



Prüfbericht-Nr.: <i>Test Report No.:</i>	50123396 001	Auftrags-Nr.: <i>Order No.:</i>	114073029	Seite 1 von 21 <i>Page 1 of 21</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	22-Dec-2017	
Auftraggeber: <i>Client:</i>	Tong Lung Metal Industry Co.,Ltd., No.82, Zhonghua Rd., Minxiong Industrial Park, Chiayi County 62157, Taiwan			
Prüfgegenstand: <i>Test item:</i>	Touchpad Proximity Electronic Deadbolt			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	PL2-TR			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C / IC RSS-210 Test report			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.225 RSS-210 Issue 8, December 2010			
Wareneingangsdatum: <i>Date of receipt:</i>	09-Jan-2018			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A000680369-002			
Prüfzeitraum: <i>Testing period:</i>	16-Jan-2018 - 16-Jan-2018			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Laboratory Taipei			
Prüflaboratorium: <i>Testing laboratory:</i>	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by: 		kontrolliert von / reviewed by: 		
31-Jan-2018 Brenda Chen / Project Engineer		31-Jan-2018 Ryan W. T. Chen / Project Manager		
Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name / Stellung <i>Name / Position</i>
				Unterschrift <i>Signature</i>
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet				
Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT

RESULT: *Passed*

5.1.2 FIELD STRENGTH OF FUNDAMENTAL

RESULT: *Passed*

5.1.3 FREQUENCY STABILITY

RESULT: *Passed*

5.1.4 99% BANDWIDTH

RESULT: *N/A*

5.1.5 SPURIOUS EMISSION

RESULT: *Passed*

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1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix P: Photo Documentation

(File Name: 50123396APPENDIX P)

Appendix D: Test Result of Radiated Emissions

(File Name: 50123396APPENDIX D)

Test Specifications

The following standards were applied (in bold: product standards, otherwise: basic standards).

Table 1: Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart C Section 15.225
RSS-210 Issue 8, December 2010
RSS-Gen, Issue 4, November 2014
ANSI C63.10:2013

2. Test Sites

2.1 Test Facilities

TUV Rheinland Taiwan Ltd.

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

FCC Registration No.: 340738
IC Canada Registration No.: 9465A-1
TAF Accredited NCC Test Lab. No.:0759
TAF ISO17025 Certification effective periods: 2016-Jul-1st to 2019-Jun-30th



Testing Laboratory
0759

2.2 List of Test and Measurement Instruments

Table 2: List of Test and Measurement Equipment

Kind of Equipment	Manu-facturer	Type	S/N	Last Calibration	Next Calibration
Test Software	Farad	EZ_EMC	Ver. TUV3A1	N/A	N/A
EMI Test Receiver	R&S	ESR 7	101549	2017/11/10	2018/11/10
Spectrum Analyzer	R&S	FSV 40	100921	2017/05/02	2018/05/01
Spectrum Analyzer	Agilent	N9010A	MY53470241	2017/05/23	2018/05/22
Preamplifier (30MHz -1GHz)	HP	8447F	2805A03335	2017/08/14	2018/08/14
Preamplifier (18 GHz -40 GHz)	COM-POWER	PAM-840	461257	2018/01/18	2019/01/18
Pre-Amplifier (1GHz~18GHz)	EM Electronics	EM01G18G	60558	2017/11/21	2018/11/21
Bilog Antenna	TESEQ	CBL6111D	29804	2017/08/18	2018/08/18
Horn Antenna	ETS-Lindgren	3117	201918	2017/08/18	2018/08/18
Horn Antenna (18GHz~40GHz)	COM-POWER	AH-840	101029	2017/11/28	2018/11/28
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2017/06/14	2018/06/14
EMI Test Receiver	R&S	ESR 7	101549	2017/11/10	2018/11/10
Spectrum Analyzer	R&S	FSL3	101943	2015/09/07	2018/09/07
Temp. & Humid. Chamber	Giant Force	GCT-099-40-S	MAF0103-007	2017/03/09	2019/03/09
LISN (1 phase)	R&S	ENV216	101243	2017/06/18	2018/06/18
LISN	R&S	ENV216	101262	2017/06/22	2018/06/21

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are ± 3 dB.

