



EMC Test Report

Product Name: Smart Phone

Product Model: ELE-L29m, ELE-L09m

Report Number: SYBH(Z-EMC)20190401022001-2

FCC ID: QISELE-LX9m

Reliability Laboratory of Huawei Technologies Co., Ltd.

(Global Compliance and Testing Center of Huawei Technologies Co., Ltd.)

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Applicant: Huawei Technologies Co., Ltd.
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Date of Receipt Test Item: 2019-04-12
Start Date of Test: 2019-04-12
End Date of Test: 2019-04-28

Test Result: Pass

Approved By
(Lab Manager)

2019-04-29
Date

He Hao
Name

He Hao
Signature

Operator
(Test Engineer)

2019-04-29
Date

Li Tao
Name

Li Tao
Signature

Modification Record

No.	Last Report No.	Modification Description
1	NA	First report

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	Smart Phone
Model Number	ELE-L29m, ELE-L09m
Input voltage	DC 3.8V
TX Frequency	GSM 850: 824MHz – 849 MHz PCS1900: 1850MHz -1910 MHz WCDMA Band II: 1850 MHz -1910 MHz WCDMA Band IV: 1710 MHz -1755 MHz WCDMA Band V: 824 MHz - 849 MHz LTE BAND 2: 1850MHz to 1910MHz LTE BAND 4: 1710MHz to 1755MHz LTE BAND 5: 824MHz to 849MHz LTE BAND 7: 2500MHz to 2570MHz LTE BAND 12: 699MHz to 716MHz LTE BAND 17: 704MHz to 716MHz LTE BAND 26: 814MHz to 849MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 41: 2535MHz to 2655MHz 2.4G WIFI: 2400MHz to 2472 MHz Bluetooth: 2400MHz to 2483.5MHz 5G WIFI:5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5825MHz NFC: 13.56MHz
RX Frequency	GSM 850: 869MHz to 894MHz GSM 1900: 1930MHz to 1990MHz WCDMA Band II: 1930MHz to 1990MHz WCDMA Band IV: 2110MHz to 2155MHz WCDMA Band V: 869MHz to 894MHz LTE BAND 2: 1930MHz to 1990MHz LTE BAND 4: 2110MHz to 2155MHz LTE BAND 5: 869MHz to 894MHz LTE BAND 7: 2620MHz to 2690MHz LTE BAND 12: 729MHz to 746MHz LTE BAND 17: 704MHz to 716MHz LTE BAND 26: 859MHz to 894MHz LTE BAND 38: 2570MHz to 2620MHz LTE BAND 41: 2535MHz to 2655MHz 2.4G WIFI: 2400MHz to 2472 MHz Bluetooth: 2400MHz to 2483.5MHz 5G WIFI:5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5825MHz GPS/ Galileo: 1575.42MHz/1176.45MHz BDS: 1561.098MHz GLONASS: 1602.5625MHz NFC: 13.56MHz
S/N	WSV0119306000070
HW Version	HL3ELLEM
SW Version	5.0.1.130 (SP2C432E131R1P11)

EUT Accessory	
Data cable(04071722)	Data Cable USB A Male to Micro USB, shielded Manufacturer: LUXSHARE Precision Industry Co., Ltd. HUIZHOU DEHONG TECHNOLOGY CO.,LTD. Ningbo Broad Telecommunication Co., Ltd.
Adapter	Manufacture: Huawei Technologies Co.,Ltd. Model: HW-050450B00 Input voltage: 100V-240V~50/60Hz, 0.75A Output voltage: 5V  2A OR 4.5V  5A OR 5V  4.5A Rated Power: 10W/22.5W S/N: H82922H3J31705 K82971H3R11886 C829Y7J7201630
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450E00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V  2A OR 5V  4.5A OR 4.5V  5A Rated Power: 10W/22.5W SN:H83010H7412711 K83059H4V07826 C83002H9V04052
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450U00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V  2A OR 5V  4.5A OR 4.5V  5A Rated Power: 10W/22.5W SN:H828K8H5303249 K82869HB800037 C82820HCJ00891
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450A00 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V  2A OR 5V  4.5A OR 4.5V  5A Rated Power: 10W/22.5W SN:H83111H3S04782 K83171H4J05584
Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450E01 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V  2A OR 5V  4.5A OR 4.5V  5A Rated Power: 10W/22.5W SN: CA37Y9J7J00262

Adapter	Manufacturer: Huawei Technologies Co.,Ltd. Model: HW-050450A01 Input voltage: 100-240V 50/60Hz ,0.75A Output voltage: 5V  2A OR 5V  4.5A OR 4.5V  5A Rated Power: 10W/22.5W SN: CA37Y6J6H01746
Rechargeable Li-ion	Manufacture: Huawei Technologies Co.,Ltd. Battery Model: HB436380ECW Rated capacity: 3550mAh Nominal Voltage: :  +3.85V Charging Voltage:  +4.43V S/N: 201810256BYJSIIA25X0011E 201809106ECDAll1910X00308 201809196BYCAYI1919X00333
Earphone(22040229)	Model: MEMD1632B580C00 Manufacturer: Jiangxi Lianchuang Hongsheng Electronic Co. ,LTD
Earphone(22040229)	Model: EMC309-001 Manufacturer: MERRY ELECTRONICS (SHENZHEN) CO., LTD.
Earphone(22040229)	Model: 1311-3291-3.5mm-229 Manufacturer: Boluo County Quancheng Electronic Co.,ltd

Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.

1.2 Differences Description

ELE-L09m and ELE-L29m are same except SIM card. ELE-L29m has dual SIM card, and ELE-L09m has single SIM card. With the consideration of difference, all the EMC tests were tested on the model ELE-L29m.

