



# FCC RADIO TEST REPORT

**FCC ID** : 2AJN7-TP00128AUC  
**Equipment** : Notebook Computer  
**Brand Name** : Lenovo  
**Model Name** : TP00128A  
**Applicant** : LC Future Center Limited Taiwan Branch  
7F., No. 780, Bei'an Rd., Zhongshan Dist.,  
Taipei City 104, Taiwan  
**Manufacturer** : LCFC (HeFei) Electronics Technology Co., Ltd.  
No. 3188-1, Yungu Road (Hefei Export  
Processing Zone), Hefei Economics &  
Technology Development Area, Anhui, CHINA  
**Standard** : FCC 47 CFR Part 2, 22(H), 24(E), 27

Equipment: Foxconn T99W175 tested inside of Lenovo Notebook Computer.

The product was received on Jun. 03, 2021 and testing was started from Jun. 09, 2021 and completed on Jun. 26, 2021. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

*Louis Wu*

Approved by: Louis Wu

**Sporton International Inc. Wensan Laboratory**

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan



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**Appendix A. Test Results of Radiated Test**

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### History of this test report

Report No.	Version	Description	Issued Date
FG0N0620-02B	01	Initial issue of report	Jun. 30, 2021
FG0N0620-02B	02	1. Add Remark Description in Summary of Test Result 2. Revise Product Feature of Equipment Under Test	Aug. 05, 2021
FG0N0620-02B	03	Revise Antenna Information	Sep. 29, 2021
FG0N0620-02B	04	Revise Antenna Information	Oct. 04, 2021
FG0N0620-02B	05	Revise Antenna Information	Oct. 05, 2021



### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	§2.1046	Conducted Output Power	Not Required	-
	§22.913 (a)(5)	Effective Radiated Power (Band 5) (Band 26)	Not Required	
	§27.50 (b)(10) §27.50 (c)(10)	Effective Radiated Power (Band 12) (Band 13) (Band 17) (Band 71)		
	§24.232 (c) §27.50 (h)(2)	Equivalent Isotropic Radiated Power (Band 2) (Band 25) (Band 7) (Band 38) (Band 41)		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (Band 4) (Band 66)		
-	§24.232 (d) §27.50 (d)(5)	Peak-to-Average Ratio	Not Required	-
-	§2.1049	Occupied Bandwidth	Not Required	-
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (c)(2)(4) §27.53 (g) §27.53 (h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 17) (Band 25) (Band 26) (Band 66) (Band 71)	Not Required	-
	§2.1051 §27.53 (m)(4)	Conducted Band Edge Measurement (Band 7) (Band 38) (Band 41)		
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (c)(2) §27.53 (g) §27.53 (h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 17) (Band 25) (Band 26) (Band 66) (Band 71)	Not Required	-
	§2.1051 §27.53 (m)(4)	Conducted Spurious Emission (Band 7) (Band 38) (Band 41)		
-	§2.1055 §22.355 §24.235 §27.54	Frequency Stability Temperature & Voltage	Not Required	-



Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1053 §22.917 (a) §24.238 (a) §27.53 (c)(2) §27.53 (f) §27.53 (g) §27.53 (h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 17) (Band 25) (Band 26) (Band 66) (Band 71)	Pass	Under limit 14.87 dB at 1568.000 MHz
	§2.1051 §27.53 (m)(4)	Radiated Spurious Emission (Band 7) (Band 38) (Band 41)		

**Note:**

1. Not required means after assessing, test items are not necessary to carry out.
2. This is a variant report by adding antenna. All the test cases were performed on original report which can be referred to Sporton Report Number FG0N0620B. Based on the original report, the test cases were verified.
3. The maximum ERP/EIRP power does not exceed the original grant.

<b>Declaration of Conformity:</b>
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
<b>Comments and Explanations:</b>
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Sheng Kuo**  
**Report Producer: Vivian Hsu**



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Notebook Computer
Brand Name	Lenovo
Model Name	TP00128A
FCC ID	2AJN7-TP00128AUC
EUT supports Radios application	WCDMA/HSPA/LTE/5G NR/GNSS/NFC/UWB WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE
EUT Stage	Production Unit

**Remark:**

1. The above EUT's information was declared by manufacturer.
2. Equipment: Foxconn T99W175 tested inside of Lenovo Notebook Computer.

WWAN Antenna Information				
Main Antenna	Manufacturer	JYT/NVC	Peak gain (dBi)	LTE Band 2 : -1.83 LTE Band 4 : -1.18 LTE Band 5 : -2.02 LTE Band 12 : -3.81 LTE Band 13 : -3.29 LTE Band 17 : -3.56 LTE Band 25 : -1.67 LTE Band 26 : -2.02 LTE Band 38 : -5.78 LTE Band 41 : -4.12 LTE Band 66 : -1.21 LTE Band 71 : -4.43
	Part number	JYAAE0154HR	Type	PIFA
MIMO 2 Antenna	Manufacturer	JYT/NVC	Peak gain (dBi)	LTE Band 2 : -1.31 LTE Band 7 : -1.8 LTE Band 66 : -3.21
	Part number	JYAAE0155HR	Type	PIFA

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.
2. All test items were performed with Main Antenna.

## 1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
<b>Tx Frequency</b>	LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz LTE Band 25: 1850.7MHz ~ 1914.3 MHz LTE Band 26 : 824.7MHz ~ 848.3 MHz LTE Band 38 : 2572.5MHz ~ 2617.5MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz LTE Band 71: 665.5 MHz ~ 695.5 MHz
<b>Rx Frequency</b>	LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5MHz ~ 2687.5 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz LTE Band 25: 1930.7MHz ~ 1994.3 MHz LTE Band 26 : 869.7MHz ~ 893.3MHz LTE Band 38 : 2572.5MHz ~ 2617.5MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 2110.7 MHz ~ 2199.3 MHz LTE Band 71: 619.5 MHz ~ 649.5 MHz
<b>Bandwidth</b>	LTE Band 2 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7 : 5MHz / 10MHz / 15MHz / 20MHz LTE Band 12 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 13 : 5MHz / 10MHz LTE Band 17 : 5MHz / 10MHz LTE Band 25: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 26 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz LTE Band 38 : 5MHz / 10MHz / 15MHz / 20MHz LTE Band 41 : 5MHz / 10MHz / 15MHz / 20MHz LTE Band 66 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 71: 5MHz / 10MHz / 15MHz / 20MHz
<b>Type of Modulation</b>	QPSK / 16QAM / 64QAM / 256QAM

## 1.3 Modification of EUT

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



### 1.4 Testing Location

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan
Test Site No.	<b>Sporton Site No.</b>
	03CH12-HY
Test Engineer	Jack Cheng, Lance Chiang and Chuan Chu
Temperature	22.3~26.4°C
Relative Humidity	58~66%

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW3786

### 1.5 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E), 27
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.





## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in Tablet Type (three orthogonal panels, X, Y, Z) and Notebook Type. The worst cases (X Plane for LTE Band 13, 41C; Y Plane for LTE Band 12, 17, 38, 38C 66B, 66C; Z Plane for LTE Band 26; Notebook Type for LTE Bnnd 5, 5B, 25, 41 (HPUE), 66, 71) were recorded in this report.

Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Radiated Spurious Emission	5				v	-	-	v				v			v	v	v
	12	v				-	-	v				v			v	v	v
	13	-	-	v	v	-	-	v				v			v	v	v
	17	-	-		v	-	-	v				v			v	v	v
	25						v	v				v			v	v	v
	26			v			-	v				v			v	v	v
	38	-	-				v	v				v			v	v	v
	41	-	-				v	v				v			v	v	v
	66	v						v				v			v	v	v
	71	-	-	v				v				v			v	v	v
Remark	<ol style="list-style-type: none"> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.</li> </ol>																

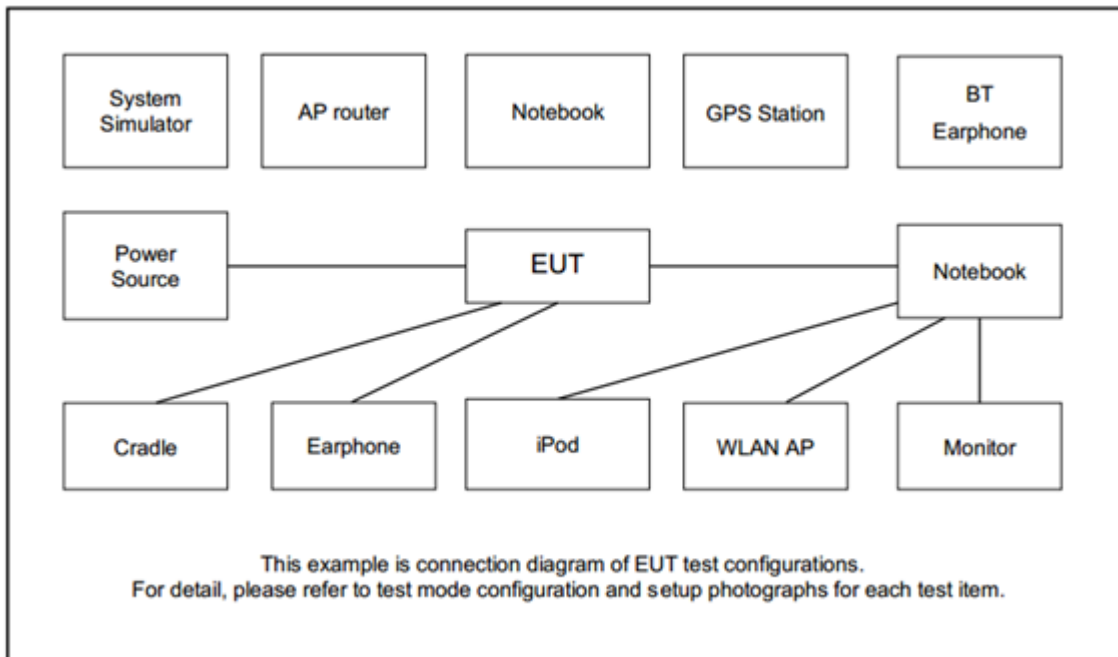
Test Items	Band	Bandwidth (MHz)					Modulation				RB #			Test Channel			
		3+5	5+3	5+10	10+5	10+10	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H	
Radiated Spurious Emission	5B_CA					v	v				v			v	v	v	
Remark	<ol style="list-style-type: none"> <li>The mark "v" means that this configuration is chosen for testing</li> <li>The mark "-" means that this bandwidth is not supported.</li> <li>The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.</li> </ol>																



Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		5+5	5+10	10+5	5+15	15+5	10+10	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Radiated Spurious Emission	66B_CA						v	v				v			v	v	v
Remark	1. The mark "v " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.																

Test Items	Band	Bandwidth (MHz)										Modulation				RB #			Test Channel		
		20+20	20+15	15+20	20+10	10+20	20+5	5+20	15+15	15+10	10+15	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Radiated Spurious Emission	38_CA	v	-	-	-	-	-	-	-	-	-	v				v			v	v	v
	41_CA	v										v				v			v	v	v
	66C_CA	v										v				v			v	v	v
Remark	1. The mark "v " means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.																				

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
2.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A

## 2.4 Frequency List of Low/Middle/High Channels

LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 12 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3

LTE Band 13 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	23230	-
	Frequency	-	782	-
5	Channel	23205	23230	23255
	Frequency	779.5	782	784.5



LTE Band 17 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23780	23790	23800
	Frequency	709	710	711
5	Channel	23755	23790	23825
	Frequency	706.5	710	713.5

LTE Band 25 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	26140	26340	26590
	Frequency	1860	1880	1905
15	Channel	26115	26340	26615
	Frequency	1857.5	1880	1907.5
10	Channel	26090	26340	26640
	Frequency	1855	1880	1910
5	Channel	26065	26340	26665
	Frequency	1852.5	1880	1912.5
3	Channel	26055	26340	26675
	Frequency	1851.5	1880	1913.5
1.4	Channel	26047	26340	26683
	Frequency	1850.7	1880	1914.3



<b>LTE Band 26 Channel and Frequency List</b>				
<b>BW [MHz]</b>	<b>Channel/Frequency(MHz)</b>	<b>Lowest</b>	<b>Middle</b>	<b>Highest</b>
15	Channel	26865	26915	26965
	Frequency	831.5	836.5	841.5
10	Channel	26840	26915	26990
	Frequency	829.0	836.5	844.0
5	Channel	26815	26915	27015
	Frequency	826.5	836.5	846.5
3	Channel	26805	26915	27025
	Frequency	825.5	836.5	847.5
1.4	Channel	26797	26915	27033
	Frequency	824.7	836.5	848.3

<b>LTE Band 38 Channel and Frequency List</b>				
<b>BW [MHz]</b>	<b>Channel/Frequency(MHz)</b>	<b>Lowest</b>	<b>Middle</b>	<b>Highest</b>
20	Channel	37850	38000	38150
	Frequency	2580.0	2595.0	2610.0
15	Channel	37825	38000	38175
	Frequency	2577.5	2595.0	2612.5
10	Channel	37800	38000	38200
	Frequency	2575.0	2595.0	2615.0
5	Channel	37775	38000	38225
	Frequency	2572.5	2595.0	2617.5

<b>LTE Band 41 Channel and Frequency List</b>				
<b>BW [MHz]</b>	<b>Channel/Frequency(MHz)</b>	<b>Lowest</b>	<b>Middle</b>	<b>Highest</b>
20	Channel	39750	40620	41490
	Frequency	2506.0	2593.0	2680.0
15	Channel	39725	40620	41515
	Frequency	2503.5	2593.0	2682.5
10	Channel	39700	40620	41540
	Frequency	2501.0	2593.0	2685.0
5	Channel	39675	40620	41565
	Frequency	2498.5	2593.0	2687.5



LTE Band 66 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	132072	132322	132572
	Frequency	1720	1745	1770
15	Channel	132047	132322	132597
	Frequency	1717.5	1745	1772.5
10	Channel	132022	132322	132622
	Frequency	1715	1745	1775
5	Channel	131997	132322	132647
	Frequency	1712.5	1745	1777.5
3	Channel	131987	132322	132657
	Frequency	1711.5	1745	1778.5
1.4	Channel	131979	132322	132665
	Frequency	1710.7	1745	1779.3

LTE Band 71 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	133222	133297	133372
	Frequency	673.0	680.5	688.0
15	Channel	133197	133297	133397
	Frequency	670.5	680.5	690.5
10	Channel	133172	133297	133422
	Frequency	668.0	680.5	693.0
5	Channel	133147	133297	133447
	Frequency	665.5	680.5	695.5

LTE Band 38 Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest	
20 + 20	PCC	Channel	37850	37901	37952
		Frequency	2580.0	2585.1	2590.2
	SCC	Channel	38048	38099	38150
		Frequency	2599.8	2604.9	2610.0
15+ 15	PCC	Channel	37825	37925	38025
		Frequency	2577.5	2587.5	2597.5
	SCC	Channel	37975	38075	38175
		Frequency	2592.5	2602.5	2612.5



