FCC TEST REPORT

FCC ID	:	**2AEIM-WC4**
Equipment	:	**Wireless Phone Charger**
Brand Name	:	**Tesla**
Model Name	:	**WC4**
Applicant	:	**Tesla Motors, Inc. 3500 Deer Creek Road Palo Alto, California US 94304 United States Of America**
Manufacturer	:	**Tesla Motors, Inc. 3500 Deer Creek Road Palo Alto, California US 94304 United States Of America**
Standard	:	**47 CFR FCC Part 15.209**

The product was received on Sep. 25, 2020, and testing was started from Oct. 21, 2020 and completed on Dec. 16, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR092529AW	01	Initial issue of report	Jan. 11, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
3.1	15.207	AC Power-line Conducted Emissions	PASS	-
3.2	15.209	Transmitter Radiated Emissions	PASS	-
3.3	15.215(c)	Emission Bandwidth	PASS	-

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:
None.

Reviewed by: Sam Tsai

Report Producer: Ann Hou

1 General Description

1.1 Information

1.1.1 General Information

Wireless Power Transfer General Information			
Frequency Range	**Modulation Mode**	**Charging Freq. (kHz)**	**Field Strength (dBuV/m)**
120-130 kHz	FSK	127.7	100.05
Power Transfer Method	**Output power from each primary coil**	**That may have multiple primary coils**	**Charging Method**
Multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.	<15W	Yes	Client directly contact
Note 1: Field strength performed peak level at 3m.			

1.1.2 Antenna Information

Antenna Category	
☐	Equipment placed on the market without antennas
☒	Integral antenna (antenna permanently attached)
	☐ Temporary RF connector provided
	☒ No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
☐	External antenna (dedicated antennas)

Antenna General Information		
No.	**Ant. Cat.**	**Ant. Type**
1	Integral	Wireless charging antenna coils

1.1.3 EUT Information

Operational Condition	
EUT Power Type	From DC Power supply
Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.:
☐	Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.:
☐	Other:

1.1.4 Test Signal Duty Cycle

Operated Mode for Worst Duty Cycle	
☒	Operated normally mode for worst duty cycle
☐	Operated test mode for worst duty cycle
Test Signal Duty Cycle (x)	
☒	100%

1.2 Testing Applied Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- KDB 680106 D01 RF Exposure Wireless Charging Apps v03
- KDB 414788 D01 v01r01

1.3 Testing Location Information

Testing Location			
☒	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
Test site Designation No. TW1190 with FCC.			
☐	Wen Shan	ADD : No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	
		TEL : 886-3-318-0787	FAX : 886-3-318-0287
Test site Designation No. TW1097 with FCC.			

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction	CO04-HY	Daniel	20.5~22.8°C / 51~61%	14/Dec/2020~ 16/Dec/2020
RF Conducted	TH06-HY	Alan	20.1~26.9°C / 50~60%	30/Nov/2020~ 02/Dec/2020
Radiated Emission	03CH02-HY	Daniel	20.2~22.5°C / 52~64%	21/Oct/2020~ 12/Dec/2020

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Condition

Condition Item	Abbreviation/Remark	Remark
Tnom Vnom	Tnom	20°C
-	Vnom	12V

2.2 The Worst Case Configuration

Mode	Field Strength (dBuV/m at 3 m)	Charger Frequencies (kHz)	Power Setting
WPC	100.05	127.7	default
Note.1: Wireless charger were performed all charging conditions including variable loading and non-charging operation, the worst mode is full charging loading. Note.2: Wireless charger frequencies are variable frequency range (120-130 kHz) and depend on charging loading.			

2.3 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral
Operating Mode	CTX
	☒ 1. DC Power Supply mode

The Worst Case Mode for Following Conformance Tests		
Tests Item	Transmitter Radiated Emissions, Emission Bandwidth	
Test Condition	Radiated measurement	
Operating Mode	CTX	
	☒	1. DC Power Supply mode
Orthogonal Planes of EUT	**Z Plane**	
		

2.4 Support Equipment

Support Equipment – AC Conduction					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Load*2	HW	HW-T0202-RX-V1.1	-	Note 1
2	DC Power Supply	GW	GPR-3510HD	-	-
3	AC Power Cable for DC Power Supply	Power sync	PW-GPC180-3	-	-
4	DC Power cable	MiSUMi	WTN1227-RED	-	Note 1
5	DC Power cable	MiSUMi	WTN1227-BLACK	-	Note 1
6	DC Power cable	GW	GPR-3510HD-01 -RED	-	-
7	DC Power cable	GW	GPR-3510HD-01 -BLACK	-	-

Note 1: No.1, 4, 5 was provided by customer.

Support Equipment – Conducted					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Load*2	HW	HW-T0202-RX-V1.1	-	Note 1
2	DC Power Supply	GW	GPS-3030DD	-	-
3	DC Power cable	MiSUMi	WTN1227-RED	-	Note 1
4	DC Power cable	MiSUMi	WTN1227-BLACK	-	Note 1
5	DC Power cable	GW	GPR-3510HD-01 -RED	-	-
6	DC Power cable	GW	GPR-3510HD-01 -BLACK	-	-

