SK TECH CO., LTD.

Certificate of Compliance

Test Report No.:	**SKTFCE-050801-066**		
NVLAP CODE :	**200220-0**		
Applicant:	**Canko Technologies Inc.**		
Applicant Address:	5th Floor, Dongsung Bldg, 17-8 Yoido-dong Youngdungpo-Ku, Seoul, 150-874 Korea		
Manufacturer :	**Canko Technologies Inc.**		
Manufacturer Address:	5th Floor, Dongsung Bldg, 17-8 Yoido-dong Youngdungpo-Ku, Seoul, 150-874 Korea		
Product:	**Digital Satellite Receiver**		
FCC ID:	**TH5FSIRNA5400**	**Model No.:**	**FSIR-5400 NA**
Buyer Model/ Multi Model No.:	**IT385SU**		
Receipt No.:	SKTEU05-0477	**Date of receipt:**	July. 11, 2005
Date of Issue:	Aug. 01, 2005		
Testing location:	**SK TECH CO., LTD.** 820-2, Wolmoon-Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, Korea		
Test Standards:	**ANSI C63.4 / 2003**		
Rule Parts:	**FCC part 15 Subpart B**		
Equipment Class :	**TV interface device**		
Test Result:	The above mentioned product has been tested and passed.		

Prepared by: S.Y.Ye	**Tested by**: *J.S.Hyun/Engineer*	**Approved by**: *C.H.Jeong /Manager& Chief Engineer*
Signature *Date*	*Signature* *Date*	*Signature* *Date*
Other Aspects :		
Abbreviations :	**· OK, Pass = passed · Fail = failed · N/A = not applicable**	

☞ **•This test report is not permitted to copy partly without our permission.**

•This test result is dependent on only equipment to be used.

•This test result is based on a single evaluation of one sample of the above mentioned.

•This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S Government.

• We certify that this test report has been based on the measurement standards that is traceable to the national or International standards.

NVLAP®

NVLAP Lab. Code: 200220-0

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1. General

This equipment has been shown to be capable of compliance with the applicable technical standards and was tested in accordance with the measurement procedures as indicated in this report.

We attest to the accuracy of data. All measurements reported herein were performed by SK Tech Co., Ltd. and were made under Chief Engineer's supervision.
We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. Test Site

SK TECH Co., Ltd.

2.1 Location

820-2, Wolmoon Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, Korea

The test site is in compliance with ISO/IEC 17025 for general requirements for the competence of testing and calibration laboratories.
This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200220-0
and DATech for DAR-Registration No.:DAT-P-076/97-01

2.2 List of Test and Measurement Instruments

Table 1 : List of Test and Measurement Equipment

Kind of Equipment	Type	S/N	Calibrated until
EMI Receiver	ESHS10	862970/019	10.2005
Artificial Mains Network	ESH2-Z5	834549/011	08.2005
EMI Receiver	ESHS10	835871/002	11.2005
Artificial Mains Network	ESH3-Z5	836679/018	08.2005
EMI Receiver	ESVS 10	825120/013	10.2005
EMI Receiver	ESVS 10	834468/008	11.2005
Spectrum Analyzer	R3361A	11730187	10.2005
Amplifier	8447F	3113A05153	08.2005
Log Periodic Antenna	UHALP9107	1819	10.2005
Biconical Antenna	BBA9106	91031626	10.2005
Open Site Cable	N/A	N/A	N/A
Antenna Turntable Driver	5907	N/A	N/A
Antenna Turntable controller	5906	N/A	N/A
Amp & Receiver connection cable	N/A	N/A	N/A
Amp & Spectrum connection cable	N/A	N/A	N/A
50Ω Switcher	MP59B	6100214538	N/A

2.3 Test Date

Date of Application : July. 11, 2005

Date of Test : July. 15, 2005 ~ July. 29, 2005

2.4 Test Environment

See each test item's description.

3. Description of the tested samples

The EUT is the Digital Satellite Receiver.

3.1 Rating and Physical Characteristics

1. Conditional Access Interface(CI Model only)	
PCMCIA	2 Slot(type I or type II) DVD Common Interface Standard (Viaccess, nagra Visionk Conax, Cryptoworks, Irdeto, ASTON)
2. Tuner&Channel <Digital part>	
type	1X F-type, IEC169-24 Female
Frequency Range	950MHz TO 2150MHz
Input Impedance	75 ohm unbalanced
Signal level	-25 to –65 dBm
LNB Power	13.5/18.5 Vdc±5%, 0.5Amax, Overload protected
22kHz Tone	Frequency:22kHz±2kHz Amplitude:0.6 V±0.2V
DiSEqC Control	Version1.2 Compatible
Demodulation	QPSK
Input symbol Rate	2-45Ms/s
FEC Decoder	Convolution Code Rate 1/2, 2/3, 3/4, 5/6 and 7/8 with constant length K=7
3. System & Memory	
Main Processor	Sti5518
Flash Memory	2 Mbytes
SDRAM	8 Mbytes
EEPROM	8 Kbytes
Channel Memory	Digital Channels:4800
Multi-language Menu	English/Italian/Turkish/French/German/Spanish/Greek
Front	7Keys, 1LED
Remote Controller	34 Keys, IR Remote Control
4.MPEG Transport Stream& A/V Decoding<Digital part>	
Transport stream	MPEG-2 ISO/IEC 13818 Transport Stream Specification
Profile Level	MPEG-2 MP@ML
Input Rate	Max 60Mbit/s
Aspect Ratio	4:3, 16:9

