



Partial FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2407-1
FCC ID : IHDT56AS2
STANDARD : 47 CFR Part 2, 22, 27, 90(S)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)
TEST DATE(S) : May 22, 2024

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

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

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (ShenZhen)

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People's Republic of China



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Product Feature of Equipment Under Test	5
1.4 Product Specification of Equipment Under Test	5
1.5 Modification of EUT	6
1.6 Specification of Accessory	6
1.7 Testing Location	7
1.8 Test Software	7
1.9 Applicable Standards	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Test Mode	8
2.2 Connection Diagram of Test System	9
2.3 Support Unit used in test configuration and system	9
2.4 Frequency List of Low/Middle/High Channels	10
3 RADIATED TEST ITEMS	12
3.1 Measuring Instruments	12
3.2 Test Setup	12
3.3 Test Result of Radiated Test	13
3.4 Radiated Spurious Emission	14
4 LIST OF MEASURING EQUIPMENT	15
5 MEASUREMENT UNCERTAINTY	16
APPENDIX A. TEST RESULTS OF RADIATED TEST	
APPENDIX B. TEST SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG441212-01B	Rev. 01	Initial issue of report	Jun. 03, 2024



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1053 §22.917(a) §27.53(l)(2) §90.691	Radiated Spurious Emission (5G NR n26) (5G NR n77) (5G NR n78)	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 14.64 dB at 5061.18 MHz

Remark: This partial report only includes 5G NR RSE test data, 5G NR other test cases are shown separately.

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.	



1 General Description

1.1 Applicant

Motorola Mobility LLC

222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC

222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2407-1
FCC ID	IHDT56AS2
IMEI Code	Radiation: 355519300014636/355519300014644
HW Version	DVT2
SW Version	U3UW34.46
EUT Stage	Identical Prototype

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	5G NR n26 : 824 MHz ~ 849 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 MHz
Rx Frequency	5G NR n26 : 869 MHz ~ 894 MHz 5G NR n77: 3700 MHz ~ 3980 MHz 5G NR n78: 3700 MHz ~ 3800 MHz
Bandwidth	n26: 5MHz / 10MHz / 15MHz / 20MHz n77/n78 : 10MHz / 15MHz / 20MHz / 30MHz / 40MHz / 50MHz / 60MHz / 70MHz / 80MHz / 90MHz / 100MHz
SCS	15kHz for n26 30kHz for n77/n78
Antenna Gain	<Ant. 0>: n26 : -5.60 dBi <Ant. 1>: n26 : -6.38 dBi <Ant. 3>: n77/n78 : -3.41 dBi <Ant. 4>: n77/n78 : -0.87 dBi <Ant. 6>: n77/n78 : -3.22 dBi



	<Ant. 9>: n77/n78 : -3.64 dBi
Type of Modulation	CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM

Remark:

1. 5G NR Bands support SA mode for n26/n77/n78 and NSA mode for n77/n78.
2. 5G NR n77/n78 support HPUE(PC2) mode.
3. 5G NR Band n77 overlaps the entire frequency range of Band n78, and n77 power > n78 power, therefore the RSE test results of n77 provided in this report cover n78.

