



RADIO TEST REPORT

Test Report No. : 29GE0061-HO-01-A

Applicant : Panasonic Corporation
Type of Equipment : ePassport Reader
Model No. : JT-P100MR-30
Test regulation : FCC Part 15 Subpart C : 2009
Section 15.207 and 15.225
FCC ID : ACJJT-P100MR1
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with 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.

Date of test: March 26 to June 10, 2009

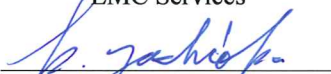
Tested by:



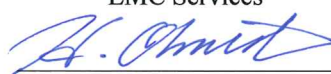
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SECTION 1: Customer information

Company Name : Panasonic Corporation
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Contact Person : Hitoshi Yoshida

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

2.1 Identification of E.U.T.

Type of Equipment : ePassport Reader
Model No. : JT-P100MR-30
Serial No. : 09A00001
Rating : AC120V/60Hz (DC12.0V)
Receipt Date of Sample : March 23, 2009
Country of Mass-production : Japan
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 No: JT-P100MR-30 (referred to as the EUT in this report) is the ePassport Reader.

Feature of EUT : This is Machine ReadablePassport Reader and the contactless IC card reader/writer which corresponds to "ISO/IEC14443 Type A, B" technology. This is reading Picture of Passport and compare the picture with Passport's IC data. The test was performed with Type B which had higher ouput power level than the power of Type A.
<The detail of feature>
Kind of equipment : Passport Reader
Acceptable card : ISO/IEC14443 Type A,B
carrier frequency : 13.56MHz
Power supply: DC INPUT 12V, MAX 700mA
Indicator : Power LED: Green, Ready LED: Orange, Error LED: Red, IC LED: Green

Clock frequency(ies) in the system : Main-CPU: 200MHz, Main-CPU-Bus: 66.6MHz, RW-CPU: 14.7456MHz, Camera: 36MHz, USB: 48MHz, RF:13.56MHz

Equipment Type : Transceiver
Frequency of Operation : 13.56MHz
Type of Modulation : ASK
Antenna Type : Printed Circuit Board (under the illumination ring)
Antenna Connector Type : U.FL connector
Method of Frequency Generation : Crystal
Power Supply (Inner) : DC9.0V, DC5.0V, DC3.3V

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<Information of Series model(s)>

JT-P100MR-30 has series models as JT-P100MR-**.

1. The product model name suffix “**” represents 2 optional alphanumeric characters.
2. Difference: Color of case, design of logo label, design of operating panel (in colors, in characters), description of label (size, with or without logo, language: mother language etc).

There is no difference in electric or transmitter certification spec.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C: 2009, final revised on February 27, 2009

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.225 : Operation within the band 13.110-14.010MHz

FCC 15.31 (e)

This EUT provides stable voltage(DC9.0V) constantly to RF Part regardless of input voltage.
Therefore, this 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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3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements <IC>RSS-Gen 7.2.2	Section 15.207 <IC>RSS-Gen 7.2.2	-	N/A	[QP] 18.1dB 27.12000MHz, N/L (with Tag) [AV] 11.9dB 27.12000MHz, N (with Tag)	Complied
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators <IC> RSS-Gen 4.8, 4.11	Section 15.225(a) <IC>RSS-210 A2.6	Radiated	N/A	37.7dB 13.56000MHz, QP (without Tag)	Complied
3	Spectrum Mask	ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.9, 4.11	Section 15.225(b)(c) <IC> RSS-210 A2.6	Radiated	N/A	18.7dB 13.567MHz, QP (without Tag)	Complied
4	20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators <IC> -	Section 15.215(c) <IC> -	Radiated	N/A	N/A	N/A
5	Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.9, 4.11	Section 15.209, Section 15.225 (d) <IC>RSS-210 A2.6	Radiated	N/A	3.1dB 40.680MHz, QP Vertical	Complied
6	Frequency Tolerance	ANSI C63.4:2003 13. Measurement of intentional radiators <IC>RSS-Gen 4.7	Section 15.225(e) <IC> RSS-210 A2.6	Radiated	N/A	See data	Complied

Note: UL Japan, Inc.'s EMI Work Procedures No.QPM05 and QPM15

3.3 Addition to standard

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.6.1	RSS-Gen 4.6.1	Radiated	N/A	N/A	N/A

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.

