Presto Engineering extends its test capabilities to 100 GHz and beyond

Booth B245 at European Microwave Week, Madrid, Spain 23-28 Sept 2018

San Jose, CA, USA — 6 September 2018 — Presto Engineering will be at European Microwave Week, in Madrid, Spain (23-28 September 2018) where it will be announcing that can now providing high volume testing of semiconductor devices up to 100 GHz and beyond. Applications that use GHz frequencies, i.e. millimeter wavelengths (MMW), are increasing rapidly and thus driving the need for high volume device testing. For example, Internet over satellite connections, car ADAS systems, and other high-speed, data transfer solutions with a projected volume of more than a billion units by 2020.

"Commercial test equipment does not test much about 50 GHz," explained Cédric Mayor, Presto's COO. "The current method used by most customers is in-house bench testing by hand which is slow and expensive. This is because testing equipment above 50 GHz becomes increasingly expensive as the frequency increases as it is non-standard. To solve this problem, we have created custom interfaces that step the test frequencies down into the range that commercial testers operate in. This enables us to provide a cost-effective testing service for ultra-high frequency or MMW devices and builds on our existing services for high frequency device testing."

Another challenge of MMW devices is that the substrate used is often much more brittle than the usual CMOS, such as Gallium Arsenide or Gallium Nitride. As a result, the wafers are much more susceptible to breakage in transit and handling. To reduce the possibility of breakage, they are usually cut into quadrants once manufactured. A broken quadrant means fewer damaged parts compared to a whole broken wafer. However, the standard handling and test equipment is designed for circular wafers so Presto has developed its own quadrant handling adapters for its test equipment. On top of this, it is also key to be able to maintain a good correlation during the test and during the self-heating of the pulsed test methods, where continuous wave measurement is normally used. In this case, all the fixturing has to be able to control temperature and heat dissipation as well as include RF systematic error compensation for the measurements and maintain the correct reproducibility during production.

“Testing at these high MMW frequencies also introduces RF issues that are not significant at lower frequencies,” added Cédric Mayor. “Connectors and even tracks can affect the impedance or act as antennae so that the test platform and regime have to be designed to allow for this, based on our years of experience in RF testing. This includes ensuring that Design for Test is incorporated into the devices, especially as access to RF signals is complicated by the integration of antenna, especially when we have to deal with phase arrays or multiple antenna products. This places limitations on the probe card’s physical design that need to be overcome by careful engineering design of the hardware. These issues also impact packaging options such that standard packages are not always appropriate, so we help customers select the optimal packaging such as stack-die, multi-die and even custom solutions to ensure the optimal performance.”

Among MMW applications already implemented or under consideration are short range wireless backhaul, connecting small cell wireless; data center interconnect (DCI) for cloud servers; radar, primarily automotive; body scanners for airport security; chip-to-chip communications on printed circuit boards where even short runs of wires or cables attenuate signals at these frequencies; and wireless communication protocols, such as 5G cellular, WiGig (802.11ad) and Wireless HD. For convenience, the markets can be considered in three segments: communications, automotive and cellular/consumer, as shown in Table 1, which includes estimates of the potential served available market (SAM) and unit volumes. The first two of these are in now. Communications, driven by expansion in small cell backhaul and cloud computing, has annual unit volumes for 2020 projected to be in the millions; and automotive, driven by assisted driving (with autonomous driving on the horizon), with projected volumes in the tens of millions. The third vertical segment, cellular/consumer, driven by WiGig and 5G mobile, is in development now with 2020 annual unit volumes projected to exceed one billion.

