

Prüfbericht-Nr.: <i>Test report no.:</i>	CN24YEAE 001	Auftrags-Nr.: <i>Order no.:</i>	48251082	Seite 1 von 22 Page 1 of 22
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2024-07-30	
Auftraggeber: <i>Client:</i>	CUBTEK INC. Rm. 7, 6F., No. 38, Taiyuan St., Zhubei City, Hsinchu County, 30265, Taiwan			
Prüfgegenstand: <i>Test item:</i>	INTERIOR RADAR CONTROLLER			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	B122-084			
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15C Test report			
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart C Section 15.255			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-08-26			
Prüfmuster-Nr.: <i>Test sample no:</i>	A003802518-001 A003802518-002			
Prüfzeitraum: <i>Testing period:</i>	2024-09-05 - 2024-09-10			
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Taipei Testing Site			
Prüflaboratorium: <i>Testing laboratory:</i>	Taipei Testing Laboratories			
Prüfergebnis*: <i>Test result*:</i>	Pass			
überprüft von: <i>compiled by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2024-09-19	 Ryan Chen		 Brenda Chen	
Stellung / Position:	Senior Project Manager		Ausstellungsdatum: <i>Issue date:</i> 2024-09-19	
			Stellung / Position: Senior Project Manager	
Sonstiges / Other:				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable
5 = mangelhaft N/T = nicht getestet 5 = poor N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Anmerkungen
Remarks

- | | |
|----------|--|
| 1 | <p>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.
Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p> |
| 2 | <p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: go.tuv.com/digital-signature</p> <p><i>As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: go.tuv.com/digital-signature</i></p> |
| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.
Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.
Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <p>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</p> <p><i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i></p> |

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.203	Antenna Requirement	Pass
5.1.2	15.255 (c)(2)(iii)	Output Power EIRP	Pass
5.1.3	2.1(C)	99% Occupied Bandwidth	Pass
5.1.4	15.255(c) (2)(iii)(A)	Duty Cycle	Pass
5.1.5	15.255 (f)	Frequency Stability	Pass
5.1.6	15.255 (d) & 15.205 & 15.209	Radiated Spurious Emissions	Pass

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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APPENDIX A - TEST RESULT OF RADIATED EMISSIONS

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APPENDIX EP - PHOTOGRAPHS OF EUT

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HISTORY OF THIS TEST REPORT

Revision	Description	Date Issued
R01	Original Release	2024-09-19

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A - Test Result of Radiated Emissions

Appendix SP - Photographs of Test Setup

Appendix EP - Photographs of EUT

Applied Standard and Test Levels

Radio
FCC 47CFR Part 15: Subpart C Section 15.255
KDB 364244 D01 Meas 15.255 Radars v01
FCC 47CFR Part 2: Subpart J Section 2.1049
ANSI C63.10:2013

1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,
New Taipei City 244
Taiwan (R.O.C.)
FCC Registration No.: 180491
ISED Registration No.: 25563

2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicate a 95% level of confidence.

Emission Measurement Uncertainty

Parameter	Uncertainty
Radiated Emission (9 kHz ~ 30 MHz)	± 1.15 dB
Radiated Emission (30 MHz ~ 200 MHz)	± 1.30 dB
Radiated Emission (200 MHz ~ 1 GHz)	± 1.30 dB
Radiated Emission (1 GHz ~ 18 GHz)	± 1.54 dB
Radiated Emission (18 GHz ~ 40 GHz)	± 2.52 dB
Radiated Emission (40 GHz ~ 200 GHz)	± 1.5 dB
Mains Conducted Emission	± 1.65 dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT is an INTERIOR RADAR CONTROLLER. It contains a 60GHz compatible module enabling the user to communicate data through a Wireless interface.

For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	INTERIOR RADAR CONTROLLER
Type Identification	B122-084
FCC ID	2AN3BB122-084

Technical Specification of EUT

Item	EUT information
Operating Frequency	62 GHz
Operation Voltage	12 Vdc
Modulation	FMCW
Antenna Information	Refer to 5.1.1
Accessory Device	Refer to 4.3

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3.3 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.4 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum emission level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with CAN-USB interface which makes it possible to control them through a test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed as below.

Test Software	VitalSign3DWinForm.exe
---------------	------------------------

The samples were used as follows:

A003802518-001

A003802518-002

Full test was applied on all test modes, but only worst case was shown.

EUT Configure Mode	Applicable To					Description
	Output Power EIRP	99% Bandwidth	Duty Cycle	Frequency Stability	Radiated Spurious Emissions	
-	√	√	√	√	√	-

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on **Y-plane**.
2. "-" means no effect.

