

# TEST REPORT





**DT&C Co., Ltd.**

42, Yurim-ro, 154Beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea, 17042  
Tel : 031-321-2664, Fax : 031-321-1664

1. Report No : DRTFCC2008-0254
2. Customer
  - Name : BLUEBIRD INC.
  - Address : 3F, 115, Irwon-ro, Gangnam-gu, Seoul, South Korea
3. Use of Report : FCC Original Grant
4. Product Name / Model Name : Enterprise-Value Full Touch Handheld Computer / VF550  
FCC ID : SS4VF550
5. Test Method Used : KDB971168 D01v03, ANSI/TIA-603-E-2016, ANSI C63.26-2015  
Test Specification : §2, §24(E), §27
6. Date of Test : 2020.06.25 ~ 2020.07.22
7. Location of Test :  Permanent Testing Lab       On Site Testing
8. Testing Environment : Refer to 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.

Affirmation	Tested by	 (Signature)	Reviewed by	 (Signature)
	Name : Inhee Bae		Name : JaeJin Lee	

2020 . 08 . 21 .

**DT&C Co., Ltd.**

Not abided by KS Q ISO / IEC 17025 and KOLAS accreditation.

If this report is required to confirmation of authenticity, please contact to [report@dtnc.net](mailto:report@dtnc.net)

## Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2008-0254	Aug. 21, 2020	Initial issue	InHee Bae	JaeJin Lee

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## 1. GENERAL INFORMATION

**Applicant Name** : BLUEBIRD INC.  
**Address** : 3F, 115, Irwon-ro, Gangnam-gu, Seoul, South Korea  
**FCC ID** : SS4VF550  
**FCC Classification** : PCS Licensed Transmitter Held to Ear (PCE)  
**EUT Type** : Enterprise-Value Full Touch Handheld Computer  
**Model Name** : VF550  
**Add Model Name** : NA  
**Supplying power** : DC 3.85 V  
**Antenna Information** : Internal Antenna

Mode	TX Frequency (MHz)	Modulation	EIRP	
			Max power (dBm)	Max power (W)
LTE Band 4	1720 ~ 1745	QPSK	24.59	0.288
LTE Band 4	1720 ~ 1745	16QAM	23.42	0.220
LTE Band 4	1717.5 ~ 1747.5	QPSK	24.54	0.284
LTE Band 4	1717.5 ~ 1747.5	16QAM	23.42	0.220
LTE Band 4	1715 ~ 1750	QPSK	24.53	0.284
LTE Band 4	1715 ~ 1750	16QAM	23.44	0.221
LTE Band 4	1712.5 ~ 1752.5	QPSK	24.40	0.275
LTE Band 4	1712.5 ~ 1752.5	16QAM	23.38	0.218
LTE Band 4	1711.5 ~ 1753.5	QPSK	24.33	0.271
LTE Band 4	1711.5 ~ 1753.5	16QAM	23.27	0.212
LTE Band 4	1710.7 ~ 1754.3	QPSK	24.38	0.274
LTE Band 4	1710.7 ~ 1754.3	16QAM	23.36	0.217
LTE Band 2	1860 ~ 1900	QPSK	21.99	0.158
LTE Band 2	1860 ~ 1900	16QAM	20.48	0.112
LTE Band 2	1857.5 ~ 1902.5	QPSK	21.82	0.152
LTE Band 2	1857.5 ~ 1902.5	16QAM	20.35	0.108
LTE Band 2	1855 ~ 1905	QPSK	21.64	0.146
LTE Band 2	1855 ~ 1905	16QAM	20.22	0.105
LTE Band 2	1852.5 ~ 1907.5	QPSK	21.66	0.147
LTE Band 2	1852.5 ~ 1907.5	16QAM	20.22	0.105
LTE Band 2	1851.5 ~ 1908.5	QPSK	21.34	0.136
LTE Band 2	1851.5 ~ 1908.5	16QAM	19.91	0.098
LTE Band 2	1850.7 ~ 1909.3	QPSK	21.41	0.138
LTE Band 2	1850.7 ~ 1909.3	16QAM	20.09	0.102

