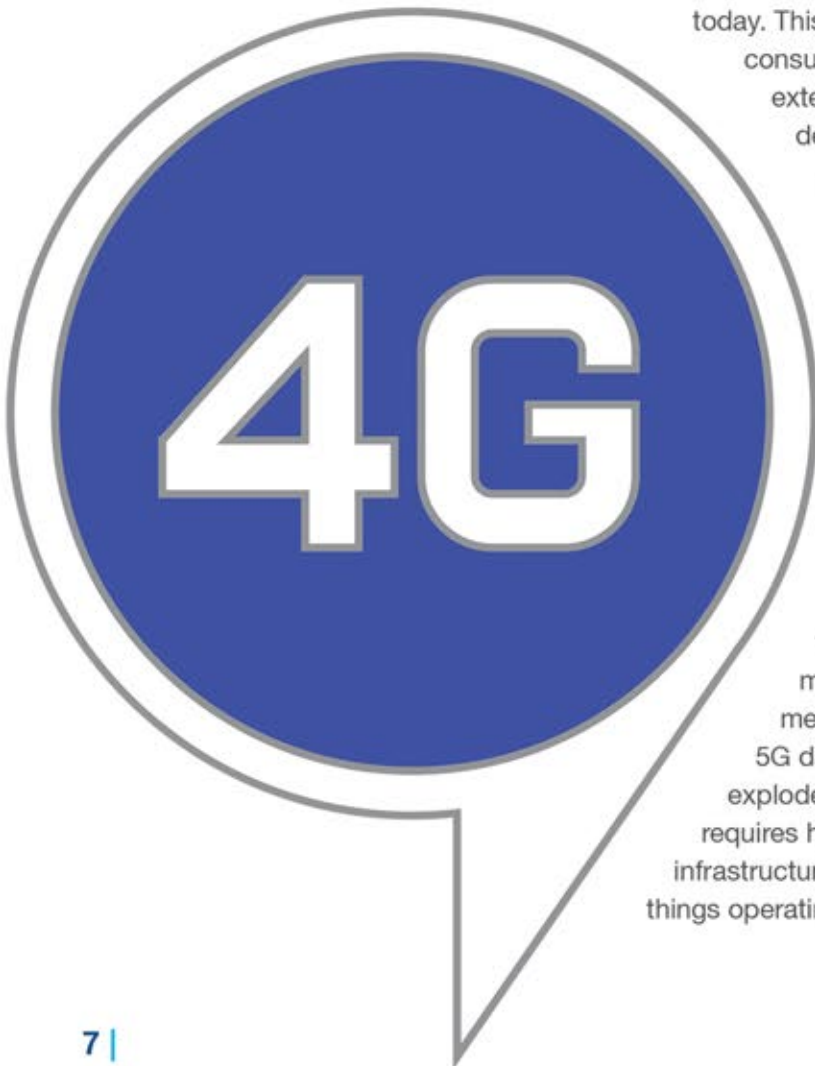
Taken into mutual consideration, all these previously mentioned facts mean that the level of 5G data throughput will explode. High throughput requires high-level infrastructure support to keep things operating smoothly.

5G Components: A Quick Glance at What Is Happening

Mouser Electronics is a leading authorized electronic component distributor, supporting an engineer's design and supply chain component needs. To this end, Mouser Electronics is the premier source of advanced technology products from leading manufacturers who supply the latest products to enable your 5G applications. Let's look at how some of these leading companies are focusing their efforts to support the coming 5G infrastructure. (*Note: This list is not comprehensive but is only intended to be representative. The companies have been placed in alphabetical order by company name.*)



Analog Devices has built one of the longest standing, highest growth companies within the technology sector, utilizing cultural pillars such as innovation, performance, and excellence. Acknowledged industry-wide as the world leader in data conversion and signal conditioning technology, Analog Devices also specializes in radio frequency (RF) and power products. The company's 5G efforts are focused on the development and supply of amplifiers, clocks and timing, data converters, interfacing, isolation, microcontroller units (MCUs), power management, RF, sensors, and wireless connectivity. In the 5G space, Analog Devices will be introducing a 12-bit, 10.25 gigasamples per second (GSPS), JESD204B, RF analog-to-digital converter (ADC). Its high-speed converters include the AD9208 their ADC dual 14-bit 3Gsp/s ADC w/





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