

80656-KRQ/EMC 98-4331

Emission measurements concerning an electronic self ballast lamp, manufactured by Sylvania Lighting International Ltd, brands Sylvania Mini-Lynx 20W/827, Sli Mini-Lynx 20W/827, ABCO Mini-Lynx 20W/827 and Westinghouse Mini-Lynx 20W/827.

Arnhem, 15th of May 1998

Author H.T. Jonker

By order of MagneTek S.p.A., at Terranuova-Arezzo, Italy.

author : H.T. Jonker

B 20 pages

annexes

MWE

reviewed : A.T. van der Meijden

approved : A.T. van der Meijden


20/05/98

MEASUREMENT/TECHNICAL REPORT**Sylvania Lighting International Ltd.****FCC ID: NU7 26023A**

15th of May 1998

This report concerns (check one):		☒ Original grant	☐ Class II change
Equipment type: RF lighting devices (ISM)			
Measurement procedure used:			
MP-5:1986			
Application for Certification prepared by:		Applicant for the device:	
Name	: H.T. Jonker	Name	: Mr. B. Grabham
Company Name	: KRQ Nederland B.V.	Company Name	: Sylvania Lighting International Ltd
Address	: Utrechtseweg 310	Address	: Otley Road
Telephone	: +31 26 - 3563748	Telephone	: + 44 1274537777
Telefax	: +31 26 - 3510178	Telefax	: + 44 1274530615
Postal code	: 6812 AR	Postal code	: BD 177LF
City/Place	: Arnhem	City/Place	: Charleston-WestYorkshire
Country	: The Netherlands	Country	: United Kingdom

1 GENERAL INFORMATION**1.1 Client information**

Purchaser : MagneTek S.p.A.
Contact person : Mr. A. Marunti
Telephone : +39 55 9195 278
Facsimile : +39 55 9195 248
e-mail : marunti@magnetek.it
Address : Settore Nord-Est, 81
Postal code : 52028
Place : Terranuova-Arezzo
Country : Italy

Manufacturer : Sylvania Lighting International Lighting Ltd. (applicant)
Contact person : Mr. B. Grabham
Telephone : +44 12 74537 777
Facsimile : +44 12 74530 615
Address : Otley Road, Charleston-West Yorkshire
Postal code : BD1777LF
Place : Shipley
Country : United Kingdom

Agent : KEMA Registered Quality Nederland B.V.
Contact person : Mr. H.T. Jonker
Telephone : +31 356 3940
Facsimile : +31 351 0178
e-mail : H.T.Jonker@kema.nl
Address : Utrechtseweg 310
Postal code : 6812 AR
Place : Arnhem
P.O. Box : 9035
Postal code : 6800 ET Arnhem
Country : The Netherlands

1.4 Test Methodology

Conducted emission testing was performed according to the procedures as mentioned in Section 18.307(c) of 47CFR, Part 18 subpart C. According to Section 18.203(a) this type of device shall be classified as a consumer ISM (lighting) device and thus is subject to certification. The measurements were performed in accordance with the test methodology of Measurement Procedure MP-5:1986.

Due to the operating frequency, generated in the device (52 kHz working frequency) and according to Section 18.309 the highest frequency of interest is 30 MHz. No field strength limits for (RF lighting devices) apply for the DUT, according to Section 18.305(c) of 47CFR.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted measurement data are located at the premises of KEMA Nederland B.V., Utrechtseweg 310, in Arnhem, The Netherlands. The FCC has per Public Notice declared this measurement facility had been reviewed and to be in compliance with the requirements of Section 2.948 of the FCC Rules. It was accepted by letter with accreditation number 31040/SIT; 1300F2, dated January 13 1998.

3 SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). The lamp was mounted into a separate fitting. According to Section 7.1 of MP-5 the fitting was connected to a power supply lead of approximately 1 m.

