FCC TEST REPORT

REPORT NO.: 050732FIA01

MODEL NO.: Bonfire remote

RECEIVED: Jul 25, 2006

TESTED: Jul. 25 ~ Aug. 7, 2006

ISSUED: Aug. 7, 2006

APPLICANT: Monster, LLC

ADDRESS: 7251 west lake mead blvd. suite 342 las vegas, NV 89128, USA

ISSUED BY: ADT (Shanghai) Corporation

ADDRESS: 2F, Building C, No.1618, Yishan rd., 201103, Shanghai, China

ADT (Shanghai) Corporation.

ACCREDITED
No.: 2343.01

Table of Contents

1 CERTIFICATION

PRODUCT:	2-Piece RF Transmitter-Receiver System
MODEL NO.:	Bonfire remote
APPLICANT:	Monster, LLC
TESTED:	Jul. 25 ~ Aug. 7, 2006
TEST ITEM:	ENGINEERING SAMPLE
STANDARDS:	FCC Part 15:2005, Subpart C (Section 15.209 and 15.231), ANSI C63.4-2003

We, **ADT (Shanghai) Corporation**, declare that the equipment above has been tested in our facility and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

TECHNICAL ACCEPTANCE : _____ , **DATE:** AUG. 7, 2006

Bright Tong
Engineering Supervisor

APPROVED BY : _____ , **DATE:** AUG. 7, 2006

Wallace Pan
Director of Operations

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Paragraph	**Test Type**	**Result**	**Remarks**
15.207	Conducted Emission Test	N/A	
15.231(a)	De-activation Time	PASS	Meet the requirement of limit
15.209 15.231(b)	Radiated Emission Test	PASS	Minimum passing margin is –9.55 dB at 3922.20 MHz
15.231(c)	20dB Occupied Bandwidth Measurement	PASS	Meet the requirement of limit

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

Measurement	Value
Conducted emissions	1.8dB
Radiated emissions	3.2dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	2-Piece RF Transmitter-Receiver System
MODEL NO.	Bonfire remote
POWER SUPPLY	3 Vdc from batteries
MODULATION TYPE	FM
CARRIER FREQUENCY OF EACH CHANNEL	435.8MHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	Printed antenna
DATA CABLE SUPPLIED	N/A
I/O PORTS	N/A

NOTE: 1. The EUT contains two parts. One is TX (model No.: Bonfire remote) and the other one is RX (model No.: Dongle). This test report only recorded the test results of TX. As to the test results of RX please refer to report 060732FA01, which produced under subcontract of Advance Data Technology Corp..

2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

One channel is provided to this EUT:

Channel	Frequency
1	435.8 MHz

Five buttons are provided to this EUT:

No.	Button
1	Play / Pause iPod On / Off
2	Volume Down
3	Previous Track / Play list
4	Volume Up
5	Next Track / Play list

Test Mode Applicability AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to						Description
	PLC	De-a T	RE<1G	RE≥1G	20dB OBM	APM	
-	-	√	√	√	√	-	N/A

Where PLC: Power Line Conducted Emission De-a T: De-activation Time
RE<1G RE: Radiated Emission below 1GHz RE≥1G: Radiated Emission above 1GHz
20dB OBM: 20dB Occupied Bandwidth Measurement APM: Antenna Port Measurement

De-activation Time:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, and X.Y.Z. axis.

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Axis
1	1	FM	X

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, and X.Y.Z. axis.

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Axis
1	1	FM	X

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, and X.Y.Z. axis.

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Axis
1	1	FM	X

20dB Occupied Bandwidth Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, and X.Y.Z. axis.

☒ Following channel(s) was (were) selected for the final test as listed below.

Available Channel	Tested Channel	Modulation Type	Axis
1	1	FM	X

3.3 DESCRIPTION OF SUPPORT UNITS

The EUT is a 2-Piece RF Transmitter-Receiver System. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

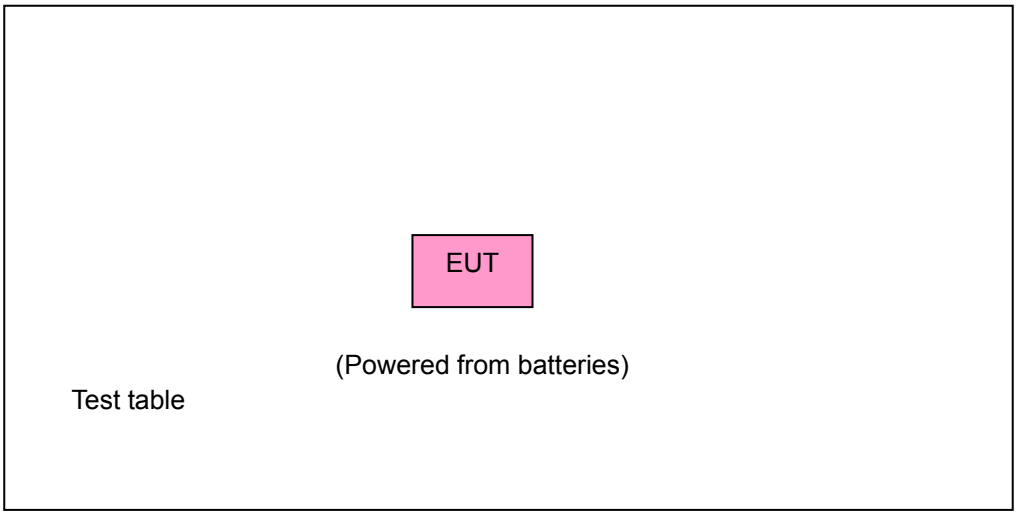
FCC Part 15, Subpart C. (15.231)

ANSI C63.4- 2003

All test items have been performed and recorded as per the above standards.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.



