TEST REPORT

FCC/ISED LTE Test for WW23D

APPLICANT
Panasonic Connect Co.,Ltd.

REPORT NO.
HCT-RF-2406-FC010

DATE OF ISSUE
July 23, 2024

Tested by
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Technical Manager
Jong Seok Lee

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DATE OF ISSUE
July 23, 2024

Applicant	**Panasonic Connect Co.,Ltd.** ytv Kyobashi Building, 2-2-33 Shiromi, Chuo-ku, Osaka 540-8553 Japan
Product Name Model Name	Wirelss Module WW23D
Date of Test	May 02, 2024 ~ June 21, 2024
Location of Test	■ Permanent Testing Lab ☐ On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 Republic of Korea)
FCC ID	ACJ9TGWW23D
IC	216H-CFWW23D
FCC Classification	PCS Licensed Transmitter (PCB)
Test Standard Used	FCC Rule Part(s) : § 22, § 24, § 27, § 90 ISED Rule Part(s): RSS-Gen Issue5, RSS-130 Issue2, RSS-132 Issue 4, RSS-133 Issue 6, RSS-139 Issue 4, RSS-140 issue 1, RSS-192 Issue 5, RSS-199 Issue 4
Test Results	PASS

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	July 23, 2024	Initial Release

Notice

Content
The measurements shown in this report were made in accordance with the procedures specified in CFR47 section § 2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)
The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated. The test results have only been applied with the test methods required by the standard(s).
The laboratory is not accredited for the test results marked *. Information provided by the applicant is marked **. Test results provided by external providers are marked ***.
When confirmation of authenticity of this test report is required, please contact www.hct.co.kr
The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

CONTENTS

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	Panasonic Connect Co.,Ltd.	
Address:	ytv Kyobashi Building, 2-2-33 Shiromi, Chuo-ku, Osaka 540-8553 Japan	
FCC ID:	ACJ9TGWW23D	
IC	216H-CFWW23D	
FCC Classification	PCS Licensed Transmitter (PCB)	
FCC Rule Part(s):	§ 22, § 24, § 27, § 90	
ISED Rule Part(s):	RSS-Gen Issue5, RSS-130 Issue2, RSS-132 Issue 4, RSS-133 Issue 6, RSS-139 Issue 4, RSS-140 issue 1, RSS-192 Issue 5, RSS-199 Issue 4	
EUT Type:	Wirelss Module	
Model(s):	WW23D	
Additional Model(s)	-	
Tx Frequency:	WCDMA	826.40 - 846.60 MHz (WCDMA850) 1 852.4 – 1 907.6 MHz (WCDMA1900) 1 712.4 – 1 752.6 MHz (WCDMA1700)
	LTE B2	1850.7 MHz – 1909.3 MHz (LTE – Band2 (1.4 MHz)) 1851.5 MHz – 1908.5 MHz (LTE – Band2 (3 MHz)) 1852.5 MHz – 1907.5 MHz (LTE – Band2 (5 MHz)) 1855.0 MHz – 1905.0 MHz (LTE – Band2 (10 MHz)) 1857.5 MHz – 1902.5 MHz (LTE – Band2 (15 MHz)) 1860.0 MHz – 1900.0 MHz (LTE – Band2 (20 MHz))
	LTE B4	1710.7 MHz – 1754.3 MHz (LTE – Band 4 (1.4 MHz)) 1711.5 MHz – 1753.5 MHz (LTE – Band 4 (3 MHz)) 1712.5 MHz – 1752.5 MHz (LTE – Band 4 (5 MHz)) 1715.0 MHz – 1750.0 MHz (LTE – Band 4 (10 MHz)) 1717.5 MHz – 1747.5 MHz (LTE – Band 4 (15 MHz)) 1720.0 MHz – 1745.0 MHz (LTE – Band 4 (20 MHz))
	LTE B5	824.7 MHz – 848.3 MHz (LTE – Band 5 (1.4 MHz)) 825.5 MHz – 847.5 MHz (LTE – Band 5 (3 MHz)) 826.5 MHz – 846.5 MHz (LTE – Band 5 (5 MHz)) 829.0 MHz – 844.0 MHz (LTE – Band 5 (10 MHz))
	LTE B7	2502.5 – 2567.5 (LTE – Band 7 (5 MHz)) 2505.0 – 2565.0 (LTE – Band 7 (10 MHz)) 2507.5 – 2562.5 (LTE – Band 7 (15 MHz)) 2510.0 – 2560.0 (LTE – Band 7 (20 MHz))
	LTE B12	699.7 MHz – 715.3 MHz (LTE – Band 12 (1.4 MHz)) 700.5 MHz – 714.5 MHz (LTE – Band 12 (3 MHz)) 701.5 MHz – 713.5 MHz (LTE – Band 12 (5 MHz)) 704.0 MHz – 711.0 MHz (LTE – Band 12 (10 MHz))
	LTE B13	779.5 MHz –784.5 MHz (LTE – Band 13 (5 MHz)) 782 MHz (LTE – Band 13 (10 MHz))
	LTE B14	790.5 MHz –795.5 MHz (LTE – BAND 14 (5MHz)) 793.0 MHz (LTE – BAND 14 (10 MHz))
	LTE B17	706.5 MHz – 713.5 MHz (LTE – Band 17 (5 MHz)) 709.0 MHz – 711.0 MHz (LTE – Band 17 (10 MHz))
	LTE B25	1850.7 MHz – 1914.3 MHz (LTE – Band25 (1.4 MHz)) 1851.5 MHz – 1913.5 MHz (LTE – Band25 (3 MHz)) 1852.5 MHz – 1912.5 MHz (LTE – Band25 (5 MHz))

