DLS ELECTRONIC SYSTEMS, INC.
NVLAP 100276-0

1250 Peterson Dr., Wheeling, IL 60090

Company: Zebra Technologies Corporation
Model Tested: 110PAX4
Report Number: 11184

FCC Rules and Regulations / Intentional Radiators

Operational in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz, Bands

Part 15, Subpart C, Section 15.247

THE FOLLOWING **"MEETS"** THE ABOVE TEST SPECIFICATION

Formal Name:	R110PAX4
Kind of Equipment:	On demand RFID \ thermal bar code print engine
Test Configuration:	Multiprotocol (Tested at 120 vac, 60 Hz)
Model Number(s):	110PAX4
Model(s) Tested:	110PAX4
Serial Number(s):	NA
Date of Tests:	November 18, 2004 and February 3 & 4, 2005
Test Conducted For:	Zebra Technologies Corporation 333 Corporate Woods Pkwy Vernon Hills, Illinois 60061

1250 Peterson Dr., Wheeling, IL 60090

SIGNATURE PAGE

Report By:

Arnom C. Rowe
Test Engineer
EMC-001375-NE

Reviewed By:

William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

Company Official:

Zebra Technologies Corporation

1250 Peterson Dr., Wheeling, IL 6009

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC 17025:1999
ISO 9002:1994

Certificate of Accreditation

DEPARTMENT OF COMMERCE ★ UNITED STATES OF AMERICA ★

D.L.S. ELECTRONIC SYSTEMS, INC.
WHEELING, IL

is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria set forth in NIST Handbook 150:2001, all requirements of ISO/IEC 17025:1999, and relevant requirements of ISO 9002:1994. Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

September 30, 2005
Effective through

For the National Institute of Standards and Technology
NVLAP Lab Code: 100276-0

NVLAP-01C (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.
1250 Peterson Drive
Wheeling, IL 60090-6454
Mr. Brian J. Mattson
Phone: 847-537-6400 Fax: 847-537-6488
E-Mail: bmattson@dlsemc.com
URL: http://www.dlsemc.com

NVLAP Code	*Designation / Description*
Emissions Test Methods:	
12/160D21	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 21 - Emission of Radio Frequency Energy
12/300220a	EN 300 220-1 V1.3.1 (2000-09): Electromagnetic compatibility and Radio spectrum Matters; Short Range Devices; Radio equipment to be used in the 25 MHz to 1000 MHz frequency range with power levels ranging up to 500 mW; Part 1: Technical characteristics and test methods
12/300386a	EN 300 386 V.1.2.1: Electromagnetic compatibility and radio spectrum matter (ERM); Telecommunication network equipment; Electromagnetic compatibility (EMC) requirements
12/C63.17	ANSI C63.17-1998: American National Standard for Methods of Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/C6317a	ANSI C63.17-1998: American National Standard for Methods of Measurement of the Electromagnetic and Operational Compatibility of Unlicensed Personal Communications Services (UPCS) Devices
12/CIS11	IEC/CISPR 11 + A1 (1997), EN 55011 (1998), AS/NZS CISPR 11 (2002), and CNS 13803 (1997): Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific, and Medical Radio-Frequency Equipment
12/CIS13	IEC/CISPR 13 (2001-04), EN 55013 (2001), AS/NZS CISPR 13 (2003), and CNS 13439 (2001): Sound and television broadcast receivers and associated equipment - Radio disturbance characteristics - Limits and methods of measurement
12/CIS14	CISPR 14-1 (March 30, 2000): Limits and Methods of Measurement of Radio interference Characteristics of Household Electrical Appliances, Portable Tools and Similiar Electrical Apparatus - Part 1: Emissions
12/CIS14a	EN 55014-1 (1993), A1 (1997), A2 (1999):
12/CIS14d	IEC/CISPR 14-1 (2001) and A1 (2001): Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emissions
12/CIS14e	EN 55014-1 (2001) and A1 (2001): Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/CIS14f	AS/NZS 1044 (2001) and A1 (2001): Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
12/CIS14g	CNS 13783-1 (2001) and A1 (2001): Electromagnetic Compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission
12/CIS15	IEC/CISPR 15 (2000) + A1 (2001): Limits and methods of measurements of radio disturbance characteristics of electrical lighting and similar equipment
12/CIS15a	AS/NZS CISPR 15 (2002): Limits and methods of measurements of radio disturbance characteristics of electrical lighting and similar equipment
12/CIS15b	CNS 13439 (2000) + A1 (2001): Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
12/CIS15c	EN 55015 (2000) + A1 (2001): Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
12/CIS22	IEC/CISPR 22 (1997) & EN 55022 (1998) + A1(2000): Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/CIS22a	IEC/CISPR 22 (1993) and EN 55022 (1994): Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Amendment 1 (1995) and Amendment 2 (1996)

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/CIS22b	CNS 13438 (1997): Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
12/EM02a	IEC 61000-3-2, Edition 2.1 (2001-10), EN 61000-3-2 (2000), and AS/NZS 2279.1 (2000): Electromagnetic compatibility (EMC) Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A)
12/EM03	IEC 61000-3-3(1995); EN 61000-3-3(1995); AS/NZS 2279.3(1995): EMC - Part 3: Limits - Section 3. Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to 16A
12/F18	FCC OST/MP-5 (1986): FCC Methods of Measurement of Radio Noise Emissions for ISM Equipment (cited in FCC Method 47 CFR Part 18 - Industrial, Scientific, and Medical Equipment)
12/FCC15b	ANSI C63.4 (2001) with FCC Method 47 CFR Part 15, Subpart B: Unintentional Radiators
12/FCC15c	ANSI C63.4 (2001) with FCC Method 47 CFR Part 15, Subpart C: Intentional Radiators
12/FCC15d	ANSI C63.4(2001) with FCC Method 47 CFR Part 15, Subpart D: Unlicensed Personal Communications Service Devices

September 30, 2005

Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/FCC15e	ANSI C63.4 (2001) with FCC Method 47 CFR Part 15, Subpart E: Unlicensed National Information Infrastructure Service Devices
12/T51	AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment
12/VCCIa	Agreement of Voluntary Control Council for Interference by Information Technology Equipment - Technical Requirements: V-3/02.04

Immunity Test Methods:

12/1089a	GR-1089-CORE, Issue 3, October 2002: Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment (sections 2, 3.3, and 3.5)
12/160D16	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 16 - Power Input
12/160D17	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 17 - Voltage Spike
12/160D18	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 18 - Audio Frequency Conducted Susceptibility - Power Inputs

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology NVLAP® National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/160D19	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 19 - Induced Signal Susceptibility
12/160D20	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 20 - Radio Frequency Susceptibility (Radiated and Conducted)
12/160D22	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 22 - Lightning Induced Transient Susceptibility
12/160D25	RTCA/DO-160D (1997): Environmental Conditions and Test Procedures for Airborne Equipment - Section 25 - Electrostatic Dischare (ESD)
12/I01	IEC 61000-4-2, Ed. 2.1 (2001), A1, A2; EN 61000-4-2: Electrostatic Discharge Immunity Test
12/I02	IEC 61000-4-3, Ed. 2.0 (2002-03); EN 61000-4-3 (2002): Radiated Radio-Frequency Electromagnetic Field Immunity Test
12/I03	IEC 61000-4-4(1995), A1(2000), A2(2001); EN 61000-4-4: Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test
12/I04	IEC 61000-4-5, Ed. 1.1 (2001-04); EN 61000-4-5: Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test

September 30, 2005

Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/I05	IEC 61000-4-6, Ed. 2.0 (2003-05); EN 61000-4-6: Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/I06	IEC 61000-4-8, Ed. 1.1 (2001); EN 61000-4-8: Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
12/I07	IEC 61000-4-11, Ed. 1.1 (2001-03); EN 61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests
12/J111324	SAE J1113/24: Immunity to radiated electromagnetic fields; 10 kHz to 200 MHz - Crawford TEM cell and 10 kHz to 5 GHz - Wideband TEM cell
12/J111341	SAE J1113/41 (1995-07): Limits and methods of measurement of radio disturbance characteristics of components and modules for the protection of receivers used on board vehicles
Radio Test Methods	
12/RSS119	RSS-119, Issue 6 (March 25, 2000): Land Mobile and Fixed Radio Transmitters and Receivers, 27.41 to 960 MHz
12/RSS123	RSS-123, Issue 1, Rev. 2 (November 6, 1999): Low Power Licensed Radiocommunication Devices

September 30, 2005

Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/RSS125	RSS-125 (March 25, 2000): Land Mobile and Fixed Radio Transmitters and Receivers, 1.705 to 50.0 MHz, Primarily Amplitude Modulated
12/RSS131	RSS-131, Issue 2 (July 2003): Zone Enhancers for the Land Mobile Service
12/RSS132	RSS-132, Issue 1 (August 2002): 800 MHz Cellular Telephones Employing New Technologies
12/RSS133	RSS-133, Issue 2, Rev. 1 (November 6, 1999): 2GHz Personal Communications Services
12/RSS134	RSS-134, Issue 1, Rev. 1 (March 25, 2000): 900 MHz Narrowband Personal Communication Service
12/RSS135	RSS-135, Issue 1 (October 26, 1996): Digital Scanner Receivers
12/RSS136	RSS-136, Issue 5 (October 2002): Land and Mobile Station Radiotelephone Transmitters and Receivers Operating in the 26.960 - 27.410 MHz General Radio Service Band
12/RSS137	RSS-137, Issue 1, Rev. 1 (September 25, 1999): Location and Monitoring Service (902 - 928 MHz)
12/RSS139	RSS-139, Isssue 1 (February 5, 2000): Licensed Radiocommunications Devices in the Band 2400 - 2483.5 MHz

September 30, 2005

Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS — **NVLAP LAB CODE 100276-0**

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/RSS141	RSS-141, Issue 1 (July 2003): Aeronautical Radiocommunication Equipment in the Frequency Band 117.975 - 137 MHz
12/RSS142	RSS-142, Issue 2 (August 2002): Narrowband Multipoint Communication Systems in the 1,427 - 1,430 MHz and 1,493.5 - 1,496.5 MHz Bands
12/RSS170	RSS-170, Issue 1, Rev. 1 (November 6, 1999): Satellite Mobile Earth Stations
12/RSS191	RSS-191, Issue 2 (August 2002): Local Multipoint Communication Systems in the 28 GHz Band; Point-to-Point and Point-to-Multipoint Broadband Communication Systems in the 24 GHz and 38 GHz Bands
12/RSS192	RSS-192, Issue 1 (November 6, 1999): Fixed Wireless Access Systems in the Band 3400 - 3700 MHz
12/RSS193	RSS-193, Issue 1 (July 2003): Multipoint and Point-to-Point Communication Systems (MCS) in the Fixed Service Operating in the 2,150 - 2,160 MHz, 2,500 - 2,596 MHz and 2,686 - 2,690 MHz Bands
12/RSS210	RSS-210, Issue 5 (November 2001): Low Power Licence-Exempt Radiocommunication Devices
12/RSS212	RSS-212, Issue 1 (February 27, 1999): Test Facilities and Test Methods for Radio Equipment

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS — **NVLAP LAB CODE 100276-0**

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
12/RSS213	RSS-213, Issue 1 (April 24, 1999): 2 GHz Licence-Exempt Personal Communications Service Devices (PCS)
12/RSS215	RSS-215, Issue 1 (November 6, 1999): Analogue Scanner Receivers
Telecommunications Test Methods:	
12/FCC2a2	TIA/EIA 603A (2001) with 47 CFR Part 2: Public Mobile Services in 47 CFR Part 22
12/FCC2b2	TIA/EIA 603A (2001) with 47 CFR Part 2: Private Land Mobile Radio Services in 47 CFR Part 90
12/FCC2d1	TIA/EIA 603A (2001) with 47 CFR Part 2: Experimental Radio, Auxiliary, Special Broadcast and Other Program Distributional Services in 47 CFR Part 74
12/FCC2e1	TIA/EIA 603A (2001) with 47 CFR Part 2: International Fixed Public Radiocommunication Services in 47 CFR Part 23
12/CIS15c	EN 55015 (2000) + A1 (2001): Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
MIL-STD-462 : Conducted Emissions:	
12/A13	MIL-STD-462 Version D Method CE101
12/A14	MIL-STD-462 Version D Method CE102
12/A16	MIL-STD-461 Version E Method CE101
12/A17	MIL-STD-461 Version E Method CE102
12/A18	MIL-STD-461 Version E Method CE106
MIL-STD-462 : Conducted Susceptibility:	
12/B12	MIL-STD-462 Version D Method CS101
12/B13	MIL-STD-462 Version D Method CS103
12/B25	MIL-STD-461 Version E Method CS114
12/B26	MIL-STD-461 Version E Method CS115
12/B27	MIL-STD-461 Version E Method CS116

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

National Institute of Standards and Technology — NVLAP® — National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

D.L.S. ELECTRONIC SYSTEMS, INC.

NVLAP Code	*Designation / Description*
MIL-STD-462 : Radiated Emissions:	
12/D04	MIL-STD-462 Version D Method RE101
12/D05	MIL-STD-462 Version D Method RE102
12/D06	MIL-STD-462 Version D Method RE103
MIL-STD-462 : Radiated Susceptibility:	
12/E08	MIL-STD-462 Version D Method RS101
12/E09	MIL-STD-462 Version D Method RS103

September 30, 2005
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

1250 Peterson Dr., Wheeling, IL 6009

TABLE OF CONTENTS

1250 Peterson Dr., Wheeling, IL 6009

TABLE OF CONTENTS

1250 Peterson Dr., Wheeling, IL 6009

1.0 SUMMARY OF TEST REPORT

It was found that the R110PAX4, Model Number(s) 110PAX4, **"meets"** the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Section 15.247 for operational in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz, Bands.

This test report relates only to the items tested and contains the following number of pages.

Text: 195

2.0 INTRODUCTION

On November 18, 2004 and February 3 & 4, 2005, a series of radio frequency interference measurements was performed on R110PAX4, Model Number(s) 110PAX4, Serial Number: NA. The tests were performed according to the procedures of the FCC as stated in the "Methods of Measurement of Radio-Noise Emissions for Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" found in the American National Standards Institute, ANSI C63.4-2003. Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency interference emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Sections 15.205, 15.209 & 15.247 for Intentional Radiators operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

4.0 TEST SET-UP

All emission tests were performed at D.L.S. Electronic Systems, Inc. and set up according to the American National Standards Institute, ANSI C63.4-2003, Section 8, (Figures 11a and 11b).

All radiated emissions tests were performed with the test item placed on a 80 cm high rotating non-conductive table, located in the test room. Equipment normally operated on the floor was placed on a metal covered turntable which is flush with the surrounding conducting ground plane. The ground plane has an electrical isolation layer over its surface approximately 7 mm thick. The EUT is separated from the turntable ground plane by a non-conductive layer. The equipment under test was set up according to ANSI C63.4-2003, Sections 6 and 8.

1250 Peterson Dr., Wheeling, IL 6009

5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the HP Spectrum Analyzer or ESI 26/40 Fixed Tuned Receiver. The data was taken using Peak, Quasi-Peak or the Average Detector Functions as required. This information was then used to determine the frequencies of maximum emissions. Above 1000 MHz, final data was taken using the Average Detector.

Below 1000 MHz, final data was taken using the HP Spectrum Analyzer and/or ESI 26/40 Fixed Tuned Receiver. These plots were made using the Peak or Quasi-Peak Detector functions, with manual measurements performed on the questionable frequencies using the Quasi-Peak or the Average Detector Function of the Analyzer or ESI 26/40 Fixed Tuned Receiver as required. Above 1000 MHz, final data was taken using the Average Detector on the Spectrum Analyzer.

The bandwidths shown below are specified by ANSI C63.4-2003, Section 4.2.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

A list of the equipment used can be found in Table 1. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

6.0 AMBIENT MEASUREMENTS

For emissions measurements, broadband antennas and an EMI Test Receiver with a panoramic spectrum display are used. First the frequency range is scanned and displayed on the test receiver display. Next the scanned frequency range is divided into smaller ranges, and then it is manually tuned through to determine the emissions from the EUT. A headset or loudspeaker is connected to the test receiver's AM/FM demodulated output as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT. If there is any doubt as to the source of the emission, it is further investigated by rotating the EUT, or by disconnecting the power from the EUT.

The EUT is set up in its typical configuration and operated in its various modes. For tabletop systems, cables are manipulated within the range of likely configurations. For floor-standing equipment, the cables are located in the same manner as the user would install them and no further manipulation is made. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions. For each mode of operation, the frequency spectrum is monitored. Variations in antenna height, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) are explored to produce the emissions that have the highest amplitude relative to the limit. These methods are performed to the specifications in ANSI C63.4: 2003.

7.0 DESCRIPTION OF TEST SAMPLE: (See also Paragraph 8.0)

7.1 Description:

Zebra R110PAX4 is a RFID Thermal Transfer on demand print engine, capable of printing RFID labels. Printer powered through an IEC 320 connector, from 85-264 VAC, 47-63 Hz. Printer uses ZPL programming language, capable of receiving data via Serial connector, Parallel connector (covered when other communications options are installed). For this test the Ethernet print server option is installed and used for sending data packets of label data to the printer, from a Dell Laptop Computer.

1250 Peterson Dr., Wheeling, IL 6009

7.0 DESCRIPTION OF TEST SAMPLE: (CON'T)

7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 38.75 cm x Width: 24 cm x Height: 30 cm

7.3 LINE FILTER USED:

Yunpen, YL06T1
High - Low 06SS3-SR-Q

7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

46 kHz, 56 kHz, and 100 kHz

Clock Frequencies:

Printer CPU: 3.6469 MHz, 8.0 MHz, 16.0 MHz, and 32.0 MHz
Print Server: 25 MHz, 33 MHz, 66 MHz

1250 Peterson Dr., Wheeling, IL 60090

7.0 DESCRIPTION OF TEST SAMPLE: (CON'T)

7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. CPU Board Assembly	PN: 57330 Rev G
2. AC power supply board assembly	PN: 57272 Rev A
3. DC power supply board assembly	PN: 43238 Rev 2
4. Control Panel Interface board Assembly	PN: 49755 Rev 2
5. Ribbon Control board Assembly	PN: 43210 Rev 3
6. Applicator Interface Board Assembly	PN: 57056 Rev C
7. Print server, 100 Base T Ethernet	PN: 47670 Rev 1
8. ASM MP UHF RFID RDR	PN: 27095 Rev B
9. ASSY UHF COUPLER ARRAY	PN: 58989

1250 Peterson Dr., Wheeling, IL 60090

8.0 ADDITIONAL DESCRIPTION OF TEST SAMPLE:
(See also Paragraph 7.0)

1: There were no additional descriptions noted at the time of test.

NOTE:
The Transmitter Reader is the same one tested on November 18, 2004 in the 170XiIII Printer. The RF Conducted test data taken on November 18, 2004 was used in this test report. See pages 39 – 75.

I certify that the above, as described in paragraph 7.0, describes the equipment tested and will be manufactured as stated.

By: _____ _____
Signature Title

For: _____ _____
Company Date

1250 Peterson Dr., Wheeling, IL 60090

9.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 R110PAX4
Model Number: 110PAX4 Serial Number: NA

Item 1 Shielded Serial Cable with Metal Shells. 2m

Item 2 Shielded 15 pin Cable with Metal Shells. 2.5m

Item 3 Non-shielded Ethernet Cable with Plastic Shells. 10m

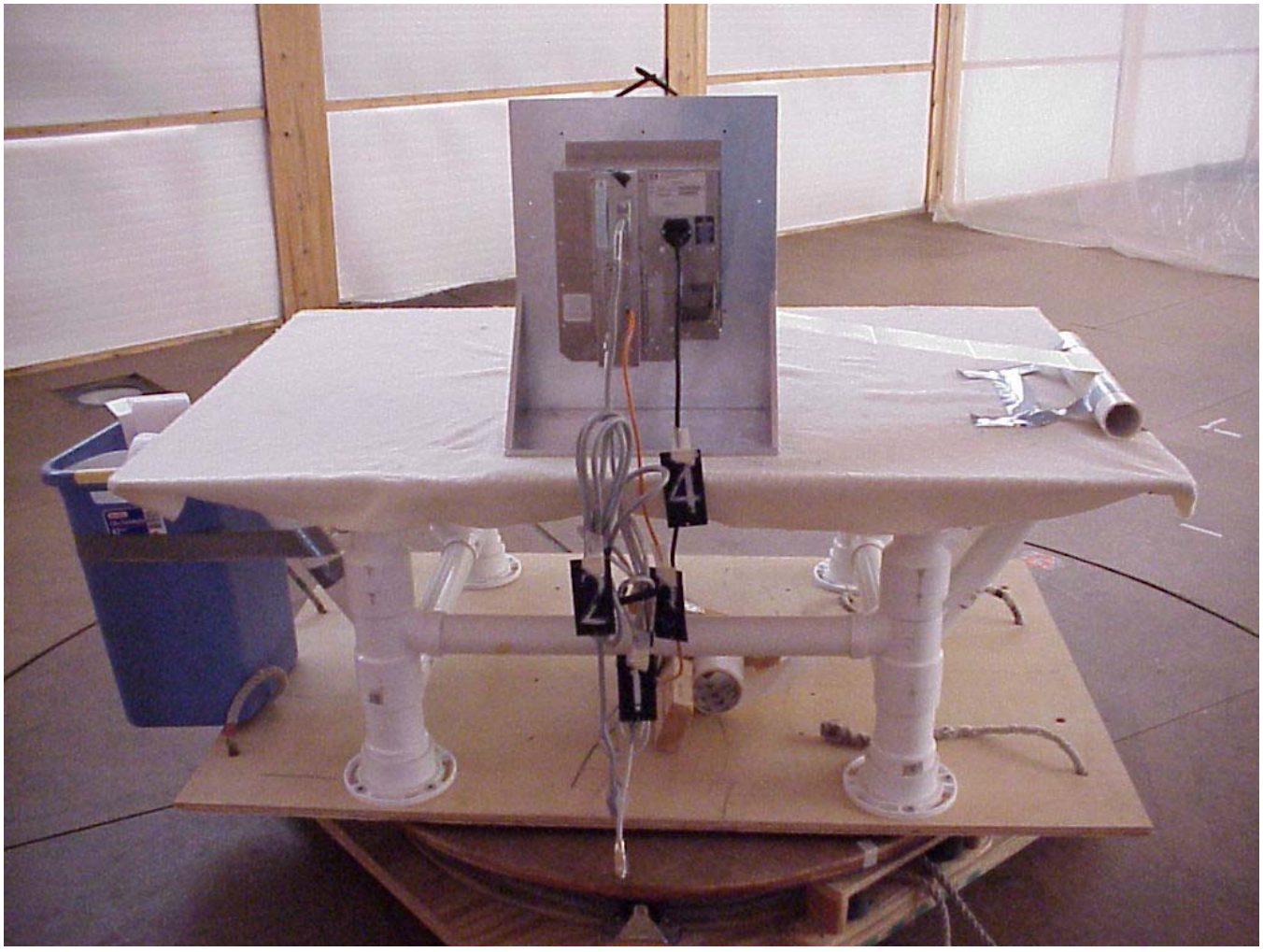
Item 4 AC Power Line Cord. 2m

1250 Peterson Dr., Wheeling, IL 60090

10.0 RADIATED PHOTOS TAKEN DURING TESTING

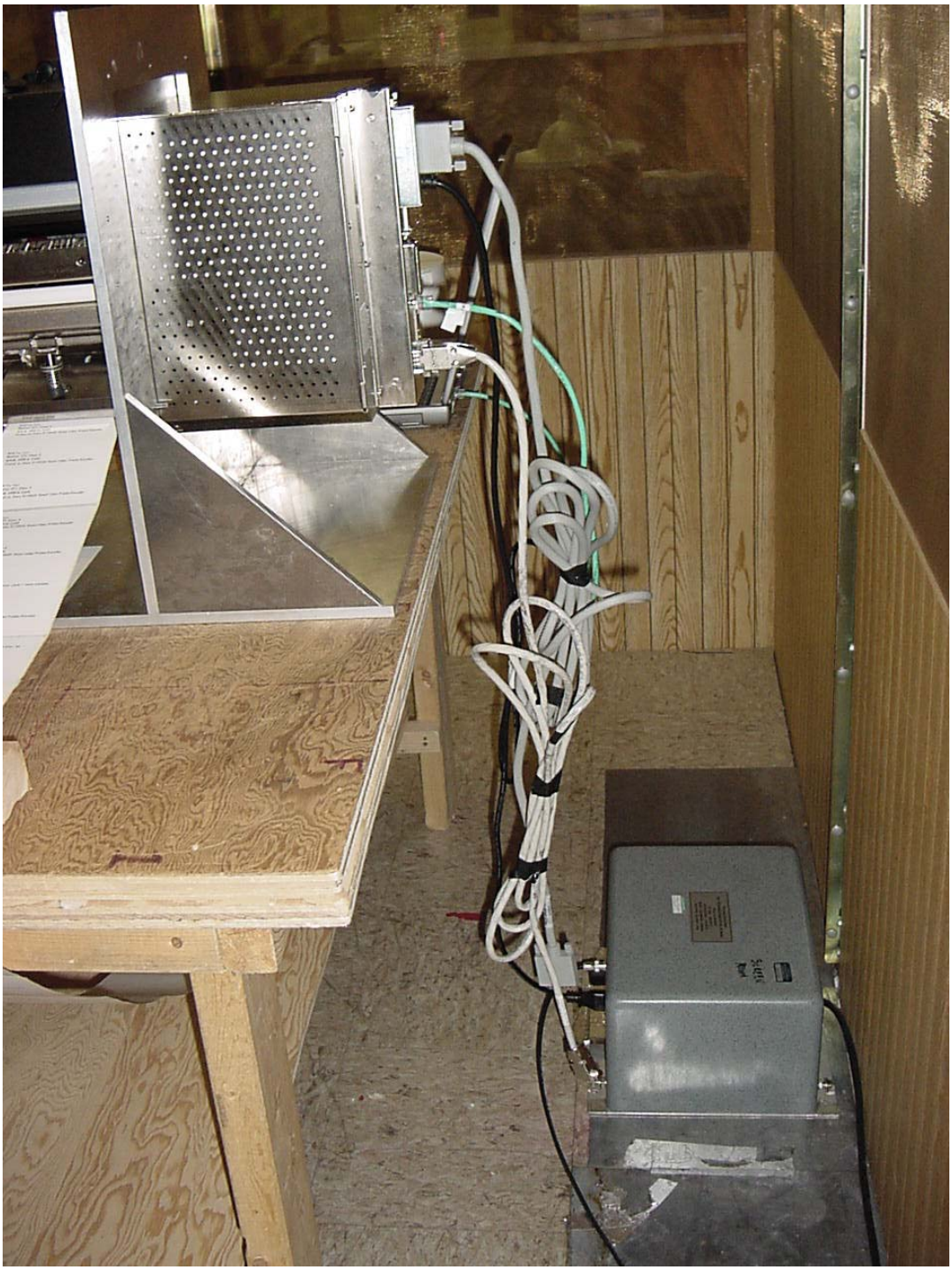
1250 Peterson Dr., Wheeling, IL 60090

10.0 RADIATED PHOTOS TAKEN DURING TESTING: (CON'T)



1250 Peterson Dr., Wheeling, IL 60090

10.0 CONDUCTED PHOTOS TAKEN DURING TESTING



1250 Peterson Dr., Wheeling, IL 60090

11.0 RESULTS OF TESTS

The radio interference emission charts results can be seen on the pages at the end of this report. Data sheets indicating the test measurements taken during testing can also be found at the end of this report. Points on the emission charts shown with a yellow mark are background frequencies that were verified during testing.

12.0 CONCLUSION

It was found that the R110PAX4, Model Number(s) 110PAX4 **"meets"** the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart C, Section 15.247 for operational in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz, Bands.

1250 Peterson Dr., Wheeling, IL 60090

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Spectrum Analyzer	Hewlett/ Packard	8566B	2240A002041	100 Hz – 22 GHz	10/05
Quasi-Peak Adapter	Hewlett/ Packard	85650A	2043A00121	10 kHz – 1 GHz	10/05
Spectrum Analyzer	Hewlett/ Packard	8566B	2421A00452	100 Hz – 22 GHz	2/05
Quasi-Peak Adapter	Hewlett/ Packard	85650A	2043A00450	10 kHz – 1 GHz	2/05
Spectrum Analyzer	Hewlett/ Packard	8591A	3009A00700	9 kHz – 1.8 GHz	3/05
Receiver	Electrometrics	EMC-30	44168	10 kHz – 1 GHz	9/05
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	11/05
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	12/05
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	12/05
Antenna	EMCO	3104C	00054891	20 MHz – 200 MHz	2/05
Antenna	Electrometrics	LPA-25	1114	200 MHz – 1 GHz	3/05
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3/05

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.

1250 Peterson Dr., Wheeling, IL 60090

TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Antenna	Electrometrics	3146	1205	200 MHz – 1 GHz	3/05
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	2/05
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	3/05
Antenna	EMCO	3115	2479	1 GHz – 18 GHz	8/05
Antenna	EMCO	3115	99035731	1 GHz – 18 GHz	4/05
Antenna	Rohde & Schwarz	HUF-Z1	829381001	20 MHz – 1 GHz	2/05
Antenna	Rohde & Schwarz	HUF-Z1	829381005	20 MHz – 1 GHz	8/05
LISN	Solar	8012-50-R-24-BNC	8305116	10 MHz – 30 MHz	8/05
LISN	Solar	8012-50-R-24-BNC	814548	10 MHz – 30 MHz	8/05
LISN	Solar	9252-50-R-24-BNC	961019	10 MHz – 30 MHz	12/05
LISN	Solar	9252-50-R-24-BNC	971612	10 MHz – 30 MHz	10/05
LISN	Solar	9252-50-R-24-BNC	92710620	10 MHz – 30 MHz	7/05

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

TEST PROCEDURE

Part 15, Subpart C, Section 15.247 (a-h)

OPERATION WITHIN THE BAND 902-928 MHz, 2400-2483.5 MHz AND 5725-5857 MHz

ELECTRONIC SYSTEMS, INC.
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

1.0 CONDUCTED EMISSION MEASUREMENTS

If applicable, the conducted emissions were measured over the frequency range from 150 kHz to 30 MHz in accordance with the power line measurements as specified in the American National Standards Institute, ANSI C63.4-2001, Section 12. Since the device is operated from the public utility lines, the 115 Vac 60 Hz power leads, high and low sides, were to be measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. All signals were then recorded. The allowed levels for Intentional Radiators cannot exceed 250 uV (47.96 dBuV) at any frequency between 150 kHz and 30 MHz, as stated in Section 15.207a.

All conducted emissions measurements were made at a test room temperature of **70°F** at **30%** relative humidity.

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

DATA AND GRAPH(S) TAKEN DURING TESTING

PART 15.207

FCC Part 15 Class A

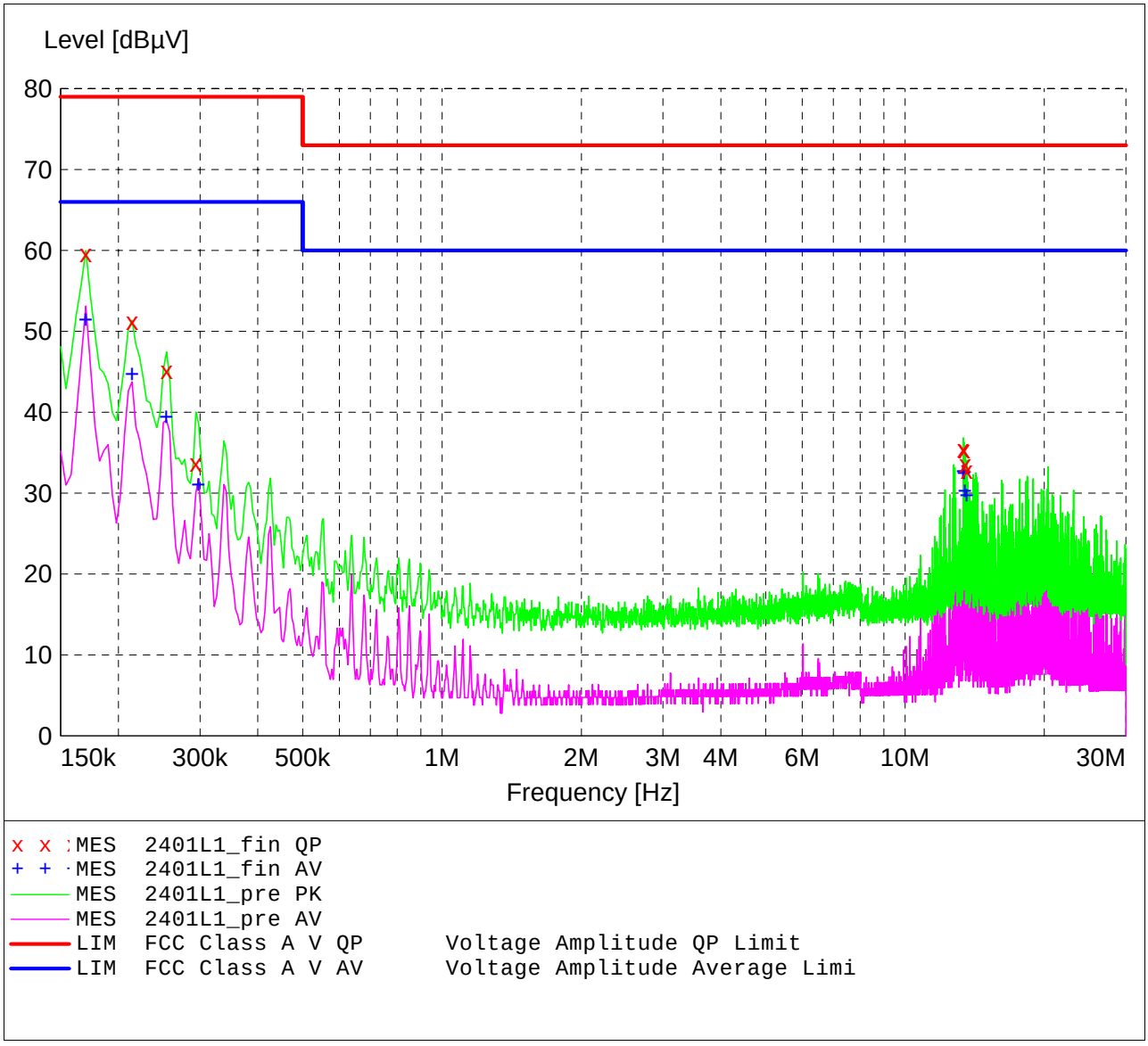
Voltage Mains Test

EUT:	R110PAX4
Manufacturer:	Zebra Technologies
Operating Condition:	70 deg F, 30% R.H.
Test Site:	DLS O.F. screen room
Operator:	Craig Brandt
Test Specification:	120 VAC; 60 Hz
Comment:	Line 1
Start of Test:	2/4/2005 / 12:13:56PM

SCAN TABLE: "FCC ClassA Voltage"

Short Description: FCC Class A Voltage Test

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "2401L1_fin QP"

2/4/2005 12:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.170000	59.60	11.2	79	19.4	1	---
0.214000	51.20	10.8	79	27.8	1	---
0.254000	45.20	10.7	79	33.8	1	---
0.294000	33.70	10.5	79	45.3	1	---
13.358000	35.50	10.8	73	37.5	1	---
13.418000	35.40	10.8	73	37.6	1	---
13.482000	33.60	10.8	73	39.4	1	---
13.602000	32.80	10.8	73	40.2	1	---

MEASUREMENT RESULT: "2401L1_fin AV"

2/4/2005 12:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.170000	51.50	11.2	66	14.5	1	---
0.214000	44.70	10.8	66	21.3	1	---
0.254000	39.50	10.7	66	26.5	1	---
0.298000	31.10	10.5	66	34.9	1	---
13.358000	32.70	10.8	60	27.3	1	---
13.418000	32.50	10.8	60	27.5	1	---
13.482000	30.30	10.8	60	29.7	1	---
13.602000	29.80	10.8	60	30.2	1	---

FCC Part 15 Class A

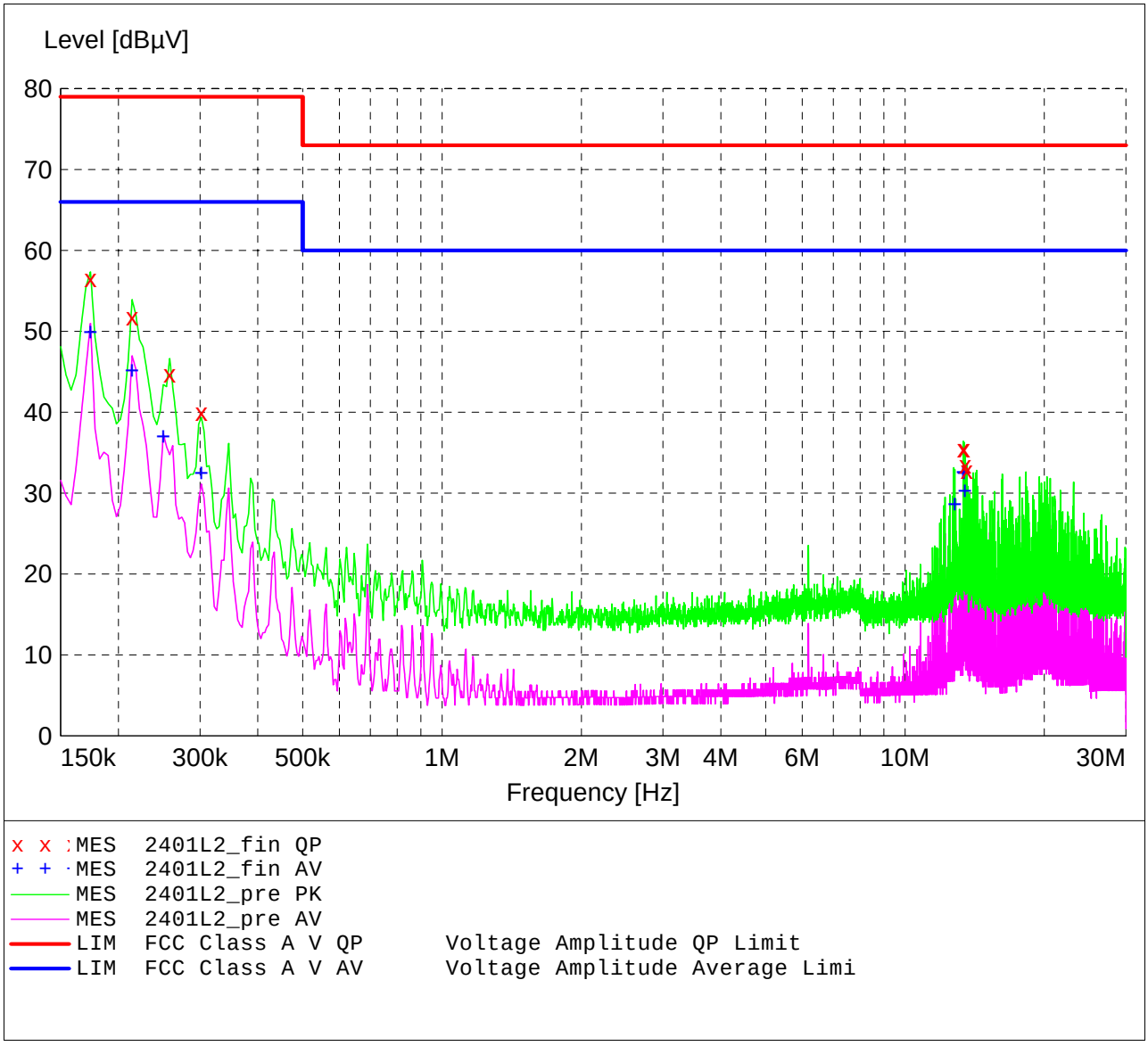
Voltage Mains Test

EUT:	R110PAX4
Manufacturer:	Zebra Technologies
Operating Condition:	70 deg F, 30% R.H.
Test Site:	DLS O.F. screen room
Operator:	Craig Brandt
Test Specification:	120 VAC; 60 Hz
Comment:	Line 2
Start of Test:	2/4/2005 / 12:19:29PM

SCAN TABLE: "FCC ClassA Voltage"

Short Description: FCC Class A Voltage Test

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "2401L2_fin QP"

2/4/2005 12:23PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.174000	56.60	11.2	79	22.4	1	---
0.214000	51.80	10.8	79	27.2	1	---
0.258000	44.80	10.7	79	34.2	1	---
0.302000	40.00	10.5	79	39.0	1	---
13.358000	35.50	10.8	73	37.5	1	---
13.418000	35.50	10.8	73	37.5	1	---
13.482000	33.50	10.8	73	39.5	1	---
13.602000	32.90	10.8	73	40.1	1	---

MEASUREMENT RESULT: "2401L2_fin AV"

2/4/2005 12:23PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.174000	49.90	11.2	66	16.1	1	---
0.214000	45.20	10.8	66	20.8	1	---
0.250000	37.00	10.7	66	29.0	1	---
0.302000	32.50	10.5	66	33.5	1	---
12.810000	28.60	10.7	60	31.4	1	---
13.358000	32.60	10.8	60	27.4	1	---
13.418000	32.50	10.8	60	27.5	1	---
13.482000	30.30	10.8	60	29.7	1	---

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

2.0 SPURIOUS EMISSIONS AT ANTENNA TERMINALS – PART 15.247(c)

Spurious conducted emissions were measured at the antenna terminals. Plots were made showing the amplitude of each harmonic emission with the equipment operated. As shown by the radiated charts there was no reason to believe that there were any spurious emissions other than the harmonics that were than individually investigated when doing the conducted test at the antenna terminals. Measurements were made up to the 10^{th} harmonic of the fundamental.

