



**CENTRE OF TESTING SERVICE
INTERNATIONAL**

OPERATE ACCORDING TO ISO/IEC 17025

EMC TEST REPORT

TEST REPORT NUMBER : CNB3110303-00555-E



CENTRE OF TESTING SERVICE CO., LTD.
Building F, Dachuang industrial park, No.379, Zhongshan Dadao,
Guangzhou, China.



TEST REPORT EN 55015:2006+A1:2007+A2:2009 Limits and methods of measurements of radio disturbance characteristics of electrical lighting and similar equipment. EN 61547:2009 Equipment for general lighting purposes-EMC immunity requirements.	
Report Reference No.	CNB3110303-00555-E
Date of issue	05 March 2011
Testing Laboratory Name Address..... Testing location/ procedure..... Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing method <input type="checkbox"/>	
Applicant's name Address.....	
Test specification: Standard EN 55015:2006+A1:2007+A2:2009, EN 61547:2009 Test Report Form No. CTSEMC-1.0 TRF Originator..... Master TRF Dated 2009-01	
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Test item description. Flashlight Trade Mark..... / Manufacturer Model/Type reference P513.332 Ratings Battery 3.6V*1 Result Positive	

Compiled by:

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Supervised by:

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EMC -- TEST REPORT

Test Report No. : CNB3110303-00555-E05 March 2011
Date of issue

Type / Model..... P513.332

EUT..... Flashlight

Applicant.....

Address.....

Telephone.....

Fax.....

Contact.....

Manufacturer.....

Address.....

Telephone.....

Fax.....

Contact.....

Factory.....

Address.....

Telephone.....

Fax.....

Contact.....

Test Result according to the standards on page 3: **Positive**

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.

TABLE OF CONTENTS

Description	Page
1 TEST STANDARDS	4
2 SUMMARY	4
2.1 GENERAL REMARKS	4
2.2 FINAL ASSESSMENT	4
3 EQUIPMENT UNDER TEST	5
3.1 Power supply system utilised	5
3.2 Short description of the Equipment under Test (EUT)	5
3.3 EUT operation mode	5
3.4 EUT configuration	6
3.5 Performance level	6
3.6 Definition related to the performance level	6
4 TEST ENVIRONMENT	7
4.1 Address of the test laboratory	7
4.2 Test facility	7
4.3 Environmental conditions	7
4.4 Definitions of symbols used in this test report	7
4.5 Statement of the measurement uncertainty	7
4.6 Measurement Uncertainty	8
4.7 Test Description	8
5 TEST CONDITIONS AND RESULTS	9
5.1 Radiated disturbance (magnetic field)	9
5.2 Radiated disturbance (Electric field)	14
6 USED TEST EQUIPMENT	18
7 TEST PHOTOGRAPHS	21
7.1. Photos of radiated emission measurement (Magnetic field)	21
7.2. Photos of radiated emission measurement (Electric field)	21
8 EXTERNAL AND INTERNAL PHOTOS OF THE EUT	22
9 Manufacturer/ Approval holder Declaration	24

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1 TEST STANDARDS

The tests were performed according to following standards:

EN 55015:2006+A1:2007+A2:2009 Limits and methods of measurements of radio disturbance characteristics of electrical lighting and similar equipment.

EN 61547:2009 Equipment for general lighting purposes-EMC immunity requirements.

2 SUMMARY

2.1 GENERAL REMARKS

Date of receipt of test sample	03 March 2011
Testing commenced on	04 March 2011
Testing concluded on	04 March 2011

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 3.

☐ - **does not** fulfil the EMC requirements cited on page 3.



3 EQUIPMENT UNDER TEST

3.1 Power supply system utilised

Power supply voltage: ☐ AC 230V/50 Hz ☐ 115V/60Hz
☐ Other (Specified blank below) ☒ Battery 3.6V*1

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:

- ☐ - Standby
- ☐ - Test programme (H - Pattern)
- ☐ - Test programme (colour bar)
- ☐ - Operating mode 2500 U/min. (1 cylinder)
- ☐ - Operating mode 1500 U/min. (> 1 cylinder)
- ☐ - Ignition on , Motor off
- ☐ - Speed 50 km/h
- ☒ - Test program (customer specific)

Operating Mode: ON

Emissions tests.....: According to EN 55015,, searching for the highest disturbance.

