



FCC RADIO TEST REPORT

FCC ID : UZ7MC27AJ
Equipment : Mobile computer
Brand Name : Zebra
Model Name : MC27AJ
Applicant : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Manufacturer : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Standard : FCC 47 CFR Part 2, 22(H), 24(E), 27

The product was received on Aug. 03, 2020 and testing was started from Aug. 28, 2020 and completed on Aug. 31, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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



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History of this test report

Report No.	Version	Description	Issued Date									
FG052917-02B	01	This is a variant report for MC27AJ, and the differences between this model name and MC27AK are as listed below:	Oct. 29, 2020									
		<table><tr><td>Item/Model</td><td>MC27AK</td><td>MC27AJ</td></tr><tr><td>Camera</td><td>O</td><td>X</td></tr><tr><td>NFC</td><td>O</td><td>X</td></tr></table>		Item/Model	MC27AK	MC27AJ	Camera	O	X	NFC	O	X
		Item/Model		MC27AK	MC27AJ							
		Camera		O	X							
NFC	O	X										
All the test cases were performed on original report which can be referred to Sporton Report Number FG052917-01B as appendix C.												
FG052917-02B	02	Revise summary of test result	Nov. 05, 2020									



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	§2.1046	Conducted Output Power	Not Required	-
	§22.913 (a)(2)	Effective Radiated Power (Band 5)	Not Required	
	§27.50 (b)(10) §27.50 (c)(10)	Effective Radiated Power (Band 12) (Band 13) (Band 17)		
	§24.232 (c) §27.50 (h)(2)	Equivalent Isotropic Radiated Power (Band 2) (Band 7)		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power (Band 4) (Band 66)		
-	§24.232 (d) §27.50 (d)(5)	Peak-to-Average Ratio	Not Required	-
-	§2.1049	Occupied Bandwidth	Not Required	-
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (c)(2)(4) §27.53 (g) §27.53 (h)	Conducted Band Edge Measurement (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 17) (Band 66)	Not Required	-
	§2.1051 §27.53 (m)(4)	Conducted Band Edge Measurement (Band 7)		
-	§2.1051 §22.917 (a) §24.238 (a) §27.53 (c)(2) §27.53 (g) §27.53 (h)	Conducted Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 17) (Band 66)	Not Required	-
	§2.1051 §27.53 (m)(4)	Conducted Spurious Emission (Band 7)		
-	§2.1055 §22.355 §24.235 §27.54	Frequency Stability Temperature & Voltage	Not Required	-



Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1053 §22.917 (a) §24.238 (a) §27.53 (c)(2) §27.53 (f) §27.53 (g) §27.53 (h)	Radiated Spurious Emission (Band 2) (Band 4) (Band 5) (Band 12) (Band 13) (Band 17) (Band 66)	Pass	Under limit 5.19 dB at 1560.000 MHz
	§2.1051 §27.53 (m)(4)	Radiated Spurious Emission (Band 7)		

Remark: Not required means after assessing, test items are not necessary to carry out.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Cindy Liu



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile computer
Brand Name	Zebra
Model Name	MC27AJ
FCC ID	UZ7MC27AJ
EUT supports Radios application	WCDMA/HSPA/LTE/GNSS WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	EV
SW Version	10-11-31.00-QG-U00-PRD-HEL-04
OS Version	Android 10
MFD	23JUN20
EUT Stage	Engineering Sample

Remark: The above EUT's information was declared by manufacturer.

Specification of Accessories				
AC Adapter	Brand Name	Zebra	Part Number	PWR-WUA5V12W0US
Battery	Brand Name	Zebra	Part Number	BT-000418-10
USB Cable (TypeA plug to TypeC plug)	Brand Name	Zebra	Part Number	CBL-TC2X-USBC-01
Trigger Handle	Brand Name	Zebra	Part Number	TRG-MC2X-SNP1-01
Holster	Brand Name	Zebra	Part Number	SG-MC2X-HLSTR-01
Holster	Brand Name	Zebra	Part Number	SG-MC3021212-01R

