FCC RF Test Report

APPLICANT	:	Green Packet Berhad, Taiwan
EQUIPMENT	:	LTE Outdoor CPE (Band 43)
BRAND NAME	:	Greenpacket
MODEL NAME	:	OT-350
FCC ID	:	W9V-OT350-GP
STANDARD	:	FCC 47 CFR Part 2, and 90(Z)
CLASSIFICATION	:	Licensed Non-Broadcast Station Transmitter (TNB)

The product was received on Jul. 07, 2015 and testing was completed on Sep. 14, 2015. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FW570718	Rev. 01	Initial issue of report	Aug. 17, 2015
FW570718	Rev. 02	Adding the manufacturer information in section 1.2	Aug. 31, 2015
FW570718	Rev. 03	Adding CAC detect test in Appendix D.	Sep. 22, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	25W / 25MHz EIRP	PASS	-
3.2	§90.1321	Peak EIRP Density	1 W / MHz EIRP	PASS	-
3.3	§2.1049 §90.1323	Occupied Bandwidth	(Reporting only)	PASS	-
3.4	§2.1051 §90.1323	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.5	§90.210	Emission Mask	Mask B	PASS	
3.6	§2.1051 §90.1323	Conducted Spurious Emission	< 43+10log10(P[Watts])	PASS	
3.7	§2.1053 §90.1323	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 24.15 dB at 14672.000 MHz
3.8	§2.1055	Frequency Stability for Temperature & Voltage	Within Operating Band	PASS	-

1 General Description

1.1 Applicant

Green Packet Berhad, Taiwan
6F, No.21, Lane 583, Rueiguang Rd. Neihu District, Taipei City 11492, Taiwan

1.2 Manufacturer

Green Packet Berhad, Taiwan
1. 6F, No.21, Lane 583, Rueiguang Rd. Neihu District, Taipei City 11492, Taiwan
2. Room A68, 3F., 151, Keyuan Road, Zhangjiang Hi-Tech Park, Pudong New Area, Shanghai 201203, P.R.China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	LTE Outdoor CPE (Band 43)
Brand Name	Greenpacket
Model Name	OT-350
FCC ID	W9V-OT350-GP
EUT supports Radios application	LTE
EUT Stage	Pre-production

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	3652.5 MHz ~ 3697.5 MHz
Rx Frequency	3652.5 MHz ~ 3697.5 MHz
Bandwidth	5MHz/10MHz/15MHz/20MHz
Maximum Output Power to Antenna	17.98 dBm
Antenna Type	Patch Antenna
Type of Modulation	QPSK / 16QAM

Remark: This test report recorded only product characteristics and test results of Licensed Non-Broadcast Station Transmitter (TNB).

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Emission Designator

LTE Band 43	QPSK			16QAM		
BW(MHz)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum Conducted Power (W)	Emission Designator (99%OBW)	Frequency Tolerance (ppm)	Maximum Conducted Power (W)
5	4M53G7D	-	0.0574	4M56W7D	-	0.0598
10	9M17G7D	0.0071	0.0569	9M09W7D	-	0.0628
15	13M5G7D	-	0.0553	13M5W7D	-	0.0601
20	18M5G7D	-	0.0491	18M5W7D	-	0.0551

1.7 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	TH05-HY

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH10-HY

1.8 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 47 CFR Part 2, 90
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- FCC KDB 552295 D01 CBP Guidance for 3650 3700 Band v02r02

