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# **FCC REPORT**

Report Reference No.....: CHTEW19030143

Report verification:

Project No.....: SHT1902018202EW

FCC ID.....: Q5EM50-4G

Applicant's name.....: Kirisun Communication Co.,Ltd.

Manufacturer...... 3rd Floor, Building A, Tongfang Information Habour, No.11

Langshan Road, Nanshan District, Shenzhen 518057, P.R.China

Address..... Kirisun Communication Co.,Ltd.

Test item description .....: 3rd Floor, Building A, Tongfang Information Habour, No.11

Langshan Road, Nanshan District, Shenzhen 518057, P.R.China

Test item description .....: PoC Trunked Mobile Radio

Trade Mark ...... KIRISUN

Model/Type reference...... M50

Listed Model(s) ..... iTALK 450

Standard .....: FCC CFR Title 47 Part 2

FCC CFR Title 47 Part 22 FCC CFR Title 47 Part 24

FCC CFR Title 47 Part 27

Date of receipt of test sample......... Feb 25, 2019

Date of testing...... Feb 26, 2019- Mar 20, 2019

Date of issue...... Mar 21, 2019

Result...... Pass

Compiled by

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Gongming, Shenzhen, China

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The test report merely correspond to the test sample.

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### 1. TEST STANDARDS AND REPORT VERSION

### 1.1. Applicable Standards

The tests were performed according to following standards:

FCC Rules Part 2: FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

FCC Rules Part 22: PUBLIC MOBILE SERVICES

FCC Rules Part 24: PERSONAL COMMUNICATIONS SERVICES

FCC Rules Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

ANSI C63.26: 2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

KDB 971168 D01 Power Meas License Digital Systems v03: MEASUREMENT GUIDANCE FOR

CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

### 1.2. Report version information

Revision No.	Date of issue	Description
N/A	2019-03-21	Original

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## 2. Test Description

Test Item	Section in CFR 47	Result	Test Engineer	
	Part 2.1046			
Conducted Output Power	Part 22.913(a)	Pass	Jiongsheng Feng	
Conducted Calput 1 and	Part 24.232(c)	1 455	Giorigonorig i orig	
	Part 27.50			
Peak-to-Average Ratio	Part 24.232	Pass	Jiongsheng Feng	
reak to Average Natio	Part 27.50	1 433	Siongsheng reng	
	Part 2.1049			
99% Occupied Bandwidth & 26 dB	Part 22.917(b)	Pass	Jiongsheng Feng	
Bandwidth	Part 24.238(b)	1 055	Jiongsheng reng	
	Part 27.53			
	Part 2.1051			
Band Edge	Part 22.917	Pass	Jiongsheng Feng	
Band Edge	Part 24.238	Fass	Jiongsheng reng	
	Part 27.53			
	Part 2.1051			
Conducted Spurious Emissions	Part 22.917	Pass	Jiongsheng Feng	
Conducted Spurious Emissions	Part 24.238	Pass		
	Part 27.53			
	Part 2.1055(a)(1)(b)			
Frequency stability VS Temperature	Part 22.355	Pass	Jiongsheng Feng	
l requericy stability v3 reinperature	Part 24.235	Fass	Jiongsheng reng	
	Part 27.54			
	Part 2.1055(d)(1)(2)			
Frequency stability VS Voltage	Part 22.355	Pass	Jiongsheng Feng	
requericy stability v3 voltage	Part 24.235	F a 5 5	Jiongsheng Feng	
	Part 27.54			
	Part 22.913(a)			
ERP and EIRP	Part 24.232(b)	Pass	Shower Dai	
	Part 27.50			
	Part 2.1053			
Padiated Spurious Emissions	Part 22.917	Pass	Shower Dai	
Radiated Spurious Emissions	Part 24.238	F d 5 5		
	Part 27.53			

Note: The measurement uncertainty is not included in the test result.

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## 3. **SUMMARY**

### 3.1. Client Information

Applicant:	Kirisun Communication Co.,Ltd.
Address:	3rd Floor, Building A, Tongfang Information Habour, No.11 Langshan Road, Nanshan District, Shenzhen 518057, P.R.China
Manufacturer:	Kirisun Communication Co.,Ltd.
Address:	3rd Floor, Building A, Tongfang Information Habour, No.11 Langshan Road, Nanshan District, Shenzhen 518057, P.R.China

## 3.2. Product Description

Name of EUT:	PoC Trunked Mobile Radio					
Trade Mark:	KIRISUN					
Model No.:	M50					
Listed Model(s):	iTALK 450					
Power supply:	DC 12V					
Hardware version:	V1.2					
Software version:	M50-AU-V4.4					
4G						
Operation Band:	☐ FDD Band 4					
	☑ FDD Band 17					
	FDD Band 4:	1710.7 MHz – 1754.3 MHz				
Transmit frequency:	FDD Band 5:	824.7 MHz – 848.3 MHz				
	FDD Band 7:	2502.5 MHz – 2567.5 MHz				
	FDD Band 17:	d 17: 706.5 MHz – 713.5 MHz				
	FDD Band 4:	2110.7 MHz – 2154.3 MHz				
Descive francisco	FDD Band 5:	869.7 MHz – 893.3 MHz				
Receive frequency:	FDD Band 7:	2622.5 MHz – 2687.5 MHz				
	FDD Band 17:	736.5 MHz – 743.5 MHz				
	FDD Band 4:	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz				
Channel bandwidth:	FDD Band 5:	1.4MHz, 3MHz, 5MHz, 10MHz				
Channel bandwidth.	FDD Band 7:	5MHz, 10MHz, 15MHz, 20MHz				
	FDD Band 17:	5MHz, 10MHz				
Power Class:	Class 3					
Modulation type:	QPSK, 16QAM					
Antenna type	PIFA Antenna					
Antenna Gain	Band4:0.45dBi Band5:0.45dBi Band7:0.45dBi Band17:0.45dBi					

