CTC Laboratories, Inc.

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TEST REPORT

Report No. ·····:	**GTI20191844E**
FCC ID·····:	**2ANTM-MD44014**
Applicant·····:	NumberFour AG
Address·····:	Schoenhauser Allee 8, 10119 Berlin, Germany
Manufacturer·····:	NumberFour AG
Address·····:	Schoenhauser Allee 8, 10119 Berlin, Germany
Product Name·····:	**Mobile POS System**
Trade Mark·····:	––
Model/Type reference·····:	HVN:ED100
Listed Model(s) ·····:	HVN:MD44014
Standard·····:	**FCC CFR Title 47 Part 2** **FCC CFR Title 47 Part 22** **FCC CFR Title 47 Part 24** **FCC CFR Title 47 Part 27**
Date of receipt of test sample…:	Aug.28.2019
Date of testing……..:	Aug.29.2019 to Sep.04.2019
Date of issue……....:	Sep.06.2019
Result……:	**PASS**

Compiled by: (Printed name+signature)	Zaki Zhang	
Supervised by: (Printed name+signature)	Miller Ma	
Approved by: (Printed name+signature)	Walter Chen	

Testing Laboratory Name.....	**CTC Laboratories, Inc.**
Address.....	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

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Any objections must be raised to CTC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit. The test report merely correspond to the test sample.

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1. SUMMARY

1.1. Test Standards

FCC Rules Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
FCC Rules Part 22: PRIVATE LAND MOBILE RADIO SERVICES.
FCC Rules Part 24: PUBLIC MOBILE SERVICES
FCC Rules Part 27: MISCELLANEOUS WIRDELESS COMMUNICATIONS SERVICES
ANSI C63.26: 2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 971168 D01 Power Meas License Digital Systems v03: MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

1.2. Report version

Revised No.	Date of issue	Description
01	Sep.06.2019	Original

1.3. Test Description

Test Item	Section in CFR 47	Result	Test Engineer
Conducted Output Power	Part 2.1046 Part 22.913(a) Part 24.232(c) Part 27.50	Pass	Roy Luo
Peak-to-Average Ratio	Part 24.232 Part 27.50	Pass	Roy Luo
99% Occupied Bandwidth & 26 dB Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b) Part 27.53	Pass	Roy Luo
Band Edge	Part 2.1051 Part 22.917 Part 24.238 Part 27.53	Pass	Roy Luo
Conducted Spurious Emissions	Part 2.1051 Part 22.917 Part 24.238 Part 27.53	Pass	Roy Luo
Frequency stability VS Temperature	Part 2.1055(a)(1)(b) Part 22.355 Part 24.235 Part 27.54	Pass	Roy Luo
Frequency stability VS Voltage	Part 2.1055(d)(1)(2) Part 22.355 Part 24.235 Part 27.54	Pass	Roy Luo
ERP and EIRP	Part 22.913(a) Part 24.232(b) Part 27.50	Pass	Roy Luo
Radiated Spurious Emissions	Part 2.1053 Part 22.917 Part 24.238 Part 27.53	Pass	Roy Luo

Note: The measurement uncertainty is not included in the test result.

1.4. Test Facility

Address of the test laboratory

CTC Laboratories, Inc.

Add: 1F, 2 Block,Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

ISED Registration No.: CN0029

The 3m alternate test site of CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: CN0029 on Dec, 2018.

FCC-Registration No.: CN1208

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration CN1208, Sep 07, 2017

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the CTC Laboratories, Inc. Ltd quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTC Laboratories, Inc. is reported:

Test Items	Measurement Uncertainty	Notes
Frequency stability	25 Hz	(1)
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-12.75 GHz	1.60 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)
Emission Mask	---------	(1)
Modulation Characteristic	---------	(1)
Transmitter Frequency Behavior	---------	(1)