3.2 Configuration of Tested System

3.2.1 Device under test

Device : Energy saving light

Trade mark (brand) : - Sylvania
- SLi
- ABCO
- Westinghouse

Type : Mini-Lynx 20W/728
Serial number : proto
FCC ID : NU726023A
Power supply : 120 V_{ac} / 60 Hz
Operating frequency: 52 kHz
Nominal Power : 20 W
Power factor : 0,5 (nominal)
Enclosure : plastic/metal
Interface cabling : not applicable
Shield termination : not applicable

3.2.2 Auxiliary equipment

Not applicable

3.3 Special Accessories

Not applicable

3.4 Modifications

Not applicable

6 PARTS LAYOUT DRAWING OF EQUIPMENT

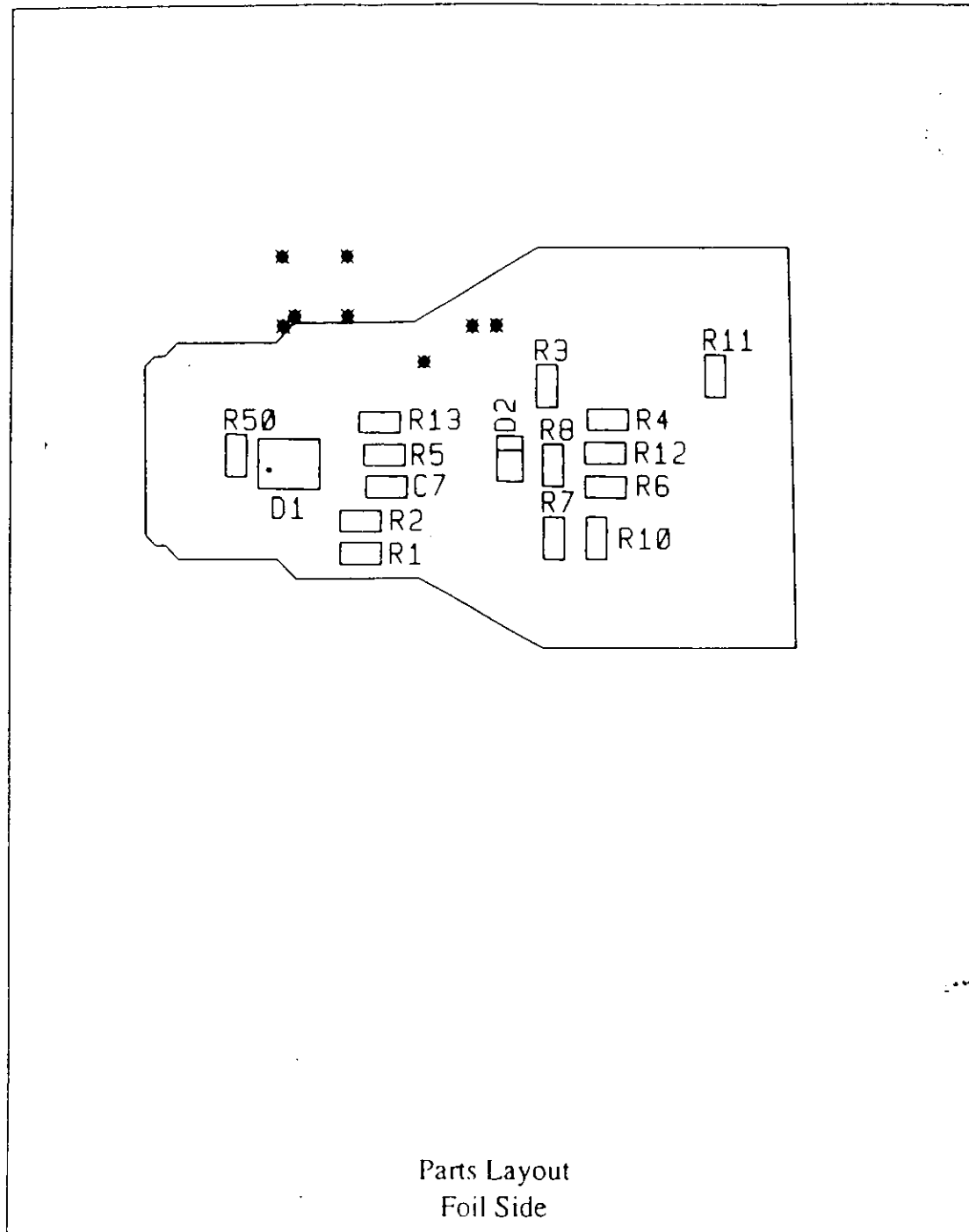


Figure 6.1 Parts layout drawings of the Mini-Lynx 20W/728

