

EMI TEST REPORT

Test Report No. 14785961M-A

Customer	Hitachi, Ltd.
Description of EUT	Contactless Vein Authentication Unit
Model Number of EUT	PC-KCC310
FCC ID	ZQDPCKCC310
Test Regulation	FCC Part 15 Subpart B, Class A
Test Result	Complied
Issue Date	May 26, 2023
Remarks	-

Representative test engineerTomoyuki Watanabe
Engineer**Approved by**Tadashi Kuroda
Leader

CERTIFICATE 1266.01

- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
- ☒ There is no testing item of "Non-accreditation".

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 22.0

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- The information provided from the customer for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No. 14785961M-A

Revision	Test report No.	Date	Page revised Contents
- (Original)	14785961M-A	May 26, 2023	-

Reference: Abbreviations (Including words undescribed in this report)

AAN	Asymmetric Artificial Network	GPS	Global Positioning System
AC	Alternating Current	Hori.	Horizontal
AM	Amplitude Modulation	ICES	Interference-Causing Equipment Standard
AMN	Artificial Mains Network	I/O	Input/Output
Amp, AMP	Amplifier	IEC	International Electrotechnical Commission
ANSI	American National Standards Institute	IEEE	Institute of Electrical and Electronics Engineers
Ant, ANT	Antenna	IF	Intermediate Frequency
AP	Access Point	ILAC	International Laboratory Accreditation Conference
ASK	Amplitude Shift Keying	ISED	Innovation, Science and Economic Development Canada
Atten., ATT	Attenuator	ISN	Impedance Stabilization Network
AV	Average	ISO	International Organization for Standardization
BPSK	Binary Phase-Shift Keying	JAB	Japan Accreditation Board
BR	Bluetooth Basic Rate	LAN	Local Area Network
BT	Bluetooth	LCL	Longitudinal Conversion Loss
BT LE	Bluetooth Low Energy	LIMS	Laboratory Information Management System
BW	BandWidth	LISN	Line Impedance Stabilization Network
C.F	Correction Factor	MRA	Mutual Recognition Arrangement
Cal Int	Calibration Interval	N/A	Not Applicable
CAV	CISPR AV	NIST	National Institute of Standards and Technology
CCK	Complementary Code Keying	NS	No signal detect.
CDN	Coupling Decoupling Network	NSA	Normalized Site Attenuation
Ch., CH	Channel	NVLAP	National Voluntary Laboratory Accreditation Program
CISPR	Comite International Special des Perturbations Radioelectriques	OBW	Occupied Band Width
Corr.	Correction	OFDM	Orthogonal Frequency Division Multiplexing
CPE	Customer premise equipment	PK	Peak
CW	Continuous Wave	P _{LT}	long-term flicker severity
DBPSK	Differential BPSK	POHC(A)	Partial Odd Harmonic Current
DC	Direct Current	Pol., Pola.	Polarization
DET	Detector	PR-ASK	Phase Reversal ASK
D-factor	Distance factor	P _{ST}	short-term flicker severity
Dmax	maximum absolute voltage change during an observation period	QAM	Quadrature Amplitude Modulation
DQPSK	Differential QPSK	QP	Quasi-Peak
DSSS	Direct Sequence Spread Spectrum	QPSK	Quadrature Phase Shift Keying
DUT	Device Under Test	r.m.s., RMS	Root Mean Square
EDR	Enhanced Data Rate	RBW	Resolution Band Width
e.i.r.p., EIRP	Equivalent Isotropically Radiated Power	RE	Radio Equipment
EM clamp	Electromagnetic clamp	REV	Reverse
EMC	ElectroMagnetic Compatibility	RF	Radio Frequency
EMI	ElectroMagnetic Interference	RFID	Radio Frequency Identifier
EMS	ElectroMagnetic Susceptibility	RSS	Radio Standards Specifications
EN	European Norm	Rx	Receiving
e.r.p., ERP	Effective Radiated Power	SINAD	Ratio of (Signal + Noise + Distortion) to (Noise + Distortion)
ETSI	European Telecommunications Standards Institute	S/N	Signal to Noise ratio
EU	European Union	SA, S/A	Spectrum Analyzer
EUT	Equipment Under Test	SG	Signal Generator
Fac.	Factor	SVSWR	Site-Voltage Standing Wave Ratio
FCC	Federal Communications Commission	THC(A)	Total Harmonic Current
FHSS	Frequency Hopping Spread Spectrum	THD(%)	Total Harmonic Distortion
FM	Frequency Modulation	TR	Test Receiver
Freq.	Frequency	Tx	Transmitting
FSK	Frequency Shift Keying	VBW	Video BandWidth
Fund	Fundamental	Vert.	Vertical
FWD	Forward	WLAN	Wireless LAN
GFSK	Gaussian Frequency-Shift Keying	xDSL	Generic term for all types of DSL technology
GNSS	Global Navigation Satellite System	-	(DSL: Digital Subscriber Line)

