TEST REPORT

DT&C Co., Ltd.
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Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC2209-0144

2. Customer

• Name (FCC) : LG Electronics USA / Name (IC) : LG ELECTRONICS INC.

• Address (FCC) : 111 Sylvan Avenue North Building Englewood Cliffs New Jersey United States 07632
Address (IC) : 222, LG-ro, Jinwi-myeon Pyeongtaek-si, Gyeonggi-do 451-713 Korea (Republic Of)

3. Use of Report : FCC & IC Class II Permissive Change

4. Product Name / Model Name : Telematics / TLVLM3IU-N
FCC ID : BEJTLVLM3IU-N
IC : 2703H-TLVLM3IUN

5. FCC Regulation(s): Part 2, 22, 24, 27
IC Standard(s): RSS-Gen Issue 5, 130 Issue 2, 132 Issue 3, 133 Issue 6, 139 Issue 3
Test Method Used : KDB971168 D01v03, ANSI/TIA-603-E-2016, ANSI C63.26-2015

6. Date of Test : 2022.06.28 ~ 2022.08.04

7 Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

8. Testing Environment : See appended test report.

9. Test Result : Refer to the attached test result.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test report is not related to KOLAS accreditation.

Affirmation	Tested by Name : JaeHyeok Bang (Signature)	Technical Manager Name : JaeJin Lee (Signature)

2022 . 09 . 06 .

DT&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2209-0144	Sep. 06, 2022	Initial issue	JaeHyeok Bang	JaeJin Lee

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1. GENERAL INFORMATION

FCC Classification	PCS Licensed Transmitter (PCB)
FCC ID	BEJTLVLM3IU-N
IC	2703H-TLVLM3IUN
Product Name	Telematics
Model Name	TLVLM3IU-N
Add Model Name	-
FVIN(Firmware Version Identification Number)	X308
EUT Serial Number	Conducted & Radiated : 205NVRG138406
Supplying power	DC 12 V
Antenna Information	Antenna Type: External Antenna (Model : 5Q0.035.507.AJ NA / PN : 35219102) Antenna gain(including connected cable loss between transmitter and antenna): -3.33 dBi (Band 12,17), -4.05 dBi (Band 13), -3.31 dBi (Band 5), -4.75 dBi (Band 4), -4.24 dBi (Band 2)

Mode	TX Frequency (MHz)	Modulation	ERP(FCC&IC)		EIRP	
			Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
LTE Band 12(17)	704 ~ 711	QPSK	14.53	0.028	-	-
LTE Band 12(17)	704 ~ 711	16QAM	13.74	0.024	-	-
LTE Band 12(17)	701.5 ~ 713.5	QPSK	14.43	0.028	-	-
LTE Band 12(17)	701.5 ~ 713.5	16QAM	13.09	0.020	-	-
LTE Band 12	700.5 ~ 714.5	QPSK	14.82	0.030	-	-
LTE Band 12	700.5 ~ 714.5	16QAM	13.41	0.022	-	-
LTE Band 12	699.7 ~ 715.3	QPSK	14.12	0.026	-	-
LTE Band 12	699.7 ~ 715.3	16QAM	12.79	0.019	-	-
LTE Band 13	782 ~ 782	QPSK	15.91	0.039	-	-
LTE Band 13	782 ~ 782	16QAM	15.19	0.033	-	-
LTE Band 13	779.5 ~ 784.5	QPSK	16.81	0.048	-	-
LTE Band 13	779.5 ~ 784.5	16QAM	15.46	0.035	-	-

Mode	TX Frequency (MHz)	Modulation	ERP(For FCC)		EIRP(For IC)	
			Max power (dBm)	Max power (W)	Max power (dBm)	Max power (W)
LTE Band 5	829 ~ 844	QPSK	13.46	0.022	15.61	0.036
LTE Band 5	829 ~ 844	16QAM	11.68	0.015	13.83	0.024
LTE Band 5	826.5 ~ 846.5	QPSK	13.35	0.022	15.50	0.035
LTE Band 5	826.5 ~ 846.5	16QAM	11.58	0.014	13.73	0.024
LTE Band 5	825.5 ~ 847.5	QPSK	13.61	0.023	15.76	0.038
LTE Band 5	825.5 ~ 847.5	16QAM	11.92	0.016	14.07	0.026
LTE Band 5	824.7 ~ 848.3	QPSK	13.37	0.022	15.52	0.036
LTE Band 5	824.7 ~ 848.3	16QAM	11.64	0.015	13.79	0.024

