TEST REPORT

Report Number	:	TZ0195250301FRF02
Product Name	:	Wiver
Model/Type reference	:	Wiver, Wiver R2, Wiver HD, Wiver HT
FCC ID	:	2BOL8-WIVER
Prepared for	:	PREDICORE TECHNOLOGY INC 18703 CLAY DR STE 200, HOUSTON, Texas, 77084, United States

Prepared By	:	Shenzhen Tongzhou Testing Co.,Ltd. 1st Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China
Standards	:	FCC CFR Title 47 Part 15C, ANSI C63.10: 2013
Date of Test	:	2025-03-11 ~ 2025-04-01
Date of Issue	:	2025-04-01
Prepared by	:	Nancy Li
Reviewed by	:	Allen Lai
Approved by	:	Max Zhang (Authorized Officer)

** Report Revise Record **

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2025-04-01	Valid	Initial release

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. Client Information

Applicant	:	PREDICORE TECHNOLOGY INC
Address	:	18703 CLAY DR STE 200, HOUSTON, Texas, 77084, United States
Manufacturer	:	PREDICORE TECHNOLOGY INC
Address	:	18703 CLAY DR STE 200, HOUSTON, Texas, 77084, United States

1.2. Description of Device (EUT)

Product Name	:	Wiver
Trade Mark	:	maper
Model Number	:	Wiver, Wiver R2, Wiver HD, Wiver HT
Model Declaration	:	The Wiver has three variants: Wiver R2, Wiver HD and Wiver HT.
Test Model	:	Wiver
Power Supply	:	DC 3V by 2*AA battery
Hardware version	:	D3
Software version	:	0.29.1

1.3. Wireless Function Tested in this Report

IEEE 802.15.4 O-QPSK PHY		
Operation Frequency	:	906 – 924 MHz
Channel Number	:	10 Channels
Modulation Technology	:	O-QPSK
Antenna Type And Gain	:	PCB Antenna; 0.83dBi

Note 1: Antenna position refer to EUT Photos.
Note 2: the above information was supplied by the applicant.

1.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:
●supplied by the manufacturer

○supplied by the lab

●	/	Model:	/
		Input:	/
		Output:	/

1.5. Description of Test Facility

FCC

Designation Number: CN1275
Test Firm Registration Number: 167722
Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA

Certificate Number: 5463.01
Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

IC

ISED#: 22033
CAB identifier: CN0099
Shenzhen Tongzhou Testing Co.,Ltd has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4 and CISPR 16-1-4:2010

1.6. 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 CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the Shenzhen Tongzhou Testing Co.,Ltd’s 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.

1.7. Measurement Uncertainty

Test Item		Uncertainty	Note
Radiation Uncertainty(9KHz~30MHz)	:	±3.26dB	(1)
Radiation Uncertainty(30MHz~1000MHz)	:	±3.92dB	(1)
Radiation Uncertainty(1GHz~40GHz)	:	±5.62dB	(1)
Conduction Uncertainty	:	±2.71dB	(1)
Occupied Channel Bandwidth	:	±3.0%	(1)
RF power, conducted	:	±0.16dB	(1)
Power Spectral Density, conducted	:	±1.3dB	(1)
Unwanted Emissions, conducted	:	±1.3dB	(1)
Time	:	±1.0%	(1)
Duty Cycle	:	±3.0%	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

1.8. Description of Test Modes

The EUT has been tested under operating condition.

This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

Worst-case mode and channel used for 150 kHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, which was determined to be **O-QPSK Middle Channel.**

Worst-case mode and channel used for 9kHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be **O-QPSK Middle Channel.**

1.9. Frequency of Channels

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	906	6	916
2	908	7	918
3	910	8	920
4	912	9	922
5	914	10	924

2. TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
The radiated testing was performed at an antenna-to-EUT distance of 3 meters. All radiated and conducted emissions measurement was performed at Shenzhen Tongzhou Testing Co.,Ltd

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.
According to FCC's request, Test Procedure KDB558074 D01 DTS Meas. Guidance v05r02 and KDB 662911 are required to be used for this kind of FCC 15.247 digital modulation device.
According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.205, 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

2.3. Test Sample

Sample ID	Description
#ReportNo.–1#	Engineer sample – continuous transmit
#ReportNo.–2#	Normal sample – Intermittent transmit

3. SYSTEM TEST CONFIGURATION

3.1. Justification

The system was configured for testing in a continuous transmits condition.

3.2. EUT Exercise Software

The system was configured for Bluetooth testing in a continuous transmits condition and change test channels by engineer mode (txstream **5 13 1**) provided by application.

3.3. Special Accessories

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/ unshielded	Notes
1	PC	ASUS	X454L	15105-0038A100	/	/	/

3.4. Block Diagram/Schematics

Please refer to the related document

3.5. Equipment Modifications

Shenzhen Tongzhou Testing Co.,Ltd has not done any modification on the EUT.

3.6. Test Setup

Please refer to the test setup photo.

4. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Sample ID	Result
§15.247(b)	Maximum Peak Conducted Output Power	TZ0195250301–1#	Compliant
§15.247(e)	Power Spectral Density	TZ0195250301–1#	Compliant
§15.247(a)(2)	6dB Bandwidth	TZ0195250301–1#	Compliant
/	Occupied Bandwidth	TZ0195250301–1#	Note 1
§15.209, §15.247(d)	Radiated and Conducted Spurious Emissions	TZ0195250301–1#	Compliant
§15.205	Emissions at Restricted Band	TZ0195250301–1#	Compliant
§15.207(a)	Conducted Emissions	N/A	Not Applicable
§15.203	Antenna Requirements	N/A	Compliant
Note 1: only for report purpose.			

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

5. TEST RESULT

5.1. On Time and Duty Cycle

5.1.1. Standard Applicable

None. for reporting purpose only.

5.1.2. Block Diagram of Test Setup

5.1.3. Test Procedures

1. Set the center frequency of the spectrum analyzer to the transmitting frequency.
2. Set the span=0MHz, RBW to the largest available value, VBW≥RBW
3. Detector = peak.
4. Trace mode = Single hold.

