

Electromagnetic Compatibility

Test Report

Product Name : High-Endurance System

Model No. : HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or
blank for marketing purpose)

Test Item : MIL-STD-461G (RE102, CE102, RS103, CS101, CS114)

Applicant : Vecow Co., Ltd.

Address : 3F., No.10, Jiankang Rd., Zhonghe Dist., New Taipei City
23586, Taiwan

Date of Receipt : 2024/05/20

Issued Date : 2024/06/04

Report No. : 2450455R-E3072800001-1

Report Version : V1.0

The test results relate only to the samples tested.

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23586, Taiwan

Model No. : HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or
blank for marketing purpose)

EUT Voltage : AC 110V / 60 Hz (Power by Adapter)

Applicable Standard : MIL-STD-461G

Test Result : In test report section

Laboratory Name : DEKRA Testing and Certification Co., Ltd.
Hsinchu EMC Laboratory

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Revision History

Report No.	Version	Description	Issued Date
2450455R-E3072800001-1	V1.0	Initial issue of report	2024/06/04

Laboratory Information

We, **DEKRA Testing and Certification Co., Ltd.**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025 and specified testing scopes:

Taiwan R.O.C.	: BSMI, NCC, TAF
USA	: FCC
Japan	: VCCI

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : <http://www.dekra.com.tw>

If you have any comments, Please don't hesitate to contact us. Our test sites as below:

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1. General Information

1.1. EUT Description

Product Name	High-Endurance System
Model No.	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)

Product Description	
Adapter	Model No. : FSP / FSP120-AAAN2
	AC Input : 100-240V~, 1.8A, 50-60Hz
	DC Output: 24V, 5A
Main unit	Model No. : HEC-1000
	Performance-core Base Frequency : 1.3GHz (CPU)
	Voltage rating : 9V to 50VDC
KPL information	
CPU:	14th Gen Intel Core i7-14700T@1.30 GHz
RAM:	Innodisk DDR4 2666 non-ECC 16GB*2
SSD:	Innodisk 2.5" SATA SSD 3TG6-P 512GB*2
M.2:	Innodisk M.2(P80) 4TG2-P 4TB

1.2. Mode of Operation

The test mode defined by client and defined as:

Operation Mode	Details
Mode 1	Normal operation with full system

Performed Item	Test applies (Y/N)	Operating Mode(s) to be used during verification
RE102, radiated emissions, electric field	Y	Mode 1
CE102, conducted emissions, radio frequency potential, power leads	Y	Mode 1
RS103, radiated susceptibility, electric field	Y	Mode 1
CS101, conducted susceptibility, power leads	Y	Mode 1
CS114, conducted susceptibility, bulk cable injection	Y	Mode 1

2. Technical Test

2.1. Summary of Test Result

Emission Test Result			
Test Item	Test Standard	Result/Remarks	
RE102, radiated emissions, electric field	MIL-STD-461G	10 kHz - 30 MHz : Margin -6.82 dB at 92.500 kHz 30 MHz - 200 MHz : Margin -4.62 dB at 36.000 MHz 200 MHz - 1 GHz : Margin -4.06 dB at 324.000 MHz 1 GHz - 18 GHz : Margin -28.75 dB at 2484.000 MHz	Under limit
CE102, conducted emissions, radio frequency potential, power leads		10 kHz - 10 MHz : Margin -1.35 dB at 25.000 kHz	Under limit

Susceptibility Test Result				
Test Item	Test Standard	Test Condition	Result/Remarks	
RS103, radiated susceptibility, electric field	MIL-STD-461G	SHIPS (METALLIC) (BELOW DECKS)	No deviation	Complied
CS101, conducted susceptibility, power leads		CURVE #1	No deviation	Complied
CS114, conducted susceptibility, bulk cable injection		SHIPS (METALLIC) (BELOW DECKS)	No deviation	Complied

2.2. Test Environment

Performed Item	Items	Value	Actual
RE102, radiated emissions, electric field	Temperature (°C)	18-28	23
CE102, conducted emissions, radio frequency potential, power leads	Temperature (°C)	18-28	23
RS103, radiated susceptibility, electric field	Temperature (°C)	18-28	21
CS101, conducted susceptibility, power leads	Temperature (°C)	18-28	21
CS114, conducted susceptibility, bulk cable injection	Temperature (°C)	18-28	22

2.3. List of Test Equipment

RE102, radiated emissions, electric field / HC-CB06

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Active ROD Antenna	R&S	HFH2-Z6	100639	2023/10/11	2024/10/10
Biconical Antenna	Schwarzbeck	VHA9103B & BBA9106	08059	2023/9/22	2024/9/21
Double-Ridged Guide Antenna	ETS-Lindgren	3106B	00205051	2024/2/2	2025/2/1
Horn Antenna	Schwarzbeck	BBHA 9120D	743	2023/9/26	2024/9/25
Pre-Amplifier	EMCI	EMC1150	980396	2024/1/30	2025/1/29
Pre-Amplifier	DEKRA	AP-180C	201801237	2023/10/2	2024/10/1
EMI Test Receiver	R&S	ESR7	101562	2023/6/27	2024/6/26
Signal & Spectrum Analyzer	R&S	FSV40	101049	2024/3/22	2025/3/21
V-LISN	Schwarzbeck	NNBL 8226-2	00259	2023/12/29	2024/12/28

CE102, conducted emissions, radio frequency potential, power leads / HC-CB06

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
V-LISN	Schwarzbeck	NNBL 8226-2	00259	2023/12/29	2024/12/28
EMI Test Receiver	R&S	ESR7	101562	2023/6/27	2024/6/26

RS103, radiated susceptibility, electric field / HC-CB06

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Generator	Keysight	N5171B	MY53051466	2023/7/10	2024/7/9
Power Meter	Keysight	N1912A	MY55326014	2023/7/18	2024/7/17
Power Sensor	Keysight	N1921A	MY55320007	2023/7/18	2024/7/17
Power Sensor	Keysight	N1921A	MY55260011	2023/7/18	2024/7/17
Power Amplifier	TESEQ	CBA1G-1200D- 10-15	1102879	NCR	NCR
High frequency amplifier	TESEQ	CBA 6G-200D- 10	1095636	NCR	NCR
V-LISN	Schwarzbeck	NNBL 8226-2	00259	2023/12/29	2024/12/28
Double-Ridged Guide Antenna	ETS-Lindgren	3106B	00205051	2024/2/2	2025/2/1
Horn Antenna	Schwarzbeck	BBHA 9120D	743	2023/9/26	2024/9/25
Electric Field Probe	Narda	EP 602	811ZX01096	2023/10/25	2024/10/24

CS101, conducted susceptibility, power leads / HC-CB06

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Audio Isolation transformer	Solar	6220-1A	2	N/A	N/A
Capacitor, 10uF	Schwarzbeck	CAP 10 8226-2	4	N/A	N/A
Waveform generator	Keysight	33510B	MY52201298	2023/7/16	2024/7/15
Oscilloscope	Tektronix	MSO54	C034665	2024/3/12	2025/3/11
Audio Power Amplifier	AE Techron	7224	7224-0216-1455	N/A	N/A
V-LISN	Schwarzbeck	NNBL 8226-2	00259	2023/12/29	2024/12/28

CS114, conducted susceptibility, bulk cable injection / HC-SR01

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Current Probe	FCC	F-120-9A	53	2023/11/23	2024/11/22
Current probe	FCC	F-65	111	2024/3/8	2025/3/7
Power Amplifier	Teseq	CBA 400M-260	T44788	NCR	NCR
RF Conducted Immunity Test System	TESEQ	NSG 4070C-0	59560	2023/6/1	2024/5/31
V-LISN	Schwarzbeck	NNBL 8226-2	00259	2023/12/29	2024/12/28

3. RE102, radiated emissions, electric field

3.1. Test Specification

According to EMC Standard: MIL-STD-461G (Section 5.18)

3.2. Test Configuration

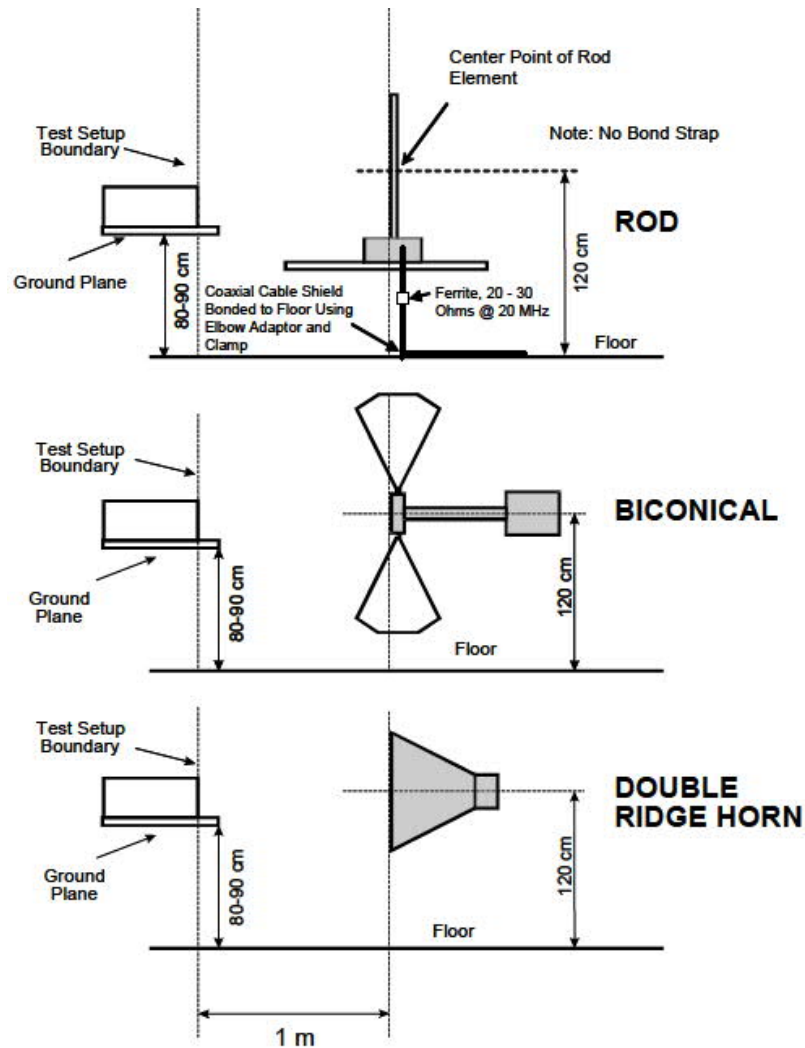


Figure RE102-6. Antenna positioning.

