



XonTel Technology Trd. Co. W.L.L

CE EMC REPORT

Prepared For :	XonTel Technology Trd. Co. W.L.L Kuwait City, Qibla, Aladel Tower, F21, state of Kuwait.
Product Name:	Smoke Detector
Trademark:	XonTel
Main Test Model:	SD-01
Prepared By :	BST Testing (Shenzhen) Co.,Ltd. No.7, New Era Industrial Zone, Guantian, Bao'an District, Shenzhen, Guangdong, China
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Manager



1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: XonTel Technology Trd. Co. W.L.L
Address of applicant: Kuwait City, Qibla, Aladel Tower, F21, state of Kuwait.
Manufacturer: XonTel Technology Trd. Co. W.L.L
Address of manufacturer: Kuwait City, Qibla, Aladel Tower, F21, state of Kuwait.

General Description of EUT	
EUT Description:	Smoke Detector
Model No.:	SD-01
Rated Voltage:	Battery: 2xLR03 AAA 1.5V
Software Version:	V1.0
Hardware Version:	V1.0
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Bluetooth	
Frequency Range:	2402MHz-2480MHz
Type of Modulation:	GFSK
Antenna Gain:	0dBi



1.2 Test Standards

The following report is prepared on behalf of the Lurbe Grup S.A. in accordance with ETSI EN 301 489-1 V2.2.3 (2019-11), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU, Final ETSI EN 301 489-9 V2.1.1 (2019-11), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 9: Specific conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU, ETSI EN 301 489-17 V3.2.2 (2019-12), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

The objective of the manufacturer is to demonstrate compliance with the standards EN 301489-1, EN301 489-9 and EN 301489-17.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with the standard ETSI EN 301 489-1 V2.2.3 (2019-11), ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU

1.4 Test Facility

CNAS Registration No.: L10611

BST Testing (Shenzhen) Co.,Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L10611. All measurement facilities used to collect the measurement data are located at No.7,New Era Industrial Zone, Guantian, Bao'an District,Shenzhen,Guangdong, China



1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
ON	Bluetooth	TR, CR, TT, CT for EMS testing

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/



1.6 Performance Criteria for EMS

According Clause 6.2 of EN 301 489-9, the performance criteria are:

In the table below:

For equipment which does not provide a continuous communication link:

- performance criteria A for category 1 equipment;
- performance criteria C for categories 2 and 3 equipment.

NOTE: For immunity tests with transient phenomena, equipment not permitting the establishment of a continuous communications link and ancillary equipment intended to be tested on a stand alone basis shall meet the performance criteria B as given in table 1, except for immunity tests with voltage dips and interruptions (see ETSI EN 301 489-1 [1], clause 9.7), where it is explicitly stated that the communications link need not be maintained in which case performance criteria C from table 1 shall apply.

For ancillary equipment tested on a stand alone basis:

The provision of ETSI EN 301 489-1 [1], clause 6.4 shall apply.

Table 2: Continuous phenomena, minimum performance criteria

Equipment category	Minimum performance criterion	Intended use
Category 1	30 dB SINAD	Professional applications
Category 2	20 dB SINAD	Domestic entertainment
Category 3	6 dB SINAD	General consumer

Where the EUT is a transmitter only, and a stand-by mode of operation is provided, the tests shall be repeated with the EUT in stand-by mode of operation to ensure that unintentional transmission does not occur. Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.



According Clause 6.1 of EN 301 489-17,

The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

Table 1: Performance criteria

Criteria	During test	After test
A	Shall operate as intended. (see note 1). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance (see note 3). Shall be no loss of function. Shall be no loss of stored data or user programmable functions.
B	May show loss of function (one or more). May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3).
<p>NOTE 1: Operate as intended during the test allows a level of degradation not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.</p> <p>NOTE 2: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.</p> <p>NOTE 3: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.</p>		



