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NVLAP Lab code: 200068-0
ISO/IEC 17025:1999, ISO 9002:1994

FCC 15.247 Test Report

Final Model Name: Nike, AY4301
Tested Model Name: Max7BT
FCC ID: o6rm7bt
IC: 3797A-M7BT

Prepared for Dynastream Innovations, Inc.

According to FCC Part 15.247
Frequency Hopping Spread Spectrum Device

Test Report #:	*DYN-0406-4150-FCC*
Job Number #:	*DYN-0407-1000-TCB*
Prepared by:	*Arcelia Maldonado*
QC Manager:	*Tony Wang*

Test Report Released by: Tony Wang — *Tony Wang* — *July 23, 2004* — *Date*

List of Attached Files

Exhibit Type	File Description	File Name
Test Report	Test Report	report.pdf
Operation Description	Technical Description	description.pdf
Test Report	Maximum Output Power Plots	maxop.pdf
Test Report	20 dB Bandwidth Plots	20dB.pdf
Test Report	Number of Hopping Frequencies, and Hopping Channel Frequency Separation	hchano.pdf
Test Report	Average Channel Occupancy Time	avetime.pdf
Test Report	Out of Band Emissions Plots	obe.pdf
Test Report	Band Edge Plots	be.pdf
External Photos	External Photos	external-photos.pdf
Internal Photos	Internal Photos	internal-photos.pdf
Set-up Photos	Test Set-up Photos	setup-photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf

Max7BT Model Name

Attn.: Arcelia Maldonado
EMC Compliance Management Group
670 National Avenue,
Mountain View, CA 94043

Date: July 23, 2004

To Whom It May Concern:

Concerning the product model name. The Max7BT will be labeled and sold under the model name "AY4301".

Please refer to the product labeling for additional information.

Yours Sincerely,

Victor Beda
EET

Test Location

EMC Compliance Management Group is located at 670 National Ave., Mountain View, CA 94043, USA.

Accreditation Bodies

EMC Compliance Management Group is a fully accredited Test Laboratory for ITE, ISM and Telecommunications Products.

In compliance with the site registration requirements of Section 2.948 of the FCC Rules to perform EMI measurements for the general public.

Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code # 200068-0.

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ADMINISTRATIVE DATA

Test Sample	*: Bluetooth Enabled Speed and Distance Monitoring System*
Model Name	*: Nike, AY4301*
Tested Model Name	*: Max7BT*
Serial Number	*: Engineering Sample*
Date Tested	*: June 10th - 14th, 2004*
Manufacturer	*: Dynastream Innovations, Inc. 228 River Avenue, Cochrane, Alberta, Canada*
Telephone	*: (403) 932-9292*
Fax	*: (403) 932-6521*

EUT Description

Dynastream Innovations, Inc., tested model name Max7BT (referred to as the EUT in this report) is a Bluetooth Enabled Speed and Distance Monitoring System.

Test Summary

The Electromagnetic Compatibility requirements on tested model name Max7BT for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

The Max7BT has been found to conform to the following parts of the 47 CFR FCC as detailed below:

Part 15	Requirement	Result Pass/Fail	Comments
15.15(b)	General technical requirements	Pass	The product contains no user accessible controls that increase transmission power above allowable levels.
15.19	Labeling requirement	Pass	The label is shown in the label exhibit.
15.21	Information to user	Pass	Information to the user is shown in the instruction manual exhibit.
15.27	Special accessories	Pass	No special accessories are required for compliance.
15.203	Antenna requirement	Pass	The antenna is soldered to the transmitter board, which is not used accessible, and there is no external antenna connection
15.205(a)	Radiated Emissions in Restricted Bands	Pass	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
15.209(a)	Radiated Emissions limits, general requirements	Pass	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
15.207(a)	AC conducted Emissions	N/A	The unit with AAA battery pack no conducted emission test required.
15.247(a)	Field Strength of Fundamental & Harmonics	Pass	The unit complies with the field strength limits of 15.247.
15.247 (c)	Out of band & Band Edge measurements	Pass	The unit complies with the band edge emissions limits of 15.247.

Continue on to next page…

Part 15	Requirement	Result Pass/Fail	Comments
15.247(a)(1)(iii)	20 dB Bandwidth	Pass	The unit complies with the 20dB bandwidth limits
15.247(b)(1)	Maximum peak Output Power	Pass	The unit complies with the band edge emissions limits of 15.247.
15.247(a)(1)(iii)	Hopping Channel Carrier Frequency Separation (>25 KHz)	Pass	The unit complies with Hopping Frequency Separation (>25 KHz) the limits of 15.247.
15.247(a)(1)(iii)	Number of the Hopping Frequency (channels)	Pass	The unit complies with the Number of the Hopping Frequency limits of 15.247.
15.247(a)(1)(iii)	Average Channel Occupancy Time (<0.4s)	Pass	The unit complies with Average Channel Occupancy Time (<0.4s) limits of 15.247.