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

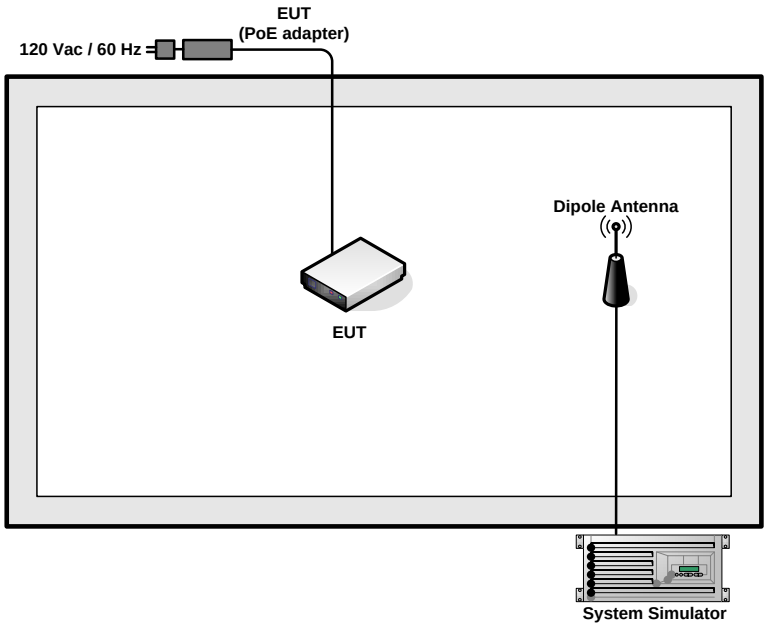
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	43	-	-	v	v	v	v	v	v	v	v	v	v	v	v
Peak EIRP Density	43	-	-	v	v	v	v	v	v	v	-	v	v	v	v
26dB and 99% Bandwidth	43	-	-	v	v	v	v	v	v	-	-	v	v	v	v
Conducted Band Edge	43	-	-	v	v	v	v	v	v	v	-	v	v		v
Emission Mask	43	-	-	v	v	v	v	v	v	v	-	v	v	v	v
Conducted Spurious Emission	43	-	-	v	v	v	v	v	v	v	-	-	v	v	v
E.I.R.P.	43	-	-	v	v	v	v	v	v	v	-	-	v	v	v
Radiated Spurious Emission	43	-	-	v	v	v	v	v		v	-	-	v	v	v
Frequency Stability	43	-	-	-	v	-	-	v		-	-	v		v	
Note	1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported.														

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.2 dB and a 10dB attenuator.

Example :

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 Conducted Output Power and ERP/EIRP

3.1.1 Description of the Conducted Output Power Measurement and ERP/EIRP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The EIRP of mobile transmitters must not exceed 25 Watts/25MHz for LTE Band 43.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, where

P_T = transmitter output power in dBm

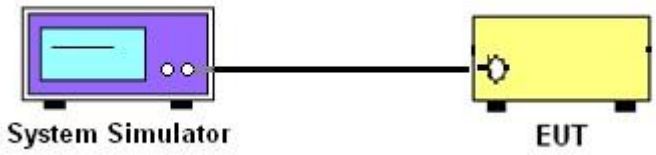
G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.1.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

3.1.3 Test Setup



3.1.4 Test Result of Conducted Output Power and EIRP

(G_T - L_C = 12.00 dB)						
Modes	**LTE Band 43 (QPSK,BW=5M)**			**LTE Band 43 (16QAM,BW=5M)**		
Channel	**44115 (Low)**	**44340 (Mid)**	**44565 (High)**	**44115 (Low)**	**44340 (Mid)**	**44565 (High)**
Frequency (MHz)	**3652.5**	**3675**	**3697.5**	**3652.5**	**3675**	**3697.5**
Conducted Power P_T (dBm)	17.59	17.26	16.91	17.77	17.63	17.26
Conducted Power P_T (Watts)	0.0574	0.0532	0.0491	0.0598	0.0579	0.0532
EIRP(dBm)	29.59	29.26	28.91	29.77	29.63	29.26
EIRP(Watts)	0.9099	0.8433	0.7780	0.9484	0.9183	0.8433

(G_T - L_C = 12.00 dB)						
Modes	**LTE Band 43 (QPSK,BW=10M)**			**LTE Band 43 (16QAM,BW=10M)**		
Channel	**44140 (Low)**	**44340 (Mid)**	**44540 (High)**	**44140 (Low)**	**44340 (Mid)**	**44540 (High)**
Frequency (MHz)	**3655**	**3675**	**3695**	**3655**	**3675**	**3695**
Conducted Power P_T (dBm)	17.55	17.2	16.85	17.98	17.54	17.25
Conducted Power P_T (Watts)	0.0569	0.0525	0.0484	0.0628	0.0568	0.0531
EIRP(dBm)	29.55	29.2	28.85	29.98	29.54	29.25
EIRP(Watts)	0.9016	0.8318	0.7674	0.9954	0.8995	0.8414