3.3. Test Limits

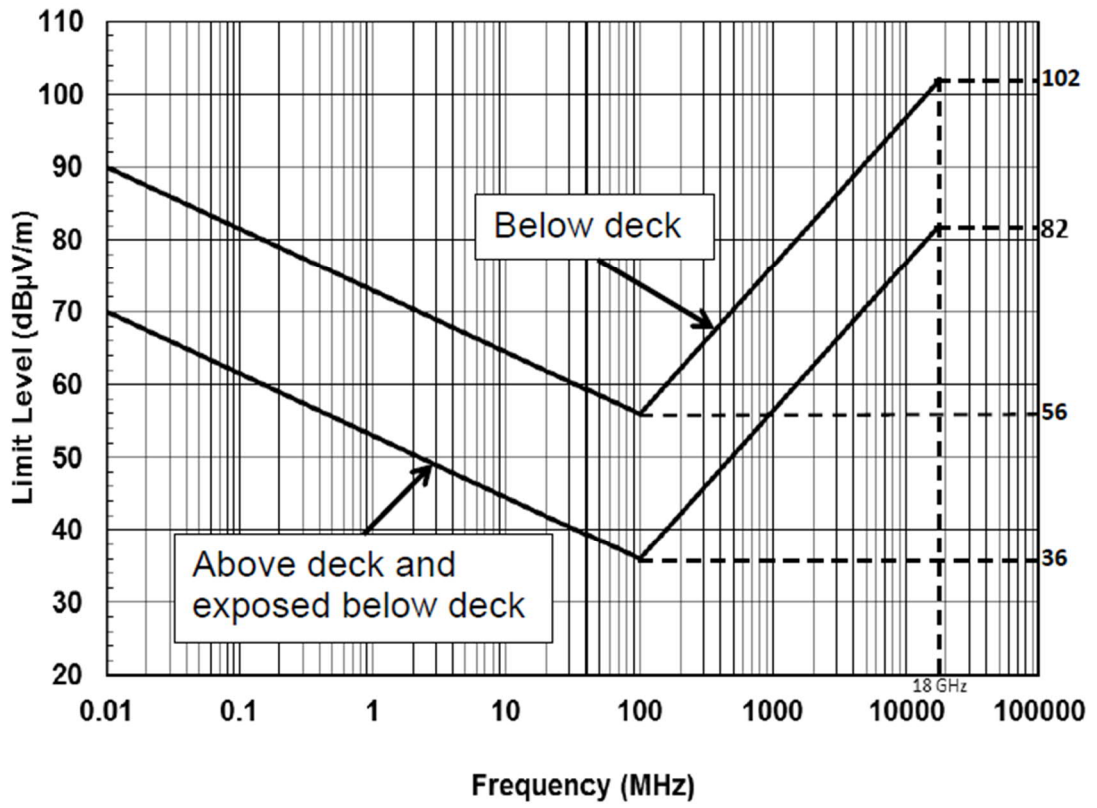
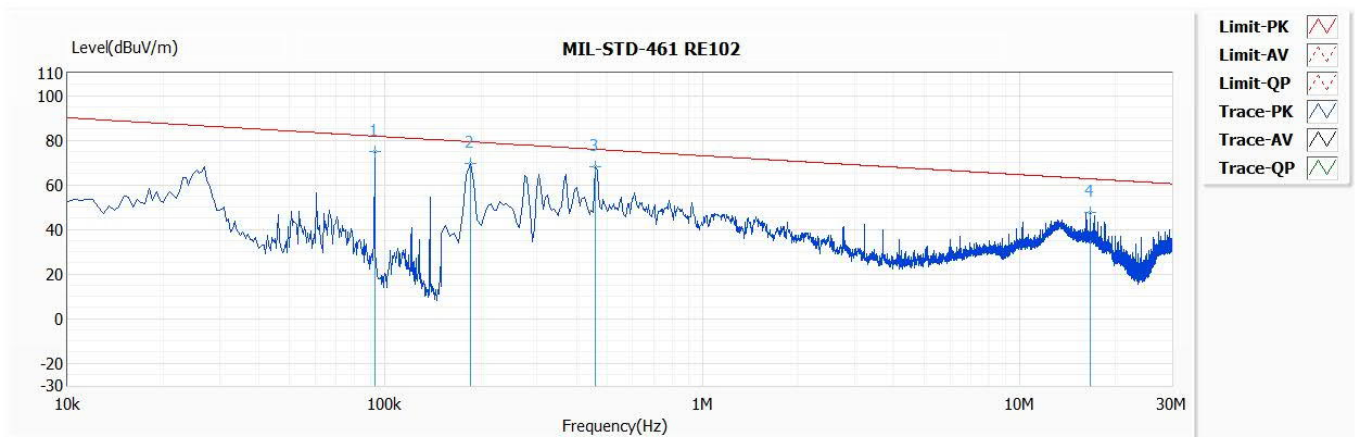


Figure RE102-1. RE102 limit for surface ship applications.

3.4. Test Result

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jerry Jhan
Polarity	Vertical	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461_RE102_radiated_emissions_electric_field(10kHz~30MHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note			

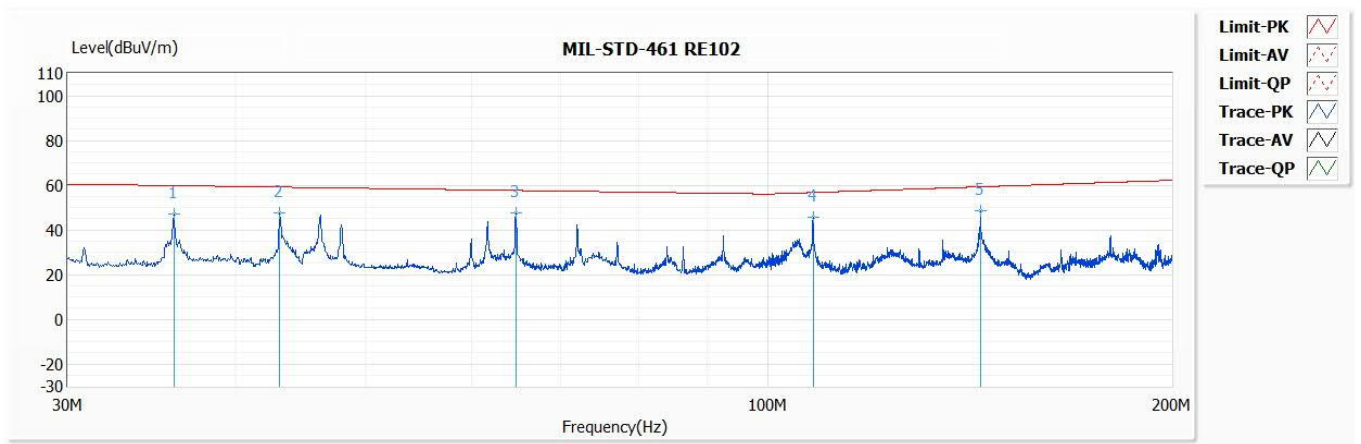


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	92.500k	74.97	81.79	-6.82	62.65	12.32	PK
2	185.000k	69.50	79.23	-9.73	57.18	12.32	PK
3	460.000k	67.91	75.87	-7.96	55.62	12.29	PK
4	16.645M	47.39	62.62	-15.23	34.66	12.73	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jerry Jhan
Polarity	Horizontal	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461_RE102_radiated_emissions_electric_field(30MHz~200MHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

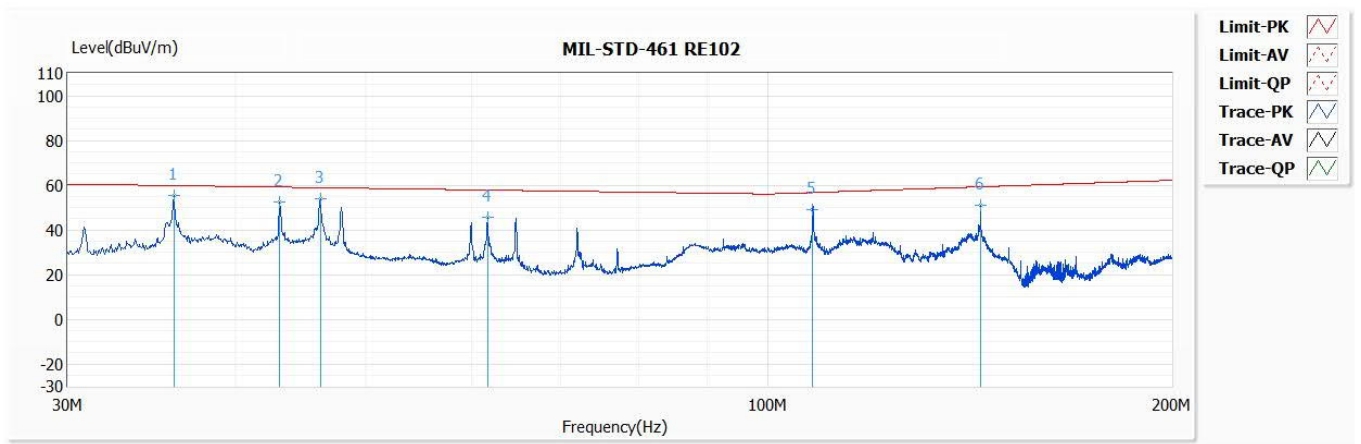


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	36.000M	46.98	59.77	-12.79	81.45	-34.47	PK
2	43.200M	47.32	59.10	-11.78	82.95	-35.63	PK
* 3	64.800M	47.45	57.60	-10.15	89.32	-41.87	PK
4	108.000M	45.68	56.68	-11.00	82.45	-36.77	PK
5	144.000M	48.30	59.23	-10.93	82.30	-34.00	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jerry Jhan
Polarity	Vertical	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461_RE102_radiated_emissions_electric_field(30MHz~200MHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

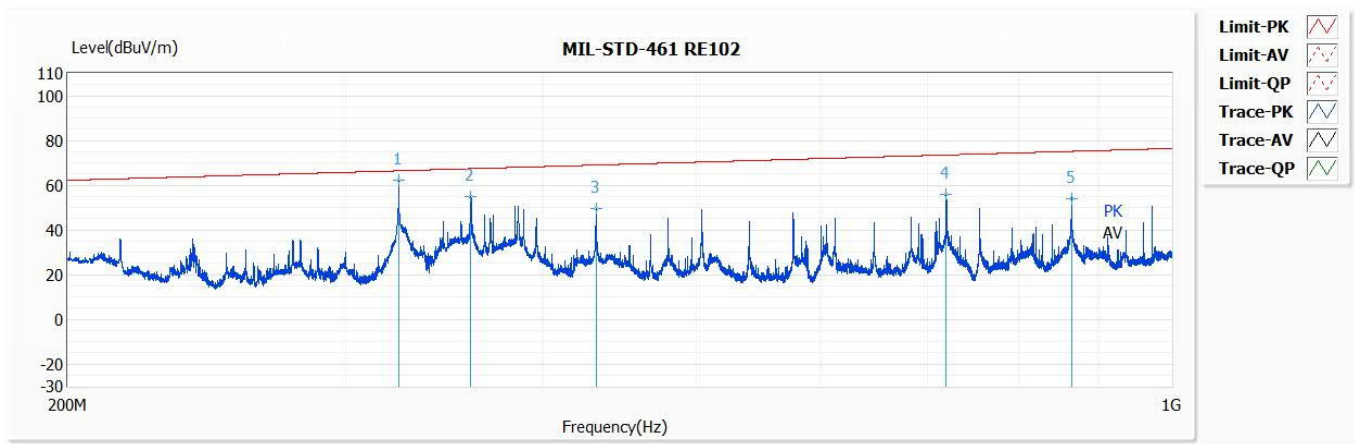


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	36.000M	55.15	59.77	-4.62	89.62	-34.47	PK
2	43.200M	52.52	59.10	-6.58	88.15	-35.63	PK
3	46.300M	53.79	58.84	-5.05	90.16	-36.37	PK
4	61.700M	45.79	57.78	-11.99	87.03	-41.24	PK
5	107.950M	49.23	56.68	-7.45	86.01	-36.78	PK
6	144.000M	51.21	59.23	-8.02	85.21	-34.00	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jay Tai
Polarity	Horizontal	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461_RE102_radiated_emissions_electric_field(200MHz~1000MHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

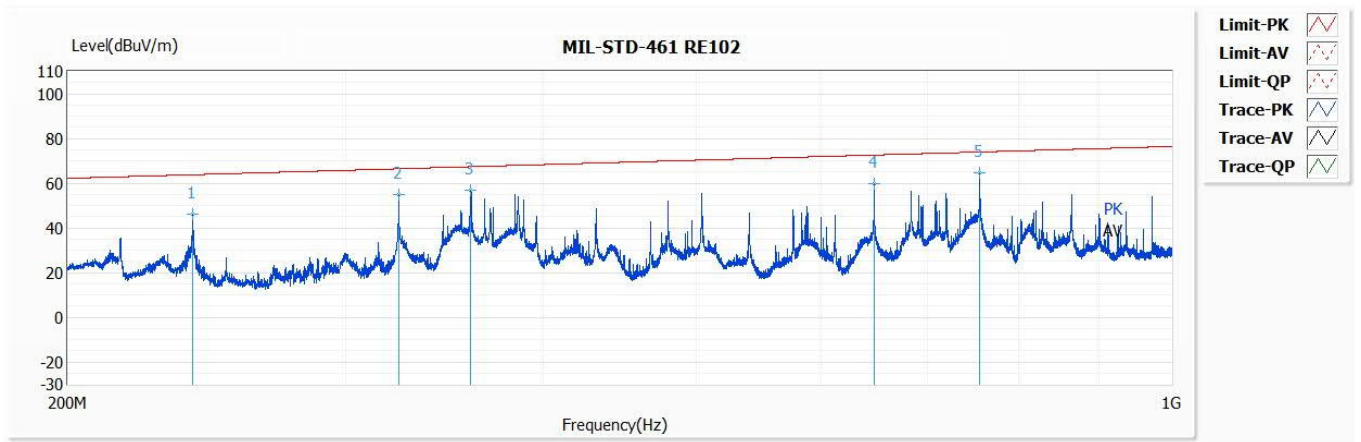


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	324.000M	62.36	66.42	-4.06	98.35	-35.99	PK
2	360.000M	54.67	67.35	-12.68	90.24	-35.57	PK
3	432.000M	49.49	68.96	-19.47	84.19	-34.70	PK
4	720.050M	55.83	73.49	-17.66	86.88	-31.05	PK
5	864.050M	54.03	75.11	-21.08	80.47	-26.44	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jerry Jhan
Polarity	Vertical	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461_RE102_radiated_emissions_electric_field(200MHz~1000MHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