Immunity tests: According to EN 61547, searching for the highest susceptibility.

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:

Not Applicable

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: normal 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 normal 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:

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

4.2 Test facility

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

CNAS-Lab Code: L3394

CENTRE OF TESTING SERVICE 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.: 8374

The 3m Alternate Test Site of CENTRE OF TESTING SERVICE CO., LTD. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 8374 on June 24, 2009 .

FCC-Registration No.: 971995

CENTRE OF TESTING SERVICE 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 21, 2009.

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.

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4.6 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	$\pm 1.22\text{dB}$	(1)
Power disturbance	30MHz~300MHz	$\pm 1.38\text{dB}$	(1)
Radiation emission (3m)	30MHz~300MHz	$\pm 3.14\text{dB}$	(1)
	300MHz~1000MHz	$\pm 3.18\text{dB}$	(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	EN 55015: 2006+A1: 2007+A2:2009	-----	N/A
Radiated Disturbance (Magnetic)	EN 55015: 2006+A1: 2007+A2:2009	-----	PASS
Radiated Disturbance (Electric)	EN 55015: 2006+A1: 2007+A2:2009	-----	PASS
Harmonic current emissions	EN 61000-3-2: 2006+A1:2009+A2: 2009	Class C	N/A
Voltage fluctuations & flicker	EN 61000-3-3: 2008	-----	N/A
IMMUNITY (EN 61547:2009)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	IEC 61000-4-2: 2008	B	N/A
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3: 2010	A	N/A
Electrical fast transient (EFT)	IEC 61000-4-4: 2007	B	N/A
Surge	IEC 61000-4-5: 2009	B	N/A
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6: 2008	A	N/A
Power frequency magnetic field	IEC 61000-4-8: 2009	A	N/A
Voltage dips and interruptions	IEC 61000-4-11: 2010	B&C	N/A
N/A is an abbreviation for Not Applicable.			

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5 TEST CONDITIONS AND RESULTS

