


Prüfbericht-Nr.: <i>Test Report No.:</i>	50277187 001	Auftrags-Nr.: <i>Order No.:</i>	168120652	Seite 1 von 37 <i>Page 1 of 37</i>	
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	2173023	Auftragsdatum: <i>Order date.:</i>	26 Jul. 2019		
Auftraggeber: <i>Client:</i>	EAST Group Co., Ltd. No.6 Northern Industry Road, Songshan Lake Sci.& Tech. industrial zone, Dongguan City, Guangdong, P.R. China				
Prüfgegenstand: <i>Test item:</i>	DC EV Charging Station				
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	EVDC-80KW-9YHW-1, EVDC-40KW-9YHW-1				
Auftrags-Inhalt: <i>Order content:</i>	TUV Rheinland - EMC service				
Prüfgrundlage: <i>Test specification:</i>	EN 61000-6-2:2005 EN 61000-6-4:2007+A1 IEC 61851-21-2:2018				
Wareneingangsdatum: <i>Date of receipt:</i>	13 Januray 2020				
Prüfmuster-Nr.: <i>Test sample No.:</i>	SPO190362-1				
Prüfzeitraum: <i>Testing period:</i>	Refer to test report				
Ort der Prüfung: <i>Place of testing:</i>	Refer to section 2.1				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von / tested by:	kontrolliert von / reviewed by:				
22.09.2020	Allen Xiao Senior Project Engineer	22.09.2020	Tongle Lee Reviewer		
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other:					
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
<p>* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</p> <p>Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested</p>					
<p>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</p> <p><i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p>					

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TEST SUMMARY

5.1.1 CONDUCTED DISTURBANCE FOR AC POWER INPUT PORT

RESULT: Pass

5.1.2 ASYMMETRIC MODE CONDUCTED EMISSIONS AT WIRED NETWORK PORT

RESULT: Pass

5.1.3 CONDUCTED DISTURBANCE FOR DC CPT PORT

RESULT: Pass

5.1.4 VOLTAGE TRANSIENT DISTURBANCE FOR DC CPT PORT

RESULT: Pass

5.1.5 RADIATED DISTURBANCE (2 KHz TO 185 KHz)

RESULT: Pass

5.2.1 RADIATED DISTURBANCE (30MHz-1000MHz)

RESULT: Pass

5.2.2 RADIATED DISTURBANCE (1000MHz-6000MHz)

RESULT: Pass

6.2.1 RADIO-FREQUENCY ELECTROMAGNETIC FIELD AMPLITUDE MODULATED (RS)

RESULT: Pass

6.2.2 RADIO-FREQUENCY CONTINUOUS CONDUCTED (CS)

RESULT: Pass

6.2.3 POWER-FREQUENCY MAGNETIC FIELDS

RESULT: Pass

6.3.1 FAST TRANSIENTS (EFT)

RESULT: Pass

6.3.2 SURGE

RESULT: Pass

6.3.3 ELECTROSTATIC DISCHARGES (ESD)

RESULT: Pass

6.4.1 VOLTAGE DIPS AND INTERRUPTIONS

RESULT: Pass

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1. General Remarks

1.1 Complementary Materials

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

Appendix 1: Test result

Appendix 2: Measurement uncertainties

2. Test Sites

2.1 Test Facilities

SHENZHEN CHENGXIN TECHNOLOGY SERVICE CO., LTD.
Dafu Plant, No. 13 North of Aiqun Road, Shangwu community, Shiyan Street, Baoan District, Shenzhen City, China.

The tests at the test site have been conducted under the supervision of a TÜV engineer.

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Conducted Disturbance (CTS)				
Test Receiver	ROHDE&SCHWARZ	ESCI 7	TE18080002	2021.03.02
LISN	SCHWARZBECK	NNLK8130	TE18080014	2021.03.12
AMN	SCHWARZBECK	NNHV 8123-200	TE18080027	2021.03.02
AMN	SCHWARZBECK	NNHV 8123-200	TE18080028	2021.03.02
ISN	TESEQ	ISN T8	51987	2020.06.28
Voltage transient disturbances(CTS)				
Oscilloscope	YOKOGAWA	DLM 2024	TS18080014	2020.04.27
DC Load	SIKES	SKS-RDC-160KW-750/1000V	TE18080071	/
AMN	SCHWARZBECK	NNHV 8123-200	TE18080027	2021.03.02
AMN	SCHWARZBECK	NNHV 8123-200	TE18080028	2021.03.02
Radiated Disturbance(2KHz-185KHz) (CTS)				
magnetic field monitoring loop	SCHWARZBECK	FESP 5133-7/41	TE18080082	2020.07.05
Test Receiver	ROHDE&SCHWARZ	ESIB 7	TE18080090	2020.09.20
Radiated Disturbance (10m Chamber)(30MHz-6000MHz) (CTS)				
10m Chamber	EMC-united	21.1x12.4x8.5 5M(H)	TE18080063	2020.04.16
Broadband Antenna	SCHWARZBECK	VULB 9163	TE18080010	2021.03.12
Test Receiver	ROHDE&SCHWARZ	ESCI 7	TE18080002	2021.03.02
Horn Antenna	SCHWARZBECK	BBHA 9120D	TE18080004	2021.03.06
Preset Amplifier	Anritsu	NH648A	TE18080057	2020.07.08
ESD (CTS)				
ESD Test System	TESEQ	NSG 437	TE18080035	2021.02.27
Radio-Frequency Electromagnetic Field Amplitude Modulated (CTS)				

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Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Signal Generator	Agilent	N5181A	TE18080045	2020.07.11
Power Meter	Agilent	N1914A	TE18080058	2020.07.11
EMS Antenna	SCHWARZBECK	STLP 9128 E	TE18080007	2021.02.04
EMS Antenna	SCHWARZBECK	BBHA 9120 J	TE18080005	2021.02.04
Power Amplifier	TESEQ	CBA 1G-1200B	TE18080055	2020.07.08
Power Amplifier	MILMEGA	AS0104-200/200	TE18080063	2020.07.08
EFT & Surge (CTS)				
EFT/Surge Test System	EM TEST	UCS500N7.2	TE18080036	2021.03.02
	EM TEST	CNI503B9.4/100A	TE18080037	2021.03.02
Capacitive clamp	EM TEST	CCI	TE18080034	2020.07.14
Radio-Frequency Continuous Conducted (CTS)				
Signal Generator	Agilent	N5181A	TE18080045	2020.07.11
Power Meter	Agilent	N1914A	TE18080058	2020.07.11
Power Amplifier	AMETEK	SCDX150	TE18080013	2020.08.30
Injection probe	TESEQ	CIP 9136A	TE18080029	2020.05.14
CDN	SCHWARZBECK	T8 RJ45	TE18080023	2021.02.28
CDN	TESEQ	M5-100-750V	TE18080032	2020.05.14
Power Frequency Magnetic Field Immunity(CTS)				
Magnetic Field Tester	3C TEST	MFS 1200	TE18080040	2020.06.08
Voltage Dips and Interruptions(CTS)				
Power Supply	Chroma	61860	TE18080043	2020.07.08
Voltage Dip Switch	TESEQ	NSG 2200-3	TE18080054	2020.06.08

3. General Product Information

3.1 Product Function and Intended Use

The EUT (Equipments Under Test) is DC EV CHARGING STATION which are used to set up a distributed charging network, could quickly and efficiently provide different power charging services for electric vehicles.

The devices consist of integrated charger and charging connector, including charging module components, sampling unit, billing unit, human-computer interface, control and protection unit and charging connector. It is suitable for the charging stations and business-specific parking lot.

Both models are same design except the number of power module/ac contactor and current rating of RCCB and EV connector. Details see below,

Model list		
Model	EVDC-80KW-9YHW-1	EVDC-40KW-9YHW-1
Input Voltage	AC 400V	
Input Current	160A Max.	80A Max.
DC output	150-1000Vdc,0-100A,80kW	150-1000Vdc,0-50A,40kW
Number of power modules	4	2
AC Contactor	2	1
Current rating of RCCB(A)	250	160
Current rating of EV connector(A)	200	125
Current rating of DC connector(A)	250	150

For details please refer to the Circuit Diagram & Instruction Manual.

3.2 Ratings and System Details

Rated Input voltage:	AC 400V, 3W+N+PE
Rated Input current:	Refer to section 3.1
Frequency:	50Hz
DC Output Voltage:	Refer to section 3.1
DC Output Current:	Refer to section 3.1
Rated Power:	Refer to section 3.1
Protection Class:	I

3.3 Independent Operation Modes

The basic operation modes are:

- A. On (Charge Mode)
- B. Stand-by (Waiting Mode)
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Material List
- PCB Layout
- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure their highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Immunity: The equipment under test (EUT) was configured to have their highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5 & 6. According to the product characteristics and model difference indicated in section 3.1, full tests were applied on model EVDC-80KW-9YHW-1
Pre-test in all operation modes, and find out the worst case for compliance test.

4.3 Special Accessories and Auxiliary Equipment

The EUT was tested together with the following accessories:

Item	Manufacturer	Model	S/N
Notebook Computer	Dell	Inspiron 5488	OA18070014
Loading Cabinet	SIKES	SKS-RDC-160KW-750/1000V	TE18080102
Oscilloscope	YOKOGAWA	DLM 2024	TS18070014
Multimeter	Fluke	Fluke 17B	TS18080067

4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance

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5. Test Results EMISSION

5.1 Emission in the Frequency Range up to 30 MHz

5.1.1 Conducted Disturbance for AC Power Input Port

RESULT:

Pass

Date of testing : Refer to Appendix 1
Test standard : EN 61000-6-4:2007+A1 & IEC 61851-21-2:2018
Frequency range : 0.15 - 30MHz
Limits : Table 2 of EN 61000-6-4:2007+A1;
Table 7 of IEC 61851-21-2:2018
Kind of test site : Shielded room
Tested port : AC Power Input Port

Test setup

Mains Voltage : AC 400V, 50Hz
Operation Condition : Clause 4 of EN 61000-6-4:2007+A1;
Clause 4.4.3 of IEC 61851-21-2:2018
Operation mode : A
Artificial hand : Not applied
Earthing : Connected

Refer to attached Appendix 1.

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5.1.2 Asymmetric Mode Conducted Emissions at Wired Network Port

RESULT:

Pass

Date of testing : Refer to Appendix 1
Test standard : EN 61000-6-4:2007+A1 & IEC 61851-21-2:2018
Frequency range : 0.15 - 30MHz
Limits : Table 3 of EN 61000-6-4:2007+A1
Table 13 of IEC 61851-21-2:2018
Kind of test site : Shielded room
Tested port : Wired Network Port

Test setup

Mains Voltage : AC 400V, 50Hz
Operation Condition : Clause 4 of EN 61000-6-4:2007+A1;
Clause 4.4.3 of IEC 61851-21-2:2018
Operation mode : A
Artificial hand : Not applied
Earthing : Connected

Refer to attached Appendix 1.

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5.1.3 Conducted Disturbance for DC CPT Port

RESULT:

Pass

Date of testing : Refer to Appendix 1
Test standard : IEC 61851-21-2:2018
Frequency range : 0.15 - 30MHz
Limits : Table 12 of IEC 61851-21-2:2018
Kind of test site : Shielded room
Tested port : DC CPT Port

Test setup

Mains Voltage : AC 400V, 50Hz
Operation Condition : Clause 4.4.3 of IEC 61851-21-2:2018
Operation mode : A
Artificial hand : Not applied
Earthing : Connected

Refer to attached Appendix 1.

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5.1.4 Voltage Transient Disturbance for DC CPT Port

RESULT:

Pass

Date of testing : Refer to Appendix 1
Test standard : IEC 61851-21-2:2018
Limits : Table D.1 of IEC 61851-21-2:2018
Kind of test site : Shielded room
Tested port : DC CPT port

Test setup

Mains Voltage : AC 400V, 50Hz
Operation Condition : Clause 4.4.3, Annex D of IEC 61851-21-2:2018
Operation mode : A
Artificial hand : Not applied
Earthing : Connected

Refer to attached Appendix 1.

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5.1.5 Radiated Disturbance (2 kHz to 185 kHz)

RESULT:

Pass

Date of testing : Refer to Appendix 1
Test standard : IEC 61851-21-2:2018
Frequency range : 2 kHz-185 kHz
Limits : Table B.1 of IEC 61851-21-2:2018
Kind of test site : 10m Semi-Anechoic Chamber
Tested Port : Enclosure

Test setup

Mains Voltage : AC 400V, 50Hz
Operation Condition : Clause 4.4.3, Annex B of IEC 61851-21-2:2018
Operation mode : A
Earthing : Connected

Refer to attached Appendix 1.

5.2 Emission in the Frequency Range above 30 MHz

5.2.1 Radiated Disturbance (30MHz-1000MHz)

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test standard	:	EN 61000-6-4:2007+A1 & IEC 61851-21-2:2018
Frequency range	:	30 - 1000MHz
Limits	:	Table 1 of EN 61000-6-4:2007+A1 Table 16 of IEC 61851-21-2:2018
Kind of test site	:	10m Semi-Anechoic Chamber
Measuring distance	:	10m (30-1000MHz)
Tested Port	:	Enclosure

Test setup

Input Voltage	:	AC 400V, 50Hz
Operation Condition	:	Clause 4 of EN 61000-6-4:2007+A1; Clause 4.4.3 of IEC 61851-21-2:2018
Operation mode	:	A
Earthing	:	Connected

Refer to attached Appendix 1.

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5.2.2 Radiated Disturbance (1000MHz-6000MHz)

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test standard	:	EN 61000-6-4:2007+A1 & IEC 61851-21-2:2018
Frequency range	:	1000MHz-6000MHz
Limits	:	Table 1 of EN 61000-6-4:2007+A1 Table 17 of IEC 61851-21-2:2018
Kind of test site	:	10m Semi-Anechoic Chamber with RF absorber on the RGP
Measuring distance	:	3m (1000-6000MHz)
Tested Port	:	Enclosure

Test setup

Input Voltage	:	AC 400V, 50Hz
Operation Condition	:	Clause 4 of EN 61000-6-4:2007+A1; Clause 4.4.3 of IEC 61851-21-2:2018
Operation mode	:	A
Earthing	:	Connected

Refer to attached Appendix 1.

6. Test Results IMMUNITY

6.1 Classification of apparatus

According to EN 61000-6-2:2005, the EUTs shall be tested in accordance with table 1, 2, 3 & 4, and comply with following performance criterion:

According to IEC 61851-21-2:2018, the EUTs shall be tested in accordance with clause 5.2, table 3 of IEC 61851-21-2:2018 and comply with following performance criterion:

Continuous Disturbance

Power-Frequency Magnetic Fields	Criterion A
Radio-Frequency Electromagnetic Field Amplitude Modulated (RS)	Criterion A
Radio-Frequency Continuous Conducted (CS)	Criterion A

Transient Disturbance

Fast Transients (EFT)	Criterion B
Surge	Criterion B
Electrostatic Discharges (ESD)	Criterion B

Power Supply Alterations

Voltage Dips and Interruptions	Criterion B & C
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6.2 Continuous Disturbances

6.2.1 Radio-Frequency Electromagnetic Field Amplitude Modulated (RS)

RESULT:

Pass

Date of Testing	:	Refer to Appendix 1
Test Specification	:	EN 61000-6-2:2005 & IEC 61851-21-2:2018
Basic Standard	:	IEC 61000-4-3:2006+A1+A2
Criterion	:	A
Frequency Range	:	80 - 2,700MHz
Test Level	:	10V/m: 80 – 1000MHz 3V/m: 1.4 – 2.0GHz 3V/m: 2.0 – 2.7GHz (Unmodulated, r.m.s.)
Modulation	:	AM 80%, 1kHz sine-wave
Tested Port	:	Enclosure

Test setup

Input Voltage	:	AC 400V, 50Hz
Operation Mode	:	A & B
Earthing	:	Connected
Ambient temperature	:	Refer to Appendix 1
Relative humidity	:	Refer to Appendix 1
Atmospheric pressure	:	101 kPa

Refer to attached Appendix 1.

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6.2.2 Radio-Frequency Continuous Conducted (CS)

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test Specification	:	EN 61000-6-2:2005 & IEC 61851-21-2:2018
Basic Standard	:	IEC 61000-4-6:2008 & IEC 61000-4-6:2013
Criterion	:	A
Frequency range	:	0.15 - 80 MHz
Source impedance	:	150Ω
Test level	:	10V (unmodulated, r.m.s.)
Modulation	:	AM 80%, 1kHz sine-wave
Sweep mode	:	automatic
Sweep rate	:	< 1.5×10 ⁻³ decade / sec.
Tested Port	:	AC Power Input, DC CPT & Wired Network Port

Test setup

Input Voltage	:	AC 400V, 50Hz
Operation Mode	:	A & B
Earthing	:	Connected
Ambient temperature	:	Refer to Appendix 1
Relative humidity	:	Refer to Appendix 1
Atmospheric pressure	:	101 kPa

Refer to attached Appendix 1.