1.2 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 17: 706.5 MHz ~ 713.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz
Rx Frequency	LTE Band 2: 1930.7 MHz ~ 1989.3 MHz LTE Band 4: 2110.7 MHz ~ 2154.3 MHz LTE Band 5: 869.7 MHz ~ 893.3 MHz LTE Band 7: 2622.5 MHz ~ 2687.5 MHz LTE Band 12: 729.7 MHz ~ 745.3 MHz LTE Band 13: 748.5 MHz ~ 753.5 MHz LTE Band 17: 736.5 MHz ~ 743.5 MHz LTE Band 66: 2110.7 MHz ~ 2199.3 MHz
Bandwidth	LTE Band 2: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 4: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz LTE Band 5: 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 7: 5MHz / 10MHz / 15MHz / 20MHz LTE Band 12: 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 13: 5MHz / 10MHz LTE Band 17: 5MHz / 10MHz LTE Band 66: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz / 20MHz
Antenna Type	PIFA Antenna
Antenna Gain	LTE Band 2: 3.35 dBi LTE Band 4: 3.04 dBi LTE Band 5: 2.20 dBi LTE Band 7: 2.80 dBi LTE Band 12: 0.40 dBi LTE Band 13: 0.00 dBi LTE Band 17: 0.40 dBi LTE Band 66: 3.04 dBi
Type of Modulation	QPSK / 16QAM / 64QAM

1.3 Modification of EUT

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



1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH11-HY
Test Engineer	Wayne Lee, Fu Chen, Troye Hsieh and JC Linag
Temperature	21.7~26.5°C
Relative Humidity	53.9~63.5%

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

FCC Designation No.: TW0007

1.5 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E), 27
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01.

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. The TAF code is not including all the FCC KDB listed without accreditation.



2 Test Configuration of Equipment Under Test

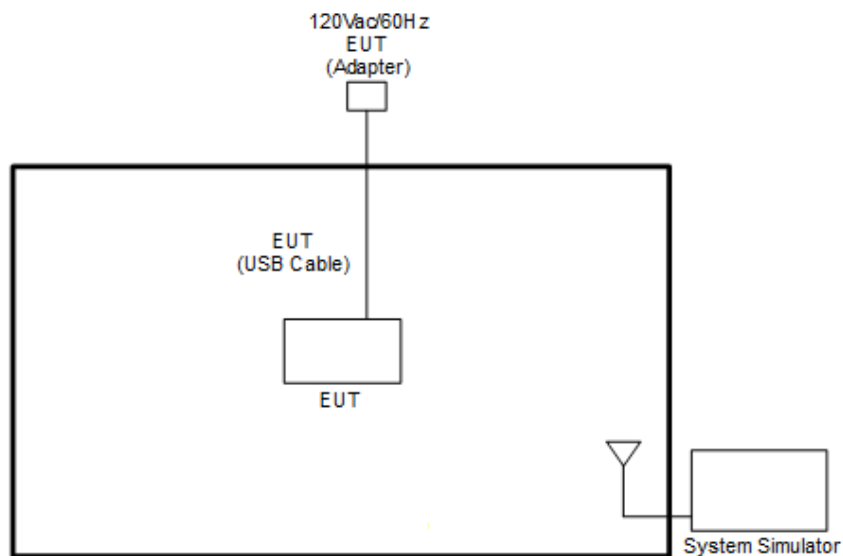
2.1 Test Mode

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

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z and SIM slot (SIM 1 and eSIM) The worst cases (X Plane for LTE Band 2 and 4; Y Plane for LTE Band 5, 7, 13, 17 and 66; Z Plane for LTE Band 12) were recorded in this report.

Test Items	Band	Bandwidth (MHz)						Modulation			RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Radiated Spurious Emission	2						v	v			v			v	v	v
	4						v	v			v			v	v	v
	5				v	-	-	v			v			v	v	v
	7	-	-				v	v			v			v	v	v
	12				v	-	-	v			v			v	v	v
	13	-	-	v		-	-	v			v			v	v	v
	17	-	-		v	-	-	v			v			v	v	v
	66						v	v			v			v	v	v
Remark	- The mark "v" means that this configuration is chosen for testing - The mark "-" means that this bandwidth is not supported. - The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.															