1.3 Test Site Information

Test Site 1:	Reliability Laboratory of Huawei Technologies Co., Ltd. Global Compliance and Testing Center of Huawei Technologies Co., Ltd.
Test Site Location:	No.2, New City Avenue, Songshan Lake Sci. & Tech. Industry Park, Dongguan, 523808, P.R.C

1.4 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15, Subpart B

2 Summary of Results

Summary of Results				
Test Items	Test Mode	Performance Class & Required Performance Criteria	Result	Site
<u>Radiated Emissions</u> Enclosure Port	Mode 2~ Mode 7	CLASS B	Pass	Site1
<u>Conducted Emissions</u> ☒ DC Power Port ☒ AC Power Port ☐ Telecommunication Ports	Mode 1~ Mode 7	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the uncertainty of test system. 2, ☒ The item has been tested; ☐ The item has not been tested.				

During the measurement, the environmental conditions complied with the range listed as below.

Item	Required
Ambient temperature	15°C ~ 35°C
Relative humidity	25% ~ 75%
Atmospheric pressure	86kPa ~ 106kPa

3 System Configuration during EMC Test

3.1 Test Mode

The EUT was configured, installed, arranged and operated in a manner consistent with typical application. The following mode(s) were applied during the compliance test.

Test Mode	
Mode 1:	Charging +traffic +WIFI+BT+NFC+GNSS On +Earphone
Mode 2:	Charging + Camera On+ Earphone +idle
Mode 3:	Charging +Video Playing+ Earphone +idle
Mode 4:	Charging + Wireless Charging Case+ Video Playing + Earphone +idle
Mode 5:	Charging +Wireless charging charger+ Wireless Charging Case +Video Playing+ Earphone +idle
Mode 6:	USB Copy(EUT with PC) +Earphone
Mode 7:	USB&DP+ Earphone +Display

Remark:

- 1) If there is one kind of accessories with different models, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.
- 2) If EUT has more than one typical operation, only the worst test mode will be recorded in this report.

Traffic Mode:

When the EUT state is switched on and with Radio Resource Control (RRC) connection established.

Idle Mode:

When the EUT state is switched on but without Radio Resource Control (RRC) connection.

Worst Case:

Radiated Emission:

Adapter (Model: HW-050450E01, SN: CA37Y9J7J00262) + Charging + Wireless Charging Case+ Video Playing+ Earphone +idle

the result is the worst (30MHz~1GHz).

Adapter (Model: HW-050450E01, SN: CA37Y9J7J00262) + Charging + Wireless Charging Case+ Video Playing+ Earphone +idle

the result is the worst (1GHz~40GHz).

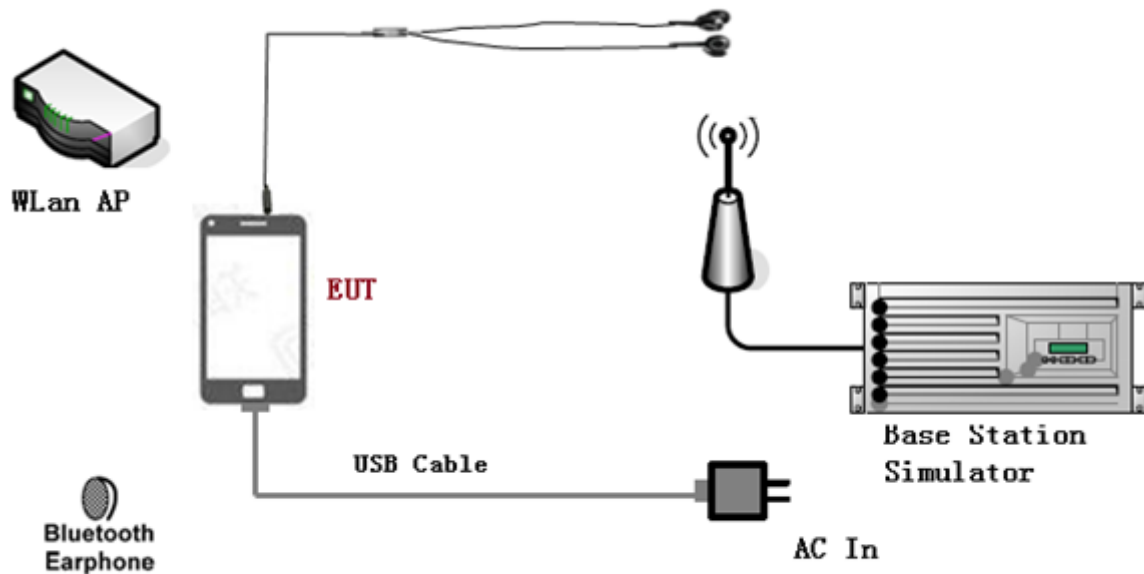
Conducted Emission:

Adapter (Model: HW-050450U00, SN: C82820HCJ00891) + Charging+Wireless charging charger+ Wireless Charging Case + Video Playing + Earphone +idle

