

Test Report

Product Name	Mobile Computer
Model No.	RS36
FCC ID	Q3N-RS36

Applicant	CipherLab Co., Ltd.
Address	12F, 333, Dunhua S.Rd., Sec.2, Taipei, Taiwan

Date of Receipt	Oct. 13, 2022
Issued Date	Apr. 11, 2023
Report No.	22A0299R-RFUSOTHV03-A
Report Version	V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.

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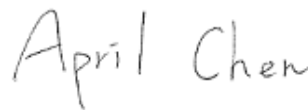
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Report



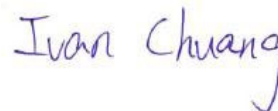
Product Name	Mobile Computer
Applicant	CipherLab Co., Ltd.
Address	12F, 333, Dunhua S.Rd., Sec.2, Taipei, Taiwan
Manufacturer	CIPHERLAB CO. LTD.
Model No.	RS36
FCC ID	Q3N-RS36
EUT Rated Voltage	AC 100-240V, 50-60Hz (Power by Adapter) or DC 3.85V (Power by Battery)
EUT Test Voltage	AC 120V, 60Hz
Trade Name	CIPHERLAB
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



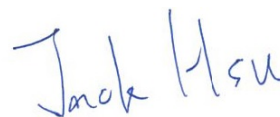
(Senior Project Specialist / April Chen)

Tested By :



(Senior Engineer / Ivan Chuang)

Approved By :



(Senior Engineer / Jack Hsu)

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Revision History

Report No.	Version	Description	Issued Date
22A0299R-RFUSOTHV03-A	V1.0	Initial issue of report.	Apr. 11, 2023

1. General Information

1.1. EUT Description

Product Name	Mobile Computer
Trade Name	CIPHERLAB
Model No.	RS36
FCC ID	Q3N-RS36
Frequency Range	13.56MHz
Modulation	ASK
Antenna Type	Loop
Power Cable (Optional)	Trade Name: CIPHERLAB, M/N: RS35 SNAP ON, Non-shielded, 1.5m
Adapter #1 (Optional)	Trade Name: Sunny, M/N: SYS1561-1005 Input: AC 100-240V~, 1.0A MAX, 50-60Hz Output: +5.0V=2.0A
Adapter #2 (Optional)	Trade Name: CWT, M/N: 2AEA010BC3D Input: AC 100-240V~ 50/60Hz 0.35A Output: 5.0V=2.0A 10.0W

Frequency of Each Channel:

Channel	Frequency (MHz)
1	13.56

Note:

1. This device is a Mobile Computer with a built-in 13.56 MHz transceiver.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.225.
3. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1	Transmit
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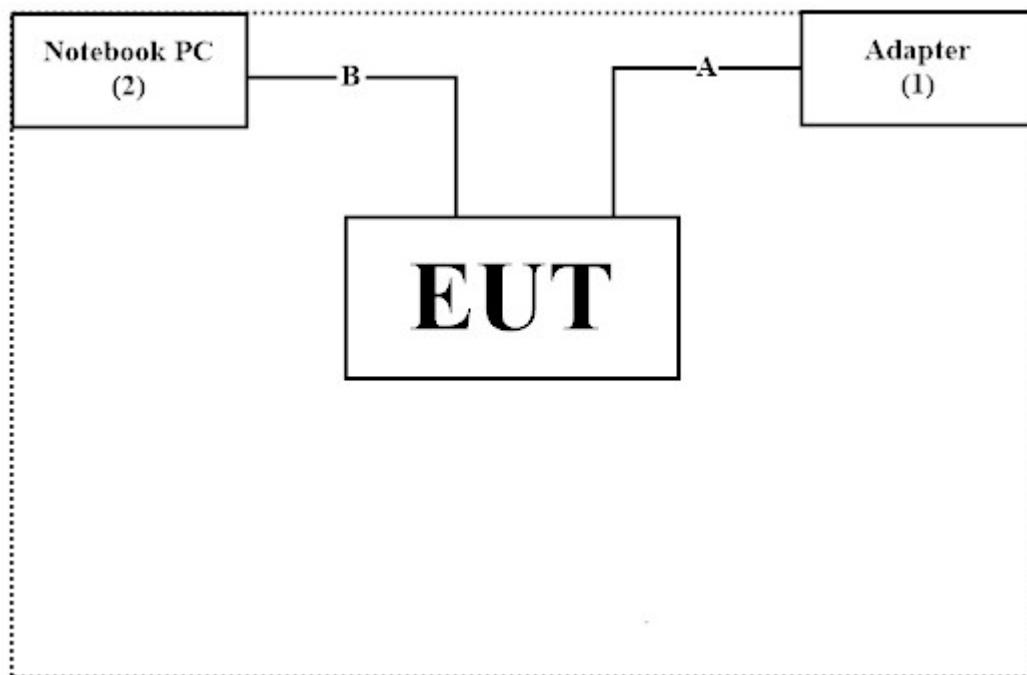
1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Adapter	Sunny	SYS1561-1005	N/A	N/A
2 Notebook PC	DELL	Latitude E5440	FS9TK32	N/A

