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TEST REPORT

SCOPE OF WORK
RAIDO FREQUENCY AND EMC TESTING–WX65 , P328.10

REPORT NUMBER
180508065SZN-001

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TEST REPORT

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Intertek Report No. : 180508065SZN-001

RADIO COMMUNICATIONS AND EMC TESTING REPORT

WX65 , P328.10

Bluetooth Speaker, WIRELESS SPERKER

BT Device

Test Report: 180508065SZN-001

Test Engineer :	Surel Guo Engineer	
Report Approved By :	Sunny Zhou Supervisor	
Date :	27 May 2018	

RADIO PERFORMANCE MEASUREMENTS
RESULT SUMMARY

Requirements	ETSI EN 300 328		Condition	Compliance
	Technical requirements	Test Specification		
	Clause Number			
RF Output Power	4.3.1.2	5.4.2		Complied
Duty cycle, Tx-Sequence, Tx-gap	4.3.1.3	5.4.2	Only for non-adaptive equipment and RF Output Power>10dBm	N/A
Accumulated Transmit time, Frequency Occupation & Hopping Sequence	4.3.1.4	5.4.4	Only for FHSS	Complied
Hopping Frequency Separation	4.3.1.5	5.4.5	Only for FHSS	Complied
Medium Utilisation	4.3.1.6	5.4.2	Only for non-adaptive equipment and RF Output Power>10dBm	N/A
Adaptivity	4.3.1.7	5.4.6	Only for adaptive equipment and RF Output Power>10dBm	N/A
Occupied Channel Bandwidth	4.3.1.8	5.4.7		Complied
Transmitter unwanted emission in the OOB domain	4.3.1.9	5.4.8		Complied
Transmitter unwanted emission in the spurious domain	4.3.1.10	5.4.9		Complied
Receiver spurious emissions	4.3.1.11	5.4.10		Complied
Receiver Blocking	4.3.1.12	5.4.11	Only for adaptive equipment and RF Output Power>10dBm	Complied
Geo-location capability	4.3.1.13	N/A	Only applies to equipment with geo-location capability	N/A
Technical requirements for other types of Wide Band modulation	4.3.2	5.4	Only for Wide band modulation other than FHSS	N/A
When determining the test conclusion, the Measurement Uncertainty of test has been considered. Note: N/A means Not apply.				

EMC COMPLIANCE MEASUREMENTS
RESULT SUMMARY

	ETSI EN 301 489-17	ETSI EN 301 489-1	Compliance
	Clause Number		
EMC Emission	7.1	8.2 8.4	Complied
Harmonic Current Emission (AC Mains Power Input Port)	7.1	8.5	N/A
Voltage Fluctuations and Flicker (AC Mains Power Input Port)	7.1	8.6	Complied
Electrostatic Discharge	7.2	9.3	Complied
Radio Frequency Electromagnetic Field (80MHz-6GHz)	7.2	9.2	Complied
Fast Transients	7.2	9.4	Complied
Surges	7.2	9.8	Complied
Conducted RF Immunity	7.2	9.5	Complied
Voltage Dips & Interruptions	7.2	9.7	Complied
When determining the test conclusion, the Measurement Uncertainty of test has been considered.			

EQUIPMENT UNDER TEST (EUT) INFORMATION

Applicant:

Description of EUT:	Bluetooth Speaker, WIRELESS SPERKER
Type Number (s):	WX65
Brand Name(s):	
Serial Number (s):	N/A
Equipment Received:	08 May 2018
Test Date (s):	08 May 2018 to 27 May 2018
Bluetooth Version:	Bluetooth 4.1 + EDR
Test Site and Location:	Intertek Testing Services Shenzhen Ltd. Longhua Branch (CNAS L0327) 1F/2F, Building B, QiaoAn Scientific Technology Park, Shangkeng Community, Guanhu Subdistrict, Longhua District, Shenzhen, P.R. China.
Test Specification (s):	ETSI EN 300 328 V2.1.1 (2016-11) Draft ETSI EN 301 489-1 V2.2.0 (2017-03) Draft ETSI EN 301 489-17 V3.2.0 (2017-03)

CONTENTS

EXHIBIT 1

GENERAL DESCRIPTION

1 INTRODUCTION

Intertek Testing Services Shenzhen Limited have tested the SHENZHEN DNS INDUSTRIES CO., LTD. WX65 Bluetooth Speaker, WIRELESS SPERKER. The sample was tested to the relevant performance specification published by the European Telecommunications Standards Institute. This report contains the results of these tests and is submitted to SHENZHEN DNS INDUSTRIES CO., LTD. as the final test results.

The Model: P328.10 is the same as the Model: WX65 in hardware aspect except. The differences are model number, appearance and trade name serves as marketing strategy. For more details please refer below list.

Trade name	Model no.
	WX65
	P328.10

The production units are required to conform to the initial sample as received when the units are placed on the market.

1.1 Product Information (Information as required by ETSI EN 300 328 V2.1.1 (2016-11), clause 5.4.1)

In accordance with ETSI EN 300 328 V2.1.1 (2016-11), clause 5.4.1, the following information is provided by the supplier.

a) The type of modulation used by the equipment:	☒ FHSS ☐ Other forms of modulation	
b) In case of FHSS modulation:	• In case of Non-Adaptive Frequency Hopping equipment: The number of Hopping Frequencies: _____	
	• In case of Adaptive Frequency Hopping Equipment: The maximum number of Hopping Frequencies: 79 The minimum number of Hopping Frequencies: 79	
	• The (average) Dwell Time: 338.12 ms Maximum	
c) Adaptive / non-adaptive equipment:	☐ Non-adaptive Equipment	
	☒ Adaptive Equipment without the possibility to switch to a non-adaptive mode	
	☐ Adaptive Equipment which can also operate in a non-adaptive mode	
d) In case of adaptive equipment:	The maximum Channel Occupancy Time implemented by the equipment: N/A ms	
	☒ The equipment has implemented an LBT based DAA mechanism	
	• In case of equipment using modulation different from FHSS:	☐ The equipment is Frame Based equipment
		☐ The equipment is Load Based equipment
		☐ The equipment can switch dynamically between Frame Based and Load Based equipment
	The CCA time implemented by the equipment: ___µs	
	☐ The equipment has implemented an non-LBT based DAA mechanism	
	☐ The equipment can operate in more than one adaptive mode	
e) In case of non-adaptive equipment:	The maximum RF Output Power (e.i.r.p.): -9.5 dBm	
	The maximum (corresponding) Duty Cycle: ____ %	
	Equipment with dynamic behaviour, that behaviour is described here. (e.g. the different combinations of duty cycle and corresponding power levels to be declared): _____	

f) The worst case operational mode for each of the following tests:	• RF Output Power: GFSK	
	• Power Spectral Density: N/A	
	• Duty cycle, Tx-Sequence, Tx-gap: N/A	
	• Accumulated Transmit time, Frequency Occupation & Hopping Sequence (only for FHSS equipment): π/4-DQPSK, GFSK	
	• Hopping Frequency Separation (only for FHSS equipment): π/4-DQPSK	
	• Medium Utilisation: N/A	
	• Adaptivity &Receiver Blocking: N/A	
	• Nominal Channel Bandwidth: π /4-DQPSK	
	• Transmitter unwanted emissions in the OOB domain: GFSK	
	• Transmitter unwanted emissions in the spurious domain: GFSK	
	• Receiver spurious emissions: GFSK	
g) The different transmit operating modes (tick all that apply):	☒ Operating mode 1: Single Antenna Equipment	☒ Equipment with only one antenna
		☐ Equipment with two diversity antennas but only one antenna active at any moment in time
		☐ Smart Antenna Systems with two or more antennas, but operating in a (legacy) mode where only one antenna is used. (e.g. IEEE 802.11™ [i.3] legacy mode in smart antenna systems)
	☐ Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming	☐ Single spatial stream / Standard throughput / (e.g. IEEE 802.11™ [i.3] legacy mode)
		☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1
		☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2
	☐ Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming	☐ Single spatial stream / Standard throughput (e.g. IEEE 802.11™ [i.3] legacy mode)
		☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 1
		☐ High Throughput (> 1 spatial stream) using Nominal Channel Bandwidth 2
h) In case of Smart Antenna Systems:	• The number of Receive chains: 1	
	• The number of Transmit chains:__1__	☐ symmetrical power distribution
		☐ asymmetrical power distribution
		In case of beam forming, the maximum (additional) beam forming gain: __dB
i) Operating Frequency Range(s) of the equipment:	• Operating Frequency Range 1: 2402MHz to 2480 MHz	
	• Operating Frequency Range 2:___MHz to___MHz	
j) Nominal Channel Bandwidth(s):	• Nominal Channel Bandwidth 1:1.18 MHz	
	• Nominal Channel Bandwidth 2: __MHz	
k) Type of Equipment (stand-alone, combined, plug-in radio device, etc.):	☒ Stand-alone	
	☐ Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment)	
	☐ Plug-in radio device (Equipment intended for a variety of host systems)	
	☐ Other:_____	

<table>
<tr><td rowspan="6">l) The normal and the extreme operating conditions that apply to the equipment:</td><td colspan="2">Normal operating conditions (if applicable):</td></tr>
<tr><td colspan="2">Operating temperature: …25… ° C</td></tr>
<tr><td colspan="2">Other (please specify if applicable): ……</td></tr>
<tr><td colspan="2">Extreme operating conditions:</td></tr>
<tr><td colspan="2">Operating temperature range: 0 ° C to 45 ° C</td></tr>
<tr><td>Details provided are for the:</td><td>☒ stand-alone equipment
☐ combined (or host) equipment
☐ test jig</td></tr>
<tr><td rowspan="5">m) The intended combination(s) of the radio equipment power settings and one or more antenna assemblies and their corresponding e.i.r.p levels:</td><td colspan="2">• Antenna Type: Internal PCB Antenna</td></tr>
<tr><td>☒ Integral Antenna</td><td>Antenna Gain: 0 dBi
If applicable, additional beamforming gain (excluding basic antenna gain):____dB
☐ Temporary RF connector provided
☐ No temporary RF connector provided</td></tr>
<tr><td>☐ Dedicated Antennas (equipment with antenna connector)</td><td>☐ Single power level with corresponding antenna(s)
☐ Multiple power settings and corresponding antenna(s)
Number of different Power Levels: ____
Power Level 1: ____ dBm
Power Level 2: ____ dBm
Power Level 3: ____ dBm
Note: These power levels are conducted power levels (at antenna connector).</td></tr>
<tr><td colspan="2">• For each of the Power Levels, provide the intended antenna assemblies, their corresponding gains (G) and the resulting e.i.r.p. levels also taking into account the beamforming gain (Y) if applicable</td></tr>
<tr><td colspan="2">Power Level 1:____ dBm
Number of antenna assemblies provided for this power level: ____
<table>
<tr><th>Assembly #</th><th>Gain (dBi)</th><th>e.i.r.p. (dBm)</th><th>Part number or model name</th></tr>
<tr><td>1</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td></tr>
</table>
Power Level 2: ____ dBm
Number of antenna assemblies provided for this power level: ____
<table>
<tr><th>Assembly #</th><th>Gain (dBi)</th><th>e.i.r.p. (dBm)</th><th>Part number or model name</th></tr>
<tr><td>1</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td></tr>
</table>
Power Level 3: ____ dBm
Number of antenna assemblies provided for this power level: ____
<table>
<tr><th>Assembly #</th><th>Gain (dBi)</th><th>e.i.r.p. (dBm)</th><th>Part number or model name</th></tr>
<tr><td>1</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td></tr>
</table></td></tr>
</table>

n) The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test jig in case of plug-in devices:	Details provided are for the:	☒ stand-alone equipment ☐ combined (or host) equipment ☐ test jig
	Supply Voltage	☐ AC mains State AC voltage ___ V ☒ DC State DC voltage 5.0 V In case of DC, indicate the type of power source ☐ Internal Power Supply ☐ External Power Supply or AC/DC adapter ☒ Battery ☐ Other: ___
o) Describe the test modes available which can facilitate testing:	N/A	
p) The equipment type (e.g. Bluetooth®, IEEE 802.11™ [i.3], IEEE 802.15.4™ [i.4], proprietary, etc.):	Bluetooth	
q) If applicable, the statistical analysis referred to in clause 5.3.1 q)	N/A	
r) If applicable, the statistical analysis referred to in clause 5.3.1 r)	N/A	
s) Geo-location capability supported by the equipment:	☐ Yes	☐ The geographical location determined by the equipment as defined in clause 4.3.1.13.2 or clause 4.3.2.12.2 is not accessible to the user.
	☒ No	
t) Describe the minimum performance criteria that apply to the equipment (see clause 4.3.1.12.3 or clause 4.3.2.11.3):	☒ The minimum performance criterion shall be a PER less than or equal to 10 %. ☐ The manufacturer may declare alternative performance criteria as long as that is appropriate for the intended use of the equipment:_____	

Note: N/A means Not apply.

2 TEST SPECIFICATION

2.1 RELEVANT PERFORMANCE SPECIFICATION

The relevant performance specifications for SHENZHEN DNS INDUSTRIES CO., LTD. WX65 Bluetooth Speaker, WIRELESS SPERKER is ETSI EN 300 328 V2.1.1 (2016-11). The harmonised standards are ETSI EN 300 328 V2.1.1 (2016-11), Draft ETSI EN 301 489-17 V3.2.0 (2017-03) and Draft ETSI EN 301 489-1 V2.2.0 (2017-03).

The tests performed are those required to demonstrate compliance with the technical specifications and the essential requirements of Article 3.1(b) and 3.2 of the Radio Equipment Directive (2014/53/EU) - RED for regulatory purposes.

2.2 TEST ENVIRONMENT

The tests were performed in the Radio communications and Electromagnetic Compatibility Test Facility at Intertek Testing Services Shenzhen Limited. The sample was subjected to the ambient conditions in the laboratory and indoor test site except during tests at extremes of temperatures and the Radiated Emissions Tests. The temperature and relative humidity recorded during the period of each test are given in the results.

2.3 CONFIGURATION OF TEST SAMPLE

The test sample consisted of one transceiver and under manufacturer's specified test mode, only the worst case data were reported.

2.4 TEST POWER SOURCES

The Bluetooth Speaker, WIRELESS SPERKER is intended to operate from DC5V, 1A. The test power source voltages were:

Nominal test voltage DC 5V

2.5 TEST FREQUENCIES

The sample supplied operated on 79 channels, nominally at 2402 - 2480 GHz for Transceiver. The channel is separated by 1 MHz channel spacing. The tests were carried out on channel 0, 39 and 78 channels of the frequency of the alignment range.

2.6 GENERAL REQUIREMENTS

2.6.1 MODULATION

Frequency Hopping Spread Spectrum (FHSS)
Constant envelope digital frequency modulation is used with GFSK, $\pi/4$ –DQPSK.

2.6.2 ANTENNA

The antenna used in Transceiver is Integral antenna.

2.6.3 Test Condition

Manufacturer's declared operating temperature: 0℃ to 45℃.

2.7 MEASUREMENT UNCERTAINTY

All measurement uncertainties stated in this report are estimated to a 95% confidence level.

