

# CTS (NINGBO) TESTING SERVICE TECHNOLOGY INTERNATIONAL

**OPERATE ACCORDING TO ISO/IEC 17025** 

# **EMC TEST REPORT**

**TEST REPORT NUMBER: CNB3180613-00445-E-D-R1** 





CTS (Ningbo) Testing Service Technology Co., Ltd.

Fl.1 & 8 West, Bldg. B, No. 66, Qingyi Rd., Hi-Tech Zone, Ningbo, Zhejiang, China





# TEST REPORT EN 61000-6-3:2007+A1:2011+AC:2012 Electromagnetic compatibility (EMC) —Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments EN 61000-6-1:2007 Electromagnetic compatibility (EMC) —Part 6-1: Generic standards — Immunity for residential, commercial and light-industrial environments Report Reference No. ...... CNB3180613-00445-E-D-R1 Date of issue ...... 25 June 2018 Guangzhou, Guangdong, China. Testing location/ procedure..... Full application of Harmonised standards ■ Partial application of Harmonised standards $\Box$ Other standard testing method $\Box$ Applicant's name ...... Midoceanbrands B.V. Address ...... Hermesweg 9, 3771 ND Barneveld ,The Netherlands EORI-number: NL806979069 Test specification: Standard...... EN 61000-6-3:2007+A1:2011+AC:2012, EN 61000-6-1:2007 Test Report Form No. ...... CTSEMC-1.0 TRF Originator ...... CTS (Ningbo) Testing Service Technology Co., Ltd. Master TRF ...... Dated 2009-01 CTS (Ningbo) Testing Service Technology Co., Ltd. All rights reserved. This publication may be reproduced in whole or in part for non-commercial purposes as long as the CTS (Ningbo) Testing Service Technology Co., Ltd. is acknowledged as copyright owner and source of the material. CTS (Ningbo) Testing Service Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context. Test item description......pan clock Trade Mark...../ Manufacturer ...... Midoceanbrands B.V. (114628) Model/Type reference ...... MO9410

Compiled by:

Supervised by:

Approved by:

Kate zhang / File administrators

Duke yang / Technique principal

Vincent yao / Manager

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Ratings ...... Battery 1.5V

Result ..... PASSED

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# **EMC -- TEST REPORT**

Type / Model	MO9410
EUT	pan clock
Applicant	Midoceanbrands B.V.
Addraga	Hermesweg 9, 3771 ND Barneveld ,The Netherlands
Address	EORI-number: NL806979069
Telephone	1
Fax	1
Contact	1
Manufacturer	Midoceanbrands B.V. (114628)
Address	1
Telephone	1
Fax	1
Contact	1
Factory	Midoceanbrands B.V
Address	Unit 201, 2/F, Laford Centre, 838 Lai Chi Kok Road, Cheung Sha Wan, Kowloon, Hong Kong.
Telephone	/
Fax	1
Contact	1

#### **Special description:**

This is an additional test report which is based on the original report **CNB3180601-00421-E**. There are no any difference among the models except for the applicant. After review, no additional test should be carried out.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## 1 TEST STANDARDS

The tests were performed according to following standards:

EN 61000-6-3:2007+A1:2011+AC:2012 Electromagnetic compatibility (EMC) —Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments

EN 61000-6-1:2007 Electromagnetic compatibility (EMC) —Part 6-1: Generic standards — Immunity for residential, commercial and light-industrial environments

#### 2 SUMMARY

#### 2.1 GENERAL REMARKS

Date of receipt of test sample	04 June 2018
Testing commenced on	04~11 June 2018
Testing concluded on	25 June 2018

#### 2.2 FINAL ASSESSMENT

TI	requirements		- 41	4	-4				
me	reduirements	репаниот	) IIIe	Technicai	Siandards	and lested	oberanon	modes	are

fulfilled.

□ - **not** fulfilled.

The equipment under test

fulfils the EMC requirements cited on page 1.

- does not fulfil the EMC requirements cited on page 1.