		1855.0 MHz – 1910.0 MHz (LTE – Band25 (10 MHz)) 1857.5 MHz – 1907.5 MHz (LTE – Band25 (15 MHz)) 1860.0 MHz – 1905.0 MHz (LTE – Band25 (20 MHz))
	LTE B26	824.7 MHz – 848.3 MHz (LTE – Band 26 (1.4 MHz)) 825.5 MHz – 847.5 MHz (LTE – Band 26 (3 MHz)) 826.5 MHz – 846.5 MHz (LTE – Band 26 (5 MHz)) 829.0 MHz – 844.0 MHz (LTE – Band 26 (10 MHz)) 831.5 MHz – 841.5 MHz (LTE – Band 26 (15 MHz))
	LTE B26 (Part 90)	814.7 MHz – 824.0 MHz (LTE – Band 26(Part90) (1.4 MHz)) 815.5 MHz – 824.0 MHz (LTE – Band 26(Part90) (3 MHz)) 816.5 MHz – 824.0 MHz (LTE – Band 26(Part90) (5 MHz)) 819.0 MHz – 824.0 MHz (LTE – Band 26(Part90) (10 MHz)) 821.5 MHz (LTE – Band 26(Part90) (15 MHz))
	LTE B38	2572.5 – 2617.5 (LTE – Band 38 (5 MHz)) 2575.0 – 2615.0 (LTE – Band 38 (10 MHz)) 2577.5 – 2612.5 (LTE – Band 38 (15 MHz)) 2580.0 – 2610.0 (LTE – Band 38 (20 MHz))
	LTE B41	2498.5 – 2687.5 (LTE – Band 41 (5 MHz)) 2501.0 – 2685.0 (LTE – Band 41 (10 MHz)) 2503.5 – 2682.5 (LTE – Band 41 (15 MHz)) 2506.0 – 2680.0 (LTE – Band 41 (20 MHz))
	LTE B66	1710.7 MHz – 1779.3 MHz (LTE – Band 66 (1.4 MHz)) 1711.5 MHz – 1778.5 MHz (LTE – Band 66 (3 MHz)) 1712.5 MHz – 1777.5 MHz (LTE – Band 66 (5 MHz)) 1715.0 MHz – 1775.0 MHz (LTE – Band 66 (10 MHz)) 1717.5 MHz – 1772.5 MHz (LTE – Band 66 (15 MHz)) 1720.0 MHz – 1770.0 MHz (LTE – Band 66 (20 MHz))
	Sub6 n2	1852.5 MHz – 1907.5 MHz (Sub6 n2 (5 MHz)) 1855.0 MHz – 1905.0 MHz (Sub6 n2 (10 MHz)) 1857.5 MHz – 1902.5 MHz (Sub6 n2 (15 MHz)) 1860.0 MHz – 1900.0 MHz (Sub6 n2 (20 MHz)) 1862.5 MHz – 1897.5 MHz (Sub6 n2 (25 MHz)) 1865.0 MHz – 1895.0 MHz (Sub6 n2 (30 MHz)) 1867.5 MHz – 1892.5 MHz (Sub6 n2 (35 MHz)) 1870.0 MHz – 1890.0 MHz (Sub6 n2 (40 MHz))
	Sub6 n5	826.5 MHz – 846.5 MHz (Sub6 n5 (5 MHz)) 829.0 MHz – 844.0 MHz (Sub6 n5 (10 MHz)) 831.5 MHz – 841.5 MHz (Sub6 n5 (15 MHz)) 834.0 MHz – 839.0 MHz (Sub6 n5 (20 MHz))
	Sub6 n66	1712.5 MHz – 1777.5 MHz (Sub6 n66(5 MHz)) 1715.0 MHz – 1775.0 MHz (Sub6 n66(10 MHz)) 1717.5 MHz – 1772.5 MHz (Sub6 n66(15 MHz)) 1720.0 MHz – 1770.0 MHz (Sub6 n66(20 MHz)) 1722.5 MHz – 1767.5 MHz (Sub6 n66(25 MHz)) 1725.0 MHz – 1765.0 MHz (Sub6 n66(30 MHz)) 1727.5 MHz – 1762.5 MHz (Sub6 n66(35 MHz)) 1730.0 MHz – 1760.0 MHz (Sub6 n66(40 MHz))
	Sub6 n77 (3450 MHz – 3550 MHz)	3455.01 MHz – 3544.99 MHz (Sub6 n77(10 MHz)) 3457.50 MHz – 3542.50 MHz (Sub6 n77(15 MHz)) 3460.02 MHz – 3540.00 MHz (Sub6 n77(20 MHz)) 3462.50 MHz – 3537.50 MHz (Sub6 n77(25 MHz)) 3465.00 MHz – 3534.99 MHz (Sub6 n77(30 MHz)) 3470.01 MHz – 3529.98 MHz (Sub6 n77(40 MHz)) 3475.02 MHz – 3525.00 MHz (Sub6 n77(50 MHz)) 3480.00 MHz – 3519.99 MHz (Sub6 n77(60 MHz)) 3485.01 MHz – 3514.98 MHz (Sub6 n77(70 MHz)) 3490.02 MHz – 3510.00 MHz (Sub6 n77(80 MHz)) 3495.00 MHz – 3504.99 MHz (Sub6 n77(90 MHz)) 3500.01 MHz (Sub6 n77(100 MHz))
	Sub6 n77 (3700 MHz –	3705.00 MHz – 3975.00 MHz (Sub6 n77(10 MHz)) 3707.51 MHz – 3972.48 MHz (Sub6 n77(15 MHz))