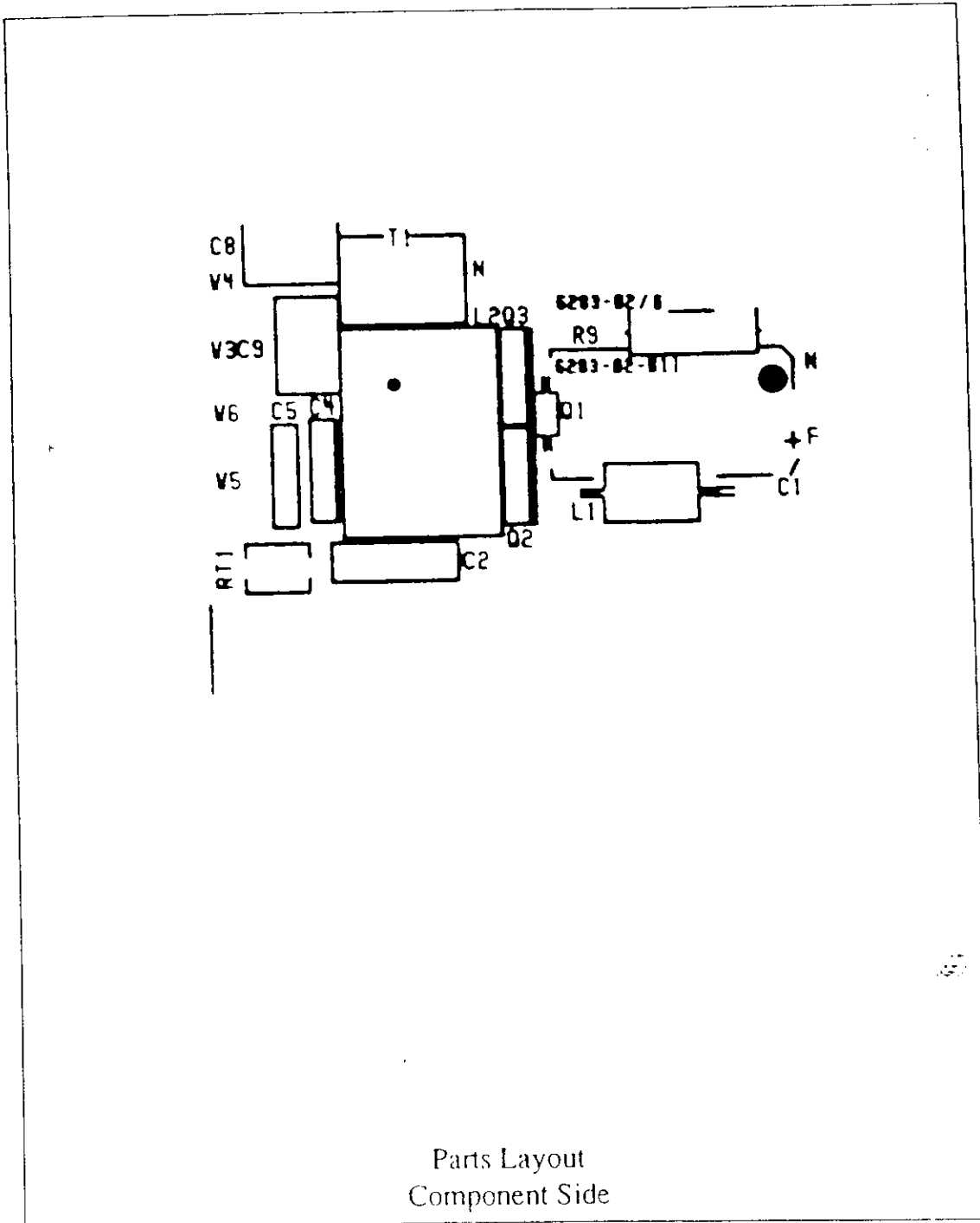


Figure 6.1 Parts layout drawings of the Mini-Lynx 20W/728

8 CONDUCTED EMISSION DATA

8.1 Test procedure

In accordance with Section 18.307(c) the conducted radio frequency disturbance voltages between each of the power lines (live, neutral) and the ground terminal were determined over the frequency range from 450 kHz to 30 MHz. The AC power line conducted emission measurements were performed at the line voltage of 120 V_{ac} and at the power frequency of 60 Hz.

The measurement shall show compliance of this consumer (ISM) lighting device with the conducted limit of 250 μ V (48 dB μ V). The test set-up was in accordance with the requirements of MP-5:1986.

