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Technical Report No. 07-114

EMI Evaluation of the art-RFID, Status Tag to FCC Part 15, Class B "Conducted and Radiated Emission Requirements" As well as Section 15.247, "Operation within the band of 902 to 928 MHz"

Performed: 29 October 2007

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1. INTRODUCTION

The art-RFID Status Tag was evaluated for compliance to the FCC CFR-47, Part 15, Class B requirements as well as Section 15.247. For the measurements, the RFID tag was set to transmit periodically a frequency shift keying (FSK) modulated signal centered at 911 MHz. The results apply only to the specific items of equipment, configurations and procedures supplied to the Florida Atlantic University EMI R&D Laboratory as reported in this document.

2. OBJECTIVE

This evaluation was performed to verify conformance of the art-RFID, Status Tag to the U.S. Federal Communications Commission (FCC), Code of Federal Regulations (CFR), Title 47 - Telecommunication, FCC Part 15 Subpart B- Unintentional Radiators, Sections 15.107(b) and 15.109 (b), FCC Class B conducted and radiated emission requirements, and Subpart C- Intentional Radiators, Section 15.247, "Operation within the bands 902-928 MHz".

3. CONCLUSION

The art-RFID, Status Tag met the FCC, Part 15 Subpart B, Class B conducted and radiated emission requirements, as well as the requirements for Section 15.247, "Operation within the band of 902 to 928 MHz", as described in the following pages.

4. TEST PROCEDURES AND RESULTS

4.1 TEST PROCEDURES

The measurement techniques identified in the measurement procedure of ANSI C63.4-2003 *"American National Standard of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"* were followed as close as practical during this evaluation. Complete details and specific procedures used are discussed in the respective test result sections.

4.2 CONDUCTED EMISSIONS TEST RESULTS

4.2.1 CONDUCTED POWERLINE EMISSIONS

The art-RFID Status Tag was evaluated for conducted emission requirements. The unit was programmed to transmit a 911 MHz signal every second. The data was transmitted and received correctly as confirmed by the art-RFID Engineer. Photographs 1 and 2 show the setup used during the evaluations.

The system was installed in the FAU EMI Research facilities conducted emissions shielded enclosure, on a wooden test table 80 centimeters above the ground plane floor and 40 centimeters from the rear wall. The device was then plugged into a Line Impedance Stabilization Network (LISN) EMCO Model No.3825/2R Serial No. 1095.

Conducted power line emissions were measured on both the phase and neutral lines with reference to earth ground, over the specified 150 kHz to 30 MHz range on an HP 8566B Spectrum Analyzer operated in the peak detection mode, in conjunction with HP 85685A Preselector, with a bandwidth of 9 kHz obtained through the HP 85650A Quasi Peak Adapter.

Photographs 1 & 2: Conducted Emission Setup

Figure 1 shows the conducted emissions on both the phase and neutral lines measured in the receiver peak detection mode.

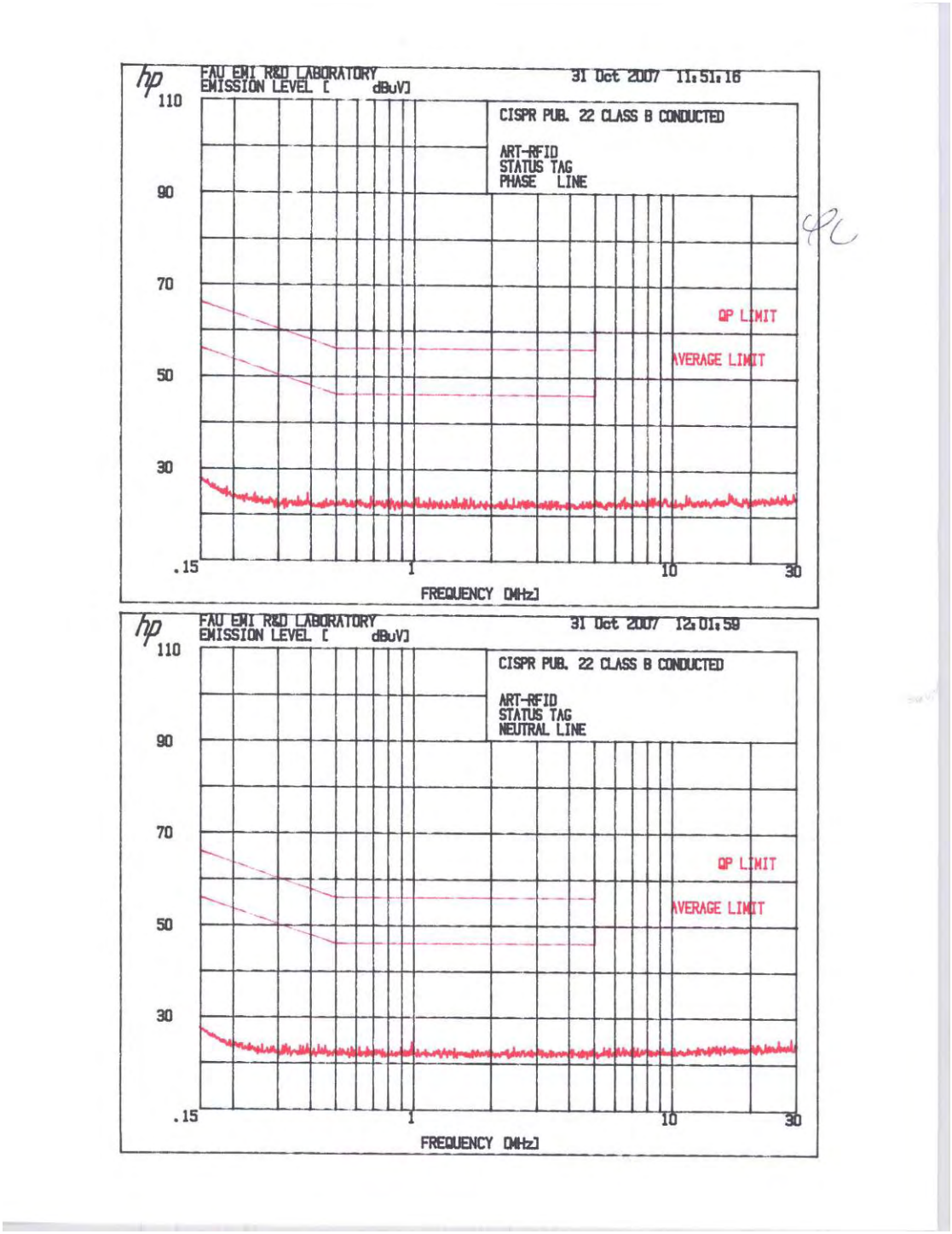


Figure 1: Phase and Neutral Conducted Emissions

From Figure 1, since no emissions exceeded or were within 5 dB of the limit, there are no values to be reported in Table 1.

Line Tested	Frequency (kHz)	Peak Value (dBµV)	QP Value (dBµV)	Average Value (dBµV)	Avg. Limit (dBµV)	Margin to Avg. Limit (dB)*
Phase						
Neutral						
Phase						
Neutral						

Table 1: Conducted Emission Peak Measurement

*****Margin to Avg. Limit (dB) = Avg. Limit (dBµV) – the measured value (either Peak , Quasi-Peak or Average Value) in dBµV

It can be seen, on both the phase and neutral lines, that the emissions did not exceed the limits. Hence, the system is in compliance.

4.3 **RADIATED EMISSIONS TEST RESULTS**

The art-RFID, Status Tag was set up on a wooden table 80 centimeters above the ground plane turntable of the Semi-Anechoic test site, as shown in Photographs 3 to 5. The unit was programmed to transmit a RF signal centered at 911 MHz every one second. This document reports results for EUT evaluated in three different positions: flat on the table (back), lying on one edge (side), upright (bottom). The data was transmitted and received correctly as confirmed by the art-RFID Engineer.

An EMCO, Model 3104, S/N 299988A, the Broadband Biconical antenna was installed on an EMCO pneumatically controlled antenna mast at a distance of 3 meters from the system. The 30 MHz to 200 MHz frequency range was automatically scanned on the HP 8566B Spectrum analyzer (SA) that was operated in the peak detector mode with a bandwidth of 120 kHz obtained through the HP 85650A Quasi Peak Adapter. It should be noted that the RES BW and VBW of the spectrum analyzer must be set to 1 MHz for the Quasi Peak Adaptor to provide a 120 kHz bandwidth correctly. Hence, in the figures, RES BW and VBW are still indicated as 1 MHz.

After setting the SA to operate between 30-200 MHz, the max hold switch on the SA was pressed. Initially, the Biconical antenna was set to horizontal polarization at 1-m above the floor. The turntable was then rotated 360 degrees. After a complete revolution, the turntable was rotated back to the previously noted azimuth angles where the higher E-fields occurred, and the antenna was then scanned from 1 to 4 meters high at those angles in order to determine the height that will provide to highest amplitude. The antenna was moved back to the location where the highest amplitude was observed and the turn table was rotated again 360º. The maximum value was plotted and presented herein. The antenna was then rotated to measure the vertical polarized E-field and the above procedure was repeated.

For the 200-1000 MHz band, a Log Periodic antenna (EMCO 3146) was installed and the SA was set to operate between 200-1000 MHz. To collect data, the above procedure was then repeated.

Figures 2-5 show the worse case radiated emissions of both configurations, for this evaluation, independent of azimuth or antenna height. The E-field is calculated using antenna factor, cable loss, and amplifier gain based on the following equation:

E (dBμV/m) = SA reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB) - Distance Factor (dB)

Note that for the unintentional radiated emission measurements, a Trilithic filter 7NM867/122-X1-AA was used at the receiver to notch the 911 MHz signal generated by the device.

