



FCC Part 15.231

TEST REPORT

For

Superior Electronics Corporation

No.10, Lane 31, Chongde St., Sinyi District, Taipei City 110, Taiwan (R.O.C.)

Report Type:	Original Report
FCC Identity:	FCC ID: K4E919T2GDW
Brand Name:	ENFORCER
Product Name:	Wired Single-Channel RF Transmitter
Model Name:	SK-919T1-GBDQ
Series Model:	SK-919T1-GBDUQ; SK-919T2-GNDQ; SK-919T2-GNDUQ; SK-919T1-GBWQ; SK-919T1-GBWUQ; SK-919T2-GNWQ; SK-919T2-GNWUQ
Report Number:	RLK201210001-00A
Report Date:	2021/03/22
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Linkou Laboratory)

Revision History

Revision	Report Number	Issue Date	Description
1.0	RLK201210001-00A	2021/03/22	Original Report

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	Superior Electronics Corporation No.10, Lane 31, Chongde St., Sinyi District, Taipei City 110, Taiwan (R.O.C.)
Manufacturer	Superior Electronics Corporation No.10, Lane 31, Chongde St., Sinyi District, Taipei City 110, Taiwan (R.O.C.)
Brand Name	ENFORCER
Product (Equipment)	Wired Single-Channel RF Transmitter
Model Name	SK-919T1-GBDQ
Series Model Name	SK-919T1-GBDUQ; SK-919T2-GNDQ; SK-919T2-GNDUQ; SK-919T1-GBWQ; SK-919T1-GBWUQ;SK-919T2-GNWQ; SK-919T2-GNWUQ
Model Discrepancy	SK-919T1-GBDQ is one button with logo SK-919T1-GBDUQ is one button with no logo SK-919T2-GNDQ is two buttons with logo SK-919T2-GNDUQ is two buttons with no logo SK-919T1-GBWQ is one button with wires and logo SK-919T1-GBWUQ is one button with wires no logo SK-919T2-GNWQ is two buttons with wires and logo SK-919T2-GNWUQ is two buttons with wires and no logo
Frequency Range	314. 9912 MHz
Number of Channels	1 Channel
Field strength	56.72 dBuV/m
Modulation Type	ASK
Power Operation (Voltage Range)	<input checked="" type="checkbox"/> DC Type <input checked="" type="checkbox"/> Battery: 3Vdc (CR2032) <input checked="" type="checkbox"/> DC Source: 3-13Vdc
Received Date	Dec. 22, 2020
Date of Test	Jan. 08, 2021 - Mar. 05, 2021

Note: All measurement and test data in this report was gathered from production sample serial number: 201210001. Assigned by Bay Area Compliance Laboratories Corp. (Linkou Laboratory)

1.2 Objective and Test Methodology

The Objective of this Test Report was to document the compliance of the Superior Electronics Corporation. Appliance (Model: SK-919T1-GBDQ; SK-919T1-GBDUQ; SK-919T2-GNDQ; SK-919T2-GNDUQ; SK-919T1-GBWQ; SK-919T1-GBWUQ; SK-919T2-GNWQ; SK-919T2-GNWUQ) to the requirements of the following Standards:

- Part 2, Subpart J, Part 15, Subparts A and C, section 15.231 of the Federal Communication Commission's rules.
- ANSI C63.10-2013 of the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

1.3 Measurement Uncertainty

Parameter	Expanded Measurement uncertainty
RF output power with Power Meter	± 1.488 dB
Occupied Channel Bandwidth	± 453.927 Hz
RF Conducted test with Spectrum	± 2.77 dB
AC Power Line Conducted Emission	± 2.66 dB
Radiated Below 1G	± 3.57 dB
Radiated Above 1G	± 5.32 dB

The test results with statement of conformity, the decision rules are based on the specifications and standards. The test results will not take the measurement uncertainty into account.

1.4 Environmental Conditions and Test Date

Test Site	Test Date	Temperature (°C)	Relative Humidity (%)	Test Engineer
Radiated (966A)	Jan. 08, 2021	17.5	55	Brian Chang
Conducted (TH-02)	Jan. 13, 2021	23.4	59	Blake Wang
Conduction (CON-01)	Mar. 05, 2021	20.7	55	Brian Chang

1.5 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Linkou Laboratory) to collect test data is located on

No.6, Wende 2Rd., Guishan Dist., Taoyuan City 33382, Taiwan (R.O.C.).

