RADIO TEST REPORT

Test Report No. : 32LE0115-HO-01-B-R1

Applicant	:	**HERUTU ELECTRONICS CORPORATION**
Type of Equipment	:	**POKAYOKE RECEIVER**
Model No.	:	**TW-800R**
FCC ID	:	**T82-TW800R**
Test regulation	:	**FCC Part 15 Subpart C: 2012**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 32LE0115-HO-01-B. 32LE0115-HO-01-B is replaced with this report.

Date of test: September 12 and 14, 2012

Representative test engineer:
Motoya Imura
Engineer of WiSE Japan,
UL Verification Service

Approved by:
Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service

NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

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SECTION 1: Customer information

Company Name	:	HERUTU ELECTRONICS CORPORATION
Address	:	62-1 TOYOOKA-CHO,KITA-KU,HAMAMATSU-SHI SHIZUOKA-KEN, 433-8103 JAPAN
Telephone Number	:	+81-53-438-3555
Facsimile Number	:	+81-53-438-3411
Contact Person	:	TAKASHI IKEGAYA

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

2.1 Identification of E.U.T.

Type of Equipment	:	POKAYOKE RECEIVER
Model No.	:	TW-800R
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 24.0V
Receipt Date of Sample	:	September 7, 2012
Country of Mass-production	:	Japan
Condition of EUT	:	Production 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 No: TW-800R (referred to as the EUT in this report) is the POKAYOKE RECEIVER.

General Specification

Clock frequency(ies) in the system	:	16MHz

Radio Specification

Equipment Type	:	Transceiver
Frequency of Operation	:	2403MHz - 2478MHz
Channel Spacing	:	1MHz
Modulation	:	GFSK
Antenna Type	:	RF1:1/2λ Dipole antenna (Flying Lead and U-FL connector) RF2:1/2λ Dipole antenna (SMA Male connector) *
Antenna Gain	:	2dBi
Method of Frequency Generation	:	Synthesizer
Inner voltage	:	DC 3.0V

* In case it is installed in product itself, the connecter is fixed by silicon resin.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	Test specification: FCC Part 15 Subpart C: 2012, final revised on August 13, 2012 and effective September 12, 2012
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.249 Operation within the bands 902-928MHz, 2400-2483.5MHz, 5725-5875MHz and 24.0-24.25GHz

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Deviation	Worst margin	Results
1	Conducted Emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	[FCC] Section 15.207(a) [IC] RSS-Gen 7.2.4	N/A	N/A	N/A *1)
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	[FCC] Section 15.249(a)(e) [IC] RSS-210 A2.9	N/A	10.0dB 2478.000MHz, Horizontal, PK, PK with Duty factor	Complied
3	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	[FCC] Section 15.205(a)(b) Section 15.209(a) Section 15.249(a)(d)(e) [IC] RSS-210 2.5 RSS-210 A2.9	N/A	9.3dB 2400.00MHz, Horizontal, PK, PK with Duty factor 2483.500MHz, Horizontal, PK, PK with Duty factor	Complied
4	20dB Bandwidth	ANSI C63.4:2003	Reference	N/A	N/A	Complied
5	Frequency Tolerance	ANSI C63.4:2003	[FCC] Section 15.249(b) [IC] RSS-210 A2.9	N/A	N/A	N/A *2)

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 is not the device that is designed to be connected to the public utility (AC) power line.
*2) The test is not required since this EUT does not operate with 24.05GHz to 24.25GHz.

*In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC 15.31 (e)
This EUT provides stable voltage(DC3.0V) constantly to RF part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement
The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	**IC:** RSS-Gen 4.6.1	**IC:** RSS-Gen 4.6.1	N/A	-	Radiated

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

3.4 Uncertainty

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

Test room (semi-anechoic chamber)	**Radiated emission**						
	(3m*)(±dB)				**(1m*)(±dB)**		**(0.5m*)(±dB)**
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

*3m/1m/0.5m = Measurement distance

Radiated emission test(3m)
The data listed in this test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

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

3.6 Data of EMI, Test instruments, and Test set up.

Refer to APPENDIX.

