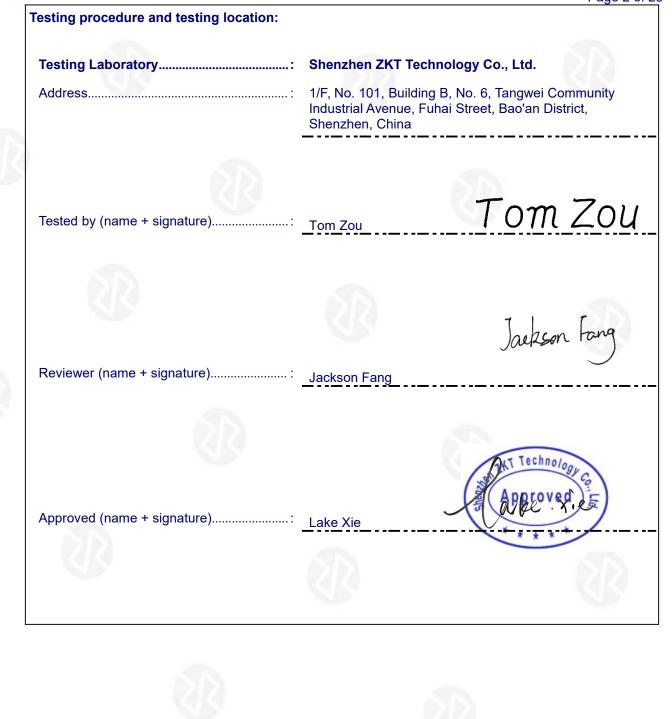


FCC TEST REPORT FCC ID:2AXCX-LTPMS0124

Report Number	: ZKT-2401301426E-5
Date of Test	Feb. 21, 2024 to Mar. 14, 2024
Date of issue	: Mar. 14, 2024
Total number of pages	23
Test Result	:: PASS
Testing Laboratory	: Shenzhen ZKT Technology Co., Ltd.
Address	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial
Applicant's name	:: Shenzhen Foxwell Technology Co., Ltd
Address	5/F, Plant C, Baocheng 71st Zone, Xin'an Street, Baoan District, Shenzhen 518106, China
Manufacturer's name	: Shenzhen Foxwell Technology Co., Ltd
Address	5/F, Plant C, Baocheng 71st Zone, Xin'an Street, Baoan District, Shenzhen 518106, China
Test specification:	
Standard	: FCC CFR Title 47 Part 15 Subpart C
Test procedure	::/
Non-standard test method	:: N/A
Test Report Form No	: TRF-EL-112_V0
Test Report Form(s) Originator	r: ZKT Testing
Master TRF	: Dated: 2020-01-06
test (EUT) is in compliance with identified in the report. This report shall not be reproduc	been tested by ZKT, and the test results show that the equipment under the FCC requirements. And it is applicable only to the tested sample ed except in full, without the written approval of ZKT, this document may sonal only, and shall be noted in the revision of the document.
Product name	: TPMS Service Tool (WiFi Version)
Trademark	
Model/Type reference	: T2000WF T66WF, TP300WF, TS300WF, PS100WF, H020WF, LT200WF, HT600WF.
50	Input : 5V===2.0A
Ratings	Battery : 3.7V, 3000mAh, 11.1Wh





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1.VERSION

Report No.	Version	Description	Approved
ZKT-2401301426E-5	Rev.01	Initial issue of report	Mar. 14, 2024
S			



















2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.225) , Subpart C								
Standard Section	Judgment	Remark						
FCC part 15.203	Antenna requirement	PASS						
FCC part 15.207	AC Power Line Conducted Emission	PASS						
FCC part 15.209	Radiated Spurious Emission Measurement	PASS						
FCC part 15.215	Channel Bandwidth	PASS						

NOTE:

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







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 \cdot where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2 \cdot providing a level of confidence of approximately 95 % \circ

