



# FCC CO-LOCATION RADIO TEST REPORT

**FCC ID** : PPQ202008EG91NAXD  
**Equipment** : LTE Module  
**Brand Name** : LITEON  
**Model Name** : EG91-NAXD  
**Applicant** : Lite-On Technology Corporation  
Bldg. C, 90, Chien 1 Rd., Chung-Ho, New Taipei  
City 23585, Taiwan (R.O.C)  
**Manufacturer** : Lite-On Technology Corporation  
Bldg. C, 90, Chien 1 Rd., Chung-Ho, New Taipei  
City 23585, Taiwan (R.O.C)  
**Standard** : FCC 47 CFR Part 2, 22(H), 24(E), 27, Part 90(S)

The product was received on Jun. 02, 2023 and testing was performed from Aug. 15, 2023 to Nov. 10, 2023. We, Sporton International Inc. EMC & Wireless Communications 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 report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

*Louis Wu*

Approved by: Louis Wu

**Sporton International Inc. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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### History of this test report

Report No.	Version	Description	Issue Date
FG351509-01	01	Initial issue of report	Nov. 17, 2023



### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1053 §22.917 (a) §24.238 (a) §27.53 (h) §90.635	Radiated Spurious Emission (Band 2) (Band 4) (Band 26)	Pass	20.43 dB under the limit at 5616.00 MHz

**Note:** The FG351509-01 report reuses test data from the FG351509 report.

Conformity Assessment Condition:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".
Disclaimer:
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Keven Cheng**

**Report Producer: Clio Lo**



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Product Feature	
General Specs	LTE
Installed into the Host	Equipment name: AC Charging Station Brand name: LITEON Model Name: W1-UC168-0ML1EP
Antenna Type	WWAN: Fixed External Antenna
Antenna Gain	LTE Band 2: 2.7 dBi LTE Band 4: 2.0 dBi LTE Band 26: 1.9 dBi

Remark: The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

## 1.2 Modification of EUT

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

## 1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	<b>Sporton Site No.</b> 03CH07-HY
Test Engineer	Jesse Wang, Stan Hsieh and Ken Wu
Temperature (°C)	23.8~29.8
Relative Humidity (%)	49.4~60.5

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

FCC Designation No.: TW1190



## **1.4 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, Part 90(S)
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.

**Remark:**

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.

