

RADIO TEST REPORT

Test Report No. 15230055M-A-R2

Customer	G-Printec, Inc.
Description of EUT	Card Printer
Model Number of EUT	CX-7650
FCC ID	2AL3XG4S002
Test Regulation	FCC Part 15 Subpart C
Test Result	Complied
Issue Date	March 18, 2025
Remarks	Except Frequency Tolerance test

Representative test engineerKazuhiro Ando
Engineer**Approved by**Kenichi Suda
Manager

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# 24.0

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REVISION HISTORY

Original Test Report No. 15230055M-A

This report is a revised version of 15230055M-A-R1. 15230055M-A-R1 is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15230055M-A	December 18, 2024	-
1	15230055M-A-R1	March 7, 2025	p.5 - Corrected the Frequency of Operation From '13.56 kHz' to '13.56 MHz' - Added the difference from the base model for similar model CX-D90H: 'Shape of front door' p.9 - Corrected the electric current from 'DC' to 'AC' in the Voltage for Frequency Tolerance.
2	15230055M-A-R2	March 18, 2025	p.1 Added the remarks 'Except Frequency Tolerance test' p.6, 7, 9, 14, 24, and 28 Deleted the Frequency Tolerance parts

Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	ICES	Interference-Causing Equipment Standard
AC	Alternating Current	IEC	International Electrotechnical Commission
AFH	Adaptive Frequency Hopping	IEEE	Institute of Electrical and Electronics Engineers
AM	Amplitude Modulation	IF	Intermediate Frequency
Amp, AMP	Amplifier	ILAC	International Laboratory Accreditation Conference
ANSI	American National Standards Institute	ISED	Innovation, Science and Economic Development Canada
Ant, ANT	Antenna	ISO	International Organization for Standardization
AP	Access Point	JAB	Japan Accreditation Board
ASK	Amplitude Shift Keying	LAN	Local Area Network
Atten., ATT	Attenuator	LIMS	Laboratory Information Management System
AV	Average	MCS	Modulation and Coding Scheme
BPSK	Binary Phase-Shift Keying	MRA	Mutual Recognition Arrangement
BR	Bluetooth Basic Rate	N/A	Not Applicable
BT	Bluetooth	NIST	National Institute of Standards and Technology
BT LE	Bluetooth Low Energy	NS	No signal detect.
BW	BandWidth	NSA	Normalized Site Attenuation
Cal Int	Calibration Interval	NVLAP	National Voluntary Laboratory Accreditation Program
CCK	Complementary Code Keying	OBW	Occupied Band Width
Ch., CH	Channel	OFDM	Orthogonal Frequency Division Multiplexing
CISPR	Comite International Special des Perturbations Radioelectriques	P/M	Power meter
CW	Continuous Wave	PCB	Printed Circuit Board
DBPSK	Differential BPSK	PER	Packet Error Rate
DC	Direct Current	PHY	Physical Layer
D-factor	Distance factor	PK	Peak
DFS	Dynamic Frequency Selection	PN	Pseudo random Noise
DQPSK	Differential QPSK	PRBS	Pseudo-Random Bit Sequence
DSSS	Direct Sequence Spread Spectrum	PSD	Power Spectral Density
EDR	Enhanced Data Rate	QAM	Quadrature Amplitude Modulation
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	QP	Quasi-Peak
EMC	ElectroMagnetic Compatibility	QPSK	Quadri-Phase Shift Keying
EMI	ElectroMagnetic Interference	RBW	Resolution Band Width
EN	European Norm	RDS	Radio Data System
ERP, e.r.p.	Effective Radiated Power	RE	Radio Equipment
EU	European Union	RF	Radio Frequency
EUT	Equipment Under Test	RMS	Root Mean Square
Fac.	Factor	RSS	Radio Standards Specifications
FCC	Federal Communications Commission	Rx	Receiving
FHSS	Frequency Hopping Spread Spectrum	SA, S/A	Spectrum Analyzer
FM	Frequency Modulation	SG	Signal Generator
Freq.	Frequency	SVSWR	Site-Voltage Standing Wave Ratio
FSK	Frequency Shift Keying	TR	Test Receiver
GFSK	Gaussian Frequency-Shift Keying	Tx	Transmitting
GNSS	Global Navigation Satellite System	VBW	Video BandWidth
GPS	Global Positioning System	Vert.	Vertical
Hori.	Horizontal	WLAN	Wireless LAN

CONTENTS	PAGE
SECTION 1: Customer Information	5
SECTION 2: Equipment Under Test (EUT).....	5
SECTION 3: Test specification, procedures & results	6
SECTION 4: Operation of EUT during testing	9
SECTION 5: Conducted Emission.....	11
SECTION 6: Radiated Emission (Fundamental, Spurious Emission and Spectrum Mask)	12
SECTION 7: Other tests.....	14
APPENDIX 1: Test data	15
Conducted Emission	15
Fundamental Emission and Spectrum Mask	17
Spurious Emission	19
20 dB Bandwidth and 99% Occupied Bandwidth.....	23
APPENDIX 2: Test instruments	24
APPENDIX 3: Photographs of test setup.....	25
Conducted Emission	25
Radiated Emission	26

SECTION 1: Customer Information

Company Name	G-Printec, Inc.
Address	Kawasaki Tech Center 5F, 580-16 Horikawacho, Saiwai-ku Kawasaki-shi kanagawa 212-0013, Japan
Telephone Number	+81-44-540-3242
Contact Person	Daisuke Kamiwano

The information provided by the customer is as follows;

- Customer, Description of EUT, Model Number of EUT, FCC ID 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

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	Card Printer
Model Number	CX-7650
Serial Number	Refer to SECTION 4.2
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	March 19, 2024
Test Date	March 21 to March 25, 2024

2.2 Product Description

General Specification

Rating	AC 100 V to 120 V, 3.5 A, 50 / 60 Hz AC 220 V to 240 V, 1.6 A, 50 / 60 Hz
Operating Temperature	+15 deg. C to +30 deg. C

The EUT has following similar model:

Model No.	Difference from the base model
CX-7650 (EUT)	-
CX-D90H	External enclosure color, Shape of front door
K65	External enclosure color

Although the model names differ (CX-7650, CX-D90H, and K65), the electrical structure, safety features, and EMC characteristics are identical across all three models. The only difference lies in the external enclosure.

