EMI TEST REPORT

Test Report No. : 26AE0124-HO-a

Applicant	:	**SATO CORPORATION**
Type of Equipment	:	**RFID Reader Module**
Model No.	:	**MP9310-NT**
Test standard	:	**FCC Part 15 Subpart C** **Section 15.207, Section 15.247: 2005**
FCC ID	:	**MMFMP9310NT1**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with the above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test: Sep. 6, 8, and Oct. 8 2005

Tested by:

Hiroka Umeyama
EMC Services

Makoto Kosaka
EMC Services

Kenichi Adachi
EMC Services

Approved by:

Naoki Sakamoto
Group Leader of
EMC Services

UL Apex Co., Ltd.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
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SECTION 1: Client information

Company Name	:	SATO CORPORATION
Address	:	1-207, Onari-cho, Omiya-ku, Saitama-shi, Saitama, 330-0852 Japan
Telephone Number	:	+81-48-663-8118
Facsimile Number	:	+81-48-651-6662
Contact Person	:	Yukio Nagashima

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

2.1 Identification of E.U.T.

Type of Equipment	:	RFID Reader Module
Model No.	:	MP9310-NT
Serial No.	:	11960 for Conducted Emission test 11943 for other tests
Country of Manufacture	:	USA
Receipt Date of Sample	:	September 6, 2005
Condition of EUT	:	Production model

2.2 Product Description

Model No: MP9310-NT (referred to as the EUT in this report) is the RFID Reader Module.

	Frequency Hopping System (RF-ID)
Equipment Type	Transceiver
Frequency Range	903.100MHz – 926.900MHz
Method of Frequency Generation	Synthsizer
Type of Modulation	FHSS
Mode of Operation	Duplex
Antenna Type	Miniature dipole
Antenna Connector Type	bulk-head mount SMA
Antenna Gain	-5 dBi
Power Supply	DC5V +/- 10%
Operating Temperature	-20-55 degree
Feature of EUT	The EUT and its antenna for performing communication with a RFID tag are built in Sato's RFID printer. The inlet (the RFID tag) which an IC chip was incorporated into is pasted on the label to use and in addition to the reading and writing of RFID; it can do a printout to the surface. In the surface, the text, the image, the bar code and so on can be printed out. The printout data which was entered from the host interface is analyzed inside the printer and is changed and is sent to RFID Reader module. The RFID Reader module communicates with the inlet (the RFID tag) which was converted to the label through the antenna. Reading of data, writing, etc. are performed between IC chips. When the writing in to the IC chip ends, a label is conveyed and a printout is done in the surface by the thermal head. The label that RFID data was written will be used for physical distribution, product management and so on.

FCC 15.31 (e)

The EUT is provided with a stable voltage (DC5.0V), and the regulated voltages, 3.3V, 1.8V, 1.2V and 5V were used in the EUT. Therefore, the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

The EUT is applied as MA and is installed into SATO's Barcode Printer (limited host equipment).
The antenna will be installed into the Barcode Printer (end product) by SATO Corp, and thus is not accessible for the end users. Therefore, the EUT complies with the requirement of 15.203.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part15 Subpart C: 2005
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits: 2005 Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz: 2005

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin*0)	Results
1	Conducted Emission	ANSI C63.4: 2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	11.3dB 0.74070MHz, L, AV	Complied
2	Carrier Frequency Separation	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section15.247 (a)(1)	Conducted	N/A	*See data.	Complied
3	20dB Bandwidth	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section15.247 (a)(1)(i)	Conducted	N/A		Complied
4	Number of Hopping Frequency	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section15.247 (a)(1)(i)	Conducted	N/A		Complied
5	Dwell time	ANSI C63.4: 2003 13.Measurement of intentional radiators	Section15.247 (a)(1)(i)	Conducted	N/A		Complied
6	Maximum Peak Output Power	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section15.247 (b)(2)	Conducted	N/A		Complied
7	Band Edge Compliance	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section15.247 (d)	Conducted	N/A		Complied
8	Spurious Emission	ANSI C63.4: 2003 13. Measurement of intentional radiators	Section15.247 (d)	Conducted/ Radiated	N/A	7.0dB 916.200MHz, Hori, QP (High Ch.)	Complied

Note: UL Apex's EMI Work Procedures No.QPM05 and QPM15.
*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
Conducted Emission
The measurement uncertainty (with a 95% confidence level) for this test is ±1.3dB.
The data listed in this test report has enough margin, more than the site margin.
Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ±4.5dB(3m)/ ±4.7dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ±5.2dB(3m)/ ±3.8dB(10m).
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ±6.6dB.
The data listed in this test report has enough margin, more than the site margin.
Other test except Conducted Emission and Spurious Emission (Radiated)
The measurement uncertainty (with a 95% confidence level) for this test is ±3.0dB.

*These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".
*These tests were performed without any deviations from test procedure except for additions or exclusions.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.4.1	-	Conducted	N/A	N/A	N/A

3.4 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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	IC4247A	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	846015	IC4247A-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-

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

3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

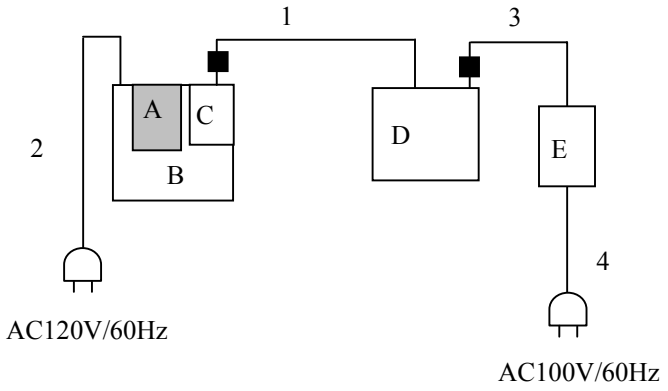
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

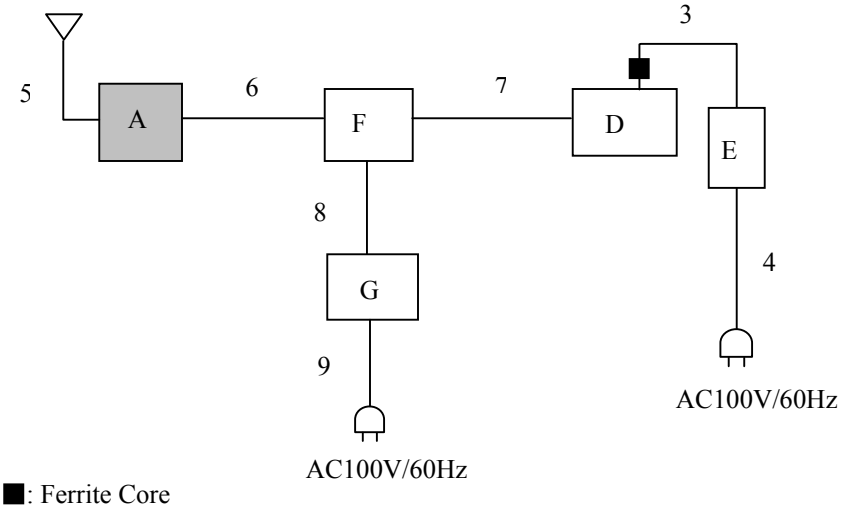
The mode is used : Transmitting mode (FHSS, Hopping ON/OFF)
- Low Channel: 903.1MHz
- Mid Channel: 915.1MHz
- High channel: 926.9MHz

4.2 Configuration and peripherals

[Conducted Emission Test]



[Other tests]



■: Ferrite Core

*Cabling was taken into consideration and test data was taken under worse case conditions.
*The test configuration is set up in the actual usage, which is in the worst conditions of the noise level.
*The measurement was performed only without tag.
Since the spurious level without tag had a higher level than the level with tag.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	RFID Reader Module	MP9310-NT	11960 for Conducted Emission test 11943 for other tests	SATO	MMFMP9310NT1
B	BARCODE PRINTER	GT412e	49000049	SATO	DoC
C	I/F Board (USB)	USB-B	1	SATO	-
D	Note PC	PP10L	11881301685	DELL	-
E	AC Adapter	PA-1650-05D	05U092-71615-49D-410D	DELL	-
F	RS232C CONVERTER	-	-	-	-
G	DC Power Supply	PW18-1.3AT	08016530	KENWOOD TMI	-

List of cables used

No.	Name	Length (m)	Shield	Remark
1	I/F Cable (USB)	0.9	Y	With one ferrite core*
2	AC Cable	1.7	N	-
3	DC Cable	1.7	N	With one standard ferrite core
4	AC Cable	0.9	N	-
5	Antenna Cable	0.85	Y	-
6	Flat Cable	0.45	N	-
7	RS232C Cable	1.8	N	-
8	DC Cable	0.87	N	-
9	DC Cable	2.0	Y	-

* The ferrite core is attached to the cables or included in the package of the end product (Barcode printer) when it is sold on the market.

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1.0m by 0.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm 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 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

1) For the tests on EUT with other peripherals (as a whole system)
I/O cable and AC 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.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.
The EUT was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

Detector : CISPR quasi-peak detector (IF BW 9 kHz)
Measurement range : 0.15-30MHz
Test data : APPENDIX 3
Test result : Pass

SECTION 6: Spurious Emission

[Conducted]

Test Procedure
The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

[Radiated]

Test Procedure
EUT was placed on a platform of nominal size, 1.5m by 0.5m, raised 80cm above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz).
The height of the measuring 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 with the Test Receiver or the Spectrum Analyzer.

The result also satisfied with the general limits specified in section 15.209(a).

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
Detector IF Bandwidth	QP: BW 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.

