

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

REPORT FOR A TV INTERFACE DEVICE

Scope – Measurement and determination of electromagnetic emission (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

RF MODULATOR

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

PART I INTRODUCTION

1. GENERAL INFORMATION	5
1.1 DESCRIPTION OF EQUIPMENT UNDER TEST	
1.2 REGULATIONS APPLIED TO THE EUT	
1.3 MEASUREMENT PROCEDURE	
1.4 MEASUREMENT SITE	
2. GENERAL TEST CONDITIONS	6
2.1 OPERATING CONDITION OF EUT	
2.2 STABILIZATION OF EUT OPERATING	
2.3 TEMPERATURE	
3. TEST SITE	6
3.1 OPEN AREA TEST SITE	
3.2 A SHIELDED ENCLOSURE	
4. MEASURING INSTRUMENTATIONS AND CALIBRATIONS	7
5. DESCRIPTION OF TEST CONDITION	7
5.1 POWER LINE CONDUCTED EMISSIONS	7
5.2 RADIATED EMISSIONS	8
5.3 OUTPUT SIGNAL MEASUREMENTS	9
5.3.1 OUTPUT SIGNAL LEVEL MEASUREMENTS	
5.3.2 OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSION MEASUREMENTS	
5.4 TRANSFER SWITCH ISOLATION MEASUREMENTS	10
6. MEASURING INSTRUMENTS AND SET-UP	11
6.1 POWER LINE CONDUCTED EMISSIONS	11
6.2 RADIATED EMISSIONS	11
6.3 OUTPUT SIGNAL MEASUREMENTS	11
6.4 TRANSFER SWITCH ISOLATION MEASUREMENTS	12
6.5 VITS SIGNAL GENERATOR ; COMMONLY USED.	12

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

PART II

TEST DATA

1. CONDUCTED EMISSIONS	14
2. RADIATED EMISSIONS	17
3. OUTPUT SIGNAL LEVEL MEASUREMENTS	18
4. OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSION MEASUREMENTS	19
5. TRANSFER SWITCH ISOLATION MEASUREMENTS	20
APPENDIX A PHOTOGRAPH OF TEST SET-UP	21
APPENDIX B LIST OF TEST EQUIPMENT	23
APPENDIX C LIST OF SUPPORT DEVICE & ACCESSORIES IN THE TEST	24
APPENDIX D LABELLING REQUIREMENTS	25

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

PART I

INTRODUCTION

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

1. GENERAL INFORMATION

1.1 DESCRIPTIONS OF EQUIPMENT UNDER TEST(EUT)

- | | | |
|-------|---------------------------------------|--|
| 1.1.1 | Manufacturer | LG Electronics Inc.
19-1 Cheongho-Ri , Jinwi-Myeon, Pyeongtaek-Si ,
Gyeonggi-Do, 451-713, Korea |
| 1.1.2 | Applicant | LG Electronics Inc.; 20, YOIDO-DONG
YOUNGDUNGPO-GU, SEOUL, 150-721, KOREA |
| 1.1.3 | MODEL Name | LSK279-8TZM |
| 1.1.4 | SERIAL NO | NOT ATTACHED |
| 1.1.5 | TRADE NAME | LG |
| 1.1.6 | FCC ID NO | BEJ9QKE00711 |
| 1.1.7 | DESCRIPTIONS | |
| | a) Product Type | HD Cable DVR STB |
| | b) RF Output Channel | Channel 3 and 4 |
| | c) RF IN/OUT Terminal Impedance | 75 ohms (Unbalance F-type coaxial) |
| | d) Number of RF IN/OUT terminal | 1EA at each |
| | e) Terminal for signal | Video/Audio out (RCA-type), USB, ETHERNET
COMPONENT OUT, S-VIDEO OUT,
EXTERNAL SATA, IEEE-1394, HDMI |
| | f) Power Supply | AC120V, 60Hz |
| 1.1.8 | Accessories connected to the EUT | |
| | a) Coaxial cables for RF-OUT terminal | |
| | b) Video/Audio cables | |
| | c) COMPONENT OUT Cables | |
| | d) SATA Cable | |
| | e) 1394 Cable | |
| | f) USB Cable | |
| | g) HDMI Cable | |
| | h) S-VIDEO OUT Cable | |

1.2 Regulations applied to the EUT .. FCC Part 15.115

1.3 Measurement Procedure MP-3 : ANSI C63.4 : 2003

1.4 Measurement site description

- Location of measurement facility
LG Electronics Inc : Pyungtaek plant
Digital-Media Standards Team
19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, 451-713 Korea

Note;

The detailed description of measuring facility was found to be in compliance
With Federal Communications Commission requirements of 2.948 according to
ANSI C63.4 :2003.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

2. GENERAL TEST CONDITIONS

The test data contained in this report was obtained by use of the measurement method recommended in FCC Rules, 47 C.F.R. 15.31(a)(3), with equipment and at the test site filed by the Federal Communications Commission (FCC). The technical standard for a TV interface device are set forth in Subpart B of Part 15 of FCC Rules and regulation. The measurement for Radiated Emissions, Power line Conducted Emissions, Output signal levels, Output Terminal Conducted Spurious Emissions and Transfer Switch Isolation were performed in accordance with the procedures described in ANSI C63.4 : 2003.

