



FCC EMI TEST REPORT

FCC ID : KR5PPE1C
Equipment : Radio Frequency Bidirectional Key
Brand Name : Continental
Model Name : PPE1C
Applicant : Continental Automotive GmbH
Siemensstrasse 12, 93055, Regensburg, Germany
Manufacturer : Continental Automotive GmbH
Siemensstrasse 12, 93055, Regensburg, Germany
Factory : Continental Automotive Lithuania UAB
Davalgoniu str. 12, Sergeiciku I k.,
Karmelavos sen., Kaunas region 54462, Lithuania
Standard : FCC 47 CFR FCC Part 15 Subpart B Class B

The product was received on Oct. 12, 2021 and testing was performed from Oct. 28, 2021 to Dec. 17, 2021. 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 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
FC101258	01	Initial issue of report	Jan. 03, 2022
FC101258	02	Add factory information, FCC ID and revise Product Specification of Equipment Under Test	Jan. 14, 2022
FC101258	03	Revise Product Specification, Test Mode and EUT Operation Test Setup	Feb. 08, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.107	AC Conducted Emission	Not Required	-
3.1	15.109	Radiated Emission	Pass	14.58 dB under the limit at 934.040 MHz

Note:

1. Not required means after assessing, test items are not necessary to carry out.
2. The test plans were defined by manufacturer.

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

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: Yun Huang

Report Producer: Emma Lo and Clio Lo

1. General Description

1.1. Product Feature of Equipment Under Test

Product Feature	
Equipment	Radio Frequency Bidirectional Key
Brand Name	Continental
Model Name	PPE1C
FCC ID	KR5PPE1C
Sample 1	EUT with PANIC Button
Sample 2	EUT without PANIC Button
EUT supports Radios application	RFID/SRD/UWB
EUT Stage	Production Unit

Remark: The above EUT's information is declared by manufacturer.

1.2. Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	SRD: 433MHz UWB: 6000MHz ~ 8500 MHz
Rx Frequency	RFID: 125 kHz SRD: 433MHz UWB: 6000MHz ~ 8500 MHz
Antenna Type	RFID: Coil Antenna SRD: Printed Loop-Antenna (PCB) UWB: Printed Antenna (PCB)
Type of Modulation	RFID: ASK SRD: FSK UWB: BPM-BPSK

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

1.3. Modification of EUT

No modifications made to the EUT during the testing.

1.4. 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

1.5. 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.

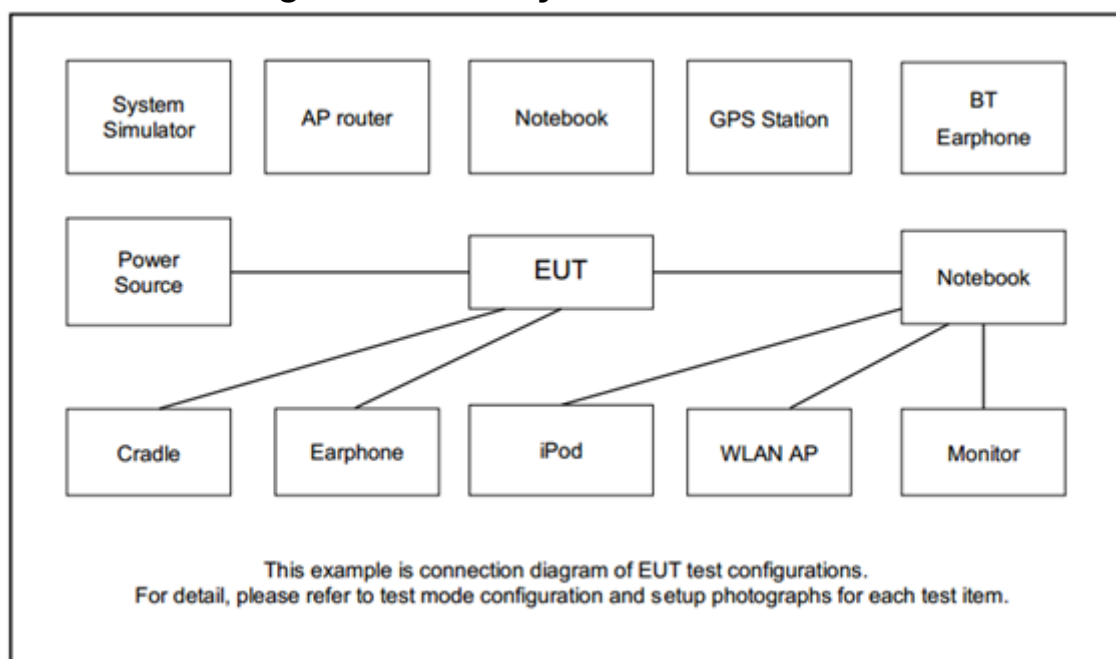
2. Test Configuration of Equipment Under Test