The allowed emissions for transmitters operating in the 902 MHz to 928 MHz bands for R110PAX4 equipment are found under Part 15, Section 15.247(c). This paragraph states that in any 100 kHz bandwidth outside the frequency band which the spread spectrum intentional radiator is operating, the radio frequency power produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

NOTE: See the following pages for the data ad graphs of the actual measurements made:

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

CONDUCTED EMISSION DATA AND GRAPH(S) TAKEN FOR

SPURIOUS EMISSION MEASUREMENTS MADE

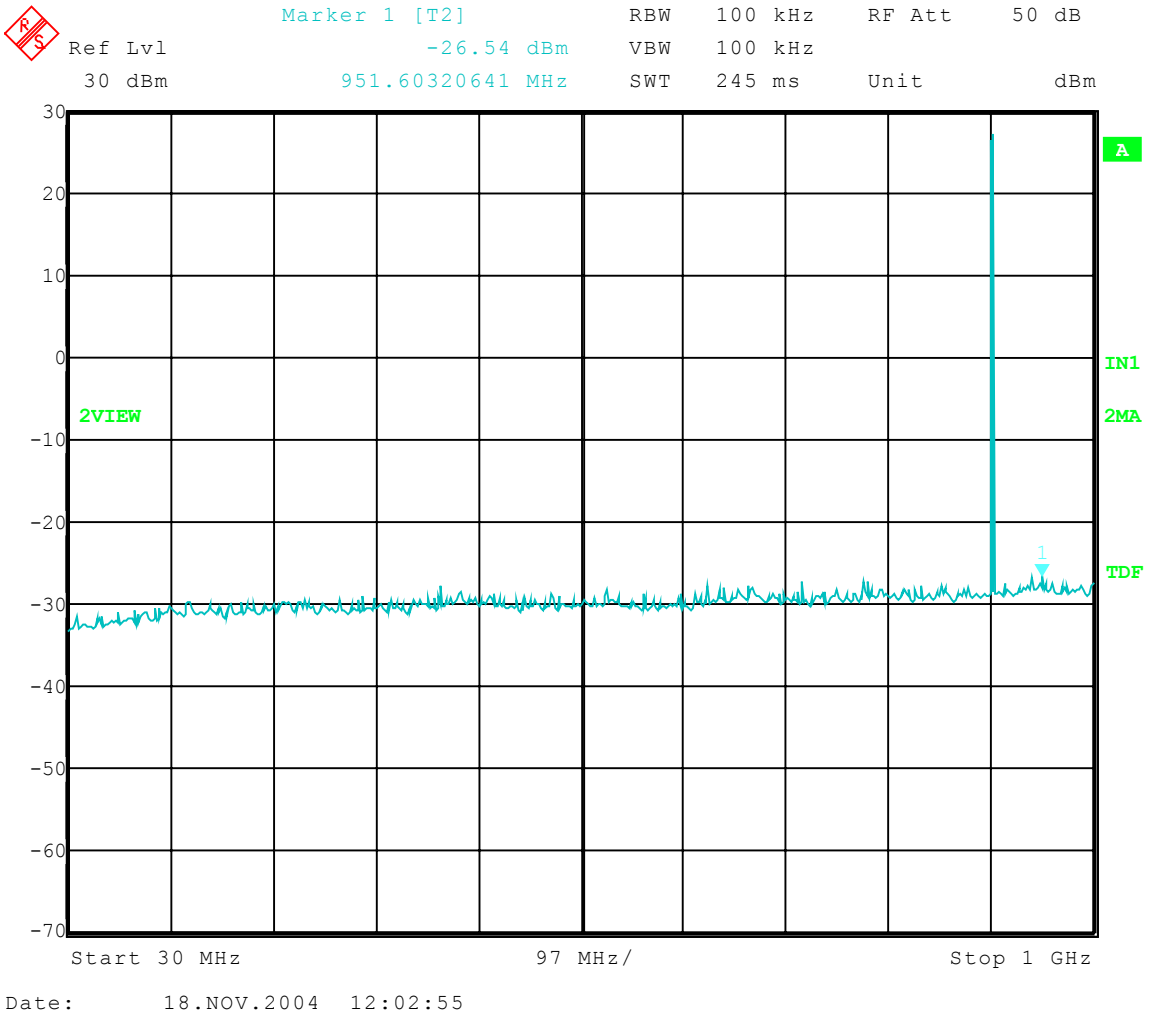
AT THE ANTENNA TERMINALS

PART 15.247(c)

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

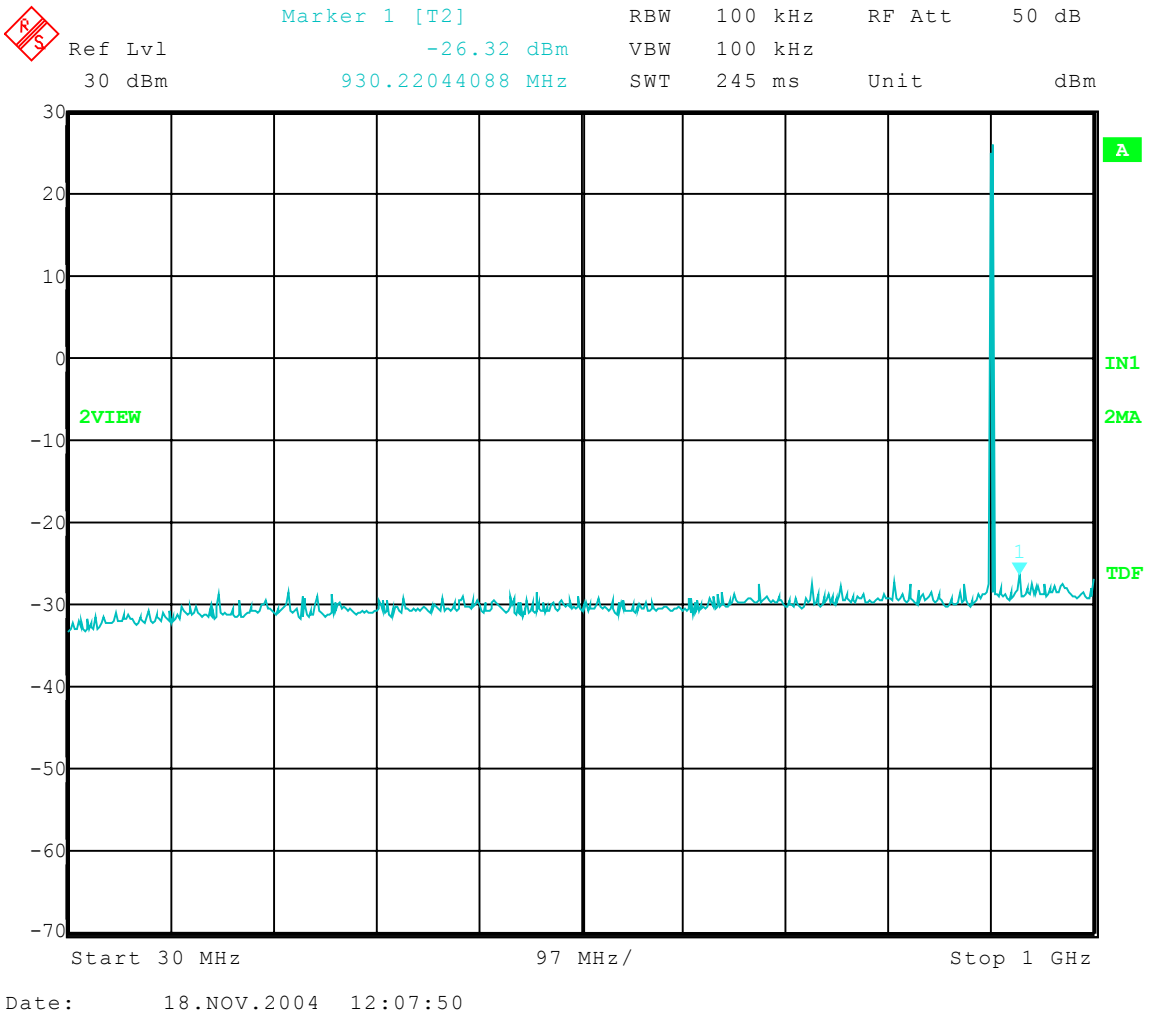
Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; High Power: Transmit = 902.967 MHz
Frequency Range: 30 to 1000 MHz
Limit = 7.16 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Mid Power: Transmit = 902.967 MHz
Frequency Range: 30 to 1000 MHz
Limit = 5.75 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

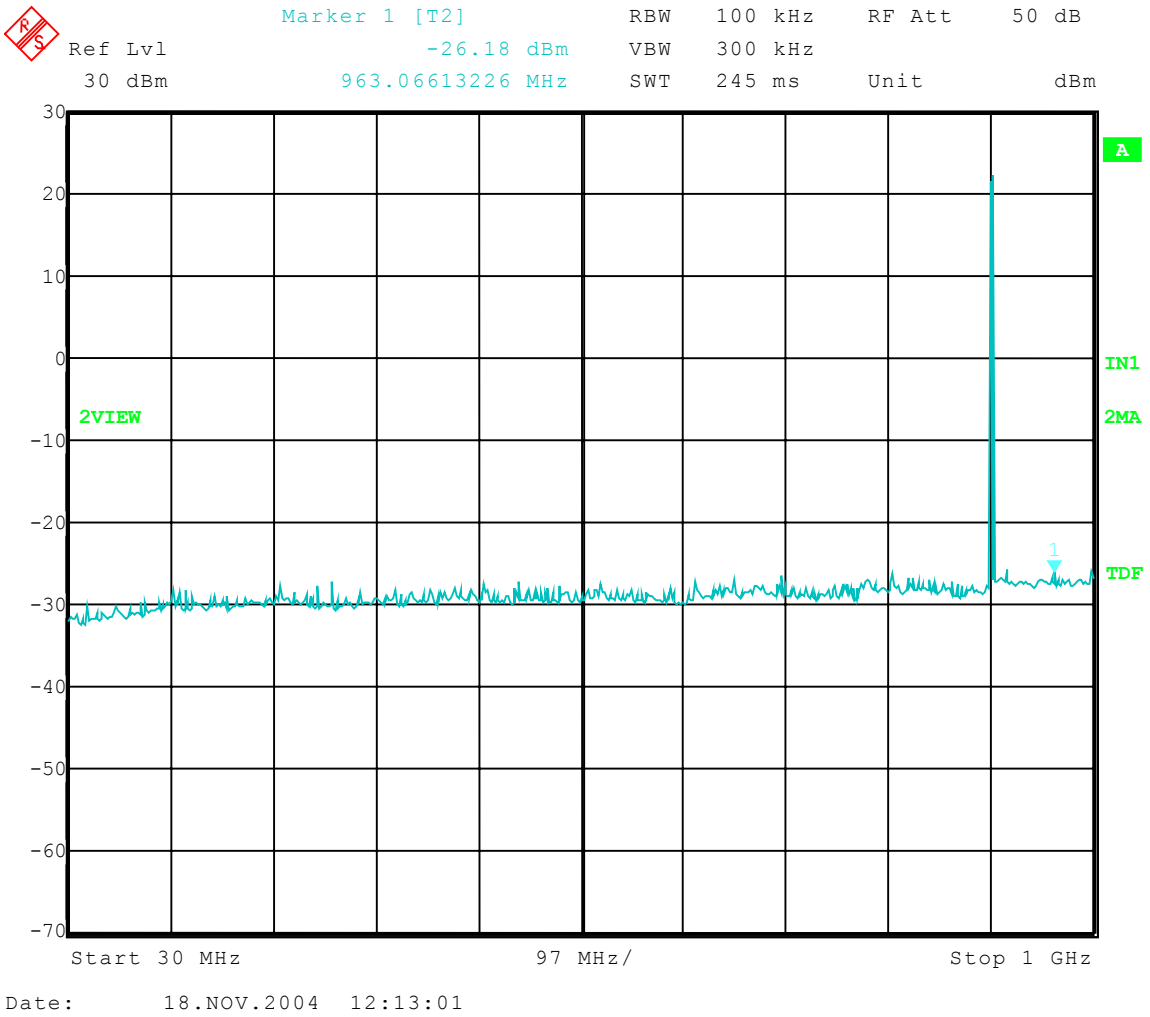


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Low Power: Transmit = 902.967 MHz
Frequency Range: 30 to 1000 MHz
Limit = 2.02 dBm

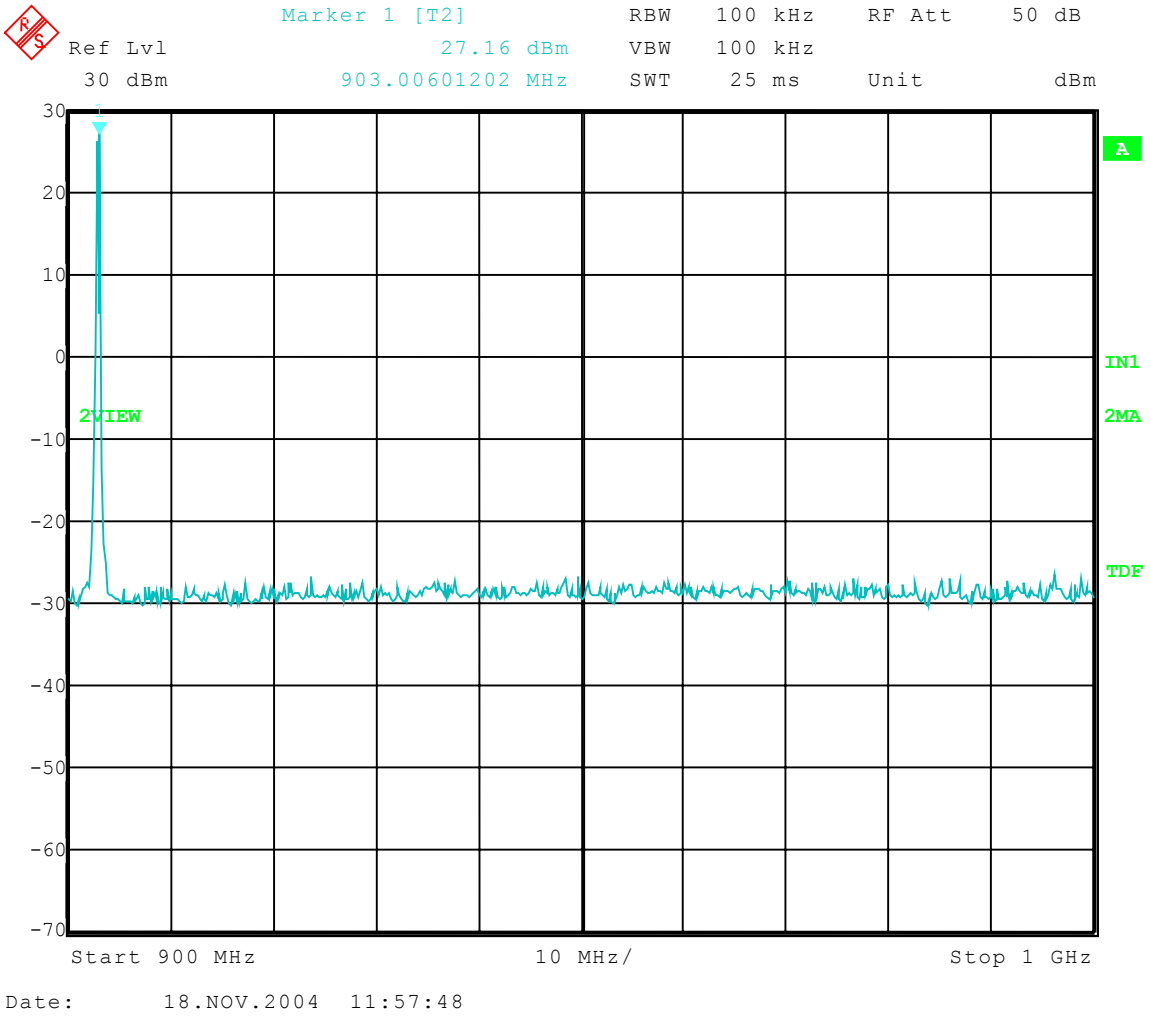
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

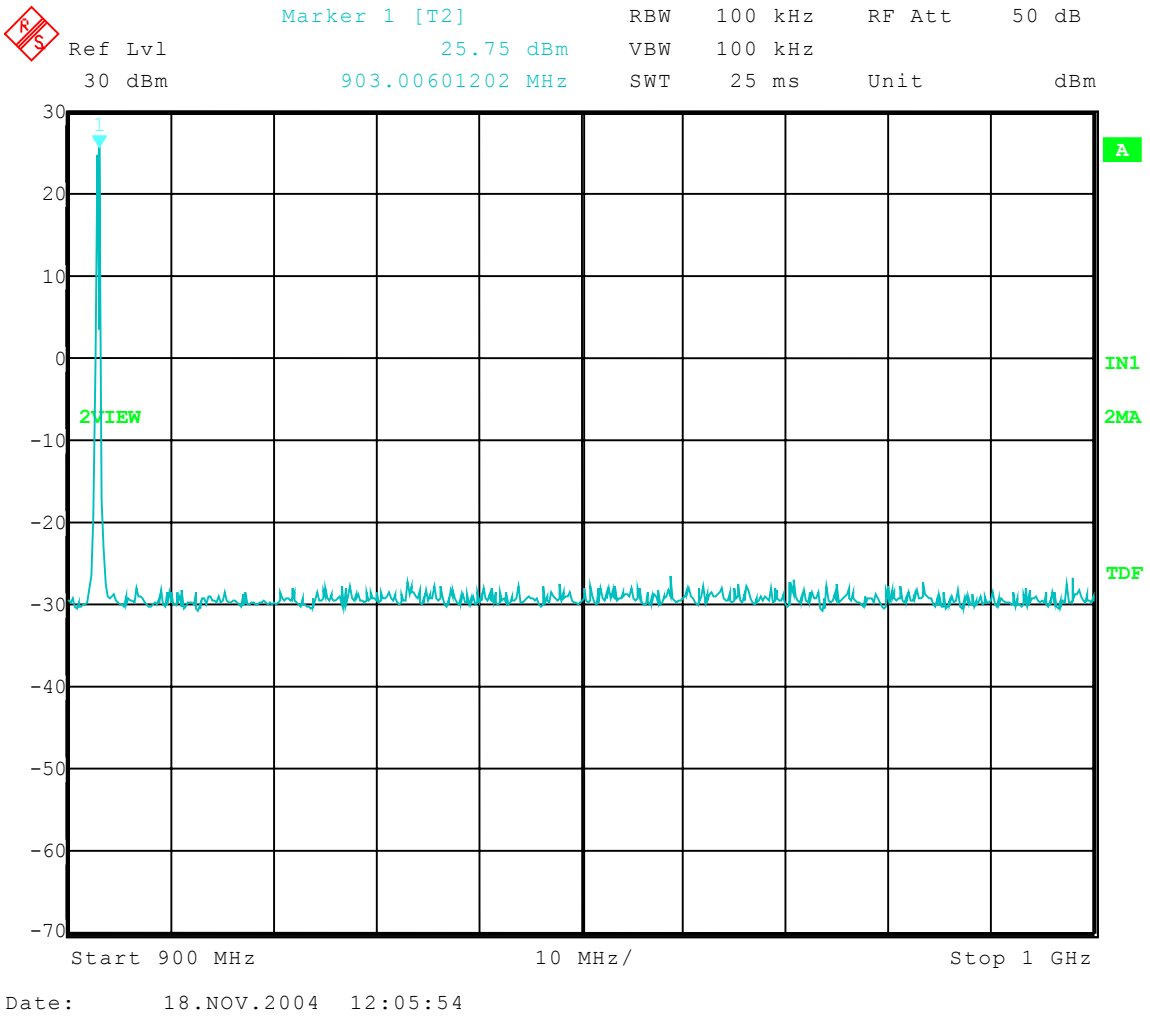
Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; High Power: Transmit = 902.967 MHz
Frequency Range: 900 to 1000 MHz
Limit = 7.16 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

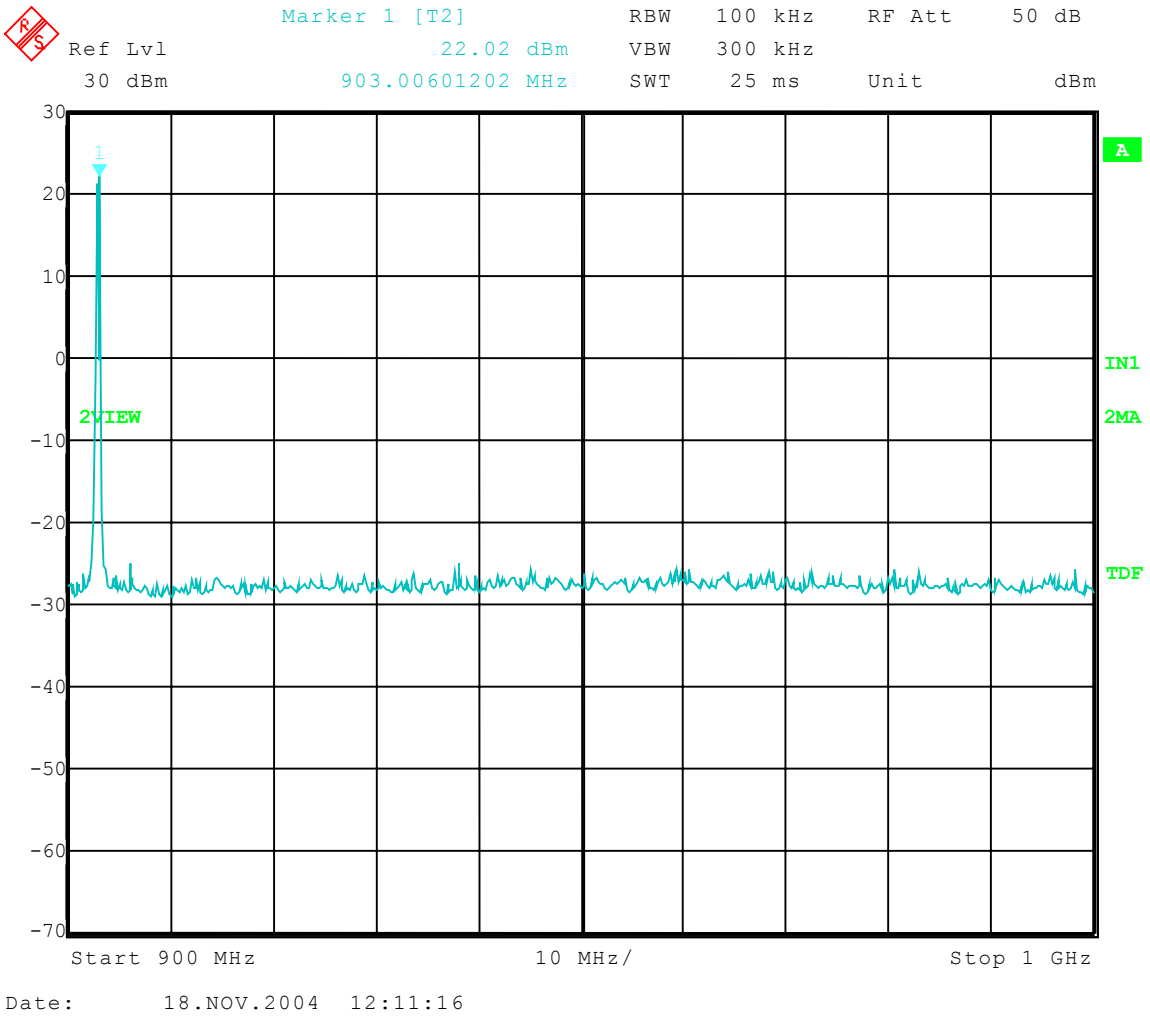
Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Mid Power: Transmit = 902.967 MHz
Frequency Range: 900 to 1000 MHz
Limit = 5.75 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

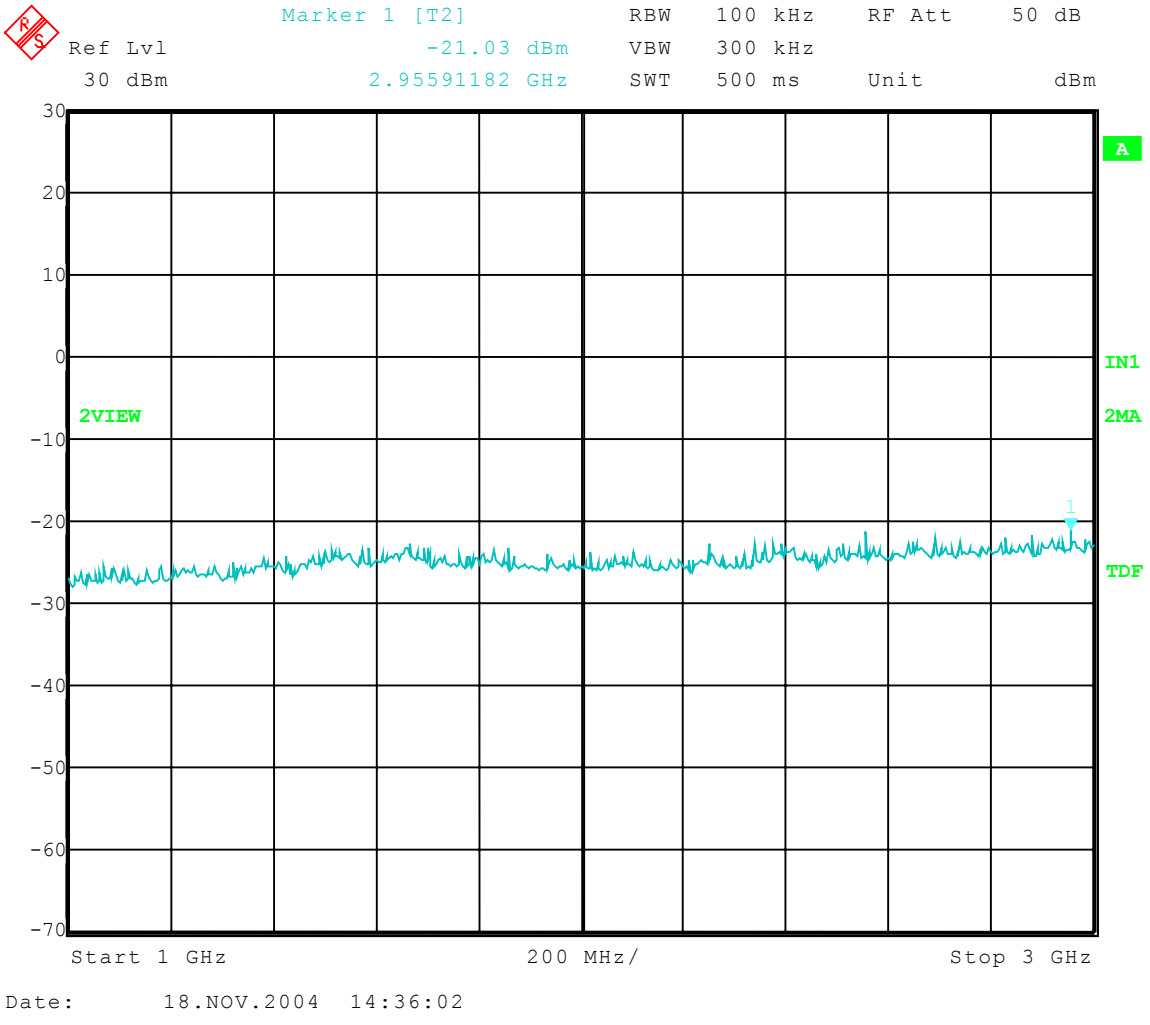
Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Low Power: Transmit = 902.967 MHz
Frequency Range: 900 to 1000 MHz
Limit = 2.02 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; High Power: Transmit = 902.967 MHz
Frequency Range: 1 to 3 GHz
Limit = 7.16 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

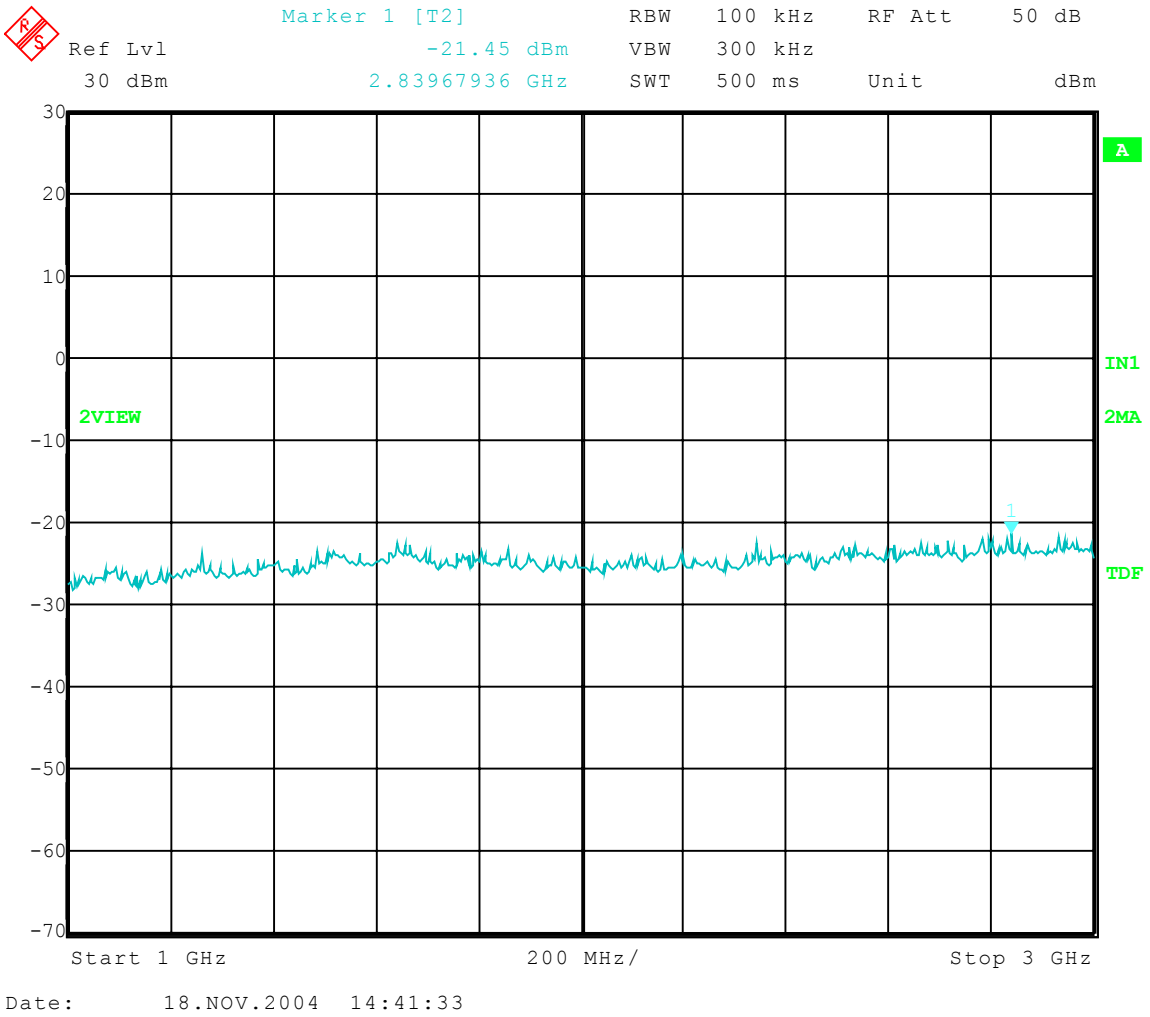


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Mid Power: Transmit = 902.967 MHz
Frequency Range: 1 to 3 GHz
Limit = 5.75 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

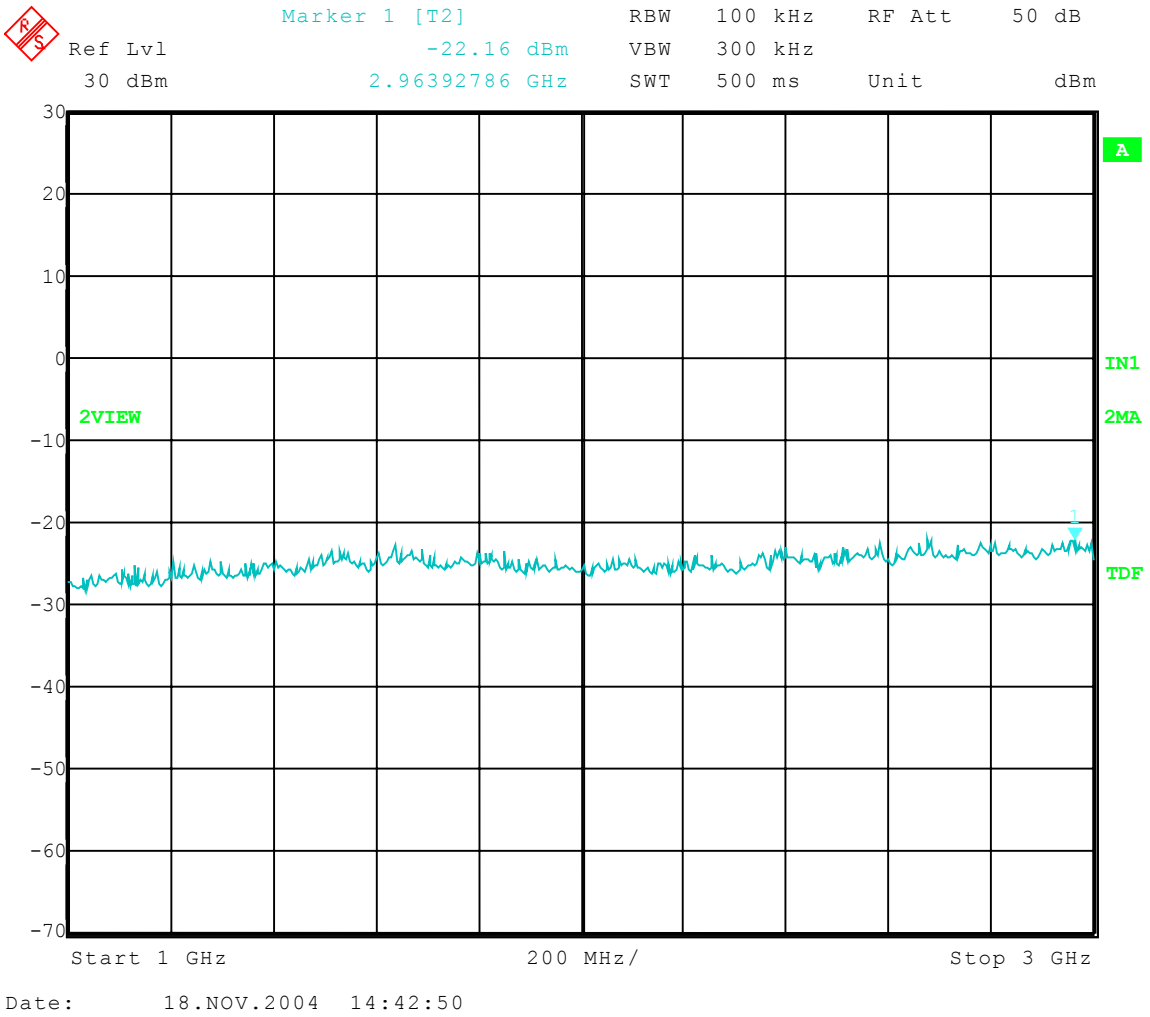


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Low Power: Transmit = 902.967 MHz
Frequency Range: 1 to 3 GHz
Limit = 2.02 dBm

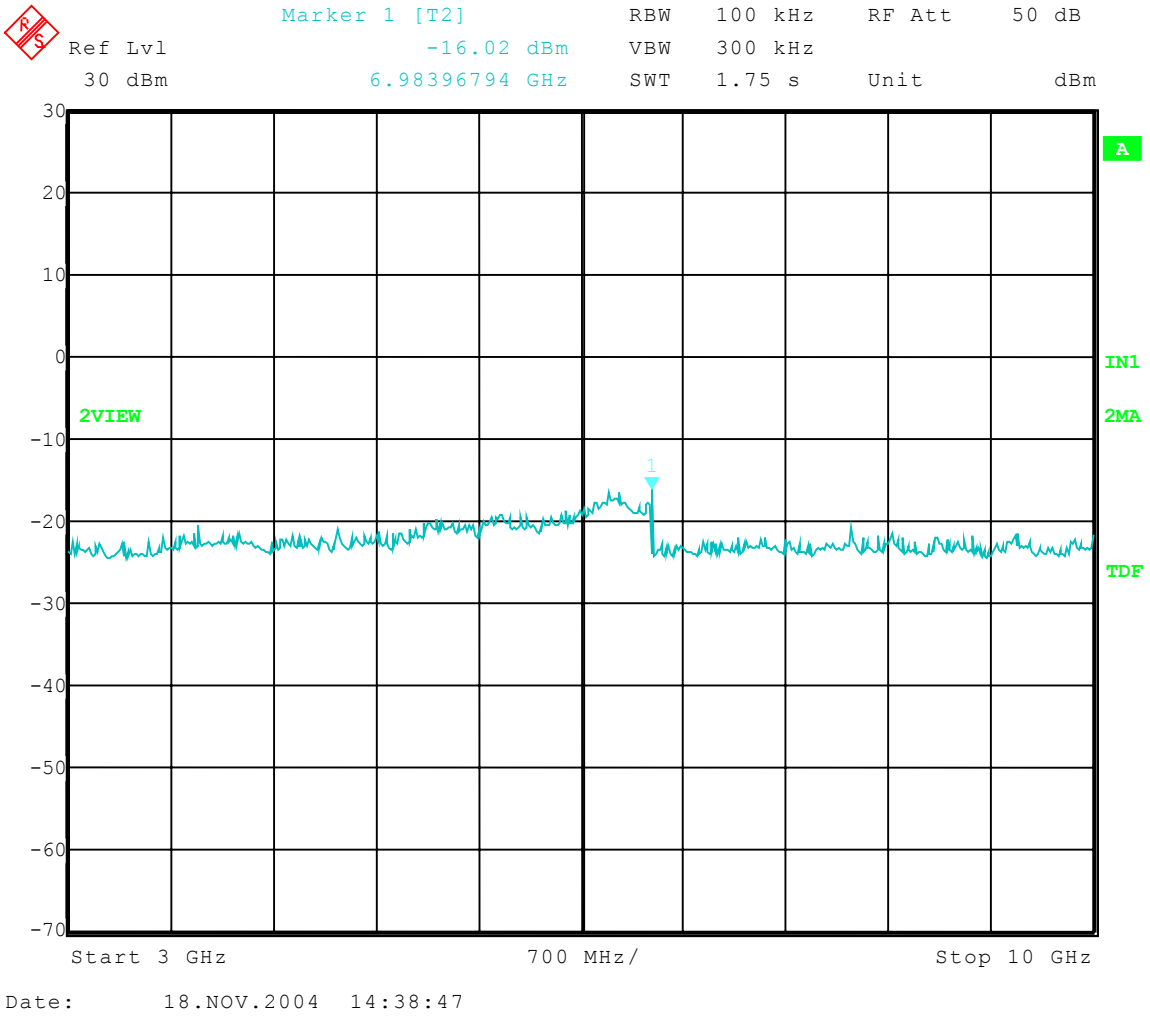
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; High Power: Transmit = 902.967 MHz
Frequency Range: 3 to 10 GHz
Limit = 7.16 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

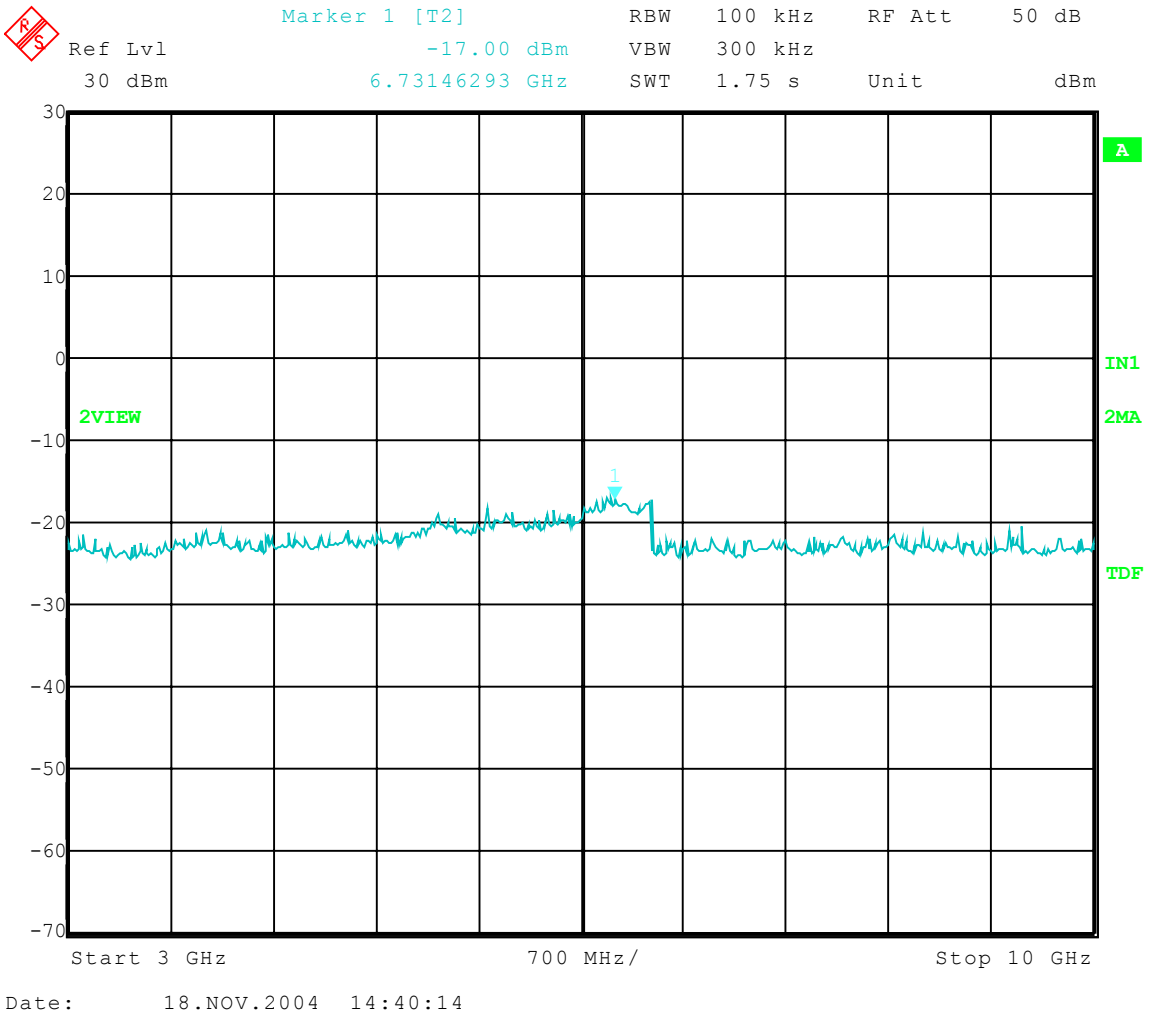


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Mid Power: Transmit = 902.967 MHz
Frequency Range: 3 to 10 GHz
Limit = 5.75 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