Cable Type	Cable Description
A Power Cable	Non-shielded, 1.5m
B Type C Cable	Shielded, 1m

1.3. Configuration of tested System



1.4. EUT Exercise Software

1. Setup the EUT as shown in Section 1.3.
2. Execute software " HF RFID Configuration v11.0.17" on the Notebook PC.
3. Configure the test mode, the test channel.
4. Press "OK" to start the continuous transmit.
5. Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	23.4 °C
	Humidity (%RH)	10~90 %	55.2 %
Radiated Emission	Temperature (°C)	10~40 °C	24.2 °C
	Humidity (%RH)	10~90 %	62.5 %
Conductive	Temperature (°C)	10~40 °C	25.1 °C
	Humidity (%RH)	10~90 %	60.0 %

USA : FCC Registration Number: TW0033

Canada : CAB Identifier Number: TW3023 / Company Number: 26930

Site Description : Accredited by TAF
Accredited Number: 3023

Test Laboratory : DEKRA Testing and Certification Co., Ltd
Address : No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan
Performed Location : No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
Phone Number : +886-3-275-7255
Fax Number : +886-3-327-8031
Email Address : info.tw@dekra.com
Website : <http://www.dekra.com.tw>

1.6. List of Test Equipment

For Conduction Measurements /HY-SR01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	EMI Test Receiver	R&S	ESR7	101601	2022/06/23	2023/06/22
V	Two-Line V-Network	R&S	ENV216	101306	2022/05/23	2023/05/22
V	Two-Line V-Network	R&S	ENV216	101307	2022/07/04	2023/07/03
V	Coaxial Cable	SUHNER	RG400_BNC	RF001	2022/05/24	2023/05/23

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version: E3 210616 dekra V9.

For Radiated Measurements /HY-CB01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Loop Antenna	AMETEK	HLA6121	56736	2022/05/14	2023/05/13
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-675	2021/08/11	2023/08/10
	Horn Antenna	ETS-Lindgren	3117	00203761	2021/11/25	2022/11/24
	Horn Antenna	Com-Power	AH-840	101087	2022/06/16	2023/06/15
V	Pre-Amplifier	SGH	SGH0301	20211007-7	2022/02/22	2023/02/21
	Pre-Amplifier	EMCI	EMC051835SE	980312	2022/02/22	2023/02/21
	Pre-Amplifier	EMCI	EMC05820SE	980362	2022/07/28	2023/07/27
	Pre-Amplifier	EMCI	EMC184045SE	980369	2022/05/12	2023/05/11
	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
	Filter	MICRO TRONICS	BRM50702	G251	2022/07/27	2023/07/26
	Filter	MICRO TRONICS	BRM50716	G188	2022/07/27	2023/07/26
V	EMI Test Receiver	R&S	ESR3	102792	2021/12/15	2022/12/14
V	Spectrum Analyzer	R&S	FSV3044	101113	2022/01/25	2023/02/24
V	Coaxial Cable	SUHNER	SUCOFLEX 106	25450/6	2022/03/22	2023/03/21
	Coaxial Cable	SGH	HA800	GD20110222-8		
	Coaxial Cable	SGH	SGH18	2021003-8		
	Coaxial Cable	EMCI	EMC106	151113		

Note:

1. Bi-Log Antenna is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version: E3 210616 dekra V9.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document, and is described in each test chapter of this report.

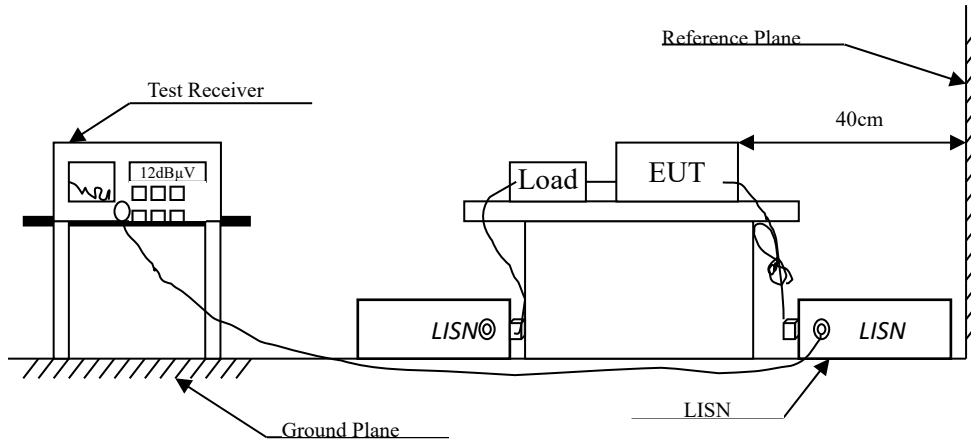
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test item	Uncertainty	
Conducted Emission	± 3.42 dB	
Radiated Emission	Under 1 GHz ± 4.06 dB	Above 1 GHz ± 3.73 dB
Band Edge	Under 1 GHz ± 4.06 dB	Above 1 GHz ± 3.73 dB
Frequency Tolerance	± 682.83 Hz	