1.5 Modification of EUT

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

1.6 Specification of Accessory

Specification of Accessory				
AC Adapter 1(EU)	Brand Name	Motorola(chenyang)	Model Name	MC-682N
AC Adapter 1(UK)	Brand Name	Motorola(chenyang)	Model Name	MC-683N
AC Adapter 1(AU)	Brand Name	Motorola(chenyang)	Model Name	MC-685N
AC Adapter 1(US)	Brand Name	Motorola(chenyang)	Model Name	MC-681N
AC Adapter 1(AR)	Brand Name	Motorola(chenyang)	Model Name	MC-686N
AC Adapter 1(CHILE)	Brand Name	Motorola(chenyang)	Model Name	MC-689N
AC Adapter 2(EU)	Brand Name	Motorola(Acbel)	Model Name	MC-682N
AC Adapter 2(UK)	Brand Name	Motorola(Acbel)	Model Name	MC-683N
AC Adapter 2(AU)	Brand Name	Motorola(Acbel)	Model Name	MC-685N
AC Adapter 2(US)	Brand Name	Motorola(Acbel)	Model Name	MC-681N
AC Adapter 2(AR)	Brand Name	Motorola(Acbel)	Model Name	MC-686N
Battery 1	Brand Name	Motorola(SUNWODA)	Model Name	QR50
Battery 2	Brand Name	Motorola(ATL)	Model Name	QR50
USB Cable 1	Brand Name	Motorola(Luxshare)	Model Name	SC18E08104
USB Cable 2	Brand Name	Motorola(Saibao)	Model Name	SC18D71644



1.7 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-SZ	CN1256	421272

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24

1.9 Applicable Standards

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

- ♦ 47 CFR Part 2, 22, 27, 90(S)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

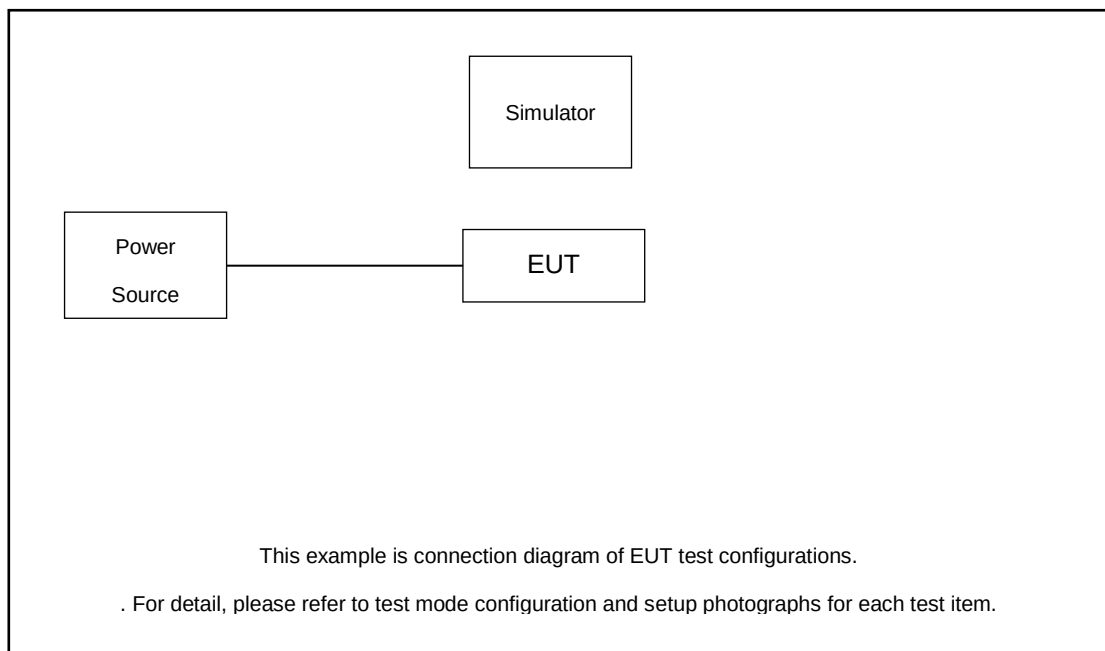
For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X/Y plane) were recorded in this report.

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.

Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			

Test Items	5G NR	Bandwidth (MHz)													Modulation				RB #		Test Channel				
		5	10	15	20	-	30	40	50	60	70	80	90	100	PI/2 BPSK	QPSK	16QAM	4QAM	56QAM	1	Full	L	M	H	
Radiated Spurious Emission	n26	Worst Case																					v		
	n77	Worst Case																					v		
Note	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 4. Frequency Stability : Normal Voltage = 3.91V ; Low Voltage =3.40V. ; High Voltage =4.50V																								

2.2 Connection Diagram of Test System



The EUT has been configuration operated in a manner tended to maximize its emission characteristics in a typical application.

