

NCC Test Report

Equipment : B-pillar Endpoint
Brand Name : Tesla
Model Name : 1509518D
Applicant : 台灣特斯拉汽車有限公司
臺北市內湖區民權東路 6 段 11 巷 6 號
Manufacturer : Tesla Motors, Inc.
3500 Deer Creek Road Palo Alto, California US
94304 United States Of America
Standard : LP0002 Section 4.2 (2020-07-01)

The product was received on Dec. 26, 2019, and testing was started from Jan. 14, 2020 and completed on Dec. 10, 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.)

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TEL : 886-3-327-3456
FAX : 886-3-327-0973
Report Template No.: HE1-F6 Ver2.8

Summary of Test Result

Report Clause	Ref. Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	3.2	Antenna Requirement	PASS	-
3.1	3.3	AC Power-line Conducted Emissions	PASS	-
3.2	4.2	Emission Bandwidth	PASS	-
3.3	4.2.1.1	Field Strength of Fundamental Emissions	PASS	-
3.4	4.2.1.2	Transmitter Radiated Unwanted Emissions	PASS	-
3.5	3.9	Receiver Radiated Unwanted Emissions	PASS	-
3.6	4.2.1.3	Frequency Stability	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: Debby Hung

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range	Modulation Mode	Ch. Frequency (MHz)	Channel Number	Field Strength (dBuV/m)
13.553 – 13.567 MHz	ISO 14443-3A (ASK)	13.56	1	78.63
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)

Ant.	Brand	Model Name	Antenna Type	Connector
1	Tesla	MY B-Pillar NFC	Loop antenna	N/A

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

Duty Cycle Operation Restriction	
The transmitter is used for	The transmitter is operated
☒ Inductive applications	☒ Automatically triggered
☐ Duty cycle fixed mode	☒ Duty cycle random mode
☒ Duty cycle mode - NFC-A (ISO 14443-3A)	
Declare transmitter duty cycle / 1 hour =	100%
☐ Duty cycle mode - NFC-B (ISO 14443-3B)	
Declare transmitter duty cycle / 1 hour =	100%
☐ Duty cycle mode - NFC-F (ISO 18092)	
Declare transmitter duty cycle / 1 hour =	100%
☐ Duty cycle mode - NFC-V (ISO 15693)	
Declare transmitter duty cycle / 1 hour =	100%

1.2 Testing Applied Standards

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

- ♦ LP0002 (2020-07-01)
- ♦ ANSI C63.10-2013
- ♦ ANSI C63.4-2014

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

- ♦ 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.					

Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
AC Conduction (TX)	CO04-HY	Edward	22.2~23.5°C / 53~55%	14/Jan/2020
AC Conduction (RX)	CO04-HY	Edward	20.3~23.4°C / 54~62%	10/Dec/2020
RF Conducted	TH01-HY	Barry	23.5~24.3°C / 61~64%	14/Jan/2020
Radiated Emission (TX)	03CH03-HY	Patrick	25.3~26.6°C / 52.9~55.1%	14/Jan/2020
Radiated Emission (RX)	03CH03-HY	Tony	23.1~27.6°C / 51~61%	09/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%
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
Frequency Stability	Tnom	20°C
-	Tmin	-40°C
-	Tmax	85°C
-	Vnom	12V
-	Vmin	10.8V
-	Vmax	13.2V

2.2 The Worst Case Modulation Configuration

Modulation Used for Conformance Testing	
Modulation Mode	Field Strength (dBuV/m at 3 m)
NFC	78.63

2.3 Test Channel Frequencies Configuration

Modulation Mode	Test Channel Frequencies (MHz)
NFC	13.56

2.4 Test Channel Mode

Test Software Version	DoS 6.1
-----------------------	---------

Mode	Power Setting
NFC	-
13.56MHz	default

2.5 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/CRX
	DC Power Supply mode

The Worst Case Mode for Following Conformance Tests	
Tests Item	Emission Bandwidth, Frequency Stability
Test Condition	Conducted measurement

The Worst Case Mode for Following Conformance Tests			
Tests Item	Field Strength of Fundamental Emissions Spectrum Mask, Transmitter Radiated Unwanted Emissions Receiver Radiated Unwanted Emissions		
Test Condition	Radiated measurement		
Operating Mode	CTX/CRX		
	DC Power Supply mode		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V		

2.6 Support Equipment

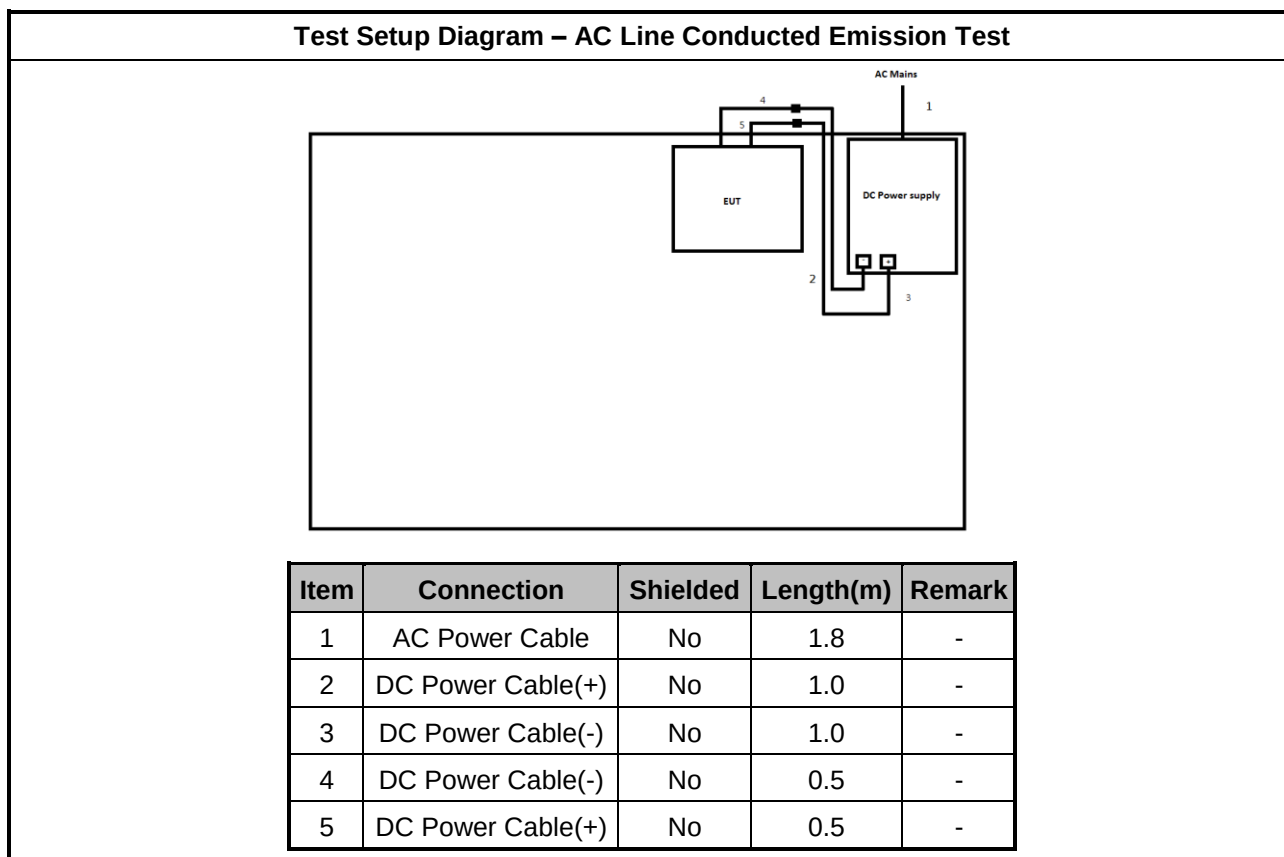
Support Equipment - AC Conduction			
No.	Equipment	Brand Name	Model Name
1	AC Power Cable	Power sync	PW-GPC180-3
2	DC Power Supply	GW	GPS-3030DD
3	DC Power Supply	GW	GPC-6030D
4	DC Power Cable(+)	MiSUMi	WTN1228-RED
5	DC Power Cable(-)	MiSUMi	WTN1228-BLACK
6	DC Power Cable(+)	MiSUMi	WTN1228-RED
7	DC Power Cable(-)	MiSUMi	WTN1228-BLACK

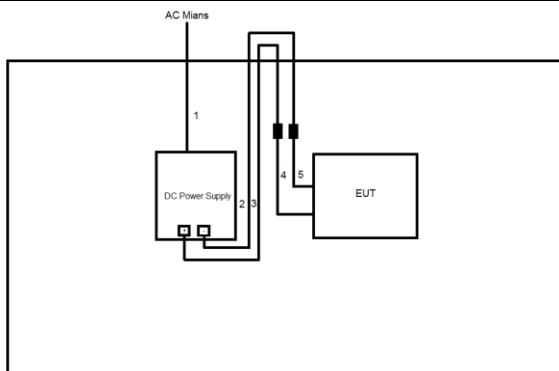
Support Equipment - RF Conducted			
No.	Equipment	Brand Name	Model Name
1	Notebook	HP	HP EliteBook 840 G3
2	Adapter for NB	HP	HSTNN-CA40
3	DC Power Supply	GW	GPS-3030DD

Note: Support equipment No.1 & No.2 were provided by customer.

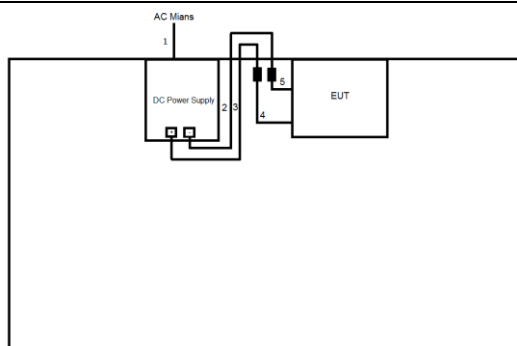
Support Equipment - Radiated			
No.	Equipment	Brand Name	Model Name
1	AC Power Cable	Power sync	PW-GPC180-3
2	DC Power Supply	GW	GPS-3030DD
3	DC Power Supply	GW	GPC-6030D
4	DC Power Cable(+)	MiSUMi	WTN1228-RED
5	DC Power Cable(-)	MiSUMi	WTN1228-BLACK
6	DC Power Cable(+)	MiSUMi	WTN1228-RED
7	DC Power Cable(-)	MiSUMi	WTN1228-BLACK

2.7 Test Setup Diagram



Test Setup Diagram - Radiated Test -TX


Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	DC Power Cable(+)	No	1.0	-
3	DC Power Cable(-)	No	1.0	-
4	DC Power Cable(-)	No	0.5	-
5	DC Power Cable(+)	No	0.5	-

Test Setup Diagram - Radiated Test - RX


Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	DC Power Cable(+)	No	1.0	-
3	DC Power Cable(-)	No	1.0	-
4	DC Power Cable(-)	No	0.5	-
5	DC Power Cable(+)	No	0.5	-