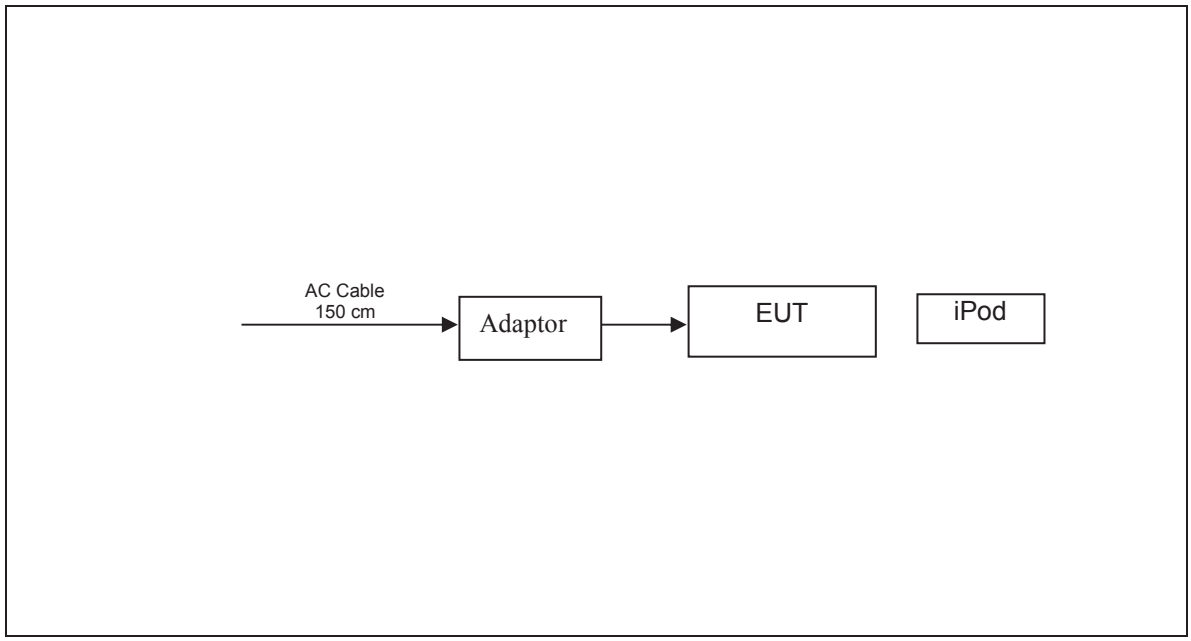
2.8 SUPPORT EQUIPMENT – RADIO PERFORMANCE MEASUREMENTS

Description	Manufacturer	Model No.
Bluetooth Tester	R&S	CMW500

2.9 SUPPORT EQUIPMENT – EMC COMPLIANCE MEASUREMENTS

Description	Manufacturer	Model No.
iPod	Apple	A1367
Adaptor	TP-LINK	T050100-2A3

2.10 CONFIGURATION OF TEST SAMPLE- – EMC COMPLIANCE MEASUREMENTS



2.11 PERFORMANCE CRITERIA

2.11.1 PERFORMANCE CRITERIA FOR CONTINUOUS PHENOMENA (CT & CR)

At the conclusion of the test the EUT shall operated as intended with no loss of user control functions or stored data, the communication link shall have been maintained during the test.

Where the EUT is transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

2.11.2 PERFORMANCE CRITERIA FOR TRANSIENT PHENOMENA (TT & TR)

At the conclusion of each exposure the EUT shall operated with no user noticeable loss of communication link.

Where the EUT is transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

EXHIBIT 2

TEST RESULT
OF
RADIO PERFORMANCE MEASUREMENTS

3 RF Output Power

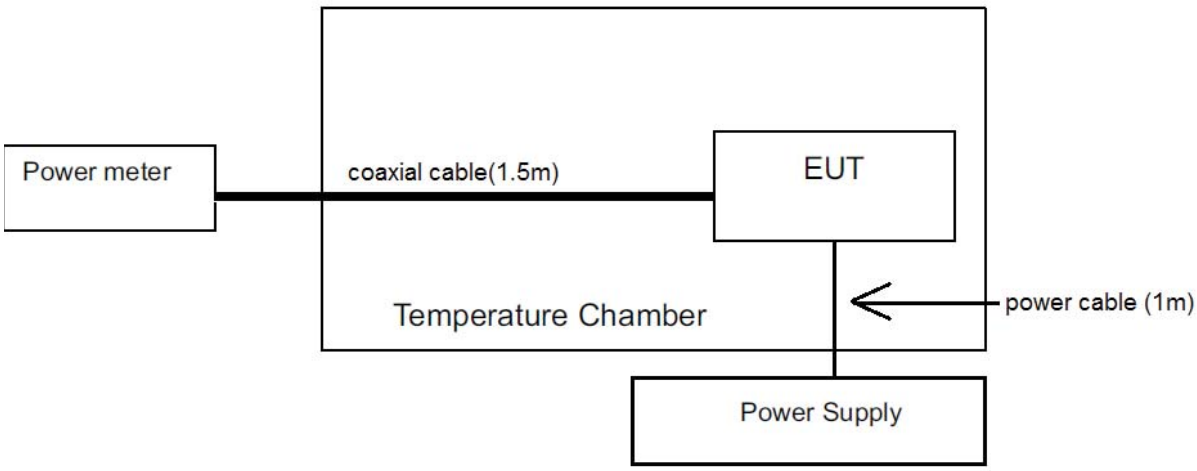
3.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.2
Test method	Conducted measurements

3.2 EQUIPMENT LIST

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ016-12	Temperature & Humidity Chamber	Terchy	MHK-120NK	24-Jan-2018	24-Jan-2019
SZ182-02	RF Power Meter	Anritsu	ML2496A	01-Jun-2017	01-Jun-2018
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	01-Jun-2017	01-Jun-2018
SZ006-12	AC Power Source	APC	AFC-11005GS	08-Jan-2018	08-Jul-2018

3.3 TEST SETUP



3.4 WORSE CASE TEST RESULT (DC Power Supply)

Worst test mode: GFSK

Test Conditions			Measured Power (dBm)	Limit (dBm)	Margin (dB)
Temperature (°C) Humidity (%)	Voltage (VAC)	Channel			
Ambient	V DC nom 5V	Channel 0	-9.5	20	-29.5
T_{min} 0℃ H_{min} 0%	V DC nom 5V		-9.8	20	-29.8
T_{max} 45℃ H_{max} 50%	V DC nom 5V		-9.7	20	-29.7
Ambient	V DC nom 5V	Channel 39	-10.2	20	-30.2
T_{min} 0℃ H_{min} 0%	V DC nom 5V		-11.3	20	-31.3
T_{max} 45℃ H_{max} 50%	V DC nom 5V		-10.9	20	-30.9
Ambient	V DC nom 5V	Channel 78	-10.7	20	-30.7
T_{min} 0℃ H_{min} 0%	V DC nom 5V		-11.5	20	-31.5
T_{max} 45℃ H_{max} 50%	V DC nom 5V		-11.2	20	-31.2

Notes: 1. Negative sign (-) in the margin column signify levels below the limit.
2. 20 dBm corresponds to 100mW.
3. Measurement Uncertainty: ±1.49dB.

4 Dwell Time, Minimum Frequency Occupation and Hopping Sequence

4.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.4
Test method	Conducted measurements

4.2 EQUIPMENT LIST

Serial No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ056-06	Signal Analyzer	R&S	FSV40	07-Jul-2017	07-Jul-2018
SZ062-14	RF cable	BELDEN	RG59-BN	05-Jan-2018	05-Jul-2018

Note1: Measurement Uncertainty: ± 5%.

4.3 Limits

4.3.1 Non-adaptive frequency hopping systems

The accumulated Dwell Time on any hopping frequency shall not be greater than 15 ms within any period of 15 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

The Minimum Frequency Occupation Time shall be equal to one dwell time within a period not exceeding four times the product of the dwell time per hop and the number of hopping frequencies in use.

4.3.2 Adaptive frequency hopping systems

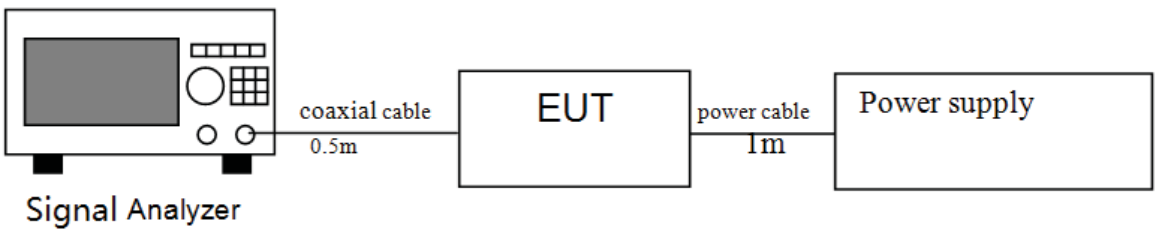
Adaptive Frequency Hopping systems shall be capable of operating over a minimum of 70 % of the band.

The maximum accumulated dwell time on any hopping frequency shall be 400 ms within any period of 400 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

The Minimum Frequency Occupation Time shall be equal to one dwell time within a period not exceeding four times the product of the dwell time per hop and the number of hopping frequencies in use.

4.4 TEST SETUP



4.5 Dwell Time

4.5.1 TEST RESULT

Worst test mode: π/4-DQPSK

Frequency (MHz)	Duty Cycle Data Packet	Dwell Time Per Hop (ms)	Minimun Number of Hop Frequency	400msX minimum number of hopping frequencies (s)	maximum accumulated dwell time (ms)	maximum dwell time limit (ms)	Result
2402	2DH5	2.92	79	31.6	338.12	400.0	Pass
2441	2DH5	2.93	79	31.6	382.36	400.0	Pass
2480	2DH5	2.93	79	31.6	391.84	400.0	Pass

4.6 Minimum Frequency Occupation

4.6.1 TEST RESULT

Worst test mode: π/4-DQPSK

Frequency (MHz)	Duty Cycle Data Packet	Dwell Time Per Hop (ms)	Actual Number of Hop Frequency (N)	[4*Dwell time per hop*N] (ms)	Number of hop in [4*Dwell time per hop*N]	Minimum Number of Hopping Limit in [4*Dwell time per hop*N] (ms)	Result
2402	2DH5	2.92	79	922.72	2	1	Pass
2441	2DH5	2.93	79	925.88	5	1	Pass
2480	2DH5	2.93	79	925.88	5	1	Pass

4.7 Hopping Sequence

4.7.1 TEST RESULT

Worst test mode: GFSK

Frequency Band	Number of Hopping Frequencies (N)		Limit	Result
2400MHz – 2483.5MHz	79		15	Pass
	-20dB Points Occupied Bandwidth	Minimum Hopping Range (%)	Minimum Hopping Range Limit (%)	Result
	79.492MHz	95.0%	70%	Pass

5 Hopping Frequency Separation

5.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.5
Test method	Conducted measurements (Option 2)

5.2 EQUIPMENT LIST

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ056-06	Signal Analyzer	R&S	FSV40	07-Jul-2017	07-Jul-2018

5.3 Limit

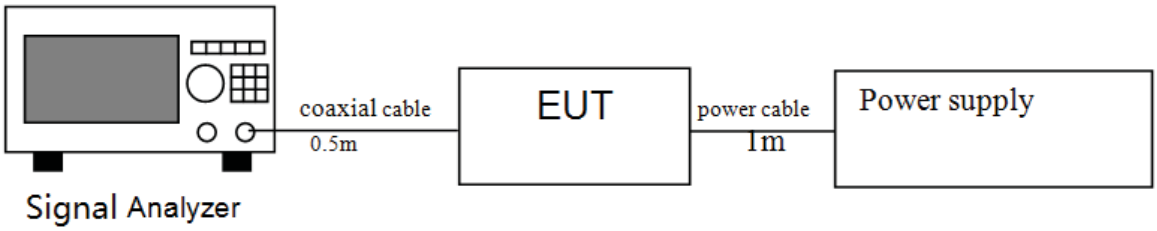
5.3.1 Non-adaptive frequency hopping systems

The minimum Hopping Frequency Separation shall be equal to Occupied Channel Bandwidth of a single hop, with a minimum separation of 100 kHz.

5.3.2 Adaptive frequency hopping systems

The minimum Hopping Frequency Separation shall be 100 kHz.

5.4 Test Setup



5.5 Test Result

Worst test mode: π/4-DQPSK

Test Channel (MHz)	F1pk (MHz)	F2pk (MHz)	Channel Separation (KHz)	Limit (KHz)
2402	2403.016	2402.015	1001	100
2441	2442.016	2441.015	1001	100
2480	2480.016	2479.015	1001	100

6 Occupied Channel Bandwidth

6.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.7
Test method :	Conducted measurements

6.2 EQUIPMENT LIST

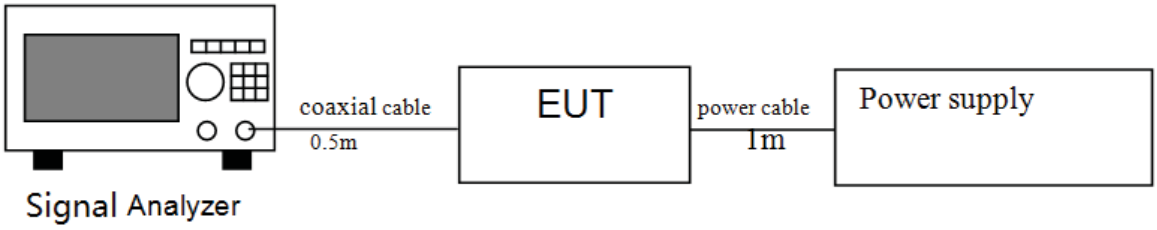
Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ056-06	Signal Analyzer	R&S	FSV40	07-Jul-2017	07-Jul-2018
SZ062-14	RF cable	BELDEN	RG59-BN	05-Jan-2018	05-Jul-2018

6.3 Limits

The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band 2,4GHz to 2,4835GHz.

For non-adaptive Frequency Hopping equipment with e.i.r.p greater than 10dBm, the Occupied Channel Bandwidth for every occupied hopping frequency shall be equal to or less than 5MHz.

6.4 Test Setup



6.5 Test Result

Worst test mode: π/4-DQPSK

Frequency (MHz)	Duty Cycle Data Packet	99% Bandwidth (MHz)	F_L at 99% BW (MHz)	F_H at 99% BW (MHz)	Result
2402	2DH5	1.18	2401.453	2402.630	Pass
2480	2DH5	1.18	2479.453	2480.630	Pass

7 Transmitter unwanted emissions in the out-of-band domain

7.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.8
Test method	Conducted measurements

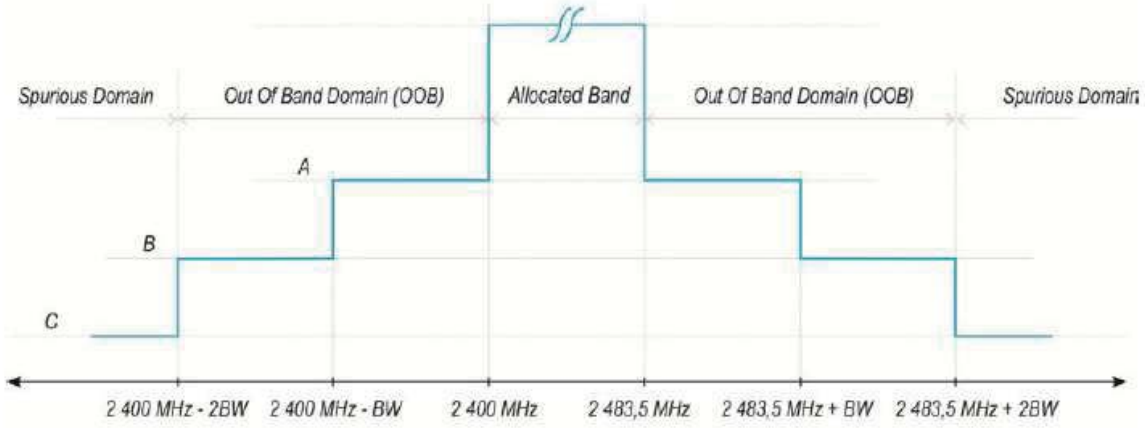
7.2 EQUIPMENT LIST

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ056-06	Signal Analyzer	R&S	FSV40	07-Jul-2017	07-Jul-2018
SZ016-12	Temperature & Humidity Chamber	Terchy	MHK-120NK	24-Jan-2018	24-Jan-2019
SZ062-14	RF cable	BELDEN	RG59-BN	05-Jan-2018	05-Jul-2018
SZ006-12	AC Power Source	APC	AFC-11005GS	08-Jan-2018	08-Jul-2018

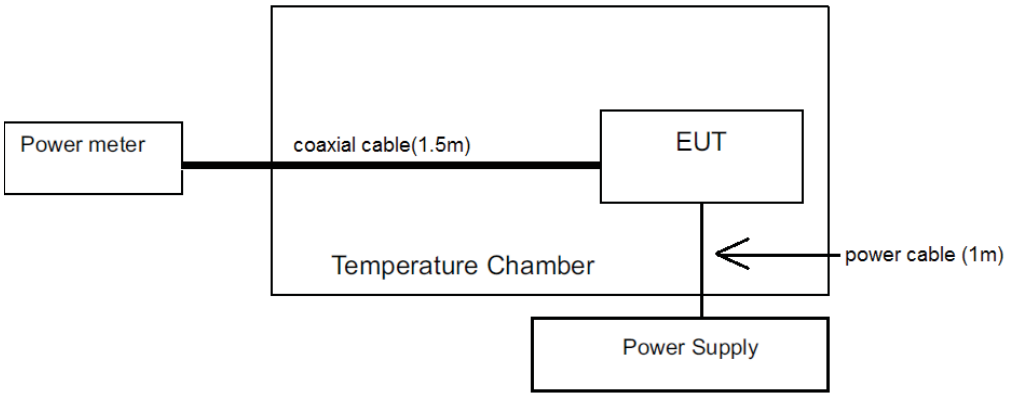
7.3 Limit

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 1.

NOTE: Within the 2 400 MHz to 2 483.5 MHz band, the Out-of-band emissions are fulfilled by compliance with the Occupied Channel Bandwidth requirement in clause 4.3.1.8.



