Topic: N092-159

Quantum Dimension

High Efficiency WCDMA Power Amplifier for MUOS Handheld Radio

This technology provides a combination Mobile User Objective System (MUOS) High Efficiency Power Amplifier (HPA) and a wideband HPA for frequency bands 225-400, 1290-1360, and 1755-1850MHz targeted for the Manpack radio. Derived from our 60% efficient MUOS power amplifier (PA) design it can be utilized for other radios in the same bandwidths. This combination HPA enables faster transmission rates, reduced power requirements, and increased battery life (2X) subsequently reduces the size, weight, and power (SWaP) of communications equipment. High linearity reduces out-of-band interference and improves the quality of signals received. Demonstration in a relevant environment will occur in 2016. This talented company develops advanced wireless components and integrates them for military benefit seeks additional funding for transition for operational testing for MUOS and other military radio programs.

Technology Category Alignment:

None
None
None

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SYSCOM: NAVWAR
Contract: N66001-14-C-5211

Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N66001-14-C-5211

Department of the Navy SBIR/STTR Transition Program

Statement A: Approved for public release, distribution is unlimited. (21 January 2016)

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Quantum Dimension

WHO

SYSCOM: SPAWAR

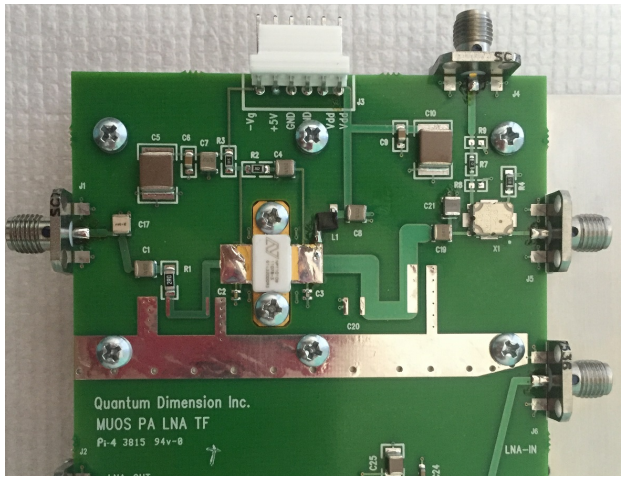
Sponsoring Program: Communications Satellite Program Office (PMW 146)

Transition Target: Mobile User Objective System (MUOS)

TPOC:
(619)226-5296

Other transition opportunities: HMS Manpack, tactical radios, military Ultra-High Frequency (UHF) radios, Wideband Code Division Multiple Access (WCDMA) (commercial cellular) or first responder applications, SRW and legacy radios

Notes: MUOS GaN High Efficiency Power Amplifier Prototype



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WHAT

Operational Need and Improvement: The HMS Manpack is capable of transmitting waveforms such as MUOS, Soldier Radio Waveform (SRW) and legacy waveforms, but not with a single power amplifier (PA). Additionally, there is a need for higher efficiency power amplifiers which have the benefit of improved battery life and less heat generation. Highly efficient power amplifiers have applicability over a wide range of programs.

Specifications Required: Operational Gap: Currently, power amplifiers tend to operate at about 40% efficiency for these types of devices. PA efficiency capabilities of greater than 50% are desired.

Customer Specifications: A power amplifier which is capable of operating at greater than 50% that combines MUOS, SRW and legacy capability in a single unit.

Technology Developed: For this project, Quantum Dimension is developing a multiband PA which is comprised of the MUOS High Power Amplifier (MHPA) and Wideband Power Amplifier (WPA) with the capability to integrate them into a single device – Universal High Power Amplifier (UHPA). Efficiency targets for both PAs are greater than 50%.

Warfighter Value: This technology is valuable for three main reasons: 1) greater power efficiency translates to more battery life, longer time in the field and less charging for same results, 2) higher power efficiency leads to less excess heat generation, and 3) a combined PA means few devices for soldiers to carry and subsequently less weight. Our high efficiency power amplifier enables faster transmission rates, reduced power requirements, and increased battery life (2X) reducing size, weight, and power (SWaP) of radio equipment.

WHEN

Contract Number: N66001-14-C-5211 **Ending on:** February 29, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
MUOS Reference Implementation Laboratory (MRIL) Testing with MUOS PA	Med	Successful test of MUOS PA	4	November 2015
WPA/Manpack Testing with Manpack AN/PRC-155(V)1 in relevant laboratory environment	Med	Successful test with Manpack for both WPA & MUOS PAs	6	February 2016
Prototype Delivery	Med	Completion of all functional testing	6-7	May 2016

HOW

Projected Business Model: At this time we are investigating teaming prime contractors to integrate our technology into their radios. We also have the capability to be a second source for the Manpack and other radios. We are also looking for commercial applications for our core technology.

Company Objectives: We seek to integrate our technology into military programs in one of two ways: 1) licensing of our intellectual property (IP) to the communications equipment manufacturers, and/or 2) develop, integrate, and test the devices at our facilities and deliver the finished product to the prime contractor.

Potential Commercial Applications: AN/PRC-155(V)1, Manpack follow-on radio, and other tactical/airborne programs and legacy military radio systems who could utilize either the MUOS HPA, the Wideband HPA or both.

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