

MEASUREMENT REPORT

FCC PART 15 Subpart E WLAN 802.11a/n/ac

Report No.: S202307034506E13

Issue Date: 01-10-2024

Applicant: BDStar Intelligent & Connected Vehicle Technology Co.,Ltd.
Address: No. 2, Building 81, Tonggui Avenue, Yufengshan Town, Yubei District, Chongqing P.R. China
FCC ID: 2BAQL-CFDLMMI001
Product: Motorcycle Media Players
Model No.: CFDLMMI001
FCC Classification: Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s): Part 15 Subpart E (Section 15.407)
Test Procedure(s): ANSI C63.10-2013, KDB 789033 D02v02r01, KDB 662911 D01v02r01
Item Receipt date: Jul 05, 2023
Test Date: Jul 17~Jul 19, 2023

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The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02v02r01. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of Fangguang Inspection & Testing Co., Ltd. Wuxi Branch.

The test report must not be used by the client to claim product certifications, approval, or endorsement by NVLAP, NIST or any agency of U.S. Government.

Revision History

Report No.	Version	Description	Issue Date
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§2.1033 General Information

Applicant:	BDStar Intelligent & Connected Vehicle Technology Co.,Ltd.
Applicant Address:	No. 2, Building 81, Tonggui Avenue, Yufengshan Town, Yubei District, Chongqing P.R. China
Manufacturer:	BDStar Intelligent & Connected Vehicle Technology Co.,Ltd.
Manufacturer Address:	No. 2, Building 81, Tonggui Avenue, Yufengshan Town, Yubei District, Chongqing P.R. China
Test Site:	Fanguang Inspection & Testing Co., Ltd.
LAB ID:	CN5037
Test Site Address:	G9 Building, China Sensor Network International Innovation Park No.200, Linghu Avenue Wuxi, Jiangsu 214000 China
FCC Rule Part(s):	Part 15 Subpart C (15.247)
FCC ID:	2BAQL-CFDLMMI001
Test Device Serial No.:	S/N.:/ ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Unlicensed National Information Infrastructure (UNII)

1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2. Fangguang Test Location

These measurement tests were performed at the Fangguang Inspection and testing Co.,LTD located at 200 Linghu Avenue, Xinwu District, Wuxi City. The detailed description of the measurement facility was found to be in compliance with the requirements of ANSI C63.4-2014.

2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name:	Motorcycle Media Players						
Model Name:	CFDLMMI001						
Additional Model:	CFDLMMI001,CFDLMMI002,CFDLMMI003,CFDLMMI004,CFDLMMI005,CFDLMMI006,CFDLMMI007						
Model Description:	They are have the same technical construction including circuit diagram, PCB LAYOUT, hardware version and software version identical. the difference refer the below table.						
	Model	Size	RG440: Wifi+BT	BE470:BT	FM/AM	GP S	USB
	CFDLMMI001	12.3 “	√	√	√	√	√
	CFDLMMI002	12.3 “	√	√	×	√	√
	CFDLMMI003	12.3 “	√	√	√	×	√
	CFDLMMI004	12.3 “	√	√	√	√	×
	CFDLMMI005	12.3 “	√	√	×	×	√
	CFDLMMI006	12.3 “	√	√	√	×	×
	CFDLMMI007	12.3 “	√	√	×	√	×
Input Voltage Range:	DC 13.5V						
Wi-Fi Specification:	802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80						

2.2. Product Specification Subjective to this Report

Frequency Range:	802.11a/n-HT20/ac-VHT20: 5180~5320MHz, 5500~5700MHz, 5745~5825MHz 802.11n-HT40/ac-VHT40: 5190~5310MHz, 5510~5670MHz, 5755 ~ 5795MHz 802.11ac-VHT80:5210MHz~5290MHz, 5530~5610MHz, 5775MHz
Type of Modulation:	802.11a/n/ac: OFDM/BPSK/QPSK/DBPSK/DQPSK/16QAM/64QAM/256QAM
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0~MCS7 802.11ac: MCS0~MCS9
Antenna Type:	PCB Antenna
Antenna Gain:	3.8dBi

2.3. Operation Frequencies and Channel List

802.11a/n-HT20/ac-VHT20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz
128	5640 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	149	5745 MHz	153	5765 MHz
157	5785 MHz	161	5805 MHz	165	5825 MHz

802.11n-HT40/ac-VHT40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550 MHz
118	5590 MHz	126	5630 MHz	134	5670 MHz
151	5755 MHz	159	5795 MHz		

802.11ac-VHT80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
122	5610 MHz	155	5775 MHz		

2.4. Device Capabilities

This device contains the following capabilities:

5GHz WLAN (UNII)&Bluetooth (5.0)

Note: 5GHz (NII) operation is possible in 20MHz, 40MHz and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 8MHz, and detector = average per the guidance of Section B)2)b) of KDB 789033 D02v02r01. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

TestMode	Antenna	Freq(MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11A	Ant1	5180	2.07	2.24	92.41
		5200	2.07	2.23	92.83
		5240	2.06	2.10	98.10
		5260	2.06	2.23	92.38
		5280	2.06	2.18	94.50
		5320	2.07	2.17	95.39
		5500	2.07	2.16	95.83
		5580	2.07	2.23	92.83
		5700	2.06	2.22	92.79
		5745	2.06	2.12	97.17
		5785	2.06	2.19	94.06
		5825	2.07	2.20	94.09
11N20SISO	Ant1	5180	1.92	2.10	91.43
		5200	1.93	2.08	92.79
		5240	1.91	2.07	92.27
		5260	1.92	2.02	95.05
		5280	1.93	2.00	96.50
		5320	1.92	2.01	95.52
		5500	1.92	2.05	93.66
		5580	1.91	2.09	91.39
		5700	1.92	2.03	94.58
		5745	1.92	2.07	92.75
		5785	1.92	2.07	92.75
		5825	1.93	2.03	95.07

11N40SISO	Ant1	5190	0.94	1.08	87.04
		5230	0.95	1.09	87.16
		5270	0.95	1.05	90.48
		5310	0.95	1.02	93.14
		5510	0.94	1.09	86.24
		5550	0.94	1.11	84.68
		5670	0.94	1.12	83.93
		5755	0.95	0.99	95.96
		5795	0.95	1.11	85.59
11AC20SISO	Ant1	5180	1.93	2.05	94.15
		5200	1.93	2.04	94.61
		5240	1.93	2.09	92.34
		5260	1.93	2.10	91.90
		5280	1.93	2.09	92.34
		5320	1.93	2.11	91.47
		5500	1.93	2.10	91.90
		5580	1.93	2.10	91.90
		5700	1.94	2.03	95.57
		5745	1.94	2.10	92.38
		5785	1.93	2.07	93.24
		5825	1.93	2.11	91.47
11AC40SISO	Ant1	5190	0.96	1.12	85.71
		5230	0.95	1.09	87.16
		5270	0.96	1.09	88.07
		5310	0.95	1.02	93.14
		5510	0.95	1.11	85.59
		5550	0.96	1.08	88.89
		5670	0.96	1.08	88.89
		5755	0.95	1.12	84.82
		5795	0.96	1.02	94.12
11AC80SISO	Ant1	5210	0.46	0.58	79.31
		5290	0.46	0.60	76.67
		5530	0.46	0.61	75.41
		5610	0.46	0.58	79.31
		5775	0.46	0.62	74.19

Test Graphs see Appendix A.

2.5. Test Software

The test utility software used during testing was “rtwpriv”, Power Parameter Value:

Test Mode	ANT1
A	60
N	60
AC	60

2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.11a
	Mode 2: Transmit by 802.11n-HT20
	Mode 3: Transmit by 802.11n-HT40
	Mode 4: Transmit by 802.11ac-VHT20
	Mode 5: Transmit by 802.11ac-VHT40
	Mode 6: Transmit by 802.11ac-VHT80

2.7. Test Configuration

The EUT was tested per the guidance of KDB 789033 D02v02r01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.8. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.9. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase.

However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 789033 D02v02r01 were used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside a 9'x4'x3' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

Line conducted emissions test results are shown in Section 7.11.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- Use a unique coupling to the intentional radiator.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	FWXGJC-2016-181	1 year	2024/03/14
Two-Line V-Network	R&S	ENV 216	FWXGJC-2016-182	1 year	2024/05/14
Thermohygrometer	Yuhuaze	HTC-1	FWXDA-2016-385	1 year	2024/03/21

Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Loop Antenna	Schwarzbeck	FMZB 1519B	FWXGJC-2018-015	3 year	2024/08/13
Bi-Log Antenna	R&S	HL562E	FWXGJC-2016-267-06	1 year	2024/03/10
Broadband Horn Antenna	R&S	HF907	FWXGJC-2016-267-07	1 year	2024/03/02
Broadband Horn Antenna	Schwarzbeck	BBHA9170	FWXGJC-2018-016	3 year	2024/06/04
EMI Receiver	R&S	ESR26	FWXGJC-2016-267-01	1 year	2023/11/08
Pre-Amplifier	R&S	SCU-18D	FWXGJC-2016-267-05	1 year	2023/11/17
Pre-Amplifier	R&S	EMC184055 SE	FWXGJC-2018-018	3 year	2025/04/13
Thermohygrometer	Yuhuaze	HTC-1	FWXDA-2016-386	1 year	2023/11/21
Anechoic Chamber	Aimuke	EMCCT-3	FWXGJC-2016-270	3 year	2025/06/07