Radio Specification

Equipment Type	Transmitter
Frequency of Operation	13.56 MHz
Type of Modulation	ASK

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart C The latest version on the first day of the testing period
Title	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.225 Operation within the band 13.110-14.010 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 <ISED> RSS-Gen 8.8	<FCC> Section 15.207 ----- <ISED> RSS-Gen 8.8	0.8 dB, 0.19462 MHz, with Tag, AV, L	Complied	-
Electric Field Strength of Fundamental Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 6.4, 6.12	<FCC> Section 15.225(a) ----- <ISED> RSS-210 B.6	76.7 dB, 13.56000 MHz, without Tag, QP, 0 deg.	Complied	Radiated
Spectrum Mask	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 6.4, 6.13	<FCC> Section 15.225(b)(c) ----- <ISED> RSS-210 B.6	43.6 dB, 13.11000 MHz, without Tag, QP, 0 deg.	Complied	Radiated
20 dB Bandwidth	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> -	<FCC> Section15.215(c) ----- <ISED> -	See data	Complied	Radiated
Electric Field Strength of Spurious Emission	<FCC> ANSI C63.10:2013 6 Standard test methods <ISED> RSS-Gen 6.4, 6.13	<FCC> Section 15.209, Section 15.225 (d) ----- <ISED> RSS-210 B.6 RSS-Gen 8.9	2.5 dB 40.029 MHz, with Tag, Vertical, QP	Complied	Radiated
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.					

FCC Part 15.31 (e)

This EUT provides stable voltage constantly to RF Module regardless of input voltage.
Therefore, this EUT complies with the requirement.

However, the supply voltage was varied and tested at 85 % and 115 % of the nominal rated supply voltage during frequency tolerance test according to Section 15.225(e).

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.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% emission bandwidth	<ISED>RSS-Gen 6.7	-	N/A	-	Radiated
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.					

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

3.4 Uncertainty

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 $k = 2$.

Conducted emission

Frequency range	Calculate Uncertainty (+/-)
0.15 MHz to 30 MHz	3.4 dB

Radiated emission

Measurement distance	Frequency range	Calculate Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
	30 MHz to 200 MHz	6.2 dB
	200 MHz to 1000 MHz	6.3 dB
	1 GHz to 6 GHz	4.7 dB
	6 GHz to 18 GHz	5.1 dB
	18 GHz to 40 GHz	5.5 dB
1 m	1 GHz to 18 GHz	5.2 dB
	18 GHz to 40 GHz	5.6 dB
0.5m	26.5 GHz to 40 GHz	5.8 dB

Antenna Terminal test

Test Item	Calculate Uncertainty (+/-)
20 dB Bandwidth / 99 % Occupied Bandwidth	1.2 %

3.5 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

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	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

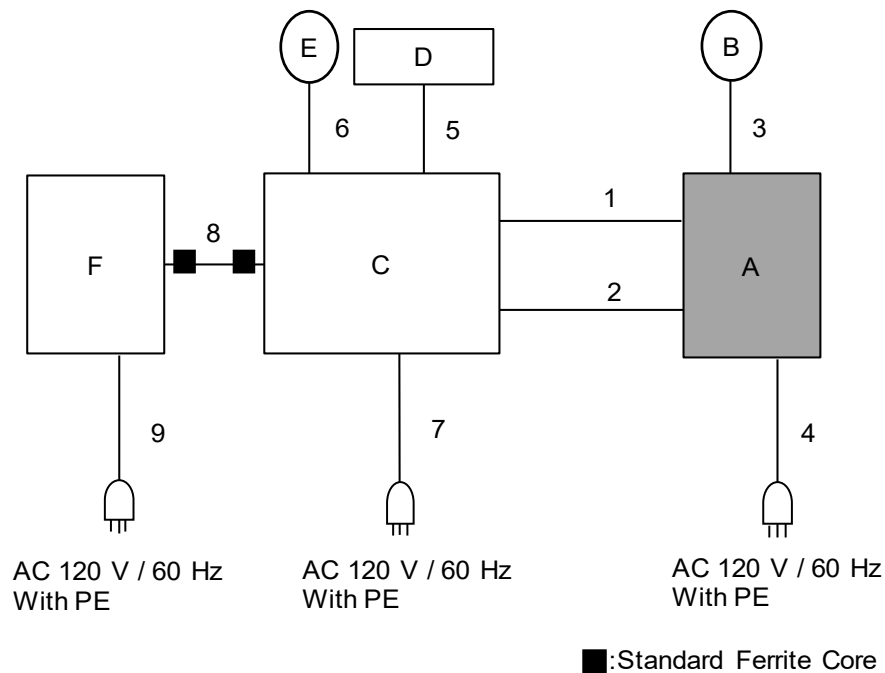
4.1 Operating Mode(s)

The mode is used:

Test mode	Remarks
1) Transmitting and Receiving mode (Tx and Rx)	The EUT Transmits and Receives at the same time and there is no receiving mode.
The EUT was operated in a manner similar to typical use during the tests.	
*Power of the EUT was set by the software as follows; Software: 1) T015-101 (Tx and Rx) (Date: 2024.03 19, Storage location: EUT memory)	
*This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	
Justification: The system was configured in typical fashion (as a user would normally use it) for testing.	

Test Item	Operating mode
Conducted Emission	1), With Tag / Without Tag
Electric Field Strength of Fundamental Emission	1), With Tag / Without Tag
Spectrum Mask	1), With Tag / Without Tag
20 dB Bandwidth and 99 % Occupied Bandwidth	1), With Tag / Without Tag
Electric Field Strength of Spurious Emission	1), With Tag / Without Tag

4.2 Configuration and peripherals



* Cabling and setup 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	Remark
A	Card Printer	CX-7650	ES1-2	G-Printec, Inc.	EUT
B	Mouse	MS111-P	CN-011D3V-73826-5C4-12EA	DELL	-
C	PC	AT998	11W001729	EPSON	-
D	Keyboard	KB-1777	2K029B00850	Chicony ELECTRONICS CO.,LTD.	-
E	Mouse	SM-9013(EPW)	C610620012B00937	EPSON	-
F	Monitor	LD1773	31E22520254	EPSON	-

