

Application for FCC Certification
On behalf of

Quintet Digital Corporation

Product Name: UHF RFID Handy Terminal

Model No.: C35

Serial No.: E2010011302

FCC ID: YAAC35010

Prepared For : Quintet Digital Corporation
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Report No. : ACI-F10029
Date of Test : Jan. 14 – Apr. 22, 2010
Date of Report : Apr. 23, 2010

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Quintet Digital Corporation
Manufacturer : Shanghai SVA DD & TT Electronic Enterprise Co., Ltd.
EUT Description : UHF RFID Handy Terminal
(A) Model No. : C35
(B) Serial No. : E2010011302
(C) Power Supply : DC 7.4V (Li-ion Battery)
(D) Test Voltage : AC 120V/60Hz via I.T.E. Power Supply

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2009
AND ANSI C63.4-2003*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: C35, S/N: E2010011302), which was tested on Jan. 14 - Mar. 18, 2010 is technically compliance with the FCC limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Jan.14 – Mar. 18, 2010 Date of Report : Mar. 18, 2010

Producer : Alan He
ALAN HE / Assistant

Review : Dio Yang
DIO YANG / Deputy Assistant Manager

AUDIX[®] For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : Sammy Chen
Authorized Signature EMC SAMMY CHEN/ Assistant Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.207(a)
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.209(a) 15.205(a)(c)
20 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.247(a)(1)
Maximum Peak Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.247(b)(2)
Emission Limitations Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.247(d)
Hopping Channel Separation	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.247(a)(1)
Number of Hopping Frequency used	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.247(a)(1)
Dwell Time on Each Channel	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2009 AND ANSI C63.4:2003 AND KDB558074	Pass	15.247(a)(1)

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : UHF RFID Handy Terminal

Type of EUT ☒ Production ☐ Pre-product ☐ Pro-type

Model Number : C35

Serial Number : E2010011302

Applicant : Quintet Digital Corporation
9F-A, 728, Yan'An West Rd., Changning District,
Shanghai 200050, China

Manufacturer : Shanghai SVA DD & TT Electronic Enterprise Co.,
Ltd.
No.589 Yuandian Road, Xinzhuang Industry Park,
Minhang District, Shanghai 201108 China

Power Supply : DC 7.4V (Li-ion Battery)

Li-ion Battery : Manufacturer : Dongguan Large Electronics Co., Ltd.
M/N : 103450-2S1P
Rating : 7.4V 1800mAh

I.T.E. Power Supply: (Adapter) Manufacturer : LEADER ELECTRONICS INC.
M/N : NU20-5120200-I2
I/P : AC 100-240V 50/60Hz 1.0A
O/P : DC 12V 2A
Output cable : Unshielded, Undetachable, 1.2m,
with one core on cable

Freq. Band : 902 MHz - 928 MHz
Total 50 Channels in 500 kHz Separation

Tested Freq. : 902.75 MHz (Channel 01)
915.25 MHz (Channel 26)
927.25 MHz (Channel 50)

Modulation : Frequency Hopping Spread Spectrum / ASK

Antenna Gain : 2.5dBi

2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber) : Sept. 17, 1998 file on
Apr 29, 2009 Renewed
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3 F 34 Bldg 680 Guiping Rd.,
Caohejing Hi-Tech Park,
Shanghai 200233, China

FCC registration Number : 91789

Accredited by NVLAP, Lab Code : 200371-0

2.3 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 1.26 dB
Radiated Emission Expanded Uncertainty : U = 3.02 dB
20 dB Bandwidth Expanded Uncertainty : U = 0.05 kHz
Maximum Peak Output Power Expanded Uncertainty : U = 0.30 dBm
Emission Limitations Expanded Uncertainty : U = 0.15 dB
Band Edge Expanded Uncertainty : U = 0.15 dB

3 CONDUCTED EMISSION TEST

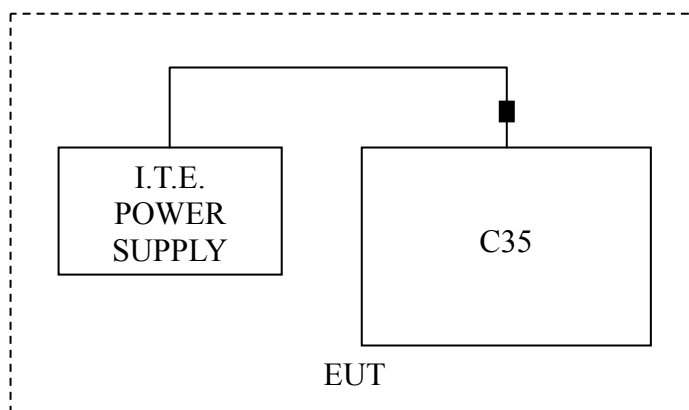
3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	100841	Nov 21, 2009	Nov 21, 2010
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Apr 02, 2009	Apr 02, 2010
3.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426389	Sep19, 2009	Mar 19, 2010
4.	50 Ω Terminator	Anritsu	BNC	001	Apr 02, 2009	Apr 02, 2010
5.	Software	Audix	E3	SET00200 9804M592	--	--

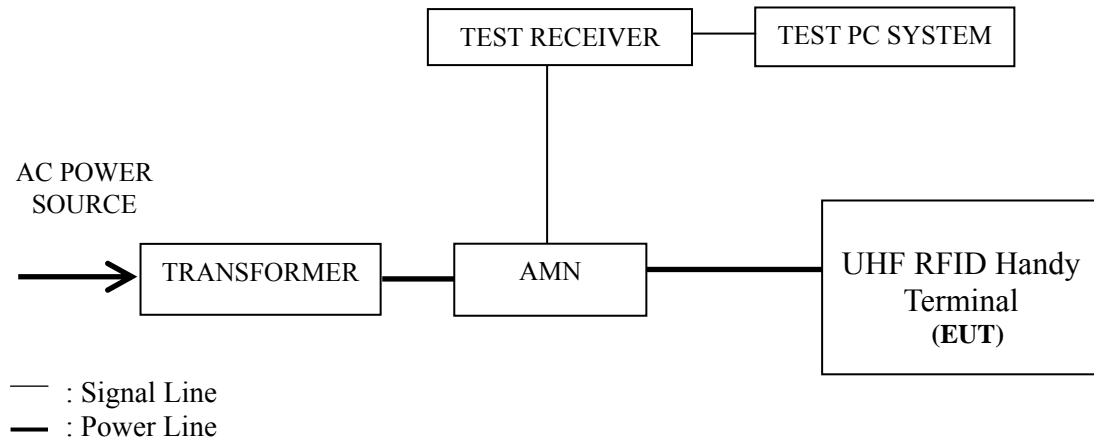
3.2 Block Diagram of Test Setup

3.2.1 EUT & Peripherals



■ : Ferrite core

3.2.2 Conducted Disturbance Test Setup



3.3 Conducted Emission Limits [FCC Part 15 Subpart C 15.207(a)]

Frequency Range (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66~56*	56~46*
0.5 ~ 5	56	46
5 ~ 30	60	50
NOTE – *Decreases with the logarithm of the frequency.		

3.4 Test Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipments and the EUT.

3.5.3 Set the EUT on the test mode (Transmitting), and then test.

3.6 Test Procedures

The EUT was connected to the power mains through an Artificial Mains Network (AMN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line (Line & Neutral) were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ANSI C63.4:2003 during conducted emission test.

The bandwidth of R&S Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz was checked.

The test modes were done on conducted disturbance test and all the test results are listed in Sec. 3.7.

3.7 Test Results

< **PASS** >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

NOTE 1 – Factor = Cable Loss + AMN Factor.

NOTE 2 – Emission Level = Meter Reading + Factor.

NOTE 3 – “QP” means “Quasi-Peak” values, “AV” means “Average” values.

NOTE 4 – The worst emission is detected at 0.190 MHz (Quasi-Peak Value) with corrected signal level of 47.25 dB (μV) (limit is 64.02 dB (μV)), when the Line of the EUT is connected to AMN.