4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

NOTES: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.1.2 TEST RESULTS

Since the EUT does not AC power port, the test item is not applicable.

4.2 DEACTIVATION TIME

4.2.1 LIMITS OF DEACTIVATION TIME MEASUREMENT

TEST STANDARD:

FCC Part 15: 2005, Subpart C (Section: 15.231(a))

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

4.2.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SIGNAL ANALYZER Rohde & Schwarz	FSP	E1S1002	Mar. 16, 2007

NOTE: The calibration interval of the above test instruments is 12 months.

4.2.3 TEST PROCEDURES

1 The EUT was placed on the turning table.

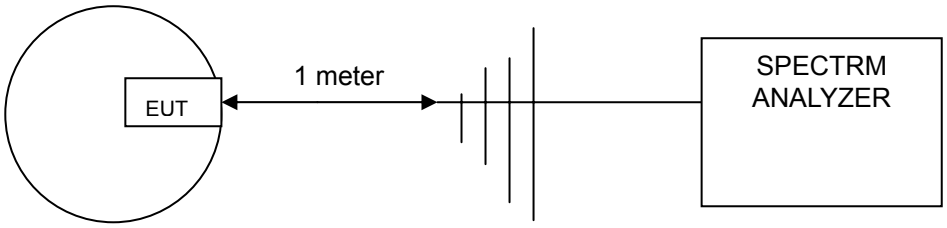
2 The signal was coupled to the spectrum analyzer through an antenna.

3 The transmission duration was measured and recorded.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

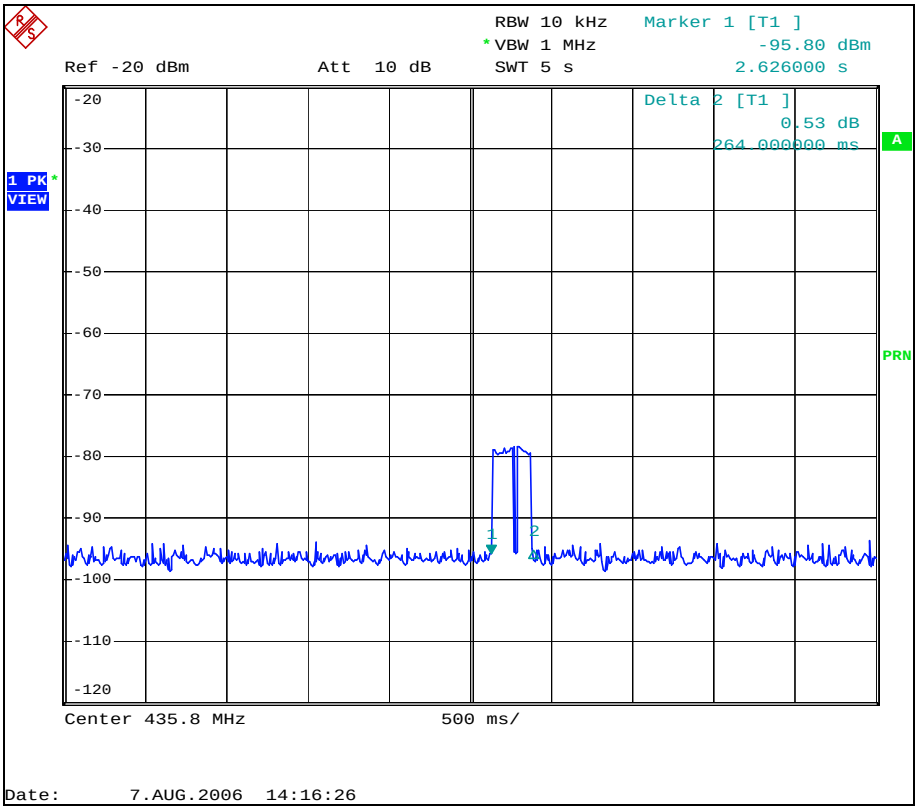
4.2.5 TEST SETUP



4.2.6 TEST RESULTS

Push button	Frequency (MHz)	Transmission duration (sec)	Maximum limit (sec)	PASS/FAIL
1	435.8	0.0264	5	PASS
2	435.8	0.0248	5	PASS
3	435.8	0.0528	5	PASS
4	435.8	0.0618	5	PASS
5	435.8	0.0688	5	PASS