LTE Band 41 Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
20 + 20	PCC	Channel	39750	40521	41292
		Frequency	2506.0	2583.1	2660.2
	SCC	Channel	39948	40719	41490
		Frequency	2525.8	2602.9	2680.0
20 + 15	PCC	Channel	39750	40546	41341
		Frequency	2506.0	2585.6	2665.1
	SCC	Channel	39921	40717	41512
		Frequency	2523.1	2602.7	2682.2
15 + 20	PCC	Channel	39728	40523	41319
		Frequency	2503.8	2593.3	2662.9
	SCC	Channel	39899	40694	41490
		Frequency	2520.9	2600.4	2680.0
20 + 10	PCC	Channel	39750	40571	41391
		Frequency	2506.0	2588.1	2670.1
	SCC	Channel	39894	40715	41535
		Frequency	2520.4	2602.5	2684.5
10 + 20	PCC	Channel	39705	40526	41346
		Frequency	2501.5	2583.6	2665.6
	SCC	Channel	39849	40670	41490
		Frequency	2515.9	2598.0	2680.0





LTE Band 41 Channel and Frequency List					
20 + 5	PCC	Channel	39750	40595	41440
		Frequency	2506.0	2590.5	2675.0
	SCC	Channel	39867	40712	41557
		Frequency	2517.7	2602.2	2686.7
5 + 20	PCC	Channel	39683	40528	41373
		Frequency	2499.3	2583.8	2668.3
	SCC	Channel	39800	40645	41490
		Frequency	2511.0	2595.5	2680.0
15 + 15	PCC	Channel	39725	40545	41365
		Frequency	2503.5	2585.5	2667.5
	SCC	Channel	39875	40695	41515
		Frequency	2518.5	2600.5	2682.5
10 + 15	PCC	Channel	39703	40549	41395
		Frequency	2501.3	2585.9	2670.5
	SCC	Channel	39823	40669	41515
		Frequency	2513.3	2597.9	2682.5
15 + 10	PCC	Channel	39725	40571	41417
		Frequency	2503.5	2588.1	2672.7
	SCC	Channel	39845	40691	41537
		Frequency	2515.5	2600.1	2684.7



<b>LTE Band 5 Channel and Frequency List</b>					
<b>BW [MHz]</b>	<b>Channel/Frequency(MHz)</b>		<b>Lowest</b>	<b>Middle</b>	<b>Highest</b>
3 + 5	PCC	Channel	20416	20501	20586
		Frequency	825.6	834.1	842.6
	SCC	Channel	20455	20540	20625
		Frequency	829.5	838.0	846.5
5 + 3	PCC	Channel	20425	20510	20595
		Frequency	826.5	835.0	843.5
	SCC	Channel	20464	20549	20634
		Frequency	830.4	838.9	847.4
5 + 10	PCC	Channel	20428	20478	20528
		Frequency	826.8	831.8	836.8
	SCC	Channel	20500	20550	20600
		Frequency	834.0	839.0	844.0
10 + 5	PCC	Channel	20450	20500	20550
		Frequency	829.0	834.0	839.0
	SCC	Channel	20522	20572	20622
		Frequency	836.2	841.2	846.2
10 + 10	PCC	Channel	20450	20476	20501
		Frequency	829.0	831.6	834.1
	SCC	Channel	20549	20575	20600
		Frequency	838.9	841.5	844.0



LTE Band 66B Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
5 + 5	PCC	Channel	131997	132398	132599
		Frequency	1712.5	1752.6	1772.7
	SCC	Channel	132045	133346	132647
		Frequency	1717.3	1757.4	1777.5
5 + 10	PCC	Channel	132000	132375	132550
		Frequency	1712.8	1750.3	1767.8
	SCC	Channel	132072	133347	132622
		Frequency	1720.0	1757.5	1775.0
10 + 5	PCC	Channel	132022	132397	132572
		Frequency	1715.0	1752.5	1770.0
	SCC	Channel	132094	133369	132644
		Frequency	1722.2	1759.7	1777.2
5 + 15	PCC	Channel	132002	132353	132504
		Frequency	1713.0	1748.1	1763.2
	SCC	Channel	132095	133346	132597
		Frequency	1722.3	1757.4	1772.5
15 + 5	PCC	Channel	132047	132398	132549
		Frequency	1717.5	1752.6	1767.7
	SCC	Channel	132140	133391	132642
		Frequency	1726.8	1761.9	1777.0
10 + 10	PCC	Channel	132022	132373	135523
		Frequency	1715.0	1750.1	1765.1
	SCC	Channel	132121	133372	132622
		Frequency	1724.9	1760.0	1775.0



LTE Band 66C Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
10 + 15	PCC	Channel	132025	132351	132477
		Frequency	1715.3	1747.9	1760.5
	SCC	Channel	132145	133371	132597
		Frequency	1727.3	1759.9	1772.5
15 + 10	PCC	Channel	132047	132373	132499
		Frequency	1717.5	1750.1	1762.7
	SCC	Channel	132167	133393	132619
		Frequency	1729.5	1761.1	1774.7
10 + 20	PCC	Channel	132027	132328	132428
		Frequency	1715.5	1745.6	1755.6
	SCC	Channel	131171	133372	132572
		Frequency	1729.9	1760.0	1770.0
20 + 10	PCC	Channel	132072	132373	132473
		Frequency	1720.0	1750.1	1760.1
	SCC	Channel	132216	133417	132617
		Frequency	1734.4	1764.5	1774.5
15 + 15	PCC	Channel	132047	132347	132447
		Frequency	1717.5	1747.5	1757.5
	SCC	Channel	132197	133397	132597
		Frequency	1732.5	1762.5	1772.5
15 + 20	PCC	Channel	132050	132325	132401
		Frequency	1717.8	1745.3	1752.9
	SCC	Channel	132221	133396	132572
		Frequency	1734.9	1762.4	1770.0
20 + 15	PCC	Channel	132072	132348	132423
		Frequency	1720.0	1747.6	1755.1
	SCC	Channel	132243	133419	132594
		Frequency	1737.1	1764.7	1772.2
20 + 5	PCC	Channel	132072	132397	132522
		Frequency	1720.0	1752.5	1765.0
	SCC	Channel	132189	133414	132639
		Frequency	1731.7	1764.2	1776.7



LTE Band 66C Channel and Frequency List					
5 + 20	PCC	Channel	132005	132330	132455
		Frequency	1713.3	1745.8	1758.3
	SCC	Channel	132122	132447	132572
		Frequency	1725.0	1757.5	1770.0
20 + 20	PCC	Channel	132072	132323	132374
		Frequency	1720.0	1745.1	1750.2
	SCC	Channel	132270	133421	132572
		Frequency	1739.8	1764.9	1770.0

