Test Report

Product Name ： SHAVED DOOR KIT
Model No. ： WS-8742
FCC ID. ： UABWS-8742

Applicant ： MANY WAIN ENTER PRISE CO., LTD
Address ： 34, Alley 2, Lane 279, Chung Chen Rd. Teong Kang City. Taiwan Shien, Taiwan, R.O.C.

Date of Receipt ： 2006/05/10
Issued Date ： 2006/05/29
Report No. ： 065L069-RF-US-P04V01

Test Report Certification

Issued Date : 2006/05/29
Report No. : 065L069-RF-US-P04V01

QuieTek
Accredited by NIST (NVLAP)
NVLAP Lab Code: 200533-0

Product Name	:	SHAVED DOOR KIT
Applicant	:	MANY WAIN ENTER PRISE CO., LTD
Address	:	34, Alley 2, Lane 279, Chung Chen Rd. Teong Kang City. Taiwan Shien, Taiwan, R.O.C.
Manufacturer	:	HONG YANG WORLD SCIENCE CO., LTD
Model No.	:	WS-8742
FCC ID.	:	UABWS-8742
Rated Voltage	:	AC 120V/ 60Hz
EUT Voltage	:	DC 12V
Trade Name	:	PAI-YING
Measurement Standard	:	FCC 15 Subpart C Section 15.231: 2005
Measurement Procedure	:	ANSI C63.4: 2003
Test Result	:	Complied

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented By : Grace Lin
(Grace Lin)

Tested By : Tom Hsieh
(Tom Hsieh)

Approved By : Gene Chang
(Gene Chang)

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1. General Information

1.1. EUT Description

Product Name	SHAVED DOOR KIT
Trade Name	PAI-YING
Model No.	WS-8742
FCC ID	UABWS-8742
Frequency Range	303.1 ~ 303.9625MHz
Number of Channel	7
Type of Modulation	FSK
EUT Voltage	DC 12V
Channel Control	Manual
Antenna Type	Printed on PCB

Working Frequency of Each Channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
01	303.1 MHz	02	303.9125 MHz	03	303.925 MHz
04	303.9625MHz	05	303.4 MHz	06	303.875 MHz
07	303.9 MHz				

Note:

1. The EUT is a SHAVED DOOR KIT with a built-in 303MHz transmitter.
2. The EUT will stop the transmission immediately when a button is pressed and releases. The EUT will stop the transmission within 3 seconds when a button is pressed and held.
3. These tests are conducted on a sample for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.231.
4. This device is a composite device in accordance with Part 15 regulations.
   (1) The transmitter is tested and produces a test report of which the report number is 065L069-RF-US-P04V01, certified under FCC ID: UABWS-8742.
   (2) The receiver is tested and produces a test report of which the report number is 065L069-RF-US-P01V02, certified under Declaration of Conformity.

1.2. Operation Description

The EUT is a SHAVED DOOR KIT with a built-in 303MHz transmitter. The kit is designed to operate two or more functions. Both doors and five other functions can be controlled by four-button remote control. The additional channels can be used to operate power door locks, power door releases, trunk releases, control linear actuators, or roll up or down power windows. The EUT operates in 303.1 – 303.9625MHz. The antenna is printed on PCB and the data modulation is FSK.

1.3. Test Mode

QuieTek verified the construction and function in typical operation. All the test modes are performed in normal operation and are defined as:

Pre-Test Mode	
TX	Mode 1: Transmit
Final Test Mode	
TX	Mode 1: Transmit

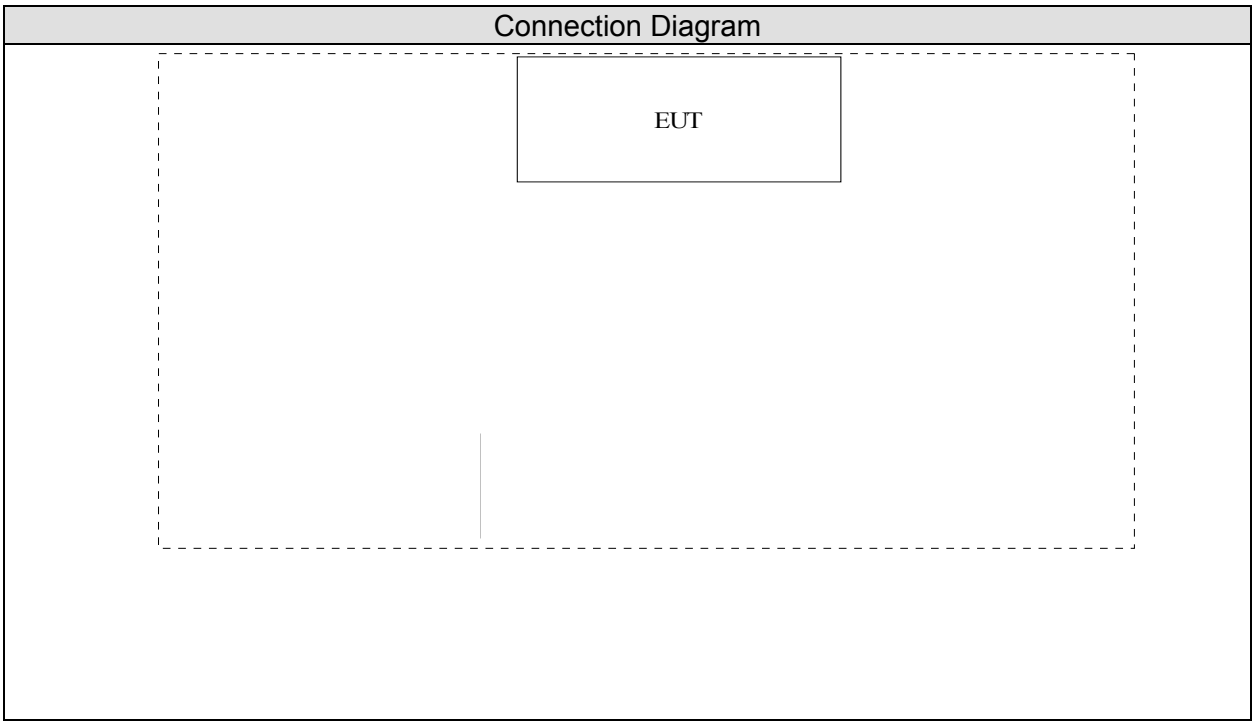
1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	N/A	N/A	N/A	N/A	N/A	N/A

1.5. Configuration of tested System

Connection Diagram



1.6. EUT Exercise Software

1	Setup the EUT as shown in section 1.5.
2	Install the batteries.
3	Press a button of the EUT.
4	Verify that the EUT transmits continuously.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.207 Conducted Emission	15 - 35	22
Humidity (%RH)		25 - 75	55
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.231 Duty Cycle	15 - 35	22
Humidity (%RH)		25 - 75	55
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.231 Occupied Bandwidth	15 - 35	22
Humidity (%RH)		25 - 75	55
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.231 Radiated Emission	15 - 35	22
Humidity (%RH)		25 - 75	55
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description:

