

On **20/09/2022** document No. **TR09220010 [0]** is applied to the following elements:

REFERENCE	DESCRIPTION
532131	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE
532181	AVANTX FM-4xLoV/HiV/U-CATV 32 FILT. (AM)

Test Report

EMC

Document No.: **IEI15012100002**

Date: **15-01-2021**

Description: **AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE**

Reference: **532131**

Made to: **Televes**

Test Data

Id	Description	Start Date	End Date	Conclusions
2397	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE	24-11-2020	15-01-2021	

Standards

Standard	Title	Part	Section
EN 50083-2:2012 + A1:2015 IEC 60728-2:2018	Cable networks for television signals, sound signals and interactive services.	Part 2: Electromagnetic compatibility for equipment.	
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 61000-3-3:2013 + A1:2019 + A2:2021 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

No.	Res.	Measure	DUTs	Standard Applied	Standard Method	Standard Limit
1	✔	Conducted emissions	5797	EN 50083-2:2012 Paragraph: 4.2.1	EN 55032:2015	EN 50083-2:2012
2	✔	Harmonic current emissions	5797	EN 50083-2:2012 Paragraph: 4.2.2	EN IEC 61000-3-2:2019	EN IEC 61000-3-2:2019
3	✔	Radiated power (30MHz - 1000MHz)	5797	EN 50083-2:2012 Paragraph: 4.3.3.2	EN 50083-2:2012	EN 50083-2:2012
4	✔	Radiated power (950MHz - 25GHz)	5797	EN 50083-2:2012 Paragraph: 4.3.3.3	EN 50083-2:2012	EN 50083-2:2012
5	✔	Immunity to conducted disturbances	5797	EN 50083-2:2012 Paragraph: 4.4.3	EN 61000-4-6:2014	EN 50083-2:2012
6	✔	Immunity from radiated fields	5797	EN 50083-2:2012 Paragraph: 4.4.3	EN 61000-4-3:2006	EN 50083-2:2012
7	✔	ESD	5797	EN 50083-2:2012 Paragraph: 4.6	EN 61000-4-2:2009	EN 50083-2:2012

Measurements made (Cont.)

No.	Res.	Measure	DUTs	Standard Applied	Standard Method	Standard Limit
8	✓	BURST	5797	EN 50083-2:2012 Paragraph: 4.7	EN 61000-4-4:2012	EN 50083-2:2012
9	✓	SURGES	5797	EN 61000-6-1:2007 Paragraph: 8	EN 61000-4-5:2014	EN 61000-6-1:2007 Paragraph: 8
10	✓	Voltage dips, short interruptions and voltage variations	5797	EN 61000-6-1:2007 Paragraph: 8	EN 61000-4-11:2004	EN 61000-6-1:2007 Paragraph: 8
11	✓	Voltage changes, voltage fluctuations and flicker	5797	EN 61000-3-3:2013	EN 61000-3-3:2013	EN 61000-3-3:2013

D.U.T.

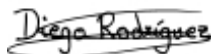
Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

Made by:



Antonio Pardo Fuentes

Checked By:



Diego Rodríguez Noguero

Approved by:



Eduardo Castro Ares

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4. Measurement of radiation from active equipment in the frequency range 950 MHz to 25 GHz using the substitution method	Pag. 32
5. External immunity to conducted disturbances, induced by radio-frequency fields (150 kHz-80 MHz)	Pag. 34
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D.U.T. Description Id. 5797

Administrative Data

D.U.T. Id: **5797**

In Date: **24-11-2020**

Out Date: **05-03-2021**

Product Data

D.U.T.: **AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE**

Trade Mark: **Televes**

Reference: **532131**

Manufacturer: **Televes**

State Development: **VPs**

Description: **AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE**

Technical Data

Type: **Active**

No. of Ports: **12**

Chassis: **Avant X**

Port	Type	Range	Direction	Connector	Comments
1	Chassis			Enclosure	
2	Mains Power	AC	Input	Power Connector	
3	RF + DC	174-230MHz/470-790MHz	Input	F Connector	U+V1
4	RF + DC	174-230MHz/470-790MHz	Input	F Connector	U+V2
5	RF + DC	174-230MHz/470-790MHz	Input	F Connector	U+V3
6	RF + DC	174-230MHz/470-790MHz	Input	F Connector	U+V4
7	RF + DC	950MHz-2150MHz	Input	F Connector	SAT
8	Radio Frequency	87MHz-108MHz	Input	F Connector	FM
9	Radio Frequency	87-108/174-230/470-790MHz	Output	F Connector	TV
10	Radio Frequency	87-108/174-230/470-790MHz	Output	F Connector	TV+SAT
11	Data	Digital	Bidirectional	Micro-USB	
12	Communications	Control	Bidirectional	RJ-45	PRGM

D.U.T. Images



Name: **20201124_153412**



Name: **IPR12182190_000_532131**

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

Measure

TSP Id.: PEE-EMI-001 Date: 12-01-2021

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 60728-2:2018

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 60728-2:2018

Standard Method

Standard: EN 55032:2015

Title: Electromagnetic compatibility of multimedia equipment. Emission requirements.

Equivalent Standards: UNE-EN 55032:2016 CISPR 32:2015

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

Environmental Conditions

Temperature: 22.1°C Humidity: 52.1% Atmospheric Pressure: 1003mbar

Televes S.A.U. document No.: TR09220010 [0] creation date 15-01-2021

Used Equipment

Id	Equipment	Trade Mark	Model	Serial No.
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

Port No.: **2**

Measure No.: **1**

Measure Date: **15-01-2021**

Signal: **DTT**

Grounded: **Yes**

Mode: **115 Vac**

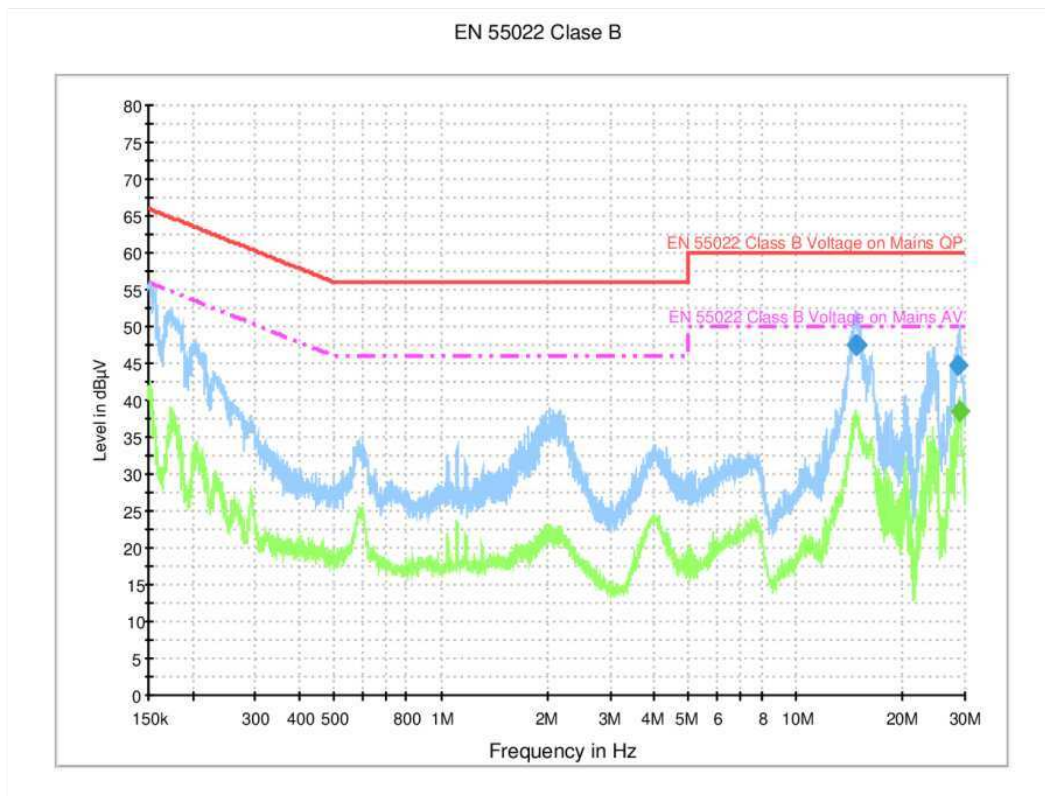
Common Information

EUT Name: AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE
 Serial Number: -----
 Test Description: Conducted emissions 150KHz to 30MHz
 Test Standard: EN 50083-2:2012 Class B
 Operator Name:
 Comment: Measurement 115 Vac with ground

Scan Setup: EN 55022 Class B fin [EMI conducted]

Hardware Setup: Voltage with 2-Lines-LISN
 Receiver: [ESCI 3]
 Level Unit: dBµV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
150 kHz - 30 MHz	.1 %	QPK; AVG	9 kHz	1 s	20 dB



Measure Data (Cont.)

Port No.: **2**

Measure No.: **1**

Measure Date: **15-01-2021**

Signal: **DTT**

Grounded: **Yes**

Mode: **115 Vac**

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
14.783892	47.6	10.0	9.000	GND	N	20.0	12.4	60.0
14.872909	47.4	10.0	9.000	GND	N	20.0	12.6	60.0
28.780236	44.7	10.0	9.000	GND	L1	20.0	15.3	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV)
28.837825	38.4	10.0	9.000	GND	N	20.0	11.6	50.0

Measure Data

Port No.: **2**

Measure No.: **2**

Measure Date: **15-01-2021**

Signal: **DTT**

Grounded: **Yes**

Mode: **230 Vac**

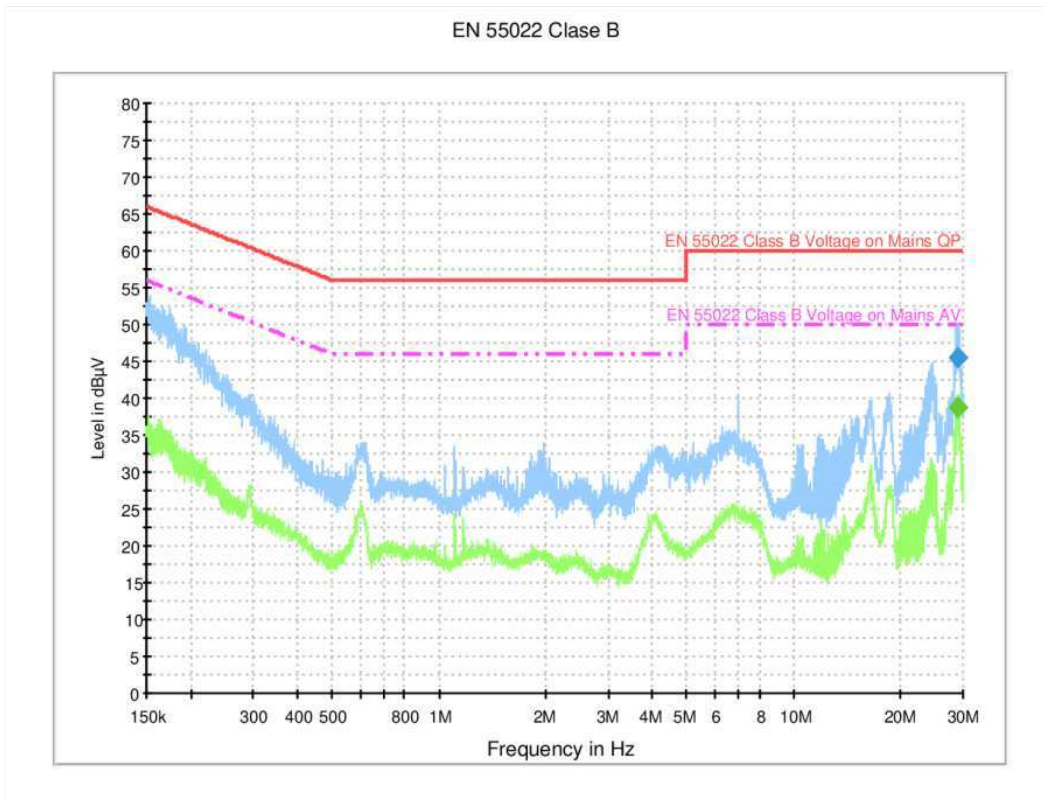
Common Information

EUT Name: AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE
 Serial Number: -----
 Test Description: Conducted emissions 150KHz to 30MHz
 Test Standard: EN 50083-2:2012 Class B
 Operator Name:
 Comment: Measurement 230 Vac with ground

