

SESSION 5a:
RF GaN REPRODUCIBILITY
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Gallium Nitride (GaN) device and Monolithic Microwave Integrate Circuit (MMIC) technology for RF applications has matured significantly over the last decade. Major efforts, such as the Defense Advanced Research Projects Agency (DARPA) sponsored Wide Band Semiconductors for RF applications (WBGs-RF) program and the multinational Key Organization for Research in Integrated Circuits in GaN Technology (KORRIGAN) initiative, a large-scale European joint Research and Technology Project performed within the European Union, have helped establish substrate and epitaxial growth capability along with advancing fabrication processes. Programs such as these, along with a myriad of other academic and industrial efforts, have been instrumental in demonstrating the art of the possible by pushing device and circuit performance limits and evaluating intrinsic reliability, but have often focused on “hero” results. This session will describe current efforts to establish large-scale GaN MMIC production capability and discuss potential applications for these mature circuits. The session will open with an invited talk from the Defense Production Act Title III program office. This talk will provide an overview of Title III mission and describe the Manufacturing Readiness Assessment (MRA) process. Key Performance Parameters (KPPs) or objectives for current efforts will also be reviewed. The following three talks will come from industry performers describing their Title III efforts and highlighting benchmarked performance levels, maturation process, yield, and reliability. The first of these performer talks will be from Raytheon (Andover, MA), who will discuss their efforts to optimize their production released coplanar waveguide (CPW) 28V X-band GaN MMIC process. The next two talks, one from TriQuint (Richardson, TX) and the other from Cree (Durham, NC), will describe their respective efforts on maturing their S-band and Wideband GaN MMIC process capabilities. Each performer will discuss current process status with respect to program baselines and provide examples of process centering activities. The final talk of the session comes from the Georgia Tech Research Institute (GTRI) and will describe the benefits and challenges of using GaN-based components in next generation transmit/receive (T/R) modules for active electronically scanned arrays (AESAs).