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

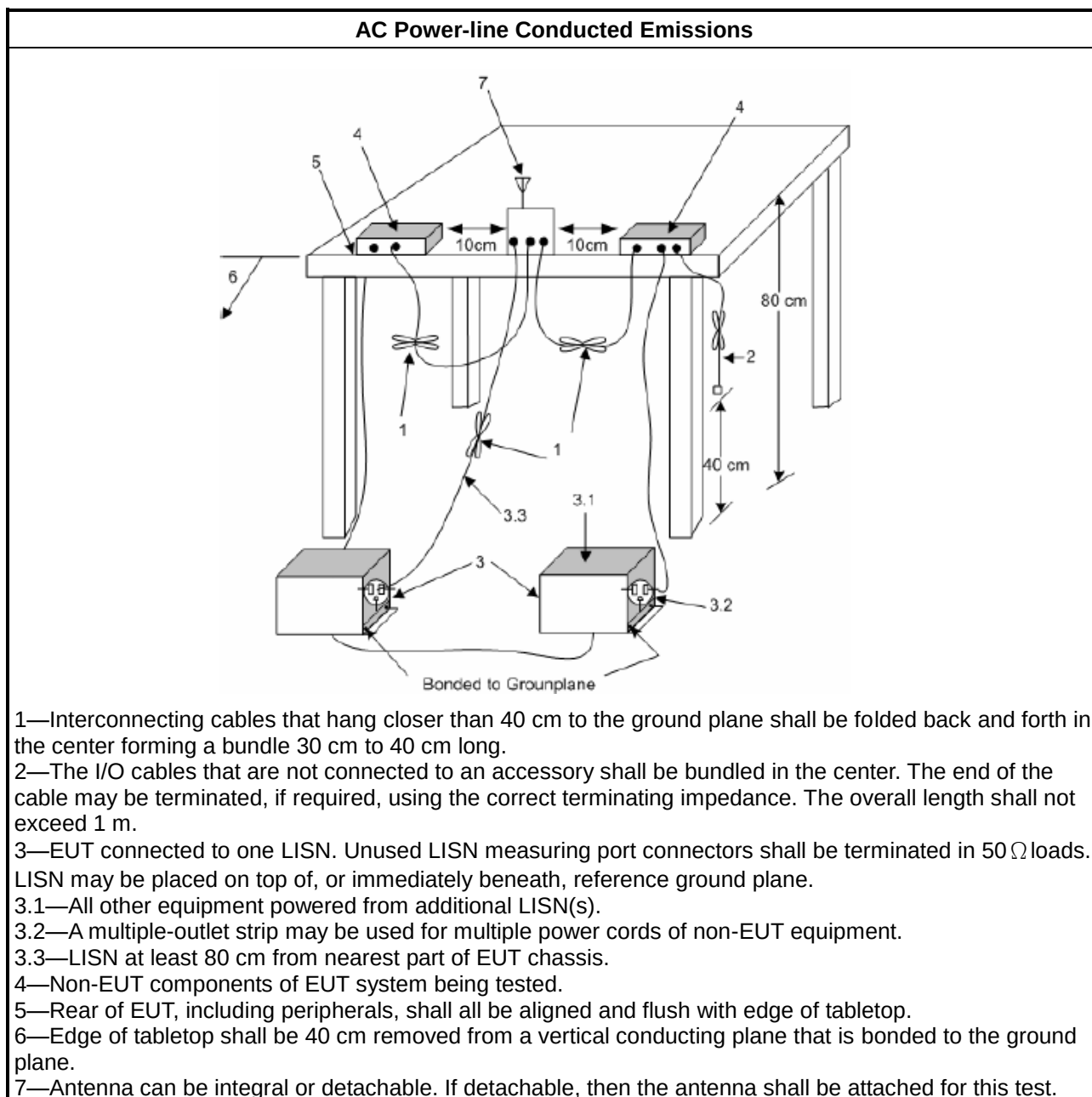
Test Method	
☒	Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.
☒	If AC conducted emissions fall in operating band, then following below test method confirm final result.
☐	Accept measurements done with a suitable dummy load replacing the antenna under the following conditions: (1) Perform the AC line conducted tests with the antenna connected to determine compliance with LP0002-3.3 limits outside the transmitter's fundamental emission band; (2) Retest with a dummy load to determine compliance with LP0002-3.3 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 LP0002-3.3 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 LP0002-3.3 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



3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 Emission Bandwidth

3.2.1 Emission Bandwidth Limit

20dB Bandwidth Limit	
☒	Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 – 13.567 MHz).

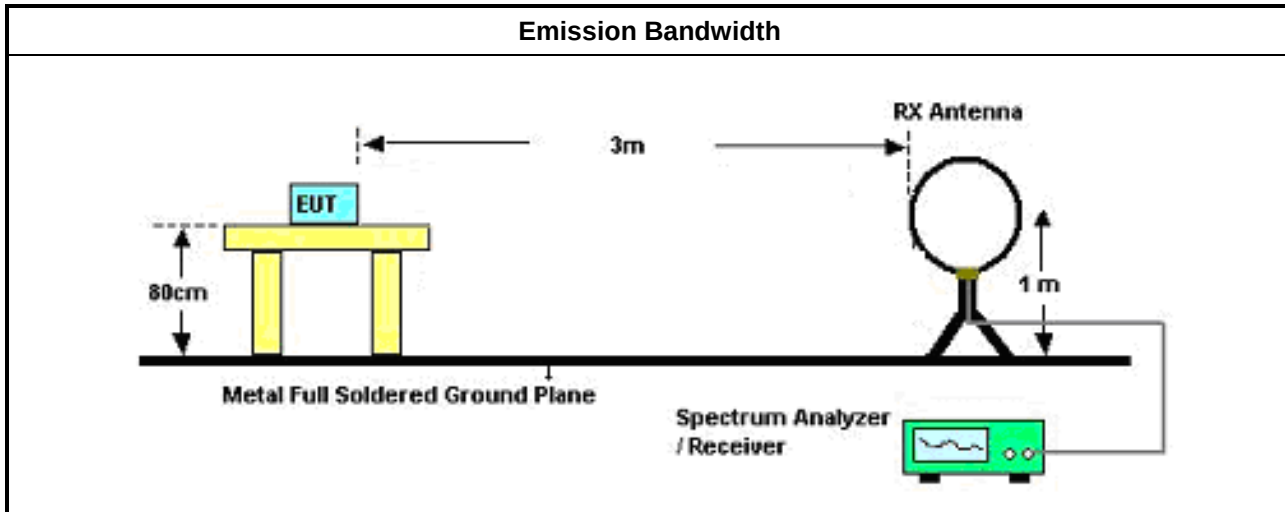
3.2.2 Measuring Instruments

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

3.2.3 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.

3.2.4 Test Setup



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Field Strength of Fundamental Emissions

3.3.1 Field Strength of Fundamental Emissions Limit

Field Strength of Fundamental Emissions					
Emissions	(uV/m)@30m	(dBuV/m)@30m	(dBuV/m)@10m	(dBuV/m)@3m	(dBuV/m)@1m
fundamental	15848	84.0	103.1	124.0	143.1
Quasi peak measurement of the fundamental.					

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

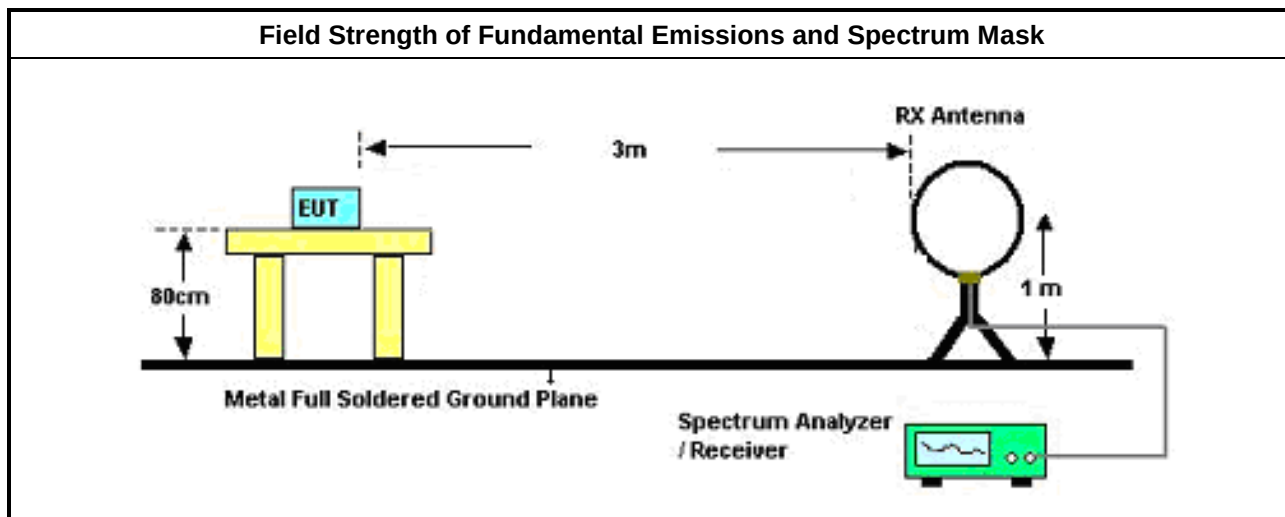
Test Method	
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
☒	At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the requirements; however, an attempt should be made to avoid making measurements 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.

3.3.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.3.5 Test Setup



3.3.6 Test Result of Field Strength of Fundamental Emissions

Refer as Appendix C

3.4 Transmitter Radiated Unwanted Emissions

3.4.1 Transmitter Radiated Unwanted Emissions Limit

Transmitter Radiated Unwanted 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.