Frame Rate	25H for PAL, 30Hz for NTSC
Video Resolution	720x576(PAL), 720X480(NTSC)
Teletext	Through VBI&OSD
Audio Decoding	MPEG/MusiCam Layer I&II
Audio Mode	Single channel/dual channel Joint Stereo/ Stereo
Frequency Response	20Hz~20kHz,<+/-2dB 60Hz~18kHz, <+0.5dB
Sampling Rate	32,44.1, 48kHz
5. A/V& Data In./Out	
S-video Output	North American model only
RCA Output	CVBS, L, R Output(Yellow, White, Red jack)with Volume Control
S/PDIF Output	RCA Output Black(Cinch) or Toslink Optical
Data Interface	RS-232, Bit Rate:115200 baud Connector:9-Pin D-Sub male type
6. RF-Modulator	
RF-Connector	75 ohm IEC169-2, Male/Female
Frequency	470MHz to 860MHz
Output Channel	CH 21-69 for the Demodulator or CH 3-4 for North America
TV Standard	NTSC, PAL B/G, D/K, I Selectable by Menu Setting
Audio Output	Mono with Volume Control
Preset Channel	Ch 3(or TBD), Software changeable by Menu screen
7. Power Supply	
Input Voltage	AC 90~240V, 50Hz~60Hz
Power Consumption	Max. 40W
Stand-by Power	<=6.5W
Protection	Separate Internal Fuse The input shall have the lightning protection
8. Physical Specificaion	
Size(WxHxD)	280x55x235mm Excluding the foot. Foot height is 6mm
Weight	2.0Kg
9.Environmental Condition	
Operating Temperature	0+/-40 Celsius
Storage Temperature	-10~50 Celsius
Operating Humidity Range	10~85%RH, Non-condensing
Storage Humidity Range	5~90%RH, Non-condensing

3.2 Submitted Documents

Test Data

4. Measurement Conditions

Operating voltage of the EUT is 110V, 60Hz

4.1 Modes of Operation

The EUT was set to the normal receiving mode in a TV mode during all test in a manner similar to a typical use. For the EUT operation, the Satellite live signal was fed to the EUT through the LNB input.

4.2 List of Peripherals

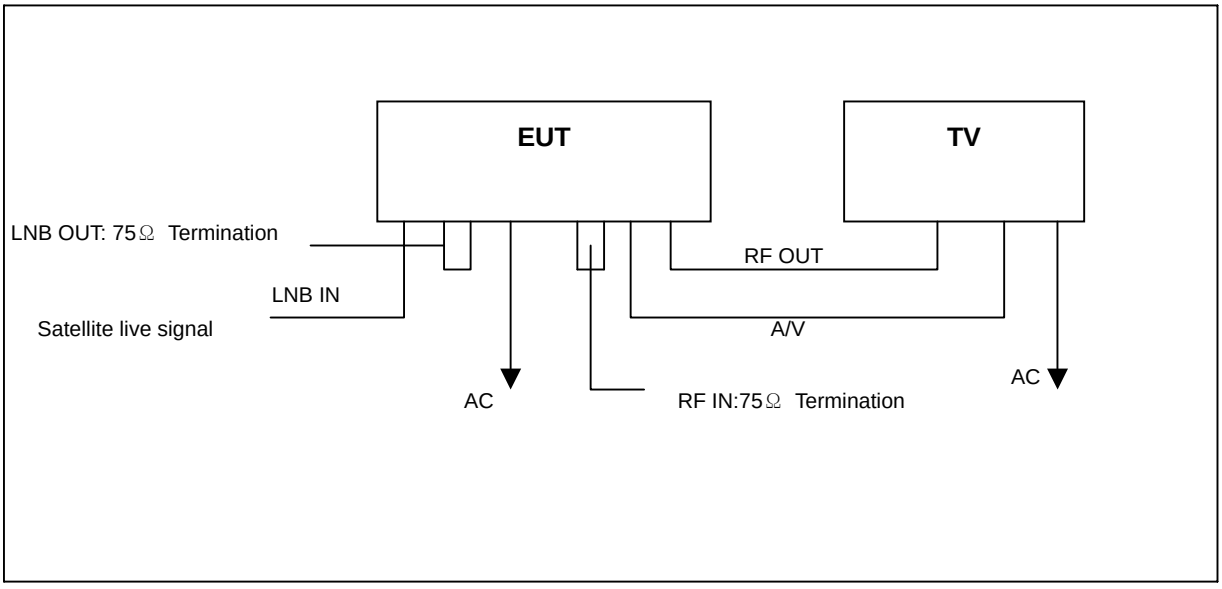
Description	Manufacturer	Model Name	Serial No.	FCC ID
Monitor	Sodiff	SDD-26XXX	-	-

4.3 Type of Used Cables

Equipment	Manufacturer	M/N	S/N	Cables &connectors
A/V	-	-	-	3.0m unshielded Interface cable
RF	-	-	-	3.0m shielded Interface cable
Power	DONGBANG	PES-21	N/A	1.2m unshielded power cable

4.4 Test Setup

The test setup photographs showed the external supply connections and interfaces.



[System Block Diagram of Test Configuration]

4.5 Uncertainty

1) Radiated disturbance

⊙ **Horizontally polarized radiated disturbances from 30MHz to 1000MHz at a distance of 10m**

Input quantity	Uncertainty of Xi		U(Xi)	Ci	Ciu(xi)	**CISPR 16-4**
	dB	Probability distribution function	dB			
1) Receiver reading	±0.1	K =1	0.1	1	**0.1**	0.10
2) Attenuation: antenna-receiver	±0.18	K=2	0.09	1	**0.09**	0.05
3) Antenna factor	±1.5	K=2	0.75	1	**0.75**	1.00
RECEIVER CORRECTIONS:						
4) Sine wave voltage	±0.56	K=2	0.28	1	**0.50**	0.50
5) Pulse amplitude response	±1.5	Rectangular (√3)	0.87	1	**0.87**	0.87
6) Pulse repetition rate response	±1.5	Rectangular (√3)	0.87	1	**0.87**	0.87
7) Noise floor proximity	±0.5	K=2	0.25	1	**0.25**	0.25
8) AF frequency interpolation	±0.3	Rectangular (√3)	0.17	1	**0.17**	0.17
9) Balance	±0.3	Rectangular (√3)	0.17	1	**0.17**	0.53
10) AF height deviations	±0.5	Rectangular (√3)	0.29	1	**0.29**	0.29
11) Phase center location	±0.3	Rectangular (√3)	0.17	1	**0.17**	0.17
12) Directive difference	+1.0	Rectangular (√3)	0.29	1	**0.29**	0.29
13) Cross polarization	±0.9	Rectangular (√3)	0.52	1	**0.52**	0.52
14) Site corrections	±2.6	Rectangular (√3)	1.5	1	**1.5**	1.63
15) Mismatch (ant-receiver)	±1.06	U-shaped (√2)	0.75	1	**0.75**	0.67

