Analysis Report

The Equipment Under Test (EUT) is a Tokenized Payment Device (TPD) which is a low cost contactless payment IoT (Internet of things) device. It functions as a tokenized alternative to traditional magnetic stripe and smart payment cards. The TPD operates pairing with a companion app that runs on a mobile phone. The companion app is used to manage the TPD device via a Bluetooth BLE connection.

The EUT contains two interfaces for payment transactions: NFC and Magnetic Secure Transmission (MST). The MST consists of a H-bridge driving an inductor. The MST uses magnetic pulses generated by the inductor to induce payment tokens formatted as magnetic stripe card data, into the magnetic stripe reader of a point of sale terminal. The 13.56 MHz passive NFC tag uses load modulation to convey information to the POS terminal's NFC reader. Depending on the type of POS, either the NFC or the MST interface is used to make a payment. The mode selection is automatic. When the TPD detects the 13.56 MHz field of the NFC reader it enters the NFC mode and disables the MST transmitter. When no NFC field is detected, the TPD uses MST to send the payment token to the POS terminal.

The Bluetooth BLE of the EUT operates at frequency range of 2402MHz to 2480MHz. There are total 40 channels with 2MHz channel spacing. The applicant declared that only Bluetooth BLE is used in the product. The MST operates in the frequency range between 0.8 kHz to 5 kHz. The NFC passive tag operates at 13.56MHz.

The EUT is powered by an internal 3.7V rechargeable battery. The USB port is for charging internal battery purpose only.

2.4GHz Bluetooth portion:
Modulation Type: GFSK
Antenna Type: Integral, Internal (PCB Trace)
Antenna gain is -2dBi
EIRP range is -4dBm to +2dBm
Frequency Range: 2402MHz - 2480MHz, 2MHz channel spacing, 40 channels

According to the KDB 447498:

Conducted Power = EIRP – antenna gain
= 2dBm + 2dBi = 4dBm = 2.51 mW

The SAR Exclusion Threshold Level:
= 3.0 * (min. test separation distance, mm) / sqrt(freq. in GHz)
= 3.0 * 5 / sqrt (2.480) mW
= 9.53 mW

Since the above conducted output power is well below the SAR Exclusion threshold level, so the EUT is considered to comply with SAR requirement without testing.