

DOKE COMMUNICATION (HK) LIMITED

TEST REPORT

SCOPE OF WORK

FCC TESTING– FORT 1

REPORT NUMBER

250522061SZN-006

ISSUE DATE

17 July 2025

[REVISED DATE]

[-----]

PAGES

21

DOCUMENT CONTROL NUMBER

FCC ID 225_C

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DOKE COMMUNICATION (HK) LIMITED

Application
For
Certification

FCC ID: 2A7DX-FORT1**Smart phone****Model: FORT 1****13.56MHz Transceiver****Report No.: 250522061SZN-006**

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-23]

Prepared and Checked by:*Bruce****Bruce Zheng
Project Engineer******Approved by:****Johnny Wang*

***Johnny Wang
Project Engineer
Date: 17 July 2025***

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Version: 01-November-2017

Page: 1 of 21

FCC ID 225_C

MEASUREMENT/TECHNICAL REPORT

This report concerns (check one): Original Grant Class II Change

Equipment Type: DXX - Part 15 Low Power Communication Device Transmitter

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes No

If yes, defer until: _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes No

If no, assumed Part 15, Subpart C for intentional radiator – the new 47 CFR [10-1-23 Edition] provision.

Report prepared by:

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1.0 Summary of Test Result

Applicant: DOKE COMMUNICATION (HK) LIMITED

Applicant Address: 19H MAXGRAND PLAZA NO 3 TAI YAU STREET SAN PO KONG KL

Manufacturer: Shenzhen DOKE Electronic Co., Ltd

Manufacturer Address: 801, Building3, 7th Industrial Zone, Yulv Community, Yutang Road, Guangming District, Shenzhen, China.

MODEL: FORT 1

FCC ID: 2A7DX-FORT1

Test Specification	Reference	Results
Transmitter Radiated Emission	15.225(a)(b)(c) &15.209 &15.205	Pass
Band edge		
Frequency Stability	15.225(e)	Pass
20dB Bandwidth	15.215(c)	Pass

Note: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

2.0 General Description

2.1 Product Description

The equipment under test (EUT) is a Smart phone with Bluetooth 5.0 (dual-mode) function operating in 2402-2480MHz, 2.4G Wi-Fi function operating in 2412-2462MHz, 5G Wi-Fi function operating in 5150MHz~5250 MHz, 5725MHz~5850MHz, NFC function and GSM, WCDMA, LTE function. The EUT can be powered by DC 3.85V from battery. For more detail information pls. refer to the user manual.

Antenna Type: Integral antenna

Modulation Type: ASK

Sample ID: Z250522061-001

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of the Smart phone which has NFC function.

For the BT EDR function was tested and demonstrated in report 250522061SZN-001.

For the BT BLE function was tested and demonstrated in report 250522061SZN-002.

For the 2.4GHz Wi-Fi function was tested and demonstrated in report 250522061SZN-003.

For the 5GHz Wi-Fi function was tested and demonstrated in report 250522061SZN-004.

For the GSM, WCDMA, LTE function was tested and demonstrated in report 250522061SZN-005.

2.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in Semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst-case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-anechoic chamber used to collect the radiated data is **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community GuanHu Subdistrict, LongHua District, Shenzhen, People's Republic of China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).

3.0 System Test Configuration

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.10 (2013).

The EUT was powered by a fully DC 3.85V rechargeable Li-ion battery and charged by DC 5V3A or DC 9V2A or DC 12V1.5A through adapter during the test, only the worst data was reported in this report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the centre of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Section 4.

The EUT and transmitting antenna was centered on the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on a turn table, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

3.2 EUT Exercising Software

There was no special software to exercise the device.

3.3 Special Accessories

N/A

3.4 Equipment Modification

Any modifications installed previous to testing by DOKE COMMUNICATION (HK) LIMITED will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd Longhua Branch.