Scan Setup: EN 55022 Class B fin [EMI conducted]

Hardware Setup: Voltage with 2-Lines-LISN
 Receiver: [ESCI 3]
 Level Unit: dBµV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
150 kHz - 30 MHz	.1 %	QPK; AVG	9 kHz	1 s	20 dB



Measure Data (Cont.)

Port No.: **2**

Measure No.: **2**

Measure Date: **15-01-2021**

Signal: **DTT**

Grounded: **Yes**

Mode: **230 Vac**

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
28.895621	45.4	10.0	9.000	GND	L1	20.0	14.6	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV)
28.953530	38.7	10.0	9.000	GND	N	20.0	11.3	50.0

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

Measure

TSP Id.: PEE-EMI-010 Date: 12-01-2021

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 60728-2:2018

Standard Method | Standard Limit

Standard: EN IEC 61000-3-2:2019

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

Equivalent Standards: UNE-EN 61000-3-2:2019
IEC 61000-3-2:2018

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

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: **15-01-2021**

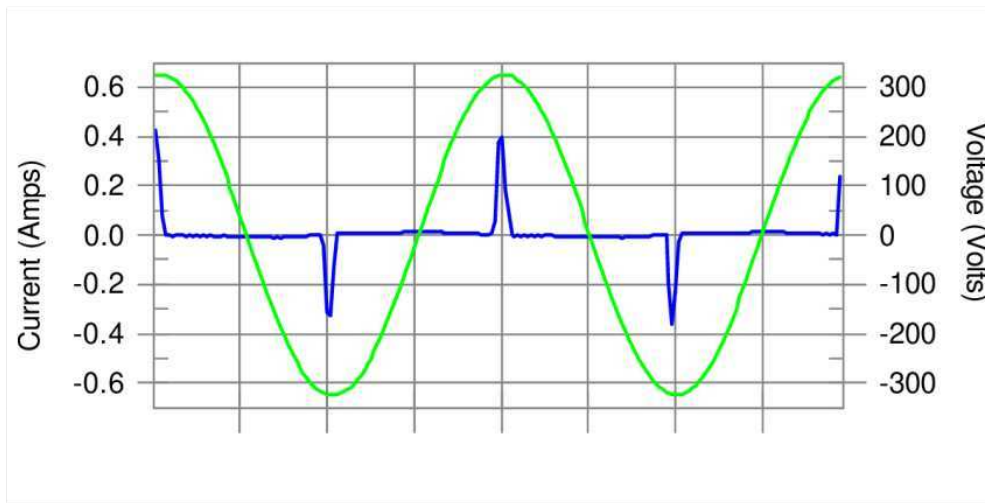
Harmonics – Class-A per EN/IEC 61000-3-2(Run time)

EUT: AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE Tested by: EN 61000-3-2:2019
 Test category: Class-A per (European limits) Test Margin: 100
 Test date: 13/01/21 Start time: 10:26:24 End time: 10:27:36
 Test duration (min): 1 Data file name: H-000444.cts_data
 Comment:
 Customer: Televes

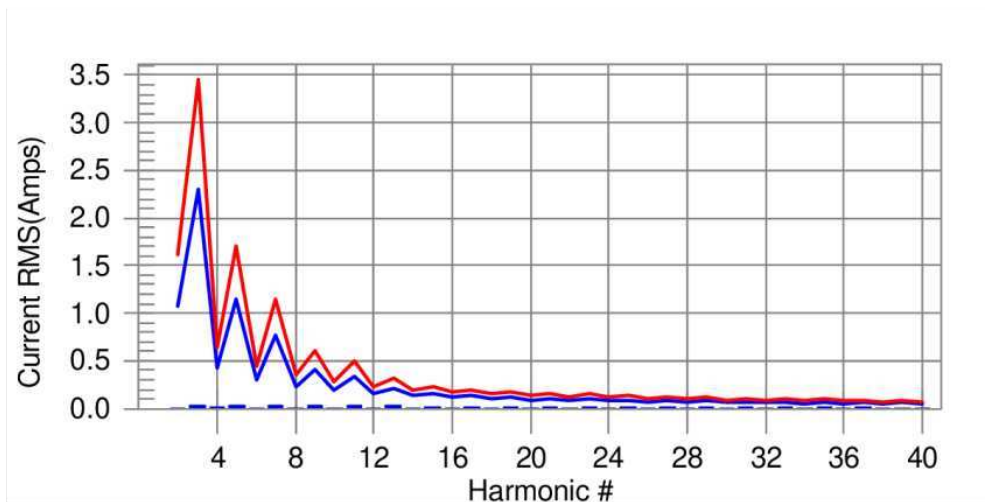
Test Result: Pass

Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #19 with 8.59% of the limit.

Measure Data (Cont.)

Port No.: 2

Measure No.: 1

Measure Date: 15-01-2021

Current Test Result Summary (Run time)

EUT: AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE Tested by: EN 61000-3-2:2019
 Test category: Class-A per (European limits) Test Margin: 100
 Test date: 13/01/21 Start time: 10:26:24 End time: 10:27:36
 Test duration (min): 1 Data file name: H-000444.cts_data
 Comment:
 Customer: Televes

Test Result: Pass Source qualification: Normal
 THC(A): 0.07 I-THD(%): 257.06 POHC(A): 0.024 POHC Limit(A): 0.251
 Highest parameter values during test:
 V_RMS (Volts): 230.10 Frequency(Hz): 50.00
 I_Peak (Amps): 0.435 I_RMS (Amps): 0.075
 I_Fund (Amps): 0.027 Crest Factor: 5.875
 Power (Watts): 6.0 Power Factor: 0.351

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	0.1	0.002	1.620	0.12	Pass
3	0.025	2.300	1.1	0.027	3.450	0.77	Pass
4	0.001	0.430	0.2	0.002	0.645	0.37	Pass
5	0.024	1.140	2.1	0.025	1.710	1.46	Pass
6	0.001	0.300	0.3	0.002	0.450	0.45	Pass
7	0.023	0.770	3.0	0.024	1.155	2.08	Pass
8	0.001	0.230	0.4	0.002	0.345	0.54	Pass
9	0.022	0.400	5.6	0.023	0.600	3.83	Pass
10	0.001	0.184	0.4	0.002	0.276	0.72	Pass
11	0.021	0.330	6.4	0.022	0.495	4.38	Pass
12	0.001	0.153	0.5	0.002	0.230	0.81	Pass
13	0.020	0.210	9.4	0.020	0.315	6.44	Pass
14	0.001	0.131	0.6	0.002	0.197	0.92	Pass
15	0.018	0.150	12.1	0.019	0.225	8.30	Pass
16	0.001	0.115	0.7	0.002	0.173	1.03	Pass
17	0.017	0.132	12.5	0.017	0.199	8.53	Pass
18	0.001	0.102	0.8	0.002	0.153	1.12	Pass
19	0.015	0.118	12.6	0.015	0.178	8.59	Pass
20	0.001	0.092	0.8	0.002	0.138	1.18	Pass
21	0.013	0.107	12.3	0.013	0.161	8.38	Pass
22	0.001	0.084	0.8	0.002	0.125	1.23	Pass
23	0.011	0.098	11.7	0.012	0.147	8.03	Pass
24	0.001	0.077	0.8	0.001	0.115	1.22	Pass
25	0.010	0.090	10.9	0.010	0.135	7.45	Pass
26	0.001	0.071	0.8	0.001	0.106	1.20	Pass
27	0.008	0.083	9.8	0.008	0.125	6.75	Pass
28	0.000	0.066	0.7	0.001	0.099	1.12	Pass
29	0.007	0.078	8.6	0.007	0.116	5.98	Pass
30	0.000	0.061	0.7	0.001	0.092	1.05	Pass
31	0.005	0.073	7.3	0.006	0.109	5.05	Pass
32	0.000	0.058	0.6	0.001	0.086	0.93	Pass
33	0.004	0.068	6.0	0.004	0.102	4.16	Pass
34	0.000	0.054	0.5	0.001	0.081	0.83	Pass
35	0.003	0.064	4.8	0.003	0.096	3.32	Pass
36	0.000	0.051	0.4	0.001	0.077	0.72	Pass
37	0.002	0.061	3.6	0.002	0.091	2.52	Pass
38	0.000	0.048	0.4	0.000	0.073	0.63	Pass
39	0.002	0.058	2.7	0.002	0.087	1.86	Pass
40	0.000	0.046	0.4	0.000	0.069	0.58	Pass

Measure Data (Cont.)

