RF TEST REPORT



Report No.: 14070594-FCC-R
Supersede Report No.: N/A

Applicant	ITALCOM GROUP			
Product Name	4G Smart F	4G Smart Phone		
Model No.	MAXX			
Serial No.	N/A			
Test Standard	FCC Part 2	7: 2014; ANSI/TIA C603 D: 2	010	
Test Date	February 04	4 to February 05, 2015		
Issue Date	February 06	February 06, 2015		
Test Result	Pass Fail			
Equipment complied with the specification				
Equipment did no	t comply with	n the specification		
Duston. Wang Alex. Lin				
Dustin Wang Test Engineer		Alex Liu Checked By		

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety



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1. Report Revision History

Report No.	Report Version	Description	Issue Date
14070594-FCC-R	NONE	Original	February 06, 2015

2. Customer information

Applicant Name	ITALCOM GROUP	
Applicant Add	1728 Coral Way, Coral Gables, Miami, Florida, United States	
Manufacturer	UTCOM TECHNOLOGY CO.,LIMITED	
Manufacturer Add	C1105-1107, Tiley Central Plaza, No3 Haide Road, Nanshan District, Shenzhen	
	518054	

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES	
	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park	
Lab Address	South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong	
	China 518108	
FCC Test Site No.	718246	
IC Test Site No.	4842E-1	
Test Software	Radiated Emission Program-To Shenzhen v2.0	



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4. Equipment under Test (EUT) Information

Description of EUT: 4G Smart Phone

Main Model: MAXX Serial Model: N/A

Date EUT received: February 03, 2015

Test Date(s): February 04 to February 05, 2015

Equipment Category: PCE

Antenna Gain: LTE Band 4: 0.35 dBi

Type of Modulation: LTE Band: QPSK, 16QAM

RF Operating Frequency (ies): LTE Band 4 TX: 1712.5 ~ 1752.5 MHz; RX: 2112.5 ~ 2152.5 MHz

Maximum Conducted AV Power: LTE Band 4: 21.51 dBm

ERP/EIRP: LTE Band 4: 17.18 dBm / EIRP

Port: Power Port, Earphone Port, USB Port

Battery:

Model: NYX1600A56X53

Spec: 3.7V 1600mAh

Input Power: Limited charger voltage: 4.2V

Adapter:

Input: AC 100-240V; 50/60Hz 0.15A

Output: DC 5.0V; 500mA

Trade Name : NYX

GPRS/EGPRS Multi-slot class 8/10/12

FCC ID: YPVITALCOMMAXX



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5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§ 1.1307; § 2.1093	RF Exposure (SAR)	Compliance
§ 27.50(c.10); § 27.50(d.4)	RF Output Power	Compliance
§ 27.50(d)	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	Compliance
§ 27.53(a.5)	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053;§ 27.53(h)	Field Strength of Spurious Radiation	Compliance
§ 27.53(h)	Out of band emission, Band Edge	Compliance
§ 2.1055; § 27.5(h); § 27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

Measurement Uncertainty

Emissions					
Test Item Description Uncertainty					
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB			
-	-	-			



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6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: 14070594-FCC-H.



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6.2 RF Output Power

Temperature	19°C		
Relative Humidity	58%		
Atmospheric Pressure	1008mbar		
Test date :	February 04, 2015		
Tested By :	Dustin Wang		

Requirement(s):

Spec	Item	Requirement	Applicable			
§27.50 (c)	a)	V				
Test Setup	EUT Base Station					
	Fo	or Conducted Power:				
	-	The transmitter output port was connected to base state	tion.			
	-	Set EUT at maximum power through base station.				
	-	Select lowest, middle, and highest channels for each be	oand and			
		different test mode.				
	For ERP/EIRP:					
	- The transmitter was placed on a wooden turntable, and it was					
	transmitting into a non-radiating load which was also placed on the turntable.					
Test Procedure	- The measurement antenna was placed at a distance of 3 meters					
	from the EUT. During the tests, the antenna height and					
	polarization as well as EUT azimuth were varied in order to identify					
	the maximum level of emissions from the EUT. The test was					
		performed by placing the EUT on 3-orthogonal axis.				
	-	- The frequency range up to tenth harmonic of the fundamental				
	frequency was investigated.					
	- Remove the EUT and replace it with substitution antenna. A signa					
		generator was connected to the substitution antenna b	y a non-			
	radiating cable. The absolute levels of the spurious emissions					



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	were measured by the substitution.
	- Spurious emissions in dB = 10 log (TX power in Watts/0.001) –
	the absolute level
	- Spurious attenuation limit in dB = 43 + 10 Log10 (power out in
	Watts.
Remark	
Result	Pass
Test Data	Yes N/A
Test Plot	Yes (See below) N/A



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Conducted Power

LTE Band 4

BW (MHz)	Ch	Freq. (MHz)	Modulation	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
				1	0	0	21.23
				1	49	0	21.32
				1	99	0	21.18
			QPSK	50	0	1	21.11
				50	24	1	21.16
				50	49	1	21.08
	20050	1720.0		100	0	1	21.05
	20050	1720.0		1	0	1	21.03
				1	49	1	21.11
				1	99	1	21.12
			16QAM	50	0	2	20.85
				50	24	2	20.82
				50	49	2	20.74
				100	0	2	20.76
		1732.5		1	0	0	21.42
20MHz			QPSK	1	49	0	21.34
				1	99	0	21.45
				50	0	1	21.44
				50	24	1	21.51
				50	49	1	21.38
	20175			100	0	1	21.42
	20175			1	0	1	21.01
				1	49	1	21.05
				1	99	1	20.64
			16QAM	50	0	2	20.49
				50	24	2	20.63
				50	49	2	20.75
				100	0	2	20.77
		1745.0		1	0	0	21.36
	20300		QPSK	1	49	0	21.39
				1	99	0	21.43



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				50	0	1	20.43
				50	24	1	20.43
				50	49	1	20.94
				100	0	1	20.68
				1	0	1	20.86
				1	49	1	20.98
				1	99	1	20.84
			16QAM	50	0	2	20.76
			50	24	2	20.54	
				50	49	2	20.51
				100	0	2	20.55

BW (MHz)	Ch	Freq. (MHz)	Modulation	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
				1	0	0	21.27
				1	37	0	21.35
				1	74	0	21.11
			QPSK	36	0	1	21.34
				36	16	1	21.22
				36	35	1	21.03
	20025	4747.5		75	0	1	21.33
	20025	1717.5		1	0	1	20.59
			16QAM	1	37	1	20.49
				1	74	1	20.48
				36	0	2	20.97
15MHz				36	16	2	20.52
				36	35	2	20.63
				75	0	2	20.54
				1	0	0	21.22
				1	37	0	21.19
				1	74	0	21.34
			QPSK	36	0	1	20.89
	20175	1732.5		36	16	1	20.94
				36	35	1	20.88
				75	0	1	20.79
			16QAM	1	0	1	20.95
				1	37	1	20.81



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				1	74	1	20.95
				36	0	2	20.26
				36	16	2	20.37
				36	35	2	20.29
				75	0	2	20.58
				1	0	0	21.34
				1	37	0	21.34
		1747.5	QPSK	1	74	0	21.36
				36	0	1	20.63
				36	16	1	20.59
				36	35	1	20.61
	20225			75	0	1	20.65
	20325			1	0	1	20.37
				1	37	1	20.66
				1	74	1	20.71
			16QAM	36	0	2	20.38
				36	16	2	20.26
				36	35	2	20.32
				75	0	2	20.64

BW (MHz)	Ch	Freq. (MHz)	Modulation	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
				1	0	0	21.41
				1	24	0	21.45
				1	49	0	21.25
		20000 1715.0	QPSK	25	0	1	20.82
				25	12	1	20.97
				25	24	1	20.86
	20000			50	0	1	20.85
10MHz	20000			1	0	1	21.04
				1	24	1	20.75
				1	49	1	20.79
			16QAM	25	0	2	20.31
				25	12	2	20.59
				25	24	2	20.36
				50	0	2	20.56
	20175	1732.5	QPSK	1	0	0	21.35



