CTS (NINGBO) TESTING SERVICE TECHNOLOGY INTERNATIONAL

OPERATE ACCORDING TO ISO/IEC 17025

EMC TEST REPORT

TEST REPORT NUMBER : CGZ3151123-01274-E

CTS (Ningbo) Testing Service Technology Co., Ltd.
2/F., South Tower, Huoju Building, No.181, Canghai Road,
Jiangdong Science and Technology Park, Ningbo, Zhejiang, China

TEST REPORT
EN 55022:2010+AC:2011
Information technology equipment-Radio disturbance characteristics-Limits of measurement
EN 55024:2010
Information technology equipment-Immunity characteristics-Limits and methods of measurement of measurement

Report Reference No.	CGZ3151123-01274-E
Date of issue.....	25 November 2015
Testing Laboratory Name	**CTS (Ningbo) Testing Service Technology Co., Ltd.**
Address	GZ test site: A101, No.65, Zhuji Road, Tianhe District, Guangzhou, Guangdong, China.
Testing location/ procedure	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's name.....	
Address	
Test specification:	
Standard	**EN 55022:2010+AC:2011, EN 55024:2010, EN 61000-3-2: 2014, EN 61000-3-3:2013**
Test Report Form No.....	CTSEMC-1.0
TRF Originator.....	CTS (Ningbo) Testing Service Technology Co., Ltd.
Master TRF.....	Dated 2009-01

Test item description.	USB HUB
Trade Mark	/
Manufacturer	
Model/Type reference.....	YC787
Ratings	DC 5V by PC
Result	**PASSED**

Compiled by:	**Supervised by:**	**Approved by:**
Kate zhang / File administrators	Duke yang / Technique principal	Vincent yao / Manager

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EMC -- TEST REPORT

Test Report No. : CGZ3151123-01274-E	25 November 2015 Date of issue

Type / Model.....	YC787
EUT.....	USB HUB
Applicant.....	
Address.....	
Telephone.....	
Fax.....	
Contact.....	/
Manufacturer.....	
Address.....	
Telephone.....	
Fax.....	
Contact.....	/
Factory.....	
Address.....	
Telephone.....	
Fax.....	
Contact.....	/

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

EN 55022: 2010+AC:2011 Information technology equipment-Radio disturbance characteristics-Limits of measurement.

EN 55024:2010 Information technology equipment-Immunity characteristics-Limits and methods of measurement of measurement.

EN 61000-3-2: 2014 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).

EN 61000-3-3: 2013 Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

2 SUMMARY

2.1 GENERAL REMARKS

Date of receipt of test sample	23 November 2015
Testing commenced on	23~24 November 2015
Testing concluded on	25 November 2015

2.2 FINAL ASSESSMENT

The EMC requirements pertaining to the technical standards and tested operation modes are

■ - fulfilled.

□ - **not** fulfilled.

The equipment under test

■ - fulfils the EMC requirements cited on page 1.

□ - **does not** fulfil the EMC requirements cited on page 1.

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3 EQUIPMENT UNDER TEST

3.1 Power supply system utilised

Power supply voltage: ■ DC 5V by PC
□ Other (Specified blank below)

3.2 Short description of the Equipment under Test (EUT)

Number of tested samples: 1
Serial number: Prototype

3.3 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

■ – Copy Data

Operating Mode: Copy Data

Emissions tests……..: According to EN 55022, searching for the highest disturbance.
Immunity tests ……..: According to EN 55024, searching for the highest susceptivity.
Harmonic current……. : According to EN 61000-3-2, searching for the highest disturbance.
Voltage fluctuation…….: According to EN 61000-3-3, searching for the highest disturbance.

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3.4 EUT configuration

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurement :

3.4.1. Monitor

M/N	:	E7722-f
S/N	:	CN-02W486-64180-3B7-01MP
Manufacturer	:	DELL
Power Cord	:	Unshielded, Detachabled, 1.8m , 3Pin
FCC ID	:	By DoC

3.4.2.Personal Computer

M/N	:	DIMENSION 4600
S/N	:	CN-OTO486-42940-37M-00XB
Manufacturer	:	DELL
Power Cord	:	Unshielded, Detachabled, 1.8m , 3Pin
CE	:	By DoC

3.4.3. Keyboard

M/N	:	SK-8110
S/N	:	CN-07N244-71616-37T-B293
Manufacturer	:	DELL
Data Cable	:	Shielded, Detachabled
CE	:	By DoC

3.4.4. Mouse

M/N	:	M-UR69
S/N	:	LNA33029188
Manufacturer	:	DELL
Data Cable	:	Shielded, Detachabled, 1.8m
CE	:	By DoC

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3.5 Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product.

3.6 Definition related to the performance level

■ based on the used product standard
□ based on the declaration of the manufacturer, requestor or purchaser

Criterion A:
Definition: Copy Data performance within limits specified by the manufacturer, requestor or purchaser:

Criterion B:
Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its Copy Data performance, without operator intervention:

Criterion C:
Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

Criterion D:
Definition: loss of function or degradation of performance, which is not recoverable, owing to damage to hardware or software, or loss of data:

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4 TEST ENVIRONMENT

4.1 Address of the test laboratory

GZ test site: A101, No.65, Zhuji Road, Tianhe District, Guangzhou, Guangdong, China

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4.2 Test facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L3394

CTS (Ningbo) Testing Service Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01: 2006 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

IC-Registration No.: 8374A

The 3m Alternate Test Site of CTS (Ningbo) Testing Service Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 8374A on May 22, 2014.

FCC-Registration No.: 971995

CTS (Ningbo) Testing Service Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration No.971995, July 13, 2012.

4.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35 ° C
Humidity:	25~75 %
Atmospheric pressure:	86~106 kPa

4.4 Definitions of symbols used in this test report

■ - The black square indicates that the listed condition, standard or equipment is applicable for this report.

□ - The empty square indicates that the listed condition, standard or equipment is **not** applicable for this report.

4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the CTS quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	±1.22dB	(1)
Power disturbance	30MHz~300MHz	±1.38dB	(1)
Radiation emission (3m)	30MHz~300MHz	±3.14dB	(1)
	300MHz~1000MHz	±3.18dB	(1)

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

4.7 Test Description

4.7.1 Description of Standards and Results

EMISSION			
Description of Test Item	**Standard**	**Limits**	**Results**
Conducted disturbance at mains terminals	EN 55022:2010+AC:2011	Class B	PASS
Conducted disturbance at telecommunication port	EN 55022:2010+AC:2011	Class B	N/A
Radiated disturbance	EN 55022:2010+AC:2011	Class B	PASS
Harmonic current emissions	EN 61000-3-2: 2014	Class D	PASS
Voltage fluctuations & flicker	EN 61000-3-3:2013	--------	PASS

IMMUNITY (EN 55024:2010)			
Description of Test Item	**Basic Standard**	**Performance Criteria**	**Results**
Electrostatic discharge (ESD)	IEC 61000-4-2: 2008	B	PASS
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3:2006 +A1:2007+A2:2010	A	PASS
Electrical fast transient (EFT)	IEC 61000-4-4:2012	B	PASS
Surge (Input a.c. power ports)	IEC 61000-4-5: 2005	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6: 2008	A	PASS
Power frequency magnetic field	IEC 61000-4-8: 2009	A	PASS
Voltage dips, >95% reduction	IEC 61000-4-11: 2004	B	PASS
Voltage dips, 30% reduction		C	PASS
Voltage interruptions		C	PASS
N/A is an abbreviation for Not Applicable.			

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5 TEST CONDITIONS AND RESULTS

5.1 Conducted disturbance

For test instruments and accessories used see section 6 part **6.2**.

5.1.1 Description of the test location

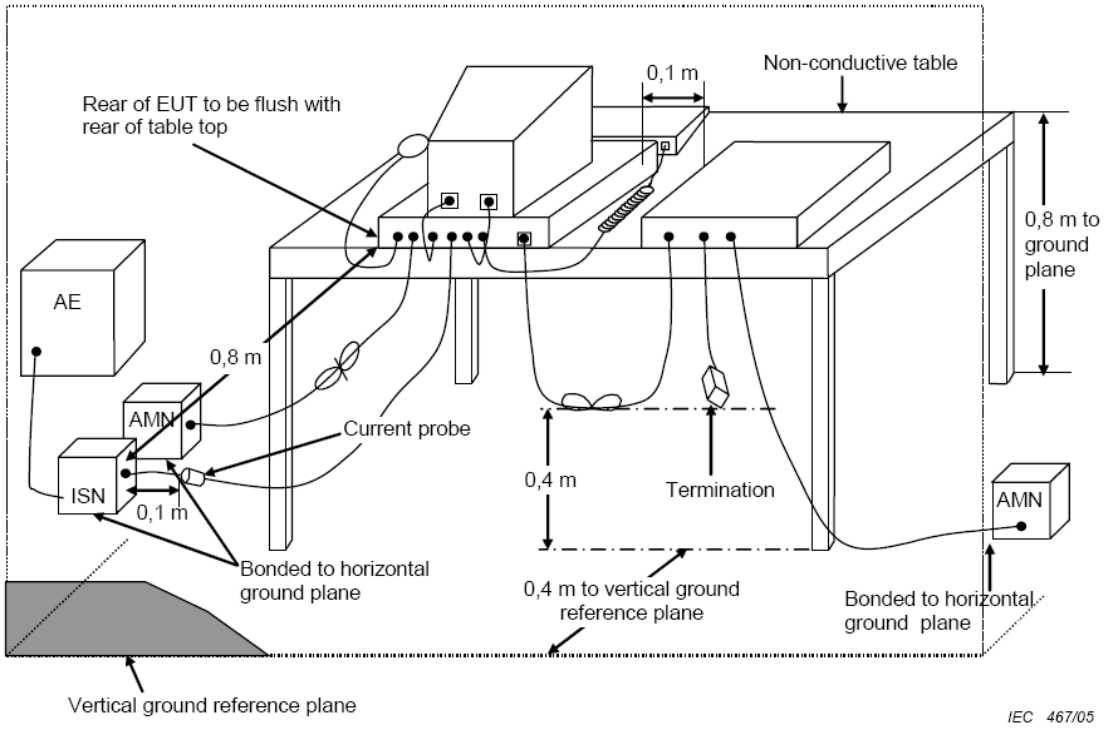
Test location: Shielded room

5.1.2 Description of the test set-up

5.1.2.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.1.2.2 Block Diagram of Test Setup



