TEST REPORT

Part 74 Subpart H

Equipment under test MIC Karaoke

Model name TKR-373MU

Derivation Model TKR-373MP

FCC ID TO8-TKR-373MP

Applicant TJ Media Co., Ltd.

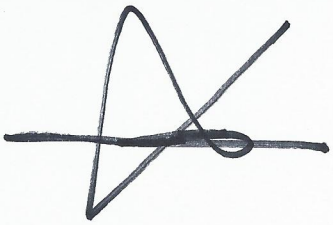
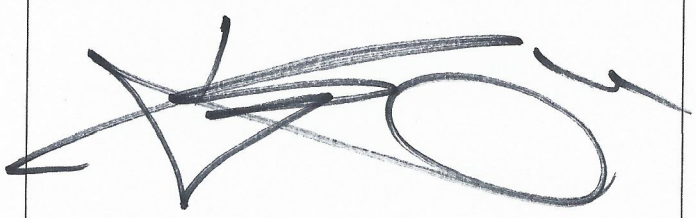
Manufacturer TJ Media Co., Ltd.

Date of test(s) 2017.06.12 ~ 2017.06.26

Date of issue 2017.07.05

Issued to
TJ Media Co., Ltd.
640-8, Deungchon-Dong, Gangseo-Gu, Seoul, South Korea
Tel: +82-31-382-2803 / Fax: +82-31-382-5511

Issued by
KES Co., Ltd.
C-3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si,
Gyeonggi-do, Korea
473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

Test and report completed by :	Report approval by :
	
Kwon-se Kim Test engineer	Jeff Do Technical manager

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Revision history

Revision	Date of issue	Test report No.	Description
-	2017.07.05	KES-RF-17T0064	Initial

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

TABLE OF CONTENTS

1. General information 4
1.1. EUT description 4
1.2. Test configuration 4
1.3. Device modifications 4
1.4. Frequency/channel operations 4
1.5. Accessory information 5
1.6. Information about derivative model 5
2. Summary of tests 6
3. Test results 7
3.1. RF output power 7
3.2. Modulation characteristics 8
3.3. Occupied bandwidth and emission mask 16
3.4. Frequency stability 19
3.5. Field strength of spurious radiation 22
3.6. Spurious emission at antenna terminals 30
Appendix A. Measurement equipment 32
Appendix B. Test setup photos 33

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

1. General information

Applicant:	TJ Media Co., Ltd.
Applicant address:	640-8, Deungchon-Dong, Gangseo-Gu, Seoul, South Korea
Test site:	KES Co., Ltd.
Test site address:	C-3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 473-21, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea
FCC rule part(s):	Part 74
FCC ID:	TO8-TKR-373MP
Test device serial No.:	☐ Production ☒ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test	MIC Karaoke
Frequency range	494.0 ㎒ ~ 505.2 ㎒
Model	TKR-373MU
Derivation Model	TKR-373MP
Modulation technique	FM
Number of channels	16 ch
Antenna specification	UHF Antenna type: Helical, Peak gain: -0.52 ㏈i
Power source	DC 3.0 V

1.2. Test configuration

The **TJ Media Co., Ltd. MIC Karaoke FCC ID: TO8-TKR-373MP** was tested according to the specification of EUT, the EUT must comply with following standards.

FCC Part 74.861
FCC Part 2
TIA-603-E (2016)
ANSI C63.4-2014

1.3. Device modifications

N/A

1.4. Frequency/channel operations

Ch.	Frequency (㎒)	Mode
01	494.0	FM
.	.	.
08	499.4	FM
.	.	.
16	505.2	FM

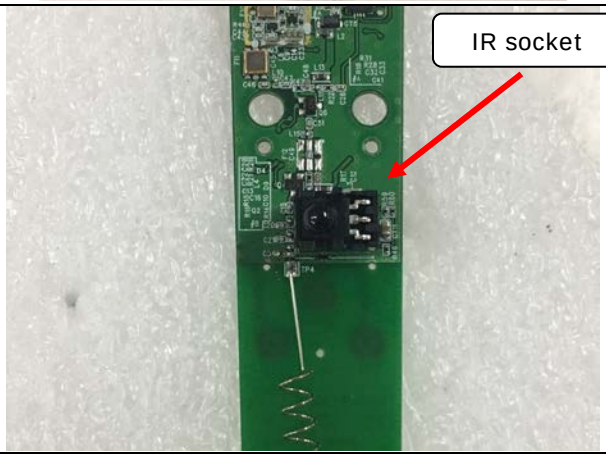
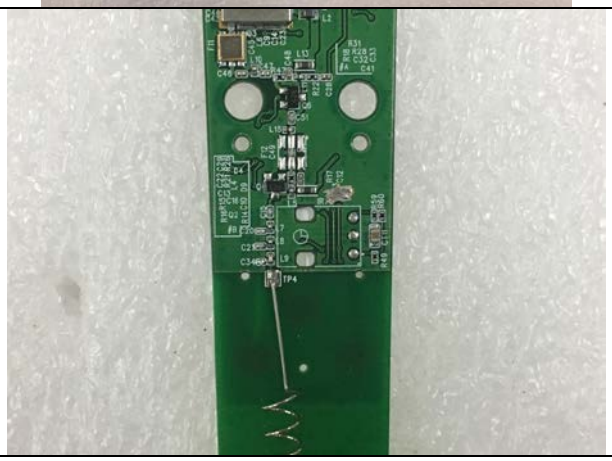
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

1.5. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source
Remote controller	Sinsunglim electronics Co., Ltd.	TR-20P	-	Battery (1.5V *2)

1.6. Information about derivative model

Derivative model use the same software of basic model. In case of derivative model, the IR socket is removed in basic model and added button key.
For detailed information, refer to the following:

Basic model	Derivative model
	
	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

2. Summary of tests

Reference	Parameter	Test results
74.861(e)(1) 2.1046	RF output power	Pass
74.861(e)(3) 2.1047	Modulation characteristics	Pass
74.861(e)(5)(6) 2.1049	Occupied bandwidth and emission mask	Pass
74.861(e)(4) 2.1055	Frequency stability	Pass
74.861(e)(6) 2.1053	Field strength of spurious radiation	Pass
74.861(e)(6) 2.1051	Spurious emissions at antenna terminals	Pass