List of Cables Used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	LAN Cable	3.0	Unshielded	Unshielded	Cat.6
2	USB Cable	2.0	Shielded	Shielded	-
3	USB Cable	1.8	Shielded	Shielded	-
4	AC Cable	2.0	Unshielded	Unshielded	3 wires
5	Keyboard Cable	1.3	Shielded	Shielded	-
6	Mouse Cable	1.8	Shielded	Shielded	-
7	AC Cable	1.8	Unshielded	Unshielded	3 wires
8	Monitor Cable	1.7	Shielded	Shielded	-
9	AC Cable	2.0	Unshielded	Unshielded	3 wires

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 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, including peripherals 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 a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

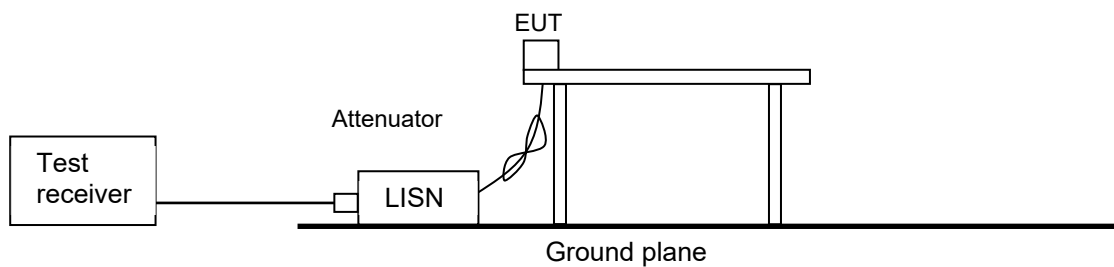
Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN / (AMN) to the input power source. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

Figure 1: Test Setup



The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector	: QP and CISPR AV
Measurement range	: 0.15 MHz to 30 MHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: Radiated Emission (Fundamental, Spurious Emission and Spectrum Mask)

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 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.

[Limit conversion]

The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to $45.5 - 51.5 = -6.0$ dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

[Frequency: From 9 kHz to 30 MHz]

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for vertical polarization (antenna angle: 0 deg., 45 deg., 90 deg., and 135 deg.) and horizontal polarization.

*Refer to Figure 2 about Direction of the Loop Antenna.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

These tests were performed in semi anechoic chamber. Therefore the measured level of emissions may be higher than if measurements were made without a ground plane. However test results were confirmed to pass against standard limit.

[Frequency: From 30 MHz to 1 GHz]

The measuring antenna height 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.

[Test instruments and test settings]

Frequency	Below 30 MHz	30 MHz to 1 GHz
Antenna Type	Loop	Hybrid

The test was made with the detector (RBW/VBW) in the following table.

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

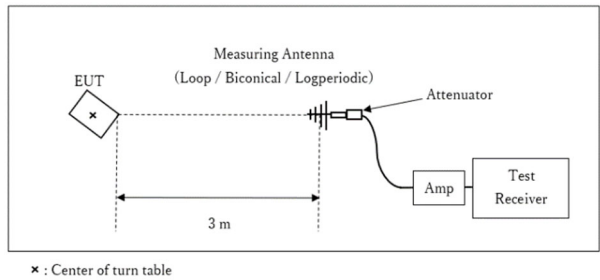
Frequency	From 9 kHz to 90 kHz and From 110 kHz to 150 kHz	From 90 kHz to 110 kHz	From 150 kHz to 490 kHz	From 490 kHz to 30 MHz	From 30 MHz to 1 GHz
Instrument used	Test Receiver				
Detector	PK / AV	QP	PK / AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	9 kHz	9 kHz	120 kHz
Test Distance	3 m *1)	3 m *1)	3 m *1)	3 m *2)	3 m

*1) Distance Factor: $40 \times \log (3 \text{ m} / 300 \text{ m}) = -80 \text{ dB}$

*2) Distance Factor: $40 \times \log (3 \text{ m} / 30 \text{ m}) = -40 \text{ dB}$

Figure 1: Test Setup

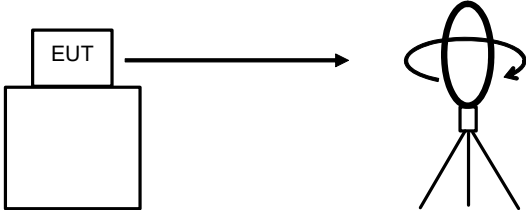
Below 1 GHz



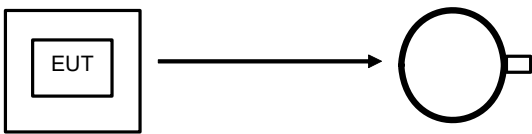
Test Distance: 3 m

Figure 2: Direction of the Loop Antenna

Side View (Vertical)

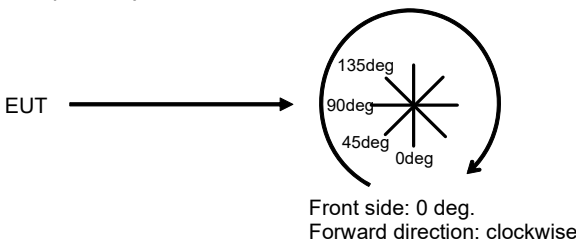


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



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

The test results and limit are rounded off to one decimal place, so some differences might be observed.

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

SECTION 7: Other tests

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20 dB Bandwidth	20 kHz	1 kHz	3 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	Peak *1)	Max Hold *1)	Spectrum Analyzer
*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100 %. Peak hold was applied as Worst-case measurement.							

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

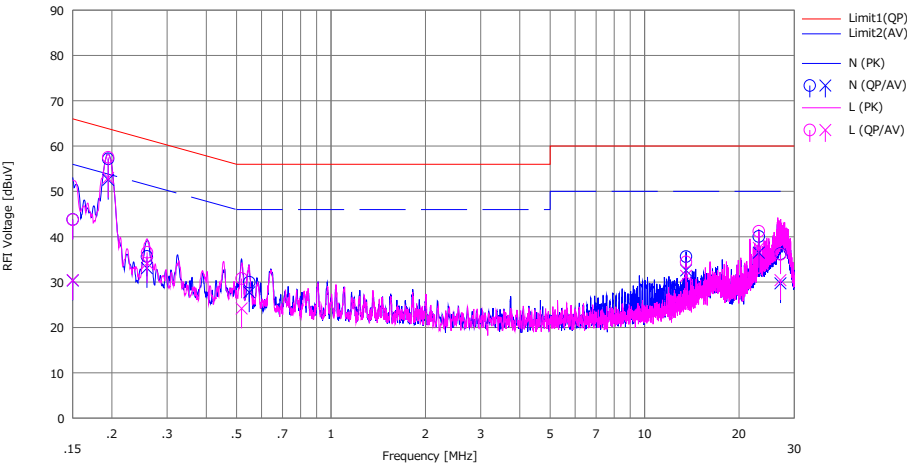
Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2024/03/21