No.	Item	Uncertainty
1	3m camber Radiated spurious emission(9KHz-30MHz)	U=4.5dB
2	3m camber Radiated spurious emission(30MHz-1GHz)	U=4.8dB
3	3m chamber Radiated spurious emission(1GHz-6GHz)	U=4.9dB
4	3m chamber Radiated spurious emission(6GHz-40GHz)	U=5.0dB
5	Conducted disturbance	U=3.2dB
6	RF conducted Spurious Emission	U=2.2dB
7	RF Occupied Bandwidth	U=1.8MHz
8	humidity uncertainty	U=5.3%
9	Temperature uncertainty	U=0.59°C

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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

	V414
Product Name:	TPMS Service Tool (WiFi Version)
Model No.:	T2000WF
Model Different.:	All the model are the same circuit and RF module, only the model name is different.
Serial No.:	T66WF, TP300WF, TS300WF, PS100WF, H020WF, LT200WF, HT600WF.
Hardware Version:	H1.0
Software Version:	S1.0
Sample(s) Status:	Engineer sample
Operation Frequency:	125kHz
Channel Numbers:	1
Channel Separation:	N/A
Modulation Type:	ASK
Antenna Type:	Spring Coil Antenna
Antenna gain:	0.50dBi
Power supply:	Input : 5V===2.0A
	Battery : 3.7V, 3000mAh, 11.1Wh

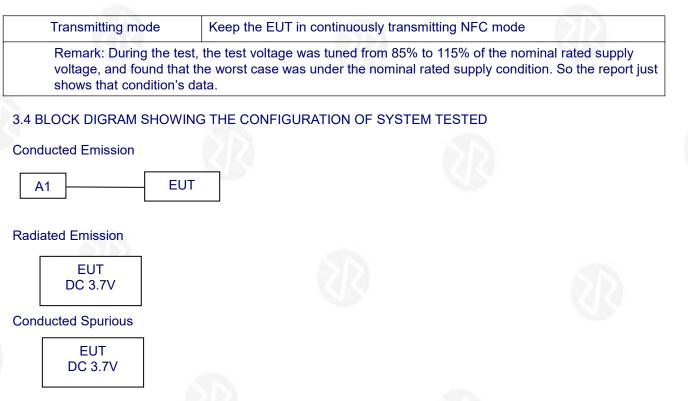
3.2 TEST CHANNEL

Channel List							
Channel	Frequency(kHz)	Channel	Frequency(kHz)				
01	125						





3.3 DESCRIPTION OF TEST MODES



3.5 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	TPMS Service Tool (WiFi Version)	N/A	BCST-21	BCST-22	EUT
A-1	Adapter	HUAWEI	HW-050100B3W	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
)		

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 $\[\]$ Length $\]$ column.
- (3) EUT used new batteries during test.

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3.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conducted emissions Test								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until	
1	LISN	R&S	ENV216	101471	N/A	Oct. 21, 2023	Oct. 20, 2024	
2	LISN	CYBERTEK	EM5040A	E185040014 9	N/A	Oct. 21, 2023	Oct. 20, 2024	
3	Test Cable	N/A	C-01	N/A	N/A	Oct. 21, 2023	Oct. 20, 2024	
4	Test Cable	N/A	C-02	N/A	N/A	Oct. 21, 2023	Oct. 20, 2024	
5	Test Cable	N/A	C-03	N/A	N/A	Oct. 21, 2023	Oct. 20, 2024	
6	EMI Test Receiver	R&S	ESCI3	101393	4.42 SP3	Oct. 28, 2023	Oct. 27, 2024	
7	Triple-Loop Antenna	N/A	RF300	N/A	N/A	Oct. 28, 2023	Oct. 27, 2024	
8	Absorbing Clamp	DZ	ZN23201	15034	N/A	Oct. 31, 2024	Oct. 30, 2024	
9	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	۱	١	