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

3. Test results

3.1. RF output power

Test procedure

TIA-603-E – Section 2.2.1

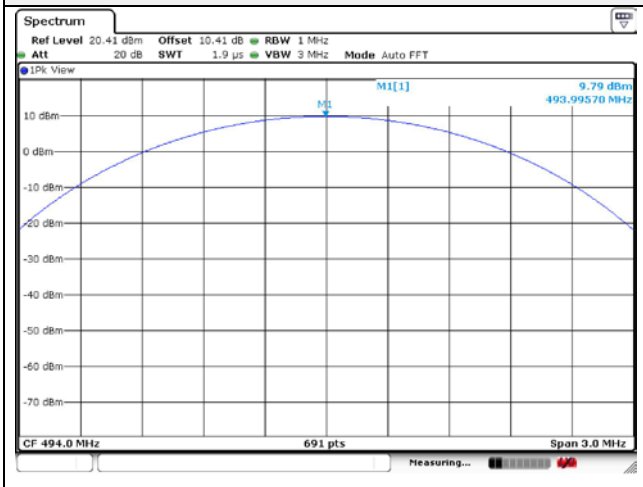
Limit

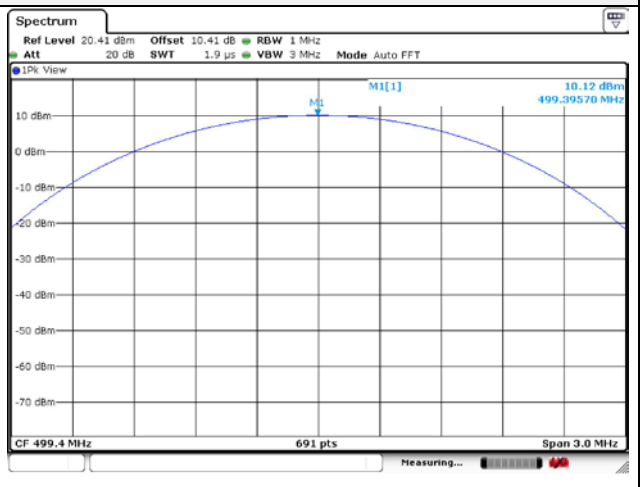
According to §74.861(e)(1)(ii), the operating frequency at 470 ~ 608 ㎒, 614 ~ 698 ㎒ shall not exceed 250 ㎽ conducted power.

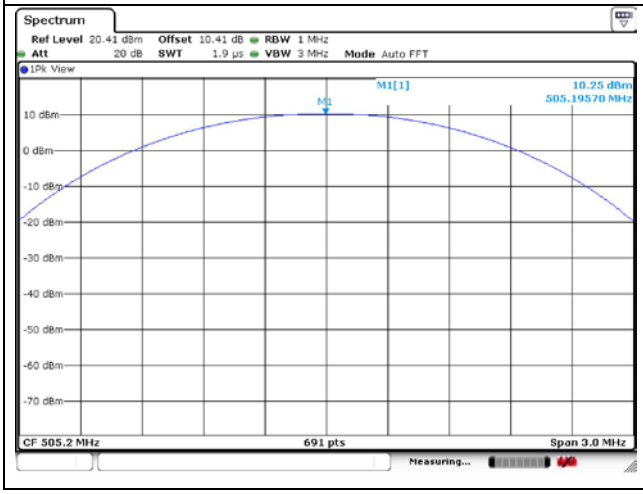
Test results

Frequency(㎒)	Peak output power(dBm)	Limit(dBm)
494.0	9.79	23.98
499.4	10.12	
505.2	10.25	

FM







N/A

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

3.2. Modulation characteristics

Test procedure

TIA-603-E – Section 2.2.3, 2.2.6, FCC Part 2.1047(a) & (b)

(a) Audio frequency response

Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 ㎐ shall be submitted. For equipment required to have an audio low pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

Section 2.2.6

1. Connect the equipment as illustrated.
2. Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤50 ㎐ to ≥15000 ㎐. Turn the de-emphasis function off.
3. Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
4. Apply a 1000 ㎐ tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
5. Set the test receiver to measure rms deviation and record the deviation reading as DEV_{REF}.
6. Set the audio frequency generator to the desired test frequency between 300 ㎐ and 3000 ㎐.
7. Record the test receiver deviation reading as DEV_{FREQ}.
8. Calculate the audio frequency response at the present frequency as:

$$audio\ frequency\ response = 20\ \log_{10}\left(\frac{DEV_{FREQ}}{DEV_{REF}}\right)$$

9. Repeat steps 6 through 8 for all the desired test frequencies.

(b) Modulation limiting

Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

Section 2.2.3

1. Connect the equipment as illustrated.
2. Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
3. Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤0.25 ㎐ to ≥15000 ㎐. Turn the de-emphasis function off.
4. Apply a 1000 ㎐ modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation.
5. Increase the level from the audio frequency generator by 20㏈ in on step (rise time between the 10% and 90% points shall be 0.1 second maximum).
6. Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.
7. With the level from the audio frequency generator held constant at the level obtained in step 5, slowly vary the audio frequency from 100 ㎐ to 3000 ㎐ and observe the steady-state deviation. Record the maximum deviation.
8. Set the test receiver to measure peak negative deviation and repeat steps 4 through 7.
9. The values recorded in steps 7 and 8 are the modulation limiting.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Limit

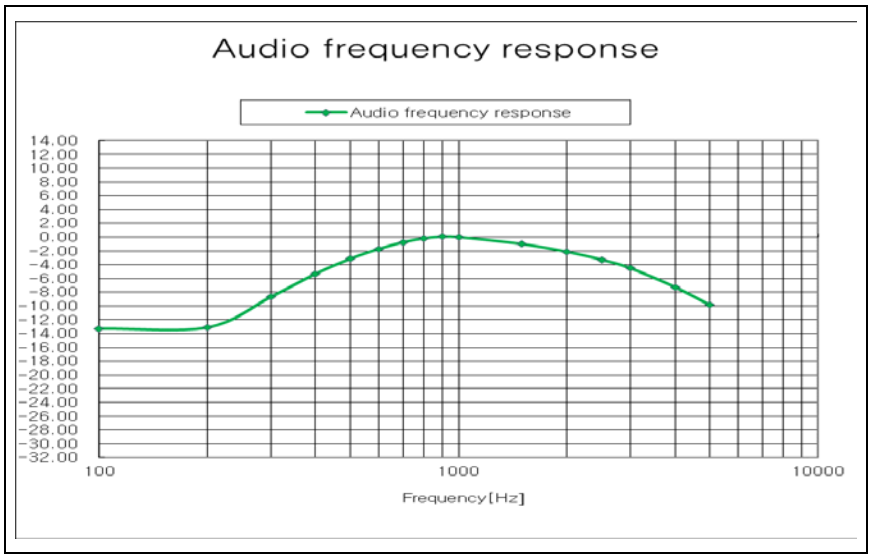
According to §74.861(e)(3), Any form of modulation may be used. A maximum deviation of ±75 ㎑ is permitted when frequency modulation is employed.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Test results
(a) Audio frequency response

Frequency: 494.0 ㎒
Channel: 01

Audio frequency(㎐)	Frequency deviation(㎑)	1㎑ Reference deviation(㎑)	Audio frequency response (㏈)
100	0.56	2.58	-13.27
200	0.57	2.58	-13.11
300	0.95	2.58	-8.68
400	1.40	2.58	-5.31
500	1.80	2.58	-3.13
600	2.12	2.58	-1.71
700	2.37	2.58	-0.74
800	2.53	2.58	-0.17
900	2.60	2.58	-0.07
1000	2.58	2.58	0.00
1500	2.30	2.58	-1.00
2000	2.02	2.58	-2.13
2500	1.77	2.58	-3.27
3000	1.54	2.58	-4.48
4000	1.12	2.58	-7.25
5000	0.83	2.58	-9.85