Port No.: 2

Measure No.: 1

Measure Date: 15-01-2021

Voltage Source Verification Data (Run time)

EUT: AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE Tested by: EN 61000-3-2:2019
 Test category: Class-A per (European limits) Test Margin: 100
 Test date: 13/01/21 Start time: 10:26:24 End time: 10:27:36
 Test duration (min): 1 Data file name: H-000444.cts_data
 Comment:
 Customer: Televes

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 230.10 Frequency(Hz): 50.00
 I_Peak (Amps): 0.435 I_RMS (Amps): 0.075
 I_Fund (Amps): 0.027 Crest Factor: 5.875
 Power (Watts): 6.0 Power Factor: 0.351

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.110	0.460	23.82	OK
3	0.545	2.070	26.34	OK
4	0.114	0.460	24.79	OK
5	0.061	0.920	6.67	OK
6	0.100	0.460	21.83	OK
7	0.040	0.690	5.76	OK
8	0.053	0.460	11.55	OK
9	0.036	0.460	7.77	OK
10	0.027	0.460	5.92	OK
11	0.021	0.230	8.97	OK
12	0.025	0.230	10.66	OK
13	0.040	0.230	17.51	OK
14	0.024	0.230	10.27	OK
15	0.021	0.230	9.26	OK
16	0.017	0.230	7.46	OK
17	0.027	0.230	11.65	OK
18	0.021	0.230	9.25	OK
19	0.021	0.230	9.23	OK
20	0.021	0.230	9.22	OK
21	0.026	0.230	11.34	OK
22	0.015	0.230	6.66	OK
23	0.029	0.230	12.59	OK
24	0.013	0.230	5.72	OK
25	0.026	0.230	11.28	OK
26	0.016	0.230	6.78	OK
27	0.029	0.230	12.74	OK
28	0.013	0.230	5.50	OK
29	0.023	0.230	9.78	OK
30	0.013	0.230	5.63	OK
31	0.021	0.230	9.28	OK
32	0.012	0.230	5.25	OK
33	0.013	0.230	5.65	OK
34	0.011	0.230	4.58	OK
35	0.015	0.230	6.38	OK
36	0.009	0.230	4.05	OK
37	0.011	0.230	4.81	OK
38	0.009	0.230	3.80	OK
39	0.012	0.230	5.19	OK
40	0.011	0.230	4.87	OK

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

Measure

TSP Id.: **PEE-EMI-006** Date: **12-01-2021**

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 60728-2:2018**

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 60728-2:2018**

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

Environmental Conditions

Temperature: **22.1°C** Humidity: **52.1%** Atmospheric Pressure: **1003mbar**

Used Equipment

Id	Equipment	Trade Mark	Model	Serial No.
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

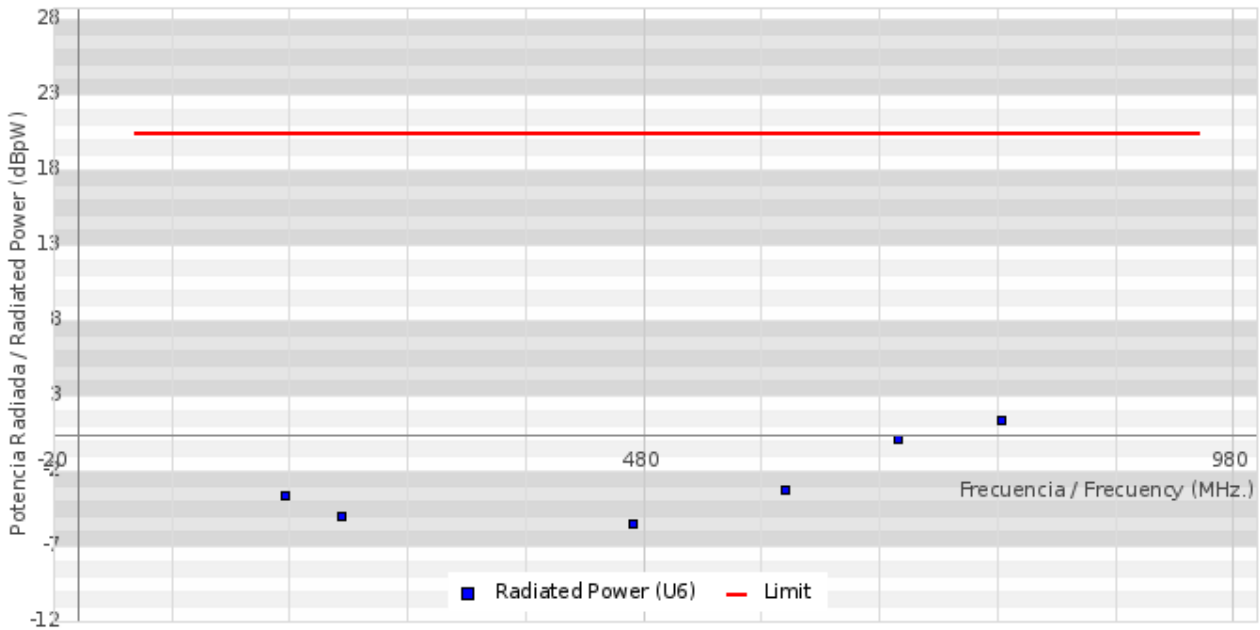
Port No.:	3	Measure No.:	1	Measure Date:	14-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V1		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	-3.97	20.00
TV Band III (Channels 5 - 12)	224.25	-5.38	20.00
TV Band IV (Channels 21 - 69)	471.25	-5.86	20.00
TV Band IV (Channels 21 - 69)	599.25	-3.59	20.00
TV Bands V (Channels 37 - 69)	695.25	-0.23	20.00
TV Bands V (Channels 37 - 69)	783.25	0.93	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 3 RF + DC 174-230MHz/470-790MHz Input F Connector



Measure Data

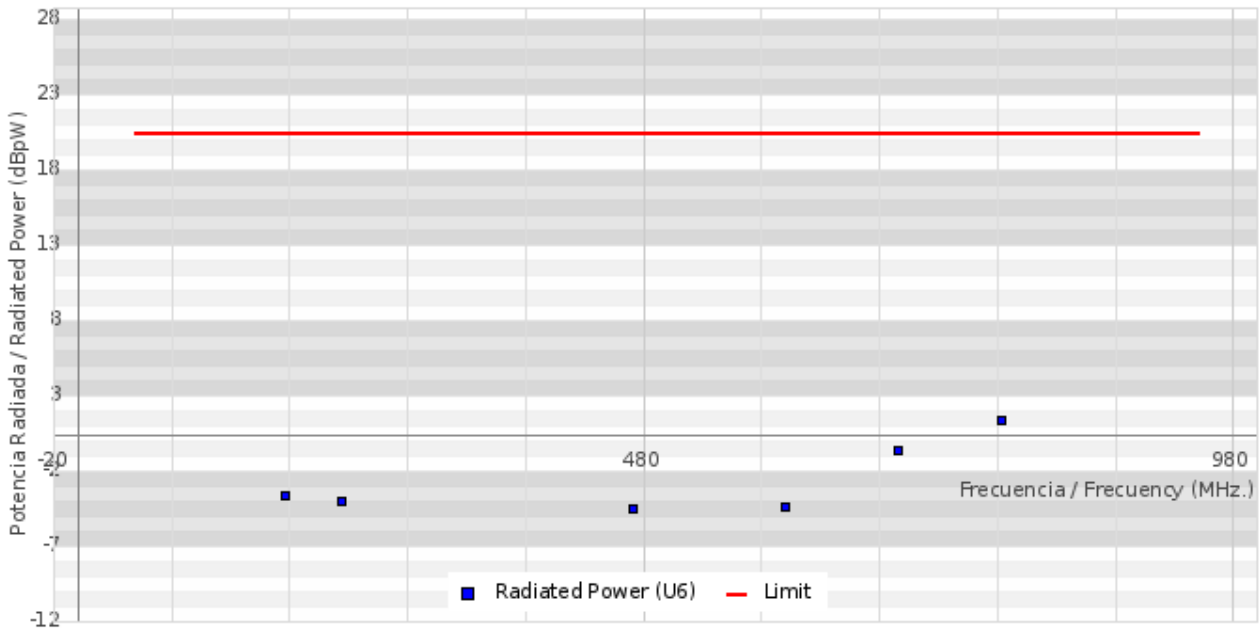
Port No.:	4	Measure No.:	1	Measure Date:	14-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V2		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	-3.97	20.00
TV Band III (Channels 5 - 12)	224.25	-4.41	20.00
TV Band IV (Channels 21 - 69)	471.25	-4.87	20.00
TV Band IV (Channels 21 - 69)	599.25	-4.78	20.00
TV Bands V (Channels 37 - 69)	695.25	-1.01	20.00
TV Bands V (Channels 37 - 69)	783.25	0.96	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 4 RF + DC 174-230MHz/470-790MHz Input F Connector



Measure Data

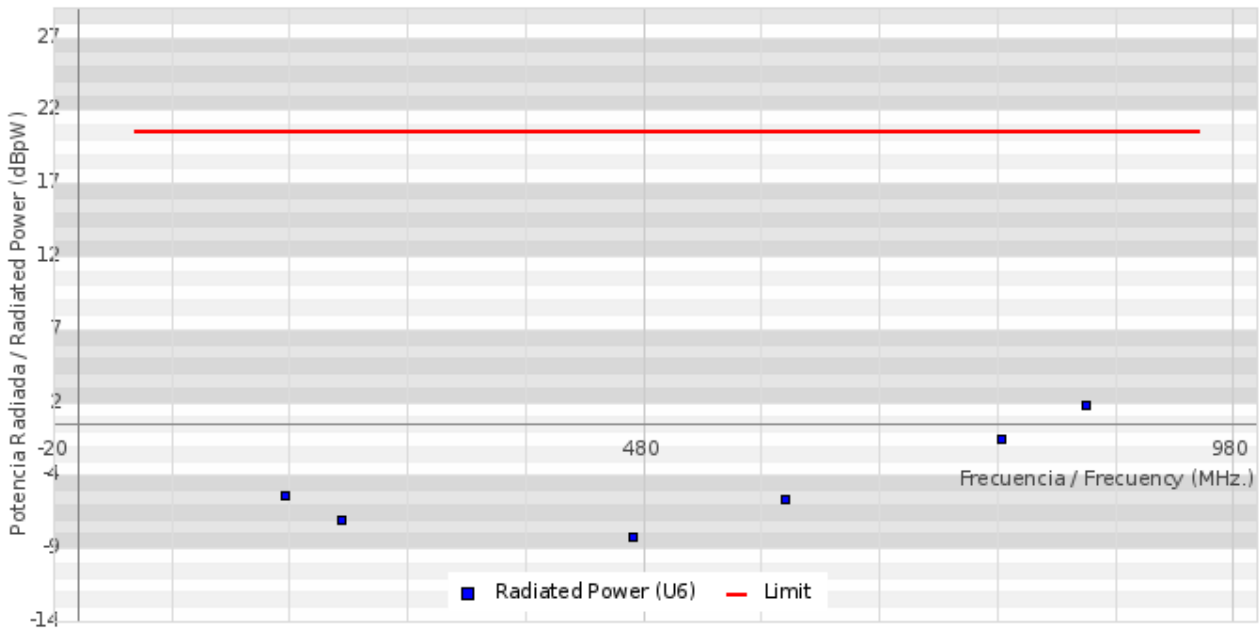
Port No.:	5	Measure No.:	1	Measure Date:	14-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V3		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	-4.82	20.00
TV Band III (Channels 5 - 12)	224.25	-6.59	20.00
TV Band IV (Channels 21 - 69)	471.25	-7.66	20.00
TV Band IV (Channels 21 - 69)	599.25	-5.14	20.00
TV Bands V (Channels 37 - 69)	783.25	-1.01	20.00
TV Bands V (Channels 37 - 69)	855.25	1.36	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 5 RF + DC 174-230MHz/470-790MHz Input F Connector