	3980 MHz)	3710.01 MHz – 3969.99 MHz (Sub6 n77(20 MHz)) 3712.50 MHz – 3967.50 MHz (Sub6 n77(25 MHz)) 3715.02 MHz – 3964.98 MHz (Sub6 n77(30 MHz)) 3720.00 MHz – 3960.00 MHz (Sub6 n77(40 MHz)) 3725.10 MHz – 3954.99 MHz (Sub6 n77(50 MHz)) 3730.02 MHz – 3949.98 MHz (Sub6 n77(60 MHz)) 3735.00 MHz – 3945.00 MHz (Sub6 n77(70 MHz)) 3740.01 MHz – 3939.99 MHz (Sub6 n77(80 MHz)) 3745.02 MHz – 3934.98 MHz (Sub6 n77(90 MHz)) 3745.02 MHz – 3934.98 MHz (Sub6 n77(90 MHz)) 3750.00 MHz – 3930.00 MHz (Sub6 n77(100 MHz))
Date(s) of Tests:	May 02, 2024 ~ June 21, 2024	
Serial number:	S0P-23-01197	
PMN (Product Marketing Number)	WW23D	
HVIN (Hardware Version Identification Number)	WW23D	
FVIN (Firmware Version Identification Number)	N/A	
HMN (Host Marketing Name)	CF-33	

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Wirelss Module with LTE & NR.

2.2. 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.

2.3. TEST FACILITY

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the **74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.**
For ISED, test facility was accepted dated March 13, 2024 (CAB identifier: KR0032).

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Conducted Output Power	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 CONDUCTED OUTPUT POWER

Test Overview

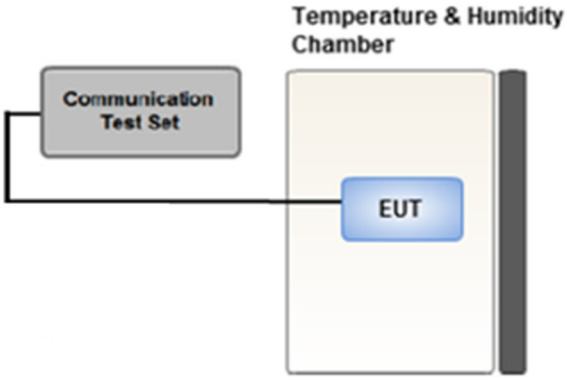
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base station emulator, communications test set, call box, or similar instrumentation that is capable of establishing a communications link with the EUT to enable control over variable parameters (e.g., output power, OBW, etc.).