Photograph 3: Tag flat on the table (back)

Photograph 4: Tag lying on one edge (side)

Photographs 5: Tag upright (bottom)

EUT flat on the Table (Back)

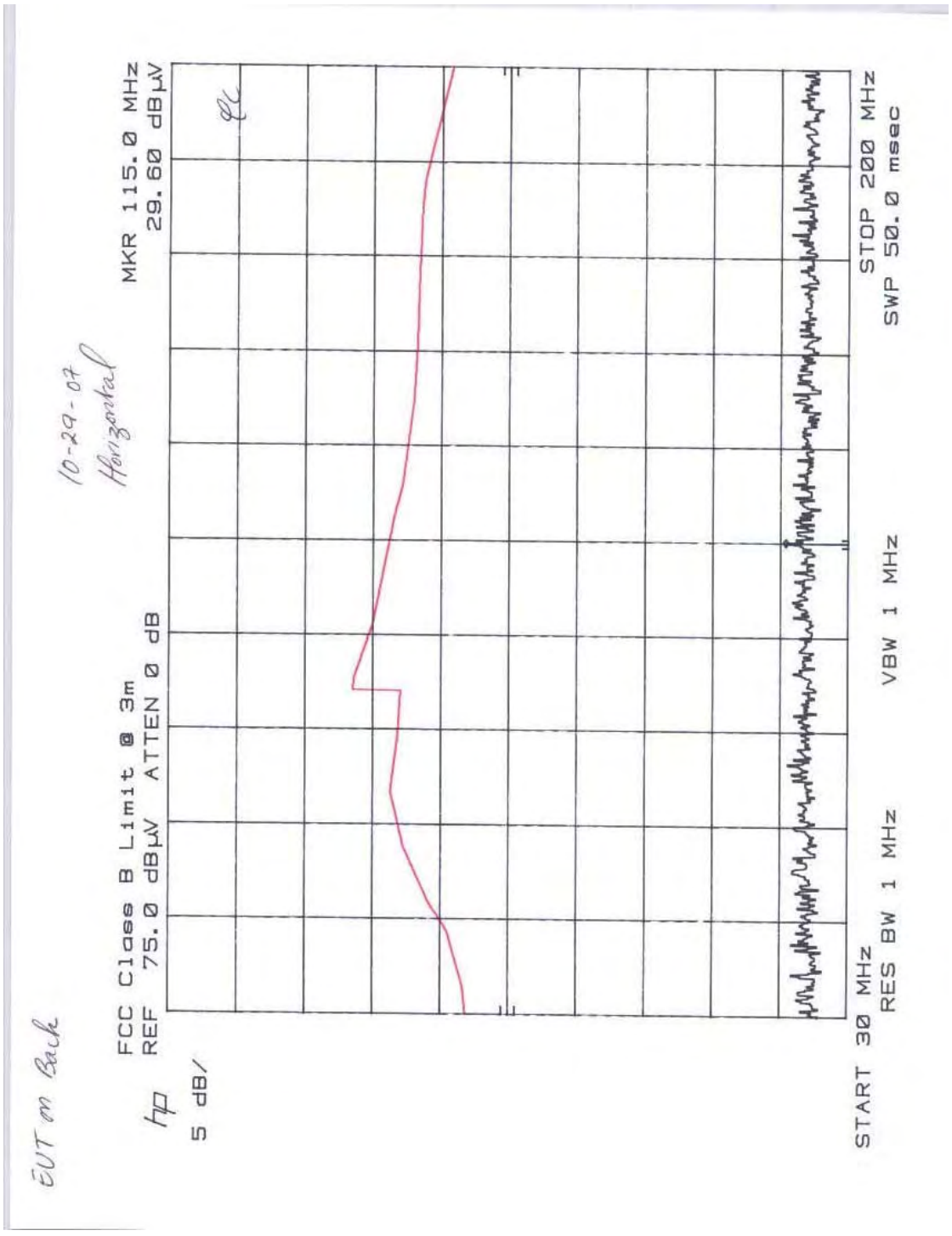


FIGURE 2: Radiated Emission 30 – 200 MHz Horizontal Polarization

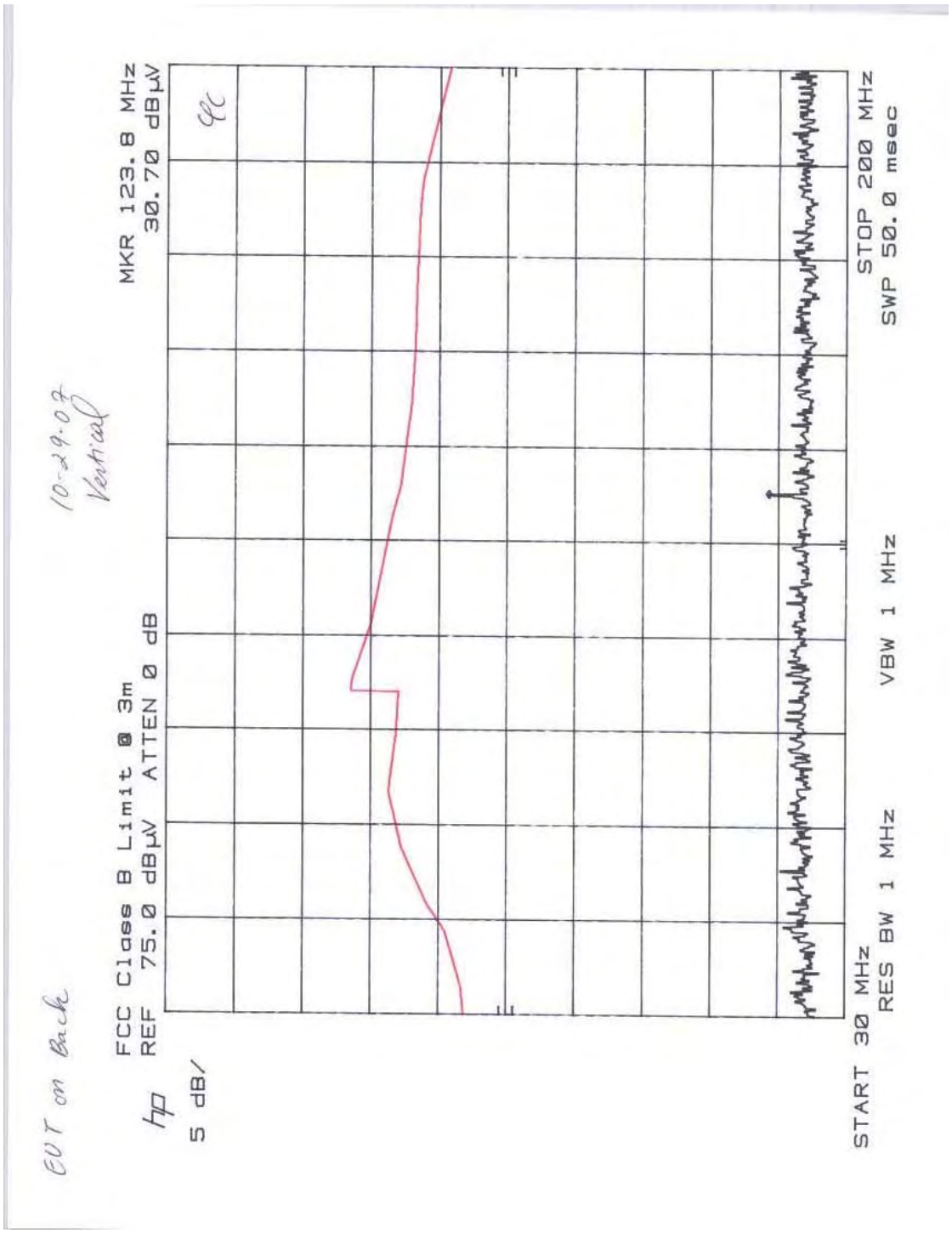