5.1.3 Limits disturbance

Frequency			Maximum RF Line Voltage (dBμV)	
			Quasi-peak Level	Average Level
150kHz	~	500kHz	66 ~ 56 *	56 ~ 46 *
500kHz	~	5MHz	56	46
5MHz	~	30MHz	60	50

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

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5.1.4 Test result

The requirements are	**Fulfilled**
Band width	9kHz
Frequency range	0.15 MHz - 30 MHz
Min. limit margin	>11.80 dB at 0.15 - 30 MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

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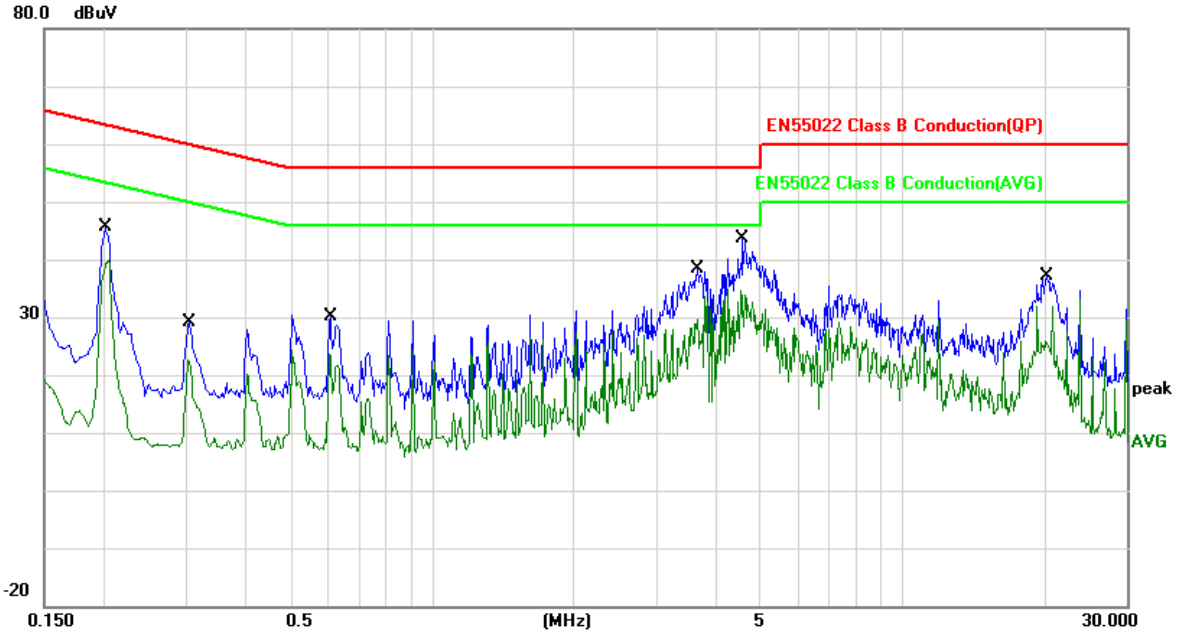
5.1.5 Test protocol

Test point Operation mode Remarks:	L Copy Data	Result:	■ - passed □ - not passed

EUT	USB HUB
MODEL NO.	YC787
Operating Condition	DC 5V by PC
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	**Eric**



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2020	10.83	33.72	44.55	63.53	-18.98	QP
2	0.2020	10.83	29.56	40.39	53.53	-13.14	AVG
3	0.3060	10.86	14.87	25.73	60.08	-34.35	QP
4	0.3060	10.86	11.47	22.33	50.08	-27.75	AVG
5	0.6100	10.91	15.58	26.49	56.00	-29.51	QP
6	0.6100	10.91	12.29	23.20	46.00	-22.80	AVG
7	3.6740	11.02	22.81	33.83	56.00	-22.17	QP
8	3.6740	11.02	17.40	28.42	46.00	-17.58	AVG
9	4.5940	11.06	26.88	37.94	56.00	-18.06	QP
10	4.5940	11.06	23.14	34.20	46.00	-11.80	AVG
11	20.3140	11.04	20.87	31.91	60.00	-28.09	QP
12	20.3140	11.04	14.57	25.61	50.00	-24.39	AVG

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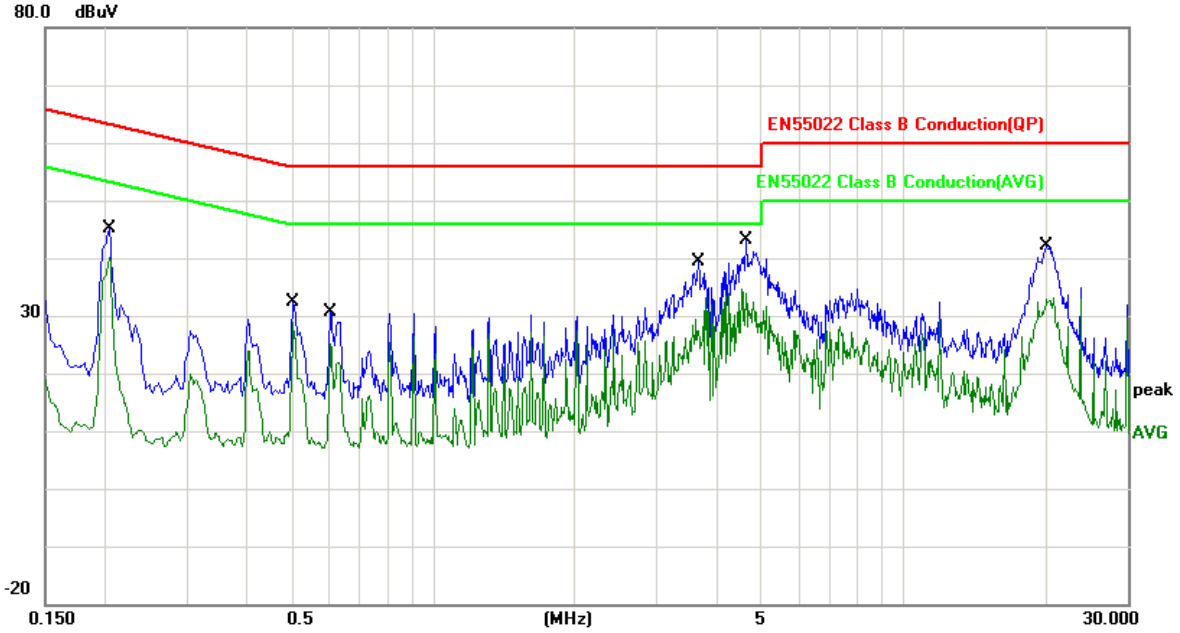
Test point: Operation mode Remarks:	N Copy Data	Result:	■ - passed □ - not passed



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2060	10.82	31.44	42.26	63.37	-21.11	QP
2	0.2060	10.82	26.49	37.31	53.37	-16.06	AVG
3	0.5060	10.90	19.47	30.37	56.00	-25.63	QP
4	0.5060	10.90	18.09	28.99	46.00	-17.01	AVG
5	0.6060	10.90	17.57	28.47	56.00	-27.53	QP
6	0.6060	10.90	14.12	25.02	46.00	-20.98	AVG
7	3.6780	11.00	22.35	33.35	56.00	-22.65	QP
8	3.6780	11.00	15.94	26.94	46.00	-19.06	AVG
9	4.6420	11.04	27.15	38.19	56.00	-17.81	QP
10	4.6420	11.04	22.25	33.29	46.00	-12.71	AVG
11	20.1580	11.00	27.76	38.76	60.00	-21.24	QP
12	20.1580	11.00	20.80	31.80	50.00	-18.20	AVG

Note:Level=Reading+Factor. Margin= Limit-Level

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5.2 Radiated disturbance (electric field)

For test instruments and accessories used see section 6 part **6.1**.

5.2.1 Description of the test location

Test location : Semi-Anechoic chamber

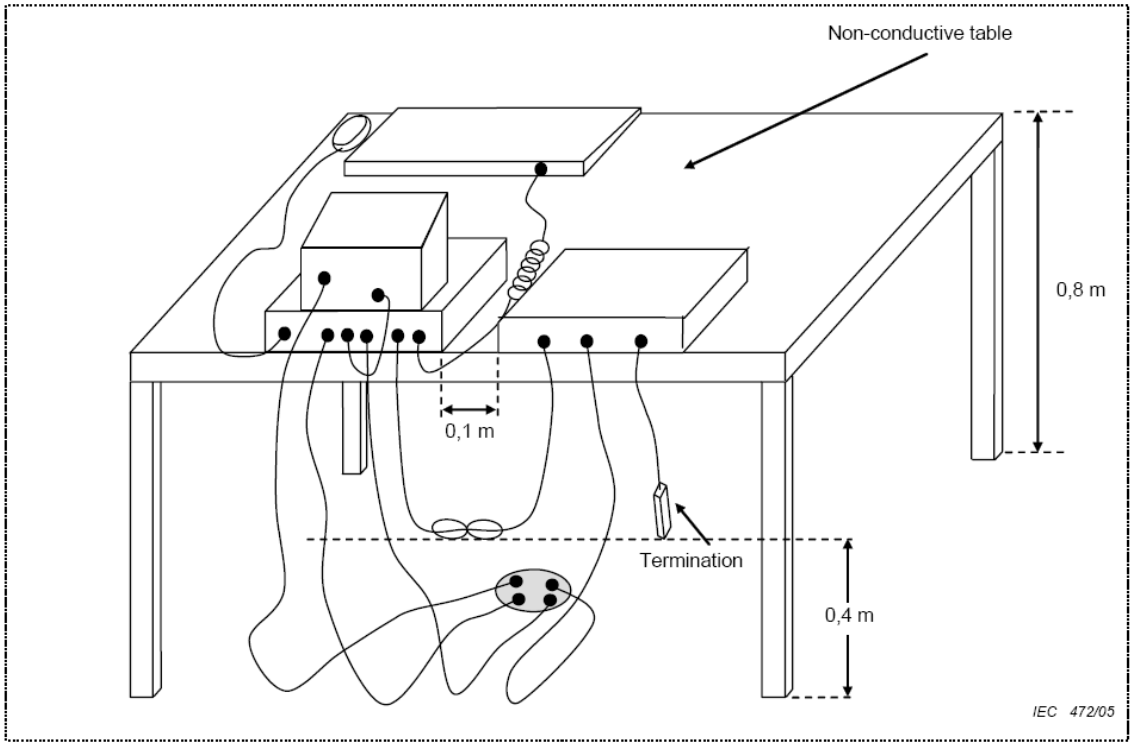
Test disturbance: 3 Meter

5.2.2 Description of the test set-up

5.2.2.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.2.2.2 Block Diagram of Test Setup



