

On **21/09/2022** document No. **TR09220012 [0]** is applied to the following elements:

<b>REFERENCE</b>	<b>DESCRIPTION</b>
<b>5317</b>	MINIKOM AMP.RET+MATV+2SAT "F" G(-5)/30..33/33..38
<b>531710</b>	MINIKOM AMP.RET+MATV+SAT "F" G(-5)/35/33...38

# Test Report

## EMC

Document No.: **IEI03101700002**

Date: **03-10-2017**

Made to: **Televes**

Product Range: **MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38**

Product Range References. **This document applies to the following references:**

Reference	Device
5317	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38
531710	MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38

**Product Range Data**

Product Range Id.: <b>196</b>	Product Range: <b>MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38</b>
Description: <b>MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38</b>	

**Product Range References**

Reference	Name
5317	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38
531710	MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38

**Standards**

Standard	Title	Part	Section
EN 61000-6-1:2007 IEC 61000-6-1:2005	Electromagnetic compatibility (EMC).	Part 6-1: Generic standards. Immunity for residential, commercial and light-industrial.	
EN 50083-2:2012 + A1:2015 IEC 60728-2:2010	Cable networks for television signals, sound signals and interactive services.	Part 2: Electromagnetic compatibility for equipment.	
EN 61000-3-3:2013 IEC 61000-3-3:2013	Electromagnetic compatibility (EMC)	Part 3-3: Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection	

**Standard Paragraphs**

Standard	Paragraph	Title
EN 50083-2:2012	4.2.1	Disturbance voltage at the mains terminals in the frequency range from 150 kHz to 30 MHz
EN 50083-2:2012	4.2.2	Disturbance voltages from equipment at the AC mains frequency and its harmonics
EN 50083-2:2012	4.3.3.2	Measurement of radiation of active equipment in the frequency range 30 MHz to 1000 MHz using the absorbing clamp method
EN 50083-2:2012	4.3.3.3	Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method
EN 50083-2:2012	4.4.3	External immunity to conducted disturbances, induced by radio-frequency fields (150 kHz-80 MHz)
EN 50083-2:2012	4.4.3	External immunity to radiated disturbances, induced by radio-frequency fields (80 MHz-3 GHz)
EN 50083-2:2012	4.6	Electrostatic discharge immunity test (ESD) for active equipment
EN 50083-2:2012	4.7	Electrical fast transient/burst immunity test for AC power ports
EN 61000-6-1:2007	8	Surge immunity test
EN 61000-6-1:2007	8	Voltage dips and voltage interruptions immunity tests

**Measurements made**

	Result	Measure	Standard Applied	Standard Method	Standard Limit
1	✔	Conducted emissions	EN 50083-2:2012 Paragraph: 4.2.1	EN 55013:2013	EN 50083-2:2012
2	✔	Harmonic current emissions	EN 50083-2:2012 Paragraph: 4.2.2	EN 61000-3-2:2014	EN 61000-3-2:2014
3	✔	Voltage changes, voltage fluctuations and flicker	EN 61000-3-3:2013	EN 61000-3-3:2013	EN 61000-3-3:2013
4	✔	Radiated power (30MHz - 1000MHz)	EN 50083-2:2012 Paragraph: 4.3.3.2	EN 50083-2:2012	EN 50083-2:2012
5	✔	Radiated power (30MHz - 1000MHz)	EN 50083-2:2012 Paragraph: 4.3.3.2	EN 50083-2:2012	EN 50083-2:2012
6	✔	Radiated power (950MHz - 25GHz)	EN 50083-2:2012 Paragraph: 4.3.3.3	EN 50083-2:2012	EN 50083-2:2012
7	✔	Radiated power (950MHz - 25GHz)	EN 50083-2:2012 Paragraph: 4.3.3.3	EN 50083-2:2012	EN 50083-2:2012
8	✔	Immunity to conducted disturbances	EN 50083-2:2012 Paragraph: 4.4.3	EN 61000-4-6:2014	EN 50083-2:2012
9	✔	Immunity from radiated fields	EN 50083-2:2012 Paragraph: 4.4.3	EN 61000-4-3:2006	EN 50083-2:2012
10	✔	ESD	EN 50083-2:2012 Paragraph: 4.6	EN 61000-4-2:2009	EN 50083-2:2012
11	✔	BURST	EN 50083-2:2012 Paragraph: 4.7	EN 61000-4-4:2012	EN 50083-2:2012

**Measurements made (Cont.)**

Result	Measure	Standard Applied	Standard Method	Standard Limit
12	SURGES	EN 61000-6-1:2007 Paragraph: 8	EN 61000-4-5:2014	EN 61000-6-1:2007
13	Voltage dips, short interruptions and voltage variations	EN 61000-6-1:2007 Paragraph: 8	EN 61000-4-11:2004	EN 61000-6-1:2007

**Product Range DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38
4999	Televes	531710		Televes	MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38

Made by:

Diego Rodriguez Noguero

Checked By:

Silvia Rey Calveiro

Approved by:

Eduardo Castro Ares

Mark:



Summary	Pag. 2
D.U.T. Description Id: 4997	Pag. 5
D.U.T. Description Id: 4999	Pag. 6
1. Disturbance voltage at the mains terminals in the frequency range from 150 kHz to 30 MHz	Pag. 7
2. Disturbance voltages from equipment at the AC mains frequency and its harmonics	Pag. 11
3. Voltage changes, voltage fluctuations and flicker	Pag. 16
4. Measurement of radiation of active equipment in the frequency range 30 MHz to 1000 MHz using the absorbing clamp method	Pag. 18
5. Measurement of radiation of active equipment in the frequency range 30 MHz to 1000 MHz using the absorbing clamp method	Pag. 23
6. Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method	Pag. 27
7. Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method	Pag. 30
8. External immunity to conducted disturbances, induced by radio-frequency fields (150 kHz-80 MHz)	Pag. 33
9. External immunity to radiated disturbances, induced by radio-frequency fields (80 MHz-3 GHz)	Pag. 38
10. Electrostatic discharge immunity test (ESD) for active equipment	Pag. 44
11. Electrical fast transient/burst immunity test for AC power ports	Pag. 47
12. Surge immunity test	Pag. 50
13. Voltage dips and voltage interruptions immunity tests	Pag. 53

**D.U.T. Description Id: 4997**

**Administrative Data**

D.U.T. Id: **4997**

In Date: **20-09-2017**

Out Date: **03-10-2017**

**D.U.T. Data**

D.U.T.: **MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38**

Trade Mark: **Televes**

Reference: **5317**

Description: **MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38**

**Technical Data**

Manufacturer: **Televes**

State Development: **VPs**

Type: **Active**

No. of Ports: **6**

Chassis: **MiniKom**

Port	Type	Range	Direction	Connector	Comments
1	Chassis			Enclosure	
2	Mains Power	AC	Input	Power Connector	
3	Radio Frequency	47-2150MHz	Input	F Connector	IF 1 + MATV
4	Radio Frequency	FI	Input	F Connector	IF 2
5	Radio Frequency	47-2150MHz	Output	F Connector	IF 1 + MATV
6	Radio Frequency	47-2150MHz	Output	F Connector	IF 2 + MATV

**D.U.T. Images**



Name **IMG\_5934**



Name **IMG\_5935**



Name **IMG\_5936**



Name **IMG\_5937**

**D.U.T. Description Id: 4999**

**Administrative Data**

D.U.T. Id: **4999**

In Date: **21-09-2017**

Out Date: **03-10-2017**

**D.U.T. Data**

D.U.T.: **MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38**

Trade Mark: **Televes**

Reference: **531710**

Description: **MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38**

**Technical Data**

Manufacturer: **Televes**

State Development: **VPs**

Type: **Active**

No. of Ports: **4**

Chassis: **MiniKom**

Port	Type	Range	Direction	Connector	Comments
1	Chassis			Enclosure	
2	Radio Frequency	47-2150MHz	Input	F Connector	SAT + TERR
3	Radio Frequency	47-2150MHz	Output	F Connector	SAT + TERR
4	Mains Power	AC	Input	Power Connector	

**D.U.T. Images**



Name **IMG\_5939**



Name **IMG\_5940**



Name **IMG\_5941**



Name **IMG\_5942**

**1. Disturbance voltage at the mains terminals in the frequency range from 150 kHz to 30 MHz**

**Measure**

Date: 20-09-2017

**Applied Procedure**

TSP Id.: PEE-EMI-001

Title: Conducted emissions

**Standard**

TSP Id.: NOR-APAR-291

Standard: EN 50083-2:2012

Paragraph: 4.2.1

Title: Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.

Paragraph: Disturbance voltage at the mains terminals in the frequency range from 150 kHz to 30 MHz

Equivalent Standards: UNE-EN 50083-2:2013  
 IEC 60728-2:2010

**Standard Limit**

Standard: EN 50083-2:2012

Title: Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.

Equivalent Standards: UNE-EN 50083-2:2013  
 IEC 60728-2:2010

**Standard Method**

Standard: EN 55013:2013

Title: Sound and television broadcast receivers and associated equipment. Radio disturbance characteristics. Limits and methods of measurement.