In some cases, these instruments also include basic digital spectrum analyzer and/or power meter capabilities that can be utilized to measure the RF output power if the specified detectors and requirements can be realized and the measurement functions have been calibrated.

Test Procedure

1. The RF port of the EUT was connected to the Communication Tester via an RF cable.
2. Conducted average power was measured using a calibrated Radio Communication Tester.

Test setup



3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points > 2 x span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10^{th} harmonics from 9 kHz.

Test Note

1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
   The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data
3. For spurious emissions above 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
   The spurious emissions is calculated by the following formula;

$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   Where: P_g is the generator output power into the substitution antenna.

   If the fundamental frequency is below 1 GHz, RF output power has been converted to EIRP.

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

3.4 RECEIVER SPURIOUS EMISSIONS

Test Procedure of Receiver Spurious Emissions (Below 1 GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz
7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)

Above 1 GHz

Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 1 GHz – 25 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 1 MHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Average):
      - We performed using a reduced video BW method was done with the analyzer in linear mode
      - Measured Frequency Range : 1 GHz – 25 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 1 MHz
      - VBW ≥ 1/τ Hz, where τ = pulse width in seconds
        The actual setting value of VBW = 1 kHz
9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
10. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacture	Serial No.	Due to Calibration	Calibration Interval
Precision Dipole Antenna	UHAP	Schwarzbeck	01273	03/10/2026	Biennial
Precision Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	02289	02/14/2026	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1299	04/27/2025	Biennial
Horn Antenna(15~40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Horn Antenna(15~40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Loop Antenna(9 kHz~30 MHz)	FMZB1513	Rohde & Schwarz	1513-175	01/16/2025	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/09/2025	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/24/2025	Biennial
RF Switching System	FBSR-06B (1G HPF + LNA)	T&M SYSTEM	F3L1	05/14/2025	Annual
RF Switching System	FBSR-06B (3G HPF + LNA)	T&M SYSTEM	F3L2	05/14/2025	Annual
RF Switching System	FBSR-06B (6G HPF + LNA)	T&M SYSTEM	F3L3	05/14/2025	Annual
RF Switching System	FBSR-06B (LNA)	T&M SYSTEM	F3L4	05/14/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	08/25/2024	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	02/29/2025	Annual
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Signal Analyzer(10 Hz~26.5 GHz)	N9020A	Agilent	MY51110063	04/04/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer(10 Hz~40 GHz)	FSV40	REOHDE & SCHWARZ	101436	02/13/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287701	05/16/2025	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/14/2025	Annual
SIGNAL GENERATOR (100 kHz~40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	06/22/2024	Annual
Signal Analyzer(5 Hz~40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/19/2024	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
2. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted & Radiated Test

-. FCC

Test Description	FCC Part Section(s)	Test Limit	Test Result
Conducted Output Power	§ 2.1046	N/A	C Note1
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 22.917(a), § 24.238(a), § 27.53(c),(g),(h), § 90.543(e)	< -13 dBm	C Note3
	§ 27.53(m)	< -25 dBm	

-. ISED

Test Description	ISED Part Section(s)	Test Limit	Test Result
Conducted Output Power	-	N/A	C Note3
Radiated Spurious and Harmonic Emissions	RSS 130(4.7) RSS 132(5.5) RSS 133(6.5) RSS 139(5.6) RSS 140(4.4)	< -13 dBm	C Note3
	RSS-199(5.6)	< -25 dBm	
	RSS 192(5.6)	< -30 dBm	
Receiver Spurious Emissions	RSS Gen(7)	Section 8.3	C Note3

Note:

1. See SAR Report
2. C = Comply, NT = Not Tested, NA = Not Applicable, NC = Not Comply
3. C2PC models are electrically identical to the Original models.
   The Product Equality Declaration includes detailed information about the changes between the devices.
4. The data from that application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the test result of section 8
5. Output power was verified to be within the expected tune up tolerances prior to performing the spot checks for radiated spurious emissions and Conducted power to confirm that the proposed changes to the digital circuitry had not adversely affected the previously reported values in the original filing.