3.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

3.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Adaptor (Provided by applicant)	N/A	Model: QZ-0180AAA00 Input: 100-240V~, 50/60Hz, 0.5A Output: 5.0V=3.0A, 9.0V=2.0A, 12.0V=1.5A
USB Cable (Provided by applicant)	N/A	Shielded, Length: 100cm

4.0 Emission Results

Data is included worst-case configuration (the configuration which resulted in the highest emission levels).

4.1 Radiated Test Results

A sample calculation, configuration photographs and data tables of the emissions are included.

4.1.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

Where FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB/m

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

Assume a receiver reading of 62.0 dB μ V is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB/m}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$AV = -10 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(42 \text{ dB}\mu\text{V/m})/20] = 125.9 \mu\text{V/m}$$

4.1.2 Radiated Emission Configuration Photograph

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos. pdf.

4.1.3 Radiated Emissions

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Worst Case Radiated Emission
at
728.432333 MHz

Judgement: Passed by 14.0 dB

TEST PERSONNEL:

Sign on file

Bruce Zheng, Project Engineer
Typed/Printed Name

09 June 2025

Date

Applicant: DOKE COMMUNICATION (HK) LIMITED

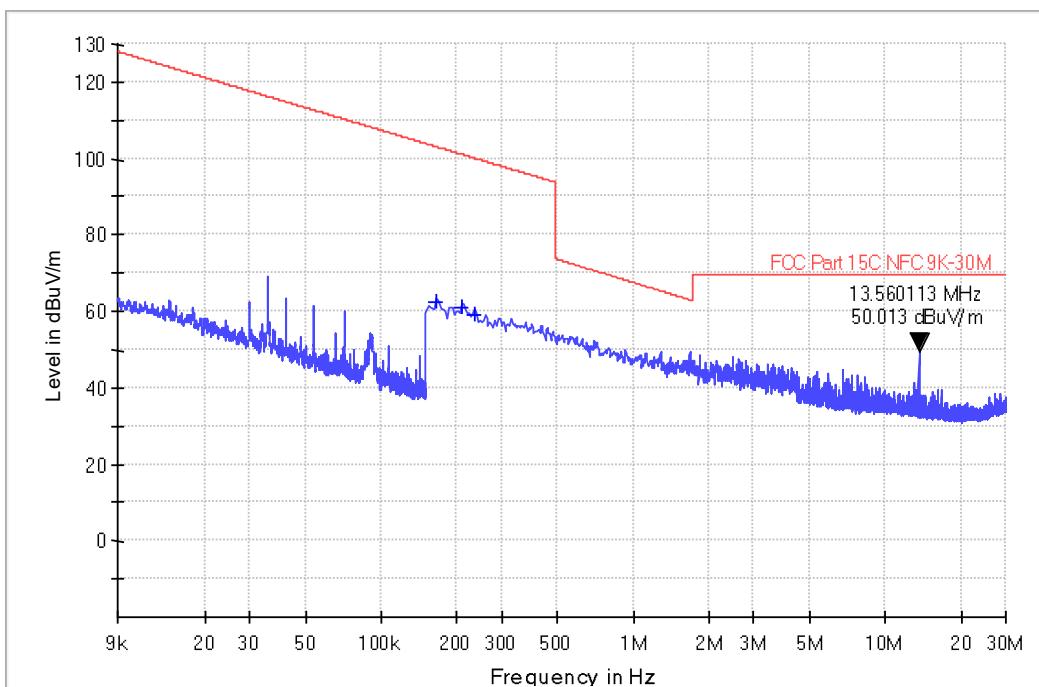
Date of Test: 09 June 2025

Model: FORT 1

Worst Case Operating Mode:

Transmitting

Table 1
Fundamental & Spurious Emission Below 30MHz



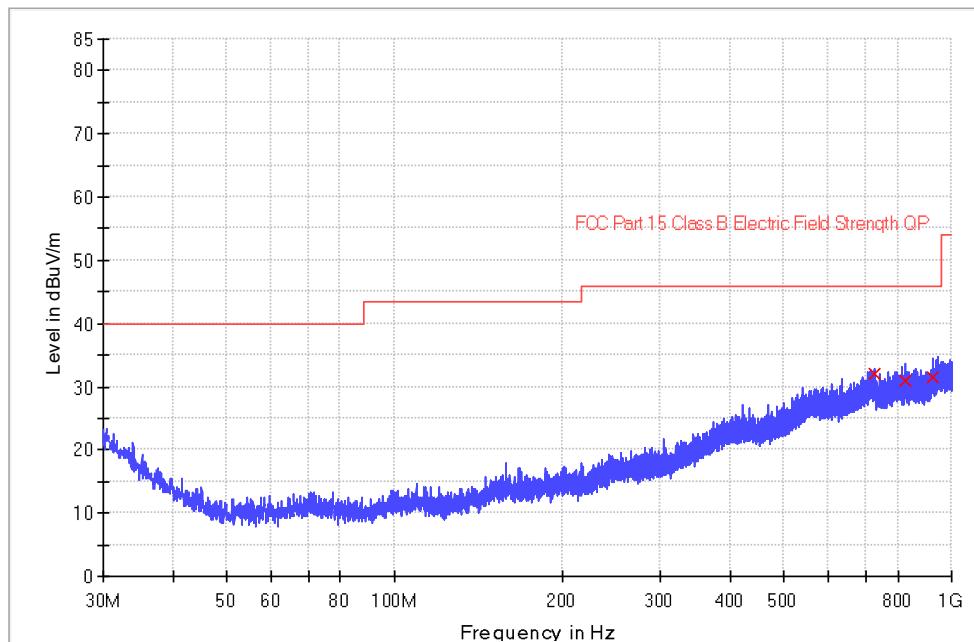
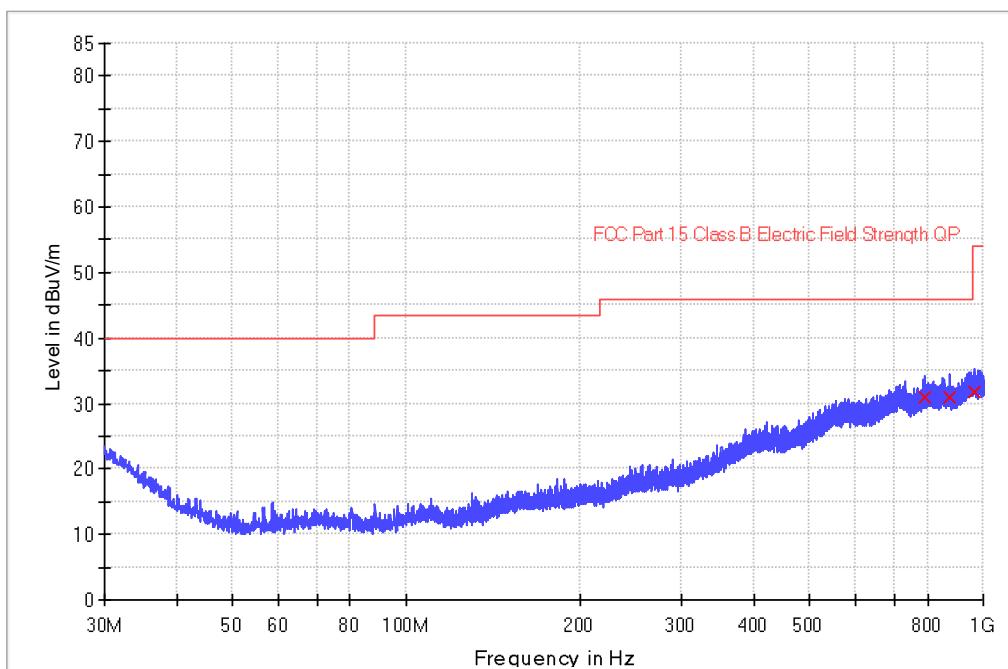
Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Distance Factor (dB)	Net at 3m (dB μ V/m)	Calculated at 30m (dB μ V/m)	Limit at 30m (dB μ V/m)	Margin (dB)
Horizontal	13.560	36.2	0	13.8	40	50.0	10.0	84.0	-74.0

