



Radio test report

99704731

based on:

- FCC part 15; subpart C; section 15.227 (10-1-05 edition)
- RSS-310, Issue 1 (Sept. 2005 edition)

Cordless Keyboard
Logitech Cordless Keyboard
Y-RAV80

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This report comprises of four modules. The total number of pages is: 15

Main module

1 Introduction

This report contains the result of tests performed by:

Telefication B.V.
Edisonstraat 12a
6902 PK Zevenaar
The Netherlands

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:1999. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie). The contents of this test report, if reproduced, shall be copied in full, unless special consent in writing for reproduction in part is granted by Telefication. Copyright of this test report is reserved to Telefication.

Ordering party:

Company name : Logitech Europe S.A.
Address : Z.I. Moulin du Choc D
Zipcode : 1122
City/town : Romanel sur Morges
Country : Switzerland
Date of order : 2 December 2005

2 Product

A sample of the following product was submitted for testing:

Product description	: Cordless Keyboard
Manufacturer	: Logitech Technology Co., Ltd
Trade mark	: Logitech Cordless Keyboard
Type designation	: Y-RAV80
FCC ID	: DZL135446
Hardware version	: Rev.03
Serial number	: --
Software release	: --

3 Test schedule

Tests were carried out in accordance with the specification detailed in chapter 7 “Summary” of this report.

Tests were carried out at the following location:

- TNO Electronic Products & Services (EPS) B.V
Smidshornerweg 18
9822 TL Niekerk
The Netherlands
- | | |
|-----------------|----------|
| FCC listed | : 90828 |
| Industry Canada | : IC3501 |

The samples of the product were received on:

- 26 May 2006

Tests were carried out on:

- 15 June 2006

4 Product documentation

For production of this report the following product documentation was used:

Description:	Date:	Identification:
Product description	May 2006	Y-RAV80
Testing indications for Cordless Keyboard	23 May 2006	Y-RAV80
PCB layout	12/20/05	Almaak Slider rev 0.3
PCB layout	Feb/13/2006	Almaak Main rev 0.3
PCB layout	29.03.06	AL01
BOM	--	Almaak Slider PCB
BOM	--	Almaak Main PCB
Circuit diagram Almaak Keyboard	May 08, 2006	Rev. 03, 3 sheets
Circuit diagram Optical Slider	March 03, 2006	Rev. 03
Circuit diagram AL01	09.01.06	Rev. C

The above-mentioned documentation will be filed at Telefication for a period of 10 years following the issue of this test report.

5 Observations and comments

During the tests the product was set in continuous transmit mode (CH1 & CH2 selectable), by means of a test mode.

6 Modifications to the sample

No modifications were made to the sample.

7 Summary

The product is intended for use in the following application area(s):

INDUCTIVE DATA TRANSMISSION APPLICATION IN THE 27 MHz BAND

The samples were tested according to the following specification(s):

FCC part 15; subpart C; section 15.227 (10-1-05 edition)
RSS-310, Issue 1 (Sept 2005 edition)

8 Conclusions

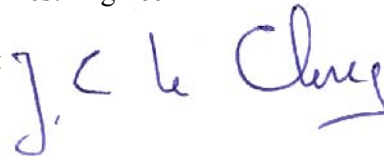
The samples of the product showed **NO NON-COMPLIANCES** to the specification stated in chapter 7 of this report.

The results of the tests as stated in this report, are exclusively applicable to the product items as identified in this test report. Telefication does not accept any responsibility for the results stated in this test report, with respect to the properties of product items not involved in these tests.

All tests are performed by:

name : ing. J.C. le Clercq

function : Test Engineer

signature : 

Review of test report by:

name : ing. S.J. van Spijker

function : Test Engineer

signature : 

The above conclusions have been verified by the following signatory:

Date : 2 August 2006

name : J.P. van de Poll

function : Co-ordinator Test Group

signature : 

Test results module

1 General information

1.1 Equipment information

Rated RF output power	n.a., integral antenna
Rated radiated RF power	25 nW
Operating frequencies	27.095 MHz; 27.145 MHz
Modulation	FSK
Modulation bit rate	2400 bit/s
ITU emission class	9K80F7D
FCC ID	DZL135446

Ambient temperature during testing: between 20 and 35 °C.

