

Reference No.: A08030704 Report No.: FCCA08030704

FCCID: TV2EFOBII Page:1 of 22

Date : Aug. 14 2008

Product Name:

Key FOB

Model Number:

24470-01, 24472-01, 24474-01

Applicant:

TriMark

500 Bailey Ave. P.O. BOX 350. New Hampton, IA 50659

Date of Receipt:

May. 19,2008

Finished date of Test:

Jun. 09, 2008

Applicable Standards:

47 CFR Part 15, Subpart C

ANSI C63.4:2003

We, Spectrum Research & Testing Laboratory Inc., hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Checked By :

Shunw Wang Date: Aug. 16 wolf

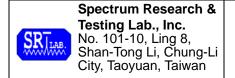
(Shunm Wang)

Date: Aug. 16 wolf

(Johnson Ho, Director)

Approved By:

Lab Code: 200099-0



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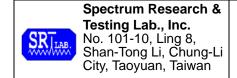
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1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source, 6 VDC, was used during the test.
- The antennas were soldered on the PCB.

1.3 EUT MODIFICATION

No modification in SRT Lab.



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2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

_	
Key FOB	
24474-01, 24470-01, 24472-01	
6Vdc	
433.92 MHz	
1	
10 dBm = 0.01W	
ASK	
L.O.: 433.92MHz	
operation Simplex	
ssion 4K	
Integral Antenna	
e 0~ 55 °C	

NOTE:

2. 24474-01, 24470-01, 24472-01 are same PCB, Exterior are different.

2.2 DESCRIPTION OF SUPPORT UNIT

The transmitter part of EUT was tested along and configured by the requirement of ANSI C63.4. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

No	Device	Brand	Model #	FCC ID/DoC	Cable
1	N/A				
2					
3					
4					
5					

NOTE: For the actual test configuration, please refer to the photos of testing.

^{1.} For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.



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2.3 DESCRIPTION OF TEST MODE

The EUT was operated in continunely transmitting mode.

3 DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of wireless product and according to the specifications provided by the applicant, must comply with the requirements of the following standards:

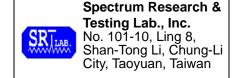
47 CFR Part 15, Subpart C

ANSI C63.4: 2003

All tests have been performed and recorded as the above standards.

4. CONDUCTED EMISSION TEST

The test item was not performed, because the EUT uses 6Vdc battery as power source.



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5 20dB Bandwidth

5.1 LIMIT

FREQUENCY (MHz)	BANDWIDTH LIMIT(kHz)
Above 70-900	0.25%xCenter Frequency(MHz)
Above 900	0.5%xCenter Frequency(MHz)

NOTE:

1. Bandwidth is determined at the points 20dB down from the modulated carrier.

5.2 TEST EQUIPMENT

The following test equipment was used during the test:

Equipment/ Facilities	Specifications	Manufacturer	Model#/ Serial#	Due Date of Cal. & Cal. center
CDECTRUM	9kHz-40GHz	ROHDE &	FSP40/	SEP. 2008
SPECTRUM	9KHZ-4UGHZ	SCHWARZ	100093	ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

5.3 TEST SET-UP



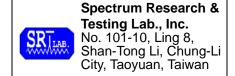
The EUT was connected to a spectrum through a 50Ω RF cable.

5.4 TEST PROCEDURE

Please refer to FCC Part15C 15.231.

5.5 EUT OPERATING CONDITION

The EUT was operated in continunely transmitting mode.



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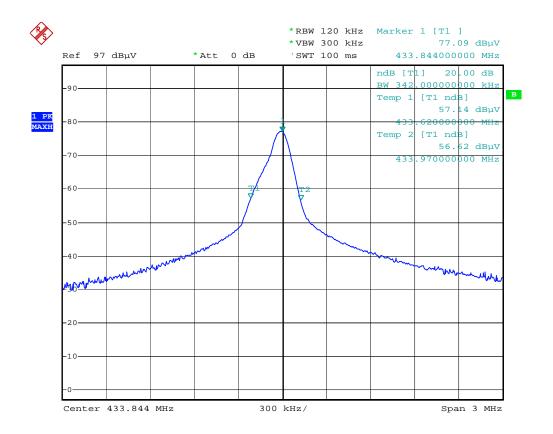
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5.6 TEST RESULT

Temperature:24°CHumidity:61%RHSpectrum Detector:PKTested by:Shunm WangTest Result:PASSTested Date:Jun. 05, 2008

CHANNEL UMBER	CHANNEL	20dB DOWN BW	MAXIMUM LIMIT
	FREQUENCY (MHz)	(kHz)	(kHz)
1	433.844	342.0	1084.78



-20dB bw

Date: 5.JUN.2008 13:35:33



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6 BAND EDGE TEST

6.1 LIMIT

FCC part15C 15.231(b) limit of fundamental and spurious emissions measurement.