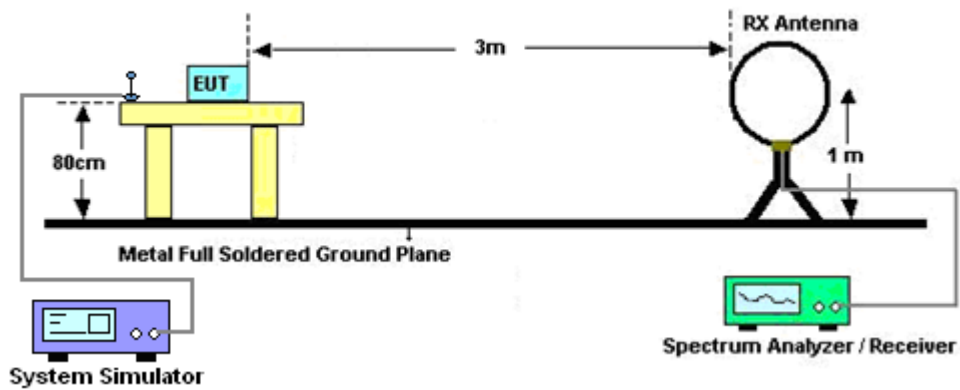
### 3 Radiated Test Items

#### 3.1 Measuring Instruments

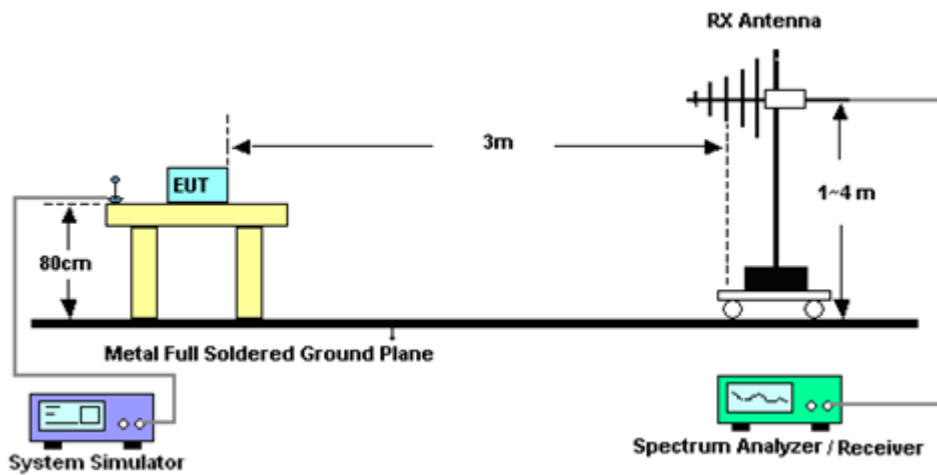
See list of measuring instruments of this test report.

##### 3.1.1 Test Setup

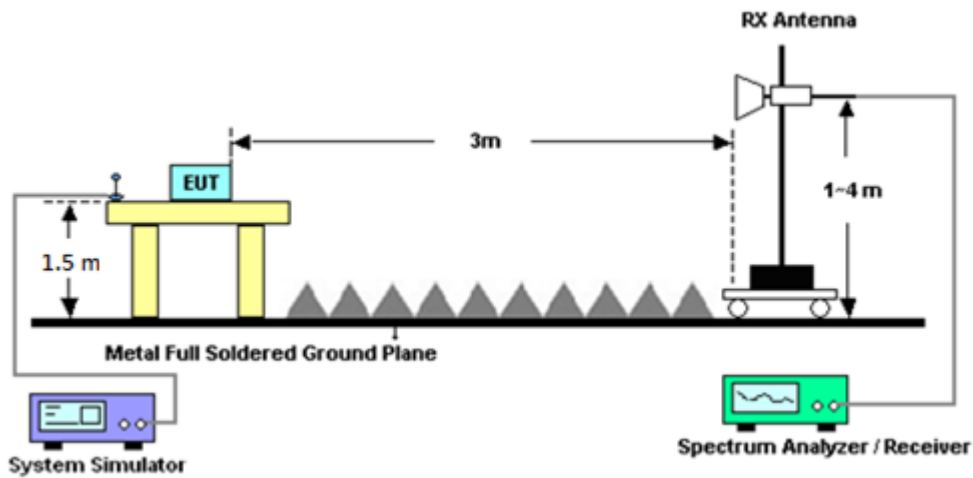
For radiated test below 30MHz



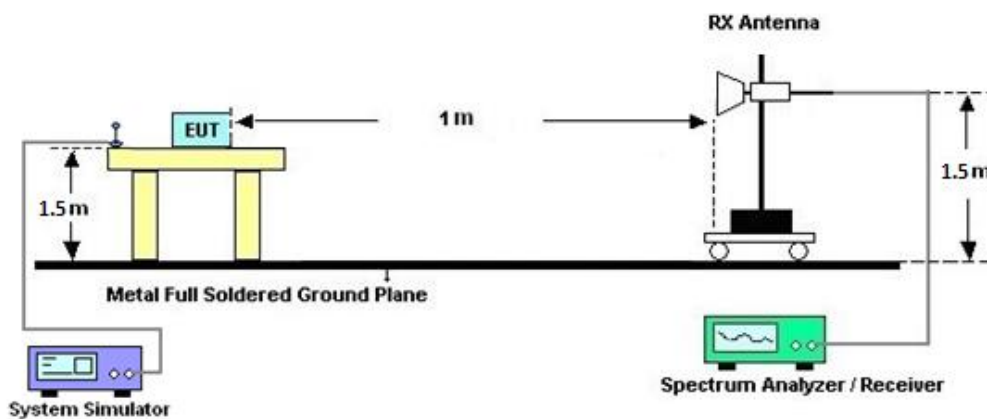
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



### 3.1.2 Test Result of Radiated Test

Please refer to Appendix A.

**Note:**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



## 3.2 Radiated Spurious Emission Measurement

### 3.2.1 Description of Radiated Spurious Emission Measurement

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

For LTE Band 7, 38, 41

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $55 + 10 \log (P)$  dB.

For LTE Band 13

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

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

### 3.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

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

For LTE Band 7, 38, 41

The limit line is derived from  $55 + 10\log(P)$ dB below the transmitter power P(Watts)

EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain

ERP (dBm) = EIRP - 2.15





## 4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	Jun. 09, 2021~ Jun. 26, 2021	Jul. 13, 2021	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	37059 & 01	30MHz~1GHz	Oct. 11, 2020	Jun. 09, 2021~ Jun. 26, 2021	Oct. 10, 2021	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 11, 2020	Jun. 09, 2021~ Jun. 26, 2021	Oct. 10, 2021	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 23, 2020	Jun. 09, 2021~ Jun. 26, 2021	Nov. 22, 2021	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1212	1GHz~18GHz	May 18, 2021	Jun. 09, 2021~ Jun. 26, 2021	May 17, 2022	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	00993	18GHz~40GHz	Nov. 19, 2020	Jun. 09, 2021~ Jun. 26, 2021	Nov. 18, 2021	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917098 0	18GHz~40GHz	Jan. 11, 2021	Jun. 09, 2021~ Jun. 26, 2021	Jan. 10, 2022	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 24, 2021	Jun. 09, 2021~ Jun. 26, 2021	Mar. 23, 2022	Radiation (03CH12-HY)
Preamplifier	Keysight	83017A	MY57280120	1GHz~26.5GHz	Jul. 20, 2020	Jun. 09, 2021~ Jun. 26, 2021	Jul. 19, 2021	Radiation (03CH12-HY)
Preamplifier	E-INSTRUME NT TECH LTD.	ERA-100M-18 G-56-01-A70	EC1900249	1GHz~18GHz	Dec. 05, 2020	Jun. 09, 2021~ Jun. 26, 2021	Dec. 04, 2021	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 11, 2020	Jun. 09, 2021~ Jun. 26, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 15, 2021	Jun. 09, 2021~ Jun. 26, 2021	Jan. 14, 2022	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	101107	100kHz~40GHz	Dec. 04, 2020	Jun. 09, 2021~ Jun. 26, 2021	Dec. 03, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 11, 2020	Jun. 09, 2021~ Jun. 26, 2021	Dec. 10, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 22, 2021	Jun. 09, 2021~ Jun. 26, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 22, 2021	Jun. 09, 2021~ Jun. 26, 2021	Feb. 21, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass Filter	Mar. 17, 2021	Jun. 09, 2021~ Jun. 26, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-1080 -1200-15000-6 OSS	SN1	1.2GHz High Pass Filter	Mar. 17, 2021	Jun. 09, 2021~ Jun. 26, 2021	Mar. 16, 2022	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 OST	SN2	3GHz High Pass Filter	Jul. 14, 2020	Jun. 09, 2021~ Jun. 26, 2021	Jul. 13, 2021	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jun. 09, 2021~ Jun. 26, 2021	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 09, 2021~ Jun. 26, 2021	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jun. 09, 2021~ Jun. 26, 2021	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jun. 09, 2021~ Jun. 26, 2021	N/A	Radiation (03CH12-HY)



