

FCC TEST REPORT

Product Name: RL ED HERO WALKIE TALKIE SET
Trade Mark: N/A
Model No.: 01382373
Report Number: 170700173SHA-001
Test Standards: FCC 47 CFR Part 15 Subpart C
FCC ID: 2AMQ901382399
Test Result: PASS
Date of Issue: June 29, 2017

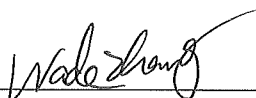
Prepared for:

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Version

Version No.	Date	Description
V1.0	June 29, 2017	Original

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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Rayland Industrial Company Limited
Address of Applicant:	13/F Wing Sum Factory Building, 12-14 Sam Chuk Street, San Po Kong, Kowloon, Hong Kong
Manufacturer:	Kinya Industrial Ltd
Address of Manufacturer:	Jinyuan Industrial District Xingxi Town Longhu Shantou, Gangdong China

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	RL ED HERO WALKIE TALKIE SET
Model No.:	01382373
Add. Model No.:	01382381 (Product Name: RL BOYS WALKIE TALKIE SET)
Trade Mark:	N/A
DUT Stage:	Identical Prototype
EUT Supports Function:	27.145 MHz
Software Version:	N/A
Hardware Version:	QY-B023
Sample Received Date:	June 16, 2017
Sample Tested Date:	June 16, 2017 to June 23, 2017
Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model 01382373, but the circuit and the electronic construction do not change, declared by the manufacturer.	

1.2.2 Description of Accessories

None

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Range:	26.96 MHz to 27.28 MHz
Nominal Operating Frequency:	27.145 MHz
Type of Modulation:	AM
Number of Channels:	1
Antenna Type:	Integral Antenna
Antenna Gain:	0 dBi
Maximum Field Strength:	50.95 dB μ V/m
Normal Test Voltage:	4.5 Vdc (3 * size "AA" batteries)

1.4 OTHER INFORMATION

None

1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested independently

1.6 TEST LOCATION

Tests were sub-contracted.

Compliance Certification Services (Shenzhen) Inc.

Address: No.10-1 Mingkeda Logistics Park, No.18 Huanguan South RD. Guan lan Town, Baoan Distr, Shenzhen, Guangdong, China.

Telephone: +86 (0) 755 28055000

Fax: +86 (0) 755 29055221

1.7 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

Compliance Certification Services (Shenzhen) Inc.

FCC Registration Number is 441872.

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.2878 dB
2	Conducted emission 150KHz-30MHz	±3.2878 dB
3	Radiated emission 30MHz-200Hz	±3.8928 dB
4	Radiated emission 200MHz-1GHz	±3.8753 dB
5	Radiated emission 1GHz-8GHz	±5.3112 dB
6	Radiated emission Above 8GHz	±5.3493 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart C Test Cases			
Test Item	Test Requirement	Test Method	Result
Antenna Requirement	FCC 47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013	PASS
Conducted Emission	FCC 47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	N/A ^{Note2}
Radiated Emissions	FCC 47 CFR Part 15 Subpart C Section 15.227/15.209	ANSI C63.10-2013	PASS
Out of Band Emissions	FCC 47 CFR Part 15 Subpart C Section 15.227/15.209	ANSI C63.10-2013	PASS
20DB Bandwidth	FCC 47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Note: 1) N/A: In this whole report not application. 2) This EUT is powered by 3 * size "AA" batteries.			

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
☒	PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	Feb. 17, 2017	Feb. 16, 2018
☒	High Noise Amplifier	Agilent	8449B	3008A01838	Feb. 11, 2017	Feb. 10, 2018
☒	Antenna	SCHAFFNER	CBL6143	5082	Feb. 12, 2017	Feb. 11, 2018
☐	Horn Antenna	SCHWARZBEC K	BBHA9120	D286	Feb. 12, 2017	Feb. 11, 2018
☐	Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	Feb. 11, 2017	Feb. 10, 2018
☒	Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
☒	Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
☒	Controller	CT	N/A	N/A	N.C.R	N.C.R
☒	Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
☒	Temp. / Humidity Meter	Anymetre	JR913	N/A	Feb. 15, 2017	Feb. 14, 2018
☒	Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

