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EMC TEST REPORT

CLIENT: **Evoke Interactive Kiosks,**
Units 5 & 6 Apex Court,
Bassendale Road,
Bromborough,
Wirral,
CH62 3RE

Report Number: 6676

CONTACT: Mr Neil Clark

ITEM TESTED:	**Interactive Kiosk**	
MODEL NUMBER:	**TDS EV6**	
SERIAL NUMBER:	**Not available**	
OVERALL SPEC:	FCC Part 15	
SPECIFICATIONS:	FCC Part 15 – Section 15.107	Conducted Emissions
	FCC Part 15 – Section 15.109	Radiated Emissions
RESULTS:	Conducted Emissions – Class B	
	Radiated Emissions – Class B	

PREPARED BY: Colin Howes **SIGNED:**

DATE REPORT WRITTEN: 30th July 2012 **DATE OF TESTING: 16th July 2012**

TEST SUMMARY

Title: EMC Test Report on: TDS EV6

Test Ref:	**Exp 453**	**Client:**	**Evoke Interactive Kiosks,**
Test Date(s):	**16th July 2012**	**Address:**	**Units 5 & 6 Apex Court, Bassendale Road, Bromborough, Wirral, CH62 3RE**
Authority:	**-**		
Sample Received:	**16th July 2012**		
Sample Returned:	**-**	**Contact:**	**Mr Neil Clark**

Test Objective/Specification:

The objective of the tests is to determine the emissions and immunity of the EUT. The specifications required are: FCC Part 15, which call up:

FCC Part 15 – Section 15.107 Conducted Emissions
FCC Part 15 – Section 15.109 Radiated Emissions

System Description: Interactive Kiosk

The Results in this Report Only Apply to the Samples Submitted for Test.

Summary of Test Results:

The EUT meets the requirements for Conducted Emissions – FCC Part 15 – Section 15.107 - Class B
The EUT meets the requirements for Radiated Emissions – FCC Part 15 – Section 15.109 - Class B

Notes:-

1. During all radiated emissions testing the EUT was connected to a 110V AC, 60Hz supply.

1 Conducted Emissions – Mains

1.1 Test Method

The conducted emissions of the unit submitted for tests were assessed within an RF shielded enclosure in accordance with the Class B limits given in FCC Part 15 – Section 15.107. A receiver was used in conjunction with an artificial mains network (AMN) to measure the conducted noise content on the mains supply. Initially two peak scans were performed, on each live and neutral line. Those measurement points exceeding the average limit were then re-measured with average and quasi-peak detectors where necessary.

1.2 Test Configuration

The EUT was powered up and exercised as in normal operation. (Picture 1)

1.3 Test Details and Results

Tests were performed within an RF shielded enclosure over a frequency range of 150 kHz – 30 MHz in order to determine if any conducted emissions were in excess or close to the specified limits.

Plot Number	Description	Frequency Range	Result
1	110V AC 60Hz Operation	150kHz – 30 MHz	Pass (Class B – Peak)
2	230V AC 50Hz Operation	150kHz – 30 MHz	Pass (Class B – Peak)

Pic 1. EUT positioned in RF Shielded Enclosure – Conducted Emissions Measurement

2 Radiated Emissions – 30MHz to 1000MHz

2.1 Test Method

The radiated emissions of the unit submitted for tests were assessed within an RF shielded enclosure in accordance with the Class B limits of FCC Part 15 – Section 15.109. A receiver was used in conjunction with a computer to measure the radiated noise content with peak measurements taken. Any measurement peaks found exceeding or within 6dB of the limit were measured in quasi-peak mode.

2.2 Test Configuration

The EUT was powered up and exercised as in normal operation. If any reading was at least 6 dB below the recorded limit no further QP measurement was made. If the reading was greater than or within 6 dB of the recorded limit, a narrow band QP measurement was made (Picture 2).

2.3 Test Details and Results

Tests were performed over a frequency range of 30 – 1000 MHz in order to determine if any radiated emissions were in excess or close to the specified limits.

Plot Numbers	Description	Antenna Position	Frequency Range	Result
3 to 6	Operational	3 m	30 – 1000 MHz	Pass (Peak - Class B)

Pic 2. EUT positioned in RF Shielded Enclosure

3 Radiated Emissions

3.1 Test Method

The radiated emissions of the unit submitted for tests were assessed within an RF shielded enclosure in accordance with the Class B limits of FCC Part 15 – Section 15.109. A receiver was used in conjunction with a computer to measure the radiated noise content with peak measurements taken. Any measurement peaks found exceeding or within 6dB of the limit were measured in quasi-peak mode.

