



Shenzhen JT Detection Technology Co., Ltd

EMC Test Report



Product : Voice Recorder
Model Number : Q70,Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,Q10,Q11,Q12,Q13,Q15,Q16,Q17,Q18,Q19,Q20,Q21,Q22,Q23,Q25,Q26,Q27,Q28,Q29,Q30,Q31,Q32,Q33,Q35,Q50,Q51,Q52,Q53,Q55,Q60,Q61,Q62,Q63,Q65,Q71,Q72,Q73,Q75,Q80,Q81,Q82,Q83,Q85,Q90,Q91,Q92,Q93,Q95,Q500,Q300,Q200,M1,M2,M3,M4,M5,M6,M7,M8,M9,M10,M11,M12,M13,M15,M16,M17,M18,M19,M20,M21,M22,M23,M25,M26,M27,M28,M29,D1,D2,D3,D4,D5,D6,D7,D8,D9,L1,L2,L3,L4,L5,L6,L7,L8,S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12,S13,S15,S16,S17,S18,S19,S20,S21,S22,S23,S25,S26,S27,S28,S29,S30,S50,S60,S70,S80,S90,Q36,Q37,Q38,Q39,Q56,Q57,Q58,Q59,Q66,Q67,Q68,Q69,Q76,Q77,Q78,Q79,Q86,Q87,Q88,Q89,Q96,Q97,Q98,Q99,V1,V2,V3,V4,V5,V6,V7,V8,V9,V10,V11,V12,V13,V14,V15,V16,V17,V18,V19,V20
Prepared for : Shenzhen Huashendi Technology Co.,Ltd.
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Brand Name : N/A
Report No. : E1210-HSD
Date of Test : Dec 03,2020
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Prepared by(Engineer):

Reviewer(Quality Manager):



Approved & Authorized Signer(Manager):



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1 Test Summary

Test procedures according to the technical standards:

<u>EMC Emission</u>				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015	Conducted Emission	/	PASS	
	Radiated Emission	/	PASS	
EN61000-3-2:2014	Harmonic Current Emission	Class C	PASS	
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	-----	PASS	
<u>EMC Immunity</u>				
Section EN 55035: 2017	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006/A2:2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2012	Fast transients	B	PASS	
EN 61000-4-5:2014	Surges	B	PASS	
EN 61000-4-6:2014	Injected Current	A	PASS	
EN 61000-4-8:2010	Power Frequency Magnetic Field	A	Unihope	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	B / C NOTE (2)	PASS	

NOTE:

- (1) "Unihope" denotes test is not applicable in this Test Report
- (2) Voltage dip: 100% reduction – Performance Criteria **B**
Voltage dip: 30% reduction – Performance Criteria **C**
- (3) For client's request and manual description, the test will not be executed.

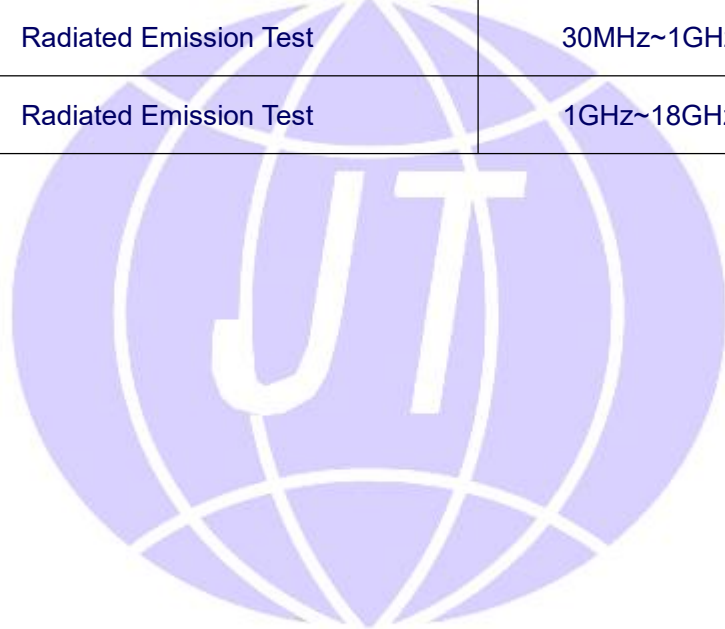


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1.1 Measurement Uncertainty

The report uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95% .

No.	Item	Frequency Range	U , Value
1	Power Line Conducted Emission	9KHz~30MHz	1.58 dB
2	MAGNETIC EMISSION MEASUREMENT	9KHz~30MHz	2.00 dB
3	Disturbance Power Emission (Conduction 1)	30MHz~300MHz	3.12 dB
4	Radiated Emission Test	30MHz~1GHz	3.40 dB
5	Radiated Emission Test	1GHz~18GHz	3.30 dB





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2 Test Facility
2.1 Deviation from standard
None
2.2 Abnormalities from standard conditions
None

3 General Information

3.1 General Description of EUT

Manufacturer:	Shenzhen Jienuo Hengxin Technology Co., Ltd.
Manufacturer Address:	904, Shijie Building, Gushu 1st Road, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
EUT Name:	Voice Recorder
Trade Name:	N/A
Model No:	Q70
Attached No.:	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,Q10,Q11,Q12,Q13,Q15,Q16,Q17,Q18, Q19,Q20,Q21,Q22,Q23,Q25,Q26,Q27,Q28,Q29,Q30,Q31,Q32,Q33,Q35,Q50, Q51,Q52,Q53,Q55,Q60,Q61,Q62,Q63,Q65,Q71,Q72,Q73,Q75,Q80,Q81,Q82,Q83,Q85,Q90, Q91,Q92,Q93,Q95,Q500,Q300,Q200,M1,M2,M3,M4,M5,M6,M7,M8,M9,M10,M11,M12,M13, M15,M16,M17,M18,M19,M20,M21,M22,M23,M25,M26,M27,M28,M29,D1,D2,D3,D4,D5,D6,D7, D8,D9,L1,L2,L3,L4,L5,L6,L7,L8,S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12,S13,S15,S16,S17, S18,S19,S20,S21,S22,S23,S25,S26,S27,S28,S29,S30,S50,S60,S70,S80,S90,Q36,Q37,Q38, Q39,Q56,Q57,Q58,Q59,Q66,Q67,Q68,Q69,Q76,Q77,Q78,Q79,Q86,Q87,Q88,Q89,Q96,Q97, Q98,Q99,V1,V2,V3,V4,V5,V6,V7,V8,V9,V10,V11,V12,V13,V14,V15,V16,V17,V18,V19,V20
Power Supply:	5V;50~60Hz ;100mA
Test Supply:	3.7V;10mA

3.1.1 EUT Test Mode

Mode 1	ON
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4 Equipments List for All Test Items

No.	Equipment	Manufacturer	Model No.	S/N	Cal date
1	EMI Test Receiver	R&S	ESCI	100612	Sept 21,2021
2	EMI Test Receiver	R&S	ESPI	100067	Sept 21,2021
3	Amplifier	HP	8447D	1937A02415	Sept 21,2021
4	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07118	Sept 21,2021
5	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-387	Sept 21,2021
6	Horn Antenna	SCHWARZBECK	BBHA9120A	B08000991-0021	Sept 21,2021
7	High Field Biconical Antenna	ELECTRO-METRICS	EM-6913	169	Sept 21,2021
8	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	818	Sept 21,2021
9	Remote Active Vertical Antenna	ELECTRO-METRICS	EM-6892	354	Sept 21,2021
10	Power Clamp	SCHWARZBECK	MDS-21	3898	Sept 21,2021
11	Single Power Conductor Module	FCC	FCC-LISN-5-50-1-01-CISPR25	07254	Sept 21,2021
12	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	D-69124	Sept 21,2021
13	Positioning Controller	C&C	CC-C-1F	MF7802155	Sept 21,2021
14	Electrostatic Discharge Simulator	TESEQ	NSG437	128	Sept 21,2021
15	Fast Transient Burst Generator	SCHAFFNER	MODULA6150	34587	Sept 21,2021
16	Fast Transient Noise Simulator	Noiseken	FNS-105AX	31438	Sept 21,2021
17	Capacitive Coupling Clamp	TESEQ	CDN8014	25115	Sept 21,2021
18	Color TV Pattern Generator	PHILIPS	PM5418	TDB-00409966	Unihope
19	Power Frequency Magnetic Field Gene	EVERFINE	EMS61000-8K	608085	Sept 21,2021
20	Triple-Loop Antenna	EVERFINE	LLA-2	607035	Sept 21,2021
21	10dB attenuator	SCHWARZBECK	MTAIMP-136	R65.90.0009	Sept 21,2021



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5 Emission Test Results

5.1 Mains Terminals Disturbance Voltage Measurement

POWER LINE CONDUCTED EMISSION(Frequency Range 9KHz-30MHz)