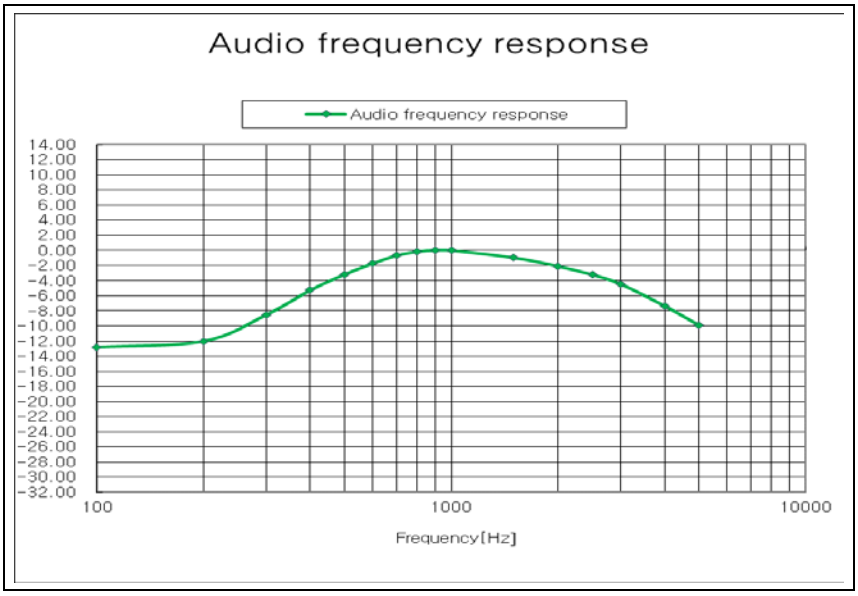


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Frequency: 499.4 ㎒

Channel: 08

Audio frequency(㎐)	Frequency deviation(㎑)	1㎑ Reference deviation㎑)	Audio frequency response (㏈)
100	0.63	2.75	-12.80
200	0.69	2.75	-12.01
300	1.03	2.75	-8.53
400	1.50	2.75	-5.26
500	1.91	2.75	-3.17
600	2.25	2.75	-1.74
700	2.54	2.75	-0.69
800	2.70	2.75	-0.16
900	2.76	2.75	0.03
1000	2.75	2.75	0.00
1500	2.46	2.75	-0.97
2000	2.16	2.75	-2.10
2500	1.90	2.75	-3.21
3000	1.65	2.75	-4.44
4000	1.18	2.75	-7.35
5000	0.88	2.75	-9.90

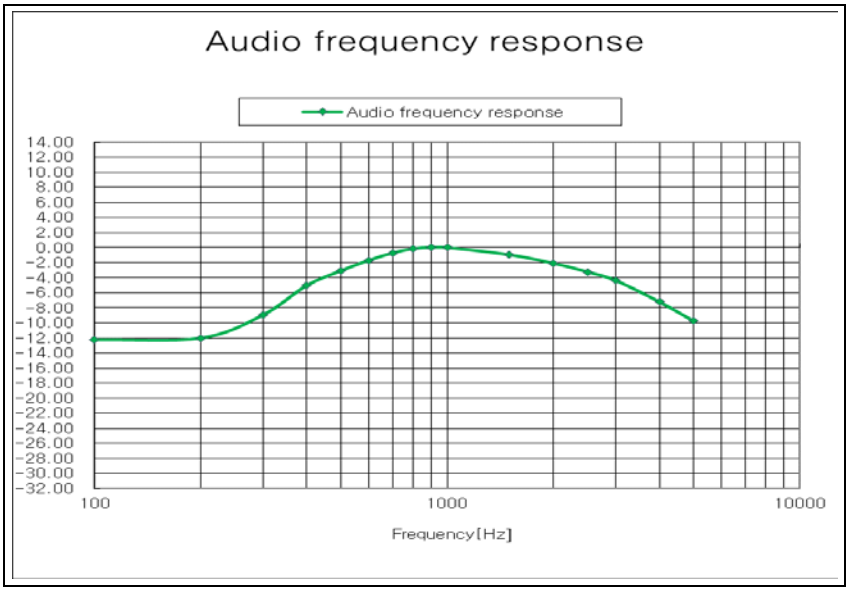


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Frequency: 505.2 ㎒

Channel: 16

Audio frequency(㎐)	Frequency deviation(㎑)	1㎑ Reference deviation㎑)	Audio frequency response (㏈)
100	0.78	3.19	-12.23
200	0.80	3.19	-12.01
300	1.14	3.19	-8.94
400	1.79	3.19	-5.02
500	2.24	3.19	-3.07
600	2.63	3.19	-1.68
700	2.94	3.19	-0.71
800	3.14	3.19	-0.14
900	3.20	3.19	0.03
1000	3.19	3.19	0.00
1500	2.86	3.19	-0.95
2000	2.51	3.19	-2.08
2500	2.20	3.19	-3.23
3000	1.93	3.19	-4.36
4000	1.39	3.19	-7.22
5000	1.04	3.19	-9.74



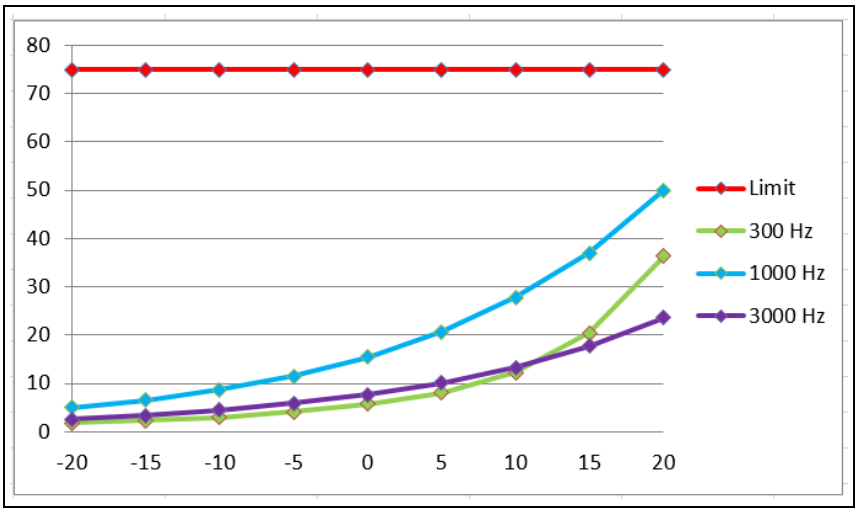
This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