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8821C	N/A	N/A	Unshielded, 1.8 m



2.4 Frequency List of Low/Middle/High Channels

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3



LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 7 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	20850	21100	21350
	Frequency	2510	2535	2560
15	Channel	20825	21100	21375
	Frequency	2507.5	2535	2562.5
10	Channel	20800	21100	21400
	Frequency	2505	2535	2565
5	Channel	20775	21100	21425
	Frequency	2502.5	2535	2567.5

LTE Band 12 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3



LTE Band 13 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	23230	-
	Frequency	-	782	-
5	Channel	23205	23230	23255
	Frequency	779.5	782	784.5

LTE Band 17 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23780	23790	23800
	Frequency	709	710	711
5	Channel	23755	23790	23825
	Frequency	706.5	710	713.5

LTE Band 66 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	132072	132322	132572
	Frequency	1720	1745	1770
15	Channel	132047	132322	132597
	Frequency	1717.5	1745	1772.5
10	Channel	132022	132322	132622
	Frequency	1715	1745	1775
5	Channel	131997	132322	132647
	Frequency	1712.5	1745	1777.5
3	Channel	131987	132322	132657
	Frequency	1711.5	1745	1778.5
1.4	Channel	131979	132322	132665
	Frequency	1710.7	1745	1779.3

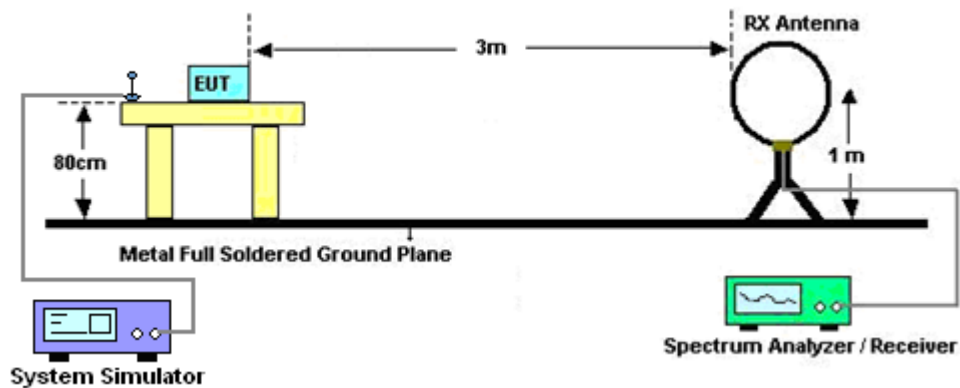
3 Radiated Test Items

3.1 Measuring Instruments

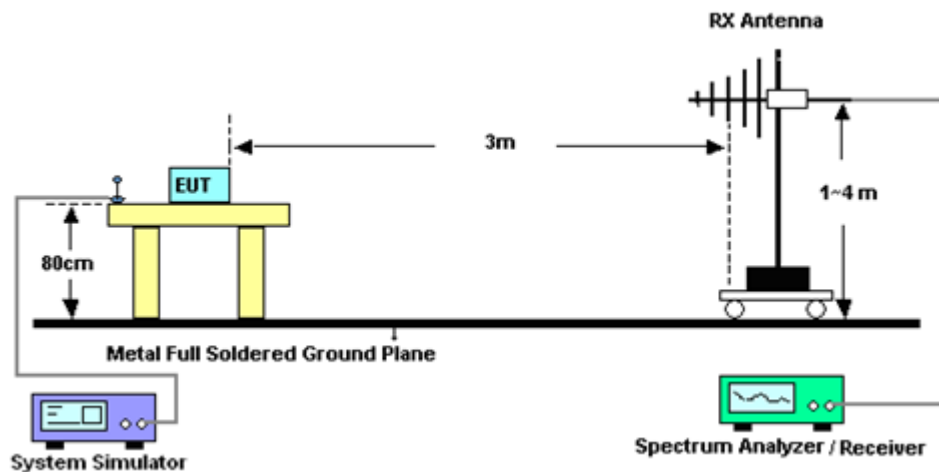
See list of measuring instruments of this test report.

