

FCC PART 15B

TEST REPORT

For

INGENICO

9 Avenue de la gare - Rolvatain TGV, Valence Cedex 9, 26958, France

FCC ID: XKB-APOSA8WULEWF

Report Type: Original Report	Product Type: Smart POS Terminal
Report Number:	RXM200310053-00E
Report Date:	2020-04-18
Reviewed By:	Ivan Cao Assistant Manager 
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		Smart POS Terminal
EUT Model:		APOS A8
Highest Operation Frequency:		2690 MHz
Rated Input Voltage:		DC 7.2V from battery or DC 5V from Adapter
Adapter Information:	Model:	P12GUSB050200
	Input:	AC 100-240V, 50/60Hz, 0.3A
	Output:	DC 5.0V, 2.0A
Serial Number:		RXM200310053-RF-S4
EUT Received Date:		2020.03.15
EUT Received Status:		Good

Note: The EUT have two configuration, the information as below, and more please refer to the Product similarity declaration:

EUT Configuration	Screen Model	Manufacturer	Serial Number
#1	MDT0550B	SKYWORTH LCD MODULES(SHENZHEN) CO., LTD	RXM200310053-RF-S4
#2	MDT0550B	TIANMA MICRO-ELECTRONICS Corporation	RXM200310053-RF-S5

Objective

This report is prepared on behalf of *INGENICO* in accordance with Part 2, Subpart J, and Part 15-Subparts A and B of the Federal Communications Commission's rules.

The objective is to determine the compliance of EUT with: FCC Part 15B Class B.

Related Submittal(s)/Grant(s)

FCC Part 15C DSS,DTS, DXX and Part 22H,24E, 27 submissions with
FCC ID: XKB-APOSA8WULEWF

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB, 200M~1GHz: 5.92 dB, 1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 dB
Temperature	±1℃
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “△”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in typical fashion (as normally used by a typical user)

The test mode configuration as below, and all modes was performed test, and typical worst mode was reported in the report.

Test Mode	EUT Configuration	Operating Configuration
1	#1	Printing
2		Video Playing
3		Camera Recording
4		Card Testing
5	#2	Printing
6		Video Playing
7		Camera Recording
8		Card Testing

The batteries made by SCUD(Fujian) Electronics Co., Ltd or Xinyu Ganfeng Electronics Co., Ltd, have been pretested and proved that the battery has no effect.

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No Software was used in test.

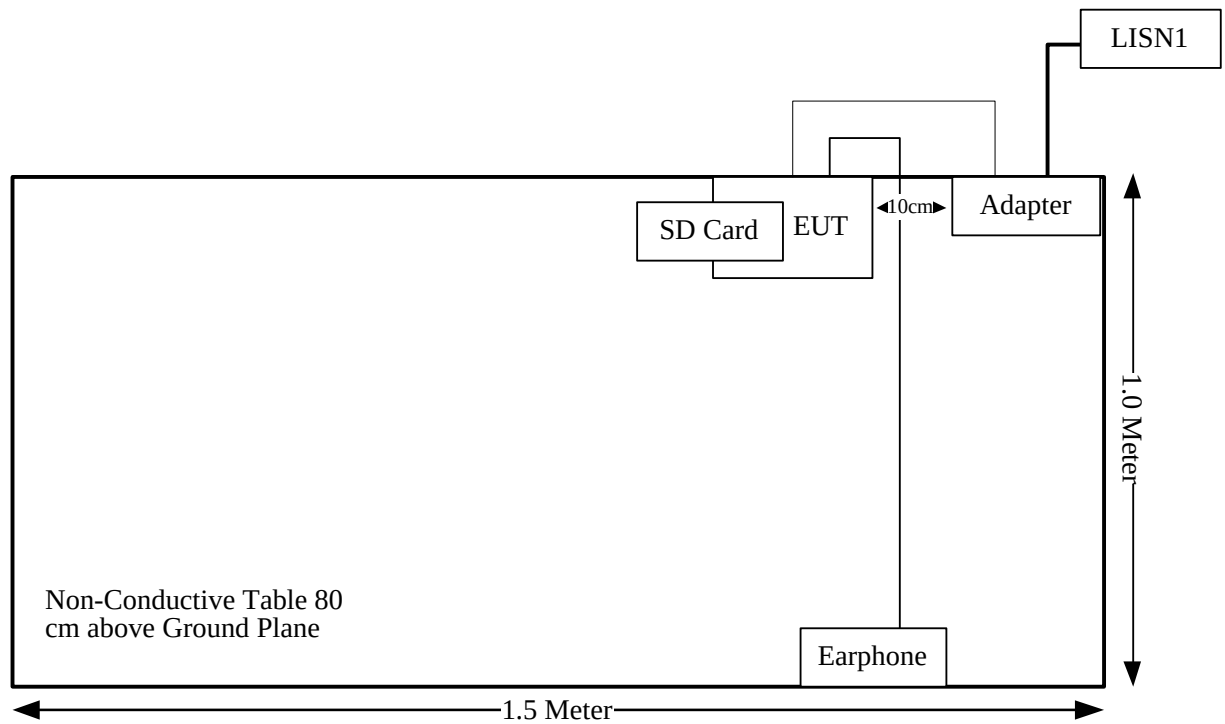
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
1MORE	earphone	1m301	5521427
Kinston	SD Card	4G	0084G

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Earphone Cable	No	No	1.2	EUT	Earphone
USB Cable	No	No	0.8	Adapter	EUT

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emissions					
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	LISN	ENV 216	101614	2019-09-12	2020-09-12
R&S	EMI Test Receiver	ESCI	101121	2019-05-09	2020-05-09
Radiated emissions Below 1GHz					
R&S	EMI Test Receiver	ESR3	102453	2019-09-12	2020-09-12
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05
Radiated emissions Above 1GHz					
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2019-09-05	2020-09-05

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

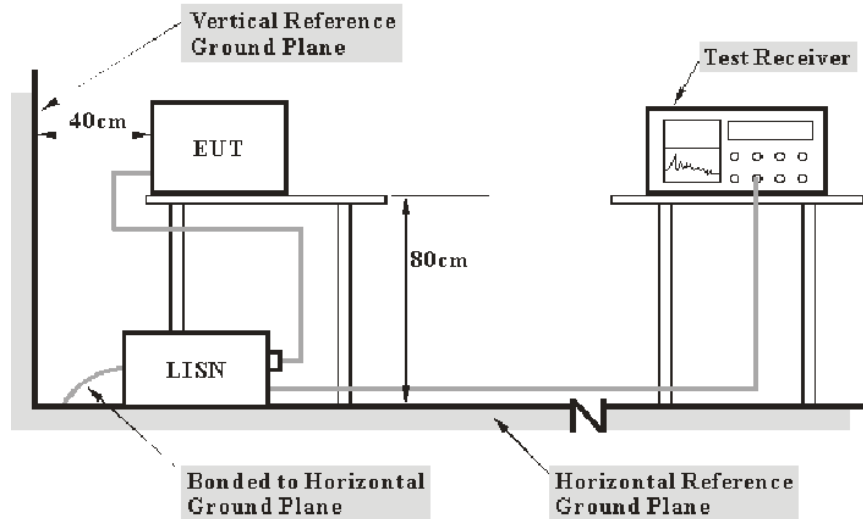
Test Item:	Conducted emissions	Radiated emissions (Below 1GHz)	Radiated emissions (Above 1GHz)
Temperature:	21.3°C	24.1°C	24.8°C
Relative Humidity:	65%	51%	49%
ATM Pressure:	101.4kPa	101.4 kPa	101.1 kPa
Tester:	Sem Xiang	Jackson Zhang	Vern Shen
Test Date:	2020-04-01	2020-03-30	2020-03-24