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

4.1 Operating Modes

The mode(s) : Transmitting (Tx)

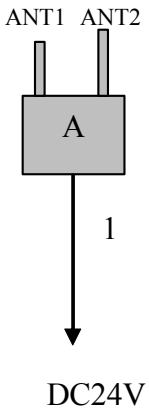
*Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Electric Field Strength of Fundamental Emission Electric Field Strength of Spurious Emission 20dB Bandwidth 99% OccupiedBandwidth	Transmitting (Tx) ,ANT2 PN9	2403MHz 2441MHz 2478MHz
The system was configured in typical fashion (as a customer would normally use it) for testing. *EUT has the power settings by the software as follows; Power settings: 0dBm Software: TW-800RF Test V1.20 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting.		

* As for the receiver (this report), preliminarily check was performed with Antenna 1 and Antenna 2, and the test was performed with Antenna 2 as its result was the worst one.

* Antenna 1 and Antenna 2 do not transmit simultaneously.

4.2 Configuration and peripherals



*Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	POKAYOKE RECEIVER	TW-800R	0181100030	HERUTU ELECTRONICS CORPORATION	EUT

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.9	Unshielded	Unshielded	-

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

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The EUT was set on the center of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
Photographs of the set up are shown in Appendix 1.

The Radiated Electric Field Strength has been measured on Semi anechoic chamber with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 and 4m (frequency 9kHz – 30MHz: loop antenna was fixed height at 1.0m) 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 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

Frequency	9kHz-150kHz	150kHz–30MHz	30MHz-1GHz	Above 1GHz	
Instrument used	Test Receiver	Test Receiver	Test Receiver	Spectrum Analyzer	
Detector	QP, AV	QP, AV	QP	PK	AV
IF Bandwidth	BW 200Hz	BW 9kHz	BW 120kHz	RBW: 1MHz VBW: 3MHz	*1)
Test Distance	3m	3m	3m	3m (below 10GHz), 1m (above 10GHz),	

*1)For Pulse emission: The Average value was calculated by reducing Duty factor from PK (PK value – Duty factor).
For Duty factor, please refer to Page 14.

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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

Measurement range : 9kHz-25GHz
Test data : APPENDIX 1
Test result : Pass

SECTION 6: 20dB Bandwidth and 99% Occupied Bandwidth

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20dB Bandwidth	3MHz	30kHz	91kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	3MHz	30kHz	91kHz	Auto	Peak*	Max Hold*	Spectrum Analyzer
*The measurement was performed with Peak detector and Max hold since the duty cycle was not 100%.							

Test data : APPENDIX 1
Test result : Pass

APPENDIX 1: Data of EMI test

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

Test place	Head Office EMC Lab. No.2&3 Semi Anechoic Chamber	
Report No.	32LE0115-HO-01	
Date	09/12/2012	09/14/2012
Temperature/ Humidity	20 deg. C / 67% RH	20 deg. C / 67% RH
Engineer	Motoya Imura	Motoya Imura
	(above 1GHz)	(below 1GHz)
Mode	Transmitting mode, 2403MHz	