Radiated emissions Test & Radio Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY55370835	A.17.05	Oct. 28, 2023	Oct. 27, 2024
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Oct. 28, 2023	Oct. 27, 2024
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	4.32	Oct. 28, 2023	Oct. 27, 2024
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	N/A	Nov. 02, 2022	Mar. 14, 2024
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	N/A	Mar. 14, 2024	Oct. 31, 2024
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	N/A	Oct. 28, 2023	Oct. 27, 2024
7	Loop Antenna	TESEQ	HLA6121	58357	N/A	Mar. 14, 2024	Oct. 31, 2024
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	060747	N/A	Nov. 15, 2022	Nov. 14, 2023
9	Amplifier (1GHz-26.5GHz)	Agilent	8449B	3008A00315	N/A	Oct. 28, 2023	Oct. 27, 2024
10	Amplifier (500MHz-40GHz)	Quanjuda	DLE-161	097	N/A	Oct. 28, 2023	Oct. 27, 2024
11	Test Cable	N/A	R-01	N/A	N/A	Oct. 28, 2023	Oct. 27, 2024
12	Test Cable	N/A	R-02	N/A	N/A	Oct. 28, 2023	Oct. 27, 2024
13	Test Cable	N/A	R-03	N/A	N/A	Oct. 28, 2023	Oct. 27, 2024
14	Test Cable	N/A	RF-01	N/A	N/A	Oct. 28, 2023	Oct. 27, 2024
15	Test Cable	N/A	RF-02	N/A	N/A	Oct. 28, 2023	Oct. 27, 2024
16	Test Cable	N/A	RF-03	N/A	N/A	Oct. 28, 2023	Oct. 27, 2024
17	ESG Signal Generator	Agilent	E4421B	N/A	B.03.84	Oct. 21, 2023	Oct. 20, 2024
18	Signal Generator	Agilent	N5182A	N/A	A.01.87	Oct. 21, 2023	Oct. 20, 2024

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19	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	N/A	Nov. 15, 2022	Nov. 14, 2023
20	Wideband Radio Communication Test	R&S	CMW500	106504	V 3.7.22	Oct. 28, 2023	Oct. 27, 2024
21	RF Power Meter	KEYSIGHT	N1912A P	N/A	A.05.00	Oct. 21, 2023	Oct. 20, 2024
22	D.C. Power Supply	LongWei	TPR-6405D	N/A	N/A	λ	Λ
23	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	N/A	١	/
24	RF Software	MW	MTS8310	V2.0.0.0	N/A	1	Λ
25	Turntable	MF	MF-7802BS	N/A	N/A	Λ	1
26	Antenna tower	MF	MF-7802BS	N/A	N/A	1	\



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 POWER LINE CONDUCTED EMISSION Limits

	Limit (Standard	
FREQUENCY (MHz)	Quas-peak	Average	Standard
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

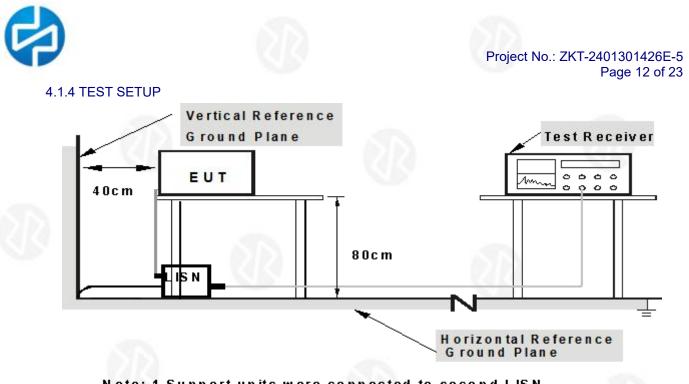
- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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

B

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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