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Distance Factor (dB)	Net at 3m (dB μ V/m)	Calculated at 300m (dB μ V/m)	Limit at 300m (dB μ V/m)	Margin (dB)
Horizontal	0.2097	44.9	0	15.9	80	60.8	-19.2	21.2	-40.4

1. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
2. Negative sign in the column shows value below limit.
3. Emission level (dB μ A/m) = 20 log Emission level (uA/m).
4. Loop antenna is used for the emissions below 30 MHz.
5. Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
6. Limit line (dB μ A/m) = specific limits (uA/m) + distance extrapolation factor.

$$= 20 \log (uA/m) + 40 \log (\text{specific distance} / \text{test distance}) (dB).$$

Table 2
Spurious emission (30MHz ~ 1GHz)

Horizontal**Vertical**

Polarization	Frequency (MHz)	Reading (dB μ V)	Pre-Amp Gain (dB)	Antenna Factor (dB/m)	Net at 3m (dB μ V/m)	Peak Limit at 3m (dB μ V/m)	Margin (dB)
Horizontal	728.432333	1.1	0	30.9	32.0	46.0	-14.0
Horizontal	826.046667	-1.1	0	32.0	30.9	46.0	-15.1
Horizontal	924.210667	-1.3	0	32.7	31.4	46.0	-14.6
Vertical	793.066667	-1.3	0	32.1	30.8	46.0	-15.2
Vertical	871.960000	-0.7	0	31.7	31.0	46.0	-15.0
Vertical	967.537333	-1.9	0	33.6	31.7	54.0	-22.3

Notes:

1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative sign in the column shows value below limit.

4.2 Frequency Stability

If required, the operating or transmitting frequency of an intentional radiator should be measured in accordance with the following procedure to ensure that the device operates outside certain precluded frequency bands and within the frequency range. No modulation needs to be supplied to the intentional radiator during these tests, unless modulation is required to produce an output, e.g., single-sideband suppressed carrier transmitters.

The frequency stability of the transmitter is measured by:

- a) Temperature: The temperature is varied from -20°C to + 60°C using an environmental chamber.
- b) for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20°C.

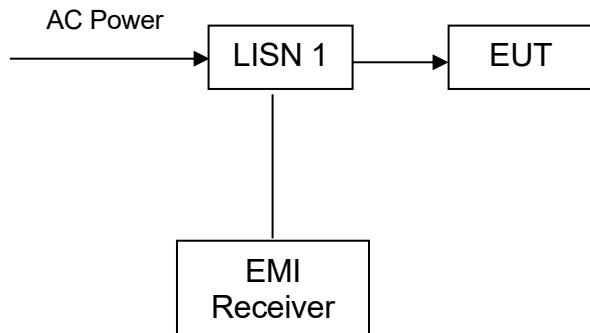
The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

Measurement Result:

Voltage (%)	Power	Temperature (°C)	Frequency (MHz)	Limit	Result
100	3.85Vdc	-20	13.560384	$\pm 0.01\%$ ($\pm 1356\text{Hz}$)	Pass
		-10	13.560399		Pass
		0	13.560425		Pass
		10	13.560412		Pass
		20	13.560460		Pass
		30	13.560452		Pass
		40	13.560344		Pass
		50	13.560456		Pass
		60	13.560447		Pass

Temperature (°C)	Power	Voltage (%)	Frequency (MHz)	Limit	Result
20	3.85Vdc	85	13.560391	$\pm 0.01\%$ ($\pm 1356\text{Hz}$)	Pass
		90	13.560422		Pass
		95	13.560416		Pass
		100	13.560457		Pass
		105	13.560451		Pass
		110	13.560433		Pass
		115	13.560419		Pass

Note: The device is deemed to comply with the requirement of FCC Part 15.225(e).