FREQUENCY (MHz)	(dBuV)	
	Quasi-peak	Average
0.009-0.05	110	--
0.05-0.15	90-80	--
0.15 -0.5	66 - 56 *	56- 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximized peak within 6dB of Average Limit
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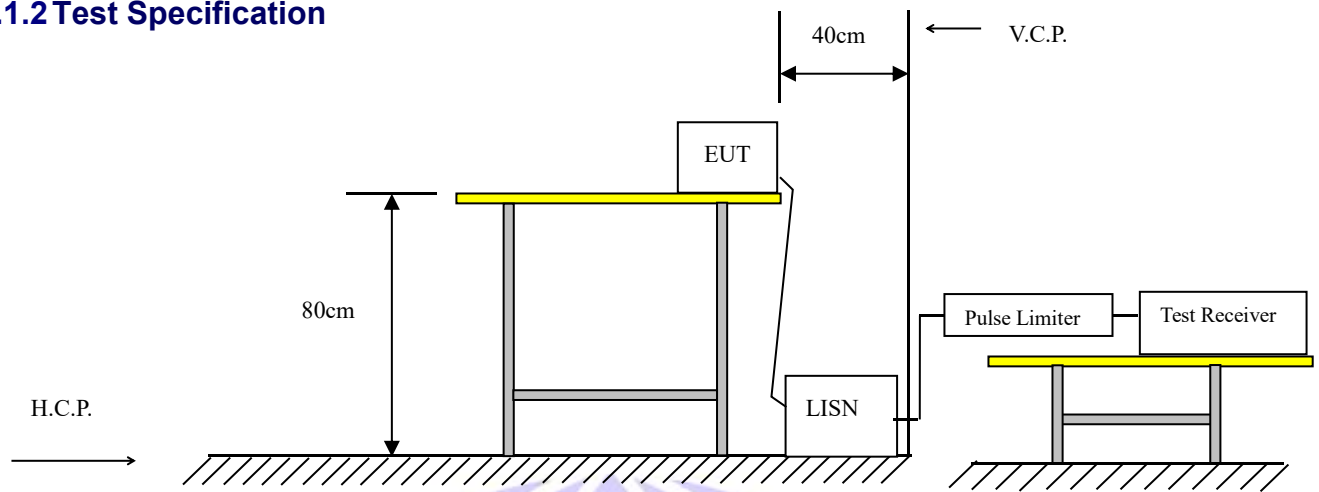
5.1.1 E.U.T. Operation

Temperature:	23°C	Humidity:	55% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	



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5.1.2 Test Specification



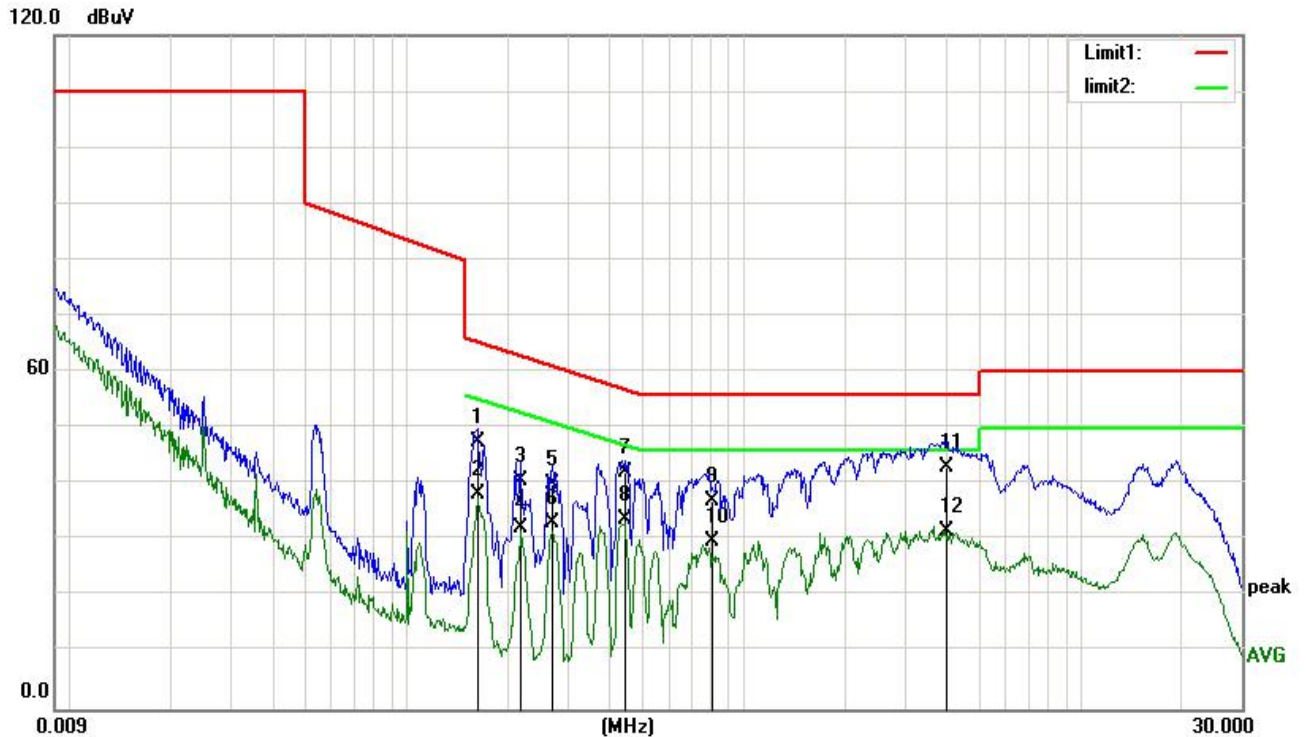
EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

5.1.3 Measurement Data



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EUT:	Voice Recorder	Model No.:	Q70
Temperature:	24°C	Relative Humidity:	55%
Probe:	L1	Test Power:	5V
Standard:	(CE)EN55032_QP	Test Result:	Pass
Test Mode:	ON	Test By:	Dylan
Note:			

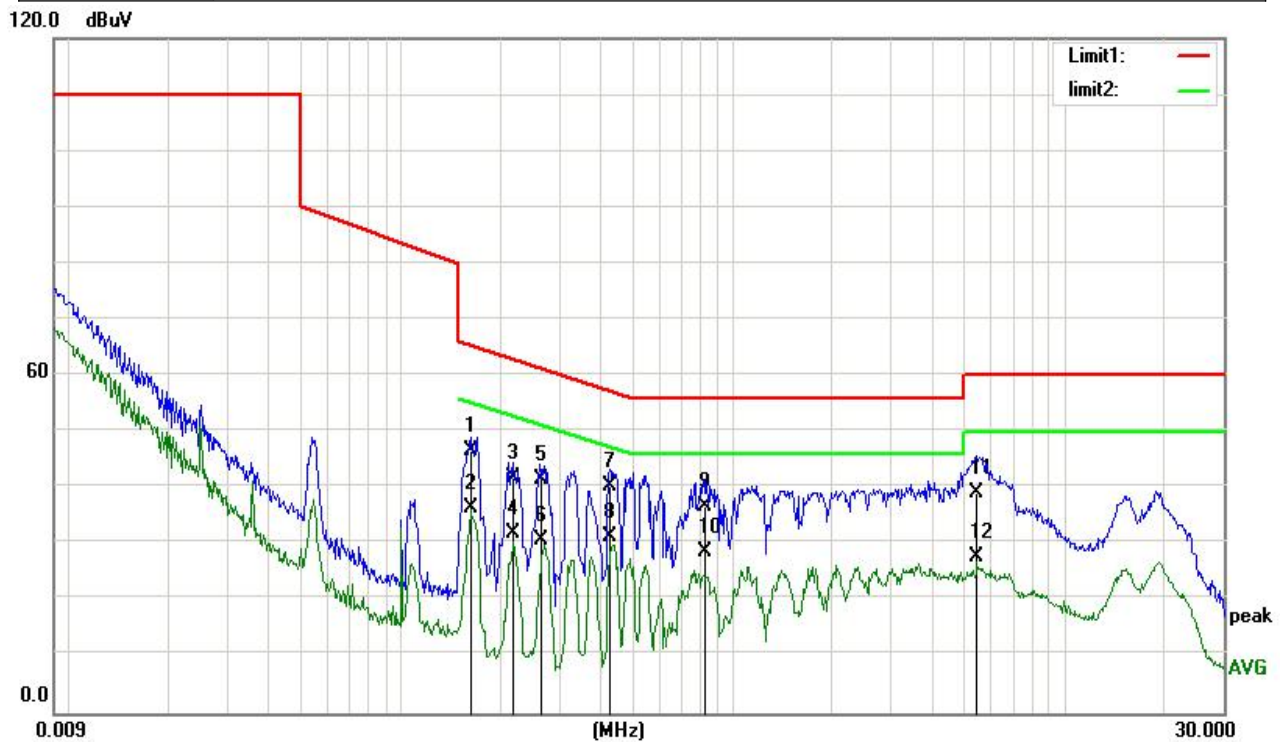


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1625	36.24	11.38	47.62	65.33	-17.71	QP
2	0.1625	26.72	11.38	38.10	55.33	-17.23	AVG
3	0.2192	29.59	10.99	40.58	62.85	-22.27	QP
4	0.2192	21.20	10.99	32.19	52.85	-20.66	AVG
5	0.2709	29.53	10.64	40.17	61.09	-20.92	QP
6	0.2709	22.58	10.64	33.22	51.09	-17.87	AVG
7	0.4442	31.77	10.25	42.02	56.98	-14.96	QP
8	0.4442	23.61	10.25	33.86	46.98	-13.12	AVG
9	0.8067	26.87	10.09	36.96	56.00	-19.04	QP
10	0.8067	19.83	10.09	29.92	46.00	-16.08	AVG
11	4.0061	32.78	10.14	42.92	56.00	-13.08	QP
12	4.0061	21.61	10.14	31.75	46.00	-14.25	AVG



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EUT:	Voice Recorder	Model No.:	Q70
Temperature:	24°C	Relative Humidity:	55%
Probe:	N	Test Power:	5V
Standard:	(CE)EN55032_QP	Test Result:	Pass
Test Mode:	ON	Test By:	Dylan
Note:			