June 22, 2001 File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2

Accredited by CNLA
Accreditation Number: 0914

0914

Accredited by NVLAP
NVLAP Lab Code: 200533-0

NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation

Site Address: No. 5, Ruei-Shu Valley, Ruei-Ping Tsuen,
Lin-Kou Shiang, Taipei,
Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

2. Conducted Emission

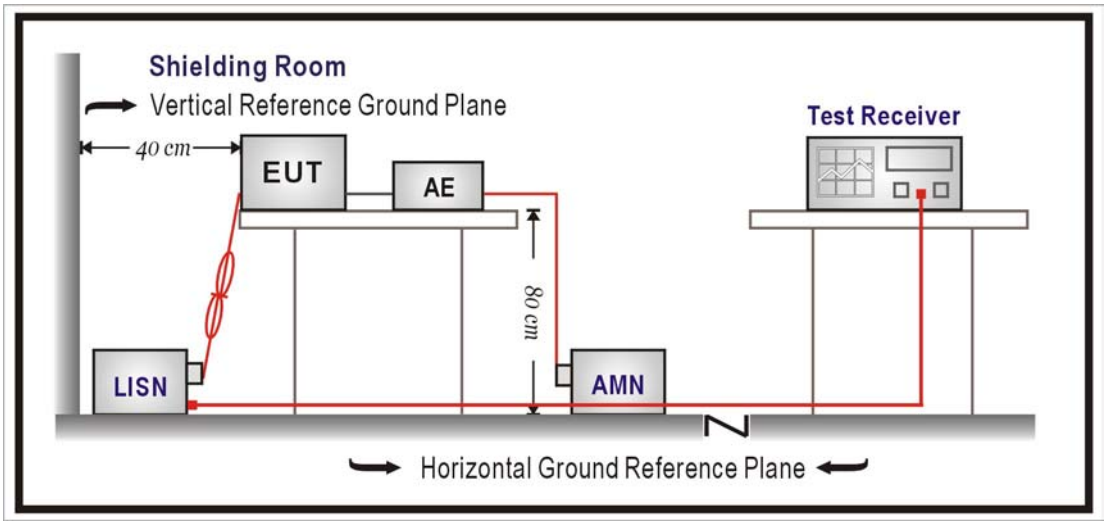
2.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/838251/001	Jan., 2006	
2	L.I.S.N.	R & S	ESH3-Z5/836679/0023	May, 2006	Peripheral
3	L.I.S.N.	R & S	ENV	May, 2006	EUT
4	Pulse Limiter	R & S	ESH3-Z2	May, 2006	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)
Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2001 on conducted measurement.
Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.207: 2005

2.6. Uncertainty

± 2.26 dB

2.7. Test Result

The power of the EUT is supplied by batteries. The test is not performed.

3. Radiated Emission

3.1. Test Equipment

The following test equipment are used during the test:

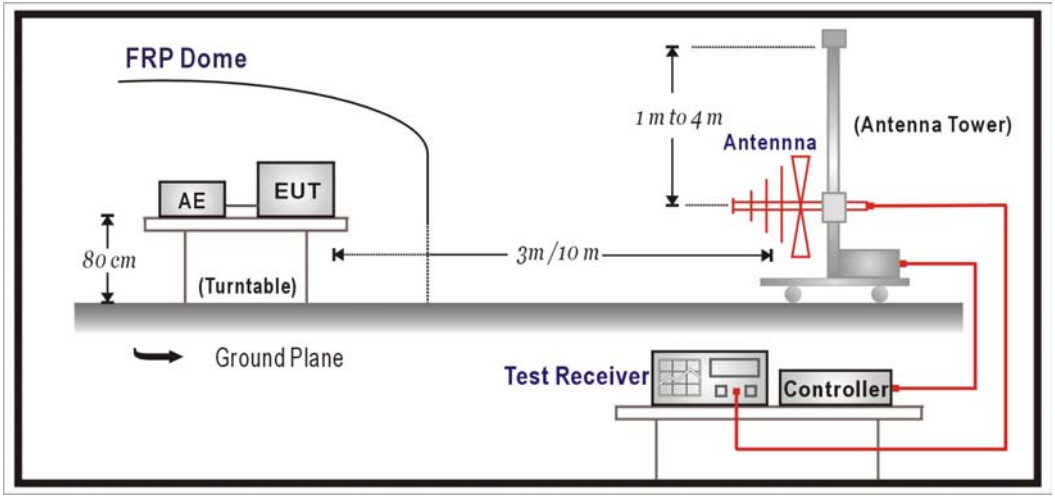
Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒OATS 3	Test Receiver	R & S	ESCS 30 / 100122	Feb., 2006
	Spectrum Analyzer	Advantest	R3162 / 120300652	Feb., 2006
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2006
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2006
	Horn Antenna	ETS	3115 / 0005-6160	July, 2005
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2005

Note: 1. All instruments are calibrated every one year.

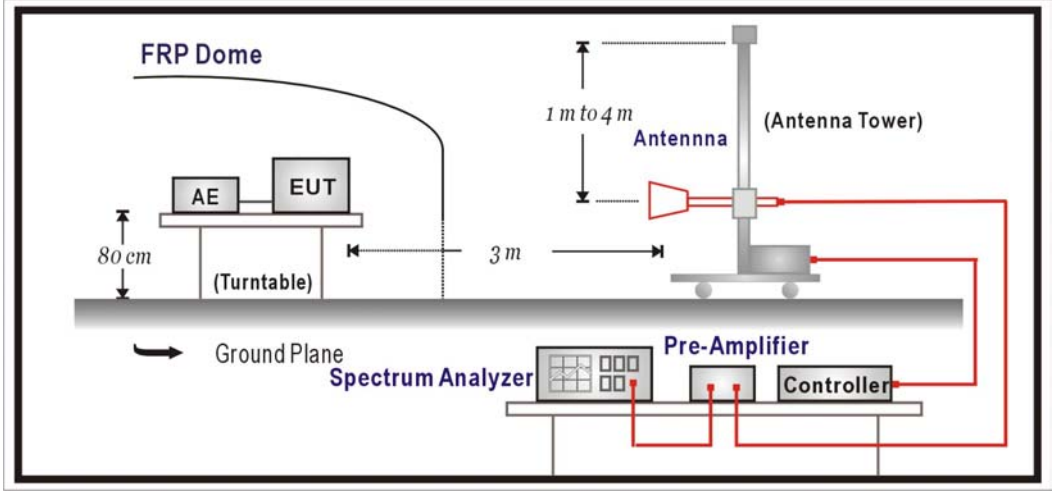
2. The test instruments marked by “X” are used to measure the final test results.