3.1.1 Test Setup

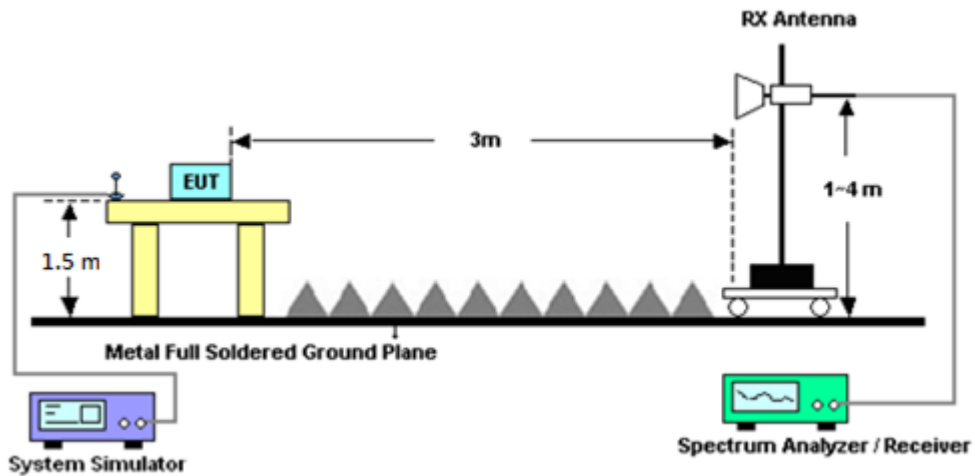
For radiated test below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



3.1.2 Test Result of Radiated Test

Please refer to Appendix A.

Note:

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



3.2 Radiated Spurious Emission Measurement

3.2.1 Description of Radiated Spurious Emission Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For LTE Band 7

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 $55 + 10 \log (P)$ dB.

For LTE Band 13

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

3.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

For LTE Band 7

The limit line is derived from $55 + 10\log(P)$ dB below the transmitter power P(Watts)

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

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



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Preamplifier	EMCE	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Aug. 28, 2020~ Aug. 31, 2020	Dec. 12, 2020	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz- 40GHz	May 22, 2020	Aug. 28, 2020~ Aug. 31, 2020	May 21, 2021	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 03, 2019	Aug. 28, 2020~ Aug. 31, 2020	Dec. 02, 2020	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 12, 2019	Aug. 28, 2020~ Aug. 31, 2020	Oct. 11, 2020	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Nov. 04, 2019	Aug. 28, 2020~ Aug. 31, 2020	Nov. 03, 2020	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Aug. 28, 2020~ Aug. 31, 2020	Dec. 25, 2020	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 13, 2019	Aug. 28, 2020~ Aug. 31, 2020	Nov. 12, 2020	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55-303K	1710001800054007	1GHz~18GHz	May 31, 2020	Aug. 28, 2020~ Aug. 31, 2020	May 30, 2021	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHz	Oct. 28, 2019	Aug. 28, 2020~ Aug. 31, 2020	Oct. 27, 2020	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-1080-1200-15000-60SS	SN2	1.2GHz High Pass Filter	Sep. 15, 2019	Aug. 28, 2020~ Aug. 31, 2020	Sep. 14, 2020	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN3	3GHz High Pass	Sep. 15, 2019	Aug. 28, 2020~ Aug. 31, 2020	Sep. 14, 2020	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Aug. 28, 2020~ Aug. 31, 2020	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Aug. 28, 2020~ Aug. 31, 2020	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Aug. 28, 2020~ Aug. 31, 2020	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001042	N/A	N/A	Aug. 28, 2020~ Aug. 31, 2020	N/A	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP161237	N/A	Oct. 25, 2019	Aug. 28, 2020~ Aug. 31, 2020	Oct. 24, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz-30MHz	Mar. 12, 2020	Aug. 28, 2020~ Aug. 31, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 12, 2020	Aug. 28, 2020~ Aug. 31, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	30MHz~18GHz	Mar. 12, 2020	Aug. 28, 2020~ Aug. 31, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 12, 2020	Aug. 28, 2020~ Aug. 31, 2020	Mar. 11, 2021	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTN-303B	TP140325	N/A	Nov. 07, 2019	Aug. 28, 2020~ Aug. 31, 2020	Nov. 06, 2020	Radiation (03CH11-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Feb. 15, 2020	Aug. 28, 2020~ Aug. 31, 2020	Feb.14, 2021	Radiation (03CH11-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.29
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.32
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.08
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Appendix A. Test Results of Radiated Test