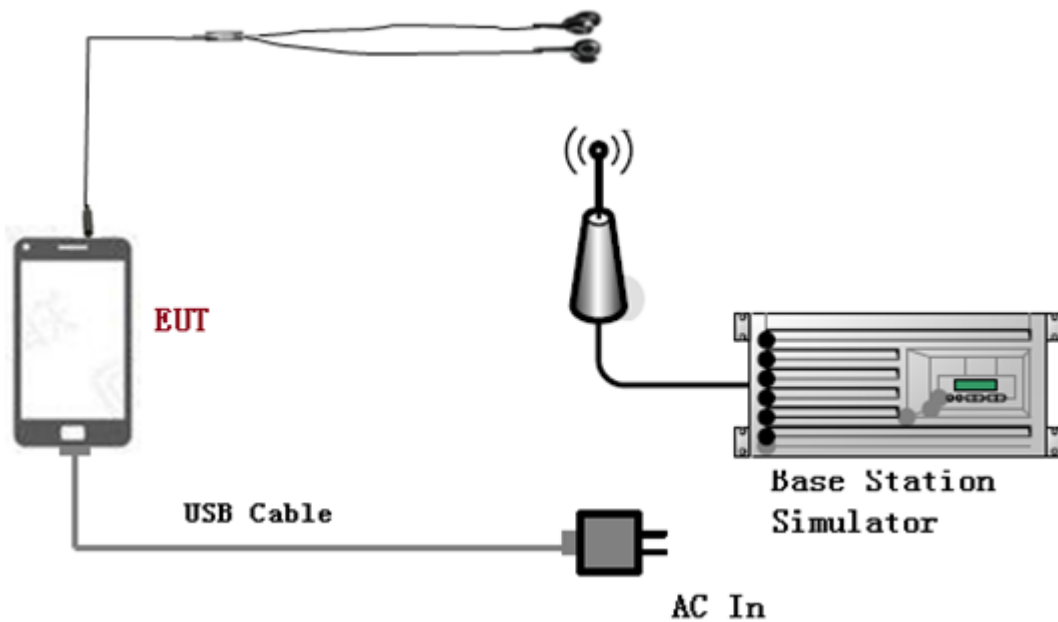
the result is the worst.

3.2 Test System Configuration

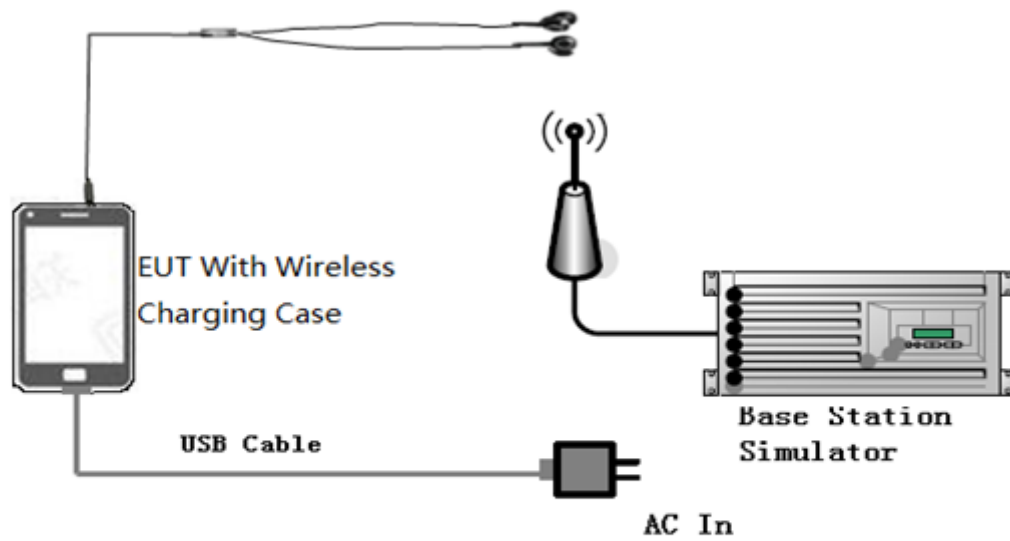
Connection Diagram (Mode 1)



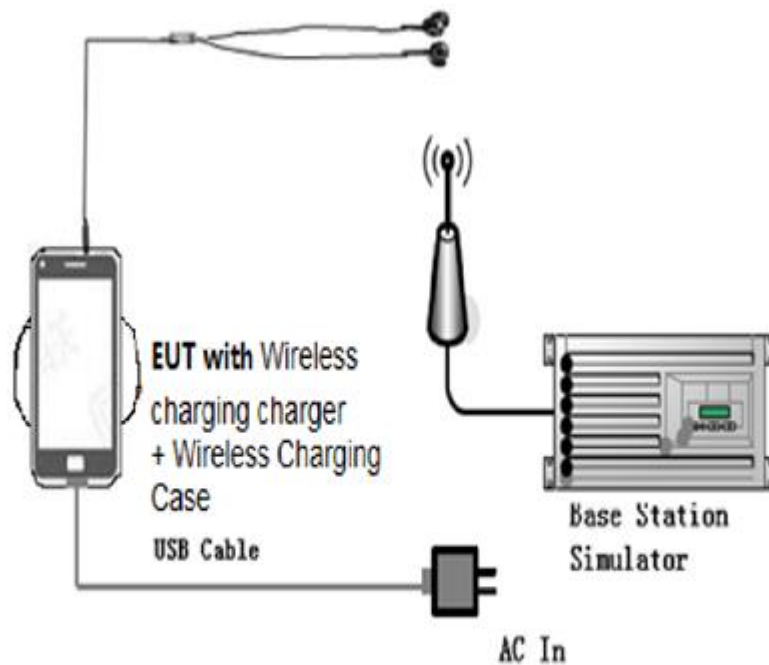
Connection Diagram (Mode 2~3)



