OBJECTIVE/SOLUTION:
Mature the W-Band GaN MMIC manufacturing process to a production relevant environment to demonstrate pilot line capability for the non-lethal weapons programs Solid State Active Denial Technology (SS-ADT) and Forecheck to repel personnel targets and identify concealed objects. This project will demonstrate high yields and reduce cost while maintaining reliability for W-band GaN MMICs. Fabrication of these GaN chips is the largest cost driver of both SS-ADT and Forecheck systems. SS-ADT is suitable for crowd control with the ability to stop, deter and turn back an advancing adversary, providing an alternative to lethal force. Forecheck is suitable for verifiable identification of concealed object detection at standoff distances.

Achievements:
• Builds upon previous ManTech effort, W-Band Solid State Manufacturing Improvements
• Addresses affordability, reliability and yield rate
• The GaN MMICs will be incorporated into the Solid State Active Denial Technology (SS-ADT) “Skid Plate” demonstrator program to enhance base protection and mounted vehicle applications to repel human targets, and Forecheck demonstrator program to provide concealed object detection at entry control checkpoints and forward operating bases
• Develops a capacitor process (PECVD Nitride Etch-Back) with superior gain performance
• Develops a GaN unique Semiconductor Gate Processing Technique with significantly lower gate-related yield loss
• Develops an Automated Visual Die Inspection process which facilitates a streamlined production-level fabrication process

Achievements (cont):
• Reduces frequency variability between wafer lots

Benefits:
• Increase yield of GaN MMICs by 155%
• Reduced GaN MMIC unit production cost by 75%
• Automated visual die inspection process
• Improved robustness and reliability of GaN MMICs

Transition and Weapon Systems/Secondary Items Impacted:
• Solid-State Active Denial Technology (SS-ADT) “Skid Plate” Demonstrator
• Forecheck Demonstrator