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FCC PART 15.249 and IC RSS-210

TEST REPORT

Applicant	NIKE, INC.
Address	ONE BOWERMAN DRIVE
	BEAVERTON OR 97005-6453 USA
FCC ID	QYUFL267
IC Certification	4571A-FL267
Model Number	WM0030
Product Description	NIKE AMP+
Date Sample Received	7/6/2007
Date Tested	7/19/2007
Tested By	Nam Nguyen
Approved By	S. S. Sanders
Report Number	2468AHT7TestReport.doc
Total Pages	12
Test Results	☒ PASS ☐ FAIL

ACCREDITED
Certificate # 0955-01

TABLE OF CONTENT

STATEMENT OF COMPLIANCE

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment complies with the appropriate standards. No modifications were made to the equipment during testing in order to demonstrate compliance with these standards.

I attest that the necessary measurements were made by me or under my supervision, at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45, Newberry, Florida 32669.

Authorized by: **Nam Nguyen**

Signature: <*Nam Nguyen*>

Function: Engineer

Date: July 20, 2007

Tested by: Nam Nguyen

GENERAL INFORMATION

DUT Specification

The test results relate only to the items tested.			
Applicable Standard	Part 15.249, ANSI C63.4 – 2003, RSS-210, RSS-GEN		
DUT Description	NIKE AMP+		
FCC ID	QYUFL267		
IC Certification	4571A-FL267		
Model Number	WM0030		
Serial Number	N/A		
Operating Frequency	2425.00 MHz		
No. of Channels	1		
DUT Power Source	☐ 110–120Vac/50– 60Hz		
	☐ DC Power		
	☒ Battery Operated Exclusively		
Test Facility	Timco Engineering, Inc. 849 NW State Road 45, Newberry, FL 32669		
Test Conditions	The DUT was tested in the laboratory in an environment with normal temperature and humidity. The temperature was 26°C with a relative humidity of 50%.		
Test Exercise	The DUT was in continuous transmit mode		
Modifications to DUT	None		
Test Item	☐ Prototype	☒ Pre-Production	☐ Production
Type of Equipment	☐ Fixed	☐ Mobile	☒ Portable

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 5/11/07	5/10/10
Antenna: Biconnical	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Antenna: Biconnical	Eaton	94455-1	1096	CAL 10/11/06	10/11/08
Analyzer Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 5/17/07	5/17/09
Analyzer Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 5/17/07	5/17/09
Analyzer Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 5/17/07	5/17/09
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/5/06	10/5/08
Antenna: Log-Periodic	Eaton	96005	1243	CAL 12/14/05	12/14/07

TEST PROCEDURE

Radiation Interference: ANSI Standard C63.4-2003. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz with an appropriate sweep speed and the video bandwidth was 300kHz up to 1.0GHz and 1.0MHz with a video BW of 3.0MHz above 1.0GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental.

Formula Of Conversion Factors: The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:			
Freq (MHz)	Meter Reading	+ ACF	+ CL = FS
33	20 dBuV	+ 10.36 dB	+ 0.5 = 30.86 dBuV/m @ 3m

Power Line Conducted Interference: The procedure used was ANSI Standard C63.4-2003 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10kHz with an appropriate sweep speed. The spectrum was scanned from 0.15 to 30 MHz.

Occupied Bandwidth: A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was printed. The vertical scale is set to -10 dBm per division.

ANSI Standard C63.4-2003 10.1 Measurement Procedures: The DUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The DUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

RADIATION INTERFERENCE

Rules Part No.: 15.249, 15.209, RSS-210

Requirements:

Frequency	Limits
Part 15.209	
9 to 490 kHz	2400/F (kHz) µV/m @ 300 meters
490 to 1705 kHz	24000/F (kHz) µV/m @ 30 meters
1705 kHz to 30 MHz	29.54 dBµV/m @ 30 meters
30 – 88	40.0 dBµV/m @ 3 meters
80 – 216	43.5 dBµV/m @ 3 meters
216 – 960	46.0 dBµV/m @ 3 meters
Above 960	54.0 dBµV/m @ 3 meters
Part 15.249	
Fundamental 902 – 928 MHz	94.0 dBµV/m @ 3 meters
Fundamental 2.4 – 2.4835 MHz	94.0 dBµV/m @ 3 meters
Harmonics	54.0 dBµV/m @ 3 meters

Test Data:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Duty Cycle dB	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
2,425.00	2,425.00	38.4	H	12.95	1.87	32.5	59.82	34.18
2,425.00	2,425.00	44.8	V	12.95	1.87	32.5	66.22	27.78
2,425.00	4,850.00	23.2	V	12.95	2.66	33.97	46.88	7.12
2,425.00	4,850.00	25.6	H	12.95	2.66	33.97	49.28	4.72
2,425.00	7,275.00	18.8	V	12.95	3.38	35.55	44.78	9.22
2,425.00	7,275.00	19.3	H	12.95	3.38	35.55	45.28	8.72
2,425.00	9,700.00	12.7	V	12.95	3.87	36.78	40.4	13.6
2,425.00	9,700.00	13.3	H	12.95	3.87	36.78	41	13

