



# RADIO TEST REPORT

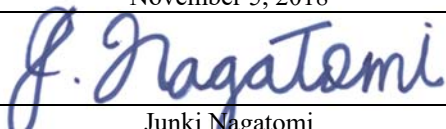
Test Report No. : 12505678H-A-R1

**Applicant** : TOKAI RIKA CO., LTD.  
**Type of Equipment** : RKE Transmitter  
**Model No.** : B3F2F2L  
**FCC ID** : MOZB3F2F2L  
**Test regulation** : FCC Part 15 Subpart C: 2018  
**Test Result** : Complied


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4. The test results in this report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
8. This report is a revised version of 12505678H-A. 12505678H-A is replaced with this report.

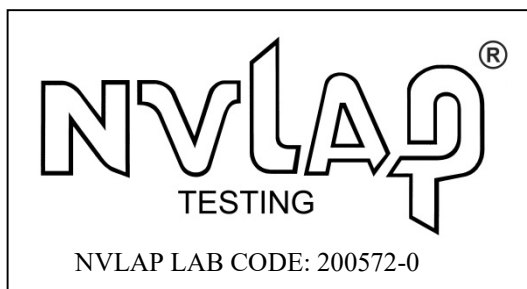
**Date of test:** November 5, 2018

**Representative test engineer:**

  
Junki Nagatomi  
Engineer  
Consumer Technology Division

**Approved by:**

  
Motoya Imura  
Leader  
Consumer Technology Division



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13-EM-F0429



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## **SECTION 1: Customer information**

Company Name : TOKAI RIKA CO., LTD.  
Address : 3-260 Toyota, Oguchi-cho, Niwa-gun, Aichi 480-0195, Japan  
Telephone Number : +81-587-95-0093  
Facsimile Number : +81-587-95-5471  
Contact Person : Hiroki Unno

## **SECTION 2: Equipment under test (E.U.T.)**

### **2.1 Identification of E.U.T.**

Type of Equipment : RKE Transmitter  
Model No. : B3F2F2L  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 3.0 V (CR2032 x 1)  
Receipt Date of Sample : October 29, 2018  
Condition of EUT : Engineering prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification of EUT : No Modification by the test lab

### **2.2 Product Description**

Model: B3F2F2L (referred to as the EUT in this report) is a RKE Transmitter.

### **Radio Specification**

Radio Type : Transmitter  
Frequency of Operation\* : Channel 1(CH1): 314.35 MHz  
Channel 2(CH2): 312.10 MHz  
Modulation : FSK  
Antenna type : Pattern Antenna  
Clock frequency (Maximum) : 33.6 MHz

\*Signals are not transmitted on CH1 and CH2 simultaneously.

Transmission alternates on CH1 and CH2, every time one of switches on RKE Transmitter is pressed.

\* Model: B3F2F2L has five types; Original (3 switches), Variation A (3 switches), Variation B (3 switches), Variation C (3 switches), and Variation D (2 switches).

The test was performed with Original (3 switches) since there was no difference in radio characteristics by the these variations.

## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C  
FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.231 Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

### **3.2 Procedures and results**

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted emission	FCC: ANSI C63.10:2013 6 Standard test methods	FCC: Section 15.207	N/A *1)	N/A	-
	IC: RSS-Gen 8.8	IC: RSS-Gen 8.8			
Automatically Deactivate	FCC: ANSI C63.10:2013 6 Standard test methods	FCC: Section 15.231(a)(1)	N/A	Complied	Radiated
	IC: -	IC: RSS-210 A1.1			
Electric Field Strength of Fundamental Emission	FCC: ANSI C63.10:2013 6 Standard test methods	FCC: Section 15.231(b)	1.7 dB 312.100 MHz Horizontal PK with Duty factor	Complied#	Radiated
	IC: RSS-Gen 6.12	IC: RSS-210 A1.2			
Electric Field Strength of Spurious Emission	FCC: ANSI C63.10:2013 6 Standard test methods	FCC: Section 15.205 Section 15.209 Section 15.231(b)	5.5 dB 1872.600 MHz Vertical PK with Duty factor	Complied	Radiated
	IC: RSS-Gen 6.13	IC: RSS-210 A1.2, 4.4 RSS-Gen 8.9			
-20dB Bandwidth	FCC: ANSI C63.10:2013 6 Standard test methods	FCC: Section 15.231(c)	N/A	Complied	Radiated
	IC: -	IC: Reference data			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.					
*1) The test is not applicable since the EUT does not have AC Mains.					
Symbols:					
Complied		The data of this test item has enough margin, more than the measurement uncertainty.			
Complied#		The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.			