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.07 dB
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.21 dB
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### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.80 dB
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# Appendix A. Test Results of Radiated Test

## LTE Band 25

LTE Band 25 / 20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3702	-55.55	-13	-42.55	-73.48	-66.76	1.41	12.62	H
	5553	-50.93	-13	-37.93	-74.09	-62.49	1.74	13.30	H
	7404	-47.08	-13	-34.08	-73.89	-56.40	1.94	11.25	H
									H
									H
									H
	3702	-54.85	-13	-41.85	-72.93	-66.06	1.41	12.62	V
	5553	-51.64	-13	-38.64	-74.33	-63.20	1.74	13.30	V
	7404	-47.05	-13	-34.05	-73.71	-56.37	1.94	11.25	V
									V
									V
									V
Middle	3742	-55.62	-13	-42.62	-73.73	-66.84	1.42	12.65	H
	5613	-51.41	-13	-38.41	-74.49	-62.97	1.74	13.30	H
	7484	-47.30	-13	-34.30	-73.74	-56.44	1.98	11.13	H
									H
									H
									H
	3742	-55.47	-13	-42.47	-73.78	-66.69	1.42	12.65	V
	5613	-50.66	-13	-37.66	-73.4	-62.22	1.74	13.30	V
	7484	-47.51	-13	-34.51	-73.9	-56.65	1.98	11.13	V
									V
									V
									V



Highest	3792	-55.18	-13	-42.18	-73.51	-66.42	1.44	12.68	H
	5688	-51.19	-13	-38.19	-74.66	-62.76	1.73	13.30	H
	7584	-47.95	-13	-34.95	-73.87	-57.07	2.00	11.12	H
									H
									H
									H
									H
	3792	-54.78	-13	-41.78	-73.37	-66.02	1.44	12.68	V
	5688	-51.53	-13	-38.53	-74.47	-63.10	1.73	13.30	V
	7584	-48.30	-13	-35.30	-74.18	-57.42	2.00	11.12	V
									V
									V
									V
									V

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



LTE Band 26

LTE Band 26 / 5MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1648	-48.00	-13	-35.00	-56.42	-53.59	0.92	8.66	H
	2473	-51.33	-13	-38.33	-64.78	-58.70	1.14	10.66	H
	3297	-57.27	-13	-44.27	-72.59	-65.81	1.32	12.01	H
									H
									H
									H
									H
	1648	-62.07	-13	-49.07	-69.96	-67.66	0.92	8.66	V
	2473	-58.55	-13	-45.55	-72.15	-65.92	1.14	10.66	V
	3297	-56.66	-13	-43.66	-72.46	-65.20	1.32	12.01	V
									V
									V
									V
									V
Middle	1668	-61.40	-13	-48.40	-69.88	-67.06	0.93	8.74	H
	2503	-59.19	-13	-46.19	-72.69	-66.59	1.15	10.70	H
	3337	-57.42	-13	-44.42	-72.66	-66.05	1.33	12.11	H
									H
									H
									H
									H
	1668	-62.48	-13	-49.48	-70.36	-68.14	0.93	8.74	V
	2503	-58.71	-13	-45.71	-72.42	-66.11	1.15	10.70	V
	3337	-56.69	-13	-43.69	-72.38	-65.32	1.33	12.11	V
									V
									V
									V
									V



Highest	1688	-60.50	-13	-47.50	-69.04	-66.23	0.93	8.81	H
	2533	-56.92	-13	-43.92	-70.42	-64.35	1.16	10.74	H
	3377	-57.67	-13	-44.67	-72.81	-66.39	1.34	12.20	H
									H
									H
									H
									H
	1688	-62.97	-13	-49.97	-70.82	-68.70	0.93	8.81	V
	2533	-58.81	-13	-45.81	-72.44	-66.24	1.16	10.74	V
	3377	-57.13	-13	-44.13	-72.71	-65.85	1.34	12.20	V
									V
									V
									V
									V

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



LTE Band 5

LTE Band 5 / 10MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1649	-49.75	-13	-36.75	-58.17	-55.35	0.92	8.67	H
	2473	-53.71	-13	-40.71	-67.16	-61.08	1.14	10.66	H
	3298	-57.32	-13	-44.32	-72.64	-65.86	1.32	12.02	H
									H
									H
									H
									H
	1649	-54.55	-13	-41.55	-62.44	-60.15	0.92	8.67	V
	2473	-55.58	-13	-42.58	-69.18	-62.95	1.14	10.66	V
	3298	-56.82	-13	-43.82	-72.61	-65.36	1.32	12.02	V
									V
									V
									V
									V
Middle	1664	-56.50	-13	-43.50	-64.97	-62.15	0.93	8.72	H
	2496	-59.21	-13	-46.21	-72.7	-66.61	1.15	10.69	H
	3328	-56.90	-13	-43.90	-72.16	-65.51	1.33	12.09	H
									H
									H
									H
									H
	1664	-55.79	-13	-42.79	-63.67	-61.44	0.93	8.72	V
	2496	-56.52	-13	-43.52	-70.22	-63.92	1.15	10.69	V
	3328	-56.69	-13	-43.69	-72.41	-65.30	1.33	12.09	V
									V
									V
									V
									V



Highest	1679	-50.80	-13	-37.80	-59.32	-56.50	0.93	8.78	H
	2518	-53.39	-13	-40.39	-66.88	-60.81	1.15	10.72	H
	3358	-57.02	-13	-44.02	-72.21	-65.69	1.33	12.16	H
									H
									H
									H
									H
	1679	-54.85	-13	-41.85	-62.72	-60.55	0.93	8.78	V
	2518	-54.76	-13	-41.76	-68.42	-62.18	1.15	10.72	V
	3358	-57.07	-13	-44.07	-72.71	-65.74	1.33	12.16	V
									V
									V
									V
									V

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





LTE Band 5B

LTE Band 5B / 10MHz+10MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1666	-49.61	-13	-36.61	-58.08	-55.26	0.93	8.73	H
	2500	-55.34	-13	-42.34	-68.83	-62.74	1.15	10.70	H
	3333	-57.26	-13	-44.26	-72.51	-65.88	1.33	12.10	H
									H
									H
									H
									H
	1666	-51.48	-13	-38.48	-59.35	-57.13	0.93	8.73	V
	2500	-56.30	-13	-43.30	-70.01	-63.70	1.15	10.70	V
	3333	-56.96	-13	-43.96	-72.67	-65.58	1.33	12.10	V
									V
									V
									V
									V
Middle	1672	-61.96	-13	-48.96	-70.46	-67.64	0.93	8.75	H
	2508	-59.05	-13	-46.05	-72.54	-66.46	1.15	10.71	H
	3344	-57.48	-13	-44.48	-72.7	-66.12	1.33	12.13	H
									H
									H
									H
									H
	1672	-57.77	-13	-44.77	-65.64	-63.45	0.93	8.75	V
	2508	-55.16	-13	-42.16	-68.85	-62.57	1.15	10.71	V
	3344	-56.75	-13	-43.75	-72.42	-65.39	1.33	12.13	V
									V
									V
									V
									V
								V	