Test data : APPENDIX 3
Test result : Pass

SECTION 7: 20dB Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 8: Maximum Peak Output Power

Test Procedure
The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 9: Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 10: Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 11: Dwell time

Test Procedure

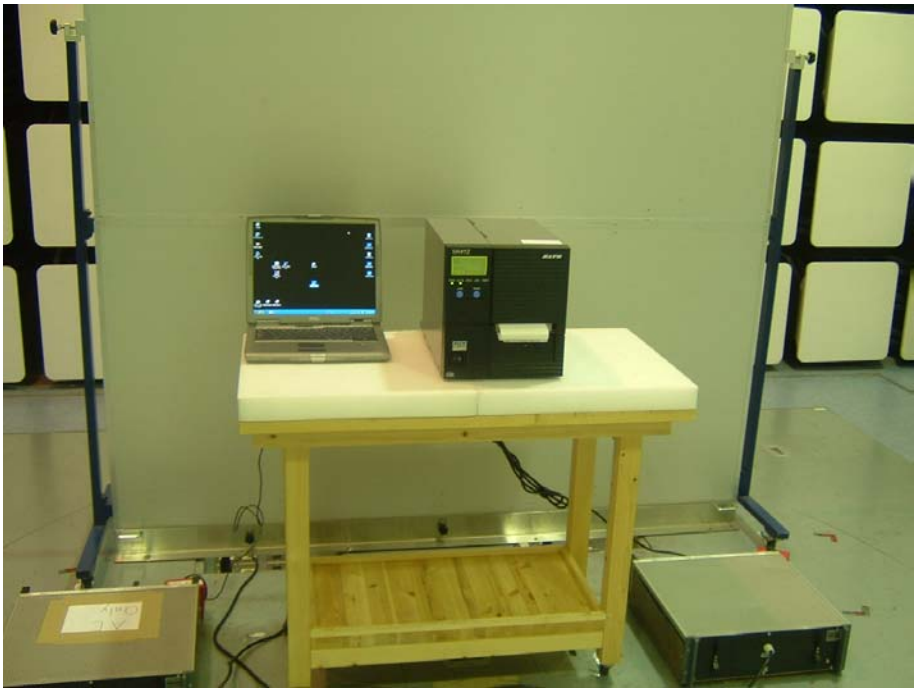
The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

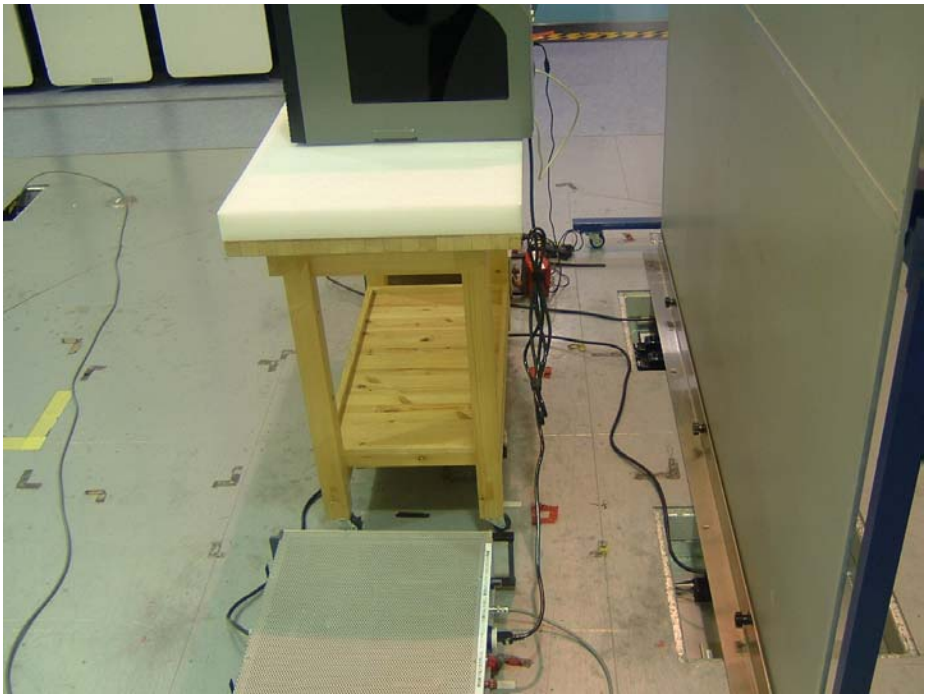
APPENDIX 1: Photographs of test setup

Conducted Emission

Front



Rear

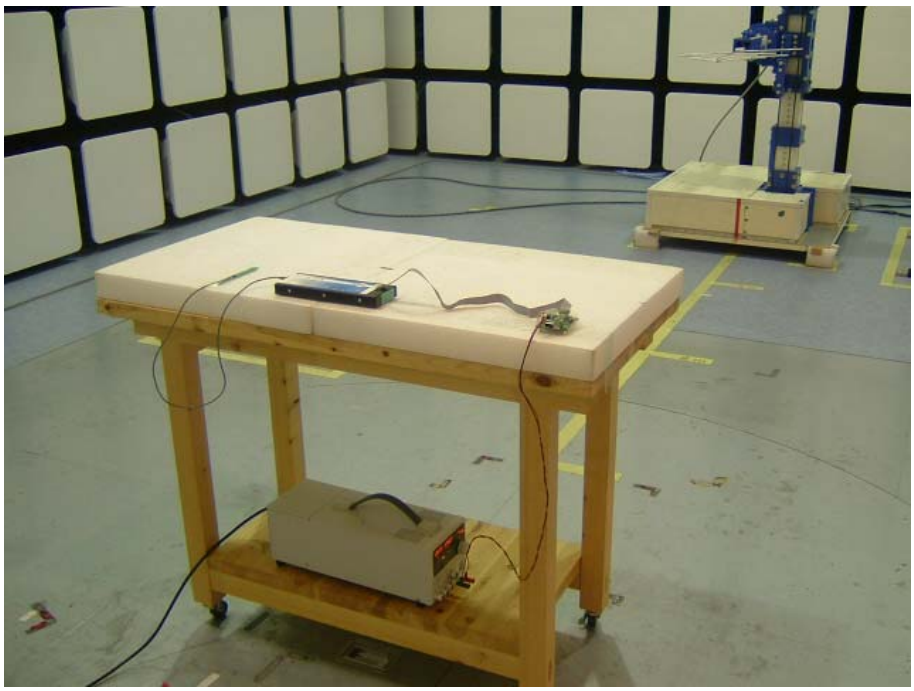


*The test configuration is set up in the actual usage, which is in the worst conditions of the noise level.

Spurious Emission (Radiated)

Front

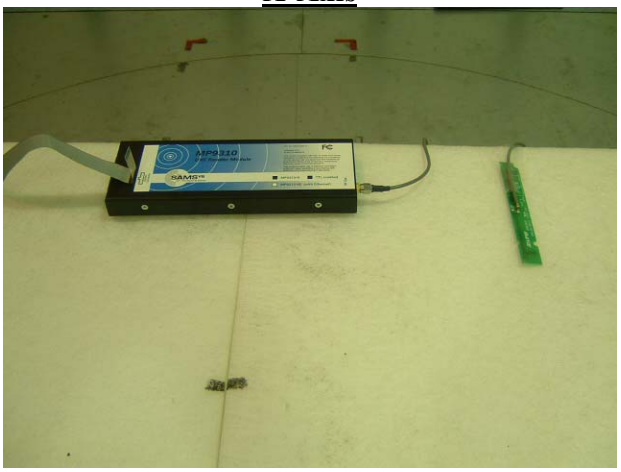
Rear



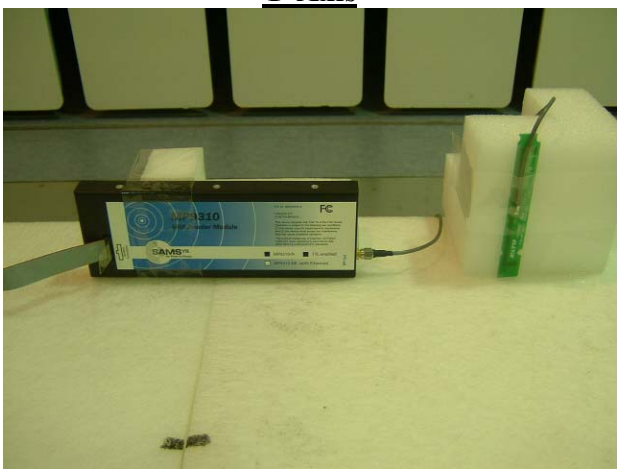
*The test configuration is set up in the actual usage, which is in the worst conditions of the noise level.

Worst Case Position (Horizontal: X-Axis/Vertical: Y-Axis)

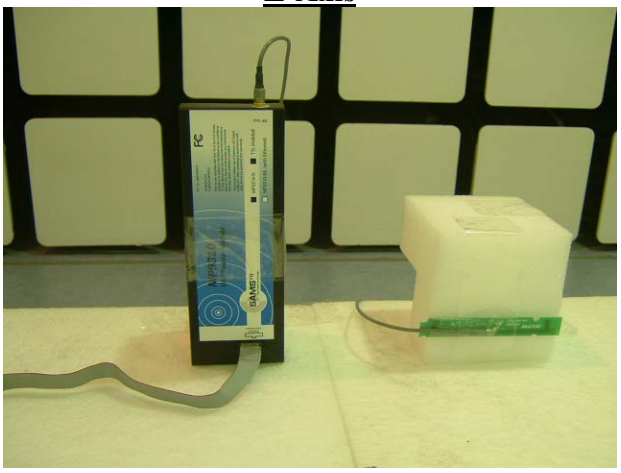
X-Axis



Y-Axis



Z-Axis



APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2005/04/11 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	RE	2005/05/19 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2005/02/02 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	RE	2005/08/31 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2004/12/16 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12
MRENT-21	Spectrum Analyzer	Advantest	R3273	AT	2005/08/19 * 12
MAT-17	Attenuator(20dB)	Weinschel Corp	93459	AT	2005/01/11 * 12
MCC-31	coaxial cable	ULApex	-	AT	2005/06/02 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2005/01/10 * 12
MCC-19	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2005/02/03 * 12
MCC-10	Coaxial cable	Storm	90-195-394	RE	2005/03/24 * 12
MCC-04	Microwave Cable 1G-50GHz	Storm	421-011 (90-1394-079)	RE	2005/01/05 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2005/02/05 * 12
MAT-22	Attenuator(10dB)(above1GHz)	Orient Microwave	BX10-0476-00	RE	2005/03/16 * 12
MHF-03	High pass Filter	Mini-Circuit	VHF-1320	RE	2004/12/09 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE（EUT）	2005/02/04 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2005/02/04 * 12
MTA-01	Termination	TME	CT-01	CE	2005/02/03 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	2005/02/24 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
Test Item:

CE: Conducted emission
RE: Radiated emission
AT: Except for CE and RE

APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

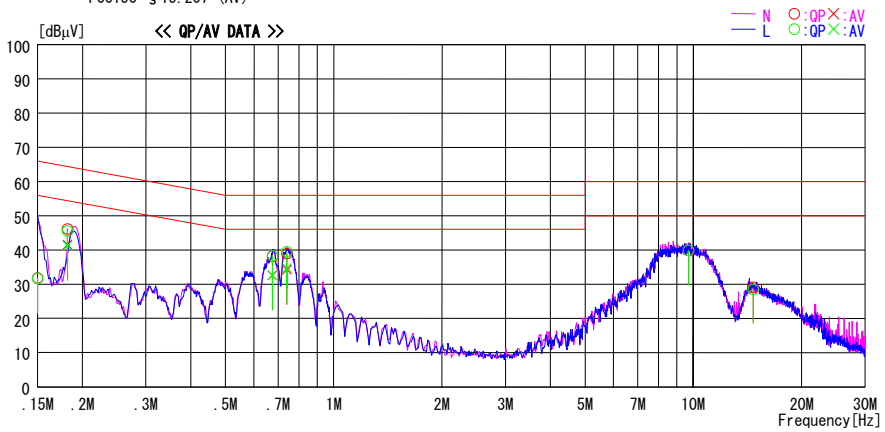
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/10/08 16:05:47