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			1	24	0	21.42
			1	49	0	21.36
			25	0	1	20.82
			25	12	1	20.79
			25	24	1	20.89
			50	0	1	20.87
			1	0	1	20.63
			1	24	1	20.56
			1	49	1	20.48
		16QAM	25	0	2	20.09
			25	12	2	20.23
			25	24	2	20.34
			50	0	2	20.41
			1	0	0	21.38
		QPSK	1	24	0	21.15
			1	49	0	21.37
			25	0	1	20.88
			25	12	1	20.99
			25	24	1	20.75
20250			50	0	1	20.93
20350	1750.0		1	0	1	20.93
			1	24	1	20.91
			1	49	1	20.98
		16QAM	25	0	2	20.64
			25	12	2	20.67
			25	24	2	20.54
			50	0	2	20.45



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BW (MHz)	Ch	Freq. (MHz)	Modulation	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
				1	0	0	21.24
				1	12	0	21.41
				1	24	0	21.37
			QPSK	12	0	1	20.99
				12	6	1	20.78
				12	11	1	20.64
	00000	4745.0		25	0	1	20.35
	20000	1715.0		1	0	1	21.01
				1	12	1	21.07
				1	24	1	20.68
			16QAM	12	0	2	20.75
				12	6	2	20.62
				12	11	2	20.55
				25	0	2	20.35
		20175 1732.5	QPSK	1	0	0	21.43
				1	12	0	21.14
5.411				1	24	0	21.19
5MHz				12	0	1	20.85
				12	6	1	20.67
				12	11	1	20.75
	00475			25	0	1	20.56
	20175			1	0	1	20.73
				1	12	1	20.66
				1	24	1	20.57
			16QAM	12	0	2	20.15
				12	6	2	20.36
				12	11	2	20.36
				25	0	2	20.24
				1	0	0	21.23
				1	12	0	21.35
	00050	4750.0	O D C L	1	24	0	21.35
	20350	1750.0	QPSK	12	0	1	20.84
				12	6	1	20.89
				12	11	1	20.86



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			25	0	1	20.69
			1	0	1	20.83
			1	12	1	20.86
		16QAM	1	24	1	20.84
			12	0	2	20.05
			12	6	2	20.18
			12	11	2	20.32
		25	0	2	20.12	

BW (MHz)	Ch	Freq. (MHz)	Modulation	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
				1	0	0	21.42
				1	7	0	21.35
				1	14	0	21.24
			QPSK	8	0	1	20.64
				8	4	1	20.56
				8	7	1	20.62
	40005	4744 5		15	0	1	20.67
	19965	1711.5		1	0	1	20.97
				1	7	1	20.35
			16QAM	1	14	1	20.68
				8	0	2	20.68
				8	4	2	20.57
3MHz				8	7	2	20.56
SIVITZ				15	0	2	20.49
				1	0	0	21.29
				1	7	0	21.41
				1	14	0	21.37
			QPSK	8	0	1	20.79
				8	4	1	20.75
	20175	1732.5		8	7	1	20.61
	20175	1/32.5		15	0	1	20.78
				1	0	1	20.62
				1	7	1	20.51
			16QAM	1	14	1	20.83
				8	0	2	20.45
				8	4	2	20.39



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				8	7	2	20.29
				15	0	2	20.35
				1	0	0	21.43
				1	7	0	21.38
				1	14	0	21.32
			QPSK	8	0	1	20.75
	20385			8	4	1	20.83
				8	7	1	20.92
		1753.5		15	0	1	20.82
		1755.5		1	0	1	20.61
				1	7	1	20.65
				1	14	1	20.52
			16QAM	8	0	2	20.32
				8	4	2	20.25
				8	7	2	20.42
				15	0	2	20.37

BW (MHz)	Ch	Freq. (MHz)	Modulation	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)	
				1	0	0	21.42	
				1	2	0	21.31	
				1	5	0	21.29	
			QPSK	3	0	0	21.4	
		1710.7		3	1	0	21.32	
				3	2	0	21.41	
	19957			6	0	1	20.69	
				1	0	1	20.78	
1.4MHz					1	2	1	20.77
1.4IVI⊓∠			16QAM	1	5	1	20.85	
				3	0	1	20.82	
				3	1	1	20.88	
				3	2	1	20.81	
				6	0	2	20.05	
				1	0	0	21.32	
	20175	1720 E	QPSK	1	2	0	21.39	
	20175	1732.5	QP3K	1	5	0	21.22	
				3	0	0	21.15	



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3 1 0	21.12
3 2 0	21.17
6 0 1	20.91
1 0 1	20.91
1 2 1	20.87
1 5 1	20.75
16QAM 3 0 1	20.57
3 1 1	20.42
3 2 1	20.54
6 0 2	20.19
1 0 0	21.12
1 2 0	21.09
1 5 0	21.35
QPSK 3 0 0	21.41
3 1 0	21.42
3 2 0	21.35
20393 1754.3 6 0 1	20.83
20393 1754.3 1 0 1	20.78
1 2 1	20.88
1 5 1	20.77
16QAM 3 0 1	20.92
3 1 1	20.87
3 2 1	20.23
6 0 2	20.34



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ERP & EIRP

EIRP for LTE Band 4 (Part 27)

					Antonna	,	Cabla	Absolute	
Frequency	BW	NA. d. L.C.	RB	Substitut	Antenna	Antenna Gain	Cable	Absolute	Limit
(MHz)	(MHz)	Modulation	Size/Offset	ed level	Polarizati	correction	Loss	Level	(dBm)
		0.7017		(dBm)	on	(dBi)	(dB)	(dBm)	
1710.7	1.4	QPSK	1/0	9.77	V	7.95	0.79	16.93	30
1732.5	1.4	QPSK	1/0	9.92	V	7.95	0.79	17.08	30
1754.3	1.4	QPSK	1/0	9.85	V	7.95	0.79	17.01	30
1710.7	1.4	QPSK	1/0	9.97	Н	7.95	0.79	17.13	30
1732.5	1.4	QPSK	1/0	9.76	Н	7.95	0.79	16.92	30
1754.3	1.4	QPSK	1/0	9.74	Н	7.95	0.79	16.9	30
1710.7	1.4	16-QAM	1/5	9.86	V	7.95	0.79	17.02	30
1732.5	1.4	16-QAM	1/0	10.02	V	7.95	0.79	17.18	30
1754.3	1.4	16-QAM	1/0	9.96	V	7.95	0.79	17.12	30
1710.7	1.4	16-QAM	1/5	9.97	Н	7.95	0.79	17.13	30
1732.5	1.4	16-QAM	1/0	9.75	Н	7.95	0.79	16.91	30
1754.3	1.4	16-QAM	1/0	9.79	Н	7.95	0.79	16.95	30
1711.5	3	QPSK	1/0	9.74	V	7.95	0.79	16.9	30
1732.5	3	QPSK	1/0	9.69	V	7.95	0.79	16.85	30
1753.5	3	QPSK	1/0	9.84	V	7.95	0.79	17	30
1711.5	3	QPSK	1/0	9.68	Н	7.95	0.79	16.84	30
1732.5	3	QPSK	1/0	9.74	Н	7.95	0.79	16.9	30
1753.5	3	QPSK	1/0	9.69	Н	7.95	0.79	16.85	30
1711.5	3	16-QAM	1/0	9.84	V	7.95	0.79	17	30
1732.5	3	16-QAM	1/0	9.89	V	7.95	0.79	17.05	30
1753.5	3	16-QAM	1/0	9.77	V	7.95	0.79	16.93	30
1711.5	3	16-QAM	1/0	9.68	Н	7.95	0.79	16.84	30
1732.5	3	16-QAM	1/0	9.73	Н	7.95	0.79	16.89	30
1753.5	3	16-QAM	1/0	9.79	Н	7.95	0.79	16.95	30
1712.5	5	QPSK	1/0	9.65	V	7.95	0.79	16.81	30
1732.5	5	QPSK	1/0	9.59	V	7.95	0.79	16.75	30
1752.5	5	QPSK	1/24	9.75	V	7.95	0.79	16.91	30
1712.5	5	QPSK	1/0	9.69	Н	7.95	0.79	16.85	30
1732.5	5	QPSK	1/0	9.81	Н	7.95	0.79	16.97	30
1752.5	5	QPSK	1/24	9.62	Н	7.95	0.79	16.78	30
1712.5	5	16-QAM	1/0	9.89	V	7.95	0.79	17.05	30
1732.5	5	16-QAM	1/0	9.75	V	7.95	0.79	16.91	30
1752.5	5	16-QAM	1/24	9.82	V	7.95	0.79	16.98	30
1712.5	5	16-QAM	1/0	9.78	Н	7.95	0.79	16.94	30