5.2.3 Limits of disturbance (Class B)

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

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5.2.4 Test result

The requirements are	**Fulfilled**
Band width	120kHz
Frequency range	30 MHz - 1000 MHz
Min. limit margin	>2.75 dB at 30 - 1000 MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

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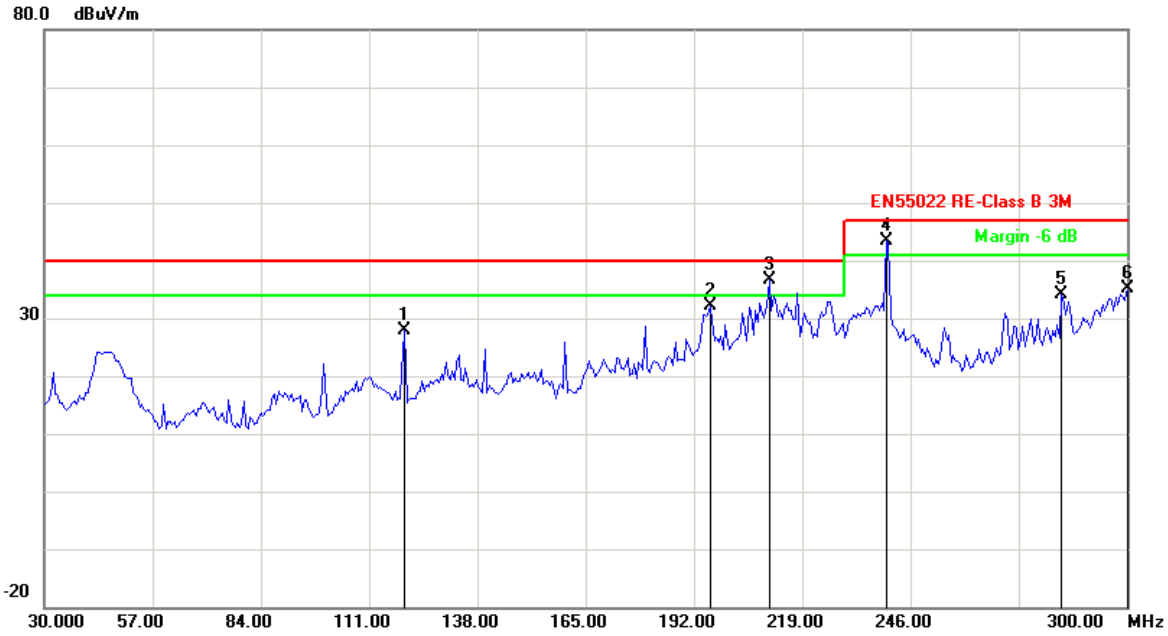
5.2.5 Test protocol

Test point: Operation mode Remarks:	Horizontal Copy Data	Result:	■ - passed □ - not passed

EUT	USB HUB
MODEL NO.	YC787
Operating Condition	DC 5V by PC
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	**Eric**



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	119.8196	-16.73	44.50	27.77	40.00	-12.23	QP
2	196.1121	-13.10	45.17	32.07	40.00	-7.93	QP
3	210.7214	-10.24	46.95	36.71	40.00	-3.29	QP
4	239.9399	-11.56	54.85	43.29	47.00	-3.71	QP
5	283.7674	-5.96	40.08	34.12	47.00	-12.88	QP
6	300.0000	-1.42	36.43	35.01	47.00	-11.99	QP

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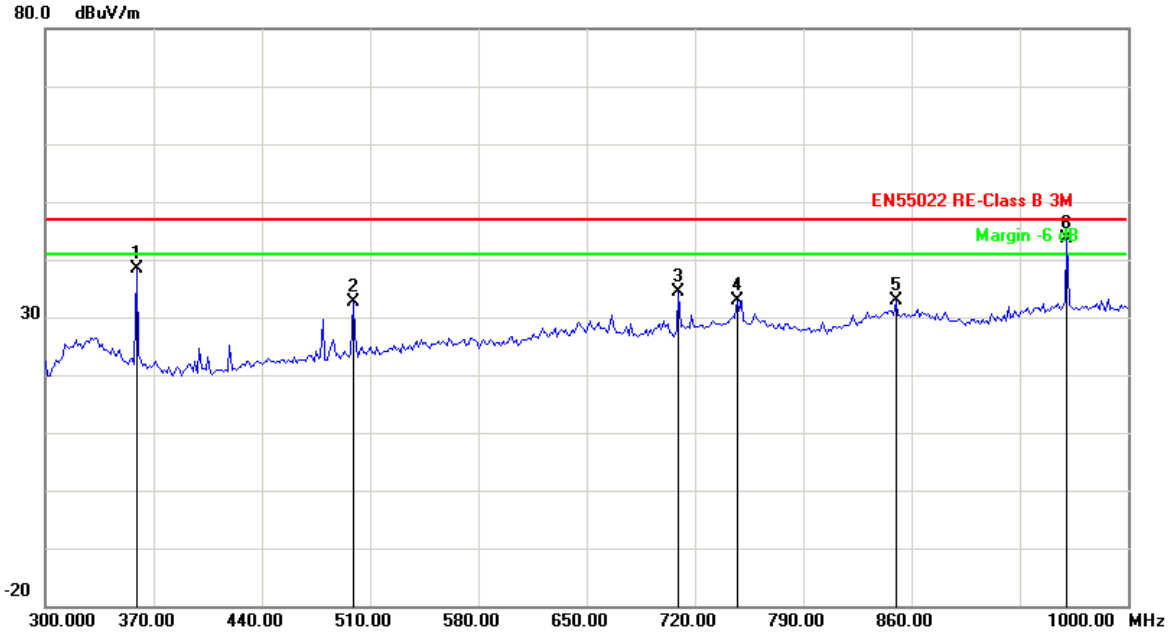

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	358.9178	-11.20	49.69	38.49	47.00	-8.51	QP
2	499.1984	-8.13	40.67	32.54	47.00	-14.46	QP
3	709.6191	-3.30	37.79	34.49	47.00	-12.51	QP
4	747.4950	-1.71	34.50	32.79	47.00	-14.21	QP
5	849.8998	-0.30	33.27	32.97	47.00	-14.03	QP
6	960.7214	0.32	43.20	43.52	47.00	-3.48	QP

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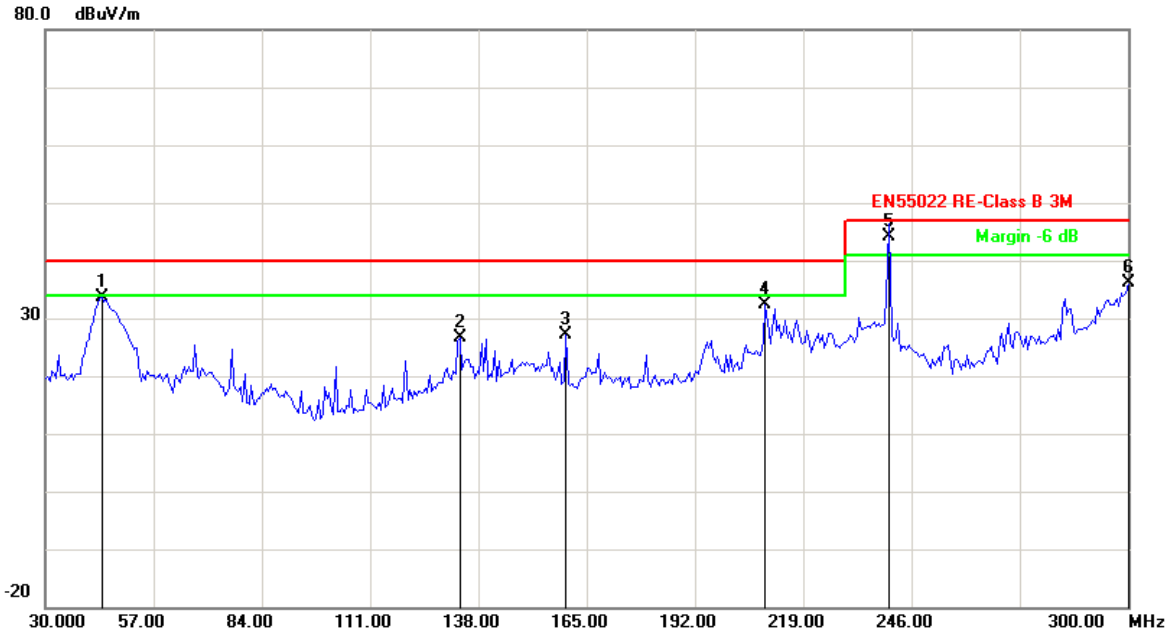
Test point: Operation mode Remarks:	Vertical Copy Data	Result:	■ - passed □ - not passed