Company : G-Printec, Inc.
Kind of EUT : Card Printer
Model No. : CX-7650
Serial No. : ES1-2
Remarks : With Tag
Mode : Tx and Rx mode
Order No. : 15230055
Power : AC 120 V / 60 Hz
Temp./Humi. : 23 deg.C / 40 %RH

Limit : FCC_Part 15 Subpart C(15.207)
Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	33.46	20.02	10.34	43.80	30.36	66.00	56.00	22.2	25.6	N	
2	0.19462	46.82	42.21	10.34	57.16	52.55	63.84	53.84	6.6	1.2	N	
3	0.25867	25.28	22.72	10.35	35.63	33.07	61.47	51.47	25.8	18.4	N	
4	0.54850	19.60	17.35	10.39	29.99	27.74	56.00	46.00	26.0	18.2	N	
5	13.56000	24.18	21.16	11.44	35.62	32.60	60.00	50.00	24.3	17.4	N	
6	23.12830	27.93	24.38	12.13	40.06	36.51	60.00	50.00	19.9	13.4	N	
7	27.12000	24.02	17.49	12.22	36.24	29.71	60.00	50.00	23.7	20.2	N	
8	0.15000	33.45	20.10	10.31	43.76	30.41	66.00	56.00	22.2	25.5	L	
9	0.19462	47.21	42.65	10.31	57.52	52.96	63.84	53.84	6.3	0.8	L	
10	0.25911	26.23	23.84	10.32	36.55	34.16	61.46	51.46	24.9	17.3	L	
11	0.51863	20.42	13.81	10.37	30.79	24.18	56.00	46.00	25.2	21.8	L	
12	13.56000	22.78	19.74	11.66	34.44	31.40	60.00	50.00	25.5	18.6	L	
13	23.12850	28.72	25.04	12.47	41.19	37.51	60.00	50.00	18.8	12.4	L	
14	27.12000	23.50	17.78	12.63	36.13	30.41	60.00	50.00	23.8	19.5	L	

Calculation:Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
LISN:143498

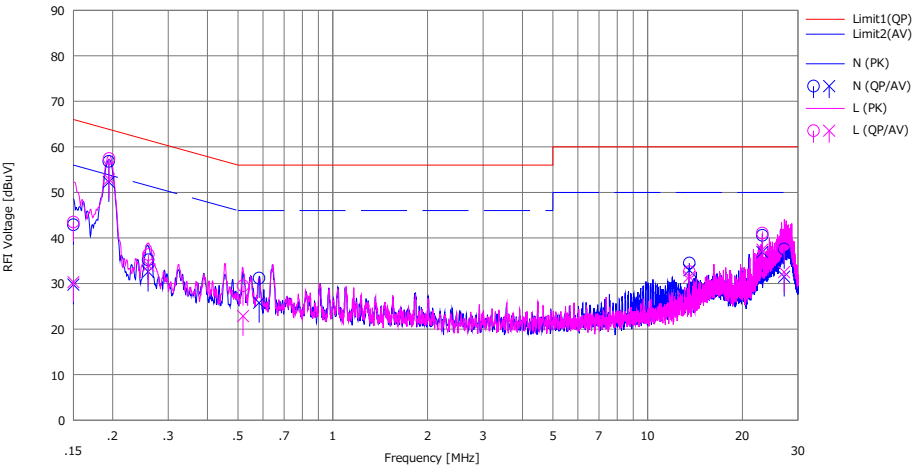
Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2024/03/21

Company : G-Printec, Inc.
Kind of EUT : Card Printer
Model No. : CX-7650
Serial No. : ES1-2
Remarks : Without Tag
Mode : Tx and Rx mode
Order No. : 15230055
Power : AC 120 V / 60 Hz
Temp./Humi. : 23 deg.C / 40 %RH

Limit : FCC_Part 15 Subpart C(15.207)
Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	32.54	19.42	10.34	42.88	29.76	66.00	56.00	23.1	26.2	N	
2	0.19436	46.48	41.94	10.34	56.82	52.28	63.85	53.85	7.0	1.5	N	
3	0.25902	24.84	22.24	10.35	35.19	32.59	61.46	51.46	26.2	18.8	N	
4	0.58337	20.76	15.38	10.41	31.17	25.79	56.00	46.00	24.8	20.2	N	
5	13.56000	23.05	21.45	11.44	34.49	32.89	60.00	50.00	25.5	17.1	N	
6	23.12825	28.45	24.79	12.13	40.58	36.92	60.00	50.00	19.4	13.0	N	
7	27.12000	25.35	19.27	12.22	37.57	31.49	60.00	50.00	22.4	18.5	N	
8	0.15000	33.19	20.00	10.31	43.50	30.31	66.00	56.00	22.5	25.6	L	
9	0.19462	47.12	42.57	10.31	57.43	52.88	63.84	53.84	6.4	0.9	L	
10	0.25963	26.05	23.61	10.32	36.37	33.93	61.44	51.44	25.0	17.5	L	
11	0.51862	19.12	12.48	10.37	29.49	22.85	56.00	46.00	26.5	23.1	L	
12	13.56000	20.92	19.80	11.66	32.58	31.46	60.00	50.00	27.4	18.5	L	
13	23.12875	28.58	24.95	12.47	41.05	37.42	60.00	50.00	18.9	12.5	L	
14	27.12000	25.89	19.88	12.63	38.52	32.51	60.00	50.00	21.4	17.4	L	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
LISN:143498

