



Variant FCC RF Test Report

APPLICANT : HTC Corporation
EQUIPMENT : Smartphone
MODEL NAME : 0P9O110
FCC ID : NM80P9O110
STANDARD : 47 CFR Part 2, 27
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)

This is a variant report which is only valid together with the original test report. The product was received on Oct. 03, 2014 and testing was completed on Oct. 09, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-C-2004 and the testing has shown the tested sample to be in 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



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG421125-01	Rev. 01	This is a variant report which can be referred Product Equality Declaration. All the test cases were performed on original report which can be referred to Sporton Report Number FG421125.	Oct. 17, 2014



SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	RSS-Gen(4.8) RSS-130(4.4)	Conducted Output Power	Reporting Only	PASS	-
3.2	§2.1053 §27.53(g)	RSS-GEN(4.9) RSS-130(4.6)	Radiated Spurious Emission	$< 43 + 10\log_{10}(P[\text{Watts}])$	PASS	Under limit 36.52 dB at 2856.000 MHz



1 General Description

1.1 Applicant

HTC Corporation

No.23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

1.2 Manufacturer

HTC Corporation

No.23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Model Name	0P9O110
Sample 1	EUT with LCM 1, Camera Front, Camera Back, Battery 1 and RF PA 1
Sample 2	EUT with LCM 2, Camera Front, Camera Back, Battery 2 and RF PA 1
Sample 3	EUT with LCM 1, Camera Front, Camera Back, Battery 2 and RF PA 2
FCC ID	NM80P9O110
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE WLAN 11b/g/n HT20 Bluetooth v3.0+HS/ v4.0-LE
EUT Stage	Identical Prototype

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 subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	LTE Band 17 : 706.5 MHz ~ 713.5 MHz
Rx Frequency	LTE Band 17 : 736.5 MHz ~ 743.5 MHz
Bandwidth	LTE Band 17 : 5MHz / 10MHz
Maximum Output Power to Antenna	LTE Band 17 : 22.30 dBm
Antenna Type	PIFA Antenna
Type of Modulation	QPSK / 16QAM

1.5 Modification of EUT

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

1.6 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 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH02-HY	03CH07-HY

1.7 Applicable Standards

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

- 47 CFR Part 2, 27
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01

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

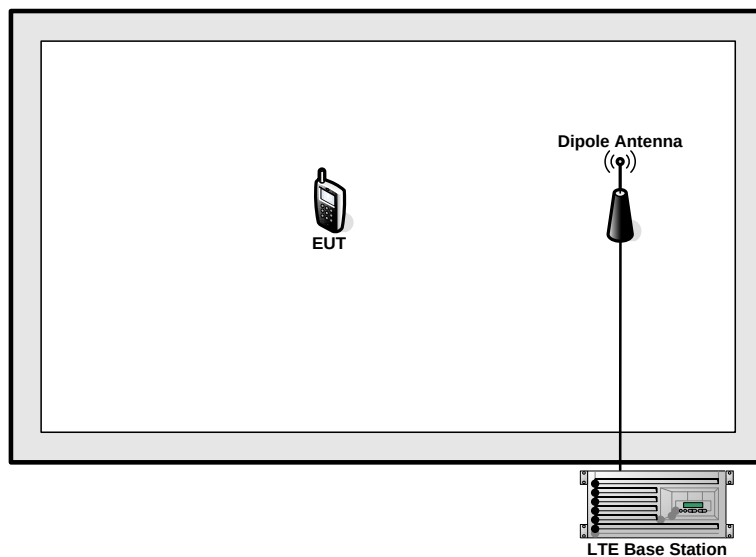
2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r01 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	17	-	-	✓	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓
Radiated Spurious Emission	17	-	-	✓	✓	-	-	✓		✓			✓	✓	✓
Note	1. The mark "✓" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.														

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

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

3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power 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.

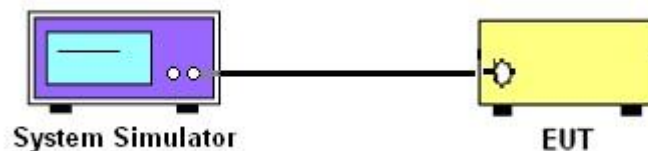
3.1.2 Measuring Instruments

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

3.1.3 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.