101 This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2. GENERAL INFORMATION

2.1. Client Information

Applicant:	NumberFour AG
Address:	Schoenhauser Allee 8, 10119 Berlin, Germany
Manufacturer:	NumberFour AG
Address:	Schoenhauser Allee 8, 10119 Berlin, Germany
Factory:	Zhangzhou Wanlida Technology Co.,Ltd.
Address:	Wanlida Industrial Zone，Nanjing,Zhangzhou, Fujian, China

2.2. General Description of EUT

Product Name:	Mobile POS System
Model/Type reference:	HVN:ED100
Marketing Name:	--
Listed Model(s):	HVN:MD44014
Power supply:	3.85Vdc 2810mAh from Li-ion Battery
Adapter:	Model: DSA-18QFB FUSA Input:100-240VAC 50/60Hz 0.8A Output: 5VDC 3A or 9VDC 2A or 12VDC 1.5A
Adapter Manufacturer:	Dee Van Enterprise Co., Ltd
Hardware version:	A267C
Software version:	HVN:ED100-1.x.x-1.x
LTE	
Operation Band:	Band 2: UL: 1850.7MHz~1909.9MHz, DL: 1930MHz~1989.9MHz Band 4: UL: 1710 MHz~1754.9MHz, DL: 2110.0MHz~2154.9MHz Band 7: UL: 2500.0MHz~2569.9MHz, DL: 2620.0MHz~2689.9MHz Band 13: UL: 777.0 MHz~786.9MHz, DL: 746.0MHz~755.9MHz Band 25: UL: 1850MHz~1941.9MHz, DL: 1930MHz~1994.9 MHz Band 41: UL: 2555 MHz~2655MHz，DL: 2555 MHz~2655MHz
Modulation Type:	QPSK, 16QAM
Antenna type:	FPC Antenna
Antenna Gain:	FDD Band 2: 1.0dBi FDD Band 4: 1.0dBi FDD Band 7: 1.0dBi FDD Band 13: 1.0dBi FDD Band 25: 1.0dBi FDD Band 41: 1.0dBi

2.3. Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing.

Test Frequency:

Band 2			
Test channel	**Bandwidth(MHz)**	**N_{UL}**	**Frequency of Uplink (MHz)**
Low Range	1.4	18607	1850.70
	3	18615	1851.50
	5	18625	1852.50
	10	18650	1855.00
	15	18675	1857.50
	20	18700	1860.00
Mid Range	1.4/3/5/10/15/20	18900	1880.00
High Range	1.4	19193	1909.30
	3	19185	1908.50
	5	19175	1907.50
	10	19150	1905.00
	15	19125	1902.50
	20	19100	1900.00

Band 4			
Test channel	**Bandwidth(MHz)**	**N_{UL}**	**Frequency of Uplink (MHz)**
Low Range	1.4	19957	1710.70
	3	19965	1711.50
	5	19975	1712.50
	10	20000	1715.00
	15	20025	1717.50
	20	20050	1720.00
Mid Range	1.4/3/5/10/15/20	20175	1732.50
High Range	1.4	20393	1754.30
	3	20385	1753.50
	5	20375	1752.50
	10	20350	1750.00
	15	20325	1747.50
	20	20300	1745.00

Band 7			
Test channel	**Bandwidth(MHz)**	**N_{UL}**	**Frequency of Uplink (MHz)**
Low Range	5	20775	2502.50
	10	20800	2505.00
	15	20825	2507.50
	20	20850	2510.00
Mid Range	5/10/15/20	21100	2535.00
High Range	5	21425	2567.50
	10	21400	2565.00
	15	21375	2562.50
	20	21350	2560.00

Band 13			
Test channel	**Bandwidth(MHz)**	**N_{UL}**	**Frequency of Uplink (MHz)**
Low Range	5	23205	779.50
	10	23230	782.00
Mid Range	5/10	23230	782.00
High Range	5	23255	784.50
	10	23230	782.00

