



TEST REPORT

Reference No. : WTX24D03049999E
Applicant : Descartes Systems Group Inc.
Address : 105 Trafalgar Street, Floor 2, Nelson, Tasman 7011, New Zealand
Manufacturer : Descartes Systems Group Inc.
Address : 105 Trafalgar Street, Floor 2, Nelson, Tasman 7011, New Zealand
Product : Reader
Model(s) : RDR001
Standards : VCCI-CISPR 32:2016
Date of Receipt sample ... : 2024-03-14
Date of Test : 2024-03-24 to 2024-06-13
Date of Issue : 2024-06-28
Test Result : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTX24D03049999E	2024-03-14	2024-03-24 to 2024-06-13	2024-06-28	Original	-	Valid

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4 General Information

4.1 Client Information

Factory name: Descartes Systems Group Inc.
 Factory address: 105 Trafalgar Street, Floor 2, Nelson, Tasman 7011, New Zealand

4.2 General Description of E.U.T.

Product: Reader
 Model(s): RDR001

4.3 Details of E.U.T.

Power Supply: Input: 12V \approx 3.0A by Adapter (Adapter input: 100-240V~, 50-60Hz, 1A MAX; Output: 12V \approx 3.0A; Model: ATS036T-W120V)
 Highest Internal Frequency: Above 1GHz
 Classification of Equipment: Class A
 I/O Port of EUT: HDMI In port, USB-A QC3.0 port.
 Accessory: HDMI cable, shielded, length 1.0m, USB-A port Connecting a USB drive.

4.4 Test Location

Laboratory: Waltek Testing Group Co., Ltd.
 Address: No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China

4.5 Test Facility

The test facilities used to collect the test data in this report:

Test Item	Registration code	Uncertainty (Note 1)
<input checked="" type="checkbox"/> Conducted Emissions from the AC mains power ports	C-20130	± 3.64 dB
<input type="checkbox"/> Asymmetric Mode Conducted Emissions 150KHz to 30MHz	T-20131	± 3.62 dB
<input checked="" type="checkbox"/> Radiated Emissions, 30MHz to 1000MHz	R-20174	± 5.24 dB
<input checked="" type="checkbox"/> Radiated Emissions, Above 1GHz	G-20166	± 5.03 dB

Note 1: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.6 Abnormalities from Standard Conditions

None

4.7 EUT Setup and Operation Mode

No	Title	Description
TM1	Working mode	AC 100V/50Hz&240V/50Hz
Pre-test in voltage input range & all operation modes, and find out the worst case for compliance test. And record it in the report.		



5 Summary of Test Results

Item	Standard	Method	Requirement	Result
Conducted emissions from AC mains power ports (150kHz-30MHz)	VCCI-CISPR 32:2016	CISPR 16-2-1	Class A	Pass
Radiated emissions (30MHz-1GHz)	VCCI-CISPR 32:2016	CISPR 16-2-3	Class A	Pass
Radiated emissions (above 1GHz)	VCCI-CISPR 32:2016	CISPR 16-2-3	Class A	Pass

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6 Equipment Used during Test

6.1 Equipment List

Conducted emissions from AC mains power ports (150kHz-30MHz)					
Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
Cable	Top	TYPE16(3.5M)	/	2023-07-27	2024-07-26
LISN	R&S	ENV216	100115	2023-07-27	2024-07-26
EMI Test Receiver	R&S	ESCI	100947	2023-07-27	2024-07-26
Test Software	Frad Technology	EZ-EMC(RA-03A1-1)	/	/	/

Radiated emissions (30MHz-1GHz)					
Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
Coaxial Cable (below 1GHz)	Lair Microwave	LE400-NMNM-8M	#02	2024-01-16	2025-01-15
Broadband Preamplifier (9KHz-6GHz)	SCHWARZBECK	BBV9744	00140	2024-01-16	2025-01-15
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	01376	2024-01-18	2025-01-17
Test Receiver (9KHz-7GHz)	R&S	ESR 7	102320	2024-01-16	2025-01-15
Test Software	Frad Technology	EZ-EMC(Ver.EMEC-3A1)	/	/	/

Radiated emissions (above 1GHz)					
Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
Coaxial Cable (above 1GHz)	ZT26-NJ-NJ-8M/FA	1GHz-18GHz	NA	2024-04-22	2025-04-21
Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2023-07-27	2024-07-26
Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2024-01-23	2025-01-22
Spectrum Analyzer	R&S	FSP30	100091	2024-04-22	2025-04-21
Test Software	Frad Technology	EZ-EMC(RA-03A1-1)	/	/	/



6.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
Display	SAMSUNG	S28AG700NC	N/A
keyboard	DELL	L100	N/A
Mouse	A4TECH	OP-550NU	N/A

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7 Emission Test Results (EMI)

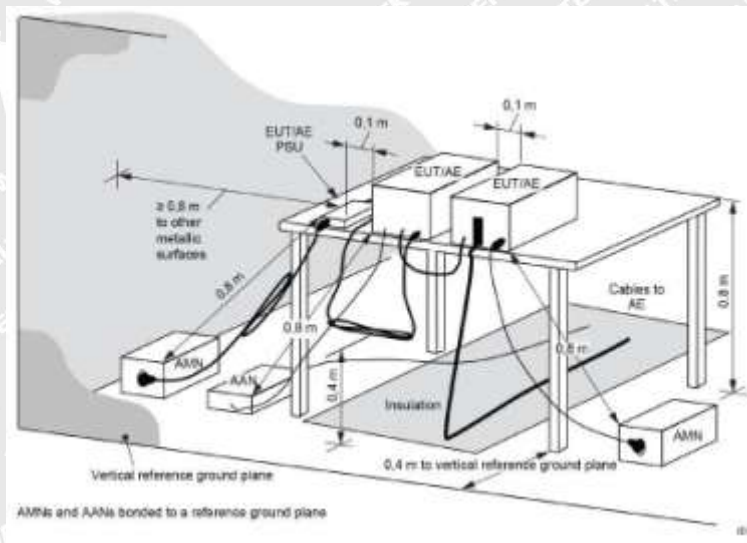
7.1 Conducted emissions from AC mains power ports (150kHz-30MHz)

Test Requirement:	Class A		
Test Limit:	Frequency Range	Limit (Quasi-Peak)	Limit (Average)
	0.15MHz to 0.5MHz	79dB(μ V)	66dB(μ V)
	0.5MHz to 30MHz	73dB(μ V)	60dB(μ V)
	Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz	
Test Method:	CISPR 16-2-1		
Procedure:	An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor		

7.1.1 E.U.T. Operation

Environmental Conditions					
Temperature:	26.7 °C	Humidity:	51.6 %	Atmospheric Pressure:	101.5 kPa
Test mode:	TM1				