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11960

Report No. : 26AE0124-HO
Power : AC120V / 60Hz(PRINTEER)
Temp./Humi. : 27deg.C / 60%
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting Hopping ON

LIMIT : FCC15C §15.207 (QP)
FCC15C §15.207 (AV)



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase
	QP	AV	Factor	QP	AV	QP	AV	QP	AV	
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]	
0.15000	31.7	----	0.1	31.8	----	66.0	----	34.2	----	N
0.18181	46.1	41.5	0.1	46.2	41.6	64.4	54.4	18.2	12.8	N
0.67520	38.0	32.4	0.2	38.2	32.6	56.0	46.0	17.8	13.4	N
0.74070	38.7	33.9	0.3	39.0	34.2	56.0	46.0	17.0	11.8	N
9.70000	38.7	----	1.2	39.9	----	60.0	----	20.1	----	N
14.67000	27.6	----	1.5	29.1	----	60.0	----	30.9	----	N
0.15000	31.6	----	0.1	31.7	----	66.0	----	34.3	----	L
0.18181	45.5	41.1	0.1	45.6	41.2	64.4	54.4	18.8	13.2	L
0.67520	38.1	32.4	0.2	38.3	32.6	56.0	46.0	17.7	13.4	L
0.74070	39.2	34.4	0.3	39.5	34.7	56.0	46.0	16.5	11.3	L
9.70000	38.7	----	1.2	39.9	----	60.0	----	20.1	----	L
14.67000	27.0	----	1.5	28.5	----	60.0	----	31.5	----	L

CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Carrier Frequency Separation

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

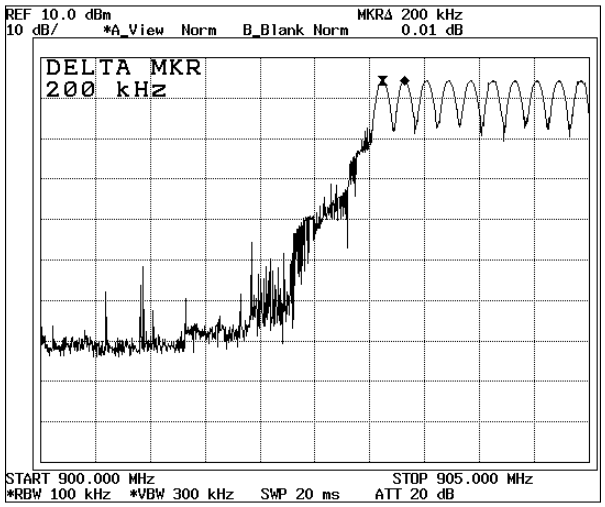
COMPANY	: SATO CORPORATION	REPORT NO	: 26AE0124-HO
EQUIPMENT	: RFID Reader Module	REGULATION	: FCC Part15C 15.247(a)(1)
MODEL	: MP9310-NT	DATE	: Sep 06, 2005
S/ N	: 11943	TEMPERATURE	: 25deg.C
POWER	: DC5.0V	HUMIDITY	: 53%
MODE	: Transmitting (Hopping On)	ENGINEER	: Makoto Kosaka

(S/A :span 10MHz, RBW 100kHz ,VBW 300kHz, sweep time AUTO)

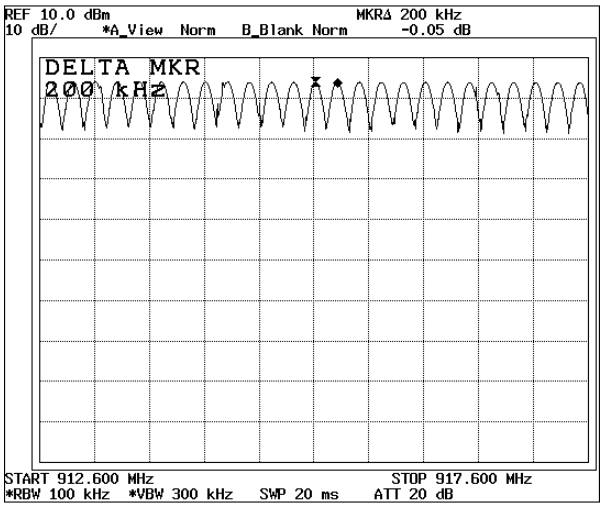
CH	FREQ [MHz]	Channel separation [MHz]	Limit
Low	902.726	0.20	>20dB Bandwidth and 25[kHz]
Mid	914.773	0.20	>20dB Bandwidth and 25[kHz]
High	927.322	0.20	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation

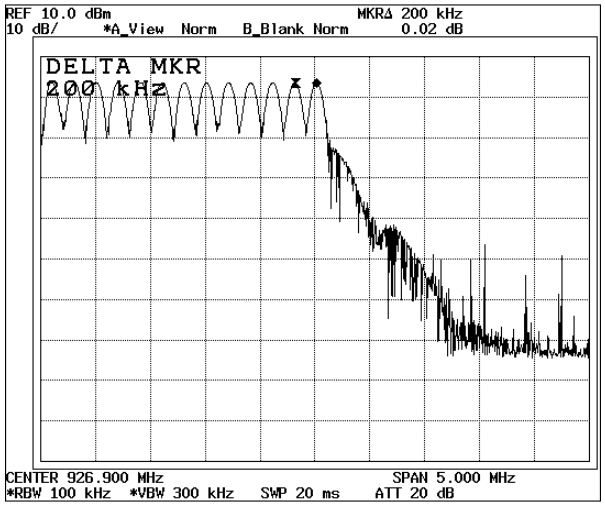
Ch : Low



Ch : Mid



Ch : High



20dB Bandwidth

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

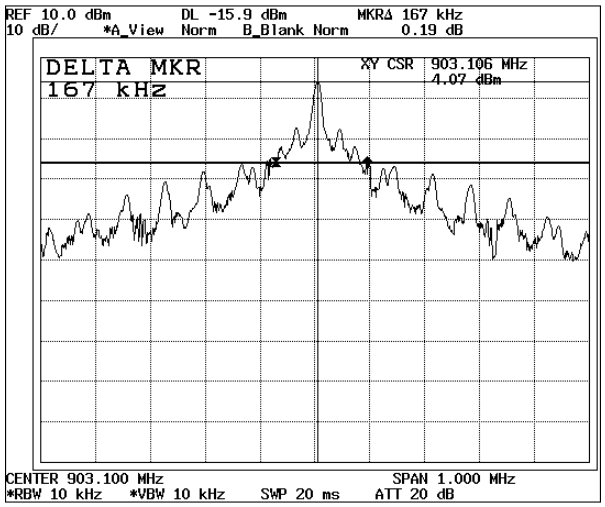
COMPANY	: SATO CORPORATION	REPORT NO	: 26AE0124-HO
EQUIPMENT	: RFID Reader Module	REGULATION	: FCC Part15C 15.247(a)(1)(i)
MODEL	: MP9310-NT	DATE	: Sep 06, 2005
S/ N	: 11943	TEMPERATURE	: 25deg.C
POWER	: DC5.0V	HUMIDITY	: 53%
MODE	: Transmitting (Hopping Off)	ENGINEER	: Makoto Kosaka

PK DETECT(S/A: span 1MHz, RBW 10kHz ,VBW 100kHz, sweep time AUTO)

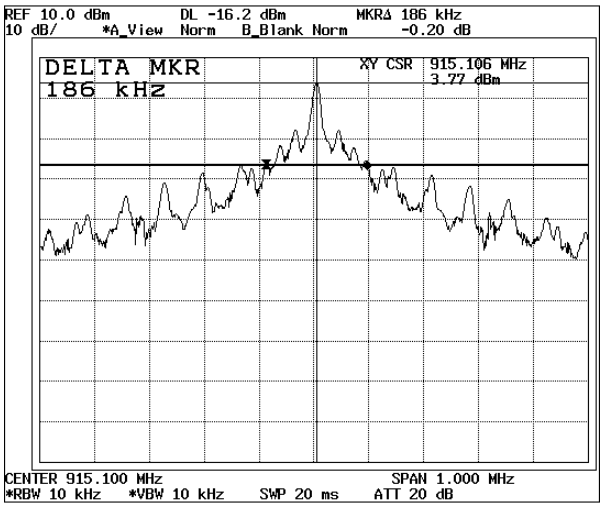
CH	FREQ [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	902.726	0.167	0.5
Mid	914.773	0.186	0.5
High	927.322	0.188	0.5

20dB Bandwidth

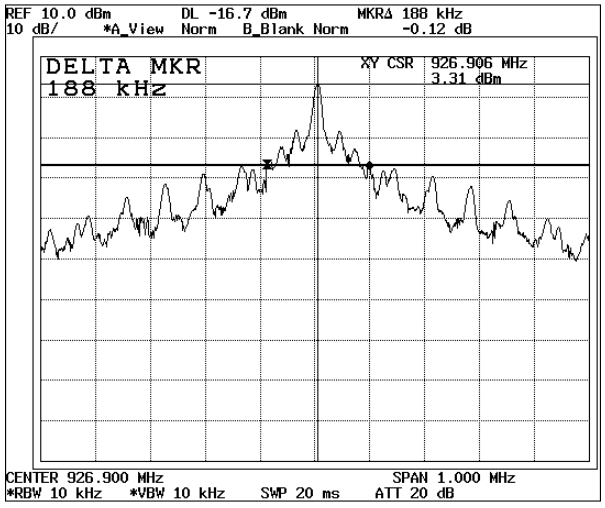
Ch : Low



Ch : Mid



Ch : High



Number of Hopping Frequency

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

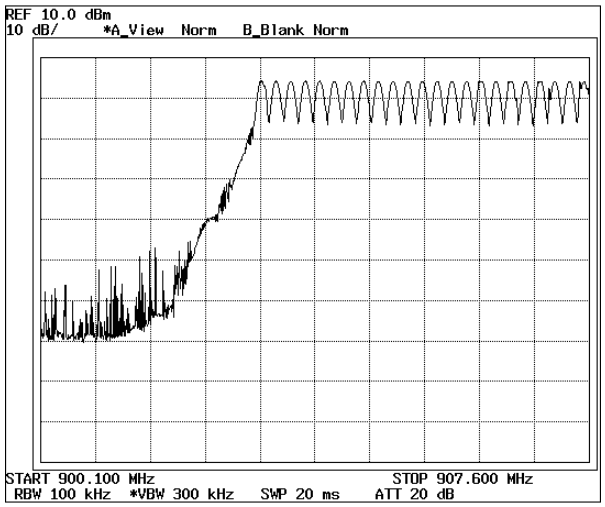
COMPANY	: SATO CORPORATION	REPORT NO	: 26AE0124-HO
EQUIPMENT	: RFID Reader Module	REGULATION	: FCC Part15C 15.247(a)(1)(i)
MODEL	: MP9310-NT	DATE	: Sep 06, 2005
S/ N	: 11943	TEMPERATURE	: 25deg.C
POWER	: DC5.0V	HUMIDITY	: 53%
MODE	: Transmitting (Hopping On)	ENGINEER	: Makoto Kosaka