Combined Uncertainty

$Uc(xi) = \sqrt{(1)^2+(2)^2+(3)^2+(4)^2+(5)^2+(6)^2+(7)^2+(8)^2+(9)^2+(10)^2+(11)^2+(12)^2}$

$+(13)^2+(14)^2+(15)^2 = 2.37$

Expanded Uncertainty

U= k*Uc(xi) = 2 * 2.37= 4.74dB (The coverage factor k =2 yields approximately a 95% level of confidence)

⊙ **Vertically polarized radiated disturbances from 30MHz to 1000MHz at a distance of 10m**

Input quantity	Uncertainty of Xi		U(Xi)	Ci	Ciu(xi)	**CISPR 16-4**
	dB	Probability distribution function	dB			
1) Receiver reading	±0.1	K =1	0.1	1	**0.1**	0.10
2) Attenuation: antenna-receiver	±0.18	K=2	0.09	1	**0.09**	0.05
3) Antenna factor	±1.5	K=2	0.75	1	**0.75**	1.00
RECEIVER CORRECTIONS:						
4) Sine wave voltage	±0.56	K=2	0.28	1	**0.50**	0.50
5) Pulse amplitude response	±1.5	Rectangular (√3)	0.87	1	**0.87**	0.87
6) Pulse repetition rate response	±1.5	Rectangular (√3)	0.87	1	**0.87**	0.87
7) Noise floor proximity	±0.5	K=2	0.25	1	**0.25**	0.25
8) AF frequency interpolation	±0.3	Rectangular (√3)	0.17	1	**0.17**	0.17
9) Balance	±0.9	Rectangular (√3)	0.52	1	**0.52**	0.52
10)AF height deviations	±0.3	Rectangular (√3)	0.17	1	**0.17**	0.17
11) phase center location	±0.3	Rectangular (√3)	0.17	1	**0.17**	0.17
12) directive difference	+1.0	Rectangular (√3)	0.29	1	**0.29**	0.29
13)cross polarization	±0.9	Rectangular (√3)	0.52	1	**0.52**	0.52
14) site corrections	±2.6	Rectangular (√3)	1.5	1	**1.5**	1.63
15) Mismatch (ant-receiver)	±1.06	U-shaped (√2)	0.75	1	**0.75**	0.67

Combined Uncertainty

$Uc(xi)= \sqrt{(1)^2+(2)^2+(3)^2+(4)^2+(5)^2+(6)^2+(7)^2+(8)^2+(9)^2+(10)^2+(11)^2+(12)^2+(13)^2+(14)^2+(15)^2} =$ **2.43**

Expanded Uncertainty

U= k*Uc(xi) = 2 * 2.43 = 4.86dB

(The coverage factor k =2 yields approximately a 95% level of confidence)

2) Conducted disturbance

⊙ **Conducted disturbance from 150KHz to 30MHz using a 50Ω/50uH AMN**

input quantity	Uncertainty of Xi		U(Xi) dB	Ci	Ciu(xi)	**CISPR 16-4**
	dB	Probability distribution function				
1) Receiver Readeing	±0.1	K =1	0.1	1	**0.1**	0.10
2) Attenuation:AMN-receiver	±0.36	Triangular (√6)	0.15	1	**0.15**	0.05
RECEIVER CORRECTIONS:						
3) Sine wave voltage	±0.5	K=2	0.25	1	**0.25**	0.50
4) Pulse amplitude response	±1.5	Rectangular (√3)	0.87	1	**0.87**	0.87
5) Pulse repetition rate response	±1.5	Rectangular (√3)	0.87	1	**0.87**	0.87
6) AMN voltage division factor	±0.07	K=2	0.04	1	**0.04**	0.1
7) Mismatch : AMN-receiver	±0.55	U-shaped (√2)	0.39	1	**0.39**	0.53
8) AMN impedance	±1.52	Triangular (√6)	0.62	1	**0.62**	1.08

- 1)~8) For numbered comments, refer to following articles

Combined Uncertainty

Uc(xi)= √ (1) ²+(2) ²+(3) ²+(4) ²+(5) ²+(6) ²+(7) ²+(8) ² = **1.47**

Expanded uncertainty

U= k*Uc(xi) = 2 * 1.47 = 2.94dB

The coverage factor k =2 yields approximately a 95% level of confidence

⊙ **Refer**

1) receiver's resolution capacity

2) refer to the sub clause 11. of a calibration report

3) quoted from CISPR 16-4

4) refer to a calibration report

5) refer to CISPR 16-4 article 5. 7)

6) refer to a calibration report and a measured AMN impedance data

5. EMISSION Test

5.1 Conducted Emissions

Result: **PASS**

The line-conducted facility is located inside a 2.0M x 3.6M x 7.2M shielded enclosure.
The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 604-05.
A 1m x 1.5m wooden table 80cm high is placed 40cm. away from the vertical wall and 1.5m away from the side wall of the shielded room. ROHDE & SCHWARZ Model ESH3-Z5 (10kHz-30MHz) 50ohm/50 uH Line-Impedance Stabilization Networks(LISNs) are bonded to the shielded room.
The EUT is powered from the ROHDE & SCHWARZ LISN and the support equipment is powered from the ROHDE & SCHWARZ LISN. Power to the LISNs are filtered by a high-current high-insertion loss Lindgren enclosures power line filters (100dB 14kHz-10GHz).
The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure.
All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2".
If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the ROHDE & SCHWARZ LISN.
All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.
Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.
The spectrum was scanned from 150kHz to 30MHz with 100msec. sweep time.
The frequency producing the maximum level was reexamined using EMI/field Intensity Meter (ESHS 10) and Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode.
The bandwidth of the receiver was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.
Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; if applicable; whichever determined the worst-case emission.
Photographs of the worst-case emission can be seen in photograph of conducted test.
Each EME reported was calibrated using self-calibrating mode.