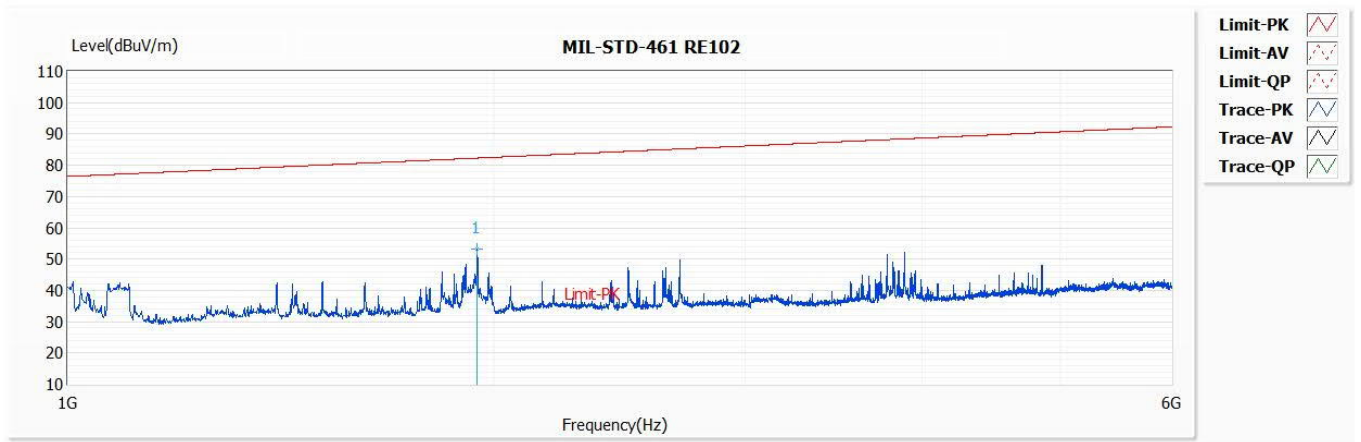


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	239.950M	46.09	63.75	-17.66	84.36	-38.27	PK
2	324.000M	55.02	66.42	-11.40	91.01	-35.99	PK
3	360.000M	56.71	67.35	-10.64	92.28	-35.57	PK
4	648.050M	59.57	72.56	-12.99	91.06	-31.49	PK
* 5	756.050M	64.80	73.92	-9.12	95.25	-30.45	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jay Tai
Polarity	Horizontal	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461G_RE102_radiated_emissions_electric_field(1GHz~18GHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

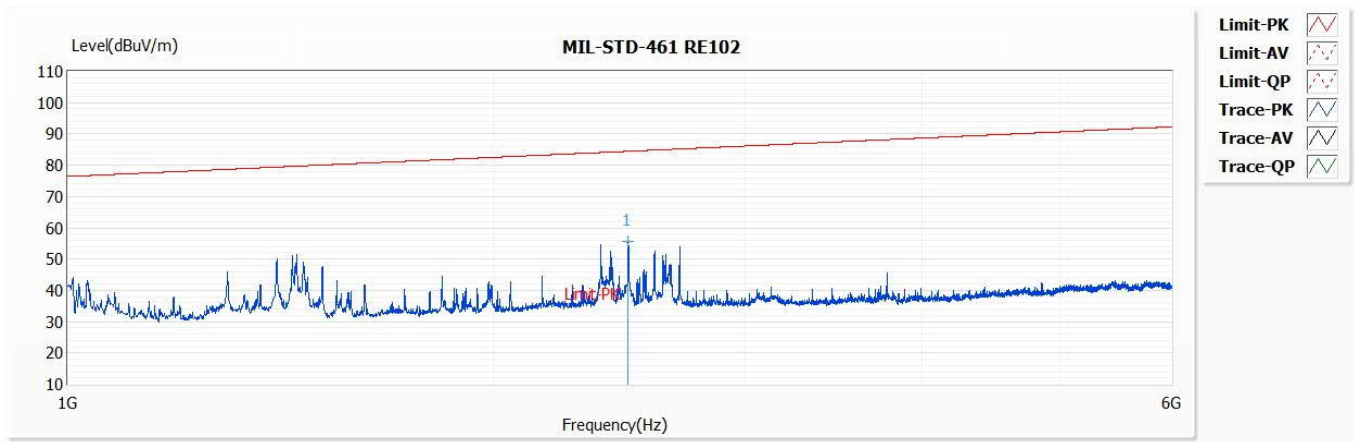


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	1944.000M	53.06	82.29	-29.23	58.29	-5.23	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jay Tai
Polarity	Vertical	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461G_RE102_radiated_emissions_electric_field(1GHz~18GHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

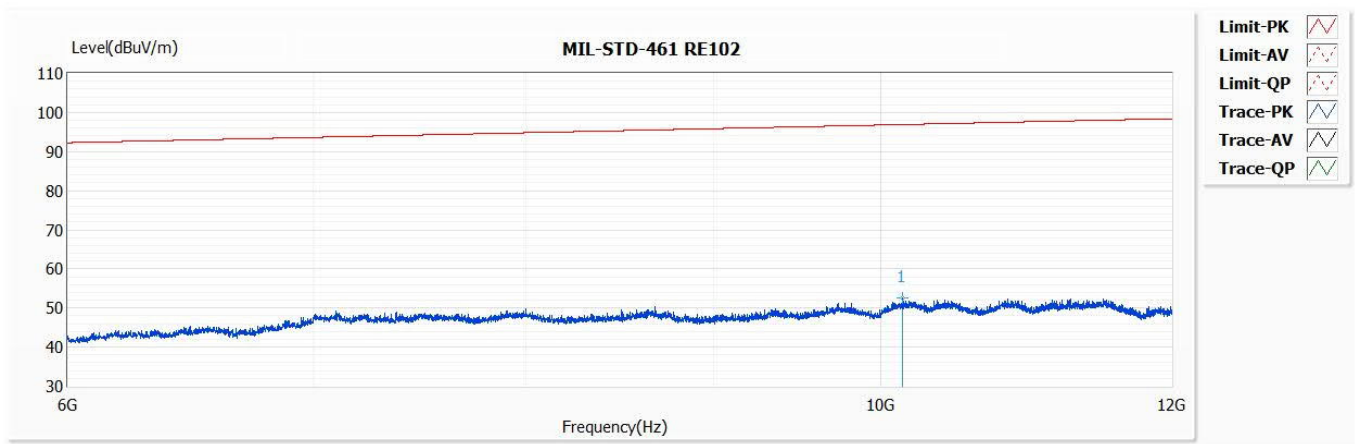


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	2484.000M	55.71	84.46	-28.75	59.40	-3.69	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jay Tai
Polarity	Horizontal	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461G_RE102_radiated_emissions_electric_field(1GHz~18GHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

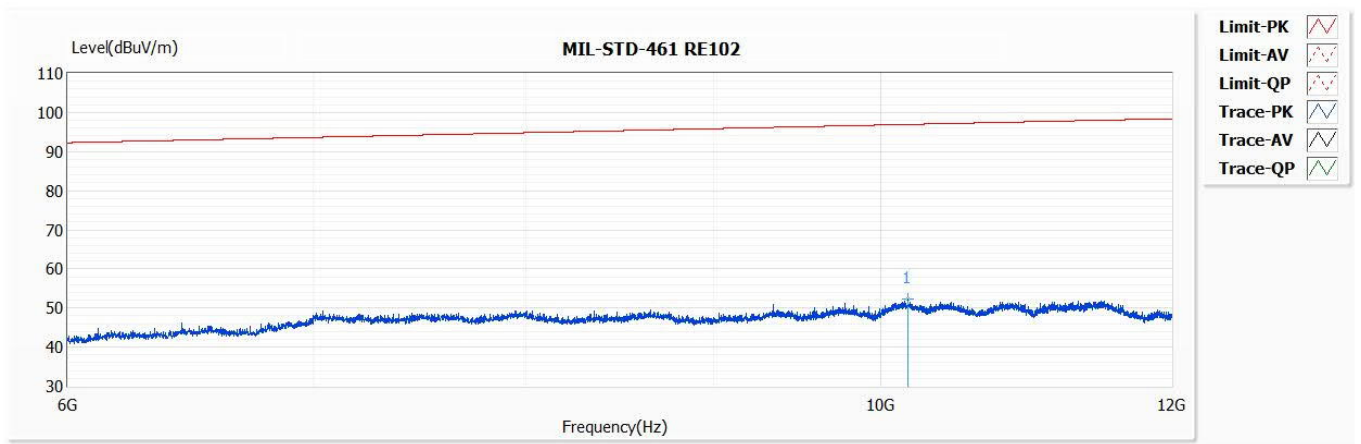


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	10134.000M	52.52	96.92	-44.40	38.72	13.80	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jay Tai
Polarity	Vertical	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461G_RE102_radiated_emissions_electric_field(1GHz~18GHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

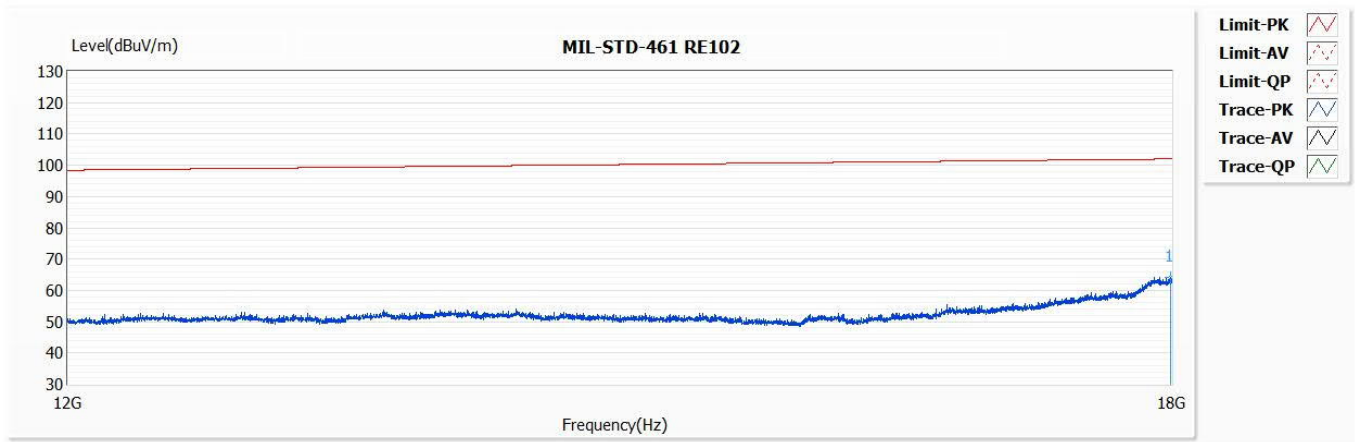


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	10168.000M	52.21	96.95	-44.74	38.27	13.94	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jay Tai
Polarity	Horizontal	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461G_RE102_radiated_emissions_electric_field(1GHz~18GHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		

