Shenzhen Huatongwei International Inspection Co., Ltd.
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FCC REPORT

Report Reference No. ..... :	**TRE1710011601**	R/C…….: 31137
FCC ID ..... :	**U46-PACE4**	
Applicant's name ..... :	**TeleEpoch Limited**	
Address.....:	5A, B1 Building, Digital Tech Zone, High-Tech Park(south), Nanshan, district Guangdong, China	
Manufacturer.....:	TeleEpoch Limited	
Address.....:	5A, B1 Building, Digital Tech Zone, High-Tech Park(south), Nanshan, district Guangdong, China	
Test item description ..... :	**PACE4**	
Trade Mark .....:	PaceControls	
Model/Type reference.....:	PACE4	
Listed Model(s) .....:	-	
Standard ..... :	**FCC Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES**	
Date of receipt of test sample…….:	Oct.24, 2017	
Date of testing……...:	Oct.25, 2017 - Nov.08, 2017	
Date of issue…….:	Nov.09, 2017	
Result..... ……...:	**Pass**	
Compiled by (position+printedname+signature)...:	File administrators Candy Liu	Candy Liu
Supervised by (position+printedname+signature)....:	Project Engineer : Edward Pan	Edward.Pan
Approved by (position+printedname+signature)....:	Manager Hans Hu	Hans Hu
Testing Laboratory Name ..... :	**Shenzhen Huatongwei International Inspection Co., Ltd.**	
Address.....:	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	

Contents

1. Test standards and Report version

1.1. Applicable Standards

The tests were performed according to following standards:

FCC Part 27:MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
TIA/EIA 603 D June 2010:Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
FCC Part 2:FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
971168 D01 Power Meas License Digital Systems v02r02:provides a methodology for fully characterizing the fundamental power of wideband (> 1 MHz) digitally modulated RF signals acceptable to the FCC for demonstrating compliance for licensed transmitters.

1.2. Report version

Version No.	Date of issue	Description
00	Nov.09, 2017	Original

2. Test Description

Test Item	Section in CFR 47	Result	Test Engineer
RF Output Power	Part 2.1046 Part 27.50	Pass	William Wang
99% & -26 dB Occupied Bandwidth	Part 2.1049	Pass	William Wang
Conducted Spurious Emissions	Part 2.1051 Part 27.53	Pass	William Wang
Band Edge	Part 2.1051 Part 27.53	Pass	William Wang
ERP and EIRP	Part 22.913(a) Part 24.232(b)	Pass	William Wang
Radiated Spurious Emissions	Part 2.1053 Part 27.53	Pass	William Wang
Frequency stability vs. temperature	Part 2.1055(a)(1)(b) Part 27.54	Pass	William Wang
Frequency stability vs. voltage	Part 2.1055(d)(1)(2) Part 27.54	Pass	William Wang
Peak-Average Ratio	Part 27.50	Pass	William Wang

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

3. SUMMARY

3.1. Client Information

Applicant:	TeleEpoch Limited
Address:	5A, B1 Building, Digital Tech Zone, High-Tech Park(south), Nanshan, district Guangdong, China
Manufacturer:	TeleEpoch Limited
Address:	5A, B1 Building, Digital Tech Zone, High-Tech Park(south), Nanshan, district Guangdong, China

3.2. Product Description

Name of EUT:	PACE4
Trade Mark:	PaceControls
Model No.:	PACE4
Listed Model(s):	-
Power supply:	DC 20V
Adapter information:	-
Hardware version:	V1.1
Software version:	TBD
RF Technical Description	
☒FDD Band 4	
Operation Frequency:	Uplink:1710.7 MHz – 1754.3 MHz Downlink: 2110.7 MHz – 2154.3 MHz
Channel bandwidth:	☒1.4MHz ☒ 3MHz ☒ 5MHz ☒ 10MHz ☒15MHz ☒20MHz
☒FDD Band 13	
Operation Frequency:	Uplink:777 MHz – 787 MHz Downlink: 746 MHz – 756 MHz
Channel bandwidth:	☐1.4MHz ☐ 3MHz ☒ 5MHz ☒ 10MHz ☐15MHz ☐20MHz
Power Class:	☐ Class 1 ☐ Class 2 ☒ Class 3 ☐ Class 4
Modulation type:	☒QPSK ☒16QAM ☐64QAM
Antenna type	External antenna
Antenna Gain	1.2 dBi

3.3. Operation state

➢ **Test frequency list**

FDD Band 4

Test Frequency ID	Bandwidth [MHz]	N_{UL}	Frequency of Uplink [MHz]	N_{DL}	Frequency of Downlink [MHz]
Low Range	1.4	19957	1710.7	1957	2110.7
	3	19965	1711.5	1965	2111.5
	5	19975	1712.5	1975	2112.5
	10	20000	1715	2000	2115
	15	20025	1717.5	2025	2117.5
	20	20050	1720	2050	2120
Mid Range	1.4/3/5/10/15/20	20175	1732.5	2175	2132.5
High Range	1.4	20393	1754.3	2393	2154.3
	3	20385	1753.5	2385	2153.5
	5	20375	1752.5	2375	2152.5
	10	20350	1750	2350	2150
	15	20325	1747.5	2325	2147.5
	20	20300	1745	2300	2145

FDD Band 13

Test Frequency ID	Bandwidth [MHz]	N_{UL}	Frequency of Uplink[MHz]	N_{DL}	Frequency of Downlink[MHz]
Low Range	5	23205	779.5	5205	748.5
Mid Range	5/10	23230	782	5230	751
High Range	5	23255	784.5	5255	753.5

3.4. EUT operation mode

For RF test items
The EUT has been tested under typical operating condition. Testing was performed by configuring EUT to maimum output power status.

Test Items	Band	Bandwidth (MHz)						Modulation		RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max OutputPower	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	13	-	-	v	v	-	-	v	v	v	v	v	v	v	v
26dB and 99% Bandwidth	4	v	v	v	v	v	v	v	v			v	v	v	v
	13	-	-	v	v	-	-	v	v			v	v	v	v
Conducted Band Edge	4	v	v	v	v	v	v	v	v	v		v	v		v
	13	-	-	v	v	-	-	v	v	v		v	v		v
Conducted Spurious Emission	4	v	v	v	v	v	v	v	v	v			v	v	v
	13	-	-	v	v	-	-	v	v	v			v	v	v
E.R.P./ E.I.R.P.	4	v	v	v	v	v	v	v	v	v			v	v	v
	13			v	v	-	-	v	v	v			v	v	v
Radiated Spurious Emission	4	v	v	v	v	v	v	v		v			v	v	v
	13			v	v	-	-	v		v			v	v	v
Frequency Stability	4						v	v	v			v		v	
	13				v			v	v			v		v	
Peak-to-AverageRatio	4						v	v	v	v		v	v	v	v
	13				v			v	v	v		v	v	v	v
Remark	1. The mark “v“means that this configuration is chosenfor testing 2. The mark “-“means that this bandwidth is not supported. 3. The device is investigatedfrom 30MHz to10 times offundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.														