Figure 1 : Spectral Diagram, LINE - PE (CH3)

25 Jul 2005 14:13

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: LINE-PE
CH3
Result File: 5400l3.dat :

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

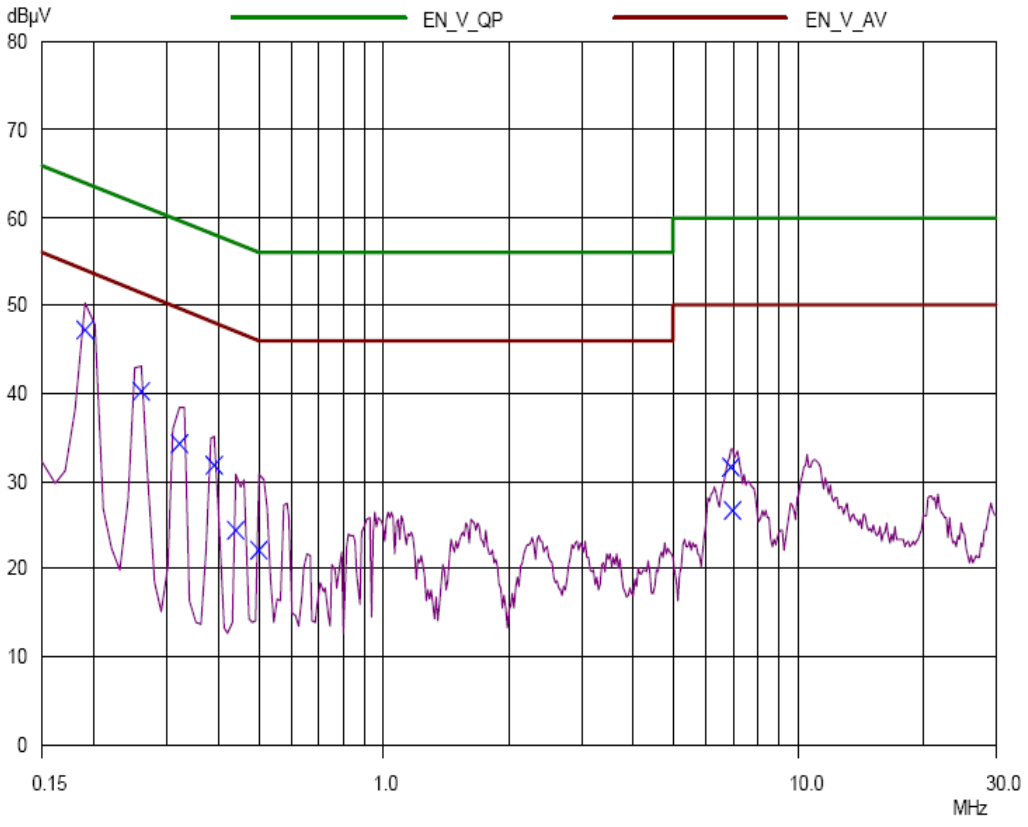


Figure 2: Test Data, LINE – PE(CH3)

25 Jul 2005 14:13

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: LINE-PE
CH3
Result File: 5400l3.dat :

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.19	47.15	64.04	16.89
0.26	40.14	61.43	21.29
0.32	34.28	59.71	25.43
0.39	31.78	58.06	26.28
0.44	24.42	57.06	32.64
0.5	22.24	56.00	33.76
6.85	31.66	60.00	28.34
6.9	26.64	60.00	33.36

* limit exceeded

Figure 3 : Spectral Diagram, NEUTRAL – PE(CH3)

25 Jul 2005 14:03

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: NEUTRAL-PE
CH3

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

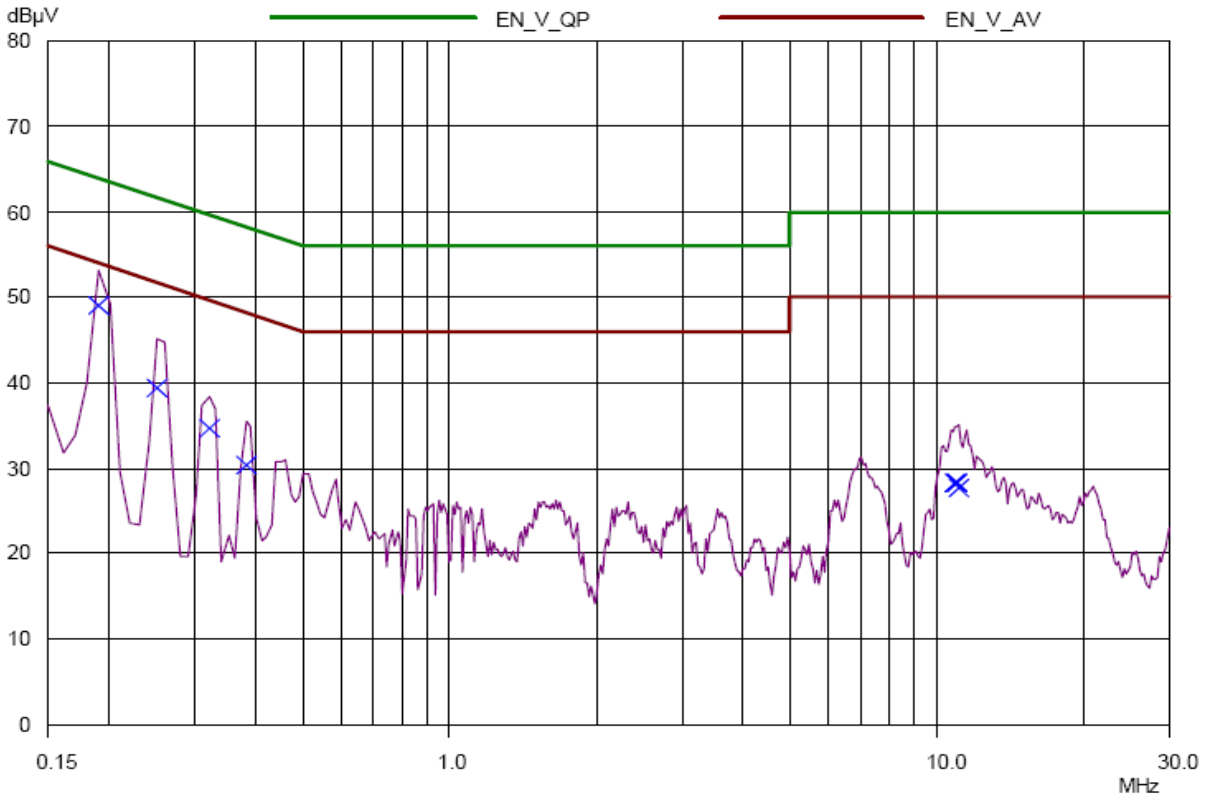


Figure 4: Test Data, NEUTRAL – PE(CH3)