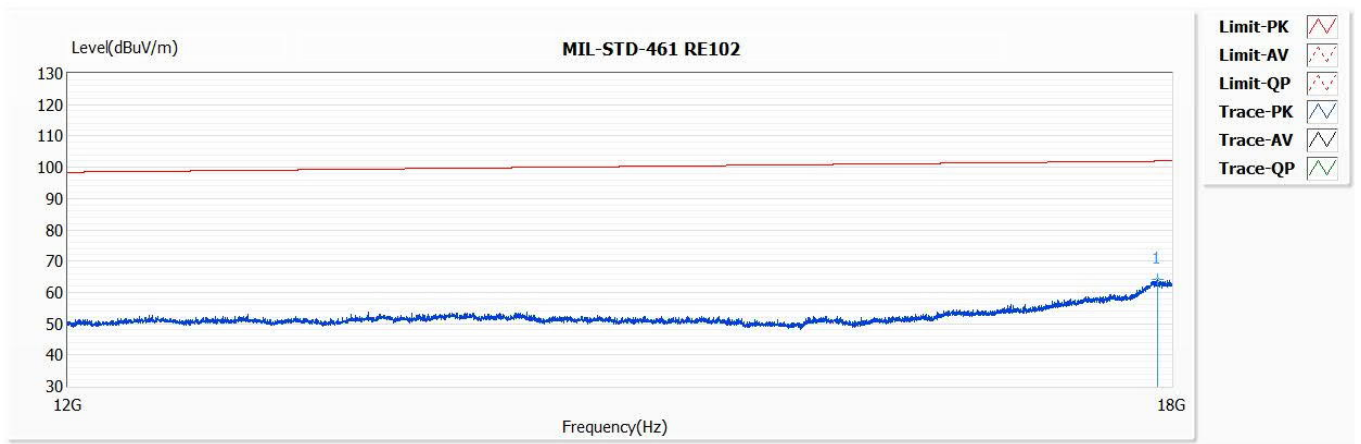


No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	17995.000M	64.28	102.01	-37.73	37.67	26.61	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jay Tai
Polarity	Vertical	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461G_RE102_radiated_emissions_electric_field(1GHz~18GHz),Item=Version G,Limit Class=RE102-1_Below deck		
Note	DVI+core		



No	Frequency (Hz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	17905.000M	64.07	101.96	-37.89	37.77	26.30	PK

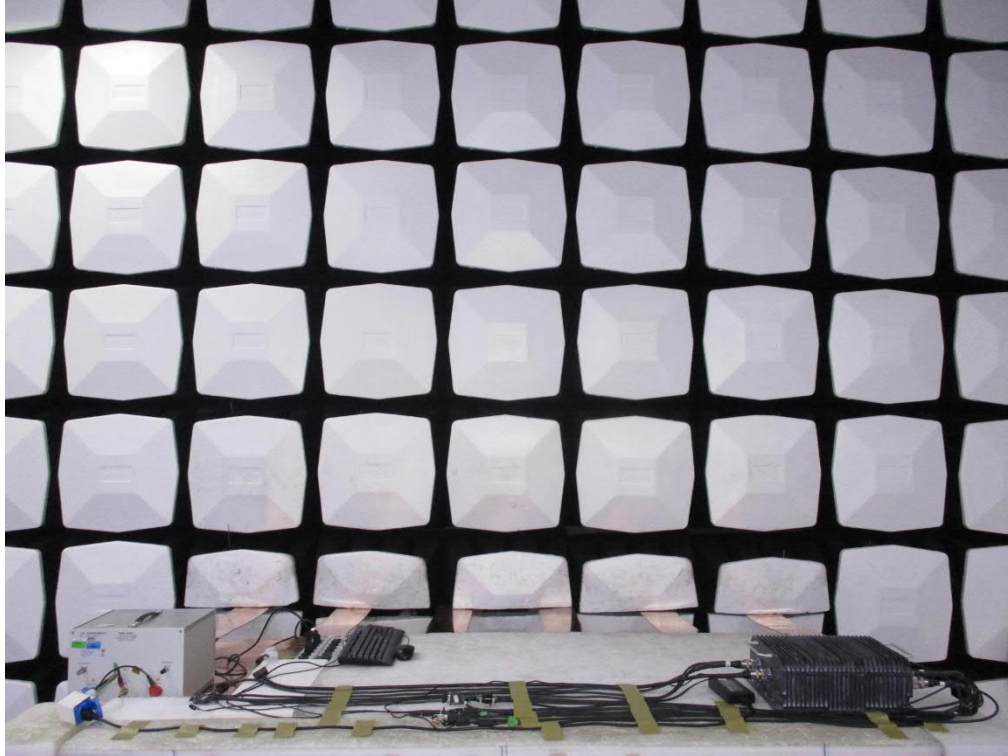
Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

3.5. Test Photograph

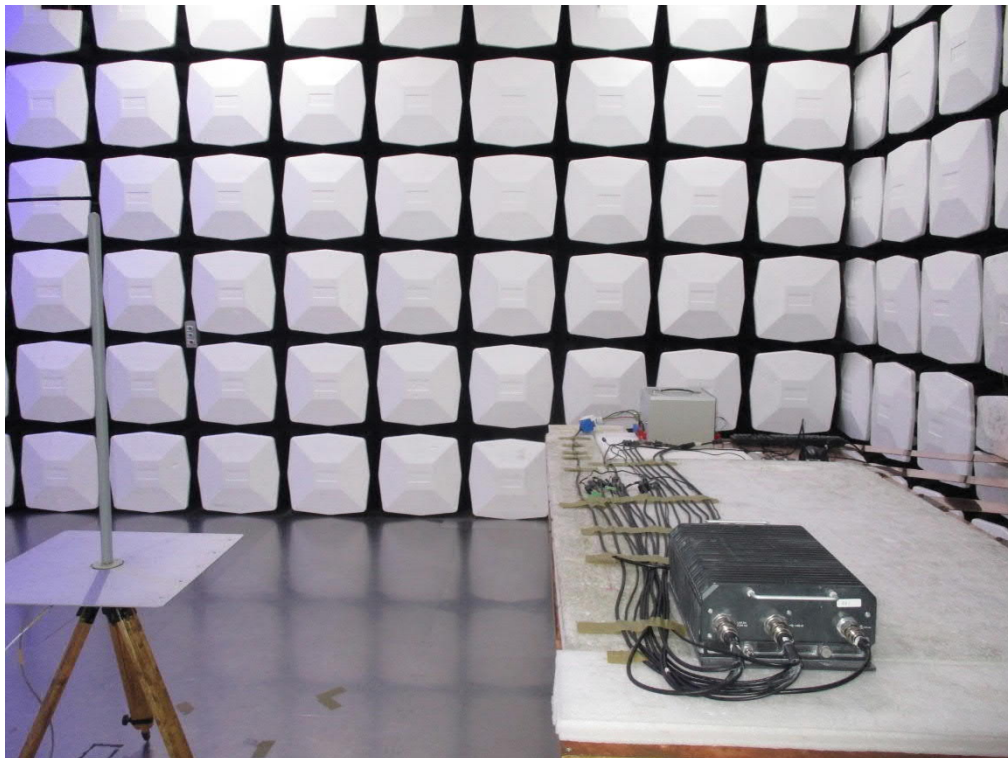
Test Mode : Mode 1: Normal operation with full system

Description : RE102, radiated emissions, electric field Test Setup



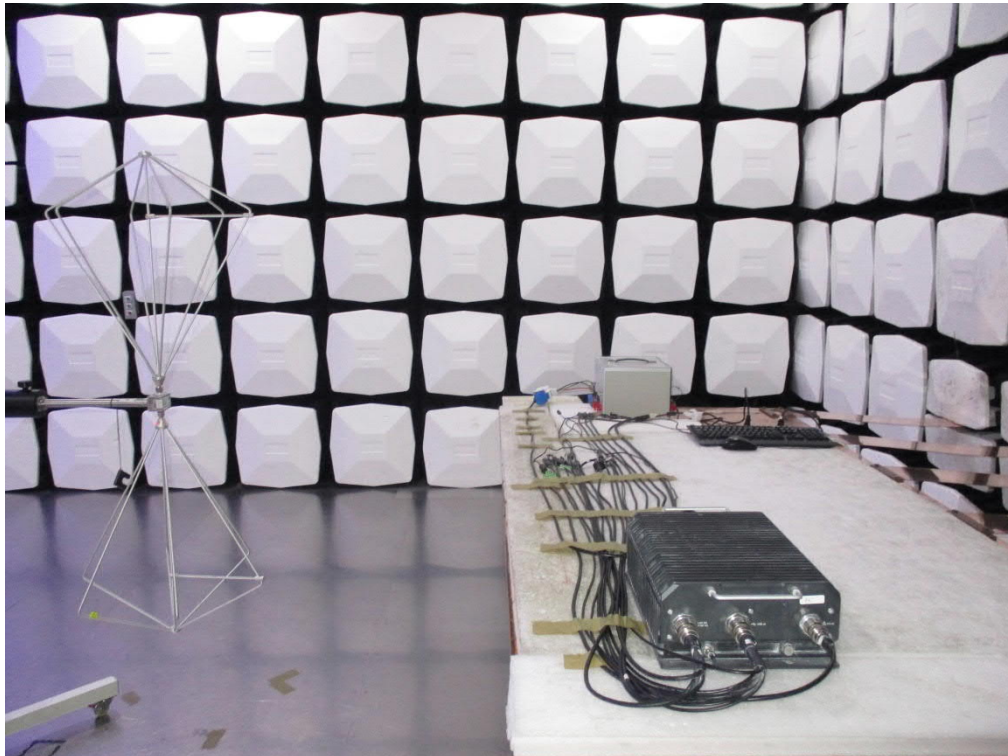
Test Mode : Mode 1: Normal operation with full system

Description : RE102, radiated emissions, electric field Test Setup



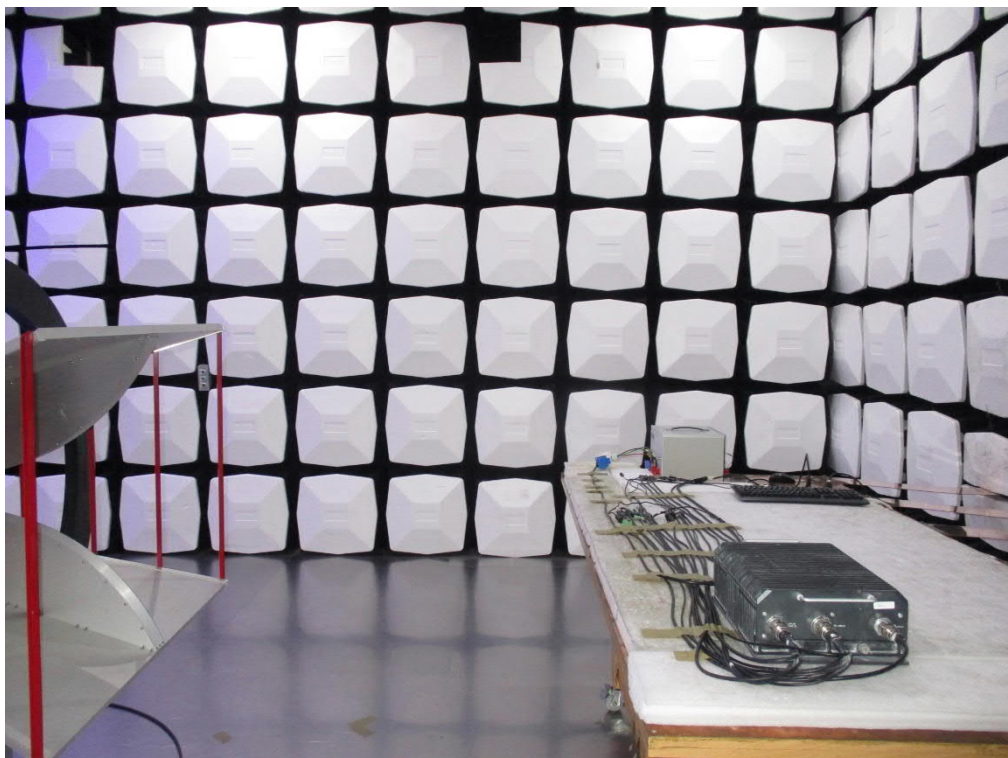
Test Mode : Mode 1: Normal operation with full system

Description : RE102, radiated emissions, electric field Test Setup



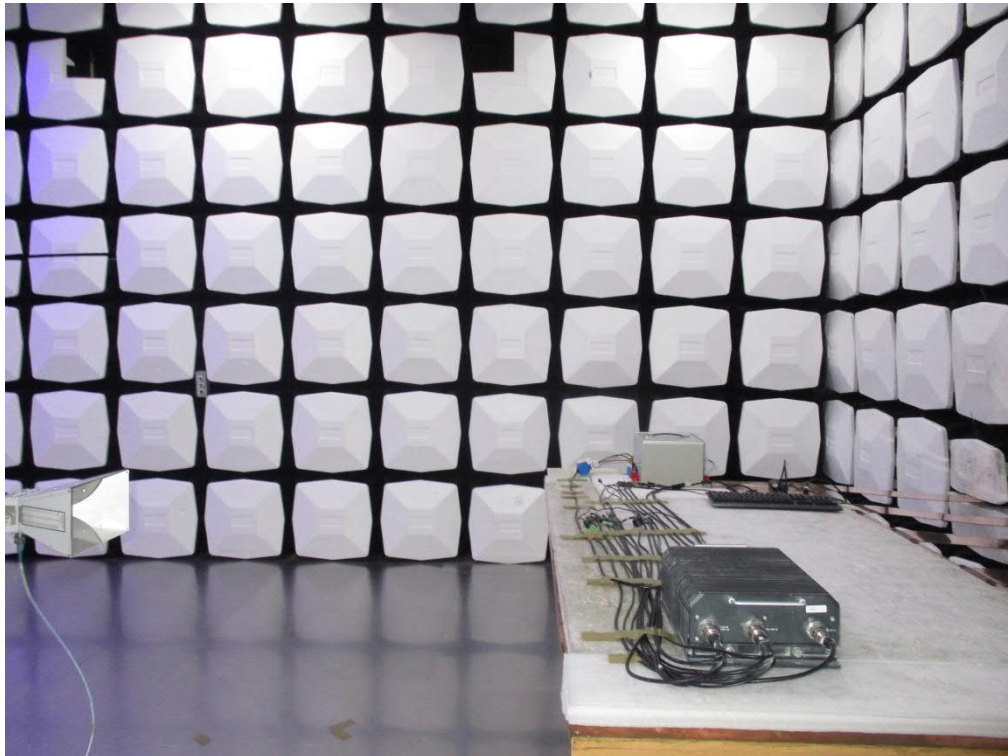
Test Mode : Mode 1: Normal operation with full system

Description : RE102, radiated emissions, electric field Test Setup



Test Mode : Mode 1: Normal operation with full system

Description : RE102, radiated emissions, electric field Test Setup



4. CE102, conducted emissions, radio frequency potential, power leads

4.1. Test Specification

According to EMC Standard: MIL-STD-461G (Section 5.5).