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Section 1: Customer information

Company Name	Hitachi, Ltd.
Address	Tower B, Omori Bellport Building, 6-26-2, Minami-Oi, Shinagawa-ku Tokyo, 140-8573 Japan
Telephone Number	+81-80-5931-7168
Contact Person	Keiji Kitane

The information provided from the customer is as follows;

- Customer, Type of EUT, Model Number of EUT on the cover and other relevant pages
 - Operating/Test Mode(s) (Mode(s)) on all the relevant pages
 - SECTION 1: Customer information
 - SECTION 2: Equipment under test (EUT) other than the Receipt Date and Test Date
 - SECTION 4: Operation of EUT during testing
- * The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

Section 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	Contactless Vein Authentication Unit
Model Number	PC-KCC310
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	April 28, 2023
Test Date	May 10 to May 11, 2023

2.2 Product description

General Specification

Rating	AC 100 V to 240 V, 50 / 60 Hz DC 12 V, 3 A
Size	Excluding cable: 96 x 135 x 83 (Width x Depth x Height (mm))
Clock frequency (ies) in the system	CPU: 1.8 GHz, USB 240 MHz

Section 3: Test specifications, procedures and results

3.1 Test specification

Test Specification	FCC Part 15 Subpart B The latest version on the first day of the testing period
Title	FCC 47CFR Part15 Radio Frequency Device Subpart B Unintentional Radiators

3.2 Procedures & results

Test Item	Test Procedure	Limits	Deviation	Worst margin	Result	Remarks
Conducted emission	ANSI C63.4:2014 7. AC powerline conducted emission measurements	Class A	N/A	25.8 dB Freq: 0.15000 MHz Detector: Quasi-Peak Phase: L	Complied	-
Radiated emission	ANSI C63.4:2014 8. Radiated emission measurements	Class A	N/A	7.0 dB Freq: 240.000 MHz Detector: Quasi-Peak Pola: Vertical	Complied	*1)

Note: UL Japan, Inc.'s EMI Work Procedure: Work Instructions-ULID-003591.

*1) Measurements were limited up to 9 GHz since the highest frequency of internal source of the EUT is 1.8 GHz.

3.3 Addition to standards

No addition, exclusion nor deviation has been made from the standards.

3.4 Confirmation

UL Japan, Inc. hereby confirm that EUT, in the configuration tested, complies with the specification(s)
FCC Part 15 Subpart B Class A.

3.5 Uncertainty

EMI

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

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

Item	Frequency range	Calculate Uncertainty ($\pm$)
Conducted emission (AC Mains) AMN	9 kHz - 150 kHz	3.6 dB
	150 kHz - 30 MHz	3.2 dB
Radiated emission (Measurement distance: 3 m)	30 MHz - 200 MHz	6.2 dB
	200 MHz - 1 GHz	6.3 dB
	1 GHz - 6 GHz	5.0 dB
	6 GHz - 18 GHz	5.4 dB

3.6 Test Location

UL Japan, Inc. Kashima EMC Lab.
1614 Mushihata, Katori-shi, Chiba-ken, 289-0341 Japan
Telephone: +81 478 88 6500
A2LA Certificate Number: 1266.01 / FCC Test Firm Registration Number: 910230
ISED Lab Company Number: 4659A / CAB identifier: JP0006

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Open site	6.0 x 5.5 x 2.5	20 x 40	10 m
No.5 Open site	8.6 x 7.1 x 2.4	18 x 23	10 m
No.1 Shielded room	5.4 x 4.5 x 2.3	-	-
No.5 Shielded Room	4.2 x 3.1 x 2.5	-	-
No.9 Shielded Room	6.1 x 3.6 x 2.8	-	-
No.6 Semi-anechoic Chamber	8.5 x 5.5 x 5.2	-	3 m
No.10 Semi-anechoic Chamber	18.4 x 9.9 x 7.7	-	10 m
No.11 Semi-anechoic Chamber	9.0 x 6.5 x 5.2	-	3 m
No.1 Measurement room	5.0 x 3.7 x 2.6	-	-
No.2 Measurement room	4.3 x 4.4 x 2.7	-	-

3.7 Test setup, Test Data & Test instruments

Refer to Appendix 1 to 3.