3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



3.3. Limits

➢ Fundamental and Harmonics Emission Limits

FCC Part 15 Subpart C Paragraph 15.231 Limits				
Fundamental Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	uV/m	dBuV/m	uV/m	dBuV/m
40.66-40.70	2250	67.0	225	47.0
70-130	1250	62.0	125	42.0
130-174	1250-3750	62.0-71.5	125-375	42.0-51.5
174-260	3750	71.5	375	51.5
260-470	3750-12500	71.5-82.00	375-1250	51.5-62.0
above 470	12500	82.00	1250	62.0

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

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

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

➢ Spurious electric field strength limits

FCC Part 15 Subpart C Paragraph 15.209 Limits			
Frequency MHz	uV/m	dBuV/m	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	See Remark[1]	300
0.490-1.705	24000/F(kHz)	See Remark[1]	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remarks : 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

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.

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

On the field strength of fundamental and harmonics, the limits shown are based on measuring equipment employing a average detector function. As an alternative, compliance with the limits may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

On the field strength of spurious electric, on any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function.

When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231: 2005

3.6. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

3.7. Test Result

Product	SHAVED DOOR KIT		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit –CH4		
Date of Test	2006/05/26	Test Site	No.3 OATS

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Fundamental Radiated Emission					
Horizontal					
Peak					
303.960	12.965	47.440	60.404	-34.531	94.935

Peak = 60.404dBuV/m, Duty Cycle = -3.88dB

Average = Peak + Duty Cycle = 56.524dBuV/

Average Limit = 74.935dBuV/m

Peak Limit = 74.935 + 20 = 94.935dBuV/m

Note:

1. The emissions of the EUT in three axes are tested. Only the worst-case data is presented.
2. Measurement Level = Reading Level +Correct Factor.
3. Test Receiver Setting: RBW=120kHz

Product	SHAVED DOOR KIT		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit –CH4		
Date of Test	2006/05/26	Test Site	No.3 OATS

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Fundamental Radiated Emission					
Vertical					
Peak					
303.960	12.715	38.220	50.935	-44.000	94.935

Peak = 50.935dBuV/m, Duty Cycle = -3.88dB

Average = Peak + Duty Cycle = 47.055dBuV/

Average Limit = 74.935dBuV/m

Peak Limit = 74.935 + 20 = 94.935dBuV/m

Note:

1. The emissions of the EUT in three axes are tested. Only the worst-case data is presented.
2. Measurement Level = Reading Level +Correct Factor.
3. Test Receiver Setting: RBW=120kHz

Product	SHAVED DOOR KIT		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit –CH4		
Date of Test	2006/05/26	Test Site	No.3 OATS

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m	Average Limit dBuV/m
Harmonic Radiated Emission						
Horizontal						
Peak						
607.920	18.939	23.630	42.570	-36.365	74.935	54.935
911.880	20.692	23.920	44.612	-30.323	74.935	54.935
1215.880	-5.206	36.500	31.295	-42.705	74.000	54.000
1519.850	-4.633	42.340	37.707	-36.293	74.000	54.000
1823.820	-4.444	37.240	32.796	-42.139	74.935	54.935
2127.790	-3.132	38.500	35.368	-38.632	74.000	54.000
2431.760	-2.105	39.900	37.794	-36.206	74.000	54.000
2735.730	-1.534	37.410	35.876	-39.059	74.935	54.935
3039.700	-1.030	35.460	34.431	-39.569	74.000	54.000

Note:

1. The emissions of the EUT in three axes are tested. Only the worst-case data is presented.
2. All Readings Levels are performed with peak and/or average measurements as necessary.
3. Measurement Level = Reading Level +Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	SHAVED DOOR KIT		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit –CH4		
Date of Test	2006/05/26	Test Site	No.3 OATS

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m	Average Limit dBuV/m
Harmonic Radiated Emission						
Vertical						
Peak						
607.920	20.379	21.460	41.839	-33.096	74.935	54.935
911.880	22.392	23.220	45.612	-29.323	74.935	54.935
1215.880	-5.206	34.520	29.315	-44.685	74.000	54.000
1519.850	-4.633	44.440	39.807	-34.193	74.000	54.000
1823.820	-4.444	37.460	33.016	-41.919	74.935	54.935
2127.790	-3.132	34.910	31.778	-42.222	74.000	54.000
2431.760	-2.105	33.710	31.604	-42.396	74.000	54.000
2725.730	-1.543	34.320	32.777	-42.158	74.935	54.935
3039.700	-1.030	35.140	34.111	-39.889	74.000	54.000

Note:

1. The emissions of the EUT in three axes are tested. Only the worst-case data is presented.
2. All Readings Levels are performed with peak and/or average measurements as necessary.
3. Measurement Level = Reading Level +Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product	SHAVED DOOR KIT		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit –CH4		
Date of Test	2006/05/26	Test Site	No.3 OATS

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Quasi-Peak					
51.300	8.666	20.440	29.107	-10.893	40.000
57.200	6.925	17.500	24.425	-15.575	40.000
142.500	12.081	20.320	32.401	-11.099	43.500
160.000	10.812	19.570	30.381	-13.119	43.500
237.600	11.631	17.220	28.851	-17.149	46.000
243.400	12.282	14.720	27.002	-18.998	46.000

Note:

1. The emissions of the EUT in three axes are tested. Only the worst-case data is presented.
2. All Reading Levels are quasi-peak values.
3. “ ” means the worst emission level.
4. Measurement Level = Reading Level + Correct Factor.

Product	SHAVED DOOR KIT		
Test Item	Radiated Emission		
Test Mode	Mode 1: Transmit –CH4		
Date of Test	2006/05/26	Test Site	No.3 OATS

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Vertical					
Quasi-Peak					
72.700	7.720	24.100	31.820	-8.180	40.000
253.100	13.581	20.980	34.561	-11.439	46.000
274.400	13.674	15.340	29.014	-16.986	46.000
293.800	13.801	19.790	33.591	-12.409	46.000
317.100	13.943	19.340	33.283	-12.717	46.000
330.700	14.376	19.100	33.476	-12.524	46.000

Note:

1. The emissions of the EUT in three axes are tested. Only the worst-case data is presented..
2. All Reading Levels are quasi-peak values.
3. “ ” means the worst emission level.
4. Measurement Level = Reading Level + Correct Factor.