#### **FCC 15.31 (e)**

This test was performed with the New Battery (DC 3.0 V) during the tests. Therefore, the EUT complies with the requirement.

#### **FCC Part 15.203 Antenna requirement**

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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### 3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Bandwidth	IC: RSS-Gen 6.7	IC: RSS-210 A1.3	N/A	Complied	Radiated

Other than above, no addition, exclusion nor deviation has been made from the standard.

### 3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k = 2$ .

Polarity	Radiated emission (Below 1 GHz)			
	(3 m*)(+/-)		(10 m*)(+/-)	
	30 MHz to 200 MHz	200 MHz to 1000 MHz	30 MHz to 200 MHz	200 MHz to 1000 MHz
Horizontal	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	5.0 dB	6.3 dB	4.9 dB	5.0 dB

Radiated emission (Above 1 GHz)				
(3 m*)(+/-)		(1 m*)(+/-)		(10 m*)(+/-)
1 GHz to 6 GHz	6 GHz to 18 GHz	10 GHz to 26.5 GHz	26.5 GHz to 40 GHz	1 GHz to 18 GHz
5.2 dB	5.5 dB	5.9 dB	5.9 dB	5.5 dB

\* Measurement distance

Automatically Deactivate
0.10 %

Bandwidth
0.96 %

### 3.5 Test Location

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NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

\* Size of vertical conducting plane (for Conducted Emission test) : 2.0 m x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating Mode(s)**

<b>Test Item*</b>	<b>Mode</b>
Automatically Deactivate Duty Cycle	Normal use mode, 312.10 MHz Normal use mode, 314.35 MHz
Electric Field Strength of Fundamental Emission Electric Field Strength of Spurious Emission -20 dB & 99 % Occupied Bandwidth	Transmitting mode, 312.10 MHz (Tx) *1) Transmitting mode, 314.35 MHz (Tx) *1)
* The system was configured in typical fashion (as a user would normally use it) for testing. *1) The software of this mode is the same as one of normal product, except that EUT continues to transmit when transmitter button is being pressed (For Normal use mode, EUT stops to transmit in a given time, even if transceiver button is being pressed.) End users cannot change the settings of the output power of the product.	

### **4.2 Configuration and peripherals**



\* Setup was taken into consideration and test data was taken under worse case conditions.

#### **Description of EUT**

<b>No.</b>	<b>Item</b>	<b>Model number</b>	<b>Serial number</b>	<b>Manufacturer</b>	<b>Remarks</b>
A	RKE Transmitter	B3F2F2L	001 *1) 002 *2)	TOKAI RIKAI CO., LTD.	EUT

\*1) Used for Normal use mode

\*2) Used for Transmitting mode

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## **SECTION 5: Radiated emission (Electric Field Strength of Fundamental and Spurious Emission)**

### **Test Procedure and conditions**

[For below 30 MHz]

The noise level was checked by moving a search-coil (Loop Antenna) close to the EUT.

[For 30 MHz to 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The measuring antenna height was varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detector function of the test receiver / spectrum analyzer.

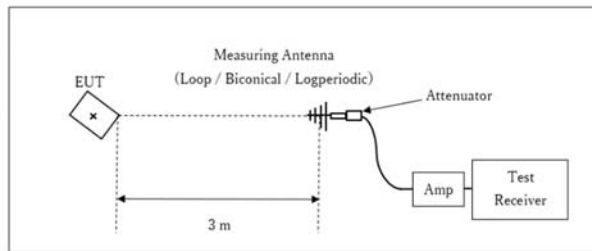
### **Test Antennas are used as below;**