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: SRD On + RFID On + UWB On + Battery for Sample 1
	Mode 2: SRD On + RFID On + UWB On + Battery for Sample 2
Remark: The worst case of RE is mode 1; only the 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.	Battery	Panasonic	CR2032	N/A	N/A	N/A

2.4. EUT Operation Test Setup

1. Turn on SRD function of EUT.
2. Turn on UWB function of EUT.
3. Turn on RFID function of EUT.

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

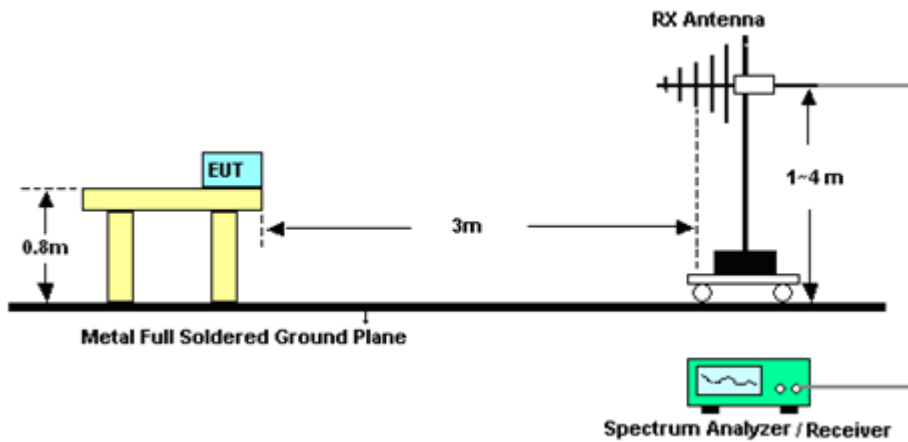
Please refer to the measuring equipment list in this test report.

3.1.3. Test Procedures

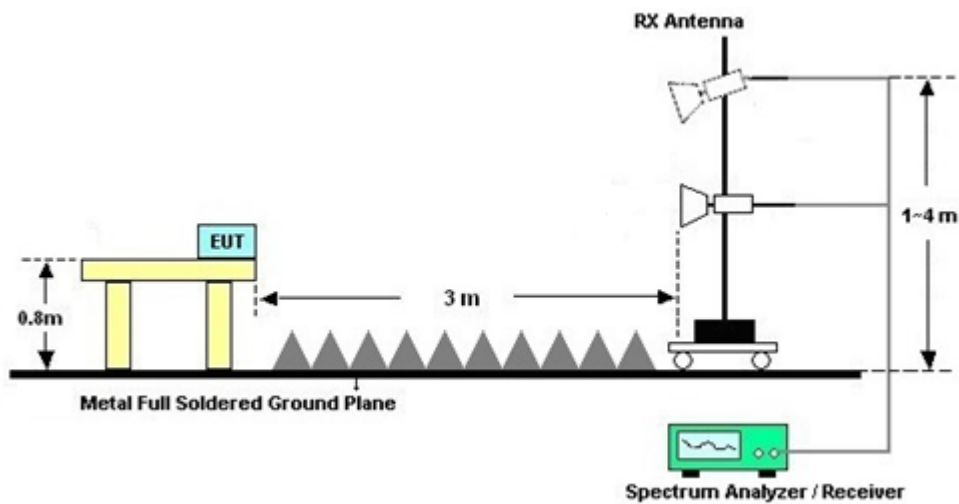
1. The EUT is placed on a turntable with 0.8 meter above ground.
2. The EUT is set 3 meters from the interference receiving antenna, which is mounted on the top of a variable height antenna tower.
3. The table is rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is 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.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.1.4. Test Setup of Radiated Emission