7.1.2 Basic Test Setup Block Diagram

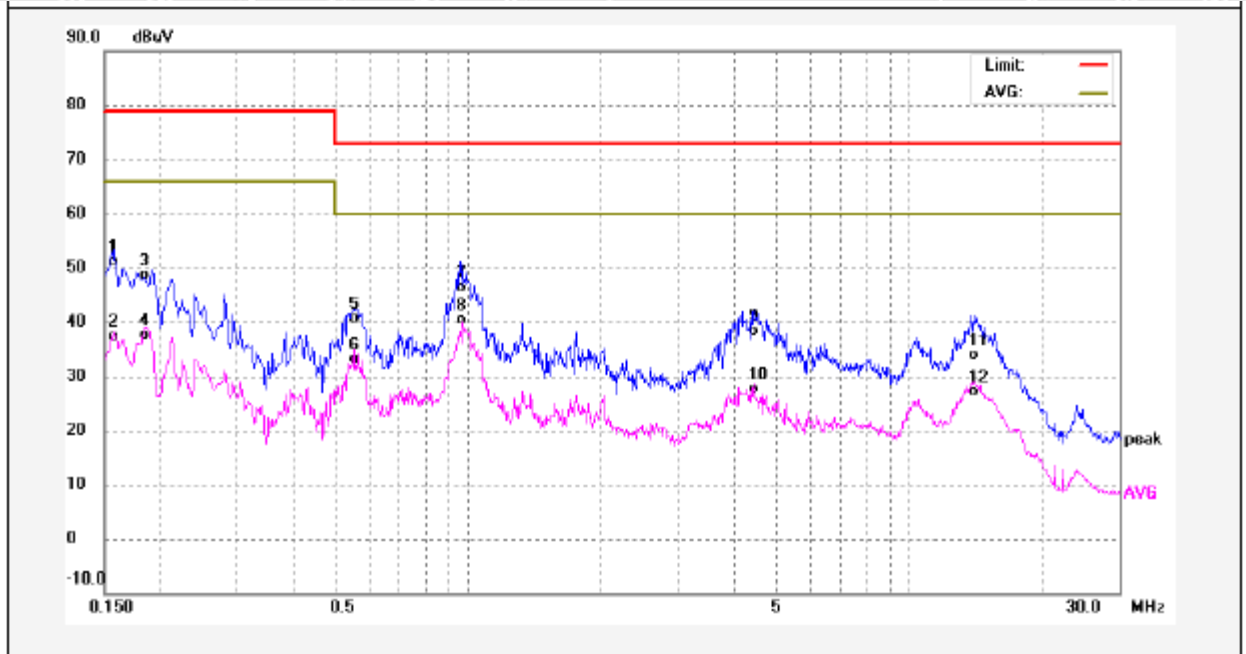




7.1.3 Summary of Test Results

AC 100V/50Hz

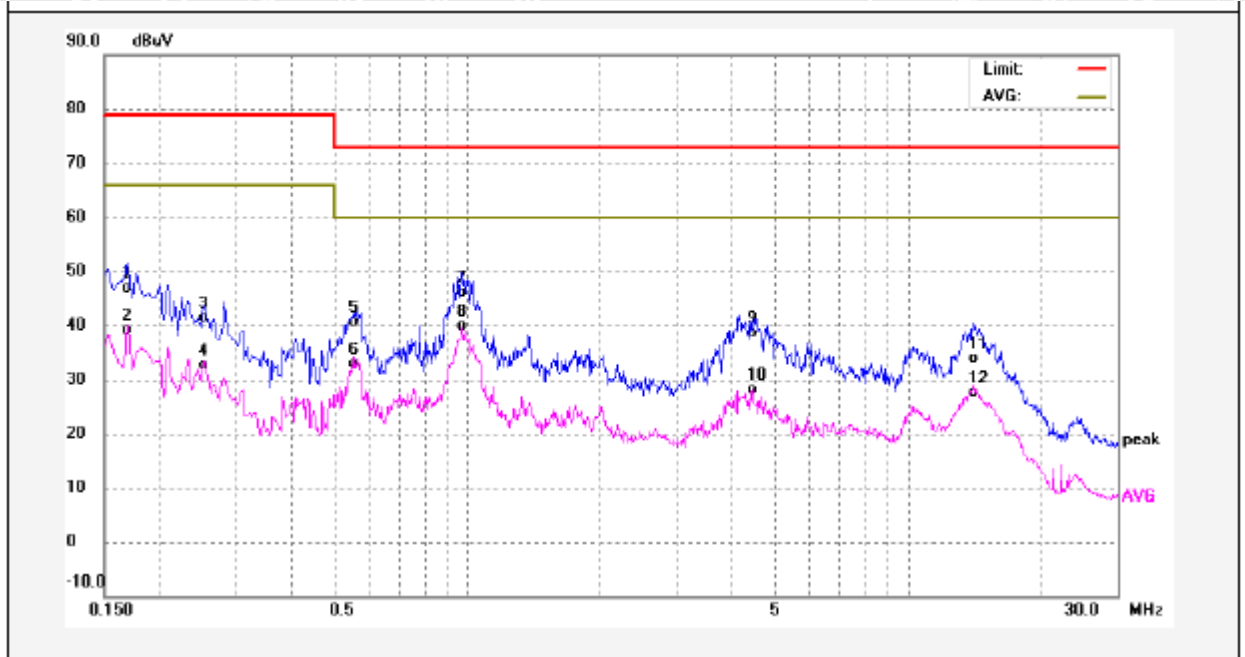
TM1 / Line: Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	0.1580	40.11	10.92	51.03	79.00	-27.97	QP	
2	0.1580	26.46	10.92	37.38	66.00	-28.62	AVG	
3	0.1860	37.62	10.93	48.55	79.00	-30.45	QP	
4	0.1860	26.82	10.93	37.75	66.00	-28.25	AVG	
5	0.5540	29.72	10.99	40.71	73.00	-32.29	QP	
6	0.5540	22.24	10.99	33.23	60.00	-26.77	AVG	
7	0.9740	35.37	11.07	46.44	73.00	-26.56	QP	
8	0.9740	29.19	11.07	40.26	60.00	-19.74	AVG	
9	4.4380	27.05	11.21	38.26	73.00	-34.74	QP	
10	4.4380	16.32	11.21	27.53	60.00	-32.47	AVG	
11	13.9180	22.41	11.58	33.99	73.00	-39.01	QP	
12	13.9180	15.58	11.58	27.16	60.00	-32.84	AVG	