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## 3.3. Operation state

## Test frequency list

FDD Band 4							
1.4	FDD Band 4	Test Frequency ID		NuL		N <sub>DL</sub>	Downlink
Low Range			1.4	19957	1710.7	1957	
Low Range		1   1	3				2111.5
10		Low Pango					
Page		Low Range					
Mid Range							
1.4   20393   1754.3   2393   2164.3							
FDD Band 5   Test Frequency ID   Bandwidth   NuL   Frequency of   Uplink [MHz]   Downlink   Mid Range   10   20350   1750   2350   2150   155   20375   1752   2325   2147   55   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   1745   2300   2145   200   20300   2145   200   203000   203000   203000   203000   203000   203000   203000   203000   203000   203000   203000   203000		Mid Range					
High Range							
FDD Band 5   Test Frequency ID   Bandwidth   NuL   Frequency of Uplink [MHz]   Not   Frequency of Uplink [MHz]   Not   Prequency of Uplink [MHz]   P							
Test Frequency ID   Bandwidth   Mu_t   Frequency of   Uplink (MHz)   Uplink (MHz)   Esserties   Section   Section		High Range					
Test Frequency ID   Bandwidth   NuL   Frequency of Uplink (MHz)   Downlink (MHz)   Programment (MHz)   Downlink (MHz)   Dow							
Test Frequency ID   Bandwidth   Nu							
MHz    Uplink [MHz    Downlink [MHz    Low Range   1.4   20407   824.7   2407   869.7   869.7   3   20415   825.5   2415   870.5   5   20425   826.5   2415   870.5   10 10   20450   829   2450   874.5   870.5   10 10   20450   829   2450   874.5   870.5   10 10   20450   829   2450   874.5   870.5   10 10   20450   829   2450   874.5   870.5   10 10   20450   829   2450   874.5   870.5   10 10   20450   829   2450   874.5   870.5   874.5   870.5   874.5   870.5   874.5   870.5   874.5   870.5				20000		2000	21.10
MHz    Uplink [MHz    Downlink [MHz    MHz    Low Range	FDD Band 5	Test Frequency ID	Bandwidth	Nu	Frequency of	Nnı	Frequency of
Low Range	1 DD Dana 3			1102		1102	Downlink
Low Range			1.4	20407	824.7	2407	
Cow Range							
Mild Range		Low Range	5				
High Range			10 [1]				
High Range		Mid Range	1.4/3/5 10 <sup>[1]</sup>	20525	836.5	2525	881.5
High Range				20643	848.3	2643	893.3
FDD Band 7   Test Frequency ID   Bandwidth   NuL   Frequency of Uplink [MHz]   Downlink [MHz]   Low Range   15   21375   2562.5   3375   2682.5   2011   21350   2560   3350   2685   NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS		<u> </u>					
Test Frequency ID		High Range					
Test Frequency ID		1 1	141				
MHz    Uplink [MHz    Downlink [MHz    MHz    MHz			or which a relaxation	of the spe			
Low Range	FDD Bond 7	36.101 [27	or which a relaxation   Clause 7.3) is allow	of the sperved.	cified UE receiver se	nsitivity requ	irement (TS
Low Range	FDD Band 7	36.101 [27	or which a relaxation Clause 7.3) is allow Bandwidth [MHz]	n of the sper yed.	Frequency of Uplink [MHz]	nsitivity requ	Frequency of Downlink [MHz]
Test Frequency ID   Bandwidth   NuL   Frequency of   NoL   Committee   North Range   Strip   23755   706.5   736.5   North Range   Strip   23750   710.5   739.5   North Range   North Range   Strip   23750   710.5   739.5   North Range   N	FDD Band 7	36.101 [27	or which a relaxation Clause 7.3) is allow Bandwidth [MHz]	N <sub>UL</sub>	Frequency of Uplink [MHz]	N <sub>DL</sub>	Frequency of Downlink [MHz] 2622.5
Mid Range	FDD Band 7	36.101 [27	or which a relaxation Clause 7.3) is allow Bandwidth [MHz] 5 10	N <sub>UL</sub> 20775 20800	Frequency of Uplink [MHz]	N <sub>DL</sub>	Frequency of Downlink [MHz] 2622.5 2625
High Range	FDD Band 7	36.101 [27	or which a relaxation Clause 7.3) is allow Bandwidth [MHz] 5 10	N <sub>UL</sub> 20775 20800 20825	Frequency of Uplink [MHz]	N <sub>DL</sub> 2775  2800  2825	Frequency of Downlink [MHz] 2622.5 2625 2627.5
High Range	FDD Band 7	Test Frequency ID	or which a relaxation   Clause 7.3) is allow   Bandwidth   [MHz]   5   10   15   20   11	N <sub>UL</sub> 20775  20800  20825  20850	Frequency of Uplink [MHz]  2502.5 2507.5 2510	N <sub>DL</sub> 2775  2800  2825  2850	Frequency of Downlink [MHz] 2622.5 2625 2627.5 2630
High Range	FDD Band 7	Test Frequency ID	or which a relaxation   Clause 7.3) is allow   Bandwidth   [MHz]   5   10   15   20   11	N <sub>UL</sub> 20775  20800  20825  20850	Frequency of Uplink [MHz]  2502.5 2507.5 2510	N <sub>DL</sub> 2775  2800  2825  2850	Frequency of Downlink [MHz] 2622.5 2625 2627.5 2630
Test Frequency ID	FDD Band 7	Test Frequency ID	Bandwidth [MHz]  5 10 15 20 19 5/10/15 20 19	N <sub>UL</sub> 20775  20800  20825  20850  21100	Frequency of Uplink [MHz]  2502.5 2605 2507.5 2510 2535	N <sub>DL</sub> 2775 2800 2825 2850 3100	Frequency of Downlink [MHz] 2622.5 2625 2627.5 2630 2655
20   19   21350   2560   3350   2680	FDD Band 7	Test Frequency ID  Low Range  Mid Range	Bandwidth [MHz]  5 10 15 10 15 20 17 5 5	NuL 20775 20800 20825 20850 21100 21425	Frequency of Uplink [MHz]  2502.5 2505 2507.5 2510 2535 2567.5	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425	Frequency of Downlink [MHz] 2622.5 2627.5 2630 2665 2687.5
Test Frequency ID   Bandwidth   NuL   Frequency of   Uplink [MHz]   Downlink [MHz]   Downlink [MHz]   Low Range   10 11   23750   706.5   5755   736.5   739.   Mid Range   5 11   10   23790   710   5790   740   High Range   5 11   23825   713.5   5825   743.5   NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101	FDD Band 7	Test Frequency ID  Low Range  Mid Range	Bandwidth [MHz]  5 10 15 20 19 57 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15	NuL 20775 20800 20825 20850 21100 21425 21400	Frequency of Uplink [MHz]  2502.5  2505  2507.5  2510  2535  2567.5  2565	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400	Frequency of Downlink [MHz] 2622.5 2627.5 2630 2665 2687.5 2685
Low Range	FDD Band 7	Test Frequency ID  Low Range  Mid Range  High Range	Principle of the control of the cont	NuL 20775 20800 20825 20850 21100 21425 21375 21350	Frequency of Uplink [MHz]  2502.5 2507.5 2510 2535 2567.5 2665 2560.5	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400 3375 3350	Frequency of Downlink [MHz] 2622.5 2625 2627.5 2630 2665 2687.5 2688 2682.5 2680
MHz    Uplink (MHz)   Downlink (MHz)	FDD Band 7	Test Frequency ID  Low Range  Mid Range  High Range	Bandwidth [MHz]  Bandwidth [MHz]  5 10 15 20 11 5/10/15 20 11 5 10 15 20 11 5 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Nu. 20775 20800 20825 21100 21425 21400 21375 21350 of the spec	Frequency of Uplink [MHz]  2502.5 2507.5 2510 2535 2567.5 2665 2560.5	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400 3375 3350	Frequency of Downlink [MHz] 2622.5 2625 2627.5 2630 2665 2687.5 2688 2682.5 2680
Low Range 5 111 23785 706.5 5755 736.5 10 111 23780 709 5780 739 Mid Range 5 111/10 111 23780 710 5790 740 High Range 5 111 23825 713.5 5825 743.5 10 111 23800 711 5800 741 NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101	FDD Band 7	Test Frequency ID  Low Range  Mid Range  High Range	Bandwidth [MHz]  Bandwidth [MHz]  5 10 15 20 11 5/10/15 20 11 5 10 15 20 11 5 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 15 20 11 10 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Nu. 20775 20800 20825 21100 21425 21400 21375 21350 of the spec	Frequency of Uplink [MHz]  2502.5 2507.5 2510 2535 2567.5 2665 2560.5	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400 3375 3350	Frequency of Downlink [MHz] 2622.5 2625 2627.5 2630 2665 2687.5 2688 2682.5 2680
Low Range		Test Frequency ID  Low Range  Mid Range  High Range  NOTE 1: Bandwidth f 36.101 [27]	Bandwidth [MHz]  Bandwidth [MHz]  5 10 15 20 11 5/10/15 20 10 15 10 15 10 15 10 15 10 15 20 10 10 15 10 15 20 10 10 15 10 15 20 10 10 15 Horizontal Standard	Nu  20775 20800 20825 20850 21100 21425 21400 21375 21350 of the specied.	Frequency of Uplink [MHz]  2502.5  2507.5  2510  2535  2567.5  2565  2562.5  2560  filed UE receiver ser	N <sub>DL</sub> 2775 2800 2825 2850 2850 3100 3425 3400 3375 3375 3375 3375	Frequency of Downlink [MHz] 2622.5 2627.5 2630 2665 2687.5 2682.5 2680 rement (TS
Mid Range   5   11   11   23790   710   5790   740		Test Frequency ID  Low Range  Mid Range  High Range  NOTE 1: Bandwidth f 36.101 [27	Bandwidth  S  10  10  10  10  10  10  10  10  10	Nut.  20775 20800 20825 20800 21100 21425 21400 21375 21350 of the specyed.	Frequency of Uplink [MHz]   2502.5   2505   2510   2535   2562.5   2562.5   2560   1fied UE receiver ser	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400 3375 3350 sitivity requii	Frequency of   Downlink   [MHz]   2622.5   2625   2630   2665   2687.5   2680   2680.5   2680   26
High Range 5 11 23825 713.5 5825 743.5 71 10 10 10 23800 711 5800 741 NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101		Test Frequency ID  Low Range  Mid Range  High Range  NOTE 1: Bandwidth f 36.101 [27	Bandwidth [MHz]  5 10 15 20 I'I Hardwidth [MHz]  Bandwidth [MHz]	NuL 20775 20800 20825 20850 21100 21425 21400 21375 21350 of the specked.	Frequency of Uplink [MHz]  2502.5  2507.5  2510  2536  2567.5  2560  2562.5  2560  iffied UE receiver ser  Frequency of Uplink [MHz]  706.5	N <sub>DL</sub> 2775 2800 2825 2826 2850 3100 3425 3400 3375 3375 3375 sitivity requii	Frequency of Downlink [MHz] 2622.5 2625 2627.5 2630 2655 2682.5 2682.5 2680 rement (TS
High Range 10 [1] 23800 711 5800 741  NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101		Test Frequency ID  Low Range  Mid Range  High Range  NOTE 1: Bandwidth f 36.101 [27	Bandwidth [MHz]  5 10 15 20 17 5/10/15 20 17 5/10/15 20 17 5/10/15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 20 10 15 15 20 10 15 15 20 10 15 15 20 10 15 15 20 10 10 10 10 10 10 10 10 10 10 10 10 10	Nut.  20775 20800 20825 20850 21100 21425 21407 21350 21350 of the specyed.	Frequency of Uplink [MHz]   2502.5   2505   2507.5   2565   2567.5   2565   2562.5   2560   2560   Erceiver ser	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400 3475 3400 3375 3350 3350 Sitivity requir	Frequency of Downlink [MHz] 2622.5 2625 2630 2655 2680.5 2680 rement (TS
NOTE 1: Bandwidth for which a relaxation of the specified UE receiver sensitivity requirement (TS 36.101		Test Frequency ID  Low Range  Mid Range  High Range  NOTE 1: Bandwidth f 36.101 [27	Bandwidth  [MHz]  5 10 15 20 10 15 20 10 15 20 10 15 20 10 15 10 15 20 10 15 10 15 20 10 15 10 15 20 10 15 10 15 20 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 15 10 10 15 10 10 15 10 10 10 10 10 10 10 10 10 10 10 10 10	Nu. 20775 20800 20825 21100 21425 21350 of the specied. Nu. 23755 23780 23790	Frequency of Uplink [MHz]  2502.5 2507.5 2510 2535 2567.5 2565 2562.5 2560 ified UE receiver ser  Frequency of Uplink [MHz] 706.5 709 710	N <sub>DL</sub> 2775 2800 2825 2825 3100 3425 3400 3375 3350 3375 N <sub>DL</sub>	Frequency of Downlink [MHz] 2622.5 2625 2625.5 2630 2665 2687.5 2680 2682.5 2680 rement (TS
		Test Frequency ID  Low Range  Mid Range  High Range  NOTE 1: Bandwidth f 36.101 [27	Bandwidth [MHz]  5 10 15 10 15 20 17 5/10/15 20 17 5/10/15 20 17 5 10 15 20 17 15 10 15 20 17 15 10 15 20 17 15 10 15 20 17 15 10 15 20 17 15 10 15 20 17 15 10 15 20 17 15 10 15 20 17 15 10 15 15 10 10 15 15 10 10 10 10 10 10 10 10 10 10 10 10 10	Nut. 20775 20800 20825 21100 21425 21350 of the specied. Nut. 23755 23780 23825 23800 23825 23800	Frequency of Uplink [MHz]  2502.5 2505.5 2507.5 2510 2535 2567.5 2562.5 2560 ified UE receiver ser  Frequency of Uplink [MHz] 706.5 709 710 713.5 711	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400 3425 3400 3475 3470 3475 3470 5755 5750 5790 5825	Frequency of Downlink [MHz] 2622.5 2625 2630 2655 2680.5 2680 rement (TS
		Test Frequency ID  Low Range  Mid Range  High Range  NOTE 1: Bandwidth f 36.101 [27	Bandwidth  [MHz]  5 10  15 20 11  5 10  15 20 11  5 10  15 20 11  5 10  15 20 11  5 10  15 15  10  15 15  10  15 15  10  15 15  10  15 15  10  15 15  10  15 15  10  15 10  10 15  10 10  10 15  10 10  10 10 10 10  10 10 10 10  10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10 10  10 10 10 10 10 10  10 10 10 10 10 10  10 10 10 10 10 10  10 10 10 10 10 10  10 10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10 10 10 10  10 10	Nut. 20775 20800 20825 21100 21425 21350 of the specied. Nut. 23755 23780 23825 23800 23825 23800	Frequency of Uplink [MHz]  2502.5 2505.5 2507.5 2510 2535 2567.5 2562.5 2560 ified UE receiver ser  Frequency of Uplink [MHz] 706.5 709 710 713.5 711	N <sub>DL</sub> 2775 2800 2825 2850 3100 3425 3400 3425 3400 3475 3470 3475 3470 5755 5750 5790 5825	Frequency of Downlink [MHz] 2622.5 2625 2630 2655 2680.5 2680 rement (TS