Fundamental Emission and Spectrum Mask

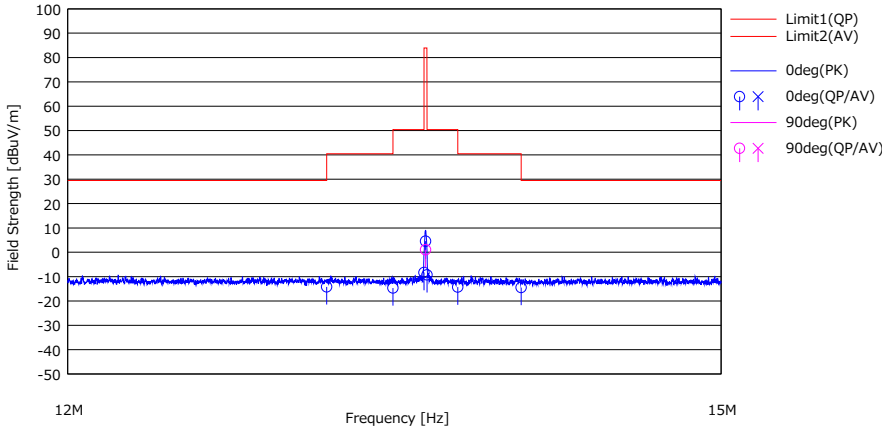
DATA OF RADIATED EMISSION(below 30MHz) TEST

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

Date : 2024/03/21

Company : G-Printec, Inc. Mode : Tx and Rx mode
Kind of EUT : Card Printer Order No. : 15230055
Model No. : CX-7650 Power : AC 120 V / 60 Hz
Serial No. : ES1-2 Temp./Humi. : 23 deg.C / 40 %RH
Remarks : With Tag

Limit : FCC15.225,PK/AV/QP,9-90 kHz:PK/AV,110-490 kHz:PK/AV,other:QP(<490 kHz:300 m,>490 kHz:30 m)
Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Antenna [deg]	Table [deg]	Comment
		<QP>	<AV>				<QP>	<AV>	<QP>	<AV>	<QP>	<AV>			
		[dBuV]	[dBuV]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]			
1	13.11000	23.87	---	19.19	-33.03	24.24	-14.21	---	29.50	---	43.7	---	0deg	251	
2	13.41000	23.39	---	19.20	-33.01	24.25	-14.67	---	40.50	---	55.1	---	0deg	251	
3	13.55300	29.73	---	19.20	-33.00	24.25	-8.32	---	50.40	---	58.7	---	0deg	251	
4	13.56000	42.58	---	19.20	-33.00	24.25	4.53	---	83.90	---	79.3	---	0deg	251	
5	13.56700	28.76	---	19.20	-33.00	24.25	-9.29	---	50.40	---	59.6	---	0deg	251	
6	13.71000	23.75	---	19.20	-33.00	24.26	-14.31	---	40.50	---	54.8	---	0deg	251	
7	14.01000	23.57	---	19.21	-32.99	24.27	-14.48	---	29.50	---	43.9	---	0deg	251	
8	13.56000	39.08	---	19.20	-33.00	24.25	1.03	---	83.90	---	82.8	---	90deg	178	

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+D.fac)[dB]-Gain(AMP)[dB]
Ant.Type=LOOP:Loop antenna

Result of the fundamental Emission at 3 m without Distance factor

QP											
Ant Deg [deg]	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Duty Factor	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
0	13.56000	QP	42.58	19.20	7.00	24.25	-	44.53	-	-	Fundamental

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

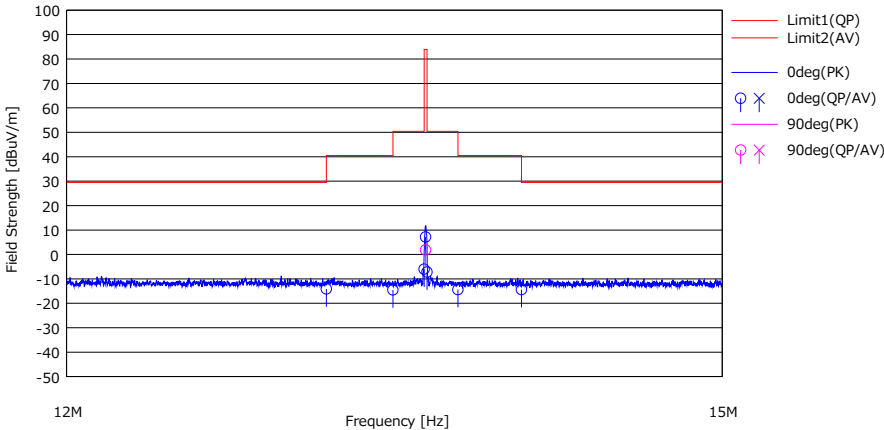
Fundamental Emission and Spectrum Mask

DATA OF RADIATED EMISSION(below 30MHz) TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2024/03/21

Company : G-Printec, Inc. Mode : Tx and Rx mode
Kind of EUT : Card Printer Order No. : 15230055
Model No. : CX-7650 Power : AC 120 V / 60 Hz
Serial No. : ES1-2 Temp./Humi. : 23 deg.C / 40 %RH
Remarks : Without Tag

Limit : FCC15.225,PK/AV/QP,9-90 kHz:PK/AV,110-490 kHz:PK/AV,other:QP(<490 kHz:300 m,>490 kHz:30 m)
Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Antenna [deg]	Table [deg]	Comment
		<QP> [dBuV]	<AV> [dBuV]				<QP> [dBuV/m]	<AV> [dBuV/m]	<QP> [dBuV/m]	<AV> [dBuV/m]	<QP> [dB]	<AV> [dB]			
		[dBuV]	[dBuV]				[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]			
1	13.11000	23.95	---	19.19	-33.03	24.24	-14.13	---	29.50	---	43.6	---	0deg	251	
2	13.41000	23.52	---	19.20	-33.01	24.25	-14.54	---	40.50	---	55.0	---	0deg	251	
3	13.55300	31.98	---	19.20	-33.00	24.25	-6.07	---	50.40	---	56.4	---	0deg	251	
4	13.56000	45.16	---	19.20	-33.00	24.25	7.11	---	83.90	---	76.7	---	0deg	251	
5	13.56700	30.83	---	19.20	-33.00	24.25	-7.22	---	50.40	---	57.6	---	0deg	251	
6	13.71000	23.64	---	19.20	-33.00	24.26	-14.42	---	40.50	---	54.9	---	0deg	251	
7	14.01000	23.61	---	19.21	-32.99	24.27	-14.44	---	29.50	---	43.9	---	0deg	251	
8	13.56000	39.88	---	19.20	-33.00	24.25	1.83	---	83.90	---	82.0	---	90deg	178	

Calculation:Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT+D.fac)[dB]-Gain(AMP)[dB]
Ant.Type=LOOP:Loop antenna

