

LTE RADIO TEST REPORT

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Report No: STS1601148F05

Issued for

ITALCOM GROUP

1728Coral Way,Coral Gables,Miami,Florida,United States 33145

Product Name:	SMART PHONE
Brand Name:	Nyx Mobile
Model No.:	A1
Series Model:	N/A
FCC ID:	YPVITALCOMA1
Test Standard:	FCC Part 22H FCC Part 24E FCC Part 27L/M

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TEST RESULT CERTIFICATION

Applicant's name..... ITALCOM GROUP

Manufacture's Name...... Vitsmo. Co. Ltd.

Address Dongwon Tower 14FL.,13,Teheran-ro 81-gil, Gangnam-gu, Seoul, Korea 135-090

Product name SMART PHONE

Brand name Nyx Mobile

Model and/or type reference. A1

Standards..... FCC Part 22H. FCC Part 24E. FCC Part 27L/M

Test procedure..... ANSI / TIA / EIA-603-C-2009

This device described above has been tested by STS and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test.....

Date of performance of tests....... 26 Jan. 2016 ~ 18 Feb. 2016

Date of Issue...... 19 Feb. 2016

Test Result Pass

Testing Engineer : Jin Ming) (Jin Ming) Technical Manager : Jin Ming) (Tony Liu) Authorized Signatory : Jin Ming)

(Bovey Yang)

Shenzhen STS Test Services Co., Ltd.

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	19 Feb. 2016	STS1601148F05	ALL	Initial Issue



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1. SUMMARY OF TEST RESULTS

1.1 TEST RESULTS DESCRIPTION AND LABORATORY INFORMATION

Setion	FCC Rule	Description	Limit	Result
	§2.1046	Conducted Output Power	Reporting Only	PASS
	§24.232(d)	Peak-to-Average Ratio	<13 dB	PASS
	§2.1049 §24.238(b) §27.53(h)(3) §27.53(m)(6)	Occupied Bandwidth	Reporting Only	PASS
	§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Conducted Band Edge Measurement (Band 4)	<43+10log10(P[Watts])	PASS
	§2.1051 §2 2.917(a) §24.238(a) §27.53(g) §27.53(h)	Conducted Spurious Emission (Band 4)	<43+10log10(P[Watts])	PASS
	§2.1055 §24.235 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22 Within Authorized Band	PASS

§27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	EIRP < 1Watt	PASS
§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)	Radiated Spurious Emission (Band 4)	< 43+10log10(P[Watts])	PASS



1.1.1 TEST FACTORY
Shenzhen STS Test Services Co., Ltd.
Add.: 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China CNAS Registration No.: L7649;
FCC Registration No.: 842334; IC Registration No.: 12108A-1

1.1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95** %.

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±2.88dB
2	Conducted Emission (150KHz-30MHz)	±2.67dB
3	RF power,conducted	±0.70dB
4	Spurious emissions, conducted	±1.19dB
5	All emissions,radiated(<1G) 30MHz-200MHz	±2.83dB
6	All emissions,radiated(<1G) 200MHz-1000MHz	±2.94dB
7	All emissions,radiated(>1G)	±3.03dB
8	Temperature	±0.5℃
9	Humidity	±2%





2. GENERAL INFORMATION

2.1 TECHNICAL SPECIFICATIONS AND REGULATIONS

2.1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	SMART PHONE
Hardware version:	NYX_A1_001
Software version:	A1_AMXNYX_V001R
FCC ID:	YPVITALCOMA1
	U.S. Bands:
	LTE FDD Band 2 KITE FDD Band 4
Frequency Bands:	LTE FDD Band 5 LTE FDD Band 7
	LTE FDD Band 12 LTE FDD Band 13
	LTE FDD Band 17
SIM CARD	Support single card
Antenna:	PIFA Antenna
Antenna gain:	-1 dBi
Power Supply:	DC 3.7V by battery or DC 5.0V supplied by adapter
Battery parameter:	Capacitance: 2300mA, Rated Voltage: 3.7V
Adapter Input:	AC100-240V, 50-60Hz, 0.15A
Adapter Output:	DC 5.0V, 1000mA

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2.1.2 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Product Specification Subjective To This Standard						
Tx Frequency LTE Band 4:1710.7~1754.3MHz						
Rx Frequency	LTE Band 4:2110.7~2154.3MHz					
Bandwidth	LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz /20MHz					
Maximum Output Power Limit	LTE Band 4 : 22.77dBm					
Type of Modulation	QPSK / 16QAM					



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2.1.3 EMISSION DESIGNATOR

LTE Band 4 BW(MHz)	Emission Designator (26dB OBW) QPSK	Emission Designator (26dB OBW)16QAM
1.4	1M29G7D	1M29W7D
3	2M91G7D	2M92W7D
5	4M95G7D	4M97W7D
10	9M80G7D	9M74W7D
15	14M6G7D	14M5W7D
20	20M7G7D	20M6W7D



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2.1.4 TEST CONFIGURATION OF EQUIPMENT UNDER TEST

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D02 Power Meas. License Digital Systems v02r02 with maximum output power.Radiated measurements are performed by rotating the EUT in three different orthogonal test planes tofind the maximum emission.

Remark:

- 1. The mark "v " 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

ITEMS	Band	Bandwidth (MHz) Modulation RB #				Test Channel									
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	Μ	Н
Max. Output Power	4	v	v	v	v	v	v	V	v	v	v	v	v	v	v
						_									
Peak&Avera		-	-		_	_									
Ratio	4			0	~		v	v	v	v		v	v	v	v
					1										
26dB&99%						-									
Bandwidth	4	v	v	v	v	v	v	v	v			v	v	v	v
Conducted		1			1			_						1	-
Band Edge	4	V	V	V	V	V	V	v	v	V		v	V	V	V

ITEMS	Band	Bandwidth (MHz)			Modulation		RB #			Test Channel					
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	Μ	Н
Conducted															
Spurious	4	v	v	v	v	v	v	v	v	v			v	v	v
Emission															
Frequency															
Frequency Stability	4				v			v				v		v	
E.R.P.&		1	T		-	•					•				
E.I.R.P.	4	v	v	v	V	v	V	v	v	v			V	v	v
Radiated		1	1	1	1	1					1			r	
Spurious	4	V	V	V	V	V	V	v		v			V	V	V
Emission															





2.1.5 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for filing to comply with the fcc part 22H&24E&27.

2.1.6 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with eut intended for fcc grant together.

2.1.7 EUT CONFIGURATION

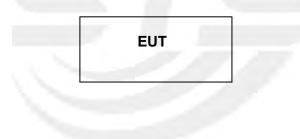
The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.1.8 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.1.9 CONFIGURATION OF EUT SYSTEM

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.





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Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	SMART PHONE	A1	FCC ID: YPVITALCOMA1	EUT

Note: All the accessories have been used during the test. the following "EUT" in setup diagram means EUT system.

2.1.10 MEASUREMENT INSTRUMENTS

The radiated emission testing was performed according to the procedures of ansi ANSI / TIA / EIA-603-C-2004 and fcc cfr 47 rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
Spectrum Analyzer	Agilent	E4407B	MY50140340	2015.10.25	2016.10.24
Test Receiver	R&S	ESCI	101427	2015.10.25	2016.10.24
Wideband Radio Com- munication	Agilent	8960	MY48360751	2015.11.20	2016.11.19
Wideband Radio Com- munication	R&S	CMU200	112012	2015.10.25	2016.10.24
Wideband Radio Com- munication	R&S	CMW500	101471	2015.07.07	2016.07.06
Test Receiver	R&S	ESCI	102086	2015.10.25	2016.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2015.11.25	2016.11.24
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2015.03.06	2016.03.05

2. 1.11 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 factorbetween EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor. Offset = RF Cable Loss + Attenuator Factor.



3. CONDUCTED OUTPUT POWER

3.1 DESCRIPTION OF THE CONDUCTED OUTPUT POWER MEASUREMENT

3.1.1 MEASUREMENT METHOD

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. configuration follows KDB 971168 D01.