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1619	35.25	11.39	46.64	65.36	-18.72	QP
2	0.1619	25.18	11.39	36.57	55.36	-18.79	AVG
3	0.2153	30.79	11.02	41.81	62.99	-21.18	QP
4	0.2153	20.79	11.02	31.81	52.99	-21.18	AVG
5	0.2642	30.86	10.68	41.54	61.30	-19.76	QP
6	0.2642	20.17	10.68	30.85	51.30	-20.45	AVG
7	0.4262	30.07	10.28	40.35	57.33	-16.98	QP
8	0.4262	20.93	10.28	31.21	47.33	-16.12	AVG
9	0.8149	26.53	10.09	36.62	56.00	-19.38	QP
10	0.8149	18.67	10.09	28.76	46.00	-17.24	AVG
11	5.4713	29.14	10.10	39.24	60.00	-20.76	QP
12	5.4713	17.57	10.10	27.67	50.00	-22.33	AVG



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5.2 MAGNETIC EMISSION MEASUREMENT						
Frequency Range:		9kHz to 30MHz				
Limits of Radiated Emission Measurement						
Frequency	<input checked="" type="checkbox"/> 2m	<input type="checkbox"/> 3m	<input checked="" type="checkbox"/> 4m			
	dB(μA)	dB(μA)	dB(μA)			
9 KHz~ 70 KHz	88	81	75			
70 KHz ~ 150 KHz	88 to 58(2)	81 to 51	75 to 45			
150 KHz ~ 3 MHz ⁽¹⁾	58 to 22(2)	51 to 15	45 to 9			
3 MHz ~ 30 MHz ⁽¹⁾	22	15 to 16	9 to 12			
<p>(1)The tighter limit applies at the band edges.</p> <p>(2)The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.</p>						
Detector:		Peak for pre-scan				
		Quasi-Peak if maximum peak within 6dB of limit				
5.2.1 E.U.T. Operation						
Temperature:	22°C	Humidity:	51% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	
5.2.2 Test Specification						
<p>EUT was placed upon a wooden test table which was placed in the center of the test antenna, and operating in the mode as mentioned above. A receiver is used to detect the actual value of each frequency which need to be checked. All three field directions were measured in sequence.</p>						



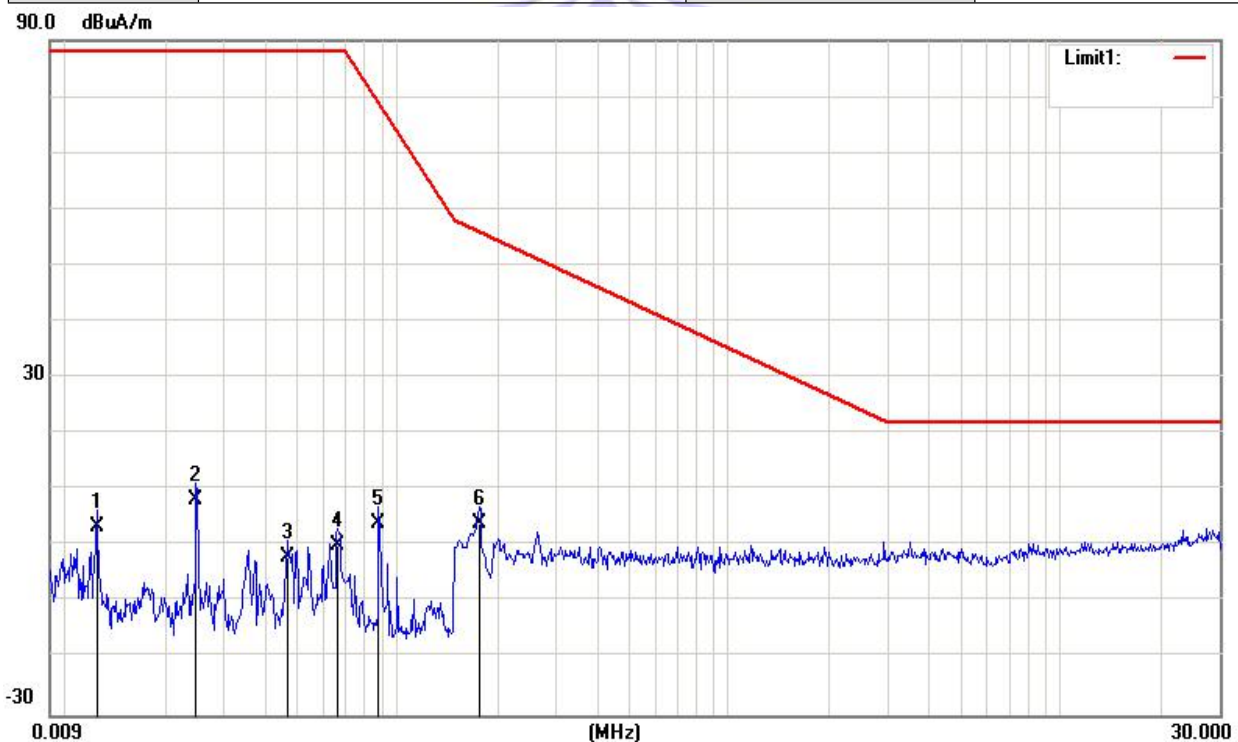
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5.2.3 Measurement Data

An initial pre-scan was performed using the receiver in peak detection mode. The EUT was measured by 3 antenna position and peak emissions from the EUT were detected within 6dB of the class B limit line.

The following quasi-peak measurements were performed on the EUT.

EUT:	Voice Recorder	Model No.:	Q70
Temperature:	24 °C	Relative Humidity:	55%
Probe:	L1	Test Power:	5V
Standard:	EN55032 TRIPLE LOOP	Test Result:	Pass
Test Mode:	ON	Test By:	Dylan



No.	Frequency (MHz)	Reading (dBuA/m)	Correct Factor(dB)	Result (dBuA/m)	Limit (dBuA/m)	Margin (dB)	Remark
1	0.0125	-15.41	18.81	3.40	88.00	-84.60	QP
2	0.0247	-9.76	18.07	8.31	88.00	-79.69	QP
3	0.0468	-19.59	17.71	-1.88	88.00	-89.88	QP
4	0.0661	-17.91	17.94	0.03	88.00	-87.97	QP
5	0.0884	-13.85	17.84	3.99	78.81	-74.82	QP
6	0.1779	-13.68	17.61	3.93	55.94	-52.01	QP

Note: "*" means the disturbance power level 20dB lower than the relevant limit.

QP Level = QP Reading + Cable Loss



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EUT:	Voice Recorder	Model No.:	Q70
Temperature:	24 °C	Relative Humidity:	55%
Probe:	L2	Test Power:	5V
Standard:	EN55032 TRIPLE LOOP	Test Result:	Pass
Test Mode:	ON	Test By:	Dylan

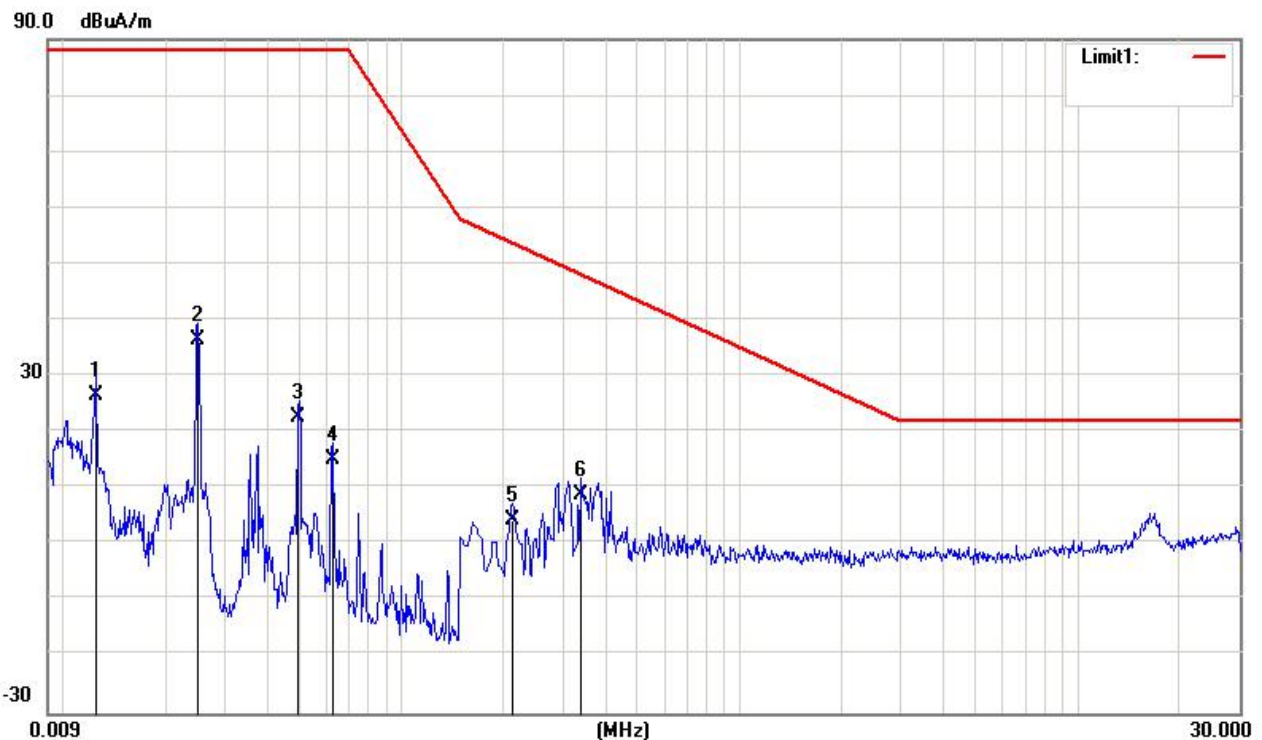


No.	Frequency (MHz)	Reading (dBuA/m)	Correct Factor(dB)	Result (dBuA/m)	Limit (dBuA/m)	Margin (dB)	Remark
1	0.0125	10.40	18.81	29.21	88.00	-58.79	QP
2	0.0250	16.76	18.06	34.82	88.00	-53.18	QP
3	0.0497	5.34	17.76	23.10	88.00	-64.90	QP
4	0.0626	-1.78	17.92	16.14	88.00	-71.86	QP
5	0.2379	-12.35	17.69	5.34	52.45	-47.11	QP
6	0.3379	-7.12	17.89	10.77	48.23	-37.46	QP