5.1.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

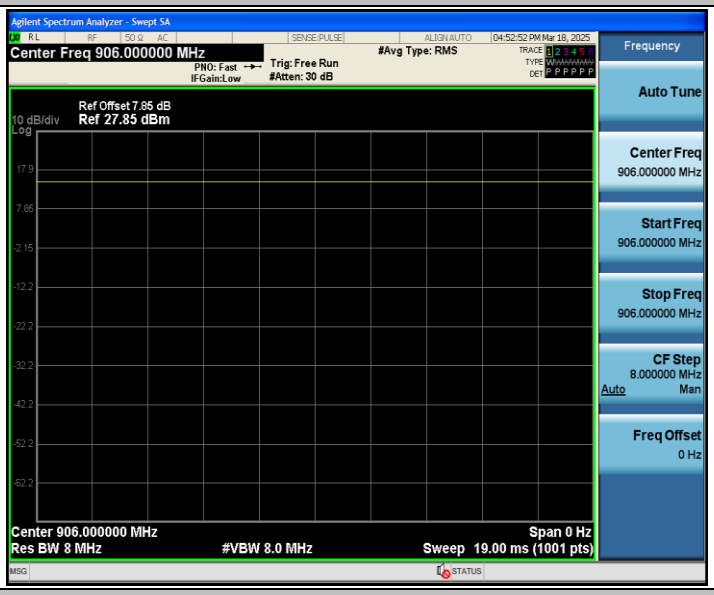
5.1.5. Test Result

Pass

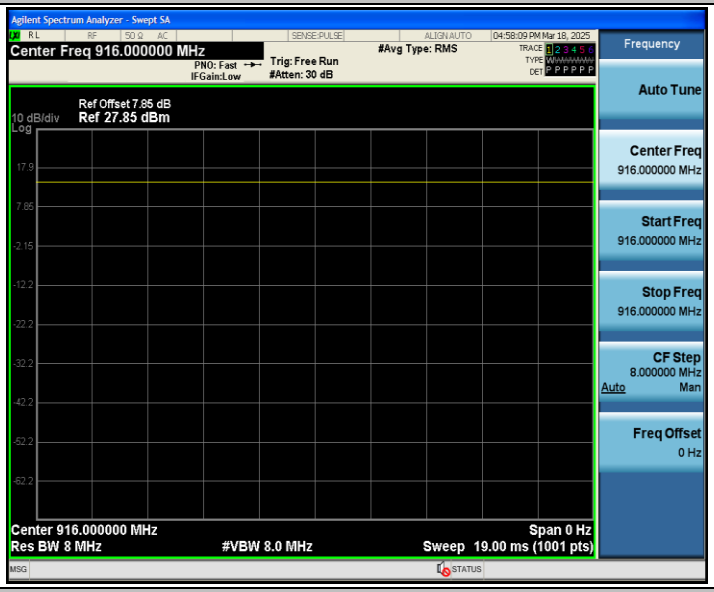
Test Mode	Antenna	Freq (MHz)	Duty Cycle [%]	Limit	Verdict
O-QPSK	Ant1	906	100	---	---
		916	100	---	---
		924	100	---	---

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

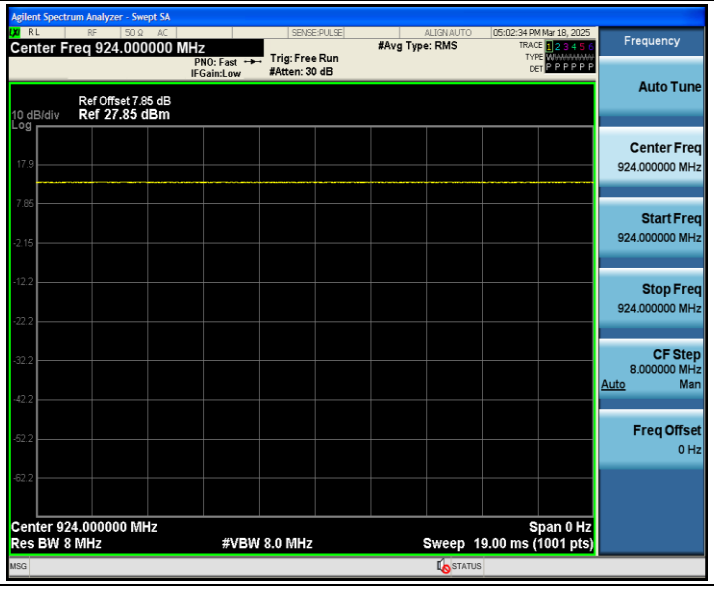
O-QPSK_Ant1_906



O-QPSK_Ant1_916



O-QPSK_Ant1_924

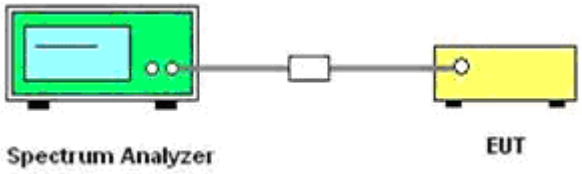


5.2. Maximum Peak Conducted Output Power Measurement

5.2.1. Standard Applicable

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

5.2.2. Block Diagram of Test Setup



5.2.3. Test Procedures

The transmitter output (antenna port) was connected to the spectrum analyzer.
According to KDB558074 D01 DTS Measurement Guidance Section 9.1 Maximum peak conducted output power 9.1.1.
This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.
a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ 3 × RBW.
c) Set span ≥ 3 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

5.2.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

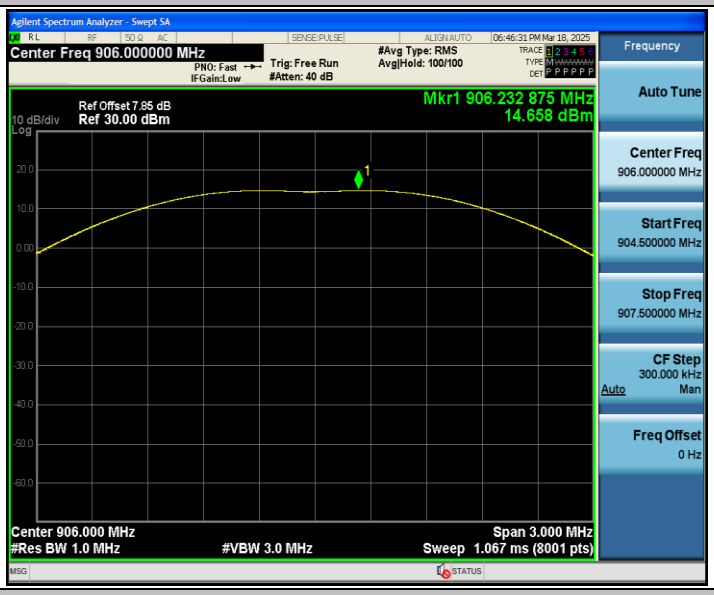
5.2.5. Test Result

Pass

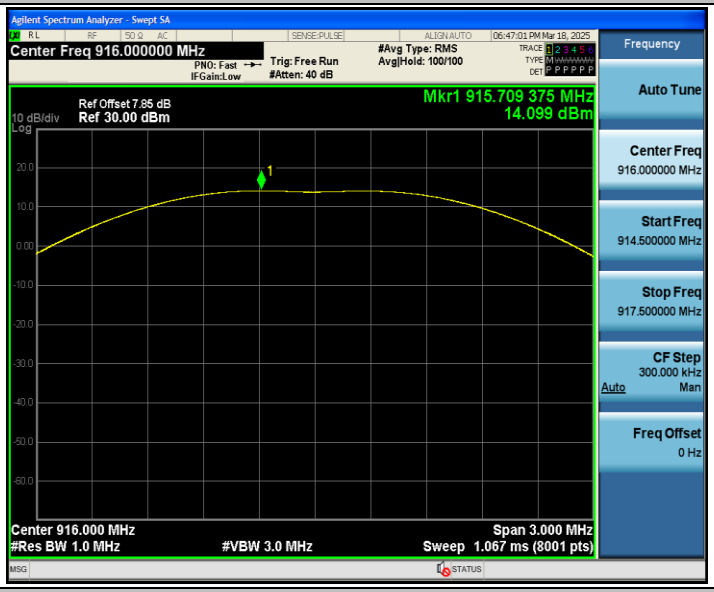
Test Mode	Antenna	Freq (MHz)	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
O-QPSK	Ant1	906	14.66	≤30	PASS
		916	14.10	≤30	PASS
		924	13.27	≤30	PASS