3.1.4 Test Setup





3.1.5 Test Result of Conducted Output Power

<LTE Band 17 Conducted Power>

BW [MHz]	Modulation	RB Size	RB Offset	Power (dBm) Low Ch. / Freq.	Power (dBm) Middle Ch. / Freq.	Power (dBm) High Ch. / Freq.
Channel				23780	23790	23800
Frequency (MHz)				709	710	711
10	QPSK	1	0	22.17	22.15	22.22
10	QPSK	1	24	22.20	22.19	22.17
10	QPSK	1	49	22.30	22.21	22.23
10	QPSK	25	0	21.23	21.20	21.15
10	QPSK	25	12	21.23	21.13	21.11
10	QPSK	25	24	21.14	21.17	21.14
10	QPSK	50	0	21.16	21.12	21.14
10	16QAM	1	0	21.05	21.02	21.11
10	16QAM	1	24	21.12	21.10	21.05
10	16QAM	1	49	21.19	21.18	21.18
10	16QAM	25	0	20.28	20.25	20.26
10	16QAM	25	12	20.29	20.22	20.22
10	16QAM	25	24	20.26	20.23	20.20
10	16QAM	50	0	20.22	20.18	20.20
Channel				23755	23790	23825
Frequency (MHz)				706.5	710	713.5
5	QPSK	1	0	22.24	22.20	22.14
5	QPSK	1	12	22.27	22.18	22.17
5	QPSK	1	24	22.26	22.27	22.21
5	QPSK	12	0	21.10	21.22	21.09
5	QPSK	12	6	21.21	21.13	21.20
5	QPSK	12	11	21.21	21.14	21.23
5	QPSK	25	0	21.20	21.13	21.17
5	16QAM	1	0	21.12	21.11	21.01
5	16QAM	1	12	21.15	21.05	21.09
5	16QAM	1	24	21.14	21.14	21.11
5	16QAM	12	0	20.18	20.24	20.15
5	16QAM	12	6	20.28	20.22	20.26
5	16QAM	12	11	20.28	20.21	20.24
5	16QAM	25	0	20.27	20.19	20.24

Note: maximum average power for LTE.



3.2 Radiated Spurious Emission Measurement

3.2.1 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.

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

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

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

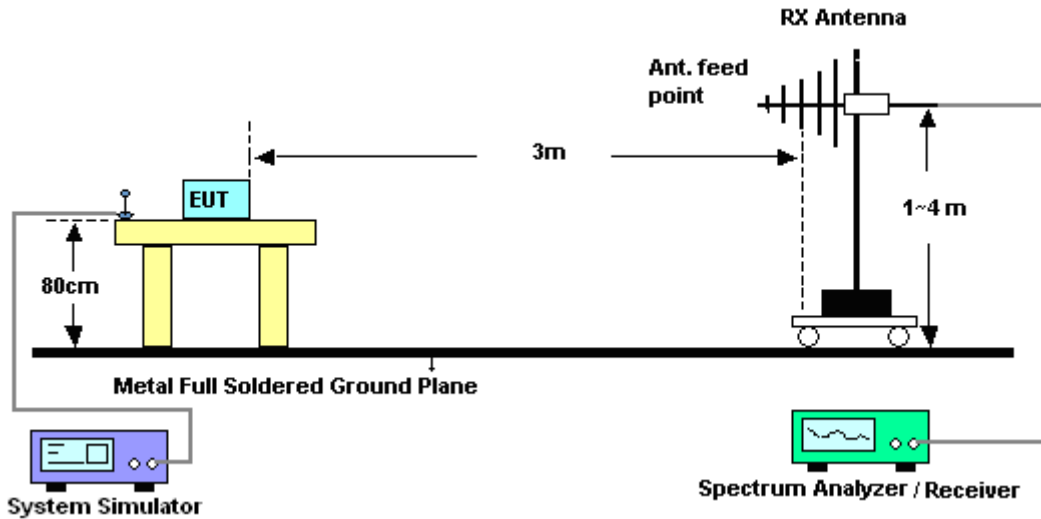
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.