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6.2.3 Power-frequency Magnetic Fields

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test Specification	:	EN 61000-6-2:2005 & IEC 61851-21-2:2018
Basic Standard	:	IEC 61000-4-8:2009
Criterion	:	A
Test Frequency	:	50Hz & 60Hz
Test level	:	30A/m for EN 61000-6-2:2005; 100A/m for IEC 61851-21-2:2018
Tested Port	:	Enclosure

Test setup

Input Voltage	:	AC 400V, 50Hz
Operation Mode	:	A & B
Earthing	:	Connected
Ambient temperature	:	Refer to Appendix 1
Relative humidity	:	Refer to Appendix 1
Atmospheric pressure	:	101 kPa

Refer to attached Appendix 1.

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6.3 Transient Disturbances

6.3.1 Fast Transients (EFT)

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test Specification	:	EN 61000-6-2:2005 & IEC 61851-21-2:2018
Basic Standard	:	IEC 61000-4-4:2004 & IEC 61000-4-4:2012
Criterion	:	B
Test level	:	±4kV for AC Power Input Port ±2kV for DC CPT & Wired Network Port
Test duration	:	≥60sec
Rise time	:	5/50ns
Repetition frequency	:	5kHz
Tested Port	:	AC Power Input, DC CPT & Wired Network Port

Test setup

Input Voltage	:	AC 400V, 50Hz
Operation Mode	:	A & B
Earthing	:	Connected
Ambient temperature	:	Refer to Appendix 1
Relative humidity	:	Refer to Appendix 1
Atmospheric pressure	:	101 kPa

Refer to attached Appendix 1.

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6.3.2 Surge

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test Specification	:	EN 61000-6-2:2005 & IEC 61851-21-2:2018
Basic Standard	:	IEC 61000-4-5:2005 & IEC 61000-4-5:2014+A1
Criterion	:	B
Source impedance	:	2Ω, 12Ω
Test level	:	±0.5kV, ±1kV, ±2kV, ±4kV for AC Power Input Port ±0.5kV, ±1kV for Wired Network Port
Number of surges	:	5 (for each combination of parameters)
Repetition rate	:	Max. 1/min
Tested Port	:	AC Power Input & Wired Network Port

Test Setup

Input Voltage	:	AC 400V, 50Hz
Operation Mode	:	A & B
Earthing	:	Connected
Ambient temperature	:	Refer to Appendix 1
Relative humidity	:	Refer to Appendix 1
Atmospheric pressure	:	101 kPa

Refer to attached Appendix 1.

Remark: Since the length of DC output power cable will not exceed 30M according to the manufacturer's functional specification, therefore surge test is not applicable to DC CPT port of the EUT.

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6.3.3 Electrostatic Discharges (ESD)

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test Specification	:	EN 61000-6-2:2005 & IEC 61851-21-2:2018
Basic Standard	:	IEC 61000-4-2:2008
Criterion	:	B
Charge voltage	:	±2.0kV, ±4.0kV, ±8kV (air discharge) ±4.0kV (contact discharge)
Number of discharges	:	>10
Tested Port	:	Enclosure

Test Setup

Input Voltage	:	AC 400V, 50Hz
Operation Mode	:	A & B
Earthing	:	Connected
Ambient temperature	:	Refer to Appendix 1
Relative humidity	:	Refer to Appendix 1
Atmospheric pressure	:	101 kPa

Refer to attached Appendix 1.

Prüfbericht - Nr.: 50277187 001
Test Report No.

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6.4 Power Supply Alterations

6.4.1 Voltage Dips and Interruptions

RESULT:

Pass

Date of testing	:	Refer to Appendix 1
Test Specification	:	EN 61000-6-2:2005 & IEC 61851-21-2:2018
Basic Standard	:	IEC 61000-4-11:2004 & IEC 61000-4-34:2005+A1
Criterion	:	B & C
Tested Port	:	AC Power Input Port

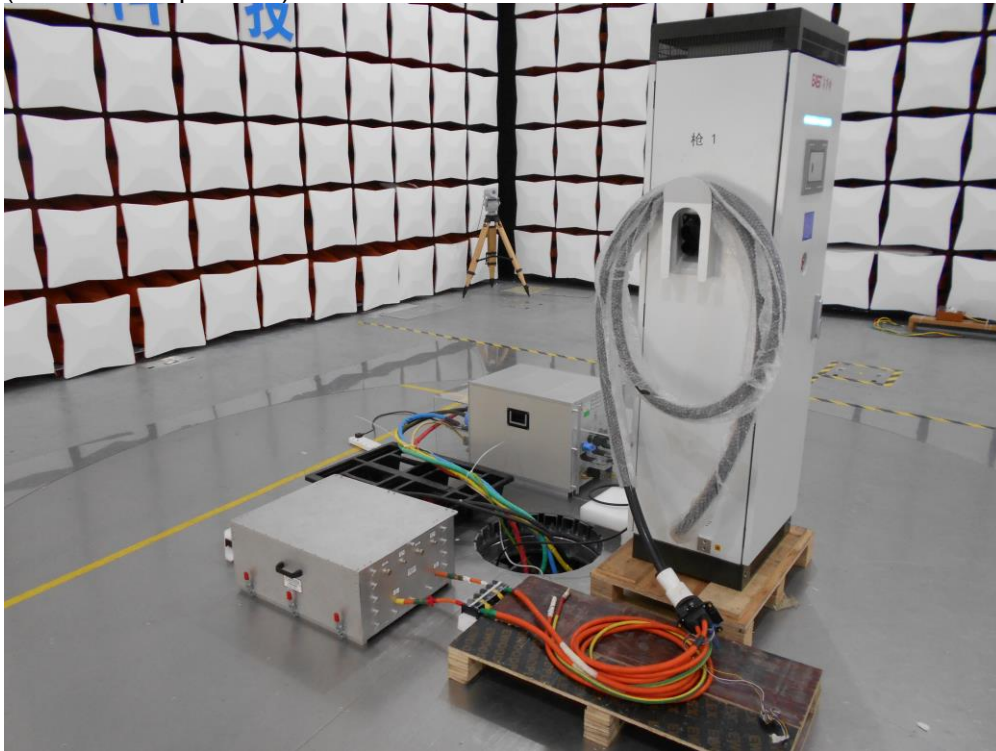
Test Setup

Input Voltage	:	AC 400V, 50Hz
Operation Mode	:	A & B
Earthing	:	Connected
Ambient temperature	:	Refer to Appendix 1
Relative humidity	:	Refer to Appendix 1
Atmospheric pressure	:	101 kPa

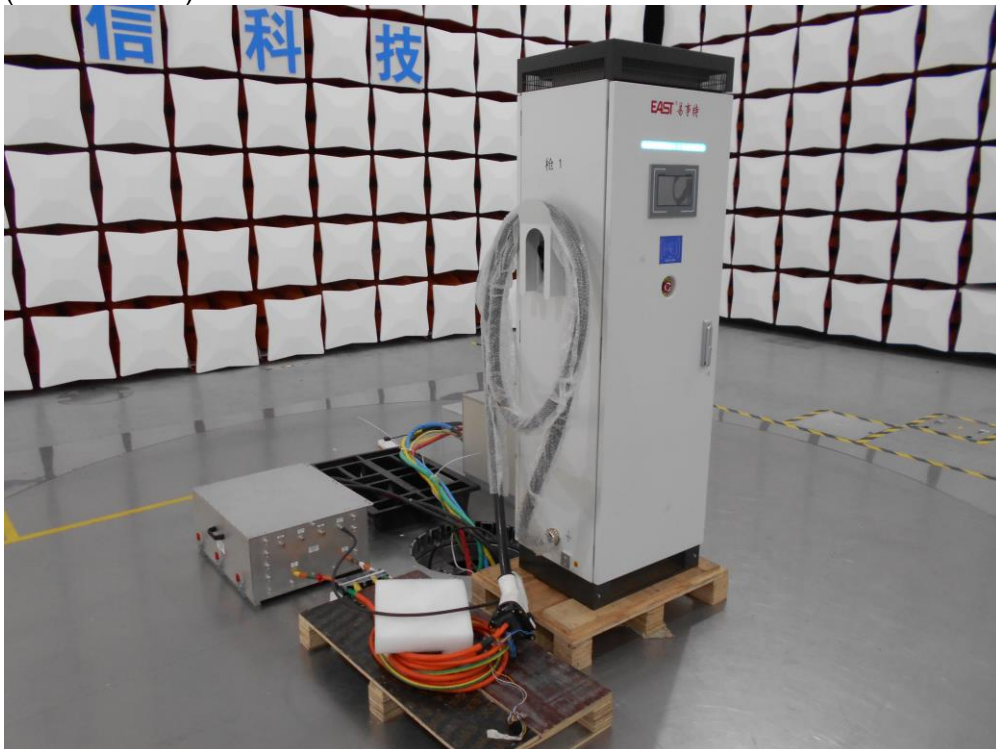
Refer to attached Appendix 1.

7. Photographs of the Test Set-Up

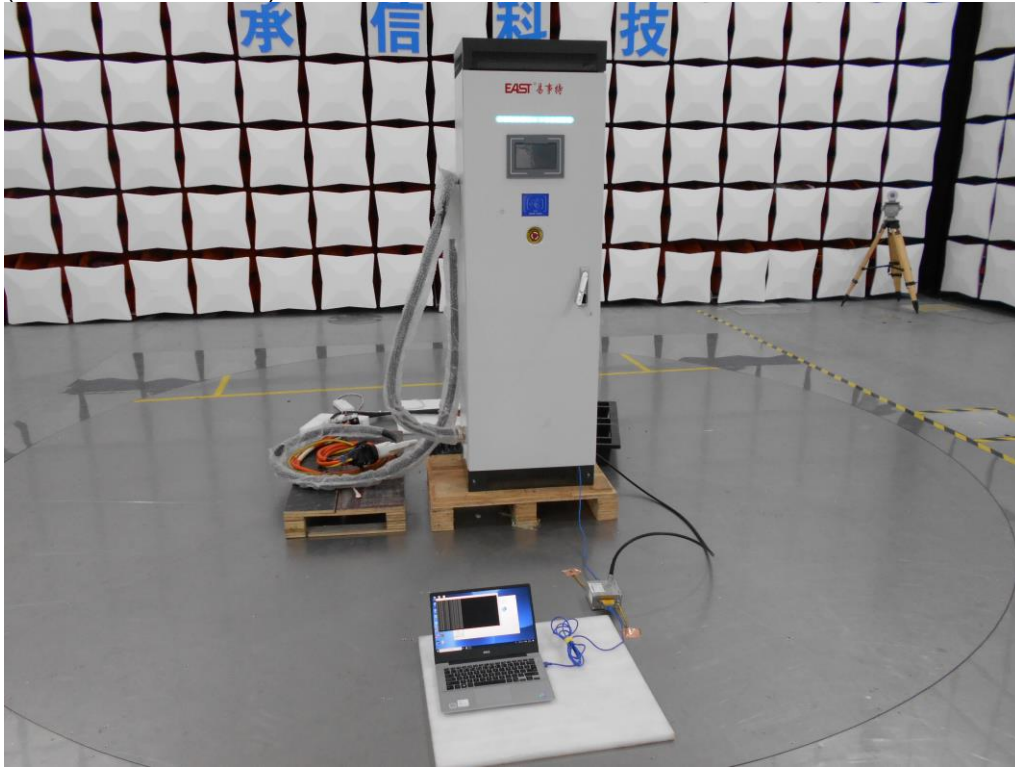
Photograph 1: Set-up for Conducted Disturbance
(AC Power Input Port)



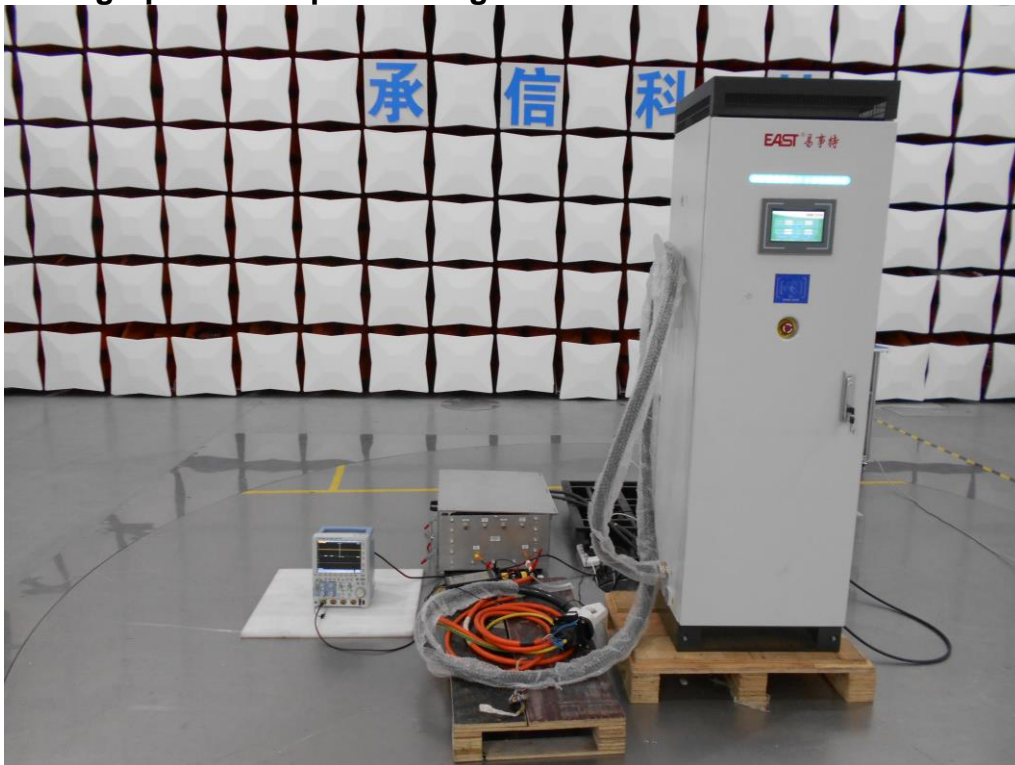
(DC CPT Port)



(Wired Network Port)



Photograph 2: Set-up for Voltage Transient Disturbance for DC CPT Port



Photograph 3: Set-up for Radiated Disturbance
(2KHz-185KHz)



(30MHz-1000MHz)

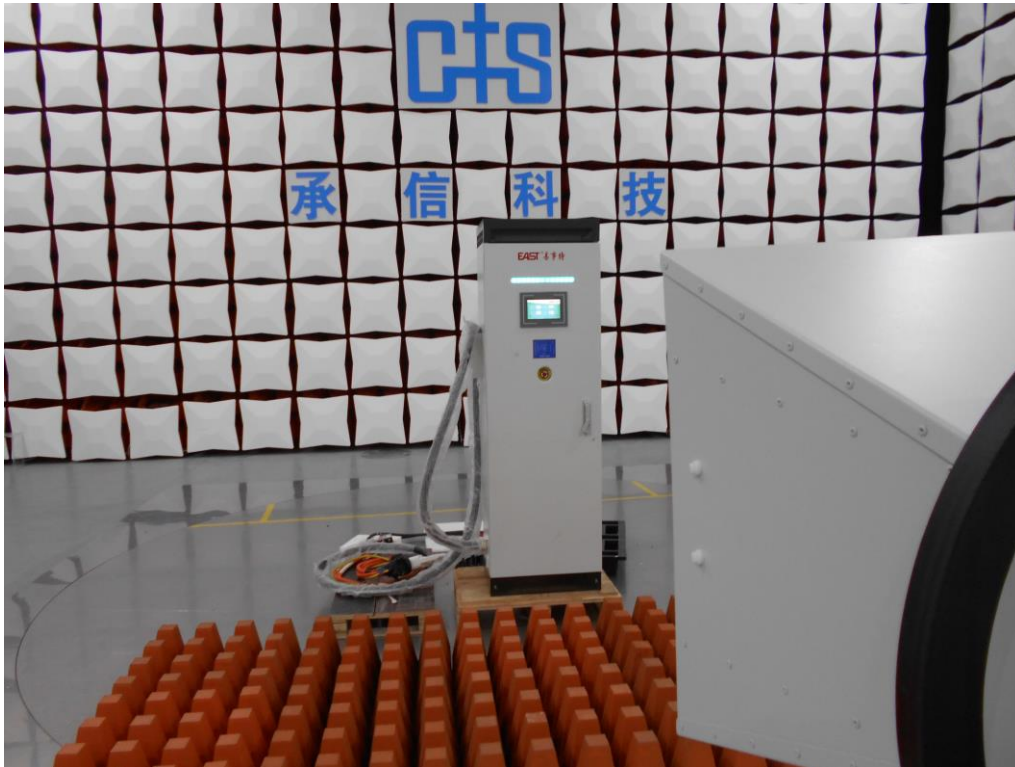


(Above 1GHz)