7.4 Test Setup



7.5 Worse Case Test Result (DC Power Supply)

Worst test mode: GFSK

Test Segment (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
2400-2*BW to 2400-BW	-44.4	-20	-24.4
2400-BW to 2400	-46.2	-10	-36.2
2483.5 to 2483.5+BW	-54.0	-10	-44
2483.5+BW to 2483.5+2*BW	-57.2	-20	-37.2

Notes: 1. Negative sign (-) in the margin column signify levels below the limit.
2. Measurement Uncertainty: ±1.49dB.

8 Transmitter unwanted emissions in the spurious domain

8.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.9
Test method	Radiated measurements
Test state	Normal operation (hopping)

8.2 EQUIPMENT LIST

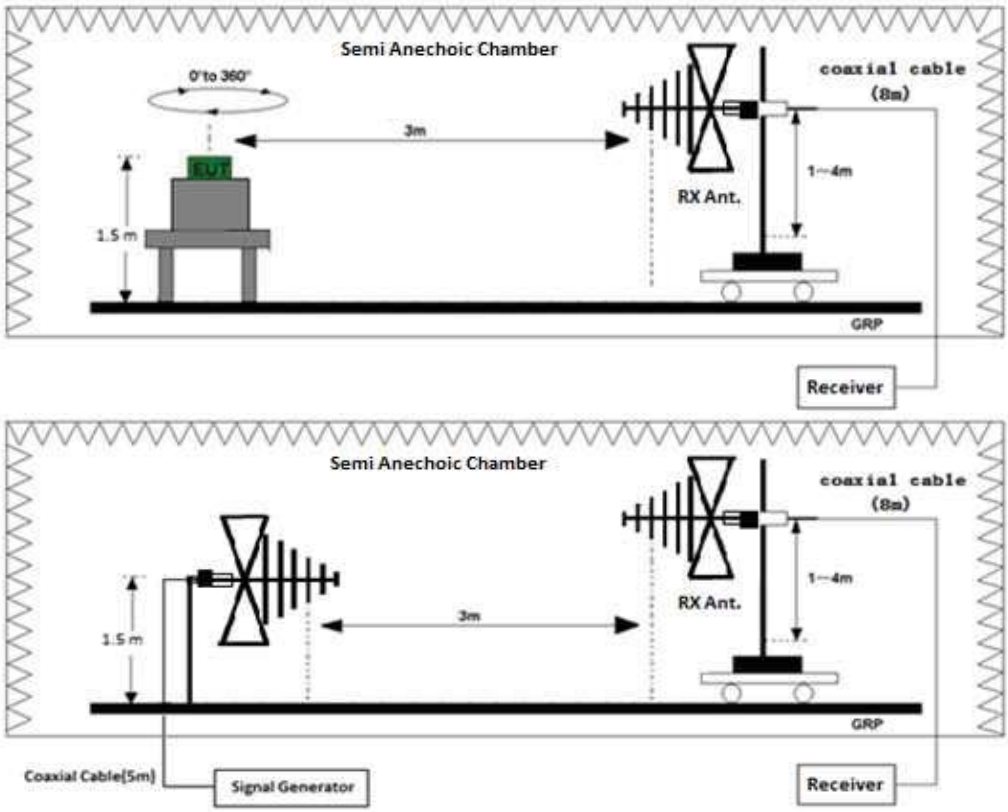
Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ185-01	EMI Receiver	R & S	ESCI	24-Jan-2018	24-Jan-2019
SZ056-06	Signal Analyzer	R&S	FSV40	07-Jul-2017	07-Jul-2018
SZ061-12	Biconilog Antenna	ETS	3142E	20-Sep-2017	20-Sep-2018
SZ061-09	Double - Ridged Waveguide Horn Antenna	ETS	3115	17-Oct-2017	17-Oct-2018
SZ181-04	Preamplifier	Agilent	8449B	24-Jan-2018	24-Jan-2019
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-2017	16-Jan-2019
SZ062-04	RF Cable	RADIALL	RG 213U	05-Jan-2018	05-Jul-2018
SZ062-13	RF Cable	Habia	0.026-26.5GHz	06-Mar-2018	06-Sep-2018
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	06-Mar-2018	06-Sep-2018

8.3 Limit

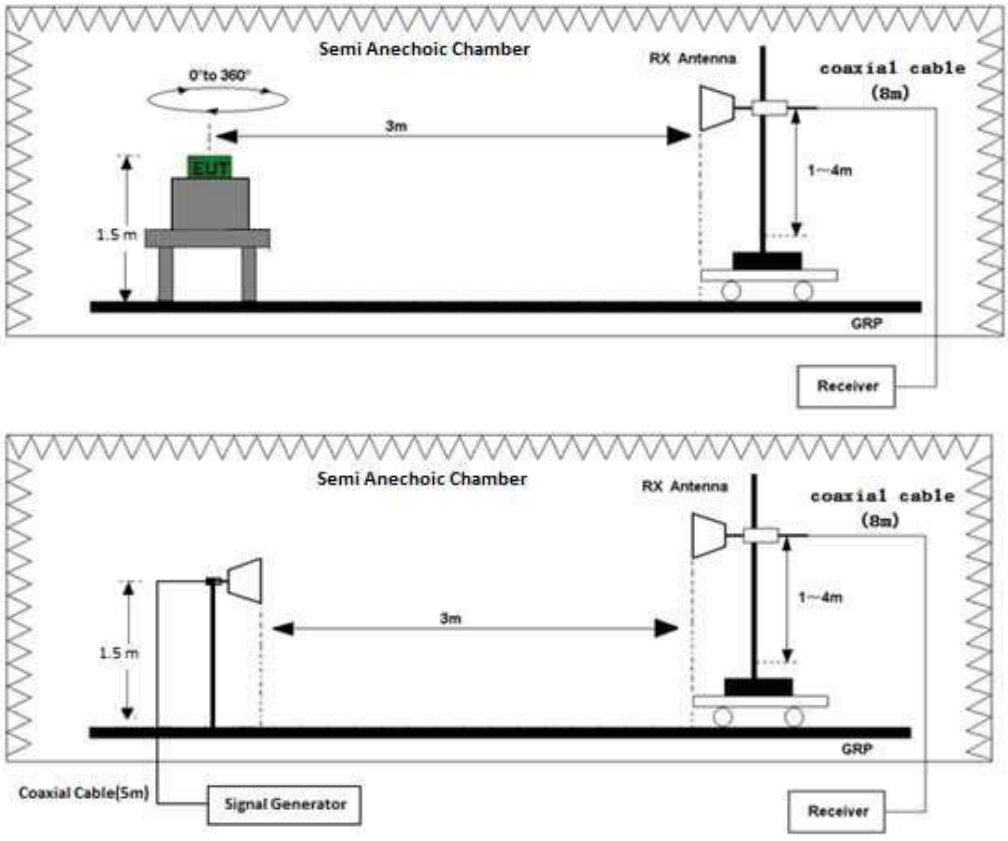
The transmitter unwanted emissions in the spurious domain shall not exceed the values.

Frequency Range	Maximum power	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87,5 MHz	-36 dBm	100 kHz
87,5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz
1 GHz to 12,75 GHz	-30 dBm	1 MHz

8.4 Test Setup



Test set-up of radiated disturbance (30MHz-1GHz)



Test set-up of radiated disturbance (above 1GHz)

8.5 Test Result

Worst test mode: GFSK

Channel 0

Antenna Polarization	Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
Horizontal	4804.000	-41.0	-30.0	-11.0
Horizontal	7206.000	-41.5	-30.0	-11.5
Horizontal	9648.000	-42.7	-30.0	-12.7

Channel 78

Antenna Polarization	Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
Horizontal	4953.000	-43.1	-30.0	-13.1
Horizontal	7432.000	-42.6	-30.0	-12.6
Horizontal	9940.000	-43.4	-30.0	-13.4

Notes:

1. Negative sign (-) in the margin column signify levels below the limit.
2. The test frequency range is 30MHz to 12.75GHz.
3. Other emissions found were at least 10 dB below the limit.
4. Measurement Uncertainty: ±4.8dB for frequency range 30MHz to 1GHz and ±6.0dB for frequency range 1GHz to 12.75GHz.

9 Receiver spurious emission

9.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.10
Test method	Radiated measurements
Test Mode	Receive-only mode
Test state	Normal operation (hopping)

9.2 EQUIPMENT LIST

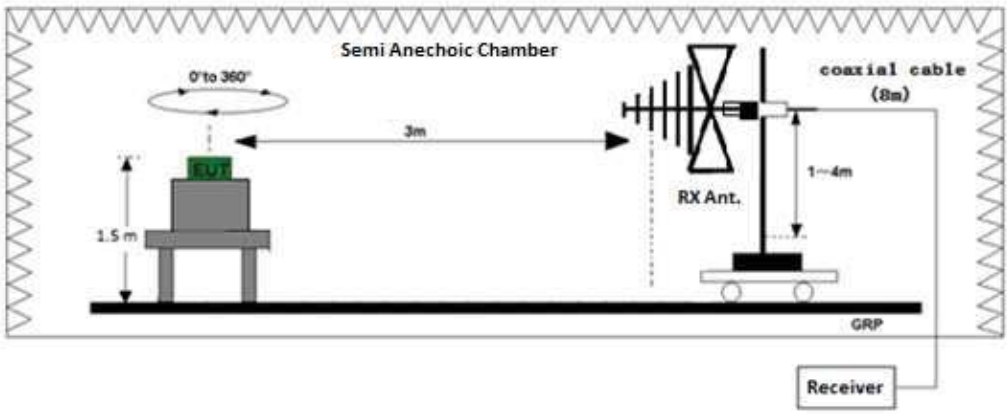
Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ185-01	EMI Receiver	R & S	ESCI	24-Jan-2018	24-Jan-2019
SZ056-06	Signal Analyzer	R&S	FSV40	07-Jul-2017	07-Jul-2018
SZ061-12	Biconilog Antenna	ETS	3142E	20-Sep-2017	20-Sep-2018
SZ061-09	Double - Ridged Waveguide Horn Antenna	ETS	3115	17-Oct-2017	17-Oct-2018
SZ181-04	Preamplifier	Agilent	8449B	24-Jan-2018	24-Jan-2019
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-2017	16-Jan-2019
SZ062-04	RF Cable	RADIALL	RG 213U	5-Jan-2018	5-Jul-2018
SZ062-13	RF Cable	Habia	0.026-26.5GHz	6-Mar-2018	6-Sep-2018
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	6-Mar-2018	6-Sep-2018

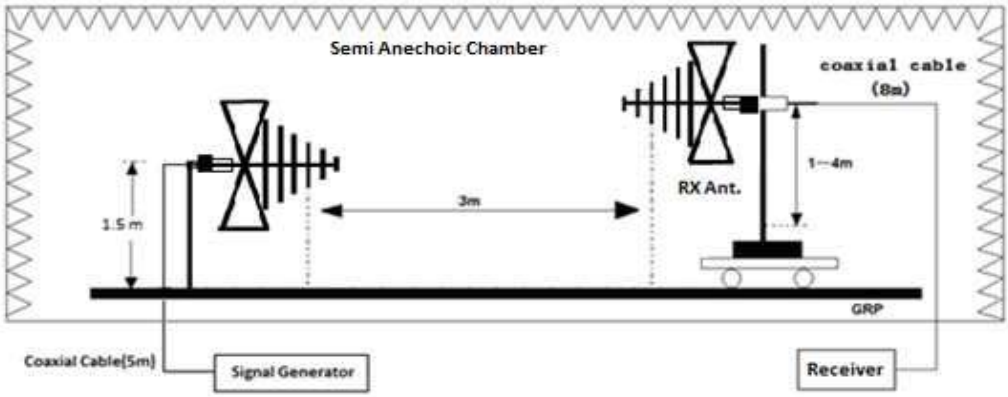
9.3 Limit

The transmitter unwanted emissions in the spurious domain shall not exceed the values.

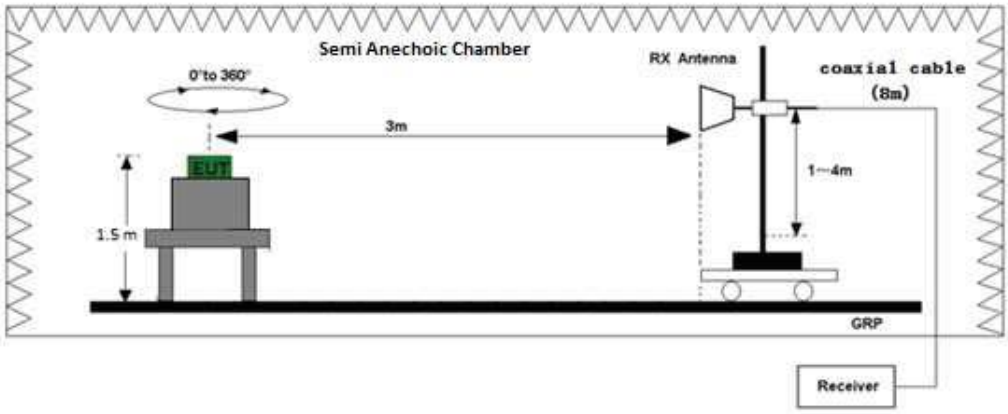
Frequency Range	Maximum power	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz
1 GHz to 12.75 GHz	-47 dBm	1 MHz

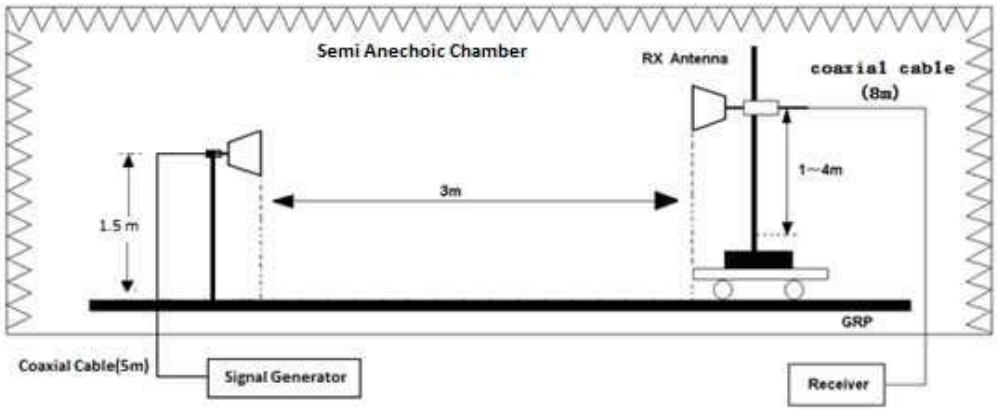
9.4 Test Setup





Test set-up of radiated disturbance (30MHz-1GHz)





Test set-up of radiated disturbance (above 1GHz)

9.5 Test Result

Worst test mode: GFSK

Channel 0

Antenna Polarization	Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
Vertical	40.112	-72.3	-57.0	-15.3
Vertical	174.260	-71.3	-57.0	-14.3
Vertical	602.339	-70.7	-57.0	-13.7
Vertical	1936.301	-71.3	-47.0	-24.3
Vertical	2283.000	-68.1	-47.0	-21.1
Vertical	4234.120	-69.6	-47.0	-22.6

☐ No emissions significantly above equipment noise floor.

Channel 78

Antenna Polarization	Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
Vertical	89.120	-77.1	-57.0	-20.1
Vertical	213.790	-73.0	-57.0	-16.0
Vertical	611.385	-69.8	-57.0	-12.8
Vertical	1696.375	-68.7	-47.0	-21.7
Vertical	2287.139	-64.9	-47.0	-17.9
Vertical	4548.820	-67.2	-47.0	-20.2

Notes:
1. Negative sign (-) in the margin column signify levels below the limit.
2. The test frequency range is 30MHz to 12.75GHz.
3. Other emissions found were at least 10 dB below the limit.
4. Measurement Uncertainty: ±4.8dB for frequency range 30MHz to 1GHz and ±6.0dB for frequency range 1GHz to 12.75GHz.
5. All mode was tested, only the worst case and polarization emissions have been included in the report.