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	44.0681	-17.85	51.38	33.53	40.00	-6.47	QP
2	133.3466	-16.11	42.78	26.67	40.00	-13.33	QP
3	159.8597	-15.97	43.10	27.13	40.00	-12.87	QP
4	209.6392	-10.27	42.72	32.45	40.00	-7.55	QP
5	240.4809	-11.56	55.81	44.25	47.00	-2.75	QP
6	300.0000	-1.42	37.62	36.20	47.00	-10.80	QP

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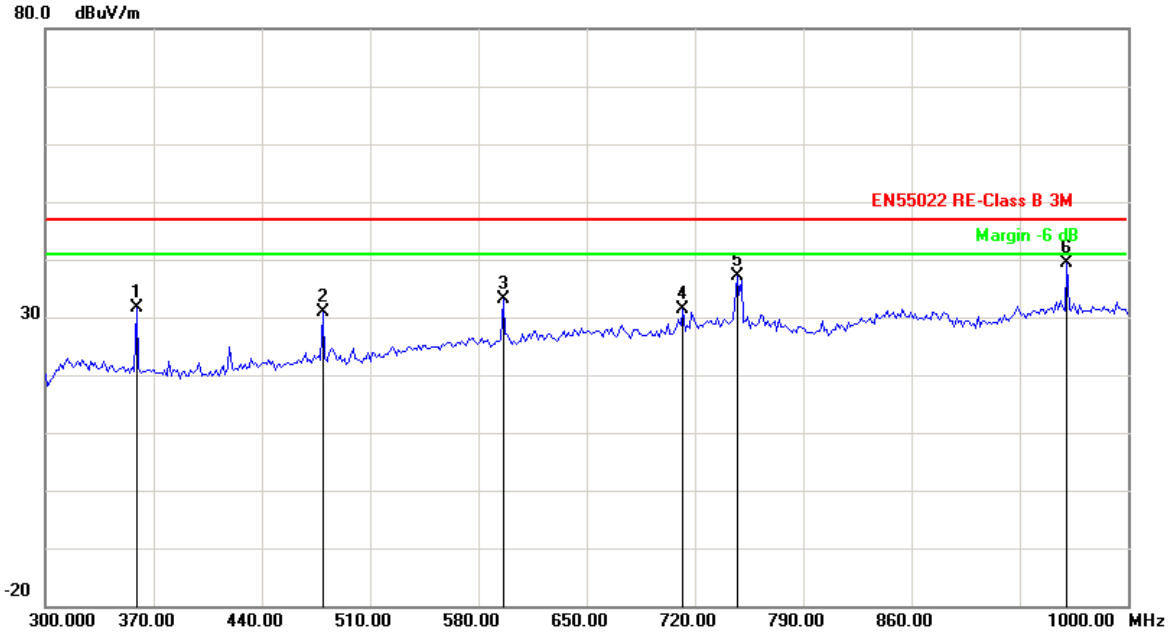

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	358.9178	-11.20	42.90	31.70	47.00	-15.30	QP
2	479.5591	-8.26	39.25	30.99	47.00	-16.01	QP
3	595.9919	-5.56	38.69	33.13	47.00	-13.87	QP
4	712.4248	-3.19	34.60	31.41	47.00	-15.59	QP
5	747.4949	-1.71	38.88	37.17	47.00	-9.83	QP
6	960.7214	0.32	39.03	39.35	47.00	-7.65	QP

Note:Level=Reading+Factor. Margin= Limit-Level

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5.3 Harmonic current

For test instruments and accessories used see section 6 part **6.3**.

5.3.1 Description of the test location

Test location : Test location no. 1

5.3.2 Limits of harmonic current

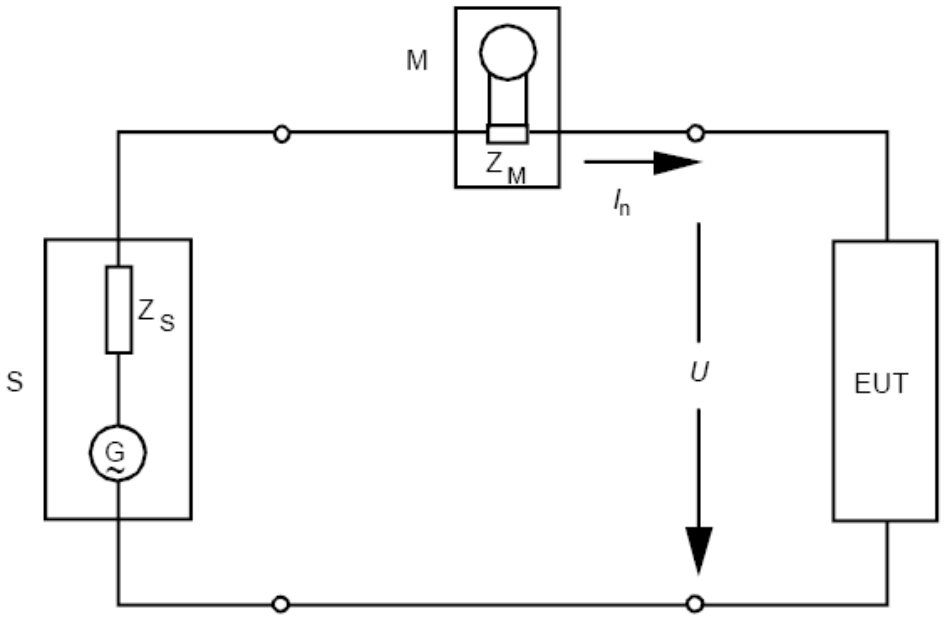
Test configuration and procedure see clause 7.1 of standard EN 61000-3-2: 2014.

5.3.3 Description of the test set-up

5.3.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.3.3.2 Block Diagram of Test Setup



5.3.4 Test result

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

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5.3.5 Test protocol

Operation mode Remarks:	Copy Data	Result:	■ - passed □ - not passed

Standard used:	EN 61000-3-2 Quasi-Stationary – Equipment class D
Observation time:	5 min
Windows width:	10 periods – (EN/IEC 61000-4-7 Edition 2002)
Mains supply voltage:	AC 230V/50Hz
Ambient Temperature:	24℃
Humidity:	56%
Barometric Pressure:	86~106KPa
E. U. T.:	USB HUB
M/N:	YC787
Date of test:	24 November 2015
Tester:	**Eric**

Test result	
E. U. T.:	PASS
Power Source:	PASS

Check harmonics 2..40 [exception odd 21..39]:

Harmonic(s) > 150%:	
Order (n):	None
Harmonic(s) with average > 100%:	
Order (n):	None

Check odd harmonics 21..39:

All Partial Odd Harmonics below partial limits.
Harmonic(s) > 150%: Order (n): None
Harmonic(s) with average > 150%: Order (n): None

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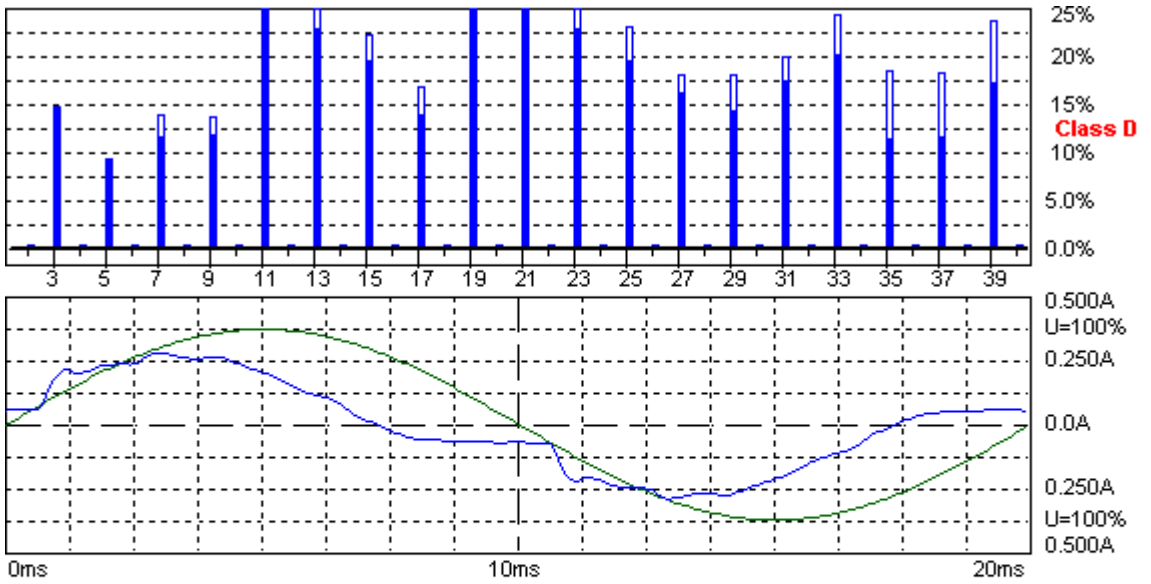

Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2) 2015-11-24 15:51:44

Urms =	229.9	V	P =	32.41	W	THD(I) =	24.0	%	Range: 0.5 A
Irms =	0.177	A	pf =	0.795		H1 (I) =	0.175	A	V-nom: 230 V
									TestTime: 10 min (10

