Test Report

According to

Test Item：MIL-STD-461G

(CE102; RE102; RS103)

Product： **SYSTEM**

Trade Name： 7Starlake

Model Number： AV600

Prepared for

7Starlake Co., Ltd.

2F., No. 190, Sec. 2, Zhongxing Rd., Xindian Dist.,
New Taipei City 23146, Taiwan (R.O.C.)

TEL.: +886 2 8911 8077

FEX.: +886 2 8911 2324

Issued by

Interocean EMC Technology Corp.
Interocean EMC Technology Tin-Fu Laboratory
No. 5-2, Lin 1, Tin-Fu, Lin-Kou Dist., New Taipei City,
Taiwan 244, R.O.C.
TEL.: +886 2 2600 6861
FAX.: +886 2 2600 6859

Remark:

The test report consists of ***36*** pages in total. It shall not be reproduced except in full, without the written approval of IETC. This document may be altered or revised by IETC only, and shall be noted in the revision section of the document.
The test result in this report is only subjected to the test sample.

Table of Contents

Statement of Compliance

Applicant : **7Starlake Co., Ltd.**
2F., No. 190, Sec. 2, Zhongxing Rd., Xindian Dist.,
New Taipei City 23146, Taiwan (R.O.C.)

Manufacturer : **7Starlake Co., Ltd.**
2F., No. 190, Sec. 2, Zhongxing Rd., Xindian Dist.,
New Taipei City 23146, Taiwan (R.O.C.)

Product : SYSTEM

Model No. : AV600

Tested Power Voltage : DC 28 V

Receipt Date of EUT : Jul. 18, 2023

Date of Test : Sep. 07 ~ 13, 2023

Measurement Procedures and Standards Used :

☒ Test result is compliance with MIL-STD-461G

Applicable Standards			
Standard	**Special**	**Location of Test**	**Test Result**
MIL-STD-461G (CE102)	Frequency Range: 10 kHz - 10 MHz	IETC LAB	PASS
MIL-STD-461G (RE102)	Frequency Range: 30 MHz - 5 GHz	IETC LAB	PASS
MIL-STD-461G (RS103)	Frequency Range: 80 MHz - 3 GHz	IETC LAB	PASS

The measurement results in this test report were performed at Interocean EMC Technology Corp. the responsibility of measurement result is only subjected to the tested sample. This report shows the EUT is technically compliance with the above official standards. This report shall not be partial reproduced without written approval by Interocean EMC Technology Corporation. Judgment of conformity is based on test result, regardless of measurement uncertainty.

Report Issued: 2023/09/19

Approved: Mike Huang
Mike Huang

1 Conducted emissions, power leads Test (CE102)

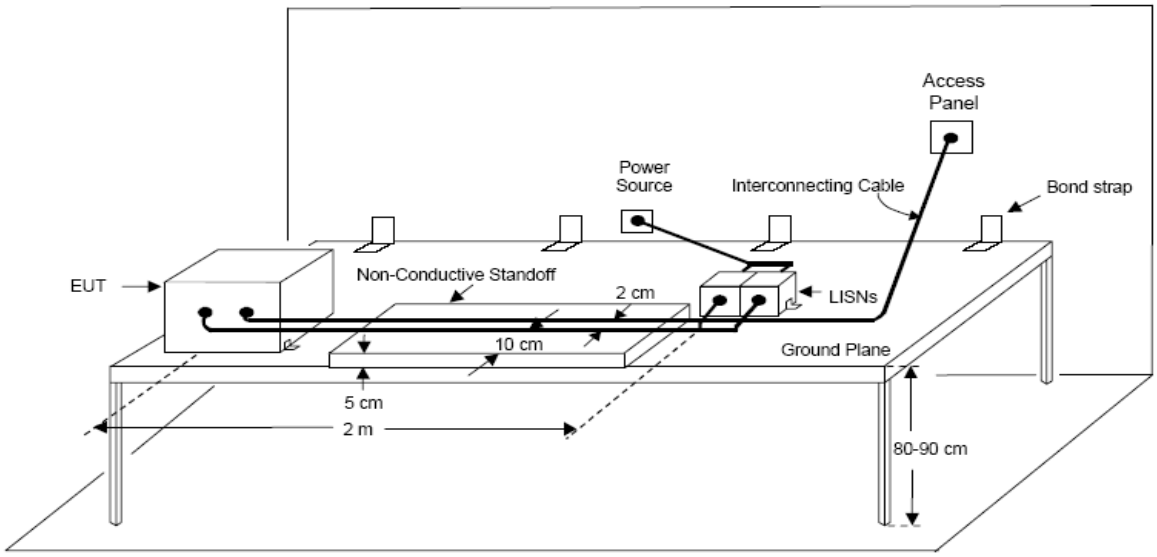
1.1 Instrument

☒Chamber 2

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	Agilent	N9038A	MY51210178	2024/08/10
DC LISN	Schwarzbeck	NNBL 8226	8226-519	2024/06/15
DC LISN	Schwarzbeck	NNBL 8226	8226-520	2024/06/15
Attenuator	Marvelous Microwave	MVE2215-20	001	2024/08/13
RF Cable	EMCI	EM106-SMSM-500	CBL75	2024/02/15
RF Cable	EMCI	EM106-SMSM-290	01	2024/02/15

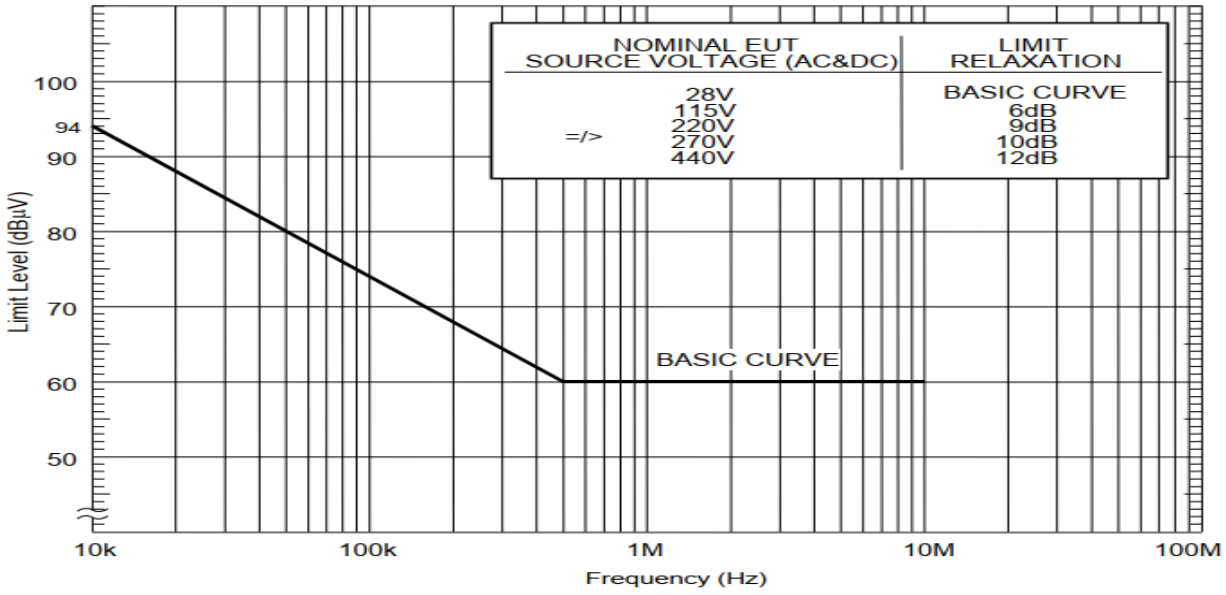
Note: The above equipments are within the valid calibration period.

1.2 Block Diagram of Test Configuration



1.3 Test Limit

According to MIL-STD-461G sub clause 5.5.2 CE102 limit figure CE102-1.



1.4 Configuration of Measurement

1.4.1 Measurement system integrity check. Perform the measurement system check using the measurement system check setup of MIL-STD-461G Figure CE102-2.

(a) Turn on the measurement equipment and allow a sufficient time for stabilization.

(b) Apply a signal level of 90 dBμV at 10.5 kHz and 100 kHz to the power output terminal of the LISN. At 10.5 kHz and 100 kHz, use an oscilloscope, in high impedance mode, to verify that there is a proper signal level at the LISN and verify that it is sinusoidal. After establishing the proper signal at the LISN, disconnect LISN and measure resulting voltage using an oscilloscope with 50 ohm input impedance. The ratio of the LISN voltage to the 50 ohm voltage measurement must be within the following tolerances: at 10.5 kHz = -14 dB (+1 dB/-2 dB) and at 100 kHz = -3 dB (+1 dB/-2 dB).

(c) Apply a signal level that is at least 6 dB below the limit at 10.5 kHz, 100 kHz, 1.95 MHz and 9.8 MHz to the power output terminal of the LISN. At 10.5 kHz and 100 kHz, use an oscilloscope to calibrate the signal level. At 1.95 MHz and 9.8 MHz, use a calibrated output level directly from a 50 Ω signal generator.

(d) Scan the measurement receiver for each frequency in the same manner as a normal data scan. Verify that the measurement receiver indicates a level within ±3 dB of the injected level. Correction factors shall be applied for the 20 dB attenuator and the voltage drop due to the LISN 0.25 μF coupling capacitor (see Figure 6).

(e) If readings are obtained which deviate by more than ±3 dB, locate the source of the error and correct the deficiency prior to proceeding with the testing.

(f) Repeat MIL-STD-461G sub clause 5.5.3.4a(2) through MIL-STD-461G sub clause 5.5.3.4a(5) for each LISN.

1.4.2 EUT testing. Perform emission data scans using the measurement setup of **MIL-STD-461G Figure CE102-3**.

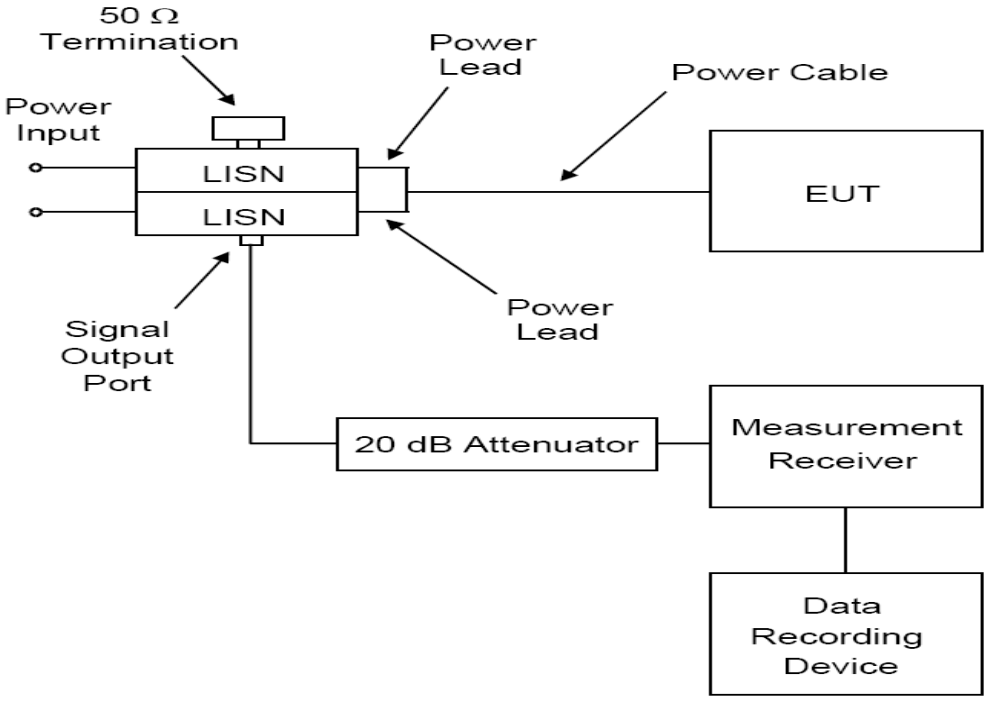
(a) Turn on the EUT and allow a sufficient time for stabilization.

(b) Select an appropriate lead for testing.

(c) Scan the measurement receiver over the applicable frequency range, using the bandwidths and minimum measurement times in the MIL-STD-461G Table II.

(d) Repeat MIL-STD-461G sub clause 5.5.3.4b(2) and MIL-STD-461G sub clause 5.5.3.4b(3) for each power lead.

FIGURE CE102-3. Measurement setup.