FIGURE 3: Radiated Emission 30 – 200 MHz Vertical Polarization

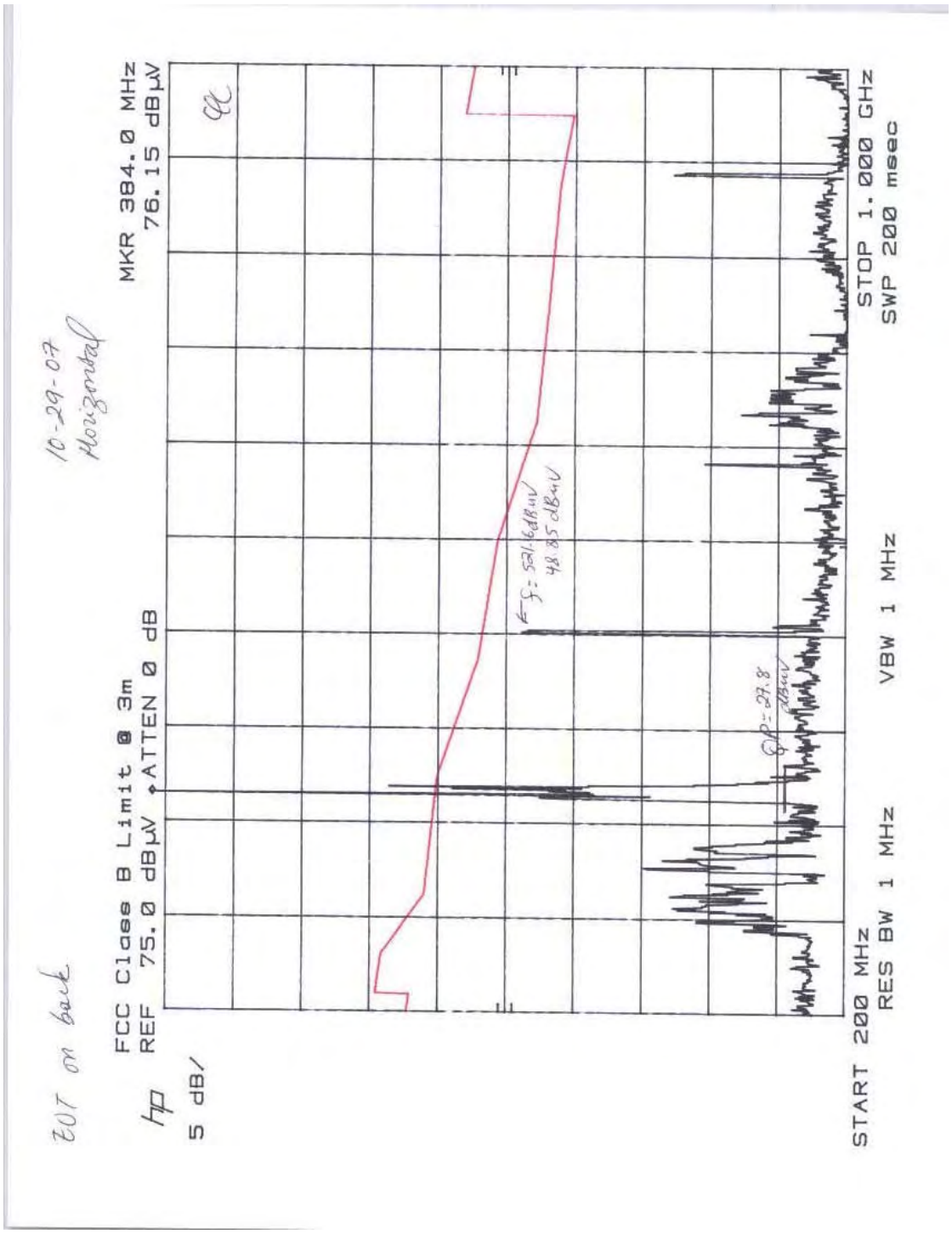


FIGURE 4: Radiated Emission 200 MHz – 1 GHz Horizontal Polarization

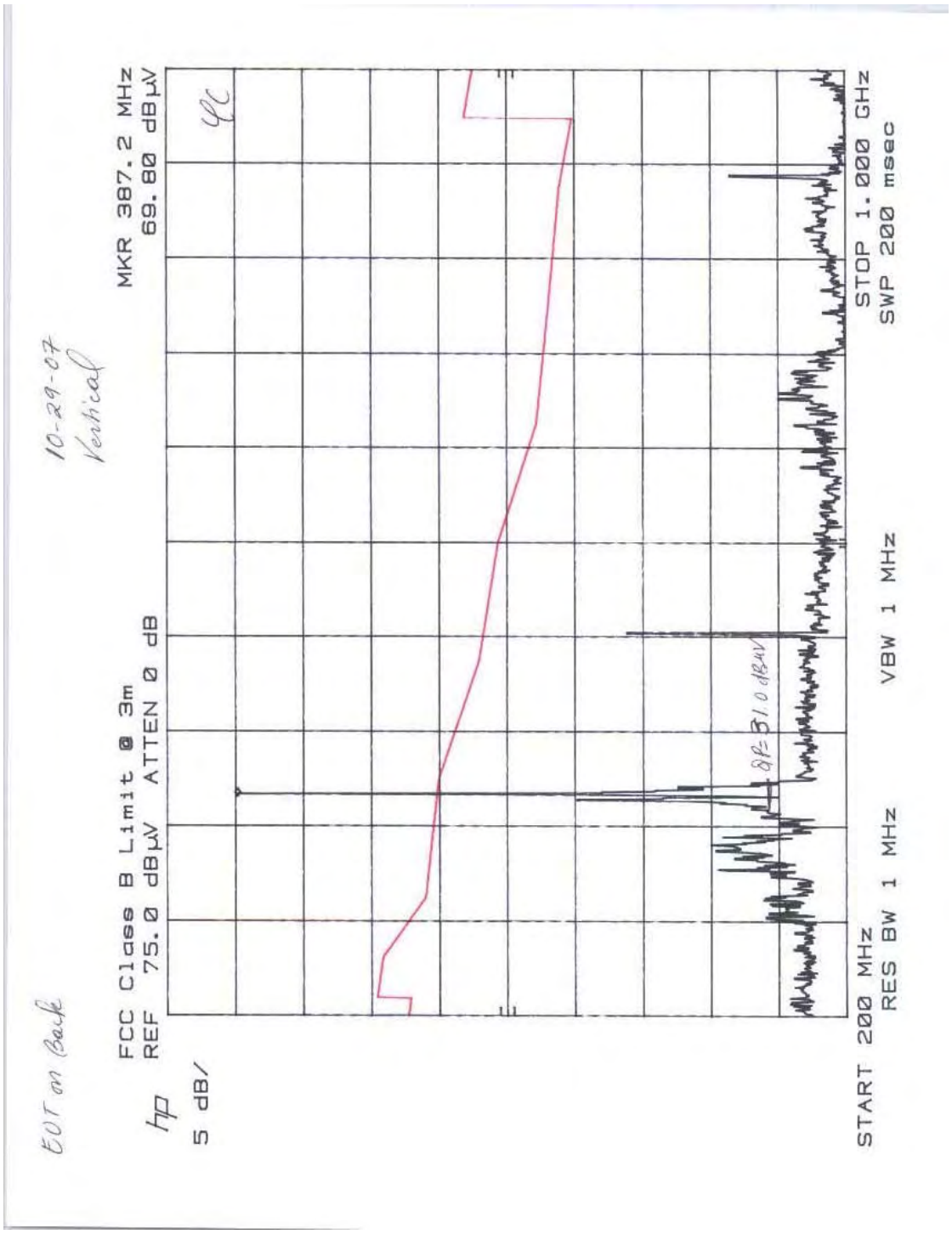


FIGURE 5: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

EUT lying on one edge (Side)