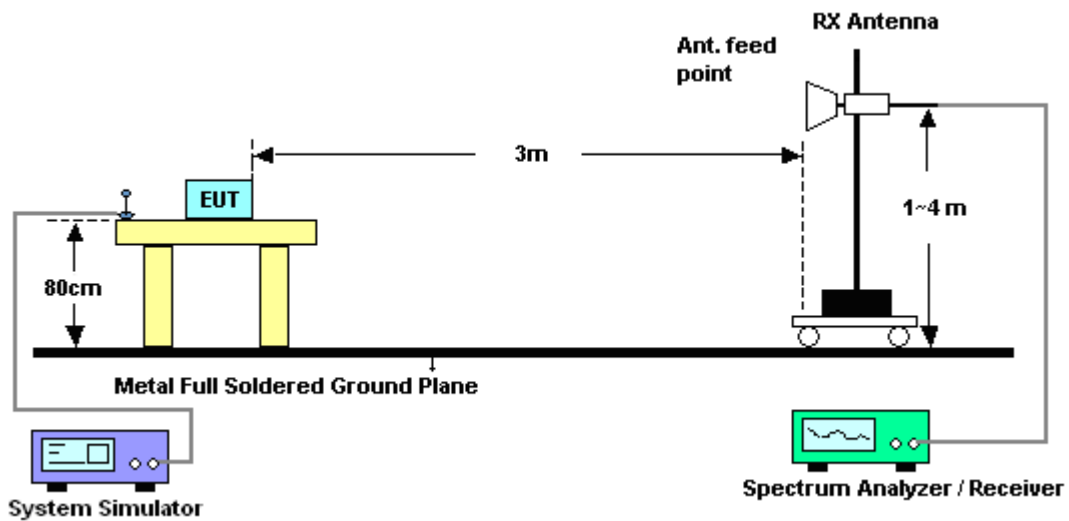
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15

3.2.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.2.5 Test Result of Field Strength of Spurious Radiated

<Low Channel>

Band :	LTE Band 17					Temperature :	23~25°C		
Test Mode :	10MHz QPSK RB Size 1 Offset 0					Relative Humidity :	45~46%		
Test Engineer :	Nick Yu					Polarization :	Horizontal		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
1424	-54.85	-13	-41.85	-62.96	-56.65	0.88	4.83	H	Pass
2144	-52.91	-13	-39.91	-64.13	-53.91	1.18	4.33	H	Pass
2856	-51.55	-13	-38.55	-64.92	-53.68	1.40	5.68	H	Pass

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1424	-52.13	-13	-39.13	-62.71	-53.93	0.88	4.83	V	Pass
2144	-51.09	-13	-38.09	-64.36	-52.09	1.18	4.33	V	Pass
2856	-49.52	-13	-36.52	-64.52	-51.65	1.40	5.68	V	Pass



<Middle Channel>

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1432	-55.51	-13	-42.51	-63.68	-57.36	0.88	4.88	H	Pass
2144	-53.24	-13	-40.24	-64.67	-54.24	1.18	4.33	H	Pass
2856	-52.16	-13	-39.16	-65.42	-54.29	1.40	5.68	H	Pass

Band :	LTE Band 17				Temperature :	23~25℃			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1432	-53.90	-13	-40.90	-64.14	-55.75	0.88	4.88	V	Pass
2144	-51.43	-13	-38.43	-64.34	-52.43	1.18	4.33	V	Pass
2856	-50.46	-13	-37.46	-65.68	-52.59	1.40	5.68	V	Pass

**<High Channel>**

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1432	-54.81	-13	-41.81	-63.19	-56.66	0.88	4.88	H	Pass
2144	-53.31	-13	-40.31	-64.41	-54.31	1.18	4.33	H	Pass
2864	-52.23	-13	-39.23	-65.16	-54.37	1.40	5.69	H	Pass

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	10MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1432	-52.69	-13	-39.69	-63.16	-54.54	0.88	4.88	V	Pass
2144	-51.17	-13	-38.17	-64.42	-52.17	1.18	4.33	V	Pass
2864	-51.07	-13	-38.07	-65.91	-53.21	1.40	5.69	V	Pass