3.1.2 TEST SETUP



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 RESULTS

LTE BAND 4

	LTE Ba	and 4 Maximu	m Average F	Power [dBr	n]	
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest
1.4	1	0		22.01	21.99	22.15
1.4	1	2		22.02	22.00	22.15
1.4	1	5		22.03	22.01	22.18
1.4	3	0	QPSK	22.10	22.09	22.20
1.4	3	1		22.03	22.03	22.13
1.4	3	3		22.08	22.07	22.21
1.4	6	0		22.00	22.00	22.14
1.4	1	0		22.11	21.90	22.33
1.4	1	2		22.05	21.90	22.32
1.4	1	5		22.11	21.89	22.36
1.4	3	0	16-QAM	21.92	22.01	22.16
1.4	3	1		21.85	21.94	22.06
1.4	3	3		21.93	21.99	22.12
1.4	6	0		21.98	22.05	22.18
3	1	0		21.97	21.99	22.14
3	1	7		21.95	21.98	22.12
3	1	14		21.95	21.98	22.14
3	8	0	QPSK	22.09	22.06	22.19
3	8	4		22.09	22.06	22.24
3	8	8		22.07	22.08	22.20
3	15	0		22.03	22.04	22.19
3	1	0		22.10	22.20	22.26
3	1	7		22.09	22.14	22.29
3	1	14		22.08	22.16	22.30
3	8	0	16-QAM	22.16	22.16	22.26
3	8	4		22.14	22.16	22.28
3	8	7		22.15	22.15	22.29
3	15	0		22.00	22.03	22.21



LTE BAND 4

	LTE Band 4 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest			
5	1	0		22.07	22.13	22.25			
5	1	12		22.05	22.09	22.19			
5	1	24		22.06	22.11	22.23			
5	12	0	QPSK	22.09	22.10	22.22			
5	12	6		22.08	22.11	22.21			
5	12	11		22.10	22.09	22.21			
5	25	0		22.05	22.04	22.20			
5	1	0		22.16	22.25	22.56			
5	1	12		22.12	22.19	22.54			
5	1	24		22.11	22.16	22.59			
5	12	0	16-QAM	22.11	22.14	22.18			
5	12	6		22.09	22.11	22.20			
5	12	11		22.09	22.08	22.19			
5	25	0		22.08	21.98	22.16			
10	1	0		22.06	22.10	22.21			
10	1	24		22.08	22.07	22.18			
10	1	49		22.01	22.08	22.23			
10	25	0	QPSK	22.06	22.04	22.15			
10	25	12		22.05	22.07	22.16			
10	25	24		22.07	22.07	22.21			
10	50	0		22.07	22.07	22.18			
10	1	0		22.18	22.32	22.26			
10	1	12		22.19	22.23	22.29			
10	1	24		22.13	22.20	22.35			
10	25	0	16-QAM	22.06	22.09	22.21			
10	25	12		22.04	22.07	22.25			
10	25	24		22.09	22.04	22.28			
10	50	0		22.01	22.02	22.14			

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LTE BAND 4

	LTE Band 4 Maximum Average Power [dBm]								
BW [MHz]	RB Size	RB Offset	Mod	Lowest	Middle	Highest			
15	1	0		22.10	22.08	22.21			
15	1	37		21.97	22.03	22.14			
15	1	75		22.03	22.13	22.26			
15	36	0	QPSK	22.13	22.08	22.28			
15	36	18		22.10	22.14	22.26			
15	36	37		22.05	22.23	22.27			
15	75	0		22.13	22.17	22.28			
15	1	0		22.21	22.30	22.05			
15	1	37		22.14	22.18	22.05			
15	1	74		22.22	22.25	22.16			
15	36	0	16-QAM	22.13	22.09	22.24			
15	36	18		22.13	22.11	22.23			
15	36	36		22.10	22.15	22.27			
15	75	0		22.09	22.16	22.18			
20	1	0		22.12	22.14	22.15			
20	1	50		22.03	22.12	22.16			
20	1	99		22.16	22.27	22.27			
20	50	0	QPSK	22.07	22.07	22.15			
20	50	24		22.05	22.09	22.16			
20	50	49		22.08	22.12	22.22			
20	100	0		22.05	22.07	22.19			
20	1	0		22.11	22.47	22.59			
20	1	49		22.06	22.42	22.61			
20	1	99		22.18	22.51	22.77			
20	50	0	16-QAM	22.06	22.08	22.06			
20	50	24		22.06	22.04	22.09			
20	50	49		22.10	22.03	22.16			
20	100	0		22.02	22.05	22.18			

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4. PEAK-TO-AVERAGE RATIO

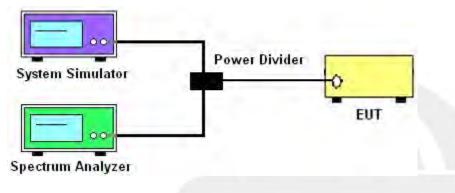
4.1 DESCRIPTION OF THE CONDUCTED OUTPUT POWER MEASUREMENT

4.1.1 MEASUREMENT METHOD

Use one of the procedures presented in 4.1 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.2 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

PAPR (dB) = PPk (dBm) - PAvg (dBm).

4.1.2 TEST SETUP



4.1.3 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v02r02 Section 5.7.2..

- 2. The EUT was connected to spectrum and system simulator via a power divider
- 3. Select lowest, middle, and highest channels for each band and different modulation.
- 4. Set the test probe and measure the peak and average power of the spectrum analyzer
- 5. Record the deviation as Peak to Average Ratio.

	LTE						
LTE BW	1.4M	3M	5M	10M	15M	20M	
Span	3MHz	6MHz	10MHz	20MHz	30MHz	40MHz	
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz	
VBW	100kHz	300kHz	300kHz	1000kHz	1000kHz	1000kHz	
Detector	PK/RMS	PK/RMS	PK/RMS	PK/RMS	PK/RMS	PK/RMS	
Peak Trace	Max	Max	Max	Max	Max	Max	
AVG Trace	Trace average at least 100 traces in power averaging (i.e., RMS) mode.						
Sweep Count	Auto	Auto	Auto	Auto	Auto	Auto	



4.1.4 TEST RESULTS

LTE BAND 4

	LTE Band 4 PAR [dBm]										
BW	RB	Mod		Lowest		Middle			Highest		
[MHz]	Size	MOU	PEAK	AVG	P-A	PEAK	AVG	P-A	PEAK	AVG	P-A
20	1	QPSK	25.38	22.16	3.22	25.24	22.27	2.97	25.23	22.27	2.96
20	100	QPSK	24.95	22.05	2.90	24.95	22.07	2.88	25.16	22.19	2.97
20	1	16-QA	25.45	22.18	3.27	25.63	22.51	3.12	25.92	22.77	3.15
20	100	М	25.14	22.02	3.12	25.27	22.05	3.22	25.26	22.18	3.08
	Limit ≤13dBm										



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5. RADIATED POWER AND EFFECTIVE ISOTROPIC RADIATED POWER

5.1 DESCRIPTION OF THE ERP/EIRP MEASUREMENT

5.1.1 MEASUREMENT METHOD

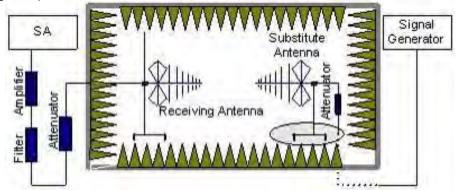
Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02.

Equivalent isotropic radiated power output measurements by substitution method according to ANSI /TIA / EIA-603-C, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. Mobile and portable (hand-held) stations operating are limited to average EIRP of 1 watt with LTE band 4.

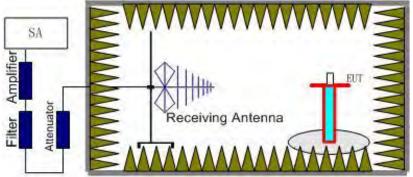
5.1.2 TEST SETUP

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx(dBuV)+CL(dB)+SA(dB)+Gain(dBi)-107(dBuV to dBm)The SA is calibrated using following setup.



b) EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.





Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the ARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

5.1.3 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v02r02 Section 5.6. and ANSI / TIA-603-C-2009 Section 2.2.17.

2. The EUT was placed on a non-conductive rotating platform 0.8 meters high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with Peak detector.

3. During the measurement, the system simulator parameters were set to force the EUTtransmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

4. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to-TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain -Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, EIRP= LVL +Correction factor and ERP = EIRP – 2.15.

5.RB Set greater than bandwidth, Vb Set spectrum analyzer Maximum support.