4.3 Conducted Emission at Mains Terminal**Block Diagram:****4.3.1 Conducted Emissions Configuration Photograph**

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

4.3.2 Conducted Emissions

Worst Case Conducted Configuration
At

0.486 MHz

Judgement: Passed by 9.0 dB margin

TEST PERSONNEL:*Sign on file*Bruce Zheng, Project Engineer*Typed/Printed Name*04 June 2025*Date*

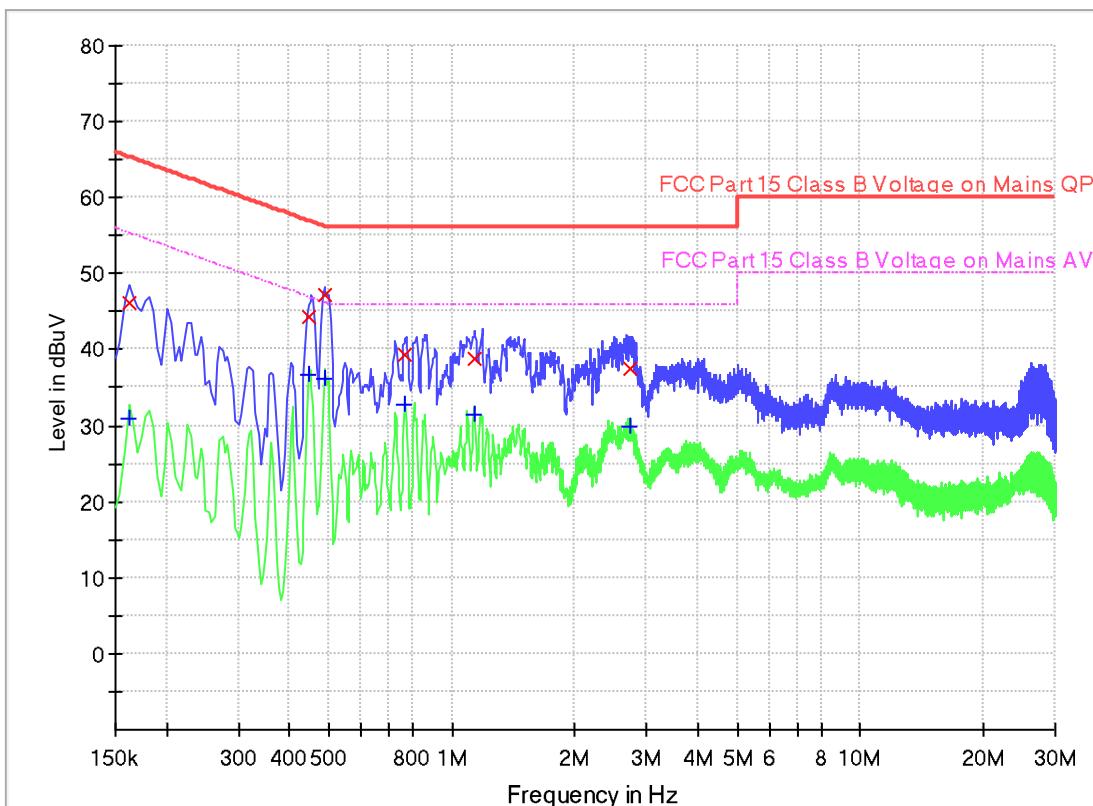
Applicant: DOKE COMMUNICATION (HK) LIMITED

Date of Test: 04 June 2025

Model: FORT 1

Operating Mode: Transmitting

Phase: Live

Conducted Emission Test**Limit and Margin QP**

Frequency (MHz)	Quasi Peak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.162000	46.3	9.000	L1	9.6	19.1	65.4
0.446000	44.3	9.000	L1	9.5	12.6	56.9
0.486000	47.2	9.000	L1	9.5	9.0	56.2
0.770000	39.3	9.000	L1	9.4	16.7	56.0
1.130000	38.8	9.000	L1	9.4	17.2	56.0
2.734000	37.5	9.000	L1	9.4	18.5	56.0