10 Receiver Blocking

10.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 328 V2.1.1 (2016-11)
Clause :	5.4.11
Test method	Conducted measurements
Test Mode	Normal test mode

10.2 EQUIPMENT LIST

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ056-05	Spectrum Analyzer	Agilent	E4407B	28-Dec-2017	28-Dec-2018
SZ070-05	Directional Coupler	Agilent	87300C	28-Dec-2017	28-Dec-2018
SZ070-20	Combiner	Mini-Circuits	ZN2PD-63-S+	01-Jun-2017	01-Jun-2018
SZ070-21	Combiner	Mini-Circuits	ZN2PD-63-S+	01-Jun-2017	01-Jun-2018
SZ180-10	Signal Generator	Wiltron	68369B	01-Jun-2017	01-Jun-2018
SZ180-13	MXG Vector Signal Generator	Keysight	N5182B	30-Oct-2017	30-Oct-2018
SZ062-14	RF cable	BELDEN	RG59-BN	05-Jan-2018	05-Jul-2018
SZ065-06	Wideband Radio Communication Tester	R&S	CMW500	07-Jul-2017	07-Jul-2018

10.3 Performance Criteria

The minimum performance criterion shall be a PER less than or equal to 10 %. The manufacturer may declare alternative performance criteria as long as that is appropriate for the intended use of the equipment (see clause 5.4.1.t)).

10.4 Limit

Receiver Blocking parameters for Receiver Category 1 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
P_{min} + 6 dB	2 380 2 503,5	-53	CW
P_{min} + 6 dB	2 300 2 330 2 360	-47	CW
P_{min} + 6 dB	2 523,5 2 553,5 2 583,5 2 613,5 2 643,5 2 673,5	-47	CW
NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal. NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels have to be corrected by the actual antenna assembly gain.			

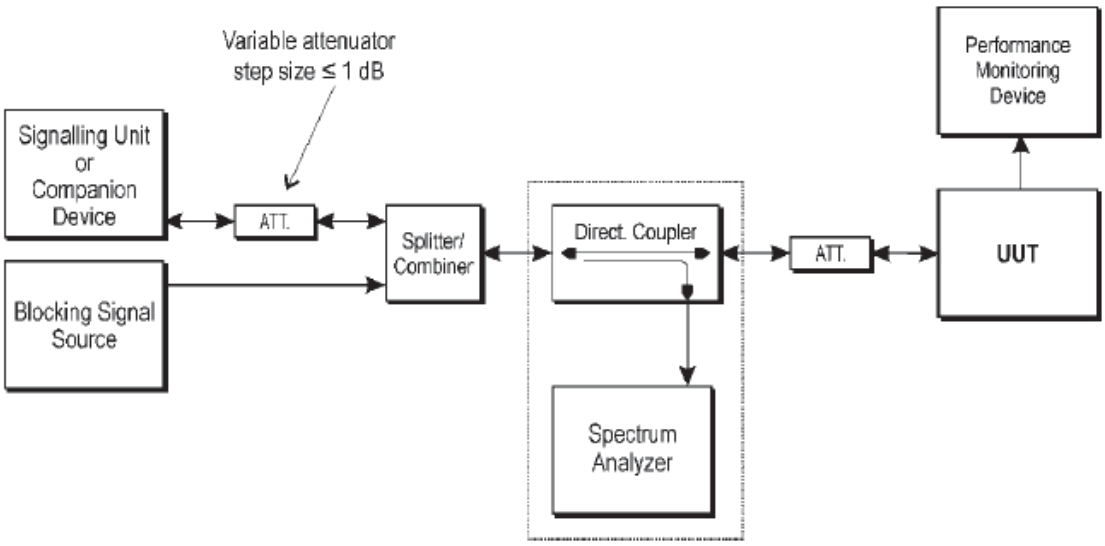
Receiver Blocking parameters receiver category 2 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
P_{min} + 6 dB	2 380 2 503,5	-57	CW
P_{min} + 6 dB	2 300 2 583,5	-47	CW
NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal. NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels have to be corrected by the actual antenna assembly gain.			

Receiver Blocking parameters receiver category 3 equipment

Wanted signal mean power from companion device (dBm)	Blocking signal frequency (MHz)	Blocking signal power (dBm) (see note 2)	Type of blocking signal
P_{min} + 12 dB	2 380 2 503,5	-57	CW
P_{min} + 12 dB	2 300 2 583,5	-47	CW
NOTE 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.3.2.11.3 in the absence of any blocking signal. NOTE 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the levels have to be corrected by the actual antenna assembly gain.			

10.5 Test Setup



10.6 Test Result

Wanted signal mean power from companion device (dBm) (P_{min}+12dB)	Blocking signal frequency (MHz)	Blocking signal power (dBm)	PER (%)	Result
-89.0+12	2380	-57	0.2	Pass
-89.0+12	2503.5	-57	0.1	Pass
-89.0+12	2300	-47	0.1	Pass
-89.0+12	2583.5	-47	0.1	Pass

Notes: 1. As the UUT is adaptive equipment with a maximum RF output power of -9.5 dBm e.i.r.p., it shall be considered as receiver category 3 equipment.

2. When adjusts the level for the wanted signal at the input of the UUT to -89.0 dBm, the UUT still meets the minimum performance criteria as specified in clause 4.3.1.12.3 of the standard. And when below the level -89.0 dBm, the UUT couldn't meet the minimum performance criteria as specified in clause 4.3.1.12.3 of the standard.

EXHIBIT 3

TEST RESULT
OF
EMC COMPLIANCE MEASUREMENT

11 EMC EMISSION TEST

11.1 TEST METHOD AND SUMMARY

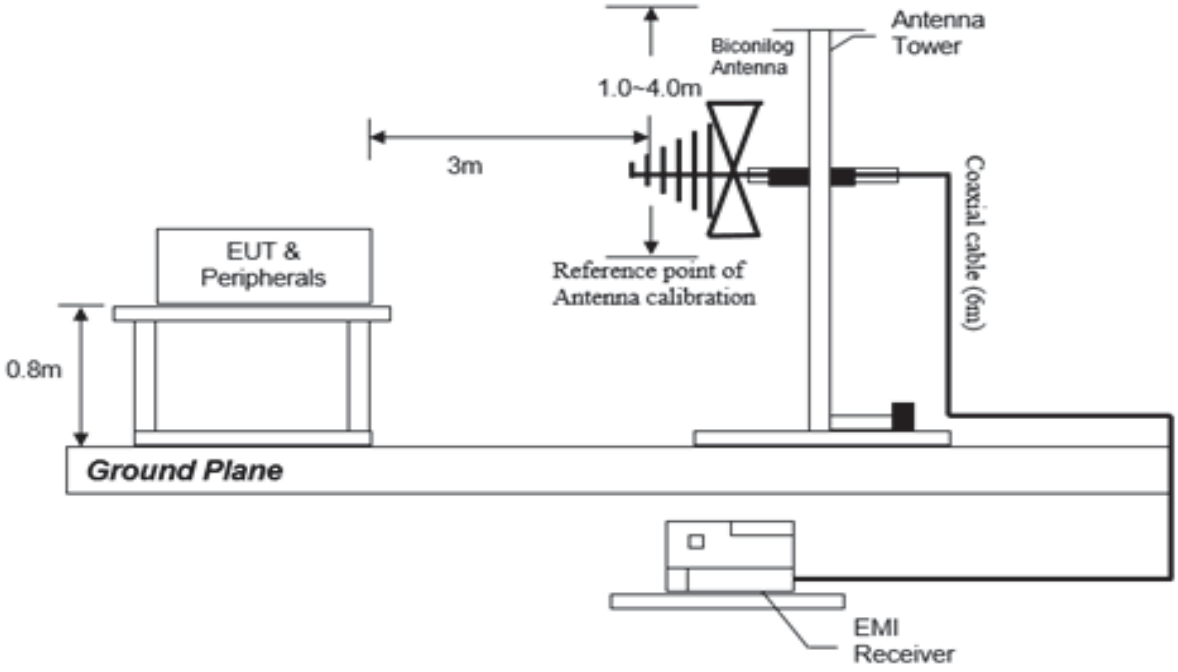
Basic Standard :	EN 55032: 2015	
Test :	Radiated Emission	Conducted Emission
Classification :	Class B	
Port :	Enclosure Port of Ancillary Equipment	AC Mains Power Port

11.2 RADIATED EMISSION TEST

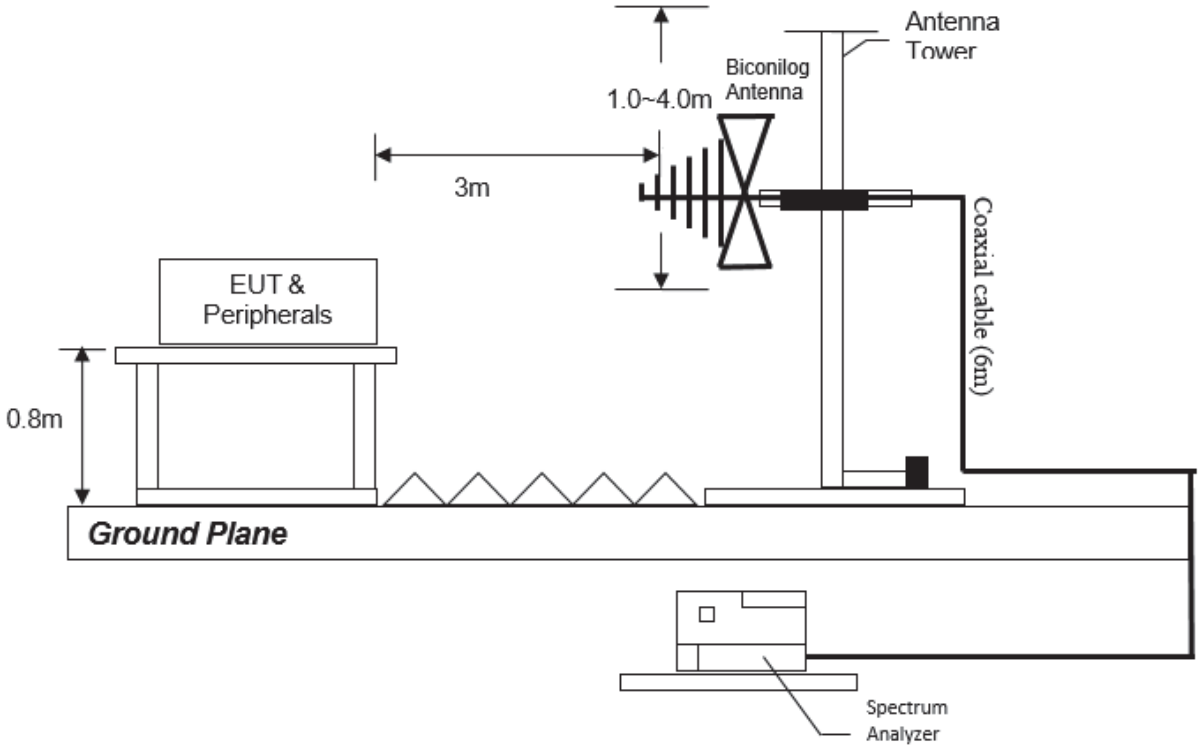
11.2.1 TEST EQUIPMENT

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ185-01	EMI Receiver	R & S	ESCI	24-Jan-2018	24-Jan-2019
SZ056-03	Spectrum Analyzer	R & S	FSP30	01-Jun-2017	01-Jun-2018
SZ061-12	Biconilog Antenna	ETS	3142E	20-Sep-2017	20-Sep-2018
SZ061-09	Double - Ridged Waveguide Horn Antenna	ETS	3115	17-Oct-2017	17-Oct-2018
SZ181-04	Preamplifier	Agilent	8449B	24-Jan-2018	24-Jan-2019
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-2017	16-Jan-2019
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	23-May-2017	23-May-2018

11.2.2 TEST SETUP DIAGRAM:



(Radiated Emission Measurements Test Setup for 30MHz to 1GHz)



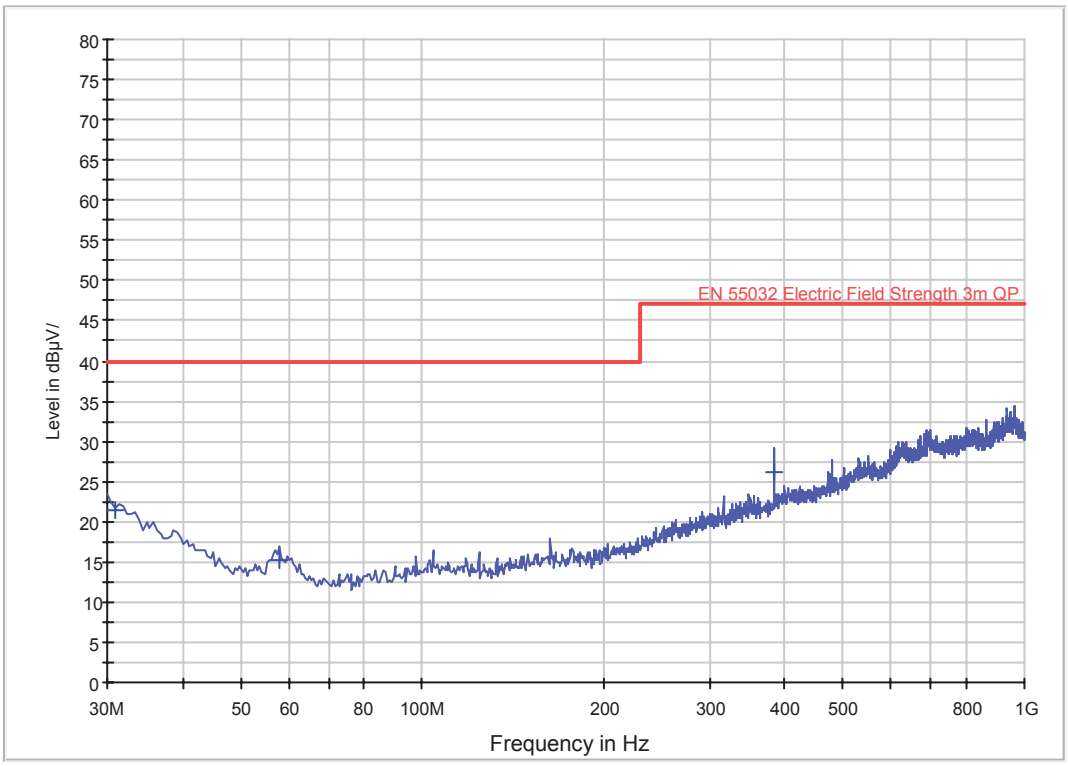
(Radiated Emission Measurements Test Setup for 1GHz to 6GHz)

11.2.3 TEST RESULT

Worst CaseTest mode: Charging+BT

Radiated Disturbance
Pursuant to EN55032: Class B Emissions Requirement
(30M to 1G) Hz

Horizontal

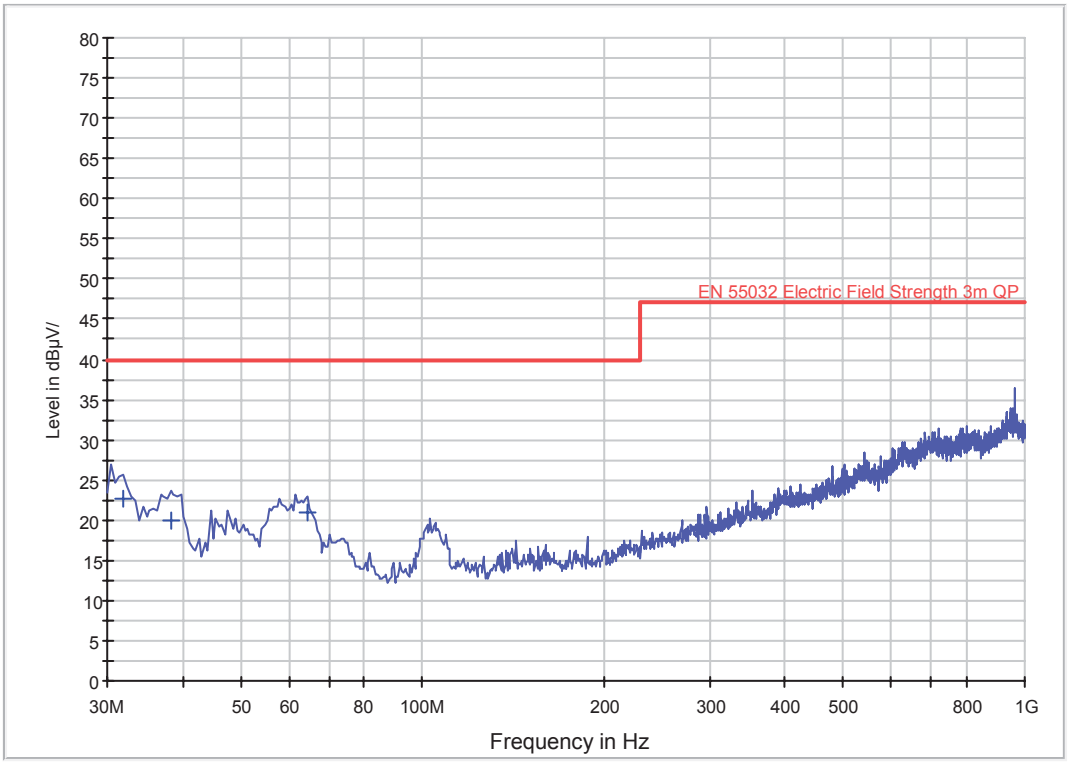


Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
31.000000	21.5	1000.0	120.000	H	17.3	18.5	40.0
58.000000	15.2	1000.0	120.000	H	8.1	24.8	40.0
384.000000	26.1	1000.0	120.000	H	18.0	20.9	47.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit QPK(dBµV/m) – QuasiPeak (dBµV/m)