5.1.4 TEST RESULTS

LTE Band 4

LTE Band 4 / 1.4MHz								
		R	3	Horizontal	Vertical			
Channel	Modulation	Size	Offset	EIRP(dBm)	EIRP(dBm)			
Lowest		1	0	21.25	21.671			
Middle	QPSK	1	0	21.32	21.55			
Highest	Q. OIX	1	0	21.28	21.52			
Lowest		1	0	21.12	21.63			
Middle	16QAM	1	0	21.71	21.74			
Highest		1	0	21.23	21.65			
Limit	EIRP<	<1W=30dBm	1	Result	PASS			

LTE Band 4 / 3MHz							
		R	В	Horizontal	Vertical		
Channel	Modulation	Size	Offset	EIRP(dBm)	EIRP(dBm)		
Lowest		1	0	20.78	20.66		
Middle	QPSK	1	0	20.62	20.65		
Highest	1	1	0	20.79	20.62		
Lowest		1	0	20.86	20.88		
Middle	16QAM	1	0	20.35	20.39		
Highest		1	0	20.69	20.45		
Limit	EIRP<	1W=30dBn	n	Result	PASS		

LTE Band 4 / 5MHz								
		RI	B	Horizontal	Vertical			
Channel	Modulation	Size	Offset	EIRP(dBm)	EIRP(dBm)			
Lowest		1	0	21.16	21.66			
Middle	QPSK	1	0	21.87	21.82			
Highest	Qi ort	1	0	21.83	21.69			
Lowest		1	0	21.20	21.16			
Middle	16QAM	1	0	21.07	21.72			
Highest		1	0	21.02	21.01			
Limit	EIRP<	1W=30dBn	n	Result	PASS			

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LTE Band 4 / 10MHz								
		RI	В	Horizontal	Vertical			
Channel	Modulation	Size	Offset	EIRP(dBm)	EIRP(dBm)			
Lowest		1	0	21.34	21.35			
Middle	QPSK	1	0	21.47	21.32			
Highest		1	0	21.83	21.67			
Lowest		1	0	21.03	21.85			
Middle	16QAM	1	0	21.27	21.58			
Highest		1	0	21.35	21.43			
Limit	EIRP<	EIRP<1W=30dBm			PASS			

LTE Band 4 / 15MHz								
		R	B	Horizontal	Vertical			
Channel	Modulation	Size	Offset	EIRP(dBm)	EIRP(dBm)			
Lowest		1	0	21.19	21.39			
Middle	QPSK	1	0	21.36	21.00			
Highest	di on	1	0	21.19	21.21			
Lowest		1	0	21.28	21.22			
Middle	16QAM	1	0	21.16	21.17			
Highest		1	0	21.25	21.10			
Limit	EIRP<	EIRP<1W=30dBm			PASS			

LTE Band 4 / 20MHz								
		RI	3	Horizontal	Vertical			
Channel	Modulation	Size	Offset	EIRP(dBm)	EIRP(dBm)			
Lowest		1	0	21.25	21.53			
Middle	QPSK	1	0	21.54	21.26			
Highest		1	0	21.67	21.21			
Lowest		1	0	21.78	21.52			
Middle	16QAM	1	0	21.52	21.23			
Highest		1	0	21.33	21.56			
Limit	EIRP<	1W=30dBn	1	Result	PASS			

Т



6. OCCUPIED BANDWIDTH

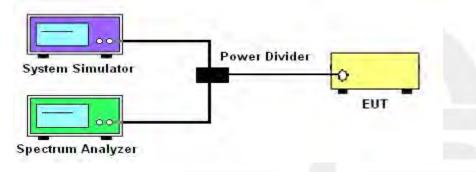
6.1 DESCRIPTION OF OCCUPIED BANDWIDTH MEASUREMENT

6.1.1 MEASUREMENT METHOD

1. 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.

2. 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.

6.1.2 TEST SETUP



6.1.3 TEST PROCEDURES

- 1. The testing follows FCC KDB 971168 v02r02 Section 4.1.and 4.2
- 2. The EUT was connected to spectrum and system simulator via a power divider
- 3. Select lowest, middle, and highest channels for each band and different modulation.
- 4. Set the test probe and measure the Occupied Bandwidth of the spectrum analyzer
- 5. Measure and record the Occupied Bandwidth from the Spectrum Analyzer.

			LI	ſE		
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	3MHz	6MHz	10MHz	20MHz	30MHz	40MHz
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz
VBW	100kHz	300kHz	300kHz	1000kHz	1000kHz	1000kHz
Detector	PK	PK	PK	PK	PK	PK
Trace	Max	Max	Max	Max	Max	Max
Sweep Count	Auto	Auto	Auto	Auto	Auto	Auto



6.1.4 MEASUREMENT RESULT

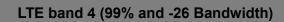
LTE BAND 4

		LTE	Band 4 Ba	ndwidth [M	lHz]		
	Mod	Low	vest	Mid	dle	High	nest
BW [MHz]	IVIOU	26dB BW	99% BW	26dB BW	99% BW	26dB BW	99% BW
1.4	QPSK	1.285	1.0988	1.261	1.1027	1.265	1.0942
1.4	16-QAM	1.266	1.0988	1.269	1.0962	1.294	1.1016
3	QPSK	2.908	2.6824	2.895	2.6867	2.909	2.6817
3	16-QAM	2.907	2.6833	2.917	2.6814	2.909	2.6783
5	QPSK	4.949	4.4873	4.947	4.48483	4.922	4.4827
5	16-QAM	4.969	4.4814	4.960	4.4848	4.948	4.4782
10	QPSK	9.796	8.9530	9.624	7.866	9.724	8.9380
10	16-QAM	9.631	8.951	9.649	8.9290	9.736	8.9469
15	QPSK	14.64	13.454	14.46	13.368	14.49	13.421
15	16-QAM	14.47	13.439	14.51	13.382	14.53	13.428
20	QPSK	20.36	18.578	20.41	18.475	20.74	18.548
20	16-QAM	20.52	18.667	20.44	18.444	20.62	18.555

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LTE band 4







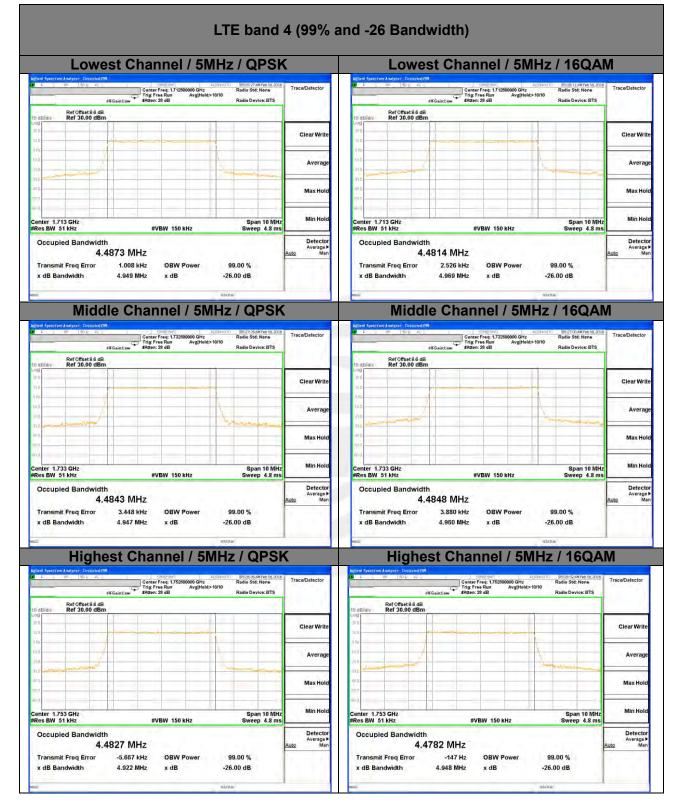
LTE band 4



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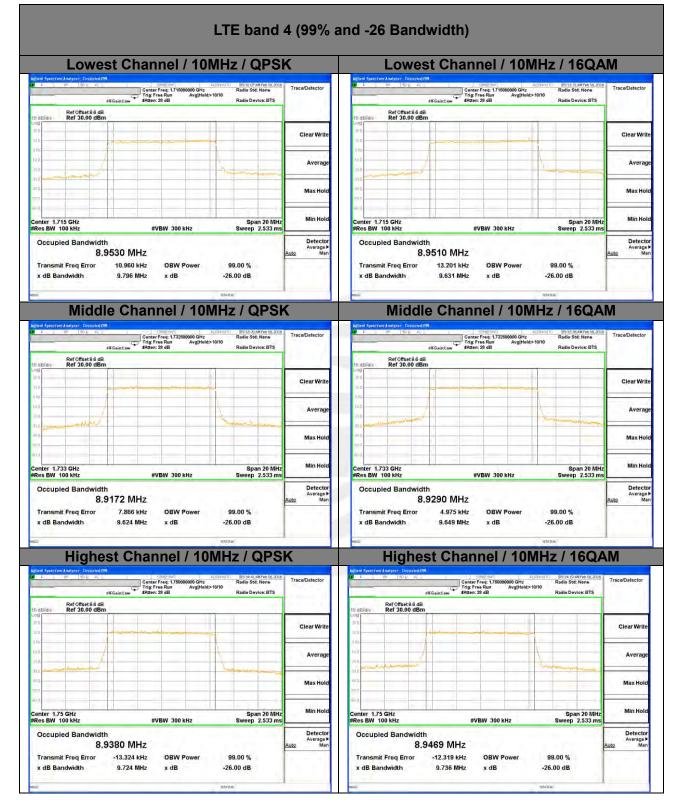