1.5 System Calibration Check

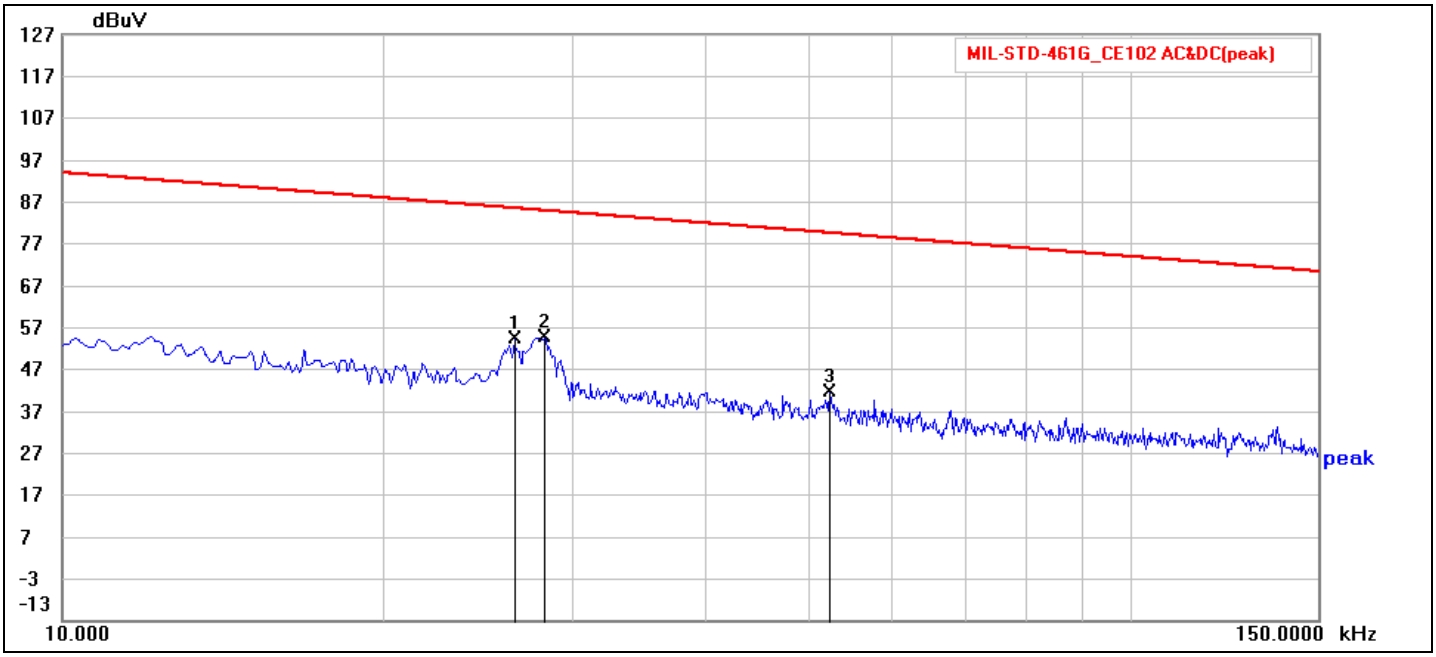
Based on MIL-STD-461G sub clause 5.5.3.4 system calibration requirement to verify the calibration level within ±3 dB at 10 kHz, 100 kHz, 2 MHz and 10 MHz.

1.6 Test Result

The final test data is shown as following pages.

Job No.:	**23A071703M**	**Polarization:**	**L1**
Standard:	**MIL-STD-461G_CE102 AC&DC**	**Power Source:**	**DC 28 V**
Test item:	**Conduction Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:21:39**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:			
Note:			

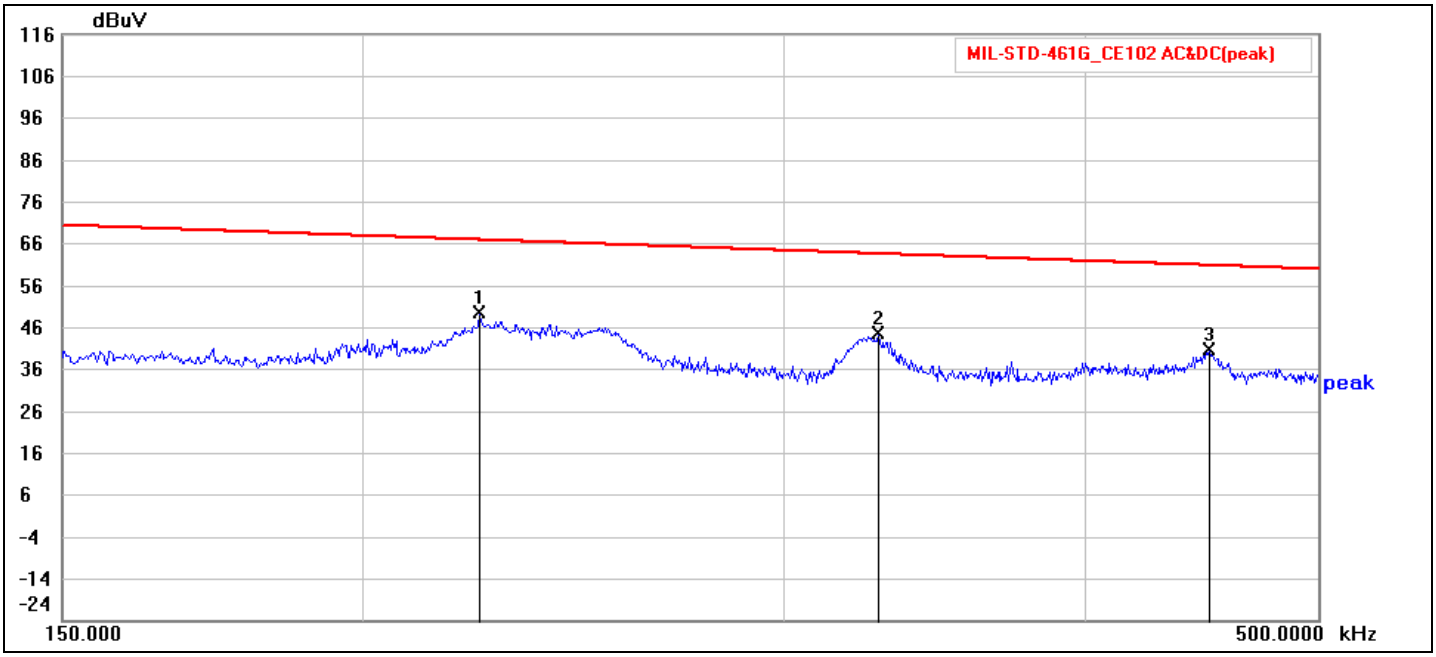
Range1 :0.01--0.15(MHz) / RBW:1(kHz) / VBW:3(kHz)	



No.	Frequency (kHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	26.520	32.39	21.88	54.27	85.52	-31.25	peak	P	
2	28.340	32.90	21.69	54.59	84.95	-30.36	peak	P	
3	52.420	20.56	20.84	41.40	79.60	-38.20	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**L1**
Standard:	**MIL-STD-461G_CE102 AC&DC**	**Power Source:**	**DC 28 V**
Test item:	**Conduction Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:22:59**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:			
Note:			

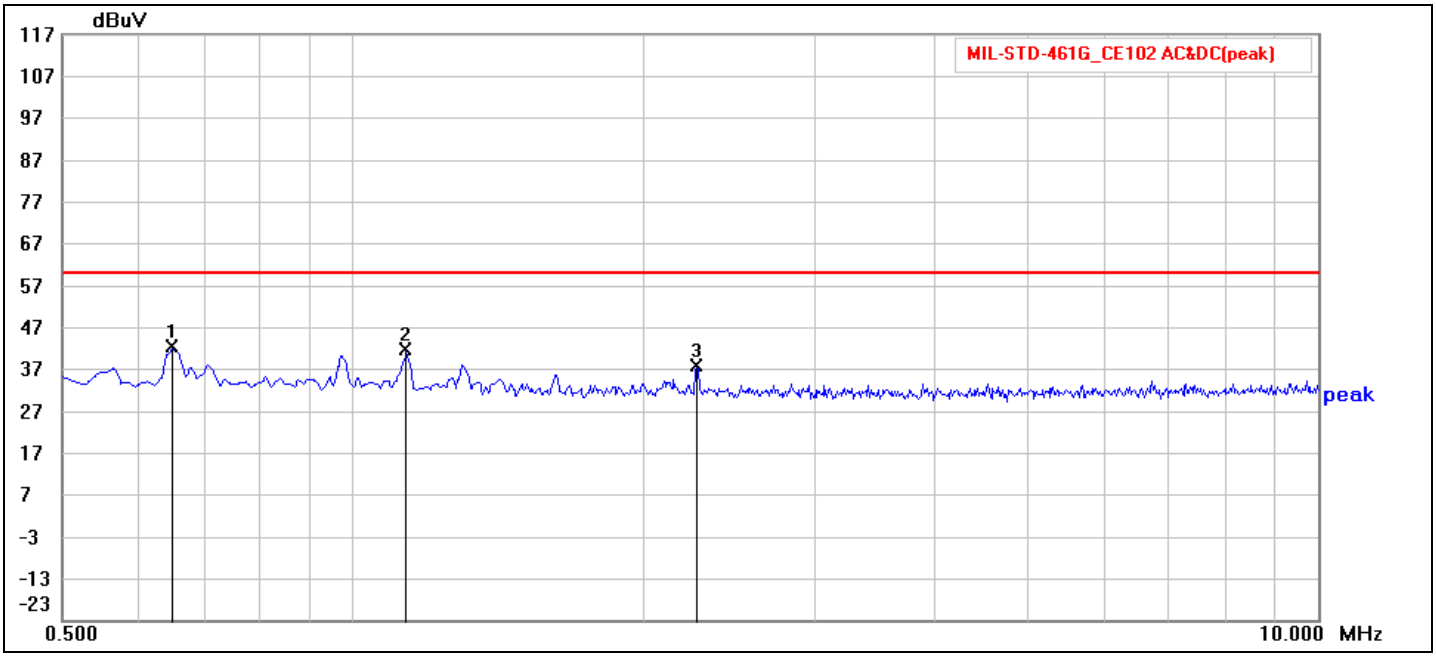
Range1 :0.15--0.5(MHz) / RBW:10(kHz) / VBW:30(kHz)



No.	Frequency (kHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	223.850	28.73	20.56	49.29	66.98	-17.69	peak	P	
2	328.150	23.70	20.62	44.32	63.66	-19.34	peak	P	
3	450.650	19.85	20.59	40.44	60.90	-20.46	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**L1**
Standard:	**MIL-STD-461G_CE102 AC&DC**	**Power Source:**	**DC 28 V**
Test item:	**Conduction Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:24:58**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:			
Note:			

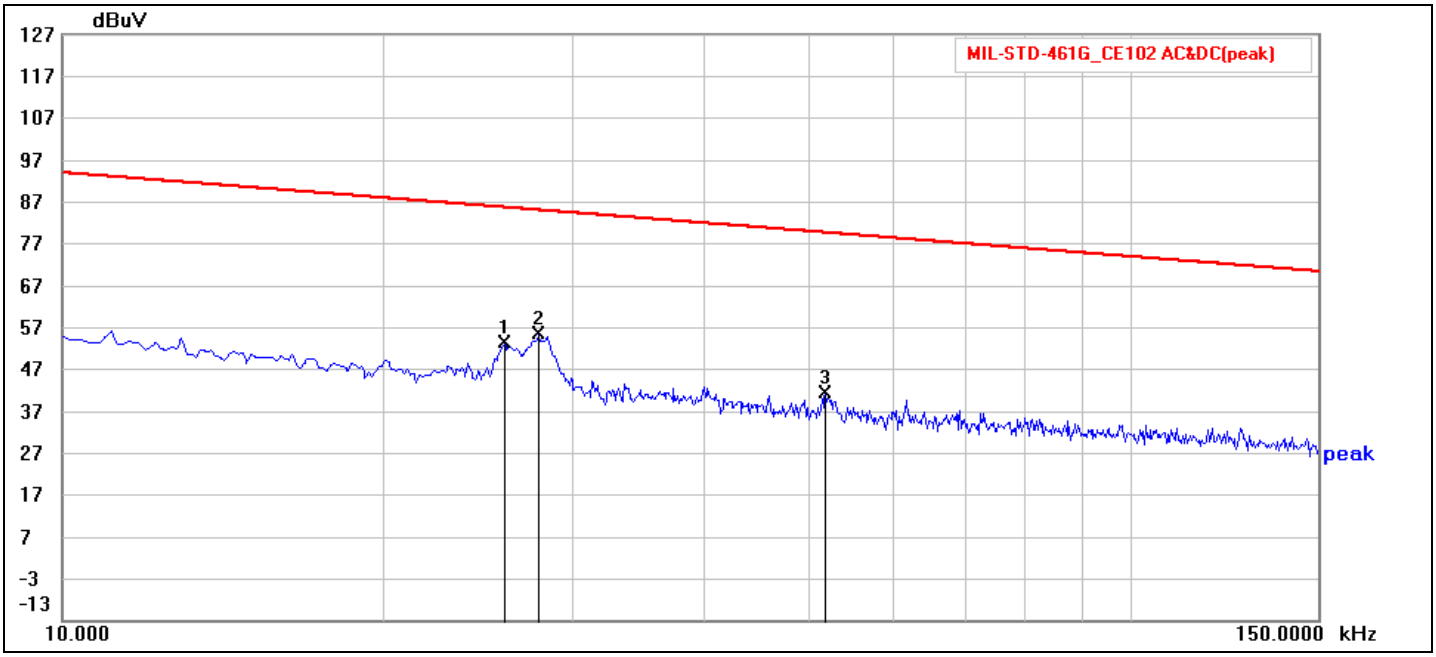
Range1 :0.5--10(MHz) / RBW:10(kHz) / VBW:30(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.652	21.43	20.55	41.98	60.00	-18.02	peak	P	
2	1.137	21.08	20.44	41.52	60.00	-18.48	peak	P	
3	2.276	17.01	20.38	37.39	60.00	-22.61	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**N**
Standard:	**MIL-STD-461G_CE102 AC&DC**	**Power Source:**	**DC 28 V**
Test item:	**Conduction Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:29:22**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:			
Note:			