(b) Modulation limiting

Operating frequency: 494.0 ㎒

Channel: 01

Audio level (dB)	Deviation 300 ㎐	Deviation 1 ㎑	Deviation 3 ㎑	Limit (㎑)
-52.6	1.87	5.05	2.56	±75
-47.6	2.30	6.56	3.30	±75
-42.6	3.01	8.65	4.43	±75
-37.6	4.14	11.48	5.83	±75
-32.6	5.70	15.43	7.62	±75
-27.6	8.00	20.72	10.11	±75
-22.6	12.21	27.75	13.30	±75
-17.6	20.43	37.03	17.74	±75
-12.6	36.30	50.00	23.56	±75

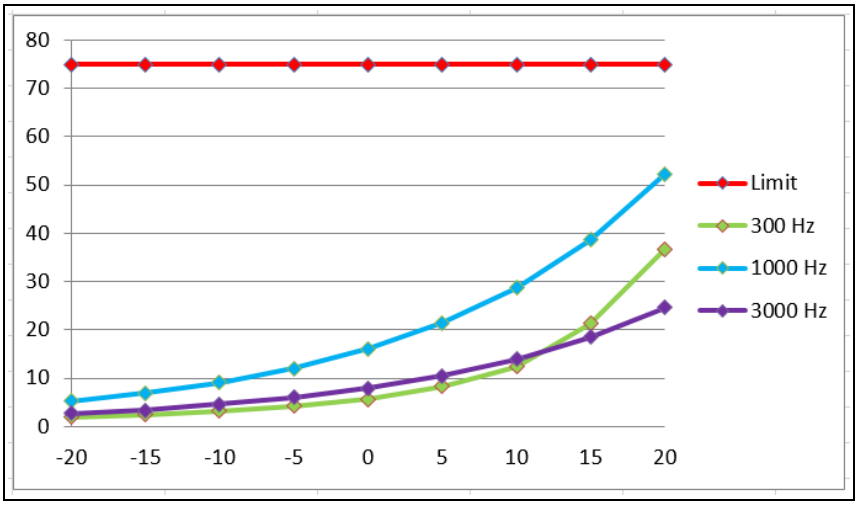


This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Operating frequency: 499.4 ㎒

Channel: 08

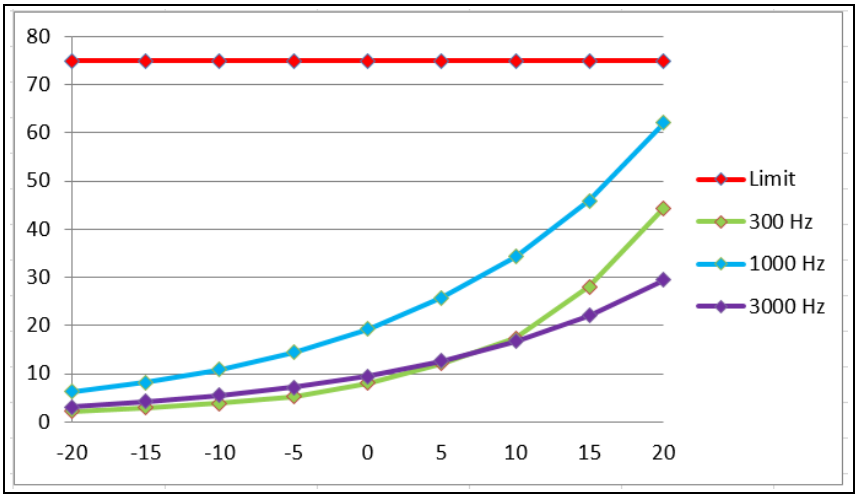
Audio level (dB)	Deviation 300 ㎐	Deviation 1 ㎑	Deviation 3 ㎑	Limit (㎑)
-52.6	1.89	5.23	2.66	±75
-47.6	2.51	6.89	3.39	±75
-42.6	3.17	9.07	4.61	±75
-37.6	4.18	12.04	6.05	±75
-32.6	5.64	16.05	7.96	±75
-27.6	8.33	21.41	10.50	±75
-22.6	12.43	28.76	13.93	±75
-17.6	21.33	38.66	18.53	±75
-12.6	36.74	52.33	24.66	±75



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Operating frequency: 505.2 ㎒
Channel: 16

Audio level (dB)	Deviation 300 ㎐	Deviation 1 ㎑	Deviation 3 ㎑	Limit (㎑)
-52.6	2.25	6.24	3.09	±75
-47.6	2.98	8.21	4.29	±75
-42.6	3.84	10.87	5.50	±75
-37.6	5.20	14.43	7.18	±75
-32.6	8.07	19.23	9.50	±75
-27.6	12.19	25.75	12.58	±75
-22.6	17.41	34.35	16.68	±75
-17.6	28.08	45.90	22.14	±75
-12.6	44.43	62.10	29.47	±75



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

3.3. Occupied bandwidth and emission mask

Test procedure

TIA-603-E – Section 2.2.11, FCC Part 2.1049

TIA-603-E – Section 2.2.11

1. Adjust the spectrum analyzer for the following settings:
- RBW : 3 ㎑
- VBW :10 ㎑
- Sweep speed slow enough to maintain measurement calibration.
- Detector mode : Peak
- Span that will allow proper viewing of the test bandwidth
2. Set the center frequency of the spectrum analyzer to the assigned transmitter frequency. Turn on the transmitter, and set the level of the unmodulated carrier to a full scale reference line. This is the 0 ㏈ reference for the measurement.
3. Modulate the transmitter with a 2500 ㎐ sine wave at input level 16 ㏈ greater than that necessary to produce 50% of rated system deviation. The input level shall be established at the frequency of maximum response of the audio modulating circuit. Transmitters employing digital modulation techniques that bypass the limiter and the audio low pass filter shall be modulated as specified by the manufacturer.

FCC Part 2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(1) Other than single sideband or independent sideband transmitters – when modulated by a 2500 ㎐ tone at an input level 16 ㏈ greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulating circuit.

Limit

According to §74.861(e)(5),(6) the operating bandwidth shall not exceed 200 ㎑.

At least 25 ㏈ on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth.

At least 35 ㏈ on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth.

At least 43 + 10 $\log_{10}$(P) ㏈ on any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth.

Note.