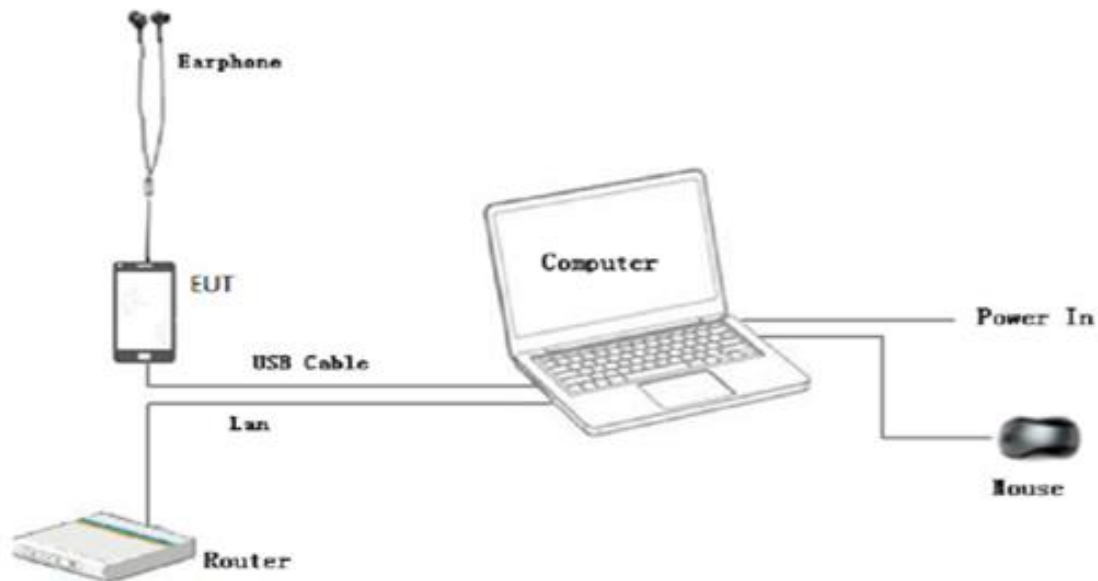
Connection Diagram (Mode 4)



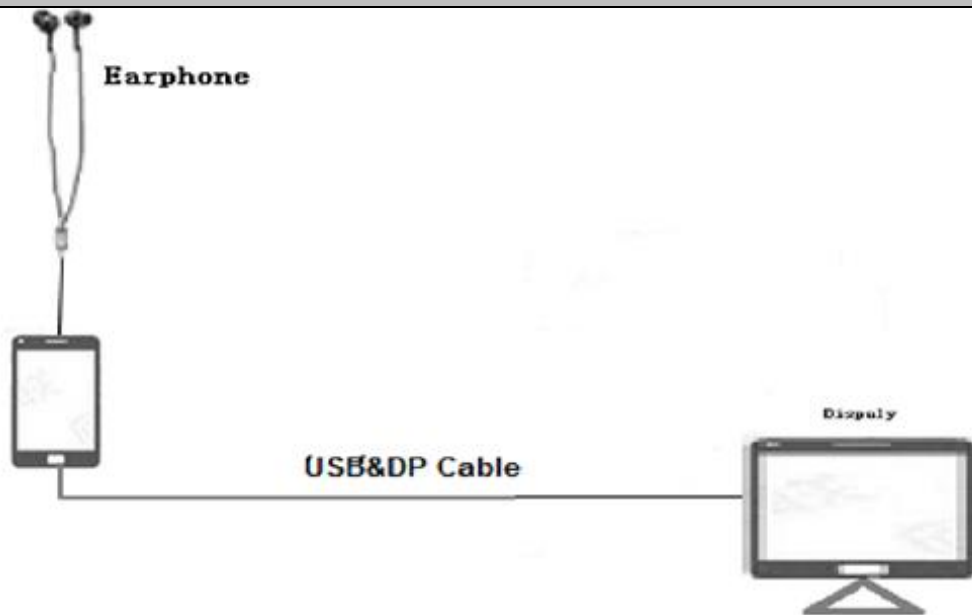
Connection Diagram (Mode 5)



Connection Diagram (Mode 6)



Connection Diagram (Mode 7)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
Earphone	1	<3m	Unshielded
USB	1	<3m	shielded
USB&DP cable	1	<3m	Shielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval
Radio Communication Tester	CMU200	R&S	3608082535	2019-05-07	12
Radio Communication Tester	MT8820C	Anritsu	A110518805	2019-05-08	12
Notebook	S3	ThinkPad	A140714638	/	/
Mouse	M-U0025-O	Lenovo	HS423HB22TB	/	/
display	L197	Lenovo	8M03373A0956983	/	/
Wireless charging charger	CP60	Huawei Technologies Co.,Ltd.	2155030314C088000033	/	/
Wireless charging case	Manufacturer: Huawei Technologies Co., Ltd. Wireless charging power: 10W max S/N :2155030684TR91000017 Charging efficiency: >75% Working temperature: 10 °C~40 °C Storage temperature: -40 °C~70°C RX:110KHz to 140KHz				

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 40GHz

4.1.1 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4-2014. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2014.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 40GHz by using test script of software; The emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m. The azimuth range of turntable was 0° to 360°. The receiving antenna has two polarizations V and H.

Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;

Measurement bandwidth (RBW) for 1000MHz to 40000 MHz: 1MHz;