Vertical



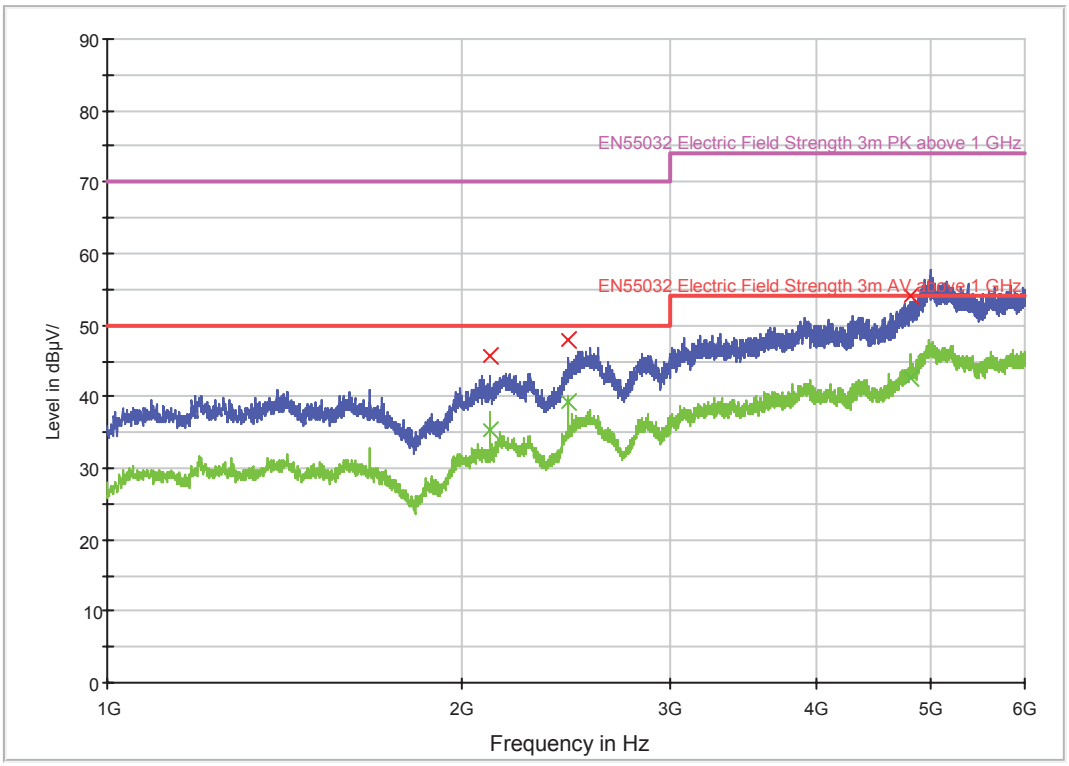
Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
31.940000	22.6	1000.0	120.000	V	16.8	17.4	40.0
38.245000	20.0	1000.0	120.000	V	13.7	20.0	40.0
64.435000	21.0	1000.0	120.000	V	8.0	19.0	40.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit QPK(dBµV/m) – QuasiPeak (dBµV/m)

Radiated Disturbance
Pursuant to EN55032: Class B Emissions Requirement
(1G to 6G) Hz

Horizontal



Limit and Margin PK

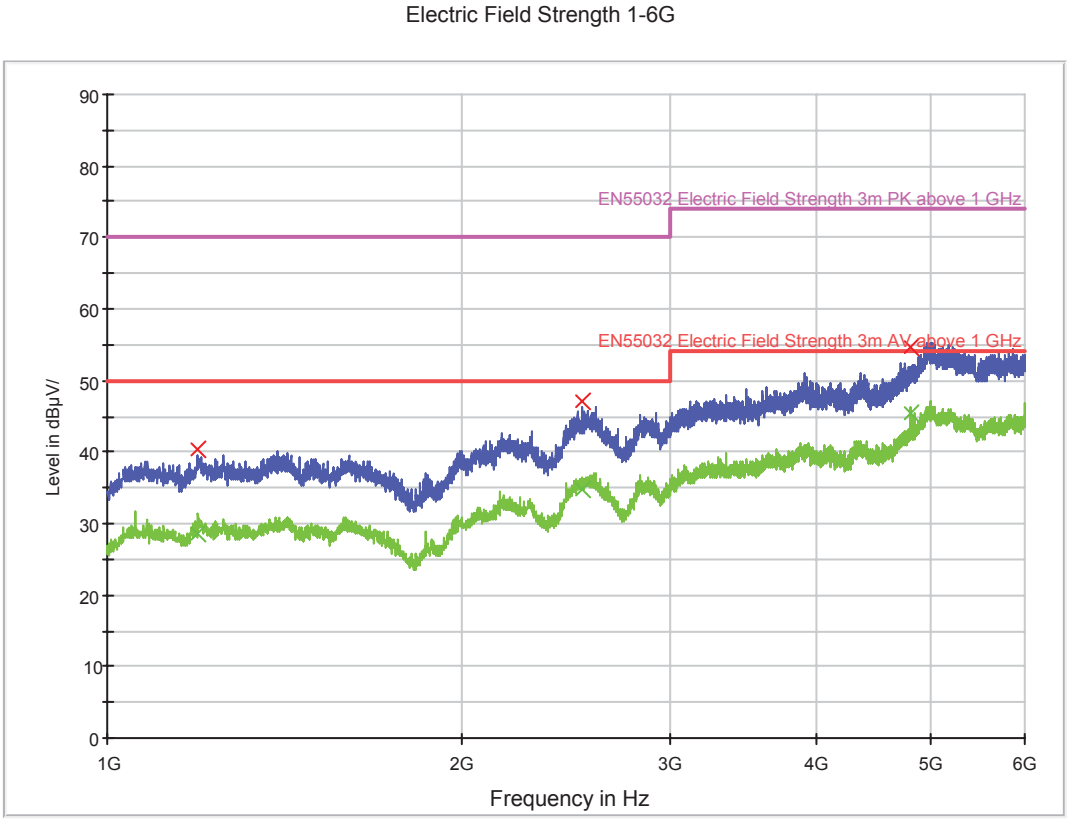
Frequency (MHz)	MaxPeak (dB¦ìV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dB¦ìV/m)
2110.625000	45.7	1000.0	1000.000	H	-2.7	24.3	70.0
2458.750000	47.8	1000.0	1000.000	H	-0.6	22.2	70.0
4800.625000	54.2	1000.0	1000.000	H	10.2	19.8	74.0

Limit and Margin AV

Frequency (MHz)	Average (dB¦ìV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB¦ìV/m)
2110.625000	35.4	1000.0	1000.000	H	-2.7	14.6	50.0
2458.750000	39.1	1000.0	1000.000	H	-0.6	10.9	50.0
4800.625000	42.6	1000.0	1000.000	H	10.2	11.4	54.0

Remark:
1. Corr. = Antenna Factor (dB) + Cable Loss (dB) - Amp. Gain (dB)
2. Emission (dBµV/m)= Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit (dBµV) – Max peak/Average (dBµV)

Vertical



Limit and Margin PK

Frequency (MHz)	MaxPeak (dB¦ìV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dB¦ìV/m)
1193.125000	40.3	1000.0	1000.000	V	-6.6	29.7	70.0
2530.000000	47.2	1000.0	1000.000	V	-0.2	22.8	70.0
4800.000000	54.6	1000.0	1000.000	V	10.2	19.4	74.0

Limit and Margin AV

Frequency (MHz)	Average (dB¦ìV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB¦ìV/m)
1193.125000	28.5	1000.0	1000.000	V	-6.6	21.5	50.0
2530.000000	34.8	1000.0	1000.000	V	-0.2	15.2	50.0
4800.000000	45.5	1000.0	1000.000	V	10.2	8.5	54.0

Remark:
1. Corr. = Antenna Factor (dB) + Cable Loss (dB) - Amp. Gain (dB)
2. Emission (dBµV/m)= Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit (dBµV) – Max peak/Average (dBµV)

11.2.3 MEASUREMENT UNCERTAINTY

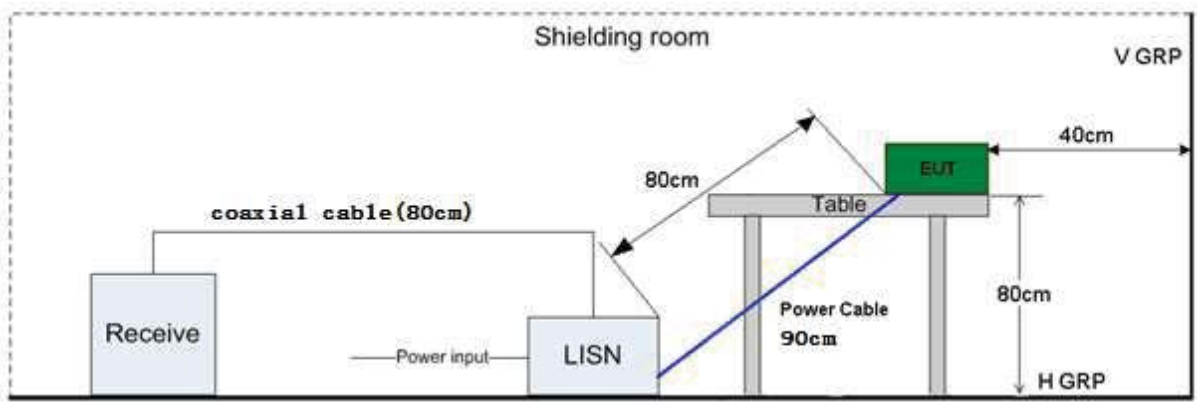
Measurement Uncertainties: ± 4.8dB. The measured result is above the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than non-compliance with the specification limit.

11.3 CONDUCTED EMISSION TEST

11.3.1 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ187-01	LISN	R & S	ENV216	30-Oct-2017	30-Oct-2018
SZ187-02	LISN	R & S	ENV216	12-Jul-2017	12-Jul-2018
SZ185-02	EMI Test Receiver	R&S	ESCI	30-Oct-2017	30-Oct-2018
SZ188-03	Shielding Room	ETS	RFD-100	16-Jan-2017	16-Jan-2019

Test Setup:

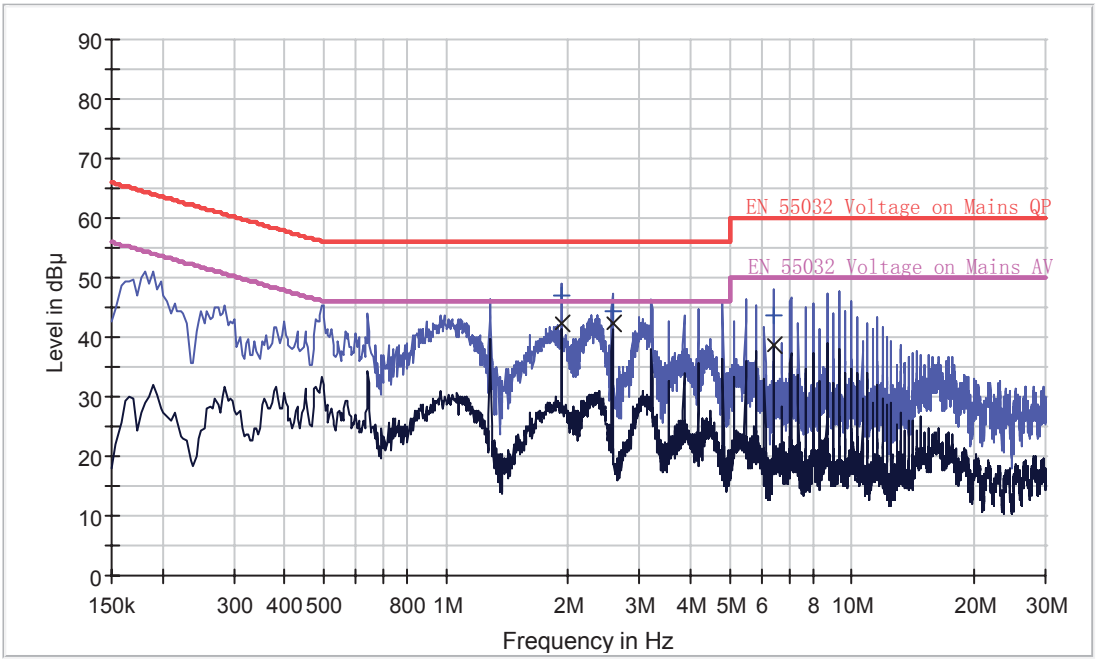


11.3.2 TEST RESULT

Worst Case Operating Mode: Charging+BT
Phase: Live

Test Data

RFI Voltage Test
Pursuant to EN55032: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB¦ÌV)	Average (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
1.930000	47.0	42.4	9.000	L1	9.7	9.0	56.0
2.570000	44.5	42.3	9.000	L1	9.7	11.5	56.0
6.426000	43.7	38.6	9.000	L1	9.8	16.3	60.0

Limit and Margin AV

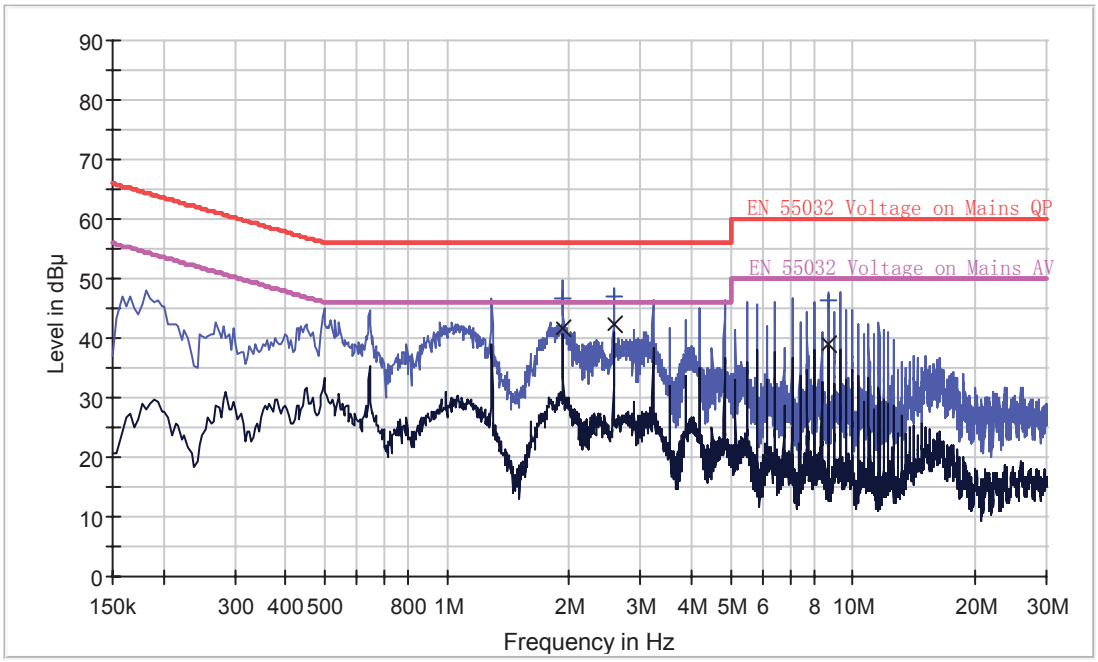
Frequency (MHz)	QuasiPeak (dB¦ÌV)	Average (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
1.930000	47.0	42.4	9.000	L1	9.7	3.6	46.0
2.570000	44.5	42.3	9.000	L1	9.7	3.7	46.0
6.426000	43.7	38.6	9.000	L1	9.8	11.4	50.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – QuasiPeak/Average (dBuV)

Worst Case Operating Mode: Charging+BT
Phase: Neutral

Test Data

RFI Voltage Test
Pursuant to EN55032: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB¦ÌV)	CAverage (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
1.934000	46.5	41.8	9.000	N	9.7	9.5	56.0
2.576000	47.0	42.3	9.000	N	9.7	9.0	56.0
8.694000	46.4	39.1	9.000	N	9.9	13.6	60.0

Limit and Margin AV

Frequency (MHz)	QuasiPeak (dB¦ÌV)	CAverage (dB¦ÌV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB¦ÌV)
1.934000	46.5	41.8	9.000	N	9.7	4.2	46.0
2.576000	47.0	42.3	9.000	N	9.7	3.7	46.0
8.694000	46.4	39.1	9.000	N	9.9	10.9	50.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – QuasiPeak/Average (dBuV)

11.3.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainties: ± 3.6dB.