SUMMARY OF TEST RESULTS

Rule and Clause	Description of Test	Test Result
FCC §15.107	Conducted emissions	Compliance
FCC §15.109	Radiated emissions	Compliance

CONDUCTED EMISSIONS

EUT Setup



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

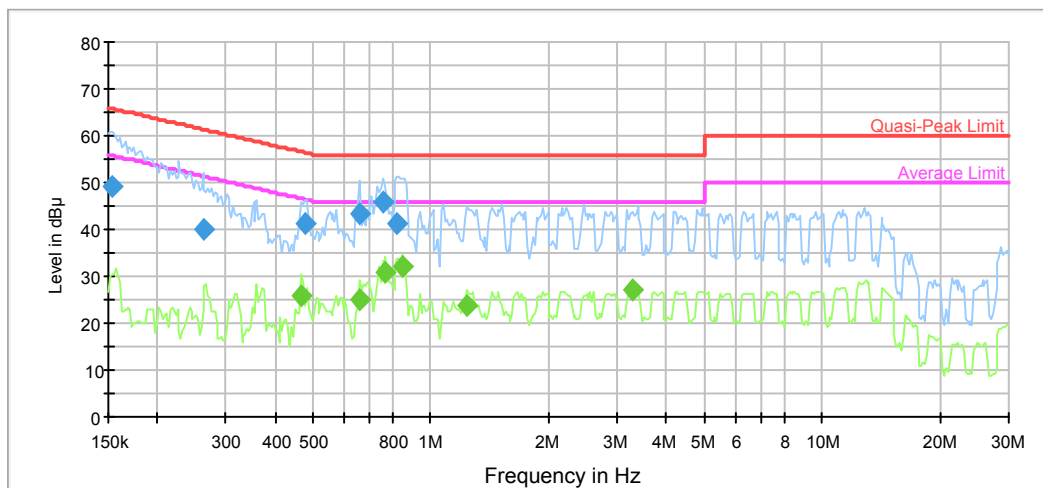
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Data

Please refer to following table and plots:

Model Number: APOS A8
 Port: L
 Test Mode: M1
 Power Source: AC 120V/60Hz



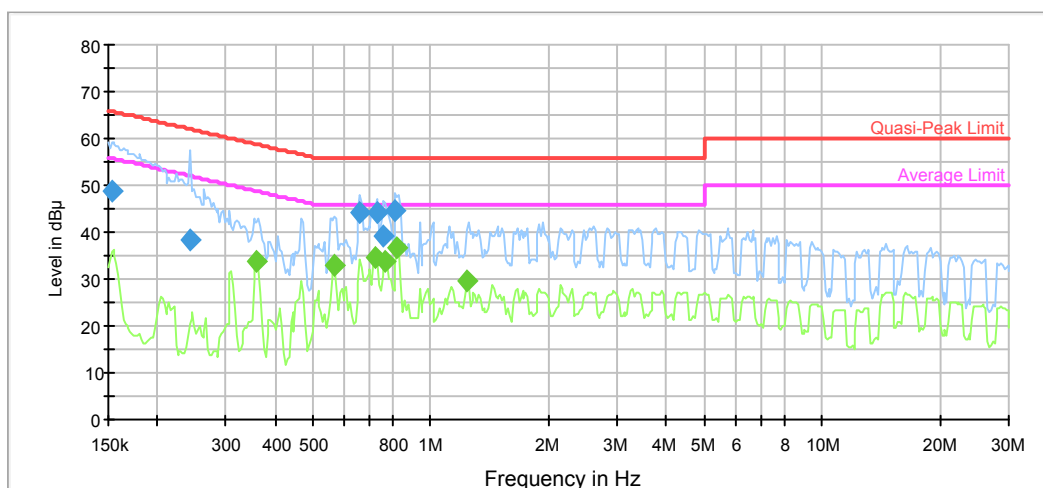
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.153015	49.3	9.000	L1	9.7	16.5	65.8
0.261872	40.1	9.000	L1	9.7	21.3	61.4
0.475741	41.3	9.000	L1	9.7	15.1	56.4
0.660657	43.4	9.000	L1	9.7	12.6	56.0
0.759409	46.0	9.000	L1	9.7	10.0	56.0
0.822331	41.5	9.000	L1	9.7	14.5	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.466367	25.9	9.000	L1	9.7	20.7	46.6
0.660657	25.0	9.000	L1	9.7	21.0	46.0
0.767003	30.8	9.000	L1	9.7	15.2	46.0
0.847248	32.1	9.000	L1	9.7	13.9	46.0
1.236582	23.6	9.000	L1	9.7	22.4	46.0
3.278819	26.9	9.000	L1	9.8	19.1	46.0

Model Number: APOS A8
Port: N
Test Mode: M1
Power Source: AC 120V/60Hz



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.153015	48.7	9.000	N	9.7	17.2	65.8
0.241834	38.2	9.000	N	9.7	23.8	62.0
0.660657	44.0	9.000	N	9.6	12.0	56.0
0.729777	44.2	9.000	N	9.6	11.8	56.0
0.759409	39.2	9.000	N	9.6	16.8	56.0
0.814189	44.6	9.000	N	9.6	11.4	56.0