LTE band 4



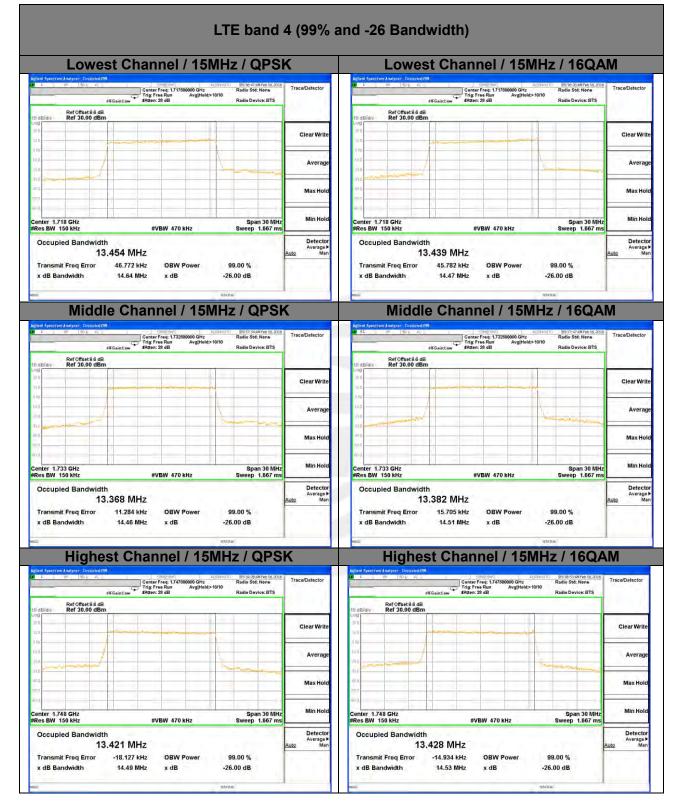


LTE band 4





LTE band 4





LTE band 4





7. CONDUCTED BAND EDGE

7.1 DESCRIPTION OF CONDUCTED BAND EDGE MEASUREMENT

7.1.1 MEASUREMENT METHOD

1. §22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

2. §24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

3. §27.53 (h)

For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4. §27.53(m)(4/6)

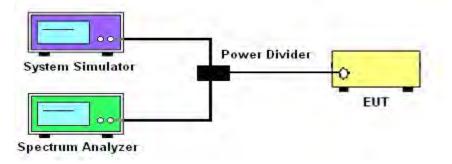
For operations in the 2502.5 MHz ~ 2567.5 MHz band this section, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licenseesoperating on frequencies below 2495 MHz may also submit a documented interference complaintagainst BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

5. §27.53 (g)

For operations in the 698 -746 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.



7.1.2 TEST SETUP



7.1.3 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/AVG detector

5. The RF fundamental frequency should be excluded against the limit line in the operating frquency 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 + 10\log(P)] (dBm) - [43 + 10\log(P)] (dB)
```

= -13dBm.

Band 7:

= P(W) - [55 + 10log(P)] (dB)

