TEST REPORT

KOSTEC Co., Ltd. 28(175-20, Annyeong-dong) 406-gil sejaro, Hwaseong-si, Gueonggi-do, Korea Tel:031-222-4251, Fax:031-222-4252	Report No.: KST-FCR-190001(1)	KOSTEC Co., Ltd. http://www.kostec.org

1. Applicant

   • Name : Dogtra Co., Ltd.

   • Address : #715-2(146BL-3L) Gojan-dong, Namdong-gu, Incheon, Korea

2. Test Item

   • Product Name: Pathfinder mini

   • Model Name: PM10U

   • Brand: None

   • FCC ID: SWN-PM10U

3. Manufacturer

   • Name : Dogtra Co., Ltd.

   • Address : #715-2(146BL-3L) Gojan-dong, Namdong-gu, Incheon, Korea

4. Date of Test : 2019. 02. 12. ~ 2019. 02. 14.

5. Test Method Used : FCC CFR 47, Part 95
   ANSI/TIA-603-E-2016

6. Test Result : Compliance

7. Note: None

Supplementary Information

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI/TIA-603-E-2016.

We attest to the accuracy of data and all measurements reported herein were performed by KOSTEC Co., Ltd. and were made under Chief Engineer's supervision. We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test report is not related to KOLAS accreditation.

Affirmation	Tested by Name : Lee, Mi-Young (Signature)	Technical Manager Name : Park, Gyeong-Hyeon (Signature)

2019. 02. 28.

KOSTEC Co., Ltd.

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1. GENERAL INFORMATION

1.1 Test Facility

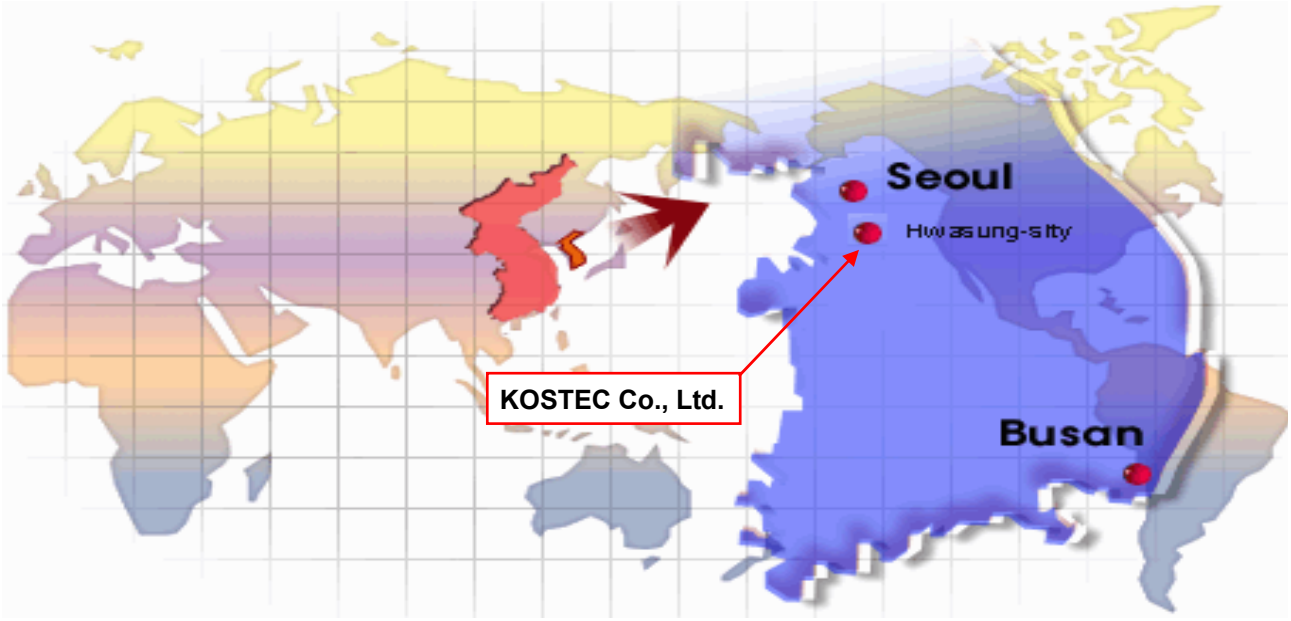
Test laboratory and address

KOSTEC Co., Ltd.
128(175-20,Annyeong-dong)406-gil sejaro, Hwaseong-si Gyeonggi-do, Korea

Registration information

KOLAS No. : 232
FCC Designation No. : KR0041
IC Registration Site No. : 8305A

1.2 Location



1.3 Revision History of test report

Rev.	Revisions	Effect page	Reviewed	Date
-	Initial issue	All	Gyeong Hyeon, Park	2019. 02. 18
1	A comment on the test frequency was added to the result table.	All	Gyeong Hyeon, Park	2019. 02. 28.

2. EQUIPMENT DESCRIPTION

The product specification described herein was declared by manufacturer. And refer to user's manual for the details.