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56 ^(註)	56-46 ^(註)
0.50-5.0	56	46
5.0 - 30	60	50

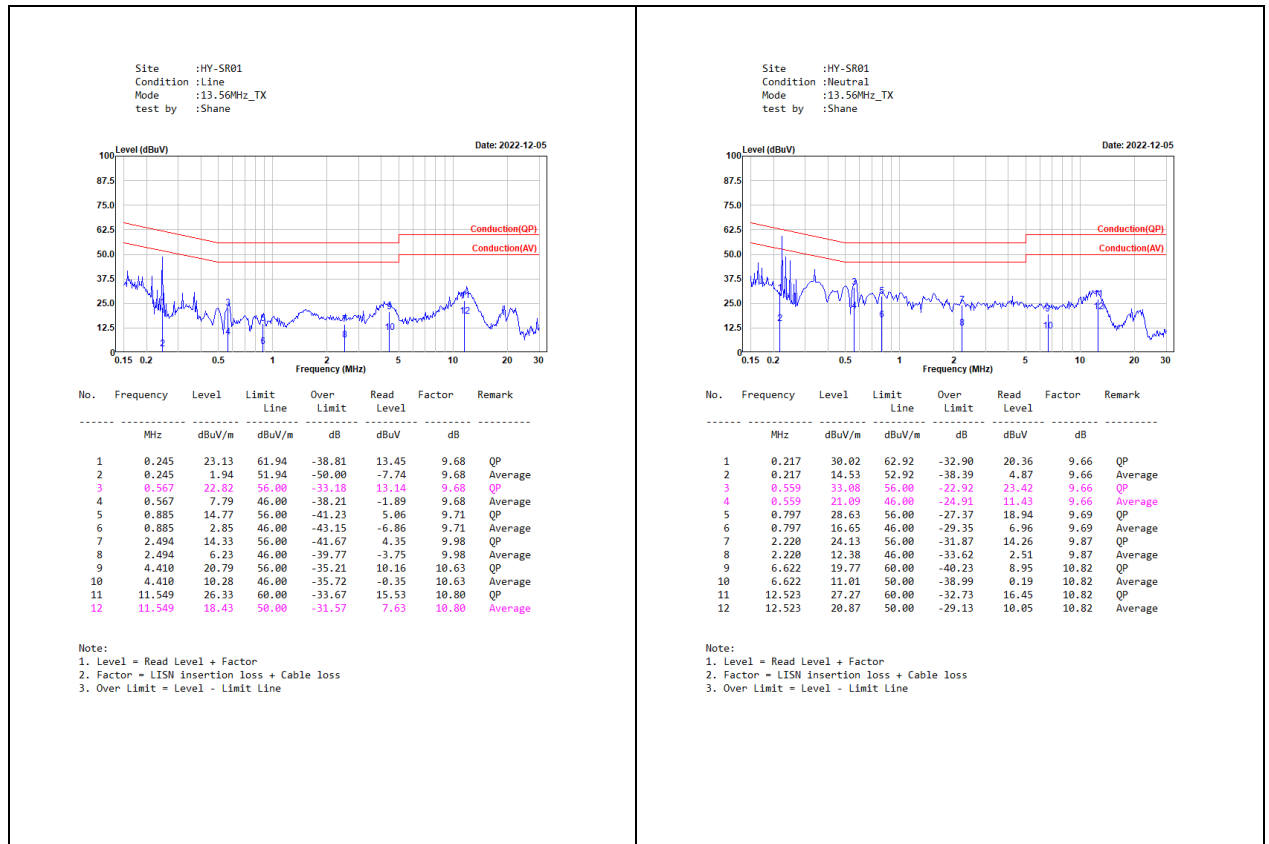
2.3. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