12 VOLTAGE FLUCTUATIONS AND FLICKER

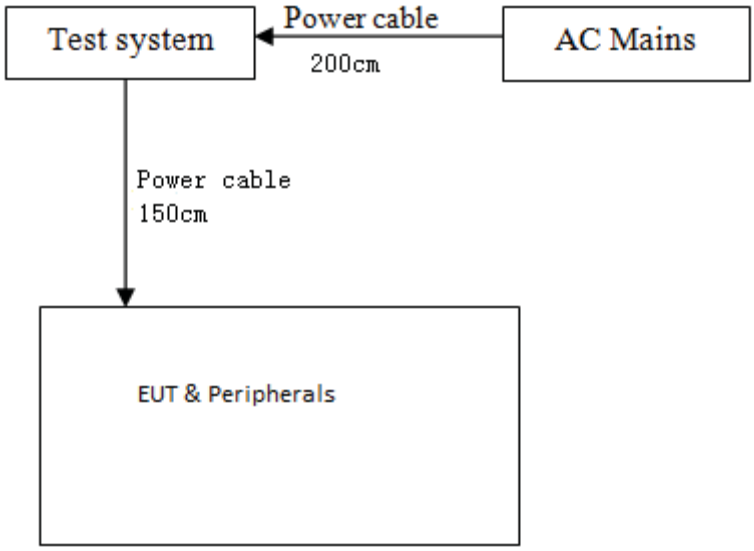
12.1 TEST METHOD AND SUMMARY

Basic Standard :	EN 61000-3-3: 2013
Port :	AC Mains Input Port

12.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ064-01	Compliance Test System	California Instruments	5001iX-CTS-400	24-Jan-2018	24-Jan-2019
SZ064-01-01	Power Analyzer and Conditioning System	California Instruments	PACS-1	29-Jan-2018	29-Jan-2019

12.3 TEST SETUP DIAGRAM

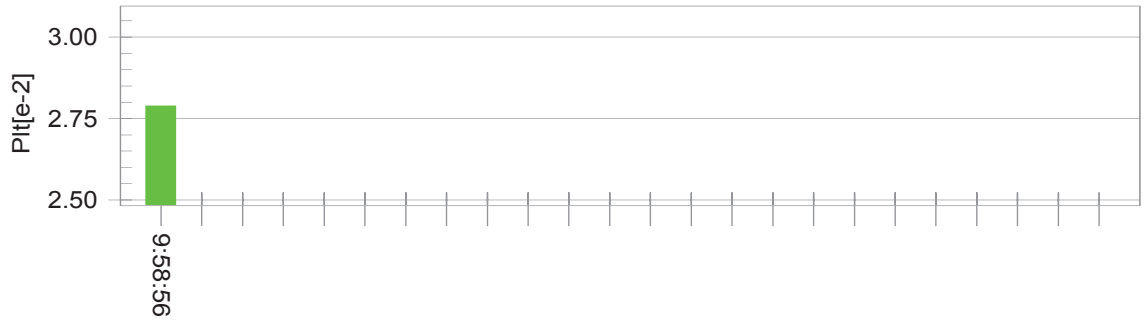


12.3 TEST RESULT

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

Worst Case Test Mode: Charging+BT
Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**229.72**			
T-max (mS):	**0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.00**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.064**	**Test limit:**	**1.00**	**Pass**

12.4 MEASUREMENT UNCERTAINTY

Measurement Uncertainties: ±0.25%.

13 ELECTROSTATIC DISCHARGE

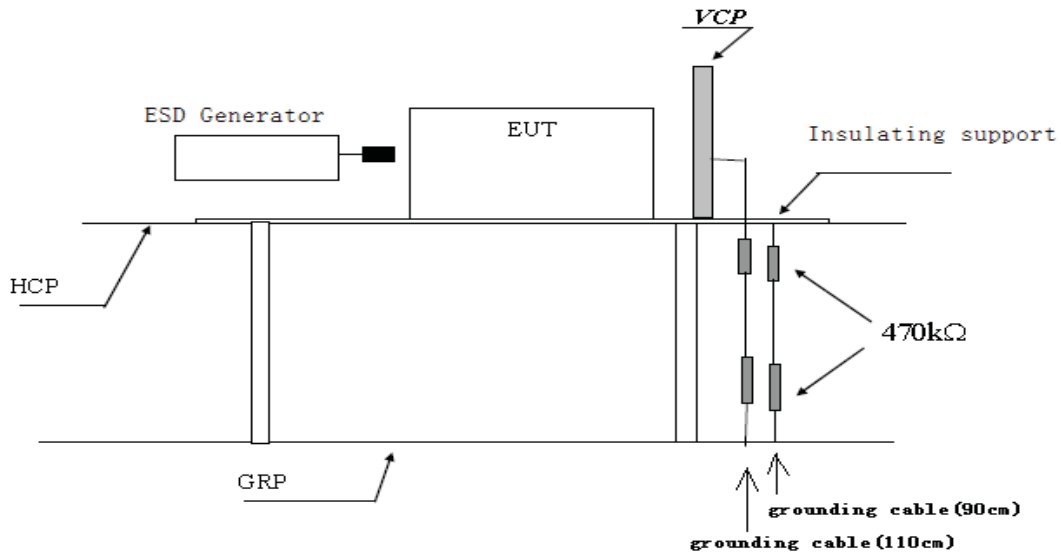
13.1 TEST METHOD AND SUMMARY

Basic Standard :	EN 61000-4-2: 2009
Port :	Enclosure
Required Performance Criterion :	TT & TR
Level :	± 2.0, ± 4.0, ±8.0 kV (Air Discharge) ±4.0 kV (Contact Discharge) ±4.0 kV (Indirect Contact Discharge)
Temperature :	21.2 ^{0}C
Relative Humidity :	50.1 %
No. of Discharge(s) :	Minimum of 10 Discharges per Each Polarity
Time Between Each Discharge :	1 second
Test Mode :	Charging+BT, BT, Idle
Test Setup :	Table-top
Test of Post-installation :	N/A

13.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ189-03	ESD Simulator	TESEQ	NSG 435	15-Nov-2017	15-Nov-2018

13.3 TEST SETUP



Test set-up of electrostatic discharge

13.4 TEST RESULT

13.4.1 TEST RESULT

Discharge Type	Applied Voltage	Result (Pursuant to ETSI EN 301 489-17 Criterion TT & TR)
Contact Discharge	± 4kV	Complied
Air Discharge	± 2, ± 4, ± 8kV	Complied
Indirect HCP Discharge	± 4kV	Complied
Indirect VCP Discharge	± 4kV	Complied

13.4.2 ADDITIONAL RESULT INFORMATION

For the electrostatic discharge test of EN 301 489-17, it was found that manual operation (by switching power ON/OFF switch) is needed to resume normal operation as intended after the test.

13.4.3 DECLARATION INFORMATION FROM APPLICANT

None

14 RADIO FREQUENCY ELECTROMAGNETIC FIELD

14.1 TEST METHOD AND SUMMARY

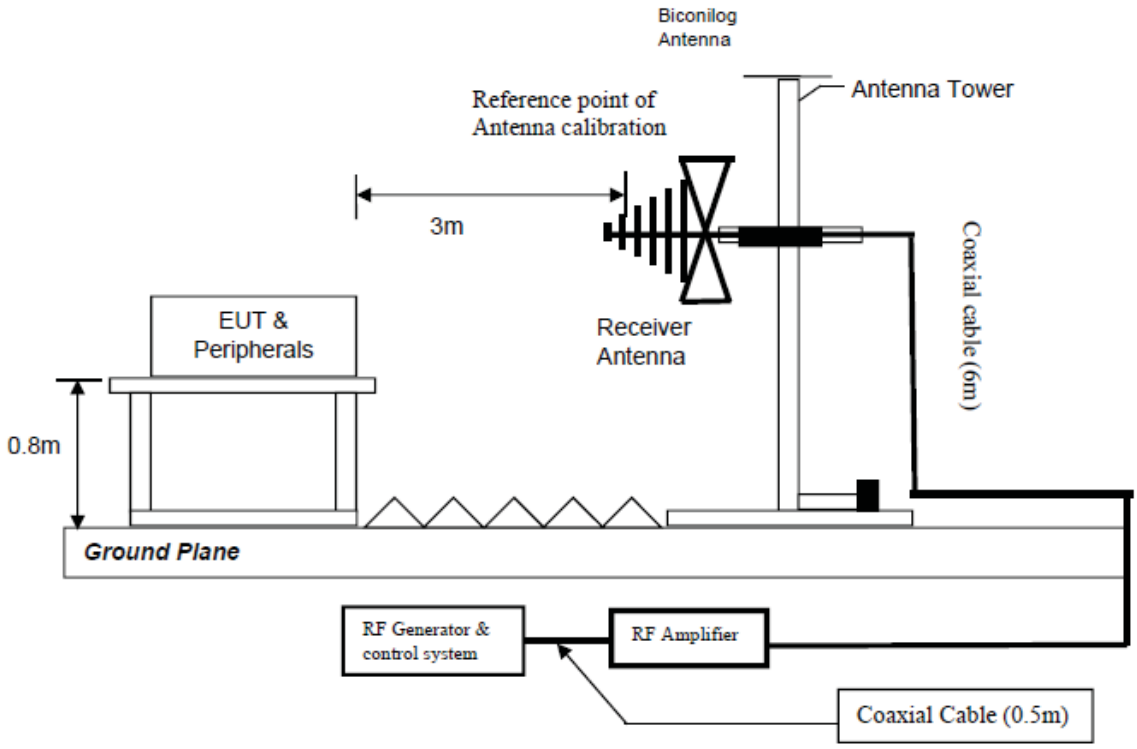
Basic Standard :	EN 61000-4-3: 2006 + A1: 2008 + A2: 2010
Port :	Enclosure
Required Performance Criterion :	CT & CR
Level :	3.0 V/m (rms)
Test Modulation :	1kHz, 80% AM
Frequency :	80 MHz to 6000 MHz
Dwell Time :	1s
Frequency Step :	1%
Temperature :	21.5 ^{0}C
Relative Humidity :	58.4 %
Test Facility :	Full Anechoic Chamber
Antenna Polarization :	Horizontal and Vertical
Type of Antenna :	Biconical / Log-periodic / Horn
Test Distance :	3m
Test Mode :	Charging+BT, BT, Idle
Test Setup :	Table-top

14.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ188-02	Anechoic Chamber	ETS	RFD-F/A-100	16-Jan-2017	16-Jan-2019
SZ061-04	Biconilog Antenna	ETS	3142C	17-Oct-2017	17-Oct-2018
EM061-06	Stacked double log.-Per. Antenna	SCHWARZBECK	STLP 9149	10-Nov-2017	10-Nov-2019
SZ180-01	Signal Generator	R&S	SML03	01-Jun-2017	01-Jun-2018
SZ181-01	Amplifier	PRANA	AP32 MT215	24-Jan-2018	24-Jan-2019
SZ190-07	RF Amplifier	Milmega	AS0860-75/45	24-Jan-2018	24-Jan-2019
SZ070-22	Open Switch and Control Unit	R&S	OSP120	07-Mar-2018	07-Sep-2018

* The Equipment would be verified together with the test system before testing.

14.3 TEST SETUP DIAGRAM



Test set-up of Immunity to Radiated Electric Fields

14.4 TEST RESULT

Frequency (MHz)	Exposed Side	Result (Pursuant to ETSI EN 301 489-17 Criterion CT & CR)
80 to 6000	Front	Complied
80 to 6000	Left	Complied
80 to 6000	Rear	Complied
80 to 6000	Right	Complied

14.5 ADDITIONAL RESULT INFORMATION

For all working mode, the EUT continue to operate as intended without operator intervention.
No degradation of performance or loss of function was occurred during and after the test.

14.6 DECLARATION INFORMATION FROM APPLICANT

None

15 FAST TRANSIENTS

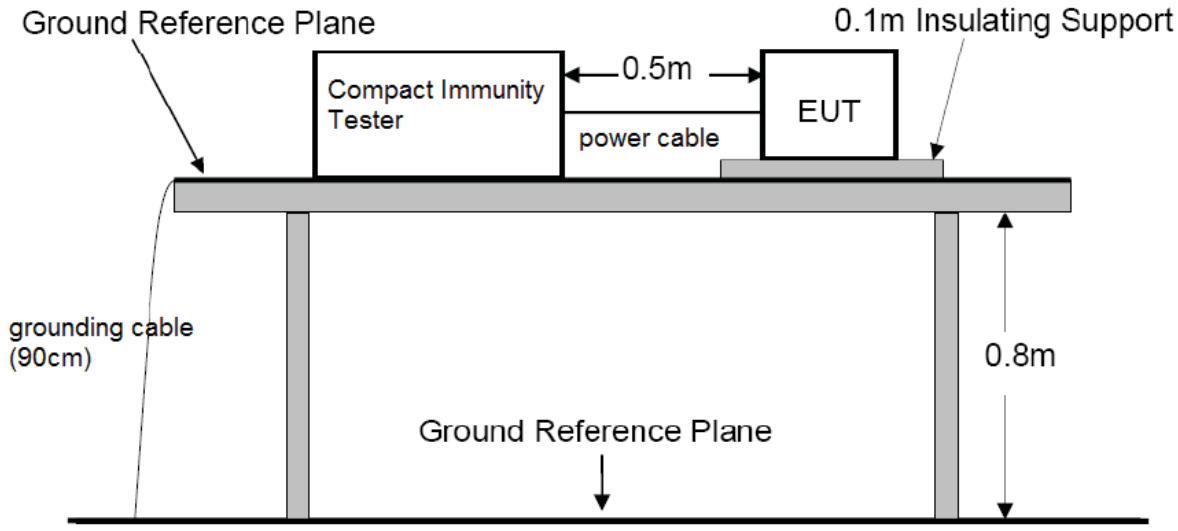
15.1 TEST METHOD AND SUMMARY

Basic Standard :	EN 61000-4-4: 2012	
Port :	A.C. Power Lines	Telecommunication Lines, D.C. Power Lines, Signal Lines and Control Lines
Required Performance Criterion :	TT & TR	
Level :	±1.0kV	±0.5kV
Temperature :	22.1 ^{0}C	
Relative Humidity :	50.2 %	
Test Duration	1 minute per each polarity	
Test Mode :	Charging+BT, Idle	
Test Setup :	Table-top	
Generator Drive :	Internal	
Sequence of Application :	Each One	

15.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ063-01	Compact Immunity Tester	Haefely	ECOMPACT 4	24-Jan-2018	24-Jan-2019

15.3 TEST SETUP DIAGRAM



15.4 TEST RESULT

15.4.1 TEST RESULT

Port	Level	Result (Pursuant to ETSI EN 301 489-17 Criterion TT & TR)
A.C. Power Lines	± 1kV	Complied
Telecommunication Lines	± 0.5kV	N/A
D.C. Power Lines	± 0.5kV	N/A
Signal Lines	± 0.5kV	N/A
Control Lines	± 0.5kV	N/A

15.4.2 ADDITIONAL RESULT INFORMATION

The EUT worked as intended during and after the test. No observable change occurred.

15.5 DECLARATION INFORMATION FROM APPLICANT

None.