Photograph 4: Set-up for Radio Frequency Electromagnetic Field (RS)





Photograph 5: Set-up for Conducted Susceptibility (CS)
(AC Power Input Port)



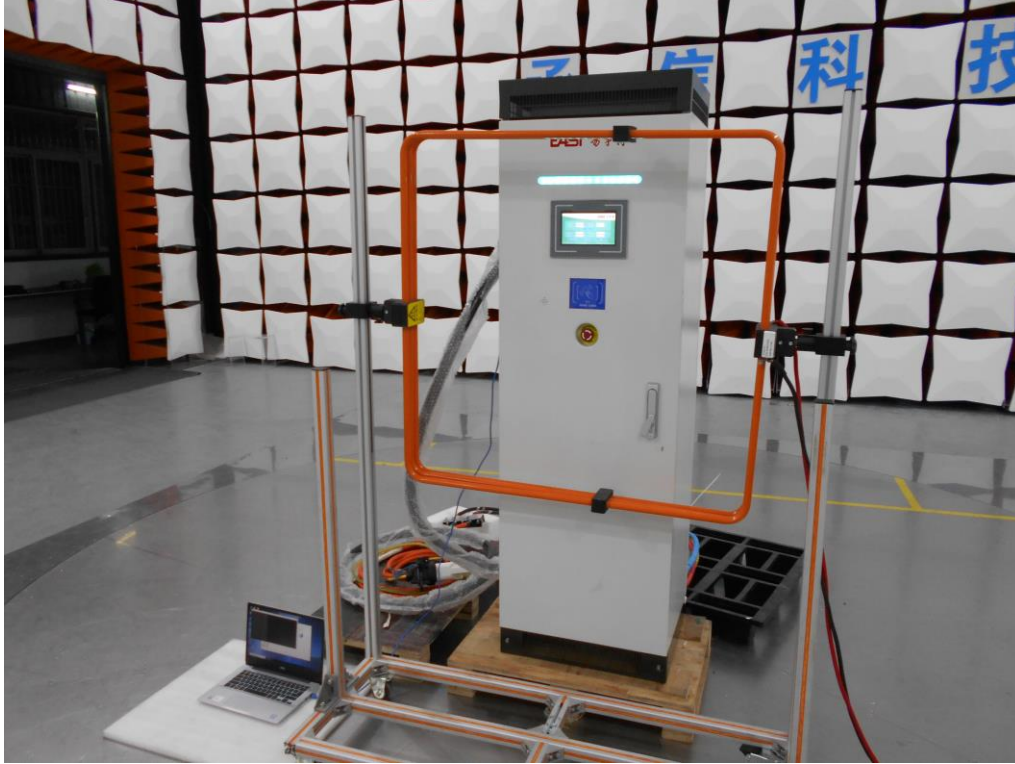
(DC CPT Port)



(Wired Network Port)



Photograph 6: Set-up for Power-frequency Magnetic Fields



**Photograph 7: Set-up for EFT
(AC Power Input Port)**



(DC CPT Port)



(Wired Network Port)



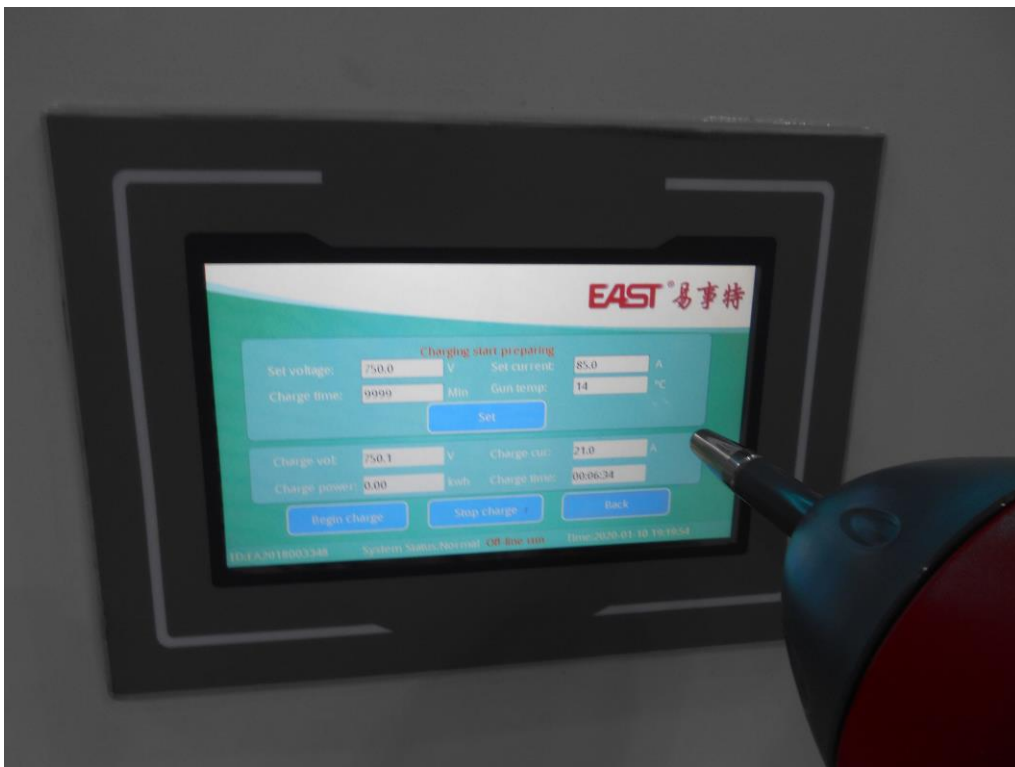
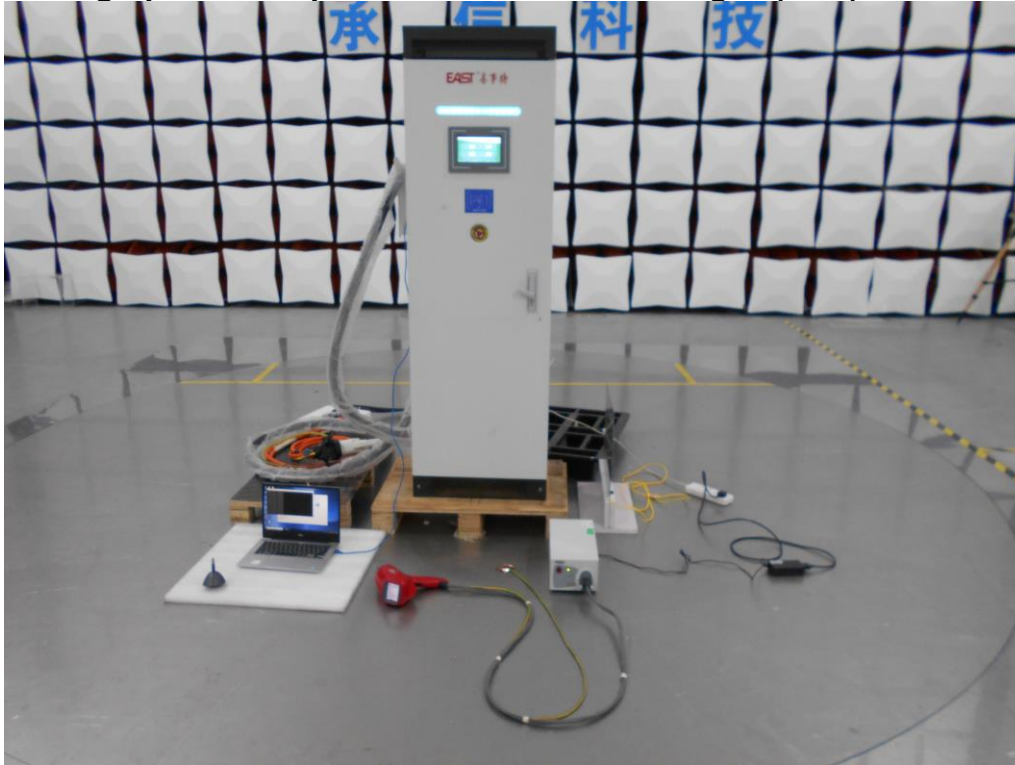
Photograph 8: Set-up for Surge
(AC Power Input Port)



(Wired Network Port)



Photograph 9: Set-up for Electrostatic Discharges (ESD)



Photograph 10: Set-up for Voltage Dips and Interruptions



8. List of Tables

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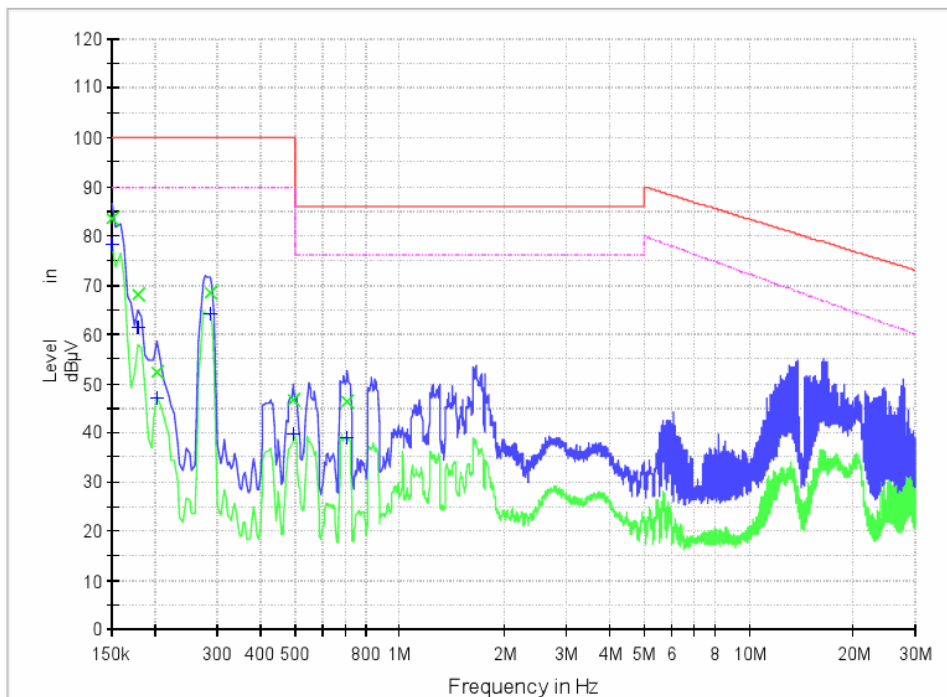
DC- 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.150000	83.6	78.3	20.0	9.000	30.1	16.4	100.0	11.7	90.0
0.178000	68.0	61.4	20.0	9.000	30.1	32.0	100.0	28.6	90.0
0.202000	52.4	46.9	20.0	9.000	30.1	47.6	100.0	43.1	90.0
0.286000	68.5	64.2	20.0	9.000	30.1	31.5	100.0	25.8	90.0
0.494000	46.5	39.5	20.0	9.000	30.1	53.5	100.0	50.5	90.0
0.710000	46.2	39.1	20.0	9.000	30.1	39.8	86.0	36.9	76.0



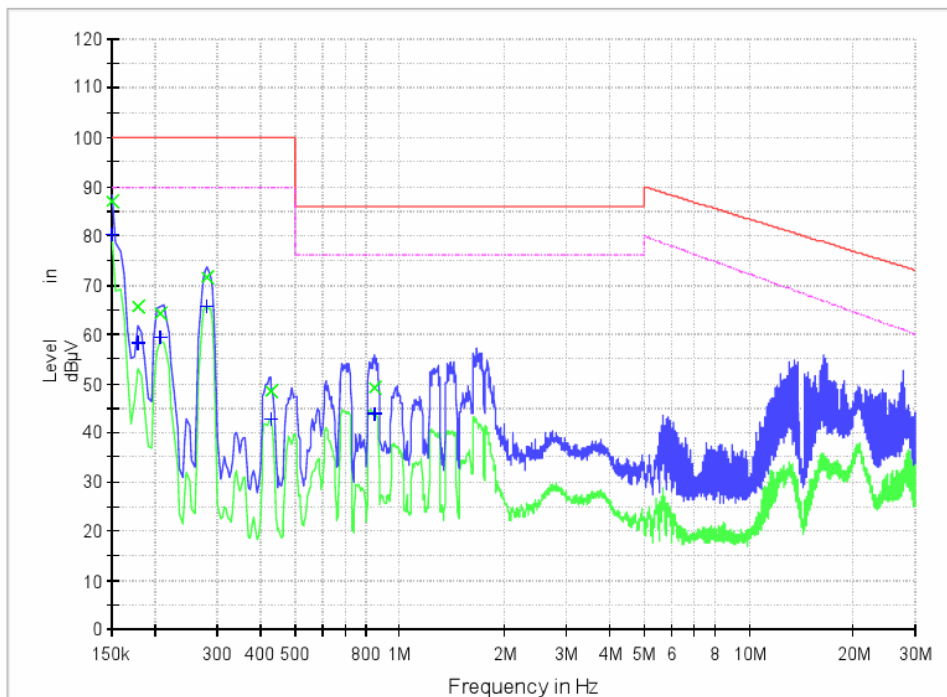
DC- 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.150000	86.9	80.2	20.0	9.000	30.1	13.1	100.0	9.8	90.0
0.178000	65.7	58.1	20.0	9.000	30.1	34.3	100.0	31.9	90.0
0.206000	64.1	59.3	20.0	9.000	30.1	35.9	100.0	30.7	90.0
0.282000	71.6	65.8	20.0	9.000	30.1	28.5	100.0	24.2	90.0
0.426000	48.5	42.7	20.0	9.000	30.1	51.5	100.0	47.3	90.0
0.846000	49.2	43.7	20.0	9.000	30.1	36.8	86.0	32.3	76.0



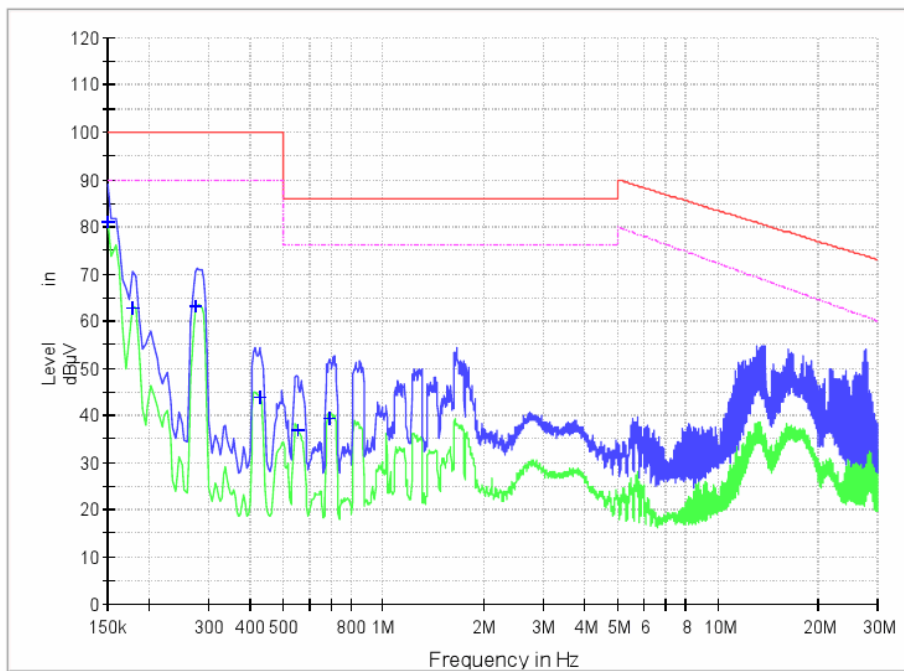
DC+ 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.150000	86.6	81.0	20.0	9.000	30.1	13.4	100.0	9.1	90.0
0.178000	70.0	62.8	20.0	9.000	30.1	30.0	100.0	27.2	90.0
0.274000	69.2	63.3	20.0	9.000	30.1	30.8	100.0	26.7	90.0
0.426000	52.3	43.9	20.0	9.000	30.1	47.7	100.0	46.1	90.0
0.554000	46.0	36.8	20.0	9.000	30.1	40.0	86.0	39.2	76.0
0.690000	50.0	39.3	20.0	9.000	30.1	36.1	86.0	36.8	76.0