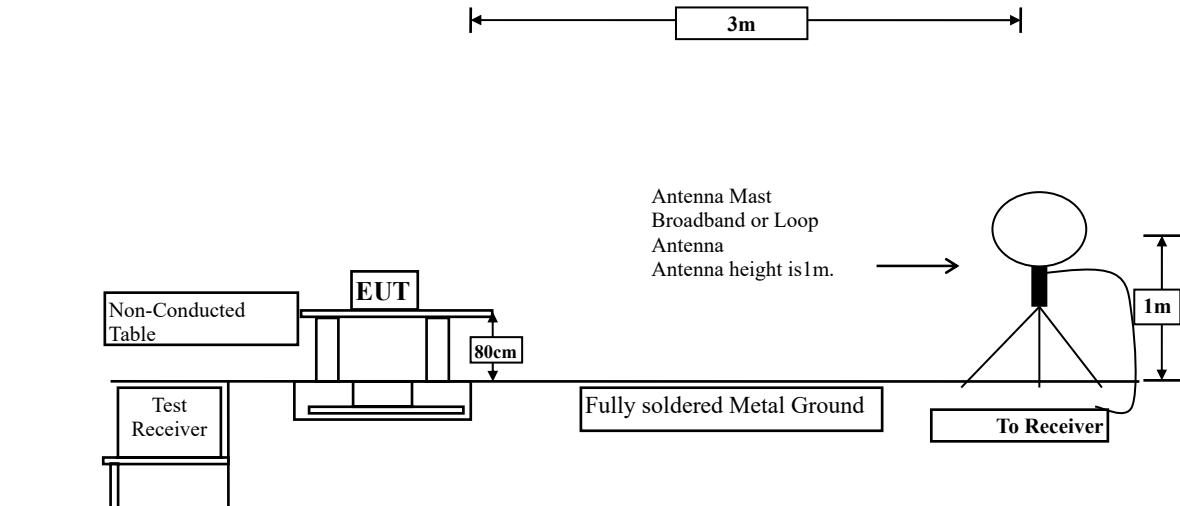
2.4. Test Result of Conducted Emission



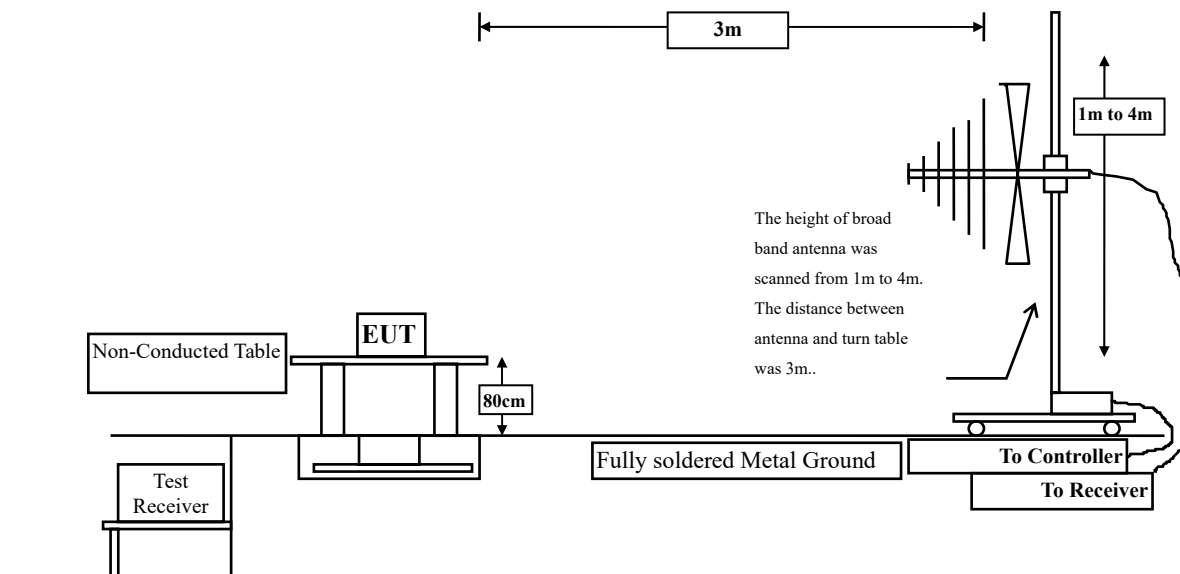
3. Radiated Emission

3.1. Test Setup

Radiated Emission Under 30 MHz



Radiated Emission Below 1 GHz



3.2. Limits

➤ Fundamental electric field strength Limit

Fundamental Frequency MHz	Field strength of fundamental			
	uV/m	Distance (meter)	dBμV/m	Distance (meter)
13.553 – 13.567	15848	30	124	3
13.410 – 13.553 and 13.567 – 13.710	334	30	90.47	3
13.110 – 13.410 and 13.710 – 14.010	106	30	80.50	3
Outside of the 13.110 – 14.010	See 15.209 Limits			

Remarks :

1. RF Voltage (dBμV) = 20 log RF Voltage (uV)
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
3. The emission limit in this paragraph is based on measurement instrumentation employing an quasi-peak detector.

➤ Spurious electric field strength Limit

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks :

1. RF Voltage (dBμV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.3. Test Procedure

Fundamental electric field strength:

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum electric field strength. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna which is 1 meter above ground. All X-axis, Y-axis and Z-axis polarization of the antenna are set on measurement.

Spurious electric field strength:

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.