FREQUENCY (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750 (NOTE 4)	125 to 375 (NOTE 6)
174-260	3750	375
260-470	3750 to 12500 (NOTE 5)	375 to 1250 (NOTE 6)
Above 470	12500	1250

NOTE:

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level (μ V/m) = 20 log Emission level (μ V/m).
- 3.In the emission tables above, the tighter limit applies at the band edges.
- 4. Limit = 20log(56.81818(F) 6136.3636); F: Fundamental Frequency (MHz)
- 5. Limit = 20log(41.667(F) 7083.3333); F: Fundamental Frequency (MHz)
- 6. Limit = The Limit of Fundamental Frequency 20dB
- 7. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

6.2 TEST EQUIPMENT

The following test equipment was used during the test:

Equipment/ Facilities	Specification	Manufacturer	Model#/ Serial#	Due Date of Cal. & Cal. Center
CDECTRUM	0kH= 40CH=	ROHDE &	FSP40/	SEP. 2008
SPECTRUM	9kHz-40GHz	SCHWARZ	100093	ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

6.3 TEST SET-UP



The EUT was connected to the spectrum through a 50 Ω RF cable.



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6.4 TEST PROCEDURE

Please refer to FCC Part15C 15.231.

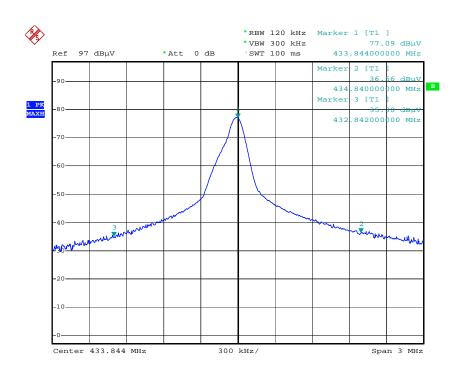
6.5 EUT OPERATING CONDITION

The EUT was operated in continunely transmitting mode.

6.6 TEST RESULT

Temperature:24°CHumidity:61%RHSpectrum Detector:PK & AVTested by:Shunm WangTest Result:PASSTested Date:Jun. 05, 2008

Frequency (MHz) RF LEVEL 120kHz BW (dBuV)		Limit of Power (dBuV)	MARGIN (dB)
433.844 77.09		80.83	-3.74



-20dB bw

Date: 5.JUN.2008 13:34:47



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7. RELEASE OR OPERATING TIME

7.1 LIMIT

- 1. A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- 2. A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- 3). Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.
- 4. Intentional radiators, which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pungency of the alarm condition.

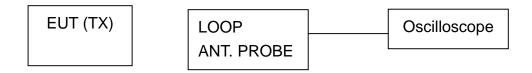
7.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
OSCILLOSCOPE	500MHz	HP	54616B/	APR. 2009
OCCILLOCCCI L			US39150351	ETC

NOTE:

7.3 TEST SET-UP



7.4 TEST PROCEDURE

A specific loop antenna was connected to oscilloscope to detect the EUT's release time. The oscilloscope displayed the EUT's release time and took a picture of measurement.

^{1.} The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



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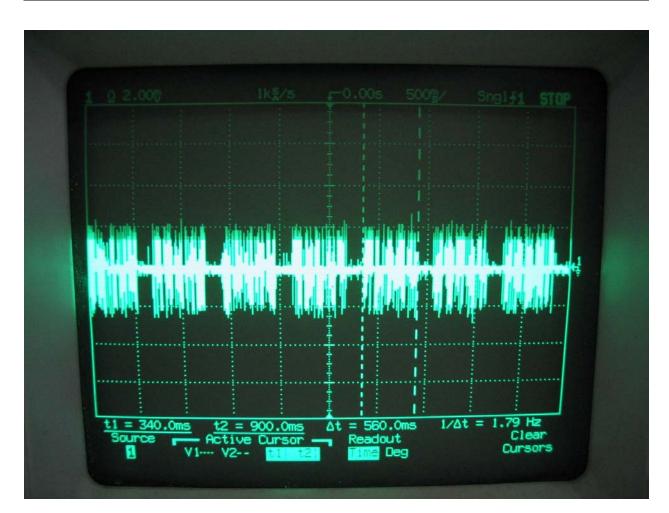
7.5 EUT OPERATING CONDITION

The EUT is normal use function.