Mode	TX Frequency (MHz)	Modulation	EIRP	
			Max power (dBm)	Max power (W)
LTE Band 7	2 510 ~ 2 560	QPSK	23.49	0.223
LTE Band 7	2 510 ~ 2 560	16QAM	22.27	0.169
LTE Band 7	2 507.5 ~ 2 562.5	QPSK	23.27	0.212
LTE Band 7	2 507.5 ~ 2 562.5	16QAM	22.08	0.161
LTE Band 7	2 505 ~ 2 565	QPSK	23.23	0.210
LTE Band 7	2 505 ~ 2 565	16QAM	21.99	0.158
LTE Band 7	2 502.5 ~ 2 567.5	QPSK	23.26	0.212
LTE Band 7	2 502.5 ~ 2 567.5	16QAM	22.12	0.163

## 2. INTRODUCTION

### 2.1 EUT DESCRIPTION

The Equipment Under Test (EUT) supports GSM/WCDMA/LTE Phone with Bluetooth, WLAN, NFC.

### 2.2. EUT CAPABILITIES

This EUT contains the following capabilities:

GSM/EDGE 850/1 900, WCDMA/HSUPA 850/1 900, Multi-band LTE, 802.11b/g/n/ac WLAN(2.4 GHz)  
802.11a/n/ac WLAN(5 GHz), Bluetooth(BDR, EDR, LE), NFC.

### 2.3. TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+21 °C ~ +25 °C
▪ Relative Humidity	39 % ~ 44 %

### 2.4 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.

### 2.5. 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)	5.1 dB (The confidence level is about 95 %, $k = 2$ )
Radiated Disturbance (Above 18 GHz)	5.3 dB (The confidence level is about 95 %, $k = 2$ )