3.2 Test Configuration

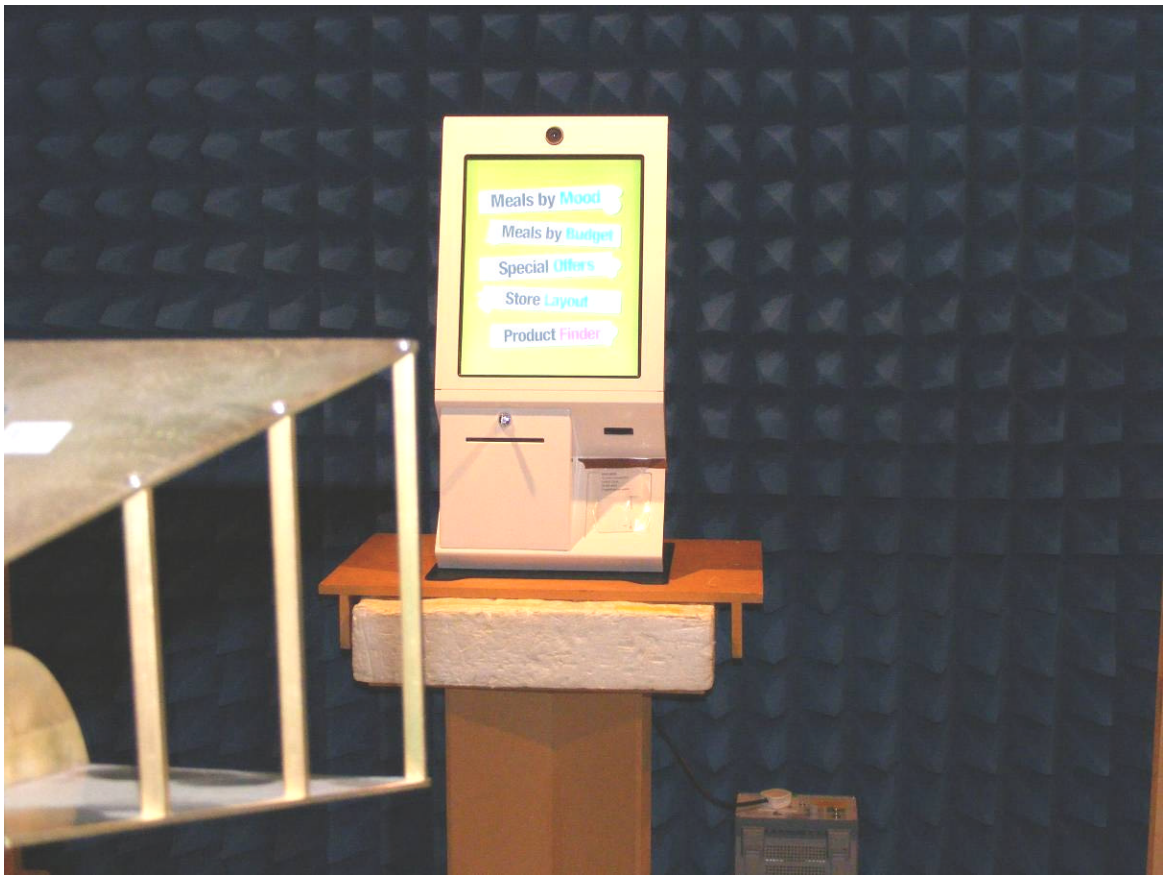
The EUT was powered up and exercised as in normal operation. If any reading was at least 6 dB below the recorded limit no further QP measurement was made. If the reading was greater than or within 6 dB of the recorded limit, a narrow band QP measurement was made (Picture 3).

3.3 Test Details and Results

Tests were performed over a frequency range of 1000 to 2000 MHz in order to determine if any radiated emissions were in excess or close to the specified limits.

Plot Numbers	Description	Antenna Position	Frequency Range	Result
7 to 10	Operational	3 m	1000 - 2000MHz	Pass (Peak - Class B)

Pic 3. EUT positioned in RF Shielded Enclosure



4 Test Equipment Used.

The list below indicates the equipment used during the EMC testing. An X indicates item of equipment was used.