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

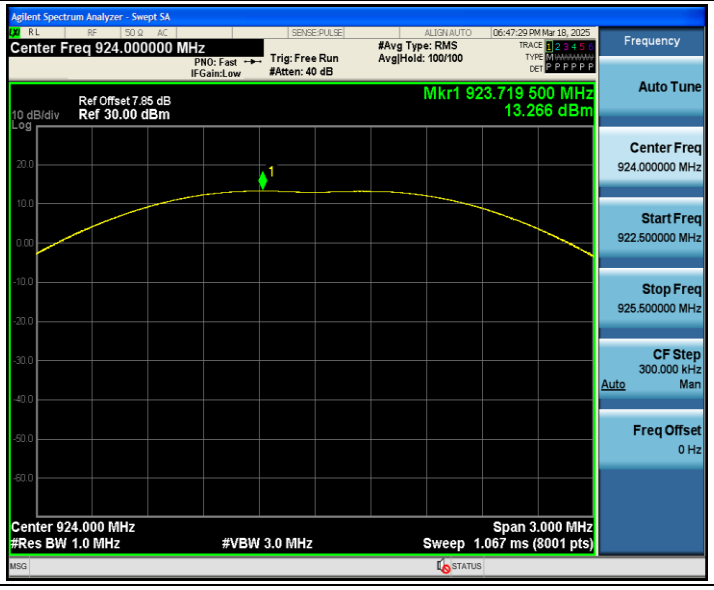
O-QPSK_Ant1_906



O-QPSK_Ant1_916



O-QPSK_Ant1_924

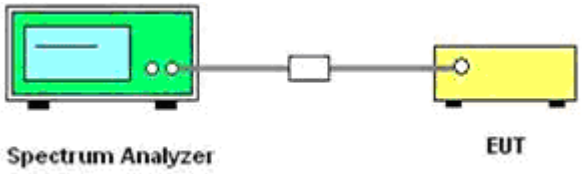


5.3. Power Spectral Density Measurement

5.3.1. Standard Applicable

According to §15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.3.2. Block Diagram of Test Setup



5.3.3. Test Procedures

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3. Set the RBW = 3kHz.
4. Set the VBW ≥ 3*RBW
5. Set the span to 1.5 times the DTS channel bandwidth.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum power level.
11. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
12. The resulting peak PSD level must be less than 8dBm.

5.3.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.3.5. Test Result

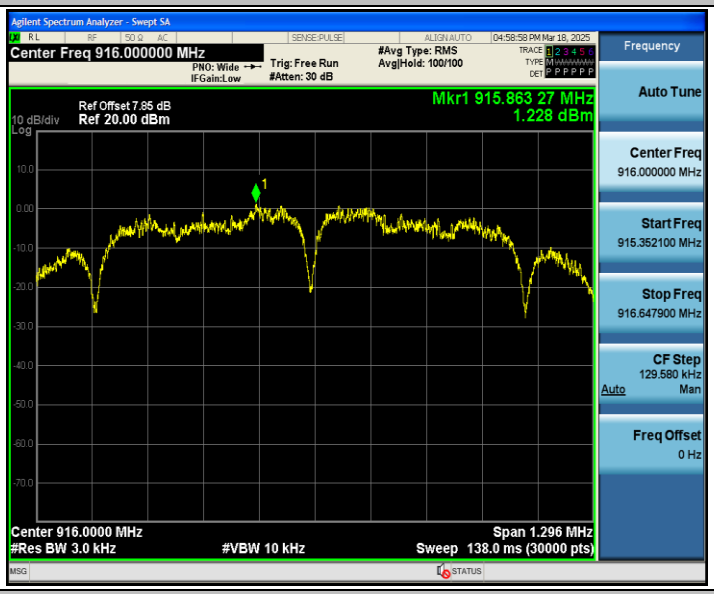
Pass

Test Mode	Antenna	Freq (MHz)	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
O-QPSK	Ant1	906	1.50	≤8.00	PASS
		916	1.23	≤8.00	PASS
		924	0.47	≤8.00	PASS

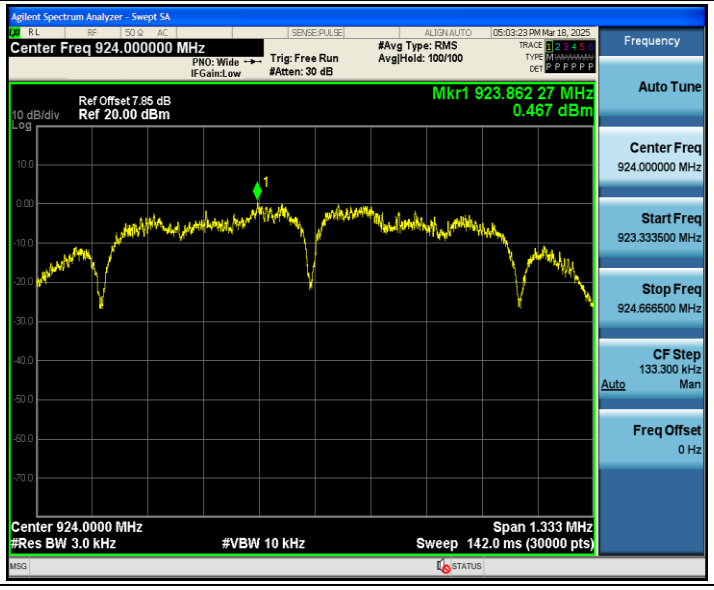
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

O-QPSK_Ant1_904

O-QPSK_Ant1_916



O-QPSK_Ant1_924

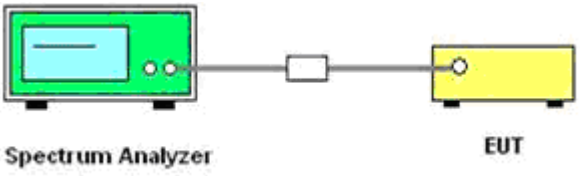


5.4. 6 dB Spectrum Bandwidth and Occupied Channel Bandwidth Measurement

5.4.1. Standard Applicable

According to §15.247(a) (2): For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

5.4.2. Block Diagram of Test Setup



5.4.3. Test Procedures

6dB Spectrum Bandwidth Test Procedure:

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth and the video bandwidth were set according to C63.10 11.8.1.
3. Measured the spectrum width with power higher than 6dB below carrier.

Occupied Bandwidth Spectrum Bandwidth Test Procedure:

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth and the video bandwidth were set according to C63.10 6.9.3
3. Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

5.4.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.4.5. Test Result

Pass

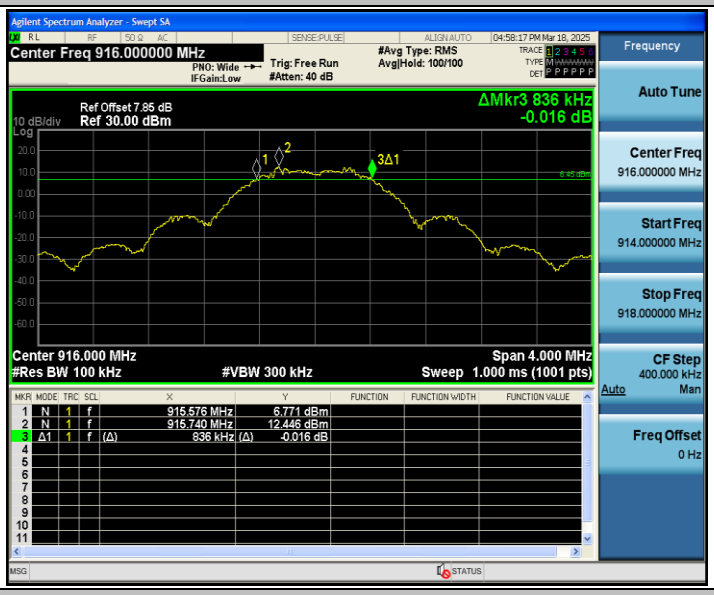
6dB Spectrum Bandwidth

Test Mode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
O-QPSK	Ant1	906	0.860	905.576	906.436	0.5	PASS
		916	0.836	915.576	916.412	0.5	PASS
		924	0.860	923.560	924.420	0.5	PASS