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## 3.4. EUT operation mode

### For RF test items

The EUT has been tested under typical operating condition. Testing was performed by configuring EUT to maximum output power status.

T	D- 1		Bandwidth (MHz)				Modu	ulation	RB#			
Test Items	Band	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full
Conducted Output Power	4	0	0	0	0	0	0	0	0	0	0	0
	5	0	0	0	0	-	-	0	0	0	0	0
	7	-	-	0	0	0	0	0	0	0	0	0
	17	-	-	0	0	-	-	0	0	0	0	0
	4	0	0	0	0	0	0	0	0	0	-	0
Peak-to-Average Ratio	5	0	0	0	0	-	-	0	0	0	-	0
	7	-	-	0	0	0	0	0	0	0	-	0
	17	-	-	0	0	-	-	0	0	0	-	0
	4	0	0	0	0	0	0	0	0	-	-	0
99% Occupied	5	0	0	0	0	-	-	0	0	-	-	0
Bandwidth & 26 dB Bandwidth	7	-	-	0	0	0	0	0	0	-	-	0
	17	-	-	0	0	-	-	0	0	-	-	0
	4	0	0	0	0	0	0	0	0	0	-	0
David Edua	5	0	0	0	0	-	-	0	0	0	-	0
Band Edge	7	-	-	0	0	0	0	0	0	0	-	0
	17	-	-	0	0	-	-	0	0	0	-	0
	4	0	0	0	0	0	0	0	0	0	-	-
Conducted	5	0	0	0	0	-	-	0	0	0	-	-
Spurious Emission	7	-	-	0	0	0	0	0	0	0	-	-
	17	-	-	0	0	-	-	0	0	0	-	-
	4	0	0	0	0	0	0	0	0	-	-	0
Frequency	5	0	0	0	0	-	-	0	0	-	-	0
Stability	7	-	-	0	0	0	0	0	0	-	-	0
	17	-	-	0	0	-	-	0	0	-	-	0
	4	0	0	0	0	0	0	0	0	0	-	-
EDD and EIDD	5	0	0	0	0	-	-	0	0	0	-	-
ERP and EIRP	7	-	-	0	0	0	0	0	0	0	-	-
	17	-	-	0	0	-	-	0	0	0	-	-
	4	0	0	0	0	0	0	0	-	0	-	-
Radiated Spurious	5	0	0	0	0	-	-	0	-	0	-	-
Emission	7	-	-	0	0	0	0	0	-	0	-	-
	17		-	0	0	-	-	0	-	0	-	-
Remark	<ol> <li>The</li> <li>The</li> </ol>	e mark " c e mark "-" e device i der differe	means th s investig	at this ba atedfrom	ndwidth i 30MHz to	s not test o10 times	offundar	mental signa	al for radiate	d spuriou	ıs emissic	n test