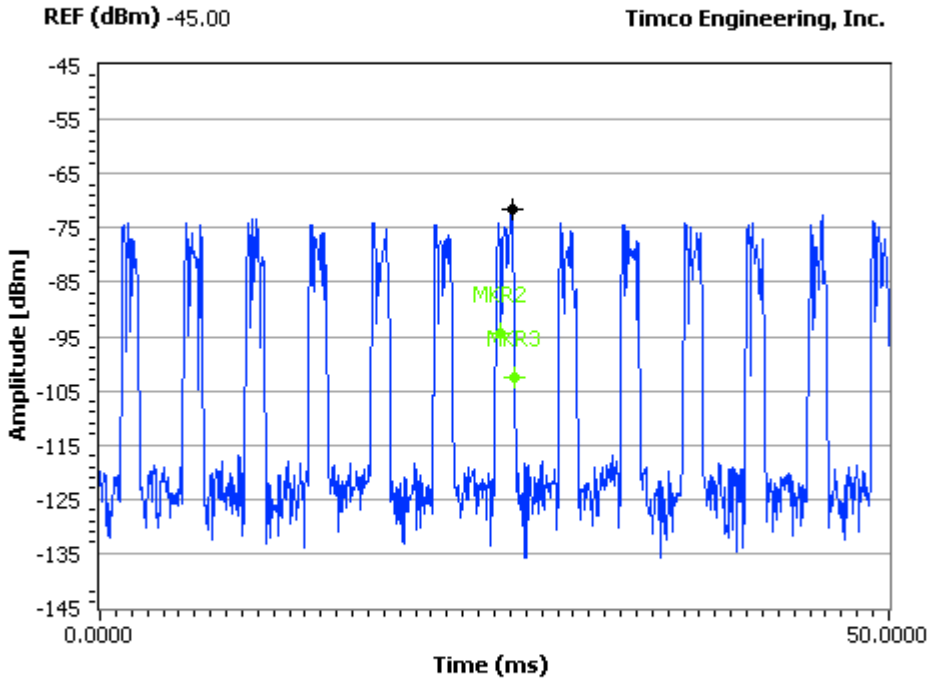
CALCULATION OF DUTY CYCLE

The period of the pulse train is determined by observing it on an oscilloscope or a spectrum analyzer with zero (0) frequency span. A plot is then made of the pulse train with a sweep time of 100 milliseconds. This sweep determines the duration of the pulse train. This sweep allows the determination of the number of and type of pulses, i.e. long & short. Plots are then made showing the duration of each type of pulse and its duration. From the 100 millisecond Plot, the number of a given type of pulse is then multiplied by the duration of that type pulse. This allows the calculation of the amount of time the UUT is on within 100 ms. If the pulse train is longer than 100 ms then this number is multiplied by 100 to determine the percentage ON TIME. If the pulse train is less than 100 ms the total on time is divided by the length of the pulse train and then multiplied by 100 to determine the percentage ON TIME. In this case there were 25 short pulses .900 mS long for a total of 22.50 ms ON TIME within a 100 ms pulse train. The average field strength is determined by multiplying the peak field strength by the percent on time.

dB = 20*log(ON TIME)/PERIOD
dB = 20*log(22.5/100)
dB = 20*log(0.225)
dB = -12.956

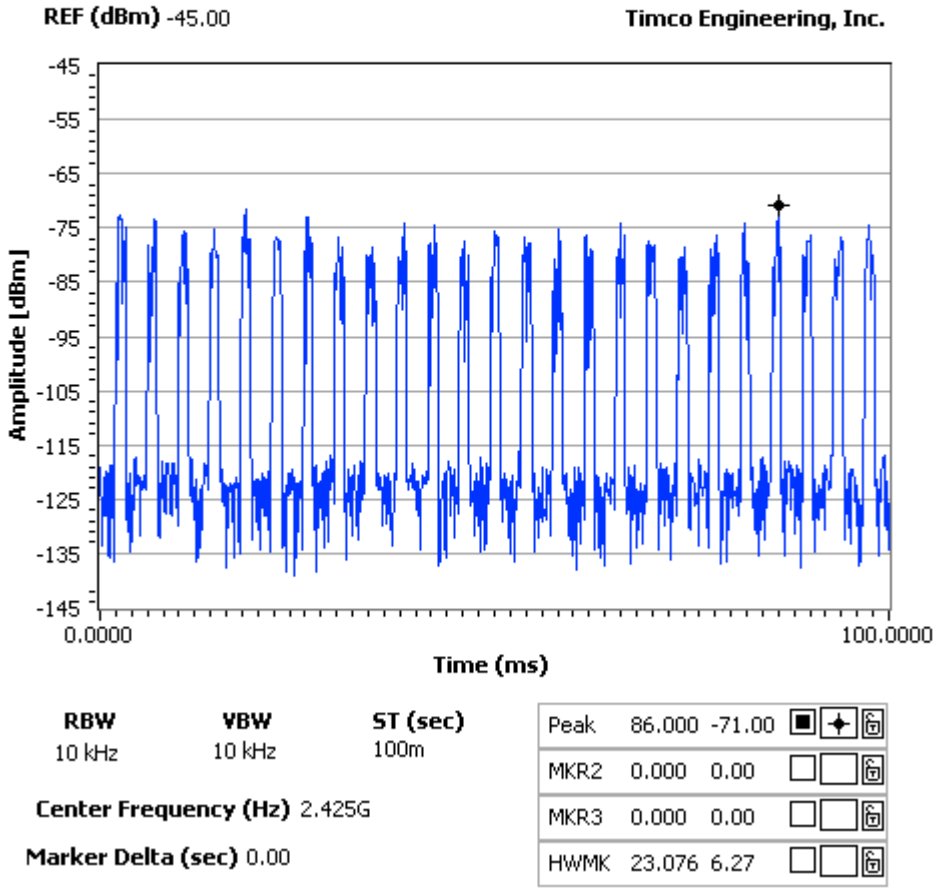
NOTES:

NIKE, INC. - FCC ID: QYUFL267
DUTY CYCLE PLOT 1



NOTES:

NIKE, INC. - FCC ID: QYUFL267
DUTY CYCLE PLOT 2



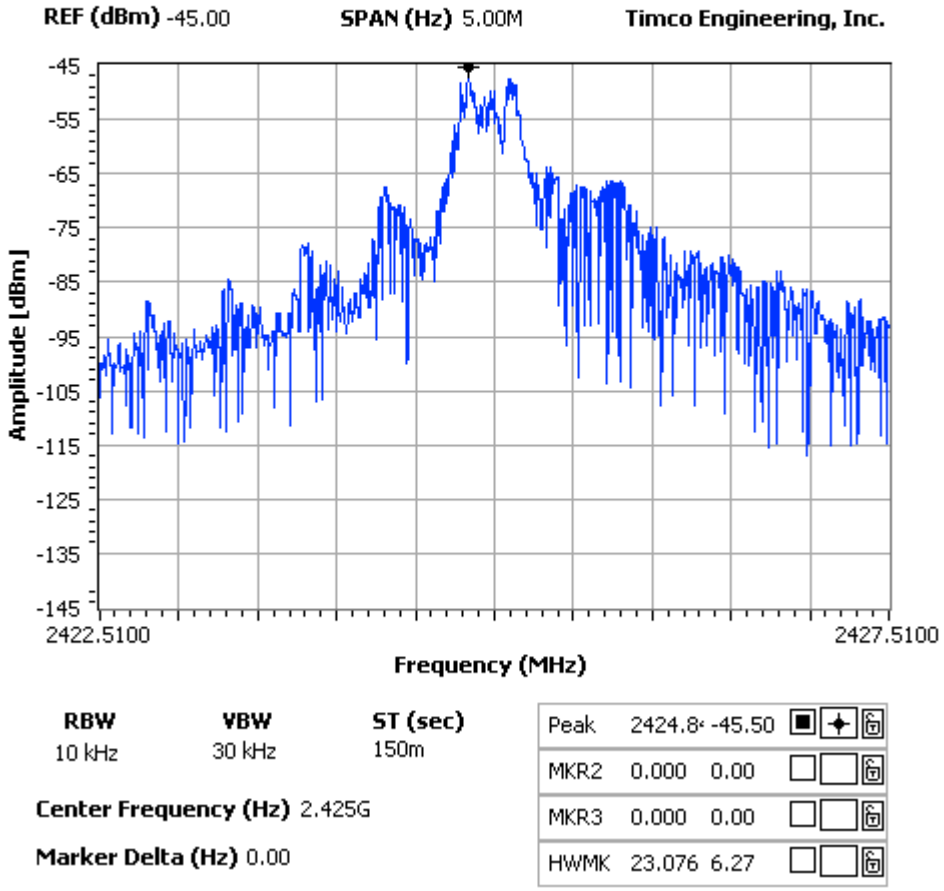
OCCUPIED BANDWIDTH

Rules Part No.: 15.249 (d), RSS-210

Requirements: The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

Test Data:

NOTES:
NIKE, INC. - FCC ID: QYUFL267
OCCUPIED BANDWIDTH PLOT



POWER LINE CONDUCTED INTERFERENCE

Rules Part No.: 15.207

Requirements:

Frequency (MHz)	Quasi Peak Limits (dBuv)	Average Limits (dBuV)
0.15 – 0.5	66 – 56	56 – 46
0.5 – 5.0	56	46
5.0 – 30	60	50

Test Data: Not applicable.