2. 1 OPERATING CONDITIONS OF THE EUT

According to the requirements in Subpart B of Part 15, the measurement is made at each function of the EUT being connected with appropriate cables and loads. The EUT has a tuner a modulator mentioned in this test report and either a video/audio output terminal in RCA-type and antenna input terminal. Therefore, every measurement was investigated in the operation mode, tuning mode (tuning to TV signal supplied through the antenna input terminal) and HDD play mode.

2. 2 STABILIZATION OF EUT OPERATION

The EUT was operated for sufficient minutes before testing to make it stabilized in a normal operating condition. The power supplied to the EUT was filtered to meet the requirements.

2. 3 TEMPERATURE

Measurement procedure recommended by FCC requires the test to be performed at the site with ambient temperature within 10 to 40 degrees centigrade (50 to 104 F). The specification for operating temperature of EUT is from 5 to 35 degrees centigrade (41 to 95 F) as described in owner's manual. The measurement data in this report was obtained at the temperature in the range of 20 ~ 25 degrees centigrade.

3. TEST SITE

3. 1 OPEN AREA TEST SITE

Measurement of radiated emissions from EUT was made at open area test site, a description of which has been submitted to the FCC pursuant to Part 15 of 47 C.F.R., 2.948.

3.2 A SHIELDED ENCLOSURE.

All other measurements, including power line conducted emissions, output signal levels, and transfer switch isolation, and transfer switch isolation were made in a shielded enclosure providing sufficient shielding effectiveness.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

4. MEASURING INSTRUMENTATIONS AND CALIBRATIONS.

Measurements of output signal level, output terminal conducted spurious emissions, and transfer switch isolation (if applicable) were made with instruments calibrated according to the recommendation by manufacturer. Measurement of radiated emissions and power line conducted emissions were made with instruments conforming to American National Standard Specification, ANSI C63.4 :2003.

The calibration of measuring instrument, including any accessories that may affect test results, was performed according to the recommendation by manufactures.

5. DESCRIPTION OF TEST CONDITION.

5.1 POWERLINE CONDUCTED EMISSION MEASUREMENT.

5.1.1 SHIELDED ENCLOSURE.

The measurement for power-line emissions from EUT was made in shielded enclosure which provides sufficient shielding effectiveness enough not to affect test results.

5.1.2 DETECTOR FUNCTION SELECTION AND BANDWIDTH.

During conducted emission measurement, a radio noise meter (ESCS 30, Rohde & Schwarz) that has a CISPR quasi-peak detector with 9 KHz IF bandwidth of 6 dB was utilized.

5.1.3 FREQUENCY RANGE TO BE SCANNED.

For conducted emissions measurement, frequency range of 150 KHz to 30 MHz, included, was investigated.

5.1.4 UNIT OF MEASUREMENT.

Test results for conducted emissions are reported in micro-volts.

5.1.5 LINE IMPEDANCE STABILIZATION NETWORK

A LISN with characteristics that conform to the requirements of Part 15 of FCC Rules was used for the measurement of conducted power-line radio noise; (50 micro-henries /50 ohms). Chassis and earth-points for grounding of the LISN were earth-grounded.

5.1.6 TEST CONDITIONS AND CONFIGURATION OF THE EUT.

The EUT was configured and operated in all modes of operation so as to find the maximum emanation of emissions from EUT.

The EUT has been designed to use the public AC lines with rated AC voltage as specified in Owner's Manual of EUT and filtered to meet the requirement. AC power was supplied to the EUT through

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

LISN with characteristics described in 5.1.5 of part I of this report.

The EUT was placed on a 1m *1.5m * 80Cm high of wooden table which is place on the earth- grounded conducting surface larger than 2 square-meter. The vertical conducting surface was located 40Cm to the EUT. Length of the power lead in excess of 80 Cm horizontally separating the EUT from LISN was folded back-and-forth form at the center of the power cord not exceeding 40 Cm in length.

Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5.2 RADIATED EMISSIONS MEASUREMENT..

