

## Interference Analysis of Dual-band WiCoPT System for Wireless Sensor Network in RVT

Ryo TAKAMORI<sup>1</sup>, Kenjiro NISHIKAWA<sup>1</sup>, Yusuke MARU<sup>2</sup> and Shigeo KAWASAKI<sup>2</sup>

<sup>1</sup> Graduate School of Science and Engineering, Kagoshima University

<sup>2</sup> Japan Aerospace Exploration Agency

### Abstract

This paper proposes and demonstrates a dual-band Wireless Communication and Power Transmission (WiCoPT) system for a wireless health monitoring sensor network in Reusable Vehicle Test (RVT). Fig. 1 shows the wireless health monitoring system based on the dual-band WiCoPT. The proposed dual-band WiCoPT system employs 25 GHz-band for uplink and data transfer and 5 GHz-band for downlink and power transfer, resulting in an efficient wireless sensor system. The paper also analyzed the interference between uplink signals and downlink signals on the IC tag. When the interference power level from the downlink is less than 0 dBm on the IC tag, the uplink performances are suitable (Fig. 2). While the stable performance of the downlink are achieved when the interference power level from the base station is less than -25 dBm (Fig. 3). Under the above conditions, each EVM value is less than 10%. In addition, the uplink performances slightly depend on the linearity of the output power amplifier. Those results provide us a design guide to realize the WiCoPT health monitoring system in the RVT.

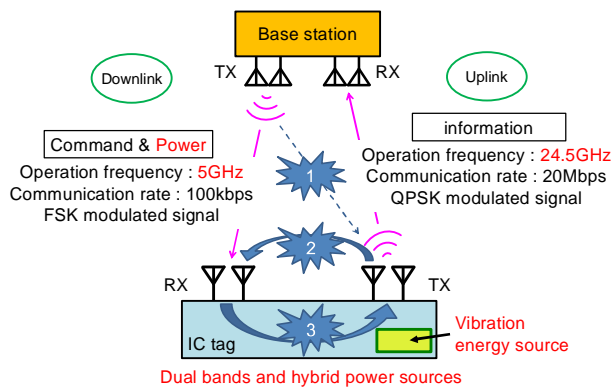


Fig. 1. Dual-band WiCoPT system

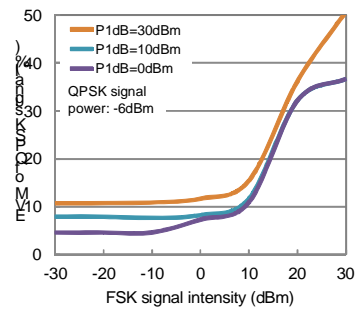


Fig. 2. EVM performances of transmitter.

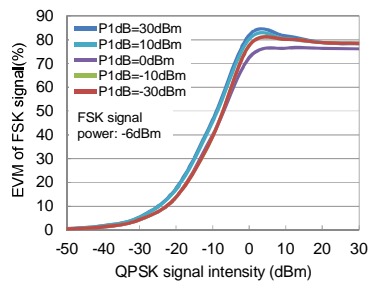


Fig. 3. EVM performances of receiver