Conducted RF test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
☒	PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	Feb. 17, 2017	Feb. 16, 2018

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NT/NV	+15 to +35	4.5	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)	Tested by
Conducted Emission	N/A	N/A	N/A	N/A
Radiated Emissions	26	50	100.2	Tiny You
Out of Band Emissions	26	50	100.2	Tiny You
20DB Bandwidth	26	50	100.2	Tiny You

4.2 TEST CHANNELS

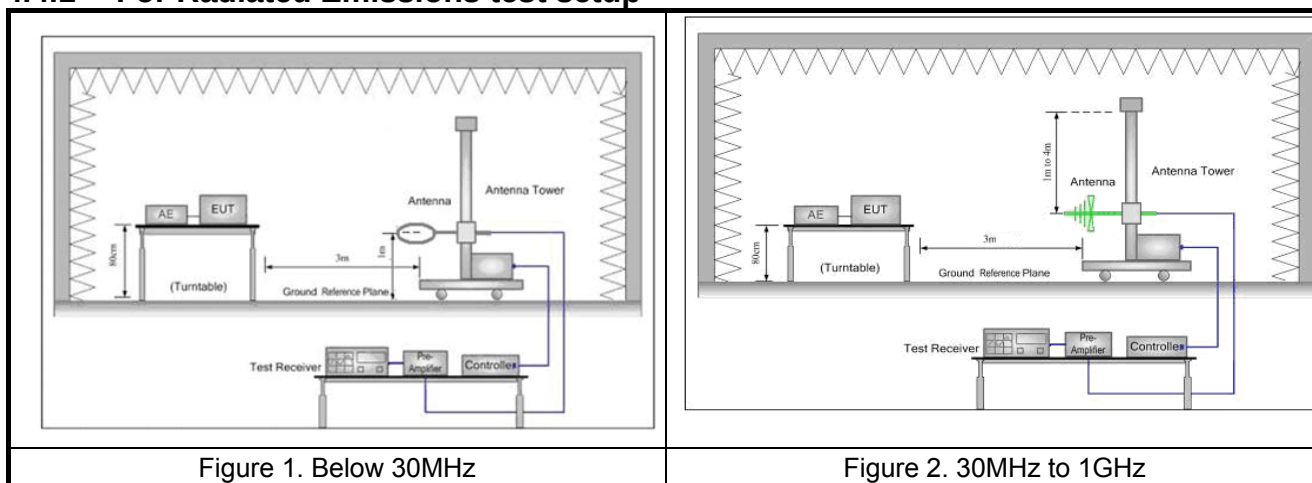
Frequency	Test RF Channel
27.145 MHz	Channel 1
	27.145 MHz

4.3 EUT TEST STATUS

Frequency	Tx Function	Description
27.145 MHz	1Tx	1. Keep the EUT in continuously transmitting with modulation test single.