5.1 Radiated disturbance (magnetic field)

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

5.1.1 Description of the test location

Test location : Shielded room

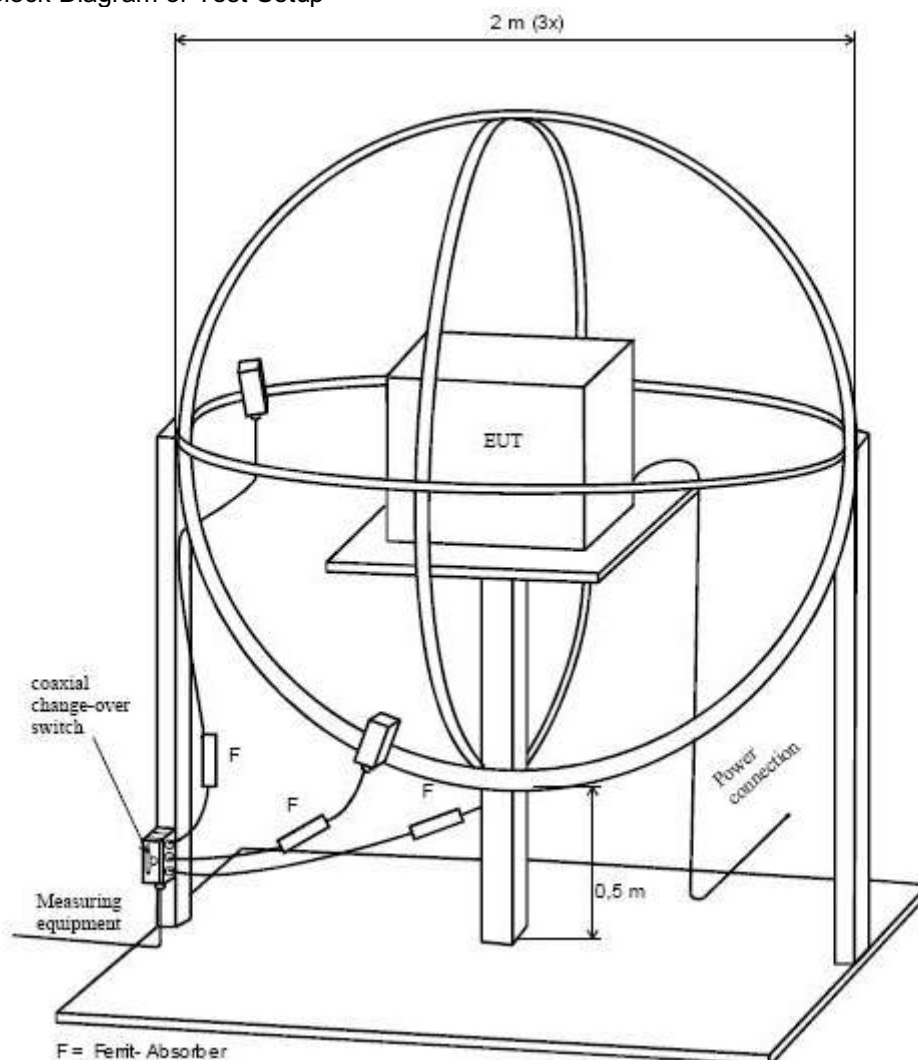
Test disturbance: 2 Meter

5.1.2 Description of the test set-up

5.1.2.1 Operating Condition

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

5.1.2.2 Block Diagram of Test Setup



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5.1.3 Limits of disturbance

Frequency	Limits for loop diameter (dB μ A)	
	2m	
9kHz ~ 70kHz	88	
70kHz ~ 150kHz	88 ~ 58*	
150kHz ~ 2.2MHz	58 ~ 26*	
2.2MHz ~ 3.0MHz	58	
3.0MHz ~ 30MHz	22	

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.

5.1.4 Test result

The requirements are	Fulfilled
Band width	9kHz
Frequency range	9kHz - 30 MHz
Min. limit margin MHz	>15.1 dB at 9kHz- 30MHz

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



5.1.5 Test protocol

Test point:	X	Result:	■ - passed □ - not passed
Operation mode			
Remarks:			

EUT	Flashlight
Operating Condition	Battery 3.6V*1
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Tony
MODEL NO.	P513.332

Level [dB_礎]

Frequency [Hz]

x MES EN 55015 R_fin QP
MES EN 55015 R_pre PK
LIM EN 55015 RADIATED Voltage QP Limit
LIM EN 55015 RADIATED Voltage QP Limit

MEASUREMENT RESULT: "EN 55015 R_fin QP"

Frequency	Level	Transd	Limit	Margin	Loop	Azimuth
MHz	dB μ A	dB	dB μ A	dB		deg
0.755518	6.80	10.0	39	32.0	X	0.00
2.099304	6.80	10.0	27	19.7	X	0.00
2.133095	6.80	10.0	26	19.6	X	0.00
4.040214	6.90	10.0	22	15.1	X	0.00
10.830073	6.90	10.0	22	15.1	X	0.00
25.754141	6.60	10.0	22	15.4	X	0.00

