

EMC Measurement and Test Report

For

ZTE Corporation

**ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District,
Shenzhen, Guangdong, P.R. China**

Test Standards:	EN 301 489-1 V1.9.2 (2011-09) EN 301 489-24 V1.5.1 (2010-10)
Product Description:	<u>LTE Outdoor CPE</u>
Tested Model:	<u>WF820</u>
Report No.:	<u>STR15068010E-2</u>
Tested Date:	<u>2015-06-04 to 2015-06-18</u>
Issued Date:	<u>2015-06-19</u>
Tested By:	<u>Seven Song/ Engineer</u> <i>Seven Song</i>
Reviewed By:	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
Approved & Authorized By:	<u>Jandy So / PSQ Manager</u> <i>Jandyso</i>
Prepared By:	

Shenzhen SEM.Test Technology Co., Ltd.
1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,
Bao'an District, Shenzhen, P.R.C (518101)
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION	4
1.2 TEST STANDARDS	5
1.3 TEST METHODOLOGY	5
1.4 TEST FACILITY	5
1.5 EUT SETUP AND OPERATION MODE	6
1.6 PERFORMANCE CRITERIA FOR EMS	7
2. SUMMARY OF TEST RESULTS	8
3. CONDUCTED EMISSIONS	9
3.1 MEASUREMENT UNCERTAINTY	9
3.2 TEST EQUIPMENT LIST AND DETAILS	9
3.3 TEST PROCEDURE	9
3.4 BASIC TEST SETUP BLOCK DIAGRAM	9
3.5 ENVIRONMENTAL CONDITIONS	11
3.6 SUMMARY OF TEST RESULTS/PLOTS	11
3.7 CONDUCTED EMISSIONS TEST DATA	11
4. RADIATED EMISSIONS	16
4.1 MEASUREMENT UNCERTAINTY	16
4.2 TEST EQUIPMENT LIST AND DETAILS	16
4.3 TEST PROCEDURE	16
4.4 CORRECTED AMPLITUDE & MARGIN CALCULATION	17
4.5 ENVIRONMENTAL CONDITIONS	17
4.6 SUMMARY OF TEST RESULTS/PLOTS	17
5. HARMONIC CURRENT EMISSIONS	20
5.1 TEST EQUIPMENT LIST AND DETAILS	20
5.2 TEST PROCEDURE	20
5.3 TEST STANDARDS	20
5.4 HARMONIC CURRENT EMISSIONS TEST DATA	20
6. VOLTAGE FLUCTUATION AND FLICKER	21
6.1 TEST EQUIPMENT LIST AND DETAILS	21
6.2 TEST PROCEDURE	21
6.3 TEST STANDARDS	21
6.4 VOLTAGE FLUCTUATION AND FLICKER TEST DATA	21
7. ELECTROSTATIC DISCHARGE (ESD)	23
7.1 TEST EQUIPMENT LIST AND DETAILS	23
7.2 TEST PROCEDURE	23
7.3 ELECTROSTATIC DISCHARGE IMMUNITY TEST DATA	23
8. RADIO FREQUENCY ELECTROMAGNETIC FIELD (R/S)	25
8.1 TEST EQUIPMENT LIST AND DETAILS	25
8.2 TEST PROCEDURE	25
8.3 CONTINUOUS RADIATED DISTURBANCES TEST DATA	26
9. FAST TRANSIENTS, COMMON MODE (EFT)	27
9.1 TEST EQUIPMENT LIST AND DETAILS	27
9.2 TEST PROCEDURE	27
9.3 ELECTRICAL FAST TRANSIENTS TEST DATA	27
10. SURGES	30
10.1 TEST EQUIPMENT LIST AND DETAILS	30
10.2 TEST PROCEDURE	30
10.3 SURGE TEST DATA	30
11. RADIO FREQUENCY, COMMON MODE (C/S)	32
11.1 TEST EQUIPMENT LIST AND DETAILS	32
11.2 TEST PROCEDURE	32
11.3 CONTINUOUS CONDUCTED DISTURBANCES TEST DATA	32

12. VOLTAGE DIPS AND INTERRUPTIONS.....34
 12.1 TEST EQUIPMENT LIST AND DETAILS34
 12.2 TEST PROCEDURE.....34
 12.3 VOLTAGE DIPS AND INTERRUPTIONS TEST DATA34
EXHIBIT 1 - PRODUCT LABELING36
 PROPOSED CE LABEL FORMAT36
 PROPOSED LABEL LOCATION ON EUT36
EXHIBIT 2 - EUT PHOTOGRAPHS.....37
EXHIBIT 3 - TEST SETUP PHOTOGRAPHS43

SEM. Test

1.GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: ZTE Corporation
Address of applicant: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,
Nanshan District, Shenzhen, Guangdong, P.R. China

Manufacturer: KZ Broadband Technologies, Ltd
Address of manufacturer: 1601 Tower C, Skyworth Building, High-Tech Industrial
Park, Nanshan District, Shenzhen, China.

General Description of EUT	
Product Name:	LTE Outdoor CPE
Brand Name:	ZTE
Model No.:	WF820
Add Model:	AirMaster 4000v, WF820+, WF820_V8, ZTE WF820, ZTE WF820+,ZTE WF820_V8
Hardware Version:	V1
Software Version:	--
Rated Voltage:	DC 24V (PoE)
PoE:	XY018-240075D Input 100-240V, 50/60Hz, Output DC 24V, 0.75A
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
LTE	
Support Bands:	TDD-LTE Band 42, Band 43
Frequency Range:	TDD-LTE Band 42: Tx: 3400~3600MHz
	TDD-LTE Band 43: Tx: 3600~3800MHz
RF Output Power:	TDD-LTE Band 42: 23.80dBm
	TDD-LTE Band 43: 23.80dBm
Modulation Type:	QPSK, 16QAM
Antenna Type:	Internal Antenna
Antenna Gain:	15dBi

1.2 Test Standards

The following report is prepared on behalf of the ZTE Corporation, Ltd In accordance with ETSI EN 301 489-1 V1.9.2, Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; ETSI EN 301 489-24 V1.5.1, Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 24: Specific conditions for IMT-2000 CDMA Direct Spread (UTRA) for Mobile andportable (UE) radio and ancillary equipment.

The objective of the manufacturer is to demonstrate compliance with the standards ETSI EN 301489-1, ETSI EN 301 489-24 V1.5.1.

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 301489-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.

1.4 Test Facility

- **FCC – Registration No.: 934118**

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

- **Industry Canada (IC) Registration No.: 11464A**

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Technology 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 L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101)

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
TM1	Normal Operating	Connected to Notebook
TM2	FDD-LTE Band 42 Transmitting &Receiving	TT, CT, TR, CR for EMS testing
TM3	FDD-LTE Band 43 Transmitting &Receiving	TT, CT, TR, CR for EMS testing

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
DC Power Cable	0.6	Unshielded	Without Ferrite
RJ45	1.2	Unshielded	Without Ferrite

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	LR-63C8R

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
RJ11	3	Unshielded	Without Ferrite
RJ45	3	Unshielded	Without Ferrite

1.6 Performance Criteria for EMS

According to the section 6.1 and 6.2 EN301489-24, the test data has been collected, reduced, and analyzed within this report in accordance with Immunity requires the following as specific performance criteria:

6.1 Performance criteria for continuous phenomena

A communication link shall be established at the start of the test, and maintained during the test, clauses 4.1 and 4.2.

In the data transfer mode, the performance criteria can be one of the following:

- if the BER (as referred in TS 134 109 [8]) is used, it shall not exceed 0,001 during the test sequence;
- if the BLER (as referred in TS 134 109 [8]) is used, it shall not exceed 0,01 during the test sequence.

The BLER calculation shall be based on evaluating the CRC on each transport block.

In the speech mode, the performance criteria shall be that the up link and downlink speech output levels shall be at least 35 dB less than the recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (annex B).

NOTE: When there is a high level of background audio noise present, the filter bandwidth can be reduced down to a minimum of 40 Hz.

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

In addition to confirming the above performance in traffic mode, the test shall be performed in idle mode, and the transmitter shall not unintentionally operate.

6.2 Performance criteria for Transient phenomena

A communications link shall be established at the start of the test, clauses 4.1 and 4.2.