Equipment Name	Pathfinder mini
Model No	PM10U
Usage	MURS radio for dog
Serial Number	Proto type
Modulation type	FSK
Emission Type	F1D
Maximum output power	1.42 W
Operated Frequency	151.820 MHz ~ 154.600 MHz
Channel Number	5 ea
Operation temperature	-10 ℃ ~ 55 ℃
Power Source	Li-Po battery / DC 3.7 V / 1 300 mA
Antenna Description	Whip antenna fixed on PCB by bolts , gain : 0 dBi
Remark	1. The device was operating at its maximum output power for all measurements. 2. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case (X) is shown in the report. 3. The above DUT's information was declared by manufacturer. Please refer to the specifications or user manual for more detailed description.
FCC ID	SWN-PM10U

3. SYSTEM CONFIGURATION FOR TEST

3.1 Characteristics of equipment

MURS radio for dog.

3.2 Used peripherals list

Description	Model No.	Serial No.	Manufacture	Remark

3.3 Product Modification

N/A

3.4 Operating Mode

Constantly transmitting with a modulated carrier at maximum power.

3.5 Test Setup of EUT

EUT
(Standalone)

3.6 Table Table for Carrier Frequencies

Channel	Freq. [MHz]
1	151.820
2	151.880
3	151.940
4	154.570
5	154.600

3.7 Used Test Equipment List

No.	Instrument	Model	S/N	Manufacturer	Due to cal date	Cal interval	used
1	T & H Chamber	PL-3J	15003623	ESPEC	2019.11.12	1 year	☐
2	T & H Chamber	SH-662	93000067	ESPEC CORP	2019.09.28	1 year	☒
3	Spectrum Analyzer	8563EC	3046A00527	Agilent Technology	2020.01.25	1 year	☐
4	Signal Analyzer	FSV13	101247	Rohde & Schwarz	2020.01.24	1 year	☐
5	Spectrum Analyzer	FSV30	20-353063	Rohde& Schwarz	2020.01.25	1 year	☐
6	Signal Analyzer	N9010A	MY56070441	Agilent Technologies	2019.05.25	1 year	☒
7	EMI Test Receiver	ESCI7	100823	Rohde& Schwarz	2020.01.22	1 year	☒
8	EMI Test Receiver	ESI	837514/004	Rohde& Schwarz	2019.09.03	1 year	☐
9	Vector Signal Analyzer	89441A	3416A02620	Agilent Technology	2020.01.25	1 year	☐
10	Network Analyzer	8753ES	US39172348	AGILENT	2019.09.03	1 year	☐
11	EPM Series Power meter	E4418B	GB39512547	Agilent Technology	2020.01.23	1 year	☐
12	RF Power Sensor	E9300A	MY41496631	Agilent Technology	2020.01.23	1 year	☐
13	Microwave Frequency Counter	5352B	2908A00480	Agilent Technology	2020.01.24	1 year	☐
14	Audio Analyzer	8903B	3514A16919	Agilent Technology	2020.01.23	1 year	☐
15	Audio Telephone Analyzer	DD-5601CID	520010281	CREDIX	2020.01.23	1 year	☐
16	Modulation Analyzer	8901A	3041A0576	H.P	2020.01.24	1 year	☐
17	Digital storage Oscilloscope	TDS3052	B015962	Tektronix	2019.09.04	1 year	☐
18	ESG-D Series Signal Generator	E4436B	US39260458	Agilent Technology	2020.01.25	1 year	☐
19	Vector Signal Generator	SMBV100A	257557	Rohde & Schwarz	2020.01.25	1 year	☐
20	GNSS Signal Generator	TC-2800A	2800A000494	TESCOM CO., LTD.	2020.01.24	1 year	☐
21	Signal Generator	SMB100A	179628	Rohde & Schwarz	2019.05.09	1 year	☒
22	SLIDAC	None	0207-4	Myoung sung Ele.	2020.01.23	1 year	☐
23	DC Power supply	DRP-5030	9028029	Digital Electronic Co.,Ltd	2020.01.23	1 year	☐
24	DC Power supply	E3610A	KR24104505	Agilent Technology	2020.01.23	1 year	☐
25	DC Power supply	UP-3005T	68	Unicon Co.,Ltd	2020.01.23	1 year	☐
26	DC Power Supply	SM 3400-D	114701000117	DELTA ELEKTRONIKA	2020.01.22	1 year	☐
27	DC Power supply	6632B	MY43004005	Agilent Technology	2020.01.23	1 year	☐
28	DC Power Supply	6632B	MY43004137	Agilent Technology	2020.01.23	1 year	☒
29	Termination	1433-3	LM718	WEINSCHEL	2019.07.09	1 year	☐
30	Termination	1432-3	QR946	AEROFLEX/WEINSCHEL	2019.07.09	1 year	☐
31	Attenuator	24-30-34	BX5630	Aeroflex / Weinschel	2019.12.19	1 year	☐
32	Attenuator	8498A	3318A09485	HP	2020.01.24	1 year	☐
33	Step Attenuator	8494B	3308A32809	HP	2020.01.24	1 year	☐
34	RF Step Attenuator	RSP	100091	Rohde & Schwarz	2020.01.24	1 year	☐
35	Attenuator	18B50W-20F	64671	INMET	2020.01.24	1 year	☐
36	Attenuator	10 dB	1	Rohde & Schwarz	2019.05.04	1 year	☐
37	Attenuator	10 dB	2	Rohde & Schwarz	2019.05.04	1 year	☐
38	Attenuator	10 dB	3	Rohde & Schwarz	2019.05.04	1 year	☐
39	Attenuator	10 dB	4	Rohde & Schwarz	2019.05.04	1 year	☐
40	Attenuator	54A-10	74564	WEINSCHEL	2019.09.04	1 year	☐
41	Attenuator	56-10	66920	WEINSCHEL	2019.05.09	1 year	☐
42	Attenuator	48-20-11	BV2658	Aeroflex/Weinschel	2019.08.06	1 year	☐
43	Attenuator	48-30-33-LIM	BL5350	Weinschel Corp.	2019.07.09	1 year	☒
44	Power divider	11636B	51212	HP	2020.01.28	1 year	☐
45	3Way Power divider	KPDSU3W	00070365	KMW	2019.09.03	1 year	☐
46	4Way Power divider	70052651	173834	KRYTAR	2020.01.28	1 year	☐
47	3Way Power divider	1580	SQ361	WEINSCHEL	2019.05.09	1 year	☐
48	OSP	OSP120	101577	Rohde & Schwarz	2019.05.04	1 year	☐
49	White noise audio filter	ST31EQ	101902	SoundTech	2019.09.04	1 year	☐