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1732.5	5	16-QAM	1/0	9.68	Н	7.95	0.79	16.84	30
1752.5	5	16-QAM	1/24	9.77	Н	7.95	0.79	16.93	30
1715	10	QPSK	1/0	9.78	V	7.95	0.79	16.94	30
1732.5	10	QPSK	1/49	9.89	V	7.95	0.79	17.05	30
1750	10	QPSK	1/0	9.62	V	7.95	0.79	16.78	30
1715	10	QPSK	1/0	9.77	Н	7.95	0.79	16.93	30
1732.5	10	QPSK	1/49	9.68	Н	7.95	0.79	16.84	30
1750	10	QPSK	1/0	9.76	Н	7.95	0.79	16.92	30
1715	10	16-QAM	1/0	9.68	V	7.95	0.79	16.84	30
1732.5	10	16-QAM	1/49	9.74	V	7.95	0.79	16.9	30
1750	10	16-QAM	1/0	9.65	V	7.95	0.79	16.81	30
1715	10	16-QAM	1/0	9.78	Н	7.95	0.79	16.94	30
1732.5	10	16-QAM	1/49	9.67	Н	7.95	0.79	16.83	30
1750	10	16-QAM	1/0	9.69	Н	7.95	0.79	16.85	30
1717.5	15	QPSK	1/0	9.74	V	7.95	0.79	16.9	30
1732.5	15	QPSK	1/74	9.59	V	7.95	0.79	16.75	30
1747.5	15	QPSK	1/0	9.62	V	7.95	0.79	16.78	30
1717.5	15	QPSK	1/0	9.64	Н	7.95	0.79	16.8	30
1732.5	15	QPSK	1/74	9.58	Н	7.95	0.79	16.74	30
1747.5	15	QPSK	1/0	9.66	Н	7.95	0.79	16.82	30
1717.5	15	16-QAM	1/0	9.71	V	7.95	0.79	16.87	30
1732.5	15	16-QAM	1/74	9.68	V	7.95	0.79	16.84	30
1747.5	15	16-QAM	1/0	9.55	٧	7.95	0.79	16.71	30
1717.5	15	16-QAM	1/0	9.49	Н	7.95	0.79	16.65	30
1732.5	15	16-QAM	1/74	9.61	Н	7.95	0.79	16.77	30
1747.5	15	16-QAM	1/0	9.74	Н	7.95	0.79	16.9	30
1720	20	QPSK	1/99	9.52	V	7.95	0.79	16.68	30
1732.5	20	QPSK	1/99	9.64	٧	7.95	0.79	16.8	30
1745	20	QPSK	1/0	9.71	V	7.95	0.79	16.87	30
1720	20	QPSK	1/99	9.65	Н	7.95	0.79	16.81	30
1732.5	20	QPSK	1/99	9.64	Н	7.95	0.79	16.8	30
1745	20	QPSK	1/0	9.67	Н	7.95	0.79	16.83	30
1720	20	16-QAM	1/99	9.59	V	7.95	0.79	16.75	30
1732.5	20	16-QAM	1/99	9.71	V	7.95	0.79	16.87	30
1745	20	16-QAM	1/0	9.63	V	7.95	0.79	16.79	30
1720	20	16-QAM	1/99	9.79	Н	7.95	0.79	16.95	30
1732.5	20	16-QAM	1/99	9.64	Н	7.95	0.79	16.8	30
1745	20	16-QAM	1/0	9.73	Н	7.95	0.79	16.89	30



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6.3 Peak-Average Ratio

Temperature	19°C
Relative Humidity	58%
Atmospheric Pressure	1008mbar
Test date :	February 04, 2015
Tested By:	Dustin Wang

Requirement(s):

Spec	Item	Requirement	Applicable
§ 27.50(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	V
Test Setup	B	EUT Spectrum Analyzer	
Test Procedure	1. The 2. Free 3. Mea 4. The 5. The continutransm syncer of the	e signal analyzer's CCDF measurement profile is enabled quency = carrier center frequency asurement BW > Emission bandwidth of signal e signal analyzer was set to collect one million samples to generate the emeasurement interval was set depending on the type of signal analyzer uous signals (>98% duty cycle), the measurement interval was set to 1 hissions, the spectrum analyzer is set to use an internal "RF Burst" to divith an incoming pulse and the measurement interval is set to less the "on time" of one burst to ensure that energy is only captured during ensmitter is operating at maximum power	ed. For ms. For burst rigger that is an the duration
Remark			
Result	▼ Pa	ss Fail	

Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	✓ _{N/A}



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LTE Band 4 (part 27)

DW/MH=) Frequency (MH=)		Mada	Madulation	Conducted Power (dBm)		Peak-Average
BW(MHz)	Frequency (MHz)	Mode Modulation		Peak	Average	Ratio (PAR)
4.4	4720 5	RB 1/0	QPSK	24.15	21.23	2.92
1.4	1732.5		16QAM	23.87	20.91	2.96
3	4720 5	RB 1/0	QPSK	24.12	21.29	2.83
3	1732.5		16QAM	23.92	20.62	3.3
5 1732.5	4720.5	RB 1/0	QPSK	24.25	21.43	2.82
	1732.5		16QAM	23.69	20.73	2.96
40	10 1732.5	RB 1/0	QPSK	24.19	21.35	2.84
10			16QAM	24.12	20.63	3.49
15 1732.5	4700 5	DD 4/0	QPSK	24.09	21.22	2.87
	1/32.5	RB 1/0	16QAM	23.94	20.95	2.99
00	4700 5	DD 4/6	QPSK	24.25	21.42	2.83
20	1732.5	RB 1/0	16QAM	24.04	21.01	3.03



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6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.



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6.5 Occupied Bandwidth

Temperature	19°C
Relative Humidity	58%
Atmospheric Pressure	1008mbar
Test date :	February 04, 2015
Tested By :	Dustin Wang

Requirement(s):

- Troquiromonic(o)	ı			
Spec	Item	Requirement	Applicable	
§2.1049,	a)	99% Occupied Bandwidth(kHz)	V	
§27.53(a)	b)	26 dB Bandwidth(kHz)	>	
Test Setup	B	EUT Spectrum Analyzer		
	-	- The EUT was connected to Spectrum Analyzer and Base Station via		
Test	power divider.			
Procedure	-	The 99% and 26 dB occupied bandwidth (BW) of the mide	dle channel	
	for the highest RF powers.			
Remark				
Result	Pa	rail Fail		

Test Data

Yes

N/A

Test Plot

Yes (See below)