1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2022-11-15	2023-11-14
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2022-11-15	2023-11-14
Amplifier	Agilent	8447F	3113A06717	2022-11-15	2023-11-14
Amplifier	C&D	PAP-1G18	2002	2022-11-15	2023-11-14
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2022-11-15	2023-11-14
Horn Antenna	ETS	3117	00086197	2022-11-15	2023-11-14
Loop Antenna	Schwarz beck	BTZB 1516	9773	2022-11-15	2023-11-14
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2022-11-15	2023-11-14
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2022-11-15	2023-11-14
AC LISN	Schwarz beck	NSLK8126	8126-224	2022-11-15	2023-11-14
DC LISN	Schwarz beck	NNBM8126D	279	2022-11-15	2023-11-14
8-WIRE LISN	Schwarz beck	8158	CAT3-8158-0059	2022-11-15	2023-11-14
8-WIRE LISN	Schwarz beck	8158	CAT5-8158-0117	2022-11-15	2023-11-14
Digital Power Analyzer	California Instrument	PACS-1	72831	2022-11-15	2023-11-14
Power Source	California Instrument	500iX	25965	2022-11-15	2023-11-14
ESD Generator	TESQ AG	NSG 437	161	2022-11-15	2023-11-14
Signal Generator	Rohde & Schwarz	SMT03	100059	2022-11-15	2023-11-14
Voltage Probe	Rohde & Schwarz	URV5-Z2	100013	2022-11-15	2023-11-14
Power Amplifier	AR	150W1000	300999	2022-11-15	2023-11-14
Power Amplifier	AR	25S1G4AM1	305993	2022-11-15	2023-11-14
Transient 2000	EMC PARTNER	TRA2000	863	2022-11-15	2023-11-14
CW Simulator	EM Test	CWS 500C	0900-03	2022-11-15	2023-11-14
EMCPRO	KEYTEK	EMCPro	0509124	2022-11-15	2023-11-14
Coil	KEYTEK	F-1000-4-8	0533	2022-11-15	2023-11-14
Audio analyzer	Rohde & Schwarz	UPA	829743/001	2022-11-15	2023-11-14
GSM Tester	Rhode & Schwarz	CMU200	112012	2022-11-15	2023-11-14
Communication Tester	Rohde & Schwarz	CMW500	148650	2022-11-15	2023-11-14
Audio Power Amplifier	B&K	2716-C-001	/	2022-11-15	2023-11-14
Conditioning Amplifier	B&K	2690-0S2	/	2022-11-15	2023-11-14
Mouth Simulator	B&K	4227	/	2022-11-15	2023-11-14
Sound Calibrator	B&K	4231	/	2022-11-15	2023-11-14
1/2" Pressure-field Microphone	B&K	4192	/	2022-11-15	2023-11-14
Ear Simulator for Telephonometry	B&K	4185	/	2022-11-15	2023-11-14
Telephone Test Head	B&K	4206 B	/	2022-11-15	2023-11-14
Anechoic chamber	Albatross Projects	MCDC	----	2022-11-15	2023-11-14



2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
EN 301489-1 V2.2.3 (2019-11)	8.2	Radiated Emissions	Pass
	8.3	Conducted Emissions for DC Power Port	N/A
	8.4	Conducted Emissions for AC Power Port	N/A
	8.5	Harmonic Current Emissions	N/A
	8.6	Voltage Fluctuations and Flicker	N/A
	8.7	Telecommunication Ports	N/A
	9.2	Radio Frequency Electromagnetic Field	Pass
	9.3	Electrostatic Discharge	Pass
	9.4	Fast Transients, Common Mode	N/A
	9.5	Radio Frequency, Common Mode	Pass
	9.6	Transient and Surges in the Vehicular Environment	N/A
	9.7	Voltage Dips and Interruptions	N/A
	9.8	Surges	N/A

Pass: The EUT complies with the essential requirements in the standard
Fail: The EUT does not comply with the essential requirements in the standard
N/A: not applicable



3.4 Environmental Conditions

Temperature:	22 ° C
Relative Humidity:	55 %
ATM Pressure:	1015 mbar

3.5 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the EN 301489 Conducted margin for a Class B device, with the *worst* margin reading of:

3.6 Conducted Emissions Test Data

N/A



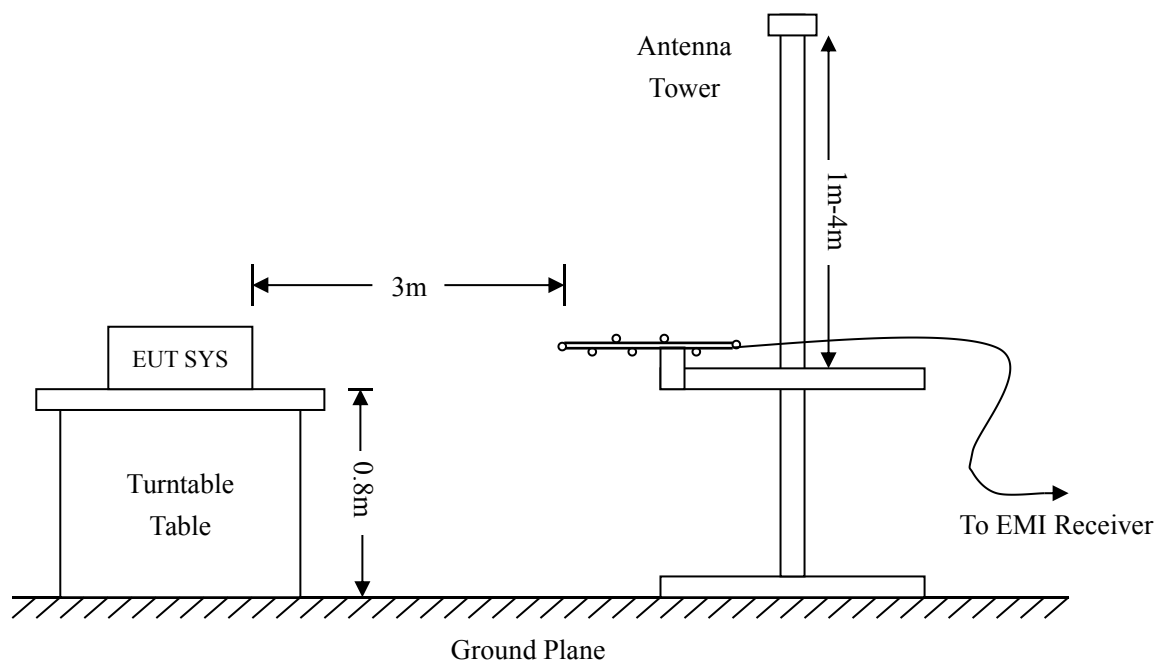
4. Radiated Emissions

4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Procedure

Test is conducting under the description of EN55032 and EN55035 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.





4.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of $-6\text{dB}\mu\text{V}$ means the emission is $6\text{dB}\mu\text{V}$ below the maximum limit for Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN 301489 Class B Limit}$$

4.4 Environmental Conditions

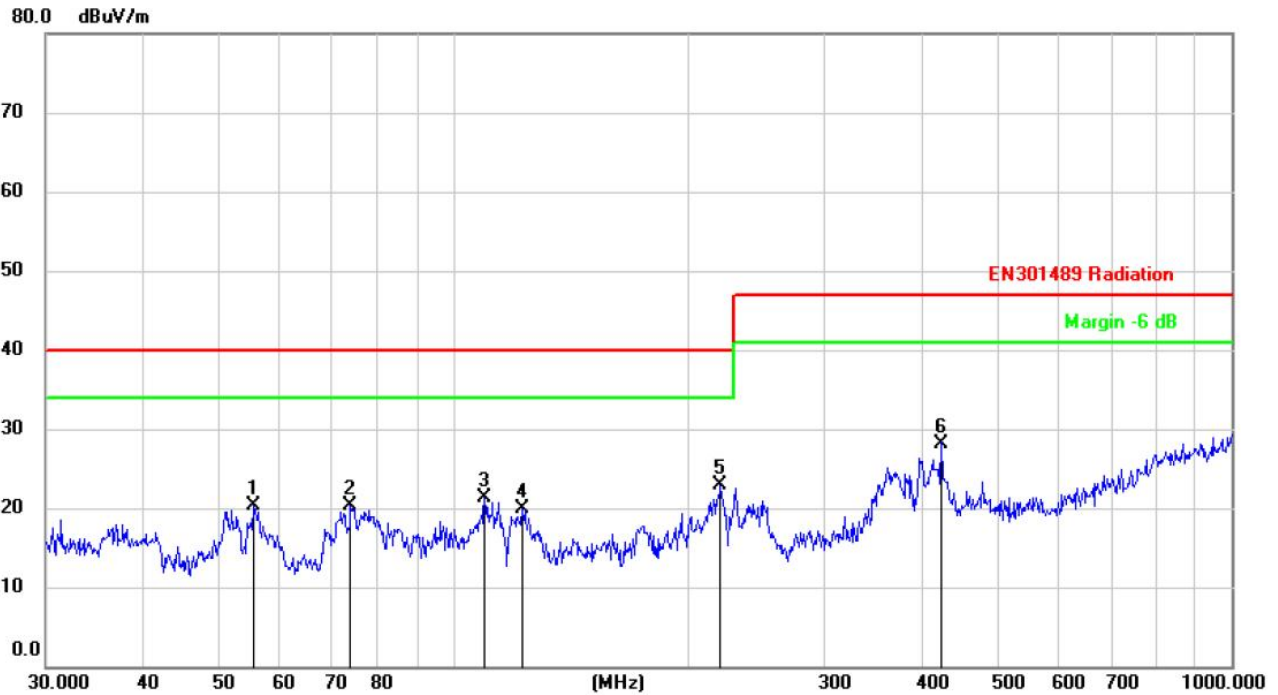
Temperature:	23° C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