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.7dB
No.2	3.7dB
No.3	3.7dB
No.4	3.7dB

Test room (semi-anechoic chamber)	Radiated emission (10m*)(+dB)			Radiated emission (3m*)(+dB)					
	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	9kHz-30MHz	30MHz-300MHz	300MHz-1GHz	1GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz
No.1	3.1dB	4.4dB	3.9dB	3.2dB	3.8dB	3.9dB	5.0dB	5.0dB	5.4dB
No.2	-	-	-	3.2dB	4.4dB	4.0dB	5.0dB	5.2dB	5.4dB
No.3	-	-	-	3.2dB	4.2dB	3.8dB	5.0dB	5.3dB	5.3dB
No.4	-	-	-	3.2dB	4.0dB	3.8dB	5.0dB	5.3dB	5.3dB

*10m/3m = Measurement distance

Conducted emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

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	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 Test set up, Data of EMI, and Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating Modes

The EUT was operated in a manner similar to typical use during the tests.

The mode is used : Transmitting(Tx) 13.56MHz mode With Tag/ Without Tag

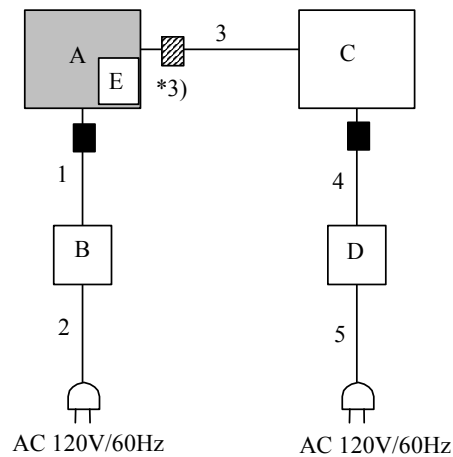
Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

Frequency Tolerance:

Temperature for the extreme tests : -20 deg.C.(minimum) to + 50deg.C.(maximum)

Voltage for the extreme tests : Vnom:AC120V, Vmin:AC102V, Vmax:AC138V : AC mains voltage

4.2 Configuration and peripherals



■ : Standard Ferrite Core

▨ : Non-standard Ferrite Core

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

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Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	ePassport Reader	JT-P100MR-30	09A00001	Panasonic	EUT
B	AC Adaptor	TAZ4CD0812H	12260LF-C30A	Panasonic	-
C	Note PC	CF-W4HC4AXS	6BKSA99974	Panasonic	-
D	AC Adaptor	CF-AA1625A	1625AM406Z26252F	Panasonic	-
E	Passport	-	45123456 *1) L898902C *2)	-	-

*1) Used for Radiated emission test only

*2) Used for the other tests except for Radiated emission test

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	1.2	Unshielded	Unshielded	-
2	AC Cable	1.5	Unshielded	Unshielded	-
3	USB Cable	1.6	Shielded	Shielded	*3)
4	DC Cable	1.2	Unshielded	Unshielded	-
5	AC Cable	0.8	Unshielded	Unshielded	-

<Notes for Ferrite cores>

*3) 1 Ferrite Core, Model No. SFT36SN (Manufacturer: TKK), 3cm from Item A, 1 turn.

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SECTION 5: Conducted emission

5.1 Operating environment

Test place : No.4 semi anechoic chamber
Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm 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 80cm from any other grounded conducting surface. EUT was located 80cm from LISN/AMN and excess AC cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/ an AMN to the input power source. All unused 50ohm connectors of the LISN/ AMN were resistively terminated in 50ohm when not connected to the measuring equipment. Photographs of the set up are shown in Appendix 1.