Result of the fundamental Emission at 3 m without Distance factor

QP

Ant Deg [deg]	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
0	13.56000	QP	45.16	19.20	7.00	24.25	-	47.11	-	-	Fundamental

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

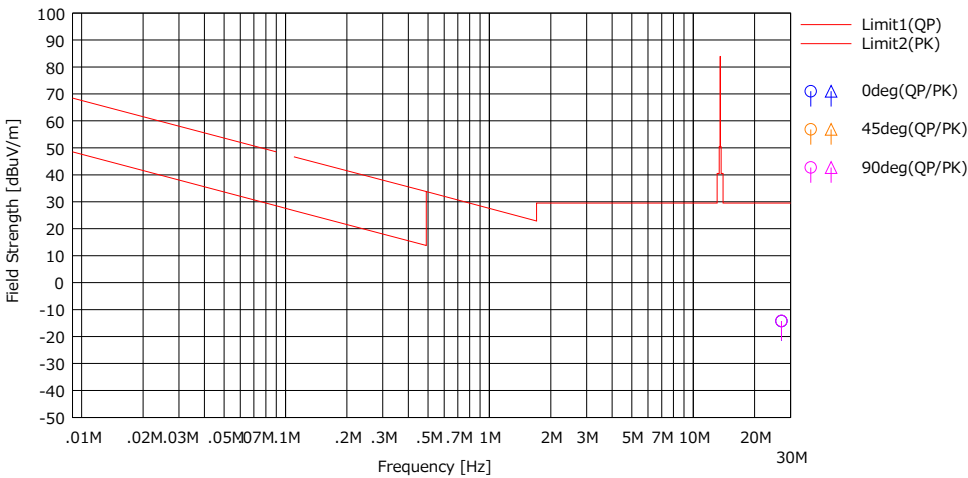
Spurious Emission

DATA OF RADIATED EMISSION(below 30MHz) TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2024/03/21

Company : G-Printec, Inc.
Kind of EUT : Card Printer
Model No. : CX-7650
Serial No. : ES1-2
Remarks : Without Tag
Mode : Tx and Rx mode
Order No. : 15230055
Power : AC 120 V / 60 Hz
Temp./Humi. : 23 deg.C / 40 %RH

Limit : FCC15.225,PK/AV/QP,9-90 kHz:PK/AV,110-490 kHz:PK/AV,other:QP(<490 kHz:300 m,>490 kHz:30 m)
Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading		Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result		Limit		Margin		Antenna [deg]	Table [deg]	Comment
		(QP) [dBuV]	(PK) [dBuV]				(QP) [dBuV/m]	(PK) [dBuV/m]	(QP) [dBuV/m]	(PK) [dBuV/m]	(QP) [dB]	(PK) [dB]			
1	27.12000	22.93	---	19.74	-32.52	24.45	-14.30	---	29.50	---	43.8	---	0deg	251	
2	27.12000	23.02	---	19.74	-32.52	24.45	-14.21	---	29.50	---	43.7	---	90deg	178	

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

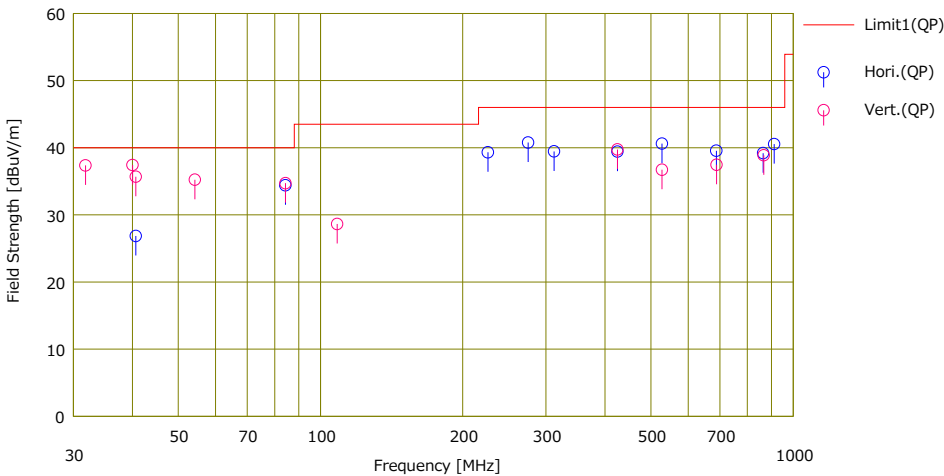
Spurious Emission

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2024/03/21

Company : G-Printec, Inc.
Kind of EUT : Card Printer
Model No. : CX-7650
Serial No. : ES1-2
Remarks : With Tag
Mode : Tx and Rx mode
Order No. : 15230055
Power : AC 120 V / 60 Hz
Temp./Humi. : 23 deg.C / 40 %RH

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK
Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margin (QP)	Pola [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	40.680	38.88	13.35	5.93	31.31	26.85	40.00	13.1	Hori.	310	300	HB	
2	84.319	50.96	8.21	6.47	31.24	34.40	40.00	5.6	Hori.	242	304	HB	
3	226.055	53.00	9.67	7.67	31.03	39.31	46.00	6.6	Hori.	132	258	HB	
4	275.010	51.00	12.81	7.99	31.04	40.76	46.00	5.2	Hori.	100	138	HB	
5	312.005	48.42	13.82	8.22	31.01	39.45	46.00	6.5	Hori.	100	249	HB	
6	425.000	45.12	16.34	8.88	30.92	39.42	46.00	6.5	Hori.	100	16	HB	
7	528.000	43.73	18.32	9.40	30.84	40.61	46.00	5.3	Hori.	190	286	HB	
8	688.083	39.39	20.79	10.09	30.72	39.55	46.00	6.4	Hori.	100	190	HB	
9	864.009	36.00	22.97	10.78	30.56	39.19	46.00	6.8	Hori.	100	185	HB	
10	912.007	36.40	23.66	10.98	30.51	40.53	46.00	5.4	Hori.	143	232	HB	
11	31.836	50.44	12.45	5.79	31.33	37.35	40.00	2.6	Vert.	100	207	HB	
12	40.029	49.48	13.33	5.92	31.31	37.42	40.00	2.5	Vert.	100	246	HB	
13	40.680	47.70	13.35	5.93	31.31	35.67	40.00	4.3	Vert.	100	256	HB	
14	54.240	46.72	13.69	6.12	31.30	35.23	40.00	4.7	Vert.	100	253	HB	
15	84.339	51.28	8.20	6.47	31.24	34.71	40.00	5.2	Vert.	100	234	HB	
16	108.480	42.82	10.30	6.71	31.20	28.63	43.50	14.8	Vert.	100	0	HB	
17	425.007	45.43	16.34	8.88	30.92	39.73	46.00	6.2	Vert.	131	270	HB	
18	528.000	39.84	18.32	9.40	30.84	36.72	46.00	9.2	Vert.	111	262	HB	
19	688.601	37.30	20.79	10.09	30.72	37.46	46.00	8.5	Vert.	115	133	HB	
20	866.447	35.60	23.04	10.79	30.56	38.87	46.00	7.1	Vert.	109	183	HB	

