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TXS Industrial Design Inc. d.b.a Brandstand Products

TEST REPORT

SCOPE OF WORK
FCC TESTING–BPEPT

REPORT NUMBER
190820017SZN-001

ISSUE DATE **[REVISED DATE]**
September 24, 2019 [----------]

PAGES
19

DOCUMENT CONTROL NUMBER
FCC ID 209_b

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TXS Industrial Design Inc. d.b.a Brandstand Products

Application
For
Certification

FCC ID: 2ARD4-BPEPT

CubiePoint

Brand Name: BRANDSTAND

Model: BPEPT

Transmitter

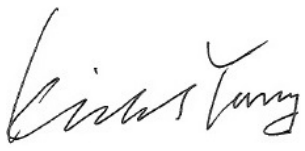
Report No.: 190820017SZN-001

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 [10-1-18]

Prepared and Checked by:

Rode Liu
Engineer

Approved by:



Kidd Yang
Technical Supervisor
Date: September 24, 2019

MEASUREMENT/TECHNICAL REPORT

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

Equipment Type: DCD - Part 15 Low Power Transmitter Below 1705 kHz

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 [10-01-18] Edition] provision.

Report prepared by:

Rode Liu
Intertek Testing Services Shenzhen Ltd. Longhua Branch
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Table of Contents

1.0 Summary of Test Results

Applicant: TXS Industrial Design Inc. d.b.a Brandstand Products
Applicant Address: 801 E Campbell Rd. #620, Richardson, TX 75081, United States
Manufacturer: HANK Electronics Co., Ltd
Manufacturer Address: 2nd-7th, A8, Hongye Industry City, Lezhujiao, Zhoushi Road, Baoan District, Shenzhen, Guangdong 518100 China

Model: BPEPT

FCC ID: 2ARD4-BPEPT

TEST ITEM	REFERENCE	RESULTS
Power Line Conducted Emissions	15.207	Pass
Transmitter Radiated Emissions	15.209	Pass
Antenna Requirement	15.203	Pass (See Notes)

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 CubiePoint operating at 110-148.5 kHz. The EUT is powered by AC 100-240V, 50/60Hz, 0.8A Max from adapter. For more detailed features description, please refer to the user's manual.

Antenna Type: Integral Antenna(embedded coil antenna)

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 DCD – Part 15 Low Power Transmitter Below 1705kHz.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. 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 and shield room used to collect the radiated data and conducted data are 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 AC 120V/60Hz from adapter during the test. The test system was pre-scanning tested based on the consideration of following EUT operation mode. Only the worst-case data is shown in the report.

Pertest mode	Description
Mode 1	Standby mode
Mode 2	Mobile phone is charging at 1% battery power
Mode 3	Mobile phone is charging at 50% battery power
Mode 4	Mobile phone is charging at 99% battery power

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 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 Section 4.0.

The rear of unit shall be flushed with the rear of the table.

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

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst-case configuration is used in all specified testing.

3.3 Special Accessories

There is no special accessories necessary for compliance of this product.

3.4 Equipment Modification

Any modifications installed previous to testing by TXS Industrial Design Inc. d.b.a Brandstand Products 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 of the test conclusion, the Measurement Uncertainty of test has been considered.

Measurement Uncertainty	Uncertainty
Channel Bandwidth	±3.46%
Radiated emission (Up to 1GHz)	±4.8dB
AC Conducted emission	±3.6 dB
Temperature	±1°C
Humidity	±5%

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Description	Manufacturer	Detail
Mobile Phone	Samsung	S7
Adapter	Provided by Applicant	Input: AC 100-240V, 50/60Hz, 0.8A Max
2*Cement Resistor	Provided by Intertek	2Ω
USB cable	Provided by Intertek	Length: 0.3meter, unshielded
USB cable	Provided by Intertek	Length: 0.6meter, unshielded
USB cable	Provided by Intertek	Length: 0.7meter, unshielded
USB cable	Provided by Intertek	Length: 1.2meter, unshielded

4.0 Measurement Results

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
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
CF = 1.6dB
AG = 29.0dB
PD = 0dB

AV = -10dB

FS = $62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32$dBμV/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
175.853MHz

Judgement: Passed by 3.0dB margin

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

Applicant: TXS Industrial Design Inc. d.b.a Brandstand Products
Date of Test: September 14, 2019
Model: BPEPT
Worst Case Operating Mode: Mode 2

Radiated Emissions (30MHz – 1000MHz)

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	92.080	46.4	20.0	8.5	34.9	43.5	-8.6
Horizontal	143.975	46.1	20.0	8.0	34.1	43.5	-9.4
Horizontal	362.710	41.6	20.0	15.0	36.6	46.0	-9.4
Vertical	145.099	51.4	20.0	8.5	39.9	43.5	-3.6
Vertical	175.853	52.3	20.0	8.2	40.5	43.5	-3.0
Vertical	207.025	38.9	20.0	17.7	36.6	43.5	-6.9

Notes:

1. Quasi-Peak detector is used for frequency below 1GHz.

2. All measurements were made at 3 meters. 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 value in the margin column shows emission below limit.