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# 3 EQUIPMENT UNDER TEST

## 3.1 Power supply system utilised

Power supply voltage: ■ Battery 1.5V

☐ Other (Specified blank below)

## 3.2 Short description of the Equipment under Test (EUT)

Number of tested samples: Serial number: Prototype

## 3.3 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

Normal

Operating Mode:	Normal
Fusionismo tonto	According to EN 04000 C 2 according for the high act distrubures
Emissions tests	: According to EN 61000-6-3, searching for the highest disturbance.
Immunity tests	: According to EN 61000-6-1, searching for the highest susceptivity.

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## 3.4 EUT configuration

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurement:

Not Applicable

#### 3.5 Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product.

### 3.6 Definition related to the performance level

- based on the used product standard
- ☐ based on the declaration of the manufacturer, requestor or purchaser

#### Criterion A:

Definition: normal performance within limits specified by the manufacturer, requestor or purchaser:

#### Criterion B:

Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention:

#### **Criterion C:**

Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

#### **Criterion D:**

Definition: loss of function or degradation of performance, which is not recoverable, owing to damage to hardware or software, or loss of data:

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#### 4 TEST ENVIRONMENT

#### 4.1 Address of the test laboratory

GZ test site: A101, No.65, Zhuji Road, Tianhe District, Guangzhou, Guangdong, China

Tel: +86-20-85543113 (32 lines) Fax: +86-20-38780406

#### 4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 ° C
Humidity:	25~75 %
Atmospheric pressure:	86~106 kPa

## 4.3 Definitions of symbols used in this test report

- The black square indicates that the listed condition, standard or equipment is applicable for this report.
- The empty square indicates that the listed condition, standard or equipment is **not** applicable for this report.

## 4.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the CTS quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

## 4.5 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	±1.22dB	(1)
Power disturbance	30MHz~300MHz	±1.38dB	(1)
Dediction emission (2m)	30MHz~300MHz	±3.14dB	(1)
Radiation emission (3m)	300MHz~1000MHz	±3.18dB	(1)

<sup>(1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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<sup>(2)</sup> The actual EUT tested items in this test report, only applies to this "measurement uncertainty" in part / all of the corresponding data.





# **4.6 Test Description**

## 4.6.1 Description of Standards and Results

EMISSION (EN 61000-6-3:2007+A1:2011+AC:2012)					
Description of Test Item		Standard			Results
Conducted disturbance at mains terminals	EN 610	000-6-3:2007+A1:2011+AC:20	)12		N/A
Conducted disturbance at telecommunication port	EN 610	000-6-3:2007+A1:2011+AC:20	12		N/A
Radiated disturbance	EN 610	00-6-3:2007+A1:2011+AC:20	12		PASS
Harmonic current emissions		EN 61000-3-2:2014		Class A	N/A
Voltage fluctuations & flicker		EN 61000-3-3:2013			N/A
	IM	MUNITY (EN 61000-6-1:2007	')		
Description of Test Ite	Basic Standard	Performance Criteria		Results	
Electrostatic discharge (ESD)		IEC 61000-4-2: 2008		В	PASS
Radio-frequency, Continuous radiated disturbance		IEC 61000-4-3:2006 +A1:2007+A2:2010		Α	PASS
Electrical fast transient (EFT)		IEC 61000-4-4:2012		В	N/A
Surge (Input a.c. power ports)		IEC 61000-4-5: 2014		В	N/A
Radio-frequency, Continuous conducted disturbance		IEC 61000-4-6: 2013		Α	N/A
Power frequency magnetic field		IEC 61000-4-8: 2009		Α	PASS
Voltage dips, >95% reduction	Voltage dips, >95% reduction			В	N/A
Voltage dips, 30% reduction		IEC 61000-4-11: 2004		В	N/A
Voltage interruptions				С	N/A
N/A is an abbreviation for Not Applicable.					

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## 5 TEST CONDITIONS AND RESULTS

## 5.1 Radiated disturbance (electric field)

For test instruments and accessories used see section 6 part 6.1.