EUT : UHF RFID Handy Terminal Temperature : 22°C

Model No. : C35 Humidity : 48%RH

Serial No. : E2010011302 Date of Test : Mar. 04, 2010

Test Mode : Transmitting

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.190	47.05	0.20	47.25	64.02	16.77	QP
	0.252	37.90	0.28	38.18	61.69	23.51	
	0.997	29.75	0.43	30.18	56.00	25.82	
	2.910	33.33	0.50	33.83	56.00	22.17	
	7.687	32.00	0.59	32.59	60.00	27.41	
	14.970	35.62	0.69	36.31	60.00	23.69	
	0.190	27.87	0.20	28.07	54.02	25.95	AV
	0.252	15.85	0.28	16.13	51.69	35.56	
	0.997	24.80	0.43	25.23	46.00	20.77	
	2.910	14.68	0.50	15.18	46.00	30.82	
	7.687	18.50	0.59	19.09	50.00	30.91	
	14.970	19.00	0.69	19.69	50.00	30.31	
Neutral	0.180	45.08	0.20	45.28	64.50	19.22	QP
	0.239	36.68	0.28	36.96	62.13	25.17	
	0.535	22.72	0.36	23.08	56.00	32.92	
	2.474	21.28	0.45	21.73	56.00	34.27	
	8.592	22.19	0.59	22.78	60.00	37.22	
	19.224	28.00	0.71	28.71	60.00	31.29	
	0.180	32.86	0.20	33.06	54.50	21.44	AV
	0.239	27.60	0.28	27.88	52.13	24.25	
	0.535	16.32	0.36	16.68	46.00	29.32	
	2.474	8.33	0.45	8.78	46.00	37.22	
	8.592	10.02	0.59	10.61	50.00	39.39	
	19.224	17.79	0.71	18.50	50.00	31.50	

TEST ENGINEER: HUGH HUANG

4 RADIATED EMISSION TEST

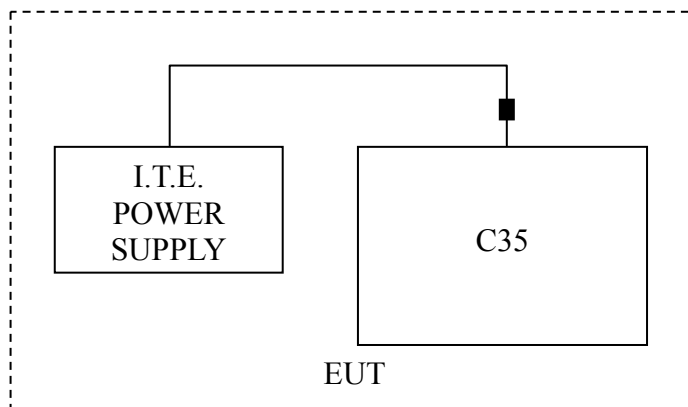
4.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	Agilent	8447D	2944A10548	Sep 19, 2009	Mar 19, 2010
2.	Preamplifier	HP	8449B	3008A00864	May 19, 2009	May 19, 2010
3.	Spectrum Analyzer	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010
4.	Test Receiver	R&S	ESVS10	844594/001	Mar 07, 2010	Mar 07, 2011
5.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 14, 2009	May 14, 2010
6.	Horn Antenna	EMCO	3115	9607-4878	Oct 26, 2009	Oct 26, 2010
7.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426390	Sep 19, 2009	Mar 19, 2010
8.	Software	Audix	E3	SET00200 9912M295-2	-	-

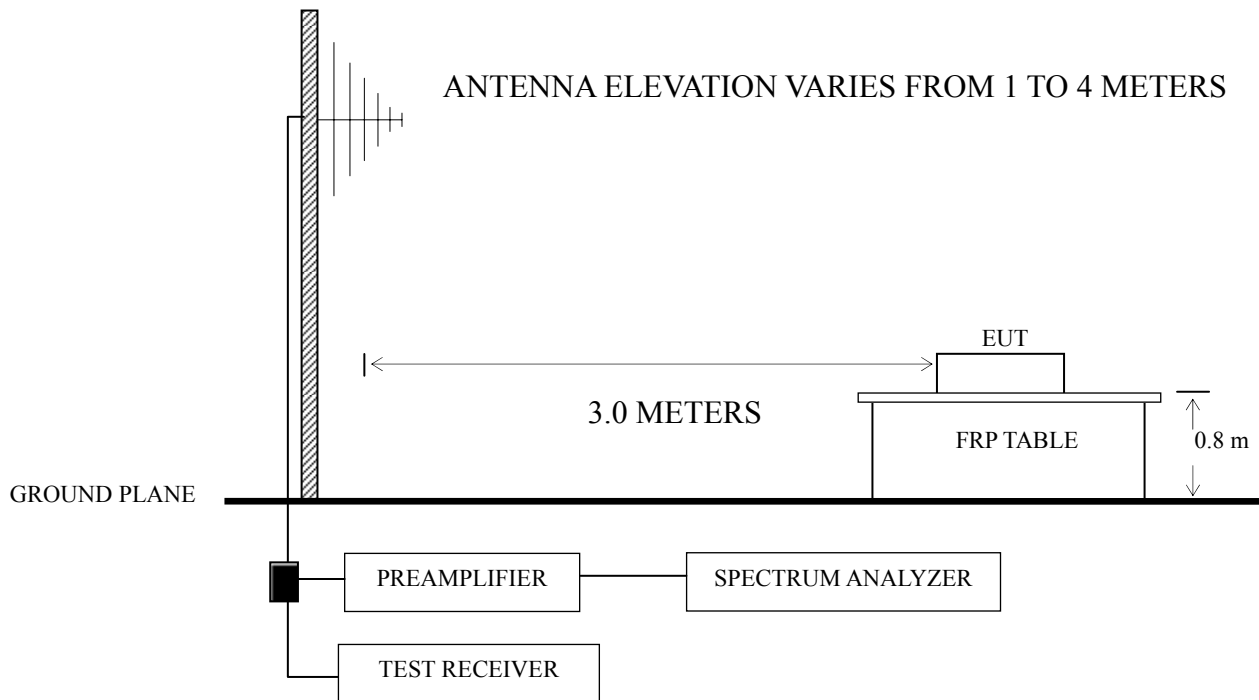
4.2 Block Diagram of Test Setup

4.2.1 EUT & Peripherals



■ : Ferrite core

4.2.2 Test Setup



■ : 50 ohm Coaxial Switch

4.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

Frequency (MHz)	Distance (m)	Field strength limits ($\mu\text{V/m}$)	
		($\mu\text{V/m}$)	dB($\mu\text{V/m}$)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB ($\mu\text{V/m}$) = $20 \log$ Emission Level ($\mu\text{V/m}$)

NOTE 2 - The tighter limit applies at the band edges.

NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.

NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

4.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.3.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

4.5 Operating Condition of EUT

- 4.5.1 Setup the EUT as shown in Sec. 3.2.
- 4.5.2 Turn on the power of all equipment.
- 4.5.3 Turn the EUT on the test mode, and then test.
- 4.5.4 Configured the EUT in three axis: Lying, Side, Stand, and test separately.

4.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESVS10 was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of the VBW was set at 1MHz and RBW was set at 1MHz for peak emission measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emission above 1GHz for Spectrum Agilent E7405A.

The frequency range from 30 MHz to 10 GHz (Up to 10th harmonics from fundamental frequency) was checked.

The EUT was tested under the following test modes:

Mode	Operation	Channel	Frequency
1.	Transmitting	01	902.75 MHz
2.		26	915.25 MHz
3.		50	927.25 MHz
4.	Transmitting Band-Edge	50	927.25 MHz

All the test results are listed in Sec.4.7.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

No.	Operation	Channel	Frequency	Data Page
1.	Transmitting	01	902.75 MHz	P17
2.		26	915.25 MHz	P18
3.		50	927.25 MHz	P19
4.	Transmitting Band Edge	50	927.25 MHz	P20-21

NOTE 1 - All reading are Quasi-Peak values below or equal to 1GHz; Peak values and Average values above 1GHz.

NOTE 2 - The emission levels recorded below is data of EUT configured in Stand direction, for Stand direction was the maximum emission direction during the test. The data of Lying & Side direction are too low against the official limit to be reported.

NOTE 3 - 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

EUT : UHF RFID Handy Terminal Temperature : 22°C

Model No. : C35 Humidity : 60%RH

Serial No. : E2010011302 Date of Test : Mar. 17, 2010

Test Mode : Transmitting Ch01

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	30.970	0.52	19.03	0.64	--	20.19	40.00	19.81	QP
	174.530	21.26	10.07	1.35	--	32.68	43.50	10.82	
	246.310	20.16	12.75	1.59	--	34.50	46.00	11.50	
	401.510	21.38	16.52	2.06	--	39.96	46.00	6.04	
	504.330	23.13	17.95	2.27	--	43.35	46.00	2.65	
	804.060	19.47	20.73	2.90	--	43.10	46.00	2.90	
	1805.500	50.58	27.15	4.61	34.18	48.16	74.00	25.84	PK
	2710.000	54.19	29.77	5.69	34.20	55.45	74.00	18.55	
	3612.000	47.88	30.88	6.30	34.20	50.86	74.00	23.14	
	4513.750	46.74	33.04	7.88	34.25	53.41	74.00	20.59	
	1805.500	38.33	27.15	4.61	34.18	35.91	54.00	18.09	AV
	2710.000	46.70	29.77	5.69	34.20	47.96	54.00	6.04	
	3612.000	42.65	30.88	6.30	34.20	45.63	54.00	8.37	
	4519.000	40.68	33.04	7.88	34.25	47.35	54.00	6.65	
Vertical	35.820	16.59	16.45	0.68	--	33.72	40.00	6.28	QP
	86.260	22.13	8.78	0.98	--	31.89	40.00	8.11	
	138.640	24.91	12.17	1.21	--	38.29	43.50	5.21	
	174.530	27.01	10.07	1.35	--	38.43	43.50	5.07	
	507.240	20.13	17.98	2.27	--	40.38	46.00	5.62	
	804.060	15.76	20.73	2.90	--	39.39	46.00	6.61	
	1805.500	51.42	27.19	4.64	34.19	49.06	74.00	24.94	PK
	2710.000	53.49	29.77	5.69	34.20	54.75	74.00	19.25	
	3612.000	51.16	30.88	6.30	34.20	54.14	74.00	19.86	
	4513.750	48.38	33.04	7.88	34.25	55.05	74.00	18.95	
	1805.500	38.84	27.19	4.64	34.19	36.48	54.00	17.52	AV
	2710.000	45.88	29.77	5.69	34.20	47.14	54.00	6.86	
	3612.000	42.12	30.88	6.30	34.20	45.10	54.00	8.90	
	4519.000	40.92	33.04	7.88	34.25	47.59	54.00	6.41	