Equivalent Standards: UNE-EN 55013:2013  
 CISPR 13:2009

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: 22.1°C

Humidity: 52.1%

Atmospheric Pressure: 1003mbar



**Used Equipment**

<b>Id</b>	<b>Equipment</b>	<b>Trade Mark</b>	<b>Model</b>	<b>Serial No.</b>
47	Faraday chamber Siemens Model B8 3107A 353	Siemens	B8 3107A 353	
22	LISN ESH3-Z5 Rohde&Schwarz	R&S	ESH3-Z5	834129/001
75	Measurement receiver R&S ESCI 3 9KHz-3GHz	R&S	ESCI-ref 1166.5950.03	100393



**Measure Data (Cont.)**

Port No.: **2**

Measure No.: **1**

Measure Date: **20-09-2017**

Load: **47 ohm**

Signal: **TDT**

Grounded: **Yes**

Mode: **230Vac**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.764023	49.2	10.0	9.000	GND	L1	20.0	6.8	56.0
2.437708	44.3	10.0	9.000	GND	L1	20.0	11.7	56.0
2.821444	43.6	10.0	9.000	GND	L1	20.0	12.4	56.0
3.292857	41.8	10.0	9.000	GND	L1	20.0	14.2	56.0
4.742675	42.3	10.0	9.000	GND	L1	20.0	13.7	56.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.587846	34.2	10.0	9.000	GND	L1	20.0	11.8	46.0
0.675822	35.0	10.0	9.000	GND	L1	20.0	11.0	46.0
0.764920	42.2	10.0	9.000	GND	L1	20.0	3.9	46.0
1.730727	35.1	10.0	9.000	GND	L1	20.0	10.9	46.0
2.464473	38.1	10.0	9.000	GND	L1	20.0	7.9	46.0
2.818210	35.7	10.0	9.000	GND	N	20.0	10.3	46.0
3.299491	35.1	10.0	9.000	GND	L1	20.0	10.9	46.0
3.994955	35.0	10.0	9.000	GND	N	20.0	11.0	46.0
4.384017	35.2	10.0	9.000	GND	L1	20.0	10.8	46.0
4.738117	35.5	10.0	9.000	GND	N	20.0	10.5	46.0

**2. Disturbance voltages from equipment at the AC mains frequency and its harmonics**

**Measure**

Date: **02-10-2017**

**Applied Procedure**

TSP Id.: **PEE-EMI-010**

Title: **Harmonic current emissions**

**Standard**

TSP Id.: **NOR-APAR-292**

Standard: **EN 50083-2:2012**

Paragraph: **4.2.2**

Title: **Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **Disturbance voltages from equipment at the AC mains frequency and its harmonics**

Equivalent Standards: **UNE-EN 50083-2:2013  
 IEC 60728-2:2010**

**Standard Method | Standard Limit**

Standard: **EN 61000-3-2:2014**

Title: **Electromagnetic compatibility (EMC)  
 Part 3-2: Limits. Limits for harmonic current emissions (equipment input current**

Equivalent Standards: **UNE-EN 61000-3-2:2014  
 CEI 61000-3-2:2014**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

<b>Id</b>	<b>Equipment</b>	<b>Trade Mark</b>	<b>Model</b>	<b>Serial No.</b>
178	PC Harmonics and flicker control	Dell (Intel)	Optiplex GX 100	37049956003
114	Proflin 2105-400, P/N: 7000-445-1 Schaffner	Schaffner	NSG 1007	54636
113	CCN 1000-1, P/N: 5004-417-1 Schaffner	Schaffner	CCN 1000	71995

**Measure Data**

Port No.: **2**

Measure No.: **1**

Measure Date: **02-10-2017**

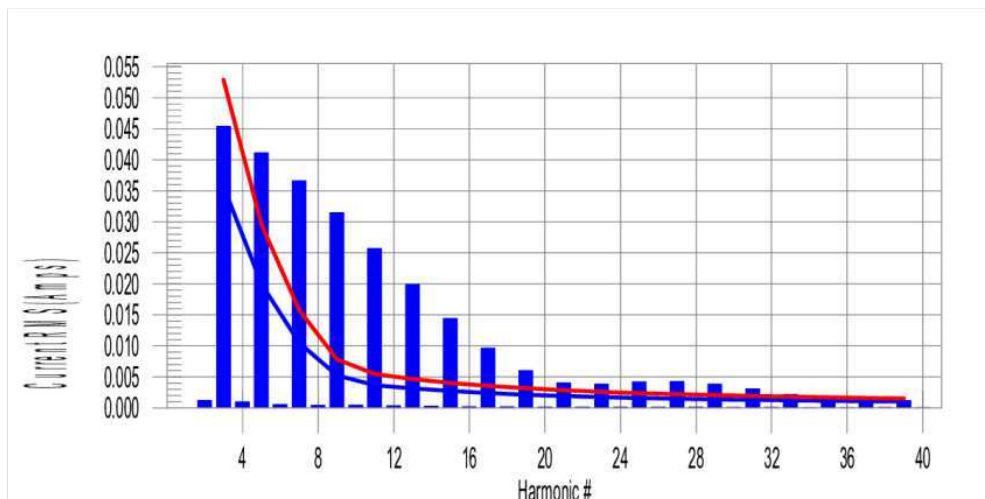
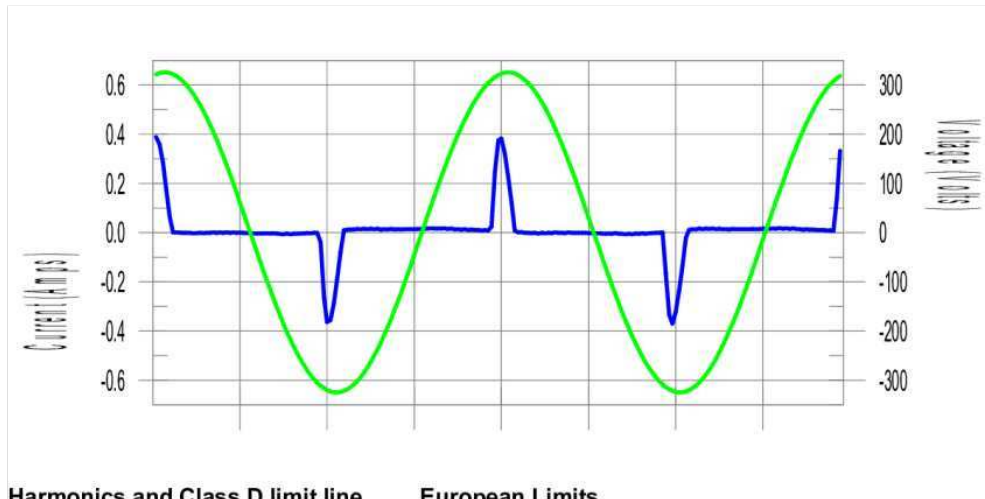
**Harmonics – Class-D per Ed. 2.2 (2004-11)(Run time)**

EUT: MINIKOM AMP. RET+MATV +2FI "F" G(-5)/30/33...38      Tested by:  
 Test category: Class-D per Ed. 2.2 (2004-11) (European limits)      Test Margin: 100  
 Test date: 29/09/17      Start time: 11:59:19      End time: 12:00:30  
 Test duration (min): 1      Data file name: H-000240.cts\_data  
 Comment: 230Vac  
 Customer: TELEVES

Test Result: **Pass**

Source qualification: **Normal**

**Current & voltage waveforms**



**Test result: Pass      Worst harmonic was #0 with 0.00% of the limit.**

**Measure Data (Cont.)**

Port No.: 2

Measure No.: 1

Measure Date: 02-10-2017

**Current Test Result Summary (Run time)**

EUT: MINIKOM AMP. RET+MATV +2FI "F" G(-5)/30/33...38 Tested by:  
 Test category: Class-D per Ed. 2.2 (2004-11) (European limits) Test Margin: 100  
 Test date: 29/09/17 Start time: 11:59:19 End time: 12:00:30  
 Test duration (min): 1 Data file name: H-000240.cts\_data  
 Comment: 230Vac  
 Customer: TELEVES

Test Result: Pass Source qualification: Normal  
 THC(A): 0.00 I-THD(%): 0.00 POHC(A): 0.000 POHC Limit(A): 0.000  
 Highest parameter values during test:  
 V\_RMS (Volts): 230.10 Frequency(Hz): 50.00  
 I\_Peak (Amps): 0.402 I\_RMS (Amps): 0.099  
 I\_Fund (Amps): 0.047 Crest Factor: 4.112  
 Power (Watts): 10.5 Power Factor: 0.464

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001						
3	0.042	0.036	0.0	0.045	0.053	0.00	Pass
4	0.001						
5	0.040	0.020	0.0	0.041	0.030	0.00	Pass
6	0.001						
7	0.036	0.010	0.0	0.037	0.016	0.00	Pass
8	0.000						
9	0.031	0.005	0.0	0.031	0.008	0.00	Pass
10	0.000						
11	0.025	0.004	0.0	0.026	0.005	0.00	Pass
12	0.000						
13	0.019	0.003	0.0	0.020	0.005	0.00	Pass
14	0.000						
15	0.014	0.003	0.0	0.014	0.004	0.00	Pass
16	0.000						
17	0.009	0.002	0.0	0.010	0.004	0.00	Pass
18	0.000						
19	0.006	0.002	0.0	0.006	0.003	0.00	Pass
20	0.000						
21	0.004	0.002	0.0	0.004	0.003	0.00	Pass
22	0.000						
23	0.004	0.002	0.0	0.004	0.003	0.00	Pass
24	0.000						
25	0.004	0.002	0.0	0.004	0.002	0.00	Pass
26	0.000						
27	0.004	0.002	0.0	0.004	0.002	0.00	Pass
28	0.000						
29	0.004	0.001	0.0	0.004	0.002	0.00	Pass
30	0.000						
31	0.003	0.001	0.0	0.003	0.002	0.00	Pass
32	0.000						
33	0.002	0.001	0.0	0.002	0.002	0.00	Pass
34	0.000						
35	0.001	0.001	0.0	0.001	0.002	0.00	Pass
36	0.000						
37	0.001	0.001	0.0	0.001	0.002	0.00	Pass
38	0.000						
39	0.001	0.001	0.0	0.001	0.002	0.00	Pass
40	0.000						

Note: The EUT power level is below 75.0 Watts and therefore has no defined limits