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

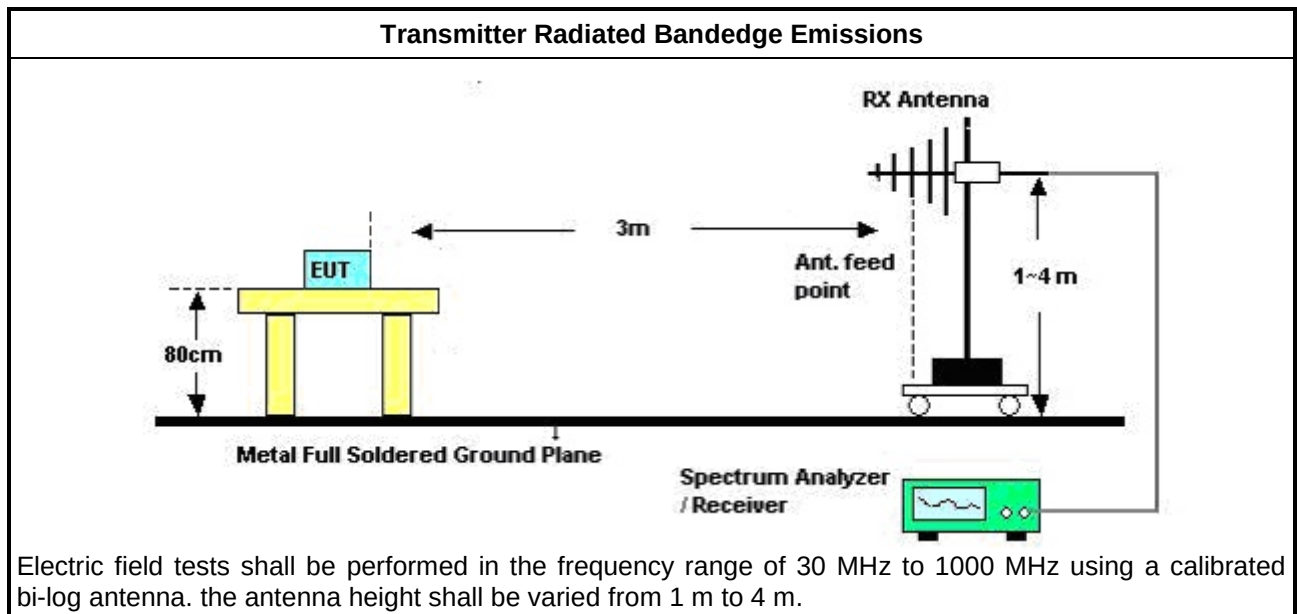
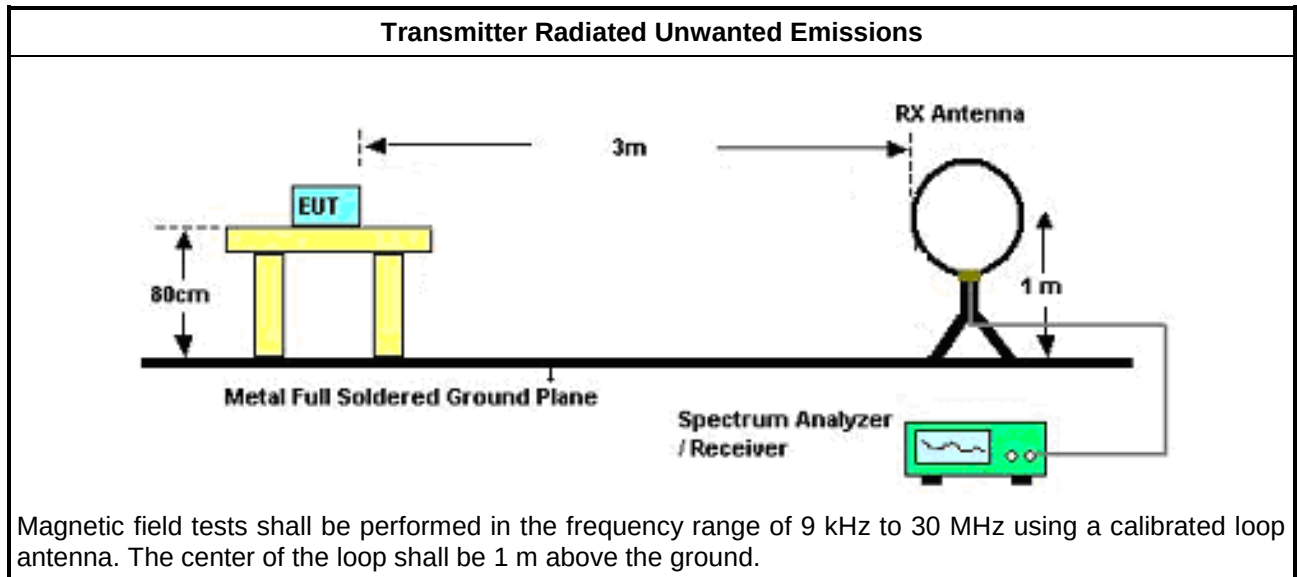
Test Method	
☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1 GHz and test distance is 3m.
☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz and test distance is 3m.
☒	At frequencies below 30 MHz, measurements may be performed at a distance closer than 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 D01 v01r01 Open-Field Test Sites and Chamber Correlation Justification.
☐	Based on LP0002 6.5.2: 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.

3.4.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.4.5 Test Setup



3.4.6 Transmitter Radiated Unwanted Emissions

Refer as Appendix D

3.5 Receiver Radiated Spurious Emissions

3.5.1 Receiver in Radiated Spurious Emissions Limit

Restricted Spurious 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.

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

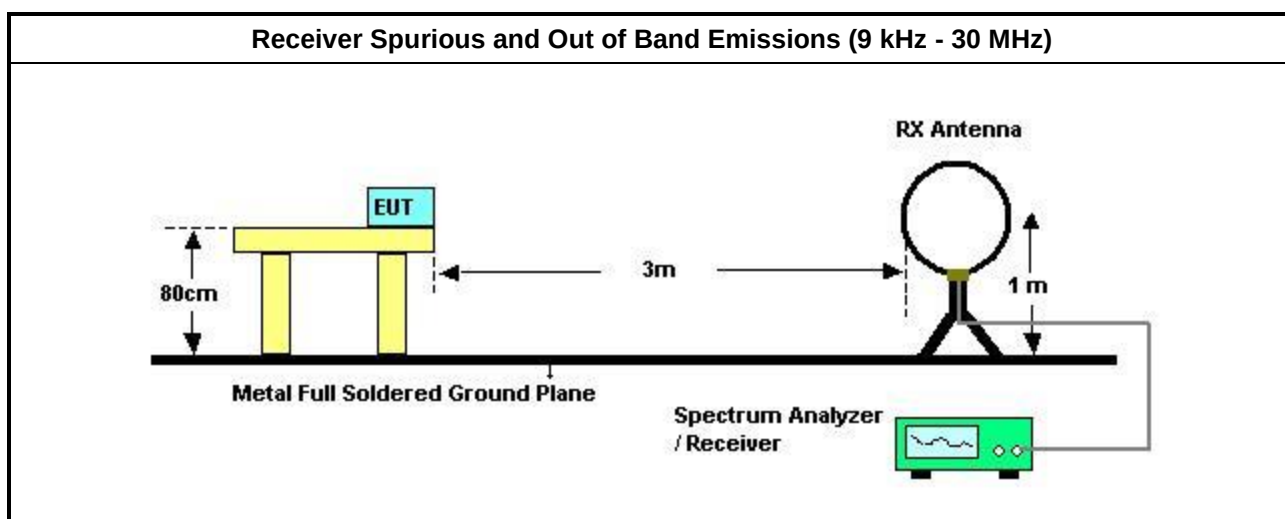
Test Method	
☒	The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.
☒	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).
☒	For radiated measurement, refer as ANSI C63.4, clause 8.3.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from below 30 MHz.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from 30 MHz-1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the QP-Limit so that the QP level does not need to be reported in addition.
☒	Refer as ANSI C63.4, clause 8.3.1.2 and 8.3.2.2 for radiated emissions from above 1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
☒	All amplitude of spurious emissions that are attenuated by more than 30 dB below the permissible value has no need to be reported.

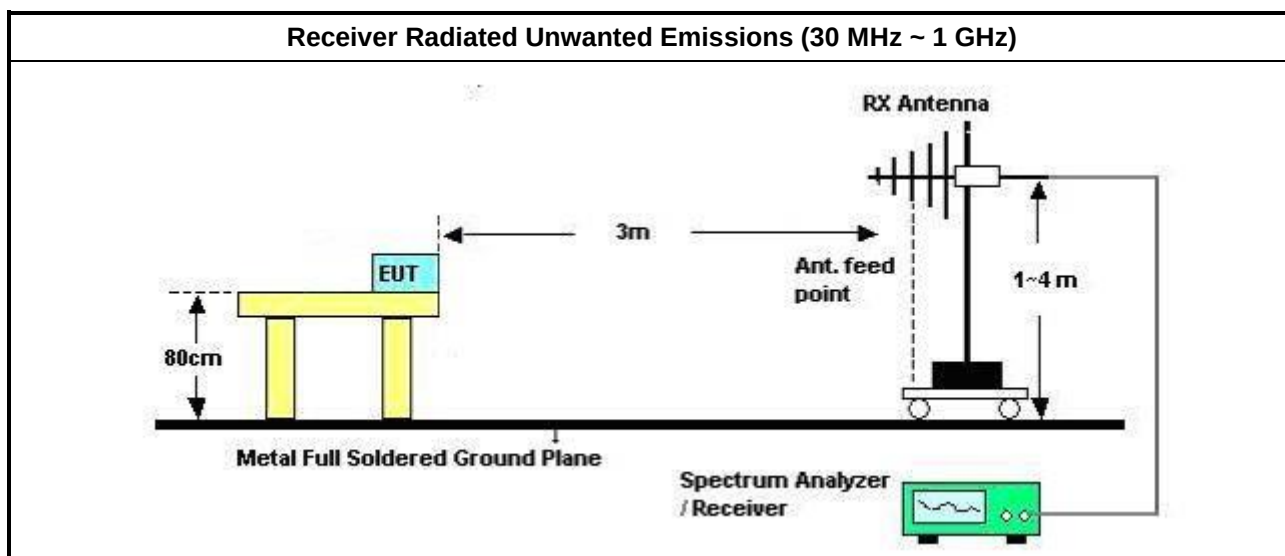
3.5.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.5.5 Test Setup





3.5.6 Receiver Radiated Unwanted Emissions (Below 30MHz)

Refer as Appendix E

3.6 Frequency Stability

3.6.1 Frequency Stability Limit

Frequency Stability Limit	
☒	Carrier frequency stability shall be maintained to $\pm 0.01\%$ (± 100 ppm).

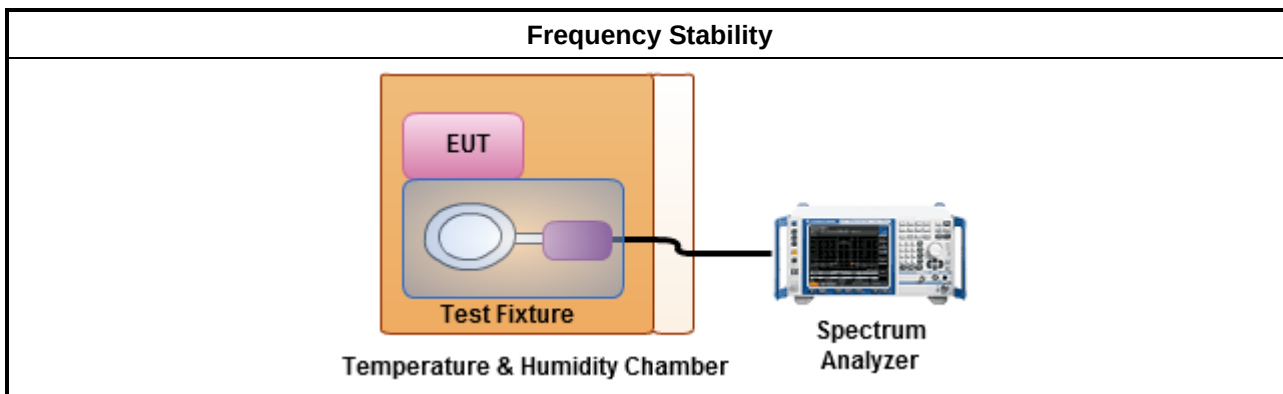
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

Test Method	
☒	Refer as ANSI C63.10, clause 6.8 for frequency stability tests
☒	Frequency stability with respect to ambient temperature
☒	Frequency stability when varying supply voltage
☐	For conducted measurement.
☒	For radiated measurement. The equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted power level.

