Seasonal Visions International Co.,Ltd

TEST REPORT

SCOPE OF WORK
FCC TESTING – HAL-24386

REPORT NUMBER
SZHH01877799-001

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TEST REPORT

Intertek Report No.: SZHH01877799-001

Seasonal Visions International Co.,Ltd

Application
For
Certification

FCC ID: 2BEA3-24386

12 ft OG Towering Skeleton with Selectable Eyes

Model: HAL-24386

Transmitter

Report No.: SZHH01877799-001

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 [10-1-22]

Prepared and Checked by:	**Approved by:**
Sign on file	
Terry Tang **Assistant Supervisor**	**Ryan Chen** **Sr. Project Engineer** **Date: Jan 22, 2024**

MEASUREMENT/TECHNICAL REPORT

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

Equipment Type: DSC - Part 15 Security Remote Control Transmitter

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

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 ___X___

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-22] Edition] provision.

Report prepared by:

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1.0 Summary of Test results

Applicant: Seasonal Visions International Co.,Ltd
Applicant Address: No. 21, Yan Hai Road, ChongTou, ChangAn DongGuan, GuangDong, China

Manufacturer: Seasonal Visions International Co.,Ltd
Manufacturer Address: No. 21, Yan Hai Road, ChongTou, ChangAn DongGuan, GuangDong, China

12 ft OG Towering Skeleton with Selectable Eyes

Model: HAL-24386

FCC ID: 2BEA3-24386

TEST ITEM	REFERENCE	RESULTS
Transmitter Field Strength	15.231(b) &15.205	Pass
Bandwidth	15.231(c)	Pass
Timing Requirement	15.231(a)(1)	Pass

Notes: 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 12 ft OG Towering Skeleton with Selectable Eyes operating at 433.92MHz. The EUT is powered by DC 3.0V (2 x 1.5V AAA batteries). For more detailed features description, please refer to the user's manual.

Antenna Type: Integral Antenna
Modulation: FSK
Antenna Gain: 2dBi

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 12 ft OG Towering Skeleton with Selectable Eyes transmitter portion.

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.

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. This test facility and site measurement data have been fully placed on file with File 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 new DC 3.0V (2 x 1.5V AAA batteries) during the test. Only the worst case data was shown in the report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the bottom of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emission at and above 30 MHz, 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 report in Exhibit 4.0.

The unit was operated standalone and placed in the center of 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 mounted to a plastic stand if necessary and placed on the styrene turntable, 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

No special accessories used.

3.4 Measurement Uncertainty

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

3.5 Equipment Modification

Any modifications installed previous to testing by Seasonal Visions International Co.,Ltd 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.

3.6 Support Equipment List and Description

N/A

4.0 System Test Configuration

4.1 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 dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
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

Example

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

RA = 62.0dBμV
AF = 7.4dB/m
CF = 1.6dB
AG = 29.0dB
PD = 0dB

AV = -10dB

FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32dBμV/m

Level in μV/m = Common Antilogarithm [(32dBμV/m)/20] = 39.8μV/m

4.2 Radiated Emission Configuration Photograph

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

4.3 Radiated Spurious Emission

Worst Case Radiated Spurious Emission
at
2169.600MHz

Judgement: Passed by 19.0dB margin

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

Applicant: Seasonal Visions International Co.,Ltd
Date of Test: Jan 5, 2024 Model: HAL-24386
Worst Case Operating Mode: Transmitting

Table 1
Radiated Emissions (30-4340MHz)

Freq. (MHz)	Ant. Pol.	Reading	Pre-amp. gain	antenna factor	Emission Level (dBµV/m)			Limit 3m (dBµV/m)		Margin (dB)	
	H/V	(dBµV)	(dB)	(dB/m)	PK	AV Factor(dB)	AV	PK	AV	PK	AV
433.920	H	34.8	/	17.1	51.9	6.9	45.0	100.8	80.8	48.9	35.8
867.840	H	21.6	/	23.8	45.4	6.9	38.5	80.8	60.8	35.4	22.3
1301.300*	H	38.6	34.1	27.0	31.5	6.9	24.6	74.0	54.0	42.5	29.4
2169.600	H	47.7	31.8	32.8	48.7	6.9	41.8	80.8	60.8	32.1	19.0
3037.440	H	38.4	31.3	34.6	41.7	6.9	34.8	80.8	60.8	39.1	26.0
4165.500*	H	36.4	31.0	36.4	41.8	6.9	34.9	74.0	54.0	32.2	19.1
4339.000*	H	33.7	30.5	36.8	40.0	6.9	33.1	74.0	54.0	34.0	20.9