2 Emission tests

2.1 Field strength of intentional signal

Compliance standard : FCC part 15, subpart C, section 15.227 (a).
Method of test : ANSI C63.4-2003, sections 5.3 & 8.2.1
Test results :

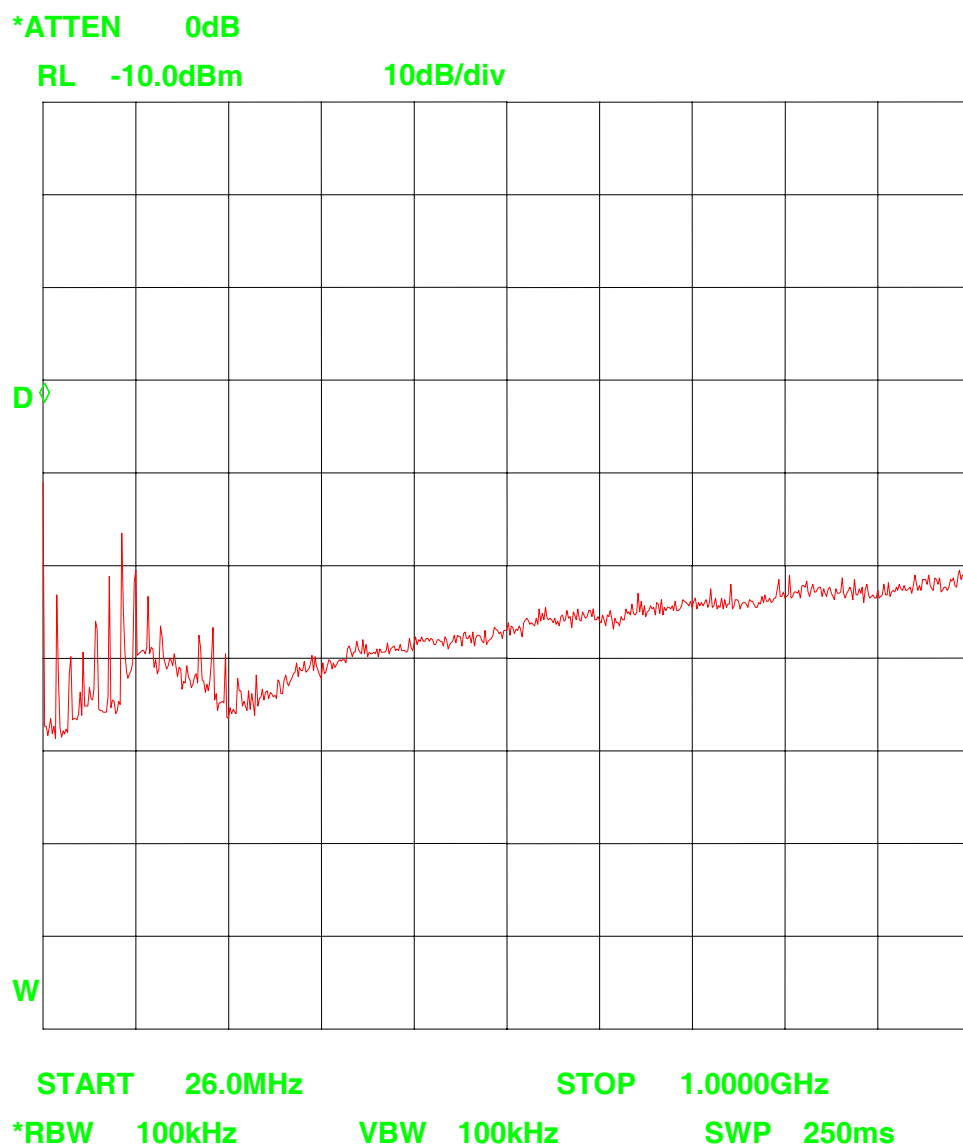
Radiated emissions (dB μ V/m) (AV)			
Orthogonal plane	Test result @ 3 m 27.045 MHz	Test result @ 3 m 27.195 MHz	Limit @ 3 m
X	48.9	49.1	80
Y	39.2	39.1	80
Z	40.5	40.3	80

Measurement uncertainty with 95% confidence level: ± 4.4 dB

2.2 Field strength of unwanted emissions

Compliance standard : FCC part 15, subpart C, section 15.227 (b).
Method of test : ANSI C63.4-2003, sections 5.4, 8.2.3 & 8.3.1.2; FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
EUT condition : 27.095 MHz channel
Test results :

Exploratory measurement of unwanted emissions 30-1000 MHz



Final measurements of unwanted emissions

< 30 MHz

Frequency (MHz)	Test result @ 3 m distance (dB μ V/m) (QP)	EUT orthogonal plane	Limit (dB μ V/m)
13.55	≤ 26.3	X	69.5
13.55	≤ 26.3	Y	69.5
13.55	≤ 26.3	Z	69.5

> 30 MHz

Frequency (MHz)	Test result @ 3 m distance (dB μ V/m) (QP)	Polarisation	Limit (dB μ V/m)
54.190	21.2	V	40
54.190	25.6	H	40
81.285	22.3	V	40
81.285	32.3	H	40
108.380	32.1	V	43.5
108.380	31.1	H	43.5
108.411	32.3	V	43.5
108.411	41.0	H	43.5
135.475	23.6	V	43.5
135.475	32.8	H	43.5
162.570	20.3	V	43.5
162.570	26.3	H	43.5
189.665	23.3	V	43.5
189.665	35.1	H	43.5
216.760	22.5	V	46
216.760	32.5	H	46
243.855	≤ 22	V	46
243.885	24.0	H	46