3.6.4 Test Setup



3.6.5 Test Result of Frequency Stability

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Brand/Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	09/Apr/2019	08/Apr/2020
EMI Test Receiver	R&S	ESR3	102051	9kHz~3.6GHz	29/May/2020	28/May/2021
LISN	R&S	ENV216	101295	9kHz~30MHz	08/Nov/2018	07/Nov/2019
LISN	R&S	ENV216	101295	9kHz~30MHz	11/Nov/2020	10/Nov/2021
RF Cable-CON	MTJ	RG142	CB002-CO	9kHz~200MHz	23/Sep/2019	22/Sep/2020
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	24/Sep/2019	23/Sep/2020
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz~30MHz	21/Sep/2020	20/Sep/2021

Instrument for Conducted Test

Instrument	Brand/Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101029	10KHz ~ 40GHz	01/Oct/2019	30/Sep/2020
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	15/Mar/2019	14/Mar/2020
Programmable Temp. & Humi. Chamber	Giant Force	GTH-225-40-CP-AR	MAA1611-005	-40~100℃	09/Dec/2019	08/Dec/2020

Instrument for Radiated Test

Instrument	Brand/Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	30/Aug/2019	29/Aug/2020
Signal Analyzer	R&S	FSP40	100305	9kHz~40 GHz	10/Jun/2019	09/Jun/2020
Amplifier	HP	8447D	2944A08033	10kHz~1.3GHz	22/Apr/2019	21/Apr/2020
Bilog Antenna & 5dB Attenuator	SCHAFFNER / MTJ	CBL 6112B / MTJ6102-05	2723 / 2	30MHz~1GHz	08/Sep/2019	07/Sep/2020
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz~30MHz	20/Jul/2019	19/Jul/2020
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	22/Mar/2019	21/Mar/2020
Loop Antenna	TESEQ	HLA 6120	31244	9k-30MHz	15/Mar/2019	14/Mar/2020
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	09/Apr/2019	08/Apr/2020
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	06/Aug/2020	05/Aug/2021
Signal Analyzer	R&S	FSV40	101500	10Hz~40GHz	19/Aug/2020	18/Aug/2021
Amplifier	HP	8447D	2944A08033	10kHz~1.3GHz	14/Apr/2020	13/Apr/2021
Bilog Antenna & 6dB Attenuator	SCHAFFNER / EMC	CBL6112B / N-6-05	22237 / AT-N-0603	30MHz~1GHz	25/Oct/2020	24/Oct/2021
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz~30MHz	19/Jun/2020	18/Jun/2021
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	18/Mar/2020	17/Mar/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



Conducted Emissions at Powerline

Appendix A

Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	1.752M	15.47	46.00	-30.53	Neutral
Mode 2	Pass	AV	20.76M	22.03	50.00	-27.97	Neutral

Mode Configure

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 1	Pass	QP	254.17k	27.03	61.62	-34.59	Line	-
Mode 1	Pass	AV	254.17k	20.12	51.62	-31.50	Line	"Worst"
Mode 1	Pass	QP	289.269k	17.58	60.55	-42.97	Line	-
Mode 1	Pass	AV	289.269k	15.99	50.55	-34.56	Line	-
Mode 1	Pass	QP	694.357k	13.08	56.00	-42.92	Line	-
Mode 1	Pass	AV	694.357k	11.79	46.00	-34.21	Line	-
Mode 1	Pass	QP	1.734M	17.26	56.00	-38.74	Line	-
Mode 1	Pass	AV	1.734M	14.26	46.00	-31.74	Line	-
Mode 1	Pass	QP	7.125M	16.85	60.00	-43.15	Line	-
Mode 1	Pass	AV	7.125M	14.76	50.00	-35.24	Line	-
Mode 1	Pass	QP	21.716M	17.82	60.00	-42.18	Line	-
Mode 1	Pass	AV	21.716M	14.88	50.00	-35.12	Line	-
Mode 1	Pass	QP	204.199k	21.81	63.44	-41.63	Neutral	-
Mode 1	Pass	AV	204.199k	17.42	53.44	-36.02	Neutral	-
Mode 1	Pass	QP	256.712k	28.07	61.54	-33.47	Neutral	-
Mode 1	Pass	AV	256.712k	20.96	51.54	-30.58	Neutral	-
Mode 1	Pass	QP	292.162k	18.99	60.46	-41.47	Neutral	-
Mode 1	Pass	AV	292.162k	17.43	50.46	-33.03	Neutral	-
Mode 1	Pass	QP	1.752M	18.65	56.00	-37.35	Neutral	-
Mode 1	Pass	AV	1.752M	15.47	46.00	-30.53	Neutral	"Worst"
Mode 1	Pass	QP	2.137M	17.48	56.00	-38.52	Neutral	-
Mode 1	Pass	AV	2.137M	14.12	46.00	-31.88	Neutral	-
Mode 1	Pass	QP	12.689M	16.70	60.00	-43.30	Neutral	-
Mode 1	Pass	AV	12.689M	14.44	50.00	-35.56	Neutral	-
Mode 2	Pass	QP	213.137k	24.28	63.07	-38.79	Line	-
Mode 2	Pass	AV	213.137k	19.26	53.07	-33.81	Line	-
Mode 2	Pass	QP	292.16k	21.10	60.46	-39.36	Line	-
Mode 2	Pass	AV	292.16k	19.50	50.46	-30.96	Line	-
Mode 2	Pass	QP	447.846k	13.21	56.92	-43.71	Line	-
Mode 2	Pass	AV	447.846k	12.16	46.92	-34.76	Line	-
Mode 2	Pass	QP	2.229M	20.60	56.00	-35.40	Line	-
Mode 2	Pass	AV	2.229M	15.49	46.00	-30.51	Line	-
Mode 2	Pass	QP	3.613M	19.68	56.00	-36.32	Line	-
Mode 2	Pass	AV	3.613M	16.55	46.00	-29.45	Line	"Worst"
Mode 2	Pass	QP	21.519M	23.54	60.00	-36.46	Line	-
Mode 2	Pass	AV	21.519M	19.17	50.00	-30.83	Line	-
Mode 2	Pass	QP	225.388k	25.20	62.62	-37.42	Neutral	-
Mode 2	Pass	AV	225.388k	19.68	52.62	-32.94	Neutral	-
Mode 2	Pass	QP	290.996k	20.72	60.49	-39.77	Neutral	-
Mode 2	Pass	AV	290.996k	19.16	50.49	-31.33	Neutral	-
Mode 2	Pass	QP	523.291k	13.86	56.00	-42.14	Neutral	-
Mode 2	Pass	AV	523.291k	12.46	46.00	-33.54	Neutral	-
Mode 2	Pass	QP	2.211M	19.15	56.00	-36.85	Neutral	-

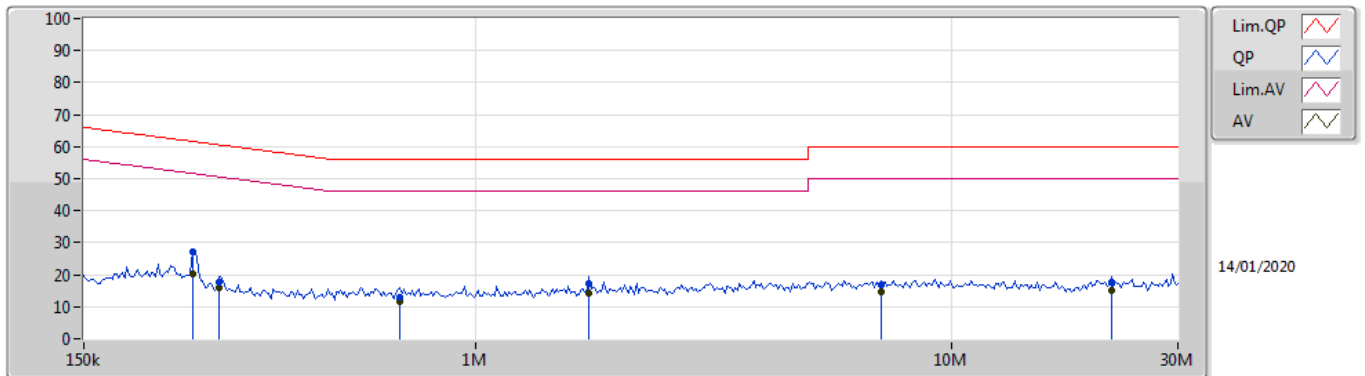


Conducted Emissions at Powerline

Appendix A

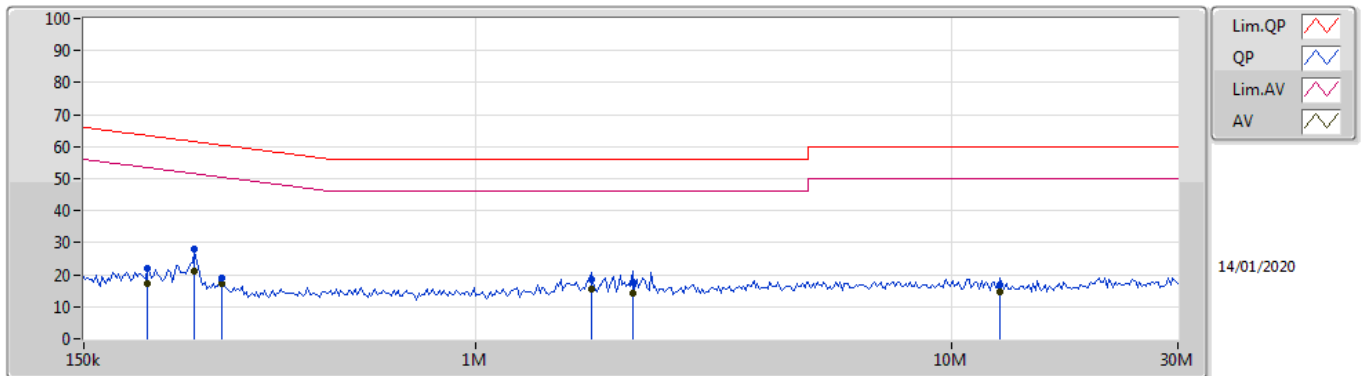
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition	Comments
Mode 2	Pass	AV	2.211M	14.72	46.00	-31.28	Neutral	-
Mode 2	Pass	QP	3.73M	21.54	56.00	-34.46	Neutral	-
Mode 2	Pass	AV	3.73M	18.01	46.00	-27.99	Neutral	-
Mode 2	Pass	QP	20.76M	24.09	60.00	-35.91	Neutral	-
Mode 2	Pass	AV	20.76M	22.03	50.00	-27.97	Neutral	"Worst"