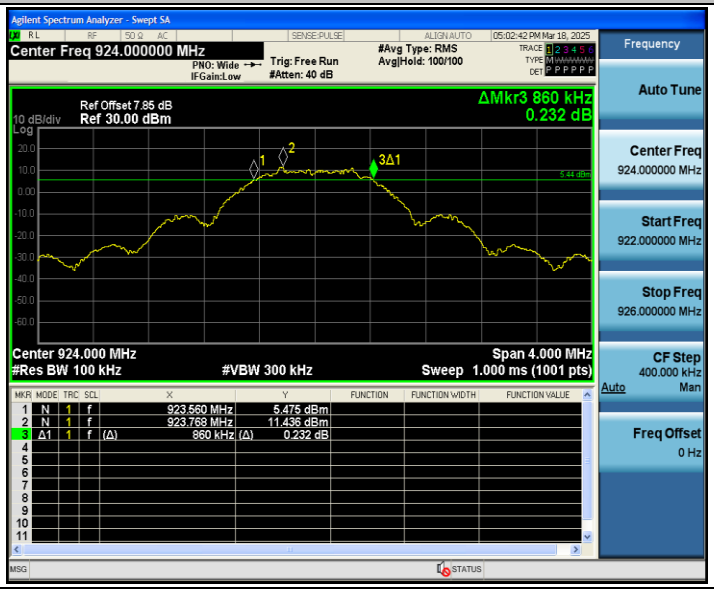
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

O-QPSK_Ant1_906

O-QPSK_Ant1_916



O-QPSK_Ant1_924

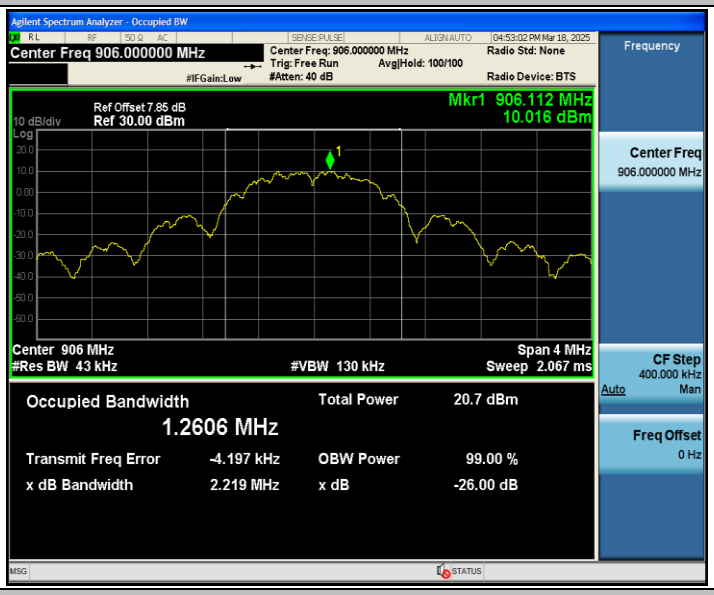


Occupied Bandwidth

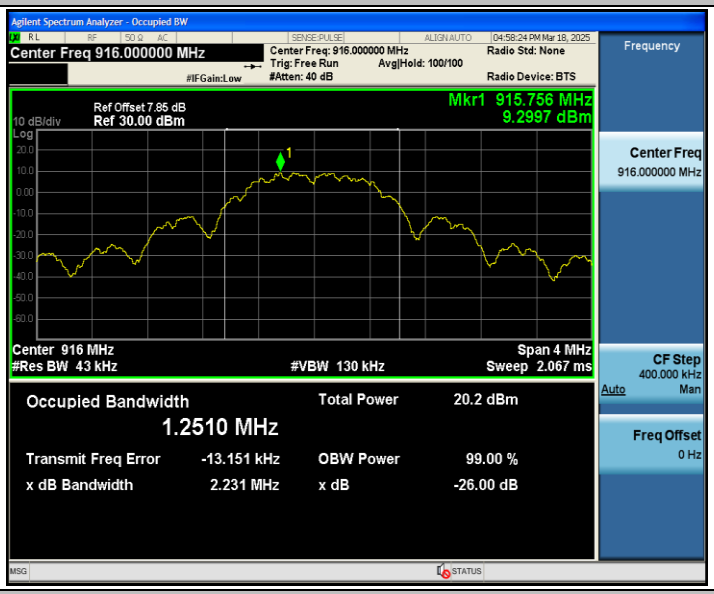
Test Mode	Antenna	Freq (MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
O-QPSK	Ant1	906	1.2606	905.3655	906.6261	---	---
		916	1.2510	915.3614	916.6124	---	---
		924	1.2516	923.3612	924.6128	---	---

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

O-QPSK_Ant1_906



O-QPSK_Ant1_916



O-QPSK_Ant1_924

5.5. Radiated Emissions Measurement

5.5.1. Standard Applicable

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.Android 10-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293.	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510MHz.
\2\ Above 38.6
According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (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

5.5.2. Measuring Instruments and Setting

The following table is the setting of spectrum analyzer and receiver.

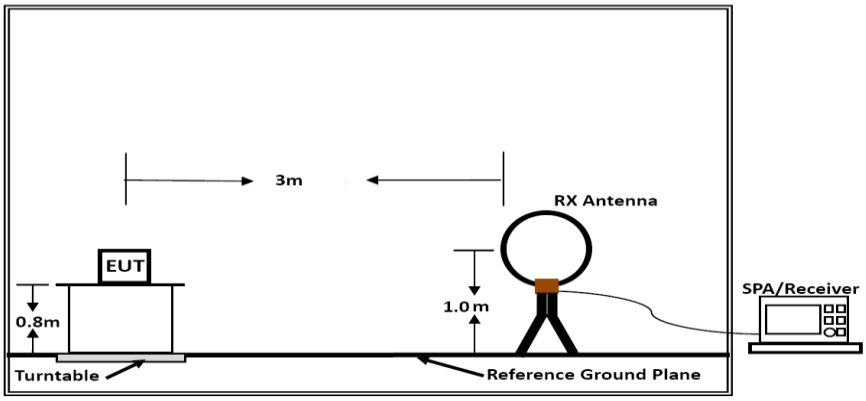
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10^{th} carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 3 MHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 3 MHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG

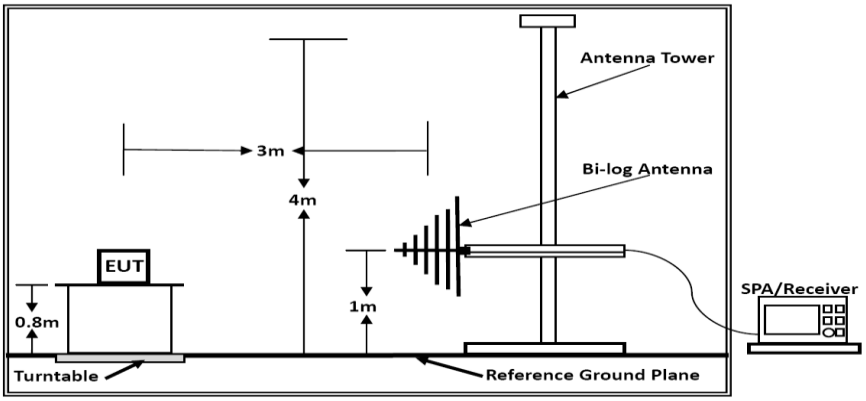
Start ~ Stop Frequency	30MHz~1000MHz / RB/VB 120kHz/1MHz for QP