This report is an application for Certification of a Transmitter operation pursuant to FCC part 15.247, code of federal regulations 47. The product covered by this report is the Dynastream tested model name: Max7BT. This report is designed to demonstrate the compliance of this device with the requirements outlined in 47 CFR Part 15 using the methods in CFR 47 Part 2.

Test Mode Justification

The EUT exercise program used during radiated testing was designed to exercise the various system components in a manner similar to a typical use.

For emission testing, the unit was setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

Equipment Modification

Any modifications installed previous to testing by Dynastream Innovations, Inc. will be incorporated in each production model sold or leased in United States.

There were no modifications installed by EMC Compliance Management Group.

Test System Details

EUT	
Model Name:	Nike, AY4301
Tested Model Name:	Max7BT
Serial Number:	Engineering Sample
Description:	Bluetooth Enabled Speed and Distance Monitoring System
Manufacturer:	Dynastream Innovations, Inc.
Support Equipment	
None	
Cable Description	
None	

Test Methodology

Radiated emissions testing are performed according to the procedures specified in ANSI C63.4-2001.

Frequency Range investigated: *30 MHz to 25 GHz*

Measurement setup:

Frequency	RBW	VBW	Sweep	Detector	Distance	Antenna polarization	Antenna height
30 – 1000 MHz	100 KHz	≥RBW	Auto	Peak	3 m	Vertical & Horizontal	1 m – 4 m
Above 1 GHz	1 MHz	≥RBW	Auto	Peak	3m / 1m	Vertical & Horizontal	1 m – 4 m

Radiated emission limits:

Frequency (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)
1.705 - 30	300	49.54
30 – 88	100	40.00
88 – 216	150	43.52
216 - 960	200	46.02
960 Above	500	53.98

Frequency	FS Fundamental	FS Fundamental	FS Harmonics	FS Harmonics
MHz	mV/m	dBuV/m	uV/m	dBuV/m
2400 –2483.5	50	93.98	500	53.98

** dBuV/m=20 x Log (uV/m)*

EUT power Source: *Fresh AAA battery pack*

Emission Maximization: *Antenna (1m to 4m) height and Horizontal/Vertical polarization 360-degree turntable rotated and EUT rotated three orthogonal axes.*

1. FCC 15.247 (b) (1) Maximum Peak Output Power

Peak Out put Power Limit:

Frequency MHz	Channels	Types of Devices	Power
2400-2483.5	>= 75	Hopping	1 Watt

Instrument setup:

R. Bandwidth	Video Bandwidth	Frequency Span	Sweep Time
1 MHz	1 MHz	10 MHz	20 msec

Measurement Test Data:

-Channel	Frequency MHz	Peak reading (dBuV/m)	Ant. Factor (dB/m)	Cable loss (dB)	Corrected reading (dBuV/m)	Watt < 1 W	Plot #
Low	2402	63.49	30	2.0	95.49	0.66 mW	1
Middle	2441	64.93	30	2.0	96.93	0.92 mW	2
High	2480	64.70	30	2.0	96.7	0.88 mW	3

Theoretical Output Power Calculation:

G = Antenna Gain: 2.14 dBi (provided by Dynastream Innovation)
AF = Antenna Factor (EMCO Horn 3115 @ 2.4 GHz = 30 dB)
D (Distance) = 3 meter
Cable Loss = 2 dB

$E=96.93\ dBuV/m=7.02x10^{-2}V/m$

$E=\sqrt{30\ P\ G}\ /\ D$

$G=10^{(2.14\ dBi\ /\ 10)}=1.6\ dB$

$P=E^2D^2/30G$

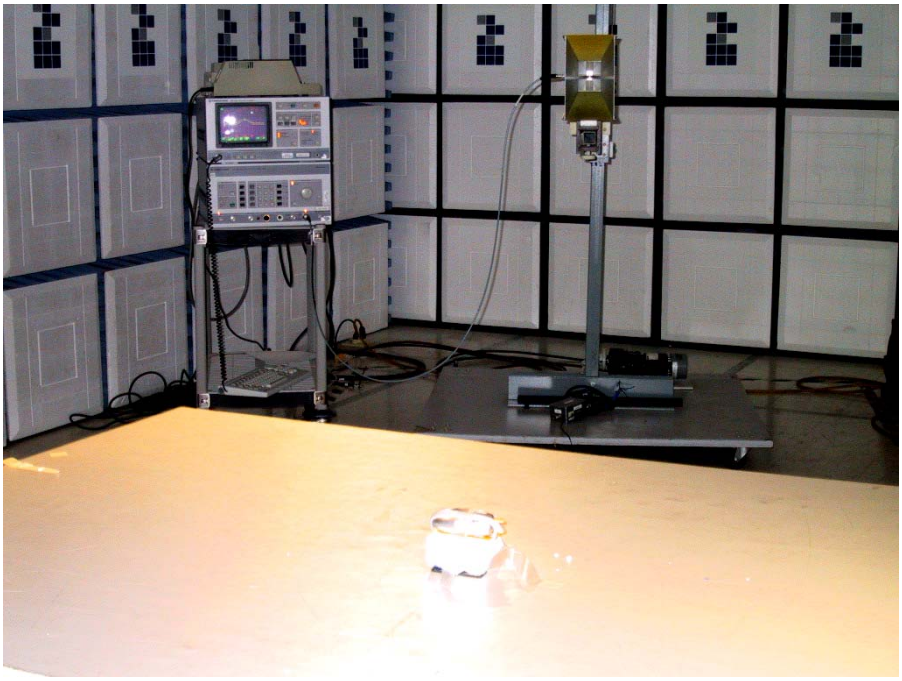
$P=((7.02x10^{-2})^2\ x\ 3^2)/(30x1.6)=9.2x10^{-4}\ W = 0.92\ mW$