Output Power EIRP

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (GHz)	Tested Frequency (GHz)
-	62	62

99% Occupied Bandwidth

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (GHz)	Tested Frequency (GHz)
-	62	62

Duty Cycle

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (GHz)	Tested Frequency (GHz)
-	62	62

Frequency Stability

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (GHz)	Tested Frequency (GHz)
-	62	62

Radiated Spurious Emissions

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Frequency (GHz)	Tested Frequency (GHz)
-	62	62

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Output Power EIRP	23-24 °C	55-58 %	Peter Chiou
99% Bandwidth	23-24 °C	55-58 %	Peter Chiou
Duty Cycle	23-24 °C	55-58 %	Peter Chiou
Frequency Stability	23-24 °C	55-58 %	Peter Chiou
Radiated Spurious Emissions	22.5-24.7 °C	56-59 %	Chuan Chu

4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Accessory of EUT

None

Support Unit

Support Unit								
No	Description	Brand	Model	S/N	Shielded	Ferrite Core (Qty)	Length (cm)	Remark
A	Radar Cable	CUBTEK	N/A	N/A	N/A	N/A	550	--
B	CAN Transmission line	CUBTEK	N/A	N/A	N/A	N/A	80	--
1	Power Supply	Gwinstek	GPS-3303	GEU915618	-	-	-	--
2	Notebook	DELL	Latitude 7490	13047Y2	-	-	-	--
3	Adapter	DELL	LA65NM130	NA	NO	NO	285	--
-	Notebook	DELL	Latitude 7490	13047Y2	-	-	-	--
-	Coincal Horn Antenna	VDI	WR15CH	WR15CH	-	-	-	Signaling Unit
-	Harmonic Mixer	VDI	SAX WR15	1-15	-	-	-	Signaling Unit

4.4 Test Setup Diagram

<Radiated Spurious Emissions mode>

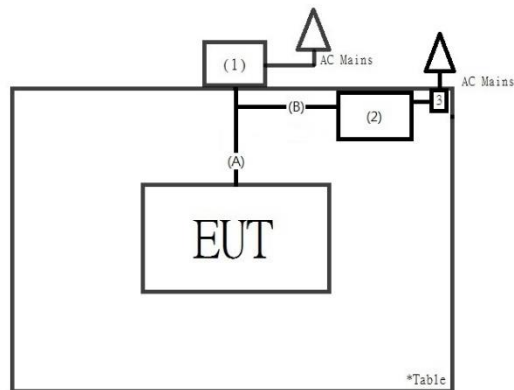
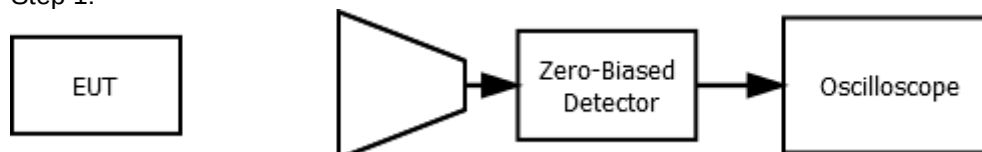
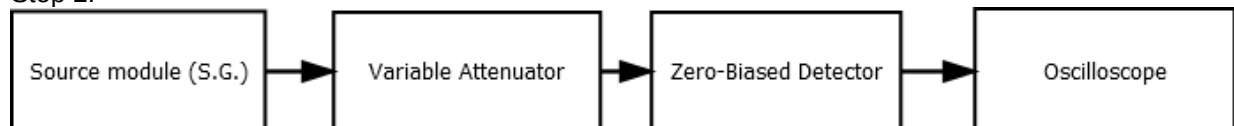


Diagram of Measurement Equipment Configuration for EIRP Measurement

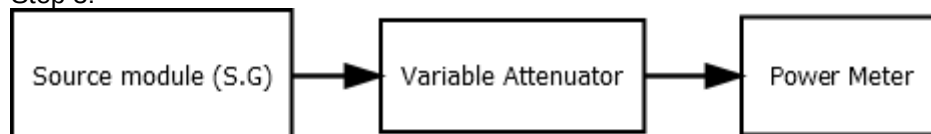
Step 1:



Step 2:



Step 3:



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

Requirement Use of approved antennas only

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 5.12 dBi. The antenna is microstrip antenna with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.
Refer to EUT photo for details.

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5.1.2 Output Power EIRP

Limit

The peak EIRP shall not exceed 14 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 25.5 milliseconds within any contiguous interval of 33 milliseconds.