No.	Instrument	Model	S/N	Manufacturer	Due to cal date	Cal interval	used
50	Dual directional coupler	778D	17693	HEWLETT PACKARD	2020.01.24	1 year	☐
51	Dual directional coupler	772D	2839A00924	HEWLETT PACKARD	2020.01.24	1 year	☐
52	Band rejection filter	3TNF-0006	26	DOVER Tech	2020.01.24	1 year	☐
53	Band rejection filter	3TNF-0007	311	DOVER Tech	2020.01.24	1 year	☐
54	Band rejection filter	WTR-BRF2442-84NN	09020001	WAVE TECH Co.,LTD	2020.01.24	1 year	☐
55	Band rejection filter	WRCJV12-5695-5725-5825-5855-50SS	1	Wainwright Instruments GmbH	2019.05.04	1 year	☐
56	Band rejection filter	WRCJV12-5120-5150-5350-5380-40SS	4	Wainwright Instruments GmbH	2019.05.04	1 year	☐
57	Band rejection filter	WRCGV10-2360-2400-2500-2540-50SS	2	Wainwright Instruments GmbH	2019.05.04	1 year	☐
58	Band rejection filter	CTF-155M-S1	001	RF One Electronics	2019.09.06	1 year	☒
59	Band rejection filter	CTF-435M-S1	001	RF One Electronics	2019.09.06	1 year	☐
60	Highpass Filter	WHJS1100-10EF	1	WAINWRIGHT	2020.01.24	1 year	☐
61	Highpass Filter	WHJS3000-10EF	1	WAINWRIGHT	2020.01.24	1 year	☐
62	Highpass Filter	WHNX6-5530-7000-26500-40CC	2	Wainwright Instruments GmbH	2019.05.09	1 year	☐
63	Highpass Filter	WHNX6-2370-3000-26500-40CC	4	Wainwright Instruments GmbH	2019.05.09	1 year	☐
64	WideBand Radio Communication Tester	CMW500	102276	Rohde & Schwarz	2020.01.24	1 year	☐
65	Bluetooth Tester	TC-3000B	3000B6A0166	TESCOM CO., LTD.	2020.01.24	1 year	☐
66	Loop Antenna	6502	9203-0493	EMCO	2019.05.29	2 year	☒
67	BiconiLog Antenna	3142B	1745	EMCO	2020.05.10	2 year	☒
68	Biconical Antenna	VUBA9117	9117-342	Schwarz beck	2020.03.12	2 year	☐
69	Trilog-Broadband Antenna	VULB 9168	9168-606	SCHWARZBECK	2020.09.14	2 year	☐
70	Horn Antenna	3115	2996	EMCO	2020.02.14	2 year	☐
71	Horn Antenna	3115	9605-4834	EMCO	2020.03.12	2 year	☐
72	Horn Antenna	BBHA9170	743	SCHWARZBECK	2021.01.22	2 year	☐
73	PREAMPLIFIER(3)	8449B	3008A00149	Agilent	2019.09.05	1 year	☐
74	AMPLIFIER(10)	TK-PA6S	120009	TESTEK	2020.01.22	1 year	☒
75	AMPLIFIER	TK-PA18	150003	TESTEK	2020.01.24	1 year	☐
76	AMPLIFIER	TK-PA1840H	160010-L	TESTEK	2020.01.22	1 year	☐
77	AMPLIFIER	8447D	2944A07881	H.P	2020.01.24	1 year	☐

4. SUMMARY TEST RESULTS

Description of Test	FCC Rule	Reference Clause	Used	Test Result
RF OutputPower	Part 95.2767	Clause 5.1	☒	Compliance
Occupied Bandwidth	Part 95.2773	Clause 5.2	☒	Compliance
Emission Mask	Part 95.2779	Clause 5.3	☒	Compliance
Transmitter Radiated Unwanted Emissions	Part 95.2779	Clause 5.4	☒	Compliance
Frequency Stability	Part 95.2765	Clause 5.5	☒	Compliance
Compliance/pass : The EUT complies with the essential requirements in the standard. Not Compliance : The EUT does not comply with the essential requirements in the standard. N/A : The test was not applicable in the standard.				