Equipment Details	Used
Rohde and Schwarz EMC Receiver – ESHS 10	X
Rohde and Schwarz EMC Receiver – ESVS 10	X
Rohde and Schwarz EMC Receiver – ESPC	X
Rohde and Schwarz ESH3-Z5 LISN	X
ETPS EAC – SMM05R Single Phase AC Source	X
Rohde and Schwarz SMY 02 Signal generator	
Rohde and Schwarz SMT 03 Signal generator	
TTi – HA1600 Harmonics, Flicker and Power Analyser	
TTi - 1000A Low distortion power supply	
Schaffner NSG 453 ESD Simulator	
Emco 3143 Broadband Antenna	X
Kalmus 737LC RF Power amp	
AH Systems SAS571 Double Ridged Horn Antenna	X
Milmega AS0825-18 RF Power Amplifier	
Holiday HI 6005 Isotropic Field Probe	
Fischer Injection Clamp – F-120-9A	
Weinschel 24-6-34 6dB attenuator	
RML-CDN S46ST6 - Network	
Rohde and Schwarz T Network	
Schaffner CDN M2/M3	
Schaffner CDN USB/pS	
Schaffner CDN T4S	
EXP Fast transient Clamp	
Schaffner Best – Surge, Voltage Dips / Interruptions Generator	
H.P. 54502A Digitizing oscilloscope	
Elditest GE8115 high impedance, high voltage differential probe.	
EM-6403-2 Helmoltz Coil - 3ft diameter	

Glossary of Terms Used in this Report

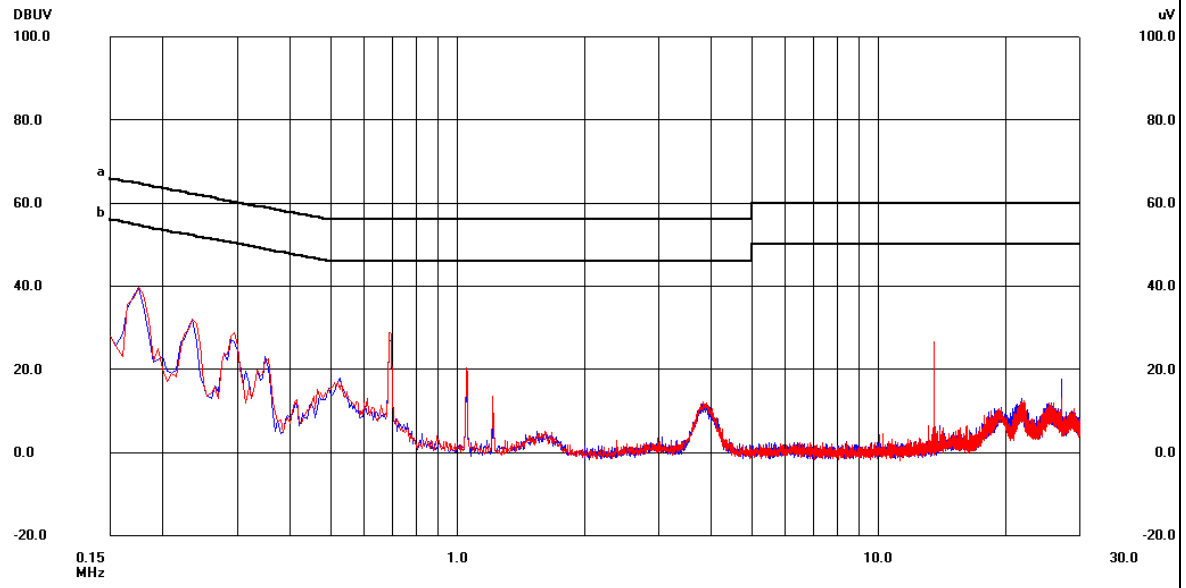
EUT	Equipment under Test
MHz	Hz x E6
GHz	Hz x E12
KHz	Hz x E3
PFC	Power Factor Correction (Cos. 0)
A	Amperes
V	Volts
kV	Kilo-volts
H	Henries (Inductance)
C	Farads (Capacitance)
mH	H x E -3
µH	H x E -6
mF	C x E -3
µF	C x E -6
Rt	Rise Time
Pw	Pulse Width
Ft	Fall Time
S	Seconds
mS	S x E-3
µS	S x E -6
dB/µv	Decibel/micro-volts. Ratio with 1 µv Reference
P	Peak
QP	Quasi Peak
Av	Average