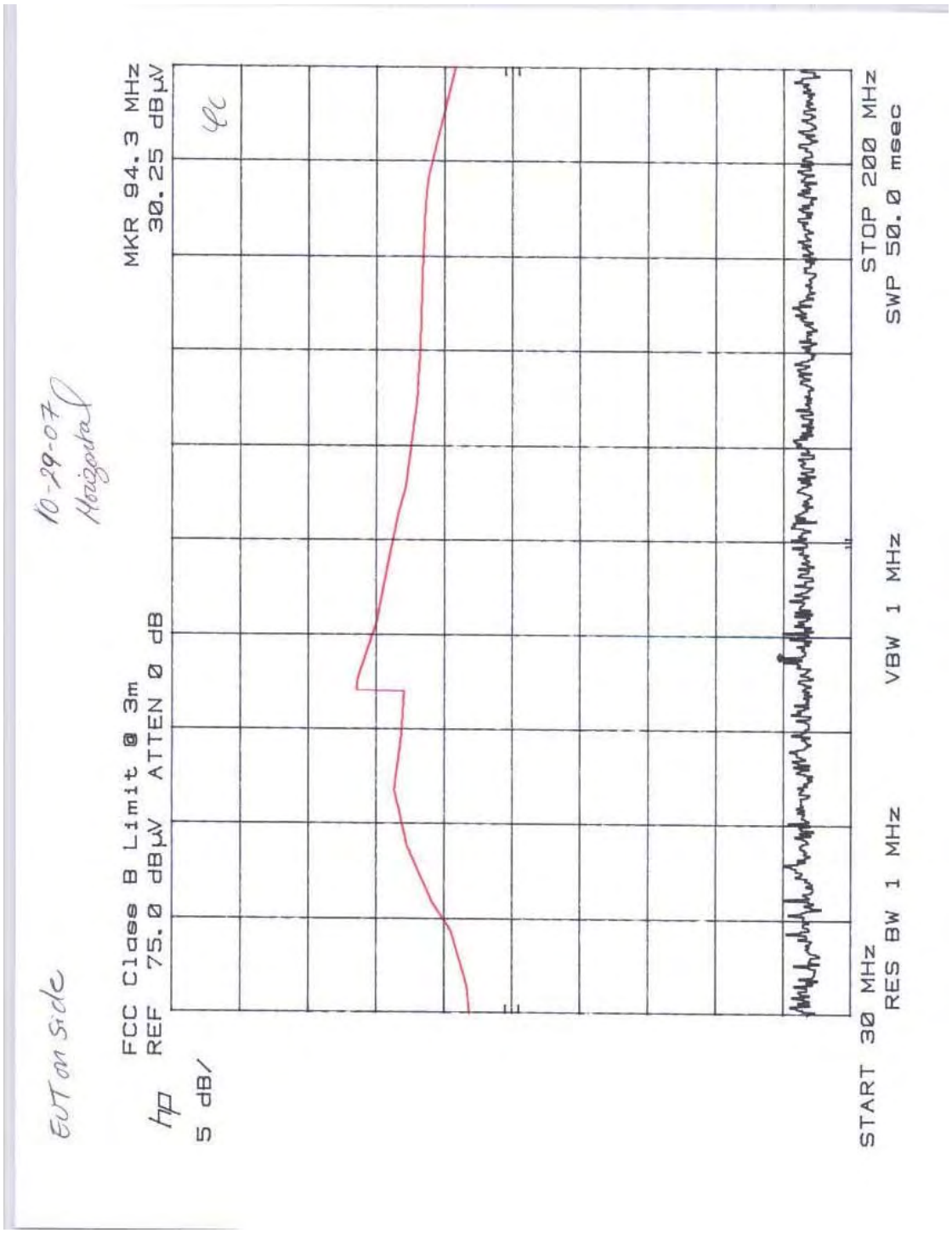


FIGURE 6: Radiated Emission 30 – 200 MHz Horizontal Polarization

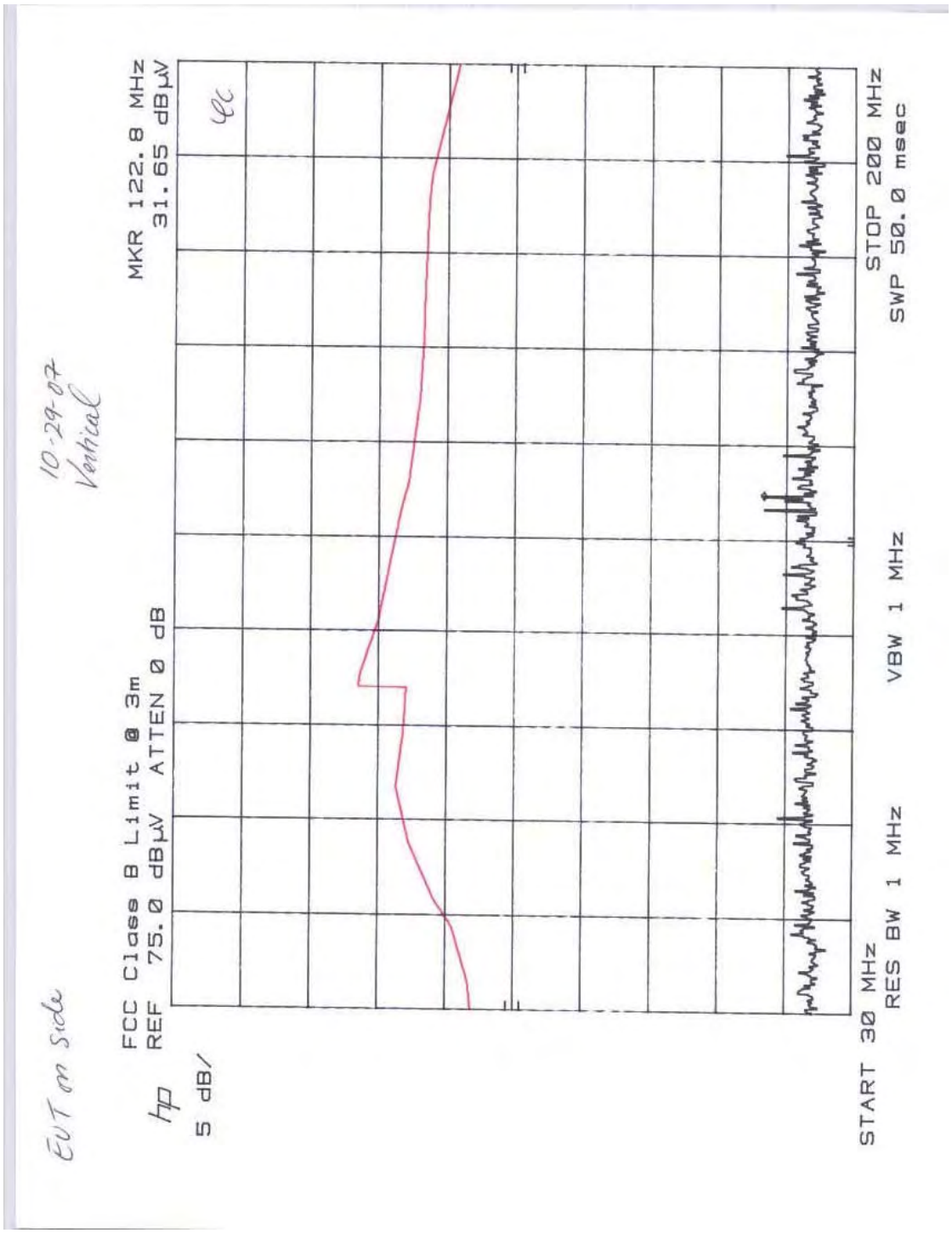


FIGURE 7: Radiated Emission 30 – 200 MHz Vertical Polarization

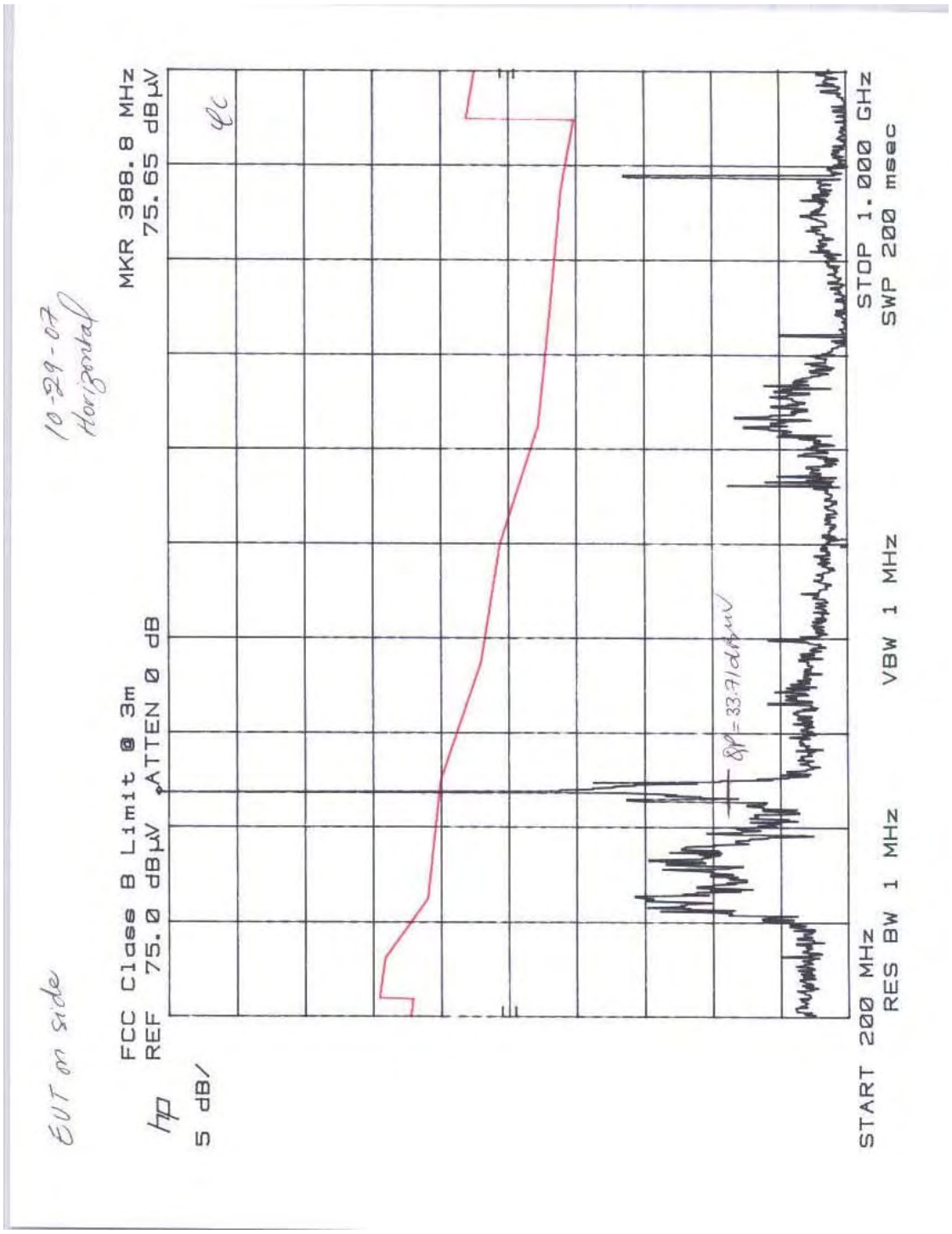


FIGURE 8: Radiated Emission 200 MHz – 1 GHz Horizontal Polarization

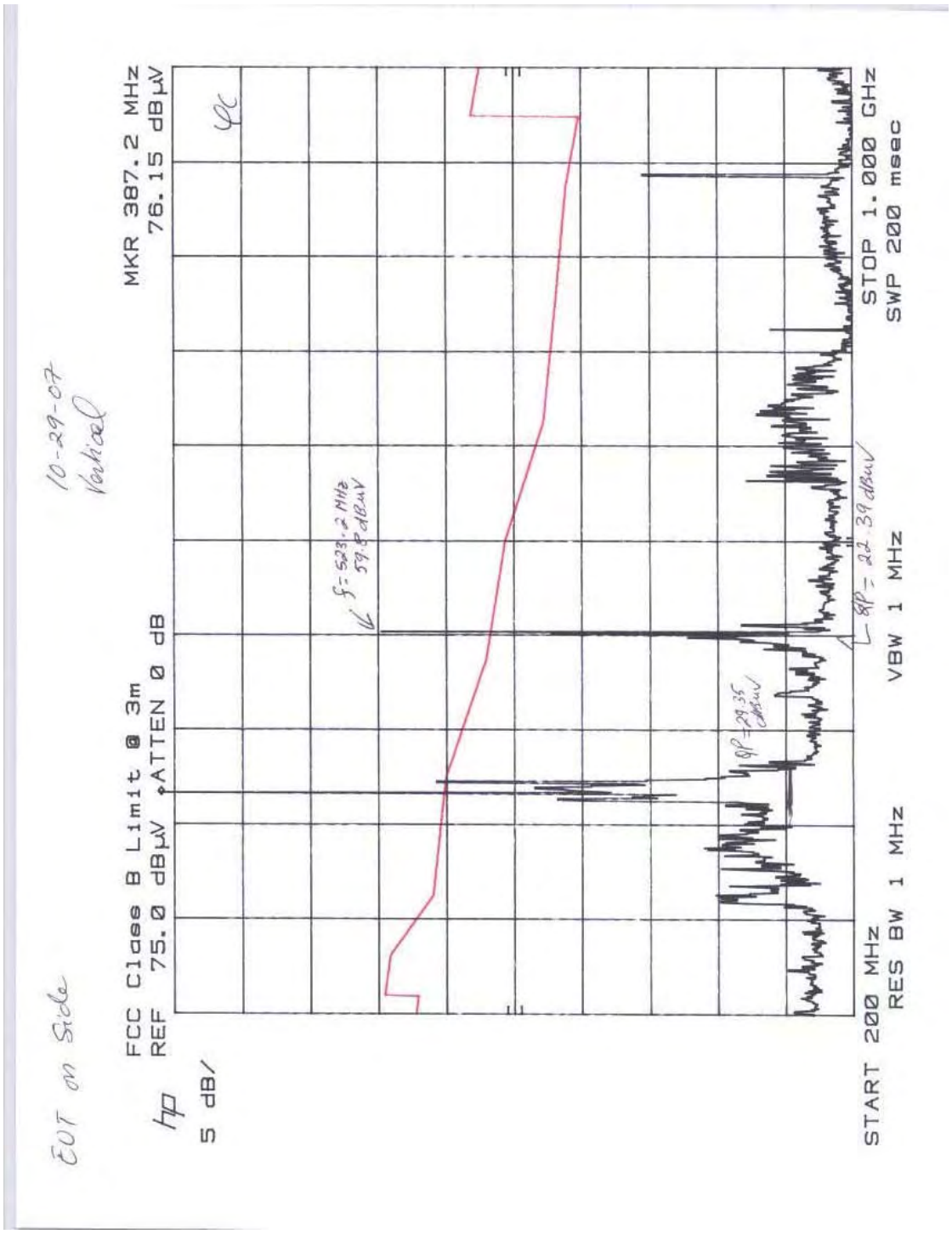


FIGURE 9: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

EUT upright (on Bottom side)