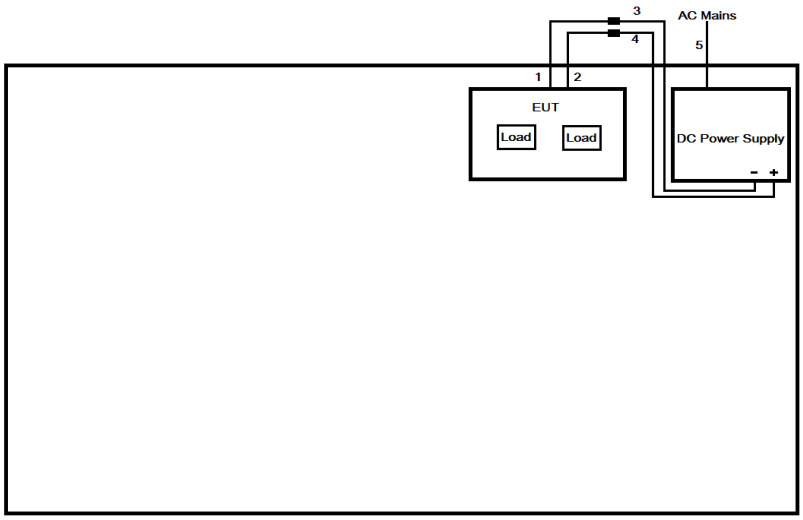
Note 1: No.1, 3, 4 was provided by customer.

Support Equipment – Radiated					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Load*2	HW	HW-T0202-RX-V1.1	-	Note 1
2	DC Power Supply	GW	GPR-3510HD	-	-
3	AC Power Cable for DC Power Supply	Power sync	PW-GPC180-3	-	-
4	DC Power cable	MiSUMi	WTN1227-RED	-	Note 1
5	DC Power cable	MiSUMi	WTN1227-BLACK	-	Note 1
6	DC Power cable	GW	GPR-3510HD-01 -RED	-	-
7	DC Power cable	GW	GPR-3510HD-01 -BLACK	-	-

Note 1: No.1, 4, 5 was provided by customer.

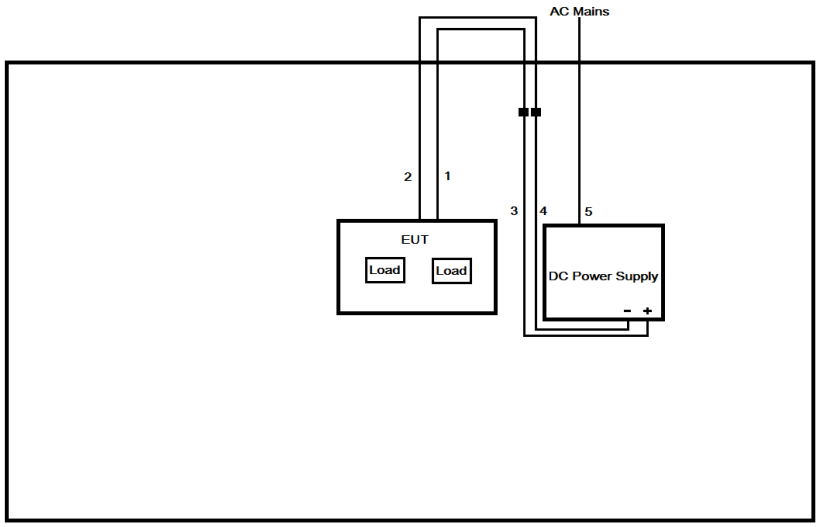
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)
1	DC Power cable(-)	No	1.7
2	DC Power cable(+)	No	1.7
3	DC Power cable(-)	No	1.0
4	DC Power cable(+)	No	1.0
5	AC Power cable	No	1.8

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)
1	DC Power cable(-)	No	1.7
2	DC Power cable(+)	No	1.7
3	DC Power cable(+)	No	1.0
4	DC Power cable(-)	No	1.0
5	AC Power cable	No	1.8

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

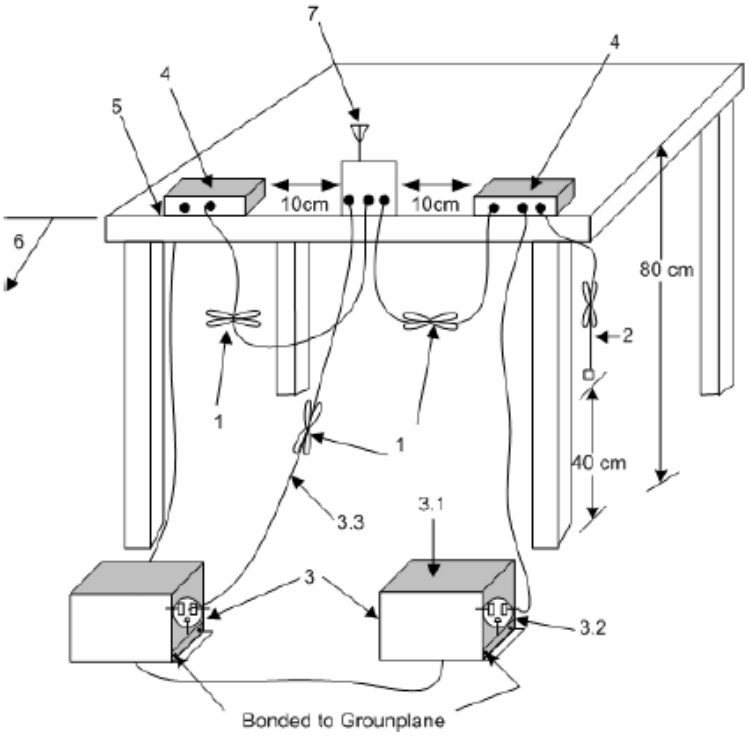
Test Method	
☒	Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.
☒	If AC conducted emissions fall in operating band, then following below test method confirm final result.
☐	Accept measurements done with a suitable dummy load replacing the antenna under the following conditions: (1) Perform the AC line conducted tests with the antenna connected to determine compliance with FCC 15.207 limits outside the transmitter's fundamental emission band; (2) Retest with a dummy load to determine compliance with FCC 15.207 limits within the transmitter's fundamental emission band.
☒	For a device with a permanent antenna operating at or below 30 MHz, accept measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) Perform the AC line conducted tests with the permanent antenna to determine compliance with the FCC 15.207 limits outside the transmitter's fundamental emission band; (2) Retest with a dummy load in lieu of the permanent antenna to determine compliance with the FCC 15.207 limits within the transmitter's fundamental emission band.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Raw(Read Level) +LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

3.1.5 Test Setup

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Transmitter Radiated Emissions

3.2.1 Transmitter Radiated Emissions Limit

Transmitter Radiated Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: the frequency bands 9-90 kHz, 110-490 kHz measurements employing an average detector and other below 1GHz measurements employing a CISPR quasi-peak detector.