Appendix 1 – Test Results

Conducted Emissions

Plot 1 – Conducted Emissions on the Mains Supply – TDS EV6
Peak Measurement - 110V AC – 60Hz
Live Line – Red / Neutral Line - Blue

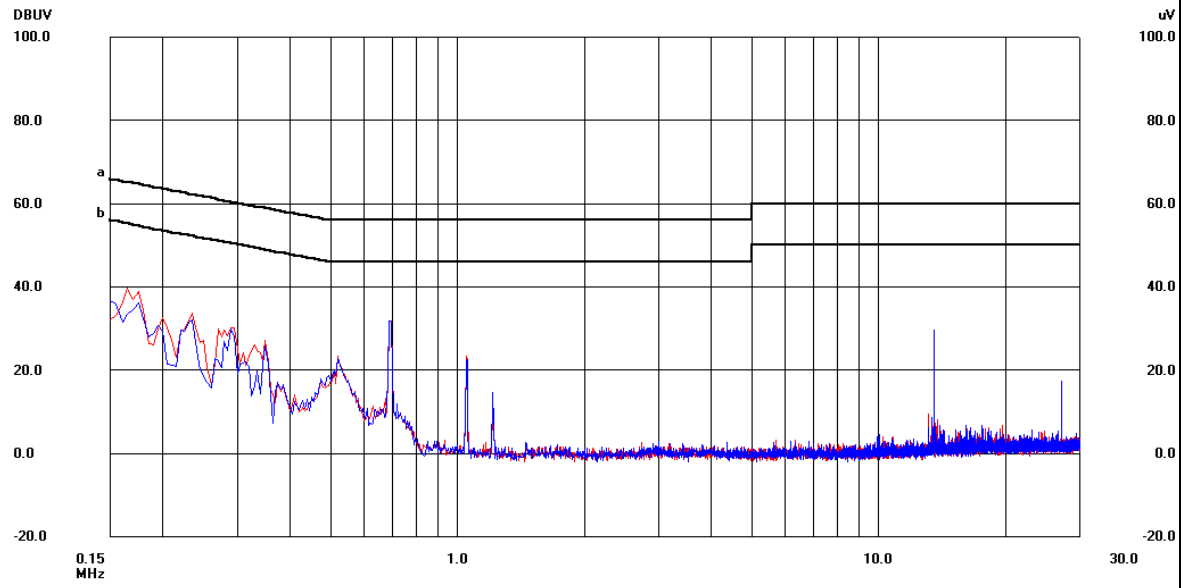
Limits: FCC Part 15 - Class B



Result: PASS

Plot 2 – Conducted Emissions on the Mains Supply – TDS EV6
Peak Measurement - 230V AC – 50Hz
Live Line – Red / Neutral Line - Blue