(S/A : RBW 100kHz ,VBW 300kHz, sweep time AUTO)

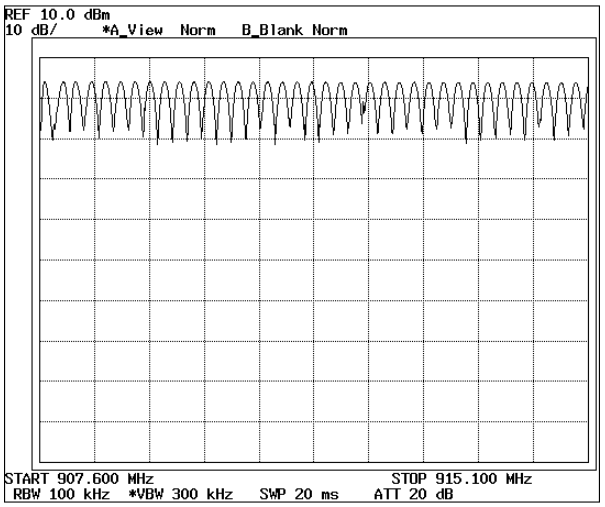
Mode	Number of channel [time]	Limit [time]
Tx(Hoppng on)	119	≧50

Number of Hopping Frequency

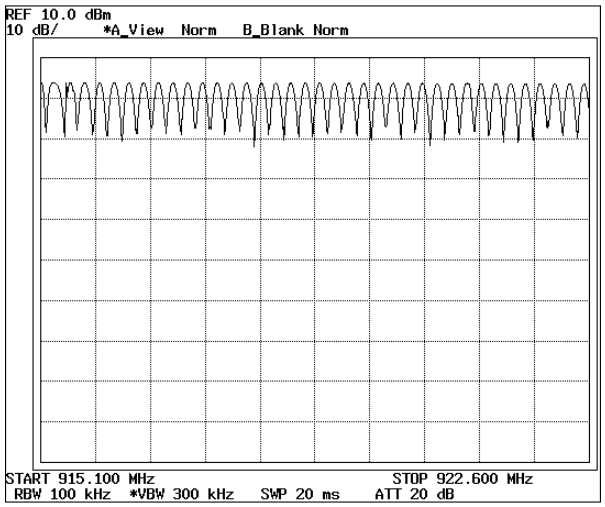
Ch : Low

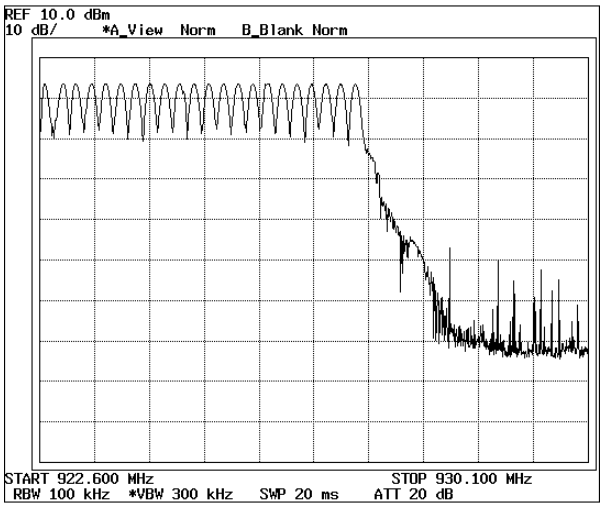


Ch : Mid



Ch : High





Dwell time

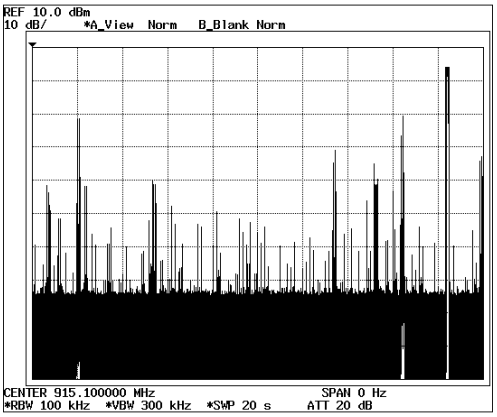
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: SATO CORPORATION	REPORT NO	: 26AE0124-HO
EQUIPMENT	: RFID Reader Module	REGULATION	: FCC Part15C 15.247(a)(1)(i)
MODEL	: MP9310-NT	DATE	: Sep 06, 2005
S/ N	: 11943	TEMPERATURE	: 25deg.C
POWER	: DC5.0V	HUMIDITY	: 53%
MODE	: Transmitting (Hopping On)	ENGINEER	: Makoto Kosaka

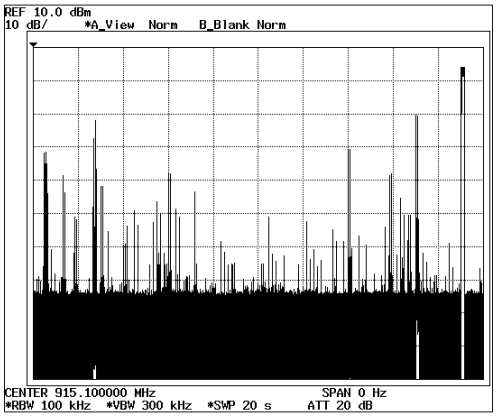
times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1	1	160.8	1* 160.8	160.80	400
2	1				
3	1				
4	1				
5	1				
Averege	1.0				

Dwell time

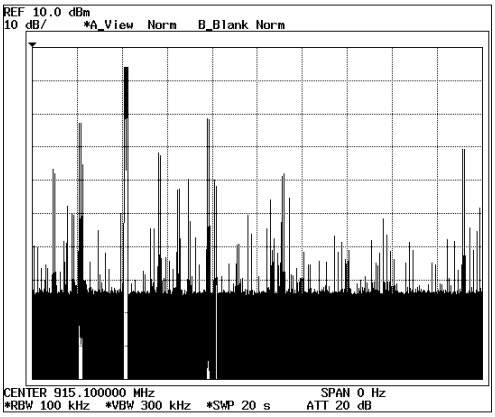
First



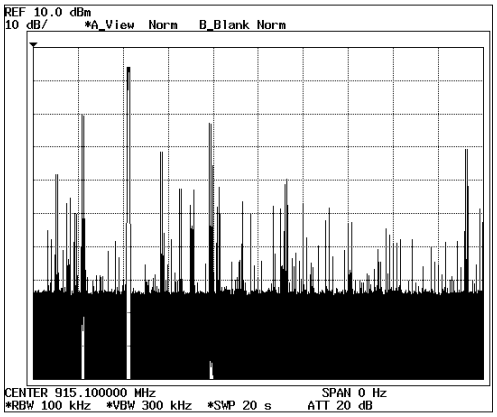
Second



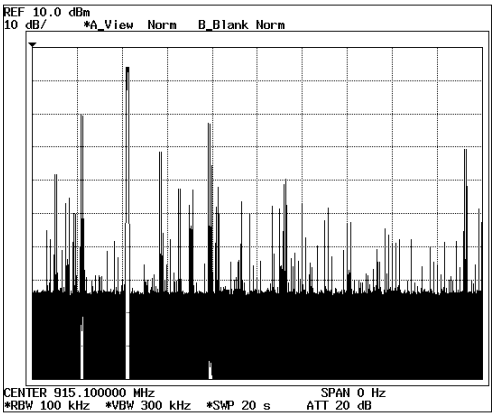
Third



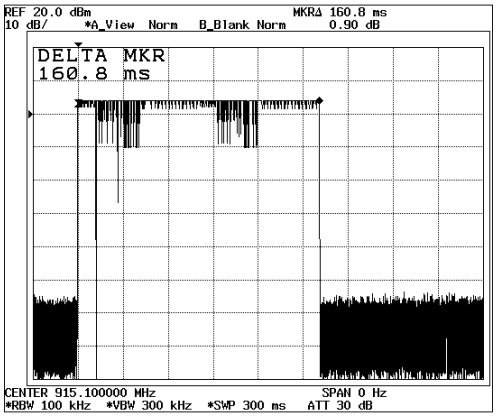
Fourth



Fifth



Length of transmission time



Maximum Peak Output Power

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: SATO CORPORATION	REPORT NO	: 26AE0124-HO
EQUIPMENT	: RFID Reader Module	REGULATION	: FCC Part 15C 15.247(b)(2)
MODEL	: MP9310-NT	TEST DISTANCE	:
SAMPLE No.	: 11943	DATE	: Sep 06, 2005
POWER	: DC5.0V	Temperature	: 25deg.C
Mode	: Transmitting (Hopping Off)	Humidity	: 53%
		ENGINEER	: Makoto Kosaka

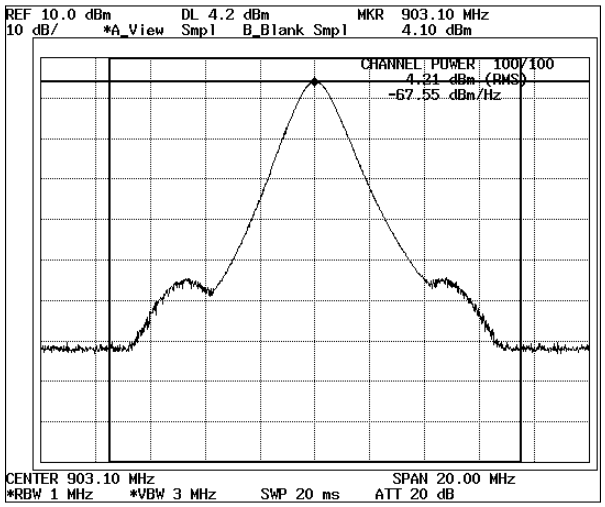
AC102V/60Hz 85%

CH	FREQ [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Attn [dB]	Result [dBm]	Limit [1.0W] [dBm]
Low	903.10	4.21	0.34	19.98	24.53	30.00
Mid	915.10	3.87	0.33	20.00	24.20	30.00
High	926.90	3.45	0.32	20.01	23.78	30.00

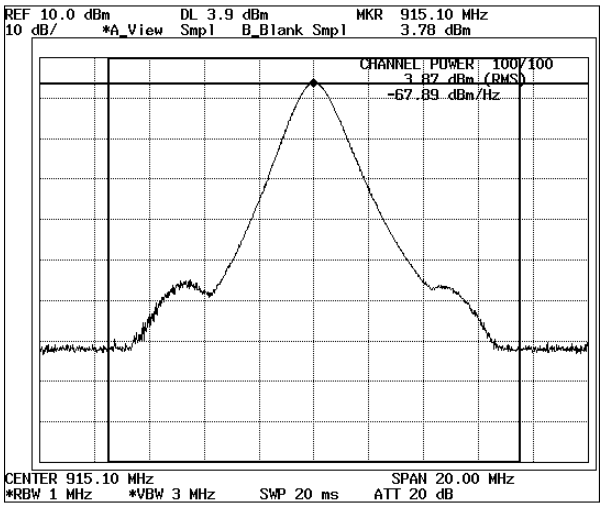
Sample Calculation:
Result = S/A Reading + Cable loss + Attenuator
Used Equipment: MAT-17, MRENT-21,MCC-31
*The test was made with the cable terminal. (Particular connector(s) and the cable(s) are supplied by the customer.)