<For SIM 1>

LTE Band 2

LTE Band 2 / 20MHz / QPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3702	-51.06	-13	-38.06	-68.46	-62.85	0.72	12.52	H
	5553	-41.58	-13	-28.58	-63.96	-53.75	1.00	13.17	H
	7404	-52.14	-13	-39.14	-77.67	-61.53	1.18	10.57	H
									H
									H
									H
	3702	-51.27	-13	-38.27	-69.87	-63.06	0.72	12.52	V
	5553	-50.44	-13	-37.44	-72.91	-62.61	1.00	13.17	V
	7404	-52.31	-13	-39.31	-77.64	-61.7	1.18	10.57	V
									V
									V
									V
Middle	3744	-52.74	-13	-39.74	-70.26	-64.54	0.70	12.50	H
	5616	-52.44	-13	-39.44	-74.75	-64.59	0.98	13.13	H
	7484	-52.12	-13	-39.12	-77.52	-61.37	1.18	10.43	H
									H
									H
									H
	3744	-52.23	-13	-39.23	-70.94	-64.03	0.70	12.50	V
	5616	-52.84	-13	-39.84	-75.32	-64.99	0.98	13.13	V
	7484	-51.84	-13	-38.84	-77.32	-61.09	1.18	10.43	V
									V
									V
									V



Highest	3784	-57.01	-13	-44.01	-74.61	-68.82	0.68	12.49	H
	5676	-51.50	-13	-38.50	-73.86	-63.61	0.99	13.09	H
	7566	-51.90	-13	-38.90	-77.41	-61.3	1.18	10.58	H
									H
									H
									H
	3784	-52.49	-13	-39.49	-71.3	-64.3	0.68	12.49	V
	5676	-52.59	-13	-39.59	-75.14	-64.7	0.99	13.09	V
	7566	-52.12	-13	-39.12	-77.5	-61.52	1.18	10.58	V
									V
									V
									V

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

**LTE Band 4**

LTE Band 4 / 20MHz / QPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3422	-33.05	-13	-20.05	-63.62	-44.02	1.35	12.31	H
	5133	-29.78	-13	-16.78	-63.74	-40.92	1.64	12.79	H
	6844	-40.77	-13	-27.77	-77.79	-51.15	1.74	12.12	H
									H
									H
									H
									H
	3422	-51.06	-13	-38.06	-68.51	-62.03	1.35	12.31	V
	5133	-42.33	-13	-29.33	-63.5	-53.47	1.64	12.79	V
	6844	-53.63	-13	-40.63	-78.08	-64.01	1.74	12.12	V
									V
									V
									V
									V
Middle	3450	-49.91	-13	-36.91	-67.52	-56.10	1.59	7.78	H
	5172	-40.54	-13	-27.54	-61.62	-47.80	2.44	9.70	H
	6894	-53.81	-13	-40.81	-77.9	-61.86	2.62	10.67	H
									H
									H
									H
									H
	3450	-53.55	-13	-40.55	-71.41	-59.74	1.59	7.78	V
	5172	-43.49	-13	-30.49	-64.74	-50.75	2.44	9.70	V
	6894	-53.45	-13	-40.45	-77.96	-61.50	2.62	10.67	V
									V
									V
									V
									V



Highest	5102	-56.20	-13	-43.20	-77.1	-67.31	1.64	12.74	H
	7653	-51.52	-13	-38.52	-77.24	-60.64	2.01	11.13	H
	10204	-46.08	-13	-33.08	-77.53	-54.82	2.40	11.14	H
									H
									H
									H
									H
	5102	-56.13	-13	-43.13	-77.22	-67.24	1.64	12.74	V
	7653	-51.64	-13	-38.64	-77.14	-60.76	2.01	11.13	V
	10204	-44.16	-13	-31.16	-77.36	-52.90	2.40	11.14	V
									V
									V
									V
									V