Table 3: Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	± 1.5 dB
Adjacent channel power	± 3 dB
Radiated emission of transmitter, valid up to 26 GHz	± 6 dB
Radiated emission of receiver, valid up to 26 GHz	± 6 dB
Temperature	± 2 °C
Humidity	± 10 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is an Electronic locks, working at 13.56 MHz with RFID function.
For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 Ratings and System Details

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment	Touchpad Proximity Electronic Deadbolt
Type Designation	PL2-TR
FCC ID	YLK-PL2-TR

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequency	13.56 MHz
Operation Voltage	6
Extreme Voltage Range	5.1V~6.9V
Modulation	ASK

3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with a special firmware which provides the test modes

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

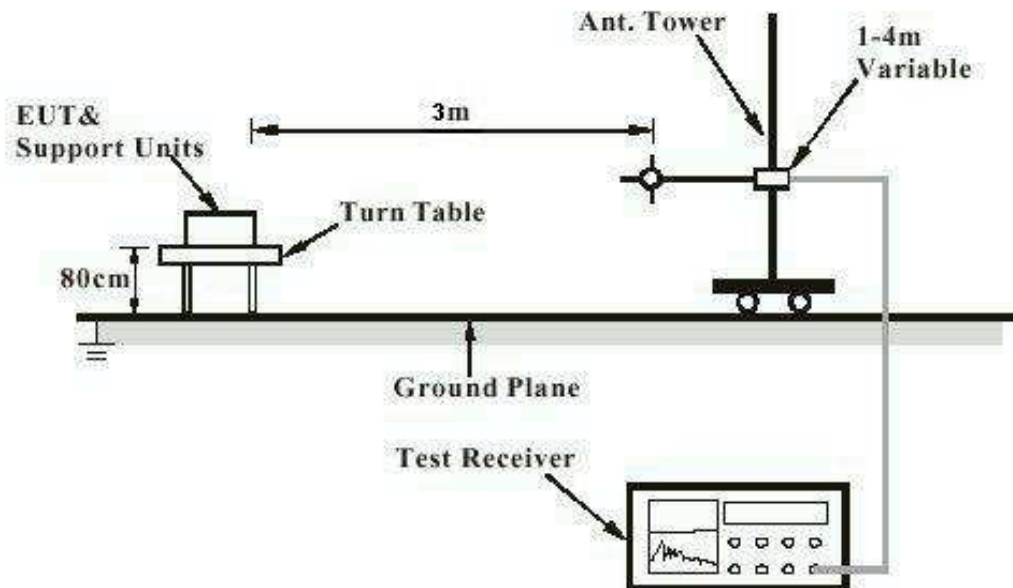
None.

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Standard : LP0002(2018): 2.2
Part 15.203 and RSS-Gen 7.1.4
Requirement : use of approved antennas only

The antenna is a printed PCB trace with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

5.1.2 Field strength of fundamental

RESULT:
Passed

Test standard : LP0002(2018) 3.2
 FCC Part 15. 225
 RSS-210 A2.6

Basic standard : ANSI C63.10:2013

Test setup

Test Frequency : 13.56 MHz
 Operation Mode : A

Table 6: Test result of Field strength of fundamental and modulation sidebands

Frequency (MHz)	Meas. Result	Detector	Test Result	Limits		Pass/Fail
	dB μ V/m @1.2m		dB μ V/m @30m	dB μ V/m@1.2m	dB μ V/m@30m	
13.560	65.01	QP	9.09	139.9	84	Pass

For details refer to Appendix D.