Eric

Test completed, Result: PASSED

HAR-1000 EMC-Par

Order	Freq.	Irms	Imax	Limit	Status
	[Hz]	[A]	[A]	[A]	
1	50	0.1736	0.1913		
2	100	0.0010	0.0036		
3	150	0.0364	0.0366	0.2550	
4	200	0.0004	0.0008		
5	250	0.0128	0.0129	0.1425	
6	300	0.0003	0.0008		
7	350	0.0085	0.0101	0.0750	
8	400	0.0004	0.0008		
9	450	0.0043	0.0050	0.0375	
10	500	0.0003	0.0007		
11	550	0.0070	0.0074	0.0262	
12	600	0.0006	0.0010		
13	650	0.0050	0.0055	0.0222	
14	700	0.0006	0.0013		
15	750	0.0037	0.0042	0.0192	
16	800	0.0003	0.0009		
17	850	0.0023	0.0028	0.0170	
18	900	0.0005	0.0012		
19	950	0.0050	0.0055	0.0152	
20	1000	0.0008	0.0012		
21	1050	0.0044	0.0048	0.0137	
22	1100	0.0005	0.0010		

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23	1150	0.0028	0.0032	0.0126	
24	1200	0.0004	0.0006		
25	1250	0.0022	0.0026	0.0115	
26	1300	0.0004	0.0006		
27	1350	0.0017	0.0019	0.0107	
28	1400	0.0003	0.0005		
29	1450	0.0014	0.0018	0.0100	
30	1500	0.0003	0.0006		
31	1550	0.0016	0.0018	0.0093	
32	1600	0.0004	0.0006		
33	1650	0.0017	0.0021	0.0088	
34	1700	0.0004	0.0006		
35	1750	0.0009	0.0015	0.0082	
36	1800	0.0002	0.0005		
37	1850	0.0009	0.0014	0.0078	
38	1900	0.0003	0.0006		
39	1950	0.0013	0.0017	0.0074	
40	2000	0.0003	0.0005		

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5.4 Voltage fluctuations and flicker

For test instruments and accessories used see section 6 part **6.4**.

5.4.1 Description of the test location

Test location : Test location no. 1

5.4.2 Limits of voltage fluctuation and flicker

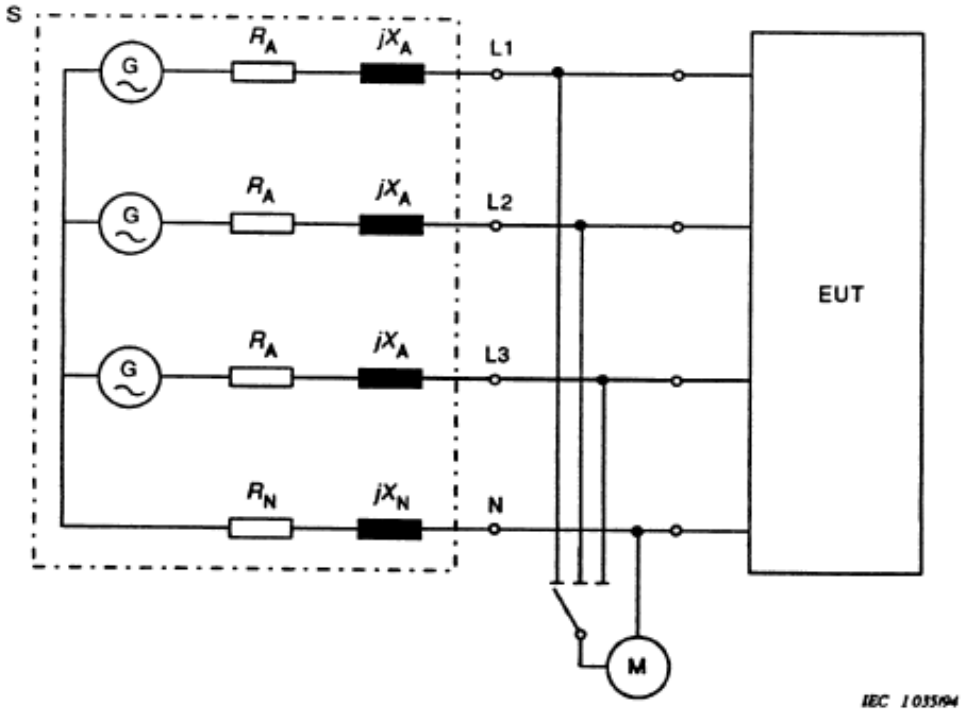
Test configuration and procedure see clause 5 of standard EN 61000-3-3: 2013.

5.4.3 Description of the test set-up

5.4.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.4.3.2 Block Diagram of Test Setup



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5.4.4 Test result

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

5.4.5 Test protocol

Operation mode Remarks:	Copy Data	Result:	■ - passed □ - not passed

Standard used:	EN 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Flickermeter:	AC 230V/50Hz
Ambient Temperature:	24℃
Humidity:	56%
Barometric Pressure:	86~106KPa
E. U. T.:	USB HUB
M/N:	YC787
Date of test:	24 November 2015
Tester:	**Eric**

Maximum Flicker results

	EUT values	**Limit**	**Result**
Pst	0.07	1.00	PASS
dc [%]	0.01	3.30	PASS
dmax [%]	0.00	4.00	PASS
dt [s]	0.00	0.50	PASS

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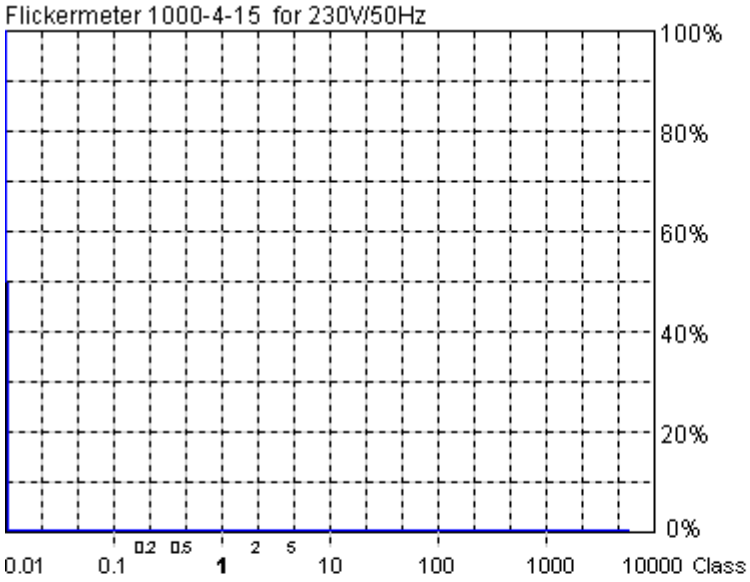

Actual Flicker (Fli):	**0.00**
Short-term Flicker (Pst):	**0.07**
Limit (Pst):	1.00
Long-term Flicker (Plt):	**0.07**
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	**0.00%**
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	**0.01%**
Limit (dc):	3.30%
Maximum Interval exceeding 3.30% (dt):	**0.00ms**
Limit (dt>Lim):	200ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3 , (EN60555-3)

2015-11-24 16:03:50

Urms =	229.7	V	P =	31.89	W
Irms =	0.175	A	pf =	0.793	

Range:	0.5 A
V-nom:	230 V
TestTime:	10 min (100%)

Eric

Test completed, Result: PASSED

HAR-1000 EMC-Partner

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5.5 Electrostatic discharge

For test instruments and accessories used see section 6 part **6.5**.

5.5.1 Description of the test location

Test location :	Test location no. 2
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.5.2 Severity of levels electrostatic discharge

5.5.2.1 Severity level: Contact discharge at ±4KV air discharge at ±8KV

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

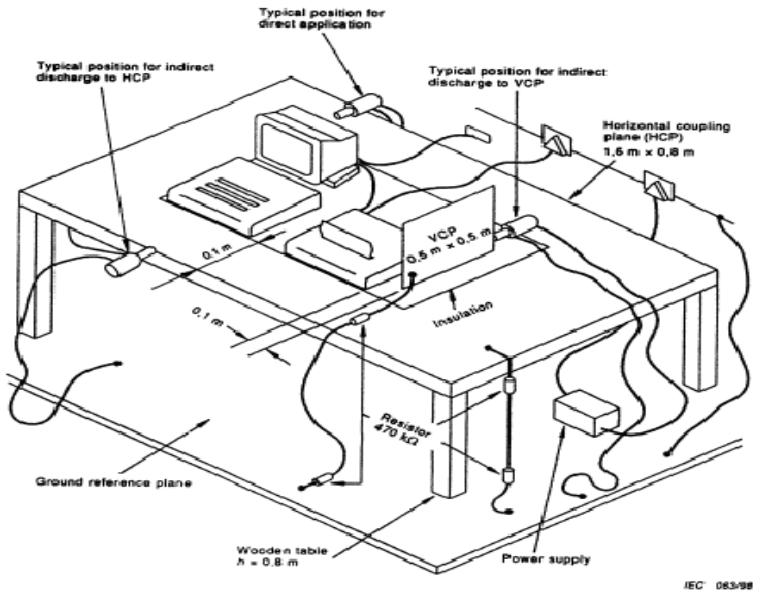
5.5.2.2 Performance criterion: B

5.5.3 Description of the test set-up

5.5.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.5.3.2 Block Diagram of Test Setup



5.5.4 Test specification:

Contact discharge voltage:	■ 2 kV ■ 4 kV	
Air discharge voltage:	■ 2 kV ■ 4 kV ■ 8 kV	
Discharge impedance:	■ 330 Ω / 150 pF	
Discharge factor:	■ ≥ 1 sec.	
Number of discharges:	■ ≥ 10	
Type of discharge:	Direct discharge	■ Air discharge
		■ Contact discharge
	Indirect discharge	■ Contact discharge
Polarity:	■ Positive	■ Negative
Discharge location:	■see photo documentation of the test set-up	
	■all external locations accessible by hand	
	■horizontal plate (HCP)	
	■vertical coupling plate (VCP)	

5.5.5 Test result

The requirements are **Fulfilled** Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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5.6 Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 6 part **6.6**.