Limit and Margin AV

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.162000	30.9	9.000	L1	9.6	24.5	55.4
0.446000	36.6	9.000	L1	9.5	10.3	46.9
0.486000	36.1	9.000	L1	9.5	10.1	46.2
0.770000	32.7	9.000	L1	9.4	13.3	46.0
1.130000	31.6	9.000	L1	9.4	14.4	46.0
2.734000	29.9	9.000	L1	9.4	16.1	46.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dB μ V) – Quasi Peak/Average (dB μ V)

Applicant: DOKE COMMUNICATION (HK) LIMITED

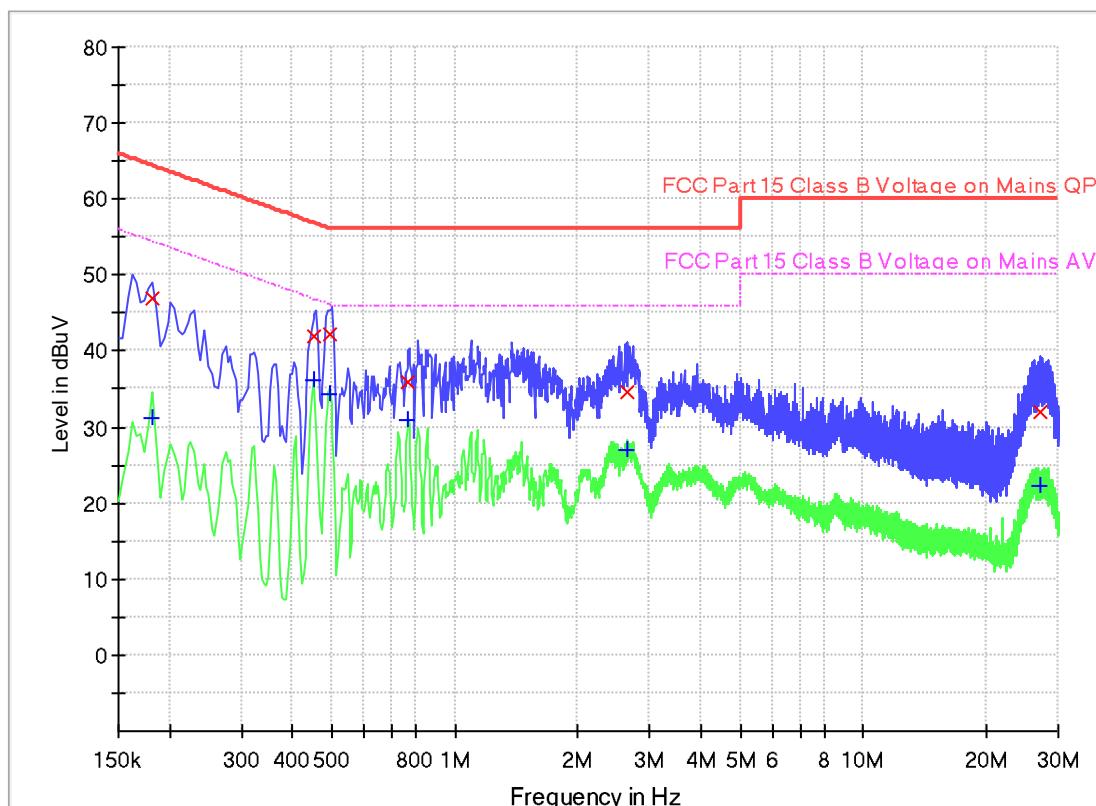
Date of Test: 04 June 2025

Model: FORT 1

Operating Mode: Transmitting

Phase: Neutral

Conducted Emission Test



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.182000	46.8	9.000	N	9.6	17.6	64.4
0.450000	42.0	9.000	N	9.6	14.9	56.9
0.494000	42.3	9.000	N	9.6	13.8	56.1
0.770000	35.8	9.000	N	9.6	20.2	56.0
2.650000	34.6	9.000	N	9.6	21.4	56.0
26.994000	32.1	9.000	N	10.7	27.9	60.0

Limit and Margin AV

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.182000	31.3	9.000	N	9.6	23.1	54.4
0.450000	36.1	9.000	N	9.6	10.8	46.9
0.494000	34.4	9.000	N	9.6	11.7	46.1
0.770000	31.0	9.000	N	9.6	15.0	46.0
2.650000	26.9	9.000	N	9.6	19.1	46.0
26.994000	22.2	9.000	N	10.7	27.8	50.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dB μ V) – Quasi Peak/Average (dB μ V)

5.0 Equipment Photographs

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.pdf & internal photos.pdf.