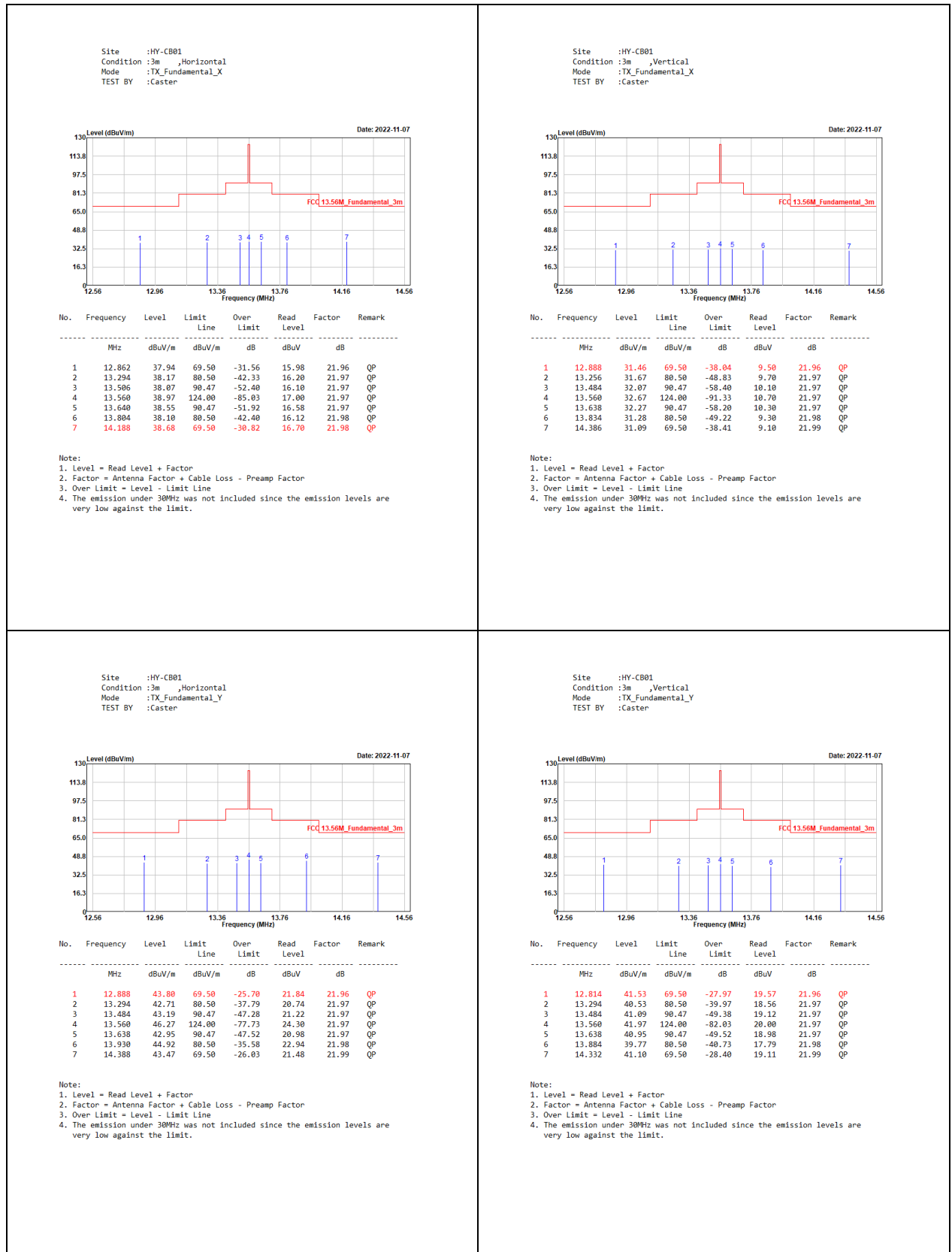
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

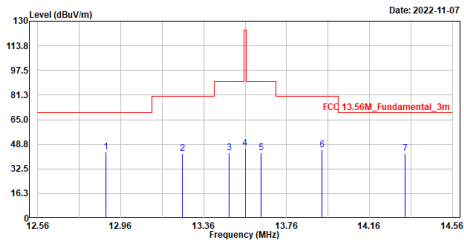
The bandwidth below 30 MHz setting on the field strength meter is 9 kHz and above 30 MHz is 120 kHz.

The frequency range from 9 kHz to 10th harmonics is checked.

3.4. Test Result of Radiated Emission



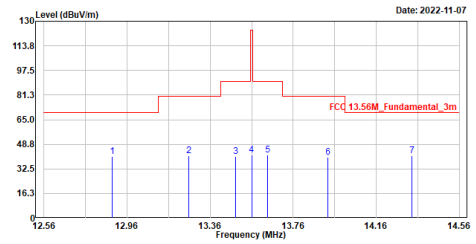
Site :HY-CB01
Condition :3m ,Horizontal
Mode :TX_Fundamental_Z
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	12.888	43.80	69.50	-25.70	21.84	21.96	QP
2	13.256	42.88	80.50	-37.62	20.91	21.97	QP
3	13.484	43.19	90.47	-47.28	21.22	21.97	QP
4	13.560	46.07	124.00	-77.93	24.10	21.97	QP
5	13.638	42.95	90.47	-47.52	20.98	21.97	QP
6	13.930	44.92	80.50	-35.58	22.94	21.98	QP
7	14.332	42.79	69.50	-26.71	20.80	21.99	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