Highest	1677	-60.49	-13	-47.49	-69	-66.18	0.93	8.77	H
	2515	-58.45	-13	-45.45	-71.94	-65.86	1.15	10.72	H
	3354	-57.34	-13	-44.34	-72.53	-66.01	1.33	12.15	H
									H
									H
									H
									H
	1677	-52.55	-13	-39.55	-60.42	-58.24	0.93	8.77	V
	2515	-56.63	-13	-43.63	-70.3	-64.04	1.15	10.72	V
	3354	-56.89	-13	-43.89	-72.53	-65.56	1.33	12.15	V
									V
									V
									V
									V

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



LTE Band 12

LTE Band 12 / 1.4MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1399	-36.02	-13	-23.02	-45.47	-40.66	0.84	7.64	H
	2098	-57.94	-13	-44.94	-70.52	-64.87	1.06	10.14	H
	2797	-46.01	-13	-33.01	-60.28	-53.70	1.22	11.06	H
	3496	-56.23	-13	-43.23	-72.24	-65.21	1.36	12.49	H
									H
									H
									H
	1399	-36.54	-13	-23.54	-44.77	-41.18	0.84	7.64	V
	2098	-53.38	-13	-40.38	-64.85	-60.31	1.06	10.14	V
	2797	-41.69	-13	-28.69	-55.90	-49.38	1.22	11.06	V
	3496	-51.80	-13	-38.80	-68.17	-60.78	1.36	12.49	V
									V
									V
									V
Middle	1414	-34.20	-13	-21.20	-43.60	-38.91	0.85	7.70	H
	2121	-55.30	-13	-42.30	-68.28	-62.25	1.07	10.17	H
	2828	-44.63	-13	-31.63	-59.02	-52.34	1.23	11.09	H
									H
									H
									H
	1414	-35.84	-13	-22.84	-44.03	-40.55	0.85	7.70	V
	2121	-50.65	-13	-37.65	-62.50	-57.60	1.07	10.17	V
	2828	-40.62	-13	-27.62	-54.98	-48.33	1.23	11.09	V
									V
									V
									V
									V
									V



Highest	1430	-35.20	-13	-22.20	-44.53	-39.98	0.85	7.78	H
	2145	-54.35	-13	-41.35	-67.75	-61.33	1.07	10.20	H
	2859	-46.64	-13	-33.64	-61.16	-54.38	1.24	11.13	H
									H
									H
									H
									H
	1430	-33.80	-13	-20.80	-41.95	-38.58	0.85	7.78	V
	2145	-51.12	-13	-38.12	-63.36	-58.10	1.07	10.20	V
	2859	-39.11	-13	-26.11	-53.63	-46.85	1.24	11.13	V
									V
									V
									V
									V

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



**LTE Band 13**

LTE Band 13 / 5MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1552	-56.88	-13	-43.88	-65.54	-62.14	0.89	8.30	H
	2336	-58.39	-13	-45.39	-72.07	-65.60	1.11	10.47	H
	3112	-57.10	-13	-44.10	-72.47	-65.23	1.29	11.57	H
									H
									H
									H
									H
	1552	-57.30	-13	-44.30	-65.25	-62.56	0.89	8.30	V
	2336	-59.05	-13	-46.05	-72.30	-66.26	1.11	10.47	V
	3112	-56.80	-13	-43.80	-72.51	-64.93	1.29	11.57	V
									V
									V
									V
									V
Middle	1560	-58.05	-42.15	-15.90	-66.64	-63.34	0.89	8.33	H
	2340	-58.39	-13	-45.39	-72.02	-65.60	1.11	10.48	H
	3119	-57.06	-13	-44.06	-72.45	-65.20	1.29	11.59	H
									H
									H
									H
									H
									V
	1560	-59.49	-42.15	-17.34	-67.44	-64.78	0.89	8.33	V
	2340	-58.59	-13	-45.59	-71.85	-65.80	1.11	10.48	V
	3119	-56.88	-13	-43.88	-72.63	-65.02	1.29	11.59	V
									V
									V
									V
								V	



Highest	1568	-57.02	-42.15	-14.87	-65.55	-62.34	0.89	8.36	H
	2344	-58.56	-13	-45.56	-72.19	-65.78	1.12	10.48	H
	3136	-57.70	-13	-44.70	-73.12	-65.88	1.29	11.63	H
									H
									H
									H
									H
	1568	-59.67	-42.15	-17.52	-67.61	-64.99	0.89	8.36	V
	2344	-58.85	-13	-45.85	-72.11	-66.07	1.12	10.48	V
	3136	-57.07	-13	-44.07	-72.88	-65.25	1.29	11.63	V
									V
									V
									V
									V

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



LTE Band 13 / 10MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1552	-57.13	-13	-44.13	-65.79	-62.39	0.89	8.30	H
	2333	-57.90	-13	-44.90	-71.59	-65.10	1.11	10.47	H
	3112	-57.22	-13	-44.22	-72.59	-65.35	1.29	11.57	H
									H
									H
									H
									H
	1552	-58.75	-13	-45.75	-66.7	-64.01	0.89	8.30	V
	2333	-58.22	-13	-45.22	-71.47	-65.42	1.11	10.47	V
	3112	-56.91	-13	-43.91	-72.62	-65.04	1.29	11.57	V
									V
									V
									V
									V

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



**LTE Band 17**

LTE Band 17 / 10MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1409	-35.12	-13	-22.12	-44.53	-39.81	0.85	7.68	H
	2114	-54.79	-13	-41.79	-67.64	-61.73	1.07	10.16	H
	2818	-47.25	-13	-34.25	-61.60	-54.96	1.23	11.08	H
									H
									H
									H
									H
	1409	-39.76	-13	-26.76	-47.95	-44.45	0.85	7.68	V
	2114	-50.17	-13	-37.17	-61.90	-57.11	1.07	10.16	V
	2818	-43.75	-13	-30.75	-58.06	-51.46	1.23	11.08	V
									V
									V
									V
									V
Middle	1411	-34.77	-13	-21.77	-44.18	-39.46	0.85	7.69	H
	2117	-54.18	-13	-41.18	-67.08	-61.13	1.07	10.16	H
	2822	-46.86	-13	-33.86	-61.23	-54.57	1.23	11.09	H
									H
									H
									H
									H
	1411	-39.47	-13	-26.47	-47.66	-44.16	0.85	7.69	V
	2117	-49.85	-13	-36.85	-61.62	-56.80	1.07	10.16	V
	2822	-42.29	-13	-29.29	-56.62	-50.00	1.23	11.09	V
									V
									V
									V
									V





Highest	1416	-34.81	-13	-21.81	-44.20	-39.53	0.85	7.71	H
	2120	-56.20	-13	-43.20	-69.15	-63.15	1.07	10.17	H
	2826	-47.00	-13	-34.00	-61.38	-54.71	1.23	11.09	H
									H
									H
									H
									H
	1416	-38.82	-13	-25.82	-47.01	-43.54	0.85	7.71	V
	2120	-50.39	-13	-37.39	-62.21	-57.34	1.07	10.17	V
	2826	-42.79	-13	-29.79	-57.14	-50.50	1.23	11.09	V
									V
									V
									V
									V