4. All emissions are below the QP limit.

Applicant: TXS Industrial Design Inc. d.b.a Brandstand Products
Date of Test: September 14, 2019
Model: BPEPT
Worst Case Operating Mode: Mode 2

Fundamental & Spurious Emission Below 30MHz

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Distance Factor (-dB)	Calulated at 300m (dBµV/m)	Limit at 300m (dBµV/m)	Margin (dB)
Horizontal	0.114	74.6	0.0	16.8	91.4	80	11.4	26.5	-15.1
Horizontal	0.341	52.9	0.0	15.7	68.6	80	-11.4	16.9	-28.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Distance Factor (-dB)	Calulated at 30m (dBµV/m)	Limit at 30m (dBµV/m)	Margin (dB)
Horizontal	0.569	44.0	0.0	15.3	59.3	40	19.3	32.5	-13.2

Notes:

1. The specified limits of frequency band 9~90 KHz, 110~490 KHz are in average and measurements are made with peak detectors. Quasi-Peak detector is used for other frequency band.

2. All measurements were made at 3 meter. Harmonic emissions not detected at the 3-meter distance 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 value in the margin column shows emission below limit.

4. Loop antenna is used for the emission under 30MHz.

5. Horizontal and Vertical polarization were tested and Only the worst Case data is shown.

4.4 Conducted Emission Configuration Photograph

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

4.5 Conducted Emission

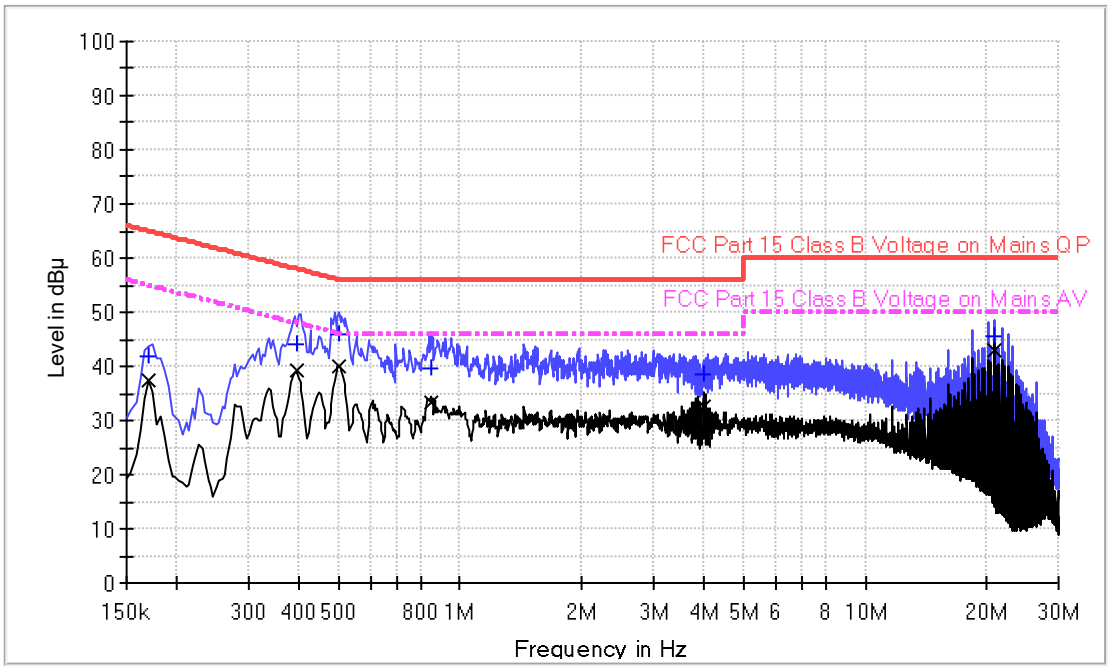
Worst Case Conducted Configuration
at
0.502MHz

Judgement: Passed by 5.9dB margin

Applicant: TXS Industrial Design Inc. d.b.a Brandstand Products
Date of Test: August 30, 2019
Model: BPEPT
Worst Case Operating Mode: Mode 2
Phase: Live