Shenzhen Huatongwei International Inspection Co., Ltd.

emissions are reported.

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## 3.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

supplied by the manufacturersupplied by the lab

0		Manufacturer:	/
0		Model No.:	/
		Manufacturer:	/
0		Model No.:	/

### 3.6. Modifications

No modifications were implemented to meet testing criteria.

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## 4. TEST ENVIRONMENT

## 4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

### 4.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

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

#### IC-Registration No.:5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

#### **ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

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## 4.3. Equipments Used during the Test

Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
•	Signal and spectrum Analyzer	R&S	FSV40	100048	2018/10/28	2019/10/27
•	Spectrum Analyzer	Agilent	N9020A	MY50510187	2018/09/29	2019/09/28
•	Radio communication tester	R&S	CMW500	137688-Lv	2018/09/29	2019/09/28
•	Test software	Tonscend	JS1120-1(LTE)	N/A	N/A	N/A
•	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A
•	Test software	Tonscend	JS1120-3(WCDMA)	N/A	N/A	N/A
•	Test software	Tonscend	JS1120-4(GSM)	N/A	N/A	N/A

•	Radiated Spurious Emission								
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)			
•	Semi-Anechoic Chamber	Albatross projects	SAC-3m-01	N/A	2018/09/30	2021/09/29			
•	Spectrum Analyzer	R&S	FSP40	100597	2018/10/27	2019/10/26			
•	Loop Antenna	R&S	HFH2-Z2	100020	2017/11/20	2020/11/19			
•	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	538	2017/04/05	2020/04/04			
•	Horn Antenna	SCHWARZBECK	9120D	1011	2017/04/01	2020/03/31			
0	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2017/03/27	2020/03/26			
0	Pre-amplifier	BONN	BLWA0160-2M	1811887	2018/11/14	2019/11/13			
•	Pre-amplifier	CD	PAP-0102	12004	2018/11/14	2019/11/13			
•	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-248	2018/04/28	2019/04/27			
•	RF Connection Cable	HUBER+SUHNER	RE-7-FH	N/A	2018/11/15	2019/11/14			
•	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	2018/11/15	2019/11/14			
•	EMI Test Software	Audix	E3	N/A	N/A	N/A			
•	Turntable	MATURO	TT2.0	N/A	N/A	N/A			
•	Antenna Mast	MATURO	TAM-4.0-P	N/A	N/A	N/A			

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### 4.4. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

	VN=Nominal Voltage	DC 12.00V	
Voltage	VL=Lower Voltage	DC 10.80V	
	VH=Higher Voltage	DC 26.00V	
Tomporoturo	TN=Normal Temperature	25 °C	
Temperature	Extreme Temperature	From −30° to + 50° centigrade	
Humidity	30~60 %		
Air Pressure	950-1050 hPa		

### 4.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01"Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongweilaboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.63 dB	(1)
Transmitter power Radiated	2.38dB for <1GHz 3.45dB for >1GHz	(1)
Conducted spurious emissions 9kHz~40GHz	0.63 dB	(1)
Radiated spurious emissions	2.38dB for <1GHz	(1)
Tradicted opariode emissions	3.45dB for >1GHz	(1)
Occupied Pandwidth	18Hz for <1GHz	(1)
Occupied Bandwidth	69Hz for >1GHz	(1)
Fraguency orrer	18Hz for <1GHz	(1)
Frequency error	69Hz for >1GHz	(1)

<sup>(1)</sup> This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

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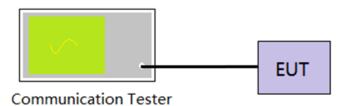
## 5. TEST CONDITIONS AND RESULTS

### 5.1. Conducted Output Power

### **LIMIT**

N/A

### **TEST CONFIGURATION**



### **TEST PROCEDURE**

- 1. The EUT output port was connected to communication tester.
- 2. Set EUT at maximum power through communication tester.
- 3. Select lowest, middle, and highest channels for each band and different modulation.
- 4. Measure the maximum burst average power.

### **TEST MODE:**

Please refer to the clause 3.3

### **TEST RESULTS**

Refer to appendix A on the section 8 appendix report

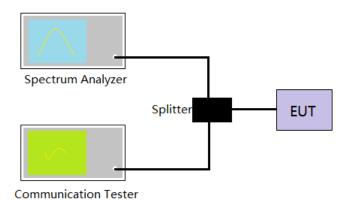
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### 5.2. Peak-to-Average Ratio

#### **LIMIT**

13dB

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. Center Frequency = Carrier frequency, RBW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed.
  - i. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.
  - ii. For bursttransmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that issynced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in whichthetransmitter is operating at maximum power
- 6. Record the maximum PAPR level associated with a probability of 0.1%.

#### **TEST MODE:**

Please refer to the clause 3.3

#### **TEST RESULTS**

Refer to appendix B on the section 8 appendix report

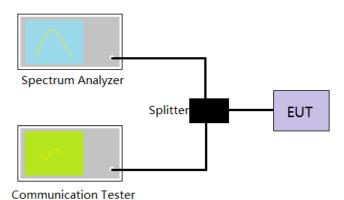
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### 5.3. 99% Occupied Bandwidth & 26 dB Bandwidth

### <u>LIMIT</u>

N/A

### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. Spectrum analyzer setting as follow:

Center Frequency= Carrier frequency, RBW=1% to 5% of the anticipated OBW, VBW= 3 \* RBW, Detector=Peak,

Trace maximum hold.

4. Record the value of 99% Occupied bandwidth and 26dB bandwidth.

### **TEST MODE:**

Please refer to the clause 3.3

### **TEST RESULTS**

Refer to appendix C on the section 8 appendix report

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### 5.4. Band Edge

#### LIMIT

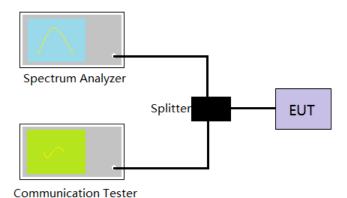
Part 24.238 and Part 22.917 and Part 27.53 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

#### LTE Band 7

Part 27.53 m(4) For mobile digital stations, 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.

#### **TEST CONFIGURATION**



### **TEST PROCEDURE**

- 1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. The band edges of low and high channels were measured.
- Spectrum analyzer setting as follow:
   RBW= no less than 1% of the OBW, VBW =3 \* RBW, Sweep time= Auto
- 5. Record the test plot.