6.0 Product Labelling

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

7.0 Technical Specifications

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

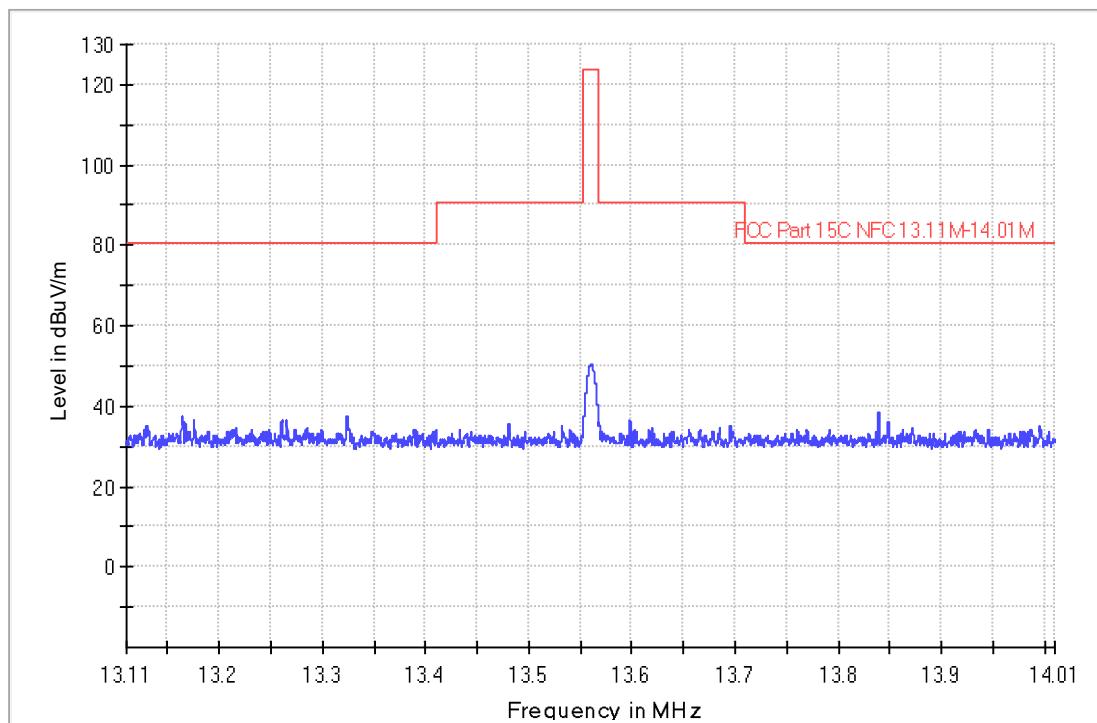
9.0 Miscellaneous Information

This miscellaneous information includes details of the measured band edge, 20dB Bandwidth, the test procedure and calculation of factor such as pulse desensitization.