3.8. Test Photo

Test Mode ： Mode 1: Transmit
Description： Front View of Radiated Emission Test Setup

Test Mode ： Mode 1: Transmit
Description： Back View of Radiated Emission Test Setup

Test Mode ： Mode 1: Transmit
Description： Front View of Radiated Emission Test Setup (Horn)

4. Occupied Bandwidth

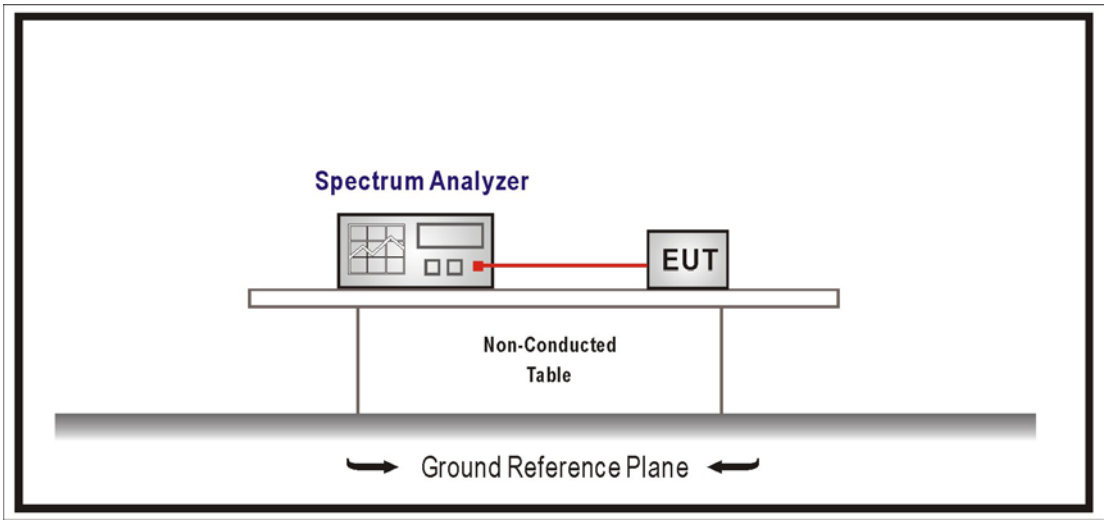
4.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2006

Note: All instruments are calibrated every one year.

4.2. Test Setup



4.3. Limits

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier

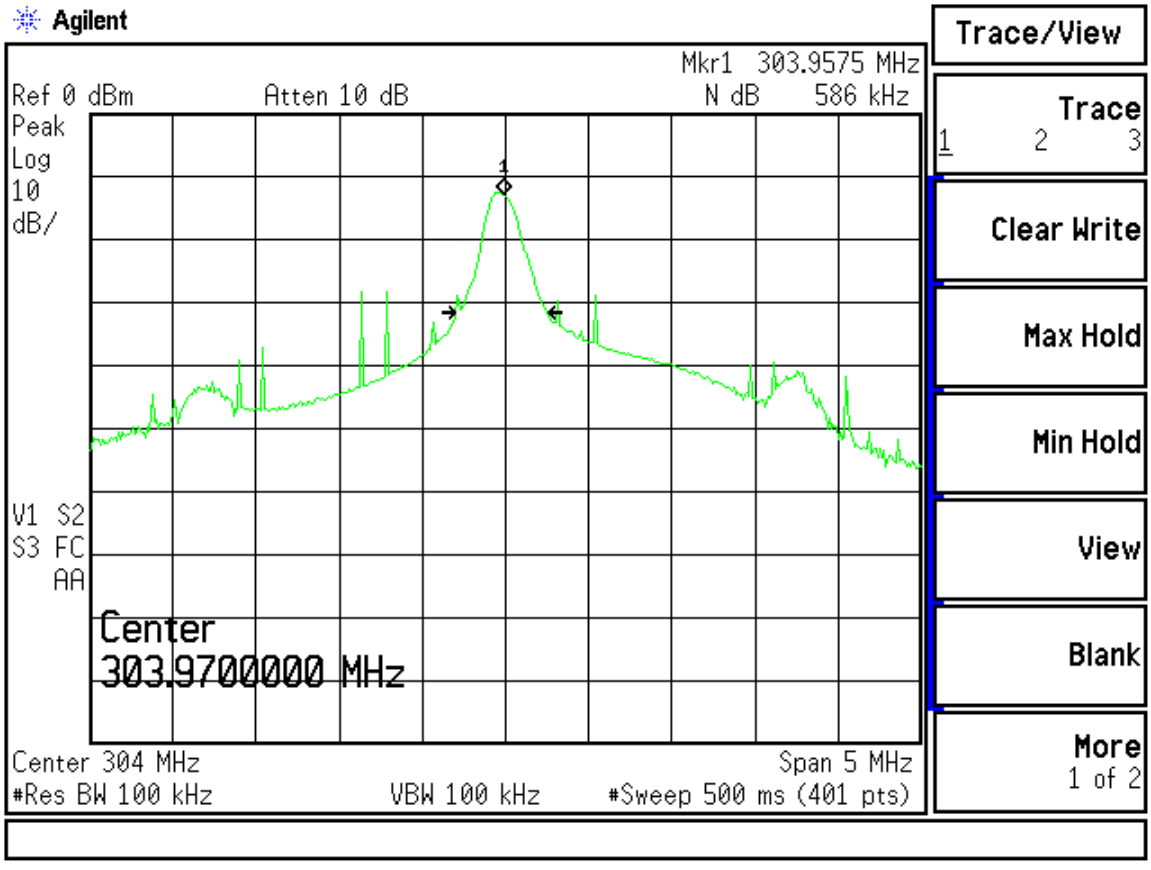
4.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231: 2005

4.5. Test Result

Product	SHAVED DOOR KIT		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit –CH4		
Date of Test	2005/05/26	Test Site	No.3 OATS

Center Frequency	303.9575 MHz
Allowable Bandwidth (70-900 MHz: 0.25%, Above 900MHz: 0.5%)	759.9 kHz
Bandwidth at 20dB down (Max)	586kHz
Result	PASS