Band 25			
Test channel	**Bandwidth(MHz)**	**N_{UL}**	**Frequency of Uplink (MHz)**
Low Range	1.4	26047	1850.70
	3	26055	1851.50
	5	26065	1852.50
	10	26090	1855.00
	15	26115	1857.50
	20	26140	1860.00
Mid Range	1.4/3/5/10/15/20	26365	1882.50
High Range	1.4	26683	1914.30
	3	26675	1913.50
	5	26665	1912.50
	10	26640	1910.00
	15	26615	1907.50
	20	26590	1905.00

Band 41			
Test channel	**Bandwidth(MHz)**	**N_{UL}**	**Frequency of Uplink (MHz)**
Low Range	5	40265	2557.50
	10	40290	2560.00
	20	40340	2565.00
Mid Range	5/10/20	40740	2605.00
High Range	5	41215	2652.50
	10	41190	2650.00
	20	41140	2645.00

2.4. Measurement Instruments List

Output Power (Radiated) & Radiated Spurious Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100967	Dec. 28, 2019
2	High pass filter	Compliance Direction systems	BSU-6	34202	Dec. 28, 2019
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec. 28, 2019
4	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4181	Dec. 28, 2019
5	Spectrum Analyzer	HP	8563E	02052	Dec. 28, 2019
6	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Dec. 28, 2019
7	Horn Antenna	Schwarzbeck	BBHA 9120D	649	Dec. 28, 2019
8	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec. 28, 2019
9	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25842	Dec. 28, 2019
10	Pre-Amplifier	HP	8447D	1937A03050	Dec. 28, 2019
11	Pre-Amplifier	EMCI	EMC051835	980075	Dec. 28, 2019
12	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 28, 2019
13	Signal Generator	Agilent	N5182A	1019356	Dec. 28, 2019
14	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	116410	Dec. 28, 2019
15	Antenna Mast	UC	UC3000	N/A	N/A
16	Antenna mast	MATURO	TAM-4.0-P	N/A	N/A
17	Turn Table	UC	UC3000	N/A	N/A
18	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Dec. 28, 2019
19	Cable Above 1GHz	Hubersuhner	SUCOFLEX102	DA1580	Dec. 28, 2019

Output Power(Conducted) & Occupied Bandwidth & Emission Bandwidth & Band Edge Compliance & Conducted Spurious Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	UNIVERSAL RADIO COMMUNICATION	Rohde & Schwarz	CMU200	114694	Dec. 28, 2019
2	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Dec. 28, 2019
3	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Dec. 28, 2019
4	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 28, 2019

Frequency Stability					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	UNIVERSAL RADIO COMMUNICATION	Rohde & Schwarz	CMU200	114694	Dec. 28, 2019
2	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Dec. 28, 2019
3	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Dec. 28, 2019
4	Splitter	Mini-Circuit	ZAPD-4	400059	Dec. 28, 2019
5	Climate Chamber	ESPEC	EL-10KA	05107008	Dec. 28, 2019

Note: 1. The Cal. Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST ITEM AND RESULTS

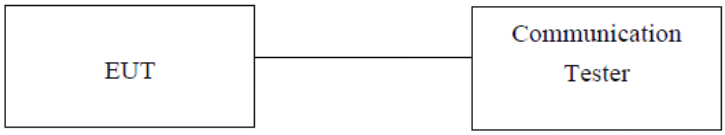
3.1. Conducted Output Power

LIMIT

Conducted Output Power: N/A

TEST CONFIGURATION

- For Conducted output Power



Note: Measurement setup for testing on Antenna connector

TEST PROCEDURE

- For Conducted output Power

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum PK burst power and maximum Avg. burst power.

TEST RESULTS

Please see the Appendix for every tested Band.

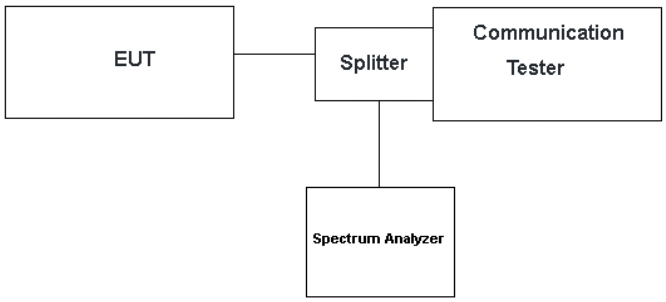
3.2. Peak-to-Average Ratio

LIMIT:

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13dB.