(G_T - L_C = 12.00 dB)						
Modes	LTE Band 43 (QPSK,BW=15M)			LTE Band 43 (16QAM,BW=15M)		
Channel	44165 (Low)	44340 (Mid)	44515 (High)	44165 (Low)	44340 (Mid)	44515 (High)
Frequency (MHz)	3657.5	3675	3692.5	3657.5	3675	3692.5
Conducted Power P_T (dBm)	17.43	17.13	16.86	17.79	17.5	17.25
Conducted Power P_T (Watts)	0.0553	0.0516	0.0485	0.0601	0.0562	0.0531
EIRP(dBm)	29.43	29.13	28.86	29.79	29.5	29.25
EIRP(Watts)	0.8770	0.8185	0.7691	0.9528	0.8913	0.8414

(G_T - L_C = 12.00 dB)						
Modes	LTE Band 43 (QPSK,BW=20M)			LTE Band 43 (16QAM,BW=20M)		
Channel	44190 (Low)	44340 (Mid)	44490 (High)	44190 (Low)	44340 (Mid)	44490 (High)
Frequency (MHz)	3660	3675	3690	3660	3675	3690
Conducted Power P_T (dBm)	16.91	16.66	16.42	17.41	17.2	16.86
Conducted Power P_T (Watts)	0.0491	0.0463	0.0439	0.0551	0.0525	0.0485
EIRP(dBm)	28.91	28.66	28.42	29.41	29.2	28.86
EIRP(Watts)	0.7780	0.7345	0.6950	0.8730	0.8318	0.7691

3.1.5 Test Result of Conducted Output Power

Please refer to Appendix A.

3.2 Peak EIRP Density

3.2.1 Description of the Peak EIRP Density

In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum.

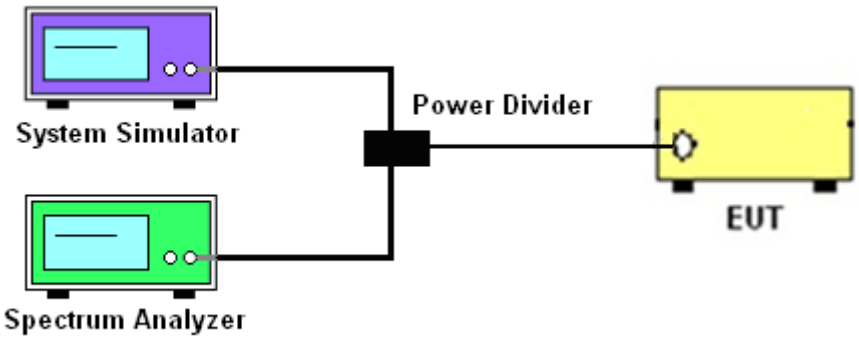
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. Set instrument center frequency to OBW center frequency.
2. Set span to at least 1.5 times the OBW.
3. Set the RBW to the specified reference bandwidth (often 1 MHz).
4. Set VBW ≥ 3 × RBW.
5. Detector = RMS (power averaging).
6. Ensure that the number of measurement points in the sweep ≥ 2 × span/RBW.
7. Spectrum is configured to trigger a sweep at the beginning of each transmission burst
8. Sweep time = auto couple.
9. Employ trace averaging (RMS) mode over a minimum of 100 traces.
10. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
11. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

3.2.4 Test Setup



3.2.5 Test Result of Peak EIRP Density

Please refer to Appendix A.