Mode	TX Frequency (MHz)	Modulation	EIRP(FCC & IC)	
			Max power(dBm)	Max power(W)
LTE Band 4	1 720 ~ 1 745	QPSK	19.00	0.079
LTE Band 4	1 720 ~ 1 745	16QAM	17.99	0.063
LTE Band 4	1 717.5 ~ 1 747.5	QPSK	18.96	0.079
LTE Band 4	1 717.5 ~ 1 747.5	16QAM	17.59	0.057
LTE Band 4	1 715 ~ 1 750	QPSK	18.96	0.079
LTE Band 4	1 715 ~ 1 750	16QAM	17.73	0.059
LTE Band 4	1 712.5 ~ 1 752.5	QPSK	18.93	0.078
LTE Band 4	1 712.5 ~ 1 752.5	16QAM	17.67	0.058
LTE Band 4	1 711.5 ~ 1 753.5	QPSK	18.76	0.075
LTE Band 4	1 711.5 ~ 1 753.5	16QAM	17.47	0.056
LTE Band 4	1 710.7 ~ 1 754.3	QPSK	18.50	0.071
LTE Band 4	1 710.7 ~ 1 754.3	16QAM	17.24	0.053
LTE Band 2	1 860 ~ 1 900	QPSK	19.06	0.081
LTE Band 2	1 860 ~ 1 900	16QAM	18.29	0.067
LTE Band 2	1 857.5 ~ 1 902.5	QPSK	19.27	0.094
LTE Band 2	1 857.5 ~ 1 902.5	16QAM	18.88	0.077
LTE Band 2	1 855 ~ 1 905	QPSK	20.00	0.100
LTE Band 2	1 855 ~ 1 905	16QAM	19.10	0.081
LTE Band 2	1 852.5 ~ 1 907.5	QPSK	19.57	0.091
LTE Band 2	1 852.5 ~ 1 907.5	16QAM	19.00	0.079
LTE Band 2	1 851.5 ~ 1 908.5	QPSK	19.20	0.083
LTE Band 2	1 851.5 ~ 1 908.5	16QAM	18.40	0.069
LTE Band 2	1 850.7 ~ 1 909.3	QPSK	18.84	0.077
LTE Band 2	1 850.7 ~ 1 909.3	16QAM	17.88	0.061

2. INTRODUCTION

2.1 EUT DESCRIPTION

The Equipment Under Test (EUT) supports 850/1900 GPRS, 850/1700/1900 WCDMA, Multi-band LTE, 802.11b/g/n WLAN(2.4GHZ).

2.2 TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+21 ℃ ~ +25 ℃
▪ Relative Humidity	42 % ~ 45 %

2.3 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.4 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated Disturbance (Below 1 GHz)	4.9 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.0 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (Above 18 GHz)	5.3 dB (The confidence level is about 95 %, k = 2)

2.5 TEST FACILITY

DT&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042.
The test site complies with the requirements of § 2.948 according to ANSI 63.4-2014.

- FCC & IC MRA Designation No. : KR0034

- ISED#: 5740A

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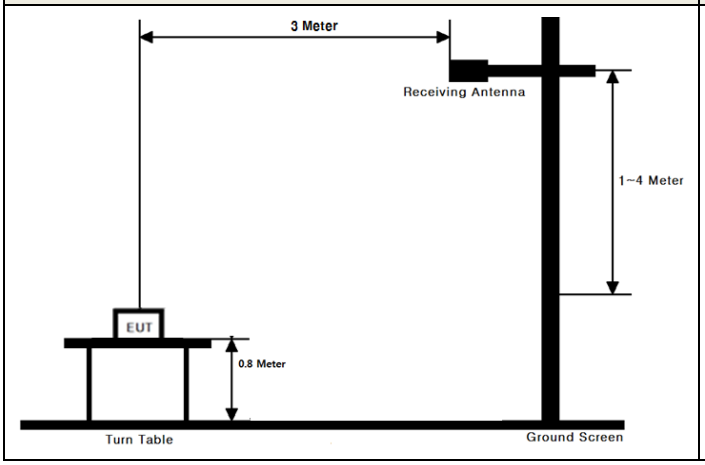
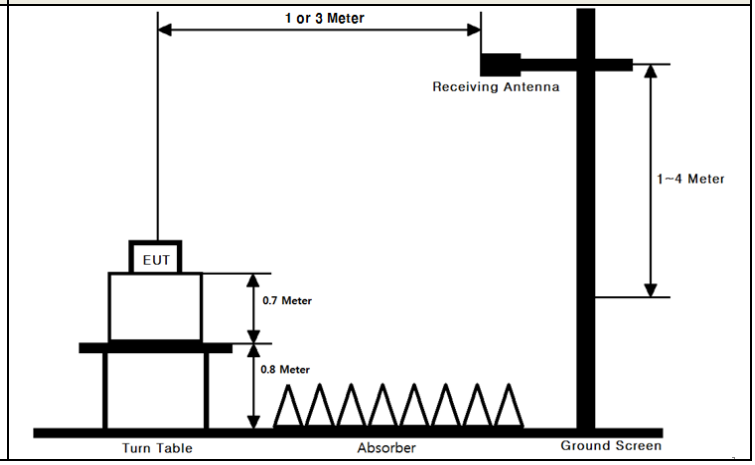
3. DESCRIPTION OF TESTS