5.5.3. Block Diagram of Test Setup

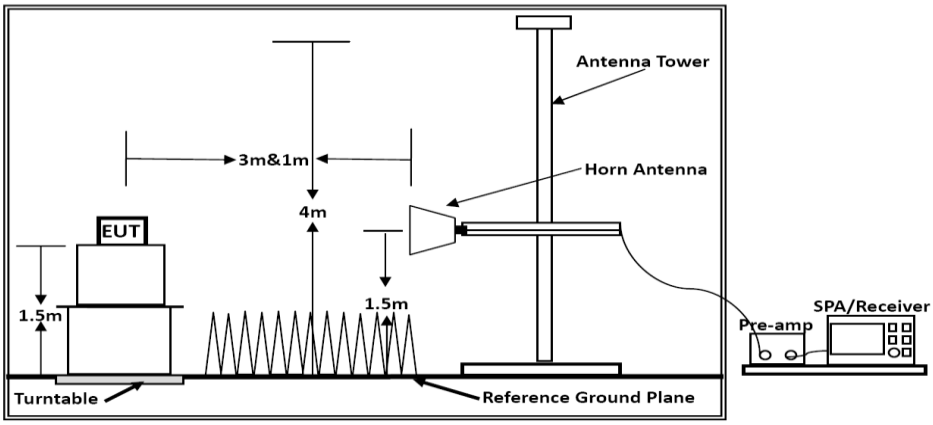
For radiated emissions below 30MHz



Below 30MHz



Below 1GHz



Above 1GHz

Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.
Distance extrapolation factor = 20 log (specific distanc [3m] / test distance [1m]) (dB).
Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

5.5.4. Test Procedures

1) Sequence of testing 9 kHz to 30 MHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna height is 1.0 meter.
--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions
Final measurement:
--- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

2) Sequence of testing 30 MHz to 1 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna is polarized vertical and horizontal.
--- The antenna height changes from 1 to 3 meter.
--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.
Final measurement:
--- The final measurement will be performed with minimum the six highest peaks.
--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meter.
--- The final measurement will be done with QP detector with an EMI receiver.
--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

3) Sequence of testing 1 GHz to 40 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 3 meter.
--- The EUT was set into operation.
Premeasurement:
--- The turntable rotates from 0° to 315° using 45° steps.
--- The antenna is polarized vertical and horizontal.
--- The antenna height scan range is 1 meter to 2.5 meter.
--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.
Final measurement:
--- The final measurement will be performed with minimum the six highest peaks.
--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (± 45°) and antenna movement between 1 and 4 meters. This procedure is repeated for both antenna polarizations.
--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

4) Sequence of testing above 18 GHz

Setup:
--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
--- Auxiliary equipment and cables were positioned to simulate normal operation conditions
--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
--- The measurement distance is 1 meter.
--- The EUT was set into operation.
Premeasurement:
--- The antenna is moved spherical over the EUT in different polarizations of the antenna.
Final measurement:
--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.5.6. Test Results

Pass

Results of Radiated Emissions (9 KHz~30MHz)

Temperature	22.5℃	Humidity	56%
Test Engineer	Tony Luo	Configurations	O-QPSK Transmitting
Test Voltage	DC 3V	/	/

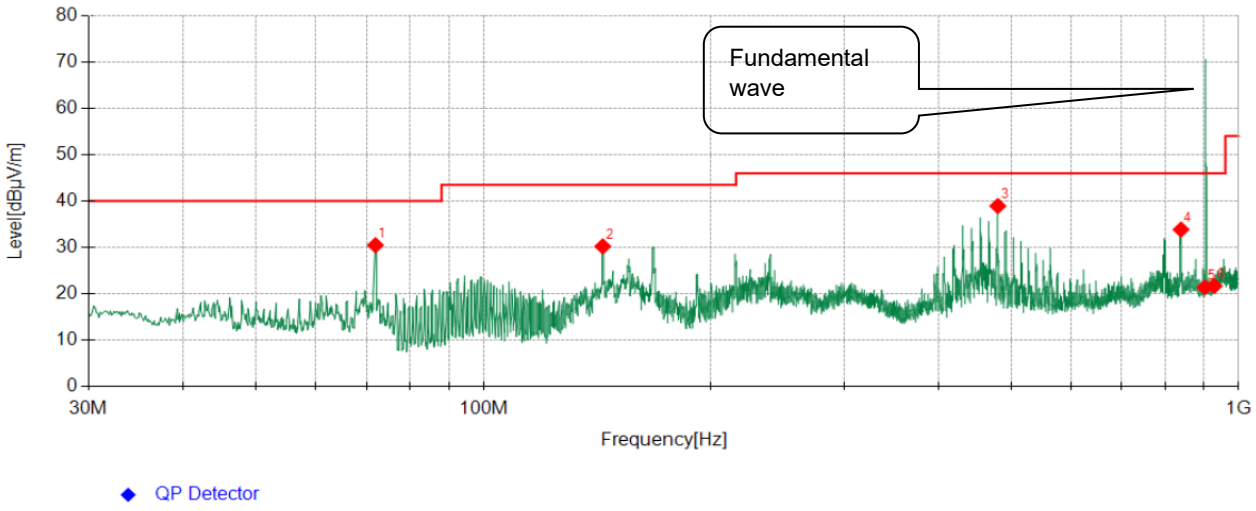
Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
Limit line = specific limits (dBuV) + distance extrapolation factor.

Results of Radiated Emissions (30MHz~1GHz)

Temperature	22.5℃	Humidity	56%
Test Engineer	Tony Luo	Configurations	O-QPSK Transmitting
Test Voltage	DC 3V	/	/

Vertical

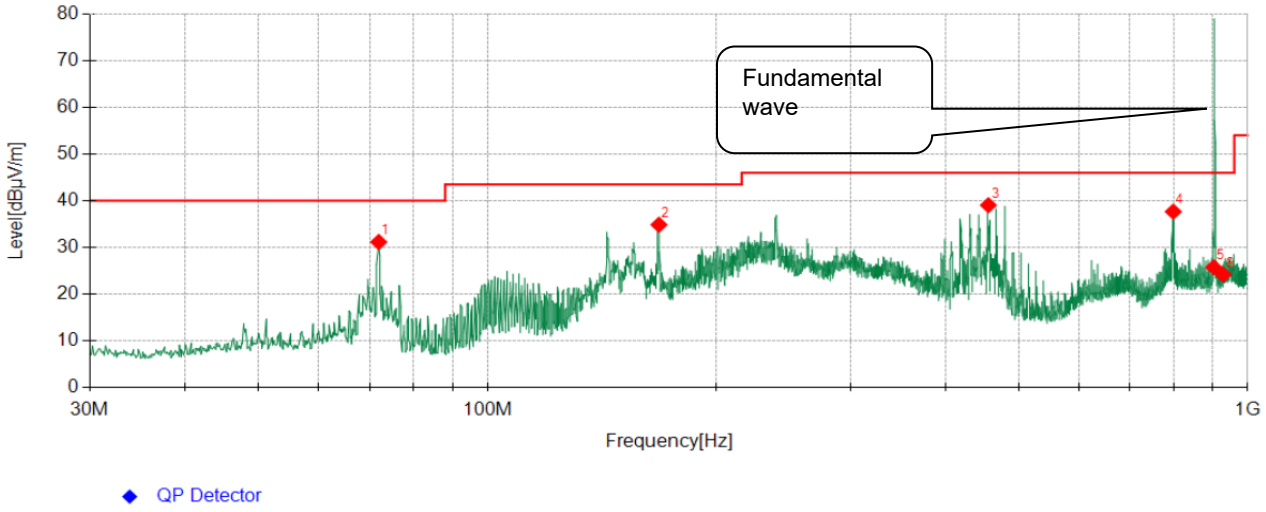


Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.95	49.07	-18.57	30.50	40.00	9.50	100	292	Vertical
2	143.8	49.59	-19.35	30.24	43.50	13.26	100	340	Vertical
3	479.9	47.40	-8.46	38.94	46.00	7.06	100	58	Vertical
4	838.8	36.04	-2.17	33.87	46.00	12.13	100	349	Vertical
5	902.0	22.43	-1.02	21.41	46.00	24.59	100	298	Vertical
6	928.0	22.43	-0.71	21.72	46.00	24.28	100	26	Vertical

