



SEESHINE LIGHTING TECHNOLOGIES LIMITED.

TEST REPORT

Prepared For:	SEESHINE LIGHTING TECHNOLOGIES LIMITED 2/F, Block 5, Baohu Ind Park, Guanlan Baoan District, Shenzhen, Guangdong, China.
Product	MR16 SPOTLIGHT
Model :	SS-MR16-COB
Prepared By :	Shenzhen BST Technology Co., Ltd. Building No.23-24, Zhiheng industrial park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China.
Test Date:	Dec. 28, 2012 – Oct. 08, 2013
Date of Report :	Oct. 09, 2013
Report No.:	BST13090577Y-1SR-2

**TEST REPORT****COMMISSION REGULATION (EU) No 1194/2012****implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to****ecodesign requirements for directional lamps, light emitting diode lamps and related equipment**

Testing laboratory	Shenzhen BST Technology Co.,Ltd.
Address:	Building No.23-24, Zhiheng industrial park, Guankouer Road, Nantou, Nanshan District, Shenzhen, Guangdong, China
Testing location:	Shenzhen BST Technology Co.,Ltd.
Applicant	SEESHINE LIGHTIN TECHNOLOGIES LIMITED.
Address	2/F, Block 5, Baohu Ind Park, Niuhu, Guanlan Baoan District, Shenzhen, Guangdong, China.
Test Result	Commission Regulation (EC) 1194/2012
Test Procedure	Implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment.
Non-standard test method	N.A.
Type of test object.	MR16 SPOTLIGHT
Trademark	SEESHINE
Model/type reference	SS-MR16-COB
Rating	12V~, 50/60Hz, 5W, 0.54A
Manufacturer	SEESHINE LIGHTIN TECHNOLOGIES LIMITED.
Address	2/F, Block 5, Baohu Ind Park, Niuhu, Guanlan Baoan District, Shenzhen, Guangdong, China.



Name and address of the testing laboratory : Shenzhen BST Technology Co.,Ltd.
Building No.23-24, Zhiheng industrial park,
Guankouer Road, Nantou, Nanshan District,
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Prepared by :

Engineer

Reviewer :

Supervisor

Approved & Authorized Signer :

Christina / Manager



<p>Possible test case verdicts :</p> <p>test case does not apply to the test object : N(.A.)</p> <p>test object does meet the requirement : P(ass)</p> <p>test object does not meet the requirement : F(ail)</p>
<p>General remarks:</p> <p>Throughout this report a point is used as the decimal separator. The test results presented in this report relate only to the object tested.</p>

<p>General remarks:</p> <p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p>	<p>Attached with:</p> <p>A. photo documentation</p>
<p>Summary of testing:</p> <ol style="list-style-type: none"> 1. All submitted models were tested according to Implementation measure EC 1194/2012. 2. The product meets the stage 1 requirement of the implementation measure. 	



Standard and test conditions for measurement

For the purpose of assessing the conformity of the product with ecodesign requirements as set in regulation (EC) 1194/2012, the following standard has been used:

Measured parameter	Standard used
Luminous efficacy	EN 50285:1999 - Energy efficiency of electric lamps for household use – Measurements methods
Lamp lifetime	EN 60357:2003 +A1: 2008 - Tungsten halogen lamps(non-vehicle)- Performance specifications
Lumen maintenance	
Lamp starting time	EN 60969:1993 + A1: 1993 A2: 2000 - Starting time test for Self-ballasted lamps for general lighting services — Performance requirement
Lamp warm-up time to 60% φ	
UV radiation	Systems - UV radiation measurement
Lamp power factor	EN61000-3-2:2006-Electromagnetic compatibility (EMC) Part 3-2:Limits - Limits for harmonic current emissions (equipment input current≤16 A per phase)
Lamp caps	EN 60061:1993 + All amendments up to A40: 2008 - Lamp caps and holders together with gauges for the control of interchangeability and safety Part 1: Lamp caps
Chromaticity Correlated Colour Temperature (Tc[K])	CIE 15:2004 – Colorimetry
Luminance	CIE 18.2:1983 - The Basis of Physical Photometry
Luminous flux	CIE 84:1989 - The Measurement of Luminous Flux
Lamp Lumen Maintenance Factor (LLMF)	CIE 97:2005 – Maintenance of indoor electric lighting systems
Lamp Survival Factor	