2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	DC Power Supply	GW	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m
3.	NR Base Station	Anritsu	MT8000A	N/A	N/A	Unshielded, 1.8 m



2.4 Frequency List of Low/Middle/High Channels

5G NR n26 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	166800	167300	167800
	Frequency	834	836.5	839
15	Channel	166300	167300	168300
	Frequency	831.5	836.5	841.5
10	Channel	165800	167300	168800
	Frequency	829	836.5	844
5	Channel	165300	167300	169300
	Frequency	826.5	836.5	846.5

5G n77 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
100	Channel	650000	656000	662000
	Frequency	3750	3840	3930
90	Channel	649668	656000	662332
	Frequency	3745.02	3840	3934.98
80	Channel	649334	656000	662666
	Frequency	3740.01	3840	3939.99
70	Channel	649000	656000	663000
	Frequency	3735	3840	3945
60	Channel	648668	656000	663332
	Frequency	3730.02	3840	3949.98
50	Channel	648334	656000	663666
	Frequency	3725.01	3840	3954.99
40	Channel	648000	656000	664000
	Frequency	3720	3840	3960
30	Channel	647668	656000	664332
	Frequency	3715.02	3840	3964.98
20	Channel	647334	656000	664666
	Frequency	3710.01	3840	3969.99
15	Channel	647168	656000	664832
	Frequency	3707.52	3840	3972.48
10	Channel	647000	656000	665000
	Frequency	3705	3840	3975



5G NR n26(90S) Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	163800	-
	Frequency	-	819	-
5	Channel	163300	163800	164300
	Frequency	816.5	819	821.5

5G NR n26(90S) Cross-rule Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	-	Middle	-
20	Channel	-	164800	-
	Frequency	-	824	-
15	Channel	-	164300	-
	Frequency	-	821.5	-

