

Prüfbericht-Nr.: Test Report No.:	50165372 001	Auftrags-Nr.: Order No.:	114079235	Seite 1 von 19 Page 1 of 19
Kunden-Referenz-Nr.: Client Reference No.:	N/A	Auftragsdatum: Order date:	03-July-2018	
Auftraggeber: Client:	香港商亞薩合萊有限公司台灣分公司 台北市大同區承德路三段 217 號 2 樓			
Prüfgegenstand: Test item:	Digital door locks			
Bezeichnung / Typ-Nr.: Identification / Type No.:	YDM7116			
Auftrags-Inhalt: Order content:	NCC LP0002 Test report (RFID)			
Prüfgrundlage: Test specification:	NCC Low-power Radio-frequency Devices Technical Regulations LP0002(2018) Section 3.2			
Wareneingangsdatum: Date of receipt:	03-July-2018			
Prüfmuster-Nr.: Test sample No.:	A000768969-001			
Prüfzeitraum: Testing period:	04-July-2018- 17-July-2018			
Ort der Prüfung: Place of testing:	EMC/RF Laboratory Taipei			
Prüflaboratorium: Testing laboratory:	TUV Rheinland Taiwan Ltd.			
Prüfergebnis*: Test result*:	Pass			
Report date / tested by:		kontrolliert von / reviewed by:		
2018-07-24 Mars Y.J. Lin/Project Engineer		2018-07-24 Rene Charton/Expert, Electrical		
Datum Date	Name / Stellung Name / Position	Unterschrift Signature	Datum Date	Name / Stellung Name / Position
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* 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. 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.				

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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 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: 50165372APPENDIX P)****Appendix D: Test Result of Radiated Emissions****(File Name: 50165372APPENDIX D)****Test Specifications**

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

Table 1: Applied Standard and Test Levels

Radio
NCC Low-power Radio-frequency Devices Technical Regulations LP0002(2018)(107 年 1 月 10 日)

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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.: 365730

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

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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	ESR7	101062	2017/11/10	2018/11/10
Spectrum Analyzer	R&S	FSV 40	100921	2018/05/02	2019/05/02
Spectrum Analyzer	Agilent	N9010A	MY53470241	2018/02/05	2019/02/04
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	060558	2017/11/21	2018/11/21
Bilog Antenna	TESEQ	CBL6111D	29804	2017/08/18	2018/08/18
Horn Antenna	ETS-Lindgren	3117	138160	2017/08/18	2018/08/18
Horn Antenna (18GHz~40GHz)	COM-POWER	AH840	101029	2017/11/28	2018/11/28
Loop Antenna	Schwarzbeck	FMZB 1513	1513-076	2018/06/14	2019/06/14
EMI Test Receiver	R&S	ESCI7	100797	2017/11/10	2018/11/10
LISN (1 phase)	R&S	ENV216	101243	2015/09/07	2018/09/07
LISN	R&S	ENV216	101262	2017/03/09	2019/03/09
Test Software	Audix	e3	Ver. 9	N/A	N/A
Test Software	Agilent	300328 testsystem	V1.9.1	2017/11/10	2018/11/10
Power sensor	Agilent	U2021XA	MY53480013	2018/05/02	2019/05/02

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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 $\pm 3\text{dB}$.

Table 3: Emission Measurement Uncertainty

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

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3. General Product Information

3.1 Product Function and Intended Use

The EUT is a digital door locks, working at 13.56 MHz with RFID function.
For details refer to the User Guide, Data Sheet and Block Diagram.

3.2 Ratings and System Details

Table 4: Basic Information of EUT

Item	EUT information
Kind of Equipment	Digital door locks
Type Designation	YDM7116
Brand Name	Yale

Table 5: Technical Specification of EUT

Technical Specification	Value
Operating Frequency	13.56 MHz
Operation Voltage	4~6.5 Vdc
Modulation	ASK
Antenna Type	Loop antenna

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3.3 Independent Operation Modes

Basic operation modes are:

- A. Transmitting

3.4 Noise Generating and Noise Suppressing Parts

Refer to the block Diagram.