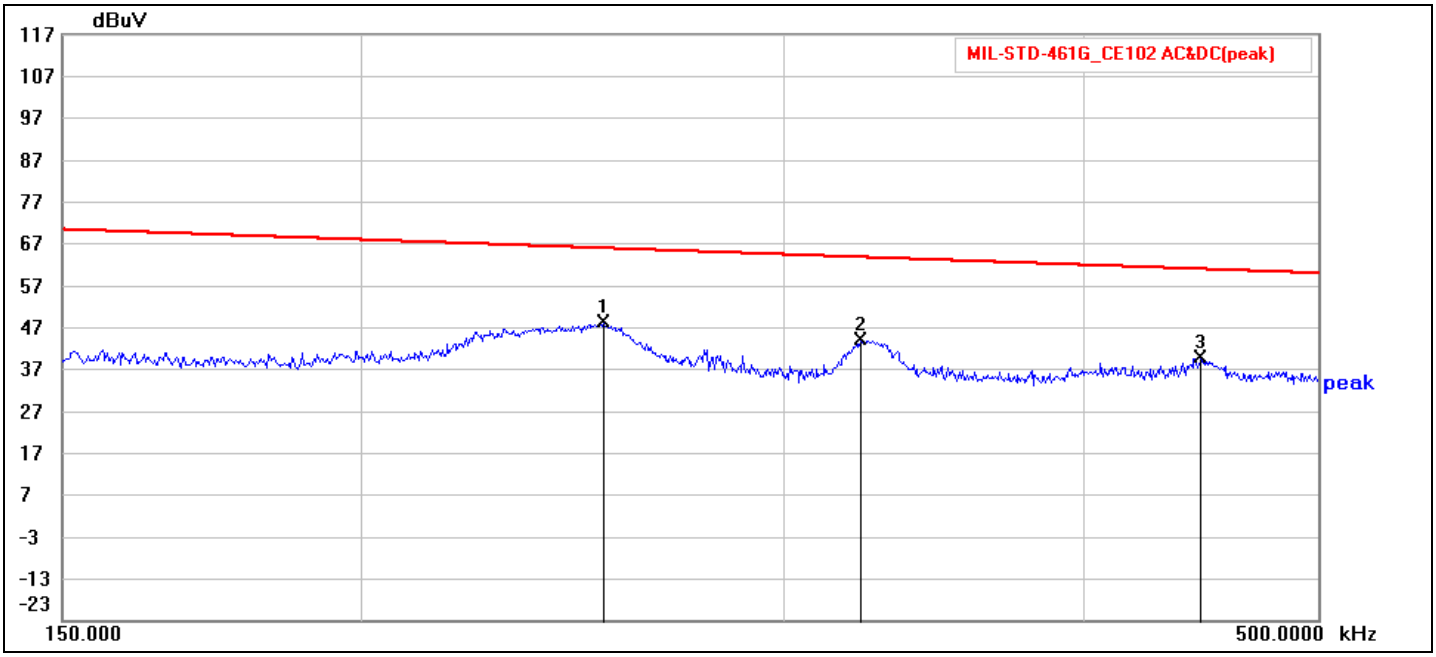
Range1 :0.01--0.15(MHz) / RBW:1(kHz) / VBW:3(kHz)	



No.	Frequency (kHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	25.960	31.24	21.96	53.20	85.71	-32.51	peak	P	
2	27.920	33.43	21.76	55.19	85.08	-29.89	peak	P	
3	52.000	20.38	20.85	41.23	79.67	-38.44	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**N**
Standard:	**MIL-STD-461G_CE102 AC&DC**	**Power Source:**	**DC 28 V**
Test item:	**Conduction Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:28:18**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:			
Note:			

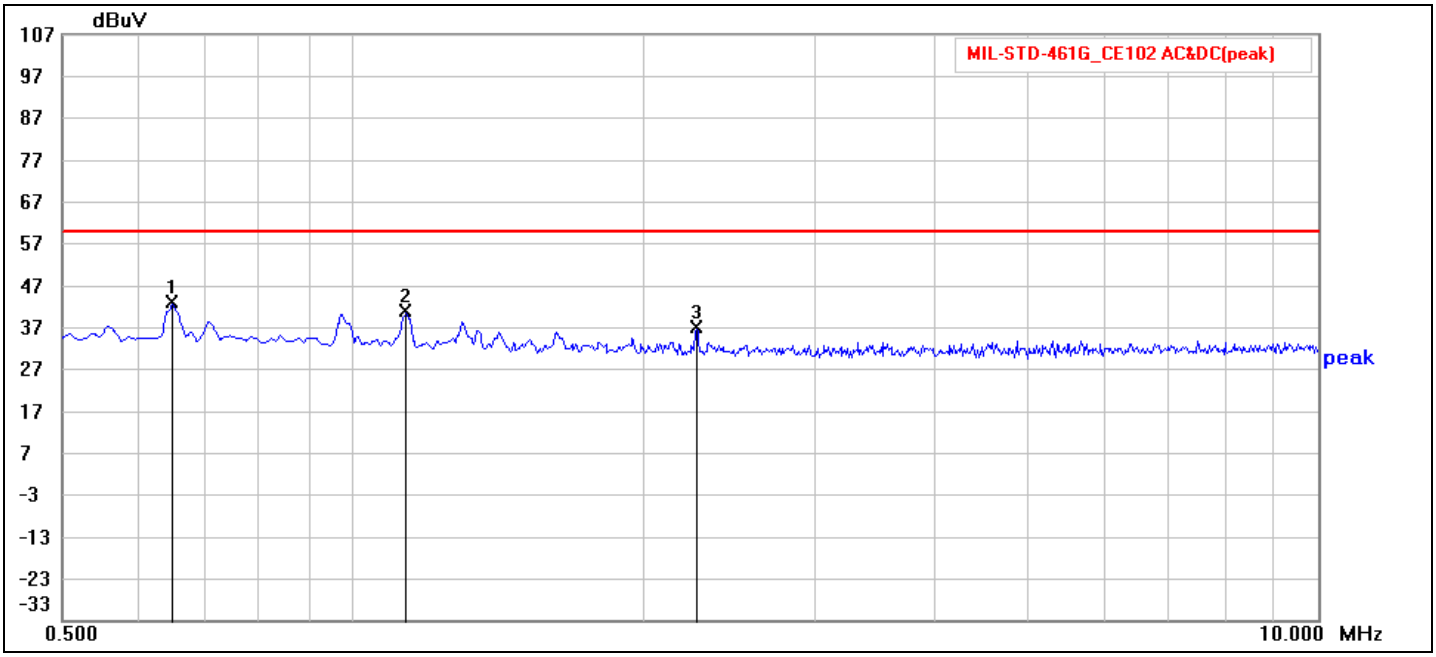
Range1 :0.15--0.5(MHz) / RBW:10(kHz) / VBW:30(kHz)	



No.	Frequency (kHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	252.200	27.41	20.59	48.00	65.95	-17.95	peak	P	
2	322.900	23.28	20.62	43.90	63.80	-19.90	peak	P	
3	447.500	19.06	20.61	39.67	60.96	-21.29	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**N**
Standard:	**MIL-STD-461G_CE102 AC&DC**	**Power Source:**	**DC 28 V**
Test item:	**Conduction Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:26:56**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:			
Note:			

Range1 :0.5--10(MHz) / RBW:10(kHz) / VBW:30(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.652	21.99	20.56	42.55	60.00	-17.45	peak	P	
2	1.137	19.94	20.45	40.39	60.00	-19.61	peak	P	
3	2.276	16.25	20.39	36.64	60.00	-23.36	peak	P	

2 Radiated emissions, electric field Test (RE102)

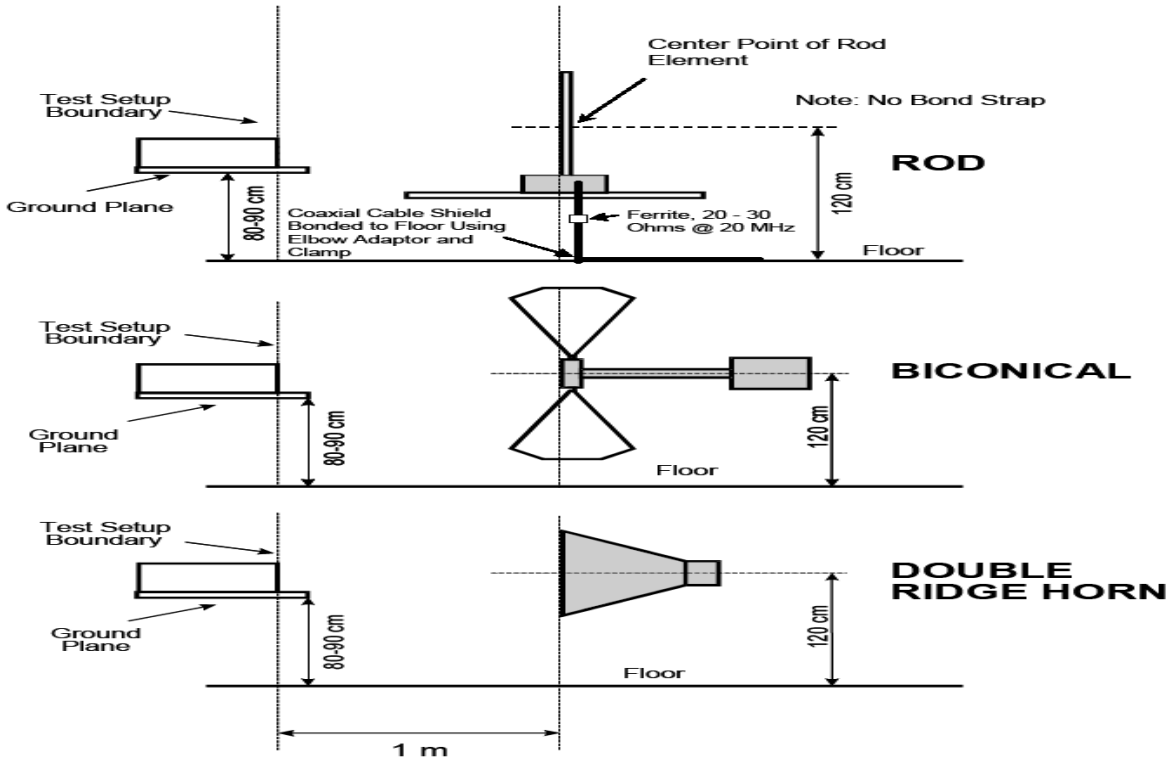
2.1 Instrument

☒Chamber 2

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Biconical Antenna	Schwarzbeck	VHA 9103 & BBA 9106	VHA 9103-2484	2024/06/26
Horn Antenna	ETS-Lindgren	3106B	00224879	2024/07/24
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-583	2023/10/11
Pre-Amplifier	EMCI	EMC330	980003	2024/06/04
Pre-Amplifier	EMCI	EMC051845	980110	2024/06/04
EMI Test Receiver	Agilent	N9038A	MY51210178	2024/08/10
Spectrum Analyzer	R&S	FSP40	100478	2024/07/30
DC LISN	Schwarzbeck	NNBL 8226	8226-519	2024/06/15
DC LISN	Schwarzbeck	NNBL 8226	8226-520	2024/06/15
RF Cable	EMCI	EM106-SMSM-500	CBL75	2024/02/15
RF Cable	EMCI	EM106-SMSM-290	01	2024/02/15
RF Cable	EMCI	EM106-SMSM-80	01	2024/02/15

Note: The above equipments are within the valid calibration period.

2.2 Block Diagram of Test Configuration



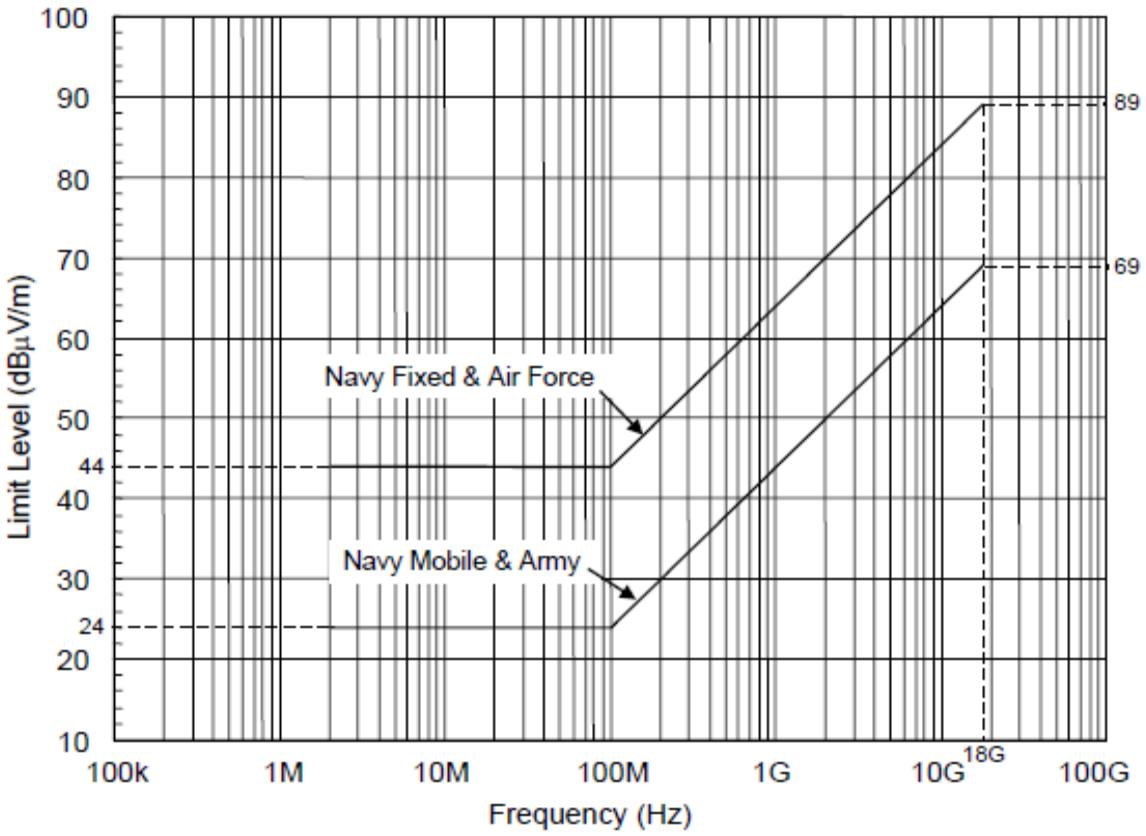
2.3 RE102 Application

2.3.1 This requirement is applicable for radiated emissions from equipment and subsystem enclosures, and all interconnecting cables. For equipment with permanently mounted antennas this requirement does not apply at the transmitter fundamental frequency and the necessary occupied bandwidth of the signal. The requirement is applicable as follows:

☒ Ground	2 MHz to 18 GHz*
☐ Ships, surface	10 kHz to 18 GHz
☐ Submarines	10 kHz to 18 GHz
☐ Aircraft (Army and Navy)	10 kHz to 18 GHz
☐ Aircraft (Air Force)	2 MHz to 18 GHz
☐ Space	10 kHz to 18 GHz

* Testing is required from 2 MHz to 18 GHz, depend on customer's required testing from 30 MHz to 5 GHz.