```
= [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)
```

= -25dBm.

			Lī	ſE		
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	12MHz	13MHz	15MHz	20MHz	25MHz	30MHz
RBW	30kHz	100kHz	100kHz	300kHz	300kHz	300kHz
VBW	100kHz	300kHz	300kHz	1000kHz	1000kHz	1000kHz
Detector	AVG	AVG	AVG	AVG	AVG	AVG
Trace	Max	Max	Max	Max	Max	Max
Sweep Count	Auto	Auto	Auto	Auto	Auto	Auto



7.1.4 MEASUREMENT RESULT

LTE band 4

Lowest Band Edge / 1 RB		Highest Band	I Edge / 1 RB	
Spectrum Analyzer Awapit N serverint approximit	100	Albini Spectrum Analyzer Swept SA Warker 1 1.755000000000 GHz PRO Wide T Figure 18 d B Ref Offset 8 6 dB	Avg Type: RMS FIRME 12,2100 Avg Type: RMS THATE 2010.0 AvgHeid>100100 THE A Avail EEAAAAA	Trace/Det Select Trace 2
Ref Offiset 86 dB MikT 1.7/10 U00 GHz addiaver Ref 28.86 dBm23,252 dBm Trace 1 Pass	Normal	Ref Offset 8.5 dB 10 dB/drg Ref 28.60 dBm 15 a 15 a	-19,936 dBm	Clear Wri
	Delta	04 204 204 204		Trace Avera
114 114 119 119	Fixed	474 614 £13		Max Ho
Verter 1.706000 GHz Span 12.00 MHz Span 12.00 MHz Res BW 30 kHz #VBW 100 kHz* Sweep 16.4 ms (1001 pts) V 1004100 kHz Sweep 16.4 ms (1001 pts) N f 1.710 000 GHz 23.288 dBm 2 N f 1.701 000 GHz 423.288 dBm 2 N f 1.701 000 GHz 423.288 dBm	ent enter en	N F 1755 000 GHz -19.973 dBm	Span 12.00 MHz Sweep 16.4 ms (1001 pts) Withom Powerfortwork Runcesovaue	Min Ho
2 N I F 1.708 388 GHz 44.216 dBm 4 5 6 7	Properties>	2 N 1 F 1.755 575 GHz 46,973 dBm 4 5 6 7		View/Blan Trace O
a time	More 1 of 2	9 10 11 12 880		
station Lowest Band Edge / Full RB	More 1 of 2	8 9 10 12 12	(and a second se	
b o constant of the stand of th	More 1 of 2	Bight Spectrum Analyzer Sweet 34 High Spectrum Analyzer Sweet 34 Warker 1 1.755000000000 GHz Fright Seal Law Trig Free Ram Free Warker 30 dB	(and a second se	Trace/Det Select Trac
Bind Spectrom Address' Sweet SA Lowest Band Edge / Full RB Starker 1,1/1000000000 GHz PRO Water Process and Pro	More 1 of 2	Biological Spectrum Analyses Spectrum Subject Spectrum Analyses Subject Spectrum Subject Spectrum Spec	Edge / Full RB	Trace/Det Select Trac
Bind Spectrum Aukyrer, Sweyl 13 Bind Spectrum Aukyrer, Sweyl 13	More 1 of 2 Marker Select Marker	Bigging States to all and all	Edge / Full RB	Mic Trace/Det Select Trac Clear Wr Trace Avera
BARNEL CONTRACT OF THE CONTRAC	More 1 of 2 Marker Select Marker 1 Normal Delta Fixedi-	AND Highest Band I Highest Band I Marker 11.755000000000 GHz Pick I and Pick I and P	Edge / Full RB	Trace/Det Select Trac Clear Wr
BALLEY CONTRACT OF THE OWNER OF THE OWNER OF THE OWNER	More 1 of 2 Marker Select Marker 1 Normal Delta Fixedi- Off	And Statistics And	Edge / Full RB	Trace/Det Select Trac Clear Wr Trace Avera
BOOLD CONTRACTOR OF A CONTRACT	More 1 of 2 Marker Select Marker 1 Normal Delta Fixedi- Off Propertiese	AND AND AND AND AND AND AND AND	Edge / Full RB	Trace/Det Select Trac Clear Wr Trace Avera Max Ho

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LTE band 4

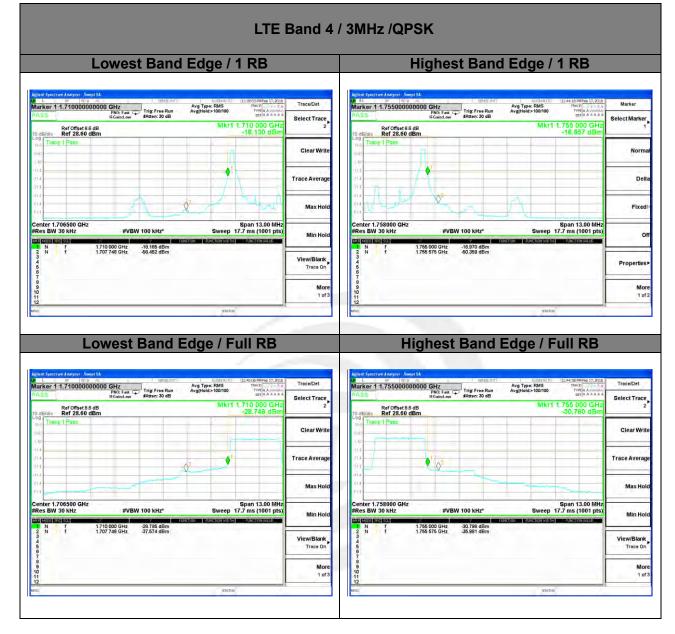
Lowest Band Edge / 1 RB		Highest Band Edge / 1 RB	
Mark Spectrum J Austryner, Bengel JA Bengel Jacobie Bengel Jacobie <th>Marker</th> <th>Agineti Spectrum Analysmi Swept Sk. Serect and the second state of the second state of</th> <th>Marker</th>	Marker	Agineti Spectrum Analysmi Swept Sk. Serect and the second state of	Marker
AB/de Ref 28.60 dBm -22.282 dBm -22.282 dBm	Select Marker	PASS FC-init rev Adder: 30 dB tcr(AAAAAA Def Offset 5 dB Mkr1 1.755 D00 GHz -21,936 dBm Def Offset 72,800 dBm -21,936 dBm -21,936 dBm	Select Marke
Trace (Pass	Normal	16 Trace 1 Pas	Norr
	Delta	94 94 99	De
and the	Fixed		Fixe
ter 1.706000 GHz Span 12.00 MHz s BW 300 KHz #VBW 100 kHz* Sweep 16.4 ms (100 pt) 2001 Hz 101 2 V tonison (Newson Web 100 kHz)	on	Center 1.759000 GHz Span 12.00 MHz #Res BW 30 KHz #VBW 100 KHz* Sweep 16.4 ms (1001 pts) Drof toosi 14 50.0 × 140n don 1 Abacteroxide 1 Distributives	
N 1 f 1710.000 GHz 22226 dBm N f 1.706 389 GHz 44.100 dBm	Properties►	N F 1.755 000 GHz 21 986 dBm 2 N F 1.755 575 GHz 49,066 dBm 3 S S S S S S S S S S S S S S S S S S S	Propertie
	More 1 of 2	5 6 7 8 9 9 10 11 11 12	M4
stana		42 M12 \$14118	
Lowest Band Edge / Full RB		Highest Band Edge / Full RB	
nt Spectrum Analyser - Swept SA		Agitari Spetirun Assiyer - Swept BA	
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Mit Spectrum Analyzyr, Swood SA Serescrift Augree/nth High SP (2000) L P S00 # Address Serescrift Augree/nth High SP (2000) Keer 1.1.7100000000000000000000 GHz Trigs Free Run (Ficalitient Avg Type: RMS Address 30 address Avg Type: RMS Avg Type: RMS Trigs Analysis Ref Offset: 65 dB Mikr1 1.710 000 GHz C5,570 dBm -25,570 dBm Trade 1 Pass Internet Pass Internet Pass Internet Pass	Select Trace 2 Clear Write	Aginan Spectrum Analyzyr Swept M. BREERIT AUGWARD LIDSHee RMee 17,2000 RASS PRO, Warr Drig Free Ram Aragintalis-100100 Trig Free Ram Aragintalis-100100 Trig A A A A A A A A A A A A A A A A A A A	Trac Trac
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Mit Specifier Madayer Swept Mat Setter C Augment Hill 2752 PMino 17,2000 Kert 11.710.0000000000 GHz Fright Fire Run Are Type: RMS Time Part An a centre of the c	Select Trace, 2 Clear Write Trace Average Max Hold	Alient Spectrum Analyzer Swept SA Tot Strategy Sectors Sector	Trai Trai Trai Trai
And Spectrum JAnatyper, Sweet BA The Construction of the Construc	Select Trace, 2 Clear Write Trace Average Max Hold Min Hold View/Blank,	Alient Spectrum Analyzy: Swep 1A. The District Market States Transformed Transformed Tra	Trac Trac Trac

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LTE band 4



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LTE band 4

Lowest Band Edge / 1 RB		Highest Band	Edge / 1 RB	
Mini Spectrum Analyser, Swept SA Spectrum Augustantic ULISA 1914/460 12.2010 L Im R02 min Augustantic ULISA 1914/460 12.2010 Larker 1 1.71000000000000 GHz Trig: Free Run Avg Type: RMS Twice 1 2.5.0 AGSD Freichaur Trig: Free Run Avg Type: RMS Twice 7 A Augustantic	Marker	All M Spectrum Analyzer. Swept 33. Sector 1. Marker 1 1.755500000000 GHz: Pito: Fea. L. Frig: Free Run Free Run SAtten: 30 dB	AUBRIANTO 11142522 PM480 12,2016 Avg Type: RMS TRACE 3 5 5 Avg[Hold>100/100 TWN A A AMA	Marker
0 dBidly Ref 28.60 dBm -16.809 dBm -16.809 dBm	Select Marker	Ref Offset 8.6 dB Ref 28.60 dBm	Mkr1 1.755 000 GHz -17.247 dBm	Select Marke
17aog 1 Pass	Normal	140 1 Pass 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Norm
	Delta	114 274 513		De
The Art that	Fixed	474 614 £13		Fixe
enter 1.706500 GHz Spepan 13.00 MHz Res BW 30 kHz #VBW 100 kHz* Sweep 17.7 ms (1001 pts) 2 floot hat 2 √ rankion floot international understanding	Off	Center 1.758000 GHz #Res BW 30 kHz #VBW 100 kHz* #26 (10009 NRHsta	Span 13.00 MHz Sweep 17.7 ms (1001 pts)	
N 1 r 1,710,000,GHz -16,800 dBm 3 1 r 1,707,748 GHz -67,651 dBm 4 - - - - 6 - - - - 7 - - - - -	Properties►	N T C 1.755 000 GHz -17.247 dBm 2 N T 1.755 575 GHz 50.193 dBm 4 5 7		Propertie
7				2
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And States	More 1 of 2	Bigging Ref Offset8 dB Ref Offset8 d	Edge / Full RB	1)
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Lowest Band Edge / Full RB	More 1 of 2 Trace/Det Select Trace 2 Clear Write Trace Average Max Hold Min Hold View/Blank	Bigging Sector Addition of the sector of the	Edge / Full RB	Trace/Det Select Trac Clear Wr Trace Avera

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LTE band 4

Lowest Band Edge / 1 RB		Hig	ghest Band	d Edge / '	1 RB	
Ident Spectrum Analyzer, Swept NA Sector Respective Respectind Respectind Respective Respective Respectind Respective Respect	Marker	Aglont Spectrum Analyzer Swept SA 10 RL PF 150 R AC Marker 11,755000000000 Base	PNO: Cast [] Trig: Free Run	AUSWAUTO Avg Type: RMS Avg[Heid>100/100	11:57:04 FM Feb 17, 2016 TRACE 3 5 6 TVFE A A A 4 A	Select Marker
Ref Offset 85 dB Mkr1 1.710 000 GHz Ref 28.60 dBm -18.482 dBm	Select Marker	Ref Offset 8.6 dB 10 dB/div Ref 28.60 dBm	IFGain:Low #Atten: 30 dB	Mkr1 1	-15,543 dBm	Marke
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	Delta	11.4 21.4 21.4	1			Marke
1 And Marthe	Fixed	514 814	- Cartana	Mar Marken and	and have	Marke
enter 1.708000 GHz Span 15.00 MHz Res BW 91 KHz #VBW 150 KHz Sweep 7.13 ms (1001 pts) 2 (2021 H2 401 v Interior [Anterior] Interior	om	Center 1.757500 GHz #Res BW 51 kHz	#VBW 150 kHz*	Sweep 7.	Span 15.00 MHz .13 ms (1001 pts)	Marke
N f f 17/10/000 GHz -16/073 dBm 3 f 1.707746 GHz -56.112 dBm 4 6 7	Properties►	N F 1.765 2 N F 1.755 3 4	000 GHz -16.586 dBm 840 GHz -50.041 dBm			Marke
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2 a stans Lowest Band Edge / Full RB		MEG	ज्यस्था	Edge / Fi	11:57:34 FM Feb 17, 2016	
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2 a b b c c c c c c c c c c c c c	Trace/Det Select Trace, 2 Clear Write	High Alfant Systian Anager Swall M A to the Total Sol A PASS Total Sol Ref Offset 86 dB Total Sol A	SPISEON	Edge / Fo	11:57:347MFeb 17, 2116 TRACE 3 5 5 TV/97 A A AMA IET A A & A & A & A 755 000 GHz	1)
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2 a b b b c c c c c c c c c c c c c	Trace/Det SelectTrace, 2 ClearWrite Trace Average Max Hold	High	Trip Free Run HiGalindaw Akter: 30 dB	Edge / Fi	1137349460 17.3100 1147348460 17.3100 114744848 1756 000 GHz -26,913 dBm -26,913 dBm -26,913 dBm -26,913 dBm -26,913 dBm -26,913 dBm -26,913 dBm -26,913 dBm	1 Trace/Det Select Tra Clear W Trace Aver Max H

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LTE band 4

Lowest Band	d Edge / 1 RB		Highest Band	Edge / 1 RB	
L PP SD 2 AC SPESENT L PP SD 2 AC Trip: Free Run Trip: Free Run PR0: Fast Trip: Free Run	AUSVAUTO 11152:16 PM Ro 17, 2016 Avg Type: RMS TRACE 35.5 AvgHold>100/100 TVTE A A AVAIL	Marker	Agleni Spectrum Analyzer Swepi SA U L PP SS 2 AC Marker 1 1,755000000000 GHz Trig: Free Run PND: Fam CD	AUSYMUTC 11156:314945e0.17,2010 Avg Type: RMS TRACE 3.3.5.6 Avg Hold:::100/100 TVTE A A MARK	Select Marker