TEST CONFIGURATION

- For Peak-to-Average Ratio



TEST PROCEDURE

- For Peak-to-Average Ratio

1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1.
2. The EUT was connected to spectrum and communication tester via a splitter
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
6. Record the deviation as Peak to Average Ratio.

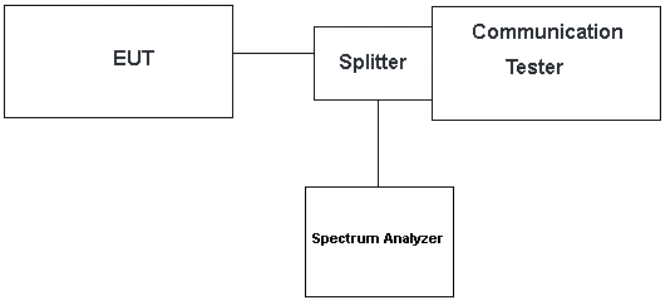
TEST RESULTS

Please see the Appendix for every tested Band.

Remark：We tested all the patterns, but only the worst data was found in the appendix.

3.3. Occupy Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, VBW≥3 times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

Please see the Appendix for every tested Band.

Remark：We tested all the patterns, but only the worst data was found in the appendix.

3.4. Out of band emission at antenna terminals

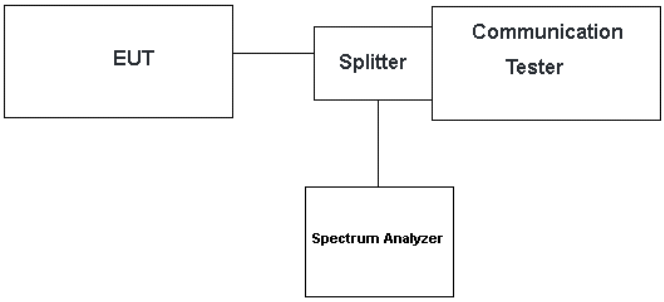
LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

For mobile and portable stations operating in the 2305-2315 MHz: by a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST CONFIGURATION



TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW = 1MHz VBW≥3 times RBW, Start=30MHz, Stop= 10th harmonic.

TEST RESULTS

Please see the Appendix for every tested Band.

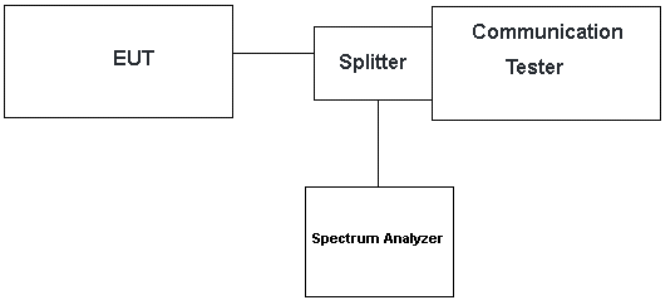
Remark：We tested all the patterns, but only the worst data was found in the appendix.

3.5. Band Edge compliance

LIMIT

FDD Band 2: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
FDD Band 4: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.
FDD Band 7: For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.
FDD Band 13: The power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB. 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 isotropic ally radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.

TEST CONFIGURATION



TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. RBW was set to about 1% of emission BW, VBW≥3 times RBW.

TEST RESULTS

Please see the Appendix for every tested Band.

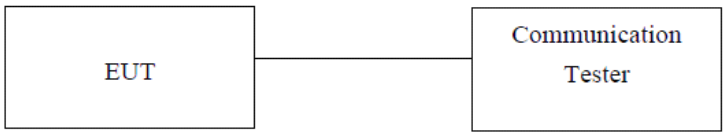
Remark：We tested all the patterns, but only the worst data was found in the appendix.