Frequency	Below 30 MHz	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

	From 9 kHz to 90 kHz and From 110 kHz to 150 kHz	From 90 kHz to 110 kHz	From 150 kHz to 490 kHz	From 490 kHz to 30 MHz	From 30 MHz to 1 GHz	Above 1 GHz
Detector Type	Peak	Peak	Peak	Peak	Peak and Peak with Duty factor	Peak and Peak with Duty factor
IF Bandwidth	200 Hz	200 Hz	9.1 kHz	9.1 kHz	120 kHz	PK: S/A: RBW 1 MHz, VBW: 3 MHz

**[Test Setup]**

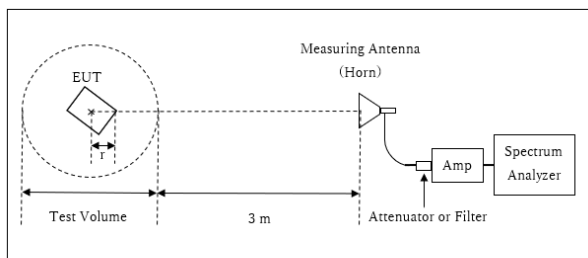
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz



r : Radius of an outer periphery of EUT

× : Center of turn table

Distance Factor:  $20 \times \log(3.75 \text{ m} / 3.0 \text{ m}) = 1.94 \text{ dB}$

\* Test Distance:  $(3 + \text{Test Volume} / 2) - r = 3.75 \text{ m}$

Test Volume : 1.5 m

(Test Volume has been calibrated based on CISPR 16-1-4.)

r = 0.0 m

\* The test was performed with r = 0.0 m since EUT is small and it was the rather conservative condition.

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined. Noise levels of all the frequencies were measured at the position.

- This EUT has two modes which mechanical key is folded in or out. The worst case was confirmed that mechanical key is folded in or out, as a result, the test which mechanical key was folded in (above 1 GHz) / out (below 1 GHz) was the worst case. Therefore the test was performed under the worst condition.

\*The result is rounded off to the second decimal place, so some differences might be observed.

**Measurement range** : 9 kHz - 3.2 GHz  
**Test data** : APPENDIX  
**Test result** : Pass

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## **SECTION 6: Automatically deactivate**

### **Test Procedure**

The measurement was performed with Electric field strength using a spectrum analyzer.

**Test data** : APPENDIX  
**Test result** : Pass

## **SECTION 7: -20 dB and 99 % Occupied Bandwidth**

### **Test Procedure**

The test was measured with a spectrum analyzer using a test fixture.

<b>Test</b>	<b>Span</b>	<b>RBW</b>	<b>VBW</b>	<b>Sweep</b>	<b>Detector</b>	<b>Trace</b>	<b>Instrument used</b>
20 dB Bandwidth	300 MHz	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto (Single)	Peak hold	Max Hold	Spectrum Analyzer

Peak hold was applied as Worst-case measurement.

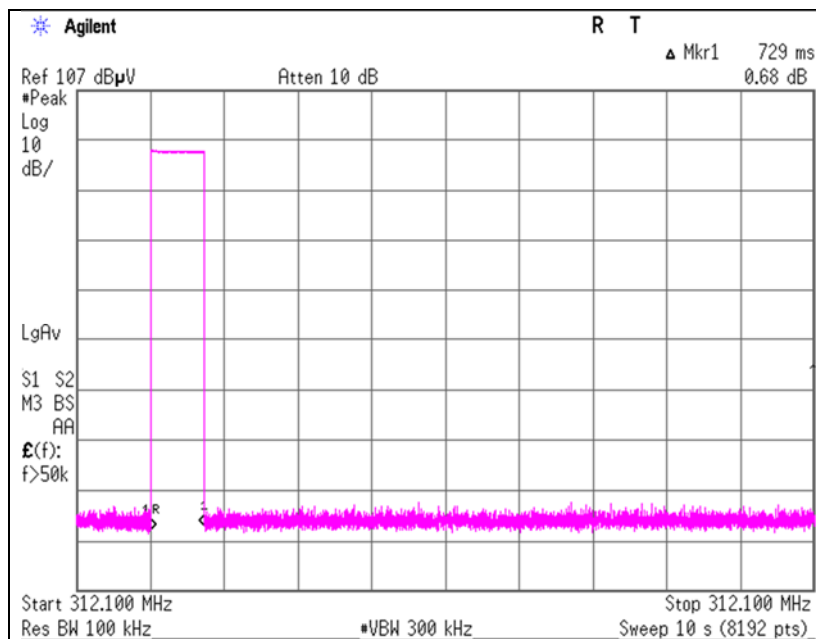
**Test data** : APPENDIX  
**Test result** : Pass