Ambient temperature:.....	25.1 °C
Test voltage(s) (V):.....	12.0V
Test Frequency (Hz):.....	60 Hz



Clasue		Requirement-Test	
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0.	General		
0.1	Power source mets requirement of: Where no requirement stated in the relevant standards EN60969 requirement are to be applied accordingly.		P
0.2	Ambient condition met requirement of: Where no requirement stated in the relevant standards EN60969 requirement are to be applied accordingly.		P
0.3	Test are done under rated value unless otherwise stated or required.		P
0.4	Sample		
	Number of sample used for tested	20 pcs for each model	P
1.	ENERGY EFFICIENCY REQUIREMENTS		
1.1	Energy efficiency requirements for directional lamps: The energy efficiency index (EEI) of the lamp is calculated as follows and rounded to two decimal places: $EEI = P_{cor} / P_{ref}$ P_{cor} is the rated power measured at nominal input voltage and corrected where appropriate in accordance with follow. The correction factors are cumulative where appropriate.		N
1.1.1	Lamps operating on external halogen lamp control gear: $P_{rated} \times 1,06$		N
1.1.2	Lamps operating on external LED lamp control gear: $P_{rated} \times 1,10$		N
1.1.3	Fluorescent lamps of 16 mm diameter (T5 lamps) and 4-pin single capped fluorescent lamps operating on external fluor- escent lamp control gear: $P_{rated} \times 1,10$		N
1.1.4	Other lamps operating on external fluorescent lamp control Gear: $P_{rated} \times (0,24 \sqrt{\Phi_{use}} + 0,0103\Phi_{use}) /$ $(0,15 \sqrt{\Phi_{use}} + 0,0097\Phi_{use})$		N
1.1.5	Lamps operating on external high-intensity discharge lamp control gear: $P_{rated} \times 1,10$		N



Clasue		Requirement-Test	
1.1.6	Lamps operating on external low pressure sodium lamp control Gear: $P_{\text{rated}} \times 1,15$		N
1.1.7	P ref is the reference power obtained from the useful luminous flux of the model (Φ_{use}) by the following formulae:		N
	For models with $\Phi_{\text{use}} < 1\,300$ lumen: $P_{\text{ref}} = 0,88 \sqrt{\Phi_{\text{use}}} + 0,049\Phi_{\text{use}}$		N
	For models with $\Phi_{\text{use}} \geq 1\,300$ lumen: $P_{\text{ref}} = 0,07341\Phi_{\text{use}}$		N
1.1.8	Φ_{use} is defined as follows:		
	directional lamps with a beam angle $\geq 90^\circ$ other than filament lamps and carrying a warning on their packaging in accordance with point 3.1.2: rated luminous flux in a 120° cone (Φ_{120°)		N
	other directional lamps: rated luminous flux in a 90° cone (Φ_{90°).		N
1.2	Energy efficiency requirements for lamp control gear		
1.2.1	As from stage 2, the no-load power of a lamp control gear intended for use between the mains and the switch for turning the lamp load on/off shall not exceed 1,0 W. As from stage 3, the limit shall be 0,50 W. For lamp control gear with output power (P) over 250 W, the no-load power limits shall be multiplied by P/250 W.		N
1.2.2	As from stage 3, the standby power of a lamp control gear shall not exceed 0,50 W.		N
1.2.3	As from stage 2, the efficiency of a halogen lamp control gear shall be at least 0,91 at 100 % load.		N
2.	FUNCTIONALITY REQUIREMENTS		
2.1	Functionality requirements for directional lamps other than LED lamps		
2.1.1	Functionality requirements for directional compact fluorescent lamps		
2.1.1.1	Lamp survival factor at 6 000 h		
	Stage 1 except where indicated otherwise: From 1 March 2014: $\geq 0,50$		N
	Stage 3: $\geq 0,70$		N
2.1.1.2	Lumen maintenance		
	Stage 1 except where indicated otherwise: At 2 000 h: $\geq 80\%$		N