Kind of Test Site 3m Semi-Anechoic Chamber

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	Agilent	N9010A	MY52221334	2024/03/13	2025/03/12	2024/9/10	2024/9/10
Coincal Horn Antenna	VDI	WR15CH	1-15	2023/8/22	2026/8/21	2024/9/10	2024/9/10
Mixer SA	VDI	SAX WR15	US54250104	2023/8/23	2026/8/22	2024/9/10	2024/9/10

Test Results

Channel Plan (GHz)	Test Freq. (GHz)	DSO (mV)	Power Measured (dBm)	EMeas (dBuV/m) (note1)	EIRP (dBm) (note 2)	EIRP Limit (dBm)
60-64	62	4.03	-35.88	116.23	11.53	14

note1 - Emeas= 126.8 – 20log(λ) + Power measured – Measurement Antenna Gain

note2 - EIRP= Emeas + 20log(Measurements distance) – 104.7

note3 - λ = 300/Frequency(MHz)

Remark: the far-field at 62GHz is 0.24m based on the below formulas.

far field = $(2 * L^2) / \lambda$,

where:

L = Largest Antenna Dimension, including the reflector, in meters

λ = wavelength in meters

5.1.3 99% Occupied Bandwidth

Limit

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage $\beta/2$ of the total mean power of a given emission. as defined in §2.1(c) of the FCC rules. This is also known as the 99% occupied bandwidth (OBW).

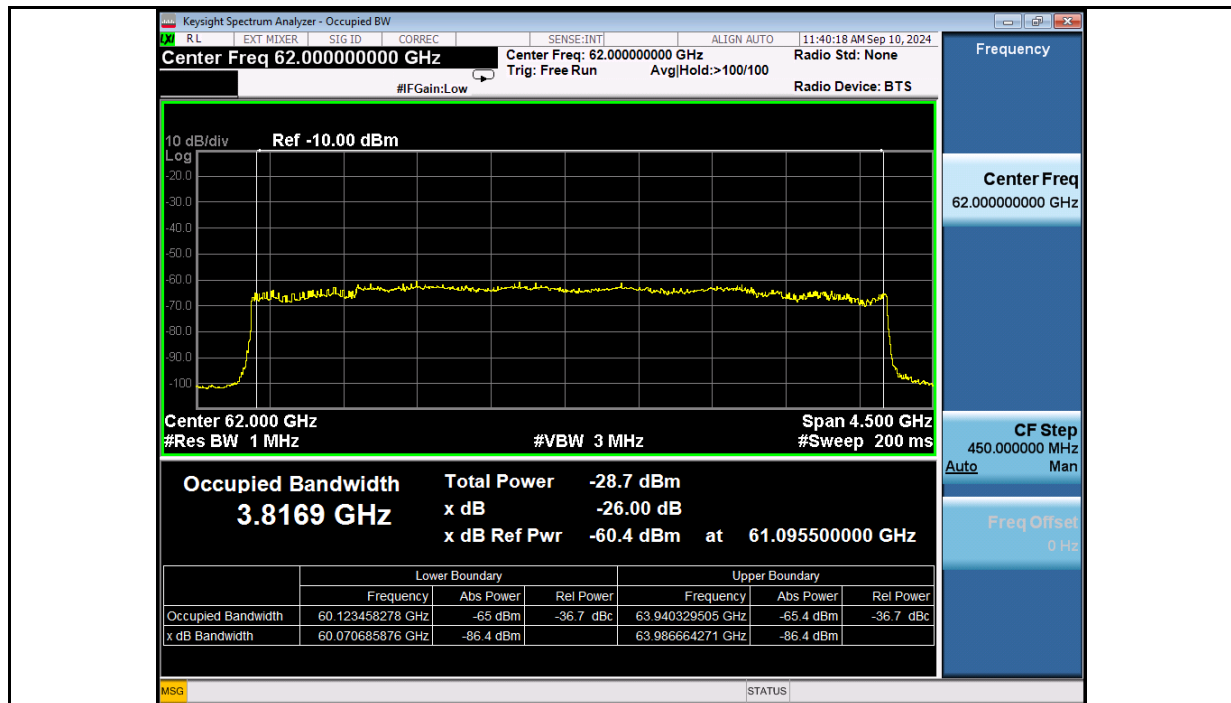
ANSI C63.10-2020 Clauses 9.4 provide standardized procedures recognized by the FCC for measuring the 99% OBW.

Kind of Test Site 3m Semi-Anechoic Chamber

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	Agilent	N9010A	MY52221334	2024/03/13	2025/03/12	2024/9/10	2024/9/10
Coincal Horn Antenna	VDI	WR15CH	1-15	2023/8/22	2026/8/21	2024/9/10	2024/9/10
Mixer SA	VDI	SAX WR15	US54250104	2023/8/23	2026/8/22	2024/9/10	2024/9/10

Test Results



5.1.4 Duty Cycle

Limit

The peak EIRP shall not exceed 14 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 25.5 milliseconds within any contiguous interval of 33 milliseconds.