TEST ENGINEER: RAVEN JIN

EUT : UHF RFID Handy Terminal Temperature : 22°C

Model No. : C35 Humidity : 60%RH

Serial No. : E2010011302 Date of Test : Mar. 17, 2010

Test Mode : Transmitting Ch26

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	31.940	0.66	18.49	0.65	--	19.80	40.00	20.20	QP
	168.710	23.80	10.25	1.32	--	35.37	43.50	8.13	
	233.700	19.83	12.28	1.56	--	33.67	46.00	12.33	
	401.510	21.72	16.52	2.06	--	40.30	46.00	5.70	
	511.120	22.87	18.04	2.29	--	43.20	46.00	2.80	
	804.060	17.09	20.73	2.90	--	40.72	46.00	5.28	
	1830.500	45.02	27.15	4.61	34.18	42.60	74.00	31.40	PK
	2746.000	53.17	29.86	5.74	34.20	54.57	74.00	19.43	
	3661.000	46.99	31.95	7.14	34.20	51.88	74.00	22.12	
	4582.000	45.29	33.09	7.93	34.25	52.06	74.00	21.94	
	1830.500	33.38	27.15	4.61	34.18	30.96	54.00	23.04	AV
	2746.000	46.14	29.86	5.74	34.20	47.54	54.00	6.46	
	3661.000	41.30	31.95	7.14	34.20	46.19	54.00	7.81	
	4582.000	40.47	33.09	7.93	34.25	47.24	54.00	6.76	
Vertical	30.970	13.61	19.03	0.64	--	33.28	40.00	6.72	QP
	86.260	25.19	8.78	0.98	--	34.95	40.00	5.05	
	138.640	25.43	12.17	1.21	--	38.81	43.50	4.69	
	174.530	26.80	10.07	1.35	--	38.22	43.50	5.28	
	401.510	14.28	16.52	2.06	--	32.86	46.00	13.14	
	506.270	18.89	17.98	2.27	--	39.14	46.00	6.86	
	1830.500	48.74	27.15	4.61	34.18	46.32	74.00	27.68	PK
	2746.000	52.54	29.86	5.74	34.20	53.94	74.00	20.06	
	3661.000	50.39	31.95	7.14	34.20	55.28	74.00	18.72	
	4582.000	47.36	33.09	7.93	34.25	54.13	74.00	19.87	
	1830.500	37.31	27.15	4.61	34.18	34.89	54.00	19.11	AV
	2746.000	45.61	29.86	5.74	34.20	47.01	54.00	6.99	
	3661.000	41.99	31.95	7.14	34.20	46.88	54.00	7.12	
	4582.000	41.55	33.09	7.93	34.25	48.32	54.00	5.68	

TEST ENGINEER: RAVEN JIN

EUT : UHF RFID Handy Terminal Temperature : 22°C

Model No. : C35 Humidity : 60%RH

Serial No. : E2010011302 Date of Test : Mar. 17, 2010

Test Mode : Transmitting Ch50

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	127.000	12.14	12.66	1.16	--	25.96	43.50	17.54	QP
	168.710	18.84	10.25	1.32	--	30.41	43.50	13.09	
	239.520	18.61	12.52	1.57	--	32.70	46.00	13.30	
	401.510	16.60	16.52	2.06	--	35.18	46.00	10.82	
	506.270	19.00	17.98	2.27	--	39.25	46.00	6.75	
	804.060	13.76	20.73	2.90	--	37.39	46.00	8.61	
	1846.000	49.01	27.19	4.64	34.19	46.65	74.00	27.35	PK
	2782.000	53.23	29.96	5.78	34.20	54.77	74.00	19.23	
	3709.000	43.22	32.03	7.19	34.20	48.24	74.00	25.76	
	4636.000	42.97	33.13	7.97	34.26	49.81	74.00	24.19	
	1846.000	38.30	27.19	4.64	34.19	35.94	54.00	18.06	AV
	2782.000	46.23	29.96	5.78	34.20	47.77	54.00	6.23	
	3709.000	32.54	32.03	7.19	34.20	37.56	54.00	16.44	
	4636.000	30.57	33.13	7.97	34.26	37.41	54.00	16.59	
Vertical	31.940	13.67	18.49	0.65	--	32.81	40.00	7.19	QP
	86.260	24.75	8.78	0.98	--	34.51	40.00	5.49	
	127.000	23.60	12.66	1.16	--	37.42	43.50	6.08	
	138.640	24.09	12.17	1.21	--	37.47	43.50	6.03	
	174.530	26.62	10.07	1.35	--	38.04	43.50	5.46	
	508.210	19.34	18.01	2.27	--	39.62	46.00	6.38	
	1854.500	48.70	27.22	4.64	34.19	46.37	74.00	27.63	PK
	2781.750	53.30	29.96	5.78	34.20	54.84	74.00	19.16	
	3709.000	43.43	32.05	7.19	34.20	48.47	74.00	25.53	
	4636.000	46.65	33.13	7.97	34.26	53.49	74.00	20.51	
	1854.500	35.56	27.22	4.64	34.19	33.23	54.00	20.77	AV
	2781.750	45.64	29.96	5.78	34.20	47.18	54.00	6.82	
	3709.000	31.46	32.03	7.19	34.20	36.48	54.00	17.52	
	4636.000	40.78	33.13	7.97	34.26	47.62	54.00	6.38	

TEST ENGINEER: RAVEN JIN

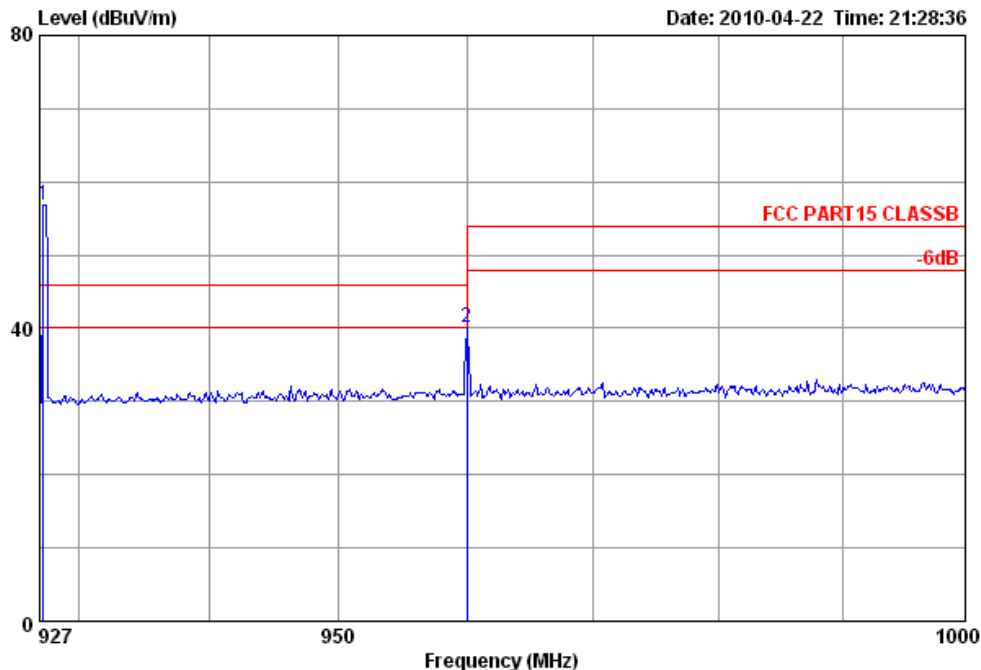


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 Shanghai 200233, China
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 audixaci@audix.com

