



FCC EMI TEST REPORT

FCC ID : APYHRO00322
Equipment : Mobile Router
Brand Name : SHARP
Applicant : SHARP CORPORATION
1 Takumi-cho, Sakai-ku, Sakai City, Osaka
590-8522, Japan
Manufacturer : SHARP CORPORATION
1 Takumi-cho, Sakai-ku, Sakai City, Osaka
590-8522, Japan
Standard : FCC 47 CFR FCC Part 15 Subpart B Class B

The product was received on Nov. 01, 2022 and testing was performed from Nov. 10, 2022 to Nov. 10, 2022. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issue Date
FC262909-04	01	Initial issue of report	Nov. 25, 2022



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.107	AC Conducted Emission	Pass	See Note
3.1	15.109	Radiated Emission	Pass	4.07 dB under the limit at 42.420 MHz for Quasi-Peak

Note:

1. Not required means after assessing, test items are not necessary to carry out.
2. This is a variant report by changing PVT version. All the test cases were performed on original report which can be referred to Sporton Report Number FC262909-02. Based on the original report, the test cases were verified.

Declaration of Conformity:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Keven Cheng

Report Producer: Ming Chen

1. General Description

1.1. Product Feature of Equipment Under Test

WCDMA/LTE, and Wi-Fi 2.4GHz 802.11b/g/n/ac/ax

Product Feature	
Antenna Type	WWAN: PIFA Antenna WLAN <Ant. 1>: FPC, PIFA Antenna <Ant. 2>: FPC, PIFA Antenna

Sample difference
1. LCM power supply changed from LDO to PMIC; 2. BackLight DC-DC convertor and peripheral componemts changed materials, but footprint no changed; 3. SAR chipset peripheral componemts changed to no assembled; 4. Main & MIMO2 antenna diplexer changed material, but footprint no changed; 5. Antenna report changed from V1.4 to V1.5B

Remark: The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2. Modification of EUT

No modifications made to the EUT during the testing.

1.3. Test Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. 03CH06-HY

FCC designation No.: TW1093

1.4. Applicable Standards

According to the specifications declared by the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC 47 CFR FCC Part 15 Subpart B Class B
- ♦ ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

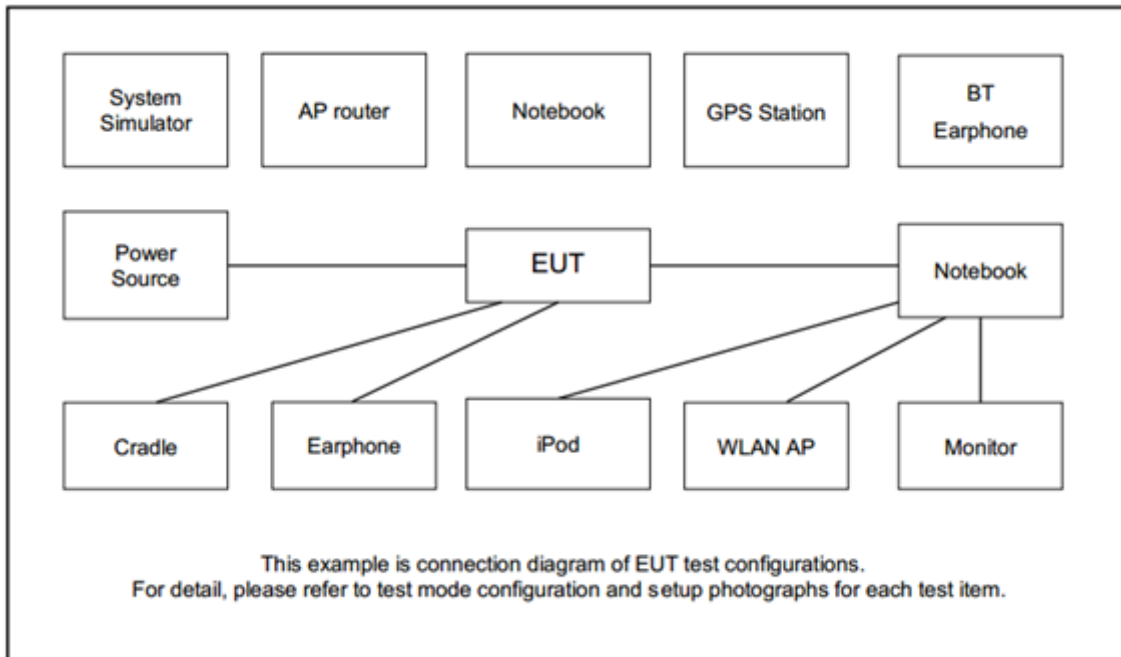
2. Test Configuration of Equipment Under Test