Test Equipment List:

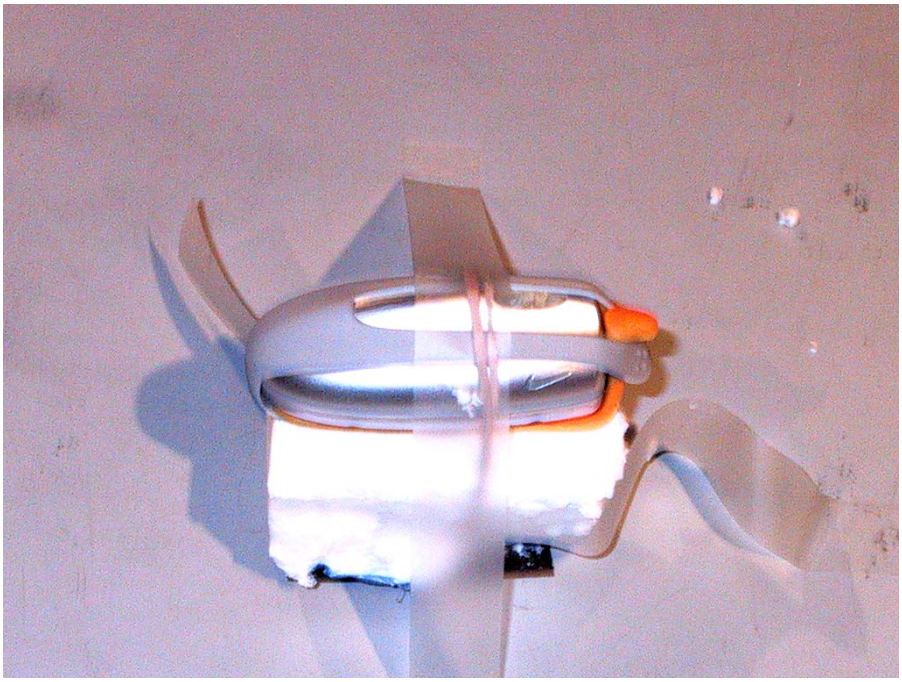
Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Receiver	R&S	ESMI-RF	849937/006	04/25/04	04/25/05
EMI Receiver	R&S	ESAI-D	825035/005	04/25/04	04/25/05
Horn Antenna	EMCO	3115	001	06/04/04	06/04/05
Plotter	HP	7470A	2308A27405	No Cal required	No Cal required

Test Result: EUT Pass, Meets Requirement.
Tested by: Richard Lee **Date:** June 10th - 14th, 2004

EUT Test Setup Photo for Tested Model Name: Max7BT



Maximum Peak Output Power Front View



Close-Up View

2. FCC 15.247 (a) (1) (iii) Hopping Channel 20 dB RF Bandwidth

a. The center frequency of the analyzer was set to the hopping channel under investigation. The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was chosen so that the display was a result of the hopping channel modulation, rather than the internal response of the analyzer. The RES BW was chosen to be as close as possible to the emission bandwidth of the EUT.

Test Results:

R. Bandwidth	Video Bandwidth	Frequency Span	Sweep Time
30 KHz	100 KHz	5 MHz	20 msec

Hopping Channel 20 dB Bandwidth (MHz) Measurements:

Frequency (MHz)	20 dB RF Bandwidth (1 MHz)	Plot #
2441	845 KHz	4,5

Note: Maximum Allowable: 1 MHz for 2400-2483.5 systems.

Test Equipment List:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Spectrum Analyzer	HP	8566B	2410A00224	06/07/04	06/07/05
Quasi Peak Adapter	HP	85650A	3145A01658	06/07/04	06/07/05
Horn Antenna	EMCO	3115	001	06/04/04	06/04/05
Horn Antenna	EMCO	3160-09	20372	06/04/04	06/04/05
Plotter	HP	7470A	2308A27405	No Cal required	No Cal required

Test Result: EUT Pass, Meets Requirement.
Tested by: Richard Lee **Date:** June 10th - 14th, 2004

3. FCC 15.247 (a) (1) (iii) Hopping Channel Carrier Frequency Separation:

Test Procedures:

a. *Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum 25 KHz or the 20 dB bandwidth of the hopping channel.*
b. *Using the Delta Marker function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit.*