FIGURE RE102-4. RE102 limit for ground applications.



2.4 Configuration of Measurement

2.4.1 Verify that the ambient requirements specified in MIL-STD-461G sub clause 4.3.4 are met. Take plots of the ambient when required by the referenced paragraph.

2.4.2 Turn on the measurement equipment and allow a sufficient time for stabilization.

2.4.3 Using the system check path of MIL-STD-461G Figure RE102-5, perform the following evaluation of the overall measurement system from the coaxial cable end used at each antenna to the data output device at 10.5 kHz (only for measurements implemented between 10 kHz and 2 MHz), 2.1 MHz, 12 MHz and 29.5 MHz for active rod antennas, 197 MHz for the biconical antenna, 990 MHz for the large double ridge horn and 17.5 GHz for the small double ridge horn. For rod antennas that use passive matching networks, the evaluation shall be performed at the center frequency of each band. A check shall also be performed when the measurement path is changed for a particular antenna such as the coaxial cable, addition or removal of preamplifiers, or different ports used on the measurement receiver. System check path verification shall be performed near the upper end of the affected frequency band.

2.4.4 Turn on the measurement equipment and allow sufficient time for stabilization.

(a) Apply a calibrated signal level, which is at least 6 dB below the limit (limit minus antenna factor), to the coaxial cable at the antenna connection point.

(b) Scan the measurement receiver in the same manner as a normal data scan. Verify that the data recording device indicates a level within ±3 dB of the injected signal level.

(c) For the 104 cm rod antenna, remove the rod element and apply the signal to the antenna matching network through a capacitor connected to the rod mount as shown on MIL-STD-461G Figure RE102-8. The capacitor value is nominally 10 pF, but shall be per the manufacturer’s instruction. Commercial calibration jigs or injection networks shall not be used.

(d) If readings are obtained which deviate by more than ±3 dB, locate the source of the error and correct the deficiency prior to proceeding with the testing.

2.4.5 Using the measurement path of MIL-STD-461G Figure RE102-5, perform the following evaluation for each antenna to demonstrate that there is electrical continuity through the antenna.

(a) Visually inspect each antenna for physical damage. Radiate a signal using an antenna or stub radiator at the highest measurement frequency of each antenna.

(b) Tune the measurement receiver to the frequency of the applied signal and verify that a received signal of appropriate amplitude is present. Note: This evaluation is intended to provide a coarse indication that the antenna is functioning properly. There is no requirement to accurately measure the signal level.

2.4.6 Turn on the EUT and allow sufficient time for stabilization.

2.4.7 Using the measurement path of MIL-STD-461G Figure RE102-5, determine the radiated emissions from the EUT and its associated cabling.

(a) Scan the measurement receiver for each applicable frequency range, using the bandwidths and minimum measurement times in Table II.

(b) Above 30 MHz, orient the antennas for both horizontally and vertically polarized fields.

(c) Take measurements for each antenna position determined under MIL-STD-461G sub clause 5.18.3.3c(2)(c) above.

2.5 System Calibration Check

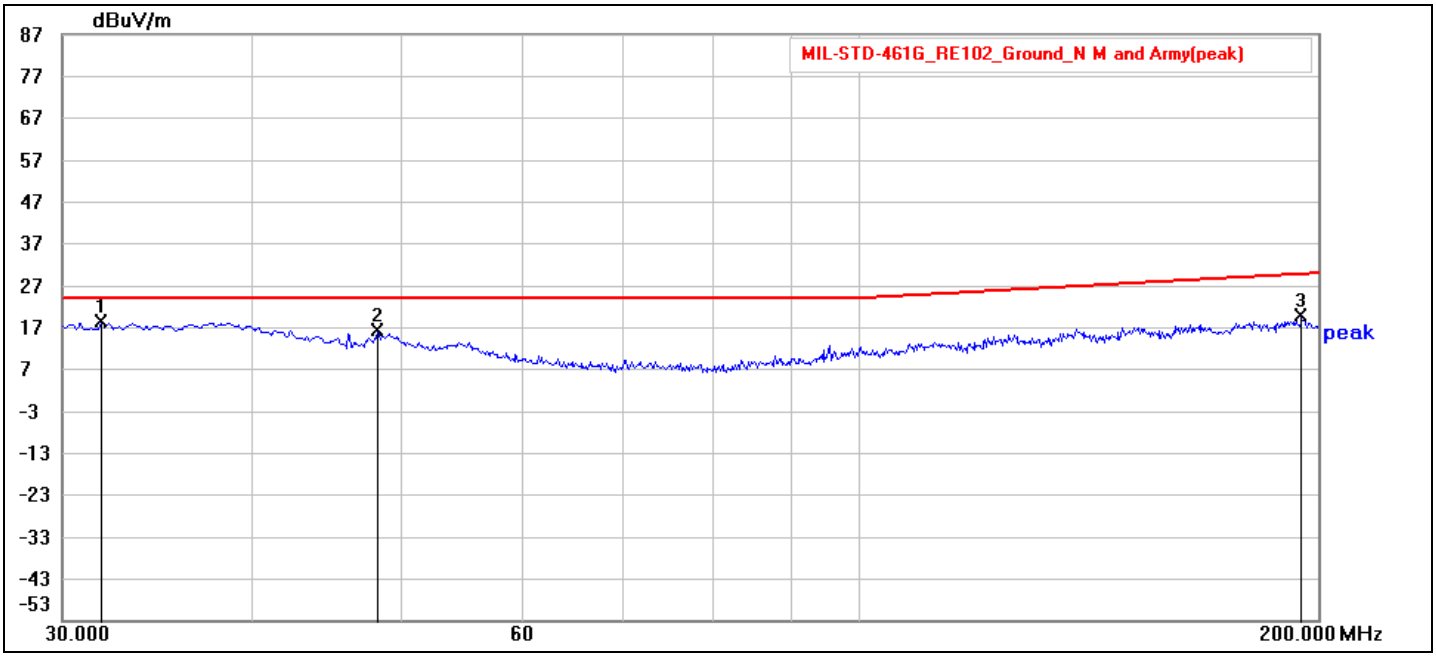
Based on MIL-STD-461G sub clause 5.18.3.4 system calibration requirement to verify the calibration level within ±3 dB in all test frequency.

2.6 Test Result

The final test data is shown as following pages.

Job No.:	**23A071703M**	**Polarization:**	**Vertical**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 09:51:19**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

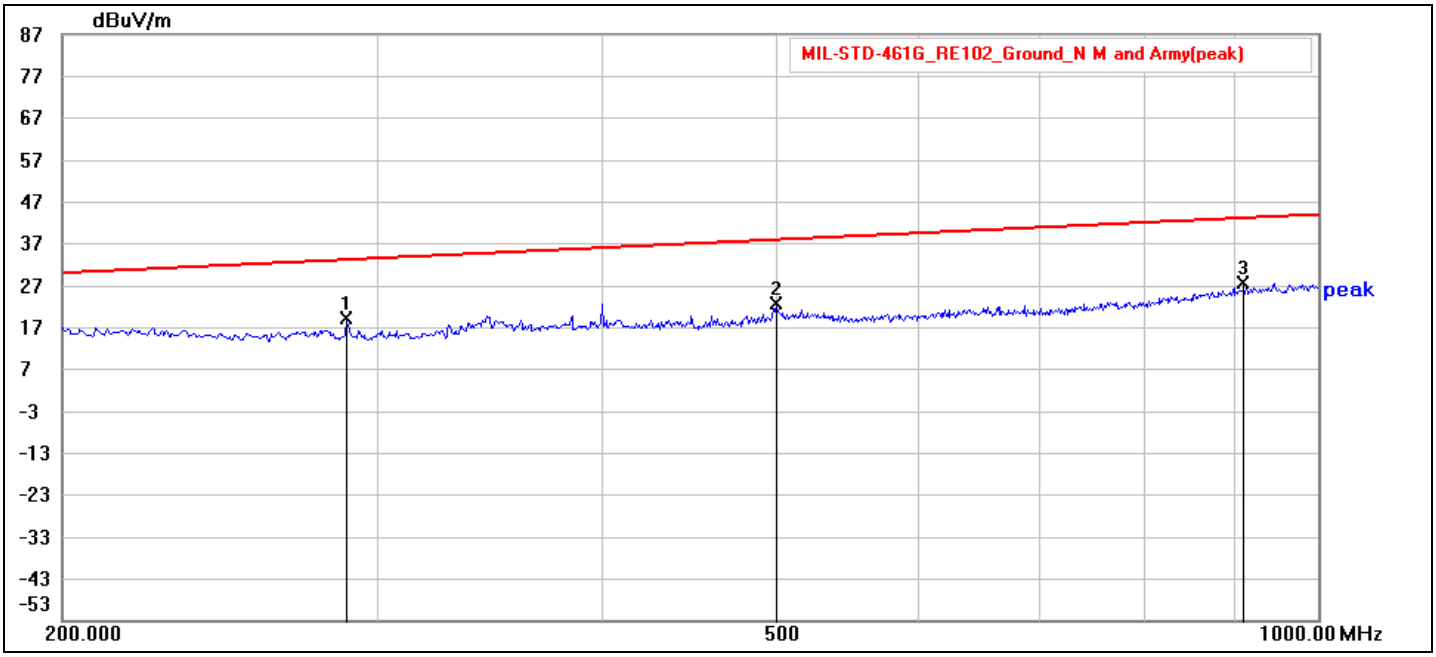
Range1 :30--200(MHz) / RBW:100(kHz) / VBW:300(kHz)



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	31.870	31.84	-13.71	18.13	24.00	-5.87	peak	P	
2	48.360	34.36	-18.41	15.95	24.00	-8.05	peak	P	
3	195.240	33.09	-13.74	19.35	29.80	-10.45	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**Vertical**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:02:35**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

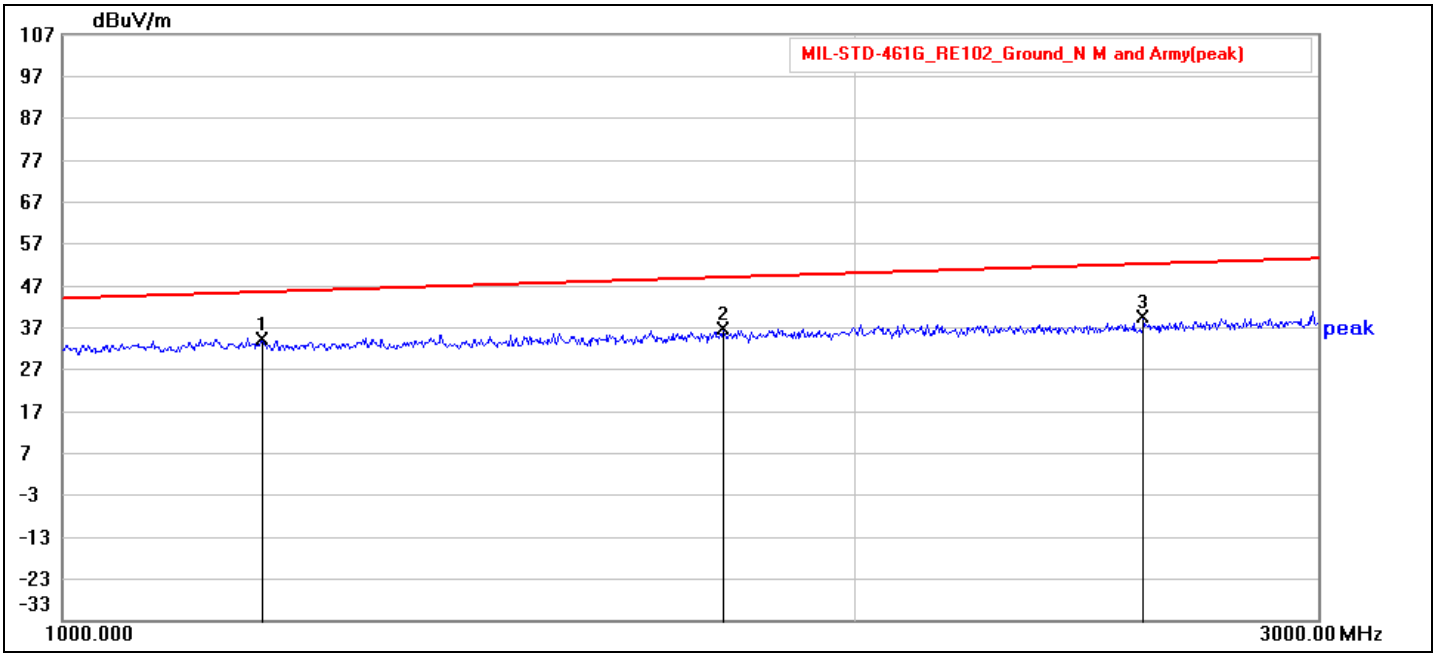
Range1 :200--1000(MHz) / RBW:100(kHz) / VBW:300(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	288.000	36.90	-18.04	18.86	33.17	-14.31	peak	P	
2	500.000	35.05	-12.85	22.20	37.95	-15.75	peak	P	
3	909.600	32.75	-5.56	27.19	43.13	-15.94	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**Vertical**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:16:30**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