#### **TEST MODE:**

Please refer to the clause 3.3

### **TEST RESULTS**

Refer to appendix D on the section 8 appendix report

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### 5.5. Conducted Spurious Emissions

#### **LIMIT**

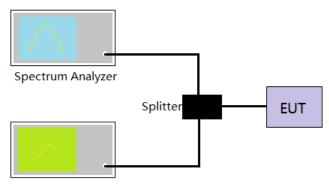
Part 24.238 and Part 22.917 and Part 27.53 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

### LTE Band 7

Part 27.53 m(4) For mobile digital stations, 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 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Limit <-25 dBm

#### **TEST CONFIGURATION**



Communication Tester

### **TEST PROCEDURE**

- 1. The EUT was connected to the spectrum analyzer and communication tester via a power splitter
- 2. Set EUT in maximum power output.
- 3. Spectrum analyzer setting as follow:

Below 1GHz, RBW=100KHz, VBW = 300KHz, Detector=Peak, Sweep time= Auto Above 1GHz, RBW=1MHz, VBW=3MHz, Detector=Peak, Sweep time= Auto Scan frequency range up to 10<sup>th</sup> harmonic.

4. Record the test plot.

#### **TEST MODE:**

Please refer to the clause 3.3

### **TEST RESULTS**

Refer to appendix E on the section 8 appendix report

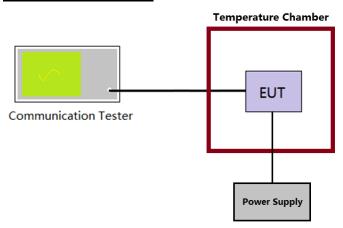
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### 5.6. Frequency stability VS Temperature measurement

### **LIMIT**

2.5ppm

### **TEST CONFIGURATION**



### **TEST PROCEDURE**

- 1. The equipment under test was connected to an external DC power supply and input rated voltage.
- 2. The EUT output port was connected to communication tester.
- 3. The EUT was placed inside the temperature chamber.
- 4. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
- 5. Repeat step 4 measure with 10°C increased per stage until the highest temperature of +50°C reached.

#### **TEST MODE:**

Please refer to the clause 3.3

#### **TEST RESULTS**

Refer to appendix F on the section 8 appendix report

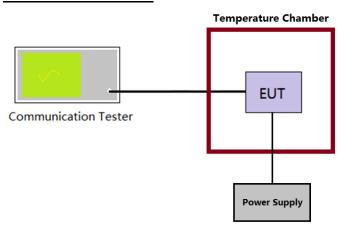
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### 5.7. Frequency stability VS Voltage measurement

### **LIMIT**

2.5ppm

### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. The equipment under test was connected to an external DC power supply and input rated voltage.
- 2. The EUT output port was connected to communication tester.
- 3. The EUT was placed inside the temperature chamber at 25°C
- 4. The power supply voltage to the EUT was varied ±15% of the nominal value measured at the input to the EUT
- 5. Record the maximum frequency change.

### **TEST MODE:**

Please refer to the clause 3.3

### **TEST RESULTS**

Refer to appendix F on the section 8 appendix report

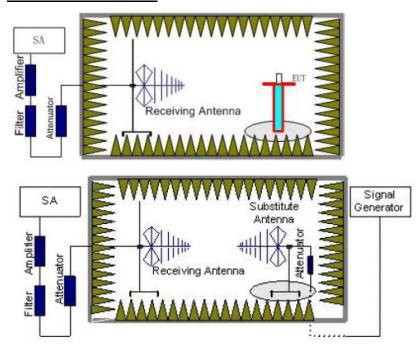
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#### 5.8. ERP and EIRP

#### LIMIT

LTE Band 7: 2W(33dBm) EIRP LTE Band 4: 1W(30dBm) EIRP LTE Band 5: 7W(38.50dBm) ERP LTE Band 17: 3W(34.77dBm) ERP

#### **TEST CONFIGURATION**



### **TEST PROCEDURE**

- 1. EUT was placed on a 0.8 meter for below 1GHz and 1.5 meter for above 1GHz 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 EUT for emission measurements. The height of receiving antenna is 1.0m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- 3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz for above 1GHz and RBW=100kHz,VBW=300kHz for 30MHz to 1GHz,, And the maximum value of the receiver should be recorded as (Pr).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest isconnected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- 5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

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- 6. The measurement results are obtained as described below:
  - Power(EIRP)=PMea- PAg Pcl + Ga
  - We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below:
  - Power(EIRP)=PMea- Pcl + Ga
- 7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
  - ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

Please refer to the clause 3.3

### **TEST RESULTS**

D	□ Nict Accellation
□ Passed	Not Applicable

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LTE Band 4-1.4MHz						
Modulation	Channel	EIRP	(dBm)	1 · · · · · / ID · ›	Dooult	
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	22.17	20.39			
QPSK	Mid	22.60	20.76	<b>200.00</b>	PASS	
	High	22.62	20.44			
	Low	20.22	18.96	≤30.00		
16QAM	Mid	20.60	19.36		PASS	
	High	20.52	19.16			

	LTE Band 4-3MHz						
Modulation	Channel	EIRP	(dBm)	Limit (dBm)	Popult		
Modulation	Channel	Vertical	Horizontal	Limit (dbin)	Result		
	Low	22.53	20.39				
QPSK	Mid	22.52	20.55	<b>~20.00</b>	PASS		
	High	22.35	20.31				
	Low	20.47	19.34	≤30.00			
16QAM	Mid	20.78	18.92		PASS		
	High	20.78	19.34				

LTE Band 4-5MHz						
Modulation	Channal	EIRP	(dBm)	Limit (dDm)	Dogult	
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	23.06	20.85			
QPSK	Mid	23.32	21.20	<b>700.00</b>	PASS	
	High	23.32	20.91			
	Low	20.88	19.29	≤30.00		
16QAM	Mid	21.18	20.14		PASS	
	High	21.00	19.41			

LTE Band 4-10MHz						
Modulation	Channel	EIRP	(dBm)	Limit (dPm)	Popult	
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	22.68	20.71	-20.00	PASS	
QPSK	Mid	23.01	21.06			
	High	23.02	20.74			
	Low	20.60	19.22	≤30.00		
16QAM	Mid	20.93	19.59		PASS	
	High	20.80	19.35			

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LTE Band 4-15MHz						
Modulation	Channel	EIRP	(dBm)	Limit (dDm)	Dogult	
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	23.06	20.67			
QPSK	Mid	22.95	20.82	<b>200.00</b>	PASS	
	High	22.77	20.59			
	Low	20.87	19.54	≤30.00		
16QAM	Mid	21.13	19.39		PASS	
	High	21.07	19.49			

LTE Band 4-20MHz						
Modulation	Channel	EIRP	(dBm)	Limit (dDm)	Result	
iviodulation	Chamer	Vertical	Horizontal	Limit (dBm)	Result	
	Low	23.11	20.72			
QPSK	Mid	23.16	20.91	<b>220.00</b>	PASS	
	High	22.94	20.64			
	Low	20.85	19.60	≤30.00		
16QAM	Mid	21.32	19.33		PASS	
	High	21.28	19.63			

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LTE Band 5-1.4MHz						
Modulation	Channel	ERP	(dBm)	Limit (dDm)	Dooult	
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	22.08	20.75			
QPSK	Mid	22.32	21.04	<b>200 50</b>	PASS	
	High	22.29	20.98			
	Low	20.72	19.39	≤38.50		
16QAM	Mid	20.77	19.84		PASS	
	High	20.80	19.61			