3.3 Bandwidth Limitations Measurement

3.3.1 Description of (Occupied) Bandwidth Limitations Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

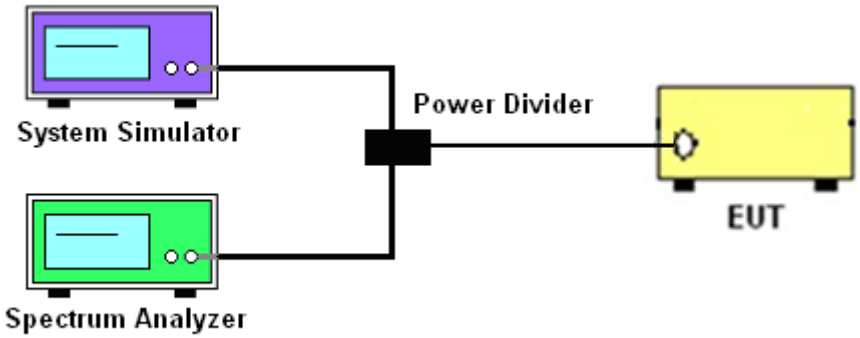
3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 4.2.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.

3.3.4 Test Setup



3.3.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Please refer to Appendix A.

3.4 Conducted Band Edge

3.4.1 Description of Conducted Band Edge Measurement

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or less, but at least one percent of the emission bandwidth of the fundamental emission of the transmitter, provided the measured energy is integrated over a 1 MHz bandwidth.

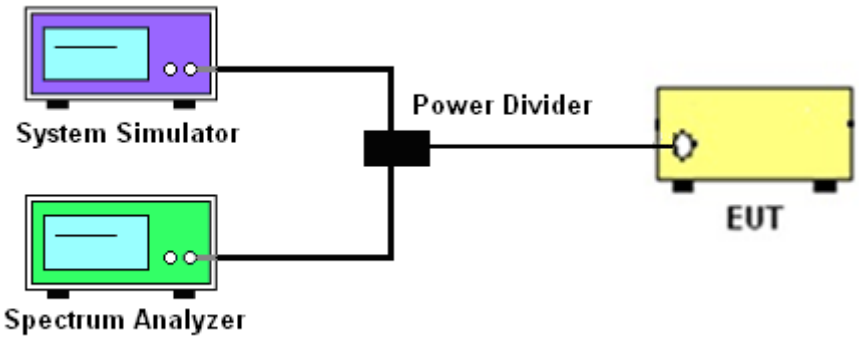
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.4.4 Test Setup



3.4.5 Test Result Conducted Band Edge

Please refer to Appendix A.

3.5 Emission Mask

3.5.1 Description of Emission Mask

The power of any emission must be attenuated below the unmodulated carrier power(P) as below:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but no more than 100 percent of the authorized bandwidth at least 25dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but no more than 250 percent of the authorized bandwidth at least 25dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least 43+10log(P) dB.

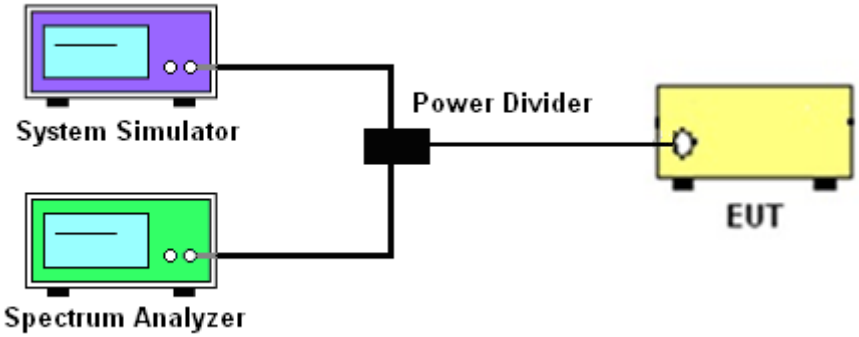
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
4. Set spectrum analyzer with RMS detector.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Emission

Please refer to Appendix A.

3.6 Conducted Spurious Emission

3.6.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30MHz up to a frequency including its 10^{th} harmonic.

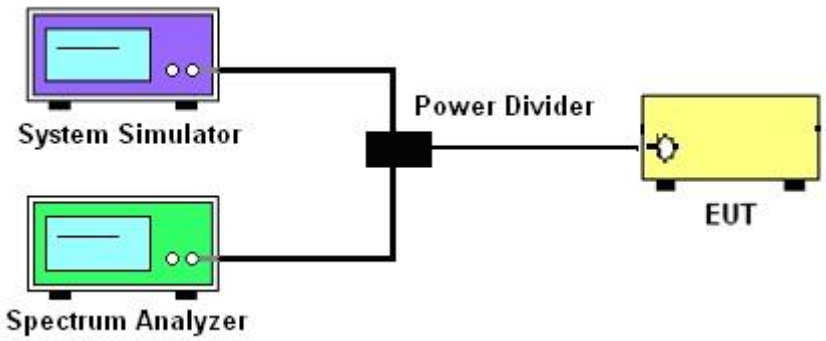
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

3.6.4 Test Setup



3.6.5 Test Result of Conducted Spurious Emission

Please refer to Appendix A.