3.6. Radiated Power Measurement

LIMIT

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.
27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.
27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.
27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP

TEST CONFIGURATION



Note: Measurement setup for testing on Antenna connector

TEST PROCEDURE

EIRP/ERP:

1. EIRP= Conducted Power +Antenan gain
2. ERP power=EIPR power-2.15dBi.

TEST RESULTS

Please see the Appendix for every tested Band.

Remark：We tested all the patterns, but only the worst data was found in the appendix.

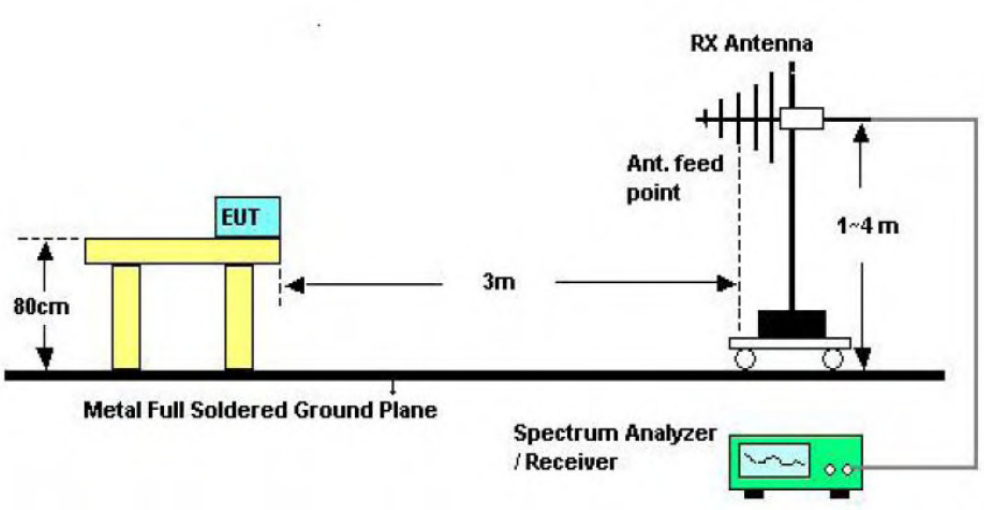
3.7. Radiated Spurious Emission

LIMIT

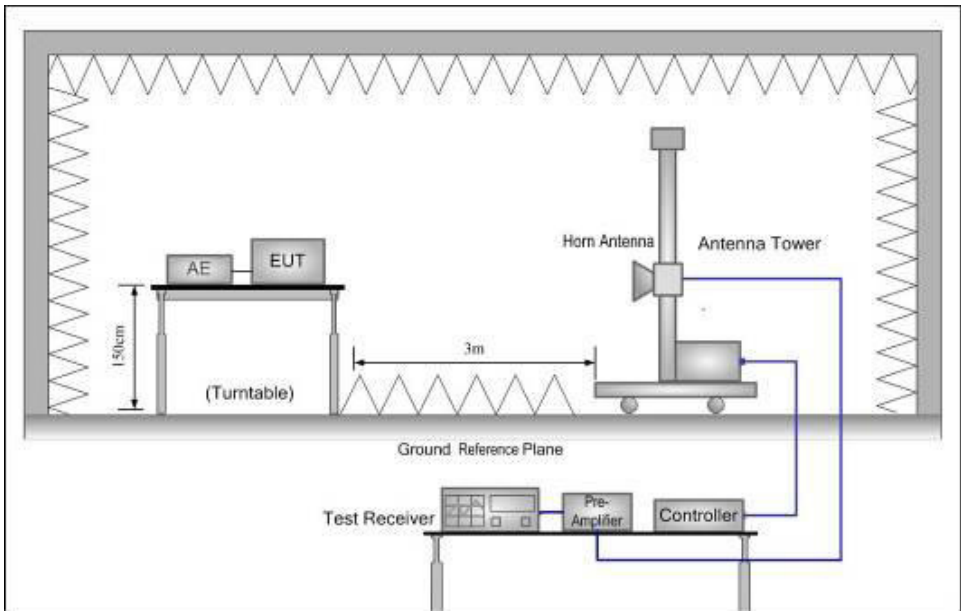
FDD Band 2: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
FDD Band 4: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.
FDD Band 5: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
FDD Band 7: For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.
FDD Band 12: the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.
FDD Band 13: The power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB. 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 isotropic ally radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth.
FDD Band 17: The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