Button 1



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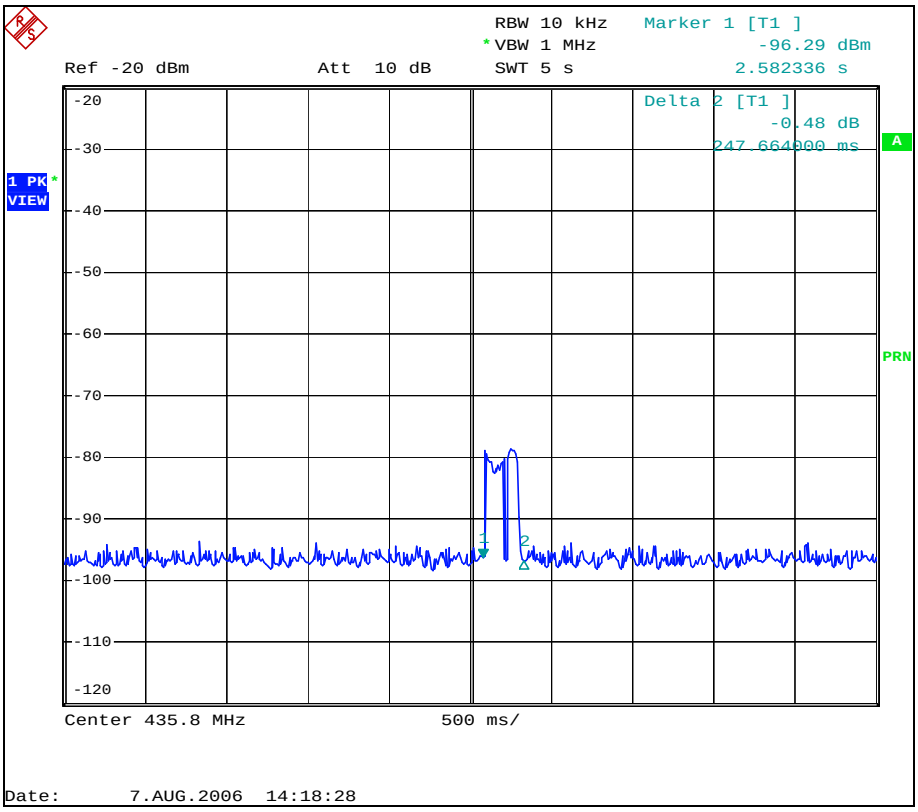

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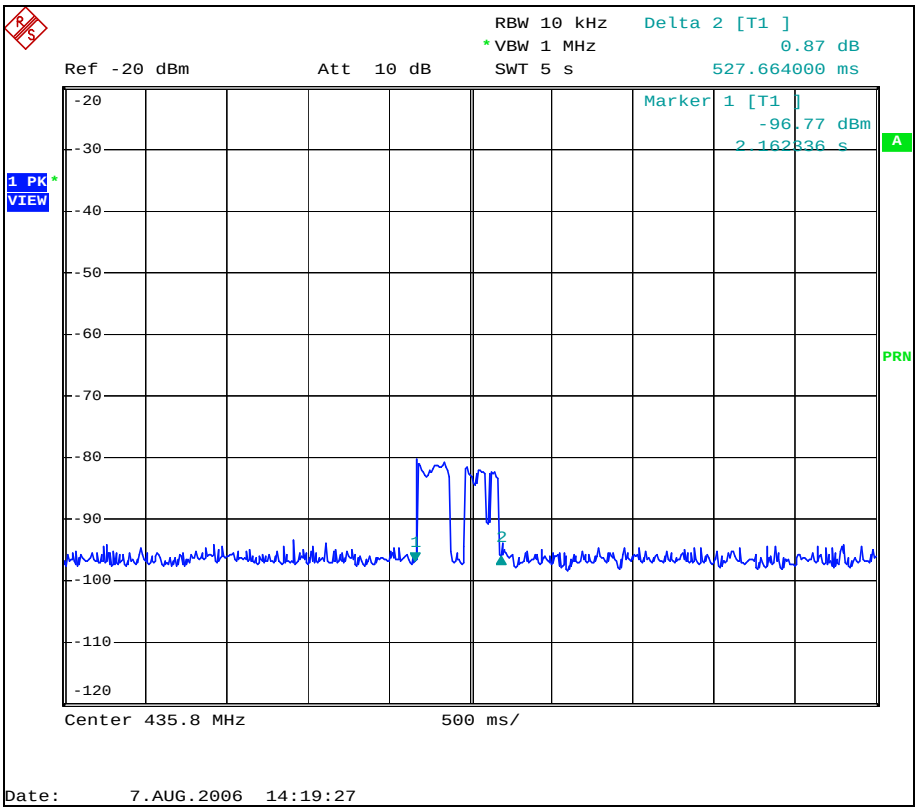

