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FCC TEST REPORT FCC ID:2AATP-TP270B

Report Number.....: ZKT-230220L0857E

Date of Test...... Feb. 09, 2023 to Feb. 24, 2023

Date of issue: Feb. 24, 2023

Test Result: PASS

Testing Laboratory.....: Shenzhen ZKT Technology Co., Ltd.

Applicant's name: SHENZHEN ECARE ELECTRONICS CO., LTD

Address 5-6/F.,Block B,Huali Industrial Building District 28, BaoAn,Shenzhen,

Guang Dong, China. P.C: 518101

Manufacturer's name: SHENZHEN ECARE ELECTRONICS CO., LTD

Guang Dong, China. P.C: 518101

Test specification:

Standard FCC CFR Title 47 Part 15 Subpart C Section 15.249 ANSI C63.10:2013

Test procedure.....:: /

Non-standard test method: N/A

Test Report Form No.: TRF-EL-111_V0

Test Report Form(s) Originator: ZKT Testing

Master TRF Dated: 2022-02-21

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Product name.....: Weather Station Indoor Outdoor Thermometer

Trademark: N/A

Model/Type reference TP270B, TP270BW, B70B

Ratings.....: DC 3.0V by 2*AA battery.

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Testing pro	ocedure an	d testina	location:

Testing Laboratory: Shenzhen ZKT Technology Co., Ltd.

1/F, No. 101, Building B, No. 6, Tangwei Community

Industrial Avenue, Fuhai Street, Bao'an District,

Shenzhen, China

Tested by (name + signature):

Alen He

Reviewer (name + signature)....:

Approved (name + signature) Lake Xie



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6.1 APPLIED PROCEDURES / LIMIT

6.3 2.2DEVIATION FROM STANDARD

6.2 2.1TEST PROCEDURE

6.4 2.3TEST SETUP

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1.VERSION

Report No.	Version	Description	Approved
ZKT-230220L0857E	Rev.01	Initial issue of report	Feb. 24, 2023



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2. SUMMARY OF TEST RESULTS

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Test procedures according to the technical standards:

FCC Part15 (15.249), Subpart C								
Standard Section	Test Item	Judgment	Remark					
FCC part 15.203	Antenna requirement	PASS						
FCC part 15.207	AC Power Line Conducted Emission	PASS						
FCC part 15.249	Fundamental &Radiated Spurious Emission Measurement	PASS						
FCC part 15.215 (c)	20dB Channel Bandwidth	PASS						
FCC part 15.205	Band Edge	PASS	50					

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



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2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.

Add.: 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an

District, Shenzhen, China

FCC Test Firm Registration Number: 692225

Designation Number: CN1299 IC Registered No.: 27033

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2 providing a level of confidence of approximately 95 %。

No.	Item	Uncertainty	
1	Conducted Emission Test	±1.38dB	Á
2	RF power conducted	±0.16dB	
3	Spurious emissions conducted	±0.21dB	
4	All emissions radiated(<1G)	±4.68dB	
5	All emissions radiated(>1G)	±4.89dB	
6	Temperature	±0.5°C	
7	Humidity	±2%	











3. GENERAL INFORMATION

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3.1 GENERAL DESCRIPTION OF EUT

7.4 5.4					
Product Name:	Weather Station Indoor Outdoor Thermometer				
Model No.:	TP270B, TP270BW, B70B				
Model Different.:	Since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only different on colour.				
Serial No.:	N/A				
Hardware Version:	TP270TX-V03				
Software Version:	XCT2205_9299				
Sample(s) Status:	Engineer sample				
Operation Frequency:	915MHz				
Channel Numbers:	1				
Modulation Type:	FSK				
Antenna Type:	Spring Antenna				
Antenna gain:	-8.55dBi				
Power supply:	DC 3.0V by 2*AA battery.				



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3.2 DESCRIPTION OF TEST MODES

Transmitting mode Keep the EUT in continuously transmitting mode	
--	--

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

Test Software	RF Test Tool
Power level setup	<0dBm

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

EUT

Conducted Emission



Adapter

Conducted Spurious

AC Line



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3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	/	/	/	/	/
E-2	1	/	/	/	/
			(212)		

Item	Shielded Type	Ferrite Core	Length	Note
C-1	1	/	1/	1

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in <code>FLength_</code> column.