3.7 Radiated Spurious Emission

3.7.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.7.2 Measuring Instruments

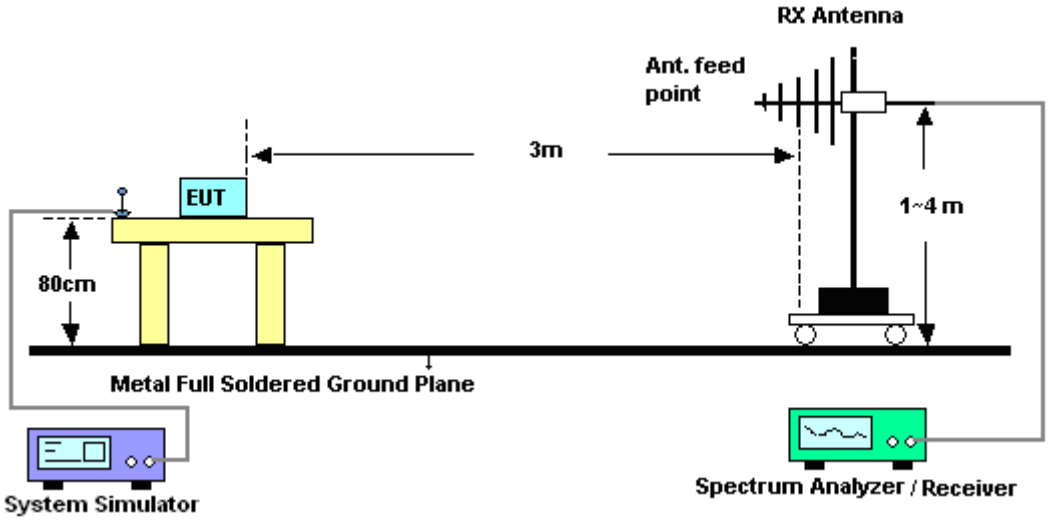
The measuring equipment is listed in the section 4 of this test report.

3.7.3 Test Procedures

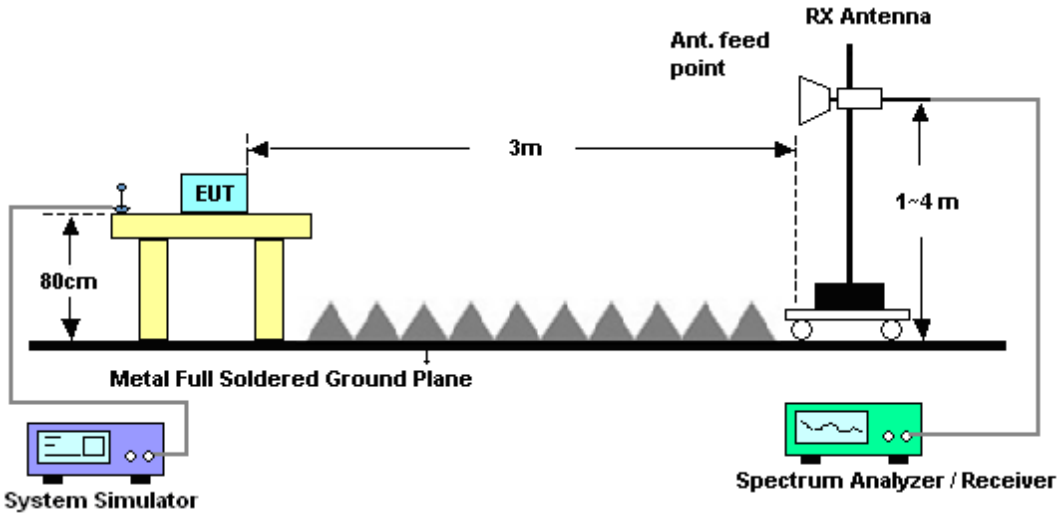
1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-C-2004 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

3.7.4 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.7.5 Test Result of Field Strength of Spurious Radiated

Please refer to Appendix B.