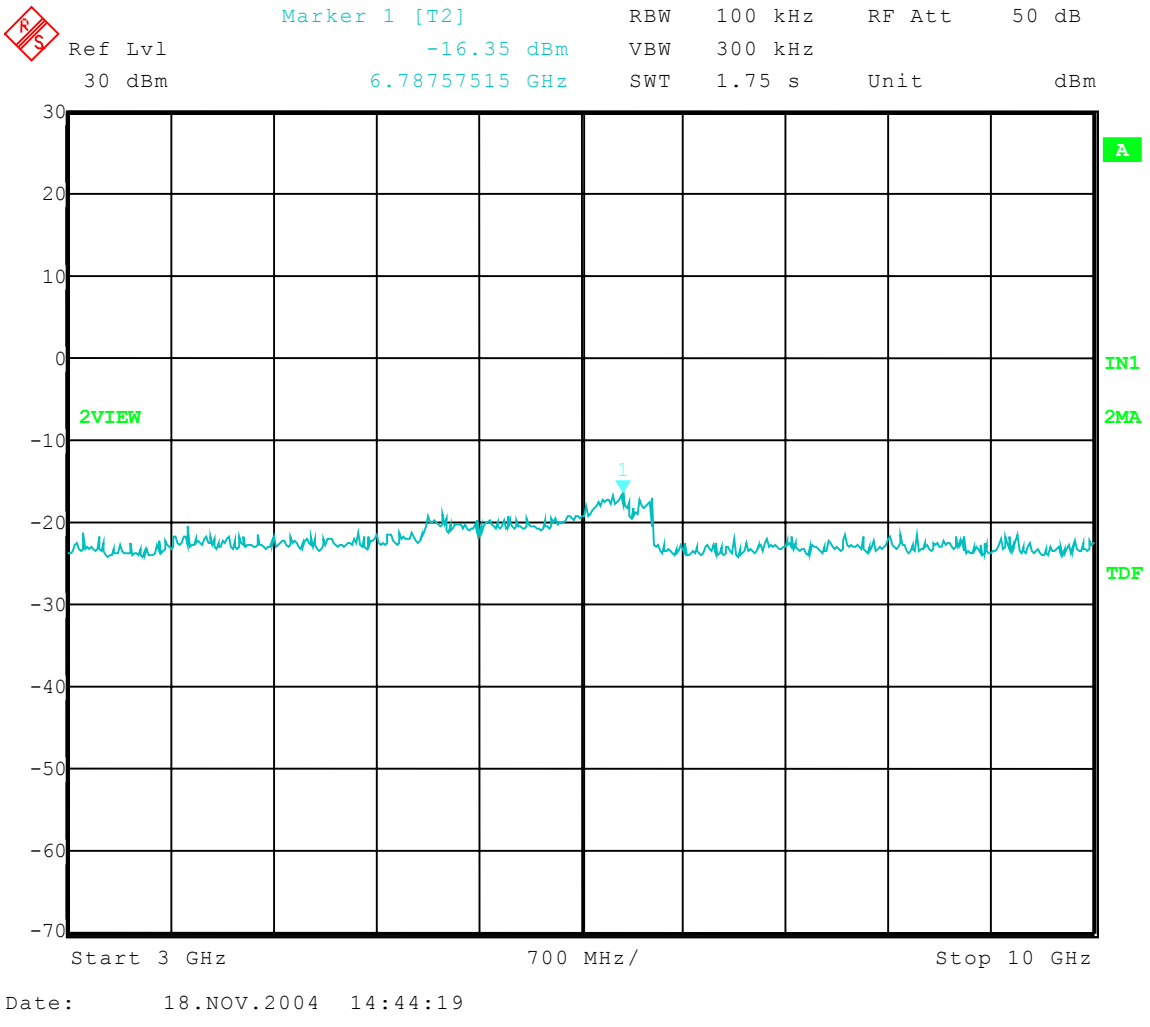


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Low Channel; Low Power: Transmit = 902.967 MHz
Frequency Range: 3 to 10 GHz
Limit = 2.02 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

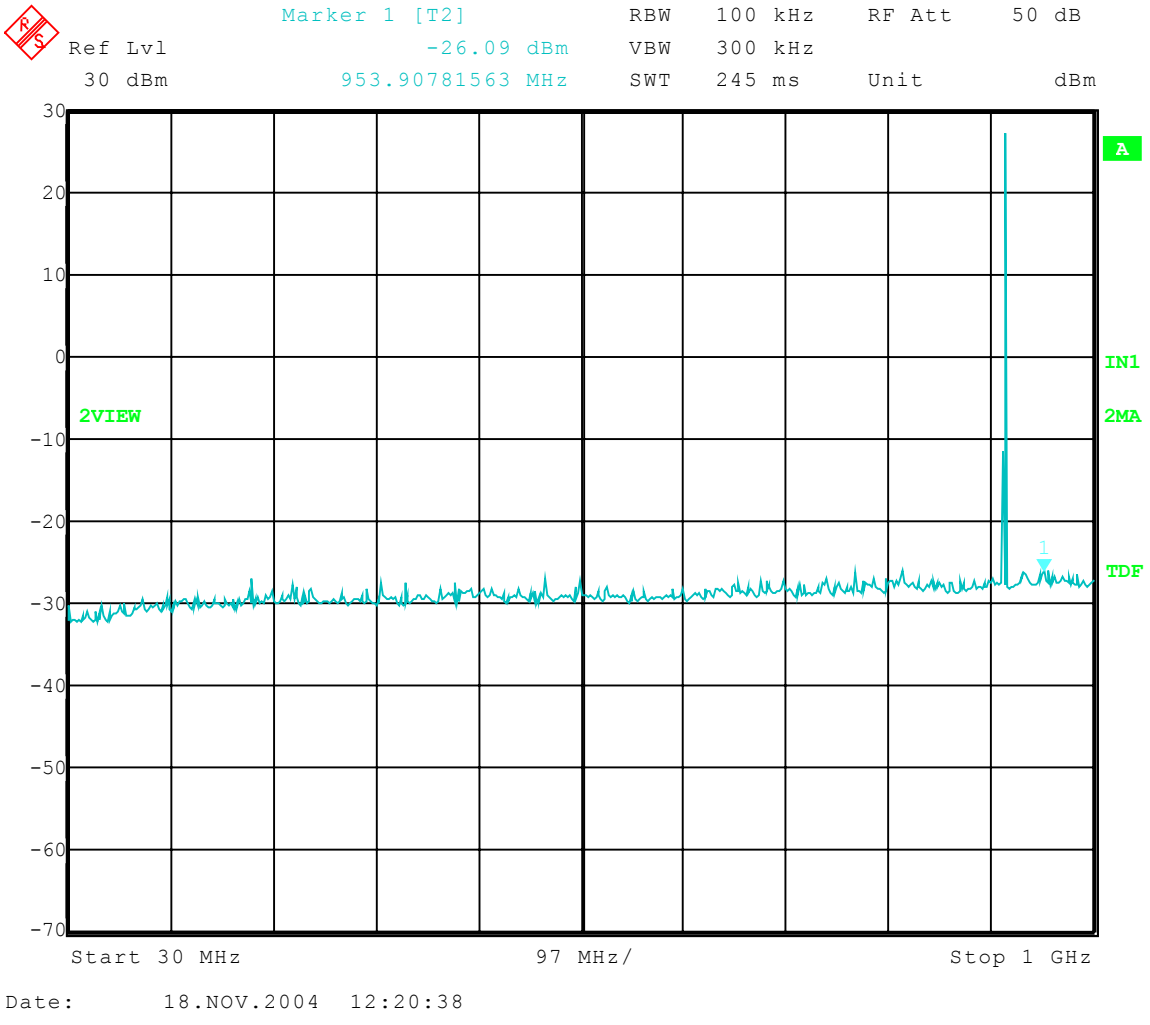


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; High Power: Transmit = 915.101 MHz
Frequency Range: 30 to 1000 MHz
Limit = 7.06 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

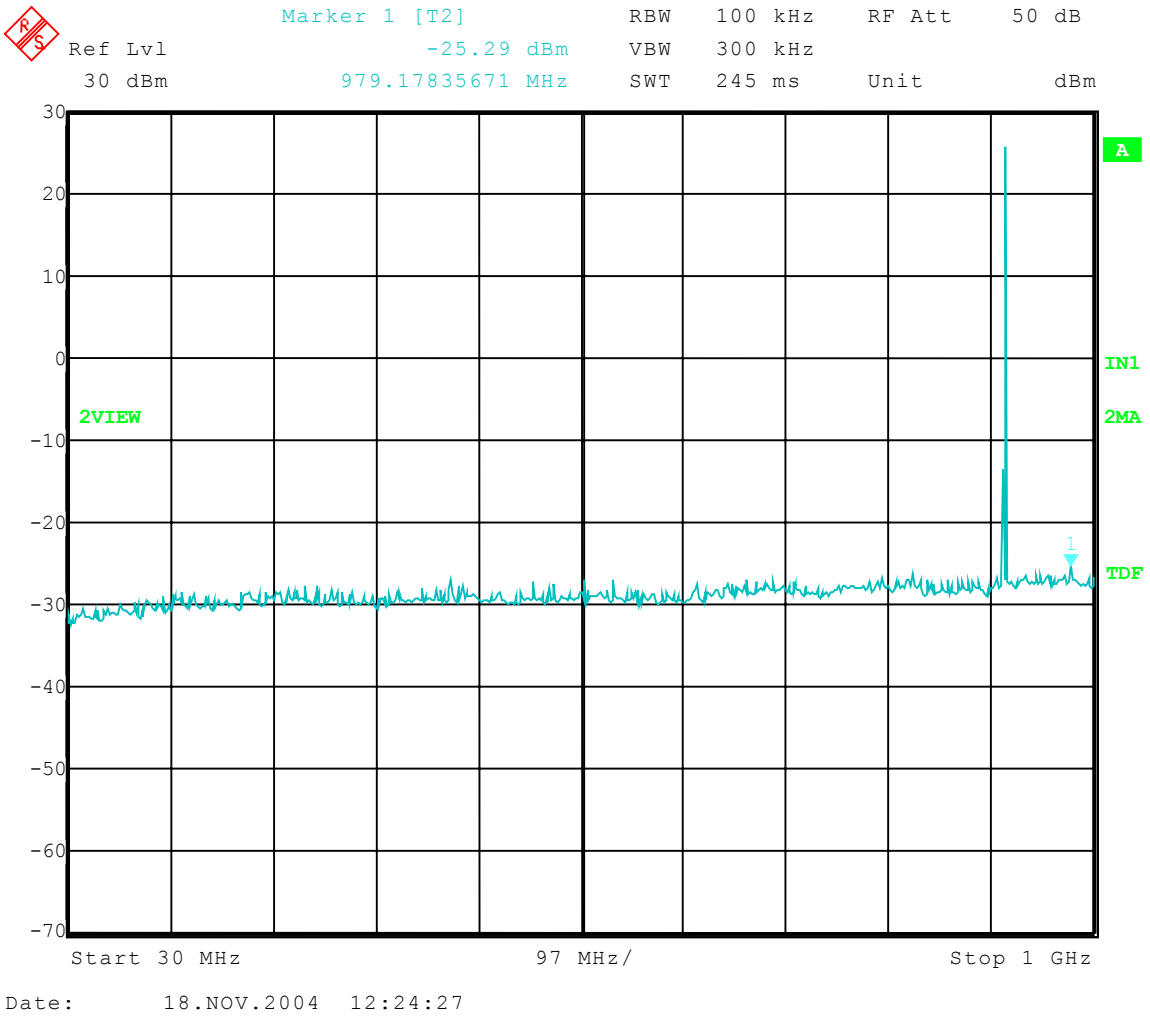


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Mid Power: Transmit = 915.101 MHz
Frequency Range: 30 to 1000 MHz
Limit = 5.63 dBm

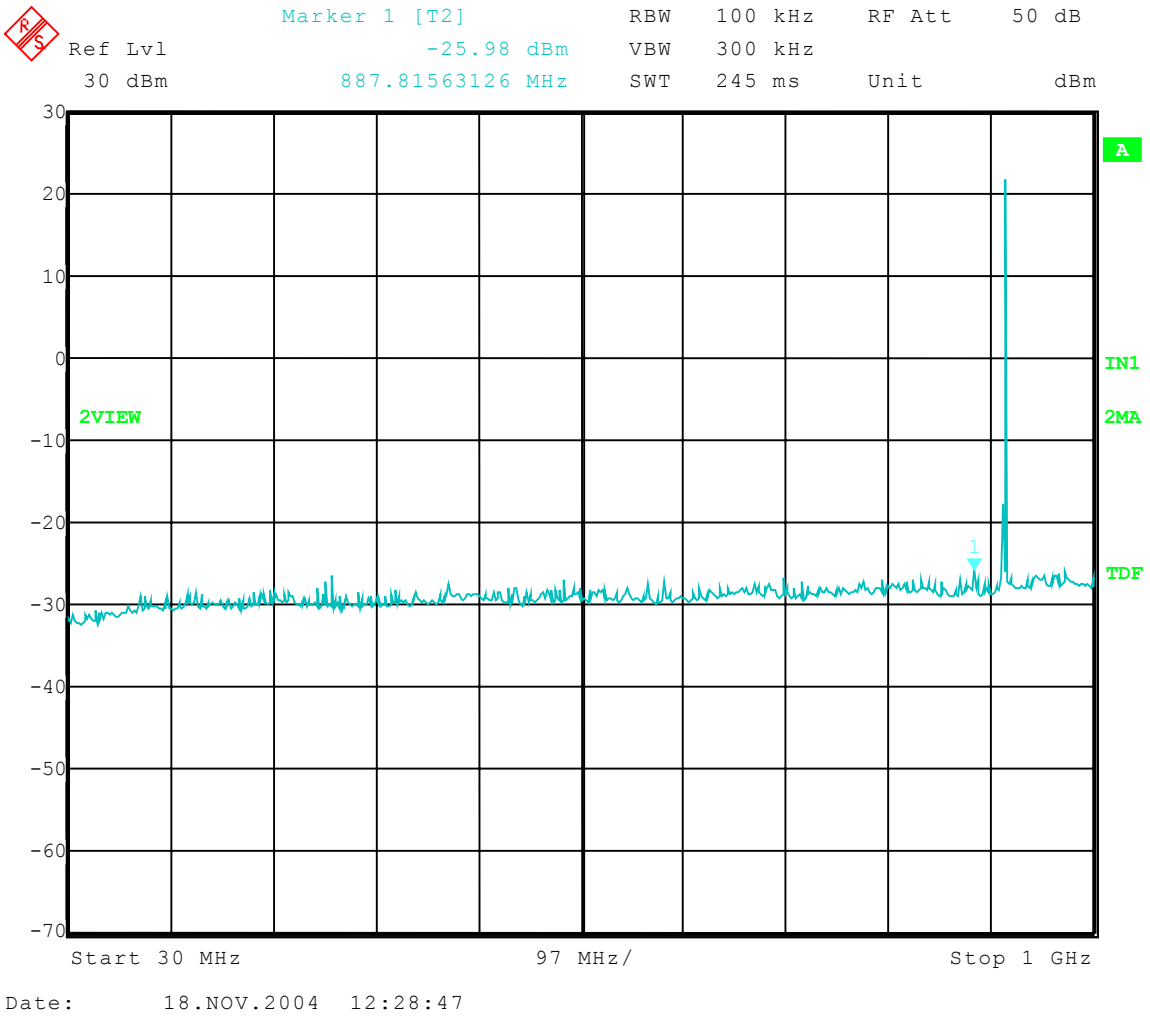
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Low Power: Transmit = 915.101 MHz
Frequency Range: 30 to 1000 MHz
Limit = 1.67 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

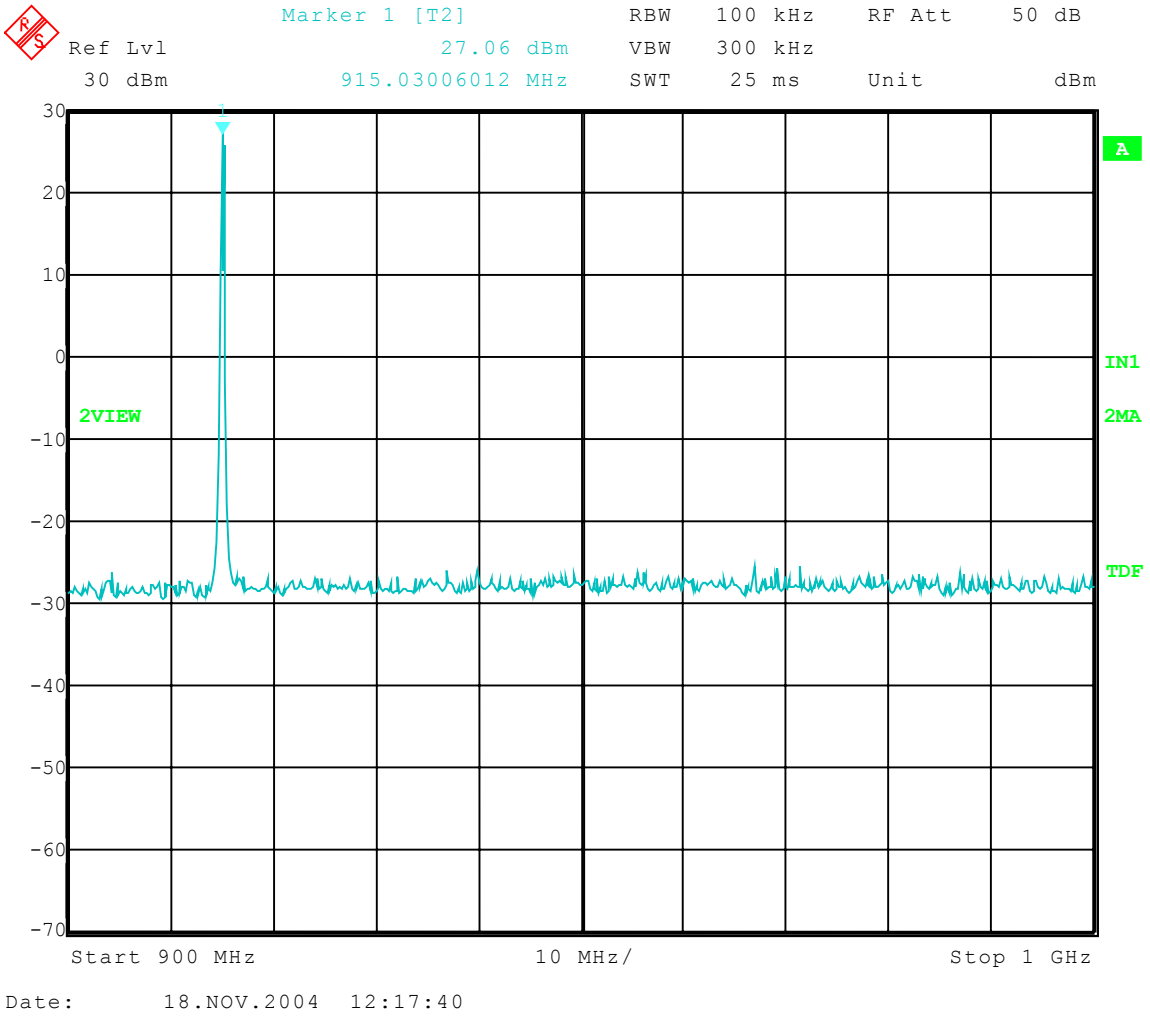


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; High Power: Transmit = 915.101 MHz
Frequency Range: 900 to 1000 MHz
Limit = 7.06 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

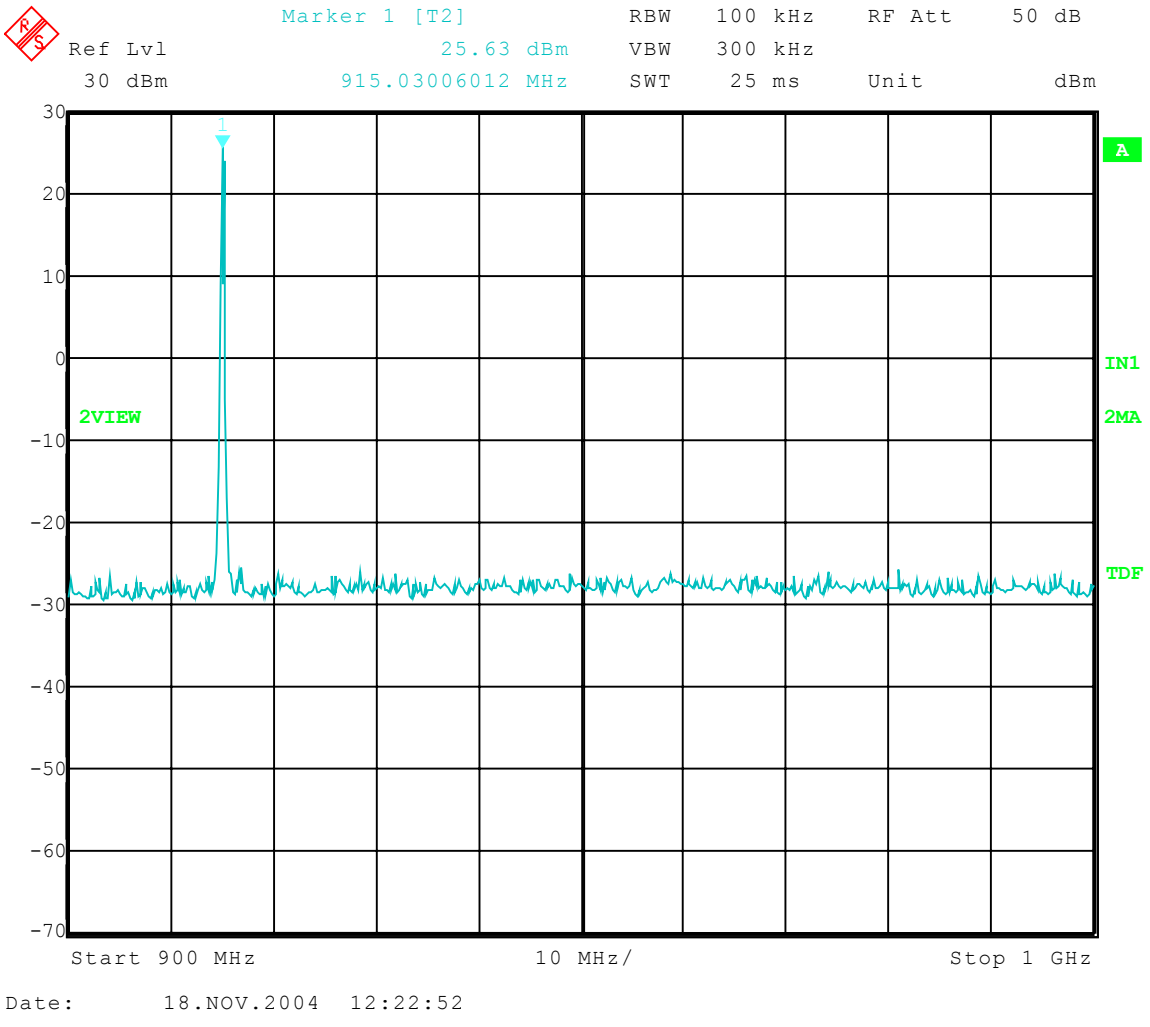


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Mid Power: Transmit = 915.101 MHz
Frequency Range: 900 to 1000 MHz
Limit = 5.63 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

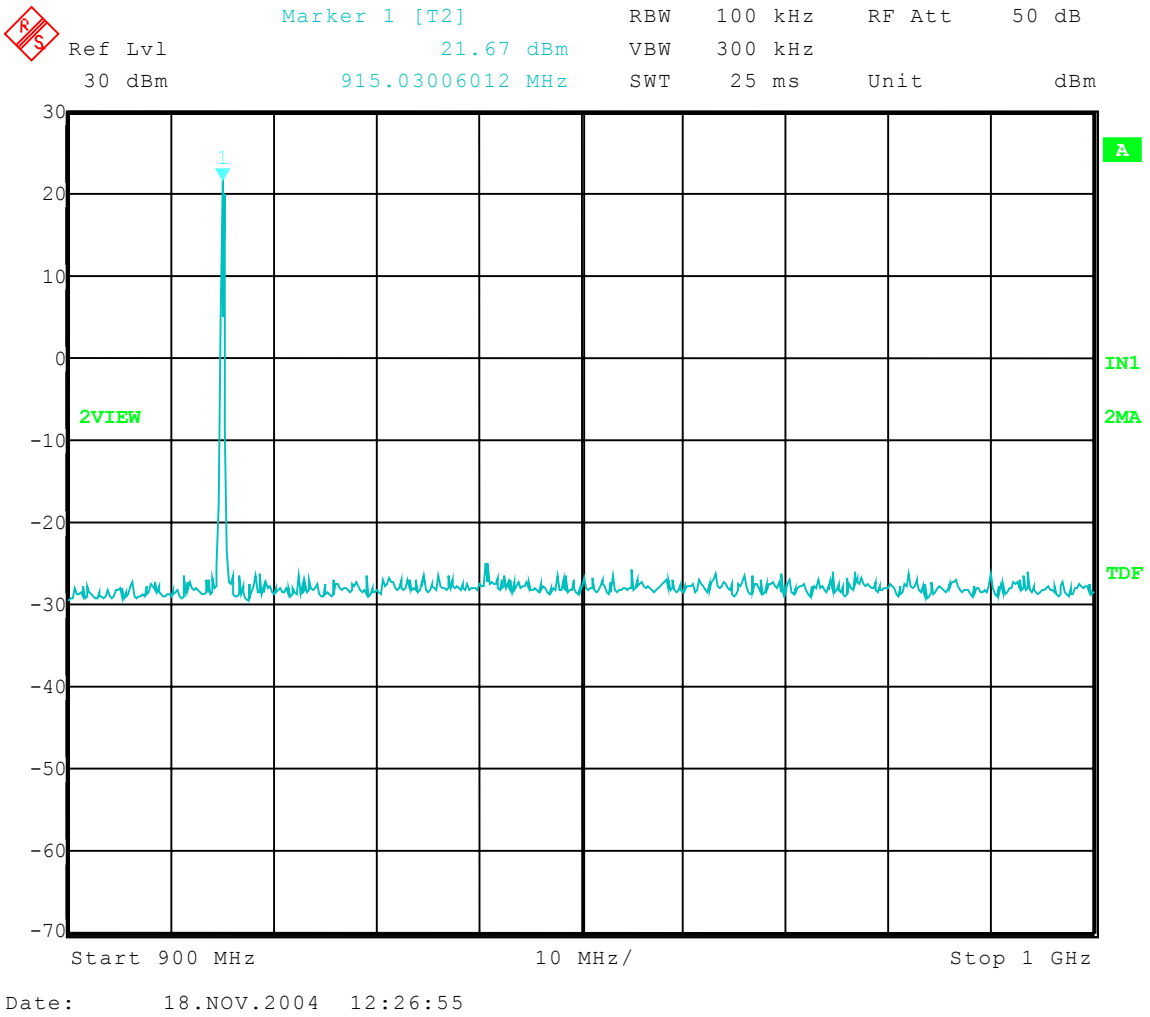


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Low Power: Transmit = 915.101 MHz
Frequency Range: 900 to 1000 MHz
Limit = 1.67 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

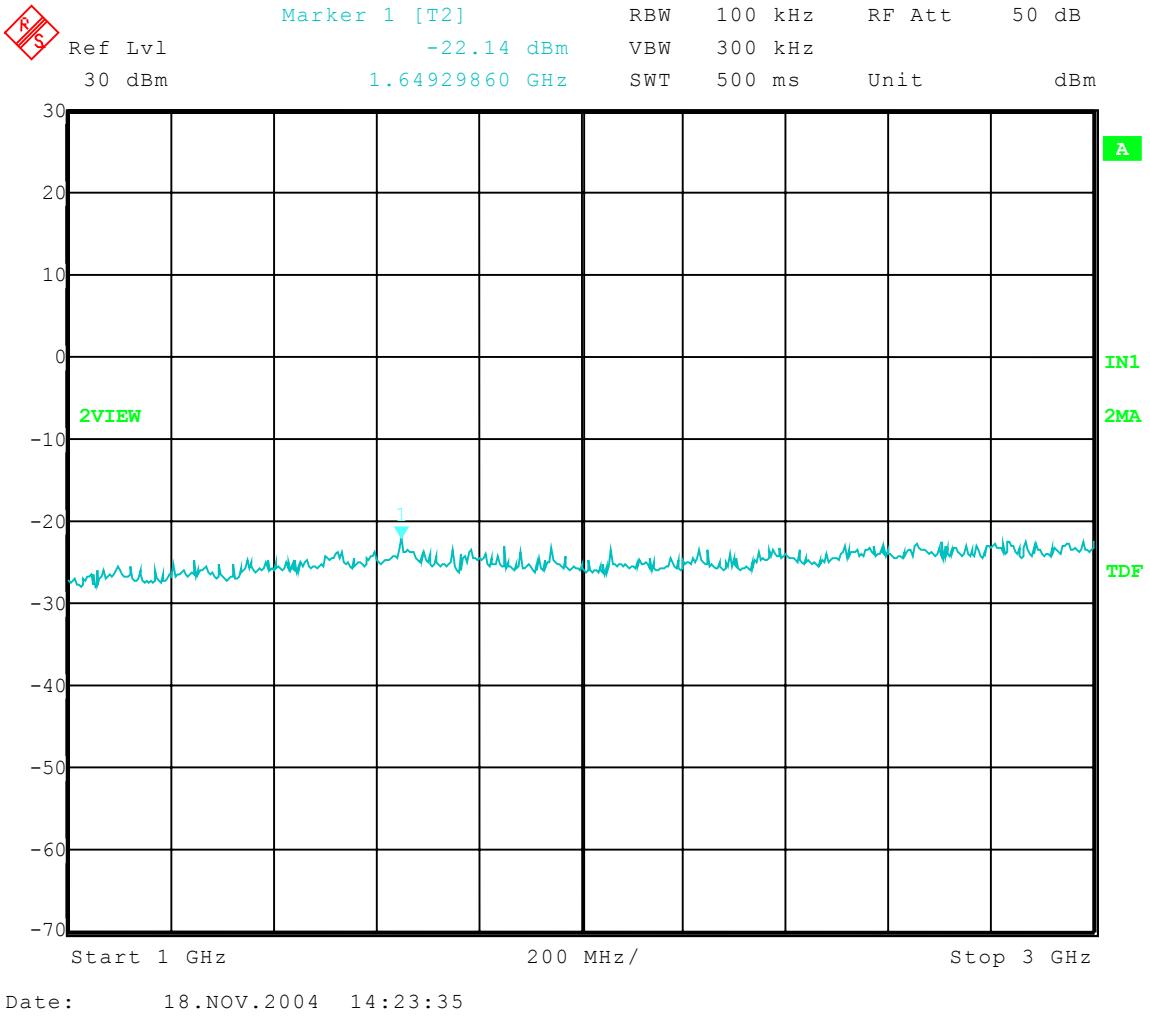


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; High Power: Transmit = 915.101 MHz
Frequency Range: 1 to 3 GHz
Limit = 7.06 dBm

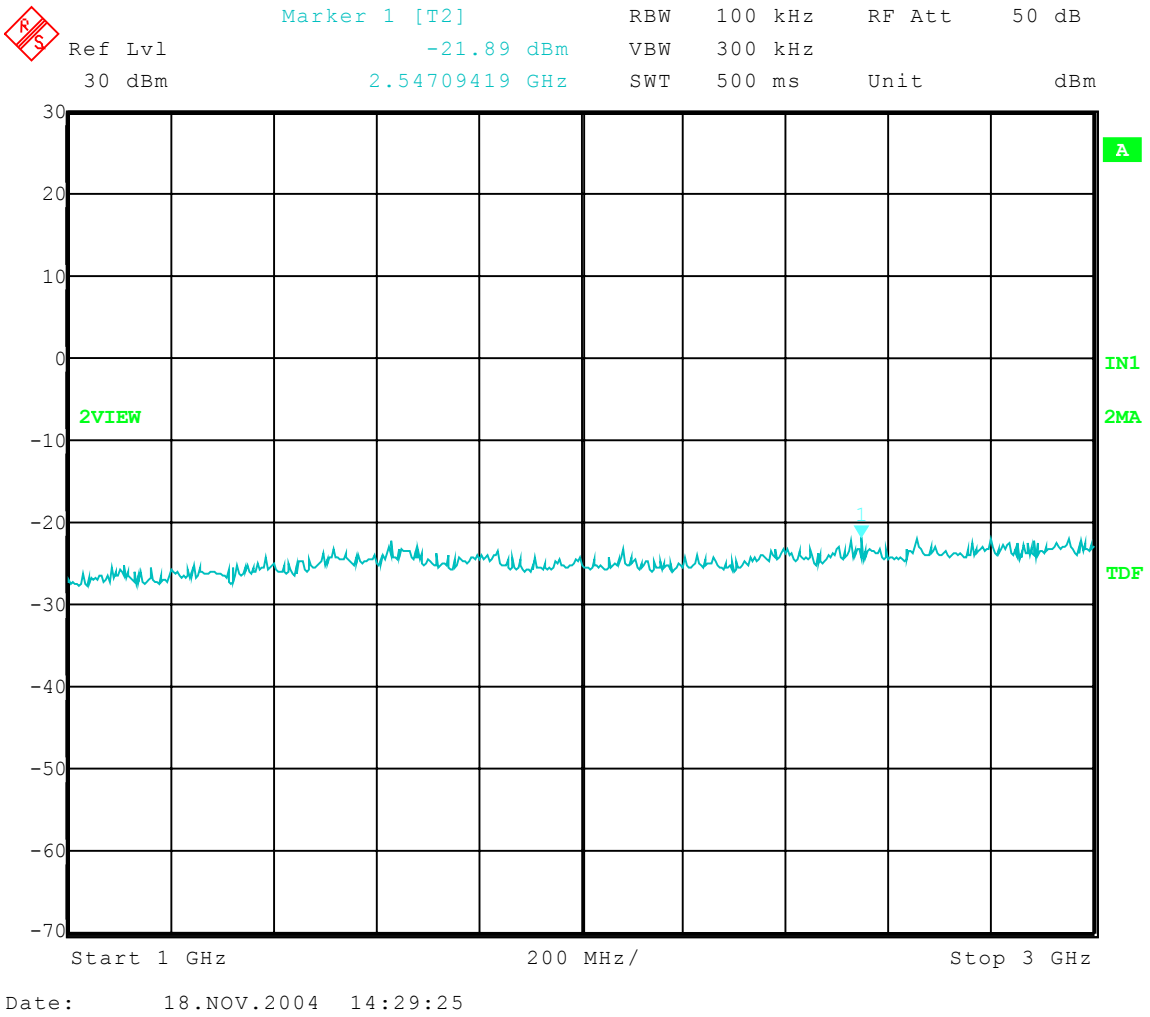
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Mid Power: Transmit = 915.101 MHz
Frequency Range: 1 to 3 GHz
Limit = 5.63 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

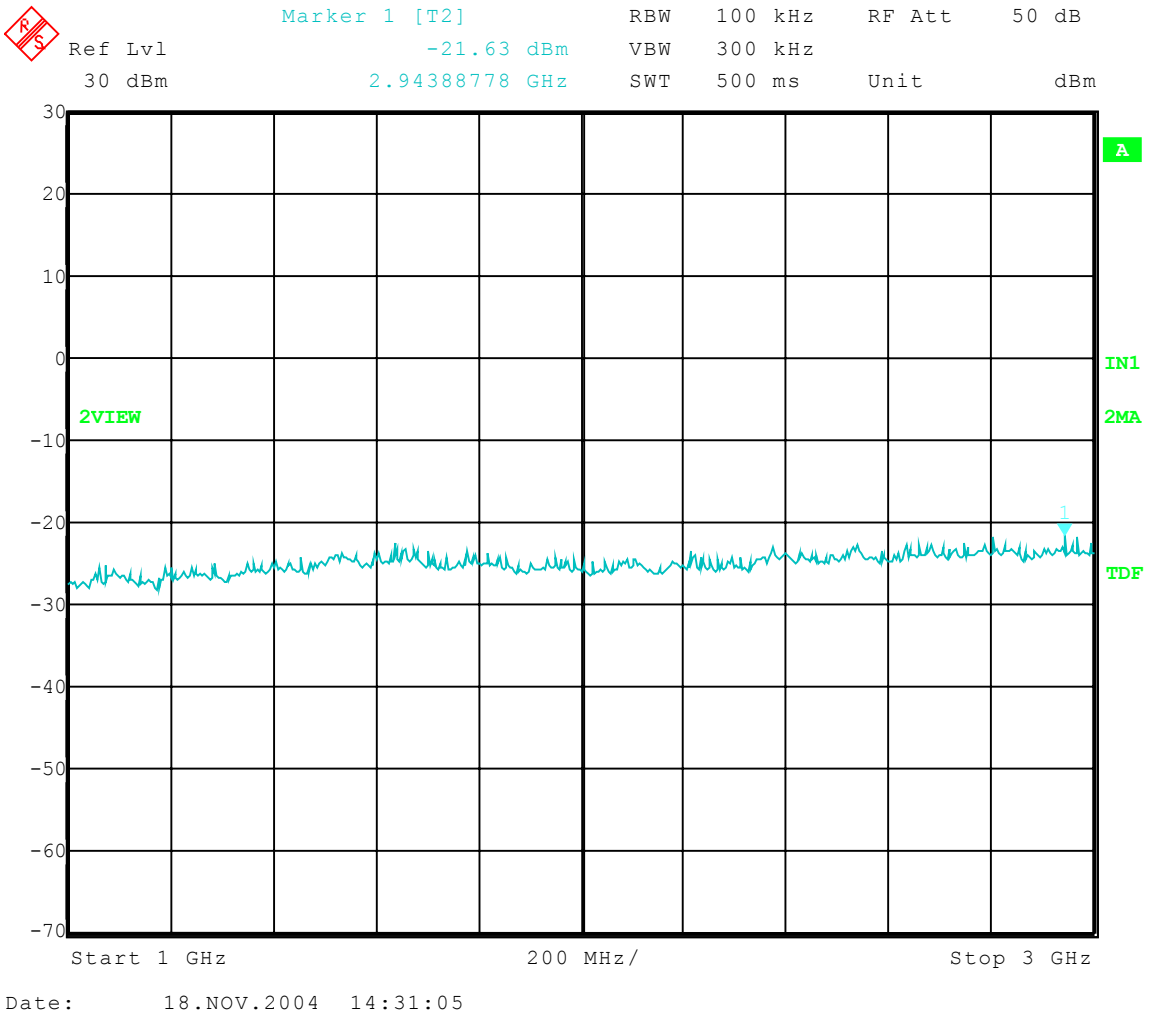


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Low Power: Transmit = 915.101 MHz
Frequency Range: 1 to 3 GHz
Limit = 1.67 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

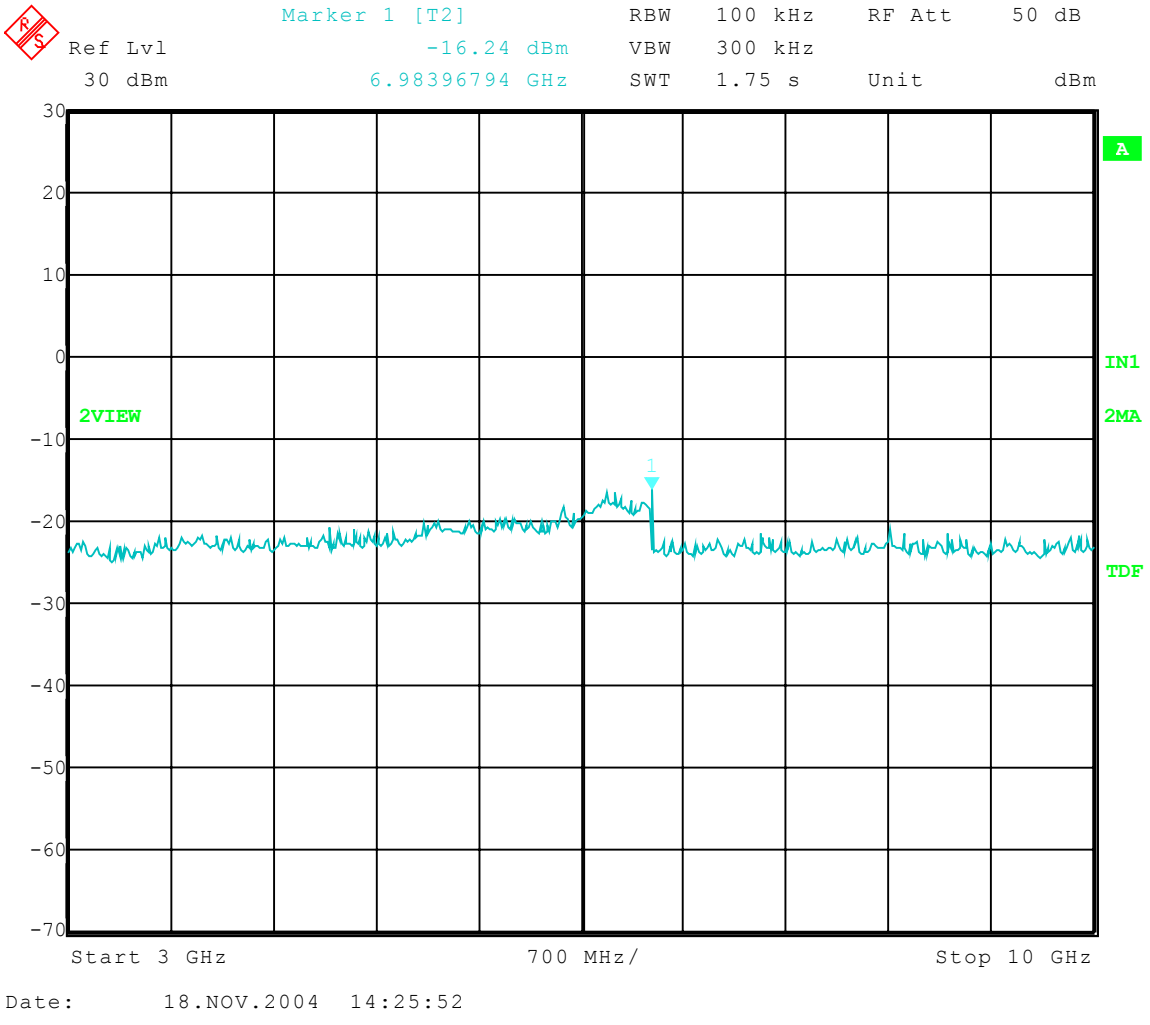


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; High Power: Transmit = 915.101 MHz
Frequency Range: 3 to 10 GHz
Limit = 7.06 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