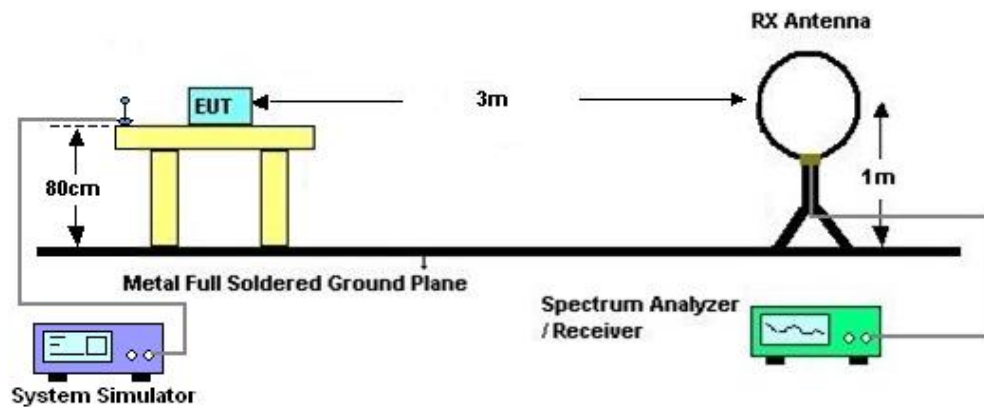
3 Radiated Test Items

3.1 Measuring Instruments

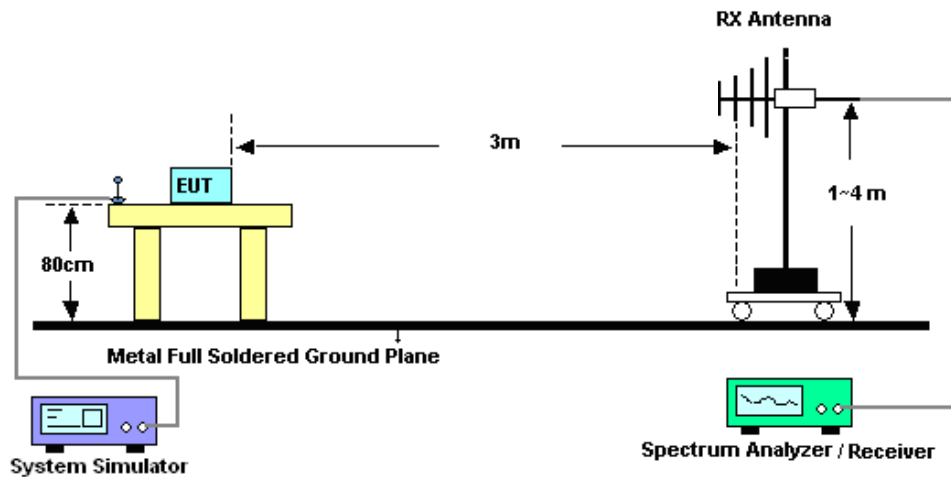
See list of measuring instruments of this test report.

3.2 Test Setup

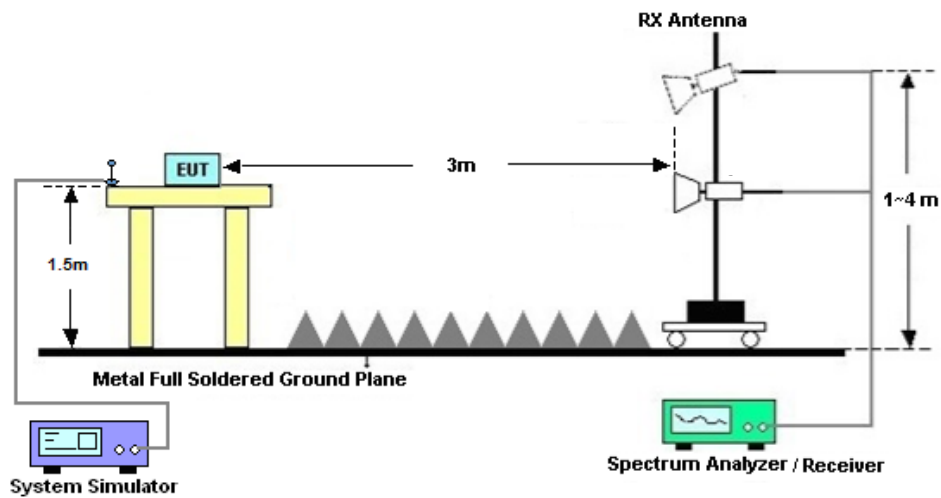
3.2.1 For radiated test below 30MHz



3.2.2 For radiated test from 30MHz to 1GHz



3.2.3 For radiated test above 1GHz



3.3 Test Result of Radiated Test

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.

Please refer to Appendix A.

3.4 Radiated Spurious Emission

3.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. 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.

3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. 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)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm}.$$



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 18, 2023	May 22, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150 213	10Hz~44GHz	Jul. 07, 2023	May 22, 2024	Jul. 06, 2024	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 28, 2022	May 22, 2024	Jun. 27, 2024	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May 09 2024	May 22, 2024	May 08, 2025	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-14 74	1GHz~18GHz	Jul. 07, 2023	May 22, 2024	Jul. 06, 2024	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Jul. 08, 2023	May 22, 2024	Jul. 07, 2024	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2023	May 22, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P-R	1943528	1GHz~18GHz	Oct. 18, 2023	May 22, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35 -HG	1871923	18GHz~40GHz	Jul. 07, 2023	May 22, 2024	Jul. 06, 2024	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY57280 136	500MHz~26.5GHz	Aug. 21, 2023	May 22, 2024	Aug. 20, 2024	Radiation (03CH04-SZ)
AC Power Source	APC	AFV-S-600B	F1190500 19	N/A	Oct. 18, 2023	May 22, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	May 22, 2024	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	May 22, 2024	NCR	Radiation (03CH04-SZ)