4.5 Summary of Test Results/Plots



Plot of Radiated Emissions Test Data (Below 1GHz)

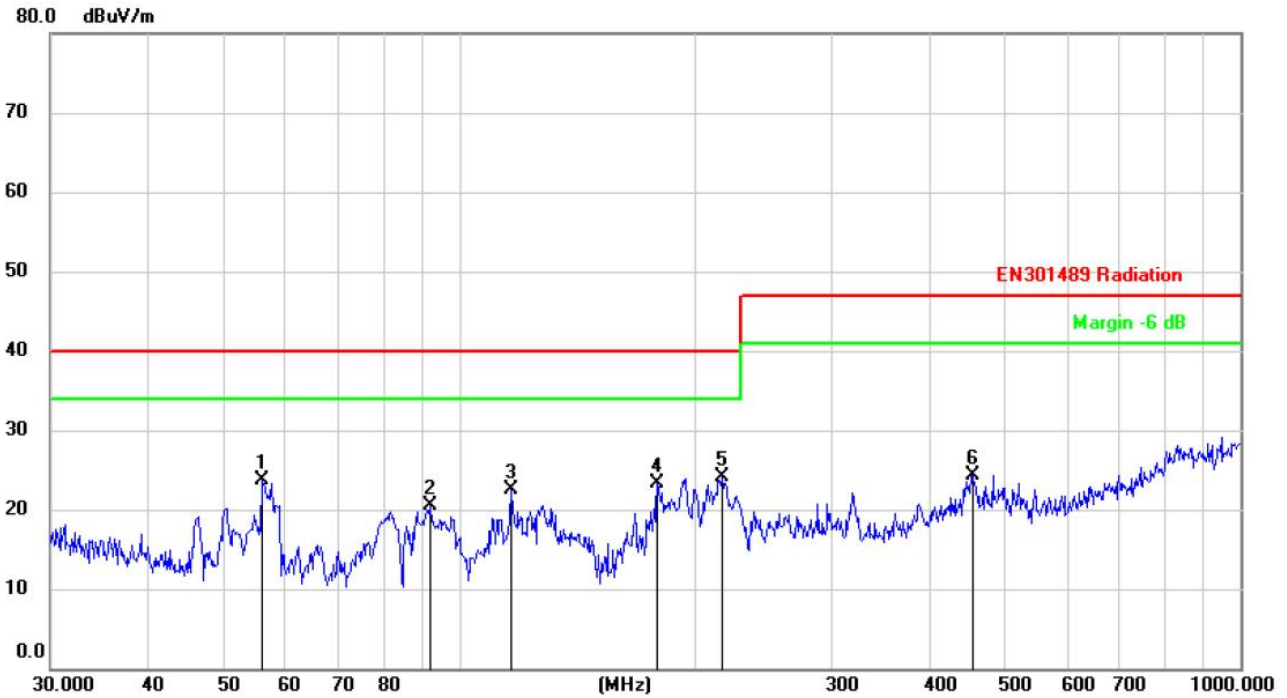
EUT: *Smoke Detector*
 Tested Model: *SD-01*
 Operating Condition: *ON*
 Comment: *DC 3.0V*
 Test Specification: *Horizontal*