Measure Data

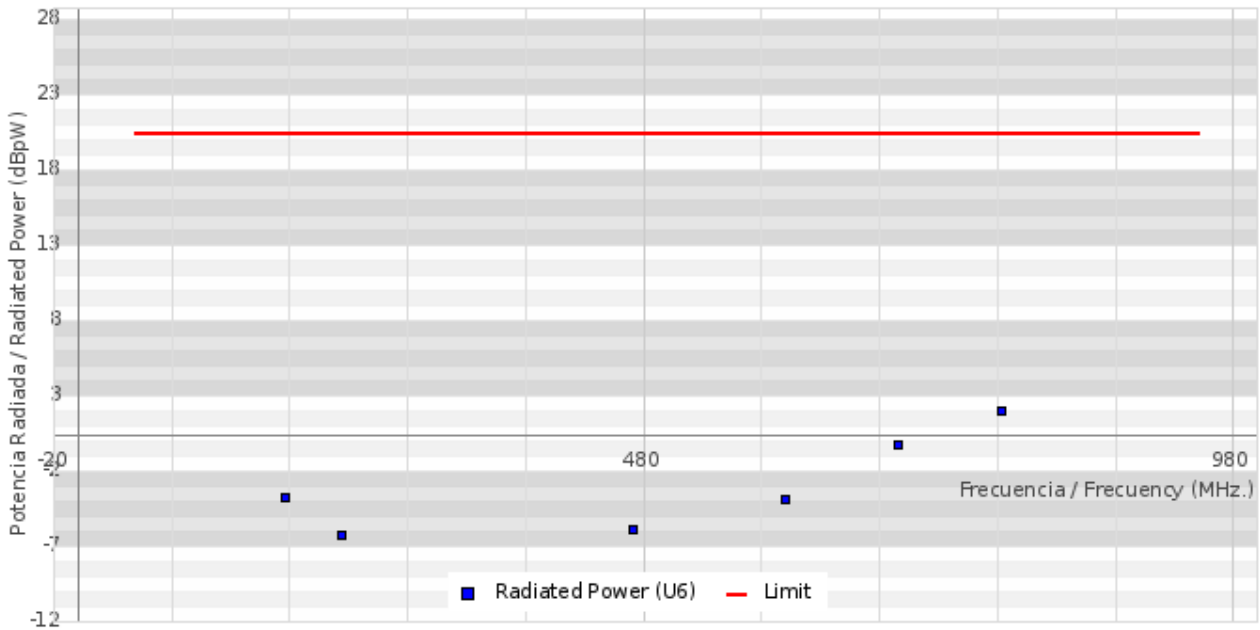
Port No.:	6	Measure No.:	1	Measure Date:	14-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V4		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	-4.08	20.00
TV Band III (Channels 5 - 12)	224.25	-6.59	20.00
TV Band IV (Channels 21 - 69)	471.25	-6.31	20.00
TV Band IV (Channels 21 - 69)	599.25	-4.28	20.00
TV Bands V (Channels 37 - 69)	695.25	-0.66	20.00
TV Bands V (Channels 37 - 69)	783.25	1.61	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 6 RF + DC 174-230MHz/470-790MHz Input F Connector



Measure Data

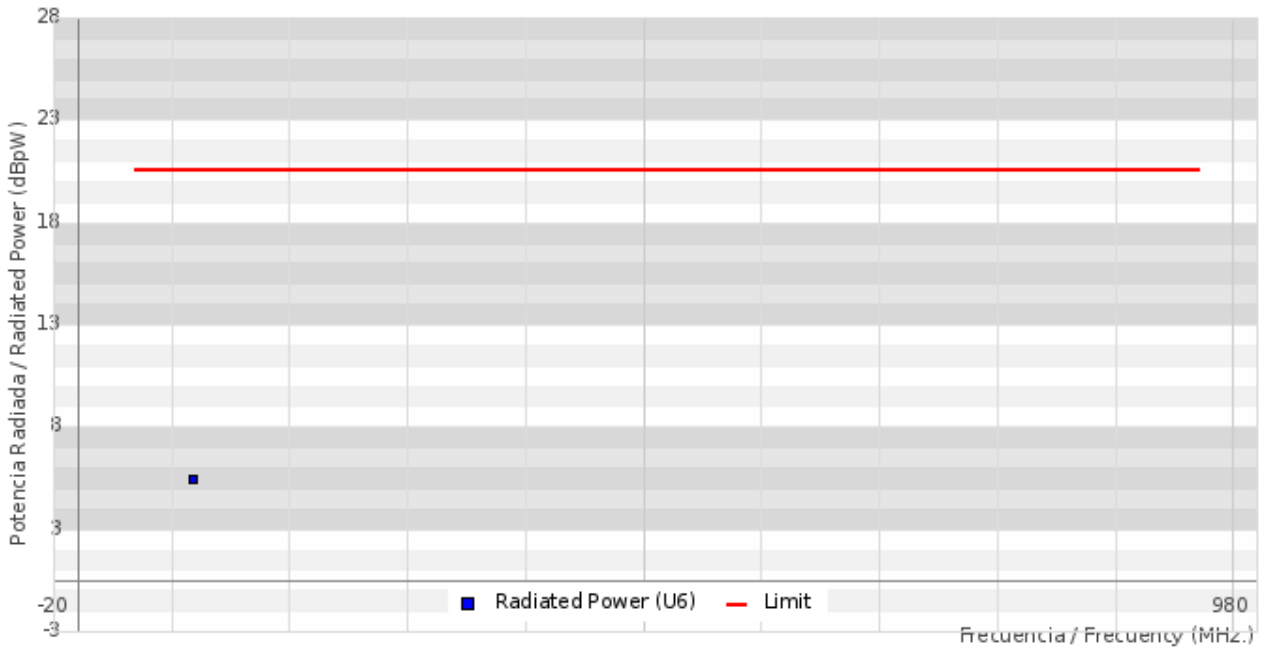
Port No.:	8	Measure No.:	1	Measure Date:	14-01-2021
Type:	Radio Frequency	Range:	87MHz-108MHz	Direction:	Input
Connector:	F Connector	Comments:	FM		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
FM Radio Band II	98.00	4.98	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 8 Radio Frequency 87MHz-108MHz Input F Connector



Measure Data

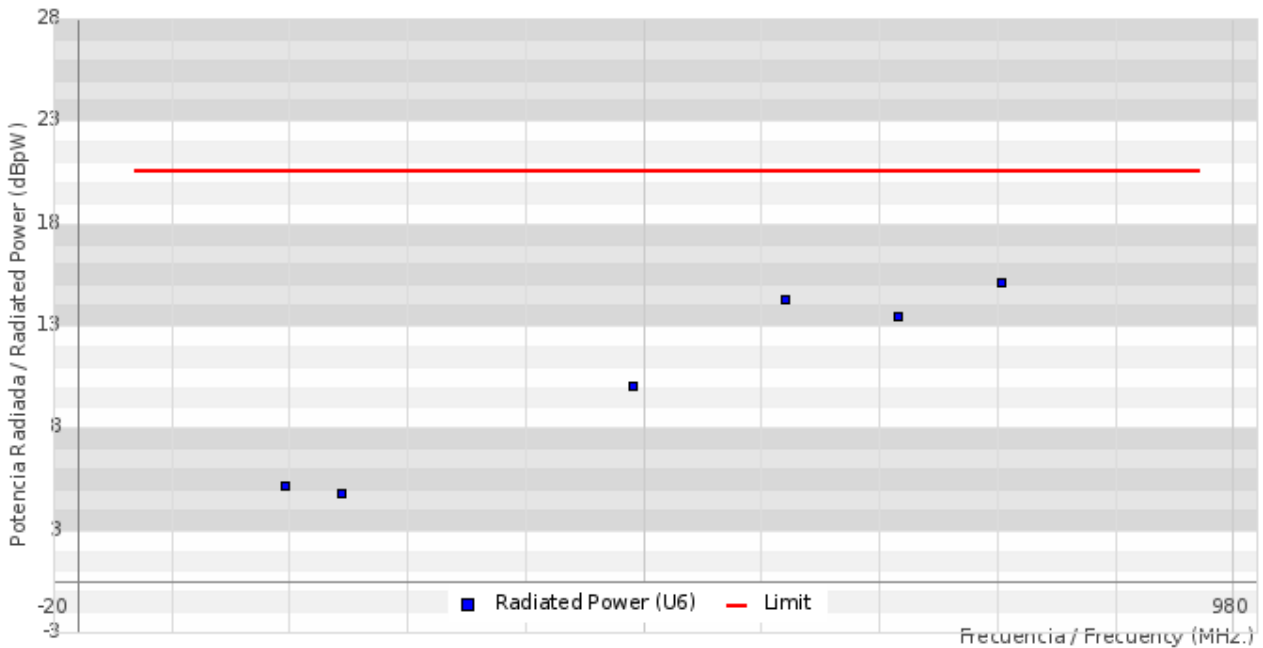
Port No.:	9	Measure No.:	1	Measure Date:	14-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	4.72	20.00
TV Band III (Channels 5 - 12)	224.25	4.34	20.00
TV Band IV (Channels 21 - 69)	471.25	9.53	20.00
TV Band IV (Channels 21 - 69)	599.25	13.76	20.00
TV Bands V (Channels 37 - 69)	695.25	12.93	20.00
TV Bands V (Channels 37 - 69)	783.25	14.61	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 9 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF1

Measure Data

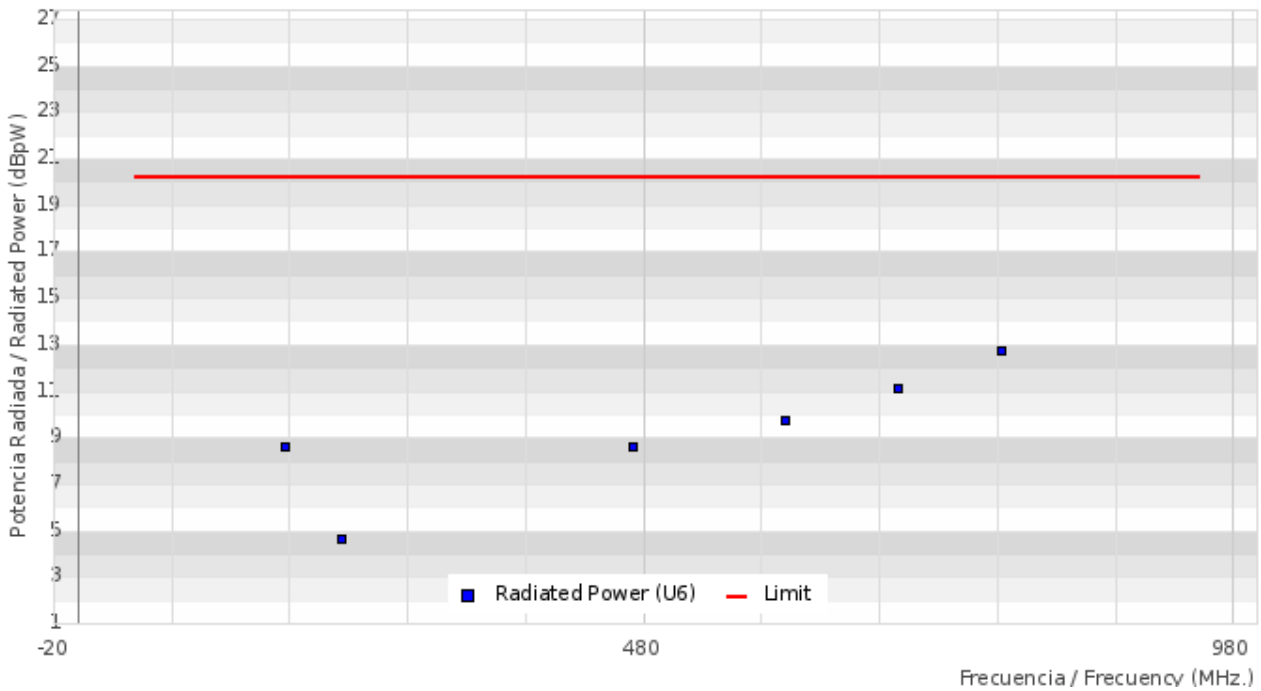
Port No.:	9	Measure No.:	2	Measure Date:	14-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	8.44	20.00
TV Band III (Channels 5 - 12)	224.25	4.48	20.00
TV Band IV (Channels 21 - 69)	471.25	8.38	20.00
TV Band IV (Channels 21 - 69)	599.25	9.58	20.00
TV Bands V (Channels 37 - 69)	695.25	10.90	20.00
TV Bands V (Channels 37 - 69)	783.25	12.55	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 9 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF2