QP or PK

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]	
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver
30.300	QP	22.6	28.4	6.5	7.2	28.5	-	7.8	13.6	40.0	32.2	26.4
62.120	QP	22.1	22.1	14.6	7.8	28.1	-	16.4	16.4	40.0	23.6	23.6
142.100	QP	21.4	21.4	16.7	8.3	27.8	-	18.6	18.6	40.0	21.4	21.4
480.600	QP	22.4	22.4	18.1	9.7	28.7	-	21.5	21.5	43.5	22.0	22.0
600.750	QP	22.2	22.2	19.8	10.2	28.8	-	23.4	23.4	46.0	22.6	22.6
803.000	QP	21.6	21.6	22.1	10.9	28.0	-	26.6	26.6	46.0	19.4	19.4
2390.000	PK	63.8	62.1	27.4	2.2	32.4	-	61.0	59.3	73.9	12.9	14.6
2400.000	PK	67.4	66.2	27.4	2.2	32.4	-	64.6	63.4	73.9	9.3	10.5
2403.000	PK	105.4	103.1	27.4	2.2	32.4	-	102.6	100.3	113.9	11.3	13.6
4806.000	PK	47.7	47.0	31.6	4.0	31.4	-	51.9	51.2	73.9	22.0	22.7
7209.000	PK	NS	NS	36.3	4.7	32.4	-	-	-	73.9	-	-
9612.000	PK	NS	NS	38.1	5.5	33.0	-	-	-	73.9	-	-
24030.000	PK	NS	NS	37.9	-1.8	31.1	-	-	-	73.9	-	-

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

PK with Duty factor

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]	
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver
2390.000	PK	63.8	62.1	27.4	2.2	32.4	-20.0	41.0	39.3	53.9	12.9	14.6
2400.000	PK	67.4	66.2	27.4	2.2	32.4	-20.0	44.6	43.4	53.9	9.3	10.5
2403.000	PK	105.4	103.1	27.4	2.2	32.4	-20.0	82.6	80.3	93.9	11.3	13.6
4806.000	PK	47.7	47.0	31.6	4.0	31.4	-20.0	31.9	31.2	53.9	22.0	22.7
7209.000	PK	NS	NS	36.3	4.7	32.4	-20.0	-	-	53.9	-	-
9612.000	PK	NS	NS	38.1	5.5	33.0	-20.0	-	-	53.9	-	-
24030.000	PK	NS	NS	37.9	-1.8	31.1	-20.0	-	-	53.9	-	-

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Duty factor (Refer to Duty factor data sheet)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
*NS: No Signal

* The test above 1GHz was performed with PK detect. Average emission measurements were calculated with PK detect and duty cycle factor.
* Duty Factor was calculated with the assumption of the worst condition in 100msec.

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

Test place	Head Office EMC Lab. No.2&3 Semi Anechoic Chamber	
Report No.	32LE0115-HO-01	
Date	09/12/2012	09/14/2012
Temperature/ Humidity	20 deg. C / 67% RH	20 deg. C / 67% RH
Engineer	Motoya Imura	Motoya Imura
	(above 1GHz)	(below 1GHz)
Mode	Transmitting mode, 2441MHz	

QP or PK

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]	
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver
73.352	QP	22.6	28.1	6.5	7.2	28.5	-	7.8	13.3	40.0	32.2	26.7
146.730	QP	22.1	22.1	14.6	7.8	28.1	-	16.4	16.4	40.0	23.6	23.6
220.073	QP	21.4	21.4	16.7	8.3	27.8	-	18.6	18.6	40.0	21.4	21.4
488.200	QP	22.3	22.3	18.2	9.7	28.7	-	21.5	21.5	43.5	22.0	22.0
610.250	QP	22.2	22.2	19.9	10.2	28.7	-	23.6	23.6	46.0	22.4	22.4
813.667	QP	21.6	21.6	22.1	11.0	28.0	-	26.7	26.7	46.0	19.3	19.3
2441.000	PK	106.4	104.0	27.6	2.2	32.4	-	103.8	101.4	113.9	10.1	12.5
4882.000	PK	49.0	48.3	31.9	3.9	31.4	-	53.4	52.7	73.9	20.5	21.2
7323.000	PK	NS	NS	36.5	4.7	32.5	-	-	-	73.9	-	-
9764.000	PK	NS	NS	38.3	5.5	33.0	-	-	-	73.9	-	-
24410.000	PK	NS	NS	38.0	-1.7	30.9	-	-	-	73.9	-	-