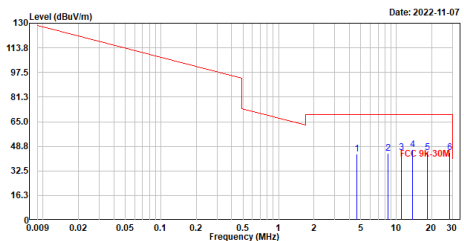
Site :HY-CB01
Condition :3m ,Vertical
Mode :TX_Fundamental_Z
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	12.888	40.94	69.50	-28.56	18.98	21.96	QP
2	13.258	40.98	80.50	-39.52	19.01	21.97	QP
3	13.484	40.54	90.47	-49.93	18.57	21.97	QP
4	13.560	41.77	124.00	-82.23	19.80	21.97	QP
5	13.638	41.52	90.47	-48.95	19.55	21.97	QP
6	13.926	40.39	80.50	-40.11	18.41	21.98	QP
7	14.332	41.24	69.50	-28.26	19.25	21.99	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

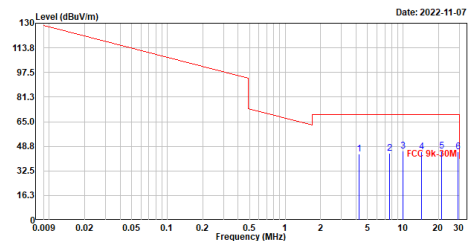
Site :HY-CB01
Condition :3m ,Horizontal
Mode :TX_9K-30M
TEST BY :Sam



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4.644	43.59	69.50	-25.91	23.26	20.33	QP
2	8.464	43.98	69.50	-25.52	22.54	21.44	QP
3	10.972	44.73	69.50	-24.77	22.81	21.92	QP
4	13.658	46.44	69.50	-23.06	24.47	21.97	QP
5	18.439	44.73	69.50	-24.77	22.66	22.07	QP
6	28.575	44.72	69.50	-24.78	22.53	22.19	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

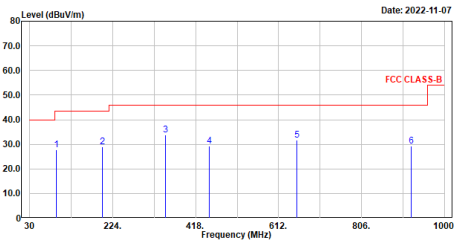
Site :HY-CB01
Condition :3m ,Vertical
Mode :TX_9K-30M
TEST BY :Sam



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	
1	4.213	43.63	69.50	-25.87	23.39	20.24	QP
2	7.679	43.99	69.50	-25.51	22.79	21.20	QP
3	10.035	45.65	69.50	-23.85	23.75	21.90	QP
4	14.340	44.98	69.50	-24.52	22.99	21.99	QP
5	21.338	45.40	69.50	-24.10	23.29	22.11	QP
6	29.042	45.01	69.50	-24.49	22.82	22.19	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

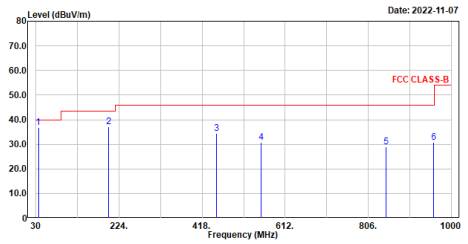
Site :HY-CB01
Condition :3m ,HORIZONTAL
Mode :TX_30W-1G
TEST BY :Caster



No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	Limit	Level	dB	
1	93.050	27.64	43.50	-15.86	57.55	-29.91	QP
2	199.750	29.02	43.50	-14.48	56.11	-27.09	QP
3	347.190	33.90	46.00	-12.10	56.20	-22.30	QP
4	450.010	29.41	46.00	-16.59	48.77	-19.36	QP
5	654.680	31.56	46.00	-14.44	46.84	-15.28	QP
6	921.430	29.18	46.00	-16.82	41.15	-11.97	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