Bay Area Compliance Laboratories Corp. (Linkou Laboratory) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3546) by Mutual Recognition Agreement (MRA). The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database. The FCC Registration No.: 0027578244. Designation No.: TW3546. The Test Firm Registration No.: 181430.

2 System Test Configuration

2.1 Test Channels and Description of Worst Test Configuration

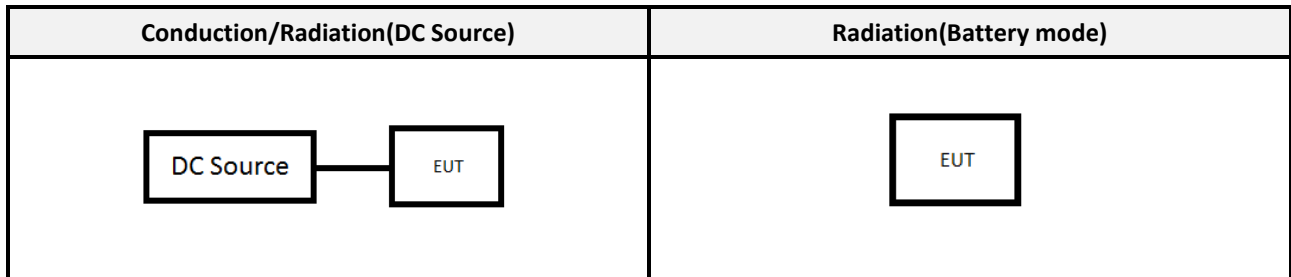
The system was configured for testing in testing mode which was provided by manufacturer. No special accessory, No modification was made to the EUT and No special equipment used during test.

SK-919T1-GBDQ, SK-919T1-GBDUQ, SK-919T2-GNDUQ, SK-919T1-GBWQ, SK- 919T1-GBWUQ, SK-919T2-GNWUQ, is/are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics as model(s): SK-919T2-GNDQ and SK-919T2-GNWQ was main tested

2.2 Support Equipment’s List and External Cable List

No.	Description	Manufacturer	Model Number	Serial Number
A	DC Source	GW	SPS-2415	N/A

2.3 Block Diagram of Test Setup



3 Summary of Test Results

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.231 (b)	Radiated Emissions	Compliance
§15.231 (c)	20dB Bandwidth	Compliance
§15.231 (a)	Deactivation Testing	Compliance

4 Test Equipment List and Details

4.1 Applicable Standard

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Radiation 3M Room (966B)					
Bilog Antenna/6 dB Attenuator	SUNOL SCIENCES & EMEC /EMCI	JB3/N-6-06	A111513/AT-N0668	2020/03/19	2021/03/18
Horn Antenna	ETS-Lindgren	3115	00085775	2020/09/17	2021/09/16
Preamplifier	A.H. Systems	PAM-0118	478	2020/05/05	2021/05/04
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101456	2020/06/03	2021/06/02
Microflex Cable (1m)	EMCI	EMC102-KM-KM-1000	180524	2020/08/06	2021/08/05
Microflex Cable (2m)	EMCI	EMC106-SM-SM-2000	180516	2020/08/06	2021/08/05
Microflex Cable (8m)	UTIFLEX	UFA210A-1-3149-300300	MFR 64639 232490-002	2020/08/06	2021/08/05
Turn Table	Chaintek	T-200-S-1	003501	N.C.R	N.C.R
Antenna Tower	Chaintek	MBD-400-1	003504	N.C.R	N.C.R
Controller	Chaintek	3000-1	003507	N.C.R	N.C.R
Software	Audix	e3 v9	E3LK-01	N.C.R	N.C.R
Conducted Room(TH-02)					
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101434	2020/05/07	2021/05/06
Cable	MTJ	MT40S	620620-MT40S-100	Each Use	-
AC Line Conduction Room (CON-01)					
Two-Line V-Network	Rohde & Schwarz	ENV216	100010	2020/09/14	2021/09/13
Pulse Limiter	SCHWARZBECK	VSTD 9561-F	00432	2020/09/11	2021/09/10
ESR EMI Test Receiver	Rohde & Schwarz	ESR3	102430	2020/05/07	2021/05/06
RF Cable	EMCI	EMCCFD300-BM-BM-8000	180526	2020/08/18	2021/08/17
Software	Audix	e3 v9	E3LK-03	N.C.R	N.C.R

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

5 FCC §15.203 - Antenna Requirements

5.1 Applicable Standard

According to § 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 replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.