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3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

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Radiation Test equipment

	root oquipmont					
Item	Equipment	Manufact urer	Type No.	Serial No.	Last calibratio n	Calibrate d until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIG HT	9020A	MY55370835	Oct. 16, 2022	Oct. 15, 2023
2	Spectrum Analyzer (1GHz-40GHz)	R&S	FSQ	100363	Oct. 15, 2022	Oct. 14, 2023
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	Oct. 16, 2022	Oct. 15, 2023
4	Bilog Antenna (30MHz-1500MHz)	Schwarz beck	VULB9168	N/A	Oct. 15, 2022	Oct. 14, 2023
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	Oct. 15, 2022	Oct. 14, 2023
6	Loop Antenna	TESEQ	HLA6121	58357	Oct. 15, 2022	Oct. 14, 2023
7	Amplifier (30-1000MHz)	EM Electroni cs	EM330 Amplifier	060747	Oct. 16, 2022	Oct. 15, 2023
8	Amplifier (1GHz-26.5GHz)	Agilent	8449B	3008A00315	Oct. 16, 2022	Oct. 15, 2023
9	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Oct. 16, 2022	Oct. 15, 2023
10	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Oct. 16, 2022	Oct. 15, 2023
11	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Oct. 16, 2022	Oct. 15, 2023
12	ESG Signal Generator	Agilent	E4421B	N/A	Oct. 20, 2022	Oct. 19, 2023
13	Signal Generator	Agilent	N5182A	N/A	Oct. 20, 2022	Oct. 19, 2023
14	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	Oct. 15, 2022	Oct. 14, 2023
15	MWRF Power Meter Test system	MW	MW100-RPC B	N/A	Oct. 15, 2022	Oct. 14, 2023
16	D.C. Power Supply	LongWei	TPR-6405D	N/A	\	\
17	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	\	\
18	RF Software	MW	MTS8310	V2.0.0.0	\	\
19	Turntable	MF	MF-7802BS	N/A	\	\
20	Antenna tower	MF	MF-7802BS	N/A	\	\

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Oct. 20, 2022	Oct. 19, 2023
2	LISN	CYBERTEK	EM5040A	E185040014 9	Oct. 20, 2022	Oct. 19, 2023

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3	Test Cable	N/A	C01	N/A	Oct. 16, 2022	Oct. 15, 2023
4	Test Cable	N/A	C02	N/A	Oct. 16, 2022	Oct. 15, 2023
5	EMI Test Receiver	R&S	ESRP3	101946	Oct. 15, 2022	Oct. 14, 2023
6	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	\	\

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4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 1POWER LINE CONDUCTED EMISSION Limits

EDEOLIENOV (MHz)	Limit (d	Standard	
FREQUENCY (MHz)	Quas -peak	Average	Staridard
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

4.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation



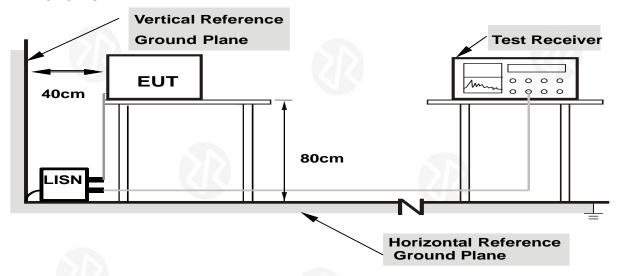






4.1.4 TEST SETUP

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Note: 1.Support units were connected to second LISN. 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

4.1.6 TEST RESULTS

N/A. Not applicable for the EUT.