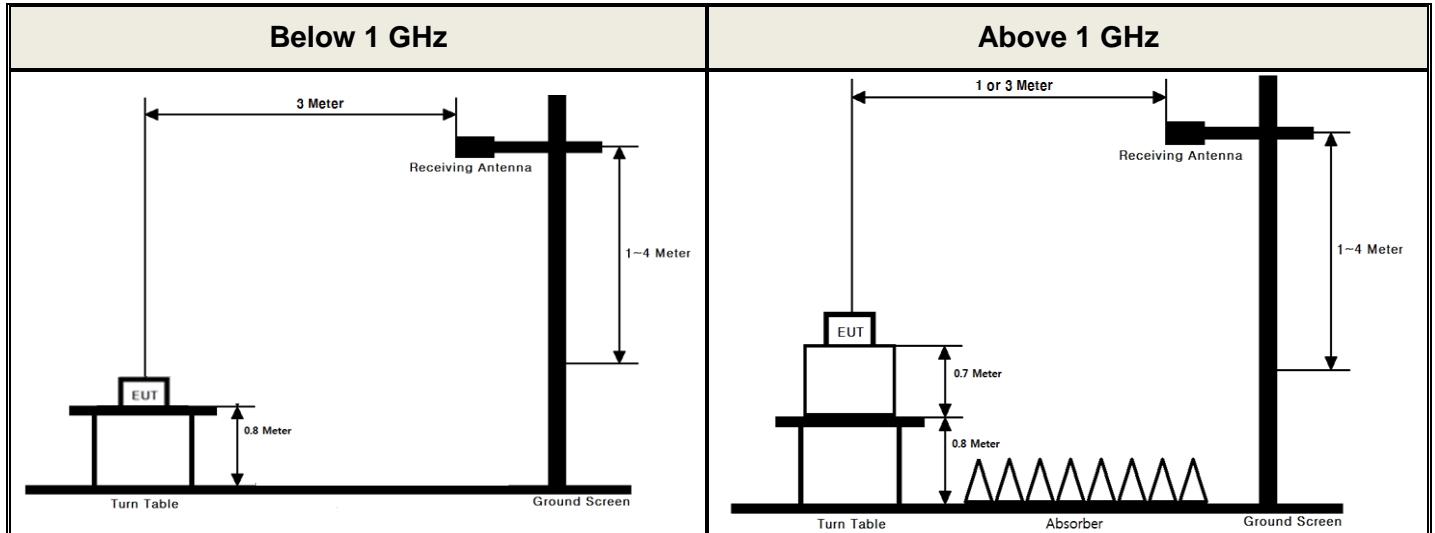
### 2.6. TEST FACILITY

<b>DT&amp;C Co., Ltd.</b>	
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 comply with the requirements of § 2.948 according to ANSI 63.4-2014.	
<b>- FCC MRA Accredited Test Firm No. : KR0034</b>	
<a href="http://www.dtnc.net">www.dtnc.net</a>	
Telephone	: + 82-31-321-2664
FAX	: + 82-31-321-1664

### 3. DESCRIPTION OF TESTS

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

##### Test Set-up



These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 1.5 meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz 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 D01v03 - 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  $\geq$  3 x RBW.
4. Set number of points in sweep  $\geq$  2 x span / RBW.
5. Sweep time:
  - 1) Set = auto-couple, or
  - 2) Set  $\geq$  [10 x (number of points in sweep) x (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:

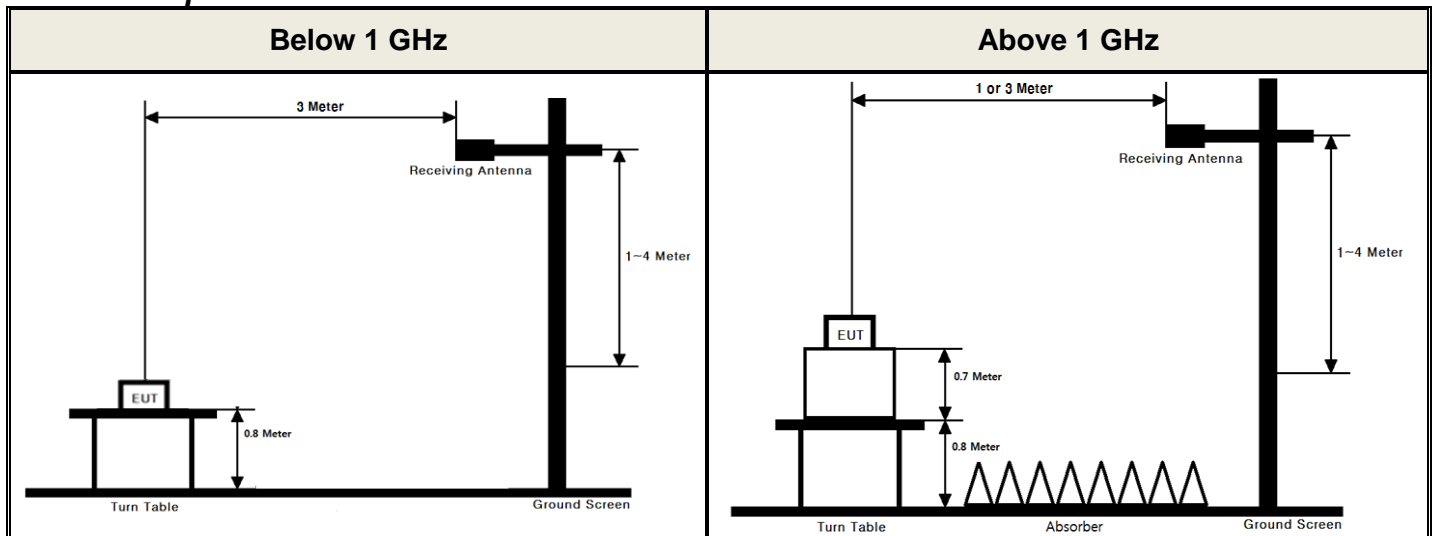
**ERP / EIRP = The conducted power at the substitute antenna's terminal [dBm] + Substitute Antenna gain [dBd for ERP, dBi for EIRP]**

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



These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 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 D01v03 - 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  $\geq$  3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point  $\geq$  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.

This measurement was performed with the EUT oriented in 3 orthogonal axis.