3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

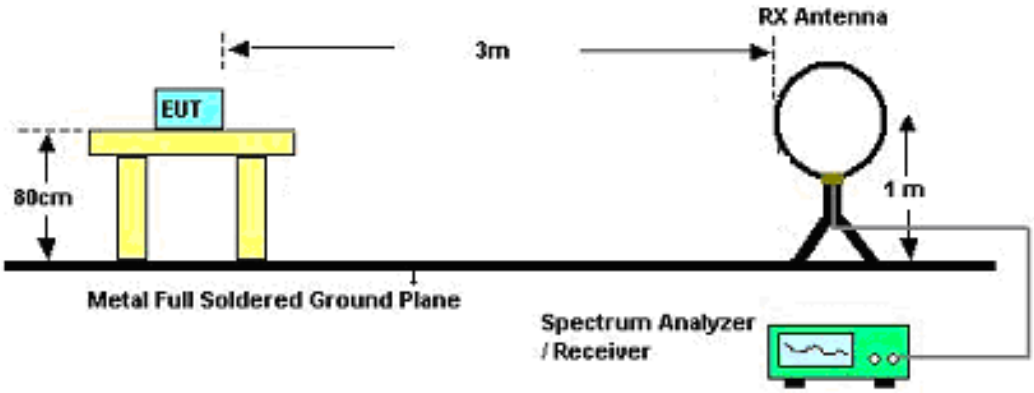
Test Method	
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz the frequency bands 9-90 kHz, 110-490 kHz measurements employing an average detector and other below 30MHz measurements employing a CISPR quasi-peak detector. Test distance is 3 m.
☒	At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be following below methods.
☐	The results shall be extrapolated to the specified distance by making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor.
☒	The results shall be by using the square of an inverse linear distance extrapolation factor (40 dB/decade).
☒	For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.
☒	The any unwanted emissions level shall not exceed the fundamental emission level.
☒	All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
☒	KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.
☒	Based on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
☒	Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

3.2.4 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

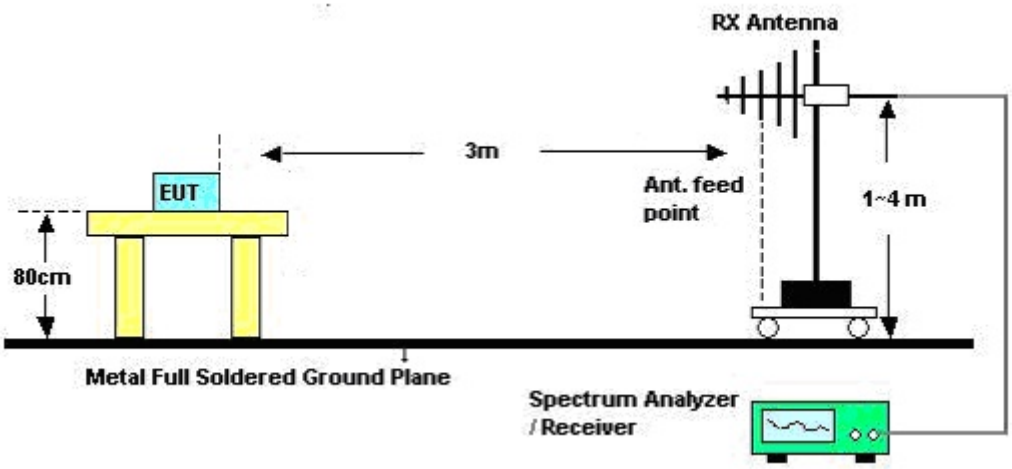
3.2.5 Test Setup

Transmitter Radiated Emissions (Below 30MHz)



Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna.

Transmitter Radiated Unwanted Emissions (Below 1GHz)



Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna.

3.2.6 Transmitter Radiated Emissions

Refer as Appendix B

3.3 Emission Bandwidth

3.3.1 Emission Bandwidth Limit

Emission Bandwidth Limit
N/A

3.3.2 Measuring Instruments

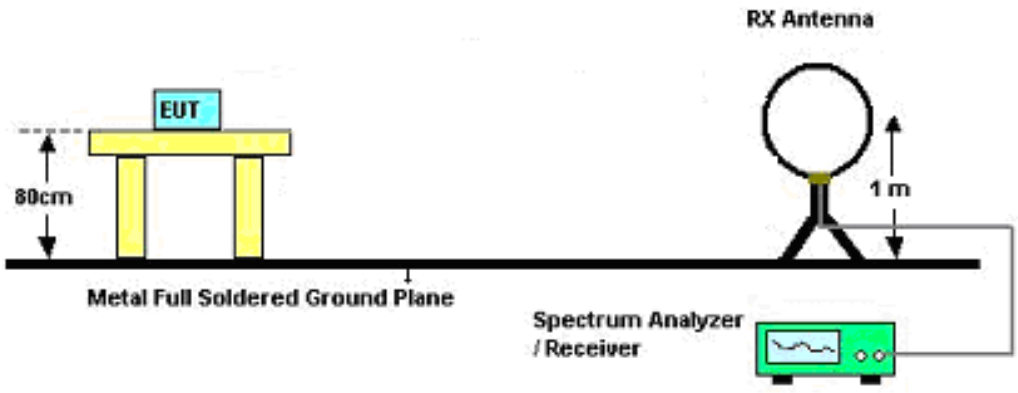
Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method	
☒	Because the measured signal is CW or CW-like adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.
☒	For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level.