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

**LTE Band 5**

LTE Band 5B / 10MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1649	-55.48	-13	-42.48	-66.02	-62.43	0.53	9.63	H
	2473	-32.31	-13	-19.31	-46.26	-40.29	0.65	10.78	H
	3298	-57.57	-13	-44.57	-74.26	-66.66	0.76	11.99	H
	4122	-55.66	-13	-42.66	-73.63	-65	0.86	12.35	H
									H
									H
									H
	1649	-49.04	-13	-36.04	-59.28	-55.99	0.53	9.63	V
	2473	-37.52	-13	-24.52	-51.99	-45.5	0.65	10.78	V
	3298	-58.33	-13	-45.33	-74.99	-67.42	0.76	11.99	V
	4122	-56.81	-13	-43.81	-75.95	-66.15	0.86	12.35	V
									V
									V
									V
Middle	1664	-49.44	-13	-36.44	-60.11	-56.42	0.53	9.66	H
	2496	-41.18	-13	-28.18	-55.11	-49.17	0.65	10.80	H
	3328	-56.82	-13	-43.82	-73.58	-65.99	0.76	12.08	H
									H
									H
									H
									H
	1664	-42.79	-13	-29.79	-53.05	-49.77	0.53	9.66	V
	2496	-39.14	-13	-26.14	-53.51	-47.13	0.65	10.80	V
	3328	-58.57	-13	-45.57	-75.16	-67.74	0.76	12.08	V
									V
									V
									V
									V



Highest	1679	-55.05	-13	-42.05	-65.84	-62.06	0.53	9.69	H
	2518	-34.80	-13	-21.80	-48.77	-42.8	0.66	10.81	H
	3358	-56.95	-13	-43.95	-73.75	-66.21	0.77	12.17	H
	4197	-56.12	-13	-43.12	-74.21	-65.46	0.84	12.32	H
									H
									H
									H
	1679	-47.07	-13	-34.07	-57.34	-54.08	0.53	9.69	V
	2518	-40.20	-13	-27.20	-54.58	-48.2	0.66	10.81	V
	3358	-58.23	-13	-45.23	-74.75	-67.49	0.77	12.17	V
	4197	-55.47	-13	-42.47	-74.81	-64.81	0.84	12.32	V
									V
									V
									V

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

**LTE Band 7**

LTE Band 7 / 20MHz / QPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	5010	-55.49	-25	-30.49	-76.15	-66.77	0.94	12.22	H
	7517	-52.17	-25	-27.17	-77.58	-61.44	1.18	10.45	H
	10026	-45.95	-25	-20.95	-77.54	-56.63	1.37	12.05	H
									H
									H
									H
									H
	5010	-55.66	-25	-30.66	-76.52	-66.94	0.94	12.22	V
	7517	-51.86	-25	-26.86	-77.32	-61.13	1.18	10.45	V
	10026	-44.26	-25	-19.26	-77.53	-54.94	1.37	12.05	V
									V
									V
									V
									V
Middle	5064	-55.42	-25	-30.42	-76.22	-66.79	0.95	5064	H
	7592	-49.12	-25	-24.12	-74.74	-58.6	1.18	7592	H
	10122	-45.78	-25	-20.78	-77.3	-56.27	1.38	10122	H
									H
									H
									H
									H
	5064	-55.64	-25	-30.64	-76.63	-67.01	0.95	5064	V
	7592	-51.81	-25	-26.81	-77.15	-61.29	1.18	7592	V
	10122	-44.27	-25	-19.27	-77.5	-54.76	1.38	10122	V
									V
									V
									V
									V



Highest	5112	-56.00	-25	-31.00	-76.93	-67.46	0.97	5112	H
	7667	-51.61	-25	-26.61	-77.36	-61.29	1.19	7667	H
	10224	-45.88	-25	-20.88	-77.32	-56.17	1.39	10224	H
									H
									H
									H
									H
	5112	-56.31	-25	-31.31	-77.41	-67.77	0.97	5112	V
	7667	-51.71	-25	-26.71	-77.25	-61.39	1.19	7667	V
	10224	-43.69	-25	-18.69	-76.89	-53.98	1.39	10224	V
									V
									V
									V
									V