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. All emissions below the Average limit.
4. "*" Emission within restricted band fulfils the requirement of section 15.205.
5. The preamplifier is used for frequencies above 1 GHz only.
6. Averaging factor in dB = 20log(duty cycle) = 20log(0.4537)=-6.9dB

5.0 Equipment Photographs

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

6.0 Product Labeling

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

7.0 Technical Specifications

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

8.0 Instruction Manual

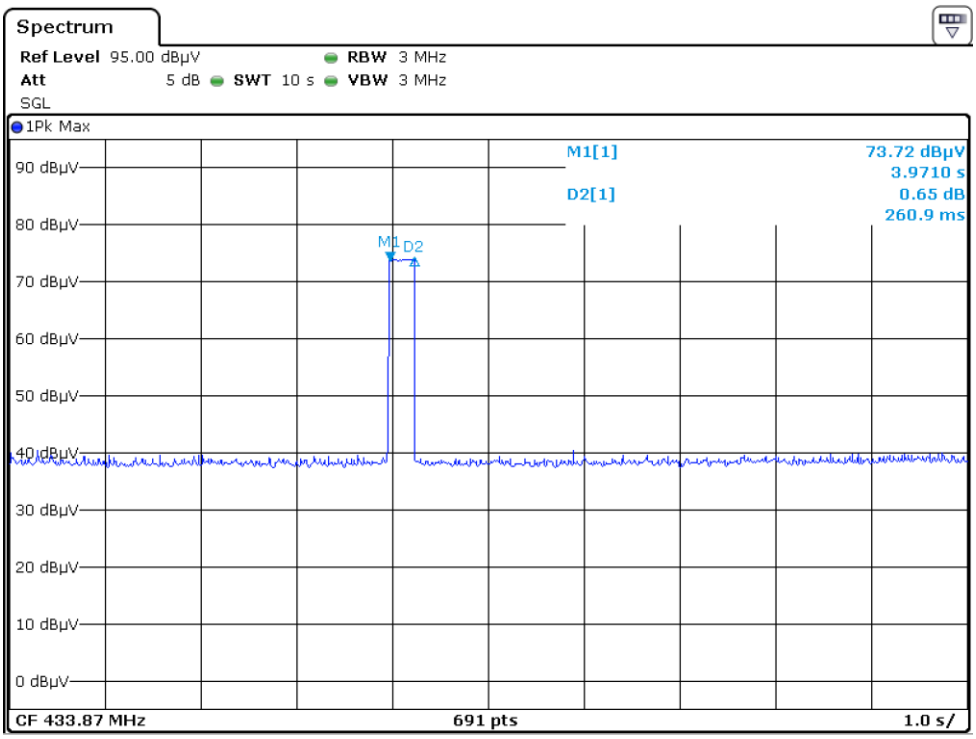
For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

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 bandwidth, the test procedure, calculation of timing requirements and pulse desensitization.

