



# CE RADIO TEST REPORT

Applicant : MtM+ Technology Corporation

Address : 8F, 178, MinQuan East Road, Section 3,  
: Taipei 10542, Taiwan

Equipment : M905

Model No. : nRF52832

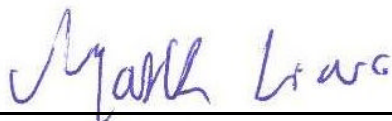
Trade Name : MtM+ Technology

## I HEREBY CERTIFY THAT :

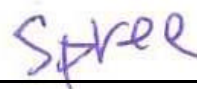
The sample was received on Nov. 08, 2017 and the testing was carried out on Nov. 08, 2017 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Tested by:



Mark Liao / Assistant Manager



Spree Yei / Engineer

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





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## 1. Summary of Test Procedure and Test Results

### 1.1 Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in EUROPEAN COUNCIL DIRECTIVE 2014/53/EU.

EN 300 330 V2.1.1 (2017-02)

Clause	Test Parameter	Remark
	<b>Transmitter parameters</b>	
<u>4.3.4</u>	Radiated H-field	Not Applicable
<u>4.3.6</u>	Radiated E-field	Not Applicable
<u>4.3.5</u>	RF carrier current	Not Applicable
<u>4.3.7</u>	Conducted spurious emissions	Not Applicable
<u>4.3.1</u>	Permitted range of operating frequencies	Not Applicable
<u>4.3.2</u>	Operating frequency ranges	Not Applicable
<u>4.3.3</u>	Modulation bandwidth	Not Applicable
<u>4.3.8 &amp; 4.3.9</u>	Spurious emissions	Not Applicable
	<b>Receiver parameters</b>	
<u>4.4.3</u>	Adjacent channel selectivity	Not Applicable
<u>4.4.4</u>	Blocking or desensitization	Not Applicable
<u>4.4.2</u>	Receiver spurious radiations	Pass



## 2. Test Configuration of Equipment under Test

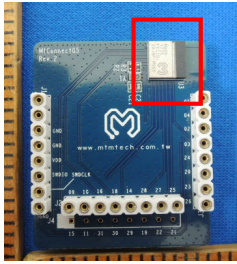
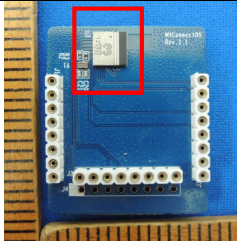
### 2.1 Feature of Equipment under Test

Modulation Type	BLE:GFSK NFC: ASK
Frequency Range	BLE: 2400-2483.5MHz NFC: 13.56MHz
Data Rate	BLE:1Mbps
Antenna Type	BLE: Chip Antenna NFC: Coil Antenna
Antenna Gain	BLE E1: -3.2 dBi E3: -5.9 dBi

\*NFC is passive mode.

### 2.2 The Difference of EUT

This model no. can use two kinds of RF Antenna.

Item	RF Chip Position
E1	 A photograph of a blue PCB with a white RF chip highlighted by a red rectangle. The chip is located near the top center of the board. The PCB has various components and a logo in the center.
E3	 A photograph of a blue PCB with a white RF chip highlighted by a red rectangle. The chip is located near the top center of the board, in a different position compared to E1. The PCB has various components and a logo in the center.

### 2.3 Carrier Frequency of Channels

Channel	Frequency(MHz)
01	13.56



## 2.4 Test Manner

- a. During testing, the interface cables and equipment positions were varied according to Europe Standard EN 300 330.
- b. An executive program, "Nrfghostudio:1.21.2" under WIN 7 was executed to transmit and receive data via RFID.
- c. The following test mode was performed for the test:

Test Mode	Operating Description
1	RF Chip: E1, 13.56MHz
2	RF Chip: E3, 13.56MHz

## 2.5 Description of Test System

The EUT was tested alone. No support devices are needed for testing.

**2.6 General Information of Test**

<input checked="" type="checkbox"/> Test Site	CerpPASS Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582	
	FCC	TW1079, TW1061, 390316, 228391, 641184
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-3428, R-4218 for Radiated emission test G-10812, G-10813 for radiated disturbance above 1GHz
<input type="checkbox"/> Test Site	<b>CerpPASS Technology (Suzhou) Co.,Ltd</b> Address: No.66, Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China Tel: +86-512-6917-5888 Fax: +86-512-6917-5666	
	FCC	916572, 331395
	IC	7290A-1, 7290A-2
	VCCI	T-343 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test G-227 for radiated disturbance above 1GHz
Test Condition	Normal Temperature : 25°C Extreme Temperature : -40°C and 85°C	