Procedure Reference

FCC CFR 47, Part 95
ANSI/TIA-603-E-2016
ANSI C63.26-2015
ANSI C63.4-2014

5. MEASUREMENT RESULTS

5.1 RF Output Power

5.1.1 Standard Applicable [FCC Part 95.2767]

Each MURS transmitter type must be designed such that the transmitter power output does not exceed 2 Watts under normal operating conditions.

5.1.2 Test Environment conditions

• Ambient temperature : (21 ~ 22) ℃ • Relative Humidity : (52 ~ 54) % R.H.

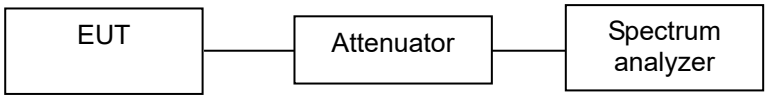
5.1.3 Measurement Procedure

The EUT was setup according to ANSI/TIA 603-E:2016 for compliance to FCC 47CFR part 95 requirements.

The transmitter output was connected to the spectrum analyzer with an attenuator. The maximum peak output power was measured and recorded with the spectrum analyzer. EUT was programmed to be in continuously transmitting mode.

The Spectrum Analyzer was set to the following:
RBW = 100 kHz
VBW ≥ 3 x RBW
Span ≥ 3 x RBW
Sweep time = auto couple
Detector = peak
Trace Mode = max hold

5.1.4 Test setup



5.1.5 Measurement Result

Channel	Frequency [MHz]	Conducted Power		Limit [W]	Test Results
		[dBm]	[W]		
1	151.820	31.52	1.42	2.0	Compliance
2	151.880	31.46	1.40	2.0	Compliance
3	151.940	31.46	1.40	2.0	Compliance
4	154.570	31.52	1.42	2.0	Compliance
5	154.600	31.49	1.41	2.0	Compliance

5.2 Occupied Bandwidth

5.2.1 Standard Applicable [FCC Part 95.2773]

(a) The occupied bandwidth of emissions transmitted on the center frequencies 151.820 MHz, 151.880 MHz, and 151.940 MHz must not exceed 11.25 kHz.

(b) The occupied bandwidth of emissions transmitted on the center frequencies 154.570 MHz and 154.600 MHz must not exceed 20.0 kHz.

5.2.2 Test Environment conditions

• Ambient temperature : (21 ~ 22) ℃ • Relative Humidity : (52 ~ 54) % R.H.

5.2.3 Measurement Procedure

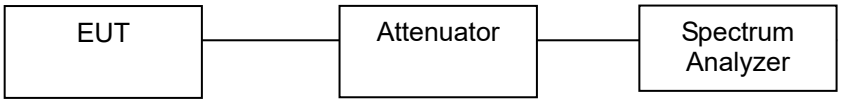
1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.

2. Measure the maximum width of the 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth.

The spectrum analyzer is set to the as follows :

- RBW : 300 Hz
- VBW : >3 x RBW
- Detector function : peak
- Trace : max hold

5.2.4 Test setup



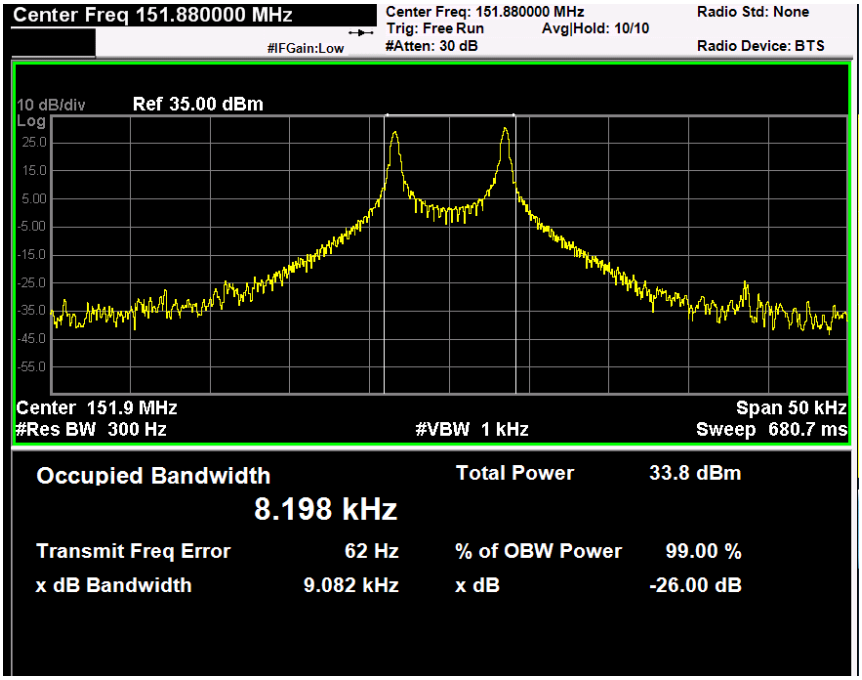
5.2.5 Measurement Result

CH	Frequency [MHz]	99% Bandwidth [kHz]	Limit [kHz]	Test Results
2	151.880	8.198	11.25	Compliance
4	154.570	8.426	20.0	Compliance