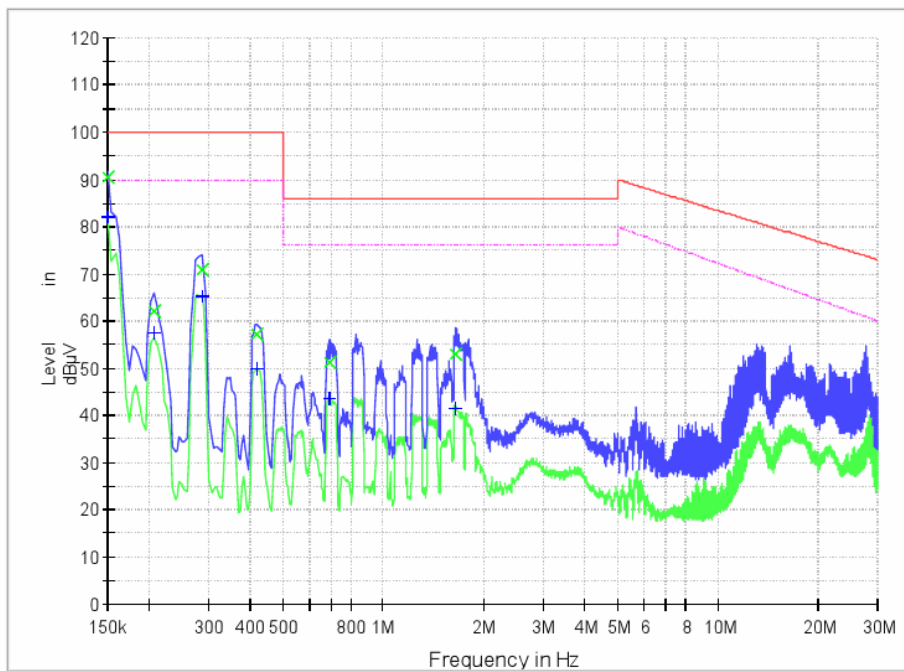
DC+ 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.150000	90.5	82.2	20.0	9.000	30.1	9.5	100.0	7.8	90.0
0.206000	62.0	57.6	20.0	9.000	30.1	38.0	100.0	32.4	90.0
0.286000	70.9	65.4	20.0	9.000	30.1	29.1	100.0	24.6	90.0
0.418000	57.4	49.8	20.0	9.000	30.1	42.6	100.0	40.2	90.0
0.690000	51.3	43.7	20.0	9.000	30.1	34.7	86.0	32.3	76.0
1.650000	52.9	41.5	20.0	9.000	30.2	33.1	86.0	34.5	76.0



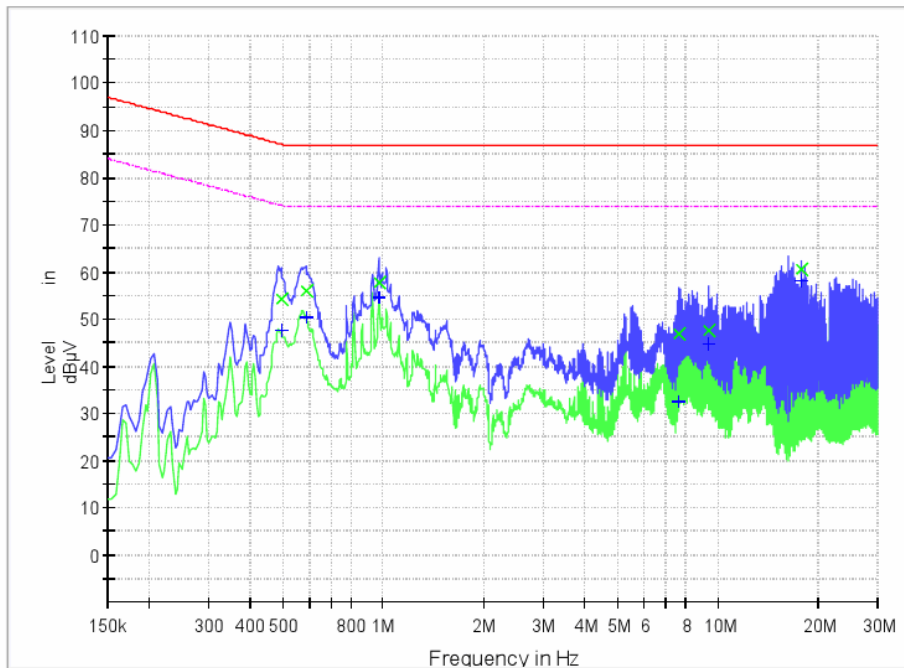
Ethernet Port

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Limit - AVG (dBµV)
0.494000	54.1	47.5	20.0	9.000	20.1	33.0	87.1	74.1
0.586000	56.1	50.5	20.0	9.000	20.1	30.9	87.0	74.0
0.970000	57.8	54.6	20.0	9.000	20.1	29.2	87.0	74.0
7.646000	46.7	32.6	20.0	9.000	20.3	40.3	87.0	74.0
9.394000	47.4	44.8	20.0	9.000	20.4	39.6	87.0	74.0
17.694000	60.6	58.0	20.0	9.000	20.5	26.5	87.0	74.0



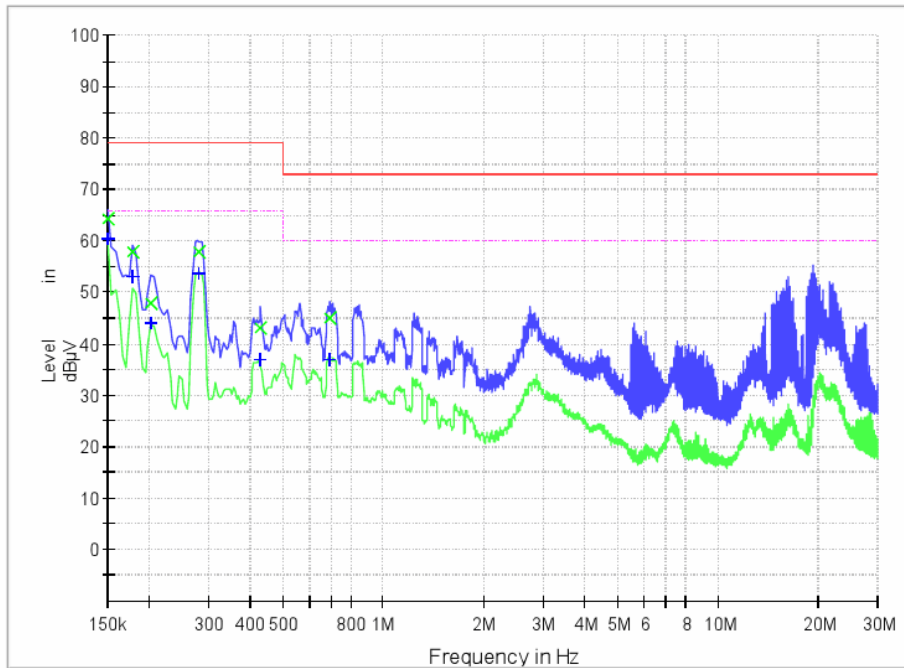
L1 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Limit - AVG (dBµV)
0.150000	64.2	60.4	20.0	9.000	30.1	14.8	79.0	66.0
0.178000	57.9	53.0	20.0	9.000	30.1	21.1	79.0	66.0
0.202000	47.8	43.9	20.0	9.000	30.1	31.2	79.0	66.0
0.282000	58.0	53.8	20.0	9.000	30.1	21.0	79.0	66.0
0.430000	43.1	36.8	20.0	9.000	30.1	35.9	79.0	66.0
0.694000	45.1	37.1	20.0	9.000	30.1	27.9	73.0	60.0



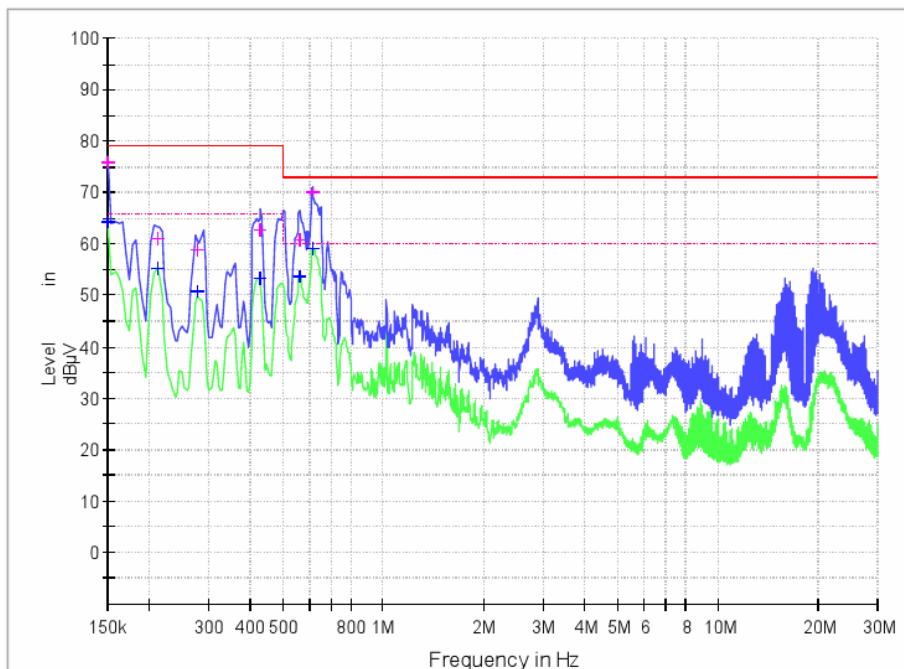
L1 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ V)	Margin - AVG (dB)	Limit - AVG (dB μ V)
0.150000	76.0	64.4	20.0	9.000	30.1	3.0	79.0	1.6	66.0
0.210000	61.0	55.2	20.0	9.000	30.1	18.1	79.0	10.8	66.0
0.278000	58.7	50.9	20.0	9.000	30.1	20.3	79.0	15.1	66.0
0.426000	62.6	53.5	20.0	9.000	30.1	16.4	79.0	12.5	66.0
0.562000	60.8	53.8	20.0	9.000	30.1	12.2	73.0	6.2	60.0
0.614000	70.2	59.0	20.0	9.000	30.1	2.8	73.0	1.0	60.0



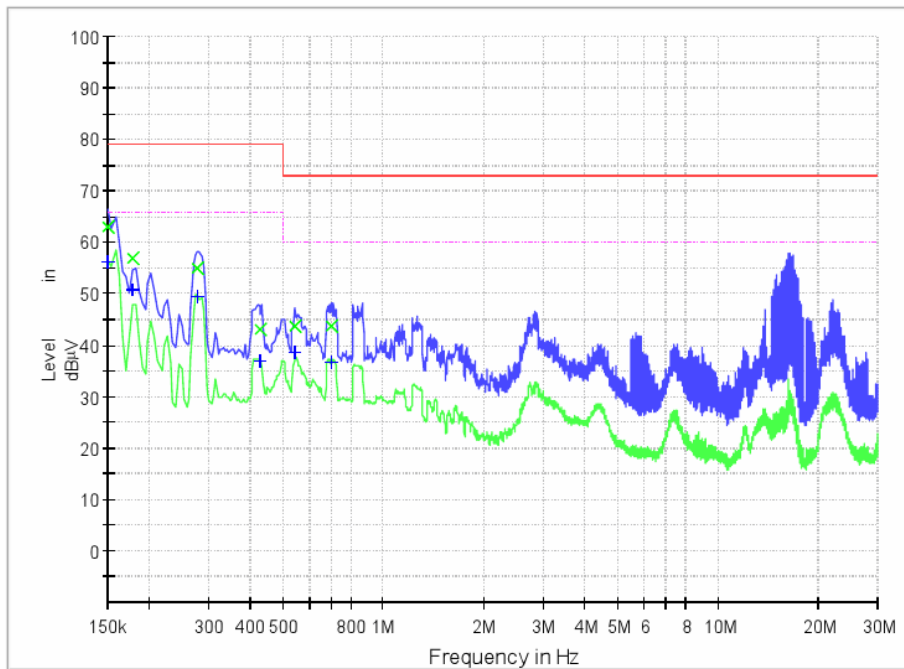
L2 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ V)	Margin - AVG (dB)	Limit - AVG (dB μ V)
0.150000	63.2	56.3	20.0	9.000	30.1	15.9	79.0	9.7	66.0
0.178000	56.9	50.7	20.0	9.000	30.1	22.1	79.0	15.3	66.0
0.278000	55.1	49.5	20.0	9.000	30.1	23.9	79.0	16.5	66.0
0.426000	43.1	37.1	20.0	9.000	30.1	35.9	79.0	28.9	66.0
0.542000	43.7	38.7	20.0	9.000	30.1	29.3	73.0	21.3	60.0
0.702000	43.8	36.6	20.0	9.000	30.1	29.2	73.0	23.4	60.0



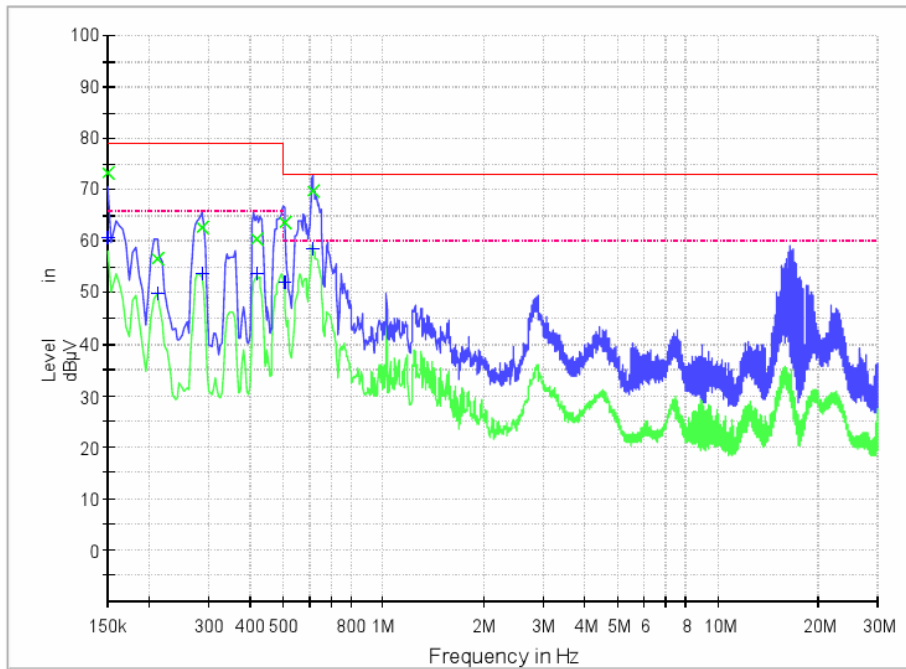
L2 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ V)	Margin - AVG (dB)	Limit - AVG (dB μ V)
0.150000	73.5	60.8	20.0	9.000	30.1	5.6	79.0	5.2	66.0
0.210000	56.7	49.9	20.0	9.000	30.1	22.3	79.0	16.1	66.0
0.286000	62.6	53.8	20.0	9.000	30.1	16.4	79.0	12.2	66.0
0.418000	60.4	53.6	20.0	9.000	30.1	18.6	79.0	12.4	66.0
0.506000	63.6	52.0	20.0	9.000	30.1	9.4	73.0	8.1	60.0
0.614000	69.8	58.6	20.0	9.000	30.1	3.2	73.0	1.4	60.0