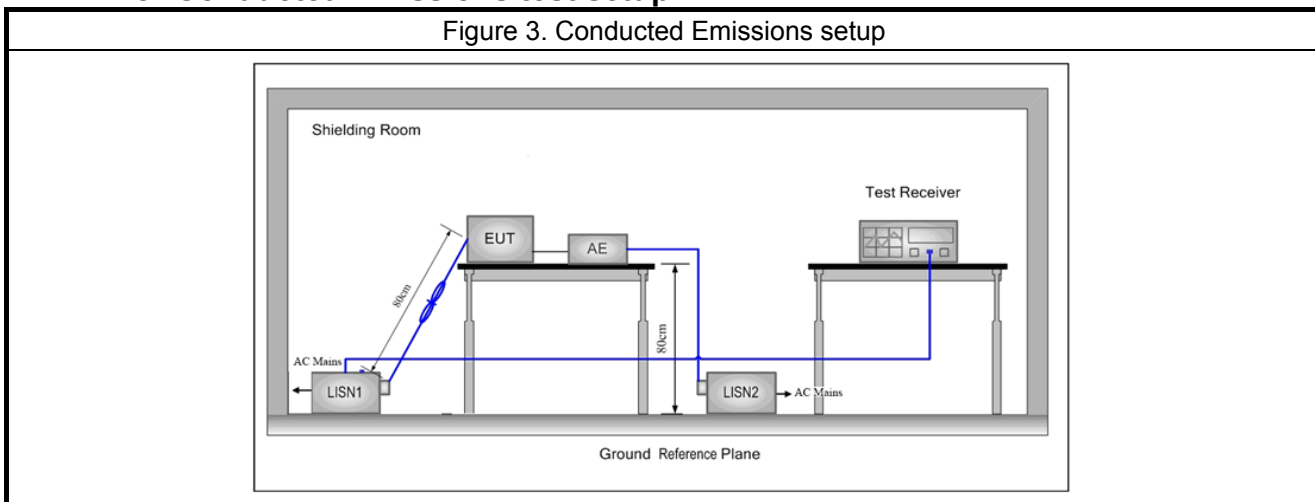
4.4 TEST SETUP

4.4.1 For Radiated Emissions test setup

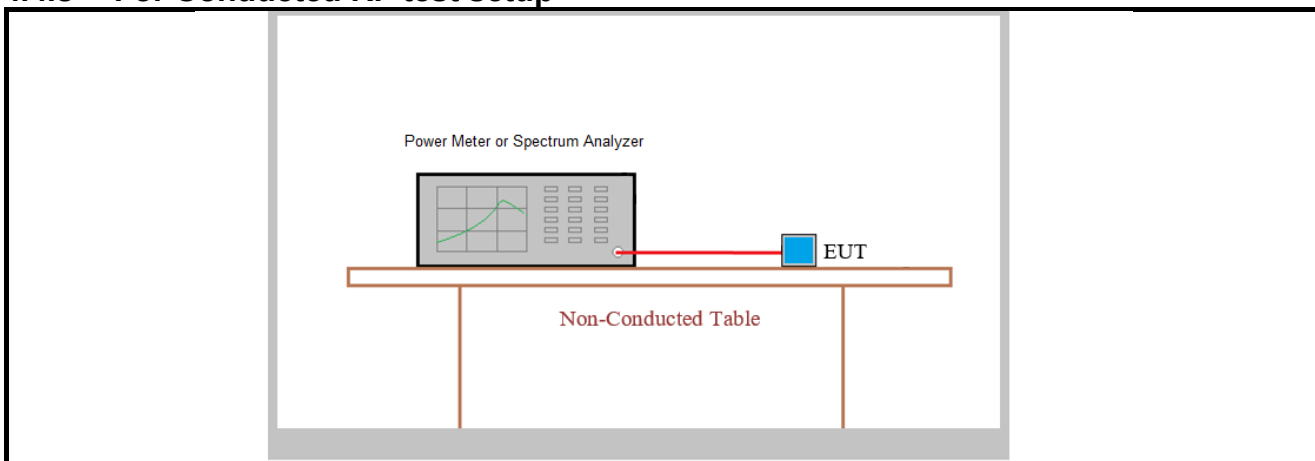


4.4.2 For Conducted Emissions test setup

Figure 3. Conducted Emissions setup



4.4.3 For Conducted RF test setup



4.5 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by 3 * size "AA" batteries. Only the worst case data were recorded in this test report.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed 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 to 40 GHz, whichever is lower.

5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 15	Radio Frequency Devices
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

5.2 ANTENNA REQUIREMENT

Standard Requirement
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
EUT Antenna: This product has a permanent antenna, fulfill the requirement of this section.

5.3 20DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.215 (c)

Test Method: ANSI C63.10

Limit: Operation within the band 26.96 MHz to 27.28 MHz

Requirement : Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be. Demonstrated by measuring the radiated emissions.

Test Procedure: Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
Use the following spectrum analyzer settings:

- Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
- RBW $\geq$ 1% of the 20 dB bandwidth
- VBW $\geq$ RBW
- Sweep = auto;
- Detector function = peak
- Trace = max hold
- All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down bandwidth of the emission.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