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

At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

In addition to confirming the above performance in traffic mode, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

2. SUMMARY OF TEST RESULTS

Standards	Reference	Description of Test Item	Result
EN 301489-1 V1.9.2 (2011-09)	8.2	Radiated Emissions	Pass
	8.3	Conducted Emissions for DC Power Port	N/A
	8.4	Conducted Emissions for AC Power Port	Pass
	8.5	Harmonic Current Emissions	Pass
	8.6	Voltage Fluctuations and Flicker	Pass
	8.7	Telecommunication Ports	N/A
	9.2	Radio Frequency Electromagnetic Field	Pass
	9.3	Electrostatic Discharge	Pass
	9.4	Fast Transients, Common Mode	Pass
	9.5	Radio Frequency, Common Mode	Pass
	9.6	Transient and Surges in the Vehicular Environment	N/A
	9.7	Voltage Dips and Interruptions	Pass
	9.8	Surges	Pass
<p>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</p>			

3. Conducted Emissions

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-05-28	2016-05-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-05-28	2016-05-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-05-28	2016-05-27
8-Wire ISN	Schwarz beck	CAT3 8158	CAT3-8158-0059	2015-05-28	2016-05-27
8-Wire ISN	Schwarz beck	CAT5 8158	CAT5-8158-0117	2015-05-28	2016-05-27

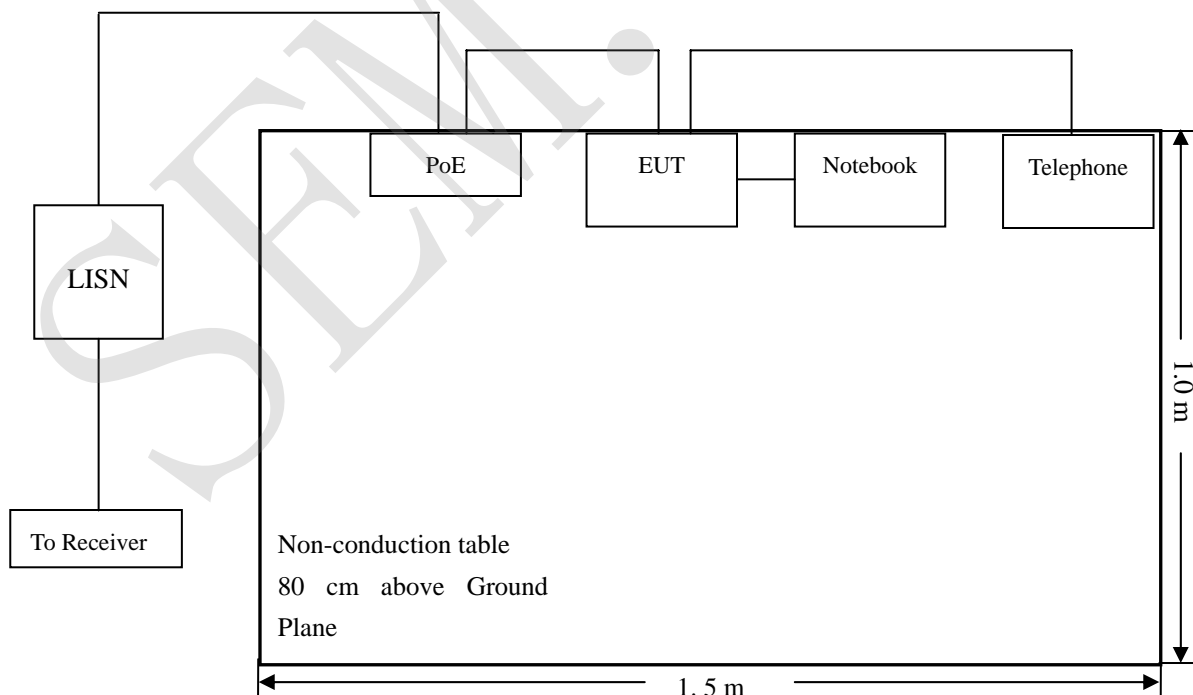
SCHWARZBECK

SCHWARZBECK

3.3 Test Procedure

Test is conducting under the description of EN55022 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

3.4 Basic Test Setup Block Diagram



SEM. Test

3.5 Environmental Conditions

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

3.6 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:

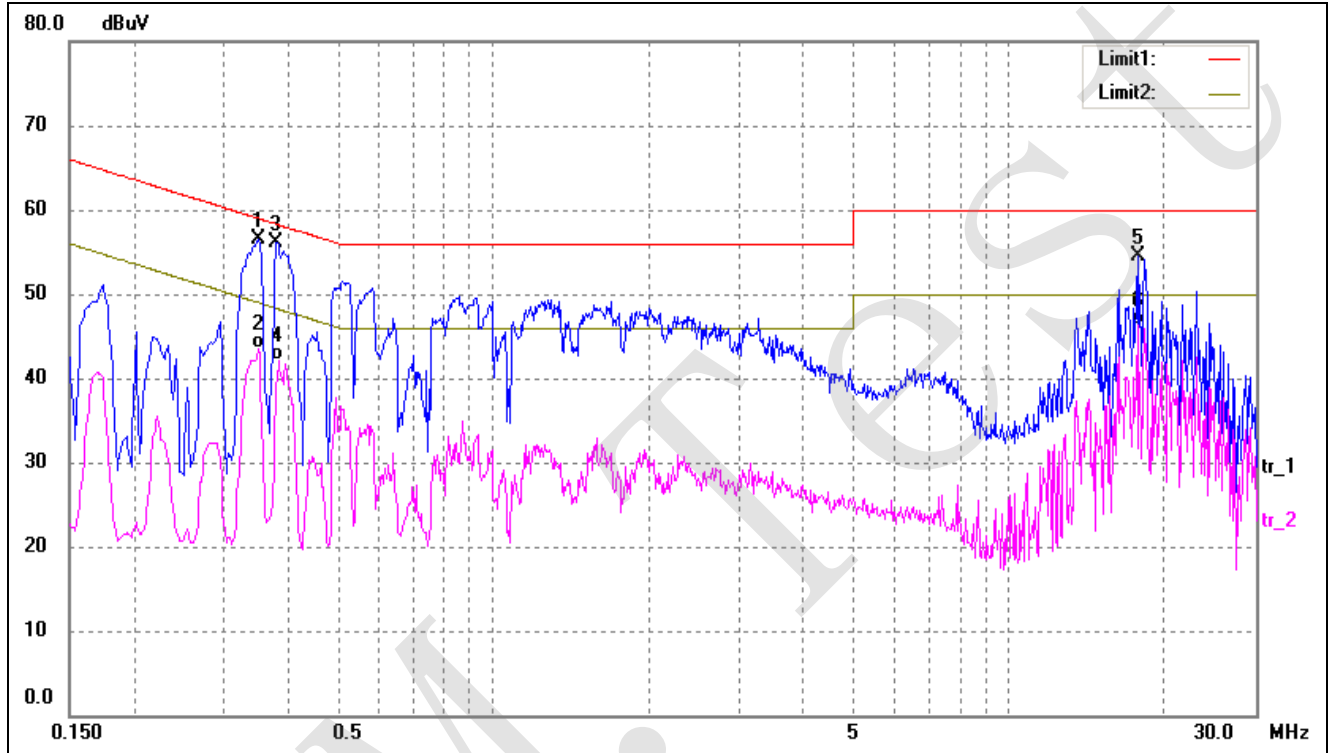
-2.20 dB at **0.3780 MHz** in the **Neutral, Peak** detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

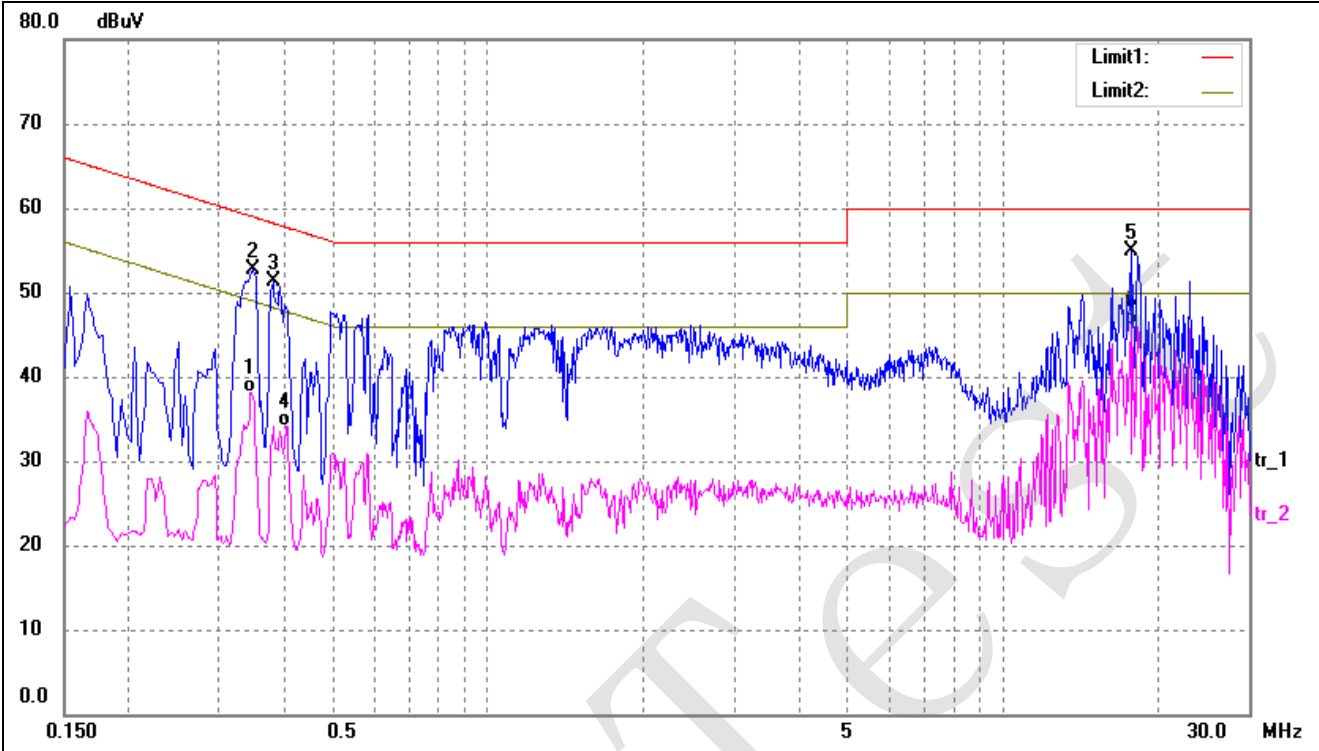
EUT: *LTE Outdoor CPE*
 Tested Model: *WF820*
 Operating Condition: *TM1*
 Comment: *AC 230V/50Hz; PoE DC 24V*