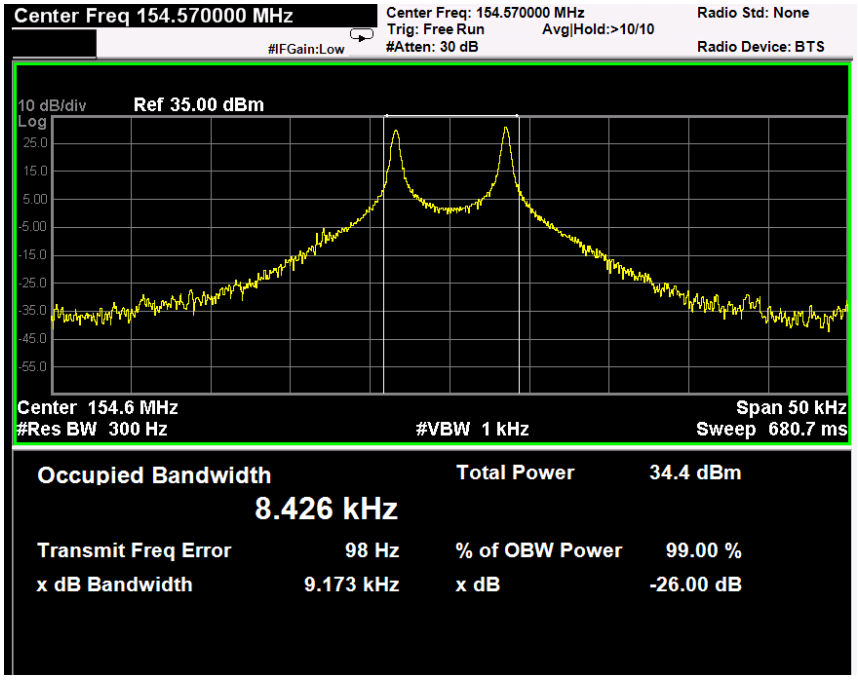
Note: All channel were tested and only worst case was listed.

5.2.6 Test Plot

(Ch2 : 151.880 MHz)



(Ch4 : 154.570 MHz)



5.3 Emission Mask

5.3.1 Standard Applicable [FCC Part 95.2779]

Emission masks. Emission masks applicable to transmitting equipment in the MURS are defined by the requirements in the following table. The numbers in the paragraphs column refer to attenuation requirement rule paragraph numbers under paragraph (b) of this section. The words “audio filter” refer to the audio filter described in §95.2775.

Channel center frequencies (MHz)	Paragraphs
151.820, 151.880 and 151.940	(1), (2).
154.570 & 154.600, with audio filter	(3), (4), (7).
154.570 & 154.600, without audio filter	(5), (6), (7).

(b) *Attenuation requirements.* The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) by at least:

(1) 7.27(f_d−2.88 kHz) dB on any frequency removed from the channel center frequency by a displacement frequency (f_d in kHz) that is more than 5.625 kHz, but not more than 12.5 kHz.

(2) 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation, on any frequency removed from the channel center frequency by more than 12.5 kHz.

(5) 83 log (f_d ÷ 5) dB on any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) that is more than 5 kHz, but not more than 10 kHz.

(6) 29 log (f_d^2 ÷ 11) dB or 50 dB, whichever is the lesser attenuation on any frequency removed from the channel center frequency by a displacement frequency (f_d in kHz) that is more than 10 kHz, but not more than 50 kHz.

(7) 43 + 10 log(P) dB on any frequency removed from the channel center frequency by more than 50 kHz.

5.3.2 Test Environment conditions

• Ambient temperature : (21 ~ 22) ℃ • Relative Humidity : (52 ~ 54) % R.H.

5.3.3 Measurement Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer.

The power of unwanted emissions in the frequency bands specified in paragraphs (b)(1) and (3) through (6) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency ranges specified in paragraphs (b)(2) and (7) of this section is measured with a reference bandwidth of at least 30 kHz.