3.1 ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8 m or 1.5 m above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.17**
- **KDB971168 D01v03r01 - Section 5.2.2**
- **ANSI C63.26-2015 – Section 5.2.4.4.1**

Test setting

1. Set span to 2 x to 3 x the OBW.
2. Set RBW = 1 % to 5 % of the OBW.
3. Set VBW ≥ 3 x RBW.
4. Set number of points in sweep ≥ 2 × span / RBW.
5. Sweep time:
   1) Set = auto-couple, or
   2) Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6. Detector = power averaging (rms).
7. If the EUT can be configured to transmit continuously, then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-power transmissions).
9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.

10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

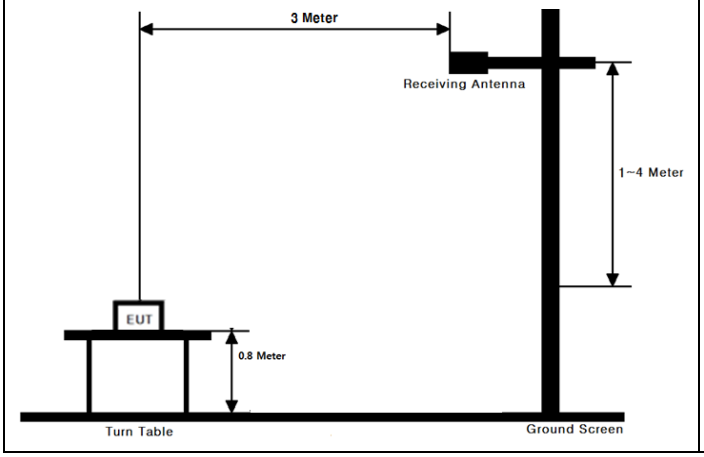
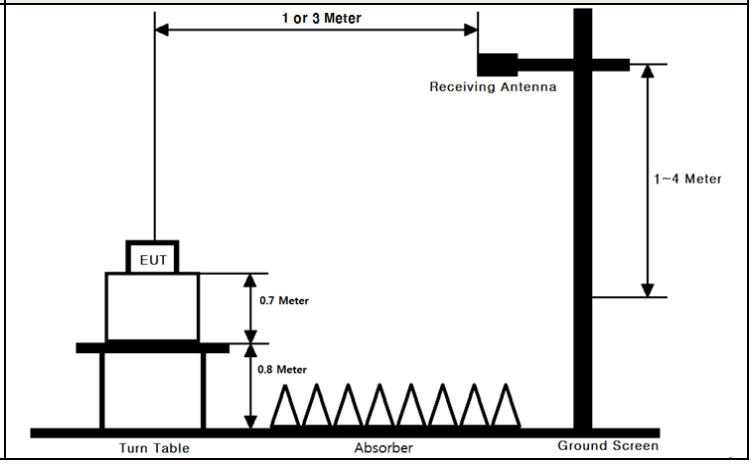
The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna`s terminal [dBm] + Substitute Antenna gain [dBd for ERP, dBi for EIRP]

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference
Between the gain of the horn antenna and an isotropic antenna are taken into consideration.

3.2 UNDESIRABLE EMISSIONS

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 0.8 m or 1.5 meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.12**
- **KDB971168 D01v03r01 - Section 5.8**
- **ANSI C63.26-2015 – Section 5.5**

Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration.