5.2.1 TEST SITE.

Preliminary measurements were performed in the anechoic chamber to determine the emissions characteristics of the EUT. Final measurements were made in outdoors as described at 3.1 of Part I in this report.

5. 2. 2 DETECTOR FUNCTION SELECTION AND BANDWIDTH.

In radiated emissions measurement, a field strength meter (ESCS 30, Rohde & Schwarz) that has a CISPR quasi-peak detector was used. The 6dB bandwidth of the detector of instrument is 120 KHz over frequency range of 9 KHz to 2750 MHz. Emissions to be scanned above 1000 MHz may be detected in peak mode.

5. 2. 3 UNIT OF MEASUREMENT.

Test results of radiated emissions measurement are reported in micro-volts per meter at the specific distance. Using the unit of dBuV on the test instrument, the indication unit was converted to field strength unit of uV/m as following method;

$$F(uV/m) = 10^{(R+CL+AF)/20} (dBuV/m)$$

here, F : Field Strength in uV/m

R : Meter Reading Level in dBuV,

CL : Cable Loss from antenna to meter in dB,

AF : Antenna Factor of receiving antenna in dB(/m)

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

5. 2. 4 ANTENNAS.

Measurements were made using calibrated half-wave tuned Bi-log antenna in range of 30 to 1000 MHz that are correctable to levels obtained with a tuned dipole antenna. For emissions above 1000MHz, horn antenna may be used. Measurements were also made for both horizontal and vertical polarization.

The horizontal distance between the receiving antenna and the closest periphery of the EUT was 3 meters as described in 8.2.3 of ANSI C63.4:2003.

5. 2. 5 FREQUENCY RANGE TO BE SCANNED.

For radiated emissions measurements, the spectrum in the range of 30 to 1000 MHz and above, if found, was investigated. The measurement for power-line emissions from EUT was made in shielded enclosure which provides

5. 2. 6 TEST CONDITIONS AND CONFIGURATION OF EUT.

The EUT was configured and operated in all modes of operation so as to find the maximum emanation of emissions from EUT.

The power was furnished with rated (normal) AC 120 volts, as specified in the Owner's Manual of EUT. The EUT was placed on the 80 Cm high of non-metallic table(1 *1.5 meter). The turn table containing the system was rotated and the antenna height was varied 1~4 m to find the maximum emanation of emissions from EUT.

Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5. 3 OUTPUT SIGNAL MEASUREMENT.

During measurements for output signal levels as the RF-out terminal, a spectrum analyzer was used with characteristics described at 4 and 9.3 of part I in this report.

5. 3. 1 OUTPUT SIGNAL LEVEL MEASUREMENT.

RF-out terminal of EUT is designed to feed modulated signals to a TV broadcast receiver via coaxial cable with 75 ohm of rated output impedance.

The output voltage of video carrier frequency at the RF-output terminal of the EUT was measured at each channel (CH. 3 & 4) connecting directly to a spectrum analyzer with 50 ohm input impedance via 75-to-50 ohm matching pad. Indicated voltage on screen of measuring instrument was converted to the voltage of 75 ohm system.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

* Data conversion method.

$$V_{75}[\mu V] = 10^{\frac{(V_r + CF)}{20}} [\text{dBuV}]$$

here,: V_{75} : Voltage at the RF-out terminal of 75 ohm in μV

V_r : Voltage read at analyzer with 50 ohm input-impedance in dBuV

CF : Conversion Factor of the matching pad in dB.

5. 3. 2 OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSION MEASUREMENT.

Any other spectrum at RF-output terminal appearing on frequencies removed by more than 4.6 MHz below or 7.4 MHz above the video carrier frequency of EUT was searched at each channel.

To clarify the emissions emanated from RF output terminal of the EUT, RF pre-amplifier was utilized. The gain of pre-amplifier at each frequency measured from EUT were obtained after sufficient warm-up for stabilization of gain.

* Data conversion method.

$$V_{75}[\mu V] = 10^{\frac{(V_r + CF - PG + AT)}{20}} [\text{dBuV}]$$

Where, V_{75} : Voltage at the RF-out terminal of 75 ohm in μV ,

V_r : Voltage read at analyzer with 50 ohm input-impedance in dBuV

CF : Conversion Factor of the matching pad in dB,.

PG : Gain of pre-amplifier in dB,

AT : Attenuation of attenuator in dB.

5. 4 TRANSFER SWITCH ISOLATION MEASUREMENT.

As a transfer switch was equipped with EUT as an antenna-in, measurement of isolation were made at RF-input terminal with rated input impedance.

The maximum voltage of video carrier frequency of the EUT at the antenna input (RF-in) terminal of the switch was measured for both channels.