Clasue		Requirement-Test	
	Stage 3: At 2 000 h: $\geq 83 \%$ At 6 000 h: $\geq 70 \%$		N
2.1.1.3	Number of switching cycles before failure		
	Stage 1 except where indicated otherwise: \geq half the lamp lifetime expressed in hours $\geq 10\,000$ if lamp starting time $>0,3$ s		N
	Stage 3: \geq lamp lifetime expressed in hours $\geq 30\,000$ if lamp starting time $>0,3$ s		N
2.1.1.4	Starting time		
	Stage 1 except where indicated otherwise: $< 2,0$ s		N
	Stage 3: $< 1,5$ s if $P < 10$ W $< 1,0$ s if $P \geq 10$ W		N
2.1.1.5	Lamp warm-up time to 60% Φ		
	Stage 1 except where indicated otherwise: < 40 s or < 100 s for lamps containing mercury in amalgam form		N
	Stage 3: < 40 s or < 100 s for lamps containing mercury in amalgam form		N
2.1.1.6	Premature failure rate		
	Stage 1 except where indicated otherwise: $\leq 5,0 \%$ at 500 h		N
	Stage 3: $\leq 5,0 \%$ at 1 000 h		N
2.1.1.7	Lamp power factor for lamps with integrated control gear		
	Stage 1 except where indicated otherwise: $\geq 0,50$ if $P < 25$ W $\geq 0,90$ if $P \geq 25$ W		N
	Stage 3: $\geq 0,55$ if $P < 25$ W $\geq 0,90$ if $P \geq 25$ W		N
2.1.1.8	Colour rendering (Ra)		



Clasue		Requirement-Test	
	Stage 1 except where indicated otherwise: ≥ 80 ≥ 65 if the lamp is intended for outdoor or industrial applications according to point 3.1.3		N
	Stage 3: ≥ 80 ≥ 65 if the lamp is intended for outdoor or industrial applications according to point 3.1.3		N
2.1.2	Functionality requirements for other directional lamps (excluding LED lamps, compact fluorescent lamps and high-intensity discharge lamps)		
2.1.2.1	Rated lamp lifetime at 50 % lamp survival		
	Stage 1 and 2: ≥ 1 000 h (≥ 2 000 h in stage 2) ≥ 2 000 h for extra low voltage lamps not complying with the stage 3 filament lamp efficiency requirement in point 1.1		N
	Stage 3: ≥ 2 000 h ≥ 4 000 h for extra low voltage lamps		N
2.1.2.2	Lumen maintenance		
	Stage 1 and 2: ≥ 80 % at 75 % of rated average lifetime		N
	Stage 3: ≥ 80 % at 75 % of rated average lifetime		N
2.1.2.3	Number of switching cycles		
	Stage 1 and 2: ≥ four times the rated lamp life expressed in hours		N
	Stage 3: ≥ four times the rated lamp life expressed in hours		N
2.1.2.4	Starting time		
	Stage 1 and 2: < 0,2 s		N
	Stage 3: < 0,2 s		N
2.1.2.5	Lamp warm-up time to 60 % Φ		
	Stage 1 and 2: ≤ 1,0 s		N



Clasue		Requirement-Test	
	Stage 3: ≤ 1,0 s		N
2.1.2.6	Premature failure rate		
	Stage 1 and 2: ≤ 5,0 % at 100 h		N
	Stage 3: ≤ 5,0 % at 200 h		N
2.1.2.7	Lamp power factor for lamps with integrated control gear		
	Stage 1 and 2: Power > 25 W: ≥ 0,9 Power ≤ 25 W: ≥ 0,5		N
	Stage 3: Power > 25 W: ≥ 0,9 Power ≤ 25 W: ≥ 0,5		N
2.2	Functionality requirements for non-directional and directional LED lamps Requirement as from stage 1, except where indicated otherwise		P
2.2.1	Lamp survival factor at 6 000 h		
	From 1 March 2014: ≥ 0,90	0.95	P
2.2.2	Lumen Maintenance at 6 000 h		
	From 1 March 2014: ≥ 0,80	0.83	P
2.2.3	Number of switching cycles before failure		
	≥ 15 000 if rated lamp life ≥ 30 000 h otherwise: ≥ half the rated lamp life expressed in hours	15000, no failure.	P
2.2.4	Starting time		
	< 0,5 s	0.36s	P
2.2.5	Lamp warm-up time to 95 % Φ		
	<2s	1.3s	P
2.2.6	Premature failure rate		
	≤ 5,0 % at 1 000 h	0%	P
2.2.7	Colour rendering (Ra)		
	≥ 80 ≥ 65 if the lamp is intended for outdoor or industrial applications in accordance with point 3.1.3	80.3	P
2.2.8	Colour consistency		
	Variation of chromaticity coordinates within a six-step MacAdam ellipse or less.	5.4SDCM	P