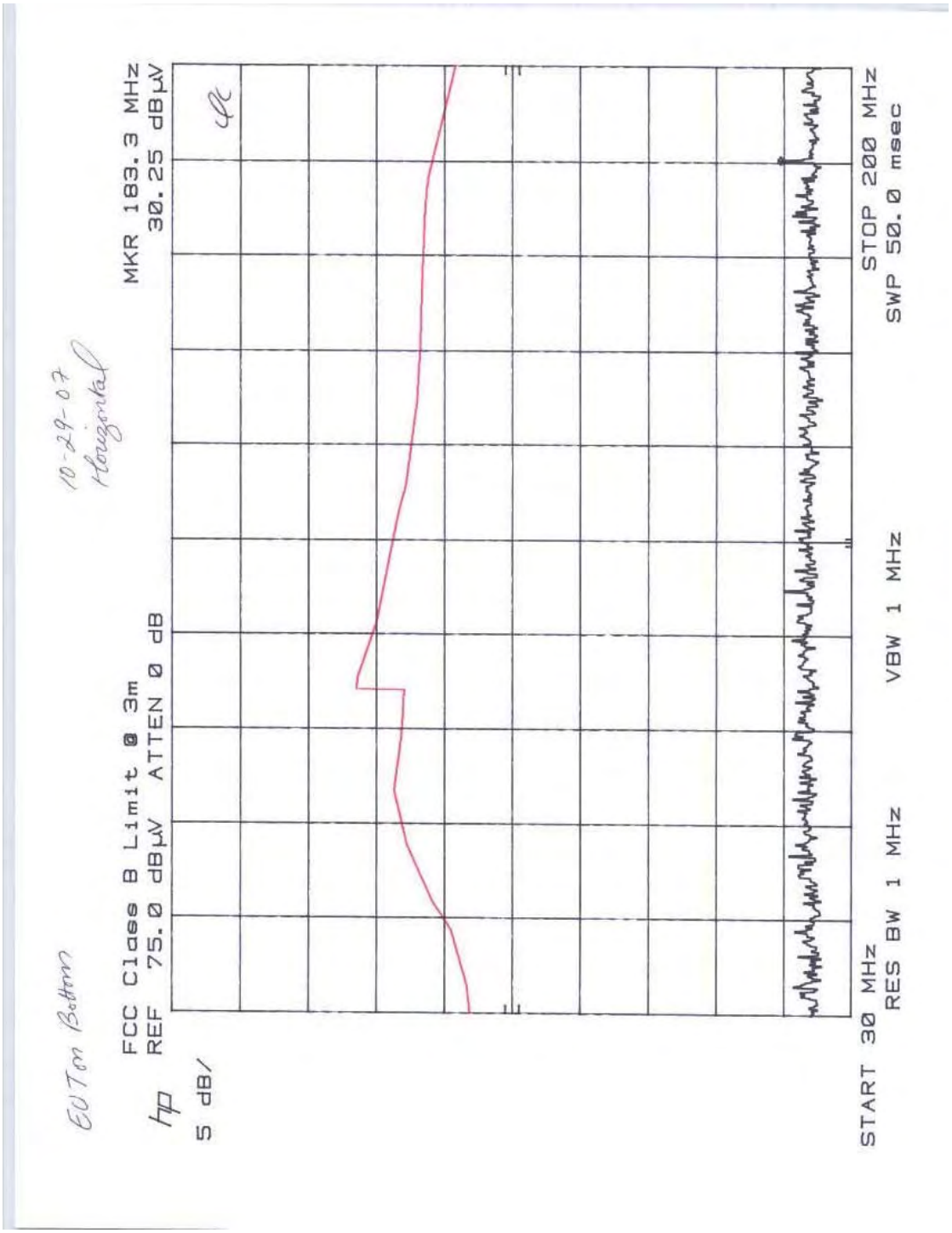


FIGURE 10: Radiated Emission 30 – 200 MHz Horizontal Polarization

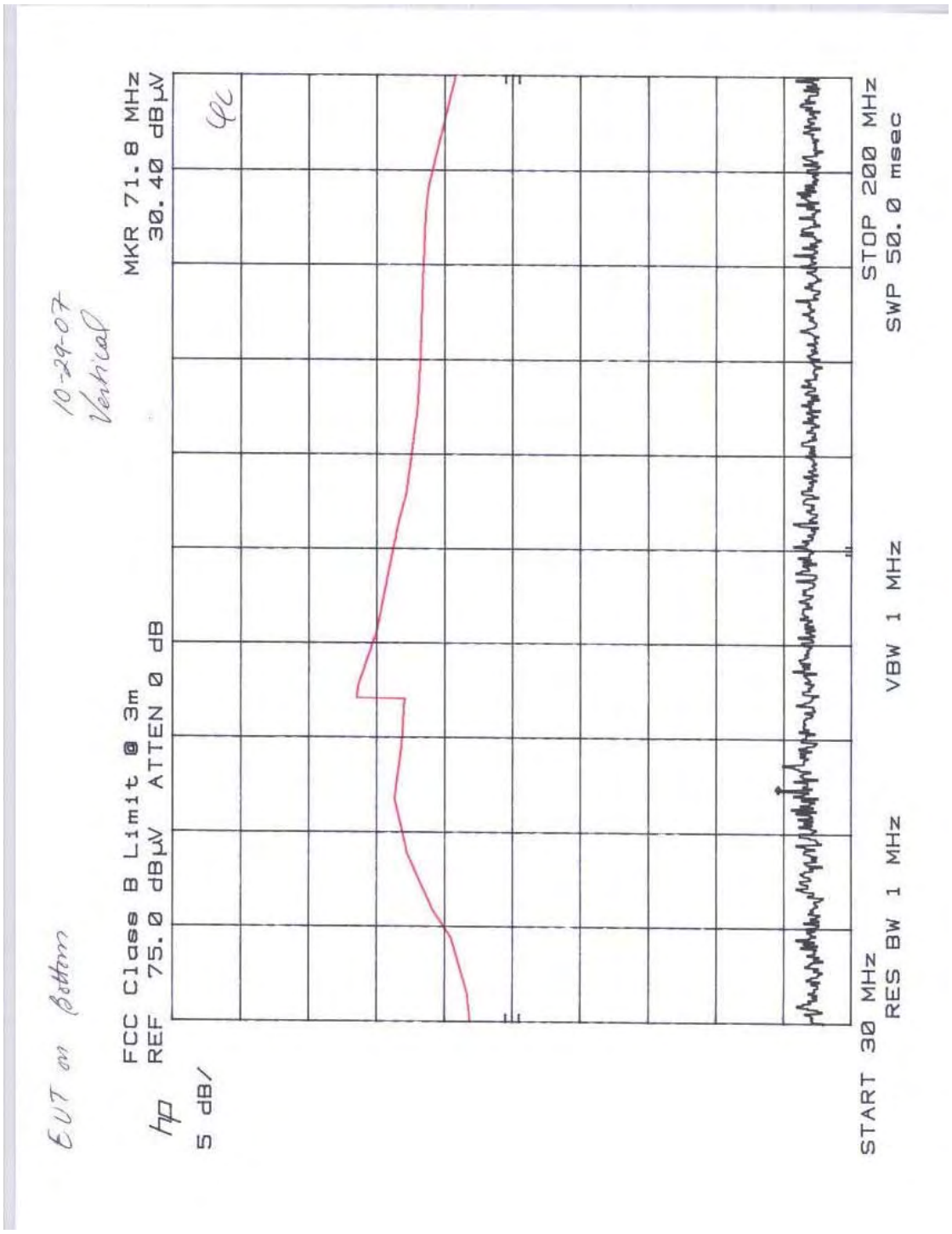


FIGURE 11: Radiated Emission 30 – 200 MHz Vertical Polarization

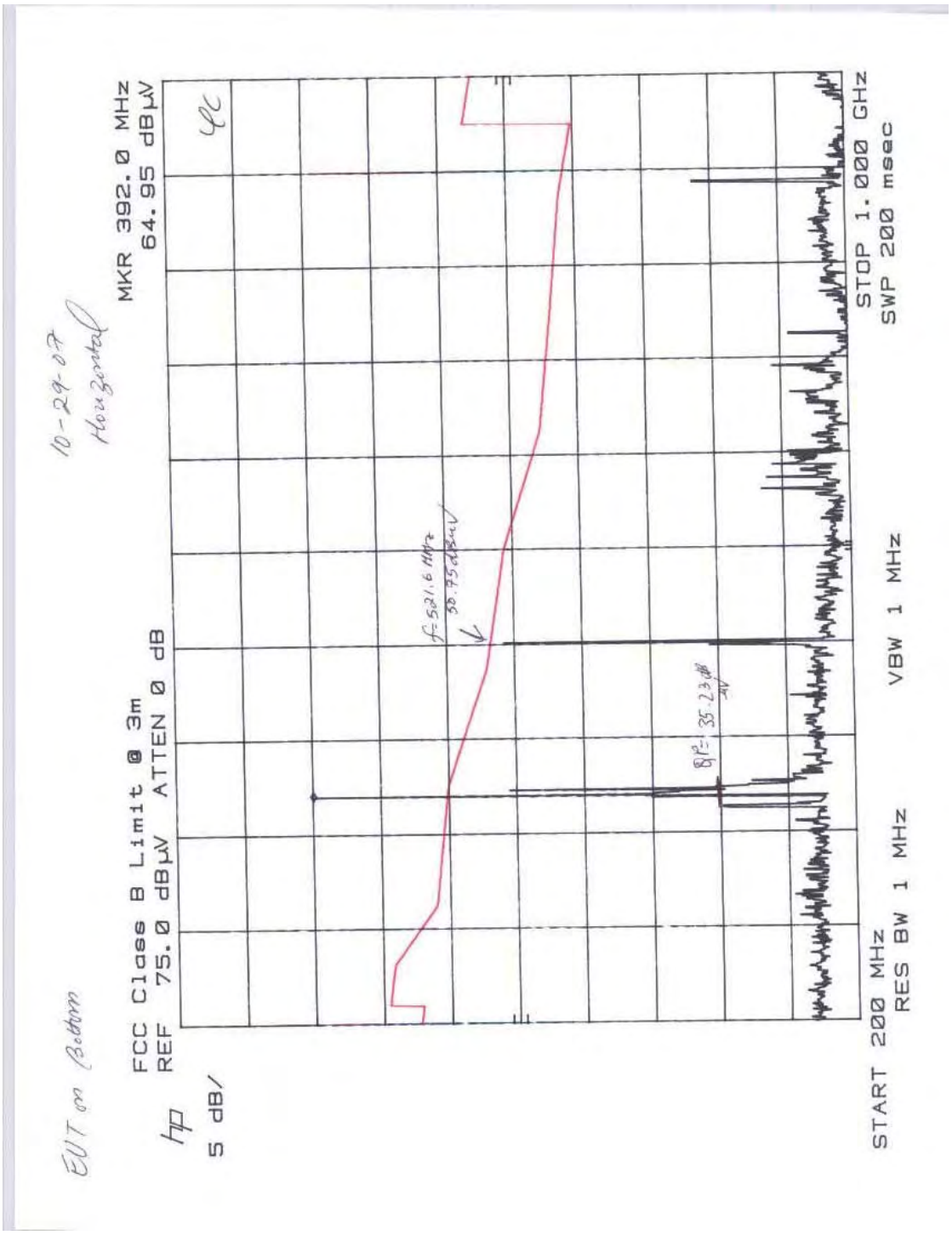


FIGURE 12: Radiated Emission 200 MHz – 1 GHz Horizontal Polarization

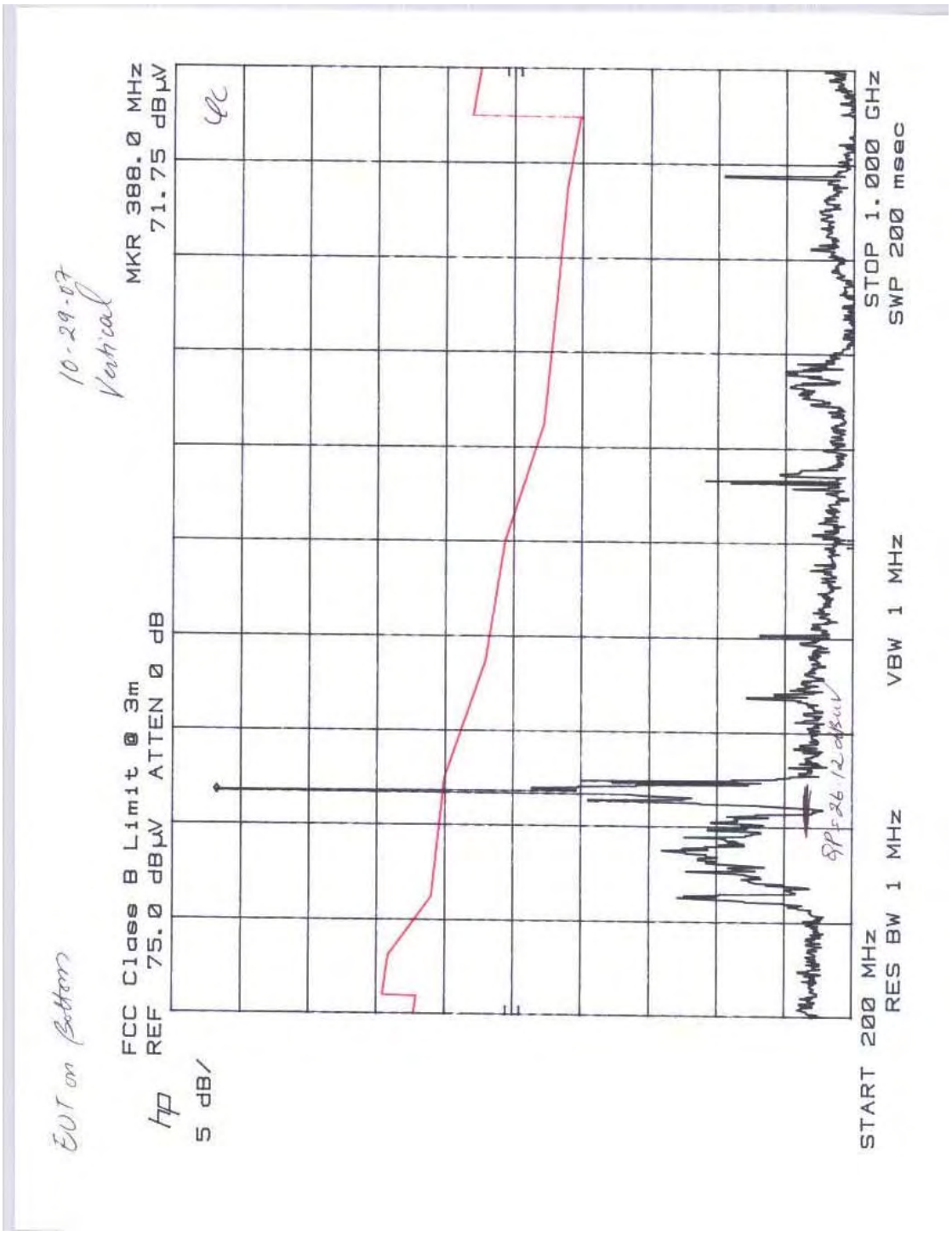


FIGURE 13: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

From Figures 2-13, the peak emissions that exceeded or were within 5 dB of the limit are reported in Table 2.

Figure No.	Frequency (MHz)	Measured Peak (dBµV)	Quasi Peak (dBµV)	Correction Factor (dB/m)	Peak Field* (dBµV/m)	FCC Limit (dBµV/m)	Margin to limit (dB)
4	384	76.15	27.8	9.2	18.6	46	27.4
4	521.6	48.85		5.75	43.1	46	2.9
5	387.2	69.8	31	9.17	21.83	46	24.17
8	388.8	75.65	33.71	9.16	24.55	46	21.45
8	912	41.8		-0.09	41.89	46	4.11
9	387.2	76.15	29.35	9.17	20.18	46	25.82
9	523.2	59.8	22.39	5.73	16.66	46	29.34
12	392	64.95	35.23	9.13	26.1	46	19.9
12	521.6	50.57		5.75	44.82	46	1.18
13	388	71.75	26.12	9.16	16.96	46	29.04

Table 2: Peak Measurement Results

* Peak field (dBµV/m) = the measured value (either Peak or Quasi Peak) in dBµV - Correction Factor (dB/m)

It can be seen from the previous figures and Table 2 that the emissions are below limit. Hence the unit is in compliance.