Attachement

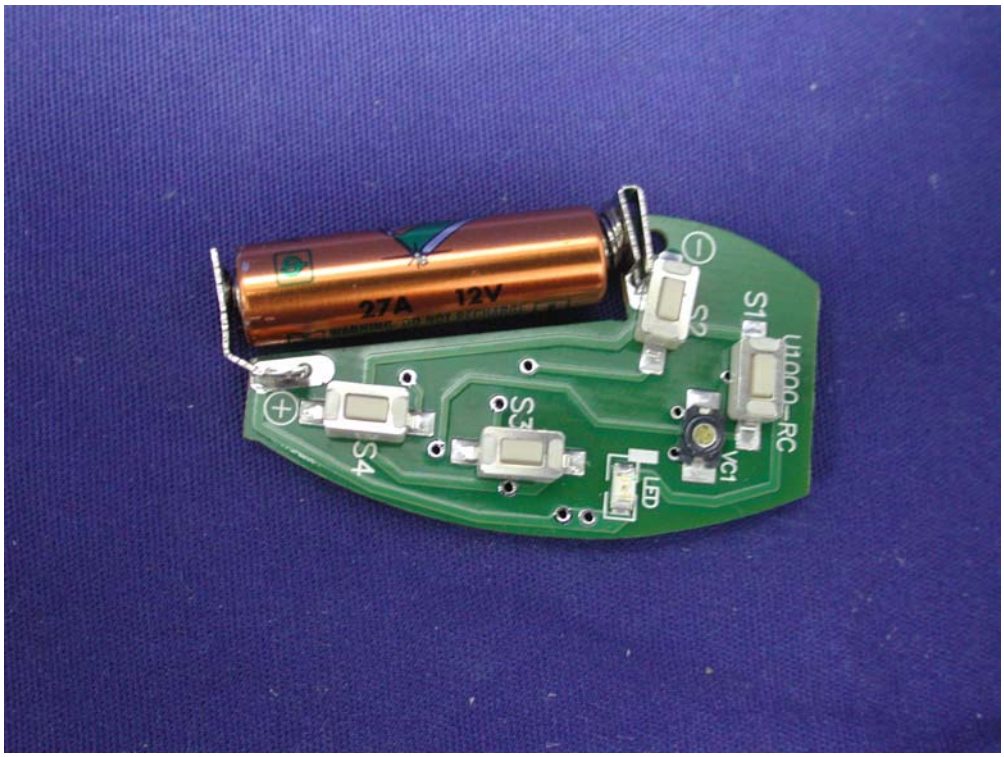
➢ EUT Photograph

(1) EUT Photo

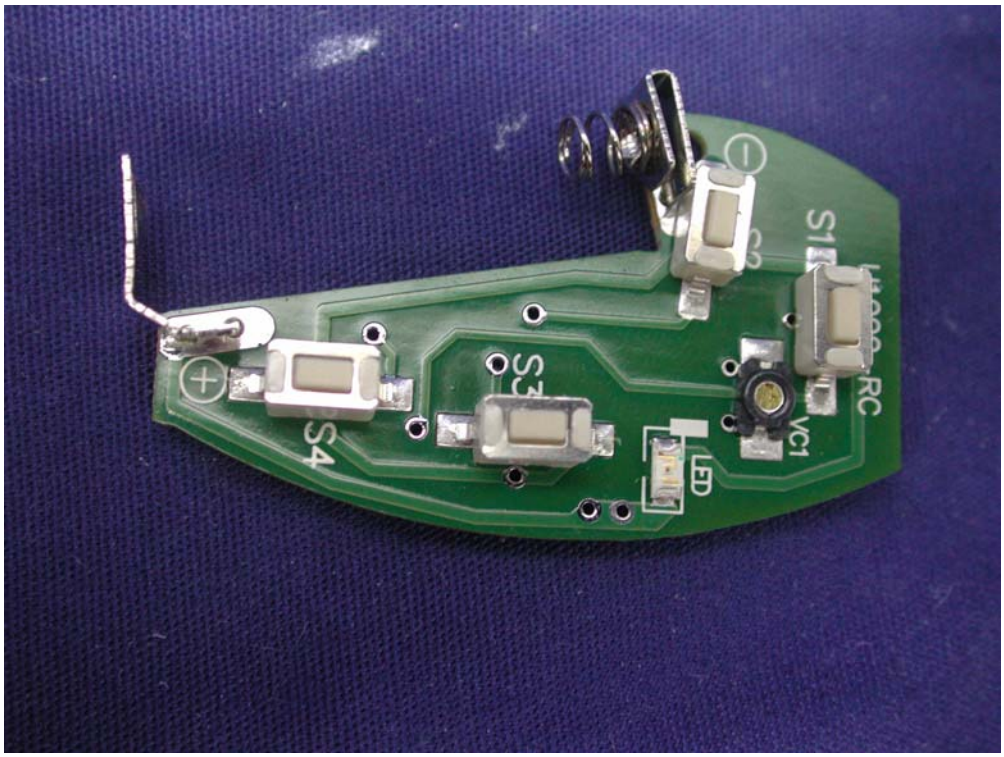
(2) EUT Photo

(3) EUT Photo

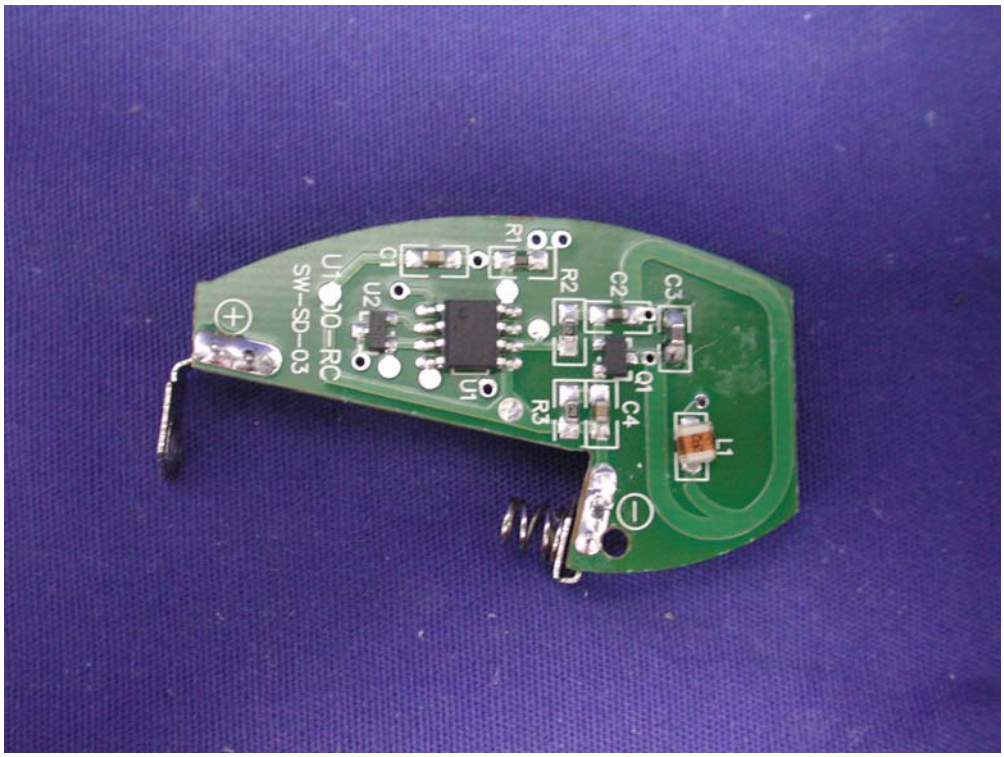
(4) EUT Photo



(5) EUT Photo



(6) EUT Photo



5. Duty Cycle

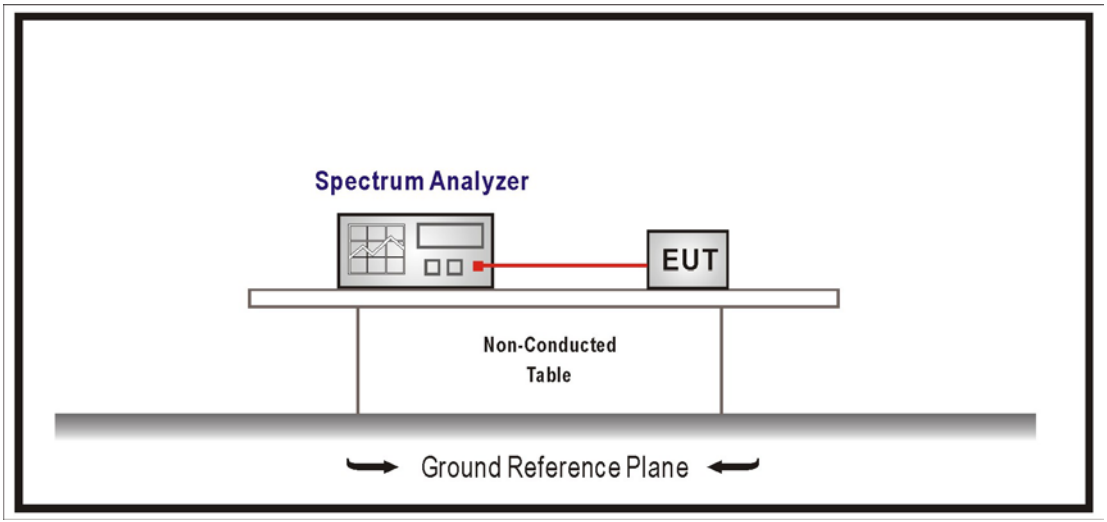
5.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2006
2	No.3 OATS			

Note: 1. All instruments are calibrated every one year.