3.3.4 Test Setup

Emission Bandwidth



3.3.5 Test Result of Emission Bandwidth

Refer as Appendix C

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR3	102051	9kHz ~ 3.6GHz	29/May/2020	28/May/2021
LISN	R&S	ENV216	101295	9kHz ~ 30MHz	11/Nov/2020	10/Nov/2021
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz ~ 200MHz	31/Aug/2020	30/Aug/2021
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	21/Sep/2020	20/Sep/2021

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101029	10Hz~40GHz	19/Oct/2020	18/Oct/2021

Instrument for Radiated Test

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	04/Aug/2020	03/Aug/2021
Signal Analyzer	R&S	FSP40	100593	9kHz~40GHz	27/Feb/2020	26/Feb/2021
Amplifier	Agilent	8447D	2944A11149	100kHz~1.3GHz	30/Jun/2020	29/Jun/2021
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	06/Sep/2020	05/Sep/2021
RF Cable-R03m	Jye Bao	RG142	CB017	9kHz~30MHz	20/Jun/2020	19/Jun/2021
RF Cable-R03m	Jye Bao	RG142	CB017	30MHz~1GHz	25/Mar/2020	24/Mar/2021
RF Cable-R03m	HUBER+SUHNER	SUCOFLEX104	805193/4+ 805192/4	1GHz~40GHz	08/Apr/2020	07/Apr/2021
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2020	15/Mar/2021
EMI Test Receiver	R&S	ESR3	102051	9kHz~3.6GHz	29/May/2020	28/May/2021

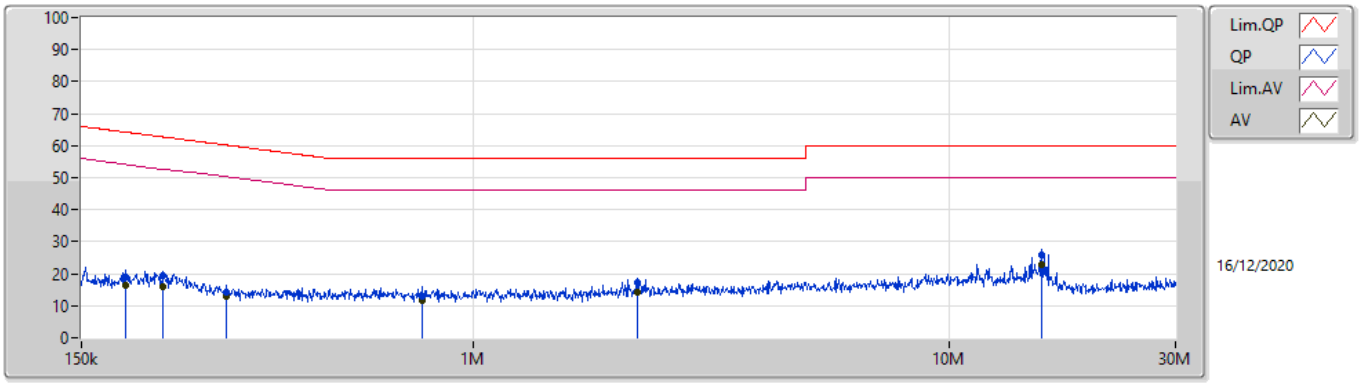
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	15.699M	26.47	50.00	-23.53	Neutral