Conducted Emissions at Powerline_Mode 1



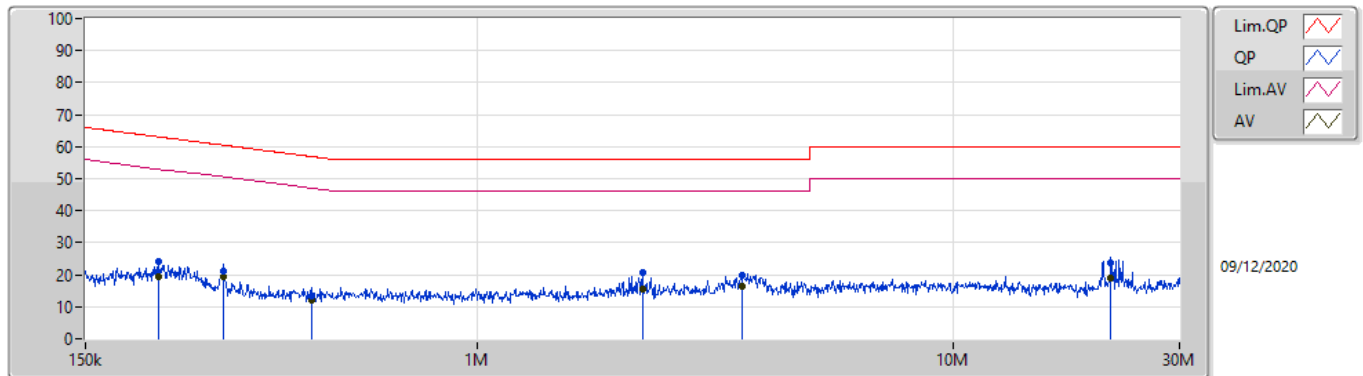
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	254.17k	27.03	61.62	-34.59	19.64	Line	-	7.39	9.65	0.12	9.87			
AV	254.17k	20.12	51.62	-31.50	19.64	Line	"Worst"	0.48	9.65	0.12	9.87			
QP	289.269k	17.58	60.55	-42.97	19.63	Line	-	-2.05	9.64	0.12	9.87			
AV	289.269k	15.99	50.55	-34.56	19.63	Line	-	-3.64	9.64	0.12	9.87			
QP	694.357k	13.08	56.00	-42.92	19.63	Line	-	-6.55	9.64	0.12	9.87			
AV	694.357k	11.79	46.00	-34.21	19.63	Line	-	-7.84	9.64	0.12	9.87			
QP	1.734M	17.26	56.00	-38.74	19.65	Line	-	-2.39	9.65	0.13	9.87			
AV	1.734M	14.26	46.00	-31.74	19.65	Line	-	-5.39	9.65	0.13	9.87			
QP	7.125M	16.85	60.00	-43.15	19.80	Line	-	-2.95	9.68	0.24	9.88			
AV	7.125M	14.76	50.00	-35.24	19.80	Line	-	-5.04	9.68	0.24	9.88			
QP	21.716M	17.82	60.00	-42.18	19.88	Line	-	-2.06	9.61	0.38	9.89			
AV	21.716M	14.88	50.00	-35.12	19.88	Line	-	-5.00	9.61	0.38	9.89			

Conducted Emissions at Powerline_Mode 1



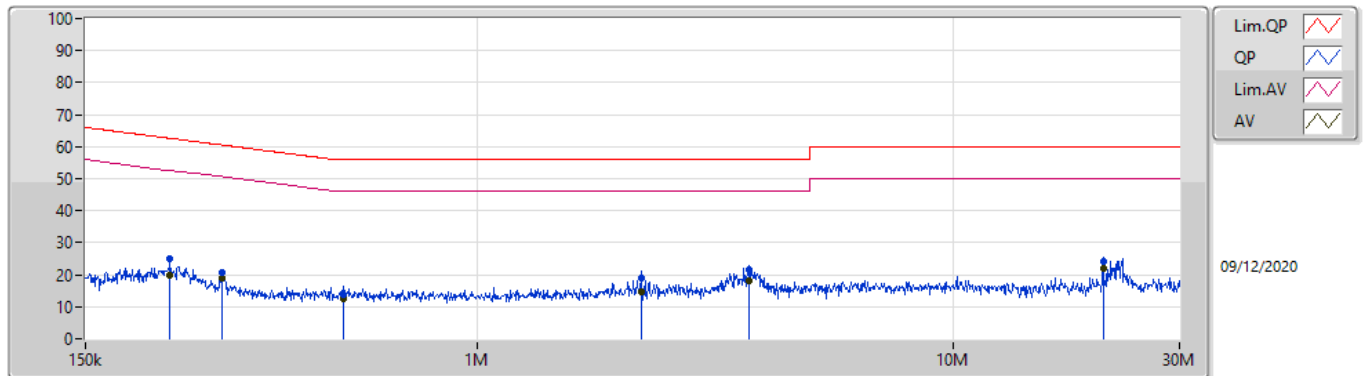
Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	204.199k	21.81	63.44	-41.63	19.62	Neutral	-	2.19	9.64	0.11	9.87			
AV	204.199k	17.42	53.44	-36.02	19.62	Neutral	-	-2.20	9.64	0.11	9.87			
QP	256.712k	28.07	61.54	-33.47	19.63	Neutral	-	8.44	9.64	0.12	9.87			
AV	256.712k	20.96	51.54	-30.58	19.63	Neutral	-	1.33	9.64	0.12	9.87			
QP	292.162k	18.99	60.46	-41.47	19.62	Neutral	-	-0.63	9.63	0.12	9.87			
AV	292.162k	17.43	50.46	-33.03	19.62	Neutral	-	-2.19	9.63	0.12	9.87			
QP	1.752M	18.65	56.00	-37.35	19.65	Neutral	-	-1.00	9.65	0.13	9.87			
AV	1.752M	15.47	46.00	-30.53	19.65	Neutral	"Worst"	-4.18	9.65	0.13	9.87			
QP	2.137M	17.48	56.00	-38.52	19.66	Neutral	-	-2.18	9.65	0.14	9.87			
AV	2.137M	14.12	46.00	-31.88	19.66	Neutral	-	-5.54	9.65	0.14	9.87			
QP	12.689M	16.70	60.00	-43.30	19.88	Neutral	-	-3.18	9.71	0.29	9.88			
AV	12.689M	14.44	50.00	-35.56	19.88	Neutral	-	-5.44	9.71	0.29	9.88			

Conducted Emissions at Powerline_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	213.137k	24.28	63.07	-38.79	19.59	Line	-	4.69	9.68	0.01	9.90			
AV	213.137k	19.26	53.07	-33.81	19.59	Line	-	-0.33	9.68	0.01	9.90			
QP	292.16k	21.10	60.46	-39.36	19.59	Line	-	1.51	9.67	0.02	9.90			
AV	292.16k	19.50	50.46	-30.96	19.59	Line	-	-0.09	9.67	0.02	9.90			
QP	447.846k	13.21	56.92	-43.71	19.58	Line	-	-6.37	9.67	0.02	9.89			
AV	447.846k	12.16	46.92	-34.76	19.58	Line	-	-7.42	9.67	0.02	9.89			
QP	2.229M	20.60	56.00	-35.40	19.59	Line	-	1.01	9.68	0.09	9.82			
AV	2.229M	15.49	46.00	-30.51	19.59	Line	-	-4.10	9.68	0.09	9.82			
QP	3.613M	19.68	56.00	-36.32	19.69	Line	-	-0.01	9.69	0.11	9.89			
AV	3.613M	16.55	46.00	-29.45	19.69	Line	"Worst"	-3.14	9.69	0.11	9.89			
QP	21.519M	23.54	60.00	-36.46	19.85	Line	-	3.69	9.64	0.31	9.90			
AV	21.519M	19.17	50.00	-30.83	19.85	Line	-	-0.68	9.64	0.31	9.90			

Conducted Emissions at Powerline_Mode 2



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	LISN (dB)	CL (dB)	AT (dB)			
QP	225.388k	25.20	62.62	-37.42	19.59	Neutral	-	5.61	9.68	0.01	9.90			
AV	225.388k	19.68	52.62	-32.94	19.59	Neutral	-	0.09	9.68	0.01	9.90			
QP	290.996k	20.72	60.49	-39.77	19.59	Neutral	-	1.13	9.67	0.02	9.90			
AV	290.996k	19.16	50.49	-31.33	19.59	Neutral	-	-0.43	9.67	0.02	9.90			
QP	523.291k	13.86	56.00	-42.14	19.57	Neutral	-	-5.71	9.67	0.03	9.87			
AV	523.291k	12.46	46.00	-33.54	19.57	Neutral	-	-7.11	9.67	0.03	9.87			
QP	2.211M	19.15	56.00	-36.85	19.58	Neutral	-	-0.43	9.68	0.09	9.81			
AV	2.211M	14.72	46.00	-31.28	19.58	Neutral	-	-4.86	9.68	0.09	9.81			
QP	3.73M	21.54	56.00	-34.46	19.70	Neutral	-	1.84	9.69	0.12	9.89			
AV	3.73M	18.01	46.00	-27.99	19.70	Neutral	-	-1.69	9.69	0.12	9.89			
QP	20.76M	24.09	60.00	-35.91	19.95	Neutral	-	4.14	9.75	0.30	9.90			
AV	20.76M	22.03	50.00	-27.97	19.95	Neutral	"Worst"	2.08	9.75	0.30	9.90			

Summary

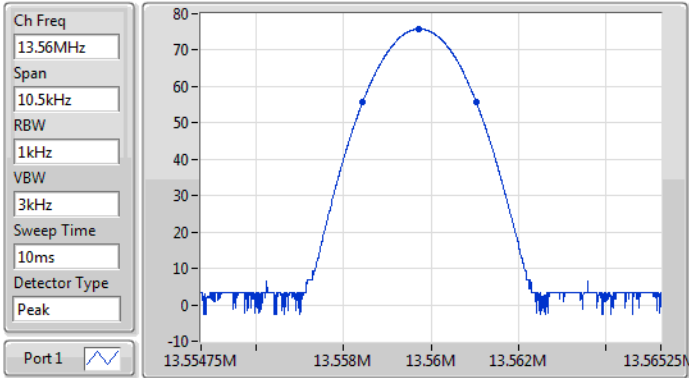
Mode	20dB (Hz)	OBW (Hz)
13.553-13.567MHz	-	-
NFC	2.583k	2.193k

Result

Mode	Result	20dB (Hz)	FI-20dB (Hz)	Fh-20dB (Hz)	OBW (Hz)	FI-OBW (Hz)	Fh-OBW (Hz)	Limit (Range)
NFC	-	-	-	-	-	-	-	-
13.56MHz_TnomVnom	Pass	2.583k	13.55845M	13.56103M	2.193k	13.55864M	13.56083M	13.553-13.567