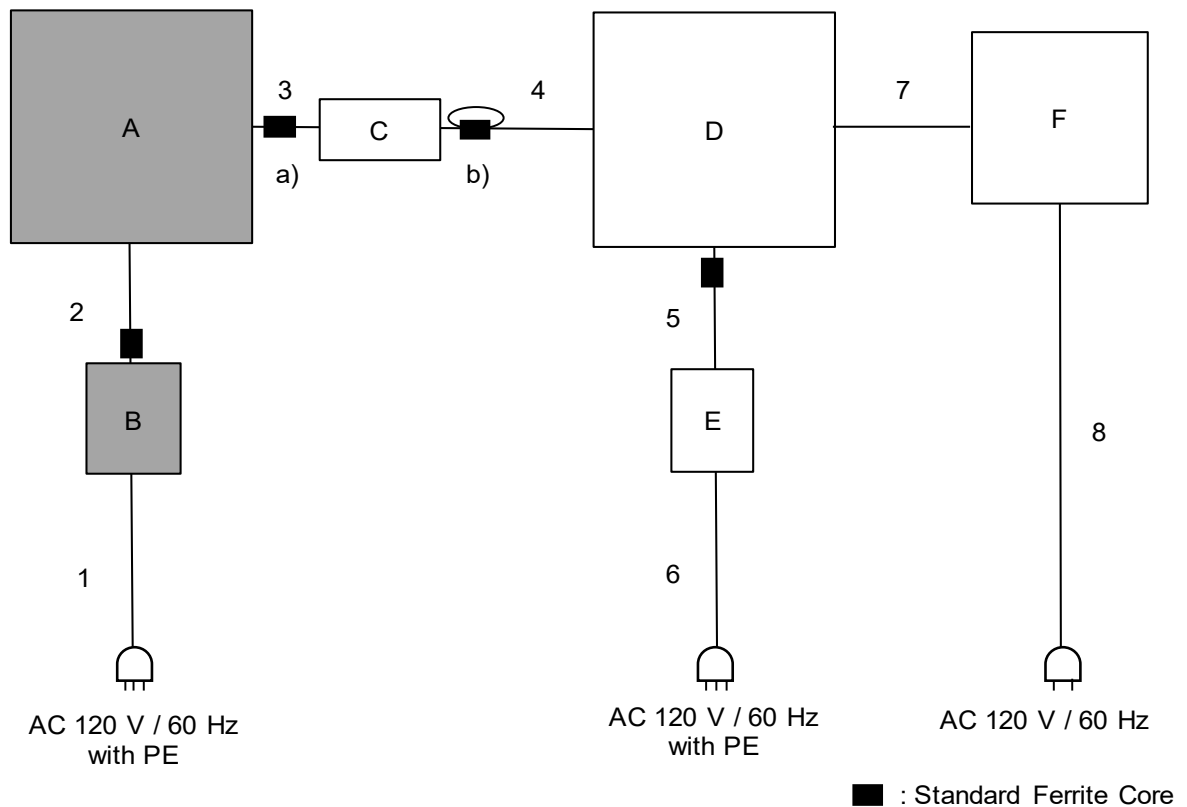
Section 4: Operation of EUT during testing

4.1 Operating mode

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Operating mode(s)	Continuous registration/authentication mode
Software	C-1 firmware Version: V01-04
Justification	The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals



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

*As a result of comparing AC 120 V and AC 240 V at pre-check, conducted emission test was performed with AC 120 V of the worst voltage as representative.

EUT(s) and support equipment(s)

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Contactless Vein Authentication Unit	PC-KCC310	No.4	Hitachi, Ltd.	EUT
B	AC Adapter	ADP-36PH B	3DQW129011S	DELTA ELECTRONICS, INC.	EUT
C	USB-LAN Adapter	ETG5-US3	BC50132832IM	IO DATA	-
D	Laptop PC	Vostro 3500	4N3K6 A01	DELL	-
E	AC Adapter	LA45NM140	CN-0KXTTW-LOC00-13G-4274-A12	DELL	-
F	Printer	K10220	FBJY52587	Canon	-

Cable(s) used

No.	Cable name	Length [m]	Shield		Remarks
			Cable	Connector	
1	AC Cable	1.0	Unshielded	Unshielded	3 wires
2	DC Cable	1.4	Unshielded	Unshielded	-
3	USB Cable	0.1	Shielded	Shielded	-
4	LAN Cable	3.0	Unshielded	Unshielded	Cat.6
5	DC Cable	1.8	Unshielded	Unshielded	-
6	AC Cable	0.9	Unshielded	Unshielded	3 wires
7	USB Cable	2.0	Shielded	Shielded	-
8	AC Cable	1.7	Unshielded	Unshielded	2 wires