PRO: Nas. Prov. Nas. 4 Atten: 30 dB #Atten: 30 dB 0 dB/dtv Ref 28.60 dBm	Mkr1 1.710 000 GHz -18,786 dBm	Select Marker	PASS PROT has been seen and the second secon	Avglifield>100/100 TYTELA A AAAAA IETA A AAAAA Mkr1 1.756 000 GHz -16,599 dBm	Marke
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LTE band 4

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enter 1.71000 GHz Span 20.00 MHz	Max Hold	er 1.75500 GHz Span 20.00 MHz	Fixe
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enter 1.75500 GHz Span 20.00 MI Exes BW 100 kHz #VBW 300 kHz* Sweep 2.36 ms (601 pt 2 (50c) 1021 400	s) Min Hold	Center 1.75200 GHz Span 25.00 MHz Res BW 150 kHz #VEW 470 kHz Sweep 3.36 ms (601 pts) Uor tool 100 kHz v Outston Sweep 3.36 ms (601 pts)	
IN I F 1756500 GHz -32,456 dBm 2 N I F 1.756 84 GHz -34,367 dBm 4 5 6 7 8	View/Blank Trace On	N F 1.756.00.0Hz 45.954 dBm 2 N F 1.757.50.0Hz 61.530 dBm 3 6	Propertie
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LTE band 4

Lowest Band E	dge / 1 RB		Highest Band	Edge / 1 RB	
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	Mannah	FixedP	- white -	he man	Fixe
enter 1.71250 GHz Res BW 150 kHz #VBW 470 kHz	Span 25.00 MHz Sweep 3.36 ms (601 pts)	Center 1.75200 GH #Res BW 150 kHz Off	#VBW 470 kHz	Span 25.00 MHz Sweep 3.36 ms (601 pts)	
	FUNCTION WIDTH - FUNCTION VALUE	2 N 1 F	1.755 00 GHz 43.919 dBm 1.757 50 GHz 61.781 dBm		
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3 6 6 7 8 9 9 10 11	grame .	Properties> More 1 of 2 1 of 2	Highest Band B	stans	M
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LTE band 4

Lowest Band Edge / 1 RB		Highest Band	I Edge / 1 RB	
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0 dBide Ref 19.80 dBm 46,406 DBm 90 00 00 00 00 00 00 00 00 00 00 00 00	10 dB Log 7 Normal 902 902	dav Ref 19.80 dBm Trace 1 Pass		Norm
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	Fixed 5			Fixed
enter 1.71500 GHz Span 30.00 MHz Res BW 300 kHz #VBW 1.0 MHz Sweep 1.04 ms (601 pts)	Off #Res	er 1.75500 GHz BW 300 kHz #VBW 1.0 MHz	Span 30.00 MHz Sweep 1.04 ms (601 pts)	
N H F 1,710 00 GHz 46,599 dBm 3 F 1,706 65 GHz 62,037 dBm 4 5 F 1 G 10	Properties► 4 6	N F 1.766 00 GHz 45.103 dBm N F 1.758 81 GHz 61.613 dBm		Properties
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an antreast Lowest Band Edge / Full RB to a second secon	More 101 7 10 10 11 11 12 Home 10 Trece/Det 10	Section Analysis - Seept SA 199 - Soo ac		1 o Trace/Det
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And Andrew Andre	More 1 of 2 1 of 2	retiron Judger, Sengt M. Total Color Acia Hittor rate of Trig Free Run EGuind ov Ref Offset 8 dB ar Ref 19.80 dBm	Edge / Full RB	10
And Standing of Contract of Co	More 1 of 2 1 of 2	refrine Judger, Swyt J. Pito: Fair Contaction of Trig, Free Run Pito: Fair Contaction of Trig, Free Run Ref 19.80 dBm Trigge 1935 rf 1.75500 CHz BW 300 kHz #VBW 1.0 MHz	Edge / Full RB	Trace/Det Select Trace Clear Wri Trace Avera Max Ho
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LTE band 4

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Res BW 300 kHz #VBW 1.0 MHz Sweep 1.04 ms (601 pts) 25 1056 FM2 531 2 5 1016 mon 500 ms (601 pts) 35 1056 FM2 533 2 5 1016 mon 600 ms (601 pts) 35 1056 FM2 533 2 5 1016 mon 600 ms (601 pts) 35 1056 FM2 533 2 5 1016 mon 600 ms (601 pts)	off	#Res BW 300 kHz #VBW 1.0 MHz Sweep 1.04 ms (60	1 pts)
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8		1	
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Lowest Band Edge / Full RB	1 of 2	Algert Specificer Malycer George MA Algert Specificer Malycer George MA Algert Specificer Malycer George MA De Tool And Trips Free Run Ang Type Log Provint Trips Free Run Ang Type Log Provint	B <u>R.NIO</u> 7 - 2 - 0 Trace/Det
Active Andrew Swept SA Lowest Band Edge / Full RB Marker 1.7.00000000000 GHz Fig Free Ran Arter: 22 dB Ref Offset 85 dB Mkr1 1.830 dBm	Trace/Det Select Trace, 2	Added Spectrum Analyzer Sweet 13. Added Spectrum A	B Select Trace/Det Select Trace
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Active Andrew Swept SA Lowest Band Edge / Full RB Marker 1.7.00000000000 GHz Fig Free Ran Active 22 dB Ref Offset 85 dB Mkr1 1.830 dBm	Trace/Det Belect Trace	Added Spectrum Analyzer Sweet 13. Added Spectrum A	B R 210 Select Trac Select Trac Clear Wr
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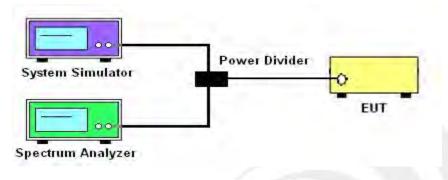
8. CONDUCTED SPURIOUS EMISSION

8.1 DESCRIPTION OF CONDUCTED SPURIOUS EMISSION MEASUREMENT

8.1.1 MEASUREMENT METHOD

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.

8.1.2 TEST SETUP



8.1.3 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 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

4. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.

5. The RF fundamental frequency should be excluded against the limit line in the operating frquency band.

6.The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

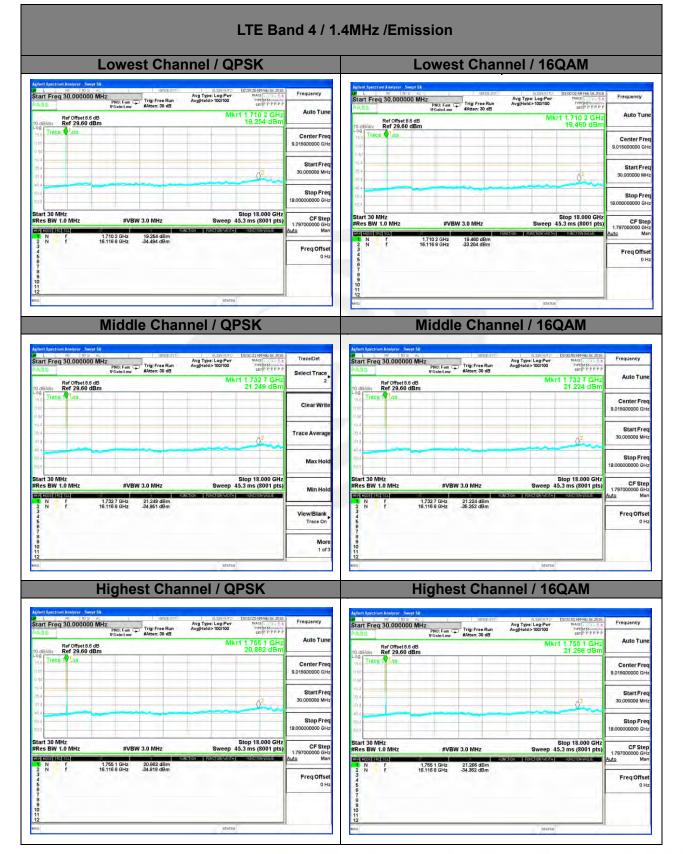
= P(W) - [43 + 10log(P)] (dB) = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

= -13dBm.

			LT	E		
LTE BW	1.4M	3M	5M	10M	15M	20M
Span	Auto	Auto	Auto	Auto	Auto	Auto
RBW	1000kHz	1000kHz	1000kHz	1000kHz	1000kHz	1000kHz
VBW	3000kHz	3000kHz	3000kHz	3000kHz	3000kHz	3000kHz
Detector	PK	PK	PK	PK	PK	PK
Trace	Max	Max	Max	Max	Max	Max









Lowest Channel / QPSK	Lowest Channel / 16QAM
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Middle Channel / QPSK	Middle Channel / 16QAM
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Lowest Channel / QPSK	Lowest Channel / 16QAM
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L PF 502 AC SECENT AUGUND DE15/19A/Feb 18.2016 arker 1 1.734903750000 GHz Avg Type: Log-Pwr TRACE as a	Marker 1 1.734903750000 GHz Trip Frag Run Avg Type Log Pur TRACE Aug P
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tart 30 MHz Stop 18.000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 45.3 ms (8001 pts) Mkr	Start 30 MHz Stop 18.000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 45.3 ms (8001 pts) Mkr-4 Mkr-4 Mkr-4
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dB/div Ref 24.00 dBm	10 dB/div Ref 24.00 dBm
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Shenzhen STS Test Services Co., Ltd.

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Lowest Channel / QPSK		Lowest Channel / 16QAM	
ის Spectrum Analyzer Swept SA. L PP 80 92 ის არბალის გადადება და ამის კველის კვ	116	Algenti Spectrum Analyzer - Swept SA Image: Section - Sec	
Ker 1 1.752873750000 GHz PNO: Fast IFGini uw Sktter: 30 dB	E Pean Search	Marker 1 1.752873750000 GHz PR0: Faat Trig: Free Run Avg Type: Log-Pvr Trig: Free Run Avg Type: Lo	Peak Search
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	More	9 9 10	Ma
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N 1 f 16,116.8 GHz -35,036 dBm	Mkr-RefLvi	N F 1700 6 GHz 20 489 dBm N F 16.116 6 GHz -36.869 dBm 4 5	Mkr-RefL
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Lowest Channel / QPSK		Lowest Channel / 16QAM		
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arker 1 1.741642500000 GHz Avg Trig: Free Run Avg Type: Leg-Pur Protocological Rest Free Run Avg Type: Leg-Pur Protocological Rest Protocological	Peak Search	Marker 1 1.741642500000 GHz Avg Type: Leg-Pwr PASE Phor.Fast Trig: Free Run FGaint Base States 30 dB	Peak Search	
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24 Model 974 (302) - 28 Y FUNCTION (100 MO (14) FUNCTION (14)		N f 1.7416 GHz 24984 dBm 2 N f 1.7416 GHz 19984 dBm 2 N f 1.61168 GHz 34,933 dBm	AND	
2 N 1 F 16:1168 GHz -34,740 dBm 4 6	Mkr→RefLvi	2 N I F 16.116.9 GHz - 34,903 dBm 4 5	Mkr→RefL	
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righest onamer a or				
Iten Specificer Analyzer Swept SA L PF 500 AC SPICE DT ALIZYONTO 10544.1844Feb 18.2010 メリカー 4 4 7565 2000 CAD PM TRAFE 2000		Action1 Spectrum Analyzer - Swept Sk. 819526777 819544-47 AMPR0 18,2010 8 L PF 19319 AC 91952677 819526777 19344-47 AMPR0 18,2010 Marchard 4 2556 250000000 CHz	Peak Search	
A35 PN0: Fast Trig: Free Run Avg Hold: 95/100 THE MIMMUNE	P	PASS PRO: Fast Trig: Free Run Avg[Hold>100/100 TVFEMINUMUM IFGaint.ew #Atten: 30 dB	NextPe	
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enter 5.015 GHz Span 17.97 GHz Span 17.97 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 45.3 ms (8001 pts) Ve/ Novi Instance www.exp 45.3 ms (8001 pts) Sweep 45.3 ms (8001 pts)	Mkr→CF	Center 9.015 GHz Span 17.97 CHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 45.3 ms (8001 pts). Dog (wsg) Rej 3.0 MHz 9 V Ponton Proclamation (9.6 Microsovau)	Mkr-c	
C 2026 EXPERIENCE 233 (2016) 123		No the interaction of the intera		
4 6 6 7	Mkr→RefLvi	3	Mkr→RefL	
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9. RADIATED SPURIOUS EMISSION

9.1 DESCRIPTION OF RADIATED SPURIOUS EMISSION

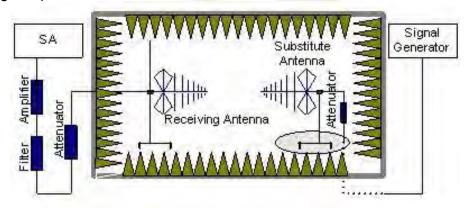
9.1.1 MEASUREMENT METHOD

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 Band 7 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 55 + 10 log (P) dB. For Band. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

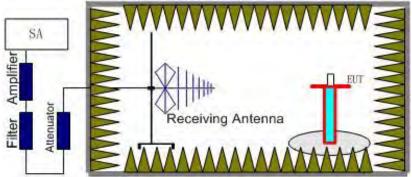
5.1.2 Test Setup

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx (dBuV) +CL (dB) +SA (dB) +Gain (dBi) -107 (dBuV to dBm) The SA is calibrated using following setup.



b) EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.





Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the ARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: Pow-er=PMea+ARpl

9.1.3 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI / TIA-603-C-2009 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 + 10\log(P)dB below the transmitter power P(Watts)
= P(W)- [43 + 10log(P)] (dB)
= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
```