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.170000	41.7	9.000	L1	9.7	23.3	65.0
0.394000	44.2	9.000	L1	9.7	13.8	58.0
0.502000	45.8	9.000	L1	9.7	10.2	56.0
0.846000	39.7	9.000	L1	9.7	16.3	56.0
3.974000	38.3	9.000	L1	9.8	17.7	56.0
20.746000	45.4	9.000	L1	10.5	14.6	60.0

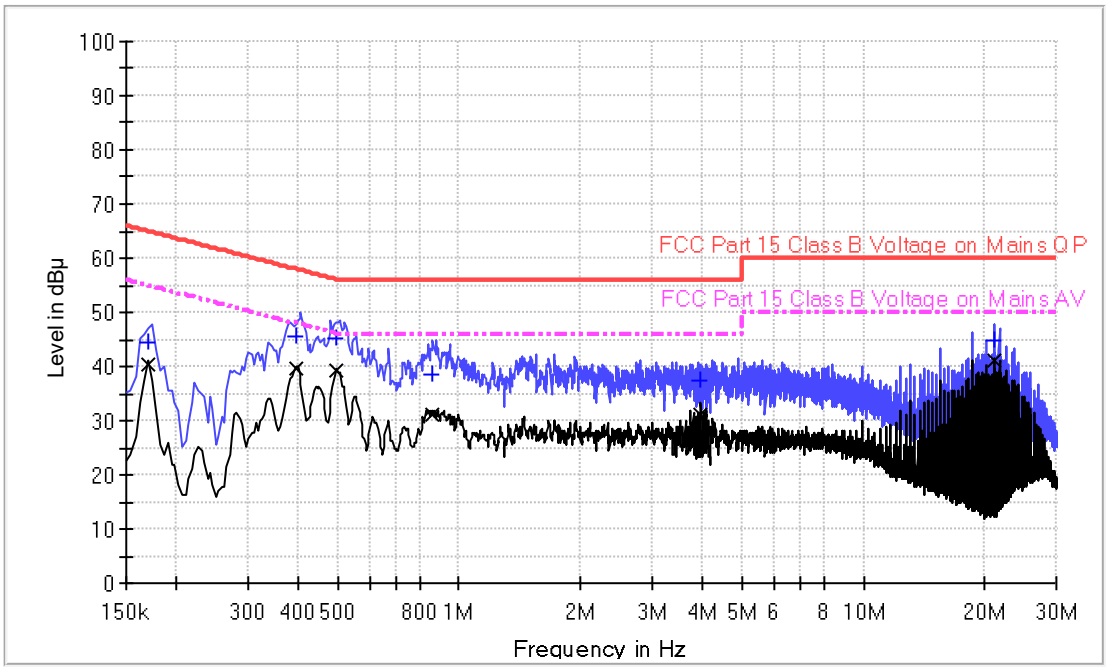
Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.170000	37.5	9.000	L1	9.7	17.5	55.0
0.394000	39.4	9.000	L1	9.7	8.6	48.0
0.502000	40.1	9.000	L1	9.7	5.9	46.0
0.846000	33.4	9.000	L1	9.7	12.6	46.0
3.974000	32.6	9.000	L1	9.8	13.4	46.0
20.746000	42.8	9.000	L1	10.5	7.2	50.0

Applicant: TXS Industrial Design Inc. d.b.a Brandstand Products
Date of Test: August 30, 2019
Model: BPEPT
Worst Case Operating Mode: Mode 2
Phase: Neutral

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.170000	44.5	9.000	N	9.7	20.5	65.0
0.394000	45.7	9.000	N	9.7	12.3	58.0
0.498000	45.1	9.000	N	9.7	10.9	56.0
0.862000	38.6	9.000	N	9.7	17.4	56.0
3.966000	37.4	9.000	N	9.8	18.6	56.0
20.990000	44.8	9.000	N	10.6	15.2	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.170000	40.2	9.000	N	9.7	14.8	55.0
0.394000	39.5	9.000	N	9.7	8.5	48.0
0.498000	39.4	9.000	N	9.7	6.6	46.0
0.862000	31.2	9.000	N	9.7	14.8	46.0
3.966000	31.2	9.000	N	9.8	14.8	46.0
20.990000	41.1	9.000	N	10.6	8.9	50.0

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.