5.3 Test conditions

Frequency range : 0.15MHz-30MHz
EUT position : Table top
EUT operation mode : See Clause 4.1

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT in the semi Anechoic Chamber. 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 had 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 and AV
IF Bandwidth : 9kHz

5.5 Test result

Summary of the test results : Pass

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

6.1 Operating environment

The test was carried out in a No.3 and No.4 semi Anechoic Chamber

Temperature : See data
Humidity : See data

6.2 Test Procedure

The Radiated Electric Field Strength intensity has been measured in a semi anechoic chamber with a ground plane and at a distance of 3m.

Frequency: From 9kHz to 30MHz at distance 3m, Used antenna: Loop
The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for each antenna angle 0deg., 45deg., 90deg., and 135 deg.
*Refer to Figure 1 about Direction of the Loop Antenna.

Frequency: From 30MHz to 2GHz at distance 3m, Used antenna: Biconical (30-300MHz), Logperiodic (300-1000MHz), Horn antenna(1-2GHz)
The measuring antenna height was varied between 1 and 4m 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.

Measurements were performed with a QP, PK, and AV detector.
The radiated emission measurements were made with the following detector function of the test receiver.

	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz	From 1GHz to 2GHz
Instrument used	Test Receiver					Spectrum Analyzer
Detector Type	PK/AV	QP	PK/AV	QP	QP	PK/AV
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz	<PK> RBW: 1MHz VBW: 1MHz <AV> RBW: 1MHz VBW: 10Hz

- 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.

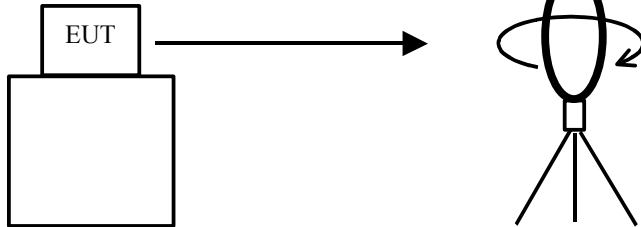
* FCC Part 15 Section 15.31 (f)(2) / IC RSS-Gen 4.11 (9kHz-30MHz)
9kHz – 490kHz [Limit at 3m]=[Limit at 300m]-40log (3[m]/300[m])
490kHz – 30MHz[Limit at 3m]=[Limit at 30m]-40log (3[m]/30[m])

6.3 Test result

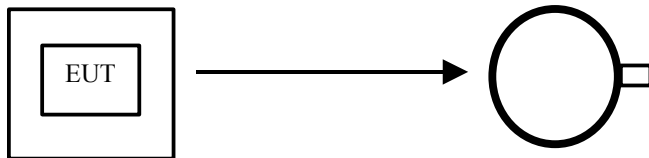
Summary of the test results : Pass

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

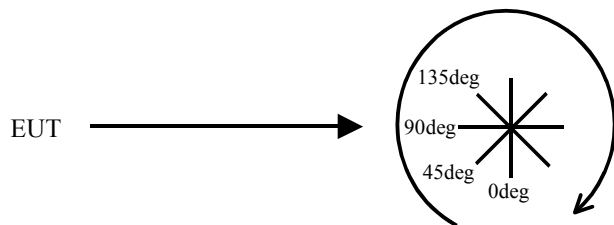


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



Front side: 0 deg.
Forward direction: clockwise

SECTION 7: 20dB Bandwidth

Test Procedure

The measurement was performed under the condition which has the maximum Electric field strength.

Test data : APPENDIX 2
Test result : Pass

SECTION 8: Frequency Tolerance

Test Procedure

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

Test data : APPENDIX 2
Test result : Pass

SECTION 9: 99% Occupied Bandwidth

Test Procedure

The measurement was performed under the condition which has the maximum Electric field strength.

Test data : APPENDIX 2
Test result : Pass