= -13dBm

For Band 7: The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts) = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB) = -25dBm EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain ERP (dBm) = EIRP - 2.15



9.1.4 TEST RESULTS

LTE BAND 4

LTE Band 4 / 1.4MHz / QPSK / RB Size 1 Offset 0/ The Worst Test Results for Lowest						
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3420.398	-31.69	0.31	-31.38	-13	-18.38	Horizontal
5130.600	-33.76	3.98	-29.78	-13	-16.78	Horizontal
6843.811	-41.79	10.50	-31.29	-13	-18.29	Horizontal
3420.392	-35.35	0.30	-35.05	-13	-22.05	Vertical
5130.600	-34.31	3.98	-30.33	-13	-17.33	Vertical
6843.808	-42.87	10.50	-32.37	-13	-19.37	Vertical
LTE Ba	nd 4 / 1.4MHz /	QPSK / RB Size	e 1 Offset 0/ The	e Worst Test Re	sults for Mid	dle
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3462.108	-36.67	0.31	-36.36	-13	-23.36	Horizontal
5198.220	-32.45	3.98	-28.47	-13	-15.47	Horizontal
6927.197	-42.65	10.50	-32.15	-13	-19.15	Horizontal
3462.110	-31.46	0.30	-31.16	-13	-18.16	Vertical
5198.214	-36.35	3.98	-32.37	-13	-19.37	Vertical
6927.203	-37.57	10.50	-27.07	-13	-14.07	Vertical
LTE Bai	nd 4 / 1.4MHz /	QPSK / RB Size	1 Offset 0/ The	Worst Test Res	sults for High	nest
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3511.396	-32.34	0.31	-32.03	-13	-19.03	Horizontal
5261.396	-35.53	3.98	-31.55	-13	-18.55	Horizontal
7018.200	-37.45	10.50	-26.95	-13	-13.95	Horizontal
3511.405	-32.56	0.30	-32.26	-13	-19.26	Vertical
5261.402	-41.46	3.98	-37.48	-13	-24.48	Vertical
7018.204	-38.35	10.50	-27.85	-13	-14.85	Vertical

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



LTE Ba	and 4 / 3MHz / 0	QPSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for Lowe	est
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3420.392	-31.57	0.31	-31.26	-13	-18.26	Horizontal
5128.597	-33.35	3.98	-29.37	-13	-16.37	Horizontal
6843.805	-41.56	10.50	-31.06	-13	-18.06	Horizontal
3420.393	-35.35	0.30	-35.05	-13	-22.05	Vertical
5128.597	-34.34	3.98	-30.36	-13	-17.36	Vertical
6843.809	-42.35	10.50	-31.85	-13	-18.85	Vertical
LTE B	and 4 / 3MHz / 0	QPSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for Mido	lle
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3462.107	-36.35	0.31	-36.04	-13	-23.04	Horizontal
5191.218	-32.24	3.98	-28.26	-13	-15.26	Horizontal
6927.199	-42.35	10.50	-31.85	-13	-18.85	Horizontal
3462.102	-31.56	0.30	-31.26	-13	-18.26	Vertical
5191.214	-36.46	3.98	-32.48	-13	-19.48	Vertical
6927.200	-37.46	10.50	-26.96	-13	-13.96	Vertical
LTE Ba	and 4 / 3MHz / 0	PSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for High	est
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3504.609	-32.34	0.31	-32.03	-13	-19.03	Horizontal
5254.405	-35.34	3.98	-31.36	-13	-18.36	Horizontal
7011.199	-37.12	10.50	-26.62	-13	-13.62	Horizontal
3504.611	-32.38	0.30	-32.08	-13	-19.08	Vertical
5254.403	-41.23	3.98	-37.25	-13	-24.25	Vertical
7011.201	-38.28	10.50	-27.78	-13	-14.78	Vertical