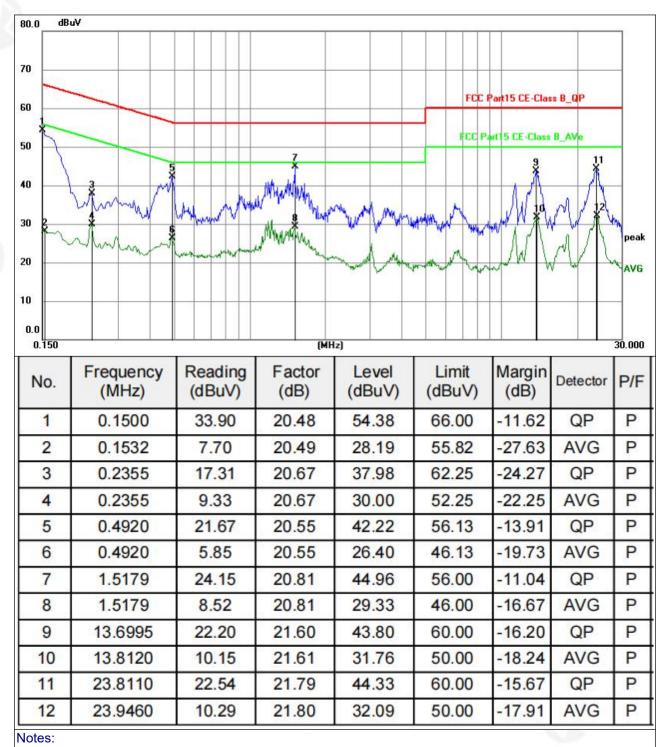
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.





4.1.6 Test Result

Temperature :	26 ℃	Relative Humidity:	54%
Pressure :	101kPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Mode:	TX ASK 125KHz



1.An initial pre-scan was performed on the line and neutral lines with peak detector.

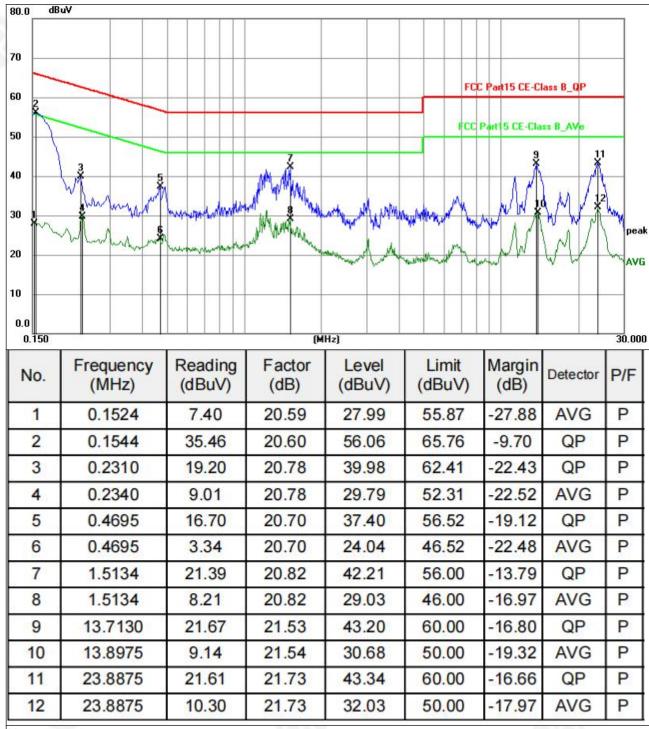
2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.3.Mesurement Level = Reading level + Correct Factor

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Temperature :	26 ℃	Relative Humidity:	54%
Pressure :	101kPa	Phase :	Ν
Test Voltage :	AC 120V/60Hz	Mode:	TX ASK 125KHz



Notes:

1.An initial pre-scan was performed on the line and neutral lines with peak detector.

2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.3.Mesurement Level = Reading level + Correct Factor



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4.2 RADIATED EMISSION MEASUREMENT

Τe	est Requirement:	FCC Part15 C Section 15.209				
Te	est Method:	ANSI C63.10:2013 9kHz to 1GHz				
Te	est Frequency Range:					
Te	est site:	Measurement Distance: 3m				
R	eceiver setup:	Frequency	Detector	RBW	VBW	Value
		9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
		150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
		30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
		Altaria 4011a	Peak	1MHz	3MHz	Peak
		Above 1GHz	Peak	1MHz	10Hz	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

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.