Test Results:

Frequency (MHz)	*Hopping frequencies separated by a minimum 25 KHz*	*Plot #*
2400 -2422	*1.01 MHz*	*6*
2422 –2444	*1.01 MHz*	*7*
2444 – 2466	*1.01 MHz*	*8*
2466 – 2483.5	*1.0 MHz*	*9*

Test Equipment List:

Test Equipment	*Manufacturer*	*Model*	*Serial No.*	*Last Cal.*	*Cal. Due*
Spectrum Analyzer	*HP*	*8566B*	*2410A00224*	*06/07/04*	*06/07/05*
Quasi Peak Adapter	*HP*	*85650A*	*3145A01658*	*06/07/04*	*06/07/05*
Horn Antenna	*EMCO*	*3115*	*001*	*06/04/04*	*06/04/05*
Plotter	*HP*	*7470A*	*2308A27405*	*No Cal required*	*No Cal required*

Test Result: *EUT Pass, Meets Requirement.*
Tested by: *Richard Lee* ***Date:*** *June 10th - 14th, 2004*

4. FCC 15.247 (a) (1) (iii) Number of Hopping Frequencies:

Test Procedures:

a. *RF pass band of the EUT was divided into 4 proximately equal bands. With the analyzer set to MAX HOLD readings were taken for 2-3 minutes in each band. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.*
b. *Number of hopping channels = 79*
c. *Minimum Requirements: At least 75 channels for 2400-2483.5 MHz systems.*
d. *At 2400-2483.5 MHz band, at least 15 non-overlapping channels.*

Test Data:

Frequency (MHz)	Number of hopping channels	Plot #
2402 -2480	79	6,7,8,9

Test Equipment List:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Spectrum Analyzer	HP	8566B	2410A00224	06/07/04	06/07/05
Quasi Peak Adapter	HP	85650A	3145A01658	06/07/04	06/07/05
Horn Antenna	EMCO	3115	001	06/04/04	06/04/05
Plotter	HP	7470A	2308A27405	No Cal required	No Cal required

Test Result: *EUT Pass, Meets Requirement.*
Tested by: *Richard Lee* ***Date:*** *June 10th - 14th, 2004*

5. FCC 15.247 (a) (1) (iii) Average Channel Occupancy Time

***Test Procedures**:*

a. Spectrum analyzer center frequency was set to one of the known hopping channels. The Sweep was set to 0.4 second, the SPAN was set to ZERO SPAN, and the TRIGGER was set to VIDEO. The time duration of the transmission so captured was measured with the MARKER DELTA function.

Specifications	Frequency (MHz)	# Of the Hopping frequency	Time of occupancy on frequency
15.247(a) (1) (iii)	2400-2483.5	15 non-overlapping channels	< 0.4s in 0.4s period X # of hopping channels

Test Data: Middle Channel

Specifications	Frequency (MHz)	Time of occupancy on frequency	Plot #
15.247(a) (1) (iii)	2441	0.034s < 0.4s	10, 11

Time of occupancy on frequency Calculation:

0.4 sec x 79 channel= 31.6 sec
T = 31.6 s / 0.48 s = 65.83
65.83 x 520 microsecond = 34231.6 microsecond = 0.034 sec

Test Equipment List:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Spectrum Analyzer	HP	8566B	2410A00224	06/07/04	06/07/05
Quasi Peak Adapter	HP	85650A	3145A01658	06/07/04	06/07/05
Horn Antenna	EMCO	3115	001	06/04/04	06/04/05
Plotter	HP	7470A	2308A27405	No Cal required	No Cal required

***Test Result:** EUT Pass, Meets Requirement.*
***Tested by:** Richard Lee* ***Date:** June 10th - 14th, 2004*

6. FCC 15.247 (c) Out of Band

Test Procedures:

a. Set analyzer RES BW to 100 KHz.
b. Set analyzer START and STOP frequencies to coincide with band edges of EUT operating frequency (example: Start 2042 MHz, Stop 2080MHz).
c. Set DISPLAY line or REF LEVEL to highest peak in RF pass-band of channel being investigated.
d. With the DISPLAY line or REF LEVEL unchanged, plot EUT output levels from 1 MHz to the 10th harmonic, or 40 GHz.
e. In any 100 KHz bandwidth outside the EUT pass-band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 KHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the pass-band, whichever results in lower attenuation.
f. All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass-band.