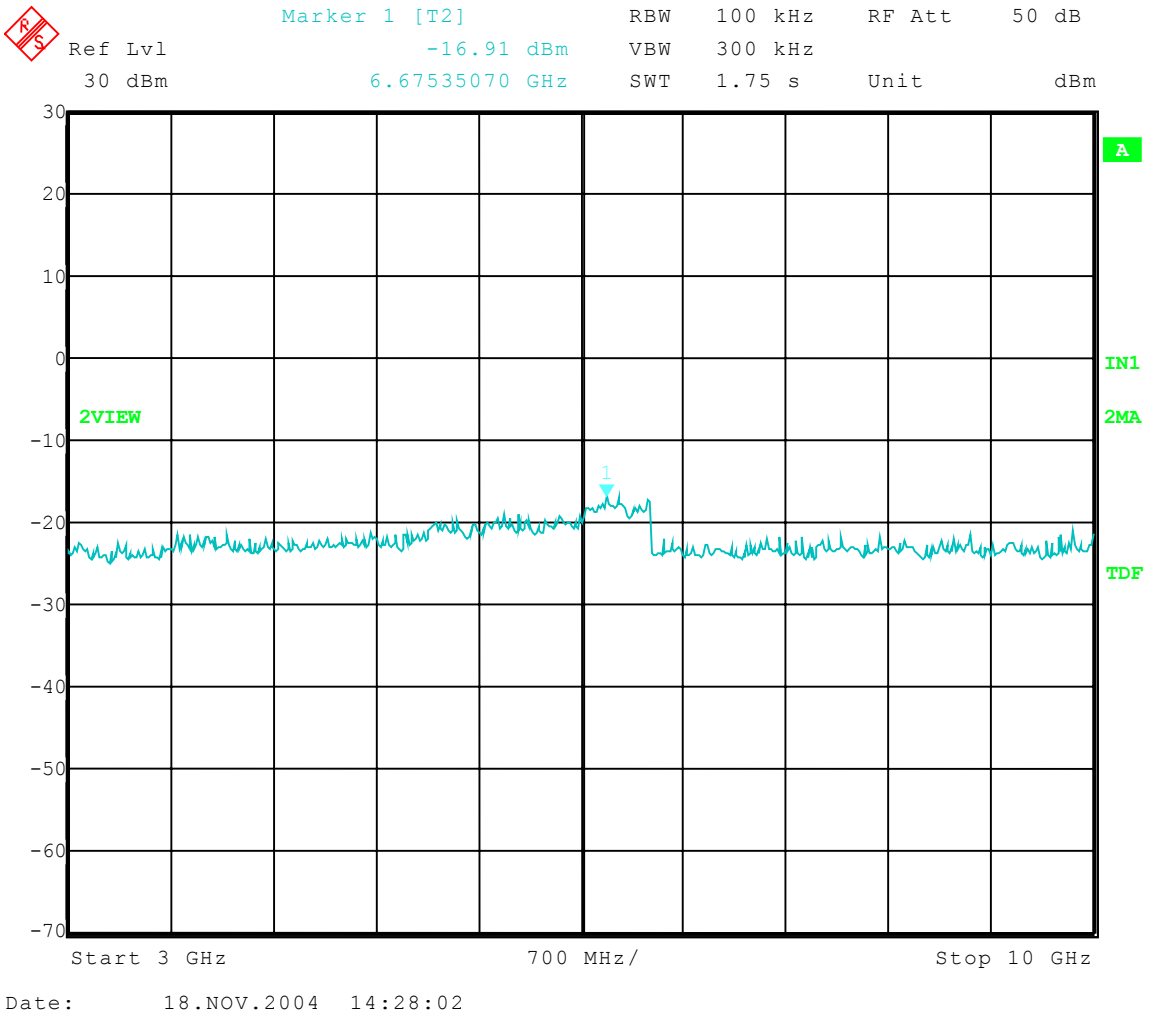


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Mid Power: Transmit = 915.101 MHz
Frequency Range: 3 to 10 GHz
Limit = 5.63 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

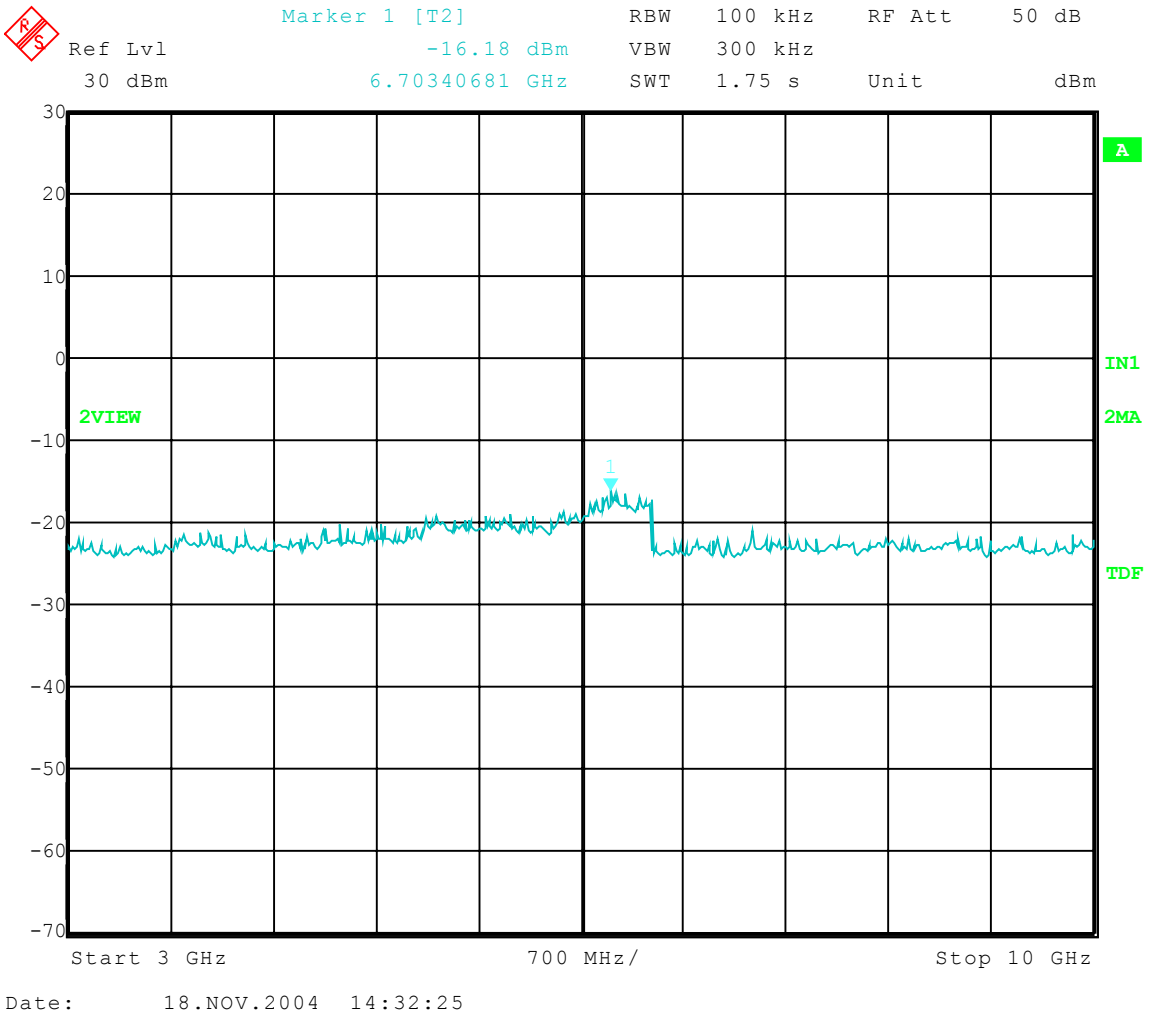


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Middle Channel; Low Power: Transmit = 915.101 MHz
Frequency Range: 3 to 10 GHz
Limit = 1.67 dBm

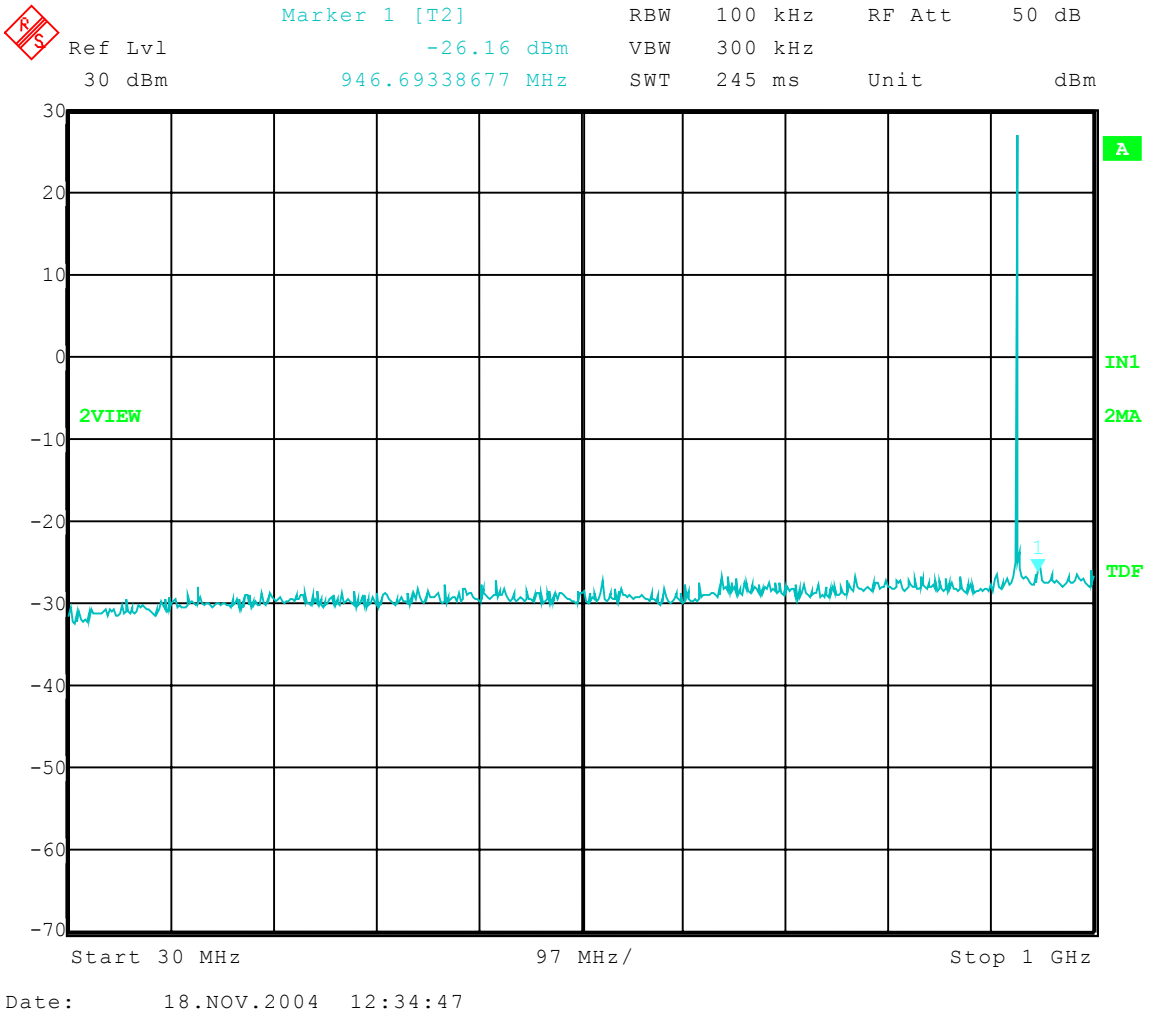
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

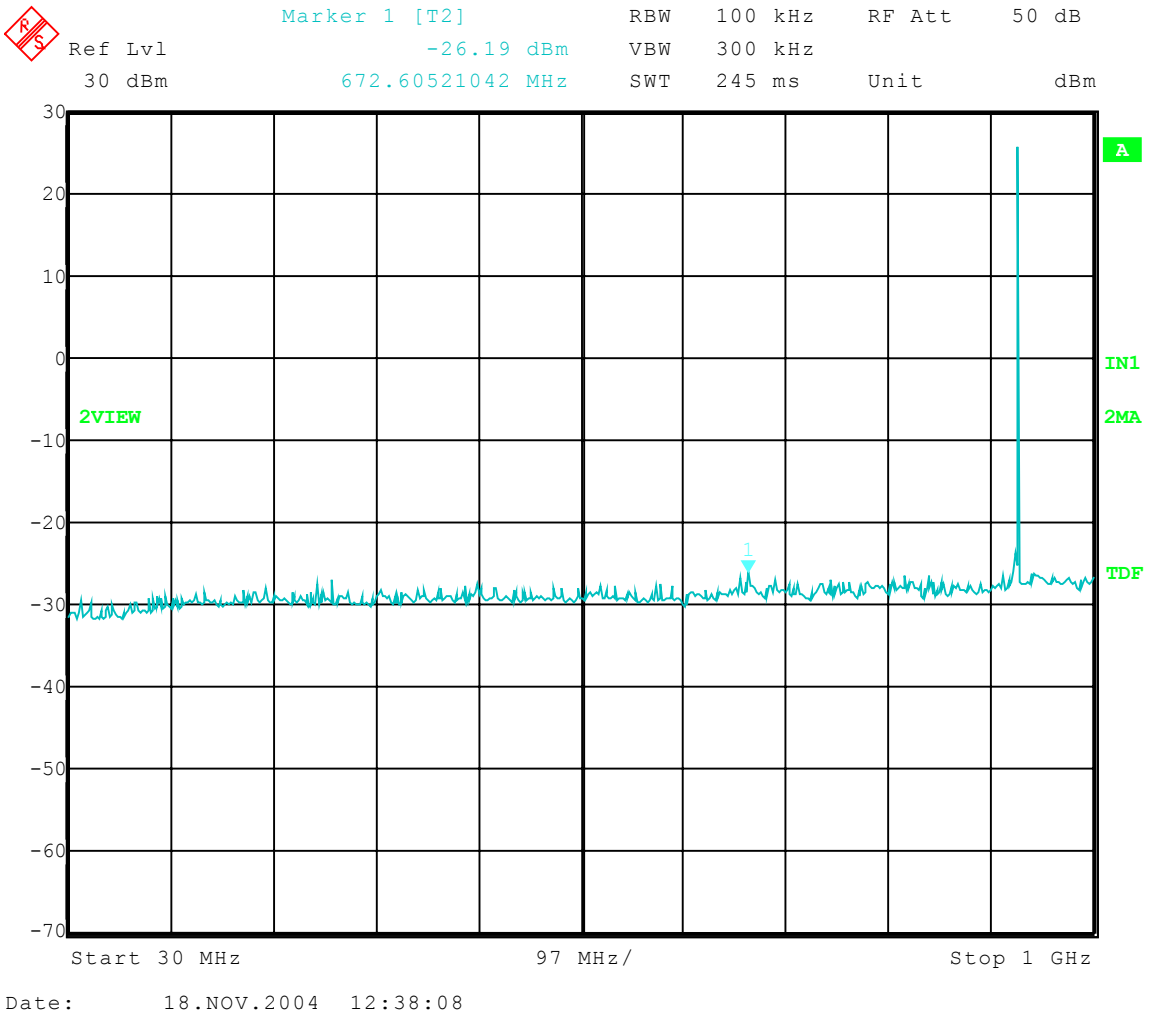
Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; High Power: Transmit = 927.233 MHz
Frequency Range: 30 to 1000 MHz
Limit = 6.91 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Mid Power: Transmit = 927.233 MHz
Frequency Range: 30 to 1000 MHz
Limit = 5.60 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

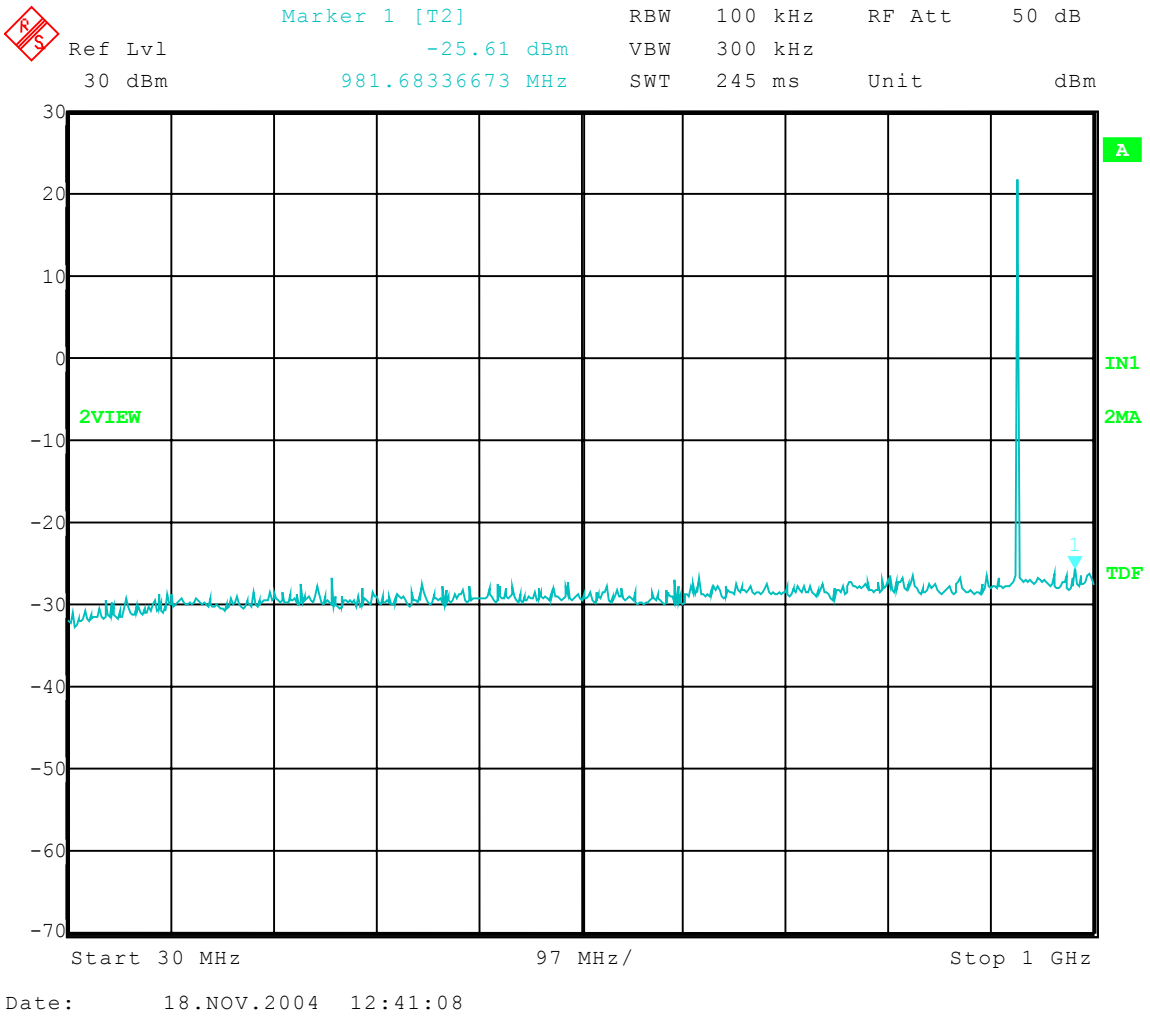


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Low Power: Transmit = 927.233 MHz
Frequency Range: 30 to 1000 MHz
Limit = 1.59 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

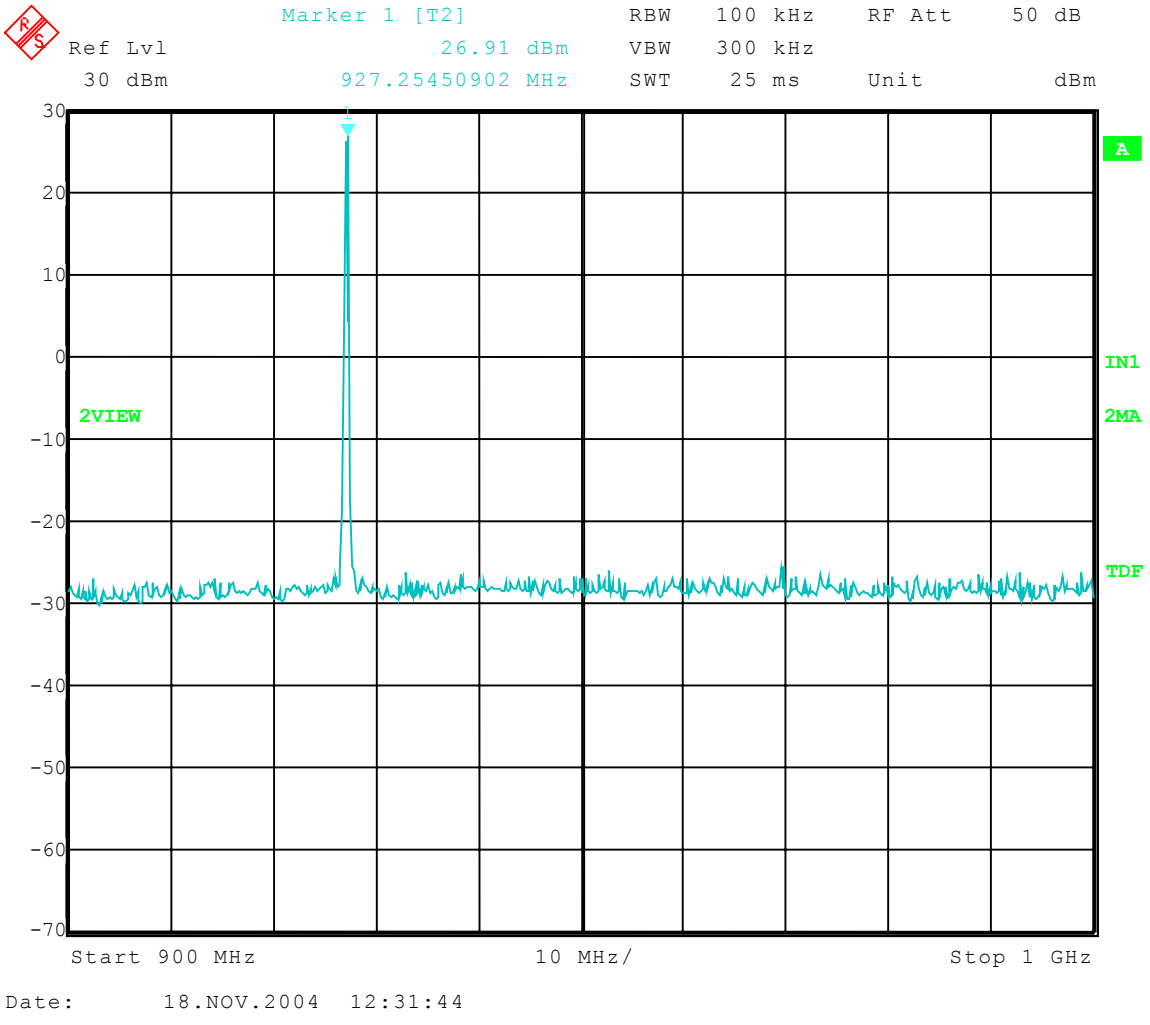


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; High Power: Transmit = 927.233 MHz
Frequency Range: 900 to 1000 MHz
Limit = 6.91 dBm

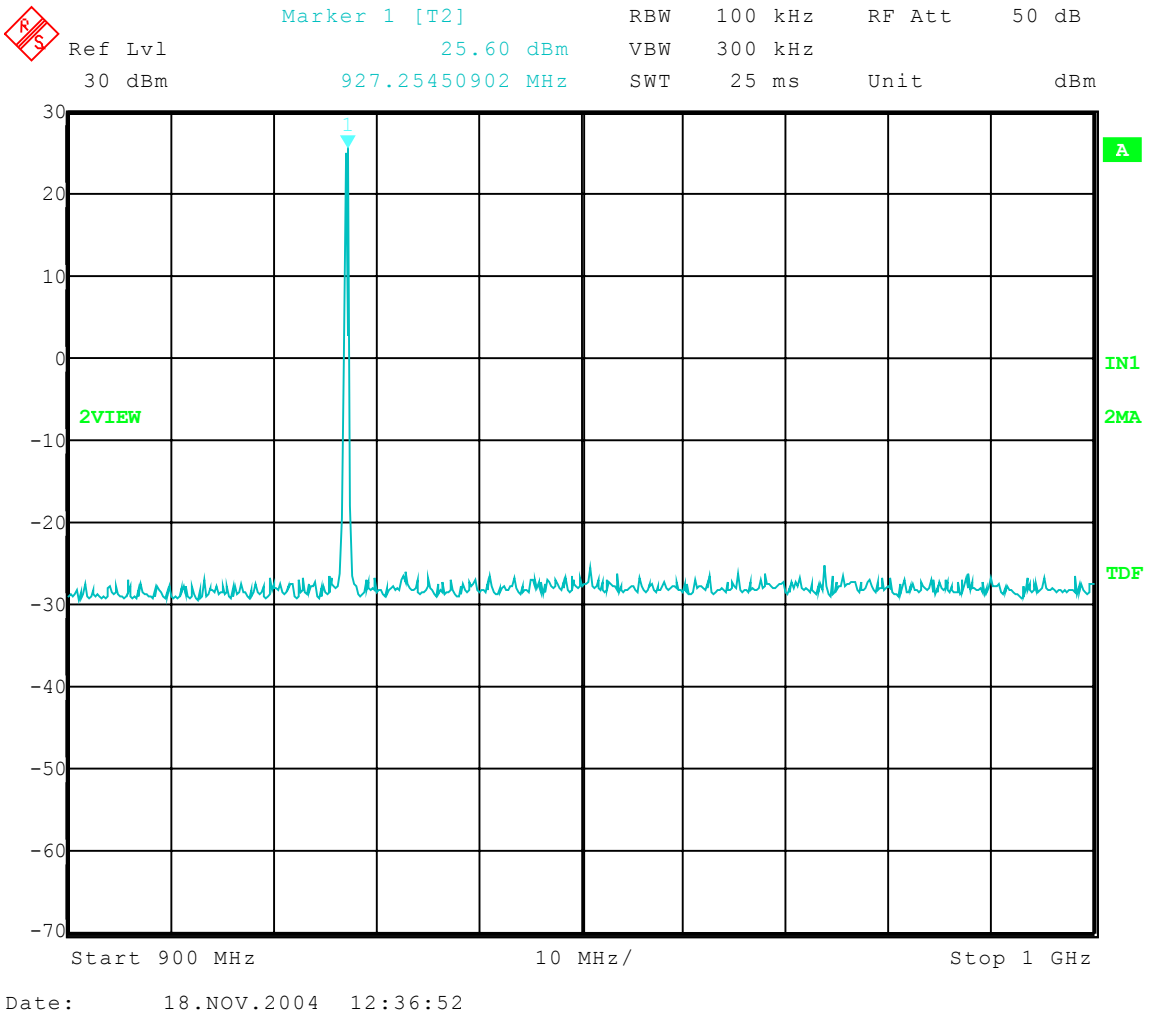
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Mid Power: Transmit = 927.233 MHz
Frequency Range: 900 to 1000 MHz
Limit = 5.60 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

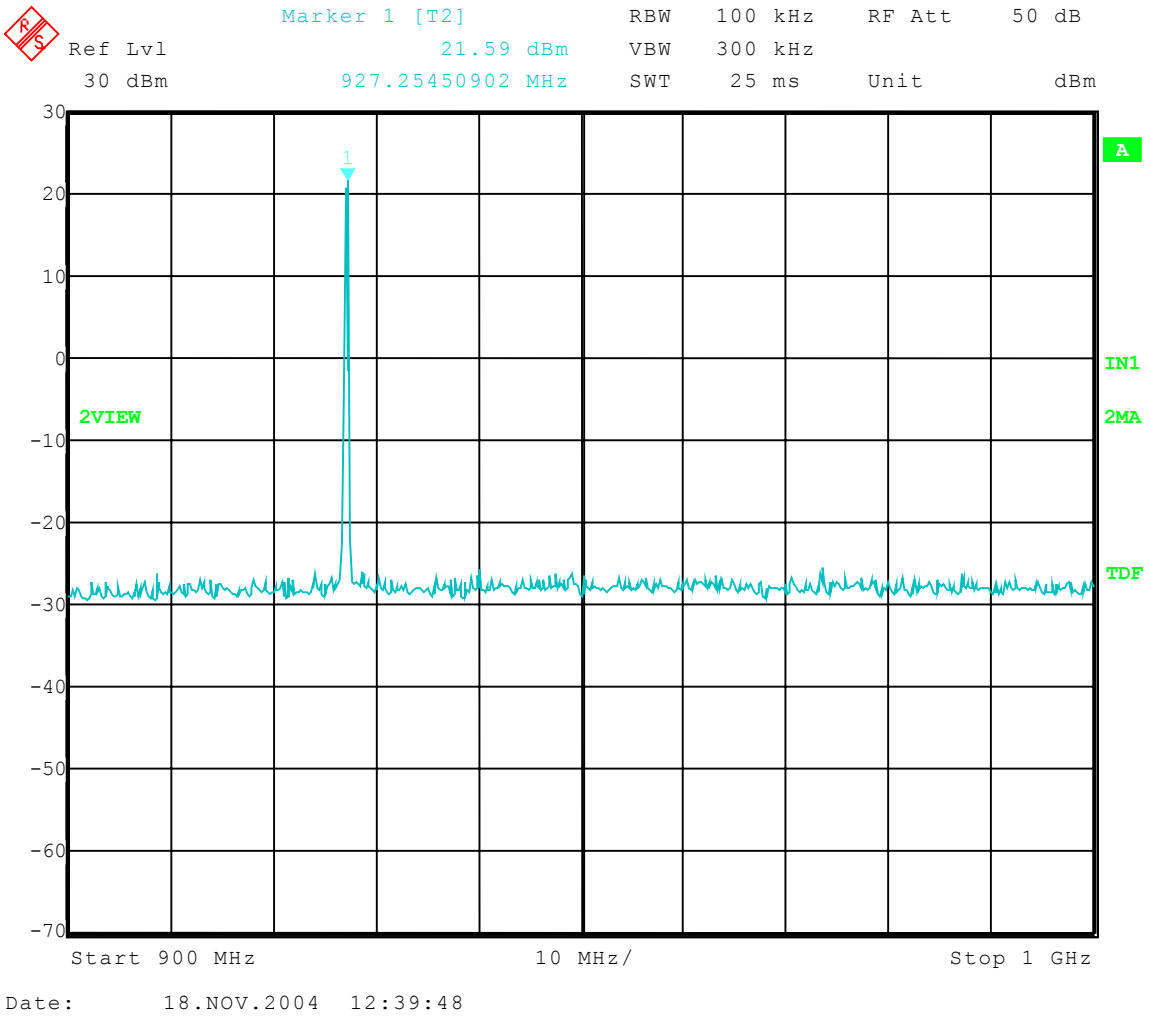


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Low Power: Transmit = 927.233 MHz
Frequency Range: 900 to 1000 MHz
Limit = 1.59 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

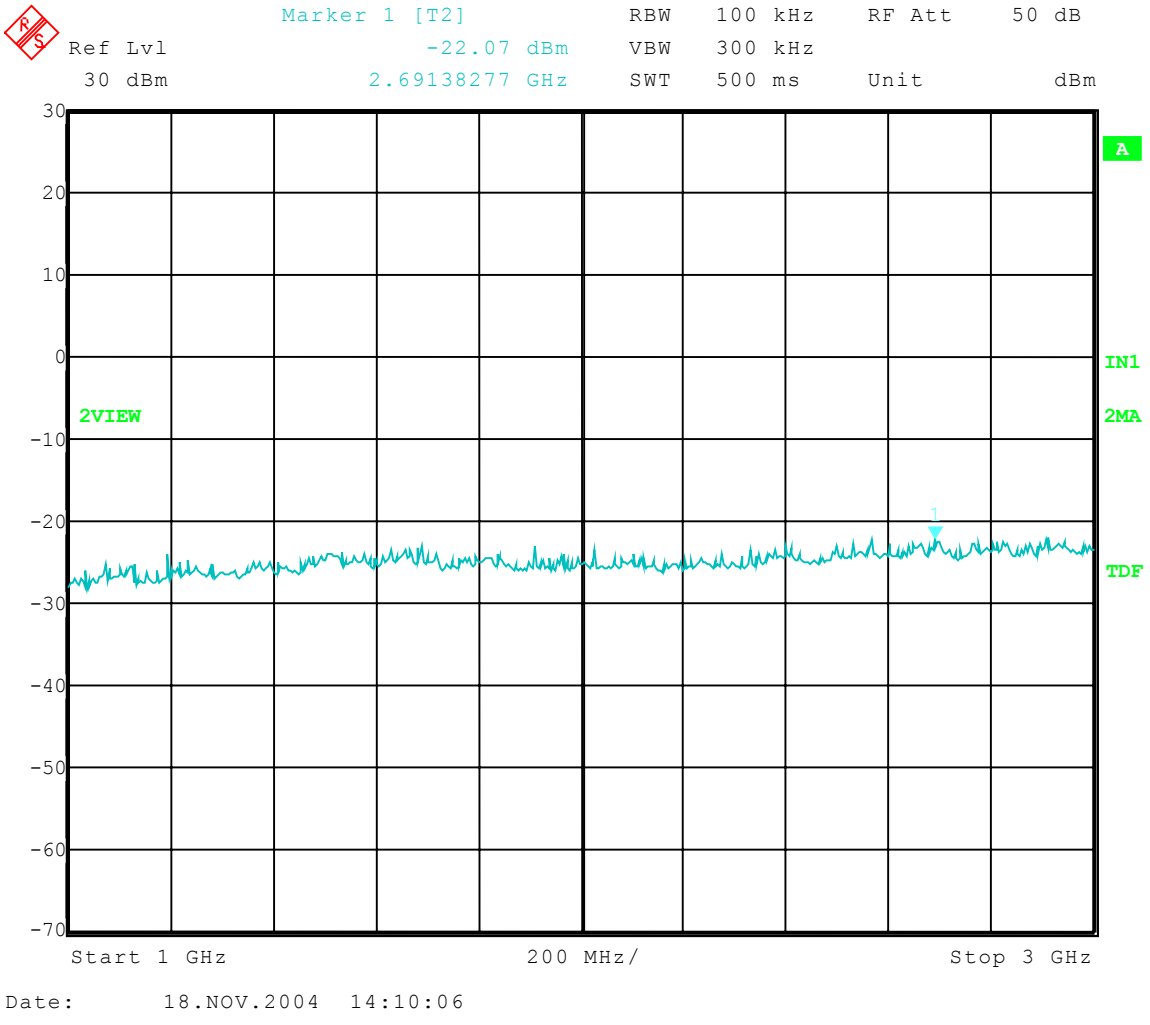


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; High Power: Transmit = 927.233 MHz
Frequency Range: 1 to 3 GHz
Limit = 6.91 dBm

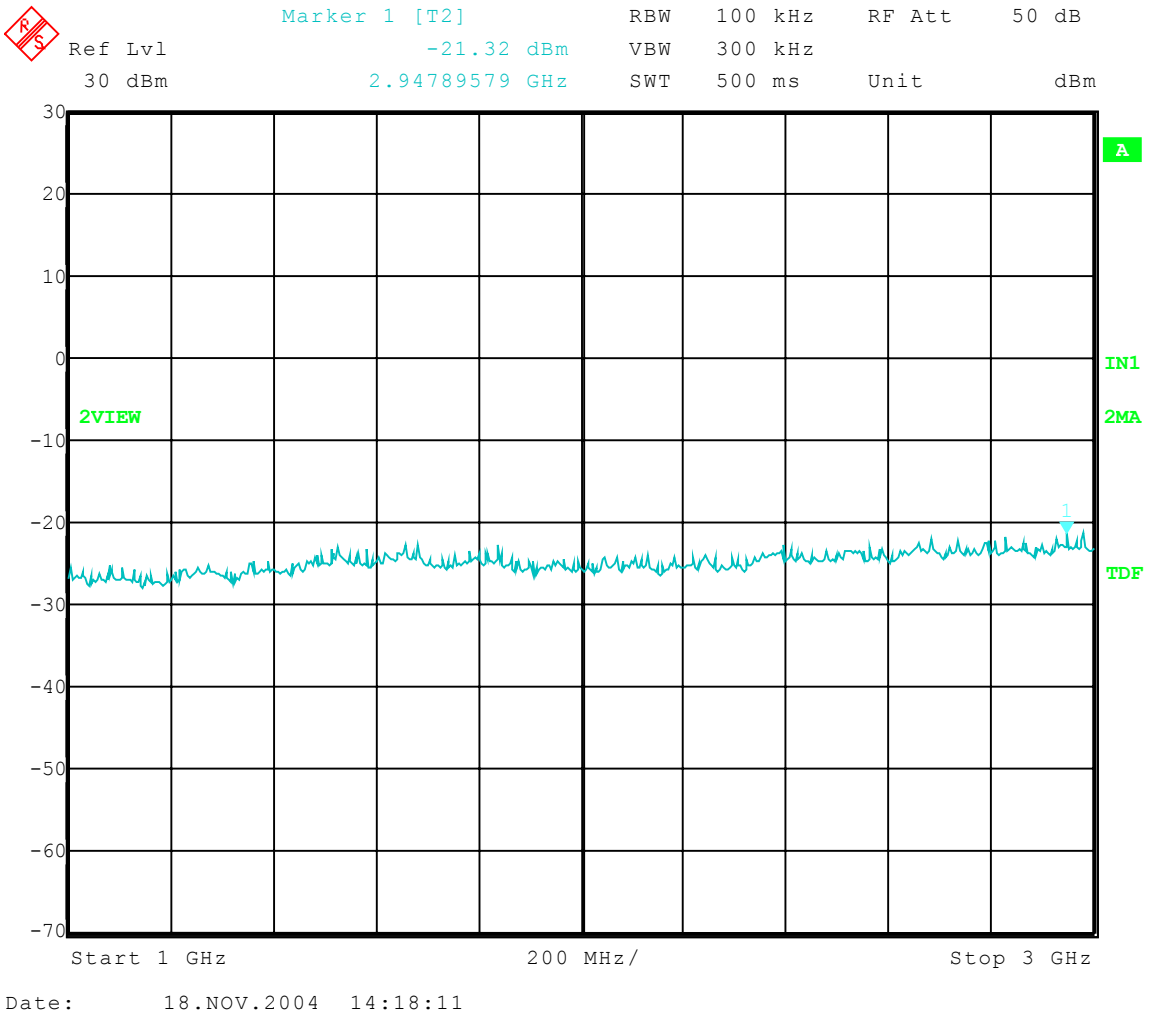
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Mid Power: Transmit = 927.233 MHz
Frequency Range: 1 to 3 GHz
Limit = 5.60 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

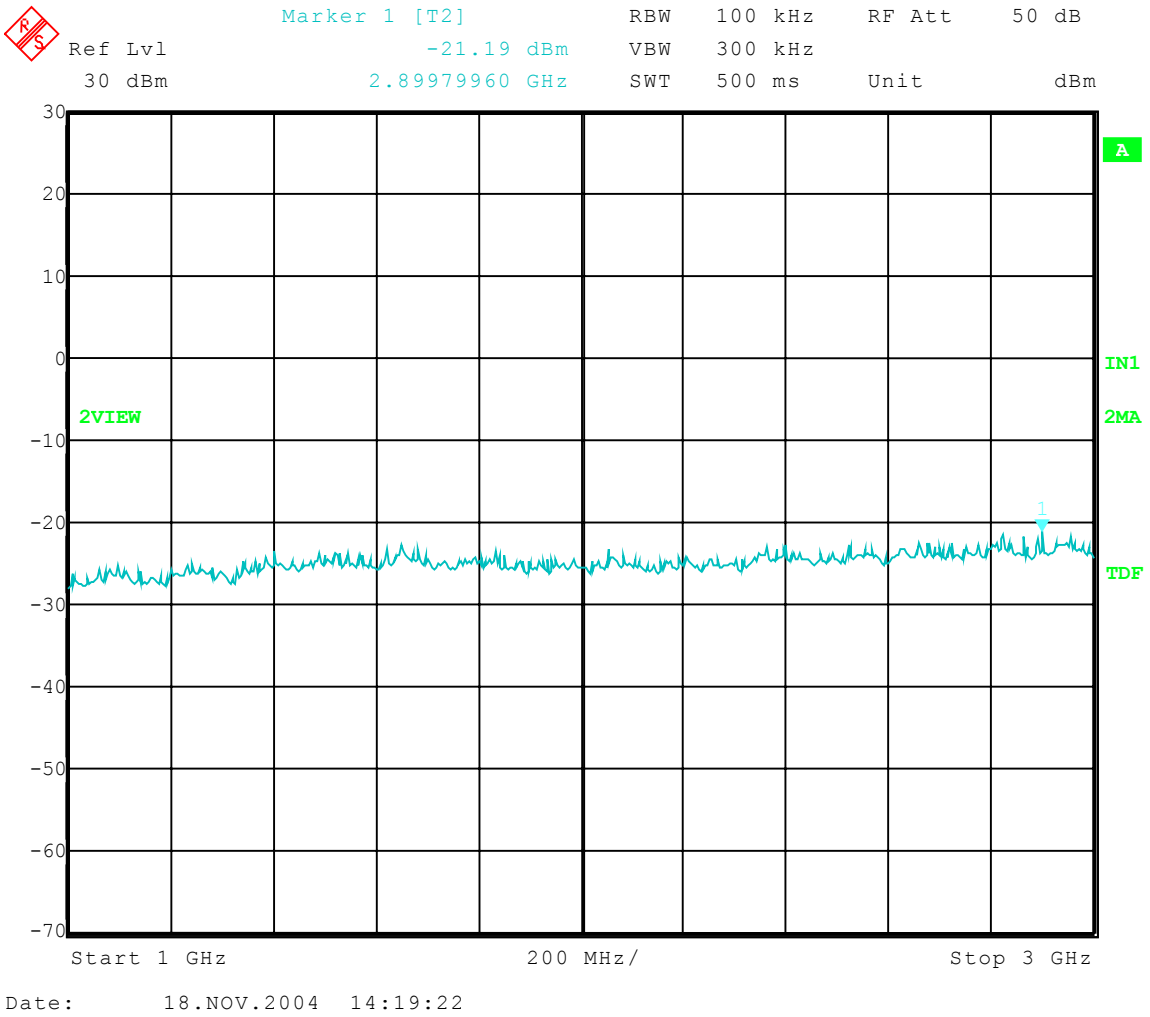


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Low Power: Transmit = 927.233 MHz
Frequency Range: 1 to 3 GHz
Limit = 1.59 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