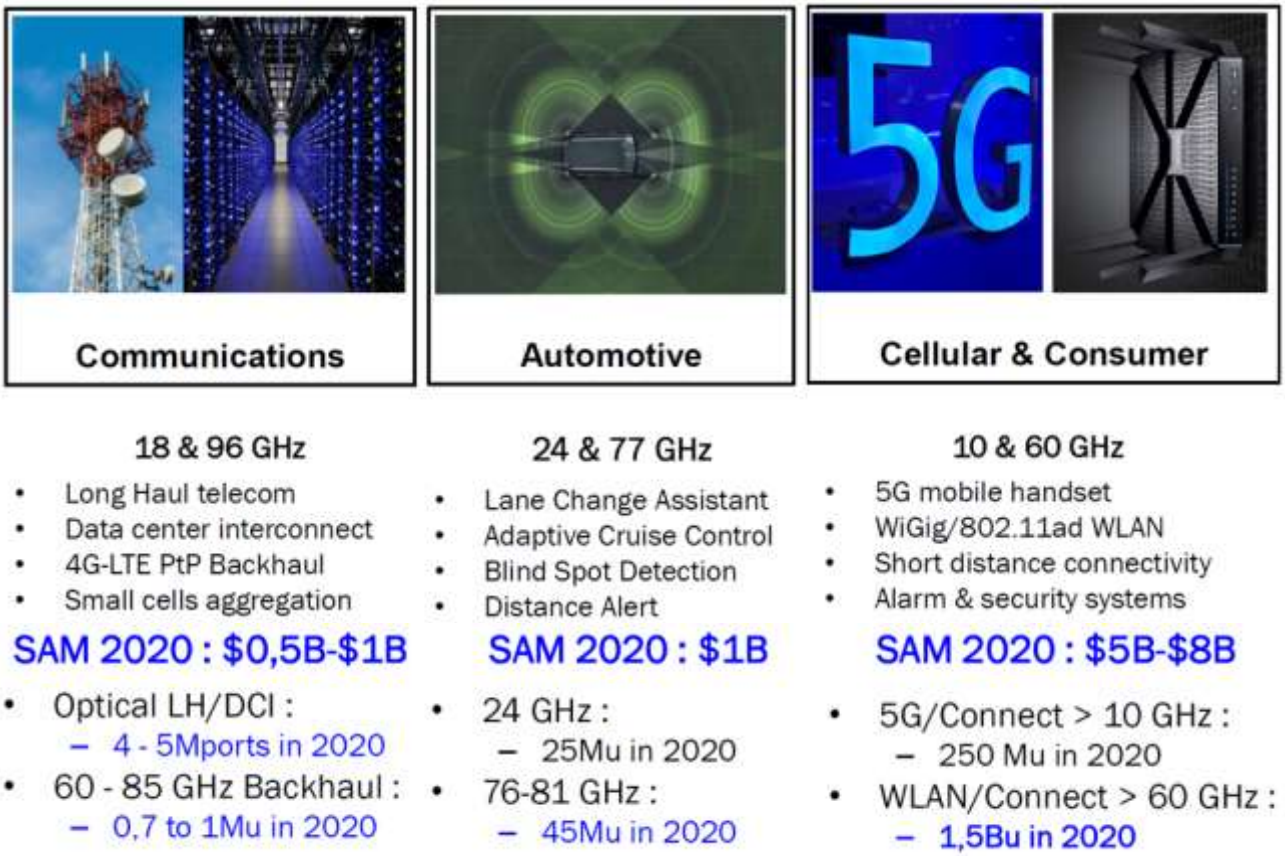

Table 1: Major application segments for MMW, including estimates of served available market (SAM) and unit volumes in 2020

Further information can be found in a Presto Engineering white paper called "*Enabling High Volume Test for Millimeter Wave RF Devices*" at: http://presto-eng.com/News/Whitepapers.html?p1=News&p2=Whitepapers

About Presto Engineering

Presto Engineering provides outsourced operations for semiconductor and IoT device companies, helping its customers minimize overhead, reduce risk and accelerate time-to-market. The company is a recognized expert in the development of industrial solutions for RF, analog, mixed-signal and secured applications – from tape-out to delivery of finished goods. Presto's proprietary, highly secure manufacturing and provisioning solution, coupled with extensive back-end expertise, gives its customers a competitive advantage. The company offers a global, flexible, dedicated framework with operations across Europe, the USA and Asia. For more information, visit: www.presto-eng.com or email info@presto-eng.com

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