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

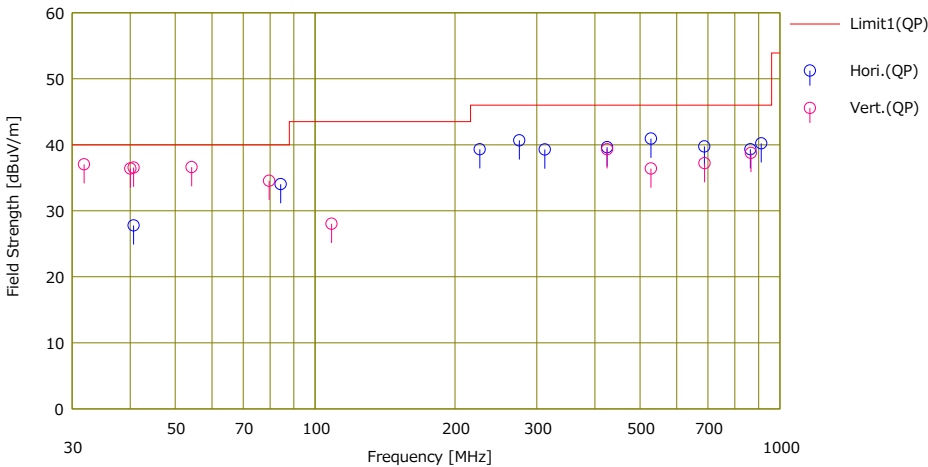
Spurious Emission

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Kashima EMC Lab. No.10 Semi-Anechoic Chamber
Date : 2024/03/21

Company : G-Printec, Inc.
Kind of EUT : Card Printer
Model No. : CX-7650
Serial No. : ES1-2
Remarks : Without Tag
Mode : Tx and Rx mode
Order No. : 15230055
Power : AC 120 V / 60 Hz
Temp./Humi. : 23 deg.C / 40 %RH

Limit : FCC15.209 3 m, below 1 GHz:QP, above 1 GHz:AV/PK
Tested by : Kazuhiro Ando



No.	Freq. [MHz]	Reading (QP)	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result (QP)	Limit (QP)	Margn (QP)	Pola [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	40.680	39.81	13.35	5.93	31.31	27.78	40.00	12.2	Hori.	286	275	HB	
2	84.319	50.59	8.21	6.47	31.24	34.03	40.00	5.9	Hori.	231	314	HB	
3	226.055	53.00	9.67	7.67	31.03	39.31	46.00	6.6	Hori.	141	247	HB	
4	275.010	50.91	12.81	7.99	31.04	40.67	46.00	5.3	Hori.	100	129	HB	
5	312.005	48.26	13.82	8.22	31.01	39.29	46.00	6.7	Hori.	100	243	HB	
6	425.000	45.32	16.34	8.88	30.92	39.62	46.00	6.3	Hori.	100	15	HB	
7	528.000	44.05	18.32	9.40	30.84	40.93	46.00	5.0	Hori.	188	282	HB	
8	688.083	39.57	20.79	10.09	30.72	39.73	46.00	6.2	Hori.	100	192	HB	
9	864.009	36.12	22.97	10.78	30.56	39.31	46.00	6.6	Hori.	100	181	HB	
10	912.007	36.08	23.66	10.98	30.51	40.21	46.00	5.7	Hori.	146	225	HB	
11	31.836	50.13	12.45	5.79	31.33	37.04	40.00	2.9	Vert.	100	203	HB	
12	40.029	48.46	13.33	5.92	31.31	36.40	40.00	3.6	Vert.	100	237	HB	
13	40.680	48.58	13.35	5.93	31.31	36.55	40.00	3.4	Vert.	100	245	HB	
14	54.240	48.10	13.69	6.12	31.30	36.61	40.00	3.3	Vert.	100	256	HB	
15	79.633	50.24	9.12	6.43	31.25	34.54	40.00	5.4	Vert.	100	216	HB	
16	108.480	42.22	10.30	6.71	31.20	28.03	43.50	15.4	Vert.	100	0	HB	
17	425.007	45.02	16.34	8.88	30.92	39.32	46.00	6.6	Vert.	140	278	HB	
18	528.000	39.52	18.32	9.40	30.84	36.40	46.00	9.6	Vert.	114	263	HB	
19	688.601	37.05	20.79	10.09	30.72	37.21	46.00	8.7	Vert.	112	137	HB	
20	866.447	35.50	23.04	10.79	30.56	38.77	46.00	7.2	Vert.	116	179	HB	