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
channel	Freq.(MHz)						W	dBm
128	824.20	-21.37	38.40	-10.61	0.95	H	0.483	26.84

ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
2) During the test, the turn table is rotated until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
20175	1,732.50	-15.75	18.45	9.90	1.76	H	0.456	26.59

EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
2) During the test, the turn table is rotated until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D
LTE BW = 4.48 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 Conducted Power

-. FCC & ISED

Modulation	Frequency	Frequency	Mode	Original (dBm)	C2PC (dBm)	Gap (dBm)
	MHz	Ch.				
WCDMA_B2	1880.0	9400	RMC	24.17	23.32	0.85
WCDMA_B4	1752.6	1513	RMC	24.40	23.77	0.63
WCDMA_B5	826.4	4132	RMC	24.28	23.43	0.85
LTE B2 (20 MHz)	1880.0	18900	QPSK	23.33	22.83	0.50
LTE B4 (20 MHz)	1745.0	20300	QPSK	23.56	22.74	0.82
LTE B5 (10 MHz)	829.0	20450	QPSK	23.00	22.53	0.47
LTE B7 (20 MHz)	2560.0	21350	QPSK	23.40	22.97	0.43
LTE B12 (10 MHz)	707.5	23095	QPSK	23.20	22.88	0.32
LTE B13 (10 MHz)	782.0	23230	QPSK	23.40	22.46	0.94
LTE B14 (10 MHz)	793.0	73330	QPSK	23.22	22.50	0.72
LTE B17 (10 MHz)	709.0	23780	QPSK	23.22	22.95	0.27
LTE B25 (20 MHz)	1860.0	26140	QPSK	23.34	22.76	0.58
LTE B26_part22 (15 MHz)	831.5	26865	QPSK	23.31	22.70	0.61
LTE B26_part90 (15 MHz)	821.5	26765	QPSK	23.09	22.80	0.29
LTE B38 (20 MHz)	2595.0	38000	QPSK	23.40	23.03	0.37
LTE B41 (20 MHz)	2680.0	41490	QPSK	25.13	22.95	2.18
LTE B66 (20 MHz)	1720.0	132072	QPSK	23.56	22.87	0.69
NR n2 (20 MHz)	1860.0	372000	BPSK	23.39	23.01	0.38
NR n5 (20 MHz)	834.0	166800	BPSK	23.42	23.10	0.32
NR n66 (20 MHz)	1770.0	354000	BPSK	23.86	23.38	0.48
NR n77 (30 MHz)	633334	3500.01	BPSK	23.17	22.92	0.25

Note:

1. All modes of operation were investigated and the worst case configuration results are reported.

8.2 RADIATED SPURIOUS EMISSIONS

-.FCC & ISED

Band	Bandwidth (MHz)	Freq (MHz)	RSE (dBm)	
			Original	C2PC
WCDMA_B2	-	3760.00	-55.18	Note2
WCDMA_B4	-	6849.60	-52.70	Note2
WCDMA_B5	-	3305.60	-56.68	Note2
LTE B2	20	3760.00	-54.54	Note2
LTE B4	3	6846.00	-54.33	Note2
LTE B5	5	3306.00	-55.85	Note2
LTE B7	10	10260.00	-52.19	Note2
LTE B12	5	2806.00	-56.46	Note2
LTE B13	5	3128.00	-55.69	Note2
LTE B14	5	3182.00	-62.74	Note2
LTE B17	5	2826.00	-57.03	Note2
LTE B25	5	3765.00	-54.70	Note2
LTE B26_part22	10	3346.00	-56.35	Note2
LTE B26_part90	5	3266.00	-55.48	Note2
LTE B38	15	10380.00	-50.66	Note2
LTE B41	10	10740.00	-48.83	Note2
LTE B66	10	7100.00	-56.94	Note2
NR n2	20	7440.00	-57.03	Note2
NR n5	20	2509.50	-62.87	Note2
NR n66	20	7080.00	-58.12	Note2
NR n77	100	7000.02	-49.28	Note2

Note:

1. All modes of operation were investigated and the worst case configuration results are reported.
2. Result : No peak found

8.3 RECEIVER SPURIOUS EMISSIONS

Frequency Range : 30 MHz ~ 1 GHz

Frequency	Reading	Ant. factor+Cable loss- Amp Gain	Ant. POL	Total	Limit	Margin
MHz	dB µV	dB /m	(H/V)	dB µV/m	dB µV/m	dB
No Peak Found						

Frequency Range : Above 1 GHz

Frequency	Reading	Ant. factor+Cable loss- Amp Gain	Ant. POL	Total	Limit	Margin
MHz	dB µV	dB /m	(H/V)	dB µV/m	dB µV/m	dB
No Peak Found						

Limit

Frequency (MHz)	Field Strength (µv/m at 3 meters)
30 – 88	100
88 - 216	150
216 – 960	200
Above 960	500