### 3. Test Equipment and Ancillaries Used for Tests

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	369	2017/03/15	2018/03/14
Active Loop Antenna	EMCO	6507	40855	2017/05/15	2018/05/14
Horn Antenna	EMCO	3115	31589	2017/02/18	2018/02/17
Horn Antenna	EMCO	3116	31970	2017/03/29	2018/03/28
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200207	2017/03/17	2018/03/16
Preamplifier	EM	EM330	060659	2017/03/13	2018/03/12
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2017/09/20	2018/09/19
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2017/11/06	2018/11/05
MXG MW Analog Signal Generator	KEYSIGHT	N5183A	MY50142931	2017/03/17	2018/03/16
MXG-B RF Vector Signal Generator	KEYSIGHT	N5182B	MY53051383	2017/03/17	2018/03/16
Spectrum Analyzer	R&S	FSP40	100047	2017/02/13	2018/02/12
BLUETOOTH TESTER	R&S	CBT	101133	2017/03/10	2018/03/09
Attenuator	KEYSIGHT	8491B	MY39250703	2017/03/07	2018/03/06
Rotary Attenuator	Agilent	8495B	MY42146680	2017/03/13	2018/03/12
Temp & Humi chamber	T-MACHINE	TMJ-9712	T-12-040111	2017/09/04	2018/09/03
Series Power Meter	Anritsu	ML2495A	1224005	2017/03/01	2018/02/28
Power Sensor	Anritsu	MA2411B	1207295	2017/03/01	2018/02/28
USB Average Power Sensor	Theda	4PS6A	TW5451013~16	2016/11/08	2018/11/07
Software	AUDIX	E3	V8.2014-8-6	N/A	N/A
Software	Keysight	Console	v0.01	N/A	N/A
Software	Keysight	ETSI Standard Test System	1.00.21	N/A	N/A
Software	Keysight	N7607B Signal Studio	V3.0.0.0	N/A	N/A
Software	Keysight	Inservice Monitor Utility	N/A	N/A	N/A





## 4. Receiver Parameters

### 4.1 Receiver Spurious Emissions (Radiated)

#### 4.1.1 Standard Applicable

According to ETSI EN 300330 Section 4.4.2.3

Frequency $9 \text{ kHz} \leq f < 10 \text{ MHz}$	Frequency $10 \text{ MHz} \leq f < 30 \text{ MHz}$
5.5 dBuA/m at 9kHz descending 3 dB/oct	-25 dBuA/m

frequencies between 30 MHz to 1 000 MHz
2 nW

#### 4.1.2 Test Procedure

According to ETSI EN 300330 Section 6.3.1



### 4.1.3 Test Result and Data

Test Date: Nov. 08, 2017

Temperature: 21°C

Humidity: 68%

Test Mode: Mode 1

&lt;9k ~ 30MHz&gt;

Antenna Polarization	Frequency (MHz)	Read level (dBuV/m)	Correct Factor (dB)	Distance Correction	Field Strength (dBuV/m)	Field Strength (dBuA/m)	Limit (dBuA/m)	Margin (dB)
Open	3.61	31.80	16.70	3	48.50	-3.00	0.72	-3.72
Close	3.55	32.67	16.68	3	49.35	-2.15	0.8	-2.95
Measurement uncertainty (dB): ±3.88								

&lt;30MHz ~ 1GHz&gt;

Antenna Polarization	Frequency (MHz)	Read level (dBuV/m)	Correct Factor (dB)	Spurious emission (dBm)	Limit (dBm)	Margin (dB)
V	40.67	-70.45	-0.75	-71.20	-57	-14.20
V	57.16	-77.39	5.23	-72.16	-57	-15.16
V	953.44	-76.88	15.09	-61.79	-57	-4.79
H	60.07	-78.01	5.48	-72.53	-57	-15.53
H	335.55	-75.04	2.34	-72.70	-57	-15.70
H	953.44	-76.95	15.19	-61.76	-57	-4.76
Measurement uncertainty (dB): ±3.88						

Note:

1. Field Strength = Reading + Antenna Factor + Cable Loss – Distance Correction
2. All the transmitter rates had been pre-tested, and the test data is worst case.



Test Date: Nov. 08, 2017

Temperature: 21°C

Humidity: 68%

Test Mode: Mode 2

&lt;9k ~ 30MHz&gt;

Antenna Polarization	Frequency (MHz)	Read level (dBuV/m)	Correct Factor (dB)	Distance Correction	Field Strength (dBuV/m)	Field Strength (dBuA/m)	Limit (dBuA/m)	Margin (dB)
Open	3.55	32.39	16.68	3	49.07	-2.43	0.8	-3.23
Close	3.61	32.78	16.70	3	49.48	-2.02	0.72	-2.74

Measurement uncertainty (dB): ±3.88

&lt;30MHz ~ 1GHz&gt;

Antenna Polarization	Frequency (MHz)	Read level (dBuV/m)	Correct Factor (dB)	Spurious emission (dBm)	Limit (dBm)	Margin (dB)
V	57.16	-75.35	5.23	-70.12	-57	-13.12
V	520.82	-75.18	7.03	-68.15	-57	-11.15
V	953.44	-77.25	15.09	-62.16	-57	-5.16
H	57.16	-78.38	5.50	-72.88	-57	-15.88
H	520.82	-74.02	7.25	-66.77	-57	-9.77
H	953.44	-76.64	15.19	-61.45	-57	-4.45

Measurement uncertainty (dB): ±3.88

Note:

1. Field Strength = Reading + Antenna Factor + Cable Loss – Distance Correction
2. All the transmitter rates had been pre-tested, and the test data is worst case.