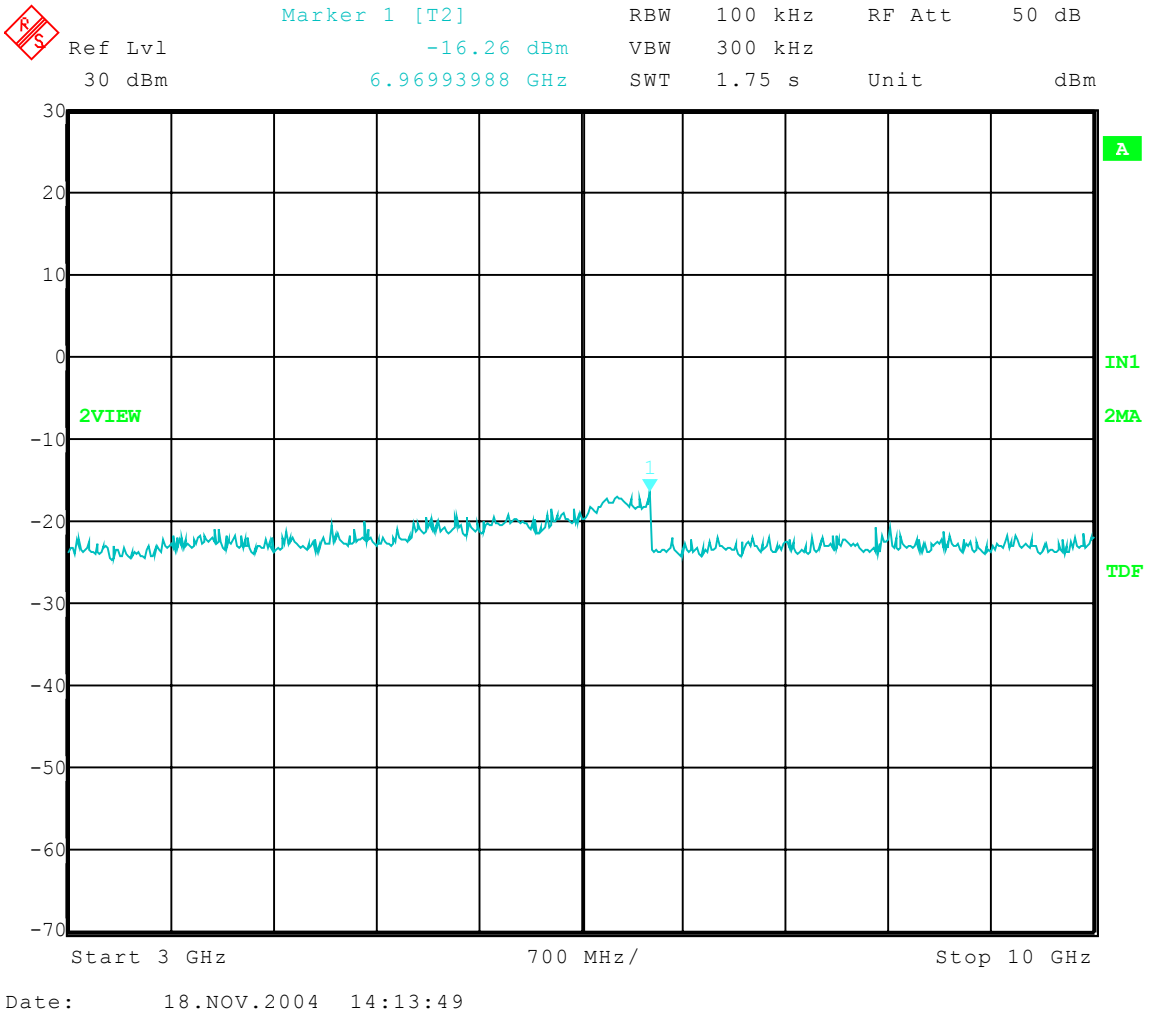


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; High Power: Transmit = 927.233 MHz
Frequency Range: 3 to 10 GHz
Limit = 6.91 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

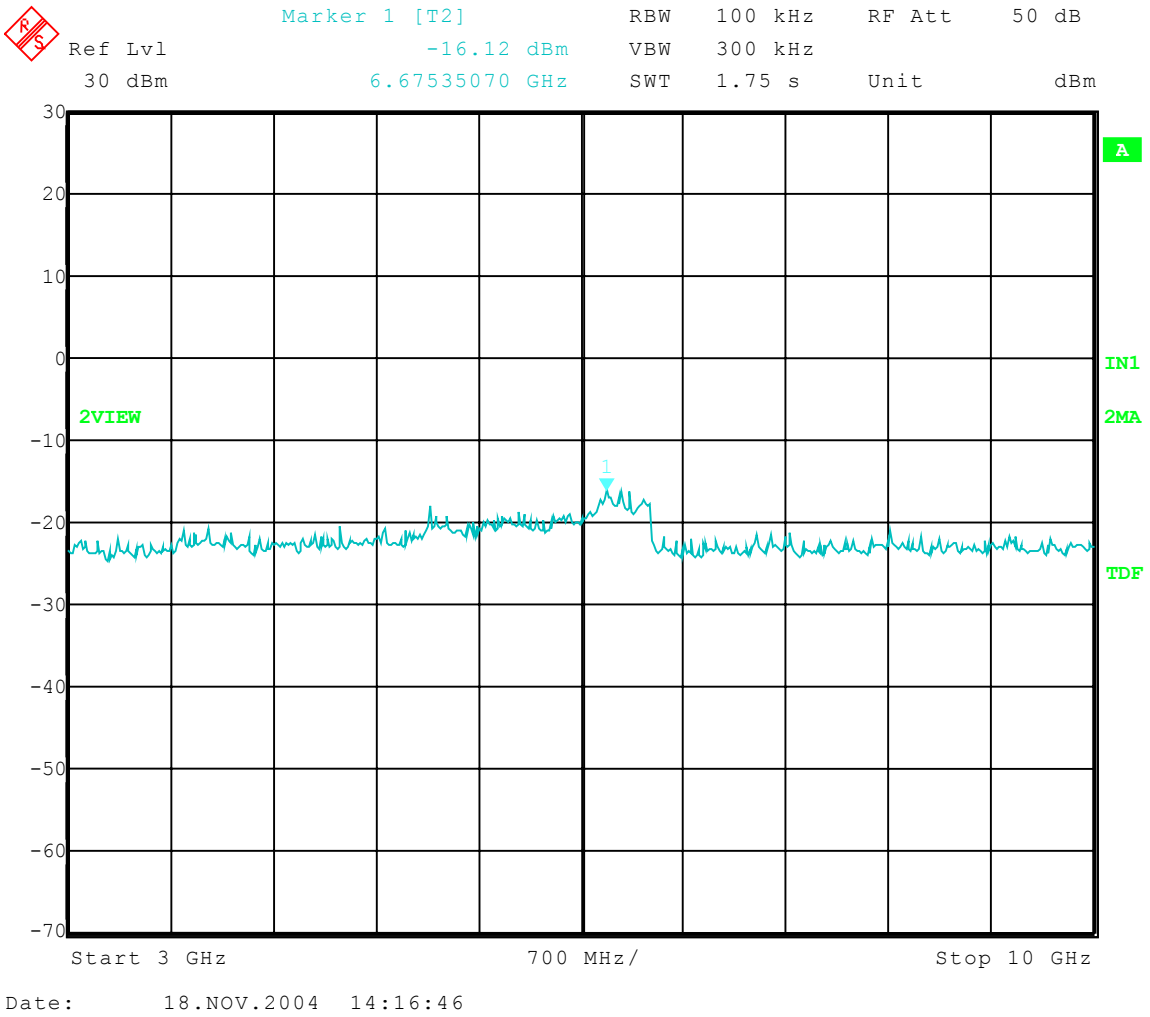


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Mid Power: Transmit = 927.233 MHz
Frequency Range: 3 to 10 GHz
Limit = 5.60 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

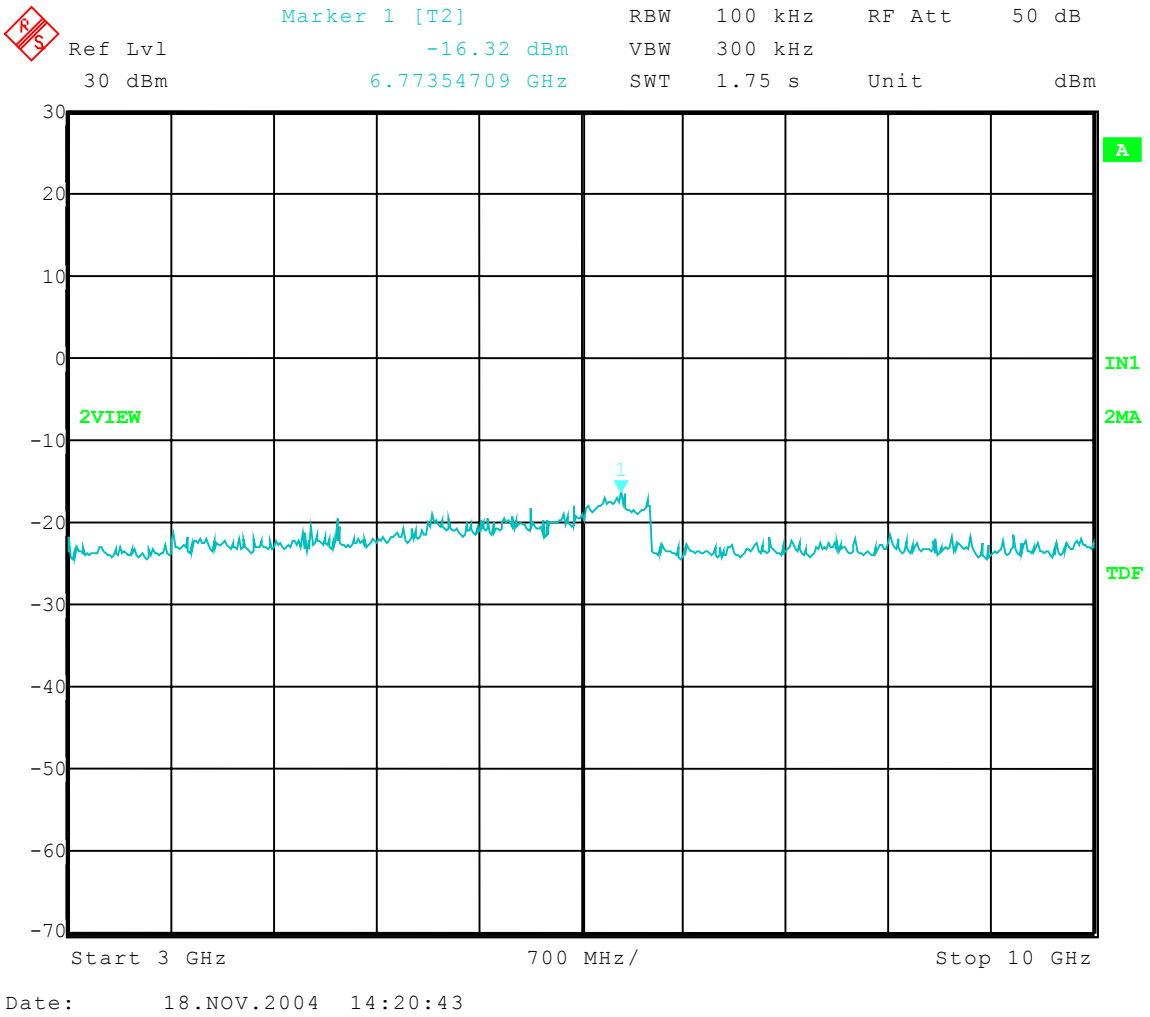


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: High Channel; Low Power: Transmit = 927.233 MHz
Frequency Range: 3 to 10 GHz
Limit = 1.59 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

3.0 RESTRICTED BANDS

As stated in Section 15.205a, the fundamental emission from the R110PAX4 shall not fall within any of the bands listed below:

Frequency in MHz	Frequency in MHz	Frequency in MHz	Frequency in GHz
.0900 to .1100	162.0125 to 167.17	2310.0 to 2390	9.30 to 9.50
.4900 to .5100	167.7200 to 173.20	2483.5 to 2500	10.60 to 12.70
2.1735 to 2.1905	240.000 to 285.00	2655.0 to 2900	13.25 to 13.40
8.362 to 8.3660	322.200 to 335.40	3260.0 to 3267	14.47 to 14.50
13.36 to 13.410	399.900 to 410.00	3332.0 to 3339	15.35 to 16.20
25.50 to 25.670	608.000 to 614.00	3345.8 to 3358	17.70 to 21.40
37.50 to 38.250	960.000 to 1240.00	3600.0 to 4400	22.01 to 23.13
73.00 to 75.500	1300.000 to 1427.00	4500.0 to 5250	23.60 to 24.00
108.00 to 121.94	1435.000 to 1626.50	5350.0 to 5450	31.20 to 31.80
123.00 to 138.00	1660.000 to 1710.00	7250.0 to 7750	36.43 to 36.50
149.90 to 150.00	1718.800 to 1722.20	8025.0 to 8500	ABOVE 38.60
156.70 to 156.90	2200.000 to 2300.00	9000.0 to 9200	

NOTE:

The noise floor within the Restricted Bands for the EMC Receiver and HP Spectrum Analyzer will typically lay 20 dB below the limit.

4.0 BAND EDGE AND RESTRICT BAND COMPLIANCE

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the attenuation below the general limits specified in 15.209 is not required.

The field strength of any **radiated emissions** which fall within the restricted bands shall not exceed the general radiated emissions limits as stated Section 15.209.

NOTE: See the following page(s) for the graph(s) made showing compliance for Band Edge and Restrict Band:

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

DATA AND GRAPH(S) TAKEN SHOWING THE BAND EDGE AND RESTRICT BAND COMPLIANCE

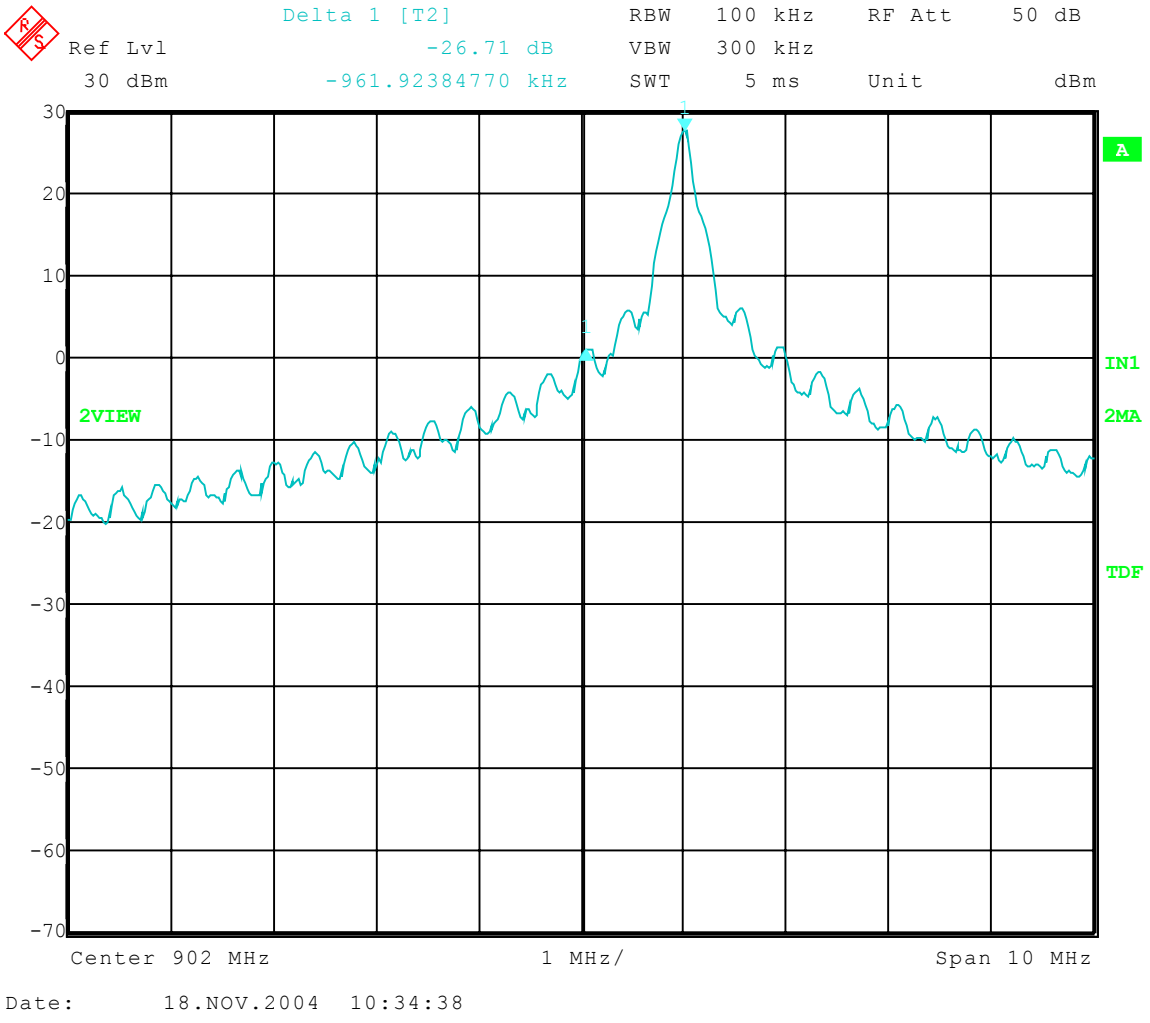
PART 15.247(c)

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Low Channel; High Power: Frequency – 902.967 MHz

Band-Edge Frequency = 902 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

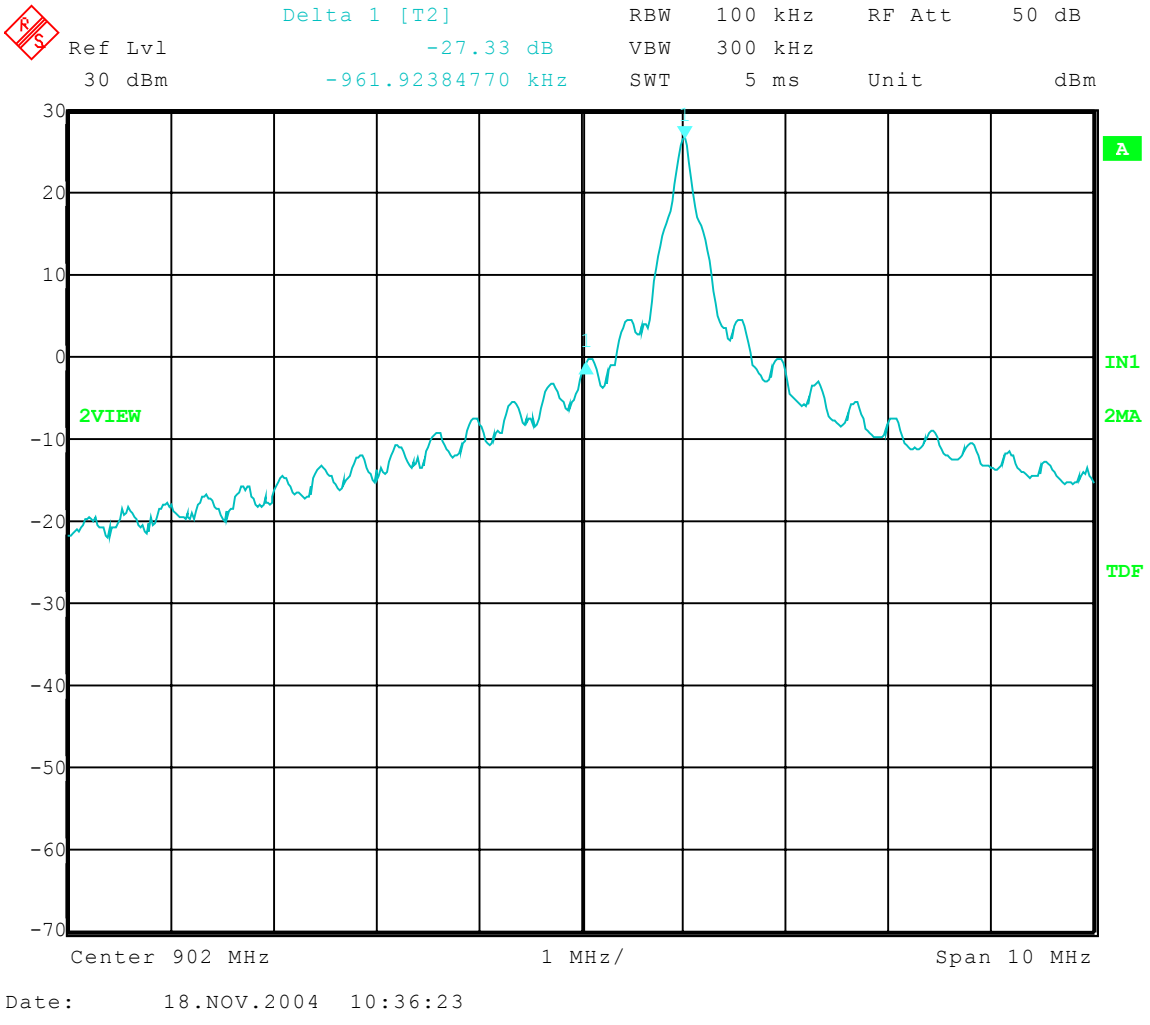


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Low Channel; Mid Power: Frequency – 902.967 MHz

Band-Edge Frequency = 902 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

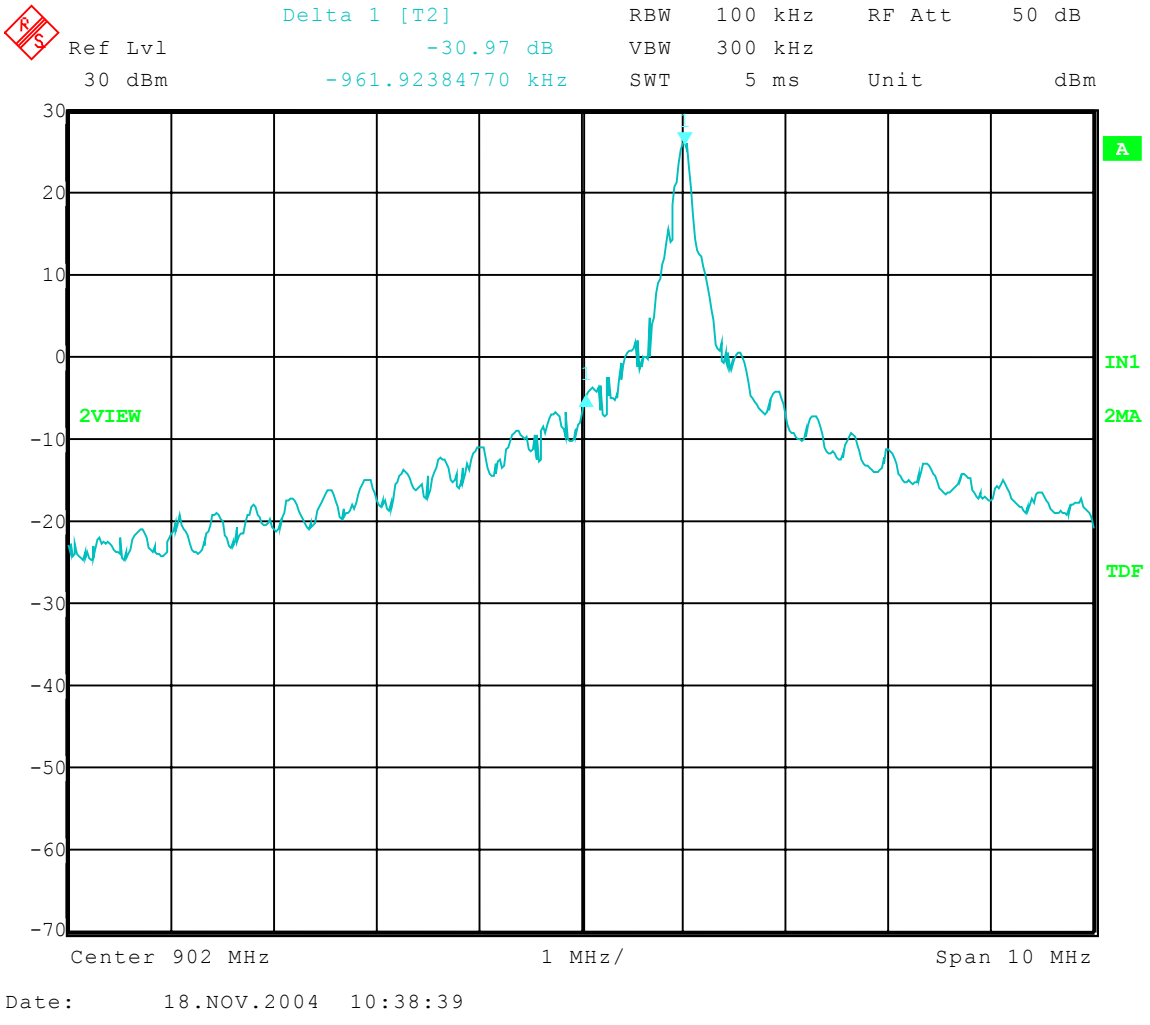


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Low Channel; Low Power: Frequency – 902.967 MHz

Band-Edge Frequency = 902 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

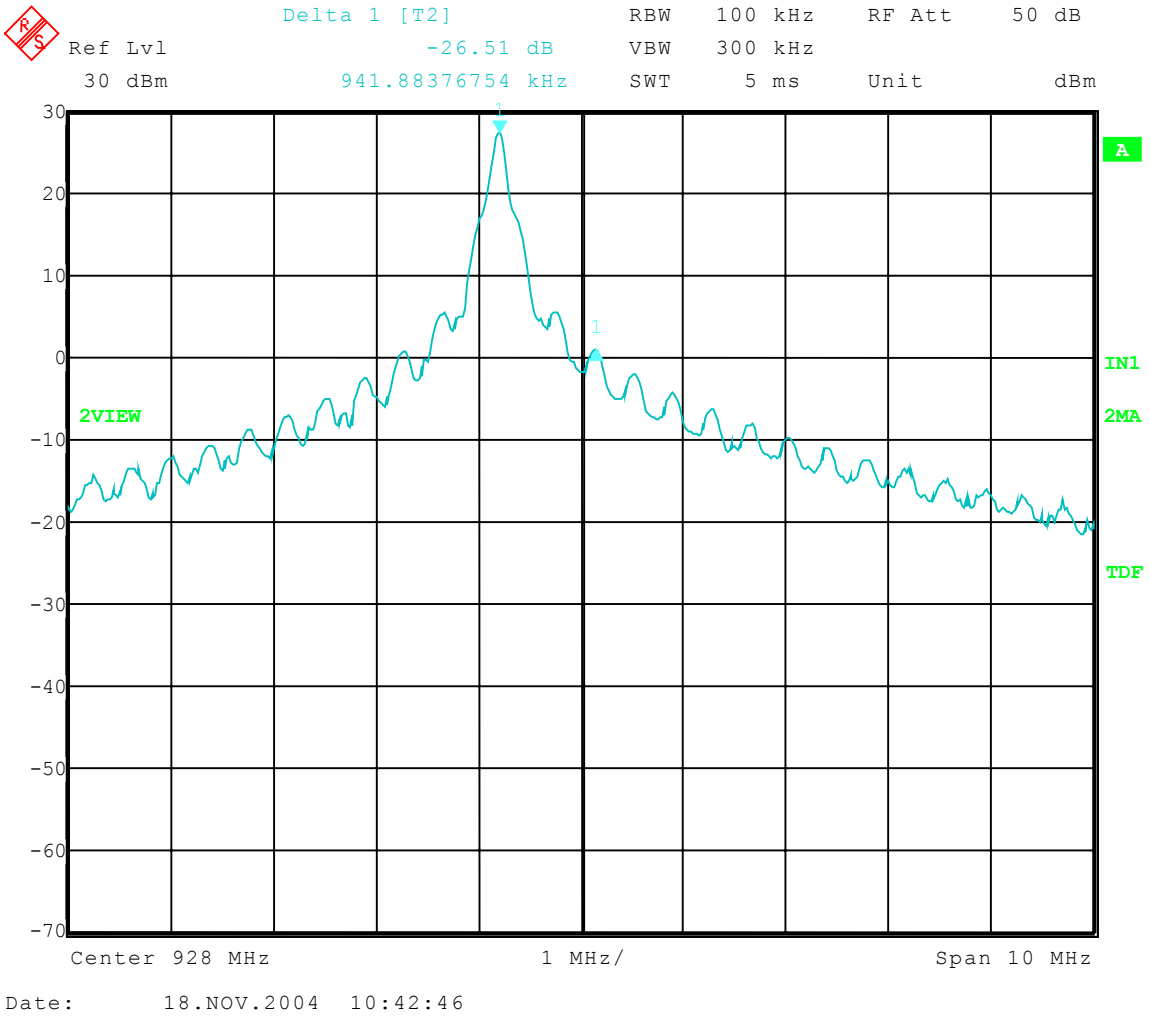


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: High Band-Edge Compliance - Conducted
Operator: Craig B
Comment: High Channel; High Power: Frequency – 927.223 MHz

Band-Edge Frequency = 928 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

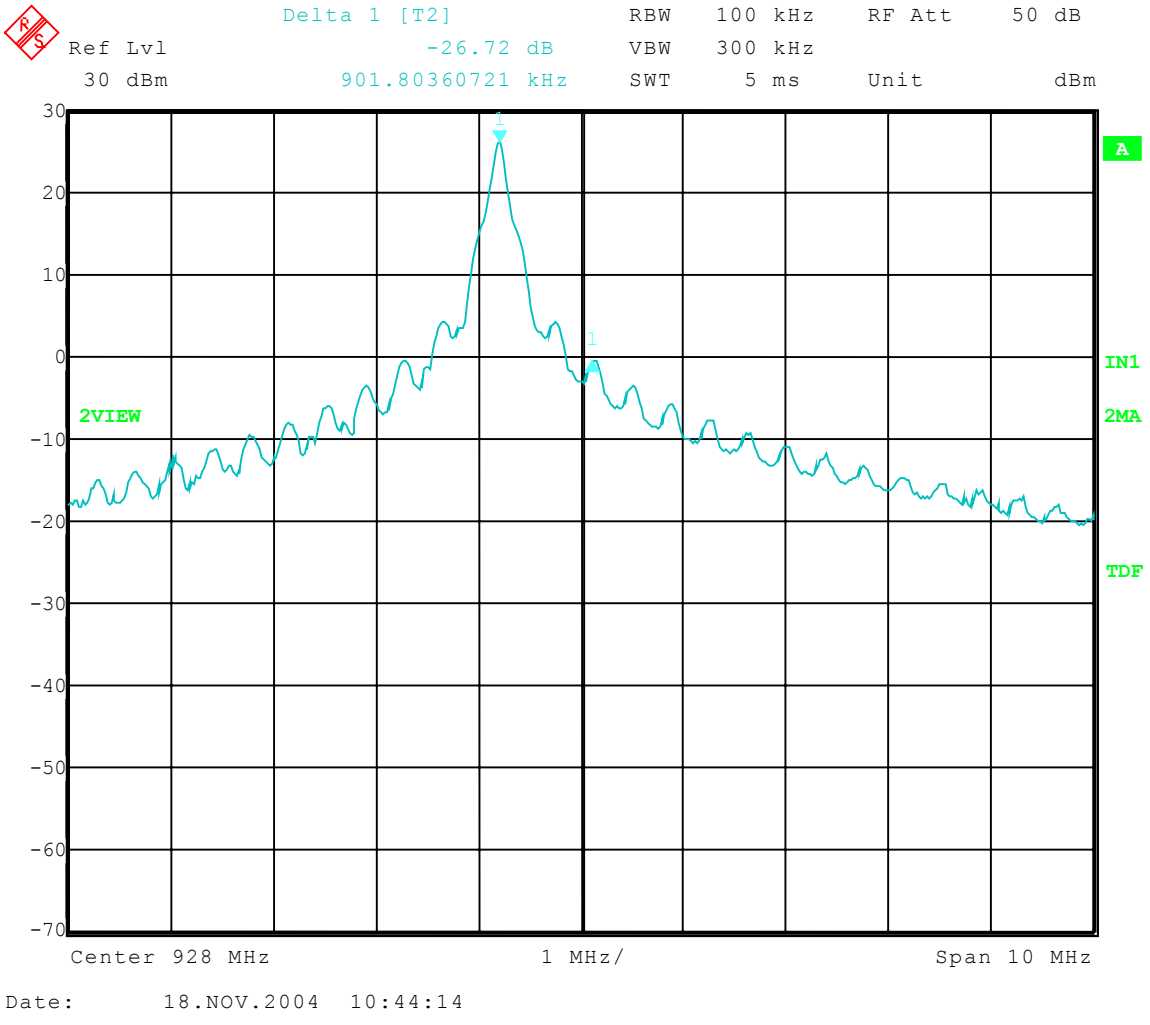


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: High Band-Edge Compliance - Conducted
Operator: Craig B
Comment: High Channel; Mid Power: Frequency – 927.223 MHz

Band-Edge Frequency = 928 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

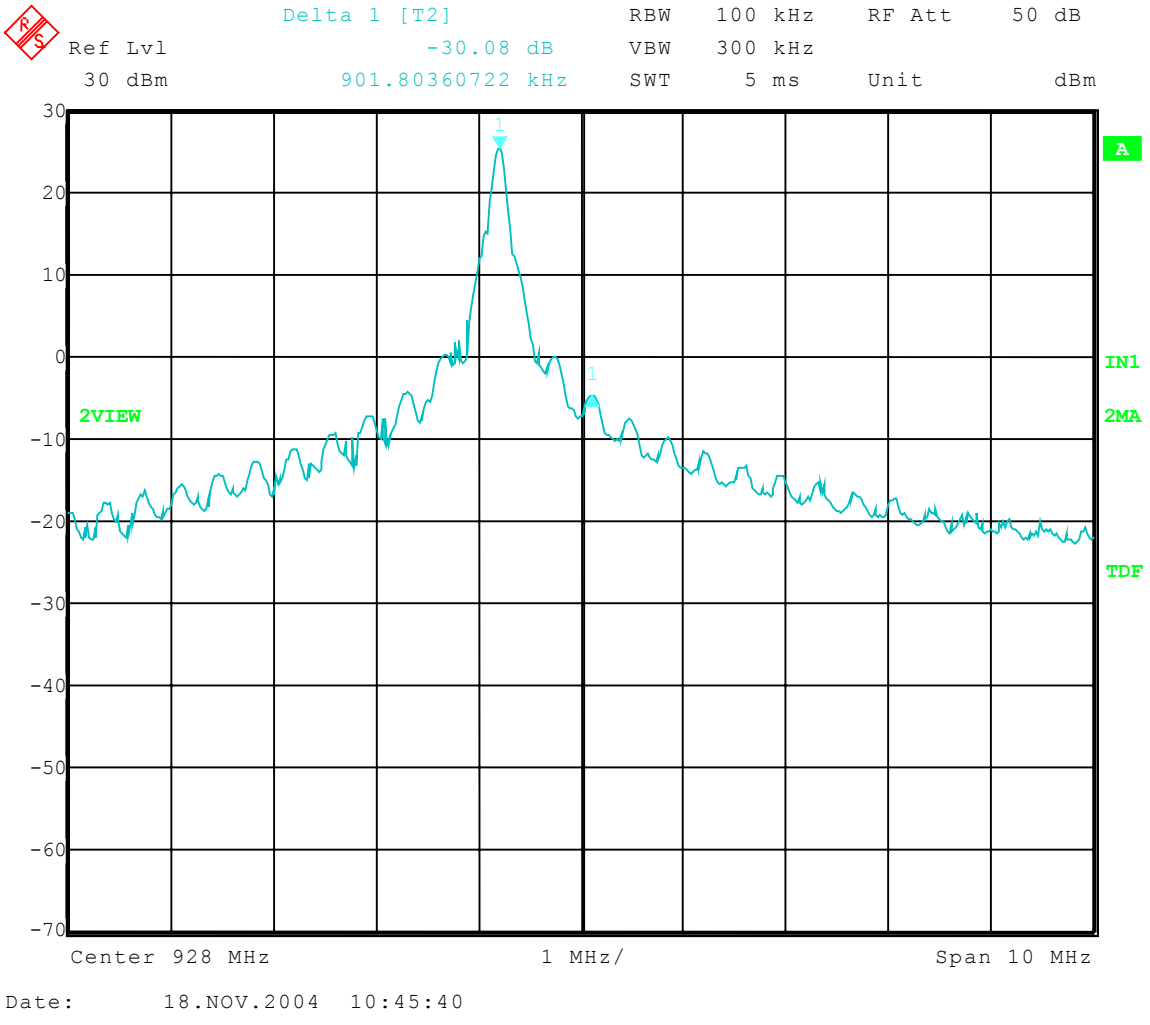


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: High Band-Edge Compliance - Conducted
Operator: Craig B
Comment: High Channel; Low Power: Frequency – 927.223 MHz

Band-Edge Frequency = 928 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

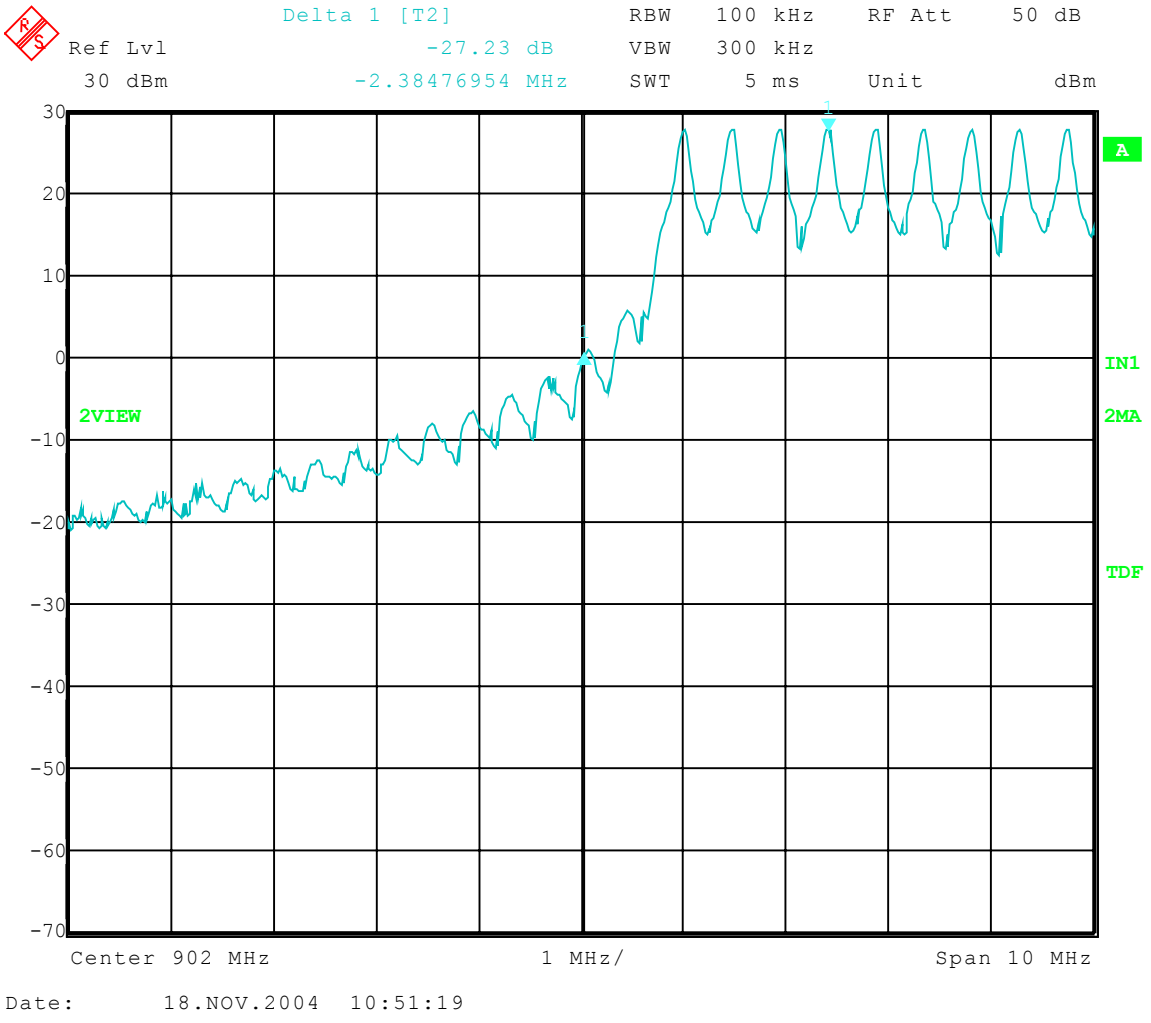


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Spread Spectrum Frequency Hopping On; High Power

Band-Edge Frequency = 902 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

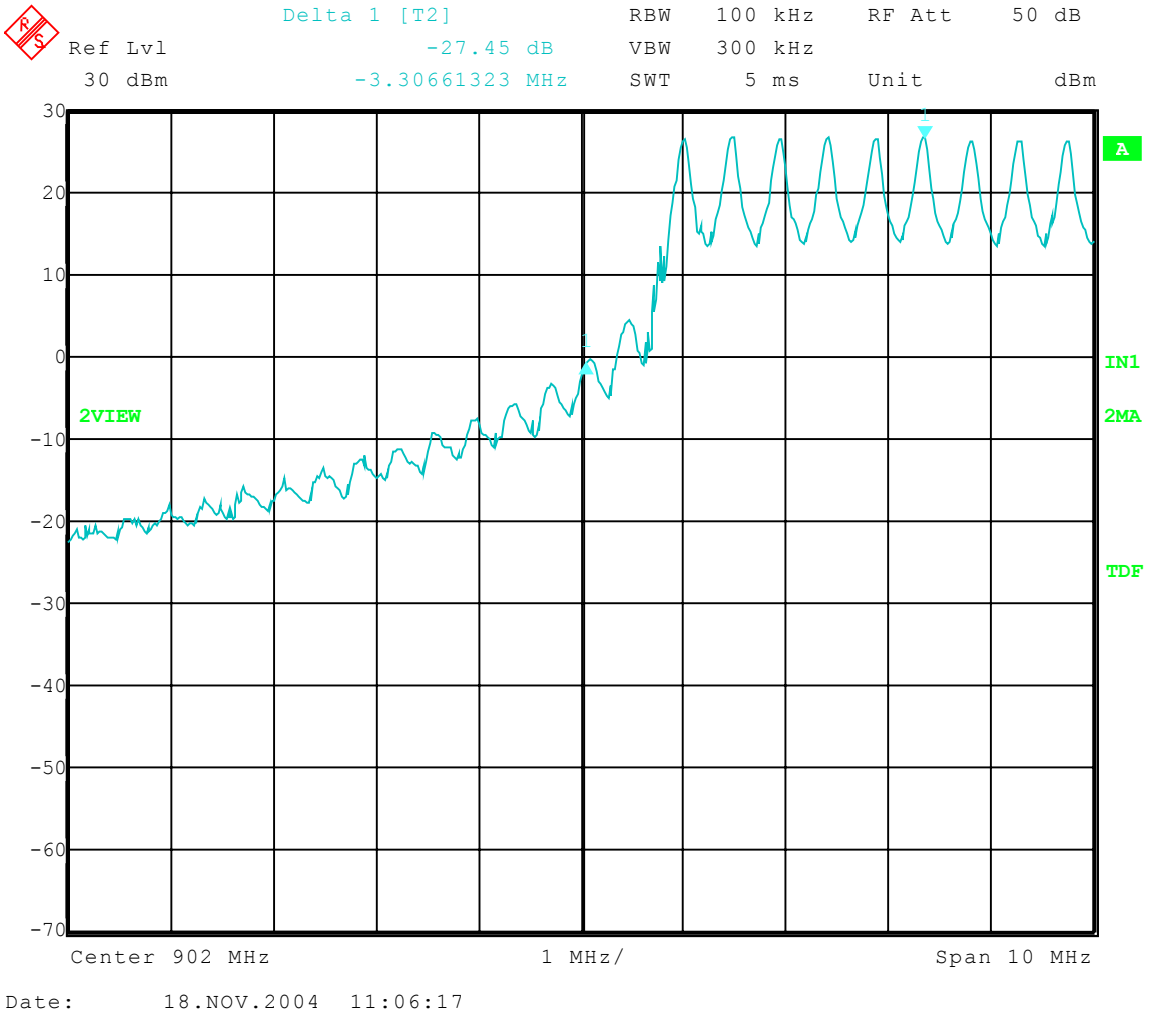


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Spread Spectrum Frequency Hopping On; Mid Power