5.3.4 Test setup

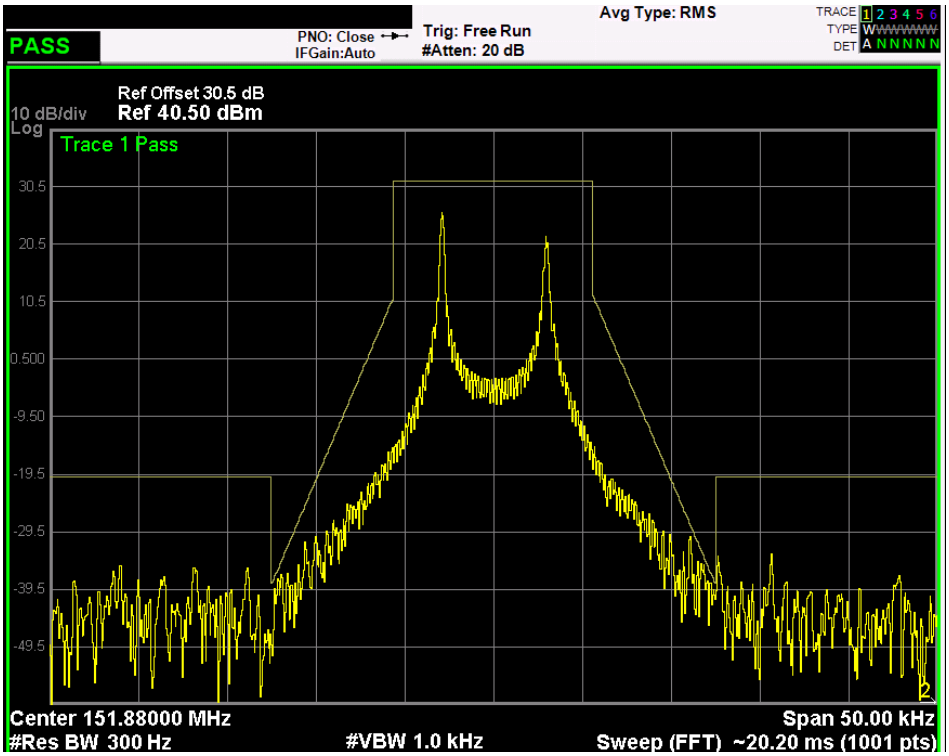
Please refer 5.2.4

5.3.5 Measurement Result

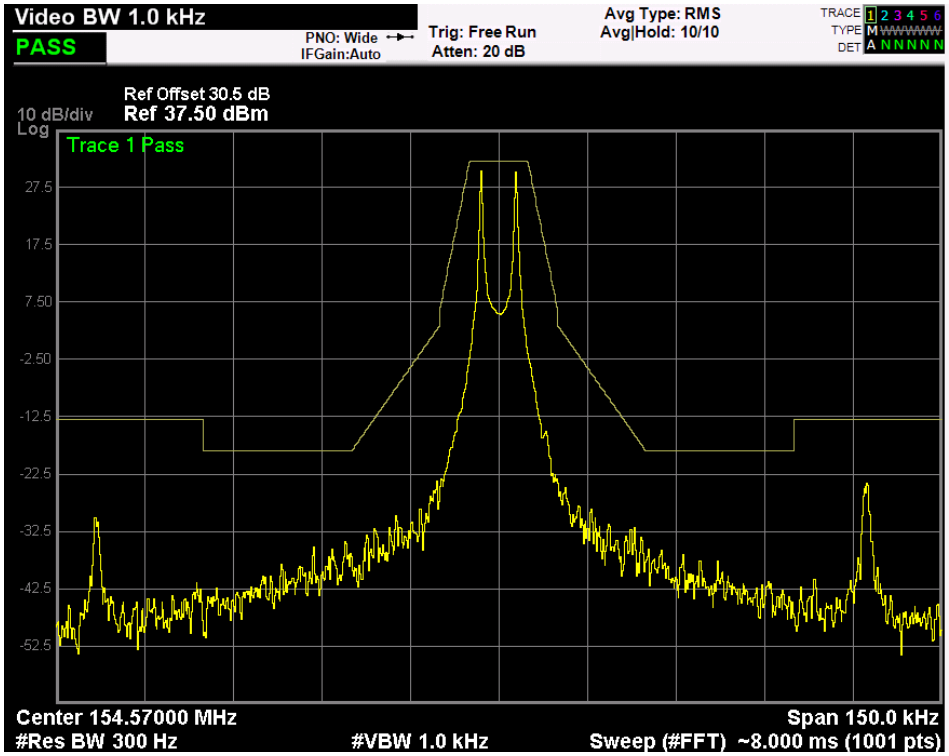
please refer 5.3.6 for details

5.3.6 Test Plot

(Ch2 : 151.880 MHz)



(Ch4 : 154.570 MHz)



Note: All channel were tested and only worst case was listed.

5.4 Transmitter Radiated Unwanted Emissions

5.4.1 Standard Applicable [FCC Part 95.2779]

According to FCC section 95.2779, the unwanted emission should be attenuated below TP(transmitter power) by at least 50+10 log (TP) dB for 151.880 MHz and at least 43+10log(TP) dB for 154.570 MHz.

5.4.2 Test Environment conditions

• Ambient temperature : (21 ~ 22) ℃ • Relative Humidity : (52 ~ 54) % R.H.

5.4.3 Measurement Procedure

Conducted: The transmitter output (antenna port) was connected to the spectrum analyzer. The RBW set for 100 kHz and the reference level was adjusted to ensure the system had sufficient dynamic range to measure spurious emissions. The frequency range from 30 MHz to the 10th harmonic of the fundamental transmitter was observed and plotted.

Radiated;

As a below test procedure (①~⑬), The result value of measurement is performed to condition of the below; The EUT will operate in continuous transmission mode during the time necessary to perform the measured of the frequency. Substitution method was performed to determine the actual P_{erp}(or P_{eirp}) emission levels of the EUT.