Site :HY-CB01
Condition :3m ,VERTICAL
Mode :TX_30W-1G
TEST BY :Caster



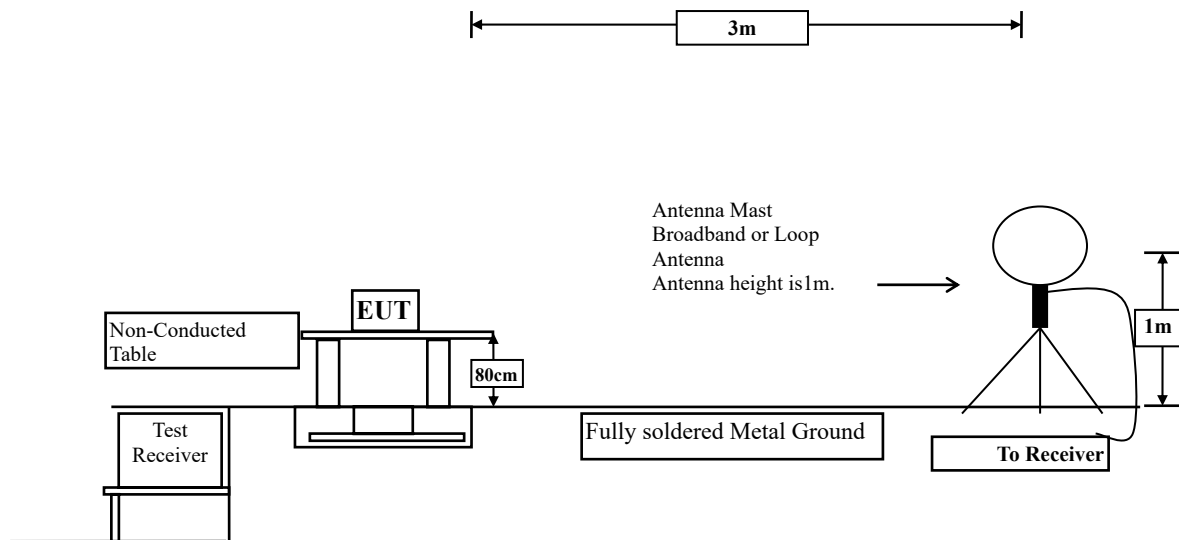
No.	Frequency	Level	Limit	Over	Read	Factor	Remark
	MHz	dBuV/m	dBuV/m	Limit	Level	dB	
1	35.820	36.95	40.00	-3.05	61.79	-24.84	QP
2	199.750	37.01	43.50	-6.49	64.10	-27.09	QP
3	451.950	34.30	46.00	-11.70	53.62	-19.32	QP
4	555.740	30.90	46.00	-15.10	48.51	-17.61	QP
5	846.740	28.90	46.00	-17.10	41.83	-12.93	QP
6	958.290	30.93	46.00	-15.07	42.48	-11.55	QP

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor
3. Over Limit = Level - Limit Line
4. The emission under 30MHz was not included since the emission levels are very low against the limit.

4. Band Edge

4.1. Test Setup

Radiated Emission Under 30 MHz



4.2. Limits

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in Section 15.209. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209

4.3. Test Procedure

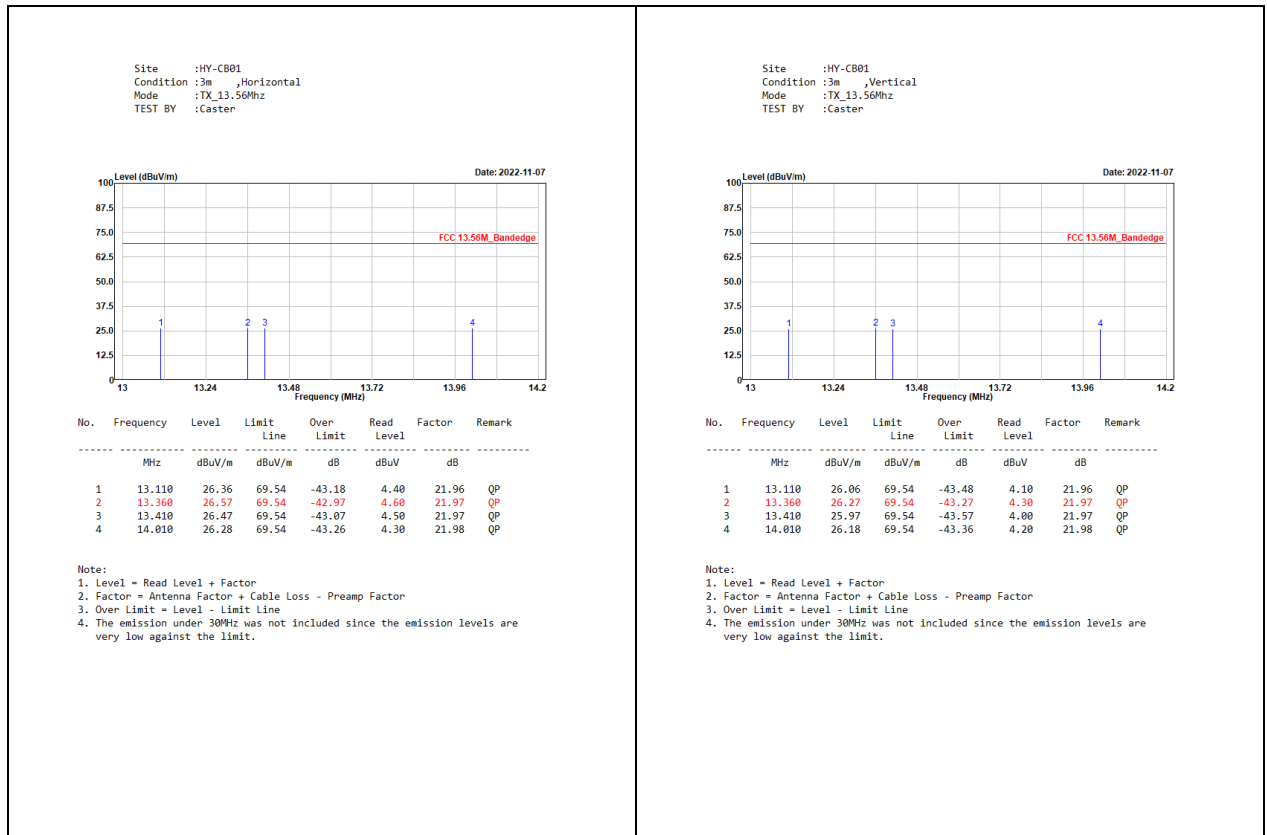
The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