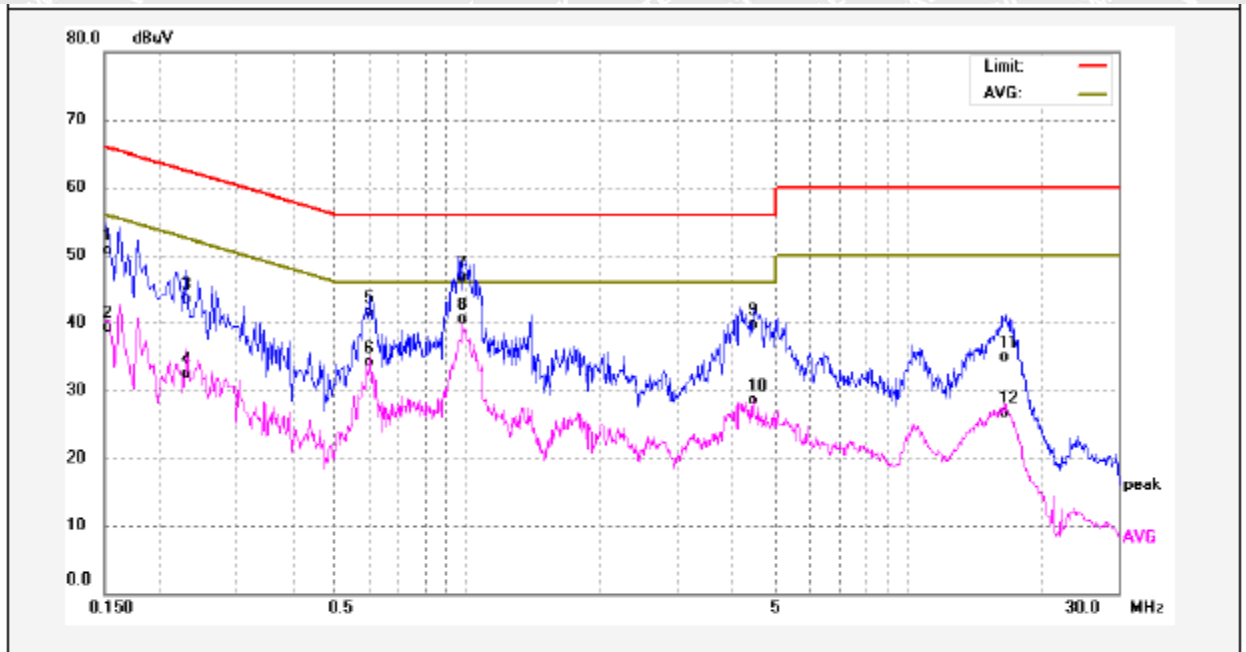
TM1 / Line: Neutral



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1700	35.87	10.92	46.79	79.00	-32.21	QP	
2	0.1700	28.26	10.92	39.18	66.00	-26.82	AVG	
3	0.2540	30.32	10.96	41.28	79.00	-37.72	QP	
4	0.2540	21.68	10.96	32.64	66.00	-33.36	AVG	
5	0.5540	29.66	10.99	40.65	73.00	-32.35	QP	
6	0.5540	22.01	10.99	33.00	60.00	-27.00	AVG	
7	0.9740	35.18	11.07	46.25	73.00	-26.75	QP	
8	0.9740	28.88	11.07	39.95	60.00	-20.05	AVG	
9	4.4340	27.35	11.21	38.56	73.00	-34.44	QP	
10	4.4340	16.83	11.21	28.04	60.00	-31.96	AVG	
11	14.0700	22.25	11.60	33.85	73.00	-39.15	QP	
12	14.0700	16.13	11.60	27.73	60.00	-32.27	AVG	



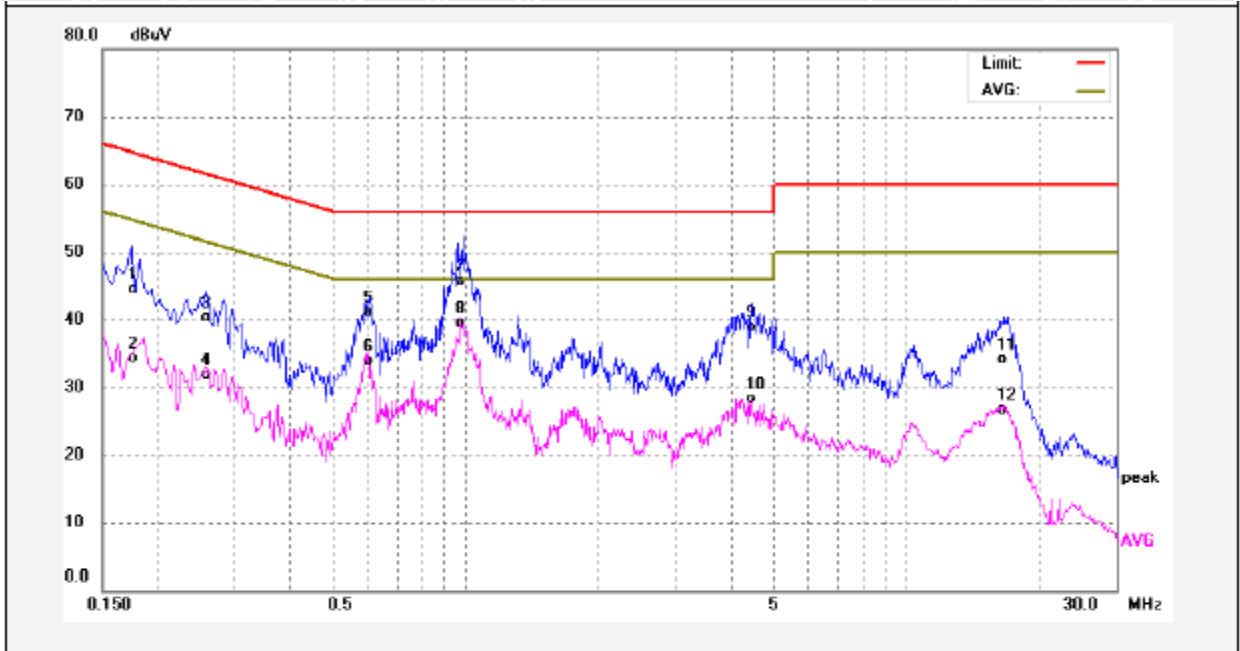
AC 230V/50Hz
TM1 / Line: Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	39.82	10.91	50.73	65.99	-15.26	QP	
2	0.1500	28.40	10.91	39.31	55.99	-16.68	AVG	
3	0.2300	32.56	10.93	43.49	62.45	-18.96	QP	
4	0.2300	21.52	10.93	32.45	52.45	-20.00	AVG	
5	0.5980	30.44	10.97	41.41	56.00	-14.59	QP	
6	0.5980	23.17	10.97	34.14	46.00	-11.86	AVG	
7	0.9740	35.70	11.00	46.70	56.00	-9.30	QP	
8	0.9740	29.46	11.00	40.46	46.00	-5.54	AVG	
9	4.4340	28.55	11.13	39.68	56.00	-16.32	QP	
10	4.4340	17.45	11.13	28.58	46.00	-17.42	AVG	
11	16.6460	23.47	11.44	34.91	60.00	-25.09	QP	
12	16.6460	15.19	11.44	26.63	50.00	-23.37	AVG	



TM1 / Line: Neutral



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1740	33.48	10.94	44.42	64.76	-20.34	QP	
2	0.1740	23.32	10.94	34.26	54.76	-20.50	AVG	
3	0.2580	29.32	10.98	40.30	61.49	-21.19	QP	
4	0.2580	20.97	10.98	31.95	51.49	-19.54	AVG	
5	0.6020	30.09	11.10	41.19	56.00	-14.81	QP	
6	0.6020	22.73	11.10	33.83	46.00	-12.17	AVG	
7	0.9700	34.42	11.21	45.63	56.00	-10.37	QP	
8	0.9700	28.27	11.21	39.48	46.00	-6.52	AVG	
9	4.4340	27.60	11.26	38.86	56.00	-17.14	QP	
10	4.4340	17.00	11.26	28.26	46.00	-17.74	AVG	
11	16.6299	22.56	11.50	34.06	60.00	-25.94	QP	
12	16.6299	15.25	11.50	26.75	50.00	-23.25	AVG	



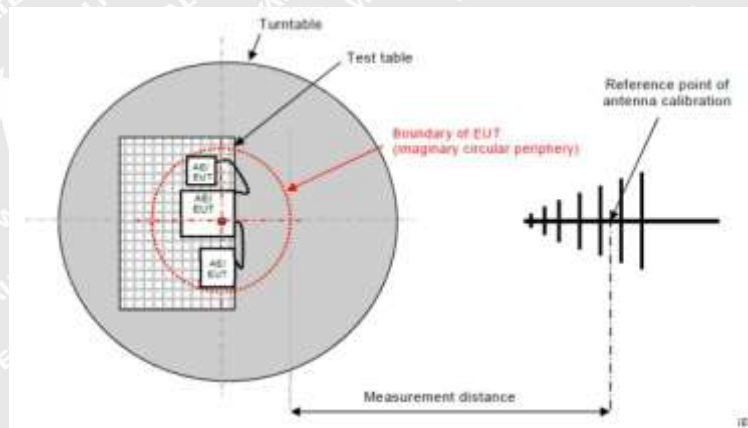
7.2 Radiated emissions (30MHz-1GHz)

Test Requirement:	Class A		
Test Limit:	Frequency (MHz)	Limit [dB(uV/m) at 10m]	Limit [dB(uV/m) at 3m]
	30 to 230	40	50
	230 to 1000	47	57
	Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz		
Test Method:	CISPR 16-2-3		
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor		

7.2.1 E.U.T. Operation

Environmental Conditions			
Temperature:	22.6 °C	Humidity:	63.4 %
Atmospheric Pressure:		101.2 kPa	
Test mode:	TM1		