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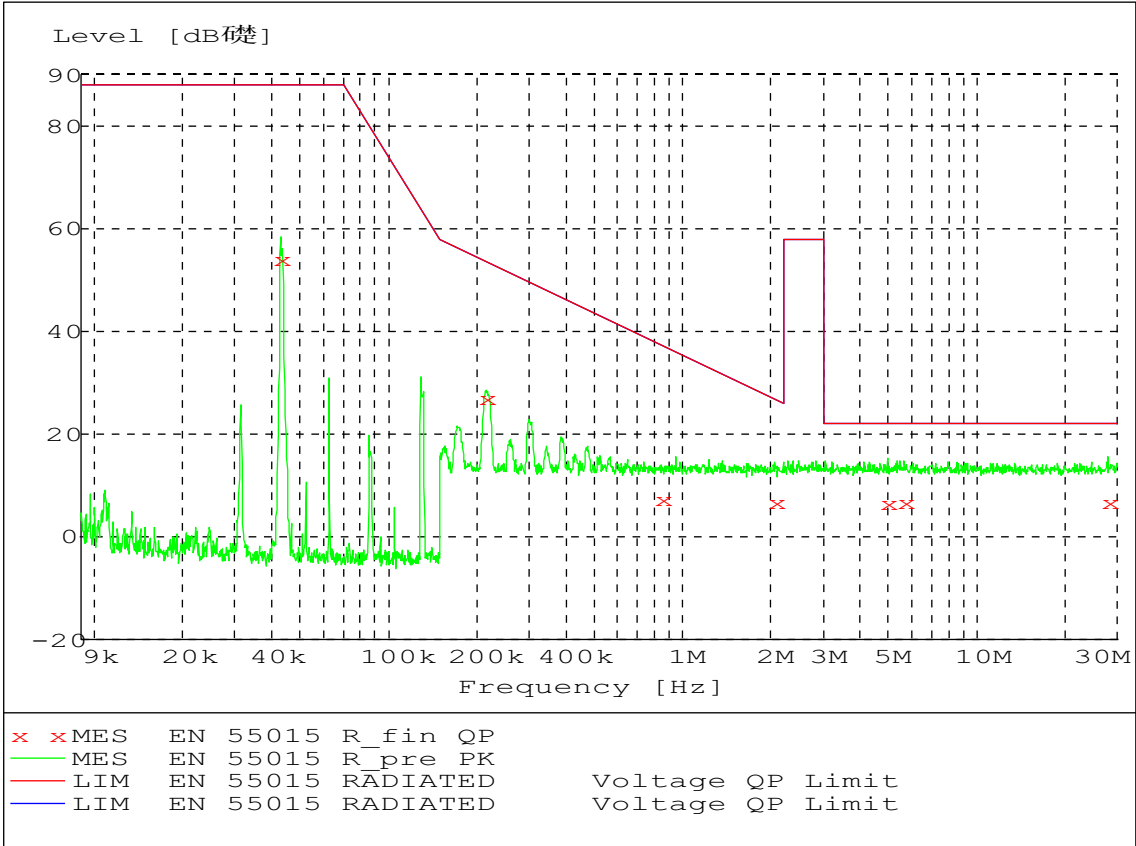
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Test point:	Y	Result:	<input checked="" type="checkbox"/> - passed
Operation mode			<input type="checkbox"/> - not passed
Remarks:			

EUT	Flashlight
Operating Condition	Battery 3.6V*1
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Tony
MODEL NO.	P513.332



MEASUREMENT RESULT: "EN 55015 R_fin QP"

Frequency	Level	Transd	Limit	Margin	Loop	Azimuth
MHz	dBμA	dB	dBμA	dB		deg
0.043039	54.20	10.0	88	33.8	Y	0.00
0.214845	27.10	10.0	54	26.7	Y	0.00
0.844868	7.40	10.0	37	30.0	Y	0.00
2.057818	6.90	10.0	27	19.9	Y	0.00
4.952491	6.70	10.0	22	15.3	Y	0.00
5.672440	6.80	10.0	22	15.2	Y	0.00
27.894676	6.90	10.0	22	15.1	Y	0.00