5.6.1 Description of the test location

Test location :	GTEM chamber
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.6.2 Severity levels of radiated, Radio-frequency, electromagnetic field

5.6.2.1 Severity level: 3V/m

Level	Field strenght(V/m)
1	1
2	3
3	10
X	Special

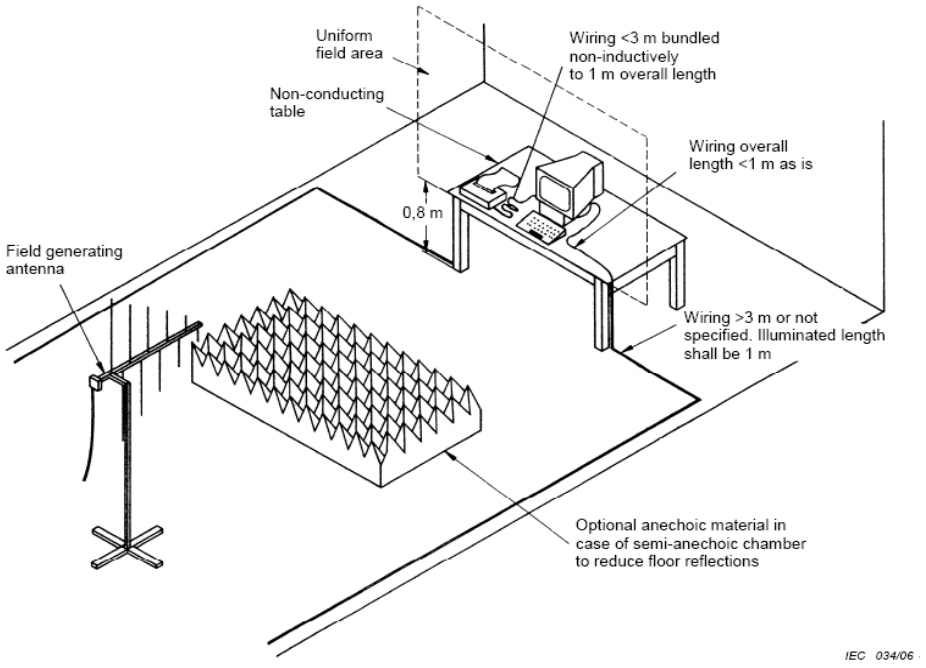
5.6.2.2 Performance criterion: A

5.6.3 Description of the test set-up

5.6.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.6.3.2 Block Diagram of Test Setup



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5.6.4 Test specification:

Frequency range:	■ 80 MHz to 1000 MHz
Field strength:	■ 3 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time
Antenna polarisation:	■ horizontal ■ vertical

5.6.5 Test result

The requirements are **Fulfilled** Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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5.7 Electrical fast transients / Burst

For test instruments and accessories used see section 6 part **6.7**.

5.7.1 Description of the test location

Test location :	Test location no. 2
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.7.2 Severity levels of electrical fast transients / Burst

5.7.2.1Severity level: ±1000V for AC power supply lines

Open circuit output test voltage and repetition rate of the impulses				
Level	**On power port, PE**		**On I/O signal, data and control ports**	
	V peak (KV)	**Repetition rate (KHz)**	**Voltage peak**	**Repetition rate (KHz)**
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X	Special	Special	Special	Special

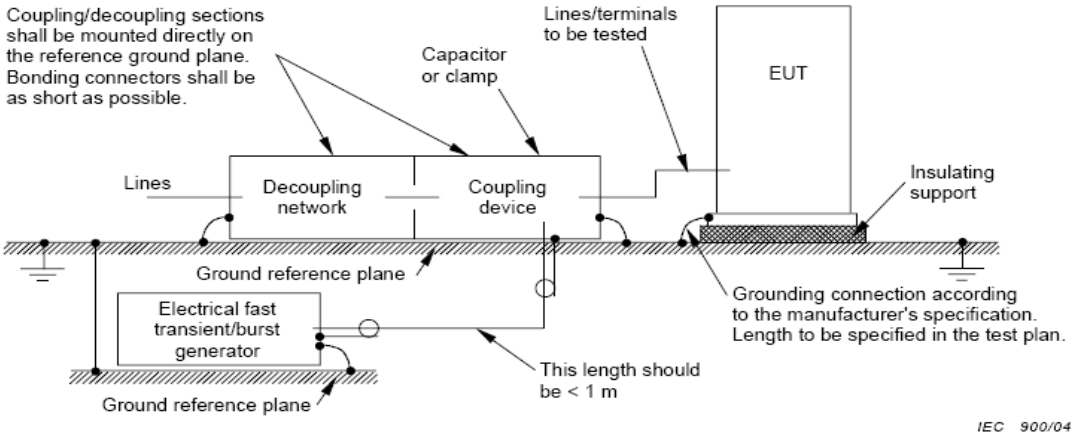
5.7.2.2 Performance criterion: B

5.7.3 Description of the test set-up

5.7.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.7.3.2 Block Diagram of Test Setup



5.7.4 Test specification:

Coupling network:	■ 0.5 kV ■ 1 kV □ 2 kV
Coupling clamp:	□ 0.5 kV □ 1 kV
Burst frequency:	■ 5.0 kHz
Coupling duration:	■ ≥ 60 s
Polarity:	■ positive ■ negative

5.7.5 Coupling points

Cable description:	AC power line: L, N,PE,L+N,L+PE,N+PE, L+N+PE
Screening:	□ screened ■ unscreened
Status:	□ passive ■ active
Signal transmission:	■ analogue □ digital
Length:	■ 1.5 m

5.7.6 Test result

The requirements are **Fulfilled** Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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5.8 Surge

For test instruments and accessories used see section 6 part **6.8**.

5.8.1 Description of the test location

Test location :	Test location no. 2
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.8.2 Severity levels of surge

5.8.2.1 Severity level: Line to line: ±1KV Line to earth: ±2KV

Level	Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
X	Special

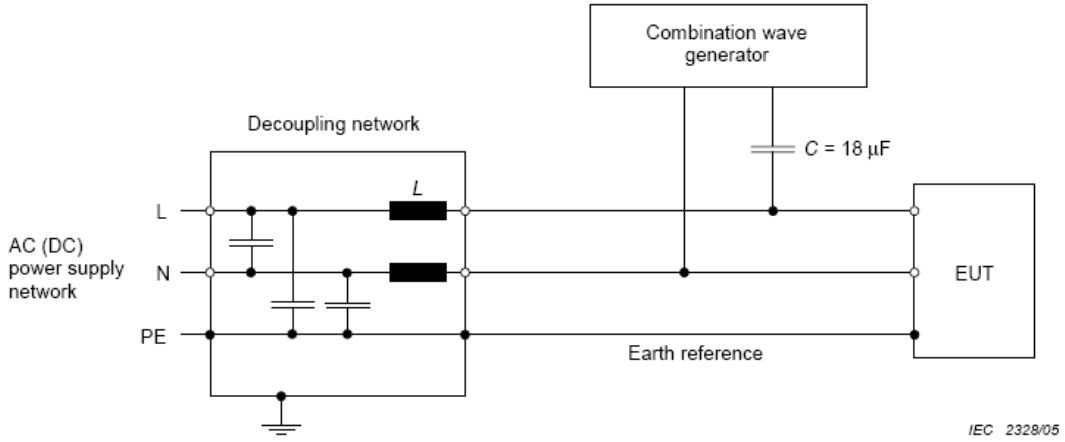
5.8.2.2 Performance Criterion: B

5.8.3 Description of the test set-up

5.8.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.8.3.2 Block Diagram of Test Setup



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5.8.4 Test specification:

Pulse amplitude-Power line sym.: Source impedance: 2 Ω + 18μF	■ 0.5 kV ■ 1 kV □ 2 kV □ 4 kV
Pulse amplitude-Power line unsym: Source impedance: 12 Ω + 9μF	■ 0.5 kV ■ 1 kV ■ 2 kV □ 4 kV
Number of surges:	■ 5 Surges/Phase angle
Phase angle:	■ 0 ° ■ 90 ° ■ 180 ° ■ 270 °
Repetition rate:	■ 60 s
Polarity:	■ positive ■ negative

5.8.5 Coupling points

Cable description:	AC power line: L+N,L+PE,N+PE
Screening:	□ screened ■ unscreened
Status:	□ passive ■ active
Signal transmission:	■ analogue □ digital
Length:	■ 1.5 m

5.8.6 Test result

The requirements are **Fulfilled** Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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5.9 Conducted disturbances induced by radio-frequency fields

For test instruments and accessories used see section 6 part **6.9**

5.9.1 Description of the test location

Test location :	Test location no. 2
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.9.2 Severity levels of conducted disturbances induced by radio-frequency fields discharge

5.9.2.1 Severity Level: 3V

Level	Field Strength （V）
1	1
2	3
3	10
X	Special

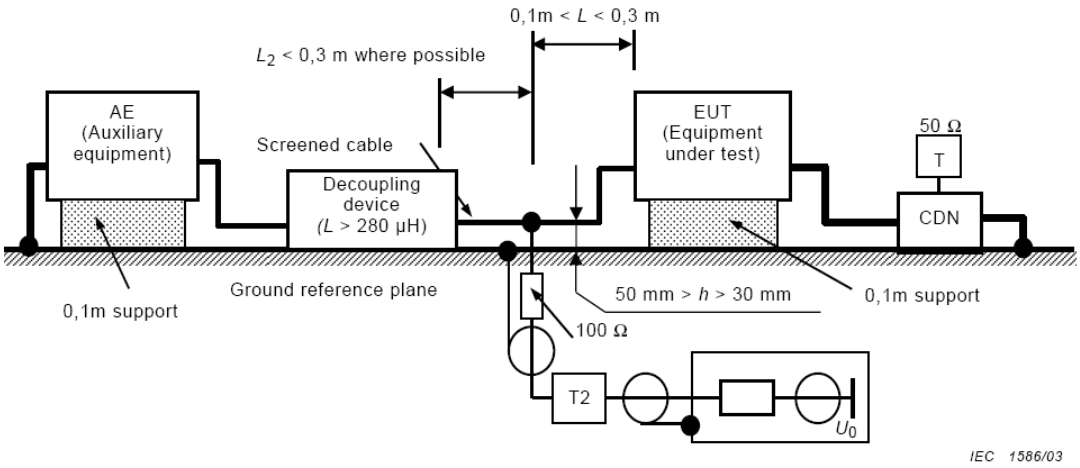
5.9.2.2 Performance Criterion: A

5.9.3 Description of the test set-up

5.9.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.9.3.2 Block Diagram of Test Setup



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5.9.4 Test specification:

Frequency range:	■ 0.15 MHz to 80 MHz
Test voltage:	■ 3 V
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time

5.9.5 Coupling points

Cable description (Port1):	AC power line: L+N+PE	
Screening:	□ screened	■ unscreened
Status:	□ passive	■ active
Signal transmission:	■ analogue	□ digital
Length:	■ 0.3 m	

5.9.6 Test result

The requirements are **Fulfilled** Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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5.10 Power frequency magnetic field

For test instruments and accessories used see section 6 part **6.10**.