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	21/12/16	22/12/16	MY46471172
Spectrum Analyzer	Agilent Technologies	N9020A	22/04/04	23/04/04	MY50410163
DC power supply	SM techno	SDP30-5D	22/06/24	23/06/24	305DMG305
DC power supply	Agilent Technologies	66332A	22/06/24	23/06/24	US37474125
Multimeter	FLUKE	17B+	21/12/16	22/12/16	36390701WS
Radio Communication Analyzer	Agilent Technologies	MT8820C	22/06/24	23/06/24	6200951873
Thermohygrometer	BODYCOM	BJ5478	21/12/16	22/12/16	120612-2
Thermohygrometer	BODYCOM	BJ5478	21/12/16	22/12/16	120612-1
Signal Generator	Rohde Schwarz	SMBV100A	21/12/16	22/12/16	255571
Signal Generator	ANRITSU	MG3695C	21/12/16	22/12/16	173501
Loop Antenna	ETS-Lindgren	6502	21/01/28	23/01/28	00226186
Bilog Antenna	Schwarzbeck	VULB 9160	21/12/16	22/12/16	3362
Dipole Antenna	A.H.Systems Inc.	FCC-4	20/12/16	22/12/16	710A
Dipole Antenna	Schwarzbeck	UHA9105	21/12/16	23/12/16	2262
HORN ANT	ETS	3117	21/12/16	22/12/16	00140394
HORN ANT	ETS	3117	22/06/24	23/06/24	00143278
HORN ANT	A.H.Systems	SAS-574	22/06/24	23/06/24	154
HORN ANT	A.H.Systems	SAS-574	22/06/24	23/06/24	155
Amplifier	EMPOWER	BBS3Q7ELU	22/06/24	23/06/24	1020
PreAmplifier	H.P	8447D	21/12/16	22/12/16	2944A07774
PreAmplifier	Agilent	8449B	22/06/24	23/06/24	3008A02108
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	22/06/24	23/06/24	7
High-pass filter	Wainwright	WHKX10-2838-3300-18000-60SS	22/06/24	23/06/24	2
High-pass filter	Wainwright	WHKX6-6320-8000-26500-40CC	22/06/24	23/06/24	2
Cable	JUNFLON	MWX241/B	22/01/04	23/01/04	M-3
Cable	JUNFLON	MWX221	22/01/04	23/01/04	M-4
Cable	JUNFLON	MWX221	22/01/04	23/01/04	M-5
Cable	DTNC	Cable	22/01/04	23/01/04	M-6
Cable	JUNFLON	J12J101757-00	22/01/04	23/01/04	M-7
Cable	HUBER+SUHNER	SUCOFLEX104	22/01/04	2301/04	M-8
Cable	Junkosha	MWX342	22/01/04	23/01/04	RFC-72

Note 1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.
Note 2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

5. SUMMARY OF TEST RESULTS

FCC Part	RSS Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
27.50(b.10) 27.50(c.10)	RSS-130 [4.6]	Radiated Output Power (B12, 17, 13)	< 3 Watts max. ERP (FCC &IC)	Radiated	C Note2
22.913(a.5)	RSS-132 [5.4]	Radiated Output Power (B5)	< 7 Watts max. ERP (FCC) < 11.5 Watts max. EIRP (IC)		C Note2
27.50(d.4)	RSS-139 [6.5]	Radiated Output Power (B4)	< 1 Watts max. EIRP (FCC &IC)		C Note2
24.232(c)	RSS-133 [6.4]	Radiated Output Power(B2)	< 2 Watts max. EIRP (FCC &IC)		C Note2
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [6.6]	Undesirable Emissions	> 43 + 10log$_{10}$ (P) dB for all out-of-band emissions		C Note2
27.53(f)	RSS-130 [4.7]	Undesirable Emissions in 1559 ~ 1610MHz	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions of less than 700 Hz bandwidth)		C Note2

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable
Note 2: This test item was performed in three orthogonal EUT positions and the worst case data was reported.