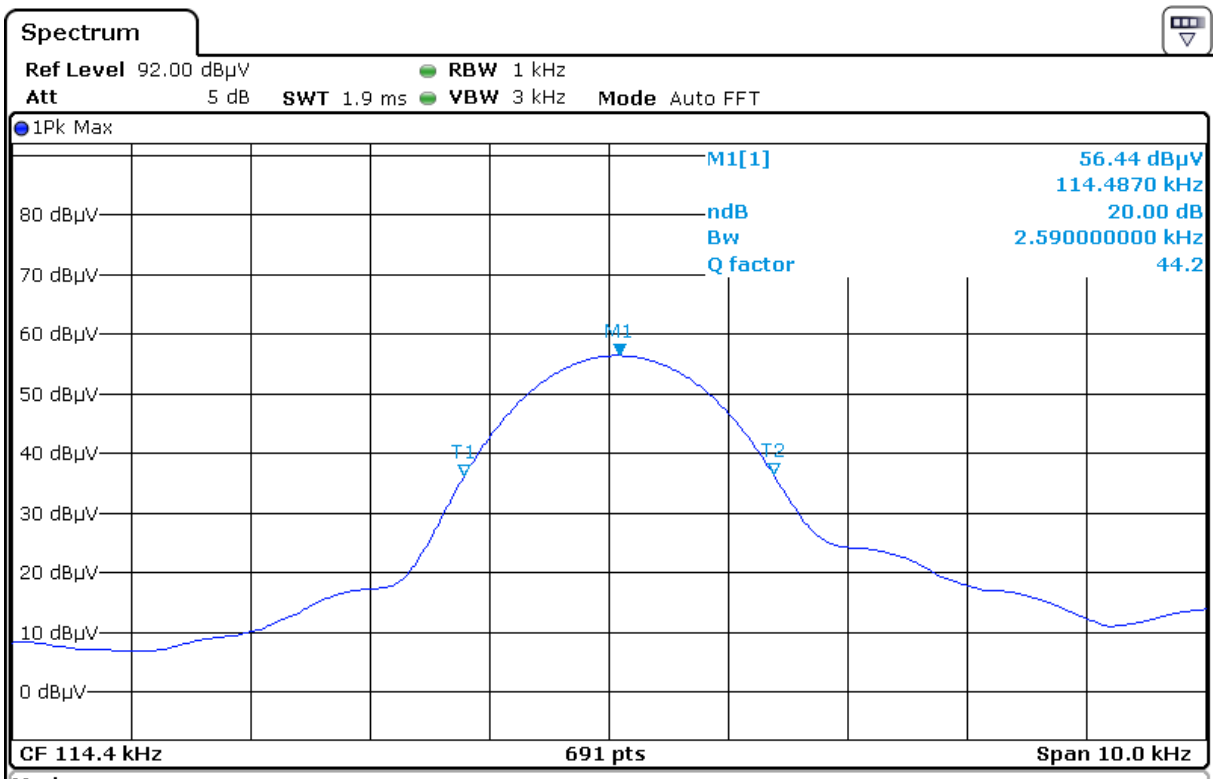
This manual will be provided to the end-user with each unit sold/leased in the United States.

9.0 Miscellaneous Information

This miscellaneous information includes 20dB bandwidth and emission measuring procedure.

9.1 20dB bandwidth

Pursuant to FCC part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) 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.



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	114.487 kHz	56.44 dBµV	ndB down	2.59 kHz
T1		1	113.184 kHz	36.27 dBµV	ndB	20.00 dB
T2		1	115.775 kHz	36.56 dBµV	Q factor	44.2

9.2 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 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.

Average detector is used for 9–90 KHz, 110–490 KHz and Quasi-Peak detector is used for other frequency band. 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.

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. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

9.2 Emissions Test Procedures (cont'd)

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.

Conducted measurements are made as described in ANSI C63.10 - 2013.

The IF bandwidth used for measurement of radiated signal strength was 10kHz for emission below 30MHz and 120kHz for emission from 30MHz to 1000MHz. 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.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the restricted bands, 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
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	30-Sep-2018	30-Sep-2019
SZ185-01	EMI Receiver	R&S	ESCI	100547	4-Jan-2019	4-Jan-2020
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	24-May-2019	24-May-2020
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	28-May-2019	28-May-2020
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	28-May-2019	28-May-2020
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	15-Jan-2019	15-Jan-2020
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	15-Dec-2018	15-Dec-2020
SZ062-02	RF Cable	RADIALL	RG 213U	--	19-June-2019	19-Dec-2019
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	30-Feb-2019	30- Sep -2019
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	30-Feb-2019	30- Sep -2019
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	26-Oct-2018	26-Oct-2019
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	28-May-2019	28-May-2020
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	16-Jan-2020
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	29-Oct-2018	29-Oct-2019

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