4.4 INTENTIONAL RADIATED EMISSIONS

4.4.1 BAND EDGE EMISSION MEASUREMENTS

The art-RFID Status Tag programmed to transmit a 911 MHz digitally modulated signal was evaluated for operation within the band of 902 to 928 MHz. The data was recorded using the HP 8566B spectrum analyzer in the peak detector mode. A resolution bandwidth of 120 kHz was achieved through the HP 85650A Quasi Peak Adapter, which necessitates VBW and RES BW of SA to be equal to 1 MHz. The data was maximized using the procedure described in the previous section.

Figures 14 and 15 show the peak emissions for the EUT configuration leading to the highest TX emissions, for both horizontal and vertical polarizations of the log-periodic antenna.

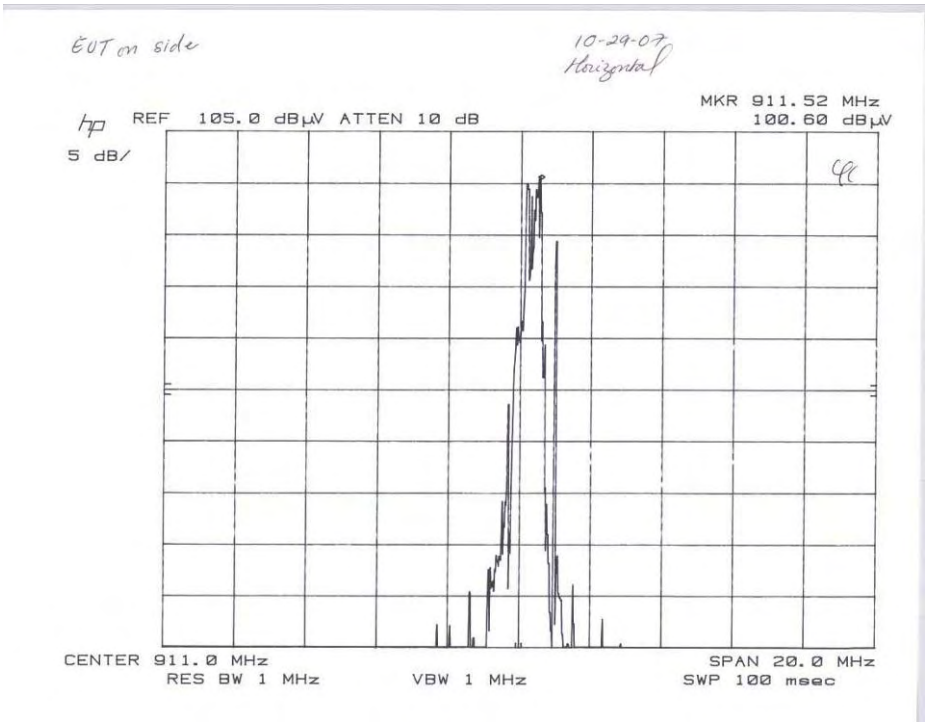


Figure 14: Operation within the band of 902-928 MHz Measurements

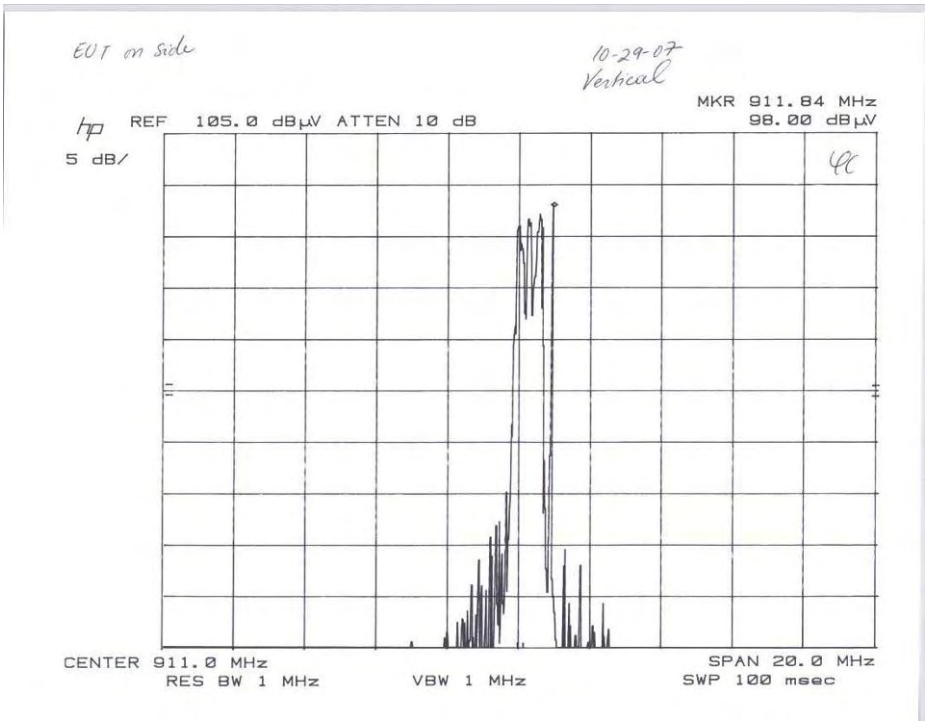
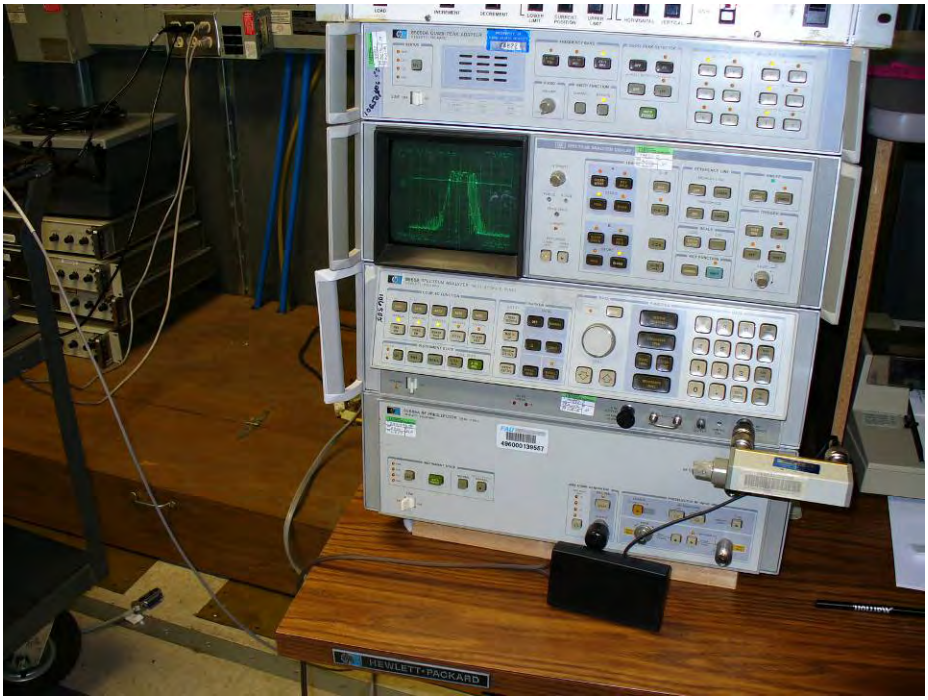


Figure 15: Operation within the Band of 902-928 MHz Measurements

It can be seen that EUT operates within the 902-928 MHz band since the emissions outside of the band of 902 – 928 MHz are at least 20 dB below the maximum peak of the fundamental. Hence, the unit is operating within the band and meets the band edge requirements.