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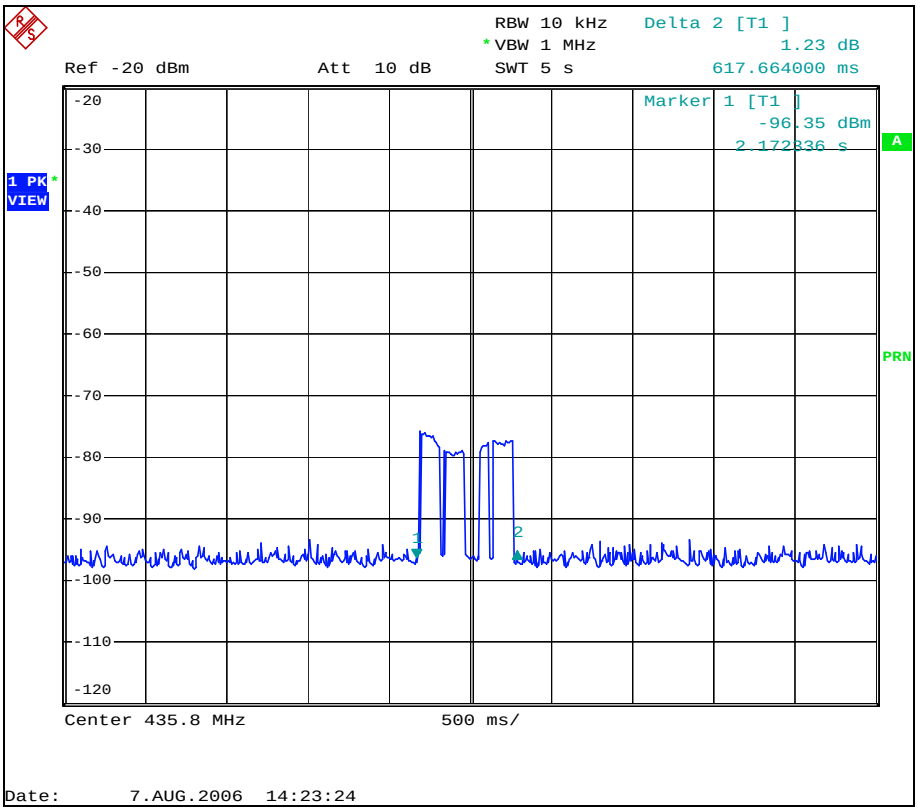

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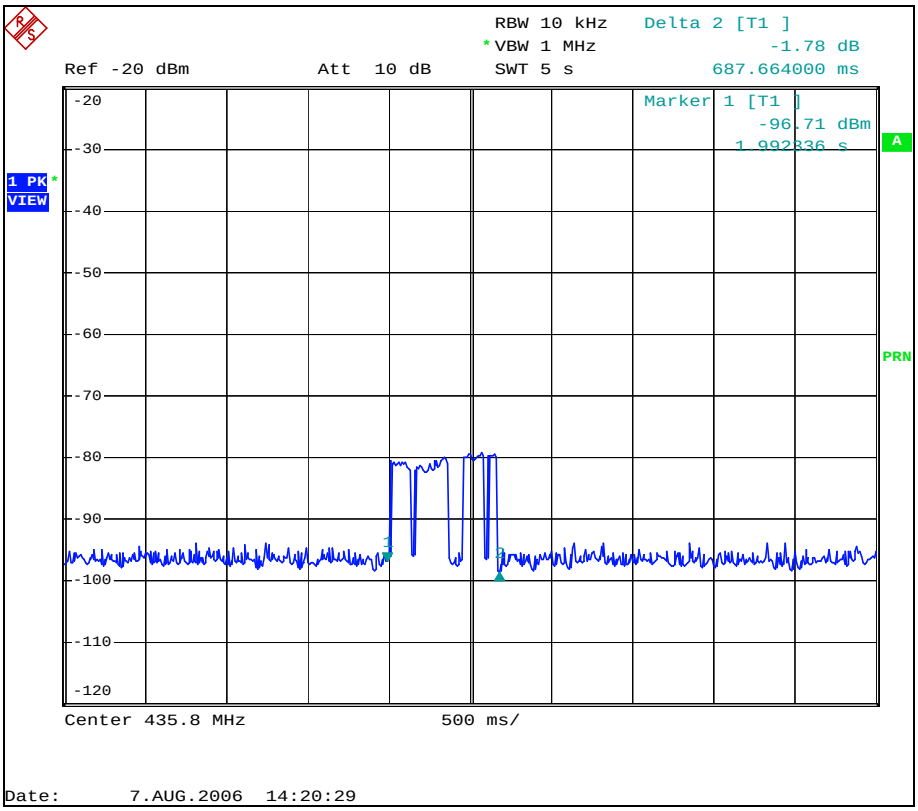


4.3 RADIATED EMISSION MEASUREMENT

4.3.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD:
FCC Part 15: 2005, Subpart C (Section: 15.205)
FCC Part 15: 2005, Subpart C (Section: 15.209)
FCC Part 15: 2005, Subpart C (Section: 15.231(b))

According to 15.231 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious	
	uV/meter	dBuV/meter	uV/meter	dBuV/meter
40.66 – 40.70	2250	67.04	225	48.04
70 – 130	1250	61.94	125	41.94
130 – 174	1250 to 3750	61.94 to 71.48	125 to 375	41.94 to 51.48
174 – 260	3750	71.48	75	37.50
260 – 470	3750 to 12500	71.48 to 81.94	375 to 1250	51.48 to 61.94
Above 470	12500	81.94	1250	61.94

NOTE:
(1) Where F is the frequency in MHz, the formula for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F)-6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F)- 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.
(2) The above field strength limits are specified at a distance of 3meters. The tighter limits apply at the band edges.