#### 5.1.1 Description of the test location

Test location : Semi-Anechoic chamber

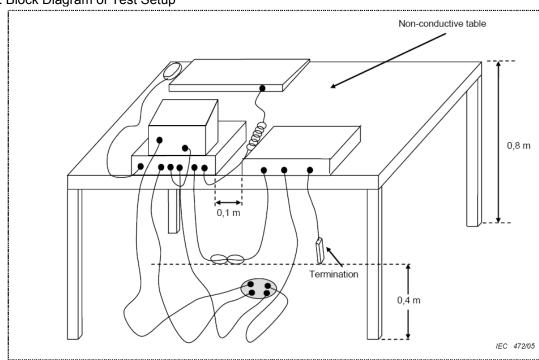
Test disturbance: 3 Meter

#### 5.1.2 Description of the test set-up

#### 5.1.2.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

#### 5.1.2.2 Block Diagram of Test Setup



#### 5.1.3 Limits of disturbance

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBµV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

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#### 5.1.4 Test result

The requirements are	Fulfilled
Band width	120kHz
Frequency range	30 MHz - 1000 MHz
Min. limit margin	>16.38 dB at 30 - 1000 MHz

**Remarks:** The limits are kept. For detailed results, please see the following page(s).

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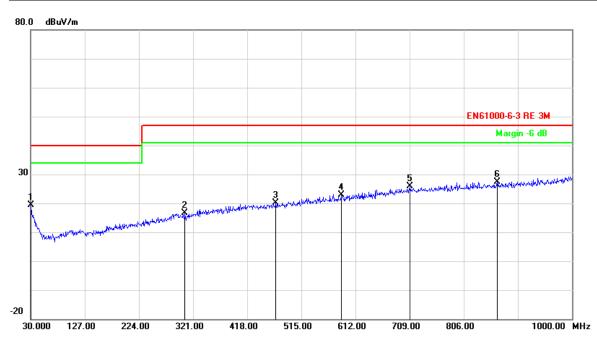
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#### 5.1.5 Test protocol

Test point:	Horizontal	Result:	- passed
Operation mode	Normal		□ - not passed
Remarks:			

EUT	pan clock
Operating Condition	Battery 1.5V
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Eric
MODEL NO.	MO9410



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	30.0000	-10.67	29.93	19.26	40.00	-20.74	QP
2	306.4500	-12.72	29.28	16.56	47.00	-30.44	QP
3	469.4100	-8.48	28.57	20.09	47.00	-26.91	QP
4	586.7800	-6.09	28.87	22.78	47.00	-24.22	QP
5	709.9699	-3.31	29.10	25.79	47.00	-21.21	QP
6	866.1400	-1.52	28.78	27.26	47.00	-19.74	QP

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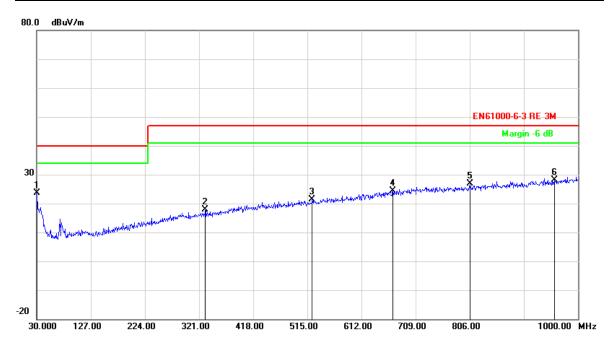
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Test point:	Vertical	Result:	■ - passed
Operation mode	Normal		☐ - not passed
Remarks:			

EUT	pan clock
MODEL NO.	MO9410
Operating Condition	Battery 1.5V
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Eric



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	30.9699	-11.12	34.74	23.62	40.00	-16.38	QP
2	332.6399	-11.89	29.69	17.80	47.00	-29.20	QP
3	523.7300	-7.41	28.78	21.37	47.00	-25.63	QP
4	668.2599	-4.18	28.59	24.41	47.00	-22.59	QP
5	806.0000	-2.19	28.98	26.79	47.00	-20.21	QP
6	957.3200	0.07	28.08	28.15	47.00	-18.85	QP

Note:Level=Reading+Factor. Margin= Limit-Level

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## 5.2 Electrostatic discharge

For test instruments and accessories used see section 6 part 6.2.