TEST CONFIGURATION

For the actual test configuration, please refer to the related Item – EUT Test Photos.



Below 1GHz



Above 1GHz

TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:

Power(EIRP)=PMea- PAg - Pcl + Ga

We used SMF100A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:

Power(EIRP)=PMea- Pcl + Ga

7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
   ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.
8. Test frequency range should extend to 10^{th} harmonic of highest fundamental frequency.

TEST RESULTS

Remark:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
2. We test all modulation type and record worst case at Voice mode.

Measured data (worst case):

Band 2 Radiated Spurious Emissions							
Bandwidth	Modulation	Test Channel	Spurious Emission			Limit (dBm)	Result
			Frequency	Level (dBm)	Polarization		
20MHz	QPSK	L	3720.00	-36.20	Vertical	-13.00	Pass
			5580.00	-41.31	Vertical		
			3720.00	-47.42	Horizontal		
			5580.00	-43.53	Horizontal		
20MHz	QPSK	M	3760.00	-37.54	Vertical	-13.00	Pass
			5640.00	-42.65	Vertical		
			3760.00	-39.82	Horizontal		
			5640.00	-37.93	Horizontal		
20MHz	QPSK	H	3800.00	-35.97	Vertical	-13.00	Pass
			5700.00	-41.08	Vertical		
			3800.00	-39.17	Horizontal		
			5700.00	-46.28	Horizontal		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

Band 4 Radiated Spurious Emissions							
Bandwidth	Modulation	Test Channel	Spurious Emission			Limit (dBm)	Result
			Frequency	Level (dBm)	Polarization		
20MHz	QPSK	L	3440.00	-42.00	Vertical	-13.00	Pass
			5160.00	-43.11	Vertical		
			3440.00	-47.48	Horizontal		
			5160.00	-42.59	Horizontal		
20MHz	QPSK	M	3500.00	-48.11	Vertical	-13.00	Pass
			5260.00	-46.22	Vertical		
			3500.00	-47.50	Horizontal		
			5260.00	-48.61	Horizontal		
20MHz	QPSK	H	3490.00	-39.08	Vertical	-13.00	Pass
			5235.00	-46.19	Vertical		
			3490.00	-40.39	Horizontal		
			5235.00	-42.50	Horizontal		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

Band 7 Radiated Spurious Emissions							
Bandwidth	Modulation	Test Channel	Spurious Emission			Limit (dBm)	Result
			Frequency	Level (dBm)	Polarization		
20MHz	QPSK	L	5020.00	-45.58	Vertical	-25.00	Pass
			7530.00	-44.69	Vertical		
			5020.00	-42.70	Horizontal		
			7530.00	-45.81	Horizontal		
20MHz	QPSK	M	5070.00	-40.26	Vertical	-25.00	Pass
			7605.00	-42.31	Vertical		
			5070.00	-47.48	Horizontal		
			7605.00	-45.59	Horizontal		
20MHz	QPSK	H	5120.00	-44.89	Vertical	-25.00	Pass
			7680.00	-43.00	Vertical		
			5120.00	-42.51	Horizontal		
			7680.00	-46.29	Horizontal		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