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

FREQUENCY RANGE OF RADIATED MEASUREMENT

(For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5^{th} harmonic of the highest frequency or 40 GHz, whichever is lower

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	E1R1001	Apr. 19, 2007
BILOG Antenna SCHWARZBECK	VULB9168	E1A1001	Sep. 26, 2006
Preamplifier Agilent	8447D	E1A2001	Jan. 27, 2007
Preamplifier Agilent	8449B	E1A2002	Jan. 27, 2007
Double Ridged Broadband Horn Antenna Schwarzbeck	BBHA 9120D	E1A1002	Feb. 15, 2007
Spectrum Analyzer Agilent	E4403B	E1S1001	Jan. 13, 2007
Signal Analyzer ROHDE & SCHWARZ	FSP	E1S1002	May. 16, 2007
RF signal cable Woken	RG-402	E1CBH01	May. 30, 2007
RF signal cable Woken	RG-402	E1CBH05	May. 30, 2007
RF signal cable Woken	RG-402	E1CBH07	May. 30, 2007
RF signal cable Woken	RG-412	E1CBL02	May. 30, 2007
RF signal cable Woken	RG-412	E1CBL03	May. 30, 2007
RF signal cable Woken	RG-412	E1CBL04	May. 30, 2007
Software ADT	ADT_Radiated_V7.5	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months.
2. "*" = These equipment are used for the final measurement.
3. The horn antenna and Agilent preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The Spectrum Analyzer (model: FSP) and RF signal cable (SERIAL: E1CBH05&E1CBH07) are used only for the measurement of emission frequency above 1GHz if tested.

4.3.3 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

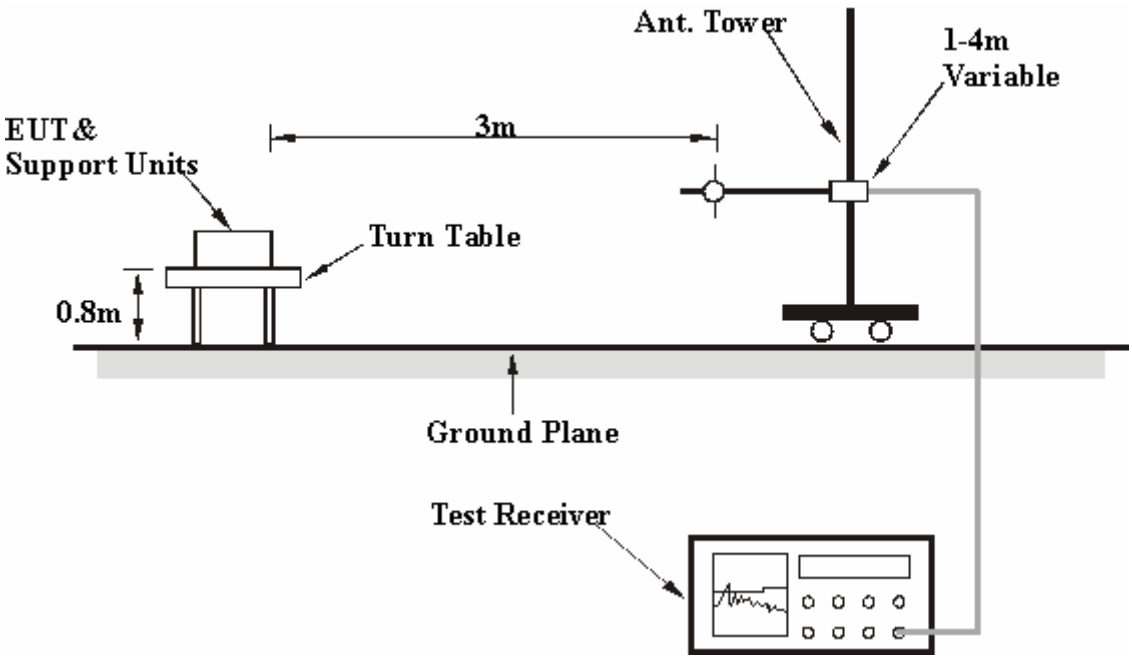
NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

4.3.6 EUT OPERATING CONDITIONS

Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.

4.3.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT	2-Piece RF Transmitter-Receiver System	**MODEL NO.**	Bonfire remote
CHANNEL	Channel 1	**FREQUENCY RANGE**	30 ~ 1000 MHz
MODULATION TYPE	FM	**INPUT POWER (SYSTEM)**	3 Vdc from batteries
ENVIRONMENTAL CONDITIONS	20 deg. C, 65% RH, 1000 hPa	**DETECTOR FUNCTION**	Quasi-Peak / Peak/ Average
TESTED BY	Bright		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Factor (dB/M)	Reading (dBuV/M)	Emission (dBuV/M)	Limit (dBuV/M)	Margin (dB)	Ant. Height (cm)	Table Angle (Deg.)
1	44.55 QP	15.55	-7.28	8.27	40.00	-31.73	111	186
2	156.10 QP	17.03	-7.44	9.59	43.50	-33.91	104	136
3	304.02 QP	16.64	-7.07	9.56	46.00	-36.44	98	85
*4	435.80 PK	19.80	50.82	70.62	100.92	-30.30	--	--
*4	435.80 AV	19.80	43.22	63.02	80.92	-17.90	--	--
5	580.48 QP	22.73	-7.72	15.01	46.00	-30.99	102	223
6	735.67 QP	25.19	-7.84	17.36	46.00	-28.64	106	266