Data: 41

File: D:\Test-Data\Q\QUNDE.EM6 (41)

Date: 2010-04-22 Time: 21:28:36



Site no	: Audix ACI (3m Chamber)	Data no.	: 41
Dis. / Ant.	: 3m / CBL 6112D-2008.05.14	Ant. pol.	: HORIZONTAL
Limit	: FCC PART15 CLASSB	Engineer	: Raven
Env. / Ins.	: 26'C 52%RH / ESVS10		
EUT	: UHF RFID Handy Terminal		
M/N	: C35		
S/N	: E2010011302		
Power Rating	: 120V/60Hz		
Test Mode	: Transmitting CH50		

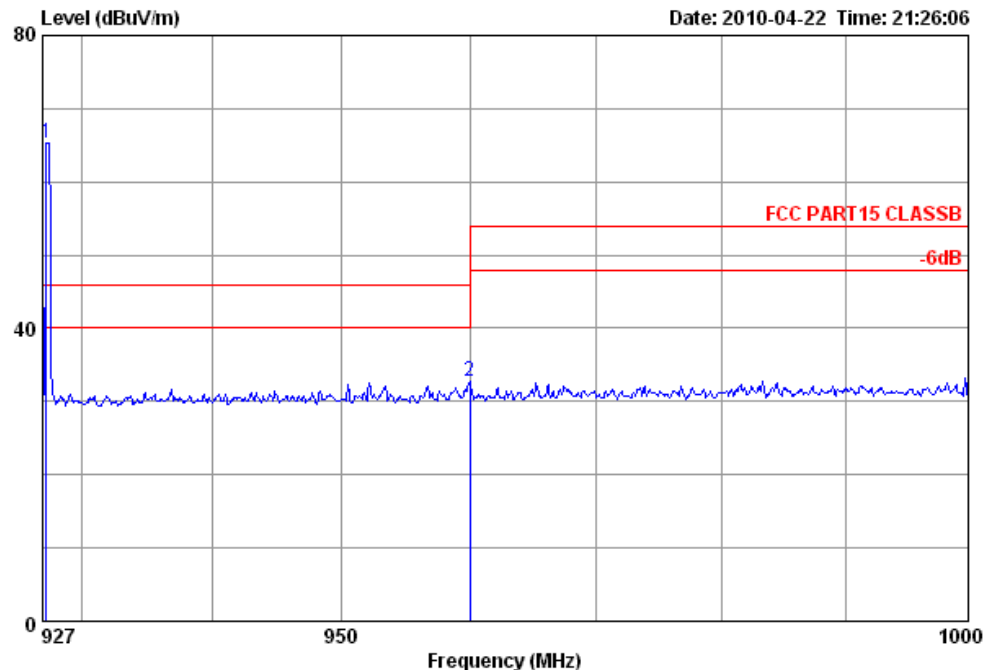
	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	927.292	21.90	3.40	31.52	56.82	46.00	-10.82
2	960.000	22.13	3.76	14.14	40.03	46.00	5.97

Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limits are not report.



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audixaci@audix.com

Data: 40 File: D:\Test-Data\Q\QUNDE.EM6 (41)



Site no	: Audix ACI (3m Chamber)	Data no.	: 40
Dis. / Ant.	: 3m / CBL 6112D-2008.05.14	Ant. pol.	: VERTICAL
Limit	: FCC PART15 CLASSB	Engineer	: Raven
Env. / Ins.	: 26'C 52%RH / ESVS10		
EUT	: UHF RFID Handy Terminal		
M/N	: C35		
S/N	: E2010011302		
Power Rating	: 120V/60Hz		
Test Mode	: Transmitting CH50		

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	927.292	21.90	3.40	39.98	65.28	46.00	-19.28
2	960.000	22.13	3.76	6.95	32.84	46.00	13.16

Remarks: 1. Emission Level = Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limits are not report.

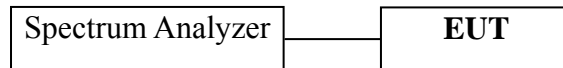
5 20 dB BANDWIDTH MEASUREMENT

5.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010

5.2 Block Diagram of Test Setup



5.3 Specification Limits (§15.247(a)(1))

The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

5.4 Operating Condition of EUT

The test program “RFID for RF Testing Version” was used to enable the EUT to transmit data at different channel frequency individually.

5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100 kHz RBW and 100 kHz VBW. The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB. The test procedure is defined in KDB558074.

5.6 Test Results

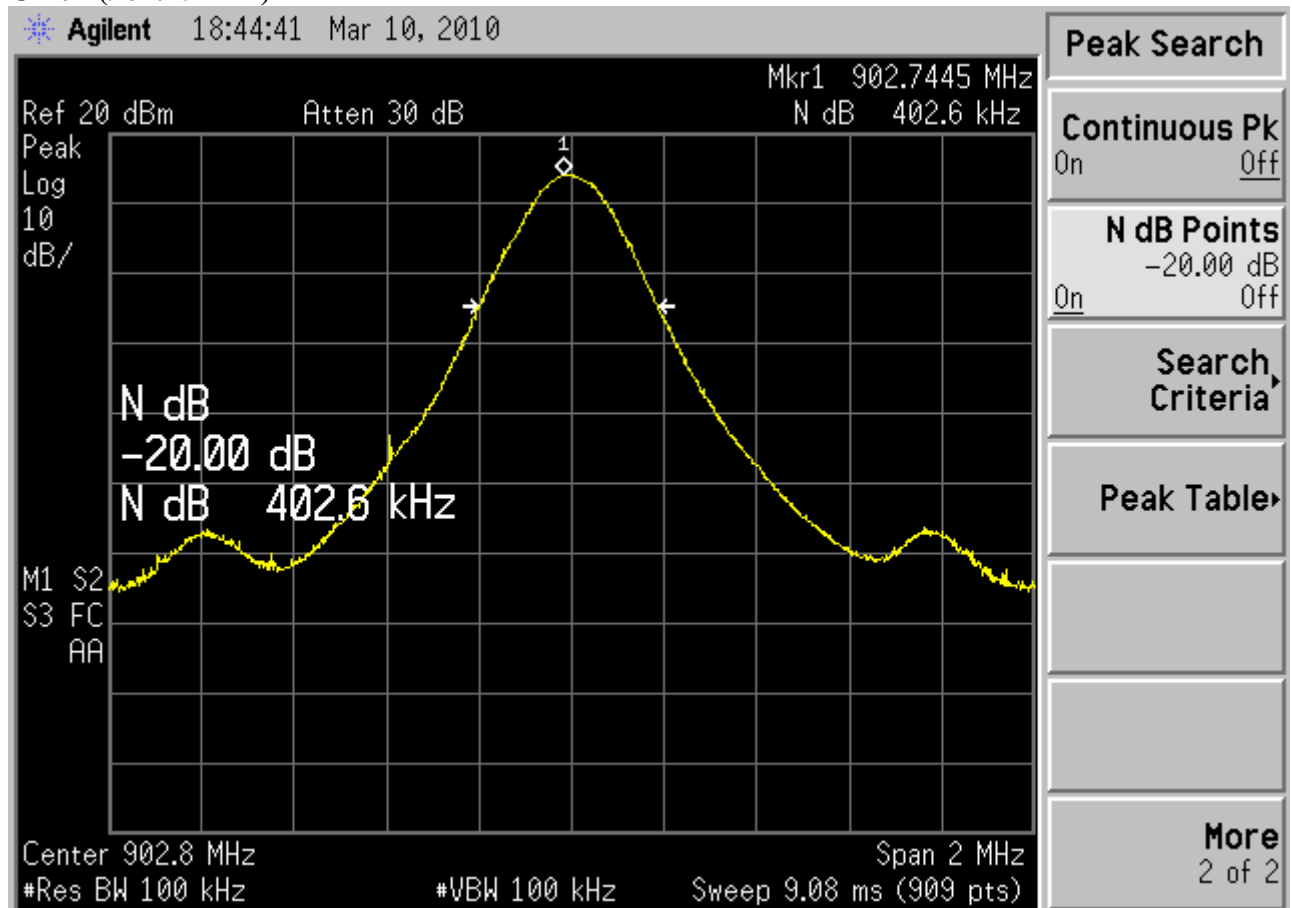
PASSED.

All the test results are attached in next pages.