Notes for Ferrite core(s)

No.	Model number	Manufacturer	Distance from the item [cm]	Turn(s)	Remarks
a)	ESD-SR-100	TOKIN	1	1	-
b)	FRC-H13	KITAGAWA INDUSTRIES	6	2	-

Section 5: Conducted emission

5.1 Operating environment

Test room	Refer to data
Temperature	Refer to data
Humidity	Refer to data

5.2 Test configuration

EUT was placed on a wooden table of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT and its peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm from the LISN/AMN. I/O cables that were connected to the other peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/AMN to the input power source. All unused 50 ohm connectors of the LISN/AMN were resistivity terminated in 50 ohm when not connected to the measuring equipment.

Photographs of the set up are shown in Appendix 1.

5.3 Test conditions

Frequency range	0.15 MHz to 30 MHz
EUT position	Table top
EUT operation	See Clause 4.1

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT within an open site. The EUT was connected to a Line Impedance Stabilization Network (LISN) / Artificial Mains network (AMN).

An overview sweep with peak detection has been performed. The measurements have been performed with a quasi-peak detector and if required, with an average detector.

The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type	QP	CISPR AV
IF Bandwidth	9 kHz	9 kHz

5.5 Results

Summary of the test results	Pass
-----------------------------	------

The test result is rounded off to one or two decimal places, so some differences might be observed.

Section 6: Radiated emission

6.1 Operating environment

Test room	Refer to data
Temperature	Refer to data
Humidity	Refer to data

6.2 Test configuration

EUT was placed on a polystyrene foam of nominal size, 1.0 m by 2.0 m (below 1 GHz), 1.0 m by 1.5 m (above 1 GHz), raised 0.8 m above the conducting ground plane.

The EUT was set on the edge 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.

6.3 Test conditions

Frequency range	30 MHz to 9000 MHz
Test distance	10.0 m (below 1 GHz) 3.0 m (above 1 GHz)
EUT position	Table top

6.4 Test procedure

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

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

For above 1 GHz, test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beam width of the antenna.

Test antenna was aimed at the emission source for receiving the maximum signal and always kept. (above 1 GHz)

The radiated emission measurements were made with the following detector function of the Test Receiver and Spectrum Analyzer.

Frequency	Below 1 GHz	Above 1 GHz *1)	
Instrument used	Test receiver	Spectrum analyzer	
Detector Type	QP	AV *2)	PK
IF Band width	120 kHz	RBW 1 MHz/ VBW 10 Hz	RBW 1 MHz/ VBW 3 MHz

*1) The measurement data was adjusted to a 10.0 m distance using the following Distance Factor.

Distance Factor: See Figure 2.

*2) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Figure 1: Antenna angle and Absorber placement

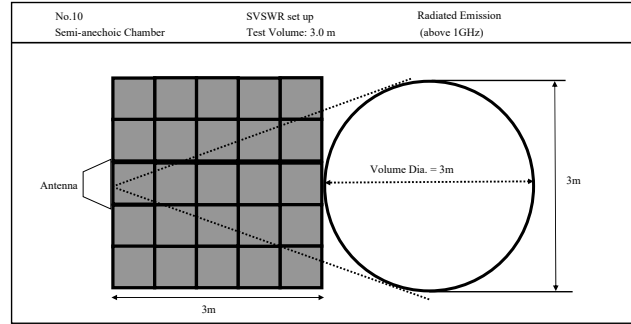
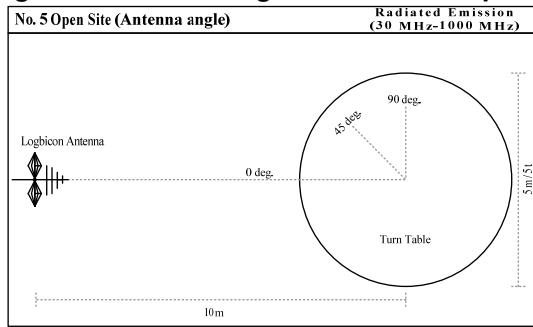
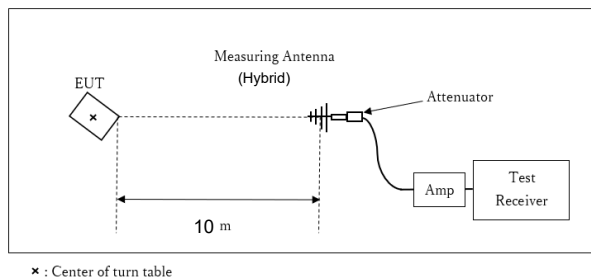