## APPENDIX 1: Test data

### Automatically deactivate

Report No. 12505678H  
 Test place Ise EMC Lab.  
 Semi Anechoic Chamber No.2  
 Date November 5, 2018  
 Temperature / Humidity 22 deg. C / 36 % RH  
 Engineer Junki Nagatomi  
 Mode Normal use mode 312.10 MHz

Time of Transmitting [sec]	Limit [sec]	Result
0.729	5.00	Pass



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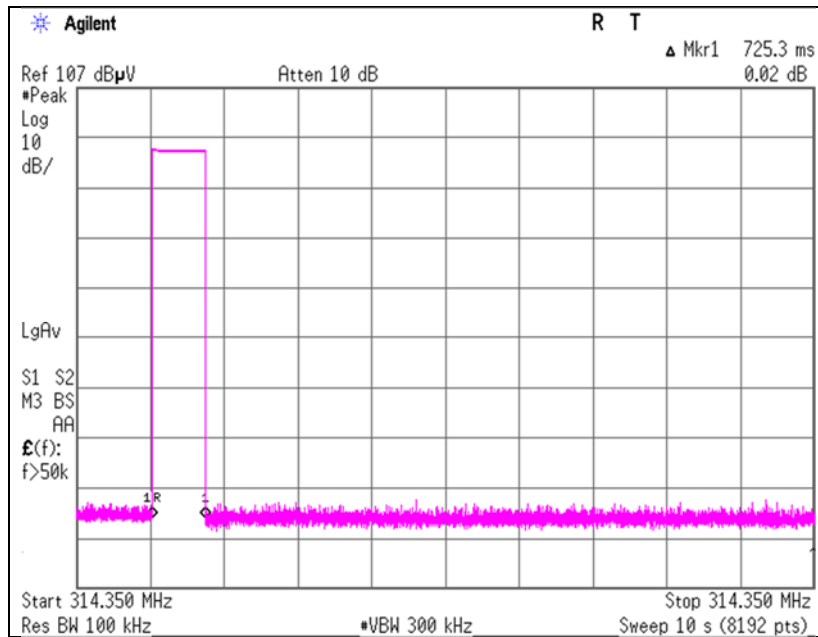
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**Automatically deactivate**

Report No. 12505678H  
 Test place Ise EMC Lab.  
 Semi Anechoic Chamber No.2  
 Date November 5, 2018  
 Temperature / Humidity 22 deg. C / 36 % RH  
 Engineer Junki Nagatomi  
 Mode Normal use mode 314.35 MHz

Time of Transmitting [sec]	Limit [sec]	Result
0.7253	5.00	Pass



## Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

Report No. 12505678H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.2  
Date November 5, 2018  
Temperature / Humidity 22 deg. C / 36 % RH  
Engineer Junki Nagatomi  
Mode Transmitting mode 312.10 MHz

**PK**

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]		Remark Inside or Outside of Restricted Bands
		Hor	Ver					Hor	Ver		Hor	Ver	
312.100	PK	80.2	77.2	13.8	9.0	29.3	-	73.7	70.7	95.4	21.7	24.7	Carrier
624.200	PK	42.4	43.1	19.3	10.3	29.6	-	42.4	43.1	75.4	33.0	32.3	Outside
936.300	PK	42.4	43.1	21.8	11.4	27.8	-	47.8	48.5	75.4	27.6	26.9	Outside
1248.400	PK	51.1	51.5	25.2	5.6	35.3	-	46.6	47.0	75.4	28.8	28.4	Outside
1560.500	PK	48.1	47.9	25.6	5.1	35.0	-	43.8	43.6	73.9	30.1	30.3	Inside
1872.600	PK	51.5	53.9	25.6	5.1	34.7	-	47.5	49.9	75.4	27.9	25.5	Outside
2184.700	PK	44.7	44.6	27.9	5.2	34.5	-	43.3	43.2	75.4	32.1	32.2	Outside
2496.800	PK	43.6	44.1	27.6	5.2	34.4	-	42.0	42.5	73.9	31.9	31.4	Inside
2808.900	PK	44.5	44.5	28.4	5.3	34.4	-	43.8	43.8	73.9	30.1	30.1	Inside
3121.000	PK	46.4	45.1	28.6	5.5	34.3	-	46.2	44.9	75.4	29.2	30.5	Outside