3.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- ● - supplied by the manufacturer
- ○ - supplied by the lab

		Manufacturer :	
		Model No. :	
		Manufacturer :	
		Model No. :	

3.6. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.
Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

4.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. 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.

IC-Registration No.:5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

4.3. Equipments Used during the Test

RF Conducted					
No.	Equipment	Manufacturer	Model No.	SerialNo.	Last Cal.
1	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	2016/11/13
2	WIDEB.RADIO COMM.TESRER	Rohde&Schwarz	CMW500	1201.0002K50	2016/11/13
3	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	2016/11/13
4	MXA Signal Analyzer	Agilent Technologies	N9020A	MY5050187	2016/11/13
5	Splitter	Mini-Circuit	ZAPD-4	400059	2016/11/13
6	Climate Chamber	ESPEC	EL-10KA	05107008	2016/11/13

RF Radiated					
No.	Equipment	Manufacturer	Model No.	SerialNo.	Last Cal.
1	UNIVERSAL RADIO COMMUNICATION	Rohde&Schwarz	CMU200	112012	2016/11/13
2	WIDEB.RADIO COMM.TESRER	Rohde&Schwarz	CMW500	1201.0002K50	2016/11/13
3	Spectrum Analyzer	Rohde&Schwarz	FSU26	201141	2016/11/13
4	HORNANTENNA	ShwarzBeck	9120D	1012	2016/11/13
5	HORNANTENNA	ShwarzBeck	9120D	1011	2016/11/13
6	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	538	2016/11/13
7	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	2016/11/13
8	TURNTABLE	MATURO	TT2.0	----	N/A
9	ANTENNA MAST	MATURO	TAM-4.0-P	----	N/A
10	EMI Test Software	Audix	E3	N/A	N/A
11	EMI Test Receiver	Rohde&Schwarz	ESIB 26	100009	2016/11/13
12	RF Test Panel	Rohde&Schwarz	TS / RSP	335015/ 0017	2016/11/13
13	High pass filter	Compliance Direction systems	BSU-6	34202	2016/11/13
14	Splitter	Mini-Circuit	ZAPD-4	400059	2016/11/13
15	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2016/11/13
16	Horn Antenna	SCHWARZBECK	BBHA9170	25842	2016/11/13
17	Preamplifier	ShwarzBeck	BBV 9718	BBV 9718	2016/11/13
18	Broadband Preamplifier	ShwarzBeck	BBV743	9743-0079	2016/11/13
19	Signal Generator	Rohde&Schwarz	SMF100A	101932	2016/11/13
20	Amplifer	Compliance Direction systems	PAP1-4060	120	2016/11/13
21	TURNTABLE	ETS	2088	2149	2016/11/13
22	ANTENNA MAST	ETS	2075	2346	2016/11/13
23	HORNANTENNA	Rohde&Schwarz	HF906	100068	2016/11/13
24	HORNANTENNA	Rohde&Schwarz	HF906	100039	2016/11/13

The calibration interval was one year.

4.4. Environmental conditions

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

Normal Conditon	Temperature	15 °C to +35 °C
	Relative humidity	20 % to 75 %.
	Voltage	the equipment shall be the nominal voltage for which the equipment was designed.
Extreme Conditon	Temperature	From −30° to + 50° centigrade
	Voltage	For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer

4.5. Statement of the 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 TR-100028-01"Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Huatongwei International Inspection Co., 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 Shenzhen Huatongweilaboratory is reported:

Test Items	MeasurementUncertainty	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 Emissio 1~18GHz	5.16 dB	(1)
Radiated Emissio 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)
Emission Mask	---------	(1)
Modulation Characteristic	---------	(1)
Transmitter Frequency Behavior	---------	(1)

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

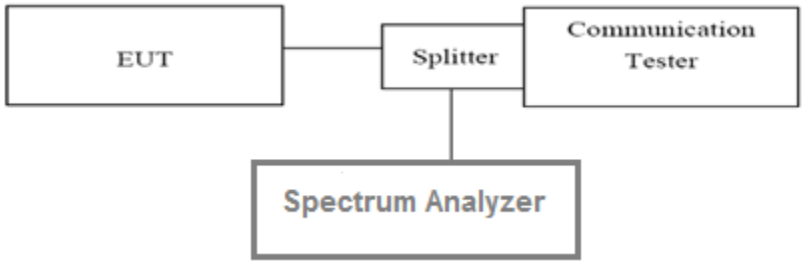
5. TEST CONDITIONS AND RESULTS

5.1. Conducted Output Power

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the spectrum analyzer 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 burst average power.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

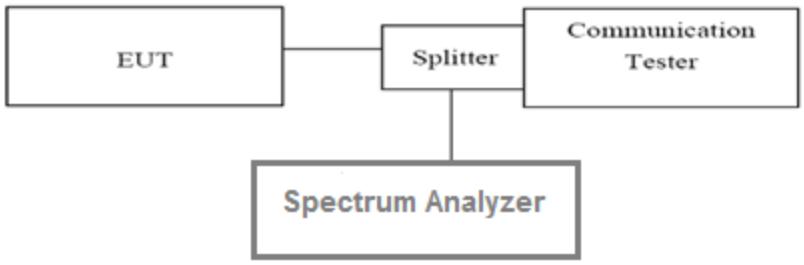
Reference Appendix A:

5.2. 99% & -26 dB Occupied Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBWwas 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 isthe delta frequency between the two points where the display line intersects the signal trace.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Reference Appendix C:

5.3. Conducted Spurious Emissions

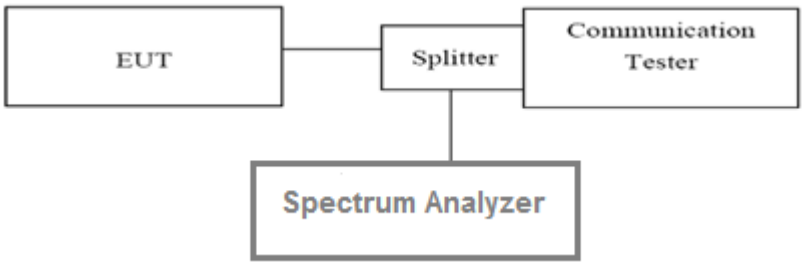
LIMIT

Part 27.53 c(2) h(1) specify that 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.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Part 27.53(f) 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. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