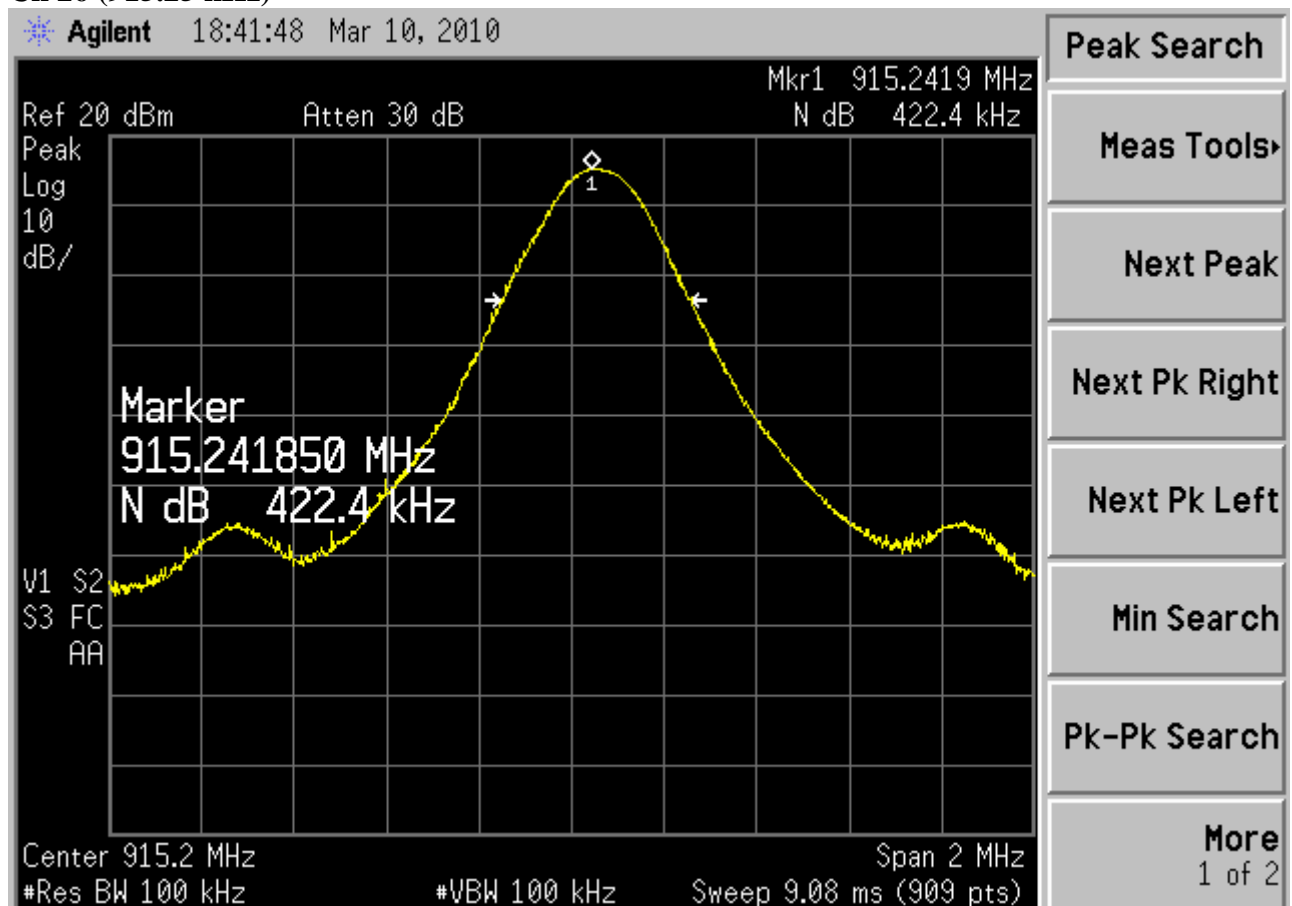
(Test Date: Mar. 10, 2010 Temperature: 21°C Humidity: 46 %)

Channel	Frequency	20dB Bandwidth	Limit
01	902.75 MHz	402.6 kHz	\leq 500 kHz
26	915.25 MHz	422.4 kHz	
50	927.25 MHz	411.4 kHz	

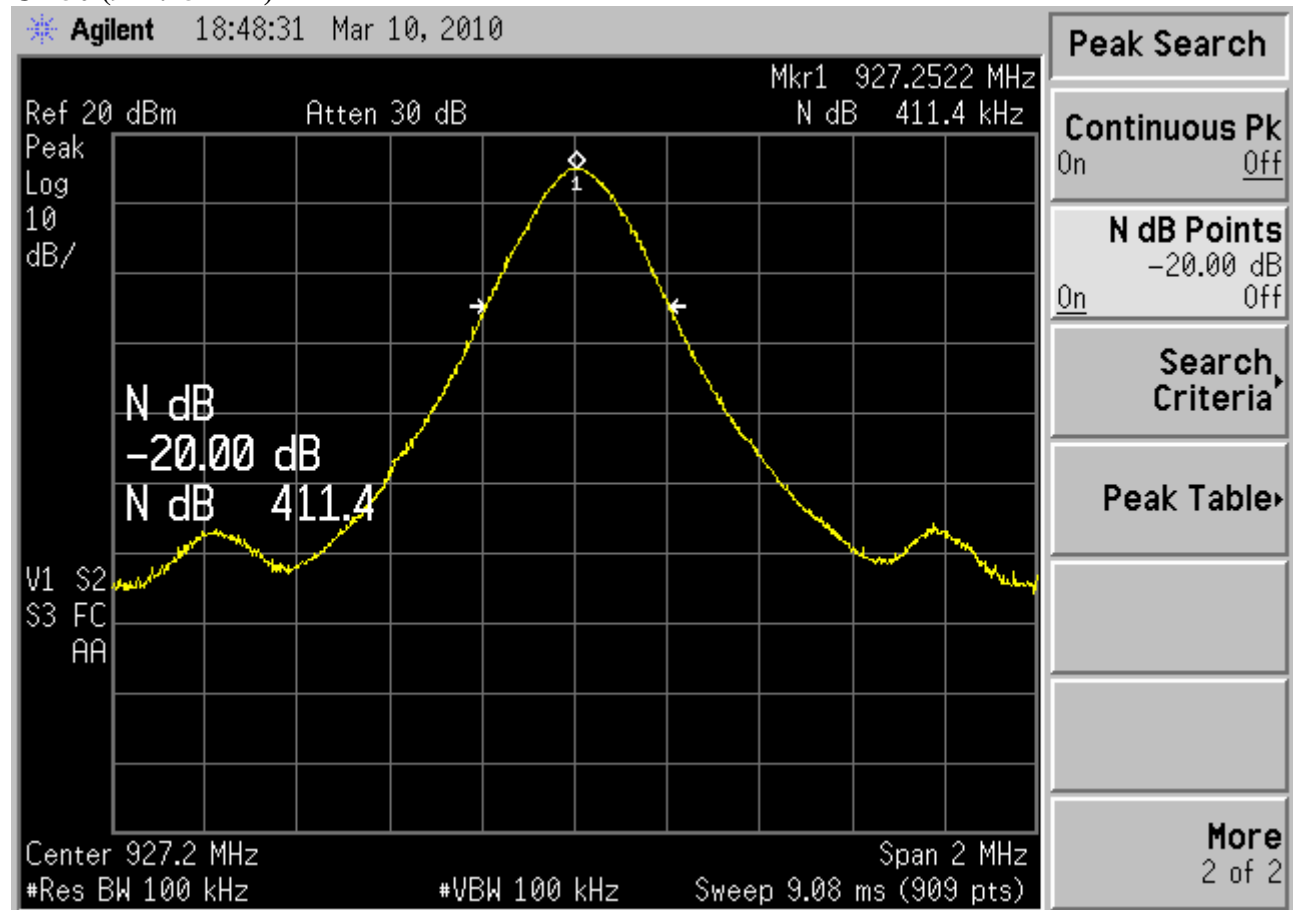
Ch 01 (902.75 kHz)



Ch 26 (915.25 kHz)



Ch 50 (927.25 kHz)



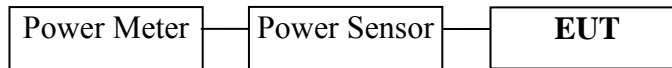
6 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

6.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power Meter	Anritsu	ML2487A	6K00003245	Aug 05, 2009	Aug 05, 2010
2.	Power Sensor	Anritsu	MA2491A	32489	Aug 05, 2009	Aug 05, 2010

6.2 Block Diagram of Test Setup



6.3 Specification Limits ((§15.247(b)(3))

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels.

6.4 Operating Condition of EUT

The test program “RFID for RF Testing Version” was used to enable the EUT to transmit data at different channel frequency individually.

6.5 Test Procedure

This is an RF conducted test. Use a direct connection between the antenna port of the transmitter and the power meter, through suitable attenuation. We use Power Output Option 1 (which defined in KDB558074) to measure the power output. Power Output Option 1 is a peak measurement. The transmitter output was connected to the power meter that was designed to detect peak value automatically.

6.6 Test Results

PASSED. All the test results are listed below.