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Keysight	N9010B	FWXGJC-2018-010	1 year	2024/03/13
RF Control Unit	Toncend	JS0806-2	FWXGJC-2018-013	1 year	2024/05/14
Thermohygrometer	Yuhuaze	HTC-1	FWXDA-2016-385	1 year	2024/03/21

Test Software	Manufacturer	Version	Asset No.	Function
EMI Test Software	tonscend	V2.5.2.4	FWXWA-2018-004	Emission Test
RF Test Software	Tonscend	3.3.10	/	/

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 2.05dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 30MHz-1GHz: 3.06dB 1GHz-12.75GHz: 4.13dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 30MHz-1GHz: 1.00 dB 1GHz-26.5GHz: 1.30 dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.60dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.80dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.20MHz

7. TEST RESULT

7.1. Summary

FCC Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section 7.2
15.407(e)	6dB Bandwidth	$\geq 500\text{kHz}$		Pass	Section 7.3
15.407(a)(1)(iv), (2), (3)	Maximum Conducted Output Power	$\leq 24\text{ dBm U-NII-1 \& U-NII-2}$ $\leq 30\text{ dBm U-NII-3}$		Pass	Section 7.4
15.407(h)(1)	Transmit Power Control	$\leq 24\text{ dBm}$		Pass	Section 7.5
15.407(a)(1)(iv), (2), (3), (5)	Peak Power Spectral Density	$\leq 11\text{ dBm/MHz U-NII-1 \& U-NII-2}$ $\leq 30\text{ dBm/500kHz U-NII-3}$		Pass	Section 7.6
15.407(g)	Frequency Stability	N/A		Pass	Section 7.7
15.205	Restricted Bands	Emissions in restricted bands must meet the radiated limits detailed in 15.205		Pass	Section 7.9
15.407(b)(1), (2), (3), (4)(i)	Undesirable Emissions	$\leq -27\text{dBm/MHz EIRP}$ Detail see section 7.9	Radiated	Pass	Section 7.8
15.209 15.407(b)(5), (6), (7)	General Field Strength Limits (Radiated Emission Limits)	Radiated Emission must meet the radiated limits detailed in 15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	N/A	Section 7.10

Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

7.2. 26dB Bandwidth Measurement and 99% Bandwidth

7.2.1. Test Limit

N/A

7.2.2. Test Procedure used

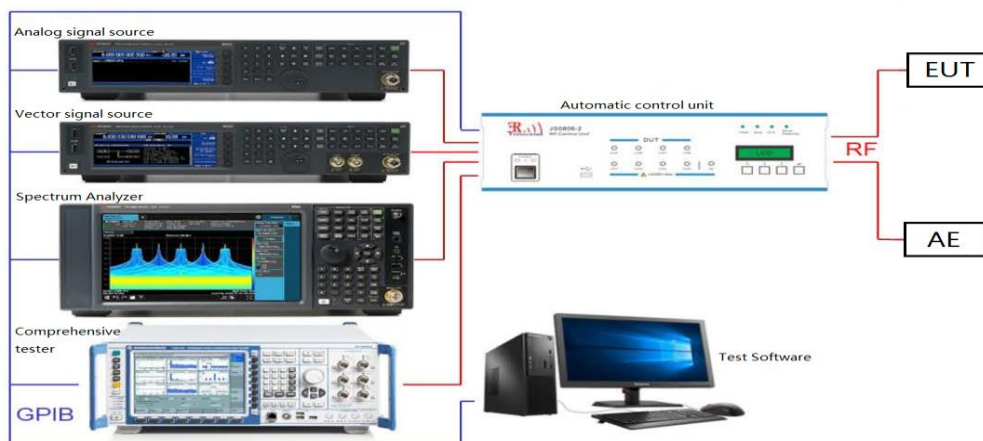
KDB 789033 D02v02r01 – Section C.1

ANSI C63.10-2013 D02v02r01 – Section C

7.2.3. Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 26$. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. $VBW \geq 3 \times RBW$.
4. Detector = Peak.
5. Trace mode = max hold.

