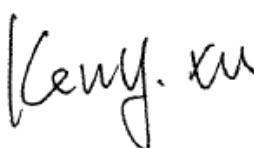


**TEST REPORT**

<b>Application No.:</b>	SZEM2007006018CR
<b>Applicant:</b>	Navico Inc.
<b>Address of Applicant:</b>	4500 S. 129th East Avenue, Ste. 200, Tulsa, Oklahoma, 74134 United States
<b>Manufacturer:</b>	Navico Auckland Limited
<b>Address of Manufacturer:</b>	Arrenway Drive, Rosedale, Auckland, 0632 New Zealand
<b>Factory:</b>	Shenzhen Fastrain Technology Co., Ltd.
<b>Address of Factory:</b>	No.3 Baolong 4th Rd., Baolong Industrial Area, Longgang District, Shenzhen, China
<b>Equipment Under Test (EUT):</b>	
<b>EUT Name:</b>	MARINE BLACK BOX DSC/AIS VHF RADIO SYSTEM
<b>Model No.:</b>	NRS-1
<b>Trade Mark:</b>	NAVICO
<b>Standard(s) :</b>	47 CFR Part 15, Subpart B
<b>Date of Receipt:</b>	2020-07-03
<b>Date of Test:</b>	2020-07-31 to 2020-09-04
<b>Date of Issue:</b>	2020-09-18
<b>Test Result:</b>	<b>Pass*</b>

\* In the configuration tested, the EUT complied with the standards specified above.



Keny Xu  
EMC Laboratory Manager



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<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
01		2020-09-18		Original

<b>Authorized for issue by:</b>			
			
		<hr/> <b>Edison Li /Project Engineer</b>	
			
		<hr/> <b>Eric Fu /Reviewer</b>	

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## 2 Test Summary

<b>Emission Part</b>				
<b>Item</b>	<b>Standard</b>	<b>Method</b>	<b>Requirement</b>	<b>Result</b>
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

<b>Internal Source</b>	<b>Upper Frequency</b>
Below 1.705MHz	30MHz
1.705MHz to 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5th harmonic of the highest frequency or 40GHz, whichever is lower

## 3 Test Summary of spot-check test data

<b>Item</b>	<b>Worst test result for original report(FCC ID:RAYVHFNRS2)</b>	<b>Worst test result for this report(FCC ID:RAYVHFNRS1)</b>
Radiated Emissions (30MHz-1GHz)	32.43dBuV/m	31.96dBuV/m
Radiated Emissions (above 1GHz)	47.69dBuV/m	47.69dBuV/m

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## 5 General Information

### 5.1 Details of E.U.T.

Power Supply:	12 VDC battery system
Cable:	DC cable: longer than 300cm unshielded
Sample Type:	Mobile device
Internal Source:	More than 108MHz

### 5.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC power	ZHAOXIN	RXN-305D	REF. No. SEA2700
Coaxial Attenuator	Provided by client	TS4	HYT168793
Cell Site Test Set	HP	8921A	3633A04615
Audio Analyzer	Rohde & Schwarz	UPV	SEM008-03
Wired Handset	SIMRAD	HS100	/
Wired Speaker	/	SP100	/
Wired Handset	B&G	H100	/
Wired Speaker	/	SP100	/

### 5.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radiated Emission	± 4.5dB (30MHz-1GHz)
2	Temperature test	± 1°C
3	Humidity test	± 3%

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## 5.4 Test Location

All tests were performed at:

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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

## 5.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

## 5.6 Deviation from Standards

None

## 5.7 Abnormalities from Standard Conditions

None

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## 6 Equipment List

<b>Radiated Emissions (30MHz-1GHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-15	2019-12-16	2020-12-15
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23
Pre-amplifier	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31

<b>Radiated Emissions (above 1GHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2020-07-10	2021-07-09
EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-12	2020-04-09	2021-04-08
Horn Antenna	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2019-09-24	2020-09-23