TEST CONFIGURATION



TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriateattenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficientscans 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 = 3MHz, Start=30MHz, Stop= 10th harmonic.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Reference Appendix E:

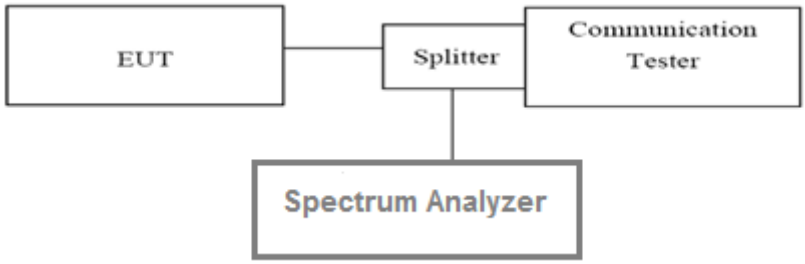
5.4. Band Edge

LIMIT

Part 27.53c(2)h(1) specify that 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.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

TEST CONFIGURATION



TEST PROCEDURE

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriateattenuation.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW>= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

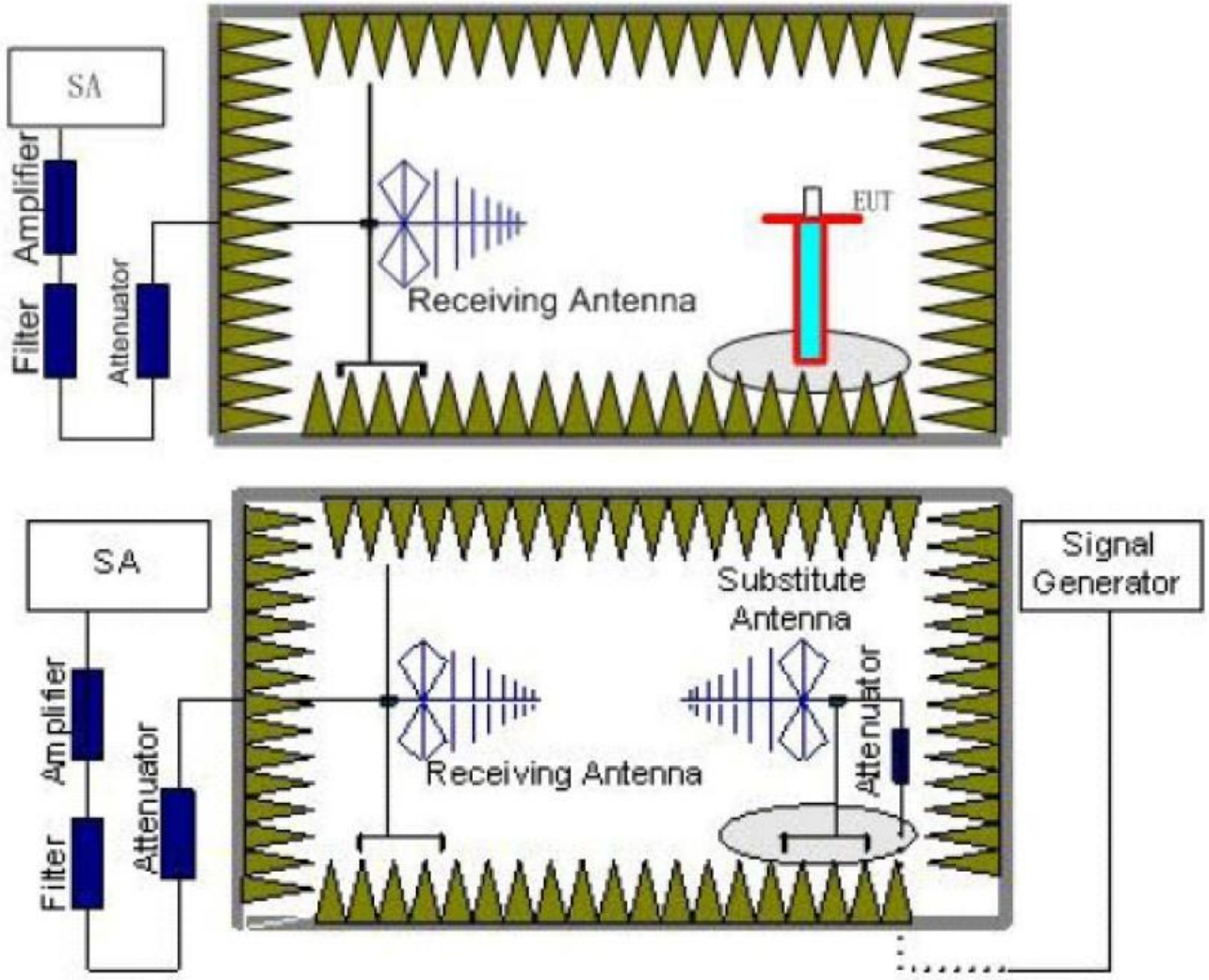
Reference Appendix D:

5.5. ERP AND EIRP

LIMIT

LTE Band 4:EIRP<1W, LTE Band 13:ERP<30W

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 0.8 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 shall be moved from 1m to 4m. 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 for above 1GHz and RBW=100kHz,VBW=300kHz for 30MHz to 1GHz,, 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 isconnected 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 adjust 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. A amplifier should be connected to the Signal Source output port. And the cable should be connect 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 micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation 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.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

LTE Band 4-1.4MHz					
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Low	22.19	20.06	30.00	PASS
	Mid	22.43	20.06		
	High	22.89	19.81		
16QAM	Low	20.04	19.20		PASS
	Mid	20.30	19.09		
	High	20.21	19.22		

LTE Band 4-3MHz					
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Low	21.54	19.25	30.00	PASS
	Mid	21.38	19.47		
	High	21.06	19.36		
16QAM	Low	20.41	19.01		PASS
	Mid	19.69	19.04		
	High	21.58	19.73		

LTE Band 4-5MHz					
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Low	21.78	20.35	30.00	PASS
	Mid	21.98	19.60		
	High	21.90	19.65		
16QAM	Low	20.68	19.68		PASS
	Mid	20.91	18.96		
	High	20.43	19.12		