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		55.4147	19.46	0.76	20.22	40.00	-19.78	QP	
2		73.8756	20.59	-0.20	20.39	40.00	-19.61	QP	
3		109.7960	19.93	1.38	21.31	40.00	-18.69	QP	
4		122.8340	17.43	2.47	19.90	40.00	-20.10	QP	
5	*	220.6170	21.34	1.50	22.84	40.00	-17.16	QP	
6		423.5403	21.78	6.42	28.20	47.00	-18.80	QP	



Test Specification: Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dBuV/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		56.0007	23.05	0.70	23.75	40.00	-16.25	QP	
2		91.8161	20.92	-0.35	20.57	40.00	-19.43	QP	
3		116.5400	20.16	2.25	22.41	40.00	-17.59	QP	
4		179.3863	22.88	0.50	23.38	40.00	-16.62	QP	
5	*	216.7828	22.69	1.50	24.19	40.00	-15.81	QP	
6		454.3100	17.08	7.28	24.36	47.00	-22.64	QP	

Emissions 1 - 6 GHz

During measurements from 1 GHz to 6 GHz, only base noise was detected.



5. Harmonic Current Emissions

5.1 Test Procedure

Test is conducting under the description of EN61000-3-2.

5.2 Test Standards

EN61000-3-2, Clause 7.1 Limits for Class A equipment.

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	48%
ATM Pressure:	1018 mbar

5.3 Harmonic Current Emissions Test Data

Result: N/A



6. Voltage Fluctuation and Flicker

6.1 Test Procedure

Test is conducting under the description of EN61000-3-3.

6.2 Test Standards

EN61000-3-3, Limit: Clause 5.

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	48%
ATM Pressure:	1018 mbar

6.3 Voltage Fluctuation and Flicker Test Data



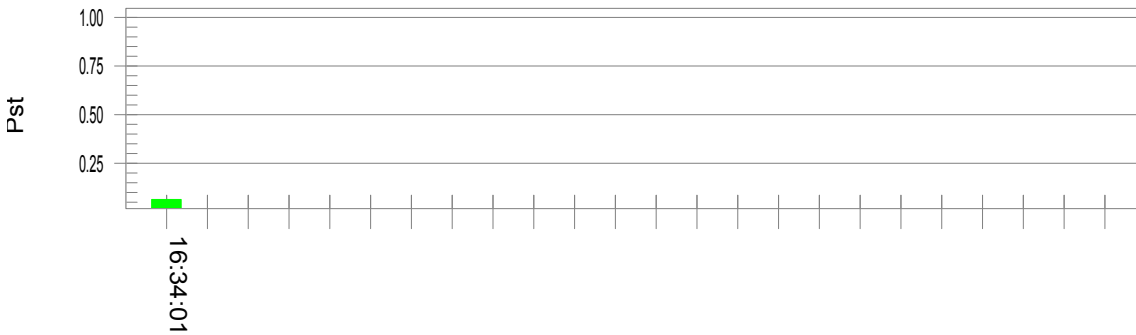
Flicker Test Summary per EN/IEC61000-3-3 (Run time)