5.2 Antenna List and Details

Brand	Model	Antenna Type	Antenna Gain	Result
ENFORCER	SK-919T1-GBDQ	PCB	0.00 dBi	Compliance

The EUT has an internal antennas arrangement and fulfill the requirement of this section.

6 FCC §15.207 - AC Line Conducted Emissions

6.1 Applicable Standard

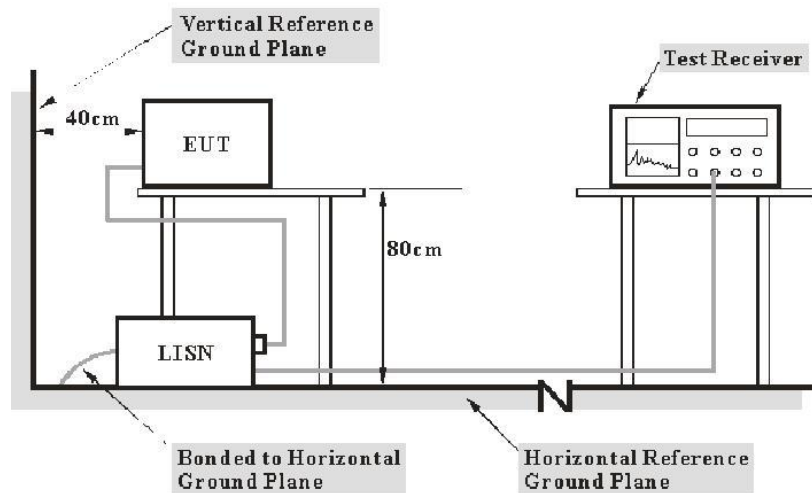
According to FCC §15.207,

For an intentional radiator that 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 the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 ^{Note 1}	56 to 46 ^{Note 2}
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency. Note 2: A linear average detector is required

6.2 EUT Setup and Test Procedure



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 30 cm from other units and other metal planes support units.

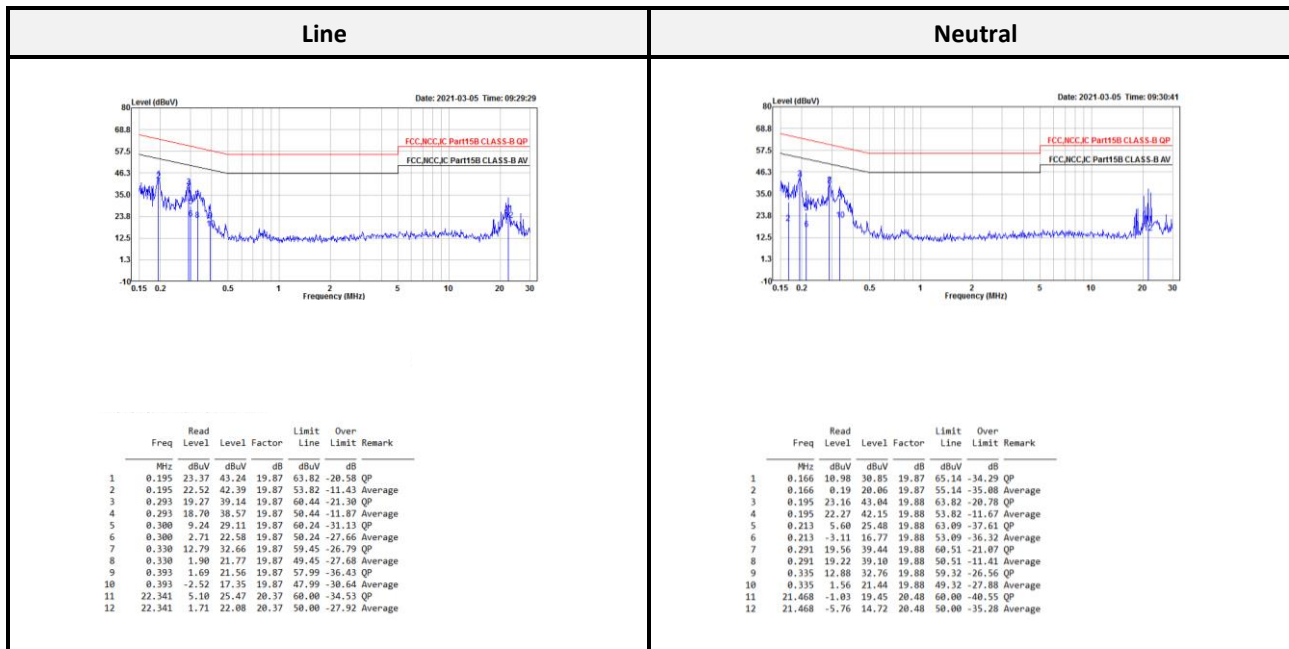
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits. The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	Receiver RBW
150 kHz - 30 MHz	9 kHz