7.6 TEST RESULT

Temperature:	24°C	Humidity:	61%RH
		Tested by:	Shunm Wang
Test Result:	PASS	Tested Date:	Jun. 05, 2008

Start release time(ms)	Stop time(ms)	Total release time(ms)	Limit of release time<(s)
340	900	560	5





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8. FUNDERMENTAL & SPURIOUS RADIATED EMISSION TEST

8.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

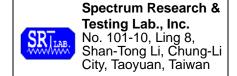
Frequency (MHz)	Distance (m)	Field Strength (dBμV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
ABOVE 960	3	54.0

- **NOTE**: 1. In the emission tables above, the tighter limit applies at the band edges.
 - 2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC part15C 15.231(b) limit of fundamental and spurious emissions measurement.

FREQUENCY (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750 (NOTE 5)	125 to 375 (NOTE 7)
174-260	3750	375 (NOTE 7)
260-470	3750 to 12500 (NOTE 6)	375 to 1250
Above 470	12500	1250

- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level (dB μ V/m) = 20 log Emission level (μ V/m).
- 3.In the emission tables above, the tighter limit applies at the band edges.
- 4. Distance refers to the distance between measuring nstrument, antenna, and the closest point of any part of the device or system.
- 5. Limit = 20log(56.81818(F) 6136.3636); F: Fundamental Frequency (MHz)
- 6. Limit = 20log(41.667 x F 7083.3333); F: Fundamental Frequency (MHz)
- 7. Limit = The Limit of Fundamental Frequency 20dB
- 8. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.



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8.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

Equipment/ Facilities	Specification	Manufacturer	Model#/ Serial#	Due Date of Cal. & Cal. Center
EMI TEST RECEIVER	9kHz TO 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 830245/012	OCT. 2008 ETC
BI-LOG ANTENNA	26 MHz TO 2 GHz	EMCO	3142B / 0005-1534	NOV. 2008 ETC
OATS	3 – 10 M MEASUREMENT	SRT	SRT-1	NOV. 2008 SRT
COAXIAL CABLE	25M	TIMES	J400 / #25M	AUG. 2008 ETC
FILTER	2 LINE, 30A	FIL.COIL	FC-943 / 869	NCR
LOOP ANTENNA	9kHz TO 30MHz	ROHDE & SCHWARZ	HFH2-Z2	MAR. 2009

- 1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.
- 2. The Open Area Test Site (SRT-1) is registered by FCC with No. 90957 and VCCI with No. R-1081.
- 3. The Open Area Test Site (SRT-2) is registered by FCC with No. 98458 and VCCI with No. R-1168.

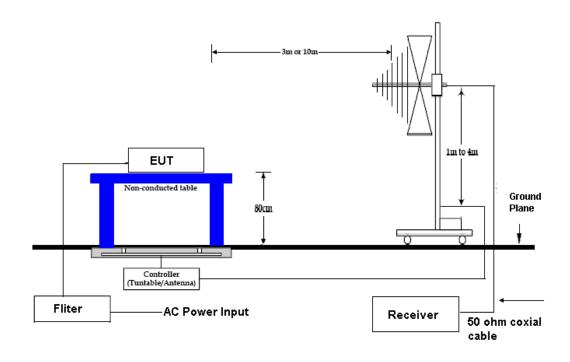


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8.3 TEST SET-UP



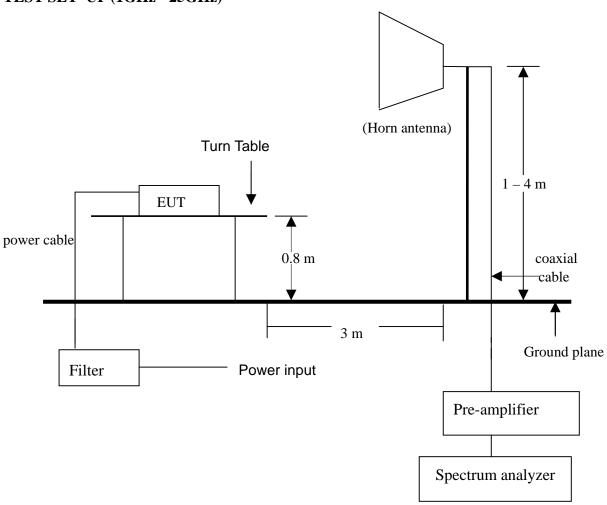
- 1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
- 2. For the actual test configuration, please refer to the photos of testing.



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TEST SET- UP (1GHz - 25GHz)



- 1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
- 2. For the actual test configuration, please refer to the photos of testing.



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8.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

8.5 EUT OPERATING CONDITION

The EUT was operated in continunely transmitting mode.