9.1 Timing Plot – Pursuant to FCC Part 15 Section 15.231(a)(1)

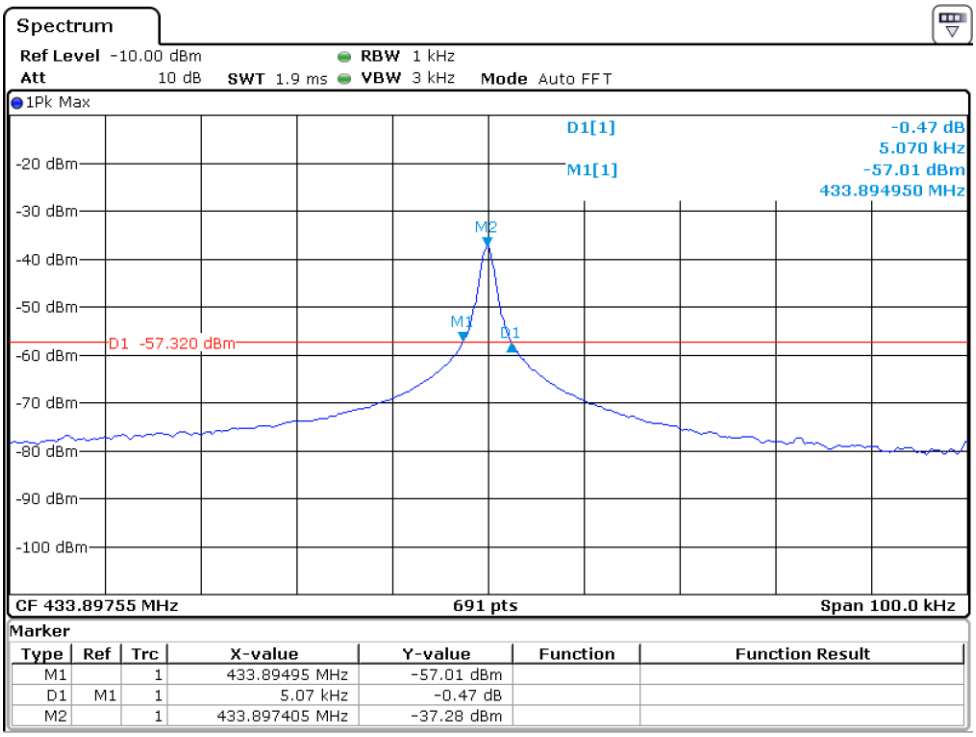


Note: The emission was found to cease within 5 seconds after button release.

Result: Pass.

9.2 Measured Bandwidth

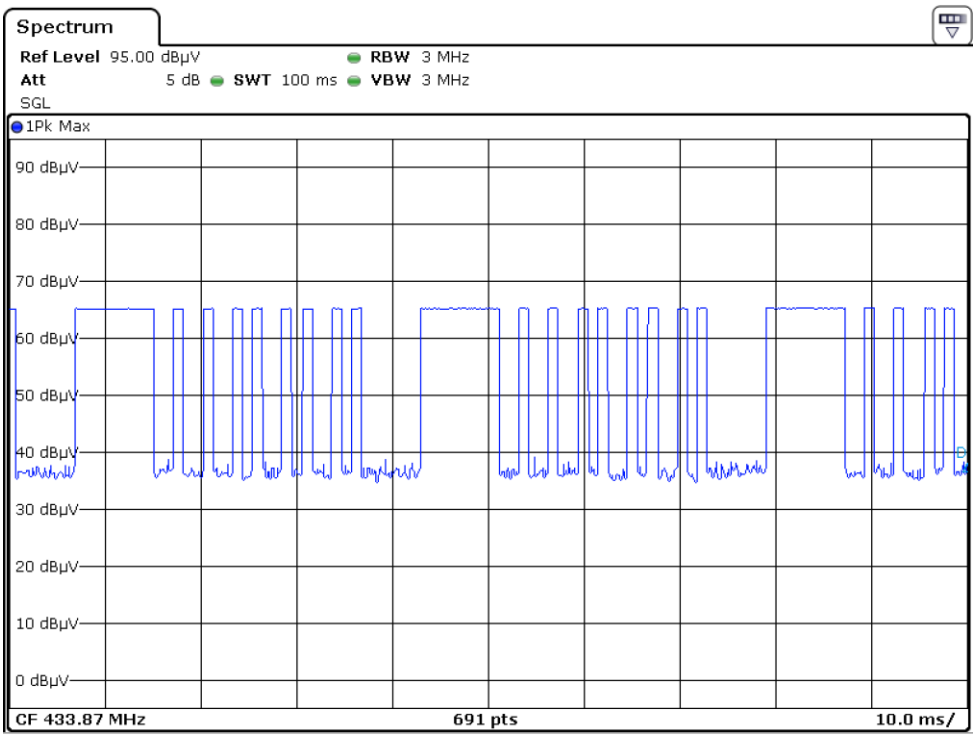
From the plot, the 20dB bandwidth is 5.07 kHz and less than the limit of 1.08MHz. It fulfils the requirement of 15.231(c).