During the conducted emission test, the adapter was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

6.3 Test Result



Note:

Level = Read Level + Factor

Over Limit (Margin) = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

7 FCC §15.205, §15.209, §15.231(b) – Spurious Emissions

7.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function.

Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1MHz.

As Per FCC §15.205(a) except as show 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	13.36-13.41	399.9-410	4.5-5.15
0.495-0.505	16.42-16.423	608-614	5.35-5.46
2.1735-2.1905	16.69475-16.69525	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
6.215-6.218	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	Above 38.6

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (micro volts/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

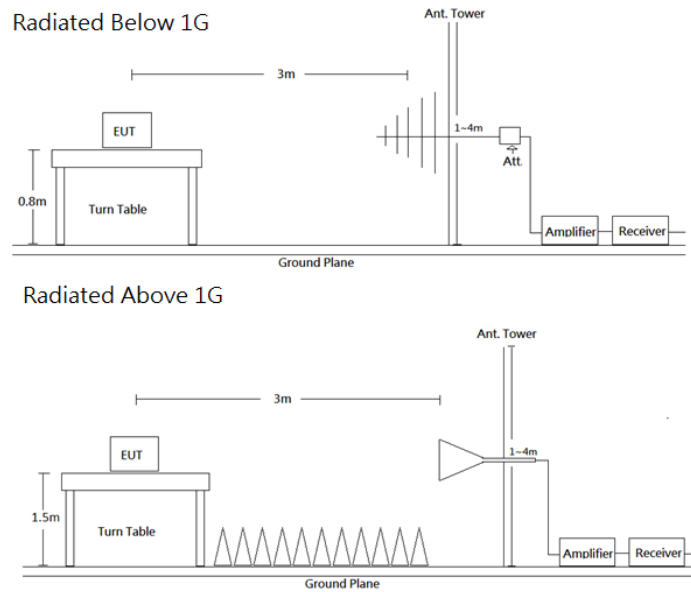
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(b) In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (millivolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750	Note ¹ 125 to 375
174-260	3,750	375
260-470	3,750 to 12,500	Note ¹ 375 to 1,250
Above 470	12,500	1,250

Note1: Linear interpolations.

7.2 EUT Setup and Test Procedure



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.247 Limits.