25 Jul 2005 14:03

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: NEUTRAL-PE
CH3

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.19	49.03	64.04	15.01
0.25	39.40	61.76	22.36
0.32	34.72	59.71	24.99
0.38	30.45	58.28	27.83
10.9	28.29	60.00	31.71
10.93	28.23	60.00	31.77
10.95	28.21	60.00	31.79
11.06	27.61	60.00	32.39

* limit exceeded

Figure 5 : Spectral Diagram, LINE - PE (CH4)

25 Jul 2005 14:38

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: LINE-PE
CH4

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

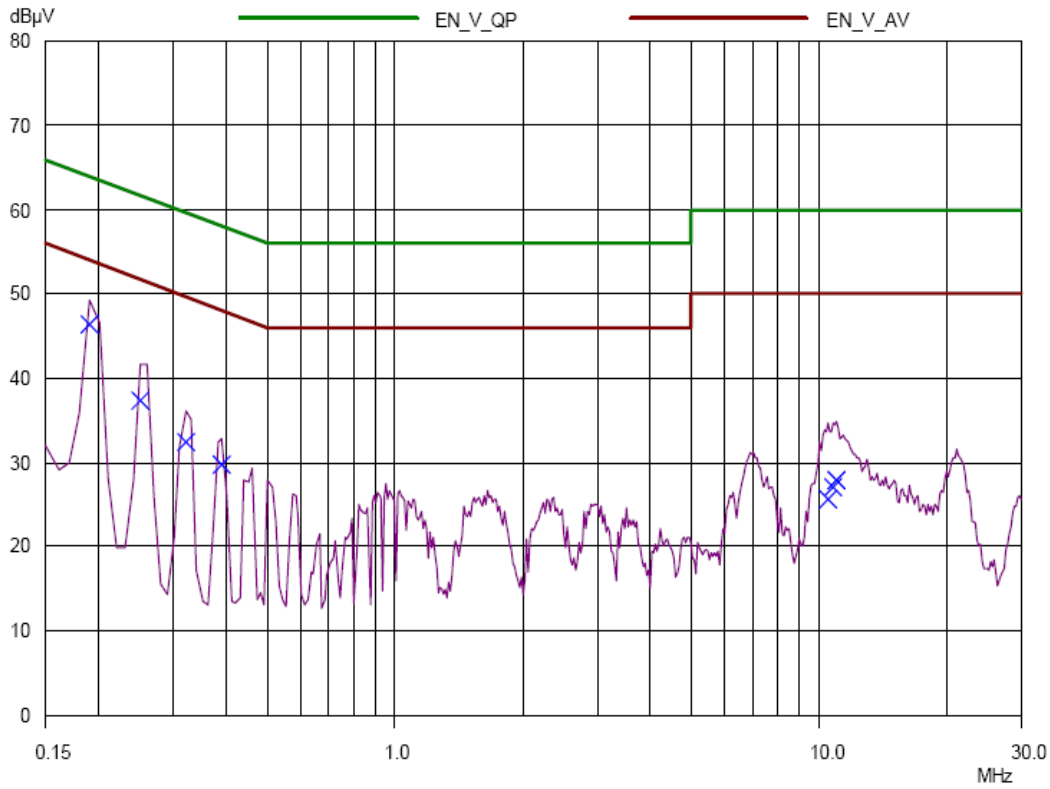


Figure 6: Test Data, LINE – PE(CH4)

25 Jul 2005 14:38

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: LINE-PE
CH4

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.19	46.46	64.04	17.58
0.25	37.39	61.76	24.37
0.32	32.39	59.71	27.32
0.39	29.70	58.06	28.36
10.51	25.73	60.00	34.27
10.79	27.10	60.00	32.90
10.93	27.97	60.00	32.03
10.99	27.94	60.00	32.06

* limit exceeded

Figure 7 : Spectral Diagram, NEUTRAL – PE(CH4)

25 Jul 2005 14:21

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: NETURAL-PE
CH4

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

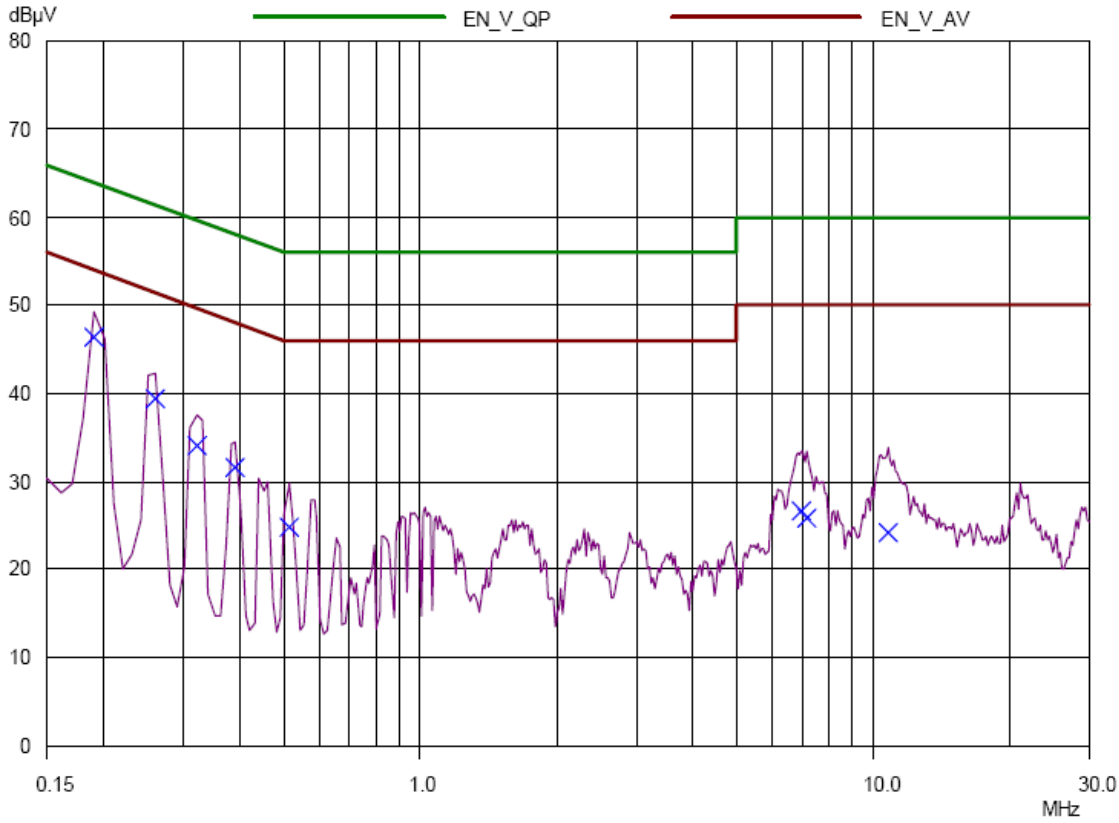


Figure 8: Test Data, NEUTRAL – PE(CH4)