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Factor (dB/M)	Reading (dBuV/M)	Emission (dBuV/M)	Limit (dBuV/M)	Margin (dB)	Ant. Height (cm)	Table Angle (Deg.)
1	51.83 QP	15.34	-7.50	7.84	40.00	-32.16	168	304
2	163.37 QP	16.75	-7.30	9.45	43.50	-34.05	119	254
3	299.18 QP	16.51	-7.13	9.38	46.00	-36.62	100	205
*4	435.80 PK	19.80	32.46	52.26	100.92	-48.66	--	--
*4	435.80 AV	19.80	24.86	44.66	80.92	-36.26	--	--
5	597.45 QP	23.08	-7.39	15.69	46.00	-30.31	116	174
6	733.25 QP	25.17	-7.92	17.25	46.00	-28.75	133	118

NOTE: 1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB)
2. Correction Factor (dB) = Antenna Factor (dB) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. "*" = Fundamental frequency
6. The average value of fundamental frequency and spurious emission is: Average = Peak value + 20log(Duty cycle)

Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log\frac{27*0.35+43*0.75\text{ms}}{100\text{ms}} = -7.6\text{dB}$$

please see page 21 for plotted duty

About 1GHz Worst-Case Data

EUT	2-Piece RF Transmitter-Receiver System	**MODEL NO.**	Bonfire remote
CHANNEL	Channel 1	**FREQUENCY RANGE**	1GHz ~ 2GHz
MODULATION TYPE	FM	**INPUT POWER (SYSTEM)**	3 Vdc from batteries
ENVIRONMENTAL CONDITIONS	20 deg. C, 65% RH, 1000 hPa	**DETECTOR FUNCTION**	Quasi-Peak / Peak/ Average
TESTED BY	Bright		

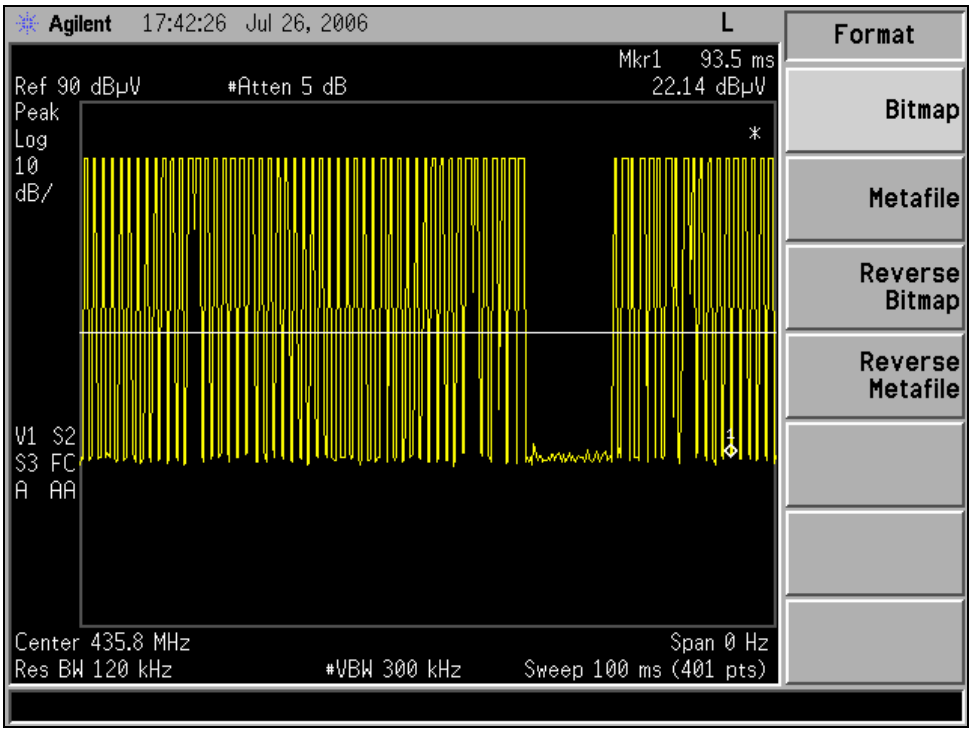
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Factor (dB/M)	Reading (dBuV/M)	Emission (dBuV/M)	Limit (dBuV/M)	Margin (dB)	Ant. Height (cm)	Table Angle (Deg.)
1	1307.40 PK	30.34	17.95	48.29	74.00	-25.71	100	129
1	1307.40 AV	30.34	10.35	40.69	54.00	-13.31	100	129
2	1743.20 PK	30.86	15.41	46.27	80.92	-34.65	100	219
2	1743.20 AV	30.86	7.81	38.67	60.92	-22.25	100	219
3	2179.00 PK	34.68	13.7	48.38	80.92	-32.54	100	314
3	2179.00 AV	34.68	6.10	40.78	60.92	-20.14	100	314
4	2614.80 PK	35.28	14.78	50.06	80.92	-30.86	100	137
4	2614.80 AV	35.28	7.18	42.46	60.92	-18.46	100	137
5	3050.60 PK	36.40	16.01	52.41	80.92	-28.51	100	12
5	3050.60 AV	36.40	8.41	44.81	60.92	-16.11	100	12
6	3486.40 PK	36.66	14.14	50.80	80.92	-30.12	100	69
6	3486.40 AV	36.66	6.54	43.20	60.92	-17.72	100	69
7	3922.20 PK	38.75	11.45	50.20	74.00	-23.80	100	79
7	3922.20 AV	38.75	3.85	42.60	54.00	-11.40	100	79