EUT was configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

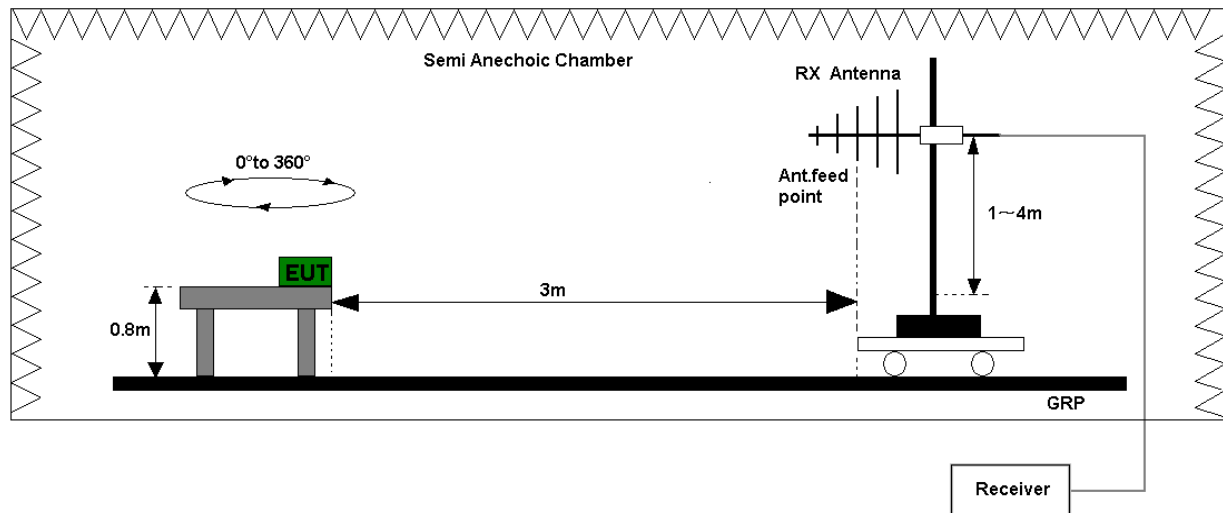


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

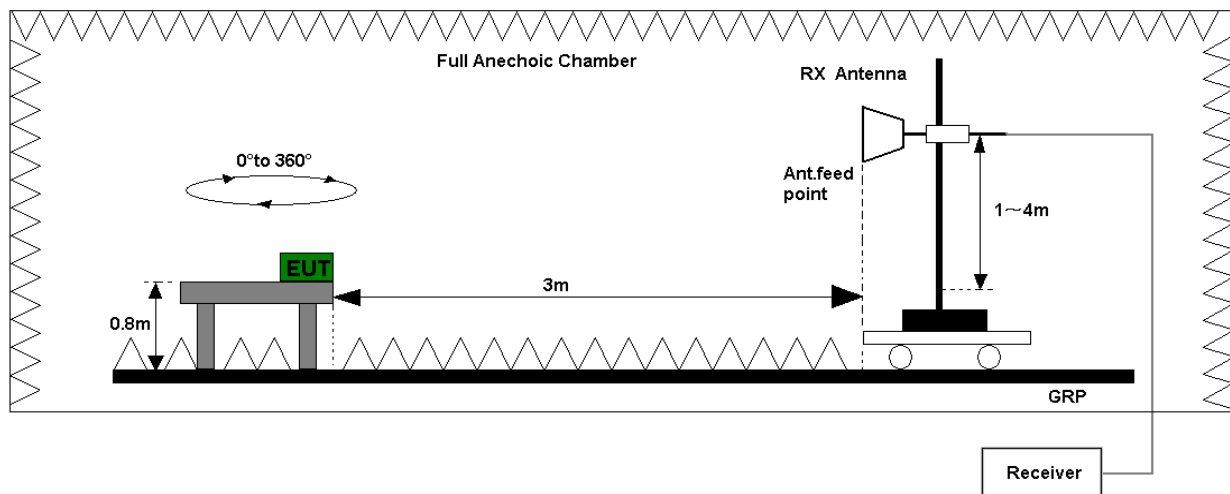


Figure 2. Test set-up of radiated disturbance(above 1GHz)

4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
Refer to the section 7 of this report for test data.

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μ V/m)		Unit(dB μ V/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74

4.2 Conducted Disturbance 0.15 MHz to 30MHz

4.2.1 Test Procedure

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm away from LISN. The set-up and test methods were according to ANSI C63.4-2014. Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector. EUT was communicated with the simulator through Air interface, the simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.

Measurement bandwidth (RBW) for 150 kHz to 30 MHz: 9 kHz;

The EUT was set in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

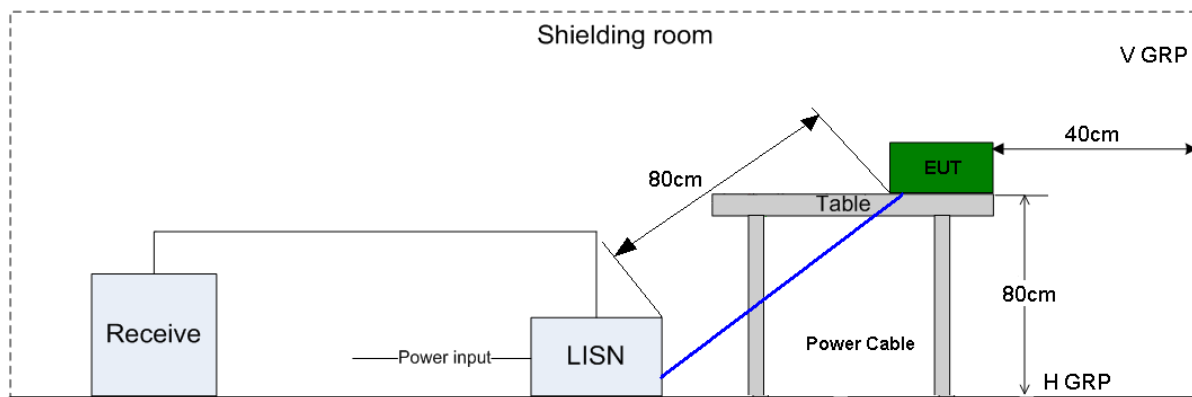


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.
Refer to the section 7 of this report for test data.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP (dBμV)	AV (dBμV)
0.15MHz~0.5MHz	66-56	56-46
0.5MHz-5MHz	56	46
5MHz~30MHz	60	50