25 Jul 2005 14:21

CONDUCTED DISTURBANCE

EUT: FSIR-5400 NA
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: NETURAL-PE
CH4

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	10kHz	10kHz	PK	100msec	Auto	OFF	60dB

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 35 dB

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.19	46.34	64.04	17.70
0.26	39.40	61.43	22.03
0.32	34.07	59.71	25.64
0.39	31.61	58.06	26.45
0.51	24.92	56.00	31.08
6.93	26.64	60.00	33.36
7.09	25.90	60.00	34.10
10.75	24.16	60.00	35.84

* limit exceeded

5.2 Radiated Emissions

Result : **PASS**

Preliminary measurements were made indoors at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found.
The spectrum was scanned from 30 to 300 MHz using biconical antenna and from 300 to 1000 MHz using log-periodic antenna. Above 1GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using SCHWARZBECK dipole antennas. The test equipment was placed on a wooden table situated on a 4x4 meter area adjacent to the measurement area. Turntable was to protect from weather in the dome that made with FRP. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter(ESVS 10) and Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 100kHz or 1MHz depending on the frequency or type of signal.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table.
The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission.
Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed, and/or support equipment, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission.
Photographs of the worst-case emission can be seen in photograph of radiated emission test.
Each EME reported was calibrated using self-calibrating mode.

Table 2 : Test Data, Radiated Emissions

Frequency [MHz]	Pol.	Height [m]	Real Reading	Correction Factor		T-Fact [dB]	Data [dBuV/m]	Limits [dBuV/m]	Margin [dB]
				Antenna	Cable				
52.24	H	4.0	16.7	10.3	0.8	11.1	27.8	40.0	12.2
183.05	H	4.0	7.0	15.8	2.1	17.9	24.9	43.5	18.6
243.12	H	4.0	8.8	17.4	2.6	20.0	28.8	46.0	17.2
365.52	H	4.0	18.2	17.3	3.3	20.6	38.8	46.0	7.2
486.21	H	2.8	18.0	18.5	3.9	22.4	40.4	46.0	5.6
730.45	H	2.1	10.9	22.6	4.9	27.5	38.4	46.0	7.6

NOTES:

1. All modes of operation were investigated and the worst-case emission are reported.
2. All other emission are non-significant.
3. All readings are calibrated by self-mode in receiver.
4. Measurements using CISPR quasi-peak mode.
5. H = Horizontal, V = Vertical Polarization
6. DATA = Real Reading + T - FACTOR(=Antenna+Cable)
7. Margin = Limits - DATA

5.3 Antenna-conducted Power Measurements

Result : **PASS**

Power on the receive antenna terminals was to be determined by measurement of the voltage present at these terminals. Antenna-Conducted power measurements is performed with the EUT antenna terminals connected directly to a spectrum analyzer, if the antenna impedance matches the impedance of the measuring instrument. Otherwise, use an impedance-matching network to connect the measuring instrument to the antenna terminals of the EUT. Losses in decibels in any impedance-matching network used is added to the measured value in dBμ.

With the EUT turned to one of the frequency over which device operates, measure both the frequency and voltage present at the antenna input terminals over the frequency range specified in the individual equipment requirements. Repeat this measurement with the receiver tuned to another frequency until the number of frequencies specified have been successively measured. Power on the receiver antenna terminals is the ratio of V^2 /R where V is the loss-corrected voltage measured at the antenna terminals, and R is the impedance of the measuring instrument.

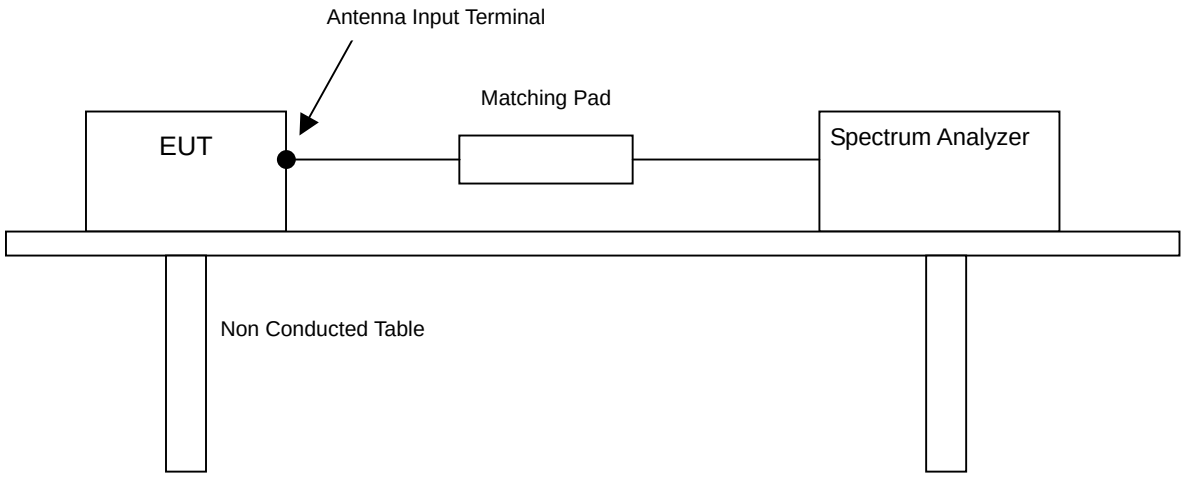


Table 3 : Test Data, Antenna Power conduction measurement

Tuned Frequency [MHz]	Meter Reading [dBuV]	Correction Factor [dB]	Emission Level [dBuV]	Limits [dBuV/m]	Margin [dB]
93	34.86	7.5	42.36	50.0	7.64
40	28.21	7.5	35.71	50.0	14.29
86	25.71	7.5	33.21	50.0	16.79
54	25.36	7.5	32.86	50.0	17.14
69	23.33	7.5	30.83	50.0	19.17

NOTES:

1. Emission level=Meter Reading +Correction Factor(Matching Loss+ Cable loss)
   Margin value=Limit-Emission Level

2. Measurements using the CISPR Quasi-peak mode in the frequency range 30 to 1000 MHz and measurements using the CISPR peak mode in the frequency range 1000 To 5000MHz.