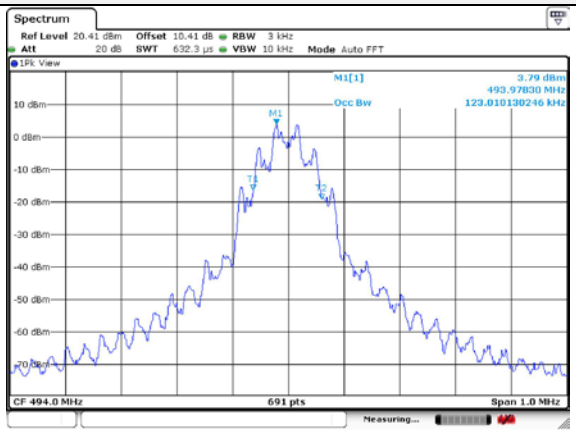
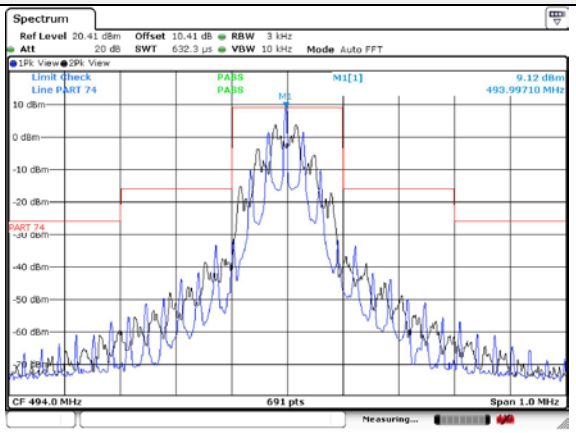
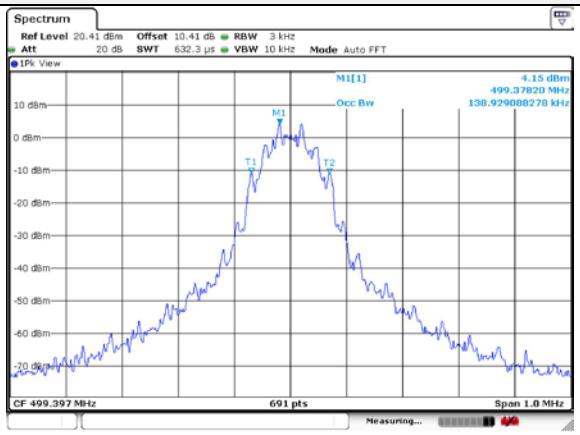
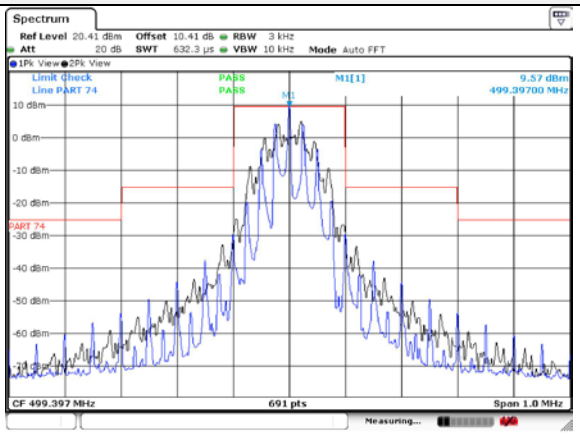
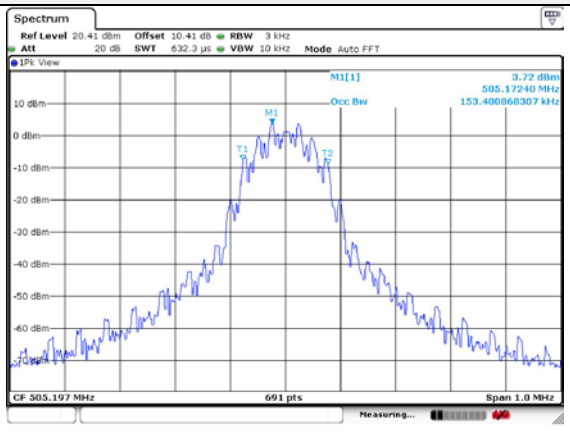
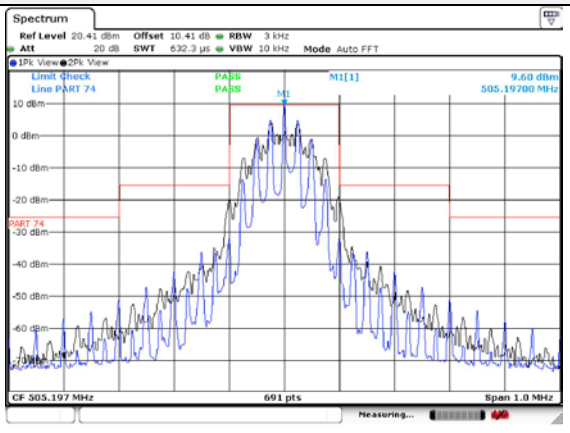
1. P is mean in watts.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Test results

Frequency(㎒)	99% bandwidth(㎑)	Limit(㎑)
494.0	123.01	200
499.4	138.93	
505.2	153.40	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

494.0 ㎒	
Occupied bandwidth	**Emission mask**
	
499.4 ㎒	
Occupied bandwidth	**Emission mask**
	
505.2 ㎒	
Occupied bandwidth	**Emission mask**
	

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

3.4. Frequency stability

Test procedure

TIA-603-E – Section 2.2.2, FCC Part 2.1055

TIA-603-E – Section 2.2.2

1. Connect the equipment as illustrated.
2. Operate the equipment in standby conditions for 15 minutes before proceeding.
3. Record the carrier frequency of the transmitter as MCF_{MHz}.
4. Calculate the ppm frequency error by the following:

$$ppm\ error = \left(\frac{MCF_{MHz}}{ACF_{MHz}} - 1 \right) * 10^6$$

Where

MCF_{MHz} is the Measured Carrier Frequency in MHz
ACF_{MHz} is the Assigned Carrier Frequency in MHz

5. The value recorded in step 4 is the carrier frequency stability.

FCC Part 2.1055

(1) From -30° to + 50° centigrade for all equipment except that specified in paragraphs (a)(2) and (3) of this section.

Limit

According to §74.861(e)(4), the frequency tolerance of the transmitter shall be 0.005 percent.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Test results

Operating frequency: 494.0 ㎒

Channel: 01

Test voltage (%)	Test voltage (V)	Temperature (℃)	Measure frequency (㎒)	Frequency deviation (㎐)	Deviation (%)
100 %	DC 3.0	-30	494.007 742	7 742	0.001 567
100 %		-20	494.007 699	7 699	0.001 558
100 %		-10	494.006 252	6 252	0.001 266
100 %		0	494.004 284	4 284	0.000 867
100 %		10	494.001 795	1 795	0.000 363
100 %		20	493.995 631	-4 369	-0.000 884
100 %		30	493.996 035	-3 965	-0.000 803
100 %		40	493.992 562	-7 438	-0.001 506
100 %		50	493.991 751	-8 249	-0.001 670
Battery end point	DC 2.4	23	493.993 277	-6 723	-0.001 361