Band-Edge Frequency = 902 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

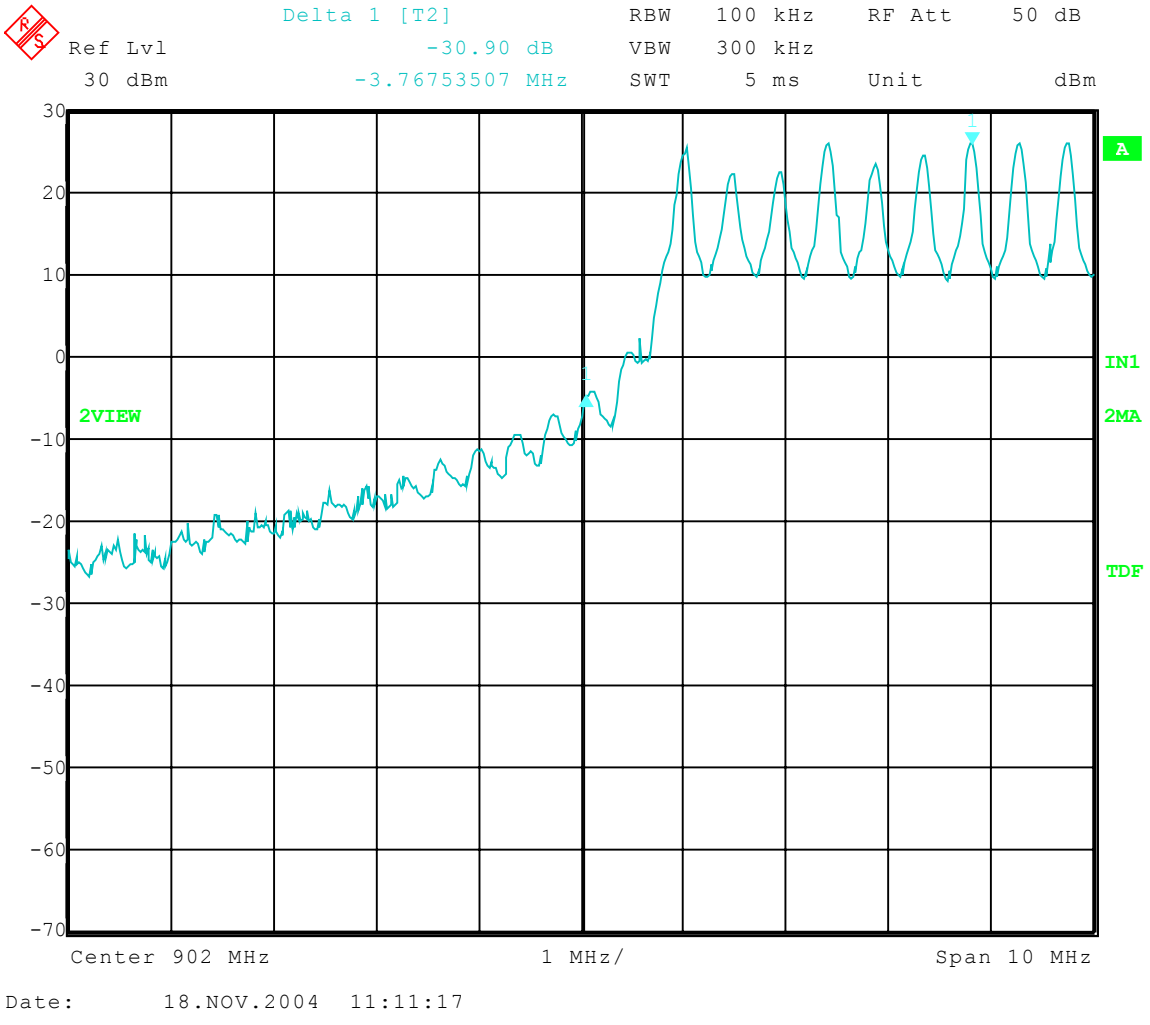


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Spread Spectrum Frequency Hopping On; Low Power

Band-Edge Frequency = 902 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

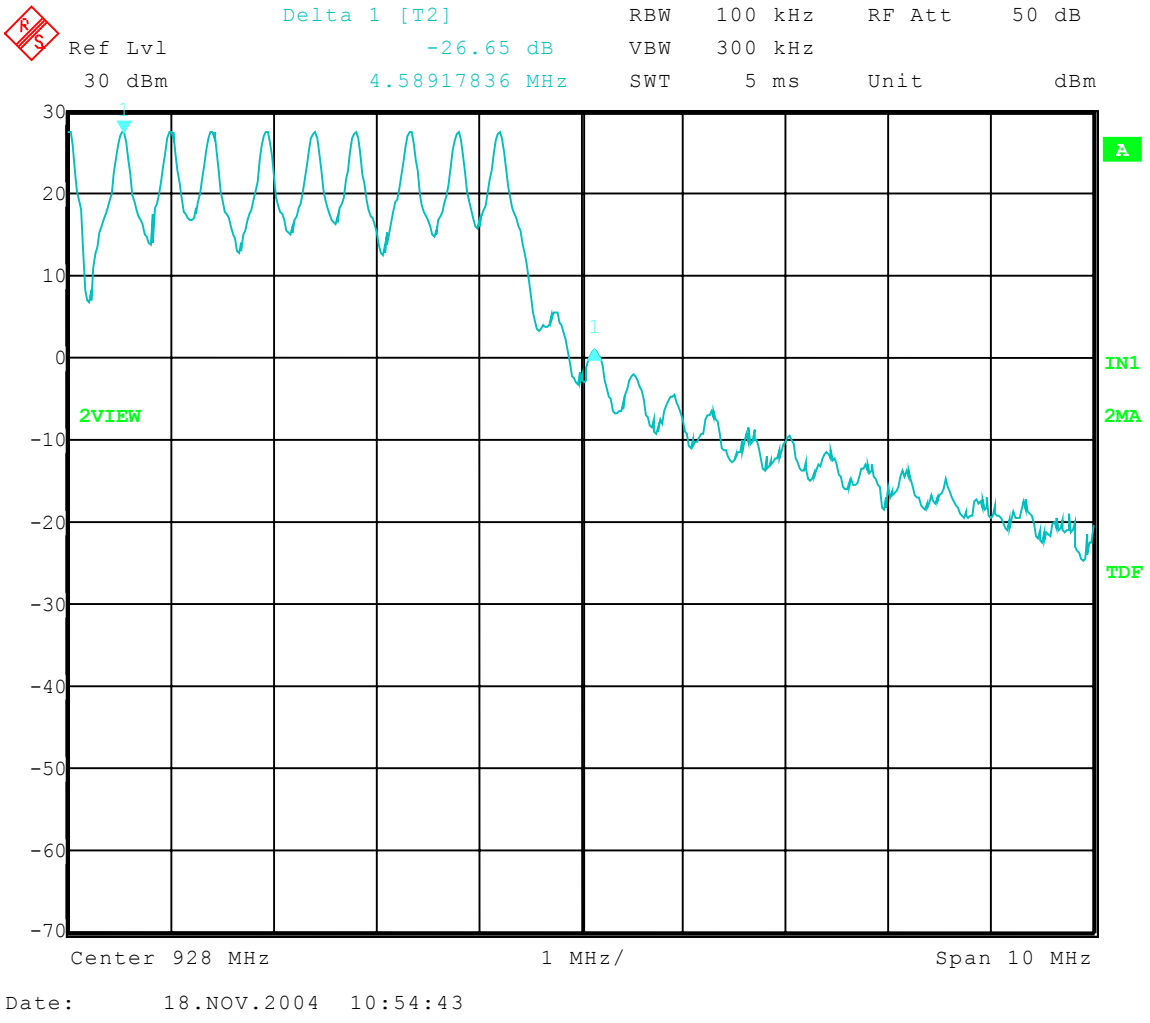


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: High Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Spread Spectrum Frequency Hopping On; High Power

Band-Edge Frequency = 928 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

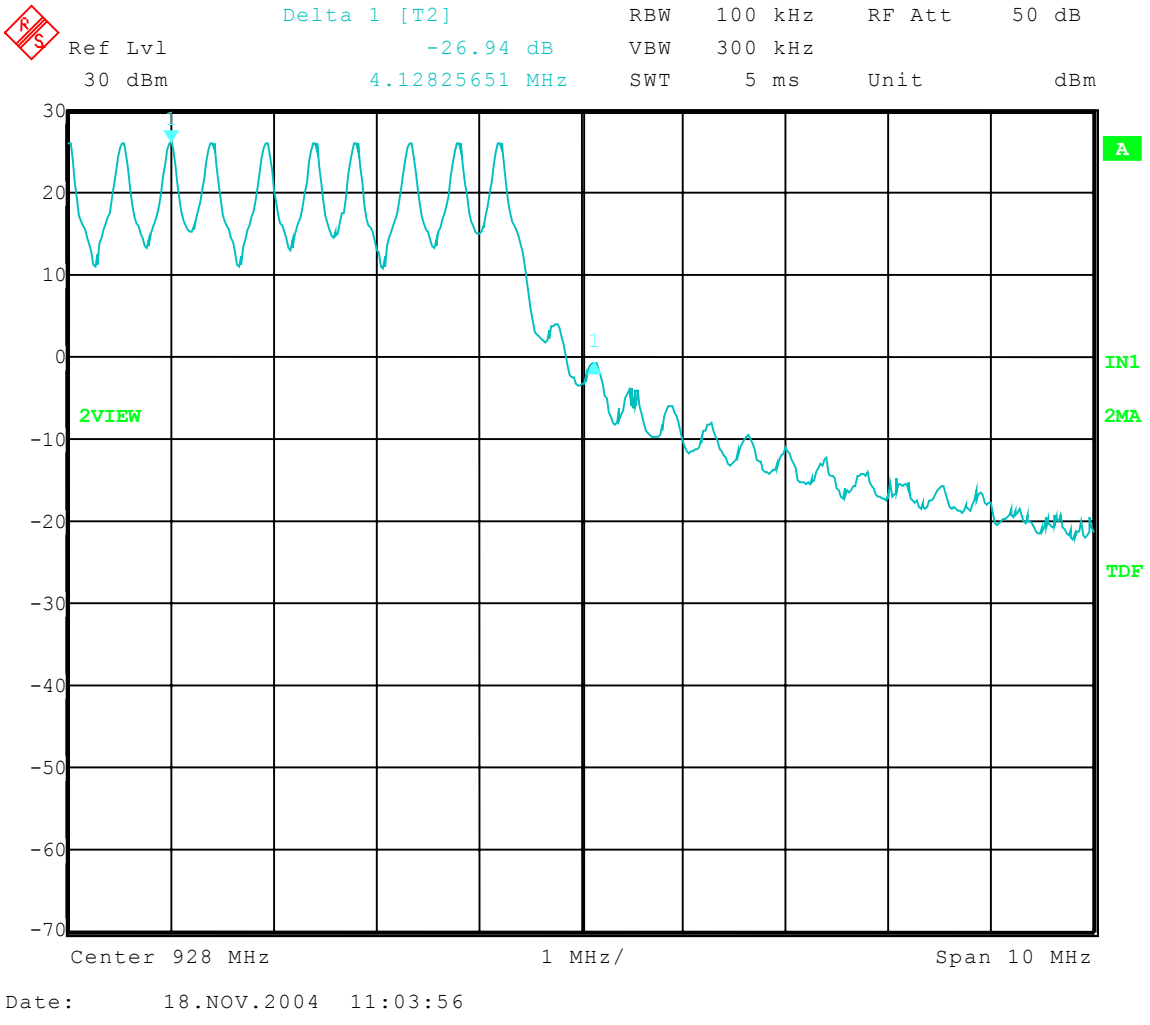


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: High Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Spread Spectrum Frequency Hopping On; Mid Power

Band-Edge Frequency = 928 MHz
Band-Edge > 20 dB Below Peak In-Band Emission

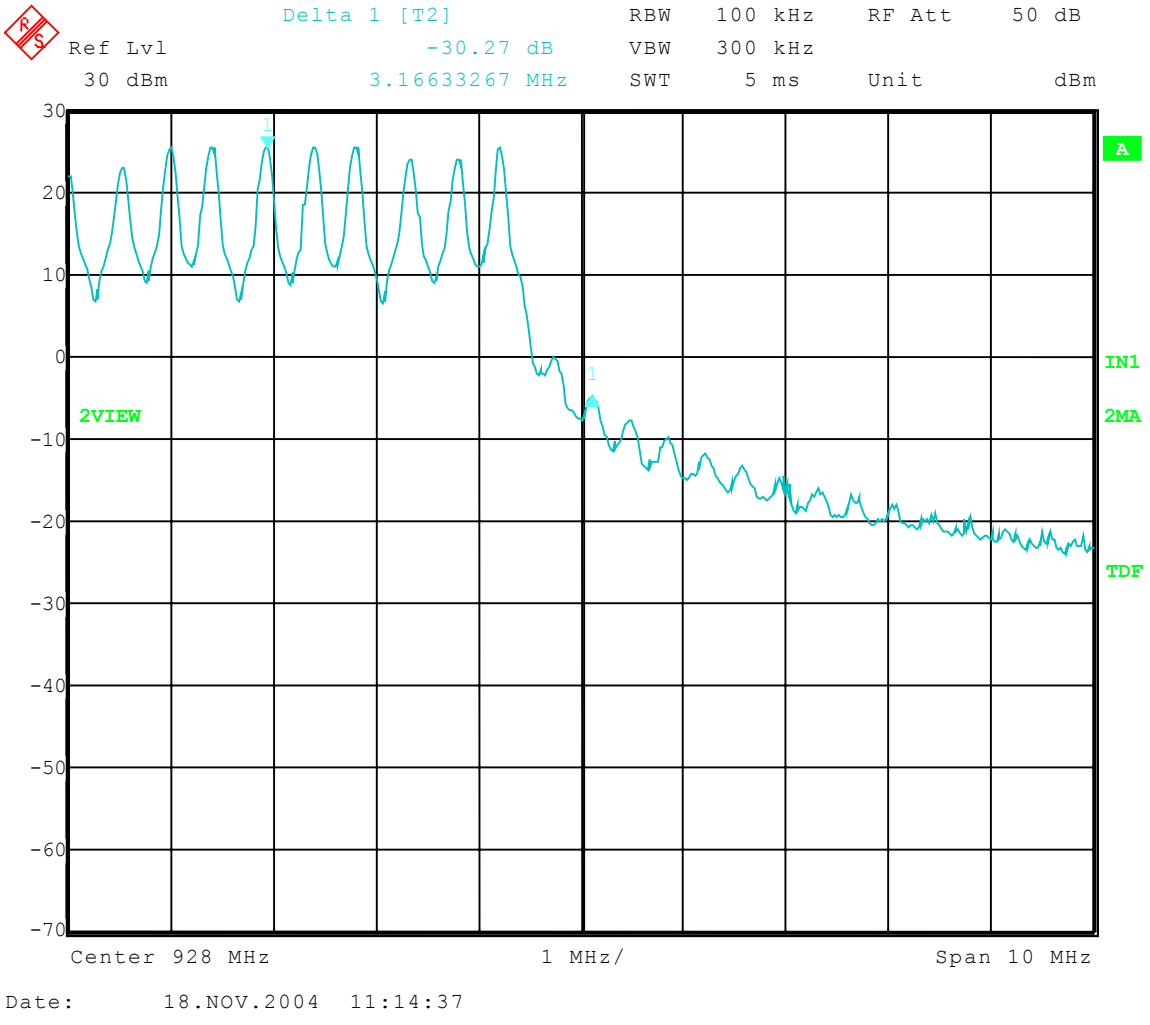


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: High Band-Edge Compliance - Conducted
Operator: Craig B
Comment: Spread Spectrum Frequency Hopping On; Low Power

Band-Edge Frequency = 928 MHz
Band-Edge > 20 dB Below Peak In-Band Emission



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

5.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS

The radiated measurements made at D.L.S. Electronic Systems, Inc., for the R110PAX4, Model Number: 110PAX4, are shown in tabulated and graph form. Preliminary radiation measurements were performed at a 3 meter test distance with the limits adjusted linearly when required. The frequency range from 30 MHz to over 960 MHz, depending upon the fundamental frequency as stated in Part 15.33a, was automatically scanned and plotted at various angles.

Measurements for the R110PAX4 were made up to 10000 MHz, in accordance with Section 15.33a for Intentional Radiators with a fundamental frequency of 928 MHz. For intentional radiators, the frequency range to be investigated is determined by the lowest radio frequency generated by the device without going below 30 MHz, up to at least the tenth harmonic of the highest fundamental frequency or 10 GHz, whichever is lower. At those frequencies where significant signals were detected, measurements were made over the entire frequency range specified in FCC Part 15, Subpart C, Section 15.247 at the open field test site, located at Genoa City, Wisconsin, FCC file number **31040/SIT**. When required, levels were extrapolated from 10 meters to 3 meters using a linear extrapolation.

All signals in the frequency range of 30 MHz to 2000 MHz were measured with a Biconical Antenna or tuned dipoles and from 200 MHz to 1000 MHz, a Log Periodic or Tuned Dipoles were used. From 1000 MHz to 25 GHz Horn Antennas were used. During the test the equipment was rotated and the antenna was raised and lowered from 1 meter to 4 meters to find the maximum level of emissions. In order to find maximum emissions, the cables were moved through all the positions the equipment would be expected to experience in the field. The EUT, peripheral equipment and cables were configured to meet the conditions in ANSI C63.4-2001, Clauses 6 & 8. Tests were made with the receive antenna(s) in both the horizontal and vertical planes of polarization. In each case, the table was rotated to find the maximum emissions.

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

5.0 FIELD STRENGTH OF SPURIOUS EMISSION MEASUREMENTS (CON'T)

As stated in Section 15.247(b) the allowed maximum peak output power of the transmitter shall not exceed 1 Watt. In any 100 kHz bandwidth outside these frequency bands (the power that is produced by the modulation products of the spreading sequence), the information sequence and the carrier frequency shall be either at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Attenuation below the general limits specified in 15.209 is not required.

Field strength limits are at a distance of 3 meters. The emission limits shown are based on measurement instrumentation employing an average detector.

Emissions radiated outside of the specified frequency bands, except for harmonics are attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Preliminary radiated emission measurements were performed at a 3 meter test distance. The frequency range from 30 MHz to 1000 MHz was automatically scanned and plotted at various angles.

NOTE:

All radiated emissions measurements were made at a test room temperature of **70°F** at **32%** relative humidity.

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

RADIATED DATA AND GRAPH(S) TAKEN FOR

FIELD STRENGTH

SPURIOUS EMISSION MEASUREMENTS

PART 15.247

TRANSMIT MODE, RECEIVED MODE, PRINTING

FCC Part 15 Class B

Electric Field Strength

```
EUT:                  R110PAX4
Manufacturer:         Zebra Technologies
Operating Condition:  70 deg. F; 32% R.H.
Test Site:            DLS OF Site 3
Operator:             Craig Brandt
Test Specification:   Tx mode; Rx mode; Printing
Comment:
                      Date: 02-03-2005
```

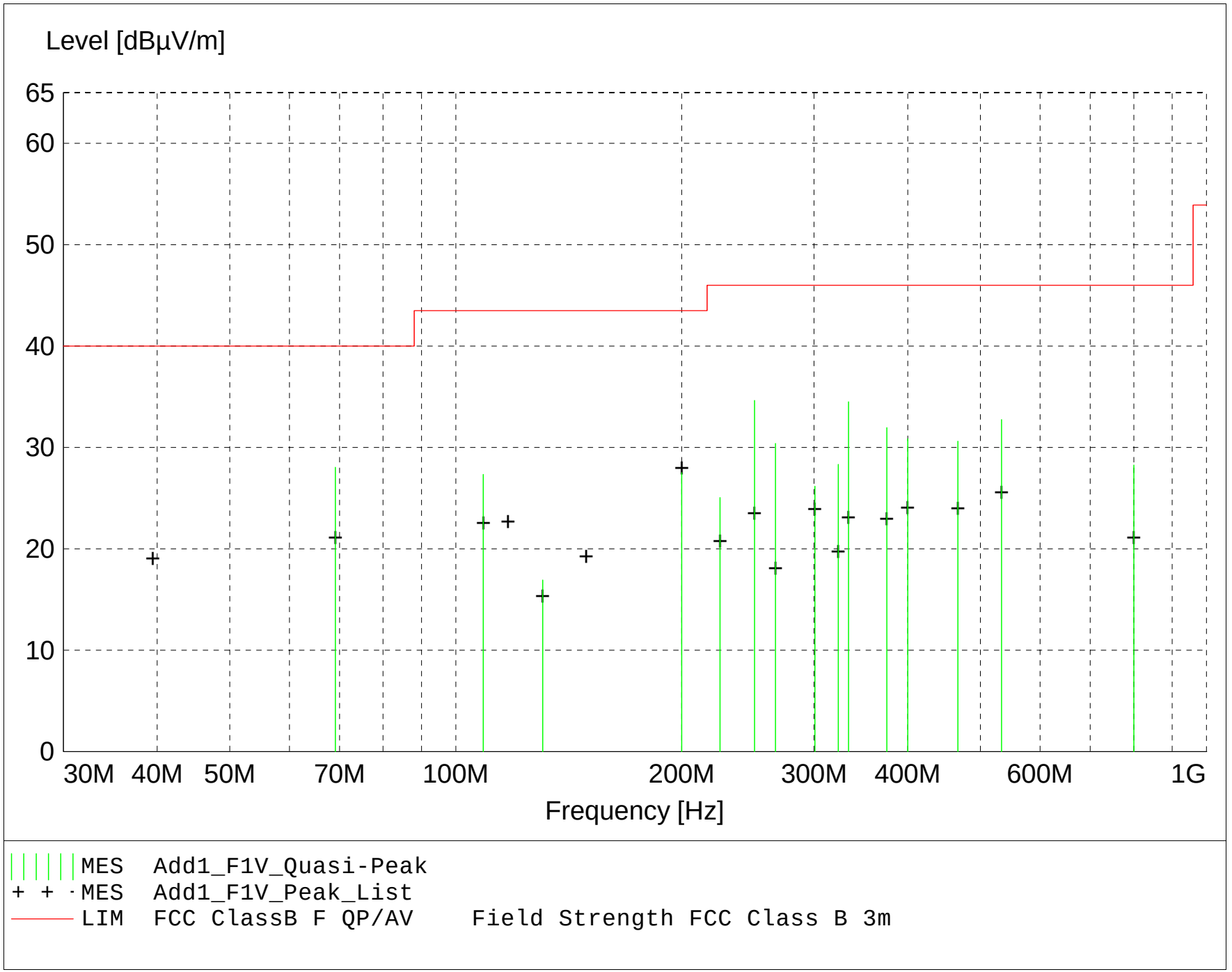
TEXT: "Site 3 MidV 3M"

```
  Short Description:            Test Set-up Vert30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 26 SN: 837491/010

                Antennas ---
                Biconical    -- EMCO 3104C SN: 9701-4785
                Log Periodic -- EMCO 3146  SN: 9702-4895

                Pre-Amp  --- Rohde&Schwarz TS-PR10 SN: 032001/005

TEST SET-UP:    EuT Measured at 3 Meters with VERTICAL Antenna Polarisation
```


Level [dBµV/m]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES Add1_F1V_Quasi-Peak
MES Add1_F1V_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add1_F1V_Final"

2/3/2005 2:59PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
250.000000	44.29	12.56	-22.2	34.6	46.0	11.4	1.00	270	QUASI-PEAK	None
333.350000	41.27	14.97	-21.8	34.5	46.0	11.5	1.80	0	QUASI-PEAK	None
69.120000	44.83	7.26	-24.0	28.0	40.0	12.0	1.00	180	QUASI-PEAK	None
533.350000	35.23	18.33	-20.8	32.7	46.0	13.3	1.00	100	QUASI-PEAK	None
375.000000	38.28	15.25	-21.6	32.0	46.0	14.0	1.50	225	QUASI-PEAK	None
400.000000	36.40	15.85	-21.4	30.8	46.0	15.2	1.00	190	QUASI-PEAK	None
466.690000	34.62	17.08	-21.1	30.6	46.0	15.4	1.00	135	QUASI-PEAK	None
266.680000	39.37	13.16	-22.1	30.4	46.0	15.6	1.90	270	QUASI-PEAK	None
200.000000	33.15	17.01	-22.7	27.5	43.5	16.0	1.00	0	QUASI-PEAK	None
108.775000	38.22	12.55	-23.4	27.3	43.5	16.2	1.00	30	QUASI-PEAK	None
323.190000	34.93	15.19	-21.8	28.3	46.0	17.7	1.30	20	QUASI-PEAK	None
800.000000	26.15	21.32	-19.2	28.3	46.0	17.7	1.00	180	QUASI-PEAK	None
300.740000	33.14	14.97	-21.9	26.2	46.0	19.8	1.00	45	QUASI-PEAK	None
224.990000	36.12	11.44	-22.5	25.1	46.0	20.9	1.00	270	QUASI-PEAK	None
130.530000	27.61	12.58	-23.3	16.9	43.5	26.6	1.00	225	QUASI-PEAK	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                  R110PAX4
Manufacturer:         Zebra Technologies
Operating Condition:  70 deg. F; 32% R.H.
Test Site:            DLS OF Site 3
Operator:             Craig Brandt
Test Specification:   Tx mode; Rx mode; Printing
Comment:
                      Date: 02-03-2005
```

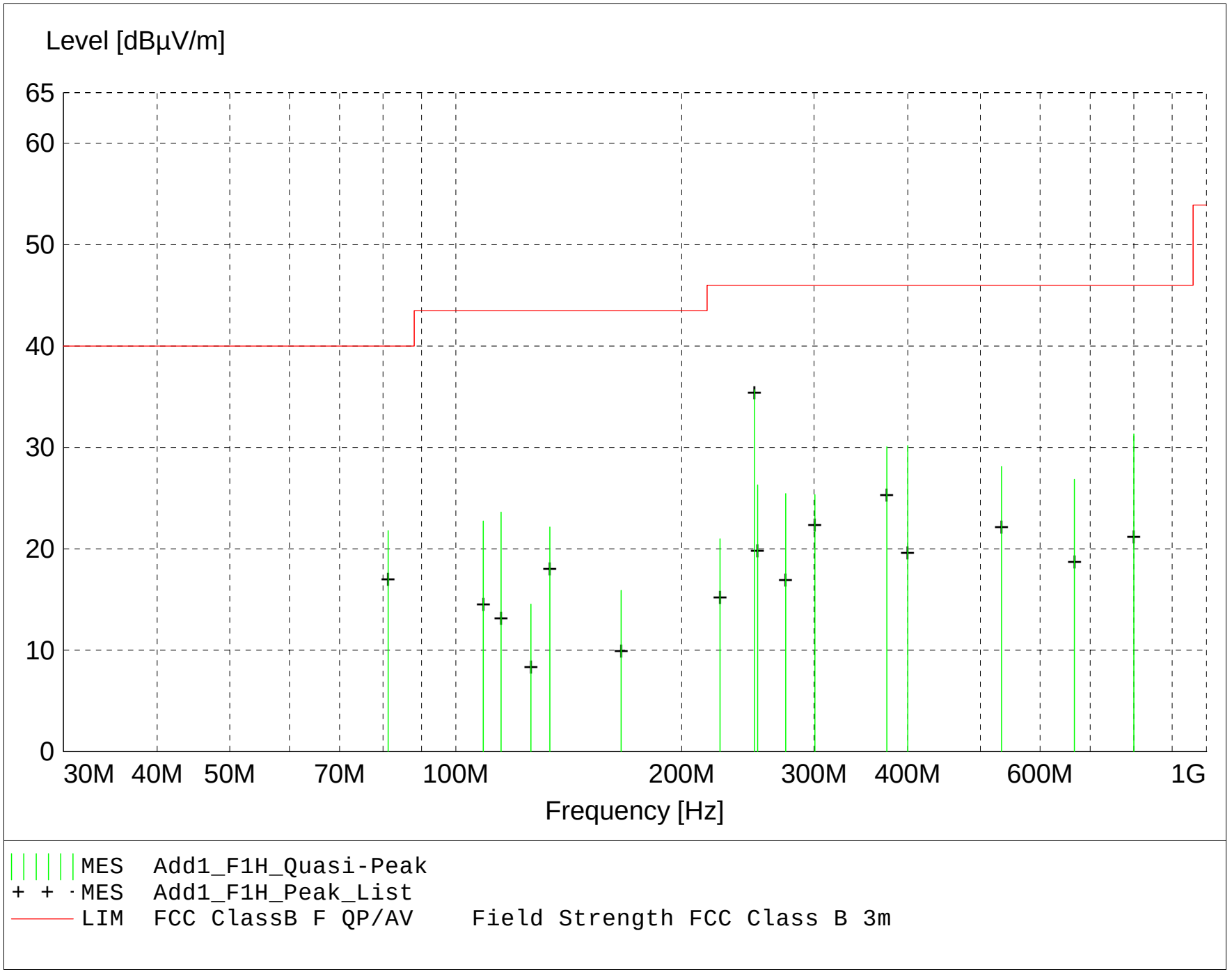
TEXT: "Site 3 MidH 3M"

```
  Short Description:            Test Set-up Horz30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Antennas ---
                Biconical    -- EMCO 3104C SN: 9701-4785
                Log Periodic -- EMCO 3146  SN: 9702-4895

                Pre-Amp  --- Rohde&Schwarz TS-PR10 SN: 032001/005

TEST SET-UP:    EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation
```


Level [dBµV/m]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES Add1_F1H_Quasi-Peak
MES Add1_F1H_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add1_F1H_Final"

2/3/2005 2:51PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
250.000000	45.35	12.56	-22.2	35.7	46.0	10.3	1.50	270	QUASI-PEAK	None
800.000000	29.24	21.32	-19.2	31.3	46.0	14.7	1.40	135	QUASI-PEAK	None
400.000000	35.75	15.85	-21.4	30.2	46.0	15.8	1.00	290	QUASI-PEAK	None
375.000000	36.39	15.25	-21.6	30.1	46.0	15.9	1.00	135	QUASI-PEAK	None
533.350000	30.62	18.33	-20.8	28.1	46.0	17.9	1.10	135	QUASI-PEAK	None
81.230000	38.51	7.14	-23.9	21.8	40.0	18.2	2.50	250	QUASI-PEAK	None
666.710000	25.89	20.74	-19.8	26.8	46.0	19.2	1.20	180	QUASI-PEAK	None
252.290000	35.91	12.59	-22.2	26.3	46.0	19.7	1.00	315	QUASI-PEAK	None
114.870000	33.88	13.11	-23.4	23.6	43.5	19.9	3.00	270	QUASI-PEAK	None
275.000000	33.95	13.61	-22.1	25.5	46.0	20.5	1.30	290	QUASI-PEAK	None
300.740000	32.30	14.97	-21.9	25.3	46.0	20.7	1.00	135	QUASI-PEAK	None
108.785000	33.63	12.55	-23.4	22.7	43.5	20.8	2.00	90	QUASI-PEAK	None
133.330000	33.01	12.39	-23.3	22.1	43.5	21.4	2.20	270	QUASI-PEAK	None
225.000000	32.06	11.44	-22.5	21.0	46.0	25.0	1.00	100	QUASI-PEAK	None
166.085000	24.93	13.89	-22.9	15.9	43.5	27.6	2.20	45	QUASI-PEAK	None
125.935000	25.04	12.79	-23.3	14.5	43.5	29.0	2.20	90	QUASI-PEAK	None

ELECTRONIC SYSTEMS, INC.
1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

RADIATED DATA AND GRAPH(S) TAKEN FOR

FIELD STRENGTH

SPURIOUS EMISSION MEASUREMENTS

PART 15.247

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode High CH, High Power
Date: 02-03-2005

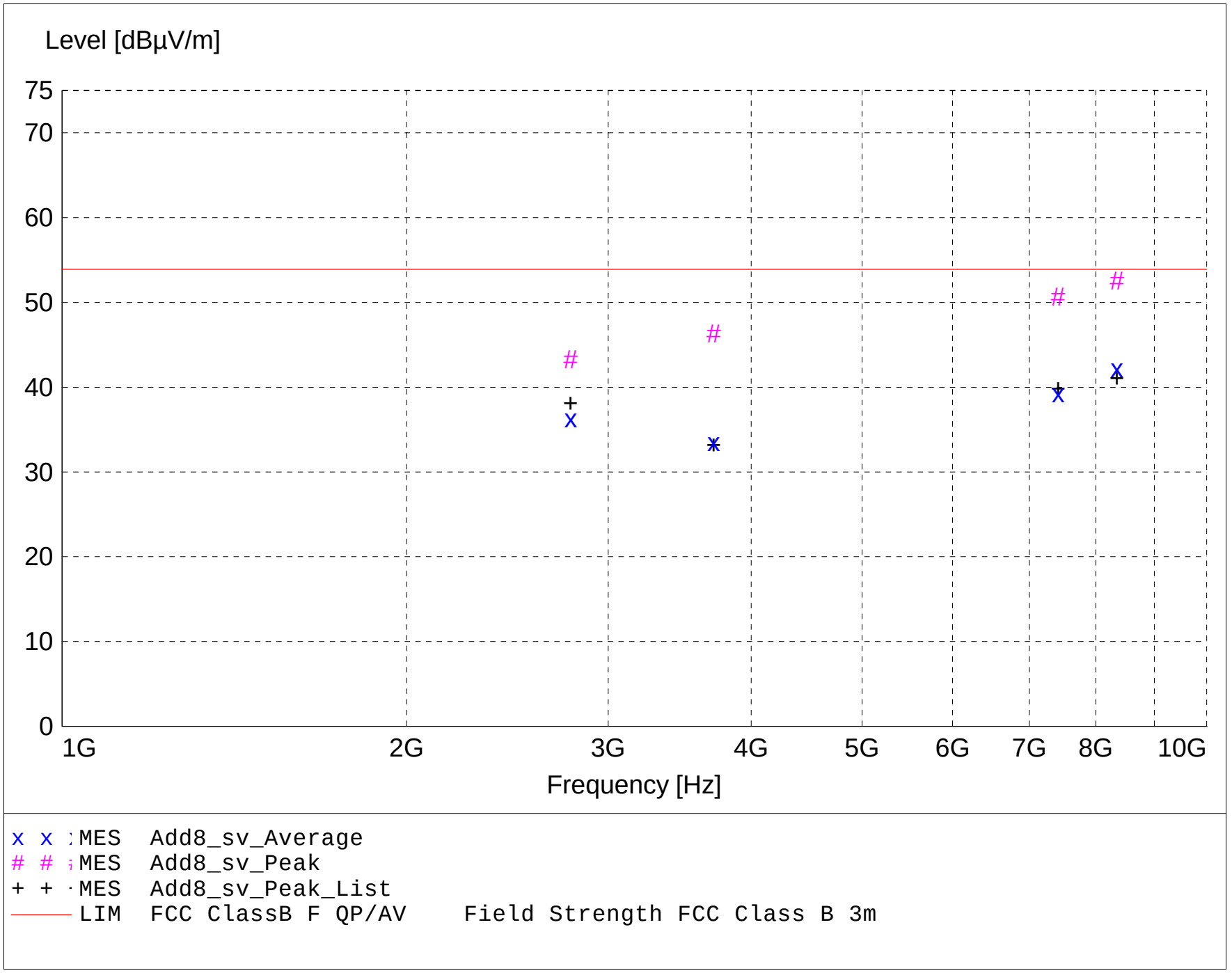
TEXT: "Site 3 5731&184 V3M"

Short Description: Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with VERTICAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add8_sv_Average
MES Add8_sv_Peak
+ + MES Add8_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add8_sv_Final"

2/3/2005 12:00PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8344.700000	49.55	37.11	-34.1	52.6	53.9	1.3	1.30	250	MAX PEAK	None
7417.500000	49.83	36.20	-35.4	50.6	53.9	3.3	1.20	270	MAX PEAK	None
3708.800000	52.75	31.78	-38.2	46.3	53.9	7.6	1.10	270	MAX PEAK	None
2781.600000	53.02	29.44	-39.2	43.3	53.9	10.6	1.20	270	MAX PEAK	None
8344.700000	39.14	37.11	-34.1	42.2	53.9	11.7	1.30	250	AVERAGE	None
7417.500000	38.41	36.20	-35.4	39.2	53.9	14.7	1.20	270	AVERAGE	None
2781.600000	46.02	29.44	-39.2	36.3	53.9	17.6	1.20	270	AVERAGE	None
3708.800000	39.95	31.78	-38.2	33.5	53.9	20.4	1.10	270	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                 R110PAX4
Manufacturer:        Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site:           DLS OF Site 3
Operator:            Craig Brandt
Test Specification:  Tx mode harmonics in restricted bands; Rx mode
Comment:             Tx mode High CH, High Power
                     Date: 02-03-2005
```

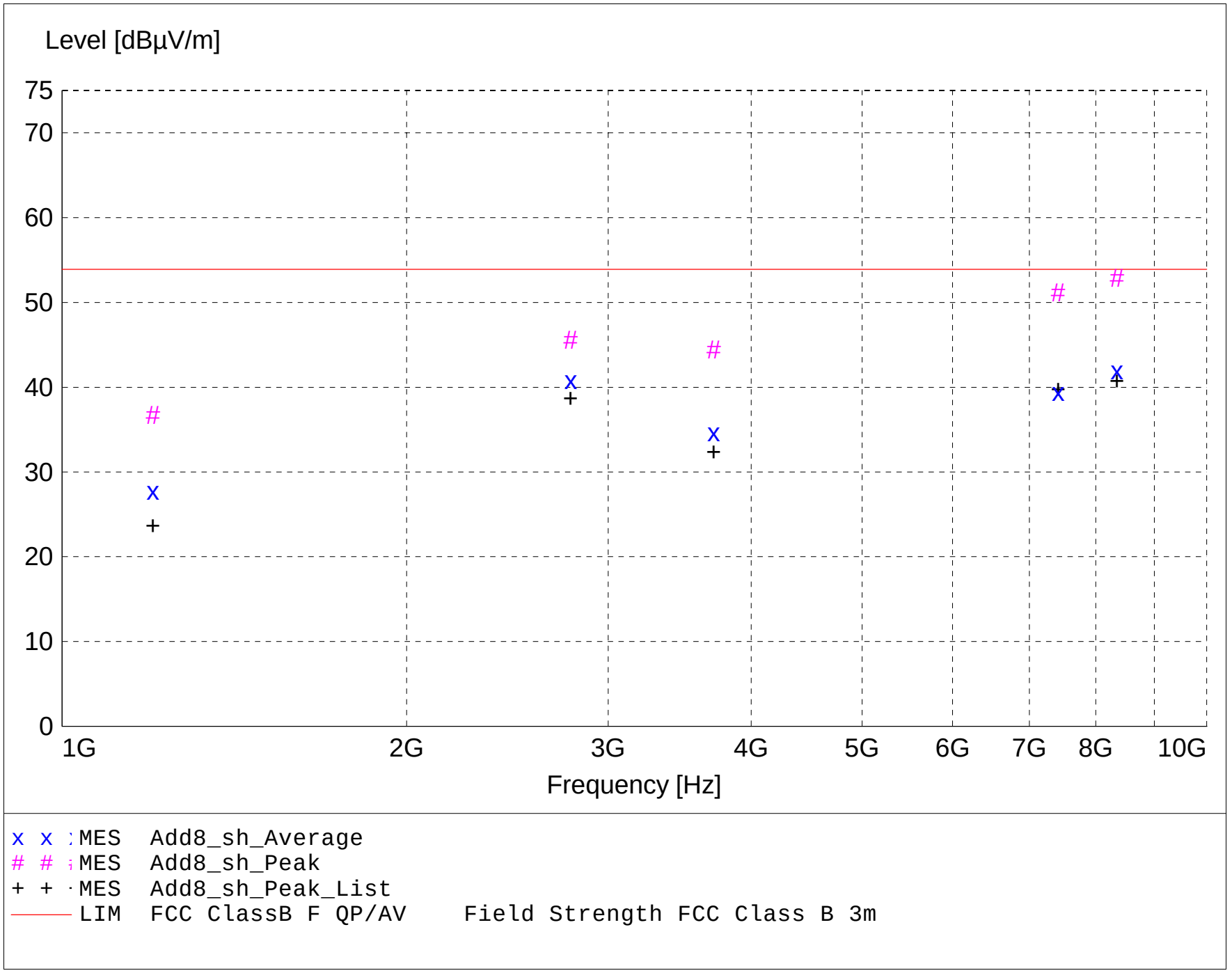
TEXT: "Site 3 5731&184 H3M"

```
  Short Description:           Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                               1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                               10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation
```


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add8_sh_Average
MES Add8_sh_Peak
+ + MES Add8_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add8_sh_Final"