7.2.2 Basic Test Setup Block Diagram

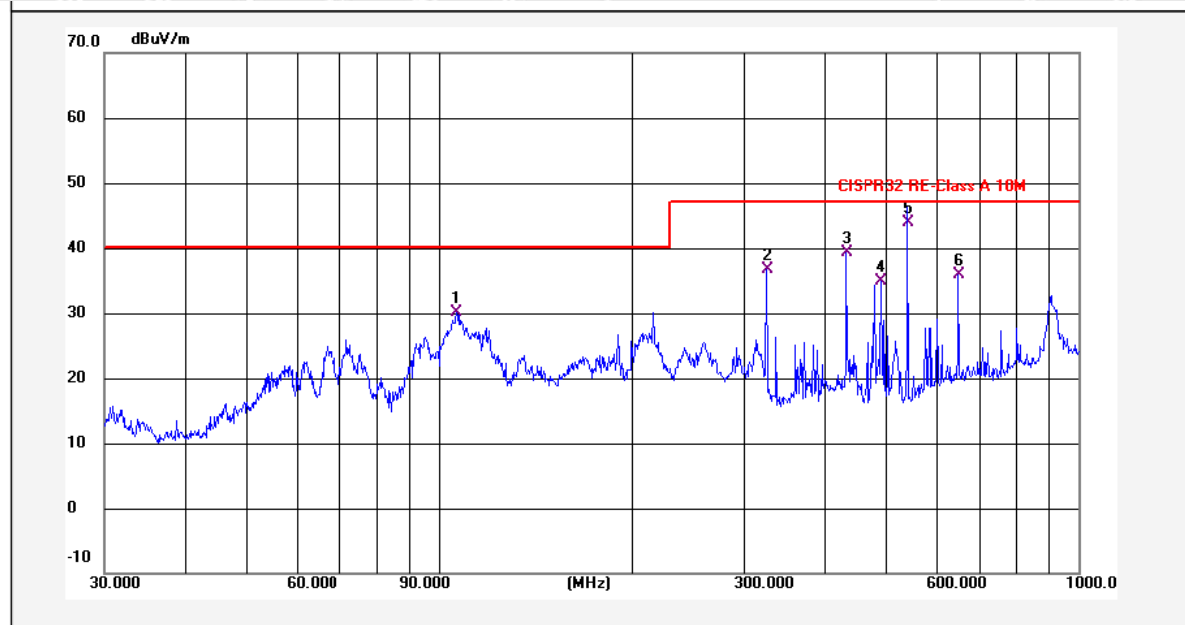




7.2.3 Summary of Test Results

AC 100V/50Hz

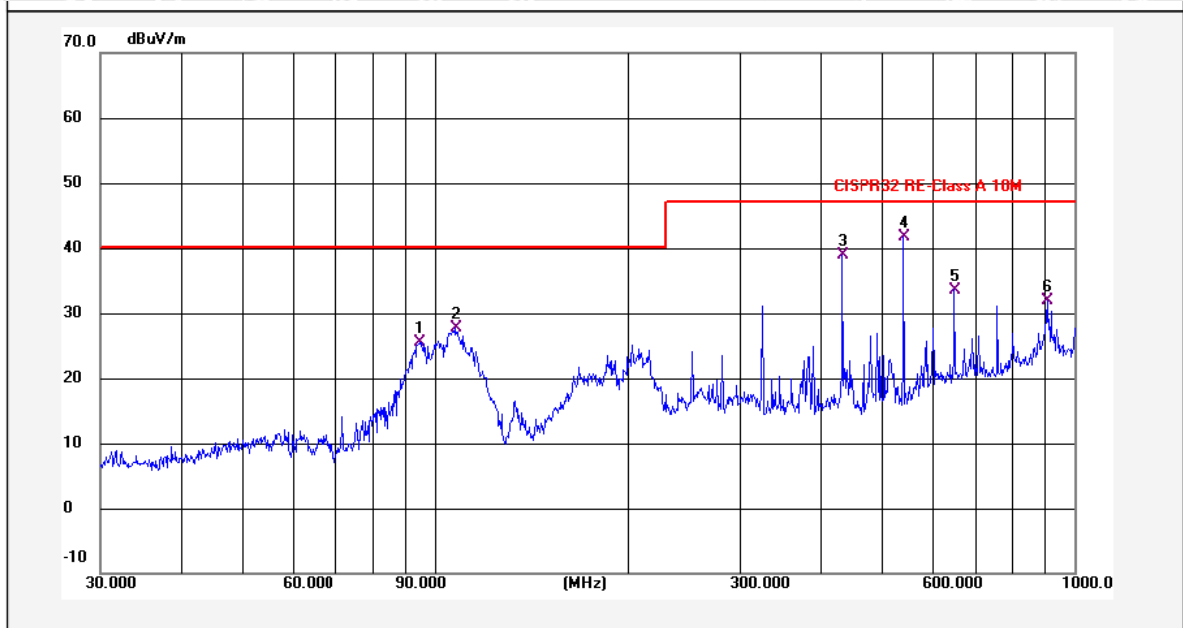
TM1 / Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/)	Margin (dB)	Detector	Remark
1	106.7587	44.60	-14.50	30.10	40.00	-9.90	QP	
2	324.4561	48.08	-11.37	36.71	47.00	-10.29	QP	
3	432.5457	48.87	-9.48	39.39	47.00	-7.61	QP	
4	492.4685	42.95	-8.01	34.94	47.00	-12.06	QP	
5	541.3725	51.11	-7.11	44.00	47.00	-3.00	QP	
6	649.6597	39.19	-3.38	35.81	47.00	-11.19	QP	



TM1 / Polarization: Vertical

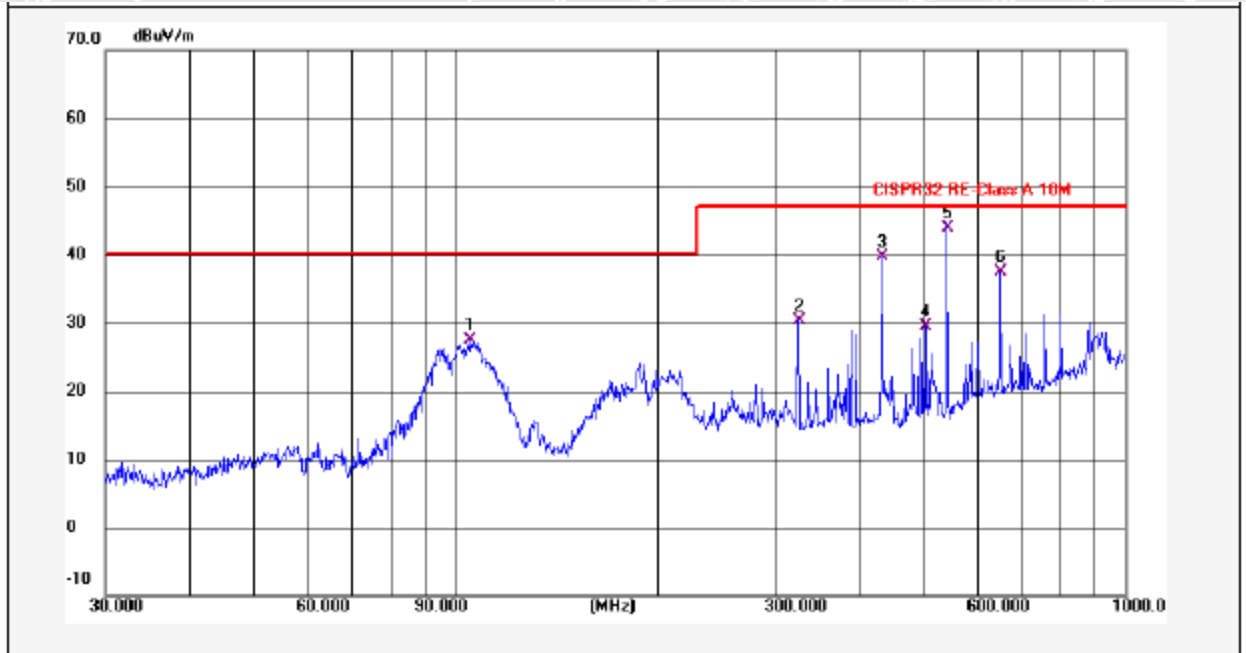


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/)	Margin (dB)	Detector	Remark
1	94.7601	41.74	-16.19	25.55	40.00	-14.45	QP	
2	107.8877	42.02	-14.38	27.64	40.00	-12.36	QP	
3	432.5457	48.47	-9.48	38.99	47.00	-8.01	QP	
4	541.3725	48.88	-7.11	41.77	47.00	-5.23	QP	
5	649.6597	36.98	-3.38	33.60	47.00	-13.40	QP	
6	906.4824	31.19	0.72	31.91	47.00	-15.09	QP	