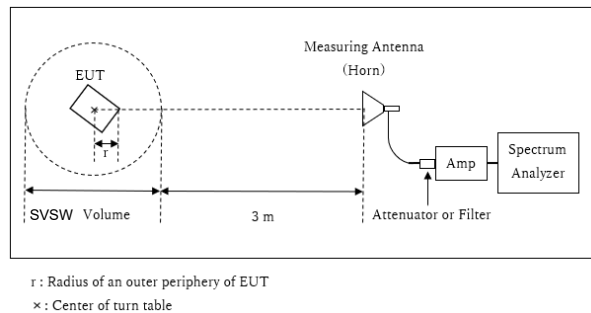
Figure 2: Test Setup

Below 1 GHz



*Test Distance: 10 m

1 GHz to 9 GHz



Distance Factor: $20 \times \log (3.60 \text{ m} / 10 \text{ m}) = -8.87 \text{ dB}$

*Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.6 \text{ m}$

SVSWR Volume: 3 m

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

$r = 0.9 \text{ m}$

The test was made on EUT at the normal use position.

6.5 Results

Summary of the test results	Pass
-----------------------------	------

The test result is rounded off to one or two decimal places, so some differences might be observed.

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.5 Open area test site
Date : 2023/05/10

Company : Hitachi, Ltd.