Test Specification: *Neutral*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3500	46.91	9.50	56.41	58.96	-2.55	peak
2	0.3500	33.99	9.50	43.49	48.96	-5.47	AVG
3*	0.3780	46.62	9.50	56.12	58.32	-2.20	peak
4	0.3820	32.53	9.50	42.03	48.23	-6.20	AVG
5	17.6940	42.89	11.54	54.43	60.00	-5.57	peak
6	17.6940	34.76	11.54	46.30	50.00	-3.70	AVG

Test Specification: Line

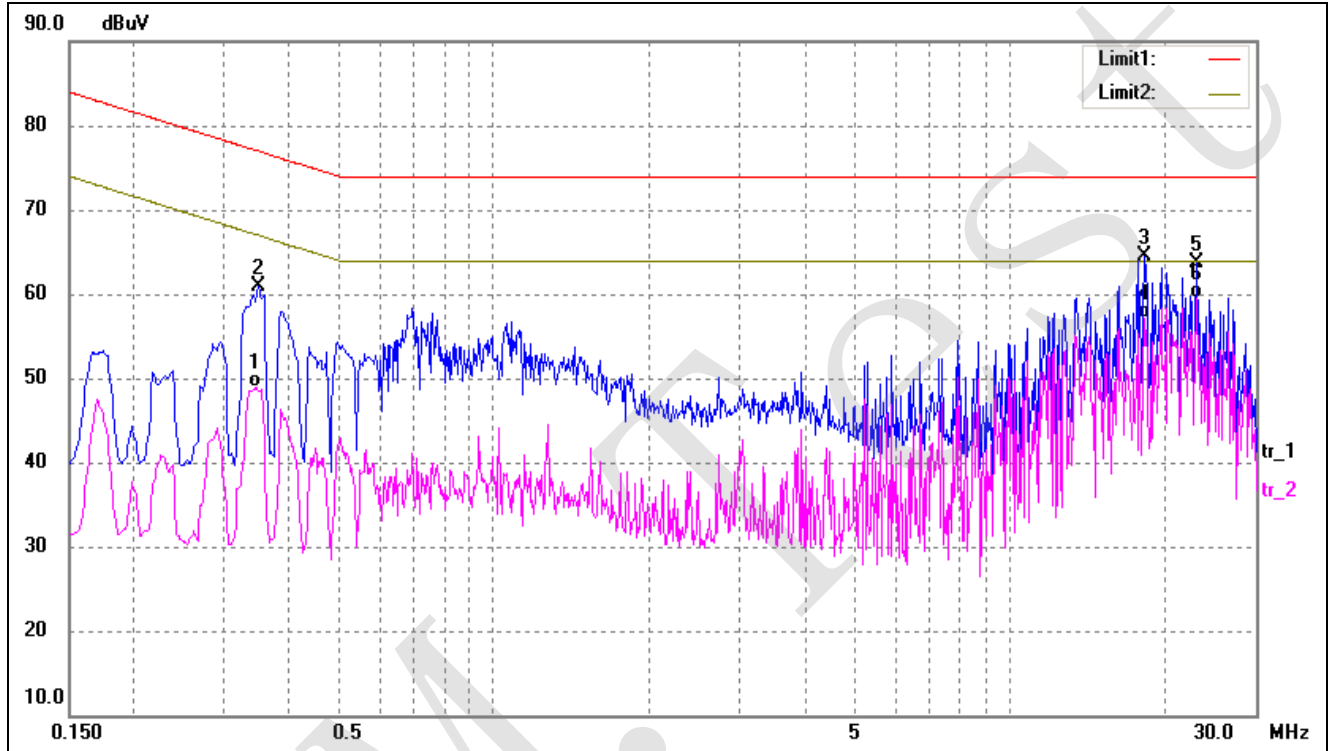


No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.3460	28.65	9.50	38.15	49.06	-10.91	AVG
2	0.3500	43.11	9.50	52.61	58.96	-6.35	peak
3	0.3820	41.87	9.50	51.37	58.24	-6.87	peak
4	0.4060	24.65	9.50	34.15	47.73	-13.58	AVG
5	17.6940	43.38	11.54	54.92	60.00	-5.08	peak
6*	17.6940	34.54	11.54	46.08	50.00	-3.92	AVG

Plot of Conducted Emissions Test Data

EUT: *LTE Outdoor CPE*
 Tested Model: *WF820*
 Operating Condition: *TM1*
 Comment: *AC 230V/50Hz; PoE DC 24V*

Test Specification: *RJ-45(Net Port)*

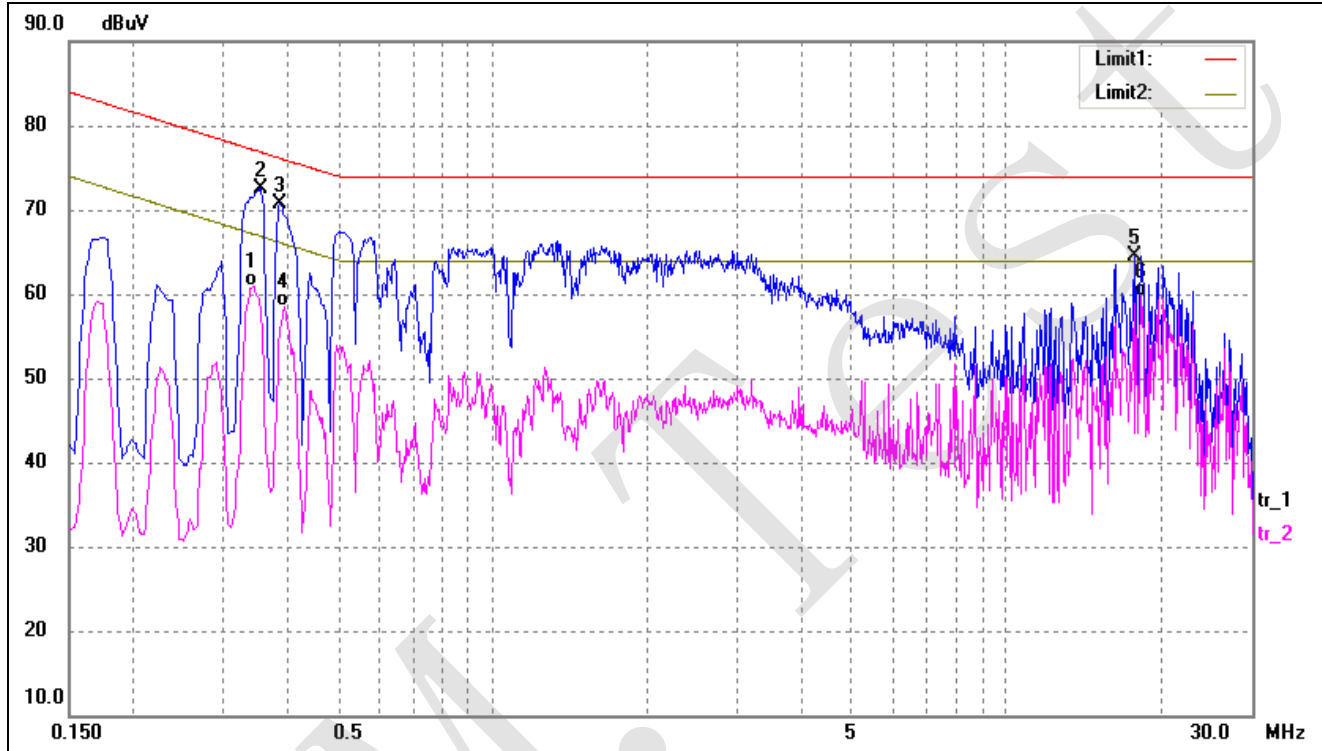


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3460	29.42	19.44	48.86	67.06	-18.20	AVG
2	0.3500	41.53	19.44	60.97	76.96	-15.99	peak
3	18.2420	43.26	21.30	64.56	74.00	-9.44	peak
4	18.2420	35.71	21.30	57.01	64.00	-6.99	AVG
5	23.1300	41.53	22.08	63.61	74.00	-10.39	peak
6*	23.1300	37.50	22.08	59.58	64.00	-4.42	AVG

Plot of Conducted Emissions Test Data

EUT: *LTE Outdoor CPE*
 Tested Model: *WF820*
 Operating Condition: *TM1*
 Comment: *AC 230V/50Hz; PoE DC 24V*

Test Specification: *RJ-11(Tel Port)*



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3420	41.52	19.44	60.96	67.15	-6.19	AVG
2	0.3540	53.06	19.44	72.50	76.87	-4.37	peak
3	0.3860	51.30	19.42	70.72	76.15	-5.43	peak
4	0.3940	39.07	19.41	58.48	65.98	-7.50	AVG
5	17.6940	43.27	21.18	64.45	74.00	-9.55	peak
6*	18.2420	38.41	21.30	59.71	64.00	-4.29	AVG