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Factor (dB/M)	Reading (dBuV/M)	Emission (dBuV/M)	Limit (dBuV/M)	Margin (dB)	Ant. Height (cm)	Table Angle (Deg.)
1	1307.40 PK	30.34	20.40	50.74	74.00	-23.26	100	230
1	1307.40 AV	30.34	12.80	43.14	54.00	-10.86	100	230
2	1743.20 PK	30.86	18.42	49.28	80.92	-31.64	100	112
2	1743.20 AV	30.86	10.82	41.68	60.92	-19.24	100	112
3	2179.00 PK	34.68	17.13	51.81	80.92	-29.11	100	34
3	2179.00 AV	34.68	9.53	44.21	60.92	-16.71	100	34
4	2614.80 PK	35.28	16.01	51.29	80.92	-29.63	100	72
4	2614.80 AV	35.28	8.41	43.69	60.92	-17.23	100	72
5	3050.60 PK	36.40	15.15	51.55	80.92	-29.37	100	167
5	3050.60 AV	36.40	7.55	43.95	60.92	-16.97	100	167
6	3486.40 PK	36.66	13.38	50.05	80.92	-30.87	100	223
6	3486.40 AV	36.66	5.78	42.45	60.92	-18.47	100	223
7	3922.20 PK	38.75	13.30	52.05	74.00	-21.95	100	64
7	**3922.20 AV**	**38.75**	**5.70**	**44.45**	**54.00**	**-9.55**	**100**	**64**

REMARKS:
1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The average value of fundamental frequency and spurious emission is: Average = Peak value + 20log(Duty cycle)
   Where the duty factor is calculated from following formula:

$$20\log(\text{Duty cycle}) = 20\log\frac{27*0.35+43*0.75\text{ms}}{100\text{ms}} = -7.6\text{dB}$$

please see page 21 for plotted duty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Mkr1 93.5 ms
22.14 dBµV
Ref 90 dBµV
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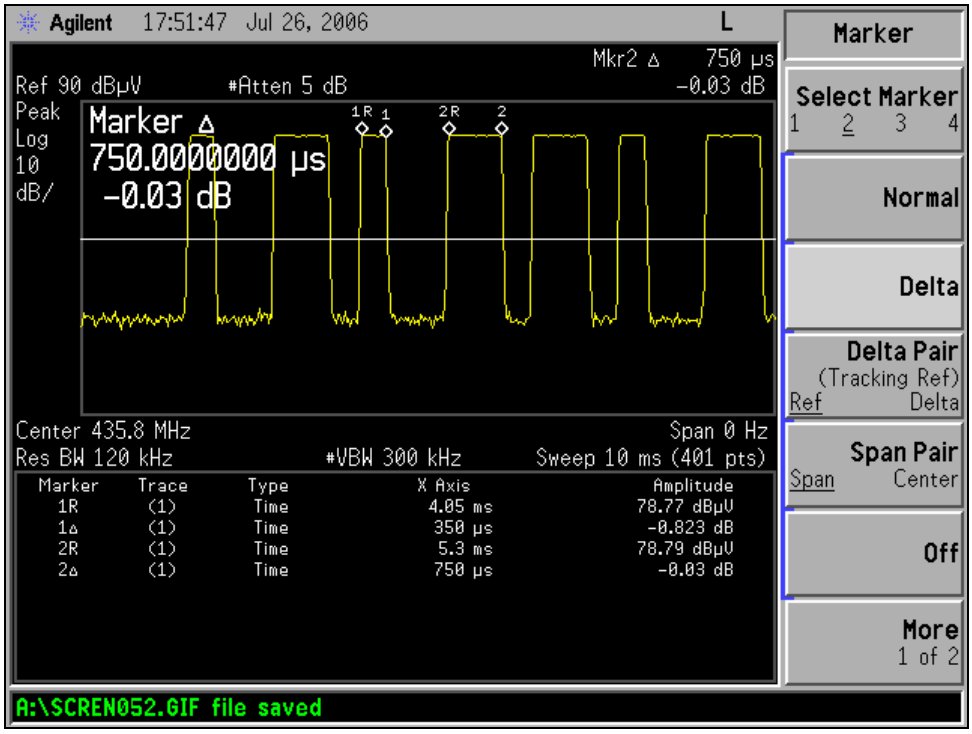
Peak
Log
10
dB/
V1 S2
S3 FC
A AA
Center 435.8 MHz
Res BW 120 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 100 ms (401 pts)
Format
Bitmap
Metafile
Reverse Bitmap
Reverse Metafile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Mkr2 Δ 750 µs
-0.03 dB
Ref 90 dBµV
#Atten 5 dB
Peak
Log
10
dB/
Marker Δ
750.0000000 µs
-0.03 dB
1R 1
2R 2
Center 435.8 MHz
Res BW 120 kHz
#VBW 300 kHz
Span 0 Hz
Sweep 10 ms (401 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 4.05 ms 78.77 dBµV
1Δ (1) Time 350 µs -0.823 dB
2R (1) Time 5.3 ms 78.79 dBµV
2Δ (1) Time 750 µs -0.03 dB
A:\SCREN052.GIF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