3.5 Submitted Documents

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

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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 test mode firmware which makes it possible to transmit signal when switched on the power

Special Accessories and Auxiliary Equipment

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

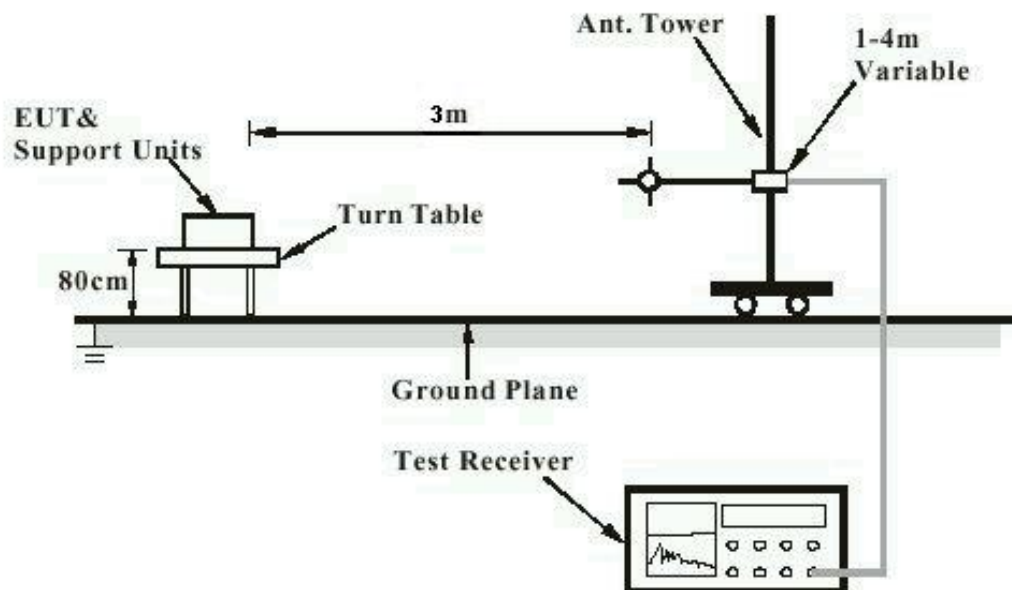
N/A

4.3 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.

4.4 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

Requirement : use of approved antennas only

The antenna is Loop antenna 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.

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5.1.2 Field strength of fundamental
RESULT:
Passed

Test standard : LP0002(2016) 3.2

Basic standard : LP0002(2016) 3.2

Test setup

Test Frequency : 13.56 MHz

Operation Mode : A

Ambient temperature : 24°C

Relative humidity : 51%

Atmospheric pressure : 100-103 kPa

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

Frequency (MHz)	Test Result	Detector	Limits		Pass/Fail
	$\text{dB}\mu\text{V/m}$ @3m		$\text{dB}\mu\text{V/m@3m}$	$\text{dB}\mu\text{V/m@30m}$	
13.562	50.50	QP	103.9	83.99	Pass

For details refer to Appendix D.

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5.1.3 Frequency Stability
RESULT:
Passed

Test standard : LP0002(2018) 3.2.1.3

Basic standard : LP0002(2018) 3.2.1.3

Kind of test site : Shielded room

Test setup

Test Frequency : 13.56 MHz

Operation Mode : A

Table 7: Test result of Frequency Stability

Frequency Stability Measurement					
Fundamental frequency (MHz)	Temperature (°C)	Voltage	Measurement frequency (MHz)	Frequency Error (ppm)	Limit $\pm 0.01\%$
13.562	-20	Normal	13.562430	2.21	$\pm 100\text{ppm}$
	-10	Normal	13.562420	1.47	
	0	Normal	13.562410	0.74	
	10	Normal	13.562410	0.74	
	20	85%	13.562392	-0.59	
	20	Normal	13.562400	0.00	
	20	115%	13.562400	0.00	
	30	Normal	13.562410	0.74	
	40	Normal	13.562420	1.47	
	50	Normal	13.562420	1.47	

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5.1.4 Spurious Emission**RESULT:****Passed**

Test standard	:	LP0002(2018) 3.2.1.2
Basic standard	:	LP0002(2018) 3.2.1.2
Limits	:	Radiated emissions which fall in the restricted bands, as defined in LP0002(2018) 2.8 must comply with the radiated emission limits specified in LP0002(2018) 2.8
		Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in LP0002(2018) 2.8
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Operation mode	:	A
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Remark: Testing was carried out within frequency range 9kHz 1GHz to the tenth harmonic.