(Test date: Mar. 10, 2010 Temperature: 21 °C Humidity: 46 %)

Channel	Frequency	Peak Output Power	Average Output Power	Limit
01	902.75 MHz	15.70 dBm	14.85 dBm	30 dBm (1 watt)
26	915.25 MHz	16.15 dBm	15.19 dBm	30 dBm (1 watt)
50	927.25 MHz	16.59 dBm	15.47 dBm	30 dBm (1 watt)

Note – The Average Output Power means the source-based time-averaging power. The power meter was used to measure the average output power, the detector was peak detector and the average time was 5 min. (due to the function of the power meter, we set a maximum average number of 512 points and observe time as 5 min to get the final average output power.)

7 EMISSION LIMITATIONS MEASUREMENT

7.1 Test Equipment

The following test equipment was used during the emission limitations test :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010

7.2 Block Diagram of Test Setup

The same as Section. 5.2.

7.3 Specification Limits (§15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (See Section 15.205(c)).(※This test result attaching to Section. 4.7)

7.4 Operating Condition of EUT

The test program “RFID for RF Testing Version” was used to enable the EUT to transmit data at different channel frequency individually.

7.5 Test Procedure

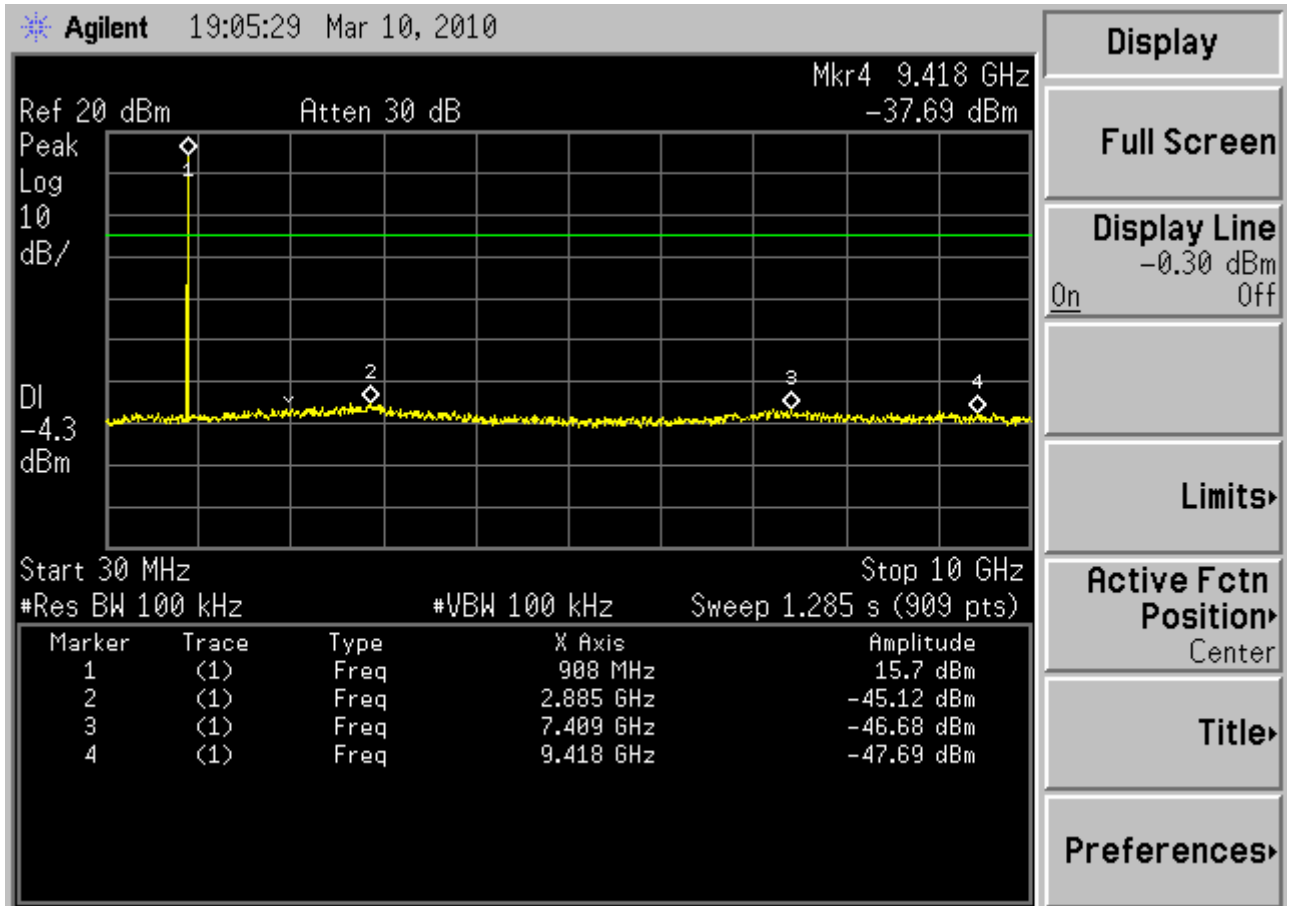
The transmitter output was connected to the spectrum analyzer. Set RBW = 100 kHz, VBW = 300 kHz, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

7.6 Test Results

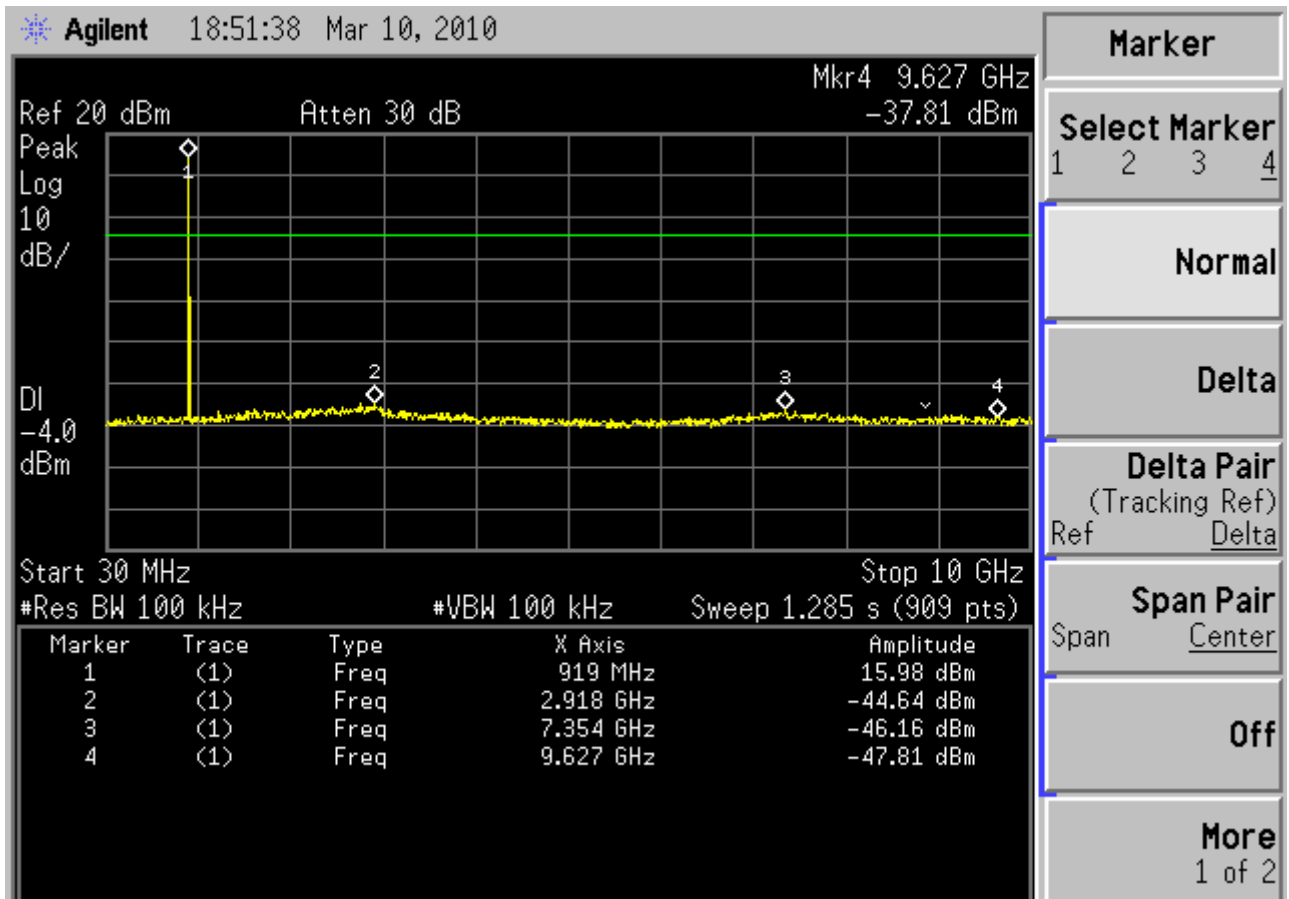
PASSED.