**Measure Data (Cont.)**

Port No.: **2**

Measure No.: **1**

Measure Date: **02-10-2017**

**Voltage Source Verification Data (Run time)**

EUT: MINIKOM AMP. RET+MATV +2FI "F" G(-5)/30/33...38      Tested by:  
 Test category: Class-D per Ed. 2.2 (2004-11) (European limits)      Test Margin: 100  
 Test date: 29/09/17      Start time: 11:59:19      End time: 12:00:30  
 Test duration (min): 1      Data file name: H-000240.cts\_data  
 Comment: 230Vac  
 Customer: TELEVES

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.10	Frequency(Hz):	50.00
I_Peak (Amps):	0.402	I_RMS (Amps):	0.099
I_Fund (Amps):	0.047	Crest Factor:	4.112
Power (Watts):	10.5	Power Factor:	0.464

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.118	0.460	25.61	OK
3	0.586	2.070	28.30	OK
4	0.087	0.460	18.88	OK
5	0.065	0.920	7.06	OK
6	0.051	0.460	11.18	OK
7	0.038	0.690	5.53	OK
8	0.024	0.460	5.20	OK
9	0.044	0.460	9.46	OK
10	0.024	0.460	5.31	OK
11	0.018	0.230	7.83	OK
12	0.025	0.230	10.83	OK
13	0.031	0.230	13.34	OK
14	0.017	0.230	7.25	OK
15	0.010	0.230	4.31	OK
16	0.018	0.230	7.86	OK
17	0.023	0.230	9.80	OK
18	0.022	0.230	9.52	OK
19	0.014	0.230	6.20	OK
20	0.022	0.230	9.56	OK
21	0.018	0.230	8.03	OK
22	0.013	0.230	5.59	OK
23	0.028	0.230	12.04	OK
24	0.011	0.230	4.88	OK
25	0.016	0.230	6.85	OK
26	0.009	0.230	3.89	OK
27	0.024	0.230	10.22	OK
28	0.008	0.230	3.65	OK
29	0.018	0.230	7.77	OK
30	0.008	0.230	3.68	OK
31	0.015	0.230	6.53	OK
32	0.008	0.230	3.51	OK
33	0.013	0.230	5.55	OK
34	0.008	0.230	3.54	OK
35	0.010	0.230	4.48	OK
36	0.008	0.230	3.32	OK
37	0.008	0.230	3.61	OK
38	0.007	0.230	3.26	OK
39	0.008	0.230	3.51	OK
40	0.010	0.230	4.45	OK



**3. Voltage changes, voltage fluctuations and flicker**

**Measure**

Date: **02-10-2017**

**Applied Procedure**

TSP Id.: **PEE-EMI-011**

Title: **Voltage changes, voltage fluctuations and flicker**

**Standard | Standard Method | Standard Limit**

Standard: **EN 61000-3-3:2013**

Title: **Electromagnetic compatibility (EMC)  
Part 3-3: Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

Id	Equipment	Trade Mark	Model	Serial No.
178	PC Harmonics and flicker control	Dell (Intel)	Optiplex GX 100	37049956003
114	Proflin 2105-400, P/N: 7000-445-1 Schaffner	Schaffner	NSG 1007	54636
113	CCN 1000-1, P/N: 5004-417-1 Schaffner	Schaffner	CCN 1000	71995

**Measure Data**

Port No.: **2**

Measure No.: **1**

Measure Date: **02-10-2017**

**Flicker Test Summary per EN/IEC61000-3-3 (Run time)**

EUT: MINIKOM AMP. RET+MATV+2FI "F" G(-5)/30/33...38  
 Test category: All parameters (European limits)  
 Test date: 29/09/17  
 Test duration (min): 10  
 Comment: 230Vac  
 Customer: Televes

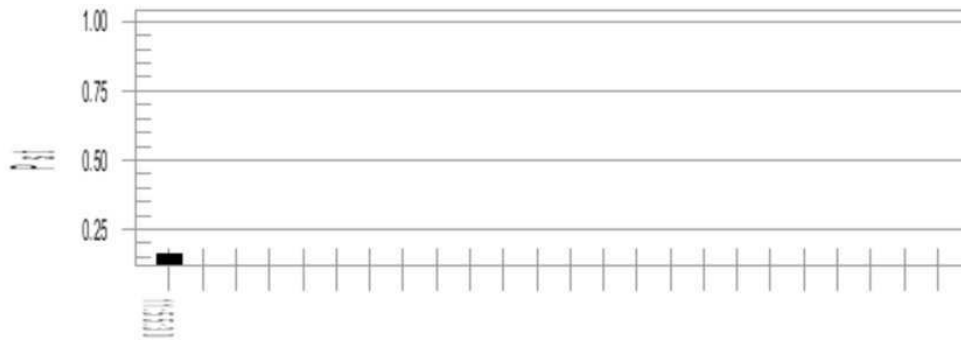
Tested by:  
 Test Margin: 100  
 Start time: 11:45:10  
 End time: 11:55:30  
 Data file name: F-000239.cts\_data

Test Result: **Pass**

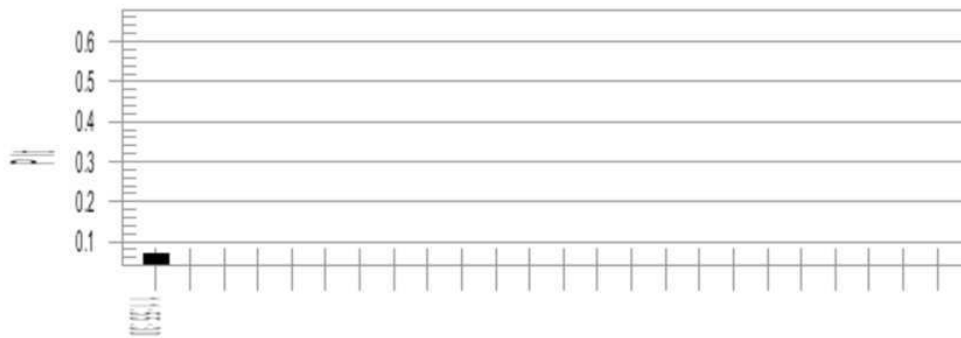
Status: **Test Completed**

**Pst and limit line**

**European Limits**



**Plt and limit line**



**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	230.06		
Highest dt (%):	0.00	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.160	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.070	Test limit:	0.650 Pass

**4. Measurement of radiation of active equipment in the frequency range 30 MHz to 1000 MHz using the absorbing clamp method**

**Measure**

Date: **02-10-2017**

**Applied Procedure**

TSP Id.: **PEE-EMI-006**

Title: **Radiated power. Manual absorbing clamp method**

**Standard**

TSP Id.: **NOR-APAR-294**

Standard: **EN 50083-2:2012**

Paragraph: **4.3.3.2**

Title: **Cable networks for television signals, sound signals and interactive services.  
Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **Measurement of radiation of active equipment in the frequency range 30 MHz to 1000 MHz using the absorbing clamp method**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Standard Method | Standard Limit**

Standard: **EN 50083-2:2012**

Title: **Cable networks for television signals, sound signals and interactive services.  
Part 2: Electromagnetic compatibility for equipment.**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

<b>Id</b>	<b>Equipment</b>	<b>Trade Mark</b>	<b>Model</b>	<b>Serial No.</b>
27	Analyzer EMC HP8591EM	HP	8591EM	3412A00118
28	Signal Generator HP 250KHz a 3GHz ESG 3000A	HP	ESG 3000A modelo E4421A	GB36260108
23	Absorbing Clamp 30-1000MHz MDS21	R&S	MDS21	832231/043

**Measure Data**

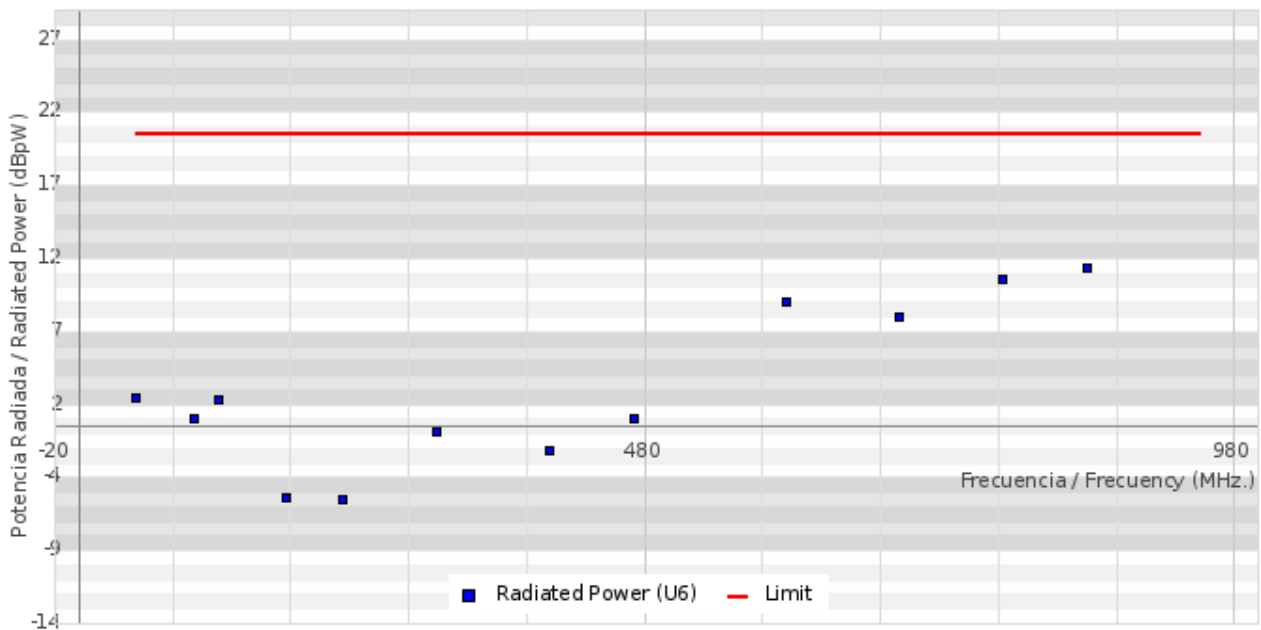
Port No.:	<b>3</b>	Measure No.:	<b>1</b>	Measure Date:	<b>02-10-2017</b>
Type:	<b>Radio Frequency</b>	Range:	<b>47-2150MHz</b>	Direction:	<b>Input</b>
Connector:	<b>F Connector</b>	Comments:	<b>IF 1 + MATV</b>		