AC 230V/50Hz

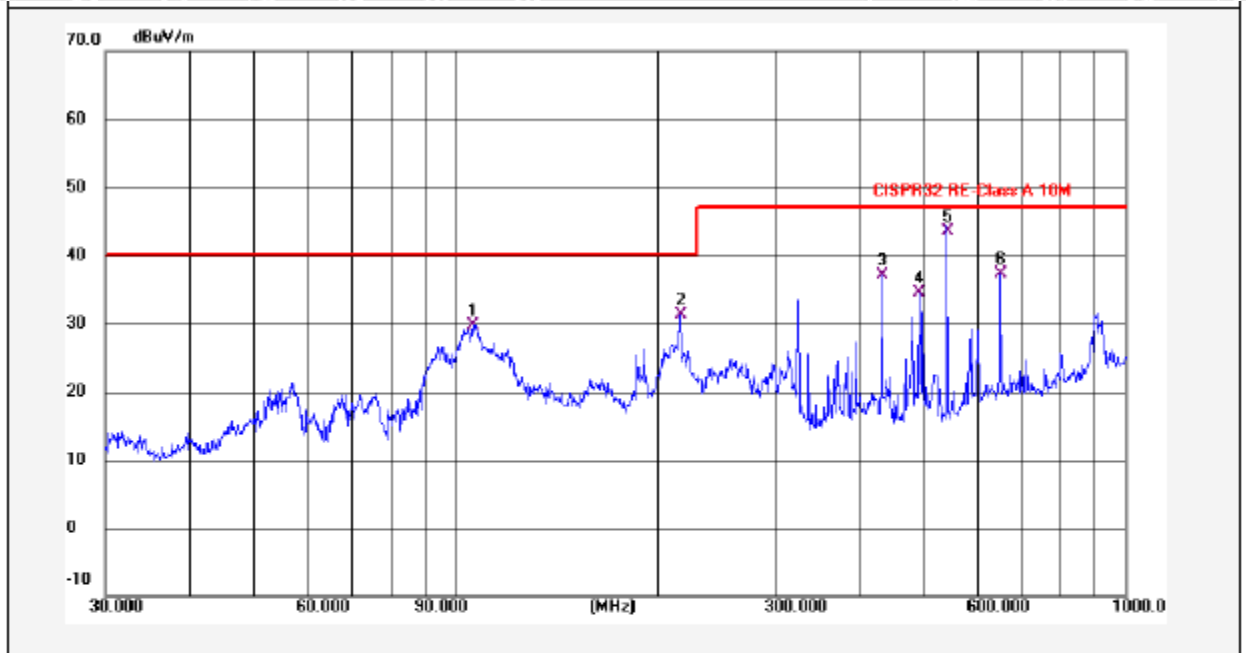
TM1 / Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	104.9033	42.22	-14.71	27.51	40.00	-12.49	QP	
2	324.4561	41.64	-11.37	30.27	47.00	-16.73	QP	
3	432.5457	49.17	-9.48	39.69	47.00	-7.31	QP	
4	504.7062	37.39	-7.80	29.59	47.00	-17.41	QP	
5	541.3725	51.01	-7.11	43.90	47.00	-3.10	QP	
6	649.6597	40.85	-3.38	37.47	47.00	-9.53	QP	



TM1 / Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV)	Margin (dB)	Detector	Remark
1	106.0126	44.28	-14.58	29.70	40.00	-10.30	QP	
2	216.0240	46.51	-15.28	31.23	40.00	-8.77	QP	
3	432.5457	46.52	-9.48	37.04	47.00	-9.96	QP	
4	492.4685	42.58	-8.01	34.57	47.00	-12.43	QP	
5	541.3725	50.62	-7.11	43.51	47.00	-3.49	QP	
6	649.6597	40.73	-3.38	37.35	47.00	-9.65	QP	



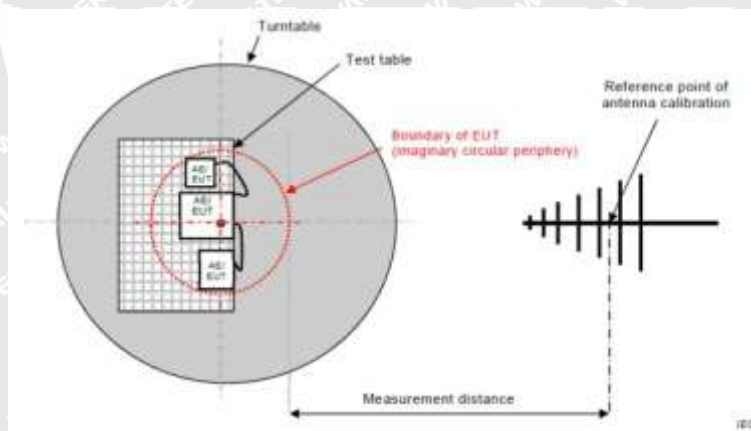
7.3 Radiated emissions (above 1GHz)

Test Requirement:	Class A		
Test Limit:	Frequency range(MHz)	Radiated emissions limit(dBμV/m)	
		Peak	Average
	1000-3000	76	56
	3000-6000	80	60
	Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 6000MHz		
Test Method:	CISPR 16-2-3		
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor		

7.3.1 E.U.T. Operation

Environmental Conditions					
Temperature:	23.1 °C	Humidity:	52.4 %	Atmospheric Pressure:	101.3 kPa
Test mode:	TM1				