5.2. Test Setup



5.3. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231: 2005

5.4. Test Result

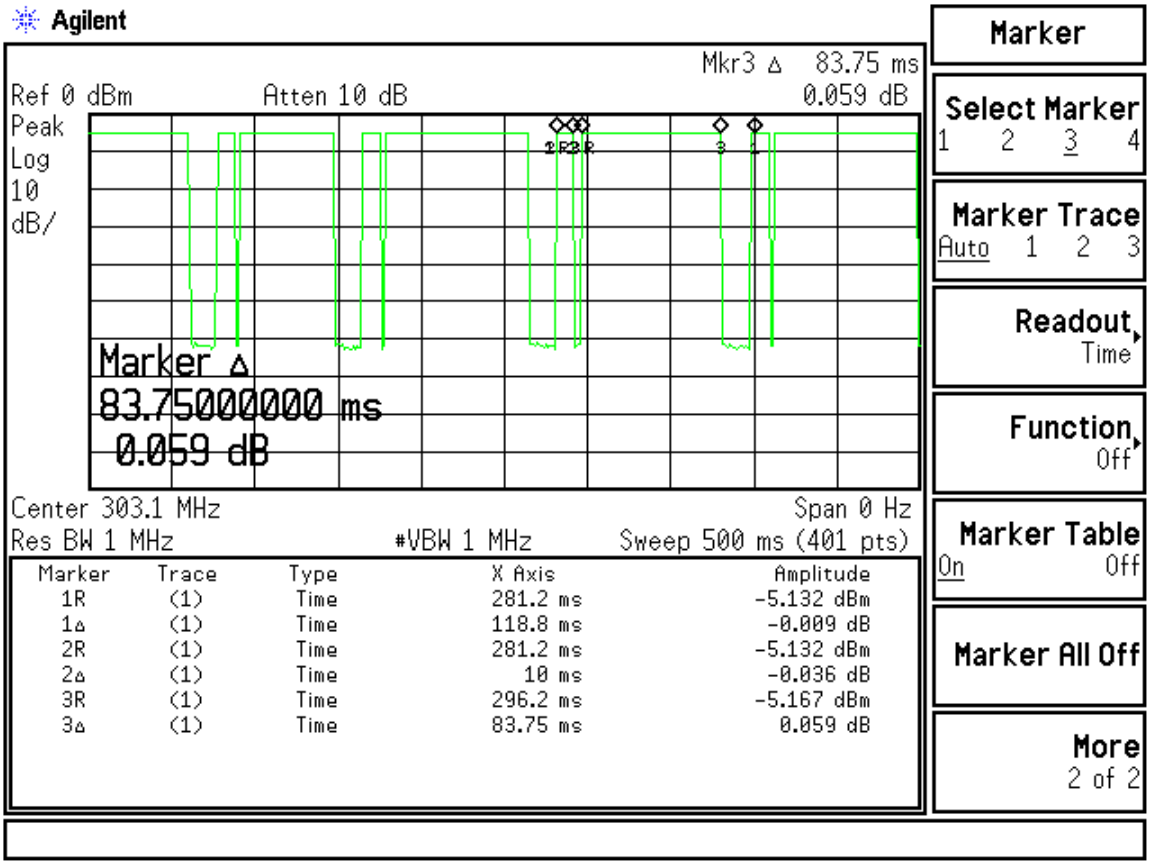
Product	Remote Control		
Test Item	Duty Cycle		
Test Mode	Mode 1: Transmit		
Date of Test	2006/03/22	Test Site	No.3 OATS

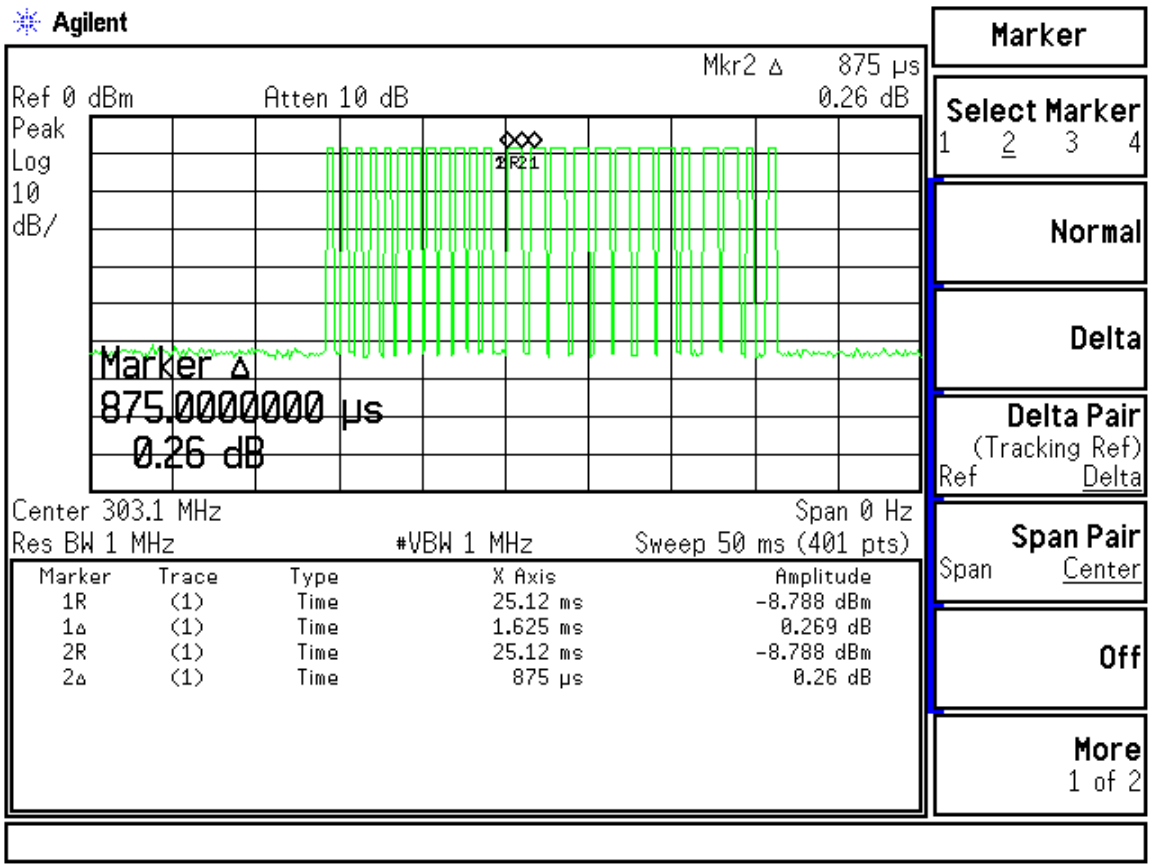
Each packet period = 118.8ms
Preamble transmit time = 10ms
Data transmit time = 83.75ms