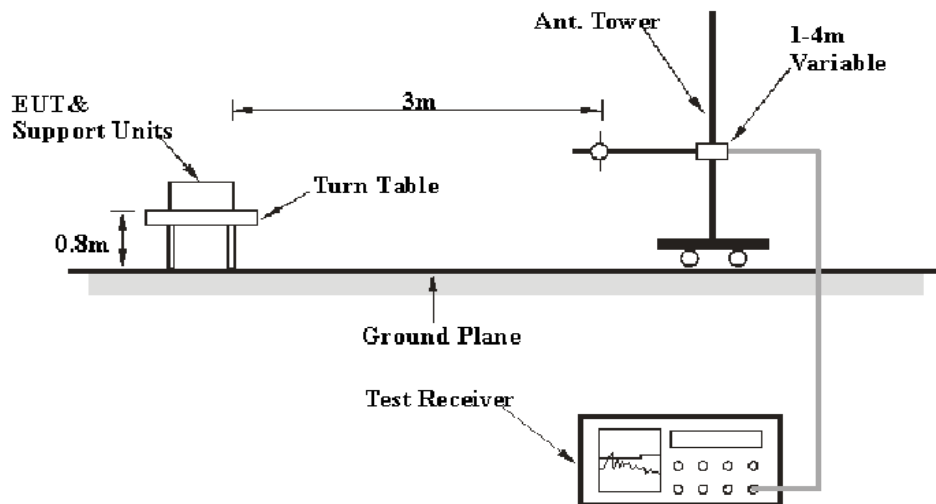
Final Result 2

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.360058	33.6	9.000	N	9.6	15.1	48.7
0.569057	32.9	9.000	N	9.6	13.1	46.0
0.722551	34.8	9.000	N	9.6	11.2	46.0
0.767003	33.6	9.000	N	9.6	12.4	46.0
0.822331	36.6	9.000	N	9.6	9.4	46.0
1.236582	29.4	9.000	N	9.6	16.6	46.0

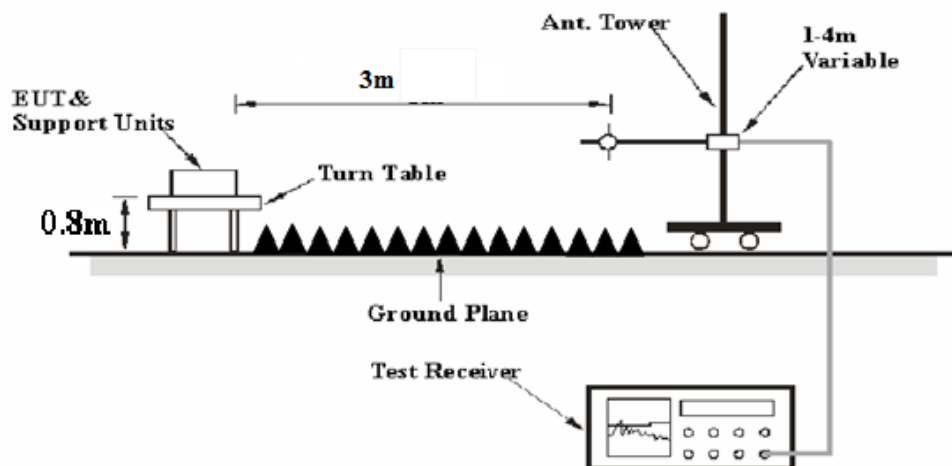
RADIATED EMISSIONS

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission below 1GHz tests were performed in the 3 meters chamber test site A, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 13.5 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	10Hz	/	AVG

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

During the radiated emissions, the adapter was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

All emissions under the average limit and under the noise floor have not recorded in the report.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Corrected

Note:

Corrected = Antenna Factor + Cable Loss - Amplifier Gain

or

Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - Amplifier Gain

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

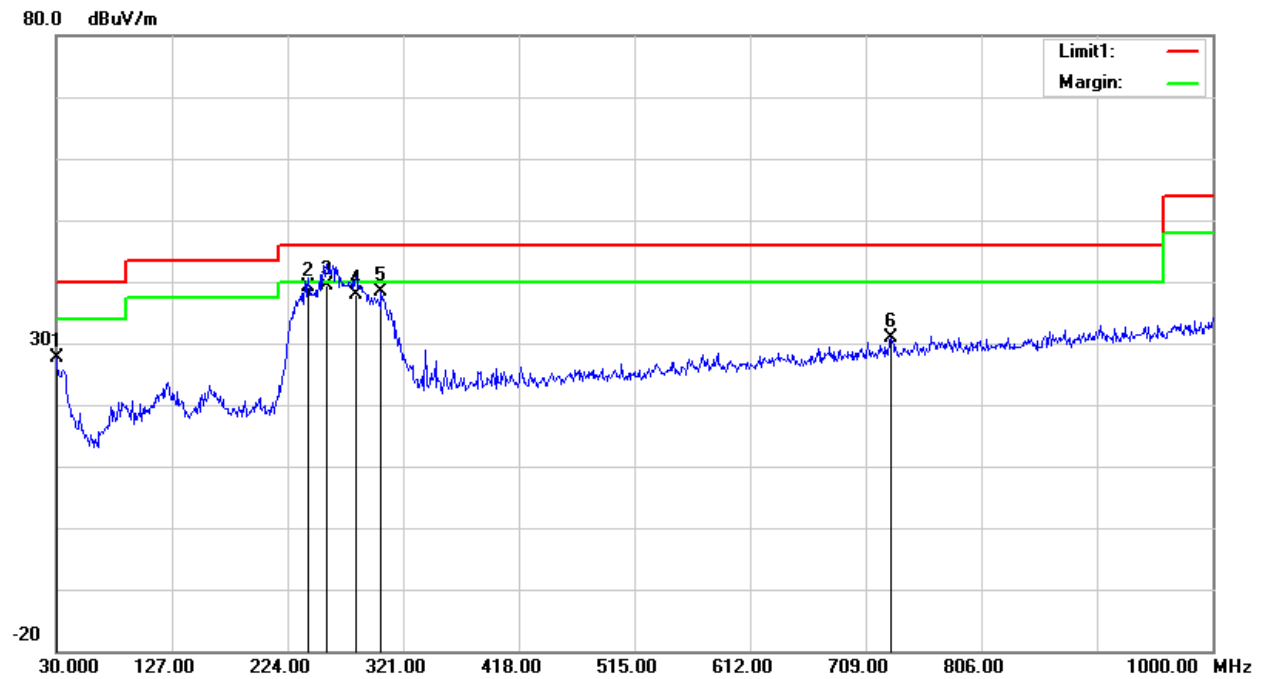
$$\text{Margin} = \text{Limit} - \text{Result}$$

Test Data

Please refer to following table and plots:

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M1

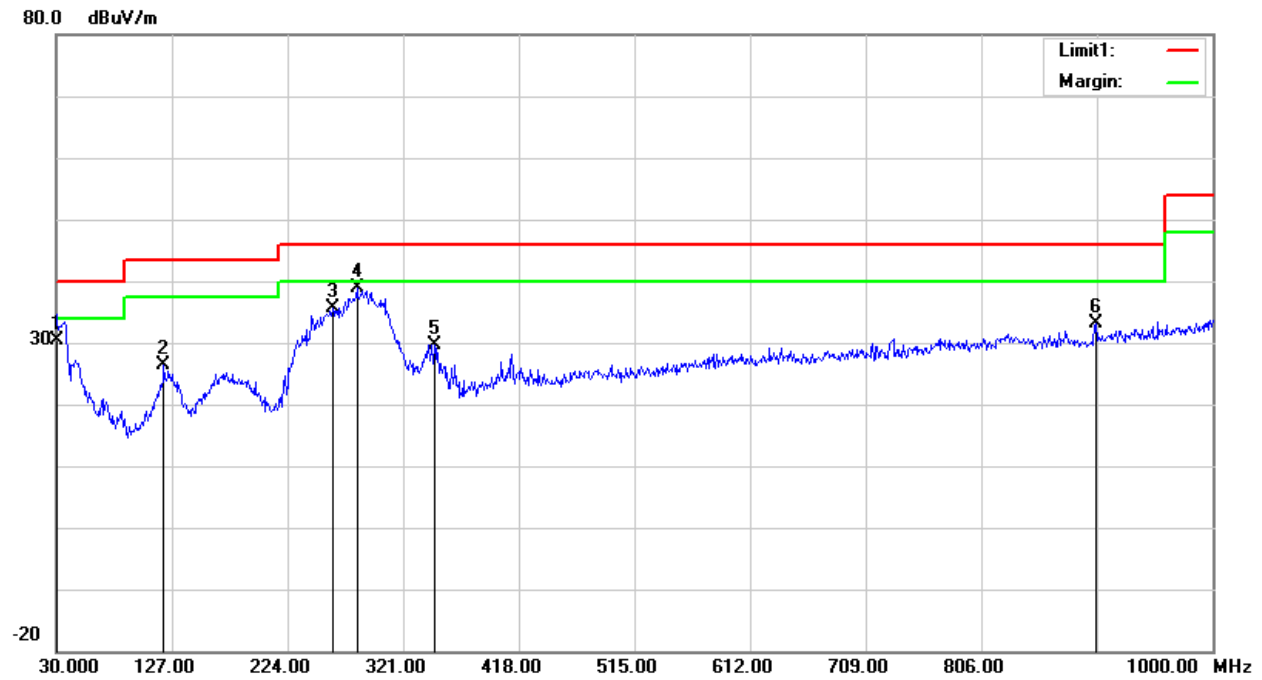
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	30.0000	25.82	peak	1.72	27.54	40.00	12.46
2	241.4600	45.00	QP	-5.97	39.03	46.00	6.97
3	256.9800	45.20	QP	-5.75	39.45	46.00	6.55
4	281.2300	42.00	QP	-4.12	37.88	46.00	8.12
5	302.5700	42.04	peak	-3.75	38.29	46.00	7.71
6	730.3400	27.61	peak	3.28	30.89	46.00	15.11

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M1

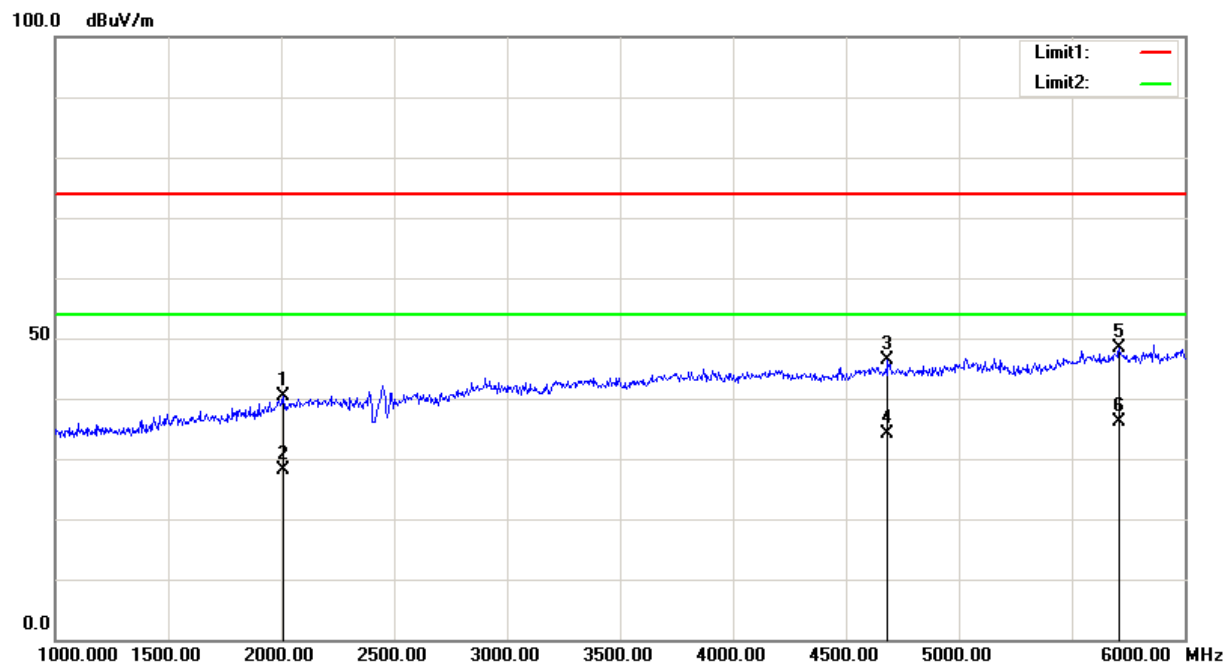
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	30.0000	28.70	QP	1.72	30.42	40.00	9.58
2	120.2100	31.09	peak	-4.83	26.26	43.50	17.24
3	261.8300	40.47	peak	-4.94	35.53	46.00	10.47
4	282.2000	43.03	peak	-4.09	38.94	46.00	7.06
5	347.1900	32.87	peak	-3.15	29.72	46.00	16.28
6	902.0300	32.95	peak	0.14	33.09	46.00	12.91