4.2. Test Configuration

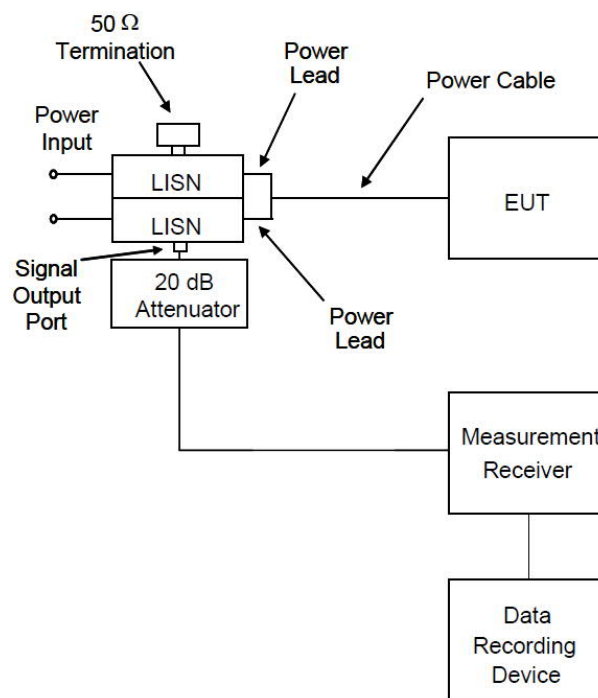


Figure CE102-3. Measurement setup.

4.3. Test Limits

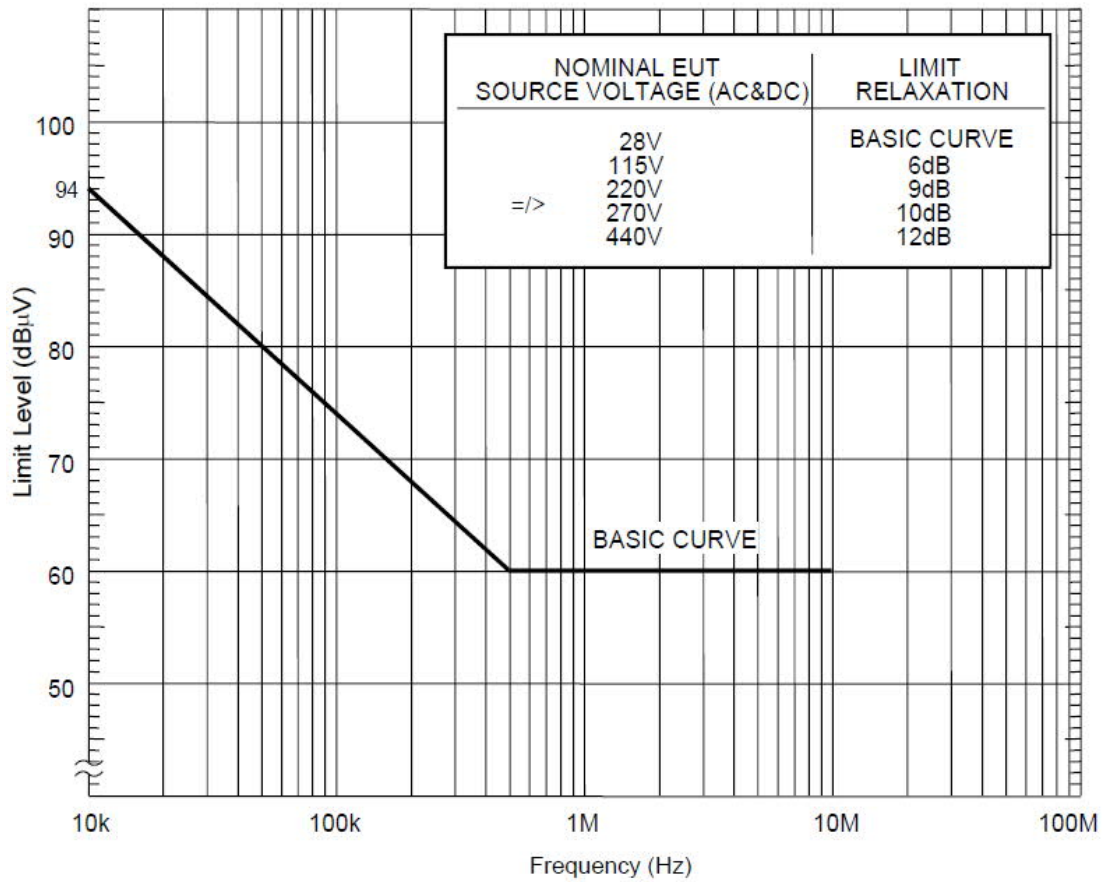
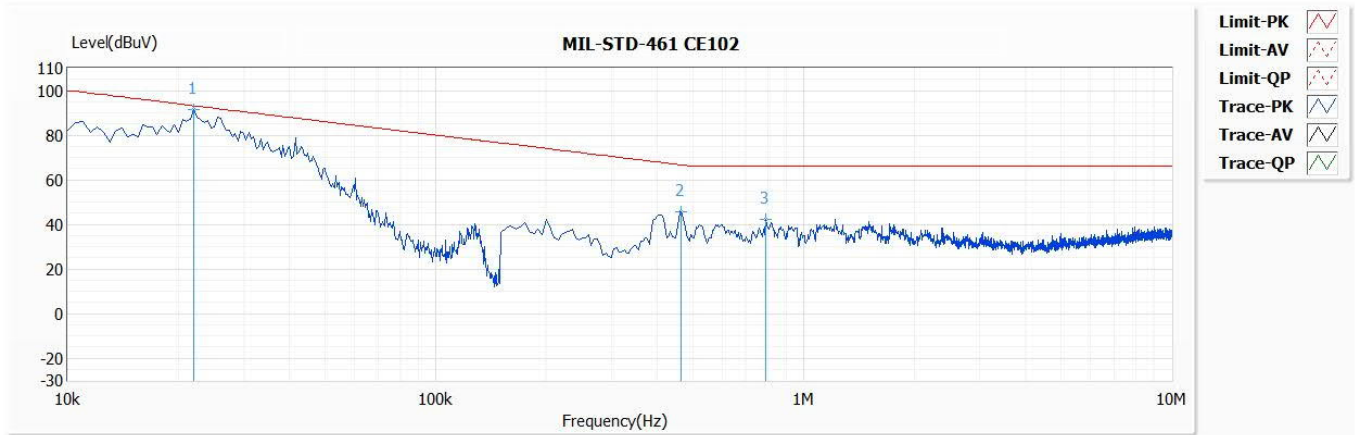


Figure CE102-1. CE102 limit (EUT power leads, AC and DC) for all applications.

4.4. Test Result

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jerry Jhan
Polarity	L	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461_CE102_AC,Item=Version D/E/F/G,Limit Class=CE102-1_>=115V		
Note			

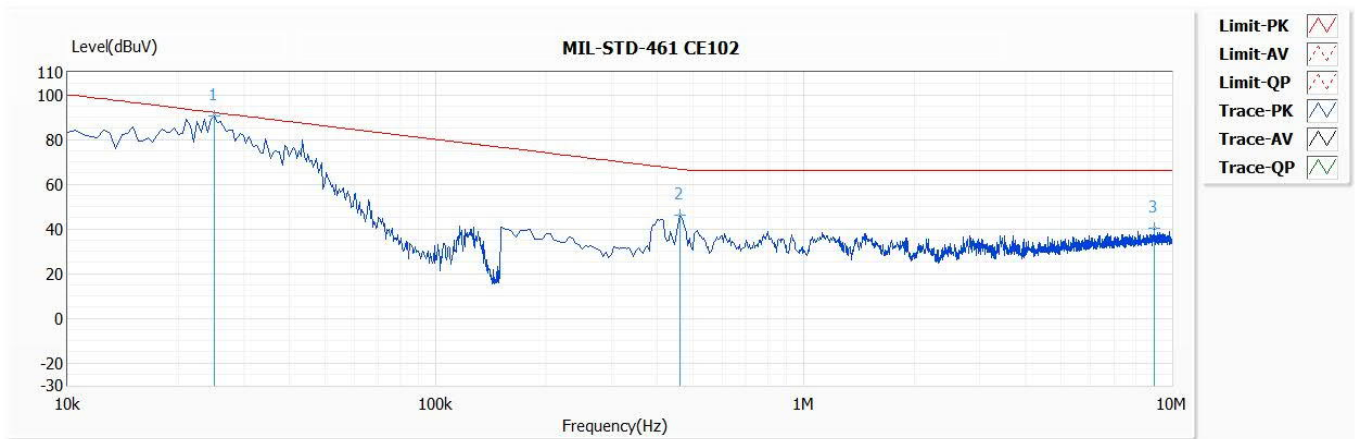


No	Frequency (Hz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	22.000k	91.29	93.15	-1.86	68.02	23.27	PK
2	465.000k	45.51	66.63	-21.12	24.93	20.58	PK
3	790.000k	42.39	66.00	-23.61	21.78	20.61	PK

Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

Model No	HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)	Site	HC-CB06
Test Voltage	110VAC / 60Hz	Test Date	2024/5/7
Test Mode	Mode 1: Normal operation with full system	Engineer	Jerry Jhan
Polarity	N	Temperature (°C)	23
Section	N/A	Humidity (%RH)	55
Limit	MIL-STD-461_CE102_AC,Item=Version D/E/F/G,Limit Class=CE102-1_>=115V		
Note			



No	Frequency (Hz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
* 1	25.000k	90.69	92.04	-1.35	68.08	22.61	PK
2	460.000k	46.14	66.73	-20.59	25.55	20.59	PK
3	8.990M	40.06	66.00	-25.94	19.07	20.99	PK

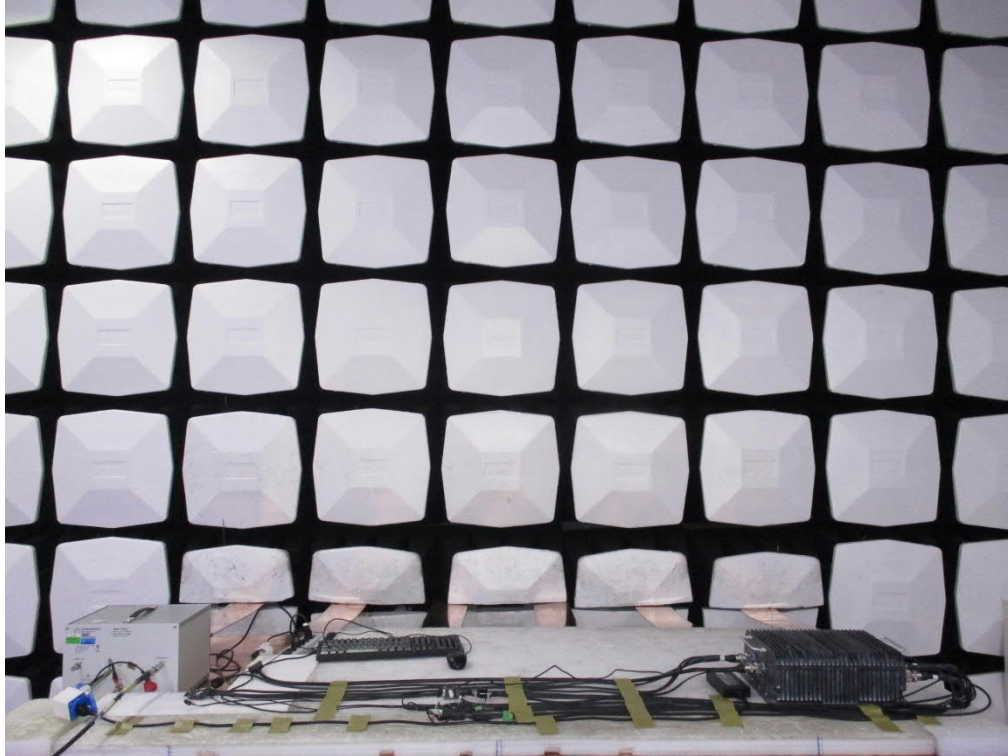
Remark:

1. "*" means this data is the worst emission level; "!" means this data is over limit.
2. "PK" means Peak detector.
3. Emission Level=Reading Level + Correct Factor(Correct Factor=Ant Factor+Cable Loss-Pre Amp).
4. Margin= Emission Level- Limit.