NFC

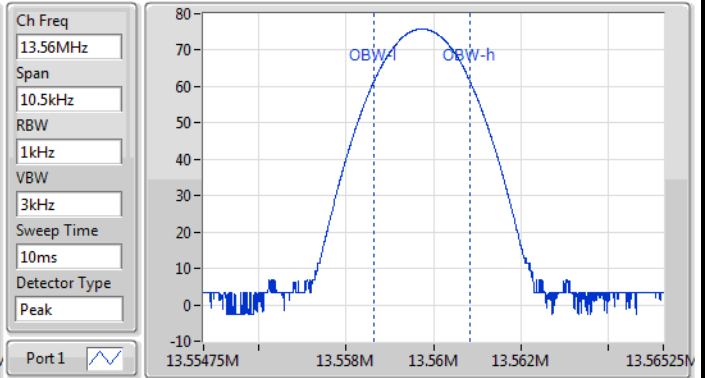
13.56MHz_TnomVnom



20dB(Hz)	FI-20dB(Hz)	Fh-20dB(Hz)	OBW(Hz)	FI-OBW(Hz)	Fh-OBW(Hz)	Limit(Range)
2.583k	13.55845M	13.56103M	2.193k	13.55864M	13.56083M	13.553-13.567

EBW

14/01/2020





Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
13.56M	-	-	-	-	-	-	-	-	-	-	-
NFC_Nss1_1TX	Pass	PK	13.56M	78.63	124.00	-45.37	22.79	3	153	1.00	-



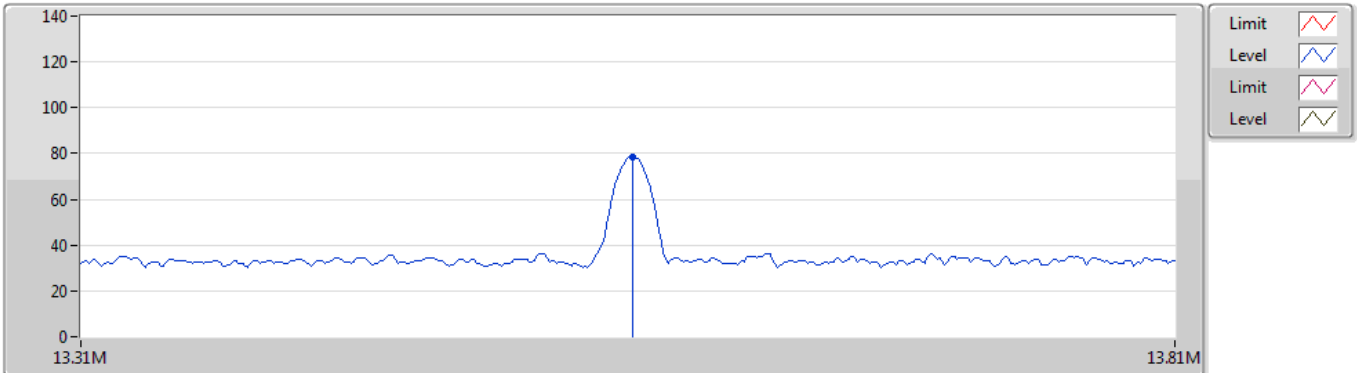
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
NFC_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-
13.56MHz_DC Power Supply	Pass	PK	13.56M	78.63	124.00	-45.37	22.79	3	153	1.00	-

NFC Operating below 30MHz

14/01/2020

13.56MHz_DC Power Supply



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	13.56M	78.63	124.00	-45.37	22.79	3	Horizontal	153	1.00	-	55.84	22.22	0.57	-



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
13.56M	-	-	-	-	-	-	-	-	-	-	-
NFC_Nss1_1TX	Pass	PK	1.225M	41.21	65.87	-24.66	20.27	3	0	1.00	-

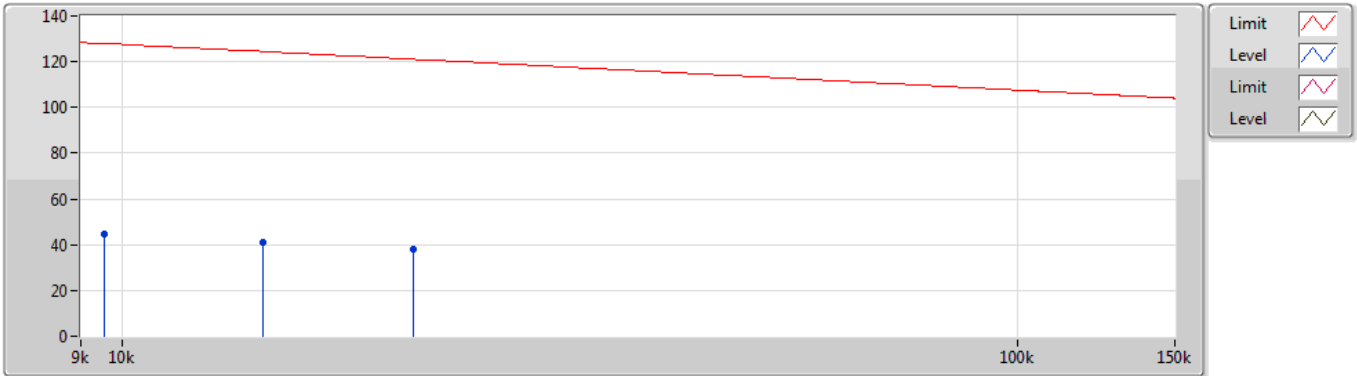
**Result**

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
NFC_Nss1_1TX	-	-	-	-	-	-	-	-	-	-	-
13.56MHz_DC Power Supply	Pass	PK	9.564k	44.75	127.96	-83.21	19.45	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	14.358k	40.86	124.44	-83.58	19.83	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	21.126k	38.00	121.08	-83.08	20.26	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	388.8k	49.77	95.80	-46.03	20.00	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	1.225M	41.21	65.87	-24.66	20.27	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	8.21M	42.50	69.50	-27.00	21.95	3	0	1.00	-

NFC Operating below 30MHz

14/01/2020

13.56MHz_DC Power Supply

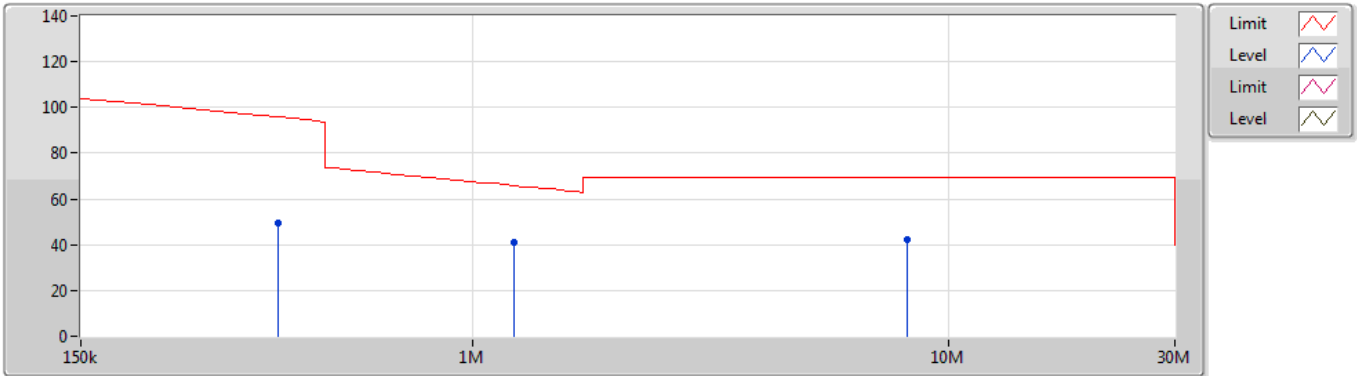


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	9.564k	44.75	127.96	-83.21	19.45	3	Horizontal	360	1.00	-	25.30	19.40	0.05	-
PK	14.358k	40.86	124.44	-83.58	19.83	3	Horizontal	360	1.00	-	21.03	19.79	0.04	-
PK	21.126k	38.00	121.08	-83.08	20.26	3	Horizontal	360	1.00	-	17.74	20.22	0.04	-

NFC Operating below 30MHz

14/01/2020

13.56MHz_DC Power Supply



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	388.8k	49.77	95.80	-46.03	20.00	3	Horizontal	0	1.00	-	29.77	19.95	0.05	-
PK	1.225M	41.21	65.87	-24.66	20.27	3	Horizontal	0	1.00	-	20.94	20.10	0.17	-
PK	8.21M	42.50	69.50	-27.00	21.95	3	Horizontal	0	1.00	-	20.55	21.54	0.41	-



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
13.553-13.567MHz	-	-	-	-	-	-	-	-	-	-	-
NFC	Pass	QP	365.62M	42.88	46.00	-3.12	-4.18	3	159	1.00	-

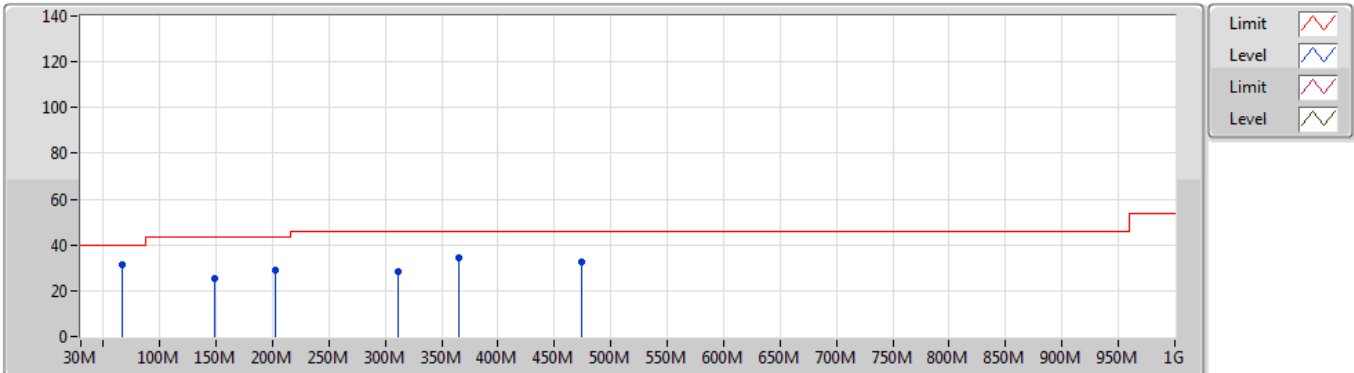
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
NFC	-	-	-	-	-	-	-	-	-	-	-
13.56MHz_DC Power Supply	Pass	PK	66.86M	31.49	40.00	-8.51	-14.92	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	148.34M	25.14	43.50	-18.36	-9.73	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	202.66M	28.86	43.50	-14.64	-10.24	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	311.3M	28.63	46.00	-17.37	-5.34	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	365.62M	34.49	46.00	-11.51	-4.18	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	474.26M	32.56	46.00	-13.44	-1.69	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	66.86M	29.27	40.00	-10.73	-14.92	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	121.18M	29.89	43.50	-13.61	-8.43	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	202.66M	36.84	43.50	-6.66	-10.24	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	474.26M	35.58	46.00	-10.42	-1.69	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	528.58M	32.59	46.00	-13.41	-1.48	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	QP	365.62M	42.88	46.00	-3.12	-4.18	3	159	1.00	-