## 2 Test Configuration of Equipment Under Test

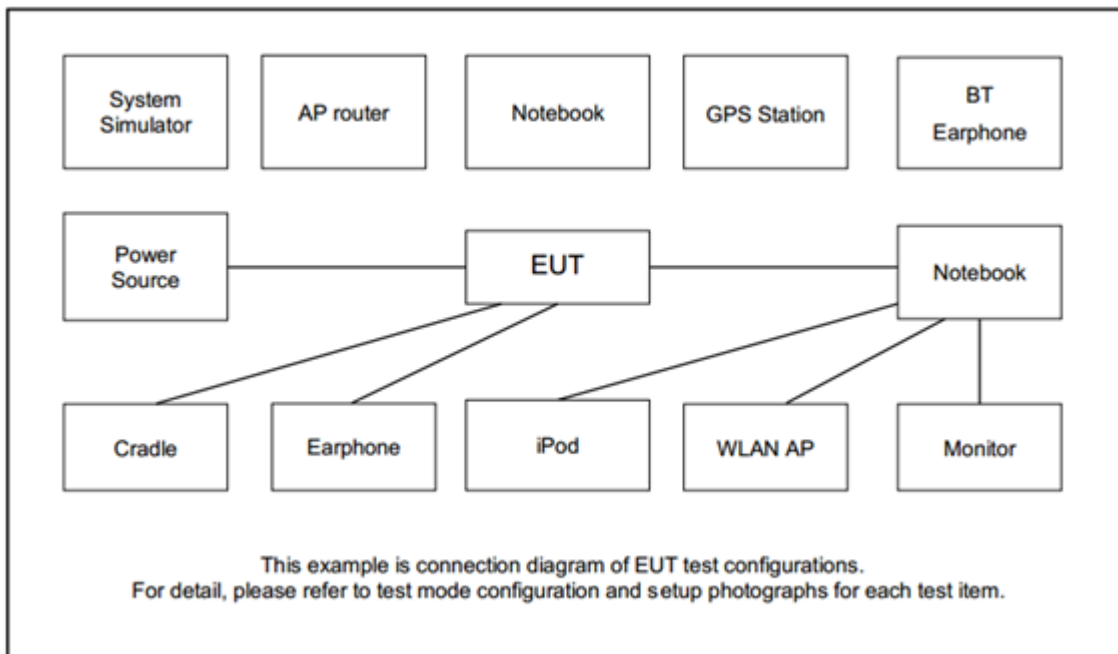
### 2.1 Test Mode

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, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and only the worst case emissions were reported in this report.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Radiated Spurious Emission	2						v	v		v				v	
	4						v	v		v				v	
	26				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.	NFC Card	winso	N/A	N/A	N/A	N/A
2.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	WiFi/BT Module	AzureWave	AW-CM467-USB-I	TLZ-CM467	N/A	N/A
4.	RFID Module	ID Tech	ID-80149014-004	WQJ-ID80149014	N/A	N/A

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

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745

LTE Band 26 Channel and Frequency List (Part22)				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	26865	26915	26965
	Frequency	831.5	836.5	841.5

LTE Band 26 Channel and Frequency List (Part90S)				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	26765	-	-
	Frequency	821.5	-	-



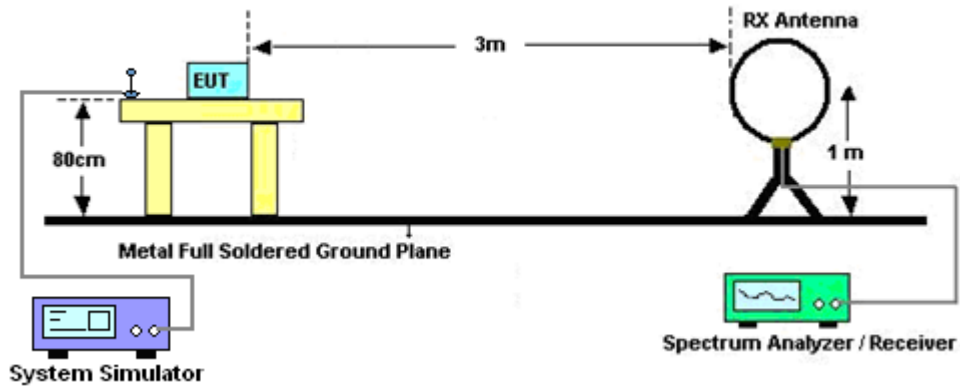
### 3 Radiated Test Items

#### 3.1 Measuring Instruments

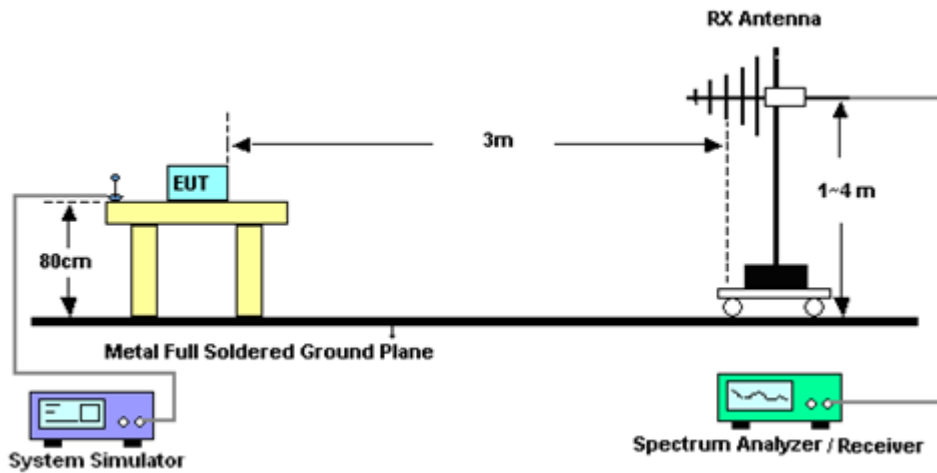
See list of measuring instruments of this test report.