Maximum Peak Output Power

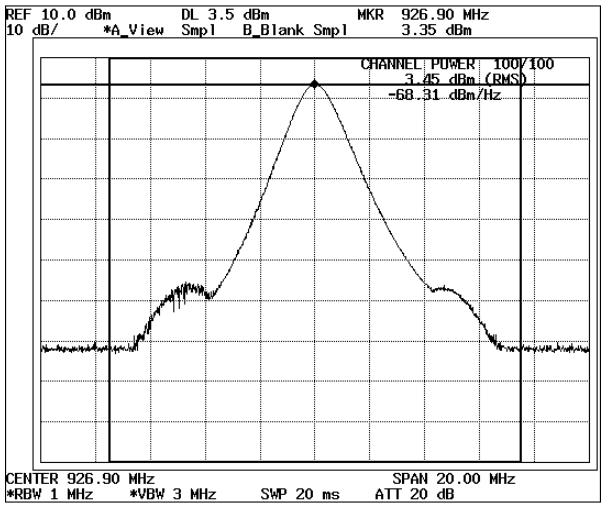
Ch : Low



Ch : Mid



Ch : High



Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

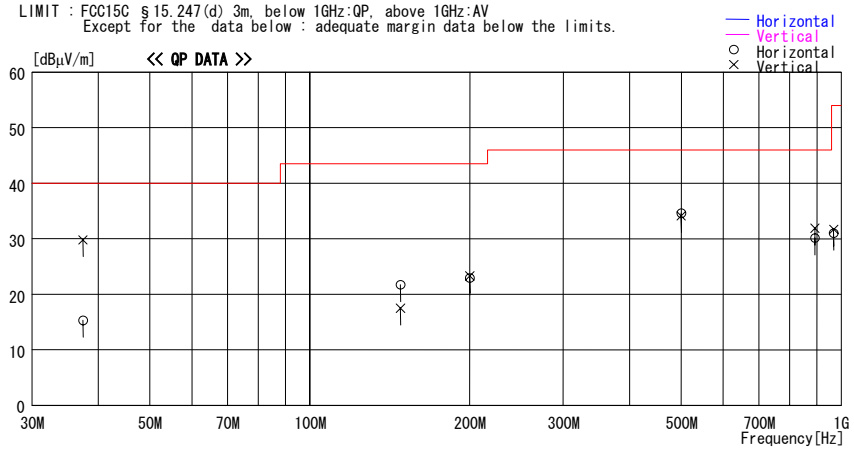
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/07 01:09:40

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5V
Temp℃/Humi% : 27deg.C / 63%
Operator : Kenichi Adachi

Mode / Remarks : 903.1MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
37.409	22.3	QP	15.1	-22.1	15.3	201	100	Hori.	40.0	24.7	
37.409	36.8	QP	15.1	-22.1	29.8	78	100	Vert.	40.0	10.2	
148.125	26.8	QP	15.5	-20.6	21.7	312	225	Hori.	43.5	21.8	
148.125	22.6	QP	15.5	-20.6	17.5	270	100	Vert.	43.5	26.0	
200.101	25.8	QP	17.1	-20.0	22.9	221	100	Hori.	43.5	20.6	
200.101	26.2	QP	17.1	-20.0	23.3	0	100	Vert.	43.5	20.2	
500.000	35.3	QP	18.9	-19.6	34.6	136	100	Hori.	46.0	11.4	
500.000	34.8	QP	18.9	-19.6	34.1	296	146	Vert.	46.0	11.9	
892.400	27.9	QP	21.9	-17.9	31.9	98	112	Vert.	46.0	14.1	
892.400	26.1	QP	21.9	-17.9	30.1	231	100	Hori.	46.0	15.9	
968.500	25.5	QP	22.9	-17.4	31.0	56	150	Hori.	54.0	23.0	
968.500	26.2	QP	22.9	-17.4	31.7	68	100	Vert.	54.0	22.3	

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

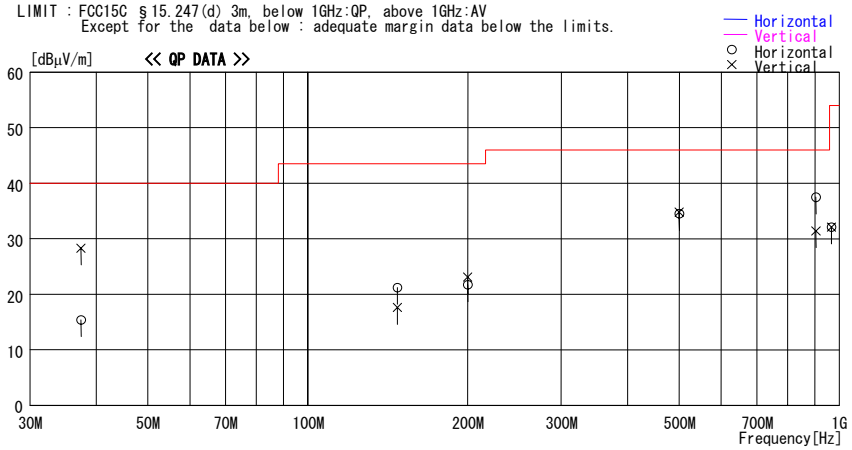
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/06 23:19:01

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5V
Temp℃/Humi% : 27deg.C / 63%
Operator : Kenichi Adachi

Mode / Remarks : 915.1MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
37.409	22.4	QP	15.1	-22.1	15.4	218	100	Hori.	40.0	24.6	
37.409	35.3	QP	15.1	-22.1	28.3	65	100	Vert.	40.0	11.7	
147.450	22.8	QP	15.5	-20.7	17.6	276	177	Vert.	43.5	25.9	
147.450	26.4	QP	15.5	-20.7	21.2	177	228	Hori.	43.5	22.3	
200.000	24.6	QP	17.1	-20.0	21.7	207	152	Hori.	43.5	21.8	
200.000	26.0	QP	17.1	-20.0	23.1	0	100	Vert.	43.5	20.4	
499.986	35.2	QP	18.9	-19.6	34.5	154	100	Hori.	46.0	11.5	
499.986	35.5	QP	18.9	-19.6	34.8	308	140	Vert.	46.0	11.2	
904.402	33.3	QP	22.0	-17.8	37.5	94	100	Hori.	46.0	8.5	
904.402	27.2	QP	22.0	-17.8	31.4	120	100	Vert.	46.0	14.6	
967.250	26.6	QP	22.9	-17.4	32.1	79	100	Vert.	54.0	21.9	
967.250	26.6	QP	22.9	-17.4	32.1	85	100	Hori.	54.0	21.9	

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

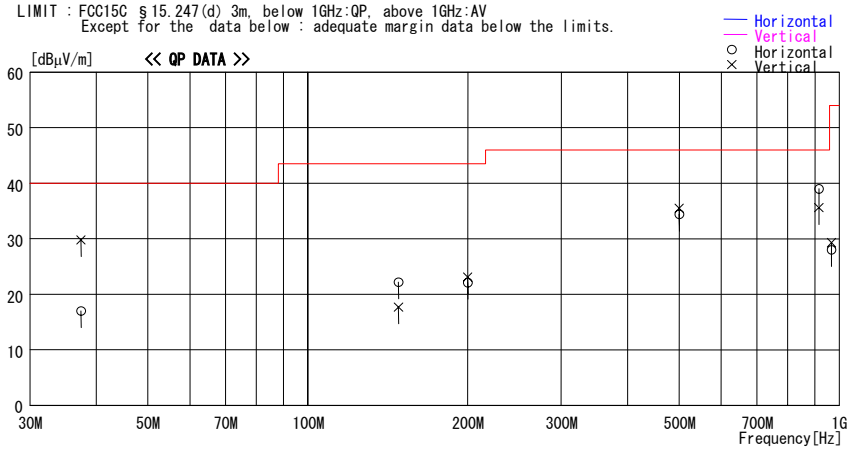
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/07 02:11:01

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5V
Temp℃/Humi% : 27deg.C / 63%
Operator : Kenichi Adachi

Mode / Remarks : 926.9MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
37.409	24.0	QP	15.1	-22.1	17.0	0	191	Hori.	40.0	23.0	
37.409	36.8	QP	15.1	-22.1	29.8	86	100	Vert.	40.0	10.2	
148.125	27.3	QP	15.5	-20.6	22.2	0	202	Hori.	43.5	21.3	
148.125	22.8	QP	15.5	-20.6	17.7	276	230	Vert.	43.5	25.8	
200.005	26.0	QP	17.1	-20.0	23.1	0	100	Vert.	43.5	20.4	
200.005	25.0	QP	17.1	-20.0	22.1	226	167	Hori.	43.5	21.4	
500.000	35.1	QP	18.9	-19.6	34.4	131	100	Hori.	46.0	11.6	
500.000	36.2	QP	18.9	-19.6	35.5	301	120	Vert.	46.0	10.5	
916.200	31.0	QP	22.2	-17.6	35.6	92	100	Vert.	46.0	10.4	
916.200	34.4	QP	22.2	-17.6	39.0	74	100	Hori.	46.0	7.0	
966.940	22.5	QP	22.9	-17.4	28.0	63	135	Hori.	54.0	26.0	
966.940	23.8	QP	22.9	-17.4	29.3	55	100	Vert.	54.0	24.7	

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

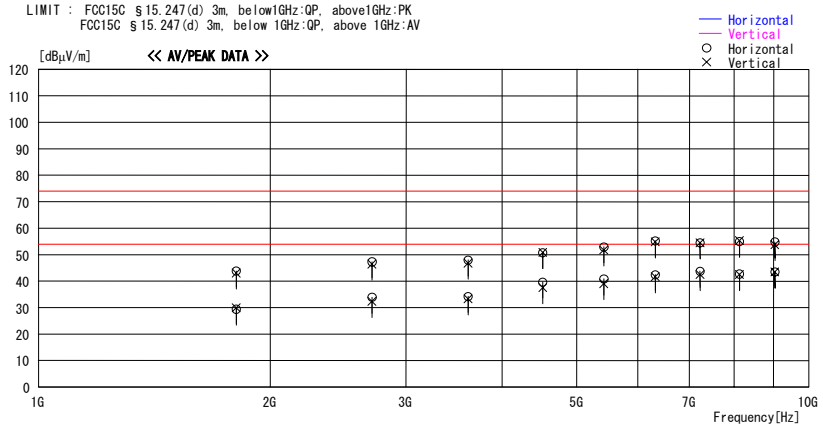
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/08 22:09:37