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

PK with Duty factor

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]	
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver
2441.000	PK	106.4	104.0	27.6	2.2	32.4	-20.0	83.8	81.4	93.9	10.1	12.5
4882.000	PK	49.0	48.3	31.9	3.9	31.4	-20.0	33.4	32.7	53.9	20.5	21.2
7323.000	PK	NS	NS	36.5	4.7	32.5	-20.0	-	-	53.9	-	-
9764.000	PK	NS	NS	38.3	5.5	33.0	-20.0	-	-	53.9	-	-
24410.000	PK	NS	NS	38.0	-1.7	30.9	-20.0	-	-	53.9	-	-

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Duty factor (Refer to Duty factor data sheet)

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

*NS: No Signal

*The test above 1GHz was performed with PK detect. Average emission measurements were calculated with PK detect and duty cycle factor.

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

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Engineer	Motoya Imura	Motoya Imura
	(above 1GHz)	(below 1GHz)
Mode	Transmitting mode, 2478MHz	

QP or PK

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]	
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver
73.398	QP	22.6	26.8	6.5	7.2	28.5	-	7.8	12.0	40.0	32.2	28.0
146.726	QP	22.1	22.1	14.6	7.8	28.1	-	16.4	16.4	40.0	23.6	23.6
220.098	QP	21.4	21.4	16.7	8.3	27.8	-	18.6	18.6	40.0	21.4	21.4
495.600	QP	22.3	22.3	18.3	9.7	28.8	-	21.5	21.5	43.5	22.0	22.0
619.500	QP	22.2	22.2	20.0	10.2	28.7	-	23.7	23.7	46.0	22.3	22.3
826.000	QP	21.6	21.6	22.1	11.0	28.0	-	26.7	26.7	46.0	19.3	19.3
2478.000	PK	106.3	103.4	27.7	2.2	32.3	-	103.9	101.0	113.9	10.0	12.9
2483.500	PK	67.0	64.4	27.7	2.2	32.3	-	64.6	62.0	73.9	9.3	11.9
4956.000	PK	52.1	51.5	32.2	4.0	31.4	-	56.9	56.3	73.9	17.0	17.6
7434.000	PK	NS	NS	36.7	4.8	32.5	-	-	-	73.9	-	-
9912.000	PK	NS	NS	38.6	5.6	33.1	-	-	-	73.9	-	-
24780.000	PK	NS	NS	38.1	-1.7	30.8	-	-	-	73.9	-	-

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

PK with Duty factor

Frequency	Detector	Reading [dBuV]		Ant Factor	Loss	Gain	Duty Factor	Result [dBuV/m]		Limit	Margin [dB]	
[MHz]		Hor	Ver	[dB/m]	[dB]	[dB]	[dB]	Hor	Ver	[dBuV/m]	Hor	Ver
2478.000	PK	106.3	103.4	27.7	2.2	32.3	-20.0	83.9	81.0	93.9	10.0	12.9
2483.500	PK	67.0	64.4	27.7	2.2	32.3	-20.0	44.6	42.0	53.9	9.3	11.9
4956.000	PK	52.1	51.5	32.2	4.0	31.4	-20.0	36.9	36.3	53.9	17.0	17.6
7434.000	PK	NS	NS	36.7	4.8	32.5	-20.0	-	-	53.9	-	-
9912.000	PK	NS	NS	38.6	5.6	33.1	-20.0	-	-	53.9	-	-
24780.000	PK	NS	NS	38.1	-1.7	30.8	-20.0	-	-	53.9	-	-

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier) + Duty factor (Refer to Duty factor data sheet)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
*NS: No Signal