4.4.2 OCCUPIED BANDWIDTH (BW) TEST RESULTS

The art-RFID, Status Tag, programmed to transmit a digitally modulated signal within the ISM band of 902 to 928 MHz, was evaluated for occupied bandwidth. The antenna was disconnected and a coaxial cable was connected at the feed point of the antenna. An HP 8495B variable attenuator set to 50 dB was connected between EUT and the spectrum analyzer to diminish risks of overloading the spectrum analyzer. The signal was measured on an HP 8566B Spectrum analyzer on the peak detector mode (Photograph 6). The measurement configuration and procedures followed the guidelines of the FCC procedures for the measurement of digital transmissions systems operating under Section 15.247.



Photograph 6: Conducted Power Measurement output

A resolution bandwidth of 120 kHz was achieved through the HP 85650A Quasi Peak adapter. The measurement configuration and procedures followed the guidelines of the FCC procedures for the measurement of digital transmissions systems operating under Section 15.247. Figure 14 shows the occupied bandwidth using 6 dB criterion.

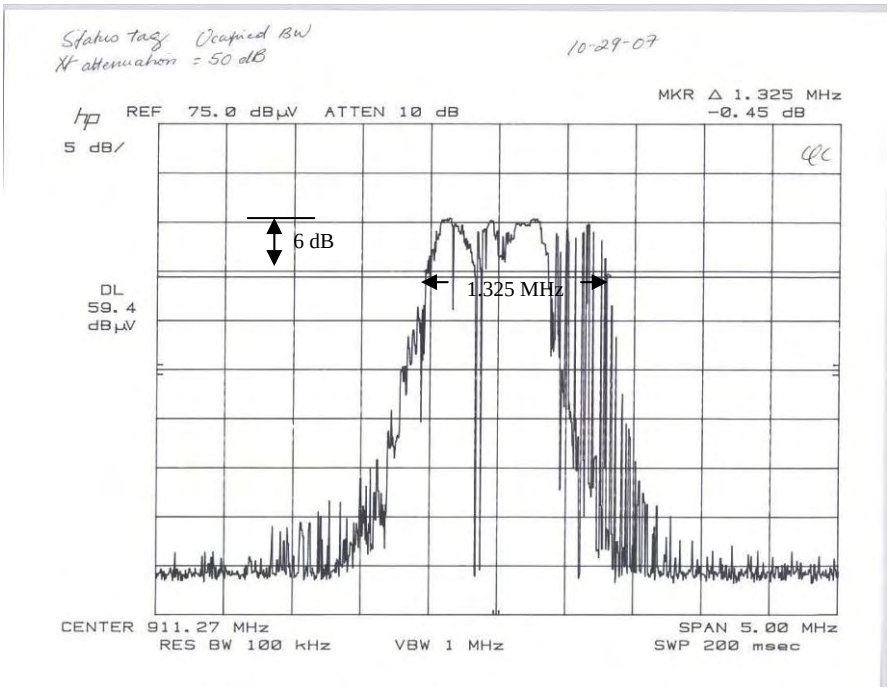


Figure 16: Occupied Bandwidth Results

The 6 dB bandwidth of the art-RFID Status tag unit was measured to be 1.325 MHz (910.75 - 912.075 MHz), hence meeting the minimum bandwidth requirement of 500 kHz.

4.4.3 MAXIMUM OUTPUT POWER MEASUREMENTS

The measurement of the maximum output power at the frequency of 911 MHz was undertaken using an HP 8566B spectrum analyzer. The HP 8566B spectrum analyzer was set on the peak detector mode with the "bypass" instrument function of the HP 85650A Quasi-Peak Adapter was activated. The resolution and video bandwidths of the analyzer were increased to 3 MHz to satisfy the resolution bandwidth > 6 dB bandwidth requirement. An HP 8495B variable attenuator set to 50 dB was connected between the spectrum analyzer and EUT. The measurement configuration and procedures followed the guidelines of the FCC procedures for the measurement of digital transmissions systems operating under Section 15.247.

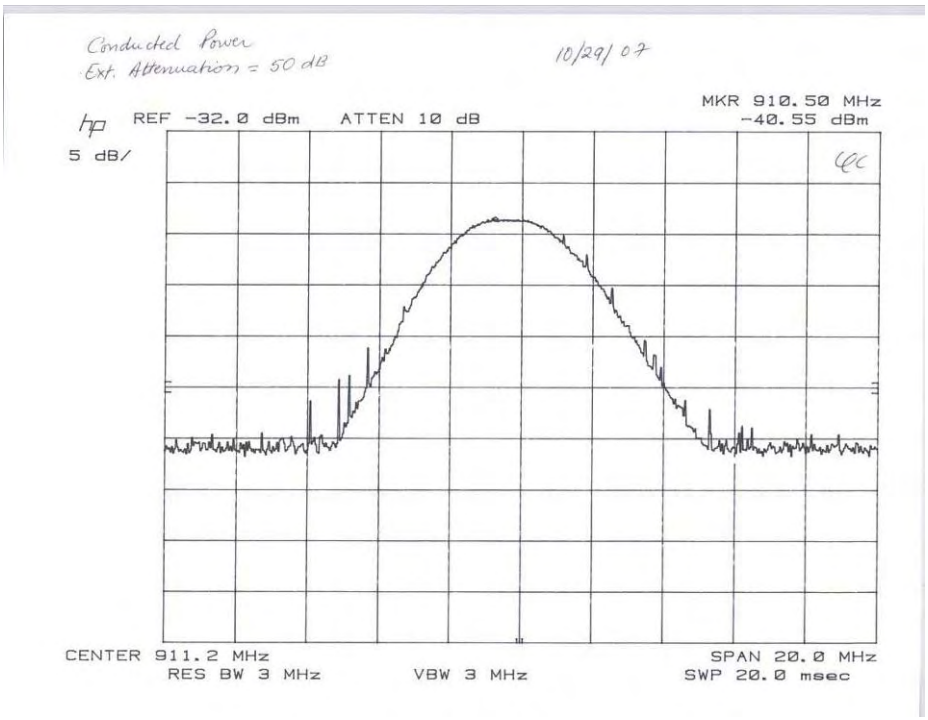


Figure 17: Conducted Output Power

SA Reading (dBm)	External Attenuation (dB)	Corrected Power (dBm)	Peak Power (mW)
-40.55	50	9.45	8.81

Table 3: Conducted Power Measurement

It can be seen from the data above that the maximum peak output power is 9.45 dBm, corresponding to 8.81 milliwatts, which is lower than the 1 watt limit. Hence, the device meets the maximum output power requirements as per Section 15.247.

4.4.4 POWER SPECTRAL DENSITY

The power spectral density of the art-RFID, Status tag, was measured on the HP 8566B spectrum analyzer on the peak detector mode while the "bypass" instrument function of the HP 85650A Quasi-Peak Adapter was activated. The Status tag was connected to SA in conjunction with an HP 8495B variable attenuator set to 50 dB. The spectrum analyzer was centered on the peak of the fundamental carrier frequency. The resolution bandwidth was reduced to 3 kHz and the span to 300 kHz. The sweep time was set to 100 seconds. The measurement configuration and procedures followed the guidelines of the FCC procedures for the measurement of digital transmissions systems operating under Section 15.247.

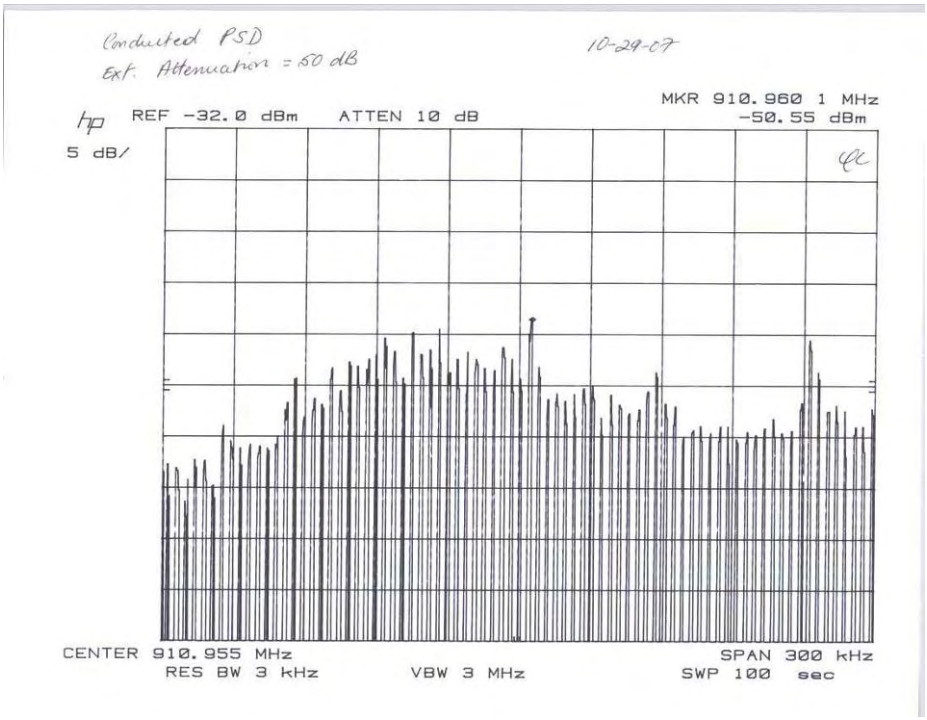


Figure 18: Power Spectral Density

SA Reading (dBm)	External Attenuation (dB)	Corrected Power (dBm)	FCC Limit (dBm)	Margin to Limit (dB)
-50.55	50	-0.55	8	8.55

Table 4: Peak Measurement Results

It can be seen from Figure 18 and Table 4 that the power spectral density did not exceed the 8 dBm limit. Hence the unit meets the power spectral density requirements as per Section 15.247.

4.4.5 SPURIOUS EMISSION MEASUREMENTS

For the measurement of the spurious emissions of the Art-RFID STATUS TAG transmitting at 911 MHz, a Trilithic, Inc. 4HC1400-1-KK high-pass filter was connected to the input of the preamp. The peak spurious emissions from the harmonic frequencies of the 911 MHz were recorded on the HP 8566B Spectrum analyzer with the max hold key. The resolution and video bandwidths of the spectrum analyzer were both set to 1 MHz and the bypass instrument function of the quasi peak adapter was activated. The data was recorded with a frequency span of 50 MHz.

An EMCO, Model 3115, double rigged horn antenna, set to horizontal polarization, was installed on the EMCO pneumatically controlled antenna mast at a distance of 3 meters from the system and 1 meter above the ground floor. The turntable was then rotated 360 degrees. After a full revolution, the turntable was rotated back to the previously noted azimuth angles where the higher E-field occurred, and the antenna was then scanned from 1 to 4 meters high, in order to determine the highest E-field amplitude. The antenna was moved back to the location where the highest amplitude was observed and the turn table was rotated 360º again. The maximum value was recorded and presented herein. The antenna was then rotated to measure the vertical polarized E-field and the above procedure was repeated.