The test data was attached in the next pages.

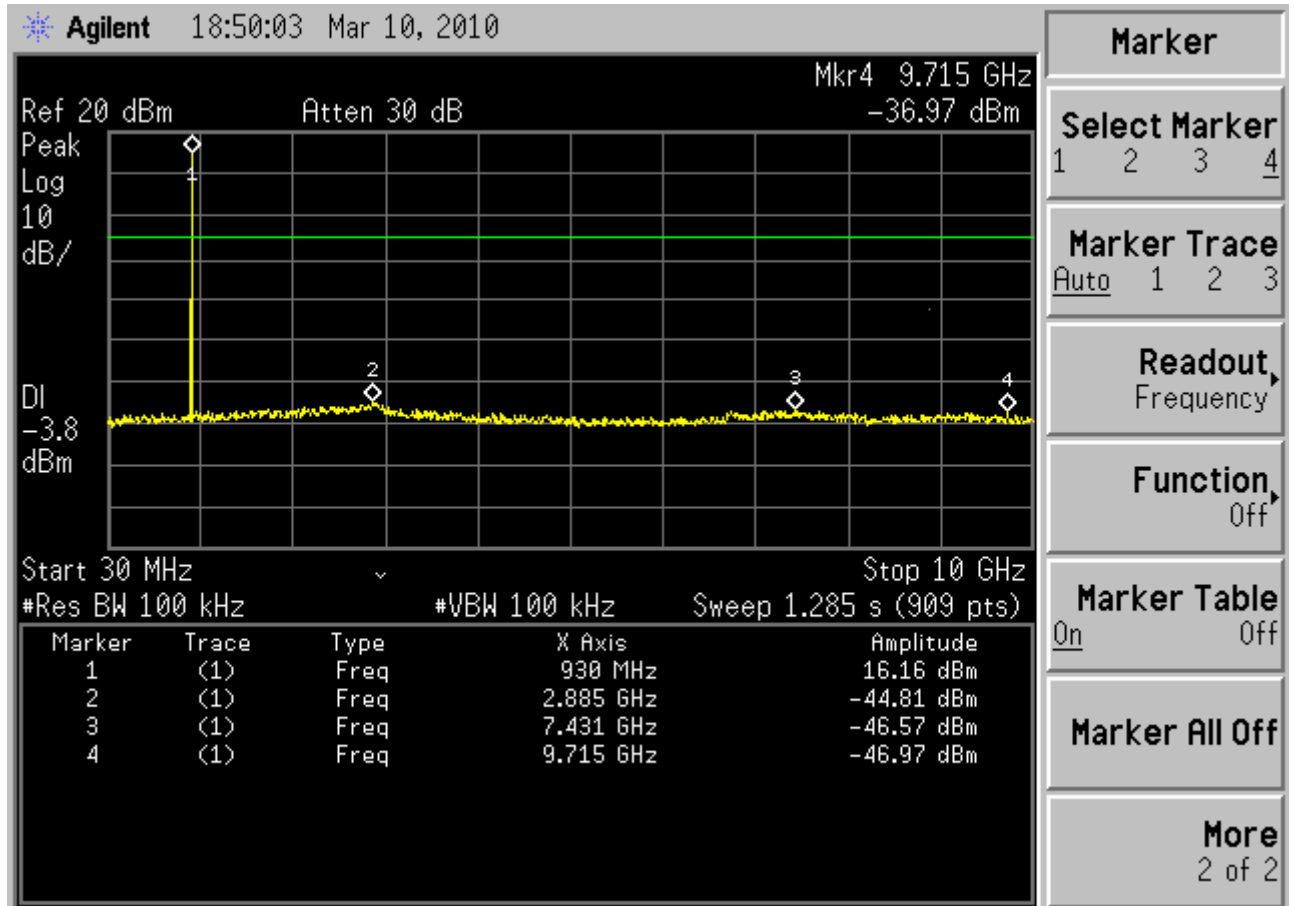
Ch01 902.75 MHz



Ch26 915.25 MHz



Ch50 927.25 MHz



8 HOPPING CHANNEL SEPARATION

8.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010

8.2 Block Diagram of Test Setup

The same as section.5.2.

8.3 Specification Limits (§15.247(a)(1))

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies.

8.4 Operating Condition of EUT

The test program “RFID for RF Testing Version” was used to enable the EUT to transmit data.

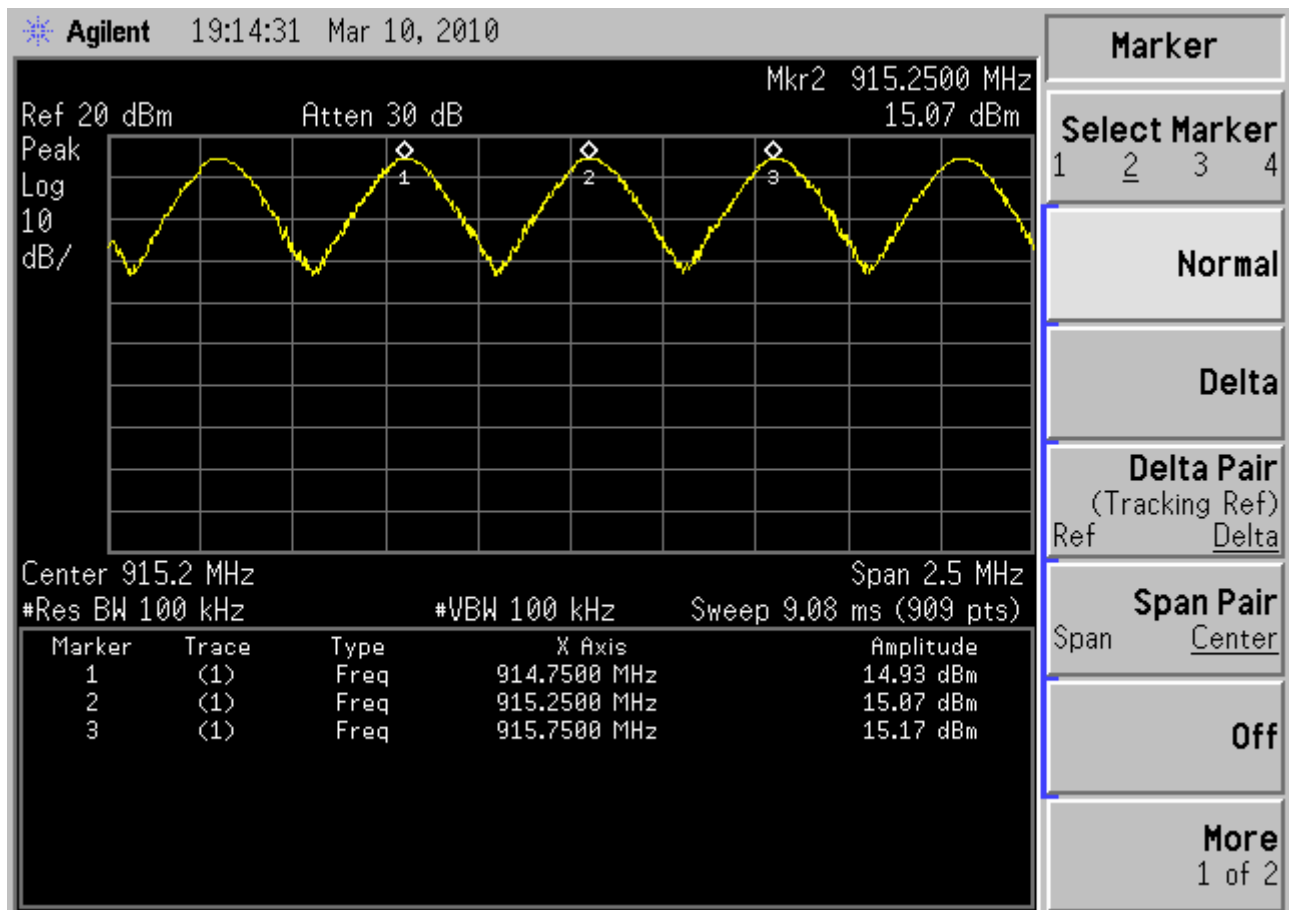
8.5 Test Procedure

The EUT is transmitting with the Hopping function enabled at maximum rate. The Spectrum is on max hold and the span is wide enough to capture two adjacent signals. Two markers are positioned in the peak of each signal and the frequency separation between signals

8.6 Test Results

PASSED. The test results are attached in next page.

Test Result: 500 kHz



9 NUMBER OF HOPPING FREQUENCY USED

9.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010

9.2 Block Diagram of Test Setup

The same as section.5.2.

9.3 Specification Limits (§15.247(a)(1)(i))

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies.

9.4 Operating Condition of EUT

The test program “RFID for RF Testing Version” was used to enable the EUT to transmit data.