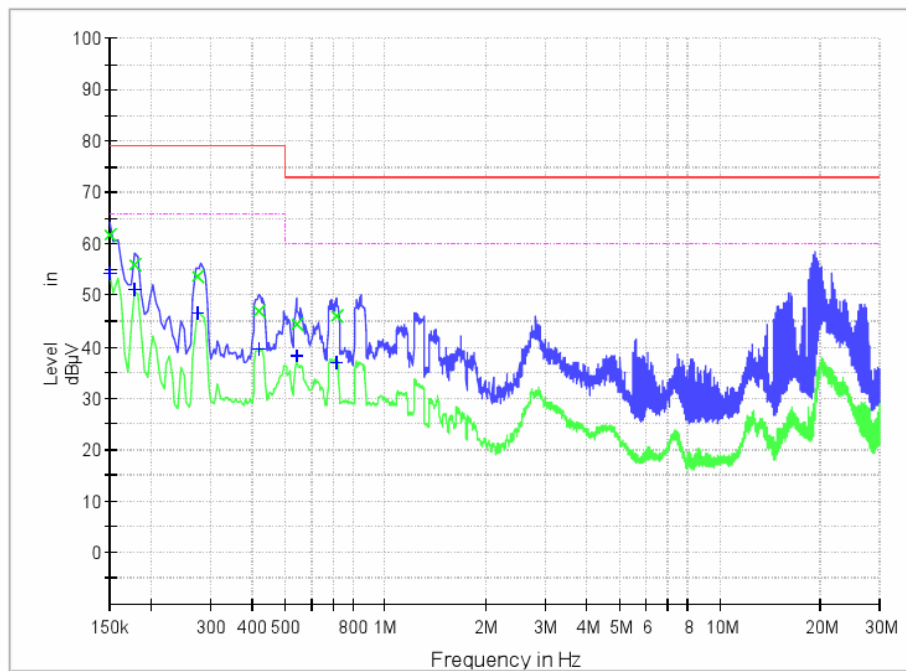
L3 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.150000	61.6	54.4	20.0	9.000	30.1	17.4	79.0	11.6	66.0
0.178000	56.0	51.3	20.0	9.000	30.1	23.0	79.0	14.7	66.0
0.274000	53.6	46.7	20.0	9.000	30.1	25.4	79.0	19.3	66.0
0.418000	47.1	39.7	20.0	9.000	30.1	31.9	79.0	26.3	66.0
0.542000	44.5	38.2	20.0	9.000	30.1	28.5	73.0	21.8	60.0
0.714000	46.0	37.0	20.0	9.000	30.1	27.0	73.0	23.0	60.0



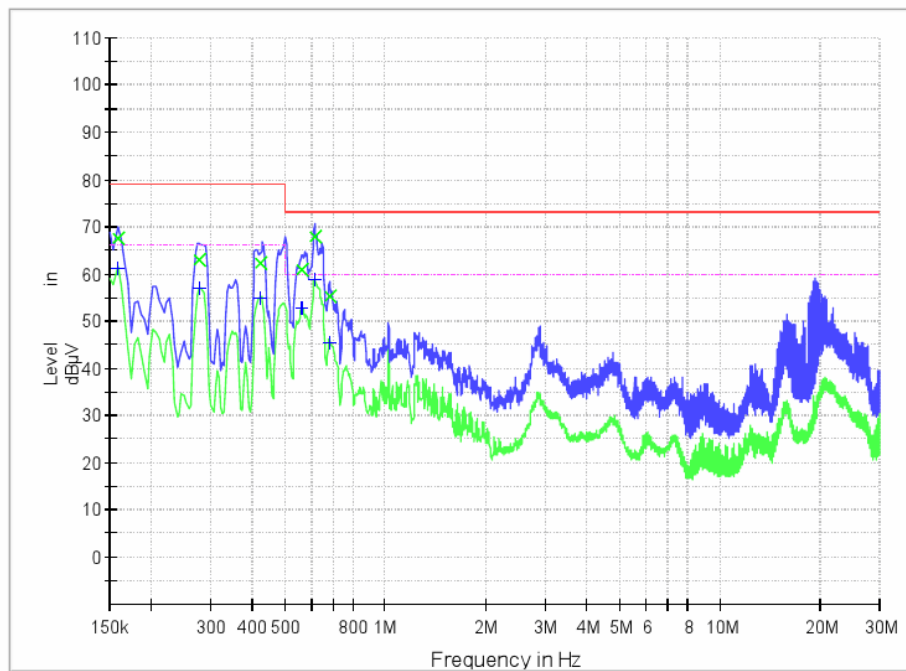
L3 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.158000	67.5	61.4	20.0	9.000	30.1	11.6	79.0	4.6	66.0
0.278000	63.1	57.1	20.0	9.000	30.1	16.0	79.0	8.9	66.0
0.422000	62.4	55.0	20.0	9.000	30.1	16.6	79.0	11.0	66.0
0.562000	60.9	52.8	20.0	9.000	30.1	12.1	73.0	7.2	60.0
0.614000	68.0	58.8	20.0	9.000	30.1	5.1	73.0	1.2	60.0
0.682000	55.1	45.6	20.0	9.000	30.1	17.9	73.0	14.5	60.0



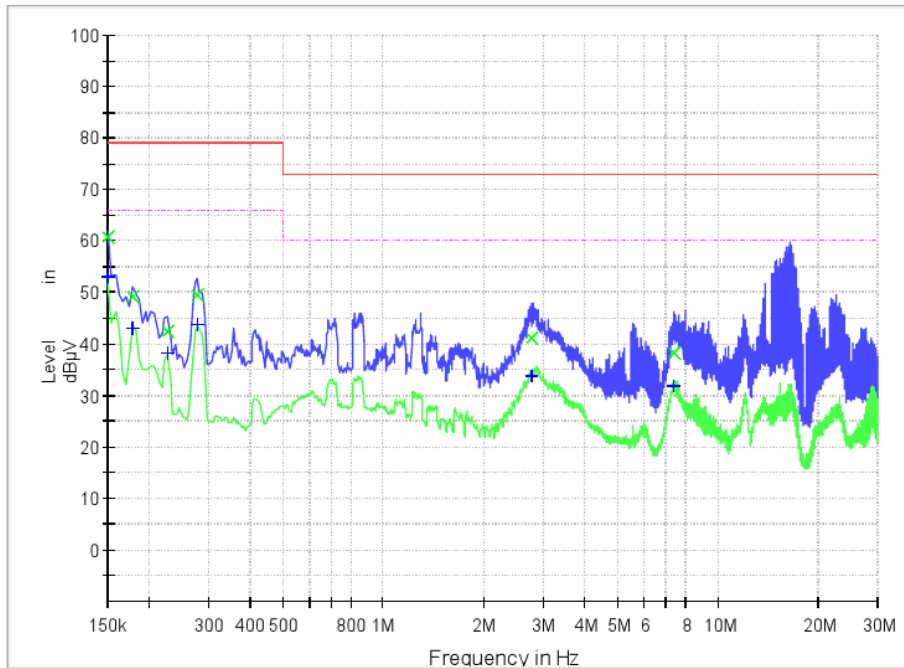
N 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.150000	60.8	53.2	20.0	9.000	30.1	18.3	79.0	12.8	66.0
0.178000	49.1	43.0	20.0	9.000	30.1	29.9	79.0	23.0	66.0
0.226000	42.3	38.3	20.0	9.000	30.1	36.7	79.0	27.8	66.0
0.278000	49.7	43.7	20.0	9.000	30.1	29.4	79.0	22.3	66.0
2.770000	41.1	33.8	20.0	9.000	30.2	31.9	73.0	26.2	60.0
7.402000	38.4	31.7	20.0	9.000	30.3	34.6	73.0	28.3	60.0



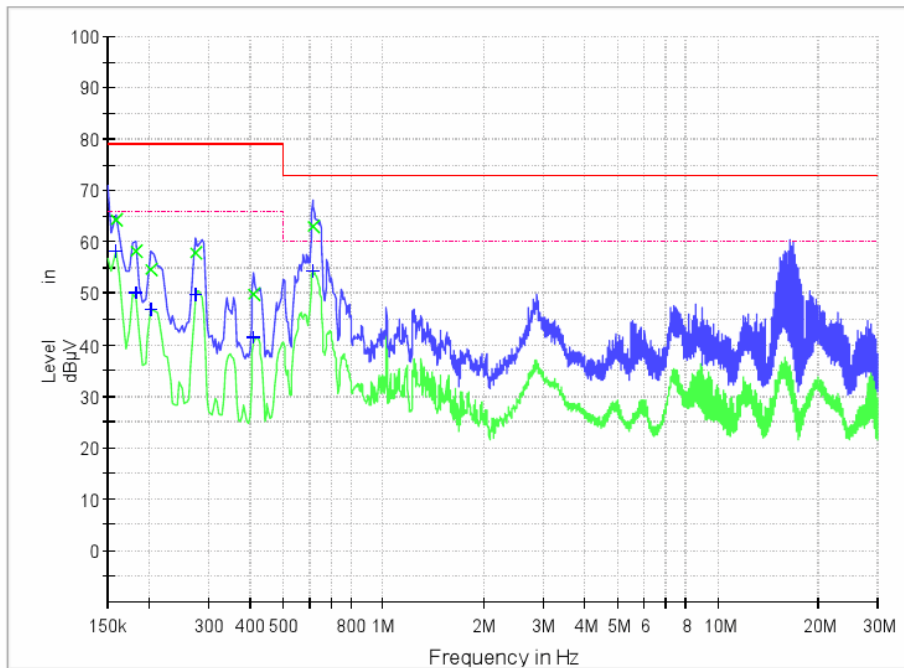
N 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.158000	64.2	58.1	20.0	9.000	30.1	14.8	79.0	7.9	66.0
0.182000	58.3	50.3	20.0	9.000	30.1	20.7	79.0	15.7	66.0
0.202000	54.5	47.0	20.0	9.000	30.1	24.5	79.0	19.0	66.0
0.274000	57.7	49.9	20.0	9.000	30.1	21.3	79.0	16.1	66.0
0.410000	50.0	41.5	20.0	9.000	30.1	29.0	79.0	24.5	66.0
0.614000	63.2	54.2	20.0	9.000	30.1	9.8	73.0	5.8	60.0



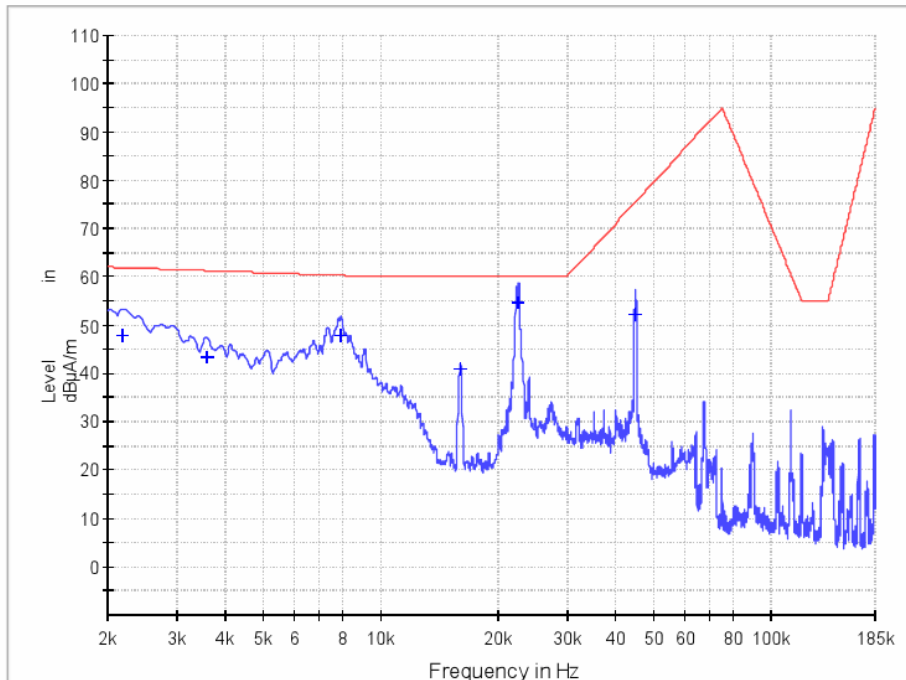
Back 20% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµA/m)
0.002182	47.9	50.0	0.200	100.0	H	43.8	14.0	61.9
0.003600	43.4	50.0	0.200	100.0	H	39.7	17.9	61.3
0.007905	47.8	50.0	0.200	100.0	H	33.3	12.5	60.3
0.016040	40.9	50.0	0.200	100.0	H	28.2	19.1	60.0
0.022555	54.5	50.0	0.200	100.0	H	28.8	5.5	60.0
0.044862	52.3	50.0	0.200	100.0	H	28.1	23.1	75.4



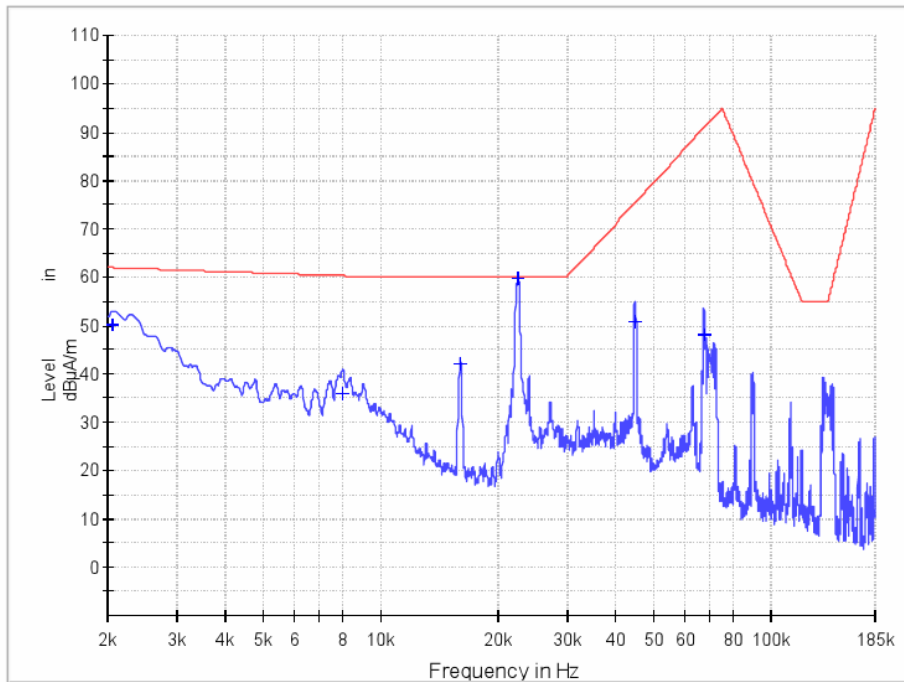
Back 80% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµA/m)
0.002069	50.3	50.0	0.200	100.0	H	44.2	11.7	62.0
0.007968	35.9	50.0	0.200	100.0	H	33.3	24.4	60.3
0.015992	42.1	50.0	0.200	100.0	H	28.2	17.9	60.0
0.022442	59.7	50.0	0.200	100.0	H	28.7	0.3	60.0
0.044772	50.9	50.0	0.200	100.0	H	28.2	24.4	75.3
0.067653	48.1	50.0	0.200	100.0	H	22.2	43.0	91.1



EMI Sweep(1)

1 / 1

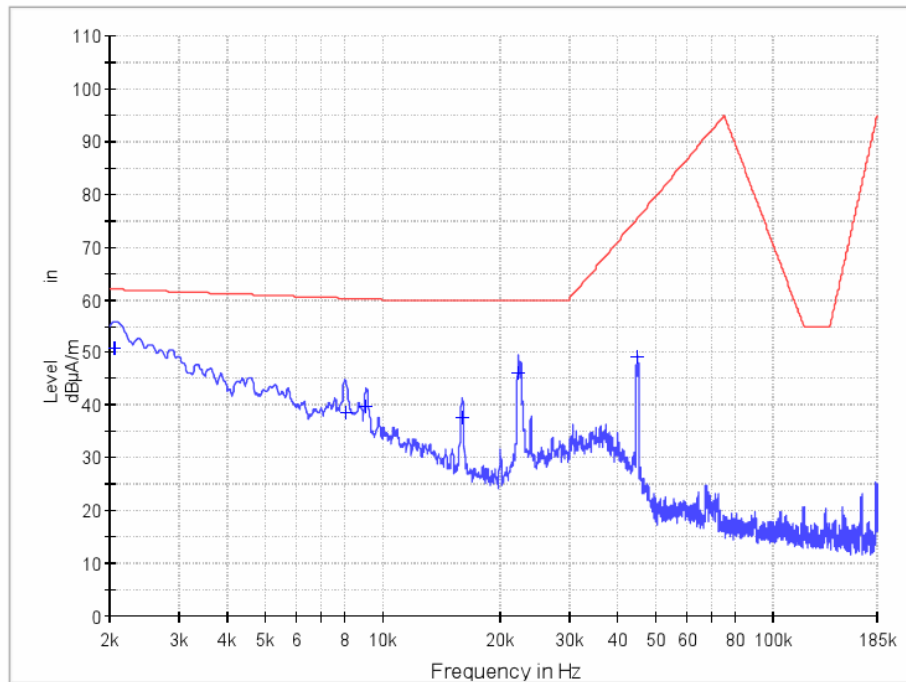
Front 20% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin

Frequency (MHz)	QuasiPeak (dB μ A/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ A/m)
0.002069	50.7	50.0	0.200	100.0	H	44.2	11.3	62.0
0.008040	38.7	50.0	0.200	100.0	H	33.2	21.6	60.3
0.009065	39.8	50.0	0.200	100.0	H	32.2	20.4	60.1
0.015976	37.8	50.0	0.200	100.0	H	28.3	22.2	60.0
0.022263	46.1	50.0	0.200	100.0	H	28.5	13.9	60.0
0.044907	49.3	50.0	0.200	100.0	H	28.1	26.1	75.4



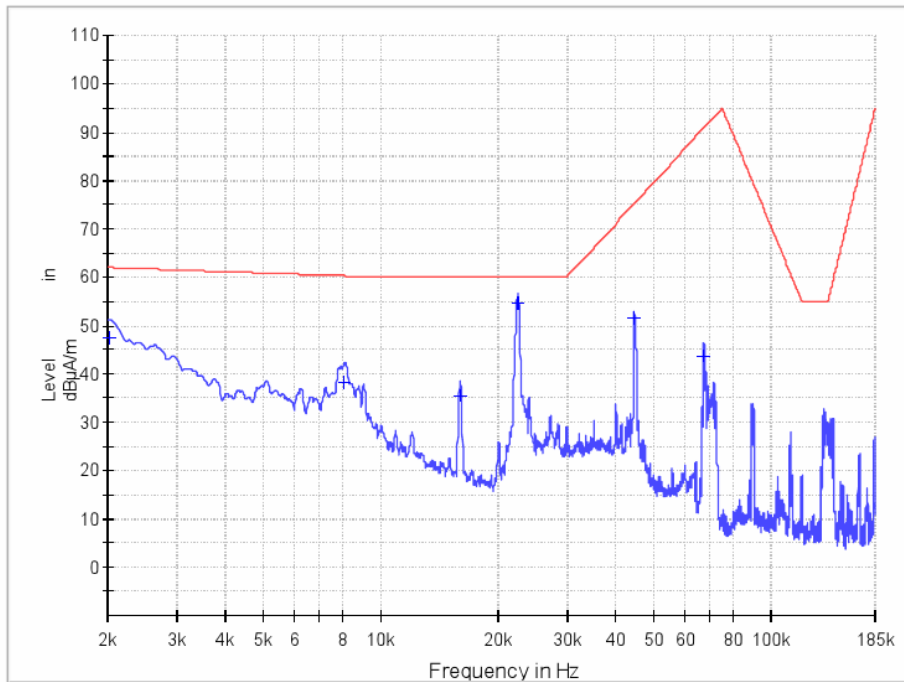
Front 80% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµA/m)
0.002022	47.3	50.0	0.200	100.0	H	44.4	14.7	62.0
0.008105	38.1	50.0	0.200	100.0	H	33.1	22.2	60.3
0.016024	35.4	50.0	0.200	100.0	H	28.2	24.6	60.0
0.022442	54.6	50.0	0.200	100.0	H	28.7	5.4	60.0
0.044683	51.4	50.0	0.200	100.0	H	28.3	23.8	75.2
0.067383	43.8	50.0	0.200	100.0	H	22.2	47.1	90.9



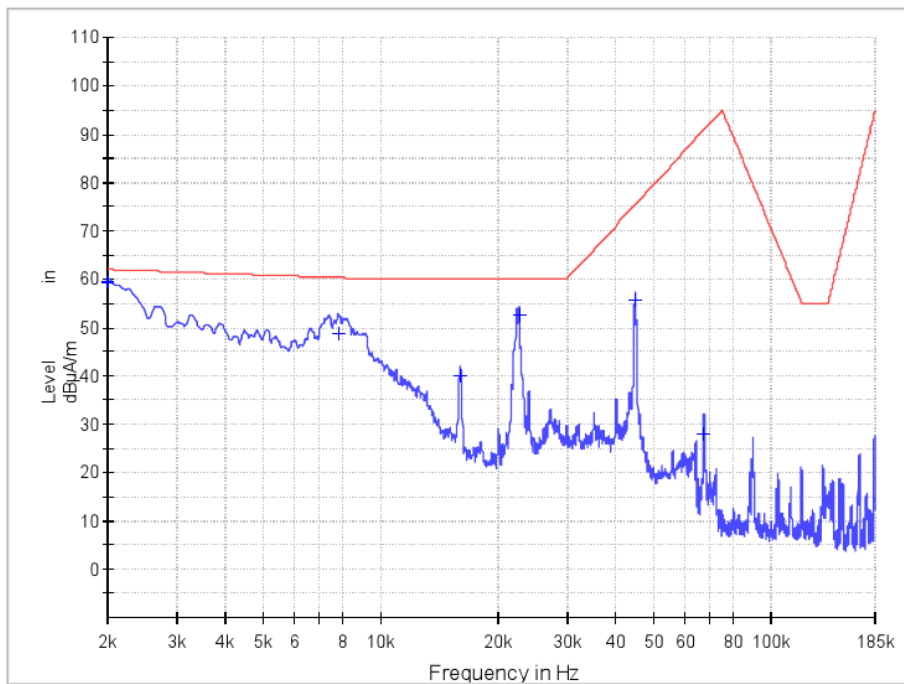
Left side 20% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµA/m)
0.002000	59.4	50.0	0.200	100.0	H	44.5	2.6	62.0
0.007810	48.6	50.0	0.200	100.0	H	33.4	11.7	60.3
0.016024	39.8	50.0	0.200	100.0	H	28.2	20.2	60.0
0.022622	52.6	50.0	0.200	100.0	H	28.8	7.4	60.0
0.044907	55.7	50.0	0.200	100.0	H	28.1	19.7	75.4
0.067383	28.0	50.0	0.200	100.0	H	22.2	62.9	90.9



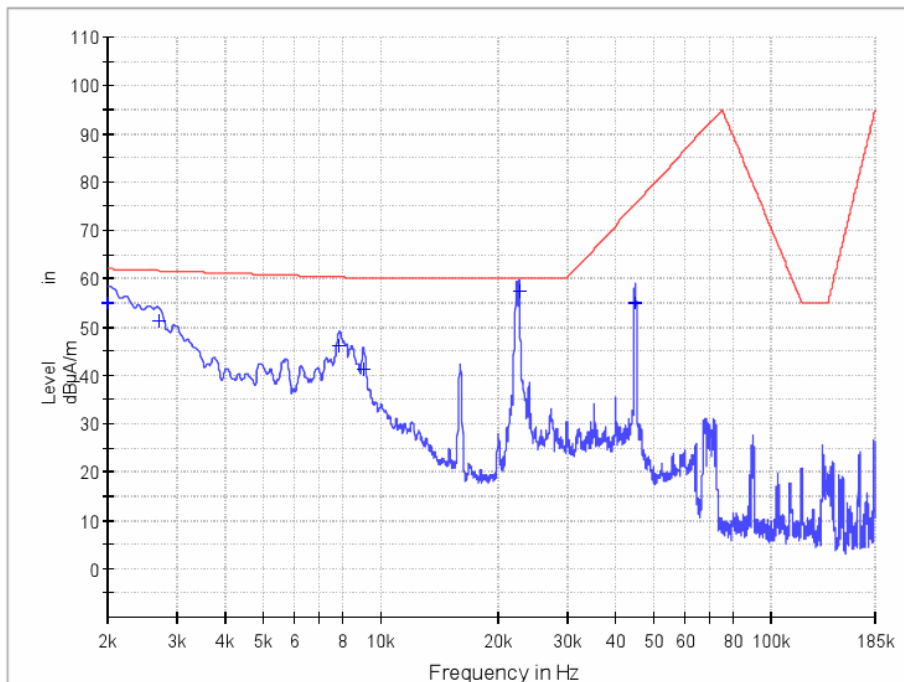
Left side 80% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµA/m)
0.002000	54.9	50.0	0.200	100.0	H	44.5	7.1	62.0
0.002710	51.3	50.0	0.200	100.0	H	42.0	10.3	61.6
0.007810	46.1	50.0	0.200	100.0	H	33.4	14.2	60.3
0.009047	41.1	50.0	0.200	100.0	H	32.2	19.0	60.1
0.022600	57.4	50.0	0.200	100.0	H	28.8	2.6	60.0
0.044862	54.9	50.0	0.200	100.0	H	28.1	20.5	75.4



EMI Sweep(1)

1 / 1

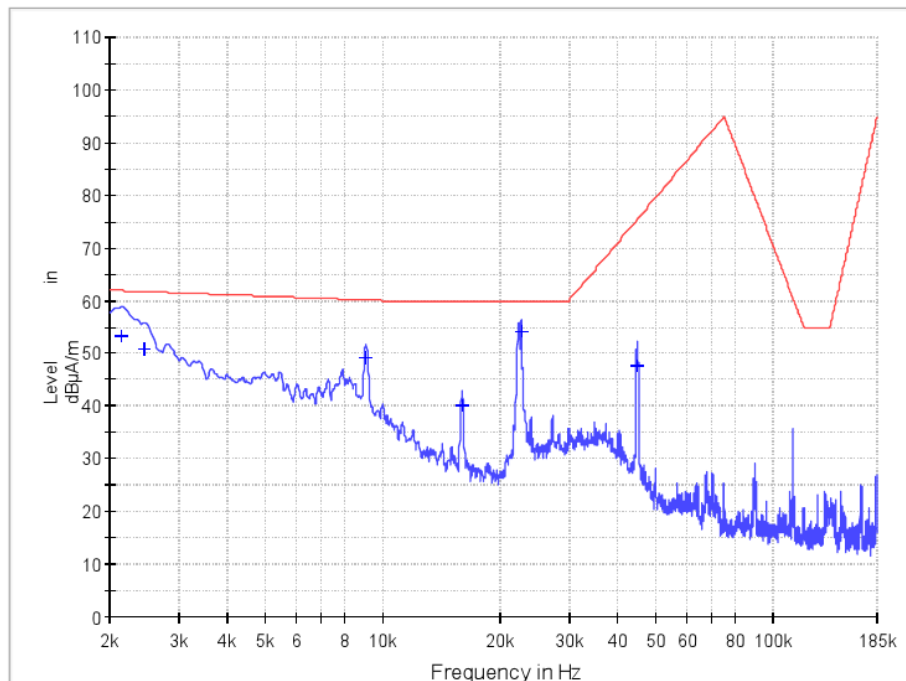
Right side 20% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin

Frequency (MHz)	QuasiPeak (dB μ A/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ A/m)
0.002136	53.4	50.0	0.200	100.0	H	44.0	8.5	61.9
0.002457	50.8	50.0	0.200	100.0	H	42.8	10.9	61.7
0.009065	49.3	50.0	0.200	100.0	H	32.2	10.8	60.1
0.015976	40.1	50.0	0.200	100.0	H	28.3	19.9	60.0
0.022622	54.3	50.0	0.200	100.0	H	28.8	5.7	60.0
0.044907	47.8	50.0	0.200	100.0	H	28.1	27.7	75.4



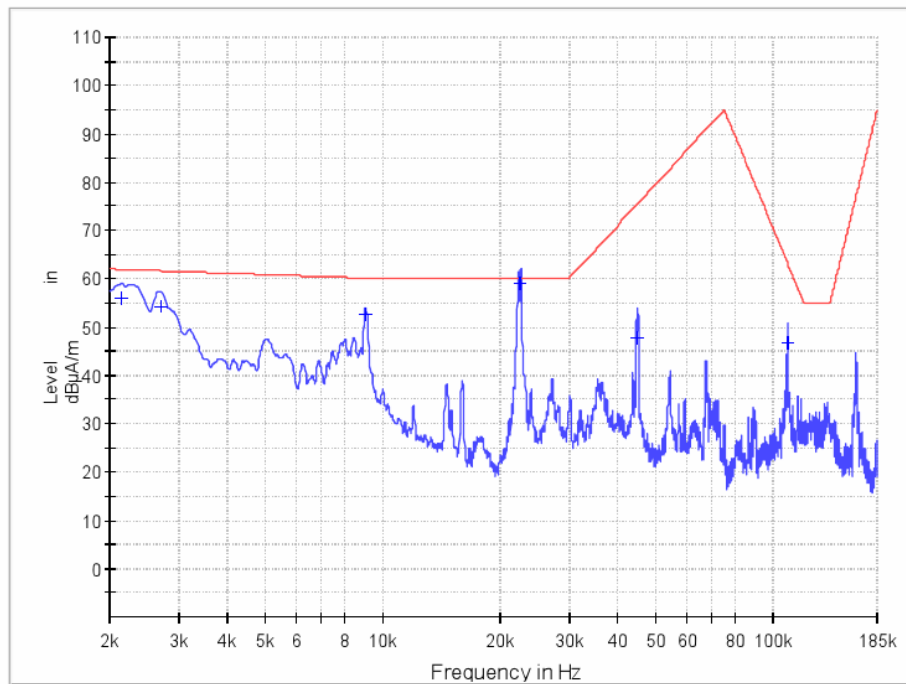
Right side 80% Load

Common Information

Test Description:
Test Site:
Test Standard:
Environment Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµA/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµA/m)
0.002136	55.9	50.0	0.200	100.0	H	44.0	6.0	61.9
0.002710	54.3	50.0	0.200	100.0	H	42.0	7.4	61.6
0.009092	52.4	50.0	0.200	100.0	H	32.2	7.7	60.1
0.022577	59.0	50.0	0.200	100.0	H	28.8	1.0	60.0
0.044862	47.7	50.0	0.200	100.0	H	28.1	27.7	75.4
0.109196	46.7	50.0	0.200	100.0	H	21.1	16.3	63.0



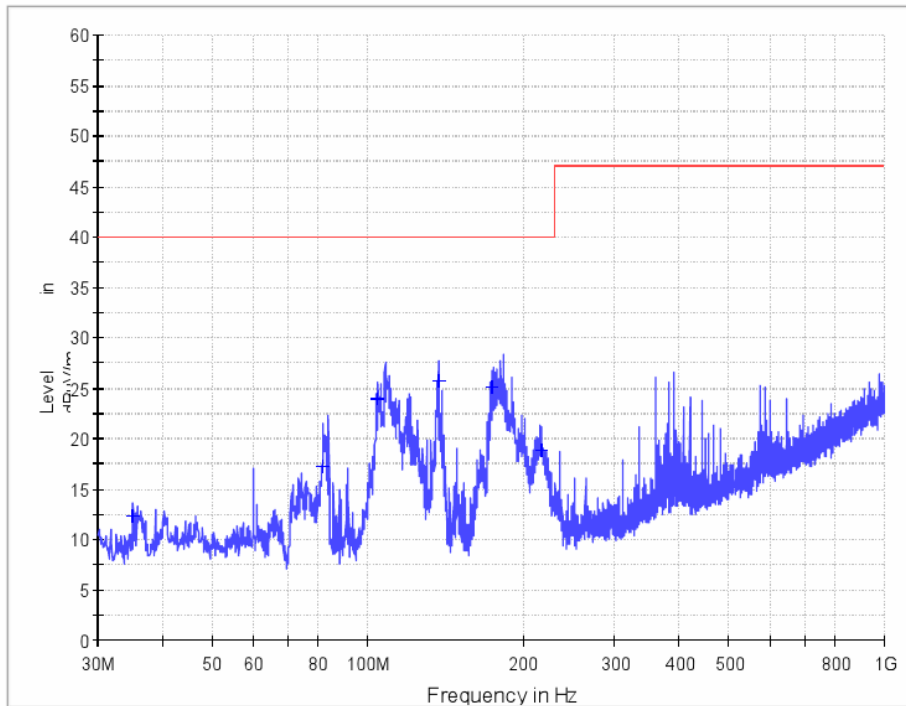
H 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
35.080000	12.3	20.0	120.000	400.0	H	215.0	-17.7	27.7	40.0
81.880000	17.2	20.0	120.000	400.0	H	201.0	-20.8	22.8	40.0
104.320000	23.9	20.0	120.000	400.0	H	125.0	-17.0	16.1	40.0
136.840000	25.7	20.0	120.000	400.0	H	297.0	-20.1	14.3	40.0
173.440000	25.1	20.0	120.000	400.0	H	137.0	-18.8	14.9	40.0
216.480000	18.9	20.0	120.000	400.0	H	207.0	-16.5	21.1	40.0