7.2.4. Test Setup



7.2.5. Test Result

Test Mode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	OCB [MHz]
11A	Ant1	5180	23.400	5168.760	5192.160	17.199
		5200	21.280	5189.320	5210.600	17.187
		5240	22.560	5227.920	5250.480	17.177
		5260	21.000	5249.400	5270.400	17.228
		5280	20.880	5269.480	5290.360	17.153
		5320	21.240	5309.160	5330.400	17.131
		5500	34.240	5482.000	5516.240	18.658
		5580	33.760	5563.960	5597.720	18.143
		5700	29.640	5687.360	5717.000	17.467
		5745	33.240	5731.440	5764.680	18.987
		5785	35.000	5768.760	5803.760	20.052
		5825	35.160	5807.960	5843.120	20.263
11N20SISO	Ant1	5180	21.560	5169.360	5190.920	18.228
		5200	21.640	5189.400	5211.040	18.212
		5240	21.920	5228.960	5250.880	18.260
		5260	21.200	5249.400	5270.600	18.118
		5280	21.040	5269.560	5290.600	18.122
		5320	21.080	5309.560	5330.640	18.170
		5500	21.280	5489.080	5510.360	18.191
		5580	36.320	5562.600	5598.920	19.572
		5700	32.400	5684.680	5717.080	18.512
		5745	35.000	5729.000	5764.000	20.717
		5785	39.160	5765.800	5804.960	20.678
		5825	35.920	5808.720	5844.640	20.162
11N40SISO	Ant1	5190	44.960	5166.080	5211.040	36.947
		5230	44.320	5207.200	5251.520	37.132
		5270	41.840	5248.720	5290.560	36.913
		5310	41.840	5289.200	5331.040	36.718
		5510	42.080	5489.040	5531.120	36.971
		5550	41.680	5529.200	5570.880	36.877
		5670	74.720	5635.120	5709.840	38.168
		5755	67.840	5727.160	5795.000	44.533
		5795	71.120	5763.640	5834.760	41.345
11AC20SISO	Ant1	5180	27.400	5163.800	5191.200	18.290

		5200	26.520	5186.440	5212.960	18.147
		5240	25.120	5229.160	5254.280	18.127
		5260	21.360	5249.160	5270.520	18.036
		5280	21.400	5269.320	5290.720	18.133
		5320	21.320	5309.240	5330.560	18.082
		5500	32.920	5482.160	5515.080	18.842
		5580	33.080	5564.760	5597.840	19.090
		5700	28.280	5687.280	5715.560	18.460
		5745	27.560	5733.120	5760.680	19.386
		5785	26.800	5773.320	5800.120	20.881
		5825	23.600	5814.440	5838.040	21.023
11AC40SISO	Ant1	5190	44.880	5169.040	5213.920	36.876
		5230	42.080	5208.720	5250.800	36.945
		5270	41.760	5249.040	5290.800	36.748
		5310	42.160	5289.040	5331.200	36.743
		5510	78.720	5470.960	5549.680	39.274
		5550	78.720	5510.720	5589.440	38.315
		5670	74.320	5634.240	5708.560	37.836
		5755	66.560	5728.440	5795.000	43.546
		5795	74.320	5760.520	5834.840	42.870
11AC80SISO	Ant1	5210	97.440	5155.120	5252.560	76.144
		5290	82.080	5248.880	5330.960	76.265
		5530	158.240	5450.320	5608.560	79.715
		5610	151.840	5538.160	5690.000	78.099
		5775	102.720	5733.880	5836.600	76.259

Test Graphs

11A_Ant1_5180



11A_Ant1_5200



11A_Ant1_5240



11A_Ant1_5260



11A_Ant1_5280



11A_Ant1_5320



11A_Ant1_5500



11A_Ant1_5580



11A_Ant1_5700



11A_Ant1_5745



11A_Ant1_5785



11A_Ant1_5825



11N20SISO_Ant1_5180



11N20SISO_Ant1_5200



11N20SISO_Ant1_5240



11N20SISO_Ant1_5260



11N20SISO_Ant1_5280



11N20SISO_Ant1_5320



11N20SISO_Ant1_5500



11N20SISO_Ant1_5580



11N20SISO_Ant1_5700



11N20SISO_Ant1_5745



11N20SISO_Ant1_5785



11N20SISO_Ant1_5825



11N40SISO_Ant1_5190



11N40SISO_Ant1_5230



11N40SISO_Ant1_5270



11N40SISO_Ant1_5310



11N40SISO_Ant1_5510



11N40SISO_Ant1_5550



11N40SISO_Ant1_5670



11N40SISO_Ant1_5755



11N40SISO_Ant1_5795



11AC20SISO_Ant1_5180



11AC20SISO_Ant1_5200



11AC20SISO_Ant1_5240



11AC20SISO_Ant1_5260