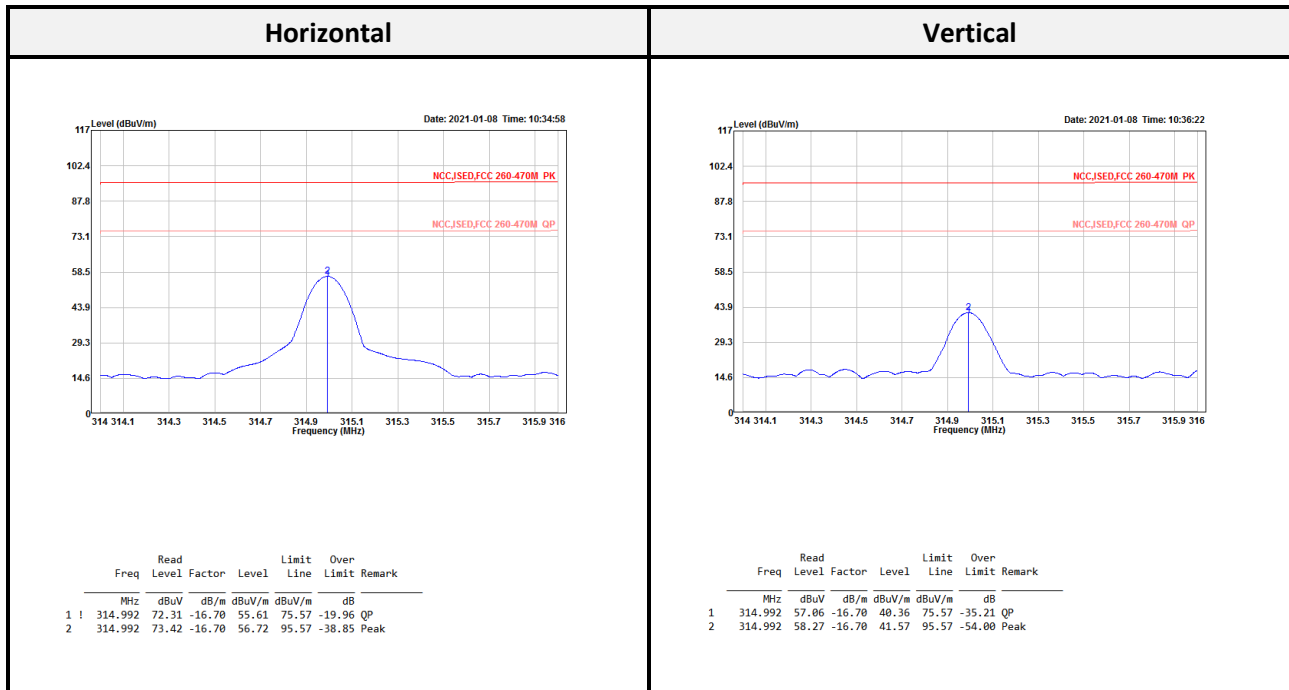
The system was investigated from 30 MHz to 26.5 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	VBW	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	-	QP
Above 1 GHz	1 MHz	3 MHz	-	PK
	1 MHz	10 Hz	>98%	PK
	1 MHz	1/T	<98%	Ave

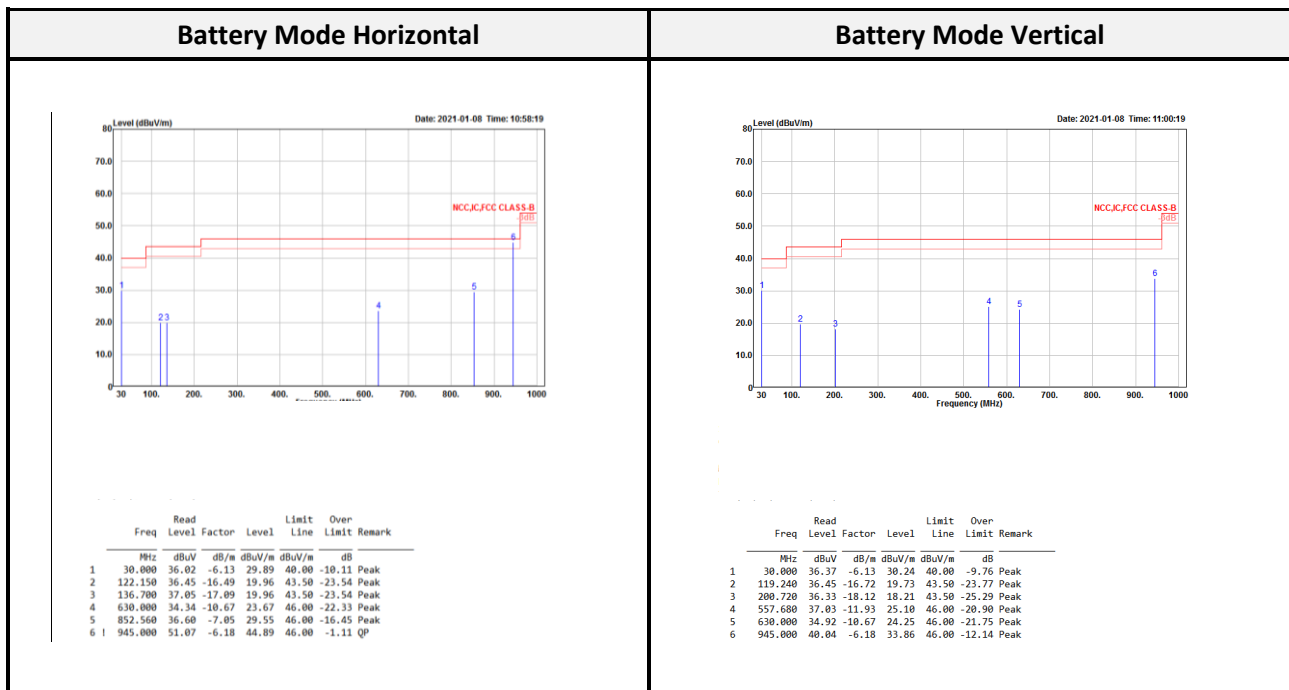
Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations. All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