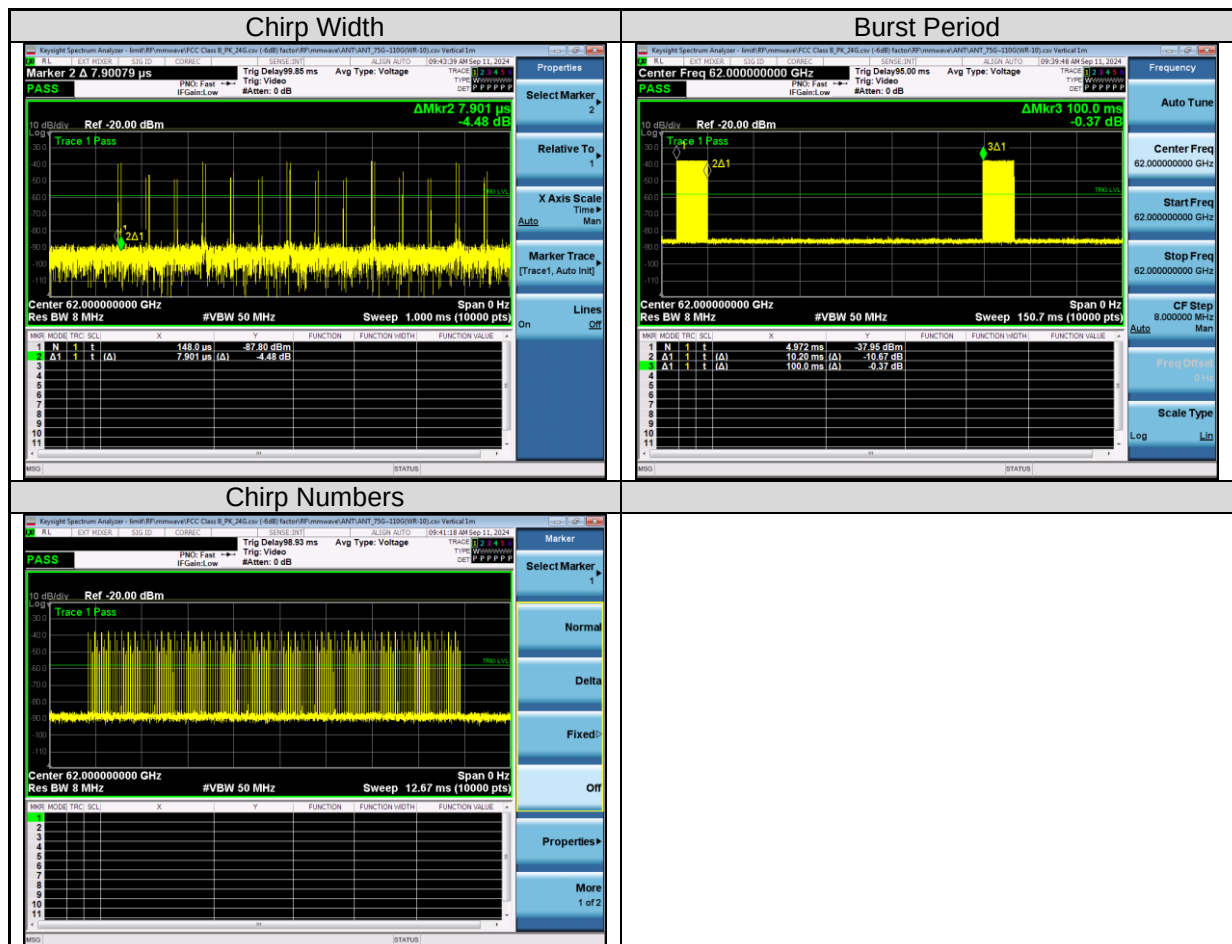
Kind of Test Site Shielded room

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	Agilent	N9010A	MY52221334	2024/03/13	2025/03/12	2024/9/10	2024/9/10
Coincal Horn Antenna	VDI	WR15CH	1-15	2023/8/22	2026/8/21	2024/9/10	2024/9/10
Mixer SA	VDI	SAX WR15	US54250104	2023/8/23	2026/8/22	2024/9/10	2024/9/10

Test Results

Chirp Width(us)	Chirp number	On Time (ms)	Off Time (ms)	Limit(ms)	Results
7.9	168	1.3272	31.6728	> 25.5	Pass