For Radiated Emissions from 30 MHz to 1 GHz



For Radiated Emissions above 1 GHz



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. 29, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Apr. 28, 2022	Radiation (03CH06-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	40103 & 07	30MHz~1GHz	Apr. 28, 2021	Oct. 28, 2021	Apr. 27, 2022	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL 6111C & N-6-06	2725 & AT-N0601	30MHz~1GHz	Nov. 11, 2021	Dec. 17, 2021	Nov. 10, 2022	Radiation (03CH06-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Feb. 03, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Feb. 02, 2022	Radiation (03CH06-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1156	1GHz~18GHz	Sep. 27, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Sep. 26, 2022	Radiation (03CH06-HY)
Preamplifier	Jet-Power	JPA00101800-30-10P	1601180001	1GHz~18GHz	Jul. 19, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Jul. 18, 2022	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF102_7000mm	532299/2	30MHz to 40GHz	Jul. 05, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Jul. 04, 2022	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF102_3000mm	532422/2	30MHz to 40GHz	Jul. 05, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Jul. 04, 2022	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF102_2000mm	532421/2	30MHz to 40GHz	Jul. 05, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Jul. 04, 2022	Radiation (03CH06-HY)
RF Cable	HUBER + SUHNER	SF104	802433/4	30Mhz to 18Ghz	Aug. 19, 2021	Oct. 28, 2021 ~ Dec. 17, 2021	Aug. 18, 2022	Radiation (03CH06-HY)
Controller	INN-CO	EM1000	060782	Control Turn table & Ant Mast	N/A	Oct. 28, 2021 ~ Dec. 17, 2021	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1m~4m	N/A	Oct. 28, 2021 ~ Dec. 17, 2021	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0-360 degree	N/A	Oct. 28, 2021 ~ Dec. 17, 2021	N/A	Radiation (03CH06-HY)
Software	Audix	E3 6.2009-8-24(k5)	N/A	N/A	N/A	Oct. 28, 2021 ~ Dec. 17, 2021	N/A	Radiation (03CH06-HY)



5. Uncertainty of Evaluation

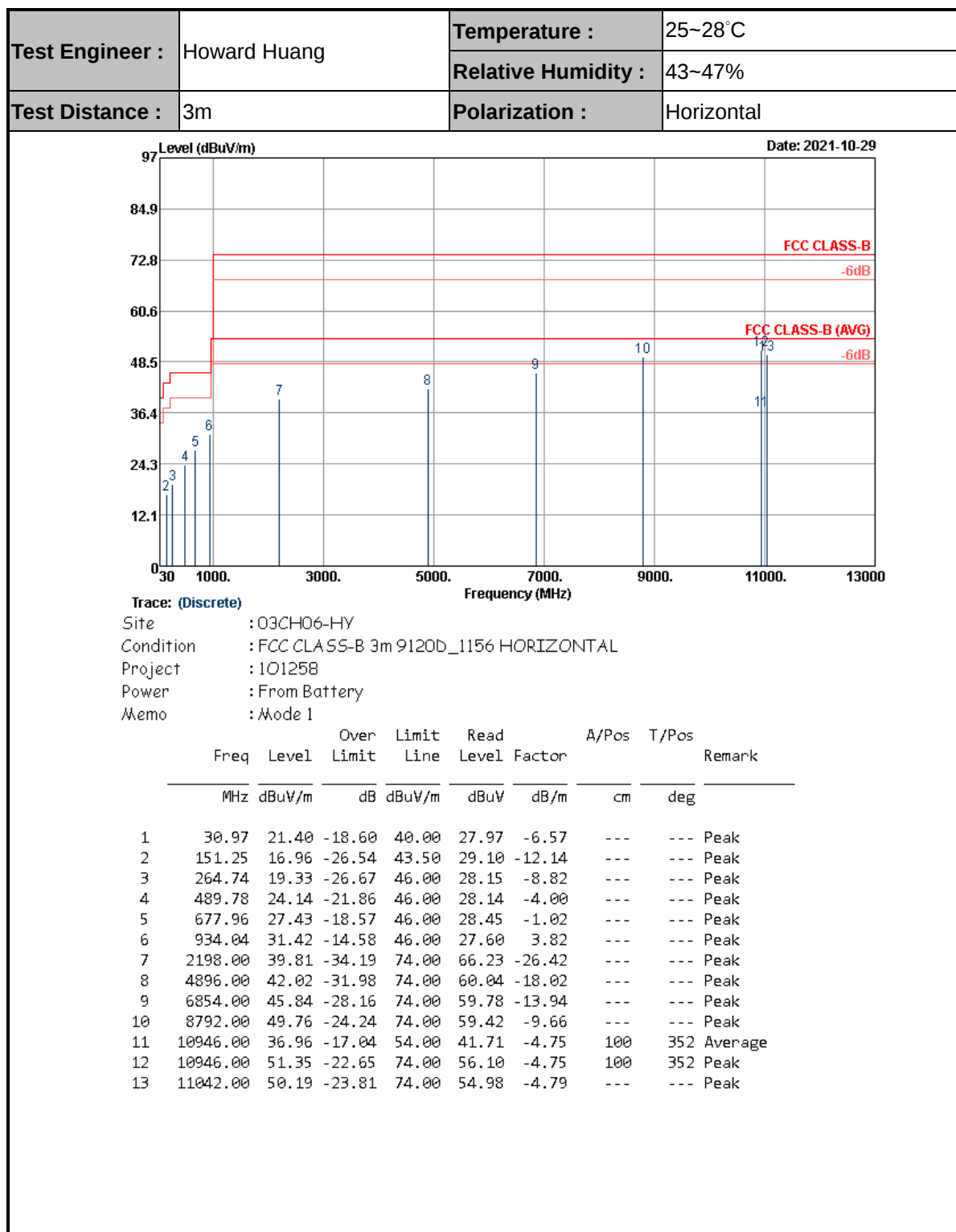
Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