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8.6 TEST RESULT

Temperature: 25°C Humidity: 60 %RH Frequency Range: 30 – 1000 MHz Measured Distance: 3m Receiver Detector: Q.P. Tested Mode: TX Shunm Wang Jun. 06, 2008 Tested By: Tested Date:

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
60.3105	1.01	3.90	13.5	18.4	40.0	-21.6	251	1.8
70.2654	1.16	6.00	14.6	21.8	40.0	-18.2	139	1.7
80.2156	1.26	7.60	12.9	21.8	40.0	-18.2	25	1.5
145.2460	1.64	11.28	15.1	28.0	43.5	-15.5	49	1.6
168.0460	1.98	8.64	11.8	22.4	43.5	-21.1	105	1.5
286.1156	2.65	13.37	13.6	29.6	46.0	-16.4	27	1.7

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
60.3105	1.01	3.90	13.1	18.0	40.0	-22.0	249	1
70.2661	1.16	6.00	14.7	21.9	40.0	-18.1	135	1
80.2149	1.26	7.60	12.5	21.4	40.0	-18.6	21	1.1
145.2451	1.64	11.28	15.2	28.1	43.5	-15.4	53	1
168.0469	1.98	8.64	11.6	22.2	43.5	-21.3	110	1.2
286.1144	2.65	13.37	13.8	29.8	46.0	-16.2	23	1.1

- 1. Measurement uncertainty is +/-3.7dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. The field strength of other emission frequencies were very low against the limit.



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Temperature: 25 °C Humidity: 60 %RH 1 – 5 GHz Measured Distance: Frequency Range: 3m Receiver Detector: PK. or AV. TX Tested Mode: Jun. 06, 2008 Tested By: Shunm Wang Tested Date:

Antenna Polarization: Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Da	ding ata µV)	Le	ssion vel V/m)		mit V/m)	Mar (d	•	AZ (°)	EL (m)
	(GD)	(GD/III)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1003.02	-34.99	24.21	30.4	*	19.6	*	74.0	54.0	-54.4	*	23	1.50
1085.27	-34.68	24.39	30.1	*	19.8	*	74.0	54.0	-54.2	*	153	1.40
1303.02	-33.73	24.87	61.4	58.6	52.5	49.7	74.0	54.0	-21.5	-4.3	122	1.51
1738.02	-33.01	26.20	62.5	55.2	55.7	48.4	74.0	54.0	-18.3	-5.6	135	1.49
1823.50	-33.05	26.53	39.9	*	33.4	*	74.0	54.0	-40.6	*	118	1.33
2173.11	-32.34	27.55	61.0	53.1	56.2	48.3	74.0	54.0	-17.8	-5.7	103	1.28

Antenna Polarization: Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Da	Reading Data (dBµV)		ssion vel V/m)	(dBµV/m)		Margin (dB)		AZ (°)	
	(42)	(42/11)	PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
1003.02	-34.99	24.21	31.9	*	21.1	*	74.0	54.0	-52.9	*	26	1.20
1085.27	-34.68	24.39	31.3	*	21.0	*	74.0	54.0	-53.0	*	157	1.30
1303.02	-33.73	24.87	60.9	58.1	52.0	49.2	74.0	54.0	-22.0	-4.8	125	1.19
1738.02	-33.01	26.20	61.2	54.7	54.4	47.9	74.0	54.0	-19.6	-6.1	131	1.25
1823.50	-33.05	26.53	39.1	*	32.6	*	74.0	54.0	-41.4	*	116	1.13
2173.11	-32.34	27.55	60.4	52.8	55.6	48.0	74.0	54.0	-18.4	-6.0	107	1.00

- 1. Measurement uncertainty is +/-3.7dB.
- 2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
- 3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
- 4. The field strength of other emission frequencies were very low against the limit.
- 5. (F):The field stregth of fundamental frequency.



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Temperature: Humidity: 25°C 60 %RH Frequency Range: 30 – 1000 MHz Measured Distance: 3m Receiver Detector: Tested Mode: Q.P. Fundamental Shunm Wang Jun. 06, 2008 Tested By: Tested Date:

Antenna Polarization: Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
433.8440	3.01	16.63	55.2	74.8	80.3	-5.5	46	1.6

Antenna Polarization: Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	AZ(°)	EL(m)
433.8440	3.01	16.63	54.9	74.5	80.3	-5.8	51	1.57

- 1. Measurement uncertainty is +/-3.7dB.
- 2. "*": Measurement does not apply for this frequency.
- 3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
- 4. The field strength of other emission frequencies were very low against the limit.



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10. TERMS OF ABBREVIATION

AV.	Average detection	
AZ(°)	Turn table azimuth	
Correct.	Correction	
EL(m)	Antenna height (meter)	
EUT	Equipment Under Test	
Horiz.	Horizontal direction	
LISN	Line Impedance Stabilization Network	
NSA	Normalized Site Attenuation	
Q.P.	Quasi-peak detection	
SRT Lab	Spectrum Research & Testing Laboratory, Inc.	
Vert.	Vertical direction	