***Note:
1. Level [dBµV/m] = Reading [dBµV] + Factor [dB/m]
2. Margin [dB] = Limit [dBµV/m] - Level [dBµV/m]

Horizontal



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Factor [dB/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.95	49.76	-18.57	31.19	40.00	8.81	100	0	Horizontal
2	168.1	53.06	-18.18	34.88	43.50	8.62	100	12	Horizontal
3	455.9	47.99	-8.93	39.06	46.00	6.94	100	316	Horizontal
4	798.3	40.61	-2.93	37.68	46.00	8.32	100	2	Horizontal
5	902.0	26.81	-1.02	25.79	46.00	20.21	100	5	Horizontal
6	928.0	24.93	-0.71	24.22	46.00	21.78	100	8	Horizontal

***Note:
1. Level [dBµV/m] = Reading [dBµV] + Factor [dB/m]
2. Margin [dB] = Limit [dBµV/m] - Level [dBµV/m]

Results for Radiated Emissions (1GHz to 10GHz)

Temperature	24℃	Humidity	55.2%
Test Engineer	Tony Luo	Configurations	O-QPSK Transmitting
Test Voltage	DC 3V	/	/

Remark: Measured all modes and recorded worst case.

906 MHz

Freq. MHz	Reading dBμV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Level dBμV/m	Limit dBμV/m	Margin dB	Remark	Pol.
2718.00	51.21	33.06	35.04	3.94	53.17	74.00	20.83	Peak	Horizontal
2718.00	44.62	33.06	35.04	3.94	46.58	54.00	7.42	Average	Horizontal
2718.00	50.99	33.06	35.04	3.94	52.95	74.00	21.05	Peak	Vertical
2718.00	44.30	33.06	35.04	3.94	46.26	54.00	7.74	Average	Vertical

916 MHz

Freq. MHz	Reading dBμV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Level dBμV/m	Limit dBμV/m	Margin dB	Remark	Pol.
2748.00	49.57	33.16	35.15	3.96	51.54	74.00	22.46	Peak	Horizontal
2748.00	44.35	33.16	35.15	3.96	46.32	54.00	7.68	Average	Horizontal
2748.00	49.96	33.16	35.15	3.96	51.93	74.00	22.07	Peak	Vertical
2748.00	45.03	33.16	35.15	3.96	47.00	54.00	7.00	Average	Vertical

924 MHz

Freq. MHz	Reading dBμV	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Level dBμV/m	Limit dBμV/m	Margin dB	Remark	Pol.
2772.00	49.88	33.26	35.14	3.98	51.98	74.00	22.02	Peak	Horizontal
2772.00	45.45	33.26	35.14	3.98	47.55	54.00	6.45	Average	Horizontal
2772.00	50.31	33.26	35.14	3.98	52.41	74.00	21.59	Peak	Vertical
2772.00	46.81	33.26	35.14	3.98	48.91	54.00	5.09	Average	Vertical

Notes:

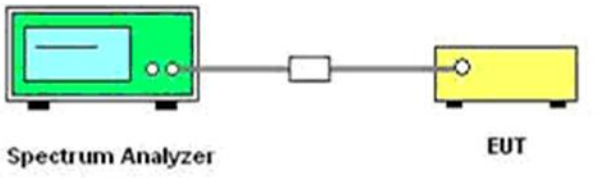
1. Measuring frequencies from 9 KHz - 10th harmonic or 26.5GHz (which is less), No emission found between lowest internal used/generated frequency to 30MHz.
2. Radiated emissions measured in frequency range from 9 KHz ~10th harmonic or 26.5GHz (which is less) were made with an instrument using Peak detector mode.
3. Level = Reading + Ant. Fac - Pre. Fac. + Cab. Loss. Margin = Limit – Level.

5.6. Conducted Spurious Emissions and Band Edges Test

5.6.1. Standard Applicable

According to §15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.6.2. Block Diagram of Test Setup



5.6.3. Test Procedures

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz
The spectrum from 30MHz to 26.5GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

5.6.4. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

5.6.5. Test Results

PASS

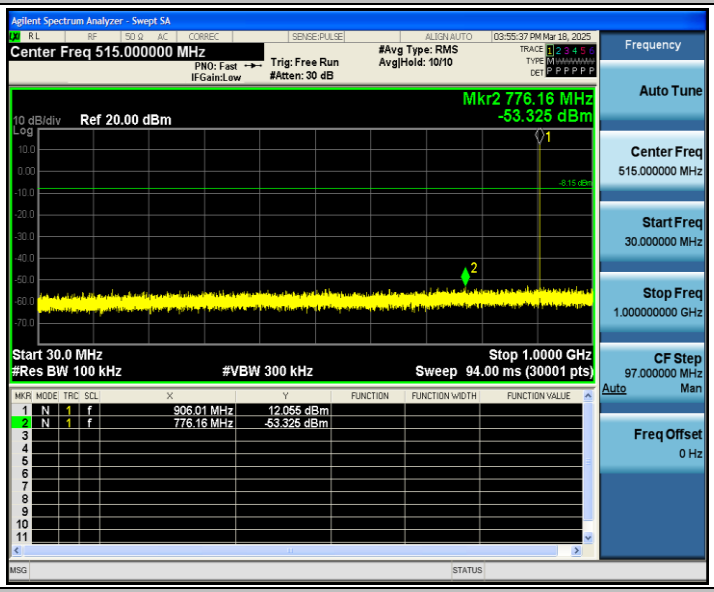
Conducted Spurious Emissions

Test Mode	Antenna	Freq (MHz)	Freq Range [MHz]	Ref Level [dBm]	Result[dBm]	Limit[dBm]	Verdict
O-QPSK	Ant1	906	Reference	11.85	11.85	---	PASS
			30~1000	11.85	-53.36	≤-8.15	PASS
			1000~26500	11.85	-34.24	≤-8.15	PASS
		916	Reference	10.91	10.91	---	PASS
			30~1000	10.91	-53.03	≤-9.09	PASS
			1000~26500	10.91	-42.4	≤-9.09	PASS
		924	Reference	9.81	9.81	---	PASS
			30~1000	9.81	-52.13	≤-10.19	PASS
			1000~26500	9.81	-45.03	≤-10.19	PASS