For details refer to Appendix D.

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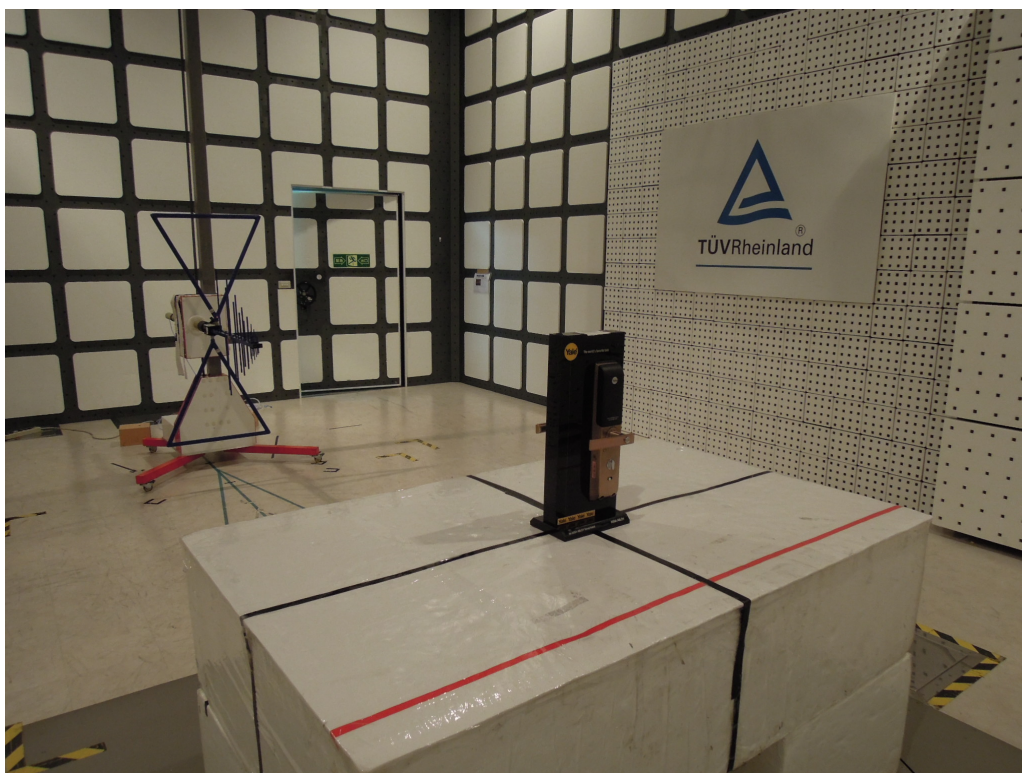
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5.2 Photographs of the Test Set-Up