For the average measurements, the spectrum analyzer was set to linear scale with sweep-time in auto mode and the video bandwidth was reduced to 10 Hz. The emissions were maximized using the procedure described above.

Tables 6 to 11 present the worst case emissions for horizontal and vertical polarizations of the receiving antenna, for EUT lying on its back, side and bottom respectively.

Note that emissions over 1 GHz falling within the restricted bands, as defined in Section 15.205, must comply with the limit of Section 15.209 of 54 dBµV/m.

For the emissions falling outside of the restricted band, the FCC limit is 20 dB below the highest level of the fundamental carrier. From Figures 14 and 15, the limits for the emissions falling outside of the restricted bands were determined as described in Table 5.

Antenna Polarization	SA Reading (dBµV)	Correction Factor (dB/m)	Peak-Field (dBµV/m)	Calculated Limit* (dBµV/m)
Horizontal	100.6	-0.08	100.68	80.68
Vertical	98.0	-0.08	98.08	78.08

Table 5: Limits for Emissions outside of the Restricted Bands

*Calculated Limit (dBµV/m) = (Fundamental) Peak Field (dBµV/m) – 20 dB

Hence the limits for the emissions falling outside of the restricted bands are 80.68 dBµV/m and 78.08 dBµV/m for horizontal and vertical polarizations of the receiving antenna respectively.

Frequency (GHz)	Peak Reading (dBµV)	Average Reading (dBµV)	CF (dB)	Peak E-Field (dBµV/m)	FCC Peak Limit (dBµV/m)	Margin to Peak Limit (dB)	Average E-Field (dBµV/m)	FCC Average Limit (dBµV/m)	Margin to Average Limit (dB)
1.822	60.25		-0.77	61.02	80.68	19.66		80.68	19.66
2.733	44.00		-3.27	47.27	74	26.73		54	6.73
3.644	51.20	35.30	-5.58	56.78	74	17.22	40.88	54	13.12
4.556	42.50	29.96	-12.51	55.01	74	18.99	42.47	54	11.53
5.446	39.60	25.75	-15.86	55.46	74	18.54	41.61	54	12.39
6.337	41.10	27.86	-18.79	59.89	80.68	20.79	46.65	80.68	34.03
7.288	40.10	27.67	-21.02	61.12	74	12.88	48.69	54	5.31
8.199	39.95	27.08	-21.97	61.92	74	12.08	49.05	54	4.95
9.111	40.00	27.28	-23.69	63.69	74	10.31	50.97	54	3.03

Table 6: Peak Spurious Emission Measurement Results for EUT on Back (Horizontal Polarization)

Frequency (GHz)	Peak Reading (dBµV)	Average Reading (dBµV)	CF (dB)	Peak E-Field (dBµV/m)	FCC Peak Limit (dBµV/m)	Margin to Peak Limit (dB)	Average E-Field (dBµV/m)	FCC Average Limit (dBµV/m)	Margin to Average Limit (dB)
1.822	63.00		-0.77	63.77	78.08	14.31		78.08	14.31
2.733	44.40		-3.27	47.67	74	26.33		54	6.33
3.644	44.80	35.98	-5.58	50.38	74	23.62	41.56	54	12.44
4.556	44.30	30.85	-12.51	56.81	74	17.19	43.36	54	10.64
5.446	44.05	28.17	-15.86	59.91	74	14.09	44.03	54	9.97
6.337	40.45	27.86	-18.79	59.24	78.08	18.84	46.65	78.08	31.43
7.288	40.50	27.61	-21.02	61.52	74	12.48	48.63	54	5.37
8.199	40.05	27.08	-21.97	62.02	74	11.98	49.05	54	4.95
9.111	40.90	27.18	-23.69	64.59	74	9.41	50.87	54	3.13

Table 7: Peak Spurious Emission Measurement Results for EUT on the back (Vertical Polarization)

Frequency (GHz)	Peak Reading (dBµV)	Average Reading (dBµV)	CF (dB)	Peak E-Field (dBµV/m)	FCC Peak Limit (dBµV/m)	Margin to Peak Limit (dB)	Average E-Field (dBµV/m)	FCC Average Limit (dBµV/m)	Margin to Average Limit (dB)
1.822	62.37		-0.77	63.14	80.68	17.54		80.68	17.54
2.733	43.73		-3.27	47.00	74	27.00		54	7.00
3.644	47.75	41.32	-5.58	53.33	74	20.67	46.90	54	7.10
4.556	42.91	32.29	-12.51	55.42	74	18.58	44.80	54	9.20
5.446	44.60	31.28	-15.86	60.46	74	13.54	47.14	54	6.86
6.337	40.35	27.71	-18.79	59.14	80.68	21.54	46.50	80.68	34.18
7.288	40.35	27.41	-21.02	61.37	74	12.63	48.43	54	5.57
8.199	40.55	26.94	-21.97	62.52	74	11.48	48.91	54	5.09
9.111	40.20	27.21	-23.69	63.89	74	10.11	50.90	54	3.10

Table 8: Peak Spurious Emission Measurement Results for EUT on one side (Horizontal Polarization)

Frequency (GHz)	Peak Reading (dBµV)	Average Reading (dBµV)	CF (dB)	Peak E-Field (dBµV/m)	FCC Peak Limit (dBµV/m)	Margin to Peak Limit (dB)	Average E-Field (dBµV/m)	FCC Average Limit (dBµV/m)	Margin to Average Limit (dB)
1.822	64.76		-0.77	65.53	78.08	12.55		78.08	12.55
2.733	44.15		-3.27	47.42	74	26.58		54	6.58
3.644	48.21	40.27	-5.58	53.79	74	20.21	45.85	54	8.15
4.556	42.70	31.80	-12.51	55.21	74	18.79	44.31	54	9.69
5.446	42.85	28.89	-15.86	58.71	74	15.29	44.75	54	9.25
6.337	40.40	27.35	-18.79	59.19	78.08	18.89	46.14	78.08	31.94
7.288	40.30	27.35	-21.02	61.32	74	12.68	48.37	54	5.63
8.199	39.75	26.94	-21.97	61.72	74	12.28	48.91	54	5.09
9.111	41.00	27.21	-23.69	64.69	74	9.31	50.90	54	3.10

Table 9: Peak Spurious Emission Measurement Results for EUT on one side (Vertical Polarization)

Frequency (GHz)	Peak Reading (dBµV)	Average Reading (dBµV)	CF (dB)	Peak E-Field (dBµV/m)	FCC Peak Limit (dBµV/m)	Margin to Peak Limit (dB)	Average E-Field (dBµV/m)	FCC Average Limit (dBµV/m)	Margin to Average Limit (dB)
1.822	61.99		-0.77	62.76	80.68	17.92		80.68	17.92
2.733	47.75		-3.27	51.02	74	22.98		54	2.98
3.644	47.05	36.36	-5.58	52.63	74	21.37	41.94	54	12.06
4.556	43.20	34.24	-12.51	55.71	74	18.29	46.75	54	7.25
5.446	42.50	28.49	-15.86	58.36	74	15.64	44.35	54	9.65
6.337	40.50	27.41	-18.79	59.29	80.68	21.39	46.20	80.68	34.48
7.288	39.80	27.71	-21.02	60.82	74	13.18	48.73	54	5.27
8.199	39.65	27.38	-21.97	61.62	74	12.38	49.35	54	4.65
9.111	40.00	27.60	-23.69	63.69	74	10.31	51.29	54	2.71

Table 10: Peak Spurious Emission Measurement Results for EUT upright (on bottom side) (Horizontal Polarization)

Frequency (GHz)	Peak Reading (dBµV)	Average Reading (dBµV)	CF (dB)	Peak E-Field (dBµV/m)	FCC Peak Limit (dBµV/m)	Margin to Peak Limit (dB)	Average E-Field (dBµV/m)	FCC Average Limit (dBµV/m)	Margin to Average Limit (dB)
1.822	64.52		-0.77	65.29	78.08	12.79		78.08	12.79
2.733	44.20		-3.27	47.47	74	26.53		54	6.53
3.644	48.55	38.68	-5.58	54.13	74	19.87	44.26	54	9.74
4.556	47.05	36.77	-12.51	59.56	74	14.44	49.28	54	4.72
5.446	42.70	31.21	-15.86	58.56	74	15.44	47.07	54	6.93
6.337	47.70	26.65	-18.79	66.49	78.08	11.59	45.44	78.08	32.64
7.288	40.25	27.75	-21.02	61.27	74	12.73	48.77	54	5.23
8.199	39.65	27.31	-21.97	61.62	74	12.38	49.28	54	4.72
9.111	39.75	27.60	-23.69	63.44	74	10.56	51.29	54	2.71

Table 11: Peak Spurious Emission Measurement Results for EUT upright (on bottom side) (Vertical Polarization)

From Tables 6 to 11, it can be seen that the peak spurious emissions did not exceed the limit. Hence the unit is in compliance.

MAJOR TEST EQUIPMENT

FAU EMI R&D LABORATORY TEST EQUIPMENT						
Equipment Type	**Manufacturer**	**Description**	**Model**	**Serial No.**	**Calibration Date**	**Calibration Interval (Years)**
Spectrum Analyzer	Hewlett Packard	RF Section	8566B	2403A06381	Aug-22-06	2
Spectrum Analyzer	Hewlett Packard	Display	85662A	2407A06381	Aug-22-06	2
Spectrum Analyzer	Hewlett Packard	Quasi Peak Adapter	85650A	2430A00559	Aug-22-06	2
RF Preselector	Hewlett Packard	Preselector	85685A	2510A00151	Feb-8-06	2
LISN	EMCO	LISN	3825/2R	1095	March-10-06	2
Antenna	EMCO	Biconical	3108	2147	Feb-24-06	2
Antenna	EMCO	Log Periodic	3146	1385	Feb-24-06	2
Amplifier	Hewlett Packard	Amplifier	8447D	2443A03952	Dec-01-06	2
Amplifier	Hewlett Packard	Microwave Amplifier	83017A	3123A00324	Nov-27-06	2
Power Meter	Rohde & Schwarz	Thermal Power Sensor	NRP-Z55	10028	July-18-07	2

TEST FACILITY

EMI Research and Development Laboratory
Department of Electrical Engineering
Florida Atlantic University
Boca Raton, Florida 33431
(561) 361-4390

A2LA Certification No. 2129.01
FCC Registration: 90599
Industry of Canada: IC46405-4076

Description	The 3m semi-anechoic chamber and Power Line Conducted Spurious Voltage test setup are constructed and calibrated to meet the FCC requirements of Section 2.948, as well as Industry Canada RSS 212 Issue 1.
Site Filing	A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046, and with the Industry Canada, Certification and Engineering Bureau, 3701 Carling Ave., Building 94, P.O. Box 11490, Station "H", Ottawa Ontario, K2H 8S2.
Instrument	All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements.

End of Report