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

**LTE Band 12**

LTE Band 12 / 10MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1400	-50.19	-13.00	-37.19	-61.71	-56.24	0.50	8.70	H
	2096	-60.23	-13.00	-47.23	-74.08	-67.97	0.59	10.48	H
	2800	-59.57	-13.00	-46.57	-74.69	-67.70	0.70	10.98	H
									H
									H
									H
									H
	1400	-56.84	-13.00	-43.84	-68.42	-62.89	0.50	8.70	V
	2096	-60.28	-13.00	-47.28	-73.99	-68.02	0.59	10.48	V
	2800	-58.56	-13.00	-45.56	-74.10	-66.69	0.70	10.98	V
									V
									V
									V
									V
Middle	1408	-50.91	-13.00	-37.91	-62.55	-57.01	0.50	8.75	H
	2112	-60.16	-13.00	-47.16	-74.31	-67.91	0.59	10.49	H
	2816	-58.95	-13.00	-45.95	-74.12	-67.08	0.71	10.99	H
									H
									H
									H
									H
	1408	-56.79	-13.00	-43.79	-68.31	-62.89	0.50	8.75	V
	2112	-57.20	-13.00	-44.20	-71.23	-64.95	0.59	10.49	V
	2816	-58.75	-13.00	-45.75	-74.30	-66.88	0.71	10.99	V
									V
									V
									V
									V



Highest	1416	-51.54	-13.00	-38.54	-63.20	-57.68	0.50	8.80	H
	2120	-60.33	-13.00	-47.33	-74.49	-68.08	0.59	10.50	H
	3536	-58.13	-13.00	-45.13	-75.06	-67.78	0.78	12.59	H
									H
									H
									H
									H
	1416	-56.77	-13.00	-43.77	-68.24	-62.91	0.50	8.80	V
	2120	-60.47	-13.00	-47.47	-74.66	-68.22	0.59	10.50	V
	3536	-57.01	-13.00	-44.01	-74.95	-66.66	0.78	12.59	V
									V
									V
									V
									V

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

**LTE Band 13**

LTE Band 13 / 5MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1552	-56.89	-13	-43.89	-67.96	-63.64	0.51	9.41	H
	2336	-49.77	-13	-36.77	-64.40	-57.67	0.62	10.67	H
	3112	-56.94	-13	-43.94	-73.12	-65.48	0.74	11.44	H
									H
									H
									H
									H
	1552	-50.96	-13.00	-37.96	-61.52	-57.71	0.51	9.41	V
	2336	-52.32	-13	-39.32	-67.44	-60.22	0.62	10.67	V
	3112	-58.57	-13	-45.57	-74.88	-67.11	0.74	11.44	V
									V
									V
									V
									V
Middle	1560	-54.48	-42.15	-12.33	-65.55	-61.25	0.51	9.43	H
	2336	-53.70	-13	-40.70	-68.33	-61.60	0.62	10.67	H
	3120	-56.29	-13	-43.29	-72.47	-64.86	0.74	11.46	H
	3896	-55.33	-13	-42.33	-72.79	-64.85	0.78	12.44	H
									H
									H
									H
	1560	-47.34	-42.15	-5.19	-57.84	-54.11	0.51	9.43	V
	2336	-50.25	-13	-37.25	-65.37	-58.15	0.62	10.67	V
	3120	-57.59	-13	-44.59	-73.95	-66.16	0.74	11.46	V
	3896	-55.86	-13	-42.86	-74.48	-65.38	0.78	12.44	V
									V
									V
									V



Highest	1568	-53.44	-42.15	-11.29	-64.05	-60.22	0.52	9.45	H
	2344	-52.51	-13	-39.51	-67.01	-60.41	0.62	10.68	H
	3128	-57.49	-13	-44.49	-73.67	-66.08	0.74	11.48	H
									H
									H
									H
									H
	1564	-48.67	-42.15	-6.52	-59.11	-55.45	0.52	9.44	V
	2347	-58.02	-13	-45.02	-73.11	-65.92	0.62	10.68	V
	3129	-58.85	-13	-45.85	-75.27	-67.44	0.74	11.49	V
									V
									V
									V
									V