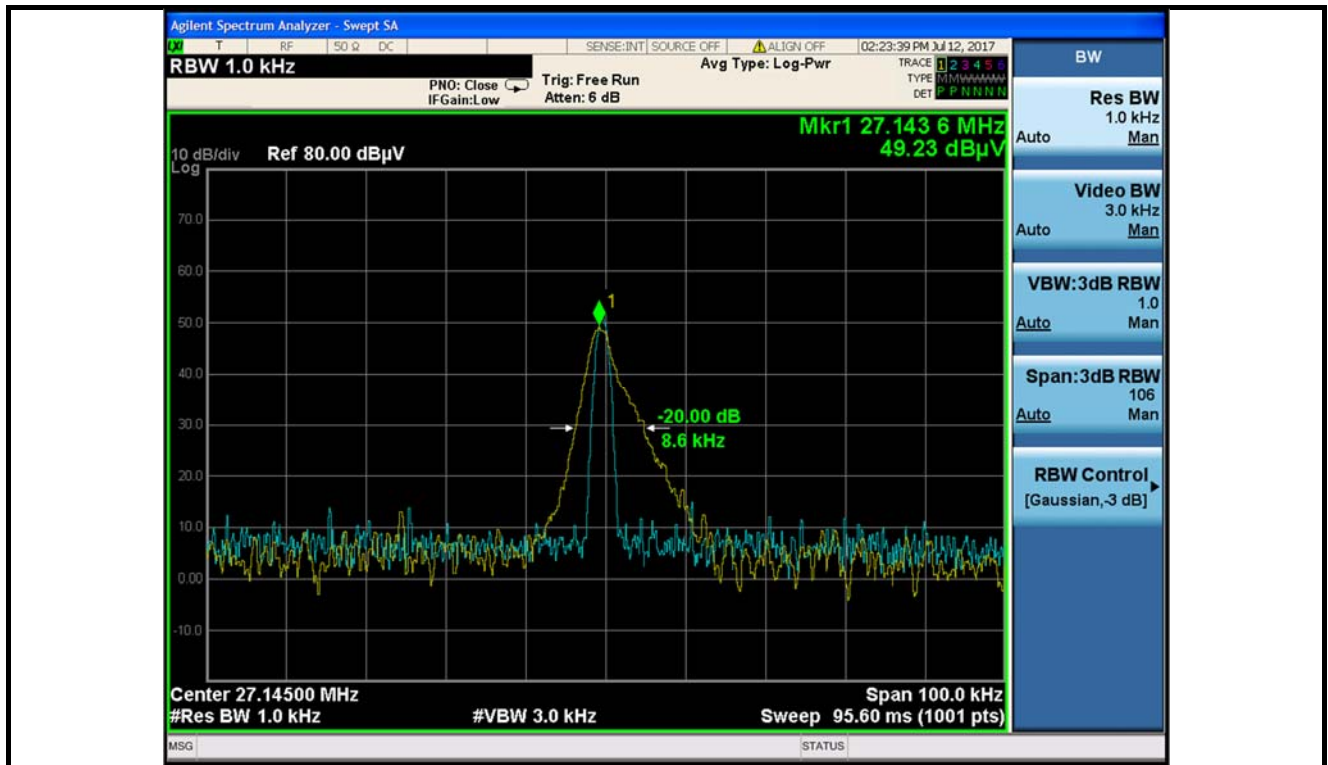
Test Setup: Refer to section 4.4.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:



5.4 RADIATED EMISSIONS

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.227/15.209

Test Method: ANSI C63.10

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009 MHz-0.090 MHz	Peak	10 kHz	30 KHz	Peak
0.009 MHz-0.090 MHz	Average	10 kHz	30 KHz	Average
0.090 MHz-0.110 MHz	Quasi-peak	10 kHz	30 KHz	Quasi-peak
0.110 MHz-0.490 MHz	Peak	10 kHz	30 KHz	Peak
0.110 MHz-0.490 MHz	Average	10 kHz	30 KHz	Average
0.490 MHz -30 MHz	Quasi-peak	10 kHz	30 kHz	Quasi-peak
30 MHz-1 GHz	Quasi-peak	100 kHz	300 KHz	Quasi-peak
Above 1 GHz	Peak	1 MHz	3 MHz	Peak
	Peak	1 MHz	10 Hz	Average

Limits:

Spurious Emissions

Frequency	Field strength (microvolt/meter)	Limit (dB μ V/m)	Remark	Measurement distance (m)
0.009 MHz-0.490 MHz	2400/F(kHz)	--	--	300
0.490 MHz-1.705 MHz	24000/F(kHz)	--	--	30
1.705 MHz-30 MHz	30	--	--	30
30 MHz-88 MHz	100	40.0	Quasi-peak	3
88 MHz-216 MHz	150	43.5	Quasi-peak	3
216 MHz-960 MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1 GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Remark:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB μ V/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Test Setup: Refer to section 4.4.1 for details.