6. SAMPLE CALCULATION

A. For substitution method

1) The EUT was placed on a turntable with 0.8 meter height for frequency below 1 GHz and 1.5 meter height for frequency
above 1 GHz respectively above ground.
2) The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3) During the test, the turn table is rotated until the maximum signal is found.
4) Record the field strength meter's level. (ex. Spectrum reading level is -8.5 dBm)
5) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
6) Increase the signal generator output till the field strength meter's level is equal to the item (4).
(ex. Signal generator level is -18.04 dBm)
7) The gain of the cable and amplifier between the signal generator and terminals of substituted antenna is 46.92 dB at test frequency.
8) Record the level at substituted antenna terminal. (ex. 28.88 dBm)
9) The result is calculated as below;

EIRP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBi)
ERP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBd)
Where, TX Antenna Gain (dBd) = TX Antenna Gain (dBi) - 2.15 dB

7. TEST DATA

7.1 ERP & EIRP

- Test Notes

1) This is device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the below table.

7.1.1 LTE Band 12(17)

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	704	QPSK	1/49	H	14.76	-0.63	14.13	0.026
		16QAM	1/49	H	13.51	-0.63	12.88	0.019
	711	QPSK	1/25	H	15.15	-0.62	14.53	0.028
		16QAM	1/25	H	14.36	-0.62	13.74	0.024
5	701.5	QPSK	1/12	H	13.83	-0.63	13.20	0.021
		16QAM	1/12	H	12.11	-0.63	11.48	0.014
	707.5	QPSK	1/24	H	15.05	-0.62	14.43	0.028
		16QAM	1/24	H	13.71	-0.62	13.09	0.020
	713.5	QPSK	1/12	H	14.93	-0.62	14.31	0.027
		16QAM	1/12	H	13.37	-0.62	12.75	0.019

7.1.2 LTE Band 12

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
3	700.5	QPSK	1/7	H	13.75	-0.63	13.12	0.021
		16QAM	1/7	H	11.88	-0.63	11.25	0.013
	707.5	QPSK	1/14	H	15.00	-0.62	14.38	0.027
		16QAM	1/14	H	13.70	-0.62	13.08	0.020
	714.5	QPSK	1/7	H	15.44	-0.62	14.82	0.030
		16QAM	1/7	H	14.03	-0.62	13.41	0.022
1.4	699.7	QPSK	1/0	H	13.85	-0.63	13.22	0.021
		16QAM	1/0	H	12.38	-0.63	11.75	0.015
	707.5	QPSK	1/5	H	14.74	-0.62	14.12	0.026
		16QAM	1/5	H	13.39	-0.62	12.77	0.019
	715.3	QPSK	1/2	H	14.72	-0.62	14.10	0.026
		16QAM	1/2	H	13.41	-0.62	12.79	0.019

7.1.3 LTE Band 13

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	782	QPSK	1/0	H	16.49	-0.58	15.91	0.039
		16QAM	1/0	H	15.77	-0.58	15.19	0.033
5	779.5	QPSK	1/12	H	17.39	-0.58	16.81	0.048
		16QAM	1/12	H	16.04	-0.58	15.46	0.035
	784.5	QPSK	1/12	H	16.44	-0.58	15.86	0.039
		16QAM	1/12	H	15.64	-0.58	15.06	0.032

7.1.4 LTE Band 5

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBd)	ERP (dBm)	ERP (W)
10	829	QPSK	1/25	H	14.19	-0.79	13.40	0.022
		16QAM	1/25	H	12.33	-0.79	11.54	0.014
	836.5	QPSK	1/0	H	14.31	-0.85	13.46	0.022
		16QAM	1/0	H	12.53	-0.85	11.68	0.015
	844	QPSK	1/25	H	14.21	-0.91	13.30	0.021
		16QAM	1/25	H	12.26	-0.91	11.35	0.014
5	826.5	QPSK	1/12	H	13.83	-0.78	13.05	0.020
		16QAM	1/12	H	11.67	-0.78	10.89	0.012
	836.5	QPSK	1/0	H	14.20	-0.85	13.35	0.022
		16QAM	1/0	H	12.43	-0.85	11.58	0.014
	846.5	QPSK	1/24	H	14.16	-0.93	13.23	0.021
		16QAM	1/24	H	11.77	-0.93	10.84	0.012
3	825.5	QPSK	1/7	H	13.67	-0.77	12.90	0.019
		16QAM	1/7	H	11.89	-0.77	11.12	0.013
	836.5	QPSK	1/0	H	13.62	-0.85	12.77	0.019
		16QAM	1/0	H	11.92	-0.85	11.07	0.013
	847.5	QPSK	1/7	H	14.55	-0.94	13.61	0.023
		16QAM	1/7	H	12.86	-0.94	11.92	0.016
1.4	824.7	QPSK	1/2	H	13.07	-0.76	12.31	0.017
		16QAM	1/2	H	11.12	-0.76	10.36	0.011
	836.5	QPSK	1/5	H	13.71	-0.85	12.86	0.019
		16QAM	1/5	H	11.96	-0.85	11.11	0.013
	848.3	QPSK	1/2	H	14.32	-0.95	13.37	0.022
		16QAM	1/2	H	12.59	-0.95	11.64	0.015