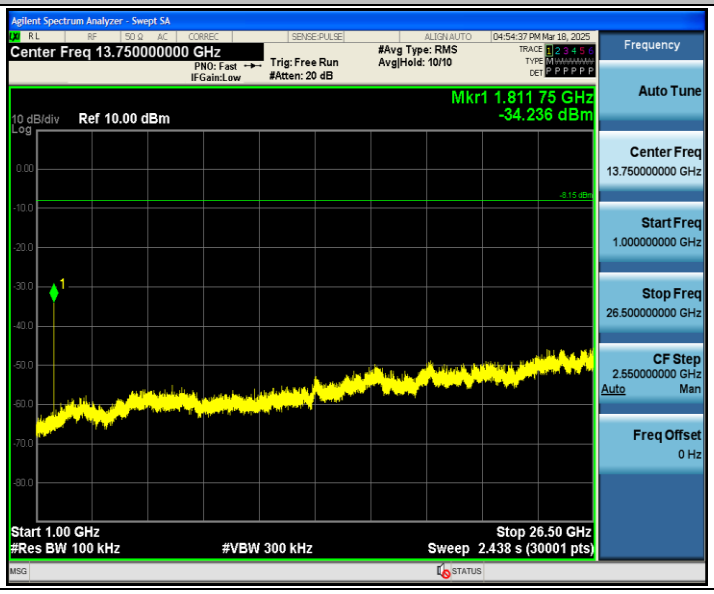
Note: Regarding the spurious emissions from 30MHz to 26.5GHz, the cable lose and attenuator factors have been set in the 'Input Correction' of the Spectrum Analyzer during the test.