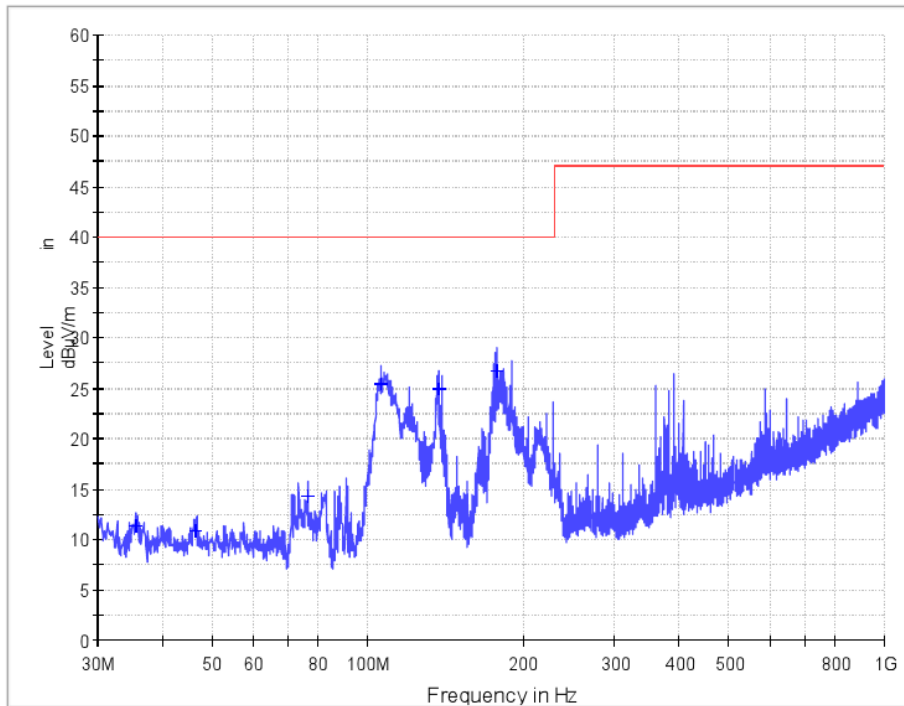
H 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB μ V/m)
35.560000	11.3	20.0	120.000	400.0	H	232.0	-17.6	28.7	40.0
46.480000	10.8	20.0	120.000	400.0	H	203.0	-15.4	29.2	40.0
76.680000	14.2	20.0	120.000	400.0	H	170.0	-21.1	25.8	40.0
105.800000	25.4	20.0	120.000	400.0	H	123.0	-17.0	14.6	40.0
136.960000	24.9	20.0	120.000	400.0	H	299.0	-20.1	15.1	40.0
177.800000	26.8	20.0	120.000	400.0	H	138.0	-18.5	13.2	40.0



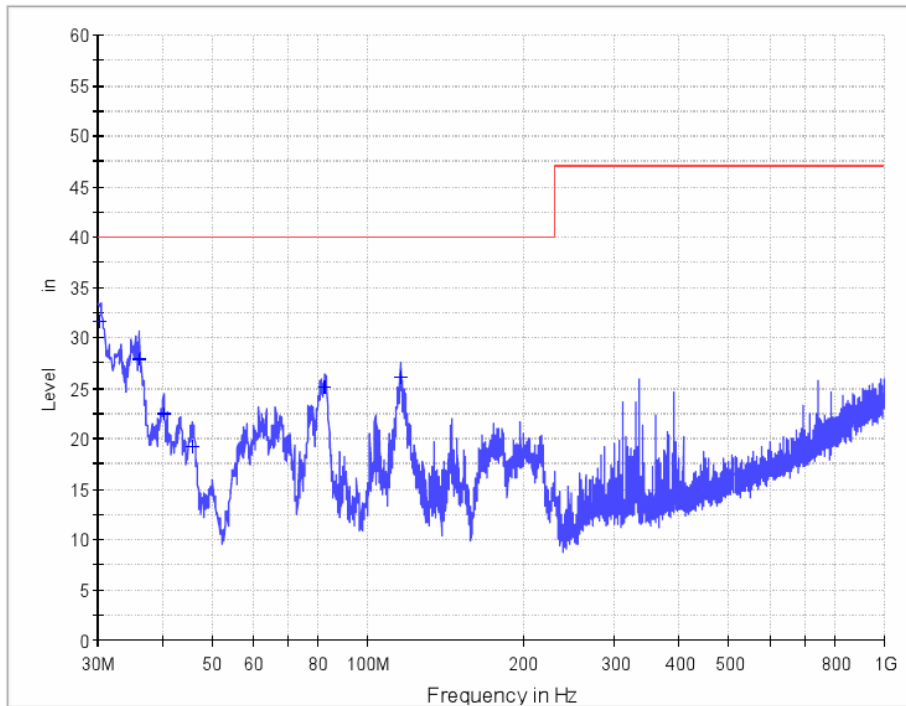
V 20% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.240000	31.6	20.0	120.000	100.0	V	310.0	-18.3	8.4	40.0
36.080000	27.8	20.0	120.000	100.0	V	90.0	-17.4	12.2	40.0
40.320000	22.4	20.0	120.000	100.0	V	90.0	-16.3	17.6	40.0
45.760000	19.2	20.0	120.000	100.0	V	30.0	-15.4	20.8	40.0
82.520000	25.1	20.0	120.000	100.0	V	1.0	-20.7	14.9	40.0
116.200000	26.1	20.0	120.000	100.0	V	231.0	-18.3	13.9	40.0



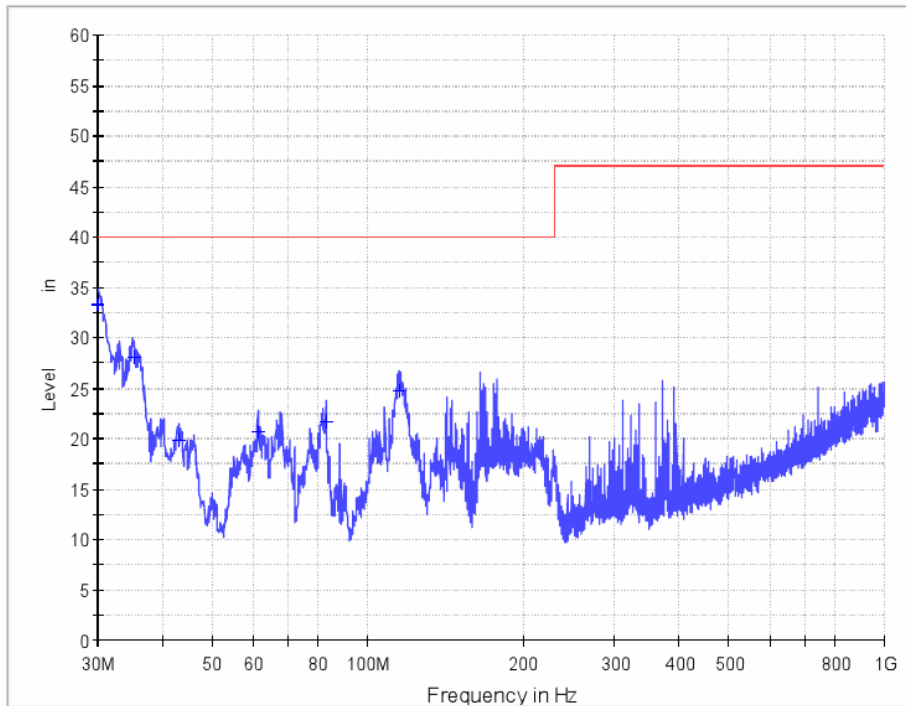
V 80% Load

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30.000000	33.2	20.0	120.000	100.0	V	297.0	-18.3	6.8	40.0
35.200000	28.1	20.0	120.000	100.0	V	113.0	-17.7	11.9	40.0
42.960000	19.8	20.0	120.000	100.0	V	101.0	-15.8	20.2	40.0
61.280000	20.7	20.0	120.000	100.0	V	266.0	-16.5	19.3	40.0
82.880000	21.6	20.0	120.000	100.0	V	351.0	-20.6	18.4	40.0
114.640000	24.8	20.0	120.000	100.0	V	201.0	-18.0	15.2	40.0



EMI Sweep(1)

1 / 1

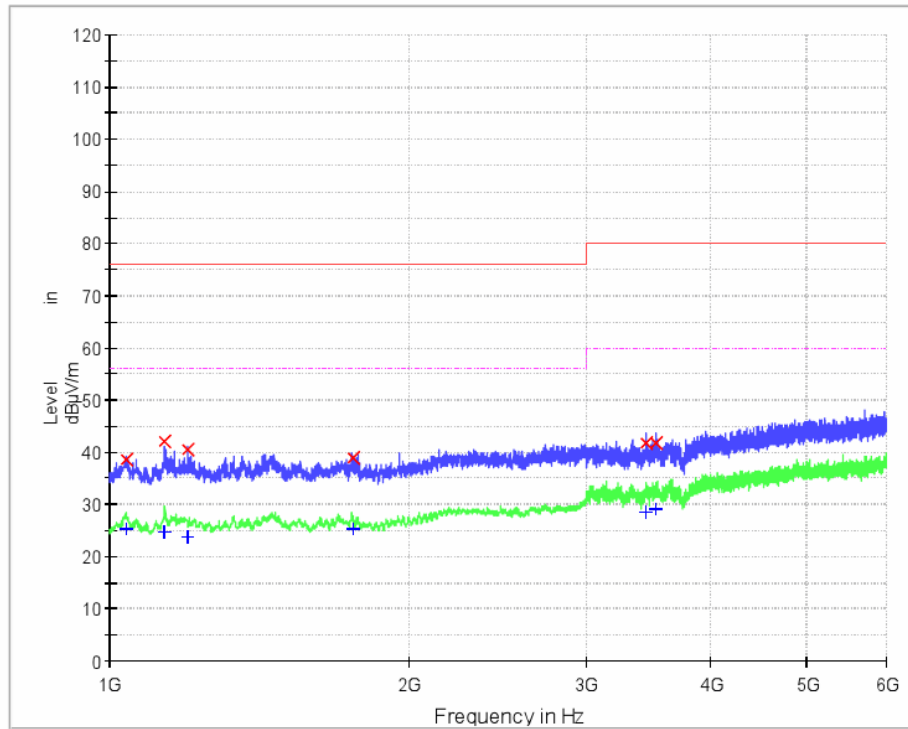
H 20% Load (1-6GHz)

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB μ V/m)
1037.673836	38.6	25.2	1000.0	1000.000	400.0	H	54.0	0.4	30.8	56.0
1134.210758	42.0	24.9	1000.0	1000.000	400.0	H	264.0	0.7	31.2	56.0
1195.913776	40.5	23.7	1000.0	1000.000	400.0	H	182.0	1.2	32.3	56.0
1750.182707	39.0	25.5	1000.0	1000.000	400.0	H	252.0	2.3	30.6	56.0
3443.133342	41.8	28.5	1000.0	1000.000	400.0	H	259.0	7.7	31.5	60.0
3530.252578	41.9	29.0	1000.0	1000.000	400.0	H	158.0	8.2	31.0	60.0



EMI Sweep(1)

1 / 1

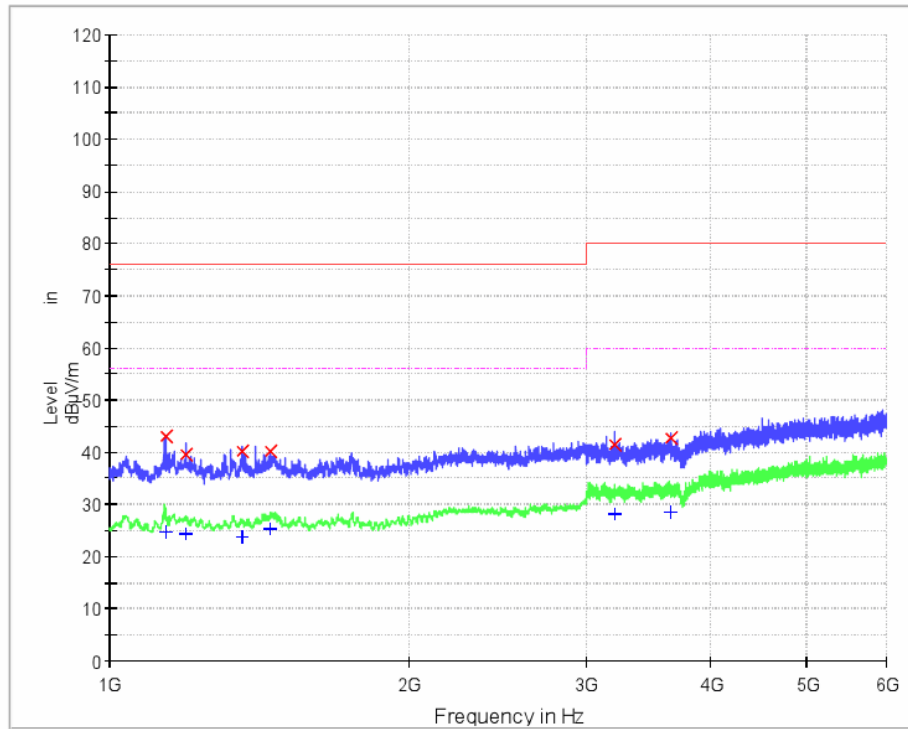
H 80% Load (1-6GHz)

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB μ V/m)
1137.616794	42.9	24.8	1000.0	1000.000	400.0	H	172.0	0.8	31.2	56.0
1193.525532	39.5	24.4	1000.0	1000.000	400.0	H	68.0	1.2	31.6	56.0
1357.774690	40.1	23.9	1000.0	1000.000	400.0	H	146.0	2.1	32.1	56.0
1448.914454	40.1	25.5	1000.0	1000.000	400.0	H	293.0	2.2	30.5	56.0
3204.057220	41.5	28.2	1000.0	1000.000	400.0	H	74.0	7.6	31.8	60.0
3648.634293	42.9	28.6	1000.0	1000.000	400.0	H	1.0	8.1	31.4	60.0



EMI Sweep(1)

1 / 1

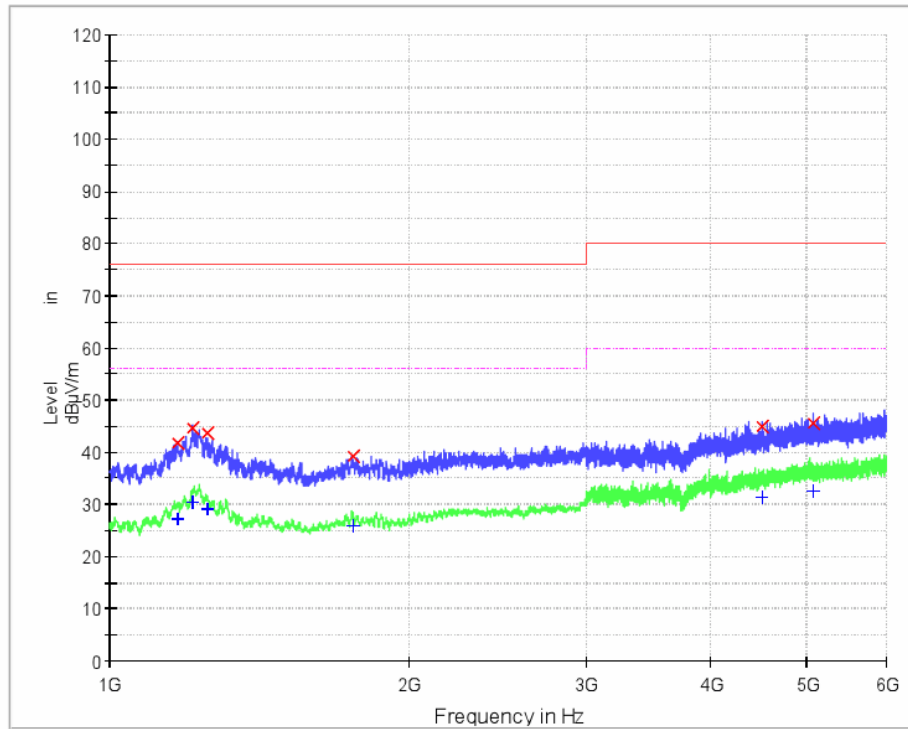
V 20% Load (1-6GHz)

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	VeigVt (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB μ V/m)
1171.073738	41.7	27.3	1000.0	1000.000	100.0	V	338.0	1.0	28.7	56.0
1211.554280	44.5	30.5	1000.0	1000.000	100.0	V	183.0	1.4	25.5	56.0
1252.181932	43.8	29.2	1000.0	1000.000	100.0	V	21.0	1.8	26.8	56.0
1750.182707	39.2	26.0	1000.0	1000.000	100.0	V	330.0	2.3	30.0	56.0
4500.767786	45.0	31.3	1000.0	1000.000	100.0	V	233.0	11.0	28.7	60.0
5079.371541	45.7	32.5	1000.0	1000.000	100.0	V	312.0	11.7	27.5	60.0