To clarify the emissions emanated from RF output terminal of the EUT, RF pre-amplifier was utilized. The gain of pre-amplifier at each frequency measured from EUT were obtained after sufficient warm-up for stabilization of gain.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

* DATA CONVERSION METHOD.

$$(V_r + CF - PG + AT)/20$$

$$V_{75}[\mu V] = 10 \quad [dB\mu V]$$

where, V_{75} : Voltage at the RF-out terminal of 75 ohm in μV
 V_r : Voltage read at analyzer with 50 ohm input-impedance in dB μV
CF : Conversion Factor of the matching pad in dB,
PG : Gain of pre-amplifier in dB,
AT : Attenuation of attenuator in dB.

6. MEASURING INSTRUMENTS AND SET-UP.

6. 1 POWERLINE CONDUCTED EMISSIONS.

6. 1. 1 Radio Noise Meter.

Rohde & Schwarz, Model ESCS 30{ 9 KHz to 2750 MHz }

Detector function : CISPR Quasi-Peak
IF Bandwidth : 9 KHz

6. 1. 2 Line Impedance Stabilization Network (LISN).

R&S, Model ESH2- Z5
Impedance Characteristic : 50 μH / 50 ohm

6. 2 RADIATED EMISSIONS.

6 2. 1 Field Strength Meter.

Rohde & Schwarz, Model ESCS 30{ 9 KHz to 2750 MHz }
ESPI { 20 Hz to 7 GHz }

Detector function : CISPR Quasi-Peak
IF Bandwidth : 120 KHz

6. 2. 2 Receiving Antennas.

a) Chase, Model CBL6111 : Bilog antenna { 30 to 1000 MHz }
b) Schwarzbeck, Model 9120D : Horn antenna { 1 GHz to 9.5 GHz }

6 . 3 OUTPUT SIGNAL MEASUREMENTS.

6. 3. 1 Spectrum Analyzer.

Agilent, Model E4402B
Span : 10 MHz SWP : 20 msec.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

RBW : 100 KHz VBW : 300 KHz

6.3.2 RF Pre-amplifier.

Langer EMV-Tech., Model PA203 : About 25 dB

6.3.3 Impedance matching pad.

Rohde & Schwarz, Model RAM : 7.5 dB loss , from 75 ohm to 50 ohm

6.3.4 Attenuator.

Rohde & Schwarz, Model DNF (N type) : 3 dB attenuation

6.4 TRANSFER SWITCH ISOLATION MEASUREMENTS.

6.4.1 Spectrum Analyzer.

Agilent, Model E4402B
Span : 1 MHz SWP : 30 msec.
RBW : 10 KHz VBW : 30 KHz

6.4.2 RF Pre-amplifier.,

Langer EMV-Tech., Model PA203 : About 25 dB

6.4.3 Impedance matching pad.

Rohde & Schwarz, Model RAM : 7.5 dB loss , from 75 ohm to 50 ohm

6.4.4 Attenuator.

Rohde & Schwarz, Model DNF (N type) : 3 dB attenuation

6.4.5 DTV Signal Generator

Model: DVG (MPEG2 MEASUREMENT GENERATOR) S/N: 100164
Model: SFQ 9TV TEST TRANSMITTER) S/N: 100256

[NOTE] 1) The list of instruments and accessories used the measurements are attached at the end of the report, Appendix A and B

2) In every test results, the margins against the limits are shown.

The margins are calculated as following;

$$\text{MARGIN[dB]} = 20\log(R/L)$$

where, R : Corrected Results, [uV] or [uV/m],
L : Corresponding Limit, [uV] or [uV/m]

3) The tight limit is applied at the edge of two frequency band.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

Part II

TEST DATA

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

1. POWER LINE CONDUCTED EMISSIONS (*15.107)

PRODUCT : HD Cable DVR STB
MODEL Name : LSK279-8TZM
Modulator Maker : BROADCOM
TEST DATE : November 16, 2007

Tuner Mode

Frequency (MHz)	RF Voltage [dBuV]		Limit [dBuV]		Margin [dB]		Line
	Q-peak	Average	Q-peak	Average	Q-peak	Average	
0.18	49.5	33.4	64.5	54.5	15.0	21.1	L1
8.55	40.4	34.8	60.0	50.0	19.6	15.2	N
9.00	41.9	36.3	60.0	50.0	18.1	13.7	N
18.28	39.4	32.5	60.0	50.0	20.6	17.5	L1

HDD Play Mode

Frequency (MHz)	RF Voltage [dBuV]		Limit [dBuV]		Margin [dB]		Line
	Q-peak	Average	Q-peak	Average	Q-peak	Average	
0.18	48.4	33.2	64.5	54.5	16.1	21.3	L1
8.60	41.3	35.9	60.0	50.0	18.7	14.1	N
8.99	43.3	37.8	60.0	50.0	16.7	12.2	L1
9.55	41.8	36.4	60.0	50.0	18.2	13.6	L1