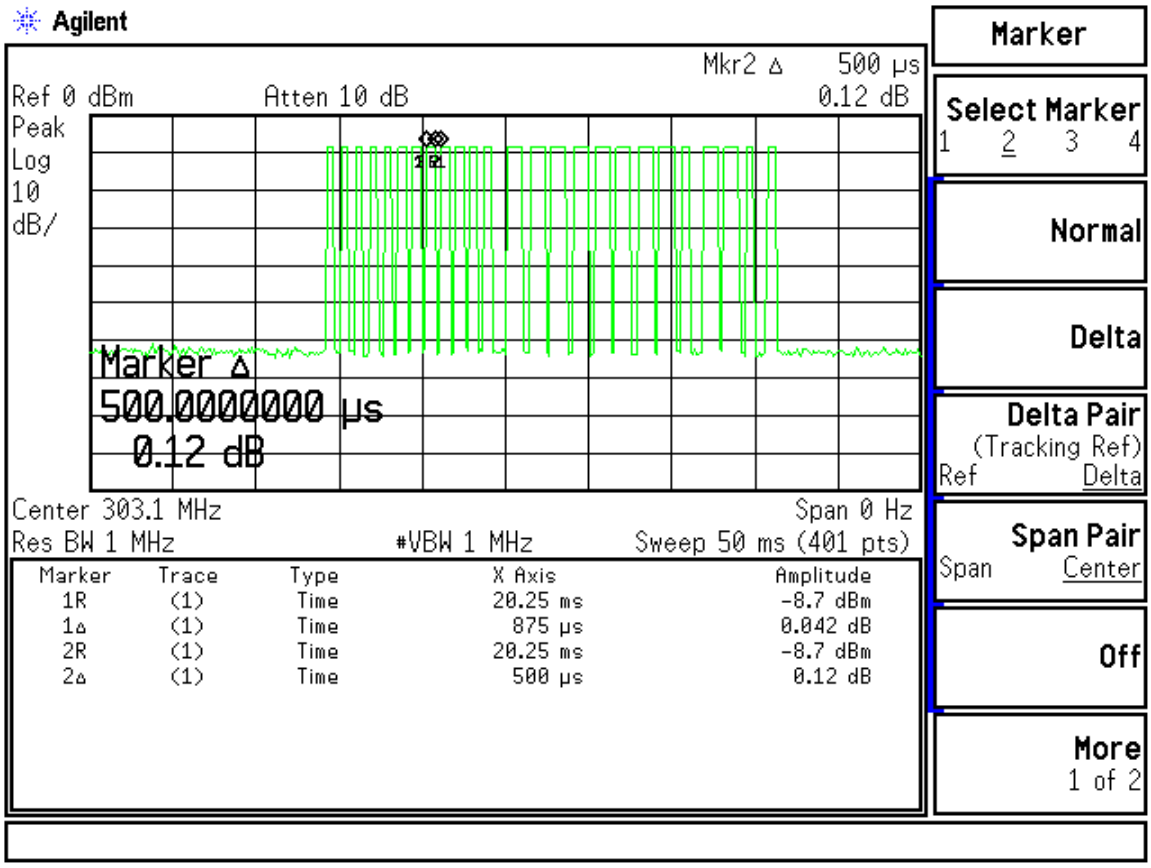
In preamble transmit,
The period of a long pulse = 1.625ms and transmit time of a long pulse = 0.875ms
The period of a short pulse = 0.875ms, transmit time of a short pulse = 0.5ms
T_{ON} = 10/0.875 * 0.5 = 5.71ms (worst cast)
In data transmit time,
The period of a pulse = 1.25ms and transmit time of a long pulse = 0.875ms
T_{ON} = 83.75/1.25 * 0.875 = 58.63ms