LTE Band 4-10MHz					
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Low	22.07	20.23	30.00	PASS
	Mid	21.96	19.51		
	High	21.40	19.72		
16QAM	Low	21.14	19.63		PASS
	Mid	21.34	18.87		
	High	20.76	19.10		

LTE Band 4-15MHz					
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Low	21.09	18.37	30.00	PASS
	Mid	20.90	18.66		
	High	21.39	18.74		
16QAM	Low	19.74	17.70		PASS
	Mid	19.74	17.85		
	High	19.92	18.14		

LTE Band 4-20MHz					
Modulation	Channel	EIRP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Low	21.31	18.43	30.00	PASS
	Mid	21.71	18.92		
	High	21.74	18.95		
16QAM	Low	19.62	17.66		PASS
	Mid	19.20	17.96		
	High	19.41	18.16		

LTE Band 13-5MHz					
Modulation	Channel	ERP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Low	20.94	19.19	44.77	PASS
	Mid	21.21	19.17		
	High	21.90	19.24		
16QAM	Low	19.29	17.85		PASS
	Mid	19.67	18.11		
	High	19.73	17.94		

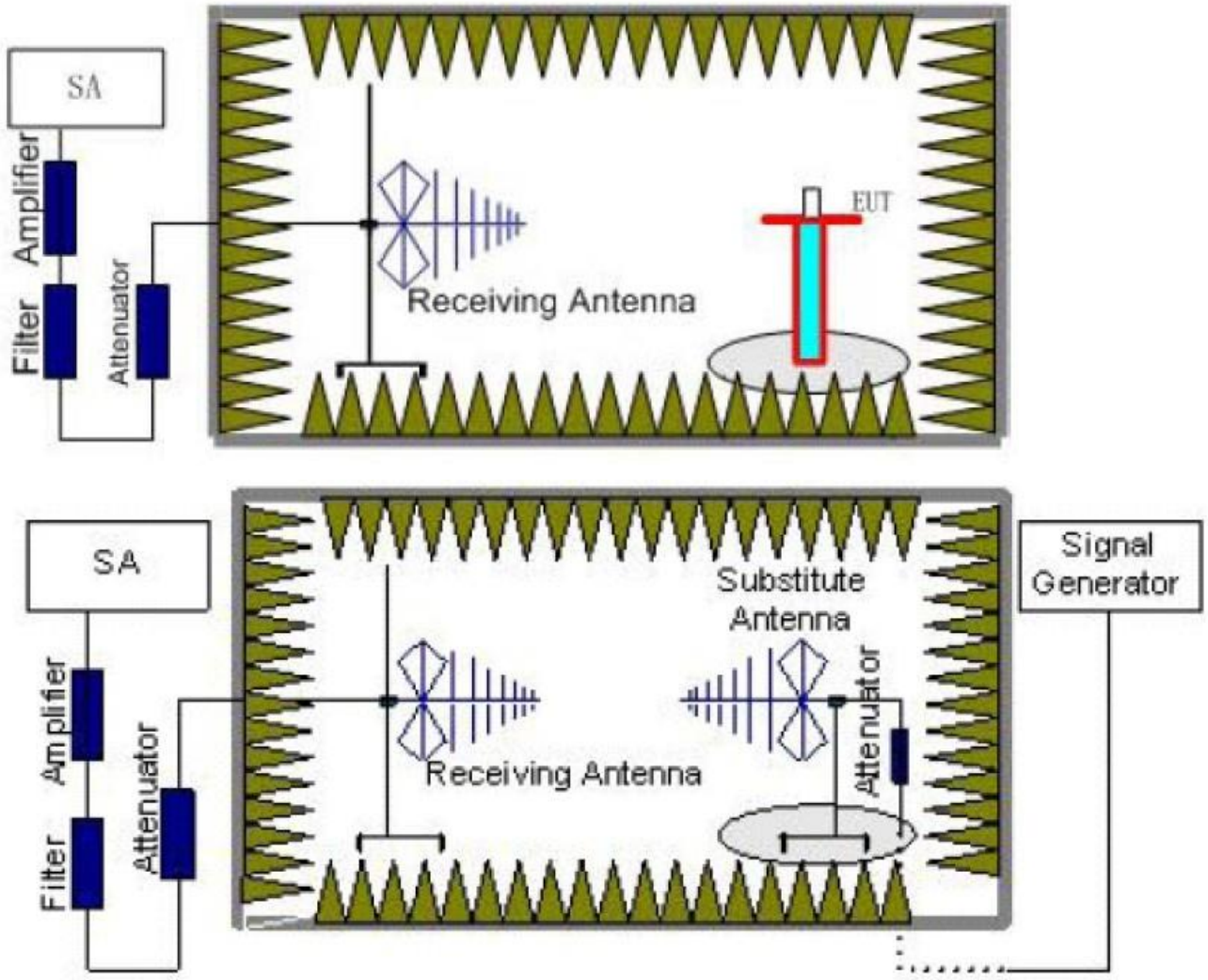
LTE Band 13-10MHz					
Modulation	Channel	ERP (dBm)		Limit (dBm)	Result
		Vertical	Horizontal		
QPSK	Mid	22.25	19.00	44.77	PASS
16QAM	Mid	20.08	18.16		PASS

5.6. Radiated Spurious Emssion

LIMIT

LTE Band 4/13:<-13dBm;

TEST CONFIGURATION



TEST RESULTS

1. EUT was placed on a 0.8 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 shall be moved from 1m to 4m. 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 for above 1GHz and RBW=100kHz,VBW=300kHz for 30MHz to 1GHz, 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 isconnected 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 adjust 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. A amplifier should be connected to the Signal Source output port. And the cable should be connect 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 micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation 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.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

LTE Band 4-1.4MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	3421.4	Vertical	-35.85	-13.00	Pass
	5132.1	V	-34.76		
	6842.8	V	---		
	3421.4	Horizontal	-37.17	-13.00	Pass
	5132.1	H	-33.43		
	6842.8	H	---		
Mid	3465	Vertical	-36.13	-13.00	Pass
	5197.5	V	-34.49		
	6930	V	---		
	3465	Horizontal	-36.82	-13.00	Pass
	5197.5	H	-33.15		
	6930	H	---		
High	3508.6	Vertical	-36.57	-13.00	Pass
	5262.9	V	-34.93		
	7017.2	V	---		
	3508.6	Horizontal	-36.94	-13.00	Pass
	5262.9	H	-33.26		
	7017.2	H	---		