2/3/2005 12:11PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8344.700000	49.83	37.11	-34.1	52.9	53.9	1.0	1.00	270	MAX PEAK	None
7417.500000	50.37	36.20	-35.4	51.2	53.9	2.7	1.20	190	MAX PEAK	None
2781.600000	55.31	29.44	-39.2	45.6	53.9	8.3	1.10	220	MAX PEAK	None
3708.800000	50.89	31.78	-38.2	44.5	53.9	9.4	1.10	220	MAX PEAK	None
8344.700000	38.93	37.11	-34.1	41.9	53.9	12.0	1.00	270	AVERAGE	None
2781.600000	50.58	29.44	-39.2	40.8	53.9	13.1	1.10	220	AVERAGE	None
7417.500000	38.65	36.20	-35.4	39.4	53.9	14.5	1.20	190	AVERAGE	None
1200.000000	52.08	24.74	-40.1	36.7	53.9	17.2	1.00	225	MAX PEAK	None
3708.800000	41.06	31.78	-38.2	34.6	53.9	19.3	1.10	220	AVERAGE	None
1200.000000	43.09	24.74	-40.1	27.7	53.9	26.2	1.00	225	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode High CH, Mid Power
Date: 02-03-2005

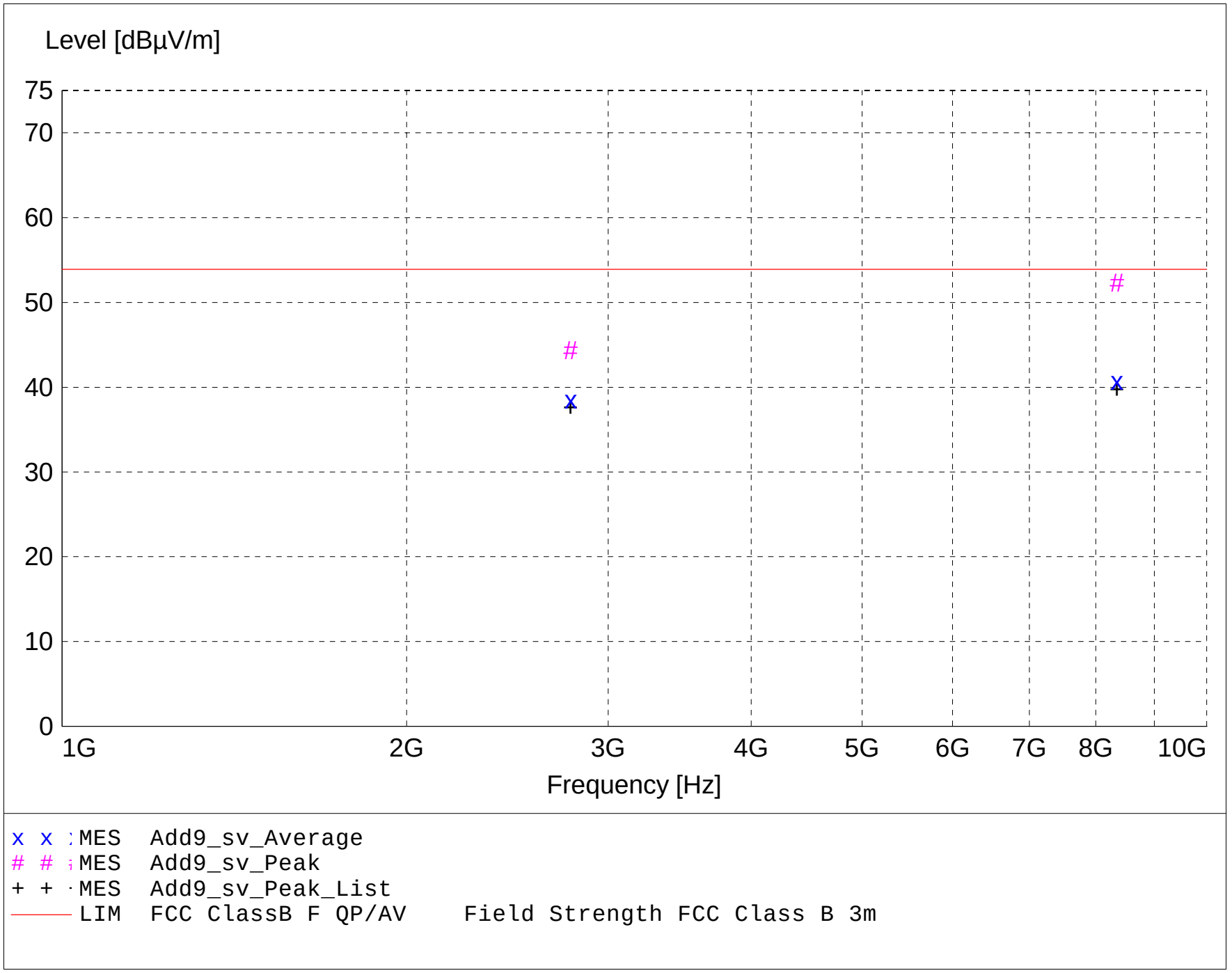
TEXT: "Site 3 5731&184 V3M"

Short Description: Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with VERTICAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add9_sv_Average
MES Add9_sv_Peak
+ + MES Add9_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add9_sv_Final"

2/3/2005 1:00PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8344.800000	49.27	37.11	-34.1	52.3	53.9	1.6	1.20	250	MAX PEAK	None
2781.600000	54.06	29.44	-39.2	44.3	53.9	9.6	1.10	190	MAX PEAK	None
8344.800000	37.72	37.11	-34.1	40.7	53.9	13.2	1.20	250	AVERAGE	None
2781.600000	48.27	29.44	-39.2	38.5	53.9	15.4	1.10	190	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode High CH, Mid Power
Date: 02-03-2005

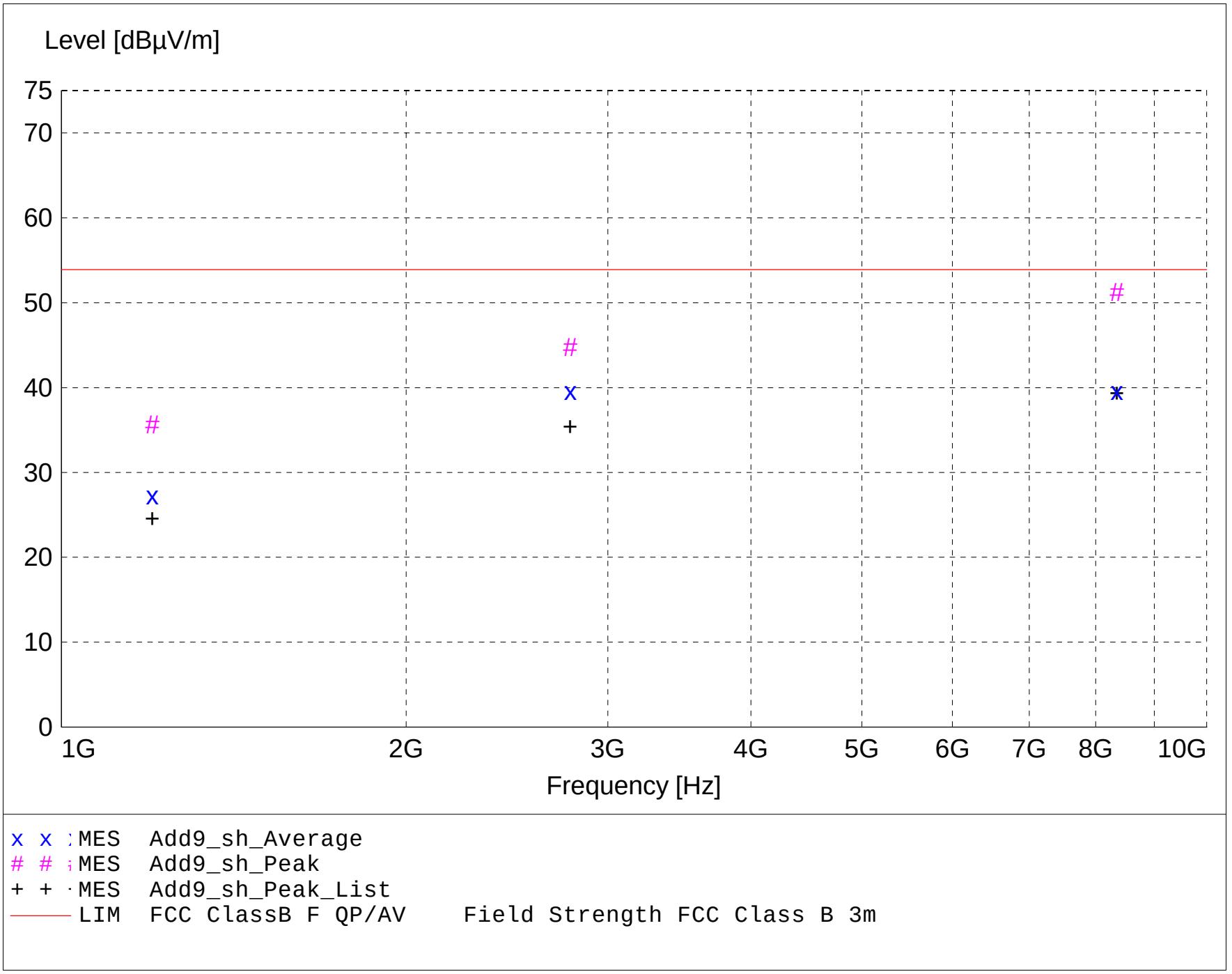
TEXT: "Site 3 5731&184 H3M"

Short Description: Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add9_sh_Average
MES Add9_sh_Peak
+ + MES Add9_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add9_sh_Final"

2/3/2005 1:09PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8344.700000	48.19	37.11	-34.1	51.2	53.9	2.7	1.00	270	MAX PEAK	None
2781.600000	54.48	29.44	-39.2	44.7	53.9	9.2	1.00	180	MAX PEAK	None
2781.600000	49.32	29.44	-39.2	39.6	53.9	14.3	1.00	180	AVERAGE	None
8344.700000	36.54	37.11	-34.1	39.6	53.9	14.3	1.00	270	AVERAGE	None
1200.000000	51.02	24.74	-40.1	35.6	53.9	18.3	1.00	180	MAX PEAK	None
1200.000000	42.60	24.74	-40.1	27.2	53.9	26.7	1.00	180	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                 R110PAX4
Manufacturer:        Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site:           DLS OF Site 3
Operator:            Craig Brandt
Test Specification:  Tx mode harmonics in restricted bands; Rx mode
Comment:             Tx mode High CH, Low Power
                     Date: 02-03-2005
```

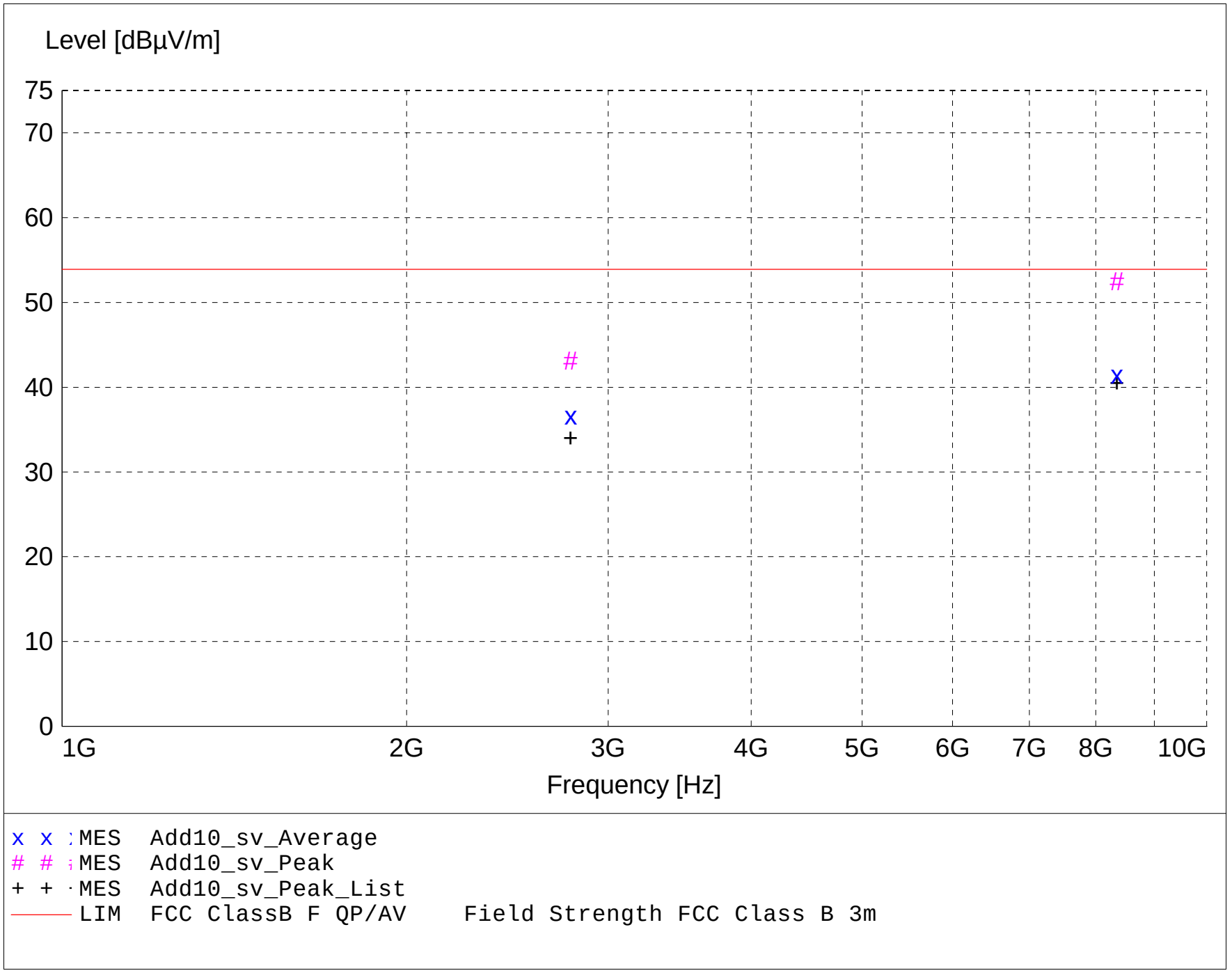
TEXT: "Site 3 5731&184 V3M"

```
  Short Description:           Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                               1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                               10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with VERTICAL Antenna Polarisation
```


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add10_sv_Average
MES Add10_sv_Peak
+ + MES Add10_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add10_sv_Final"

2/3/2005 1:18PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8344.700000	49.41	37.11	-34.1	52.4	53.9	1.5	1.00	270	MAX PEAK	None
2781.600000	52.88	29.44	-39.2	43.1	53.9	10.8	1.30	180	MAX PEAK	None
8344.700000	38.42	37.11	-34.1	41.4	53.9	12.5	1.00	270	AVERAGE	None
2781.600000	46.38	29.44	-39.2	36.6	53.9	17.3	1.30	180	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                 R110PAX4
Manufacturer:        Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site:           DLS OF Site 3
Operator:            Craig Brandt
Test Specification:  Tx mode harmonics in restricted bands; Rx mode
Comment:             Tx mode High CH, Low Power
                     Date: 02-03-2005
```

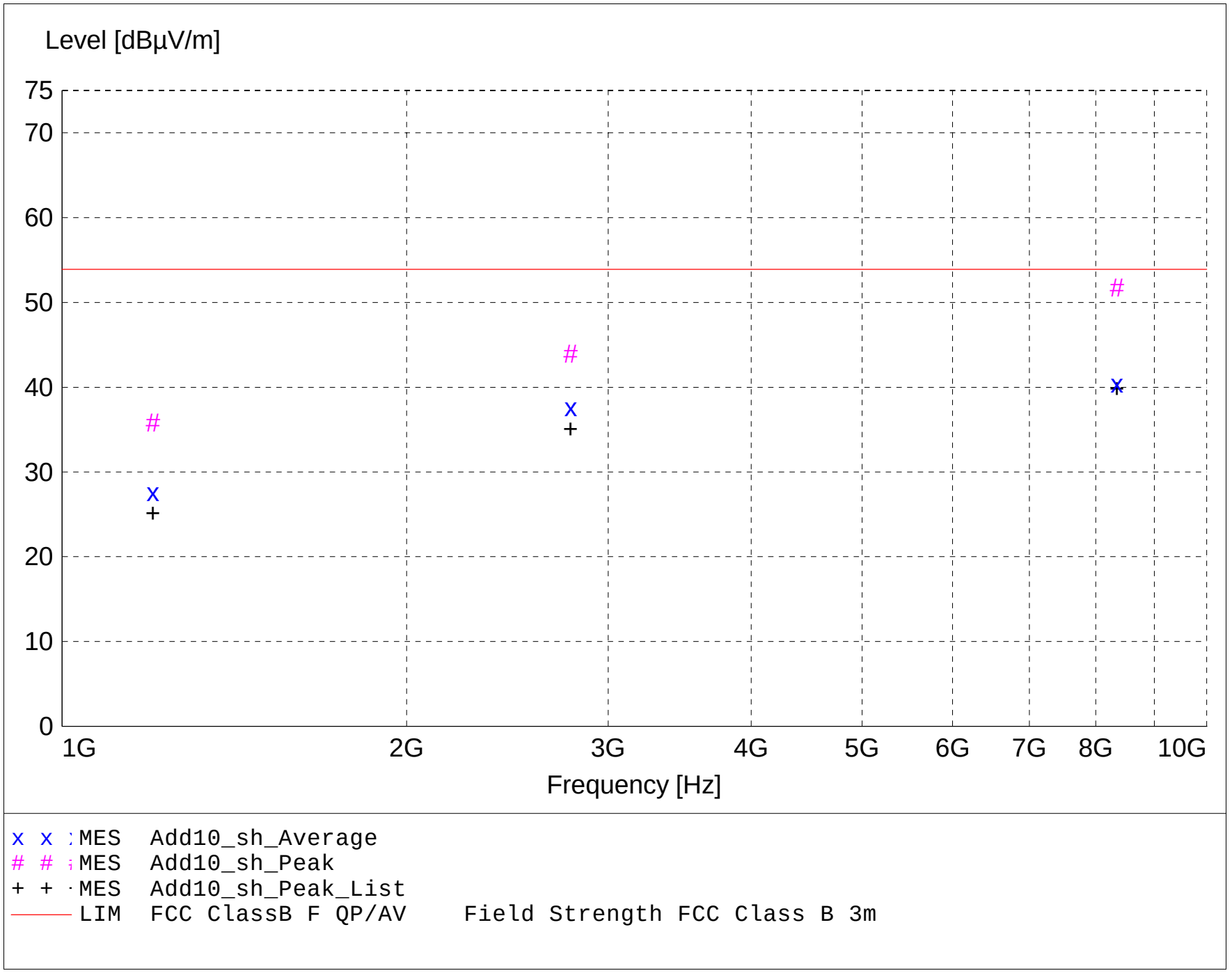
TEXT: "Site 3 5731&184 H3M"

```
  Short Description:           Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                               1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                               10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation
```



x x : MES Add10_sh_Average
: MES Add10_sh_Peak
+ + : MES Add10_sh_Peak_List
——— LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add10_sh_Final"

2/3/2005 1:26PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8344.700000	48.72	37.11	-34.1	51.7	53.9	2.2	1.00	250	MAX PEAK	None
2781.600000	53.67	29.44	-39.2	43.9	53.9	10.0	1.00	170	MAX PEAK	None
8344.700000	37.39	37.11	-34.1	40.4	53.9	13.5	1.00	250	AVERAGE	None
2781.600000	47.41	29.44	-39.2	37.6	53.9	16.3	1.00	170	AVERAGE	None
1200.000000	51.15	24.74	-40.1	35.8	53.9	18.1	1.10	225	MAX PEAK	None
1200.000000	42.96	24.74	-40.1	27.6	53.9	26.3	1.10	225	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode Mid CH, High Power
Date: 02-03-2005

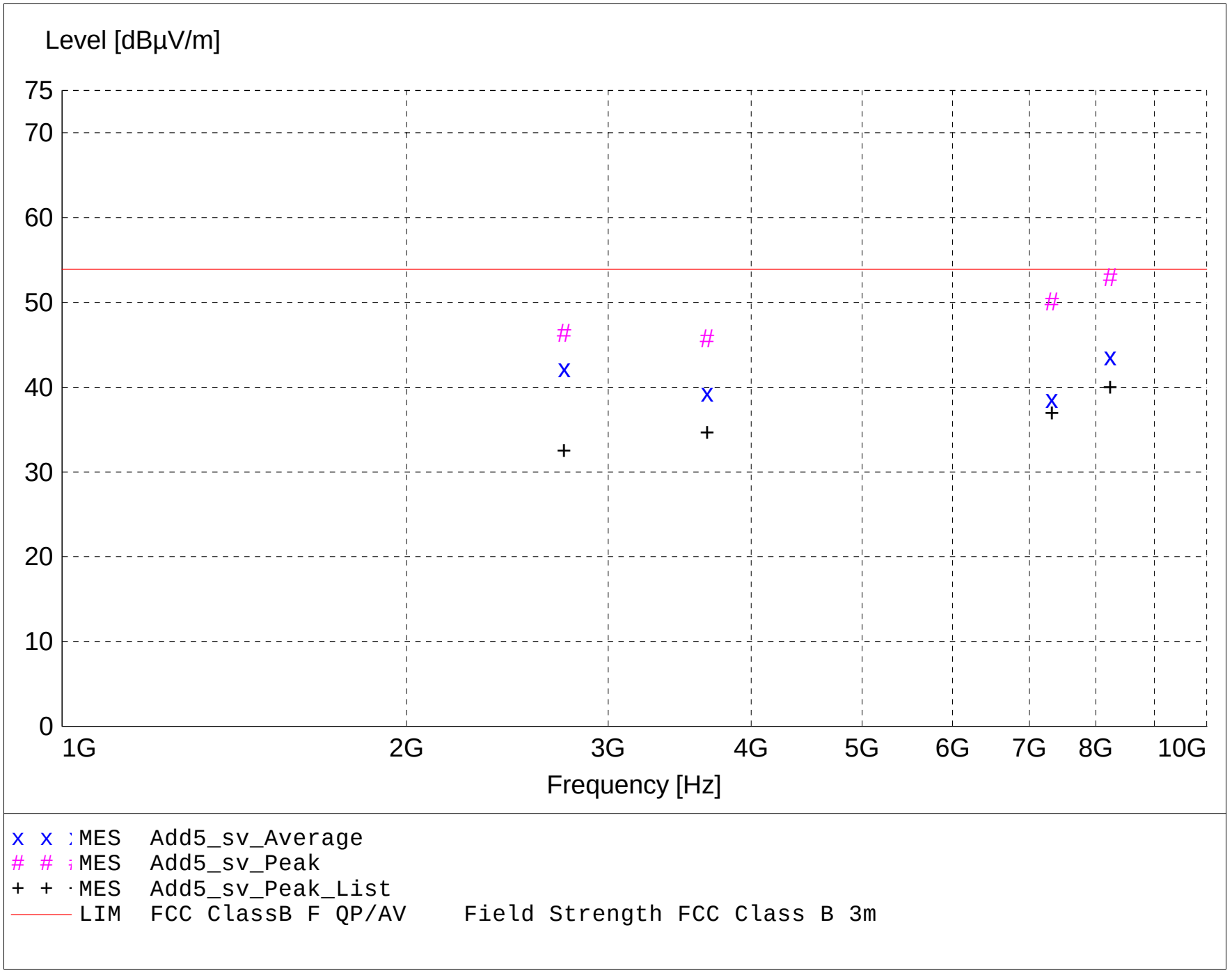
TEXT: "Site 3 5731&184 V3M"

Short Description: Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with VERTICAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add5_sv_Average
MES Add5_sv_Peak
+ + MES Add5_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add5_sv_Final"

2/3/2005 10:54AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8236.100000	49.83	36.98	-33.9	53.0	53.9	0.9	1.10	200	MAX PEAK	None
7321.000000	49.83	35.97	-35.7	50.1	53.9	3.8	1.00	180	MAX PEAK	None
2745.400000	56.38	29.34	-39.4	46.4	53.9	7.5	1.00	225	MAX PEAK	None
3660.500000	52.49	31.65	-38.4	45.8	53.9	8.1	1.00	280	MAX PEAK	None
8236.100000	40.45	36.98	-33.9	43.6	53.9	10.3	1.10	200	AVERAGE	None
2745.400000	52.18	29.34	-39.4	42.2	53.9	11.7	1.00	225	AVERAGE	None
3660.500000	46.01	31.65	-38.4	39.3	53.9	14.6	1.00	280	AVERAGE	None
7321.000000	38.33	35.97	-35.7	38.6	53.9	15.3	1.00	180	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode Mid CH, High Power
Date: 02-03-2005

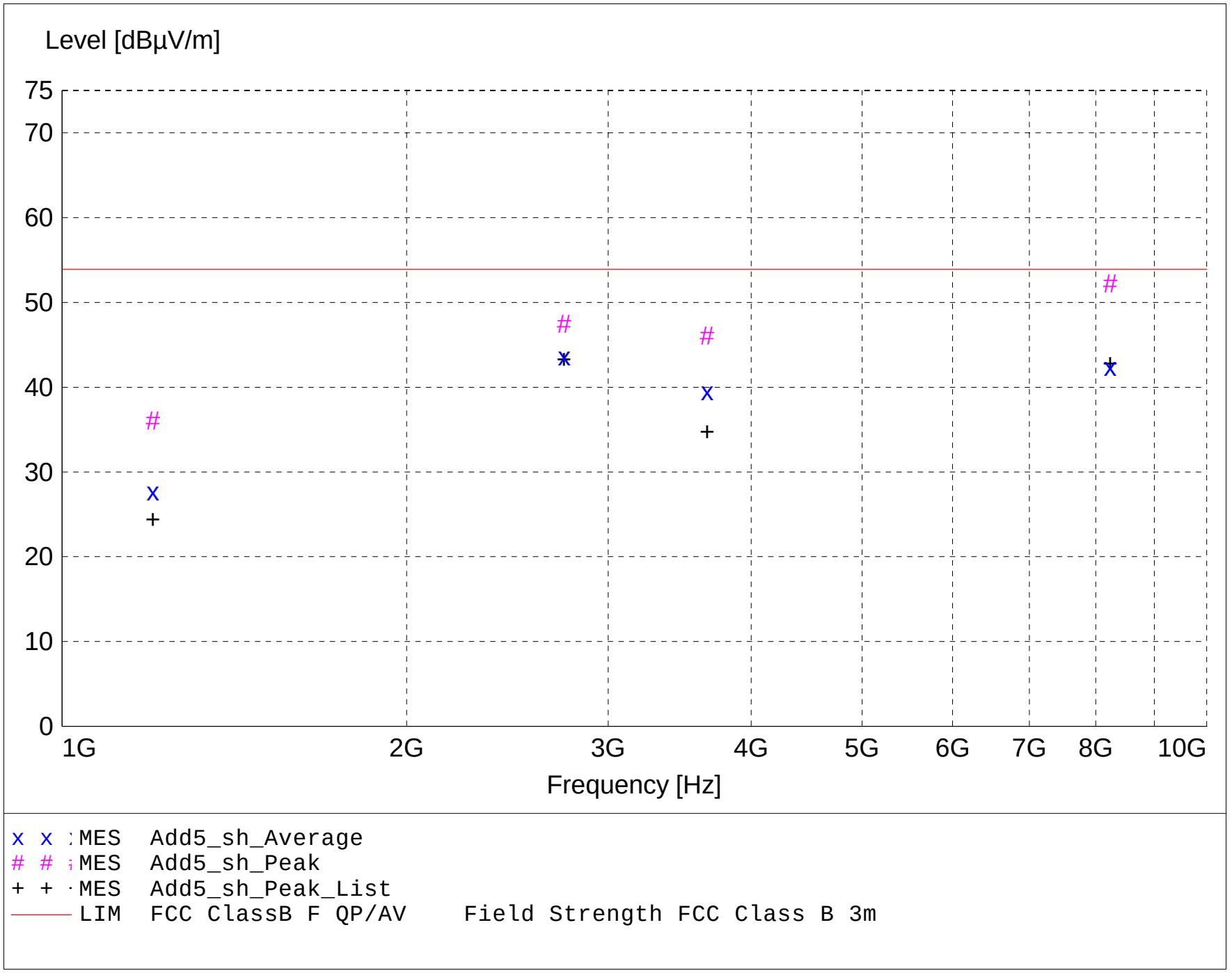
TEXT: "Site 3 5731&184 H3M"

Short Description: Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add5_sh_Average
MES Add5_sh_Peak
+ + MES Add5_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add5_sh_Final"

2/3/2005 11:04AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8236.100000	49.12	36.98	-33.9	52.3	53.9	1.6	1.00	270	MAX PEAK	None
2745.400000	57.41	29.34	-39.4	47.4	53.9	6.5	1.00	200	MAX PEAK	None
3660.500000	52.75	31.65	-38.4	46.0	53.9	7.9	1.10	180	MAX PEAK	None
2745.400000	53.61	29.34	-39.4	43.6	53.9	10.3	1.00	200	AVERAGE	None
8236.100000	39.24	36.98	-33.9	42.4	53.9	11.5	1.00	270	AVERAGE	None
3660.500000	46.22	31.65	-38.4	39.5	53.9	14.4	1.10	180	AVERAGE	None
1200.000000	51.42	24.74	-40.1	36.0	53.9	17.9	1.20	225	MAX PEAK	None
1200.000000	43.05	24.74	-40.1	27.7	53.9	26.2	1.20	225	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode Mid CH, Mid Power
Date: 02-03-2005

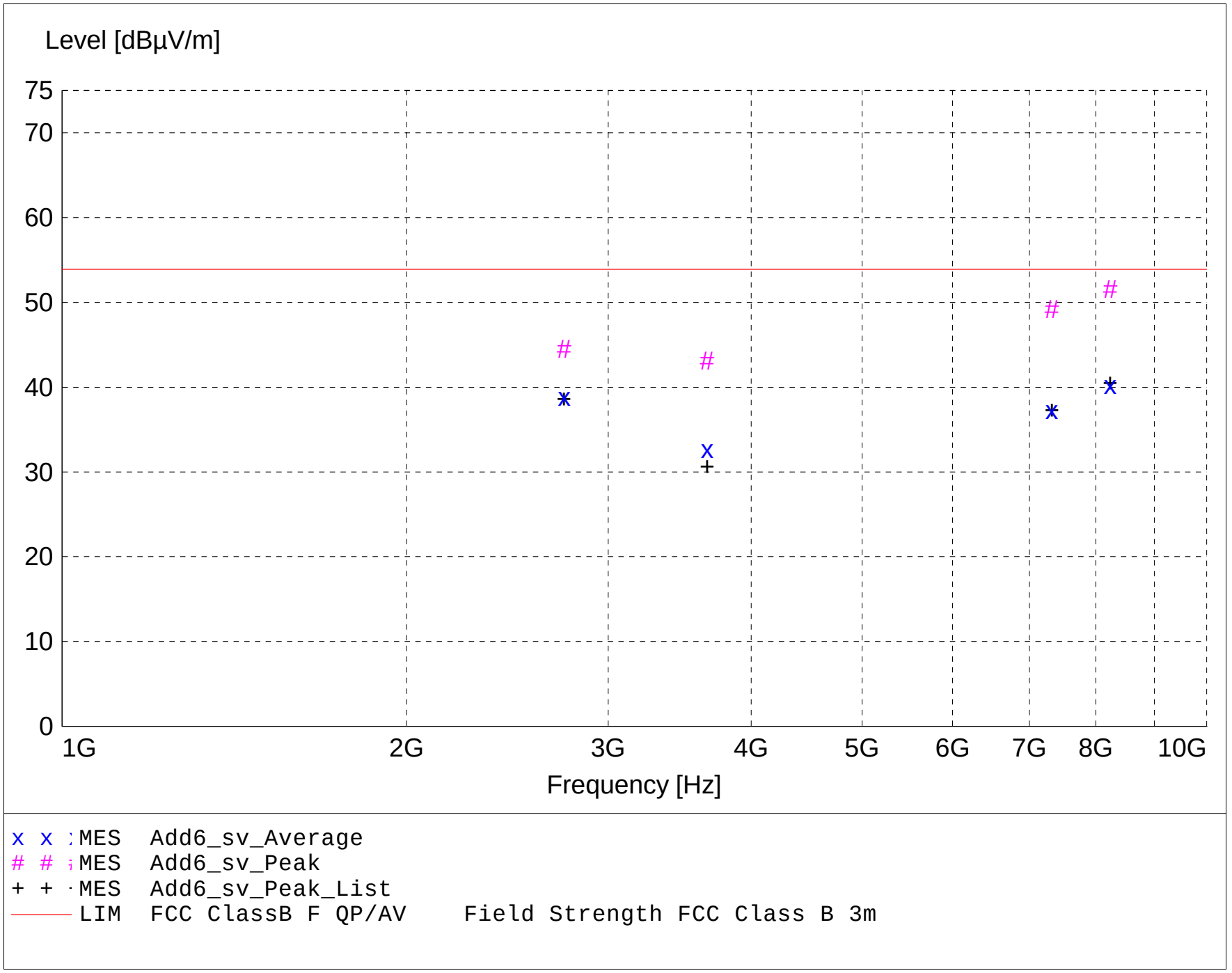
TEXT: "Site 3 5731&184 V3M"

Short Description: Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with VERTICAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add6_sv_Average
MES Add6_sv_Peak
+ + MES Add6_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add6_sv_Final"

2/3/2005 11:15AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8236.100000	48.46	36.98	-33.9	51.6	53.9	2.3	1.50	190	MAX PEAK	None
7321.000000	48.98	35.97	-35.7	49.2	53.9	4.7	1.00	190	MAX PEAK	None
2745.400000	54.48	29.34	-39.4	44.5	53.9	9.4	1.00	190	MAX PEAK	None
3660.500000	49.83	31.65	-38.4	43.1	53.9	10.8	1.00	270	MAX PEAK	None
8236.100000	37.07	36.98	-33.9	40.2	53.9	13.7	1.50	190	AVERAGE	None
2745.400000	48.89	29.34	-39.4	38.9	53.9	15.0	1.00	190	AVERAGE	None
7321.000000	37.04	35.97	-35.7	37.3	53.9	16.6	1.00	190	AVERAGE	None
3660.500000	39.45	31.65	-38.4	32.7	53.9	21.2	1.00	270	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                  R110PAX4
Manufacturer:         Zebra Technologies
Operating Condition:  70 deg. F; 32% R.H.
Test Site:            DLS OF Site 3
Operator:             Craig Brandt
Test Specification:   Tx mode harmonics in restricted bands; Rx mode
Comment:              Tx mode Mid CH, Mid Power
                      Date: 02-03-2005
```

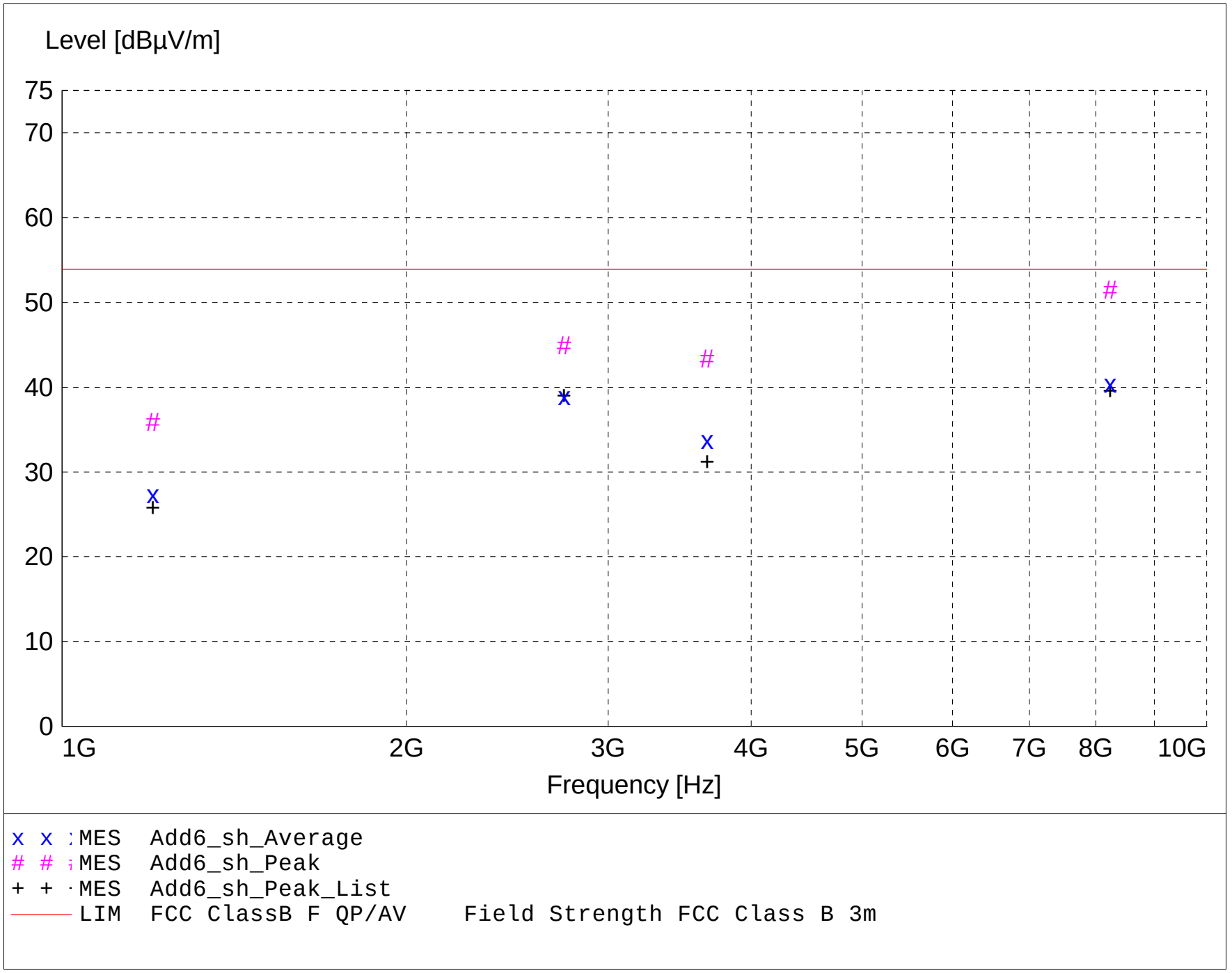
TEXT: "Site 3 5731&184 H3M"

```
  Short Description:            Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                                1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                                10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation
```


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add6_sh_Average
MES Add6_sh_Peak
+ + MES Add6_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add6_sh_Final"

2/3/2005 11:24AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8236.100000	48.32	36.98	-33.9	51.5	53.9	2.4	1.00	270	MAX PEAK	None
2745.400000	54.90	29.34	-39.4	44.9	53.9	9.0	1.00	180	MAX PEAK	None
3660.500000	50.11	31.65	-38.4	43.4	53.9	10.5	1.10	180	MAX PEAK	None
8236.100000	37.26	36.98	-33.9	40.4	53.9	13.5	1.00	270	AVERAGE	None
2745.400000	48.98	29.34	-39.4	39.0	53.9	14.9	1.00	180	AVERAGE	None
1200.000000	51.29	24.74	-40.1	35.9	53.9	18.0	1.10	225	MAX PEAK	None
3660.500000	40.48	31.65	-38.4	33.8	53.9	20.1	1.10	180	AVERAGE	None
1200.000000	42.72	24.74	-40.1	27.3	53.9	26.6	1.10	225	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode Mid CH, Low Power
Date: 02-03-2005

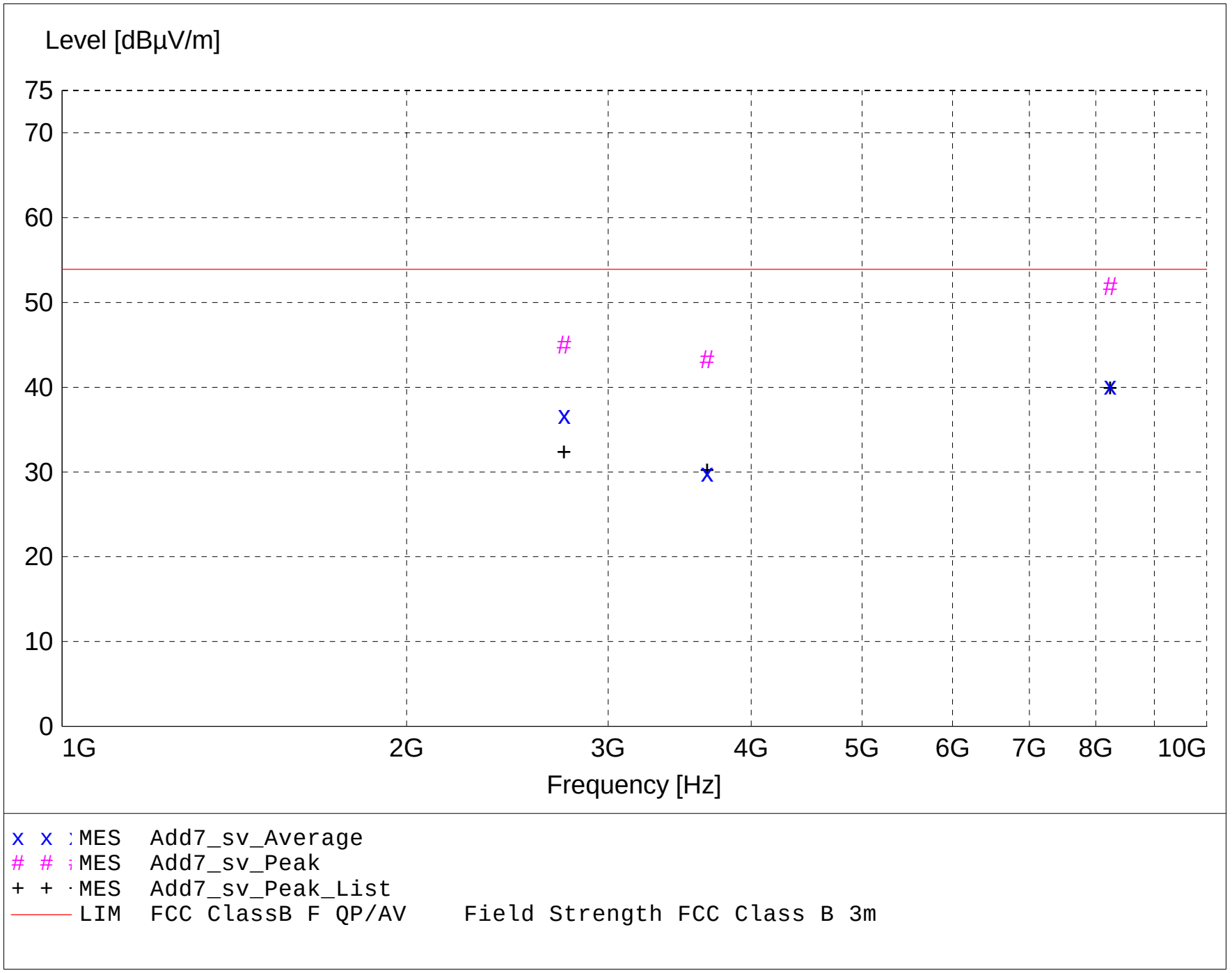
TEXT: "Site 3 5731&184 V3M"

Short Description: Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with VERTICAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add7_sv_Average
MES Add7_sv_Peak
+ + MES Add7_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add7_sv_Final"

2/3/2005 11:36AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8236.100000	48.72	36.98	-33.9	51.9	53.9	2.0	1.00	190	MAX PEAK	None
2745.400000	55.04	29.34	-39.4	45.0	53.9	8.9	1.00	190	MAX PEAK	None
3660.600000	49.97	31.65	-38.4	43.2	53.9	10.7	1.00	180	MAX PEAK	None
8236.100000	37.04	36.98	-33.9	40.2	53.9	13.7	1.00	190	AVERAGE	None
2745.400000	46.74	29.34	-39.4	36.7	53.9	17.2	1.00	190	AVERAGE	None
3660.600000	36.59	31.65	-38.4	29.9	53.9	24.0	1.00	180	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                  R110PAX4
Manufacturer:         Zebra Technologies
Operating Condition:  70 deg. F; 32% R.H.
Test Site:            DLS OF Site 3
Operator:             Craig Brandt
Test Specification:   Tx mode harmonics in restricted bands; Rx mode
Comment:              Tx mode Mid CH, Low Power
                      Date: 02-03-2005
```