Test Procedures:

- 1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotating table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

- 6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- 7) The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.(for portable and mobile devices)

Remark: Test Procedure: For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10: 2009. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

Intentional Emission:

Fundamental frequency	Polarization	Detector	Result at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
27.145 MHz	V	Peak	50.95	100	-49.05
	V	Average	50.95	80	-29.05
	H	Peak	43.54	100	-56.46
	H	Average	43.54	80	-36.46

Note:

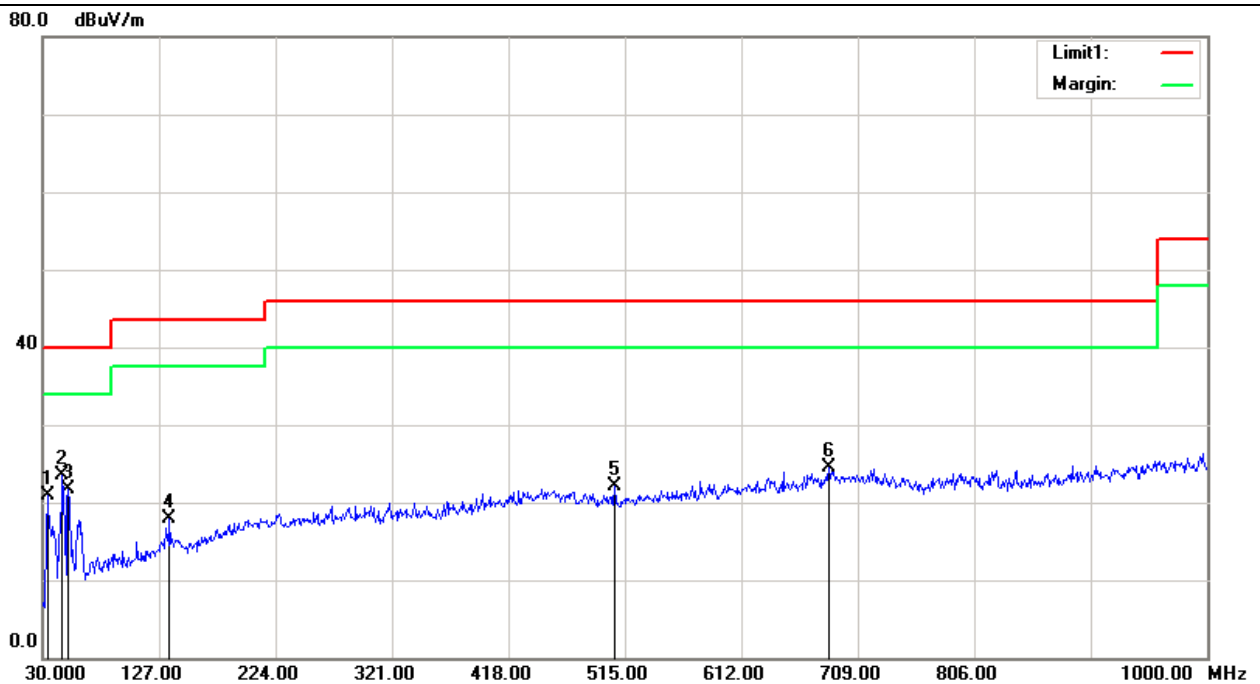
1. Average value = Peak value - Average factor;
2. Average factor = 0.