**PK with Duty factor**

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]		Remark
		Hor	Ver					Hor	Ver		Hor	Ver	
312.100	PK	80.2	77.2	13.8	9.0	29.3	0.0	73.7	70.7	75.4	1.7	4.7	Carrier
624.200	PK	42.4	43.1	19.3	10.3	29.6	0.0	42.4	43.1	55.4	13.0	12.3	Outside
936.300	PK	42.4	43.1	21.8	11.4	27.8	0.0	47.8	48.5	55.4	7.6	6.9	Outside
1248.400	PK	51.1	51.5	25.2	5.6	35.3	0.0	46.6	47.0	55.4	8.8	8.4	Outside
1560.500	PK	48.1	47.9	25.6	5.1	35.0	0.0	43.8	43.6	53.9	10.1	10.3	Inside
1872.600	PK	51.5	53.9	25.6	5.1	34.7	0.0	47.5	49.9	55.4	7.9	5.5	Outside
2184.700	PK	44.7	44.6	27.9	5.2	34.5	0.0	43.3	43.2	55.4	12.1	12.2	Outside
2496.800	PK	43.6	44.1	27.6	5.2	34.4	0.0	42.0	42.5	53.9	11.9	11.4	Inside
2808.900	PK	44.5	44.5	28.4	5.3	34.4	0.0	43.8	43.8	53.9	10.1	10.1	Inside
3121.000	PK	46.4	45.1	28.6	5.5	34.3	0.0	46.2	44.9	55.4	9.2	10.5	Outside

Sample calculation:

Result of PK = Reading + Ant Factor + Loss {Cable + Attenuator + Filter (above 1GHz) +Distance factor (above 1 GHz)} - Gain (Amplifier)

Result of PK with Duty factor = Reading + Ant Factor + Loss {Cable + Attenuator + Filter (above 1 GHz) +Distance factor (above 1 GHz)} - Gain (Amplifier) + Duty factor

For above 1GHz : Distance Factor:  $20 \times \log(3.75 \text{ m}/3.0 \text{ m}) = 1.94 \text{ dB}$

\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Since the peak emission result satisfied the average limit, duty factor was omitted.

Although Duty of this product was 100% or less, the result of AV (PK with Duty factor) was calculated by applying Duty 100% as worst.

## Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

Report No. 12505678H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.2  
Date November 5, 2018  
Temperature / Humidity 22 deg. C / 36 % RH  
Engineer Junki Nagatomi  
Mode Transmitting mode 314.35 MHz

**PK**

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]		Remark Inside or Outside of Restricted Bands
		Hor	Ver					Hor	Ver		Hor	Ver	
314.350	PK	79.9	76.9	13.9	9.0	29.3	-	73.5	70.5	95.5	22.0	25.0	Carrier
628.700	PK	42.1	42.4	19.3	10.3	29.6	-	42.1	42.4	75.5	33.4	33.1	Outside
943.050	PK	41.2	41.7	21.8	11.5	27.8	-	46.7	47.2	75.5	28.8	28.3	Outside
1257.400	PK	52.4	51.8	25.3	5.6	35.3	-	48.0	47.4	75.5	27.5	28.1	Outside
1571.750	PK	47.1	46.9	25.5	5.1	35.0	-	42.7	42.5	73.9	31.2	31.4	Inside
1886.100	PK	50.0	52.0	25.7	5.1	34.7	-	46.1	48.1	75.5	29.4	27.4	Outside
2200.450	PK	45.2	45.2	27.9	5.2	34.5	-	43.8	43.8	73.9	30.1	30.1	Inside
2514.800	PK	44.5	43.8	27.8	5.2	34.4	-	43.1	42.4	75.5	32.4	33.1	Outside
2829.150	PK	43.6	43.7	28.4	5.3	34.4	-	42.9	43.0	73.9	31.0	30.9	Inside
3143.500	PK	48.6	47.6	28.6	5.5	34.2	-	48.5	47.5	75.5	27.0	28.0	Outside