Clasue			Requirement-Test
2.2.9	Lamp power factor (PF) for lamps with integrated control gear		
	$P \leq 2 \text{ W}$: no requirement $2 \text{ W} < P \leq 5 \text{ W}$: $PF > 0,4$ $5 \text{ W} < P \leq 25 \text{ W}$: $PF > 0,5$ $P > 25 \text{ W}$: $PF > 0,9$	0.7195 $P=5\text{W}$	P
2.3.	Functionality requirement for equipment designed for installation between the mains and the lamps		
2.3.1	As from stage 2, equipment designed for installation between the mains and the lamps shall comply with state-of-the-art requirements for compatibility with lamps whose energy efficiency index (calculated for both directional and non-directional lamps in accordance with the method set out in point 1.1) is at most:		N
2.3.1.1	0,24 for non-directional lamps (assuming that Φ use = total rated luminous flux),		N
2.3.1.2	0,40 for directional lamps.		N
2.3.2	When a dimming control device is switched on at its lowest control setting for which the operated lamps consume power, the operated lamps shall emit at least 1 % of their luminous flux at full load.		N
2.3.3	When a luminaire is placed on the market and intended to be marketed to the end-users, and lamps that the end-user can replace are included with the luminaire, these lamps shall be of one of the two highest energy classes, according to Commission Delegated Regulation (EU) No 874/2012, with which the luminaire is labelled to be compatible.		N
3.	PRODUCT INFORMATION REQUIREMENTS		
3.1.	Product information requirements for directional lamps		
3.1.1	Information to be displayed on the lamp itself		N
3.1.2	Information to be visibly displayed to end-users, prior to their purchase, on the packaging and on free access websites		N
3.1.2.1	Nominal useful luminous flux displayed in a font at least twice as large as any display of the nominal lamp power;		N
3.1.2.2	Nominal life time of the lamp in hours (not longer than the rated life time);		N
3.1.2.3	Colour temperature, as a value in Kelvins and also expressed graphically or in words;	5752K	P
3.1.2.4	Number of switching cycles before premature failure;		N
3.1.2.5	Warm-up time up to 60 % of the full light output (may be indicated as 'instant full light' if less than 1 second);		N



Clasue		Requirement-Test	
3.1.2.6	A warning if the lamp cannot be dimmed or can be dimmed only on specific dimmers; in the latter case a list of compatible dimmers shall be also provided on the manufacturer's website;		N
3.1.2.7	If designed for optimum use in non-standard conditions (such as ambient temperature $T_a \neq 25^\circ \text{C}$ or specific thermal management is necessary), information on those conditions;		N
3.1.2.8	Lamp dimensions in millimetres (length and largest diameter);		N
3.1.2.9	Nominal beam angle in degrees;		N
3.1.2.10	If the lamp's beam angle is $\geq 90^\circ$ and its useful luminous flux as defined in point 1.1 of this Annex is to be measured in a 120° cone, a warning that the lamp is not suitable for accent lighting;		N
3.1.2.11	If the lamp cap is a standardised type also used with filament lamps, but the lamp's dimensions are different from the dimensions of the filament lamp(s) that the lamp is meant to replace, a drawing comparing the lamp's dimensions to the dimensions of the filament lamp(s) it replaces;		N
3.1.2.12	An indication that the lamp is of a type listed in the first column of Table 6 may be displayed only if the luminous flux of the lamp in a 90° cone ($\Phi 90^\circ$) is not lower than the reference luminous flux indicated in Table 6 for the smallest wattage among the lamps of the type concerned. The reference luminous flux shall be multiplied by the correction factor in Table 7. For LED lamps, it shall be in addition multiplied by the correction factor		N
3.1.2.13	An equivalence claim involving the power of a replaced lamp type may be displayed only if the lamp type is listed in Table 6 and if the luminous flux of the lamp in a 90° cone ($\Phi 90^\circ$) is not lower than the corresponding reference luminous flux in Table 6. The reference luminous flux shall be multiplied by the correction factor in Table 7. For LED lamps, it shall be in addition multiplied by the correction factor in Table 8. The intermediate values of both the luminous flux and the claimed equivalent lamp power (rounded to the nearest 1 W) shall be calculated by linear interpolation between the two adjacent values.		N
	If the lamp contains mercury:		
3.1.2.14	Lamp mercury content as X,X mg;		N