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M1

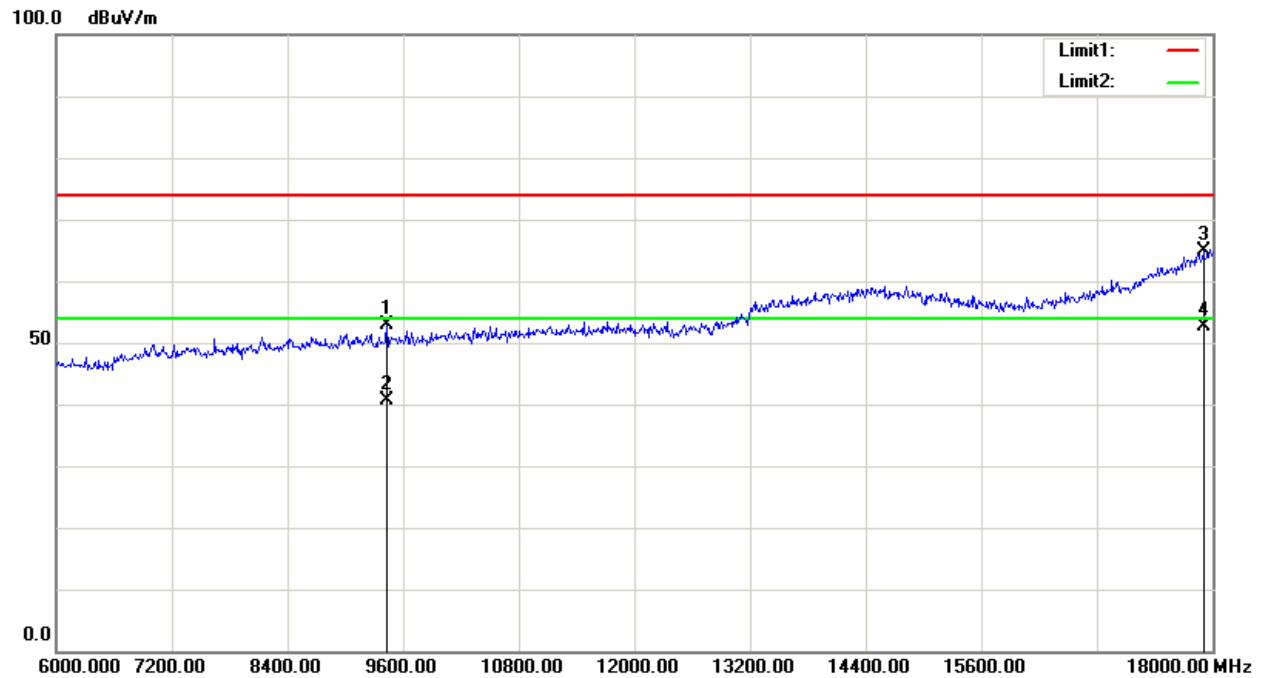
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	2010.000	36.68	peak	3.71	40.39	74.00	33.61
2	2010.000	24.43	AVG	3.71	28.14	54.00	25.86
3	4687.500	36.27	peak	10.00	46.27	74.00	27.73
4	4687.500	24.13	AVG	10.00	34.13	54.00	19.87
5	5712.500	35.27	peak	13.04	48.31	74.00	25.69
6	5712.500	23.16	AVG	13.04	36.20	54.00	17.80

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M1

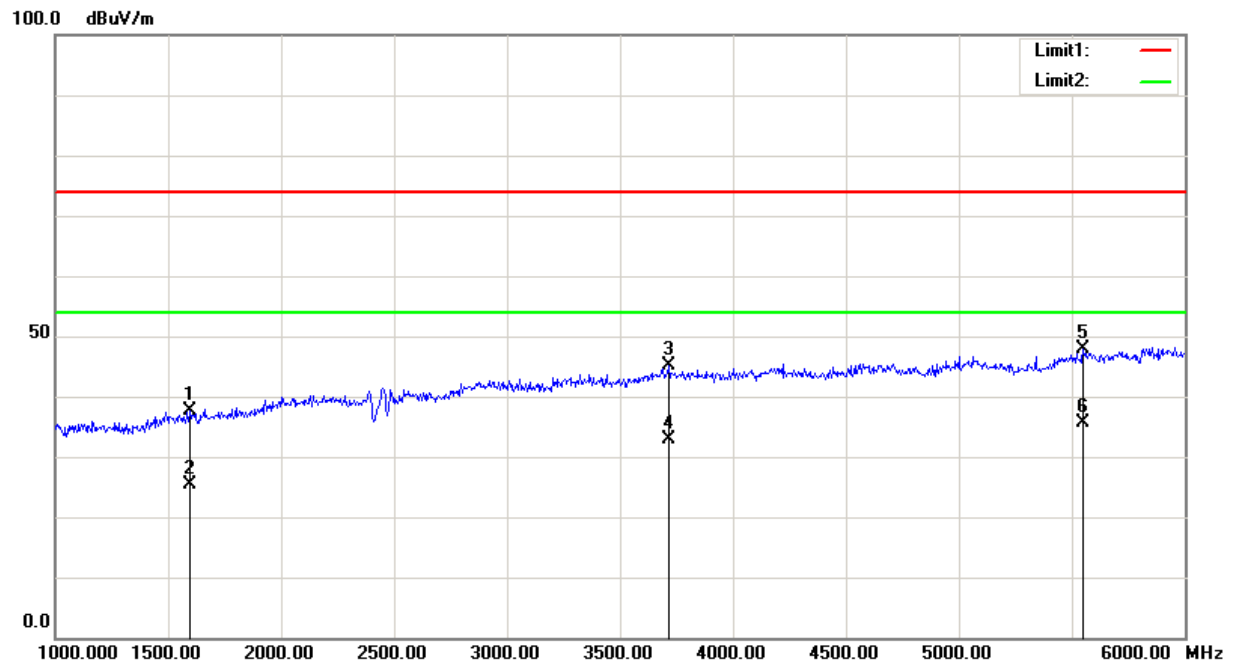
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	9438.000	34.77	peak	18.09	52.86	74.00	21.14
2	9438.000	22.56	AVG	18.09	40.65	54.00	13.35
3	17904.000	33.79	peak	31.20	64.99	74.00	9.01
4	17904.000	21.44	AVG	31.20	52.64	54.00	1.36