Radiated Emission Test Data (9 KHz ~ 30 MHz):

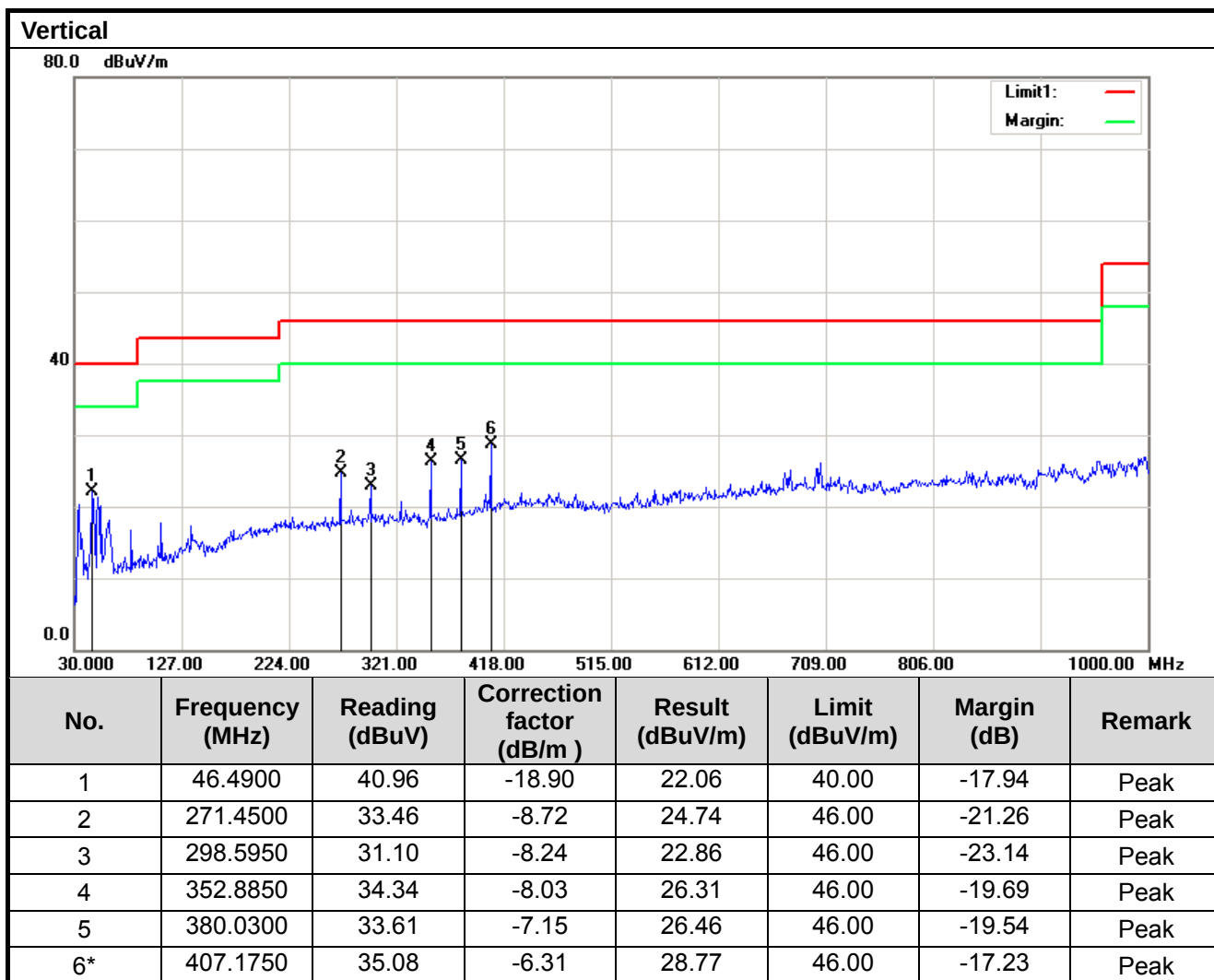
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

Radiated Emission Test Data (30 MHz ~ 1 GHz):

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	33.8800	41.47	-20.50	20.97	40.00	-19.03	Peak
2*	46.4900	42.49	-18.90	23.59	40.00	-16.41	Peak
3	54.2900	40.33	-18.66	21.67	40.00	-18.33	Peak
4	135.7300	30.31	-12.40	17.91	43.50	-25.59	Peak
5	506.2700	28.14	-5.99	22.15	46.00	-23.85	Peak
6	684.7500	26.97	-2.51	24.46	46.00	-21.54	Peak



5.5 OUT OF BAND EMISSIONS

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.227/15.209

Test Method: ANSI C63.10

Limits:

According to FCC 15.227 (b) The field strength of any emissions which appear outside of 26.96MHz to 27.28MHz shall not exceed the general radiated emission limits in §15.209.

Test Setup: Refer to section 4.4.1 for details.