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4.2 RADIATED EMISSION MEASUREMENT

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Test Requirement: FCC Part15 C Section 15.209 Test Method: ANSI C63.10:2013 9kHz to 25GHz Test Frequency Range: Test site: Measurement Distance: 3m Receiver setup: **RBW VBW** Frequency Detector Value 9KHz-150KHz Quasi-peak 200Hz 600Hz Quasi-peak 150KHz-30MHz 30KHz Quasi-peak 9KHz Quasi-peak 30MHz-1GHz Quasi-peak 100KHz 300KHz Quasi-peak

Peak

Peak

1MHz

1MHz

3MHz

10Hz

Peak

Average

4.2.1 RADIATED EMISSION LIMITS

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Above 1GHz

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

LIMITS OF RADIATED EMISSION MEASUREMENT

	Limit (dBuV/m) (at 3M)			
FREQUENCY (MHz)	PEAK	AVERAGE		
Above 1000	74	54		

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

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- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

4.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.
- g. For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

Note:

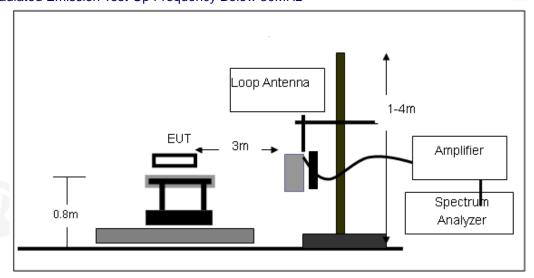
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3 DEVIATION FROM TEST STANDARD

No deviation

4.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



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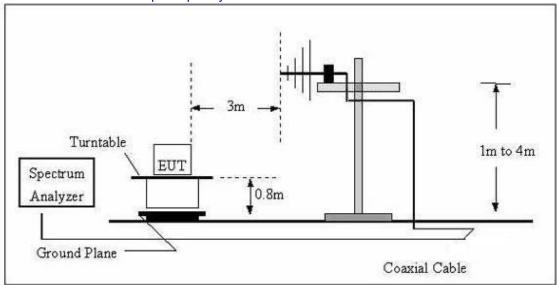




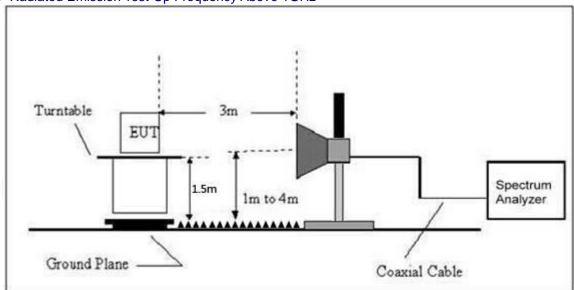




(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.6 TEST RESULTS (Between 9KHz - 30 MHz)

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

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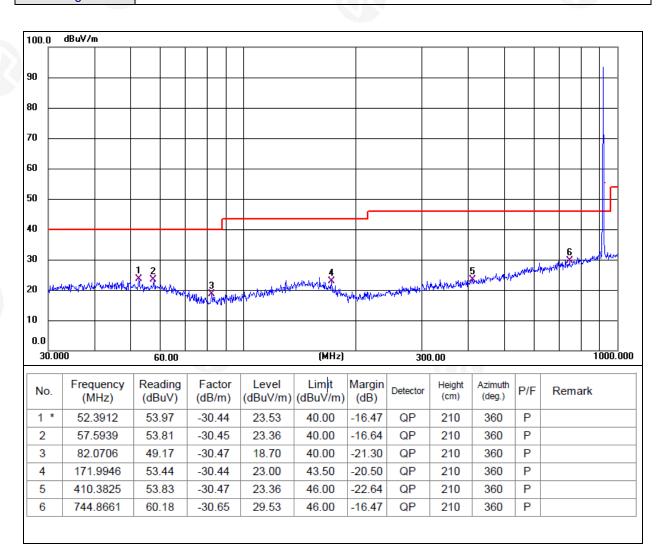