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5.0V
Temp℃/Humi% : 27deg.C / 46%
Operator : Kenichi Adachi

Mode / Remarks : 903.1MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:PK
FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBμV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBμV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBμV/m]	Margin [dB]	Comment
1806.200	45.7	PK	28.2	-30.1	43.8	0	100	Hori.	74.0	30.2	
1806.200	45.0	PK	28.2	-30.1	43.1	170	100	Vert.	74.0	30.9	
1806.200	31.3	AV	28.2	-30.1	29.4	0	100	Hori.	54.0	24.6	
1806.200	31.9	AV	28.2	-30.1	30.0	170	100	Vert.	54.0	24.1	
2709.300	45.2	PK	31.1	-29.0	47.3	0	100	Hori.	74.0	26.7	
2709.300	44.3	PK	31.1	-29.0	46.4	0	100	Vert.	74.0	27.6	
2709.300	31.8	AV	31.1	-29.0	33.9	0	100	Hori.	54.0	20.1	
2709.300	30.2	AV	31.1	-29.0	32.3	0	100	Vert.	54.0	21.7	
3612.400	43.7	PK	31.5	-27.3	47.9	0	100	Hori.	74.0	26.1	
3612.400	42.6	PK	31.5	-27.3	46.8	0	100	Vert.	74.0	27.2	
3612.400	30.0	AV	31.5	-27.3	34.2	0	100	Hori.	54.0	19.8	
3612.400	29.1	AV	31.5	-27.3	33.3	0	100	Vert.	54.0	20.7	
4515.500	43.0	PK	33.4	-25.6	50.8	0	100	Hori.	74.0	23.2	
4515.500	43.1	PK	33.4	-25.6	50.9	0	100	Vert.	74.0	23.2	
4515.500	31.8	AV	33.4	-25.6	39.6	0	100	Hori.	54.0	14.4	
4515.500	29.7	AV	33.4	-25.6	37.5	0	100	Vert.	54.0	16.5	
5418.600	41.3	PK	35.9	-24.3	52.9	0	100	Hori.	74.0	21.1	
5418.600	40.2	PK	35.9	-24.3	51.8	0	100	Vert.	74.0	22.3	
5418.600	29.2	AV	35.9	-24.3	40.8	0	100	Hori.	54.0	13.2	
5418.600	27.5	AV	35.9	-24.3	39.1	0	100	Vert.	54.0	15.0	
6321.700	41.9	PK	36.7	-23.4	55.2	0	100	Hori.	74.0	18.8	
6321.700	41.5	PK	36.7	-23.4	54.8	0	100	Vert.	74.0	19.2	

CHART:WITHOUT FACTOR ANT TYPE:-30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/08 22:09:37

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5.0V
Temp℃/Humi% : 27deg.C / 46%
Operator : Kenichi Adachi

Mode / Remarks : 903.1MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:PK
FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV

Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
6321.700	29.1	AV	36.7	-23.4	42.4	0	100	Hori.	54.0	11.6	
6321.700	28.3	AV	36.7	-23.4	41.6	0	100	Vert.	54.0	12.4	
7224.800	40.2	PK	37.7	-23.4	54.5	0	100	Hori.	74.0	19.5	
7224.800	40.1	PK	37.7	-23.4	54.4	0	100	Vert.	74.0	19.6	
7224.800	29.4	AV	37.7	-23.4	43.7	0	100	Hori.	54.0	10.3	
7224.800	28.2	AV	37.7	-23.4	42.5	0	100	Vert.	54.0	11.5	
8127.900	40.5	PK	36.8	-22.3	55.0	0	100	Hori.	74.0	19.0	
8127.900	40.8	PK	36.8	-22.3	55.3	0	100	Vert.	74.0	18.7	
8127.900	28.2	AV	36.8	-22.3	42.7	0	100	Hori.	54.0	11.3	
8127.900	28.0	AV	36.8	-22.3	42.5	0	100	Vert.	54.0	11.5	
9031.000	39.5	PK	36.8	-21.5	54.8	0	100	Hori.	74.0	19.2	
9031.000	38.5	PK	36.8	-21.5	53.8	0	100	Vert.	74.0	20.2	
9031.000	28.1	AV	36.8	-21.5	43.4	0	100	Hori.	54.0	10.6	
9031.000	28.1	AV	36.8	-21.5	43.4	0	100	Vert.	54.0	10.6	

CHART:WITHOUT FACTOR ANT TYPE:-30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

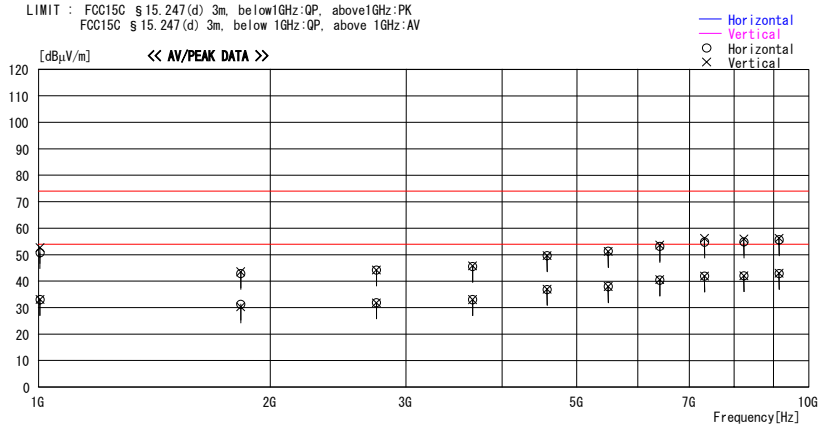
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/08 23:57:39

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5.0V
Temp℃/Humi% : 27deg.C / 46%
Operator : Kenichi Adachi

Mode / Remarks : 915.1MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:PK
FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
1004.800	50.6	PK	22.5	-22.4	50.7	233	100	Hori.	74.0	23.3	With MAT-22
1004.800	52.6	PK	22.5	-22.4	52.7	199	155	Vert.	74.0	21.3	With MAT-22
1004.800	32.9	AV	22.5	-22.4	33.0	233	100	Hori.	54.0	21.0	With MAT-22
1004.800	33.0	AV	22.5	-22.4	33.1	199	155	Vert.	54.0	20.9	With MAT-22
1830.200	45.2	PK	28.4	-30.6	43.0	247	100	Hori.	74.0	31.1	
1830.200	45.7	PK	28.4	-30.6	43.5	258	133	Vert.	74.0	30.5	
1830.200	33.5	AV	28.4	-30.6	31.3	247	100	Hori.	54.0	22.7	
1830.200	32.4	AV	28.4	-30.6	30.2	258	133	Vert.	54.0	23.8	
2745.300	42.4	PK	31.2	-29.3	44.3	0	100	Hori.	74.0	29.8	
2745.300	42.3	PK	31.2	-29.3	44.2	0	100	Vert.	74.0	29.8	
2745.300	30.0	AV	31.2	-29.3	31.9	0	100	Hori.	54.0	22.2	
2745.300	29.9	AV	31.2	-29.3	31.8	0	100	Vert.	54.0	22.2	
3660.400	41.6	PK	31.7	-27.8	45.5	0	100	Hori.	74.0	28.5	
3660.400	41.9	PK	31.7	-27.8	45.8	0	100	Vert.	74.0	28.2	
3660.400	29.1	AV	31.7	-27.8	33.0	0	100	Hori.	54.0	21.0	
3660.400	29.1	AV	31.7	-27.8	33.0	0	100	Vert.	54.0	21.0	
4575.500	42.4	PK	33.8	-26.5	49.7	0	100	Hori.	74.0	24.3	
4575.500	42.3	PK	33.8	-26.5	49.6	0	100	Vert.	74.0	24.4	
4575.500	29.6	AV	33.8	-26.5	36.9	0	100	Hori.	54.0	17.1	
4575.500	29.7	AV	33.8	-26.5	37.0	0	100	Vert.	54.0	17.0	
5490.600	40.7	PK	35.8	-25.2	51.3	0	100	Hori.	74.0	22.7	
5490.600	40.6	PK	35.8	-25.2	51.2	0	100	Vert.	74.0	22.8	

CHART:WITHOUT FACTOR ANT TYPE:-30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/08 23:57:39

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5.0V
Temp℃/Humi% : 27deg.C / 46%
Operator : Kenichi Adachi

Mode / Remarks : 915.1MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:PK
FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV

Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
5490.600	27.3	AV	35.8	-25.2	37.9	0	100	Hori.	54.0	16.1	
5490.600	27.4	AV	35.8	-25.2	38.0	0	100	Vert.	54.0	16.0	
6405.700	40.8	PK	36.6	-24.3	53.1	0	100	Hori.	74.0	20.9	
6405.700	41.3	PK	36.6	-24.3	53.6	0	100	Vert.	74.0	20.4	
6405.700	28.1	AV	36.6	-24.3	40.4	0	100	Hori.	54.0	13.6	
6405.700	28.3	AV	36.6	-24.3	40.6	0	100	Vert.	54.0	13.5	
7320.800	40.5	PK	37.9	-23.6	54.8	0	100	Hori.	74.0	19.2	
7320.800	41.8	PK	37.9	-23.6	56.1	0	100	Vert.	74.0	17.9	
7320.800	27.6	AV	37.9	-23.6	41.9	0	100	Hori.	54.0	12.1	
7320.800	27.6	AV	37.9	-23.6	41.9	0	100	Vert.	54.0	12.1	
8235.900	40.5	PK	36.9	-22.6	54.8	0	100	Hori.	74.0	19.2	
8235.900	41.5	PK	36.9	-22.6	55.8	0	100	Vert.	74.0	18.2	
8235.900	27.8	AV	36.9	-22.6	42.1	0	100	Hori.	54.0	12.0	
8235.900	27.8	AV	36.9	-22.6	42.1	0	100	Vert.	54.0	12.0	
9151.000	40.5	PK	36.9	-21.7	55.7	0	100	Hori.	74.0	18.4	
9151.000	41.0	PK	36.9	-21.7	56.2	0	100	Vert.	74.0	17.8	
9151.000	27.7	AV	36.9	-21.7	42.9	0	100	Hori.	54.0	11.1	
9151.000	27.7	AV	36.9	-21.7	42.9	0	100	Vert.	54.0	11.1	

CHART:WITHOUT FACTOR ANT TYPE:-30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

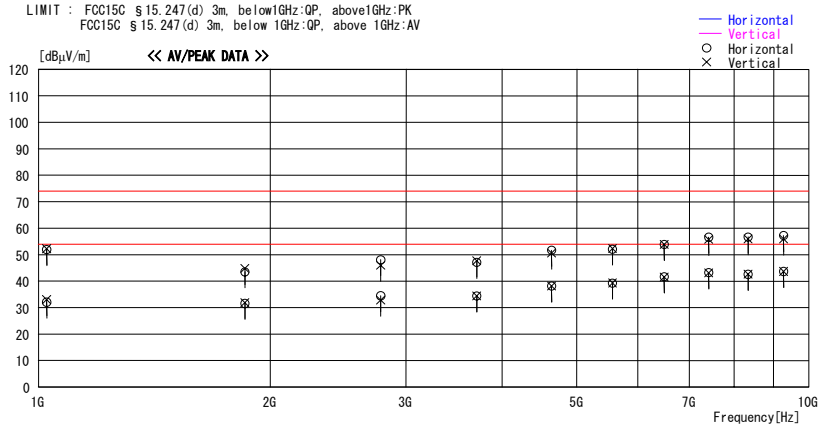
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/09 01:05:13