3. The limits is 2.0 nanowatts in the frequency range 30 to 5000MHz.

5.4 Output Signal Conducted Level Measurement

Result : **PASS**

The output signal level is the maximum voltage level present ata the output terminals of the EUT on a particular frequency during normal use of the device.

The signal level was measured by direct connection to the spectrum analyzer with 50/75 ohm matching transformer between the spectrum analyzer and the TV interface device. The RF output signal level measured was the highest FR level present at the output terminals during normal use of the device. Measurements were made of the levels of both the visual and audio carrier for each TV channel (3 and 4) on which the device operates. The cable was supported between the EUT and the measuring instrument in a straight horizontal line so it had at least 75cm clearance from any conducting surface.

The EUT is provided with a typical signal consistent with normal operation. For each channel on which the EUT operates and in each mode in which the device operates, the video and audio carrier level is measured and recorded.

The voltage corresponding to the peak envelope power of the video modulated signal during maximum amplitude peaks across a resistance (R ohms) matching the rated output impedance of the device, must not exceed 692.8 R $^{1/2^2}$ μN for all other TV interface device. The voltage corresponding to peak envelope power of the audio modulated signal, if provided by the TV interface device, must not exceed 155R $^{1/2}$ μN , for cable system terminal device of TV interface device used with a master antenna, and 77.5 R $^{1/2}$ μN for all other TV interface device.Losses in decibels in any impedance-matching network used is added to the measured value in dBμN. The EUT was configured in accordance with ANSI C63.4-2003 Section 12.2 as below configuration block diagram.

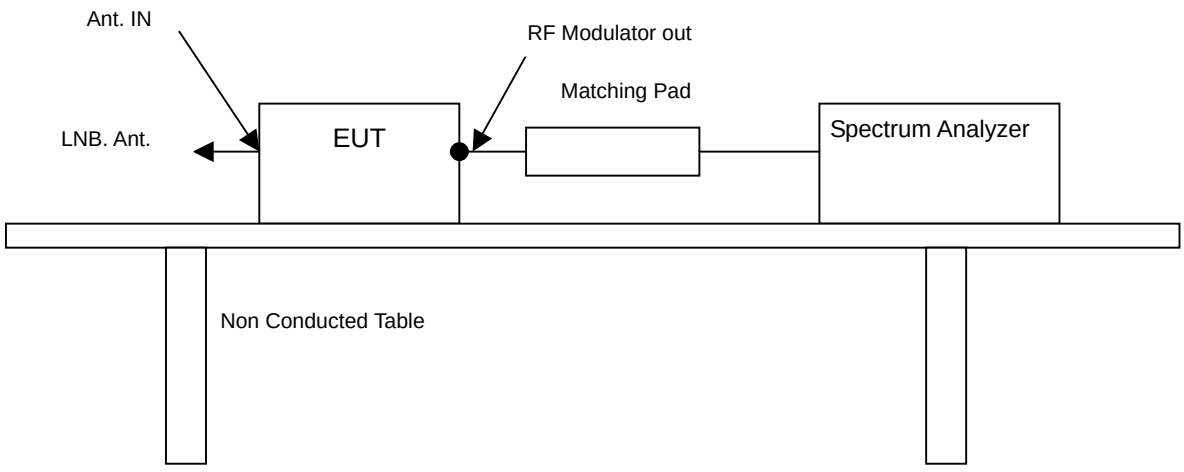


Table 4 : Test Data, Output signal Level Measurement

Test Channel	Emission Frequency	Meter Reading	Correction Factor	Emission Level	Limits	Margin
	[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV/m]	[dB]
3	61.35	59.2	7.5	66.7	69.5	2.8
	56.85	43.3	7.5	50.8	69.5	18.7
4	67.35	59.7	7.5	67.2	69.5	2.3
	62.85	44.2	7.5	51.7	69.5	17.8

NOTES:

1. The correction factor consist of the insertion loss of the impedance matching transformer and the coaxial cable used for the test.

2. The spectrum was checked in each test mode and operation mode, and the maximum Measured data were reported.

3. Signal Level=Meter Reading +Correction Factor(matching Loss+Cable loss)
Margin value=Limit-Signal Level

5.5 Output Terminal Conducted spurious Emission Measurement

Result : **PASS**

The RF output signal was fed to the TV receiver via coaxial cable. Measurements were made by direct connection to the spectrum analyzer and TV interface device with 50/75 ohm matching transformer.
The frequency range 30 to 1000 MHz was investigated for significant emission.
The maximum RMS voltage of any emission appearing on frequencies removed by more than 4. 6 MHz below and 7.4 MHz above the video carrier frequency on which the TV interface device is operated must not exceed 692.8 R $^{1/2}\mu V$ for cable system terminal device or TV interface device used with a master antenna and 10.95 R $^{1/2}\mu V$ for all other TV interface device when terminated with a resistance (R ohms) matching the rated output impedance of the TV interface device. The EUT was configured in accordance with ANSI C63.4-2003 Section 12.2 as below configuration block diagram.