3.8 Frequency Stability Measurement

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

3.8.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

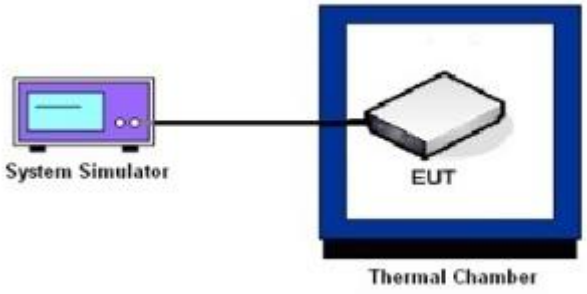
3.8.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.8.4 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Please refer to Appendix A.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Sep. 17, 2014	Jul. 24, 2015 ~ Aug. 05, 2015	Sep. 16 2015	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-30 ~70 degree	Dec. 04, 2014	Jul. 24, 2015 ~ Aug. 05, 2015	Dec. 03, 2015	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890089	1V~20V 0.5A~5A	Jan. 14, 2015	Jul. 24, 2015 ~ Aug. 05, 2015	Jan. 13, 2016	Conducted (TH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Oct. 02, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Oct. 01, 2015	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 03, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Nov. 02, 2015	Radiation (03CH10-HY)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Nov. 24, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Nov. 23, 2015	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D	35413	30MHz~1GHz	Oct. 24, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Oct. 23, 2015	Radiation (03CH10-HY)
EMI Test Receiver	Keysight	N9038A	MY54130085	20Hz ~ 8.4GHz	Nov. 05, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Nov. 04, 2015	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Oct. 03, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Oct. 02, 2015	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Nov. 20, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Nov. 19, 2015	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHZ	Oct. 14, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Oct. 13, 2015	Radiation (03CH10-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Jul. 25, 2015 ~ Aug. 05, 2015	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jul. 25, 2015 ~ Aug. 05, 2015	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0-360 degree	N/A	Jul. 25, 2015 ~ Aug. 05, 2015	N/A	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D	35414	30MHz~1GHz	Oct. 24, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Oct. 23, 2015	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 03, 2014	Jul. 25, 2015 ~ Aug. 05, 2015	Oct. 02, 2015	Radiation (03CH10-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May. 22, 2015	Jul. 25, 2015 ~ Aug. 05, 2015	May. 21, 2016	Radiation (03CH10-HY)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.90**

Appendix A. Test Results of Conducted Test

Conducted Output Power (Average power)

LTE Band 43 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
5	1	0	QPSK	17.59	17.26	16.91
5	1	12		17.39	17.05	16.75
5	1	24		17.42	17.16	16.78
5	12	0		17.34	17.02	16.7
5	12	6		17.24	16.96	16.6
5	12	11		17.25	16.95	16.6
5	25	0		17.26	16.97	16.65
5	1	0	16-QAM	17.77	17.63	17.26
5	1	12		17.53	17.39	17.1
5	1	24		17.56	17.4	17.25
5	12	0		17.41	17.03	16.72
5	12	6		17.34	16.95	16.63
5	12	11		17.37	16.97	16.62
5	25	0		17.37	16.99	16.67
10	1	0	QPSK	17.55	17.2	16.85
10	1	24		17.41	17.05	16.69
10	1	49		17.26	16.9	16.56
10	25	0		17.4	17.04	16.7
10	25	12		17.35	16.96	16.64
10	25	24		17.27	16.88	16.55
10	50	0		17.29	16.92	16.6
10	1	0	16-QAM	**17.98**	17.54	17.25
10	1	24		17.84	17.51	17.13
10	1	49		17.68	17.32	16.97
10	25	0		17.39	17.03	16.7
10	25	12		17.34	16.96	16.63
10	25	24		17.25	16.88	16.55
10	50	0		17.33	16.98	16.63