5 Main Test Instruments

Main Test Equipments						
Test item	Test Instrument	Model	S/N	Manufacturer	Calibrated Deadline	Cal interval
RE	EMI Test Receiver	ESU26	100387	R&S	Jan.14, 2020	12
	Spectrum Analyzer	FSU43	100144	R&S	Jan.14, 2020	12
	Broadband Antenna	VULB 9163	9163-491	SCHWARZ BECK	Feb. 21, 2021	24
	Horn Antenna(1G-18G)	HF906	100683	R&S	Mar. 01, 2020	24
	Horn Antenna(18G-26.5G)	3160-09	00206665	ETS-Lindgren	Apr. 20, 2020	24
	Horn Antenna(26.5G-40G)	3160-10	00205695	ETS-Lindgren	Apr. 20, 2020	24
CE	EMI Test receiver	ESCI	101163	R&S	Jan. 14, 2020	12
	Artificial Mains Network	ENV216	100382	R&S	Feb. 29, 2020	12
Software Information						
Test Item	Software Name	Manufacturer		Version		
RE	EMC32	R&S		V9.25.0		
CE	EMC32	R&S		V9.25.0		

6 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty		
Items		Extended Uncertainty
RE(30MHz-1GHz)	Field strength (dBμV/m)	U=5.24dB; k=2
RE(1GHz-18GHz)	Field strength (dBμV/m)	U=4.84dB; k=2
RE(18 GHz-26.5GHz)	Field strength (dBμV/m)	U=4.62dB; k=2
RE (26.5 GHz- 40GHz)	Field strength (dBμV/m)	U=5.12dB; k=2
CE	Disturbance Voltage (dBμV)	U=2.3dB; k=2

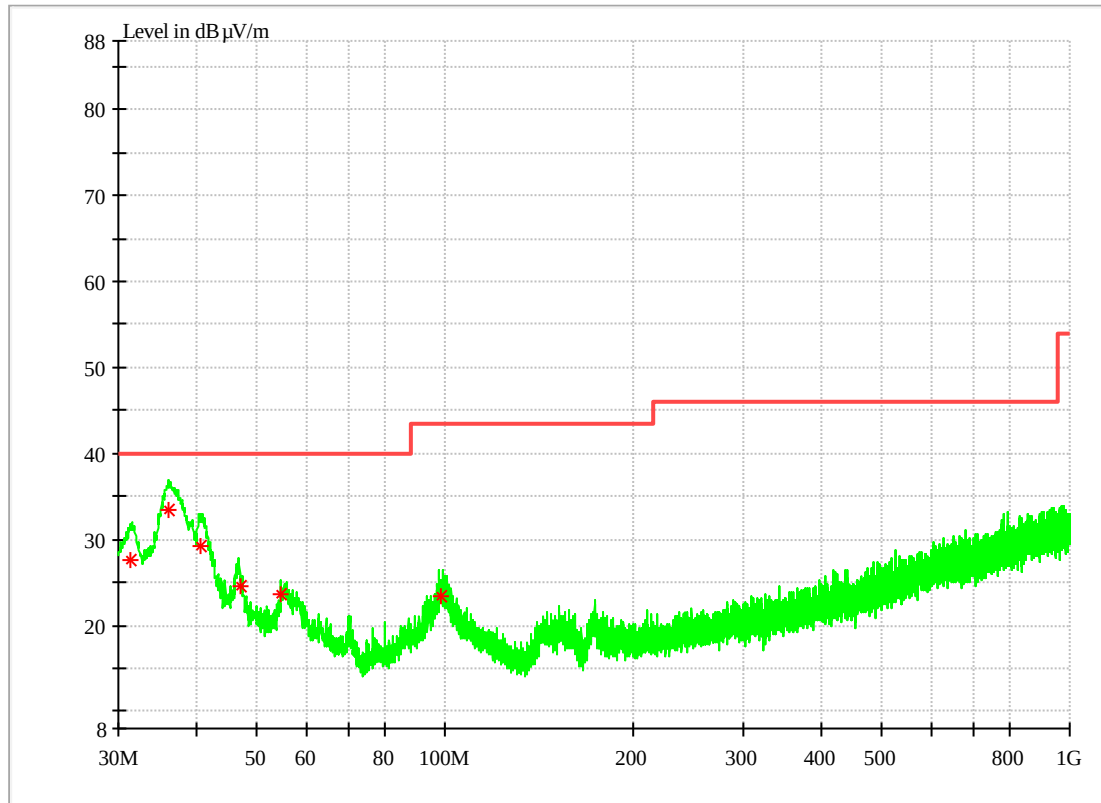
7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Test Mode 4: Charging + Wireless Charging Case+ Video Playing+ Earphone +idle