Test Data:

Channel	Frequency (MHz)	20 dB below in 100 KHz BW	Plot #
Low	2402	-29.56	12, 13, 14
Middle	2441	-30.47	15, 16, 17
High	2480	-29.33	18, 19, 20

Test Equipment List:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Receiver	R&S	ESMI-RF	849937/006	04/25/04	04/25/05
EMI Receiver	R&S	ESAI-D	825035/005	04/25/04	04/25/05
Spectrum Analyzer	HP	8566B	2410A00224	06/07/04	06/07/05
Quasi Peak Adapter	HP	85650A	3145A01658	06/07/04	06/07/05
Horn Antenna	EMCO	3115	001	06/04/04	06/04/05
Horn Antenna	EMCO	3160-09	20372	06/09/04	06/09/05
Plotter	HP	7470A	2308A27405	No Cal required	No Cal required

Test Result: EUT Pass, Meets Requirement.
Tested by: Richard Lee **Date:** June 10th - 14th, 2004

7. FCC 15.247 (c) Band edge

Test Procedures:

a. *Set analyzer RES BW to 100 KHz.*
b. *Set analyzer START and STOP frequencies to coincide with band edges of EUT operating frequency (example: Start 2400 MHz, Stop 2483 MHz).*
c. *Set DISPLAY line or REF LEVEL to highest peak in RF pass-band of channel being investigated.*
d. *With the DISPLAY line or REF LEVEL unchanged, plot EUT output levels from 1 MHz to the 10th harmonic, or 40 GHz.*
e. *In any 100 KHz bandwidth outside the EUT pass-band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 KHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the pass-band, whichever results in lower attenuation.*
f. *All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass-band.*

Test Measurement Data: Low & High Channels

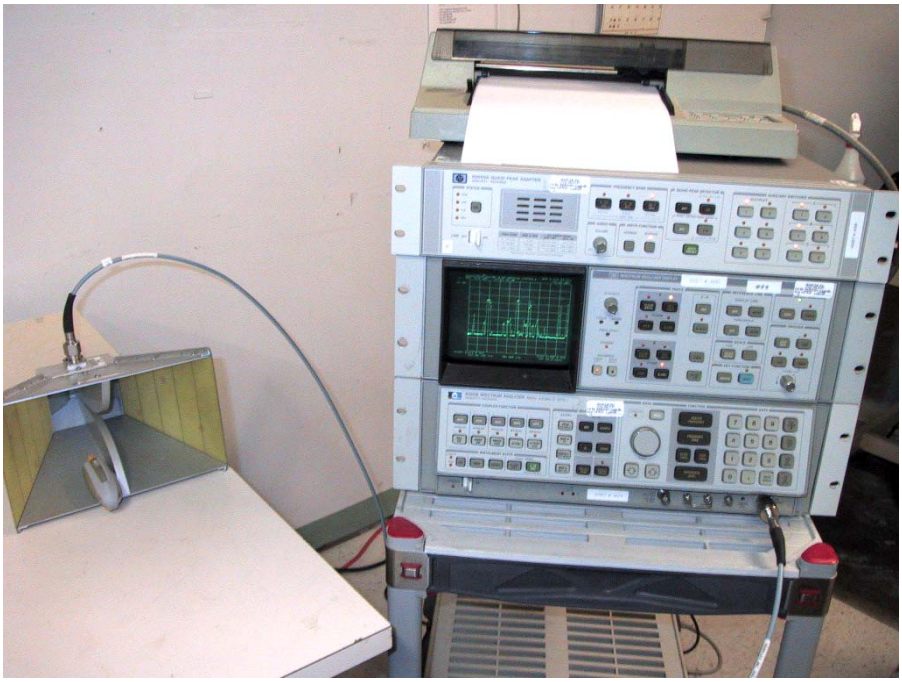
Channel	Frequency (MHz)	Out of Band 20 dB below 100KHz bandwidth	Plot #
Low	2402	-41.90	21
High	2480	-37.70	22

Test Equipment List:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Spectrum Analyzer	HP	8566B	2410A00224	06/07/04	06/07/05
Quasi Peak Adapter	HP	85650A	3145A01658	06/07/04	06/07/05
Horn Antenna	EMCO	3115	001	06/04/04	06/04/05
Plotter	HP	7470A	2308A27405	No Cal required	No Cal required

Test Result: *EUT Pass, Meets Requirement.*
Tested by: *Richard Lee* ***Date:*** *June 10th - 14th, 2004*

EUT Test Setup Photo for Tested Model Name: Max7BT



Band Edge Test Set-Up Front View

8. FCC 15.205 (a) Radiated Emissions in Restricted Bands

Test Procedures:

a. The EUT was tested for radiated emissions in the restricted bands of operation. The EUT was replaced on a non-conductive table at a height of 0.8 meter above the ground plane of a 3 meter chamber test site. For each frequency investigated, the turntable was rotated 360 degrees. And the antenna was raised and lowered in both horizontal and vertical polarizations, in an attempt to maximize the received emissions.
b. The EUT was also placed in the three orthogonal axes.
c. For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at 3 meter separation distance to determine whether these emissions complied with the general radiated emissions requirement.