N/A



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LTE Band 4 (Part 27) result

	Dana + (i ai	Frequency		99% Occupied	26 dB Bandwidth
BW(MHz)	Channel	(MHz)	Modulation	Bandwidth (MHz)	(MHz)
4.4	40057	4740.7	QPSK	1.1069	1.27
1.4	19957	1710.7	16QAM	1.0943	1.273
4.4	00475	4700 5	QPSK	1.1027	1.298
1.4	20175	1732.5	16QAM	1.101	1.431
4.4	20202	4754.0	QPSK	1.0999	1.27
1.4	20393	1754.3	16QAM	1.0987	1.268
3	19965	1711.5	QPSK	2.746	3.085
3	19905	1711.5	16QAM	2.7539	3.092
3	20475	4720 F	QPSK	2.758	3.101
3	20175	1732.5	16QAM	2.7518	3.666
2	20205	1750.5	QPSK	2.7549	3.095
3	20385	1753.5	16QAM	2.7449	3.083
E	10075	1710.5	QPSK	4.5291	5.077
5	19975	1712.5	16QAM	4.5154	5.086
E	20475	1732.5	QPSK	4.5151	5.092
o L	5 20175		16QAM	4.5195	4.996
E	20275	75 1752.5	QPSK	4.5128	5.009
o J	5 20375		16QAM	4.499	5.009
10	10 20000	0000 1715	QPSK	9.0493	10.037
10		1715	16QAM	9.0717	10.114
40	20475	4720 E	QPSK	9.0639	10.233
10	20175	1732.5	16QAM	9.0839	11.681
10	20250	20350 1750	QPSK	9.092	10.187
10	20350		16QAM	9.0663	10.115
15	2225	1717.5	QPSK	13.4467	14.723
15	20025		16QAM	13.4386	14.728
15	20175	20175 1732.5	QPSK	13.4871	14.836
ານ 			16QAM	13.551	15.252
15	20225	4747 5	QPSK	13.4985	14.743
15	20325	1747.5	16QAM	13.4936	14.937



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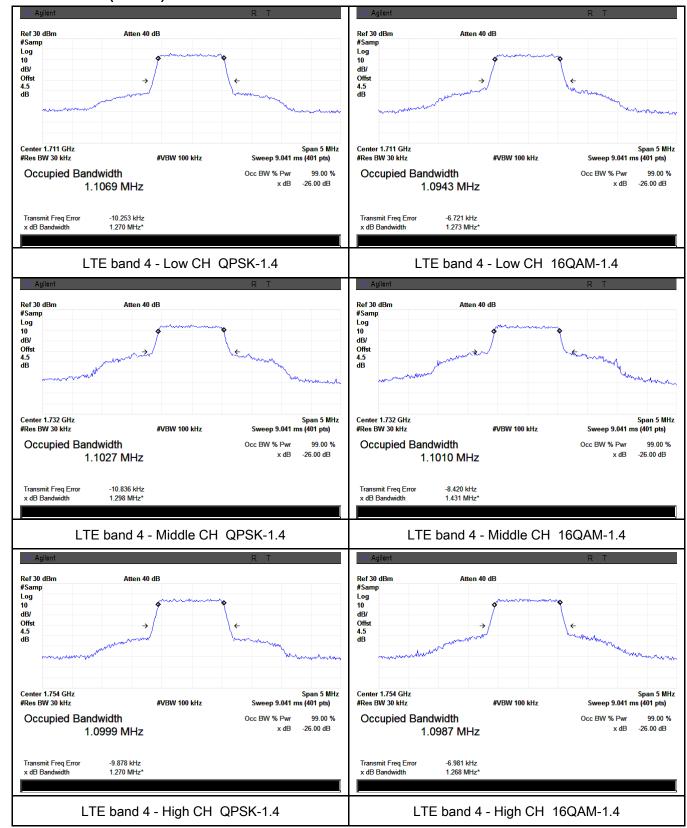
20 20050	4700	QPSK	17.8479	19.488	
20	20050	1720	16QAM	17.8473	19.153
20	20.475	4700 5	QPSK	17.9125	19.504
20 20175	1732.5	16QAM	17.9599	19.223	
20	20 20300 1745	4745	QPSK	17.8891	19.204
20 20300		16QAM	17.8996	19.247	



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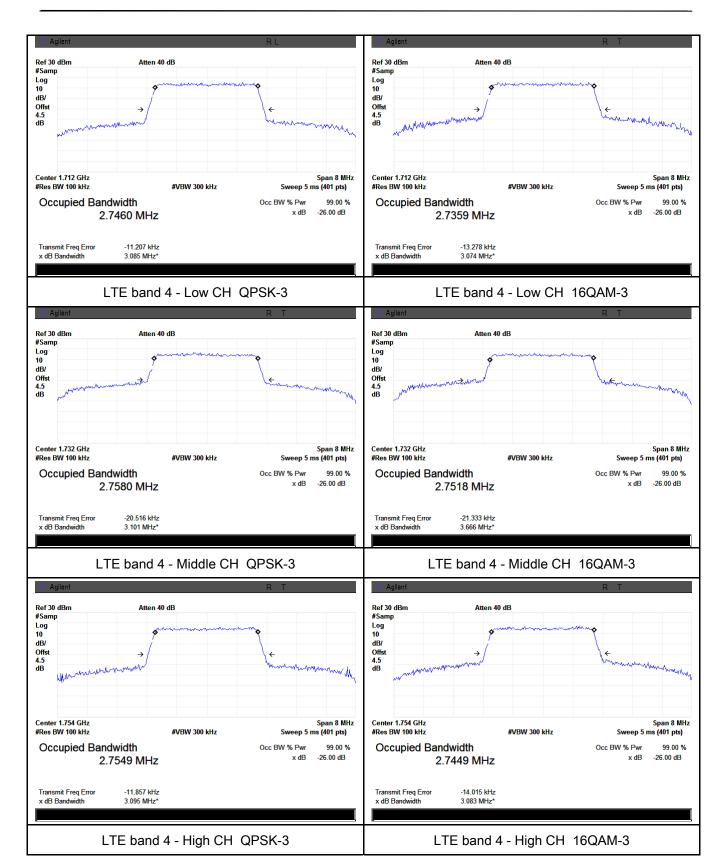
Test Plots

LTE Band 4 (Part 27)