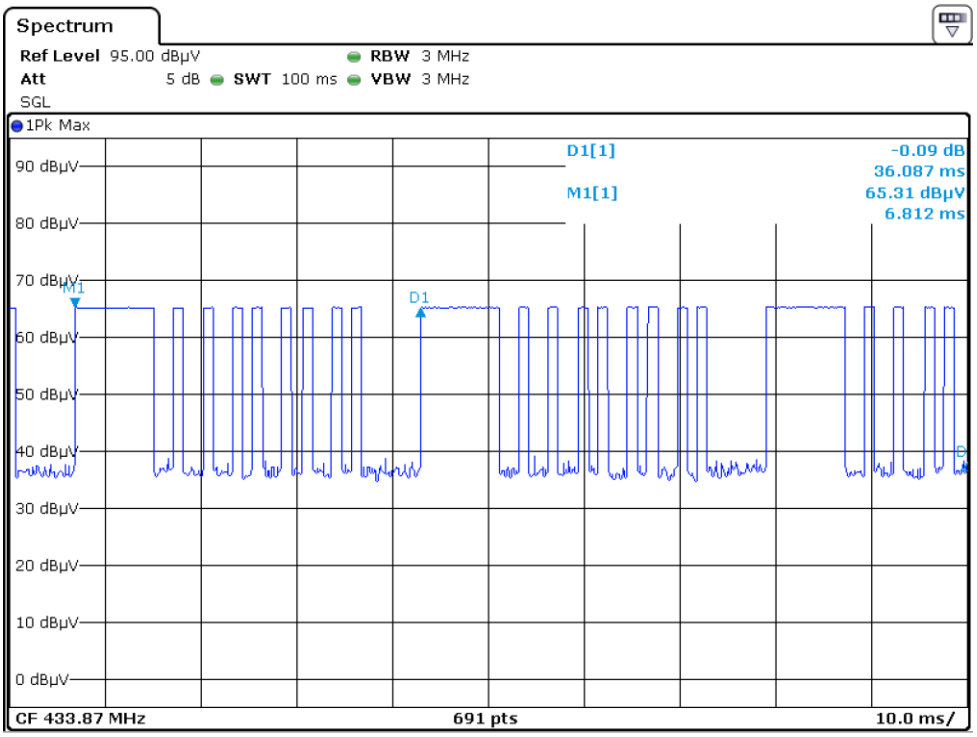


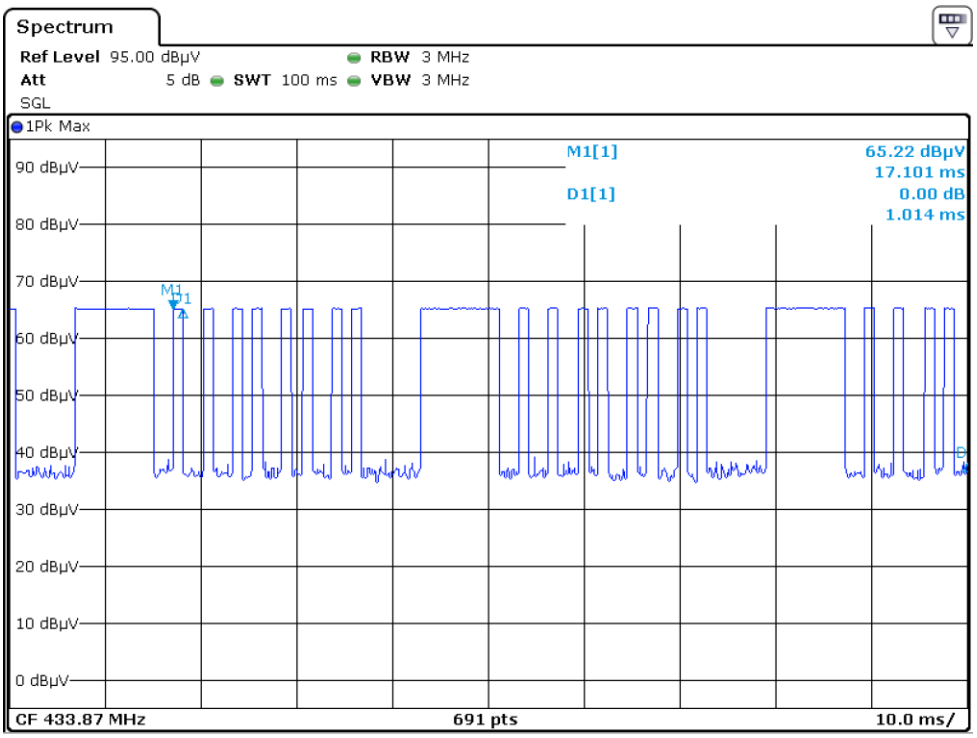
9.3 Discussion of Pulse Desensitization

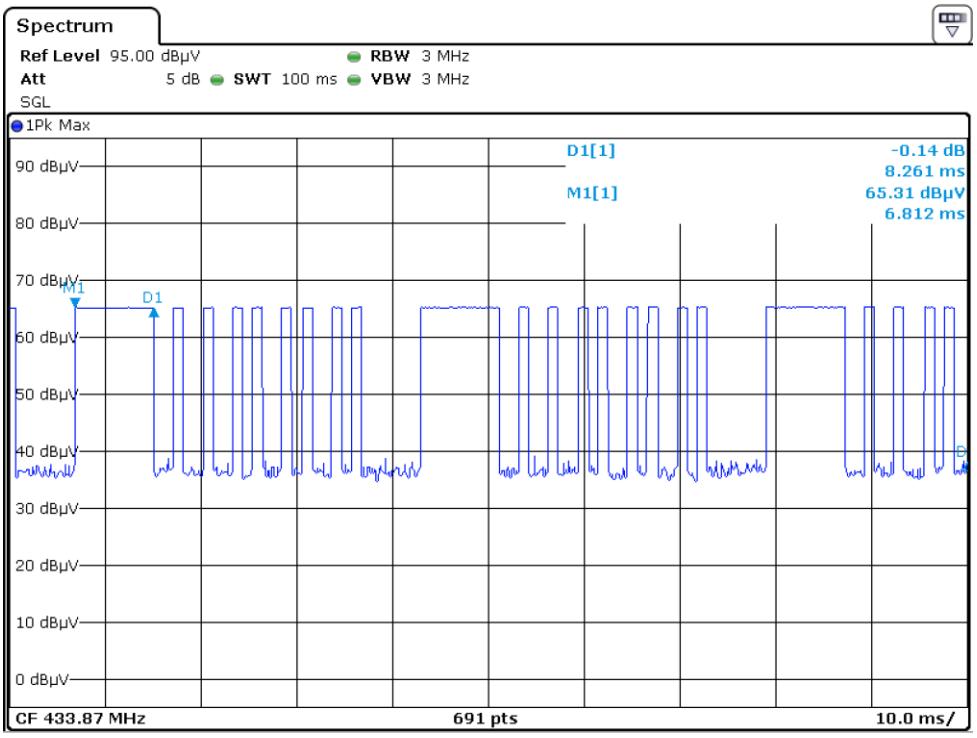
Pulse desensitivity is not applicable for this device. The effective period (T_{eff}) is approximately 1.014ms for a digital "1" bit which illustrated on technical specification. With a resolution bandwidth (3 dB) of 100 kHz, the pulse desensitivity factor was 0 dB.

The duty cycle is simply the on-time divided by the period:
The duration of one cycle = 36.087ms
Effective period of the cycle = 1.014ms x 8 + 8.261ms=16.373ms
DC = 16.373ms / 36.087ms = 0.4537 or 45.37%
Therefore, the averaging factor is found by 20 $\log_{10}$(0.4537)=-6.9dB




Spectrum
Ref Level 95.00 dBµV
RBW 3 MHz
Att 5 dB SWT 100 ms VBW 3 MHz
SGL
1Pk Max
D1[1] -0.09 dB
36.087 ms
M1[1] 65.31 dBµV
6.812 ms
90 dBµV
80 dBµV
70 dBµV
60 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
0 dBµV
M1
D1
CF 433.87 MHz
691 pts
10.0 ms/


Spectrum
Ref Level 95.00 dBµV
RBW 3 MHz
Att 5 dB SWT 100 ms VBW 3 MHz
SGL
1Pk Max
M1[1] 65.22 dBµV
17.101 ms
D1[1] 0.00 dB
1.014 ms
90 dBµV
80 dBµV
70 dBµV
60 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
0 dBµV
M1
D1
CF 433.87 MHz
691 pts
10.0 ms/


Spectrum
Ref Level 95.00 dBµV
RBW 3 MHz
Att 5 dB SWT 100 ms VBW 3 MHz
SGL
1Pk Max
D1[1]
-0.14 dB
8.261 ms
M1[1]