EMI Sweep(1)

1 / 1

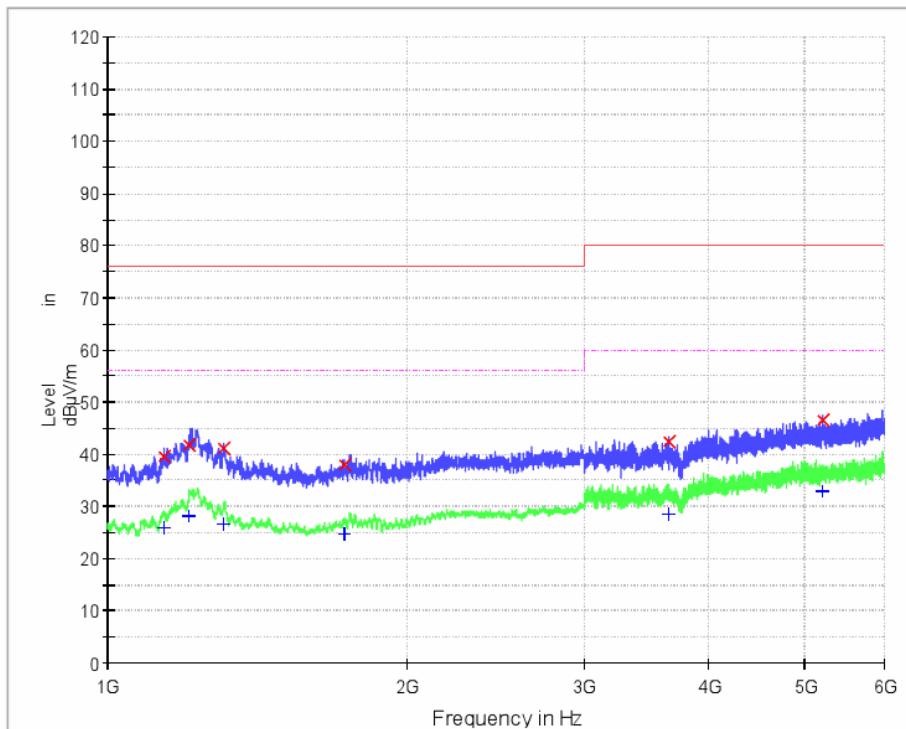
V 80% Load (1-6GHz)

Common Information

Test Description:
Operating Conditions:
Operator Name:
Comment:

Limit and Margin

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	VeigVt (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dB μ V/m)
1138.754411	39.7	26.0	1000.0	1000.000	100.0	V	156.0	0.8	30.0	56.0
1205.514639	41.9	28.3	1000.0	1000.000	100.0	V	317.0	1.3	27.7	56.0
1307.172084	41.1	26.7	1000.0	1000.000	100.0	V	284.0	2.1	29.3	56.0
1729.316394	37.9	24.8	1000.0	1000.000	100.0	V	64.0	2.3	31.2	56.0
3648.634293	42.4	28.6	1000.0	1000.000	100.0	V	55.0	8.1	31.4	60.0
5218.312379	46.6	32.8	1000.0	1000.000	100.0	V	193.0	11.8	27.2	60.0



Voltage Transient Disturbance for DC CPT Port

Measuring point	Between positive (+) and negative (-)	Between positive (+) and ground	Between negative (-) and ground
20% load	4.7V	4.6V	4.4V
80% load	5.3V	4.5V	4.9V



Electrostatic Discharge Immunity

Sample No:	SPO190362-1	Standard:	IEC 61851-21-2
EUT:	DC EV Charging Station	Environment:	Temperature 22 °C
Model No.:	EVDC-80KW-9YHW-1		Humidity 49 %RH
Test Location	10m Chamber	Test Date:	2020.01.11
Test Mode	Standby, 20% Load		

Standard requirement:

Test Level	Air: <input type="checkbox"/> ±2kV; <input type="checkbox"/> ±4kV; <input type="checkbox"/> ±6kV; <input checked="" type="checkbox"/> ±8kV; <input type="checkbox"/> ±15kV; Contact: <input type="checkbox"/> ±2kV; <input checked="" type="checkbox"/> ±4kV; <input type="checkbox"/> ±6kV; <input type="checkbox"/> ±8kV;	Performance Criterion	<input type="checkbox"/> A; <input checked="" type="checkbox"/> B; <input type="checkbox"/> C
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Test Result:

Discharge Location	Discharge Voltage/kV	Type of discharge	Remarks	Performance Criterion
Metallic enclosure	±4	<input type="checkbox"/> Air <input checked="" type="checkbox"/> Contact	EUT work as intended	A
Screw	±4	<input type="checkbox"/> Air <input checked="" type="checkbox"/> Contact	EUT work as intended	A
HCP	±4	<input type="checkbox"/> Air <input checked="" type="checkbox"/> Contact	EUT work as intended	A
Switch & LED	±2; ±4; ±8	<input checked="" type="checkbox"/> Air <input type="checkbox"/> Contact	EUT work as intended	A
Button	±2; ±4; ±8	<input checked="" type="checkbox"/> Air <input type="checkbox"/> Contact	EUT work as intended	A
Display panel	±2; ±4; ±8	<input checked="" type="checkbox"/> Air <input type="checkbox"/> Contact	EUT work as intended	A

Test by: Jiang Haibiao

Revised By: Chen Weichang



Radiated, Radio-Frequency Electromagnetic Field Immunity

Sample No:	SPO190362-1	Standard:	IEC 61851-21-2
EUT:	DC EV Charging Station	Environment:	Temperature 22 °C
Model No.:	EVDC-80KW-9YHW-1	Humidity	49 %RH
Test Location	10m Chamber	Test Date:	2020.01.11
Test Mode	Standby, 20% Load		

Standard requirement:

Frequency range	<input checked="" type="checkbox"/> 80MHz-1000MHz	<input checked="" type="checkbox"/> 1.4GHz -2.0GHz	<input checked="" type="checkbox"/> 2.0GHz -2.7GHz	Performance Criterion <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Test Level	<input checked="" type="checkbox"/> 10V/m	<input checked="" type="checkbox"/> 3V/m	<input checked="" type="checkbox"/> 3V/m	
Modulation	<input checked="" type="checkbox"/> 80%AM, 1kHz sine; <input type="checkbox"/> 1/8duty cycle, 217Hz			
Frequency Step	<input checked="" type="checkbox"/> 1% <input type="checkbox"/> _____			
Dwell Time	<input checked="" type="checkbox"/> 3S; <input type="checkbox"/> 30S; <input type="checkbox"/> _____			

Test Result:

EUT orientation	Ant. Polarization	Remark	Performance Criterion
0°	H	EUT work as intended	A
90°	H	EUT work as intended	A
180°	H	EUT work as intended	A
270°	H	EUT work as intended	A
0°	V	EUT work as intended	A
90°	V	EUT work as intended	A
180°	V	EUT work as intended	A
270°	V	EUT work as intended	A

Test by: Jiang Haibiao

Revised By: Chen Weichang



Electrical Fast Transient/Burst Immunity

Sample No:	SPO190362-1	Standard:	IEC 61851-21-2
EUT:	DC EV Charging Station	Environment:	Temperature 23 °C
Model No.:	EVDC-80KW-9YHW-1		Humidity 50 %RH
Test Location	10m Chamber	Test Date:	2020.01.13
Test Mode	Standby, 20% Load		

Standard requirement:

Test Level	<input checked="" type="checkbox"/> Power port: <input type="checkbox"/> ±0.5kV; <input type="checkbox"/> ±1kV; <input checked="" type="checkbox"/> ±2kV; <input checked="" type="checkbox"/> ±4kV;	Performance Criterion	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C
	<input checked="" type="checkbox"/> CPT port: <input type="checkbox"/> ±0.5kV; <input type="checkbox"/> ±1kV; <input checked="" type="checkbox"/> ±2kV; <input checked="" type="checkbox"/> ±4kV;		
	<input checked="" type="checkbox"/> Signal port: <input type="checkbox"/> ±0.5kV; <input type="checkbox"/> ±1kV; <input checked="" type="checkbox"/> ±2kV;		
Burst Frequency	<input checked="" type="checkbox"/> 5kHz; <input type="checkbox"/> 100kHz, <input type="checkbox"/> _____.		
Dwell Time	<input type="checkbox"/> 60s; <input checked="" type="checkbox"/> 120s		

Test Result:

Test Location	Test Level /kV	Remark	Performance Criterion
a.c. power port	±4	EUT work as intended	A
CPT port	±4	EUT work as intended	A
Signal port	±2	After the test, the communication is normal	B

Test by: Jiang Haibiao

Revised By: Chen Weichang



Surge Immunity

Sample No:	SPO190362-1	Standard:	IEC 61851-21-2
EUT:	DC EV Charging Station	Environment:	Temperature 24 °C
Model No.:	EVDC-80KW-9YHW-1	Humidity	52 %RH
Test Location	10m Chamber	Test Date:	2020.01.13
Test Mode	Standby, 20% Load		

Standard requirement:

Test Level	<input checked="" type="checkbox"/> AC power port: <input checked="" type="checkbox"/> line to line: <input checked="" type="checkbox"/> ±1kV; <input checked="" type="checkbox"/> ±2kV; <input checked="" type="checkbox"/> line to earth: <input checked="" type="checkbox"/> ±2kV; <input checked="" type="checkbox"/> ±4kV;	Performance Criterion	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C
Phase Angle	<input checked="" type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input checked="" type="checkbox"/> 180° <input checked="" type="checkbox"/> 270° <input type="checkbox"/> _____		
Repetition Rate	<input checked="" type="checkbox"/> 60s; <input type="checkbox"/> _____		
Number of surges	<input checked="" type="checkbox"/> 5; <input type="checkbox"/> _____		

Test Result:

Test Location	Test Level /kV	Remark	Performance Criterion
a.c. power line L1-L2	±0.5, ±1, ±2	EUT work as intended	A
a.c. power line L1-L3	±0.5, ±1, ±2	EUT work as intended	A
a.c. power line L2-L3	±0.5, ±1, ±2	EUT work as intended	A
a.c. power line L1-N	±0.5, ±1, ±2	EUT work as intended	A
a.c. power line L2-N	±0.5, ±1, ±2	EUT work as intended	A
a.c. power line L3-N	±0.5, ±1, ±2	EUT work as intended	A
a.c. power line L1-PE	±0.5, ±1, ±2, ±4	EUT work as intended	A
a.c. power line L2-PE	±0.5, ±1, ±2, ±4	EUT work as intended	A
a.c. power line L3-PE	±0.5, ±1, ±2, ±4	EUT work as intended	A
a.c. power line N-PE	±0.5, ±1, ±2, ±4	EUT work as intended	A

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Sample No:	SPO190362-1	Standard:	IEC 61851-21-2
EUT:	DC EV Charging Station	Environment:	Temperature 24 °C
Model No.:	EVDC-80KW-9YHW-1		Humidity 55 %RH
Test Location	10m Chamber	Test Date:	2020.01.13
Test Mode	Standby, 20% Load		

Standard requirement:

Test Level	<input type="checkbox"/> line to line: <input type="checkbox"/> ±0.5kV; <input type="checkbox"/> ±1kV; <input type="checkbox"/> ±2kV; <input type="checkbox"/> ±4kV; <input type="checkbox"/> line to earth: <input type="checkbox"/> ±1kV; <input type="checkbox"/> ±2kV; <input type="checkbox"/> ±4kV; <input type="checkbox"/> ± kV; <input checked="" type="checkbox"/> Signal port: <input type="checkbox"/> ±0.5kV; <input checked="" type="checkbox"/> ±1kV; <input type="checkbox"/> ±2kV; <input type="checkbox"/> ± kV;	Performance Criterion	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C
Phase Angle	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270° <input checked="" type="checkbox"/> -		
Repetition Rate	<input checked="" type="checkbox"/> 60s; <input type="checkbox"/> _____		
Number of surges	<input checked="" type="checkbox"/> 5; <input type="checkbox"/> _____		

Test Result:

Test Location	Test Level	Remark	Performance Criterion
Signal port	±0.5, ±1	The communication connection was normal after the test	B

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Immunity to Conducted Disturbances, Induced by RF fields

Sample No:	<u>SPO190362-1</u>	Standard:	<u>IEC 61851-21-2</u>
EUT:	<u>DC EV Charging Station</u>	Environment:	<u>Temperature 24 °C</u>
Model No.:	<u>EVDC-80KW-9YHW-1</u>		<u>Humidity 52 %RH</u>
Test Location	<u>10m Chamber</u>	Test Date:	<u>2020.01.14</u>
Test Mode	<u>Standby, 20% Load</u>		

Standard requirement:

Test Level	<input checked="" type="checkbox"/> Power port, <input checked="" type="checkbox"/> 10V (Urmodulated, r. m. s); <input type="checkbox"/> ; <input checked="" type="checkbox"/> Signal port: <input type="checkbox"/> 1Vrms; <input type="checkbox"/> 3Vrms; <input checked="" type="checkbox"/> 10Vrms; <input type="checkbox"/> ;	Performance Criterion	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C
Frequency Range	<input checked="" type="checkbox"/> 0.15MHz-80MHz; <input type="checkbox"/>		
Frequency Step	<input checked="" type="checkbox"/> 1% <input type="checkbox"/> _____		
Modulation	<input checked="" type="checkbox"/> 80%AM, 1kHz sine; <input type="checkbox"/> 1/8duty cycle, 217Hz		
Dwell time	<input checked="" type="checkbox"/> 3s <input type="checkbox"/> _____		

Test Result:

Test Location	Test Level	Remark	Performance Criterion
AC power port	10V	EUT work as intended	A
CPT port	10V	EUT work as intended	A
Signal port	10V	EUT work as intended	A

Test by: Jiang Haibiao

Revised By: Chen Weichang



Power Frequency Magnetic Field Immunity

Sample No:	SPO190362-1	Standard:	IEC 61851-21-2
EUT:	DC EV Charging Station	Environment:	Temperature 24 °C
Model No.:	EVDC-80KW-9YHW-1	Humidity	52 %RH
Test Location	10m Chamber	Test Date:	2020.01.14
Test Mode	Standby, 20% Load		

Standard requirement:

Magnetic field frequency	<input checked="" type="checkbox"/> 50Hz; <input type="checkbox"/> 60Hz	Performance Criterion	<input checked="" type="checkbox"/> A
Magnetic field intensity	<input type="checkbox"/> 1A/m; <input type="checkbox"/> 3A/m; <input type="checkbox"/> 10A/m; <input checked="" type="checkbox"/> 30A/m; <input checked="" type="checkbox"/> 100A/m; <input type="checkbox"/> ___ A/m		<input type="checkbox"/> B
Duration	<input checked="" type="checkbox"/> 300Sec; <input type="checkbox"/> _____		<input type="checkbox"/> C

Test Result:

Frequency magnetic field applied orientation (X/Y/Z)	Remark	Performance Criterion
X	EUT work as intended	A
Y	EUT work as intended	A
Z	EUT work as intended	A

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Voltage Dips, Short Interruptions and Voltage Variations

Immunity

Sample No:	SPO190362-1	Standard:	IEC 61851-21-2
EUT:	DC EV Charging Station	Environment:	Temperature 22 °C
Model No.:	EVDC-80KW-9YHW-1		Humidity 51 %RH
Test Location	10m Chamber	Test Date:	2020.01.14
Test Mode	Standby, 20% Load		

Standard requirement:

Voltage Dips:	60% reduction, 10 periods	Performance Criterion	C
	30% reduction, 25 periods		C
	100% reduction, 1 periods		B
Voltage interruptions	100% reduction, 250 periods		C

Test Result:

Test level, %U	Duration/period	Remark	Performance Criterion
0%	1	EUT work as intended	A
40%	10	The performance degradation was observed in the voltage interruption test. The EUT automatically returns to normal after testing	B
70%	25	The performance degradation was observed in the voltage interruption test. The EUT automatically returns to normal after testing	B
0%	250	The performance degradation was observed in the voltage interruption test. The EUT automatically returns to normal after testing	B

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Measurement Uncertainties

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Table 1: Measurement Uncertainty levels

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 3.3 dB ± 3.3 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (30MHz to 1000MHz, Horizontal) (30MHz to 1000MHz, Vertical)	± 4.50 dB ± 4.50 dB	± 6.3 dB
Radiated Emission	Level accuracy (above 1000MHz, Horizontal) (above 1000MHz, Vertical)	± 4.80 dB ± 4.80 dB	N/A

As U_{lab} in all applicable tests listed above are less than U_{cispr} according to CISPR 16-4-2:2011,

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.