7.1.5 LTE Band 4

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 720	QPSK	1/0	V	13.12	5.83	18.95	0.079
		16QAM	1/0	V	11.98	5.83	17.81	0.060
	1 732.5	QPSK	1/0	V	13.19	5.69	18.88	0.077
		16QAM	1/0	V	12.06	5.69	17.75	0.060
	1 745	QPSK	1/0	V	13.44	5.56	19.00	0.079
		16QAM	1/0	V	12.43	5.56	17.99	0.063
15	1 717.5	QPSK	1/0	V	13.03	5.86	18.89	0.077
		16QAM	1/0	V	11.73	5.86	17.59	0.057
	1 732.5	QPSK	1/0	V	13.27	5.69	18.96	0.079
		16QAM	1/0	V	11.65	5.69	17.34	0.054
	1 747.5	QPSK	1/0	V	11.37	5.53	16.90	0.049
		16QAM	1/0	V	9.98	5.53	15.51	0.036
10	1 715	QPSK	1/25	V	12.25	5.89	18.14	0.065
		16QAM	1/25	V	11.18	5.89	17.07	0.051
	1 732.5	QPSK	1/25	V	13.27	5.69	18.96	0.079
		16QAM	1/25	V	12.04	5.69	17.73	0.059
	1 750	QPSK	1/49	V	10.98	5.50	16.48	0.044
		16QAM	1/49	V	9.67	5.50	15.17	0.033
5	1 712.5	QPSK	1/12	V	12.45	5.91	18.36	0.069
		16QAM	1/12	V	11.12	5.91	17.03	0.050
	1 732.5	QPSK	1/12	V	13.24	5.69	18.93	0.078
		16QAM	1/12	V	11.98	5.69	17.67	0.058
	1 752.5	QPSK	1/24	V	11.98	5.47	17.45	0.056
		16QAM	1/24	V	10.71	5.47	16.18	0.041
3	1 711.5	QPSK	1/7	V	12.22	5.92	18.14	0.065
		16QAM	1/7	V	10.90	5.92	16.82	0.048
	1 732.5	QPSK	1/14	V	13.07	5.69	18.76	0.075
		16QAM	1/14	V	11.78	5.69	17.47	0.056
	1 753.5	QPSK	1/7	V	12.06	5.46	17.52	0.056
		16QAM	1/7	V	10.82	5.46	16.28	0.042
1.4	1 710.7	QPSK	1/5	V	11.94	5.93	17.87	0.061
		16QAM	1/5	V	10.54	5.93	16.47	0.044
	1 732.5	QPSK	1/2	V	12.81	5.69	18.50	0.071
		16QAM	1/2	V	11.55	5.69	17.24	0.053
	1 754.3	QPSK	1/2	V	12.24	5.45	17.69	0.059
		16QAM	1/2	V	10.66	5.45	16.11	0.041