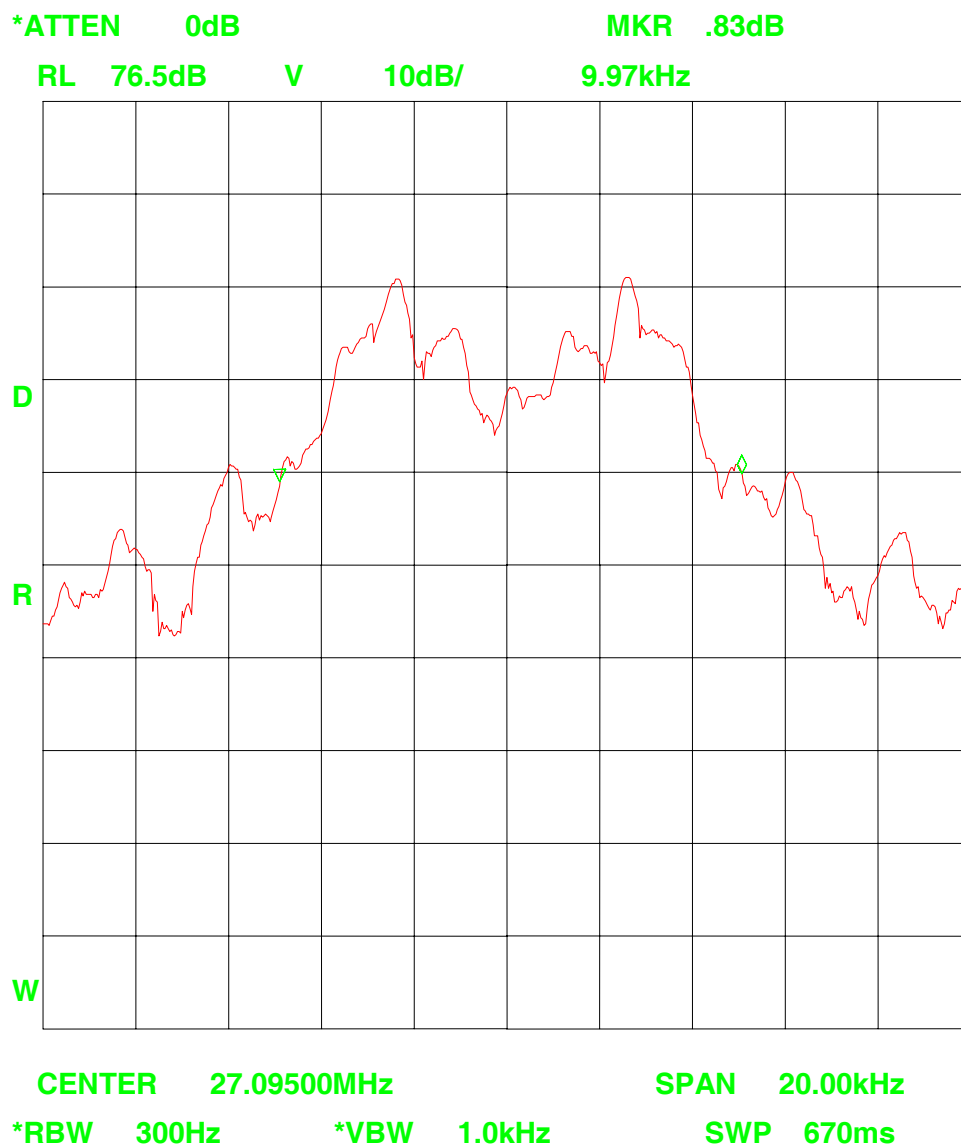
Measurement uncertainty with 95% confidence level: ± 4.4 dB

Remark: according to FCC part 15, subpart C, section 15.209 signals with a frequency of 13.55 MHz should be measured at a distance of 30 meters. The limit at 30 meters distance is 30 microvolts/meter, which corresponds to 29.5 dB μ V/m.

According to FCC part 15, subpart A, section 15.31 (f2) measurements at frequencies below 30 MHz measurements may be performed at a distance closer than that specified in the regulations.