#### 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	20/06/24	21/06/24	US47360812
DC power supply	Agilent Technologies	66332A	20/06/24	21/06/24	MY43000394
Multimeter	FLUKE	17B+	19/12/16	20/12/16	36390701WS
Radio Communication Analyzer	Anritsu	MT8820C	19/12/16	20/12/16	6201274516
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-2
Thermohygrometer	BODYCOM	BJ5478	19/12/18	20/12/18	120612-1
Signal Generator	Rohde Schwarz	SMBV100A	19/12/16	20/12/16	255571
Signal Generator	ANRITSU	MG3695C	19/12/16	20/12/16	173501
Loop Antenna	ETS-Lindgren	6502	19/09/18	21/09/18	00226186
Bilog Antenna	Schwarzbeck	VULB 9160	19/04/23	21/04/23	9160-3362
Dipole Antenna	Schwarzbeck	UHA9105	20/04/10	22/04/10	2262
HORN ANT	ETS	3117	20/04/24	21/04/24	00140394
HORN ANT	A.H.Systems	SAS-574	20/06/24	21/06/24	155
PreAmplifier	H.P	8447D	19/12/16	20/12/16	2944A07774
PreAmplifier	Agilent	8449B	20/06/24	21/06/24	3008A02108
High-pass filter	Wainwright	WHNX8.5/26.5G-6SS	20/06/24	21/06/24	1
High-pass filter	Wainwright	WHKX10-2838-3300-18000-60SS	20/06/24	21/06/24	2
Cable	DTNC	Cable	20/01/16	21/01/16	M-01
Cable	DTNC	Cable	20/01/16	21/01/16	M-04
Cable	Junkosha	MWX315	20/01/16	21/01/16	M-05
Cable	Junkosha	MWX221	20/01/16	21/01/16	M-06

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.

Note2: The cable is not a regular calibration item, so it has been calibrated by DT & C itself.

## 5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
2.1046	Conducted Output Power	N/A	Conducted	NA Note 2
2.1049	Occupied Bandwidth	N/A		NA Note 2
24.232(d) 27.50(d.5)	Peak to Average Ratio	< 13 dB		NA Note 2
2.1051 24.238(a) 27.53(h)	Band Edge / Conducted Spurious Emissions	> 43 + 10log <sub>10</sub> (P) dB at Band edge and for all out-of-band emissions		NA Note 2
27.53(m)	Band Edge / Conducted Spurious Emissions	> 40 + 10log <sub>10</sub> (P) dB at channel edge and 5 MHz from the channel edge > 43 + 10log <sub>10</sub> (P) dB at 5 MHz and X MHz from the channel edge > 55 + 10log <sub>10</sub> (P) dB at all frequencies more than X MHz from the channel edge		NA Note 2
2.1055 24.235 27.54	Frequency Stability	Fundamental emissions must stay within Authorized frequency block (Part 24, 27)		NA Note 2
27.50(d.4)	Radiated Output Power (B4)	< 1 Watts max. EIRP	Radiated	C
24.232(c)	Radiated Output Power (B2)	< 2 Watts max. EIRP		C
27.50(h.2)	Radiated Output Power (B7)	< 2 Watts max. EIRP		C
2.1053 24.238(a) 27.53(h)	Undesirable Emissions (B2, B4)	> 43 + 10log <sub>10</sub> (P) dB for all out-of-band emissions		C
27.53(m)	Undesirable Emissions (B7)	> 55 + 10log <sub>10</sub> (P) dB for all out-of-band emissions		C

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: These test items were not performed because this device uses the granted module.