The initial step in collecting conducted data is a peak scan measurement over the frequency range of interest. Significant peaks are then marked, and these signals are then quasi-peaked. In accordance with Section 2.2.2 of MP-5 the detector function of the measurement receiver was set to the CISPR Quasi-Peak function for this lighting device. This procedure is implemented in the utilised test receiver by the incorporated EMI software. The test receiver employs a CISPR quasi-peak detector function with a bandwidth of 9 - 10 kHz.

8.2 Test Instrumentation Used for Conducted Measurements

EMI Equipment	Type	Manufacturer	Serial no.	ORS No.	Cal interval
LISN (1 x 10 A)	ESH3-Z5	Rohde & Schwarz	840062/017	077959	yearly (07-98)
EMI test receiver	ESHS 10	Rohde & Schwarz	840046/009	077989	yearly (07-98)

Note : The Object Registration Number (ORS) is a unique number within the KEMA quality system, which identifies the equipment.

8.3 Measured Data (Mains conducted disturbance voltage)

Standard : FCC, Part 18 Subpart C Section 18.307(c)
Limits :

Frequency [MHz]	Limit [μ V]	Limit [dB(μ V)]
0.45 - 30.0	250.0	48.0

Port : AC mains supply line/neutral

Results :

Frequency [MHz]	Level Line [dB(μ V)]	Level Neutral [dB(μ V)]	Limit [dB(μ V)]
0.548	46.8	46.9	48.0
0.635	47.0	46.8	48.0
0.768	46.8	46.7	48.0
1.010	43.8	43.7	48.0
1.325	38.4	38.6	48.0
2.172	32.8	32.6	48.0
2.382	30.2	29.8	48.0
13.603	37.3	37.0	48.0
13.837	35.8	35.7	48.0

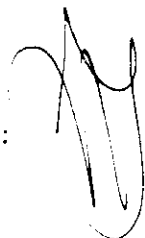
Measurement uncertainty: 2 dB

Note : According to section 2.2.2 of MP-5 all readings are quasi-peak unless stated otherwise, using a quasi-peak bandwidth of 9 - 10 kHz.

Judgement : Pass (Passed by 1.0 dB at 635 kHz)

Test personnel:

Tester Signature :



Date: 1998-05-13

Name : H.T. Jonker

9 **RADIATED EMISSION DATA**

Not applicable.

1.2 Product Description type Mini-Lynx 20W/827

The Sylvania/Magnetek Mini-Lynx self ballasted lamps are designed to replace a standard incandescent lamp to provide an energy efficient light source.

The working principle is the following: it is an AC/AC inverter that provides an almost sinusoidal high frequency voltage and current wave to the lamp. As showed in the block diagrams the AC input voltage is rectified in a DC voltage of amplitude 120×1.41 then with a half bridge switching oscillator it is converted to a square wave. The first sinusoidal harmonic component of this square wave is then fed to the lamp through a low pass filter which is a series resonant circuit. The half bridge is self oscillating and is driven by a saturating toroid.

It has also included a PTC to provide cathode pre-heating during start.

The Mini-Lynx 11W/827 is manufactured by Sylvania Lighting International Ltd. and will be marketed under four different brand names: Sylvania-, SLi-, ABCO- and Westinghouse Mini Lynx 11W/827.

CONTENTS

	page
1 GENERAL INFORMATION	
1.1 Client information	5
1.2 Product Description type Mini-Lynx 20W	5
1.3 Photographs of the Mini-Lynx 20W	6
1.4 Test Methodology	7
1.5 Test Facility	9
2 PRODUCT LABELLING	9
	10
3 SYSTEM TEST CONFIGURATION	
3.1 Justification	11
3.2 Configuration of Tested System	11
3.2.1 Device under test	11
3.2.2 Auxiliary equipment	11
3.3 Special Accessories	11
3.4 Modifications	11
	11
4 CIRCUIT DIAGRAM(S) OF EQUIPMENT	12
5 BLOCK DIAGRAM(S) OF EQUIPMENT	13
6 PARTS LAYOUT DRAWING OF EQUIPMENT	14
7 CONDUCTED EMISSION MEASUREMENT SETUP PHOTOS	
7.1 Conducted emission measurement setup in shielded room	16
	16
8 CONDUCTED EMISSION DATA	
8.1 Test procedure	18
8.2 Test Instrumentation Used for Conducted Measurements	18
8.3 Measured Data (Mains conducted disturbance voltage)	18
	19
9 RADIATED EMISSION DATA	
	20