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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.

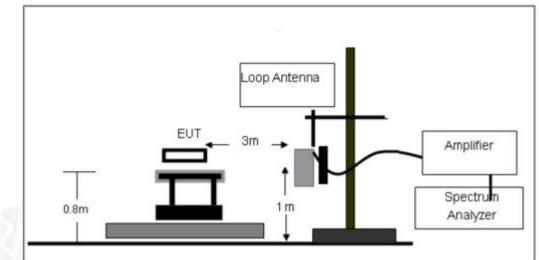
The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna 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

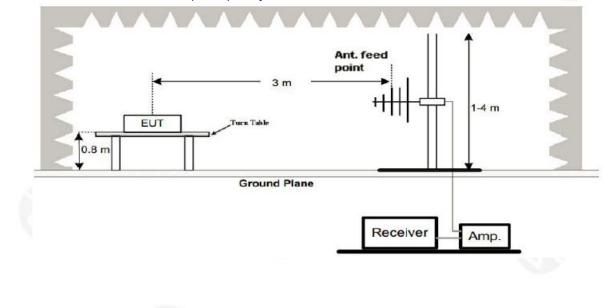
4.2.3 DEVIATION FROM TEST STANDARD No deviation

4.2.4 TEST SETUP

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



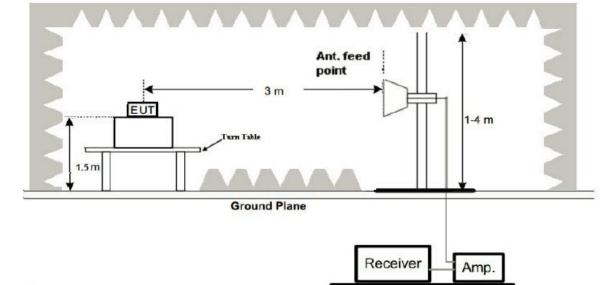
(B) Radiated Emission Test-Up Frequency 30MHz~1GHz







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



4.2.5 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.

4.2.6 TEST RESULTS

Field Strength of Fundamental



Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80 Limit dBuV/m @3m = Limit dBuV/m @30m + 40

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(kHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	- Detector Type
23.85	37.52	15.35	52.87	120.05	-67.18	AV
59.33	38.64	15.26	53.90	112.14	-58.24	AV
125.00	56.69	16.89	73.58	105.67	-32.09	AV
1237.15	38.45	15.87	54.32	65.76	-11.44	QP
2136.25	36.36	17.48	53.84	69.54	-15.70	QP
3217.92	34.59	18.72	53.31	69.54	-16.23	QP
6845.63	32.38	16.34	48.72	69.54	-20.82	QP
9272.28	30.74	12.85	43.59	69.54	-25.95	QP
11136.58	31.85	11.36	43.21	69.54	-26.33	QP



Pre-scan in the all of mode, the worst case in of was recorded. Factor = antenna factor + cable loss – pre-amplifier. Margin = Emission Level- Limit.

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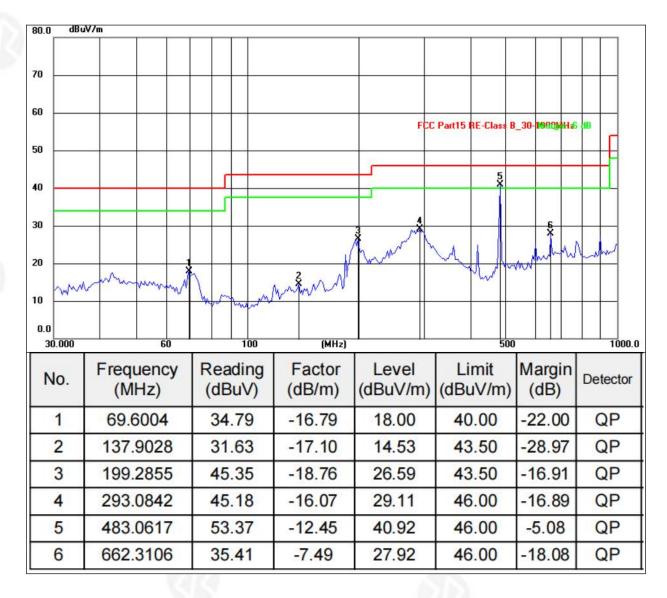
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Between 30MHz - 1GHz