Kind of EUT : Contactless Vein Authentication Unit

Model No. : PC-KCC310

Serial No. : No.4

Remarks : -

Mode : Continuous registration/authentication mode

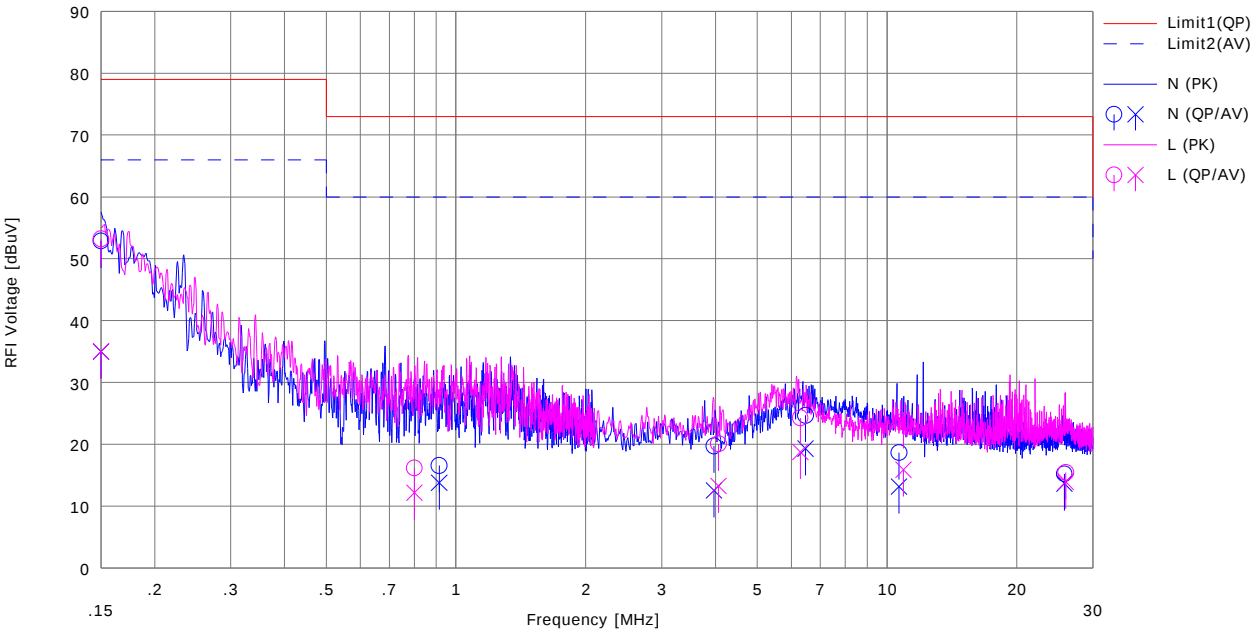
Order No. : 14785961

Power : AC 120 V / 60 Hz

Temp./Humi. : 21 deg.C / 51 %RH

Limit : FCC_Part 15 Subpart B(15.107)_Class A

Tested by : Tomoyuki Watanabe



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	42.80	24.90	10.08	52.88	34.98	79.00	66.00	26.1	31.0	N	
2	0.91395	6.40	3.60	10.18	16.58	13.78	73.00	60.00	56.4	46.2	N	
3	3.96800	9.30	2.10	10.44	19.74	12.54	73.00	60.00	53.2	47.4	N	
4	6.47536	14.10	8.70	10.62	24.72	19.32	73.00	60.00	48.2	40.6	N	
5	10.66543	7.80	2.30	10.87	18.67	13.17	73.00	60.00	54.3	46.8	N	
6	25.77568	3.60	2.00	11.65	15.25	13.65	73.00	60.00	57.7	46.3	N	
7	0.15000	43.10	24.90	10.10	53.20	35.00	79.00	66.00	25.8	31.0	L	
8	0.80075	6.00	2.00	10.19	16.19	12.19	73.00	60.00	56.8	47.8	L	
9	4.06600	9.60	2.80	10.48	20.08	13.28	73.00	60.00	52.9	46.7	L	
10	6.29254	13.60	8.10	10.67	24.27	18.77	73.00	60.00	48.7	41.2	L	
11	10.92103	12.70	4.90	11.01	23.71	15.91	73.00	60.00	49.2	44.0	L	
12	25.99365	3.50	2.00	11.97	15.47	13.97	73.00	60.00	57.5	46.0	L	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.5 Open area test site

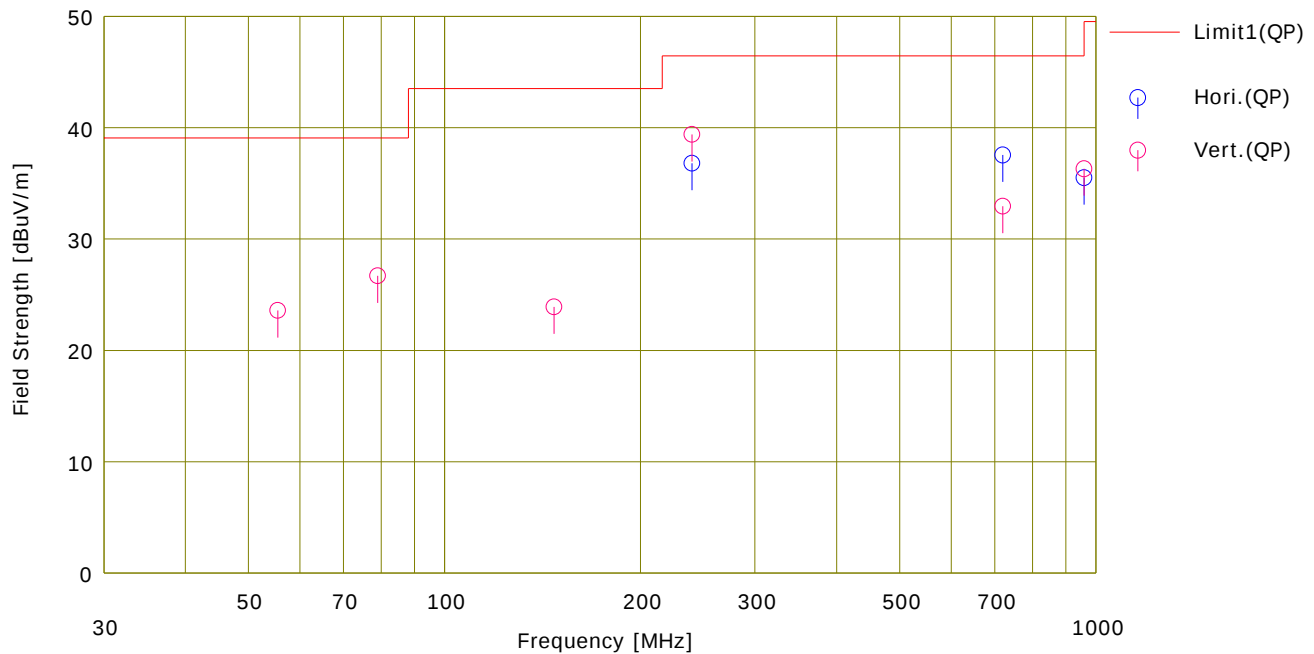
Date : 2023/05/11

Company : Hitachi, Ltd.
 Kind of EUT : Contactless Vein Authentication Unit
 Model No. : PC-KCC310
 Serial No. : No.4
 Remarks : -