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

**LTE Band 17**

LTE Band 17 / 10MHz / QPSK									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1408	-55.37	-13	-42.37	-67.01	-61.47	0.50	8.75	H
	2112	-54.40	-13	-41.40	-68.55	-62.15	0.59	10.49	H
	2816	-58.53	-13	-45.53	-73.70	-66.66	0.71	10.99	H
									H
									H
									H
									H
	1408	-48.56	-13	-35.56	-60.08	-54.66	0.50	8.75	V
	2112	-59.54	-13	-46.54	-73.57	-67.29	0.59	10.49	V
	2816	-59.18	-13	-46.18	-74.73	-67.31	0.71	10.99	V
									V
									V
									V
									V
Middle	1408	-54.77	-13	-41.77	-66.41	-60.87	0.50	8.75	H
	2120	-55.37	-13	-42.37	-69.43	-63.12	0.59	10.50	H
	2824	-58.85	-13	-45.85	-74.01	-66.99	0.71	10.99	H
									H
									H
									H
									H
	1408	-48.46	-13	-35.46	-59.98	-54.56	0.50	8.75	V
	2120	-56.26	-13	-43.26	-70.45	-64.01	0.59	10.50	V
	2824	-59.16	-13	-46.16	-74.70	-67.30	0.71	10.99	V
									V
									V
									V
									V



Highest	1416	-55.71	-13	-42.71	-67.37	-61.85	0.50	8.80	H
	2120	-53.91	-13	-40.91	-68.07	-61.66	0.59	10.50	H
	2824	-59.32	-13	-46.32	-74.48	-67.46	0.71	10.99	H
									H
									H
									H
									H
	1416	-49.13	-13	-36.13	-60.60	-55.27	0.50	8.80	V
	2120	-55.85	-13	-42.85	-70.04	-63.60	0.59	10.50	V
	2824	-59.14	-13	-46.14	-74.68	-67.28	0.71	10.99	V
									V
									V
									V
									V

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

**LTE Band 66**

LTE Band 66 / 20MHz / QPSK									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3420	-52.13	-13	-39.13	-69.74	-63.72	0.77	12.36	H
	5136	-38.35	-13	-25.35	-59.34	-49.85	0.97	12.47	H
	6846	-53.92	-13	-40.92	-77.89	-64.74	0.82	11.64	H
									H
									H
									H
									H
	3420	-46.89	-13	-33.89	-64.31	-58.48	0.77	12.36	V
	5136	-38.11	-13	-25.11	-59.28	-49.61	0.97	12.47	V
	6846	-53.34	-13	-40.34	-77.79	-64.16	0.82	11.64	V
									V
									V
									V
									V
Middle	3474	-50.15	-13	-37.15	-67.8	-61.89	0.78	12.52	H
	5208	-38.04	-13	-25.04	-59.21	-49.66	0.99	12.62	H
	6944	-53.03	-13	-40.03	-77.26	-63.41	1.04	11.42	H
									H
									H
									H
									H
	3474	-49.94	-13	-36.94	-68.17	-61.68	0.78	12.52	V
	5208	-33.49	-13	-20.49	-54.84	-45.11	0.99	12.62	V
	6944	-52.65	-13	-39.65	-77.23	-63.03	1.04	11.42	V
									V
									V
									V
									V



Highest	3522	-46.83	-13	-33.83	-64.4	-58.64	0.78	12.59	H
	5286	-43.65	-13	-30.65	-65.03	-55.40	1.02	12.77	H
	7044	-51.39	-13	-38.39	-75.9	-61.44	1.17	11.22	H
									H
									H
									H
									H
	3522	-45.63	-13	-32.63	-64.18	-57.44	0.78	12.59	V
	5286	-38.74	-13	-25.74	-60.29	-50.49	1.02	12.77	V
	7044	-51.76	-13	-38.76	-76.6	-61.81	1.17	11.22	V
									V
									V
									V
									V

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