7.1.6 LTE Band 2

Channel Bandwidth (MHz)	Test Frequency (MHz)	Test Mode	RB Size/ Offset	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain (dBi)	EIRP (dBm)	EIRP (W)
20	1 860	QPSK	1/0	V	14.37	4.69	19.06	0.081
		16QAM	1/0	V	13.60	4.69	18.29	0.067
	1 880	QPSK	1/50	V	14.20	4.56	18.76	0.075
		16QAM	1/50	V	13.26	4.56	17.82	0.061
	1 900	QPSK	1/0	V	14.01	4.42	18.43	0.070
		16QAM	1/0	V	13.04	4.42	17.46	0.056
15	1 857.5	QPSK	1/36	V	15.01	4.71	19.72	0.094
		16QAM	1/36	V	14.17	4.71	18.88	0.077
	1 880	QPSK	1/0	V	14.99	4.56	19.55	0.090
		16QAM	1/0	V	14.06	4.56	18.62	0.073
	1 902.5	QPSK	1/0	V	14.48	4.43	18.91	0.078
		16QAM	1/0	V	13.30	4.43	17.73	0.059
10	1 855	QPSK	1/25	V	15.27	4.73	20.00	0.100
		16QAM	1/25	V	14.37	4.73	19.10	0.081
	1 880	QPSK	1/0	V	14.91	4.56	19.47	0.089
		16QAM	1/0	V	14.21	4.56	18.77	0.075
	1 905	QPSK	1/0	V	13.27	4.43	17.70	0.059
		16QAM	1/0	V	12.31	4.43	16.74	0.047
5	1 852.5	QPSK	1/12	V	14.82	4.74	19.56	0.090
		16QAM	1/12	V	14.26	4.74	19.00	0.079
	1 880	QPSK	1/0	V	15.01	4.56	19.57	0.091
		16QAM	1/0	V	14.36	4.56	18.92	0.078
	1 907.5	QPSK	1/12	V	14.60	4.44	19.04	0.080
		16QAM	1/12	V	13.60	4.44	18.04	0.064
3	1 851.5	QPSK	1/14	V	14.43	4.75	19.18	0.083
		16QAM	1/14	V	13.55	4.75	18.30	0.068
	1 880	QPSK	1/0	V	14.64	4.56	19.20	0.083
		16QAM	1/0	V	13.84	4.56	18.40	0.069
	1 908.5	QPSK	1/7	V	14.28	4.44	18.72	0.074
		16QAM	1/7	V	13.34	4.44	17.78	0.060
1.4	1 850.7	QPSK	1/2	V	13.73	4.76	18.49	0.071
		16QAM	1/2	V	13.01	4.76	17.77	0.060
	1 880	QPSK	1/0	V	13.85	4.56	18.41	0.069
		16QAM	1/0	V	13.30	4.56	17.86	0.061
	1 909.3	QPSK	1/2	V	14.39	4.45	18.84	0.077
		16QAM	1/2	V	13.43	4.45	17.88	0.061

7.2 UNDESIRABLE EMISSIONS (Radiated)

- Test Notes

1) This device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported.
2) The frequency spectrum is examined from 9 kHz to the 10 th harmonic of the fundamental frequency of the transmitter.
   No other spurious and harmonic emissions were reported greater than listed emissions.
3) Limit Calculation for Band 2/4/5/12(17)/13 = 43 + 10 log10 (P[Watts])
4) Limit Calculation for 1 559 MHz ~ 1 610 MHz in Band 13 = −70 dBW/MHz (equivalent isotropically radiated power for wideband signals)

7.2.1 LTE Band 12(17)

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	704	1/49	QPSK	1 416.76	V	-60.41	3.06	-57.35	71.48	27.13
				2 125.22	V	-57.42	2.90	-54.52	68.65	
			16QAM	1 416.87	V	-61.78	3.07	-58.71	71.59	25.88
				2 125.64	V	-59.24	2.90	-56.34	69.22	
	711	1/25	QPSK	1 422.18	V	-58.43	3.12	-55.31	69.84	27.53
				2 133.50	V	-58.88	2.90	-55.98	70.51	
			16QAM	1 422.33	V	-59.98	3.12	-56.86	70.60	26.74
				2 133.23	V	-60.38	2.90	-57.48	71.22	

7.2.2 LTE Band 12

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
3	714.5	1/7	QPSK	1 428.95	V	-54.55	3.33	-51.22	66.04	27.82
				2 143.49	V	-58.88	3.32	-55.56	70.38	
			16QAM	1 429.04	V	-56.38	3.33	-53.05	66.46	26.41
				2 143.38	V	-60.45	3.32	-57.13	70.54	

7.2.3 LTE Band 13

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	782	1/0	QPSK	1 555.15	H	-63.31	3.59	-59.72	75.63	28.91
				2 340.81	H	-65.80	3.61	-62.19	78.10	
			16QAM	1 555.11	H	-64.32	3.59	-60.73	75.92	28.19
				2 338.75	H	-65.78	3.60	-62.18	77.37	
5	779.5	1/12	QPSK	2 338.20	H	-65.55	4.17	-61.38	78.19	29.81
			16QAM	2 338.60	H	-65.83	4.17	-61.66	77.12	28.46