Mode : Continuous registration/authentication mode
 Order No. : 14785961
 Power : AC 120 V / 60 Hz
 Temp./Humi. : 19 deg.C / 58 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class A

Tested by : Tomoyuki Watanabe



No.	Freq.	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height	Angle	Ant. Type	Comment
		<QP>				<QP>	<QP>	<QP>					
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	240.000	44.30	11.23	8.44	27.17	36.80	46.44	9.6	Hori.	400	54	HB	
2	720.000	33.90	21.11	11.37	28.84	37.54	46.44	8.9	Hori.	400	0	HB	
3	960.000	27.20	24.01	12.50	28.20	35.51	46.44	10.9	Hori.	100	160	HB	
4	55.471	31.40	13.42	6.46	27.69	23.59	39.08	15.4	Vert.	100	291	HB	
5	78.945	38.00	9.57	6.80	27.68	26.69	39.08	12.3	Vert.	113	97	HB	
6	147.275	30.90	12.92	7.60	27.52	23.90	43.52	19.6	Vert.	100	0	HB	
7	240.000	46.90	11.23	8.44	27.17	39.40	46.44	7.0	Vert.	100	352	HB	
8	720.000	29.30	21.11	11.37	28.84	32.94	46.44	13.5	Vert.	315	303	HB	
9	960.000	28.00	24.01	12.50	28.20	36.31	46.44	10.1	Vert.	180	175	HB	

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]

Ant.Type=HB: Hybrid Antenna

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber

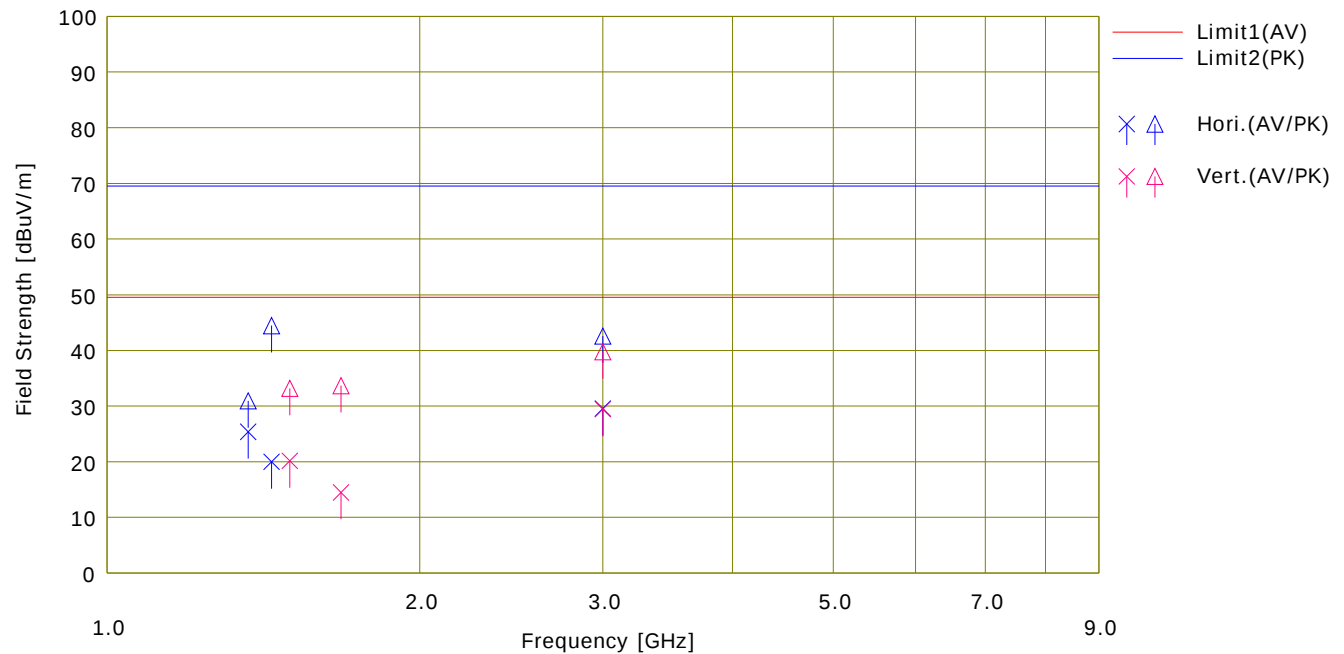
Date : 2023/05/11

Company : Hitachi, Ltd.
 Kind of EUT : Contactless Vein Authentication Unit
 Model No. : PC-KCC310
 Serial No. : No.4
 Remarks : Test Distance = 3.6 m