##### 3.1.1 Test Setup

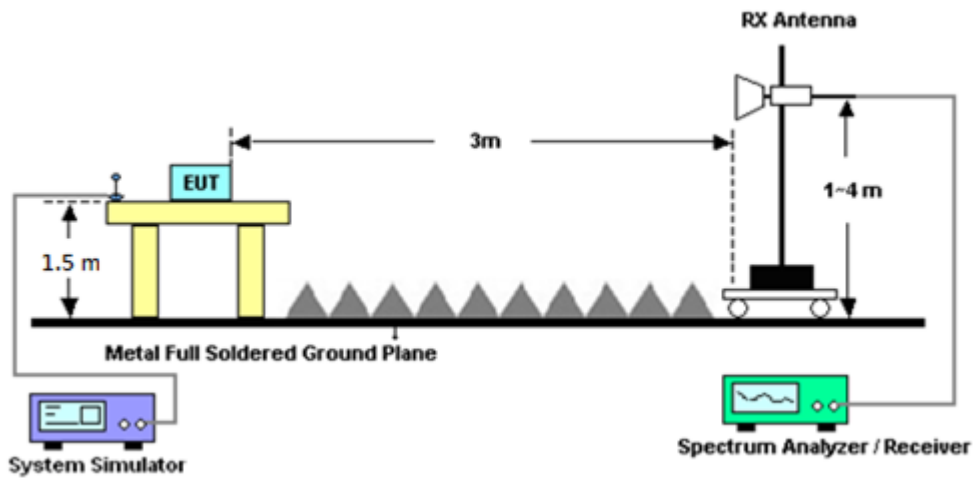
For radiated test below 30MHz



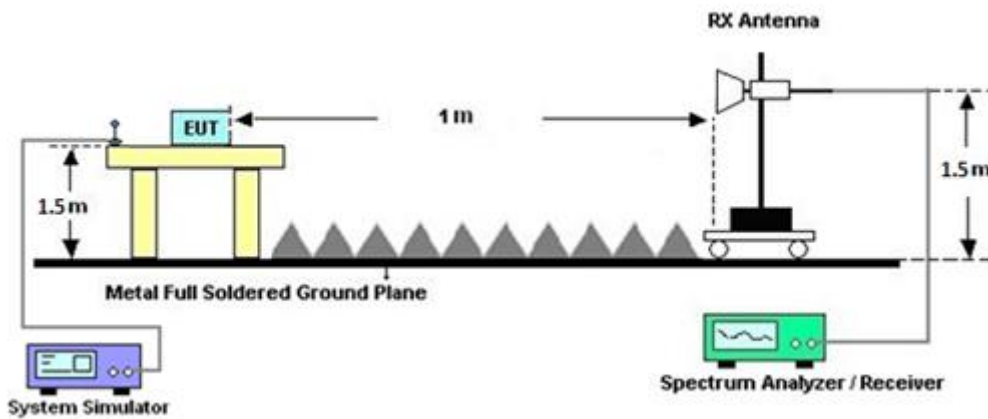
For radiated test from 30MHz to 1GHz



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.

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)

$EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$

$ERP \text{ (dBm)} = EIRP - 2.15$



## 4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	35419 & 03	30MHz~1GHz	Apr. 23, 2023	Aug. 15, 2023~Nov. 10, 2023	Apr. 22, 2024	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 01, 2022	Aug. 15, 2023~Nov. 10, 2023	Nov. 30, 2023	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 20, 2023	Aug. 15, 2023~Nov. 10, 2023	Apr. 19, 2024	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 03, 2022	Aug. 15, 2023~Aug. 16, 2023	Oct. 02, 2023	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 02, 2023	Nov. 10, 2023	Oct. 01, 2024	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Mar. 24, 2023	Aug. 15, 2023~Nov. 10, 2023	Mar. 23, 2024	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 25, 2023	Aug. 15, 2023~Nov. 10, 2023	Jul. 24, 2024	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Mar. 28, 2023	Aug. 15, 2023~Nov. 10, 2023	Mar. 27, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682/4	30MHz to 18GHz	Feb. 22, 2023	Aug. 15, 2023~Nov. 10, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4	9kHz to 18GHz	Feb. 22, 2023	Aug. 15, 2023~Nov. 10, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4	9kHz to 18GHz	Feb. 22, 2023	Aug. 15, 2023~Nov. 10, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 22, 2023	Aug. 15, 2023~Nov. 10, 2023	Feb. 21, 2024	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	801606/2	9KHz ~ 40GHz	Apr. 20, 2023	Aug. 15, 2023~Nov. 10, 2023	Apr. 19, 2024	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Aug. 15, 2023~Nov. 10, 2023	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Aug. 15, 2023~Nov. 10, 2023	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Aug. 15, 2023~Nov. 10, 2023	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Aug. 15, 2023~Nov. 10, 2023	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	Aug. 15, 2023~Nov. 10, 2023	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 14, 2023	Aug. 15, 2023~Nov. 10, 2023	Mar. 13, 2024	Radiation (03CH07-HY)
Horn Antenna	ETS-Lindgren	3117	00143261	1GHz~18GHz	Feb. 24, 2023	Aug. 15, 2023~Nov. 10, 2023	Feb. 23, 2024	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 24, 2022	Aug. 15, 2023~Nov. 10, 2023	Nov. 23, 2023	Radiation (03CH07-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	Jan. 11, 2023	Aug. 15, 2023~Nov. 10, 2023	Jan. 10, 2024	Radiation (03CH07-HY)