<b>General used equipment</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2019-09-26	2020-09-25
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06

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## 7 Emission Test Results

### 7.1 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Frequency Range: 30MHz to 1GHz

Measurement Distance: 3m

Limit:

30MHz -88MHz 40.0(dB $\mu$ V/m) quasi-peak

88MHz-216MHz 43.5(dB $\mu$ V/m) quasi-peak

216MHz-960MHz 46.0(dB $\mu$ V/m) quasi-peak

960MHz-1000MHz 54.0(dB $\mu$ V/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

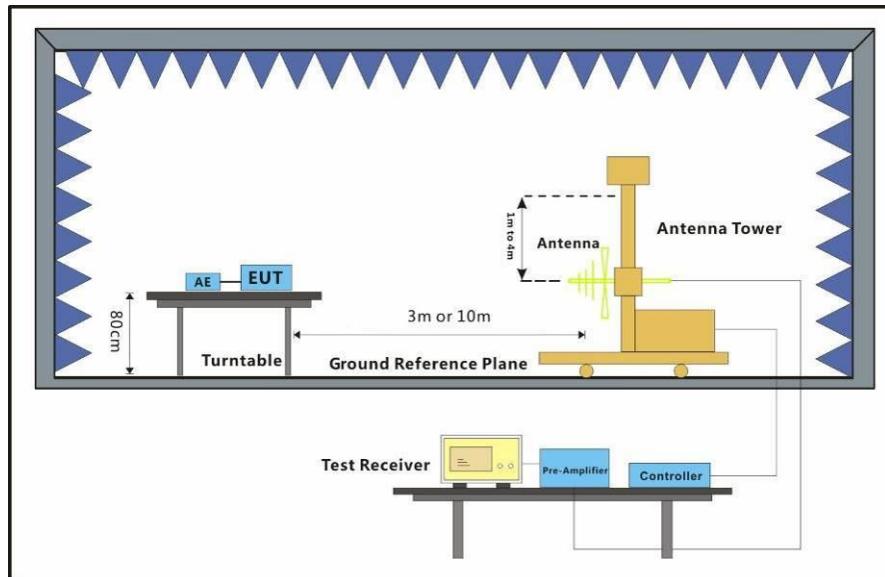
#### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1000 mbar

Test mode: 00:Normal Working\_Blank

#### 7.1.2 Test Setup Diagram



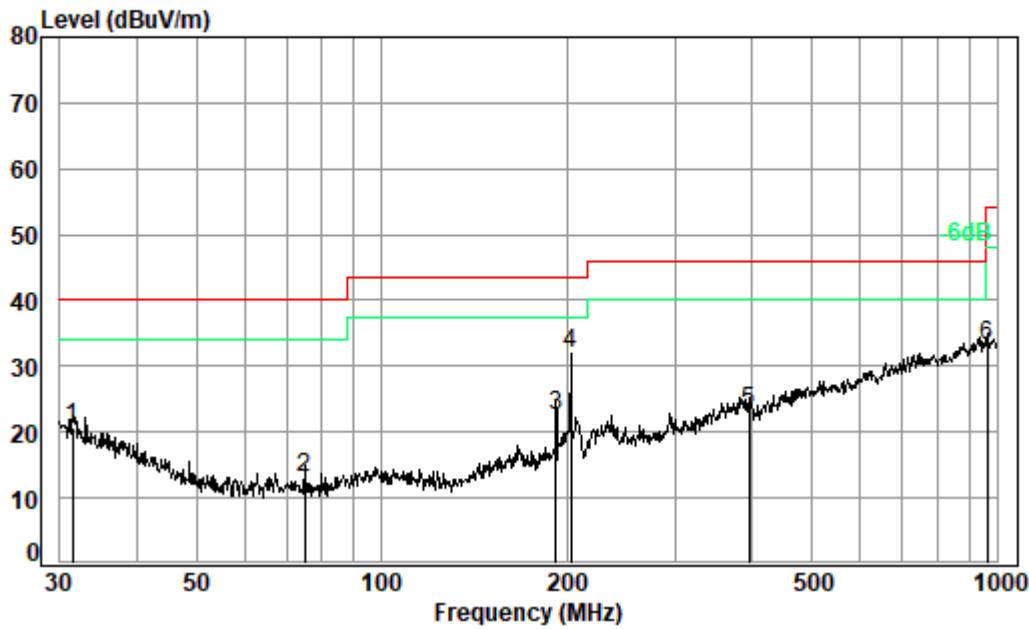
#### 7.1.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