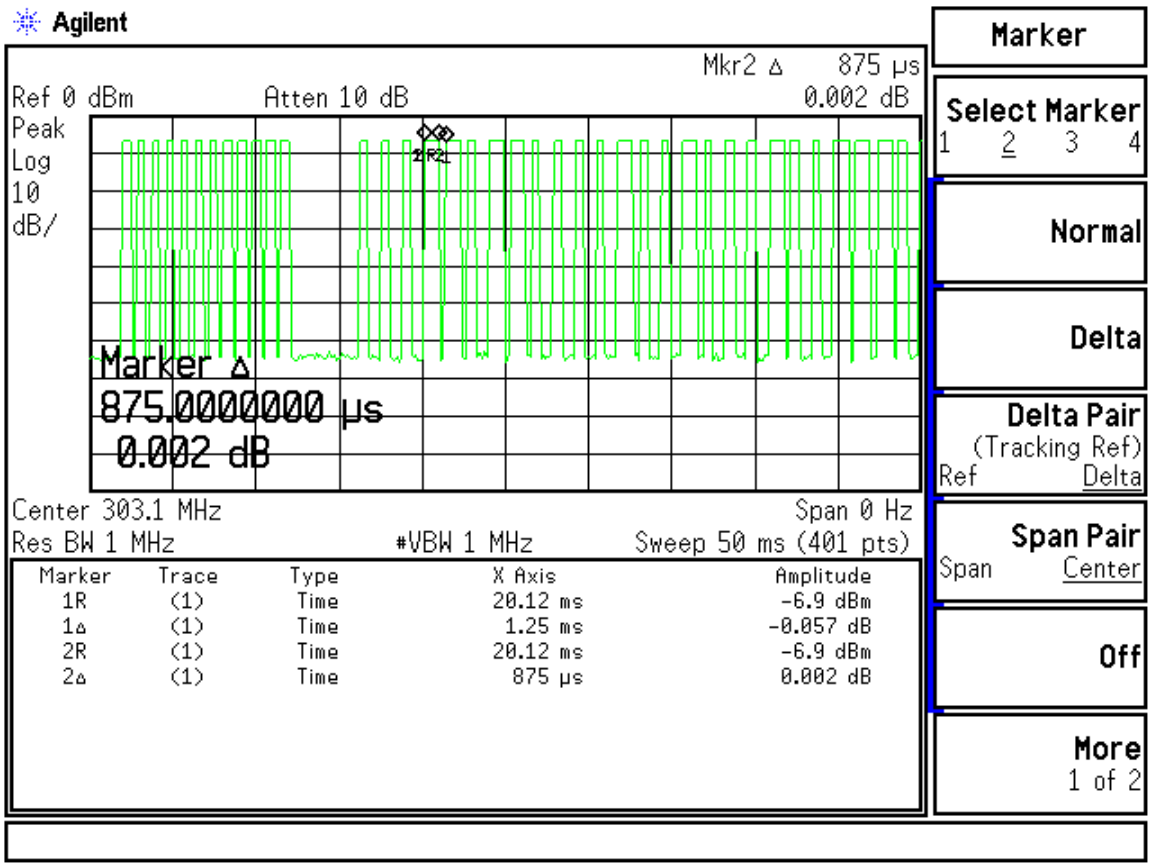
Duty cycle = (5.71 + 58.63) / 100 = 0.64
Duty Cycle Correct Factor = 20log(0.32) = -3.88 dB

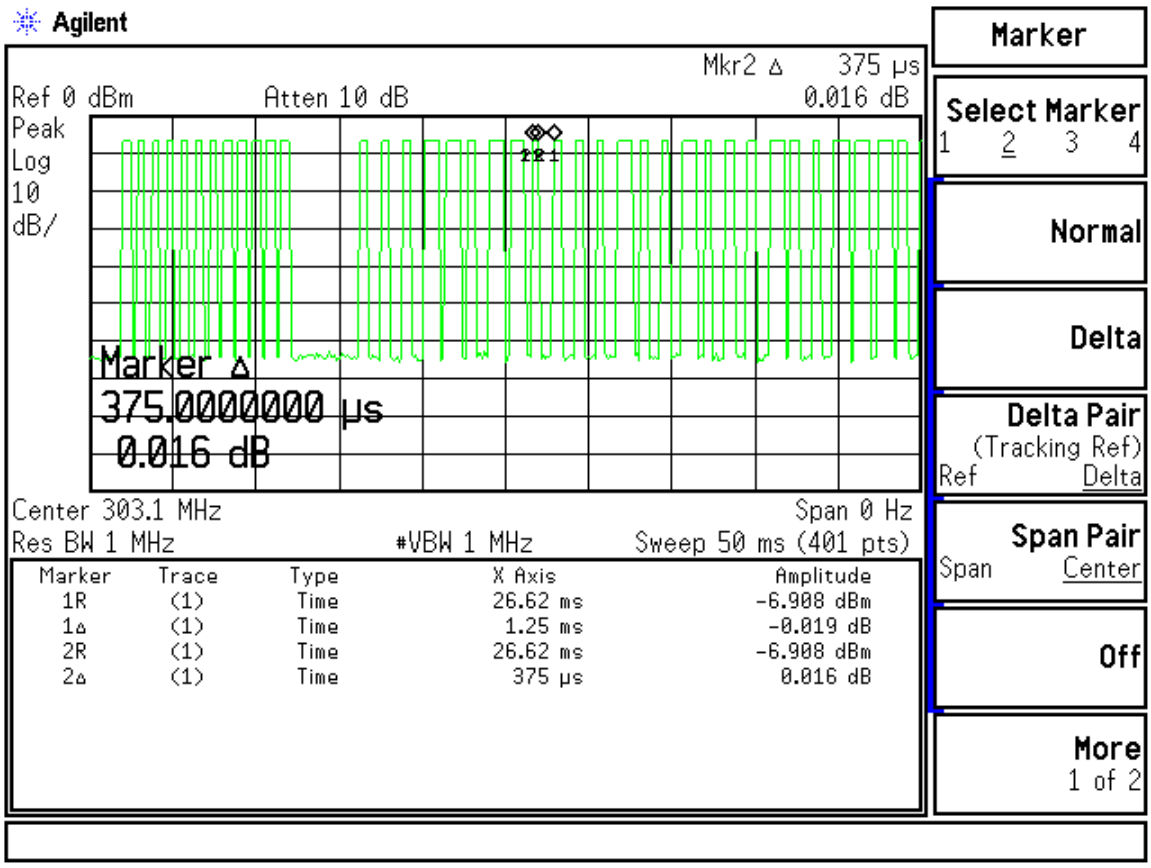
Result	Duty Cycle Correct Factor＝-3.88 dB




Agilent
Mkr2 Δ 875 µs
Ref 0 dBm
Atten 10 dB
0.26 dB
Peak
Log
10
dB/
Marker Δ
875.0000000 µs
0.26 dB
Center 303.1 MHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 50 ms (401 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 25.12 ms -8.788 dBm
1Δ (1) Time 1.625 ms 0.269 dB
2R (1) Time 25.12 ms -8.788 dBm
2Δ (1) Time 875 µs 0.26 dB
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
Mkr2 Δ 500 µs
Ref 0 dBm
Atten 10 dB
0.12 dB
Peak
Log
10
dB/
Marker Δ
500.0000000 µs
0.12 dB
Center 303.1 MHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 50 ms (401 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 20.25 ms -8.7 dBm
1Δ (1) Time 875 µs 0.042 dB
2R (1) Time 20.25 ms -8.7 dBm
2Δ (1) Time 500 µs 0.12 dB
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
Mkr2 Δ 875 µs
Ref 0 dBm
Atten 10 dB
0.002 dB
Peak
Log
10
dB/
Marker Δ
875.0000000 µs
0.002 dB
Center 303.1 MHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 50 ms (401 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 20.12 ms -6.9 dBm
1Δ (1) Time 1.25 ms -0.057 dB
2R (1) Time 20.12 ms -6.9 dBm
2Δ (1) Time 875 µs 0.002 dB
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2


Agilent
Mkr2 Δ 375 µs
Ref 0 dBm
Atten 10 dB
0.016 dB
Peak
Log
10
dB/
Marker Δ
375.0000000 µs
0.016 dB
Center 303.1 MHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 50 ms (401 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 26.62 ms -6.908 dBm
1Δ (1) Time 1.25 ms -0.019 dB
2R (1) Time 26.62 ms -6.908 dBm
2Δ (1) Time 375 µs 0.016 dB
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2