The following test procedure as below;

The test is performed in a fully pyramidal chamber to determine the accurate frequencies, after maximum emissions level will be checked on a test chamber and measuring distance is 3 m from EUT to test antenna.

① The EUT was set on with continuous transmission mode and placed on a high non-conductive table on the chamber.

② The test antenna is used on Bi-Log antenna at above 30 MHz, and used on Horn antenna at 1 GHz and then the measurements are repeated with the test antenna for vertical and horizontal polarization. The output of the test antenna will be connected to a measuring receiver, and it is set to tuned over the required standard measuring frequency range.

③ At each frequency at which a relevant spurious component is detected, the test antenna will be raised and lowered through the specified range of heights until an maximum signal level is detected on the measuring receiver.

④ The EUT is position x, y, z axis on rotating through 360 degrees in the horizontal plane, until the Max. signal level is detected by the measuring receiver.

⑤ The receiver is scanned from requested measuring frequency band and then the maximum meter reading is recorded. The radiated emissions were measured with requested standard specification (detector and resolution bandwidth etc.)

⑥ The EUT was then removed and replaced with substitution antenna .The center of the antenna was approximately at the same location as the center of the EUT, and calibrated for the frequency of the spurious component detected.

⑦ Signal generator output port connected with substitution antenna input port. If necessary, may use shield cable between signal generator and substitution antenna

⑧ The frequency of the calibrated signal generator is set to frequency of the spurious component detected, and the input attenuator setting of the measuring receiver was adjust in order to increase the sensitivity of the measuring receiver, if necessary

⑨ The test antenna was raised and lowered through the specified range of heights to ensure that maximum signal is received.

⑩ The input signal to the substitution antenna was be adjusted until an equal or a known related level to that detected from the transmitter is obtained on the measuring receiver.

⑪ The input signal to the substitution antenna was be recorded as a power level and corrected for any change of input attenuator setting of the measuring receiver

⑫ The measure of P_{erp}(or P_{eirp}) the spurious components is the larger of the two power levels recorded for each spurious component at the input to the substitution antenna, corrected for the gain of the substitution antenna, if necessary.

⑬ It is correction to signal generator's offset value. In this case of P_{erp}(or P_{eirp}) shall calculated as follow as formula ;

• P_{erp}(or P_{eirp}) = Signal generator level (dBm) – Cable loss(dB)

The compliance limit was calculated as the following table:

CH	Freq [MHz]	Max output power [dBm]	Required attenuation [dB]
2	151.880	31.45	50 + 10log(1.40) = 51.5
4	154.570	31.51	43 + 10log(1.42) = 44.5

5.4.4 Measurement Result

(Conducted)

(Ch2 : 151.880 MHz)

Emission Frequency [MHz]	Level below Carrier [dBc]	Margin [dB]	Limit [dBc]	Test Results
303.83	62.27	10.77	51.5	Compliance
910.59	62.15	10.65	51.5	Compliance
1 062.28	63.66	12.16	51.5	Compliance
1 215.94	60.53	9.03	51.5	Compliance
1 367.63	64.04	12.54	51.5	Compliance
1 519.32	66.48	14.98	51.5	Compliance

(Ch4 : 154.570 MHz)

Emission Frequency [MHz]	Level below Carrier [dBc]	Margin [dB]	Limit [dBc]	Test Results
463.4	62.69	18.19	44.5	Compliance
928.32	61.04	16.54	44.5	Compliance
1 081.98	66.61	22.11	44.5	Compliance
1 237.61	61.78	17.28	44.5	Compliance
1 700.56	64.04	19.54	44.5	Compliance

(Radiated)

(Ch2 : 151.880 MHz)

Emission Frequency [MHz]	Ant Pol	Level below Carrier [dBc]	Margin [dB]	Limit [dBc]	Test Results
303.75	V	73.01	21.51	51.5	Compliance
-	-	-	-	-	-
-	-	-	-	-	-

(Ch4 : 154.570 MHz)

Emission Frequency [MHz]	Ant Pol	Level below Carrier [dBc]	Margin [dB]	Limit [dBc]	Test Results
463.35	V	72.38	27.88	44.5	Compliance
-	-	-	-	-	-
-	-	-	-	-	-

Note: All channel were tested and only worst case was listed.

5.5 Frequency Stability

5.5.1 Standard Applicable [FCC Part 95.2765]

(a) MURS transmitters that operate with an emission bandwidth of 6.25 kHz or less must be designed such that the carrier frequencies remain within ±2.0 parts-per-million (ppm) of the channel center frequencies specified in §95.2763 during normal operating conditions.

(b) MURS transmitters that operate with an emission bandwidth greater than 6.25 kHz must be designed such that the carrier frequencies remain within ±5.0 ppm of the channel center frequencies specified in §95.2763 during normal operating conditions.

5.5.2 Test Environment conditions

• Ambient temperature : (21 ~ 22) ℃ • Relative Humidity : (52 ~ 54) % R.H.

5.5.3 Measurement Procedure

EUT connect to Spectrum analyzer, test is performed in T&H chamber.