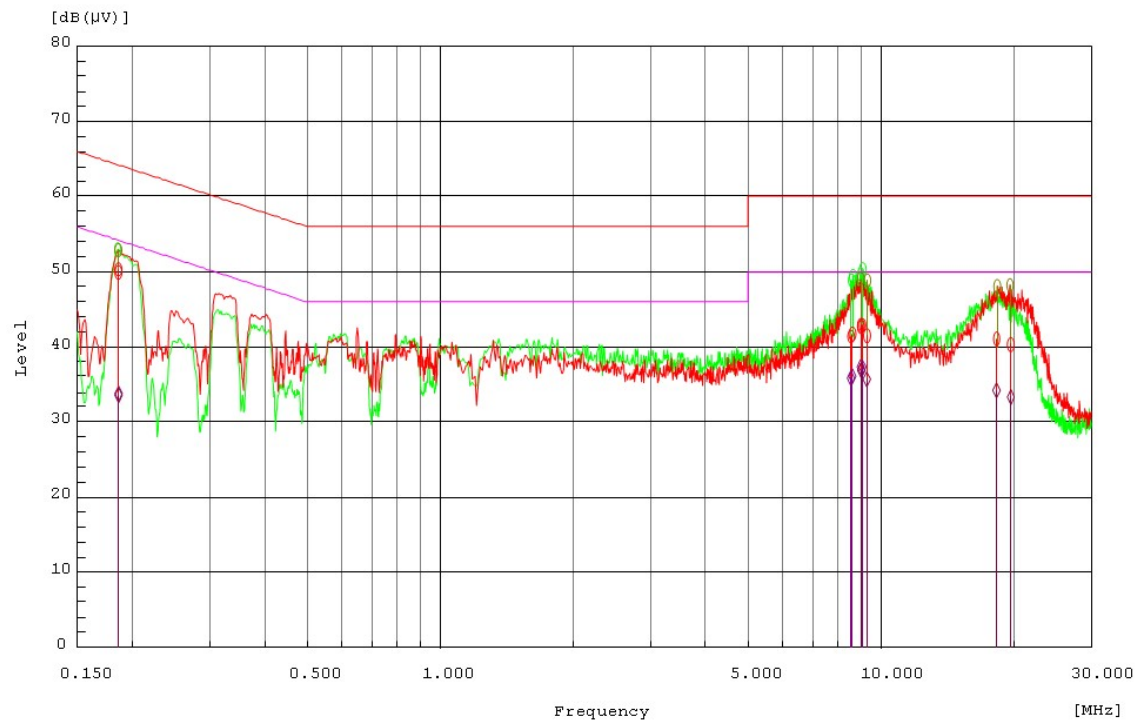
NOTES:

- 1. All modes of operation were investigated. The RF modulator was switched to Channel 3 or 4 and worst-case emissions are reported*
2. All other emissions are non-significant.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