4. Radiated Emissions

4.1 Measurement Uncertainty

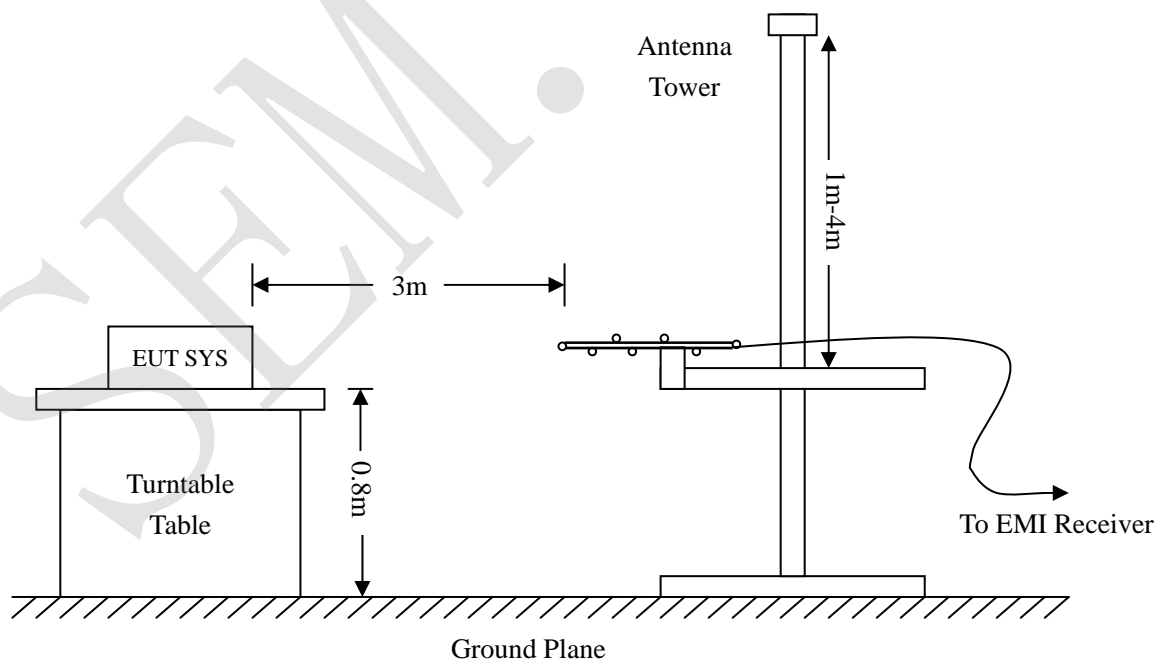
Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

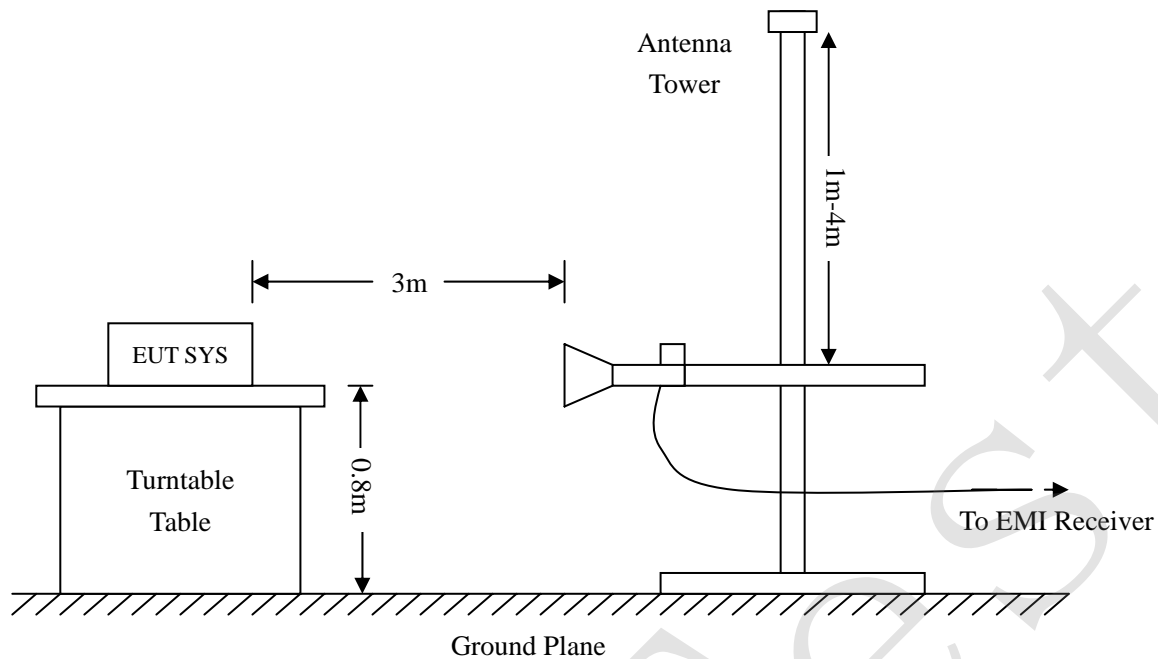
4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2015-05-28	2016-05-27
EMI Test Receiver	R&S	ESVB	825471/005	2015-05-28	2016-05-27
Pre-amplifier	Agilent	8447F	3113A06717	2015-05-28	2016-05-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2015-05-28	2016-05-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2015-05-24	2016-05-23
Horn Antenna	ETS	3117	00086197	2015-05-24	2016-05-23

4.3 Test Procedure

Test is conducting under the description of EN55022 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.





4.4 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 -6dBμV means the emission is 6dBμV below the maximum limit for Class B device. The equation for margin calculation is as follows:

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

4.5 Environmental Conditions

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

4.6 Summary of Test Results/Plots

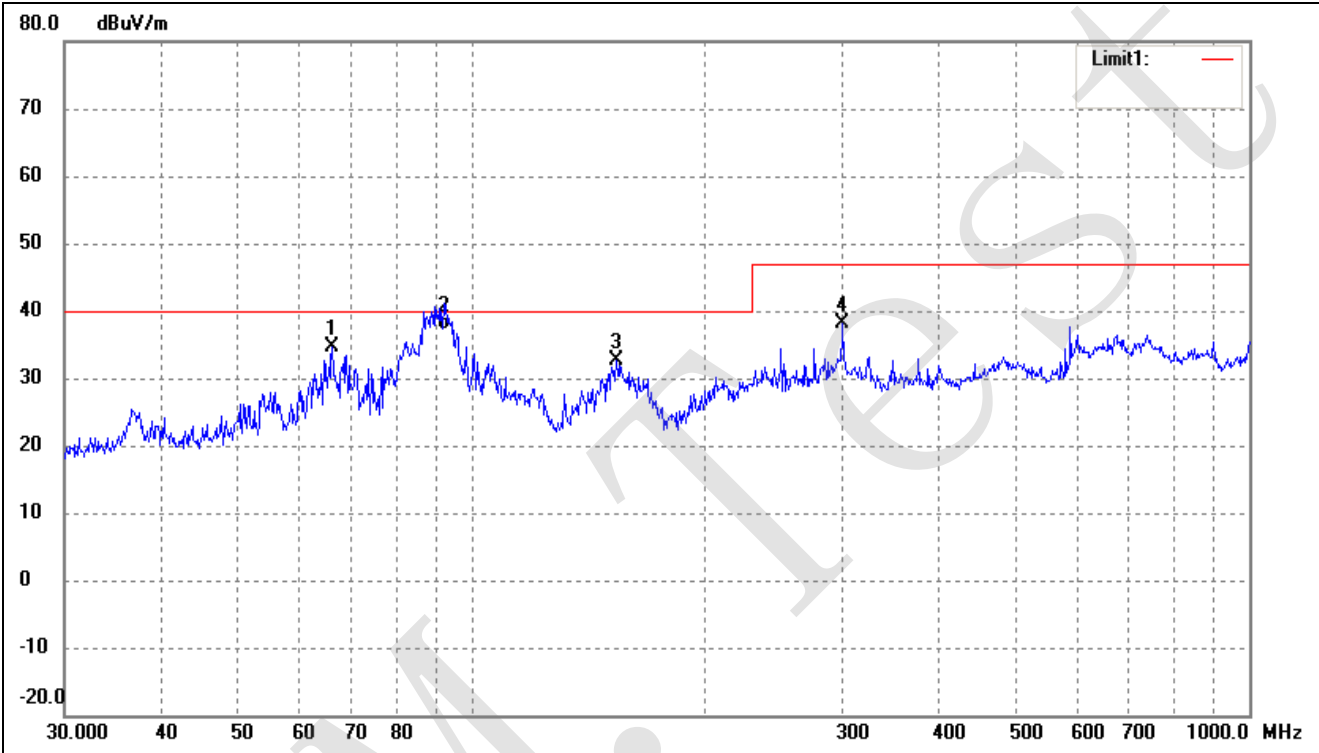
According to the data in section 4.6, the EUT complied with the EN 301489 Class B standards, and had the worst margin is:

-3.37 dB at 57.1914 MHz in the, Vertical polarization TM2, 30 MHz to 6 GHz, 3Meters

