RE051-13-103173-3-A Ed. 0

EMF TEST REPORT

According to the standard:
KDB 447498 D01
General RF Exposure Guidance v05r01

Equipment under test:
Wi-Fi Payment Terminal
INGENICO IWL228 & IWL257

FCC ID: XKB-IWL2XXWBCL
IC: 2586D-IWL2WBCL

Company:
INGENICO

DISTRIBUTION: Mr. GOBION **Company: INGENICO**

Number of pages: 8

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EQUIPMENT UNDER TEST:	Wi-Fi Payment Terminal
Reference:	INGENICO IWL228 & IWL257
Serial number (S/N):	-
Part number (P/N):	-
MANUFACTURER:	-
APPLICANT:	
Company:	INGENICO
Address:	Batiment M2, Parc Innolin 10 rue du Golf 33700 MERIGNAC FRANCE
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DATE(S) OF TEST(S):	-
TEST SITE:	EMITECH laboratory at Le Mans (72) - FRANCE
TEST(S) OPERATOR(S):	Emmanuel TOUTAIN

SUMMARY

1. INTRODUCTION

This test report according to the KDB 447498 D01 provides exclusion method for low-power equipment to an exposure limit relevant to electromagnetic fields (EMF) for evaluating compliance with the FCC Guidelines and the SAR limits.

2. REFERENCE DOCUMENTS

The reference documents referred throughout this report are listed below.
These reference documents are applicable to the entire report, although extensions (version, date and amendment) are not repeated.

Reference	Document title	Date
KDB 447498 D01	KDB 447498 D01 General RF Exposure Guidance v05r01	2013
FCC 47 CFR	§ 2.1093 Radiofrequency radiation exposure evaluation: portable devices	-
IEEE Std C95.1	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz	1999
Safety Code 6	Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz	2009

3. PRESENTATION OF EQUIPMENT FOR TESTING PURPOSES

The wireless communication devices INGENICO IWL228 and IWL257, using the Wi-Fi 802.11a standard in the 5100 to 5800MHz frequency band, are shown in Fig. 1. The antenna is integrated.

This wireless communication device is a hand-held device and is intended to be only held in the hand as defined by the applicant.

Note: The also supported Wi-Fi 802.11 b/g/n standard (2450MHz frequency band) is not part of this report. SAR measurements according to the Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01) and RSS102 Issue 4: 2010 are reported in the EMITECH test reports:

- INGENICO IWL257: RE051-13-103173-1-A
- INGENICO IWL228: RE051-13-103173-2-A

IWL228 and IWL257

Fig. 1: Photographs of the equipment under test

4. TESTS RESULTS SUMMARY

Object	Satisfying results? ≤ 4W/kg (SAR limit for hands, wrists, feet, ankles)		Remarks
	Yes	No	
Test exclusion for 10-g extremity SAR	X		Calculation result = 6.8 < 7.5

Conclusion:

The equipment INGENICO IWL228 - IWL257 (802.11a standard) when held in the hand is in conformity with the FCC Guidelines (FCC 47 CFR § 2.1093 and IEEE Std C95.1: 1999) and the SAR limits established in Health Canada's RF exposure guideline, Safety Code 6, for general population/uncontrolled exposure according to the KDB 447498 D01 General RF Exposure Guidance v05r01.

5. SAR TEST EXCLUSION

SAR test exclusion is conducted according to KDB 447498 D01, section 4.3. General SAR test reduction and exclusion guidance, 4.3.1. Standalone SAR test exclusion considerations.

10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied.

The 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm is determined by:

[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)] · [√f(GHz)] ≤ 7.5 for 10-g extremity SAR,

where:

- f(GHz) is the RF channel transmit frequency in GHz,

- Power and distance are rounded to the nearest mW and mm before calculation,

- The result is rounded to one decimal place for comparison.

As shown in Fig. 2 and as defined by the applicant, the minimum test separation distance is 2.06mm (i.e., smallest distance from the antenna through outer surface of the device to any part of extremity of a user).

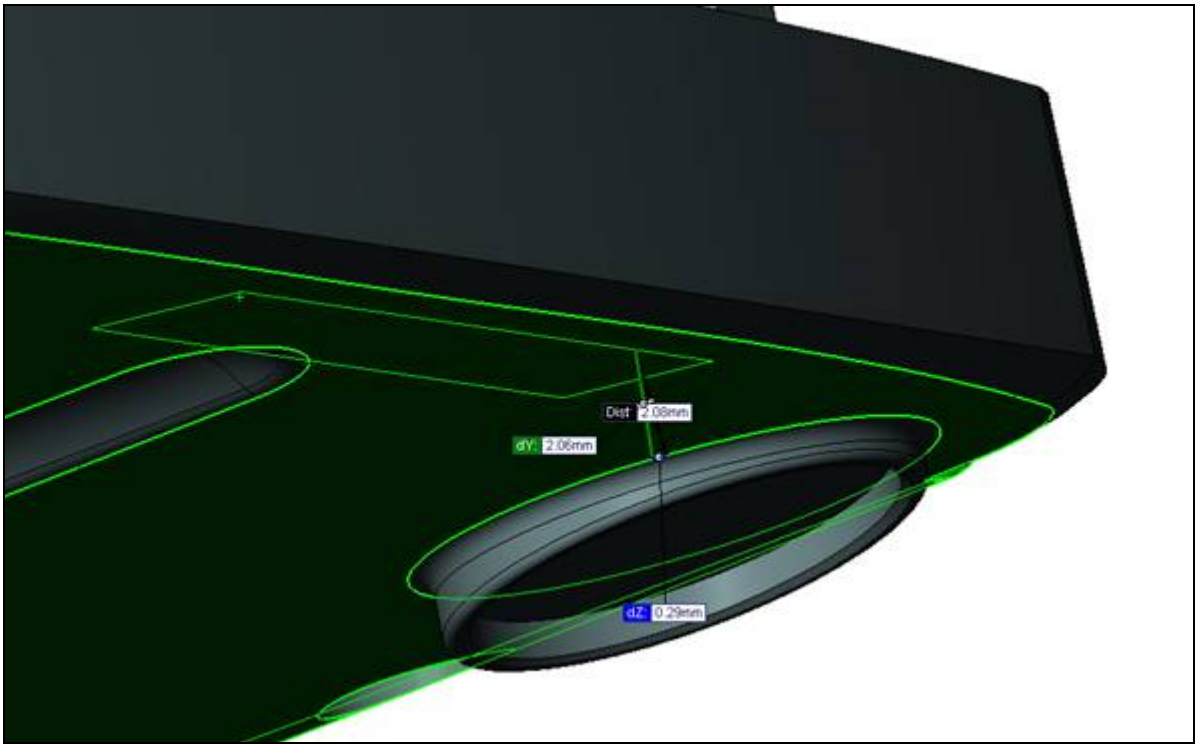

Fig. 2: Drawing of the rear side of the equipment

When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 of KDB 447498 D01 is applied to determine SAR test exclusion.

The power supplied by the transmitter to the transmission line of the antenna is, as defined by the applicant, 11.5 dBm = 14.13 mW. Rounded to the nearest mW, the power is 14 mW.

SAR Test Exclusion calculations are illustrated in the following table:

Frequency (GHz)		**Calculation result**	**SAR Test Exclusion ≤ 7.5**
f_{low}	5.18	[14/5].[√5.18] = 6.4	**Pass**
f_{high}	5.825	[14/5].[√5.825] = 6.8	**Pass**

SAR Test Exclusion Threshold condition is satisfied, calculations results are below 7.5. SAR testing is not required.

□□□ End of report □□□