Measure Data

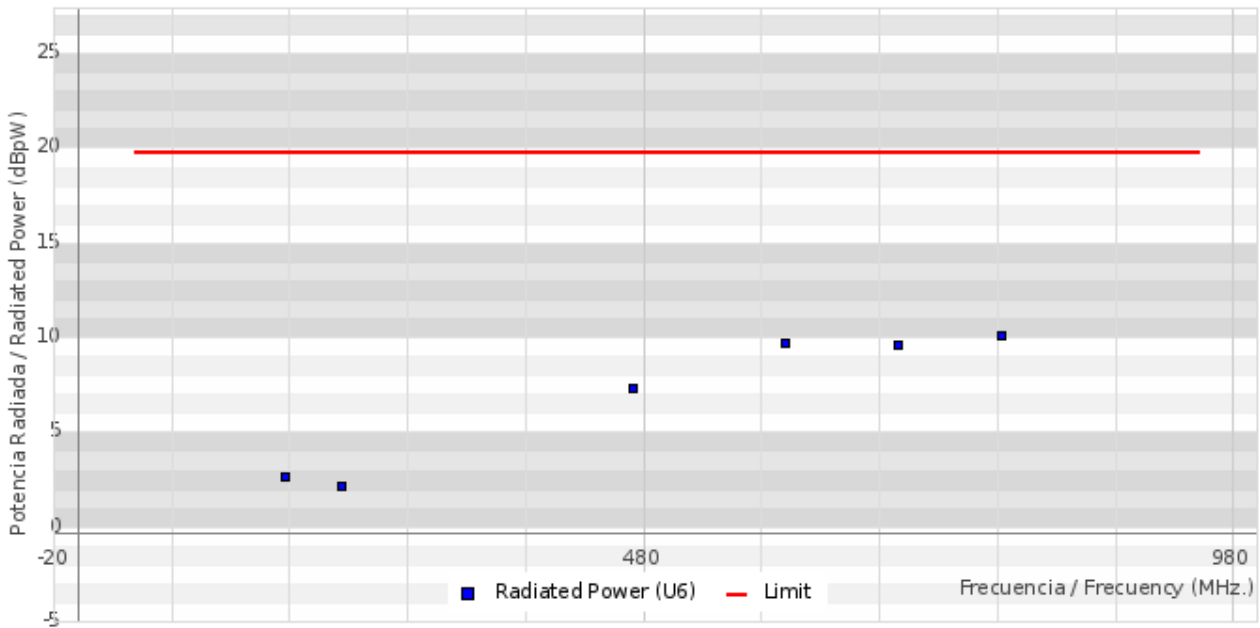
Port No.:	9	Measure No.:	3	Measure Date:	14-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	2.93	20.00
TV Band III (Channels 5 - 12)	224.25	2.50	20.00
TV Band IV (Channels 21 - 69)	471.25	7.66	20.00
TV Band IV (Channels 21 - 69)	599.25	10.03	20.00
TV Bands V (Channels 37 - 69)	695.25	9.92	20.00
TV Bands V (Channels 37 - 69)	783.25	10.39	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 9 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF3

Measure Data

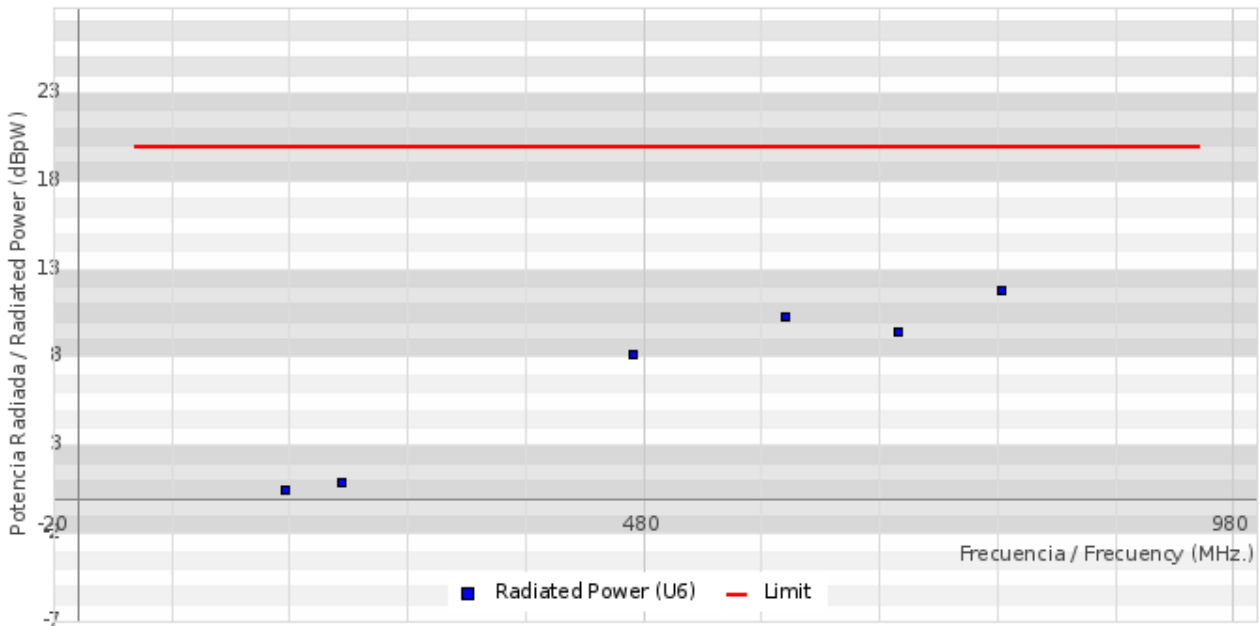
Port No.:	9	Measure No.:	4	Measure Date:	14-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	0.62	20.00
TV Band III (Channels 5 - 12)	224.25	1.01	20.00
TV Band IV (Channels 21 - 69)	471.25	8.22	20.00
TV Band IV (Channels 21 - 69)	599.25	10.34	20.00
TV Bands V (Channels 37 - 69)	695.25	9.53	20.00
TV Bands V (Channels 37 - 69)	783.25	11.92	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 9 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF4

Measure Data

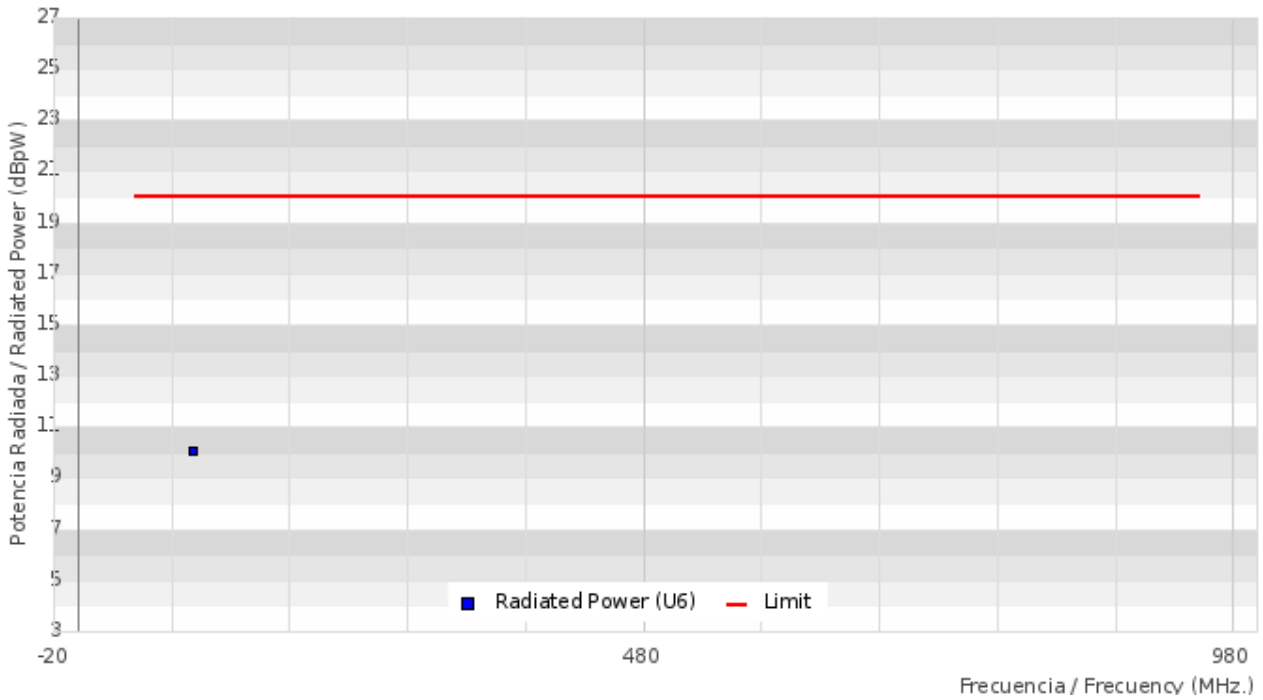
Port No.:	9	Measure No.:	5	Measure Date:	14-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
FM Radio Band II	98.00	10.10	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 9 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