#### 5.2.1 Description of the test location

Test location:	Test location no. 2
Power supply:	Battery 1.5V
Test condition:	Ambient Temperature: 24℃, Humidity:56%
Date of test :	04~11 June 2018
Operator :	Eric

#### 5.2.2 Severity of levels electrostatic discharge

5.2.2.1 Severity level: Contact discharge at  $\pm$ 4KV air discharge at  $\pm$ 8KV

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

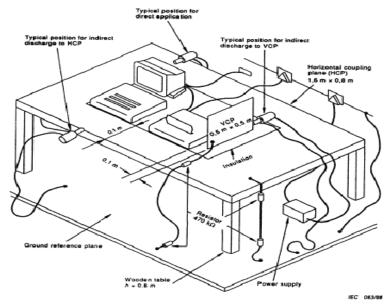
5.2.2.2 Performance criterion: B

## 5.2.3 Description of the test set-up

5.2.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

#### 5.2.3.2 Block Diagram of Test Setup



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## 5.2.4 Test specification:

Contact discharge voltage:	■ 2 kV	1 kV	
Air discharge voltage:	■ 2 kV ■ 4	4 kV ■ 8 kV	
Discharge impedance:	■ 330 Ω / 150 pF		
Discharge factor:	■ ≥1 sec.		
Number of discharges:	■ ≥10		
Type of discharge:	Direct discharge	■ Air discharge	
	Indirect discharge	<ul><li>■ Contact discharge</li><li>■ Contact discharge</li></ul>	
Polarity:	■ Positive	■ Negative	
Discharge location:	■see photo docume	ntation of the test set-up	
	■all external location	ns accessible by hand	
	■horizontal plate (HCP)		
	■vertical coupling plate (VCP)		

#### 5.2.5 Test result

The requirements are **Fulfilled** Performance Criterion: **B** 

**Remarks:** During the test no deviation was detected to the selected operation mode(s).

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## 5.3 Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 6 part 6.3.

#### 5.3.1 Description of the test location

Test location:	Test location no. 2
Power supply:	Battery 1.5V
Test condition:	Ambient Temperature: 24℃, Humidity:56%
Date of test :	04~11 June 2018
Operator :	Eric

### 5.3.2 Severity levels of radiated, Radio-frequency, electromagnetic field

5.3.2.1 Severity level: 3V/m and 1V/m

Level	Field strenght(V/m)
1	1
2	3
3	10
X	Special

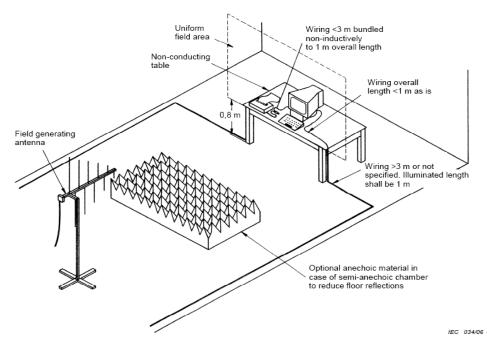
5.3.2.2 Performance criterion: A

#### 5.3.3 Description of the test set-up

5.3.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

## 5.3.3.2 Block Diagram of Test Setup



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## 5.3.4 Test

Test specification:	
Frequency range:	■ 80 MHz to 1000 MHz
Field strength:	■ 3 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time
Antenna polarisation:	■ horizontal ■ vertical
Frequency range:	■ 1400 MHz to 2000 MHz
Field strength:	■ 3 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time
Antenna polarisation:	■ horizontal ■ vertical
Frequency range:	■ 2000 MHz to 2700 MHz
Field strength:	■ 1 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time

#### 5.3.5 Test result

The requirements are Fulfilled Performance Criterion: A

Remarks: During the test no deviation was detected to the selected operation mode(s).

horizontal

vertical

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## 5.4 Power frequency magnetic field

For test instruments and accessories used see section 6 part 6.4.