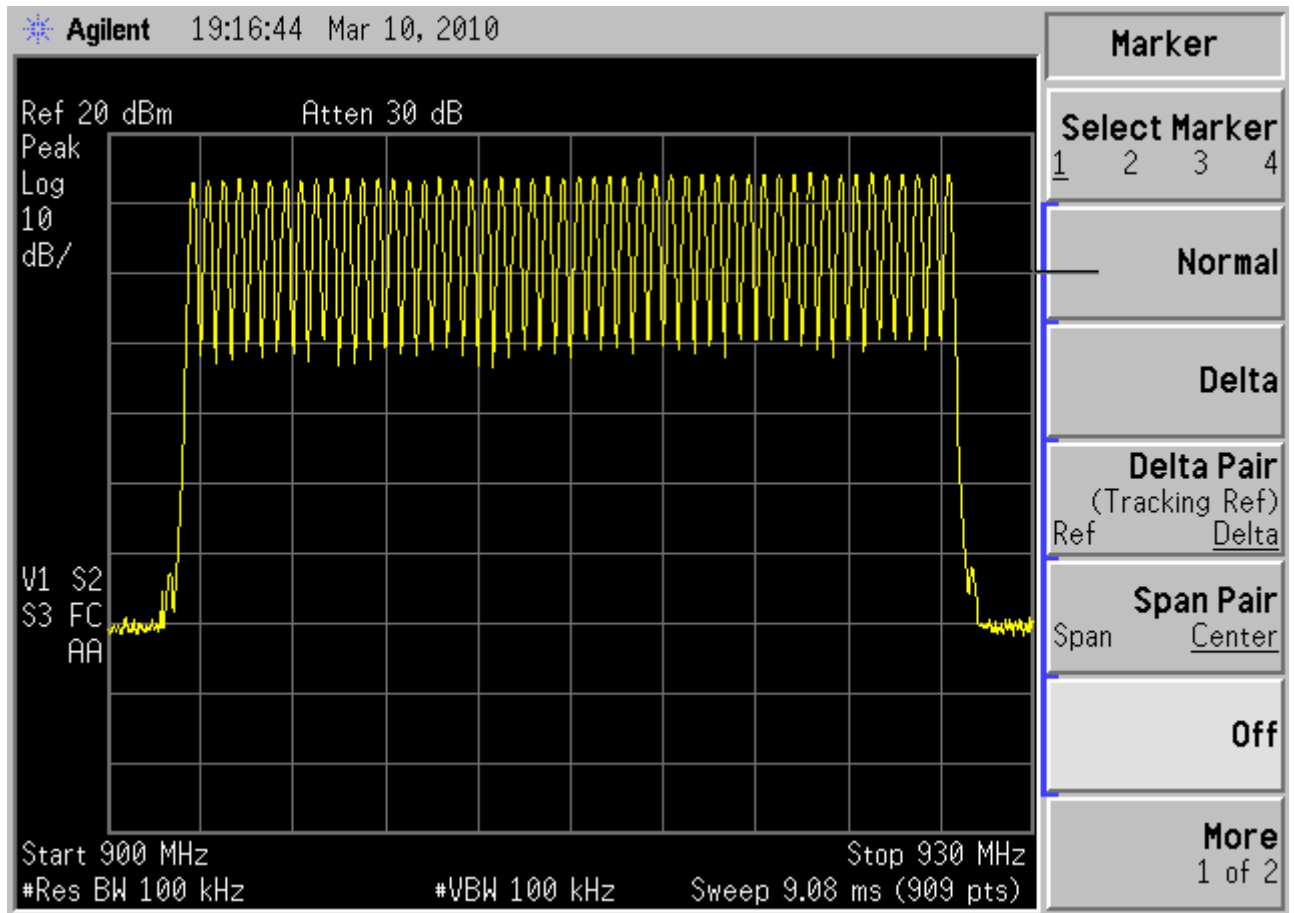
9.5 Test Procedure

The EUT is transmitting with the Hopping function enabled at maximum rate. The spectrum is on max hold and the span is wide enough to capture all the channels (902-928 MHz). All the signals within the screen are the number of hopping channels.

9.6 Test Results

PASSED. The test results are attached in next page.

Test Result: 50 channels



10 DWELL TIME ON EACH CHANNEL

10.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	Agilent	E7405A	MY45106600	May 19, 2009	May 19, 2010

10.2 Block Diagram of Test Setup

The same as section.5.2.

10.3 Specification Limits (§15.247(a)(1)(i))

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

10.4 Operating Condition of EUT

The test program “RFID for RF Testing Version” was used to enable the EUT to transmit data.

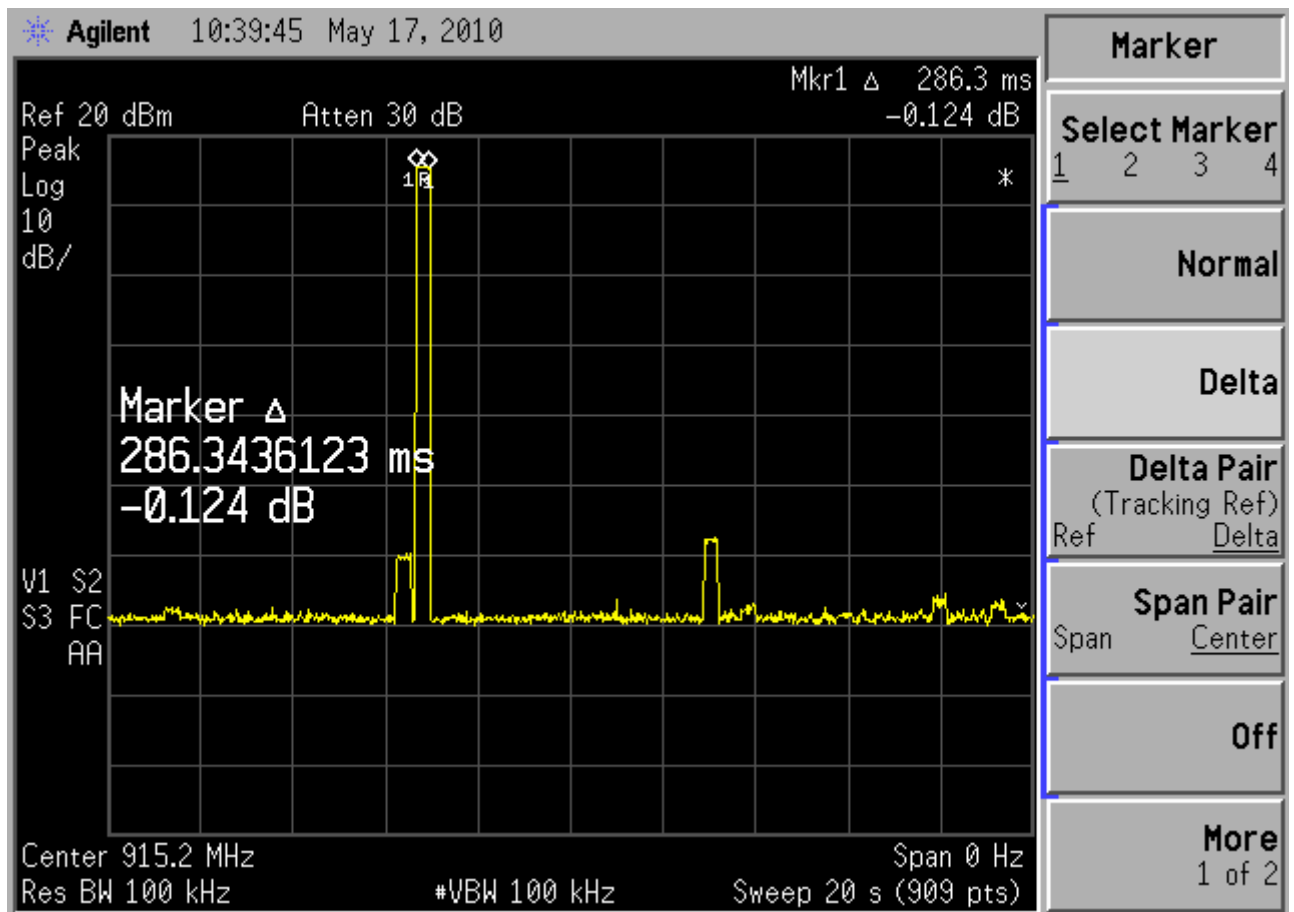
10.5 Test Procedure

The EUT is transmitting with the Hopping function enabled at maximum rate. The spectrum is on oscilloscope mode (zero span) and on max hold. Frequency is centered in a channel and the sweep time is set to 10 second period to determine the result

10.6 Test Results

PASSED. The test results are attached in next page.

Test Result: 0.2863 seconds within a 20 second period



11 DEVIATION TO TEST SPECIFICATIONS

None.