Instrument Setup:

Frequency	RES BW	VID BW
< 1 GHz	100 KHz	100 KHz
> 1 GHz	1 MHZ	1 MHz

Radiated Limit:

Frequency	FS Fundamental	FS Fundamental	FS Harmonics	FS Harmonics
MHz	mV/m	dBuV/m	uV/m	dBuV/m
2400 –2483.5	50	93.98	500	53.98

Radiated Emission Measurements Mode: 2402 MHz (Low Channel)

Frequency (MHz)	Raw reading (dBuV)	Pol (V/H)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Gain (dB)	High pass filter (dB)	Distance Factor (dB)	Corrected Reading (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4803.981	50.08	H	33.5	2.11	43.34	1	0	43.35	54	-10.65
4803.981	52.87	V	33.5	2.11	43.34	1	0	46.14	54	-7.86
7205.953	44.47	H	36	3	43.88	1	0	40.59	54	-13.41
7205.953	46.53	V	36	3	43.88	1	0	42.65	54	-11.35
9607.96	43.13	H	38.1	3.19	40.86	1	0	44.56	54	-9.44
9607.96	43.33	V	38.1	3.19	40.86	1	0	44.76	54	-9.24
*12009.98	41.6	H	39.2	3.95	40.14	1	9.54	36.07	54	-17.93
*12009.98	42.8	V	39.2	3.95	40.14	1	9.54	37.27	54	-16.73
*14411.96	44.3	H	41.2	4.26	41.82	1	9.54	39.4	54	-14.6
*14411.96	45.6	V	41.2	4.26	41.82	1	9.54	40.7	54	-13.3
*16813.96	44.8	H	40.7	4.35	43	1	9.54	38.31	54	-15.69
*16813.96	45.5	V	40.7	4.35	43	1	9.54	39.01	54	-14.99
*19215.96	47.6	H	40.2	4.8	38	1	9.54	46.06	54	-7.94
*19215.96	48.3	V	40.2	4.8	38	1	9.54	46.76	54	-7.24
*21617.96	47.2	H	40.3	5	38	1	9.54	45.96	54	-8.04
*21617.96	48.38	V	40.3	5	38	1	9.54	47.14	54	-6.86
*24020.00	47.6	H	40.4	5.1	38	1	9.54	46.56	54	-7.44
*24020.00	48.5	V	40.4	5.1	38	1	9.54	47.46	54	-6.54

*** Noise Floor measured at 1 meter distance.**

Radiated Emission Measurements Mode: 2441 MHz (Middle Channel)

Frequency (MHz)	Raw reading (dBuV)	Pol (V/H)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Gain (dB)	High pass filter (dB)	Distance Factor (dB)	Corrected Reading (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4881.76	51.25	H	33.5	2.11	43.34	1	0	44.52	54	-9.48
4881.76	50.88	V	33.5	2.11	43.34	1	0	44.15	54	-9.85
7322.95	49.22	H	36	3	43.88	1	0	45.34	54	-8.66
7322.95	48.36	V	36	3	43.88	1	0	44.48	54	-9.52
9763.96	43.23	H	38.1	3.19	40.86	1	0	44.66	54	-9.34
9763.96	42.1	V	38.1	3.19	40.86	1	0	43.53	54	-10.47
*12204.98	41.3	H	39.2	3.95	40.14	1	9.54	35.77	54	-18.23
*12204.98	42.1	V	39.2	3.95	40.14	1	9.54	36.57	54	-17.43
*14645.96	43.8	H	41.2	4.26	41.82	1	9.54	38.9	54	-15.1
*14645.96	45.2	V	41.2	4.26	41.82	1	9.54	40.3	54	-13.7
*17086.97	44.3	H	41.2	4.35	43.01	1	9.54	38.3	54	-15.7
*17086.97	45.2	V	41.2	4.35	43.01	1	9.54	39.2	54	-14.8
*19257.96	47.1	H	40.2	4.8	38	1	9.54	45.56	54	-8.44
*19257.96	48.6	V	40.2	4.8	38	1	9.54	47.06	54	-6.94
*21968.97	47.1	H	40.3	5	38	1	9.54	45.86	54	-8.14
*21968.97	48.12	V	40.3	5	38	1	9.54	46.88	54	-7.12
*24410.00	46.6	H	40.4	5.1	38	1	9.54	45.56	54	-8.44
*24410.00	47.8	V	40.4	5.1	38	1	9.54	46.76	54	-7.24