Mode : Continuous registration/authentication mode
 Order No. : 14785961
 Power : AC 120 V / 60 Hz
 Temp./Humi. : 19 deg.C / 49 %RH

Limit : FCC_Part 15 Subpart B(15.109)_Class A

Tested by : Keigo Kaneoya



No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	D.Fac [dB]	Result		Limit		Margin		Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<AV>	<PK>					<AV>	<PK>	<AV>	<PK>	<AV>	<PK>					
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]					
1	1368.000	50.02	55.56	25.25	2.39	43.41	-8.87	25.38	30.92	49.54	69.54	24.1	38.6	Hori.	365	289	Horn	
2	1440.000	44.48	68.91	25.45	2.47	43.53	-8.87	20.00	44.43	49.54	69.54	29.5	25.1	Hori.	371	344	Horn	
3	3000.000	49.17	62.18	29.14	3.61	43.51	-8.87	29.54	42.55	49.54	69.54	20.0	26.9	Hori.	310	141	Horn	
4	1500.000	44.57	57.60	25.55	2.51	43.61	-8.87	20.15	33.18	49.54	69.54	29.3	36.3	Vert.	126	170	Horn	
5	1680.000	39.01	58.19	25.34	2.66	43.65	-8.87	14.49	33.67	49.54	69.54	35.0	35.8	Vert.	135	168	Horn	
6	3000.000	49.05	59.37	29.14	3.61	43.51	-8.87	29.42	39.74	49.54	69.54	20.1	29.8	Vert.	100	73	Horn	

Appendix 3 : Test Instruments

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Cal Date	CalInt
CE	CLS-08	143502	A.M.N.	Rohde & Schwarz	ESH3-Z5	847265/011	2022/07/20	12
CE	CLS-11	143505	A.M.N.	Rohde & Schwarz	ESH3-Z5	835239/022	2022/07/20	12
CE	CTM-28	143705	Terminator	Suhner	65_BNC-50-0-2/133_NE	none	2022/11/08	12
CE	CCC-S5-C(SR)	143167	5 Site CE (SR) System	N/A	none(No.5 CE SR)	-	2022/07/01	12
CE	CTR-04	144195	Test Receiver	Rohde & Schwarz	ESCI	100053	2022/09/14	12
RE	CCC-S5-RL	142985	5 Site RE System	N/A	none(No.5 RE)	none	2023/01/11	12
RE	CBL-06	143119	LOGBICON	Schwarzbeck Mess-Elektronik	VULB 9168	130	2023/04/18	12
RE	CAF-06	142928	Pre-Amplifier	Hewlett Packard	8447D	2944A09906	2022/07/01	12
RE	CAT5-02	178805	5dB Fixed Atten.	Pasternack Enterprises	PE7047-5	none	2023/04/18	12
RE	CTR-04	144195	Test Receiver	Rohde & Schwarz	ESCI	100053	2022/09/14	12
RE	COATS-05(NSA)	144665	Open Site	EMC Kashima	NSA (No.5)	5	2022/05/18	12
RE	CHA-24	143455	Double Ridged Wave Guide	ETS-Lindgren (Cedar Park,	3115	00204569	2023/02/04	12
RE	CCC-G09	143140	Micro Wave Cable	Junkosha	MWX221	1407S222	2022/11/21	12
RE	CCC-G16	192243	Microwave Cable	Huber+Suhner	SF104/11N/11PC35/8000MM	808995/4	2023/01/17	12
RE	CAF-22	142940	Pre-Amplifier	Micro Wave Factory	MPR-1G26.5-35	161399	2022/06/14	12
RE	CAEC-10(SVSWR)	144633	Semi Anechoic Chamber	TDK	SVSWR (No.10)	10	2022/05/09	12
EMI	CSCL-21	222614	Measure	SHINWA RULES CO., LTD.	80862	none	-	-
EMI	COS-30	222854	Temperature & Humidity Logger	HIOKI E.E. CORPORATION	LR5001/LR9504	220820033/220899853	2022/09/20	12
EMI	CBM-10	143133	Barometer	Sanoh Co., Ltd	SBR-151	001439	2023/03/10	36
EMI	CTS-09	144211	Digital Multimeter	Fluke Corporation	112	89790194	2022/10/19	12
EMI	COTS-CEMI-03	178804	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	Ver 3.1.0484	-	-

*Hyphens for Last Calibration 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.

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

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

Test Item :

CE:Conducted emission

RE:Radiated emission

End of Report