(FCC ID: XMR201805EC25AU)

Please refer to the test report of the granted module

## 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;

$$\text{EIRP(dBm)} = \text{LEVLE@ANTENNA TERMINAL} + \text{TX Antenna Gain (dBi)}$$

$$\text{ERP(dBm)} = \text{LEVLE@ANTENNA TERMINAL} + \text{TX Antenna Gain (dBd)}$$

$$\text{Where, TX Antenna Gain (dBd)} = \text{TX Antenna Gain (dBi)} - 2.15 \text{ dB}$$

## 7. TEST DATA

### 7.1 EIRP

#### - Test Notes

- 1) This 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 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)	Note
20	1 720	QPSK	1/50	H	18.44	5.28	23.72	0.236	-
		16QAM	1/50	H	17.31	5.28	22.59	0.182	-
	1 732.5	QPSK	1/50	H	19.16	5.33	24.49	0.281	-
		16QAM	1/50	H	18.00	5.33	23.33	0.215	-
	1 745	QPSK	1/99	H	19.21	5.38	24.59	0.288	-
		16QAM	1/99	H	18.04	5.38	23.42	0.220	-
15	1 717.5	QPSK	1/36	H	18.16	5.27	23.43	0.220	-
		16QAM	1/36	H	17.03	5.27	22.30	0.170	-
	1 732.5	QPSK	1/36	H	19.09	5.33	24.42	0.277	-
		16QAM	1/36	H	17.88	5.33	23.21	0.209	-
	1 747.5	QPSK	1/36	H	19.15	5.39	24.54	0.284	-
		16QAM	1/36	H	18.03	5.39	23.42	0.220	-
10	1 715	QPSK	1/25	H	18.06	5.26	23.32	0.215	-
		16QAM	1/25	H	17.11	5.26	22.37	0.173	-
	1 732.5	QPSK	1/25	H	19.13	5.33	24.46	0.279	-
		16QAM	1/25	H	17.72	5.33	23.05	0.202	-
	1 750	QPSK	1/25	H	19.13	5.40	24.53	0.284	-
		16QAM	1/25	H	18.04	5.40	23.44	0.221	-

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)	Note
5	1 712.5	QPSK	1/12	H	18.00	5.25	23.25	0.211	-
		16QAM	1/12	H	16.90	5.25	22.15	0.164	-
	1 732.5	QPSK	1/12	H	19.07	5.33	24.40	0.275	-
		16QAM	1/12	H	17.94	5.33	23.27	0.212	-
	1 752.5	QPSK	1/12	H	18.93	5.38	24.31	0.270	-
		16QAM	1/12	H	18.00	5.38	23.38	0.218	-
3	1 711.5	QPSK	1/7	H	18.02	5.25	23.27	0.212	-
		16QAM	1/7	H	16.86	5.25	22.11	0.163	-
	1 732.5	QPSK	1/7	H	19.00	5.33	24.33	0.271	-
		16QAM	1/7	H	17.93	5.33	23.26	0.212	-
	1 753.5	QPSK	1/7	H	18.94	5.37	24.31	0.270	-
		16QAM	1/7	H	17.90	5.37	23.27	0.212	-
1.4	1 710.7	QPSK	1/2	H	17.94	5.24	23.18	0.208	-
		16QAM	1/2	H	16.92	5.24	22.16	0.164	-
	1 732.5	QPSK	1/2	H	19.05	5.33	24.38	0.274	-
		16QAM	1/2	H	17.97	5.33	23.30	0.214	-
	1 754.3	QPSK	1/2	H	18.93	5.36	24.29	0.269	-
		16QAM	1/2	H	18.00	5.36	23.36	0.217	-