5.1.5 Frequency Stability

Limit

Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

Kind of Test Site Shielded room

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date	Test Date	
						From	Until
Spectrum Analyzer	Agilent	N9010A	MY52221334	2024/03/13	2025/03/12	2024/9/10	2024/9/10
Thermal Chamber	GIANT FORCE	GCT-099-40-S	MAF0103-007	2024/02/22	2025/02/20	2024/9/10	2024/9/10
Coincal Horn Antenna	VDI	WR15CH	1-15	2023/8/22	2026/8/21	2024/9/10	2024/9/10
Mixer SA	VDI	SAX WR15	US54250104	2023/8/23	2026/8/22	2024/9/10	2024/9/10

Test Result

Temperature	Voltage	Measured Frequency	Limit
(°C)	(Vdc)	(MHz)	(+/- kHz)
50	12	62.029250	Within Band
40	12	62.029250	Within Band
30	12	62.031500	Within Band
20	12	62.029250	Within Band
10	12	62.029250	Within Band
0	12	62.031500	Within Band
-10	12	62.031500	Within Band
-20	12	62.031500	Within Band

Temperature	Voltage	Measured Frequency	Limit
(°C)	(Vdc)	(MHz)	(+/- kHz)
20	13.8	62.028150	Within Band
20	12	62.029250	Within Band
20	10.2	62.031500	Within Band

5.1.6 Radiated Spurious Emission

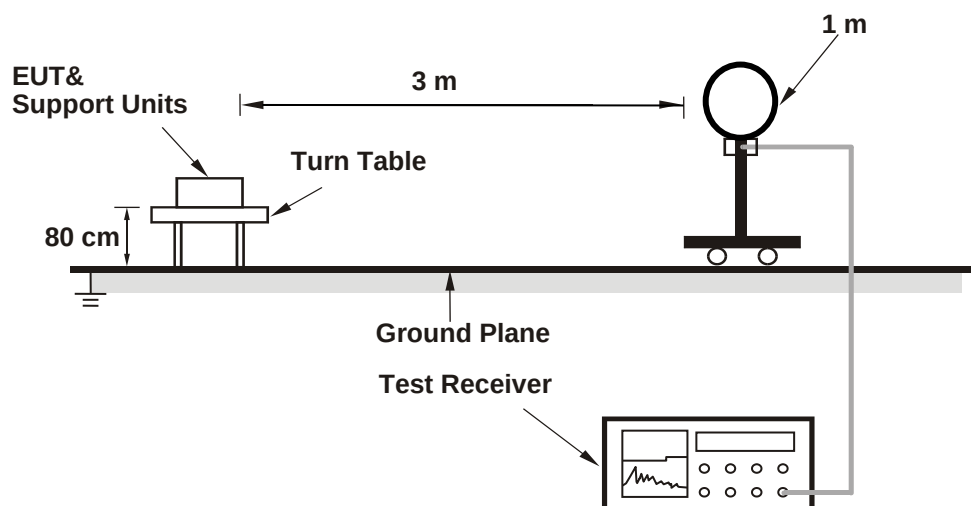
Limit

- 1) The power density of any emissions outside the 57-71 GHz band shall consist solely of spurious emissions.
- 2) Radiated emissions below 40 GHz shall not exceed the general limits in § 15.209.
- 3) Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm² at a distance of 3 meters.
- 4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

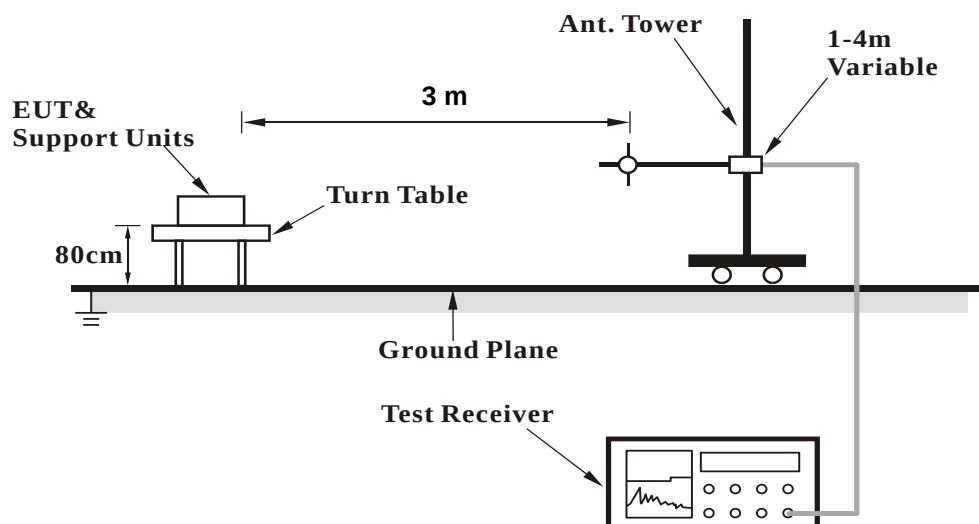
Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