**PK with Duty factor**

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit [dBuV/m]	Margin [dB]		Remark
		Hor	Ver					Hor	Ver		Hor	Ver	
314.350	PK	79.9	76.9	13.9	9.0	29.3	0.0	73.5	70.5	75.5	2.0	5.0	Carrier
628.700	PK	42.1	42.4	19.3	10.3	29.6	0.0	42.1	42.4	55.5	13.4	13.1	Outside
943.050	PK	41.2	41.7	21.8	11.5	27.8	0.0	46.7	47.2	55.5	8.8	8.3	Outside
1257.400	PK	52.4	51.8	25.3	5.6	35.3	0.0	48.0	47.4	55.5	7.5	8.1	Outside
1571.750	PK	47.1	46.9	25.5	5.1	35.0	0.0	42.7	42.5	53.9	11.2	11.4	Inside
1886.100	PK	50.0	52.0	25.7	5.1	34.7	0.0	46.1	48.1	55.5	9.4	7.4	Outside
2200.450	PK	45.2	45.2	27.9	5.2	34.5	0.0	43.8	43.8	53.9	10.1	10.1	Inside
2514.800	PK	44.5	43.8	27.8	5.2	34.4	0.0	43.1	42.4	55.5	12.4	13.1	Outside
2829.150	PK	43.6	43.7	28.4	5.3	34.4	0.0	42.9	43.0	53.9	11.0	10.9	Inside
3143.500	PK	48.6	47.6	28.6	5.5	34.2	0.0	48.5	47.5	55.5	7.0	8.0	Outside

Sample calculation:

Result of PK = Reading + Ant Factor + Loss {Cable + Attenuator + Filter (above 1GHz) +Distance factor (above 1 GHz)} - Gain (Amplifier)

Result of PK with Duty factor = Reading + Ant Factor + Loss {Cable + Attenuator + Filter (above 1 GHz) +Distance factor (above 1 GHz)} - Gain (Amplifier) + Duty factor

For above 1GHz : Distance Factor:  $20 \times \log(3.75 \text{ m}/3.0 \text{ m}) = 1.94 \text{ dB}$

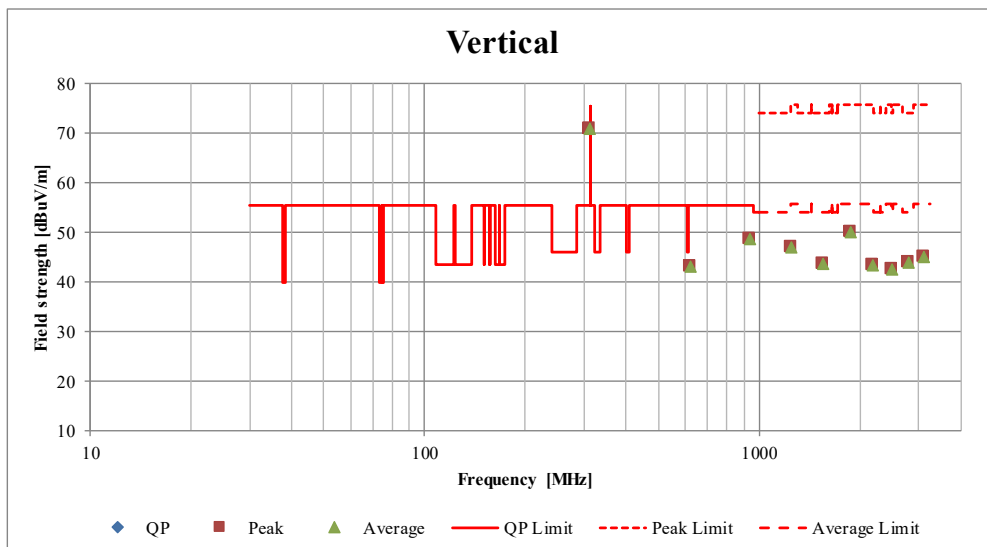
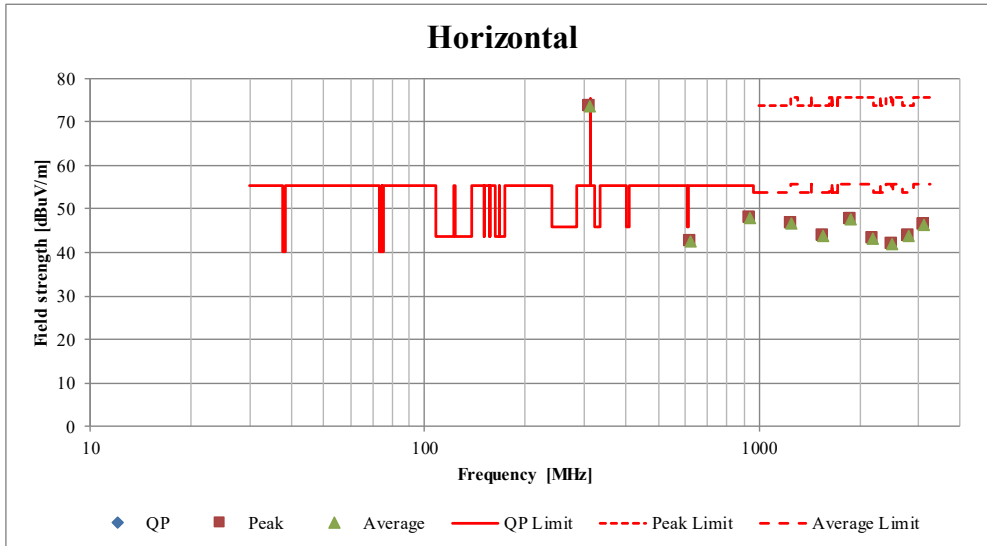
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Since the peak emission result satisfied the average limit, duty factor was omitted.