Test Result: Pass

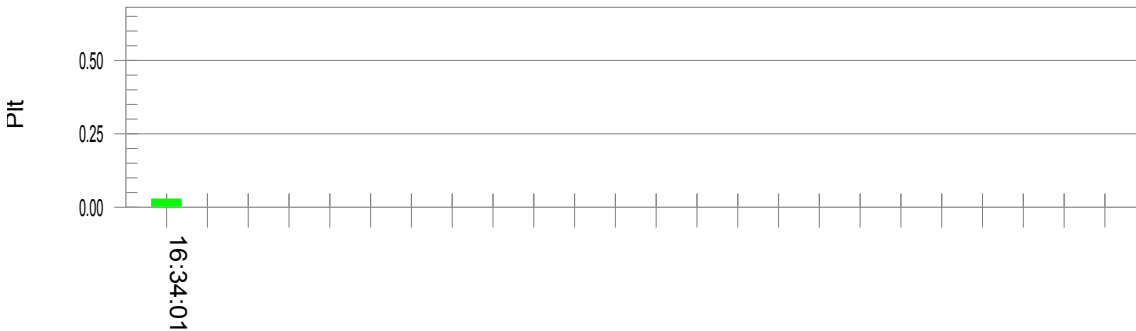
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	5.06		
Highest dt (%):	0.00	Test limit (%):	2.10
Time(mS) > dt:	0.0	Test limit (mS):	500.0
Highest dc (%):	0.00	Test limit (%):	2.10
Highest dmax (%):	0.00	Test limit (%):	3.00
Highest Pst (10 min. period):	0.051	Test limit:	1.000
Highest Plt (2 hr. period):	0.035	Test limit:	0.510

Test Result: N/A



7. Electrostatic Discharge (ESD)

7.1 Test Procedure

Test is conducting under the description of IEC61000-4-2.

7.2 Test Performance

Performance Criterion: A for BT_ CT, CR

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

7.3 Electrostatic Discharge Immunity Test Data



Test mode:

EN 61000-4-2 Test Points	Test Levels (Kv)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
USB port	B	B	B	B	B	B	B	B
Button	B	B	B	B	B	B	B	B
Screen	B	B	B	B	B	B	B	B
Plastic Part	B	B	B	B	B	B	B	B
Direct Contact Discharge								
Charge port	B	B	B	B				
Speaker	B	B	B	B				

EN 61000-4-2 Test Points	Test Levels (kV)							
	Indirect Contact Discharge (HCP)				Indirect Contact Discharge (VCP)			
	-2	+2	-4	+4	-2	+2	-4	+4
Front Side	A	A	A	A	A	A	A	A
Top Side	A	A	A	A	A	A	A	A
Back Side	A	A	A	A	A	A	A	A
Left Side	A	A	A	A	A	A	A	A
Right Side	A	A	A	A	A	A	A	A

Test Result: Pass



8. Radio Frequency Electromagnetic Field (R/S)

8.1 Test Procedure

Test is conducting under the description of IEC61000-4-3.

8.2 Test Performance

Performance Criterion: A for BT_ CT, CR

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1010 mbar

8.3 Continuous Radiated Disturbances Test Data

Frequency step: 1% of fundamental

Dwell time: 1 second

Modulation: AM by 1kHz sine wave with 80% modulation depth

Test model:

Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1000-3000	3	A	A	A	A	A	A	A	A
3000-6000	3	A	A	A	A	A	A	A	A

Test Result: Pass



9. Fast Transients, Common Mode (EFT)

9.1 Test Procedure

Test is conducting under the description of IEC61000-4-4.

9.2 Test Performance

Performance Criterion:

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

9.3 Electrical Fast Transients Test Data

Test mode:

EN 61000-4-4 Test Points		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
Power Supply Power Port of EUT	L1	B	B	B	B	/	/	/	/
	L2	B	B	B	B	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L1+L2	B	B	B	B	/	/	/	/
	L1 + PE	/	/	/	/	/	/	/	/
	L2 + PE	/	/	/	/	/	/	/	/
	L1+L2+PE	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	

Test Result: N/A



10. Surges

10.1 Test Procedure

Test is conducting under the description of IEC 61000-4-5.

10.2 Test Performance

Performance Criterion: A for BT_ CT, CR

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1008mbar

10.3 Surge Test Data

Test mode: BT_TT, TR

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L-N	B	/
2	1kV	±	L-N	B	/
3	2kV	±	L-N, L-PE, N-PE	B	/
4	4kV	±	L-N, L-PE, N-PE	/	/

Test Result: N/A



11. Radio Frequency, Common Mode (C/S)

11.1 Test Procedure

Test is conducting under the description of IEC 61000-4-6.