4.5. Test Photograph

Test Mode : Mode 1: Normal operation with full system

Description : CE102, conducted emissions, radio frequency potential, power leads Test Setup



Test Mode : Mode 1: Normal operation with full system

Description : CE102, conducted emissions, radio frequency potential, power leads Test Setup



5. RS103, radiated susceptibility, electric field

5.1. Test Specification

According to EMC Standard: MIL-STD-461G (Section 5.21).

5.2. Test Configuration

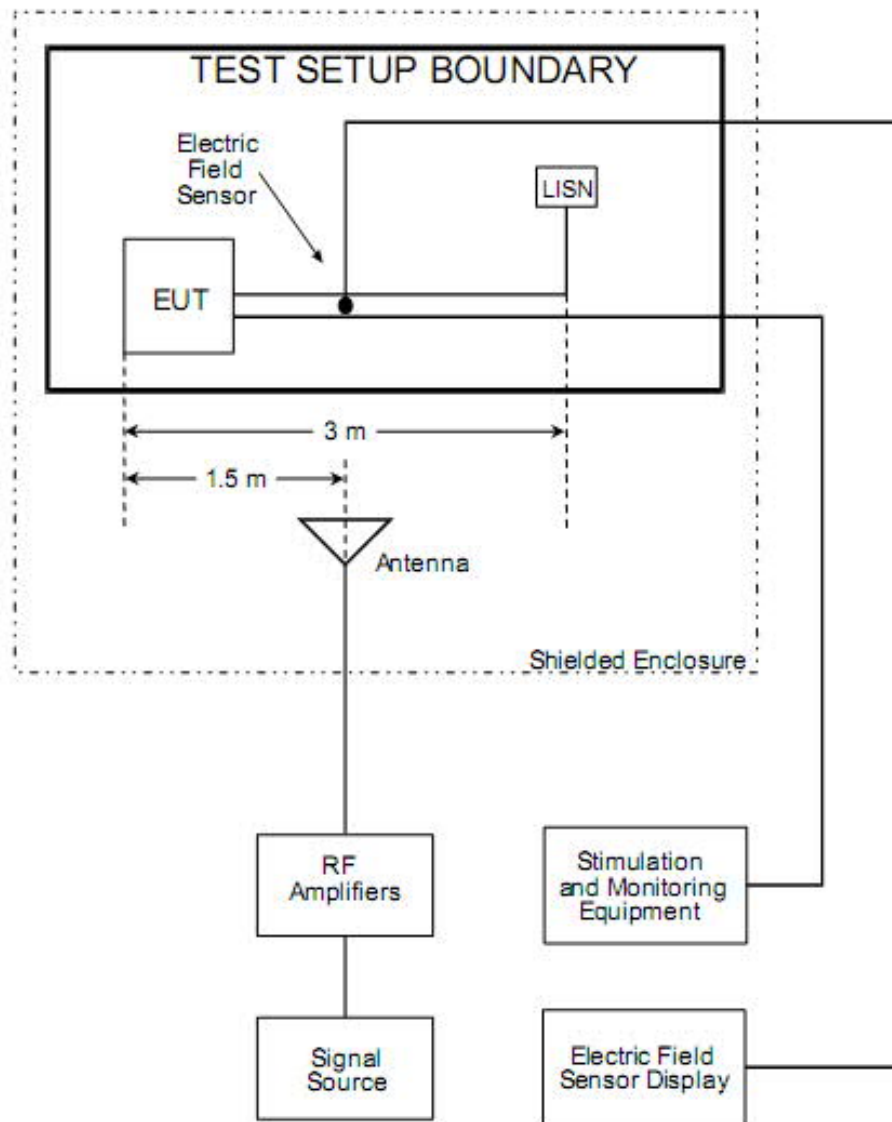


Figure RS103-1. Test equipment configuration.

5.3. Test Limits

Table XI. RS103 limits

PLATFORM FREQUENCY RANGE		LIMIT LEVELS (VOLTS/METER)							
		AIRCRAFT (EXTERNAL OR SAFETY CRITICAL)	AIRCRAFT INTERNAL	ALL SHIPS (ABOVE DECK & EXPOSED BELOW DECK) AND SUBMARINES (EXTERNAL)*	SHIPS (METALLIC) (BELOW DECKS)	SHIPS (NON-METALLIC) (BELOW DECK)**	SUBMARINE (INTERNAL)	GROUND	SPACE
2 MHz to 30 MHz	A	200	200	200	10	50	5	50	20
	N	200	200	200	10	50	5	10	20
	AF	200	20	-	-	-	-	10	20
30 MHz to 1 GHz	A	200	200	200	10	10	10	50	20
	N	200	200	200	10	10	10	10	20
	AF	200	20	-	-	-	-	10	20
1 GHz to 18 GHz	A	200	200	200	10	10	10	50	20
	N	200	200	200	10	10	10	50	20
	AF	200	60	-	-	-	-	50	20
18 GHz to 40 GHz	A	200	200	200	10	10	10	50	20
	N	200	60	200	10	10	10	50	20
	AF	200	60	-	-	-	-	50	20

KEY: A= Army
 N= Navy
 AF= Air Force

* For equipment located external to the pressure hull of a submarine but within the superstructure, use SHIPS (METALLIC) (BELOW DECK)
 ** For equipment located in the hanger deck of Aircraft Carriers

5.4. Test Result

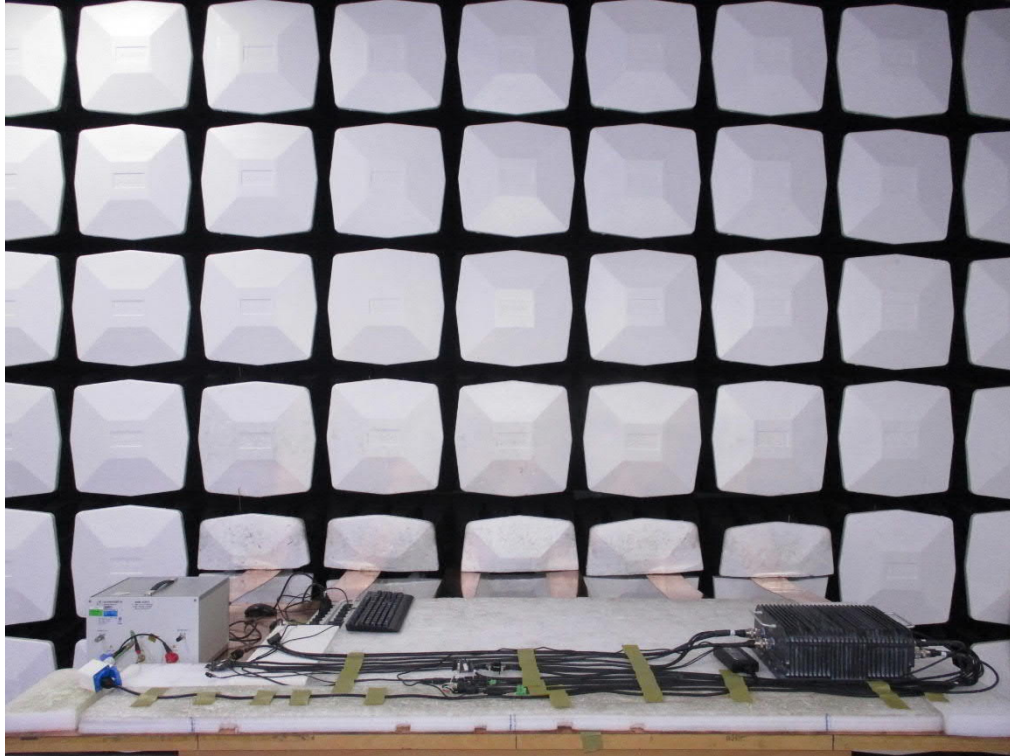
Product	High-Endurance System		
Test Item	RS103, radiated susceptibility, electric field		
Test Mode	Mode 1: Normal operation with full system		
Date of Test	2024/05/07-2024/05/08	Test Site	HC-CB06

Frequency (MHz)	Modulation	Polarity (H or V)	Field Strength (V/m)	Test Result
80-6000	PM (1kHz, 50%)	V	10	Pass
80-6000	PM (1kHz, 50%)	H	10	Pass

5.5. Test Photograph

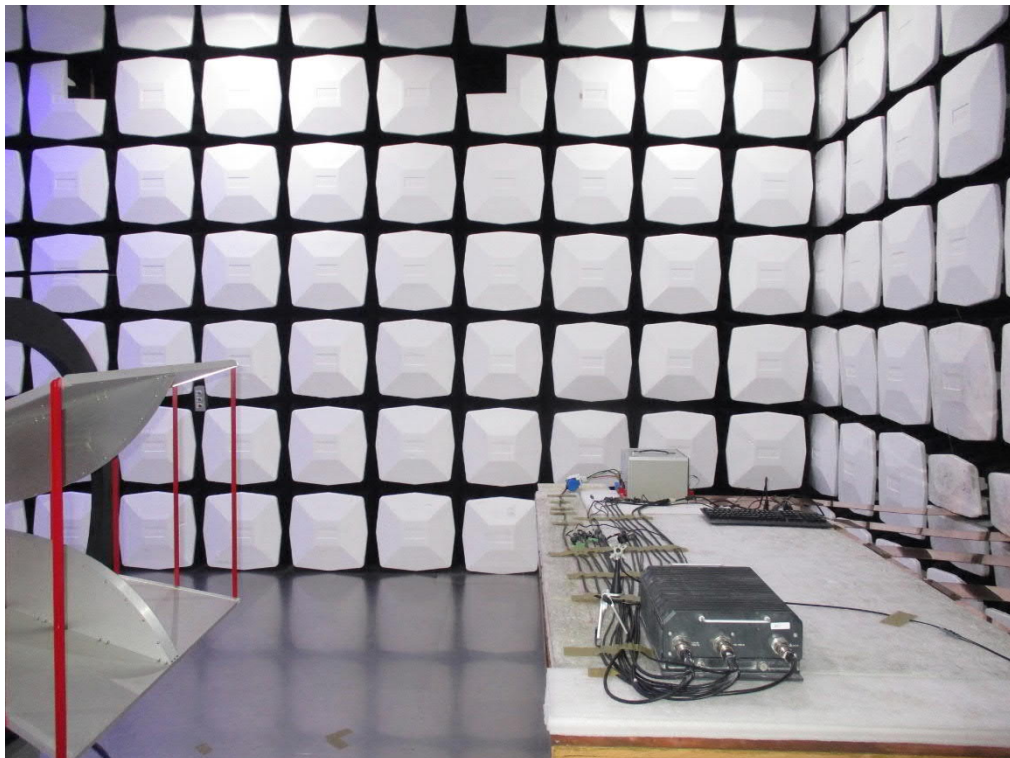
Test Mode : Mode 1: Normal operation with full system