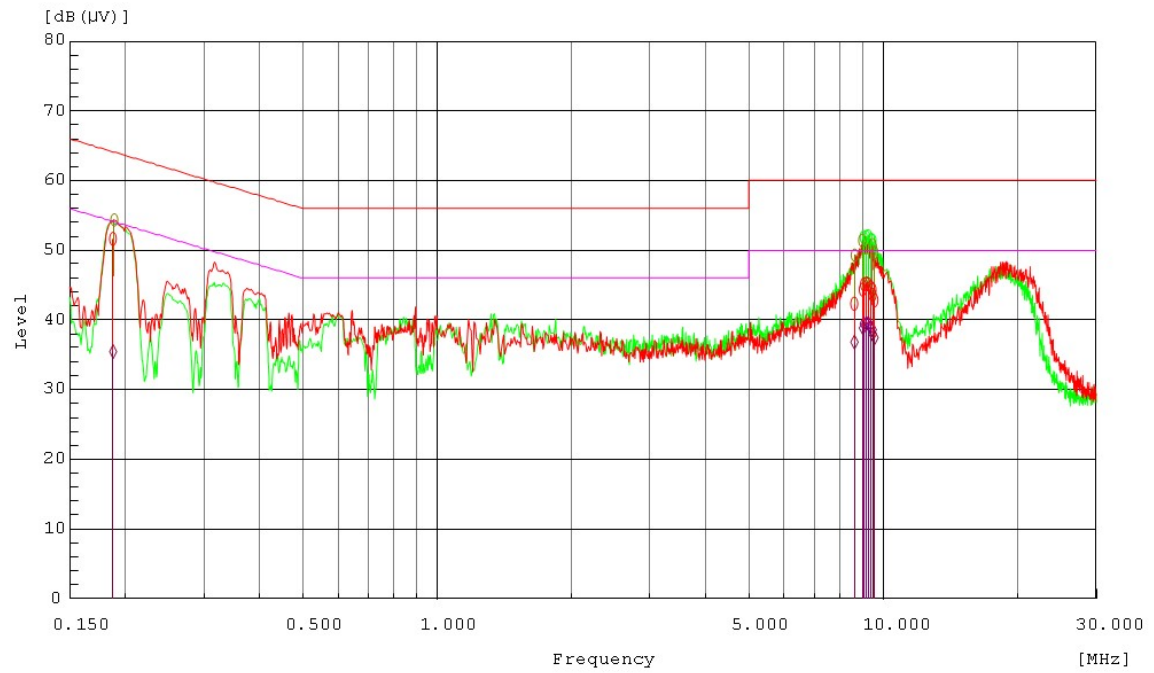
1) Tuner Mode



LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

2) HDD Play Mode



LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

2.RADIATED EMISSIONS (*15.109)

PRODUCT : HD Cable DVR STB
MODEL Name : LSK279-8TZM
Modulator Maker : BROADCOM
TEST DATE : November 16th, 2007

<i>FREQ.</i> <i>[MHz]</i>	<i>Reading</i> <i>[dBuV]</i>	<i>AF</i> <i>[dB/m]</i>	<i>CL</i> <i>[dB]</i>	<i>Pol.</i> <i>(Hor / Ver)</i>	<i>F/S</i> <i>[uV/m]</i>	<i>Limit</i> <i>[uV/m]</i>	<i>Margin</i> <i>[dB]</i>
99.8	17.20	18.60	1.40	Ver	72.4	150	-6.3
182.5	25.00	7.40	2.30	Hor	54.3	150	-8.8
399.0	22.50	10.40	2.50	Ver	58.9	200	-10.6
499.5	24.70	8.10	3.20	Ver	63.1	200	-10.0
666.6	16.50	17.90	5.90	Ver	103.5	200	-5.7
798.0	11.20	21.60	7.70	Ver	105.9	200	-5.5

* Sample Calculation at 99.8 MHz = 10 $\frac{[(17.2+18.6+1.4)/20]}{10}$ = 72.4 uV/m

NOTES:

- 1. All modes of operation were investigated. The RF modulator was switched to Channel 3 or 4 and worst-case emissions are reported.*
- 2. All other emissions are non-significant.*
- 3. AF = Antenna factor CL = Cable loss F/S = Field Strength*

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

3.OUTPUT TERMINAL SIGNAL LEVEL (*15.115)

PRODUCT : HD Cable DVR STB
MODEL Name : LSK279-8TZM
Modulator Maker : BROADCOM
TEST DATE : November 19th, 2007

CH	Frequency (MHz)	Reading [dBuV]	M/P Loss (dB)	RF Voltage [uV]	Limit [uV]	Margin [dB] Q-peak
3 (Visual)	61.25	60.05	7.5	2385.06	3000	-2.0
3 (Aural)	65.75	45.25		434.01	671	-3.8
4 (Visual)	67.25	60.11	7.5	2401.60	3000	-1.9
4 (Aural)	71.75	45.50		446.68	671	-3.5

* Sample Calculation at 61.25 MHz = $10^{[(60.05+7.5)/20]}$ = 2385.06 uV

NOTES:

1. All modes of operation were investigated and worst -case emissions are reported.
2. Output Impedance of RF-Output Terminal : 75 ohm
3. MP = Impedance Matching Pad

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

4. OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSIONS

PRODUCT : HD Cable DVR STB
 MODEL Name : LSK279-8TZM
 Modulator Maker : BROADCOM
 TEST DATE : November 19th, 2007

CH	Frequency (MHz)	Reading [dBuV]	M/P Loss [dB]	PreAmp Gain [dB]	Attn. [dB]	Output Level [uV]	Limit [uV]	Margin [dB]
3	168.0	30.80	7.5	20.0	3.0	11.6	95	-18.3
	185.3	31.50		20.0		12.6		-17.6
	233.5	33.00		20.0		15.0		-16.1
4	133.5	32.00	7.5	20.0	3.0	13.3	95	-17.1
	233.8	35.50		20.0		20.0		-13.6
	780.5	36.10		20.0		21.4		-13.0

$$[(30.8+7.5-20.0+3.0)/20]$$
 * Sample Calculation at 168.0 MHz = 10 = 11.6 uV

NOTES:

1. Frequency range of 30 MHz to 1000 MHz removed by more than 4.6 MHz below or 7.4 MHz above the video carrier frequency of EUT was investigated at each channel.
2. All other emissions are not significant.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