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Mode:00;Horizontal



Condition: 3m HORIZONTAL

Job No. : 06018CR

Test Mode: 00

: 2#

Freq	Cable	Ant	Preamp	Read	Limit	Over	Remark	
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	31.51	0.62	21.86	27.73	25.78	20.53	40.00	-19.47 QP
2	74.92	1.00	12.40	27.64	27.22	12.98	40.00	-27.02 QP
3	191.75	1.19	15.55	27.17	33.01	22.58	43.50	-20.92 QP
4 pp	202.81	1.23	15.66	27.13	42.20	31.96	43.50	-11.54 QP
5	394.85	2.29	22.01	27.37	26.23	23.16	46.00	-22.84 QP
6	965.54	3.57	29.50	26.83	26.79	33.03	54.00	-20.97 QP

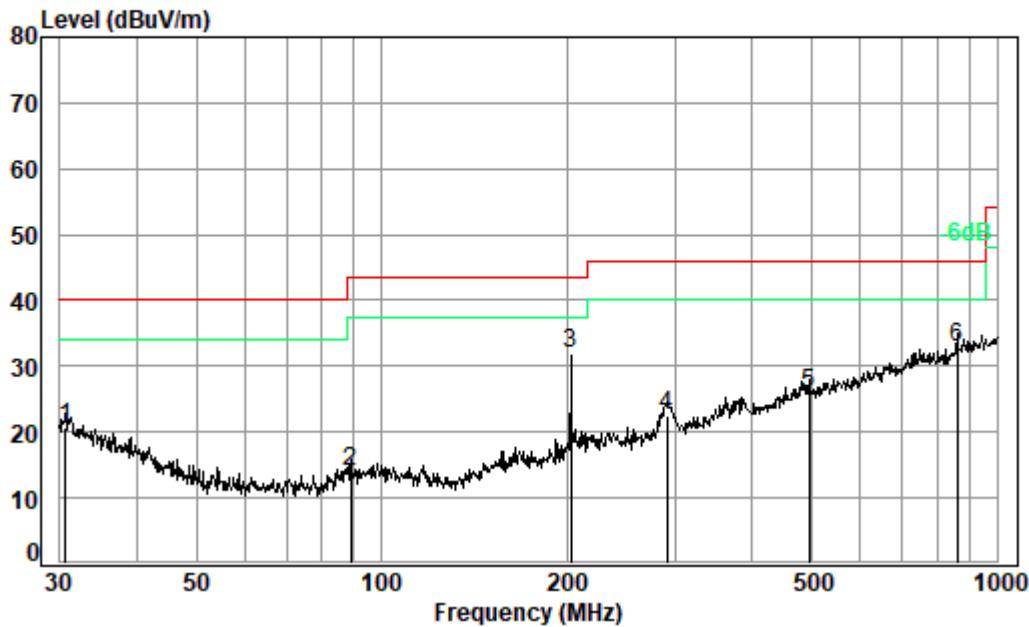
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Mode:00 ;Vertical