4.4 20DB OCCUPIED BANDWIDTH MEASUREMENT

4.4.1 LIMITS OF BAND EDGES MEASUREMENT

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for device operating above 70 MHz and below 900 MHz.

Fundamental Frequency (MHz)	Limit of 20 dB Bandwidth(kHz)
435.8	1089.5

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SIGNAL ANALYZER Rohde & Schwarz	FSP	E1S1002	Mar. 16, 2007

NOTE: The calibration interval of the above test instruments is 12 months.

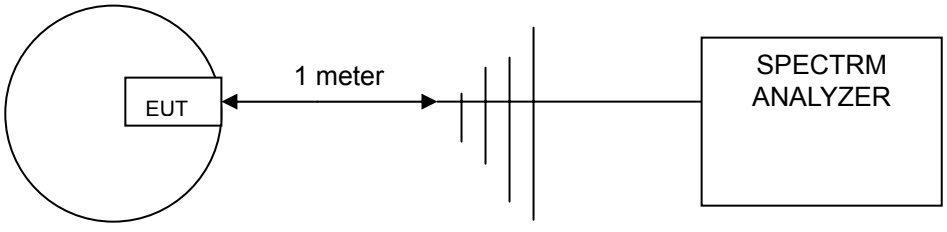
4.4.3 TEST PROCEDURES

1. The EUT was placed on the turning table.
2. The signal was coupled to the spectrum analyzer through an antenna.
3. Set the resolution bandwidth to 10 kHz and video bandwidth to 1MHz then select Peak function to scan the channel frequency.
4. The 20dB bandwidth was measured and recorded.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

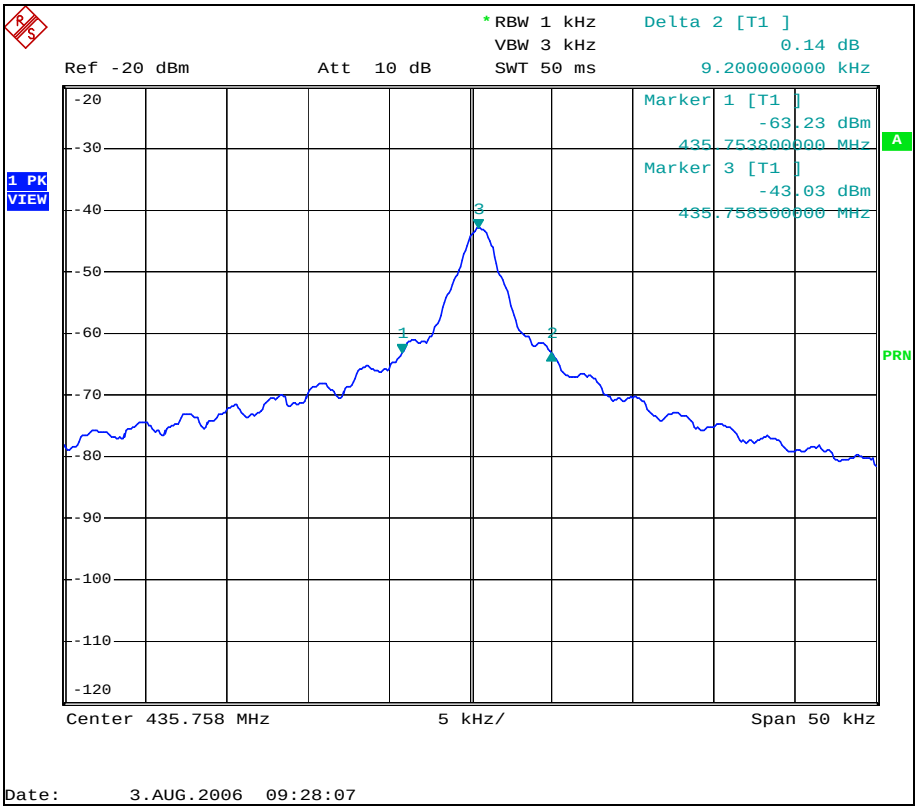
4.4.5 TEST SETUP



4.4.6 TEST RESULTS

Frequency (MHz)	20 dB bandwidth (kHz)	Maximum limit (kHz)	PASS/FAIL
435.8	9.2	1089.5	PASS

The plot of test result is attached as below.



5 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, ADT (Shanghai) Corp., were founded in 2003 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

JAPAN	VCCI
USA	FCC, A2LA
Norway	DNV

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.cnadt.com
If you have any comments, please feel free to contact us at the following:

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