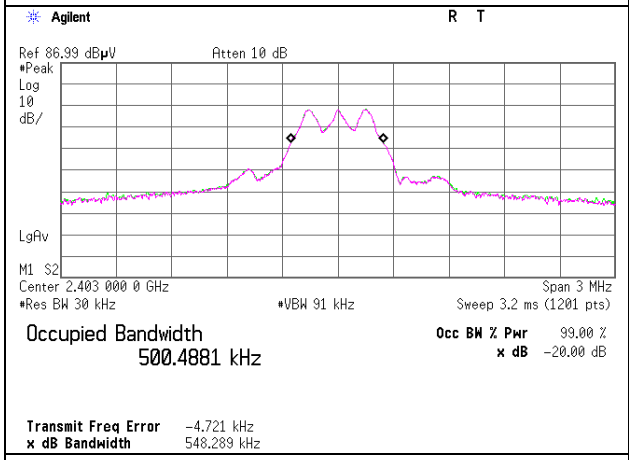
*The test above 1GHz was performed with PK detect. Average emission measurements were calculated with PK detect and Duty cycle factor.
*Duty Factor was calculated with the assumption of the worst condition in 100msec.
*The noise measured with PK detect was pulse emission.

20dB Bandwidth

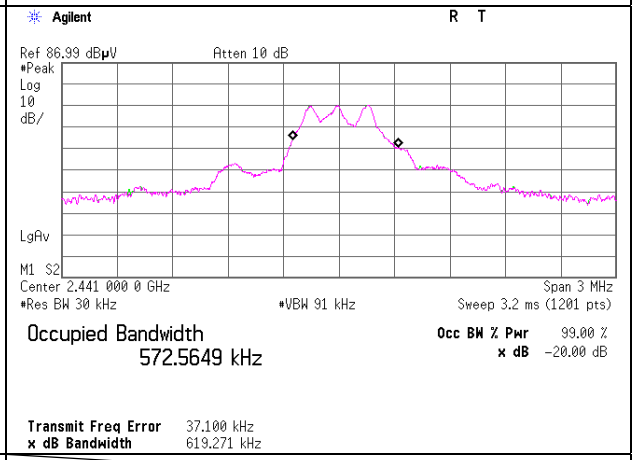
Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	32LE0115-HO-01
Date	09/14/2012
Temperature/ Humidity	20 deg. C / 67% RH
Engineer	Motoya Imura
Mode	Transmitting mode

Frequency [MHz]	20dB Bandwidth [MHz]	Limit [kHz]
2403	0.548	-
2441	0.619	-
2478	1.745	-

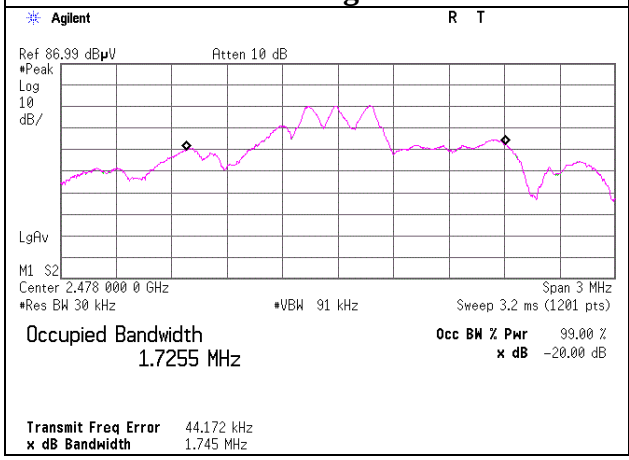
Ch:Low



Ch:Mid



Ch:High



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Duty Cycle

ON time [ms]	Times	ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
1.0000	10	10.0000	100.00	0.1000	-20.0

Duty = $20\log_{10}$(ON time/Cycle)

TW-800R is an exclusive receiver of TW-800T, and answers to a call request of TW-800T which has been established a communicative pair setup. TW-800R itself does not have the transmitting function.
TW-800R can be established a pair setup with up to four sets of TW-800T, and performs response transmission to a maximum of four sets.
Since the transmitting trigger of TW-800T has an interval of 0.1 second or more, normal response time will be 4 times at 0.1 second.
However, when TW-800T makes a mistake in receipt of response of TW-800R, TW-800T may also retransmit and respond to this infrequently.
It will be about 10 times from the various processing time that TW-800R can answer to the utmost.
Since one response transmitting time of TW-800R is **0.001** second, **0.1** second will have the transmission of **0.01** second at the maximum.