FM

Measure Data

Port No.: **10**

Measure No.: **1**

Measure Date: **14-01-2021**

Type: **Radio Frequency**

Range: **87-108/174-230/470-790MHz**

Direction: **Output**

Connector: **F Connector**

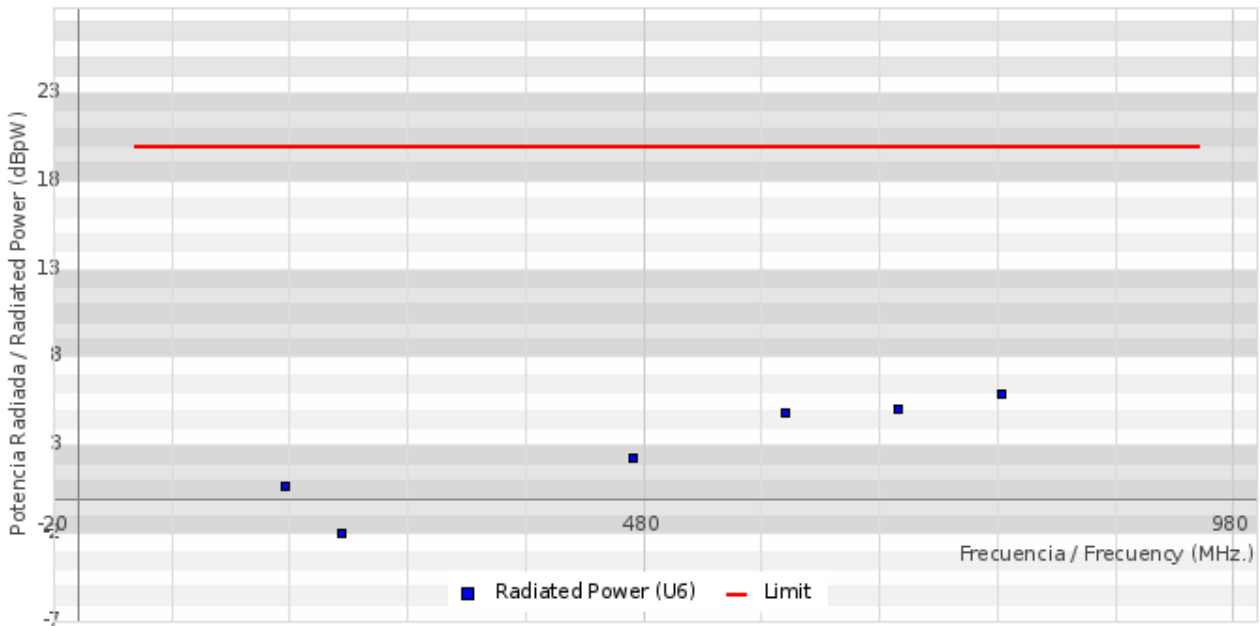
Comments: **TV+SAT**

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	0.81	20.00
TV Band III (Channels 5 - 12)	224.25	-1.89	20.00
TV Band IV (Channels 21 - 69)	471.25	2.44	20.00
TV Band IV (Channels 21 - 69)	599.25	4.90	20.00
TV Bands V (Channels 37 - 69)	695.25	5.14	20.00
TV Bands V (Channels 37 - 69)	783.25	5.99	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 10 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF1

Measure Data

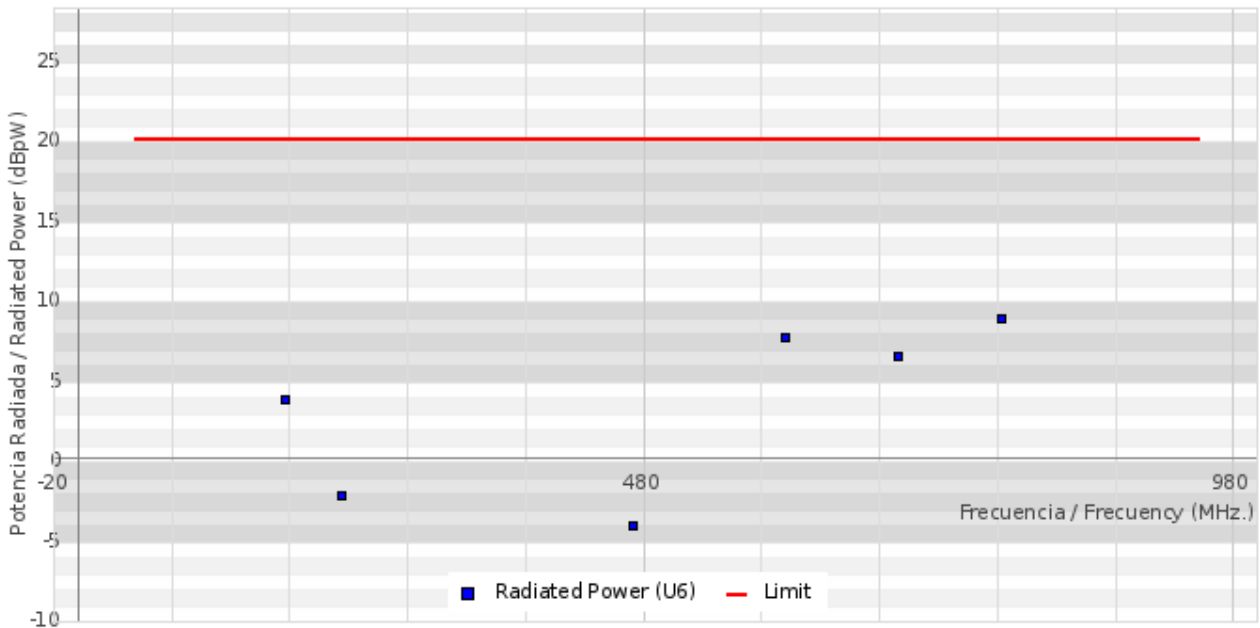
Port No.:	10	Measure No.:	2	Measure Date:	14-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV+SAT		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	3.68	20.00
TV Band III (Channels 5 - 12)	224.25	-2.29	20.00
TV Band IV (Channels 21 - 69)	471.25	-4.18	20.00
TV Band IV (Channels 21 - 69)	599.25	7.60	20.00
TV Bands V (Channels 37 - 69)	695.25	6.44	20.00
TV Bands V (Channels 37 - 69)	783.25	8.72	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 10 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF2

Measure Data

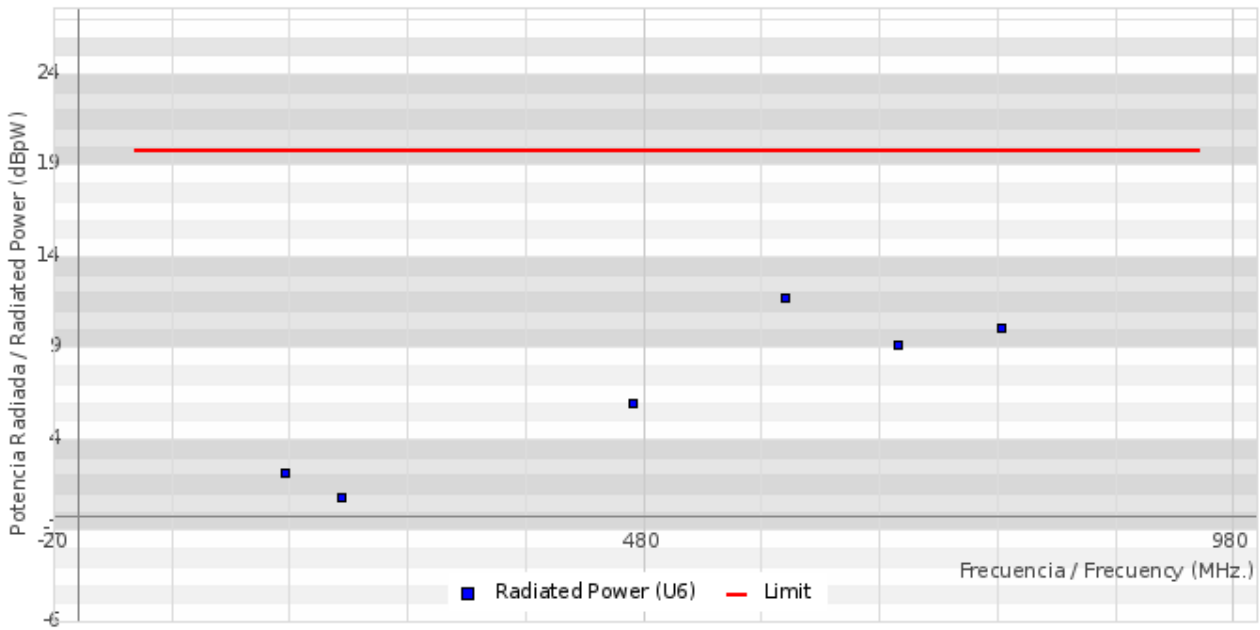
Port No.:	10	Measure No.:	3	Measure Date:	15-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV+SAT		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	2.35	20.00
TV Band III (Channels 5 - 12)	224.25	0.98	20.00
TV Band IV (Channels 21 - 69)	471.25	6.12	20.00
TV Band IV (Channels 21 - 69)	599.25	11.97	20.00
TV Bands V (Channels 37 - 69)	695.25	9.36	20.00
TV Bands V (Channels 37 - 69)	783.25	10.33	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 10 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF3

Measure Data

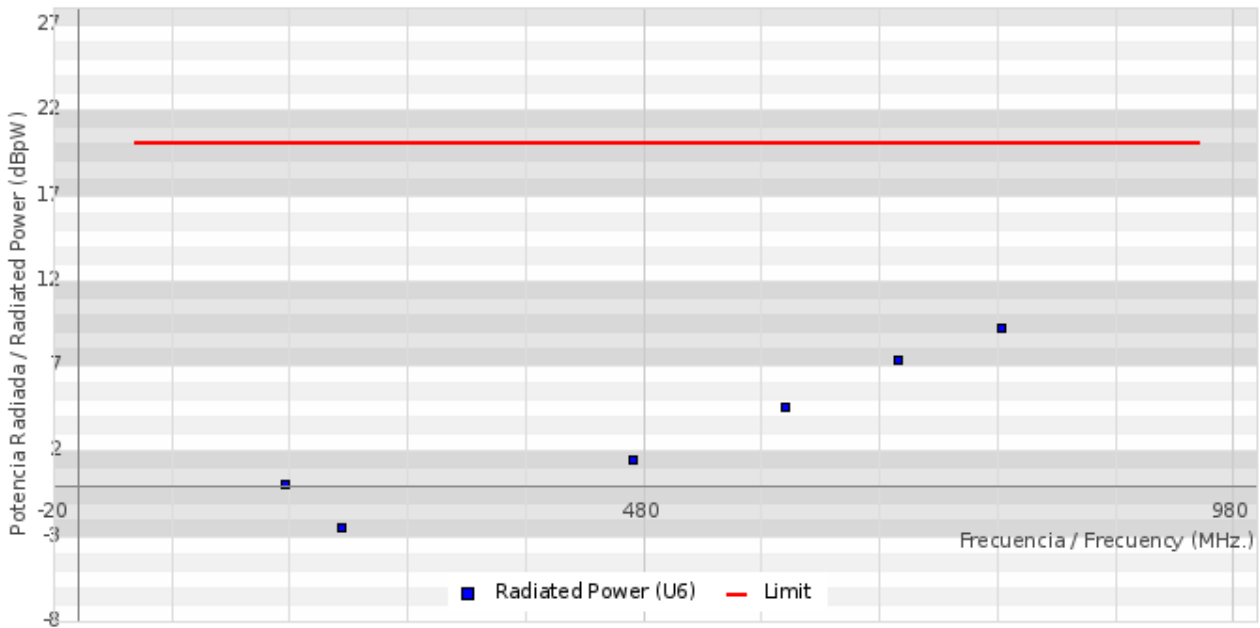
Port No.:	10	Measure No.:	4	Measure Date:	15-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV+SAT		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
TV Band III (Channels 5 - 12)	175.25	0.01	20.00
TV Band III (Channels 5 - 12)	224.25	-2.52	20.00
TV Band IV (Channels 21 - 69)	471.25	1.52	20.00
TV Band IV (Channels 21 - 69)	599.25	4.54	20.00
TV Bands V (Channels 37 - 69)	695.25	7.32	20.00
TV Bands V (Channels 37 - 69)	783.25	9.24	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 10 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