**Data Table**

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band I (Channels 2 - 4)	48.25	1.95	20.00
FM Radio Band II	98.00	0.54	20.00
Low S Band	119.25	1.82	20.00
TV Band III (Channels 5 - 12)	175.25	-4.88	20.00
TV Band III (Channels 5 - 12)	224.25	-4.98	20.00
Hyperband	303.25	-0.37	20.00
Hyperband	399.25	-1.69	20.00
TV Band IV (Channels 21 - 69)	471.25	0.54	20.00
TV Band IV (Channels 21 - 69)	599.25	8.56	20.00
TV Bands V (Channels 37 - 69)	695.25	7.48	20.00
TV Bands V (Channels 37 - 69)	783.25	10.06	20.00
TV Bands V (Channels 37 - 69)	855.25	10.88	20.00

**Graph**

MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38 - Port No 3 Radio Frequency 47-2150MHz Input F Connector



**Measure Data**

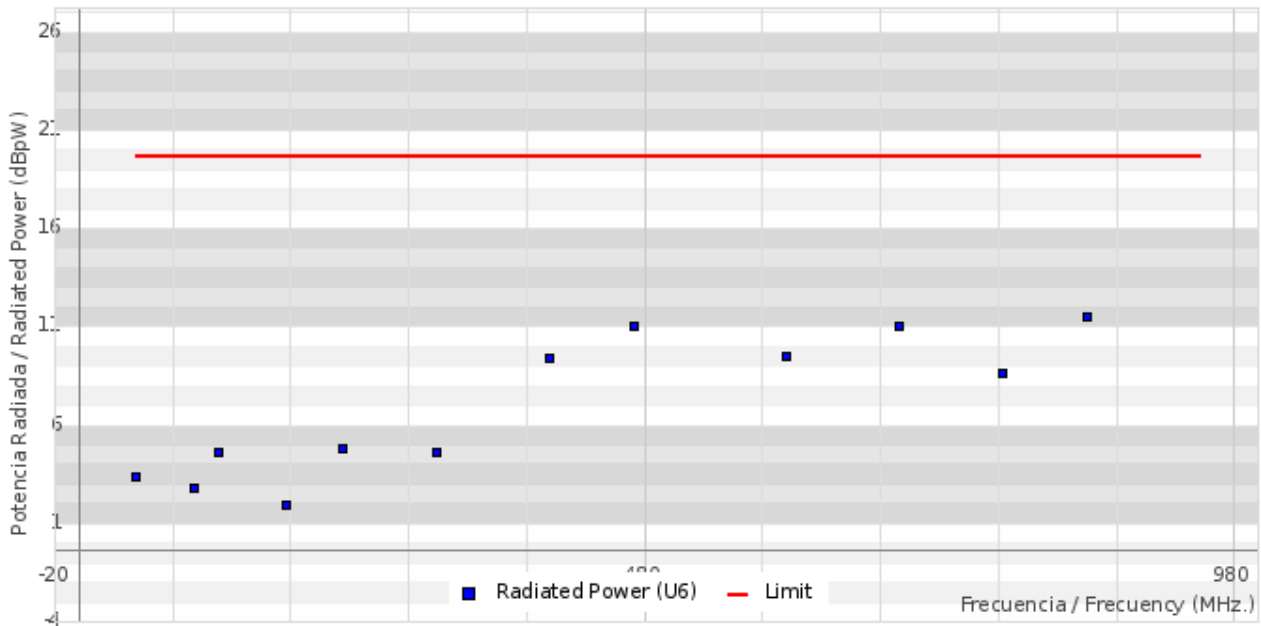
Port No.:	<b>5</b>	Measure No.:	<b>1</b>	Measure Date:	<b>02-10-2017</b>
Type:	<b>Radio Frequency</b>	Range:	<b>47-2150MHz</b>	Direction:	<b>Output</b>
Connector:	<b>F Connector</b>	Comments:	<b>IF 1 + MATV</b>		

**Data Table**

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band I (Channels 2 - 4)	48.25	3.73	20.00
FM Radio Band II	98.00	3.20	20.00
Low S Band	119.25	5.00	20.00
TV Band III (Channels 5 - 12)	175.25	2.32	20.00
TV Band III (Channels 5 - 12)	224.25	5.16	20.00
Hyperband	303.25	5.03	20.00
Hyperband	399.25	9.81	20.00
TV Band IV (Channels 21 - 69)	471.25	11.42	20.00
TV Band IV (Channels 21 - 69)	599.25	9.87	20.00
TV Bands V (Channels 37 - 69)	695.25	11.40	20.00
TV Bands V (Channels 37 - 69)	783.25	9.08	20.00
TV Bands V (Channels 37 - 69)	855.25	11.89	20.00

**Graph**

MINIKOM AMP.RET+MATV+2SAT 'F' G(-5)/30/38 - Port No 5 Radio Frequency 47-2150MHz Output F Connector



**Measure Data**

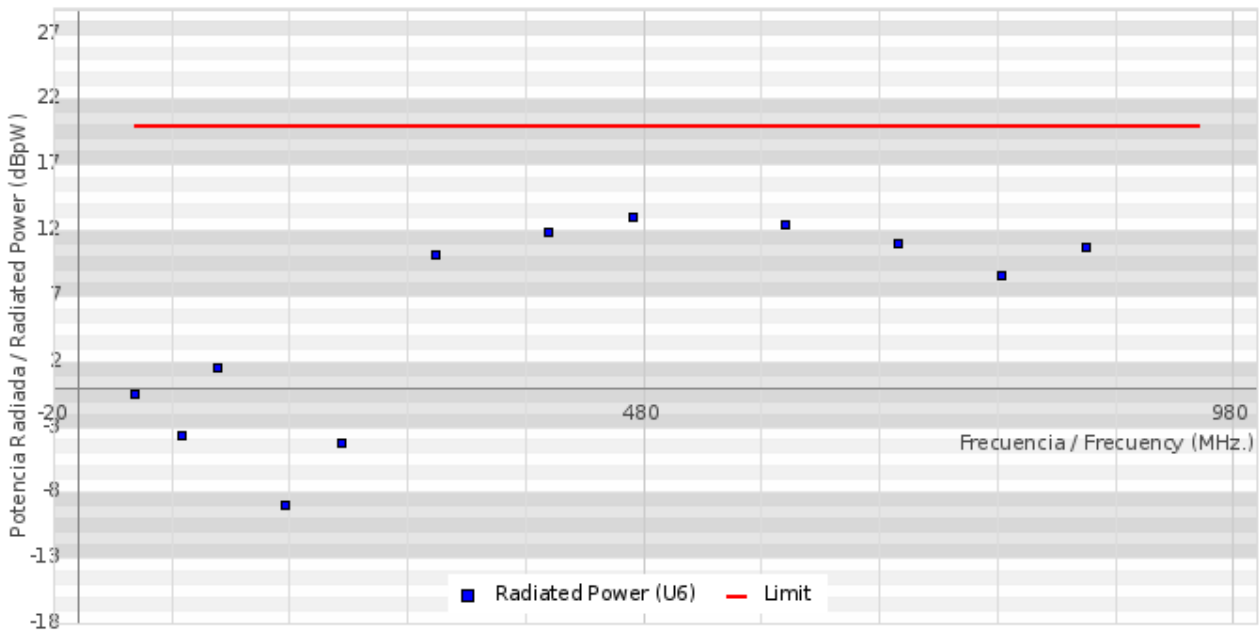
Port No.:	<b>6</b>	Measure No.:	<b>1</b>	Measure Date:	<b>02-10-2017</b>
Type:	<b>Radio Frequency</b>	Range:	<b>47-2150MHz</b>	Direction:	<b>Output</b>
Connector:	<b>F Connector</b>	Comments:	<b>IF 2 + MATV</b>		

**Data Table**

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band I (Channels 2 - 4)	48.25	-0.33	20.00
FM Radio Band II	88.00	-3.58	20.00
Low S Band	119.25	1.58	20.00
TV Band III (Channels 5 - 12)	175.25	-8.83	20.00
TV Band III (Channels 5 - 12)	224.25	-4.15	20.00
Hyperband	303.25	10.28	20.00
Hyperband	399.25	11.99	20.00
TV Band IV (Channels 21 - 69)	471.25	13.10	20.00
TV Band IV (Channels 21 - 69)	599.25	12.60	20.00
TV Bands V (Channels 37 - 69)	695.25	11.07	20.00
TV Bands V (Channels 37 - 69)	783.25	8.72	20.00
TV Bands V (Channels 37 - 69)	855.25	10.80	20.00

**Graph**

MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38 - Port No 6 Radio Frequency 47-2150MHz Output F Connector



**5. Measurement of radiation of active equipment in the frequency range 30 MHz to 1000 MHz using the absorbing clamp method**

**Measure**

Date: **02-10-2017**

**Applied Procedure**

TSP Id.: **PEE-EMI-006**

Title: **Radiated power. Manual absorbing clamp method**

**Standard**

TSP Id.: **NOR-APAR-294**

Standard: **EN 50083-2:2012**

Paragraph: **4.3.3.2**

Title: **Cable networks for television signals, sound signals and interactive services. Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **Measurement of radiation of active equipment in the frequency range 30 MHz to 1000 MHz using the absorbing clamp method**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Standard Method | Standard Limit**