Mode Configure

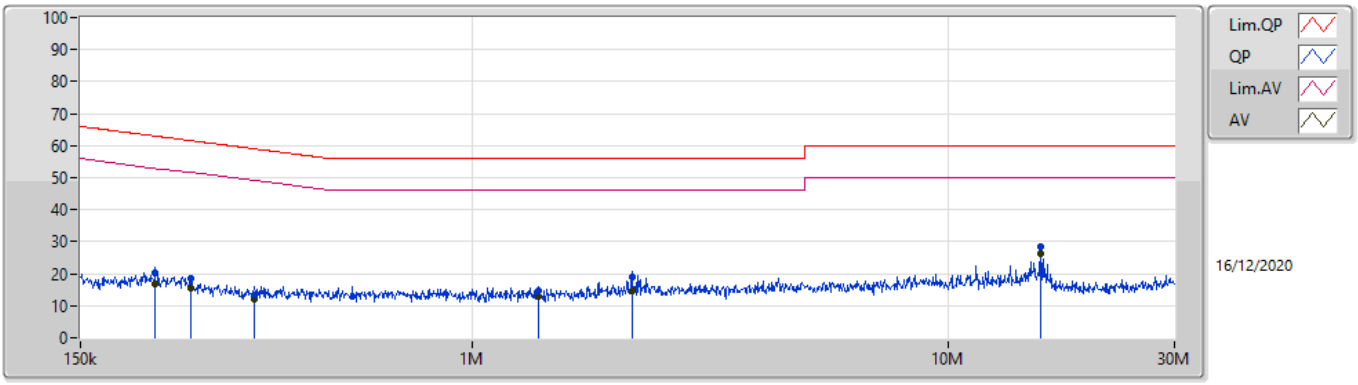
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	185.344k	18.98	64.24	-45.26	Line	-
Mode 1	Pass	AV	185.344k	16.21	54.24	-38.03	Line	-
Mode 1	Pass	QP	222.704k	19.30	62.71	-43.41	Line	-
Mode 1	Pass	AV	222.704k	16.13	52.71	-36.58	Line	-
Mode 1	Pass	QP	301.641k	14.06	60.21	-46.15	Line	-
Mode 1	Pass	AV	301.641k	12.80	50.21	-37.41	Line	-
Mode 1	Pass	QP	780.036k	12.93	56.00	-43.07	Line	-
Mode 1	Pass	AV	780.036k	11.83	46.00	-34.17	Line	-
Mode 1	Pass	QP	2.211M	17.40	56.00	-38.60	Line	-
Mode 1	Pass	AV	2.211M	14.11	46.00	-31.89	Line	-
Mode 1	Pass	QP	15.699M	25.86	60.00	-34.14	Line	-
Mode 1	Pass	AV	15.699M	22.80	50.00	-27.20	Line	"Worst"
Mode 1	Pass	QP	215.704k	20.35	62.98	-42.63	Neutral	-
Mode 1	Pass	AV	215.704k	16.75	52.98	-36.23	Neutral	-
Mode 1	Pass	QP	256.1k	18.36	61.56	-43.20	Neutral	-
Mode 1	Pass	AV	256.1k	15.47	51.56	-36.09	Neutral	-
Mode 1	Pass	QP	348.261k	13.17	59.00	-45.83	Neutral	-
Mode 1	Pass	AV	348.261k	12.20	49.00	-36.80	Neutral	-
Mode 1	Pass	QP	1.38M	14.64	56.00	-41.36	Neutral	-
Mode 1	Pass	AV	1.38M	13.01	46.00	-32.99	Neutral	-
Mode 1	Pass	QP	2.167M	18.96	56.00	-37.04	Neutral	-
Mode 1	Pass	AV	2.167M	14.84	46.00	-31.16	Neutral	-
Mode 1	Pass	QP	15.699M	28.53	60.00	-31.47	Neutral	-
Mode 1	Pass	AV	15.699M	26.47	50.00	-23.53	Neutral	"Worst"

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	185.344k	18.98	64.24	-45.26	19.59	Line	-	-0.61	9.68	0.01	9.90
AV	185.344k	16.21	54.24	-38.03	19.59	Line	-	-3.38	9.68	0.01	9.90
QP	222.704k	19.30	62.71	-43.41	19.59	Line	-	-0.29	9.68	0.01	9.90
AV	222.704k	16.13	52.71	-36.58	19.59	Line	-	-3.46	9.68	0.01	9.90
QP	301.641k	14.06	60.21	-46.15	19.59	Line	-	-5.53	9.67	0.02	9.90
AV	301.641k	12.80	50.21	-37.41	19.59	Line	-	-6.79	9.67	0.02	9.90
QP	780.036k	12.93	56.00	-43.07	19.54	Line	-	-6.61	9.67	0.04	9.83
AV	780.036k	11.83	46.00	-34.17	19.54	Line	-	-7.71	9.67	0.04	9.83
QP	2.211M	17.40	56.00	-38.60	19.58	Line	-	-2.18	9.68	0.09	9.81
AV	2.211M	14.11	46.00	-31.89	19.58	Line	-	-5.47	9.68	0.09	9.81
QP	15.699M	25.86	60.00	-34.14	19.85	Line	-	6.01	9.69	0.26	9.90
AV	15.699M	22.80	50.00	-27.20	19.85	Line	"Worst"	2.95	9.69	0.26	9.90

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	215.704k	20.35	62.98	-42.63	19.59	Neutral	-	0.76	9.68	0.01	9.90
AV	215.704k	16.75	52.98	-36.23	19.59	Neutral	-	-2.84	9.68	0.01	9.90
QP	256.1k	18.36	61.56	-43.20	19.59	Neutral	-	-1.23	9.68	0.01	9.90
AV	256.1k	15.47	51.56	-36.09	19.59	Neutral	-	-4.12	9.68	0.01	9.90
QP	348.261k	13.17	59.00	-45.83	19.59	Neutral	-	-6.42	9.67	0.02	9.90
AV	348.261k	12.20	49.00	-36.80	19.59	Neutral	-	-7.39	9.67	0.02	9.90
QP	1.38M	14.64	56.00	-41.36	19.53	Neutral	-	-4.89	9.67	0.06	9.80
AV	1.38M	13.01	46.00	-32.99	19.53	Neutral	-	-6.52	9.67	0.06	9.80
QP	2.167M	18.96	56.00	-37.04	19.57	Neutral	-	-0.61	9.68	0.08	9.81
AV	2.167M	14.84	46.00	-31.16	19.57	Neutral	-	-4.73	9.68	0.08	9.81
QP	15.699M	28.53	60.00	-31.47	19.90	Neutral	-	8.63	9.74	0.26	9.90
AV	15.699M	26.47	50.00	-23.53	19.90	Neutral	"Worst"	6.57	9.74	0.26	9.90

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
WPT	-	-	-	-	-	-	-	-	-	-	-	-
120-130kHz	Pass	PK	127.78k	100.05	105.47	-5.42	20.07	3	Horizontal	201	1.00	-