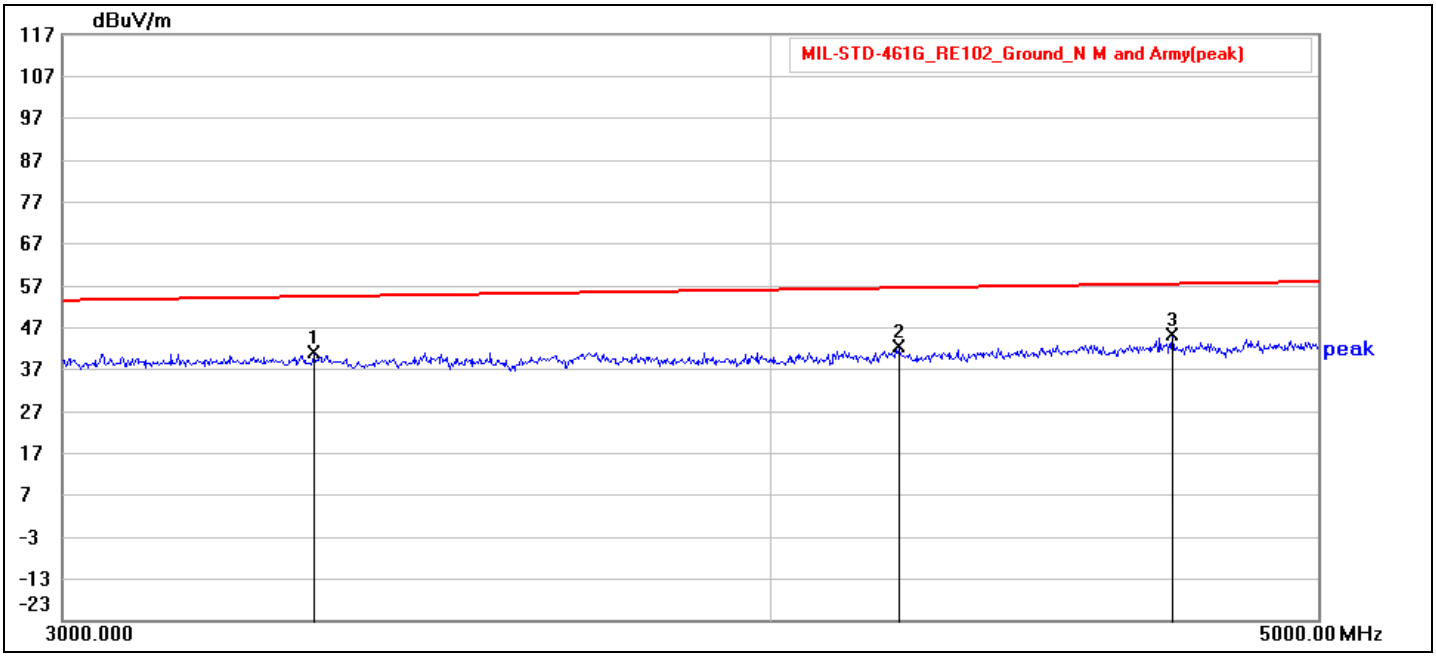
Range1 :1000--3000(MHz) / RBW:1000(kHz) / VBW:3000(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1189.557	58.35	-24.39	33.96	45.45	-11.49	peak	P	
2	1782.000	58.19	-21.78	36.41	48.96	-12.55	peak	P	
3	2574.000	58.55	-19.43	39.12	52.14	-13.02	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**Vertical**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:15:15**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

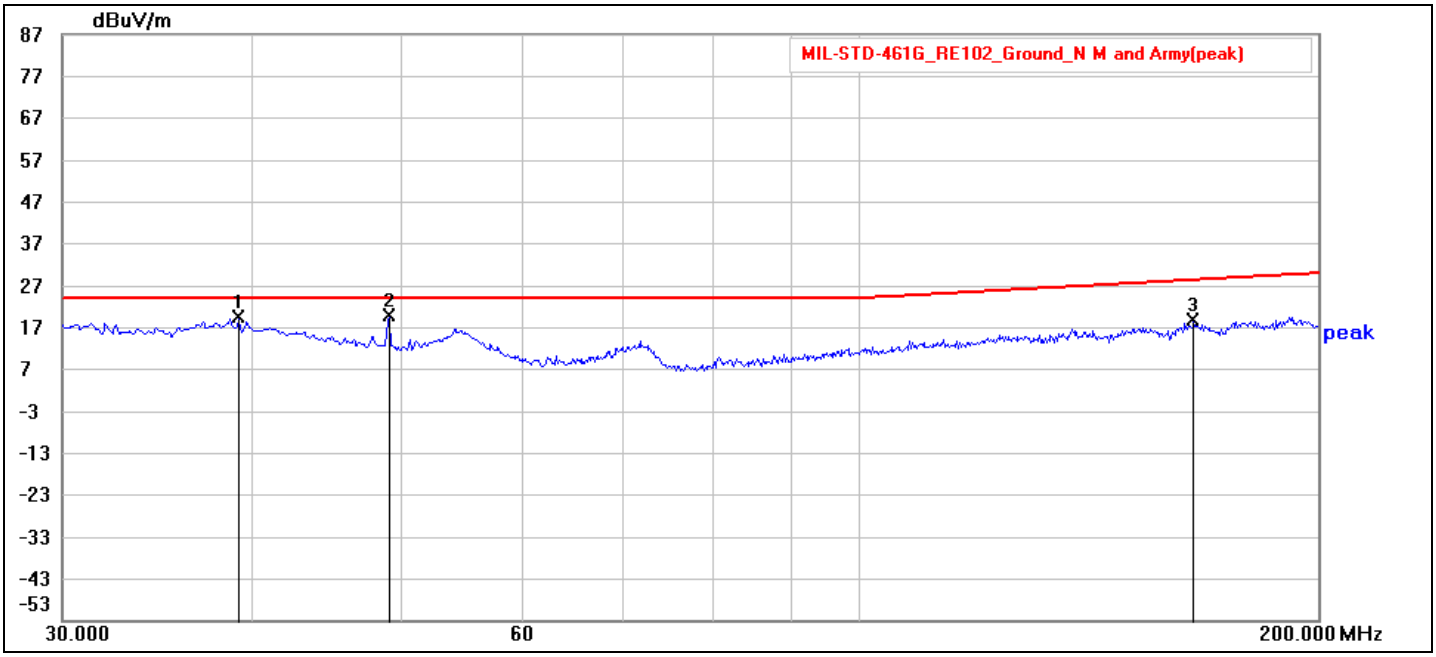
Range1 :3000--5000(MHz) / RBW:1000(kHz) / VBW:3000(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	3322.000	58.27	-17.63	40.64	54.35	-13.71	peak	P	
2	4214.000	57.68	-15.70	41.98	56.42	-14.44	peak	P	
3	4712.000	58.78	-13.93	44.85	57.39	-12.54	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**Horizontal**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 09:55:22**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

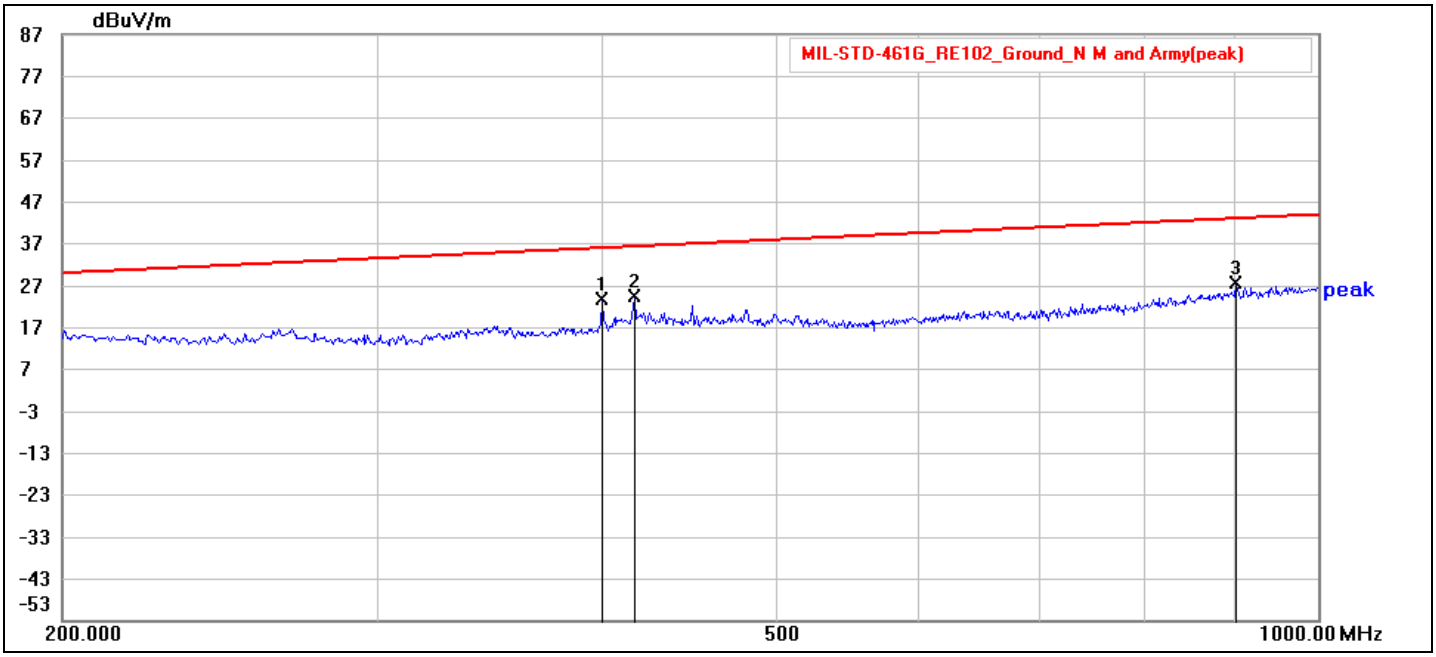
Range1 :30--200(MHz) / RBW:100(kHz) / VBW:300(kHz)



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	39.180	34.51	-15.24	19.27	24.00	-4.73	peak	P	
2	49.210	38.18	-18.80	19.38	24.00	-4.62	peak	P	
3	165.830	33.41	-15.02	18.39	28.38	-9.99	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**Horizontal**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:04:55**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

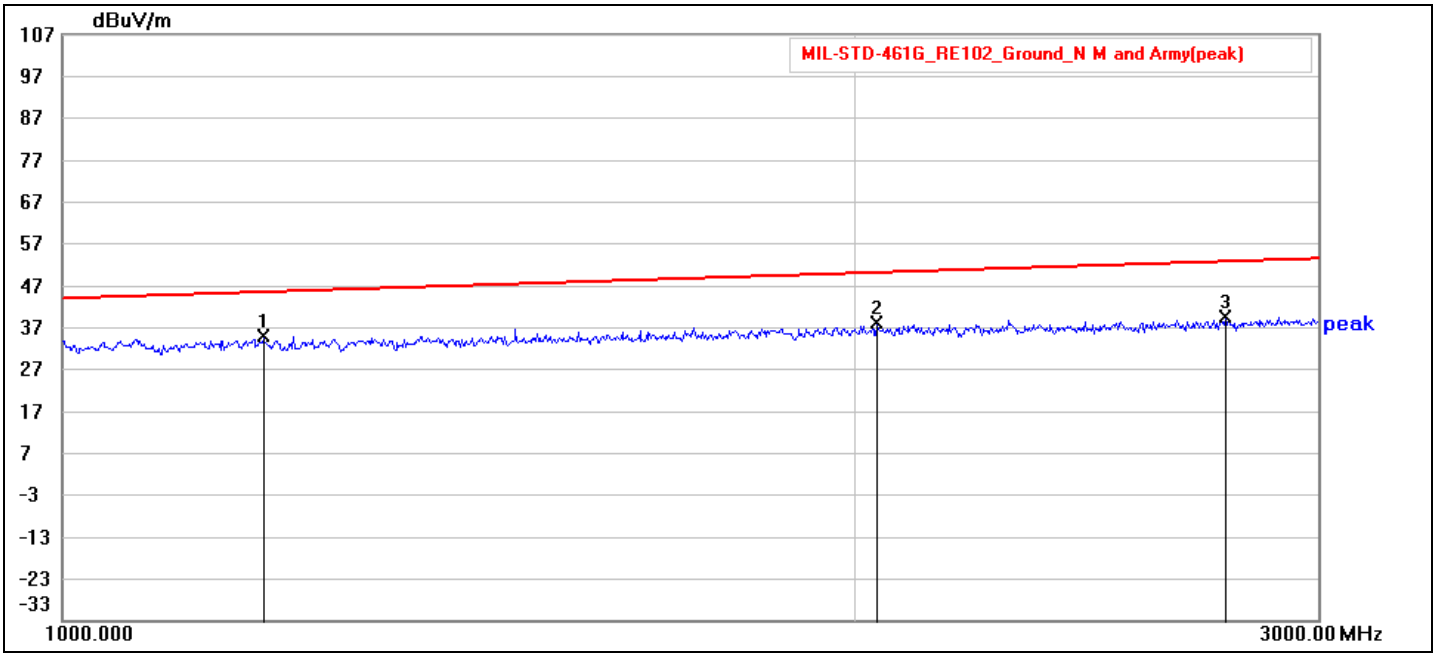
Range1 :200--1000(MHz) / RBW:100(kHz) / VBW:300(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	400.000	39.15	-15.96	23.19	36.01	-12.82	peak	P	
2	416.800	39.68	-15.71	23.97	36.37	-12.40	peak	P	
3	900.800	32.99	-5.62	27.37	43.04	-15.67	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**Horizontal**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:12:04**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