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



**LTE Band 38**

LTE Band 38 / 20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	5142	-52.73	-25	-27.73	-74.69	-63.88	1.65	12.80	H
	7716	-47.71	-25	-22.71	-73.61	-56.83	2.02	11.14	H
	10287	-43.87	-25	-18.87	-74.15	-52.55	2.39	11.07	H
									H
									H
									H
									H
	5142	-52.51	-25	-27.51	-74.22	-63.66	1.65	12.80	V
	7716	-46.69	-25	-21.69	-72.4	-55.81	2.02	11.14	V
	10287	-43.81	-25	-18.81	-74.26	-52.49	2.39	11.07	V
									V
									V
									V
									V
Middle	5172	-52.47	-25	-27.47	-74.42	-63.66	1.65	12.84	H
	7758	-47.73	-25	-22.73	-73.64	-56.86	2.03	11.15	H
	10341	-43.72	-25	-18.72	-74.14	-52.35	2.39	11.03	H
									H
									H
									H
									H
	5172	-52.51	-25	-27.51	-74.26	-63.70	1.65	12.84	V
	7758	-48.42	-25	-23.42	-74.08	-57.55	2.03	11.15	V
	10341	-43.22	-25	-18.22	-73.69	-51.85	2.39	11.03	V
									V
									V
									V
									V



Highest	5202	-53.08	-25	-28.08	-75.02	-64.30	1.66	12.88	H
	7806	-48.02	-25	-23.02	-73.99	-57.15	2.03	11.16	H
	10404	-43.21	-25	-18.21	-73.8	-51.79	2.39	10.98	H
									H
									H
									H
									H
	5202	-53.18	-25	-28.18	-74.95	-64.40	1.66	12.88	V
	7806	-48.01	-25	-23.01	-73.68	-57.14	2.03	11.16	V
	10404	-43.07	-25	-18.07	-73.58	-51.65	2.39	10.98	V
									V
									V
									V
									V
								V	

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



**LTE Band 38C**

LTE Band 38C / 20MHz+20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	5142	-52.89	-25	-27.89	-74.85	-64.04	1.65	12.80	H
	7716	-47.68	-25	-22.68	-73.58	-56.80	2.02	11.14	H
	10287	-43.83	-25	-18.83	-74.11	-52.51	2.39	11.07	H
									H
									H
									H
									H
	5142	-53.26	-25	-28.26	-74.97	-64.41	1.65	12.80	V
	7716	-48.40	-25	-23.40	-74.11	-57.52	2.02	11.14	V
	10287	-44.16	-25	-19.16	-74.61	-52.84	2.39	11.07	V
									V
									V
									V
									V
Middle	5154	-52.64	-25	-27.64	-74.59	-63.81	1.65	12.82	H
	7728	-48.01	-25	-23.01	-73.91	-57.13	2.02	11.15	H
	10305	-43.74	-25	-18.74	-74.06	-52.40	2.39	11.06	H
									H
									H
									H
									H
	5154	-52.98	-25	-27.98	-74.7	-64.15	1.65	12.82	V
	7728	-48.52	-25	-23.52	-74.21	-57.64	2.02	11.15	V
	10305	-43.94	-25	-18.94	-74.4	-52.60	2.39	11.06	V
									V
									V
									V
									V



Highest	5160	-52.70	-25	-27.70	-74.65	-63.87	1.65	12.82	H
	7746	-48.43	-25	-23.43	-74.34	-57.55	2.02	11.15	H
	10323	-44.26	-25	-19.26	-74.63	-52.91	2.39	11.04	H
									H
									H
									H
									H
	5160	-52.78	-25	-27.78	-74.52	-63.95	1.65	12.82	V
	7746	-48.83	-25	-23.83	-74.51	-57.95	2.02	11.15	V
	10323	-44.06	-25	-19.06	-74.53	-52.71	2.39	11.04	V
									V
									V
									V
									V

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



**LTE Band 41 (HPUE)**

LTE Band 41 / 20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	4992	-42.77	-25	-17.77	-64.77	-53.76	1.61	12.60	H
	7488	-47.32	-25	-22.32	-73.73	-56.46	1.98	11.12	H
	9981	-44.34	-25	-19.34	-73.96	-53.25	2.39	11.31	H
									H
									H
									H
									H
	4992	-42.17	-25	-17.17	-63.71	-53.16	1.61	12.60	V
	7488	-47.48	-25	-22.48	-73.85	-56.62	1.98	11.12	V
	9981	-43.36	-25	-18.36	-73.72	-52.27	2.39	11.31	V
									V
									V
									V
									V
Middle	5184	-51.67	-25	-26.67	-73.61	-62.87	1.66	12.86	H
	7770	-47.74	-25	-22.74	-73.66	-56.87	2.03	11.15	H
	10359	-43.28	-25	-18.28	-73.75	-51.90	2.39	11.01	H
									H
									H
									H
									H
	5184	-51.08	-25	-26.08	-72.84	-62.28	1.66	12.86	V
	7770	-48.00	-25	-23.00	-73.65	-57.13	2.03	11.15	V
	10359	-43.21	-25	-18.21	-73.7	-51.83	2.39	11.01	V
									V
									V
									V
									V



Highest	5370	-52.23	-25	-27.23	-74.77	-63.64	1.71	13.12	H
	8058	-46.73	-25	-21.73	-73.77	-55.99	2.06	11.32	H
	10737	-42.73	-25	-17.73	-73.61	-51.12	2.51	10.90	H
									H
									H
									H
									H
	5370	-52.09	-25	-27.09	-74.25	-63.50	1.71	13.12	V
	8058	-46.47	-25	-21.47	-73.51	-55.73	2.06	11.32	V
	10737	-43.30	-25	-18.30	-73.95	-51.69	2.51	10.90	V
									V
									V
									V
									V

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



### LTE Band 41C

LTE Band 41C / 20MHz+20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	4992	-51.78	-25	-26.78	-73.78	-62.77	1.61	12.60	H
	7494	-47.35	-25	-22.35	-73.74	-56.47	1.99	11.11	H
	9990	-44.20	-25	-19.20	-73.78	-53.11	2.40	11.30	H
									H
									H
									H
									H
	4992	-52.22	-25	-27.22	-73.76	-63.21	1.61	12.60	V
	7494	-47.01	-25	-22.01	-73.36	-56.13	1.99	11.11	V
	9990	-43.77	-25	-18.77	-74.12	-52.68	2.40	11.30	V
									V
									V
									V
									V
Middle	5148	-52.74	-25	-27.74	-74.69	-63.90	1.65	12.81	H
	7722	-47.74	-25	-22.74	-73.64	-56.86	2.02	11.14	H
	10296	-43.77	-25	-18.77	-74.07	-52.44	2.39	11.06	H
									H
									H
									H
									H
	5148	-52.70	-25	-27.70	-74.41	-63.86	1.65	12.81	V
	7722	-47.72	-25	-22.72	-73.42	-56.84	2.02	11.14	V
	10296	-43.33	-25	-18.33	-73.79	-52.00	2.39	11.06	V
									V
									V
									V
									V





Highest	5304	-52.57	-25	-27.57	-74.87	-63.91	1.69	5304	H
	7956	-46.63	-25	-21.63	-73.56	-55.77	2.05	7956	H
	10602	-43.11	-25	-18.11	-73.96	-51.57	2.44	10602	H
									H
									H
									H
									H
	5304	-52.56	-25	-27.56	-74.56	-63.90	1.69	13.03	V
	7956	-47.10	-25	-22.10	-73.85	-56.24	2.05	11.19	V
	10602	-43.50	-25	-18.50	-74.08	-51.96	2.44	10.90	V
									V
									V
									V
									V