Description : RS103, radiated susceptibility, electric field Test Setup



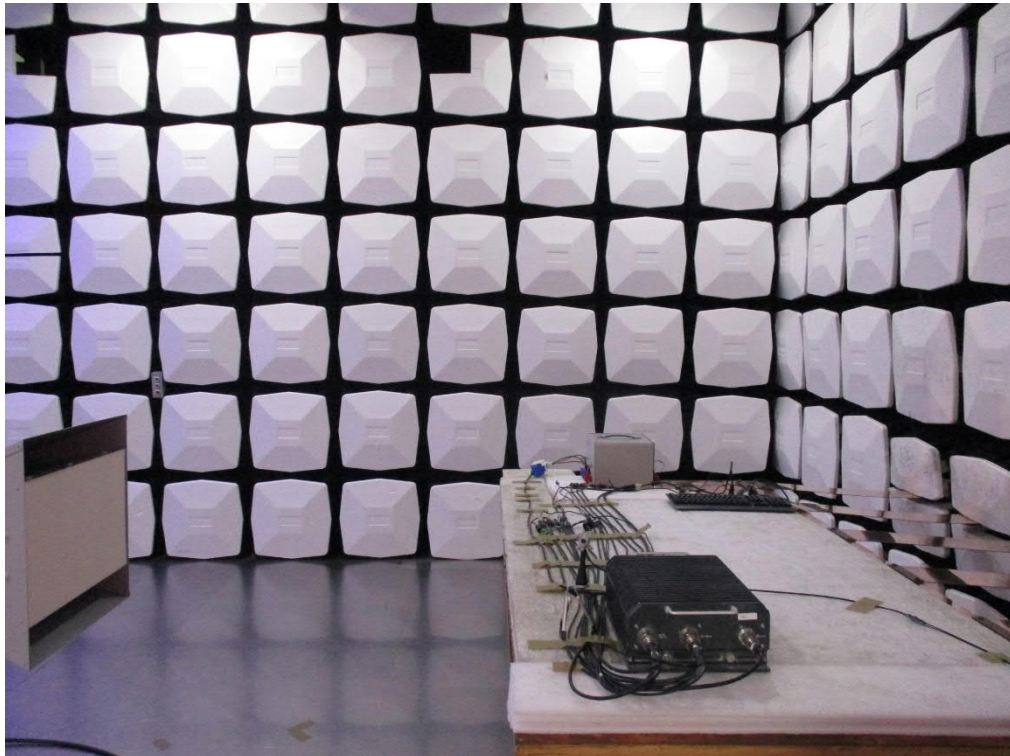
Test Mode : Mode 1: Normal operation with full system

Description : RS103, radiated susceptibility, electric field Test Setup



Test Mode : Mode 1: Normal operation with full system

Description : RS103, radiated susceptibility, electric field Test Setup



6. CS101, conducted susceptibility, power leads

6.1. Test Specification

According to EMC Standard: MIL-STD-461G (Section 5.7)

6.2. Test Configuration

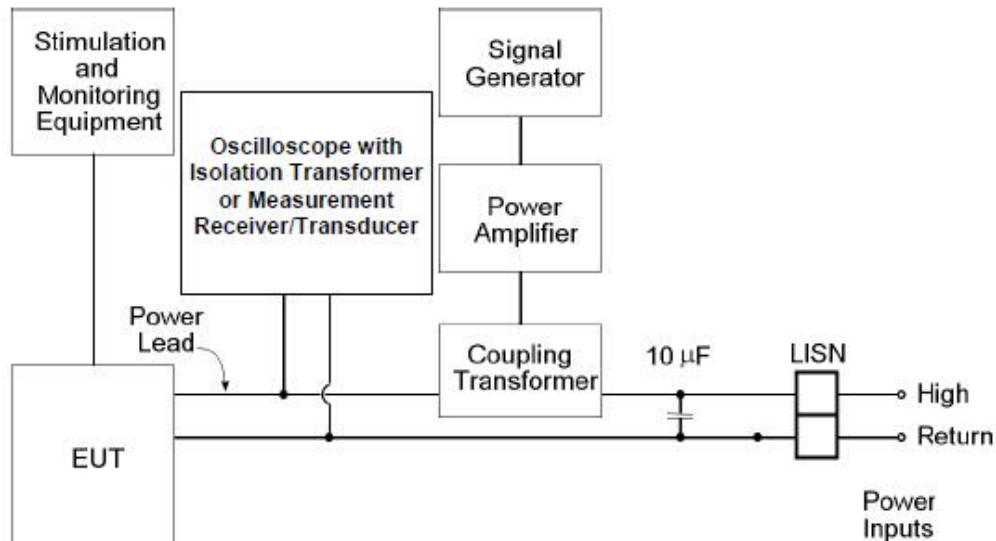


Figure CS101-4. Signal injection, DC or single phase AC.

6.3. Test Limits

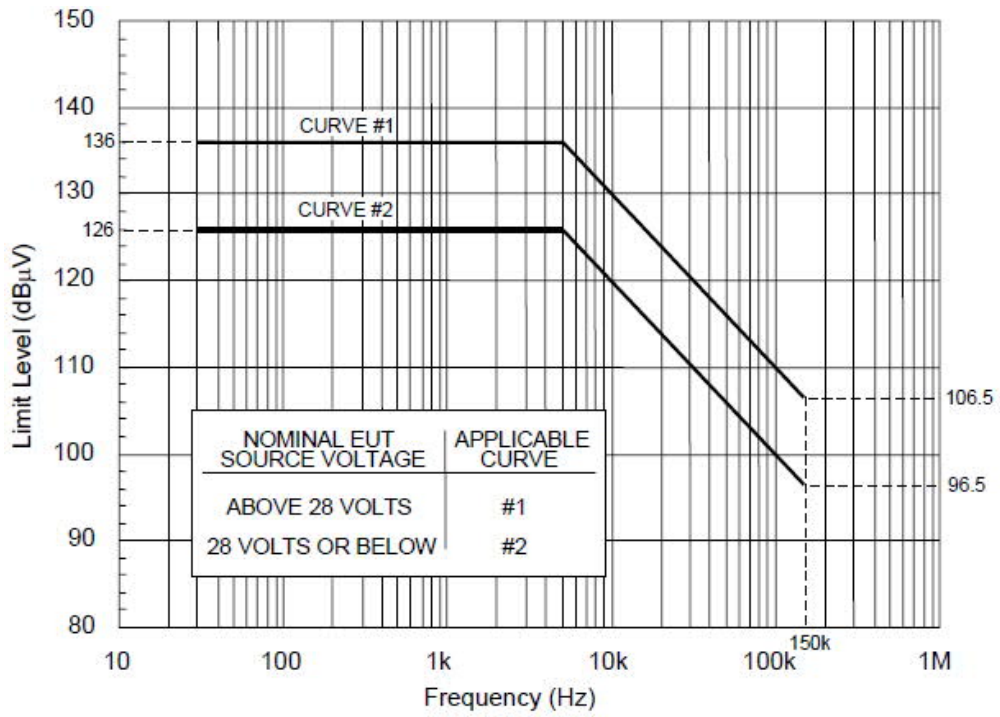


Figure CS101-1. CS101 voltage limit for all applications.

6.4. Test Result

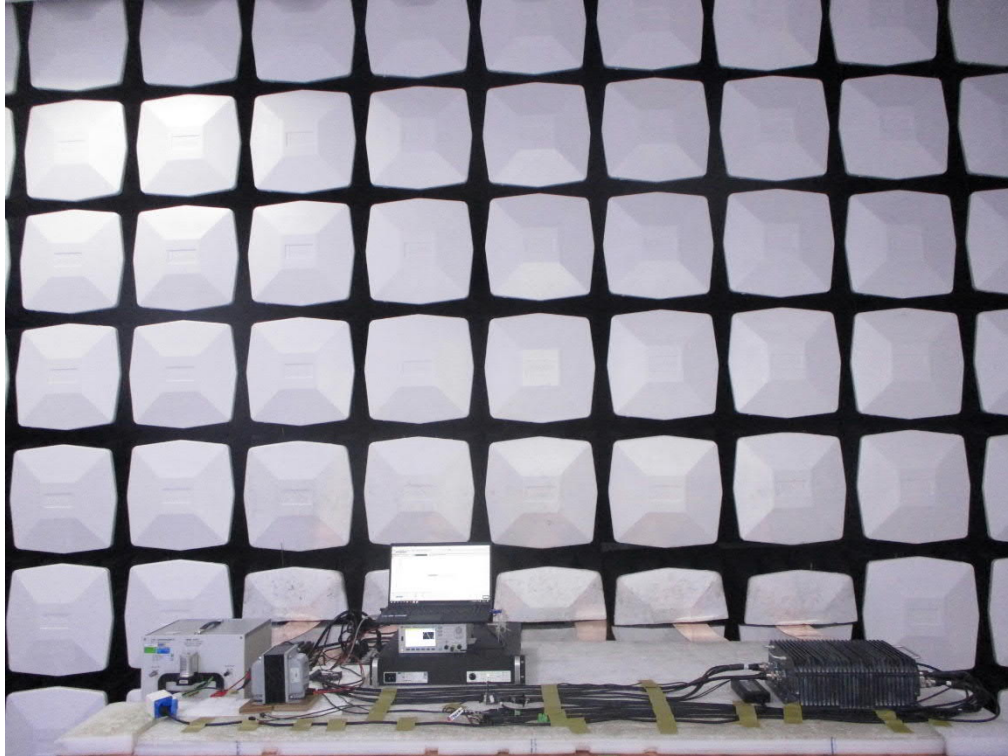
Product	High-Endurance System		
Test Item	CS101, conducted susceptibility, power leads		
Test Mode	Mode 1: Normal operation with full system		
Date of Test	2024/05/08	Test Site	HC-CB06

Frequency (Hz)	Limit Level (dBuV)	Injection Line	Injection Method	Test Result
30 ~ 5k	136	Power	Direct	Pass
5k-150k	136-106.5	Power	Direct	Pass

6.5. Test Photograph

Test Mode : Mode 1: Normal operation with full system

Description : CS101, conducted susceptibility, power leads Test Setup



7. CS114, conducted susceptibility, bulk cable injection

7.1. Test Specification

According to EMC Standard: MIL-STD-461G (Section 5.12)

7.2. Test Configuration

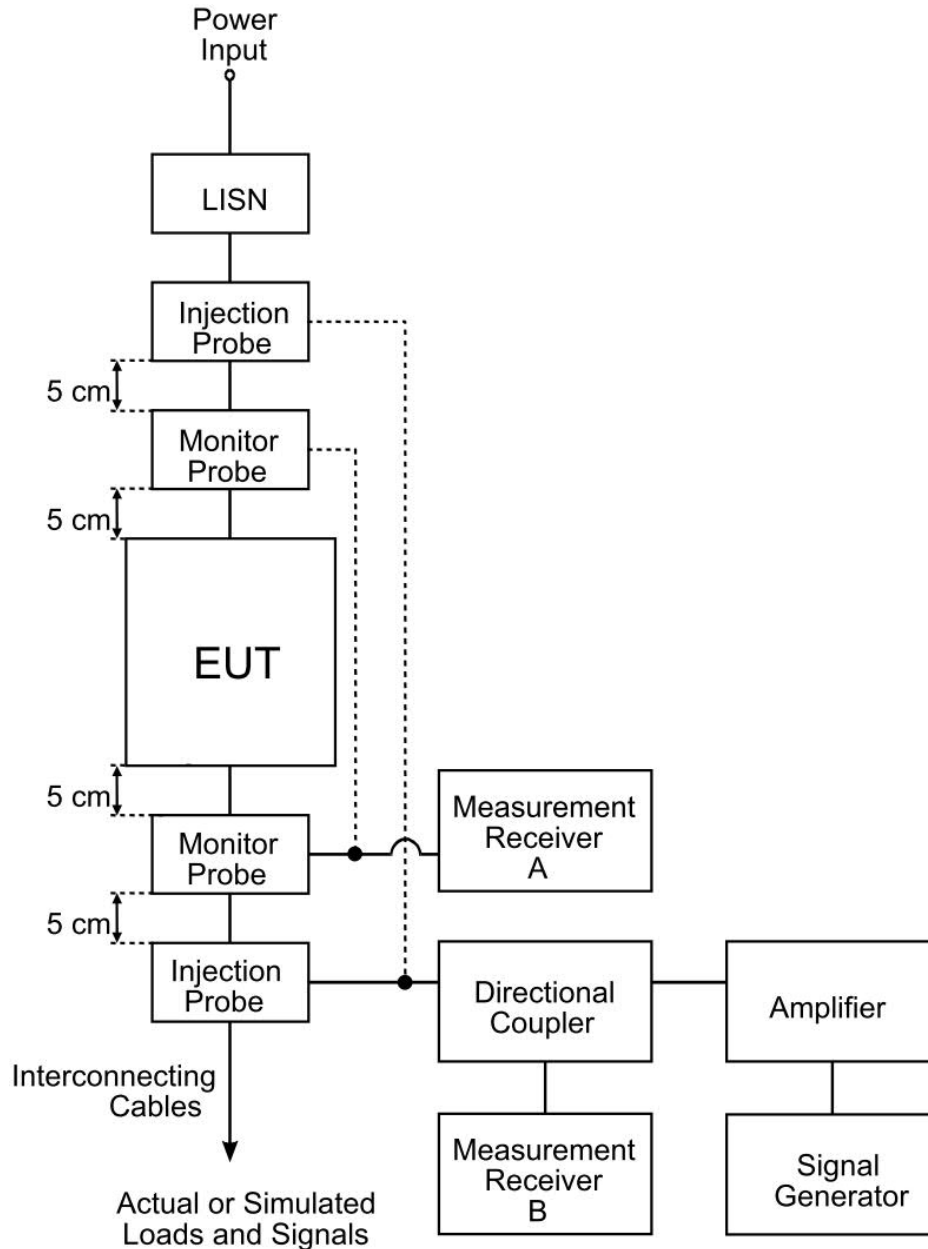


Figure CS114-5. Bulk cable injection evaluation.