16 SURGES

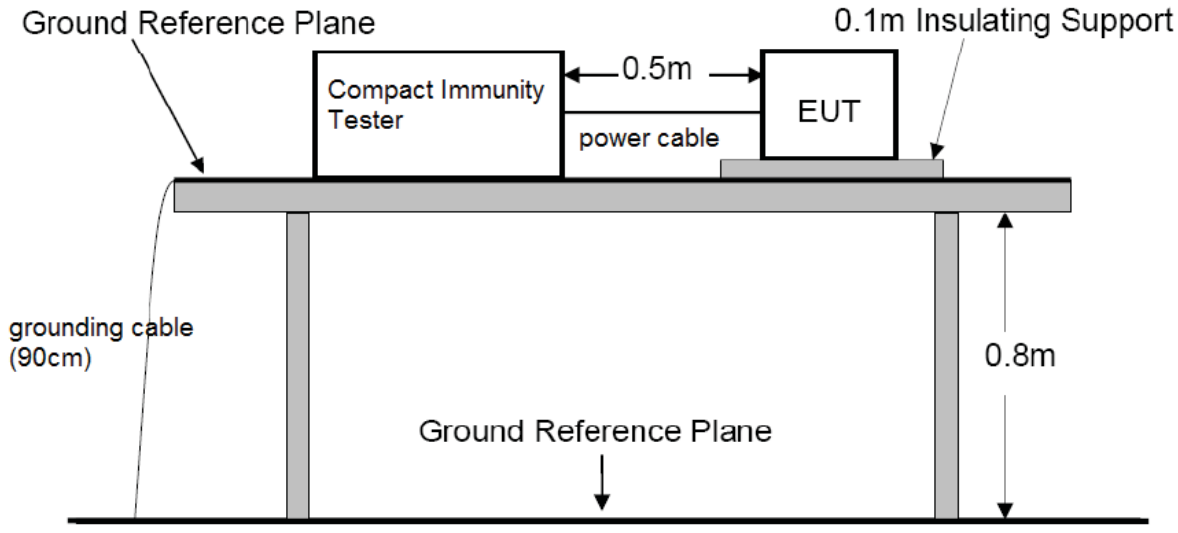
16.1 TEST METHOD AND SUMMARY

Basic Standard :	EN 61000-4-5 : 2006		
Port :	A.C. Power Lines		
	Phase And Neutral	Phase And Earth	Neutral And Earth
Level :	5 Positive And 5 Negative Surges		
	±1kV	N/A	N/A
Generator Impedance :	2 ohm	12 ohm	12 ohm
Required Performance Criterion :	TT & TR		
Temperature :	21.5 °C		
Relative Humidity :	50.2 %		
Repetition Rate :	1 minute		
Test Mode :	Charging+BT, Idle		
Test Setup :	Capacitive Coupling		
Surge Generator Trigger :	Internal		
Installation Condition :	Class 3: Electrical environment where cables run in parallel.		
Phase Angle :	0°, 90°, 180°, 270°		

16.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ063-01	Compact Immunity Tester	Haefely	ECOMPACT 4	24-Jan-2018	24-Jan-2019

16.3 TEST SETUP DIAGRAM



16.4 TEST RESULT

16.4.1 TEST RESULT

Level		Result (Pursuant to ETSI EN 301 489-17 Criterion TT & TR)
Between Phase And Neutral :	± 1kV	Complied
Between Phase And Earth :	± 2kV	N/A
Between Neutral And Earth :	± 2kV	N/A

16.4.2 ADDITIONAL RESULT INFORMATION

The EUT worked as intended during and after the test. No observable change occurred.

16.5 DECLARATION INFORMATION FROM APPLICANT

None.

17 CONDUCTED RF IMMUNITY

17.1 TEST METHOD AND SUMMARY

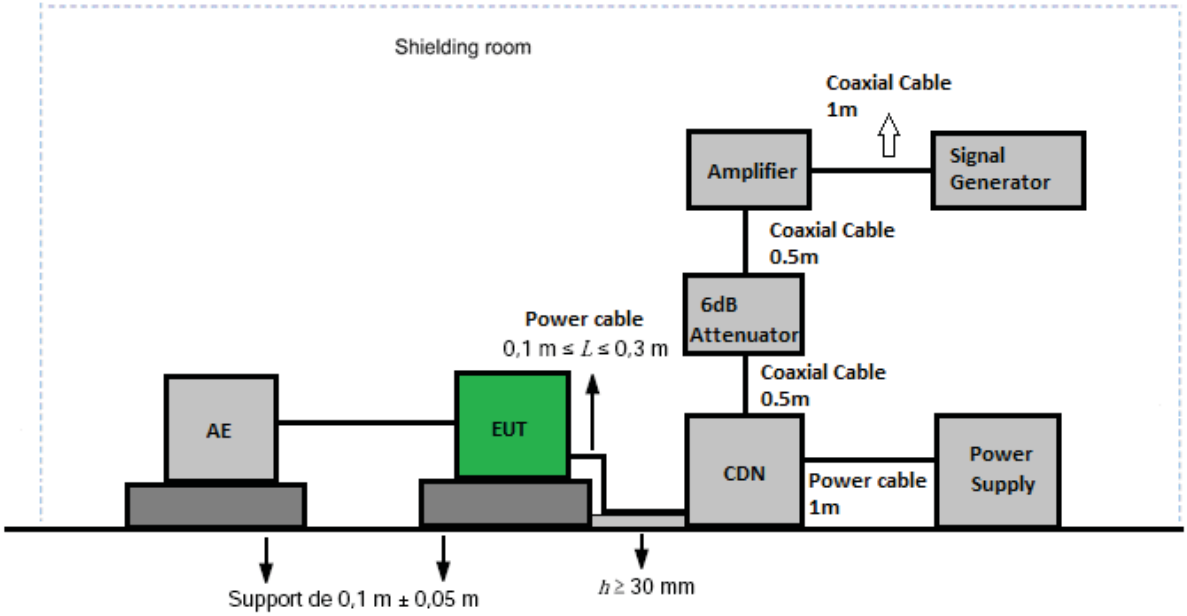
Basic Standard :	EN 61000-4-6: 2009
Port :	A.C. Power Lines, Telecommunication Lines, D.C. Power Lines, Signal Lines and Control Lines
Required Performance Criterion :	CT & CR
Level :	3.0V (rms)
Test Modulation :	1 kHz, 80% AM
Frequency :	0.15 MHz to 80 MHz
Dwell Time :	1s
Frequency Step :	1%
Temperature :	22.6^{0}C
Relative Humidity :	57.6%
Coupling Factor of CDN :	-1.0dB ~ –1.7dB
Test Mode :	Charging+BT, BT, Idle
Test Setup :	Table-top
Equipment Under Test (EUT):	Single Unit

17.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ180-02	Signal Generator	Aeroflex	2023A	24-Jan-2018	24-Jan-2019
SZ181-03	Amplifier	AR-WORLDWIDE	75A250	24-Jan-2018	24-Jan-2019
SZ181-03-01	Attenuator	AR-WORLDWIDE	6dB/50FH-006-100	24-Jan-2018	24-Jan-2019
SZ184-01	Coupling-Decoupling Network	LUTHI	CDN L-801 M2/M3	24-Jan-2018	24-Jan-2019

* The Equipment would be verified together with the test system before testing.

17.3 TEST SETUP DIAGRAM



17.4 TEST RESULT

17.4.1 TEST RESULT

Port	Level	Result (Pursuant to ETSI EN 301 489-17 Criterion CT & CR)
A.C. Power Lines	3V (rms)	Complied
Telecommunication Lines	3V (rms)	N/A
D.C. Power Lines	3V (rms)	N/A
Signal Lines	3V (rms)	N/A
Control Lines	3V (rms)	N/A

17.4.2 ADDITIONAL RESULT INFORMATION

The EUT worked as intended during and after the test. No observable change occurred.

17.5 DECLARATION INFORMATION FROM APPLICANT

None.

18 VOLTAGE DIPS & INTERRUPTIONS

18.1 TEST METHOD AND SUMMARY

Basic Standard :	EN 61000-4-11: 2004			
Port :	A.C. Power Lines			
Level :	Test level in %U_T	Duration(s)	Required Performance Criterion	
			Transmitter	Receiver
	0	0.01	TT	TR
	0	0.02	TT	TR
	70	0.5	TT	TR
	0	5	TT	TR
No. of Dips/Interruptions :	3			
Temperature :	21.2 ^{0}C			
Relative Humidity :	50.1 %			
Test Mode :	Charging+BT, Idle			
Test Setup :	Test generator causes the interference to the EUT AC mains			

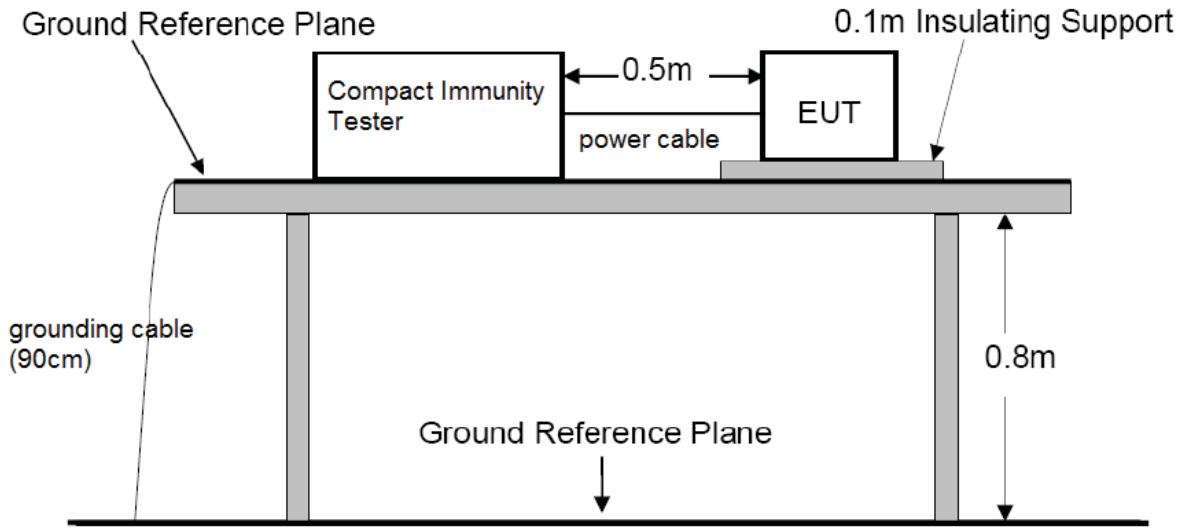
U_T is the rated voltage for the equipment.

18.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ063-01	Compact Immunity Tester	Haefely	ECOMPACT 4	24-Jan-2018	24-Jan-2019

* The Equipment would be verified together with the test system before testing.

18.3 TEST SETUP DIAGRAM



18.4 TEST RESULT

18.4.1 TEST RESULT FOR TRANSMITTER

Test Condition		Result (Pursuant to ETSI EN 301 489-17)	
Test Level in %U_T	Duration(s)	Meet Criterion CT & CR	Meet Criterion TT & TR
0	0.01	N/A	Complied
0	0.02	N/A	Complied
70	0.5	N/A	Complied
0	5	N/A	Complied

U_T is the rated voltage for the equipment.

18.3.3 ADDITIONAL RESULT INFORMATION

The communication link of EUT could not maintain during the test and could be reset by operator after the test at test level 0%UT, 5s of Interrupt.

18.4 DECLARATION INFORMATION FROM APPLICANT

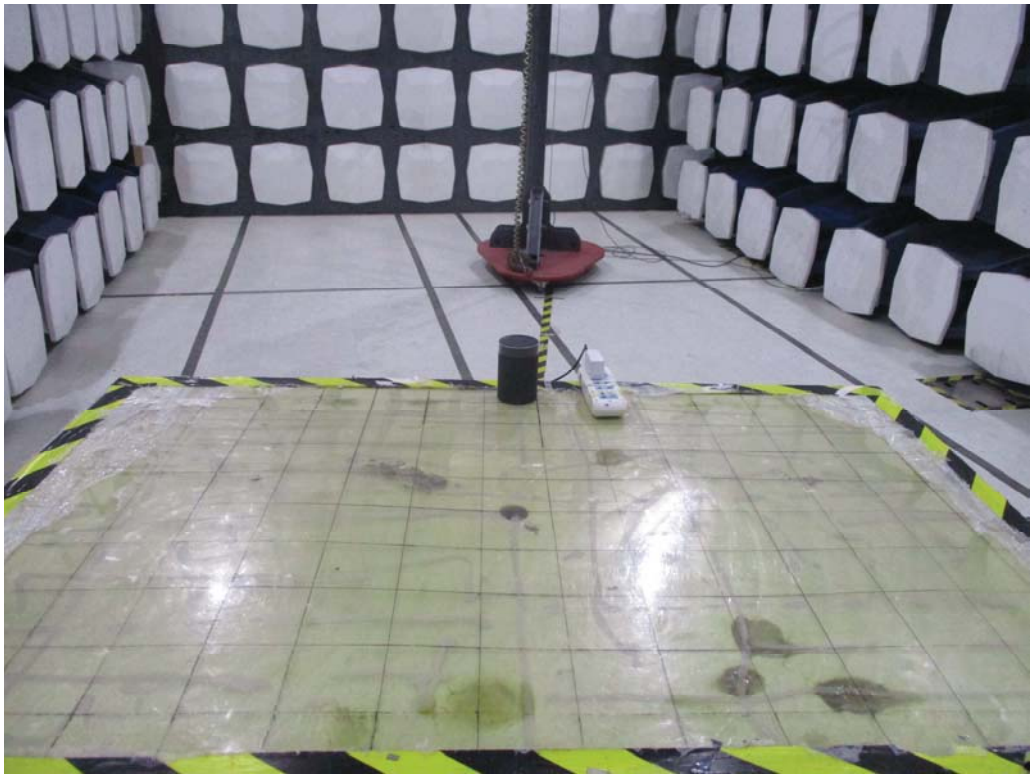
None.