Remark:
1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-3MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	3423	Vertical	-37.06	-13.00	Pass
	5134.5	V	-34.33		
	6846	V	---		
	3423	Horizontal	-36.40	-13.00	Pass
	5134.5	H	-33.03		
	6846	H	---		
Mid	3465	Vertical	-37.38	-13.00	Pass
	5197.5	V	-34.63		
	6930	V	---		
	3465	Horizontal	-36.20	-13.00	Pass
	5197.5	H	-33.19		
	6930	H	---		
High	3507	Vertical	-37.66	-13.00	Pass
	5260.5	V	-34.38		
	7014	V	---		
	3507	Horizontal	-35.86	-13.00	Pass
	5260.5	H	-33.50		
	7014	H	---		

Remark:
1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-5MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	3425	Vertical	-38.43	-13.00	Pass
	5137.5	V	-34.51		
	6850	V	---		
	3425	Horizontal	-36.04	-13.00	Pass
	5137.5	H	-33.67		
	6850	H	---		
Mid	3465	Vertical	-38.30	-13.00	Pass
	5197.5	V	-34.38		
	6930	V	-		
	3465	Horizontal	-36.28	-13.00	Pass
	5197.5	H	-33.86		
	6930	H	---		
High	3505	Vertical	-37.97	-13.00	Pass
	5257.5	V	-34.08		
	7010	V	-		
	3505	Horizontal	-36.40	-13.00	Pass
	5257.5	H	-33.98		
	7010	H	---		

Remark:
1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-10MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	3430	Vertical	-37.88	-13.00	Pass
	5145	V	-34.80		
	6860	V	---		
	3430	Horizontal	-35.98	-13.00	Pass
	5145	H	-33.62		
	6860	H	---		
Mid	3465	Vertical	-38.10	-13.00	Pass
	5197.5	V	-35.01		
	6930	V	---		
	3465	Horizontal	-35.78	-13.00	Pass
	5197.5	H	-33.46		
	6930	H	-		
High	3500	Vertical	-38.38	-13.00	Pass
	5250	V	-35.26		
	7000	V	-		
	3500	Horizontal	-35.62	-13.00	Pass
	5250	H	-33.31		
	7000	H	---		

Remark:
1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-15MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	3435	Vertical	-36.92	-13.00	Pass
	5152.5	V	-35.20		
	6870	V	---		
	3435	Horizontal	-36.01	-13.00	Pass
	5152.5	H	-32.94		
	6870	H	---		
Mid	3465	Vertical	-37.22	-13.00	Pass
	5197.5	V	-35.47		
	6930	V	---		
	3465	Horizontal	-36.26	-13.00	Pass
	5197.5	H	-33.15		
	6930	H	---		
High	3495	Vertical	-36.86	-13.00	Pass
	5242.5	V	-35.14		
	6990	V	---		
	3495	Horizontal	-36.21	-13.00	Pass
	5242.5	H	-33.10		
	6990	H	---		

Remark:
1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 4-20MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	3440	Vertical	-35.67	-13.00	Pass
	5160	V	-35.59		
	6880	V	---		
	3440	Horizontal	-35.79	-13.00	Pass
	5160	H	-33.45		
	6880	H	---		
Mid	3465	Vertical	-35.35	-13.00	Pass
	5197.5	V	-35.89		
	6930	V	---		
	3465	Horizontal	-36.10	-13.00	Pass
	5197.5	H	-33.20		
	6930	H	---		
High	3490	Vertical	-34.93	-13.00	Pass
	5235	V	-33.06		
	6980	V	---		
	3490	Horizontal	-35.48	-13.00	Pass
	5235	H	-33.16		
	6980	H	---		

Remark:
1. Remark"---" means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 13-5MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Low	1413	Vertical	-35.75	-13.00	Pass
	2119.5	V	-40.41		
	2826	V	---		
	1413	Horizontal	-39.27	-13.00	Pass
	2119.5	H	-41.58		
	2826	H	---		
Mid	1420	Vertical	-34.07	-13.00	Pass
	2130	V	-38.93		
	2840	V	---		
	1420	Horizontal	-37.54	-13.00	Pass
	2130	H	-40.26		
	2840	H	---		
High	1427	Vertical	-35.41	-13.00	Pass
	2140.5	V	-41.13		
	2854	V	---		
	1427	Horizontal	-36.42	-13.00	Pass
	2140.5	H	-41.36		
	2854	H	---		

Remark：

1. Remark”---“ means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

LTE Band 13-10MHz					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
Mid	1420	Vertical	-37.11	-13.00	Pass
	2130	V	-41.03		
	2840	V	---		
	1420	Horizontal	-39.21	-13.00	Pass
	2130	H	-42.09		
	2840	H	---		

Remark：

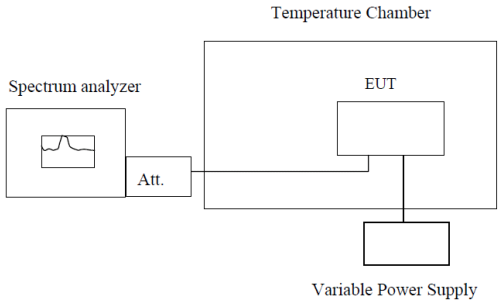
1. Remark”---“ means that the emission level is too low to be measured
2. The emission levels of below 1 GHz are very lower than the limit and not show in test report

5.7. Frequency stability V.S. Temperature measurement

LIMIT

2.5ppm

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°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

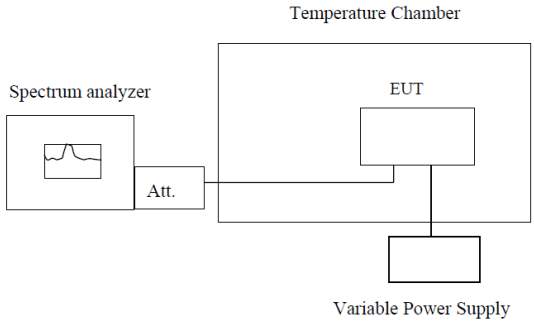
Reference Appendix F:

5.8. Frequency stability V.S. Voltagemeasurement

LIMIT

2.5ppm

TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. Set chamber temperature to 25°C. Use a variable DC power source topower the EUT and set the voltage to rated voltage.
2. Set the spectrum analyzer RBW lowenough to obtain the desired frequency resolution and recorded the frequency.
3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, recordthe maximum frequency change.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