Standard: **EN 50083-2:2012**

Title: **Cable networks for television signals, sound signals and interactive services. Part 2: Electromagnetic compatibility for equipment.**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4999	Televes	531710		Televes	MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**



**Used Equipment**

<b>Id</b>	<b>Equipment</b>	<b>Trade Mark</b>	<b>Model</b>	<b>Serial No.</b>
27	Analyzer EMC HP8591EM	HP	8591EM	3412A00118
28	Signal Generator HP 250KHz a 3GHz ESG 3000A	HP	ESG 3000A modelo E4421A	GB36260108
23	Absorbing Clamp 30-1000MHz MDS21	R&S	MDS21	832231/043

**Measure Data**

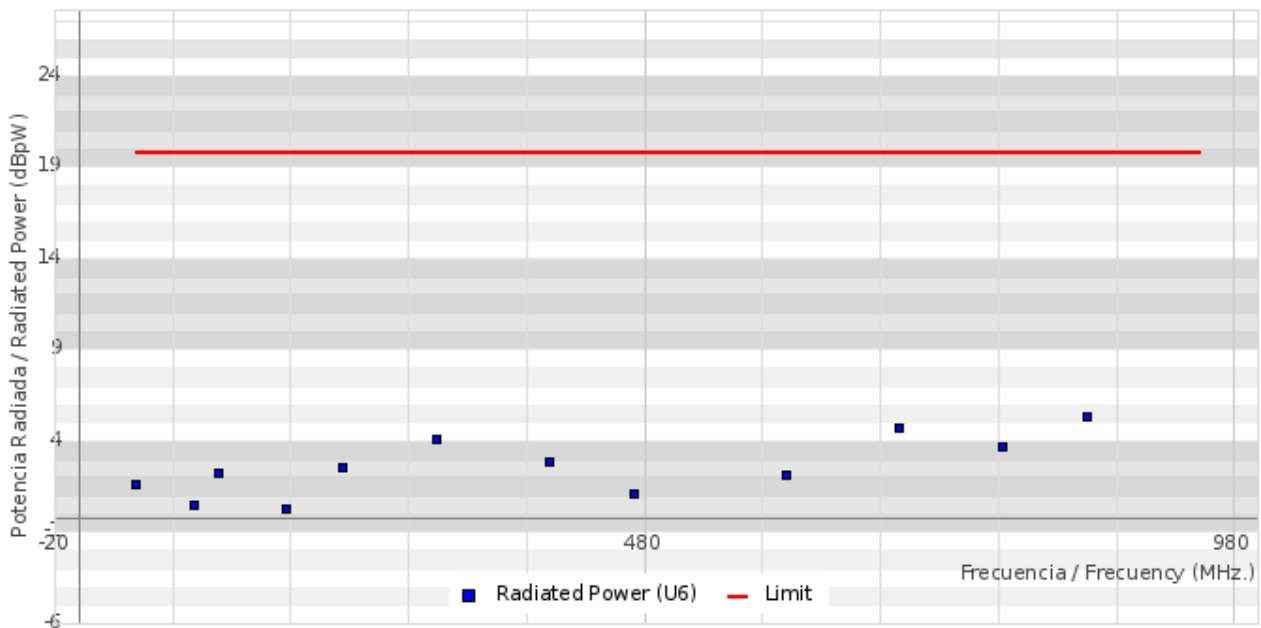
Port No.:	<b>2</b>	Measure No.:	<b>1</b>	Measure Date:	<b>02-10-2017</b>
Type:	<b>Radio Frequency</b>	Range:	<b>47-2150MHz</b>	Direction:	<b>Input</b>
Connector:	<b>F Connector</b>	Comments:	<b>SAT + TERR</b>		

**Data Table**

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band I (Channels 2 - 4)	48.25	1.86	20.00
FM Radio Band II	98.00	0.68	20.00
Low S Band	119.25	2.48	20.00
TV Band III (Channels 5 - 12)	175.25	0.53	20.00
TV Band III (Channels 5 - 12)	224.25	2.71	20.00
Hyperband	303.25	4.30	20.00
Hyperband	399.25	3.03	20.00
TV Band IV (Channels 21 - 69)	471.25	1.36	20.00
TV Band IV (Channels 21 - 69)	599.25	2.32	20.00
TV Bands V (Channels 37 - 69)	695.25	4.88	20.00
TV Bands V (Channels 37 - 69)	783.25	3.88	20.00
TV Bands V (Channels 37 - 69)	855.25	5.56	20.00

**Graph**

MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38 - Port No 2 Radio Frequency 47-2150MHz Input F Connector



**Measure Data**

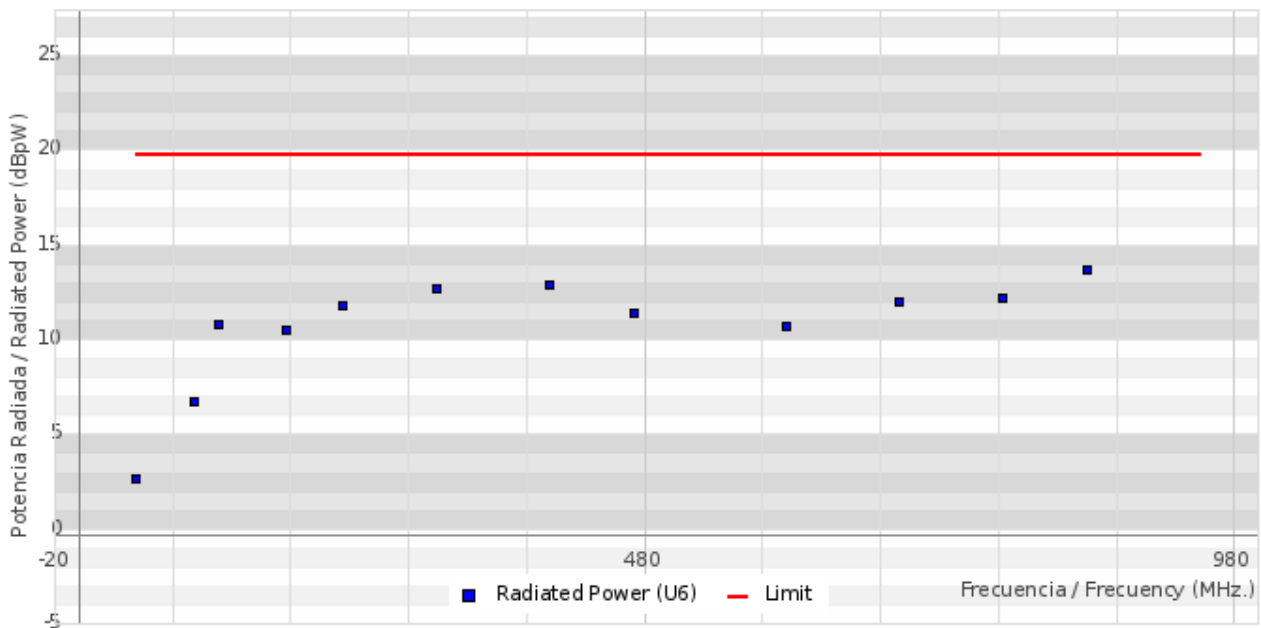
Port No.:	<b>3</b>	Measure No.:	<b>1</b>	Measure Date:	<b>02-10-2017</b>
Type:	<b>Radio Frequency</b>	Range:	<b>47-2150MHz</b>	Direction:	<b>Output</b>
Connector:	<b>F Connector</b>	Comments:	<b>SAT + TERR</b>		

**Data Table**

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band I (Channels 2 - 4)	48.25	2.98	20.00
FM Radio Band II	98.00	6.98	20.00
Low S Band	119.25	11.13	20.00
TV Band III (Channels 5 - 12)	175.25	10.78	20.00
TV Band III (Channels 5 - 12)	224.25	12.13	20.00
Hyperband	303.25	13.04	20.00
Hyperband	399.25	13.23	20.00
TV Band IV (Channels 21 - 69)	471.25	11.74	20.00
TV Band IV (Channels 21 - 69)	599.25	10.98	20.00
TV Bands V (Channels 37 - 69)	695.25	12.33	20.00
TV Bands V (Channels 37 - 69)	783.25	12.53	20.00
TV Bands V (Channels 37 - 69)	855.25	13.98	20.00

**Graph**

MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38 - Port No 3 Radio Frequency 47-2150MHz Output F Connector



**6. Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method**

**Measure**

Date: **02-10-2017**

**Applied Procedure**

TSP Id.: **PEE-EMI-018**

Title: **Radiated power. Automatic test of FI measurements in anechoic chamber**

**Standard**

TSP Id.: **NOR-APAR-295**

Standard: **EN 50083-2:2012**

Paragraph: **4.3.3.3**

Title: **Cable networks for television signals, sound signals and interactive services. Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Standard Method | Standard Limit**

Standard: **EN 50083-2:2012**

Title: **Cable networks for television signals, sound signals and interactive services. Part 2: Electromagnetic compatibility for equipment.**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

<b>Id</b>	<b>Equipment</b>	<b>Trade Mark</b>	<b>Model</b>	<b>Serial No.</b>
48	Ultra broadband antenna R&S HL 562 Ultralog	R&S	4041.3000.02	100211
43	Anechoic chamber Albatros M-CDC Model B83117	Albatross Projects	B83117-A1431-T162	22180
149	FSM Controller INN-CO 2000	INN-CO 2000	CO 2000	CO 2000/366/12680506/L
138	Signal generator R&S (9KHz-3.3GHz)	R&S	SML03-ref 1090.3000.13	102478
63	Measurement receiver R&S ESIB (20Hz-26.5GHz)	R&S	ESIB-ref 1088.7490.26	100338