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5.0V
Temp℃/Humi% : 27deg.C / 46%
Operator : Kenichi Adachi

Mode / Remarks : 926.9MHz Max_Axis

LIMIT : FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:PK
FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
1025.000	51.7	PK	22.6	-22.4	51.9	228	100	Hori.	74.0	22.1	With MAT-22
1025.000	52.0	PK	22.6	-22.4	52.2	179	129	Vert.	74.0	21.8	With MAT-22
1025.000	31.9	AV	22.6	-22.4	32.1	228	100	Hori.	54.0	21.9	With MAT-22
1025.000	32.8	AV	22.6	-22.4	33.0	179	129	Vert.	54.0	21.0	With MAT-22
1853.800	44.7	PK	28.7	-29.9	43.5	253	131	Hori.	74.0	30.5	
1853.800	46.0	PK	28.7	-29.9	44.8	235	100	Vert.	74.0	29.2	
1853.800	32.8	AV	28.7	-29.9	31.6	253	131	Hori.	54.0	22.4	
1853.800	33.1	AV	28.7	-29.9	31.9	235	100	Vert.	54.0	22.2	
2780.700	45.6	PK	31.3	-28.8	48.1	0	100	Hori.	74.0	25.9	
2780.700	43.5	PK	31.3	-28.8	46.0	0	100	Vert.	74.0	28.1	
2780.700	31.9	AV	31.3	-28.8	34.4	0	100	Hori.	54.0	19.6	
2780.700	30.3	AV	31.3	-28.8	32.8	0	100	Vert.	54.0	21.2	
3707.600	42.3	PK	31.9	-27.1	47.1	0	100	Hori.	74.0	26.9	
3707.600	42.9	PK	31.9	-27.1	47.7	0	100	Vert.	74.0	26.3	
3707.600	29.6	AV	31.9	-27.1	34.4	0	100	Hori.	54.0	19.6	
3707.600	29.6	AV	31.9	-27.1	34.4	0	100	Vert.	54.0	19.6	
4634.500	42.8	PK	34.1	-25.3	51.6	0	100	Hori.	74.0	22.4	
4634.500	41.8	PK	34.1	-25.3	50.6	0	100	Vert.	74.0	23.4	
4634.500	29.4	AV	34.1	-25.3	38.2	0	100	Hori.	54.0	15.8	
4634.500	29.4	AV	34.1	-25.3	38.2	0	100	Vert.	54.0	15.8	
5561.400	40.3	PK	36.0	-24.2	52.1	0	100	Hori.	74.0	21.9	
5561.400	40.5	PK	36.0	-24.2	52.3	0	100	Vert.	74.0	21.7	

CHART:WITHOUT FACTOR ANT TYPE:-30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Radiated Spurious Emission

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2005/09/09 01:05:13

Applicant : SATO CORPORATION
Kind of EUT : RFID Reader Module
Model No. : MP9310-NT
Serial No. : 11943

Report No. : 26AE0124-HO
Power : DC +5.0V
Temp℃/Humi% : 27deg.C / 46%
Operator : Kenichi Adachi

Mode / Remarks : 926.9MHz Max_Axis

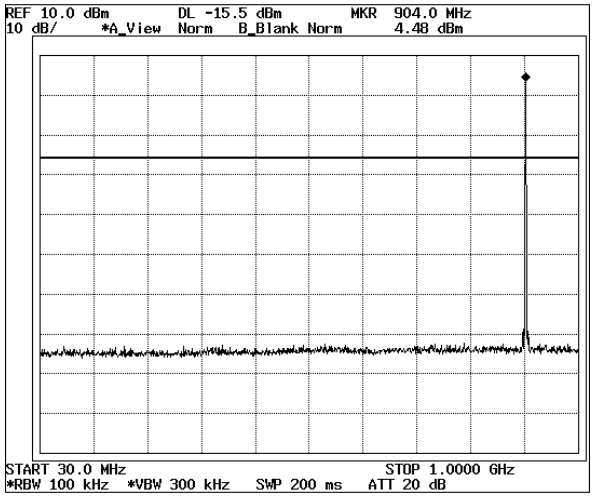
LIMIT : FCC15C §15.247(d) 3m, below1GHz:QP, above1GHz:PK
FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV

Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
5561.400	27.5	AV	36.0	-24.2	39.3	0	100	Hori.	54.0	14.7	
5561.400	27.5	AV	36.0	-24.2	39.3	0	100	Vert.	54.0	14.7	
6488.300	40.7	PK	36.5	-23.3	53.9	0	100	Hori.	74.0	20.1	
6488.300	40.7	PK	36.5	-23.3	53.9	0	100	Vert.	74.0	20.2	
6488.300	28.4	AV	36.5	-23.3	41.6	0	100	Hori.	54.0	12.4	
6488.300	28.3	AV	36.5	-23.3	41.5	0	100	Vert.	54.0	12.5	
7415.200	41.1	PK	38.1	-22.6	56.6	0	100	Hori.	74.0	17.4	
7415.200	40.3	PK	38.1	-22.6	55.8	0	100	Vert.	74.0	18.2	
7415.200	27.7	AV	38.1	-22.6	43.2	0	100	Hori.	54.0	10.8	
7415.200	27.6	AV	38.1	-22.6	43.1	0	100	Vert.	54.0	10.9	
8342.100	41.8	PK	37.0	-22.2	56.6	0	100	Hori.	74.0	17.4	
8342.100	41.1	PK	37.0	-22.2	55.9	0	100	Vert.	74.0	18.1	
8342.100	27.8	AV	37.0	-22.2	42.6	0	100	Hori.	54.0	11.4	
8342.100	27.8	AV	37.0	-22.2	42.6	0	100	Vert.	54.0	11.4	
9269.000	41.9	PK	37.0	-21.6	57.3	0	100	Hori.	74.0	16.7	
9269.000	40.5	PK	37.0	-21.6	55.9	0	100	Vert.	74.0	18.1	
9269.000	28.2	AV	37.0	-21.6	43.6	0	100	Hori.	54.0	10.4	
9269.000	28.2	AV	37.0	-21.6	43.6	0	100	Vert.	54.0	10.4	

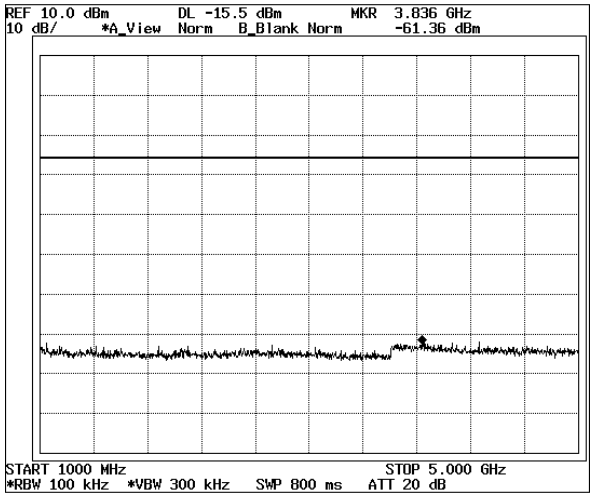
CHART:WITHOUT FACTOR ANT TYPE:-30MHz LOOP,30-300MHz BICONICAL,300MHz-1000MHz LOGPERIODIC,1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP.GAIN
Page:

Conducted Spurious Emission
Ch:Low

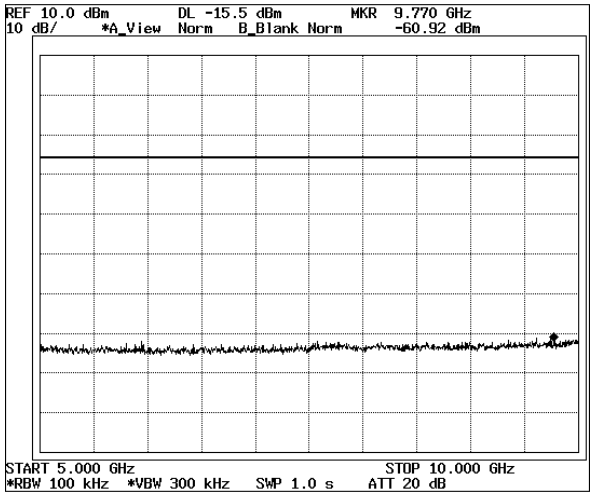
30MHz-1GHz



1GHz-5GHz

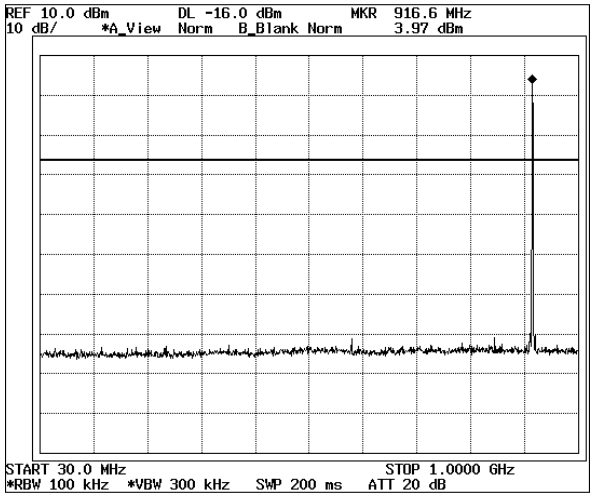


5GHz-10GHz

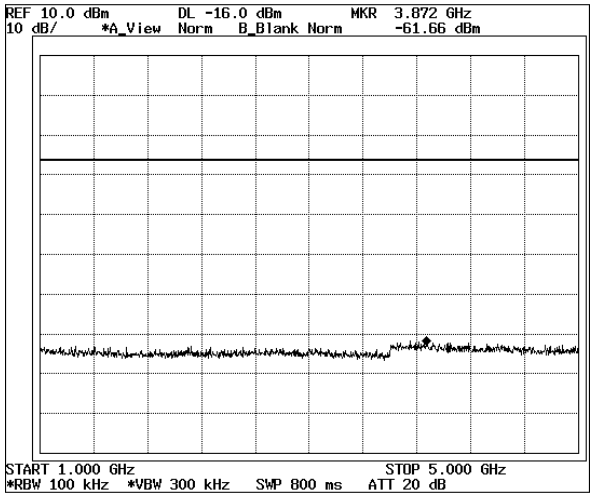


Conducted Spurious Emission
Ch:Mid

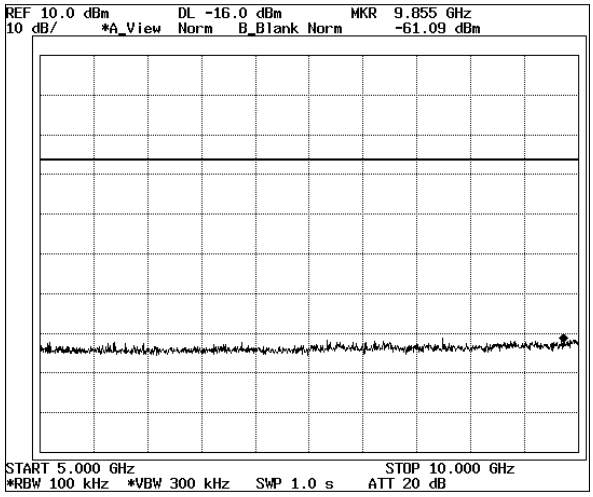
30MHz-1GHz



1GHz-5GHz

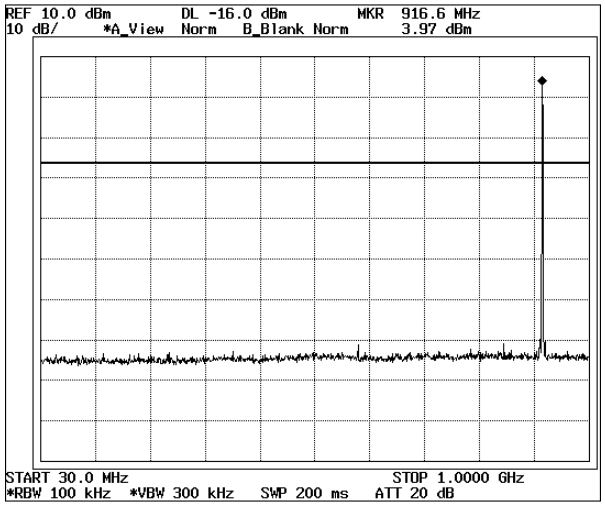


5GHz-10GHz

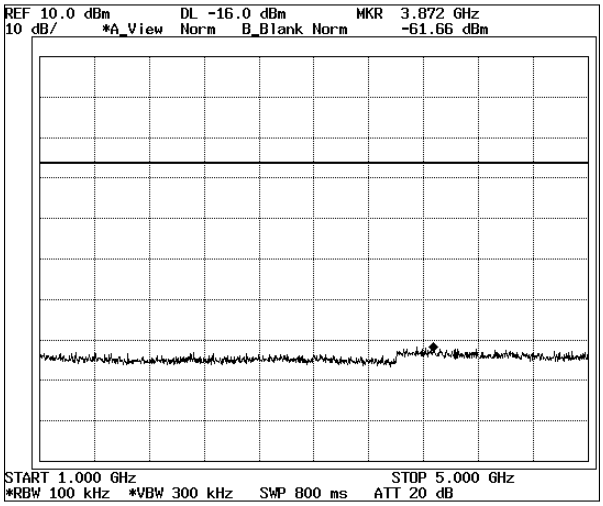


Conducted Spurious Emission
Ch:High

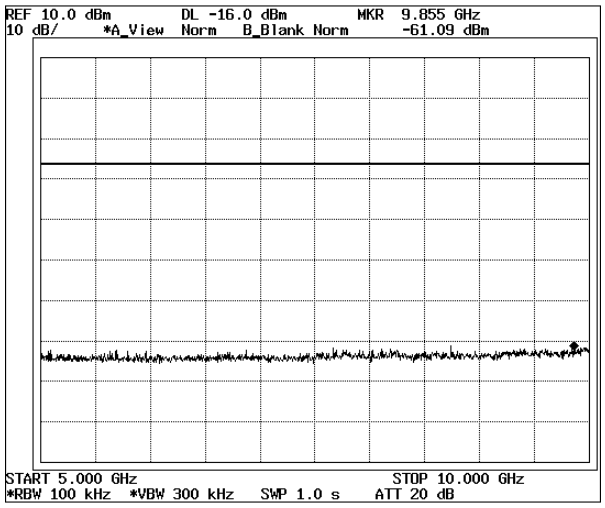
30MHz-1GHz



1GHz-5GHz

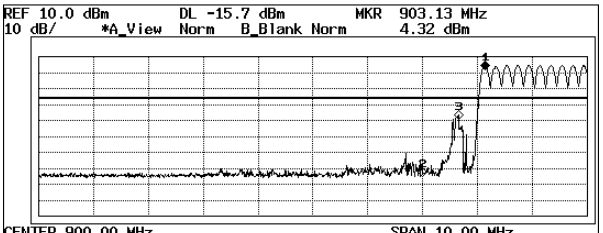


5GHz-10GHz



Conducted Spurious Emission
Band Edge compliance

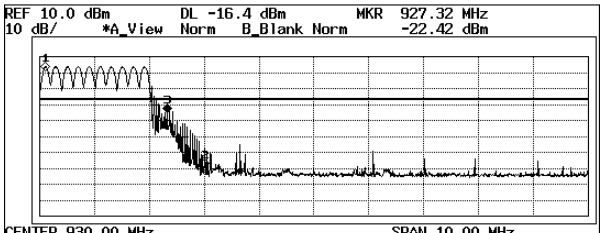
Hopping on (Ch:Low)



Multi Marker List

1:	903.13 MHz	4.32 dBm
2:	902.00 MHz	-62.28 dBm
3:	902.65 MHz	-26.64 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

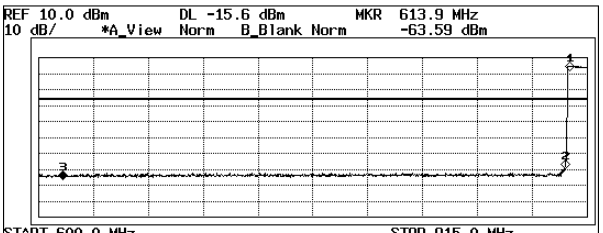
Hopping on (Ch:High)



Multi Marker List

1:	925.11 MHz	3.63 dBm
2:	928.00 MHz	-56.88 dBm
3:	927.32 MHz	-22.42 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

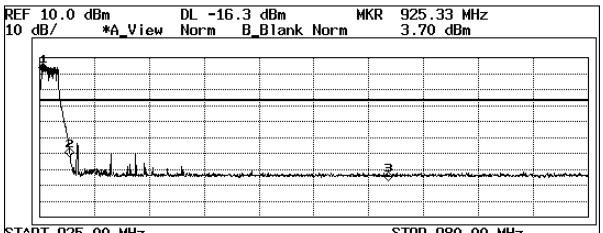
Hopping on (Ch:Low)



Multi Marker List

1:	904.9 MHz	4.38 dBm
2:	902.1 MHz	-56.84 dBm
3:	613.9 MHz	-63.59 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

Hopping on (Ch:High)

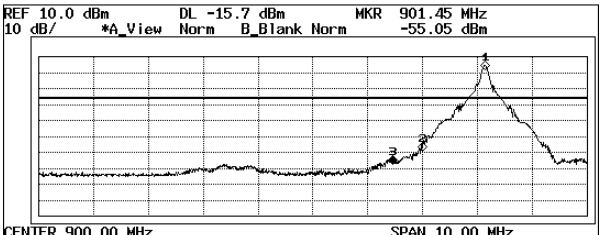


Multi Marker List

1:	925.33 MHz	3.70 dBm
2:	928.02 MHz	-49.23 dBm
3:	959.98 MHz	-64.30 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

Conducted Spurious Emission
Band Edge compliance

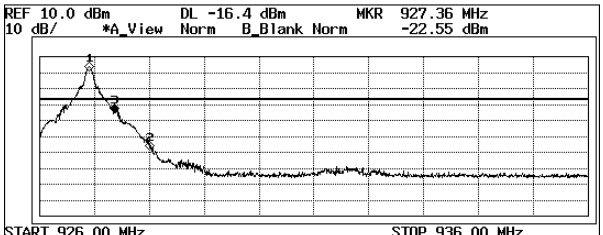
Hopping off (Ch:Low)



Multi Marker List

1:	903.13 MHz	4.34 dBm
2:	902.00 MHz	-46.59 dBm
3:	901.45 MHz	-55.05 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

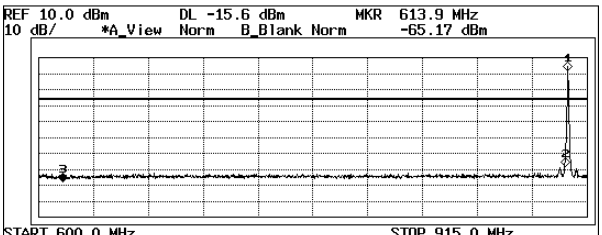
Hopping off (Ch:High)



Multi Marker List

1:	926.91 MHz	3.64 dBm
2:	928.00 MHz	-45.54 dBm
3:	927.36 MHz	-22.55 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

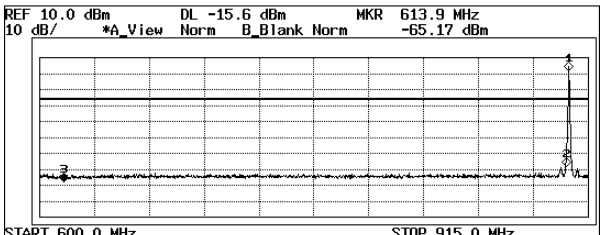
Hopping off (Ch:Low)



Multi Marker List

1:	903.7 MHz	4.40 dBm
2:	902.1 MHz	-55.23 dBm
3:	613.9 MHz	-65.17 dBm
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

Hopping off (Ch:High)



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1:	903.7 MHz	4.40 dBm
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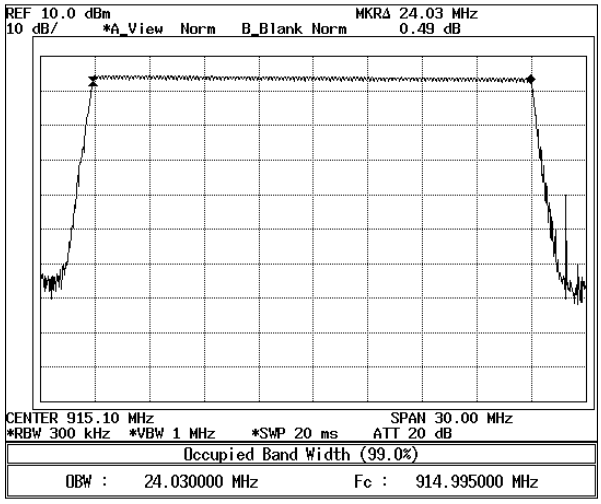
4:		
5:		
6:		
7:		
8:		
9:		
10:		
Δ:		

99% Occupied Bandwidth

Hopping on



Hopping off