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M1

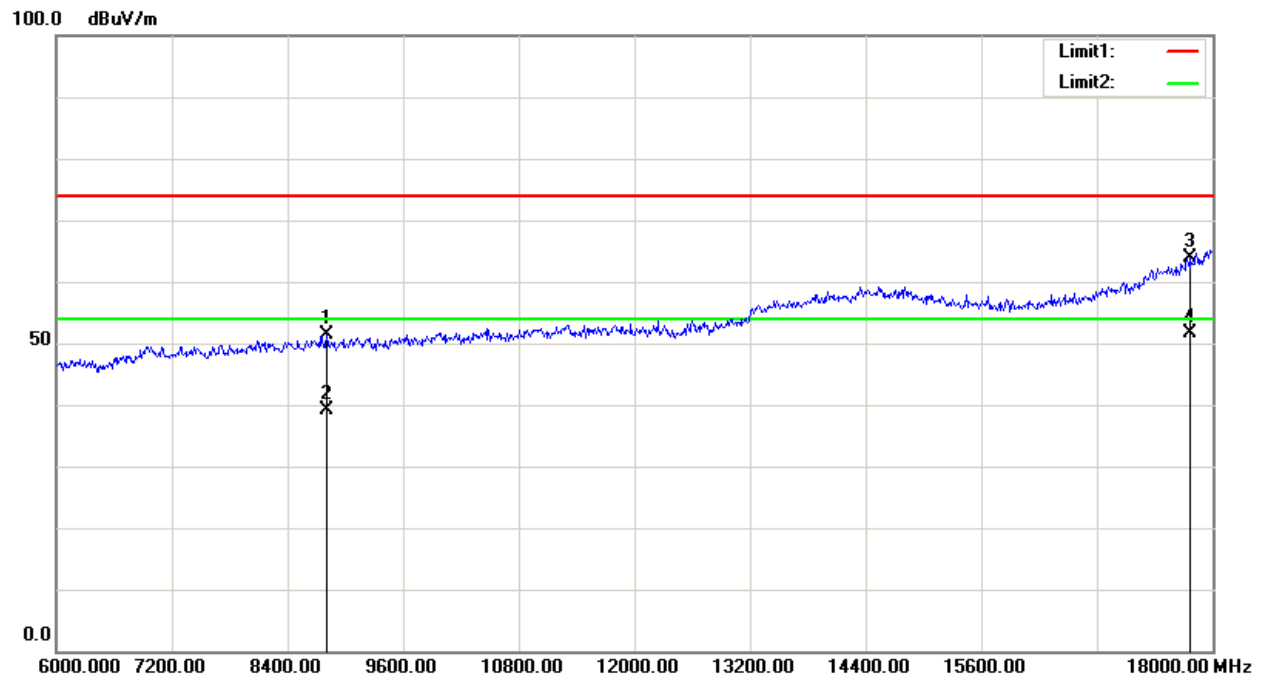
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	1597.500	36.13	peak	1.43	37.56	74.00	36.44
2	1597.500	24.05	AVG	1.43	25.48	54.00	28.52
3	3715.000	36.58	peak	8.44	45.02	74.00	28.98
4	3715.000	24.37	AVG	8.44	32.81	54.00	21.19
5	5550.000	35.34	peak	12.44	47.78	74.00	26.22
6	5550.000	23.19	AVG	12.44	35.63	54.00	18.37

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M1

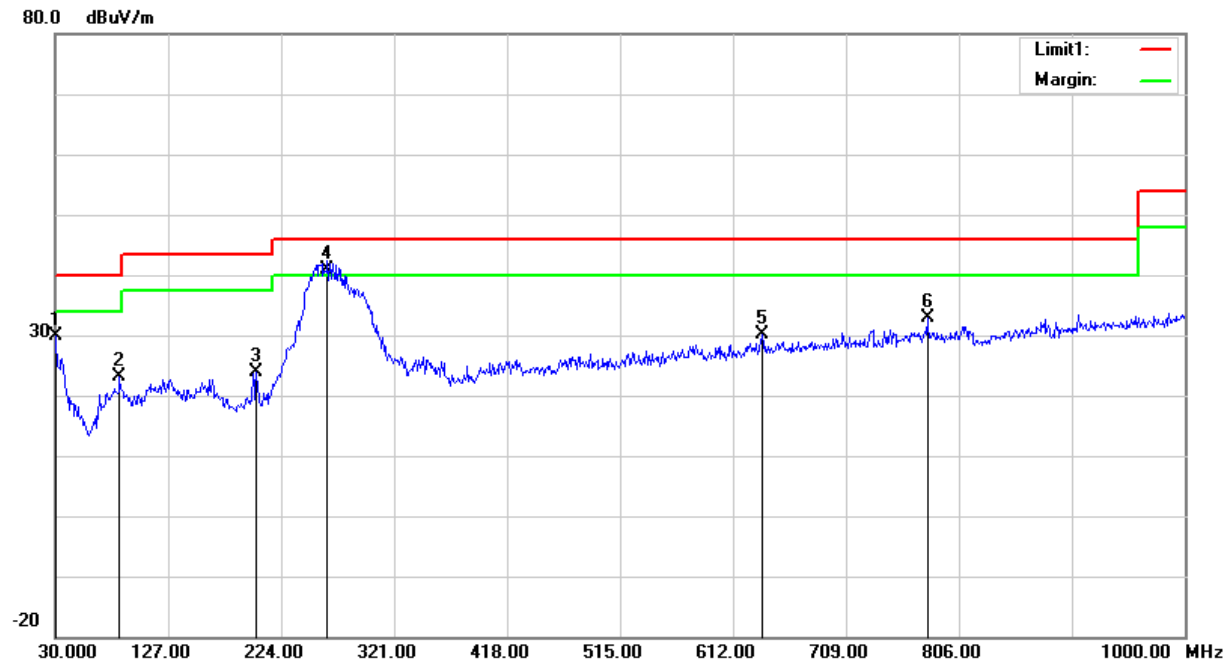
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	8814.000	34.33	peak	17.04	51.37	74.00	22.63
2	8814.000	22.16	AVG	17.04	39.20	54.00	14.80
3	17778.000	33.51	peak	30.36	63.87	74.00	10.13
4	17778.000	21.26	AVG	30.36	51.62	54.00	2.38

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M5

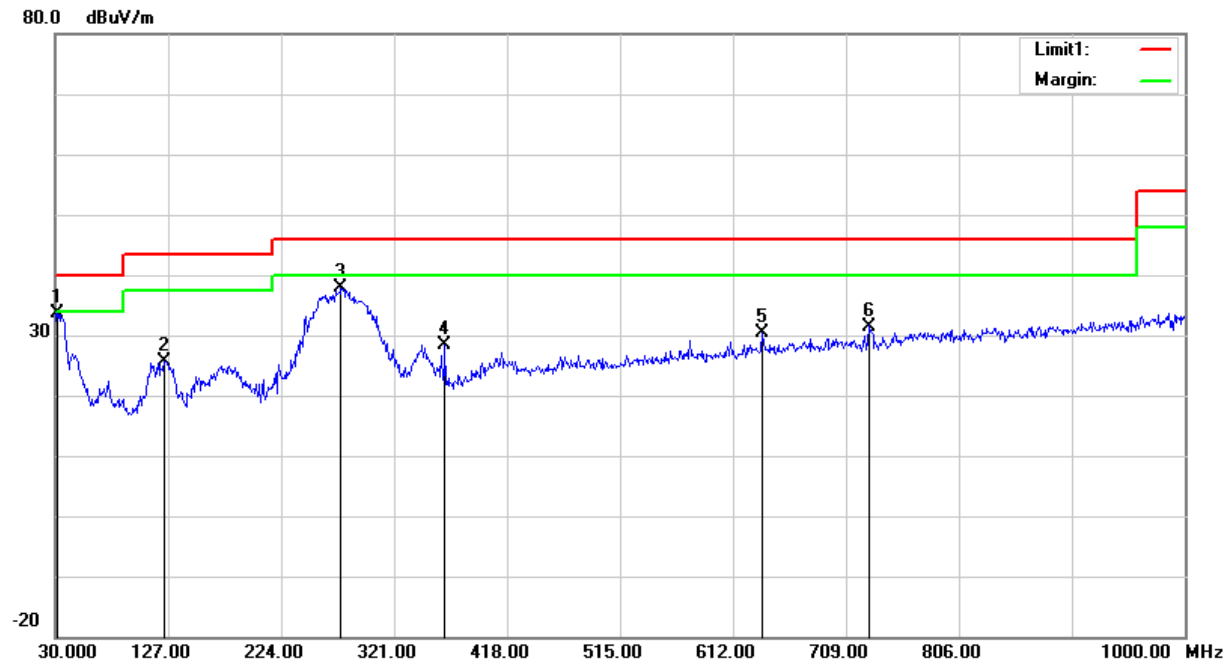
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	30.0000	28.22	peak	1.72	29.94	40.00	10.06
2	85.2900	34.52	peak	-11.41	23.11	40.00	16.89
3	202.6600	29.81	peak	-6.04	23.77	43.50	19.73
4	263.7700	45.60	QP	-4.63	40.97	46.00	5.03
5	637.2200	28.02	peak	2.20	30.22	46.00	15.78
6	778.8400	28.53	peak	4.36	32.89	46.00	13.11