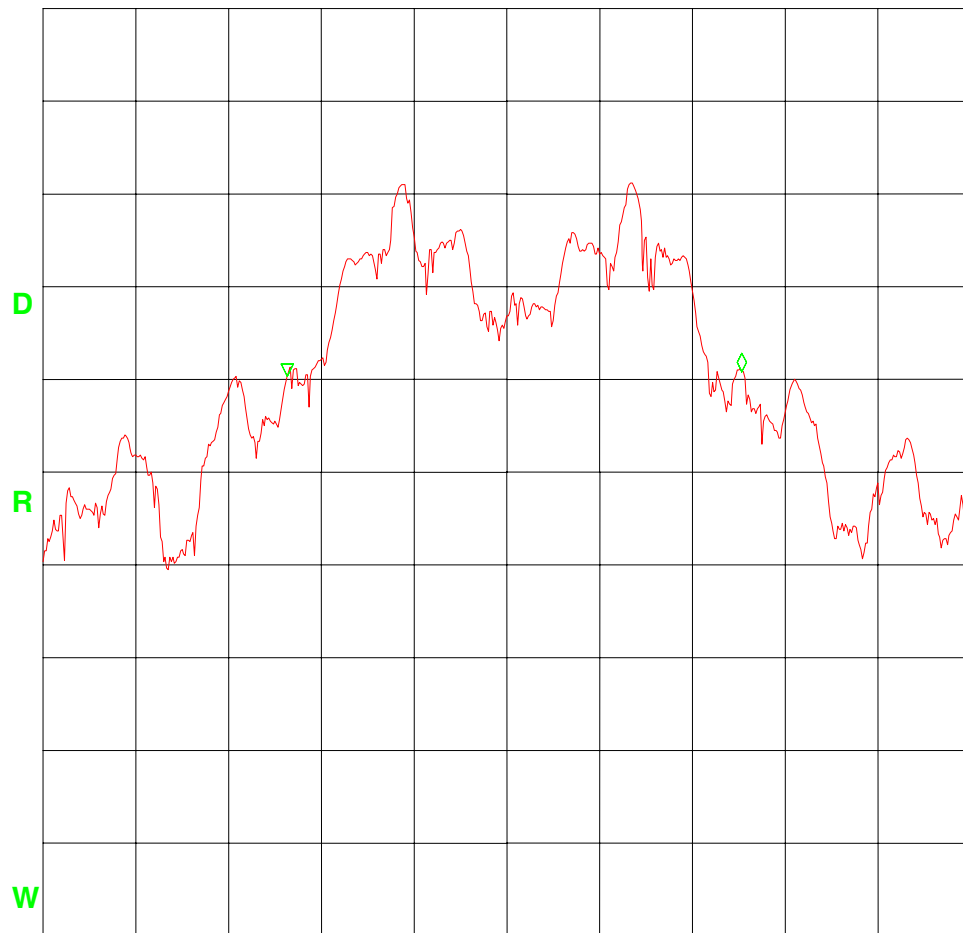
The square of an inverse linear distance extrapolation factor should be used (40 dB/decade)

The limit at 3 meters distance on 13.55 MHz: $29.5 + 40.0 = 69.5$ dB μ V/m



*ATTEN 0dB MKR .50dB

RL 76.5dB V 10dB/ 9.80kHz



CENTER 27.14500MHz

SPAN 20.00kHz

*RBW 300Hz *VBW 1.0kHz

SWP 670ms

Channel	Frequency	Occupied bandwidth
1	27.095 MHz	9.97 kHz
2	27.145 MHz	9.80 kHz

Measurement uncertainty: ± 1.96 kHz

Cross reference table module

Cross reference table	
Category II transmitter	
CNR RSS-310 Issue 1	FCC 47 CFR Ch. 1 part 15 subpart C (10-1-05 Edition)
Par. 3.7	§ 15.227

Used test equipment module

The following measurement equipment was used:

Description	ID / SN	Manufacturer	Model	Used at par.
Plastic measurement room	12636	Polyforce	--	2.2
Open Area Test Site	13886	Comtest	--	2.2
Antenna mast 4m	--	EMCO	1070	2.2
Controller OATS	--	EMCO	1090	2.2
Loop Antenna	1107	Chase	HLA6120	2.2
Biconilog antenna 30MHz – 1000MHz	15633	Chase	CBL6111B	2.2
EMI test receiver	TE00091	Rohde & Schwarz	ESVP	2.2
Turntable OATS	99108	Heinrich Deisel	HD050	2.2
EMI test receiver	TE00205	Rohde & Schwarz	ESH3	2.1
Loop Antenna	TE00746	Rohde & Schwarz	HFH2-Z2	2.1
Spectrum Analyzer	TE00359	Hewlett Packard	HP8563E	2.2, 2.3
Anechoic chamber	TE01064	Euroshield	RFB-F-100	2.2, 2.3
Antenna tower	--	HD	AS 620P	2.2, 2.3
Turntable	--	HD	DS-412	2.2, 2.3
Turntable controller	--	HD	HD-050	2.2, 2.3
Biconilog antenna	TE00700	EMCO	3143	2.2, 2.3
Pre-amplifier 10 dB	TE00098	Rohde & Schwarz	ESV-Z3	2.2, 2.3