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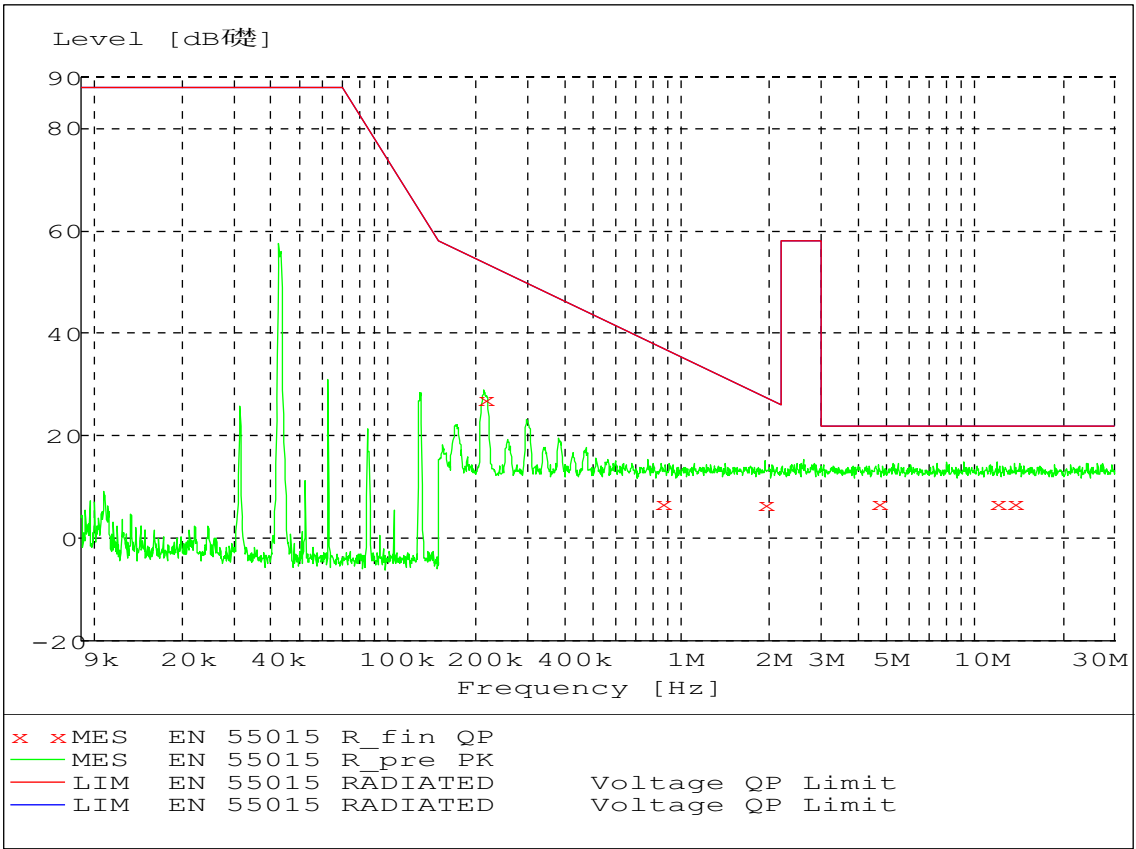
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Test point:	Z	Result:	■ - passed
Operation mode			□ - not passed
Remarks:			

EUT	Flashlight
Operating Condition	Battery 3.6V*1
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Tony
MODEL NO.	P513.332



MEASUREMENT RESULT: "EN 55015 R_fin QP"

Frequency	Level	Transd	Limit	Margin	Loop	Azimuth
MHz	dB _{μA}	dB	dB _{μA}	dB		deg
0.213137	27.20	10.0	54	26.6	Z	0.00
0.855047	6.90	10.0	37	30.3	Z	0.00
1.930490	6.80	10.0	28	20.8	Z	0.00
4.702030	6.90	10.0	22	15.1	Z	0.00
11.919019	6.90	10.0	22	15.1	Z	0.00
13.651700	6.90	10.0	22	15.1	Z	0.00

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5.2 Radiated disturbance (Electric field)

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

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 engraving during the test, and the results of the maximum emanation are recorded

5.2.2.2 Block Diagram of Test Setup



(EUT: Flashlight)

5.2.3 Limits of disturbance

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
30 ~ 230	3	40
230 ~ 300	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.



5.2.4 Test result

The requirements are	Fulfilled
Band width	120kHz
Frequency range	30 MHz - 300 MHz
Min. limit margin	>6 dB at 30 - 300 MHz