5.1.3 Frequency Stability

RESULT:
Passed

Test standard : LP0002(2018) 3.2.1.3
 FCC Part 15. 225(e)
 RSS-210 A2.6

Basic standard : ANSI C63.10:2013
 Kind of test site : Shielded room

Test setup

Test Frequency : 13.56 MHz
 Operation Mode : A

Relative humidity : 50-65 %
 Atmospheric pressure : 100-103 kPa

Table 7: Test result of Frequency Stability

Frequency Stability Measurement					
Fundamental frequency (MHz)	Temperature (°C)	Voltage	Measurement frequency (MHz)	Frequency Error (ppm)	Limit ±0.01%
13.56	-20	Normal	13.560300	22.12	±100ppm
	-10	Normal	13.560500	36.87	
	0	Normal	13.560600	44.25	
	10	Normal	13.560700	51.62	
	20	85%	13.560500	36.87	
	20	Normal	13.560400	29.50	
	20	115%	13.560400	29.50	
	30	Normal	13.560300	22.12	
	40	Normal	13.560400	29.50	
50	Normal	13.560350	25.81		

5.1.4 99% Bandwidth

RESULT:**N/A**

Test standard : LP0002(2018) 3.1
RSS-Gen
Basic standard : ANSI C63.10:2013, KDB558074
Kind of test site : Shielded room

Test setup

Operation Mode : A
Ambient temperature : 22-26 °C
Relative humidity : 50-65 %
Atmospheric pressure : 100-103 kPa

5.1.5 Spurious Emission

RESULT:**Passed**

Test standard	:	LP0002(2018) 3.2.1.2 FCC part 15.209 FCC part 15.225 RSS-210 A2.6
Basic standard	:	ANSI C63.10: 2013
Limits	:	The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209. RSS-210: 30 microvolts/m (29.5 dB μ V/m) at 30 m, outside the band 13.110-14.010 MHz.
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Operation mode : A

Remark: Testing was carried out within frequency range 30MHz to the tenth harmonic.

For details refer to Appendix D.

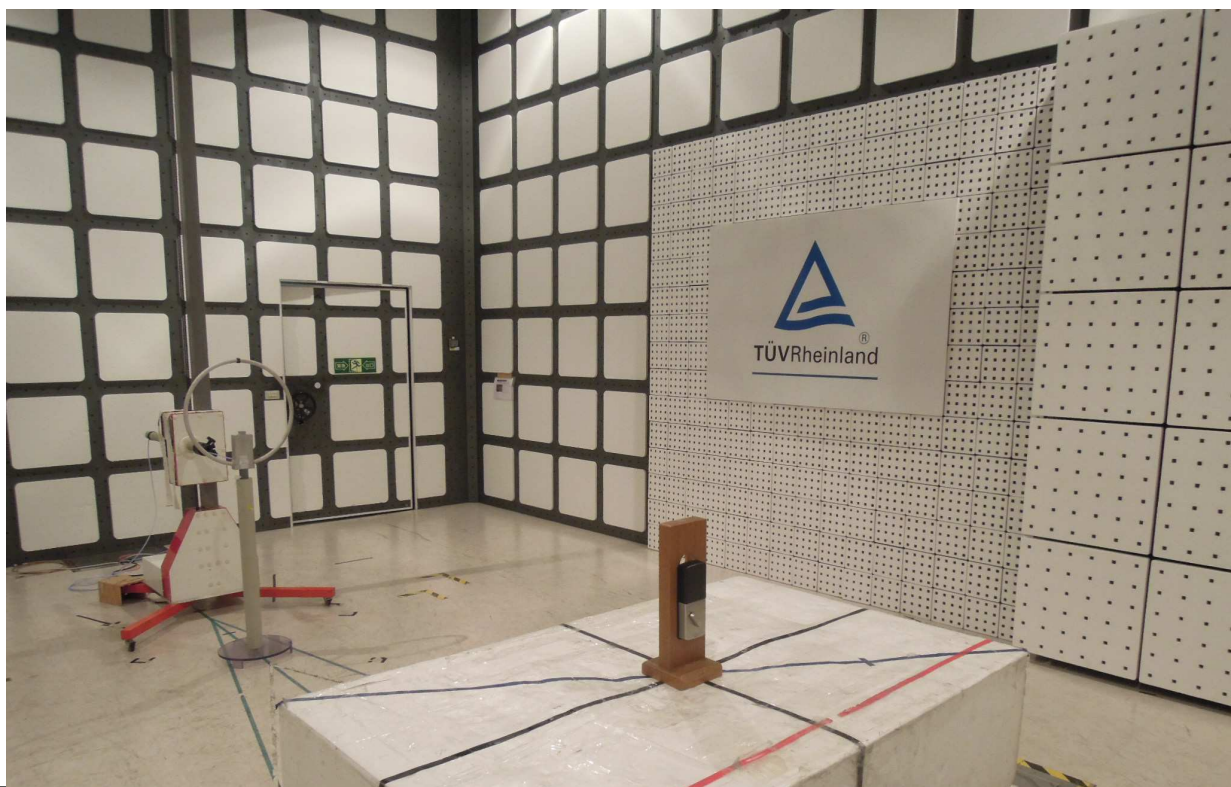
The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case orientation is recorded in this test report.