Operating frequency: 499.4 ㎒

Channel: 08

Test voltage (%)	Test voltage (V)	Temperature (℃)	Measure frequency (㎒)	Frequency deviation (㎐)	Deviation (%)
100 %	DC 3.0	-30	499.407 709	7 709	0.001 544
100 %		-20	499.407 709	7 709	0.001 544
100 %		-10	499.406 493	6 493	0.001 300
100 %		0	499.404 207	4 207	0.000 842
100 %		10	499.401 949	1 949	0.000 390
100 %		20	499.395 524	-4 476	-0.000 896
100 %		30	499.395 958	-4 042	-0.000 809
100 %		40	499.392 398	-7 602	-0.001 522
100 %		50	499.391 906	-8 094	-0.001 621
Battery end point	DC 2.4	23	499.395 664	-4 336	-0.000 868

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Operating frequency: 505.2 ㎒

Channel: 16

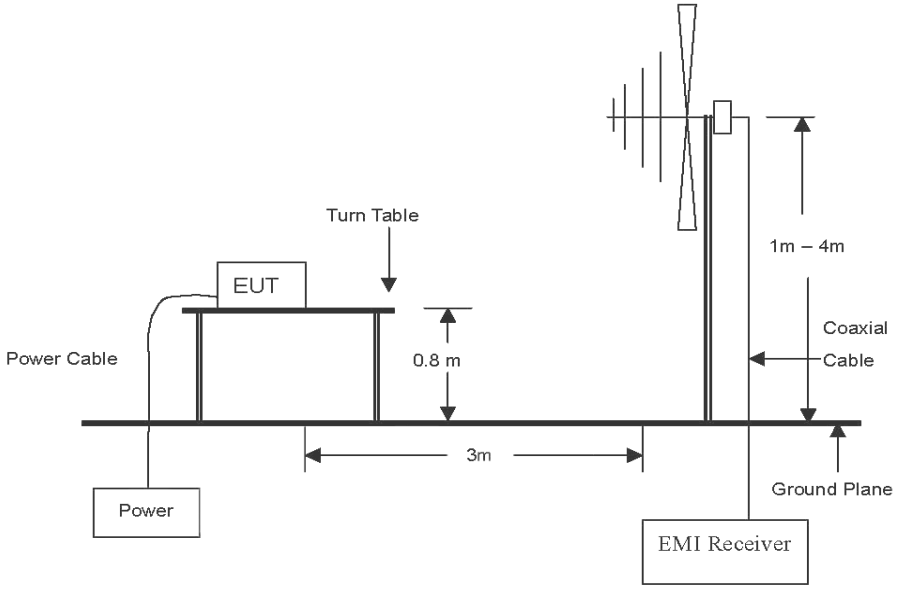
Test voltage (%)	Test voltage (V)	Temperature (℃)	Measure frequency (㎒)	Frequency deviation (㎐)	Deviation (%)
100 %	DC 3.0	-30	505.207 781	7 781	0.001 540
100 %		-20	505.207 781	7 781	0.001 540
100 %		-10	505.206 638	6 638	0.001 314
100 %		0	505.203 918	3 918	0.000 776
100 %		10	505.202 094	2 094	0.000 414
100 %		20	505.195 495	-4 505	-0.000 892
100 %		30	505.195 929	-4 071	-0.000 806
100 %		40	505.192 311	-7 689	-0.001 522
100 %		50	505.189 884	-10 116	-0.002 002
Battery end point	DC 2.4	23	505.195 577	-4 423	-0.000 876

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

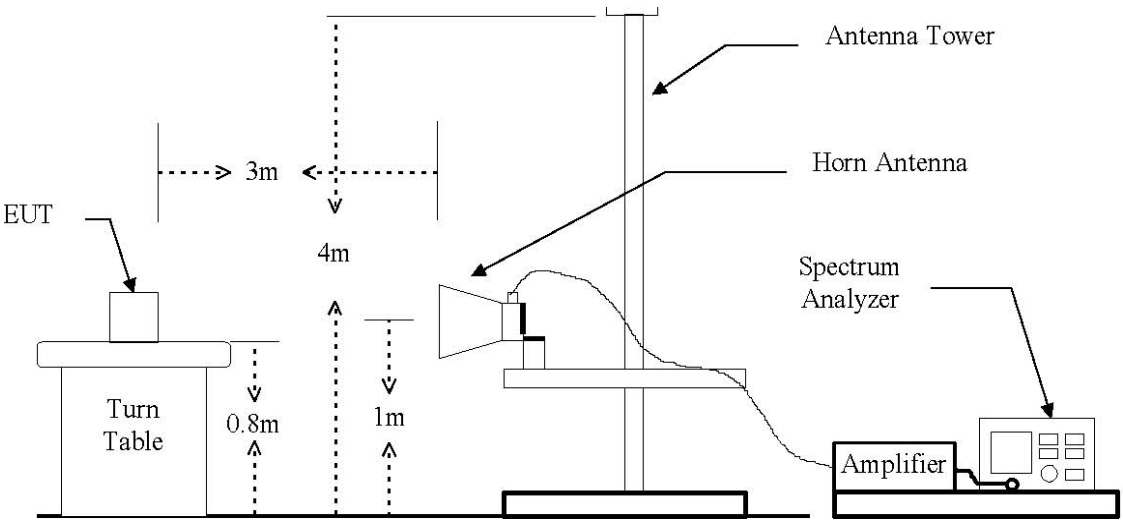
3.5. Field strength of spurious radiation

Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.

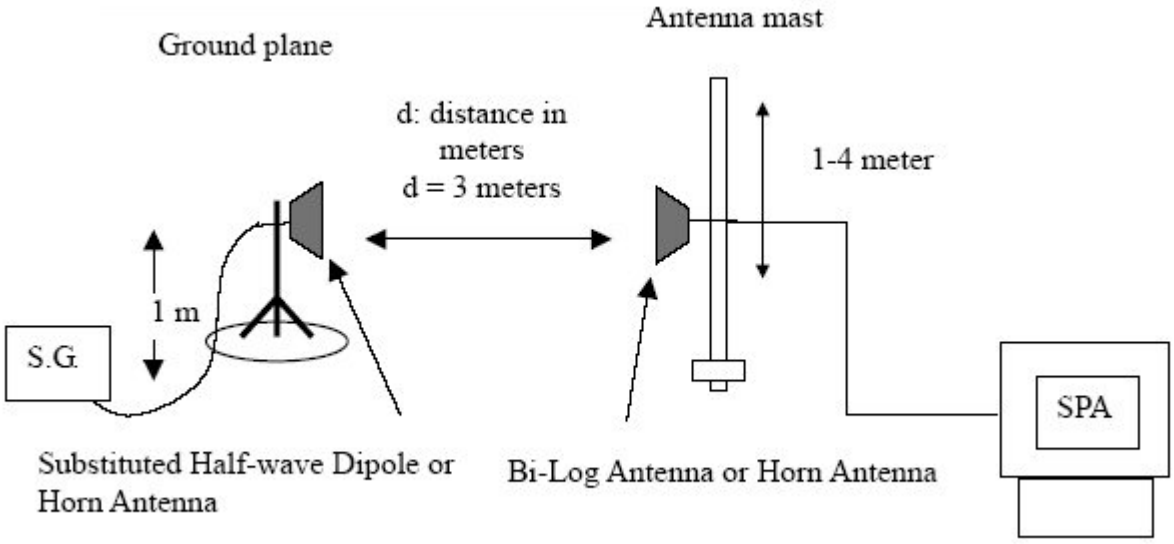


The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



The diagram below shows the test setup for substituted method

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Test procedure above 30 ㎒

1. On a test site, the EUT shall be placed at 80㎝ height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then the rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a horn (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Limit

According to §2.1053, measurements shall be made to detect spurious emission that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal condition of installation and operation. Information submitted shall include the relative radiated power of spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from a half wave dipole antenna.