## 5.4.1 Description of the test location

Test location:	Test location no. 2
Power supply:	Battery 1.5V
Test condition:	Ambient Temperature: 24℃, Humidity:56%
Date of test :	04~11 June 2018
Operator :	Eric

#### 5.4.2 Severity levels of magnetic field immunity

5.4.2.1 Severity Level: 3A/m

Level	Magnetic Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X	Special

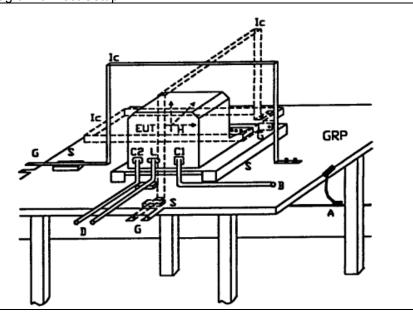
5.4.2.2 Performance Criterion: A

#### 5.4.3 Description of the test set-up

#### 5.4.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

#### 5.4.3.2 Block Diagram of Test Setup



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## 5.4.4 Test specification:

Test frequency:	■ 50 Hz
Continuous field:	■ 3 A/m
Duration (Continuous field):	■ 60 s each Axis
Short duration (1-3s):	■ 3S
Axis:	■ x-axis ■ y-axis ■ z-axis

#### 5.4.5 Test result

The requirements are **Fulfilled** Performance Criterion: **A** 

**Remarks:** During the test no deviation was detected to the selected operation mode(s).

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# 6 USED TEST EQUIPMENT

6.1

Radiated Emission(Electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2018/03/20
2	EMI Test Receiver	ROHDE & SCHWARZ	ESVS 10	842885/001	2017/10/18
3	Log per Antenna	ETS	3142C	00060447	2018/03/20
4	Pre-Amplifier	EMC	EMC330	980113	2018/03/20
5	Pre-Amplifier	EMC	EMC012645	980114	2018/03/20
6	EMI Test Software	Farad	EZ-EMC	N/A	N/A

6.2

Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	Schlöder	SESD 230	106003	2018/03/20

6.3

RF Field Strength Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	ROHDE & SCHWARZ	SMY 01	843215/014	2017/10/18
2	Signal Generator	ROHDE & SCHWARZ	SML03	102986	2017/10/18
3	Amplifier	KALMUS	713FC	7385-1	2017/10/18
4	Power Meter	ROHDE & SCHWARZ	NRVS	842856/049	2017/10/18
5	Field Probe	ETS	HI-6005	00075047	2017/10/18
6	RS Test Software	Farad	EZ-RS	N/A	N/A

6.4

Power Frequency Magnetic Field Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power frequency mag-field generator System	EM TEST	EMS61000-8K	409001	2017/10/18

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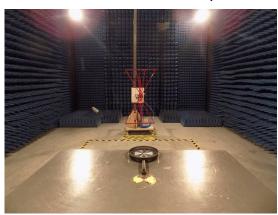
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# 7 TEST PHOTOGRAPHS

7.1. Photo of radiated emission measurement (R.E. Electric field)



7.2. Photo of electrostatic discharge Immunity measurement (E.S.D.)



## 7.3. Photo of RF field strength Immunity measurement (R.S.)



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## 7.4. Photo of PFM field immunity measurement (P.F.M.F.)



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# 8 EXTERNAL AND INTERNAL PHOTOS OF THE EUT



**External view 1** 



**External view 2** 



**External view 3** 

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**External view 4** 



Internal view



**Following Number External view** 

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# 9 Manufacturer/ Approval holder Declaration

The following identical model(s):

MO7503

Belong to the tested device:

Product description: pan clock Model name: MO9410

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