LORA_DTS_SF5_Ant1_906_0~Reference

LORA_DTS_SF5_Ant1_906_30~1000

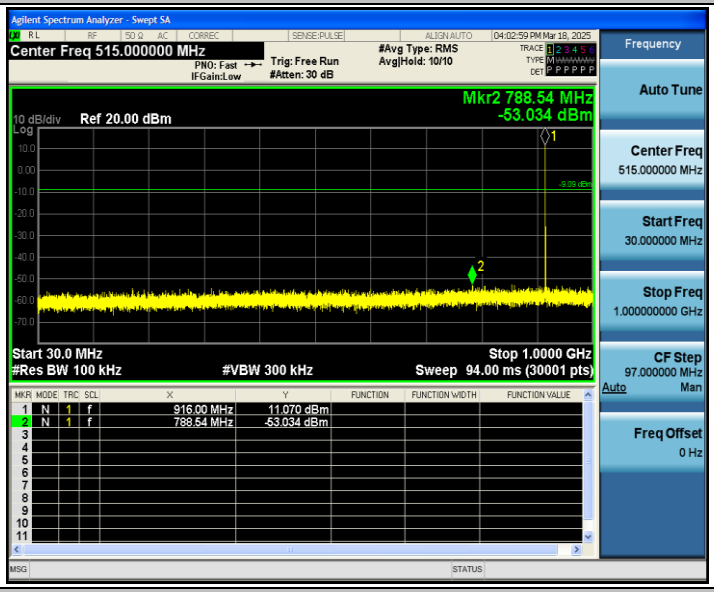


LORA_DTS_SF5_Ant1_906_1000~26500

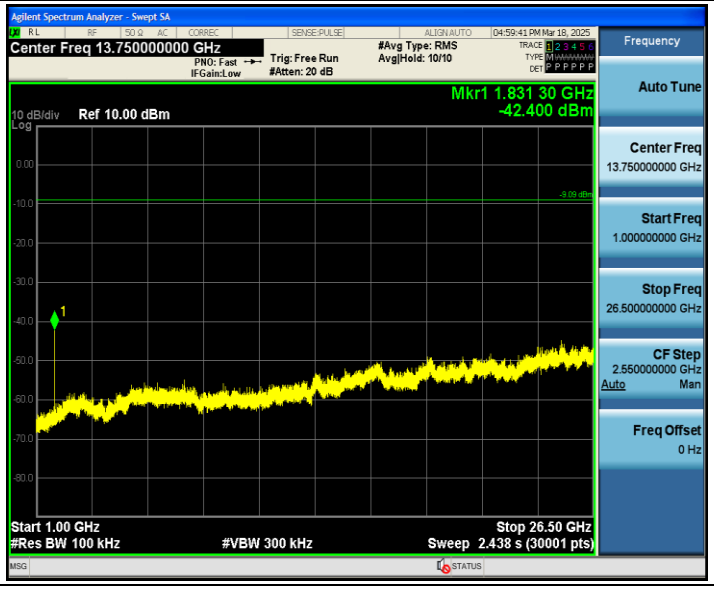


LORA_DTS_SF5_Ant1_916_0~Reference

LORA_DTS_SF5_Ant1_916_30~1000

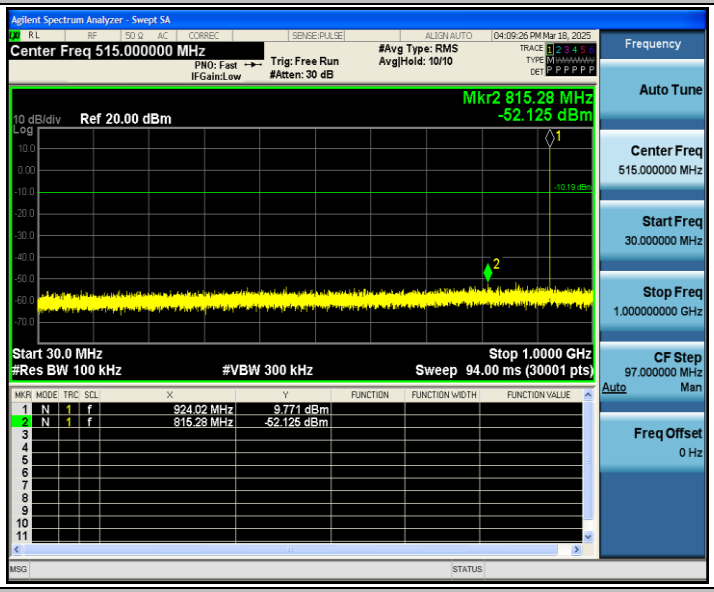


LORA_DTS_SF5_Ant1_916_1000~26500

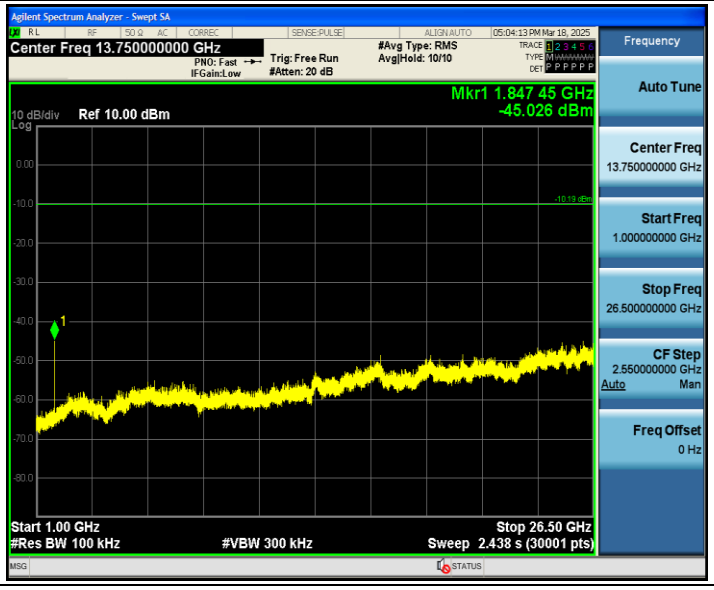


LORA_DTS_SF5_Ant1_924_0~Reference

LORA_DTS_SF5_Ant1_924_30~1000



LORA_DTS_SF5_Ant1_924_1000~26500

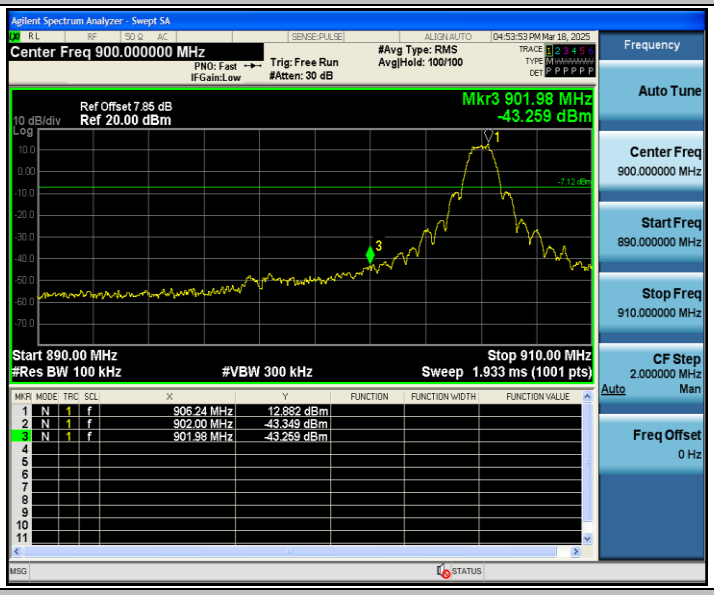


Band Edge Emissions

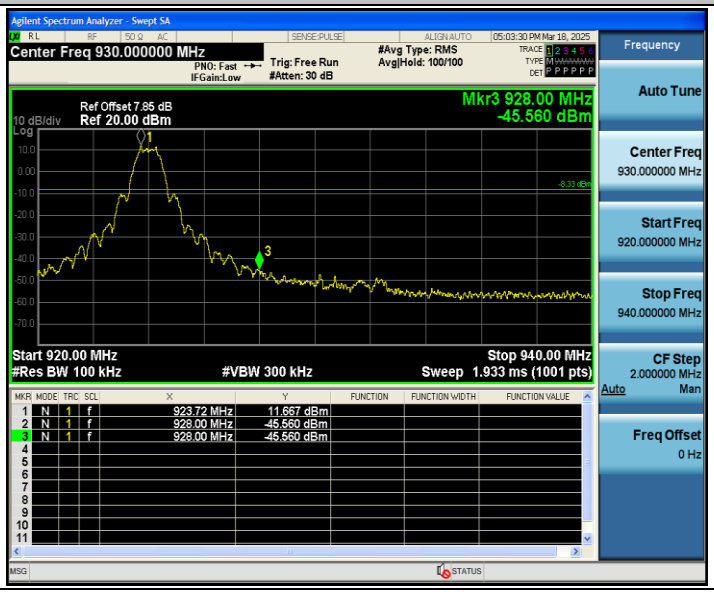
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
O-QPSK	Ant1	Low	12.88	-43.26	≤-7.12	12.88	PASS
		High	11.67	-45.56	≤-8.33	11.67	PASS

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

O-QPSK_Ant1_Low_906



O-QPSK_Ant1_High_924



5.7. AC Power line conducted emissions

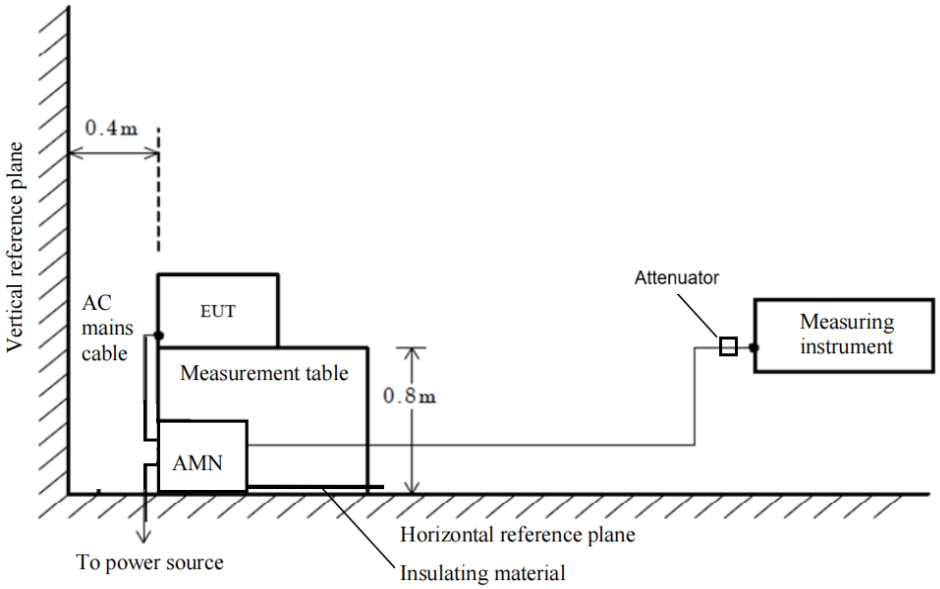
5.7.1. Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

* Decreasing linearly with the logarithm of the frequency

5.7.2. Block Diagram of Test Setup



Note: the distance between LISN and Vertical reference plane is 40 cm and the distance between LISN and EUT is 80 cm.

5.7.3. Test Results

N/A
As power supplied by battery and can‘t connect to AC main network

5.8. Antenna Requirements

5.8.1. Standard Applicable

According to antenna requirement of §15.203.
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 shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

5.8.2. Antenna Connected Construction

The directional gains of antenna refer to section 1.3 of this report, and the antenna is an Internal antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

5.8.3. Results

Compliance

6. LIST OF MEASURING EQUIPMENT

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
1	MXA Signal Analyzer	Keysight	N9020A	MY52091623	2024-12-31	2025-12-30
2	Power Sensor	Agilent	U2021XA	MY5365004	2024-12-31	2025-12-30
3	Power Meter	Agilent	U2531A	TW53323507	2024-12-31	2025-12-30
4	Loop Antenna	schwarzbeck	FMZB1519 B	00023	2022-11-13	2025-11-12
5	Wideband Antenna	schwarzbeck	VULB 9163	958	2022-11-13	2025-11-12
6	Horn Antenna	schwarzbeck	BBHA 9120D	01989	2022-11-13	2025-11-12
7	EMI Test Receiver	R&S	ESCI	100849/003	2024-12-31	2025-12-30
8	Controller	MF	MF7802	N/A	N/A	N/A
9	Amplifier	schwarzbeck	BBV 9743	209	2024-12-31	2025-12-30
10	Amplifier	Tonscend	TSAMP-05 18SE	--	2024-12-31	2025-12-30
11	RF Cable(below 1GHz)	HUBER+SUHNER	RG214	N/A	2024-12-31	2025-12-30
12	RF Cable(above 1GHz)	HUBER+SUHNER	RG214	N/A	2024-12-31	2025-12-30
13	Fixed Attenuator	Mini circuits	BW-S6-2W 263A+	N/A	2024-12-31	2025-12-30

Test software used:

Item	Test Software	Manufacturer	Name	Version
1	EMI Test Software	ROHDE & SCHWARZ	ESK1	V1.71
2	RE test software	Tonscend	JS32-RE	V5.0.0.0
3	Test Software	Tonscend	JS1120-3	V3.2.22

7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

8. EXTERIOR PHOTOGRAPHS OF EUT

Please refer to separated files for External Photos of the EUT.

9. INTERIOR PHOTOGRAPHS OF EUT

Please refer to separated files for Internal Photos of the EUT.

----------THE END OF REPORT----------