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M5

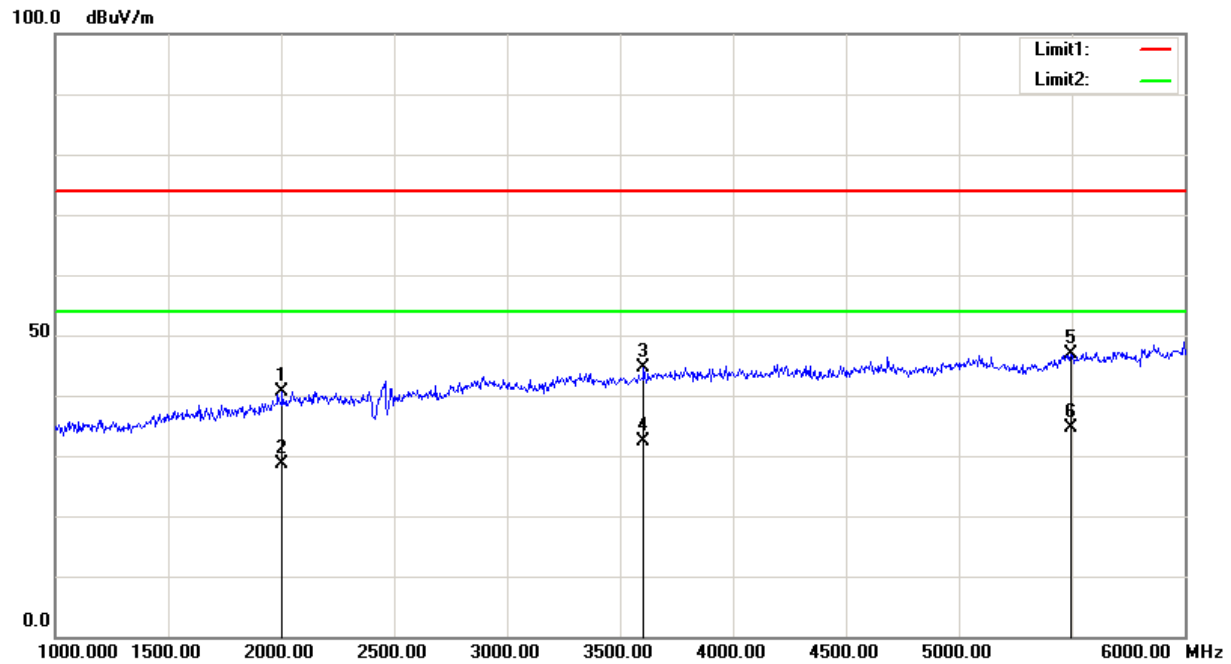
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	31.9400	33.44	peak	0.19	33.63	40.00	6.37
2	123.1200	30.30	peak	-4.57	25.73	43.50	17.77
3	275.4100	41.94	peak	-4.13	37.81	46.00	8.19
4	364.6500	31.18	peak	-2.82	28.36	46.00	17.64
5	637.2200	28.20	peak	2.20	30.40	46.00	15.60
6	728.4000	28.24	peak	3.26	31.50	46.00	14.50

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M5

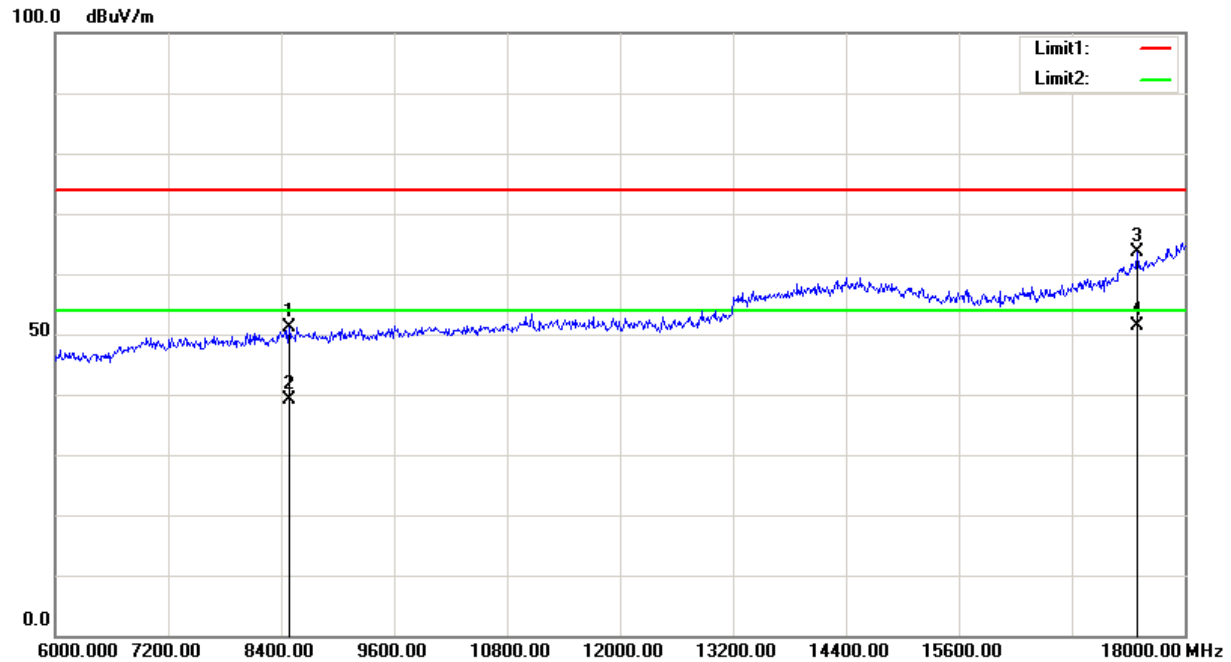
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	2005.000	37.00	peak	3.70	40.70	74.00	33.30
2	2005.000	24.85	AVG	3.70	28.55	54.00	25.45
3	3605.000	36.60	peak	7.98	44.58	74.00	29.42
4	3605.000	24.43	AVG	7.98	32.41	54.00	21.59
5	5497.500	34.57	peak	12.34	46.91	74.00	27.09
6	5497.500	22.39	AVG	12.34	34.73	54.00	19.27