*** Noise Floor measured at 1 meter distance.**

Radiated Emission Measurements Mode: 2480 MHz High Channel

Frequency (MHz)	Raw reading (dBuV)	Pol (V/H)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Gain (dB)	High pass filter (dB)	Distance Factor (dB)	Corrected Reading (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4960	49.72	H	33.5	2.11	43.34	1	0	42.99	54	-11.01
4960	48.6	V	33.5	2.11	43.34	1	0	41.87	54	-12.13
7439.97	47.66	H	36	3	43.88	1	0	43.78	54	-10.22
7439.97	47.1	V	36	3	43.88	1	0	43.22	54	-10.78
9920	40.96	H	38.1	3.19	40.86	1	0	42.39	54	-11.61
9920	40.12	V	38.1	3.19	40.86	1	0	41.55	54	-12.45
*12400	41.8	H	39.2	3.95	40.14	1	9.54	36.27	54	-17.73
*12400	42.3	V	39.2	3.95	40.14	1	9.54	36.77	54	-17.23
*14880	43.6	H	41.2	4.26	41.82	1	9.54	38.7	54	-15.3
*14880	45.1	V	41.2	4.26	41.82	1	9.54	40.2	54	-13.8
*17360	43.9	H	41.2	4.35	43.01	1	9.54	37.9	54	-16.1
*17360	45.1	V	41.2	4.35	43.01	1	9.54	39.1	54	-14.9
*19840	46.7	H	40.2	4.8	38	1	9.54	45.16	54	-8.84
*19840	48.3	V	40.2	4.8	38	1	9.54	46.76	54	-7.24
*22320	46.9	H	40.3	5	38	1	9.54	45.66	54	-8.34
*22320	48.02	V	40.3	5	38	1	9.54	46.78	54	-7.22
*24800	46.01	H	40.4	5.1	38	1	9.54	44.97	54	-9.03
*24800	47.3	V	40.4	5.1	38	1	9.54	46.26	54	-7.74

*** Noise Floor measured at 1 meter distance.**

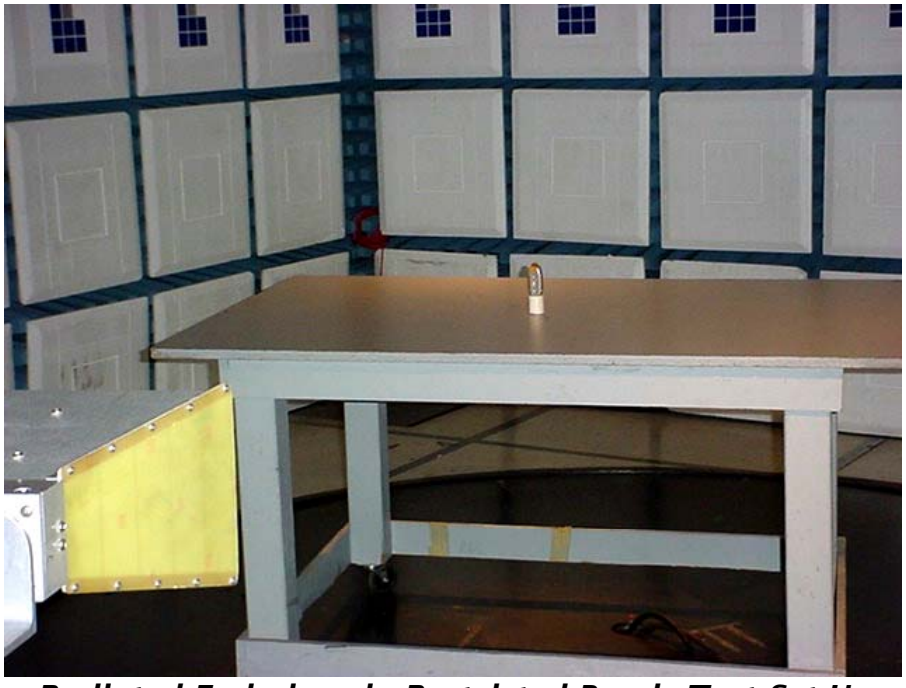
Test Equipment List:

Test Equipment	*Manufacturer*	*Model*	*Serial No.*	*Last Cal.*	*Cal. Due*
EMI Receiver	*R&S*	*ESMI-RF*	*849937/006*	*04/25/04*	*04/25/05*
EMI Receiver	*R&S*	*ESAI-D*	*825035/005*	*04/25/04*	*04/25/05*
Bi-log Antenna	*CHASE*	*CBL6112A*	*2257*	*07/14/03*	*07/14/04*
Horn Antenna	*EMCO*	*3115*	*001*	*06/04/04*	*06/04/05*
Horn Antenna	*EMCO*	*3160-09*	*20372*	*06/04/04*	*06/04/05*
Pre-Amplifier	*MITEQ*	*AFS44-00102650-42-10P-44*	*969305*	*03/10/04*	*03/10/05*
Pre-Amplifier	*TEC*	*PA-102*	*44054*	*09/03/03*	*09/03/04*
High Pass Filter	*REACTEL*	*7HS-4/18 S11*	*942*	*No Cal required*	*No Cal required*
High Pass Filter	*Mini-circuits*	*NHP-900*	*1-9752*	*No Cal required*	*No Cal required*
Plotter	*HP*	*7470A*	*2308A27405*	*No Cal required*	*No Cal required*

Test Result: *EUT Pass, Meets Requirement (low, middle, high).*
Tested by: *Richard Lee* ***Date:*** *June 10th - 14th, 2004*

Radiated Emissions Test Setup Photos for Tested Model Name: Max7BT

Radiated Emissions in Restricted Bands Test Set-Up



Radiated Emissions in Restricted Bands Test Set-Up

9. FCC 15.209 (a) Radiated Emission Measurement

Test Procedure:

a. EUT was replaced on a non-conductive table at a height of 0.8 meter above the ground plane of a 3 meter chamber test site. For each frequency investigated, the turntable was rotated 360 degrees. And the antenna was raised and lowered in both horizontal and vertical polarizations, in an attempt to maximize the received emissions.

b. Emissions from an intentional radiator shall not exceed the field strength levels specified in the following table
For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at 3 meter separation distance to determine whether these emissions complied with the general radiated emissions requirement.