MEASUREMENT RESULT: QP Detector

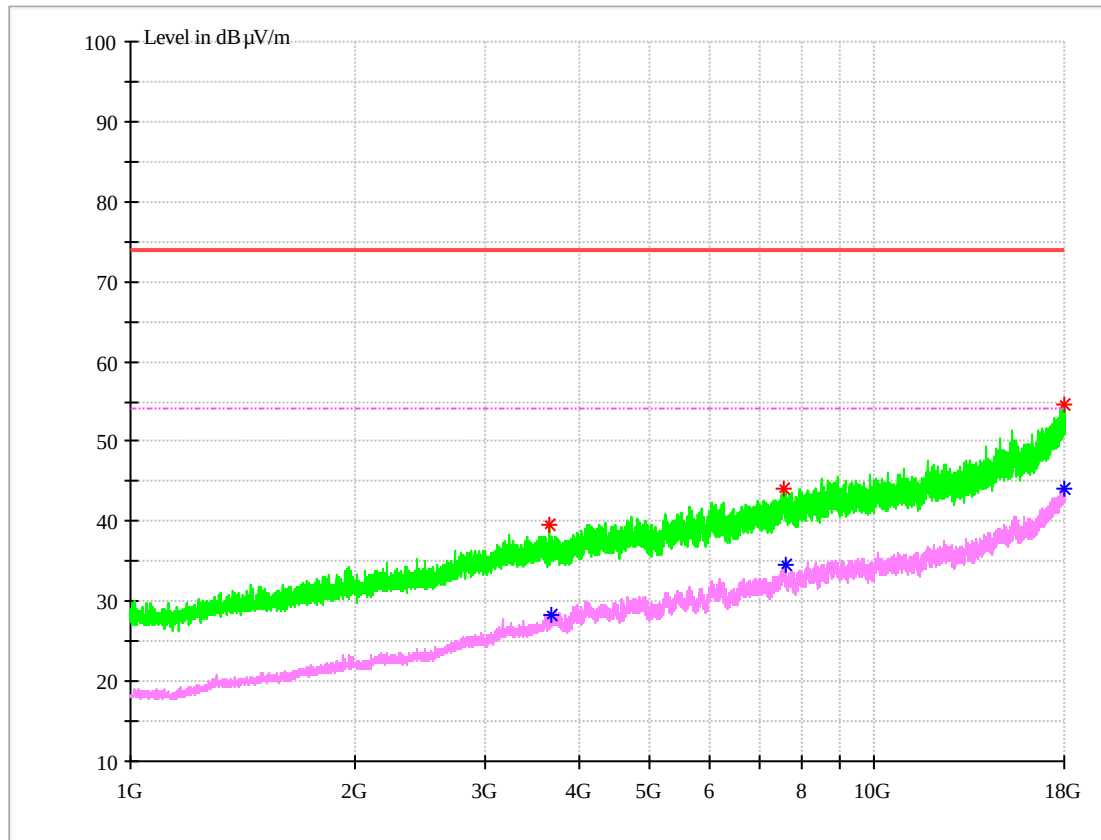
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
31.389740	27.50	12.6	40.00	12.50	100.0	48.0	V
36.211280	33.43	13.2	40.00	6.57	102.0	274.0	V
40.570000	29.29	14.5	40.00	10.71	101.0	87.0	V
46.929400	24.52	13.9	40.00	15.48	113.0	178.0	V
54.691180	23.58	13.5	40.00	16.42	101.0	31.0	V
98.486380	23.39	13.9	43.50	20.11	100.0	139.0	V

Note:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.1.2 1GHz~18GHz

Test Mode 4: Charging + Wireless Charging Case+ Video Playing+ Earphone +idle



MEASUREMENT RESULT: PK Detector

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3654.266667	39.46	-6.3	74.00	34.54	100.0	235.0	H
7548.400000	44.05	1.1	74.00	29.95	100.0	131.0	H
17984.133333	54.61	14.60	74.00	19.39	100.0	64.0	H

MEASUREMENT RESULT: AV Detector

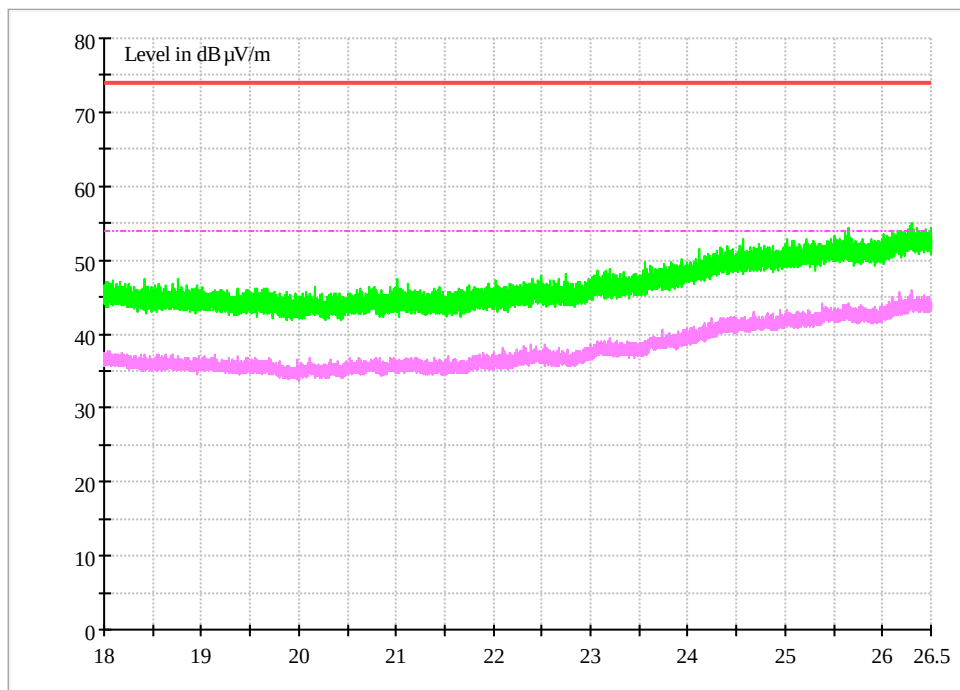
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg	Polarisation
3667.300000	28.21	-6.2	54.00	25.79	100.0	0	H
7584.666667	34.45	1.1	54.00	19.55	100.0	2.0	V
17967.700000	44.18	14.6	54.00	9.82	100.0	233.0	V

Note:

Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

7.1.3 18GHz~26.5GHz

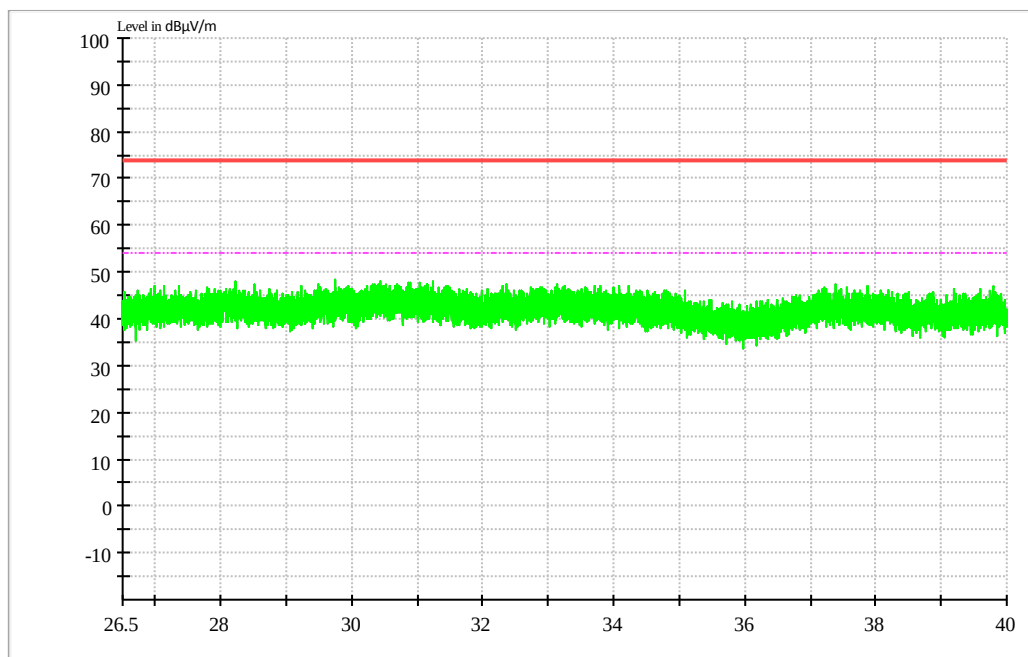
Test Mode 4: Charging + Wireless Charging Case+ Video Playing+ Earphone +idle



NOTE 1: No peak found in the Test Range of "18GHz to 26.5GHz".

7.1.4 26.5GHz~40GHz

Test Mode 4: Charging + Wireless Charging Case+ Video Playing+ Earphone +idle



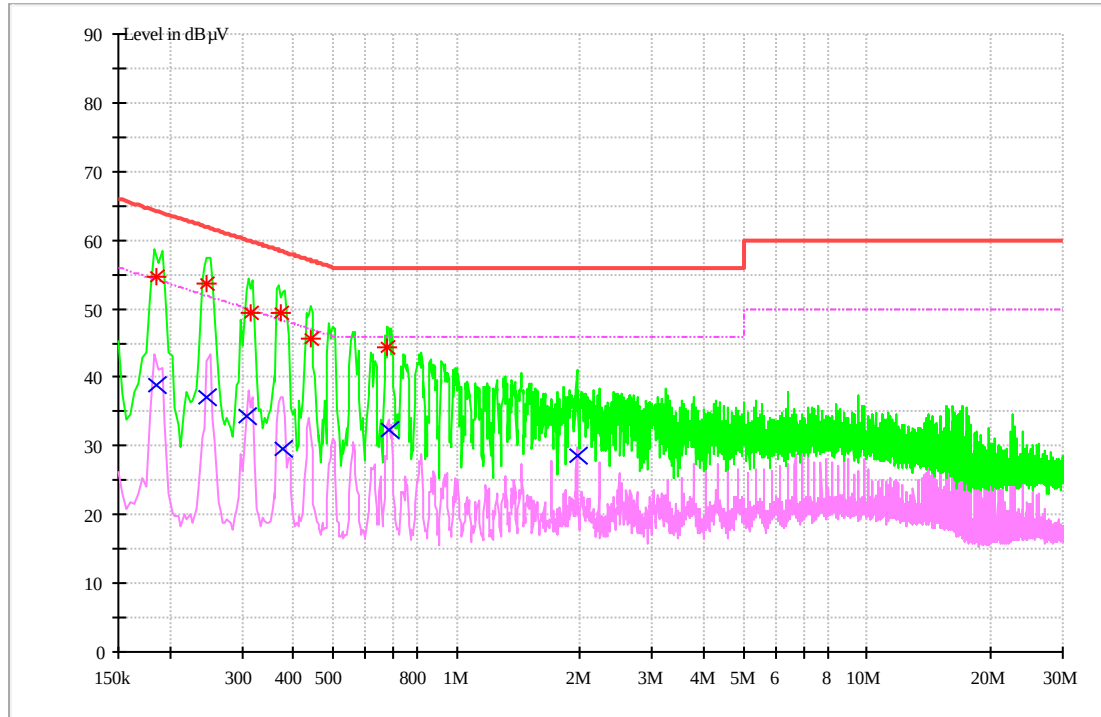
NOTE 1: The data was measured by Peak detector.

NOTE 2: No peak found in the Test Range of "26.5GHz to 40GHz".

7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Test Mode 5: Charging +Wireless charging charger+ Wireless Charging Case +Video Playing+ Earphone +idle



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.185015	54.65	L1	9.7	9.61	64.26	FLO
0.247069	53.61	L1	9.7	8.25	61.86	FLO
0.313945	49.41	N	9.7	10.46	59.87	FLO
0.371239	49.41	L1	9.7	9.06	58.47	FLO
0.443693	45.59	L1	9.7	11.40	56.99	FLO
0.679416	44.29	L1	9.7	11.71	56.00	FLO

MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBμV	Line	Transd dB	Margin dB	Limit dBμV	PE
0.186535	38.81	L1	9.7	15.38	54.19	FLO
0.246710	37.18	L1	9.7	14.69	51.87	FLO
0.308881	34.36	L1	9.7	15.64	50.00	FLO
0.378900	29.50	N	9.7	18.80	48.30	FLO
0.681865	32.30	L1	9.7	13.70	46.00	FLO
1.965270	28.63	N	9.7	17.37	46.00	FLO

-----END-----