UNDESIRABLE EMISSIONS IN 1559~1610MHz (LTE Band 13)

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result	Margin	Limit (dBm/MHz)
								(dBm/ MHz)	(dB)	
10	782	1/49	QPSK	1 572.85	H	-59.95	5.90	-54.05	14.05	-40.00
			16QAM	1 572.76	H	-61.09	5.90	-55.19	15.19	
5	779.5	1/24	QPSK	1 563.23	H	-60.10	5.81	-54.29	14.29	
			16QAM	1 563.38	H	-61.73	5.82	-55.91	15.91	

7.2.4 LTE Band 5

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBd)	Result		Limit (dBc)
								(dBm)	(dBc)	
10	829	1/25	QPSK	1 654.48	H	-68.69	4.03	-64.66	78.06	26.40
				2 487.24	V	-52.90	3.59	-49.31	62.71	
			16QAM	1 653.55	H	-68.65	4.03	-64.62	76.16	24.54
				2 487.36	V	-52.50	3.59	-48.91	60.45	
	836.5	1/0	QPSK	1 664.13	H	-68.05	4.00	-64.05	77.51	26.46
				2 496.14	V	-54.74	3.53	-51.21	64.67	
			16QAM	1 664.13	H	-68.46	4.00	-64.46	76.14	24.68
				2 496.28	V	-54.85	3.53	-51.32	63.00	
	844	1/25	QPSK	1 688.12	H	-66.05	3.93	-62.12	75.42	26.30
				2 532.32	V	-53.24	3.75	-49.49	62.79	
			16QAM	1 688.07	H	-66.69	3.93	-62.76	74.11	24.35
				2 532.39	V	-55.25	3.75	-51.50	62.85	
3	847.5	1/7	QPSK	1 695.09	H	-67.24	4.57	-62.67	76.28	26.61
				2 542.43	V	-53.21	4.19	-49.02	62.63	
			16QAM	1 694.85	H	-67.50	4.57	-62.93	74.85	24.92
				2 542.41	V	-53.96	4.19	-49.77	61.69	

7.2.5 LTE Band 4

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1 720	1/0	QPSK	3 439.89	V	-66.32	8.05	-58.27	77.22	31.95
			16QAM	3 410.77	V	-66.53	7.95	-58.58	76.39	30.81
	1 732.5	1/0	QPSK	3 434.73	V	-66.53	8.03	-58.50	77.38	31.88
			16QAM	3 438.68	V	-66.35	8.04	-58.31	76.06	30.75
	1 745	1/0	QPSK	3 472.24	V	-64.75	8.14	-56.61	75.61	32.00
			16QAM	3 472.22	V	-65.56	8.14	-57.42	75.41	30.99

7.2.6 LTE Band 2

B.W (MHz)	Test Freq. (MHz)	RB Size/ Offset	Test Mode	Freq.(MHz)	Ant Pol (H/V)	Level(dBm) @ Ant Terminal	TX Ant Gain(dBi)	Result		Limit (dBc)
								(dBm)	(dBc)	
20	1 860	1/0	QPSK	3 702.29	V	-63.33	8.21	-55.12	74.18	32.06
				5 553.20	H	-66.31	10.18	-56.13	75.19	
			16QAM	3 702.18	V	-64.12	8.21	-55.91	74.20	31.29
				5 553.39	H	-65.03	10.18	-54.85	73.14	
	1 880	1/50	QPSK	3 760.28	V	-63.61	8.27	-55.34	74.10	31.76
				5 664.17	H	-67.17	10.28	-56.89	75.65	
			16QAM	3 760.25	V	-64.90	8.27	-56.63	74.45	30.82
				5 661.20	H	-67.19	10.28	-56.91	74.73	
	1 900	1/0	QPSK	3 782.24	V	-62.47	8.32	-54.15	72.58	31.43
				5 660.31	H	-67.32	10.28	-57.04	75.47	
			16QAM	3 781.95	V	-63.88	8.32	-55.56	73.02	30.46
				5 657.85	H	-67.10	10.27	-56.83	74.29	
10	1 855	1/25	QPSK	3 710.28	V	-64.15	8.22	-55.93	75.93	33.00
				5 565.29	H	-66.37	10.18	-56.19	76.19	
			16QAM	3 710.28	V	-64.90	8.22	-56.68	75.78	32.10
				5 565.37	H	-66.71	10.18	-56.53	75.63	