**<Low Channel>**

Band :	LTE Band 17	Temperature :	23~25°C						
Test Mode :	5MHz QPSK RB Size 1 Offset 0	Relative Humidity :	45~46%						
Test Engineer :	Nick Yu	Polarization :	Horizontal						
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1416	-55.00	-13	-42.00	-63.36	-56.75	0.87	4.78	H	Pass
2128	-53.16	-13	-40.16	-64.41	-54.12	1.17	4.28	H	Pass
2832	-53.09	-13	-40.09	-66.04	-55.21	1.39	5.67	H	Pass

Band :	LTE Band 17					Temperature :	23~25°C		
Test Mode :	5MHz QPSK RB Size 1 Offset 0					Relative Humidity :	45~46%		
Test Engineer :	Nick Yu					Polarization :	Vertical		
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1416	-53.16	-13	-40.16	-63.57	-54.91	0.87	4.78	V	Pass
2128	-51.90	-13	-38.90	-64.63	-52.86	1.17	4.28	V	Pass
2832	-50.19	-13	-37.19	-64.77	-52.31	1.39	5.67	V	Pass

**<Middle Channel>**

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
1424	-55.09	-13	-42.09	-63.47	-56.89	0.88	4.83	H	Pass
2136	-53.35	-13	-40.35	-64.25	-54.33	1.18	4.31	H	Pass
2848	-52.54	-13	-39.54	-65.86	-54.67	1.40	5.68	H	Pass

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1424	-52.89	-13	-39.89	-63.33	-54.69	0.88	4.83	V	Pass
2136	-50.69	-13	-37.69	-63.71	-51.67	1.18	4.31	V	Pass
2848	-50.69	-13	-37.69	-65.68	-52.82	1.40	5.68	V	Pass

**<High Channel>**

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Horizontal			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
(MHz)	(dBm)	(dBm)	Limit (dB)	Reading (dBm)	Power (dBm)	loss (dB)	Gain (dBi)	(H/V)	
1432	-55.01	-13	-42.01	-63.27	-56.86	0.88	4.88	H	Pass
2144	-52.82	-13	-39.82	-64.19	-53.82	1.18	4.33	H	Pass
2864	-52.02	-13	-39.02	-65.33	-54.16	1.40	5.69	H	Pass

Band :	LTE Band 17				Temperature :	23~25°C			
Test Mode :	5MHz QPSK RB Size 1 Offset 0				Relative Humidity :	45~46%			
Test Engineer :	Nick Yu				Polarization :	Vertical			
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.								
Frequency	ERP	Limit	Over	SPA	S.G.	TX Cable	TX Antenna	Polarization	Result
			Limit	Reading	Power	loss	Gain		
(MHz)	(dBm)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	(dBi)	(H/V)	
1432	-53.25	-13	-40.25	-63.59	-55.10	0.88	4.88	V	Pass
2144	-51.21	-13	-38.21	-63.98	-52.21	1.18	4.33	V	Pass
2864	-50.22	-13	-37.22	-65.26	-52.36	1.40	5.69	V	Pass



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LTE Base Station	Anritsu	MT8820C	6201026480	30MHz~2.7GHz SISO	Jan. 07, 2014	Oct. 09, 2014	Jan. 06, 2015	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	101749	10Hz ~ 30GHz	Feb. 10, 2014	Oct. 07, 2014	Feb. 09, 2015	Radiation (03CH07-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 10, 2013	Oct. 07, 2014	Oct. 09, 2014	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 19, 2014	Oct. 07, 2014	Aug. 18, 2015	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10 MHz ~ 1000MHz	Mar. 17, 2014	Oct. 07, 2014	Mar. 16, 2015	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1 GHz~26.5 GHz	Nov. 29, 2013	Oct. 07, 2014	Nov. 28, 2014	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Oct. 07, 2014	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	M-400-0	114/8000604	N/A	N/A	Oct. 07, 2014	N/A	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA91702 51	15GHz- 40GHz	Oct. 02, 2014	Oct. 07, 2014	Oct. 01, 2015	Radiation (03CH07-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.50
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