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



LTE Ba	and 4 / 5MHz / (QPSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for Lowe	st
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3420.391	-31.46	0.31	-31.15	-13	-18.15	Horizontal
5128.596	-33.83	3.98	-29.85	-13	-16.85	Horizontal
6843.805	-41.35	10.50	-30.85	-13	-17.85	Horizontal
3420.399	-35.33	0.30	-35.03	-13	-22.03	Vertical
5128.601	-34.53	3.98	-30.55	-13	-17.55	Vertical
6843.810	-42.08	10.50	-31.58	-13	-18.58	Vertical
LTE B	and 4 / 5MHz / (QPSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for Midd	le
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3464.110	-36.97	0.31	-36.66	-13	-23.66	Horizontal
5190.213	-32.46	3.98	-28.48	-13	-15.48	Horizontal
6928.196	-42.42	10.50	-31.92	-13	-18.92	Horizontal
3464.104	-31.56	0.30	-31.26	-13	-18.26	Vertical
5190.214	-36.36	3.98	-32.38	-13	-19.38	Vertical
6928.194	-37.64	10.50	-27.14	-13	-14.14	Vertical
LTE Ba	and 4 / 5MHz / 0	PSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for Highe	est
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3462.609	-32.42	0.31	-32.11	-13	-19.11	Horizontal
5191.400	-35.64	3.98	-31.66	-13	-18.66	Horizontal
6920.204	-37.61	10.50	-27.11	-13	-14.11	Horizontal
3462.612	-32.47	0.30	-32.17	-13	-19.17	Vertical
5191.399	-41.8	3.98	-37.82	-13	-24.82	Vertical
6920.199	-38.67	10.50	-28.17	-13	-15.17	Vertical
					-	

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

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LTE Ba	ind 4 / 10MHz /	QPSK / RB Size	1 Offset 0/ The	Worst Test Res	sults for Low	est
Frequency(MHz)	Power(dBm)	ARpl (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3420.392	-31.45	0.31	-31.14	-13	-18.14	Horizontal
5132.596	-33.35	3.98	-29.37	-13	-16.37	Horizontal
6843.808	-41.55	10.50	-31.05	-13	-18.05	Horizontal
3420.395	-35.94	0.30	-35.64	-13	-22.64	Vertical
5132.594	-34.78	3.98	-30.8	-13	-17.8	Vertical
6843.805	-42.75	10.50	-32.25	-13	-19.25	Vertical
LTE Ba	and 4 / 10MHz /	QPSK / RB Size	1 Offset 0/ The	Worst Test Res	sults for Mid	dle
Frequency(MHz)	Power(dBm)	ARpl (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3455.102	-36.43	0.31	-36.12	-13	-23.12	Horizontal
5184.219	-32.57	3.98	-28.59	-13	-15.59	Horizontal
6928.195	-42.65	10.50	-32.15	-13	-19.15	Horizontal
3455.107	-31.36	0.30	-31.06	-13	-18.06	Vertical
5184.219	-36.58	3.98	-32.6	-13	-19.6	Vertical
6913.201	-37.75	10.50	-27.25	-13	-14.25	Vertical
LTE Ba	nd 4 / 10MHz / (QPSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for High	est
Frequency(MHz)	Power(dBm)	ARpl (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3490.610	-32.48	0.31	-32.17	-13	-19.17	Horizontal
5240.396	-35.34	3.98	-31.36	-13	-18.36	Horizontal
6983.200	-37.52	10.50	-27.02	-13	-14.02	Horizontal
3490.603	-32.56	0.30	-32.26	-13	-19.26	Vertical
5240.397	-41.43	3.98	-37.45	-13	-24.45	Vertical
6983.202	-38.25	10.50	-27.75	-13	-14.75	Vertical

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



LTE Ba	ind 4 / 15MHz /	QPSK / RB Size	1 Offset 0/ The	Worst Test Res	sults for Low	est
Frequency(MHz)	Power(dBm)	ARpl (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3420.391	-31.56	0.31	-31.25	-13	-18.25	Horizontal
5135.595	-33.43	3.98	-29.45	-13	-16.45	Horizontal
6843.812	-41.35	10.50	-30.85	-13	-17.85	Horizontal
3420.392	-35.67	0.30	-35.37	-13	-22.37	Vertical
5135.592	-34.23	3.98	-30.25	-13	-17.25	Vertical
6843.801	-42.72	10.50	-32.22	-13	-19.22	Vertical
LTE Ba	and 4 / 15MHz /	QPSK / RB Size	1 Offset 0/ The	Worst Test Re	sults for Mid	dle
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3455.102	-36.53	0.31	-36.22	-13	-23.22	Horizontal
5177.215	-32.58	3.98	-28.6	-13	-15.6	Horizontal
6906.200	-42.52	10.50	-32.02	-13	-19.02	Horizontal
3455.109	-31.35	0.30	-31.05	-13	-18.05	Vertical
5177.220	-36.62	3.98	-32.64	-13	-19.64	Vertical
6906.196	-37.53	10.50	-27.03	-13	-14.03	Vertical
LTE Ba	nd 4 / 15MHz / (QPSK / RB Size	1 Offset 0/ The	Worst Test Res	ults for High	est
Frequency(MHz)	Power(dBm)	A _{Rpl} (dBm)	Р _{меа} (dBm)	Limit (dBm)	Margin	Polarity
3483.606	-32.35	0.31	-32.04	-13	-19.04	Horizontal
5226.404	-35.43	3.98	-31.45	-13	-18.45	Horizontal
6962.199	-37.45	10.50	-26.95	-13	-13.95	Horizontal
3508.606	-32.73	0.30	-32.43	-13	-19.43	Vertical
5226.406	-41.56	3.98	-37.58	-13	-24.58	Vertical
6962.203	-38.57	10.50	-28.07	-13	-15.07	Vertical

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

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LTE Ba	nd 4 / 20MHz /	QPSK / RB Size	e 1 Offset 0/ The	e Worst Test Res	sults for Low	est
Frequency(MHz)	Power(dBm)	ARpl (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3420.391	-31.56	0.31	-31.25	-13	-18.25	Horizontal
5135.598	-33.56	3.98	-29.58	-13	-16.58	Horizontal
6843.809	-41.35	10.50	-30.85	-13	-17.85	Horizontal
3420.401	65.54	0.30	65.84	-13	78.84	Vertical
5135.597	-34.47	3.98	-30.49	-13	-17.49	Vertical
6843.804	-42.78	10.50	-32.28	-13	-19.28	Vertical
LTE Ba	and 4 / 20MHz /	QPSK / RB Size	e 1 Offset 0/ Th	e Worst Test Res	sults for Mid	dle
Frequency(MHz)	Power(dBm)	ARpl (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3448.106	-36.81	0.31	-36.5	-13	-23.5	Horizontal
5170.214	-32.65	3.98	-28.67	-13	-15.67	Horizontal
6892.197	-42.64	10.50	-32.14	-13	-19.14	Horizontal
3448.102	-31.97	0.30	-31.67	-13	-18.67	Vertical
5170.215	-36.53	3.98	-32.55	-13	-19.55	Vertical
6892.201	-37.46	10.50	-26.96	-13	-13.96	Vertical
LTE Ba	nd 4 / 20MHz / (QPSK / RB Size	1 Offset 0/ The	e Worst Test Res	ults for High	est
Frequency(MHz)	Power(dBm)	ARpl (dBm)	P _{Mea} (dBm)	Limit (dBm)	Margin	Polarity
3476.606	-32.63	0.31	-32.32	-13	-19.32	Horizontal
5212.404	-35.24	3.98	-31.26	-13	-18.26	Horizontal
6948.198	-37.53	10.50	-27.03	-13	-14.03	Horizontal
3476.605	-32.45	0.30	-32.15	-13	-19.15	Vertical
5212.403	-41.57	3.98	-37.59	-13	-24.59	Vertical
6948.204	-38.12	10.50	-27.62	-13	-14.62	Vertical

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

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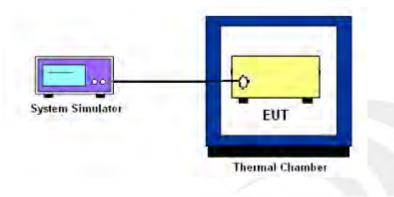
10. FREQUENCY STABILITY

10.1 DESCRIPTION OF FREQUENCY STABILITY MEASUREMENT

10.1.1 MEASUREMENT METHOD

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 $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

10.1.2 Test Setup



10.1.3 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.

10.1.4 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 similator.

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.



10.1.4 MEASUREMENT RESULT

LTE BAND 4

Test Conditions		LTE Band 4 (QPSK 173) / Middle Channel 2.5MHz	Limit
Temperature	Voltage	BW 1	BW 10MHz	
(°C)	(Volt)	Deviation (Hz)	Deviation (ppm)	Result
50°C	Normal Votage	26	0.015	
30°C	Normal Votage	25	0.014	
20°C	Normal Votage	21	0.012	
10°C	Normal Votage	-24	-0.014	
0°C	Normal Votage	-32	-0.018	
-10°C	Normal Votage	22	0.013	PASS
-20°C	Normal Votage	17	0.010	
-30°C	Normal Votage	22	0.013	
20°C	Maximum Votage	-21	-0.012	
20°C	Normal Votage	-22	-0.013	
20°C	Battery End Point	26	0.015	

Note:

1. Normal Voltage = 3.7V. ; Battery End Point (BEP) = 3.5 V.; Maximum Voltage = 4.2 V

2. Note: The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.





PHOTOS OF TEST SETUP

RADIATED SPURIOUS EMISSION





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

Shenzhen STS Test Services Co., Ltd.