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EUT:	Voice Recorder	Model No.:	Q70
Temperature:	24 °C	Relative Humidity:	55%
Probe:	L3	Test Power:	5V
Standard:	EN55032 TRIPLE LOOP	Test Result:	Pass
Test Mode:	ON	Test By:	Dylan



No.	Frequency (MHz)	Reading (dBuA/m)	Correct Factor(dB)	Result (dBuA/m)	Limit (dBuA/m)	Margin (dB)	Remark
1	0.0125	7.60	18.81	26.41	88.00	-61.59	QP
2	0.0250	18.26	18.06	36.32	88.00	-51.68	QP
3	0.0497	4.84	17.76	22.60	88.00	-65.40	QP
4	0.0626	-2.78	17.92	15.14	88.00	-72.86	QP
5	0.2139	-13.28	17.64	4.36	53.73	-49.37	QP
6	0.3379	-9.12	17.89	8.77	48.23	-39.46	QP



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5.3 Radiated Emission Measurement

Limits of Radiated Emission Measurement (Below 1GHz)

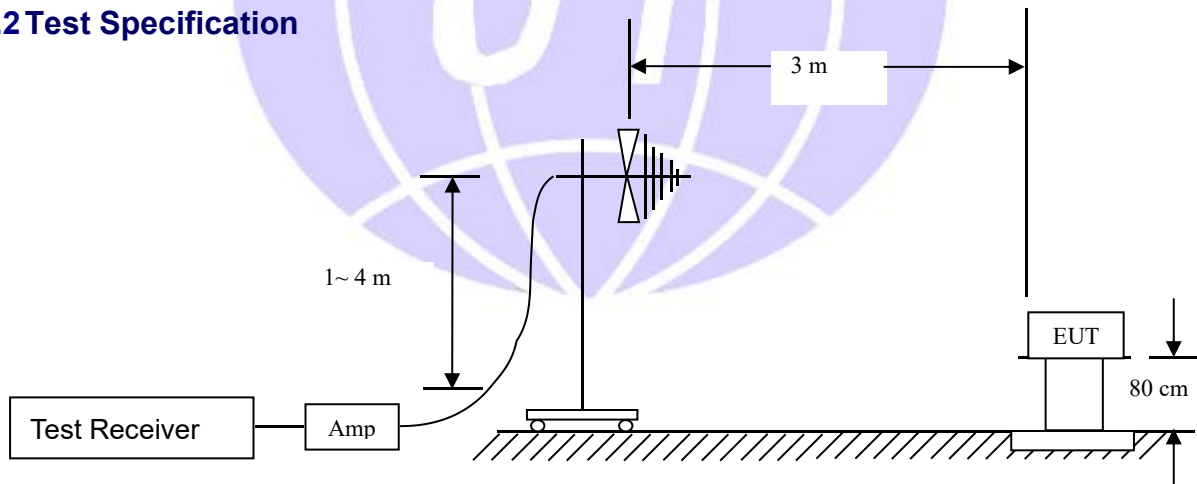
Frequency (MHz)	<input type="checkbox"/> Class A (10m)	<input checked="" type="checkbox"/> Class B (3m)
	Quasi-Peak dB(μ V/m)	
30 ~ 230	40.0	40.0
230 ~ 300	47.0	47.0

Detector: Peak for pre-scan (120kHz resolution bandwidth)
 Quasi-Peak if maximum peak within 6dB of limit

5.3.1 E.U.T. Operation

Temperature:	24°C	Humidity:	52% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	

5.3.2 Test Specification



EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested.



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5.3.3 Measurement Data

An initial pre-scan was performed in the 3m chamber using the spectrum analyzers in peak detection mode. The EUT was measured by Biology antenna with 2 orthogonal polarities and peak emissions from the EUT were detected within 6dB of the class B limit line.

The following quasi-peak measurements were performed on the EUT.

EUT:	Voice Recorder	Model No.:	Q70
Temperature:	24°C	Relative Humidity:	55%
Distance:	3m	Test Power:	5V
Polarization:	Horizontal	Test Result:	Pass
Standard:	(RE)EN55032 class B 3m	Test By:	Dylan
Test Mode:	ON		

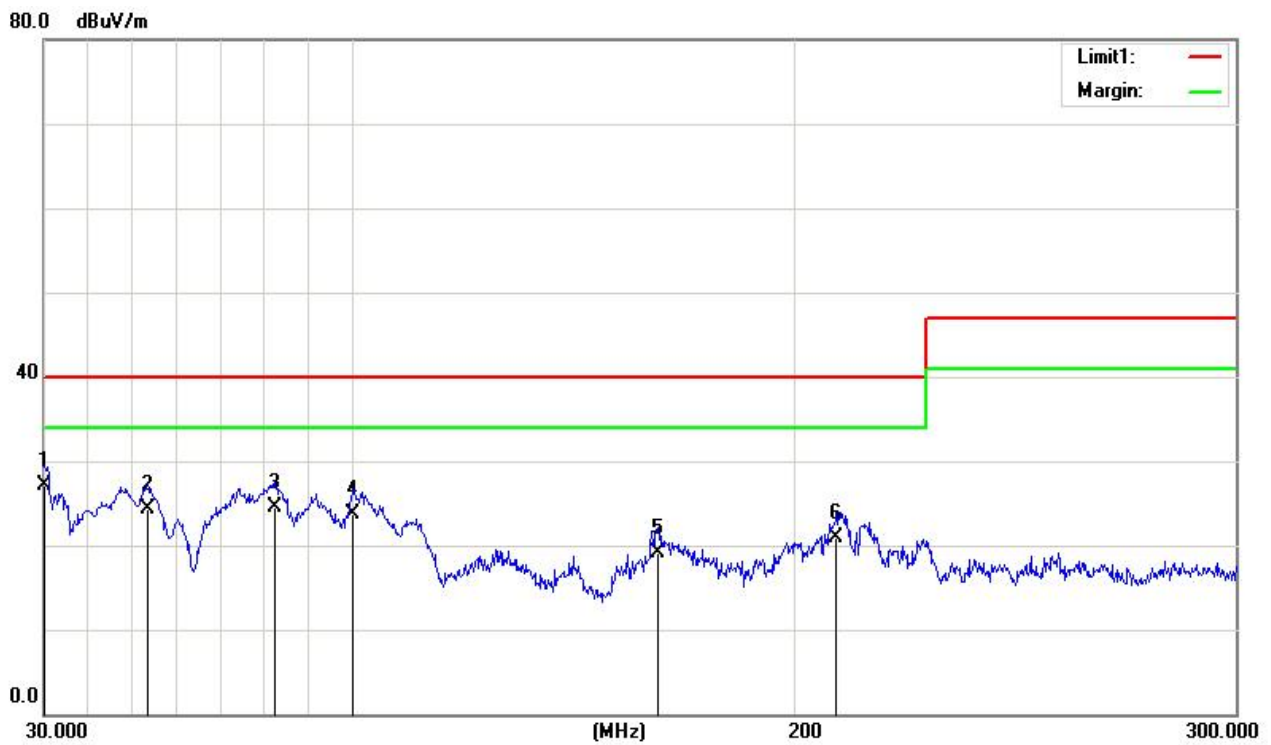


No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	31.8900	33.48	-8.91	24.57	40.00	-15.43	QP
2	53.4900	28.56	-14.04	14.52	40.00	-25.48	QP
3	80.4900	31.85	-16.98	14.87	40.00	-25.13	QP
4	102.0899	30.27	-16.88	13.39	40.00	-26.61	QP
5	116.1299	27.12	-14.84	12.28	40.00	-27.72	QP
6	211.7100	28.39	-12.53	15.86	40.00	-24.14	QP



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EUT:	Voice Recorder	Model No.:	Q70
Temperature:	24°C	Relative Humidity:	55%
Distance:	3m	Test Power:	5V
Polarization:	Vertical	Test Result:	Pass
Standard:	(RE)EN55032 class B 3m	Test By:	Dylan
Test Mode:	ON		



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	35.39	-8.32	27.07	40.00	-12.93	QP
2	53.4900	36.94	-12.73	24.21	40.00	-15.79	QP
3	82.3799	38.71	-14.15	24.56	40.00	-15.44	QP
4	99.9300	35.94	-12.17	23.77	40.00	-16.23	QP
5	169.0500	27.26	-8.13	19.13	40.00	-20.87	QP
6	209.5500	29.51	-8.54	20.97	40.00	-19.03	QP