**7.1.2 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)	Note
20	1 860	QPSK	1/50	H	15.46	4.80	20.26	0.106	-
		16QAM	1/50	H	14.00	4.80	18.80	0.076	-
	1 880	QPSK	1/99	H	15.90	4.60	20.50	0.112	-
		16QAM	1/99	H	14.17	4.60	18.77	0.075	-
	1 900	QPSK	1/50	H	17.59	4.40	21.99	0.158	-
		16QAM	1/50	H	16.08	4.40	20.48	0.112	-
15	1 857.5	QPSK	1/36	H	15.50	4.83	20.33	0.108	-
		16QAM	1/36	H	14.04	4.83	18.87	0.077	-
	1 880	QPSK	1/36	H	15.67	4.60	20.27	0.106	-
		16QAM	1/36	H	14.29	4.60	18.89	0.077	-
	1 902.5	QPSK	1/36	H	17.41	4.41	21.82	0.152	-
		16QAM	1/36	H	15.94	4.41	20.35	0.108	-
10	1 855	QPSK	1/25	H	15.43	4.85	20.28	0.107	-
		16QAM	1/25	H	14.01	4.85	18.86	0.077	-
	1 880	QPSK	1/25	H	15.75	4.60	20.35	0.108	-
		16QAM	1/25	H	14.32	4.60	18.92	0.078	-
	1 905	QPSK	1/25	H	17.22	4.42	21.64	0.146	-
		16QAM	1/25	H	15.80	4.42	20.22	0.105	-
5	1 852.5	QPSK	1/12	H	15.36	4.88	20.24	0.106	-
		16QAM	1/12	H	13.93	4.88	18.81	0.076	-
	1 880	QPSK	1/12	H	15.51	4.60	20.11	0.103	-
		16QAM	1/12	H	14.06	4.60	18.66	0.073	-
	1 907.5	QPSK	1/12	H	17.23	4.43	21.66	0.147	-
		16QAM	1/12	H	15.79	4.43	20.22	0.105	-
3	1 851.5	QPSK	1/7	H	15.41	4.89	20.30	0.107	-
		16QAM	1/7	H	14.10	4.89	18.99	0.079	-
	1 880	QPSK	1/7	H	15.55	4.60	20.15	0.104	-
		16QAM	1/7	H	14.20	4.60	18.80	0.076	-
	1 908.5	QPSK	1/7	H	16.91	4.43	21.34	0.136	-
		16QAM	1/7	H	15.48	4.43	19.91	0.098	-
1.4	1 850.7	QPSK	1/2	H	15.36	4.89	20.25	0.106	-
		16QAM	1/2	H	13.91	4.89	18.80	0.076	-
	1 880	QPSK	1/2	H	15.43	4.60	20.03	0.101	-
		16QAM	1/2	H	14.09	4.60	18.69	0.074	-
	1 909.3	QPSK	1/2	H	16.97	4.44	21.41	0.138	-
		16QAM	1/2	H	15.65	4.44	20.09	0.102	-

### 7.1.3 LTE Band 7

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)	Note
20	2 510	QPSK	1/50	H	15.24	5.94	21.18	0.131	-
		16QAM	1/50	H	14.27	5.94	20.21	0.105	-
	2 535	QPSK	1/50	H	16.55	6.04	22.59	0.182	-
		16QAM	1/50	H	15.43	6.04	21.47	0.140	-
	2 560	QPSK	1/99	H	17.37	6.12	23.49	0.223	-
		16QAM	1/99	H	16.15	6.12	22.27	0.169	-
15	2 507.5	QPSK	1/36	H	15.35	5.93	21.28	0.134	-
		16QAM	1/36	H	14.31	5.93	20.24	0.106	-
	2 535	QPSK	1/36	H	16.50	6.04	22.54	0.179	-
		16QAM	1/36	H	15.38	6.04	21.42	0.139	-
	2 562.5	QPSK	1/36	H	17.14	6.13	23.27	0.212	-
		16QAM	1/36	H	15.95	6.13	22.08	0.161	-
10	2 505	QPSK	1/25	H	15.37	5.92	21.29	0.135	-
		16QAM	1/25	H	14.34	5.92	20.26	0.106	-
	2 535	QPSK	1/25	H	16.53	6.04	22.57	0.181	-
		16QAM	1/25	H	15.44	6.04	21.48	0.141	-
	2 565	QPSK	1/25	H	17.10	6.13	23.23	0.210	-
		16QAM	1/25	H	15.86	6.13	21.99	0.158	-
5	2 502.5	QPSK	1/12	H	15.26	5.91	21.17	0.131	-
		16QAM	1/12	H	14.03	5.91	19.94	0.099	-
	2 535	QPSK	1/12	H	16.51	6.04	22.55	0.180	-
		16QAM	1/12	H	15.53	6.04	21.57	0.144	-
	2 567.5	QPSK	1/12	H	17.12	6.14	23.26	0.212	-
		16QAM	1/12	H	15.98	6.14	22.12	0.163	-