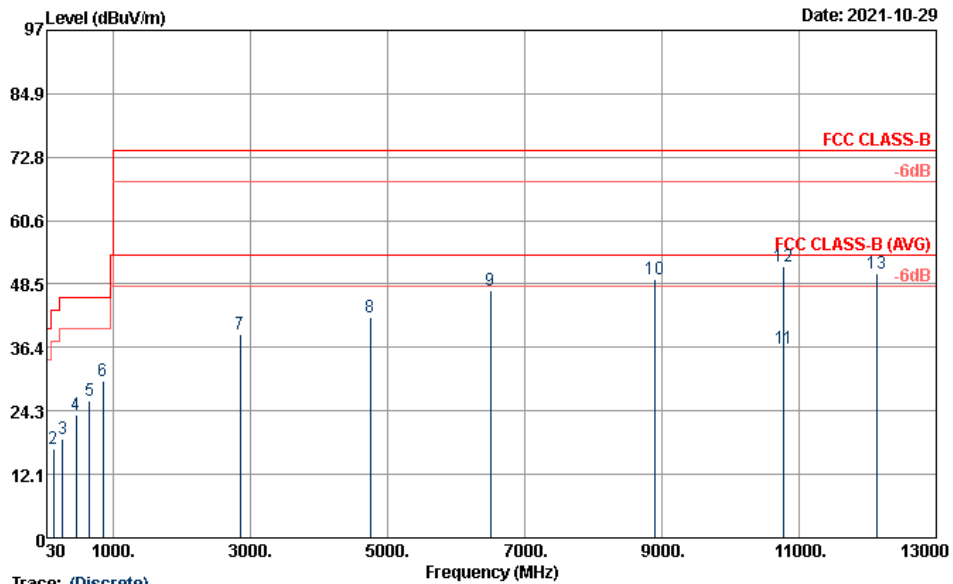
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.4 dB
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Appendix A. Radiated Emission Test Result





Test Engineer :	Howard Huang	Temperature :	25~28°C
		Relative Humidity :	43~47%
Test Distance :	3m	Polarization :	Vertical



Site : 03CHO6-HY
Condition : FCC CLASS-B 3m 9120B_1156 VERTICAL
Project : 101258
Power : From Battery
Memo : Mode 1

	Freq	Level	Over	Limit	Read		A/Pos	T/Pos	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor			
			dB	dBuV/m	dBuV	dB/m	cm	deg	
1	30.00	23.89	-16.11	40.00	29.75	-5.86	---	---	Peak
2	123.12	16.94	-26.56	43.50	28.83	-11.89	---	---	Peak
3	263.77	19.03	-26.97	46.00	27.89	-8.86	---	---	Peak
4	460.68	23.38	-22.62	46.00	27.80	-4.42	---	---	Peak
5	653.71	26.30	-19.70	46.00	27.57	-1.27	---	---	Peak
6	853.53	30.04	-15.96	46.00	27.60	2.44	---	---	Peak
7	2848.00	38.97	-35.03	74.00	64.03	-25.06	---	---	Peak
8	4742.00	42.19	-31.81	74.00	61.23	-19.04	---	---	Peak
9	6504.00	47.29	-26.71	74.00	61.21	-13.92	---	---	Peak
10	8906.00	49.54	-24.46	74.00	58.73	-9.19	---	---	Peak
11	10778.00	36.11	-17.89	54.00	41.51	-5.40	100	354	Average
12	10778.00	51.77	-22.23	74.00	57.17	-5.40	100	354	Peak
13	12144.00	50.44	-23.56	74.00	55.47	-5.03	---	---	Peak