5.TRANSFER SWITCH ISOLATION (* 1 5 . 1 1 5)

PRODUCT : HD Cable DVR STB
MODEL Name : LSK279-8TZM
Modulator Maker : BROADCOM
TEST DATE : November 19th, 2007

CH	Frequency (MHz)	Reading [dBuV]	M/P Loss [dB]	PreAmp Gain [dB]	Attn. [dB]	Output Level [uV]	Limit [uV]	Margin [dB]
3	61.250	9.80	7.5	20.0	3.0	1.04	3.0	-9.2
4	67.250	9.50	7.5	20.0	3.0	1.00	3.0	-9.5

NOTES:

1. The transfer switch is internal to the device and is access automatically.
2. The transfer isolation switch provides automatic selection of either antenna/TV or VCR.

$$\begin{aligned} & \text{[(9.8+7.5-20.0+3.0)/20]} \\ * \text{ Sample Calculation at 61.250 MHz} &= 10 \qquad \qquad \qquad = 1.04 \text{ uV} \end{aligned}$$

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

Appendix A

Photograph of Test Set-up (Power line conducted emissions)



LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

Photographs of Test Set-up (Radiated emissions)



LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

Appendix B

List Of Test Equipment

Type	Model	Cal.	Due	S / N
EMI Test Receiver	R&S, ESPI	05/10/2008		100128
Test receiver	R&S, ESCS 30	09/07/2007		100093
Pre-Amplifier	Langer EMV-Tech., PA203	08/24/2007		9/2004
Pre-Amplifier	Langer EMV-Tech., PA203	08/24/2007		10/2004
Pre-Amplifier	Langer EMV-Tech., PA203	08/24/2007		13/2004
MPEG2 MEASUREMENT GENERATOR	R&S, DVG	12/04/2007		100164
TV TEST TRANSMITTER	R&S, SFQ	12/04/2007		100256
Dipole Antenna	Schwarzbeck, VHAP	05/28/2008		N/A
Dipole Antenna	Schwarzbeck, UHAP	05/28/2008		N/A
Bilog Antenna	Chase, CBL611	02/09/2008		1234
Biconical Antenna	S/B, BBA9106	09/07/2008		N/A
Biconical Antenna	S/B, BBA9106	09/07/2008		N/A
Log-periodic Antenna	Schwarzbeck, UHAL9107	09/07/2008		1513
Log-periodic Antenna	Schwarzbeck, UHAL9107	09/07/2008		1538
Horn Antenna	Schwarzbeck, 9120D	03/30/2008		184
Absorbing Clamp	R&S, MDS21	09/22/2008		860846/004
Absorbing Clamp	R&S, MDS21	03/05/2009		860844/012
Artificial Mains Network	ESH2-Z5	09/04/2007		892602/012
Test receiver	ESPI3	01/25/2008		101012
Spectrum Analyzer	E4402B	01/25/2008		MY44211574

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

Appendix C

List of Support Device and Accessories in the test

1. EUT : HD Cable DVR STB

Model : LSK279-8TZM S / N : N/A

2. Accessories

1.5 m. unshielded Smart-Antenna cable supplied by manufacturer (1 EA)

1.5 m. unshielded RCA cables for Video/Audio

IEC-106 Antenna

3. TV Monitor

Model : LTDR2100K S/N : TS2010K00034600015

4. DTV Signal Generator

Model: DVG (MPEG2 MEASUREMENT GENERATOR)
Model: SFQ (TV TEST TRANSMITTER)

S/N: 100164
S/N: 100256

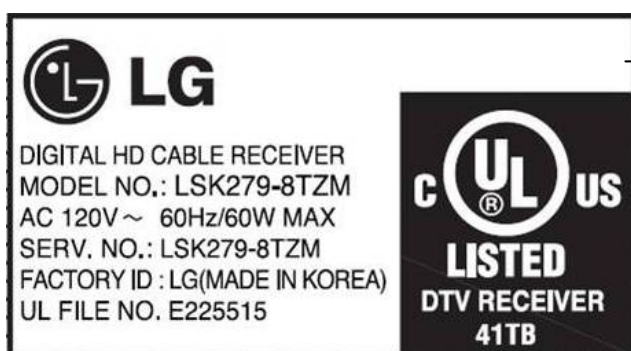
LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

Appendix D

SAMPLE LABEL :

According to Labeling Requirements per * 2.295 & * 15.19



The Label shown shall be affixed on the rear panel of the device.
See the attached photograph.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:
1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND
2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING
INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

The statement is written on the rear panel of the device.
See the attached photograph.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