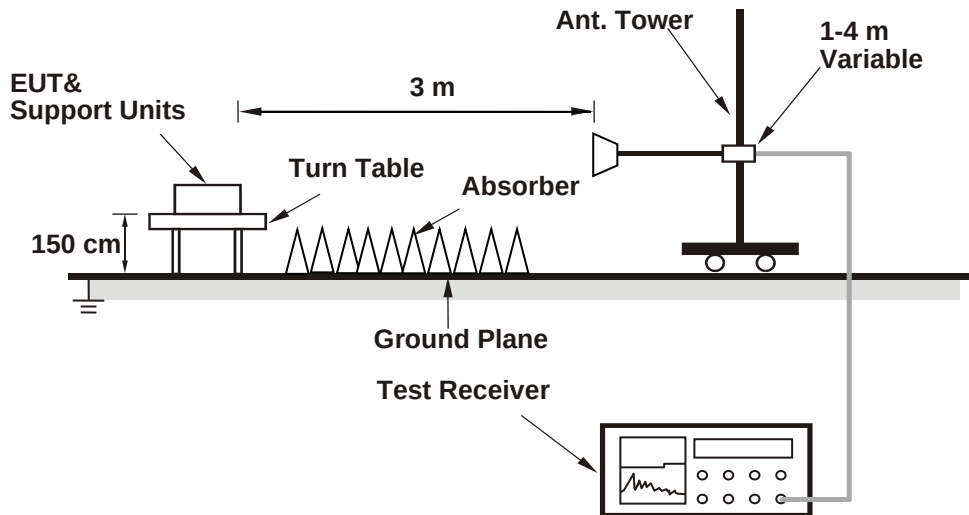
<Radiated Emissions below 30 MHz>



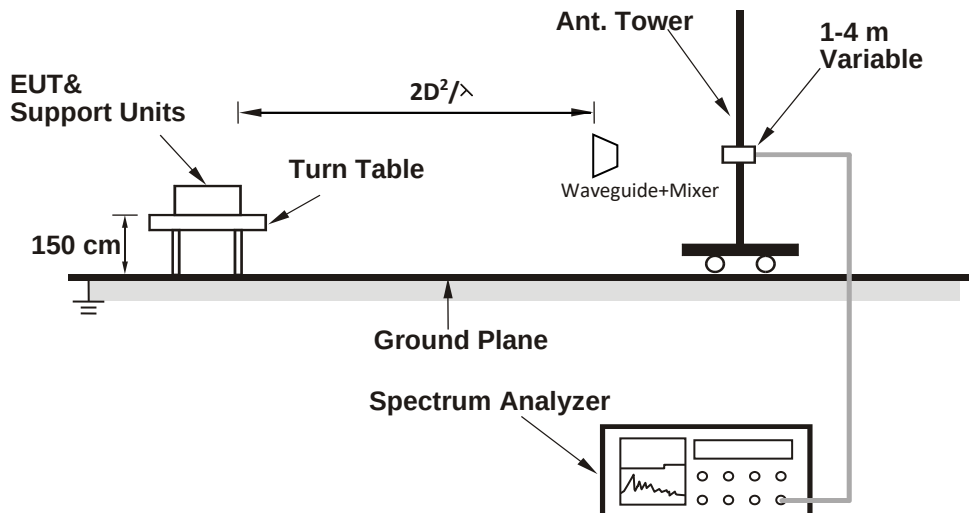
<Radiated Emissions 30 MHz to 1 GHz>



<Radiated Emissions 1 GHz to 40 GHz>



<Radiated Emissions above 40 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Above 1 GHz					
Signal Analyzer	R&S	FSV40	101509	2024/4/24	2025/4/23
Horn Antenna	ETS-Lindgren	3117	00218930	2024/2/22	2025/2/20
HF-AMP + AC source	EMCI	EM01G18GA	980633	2024/1/24	2025/1/22
HF-AMP + AC source	EMCI	EMC184045SE	980657	2024/1/24	2025/1/22
Horn Antenna	SCHWARZBECK	BBHA 9170	00890	2024/5/2	2025/5/1
Coincal Horn Antenna	VDI	WR15CH	1-15	2023/8/22	2026/8/21
Coincal Horn Antenna	VDI	WR12CH	RCH012RL	2023/8/22	2026/8/21
Coincal Horn Antenna	VDI	WR10CH	1-10	2023/8/22	2026/8/21
Coincal Horn Antenna	VDI	WR8.0CH	1-8.0	2023/8/22	2026/8/21
Coincal Horn Antenna	VDI	WR5.1CH	1-5.1	2023/8/28	2026/8/27
Mixer SA	VDI	SAX WR15	US54250104	2023/8/23	2026/8/22
Mixer SA	VDI	SAX WR12	US54250151	2023/8/23	2026/8/22
Mixer SA	VDI	SAX WR10	US53250005	2023/8/23	2026/8/22
Mixer SA	VDI	SAX WR8.0	US53250003	2023/8/24	2026/8/23
Mixer SA	VDI	SAX WR5.1	US53250002	2023/8/28	2026/8/27
Horn Antenna	OML	M19RH	16070501	2023/8/21	2026/8/20
Harmonic Mixer	OML	M19HWDX	160118-1	2023/8/23	2026/8/22
Signal Analyzer	Agilent	N9010A	MY52221334	2024/3/13	2025/3/12
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A
30 MHz ~ 1 GHz					
Receiver	R&S	ESR7	102109	2024/2/23	2025/2/21
Bilog Antenna	SCHWARZBECK	VULB-9168	00951	2024/3/29	2025/3/28
LF-AMP	Agilent	8447D	2944a107722	2024/3/20	2025/3/19
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A
Below 30 MHz					
Receiver	R&S	ESR7	102109	2024/2/23	2025/2/21
Loop Antenna	SCHWARZBECK	FMZB 1519B	00215	2024/1/4	2025/1/2
Test Software	Audix E3	15914a_20191106 tuv	PK-001087	N/A	N/A

Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) – Amplifier (dB)

Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Refer to Appendix A for the test results below 40GHz.

Test results above 40GHz are as below:

62 GHz				