Condition: 3m VERTICAL

Job No. : 06018CR

Test Mode: 00

: 2#

Freq	Cable	Ant	Preamp	Read	Limit	Over	Remark	
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.64	0.61	22.51	27.73	25.32	20.71	40.00	-19.29 QP
2	89.28	1.29	13.03	27.62	27.19	13.89	43.50	-29.61 QP
3 pp	202.81	1.23	15.66	27.13	42.04	31.80	43.50	-11.70 QP
4	291.04	1.94	18.38	26.89	29.11	22.54	46.00	-23.46 QP
5	495.93	2.49	24.18	27.78	27.09	25.98	46.00	-20.02 QP
6	863.06	3.43	28.51	27.37	28.29	32.86	46.00	-13.14 QP

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## 7.2 Radiated Emissions (above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Frequency Range: Above 1GHz

Measurement Distance: 3m

Limit:

Above 1GHz 74(dB $\mu$ V/m) peak, 54(dB $\mu$ V/m) average

Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

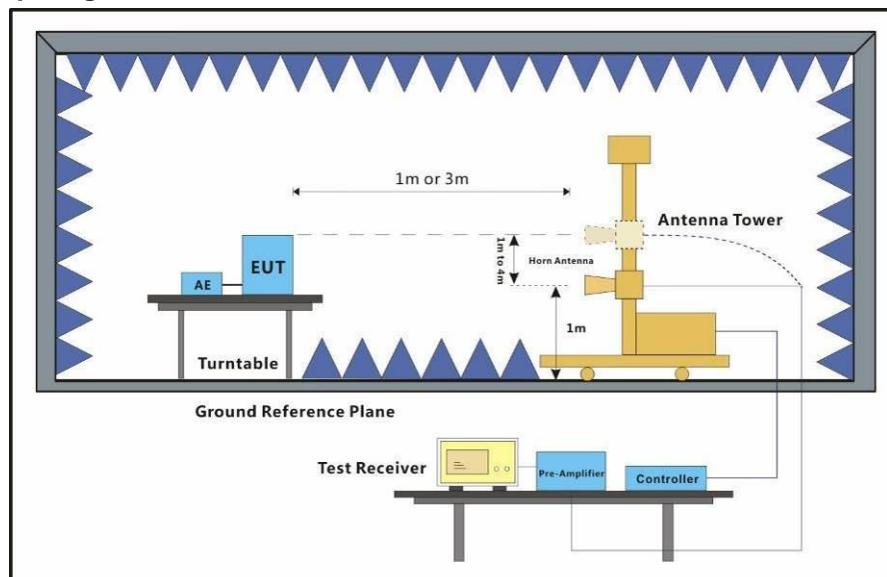
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.4 °C Humidity: 60.6 % RH Atmospheric Pressure: 1010 mbar

Test mode 00:Normal Working\_Blank

### 7.2.2 Test Setup Diagram



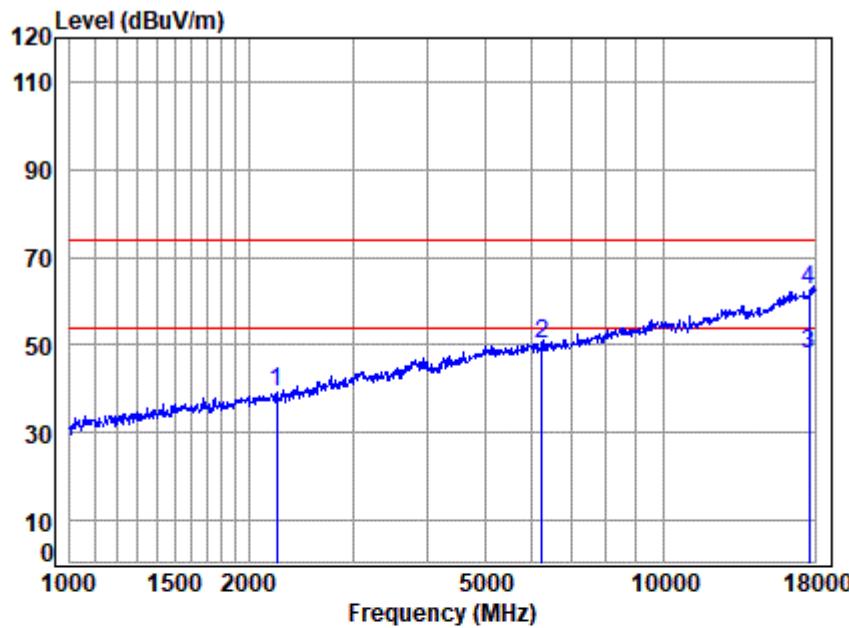
### 7.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