Band 13 Radiated Spurious Emissions							
Bandwidth	Modulation	Test Channel	Spurious Emission			Limit (dBm)	Result
			Frequency	Level (dBm)	Polarization		
10MHz	QPSK	L	1564.00	-43.42	Vertical	-13.00	Pass
			2346.00	-42.53	Vertical		
			1564.00	-46.64	Horizontal		
			2346.00	-41.75	Horizontal		
10MHz	QPSK	M	1564.00	-42.36	Vertical	-13.00	Pass
			2346.00	-45.47	Vertical		
			1564.00	-46.58	Horizontal		
			2346.00	-43.69	Horizontal		
10MHz	QPSK	H	1564.00	-47.43	Vertical	-13.00	Pass
			2346.00	-45.54	Vertical		
			1564.00	-46.65	Horizontal		
			2346.00	-42.76	Horizontal		

Remark：

1. The emission behavior belongs to narrowband spurious emission.
2. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

Band 25 Radiated Spurious Emissions							
Bandwidth	Modulation	Test Channel	Spurious Emission			Limit (dBm)	Result
			Frequency	Level (dBm)	Polarization		
20MHz	QPSK	L	3720.00	-49.57	Vertical	-13.00	Pass
			5580.00	-47.68	Vertical		
			3720.00	-46.79	Horizontal		
			5580.00	-44.90	Horizontal		
20MHz	QPSK	M	3770.00	-49.80	Vertical	-13.00	Pass
			5650.00	-47.91	Vertical		
			3770.00	-47.02	Horizontal		
			5650.00	-45.13	Horizontal		
20MHz	QPSK	H	3810.00	-48.69	Vertical	-13.00	Pass
			5720.00	-45.80	Vertical		
			3810.00	-41.91	Horizontal		
			5720.00	-49.02	Horizontal		

Remark：

3. The emission behavior belongs to narrowband spurious emission.
4. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

Band 41 Radiated Spurious Emissions							
Bandwidth	Modulation	Test Channel	Spurious Emission			Limit (dBm)	Result
			Frequency	Level (dBm)	Polarization		
20MHz	QPSK	L	5130.00	-45.29	Vertical	-13.00	Pass
			7695.00	-42.40	Vertical		
			5130.00	-44.51	Horizontal		
			7695.00	-46.62	Horizontal		
20MHz	QPSK	M	5210.00	-47.47	Vertical	-13.00	Pass
			7815.00	-48.58	Vertical		
			5210.00	-48.69	Horizontal		
			7815.00	-45.80	Horizontal		
20MHz	QPSK	H	5290.00	-49.42	Vertical	-13.00	Pass
			7935.00	-46.53	Vertical		
			5290.00	-45.64	Horizontal		
			7935.00	-44.75	Horizontal		

Remark：

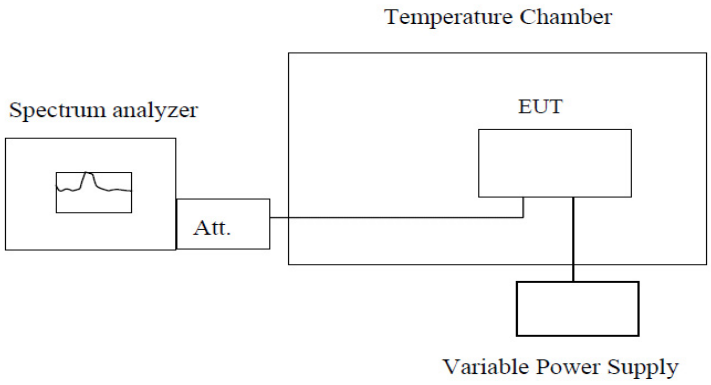
5. The emission behavior belongs to narrowband spurious emission.
6. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

3.8. Frequency stability

LIMIT

Cellular Band: ±2.5ppm PCS Band: Within the authorized frequency block

TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25℃ operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to –30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10℃ increased per stage until the highest temperature of +55℃ reached.
7. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

TEST RESULTS

Please see the Appendix for every tested Band.

Remark：We tested all the patterns, but only the worst data was found in the appendix.

4. EUT TEST PHOTOS

Reference to the document No.: Test Photographs

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5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Reference to the document No.: External Photographs and Internal Photographs.

**********THE END**********