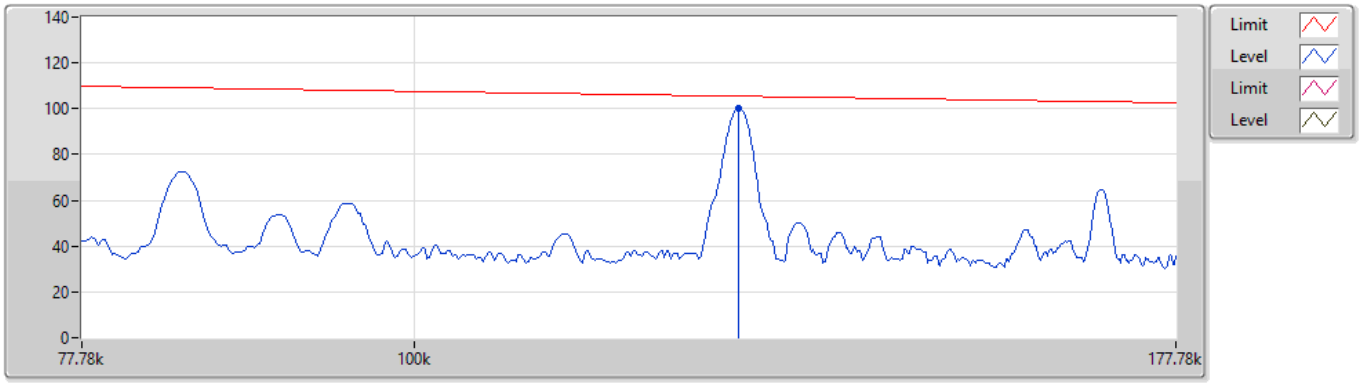
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
120-130kHz	-	-	-	-	-	-	-	-	-	-	-	-
0.127MHz_TX	Pass	PK	127.78k	100.05	105.47	-5.42	20.07	3	Horizontal	201	1.00	-
0.127MHz_TX	Pass	PK	31.56k	83.33	117.61	-34.28	21.25	3	Horizontal	0	1.00	-
0.127MHz_TX	Pass	PK	41.994k	78.80	115.13	-36.33	21.25	3	Horizontal	0	1.00	-
0.127MHz_TX	Pass	PK	84.012k	75.64	109.11	-33.47	20.28	3	Horizontal	0	1.00	-
0.127MHz_TX	Pass	PK	388.8k	73.34	95.80	-22.46	20.54	3	Horizontal	360	1.00	-
0.127MHz_TX	Pass	PK	1.105M	58.43	66.77	-8.34	20.51	3	Horizontal	360	1.00	-
0.127MHz_TX	Pass	PK	3.971M	53.40	69.50	-16.10	20.58	3	Horizontal	360	1.00	-

120-130kHz

09/12/2020

0.127MHz_TX

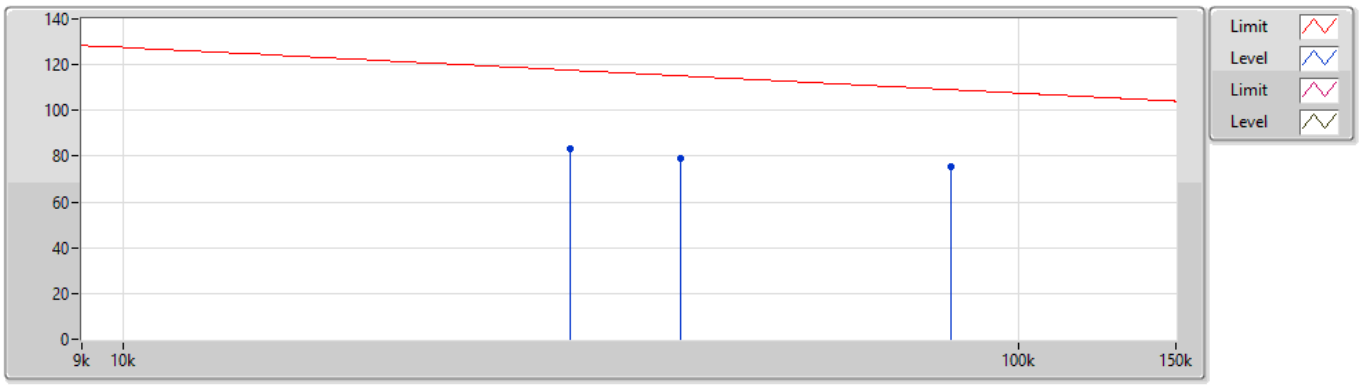


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	127.78k	100.05	105.47	-5.42	20.07	3	Horizontal	201	1.00	-	79.98	20.01	0.06	-