7.3.2 Basic Test Setup Block Diagram

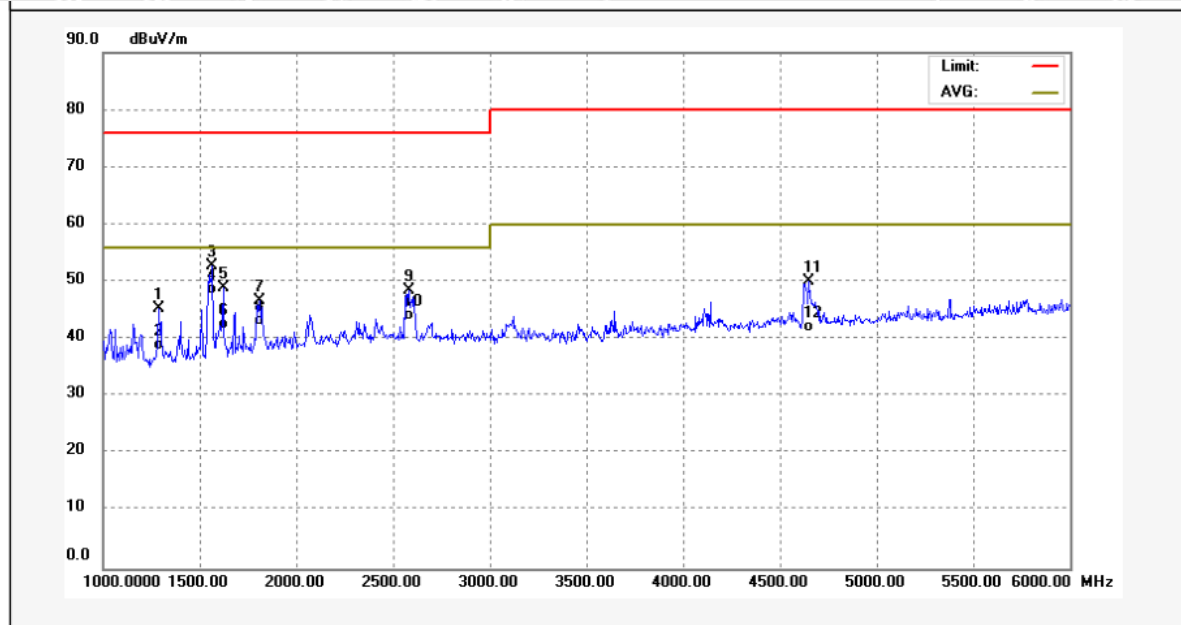




7.3.3 Summary of Test Results

AC 100V/50Hz

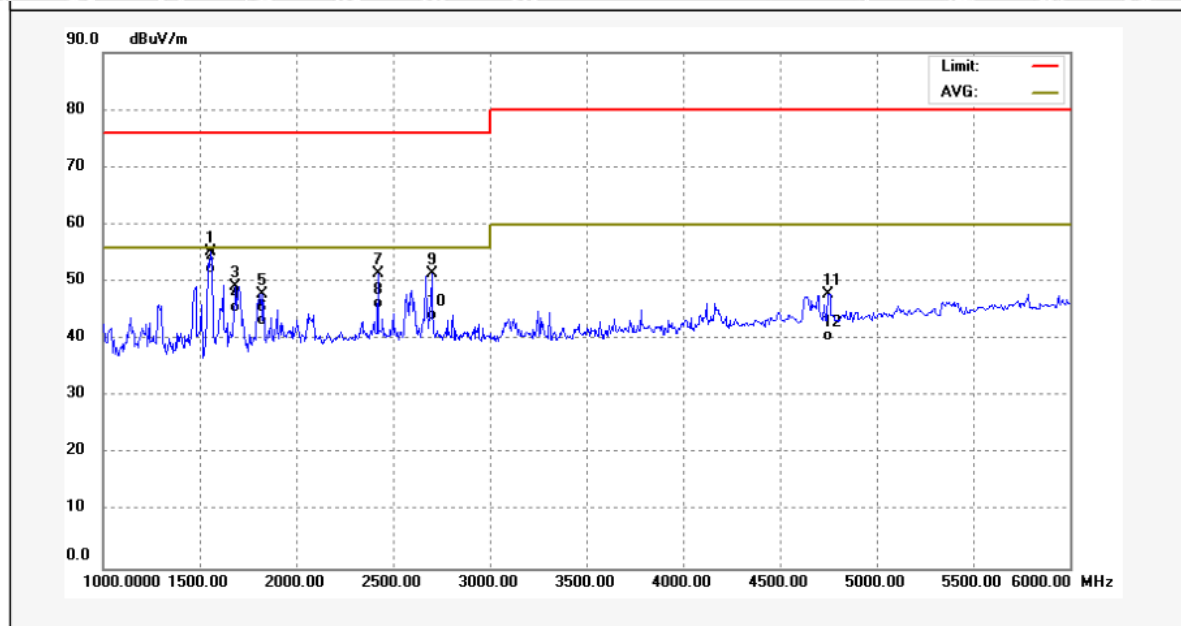
TM1 / Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1290.000	58.09	-12.85	45.24	76.00	-30.76	peak	
2	1290.000	51.87	-12.85	39.02	56.00	-16.98	AVG	
3	1565.000	64.71	-11.96	52.75	76.00	-23.25	peak	
4	1565.000	60.61	-11.96	48.65	56.00	-7.35	AVG	
5	1620.000	60.66	-11.68	48.98	76.00	-27.02	peak	
6	1620.000	54.30	-11.68	42.62	56.00	-13.38	AVG	
7	1810.000	57.46	-10.69	46.77	76.00	-29.23	peak	
8	1810.000	54.04	-10.69	43.35	56.00	-12.65	AVG	
9	2580.000	56.63	-8.18	48.45	76.00	-27.55	peak	
10	2580.000	52.44	-8.18	44.26	56.00	-11.74	AVG	
11	4650.000	55.84	-5.76	50.08	80.00	-29.92	peak	
12	4650.000	48.01	-5.76	42.25	60.00	-17.75	AVG	



TM1 / Polarization: Vertical

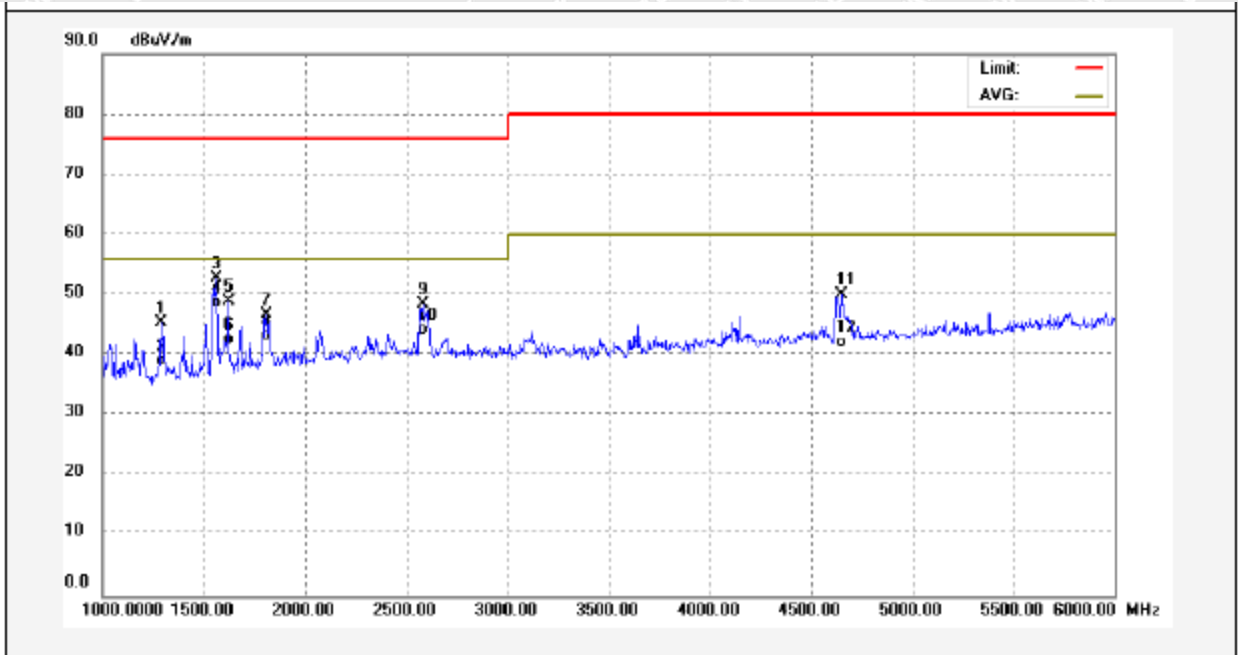


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1555.000	67.15	-12.00	55.15	76.00	-20.85	peak	
2	1555.000	64.24	-12.00	52.24	56.00	-3.76	AVG	
3	1685.000	60.59	-11.34	49.25	76.00	-26.75	peak	
4	1685.000	56.99	-11.34	45.65	56.00	-10.35	AVG	
5	1820.000	58.47	-10.66	47.81	76.00	-28.19	peak	
6	1820.000	53.91	-10.66	43.25	56.00	-12.75	AVG	
7	2420.000	59.76	-8.41	51.35	76.00	-24.65	peak	
8	2420.000	54.66	-8.41	46.25	56.00	-9.75	AVG	
9	2700.000	59.76	-8.24	51.52	76.00	-24.48	peak	
10	2700.000	52.50	-8.24	44.26	56.00	-11.74	AVG	
11	4750.000	53.42	-5.59	47.83	80.00	-32.17	peak	
12	4750.000	46.24	-5.59	40.65	60.00	-19.35	AVG	