NCR: No Calibration Required

5 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.8 dB
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.1 dB
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	3.9 dB
--	--------

----- THE END -----



Appendix A. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Kuang Jia	Temperature :	22~25°C
		Relative Humidity :	48~52%

Note: Pre-scanned harmonic for the different antenna combinations, we choose the worst antenna mode to perform final test.

n26(22H) SA / NR 20MHz / QPSK(ANT0)									
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	1654	-64.73	-13	-51.73	-72.53	-67.98	4.00	9.40	H
	2481	-60.16	-13	-47.16	-71.91	-63.73	4.88	10.60	H
	3308	-61.56	-13	-48.56	-75.99	-66.49	5.52	12.60	H
	1654	-65.87	-13	-52.87	-73.75	-69.12	4.00	9.40	V
	2481	-62.05	-13	-49.05	-73.85	-65.62	4.88	10.60	V
	3308	-61.62	-13	-48.62	-75.99	-66.55	5.52	12.60	V

n77 SA / NR 100MHz / QPSK(ANT4)									
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	7582.36	-39.00	-13	-26.00	-32.18	-42.30	8.30	11.60	H
	11373.54	-49.09	-13	-36.09	-50.10	-50.61	10.48	12.00	H
	15164.72	-43.98	-13	-30.98	-47.38	-45.68	11.80	13.50	H
	7582.36	-45.73	-13	-32.73	-39.39	-49.03	8.30	11.60	V
	11373.54	-52.04	-13	-39.04	-53.01	-53.56	10.48	12.00	V
	15164.72	-40.71	-13	-27.71	-45.69	-42.41	11.80	13.50	V

EN-DC 7A_n77A / LTE 10MHz + NR 100MHz / QPSK (ANT0+4)									
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)
NR n77 Middle	7582.36	-41.07	-13	-28.07	-65.55	-44.37	8.30	11.60	H
	11373.54	-47.06	-13	-34.06	-77.95	-48.58	10.48	12.00	H
	15164.72	-43.98	-13	-30.98	-77.31	-45.68	11.80	13.50	H
	7582.36	-50.79	-13	-37.79	-75.75	-54.09	8.30	11.60	V
	11373.54	-48.32	-13	-35.32	-79.17	-49.84	10.48	12.00	V
	15164.72	-42.45	-13	-29.45	-77.36	-44.15	11.80	13.50	V
LTE Band7 Middle	5061.18	-39.64	-25	-14.64	-59.11	-45.20	7.14	12.70	H
	7591.77	-54.60	-25	-29.60	-79.05	-57.90	8.30	11.60	H
	10122.36	-50.89	-25	-25.89	-79.80	-52.41	10.48	12.00	H
	5061.18	-46.54	-25	-21.54	-65.88	-52.10	7.14	12.70	V
	7591.77	-54.17	-25	-29.17	-79.12	-57.47	8.30	11.60	V
	10122.36	-52.25	-25	-27.25	-79.85	-53.77	10.48	12.00	V

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

n26(90S) SA / NR 20MHz / QPSK(ANT0)									
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	1630	-64.85	-13	-51.85	-73.15	-68.10	4.00	9.40	H
	2445	-62.12	-13	-49.12	-73.86	-65.69	4.88	10.60	H
	3260	-60.92	-13	-47.92	-75.51	-65.85	5.52	12.60	H
	1630	-65.26	-13	-52.26	-73.49	-68.51	4.00	9.40	V
	2445	-63.36	-13	-50.36	-75.06	-66.93	4.88	10.60	V
	3260	-61.02	-13	-48.02	-75.44	-65.95	5.52	12.60	V

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