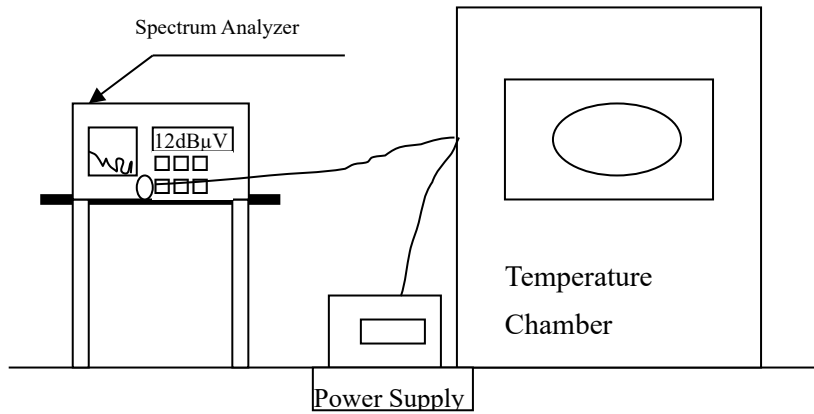
The bandwidth below 30 MHz setting on the field strength meter is 9 kHz and above 30 MHz is 120 kHz.

4.4. Test Result of Band Edge



5. Frequency Tolerance

5.1. Test Setup



5.2. Limits

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.

5.3. Test Procedure

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.4. Test Result of Frequency Stability

Product : Mobile Computer
 Test Item : Frequency Tolerance
 Test Mode : Transmit
 Test date : 2022/11/09

Temperature (°C)	Voltage (V)	Observe Time	Declared Frequency (MHz)	Read Frequency (MHz)	Tolerance (%)	Limit (%)
20	3.85	start	13.56	13.559826	-0.001283	± 0.01 %
		2mins	13.56	13.559830	-0.001254	
		5mins	13.56	13.559830	-0.001254	
		10mins	13.56	13.559830	-0.001254	
20	4.4	start	13.56	13.559826	-0.001283	± 0.01 %
		2mins	13.56	13.559826	-0.001283	
		5mins	13.56	13.559826	-0.001283	
		10mins	13.56	13.559826	-0.001283	
20	3.2	start	13.56	13.559826	-0.001283	± 0.01 %
		2mins	13.56	13.559855	-0.001069	
		5mins	13.56	13.559855	-0.001069	
		10mins	13.56	13.559855	-0.001069	
50	3.85	start	13.56	13.559834	-0.001227	± 0.01 %
		2mins	13.56	13.559834	-0.001227	
		5mins	13.56	13.559834	-0.001227	
		10mins	13.56	13.559834	-0.001227	
40	3.85	start	13.56	13.559841	-0.001174	± 0.01 %
		2mins	13.56	13.559841	-0.001174	
		5mins	13.56	13.559841	-0.001174	
		10mins	13.56	13.559841	-0.001174	
30	3.85	start	13.56	13.559855	-0.001067	± 0.01 %
		2mins	13.56	13.559855	-0.001067	
		5mins	13.56	13.559855	-0.001067	
		10mins	13.56	13.559855	-0.001067	

10	3.85	start	13.56	13.559841	-0.001173	± 0.01 %
		2mins	13.56	13.559841	-0.001173	
		5mins	13.56	13.559841	-0.001173	
		10mins	13.56	13.559840	-0.001180	
0	3.85	start	13.56	13.559894	-0.000782	± 0.01 %
		2mins	13.56	13.559883	-0.000863	
		5mins	13.56	13.559883	-0.000863	
		10mins	13.56	13.559883	-0.000863	
-10	3.85	start	13.56	13.559894	-0.000782	± 0.01 %
		2mins	13.56	13.559883	-0.000863	
		5mins	13.56	13.559883	-0.000863	
		10mins	13.56	13.559883	-0.000863	
-20	3.85	start	13.56	13.559884	-0.000855	± 0.01 %
		2mins	13.56	13.559442	-0.004115	
		5mins	13.56	13.559913	-0.000642	
		10mins	13.56	13.559913	-0.000642	