AC 230V/50Hz

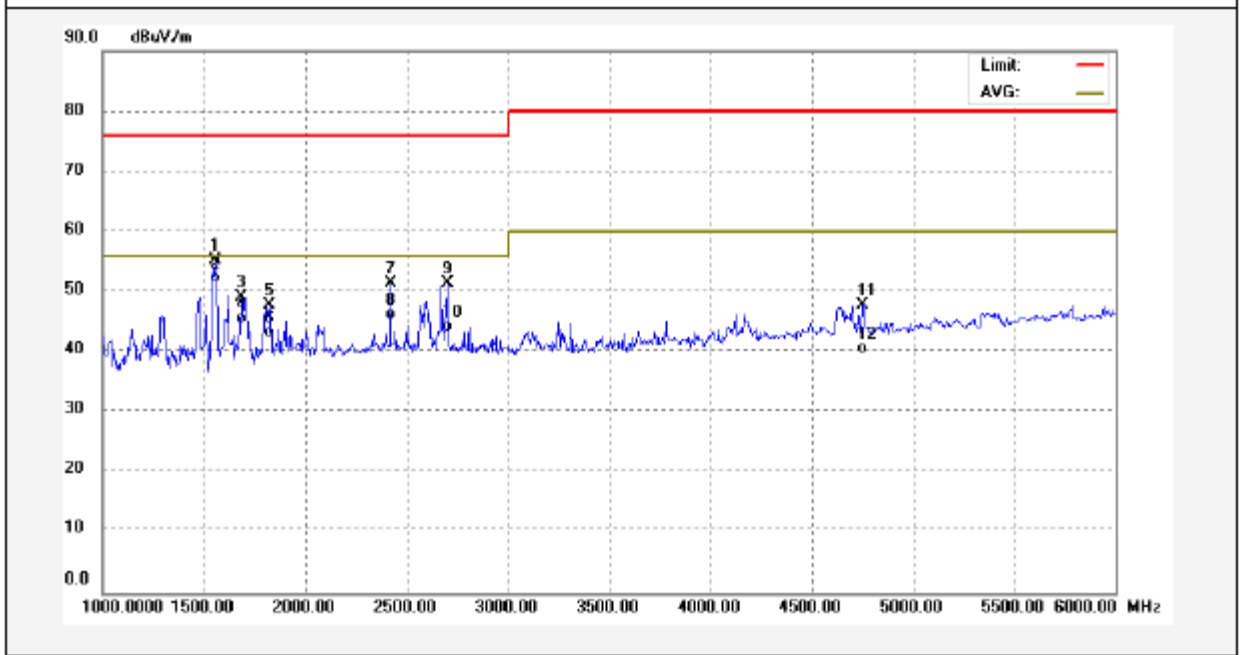
TM1 / Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Lim it (dBuV/m)	Margin (dB)	Detector	Remark
1	1290.000	58.09	-12.85	45.24	76.00	-30.76	peak	
2	1290.000	51.87	-12.85	39.02	56.00	-16.98	AVG	
3	1565.000	64.71	-11.96	52.75	76.00	-23.25	peak	
4	1565.000	60.61	-11.96	48.65	56.00	-7.35	AVG	
5	1620.000	60.66	-11.68	48.98	76.00	-27.02	peak	
6	1620.000	54.30	-11.68	42.62	56.00	-13.38	AVG	
7	1810.000	57.46	-10.69	46.77	76.00	-29.23	peak	
8	1810.000	54.04	-10.69	43.35	56.00	-12.65	AVG	
9	2580.000	56.63	-8.18	48.45	76.00	-27.55	peak	
10	2580.000	52.44	-8.18	44.26	56.00	-11.74	AVG	
11	4650.000	55.84	-5.76	50.08	80.00	-29.92	peak	
12	4650.000	48.01	-5.76	42.25	60.00	-17.75	AVG	



TM1 / Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1555.000	67.15	-12.00	55.15	76.00	-20.85	peak	
2	1555.000	64.24	-12.00	52.24	56.00	-3.76	AVG	
3	1685.000	60.59	-11.34	49.25	76.00	-26.75	peak	
4	1685.000	56.99	-11.34	45.65	56.00	-10.35	AVG	
5	1820.000	58.47	-10.66	47.81	76.00	-28.19	peak	
6	1820.000	53.91	-10.66	43.25	56.00	-12.75	AVG	
7	2420.000	59.76	-8.41	51.35	76.00	-24.65	peak	
8	2420.000	54.66	-8.41	46.25	56.00	-9.75	AVG	
9	2700.000	59.76	-8.24	51.52	76.00	-24.48	peak	
10	2700.000	52.50	-8.24	44.26	56.00	-11.74	AVG	
11	4750.000	53.42	-5.59	47.83	80.00	-32.17	peak	
12	4750.000	46.24	-5.59	40.65	60.00	-19.35	AVG	