LTE Band 43 Maximum Average Power [dBm]						
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
15	1	0	QPSK	17.43	17.13	16.86
15	1	37		17.05	16.72	16.49
15	1	74		16.97	16.67	16.37
15	36	0		17.09	16.78	16.52
15	36	18		17.03	16.68	16.44
15	36	37		16.87	16.54	16.28
15	75	0		16.96	16.64	16.37
15	1	0	16-QAM	17.79	17.5	17.25
15	1	37		17.38	17.12	16.83
15	1	74		17.31	17.02	16.71
15	36	0		17.02	16.74	16.45
15	36	18		16.98	16.68	16.4
15	36	37		16.81	16.54	16.25
15	75	0		17.00	16.69	16.4
20	1	0	QPSK	16.91	16.66	16.42
20	1	49		16.81	16.56	16.3
20	1	99		16.31	16.07	15.78
20	50	0		16.53	16.31	16.07
20	50	24		16.52	16.28	16.02
20	50	49		16.29	16.05	15.75
20	100	0		16.43	16.17	15.92
20	1	0	16-QAM	17.41	17.2	16.86
20	1	49		17.33	17.11	16.84
20	1	99		16.85	16.6	16.31
20	50	0		16.58	16.35	16.11
20	50	24		16.56	16.31	16.04
20	50	49		16.30	16.07	15.79
20	100	0		16.45	16.22	15.96