Although Duty of this product was 100% or less, the result of AV (PK with Duty factor) was calculated by applying Duty 100% as worst.

**Radiated Spurious Emission**  
**(Plot data, Worst case)**

Report No. 12505678H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.2  
Date November 5, 2018  
Temperature / Humidity 22 deg. C / 36 % RH  
Engineer Junki Nagatomi  
Mode Transmitting mode 312.10 MHz



\*These plots data contains sufficient number to show the trend of characteristic features for EUT.



**-20dB and 99% Occupied Bandwidth**  
**312.10 MHz / 314.35 MHz**

Report No. 12505678H  
Test place Ise EMC Lab.  
Semi Anechoic Chamber No.2  
Date November 5, 2018  
Temperature / Humidity 22 deg. C / 36 % RH  
Engineer Junki Nagatomi  
Mode Transmitting mode 312.10 MHz / 314.35 MHz

Bandwidth Limit : Fundamental Frequency **312.10** MHz x 0.25% = 780.25 kHz

\* The above limit was calculated from more stringent nominal frequency.

\* Method of KDB 926416 for systems employing non sweeping frequencies was referred.

**312.10MHz**

-20dB Bandwidth [kHz]
75.80

**314.35MHz**

-20dB Bandwidth [kHz]
72.33

-20dB Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
148.13	780.25	Pass

Bandwidth Limit : Fundamental Frequency **312.10** MHz x 0.25% = 780.25 kHz

99% Occupied Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
201.9983	780.25	Pass

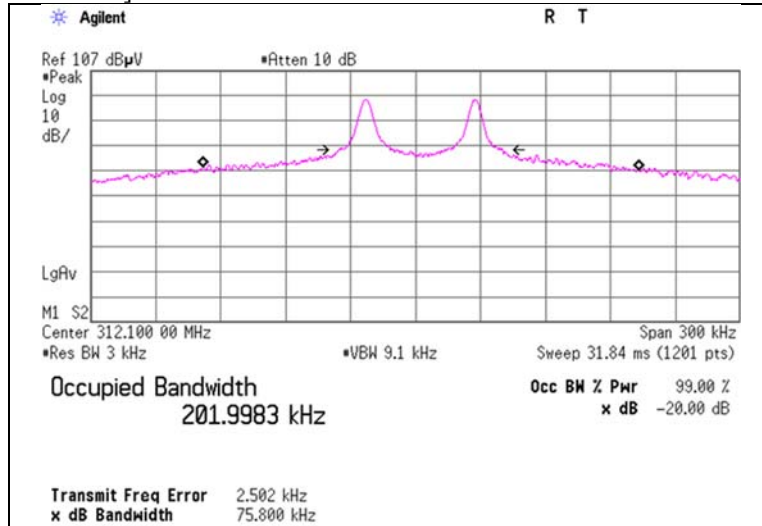
Bandwidth Limit : Fundamental Frequency **314.35** MHz x 0.25% = 785.88 kHz