Frequency (MHz)	Field strength (micro volts/meter)	Measure 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

Limited for Radiated Emissions (FCC 47 CFR 15.209)

Frequency (MHz)	Field Strength (uV/m)	QP (dBuV/m) (3m)
1.705 - 30	300	49.54
30 – 88	100	40.00
88 – 216	150	43.52
216 - 960	200	46.02
960 Above	500	53.98

- **dBuV/m=20 x Log (uV/m)**

Radiated Emission Test Results:

Set-up/Configuration: ANSI C63.4: 2001, CISPR 16-1:1999

Frequency [MHz]	Antenna Polarization [V/H]	Raw Reading (dBuV)	Correction Factors [dB/m]	Corrected Reading [dBµV/m]	3 Meters Limits (dBuV/m)	Delta, QP [dB]
315.48	V	31.8	2.9	34.7	46	-11.3
604.45	V	30.5	-1	29.5	46	-16.5
940.72	V	29.5	3.6	33.1	46	-12.9

Note: *Horizontal orientation, no significant emissions were found*

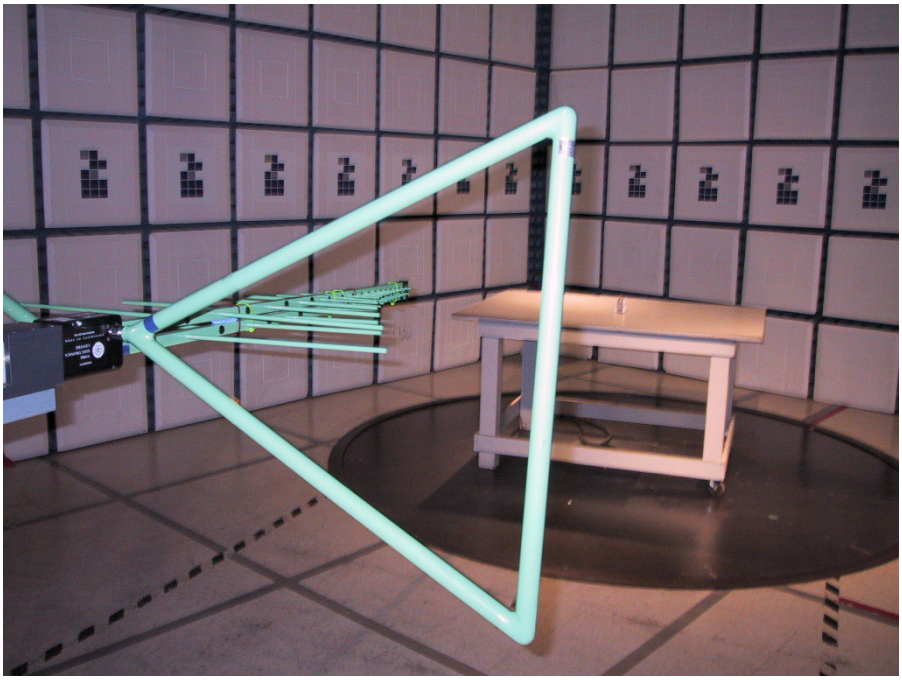
Notes: *EUT is rotated through three orthogonal axes to obtain the maximum emissions.*

Test Equipment List:

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Receiver	R&S	ESMI-RF	849937/006	04/25/04	04/25/05
EMI Receiver	R&S	ESAI-D	825035/005	04/25/04	04/25/05
Bi-log Antenna	CHASE	CBL6112A	2257	07/14/03	07/14/04
Pre-Amplifier	TEC	PA-102	44054	09/03/03	09/03/04
High Pass Filter	REACTEL	7HS-4/18 S11	942	No Cal required	No Cal required

Test Result: *EUT Pass, Meets Requirement.*
Tested by: *Richard Lee* ***Date:*** *June 10th - 14th, 2004*

EUT Test Setup Photos for Tested Model Name: Max7BT



Radiated Emission Measurement Test Set-Up

Radiated Emission Measurement Test Set-Up

10. FCC 15.207 (a) Conducted Emission Measurement

***Test Procedures**:*
The EUT was placed on a non-conductive table at 0.8 meter above the ground plane of a shielded enclosure, and 40 cm away from the shielded enclosure wall. The AC power cord of the EUT was plugged into a 50 ohm, 50 uH LISN.
RF emissions on the AC power line were measured using the spectrum analyzer connected to the LISN RF port via coaxial cable.

Frequency (MHz)	QP (dBuV)	Average (dBuV)
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5.0	56	46
5.0 – 30	60	50

***Test Results:** EUT was Battery operated, No test required.*
***Tested by:** Richard Lee* ***Date:** June 10th - 14th, 2004*