120-130kHz

09/12/2020

0.127MHz_TX

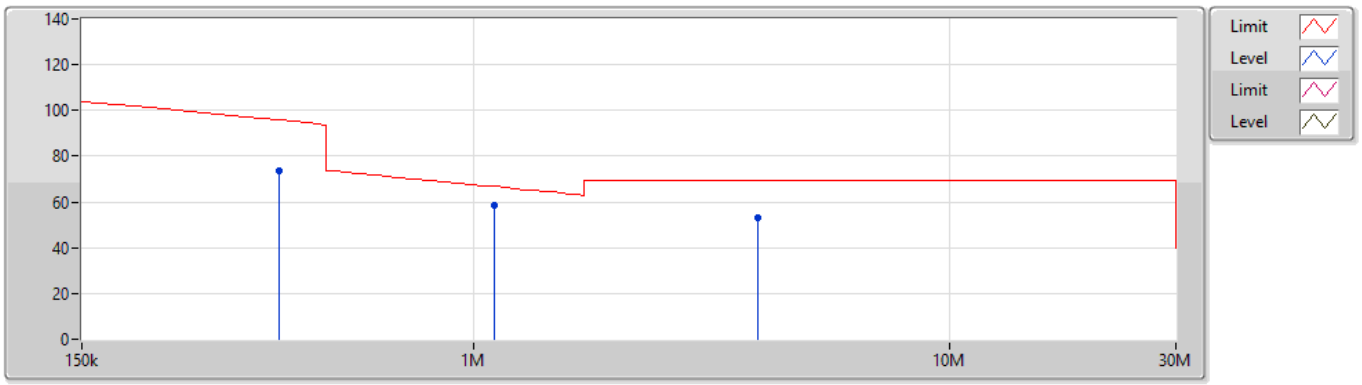


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	31.56k	83.33	117.61	-34.28	21.25	3	Horizontal	0	1.00	-	62.08	21.20	0.05	-
PK	41.994k	78.80	115.13	-36.33	21.25	3	Horizontal	0	1.00	-	57.55	21.20	0.05	-
PK	84.012k	75.64	109.11	-33.47	20.28	3	Horizontal	0	1.00	-	55.36	20.23	0.05	-

120-130kHz

0.127MHz_TX

09/12/2020



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	388.8k	73.34	95.80	-22.46	20.54	3	Horizontal	360	1.00	-	52.80	20.45	0.09	-
PK	1.105M	58.43	66.77	-8.34	20.51	3	Horizontal	360	1.00	-	37.92	20.35	0.16	-
PK	3.971M	53.40	69.50	-16.10	20.58	3	Horizontal	360	1.00	-	32.82	20.29	0.29	-

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
WPT	-	-	-	-	-	-	-	-	-	-	-	-
120-130kHz	Pass	QP	30M	35.39	40.00	-4.61	-3.19	3	Vertical	190	1.00	-

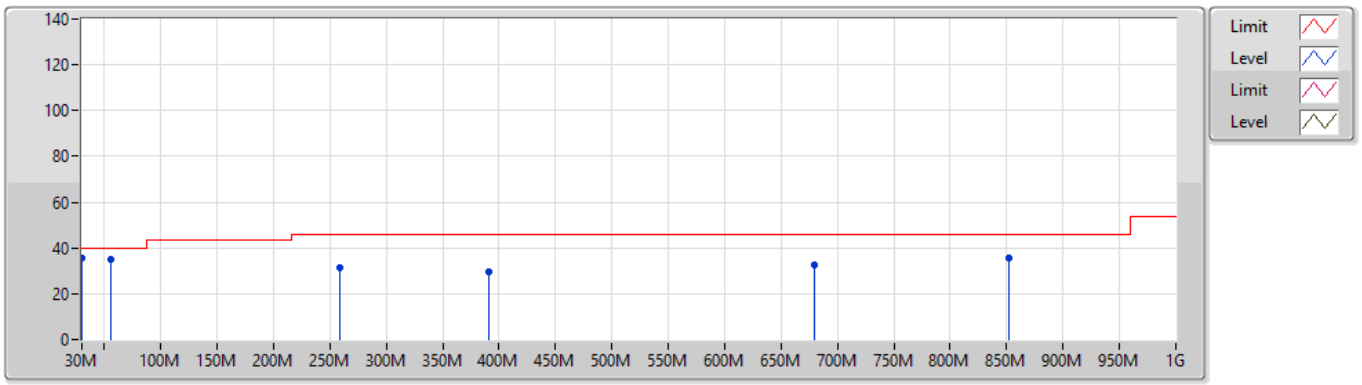
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
120-130kHz	-	-	-	-	-	-	-	-	-	-	-	-
0.127MHz_DC Source	Pass	PK	55.22M	35.05	40.00	-4.95	-14.68	3	Vertical	0	1.00	-
0.127MHz_DC Source	Pass	PK	258.92M	31.25	46.00	-14.75	-5.97	3	Vertical	0	1.00	-
0.127MHz_DC Source	Pass	PK	390.84M	29.54	46.00	-16.46	-4.09	3	Vertical	0	1.00	-
0.127MHz_DC Source	Pass	PK	679.9M	32.44	46.00	-13.56	0.10	3	Vertical	0	1.00	-
0.127MHz_DC Source	Pass	PK	852.56M	35.72	46.00	-10.28	2.54	3	Vertical	0	1.00	-
0.127MHz_DC Source	Pass	QP	30M	35.39	40.00	-4.61	-3.19	3	Vertical	190	1.00	-
0.127MHz_DC Source	Pass	PK	57.16M	31.01	40.00	-8.99	-14.91	3	Horizontal	360	1.00	-
0.127MHz_DC Source	Pass	PK	136.7M	29.38	43.50	-14.12	-9.34	3	Horizontal	360	1.00	-
0.127MHz_DC Source	Pass	PK	319.06M	26.94	46.00	-19.06	-5.66	3	Horizontal	360	1.00	-
0.127MHz_DC Source	Pass	PK	594.54M	31.32	46.00	-14.68	-0.59	3	Horizontal	360	1.00	-
0.127MHz_DC Source	Pass	PK	790.48M	33.92	46.00	-12.08	1.74	3	Horizontal	360	1.00	-
0.127MHz_DC Source	Pass	QP	30M	32.33	40.00	-7.67	-3.19	3	Horizontal	200	2.20	-