EXHIBIT 4

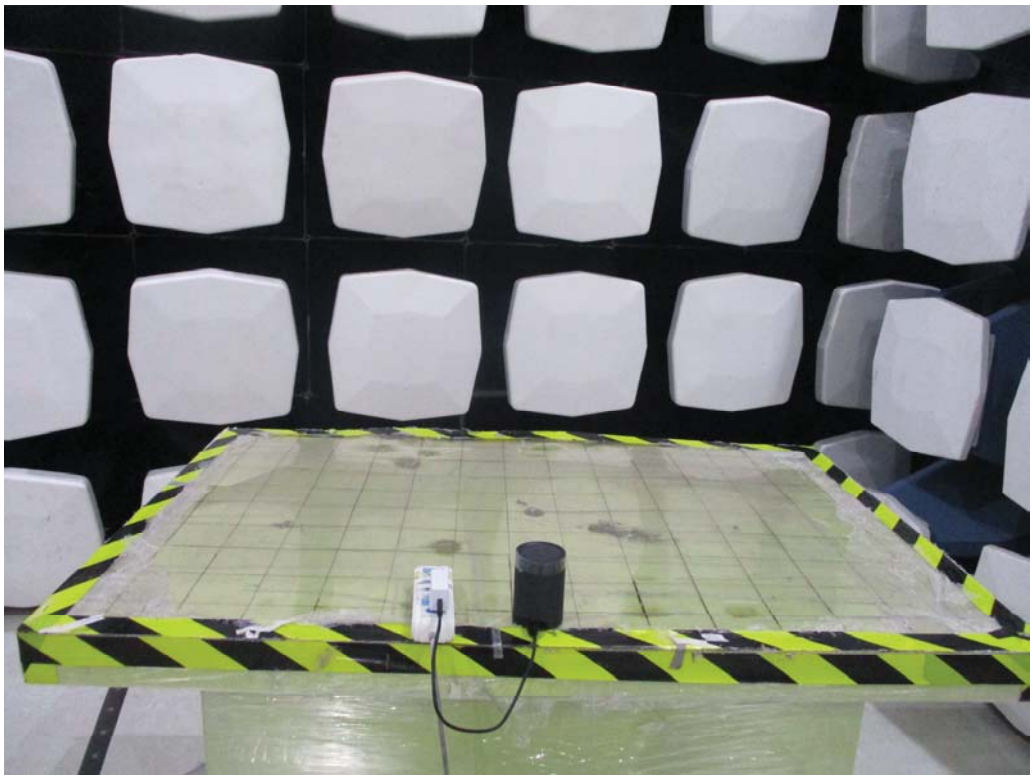
PHOTOS OF EUT

19. PHOTOS OF TEST SET-UP

Radiated Disturbance



Radiated Disturbance



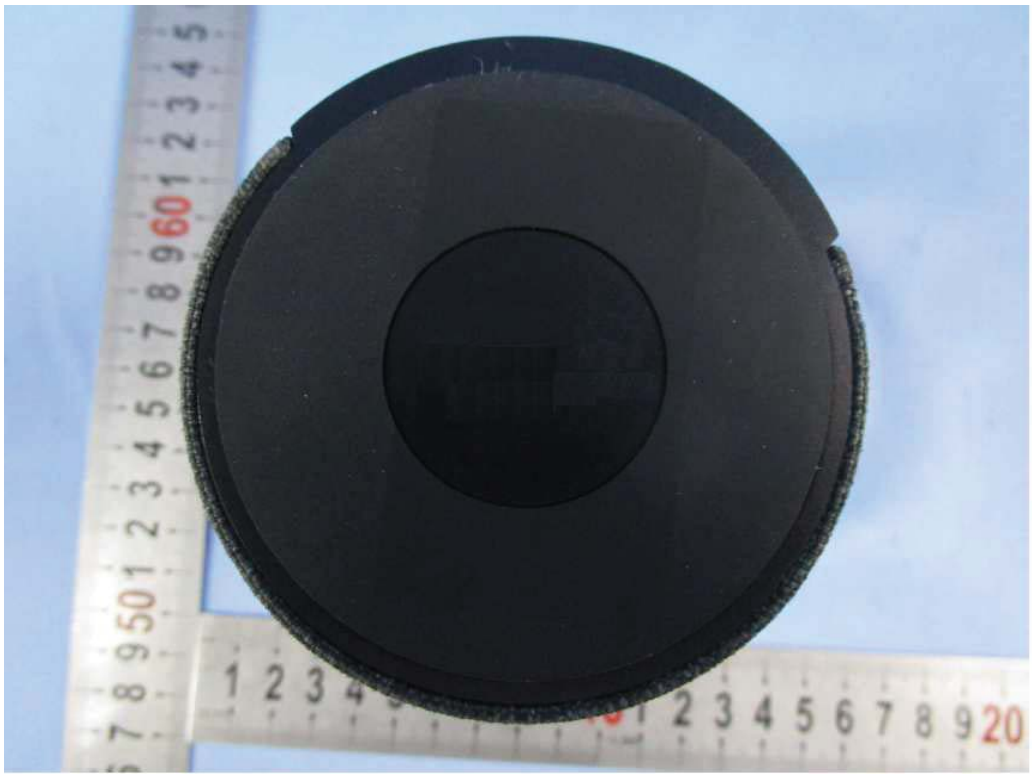
RFI Voltage Test

RFI Voltage Test

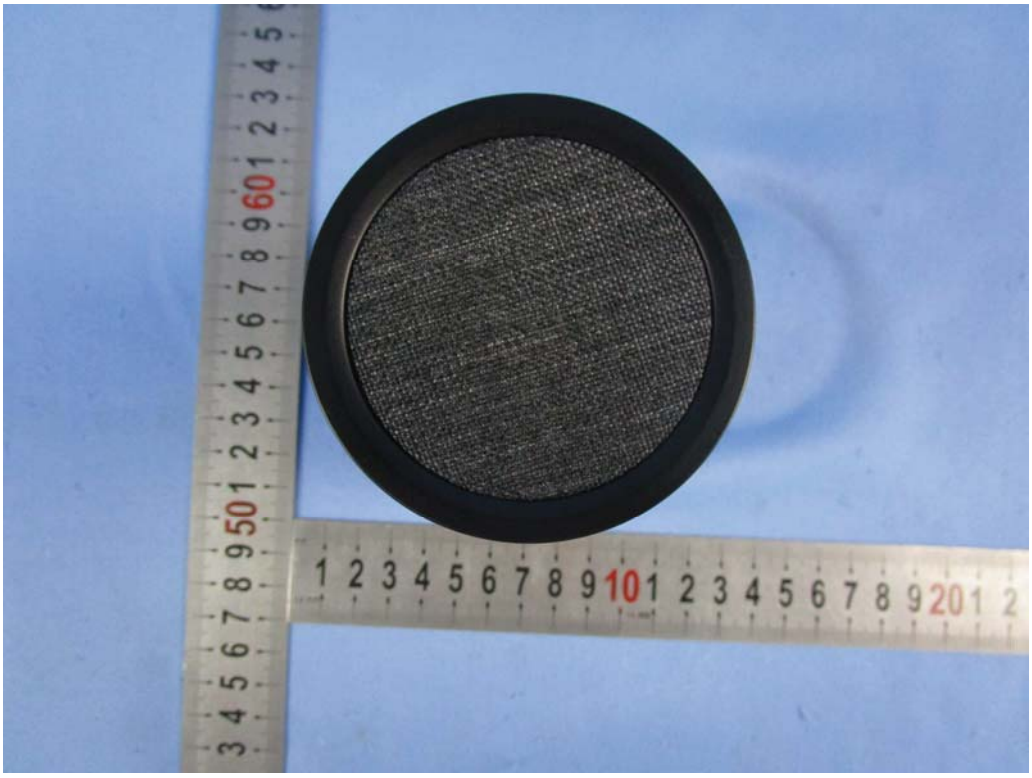
20 EUT PHOTOS

External Photo

External Photo



External Photo



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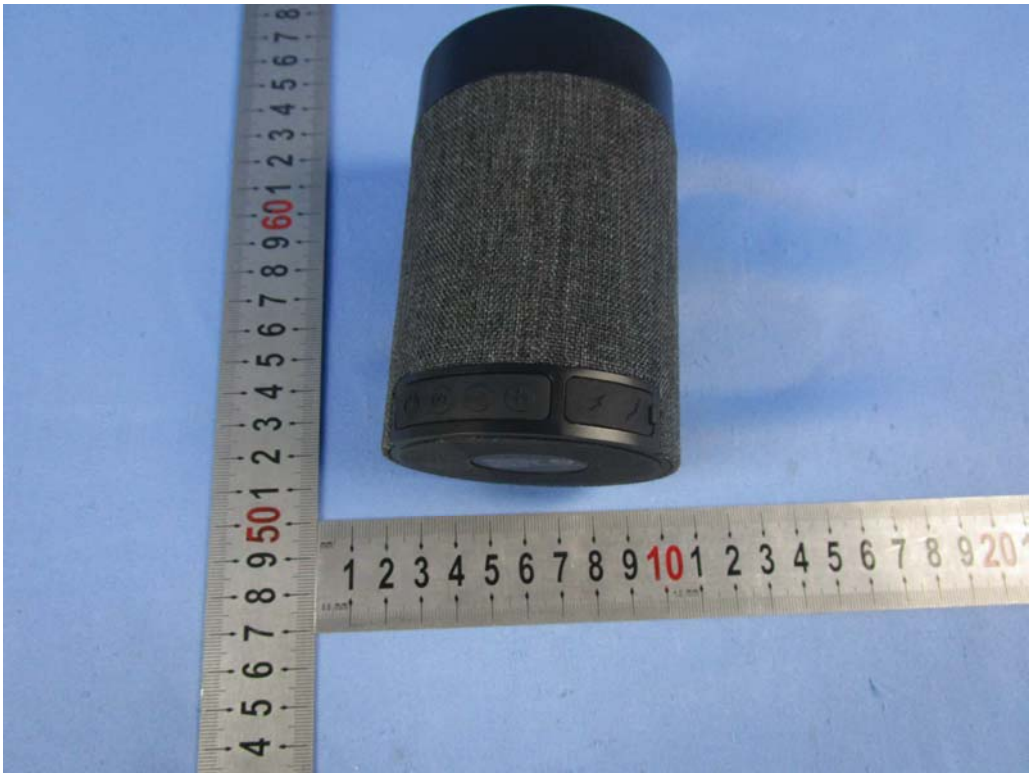

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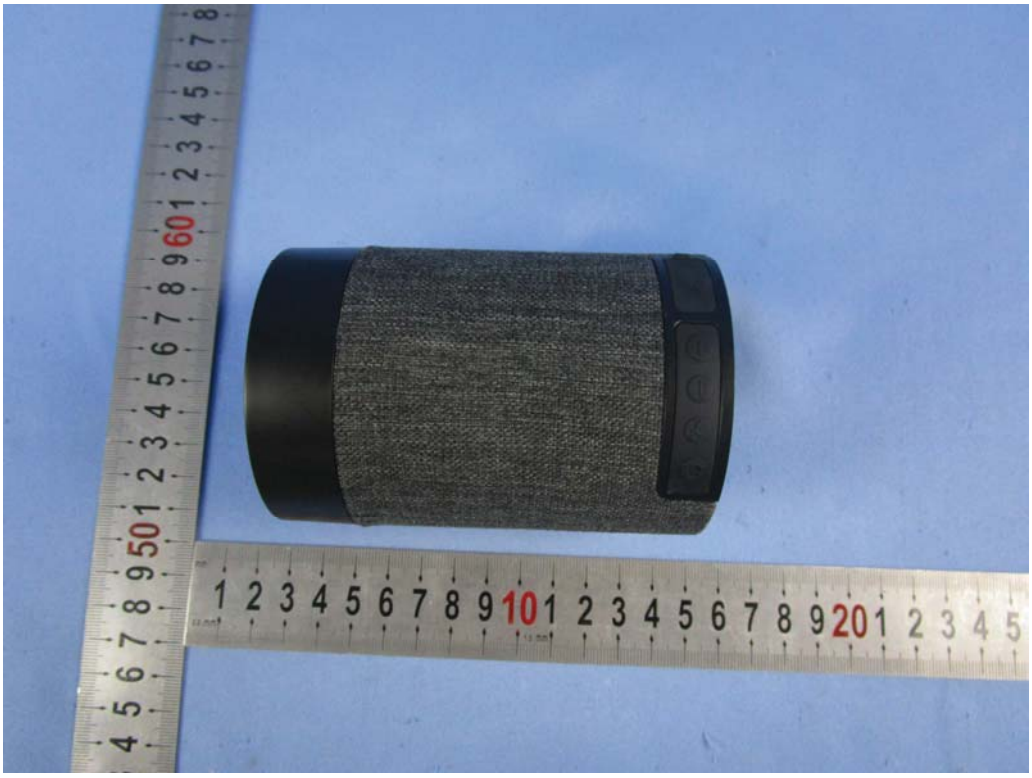

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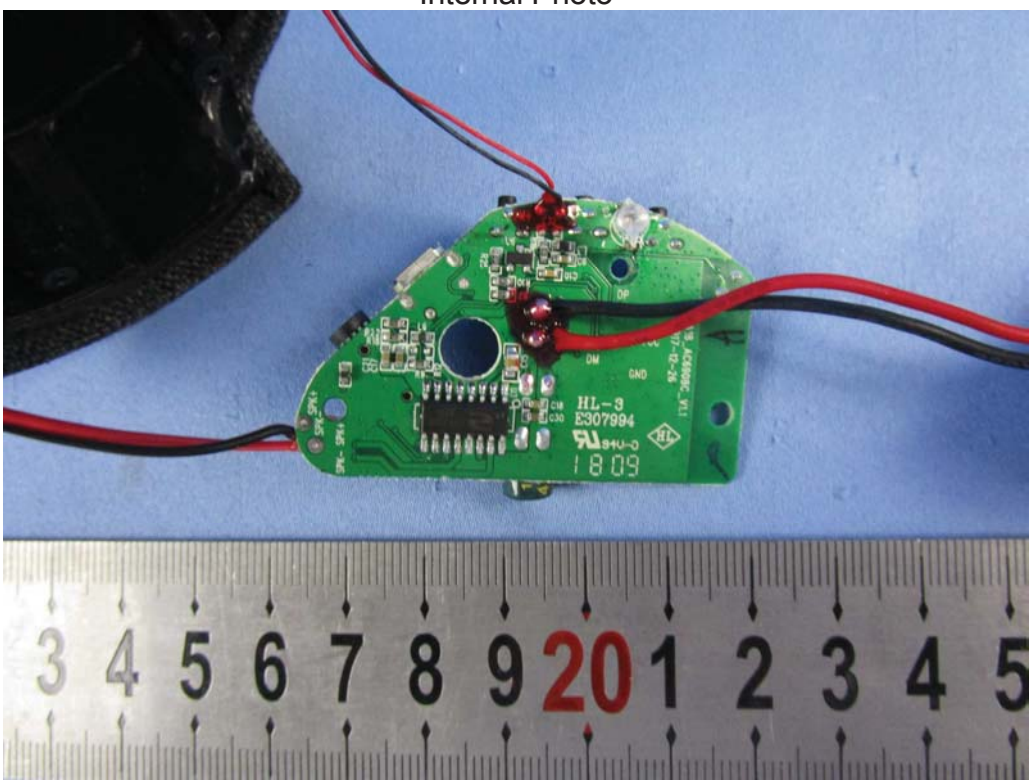
Internal Photo



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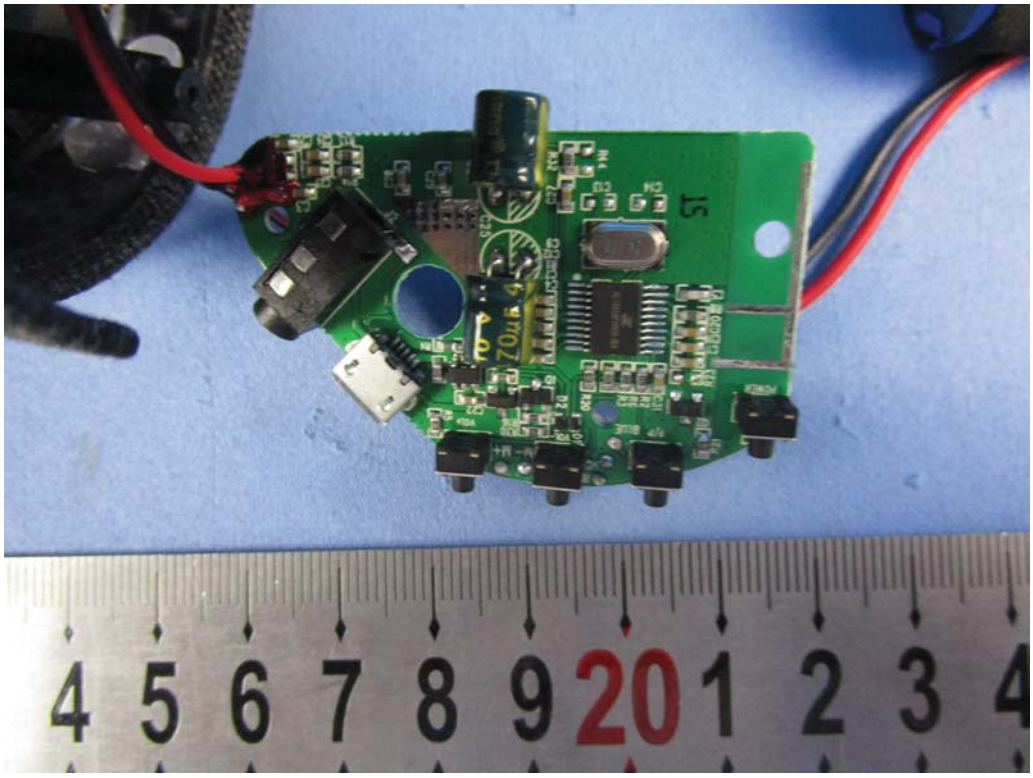

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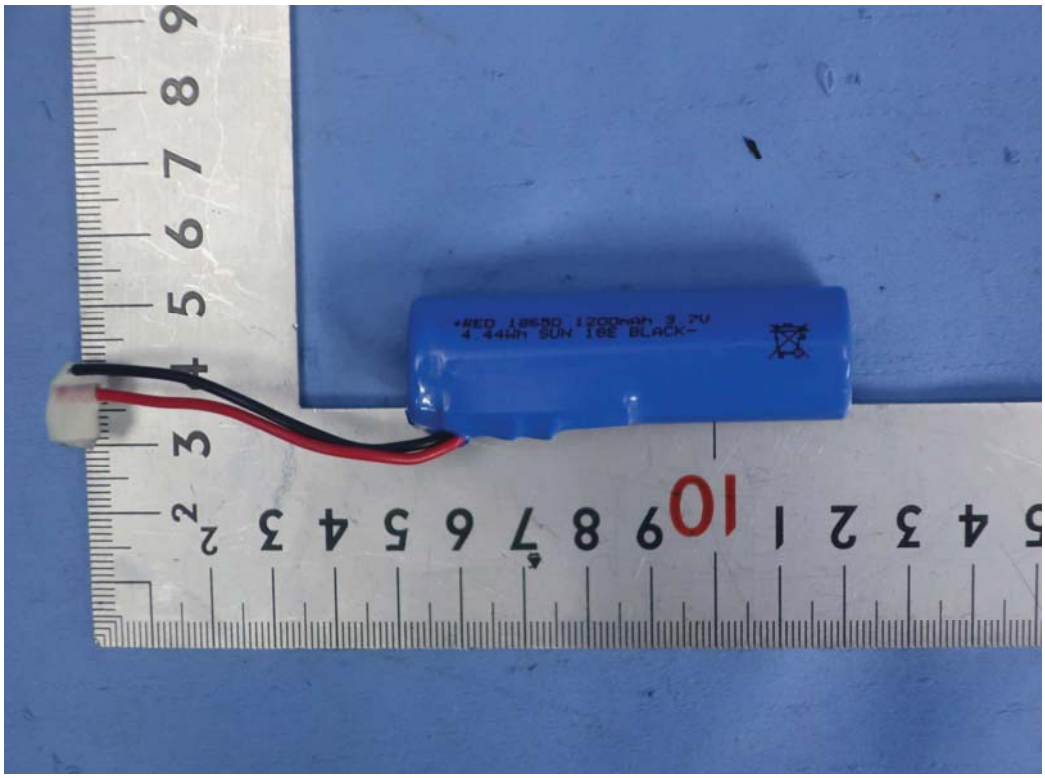

Internal Photo