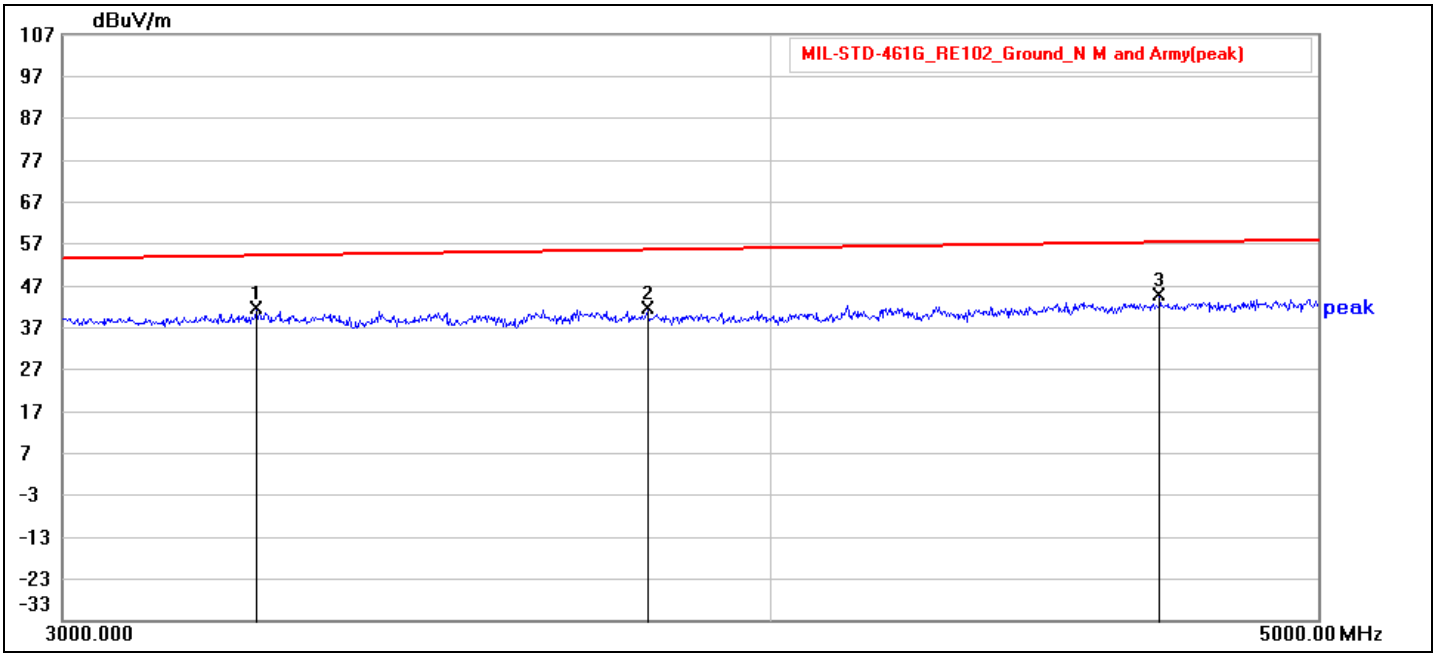
Range1 :1000--3000(MHz) / RBW:1000(kHz) / VBW:3000(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1192.000	58.94	-24.37	34.57	45.47	-10.90	peak	P	
2	2040.000	58.19	-20.61	37.58	50.13	-12.55	peak	P	
3	2764.000	58.18	-18.90	39.28	52.76	-13.48	peak	P	

Job No.:	**23A071703M**	**Polarization:**	**Horizontal**
Standard:	**MIL-STD-461G_RE102_Ground_N M and Army**	**Power Source:**	**DC 28 V**
Test item:	**Radiation Test**	**Date:**	**2023 / 9 / 7**
Company:	**7Starlake Co., Ltd.**	**Time:**	**上午 10:13:29**
EUT Name:	**SYSTEM**	**Temp.(℃)/Hum.(%):**	**24.1 (℃) / 49 %**
EUT Model:	**AV600**	**Engineer Signature:**	**Max Chiu**
Distance:	**1m**		
Note:			

Range1 :3000--5000(MHz) / RBW:1000(kHz) / VBW:3000(kHz)	



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	3246.000	59.00	-17.77	41.23	54.15	-12.92	peak	P	
2	3806.000	57.82	-16.74	41.08	55.53	-14.45	peak	P	
3	4686.000	58.33	-14.03	44.30	57.34	-13.04	peak	P	

3 Radiated susceptibility, electric field test (RS103)

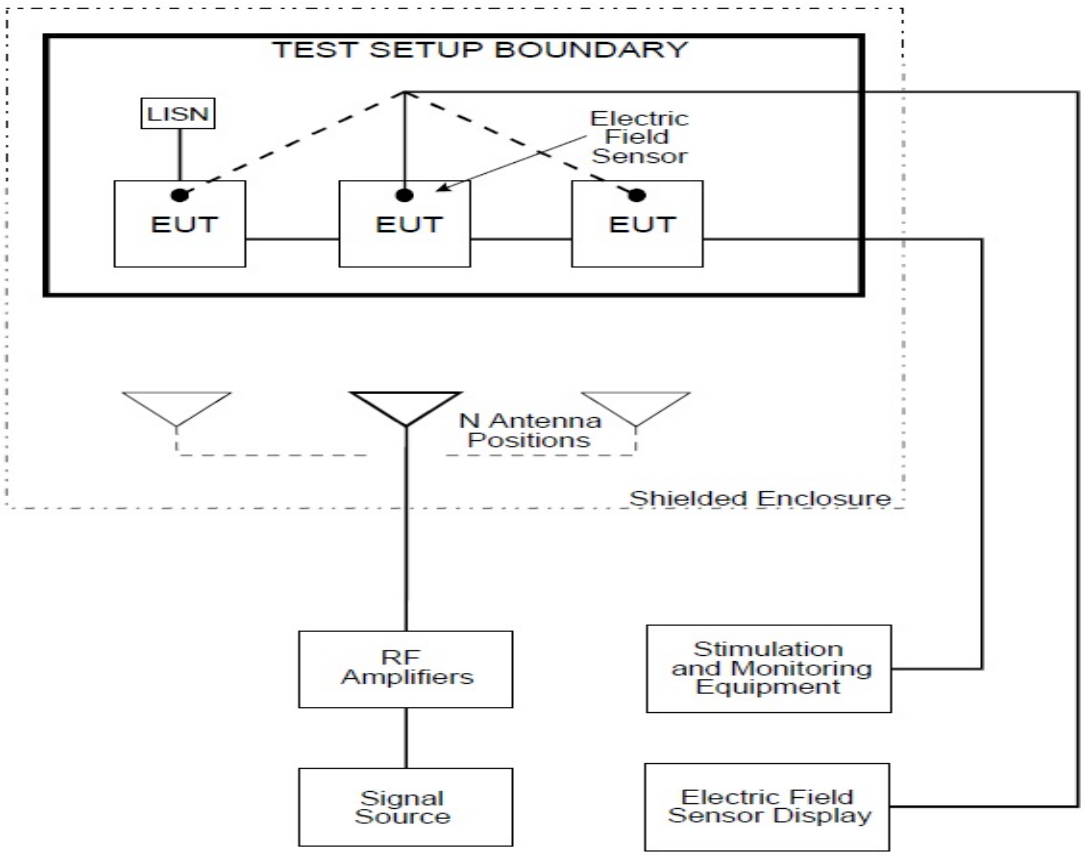
3.1 Instrument

☒Chamber 3

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Signal Generator	Anapico	APSIN20G	121-33B6D0010-2271	2023/10/17
RF Power Amplifier	R&K	A009K251-5757R	B41240-1	N.C.R.
RF Power Amplifier	R&K	A080M102-5555R	B30850	N.C.R.
RF Power Amplifier	R&K	A701M402-4747R	B30850	N.C.R.
Attenuator	SCHAFFNER	ATN6075	22300	N.C.R.
Log Antenna	Schwarzbeck	VULP 9118 G Special	9118GS912	N.C.R.
Horn Antenna	ETS-Lindgren	3106B	00154771	N.C.R.
Horn Antenna	AR	ATH800M6G	0357373	N.C.R.
DC LISN	Schwarzbeck	NNBL 8225	8225-120	2024/05/17
DC LISN	Schwarzbeck	NNBL 8225	8225-121	2024/05/17

Note: The above equipments are within the valid calibration period.

3.2 Block Diagram of Test Configuration



3.3 Test Limit

According to MIL-STD-461G sub clause 5.21.2 RS103 limit.

FREQUENCY RANGE / PLATFORM		LIMIT LEVELS (VOLTS/METER)							
		AIRCRFAFT (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

3.4 Procedure

3.4.1 Turn on the measurement equipment and EUT and allow a sufficient time for stabilization.

3.4.2 Assess the test area for potential RF hazards and take necessary precautionary steps to assure safety of test personnel.

3.4.3 EUT Testing.

(1) Perform testing over the required frequency range with the transient antenna vertically polarized:

(a) Set the signal source to 1 kHz pulse modulation, 50% duty cycle, verify that the modulation is present on the drive signal for each signal generator/modulation source combination. Ensure that the modulation frequency, waveform and depth(40 dB minimum from peak to baseline) are corrent. Using appropriate amplifier and transient antenna, establish an electric field at the test start frequency. Gradually increase the electric field level until it reaches the applicable limit.

(b) Scan the required frequency ranges in accordance with the rates and durations specified in Table III. Maintain field strength levels in accordance with the applicable limit. Monitor EUT performance for susceptibility effects.

(c) Ensure that the E-field sensor is indicating the field from the fundamental frequency and not from the harmonics.

(2) If susceptibility is noted, determine the threshold level in accordance with MIL-STD-461G sub clause 4.3.10.4.3.

(3) Repeat the test above 30MHz with the transient antenna horizontally polarized.

(4) Repeat MIL-STD-461G sub clause 5.21.3.4c for each transient antenna position required by MIL-STD-461G sub clause 5.21.3.3c.

3.5 Test Result

The final test data is shown as following pages.

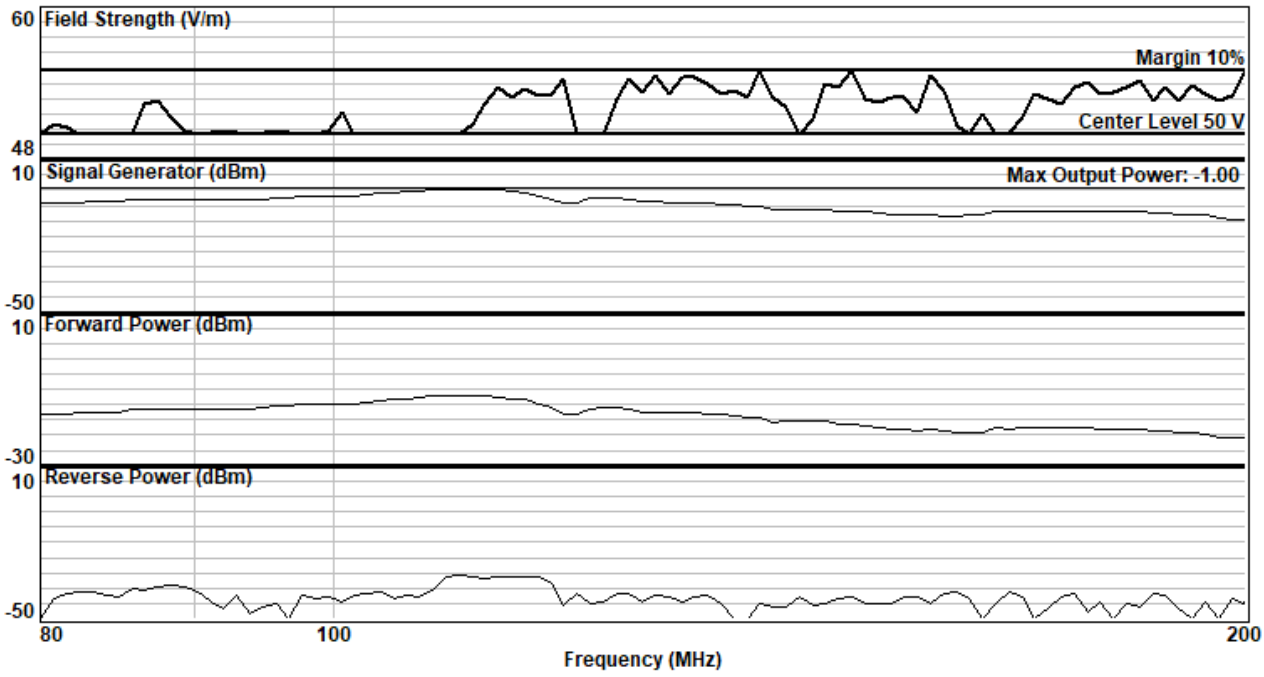
Applicant：7Starlake Co., Ltd.	Date of Measurement：2023 / 09 / 13
EUT：SYSTEM	Temp./Humidity/Atm.press.：24.2°C / 53% / 996hPa
M/N：AV600	Test Mode：Working Mode
Input Voltage：DC 28 V	Test Engineer：Scott Chang