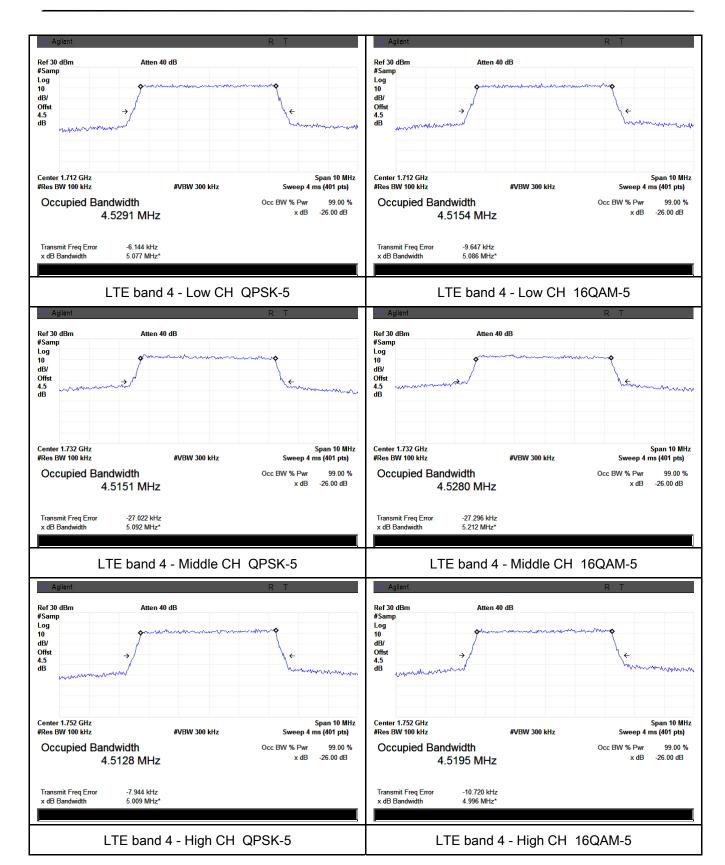


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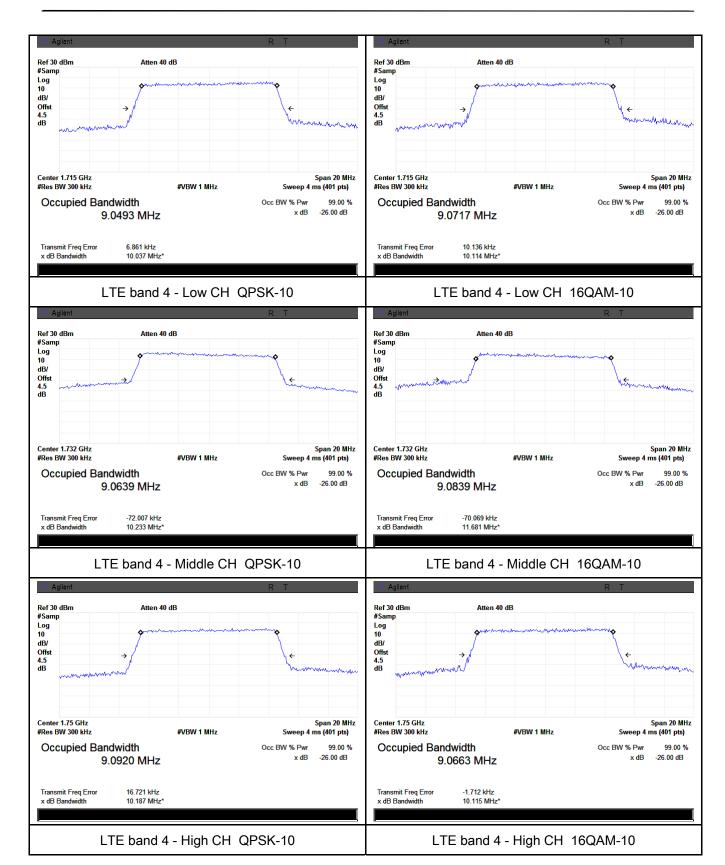


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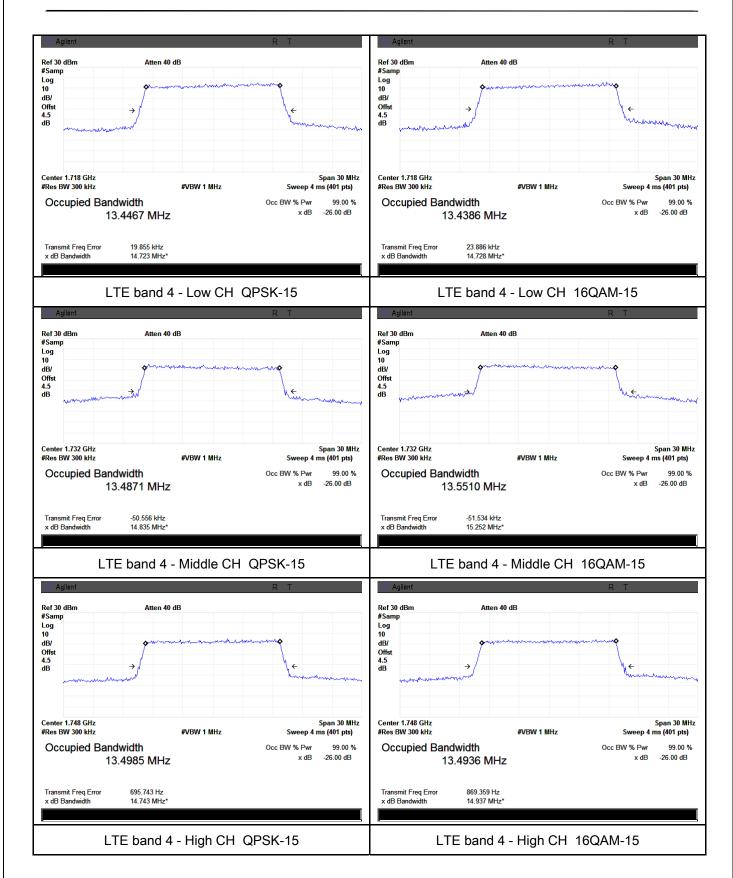


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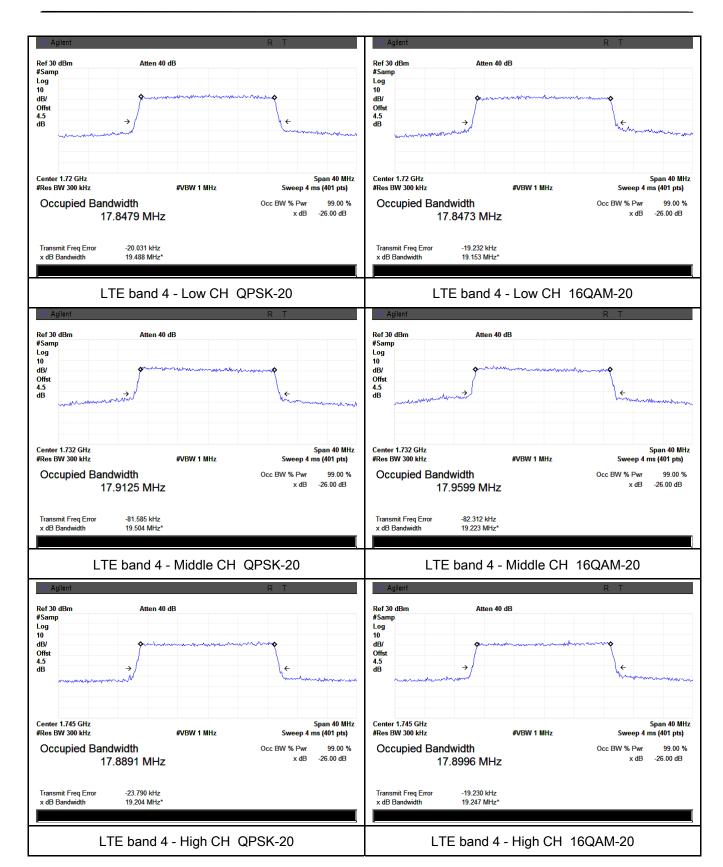


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6.6 Spurious Emissions at Antenna Terminals

Temperature	18°C
Relative Humidity	59%
Atmospheric Pressure	1011mbar
Test date :	February 05, 2015
Tested By :	Dustin Wang

Requirement(s):

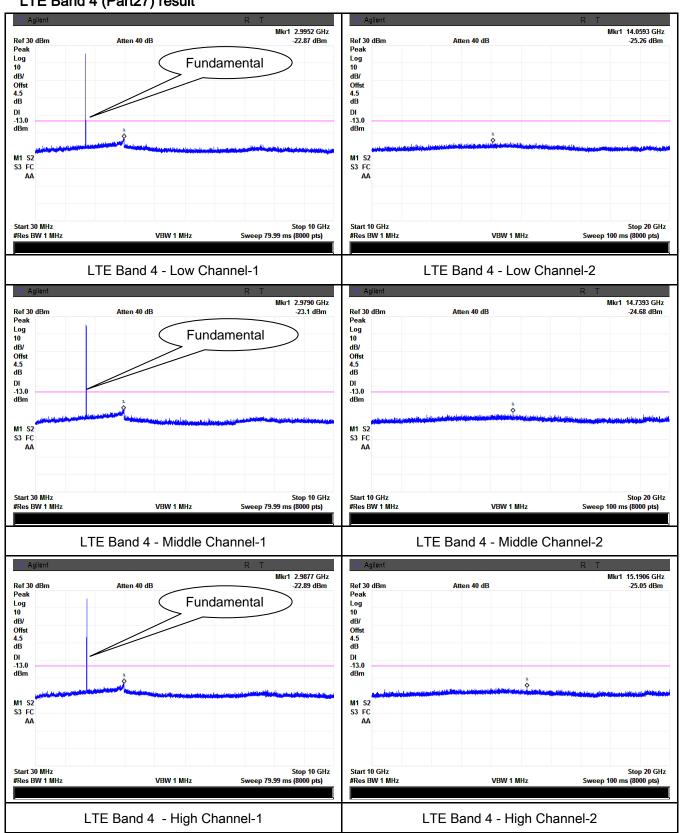
Spec	Item	Requirement	Applicable
§2.1051, § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB	(
Test Setup		Base Station Spectrum Analyzer	
Test Procedure	 The EUT was connected to Spectrum Analyzer and Base Station via power divider. The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100. 		
Remark			
Result	☑ Pa	ss Fail	

Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	□ _{N/A}



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Test Plots 30MHz-5GHz LTE Band 4 (Part27) result





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6.7 Spurious Radiated Emissions

Temperature	18°C
Relative Humidity	59%
Atmospheric Pressure	1011mbar
Test date :	February 05, 2015
Tested By :	Dustin Wang

Requirement(s):

Spec	Item	Requirement	Applicable	
§2.1053, § 27.53(h)	a)	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.	(
Test setup	Ant. Tower Support Units Turn Table Ground Plane Test Receiver			
Test Procedure	 The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used) 			
Remark				



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Result	Pass	☐ Fail	

Test Data Yes

Test Plot Yes (See below)

LTE Band 4(Part27) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3440	-47.11	V	10.06	2.52	-39.57	-13	-26.57
3440	-48.05	Н	10.06	2.52	-40.51	-13	-27.51
572.8	-57.64	V	6.5	0.36	-51.5	-13	-38.5
843.1	-50.52	Н	6.8	0.44	-44.16	-13	-31.16

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3465	-48.44	V	10.09	2.52	-40.87	-13	-27.87
3465	-48.67	Н	10.09	2.52	-41.1	-13	-28.1
570.6	-57.95	٧	6.5	0.36	-51.81	-13	-38.81
843.5	-49.82	Н	6.8	0.44	-43.46	-13	-30.46

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3490	-47.95	٧	10.09	2.52	-40.38	-13	-27.38
3490	-48.34	Н	10.09	2.52	-40.77	-13	-27.77
572.2	-58.04	V	6.5	0.36	-51.9	-13	-38.9
843.7	-50.33	Н	6.8	0.44	-43.97	-13	-30.97



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6.8 Band Edge

Temperature	18°C
Relative Humidity	59%
Atmospheric Pressure	1011mbar
Test date :	February 05, 2015
Tested By :	Dustin Wang

Requirement(s):

- requirement(e)	•	<u> </u>	
Spec	Item	Requirement	Applicable
§ 27.53(h)	a)	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.	>
Test setup	Base Station Spectrum Analyzer		
Procedure	 The EUT was connected to Spectrum Analyzer and Base Station via power divider. The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100. 		
Remark			
Result	☑ Pa	ss Fail	

Test Data	Yes	□ _{N/A}
Test Plot	Yes (See below)	□ _{N/A}



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LTE Band 4 (Part 27) result

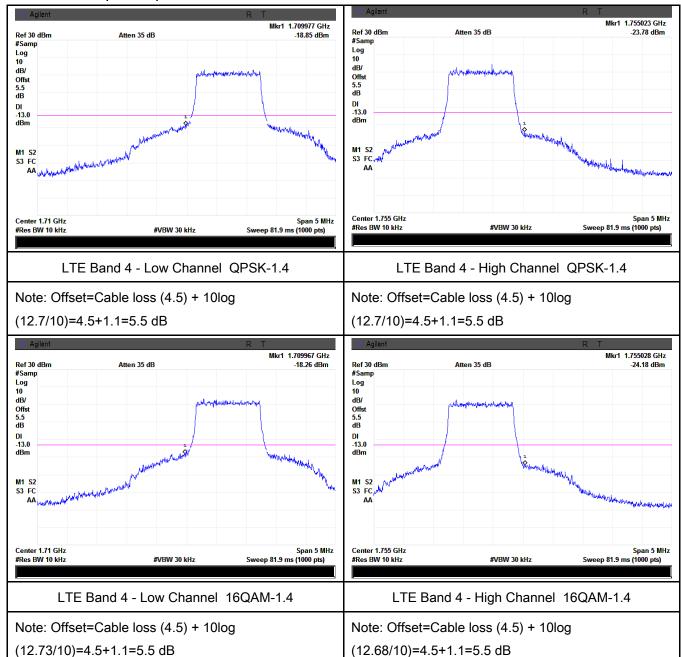
BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)	
4.4	40057	4740.7	QPSK	-18.85	-13	
1.4 19957	1710.7	16QAM	-18.26	-13		
1.4	20393	1751 2	QPSK	-23.78	-13	
1.4	20393	1754.3	16QAM	-24.18	-13	
3	19965	1711.5	QPSK	-16.32	-13	
3	19905	1711.5	16QAM	-16.89	-13	
3	20385	1753.5	QPSK	-18.45	-13	
3	20363	1755.5	16QAM	-19.95	-13	
ĸ	10075	1712.5	QPSK	-17.93	-13	
5	5 19975	1712.5	16QAM	-15.09	-13	
ĸ	20275	1752.5	QPSK	-16.87	-13	
5	5 20375		16QAM	-15.88	-13	
10	0 20000	20000	1715	QPSK	-16.29	-13
10	20000	1715	16QAM	-18.22	-13	
10	10 20350	1750	QPSK	-19.33	-13	
10	20330	1750	16QAM	-19.55	-13	
15	20025	4747 E	QPSK	-14.85	-13	
15	20025	1717.5	16QAM	-16.06	-13	
15	20225	4747 E	QPSK	-17.95	-13	
15	15 20325	1747.5	16QAM	-18.93	-13	
20	20050	1720	QPSK	-19.62	-13	
20	20000	20030 1720	16QAM	-19.33	-13	
20	20300	1745	QPSK	-22.27	-13	
20	20300	1745	16QAM	-22.16	-13	



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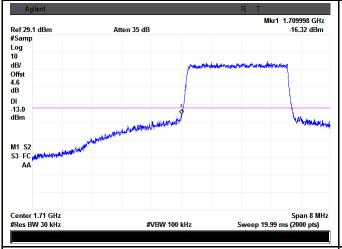
Test Plots

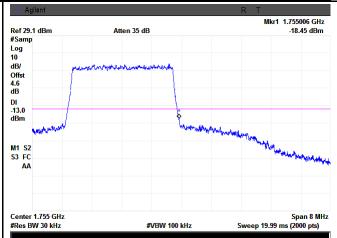
LTE Band 4 (Part 27)





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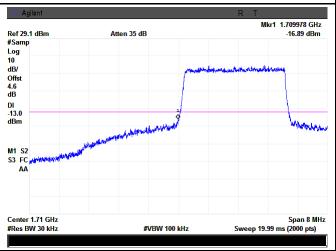


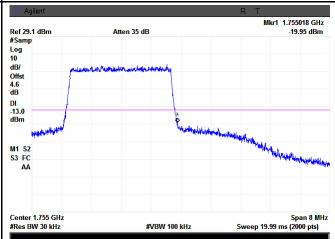
LTE Band 4 - Low Channel QPSK-3

LTE Band 4 - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log (30.85/30)=4.5+0.1=4.6 dB

Note: Offset=Cable loss (4.5) + 10log (30.95/30)=4.5+0.1=4.6 dB



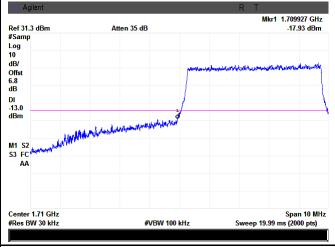


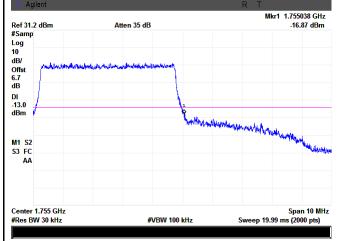
LTE Band 4 - Low Channel 16QAM-3

LTE Band 4 - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log (30.92/30)=4.5+0.1=4.6 dB

Note: Offset=Cable loss (4.5) + 10log (30.83/30)=4.5+0.1=4.6 dB





LTE Band 4 - Low Channel QPSK-5

LTE Band 4 - High Channel QPSK-5

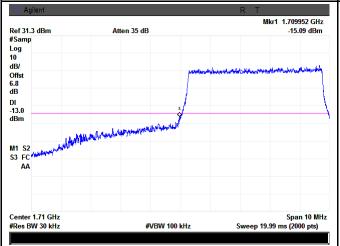


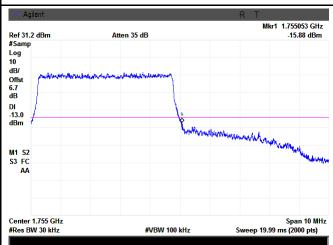
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Note: Offset=Cable loss (4.5) + 10log