Frequency (GHz)	Measurement Distance (m)	Measured Power (dBm)	Rx Antenna Gain (dBi)	EIRP (dBm)
52.345	1	-74.409	21	-28.59
EIRP (W)	Specification Distance (m)	Power Density (W/cm ²)	Power Density (pW/cm ²)	Limit (pW/cm ²)
0.00000138	3	0.000000012	1.22	90

Remark:

1. Rx antenna is the receiver antenna from the test equipment.
2. The measured power level is converted to EIRP using the Friis equation:

$$EIRP = P_T * G_T = (P_R / G_R) * (4 * \pi * D / \lambda)^2$$

Where :

PR is the power of the receive measurement

GR is the gain of the receive measurement antenna

D is the measurement distance

λ is the wavelength

3. The PD is converted using the equation below:

$$PD = EIRP_{Linear} / (4 * \pi * d^2)$$

Where:

PD is the power density at the distance specified by the limit, in W/m²

$EIRP_{Linear}$ is the equivalent isotropic radiated power, in watts

D is the distance at which the power density limit is specified, in m

Appendix A: Test Results of Radiated Spurious Emissions

Spurious Emissions, Tx / Rx Mode, 9kHz ~ 30MHz

62GHz

(Open) 9kHz~30MHz

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Level (dBuV/m) Date: 2024-09-05

Frequency (MHz)

	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	0.02	57.90	39.12	18.78	123.33	-65.43	100	178	Peak	Open		
2	0.03	57.37	37.82	19.55	119.13	-61.76	100	239	Peak	Open		
3	0.05	40.77	21.32	19.45	113.09	-72.32	100	74	Peak	Open		
4	0.09	36.95	18.14	18.81	100.95	-72.00	100	172	Peak	Open		
5	0.10	39.70	21.10	18.60	107.96	-68.26	100	175	Peak	Open		
6	0.13	31.04	12.43	18.61	105.22	-74.18	100	151	Peak	Open		

(Close) 9kHz~30MHz

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Level (dBuV/m) Date: 2024-09-05

Frequency (MHz)

	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	0.75	52.09	33.04	19.05	70.14	-18.05	100	140	Peak	Open		
2	1.43	51.63	32.63	19.00	64.48	-12.85	100	160	Peak	Open		
3	4.42	39.83	19.68	19.35	69.50	-30.47	100	99	Peak	Open		
4	12.81	35.52	14.18	21.34	69.50	-33.98	100	298	Peak	Open		
5	18.90	36.36	14.29	22.07	69.50	-33.14	100	108	Peak	Open		
6	23.25	36.36	14.06	22.30	69.50	-33.14	100	161	Peak	Open		