NFC Operating above 30MHz

14/01/2020

13.56MHz_DC Power Supply

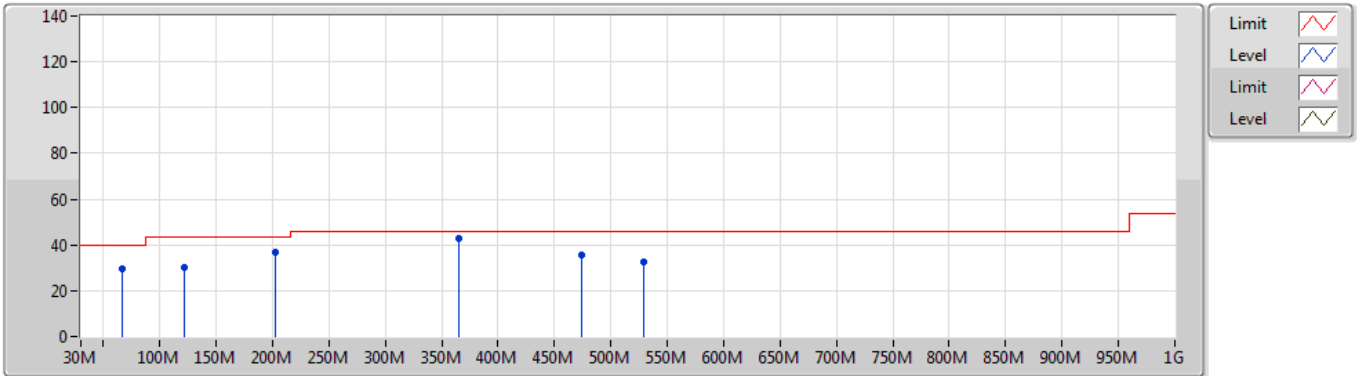


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	66.86M	31.49	40.00	-8.51	-14.92	3	Vertical	360	1.00	-	46.41	11.32	1.23	27.47
PK	148.34M	25.14	43.50	-18.36	-9.73	3	Vertical	360	1.00	-	34.87	15.58	1.88	27.19
PK	202.66M	28.86	43.50	-14.64	-10.24	3	Vertical	360	1.00	-	39.10	14.46	2.22	26.92
PK	311.3M	28.63	46.00	-17.37	-5.34	3	Vertical	360	1.00	-	33.97	18.63	2.80	26.77
PK	365.62M	34.49	46.00	-11.51	-4.18	3	Vertical	360	1.00	-	38.67	19.86	3.03	27.07
PK	474.26M	32.56	46.00	-13.44	-1.69	3	Vertical	360	1.00	-	34.25	22.57	3.50	27.76

NFC Operating above 30MHz

14/01/2020

13.56MHz_DC Power Supply



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	66.86M	29.27	40.00	-10.73	-14.92	3	Horizontal	0	1.00	-	44.19	11.32	1.23	27.47
PK	121.18M	29.89	43.50	-13.61	-8.43	3	Horizontal	0	1.00	-	38.32	17.19	1.69	27.31
PK	202.66M	36.84	43.50	-6.66	-10.24	3	Horizontal	0	1.00	-	47.08	14.46	2.22	26.92
PK	474.26M	35.58	46.00	-10.42	-1.69	3	Horizontal	0	1.00	-	37.27	22.57	3.50	27.76
PK	528.58M	32.59	46.00	-13.41	-1.48	3	Horizontal	0	1.00	-	34.07	22.77	3.70	27.95
QP	365.62M	42.88	46.00	-3.12	-4.18	3	Horizontal	159	1.00	-	47.06	19.86	3.03	27.07



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
13.553-13.567MHz	-	-	-	-	-	-	-	-	-	-	-
NFC	Pass	PK	2.12M	45.61	69.50	-23.89	20.21	3	360	1.00	-

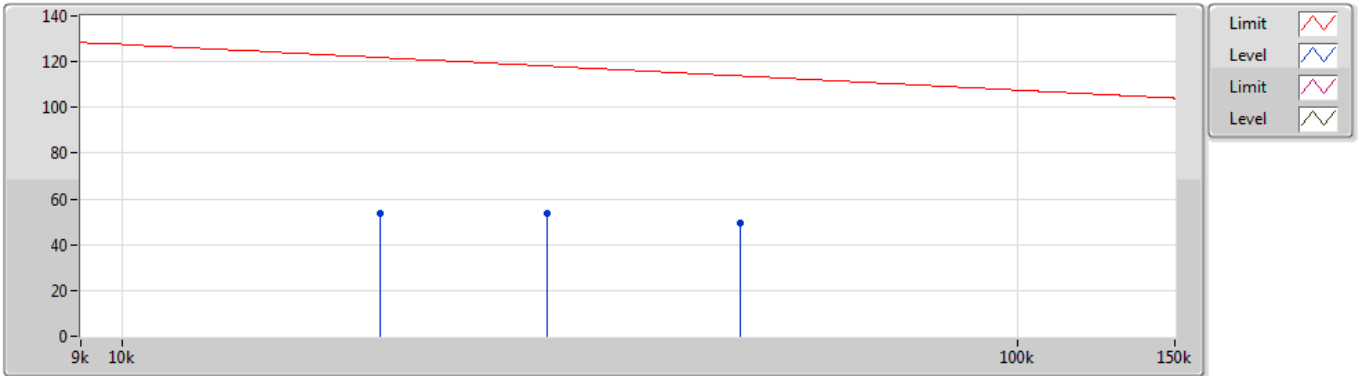
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
NFC	-	-	-	-	-	-	-	-	-	-	-
13.56MHz_DC Power Supply	Pass	PK	19.434k	53.63	121.80	-68.17	20.61	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	29.868k	53.41	118.09	-64.68	21.23	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	49.044k	49.55	113.77	-64.22	21.25	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	209.7k	49.89	101.16	-51.27	20.32	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	388.8k	49.01	95.80	-46.79	20.55	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	2.12M	45.61	69.50	-23.89	20.21	3	360	1.00	-

NFC Standby below 30MHz

09/12/2020

13.56MHz_DC Power Supply

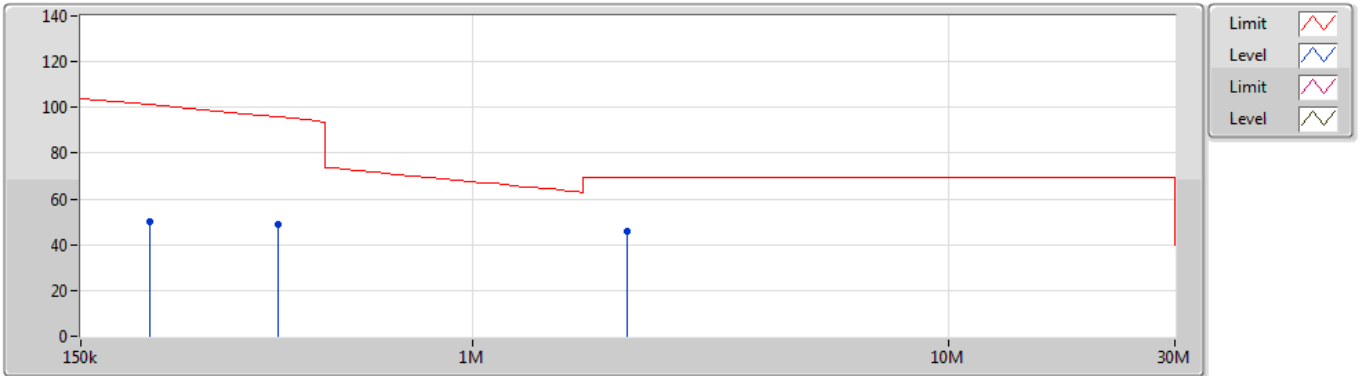


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	19.434k	53.63	121.80	-68.17	20.61	3	Horizontal	0	1.00	-	33.02	20.57	0.04	-
PK	29.868k	53.41	118.09	-64.68	21.23	3	Horizontal	0	1.00	-	32.18	21.19	0.04	-
PK	49.044k	49.55	113.77	-64.22	21.25	3	Horizontal	0	1.00	-	28.30	21.20	0.05	-

NFC Standby below 30MHz

09/12/2020

13.56MHz_DC Power Supply



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	209.7k	49.89	101.16	-51.27	20.32	3	Horizontal	360	1.00	-	29.57	20.24	0.08	-
PK	388.8k	49.01	95.80	-46.79	20.55	3	Horizontal	360	1.00	-	28.46	20.45	0.10	-
PK	2.12M	45.61	69.50	-23.89	20.21	3	Horizontal	360	1.00	-	25.40	19.99	0.22	-



Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
13.553-13.567MHz	-	-	-	-	-	-	-	-	-	-	-
NFC	Pass	PK	941.8M	32.10	46.00	-13.90	4.04	3	360	1.00	-

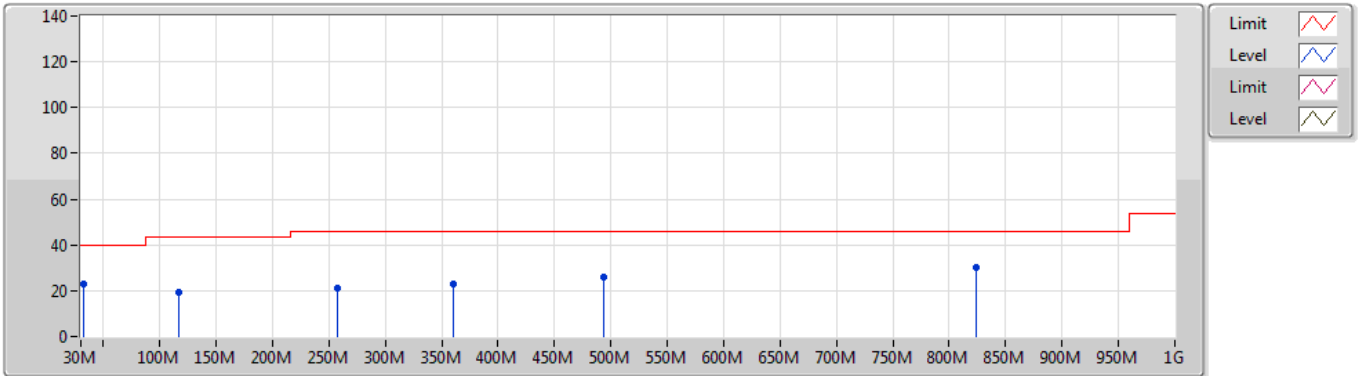
Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Azimuth (°)	Height (m)	Comments
NFC	-	-	-	-	-	-	-	-	-	-	-
13.56MHz_DC Power Supply	Pass	PK	31.94M	22.97	40.00	-17.03	-4.56	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	117.3M	19.07	43.50	-24.43	-7.97	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	256.98M	21.31	46.00	-24.69	-5.47	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	359.8M	22.85	46.00	-23.15	-3.90	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	493.66M	26.01	46.00	-19.99	-1.45	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	823.46M	30.16	46.00	-15.84	2.66	3	0	1.00	-
13.56MHz_DC Power Supply	Pass	PK	30M	22.66	40.00	-17.34	-3.17	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	121.18M	18.70	43.50	-24.80	-7.91	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	260.86M	20.12	46.00	-25.88	-5.14	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	350.1M	22.50	46.00	-23.50	-4.24	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	575.14M	27.80	46.00	-18.20	0.09	3	360	1.00	-
13.56MHz_DC Power Supply	Pass	PK	941.8M	32.10	46.00	-13.90	4.04	3	360	1.00	-