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5.4 Harmonics

Frequency Range: 100Hz to 2kHz

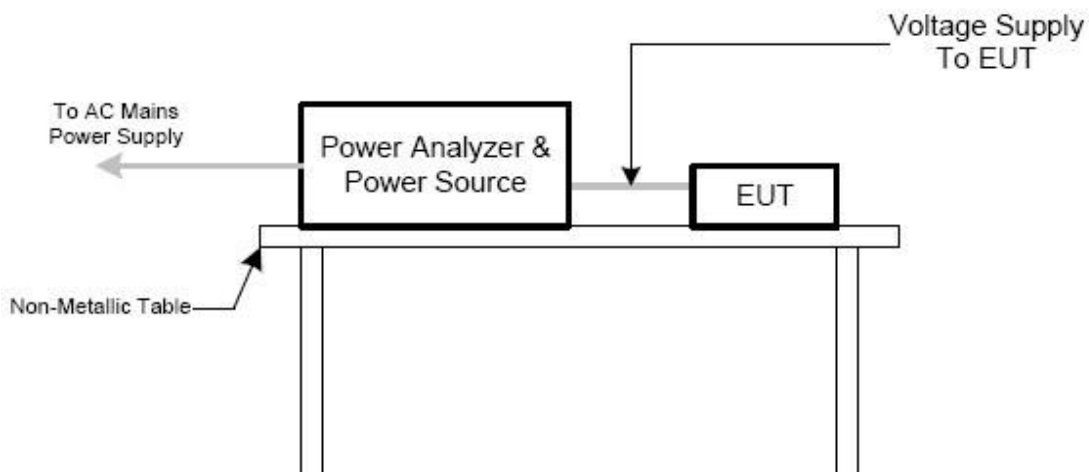
Test Requirement: EN 61000-3-2

5.4.1 E.U.T. Operation

Temperature:	22°C	Humidity:	50% RH	Atmospheric Pressure:	101	Kpa
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Test Mode:	Mode 1	The Worst Mode:	Mode 1
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5.4.2 Test specification



EUT operated in the mode as mentioned above, and connected to Harmonic/Flicker measuring equipment which was connected to an AC power source. Measurement was performed after EUT operating in static state for 10 seconds. Each order harmonics found to meet the relevant limits.



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5.4.3 Measurement Data

Unihope

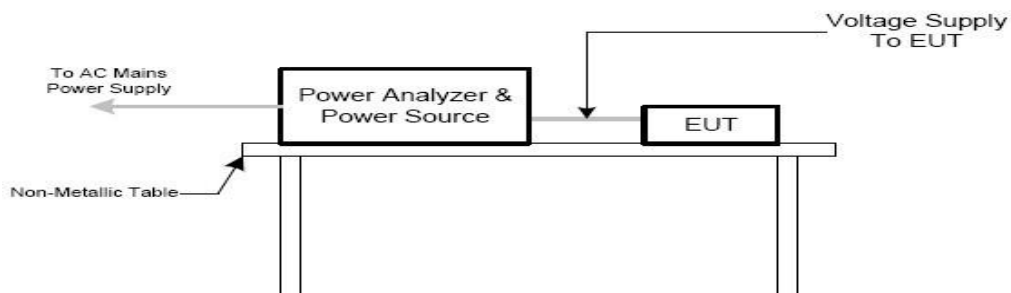
5.5 Voltage changes, voltage fluctuations and flicker

Test Requirement: EN 61000-3-3

5.5.1 E.U.T. Operation

Temperature:	22°C	Humidity:	50% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1		The Worst Mode:		Mode 1	

5.5.2 Test specification

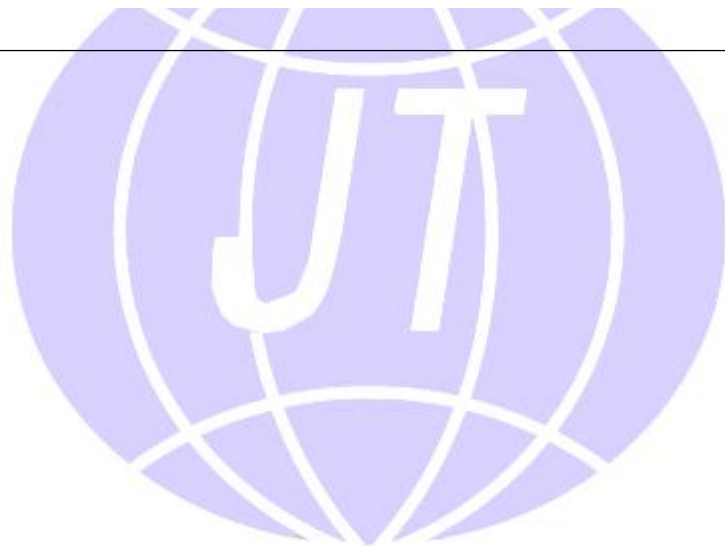
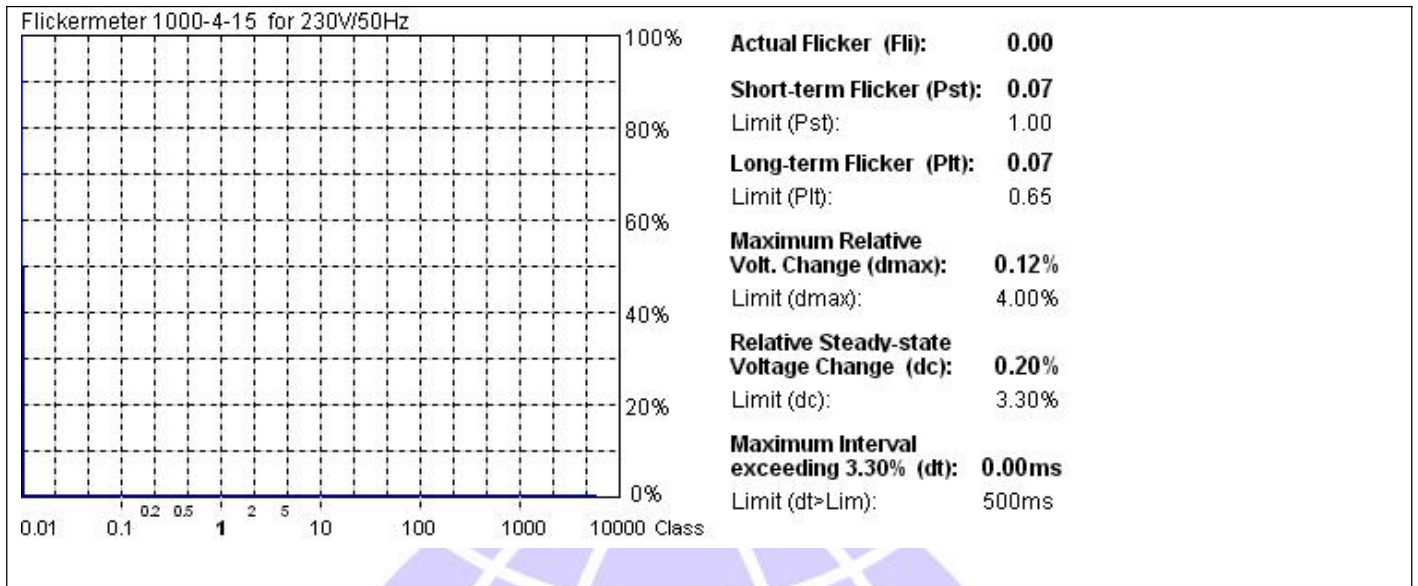


EUT was operated in the mode as mentioned above, and connected to Harmonic/Flicker measuring equipment which was connected to an AC power source.



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5.5.3 Measurement Data





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6 Immunity Test Results

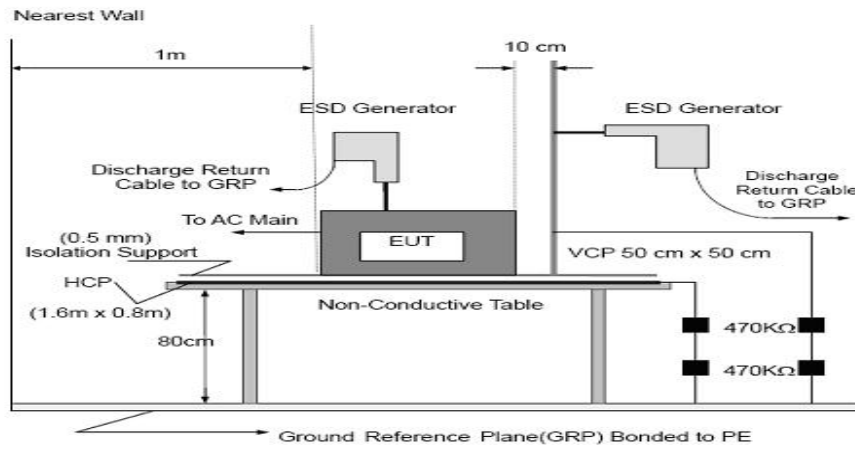
6.1 Electrostatic discharge immunity test

Acceptable Performance Criterion:	B					
Discharge Impedance:	330 Ω / 150 pF					
Discharge Voltage:	Air Discharge:		± 8 kV			
	Contact Discharge:		± 4 kV			
	VCP, HCP:		± 4 kV			
Polarity:	Positive & Negative					
Minimum discharge Interval:	1 second					
6.1.1 E.U.T. Operation						
Temperature:	24°C	Humidity:	48% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	



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6.1.2 Test specification



EUT was operated in the mode as mentioned above. Both contact and air discharge was executed. Contact discharge to the conductive surfaces and to coupling planes; air discharge at insulating surfaces. Each test point shall be subjected to 10 discharges at least (For each voltage and polarity).