7.3 Test Result

Fundamental (Pre-scan with three orthogonal axis, and worse case as X axis)



Below 1G (30 MHz-1 GHz):



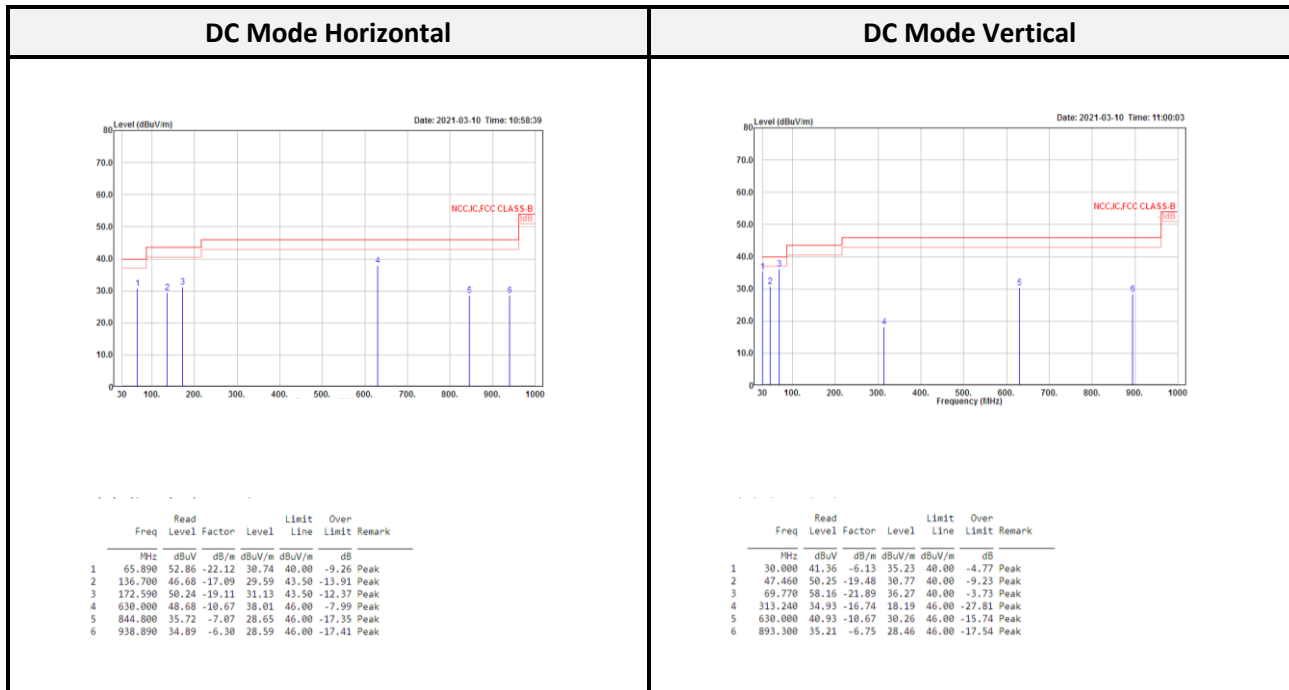
Note:

Result = Reading + Correct Factor ; Margin = Result – Limit.