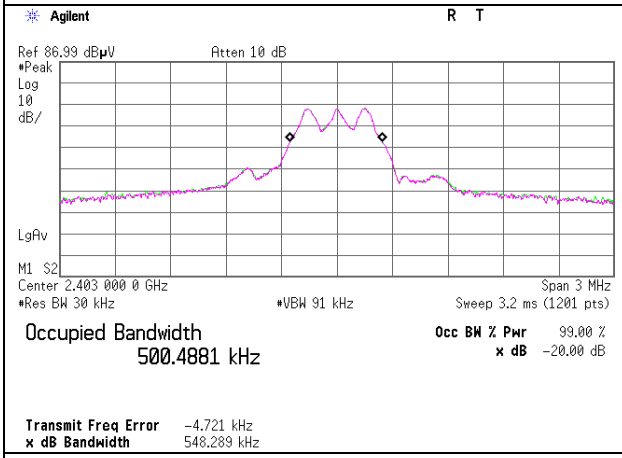
* We calculated the duty value based on the above information provided by the customer.

99% Occupied Bandwidth

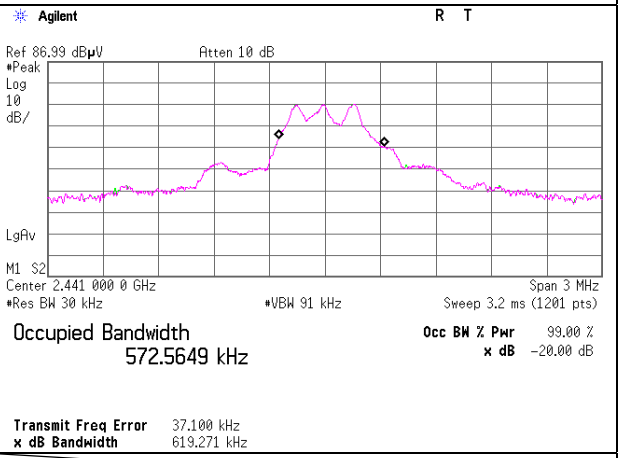
Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	32LE0115-HO-01
Date	09/14/2012
Temperature/ Humidity	20 deg. C / 67% RH
Engineer	Motoya Imura
Mode	Transmitting mode

Frequency [MHz]	99%Occupied Bandwidth [MHz]	Limit [kHz]
2403	0.500	-
2441	0.573	-
2478	1.726	-

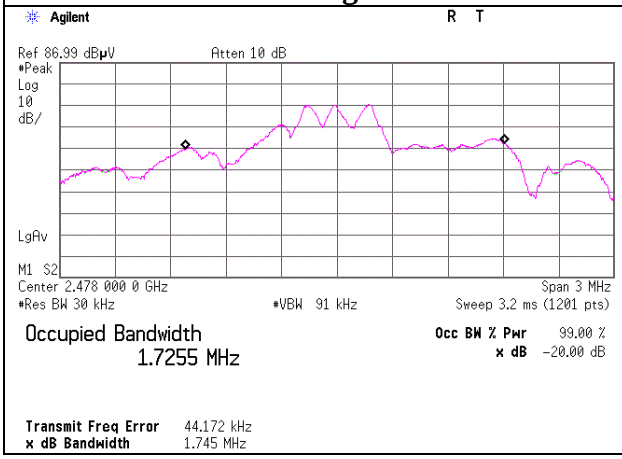
Ch:Low



Ch:Mid



Ch:High



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APPENDIX 2: Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12
MJM-15	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2011/11/23 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2012/05/25 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2012/09/05 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2012/03/29 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2012/05/21 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2012/04/06 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2012/04/03 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2011/10/23 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2011/10/23 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2011/11/02 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2011/10/19 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2012/07/27 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/5D-2W(5m)/5D-2W(0.8m)/5D-2W(1m)	-	RE	2012/02/16 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12

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, 20dB bandwidth, 99% occupied bandwidth