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6.1.3 Measurement Data Test Record

Form: AMC 410-6

Electrostatic Discharge Test Results																			
Applicant: <u>Shenzhen Huashendi Technology Co., Ltd.</u>										Test Date: <u>Dec 03, 2020</u>				<input type="checkbox"/> IEC61000-4-2 <input checked="" type="checkbox"/> EN61000-4-2 <input type="checkbox"/> other: _____					
EUT: <u>Voice Recorder</u>										Test Result: <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail									
M/N: <u>Q70</u>										Temp: <u>24</u> °C				Humi: <u>48</u> %					
Test Voltage: <u>5V</u>										Atmospheric Pressure: <u>101</u> Kpa									
Operating Mode		ON																	
Discharge times		Contact discharge: minimum <u>10</u> times (+/- respectively) at each point, Air discharge: minimum <u>10</u> times (+/- respectively) at each point.																	
Discharge Mode		Air Discharge								Contact Discharge								Performance Criterion	Result
Test level (kV)		4		8		10		15		2		4		6		8			
Test Location		+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
HCP														A	A			B	Pass
VCP														A	A				Pass
A1				B	B														Pass
A2				B	B														Pass
Note: "P" means Pass , Horizontal Coupling Plane(HCP) and Vertical Coupling plane(VCP).																			



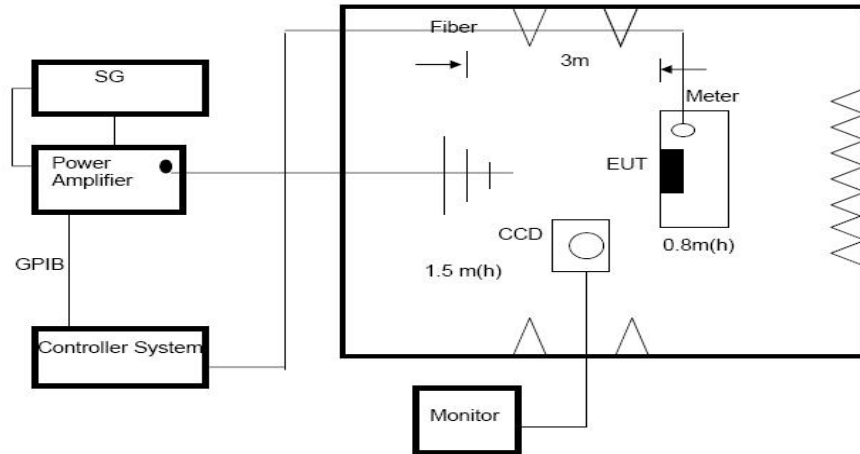
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6.2 RF field strength immunity test						
Acceptable Performance Criterion:	A					
Test Level	3 V/m					
Test Distance	3 m					
Frequency Range	80MHz~1000MHz					
Polarity:	Horizontal & Vertical					
6.2.1 E.U.T. Operation						
Temperature:	24°C	Humidity:	52% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	



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6.2.2 Test specification



Test was executed in a fully Anechoic chamber. An antenna was used to transmit interference signal. EUT was placed upon a wooden table above the reference ground 0.8m, and was positioned so that the four sides of the EUT shall be exposed to the electromagnetic field in a sequence. In each position the performance of the EUT was investigated. A camera was used to monitor the loss of function or degradation of performance of the EUT.



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6.2.3 Measurement Data

Test Record

Form: AMC410-7

Radiated Frequency Field Strength Susceptibility Results					
Applicant: <u>Shenzhen Huashendi Technology Co.,Ltd.</u>		Test Date: <u>Dec 03,2020</u>		<input type="checkbox"/> IEC61000-4-2 <input checked="" type="checkbox"/> EN61000-4-2 <input type="checkbox"/> other: _____	
EUT: <u>Voice Recorder</u>		Test Result: <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail			
M/N: <u>Q70</u>		Temp: <u>24</u> °C	Humi: <u>48</u> %		
Test Voltage: <u>5V</u>		Atmospheric Pressure: <u>101</u> Kpa			
Test Port	Enclosure				
Operating Mode	Mode 1				
Test Level	<u>3</u> V/m(r.m.s) (unmodulated)			Criteria	
Frequency Range(MHz)	Antenna polarity	Modulation	EUT position	Result	
80~1000	Horizontal	1KHz, 80% AM	Front	Pass	
			Rear	Pass	
			Left	Pass	
			Right	Pass	
80~1000	Vertical	1KHz, 80% AM	Front	Pass	
			Rear	Pass	
			Left	Pass	
			Right	Pass	



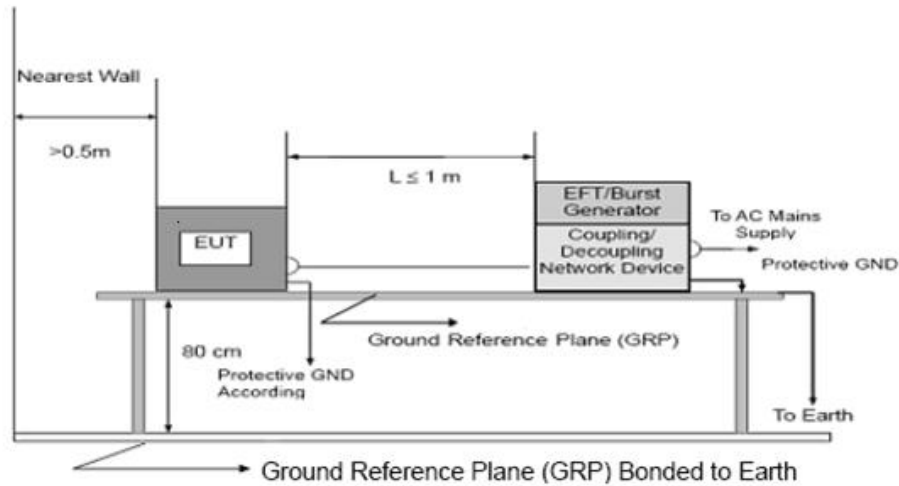
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6.3 Electrical fast transient/burst immunity test						
Acceptable Performance Criterion:	B					
Test Level:	0.5, 1.0, kV on AC Line					
Repetition Frequency:	5 kHz					
Burst Duration:	300 ms					
Test Duration:	1 minutes for each level & polarity					
6.3.1 E.U.T. Operation						
Temperature:	24°C	Humidity:	48% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	



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6.3.2 Test specification



EUT was placed on a metal ground reference plane and was insulated from it by a wooden support which is 0.1m thick. The ground reference plane is connected to the protective earth. The test generator and the coupling/decoupling network were placed directly on, and bonded to the ground reference plane.

6.3.3 Measurement Data

Mode	(X) AC Power Line		() DC Power Line		() Signal/Control Line	
Test Level	1KV		0.5KV		0.5KV	
Port(s)	Polarity	Results	Polarity	Results	Polarity	Results
Line (L)	P	A	P		P	
	N	A	N		N	
Neutral (N)	P	A	P		P	
	N	A	N		N	
Line + Neutral (L+N)	P	A	P		P	
	N	A	N		N	
Ground (PE)	P		P		P	
	N		N		N	
Line + Ground (L+PE)	P		P		P	
	N		N		N	



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Neutral + Ground (N+PE)	P		P		P	
	N		N		N	
Line + Neutral+ Ground(L+N+PE)	P		P		P	
	N		N		N	
Signal/Control Line	P		P		P	
	N		N		N	
Criteria	B		B		B	
Result	A		Unihope		Unihope	
Judgment	PASS		Unihope		Unihope	

Note:

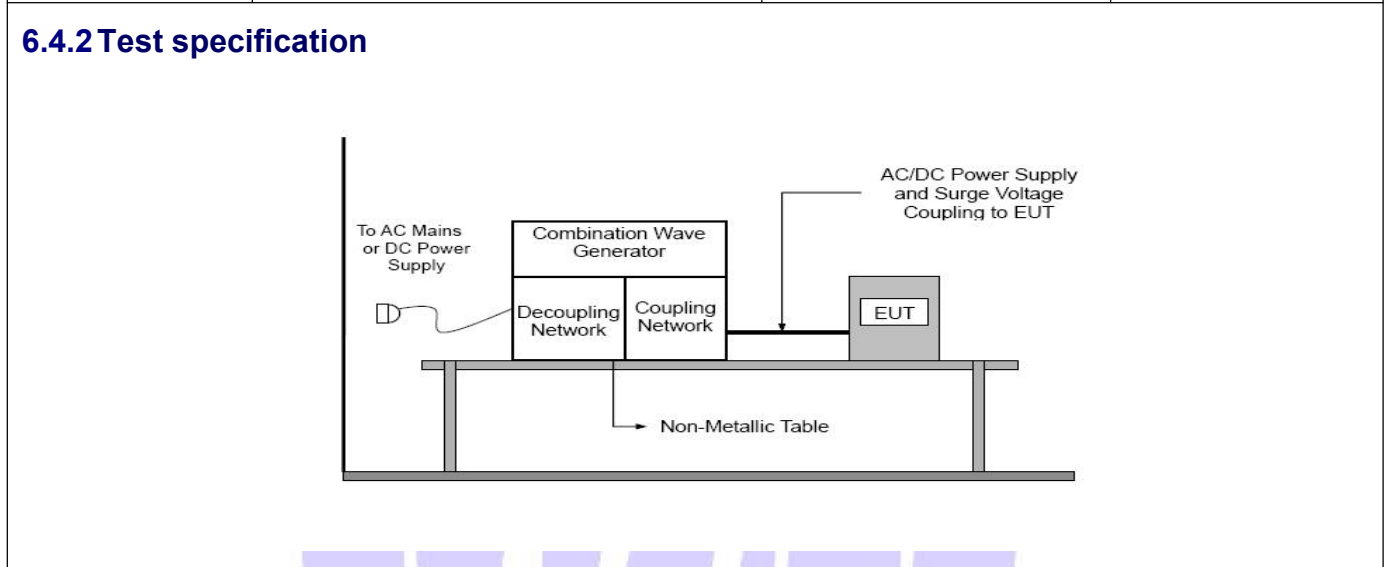
- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) Unihope - denotes test is not applicable in this test report
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.