Between 30MHz - 1GHz



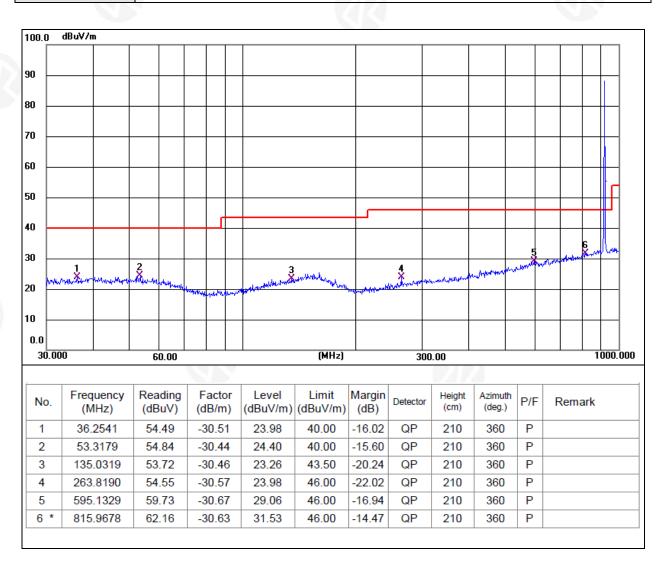
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 3V.	21.7	(4.6)





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Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 3V.		212



Remarks:

1.Final Level =Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor

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2.The emission levels of other frequencies are very lower than the limit and not show in test report.

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FSK

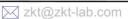
Polar	Frequency	Meter Reading	Pre-ampli fier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector	
(H/V)	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Туре	
	Low Channel:2402MHz									
V	V 1830.00 51.08 30.55 5.77 24.66 50.96 74.00 -23.04 Pk									
V	1830.00	43.28	30.55	5.77	24.66	43.16	54.00	-10.84	AV	
V	2745.00	53.65	30.33	6.32	24.55	54.19	74.00	-19.81	Pk	
V	2745.00	43.23	30.33	6.32	24.55	43.77	54.00	-10.23	AV	
V	3660.00	50.21	30.85	7.45	24.69	51.50	74.00	-22.50	Pk	
V	3660.00	42.91	30.85	7.45	24.69	44.20	54.00	-9.80	AV	
V	4575.00	50.69	31.02	8.99	25.57	54.23	74.00	-19.77	Pk	
V	4575.00	43.78	31.02	8.99	25.57	47.32	54.00	-6.68	AV	
Н	1830.00	54.22	30.55	5.77	24.66	54.10	74.00	-19.90	Pk	
Н	1830.00	43.22	30.55	5.77	24.66	43.10	54.00	-10.90	AV	
Н	2745.00	55.44	30.33	6.32	24.55	55.98	74.00	-18.02	Pk	
Н	2745.00	44.47	30.33	6.32	24.55	45.01	54.00	-8.99	AV	
Н	3660.00	52.39	30.85	7.45	24.69	53.68	74.00	-20.32	Pk	
Н	3660.00	43.90	30.85	7.45	24.69	45.19	54.00	-8.81	AV	
Н	4575.00	54.43	31.02	8.99	25.57	57.97	74.00	-16.03	Pk	
H	4575.00	44.06	31.02	8.99	25.57	47.60	54.00	-6.40	AV	

Remark:

- Emission Level = Meter Reading + Antenna Factor + Cable Loss Pre-amplifier, Margin= Emission Level - Limit
- 2. If peak below the average limit, the average emission was no test.
- 3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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5. BANDWIDTH OF FREQUENCY BAND EDGE

5.1 TEST REQUIREMENT:

Test Requirement:	FCC Part15 C	Section 15.209	and 15.20)5		
Test Method:	ANSI C63.10: 2013					
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.					
Test site:	Measurement Distance: 3m					
Receiver setup:	Frequency Detector RBW VBW Value					
	Above Peak 1MHz 3MHz Peak					
	1GHz	Average	1MHz	3MHz	Average	

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation

5.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the Highest channel

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

5.3 DEVIATION FROM TEST STANDARD No deviation

5.4 TEST SETUP

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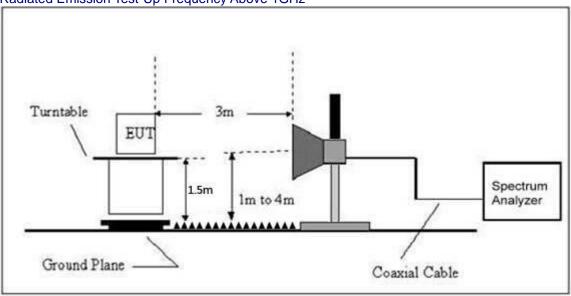