120-130kHz

09/12/2020

0.127MHz_DC Source

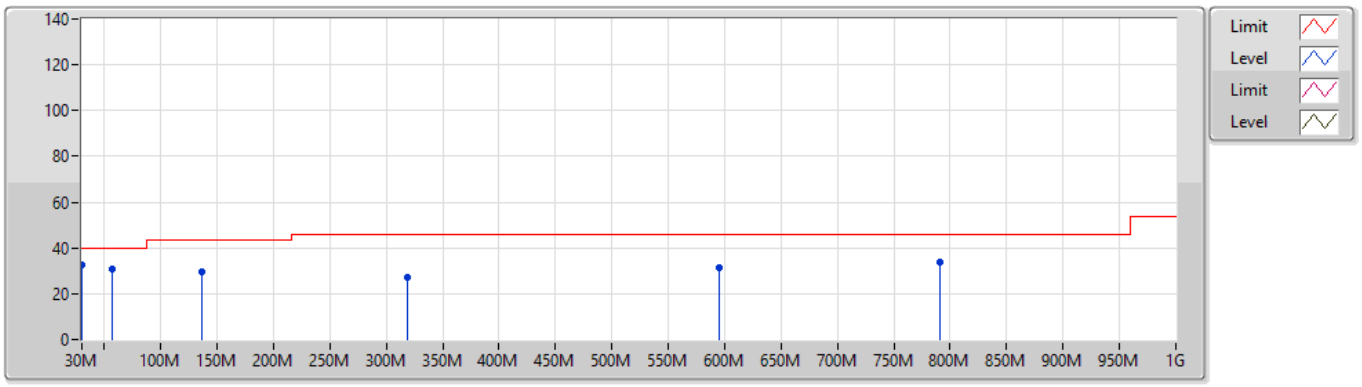


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	55.22M	35.05	40.00	-4.95	-14.68	3	Vertical	0	1.00	-	49.73	12.11	1.00	27.79
PK	258.92M	31.25	46.00	-14.75	-5.97	3	Vertical	0	1.00	-	37.22	18.64	2.44	27.05
PK	390.84M	29.54	46.00	-16.46	-4.09	3	Vertical	0	1.00	-	33.63	20.60	2.96	27.65
PK	679.9M	32.44	46.00	-13.56	0.10	3	Vertical	0	1.00	-	32.34	24.16	4.12	28.18
PK	852.56M	35.72	46.00	-10.28	2.54	3	Vertical	0	1.00	-	33.18	25.53	4.61	27.60
QP	30M	35.39	40.00	-4.61	-3.19	3	Vertical	190	1.00	-	38.58	23.32	0.70	27.21

120-130kHz

09/12/2020

0.127MHz_DC Source



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	57.16M	31.01	40.00	-8.99	-14.91	3	Horizontal	360	1.00	-	45.92	11.84	1.04	27.79
PK	136.7M	29.38	43.50	-14.12	-9.34	3	Horizontal	360	1.00	-	38.72	16.61	1.68	27.63
PK	319.06M	26.94	46.00	-19.06	-5.66	3	Horizontal	360	1.00	-	32.60	18.81	2.68	27.15
PK	594.54M	31.32	46.00	-14.68	-0.59	3	Horizontal	360	1.00	-	31.91	23.95	3.78	28.32
PK	790.48M	33.92	46.00	-12.08	1.74	3	Horizontal	360	1.00	-	32.18	25.10	4.46	27.82
QP	30M	32.33	40.00	-7.67	-3.19	3	Horizontal	200	2.20	-	35.52	23.32	0.70	27.21

Summary

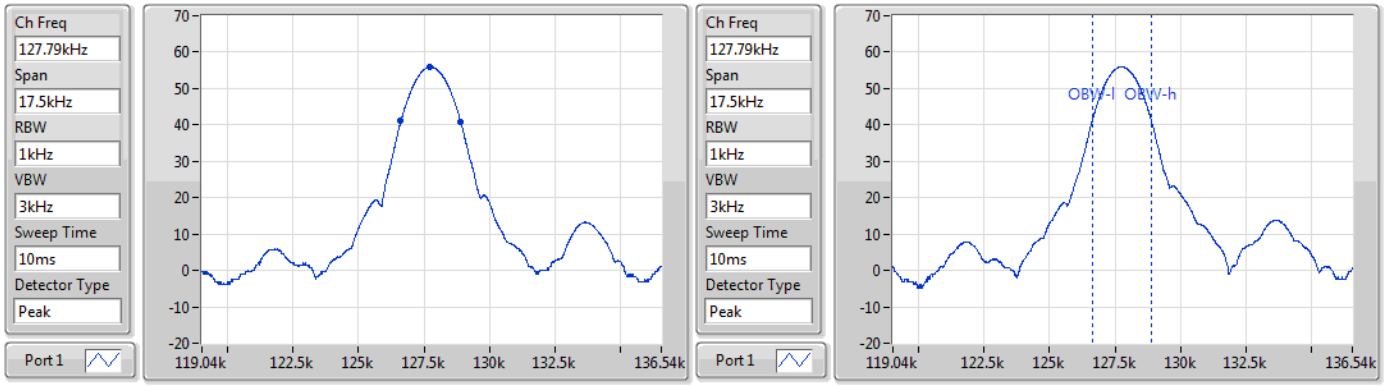
Mode	15dB (Hz)	OBW (Hz)
110k-205kHz	-	-
WPC	2.275k	2.248k

Result

Mode	Result	15dB (Hz)	Fl-15dB (Hz)	Fh-15dB (Hz)	OBW (Hz)	Fl-OBW (Hz)	Fh-OBW (Hz)	Limit (Range)
WPC	-	-	-	-	-	-	-	-
0.12779MHz_TnomVnom	Pass	2.275k	126.61750k	128.89250k	2.248k	126.63558k	128.88320k	-

WPC **EBW**

0.12779MHz_TnomVnom



15dB(Hz)	Fl-15dB(Hz)	Fh-15dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Range)
2.275k	126.61750k	128.89250k	2.248k	126.63558k	128.88320k	-