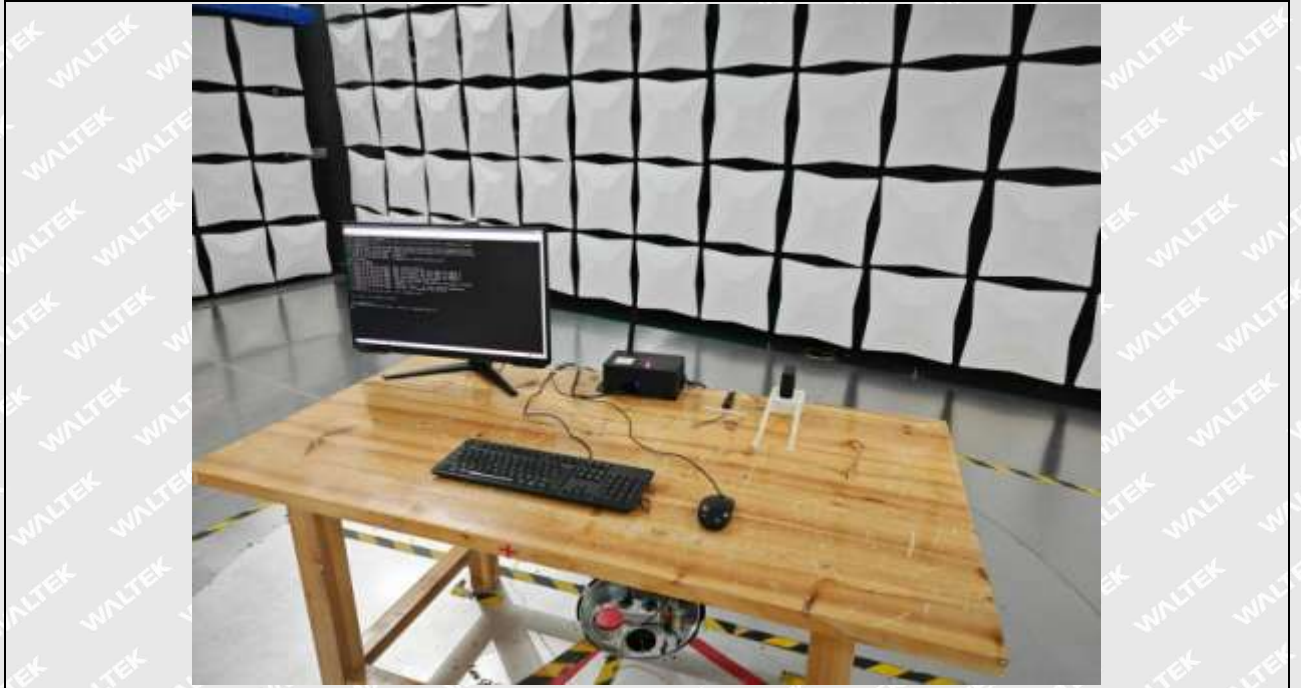
8 Photographs – Test Setup

8.1 Conducted emissions from AC mains power ports (150kHz-30MHz)

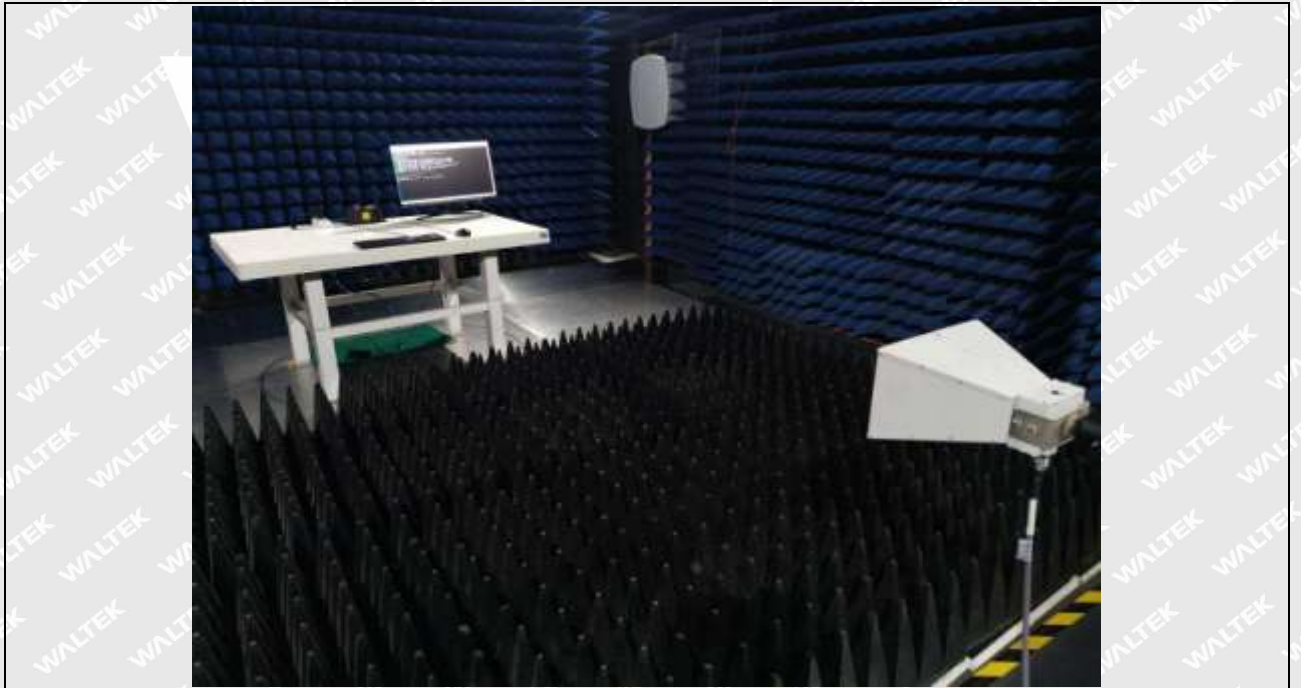


8.2 Radiated emissions (30MHz-1GHz)





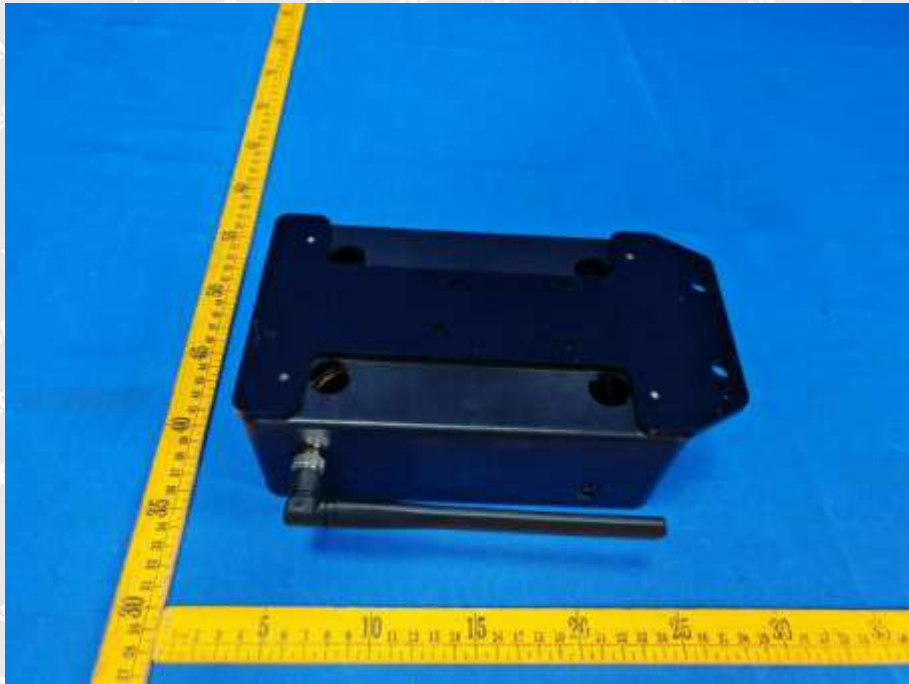
8.3 Radiated emissions (above 1GHz)

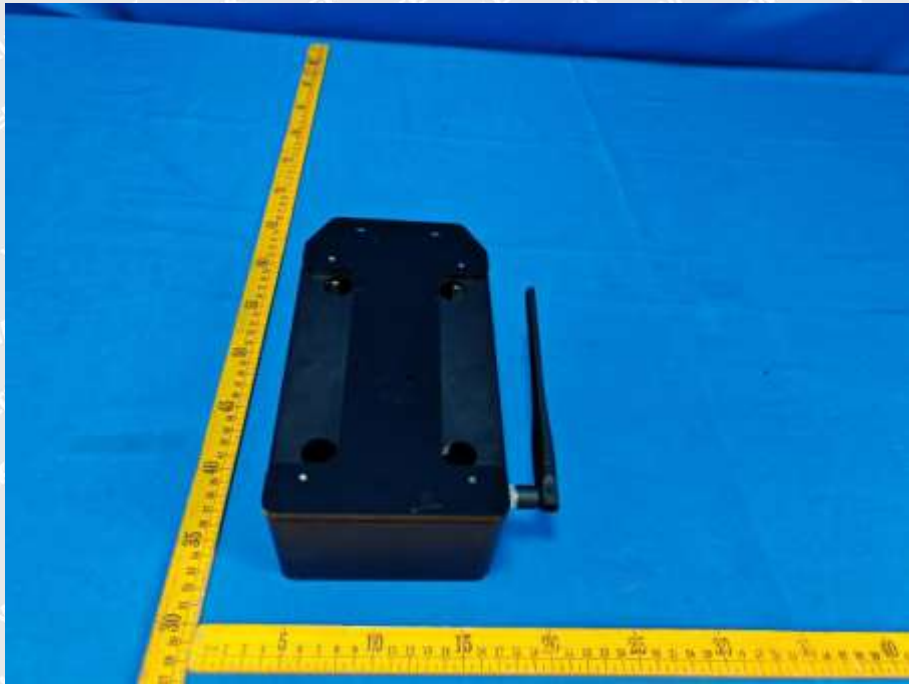




9 Photographs – Constructional Details









===== End of Report =====

WALTEK