5.10.1 Description of the test location

Test location :	Test location no. 2
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.10.2 Severity levels of magnetic field immunity

5.10.2.1 Severity Level: 1A/m

Level	Magnetic Field Strength (A/m)
1	1
2	3
3	10
4	30
5	100
X	Special

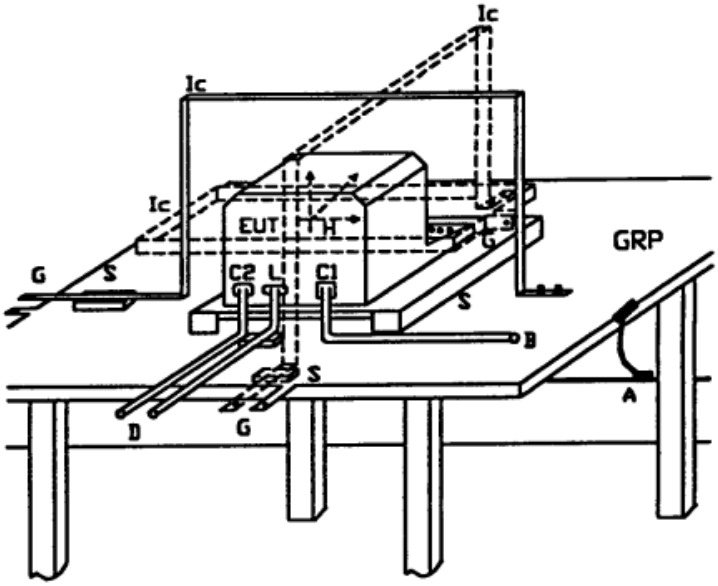
5.10.2.2 Performance Criterion: A

5.10.3 Description of the test set-up

5.10.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.10.3.2 Block Diagram of Test Setup



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5.10.4 Test specification:

Test frequency:	■ 50 Hz		
Continuous field:	■ 1 A/m		
Duration (Continuous field):	■ 60 s each Axis		
Short duration (1-3s):	■ 3s		
Axis:	■ x-axis	■ y-axis	■ z-axis

5.10.5 Test result

The requirements are **Fulfilled** Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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5.11 Voltage dips

For test instruments and accessories used see section 6 part **6.11**.

5.11.1 Description of the test location

Test location :	Test location no. 2
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.11.2 Severity levels of voltage dips

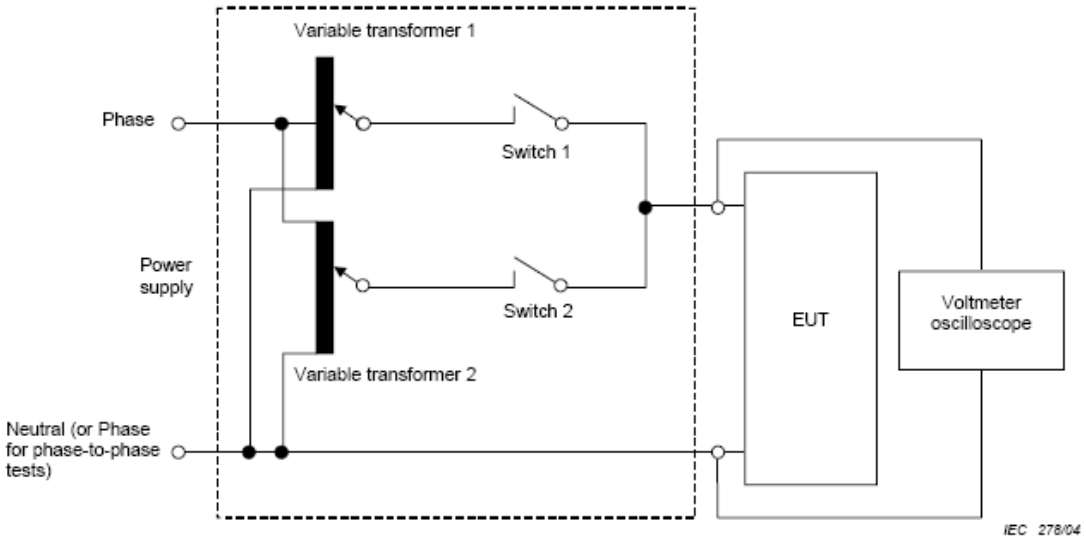
Test Level (%Ut)	Voltage Dips (%Ut)	Performance Criterion	Duration (in period)
0	100	B	0.5
70	30	C	25

5.11.3 Description of the test set-up

5.11.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.11.3.2 Block Diagram of Test Setup



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5.11.4 Test specification:

Nominal Mains Voltage (V_N):	■ AC 230V
Number of voltage fluctuations:	■ 3
Level of reduction(dip) / duration:	■ 100 % / 20ms
Level of reduction(dip) / duration:	■ 30 % / 500ms

5.11.5 Test result

The requirements are **Fulfilled** Performance Criterion: **B/C**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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5.12 Voltage Short interruptions

For test instruments and accessories used see section 6 part **6.12**.

5.12.1 Description of the test location

Test location :	Test location no. 2
Power supply:	DC 5V by PC
Test condition:	Ambient Temperature: 24℃, Humidity:46%
Date of test :	23~24 November 2015
Operator :	**Eric**

5.12.2 Severity levels of voltage short interruptions

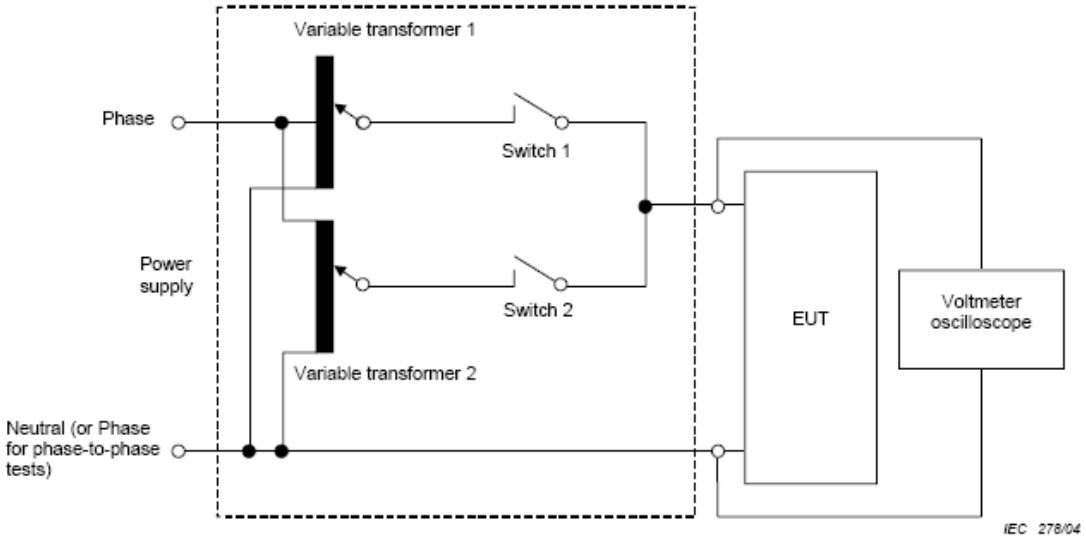
Test Level (%Ut)	Voltage Short Interruptions (%Ut)	Performance Criterion	Duration (in period)
0	100	C	250

5.12.3 Description of the test set-up

5.12.3.1 Operating Condition

The EUT is Copy Data during the test, and the results of the maximum emanation are recorded

5.12.3.2 Block Diagram of Test Setup



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5.12.4 Test specification:

Nominal Mains Voltage (V_N):	■ AC 230 V
Number of voltage fluctuations:	■ 3
Level of reduction(dip) / duration:	■ 5000 ms

5.12.5 Test result

The requirements are **Fulfilled** Performance Criterion: **C**

Remarks: During the test no deviation was detected to the selected operation mode(s).