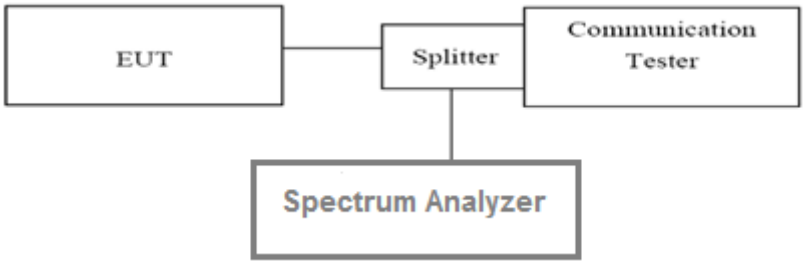
Reference Appendix F:

5.9. Peak-Average Ratio

LIMIT

13dB

TEST CONFIGURATION



TEST PROCEDURE

According with KDB 971168
1. The signal analyzer' s CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. Forcontinuoussignals(>98% duty cycle), the measurement interval was set to 1ms. For bursttransmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that issynced with an incoming pulse and the measurement interval is set to less than the durationof the " on time" of one burst to ensure that energy is only captured during a time in whichthetransmitter is operating at maximum power

TEST MODE:

Please refer to the clause 3.3

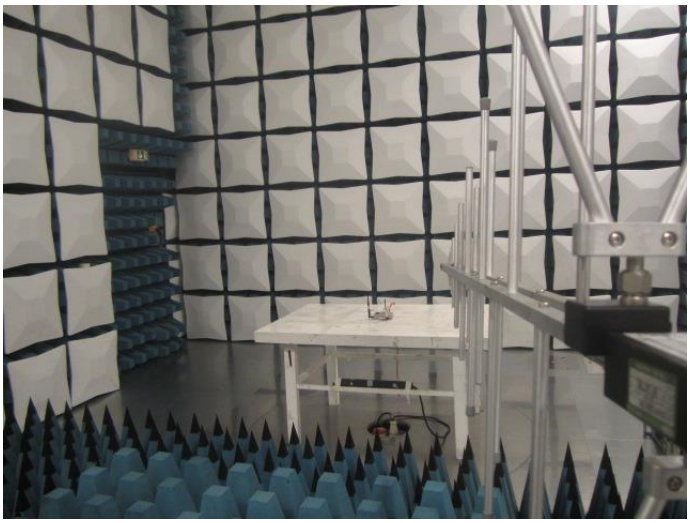
TEST RESULTS

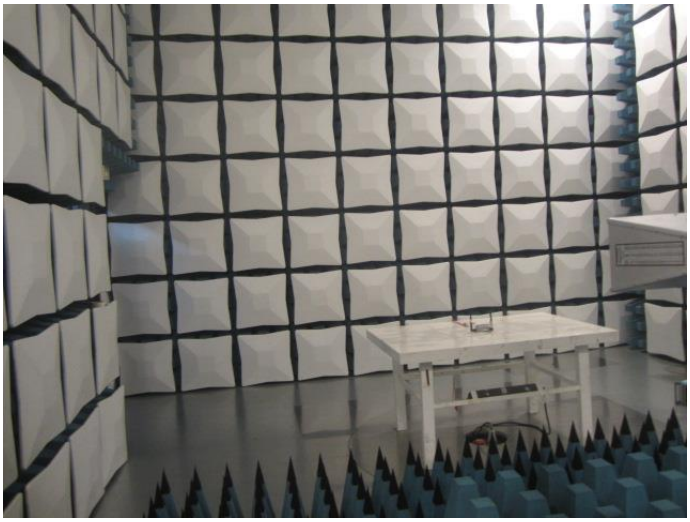
☒ **Passed** ☐ **Not Applicable**

Reference Appendix B:

6. Test Setup Photos of the EUT

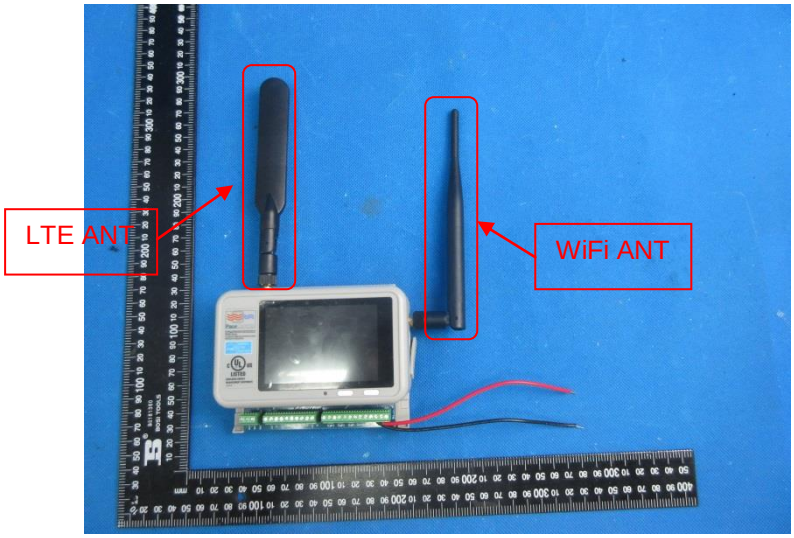
Radiated emission:

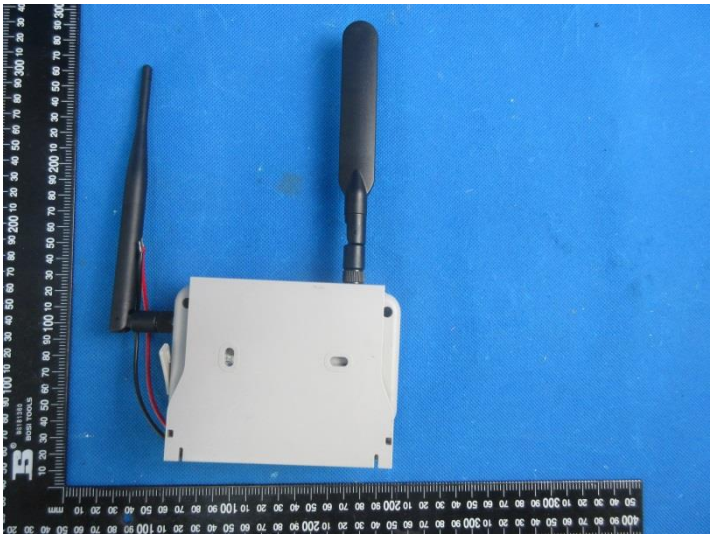


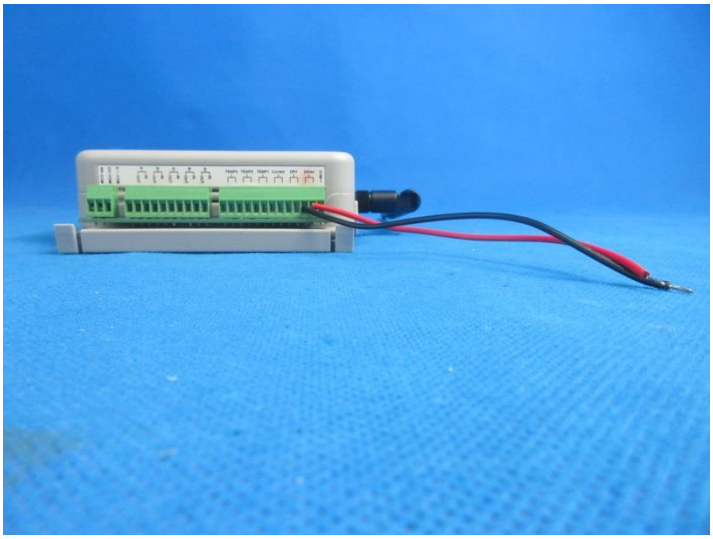


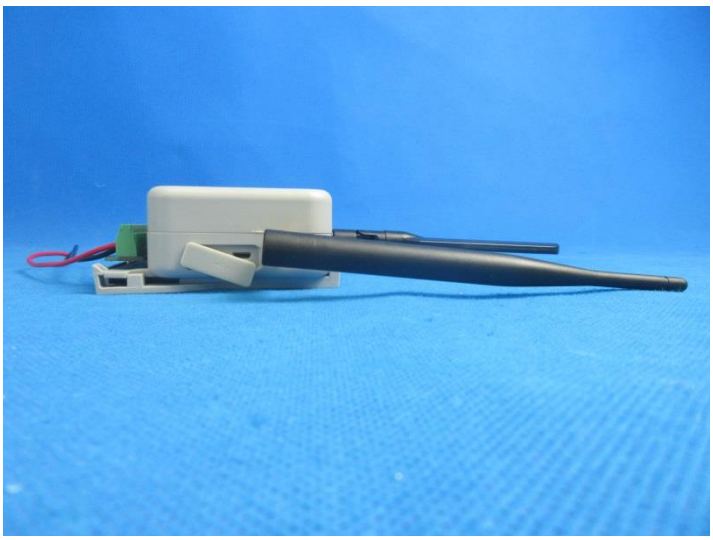
7. External and Internal Photos of the EUT