2.1. Test Mode

The EUT is tested along with the peripherals, operating under possible configurations in compliant with normal operation. The maximum emissions can be identified by a pre-scan carried out in different orientations of placement pursuant to ANSI C63.4-2014. Frequency range covered: Radiation Emission (30 MHz to the 5th harmonics of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Functions Enabled
Radiated Emissions	Mode 1 : LTE Band 12 Idle + WLAN (2.4GHz) Link + Battery + USB-Ethernet Dongle (LAN Link) + USB Cable (Charging form Adapter)
Remark: For Radiation Emission after pre-scanned the cellular band between 30MHz ~ 960MHz (LTE Band 12); only the worst case for cellular band test data of this mode was reported.	

2.2. Connection Diagram of Test System





2.3. Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Adapter	docomo	AC08	N/A	N/A	N/A

2.4. EUT Operation Test Setup

The EUT is in LTE idle mode during the test. The EUT is synchronized with the BCCH, and has been continuous receiving mode by setting paging reorganization of the system simulator.

At the same time, the EUT is attached to the Notebook via WLAN function, and the following programs installed in the EUT are programmed during the test:

1. EUT links with Notebook and executes ping via RJ-45 Cable.



3. Test Result

3.1. Test of Radiated Emission Measurement

3.1.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.1.2. Measuring Instruments

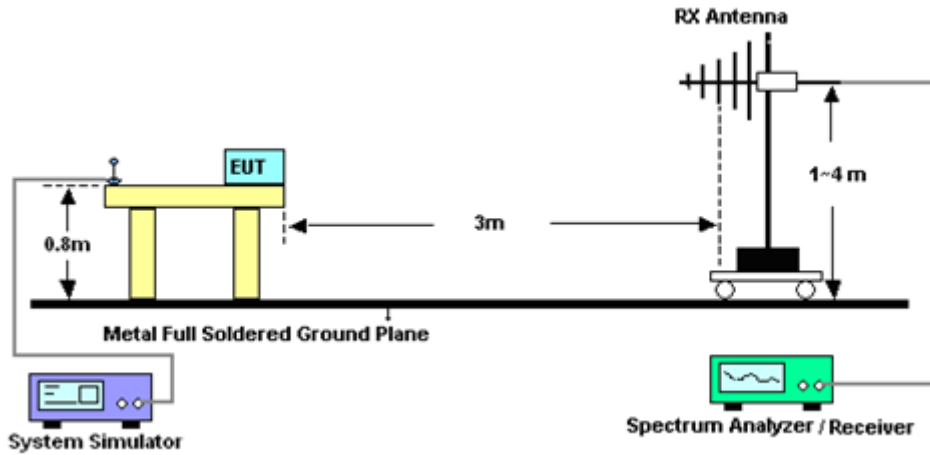
Please refer to the measuring equipment list in this test report.