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Mode:	TX ASK 125KHz

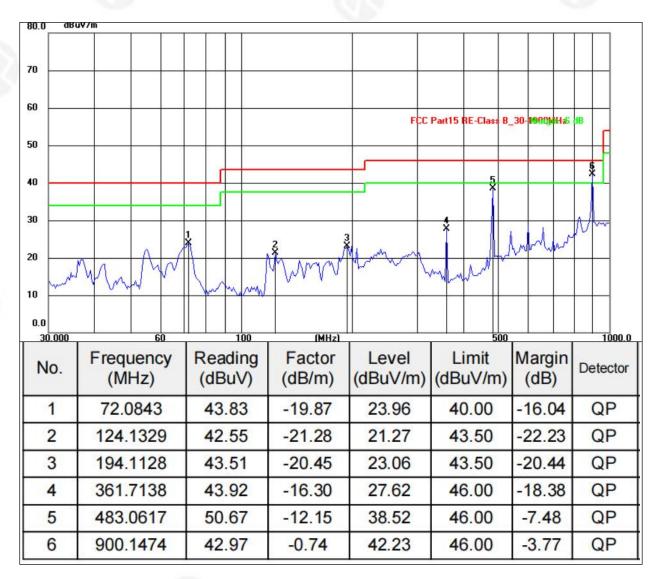


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Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Mode:	TX ASK 125KHz



Remarks:

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

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





5. CHANNEL BANDWIDTH

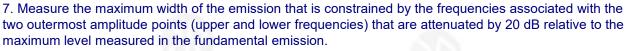
Test Requirement:	FCC Part15 C Section 15.215
Test Method:	ANSI C63.10: 2013

6.1 APPLIED PROCEDURES / LIMIT

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be deomonstrated by measuring the radiated emissions.

6.2 TEST PROCEDURE

- 1. Set RBW = 200 Hz.
- 2. Set the video bandwidth (VBW) ≥RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.



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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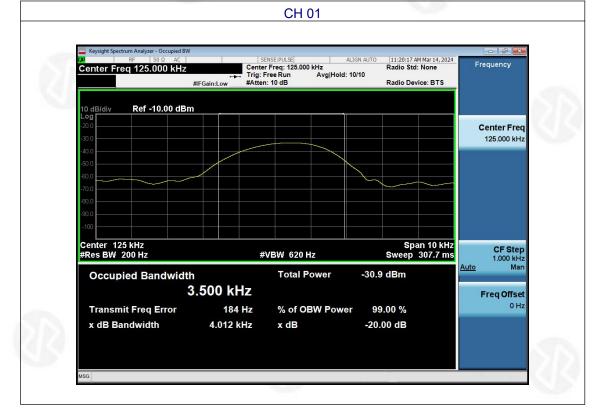


6.6 TEST RESULT

Temperature :	26 ℃	Relative Humidity :	54%
Test Mode :	ASK	Test Voltage :	AC 120V/60Hz



Test channel	20dB Channel Bandwidth (KHz)	Result
1	4.012	Pass







7.ANTENNA REQUIREMENT

	Standard requirement:	FCC Part15 C Section 15.203
	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.	
EUT Antenna:		
	The antennas is Spring Coil Antenna, the best case gain of the antennas is 0.50dBi, reference to the appendix II for details	





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Reference to the appendix I for details.

9. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

******** END OF REPORT *******