Limits: FCC Part 15 - Class B

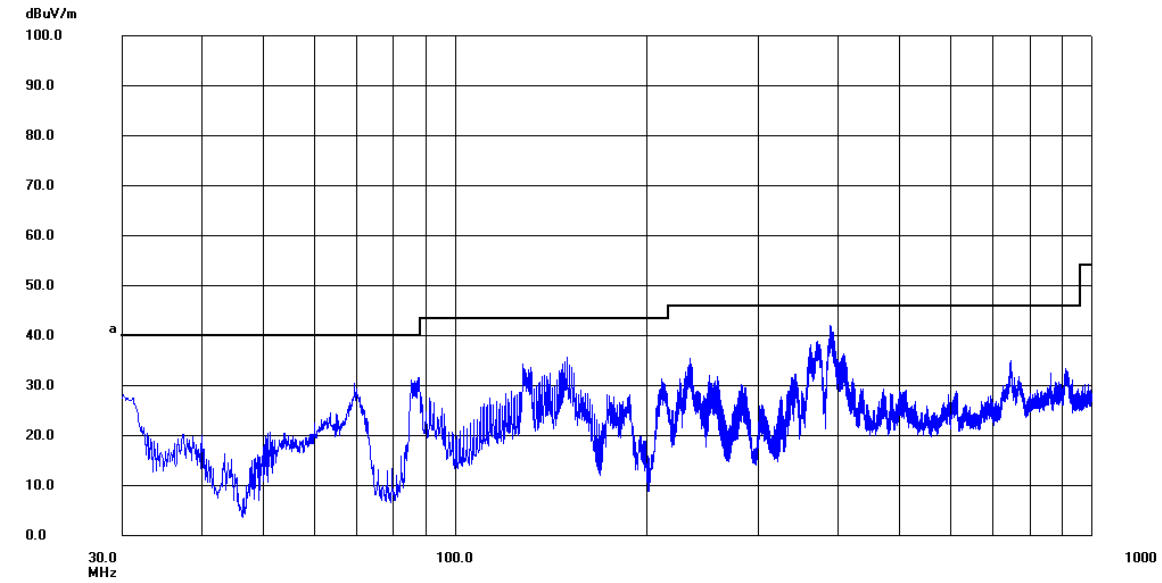


Result: PASS

Radiated Emissions

Plot 3 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Vertical Polarisation – Front Elevation
30 – 1000MHz

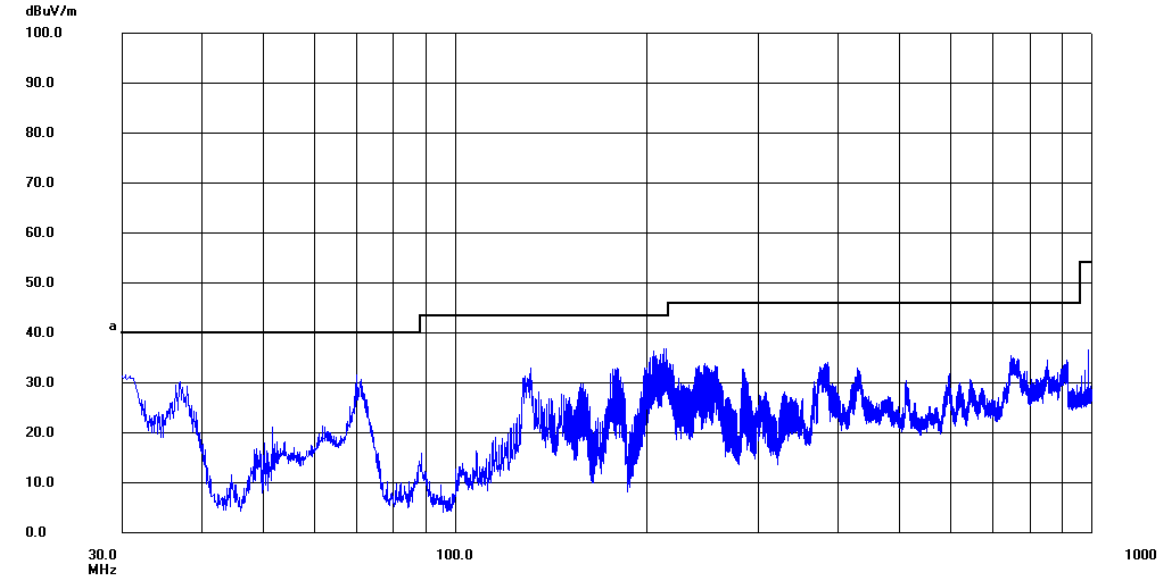
Mode: E.U.T. active
Limits: FCC Part 15 - Class B



Result: Pass

Plot 4 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Horizontal Polarisation – Front Elevation
30 – 1000MHz