Spurious Emissions, Tx / Rx Mode, 30MHz ~ 1GHz

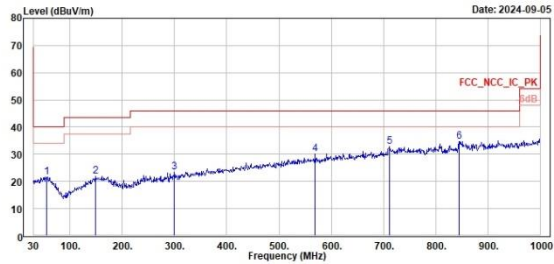
62GHz

Horizontal

Vertical



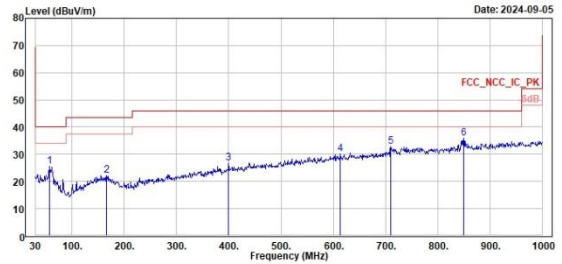
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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	55.22	21.68	28.71	-7.03	40.00	-18.32	300	69	Peak	Horizontal
2	148.34	21.78	28.89	-7.11	43.50	-21.72	100	184	Peak	Horizontal
3	299.66	23.57	29.82	-6.25	46.00	-22.43	100	305	Peak	Horizontal
4	569.32	30.22	30.84	-0.62	46.00	-15.78	300	240	Peak	Horizontal
5	711.91	32.70	30.52	2.18	46.00	-13.30	100	336	Peak	Horizontal
6	844.80	34.69	30.48	4.21	46.00	-11.31	100	38	Peak	Horizontal



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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	57.16	25.44	32.50	-7.06	40.00	-14.56	200	176	Peak	Vertical
2	166.77	22.26	28.99	-6.73	43.50	-21.24	100	68	Peak	Vertical
3	399.57	26.72	30.62	-3.90	46.00	-19.28	200	177	Peak	Vertical
4	613.94	30.24	29.83	0.41	46.00	-15.76	300	344	Peak	Vertical
5	709.97	32.76	30.58	2.18	46.00	-13.24	100	89	Peak	Vertical
6	849.65	36.03	31.71	4.32	46.00	-9.97	200	319	Peak	Vertical

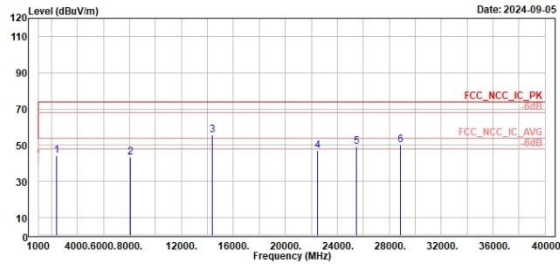
Spurious Emissions, 1GHz ~ 40GHz

62GHz

Horizontal



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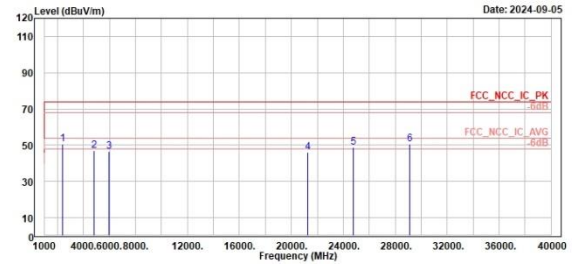


	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2399.00	44.14	58.02	-13.88	74.00	-29.86	200	89 Peak	Horizontal	
2	8844.00	43.15	50.54	-7.39	74.00	-30.85	300	70 Peak	Horizontal	
3	14400.00	55.86	54.08	1.78	74.00	-18.14	100	251 Peak	Horizontal	
4	22490.00	47.18	48.14	-0.96	74.00	-26.82	202	0 Peak	Horizontal	
5	25481.00	49.14	47.82	1.32	74.00	-24.86	100	85 Peak	Horizontal	
6	28835.00	49.98	47.54	2.44	74.00	-24.02	200	236 Peak	Horizontal	

Vertical



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	Freq	Level	Read	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2394.00	50.74	64.63	-13.89	74.00	-23.26	200	198 Peak	Vertical	
2	4799.00	46.98	56.99	-10.01	74.00	-27.02	300	162 Peak	Vertical	
3	9796.00	46.74	54.91	-8.17	74.00	-27.26	100	92 Peak	Vertical	
4	21351.00	45.86	48.23	-2.37	74.00	-28.14	200	163 Peak	Vertical	
5	24750.00	48.88	47.98	0.90	74.00	-25.12	300	304 Peak	Vertical	
6	29104.00	50.44	47.84	2.60	74.00	-23.56	300	92 Peak	Vertical	