7.3. Test Limits

Table VI. CS114 limit curves.

		LIMIT CURVE NUMBERS SHOWN IN FIGURE CS-114-1 AND LIMITS							
FREQUENCY RANGE	PLATFORM	AIRCRAFT (EXTERNAL OR SAFETY CRITICAL)	AIRCRAFT INTERNAL	ALL SHIPS (ABOVE DECKS) AND SUBMARINES (EXTERNAL)*	SHIPS (METALLIC) (BELOW DECKS)	SHIPS (NON-METALLIC) (BELOW DECK) **	SUBMARINE (INTERNAL)	GROUND	SPACE
4 kHz to 1MHz	N	-	-	77 dBμA	77 dBμA	77 dBμA	77 dBμA	-	-
10 kHz to 2 MHz	A	5	5	2	2	2	1	3	3
	N	5	3	2	2	2	1	2	3
	AF	5	3	-	-	-	-	2	3
2 MHz to 30 MHz	A	5	5	5	2	4	1	4	3
	N	5	5	5	2	4	1	2	3
	AF	5	3	-	-	-	-	2	3
30 MHz to 200 MHz	A	5	5	5	2	2	2	4	3
	N	5	5	5	2	2	2	2	3
	AF	5	3	-	-	-	-	2	3

KEY: A = Army
 N = Navy
 AF = Air Force

* For equipment located external to the pressure hull of a submarine but within the superstructure, use SHIPS (METALLIC) (BELOW DECKS)

** For equipment located in the hanger deck of Aircraft Carriers

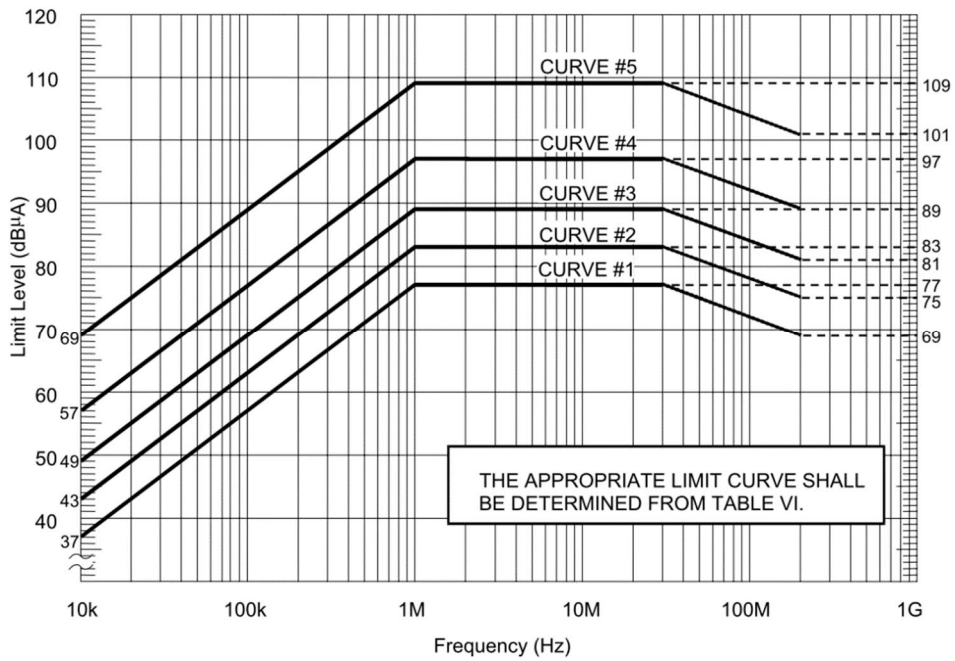


Figure CS114-1. CS114 calibration limits.

7.4. Test Result

Product	High-Endurance System		
Test Item	CS114, conducted susceptibility, bulk cable injection		
Test Mode	Mode 1: Normal operation with full system		
Date of Test	2024/05/13	Test Site	HC-SR01

Frequency (MHz)	Line	Modulation	Field Strength (dBuA)	Test Result
0.01~1	I/O Port 1 : DVI-I, Audio	PM	43~83	No deviation
1~30	I/O Port 2 : DVI-I, Audio	PM	83	No deviation
30~200	I/O Port 3 : DVI-I, Audio	PM	83~75	No deviation
0.01~1	I/O Port 2 : LAN 1/2, COM 3/4	PM	43~83	No deviation
1~30	I/O Port 2 : LAN 1/2, COM 3/4	PM	83	No deviation
30~200	I/O Port 2 : LAN 1/2, COM 3/4	PM	83~75	No deviation

Remark:

PLATFORM : SHIPS (METALLIC) (BELOW DECKS)

Army : CURVE#2

- Frequency Step Size

10 kHz – 1 MHz : 25%

1 MHz – 30 MHz : 5%

30 MHz – 200MHz : 2.5%

(Increase frequency steps of MIL-STD-461G by five times)

- Interface connector injection point used for this test

I/O Port 1 : DVI-I, Audio

I/O Port 2 : LAN 1/2, COM 3/4

7.5. Test Photograph

Test Mode : Mode 1: Normal operation with full system

Description : CS114, conducted susceptibility, bulk cable injection Test Setup



Test Mode : Mode 1: Normal operation with full system

Description : CS114, conducted susceptibility, bulk cable injection Test Setup



8. EUT Photograph

(1) EUT Photo



(2) EUT Photo



(3) EUT Photo



(4) EUT Photo



(5) EUT Photo



(6) EUT Photo



(7) EUT Photo



(8) EUT Photo



(9) EUT Photo



(10) EUT Photo



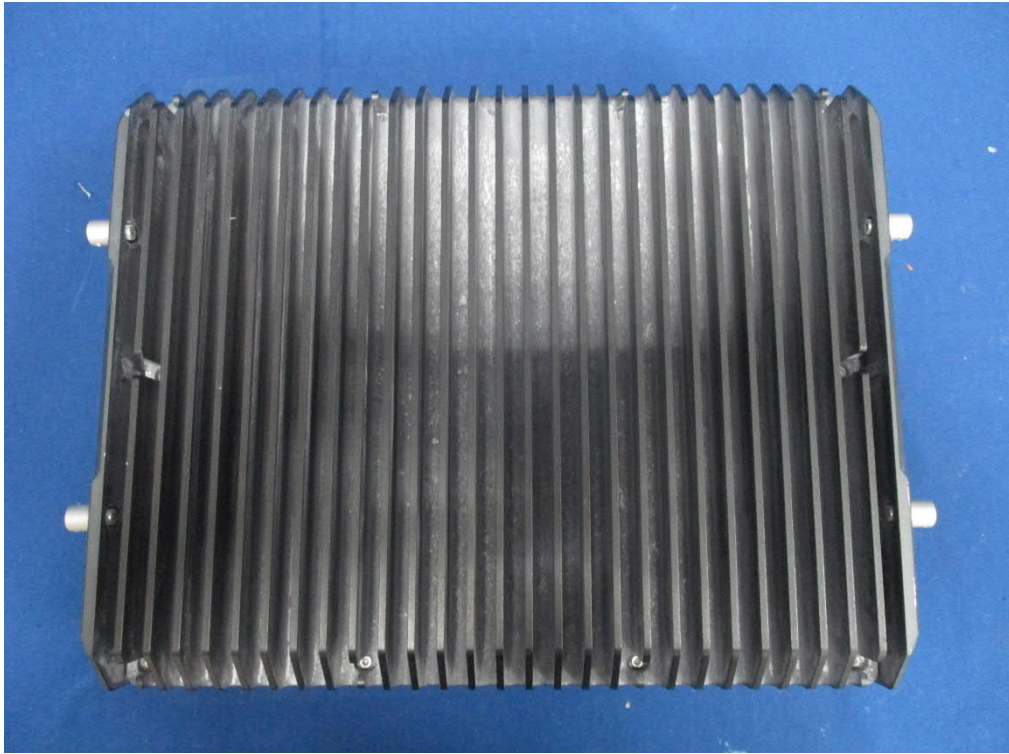
(11) EUT Photo_Adapter



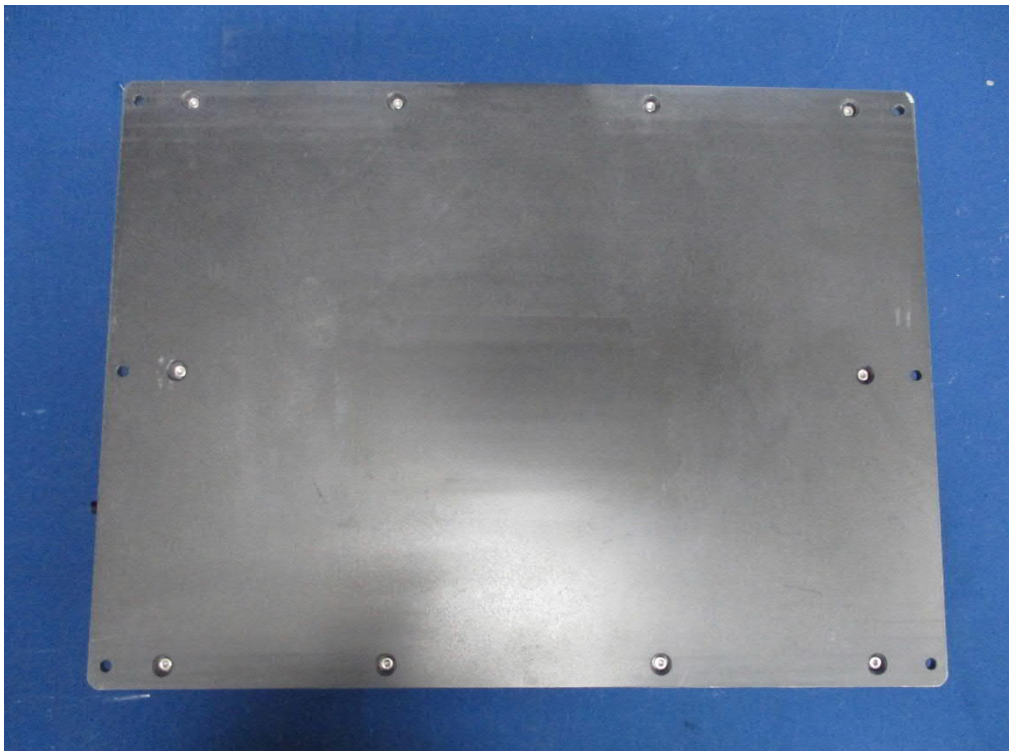
(12) EUT Photo_Adapter



(13) EUT Photo_HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)



(14) EUT Photo_HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)



(15) EUT Photo_HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)



(16) EUT Photo_HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)



(17) EUT Photo_HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)



(18) EUT Photo_HEC-1XXXXXXXXXXXXXXXXX Series ("X" can be 0-9, A-Z or blank for marketing purpose)