Appendix B. Test Results of Radiated Test

LTE Band 43 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	7304	-46.65	-13	-33.65	-75.17	-55.57	2.49	11.41	H
	10956	-45.32	-13	-32.32	-77.58	-55.12	2.69	12.49	H
	14608	-42.04	-13	-29.04	-79.43	-51.73	3.43	13.13	H
	7304	-47.10	-13	-34.10	-75.45	-56.02	2.49	11.41	V
	10956	-45.94	-13	-32.94	-77.38	-55.74	2.69	12.49	V
	14608	-40.11	-13	-27.11	-79.31	-49.80	3.43	13.13	V
Middle	7344	-45.20	-13	-32.20	-73.94	-54.21	2.48	11.49	H
	11016	-43.87	-13	-30.87	-76.29	-53.68	2.69	12.49	H
	14688	-40.50	-13	-27.50	-77.82	-50.26	3.47	13.23	H
	7344	-45.85	-13	-32.85	-74.05	-54.86	2.48	11.49	V
	11016	-44.08	-13	-31.08	-75.55	-53.89	2.69	12.49	V
	14688	-38.44	-13	-25.44	-77.8	-48.20	3.47	13.23	V
Highest	7392	-45.76	-13	-32.76	-74.62	-54.88	2.46	11.58	H
	11088	-43.75	-13	-30.75	-76.14	-53.53	2.69	12.46	H
	14784	-40.04	-13	-27.04	-77.19	-49.87	3.51	13.34	H
	7392	-47.31	-13	-34.31	-75.11	-56.43	2.46	11.58	V
	11088	-42.88	-13	-29.88	-74.67	-52.66	2.69	12.46	V
	14784	-38.20	-13	-25.20	-77.44	-48.03	3.51	13.34	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 43 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	7304	-47.56	-13	-34.56	-76.09	-54.03	5.42	11.89	H
	10956	-45.36	-13	-32.36	-77.6	-51.65	6.88	13.17	H
	14608	-41.90	-13	-28.90	-79.26	-47.40	8.41	13.91	H
	7304	-48.73	-13	-35.73	-77.07	-55.20	5.42	11.89	V
	10956	-46.13	-13	-33.13	-77.57	-52.42	6.88	13.17	V
	14608	-39.91	-13	-26.91	-79.11	-45.41	8.41	13.91	V
Middle	7344	-44.53	-13	-31.53	-73.09	-53.54	2.48	11.49	H
	11016	-45.39	-13	-32.39	-77.69	-55.20	2.69	12.49	H
	14688	-41.78	-13	-28.78	-79.21	-51.54	3.47	13.23	H
	7344	-47.46	-13	-34.46	-75.66	-56.47	2.48	11.49	V
	11016	-45.86	-13	-32.86	-77.46	-55.67	2.69	12.49	V
	14688	-39.82	-13	-26.82	-79.01	-49.58	3.47	13.23	V
Highest	7384	-44.13	-13	-31.13	-73.04	-53.23	2.47	11.57	H
	11080	-43.63	-13	-30.63	-76.1	-53.41	2.69	12.47	H
	14768	-40.37	-13	-27.37	-77.67	-50.19	3.50	13.32	H
	7384	-47.45	-13	-34.45	-75.43	-56.55	2.47	11.57	V
	11080	-44.50	-13	-31.50	-76.3	-54.28	2.69	12.47	V
	14768	-38.30	-13	-25.30	-77.61	-48.12	3.50	13.32	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 43 / 15MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	7304	-47.61	-13	-34.61	-76.15	-54.10	5.43	11.92	H
	10956	-45.29	-13	-32.29	-77.55	-51.56	6.91	13.18	H
	14608	-41.24	-13	-28.24	-78.62	-46.73	8.43	13.92	H
	7304	-48.81	-13	-35.81	-77.14	-55.30	5.43	11.92	V
	10956	-46.08	-13	-33.08	-77.52	-52.35	6.91	13.18	V
	14608	-39.60	-13	-26.60	-78.84	-45.09	8.43	13.92	V
Middle	7336	-44.74	-13	-31.74	-73.38	-53.73	2.48	11.47	H
	11008	-44.10	-13	-31.10	-76.37	-53.91	2.69	12.50	H
	14672	-39.41	-13	-26.41	-76.77	-49.15	3.46	13.21	H
	7336	-46.81	-13	-33.81	-74.99	-55.80	2.48	11.47	V
	11008	-43.48	-13	-30.48	-75.01	-53.29	2.69	12.50	V
	14672	-38.04	-13	-25.04	-77.25	-47.78	3.46	13.21	V
Highest	7376	-44.27	-13	-31.27	-73.03	-53.35	2.47	11.55	H
	11064	-43.45	-13	-30.45	-75.99	-53.24	2.69	12.47	H
	14752	-39.79	-13	-26.79	-77.19	-49.60	3.49	13.30	H
	7376	-46.20	-13	-33.20	-74.33	-55.28	2.47	11.55	V
	11064	-44.55	-13	-31.55	-76.22	-54.34	2.69	12.47	V
	14752	-38.31	-13	-25.31	-77.5	-48.12	3.49	13.30	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 43 / 20MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	7304	-48.71	-13	-35.71	-77.24	-55.22	5.42	11.93	H
	10952	-45.24	-13	-32.24	-77.46	-51.52	6.91	13.19	H
	14604	-41.86	-13	-28.86	-79.22	-47.35	8.45	13.94	H
	7304	-48.97	-13	-35.97	-77.32	-55.48	5.42	11.93	V
	10952	-46.26	-13	-33.26	-77.67	-52.54	6.91	13.19	V
	14604	-39.82	-13	-26.82	-79.07	-45.31	8.45	13.94	V
Middle	7336	-44.59	-13	-31.59	-73.23	-53.58	2.48	11.47	H
	11000	-44.24	-13	-31.24	-76.49	-54.05	2.69	12.50	H
	14672	-40.44	-13	-27.44	-77.68	-50.18	3.46	13.21	H
	7336	-45.43	-13	-32.43	-73.61	-54.42	2.48	11.47	V
	11000	-43.83	-13	-30.83	-75.21	-53.64	2.69	12.50	V
	14672	-37.15	-13	-24.15	-76.39	-46.89	3.46	13.21	V
Highest	7360	-44.26	-13	-31.26	-72.83	-53.31	2.47	11.52	H
	11040	-43.74	-13	-30.74	-76	-53.54	2.69	12.48	H
	14720	-40.57	-13	-27.57	-77.75	-50.35	3.48	13.26	H
	7360	-46.31	-13	-33.31	-74.48	-55.36	2.47	11.52	V
	11040	-44.20	-13	-31.20	-75.79	-54.00	2.69	12.48	V
	14720	-38.25	-13	-25.25	-77.41	-48.03	3.48	13.26	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.