5.2 Photographs of the Test Set-Up

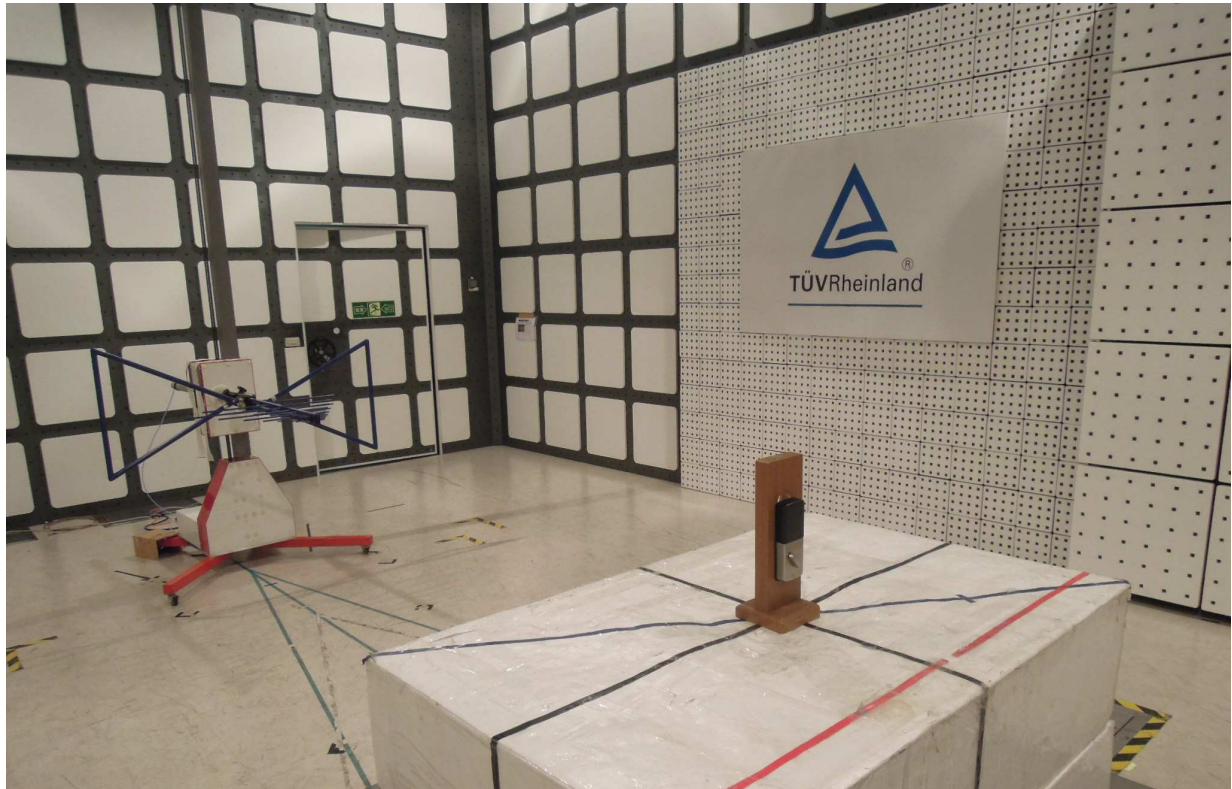
Photograph 1: Set-up for Spurious Emissions (Front View)



Photograph 2: Set-up for Spurious Emissions (Back View 1)



Photograph 3: Set-up for Spurious Emissions (Back View 2)



Photograph 4: Set-up for Conducted testing



Photograph 5: Set-up for Conducted testing



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