Mode: E.U.T. active
Limits: FCC Part 15 - Class B

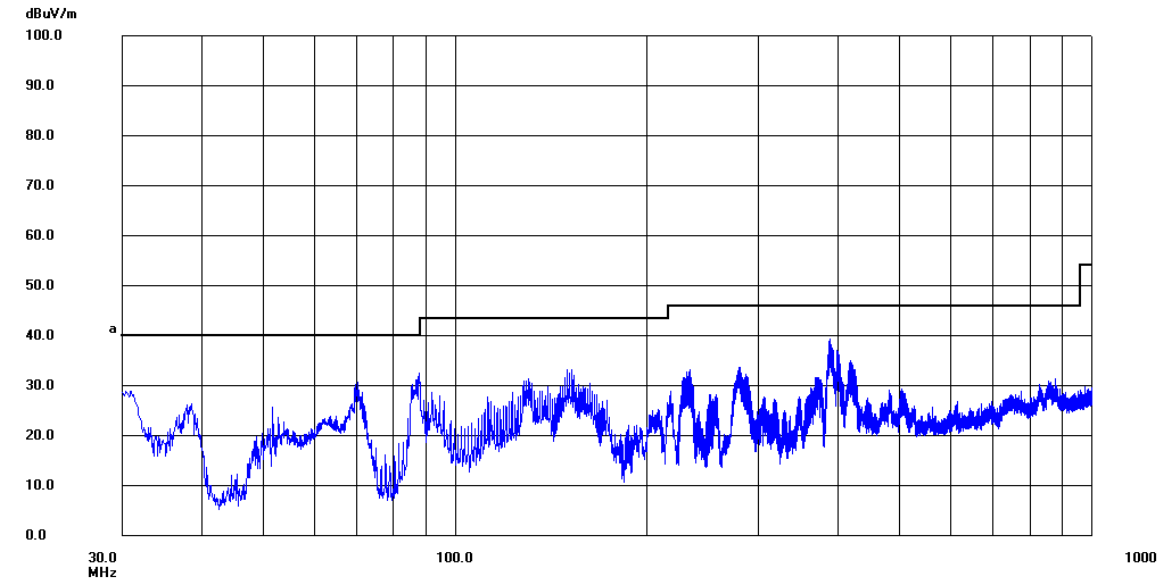


Result: Pass

Radiated Emissions – cont'

Plot 5 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Vertical Polarisation – Side Elevation
30 – 1000MHz

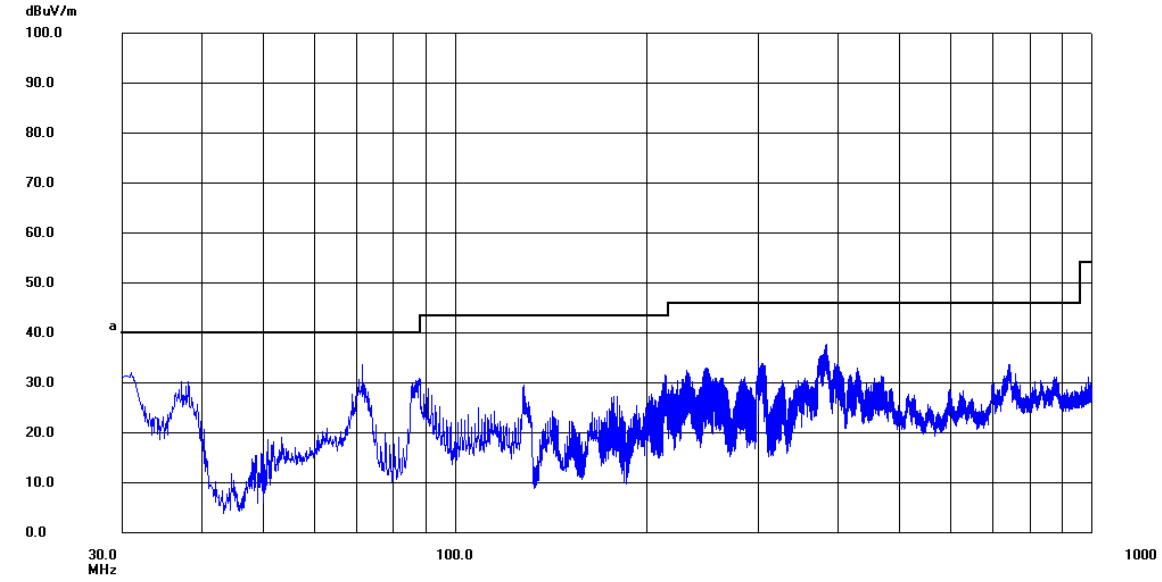
Mode: E.U.T. active
Limits: FCC Part 15 - Class B



Result: Pass

Plot 6 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Horizontal Polarisation – Side Elevation
30 – 1000MHz