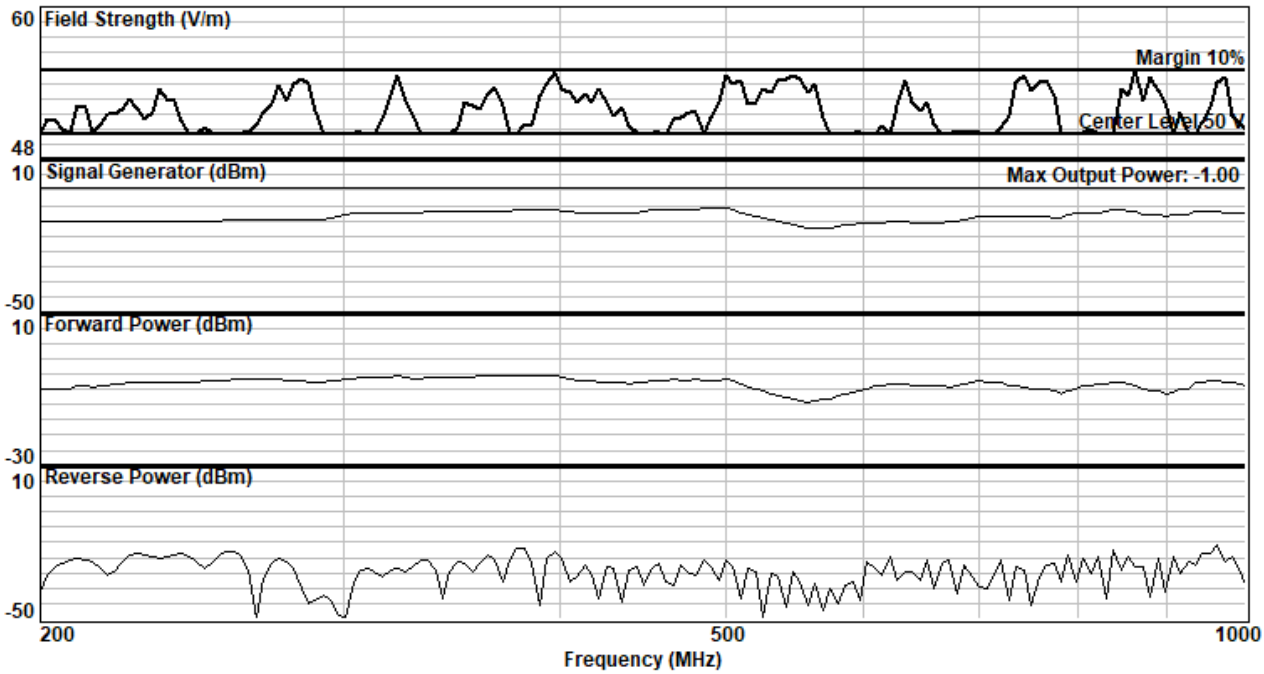
Frequency Range (MHz)	Field Strength (V/m)	Modulation	Antenna Polarity		Results
			Horizontal	Vertical	
80 - 3000	50	PM 50%	○	○	As in NOTE

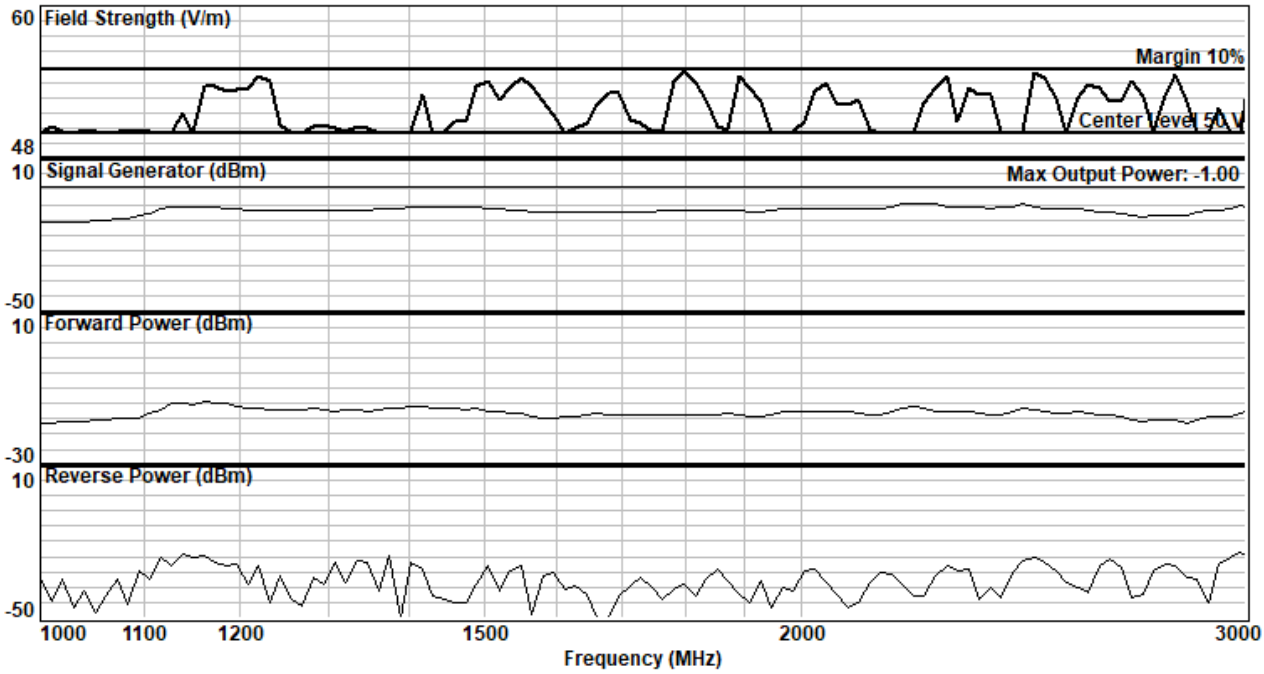
NOTE：

- GROUND, Army
- Monitoring method: Observe screen then record the phenomena.

- Before the test: The screen shows image is in normal state.
- During the test: The screen shows image is in normal state.
- After the test: The screen shows image is in normal state.



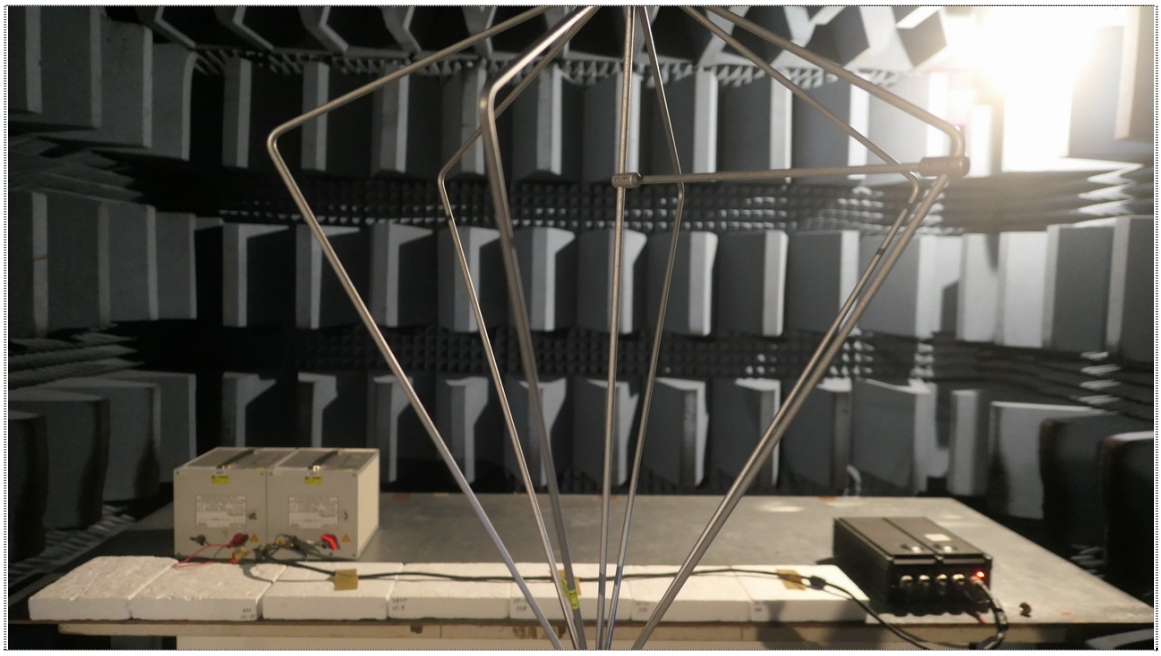

60
Field Strength (V/m)
Margin 10%
Center Level 50 V
48
10
Signal Generator (dBm)
Max Output Power: -1.00
-50
10
Forward Power (dBm)
-30
10
Reverse Power (dBm)
-50
200
500
1000
Frequency (MHz)


60
Field Strength (V/m)
Margin 10%
Center Level 50 V
48
10
Signal Generator (dBm)
Max Output Power: -1.00
-50
10
Forward Power (dBm)
-30
10
Reverse Power (dBm)
-50
1000
1100
1200
1500
2000
3000
Frequency (MHz)

4 Photographs of Test

4.1 Conducted emissions, power leads Test (CE102)

4.2 Radiated emissions, electric field Test (RE102)

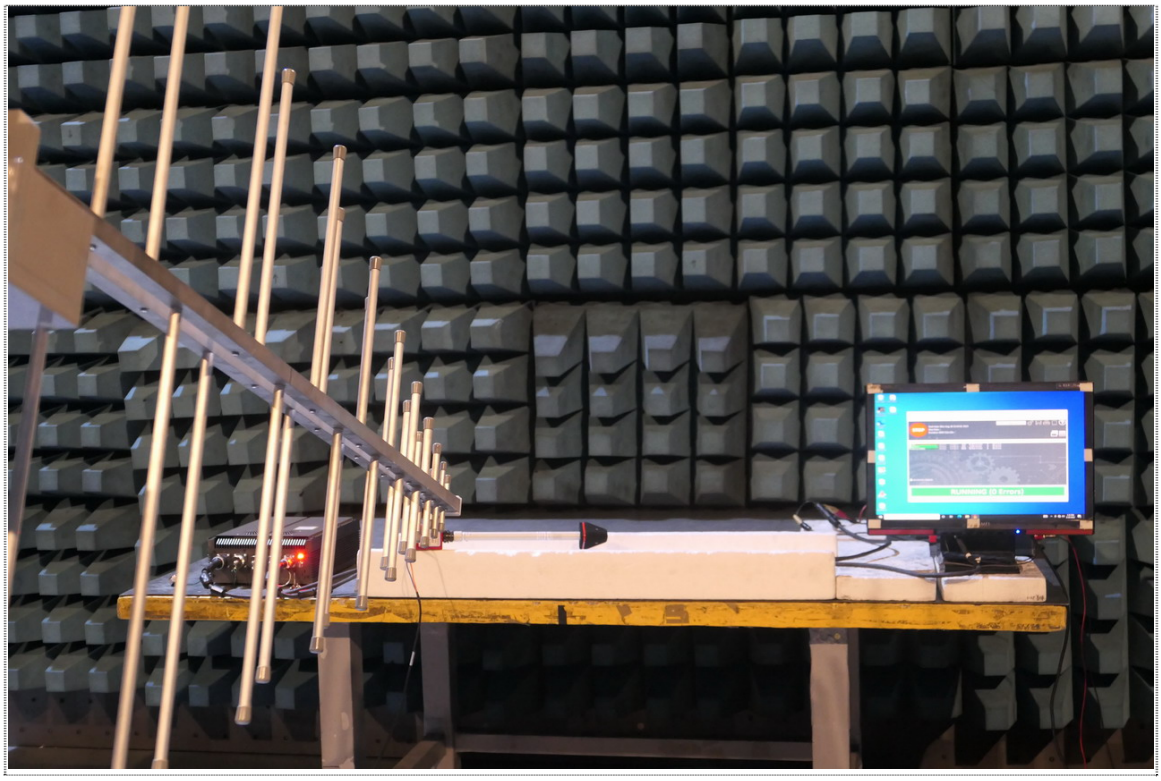


View of Measurement (Frequency: 30 MHz - 200 MHz)

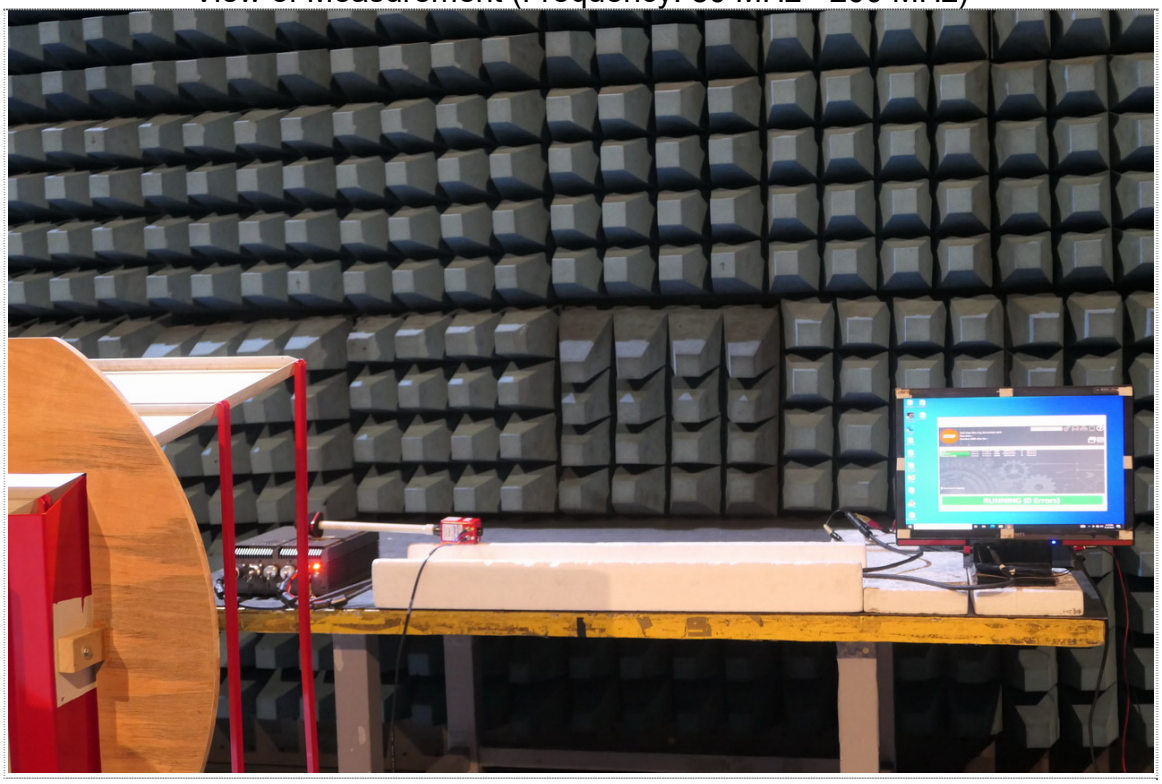
View of Measurement (Frequency: 200 MHz - 1 GHz)