Plot of Radiated Emissions Test Data

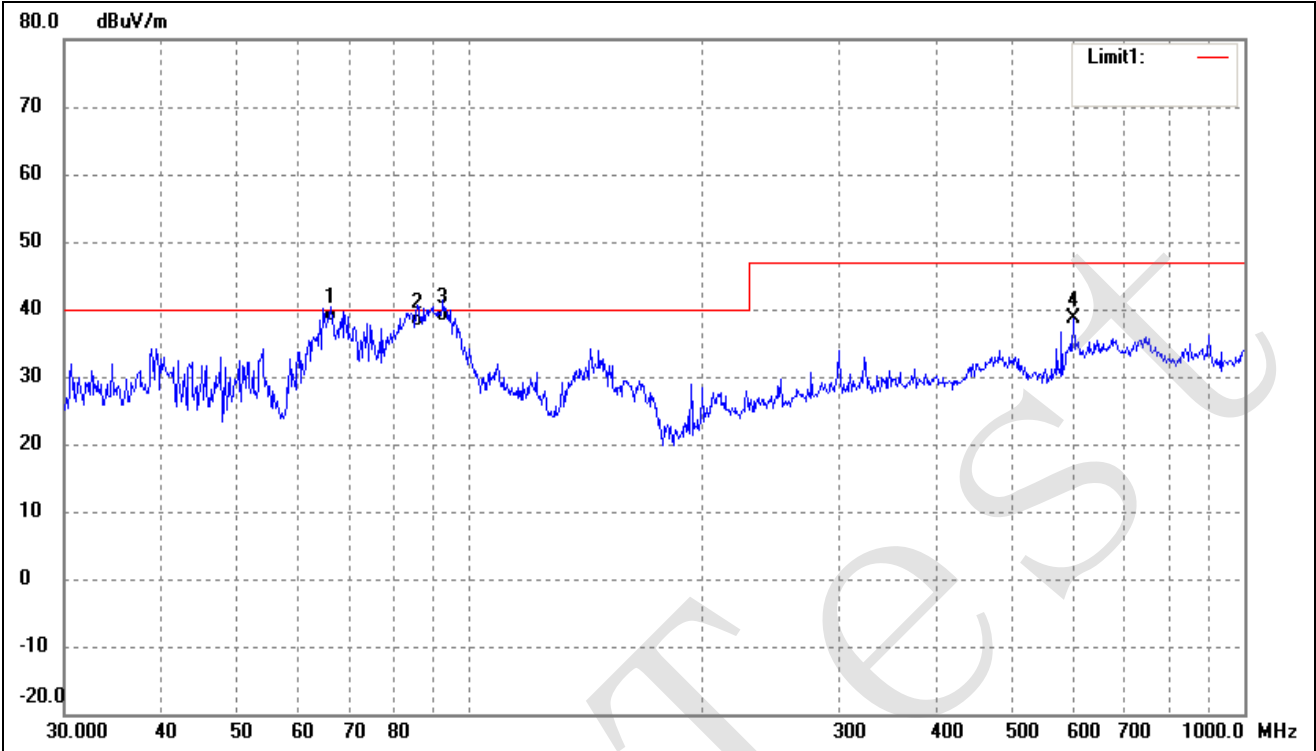
EUT: LTE Outdoor CPE
Tested Model: WF820
Operating Condition: TM1
Comment: AC 230V/50Hz; PoE DC 24V

Test Specification: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	66.2662	30.72	4.01	34.73	40.00	-5.27	131	100	peak
2	92.1388	33.20	3.94	37.14	40.00	-2.86	227	100	QP
3	153.7385	29.86	2.85	32.71	40.00	-7.29	271	100	peak
4	300.3672	25.84	12.18	38.02	47.00	-8.98	360	100	peak

Test Specification: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	()	(cm)	
1	66.2660	34.20	4.01	38.21	40.00	-1.79	224	100	QP
2	85.5977	34.50	2.91	37.41	40.00	-2.59	189	100	QP
3	92.4624	34.20	3.99	38.19	40.00	-1.81	340	100	QP
4	601.4265	19.51	19.22	38.73	47.00	-8.27	212	100	peak

Note: emissions are only the base noise in frequency 1GHz~6GHz .

5. Harmonic Current Emissions

5.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Digital Power Analyzer	California Instrument	CTS	72831	2015-05-28	2016-05-27
Power Source	California Instrument	5001IX-CTS-400	60077	2015-05-28	2016-05-27

5.2 Test Procedure

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

5.3 Test Standards

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

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	48%
ATM Pressure:	1022 mbar

5.4 Harmonic Current Emissions Test Data

According to Clause 7 of EN61000-3-2, the EUT rated power is less than 75W, belong to 'equipment with a rated power of 75W or less', therefore 'limits are not specified in this edition of the standards'. It is deem to full fit the requirements of the standards.

Result: The EUT complies with the requirements of this section.

6. Voltage Fluctuation and Flicker

6.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Digital Power Analyzer	California Instrument	CTS	72831	2015-05-28	2016-05-27
Power Source	California Instrument	5001IX-CTS-400	60077	2015-05-28	2016-05-27

6.2 Test Procedure

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

6.3 Test Standards

EN61000-3-3, Limit: Clause 5.

Environmental Conditions

Temperature:	22 °C
Relative Humidity:	48%
ATM Pressure:	1022 mbar

6.4 Voltage Fluctuation and Flicker Test Data

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

EUT: LET Outdoor CPE

Tested by: Seven Song

Test category: All parameters (European limits)

Test Margin: 100

Test date: 2015-06-12

Start time: 17:13:27 PM

End time: 17:23:39 PM

Test duration (min): 10

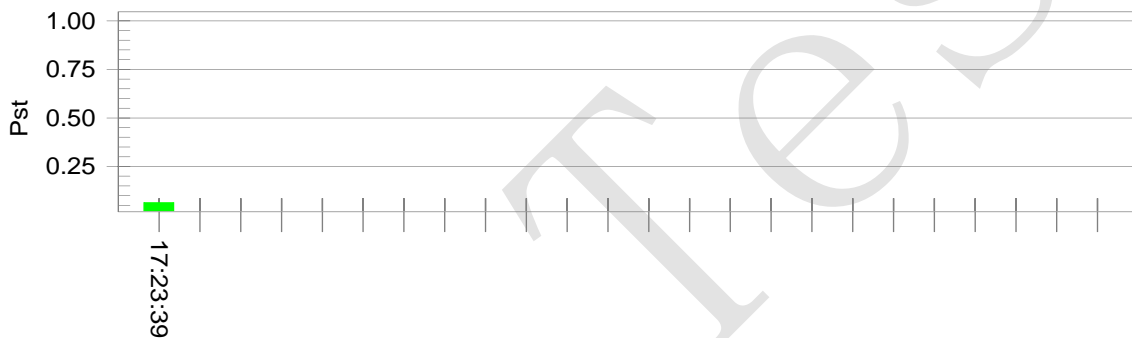
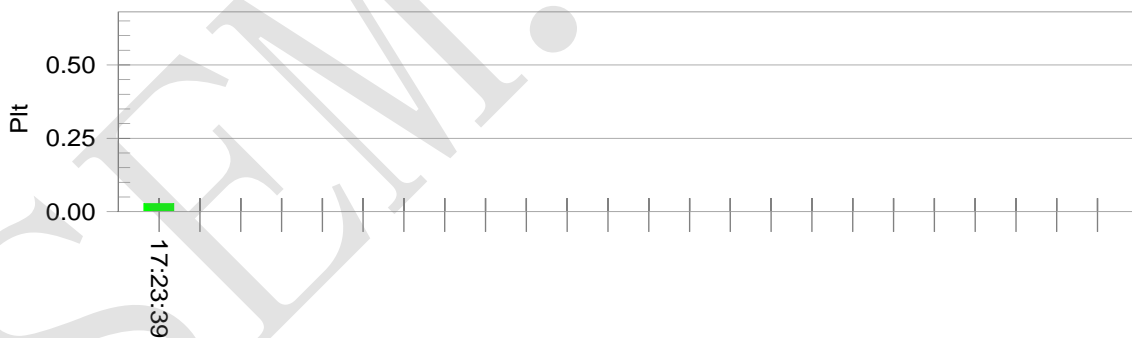
Data file name: F-000046.cts_data

Comment: TM1

Customer: KZ BroadBand Technologies,Ltd

Test Result: Pass

Status: Test Completed

Pst_i and limit lineEuropean LimitsPlt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	231.10			
Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	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):	0.062	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.630	Pass

7. Electrostatic Discharge (ESD)

7.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
ESD Generator	TESQ AG	NSG 437	161	2015-05-28	2016-05-27

7.2 Test Procedure

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

Test Performance

Performance Criterion: PASS for FDD-LTE_TT & TR

B for Operating

Environmental Conditions

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

7.3 Electrostatic Discharge Immunity Test Data

Test mode: FDD-LTE Band 42_TT & TR

EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
LED	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Buttons	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Slots	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I/O Port	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Direct Contact Discharge								
I/O Port(Metal Part)	/	/		/	/	/		/

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	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Top Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Back Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Left Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Right Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Test mode: FDD-LTE Band 43_TT & TR

EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
LED	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Buttons	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Slots	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
I/O Port	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Direct Contact Discharge								
I/O Port(Metal Part)	/	/		/	/	/		/

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	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Top Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Back Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Left Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Right Side	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Test mode: Connect to Notebook

EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
LED	A	A	A	A	A	A	A	A
Buttons	A	A	A	A	A	A	A	A
Slots	A	A	A	A	A	A	A	A
I/O Port	A	A	A	A	A	A	A	A
Direct Contact Discharge								
I/O Port(Metal Part)	/	/	/	/				

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 Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Signal Generator	Rohde & Schwarz	SMT03	100059	2015-05-28	2016-05-27
Voltage Probe	Rohde & Schwarz	URV5-Z2	100013	2015-05-28	2016-05-27
Power Amplifier	AR	150W1000	300999	2015-05-28	2016-05-27
Power Amplifier	AR	25S1G4AM1	305993	2015-05-28	2016-05-27
Trilog Antenna	SCHWARZBEC K	VULB9163	9163-333	2015-05-24	2016-05-23
Anechoic chamber	Albatross Projects	MCDC	----	2013-12-16	2015-12-15
Audio analyzer	Rohde & Schwarz	UPA	829743/001	2015-05-28	2016-05-27
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	1201.0002k50- 148650-FB	2015-05-28	2016-05-27
Audio Power Amplifier	B&K	2716-C-001	/	2015-05-28	2016-05-27
Conditioning Amplifier	B&K	2690-0S2	/	2015-05-28	2016-05-27
Mouth Simulator	B&K	4227	/	2015-05-28	2016-05-27
Sound Calibrator	B&K	4231	/	2015-05-28	2016-05-27
1/2" Pressure-field Microphone	B&K	4192	/	2015-05-28	2016-05-27
Ear Simulator for Telephonometry	B&K	4185	/	2015-05-28	2016-05-27
Telephone Test Head	B&K	4206 B	/	2015-05-28	2016-05-27

8.2 Test Procedure

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

Test Performance

Performance Criterion: PASS for FDD-LTE_TT & TR

A for Operating

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: FDD-LTE Band 42_CT, CR

Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1400-2700	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Test model: FDD-LTE Band 43_CT, CR

Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
1400-2700	3	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Test model: Connect to Notebook

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
1400-2700	3	A	A	A	A	A	A	A	A

Test Result: Pass

9. Fast Transients, Common Mode (EFT)

9.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Transient 2000	EMC PARTNER	TRA2000	863	2015-05-28	2016-05-27
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2015-05-28	2016-05-27

9.2 Test Procedure

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

Test Performance

Performance Criterion: PASS for FDD-LTE_TT & TR
B for Operating

Environmental Conditions

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

9.3 Electrical Fast Transients Test Data

Test mode: FDD-LTE Band 42_TT, TR

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	PASS	PASS	PASS	PASS	/	/	/	/
	L2	PASS	PASS	PASS	PASS	/	/	/	/
	PE	PASS	PASS	PASS	PASS	/	/	/	/
	L1+L2	PASS	PASS	PASS	PASS	/	/	/	/
	L1 + PE	PASS	PASS	PASS	PASS	/	/	/	/
	L2 + PE	PASS	PASS	PASS	PASS	/	/	/	/
	L1+L2+PE	PASS	PASS	PASS	PASS	/	/	/	/
Signal ports	RJ45(Net Port)	PASS	PASS	PASS	PASS	/	/	/	/
Signal ports	RJ11(Tel Port)	PASS	PASS	PASS	PASS				

Test modeE : FDD-LTE Band 43_TT, TR

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	PASS	PASS	PASS	PASS	/	/	/	/
	L2	PASS	PASS	PASS	PASS	/	/	/	/
	PE	PASS	PASS	PASS	PASS	/	/	/	/
	L1+L2	PASS	PASS	PASS	PASS	/	/	/	/
	L1 + PE	PASS	PASS	PASS	PASS	/	/	/	/
	L2 + PE	PASS	PASS	PASS	PASS	/	/	/	/
	L1+L2+PE	PASS	PASS	PASS	PASS	/	/	/	/
Signal ports	RJ45(Net Port)	PASS	PASS	PASS	PASS	/	/	/	/
Signal ports	RJ11(Tel Port)	PASS	PASS	PASS	PASS				

Test mode: Connect to Notebook

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	A	A	A	A	/	/	/	/
	L2	A	A	A	A	/	/	/	/
	PE	A	A	A	A	/	/	/	/
	L1+L2	A	A	A	A	/	/	/	/
	L1 + PE	A	A	A	A	/	/	/	/
	L2 + PE	A	A	A	A	/	/	/	/
	L1+L2+PE	A	A	A	A	/	/	/	/
Signal ports	RJ45(Net Port)	A	A	A	A	/	/	/	/
Signal ports	RJ11(Tel Port)	A	A	A	A				

Test Result: Pass

10. Surges

10.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Transient 2000	EMC PARTNER	TRA2000	863	2015-05-28	2016-05-27

10.2 Test Procedure

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

Test Performance

Performance Criterion: PASS for FDD-LTE_TT & TR
B for Operating

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

10.3 Surge Test Data

Test mode: FDD-LTE Band 1_TT, TR

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L-N	PASS	/
2	1kV	±	L-N	PASS	/
3	1kV	±	Line-Gnd(RJ45-ODU)	PASS	/

Test mode: FDD-LTE Band 3_TT, TR

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L-N	PASS	/
2	1kV	±	L-N	PASS	/
3	1kV	±	Line-Gnd(RJ45-ODU)	PASS	/

Test mode: Connect to Notebook

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L-N	PASS	/
2	1kV	±	L-N	PASS	/
3	1kV	±	Line-Gnd(RJ45-ODU)	PASS	/

Test Result: Pass

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

11.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Immunity simulator	EMTEST	MV500	0800-44	2015-05-28	2016-05-27
Antenna	Sunol Sciences	JB1	/	2015-05-28	2016-05-27
Audio analyzer	Rohde & Schwarz	UPA	829743/001	2015-05-28	2016-05-27
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	1201.0002k50-148650-FB	2015-05-28	2016-05-27
Audio Power Amplifier	B&K	2716-C-001	/	2015-05-28	2016-05-27
Conditioning Amplifier	B&K	2690-0S2	/	2015-05-28	2016-05-27
Mouth Simulator	B&K	4227	/	2015-05-28	2016-05-27
Sound Calibrator	B&K	4231	/	2015-05-28	2016-05-27
1/2" Pressure-field Microphone	B&K	4192	/	2015-05-28	2016-05-27
Ear Simulator for Telephonometry	B&K	4185	/	2015-05-28	2016-05-27
Telephone Test Head	B&K	4206 B	/	2015-05-28	2016-05-27

11.2 Test Procedure

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

Test Performance

Performance Criterion: PASS for FDD-LTE_TT & TR
A for Operating

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

11.3 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second

Test mode: FDD-LTE Band 42_CT, CR

Port	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
AC	3	AM 80%, 1kHz sinewave	PASS	/
RJ45(Net)	3	AM 80%, 1kHz sinewave	A	/
RJ11	3	AM 80%, 1kHz sinewave	A	/

Test mode: FDD-LTE Band 43_CT, CR

Port	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
AC	3	AM 80%, 1kHz sinewave	PASS	/
RJ45(Net)	3	AM 80%, 1kHz sinewave	A	/
RJ11	3	AM 80%, 1kHz sinewave	A	/

Test mode: Connect to Notebook

Port	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
AC	3	AM 80%, 1kHz sinewave	PASS	/
RJ45(Net)	3	AM 80%, 1kHz sinewave	A	/
RJ11	3	AM 80%, 1kHz sinewave	A	/

12. Voltage Dips and Interruptions

12.1 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Transient 2000	EMC PARTNER	TRA2000	863	2014-05-28	2015-05-27

12.2 Test Procedure

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

Test Performance

Performance Criterion: PASS for FDD-LTE_TT & TR

B for Operating

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

12.3 Voltage Dips And Interruptions Test Data

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

T: Test duration

Test mode: FDD-LTE Band 42_TT, TR

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

Test mode: FDD-LTE Band 43_TT, TR

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

Test mode: Connect to Notebook

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

Test Result: Pass

EXHIBIT 1 - PRODUCT LABELING

Proposed CE Label Format

CE 0700

Specifications: Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT. The 'CE' marking must be affixed to the EUT or to its data plate. Where this is not possible or not warranted on account of the nature of the apparatus, it must be affixed to the packaging, if any, and to the accompanying documents. The 'CE' marking must have a height of at least 5 mm. If the 'CE' marking is reduced or enlarged the proportions given in the above graduated drawing must be respected.