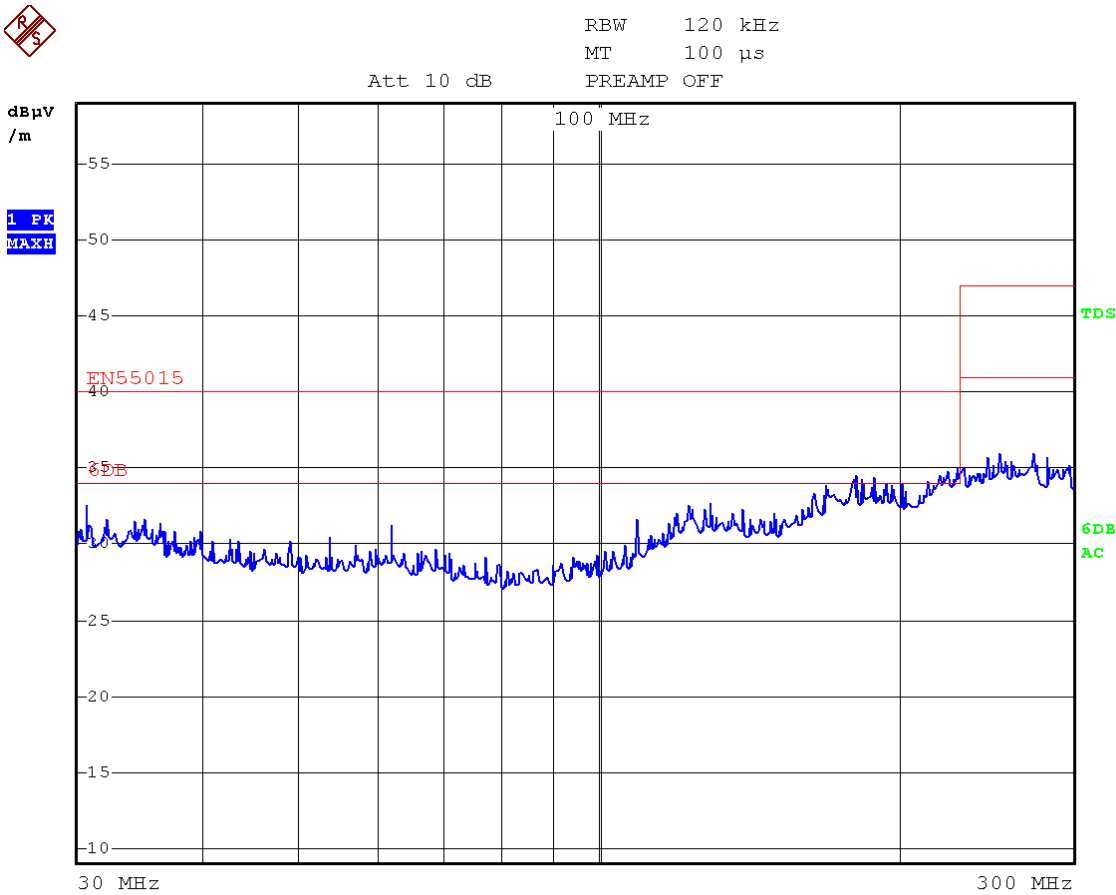
Remarks: The limits are kept. For detailed results, please see the following page(s).



5.2.5 Test protocol

Test point:	Horizontal	Result:	<input checked="" type="checkbox"/> - passed
Operation mode			<input type="checkbox"/> - not passed
Remarks:			

EUT	Flashlight
Operating Condition	Battery 3.6V*1
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Tony
MODEL NO.	P513.332



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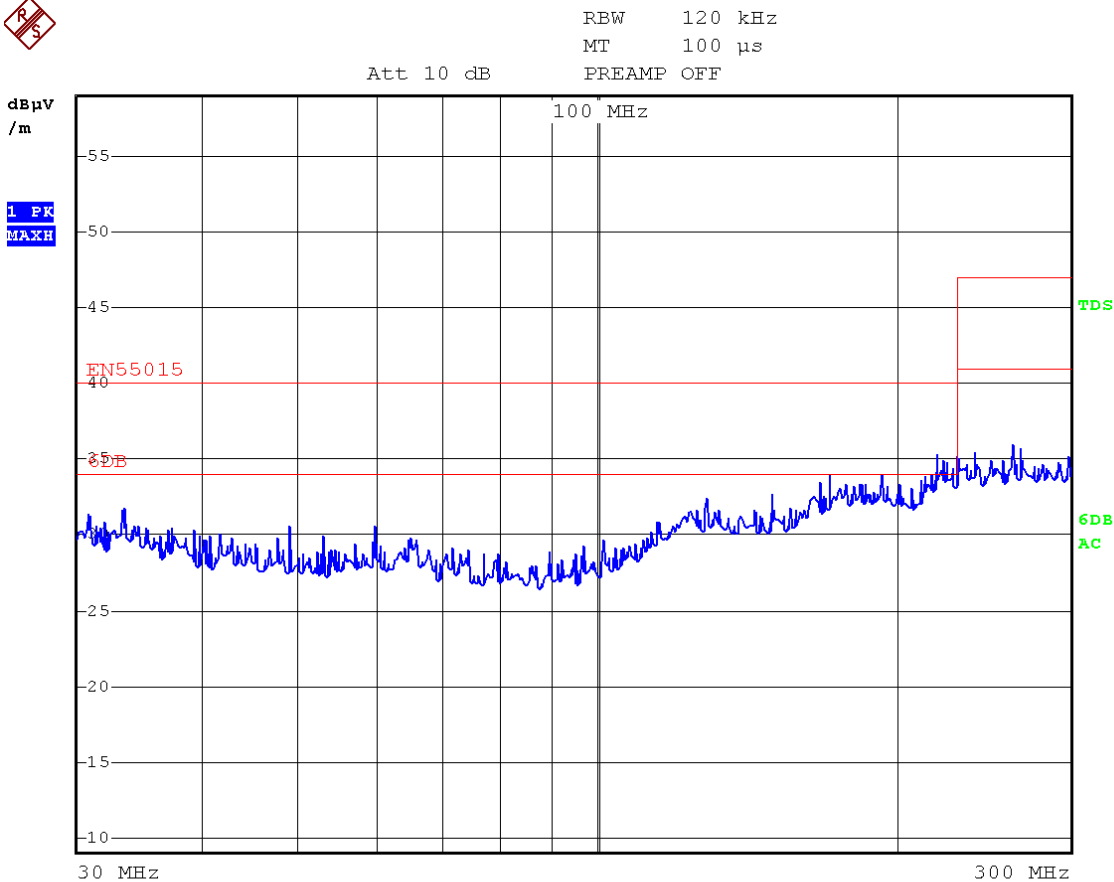
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Test point:	Vertical	Result:	<input checked="" type="checkbox"/> - passed
Operation mode			<input type="checkbox"/> - not passed
Remarks:			