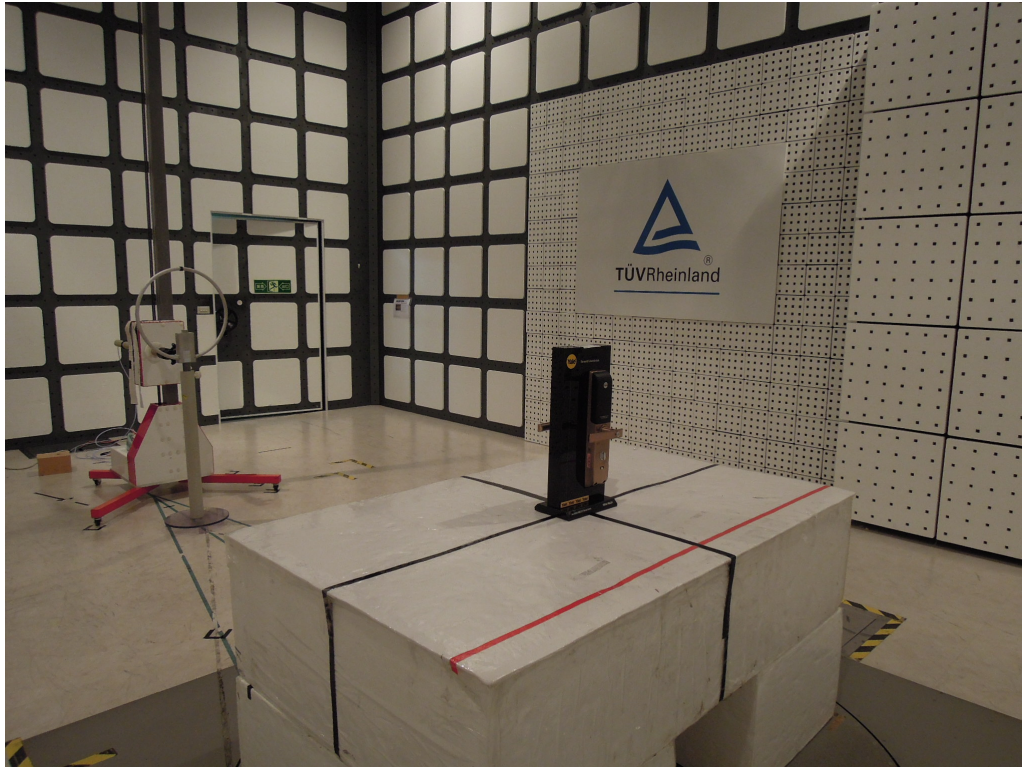
Photograph 1: Set-up for Spurious Emissions (Front View)



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



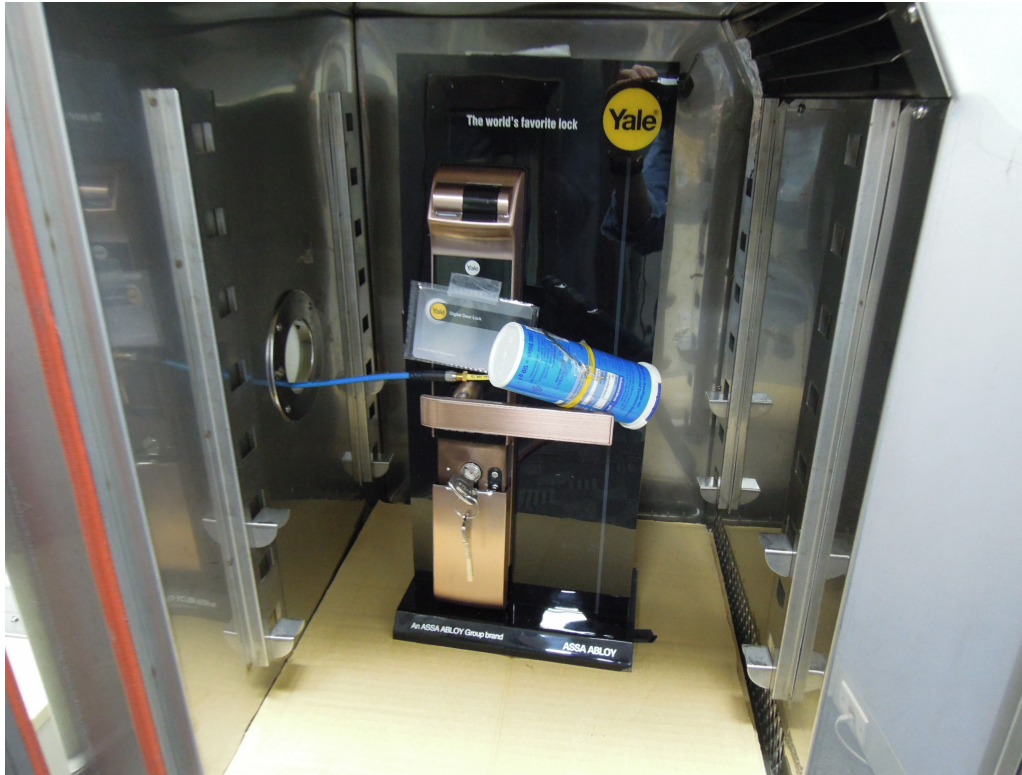
Photograph 3: Set-up for Spurious Emissions (Back View 2)



Photograph 4: Set-up for Conducted testing



Photograph 5: Set-up for Conducted testing



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