LTE Band 5-3MHz						
Modulation	Channel	ERP	(dBm)	Limit (dPm)	Result	
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	22.97	20.37			
QPSK	Mid	22.71	20.64	<b>220.50</b>	PASS	
	High	22.23	20.40			
16QAM	Low	20.77	19.89	≤38.50		
	Mid	20.87	19.66		PASS	
	High	20.89	19.45			

LTE Band 5-5MHz						
Modulation	Channel	ERP	(dBm)	Limit (dPm)	Docult	
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	22.63	20.58			
QPSK	Mid	22.49	20.85	<b>200 50</b>	PASS	
	High	22.05	20.52			
	Low	21.17	19.90	≤38.50	PASS	
16QAM	Mid	21.06	20.17			
	High	21.02	20.03			

LTE Band 5-10MHz						
Modulation	Channel	ERP	(dBm)	Limit (dPm)	Dogult	
iviodulation	Channel	Vertical	Horizontal	Limit (dBm)	Result	
	Low	22.58	20.60			
QPSK	Mid	22.43	20.87	<b>220.50</b>	PASS	
	High	22.02	20.53			
	Low	21.05	19.56	≤38.50		
16QAM	Mid	21.14	20.03		PASS	
	High	21.20	19.82			

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LTE Band 7-5MHz							
Modulation	Channel	EIRP	EIRP (dBm)		D !!		
Modulation	Channel	Vertical	Horizontal	Limit (dBm)	Result		
	Low	21.19	19.38		PASS		
QPSK	Mid	21.34	19.36	<b>200.00</b>			
	High	21.20	19.02				
	Low	19.62	18.76	- ≤33.00			
16QAM	Mid	19.78	18.70		PASS		
	High	19.67	18.69				

LTE Band 7-10MHz							
Modulation	Channel	EIRP	(dBm)	Limit (dPm)	Result		
Modulation	Channel	Vertical	Horizontal	Limit (dBm)			
	Low	21.07	19.16	<b>400.00</b>			
QPSK	Mid	21.15	19.00		PASS		
	High	21.03	18.98				
	Low	19.98	18.84	≤33.00 			
16QAM	Mid	19.96	18.61		PASS		
	High	19.89	18.50				

LTE Band 7-15MHz							
Modulation	Channel	EIRP	(dBm)	Limit (dPm)	Result		
Modulation	Chamei	Vertical	Horizontal	Limit (dBm)			
	Low	21.07	19.23	≤33.00			
QPSK	Mid	21.21	19.35		PASS		
	High	21.07	19.22				
	Low	19.74	18.57				
16QAM	Mid	19.89	18.48		PASS		
	High	19.77	18.48				

	LTE Band 7-20MHz							
Madulation	Channal	EIRP	(dBm)	Limit (dDm)	Result			
Modulation	Channel	Vertical	Horizontal	Limit (dBm)				
	Low	21.04	19.31					
QPSK	Mid	21.12	19.14	<b>200.00</b>	PASS			
	High	21.00	19.13					
	Low	20.05	18.93	≤33.00				
16QAM	Mid	20.27	19.01		PASS			
	High	20.08	18.97					

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LTE Band 17-5MHz							
Modulation	Channel	ERP	(dBm)	Limit (dPm)	Result		
iviodulation	Channel	Vertical	Horizontal	Limit (dBm)			
	Low	21.56	19.43	<24.77			
QPSK	Mid	21.88	19.48		PASS		
	High	21.40	19.28				
	Low	19.86	18.17	≤34.77			
16QAM	Mid	20.29	18.48		PASS		
	High	19.93	18.40				

LTE Band 17-10MHz							
Modulation	Channel	ERP	(dBm)	Limit (dBm)	Result		
Modulation	Chamei	Vertical	Horizontal	Limit (dbin)			
	Low	21.51	19.06	 ≤34.77			
QPSK	Mid	21.89	19.33		PASS		
	High	21.35	19.14				
	Low	19.90	18.24				
16QAM	Mid	20.32	18.53		PASS		
	High	19.96	18.42				

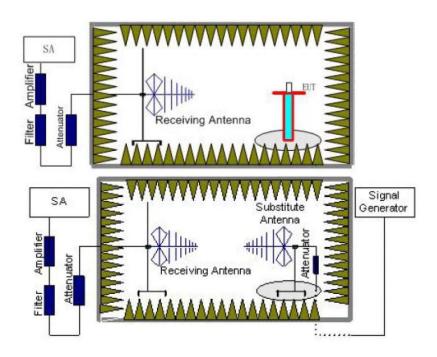
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### 5.9. Radiated Spurious Emission

#### LIMIT

LTE Band 4/5/17: -13dBm; LTE Band 7: -25dBm

#### **TEST CONFIGURATION**



#### **TEST PROCEDURE**

- 1. EUT was placed on a 0.8 meter for below 1GHz and 1.5 meter for above 1GHz 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 EUT for emission measurements. The height of receiving antenna is 1.0m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- 3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz for above 1GHz and RBW=100kHz,VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest isconnected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- 5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.

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- 6. The measurement results are obtained as described below:
  - Power(EIRP)=PMea- PAg Pcl + Ga
  - We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below:

Power(EIRP)=PMea- Pcl + Ga

- 7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
  - ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

### **TEST MODE:**

Please refer to the clause 3.3

### **TEST RESULTS**

⊠ Passed	☐ Not Applicable
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	LTE Band 4-1.4MHz							
Channal	Frequency	Spurious I	Emission	Limit (dDm)	Dogult			
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result			
	3421.40	Vertical	-32.02					
	5132.10	V	-38.05	≤-13.00	Pass			
Low	6842.80	V	-37.12					
LOW	3421.40	Horizontal	-34.21					
	5132.10	Н	-40.11	≤-13.00	Pass			
	6842.80	Н	-38.87					
	3465.00	Vertical	-30.37	≤-13.00	Pass			
	5197.50	V	-36.50					
Mid	6930.00	V	-35.66					
iviid	3465.00	Horizontal	-32.20					
	5197.50	Н	-38.48	≤-13.00	Pass			
	6930.00	Н	-37.32					
	3508.60	Vertical	-27.56					
	5262.90	V	-33.94	≤-13.00	Pass			
Lliah	7017.20	V	-33.23					
High	3508.60	Horizontal	-29.89					
	5262.90	Н	-36.29	≤-13.00	Pass			
	7017.20	Н	-35.24					

LTE Band 4-3MHz							
Channal	Frequency	Spurious I	Emission	Limeit (dDms)	Decult		
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result		
	3423.00	Vertical	-31.08				
	5134.50	V	-37.08	≤-13.00	Pass		
Low	6846.00	V	-36.34				
LOW	3423.00	Horizontal	-32.69				
	5134.50	Н	-40.72	≤-13.00	Pass		
	6846.00	Н	-38.61				
	3465.00	Vertical	-34.76	≤-13.00	Pass		
	5197.50	V	-40.76				
Mid	6930.00	V	-39.18				
IVIIU	3465.00	Horizontal	-39.75				
	5197.50	Н	-45.70	≤-13.00	Pass		
	6930.00	Н	-44.39				
	3507.00	Vertical	-37.23				
	5260.50	V	-43.01	≤-13.00	Pass		
Lligh	7014.00	V	-41.32				
High	3507.00	Horizontal	-43.17				
	5260.50	Н	-49.55	≤-13.00	Pass		
	7014.00	Н	-47.20				