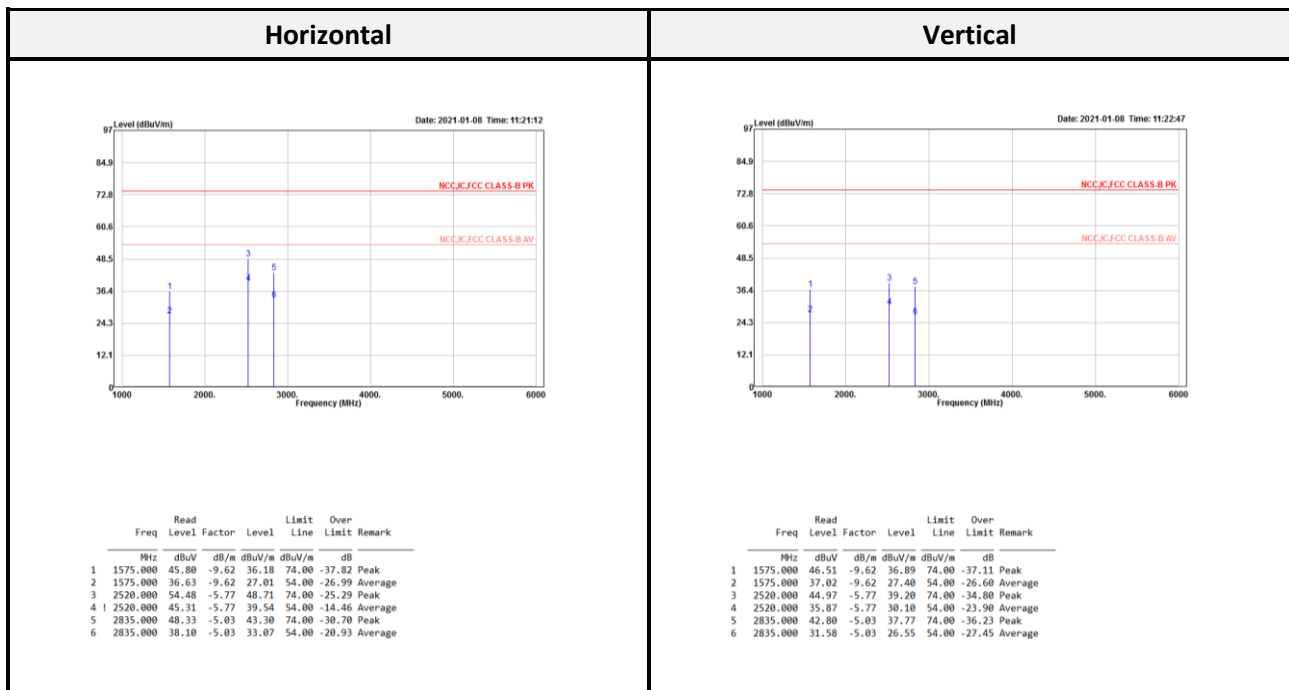
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

Below 1G (30 MHz-1 GHz):



Above 1G (1 GHz -6 GHz):



Note:

Result = Reading + Correct Factor ; Margin = Result – Limit.

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

8 FCC §15.231(c) – 20 dB Emission Bandwidth

8.1 Applicable Standard

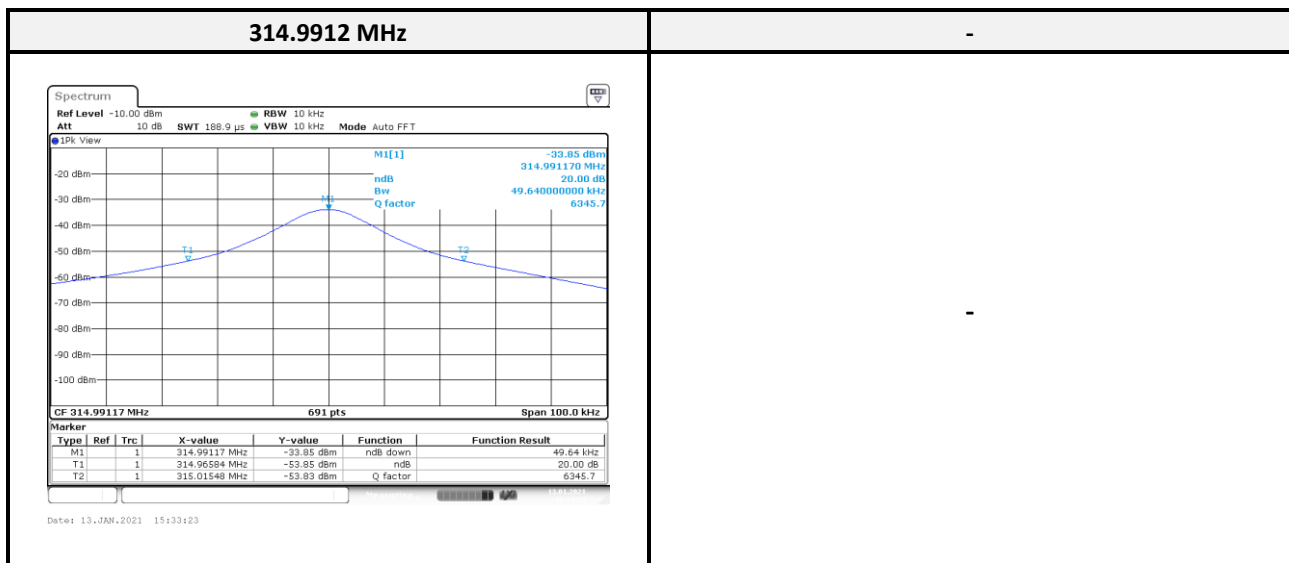
Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

