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Integrated Phased Array Transducer for On-Board Structural Health Monitoring

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Permanently bonded onto a structure, an integrated Phased Array (PhA II) transducer that can provide reliable electromechanical connection with corresponding sophisticated miniaturized "all in one" SHM electronic device installed directly above it, without need for any interface cabling, during all aerospace structure lifecycle phases and for a huge variety of real harsh service environments of structures to be monitored is presented. This integrated PhA II transducer [1], as a key component of the PAMELA SHM™ (Phased Array Monitoring for Enhanced Life Assessment) system, has two principal tasks at the same time, reliably transceive elastic waves in real aerospace service environments and serves as a reliable sole carrier or support for associated integrated on-board SHM electronic device attached above. The PhA II transducer successfully accomplished both required task throughout extensive test campaigns which included low to high temperature tests, temperature cycling, mechanical loading, combined thermo-mechanical loading and vibration resistance, etc. both with and without SHM device attached above due to RTCA DO-160F.

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Ключевые слова:

Содержание.

Abstract

Introduction

Integrated phased array transducer PhA II

Performance verification tests

Conclusions and recommendations