## 5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.46 dB
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### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.33 dB
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### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	3.91 dB
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### Appendix A. Test Results of Radiated Test

#### LTE Band 2 + WLAN (2.4GHz) 802.11g CH11 + NFC Link + Bluetooth (1M) CH78

LTE Band 2 / 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)
Middle	3744	-49.08	-13	-36.08	-71.25	-55.69	1.68	8.29	H
	5616	-34.06	-13	-21.06	-60.88	-41.11	2.69	9.75	H
	7482	-48.43	-13	-35.43	-77.25	-57.76	2.44	11.76	H
									H
									H
									H
									H
	3744	-48.89	-13	-35.89	-71.05	-55.5	1.68	8.29	V
	5616	-36.29	-13	-23.29	-63.13	-43.34	2.69	9.75	V
	7482	-51.17	-13	-38.17	-79.59	-60.5	2.44	11.76	V
									V
									V
									V
									V

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



**LTE Band 4 + WLAN (2.4GHz) 802.11g CH11 + NFC Link + Bluetooth (1M) CH78**

LTE Band 4 / 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)
Middle	3450	-41.34	-13	-28.34	-63.53	-47.53	1.59	7.78	H
	5172	-40.11	-13	-27.11	-65.5	-47.37	2.44	9.70	H
	6894	-41.73	-13	-28.73	-69.99	-49.78	2.62	10.67	H
									H
									H
									H
									H
	3450	-43.07	-13	-30.07	-65.16	-49.26	1.59	7.78	V
	5172	-41.89	-13	-28.89	-67.45	-49.15	2.44	9.70	V
	6894	-40.19	-13	-27.19	-68.42	-48.24	2.62	10.67	V
									V
									V
									V
									V

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



**LTE Band 26 + WLAN (2.4GHz) 802.11g CH11 + NFC Link + Bluetooth (1M) CH78**

LTE Band 26 / 15MHz / 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	1656	-56.54	-13	-43.54	-70.18	-58.27	0.98	4.86	H
	3320	-57.07	-13	-44.07	-78.07	-60.58	1.55	7.21	H
	4144	-57.19	-13	-44.19	-79.58	-61.82	1.84	8.63	H
									H
									H
									H
									H
	1656	-57.08	-13	-44.08	-70.35	-58.81	0.98	4.86	V
	3320	-57.51	-13	-44.51	-78.18	-61.02	1.55	7.21	V
	4144	-57.43	-13	-44.43	-79.55	-62.06	1.84	8.63	V
									V
									V
									V
									V

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





LTE Band 26 (Part 90S) + WLAN (2.4GHz) 802.11g CH11 + NFC Link + Bluetooth (1M) CH78

LTE Band 26 / 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	1632	-54.01	-13	-41.01	-67.46	-55.82	0.97	4.93	H
	3256	-55.89	-13	-42.89	-78.17	-59.14	1.53	6.93	H
	4072	-56.06	-13	-43.06	-79.71	-60.72	1.80	8.61	H
									H
									H
									H
									H
	1632	-56.82	-13	-43.82	-69.79	-58.63	0.97	4.93	V
	3256	-57.13	-13	-44.13	-77.58	-60.38	1.53	6.93	V
	4072	-57.56	-13	-44.56	-79.7	-62.22	1.80	8.61	V
									V
									V
									V
									V

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



**LTE Band 2 + WLAN (5GHz) 802.11ac CH 155 + NFC Link + Bluetooth (1M) CH78**

LTE Band 2 / 20MHz / QPSK									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Margin ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	3744	-48.92	-13	-35.92	-71.19	-55.53	1.68	8.29	H
	5616	-33.43	-13	-20.43	-60.32	-40.48	2.69	9.75	H
	7482	-47.92	-13	-34.92	-76.73	-57.25	2.44	11.76	H
									H
									H
									H
									H
	3744	-48.94	-13	-35.94	-71.19	-55.55	1.68	8.29	V
	5616	-38.27	-13	-25.27	-65.14	-45.32	2.69	9.75	V
	7482	-51.04	-13	-38.04	-79.42	-60.37	2.44	11.76	V
									V
									V
									V
									V

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