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LTE Band 4-5MHz							
Channal	Frequency	Spurious	Emission	Lineit (dDne)	,		
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result		
	3425.00	Vertical	-41.75				
	5137.50	V	-46.33	≤-13.00	Pass		
Low	6850.00	V	-45.82	]			
Low	3425.00	Horizontal	-44.98				
	5137.50	Н	-51.25	≤-13.00	Pass		
	6850.00	Н	-48.64				
	3465.00	Vertical	-43.11	≤-13.00	Pass		
	5197.50	V	-47.60				
Mid	6930.00	V	-47.02				
iviid	3465.00	Horizontal	-46.57				
	5197.50	Н	-52.54	≤-13.00	Pass		
	6930.00	Н	-49.86				
	3505.00	Vertical	-45.06				
	5257.50	V	-49.38	≤-13.00	Pass		
∐iah	7010.00	V	-48.71				
High	3505.00	Horizontal	-47.84				
	5257.50	Н	-53.74	≤-13.00	Pass		
	7010.00	Н	-50.88				

LTE Band 4-10MHz							
Channal	Frequency	Spurious I	Emission	Lineit (dDne)	Dooult		
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result		
	3430.00	Vertical	-48.51				
	5145.00	V	-51.49	≤-13.00	Pass		
Low	6860.00	V	-49.99				
LOW	3430.00	Horizontal	-48.10				
	5145.00	Н	-53.98	≤-13.00	Pass		
	6860.00	Н	-51.09				
	3465.00	Vertical	-48.70	≤-13.00	Pass		
	5197.50	V	-51.67				
Mid	6930.00	V	-50.52				
IVIIU	3465.00	Horizontal	-48.31				
	5197.50	Н	-54.15	≤-13.00	Pass		
	6930.00	Н	-51.25				
	3500.00	Vertical	-48.96				
	5250.00	V	-51.91	≤-13.00	Pass		
High	7000.00	V	-50.75				
riigri	3500.00	Horizontal	-48.51				
	5250.00	Н	-54.34	≤-13.00	Pass		
	7000.00	Н	-51.41				

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LTE Band 4-15MHz							
Ohamal	Frequency	Spurious	Emission	Limit (dDm)			
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result		
	3435.00	Vertical	-49.65				
	5152.50	V	-52.61	≤-13.00	Pass		
Low	6870.00	V	-51.30				
LOW	3435.00	Horizontal	-51.26				
	5152.50	Н	-56.93	≤-13.00	Pass		
	6870.00	Н	-56.20				
	3465.00	Vertical	-54.15	≤-13.00	Pass		
	5197.50	V	-56.84				
Mid	6930.00	V	-55.28				
iviid	3465.00	Horizontal	-54.76				
	5197.50	Н	-59.77	≤-13.00	Pass		
	6930.00	Н	-58.89				
	3495.00	Vertical	-57.46				
	5242.50	V	-59.86	≤-13.00	Pass		
∐iah	6990.00	V	-58.14				
High	3495.00	Horizontal	-57.72				
	5242.50	Н	-62.55	≤-13.00	Pass		
	6990.00	Н	-64.04				

LTE Band 4-20MHz						
Channal	Frequency	Spurious	Emission	Lineit (dDne)	<b>.</b>	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	3440.00	Vertical	-73.81			
	5160.00	V	-63.58	≤-13.00	Pass	
Low	6880.00	V	-61.30			
LOW	3440.00	Horizontal	-60.87			
	5160.00	Н	-76.10	≤-13.00	Pass	
	6880.00	Н	-77.64			
	3465.00	Vertical	-88.40		Pass	
	5197.50	V	-70.53	≤-13.00		
Mid	6930.00	V	-67.83			
iviid	3465.00	Horizontal	-70.10			
	5197.50	Н	-85.54	≤-13.00	Pass	
	6930.00	Н	-82.73			
	3490.00	Vertical	-92.56			
	5235.00	V	-73.20	≤-13.00	Pass	
Lligh	6980.00	V	-70.26			
High	3490.00	Horizontal	-72.41		_	
	5235.00	Н	-87.73	≤-13.00	Pass	
	6980.00	Н	-84.81			

### Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 5-1.4MHz						
Channel	Frequency	Spurious	Emission	Limit (dDm)	<b>D</b> 1	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	1649.40	Vertical	-35.51			
	2474.10	V	-43.15	≤-13.00	Pass	
Low	3298.80	V	-43.60			
LOW	1649.40	Horizontal	-38.66			
	2474.10	Н	-46.86	≤-13.00	Pass	
	3298.80	Н	-46.98			
	1673.00	Vertical	-34.57		Pass	
	2509.50	V	-42.27	≤-13.00		
Mid	3346.00	V	-42.58			
IVIIG	1673.00	Horizontal	-37.70		Pass	
	2509.50	Н	-45.96	≤-13.00		
	3346.00	Н	-46.13			
	1696.60	Vertical	-33.50			
	2544.90	V	-41.40	≤-13.00	Pass	
High	3393.20	V	-41.76			
High	1696.60	Horizontal	-33.97			
	2544.90	Н	-40.96	≤-13.00	Pass	
	3393.20	Н	-42.52		ļ	

LTE Band 5-3MHz						
Oh a a a a l	Frequency	Spurious	Emission	Limit (dDay)		
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	1651.00	Vertical	-31.56			
	2476.50	V	-39.57	≤-13.00	Pass	
Low	3302.00	V	-40.21			
LOW	1651.00	Horizontal	-32.69			
	2476.50	Н	-39.76	≤-13.00	Pass	
	3302.00	Н	-41.50			
	1673.00	Vertical	-30.60	≤-13.00	Pass	
	2509.50	V	-38.67			
Mid	3346.00	V	-39.36			
IVIIU	1673.00	Horizontal	-30.98		Pass	
	2509.50	Н	-38.37	≤-13.00		
	3346.00	Н	-40.18			
	1695.00	Vertical	-28.50			
	2542.50	V	-36.75	≤-13.00	Pass	
Lligh	3390.00	V	-37.54			
High	1695.00	Horizontal	-29.42			
	2542.50	Н	-36.90	≤-13.00	Pass	
	3390.00	Н	-38.93			

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	LTE Band 5-5MHz						
Channal	Frequency	Spurious I	Emission	Lineit (dDne)			
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result		
	1653.00	Vertical	-24.60				
	2479.50	V	-34.33	≤-13.00	Pass		
Low	3306.00	V	-34.34				
LOW	1653.00	Horizontal	-30.36				
	2479.50	Н	-37.78	≤-13.00	Pass		
	3306.00	Н	-39.68				
	1673.00	Vertical	-25.30		Pass		
	2509.50	V	-34.99	≤-13.00			
Mid	3346.00	V	-34.96				
iviid	1673.00	Horizontal	-30.51				
	2509.50	Н	-37.90	≤-13.00	Pass		
	3346.00	Н	-39.80				
	1693.00	Vertical	-26.17				
	2539.50	V	-35.78	≤-13.00	Pass		
Lligh	3386.00	V	-35.71				
High	1693.00	Horizontal	-28.89				
	2539.50	Н	-36.38	≤-13.00	Pass		
	3386.00	Н	-38.51				

LTE Band 5-10MHz						
Channal	Frequency	Spurious I	Emission	Limeit (dDme)	Б	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	1658.00	Vertical	-25.07			
	2487.00	V	-34.84	≤-13.00	Pass	
Low	3316.00	V	-34.91			
LOW	1658.00	Horizontal	-30.15			
	2487.00	Н	-37.56	≤-13.00	Pass	
	3316.00	Н	-39.51			
	1673.00	Vertical	-26.01			
	2509.50	V	-35.73	≤-13.00	Pass	
Mid	3346.00	V	-35.74			
IVIIU	1673.00	Horizontal	-30.34			
	2509.50	Н	-37.71	≤-13.00	Pass	
	3346.00	Н	-39.66		1	
	1688.00	Vertical	-26.24			
	2532.00	V	-35.94	≤-13.00	Pass	
Lliah	3376.00	V	-35.94			
High	1688.00	Horizontal	-30.52			
	2532.00	Н	-37.88	≤-13.00	Pass	
	3376.00	Н	-39.80			

### Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 7-5MHz						
Channal	Frequency	Spurious I	Emission	Lineit (dDne)		
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	5005.00	Vertical	-36.29			
	7507.50	V	-40.58	≤-25.00	Pass	
Low	10010.00	V	-40.95			
LOW	5005.00	Horizontal	-39.59			
	7507.50	Н	-44.64	≤-25.00	Pass	
	10010.00	Н	-43.34			
	5070.00	Vertical	-34.62	≤-25.00		
	7605.00	V	-38.11		Pass	
Mid	10140.00	V	-38.88			
iviid	5070.00	Horizontal	-35.05		Pass	
	7605.00	Н	-40.78	≤-25.00		
	10140.00	Н	-40.76			
	5135.00	Vertical	-29.93			
	7702.50	V	-33.84	≤-25.00	Pass	
∐iah	10270.00	V	-34.82			
High	5135.00	Horizontal	-31.93		_	
	7702.50	Н	-37.84	≤-25.00	Pass	
	10270.00	Н	-38.26			

LTE Band 7-10MHz						
Channal	Frequency	Spurious Emission		Limeit (dDms)	5 "	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	5010.00	Vertical	-27.81			
	7515.00	V	-32.04	≤-25.00	Pass	
Low	10020.00	V	-33.29			
LOW	5010.00	Horizontal	-33.70			
	7515.00	Н	-39.50	≤-25.00	Pass	
	10020.00	Н	-39.67			
	5070.00	Vertical	-29.14	≤-25.00	Pass	
	7605.00	V	-33.29			
Mid	10140.00	V	-34.46			
iviid	5070.00	Horizontal	-35.84		Pass	
	7605.00	Н	-41.23	≤-25.00		
	10140.00	Н	-41.31			
	5130.00	Vertical	-31.31			
	7695.00	V	-35.27	≤-25.00	Pass	
High	10260.00	V	-36.34			
riigii	5130.00	Horizontal	-37.25			
	7695.00	Н	-42.55	≤-25.00	Pass	
	10260.00	Н	-42.43			

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LTE Band 7-15MHz						
Channal	Frequency	Spurious I	Emission	Limeit (dDms)	5 "	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	5015.00	Vertical	-29.40			
	7522.50	V	-33.64	≤-25.00	Pass	
Low	10030.00	V	-34.96			
LOW	5015.00	Horizontal	-40.21			
	7522.50	Н	-46.84	≤-25.00	Pass	
	10030.00	Н	-46.63			
	5070.00	Vertical	-33.43	≤-25.00	Pass	
	7605.00	V	-37.19			
Mid	10140.00	V	-37.56			
IVIIU	5070.00	Horizontal	-38.53			
	7605.00	Н	-45.48	≤-25.00	Pass	
	10140.00	Н	-45.33			
	5125.00	Vertical	-31.36			
	7687.50	V	-35.30	≤-25.00	Pass	
Ligh	10250.00	V	-35.77			
High	5125.00	Horizontal	-37.15			
	7687.50	Н	-44.18	≤-25.00	Pass	
	10250.00	Н	-44.23			

LTE Band 7-20MHz						
Channal	Frequency	Spurious I	Emission	Limeit (dDms)	D "	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	5020.00	Vertical	-29.32			
	7530.00	V	-32.75	≤-25.00	Pass	
Low	10040.00	V	-33.60			
LOW	5020.00	Horizontal	-35.19			
	7530.00	Н	-42.34	≤-25.00	Pass	
	10040.00	Н	-42.66			
	5070.00	Vertical	-27.85			
	7605.00	V	-31.37	≤-25.00	Pass	
Mid	10140.00	V	-32.30			
iviiu	5070.00	Horizontal	-32.63			
	7605.00	Н	-40.27	≤-25.00	Pass	
	10140.00	Н	-40.69			
	5120.00	Vertical	-26.04			
	7680.00	V	-29.72	≤-25.00	Pass	
High	10240.00	V	-30.73			
riigii	5120.00	Horizontal	-35.37			
	7680.00	Н	-42.85	≤-25.00	Pass	
	10240.00	Н	-42.88			

### Remark:

- 1. Remark"---" means that the emission level is too low to be measured
- 2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

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LTE Band 17-5MHz						
Ohamad	Frequency	Spurious I	Emission	Lineit (dDae)		
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	1413.00	Vertical	-36.86			
	2119.50	V	-39.51	≤-13.00	Pass	
Low	2826.00	V	-40.27			
LOW	1413.00	Horizontal	-40.29			
	2119.50	Н	-42.73	≤-13.00	Pass	
	2826.00	Н	-43.01			
	1420.00	Vertical	-34.29	≤-13.00	Pass	
	2130.00	V	-37.09			
Mid	2840.00	V	-38.00			
IVIIU	1420.00	Horizontal	-37.10		Pass	
	2130.00	Н	-39.35	≤-13.00		
	2840.00	Н	-39.80			
	1427.00	Vertical	-28.45			
	2140.50	V	-31.78	≤-13.00	Pass	
∐iah	2854.00	V	-32.95			
High	1427.00	Horizontal	-33.21		Pass	
	2140.50	Н	-35.70	≤-13.00		
	2854.00	Н	-35.23			

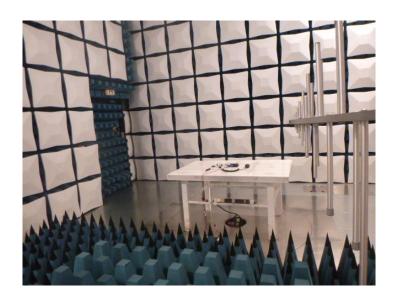
LTE Band 17-10MHz						
Channal	Frequency	Spurious I	Spurious Emission		<b>.</b>	
Channel	(MHz)	Polarization	Level (dBm)	Limit (dBm)	Result	
	1418.00	Vertical	-24.57			
	2127.00	V	-28.48	≤-13.00	Pass	
Low	2836.00	V	-30.15			
LOW	1418.00	Horizontal	-29.62			
	2127.00	Н	-32.33	≤-13.00	Pass	
	2836.00	Н	-32.36			
	1420.00	Vertical	-21.87	≤-13.00	Pass	
	2130.00	V	-25.95			
Mid	2840.00	V	-27.77			
IVIIU	1420.00	Horizontal	-26.57		Pass	
	2130.00	Н	-29.86	≤-13.00		
	2840.00	Н	-30.01			
	1422.00	Vertical	-18.94			
	2133.00	V	-23.28	≤-13.00	Pass	
Lliah	2844.00	V	-25.24			
High	1422.00	Horizontal	-23.73			
	2133.00	Н	-27.19	≤-13.00	Pass	
	2844.00	Н	-27.74			

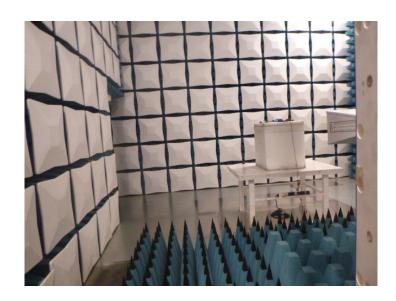
### Remark:

- 1.
- Remark"---" means that the emission level is too low to be measured The emission levels of below 1 GHz are very lower than the limit and not show in test report

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## 6. TEST SETUP PHOTOS OF THE EUT





## 7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Refere to the test report No.: CHTEW19030141

## 8. APPENDIX REPORT