Proposed Label Location on EUT

CE Label Location



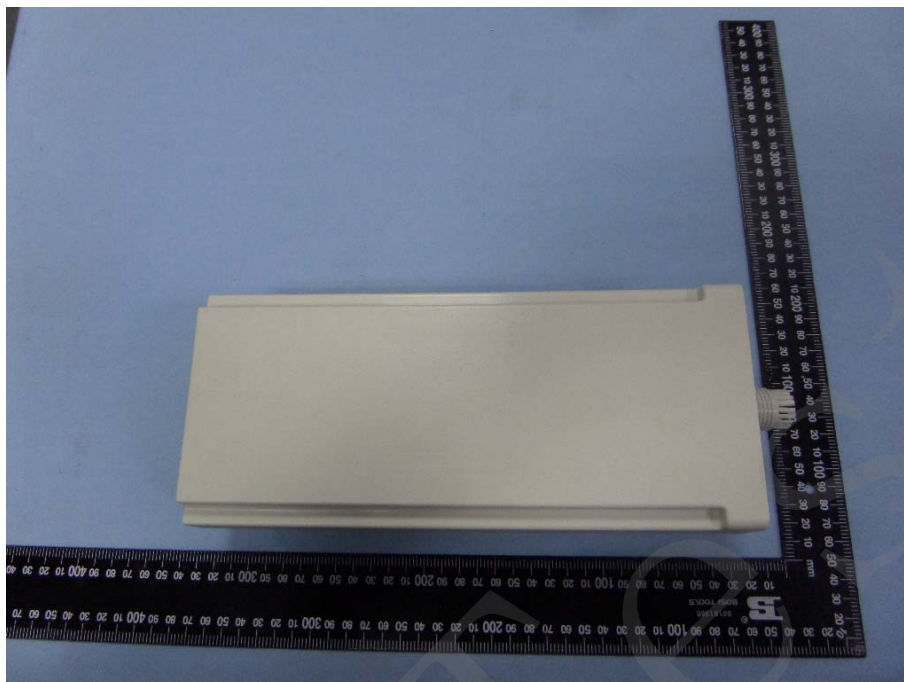
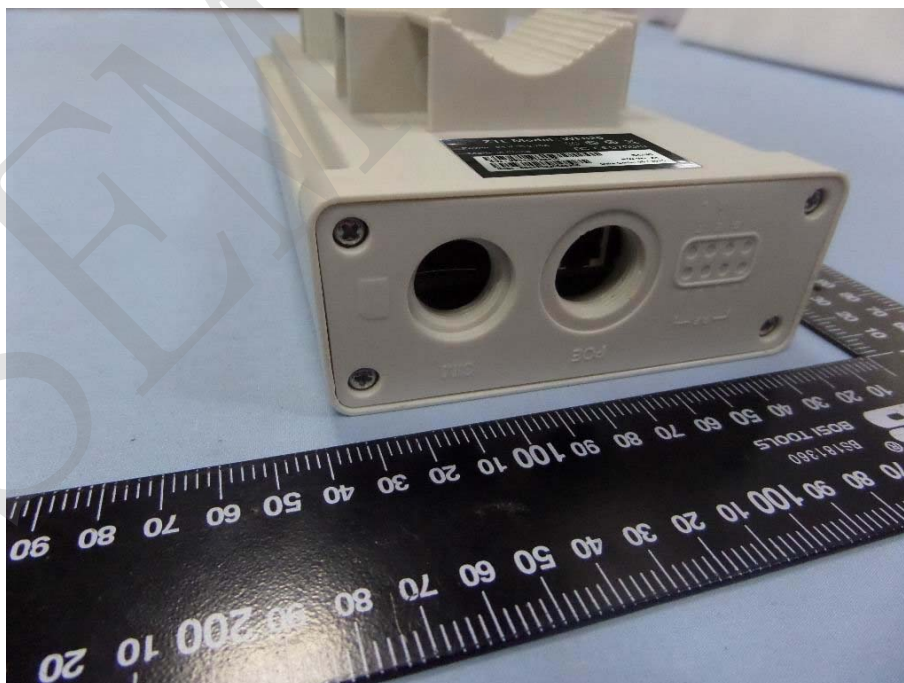
EXHIBIT 2 - EUT PHOTOGRAPHS

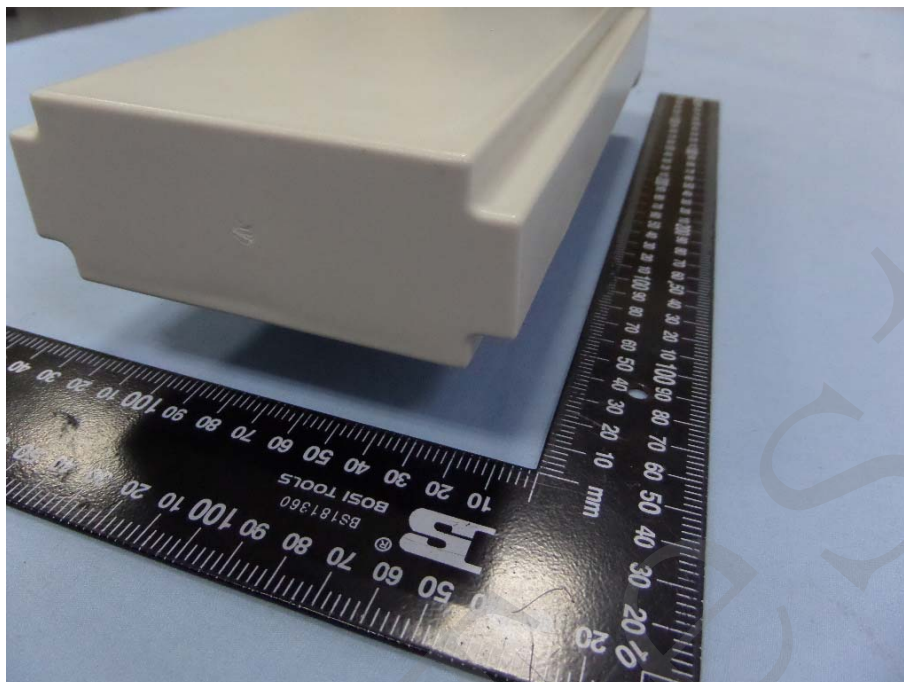
EUT View 1



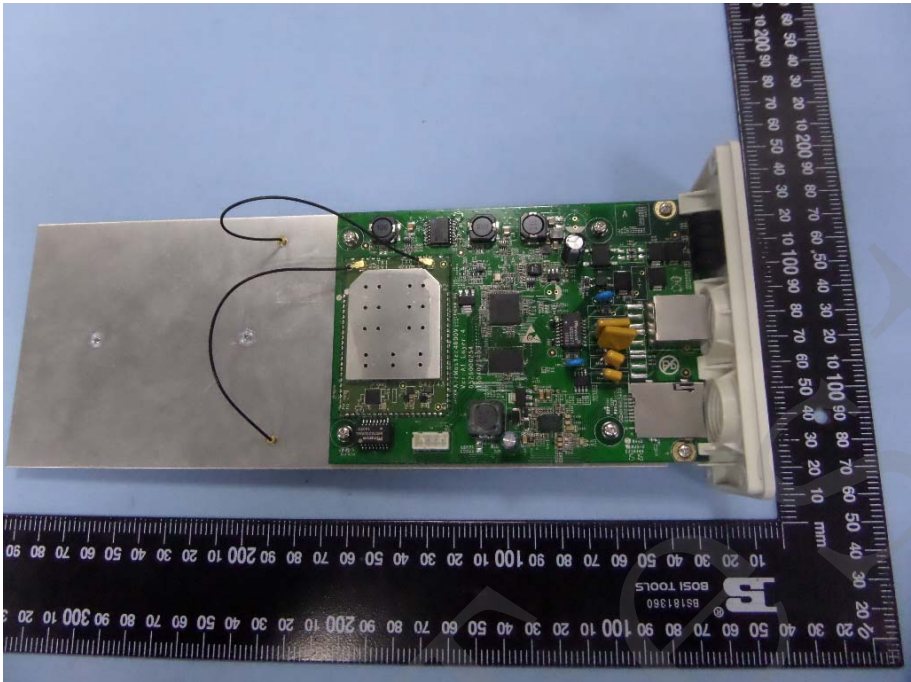
EUT View 2 (Front)



EUT View 3 (Rear)**EUT View 4**

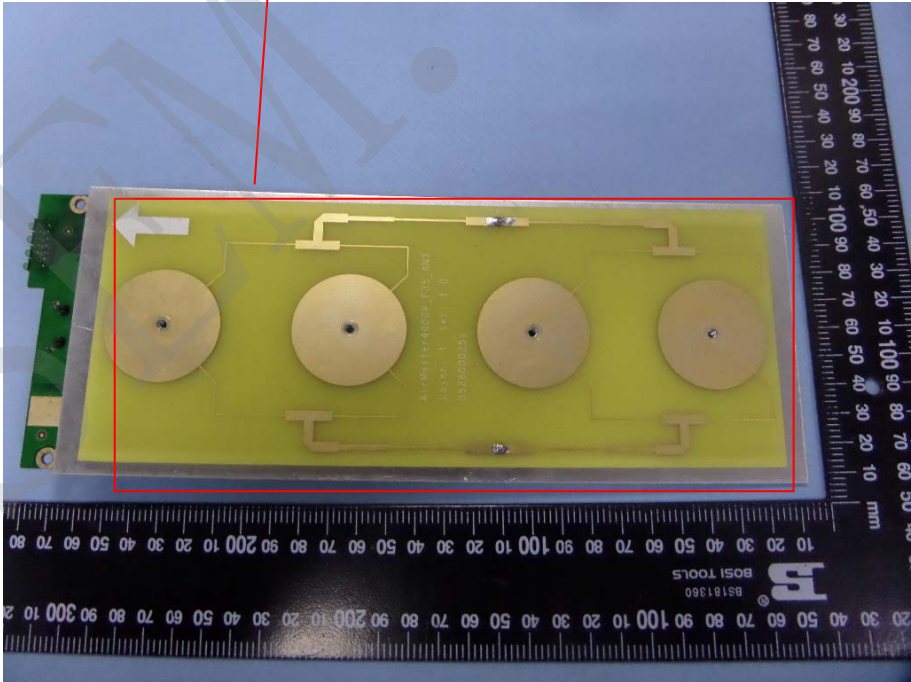
EUT View 5**EUT Housing and Board View 1**