According to §74.861(e)(ii)(6), the mean power of emission shall be attenuated below the mean output power of the transmitter in accordance with the following sceedule:

(i) 470 ~ 608 ㎒ and 614 ~ 698 ㎒ : 250 ㎽ (23.98 ㏈m)

(ii) on any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth : at least 25 ㏈

(iii) on any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth : at least 23 ㏈

(iv) on any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth shall be attenuated below the unmodulated carrier by at least 43 + 10log(P) ㏈.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Test results (Below 1 000 ㎒)

Mode: FM
Distance of measurement: 3 meter
Channel: 01

Frequency (㎒)	Ant. Pol. (H/V)	E.R.P.	
		(dBm)	(W)
494.00	H	-13.50	0.000 045
494.00	V	10.11	0.010 257

Mode: FM
Distance of measurement: 3 meter
Channel: 08

Frequency (㎒)	Ant. Pol. (H/V)	E.R.P.	
		(dBm)	(W)
499.40	H	-14.71	0.000 034
499.40	V	10.19	0.010 447

Mode: FM
Distance of measurement: 3 meter
Channel: 16

Frequency (㎒)	Ant. Pol. (H/V)	E.R.P.	
		(dBm)	(W)
505.20	H	-13.20	0.000 048
505.20	V	10.50	0.011 220

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Test results (Above 1 000 ㎒)

Mode: FM

Distance of measurement: 3 meter

Channel: 01

Frequency (㎒)	Ant. Pol. (H/V)	Spurious attenuation (dBc)	Limit (dBm)	Margin (dB)
988.10	H	66.26	-13.00	43.15
988.10	V	55.50	-13.00	32.39
1 483.40	H	77.93	-13.00	54.82
1 483.40	V	66.11	-13.00	43.00
1 836.50	H	79.19	-13.00	56.08
1 975.40	V	66.35	-13.00	43.24
2 455.86	V	66.65	-13.00	43.54
3 457.30	H	66.84	-13.00	43.73
3 457.30	V	64.49	-13.00	41.38

Note.
1. Spurious attenuation = EUT max. output power(dBm) - absolute level
2. Spurious attenuation limit in dB = 43 + 10log(power in watts)

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Mode: FM

Distance of measurement: 3 meter

Channel: 08

Frequency (㎒)	Ant. Pol. (H/V)	Spurious attenuation (㏈c)	Limit (㏈m)	Margin (㏈)
998.778	H	55.40	-13.00	32.21
998.778	V	55.53	-13.00	32.34
1 498.167	H	58.49	-13.00	35.30
1 498.167	V	66.50	-13.00	43.31
1 997.556	H	60.35	-13.00	37.16
1 997.556	V	59.77	-13.00	36.58
2 496.945	H	60.17	-13.00	36.98
2 496.945	V	72.28	-13.00	49.09
2 996.334	H	60.41	-13.00	37.22
2 996.334	V	65.05	-13.00	41.86
3 495.723	H	67.19	-13.00	44.00
3 495.723	V	62.42	-13.00	39.23

Note.
1. Spurious attenuation = EUT max. output power(㏈m) - absolute level
2. Spurious attenuation limit in ㏈ = 43 + 10log(power in watts)

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Mode: FM

Distance of measurement: 3 meter

Channel: 16

Frequency (㎒)	Ant. Pol. (H/V)	Spurious attenuation (dBc)	Limit (dBm)	Margin (dB)
1 010.384	H	71.52	-13.00	48.02
1 010.384	V	57.63	-13.00	34.13
1 515.576	H	76.68	-13.00	53.18
1 515.576	V	65.45	-13.00	41.95
2 020.768	H	67.56	-13.00	44.06
2 020.768	V	60.21	-13.00	36.71
2 525.960	H	67.91	-13.00	44.41
2 525.960	V	77.24	-13.00	53.74
3 031.152	H	67.26	-13.00	43.76
3 536.344	H	66.15	-13.00	42.65
3 536.344	V	60.71	-13.00	37.21

Note.
1. Spurious attenuation = EUT max. output power(㏈m) - absolute level
2. Spurious attenuation limit in ㏈ = 43 + 10log(power in watts)

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

3.6. Spurious emission at antenna terminals

Test procedure

TIA-603-E – Section 2.2.13, FCC Part 74.861(e)(6)(iii)

TIA-603-E –Section 2.2.13

1. Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.
2. Modulate the transmitter with a 2500 ㎐ sine wave at an input level 16 ㏈ greater than that necessary to produce 50% of rated system deviation.
   The input level shall be established at the frequency of maximum response of the audio modulating circuit.
3. Record the frequencies and levels of spurious emissions.

FCC Part 74.861(e)(6)(iii)

1. On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth : at least 43 + 10log(P) ㏈.

Note.

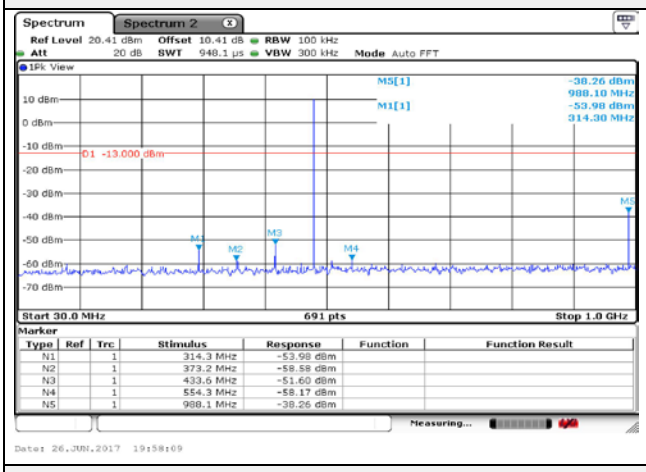
1. P is mean in watts.