99% Occupied Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
201.7206	785.88	Pass

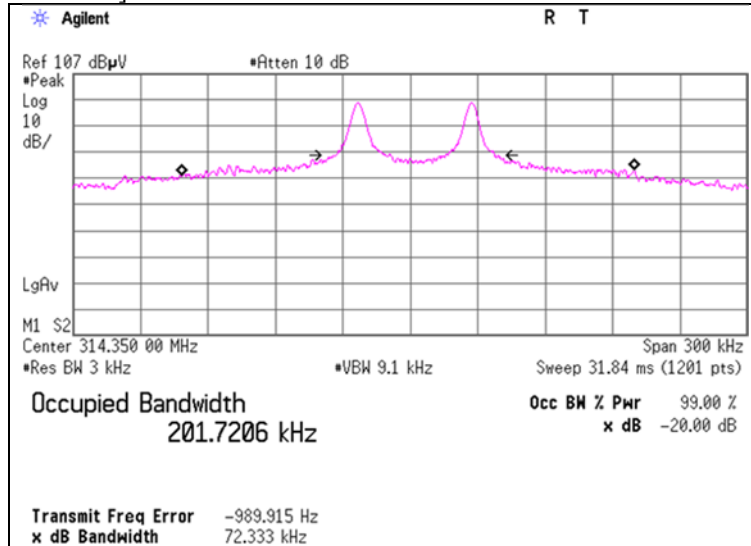
**-20dB and 99% Occupied Bandwidth**  
**312.10 MHz / 314.35 MHz**

Report No.	12505678H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	November 5, 2018
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Junki Nagatomi
Mode	Transmitting mode 312.10 MHz / 314.35 MHz

[312.10MHz]



[314.35MHz]



## **APPENDIX 2: Test instruments**

### **Test Instruments**

Test item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
RE	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	6/29/2018	6/30/2020	24
RE	141152	EMI measurement program	TSJ	TEPTO-DV	-	-	-	-
RE	141556	Thermo-Hygrometer	CUSTOM	CTH-201	0003	12/21/2017	12/31/2018	12
RE	142182	Measure	KOMELON	KMC-36	-	-	-	-
RE	141900	Spectrum Analyzer	AGILENT	E4440A	MY46185823	11/16/2017	11/30/2018	12
RE	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	8/8/2018	8/31/2019	12
RE	141427	Biconical Antenna	Schwarzbeck	VHA9103B	8031	5/31/2018	5/31/2019	12
RE	141265	Logperiodic Antenna(200-1000 MHz)	Schwarzbeck	VUSLP9111B	911B-190	5/31/2018	5/31/2019	12
RE	141317	Coaxial Cable	Fujikura/Agilent	-	-	2/23/2018	2/28/2019	12
RE	141578	Pre Amplifier	AGILENT	8447D	2944A10845	9/19/2018	9/30/2019	12
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	8/21/2018	8/31/2019	12
RE	141512	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	6/6/2018	6/30/2019	12
RE	141392	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	8/8/2018	8/31/2019	12
RE	141579	Pre Amplifier	AGILENT	8449B	3008A02142	1/23/2018	1/31/2019	12
RE	141297	High Pass Filter(1.1-10GHz)	TOKYO KEIKI	TF219CD1	1001	1/18/2018	1/31/2019	12
RE	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/5/2018	11/30/2019	12
RE	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	4/1/2018	4/30/2019	12
RE	142645	Loop Antenna	UL Japan	-	-	-	-	-

\*Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

**Test item:**

**RE: Radiated emission, 99 % Occupied Bandwidth, -20 dB bandwidth, and Automatically deactivate tests**

**UL Japan, Inc.**

**Ise EMC Lab.**

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