Mode: E.U.T. active
Limits: FCC Part 15 - Class B

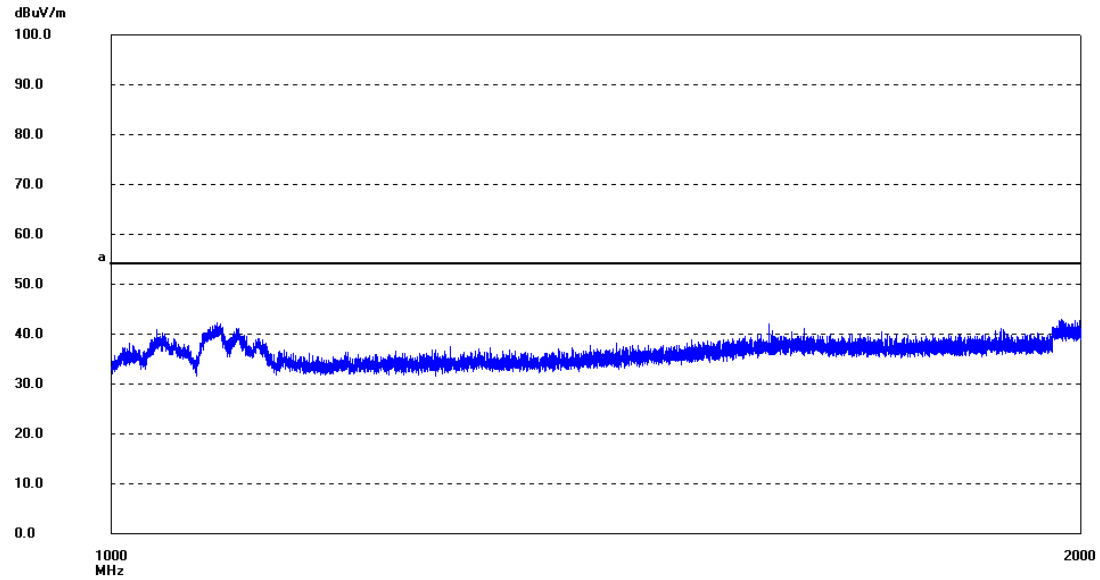


Result: Pass

Radiated Emissions – cont'

Plot 7 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Vertical Polarisation – Front Elevation
1000 - 2000MHz

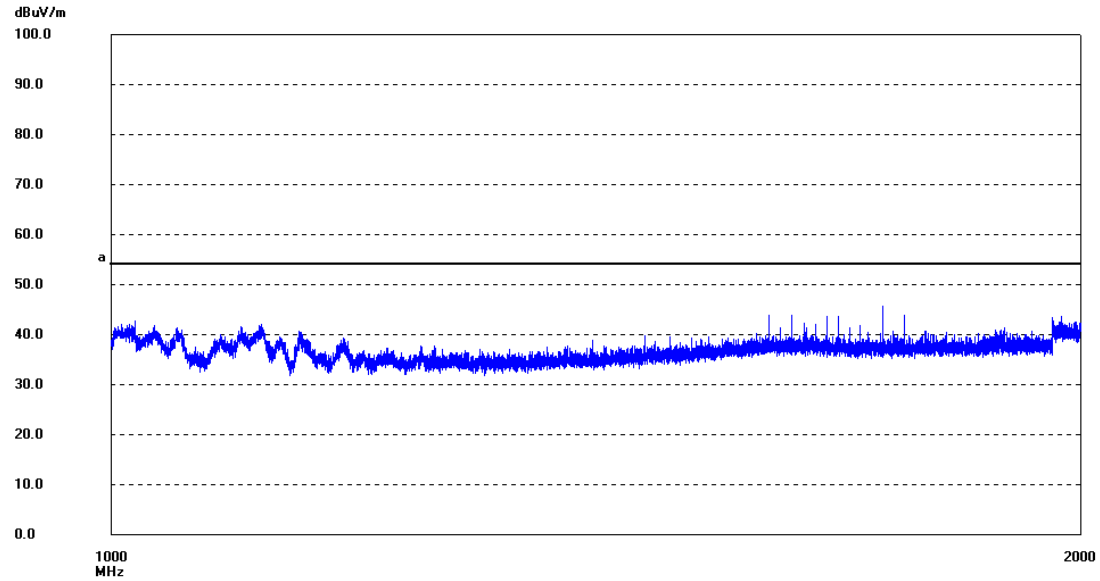
Mode: E.U.T. active
Limits: FCC Part 15 - Class B



Result: Pass

Plot 8 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Horizontal Polarisation – Front Elevation
1000 - 2000MHz