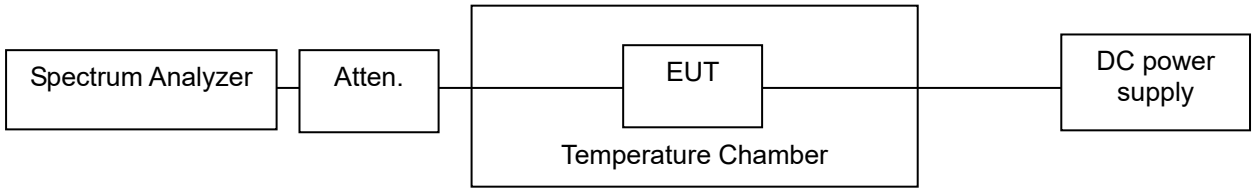
These measurements shall also be performed at normal and extreme test conditions.

▪ Test Method : ANSI/TIA-603-E-2016 for frequency stability tests

-Frequency stability with respect to ambient temperature (-30 °C to 50 °C)

-Frequency stability when varying supply voltage (85 % to 115 %)

5.5.4 Test setup



5.5.5 Measurement Result

(Ch2 : 151.880 MHz)

Temp(℃)	Power Supply	Measured Freq(Hz)	Freq Drift(ppm)
50	DC 3.7 (Vnom)	151 880 148	0.97
40	DC 3.7 (Vnom)	**151 880 151**	**0.99**
30	DC 3.7 (Vnom)	151 880 139	0.92
20	DC 3.7 (Vnom)	151 880 142	0.93
10	DC 3.7 (Vnom)	151 880 137	0.90
0	DC 3.7 (Vnom)	151 879 982	-0.12
-10	DC 3.7 (Vnom)	151 879 872	-0.84
-20	DC 3.7 (Vnom)	151 879 877	-0.81
-30	DC 3.7 (Vnom)	151 879 875	-0.82
Nom Temperature	DC 3.15 (Vmin)	151 880 137	0.90
Nom Temperature	DC 4.26 (Vmax)	151 880 129	0.85
Limit		±5.0 ppm	
Test Results		Compliance	

(Ch4 : 154.570 MHz)

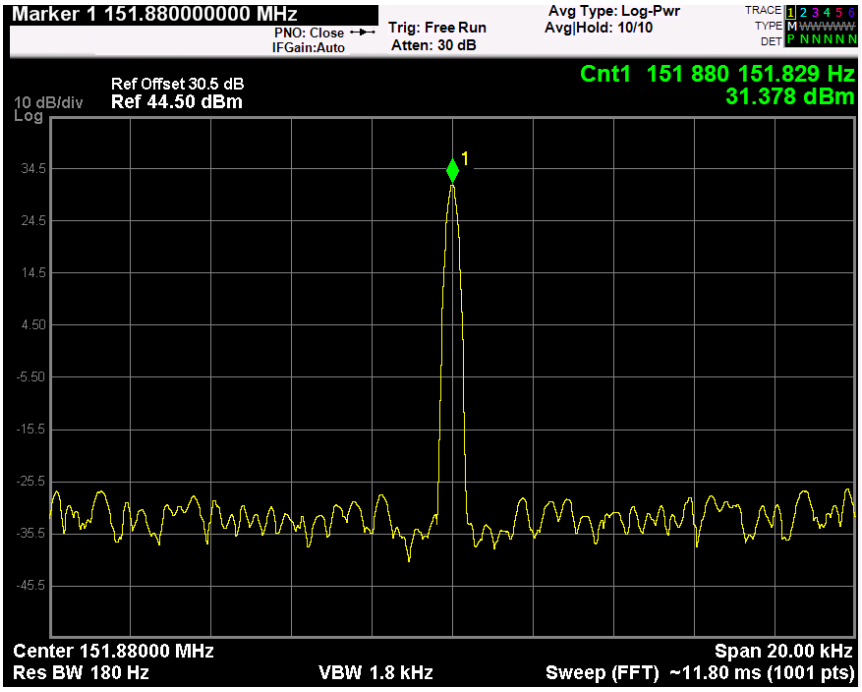
Temp(℃)	Power Supply	Measured Freq(Hz)	Freq Drift(ppm)
50	DC 3.7 (Vnom)	154 570 041	0.27
40	DC 3.7 (Vnom)	**154 570 058**	**0.38**
30	DC 3.7 (Vnom)	154 570 031	0.20
20	DC 3.7 (Vnom)	154 570 022	0.14
10	DC 3.7 (Vnom)	154 570 019	0.12
0	DC 3.7 (Vnom)	154 569 983	-0.11
-10	DC 3.7 (Vnom)	154 569 952	-0.31
-20	DC 3.7 (Vnom)	154 569 959	-0.27
-30	DC 3.7 (Vnom)	154 569 954	-0.30
Nom Temperature	DC 3.15 (Vmin)	154 570 030	0.19
Nom Temperature	DC 4.26 (Vmax)	154 570 028	0.18
Limit		±5.0 ppm	
Test Results		Compliance	

Note: All channel were tested and only worst case was listed.

5.5.6 Test Plot

*Worst case only

(Ch2 : 151.880 MHz)



(Ch4 : 154.570 MHz)