View of Measurement (Frequency: 1 GHz - 5 GHz)

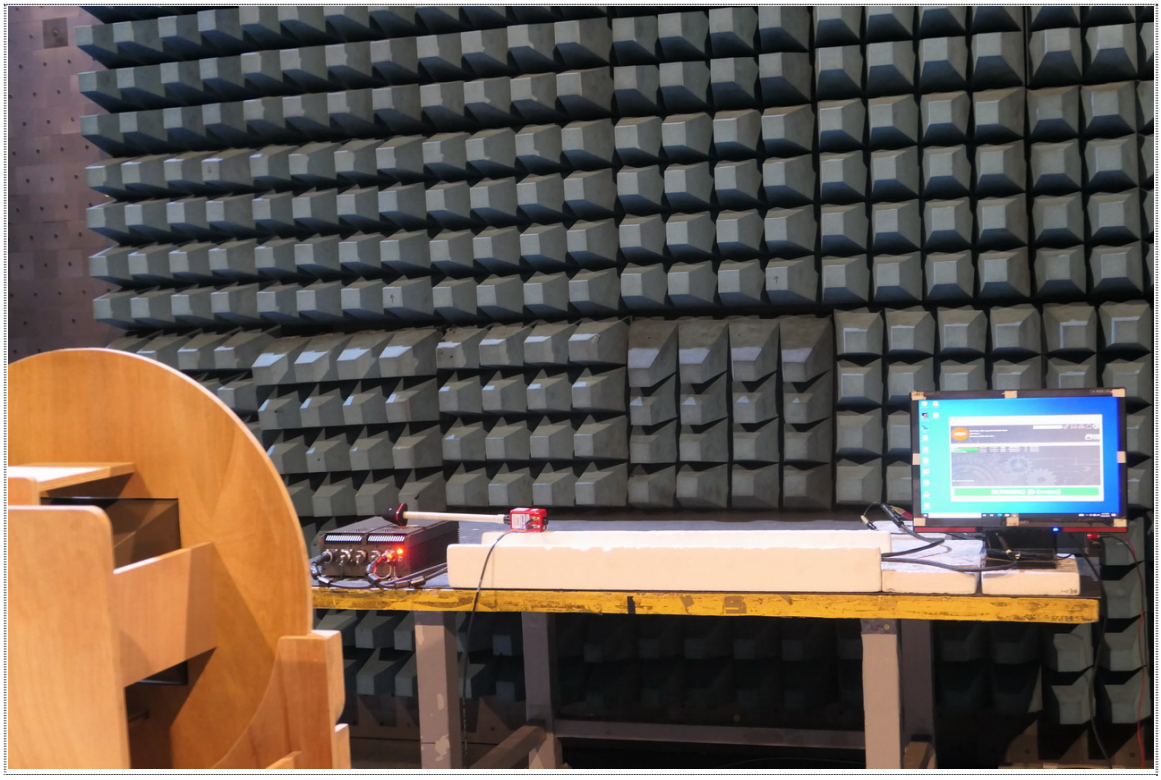
4.3 Radiated susceptibility, electric field test (RS103)



View of Measurement (Frequency: 80 MHz - 200 MHz)



View of Measurement (Frequency: 200 MHz - 1 GHz)

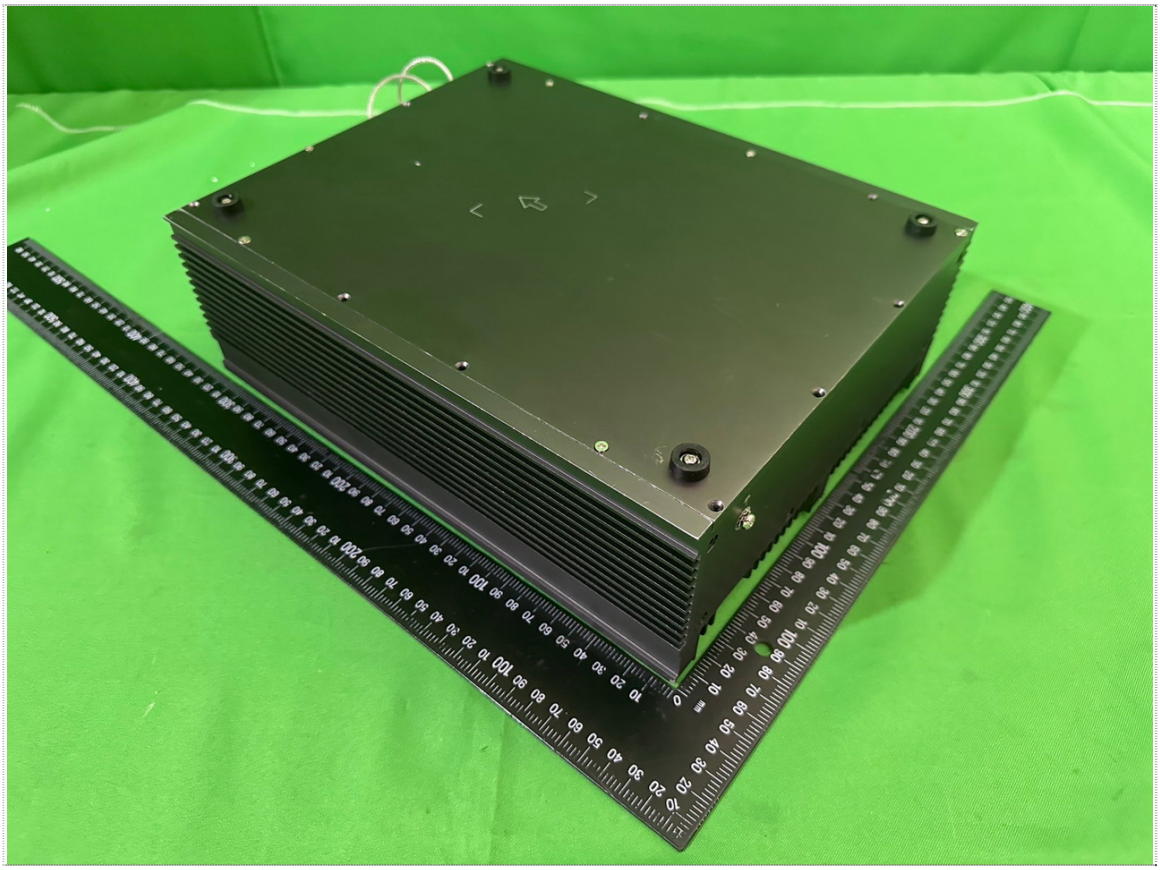


View of Measurement (Frequency: 1 GHz - 3 GHz)

5 Photographs of EUT

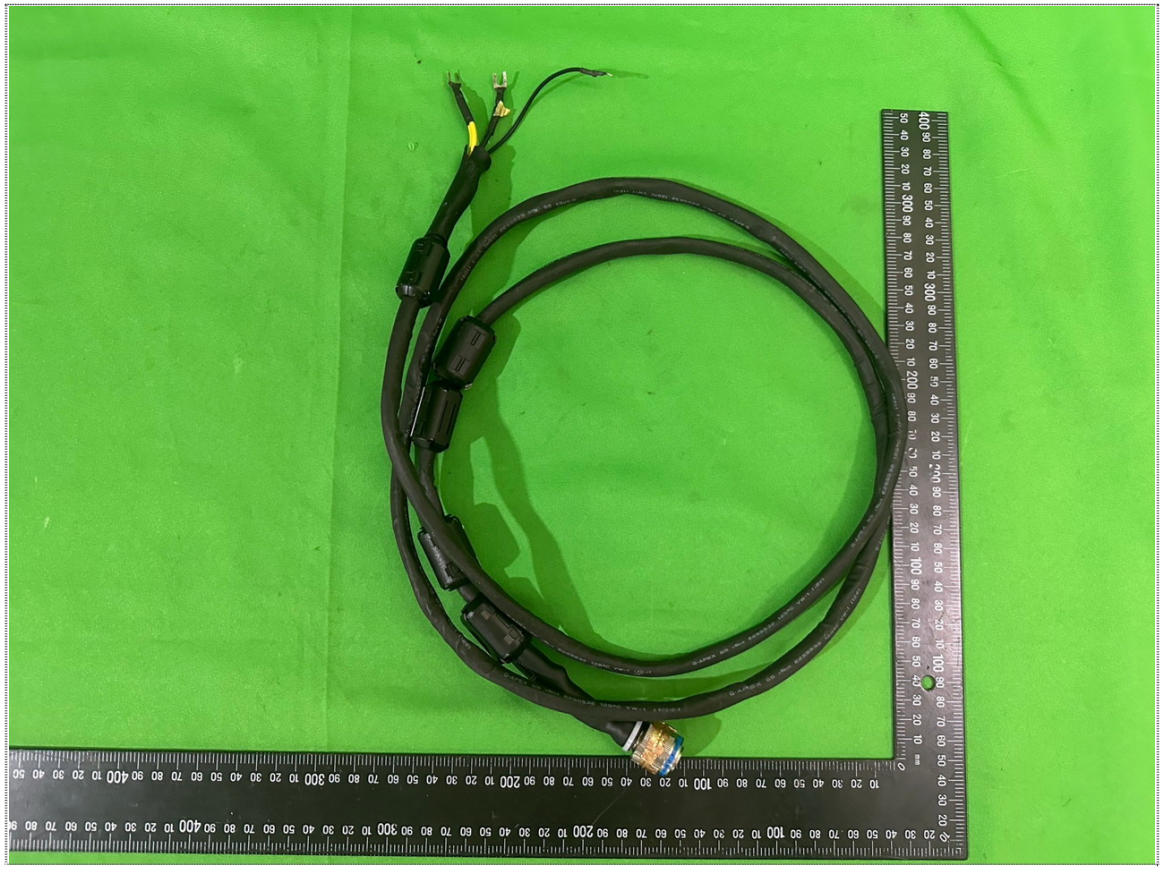
5.1 Model No.: AV600

Front View of EUT

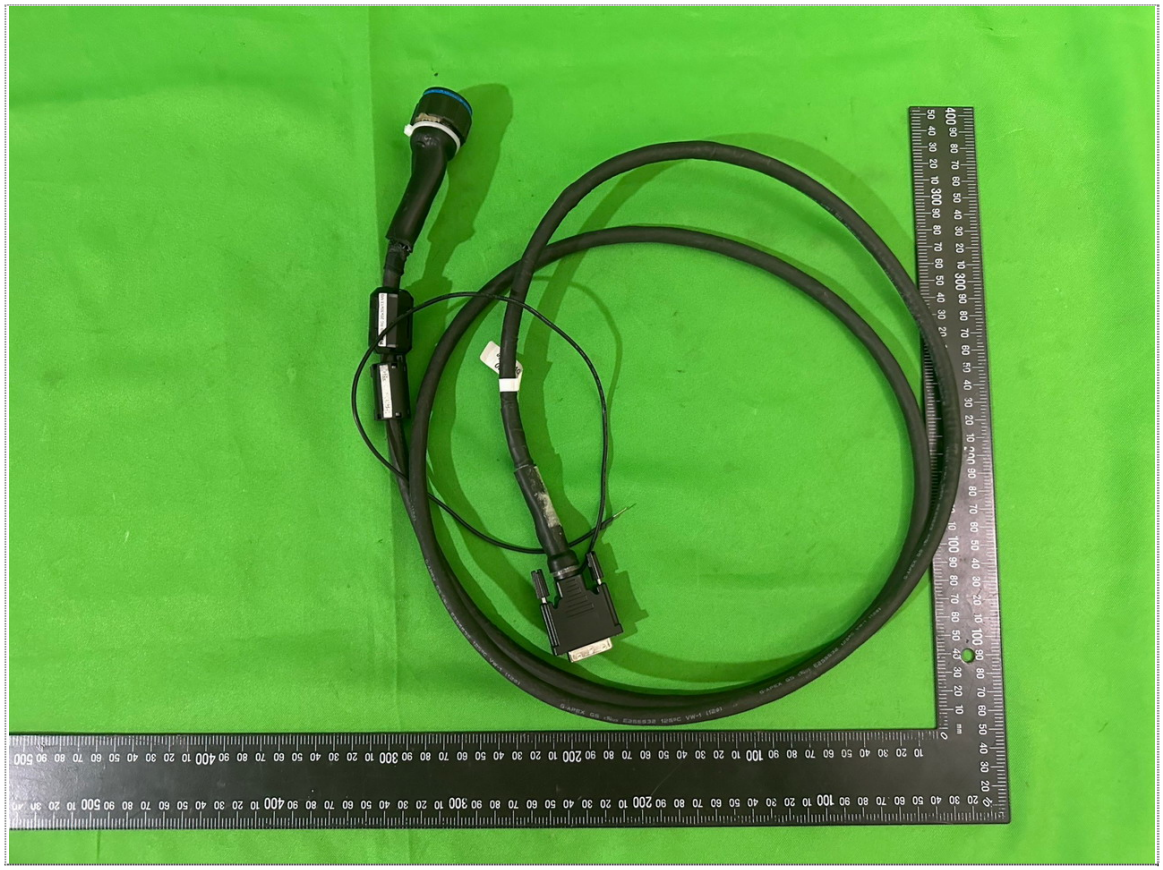


Rear View of EUT

View of I/O Port



View of Cable-1



View of Cable-2