UHF+VHF4

Measure Data

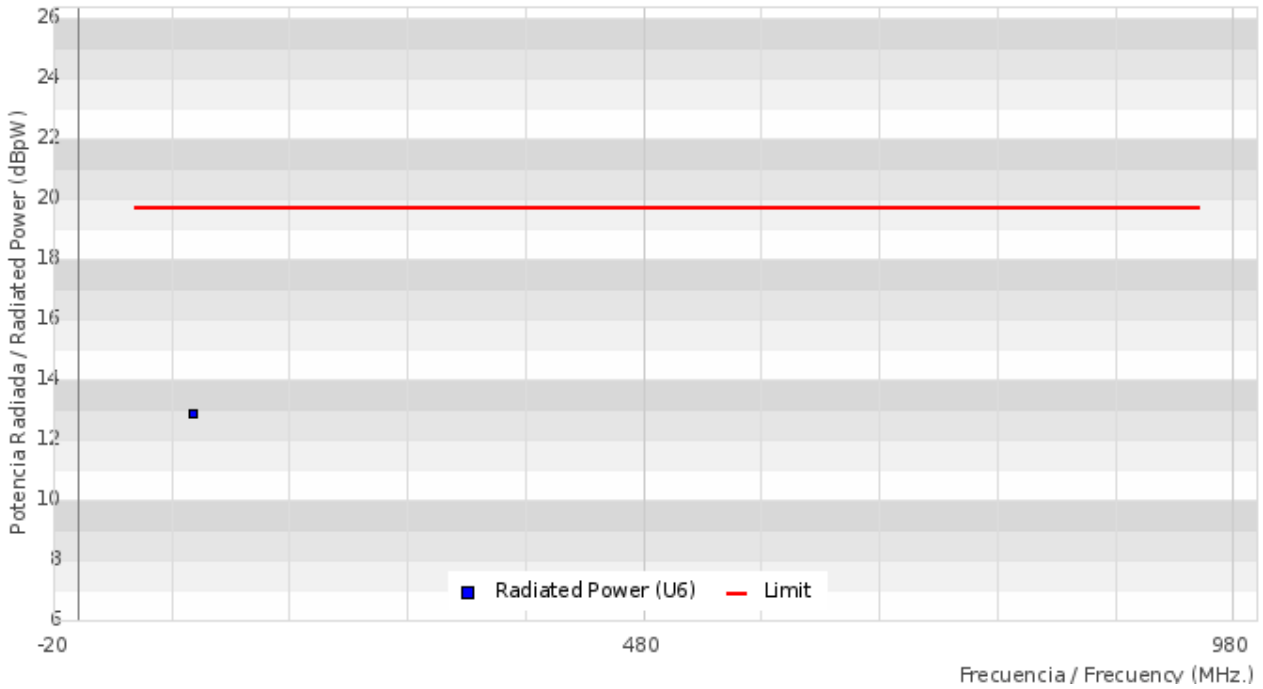
Port No.:	10	Measure No.:	5	Measure Date:	15-01-2021
Type:	Radio Frequency	Range:	87-108/174-230/470-790MHz	Direction:	Output
Connector:	F Connector	Comments:	TV+SAT		

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
FM Radio Band II	98.00	13.21	20.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 10 Radio Frequency 87-108/174-230/470-790MHz Output F Connector



Coments

FM

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

Measure

TSP Id.: PEE-EMI-018

Date: 12-01-2021

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 60728-2:2018

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 60728-2:2018

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

Environmental Conditions

Temperature: 22.1°C

Humidity: 52.1%

Atmospheric Pressure: 1003mbar

Used Equipment

Id	Equipment	Trade Mark	Model	Serial No.
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: **15-01-2021**

Type: **Chassis**

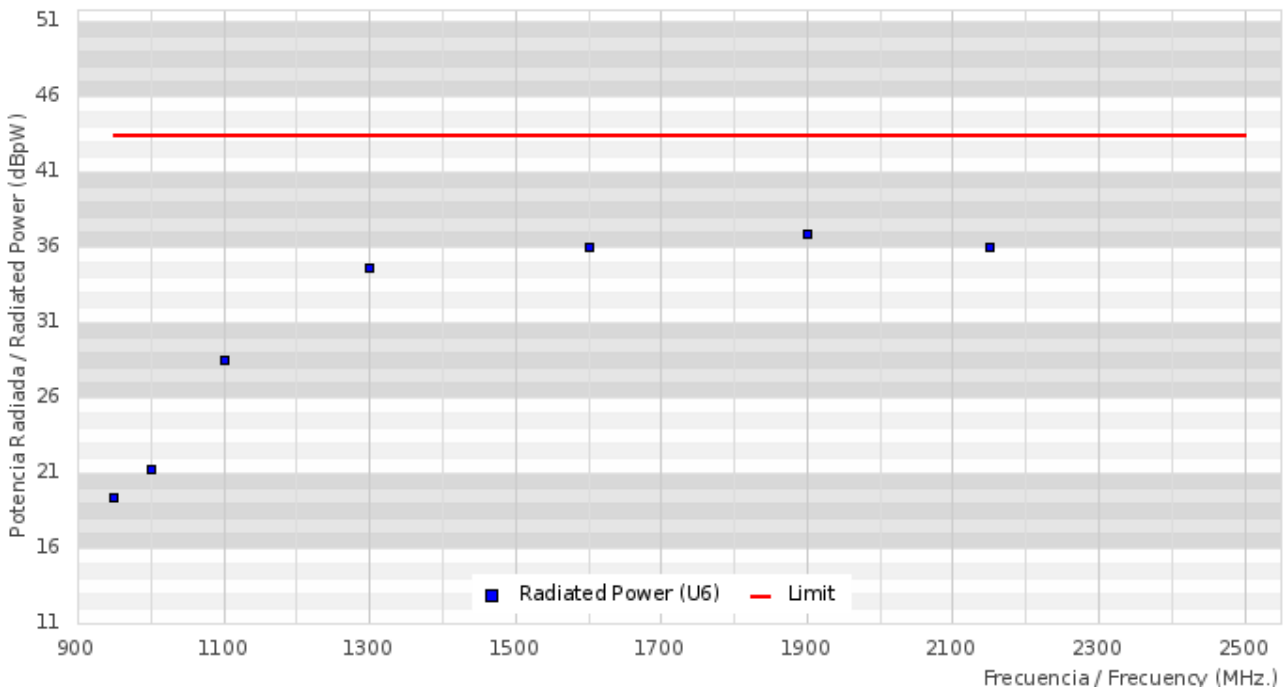
Connector: **Enclosure**

Data Table

Band	Frequency (MHz)	Level (dBpW)	Limit
-	950.00	18.98	43.00
-	1000.00	20.85	43.00
-	1100.00	28.08	43.00
-	1300.00	34.23	43.00
-	1600.00	35.61	43.00
-	1900.00	36.50	43.00
-	2150.00	35.60	43.00

Graph

AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE - Port No 1 Chassis Enclosure



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

Measure

TSP Id.: PEE-INM-001 Date: 12-01-2021

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 60728-2:2018

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 60728-2:2018

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

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE


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.:	2	Measure No.:	1	Measure Date:	15-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector	Measure:	Out-Band		
Measurement Range:	0.15MHz - 80MHz	Voltage (V):	1.78	Voltage (dBµV):	125
Modulation:	80% AM (1KHz)	Frequency Steps:	1%	Time Spent:	0.5s
Acceptance Criteria:	A - No loss of Functionality or Activity				
Result:	 (A - No loss of Functionality or Activity)				




Data Table

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


Measure Data

Port No.:	3	Measure No.:	1	Measure Date:	18-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V1	Measure:	Out-Band
Measurement Range:	0.15MHz - 80MHz	Voltage (V):	1.78	Voltage (dBµV):	125
Modulation:	80% AM (1KHz)	Frequency Steps:	1%	Time Spent:	0.5s
Acceptance Criteria:	A - No loss of Functionality or Activity				
Result:	 (A - No loss of Functionality or Activity)				




Data Table

Frequency (MHz)	Pass
176	
480	
680	


Measure Data

Port No.:	4	Measure No.:	1	Measure Date:	18-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V2		
		Measure:	Out-Band		
Measurement Range:	0.15MHz - 80MHz	Voltage (V):	1.78	Voltage (dBµV):	125
Modulation:	80% AM (1KHz)	Frequency Steps:	1%	Time Spent:	0.5s
Acceptance Criteria:	A - No loss of Functionality or Activity				
Result:	 (A - No loss of Functionality or Activity)				




Data Table

Frequency (MHz)	Pass
176	
480	
680	


Measure Data

Port No.:	5	Measure No.:	1	Measure Date:	18-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V3		
		Measure:	Out-Band		
Measurement Range:	0.15MHz - 80MHz	Voltage (V):	1.78	Voltage (dBµV):	125
Modulation:	80% AM (1KHz)	Frequency Steps:	1%	Time Spent:	0.5s
Acceptance Criteria:	A - No loss of Functionality or Activity				
Result:	 (A - No loss of Functionality or Activity)				




Data Table

Frequency (MHz)	Pass
176	
480	
680	


Measure Data

Port No.:	6	Measure No.:	1	Measure Date:	18-01-2021
Type:	RF + DC	Range:	174-230MHz/470-790MHz	Direction:	Input
Connector:	F Connector	Comments:	U+V4		
		Measure:	Out-Band		
Measurement Range:	0.15MHz - 80MHz	Voltage (V):	1.78	Voltage (dBµV):	125
Modulation:	80% AM (1KHz)	Frequency Steps:	1%	Time Spent:	0.5s
Acceptance Criteria:	A - No loss of Functionality or Activity				
Result:	 (A - No loss of Functionality or Activity)				






Data Table

Frequency (MHz)	Pass
176	
480	
680	


Measure Data

Port No.:	7	Measure No.:	1	Measure Date:	18-01-2021
Type:	RF + DC	Range:	950MHz-2150MHz	Direction:	Input
Connector:	F Connector	Comments:	SAT		
		Measure:	Out-Band		
Measurement Range:	0.15MHz - 80MHz	Voltage (V):	1.78	Voltage (dBµV):	125
Modulation:	80% AM (1KHz)	Frequency Steps:	1%	Time Spent:	0.5s
Acceptance Criteria:	A - No loss of Functionality or Activity				
Result:	 (A - No loss of Functionality or Activity)				