9.1 Band edge Plot

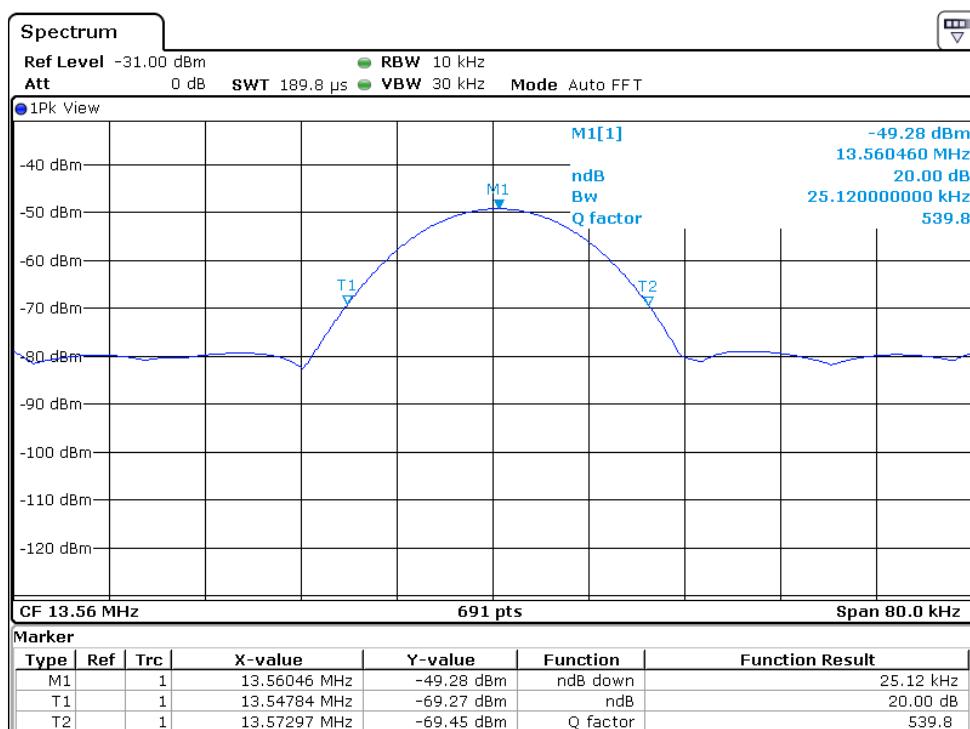
The test plots are attached as below. From the plot, the field strength of any emissions is below the limit of 90.5dB_{uV/m} in the range of outside of (13.410–13.553 MHz and 13.567–13.710 MHz) and the limit of 80.5dB_{uV/m} in the frequency range of (13.110–13.410MHz and 13.710–14.010MHz). Therefore, they meet the requirement of Section 15.225(b), (c).

Note: The field strength is tested at 3m distance then convert to 30m by adding distance factor $40 \cdot \log(d_1/d_2)$.



9.2 20dB Bandwidth

Pursuant to FCC part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (13.110-14.010MHz) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered. The test plots are reported as below.



Remark: Because the measured signal is CW adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

9.3 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

9.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of transmitters operating under Part 15, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.10 - 2013.

The transmitting equipment under test (EUT) is placed on a styrene turntable which is four feet in diameter and approximately 0.8 meter up to 1GHz in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axes to obtain maximum emission levels. The antenna height and polarization are varied during the testing to search for maximum signal levels.

Detector function for radiated emissions is in peak mode. The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz up to the 1GHz.

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

The IF bandwidth used for measurement of radiated signal strength was 10 kHz for emission below 30 MHz and 120 kHz for emission from 30 MHz to 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Section 9.3).

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, but those measurements taken at a closer distance are so marked.

10.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ056-07	Signal Analyzer	R&S	FSV40	101214	2024-12-05	2025-12-05
SZ185-03	EMI Receiver	R&S	ESR7	101975	2025-04-13	2026-04-13
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2024-05-05	2027-05-05
SZ061-13	Biconilog Antenna	ETS	3142E	00217919	2022-07-13	2025-07-13
SZ188-05	Anechoic Chamber	ETS	FACT 3-2.0	CT001880-Q1391	2021-05-25	2026-05-25
SZ062-40	RF Cable	Talent Microwave	A50-3.5M3.5M-4.5M	22012932	2024-09-30	2025-09-30
SZ062-41	RF Cable	Talent Microwave	A50-3.5M3.5M-8M	22012931	2024-09-30	2025-09-30
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2024-07-09	2025-07-09
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	2025-04-25	2026-04-25
SZ188-03	Shielding Room	ETS	RFD-100	4100	2022-12-20	2025-12-20
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	2024-07-10	2025-07-10

*****End of Report*****