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Mode:00;Horizontal



Site : chamber  
Condition: 3m HORIZONTAL  
Job No : 06018CR  
Mode : 00  
Note :

Freq	Cable Loss	Ant Factor	Preamp Factor	Read	Limit Level	Line Limit	Over Limit	Remark
				Level				
MHz	dB	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	2226.950	4.07	28.23	40.33	47.36	39.33	74.00	-34.67 Peak
2	6249.464	8.27	35.35	42.22	48.85	50.25	74.00	-23.75 Peak
3	17639.470	14.22	43.07	40.19	30.59	47.69	54.00	-6.31 Average
4	17639.470	14.22	43.07	40.19	45.59	62.69	74.00	-11.31 Peak

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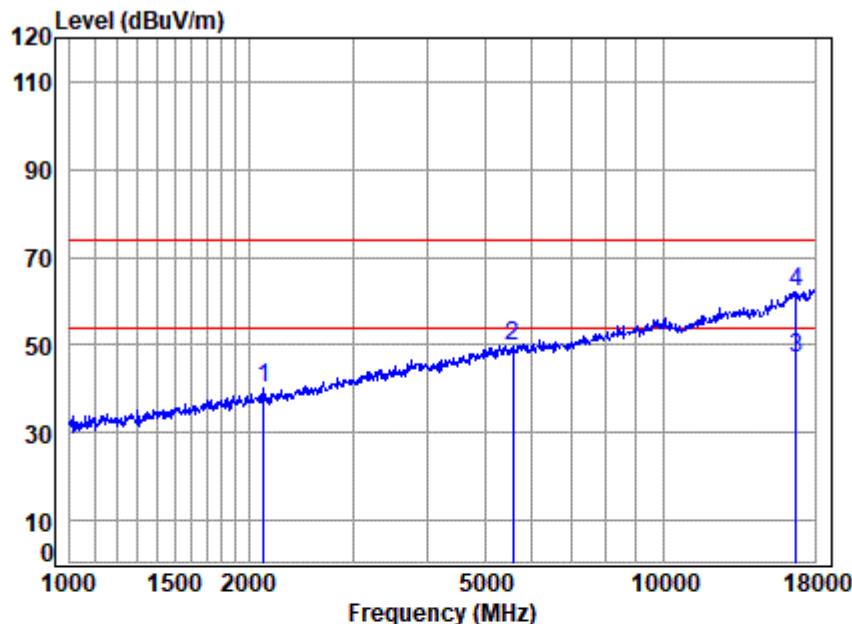
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Mode:00 ;Vertical



Site : chamber  
Condition: 3m VERTICAL  
Job No : 06018CR  
Mode : 00  
Note :

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level		Limit Line	Over Limit	Remark
				dB	dBuV			
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 2120.171	3.88	28.04	40.27	48.53	40.18	74.00	-33.82	Peak
2 5583.251	8.19	34.69	42.36	49.17	49.69	74.00	-24.31	Peak
3 16745.210	14.50	42.40	40.41	30.64	47.13	54.00	-6.87	Average
4 16745.210	14.50	42.40	40.41	45.64	62.13	74.00	-11.87	Peak

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## 8 Photographs

### 8.1 Setup photos.

Please refer to setup photos.

### 8.2 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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