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



LTE Band 66

LTE Band 66 / 1.4MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3420	-56.39	-13	-43.39	-72.31	-67.35	1.35	12.31	H
	5131	-48.63	-13	-35.63	-70.59	-59.77	1.64	12.78	H
	6841	-48.51	-13	-35.51	-73.87	-58.89	1.74	12.12	H
									H
									H
									H
									H
	3420	-54.72	-13	-41.72	-71.07	-65.68	1.35	12.31	V
	5131	-47.76	-13	-34.76	-69.46	-58.90	1.64	12.78	V
	6841	-48.73	-13	-35.73	-73.7	-59.11	1.74	12.12	V
									V
									V
									V
									V
Middle	3490	-56.17	-13	-43.17	-72.76	-67.29	1.36	12.48	H
	5234	-44.68	-13	-31.68	-66.72	-55.94	1.67	12.93	H
	6978	-47.79	-13	-34.79	-73.85	-58.00	1.72	11.93	H
									H
									H
									H
									H
	3490	-54.59	-13	-41.59	-71.55	-65.71	1.36	12.48	V
	5234	-45.81	-13	-32.81	-67.65	-57.07	1.67	12.93	V
	6978	-48.26	-13	-35.26	-73.82	-58.47	1.72	11.93	V
									V
									V
									V
									V



Highest	3560	-54.47	-13	-41.47	-71.65	-65.63	1.38	12.54	H
	5337	-43.18	-13	-30.18	-65.59	-54.55	1.70	13.07	H
	7115	-47.20	-13	-34.20	-73.72	-57.13	1.78	11.72	H
									H
									H
									H
									H
	3560	-54.07	-13	-41.07	-71.38	-65.23	1.38	12.54	V
	5337	-41.84	-13	-28.84	-63.91	-53.21	1.70	13.07	V
	7115	-47.43	-13	-34.43	-73.58	-57.36	1.78	11.72	V
									V
									V
									V
									V

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



LTE Band 66B

LTE Band 66B / 10MHz+10MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3441	-56.56	-13	-43.56	-72.69	-67.57	1.35	12.36	H
	5156	-49.43	-13	-36.43	-71.38	-60.60	1.65	12.82	H
	6878	-48.75	-13	-35.75	-74.3	-59.08	1.74	12.07	H
									H
									H
									H
									H
	3441	-56.27	-13	-43.27	-72.8	-67.28	1.35	12.36	V
	5156	-52.89	-13	-39.89	-74.62	-64.06	1.65	12.82	V
	6878	-49.00	-13	-36.00	-74.13	-59.33	1.74	12.07	V
									V
									V
									V
									V
Middle	3511	-55.93	-13	-42.93	-72.7	-67.07	1.36	12.51	H
	5261	-52.51	-13	-39.51	-74.66	-63.80	1.68	12.97	H
	7018	-47.45	-13	-34.45	-73.67	-57.59	1.73	11.87	H
									H
									H
									H
									H
	3511	-55.58	-13	-42.58	-72.67	-66.72	1.36	12.51	V
	5261	-52.93	-13	-39.93	-74.85	-64.22	1.68	12.97	V
	7018	-48.38	-13	-35.38	-74.12	-58.52	1.73	11.87	V
									V
									V
									V
									V



Highest	3539	-55.96	-13	-42.96	-72.97	-67.11	1.37	12.52	H
	5310	-52.48	-13	-39.48	-74.8	-63.82	1.69	13.03	H
	7081	-47.98	-13	-34.98	-74.4	-57.99	1.76	11.77	H
									H
									H
									H
									H
	3539	-55.56	-13	-42.56	-72.79	-66.71	1.37	12.52	V
	5310	-52.78	-13	-39.78	-74.8	-64.12	1.69	13.03	V
	7081	-48.22	-13	-35.22	-74.23	-58.23	1.76	11.77	V
									V
									V
									V
									V

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



**LTE Band 66C**

LTE Band 66C / 20MHz+20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3420	-57.38	-13	-44.38	-73.3	-67.74	1.80	12.16	H
	5135	-52.40	-13	-39.40	-74.35	-62.22	2.30	12.13	H
	6843	-49.19	-13	-36.19	-74.56	-57.88	2.37	11.06	H
									H
									H
									H
									H
	3420	-57.04	-13	-44.04	-73.38	-67.40	1.80	12.16	V
	5135	-52.90	-13	-39.90	-74.6	-62.72	2.30	12.13	V
	6843	-49.54	-13	-36.54	-74.51	-58.23	2.37	11.06	V
									V
									V
									V
									V
Middle	3469	-56.69	-13	-43.69	-73.09	-67.15	1.84	12.31	H
	5212	-52.73	-13	-39.73	-74.7	-62.60	2.27	12.14	H
	6948	-48.31	-13	-35.31	-74.21	-56.86	2.40	10.95	H
									H
									H
									H
									H
	3469	-56.05	-13	-43.05	-72.83	-66.51	1.84	12.31	V
	5212	-52.36	-13	-39.36	-74.15	-62.23	2.27	12.14	V
	6948	-48.75	-13	-35.75	-74.19	-57.30	2.40	10.95	V
									V
									V
									V
									V



Highest	3483	-56.70	-13	-43.70	-73.23	-67.19	1.86	12.35	H
	5226	-52.38	-13	-39.38	-74.4	-62.26	2.27	12.15	H
	6962	-48.63	-13	-35.63	-74.61	-57.16	2.41	10.94	H
									H
									H
									H
									H
	3483	-56.24	-13	-43.24	-73.14	-66.73	1.86	12.35	V
	5226	-52.47	-13	-39.47	-74.29	-62.35	2.27	12.15	V
	6962	-49.12	-13	-36.12	-74.62	-57.65	2.41	10.94	V
									V
									V
									V
									V

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



**LTE Band 71**

LTE Band 71 / 5MHz / QPSK									
Channel	Frequency ( MHz )	ERP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1327	-40.47	-13	-27.47	-49.48	-46.95	0.83	7.30	H
	1990	-50.31	-13	-37.31	-61.06	-59.24	1.04	9.96	H
	2653	-57.45	-13	-44.45	-71.15	-67.15	1.19	10.88	H
	3320	-56.31	-13	-43.31	-71.58	-67.05	1.33	12.07	H
									H
									H
									H
	1327	-41.88	-13	-28.88	-50.06	-48.36	0.83	7.30	V
	1990	-51.80	-13	-38.80	-61.57	-60.73	1.04	9.96	V
	2653	-58.48	-13	-45.48	-72.14	-68.18	1.19	10.88	V
	3320	-55.19	-13	-42.19	-70.92	-65.93	1.33	12.07	V
									V
									V
									V
Middle	1347	-40.14	-13	-27.14	-49.27	-46.71	0.83	7.40	H
	2020	-36.22	-13	-23.22	-60.41	-45.20	1.04	10.03	H
	2693	-41.99	-13	-28.99	-68.84	-51.73	1.20	10.93	H
	3367	-43.09	-13	-30.09	-71.26	-53.93	1.34	12.18	H
									H
									H
									H
	1347	-40.76	-13	-27.76	-48.94	-47.33	0.83	7.40	V
	2020	-51.37	-13	-38.37	-61.57	-60.35	1.04	10.03	V
	2693	-58.64	-13	-45.64	-72.45	-68.38	1.20	10.93	V
	3367	-53.99	-13	-40.99	-69.61	-64.83	1.34	12.18	V
									V
									V
									V





Highest	1384	-38.69	-13	-25.69	-48.04	-45.42	0.84	7.57	H
	2080	-50.95	-13	-37.95	-63.21	-60.00	1.06	10.11	H
	2773	-54.26	-13	-41.26	-68.43	-64.07	1.22	11.03	H
	3467	-56.64	-13	-43.64	-72.38	-67.71	1.35	12.42	H
									H
									H
									H
	1384	-40.60	-13	-27.60	-48.81	-47.33	0.84	7.57	V
	2080	-54.29	-13	-41.29	-65.47	-63.34	1.06	10.11	V
	2773	-52.85	-13	-39.85	-66.97	-62.66	1.22	11.03	V
	3467	-54.97	-13	-41.97	-71.09	-66.04	1.35	12.42	V
									V
									V
									V

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