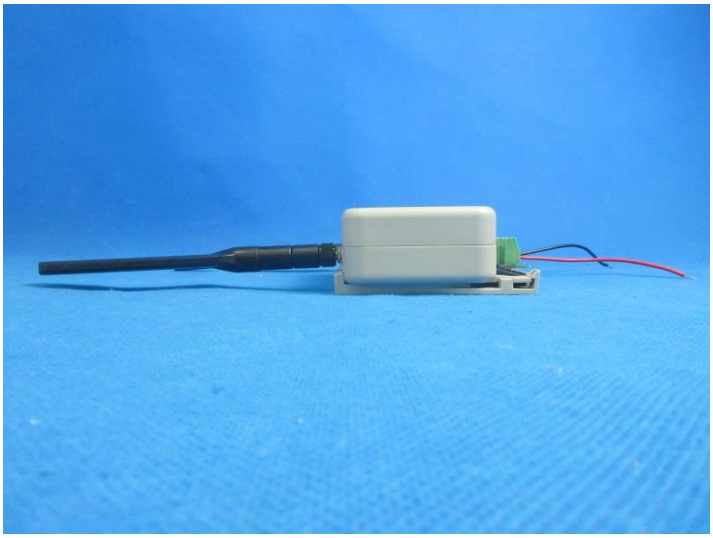
External photos of the EUT



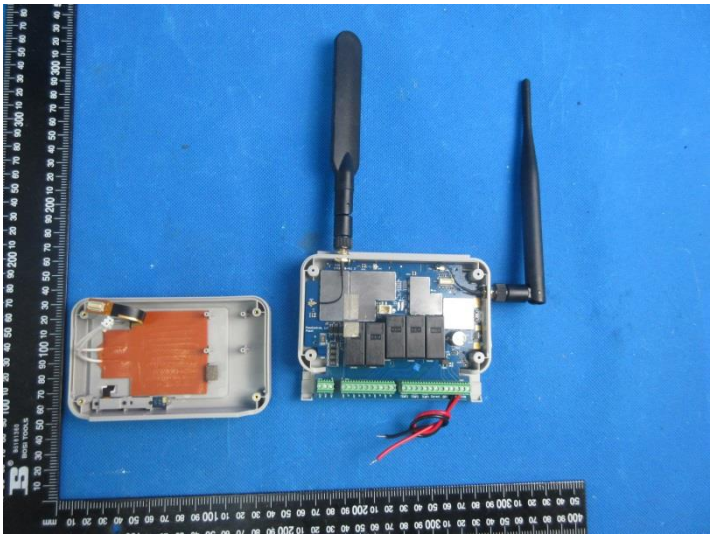


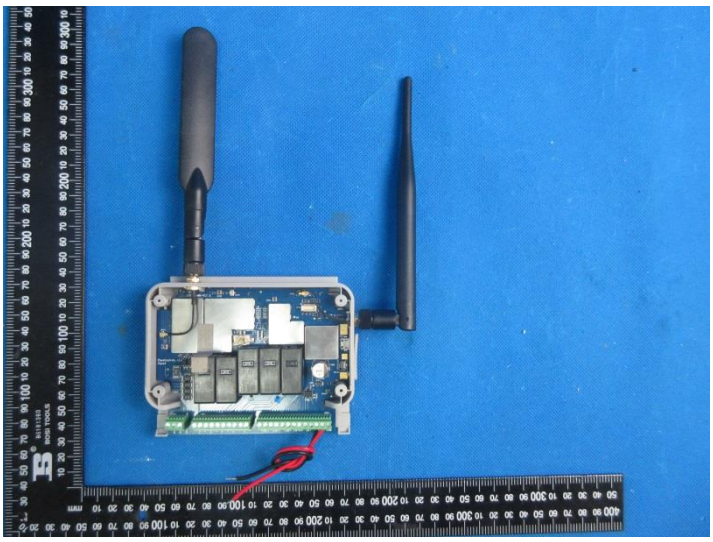


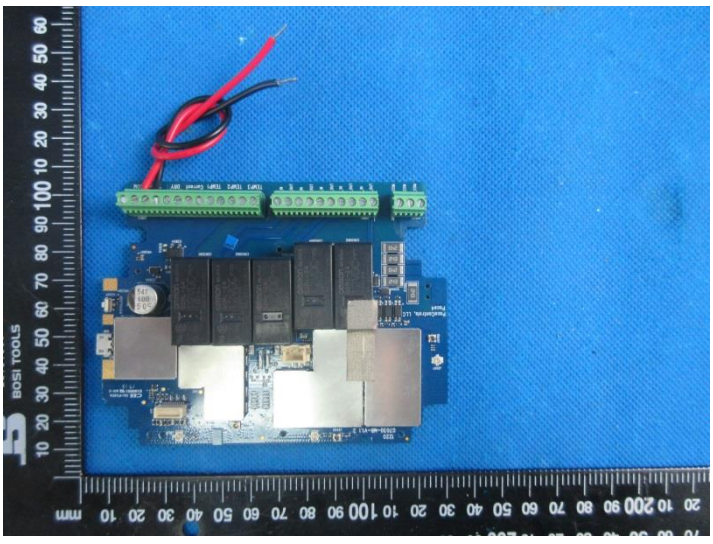


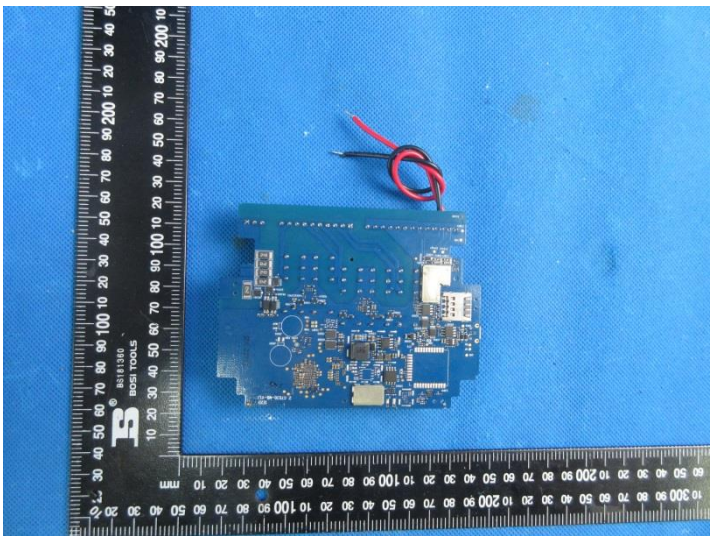


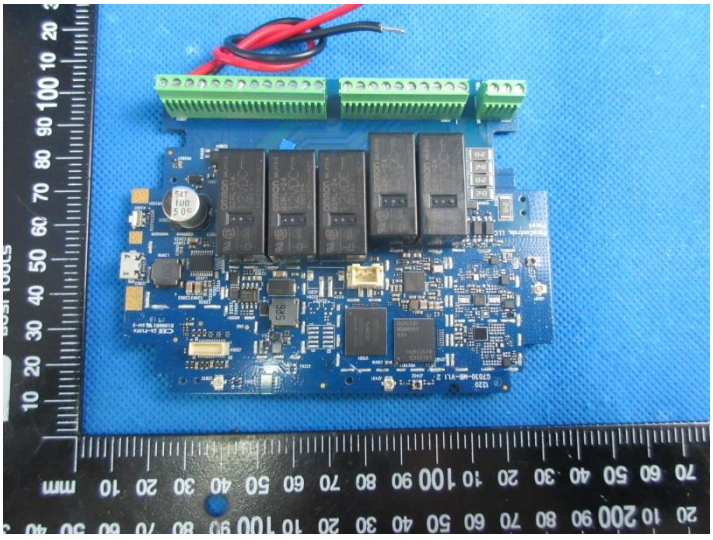
Internal photos of the EUT

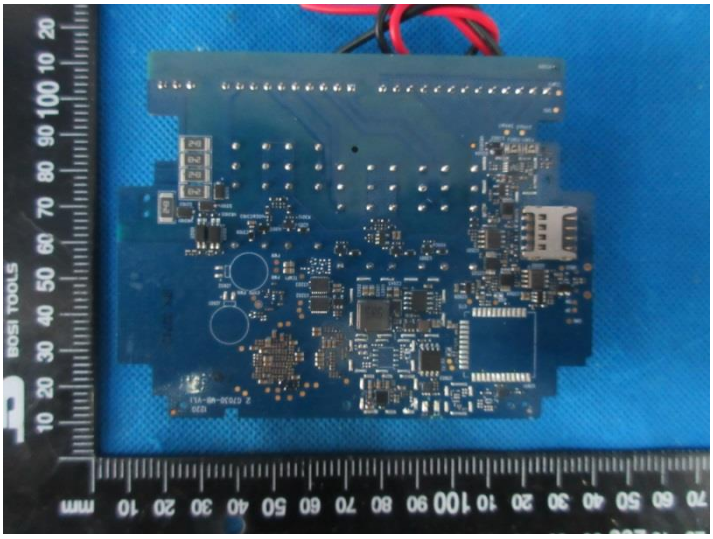


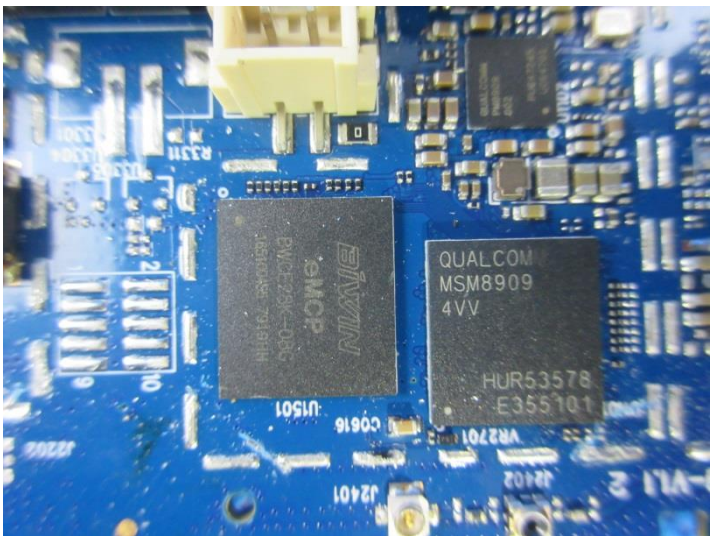












.....End of Report.....