CERTIFICATE

Issued date : November 22th, 2007
EUT : HD Cable DVR STB
Model No. : LSK279-8TZM Serial No. : N / A
FCC ID No. : BEJ9QKE00711
Manufacturer : LG Electronics Inc. Trade name : LG
Applicant& Address : LG Electronics Inc,
20 Yoido-Dong Youngdungpo-Gu, Seoul, 150-721 Korea
Regulation : Subpart B of Part 15, 47 C.F.R; FCC Rules (Docket 87-389)
Procedure : MP-3; ANSI C63.4 : 2003
Test Location : LG Electronics Digital-media Research Lab.
Measurement facility (3 & 10 m site)

I hereby certify that the measurements shown in Part II of this report were made in accordance with the procedures indicated and energy emitted by this equipment was found to be within the limits applicable.

I further certify that on the basis of the measurements, the equipment tested is capable of operation in accordance with the requirements set forth in Part 15 of the FCC rules & Regulations under normal use and maintenance.

LG Electronics Inc. hereby assumes responsibility for the certification of compliance to applicable FCC limits in every measurement.

ISSUED BY



In-Ha Kim

Research Engineer

REVIEWED BY



M. K. Lee

Technical Manager

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

LG Electronics Inc. Pyungtaek Digital-media Standards Team

19-1, Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, KOREA
Tel.: 82-31-610-5336, FAX: 82-31-610-5355

Report of Measurements for TV Receiver under FCC Part 15

Manufacture : PT. LG Electronics Display Devices Indonesia
Block G, MM2100 Industrial Town, Cikarang Barat, Bekasi
17520, West Java, Indonesia

PRODUCT : HD Cable DVR STB
EUT Model Name : LSK279-8TZM
Serial No : N/A

Description of the Modulator & Tuner unit ;

Tuner Maker : BROADCOM.
Tuner type : LSK279-8TZM

Frequency range tuned by the receiver : 54 ~ 807 MHz

This receiver meets FCC Regulations covering comparable systems of VHF and UHF TV tuning .

Measurement Procedure : EIA RS – 378 , MP – 2 , ANSI C63.4 : 2003

Date of Measurements : November 16th ~ 19th 2007

Measurements Results : The results obtained from the measuring of this device
Are as shown in the attached sheets.
And comply with new rules adapted under Docket 87-389

1. Peak Picture Sensitivity : UHF – VHF < 8.0 dBuV
2. UHF Noise figure : Meet noise figure of 14 dB
3. Radiation of VHF/UHF Portion : N/A
4. Antenna Power conduction : Highest 30.2 dBuV at 906.75 MHz



In-Ha Kim
Research engineer
Digital-media standards team

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

1. Peak Picture Sensitivity :

Pass (Result < 8 dBuV)

2. UHF Noise Figure ;

Channels	Reading (dB)	Matching Loss(dB)	Noise Figure (dB)	Limit (dB)
25	10.3	1.75	8.55	14.0
30	10.5		8.75	
40	10.0		8.25	
50	9.7		7.95	
70	10.2		8.45	
90	10.3		8.55	
100	9.8		8.05	
110	10.0		8.25	
120	10.9		9.15	
130	11.0		9.25	
4.0dB subtracted for power splitter, < 0.3 dB added for IF amp contribution				

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

3. Radiated Emission Measurements

EUT has no external port of tuner to be connected to the antenna.

LSK279-8TZM Test Report

Test Report No. : 4521-071120IH

4. Antenna Power Conduction Measurements

Frequency to which tuned		Frequency of the emission (MHz)	Result at 3 m (dBuV/m)	Limit at 3 m (dBuV/m)
Channel	(MHz)			
2	57.0	102.75	<20	43.5
5	79.0	124.75	<20	43.5
7	177.0	222.75	<20	43.5
10	195.0	240.75	<20	43.5
15	129.0	174.75	<20	43.5
20	159.0	204.75	<20	43.5
25	231.0	276.75	<20	46.0
30	261.0	306.75	<20	46.0
40	321.0	366.75	<20	46.0
50	381.0	426.75	<20	46.0
60	441.0	486.75	<20	46.0
70	501.0	546.75 1093.5	<30 <40	46.0 54.0
80	561.0	606.75 1213.5	<30 <40	46.0 54.0
90	621.0	666.75 1333.5	<30 <40	46.0 54.0
100	651.0	696.75 1393.5	<30 <40	46.0 54.0
110	711.0	756.75 1513.5	<30 <40	46.0 54.0
120	771.0	816.75 1633.5	<29.7 <40	46.0 54.0
130	831.0	876.75 1753.5	30.0 <40	46.0 54.0
135	861.0	906.75 1813.5	30.2 <40	46.0 54.0