**Measure Data**

Port No.: **1**

Measure No.: **1**

Measure Date: **02-10-2017**

Type: **Chassis**

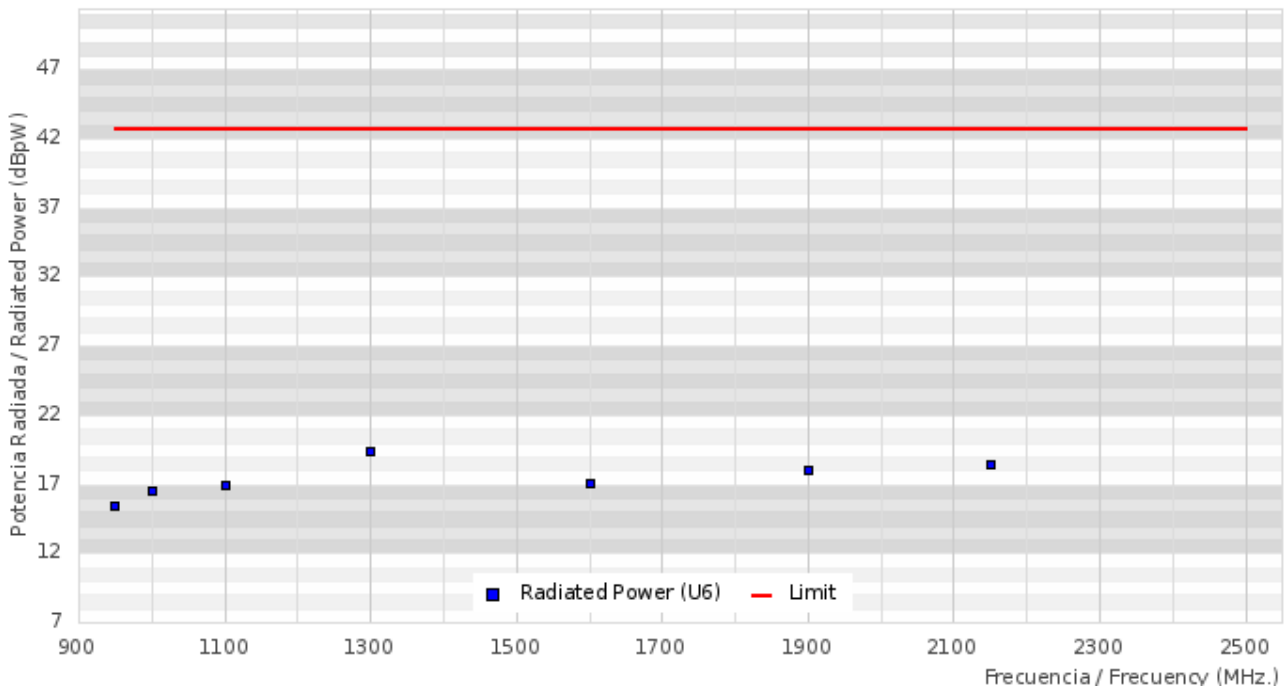
Connector: **Enclosure**

**Data Table**

Band	Frequency (MHz)	Level (dBpW)	Limit
-	950.00	15.73	43.00
-	1000.00	16.77	43.00
-	1100.00	17.21	43.00
-	1300.00	19.70	43.00
-	1600.00	17.33	43.00
-	1900.00	18.39	43.00
-	2150.00	18.78	43.00

**Graph**

MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38 - Port No 1 Chassis Enclosure



**7. Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method**

**Measure**

Date: **02-10-2017**

**Applied Procedure**

TSP Id.: **PEE-EMI-018**

Title: **Radiated power. Automatic test of FI measurements in anechoic chamber**

**Standard**

TSP Id.: **NOR-APAR-295**

Standard: **EN 50083-2:2012**

Paragraph: **4.3.3.3**

Title: **Cable networks for television signals, sound signals and interactive services. Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Standard Method | Standard Limit**

Standard: **EN 50083-2:2012**

Title: **Cable networks for television signals, sound signals and interactive services. Part 2: Electromagnetic compatibility for equipment.**

Equivalent Standards: **UNE-EN 50083-2:2013  
IEC 60728-2:2010**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4999	Televes	531710		Televes	MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

<b>Id</b>	<b>Equipment</b>	<b>Trade Mark</b>	<b>Model</b>	<b>Serial No.</b>
48	Ultra broadband antenna R&S HL 562 Ultralog	R&S	4041.3000.02	100211
43	Anechoic chamber Albatros M-CDC Model B83117	Albatross Projects	B83117-A1431-T162	22180
149	FSM Controller INN-CO 2000	INN-CO 2000	CO 2000	CO 2000/366/12680506/L
138	Signal generator R&S (9KHz-3.3GHz)	R&S	SML03-ref 1090.3000.13	102478
63	Measurement receiver R&S ESIB (20Hz-26.5GHz)	R&S	ESIB-ref 1088.7490.26	100338



**Measure Data**

Port No.: **1**

Measure No.: **1**

Measure Date: **02-10-2017**

Type: **Chassis**

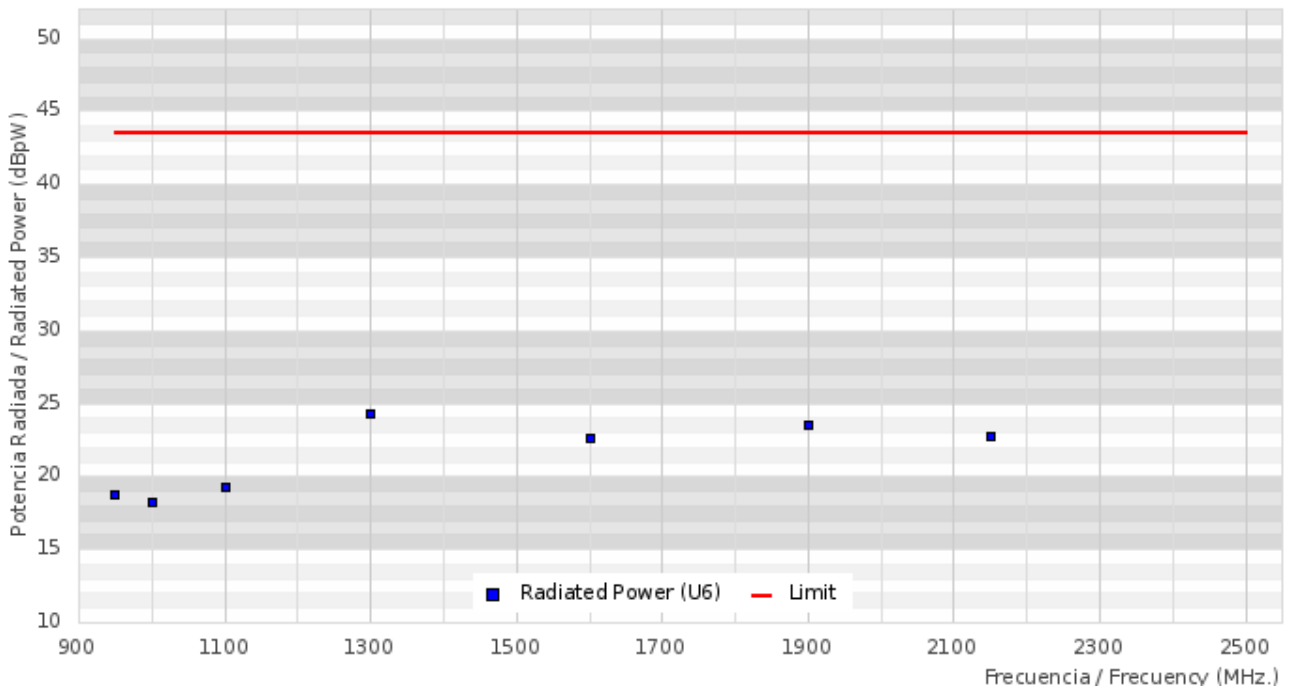
Connector: **Enclosure**

**Data Table**

Band	Frequency (MHz)	Level (dBpW)	Limit
-	950.00	18.20	43.00
-	1000.00	17.80	43.00
-	1100.00	18.81	43.00
-	1300.00	23.83	43.00
-	1600.00	22.15	43.00
-	1900.00	22.98	43.00
-	2150.00	22.28	43.00

**Graph**

MINIKOM AMP.RET+MATV+SAT `F` G(-5)/30/38 - Port No 1 Chassis Enclosure



**8. External immunity to conducted disturbances, induced by radio-frequency fields (150 kHz-80 MHz)**

**Measure**

Date: 11-09-2017

**Applied Procedure**

TSP Id.: PEE-INM-001

Title: External immunity to induced voltage. Automatic test with EM test equipment

**Standard**

TSP Id.: NOR-APAR-296

Standard: EN 50083-2:2012

Paragraph: 4.4.3

Title: Cable networks for television signals, sound signals and interactive services.  
Part 2: Electromagnetic compatibility for equipment.

Paragraph: External immunity to conducted disturbances, induced by radio-frequency fields (150 kHz-80 MHz)

Equivalent Standards: UNE-EN 50083-2:2013  
IEC 60728-2:2010

**Standard Limit**

Standard: EN 50083-2:2012

Title: Cable networks for television signals, sound signals and interactive services.  
Part 2: Electromagnetic compatibility for equipment.