## 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 10th 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 =  $43 + 10\log_{10}(P[\text{Watts}])$
- 4) Limit Calculation for Band 7 =  $55 + 10\log_{10}(P[\text{Watts}])$

### 7.2.1 LTE Band 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)	Note
								(dBm)	(dBc)		
20	1 720	1/50	QPSK	3 440.10	H	-54.31	7.78	-46.53	70.25	36.72	-
				5 160.19	H	-47.64	10.32	-37.32	61.04		-
			16QAM	3 440.05	H	-54.80	7.78	-47.02	69.61	35.59	-
				5 160.49	H	-48.20	10.32	-37.88	60.47		-
	1 732.5	1/50	QPSK	3 465.58	H	-54.81	7.83	-46.98	71.47	37.49	-
				5 197.70	H	-49.56	10.40	-39.16	63.65		-
			16QAM	3 465.20	H	-54.94	7.83	-47.11	70.44	36.33	-
				5 197.75	H	-50.40	10.40	-40.00	63.33		-
	1 745	1/99	QPSK	3 507.89	H	-55.19	7.93	-47.26	71.85	37.59	-
				5 261.83	H	-47.70	10.32	-37.38	61.97		-
			16QAM	3 507.67	H	-55.17	7.93	-47.24	70.66	36.42	-
				5 261.88	H	-48.43	10.32	-38.11	61.53		-

**7.2.2 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)	Note
								(dBm)	(dBc)		
20	1 860	1/50	QPSK	3 745.51	V	-51.46	8.39	-43.07	63.33	33.26	-
				5 580.32	V	-43.59	10.68	-32.91	53.17		-
			16QAM	3 744.69	V	-52.72	8.39	-44.33	63.13	31.80	-
				5 580.20	V	-45.20	10.68	-34.52	53.32		-
	1 880	1/99	QPSK	3 777.44	V	-51.30	8.45	-42.85	63.35	33.50	-
				5 666.69	V	-42.08	10.67	-31.41	51.91		-
			16QAM	3 777.86	V	-52.11	8.46	-43.65	62.42	31.77	-
				5 666.68	V	-41.60	10.67	-30.93	49.70		-
	1 900	1/50	QPSK	3 801.26	V	-51.76	8.50	-43.26	65.25	34.99	-
				5 700.35	V	-42.08	10.60	-31.48	53.47		-
			16QAM	3 800.74	V	-52.47	8.50	-43.97	64.45	33.48	-
				5 700.01	V	-42.61	10.60	-32.01	52.49		-

**7.2.3 LTE Band 7**

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)	Note
								(dBm)	(dBc)		
20	2 510	1/50	QPSK	5 019.93	H	-48.53	10.24	-38.29	59.47	46.18	-
				7 530.07	V	-44.89	12.16	-32.73	53.91		-
				10 040.41	H	-53.10	13.10	-40.00	61.18		-
			16QAM	5 020.09	H	-48.76	10.24	-38.52	58.73	45.21	-
				7 530.50	V	-45.74	12.16	-33.58	53.79		-
				10 040.41	H	-54.98	13.10	-41.88	62.09		-
	2 535	1/50	QPSK	5 070.17	H	-50.25	10.30	-39.95	62.54	47.59	-
				7 605.07	V	-46.06	12.20	-33.86	56.45		-
				10 140.36	H	-53.30	13.02	-40.28	62.87		-
			16QAM	5 069.99	H	-51.29	10.30	-40.99	62.46	46.47	-
				7 605.08	V	-47.01	12.20	-34.81	56.28		-
				10 140.60	H	-55.27	13.02	-42.25	63.72		-
	2 560	1/99	QPSK	5 138.26	H	-49.50	10.30	-39.20	62.69	48.49	-
				7 707.16	V	-46.89	12.21	-34.68	58.17		-
				10 275.64	H	-52.13	13.05	-39.08	62.57		-
			16QAM	5 137.60	H	-49.97	10.30	-39.67	61.94	47.27	-
				7 706.77	V	-46.45	12.21	-34.24	56.51		-
				10 275.73	H	-53.18	13.05	-40.13	62.40		-