EUT	Flashlight
Operating Condition	Battery 3.6V*1
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Operator	Tony
MODEL NO.	P513.332



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6 USED TEST EQUIPMENT

6.1

Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESHS10	842884/012	2010/12
2	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/025	2010/12
3	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100301	2010/12
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2010/12

6.2

Radiated Disturbance (Magnetic field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESHS10	842884/012	2010/12
2	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/025	2010/12
3	Triple-loop antenna	ROHDE & SCHWARZ	HM020	100015	2010/12
4	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100301	2010/12
5	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2010/12

6.3

Radiated Emission(Electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100868	2010/12
2	Biconical Antenna	ROHDE & SCHWARZ	HK116	100221	2010/12
3	Log per Antenna	ROHDE & SCHWARZ	HL223	100226	2010/12
4	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2010/12
5	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2010/12

6.4

Harmonic Current					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	HAR1H01B	HAR1000-48	2010/12

6.5

Voltage fluctuation and Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	HAR1H01B	HAR1000-48	2010/12

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6.6

Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	Schlöder	SESD 200	302016	2010/12

6.7

RF Field Strength Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	SIGNAL GENERATOR	ROHDE & SCHWARZ	SMY 01	843215/014	2010/12
2	AMPLIFIER	KALMUS	713FC	Jan-85	2010/12
3	EMS Test Software	ROHDE & SCHWARZ	ESK1	N/A	2010/12

6.8

Electrical Fast Transient/Burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	TRA1H01B	HAR1000-78	2010/12
2	Coupling Clamp	EMC Partner	SFT 410	302015	2010/12

6.9

Surge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	TRA1H01B	HAR1000-78	2010/12

6.10

Conducted Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	RF generator / amplifier	Schlöder	CDG 6000	HU906007	2010/12
2	CDN	Schlöder	CDN M3	A3003008	2010/12
3	CDN	Schlöder	CDN T2	A3010005	2010/12
4	EM injection clamp	Liithi	EM101	35670	2010/12
5	EMS Test Software	ROHDE & SCHWARZ	ESK1	N/A	2010/12

6.11

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	2010/12

6.12

Voltage Dips					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	TRA1H01B	HAR1000-78	2010/12

6.13

Voltage Short Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	TRA1H01B	HAR1000-78	2010/12

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7 TEST PHOTOGRAPHS

7.1. Photos of radiated emission measurement (Magnetic field)



7.2. Photos of radiated emission measurement (Electric field)



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8 EXTERNAL AND INTERNAL PHOTOS OF THE EUT



External view front



External view back

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External view side



Internal view

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9 Manufacturer/ Approval holder Declaration

The following identical model(s):

P518.001, P518.02*, P518.012, P513.08*, P238.814, P510.142, P191.20* , P191.08* , P252.031

Belong to the tested device:

Product description: **Flashlight**
Model name: **P513.332**

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