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

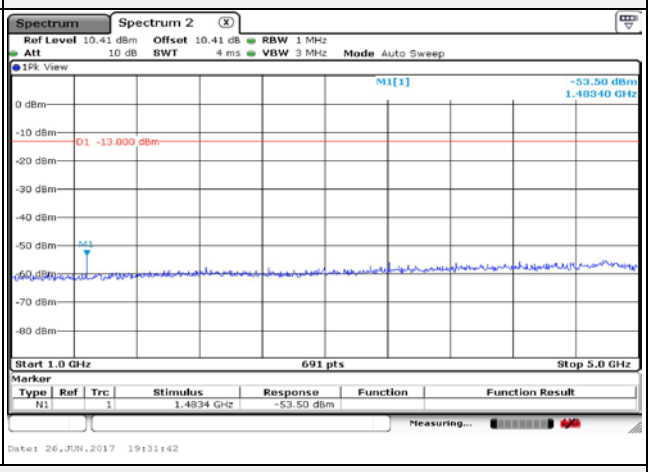
Test results

494.0 ㎒

30 ㎒ to 1 ㎓

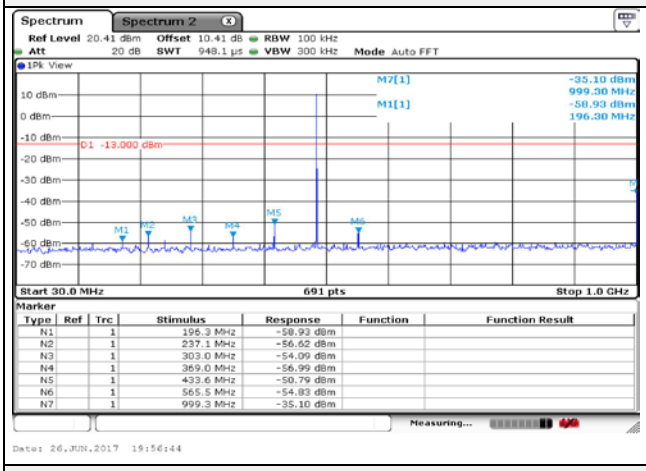


1 ㎓ to 5 ㎓

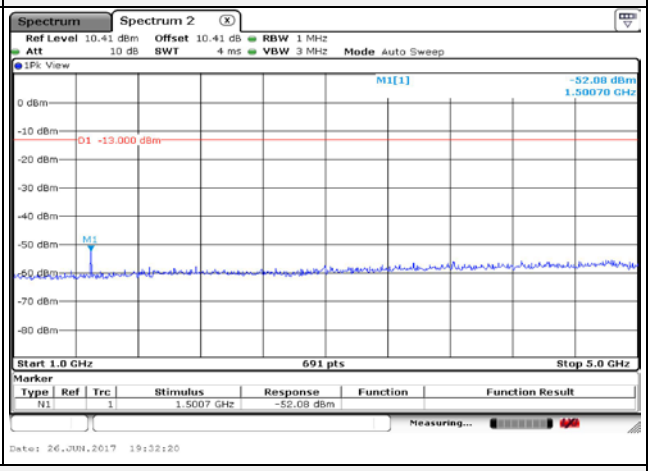


499.4 ㎒

30 ㎒ to 1 ㎓

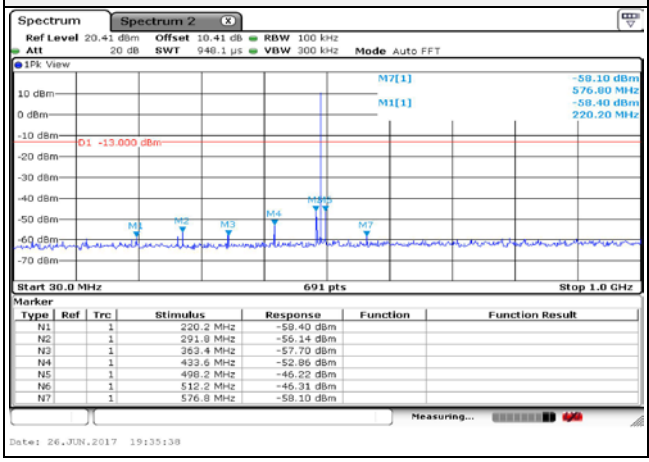


1 ㎓ to 5 ㎓

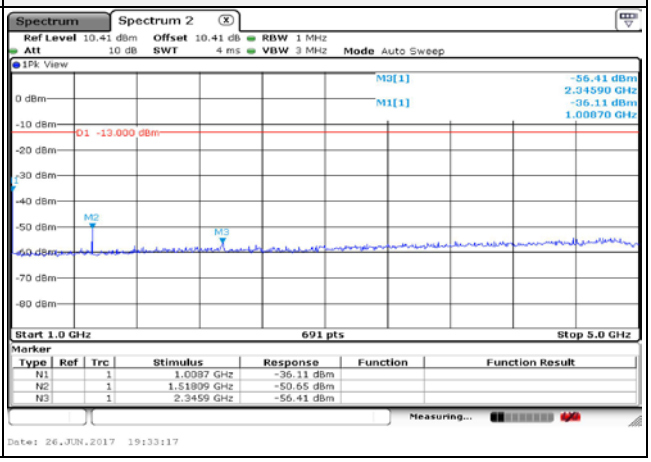


505.2 ㎒

30 ㎒ to 1 ㎓



1 ㎓ to 5 ㎓



This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.

Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial No.	Calibration interval	Calibration due.
Spectrum Analyzer	R&S	FSV30	101389	1 year	2018.01.23
8360B Series Swept Signal Generator	HP	83630B	3844A00786	1 year	2018.01.23
MXG Vector Signal Generator	Agilent	N5182A	MY50143829	1 year	2018.01.19
DC Power Supply	Agilent	6632B	US36351824	1 year	2018.01.19
Attenuator	KEYSIGHT	8493C	82507	1 year	2018.01.23
Modulation Analyzer	HP	8901B	3438A05094	1 year	2018.01.20
Audio Analyzer	HP	8903B	3413A14728	1 year	2018.07.03
Trilog-broadband antenna	SCHWARZBECK	VULB 9163	9168-714	2 years	2018.11.28
Dipole antenna	SCHWARZBECK	VHA9103	3093	2 years	2019.05.19
Dipole antenna	SCHWARZBECK	UHA9105	2703	2 years	2019.05.19
Dipole antenna	SCHWARZBECK	VHA9103	3101	2 years	2019.05.19
Dipole antenna	SCHWARZBECK	UHA9105	2702	2 years	2019.05.19
Horn Antenna	A.H.	SAS-571	781	2 years	2019.05.02
Horn Antenna	A.H SYSTEMS	SAS-571	414	2 years	2019.02.15
High Pass Filter	Mini-Circuits	NHP-800+	15542	1 year	2018.07.03
Preamplifier	SCHWARZBECK	BBV-9718	9718-246	1 year	2017.10.14
Preamplifier	HP	8447F	2805A02570	1 year	2018.01.19
EMI Test Receiver	R&S	ESU26	100552	1 year	2018.04.19
Temperature & Humidity Chamber	Daehan Engineering	DH-1000	DH1000060628	1 year	2018.02.03

Peripheral devices

Device	Manufacturer	Model No.	Serial No.
-	-	-	-

This report shall not be reproduced except in full, without the written approval of KES Co., Ltd.
The test results in the report only apply to the tested sample.