(50.77/30)=4.5+2.3=6.8 dB

Note: Offset=Cable loss (4.5) + 10log (50.09/30)=4.5+2.2=6.7 dB





LTE Band 4 - Low Channel 16QAM-5

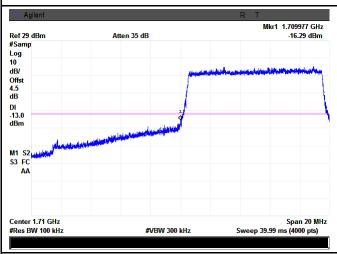
Note: Offset=Cable loss (4.5) + 10log

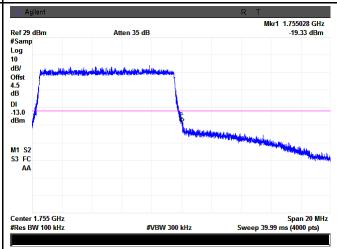
(50.86/30)=4.5+2.3=6.8 dB

LTE Band 4 - High Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log

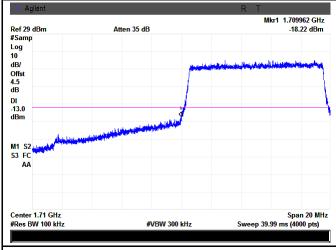
(50.09/30)=4.5+2.2=6.7 dB

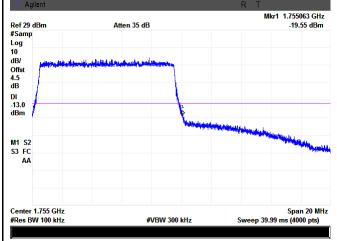




LTE Band 4 - Low Channel QPSK-10

LTE Band 4 - High Channel QPSK-10



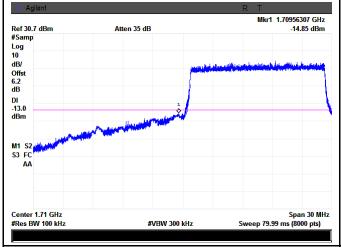


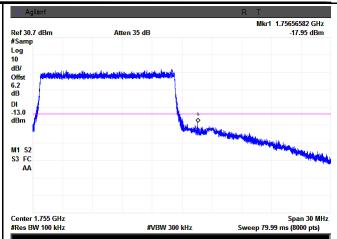
LTE Band 4 - Low Channel 16QAM-10

LTE Band 4 - High Channel 16QAM-10



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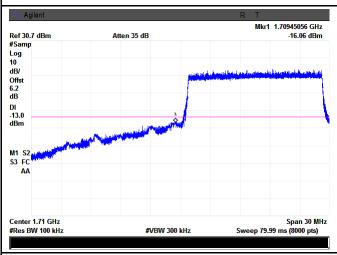


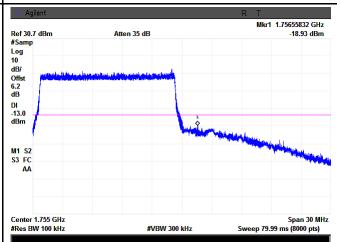
LTE Band 4 - Low Channel QPSK-15

LTE Band 4 - High Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log (147.23/100)=4.5+1.7=6.2 dB

Note: Offset=Cable loss (4.5) + 10log (147.43/100)=4.5+1.7=6.2 dB



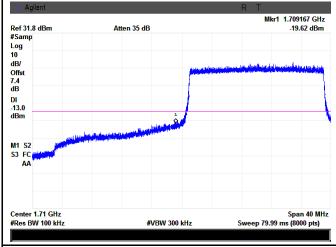


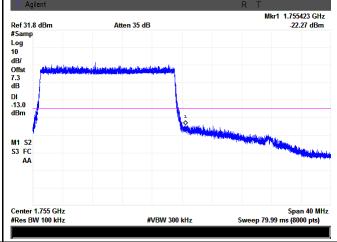
LTE Band 4 - Low Channel 16QAM-15

LTE Band 4 - High Channel 16QAM-15

Note: Offset=Cable loss (4.5) + 10log (147.28/100)=4.5+1.7=6.2 dB

Note: Offset=Cable loss (4.5) + 10log (149.37/100)=4.5+1.7=6.2 dB





LTE Band 4 - Low Channel QPSK-20

LTE Band 4 - High Channel QPSK-20

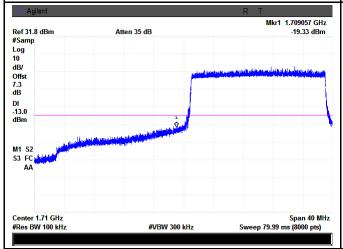


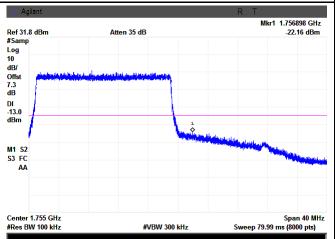
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Note: Offset=Cable loss (4.5) + 10log

(194.88/100)=4.5+2.9=7.4 dB

Note: Offset=Cable loss (4.5) + 10log (192.04/100)=4.5+2.8=7.3 dB





LTE Band 4 - Low Channel 16QAM-20

LTE Band 4 - High Channel 16QAM-20

Note: Offset=Cable loss (4.5) + 10log (191.53/100)=4.5+2.8=7.3 dB

Note: Offset=Cable loss (4.5) + 10log (192.47/100)=4.5+2.8=7.3 dB



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6.9 Frequency Stability

Temperature	18°C
Relative Humidity	59%
Atmospheric Pressure	1011mbar
Test date :	February 05, 2015
Tested By :	Dustin Wang

Requirement(s):

Spec	Item	Requirement			Applicable		
		According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below: Frequency Tolerance for Transmitters in the Public Mobile Services					
		Frequency Range	Base, fixed	Mobile ≤ 3 watts	Mobile ≤ 3 watts		
		(MHz)	(ppm)	(ppm)	(ppm)		
\$2.40EE	§2.1055, § 27.5(h); a) § 27.54	25 to 50	20.0	20.0	50.0		
		50 to 450	5.0	5.0	50.0		
§ 27.5(h);			450 to 512	2.5	5.0	5.0	
§ 27.54			821 to 896	1.5	2.5	2.5	
		928 to 929.	5.0	N/	N/A		
		929 to 960.	.5	N/A	N/A		
		2110 to 2220	10.0	N/A	N/A		
		According to §24.2	35, the frequ	ency stability sha	Il be sufficient to		
		ensure that the fun	damental en	nissions stay withi	n the authorized		
		frequency block.					
		According to §27.54, The frequency stability shall be sufficient to		I be sufficient to			
		ensure that the fundamental emissions stay within the authorized					
		bands of operation					



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	,		
Test setup	Base Station EUT Thermal Chamber		
	A communication link was established between EUT and base station. The		
	frequency error was monitored and measured by base station under variation		
Procedure	of ambient temperature and variation of primary supply voltage.		
	Limit: The frequency stability of the transmitter shall be maintained within		
	±0.00025% (±2.5ppm) of the center frequency.		
	Frequency Stability versus Temperature: The Frequency tolerance of the		
Remark	carrier signal shall be maintained within 2.5ppm of the operating frequency		
	over a temperature variation of -10°C to +55°C at normal supply voltage.		
Result	Pass Fail		
Test Data	Yes N/A		
Test Plot	Yes (See below) N/A		