11.2 Test Performance

Performance Criterion: A for BT_ CT, CR

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1008 mbar

11.3 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second

Test mode:

Level	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
1	1	AM 80%, 1kHz sinewave	/	/
2	3	AM 80%, 1kHz sinewave	A	/
3	10	AM 80%, 1kHz sinewave	/	/
X	Special	/	/	/

Test Result: N/A



12. Voltage Dips and Interruptions

12.1 Test Procedure

Test is conducting under the description of IEC 61000-4-11.

Test Performance

Performance Criterion: B/C

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1008 mbar

12.2 Voltage Dips And Interruptions Test Data

U: Voltage dips in % U_T (U_T is rated voltage for the EUT)

T: Test duration

ON(Worst)

Level	U	T	Phase Angle	N	Pass	Fail
1	100%	10ms	0/90/180/270	3	B	/
2	100%	20ms	0/90/180/270	3	B	/
3	30%	500ms	0/90/180/270	3	B	/
4	100%	5000ms	0/90/180/270	3	C	/

Test Result: N/A



**ANNEX A:
Photo-documentation**



Photo 1

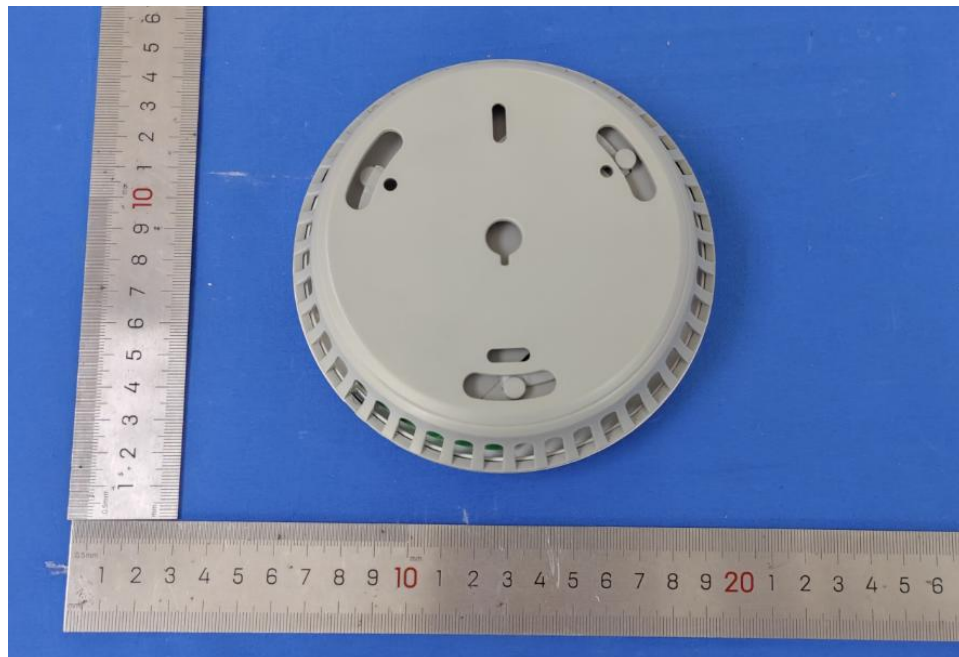


Photo 2

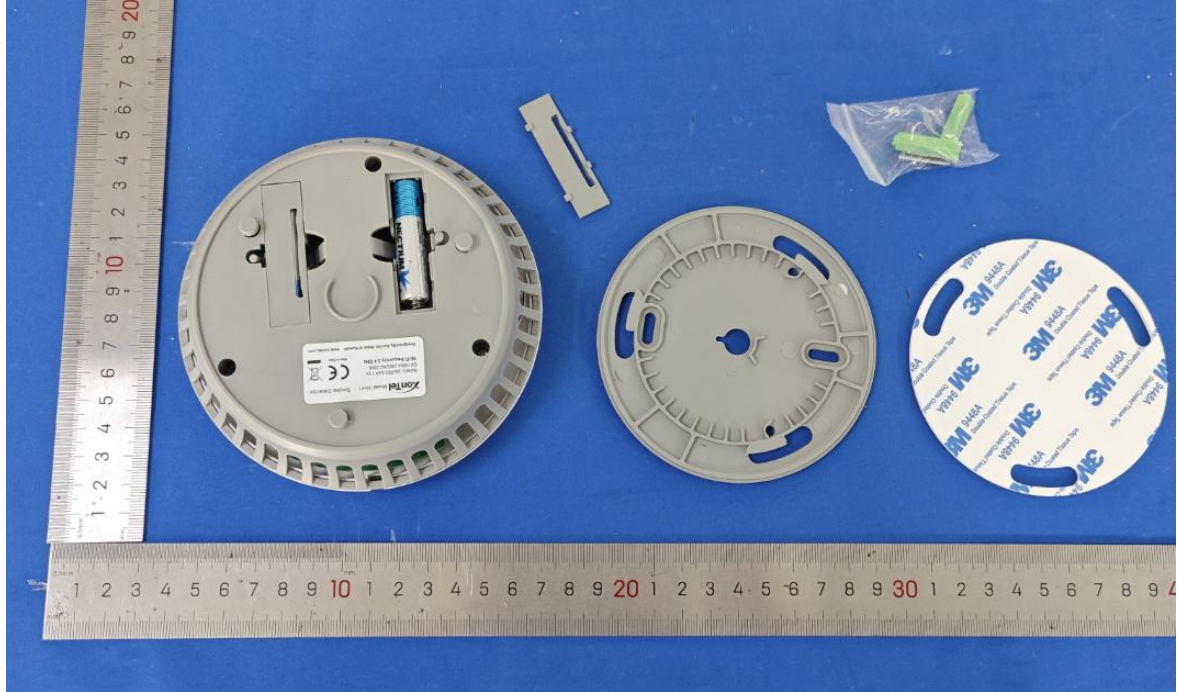


Photo 3

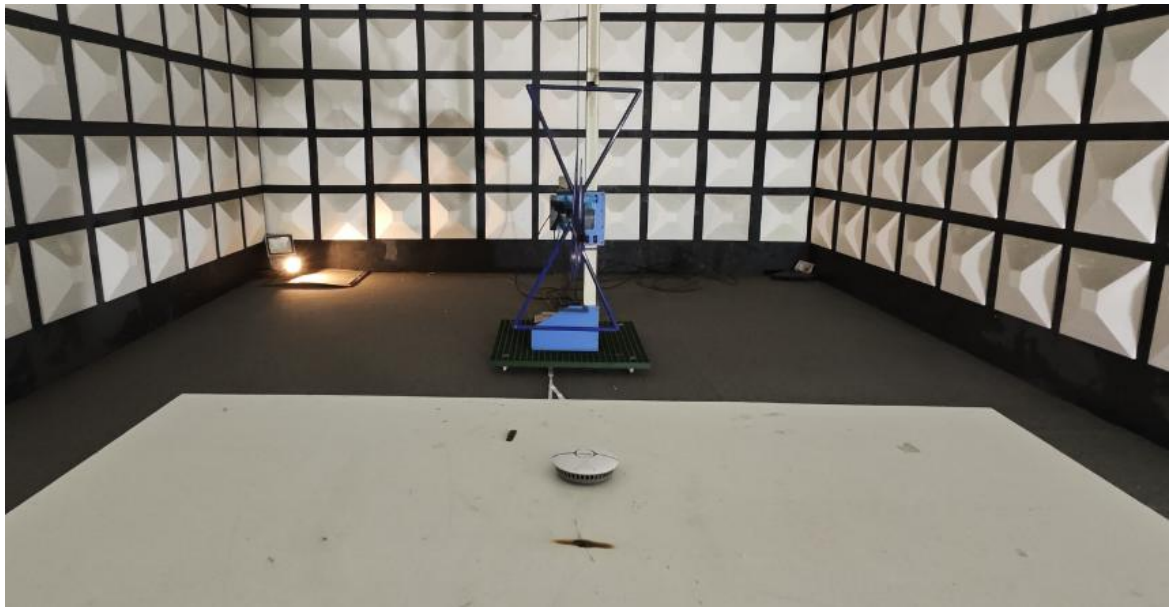


Photo 4

***** END OF REPORT *****