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6 USED TEST EQUIPMENT

6.1					
Radiated disturbance (Electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2015/03/24
2	EMI Test Receiver	ROHDE & SCHWARZ	ESVS 10	842885/001	2015/10/30
3	Biconical Antenna	ROHDE & SCHWARZ	HK116	100221	2015/03/24
4	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2015/03/24
5	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2015/03/24
6	Pre-Amplifier	EMC	EMC330	980113	2015/03/24
7	Pre-Amplifier	EMC	EMC012645	980114	2015/03/24
8	EMI Test Software	Farad	EZ-EMC	N/A	N/A

6.2					
Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100868	2015/10/30
2	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/025	2015/10/30
3	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z6	100140	2015/10/30
4	Pulse Limiter	ROHDE & SCHWARZ	ESHS-Z2	100301	2015/10/30
5	EMI Test Software	Farad	EZ-EMC	N/A	N/A

6.3					
Harmonic Current					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	Harmonics1000-1P	103488	2015/10/30
2	Harmonics-1000	EMC Partner	N/A	N/A	N/A

6.4					
Voltage Fluctuation and Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	Harmonics1000-1P	103488	2015/10/30
2	Harmonics-1000	EMC Partner	N/A	N/A	N/A

6.5					
Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	Schlöder	SESD 200	0302016	2015/03/24

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6.6					
RF Field Strength Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	ROHDE & SCHWARZ	SMY 01	843215/014	2015/10/30
2	Signal Generator	ROHDE & SCHWARZ	SML03	102986	2015/10/30
3	Amplifier	KALMUS	713FC	7385-1	2015/10/30
4	Power Meter	ROHDE & SCHWARZ	NRVS	842856/049	2015/10/30
5	Field Probe	ETS	HI-6005	00075047	2015/11/10
6	RS Test Software	Farad	EZ-RS	N/A	N/A

6.7					
Electrical Fast Transient/Burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2015/10/30
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2015/10/30
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2015/10/30
4	Genecs Software	EMC Partner	N/A	N/A	N/A

6.8					
Surge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2015/10/30
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2015/10/30
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2015/11/05
4	Genecs Software	EMC Partner	N/A	N/A	N/A

6.9					
Conducted Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	RF generator / amplifier	Schlöder	CDG 6000	HU906007	2015/10/30
2	CDN	Schlöder	CDN M3	A3003008	2015/10/30
3	CDN	Schlöde	CDN T2	A3010005	2015/10/30
4	Attenuator	Abschwächer	DC-500MHz	N/A	2015/10/30
5	EM injection clamp	Liithi	EM101	35670	2015/11/09
6	CDG-6000 Software	Schlöder	N/A	N/A	N/A

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6.10					
Power Frequency Magnetic Field Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power frequency mag-field generator System	EM TEST	EMS61000-8K	409001	2015/10/30

6.11					
Voltage Dips					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2015/10/30
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2015/10/30
3	GenecsSoftware	EMC Partner	N/A	N/A	N/A

6.12					
Voltage Short Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2015/10/30
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2015/10/30
3	GenecsSoftware	EMC Partner	N/A	N/A	N/A

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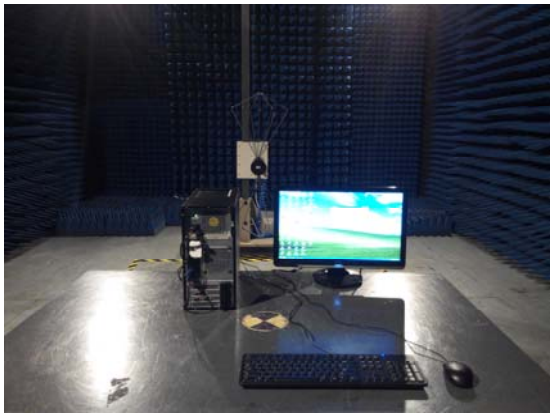
7 TEST PHOTOGRAPHS

7.1. Photo of power line conducted emission measurement(C.E.)

7.2. Photo of radiated emission measurement (R.E. Electric field)



7.3. Photo of harmonic current and flicker emission measurement(H.&F.)

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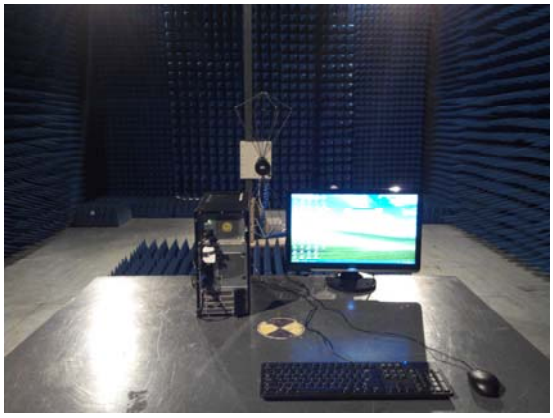
7.4. Photo of electrostatic discharge Immunity measurement(E.S.D)

7.5. Photo of RF field strength Immunity measurement(R.S.)



7.6. Photo of EFT/surge/Dips immunity measurement(E.F.T./Surge./Dips.)

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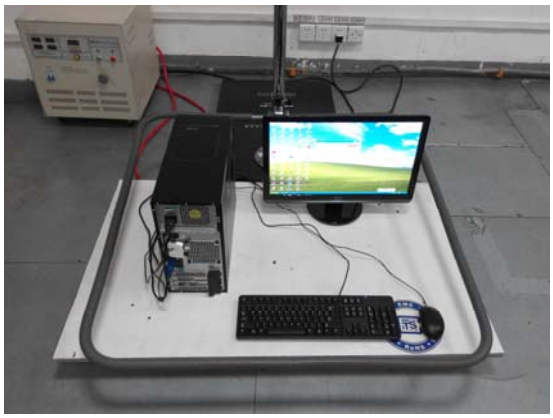
7.7. Photo of conducted disturbance Immunity measurement(C.S.)

7.8. Photo of PFM field immunity measurement(P.F.M.F.)



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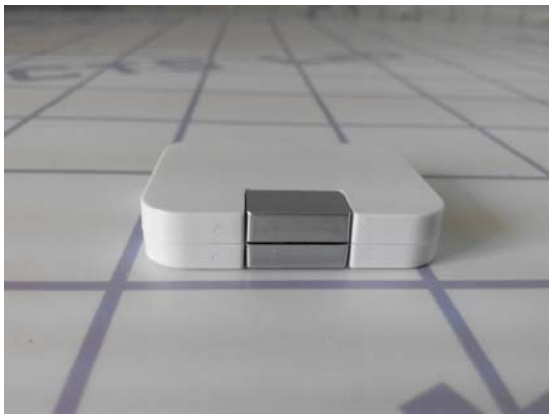
8 EXTERNAL AND INTERNAL PHOTOS OF THE EUT

External view 1

External view 2



External view 3

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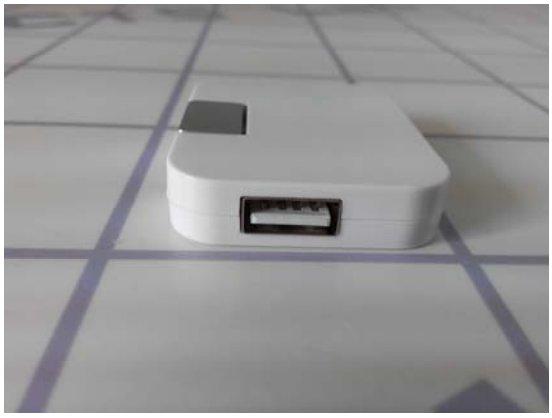

External view 4

External view 5

External view 6

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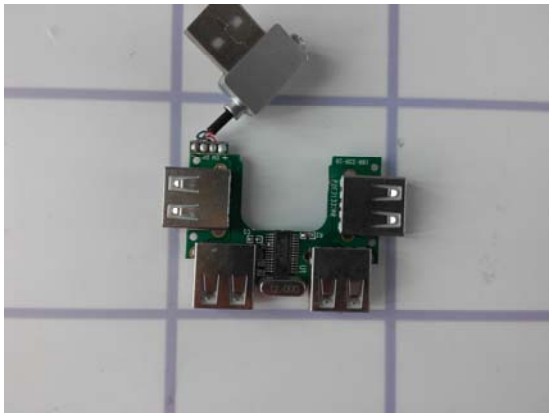
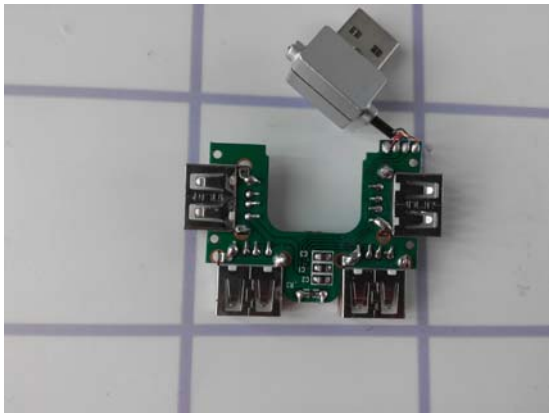
External view 7



PCB view 1



PCB view 2

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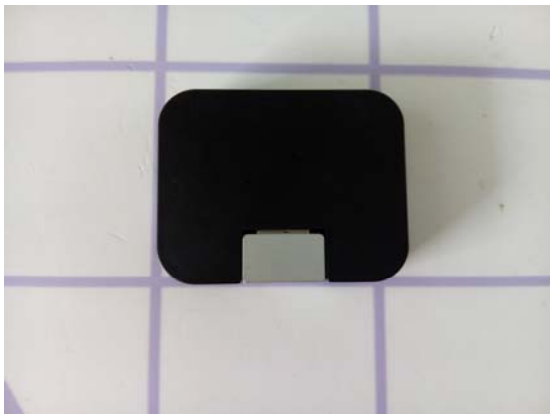
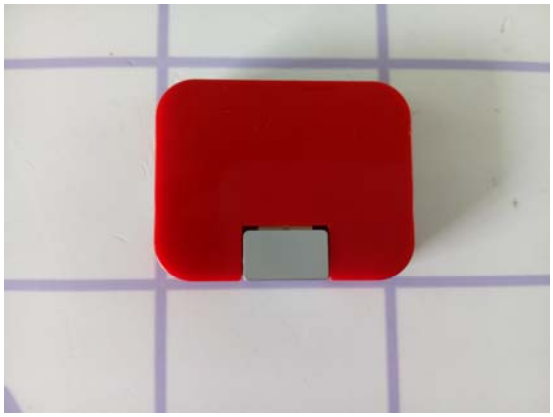
Following Number External view 1



Following Number External view 2



Following Number External view 3

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9 Manufacturer/ Approval holder Declaration

The following identical model(s):

N/A

Belong to the tested device:

Product description: **USB HUB**
Model name: **YC787**

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