6.4 Surge immunity test	
Acceptable Performance Criterion:	B
Test Level:	0.5, 1kV Line to Neutral
	0.5, 1, 2kV Line, Neutral to Earth
Polarity:	Positive & Negative
Generator source impedance:	2 Ω & 12 Ω
Trigger Mode:	Internal
No. of surges:	5 positive & 5 negative at 90°, 270°.



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6.4.1 E.U.T. Operation						
Temperature:	23°C	Humidity:	51% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	



EUT was placed on a wooden table which is 0.8m above the ground and operated in the mode as mentioned above. The power cord between the EUT and the coupling/decoupling network was bundled so as to make it less than 2 m in length.



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6.4.3 Measurement Data

Wave Form EUT Ports Tested	1.2/50(8/20)Ti/Th us						Criteria	Judgment
	Polarity	Phase	Voltage					
			0.5kV	1kV	1.5kV	2kV		
L - N	+/-	0°					B	PASS
	+/-	90°	A					
	+/-	180°						
	+/-	270°	A					
L - PE	+/-	0°					B	PASS
	+/-	90°		A				
	+/-	180°						
	+/-	270°		A				
N - PE	+/-	0°					B	PASS
	+/-	90°		A				
	+/-	180°						
	+/-	270°		A				
Signal Line (Unihope)	+/-	0°					B	Unihope
	+/-	90°						
	+/-	180°						
	+/-	270°						

Note:

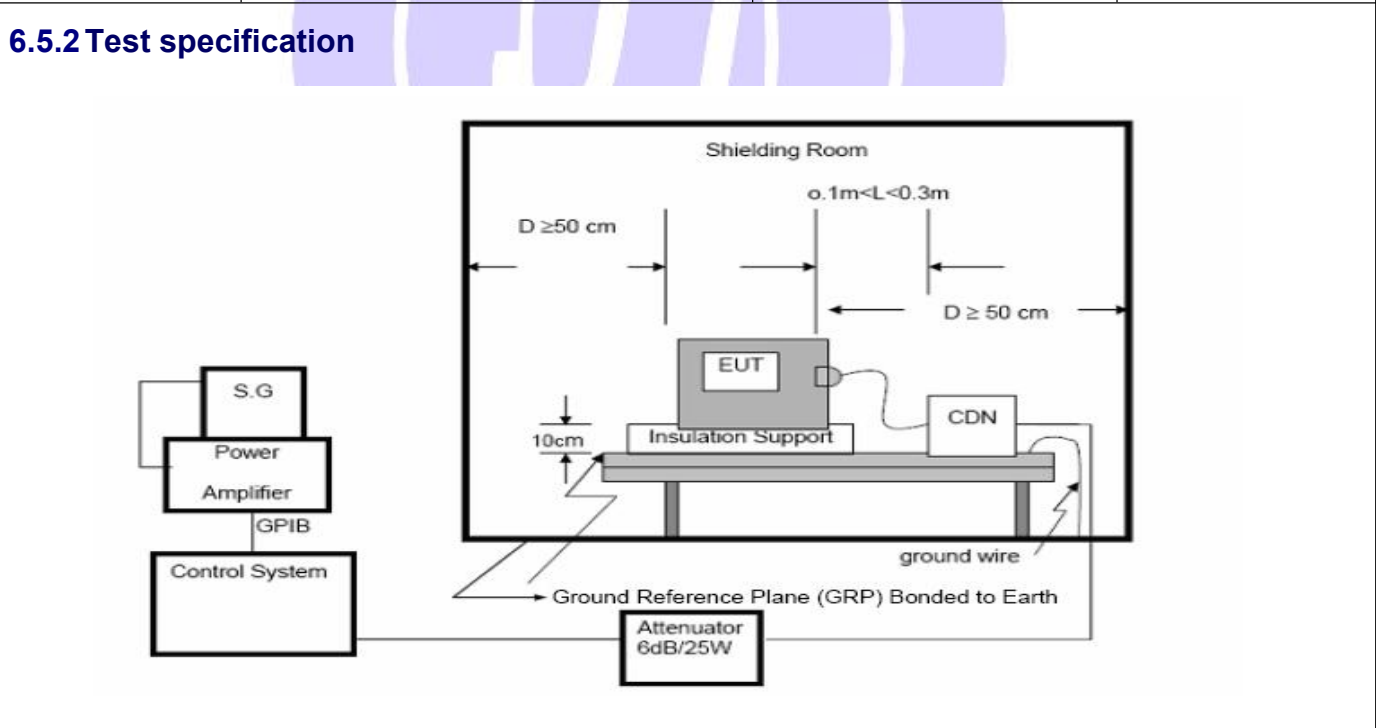
- 1) +/- denotes the Positive/Negative polarity of the output voltage.
- 2) Polarity and Numbers of Impulses: 5 Pst / Ngt at each tested mode
- 3) Unihope - denotes test is not applicable in this Test Report
- 4) All voltages of the lower levels shall be satisfied



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6.5 Conducted disturbance immunity Test	
Acceptable Performance Criterion:	A
Test Level	3 V
Frequency Range	0.150MHz~80MHz

6.5.1 E.U.T. Operation						
Temperature:	24°C	Humidity:	50% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1		The Worst Mode:		Mode 1	



The equipment to be tested was placed on an insulating support of 0,1m height above a ground reference Plane. The minimum distance between the EUT and all other conductive structures, except the ground reference plane is more than 0.5m. All relevant cables were provided with the appropriate coupling and decoupling devices at a distance between 0.1m and 0.3m from the projected geometry of the EUT.



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6.5.3 Measurement Data

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	A	A	PASS
Input/ Output DC. Power Port	0.15 --- 80		A	Unihope	Unihope
Signal Line (Unihope)	0.15 --- 80		A	Unihope	Unihope

Note:

- 1) Unihope - denotes test is not applicable in this Test Report.





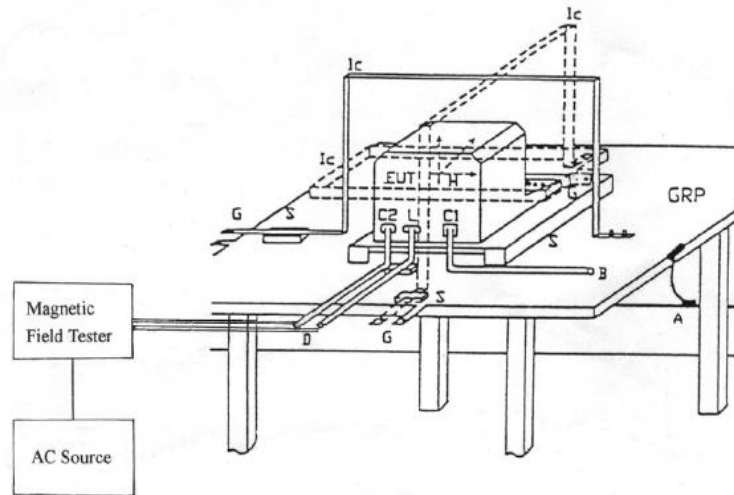
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6.6 Power frequency magnetic field immunity test						
Acceptable Performance Criterion:	A					
Test Level:	1 A/m					
Coil Orientation:	X & Y & Z					
Test Duration:	5 Minutes for each orientation					
6.6.1 E.U.T. Operation						
Temperature:	20°C	Humidity:	52% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1		The Worst Mode:		Mode 1	



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6.6.2 Test specification



The equipment is configured and connected to satisfy its functional requirements. It was placed on the ground reference plane with the interposition of a 0.1 m thickness wooden support and was placed in the center of the induction coil. All cables (include power cord and signal line) were exposed to the magnetic field for at least 1m of their length.

6.6.3 Measurement Data

Unihope

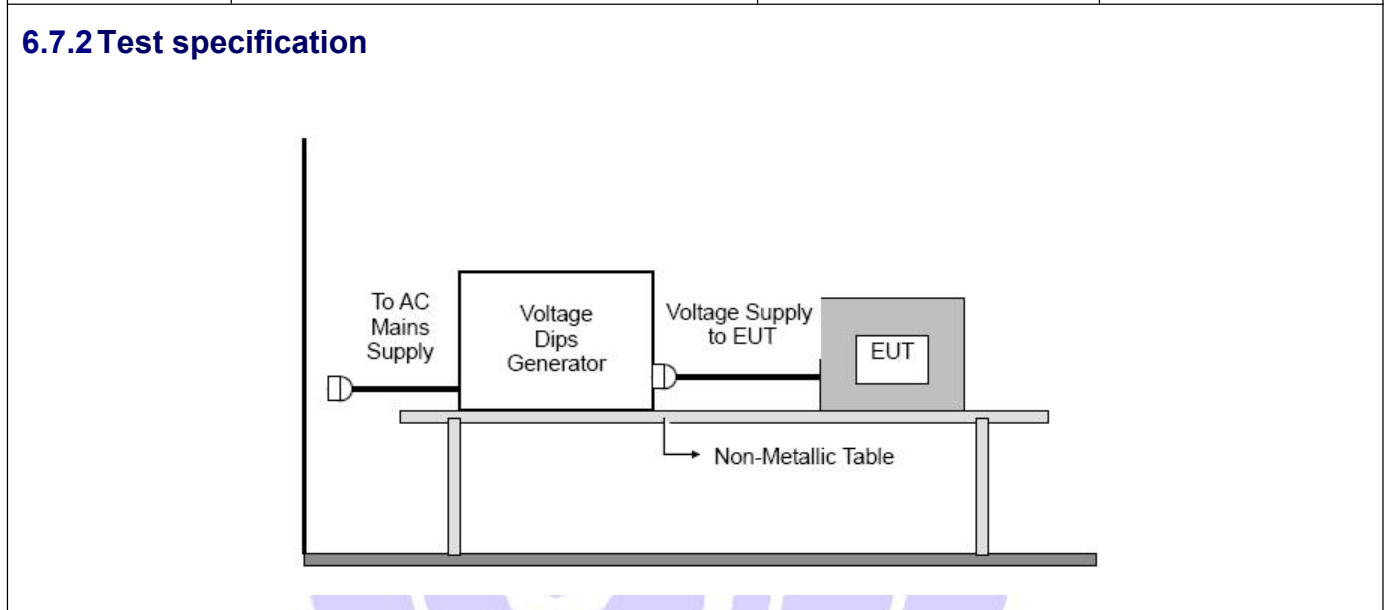
6.7 Voltage dips and interruptions immunity test