Equivalent Standards: UNE-EN 50083-2:2013  
IEC 60728-2:2010

**Standard Method**

Standard: EN 61000-4-6:2014

Title: Electromagnetic compatibility (EMC).  
Part 4-6: Testing and measurement techniques. Immunity to conducted disturbances, induced by radio-frequency fields

Equivalent Standards: UNE-EN 61000-4-6:2014  
IEC 61000-4-6:2013

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: 22.1°C

Humidity: 52.1%

Atmospheric Pressure: 1003mbar

**Used Equipment**

Id	Equipment	Trade Mark	Model	Serial No.
52	CWS 500A / CNC 508 EM TEST	EMTEST	CWS500   CNC508	1099-10   0500-01

**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>1</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>	Measure:	<b>Out-Band</b>		
Measurement Range:	<b>0.15MHz - 47MHz</b>	Voltage (V):	<b>1.78</b>	Voltage (dBµV):	<b>125</b>
Modulation:	<b>80% AM (1KHz)</b>	Frequency Steps:	<b>1%</b>	Time Spent:	<b>0.5ss</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
48	✔
100	✔
176	✔
480	✔
680	✔
850	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>2</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>	Measure:	<b>In-Band</b>		
Measurement Range:	<b>47MHz - 80MHz</b>	Voltage (V):	<b>0.2</b>	Voltage (dBµV):	<b>106</b>
Modulation:	<b>80% AM (1KHz)</b>	Frequency Steps:	<b>1%</b>	Time Spent:	<b>0.5ss</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
48	✔
144	✔
176	✔
300	✔
470	✔
680	✔
860	✔
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.:	<b>3</b>	Measure No.:	<b>1</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>RF + DC</b>	Range:	<b>950MHz-2150MHz</b>	Direction:	<b>Input</b>
Connector:	<b>F Connector</b>	Measure:	<b>Out-Band</b>		
Measurement Range:	<b>0.15MHz - 47MHz</b>	Voltage (V):	<b>1.78</b>	Voltage (dBµV):	<b>125</b>
Modulation:	<b>80% AM (1KHz)</b>	Frequency Steps:	<b>1%</b>	Time Spent:	<b>0.5ss</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.:	<b>3</b>	Measure No.:	<b>2</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>RF + DC</b>	Range:	<b>950MHz-2150MHz</b>	Direction:	<b>Input</b>
Connector:	<b>F Connector</b>	Measure:	<b>In-Band</b>		
Measurement Range:	<b>47MHz - 80MHz</b>	Voltage (V):	<b>0.2</b>	Voltage (dBµV):	<b>106</b>
Modulation:	<b>80% AM (1KHz)</b>	Frequency Steps:	<b>1%</b>	Time Spent:	<b>0.5ss</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.:	<b>4</b>	Measure No.:	<b>1</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Radio Frequency</b>	Range:	<b>47MHz-862MHz</b>	Direction:	<b>Input</b>
Connector:	<b>F Connector</b>	Measure:	<b>Out-Band</b>		
Measurement Range:	<b>0.15MHz - 47MHz</b>	Voltage (V):	<b>1.78</b>	Voltage (dBµV):	<b>125</b>
Modulation:	<b>80% AM (1KHz)</b>	Frequency Steps:	<b>1%</b>	Time Spent:	<b>0.5ss</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
48	✔
100	✔
176	✔
480	✔
680	✔
850	✔

**Measure Data**

Port No.:	<b>4</b>	Measure No.:	<b>2</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Radio Frequency</b>	Range:	<b>47MHz-862MHz</b>	Direction:	<b>Input</b>
Connector:	<b>F Connector</b>	Measure:	<b>In-Band</b>		
Measurement Range:	<b>47MHz - 80MHz</b>	Voltage (V):	<b>0.2</b>	Voltage (dBµV):	<b>106</b>
Modulation:	<b>80% AM (1KHz)</b>	Frequency Steps:	<b>1%</b>	Time Spent:	<b>0.5ss</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
48	✔
144	✔
176	✔
300	✔
470	✔
680	✔
860	✔

**9. External immunity to radiated disturbances, induced by radio-frequency fields (80 MHz-3 GHz)**

**Measure**

Date: **11-09-2017**

**Applied Procedure**

TSP Id.: **PEE-INM-003**

Title: **External immunity to radiated fields. Anechoic chamber measurement**

**Standard**

TSP Id.: **NOR-APAR-297**

Standard: **EN 50083-2:2012**

Paragraph: **4.4.3**

Title: **Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **External immunity to radiated disturbances, induced by radio-frequency fields (80 MHz-3 GHz)**

Equivalent Standards: **UNE-EN 50083-2:2013  
 IEC 60728-2:2010**

**Standard Limit**

Standard: **EN 50083-2:2012**

Title: **Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.**

Equivalent Standards: **UNE-EN 50083-2:2013  
 IEC 60728-2:2010**

**Standard Method**

Standard: **EN 61000-4-3:2006**

Title: **Electromagnetic compatibility (EMC).  
 Part 4-3: Testing and measurement techniques.  
 Radiated, radio-frequency, electromagnetic field immunity test.**

Equivalent Standards: **UNE-EN 61000-4-3:2007  
 IEC 61000-4-3:2006**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

<b>Id</b>	<b>Equipment</b>	<b>Trade Mark</b>	<b>Model</b>	<b>Serial No.</b>
142	Power amplifier BLWA 0830-160/100/20D BONN Elektronik (80MHz-3GHz)	BONN Elektronik	BLWA 0830-160/100/20D	056113B
48	Ultra broadband antenna R&S HL 562 Ultralog	R&S	4041.3000.02	100211
43	Anechoic chamber Albatros M-CDC Model B83117	Albatross Projects	B83117-A1431-T162	22180
138	Signal generator R&S (9KHz-3.3GHz)	R&S	SML03-ref 1090.3000.13	102478



**Measure Data**

Port No.:	<b>1</b>	Measure No.:	<b>1</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Chassis</b>				
Connector:	<b>Enclosure</b>				
Unwanted signal range:	<b>80MHz - 790MHz</b>	Measure:	<b>In-Band</b>		
Voltage (V/m):	<b>0.2</b>	Voltage (dBµV/m):	<b>106</b>	Modulation:	<b>80% AM (1KHz)</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
48	✔
144	✔
176	✔
300	✔
470	✔
680	✔
860	✔
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.:	<b>1</b>	Measure No.:	<b>2</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Chassis</b>				
Connector:	<b>Enclosure</b>				
Unwanted signal range:	<b>790MHz - 862MHz</b>	Measure:	<b>In-Band</b>		
Voltage (V/m):	<b>1</b>	Voltage (dBµV/m):	<b>120</b>	Modulation:	<b>80% AM (1KHz)</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
48	✔
144	✔
176	✔
300	✔
470	✔
680	✔
860	✔
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.: **1** Measure No.: **3** Measure Date: **12-09-2017**

Type: **Chassis**

Connector: **Enclosure**

Unwanted signal range: **862MHz - 950MHz** Measure: **Out-Band**

Voltage (V/m): **1.78** Voltage (dBµV/m): **125** Modulation: **80% AM (1KHz)**

Acceptance Criteria: **A - No loss of Functionality or Activity**

Result: **✔ (A - No loss of Functionality or Activity)**

**Data Table**

Frequency (MHz)	Pass
48	✔
100	✔
176	✔
480	✔
680	✔
850	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.: **1** Measure No.: **4** Measure Date: **12-09-2017**

Type: **Chassis**

Connector: **Enclosure**

Unwanted signal range: **950MHz - 2150MHz** Measure: **In-Band**

Voltage (V/m): **0.2** Voltage (dBµV/m): **106** Modulation: **80% AM (1KHz)**

Acceptance Criteria: **A - No loss of Functionality or Activity**

Result: **✔ (A - No loss of Functionality or Activity)**

**Data Table**

Frequency (MHz)	Pass
48	✔
144	✔
176	✔
300	✔
470	✔
680	✔
860	✔
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**Measure Data**

Port No.:	<b>1</b>	Measure No.:	<b>5</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Chassis</b>				
Connector:	<b>Enclosure</b>				
Unwanted signal range:	<b>2150MHz - 3000MHz</b>	Measure:	<b>Out-Band</b>		
Voltage (V/m):	<b>1.78</b>	Voltage (dB $\mu$ V/m):	<b>125</b>	Modulation:	<b>80% AM (1KHz)</b>
Acceptance Criteria:	<b>A - No loss of Functionality or Activity</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Data Table**

Frequency (MHz)	Pass
48	✔
100	✔
176	✔
480	✔
680	✔
850	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

**10. Electrostatic discharge immunity test (ESD) for active equipment**

**Measure**

Date: **11-09-2017**

**Applied Procedure**

TSP Id.: **PEE-INM-010**

Title: **Electrostatic discharge immunity test (ESD)**

**Standard**

TSP Id.: **NOR-APAR-301**

Standard: **EN 50083-2:2012**

Paragraph: **4.6**

Title: **Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **Electrostatic discharge immunity test (ESD) for active equipment**

Equivalent Standards: **UNE-EN 50083-2:2013  
 IEC 60728-2:2010**

**Standard Method**

Standard: **EN 61000-4-2:2009**

Title: **Electromagnetic compatibility (EMC).  
 Part 4-2: Testing and measurement techniques.  
 Electrostatic discharge immunity test.**

Equivalent Standards: **UNE-EN 61000-4-2:2010  
 IEC 61000-4-2:2008**

**Standard Limit**

Standard: **EN 50083-2:2012**

Title: **Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.**

Equivalent Standards: **UNE-EN 50083-2:2013  
 IEC 60728-2:2010**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

Id	Equipment	Trade Mark	Model	Serial No.
65	ESD Simulator System	Schaffner	NSG 438	516

**Measure Data**Port No.: **1** Measure No.: **1** Measure Date: **11-09-2017**Type: **Chassis**Connector: **Enclosure**D.U.T Position: **Table**Point Description: **User-accessible points**Level: **2** Discharge voltage: **4 kV** No. of Discharges: **20**Discharge Type: **Direct - contact** Polarity: **±** Discharges Frequency: **1 Hz**Acceptance Criteria: **B -Temporal Loss of Function or Activity with auto recovery**Result:  **(B -Temporal Loss of Function or Activity with auto recovery)**