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M5

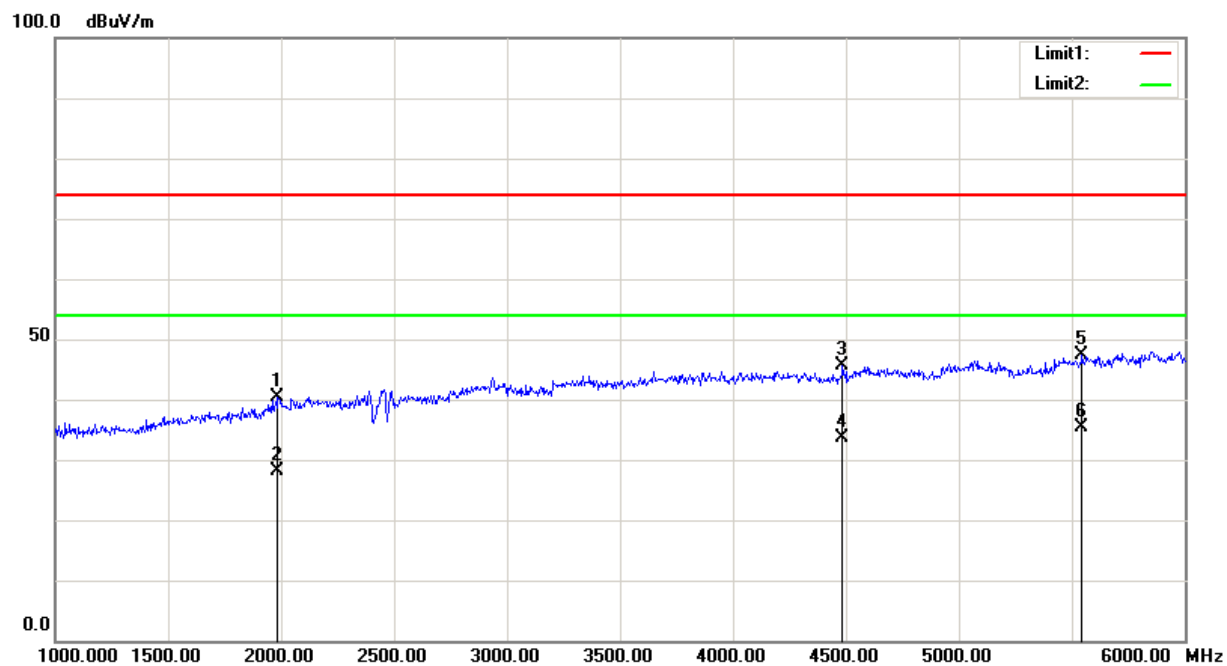
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	8484.000	34.76	peak	16.46	51.22	74.00	22.78
2	8484.000	22.57	AVG	16.46	39.03	54.00	14.97
3	17502.000	35.08	peak	28.50	63.58	74.00	10.42
4	17502.000	22.85	AVG	28.50	51.35	54.00	2.65

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M5

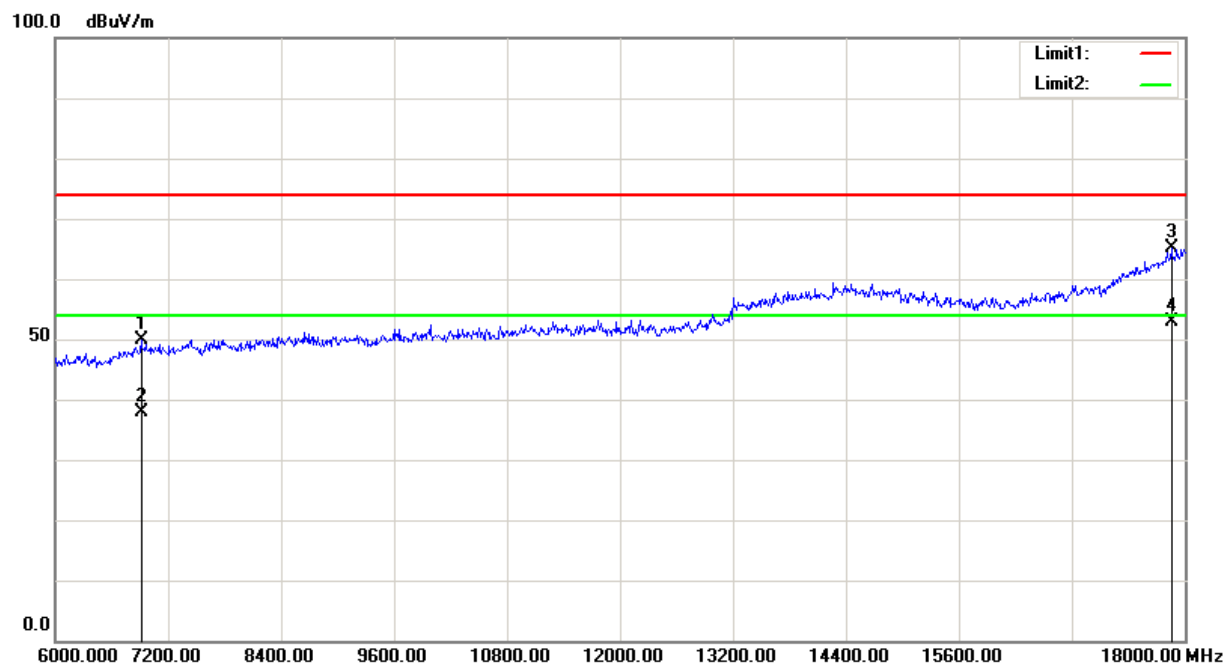
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	1987.500	36.81	peak	3.52	40.33	74.00	33.67
2	1987.500	24.68	AVG	3.52	28.20	54.00	25.80
3	4487.500	36.14	peak	9.57	45.71	74.00	28.29
4	4487.500	24.03	AVG	9.57	33.60	54.00	20.40
5	5547.500	35.03	peak	12.44	47.47	74.00	26.53
6	5547.500	23.01	AVG	12.44	35.45	54.00	18.55

Condition: FCC Part 15B Class B
EUT: Smart POS Terminal
Model: APOS A8
Test mode: M5

Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	6918.000	35.14	peak	14.77	49.91	74.00	24.09
2	6918.000	23.05	AVG	14.77	37.82	54.00	16.18
3	17856.000	34.15	peak	30.88	65.03	74.00	8.97
4	17856.000	22.01	AVG	30.88	52.89	54.00	1.11

*****END OF REPORT*****