8.2 Test Procedure

The waveform was received by the spectrum analyzer/EMI Test Receiver, plot the 20 dB bandwidth.

8.3 Test Results

Frequency (MHz)	20 dB BW (kHz)	Limit (MHz)	Result
314.9912	49.64	0.79	Compliance



9 FCC §15.231(a) – Deactivation Testing

9.1 Applicable Standard

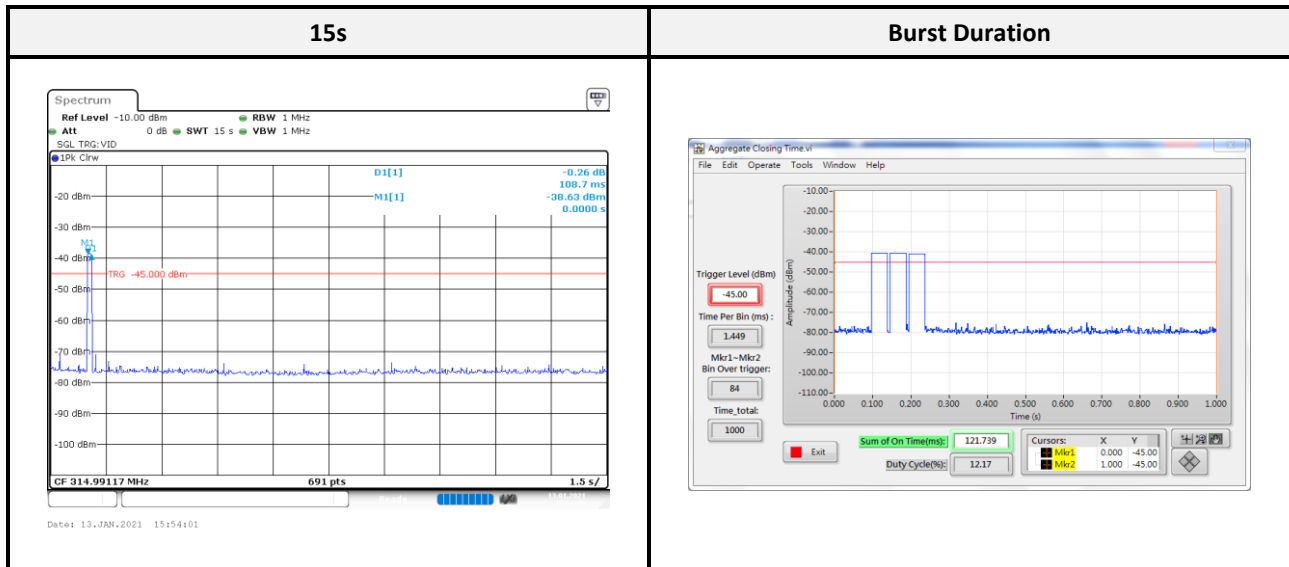
Per 15.231(a) (1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

9.2 Test Procedure

- (1) Place the EUT on a bench and set it in transmitting mode.
- (2) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to measuring equipment.
- (3). Add a correction factor to the display.

9.3 Test Results

Frequency (MHz)	Burst Duration (ms)	Limit (Sec)	Result
Manually Operated	121.74	5	Compliance



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