65.31 dBµV
6.812 ms
90 dBµV
80 dBµV
70 dBµV
60 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
0 dBµV
M1
D1
CF 433.87 MHz
691 pts
10.0 ms/

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, up to 1GHz 0.8m and above 1GHz 1.5m 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 adjust 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 based on the use of measurement instrumentation with a CISPR quasi-peak detector.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

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. Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

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
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	2023-12-13	2024-12-13
SZ062-10	RF Cable	Bedea	RG 58	--	2023-11-01	2024-05-01
SZ056-08	Signal Analyzer	R&S	FSV 40	101430	2023-12-13	2024-12-13
SZ185-03	EMI Receiver	R&S	ESR7	101975	2023-04-27	2024-04-27
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2021-05-18	2024-05-18
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	2021-08-04	2024-08-04
SZ181-08	Microwave System Amplifier	Agilent	83017A	MY57280108	2023-07-27	2024-07-27
SZ188-05	Anechoic Chamber	ETS	FACT 3-2.0	CT001880-Q1391	2021-05-25	2024-05-25
SZ062-23	RF Cable	RADIALL	SF104PE	MY4262/4PE	2023-09-26	2024-09-26
SZ062-35	RF Cable	Rebes	A50-3.5M3.5M-8M	19100879	2023-11-14	2024-11-14