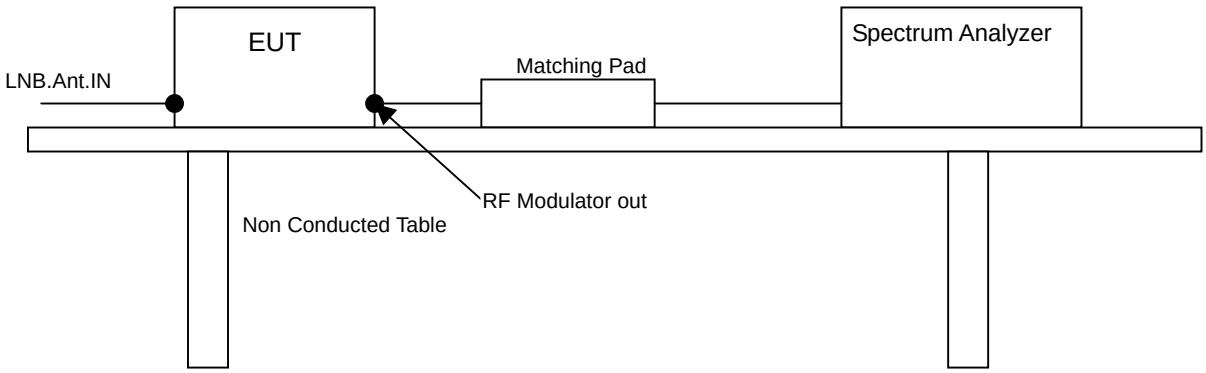


Table 6 : Test Data, Output Terminal conducted Spurious

Test Channel	Emission Frequency	Meter Reading	Correction Factor	Emission Level	Limits	Margin
	[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV/m]	[dB]
3	973	17.34	7.5	24.84	39.5	14.66
	851	14.7	7.5	22.2	39.5	17.3
	365	15.64	7.5	23.14	39.5	16.36
4	973	18.4	7.5	25.9	39.5	13.6
	365	16.77	7.5	24.27	39.5	15.23
	135	16.21	7.5	23.71	39.5	15.79

NOTES:

1 The correction factor consist of the insertion loss of the impedance matching transformer, the coaxial cable used for the test.

2. The spectrum was checked in each test mode and operation mode, and the maximum measured data were reported.

3. Emission Level=Meter Reading+Correction (Matching Loss+Cable loss)
Margin value=Limit-signal Level

5.6 Antenna Transfer Switch Measurement

Result : **PASS**

Isolation was measured for all positions of an antenna transfer switch on all output channels of the EUT. TV interface device transfer switch isolation is the difference the levels of a signal going into one antenna input port of the switch and that of the same signal coming out of another antenna terminal of transfer switch. The isolation of an antenna transfer switch equipped with coaxial connectorsis performed by measuring the maximum voltage of the visual carrier. Measurements were made of the maximum RMS voltage corresponds to the peak envelope power of the video signal during maximum amplitude peaks. In either position of the receiver transfer switch, the maximum voltage at the receiving antenna input of the switch, must not exceed 0.346 R $^{1/2}\mu N$.

The maximum voltage corresponds to the peak envelope power of the video modulated signal during maximum amplitude.

The EUT was configured in accordance with ANSI C63.4-2003 Section 12.2 as below configuration block diagram, and the EUT configuration can also be seen in Appendix B. Photographs of the test setup. The unused RF input/output terminals are terminated in a proper impedance. The antenna input terminal is connected to the input of preamplifier through the matching transformer coaxial cable. And the output of preamplifier is connected to the spectrum analyzer. Then, the signal level on the antenna input terminal is measured under the EUT condition produced the maximum signal level.

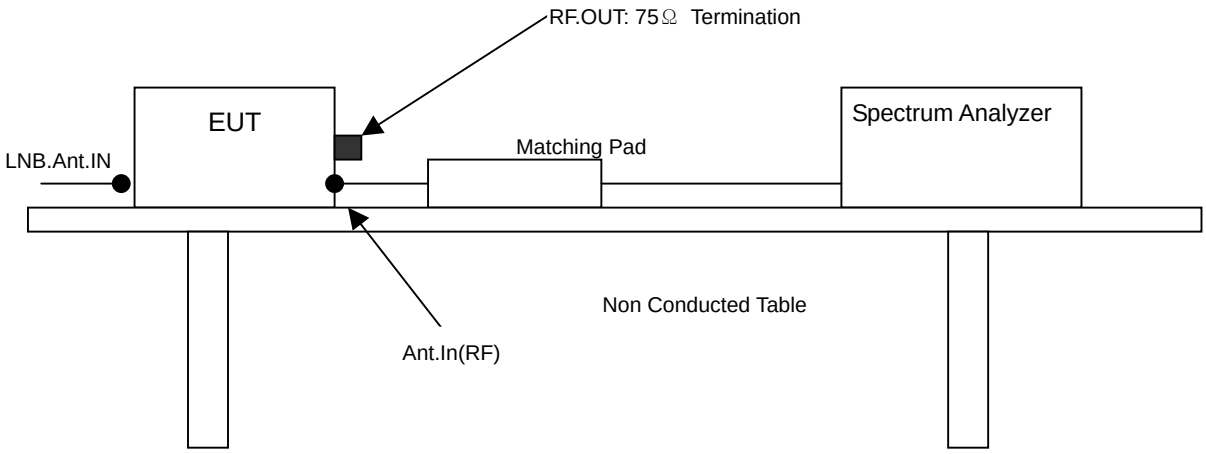


Table 7 : Test Data, Antenna Transfer Switch

Test Channel	Emission Frequency	Meter Reading	Correction Factor	Emission Level	Limits	Margin
	[MHz]	[dBuV]	[dB]	[dBuV]	[dBuV/m]	[dB]
3	61.30	During this test nosignal detected			9.5	–
4	67.50				9.5	–

NOTES:

1 .No emission was observed during the test. The spectrum was checked in each test mode and operation mode Transfer switch isolation measurements were made on the Channel or 4 video output frequency of 61.30 or 67.30 MHz and both positions of the transfer switch were checked for compliance.

2 To clarify the emission emanated from ANT. Input terminal on the EUT, RF pre-amplifier was used. The gain of pre-amplifier at each frequency measured from the EUT was obtained after sufficient warm-up for stabilization of gain. The correction factor consist of the insertion loss of the impedance matching transformer, the coaxial cable used for the test and the gain of pre-amplifier.

3. Emission Level=Meter Reading+Correction Factor(Matching Loss+Cable loss)
Margin value=Limit-Emission Level

4 Spectrum analyzer setting: Frequency Span 1MHz, Resolution bandwidth 100 kHz, Video bandwidth 3MHz. Detector function Peak mode.