Data Table

Frequency (MHz)	Pass
970	
1220	
1470	
1720	
1970	

Measure Data

Port No.:	8	Measure No.:	1	Measure Date:	18-01-2021
Type:	Radio Frequency	Range:	87MHz-108MHz	Direction:	Input
Connector:	F Connector	Comments:	FM		
		Measure:	Out-Band		
Measurement Range:	0.15MHz - 80MHz	Voltage (V):	1.78	Voltage (dBµV):	125
Modulation:	80% AM (1KHz)	Frequency Steps:	1%	Time Spent:	0.5s
Acceptance Criteria:	A - No loss of Functionality or Activity				
Result:	 (A - No loss of Functionality or Activity)				

Data Table

Frequency (MHz)	Pass
100	

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

Measure

TSP Id.: PEE-INM-003 Date: 12-01-2021

Title: External immunity to radiated fields. Anechoic chamber measurement

Description: Radiated, radio-frequency, electromagnetic field immunity test

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 60728-2:2018

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 60728-2:2018

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

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

Environmental Conditions

Temperature: **22.1°C**

Humidity: **52.1%**

Atmospheric Pressure: **1003mbar**

Used Equipment

Id	Equipment	Trade Mark	Model	Serial No.
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.:	1	Measure No.:	1	Measure Date:	15-01-2021
Type:	Chassis				
Connector:	Enclosure				
Unwanted signal range:	80MHz - 87MHz			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
100	✔
176	✔
480	✔
680	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

Measure Data

Port No.: **1**

Measure No.: **2**

Measure Date: **15-01-2021**

Type: **Chassis**

Connector: **Enclosure**

Unwanted signal range: **87MHz - 108MHz**


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
176	
470	
680	
960	
970	
1220	
1470	
1720	
1970	

Measure Data

Port No.: **1**

Measure No.: **3**

Measure Date: **15-01-2021**

Type: **Chassis**

Connector: **Enclosure**

Unwanted signal range: **108MHz - 174MHz**


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
100	
176	
480	
680	
970	
1220	
1470	
1720	
1970	

Measure Data

Port No.:	1	Measure No.:	4	Measure Date:	15-01-2021
Type:	Chassis				
Connector:	Enclosure				
Unwanted signal range:	174MHz - 230MHz			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
176	✔
470	✔
680	✔
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

Measure Data

Port No.: **1**

Measure No.: **5**

Measure Date: **15-01-2021**

Type: **Chassis**

Connector: **Enclosure**

Unwanted signal range: **230MHz - 470MHz**

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
100	
176	
480	
680	
970	
1220	
1470	
1720	
1970	

Measure Data

Port No.:	1	Measure No.:	6	Measure Date:	15-01-2021
Type:	Chassis				
Connector:	Enclosure				
Unwanted signal range:	470MHz - 790MHz			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
176	✔
470	✔
680	✔
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

Measure Data

Port No.:	1	Measure No.:	7	Measure Date:	15-01-2021
Type:	Chassis				
Connector:	Enclosure				
Unwanted signal range:	790MHz - 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
100	✔
176	✔
480	✔
680	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

Measure Data

Port No.:	1	Measure No.:	8	Measure Date:	15-01-2021
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
176	✔
470	✔
680	✔
960	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

Measure Data

Port No.:	1	Measure No.:	9	Measure Date:	15-01-2021
Type:	Chassis				
Connector:	Enclosure				
Unwanted signal range:	2150MHz - 3000MHz			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
100	✔
176	✔
480	✔
680	✔
970	✔
1220	✔
1470	✔
1720	✔
1970	✔

7. Electrostatic discharge immunity test (ESD) for active equipment

Measure

TSP Id.: PEE-INM-010 Date: 12-01-2021

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 60728-2:2018

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 60728-2:2018

Measure D.U.Ts


Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

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 DataPort No.: **1** Measure No.: **1** Measure Date: **12-01-2021**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:  **(A - No loss of Functionality or Activity)**

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

Measure

TSP Id.: PEE-INM-007 Date: 12-01-2021

Title: Electrical fast transient/burst immunity test

Description: 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 60728-2:2018

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 60728-2:2018

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

Environmental ConditionsTemperature: **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.:	2	Measure No.:	1	Measure Date:	12-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector				
D.U.T Position:	Table				
Coupling:	Line to ground / Neutral to ground	Application Mode:	Asynchronous	Polarity:	±
Peak Voltage:	1kV	Level:	2		
Wave form:	5/50	Rise time (Impulse):	5ns	Duration at 50% (Pulse):	50ns
Repetition Frequency (Pulse):	5kHz	Duration (Burst):	15ms	Period (Burst):	300ms
Test Duration:	240s	No. of Burst:	800	No. of Pulses:	60000
Acceptance Criteria:	B -Temporal Loss of Function or Activity with auto recovery				
Result:	✔ (A - No loss of Functionality or Activity)				

9. Surge immunity test

Measure

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

Date: **12-01-2021**

Title: **Surge immunity test**

Description: **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 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**

Standard Limit

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**


Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

Environmental ConditionsTemperature: **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.:	2	Measure No.:	1	Measure Date:	12-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector				
D.U.T Position:	Table				
Level:	3	Peak Voltage:	1kV	Coupling:	Line to Line
Front Length:	1,2µs [U] / 8µs [I]	Time to Half Value:	50µs [U] / 20µs [I]	Time between pulses:	6s
Open circuit Voltage:	1,2/50	Short circuit current:	8/20	No. of Pulses:	40
Gap:	0°, 90°, 180°, 270°	Polarity:	±	Test Duration:	4min
Acceptance Criteria:	B -Temporal Loss of Function or Activity with auto recovery				
Result:	 (A - No loss of Functionality or Activity)				

Measure Data

Port No.:	2	Measure No.:	2	Measure Date:	12-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector				
D.U.T Position:	Table				
Level:	3	Peak Voltage:	2kV	Coupling:	Line to ground / Neutral to ground
Front Length:	1,2µs [U] / 8µs [I]	Time to Half Value:	50µs [U] / 20µs [I]	Time between pulses:	6s
Open circuit Voltage:	1,2/50	Short circuit current:	8/20	No. of Pulses:	80
Gap:	0°, 90°, 180°, 270°	Polarity:	±	Test Duration:	8min
Acceptance Criteria:	B -Temporal Loss of Function or Activity with auto recovery				
Result:	 (A - No loss of Functionality or Activity)				

10. Voltage dips and voltage interruptions immunity tests

Measure

TSP Id.: PEE-INM-009 Date: 12-01-2021

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

Description: 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 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


Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE


Environmental ConditionsTemperature: **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.:	2	Measure No.:	1	Measure Date:	15-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector				
D.U.T Position:	Table				
Supply Voltage:	230V	Supply Frequency:	50Hz		
Class:	2	Test Level:	70%	Peak Voltage:	161V
Event Duration:	500ms	Event Duration (T):	25	Event No.:	3
Time Between Events:	10s	Angle:	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°		
Acceptance Criteria:	C - Loss of Function or Temporary Activity that Requires the Action of the Operator or a System Reset				
Result:	 (B - See performance criteria)				


Measure Data

Port No.:	2	Measure No.:	2	Measure Date:	15-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector				
D.U.T Position:	Table				
Supply Voltage:	230V	Supply Frequency:	50Hz		
Class:	2	Test Level:	0%	Peak Voltage:	0V
Event Duration:	10ms	Event Duration (T):	0.5	Event No.:	3
Time Between Events:	10s	Angle:	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°		
Acceptance Criteria:	B - Temporal Loss of Function or Activity with auto recovery				
Result:	 (A - No loss of Functionality or Activity)				

Measure Data

Port No.:	2	Measure No.:	3	Measure Date:	15-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector				
D.U.T Position:	Table				
Supply Voltage:	230V	Supply Frequency:	50Hz		
Class:	2	Test Level:	0%	Peak Voltage:	0V
Event Duration:	20ms	Event Duration (T):	1	Event No.:	3
Time Between Events:	10s	Angle:	0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°		
Acceptance Criteria:	B - Temporal Loss of Function or Activity with auto recovery				
Result:	 (A - No loss of Functionality or Activity)				

Measure Data

Port No.:	2	Measure No.:	4	Measure Date:	15-01-2021
Type:	Mains Power	Range:	AC	Direction:	Input
Connector:	Power Connector				
D.U.T Position:	Table				
Supply Voltage:	230V	Supply Frequency:	50Hz		
Class:	2	Test Level:	0%	Peak Voltage:	0V
Event Duration:	5000ms	Event Duration (T):	250	Event No.:	3
Time Between Events:	10s	Angle:	0°		
Acceptance Criteria:	C - Loss of Function or Temporary Activity that Requires the Action of the Operator or a System Reset				
Result:	 (B - Temporal Loss of Function or Activity with auto recovery)				

11. Voltage changes, voltage fluctuations and flicker

Measure

TSP Id.: PEE-EMI-011

Date: 12-01-2021

Title: Voltage changes, voltage fluctuations and flicker

Standard

TSP Id.: NOR-COMP-112

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

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

Measure D.U.Ts

Id	Trade Mark	Reference	Model	Manufacturer	D.U.T.
5797	Televes	532131		Televes	AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE

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: **15-01-2021**

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

EUT: AVANTX PRO-SAT FM-4xV/U-SAT 32FILT.AUTOLTE Tested by: EN61000-3-3:2013
 Test category: All parameters (European limits) Test Margin: 100
 Test date: 13/01/21 Start time: 10:32:39 End time: 10:42:59
 Test duration (min): 10 Data file name: F-000445.cts_data
 Comment:
 Customer: Televes

Test Result: Pass

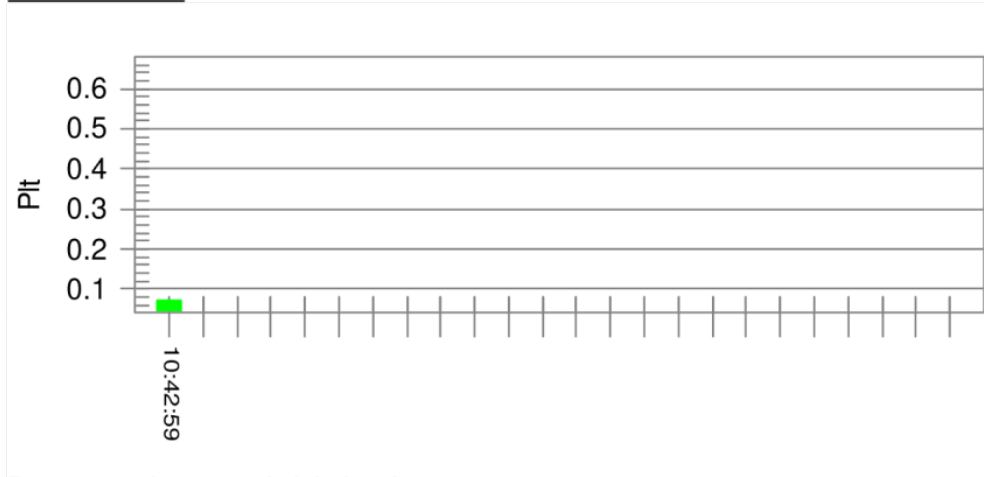
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.92		
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