3.1.3. Test Procedures

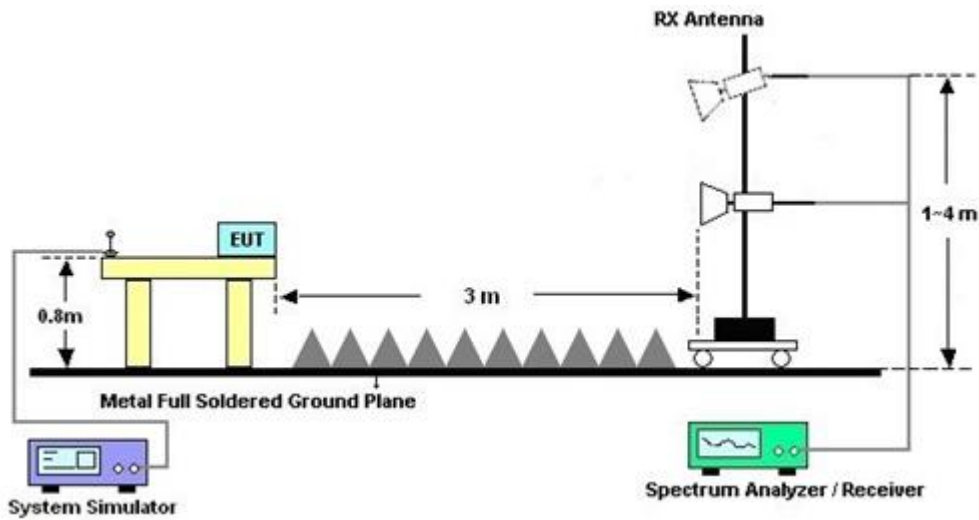
1. The EUT is placed on a turntable with 0.8 meter above ground.
2. The EUT is set 3 meters from the interference receiving antenna, which is mounted on the top of a variable height antenna tower.
3. The table is rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120 kHz/VBW=300 kHz for frequency below 1 GHz; RBW=1 MHz VBW=3 MHz (Peak), RBW=1 MHz/VBW=10 Hz (Average) for frequency above 1 GHz).
7. If the emission level of the EUT in peak mode is 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.

3.1.4. Test Setup of Radiated Emission

For Radiated Emissions from 30 MHz to 1 GHz



For Radiated Emissions from 1GHz to 18GHz



3.1.5. Test Result of Radiated Emission

Please refer to Appendix A.



4. List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Amplifier	SONOMA	310N	186713	9kHz~1GHz	Apr. 28, 2022	Nov. 10, 2022	Apr. 27, 2023	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL 6111C & N-6-06	2725 & AT-N0601	30MHz~1GHz	Nov. 06, 2022	Nov. 10, 2022	Nov. 05, 2023	Radiation (03CH06-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Feb. 09, 2022	Nov. 10, 2022	Feb. 08, 2023	Radiation (03CH06-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02037	1GHz~18GHz	Dec. 20, 2021	Nov. 10, 2022	Dec. 19, 2022	Radiation (03CH06-HY)
Preamplifier	Jet-Power	JPA00101800-30-10P	1601180001	1GHz~18GHz	Jul. 18, 2022	Nov. 10, 2022	Jul. 17, 2023	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF102_7000m m	532299/2	30MHz to 40GHz	Jul. 04, 2022	Nov. 10, 2022	Jul. 03, 2023	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF102_3000m m	532422/2	30MHz to 40GHz	Jul. 04, 2022	Nov. 10, 2022	Jul. 03, 2023	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF102_2000m m	532421/2	30MHz to 40GHz	Jul. 04, 2022	Nov. 10, 2022	Jul. 03, 2023	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF104	802433/4	30Mhz to 18Ghz	Aug. 18, 2022	Nov. 10, 2022	Aug. 17, 2023	Radiation (03CH06-HY)
Controller	INN-CO	EM1000	060782	Control Turn table & Ant Mast	N/A	Nov. 10, 2022	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1m~4m	N/A	Nov. 10, 2022	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0-360 degree	N/A	Nov. 10, 2022	N/A	Radiation (03CH06-HY)
Software	Audix	E3 6.2009-8-24 (k5)	N/A	N/A	N/A	Nov. 10, 2022	N/A	Radiation (03CH06-HY)



5. Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.30 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.60 dB
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Uncertainty of Radiated Emission Measurement (6000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.50 dB
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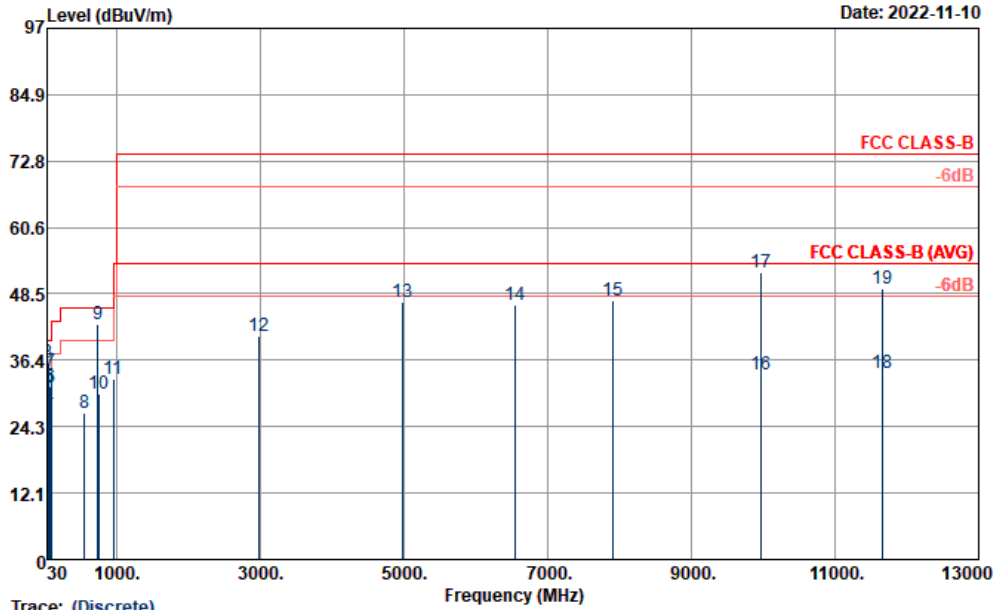
Appendix A. Radiated Emission Test Result

Test Engineer :	Jin Peng	Temperature :	24~26°C																																																																																																																																																																																	
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<div style="text-align: right;">Date: 2022-11-10</div> <p>Trace: (Discrete) Site : chamber Condition : FCC CLASS-B 3m 9120D_02037 HORIZONTAL Project : 262909-04 Power : 120 Vac/60Hz Memo : Mode 1</p> <table border="1"> <thead> <tr> <th></th> <th>Freq</th> <th>Level</th> <th>Over</th> <th>Limit</th> <th>Read</th> <th>A/Pos</th> <th>T/Pos</th> <th>Remark</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV/m</th> <th>Limit</th> <th>Line</th> <th>Level</th> <th>Factor</th> <th>cm</th> <th>deg</th> </tr> <tr> <th></th> <th></th> <th></th> <th>dB</th> <th>dBuV/m</th> <th>dBuV</th> <th>dB/m</th> <th></th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>52.95</td><td>28.39</td><td>-11.61</td><td>40.00</td><td>45.91</td><td>-17.52</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>2</td><td>74.01</td><td>27.17</td><td>-12.83</td><td>40.00</td><td>44.85</td><td>-17.68</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>3</td><td>196.59</td><td>25.98</td><td>-17.52</td><td>43.50</td><td>40.35</td><td>-14.37</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>4</td><td>521.90</td><td>27.74</td><td>-18.26</td><td>46.00</td><td>31.55</td><td>-3.81</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>5</td><td>720.00</td><td>30.46</td><td>-15.54</td><td>46.00</td><td>30.39</td><td>0.07</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>6 !</td><td>737.50</td><td>43.57</td><td></td><td></td><td>42.74</td><td>0.83</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>7</td><td>948.90</td><td>33.66</td><td>-12.34</td><td>46.00</td><td>28.57</td><td>5.09</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>8</td><td>2982.00</td><td>39.61</td><td>-34.39</td><td>74.00</td><td>63.67</td><td>-24.06</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>9</td><td>4982.00</td><td>46.44</td><td>-27.56</td><td>74.00</td><td>64.17</td><td>-17.73</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>10</td><td>6846.00</td><td>46.46</td><td>-27.54</td><td>74.00</td><td>60.03</td><td>-13.57</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>11</td><td>7906.00</td><td>47.39</td><td>-26.61</td><td>74.00</td><td>59.62</td><td>-12.23</td><td>---</td><td>---</td><td>Peak</td></tr> <tr><td>12</td><td>9964.00</td><td>32.47</td><td>-21.53</td><td>54.00</td><td>42.70</td><td>-10.23</td><td>100</td><td>150</td><td>Average</td></tr> <tr><td>13</td><td>9964.00</td><td>49.26</td><td>-24.74</td><td>74.00</td><td>59.49</td><td>-10.23</td><td>100</td><td>150</td><td>Peak</td></tr> <tr><td>14</td><td>12166.00</td><td>33.26</td><td>-20.74</td><td>54.00</td><td>39.19</td><td>-5.93</td><td>100</td><td>320</td><td>Average</td></tr> <tr><td>15</td><td>12166.00</td><td>49.02</td><td>-24.98</td><td>74.00</td><td>54.95</td><td>-5.93</td><td>100</td><td>320</td><td>Peak</td></tr> </tbody> </table>					Freq	Level	Over	Limit	Read	A/Pos	T/Pos	Remark		MHz	dBuV/m	Limit	Line	Level	Factor	cm	deg				dB	dBuV/m	dBuV	dB/m			1	52.95	28.39	-11.61	40.00	45.91	-17.52	---	---	Peak	2	74.01	27.17	-12.83	40.00	44.85	-17.68	---	---	Peak	3	196.59	25.98	-17.52	43.50	40.35	-14.37	---	---	Peak	4	521.90	27.74	-18.26	46.00	31.55	-3.81	---	---	Peak	5	720.00	30.46	-15.54	46.00	30.39	0.07	---	---	Peak	6 !	737.50	43.57			42.74	0.83	---	---	Peak	7	948.90	33.66	-12.34	46.00	28.57	5.09	---	---	Peak	8	2982.00	39.61	-34.39	74.00	63.67	-24.06	---	---	Peak	9	4982.00	46.44	-27.56	74.00	64.17	-17.73	---	---	Peak	10	6846.00	46.46	-27.54	74.00	60.03	-13.57	---	---	Peak	11	7906.00	47.39	-26.61	74.00	59.62	-12.23	---	---	Peak	12	9964.00	32.47	-21.53	54.00	42.70	-10.23	100	150	Average	13	9964.00	49.26	-24.74	74.00	59.49	-10.23	100	150	Peak	14	12166.00	33.26	-20.74	54.00	39.19	-5.93	100	320	Average	15	12166.00	49.02	-24.98	74.00	54.95	-5.93	100	320	Peak
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Test Engineer :	Jin Peng	Temperature :	24~26°C
		Relative Humidity :	43~50%
Test Distance :	3m	Polarization :	Vertical
Remark :	#9 is system simulator signal which can be ignored.		