Mode: E.U.T. active
Limits: FCC Part 15 - Class B

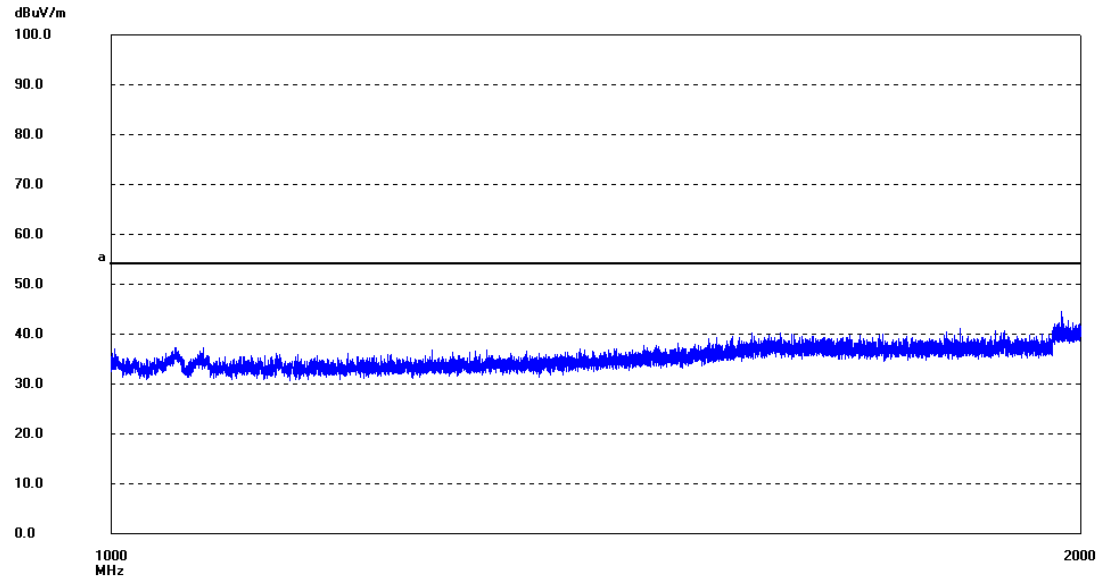


Result: Pass

Radiated Emissions – cont'

Plot 9 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Vertical Polarisation – Side Elevation
1000 - 2000MHz

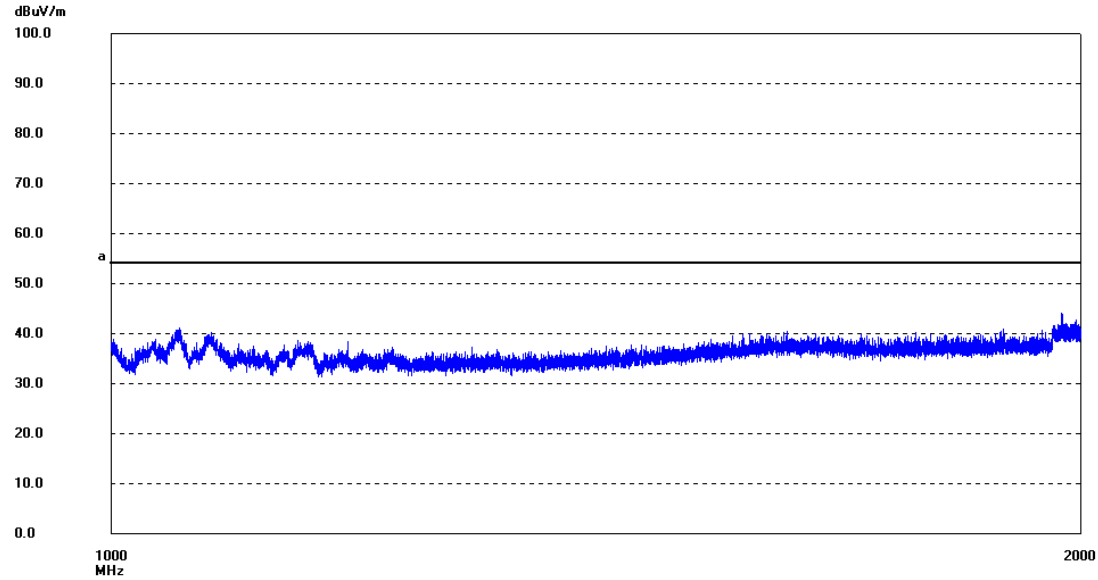
Mode: E.U.T. active
Limits: FCC Part 15 - Class B



Result: Pass

Plot 10 – Radiated Emissions – TDS EV6 – 110V AC – 60Hz
Peak measurement – Horizontal Polarisation – Side Elevation
1000 - 2000MHz

Mode: E.U.T. active
Limits: FCC Part 15 - Class B



Result: Pass

End of Report