NFC Standby above 30MHz

09/12/2020

13.56MHz_DC Power Supply

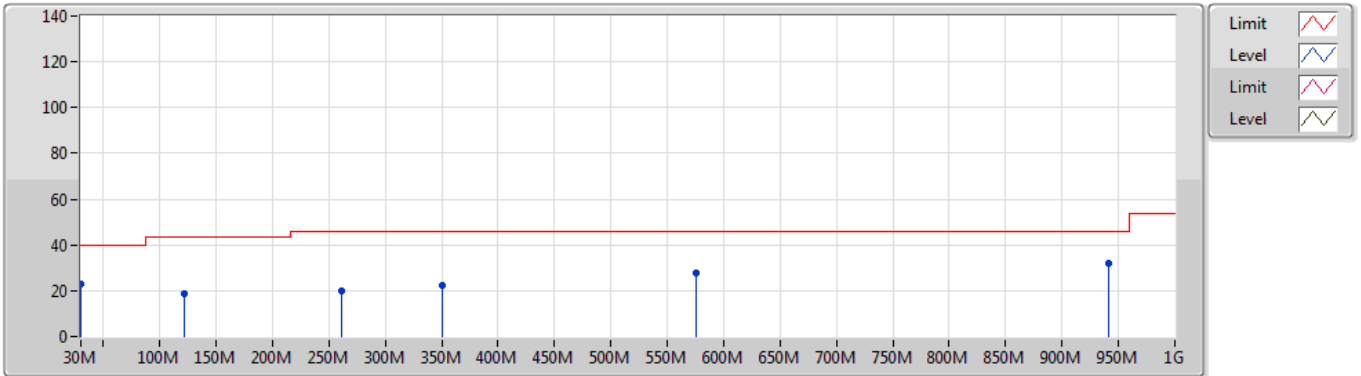


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	31.94M	22.97	40.00	-17.03	-4.56	3	Vertical	0	1.00	-	27.53	22.11	0.90	27.57
PK	117.3M	19.07	43.50	-24.43	-7.97	3	Vertical	0	1.00	-	27.04	17.56	1.77	27.30
PK	256.98M	21.31	46.00	-24.69	-5.47	3	Vertical	0	1.00	-	26.78	18.59	2.64	26.70
PK	359.8M	22.85	46.00	-23.15	-3.90	3	Vertical	0	1.00	-	26.75	19.96	3.14	27.00
PK	493.66M	26.01	46.00	-19.99	-1.45	3	Vertical	0	1.00	-	27.46	22.67	3.66	27.78
PK	823.46M	30.16	46.00	-15.84	2.66	3	Vertical	0	1.00	-	27.50	25.58	4.85	27.77

NFC Standby above 30MHz

09/12/2020

13.56MHz_DC Power Supply



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
PK	30M	22.66	40.00	-17.34	-3.17	3	Horizontal	360	1.00	-	25.83	23.51	0.90	27.58
PK	121.18M	18.70	43.50	-24.80	-7.91	3	Horizontal	360	1.00	-	26.61	17.57	1.81	27.29
PK	260.86M	20.12	46.00	-25.88	-5.14	3	Horizontal	360	1.00	-	25.26	18.89	2.67	26.70
PK	350.1M	22.50	46.00	-23.50	-4.24	3	Horizontal	360	1.00	-	26.74	19.60	3.10	26.94
PK	575.14M	27.80	46.00	-18.20	0.09	3	Horizontal	360	1.00	-	27.71	24.10	4.00	28.01
PK	941.8M	32.10	46.00	-13.90	4.04	3	Horizontal	360	1.00	-	28.06	26.08	5.33	27.37



Summary

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
13.553-13.567MHz	-	-	-	-	-	-	-
NFC	Pass	13.56M	13.559696M	22.3884	100	1	0 min

Result

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
NFC	-	-	-	-	-	-	-
13.56MHz_-40°C	Pass	13.56M	13.560171M	12.6459	100	1	0 min
13.56MHz_-40°C	Pass	13.56M	13.560173M	12.775	100	1	2 min
13.56MHz_-40°C	Pass	13.56M	13.560173M	12.775	100	1	5 min
13.56MHz_-40°C	Pass	13.56M	13.560172M	12.7104	100	1	10 min
13.56MHz_-30°C	Pass	13.56M	13.560173M	12.775	100	1	0 min
13.56MHz_-30°C	Pass	13.56M	13.560174M	12.8395	100	1	2 min
13.56MHz_-30°C	Pass	13.56M	13.560173M	12.775	100	1	5 min
13.56MHz_-30°C	Pass	13.56M	13.560174M	12.8395	100	1	10 min
13.56MHz_-20°C	Pass	13.56M	13.559915M	6.2584	100	1	0 min
13.56MHz_-20°C	Pass	13.56M	13.559916M	6.1939	100	1	2 min
13.56MHz_-20°C	Pass	13.56M	13.559915M	6.2584	100	1	5 min
13.56MHz_-20°C	Pass	13.56M	13.559915M	6.2584	100	1	10 min
13.56MHz_-10°C	Pass	13.56M	13.559858M	10.4522	100	1	0 min
13.56MHz_-10°C	Pass	13.56M	13.559859M	10.3877	100	1	2 min
13.56MHz_-10°C	Pass	13.56M	13.559858M	10.4522	100	1	5 min
13.56MHz_-10°C	Pass	13.56M	13.559859M	10.3877	100	1	10 min
13.56MHz_0°C	Pass	13.56M	13.55978M	16.259	100	1	0 min
13.56MHz_0°C	Pass	13.56M	13.559776M	16.5171	100	1	2 min
13.56MHz_0°C	Pass	13.56M	13.559775M	16.5816	100	1	5 min
13.56MHz_0°C	Pass	13.56M	13.559776M	16.5171	100	1	10 min
13.56MHz_10°C	Pass	13.56M	13.559774M	16.6461	100	1	0 min
13.56MHz_10°C	Pass	13.56M	13.559773M	16.7107	100	1	2 min
13.56MHz_10°C	Pass	13.56M	13.559774M	16.6461	100	1	5 min
13.56MHz_10°C	Pass	13.56M	13.559773M	16.7107	100	1	10 min
13.56MHz_20°C	Pass	13.56M	13.559727M	20.1302	100	1	0 min
13.56MHz_20°C	Pass	13.56M	13.55973M	19.9367	100	1	2 min
13.56MHz_20°C	Pass	13.56M	13.55973M	19.9367	100	1	5 min
13.56MHz_20°C	Pass	13.56M	13.559731M	19.8076	100	1	10 min
13.56MHz_30°C	Pass	13.56M	13.559763M	17.4849	100	1	0 min
13.56MHz_30°C	Pass	13.56M	13.559761M	17.6139	100	1	2 min
13.56MHz_30°C	Pass	13.56M	13.559761M	17.6139	100	1	5 min
13.56MHz_30°C	Pass	13.56M	13.55976M	17.6785	100	1	10 min
13.56MHz_40°C	Pass	13.56M	13.559743M	18.9689	100	1	0 min
13.56MHz_40°C	Pass	13.56M	13.559744M	18.9043	100	1	2 min
13.56MHz_40°C	Pass	13.56M	13.559743M	18.9689	100	1	5 min
13.56MHz_40°C	Pass	13.56M	13.559743M	18.9689	100	1	10 min
13.56MHz_50°C	Pass	13.56M	13.559696M	22.3884	100	1	0 min
13.56MHz_50°C	Pass	13.56M	13.559697M	22.3239	100	1	2 min
13.56MHz_50°C	Pass	13.56M	13.559698M	22.2594	100	1	5 min
13.56MHz_50°C	Pass	13.56M	13.559698M	22.2594	100	1	10 min
13.56MHz_60°C	Pass	13.56M	13.560173M	12.775	100	1	0 min
13.56MHz_60°C	Pass	13.56M	13.560176M	12.9685	100	1	2 min
13.56MHz_60°C	Pass	13.56M	13.560176M	12.9685	100	1	5 min

Mode	Result	Ch (Hz)	Center (Hz)	ppm	Limit (ppm)	Port	Remark
13.56MHz_60°C	Pass	13.56M	13.560176M	12.9685	100	1	10 min
13.56MHz_70°C	Pass	13.56M	13.560176M	12.9685	100	1	0 min
13.56MHz_70°C	Pass	13.56M	13.560176M	12.9685	100	1	2 min
13.56MHz_70°C	Pass	13.56M	13.560176M	12.9685	100	1	5 min
13.56MHz_70°C	Pass	13.56M	13.560171M	12.5814	100	1	10 min
13.56MHz_80°C	Pass	13.56M	13.560176M	12.9685	100	1	0 min
13.56MHz_80°C	Pass	13.56M	13.560176M	12.9685	100	1	2 min
13.56MHz_80°C	Pass	13.56M	13.560175M	12.904	100	1	5 min
13.56MHz_80°C	Pass	13.56M	13.560176M	12.9685	100	1	10 min
13.56MHz_85°C	Pass	13.56M	13.560176M	12.9685	100	1	0 min
13.56MHz_85°C	Pass	13.56M	13.560176M	12.9685	100	1	2 min
13.56MHz_85°C	Pass	13.56M	13.560176M	12.9685	100	1	5 min
13.56MHz_85°C	Pass	13.56M	13.560177M	13.033	100	1	10 min
13.56MHz_20°C-10.8V	Pass	13.56M	13.559729M	20.0012	100	1	0 min
13.56MHz_20°C-10.8V	Pass	13.56M	13.559729M	20.0012	100	1	2 min
13.56MHz_20°C-10.8V	Pass	13.56M	13.55973M	19.9367	100	1	5 min
13.56MHz_20°C-10.8V	Pass	13.56M	13.55973M	19.9367	100	1	10 min
13.56MHz_20°C-13.2V	Pass	13.56M	13.55973M	19.9367	100	1	0 min
13.56MHz_20°C-13.2V	Pass	13.56M	13.559734M	19.6141	100	1	2 min
13.56MHz_20°C-13.2V	Pass	13.56M	13.559729M	20.0012	100	1	5 min
13.56MHz_20°C-13.2V	Pass	13.56M	13.559729M	20.0012	100	1	10 min