Solder Board-Component View 1

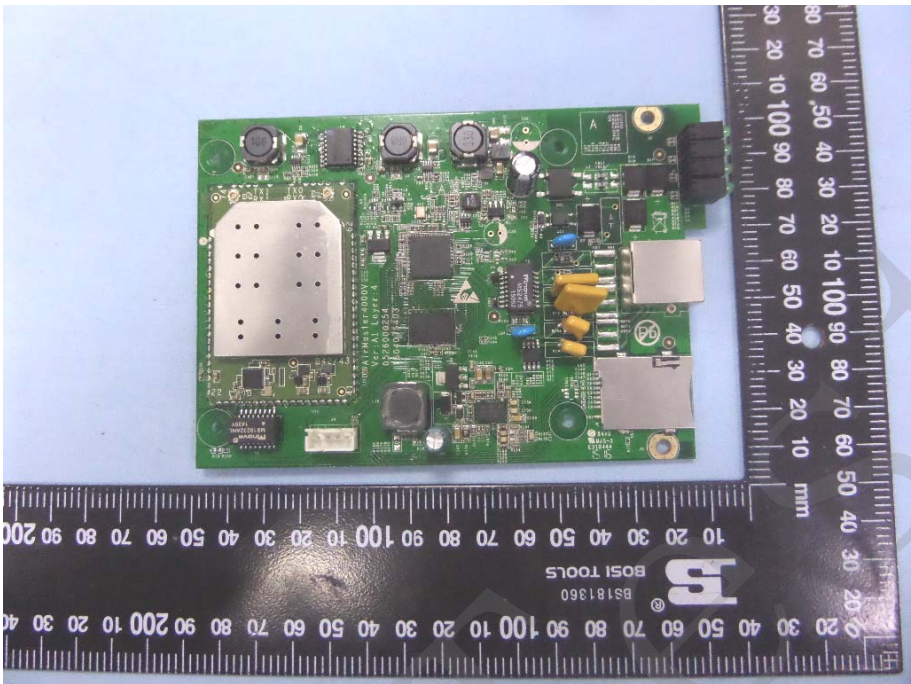


Solder Board-Component View 2

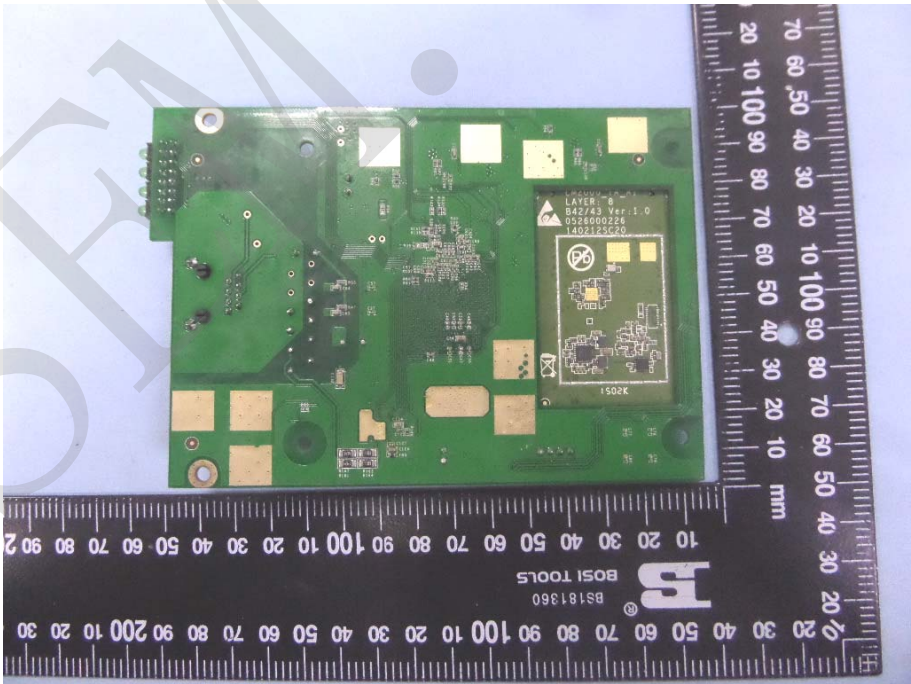
GSM/WCDMA/LTE Antenna



Solder Board-Component View 3



Solder Board-Component View 4



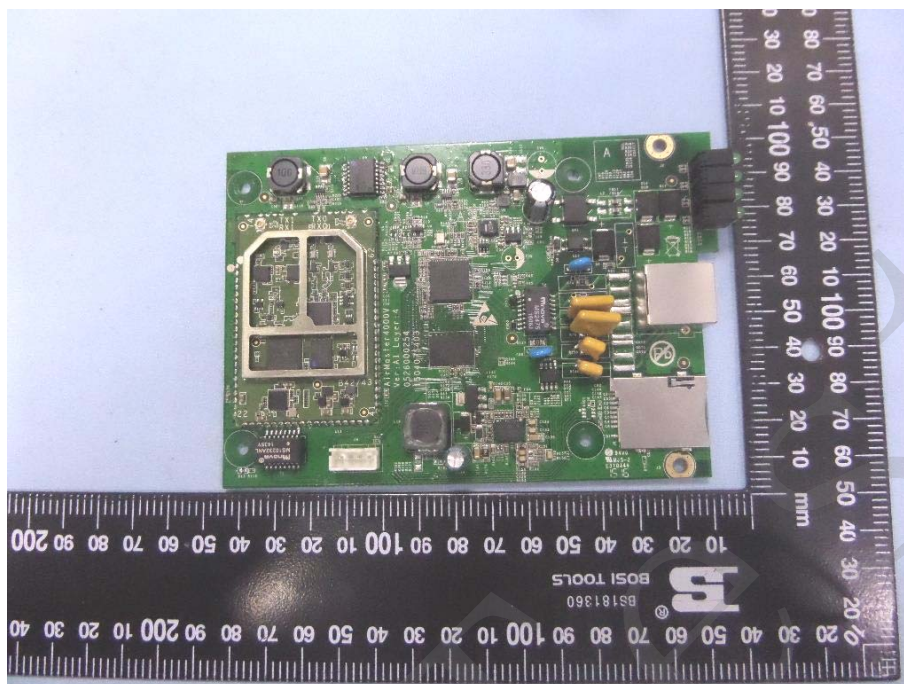
Solder Board-Component View 5

EXHIBIT 3 - TEST SETUP PHOTOGRAPHS

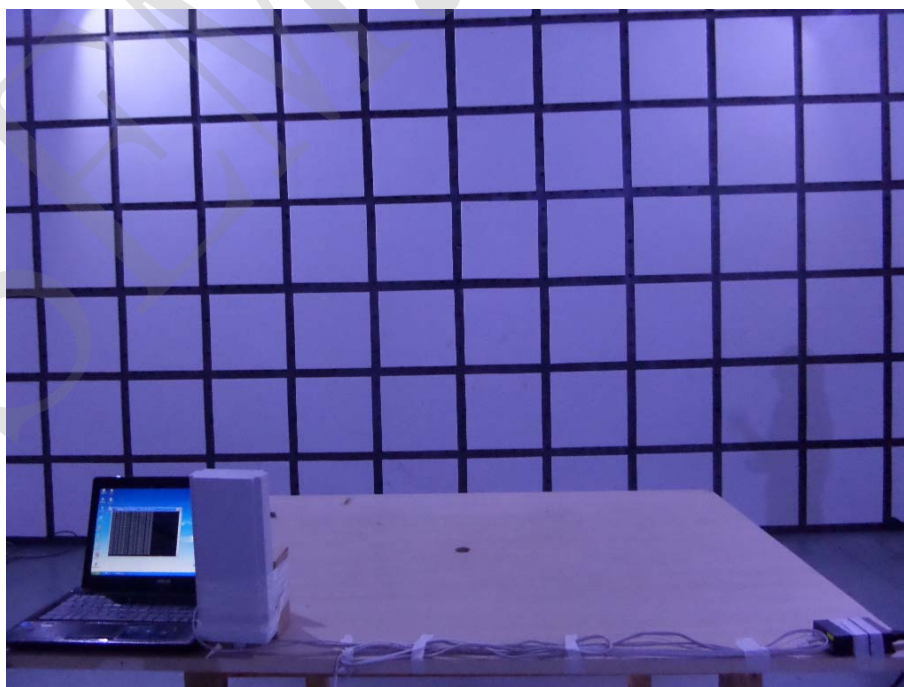
Conduction Emission Test View



Radiation Emission Test View



Harmonic/Flicker Test View**IEC61000-4-2 Test View**

ESD Test Point**IEC61000-4-3 Test View**

IEC61000-4-4/5/11 Test View**IEC61000-4-6 Test View**

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