Acceptable Performance Criterion:	B & C
Test Level:	<5% of U_T (Supply Voltage) for 0.5 and 250 Periods
	70 % of U_T (Supply Voltage) for 25 Periods
No. of Dips / Interruptions:	3 per Level



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6.7.1 E.U.T. Operation						
Temperature:	22°C	Humidity:	47% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1			The Worst Mode:	Mode 1	



EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer. The rated voltage of the EUT was used as the basis for voltage test level specification. After each group of tests, a full functional check was performed.

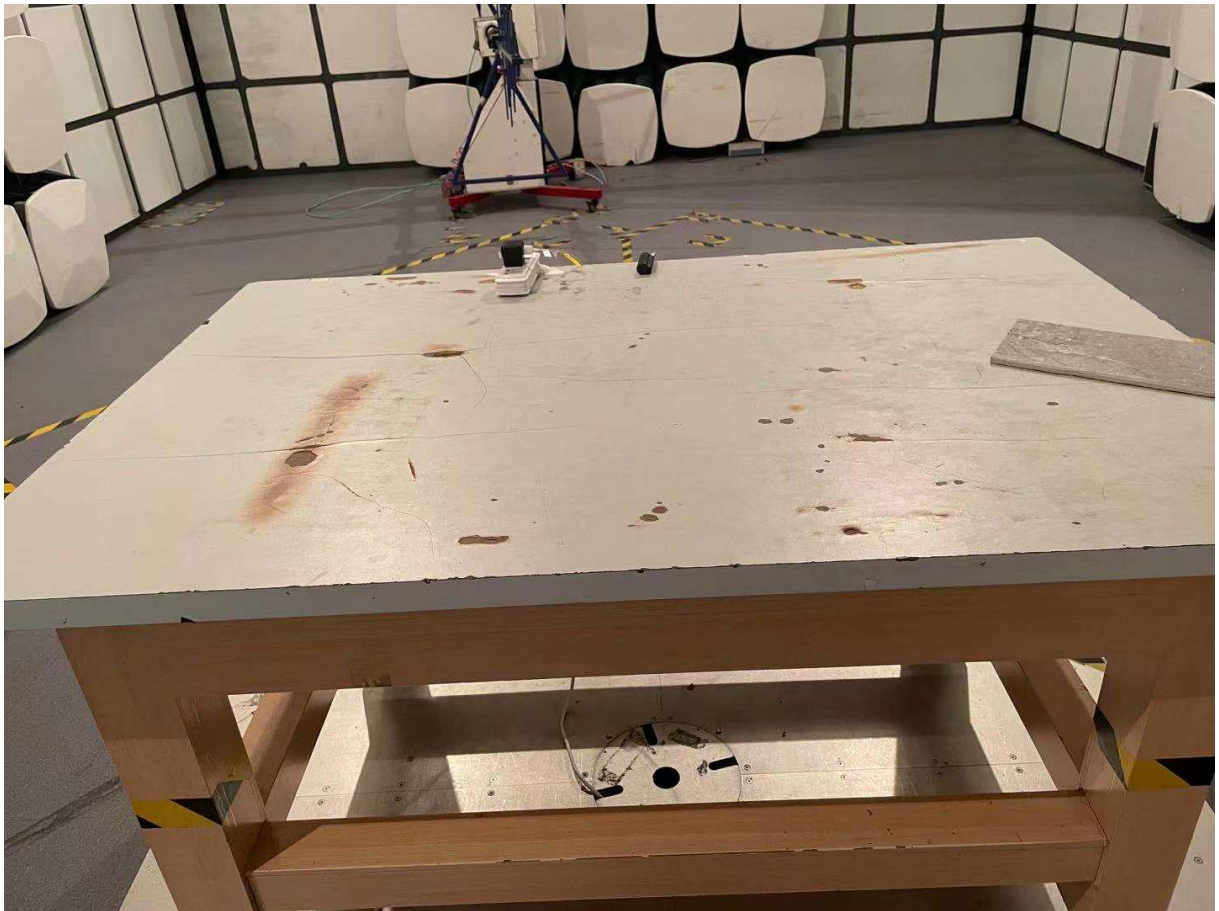
6.7.3 Measurement Data

<u>Voltage Reduction</u>	Periods	Perform Criteria	Results	Judgment
Voltage dip >95%	0.5	B	A	PASS
Voltage dip 30%	25	C	A	PASS



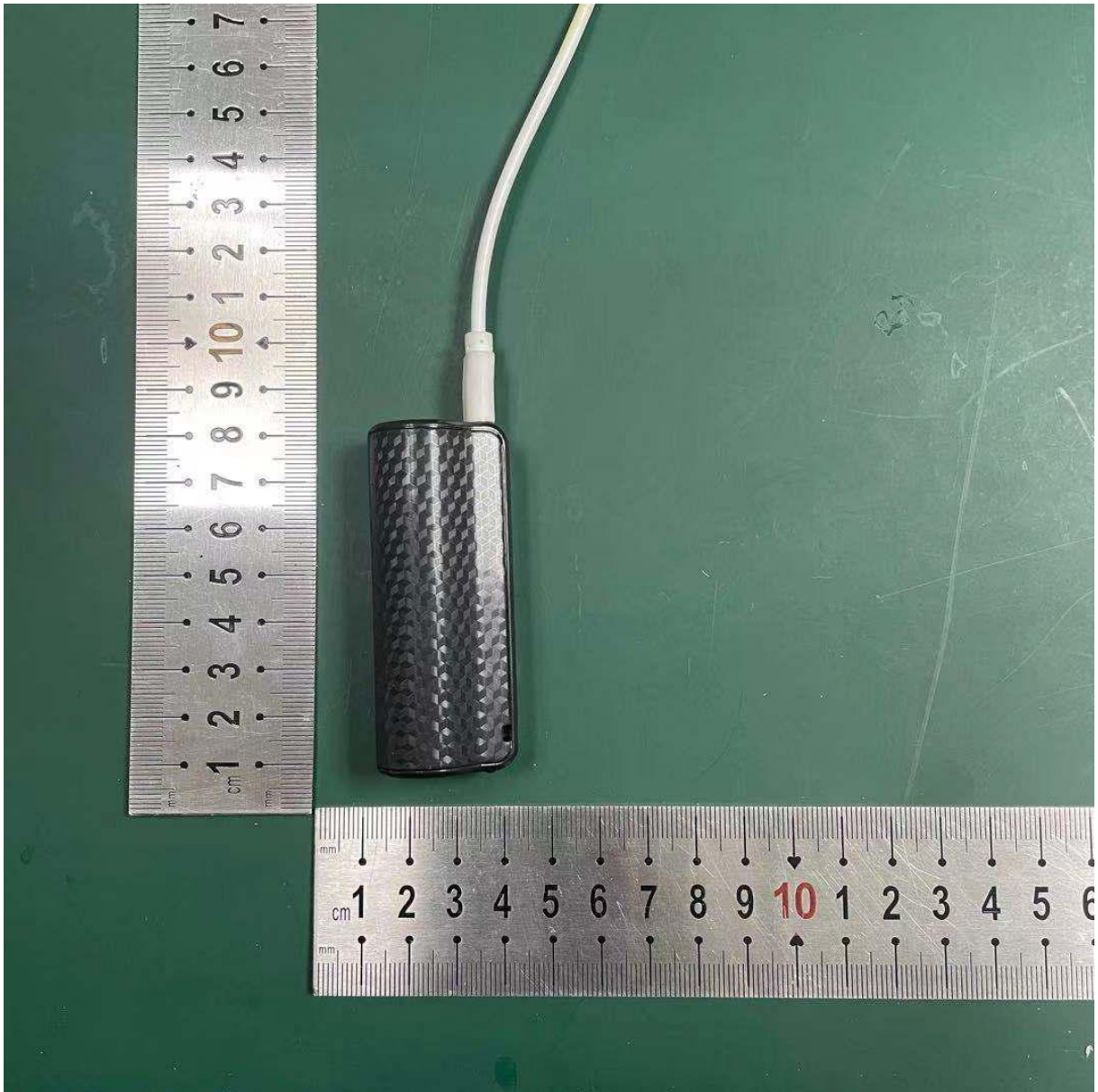
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7 APPENDIX-Photographs of EUT Constructional Details





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******End of Report******