**11. Electrical fast transient/burst immunity test for AC power ports**

**Measure**

Date: **11-09-2017**

**Applied Procedure**

TSP Id.: **PEE-INM-007**

Title: **Electrical fast transient/burst immunity test**

**Standard**

TSP Id.: **NOR-APAR-302**

Standard: **EN 50083-2:2012**

Paragraph: **4.7**

Title: **Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.**

Paragraph: **Electrical fast transient/burst immunity test for AC power ports**

Equivalent Standards: **UNE-EN 50083-2:2013  
 IEC 60728-2:2010**

**Standard Method**

Standard: **EN 61000-4-4:2012**

Title: **Electromagnetic compatibility (EMC).  
 Part 4-4: Testing and measurement techniques.  
 Electrical fast transient/burst immunity test.**

Equivalent Standards: **UNE-EN 61000-4-4:2013  
 IEC 61000-4-4:2012**

**Standard Limit**

Standard: **EN 50083-2:2012**

Title: **Cable networks for television signals, sound signals and interactive services.  
 Part 2: Electromagnetic compatibility for equipment.**

Equivalent Standards: **UNE-EN 50083-2:2013  
 IEC 60728-2:2010**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**


Atmospheric Pressure: **1003mbar**



**Used Equipment**

Id	Equipment	Trade Mark	Model	Serial No.
86	Ultra compact simulator Immunity UCS 500M6B EM TEST, S/N: V051500279	EMTEST	UCS 500M6B	V0515100279

**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>1</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>				
D.U.T Position:	<b>Table</b>				
Coupling:	<b>Lines to ground</b>	Application Mode:	<b>Asynchronous</b>	Polarity:	<b>±</b>
Peak Voltage:	<b>1kV</b>	Level:	<b>2</b>		
Wave form:	<b>5/50</b>	Rise time (Impulse):	<b>5ns</b>	Duration at 50% (Pulse):	<b>50ns</b>
Repetition Frequency (Pulse):	<b>5kHz</b>	Duration (Burst):	<b>15ms</b>	Period (Burst):	<b>300ms</b>
Test Duration:	<b>120s</b>	No. of Burst:	<b>800</b>	No. of Pulses:	<b>60000</b>
Acceptance Criteria:	<b>B -Temporal Loss of Function or Activity with auto recovery</b>				
Result:	 <b>(A - No loss of Functionality or Activity)</b>				

## 12. Surge immunity test

### Measure

Date: **11-09-2017**

### Applied Procedure

TSP Id.: **PEE-INM-008**

Title: **Surge immunity test**

### Standard

TSP Id.: **NOR-APAR-013**

Standard: **EN 61000-6-1:2007**

Paragraph: **8**

Title: **Electromagnetic compatibility (EMC).  
Part 6-1: Generic standards. Immunity for residential, commercial and light-industrial.**

Paragraph: **Surge immunity test**

Equivalent Standards: **UNE-EN 61000-6-1:2007  
IEC 61000-6-1:2005**

### Standard Limit

Standard: **EN 61000-6-1:2007**

Title: **Electromagnetic compatibility (EMC).  
Part 6-1: Generic standards. Immunity for residential, commercial and light-industrial.**

Equivalent Standards: **UNE-EN 61000-6-1:2007  
IEC 61000-6-1:2005**

### Standard Method

Standard: **EN 61000-4-5:2014**

Title: **Electromagnetic compatibility (EMC).  
Part 4-5: Testing and measurement techniques.  
Surge immunity test.**

Equivalent Standards: **UNE-EN 61000-4-5:2015  
IEC 61000-4-5:2014**

### Measurement DUTs

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

### Environmental Conditions

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

Id	Equipment	Trade Mark	Model	Serial No.
86	Ultra compact simulator Immunity UCS 500M6B EM TEST, S/N: V051500279	EMTEST	UCS 500M6B	V0515100279

**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>1</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>				
D.U.T Position:	<b>Table</b>				
Level:	<b>2</b>	Peak Voltage:	<b>1kV</b>	Coupling:	<b>Line to Line</b>
Front Length:	<b>1,2µs [U] / 8µs [I]</b>	Time to Half Value:	<b>50µs [U] / 20µs [I]</b>	Time between pulses:	<b>6s</b>
Open circuit Voltage:	<b>1,2/50</b>	Short circuit current:	<b>8/20</b>	No. of Pulses:	<b>40</b>
Gap:	<b>0°, 90°, 180°, 270°</b>	Polarity:	<b>±</b>	Test Duration:	<b>4min</b>
Acceptance Criteria:	<b>B -Temporal Loss of Function or Activity with auto recovery</b>				
Result:	<b>✅ (A - No loss of Functionality or Activity)</b>				

**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>2</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>				
D.U.T Position:	<b>Table</b>				
Level:	<b>3</b>	Peak Voltage:	<b>2kV</b>	Coupling:	<b>Lines to ground</b>
Front Length:	<b>1,2µs [U] / 8µs [I]</b>	Time to Half Value:	<b>50µs [U] / 20µs [I]</b>	Time between pulses:	<b>6s</b>
Open circuit Voltage:	<b>1,2/50</b>	Short circuit current:	<b>8/20</b>	No. of Pulses:	<b>80</b>
Gap:	<b>0°, 90°, 180°, 270°</b>	Polarity:	<b>±</b>	Test Duration:	<b>8min</b>
Acceptance Criteria:	<b>B -Temporal Loss of Function or Activity with auto recovery</b>				
Result:	<b>✅ (A - No loss of Functionality or Activity)</b>				

**13. Voltage dips and voltage interruptions immunity tests**

**Measure**

Date: **11-09-2017**

**Applied Procedure**

TSP Id.: **PEE-INM-009**

Title: **Voltage dips, short interruptions and voltage variations immunity tests**

**Standard**

TSP Id.: **NOR-APAR-014**

Standard: **EN 61000-6-1:2007**

Paragraph: **8**

Title: **Electromagnetic compatibility (EMC).  
 Part 6-1: Generic standards. Immunity for residential, commercial and light-industrial.**

Paragraph: **Voltage dips and voltage interruptions immunity tests**

Equivalent Standards: **UNE-EN 61000-6-1:2007  
 IEC 61000-6-1:2005**

**Standard Method**

Standard: **EN 61000-4-11:2004**

Title: **Electromagnetic compatibility (EMC).  
 Part 4-11: Testing and measurement techniques.  
 Voltage dips, short interruptions and voltage variations immunity tests.**

Equivalent Standards: **UNE-EN 61000-4-11:2005  
 IEC 61000-4-11:2004**

**Standard Limit**

Standard: **EN 61000-6-1:2007**

Title: **Electromagnetic compatibility (EMC).  
 Part 6-1: Generic standards. Immunity for residential, commercial and light-industrial.**

Equivalent Standards: **UNE-EN 61000-6-1:2007  
 IEC 61000-6-1:2005**

**Measurement DUTs**

Id.	Trade Mark	Reference	Model	Manufacturer	D.U.T.
4997	Televes	5317		Televes	MINIKOM AMP.RET+MATV+2SAT `F` G(-5)/30/38

**Environmental Conditions**

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

**Used Equipment**

Id	Equipment	Trade Mark	Model	Serial No.
86	Ultra compact simulator Immunity UCS 500M6B EM TEST, S/N: V051500279	EMTEST	UCS 500M6B	V0515100279

**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>1</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>				
D.U.T Position:	<b>Table</b>				
Supply Voltage:	<b>230V</b>	Supply Frequency:	<b>50Hz</b>		
Class:	<b>2</b>	Test Level:	<b>70%</b>	Peak Voltage:	<b>161V</b>
Event Duration:	<b>500ms</b>	Event Duration (T):	<b>25</b>	Event No.:	<b>3</b>
Time Between Events:	<b>10s</b>	Angle:	<b>0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°</b>		
Acceptance Criteria:	<b>C - Loss of Function or Temporary Activity that Requires the Action of the Operator or a System Reset</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Measure Data**


Port No.:	<b>2</b>	Measure No.:	<b>2</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>				
D.U.T Position:	<b>Table</b>				
Supply Voltage:	<b>230V</b>	Supply Frequency:	<b>50Hz</b>		
Class:	<b>2</b>	Test Level:	<b>0%</b>	Peak Voltage:	<b>0V</b>
Event Duration:	<b>10ms</b>	Event Duration (T):	<b>0.5</b>	Event No.:	<b>3</b>
Time Between Events:	<b>10s</b>	Angle:	<b>0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°</b>		
Acceptance Criteria:	<b>B -Temporal Loss of Function or Activity with auto recovery</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				

**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>3</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>				
D.U.T Position:	<b>Table</b>				
Supply Voltage:	<b>230V</b>	Supply Frequency:	<b>50Hz</b>		
Class:	<b>2</b>	Test Level:	<b>0%</b>	Peak Voltage:	<b>0V</b>
Event Duration:	<b>20ms</b>	Event Duration (T):	<b>1</b>	Event No.:	<b>3</b>
Time Between Events:	<b>10s</b>	Angle:	<b>0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°</b>		
Acceptance Criteria:	<b>B -Temporal Loss of Function or Activity with auto recovery</b>				
Result:	<b>✔ (A - No loss of Functionality or Activity)</b>				



**Measure Data**

Port No.:	<b>2</b>	Measure No.:	<b>4</b>	Measure Date:	<b>12-09-2017</b>
Type:	<b>Power</b>	Range:	<b>AC</b>	Direction:	<b>Input</b>
Connector:	<b>Plug</b>				
D.U.T Position:	<b>Table</b>				
Supply Voltage:	<b>230V</b>	Supply Frequency:	<b>50Hz</b>		
Class:	<b>2</b>	Test Level:	<b>0%</b>	Peak Voltage:	<b>0V</b>
Event Duration:	<b>5000ms</b>	Event Duration (T):	<b>250</b>	Event No.:	<b>3</b>
Time Between Events:	<b>10s</b>	Angle:	<b>0°</b>		
Acceptance Criteria:	<b>C - Loss of Function or Temporary Activity that Requires the Action of the Operator or a System Reset</b>				
Result:	 <b>(B -Temporal Loss of Function or Activity with auto recovery)</b>				