LTE Band 4 (Part 27) result

Middle Channel, f₀ = 1732.5 MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10		14	0.0081	2.5
0		13	0.0075	2.5
10	3.7	8	0.0046	2.5
20		5	0.0029	2.5
30		6	0.0035	2.5
40		7	0.0040	2.5
50		9	0.0052	2.5
55		15	0.0087	2.5
25	4.2	12	0.0069	2.5
25	3.5	15	0.0087	2.5



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Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/17/2014	09/16/2015	T
Power Splitter	1#	1#	09/02/2014	09/01/2015	•
Universal Radio Communication Tester	CMU200	121393	09/26/2014	09/25/2015	<u><</u>
Wideband Radio Communication Tester	CMW500	120906	03/29/2014	03/28/2015	\
Temperature/Humidity Chamber	UHL-270	001	10/10/2014	10/09/2015	(
DC Power Supply	E3640A	MY40004013	09/18/2014	09/17/2015	<
Radiated Emissions					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	<
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	>
Microwave Preamplifier (0.5 ~ 18GHz)	PAM-118	443008	09/02/2014	09/01/2015	<u><</u>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	<u><</u>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/22/2014	09/21/2015	<u><</u>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/25/2014	09/24/2015	<u><</u>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/25/2014	09/24/2015	<u><</u>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/18/2014	09/17/2015	<u><</u>
Tunable Notch Filter	3NF- 800/1000-S	AA4	09/02/2014	09/01/2015	\
Tunable Notch Filter	3NF- 1000/2000-S	AM 4	09/02/2014	09/01/2015	V



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Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

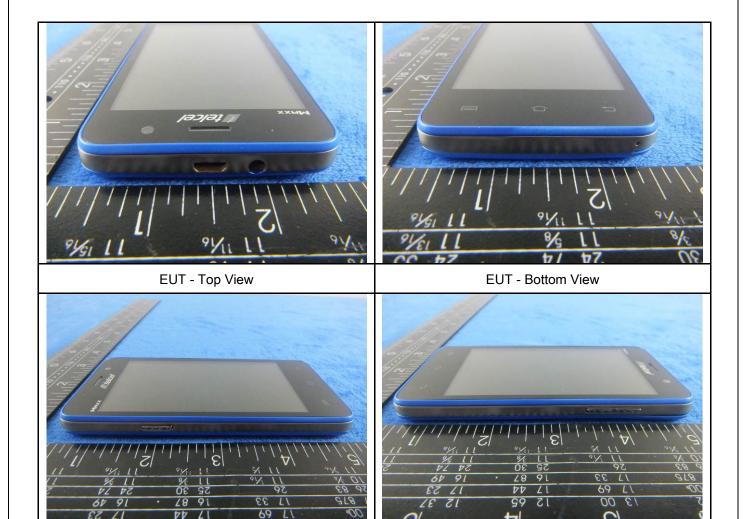




EUT - Left View

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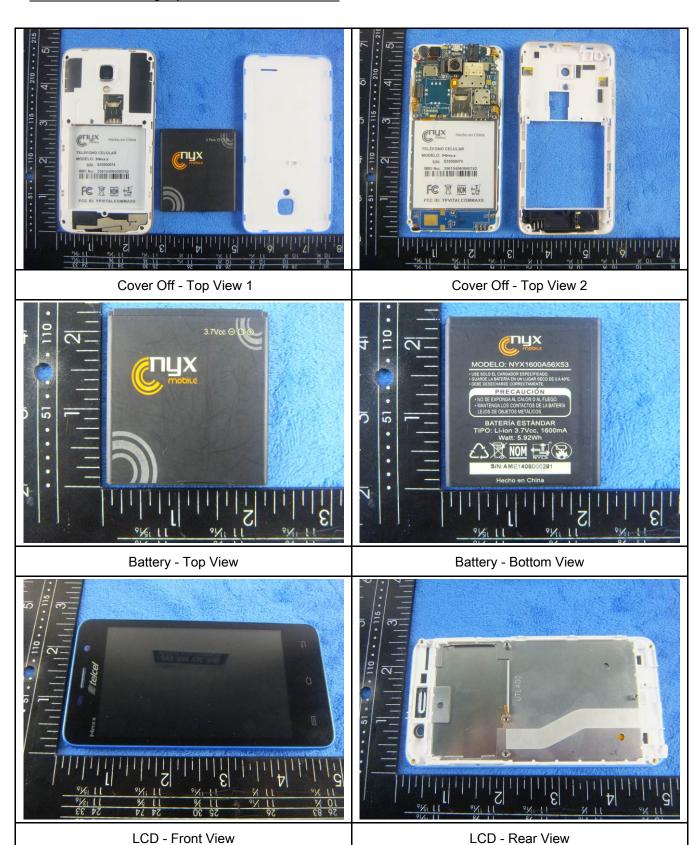
EUT - Right View





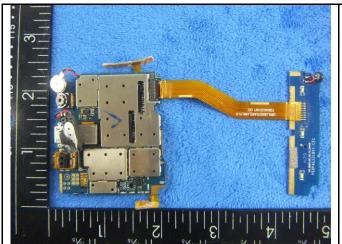
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Annex B.ii. Photograph: EUT Internal Photo





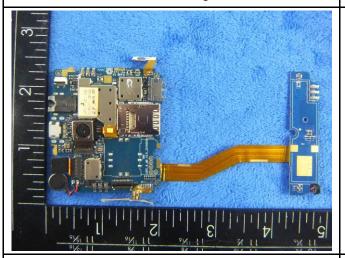
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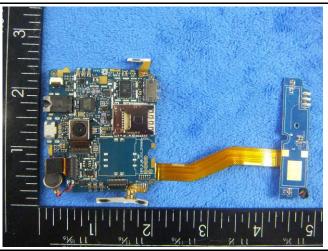
Mainborad With Shielding - Front View



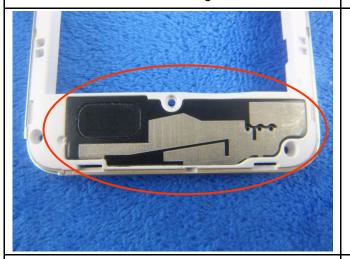
Mainborad Without Shielding - Front View



Mainborad With Shielding - Rear View



Mainborad Without Shielding - Rear View



LTE Antenna View



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Annex B.iii. Photograph: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz



Radiated Spurious Emissions Test Setup Above 1GHz

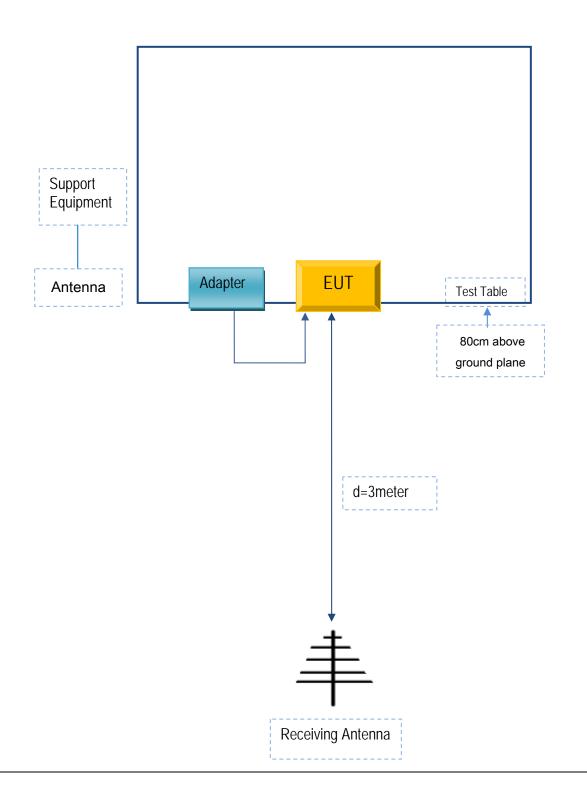


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Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions





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Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
N/A	N/A	N/A	N/A	N/A



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Annex C.ii. EUT OPERATING CONKITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was communicating with base station and set to work at maximum output power.
Others Testing	The EUT was communicating with base station and set to work at maximum output power.



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Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment



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Annex E. DECLARATION OF SIMILARITY

N/A