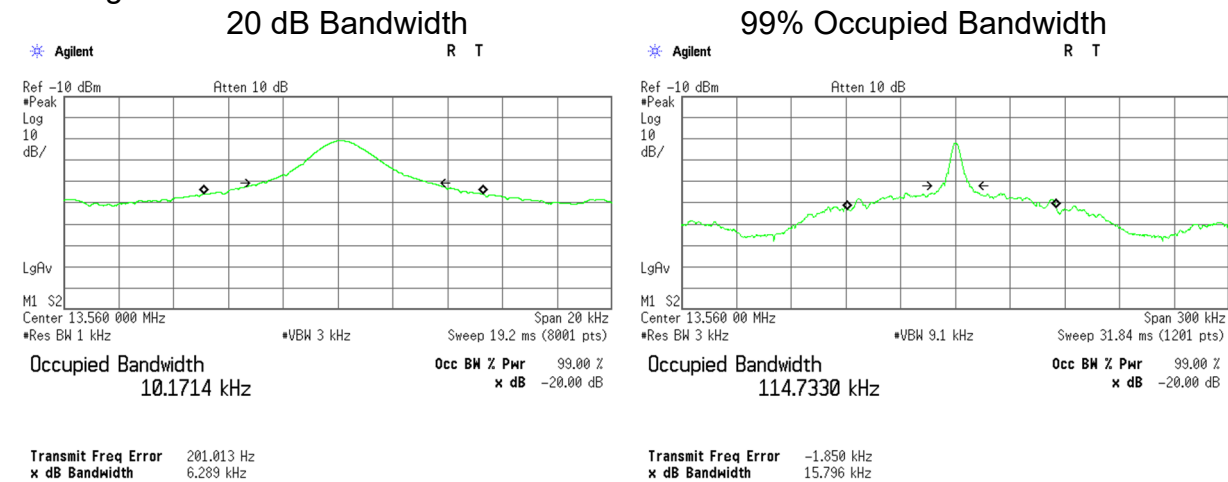
Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]
Ant.Type=HB:Hybrid Antenna

20 dB Bandwidth and 99% Occupied Bandwidth

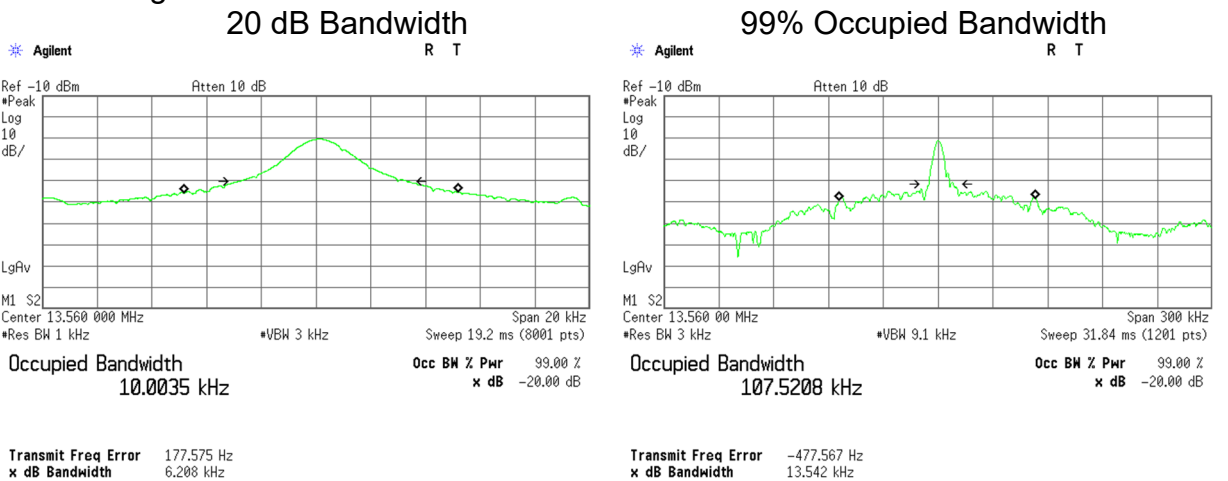
Test place Kashima EMC Lab. No.2 Measurement room
Date March 25, 2024
Temperature / Humidity 22 deg. C / 43 % RH
Engineer Kazuhiro Ando
Mode Tx and Rx, Mod. on

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	with Tag	6.29	114.73
	without Tag	6.21	107.52

with Tag



without Tag



APPENDIX 2: Test instruments

Test Equipment

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CE	143500	A.M.N.	Rohde & Schwarz	ESH3-Z5	838576/017	2023/07/12	12
CE	143498	A.M.N.	Rohde & Schwarz	ESH3-Z5	828874/019	2023/07/12	12
CE	143157	10 Site CE System	UL Japan	none	none	2023/08/01	12
CE	143718	Terminator	Suhner	65_BNC-50-0-2/133_NE	none	2023/11/17	12
CE	144199	Test Receiver	Keysight Technologies Inc	N9038A	MY53290016	2023/07/05	12
RE	143121	LOGBICON	Schwarzbeck Mess-Elektronik OHG	VULB 9168	343	2023/04/18	12
RE	178806	5dB Fixed Atten.	Pasternack Enterprises	PE7047-5	none	2023/04/18	12
RE	143165	10 Site RE 3m System	UL Japan	none	none	2023/08/01	12
RE	183880	Pre-Amplifier	UL Japan	ZKL-2	001	2023/04/21	12
RE	144199	Test Receiver	Keysight Technologies Inc	N9038A	MY53290016	2023/07/05	12
RE	144632	Semi Anechoic Chamber	TDK	NSA (No.10)	10	2023/05/08	12
RE	143833	Loop Antenna	Rohde & Schwarz	HFH2-Z2	827779/008	2023/10/20	12
RE	143161	Coaxial Cable	Fujikura,HP,Mini-Circuits,Fujikura	3D2W	none	2023/05/24	12
RE	144245	6dB Fixed Atten.	Suhner	6906.01.A	none	2023/07/06	12
RE	171927	Pre Amplifier	Mini-Circuits	GALI-84+	001	2023/07/03	12
RE	143157	10 Site CE System	UL Japan	none	none	2023/08/01	12
BW	143942	Near Field Probe	Langer	LF-R400	02-0815	-	-
BW	143643	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY52490024	2023/06/21	12
CE, RE	222745	Measure	SHINWA RULES CO., LTD.	80862	none	-	-
CE, RE	143542	Temperature & Humidity Indicator	HIOKI E.E. CORPORATION	3641/9680-50	090999895/090905406	2023/06/27	12
CE, RE	143133	Barometer	Sanoh Co., Ltd	SBR-151	001439	2023/03/10	36
CE, RE	144216	Digital Multimeter	Fluke Corporation	115	994460954	2023/10/24	12
CE, RE	178804	EMI Software	TSJ (Techno Science Japan)	TEPTO-DV3(RE,CE,ME,PE)	Ver 3.1.0484	-	-
BW	144210	Digital Multimeter	Fluke Corporation	112	89790193	2023/10/24	12
BW	200034	Temperature & Humidity Logger	HIOKI E.E. CORPORATION	LR5001/LR9504	200636456/200699552	2023/07/18	12
BW	143133	Barometer	Sanoh Co., Ltd	SBR-151	001439	2023/03/10	36

*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

BW: Bandwidth