Clasue		Requirement-Test	
3.1.2.15	Indication of which website to consult in case of accidental lamp breakage to find instructions on how to clean up the lamp debris.		
3.1.3	Information to be made publicly available on free-access websites and in any other form the manufacturer deems appropriate. As a minimum, the following information shall be expressed at least as values.		
3.1.3.1	The information specified in point 3.1.2;		N
3.1.3.2	Rated power (0,1 W precision);		P
3.1.3.3	Rated useful luminous flux;		P
3.1.3.4	Rated lamp life time;		P
3.1.3.5	Lamp power factor;		P
3.1.3.6	Lumen maintenance factor at the end of the nominal life (except for filament lamps);		P
3.1.3.7	Starting time (as X,X seconds);		N
3.1.3.8	Colour rendering;		P
3.1.3.9	Colour consistency (only for LEDs);		P
3.1.3.10	Rated peak intensity in candela (cd);		P
3.1.3.11	Rated beam angle;		P
3.1.3.12	If intended for use in outdoor or industrial applications, an indication to this effect;		N
3.1.3.14	Spectral power distribution in the range 180-800 nm;		P
	If the lamp contains mercury:		N
3.1.3.15	Instructions on how to clean up the lamp debris in case of accidental lamp breakage;		N
3.1.3.16	Recommendations on how to dispose of the lamp at the end of its life for recycling in line with Directive 2012/19/EU of the European Parliament and of the Council (1).		N
3.2	Additional product information requirements for LED lamps replacing fluorescent lamps without integrated ballast		N
	Claims that an LED lamp replaces a fluorescent lamp without integrated ballast of a particular wattage may be made only if:		N
3.2.1	the luminous intensity in any direction around the tube axis does not deviate by more than 25 % from the average luminous intensity around the tube,		N
3.2.2	the luminous flux of the LED lamp is not lower than the luminous flux of the fluorescent lamp of the claimed wattage. The luminous flux of the fluorescent lamp shall be obtained by multiplying the claimed wattage with the minimum luminous efficacy value corresponding to the fluorescent lamp in Commission Regulation (EC) No 245/2009 (1)		N



Clasue		Requirement-Test	
3.2.3	the wattage of the LED lamp is not higher than the wattage of the fluorescent lamp it is claimed to replace.		N
3.3.	Product information requirements for equipment other than luminaires, designed for installation between the mains and the lamps		N
3.4	Product information requirements for lamp control gears As from stage 2, the following information shall be published on publicly available free access websites and in other forms the manufacturer deems appropriate:		N
3.4.1	Indication that the product is intended to be used as a lamp control gear,		N
3.4.2	If applicable, the information that the product may be operated in no-load mode.		N

Applicable requirements and beginning for compliance as referred in Regulation (EC) No. 1194/2012	
Stage 1:	1 September 2013
Stage 2:	1 September 2014
Stage 3:	1 September 2016

The maximum EEI of directional lamps:

Applicatio n date	Maximum energy efficiency index (EEI)				Averag e result	Verdi ct
	Main-voltage filament lamps	Other filament	High-intensit y discharge	Othe r lamp		
Stage 1	If Φ use > 450 lm: 1,75	If Φ use \leq 450lm:1,20; If Φ use > 450 lm:	0.5	0.5	-	N
Stage 2	1.75	0.95	0.5	0.5	-	N
Stage 3	0.95	0.95	0.36	0.2	-	N



Table 6
Reference luminous flux for equivalence claims

Extra-low voltage reflector type		
Type	Power (W)	Reference Φ 90° (lm)
MR11 GU4	20	160
	35	300
MR16 GU 5.3	20	180
	35	300
	50	540
AR111	35	250
	50	390
	75	640
	100	785
Mains-voltage blown glass reflector type		
R50/NR50	25	90
	40	170
R63/NR63	40	180
	60	300
R80/NR80	60	300
	75	350
	100	580
R95/NR95	75	350
	100	540
R125	100	580
	150	1000
	180	1000



Clasue		Requirement-Test	
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Mains-voltage pressed glass reflector type		
PAR16	20	90
	25	125
	35	200
	50	300
PAR20	35	200
	50	300
	75	500
PAR25	50	350
	75	550
PAR30S	50	350
	75	550
	100	750
PAR36	50	350
	75	550
	100	720
PAR38	60	400
	75	555
	80	600
	100	760
	120	900

Table 7
Multiplication factors for lumen maintenance

Lamp type	Luminous flux multiplication factor
Halogen lamps	1
Compact fluorescent lamps	1,08
LED lamps	$1 + 0,5 \times (1 - \text{LLMF})$ where LLMF is the lumen maintenance factor at the end of the nominal life



Clasue		Requirement-Test	
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Table 8
Multiplication factors for LED lamps

LED lamp beam angle	Luminous flux multiplication factor
$20^\circ \leq \text{beam angle}$	1
$15^\circ \leq \text{beam angle} < 20^\circ$	0,9
$10^\circ \leq \text{beam angle} < 15^\circ$	0,85
$\text{beam angle} < 10^\circ$	0,80



ANNEX A:

Photo-documentation

Photo 1 General Appearance of the EUT

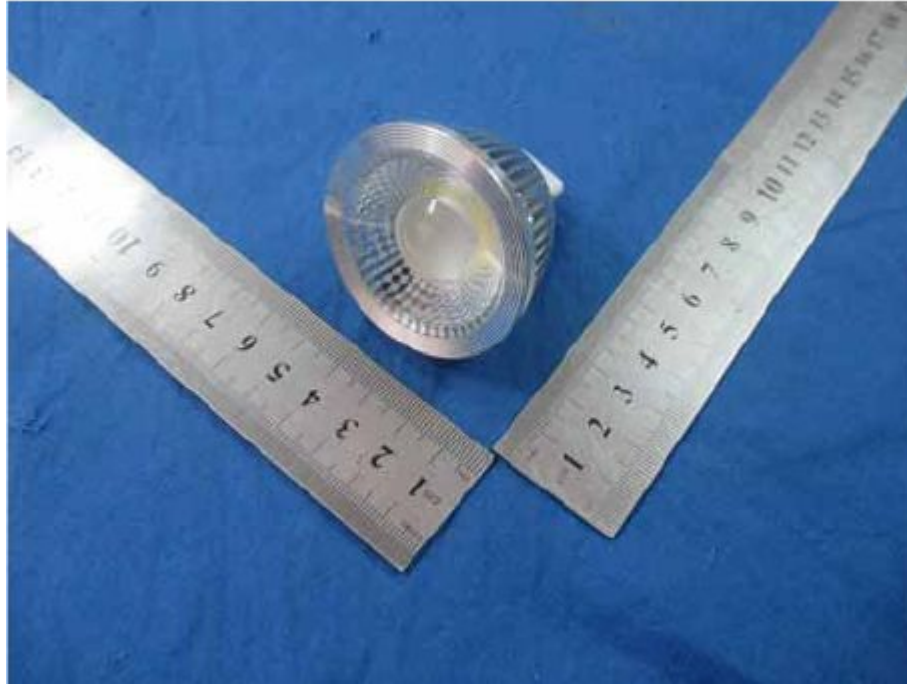


Photo 2 General Appearance of the EUT