- Emission level (dBμV/m) = 20 log Emission level (μV/m)
- Factor(dB) = Antenna Factor + Cable Loss + Filter loss – Preamp Factor
- Corrected Reading: Factor(dB) + Read Level = Level



Trace: (Discrete)

Site : chamber
 Condition : FCC CLASS-B 3m 9120D_02037 VERTICAL
 Project : 262909-04
 Power : 120 Vac/60Hz
 Memo : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	cm	deg	
1	33.78	30.60	-9.40	40.00	38.89	-8.29	100	325	QP
2	38.64	27.33	-12.67	40.00	38.00	-10.67	100	355	QP
3 !	42.42	35.93	-4.07	40.00	48.50	-12.57	100	353	QP
4	56.46	27.95	-12.05	40.00	46.10	-18.15	100	360	QP
5	64.29	31.58	-8.42	40.00	50.00	-18.42	100	60	QP
6	76.71	31.31	-8.69	40.00	48.70	-17.39	100	150	QP
7 !	82.92	34.22	-5.78	40.00	50.60	-16.38	100	15	QP
8	554.10	26.65	-19.35	46.00	28.49	-1.84	---	---	Peak
9 !	737.50	42.89	---	---	42.06	0.83	---	---	Peak
10	746.60	30.26	-15.74	46.00	29.40	0.86	---	---	Peak
11	955.20	32.96	-13.04	46.00	27.73	5.23	---	---	Peak
12	2978.00	40.73	-33.27	74.00	64.84	-24.11	---	---	Peak
13	4984.00	47.10	-26.90	74.00	64.81	-17.71	---	---	Peak
14	6536.00	46.54	-27.46	74.00	60.43	-13.89	---	---	Peak
15	7898.00	47.29	-26.71	74.00	59.53	-12.24	---	---	Peak
16	9960.00	33.77	-20.23	54.00	43.99	-10.22	100	20	Average
17	9960.00	52.42	-21.58	74.00	62.64	-10.22	100	20	Peak
18	11660.00	33.96	-20.04	54.00	40.61	-6.65	100	150	Average
19	11660.00	49.36	-24.64	74.00	56.01	-6.65	100	150	Peak

THE END