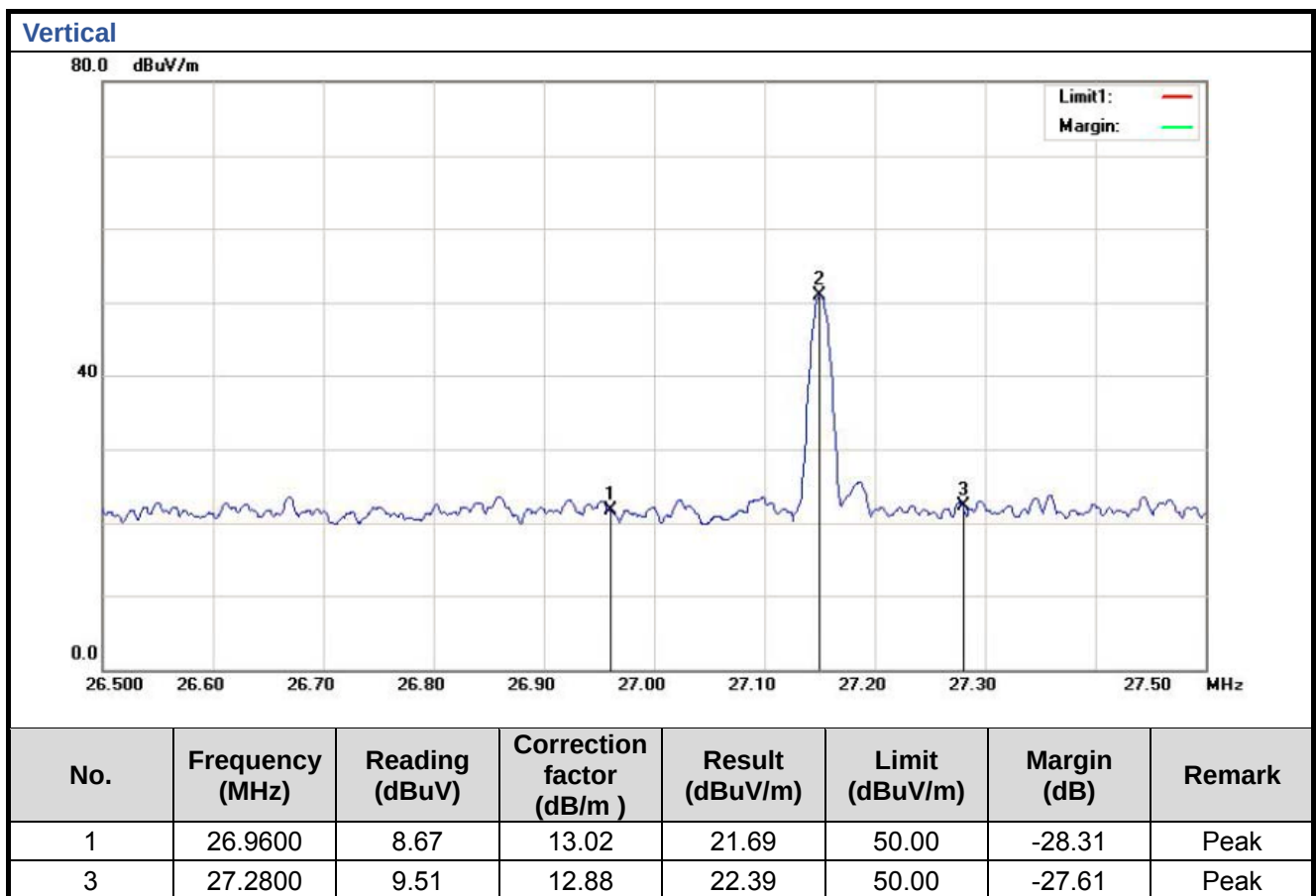
Test Procedures:

As the radiation test, set the RBW=10kHz VBW=30kHz, observed the outside band of 26.96MHz to 27.28MHz, than mark the higher-level emission for comparing with the FCC rules.

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The worst case test data as below.



Note: The edge emissions are below the FCC 15.209 Limits or complies with the 15.227(b) requirements.

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

See test photographs attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photographs.

*** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of Intertek, this report can't be reproduced except in full.