Radiated Emission Test-Up Frequency Above 1GHz



5.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

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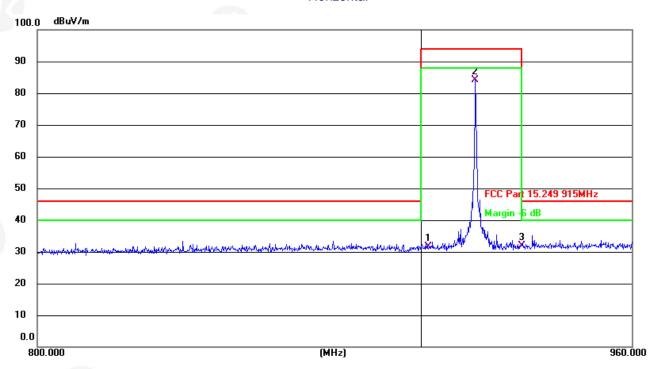


5.6 TEST RESULT

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Temperature :	26 ℃	Relative Humidity:	54%
Pressure :	101 kPa	Test Voltage :	DC 3.0V
Test Mode :	TX Mode-FSK Mode		

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	902.0000	62.15	-30.56	31.59	46.00	-14.41	QP
2 *	915.0400	114.65	-30.52	84.13	94.00	-9.87	QP
3	928.0000	62.47	-30.49	31.98	46.00	-14.02	QP

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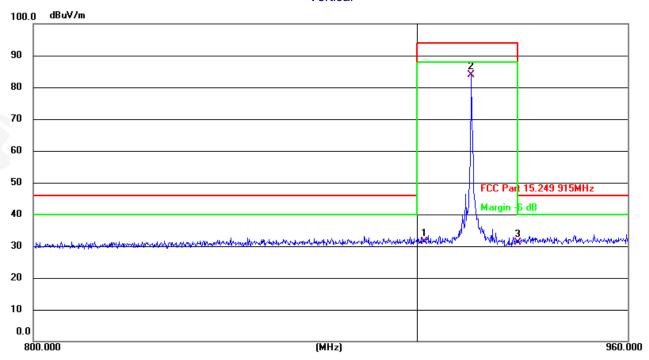








Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	902.0000	62.02	-30.56	31.46	46.00	-14.54	QP
2 '	915.0400	114.47	-30.52	83.95	94.00	-10.05	QP
3	928.0000	61.62	-30.49	31.13	46.00	-14.87	QP



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6. CHANNEL BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.249/15.215	
Test Method:	ANSI C63.10: 2013	

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.249) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.249(c)	Bandwidth	2400-2483.5	PASS

6.2 TEST PROCEDURE

- 1. Set resolution bandwidth (RBW) = 1-5% or DTS BW, not to exceed 100 kHz.
- 2. Set the video bandwidth (VBW) \geq 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

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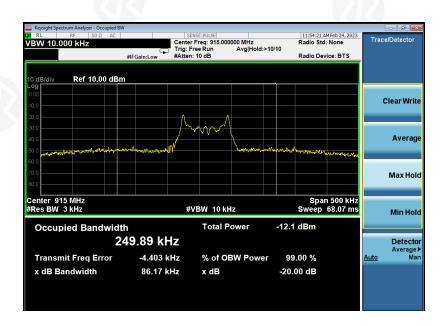






Temperature :	26 ℃	Relative Humidity:	54%
Test Mode :	FSK	Test Voltage :	DC 3.0V

Mode	Test channel	20dB Emission Bandwidth (KHz)	Result	
FSK	915MHz	86.17	Pass	







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7.ANTENNA REQUIREMENT

FCC Part15 C Section 15.203 Standard requirement:

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The antennas are PCB antenna, the best case gain of the antennas are -8.55dBi, reference to the appendix II for details.

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8. TEST SETUP PHOTO

Reference to the appendix I for details.

9. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

**** END OF REPORT ****

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