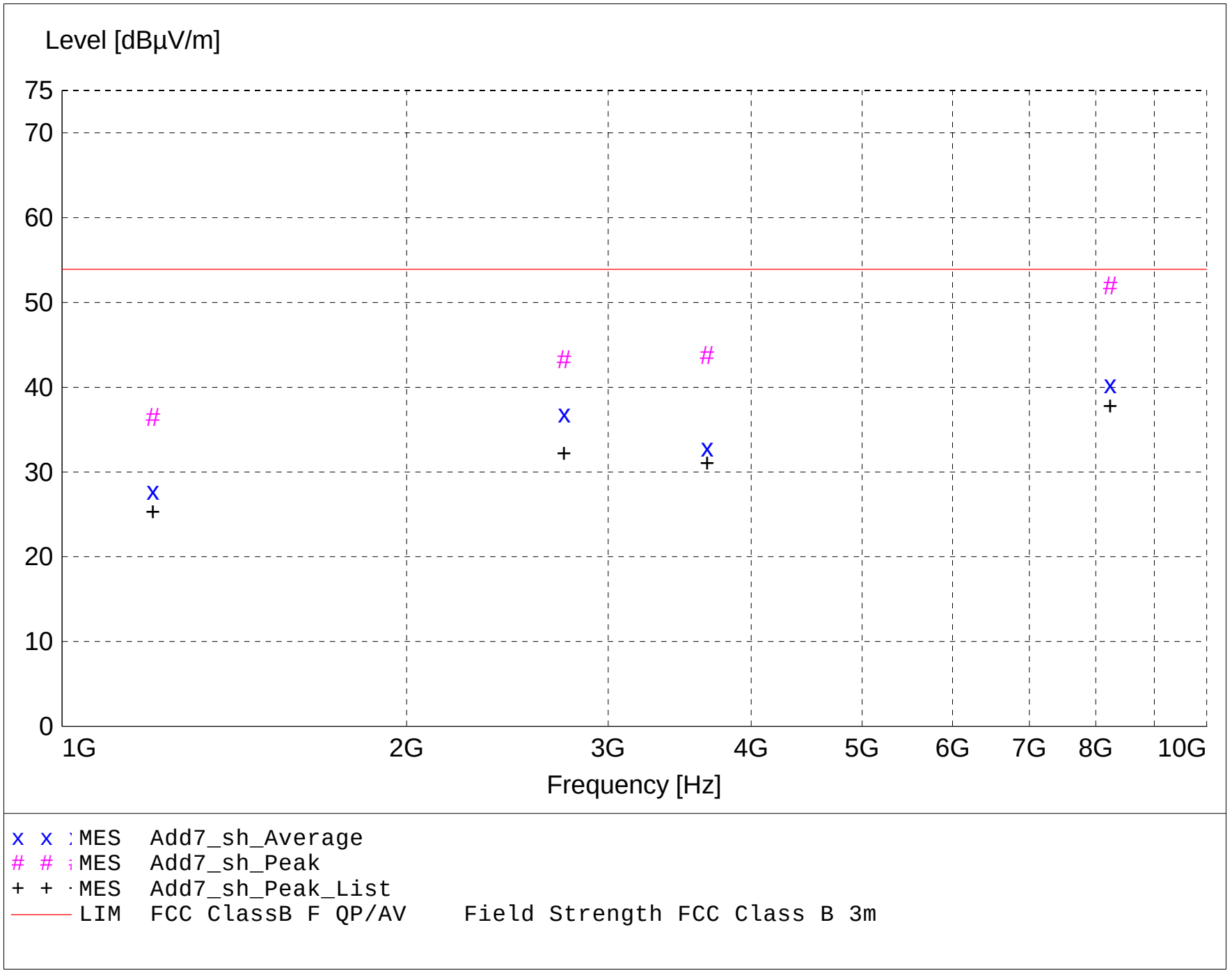
TEXT: "Site 3 5731&184 H3M"

```
  Short Description:            Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                                1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                                10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation
```


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add7_sh_Average
MES Add7_sh_Peak
+ + MES Add7_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add7_sh_Final"

2/3/2005 11:46AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8236.100000	48.85	36.98	-33.9	52.0	53.9	1.9	1.00	270	MAX PEAK	None
3660.500000	50.50	31.65	-38.4	43.8	53.9	10.1	1.10	225	MAX PEAK	None
2745.400000	53.28	29.34	-39.4	43.3	53.9	10.6	1.00	180	MAX PEAK	None
8236.100000	37.15	36.98	-33.9	40.3	53.9	13.6	1.00	270	AVERAGE	None
2745.400000	46.85	29.34	-39.4	36.8	53.9	17.1	1.00	180	AVERAGE	None
1200.000000	51.82	24.74	-40.1	36.4	53.9	17.5	1.10	225	MAX PEAK	None
3660.500000	39.54	31.65	-38.4	32.8	53.9	21.1	1.10	225	AVERAGE	None
1200.000000	43.09	24.74	-40.1	27.7	53.9	26.2	1.10	225	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                  R110PAX4
Manufacturer:         Zebra Technologies
Operating Condition:  70 deg. F; 32% R.H.
Test Site:            DLS OF Site 3
Operator:             Craig Brandt
Test Specification:   Tx mode harmonics in restricted bands; Rx mode
Comment:              Tx mode Low CH, High Power
                      Date: 02-03-2005
```

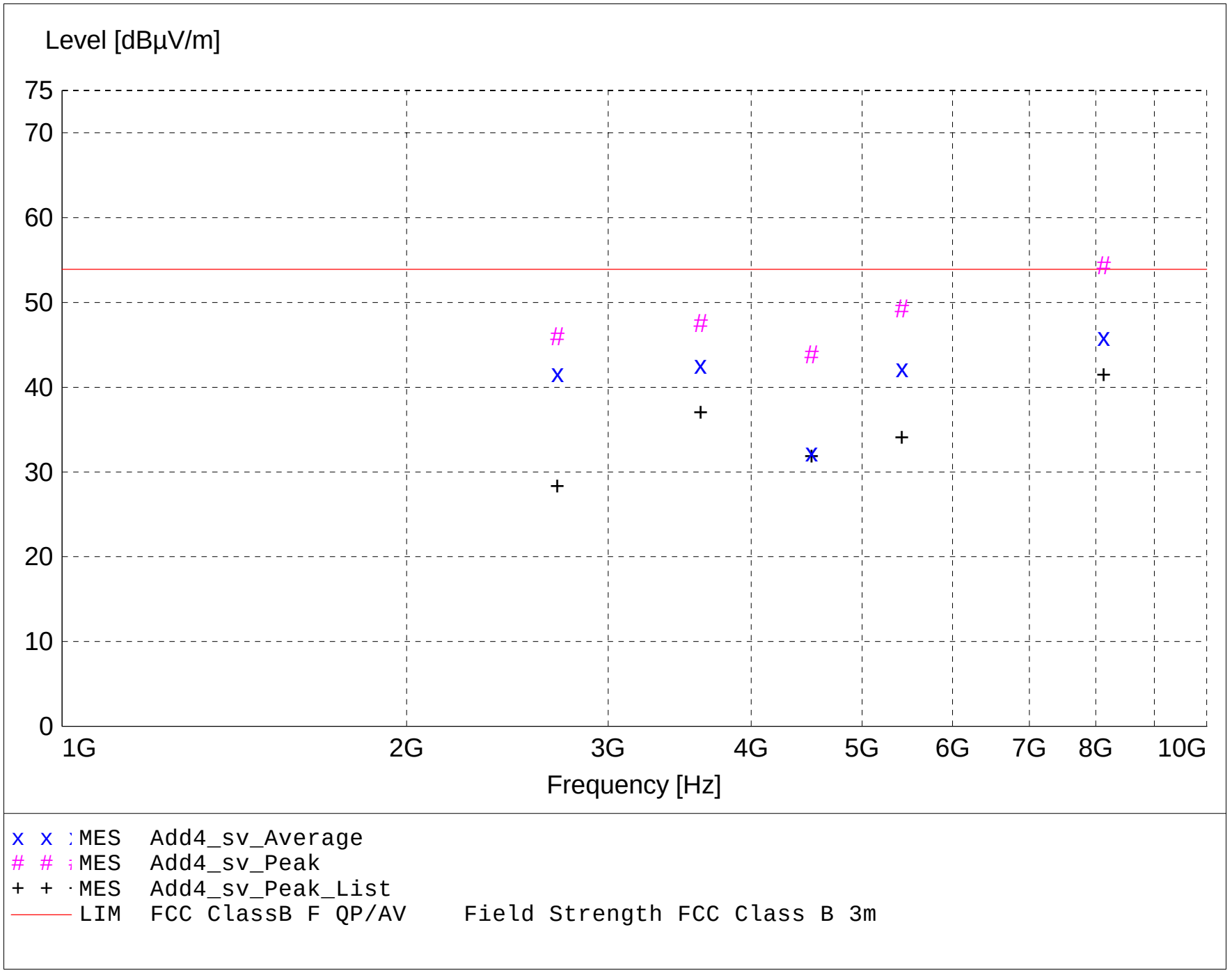
TEXT: "Site 3 5731&184 V3M"

```
  Short Description:            Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                               1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                               10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with VERTICAL Antenna Polarisation
```



x x MES Add4_sv_Average
MES Add4_sv_Peak
+ + MES Add4_sv_Peak_List
——— LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add4_sv_Final"

2/3/2005 10:30AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8126.900000	51.29	36.85	-33.8	54.4	53.9	-0.5	1.10	190	MAX PEAK	None
5418.000000	52.22	34.07	-37.1	49.2	53.9	4.7	1.10	200	MAX PEAK	None
3612.000000	54.34	31.51	-38.3	47.6	53.9	6.3	1.20	270	MAX PEAK	None
2709.000000	56.38	29.23	-39.6	46.0	53.9	7.9	1.10	200	MAX PEAK	None
8126.900000	42.79	36.85	-33.8	45.9	53.9	8.0	1.10	190	AVERAGE	None
4515.000000	48.46	32.33	-37.0	43.8	53.9	10.1	1.10	200	MAX PEAK	None
3612.000000	49.36	31.51	-38.3	42.6	53.9	11.3	1.20	270	AVERAGE	None
5418.000000	45.22	34.07	-37.1	42.2	53.9	11.7	1.10	200	AVERAGE	None
2709.000000	52.02	29.23	-39.6	41.6	53.9	12.3	1.10	200	AVERAGE	None
4515.000000	36.89	32.33	-37.0	32.3	53.9	21.6	1.10	200	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                  R110PAX4
Manufacturer:         Zebra Technologies
Operating Condition:  70 deg. F; 32% R.H.
Test Site:            DLS OF Site 3
Operator:             Craig Brandt
Test Specification:   Tx mode harmonics in restricted bands; Rx mode
Comment:              Tx mode Low CH, High Power
                      Date: 02-03-2005
```

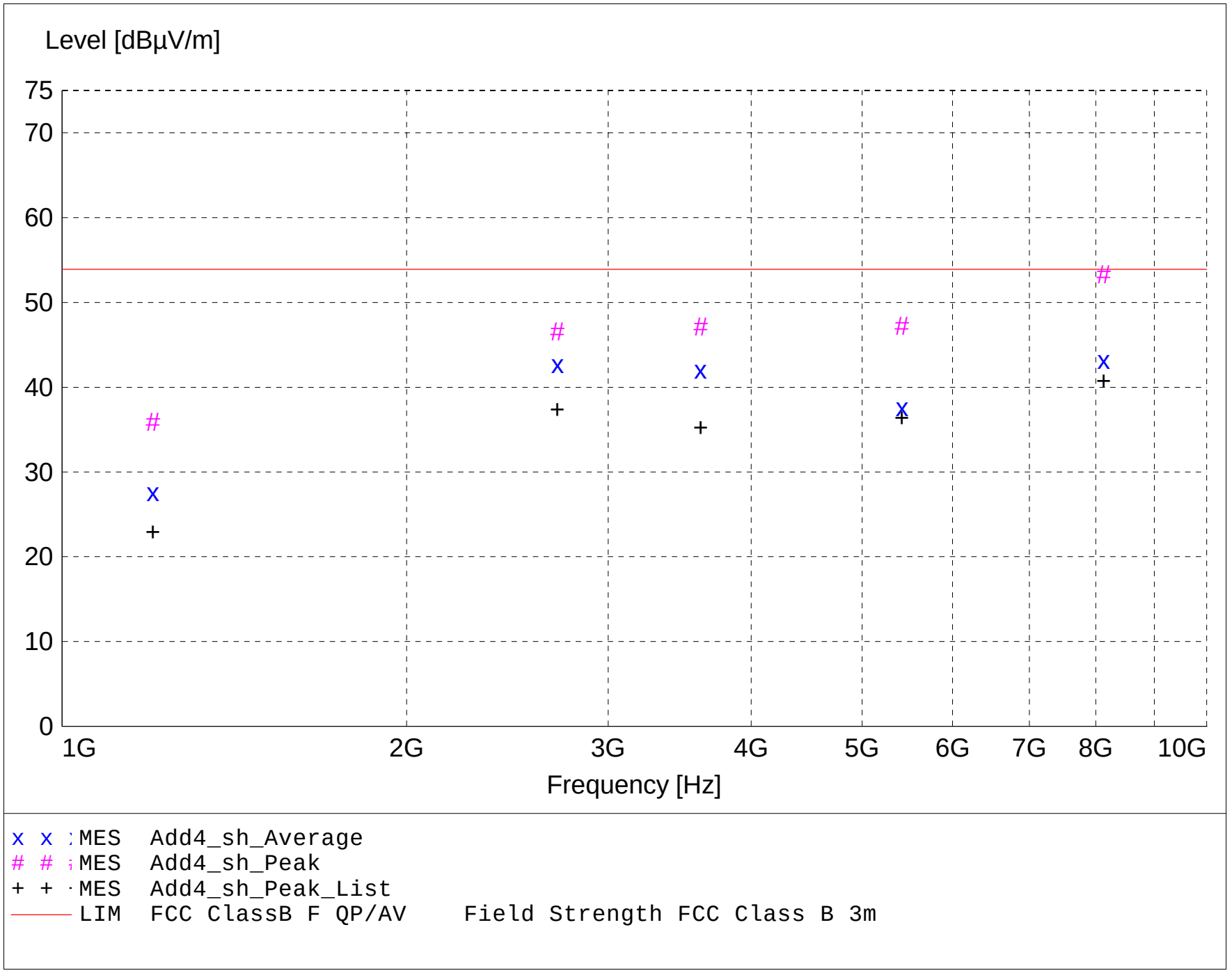
TEXT: "Site 3 5731&184 H3M"

```
  Short Description:            Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                                1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                                10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation
```


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add4_sh_Average
MES Add4_sh_Peak
+ + MES Add4_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add4_sh_Final"

2/3/2005 10:42AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8126.900000	50.24	36.85	-33.8	53.3	53.9	0.6	1.10	225	MAX PEAK	None
5418.000000	50.24	34.07	-37.1	47.2	53.9	6.7	1.00	225	MAX PEAK	None
3612.000000	53.93	31.51	-38.3	47.1	53.9	6.8	1.00	180	MAX PEAK	None
2709.000000	56.90	29.23	-39.6	46.5	53.9	7.4	1.10	200	MAX PEAK	None
8126.900000	40.08	36.85	-33.8	43.2	53.9	10.7	1.10	225	AVERAGE	None
2709.000000	53.09	29.23	-39.6	42.7	53.9	11.2	1.10	200	AVERAGE	None
3612.000000	48.85	31.51	-38.3	42.1	53.9	11.8	1.00	180	AVERAGE	None
5418.000000	40.62	34.07	-37.1	37.6	53.9	16.3	1.00	225	AVERAGE	None
1200.100000	51.29	24.74	-40.1	35.9	53.9	18.0	1.00	225	MAX PEAK	None
1200.100000	42.96	24.74	-40.1	27.6	53.9	26.3	1.00	225	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode Low CH, Mid Power
Date: 02-03-2005

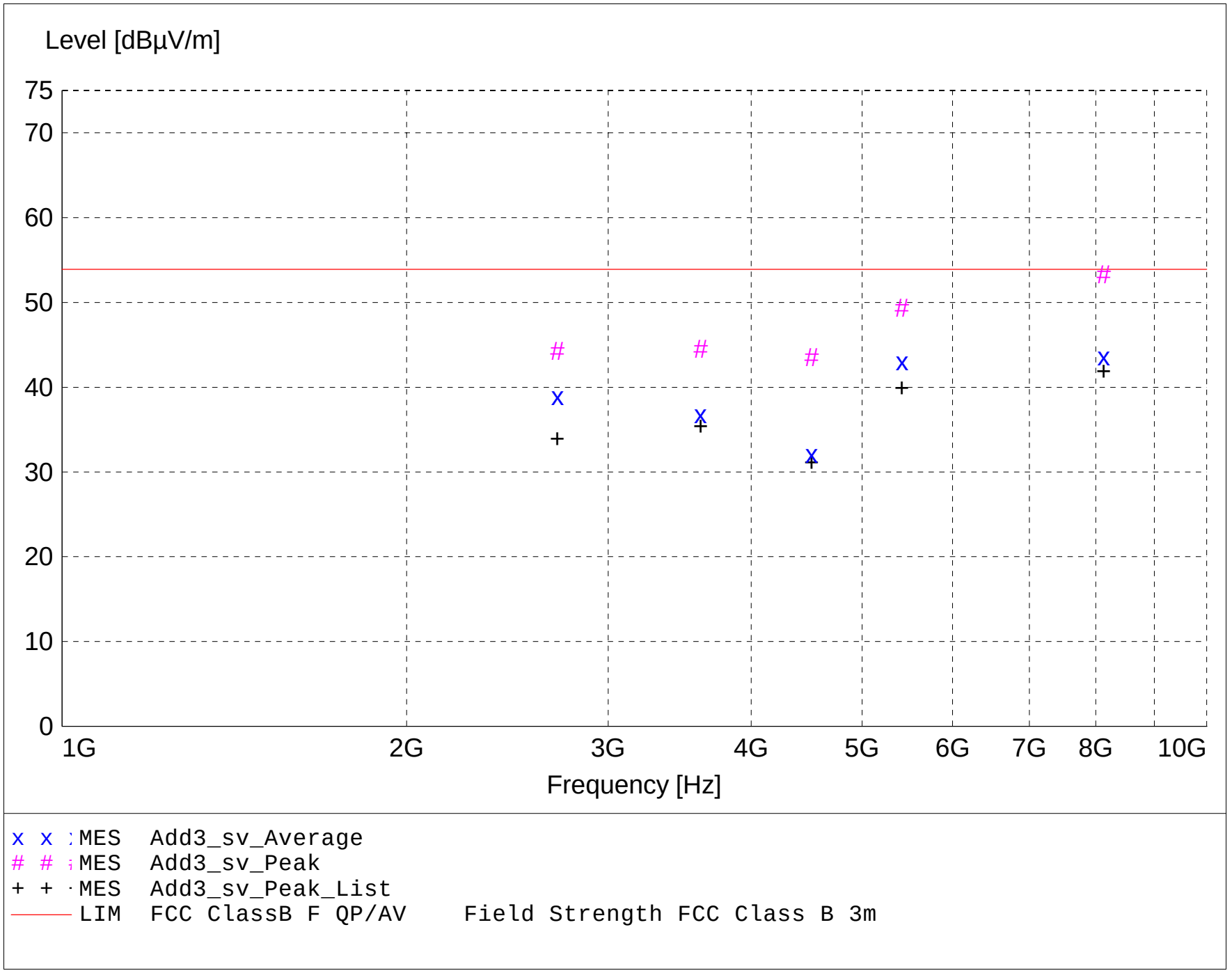
TEXT: "Site 3 5731&184 V3M"

Short Description: Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with VERTICAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add3_sv_Average
MES Add3_sv_Peak
+ + MES Add3_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add3_sv_Final"

2/3/2005 10:01AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8126.900000	50.24	36.85	-33.8	53.3	53.9	0.6	1.00	180	MAX PEAK	None
5418.000000	52.35	34.07	-37.1	49.4	53.9	4.5	1.10	200	MAX PEAK	None
3612.000000	51.29	31.51	-38.3	44.5	53.9	9.4	1.50	270	MAX PEAK	None
2709.000000	54.62	29.23	-39.6	44.2	53.9	9.7	1.00	200	MAX PEAK	None
8126.900000	40.56	36.85	-33.8	43.6	53.9	10.3	1.00	180	AVERAGE	None
4515.000000	48.19	32.33	-37.0	43.6	53.9	10.3	1.10	200	MAX PEAK	None
5418.000000	46.05	34.07	-37.1	43.1	53.9	10.8	1.10	200	AVERAGE	None
2709.000000	49.28	29.23	-39.6	38.9	53.9	15.0	1.00	200	AVERAGE	None
3612.000000	43.53	31.51	-38.3	36.7	53.9	17.2	1.50	270	AVERAGE	None
4515.000000	36.74	32.33	-37.0	32.1	53.9	21.8	1.10	200	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

```
EUT:                 R110PAX4
Manufacturer:        Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site:           DLS OF Site 3
Operator:            Craig Brandt
Test Specification:  Tx mode harmonics in restricted bands; Rx mode
Comment:             Tx mode Low CH, Mid Power
                     Date: 02-03-2005
```

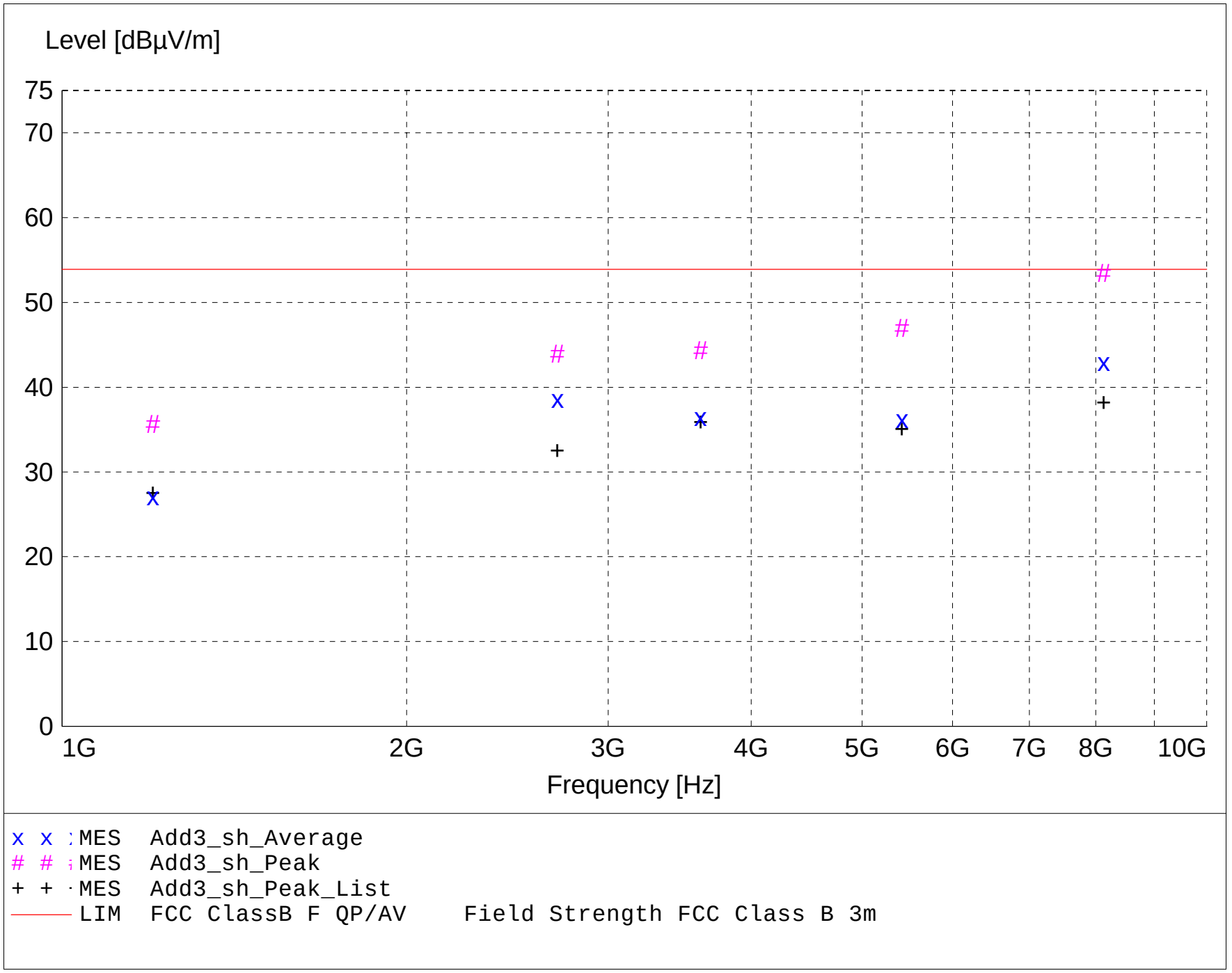
TEXT: "Site 3 5731&184 H3M"

```
  Short Description:           Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

                Horn Antenna --- EMCO 3115 SN: 9903-5731

                Pre-Amps ---
                               1 - 10 GHz  -- Miteq AMF-6D-010100-50 SN: 682425
                               10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP:    EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation
```


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add3_sh_Average
MES Add3_sh_Peak
+ + MES Add3_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add3_sh_Final"

2/3/2005 10:13AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8127.000000	50.37	36.85	-33.8	53.4	53.9	0.5	1.10	225	MAX PEAK	None
5418.000000	49.97	34.07	-37.1	47.0	53.9	6.9	1.20	270	MAX PEAK	None
3612.000000	51.15	31.51	-38.3	44.4	53.9	9.5	1.10	225	MAX PEAK	None
2709.000000	54.34	29.23	-39.6	44.0	53.9	9.9	1.50	180	MAX PEAK	None
8127.000000	39.85	36.85	-33.8	42.9	53.9	11.0	1.10	225	AVERAGE	None
2709.000000	48.95	29.23	-39.6	38.6	53.9	15.3	1.50	180	AVERAGE	None
3612.000000	43.23	31.51	-38.3	36.4	53.9	17.5	1.10	225	AVERAGE	None
5418.000000	39.18	34.07	-37.1	36.2	53.9	17.7	1.20	270	AVERAGE	None
1200.000000	51.02	24.74	-40.1	35.6	53.9	18.3	1.00	180	MAX PEAK	None
1200.000000	42.51	24.74	-40.1	27.1	53.9	26.8	1.00	180	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode Low CH, Low Power
Date: 02-03-2005

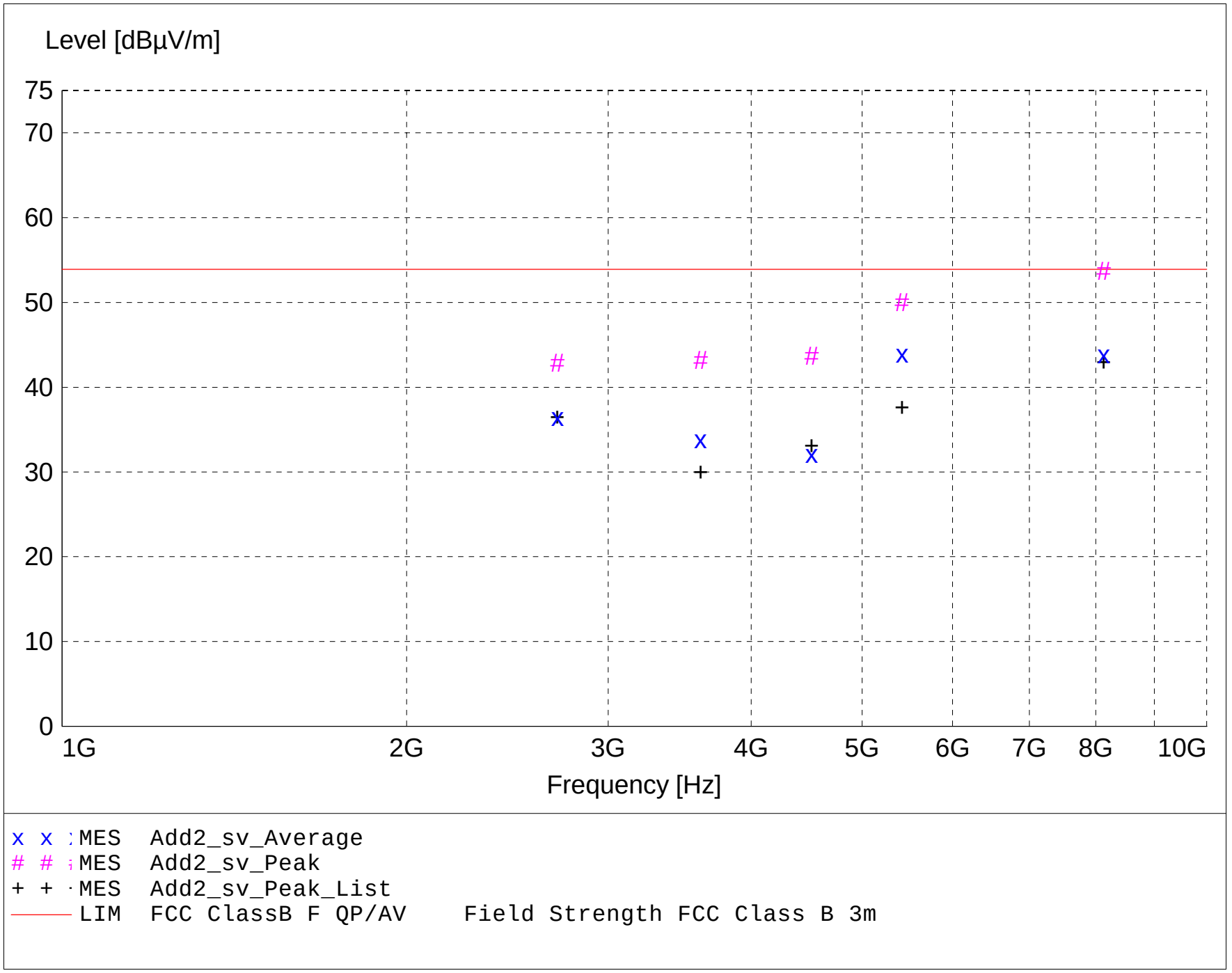
TEXT: "Site 3 5731&184 V3M"

Short Description: Test Set-up Vert1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with VERTICAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add2_sv_Average
MES Add2_sv_Peak
+ + MES Add2_sv_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add2_sv_Final"

2/3/2005 9:15AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8126.900000	50.63	36.85	-33.8	53.7	53.9	0.2	1.10	200	MAX PEAK	None
5418.000000	53.02	34.07	-37.1	50.0	53.9	3.9	1.00	225	MAX PEAK	None
5418.000000	46.92	34.07	-37.1	43.9	53.9	10.0	1.00	225	AVERAGE	None
8126.900000	40.78	36.85	-33.8	43.8	53.9	10.1	1.10	200	AVERAGE	None
4515.000000	48.32	32.33	-37.0	43.7	53.9	10.2	1.00	180	MAX PEAK	None
3612.000000	49.97	31.51	-38.3	43.2	53.9	10.7	1.00	270	MAX PEAK	None
2709.000000	53.28	29.23	-39.6	42.9	53.9	11.0	1.00	180	MAX PEAK	None
2709.000000	46.81	29.23	-39.6	36.4	53.9	17.5	1.00	180	AVERAGE	None
3612.000000	40.65	31.51	-38.3	33.9	53.9	20.0	1.00	270	AVERAGE	None
4515.000000	36.74	32.33	-37.0	32.1	53.9	21.8	1.00	180	AVERAGE	None

FCC Part 15 Class B

Electric Field Strength

EUT: R110PAX4
Manufacturer: Zebra Technologies
Operating Condition: 70 deg. F; 32% R.H.
Test Site: DLS OF Site 3
Operator: Craig Brandt
Test Specification: Tx mode harmonics in restricted bands; Rx mode
Comment: Tx mode Low CH, Low Power
Date: 02-03-2005

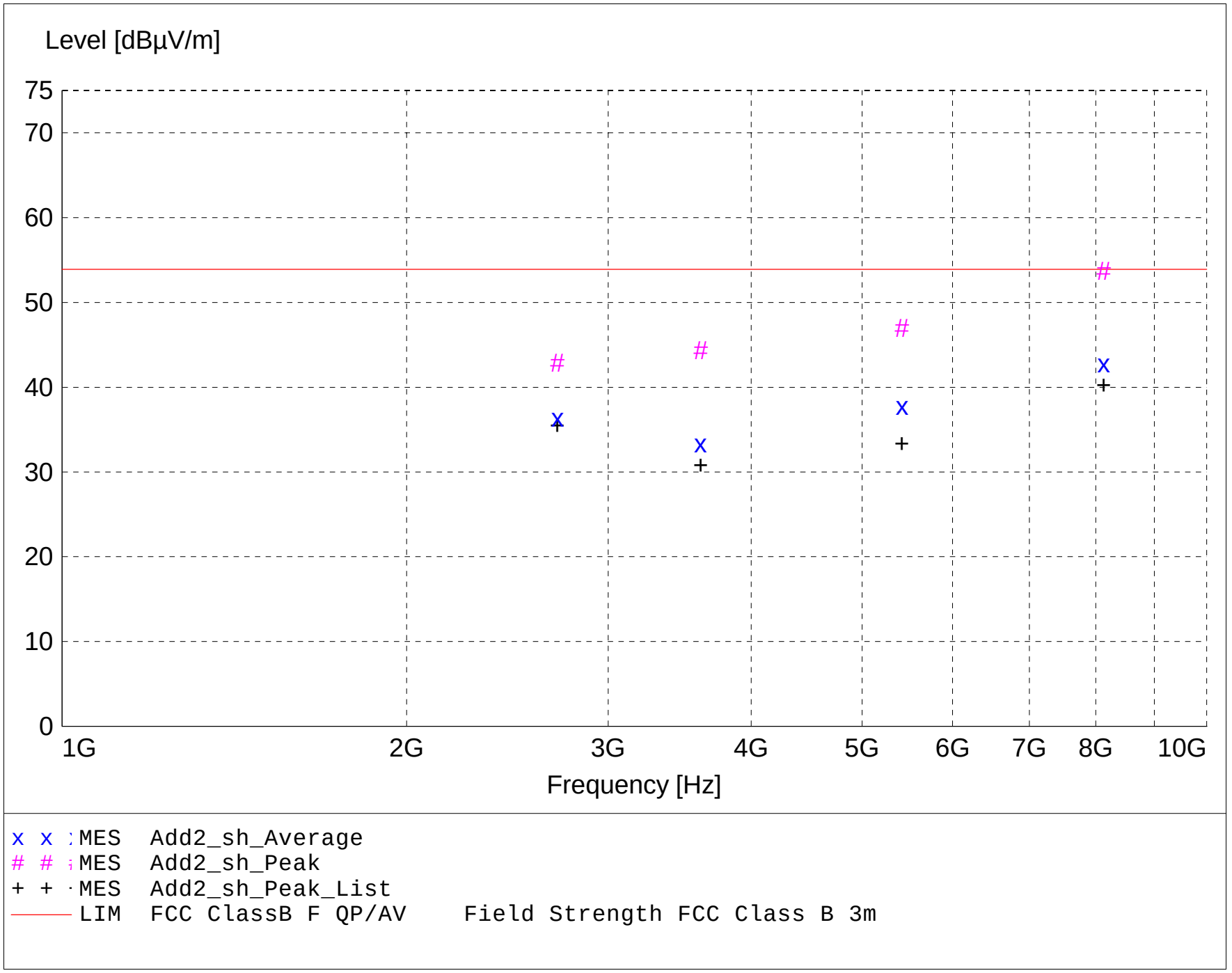
TEXT: "Site 3 5731&184 H3M"

Short Description: Test Set-up Horz1GHz-
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/006

Horn Antenna --- EMCO 3115 SN: 9903-5731

Pre-Amps ---
1 - 10 GHz -- Miteq AMF-6D-010100-50 SN: 682425
10 - 18 GHz -- Miteq AMF-6F-100200-50-10P SN: 668382

TEST SET-UP: EuT Measured at 3 Meters with HORIZONTAL Antenna Polarisation


Level [dBµV/m]
75
70
60
50
40
30
20
10
0
1G
2G
3G
4G
5G
6G
7G
8G
10G
Frequency [Hz]
x x MES Add2_sh_Average
MES Add2_sh_Peak
+ + MES Add2_sh_Peak_List
LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

MEASUREMENT RESULT: "Add2_sh_Final"

2/3/2005 9:31AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
8126.900000	50.63	36.85	-33.8	53.7	53.9	0.2	1.50	200	MAX PEAK	None
5418.000000	49.97	34.07	-37.1	47.0	53.9	6.9	1.30	190	MAX PEAK	None
3612.000000	51.15	31.51	-38.3	44.4	53.9	9.5	1.30	225	MAX PEAK	None
2709.000000	53.28	29.23	-39.6	42.9	53.9	11.0	1.10	190	MAX PEAK	None
8126.900000	39.73	36.85	-33.8	42.8	53.9	11.1	1.50	200	AVERAGE	None
5418.000000	40.79	34.07	-37.1	37.8	53.9	16.1	1.30	190	AVERAGE	None
2709.000000	46.74	29.23	-39.6	36.4	53.9	17.5	1.10	190	AVERAGE	None
3612.000000	40.13	31.51	-38.3	33.3	53.9	20.6	1.30	225	AVERAGE	None

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

SECTION 6.0

20 dB BANDWIDTH GRAPHS

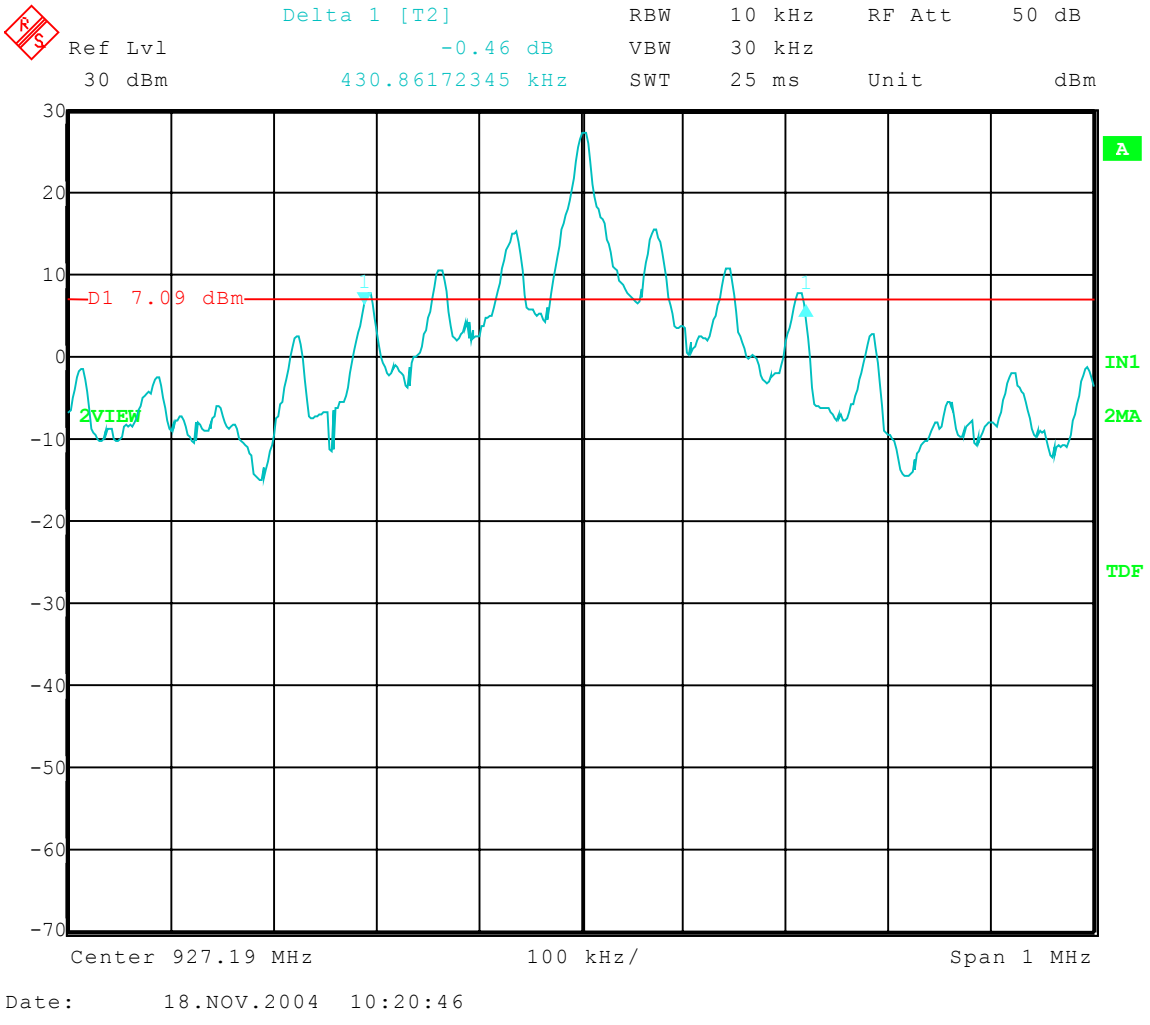
PART 15.247

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: High Channel; High Power: Frequency – 927.233 MHz

20 dB Bandwidth = 430.86 kHz

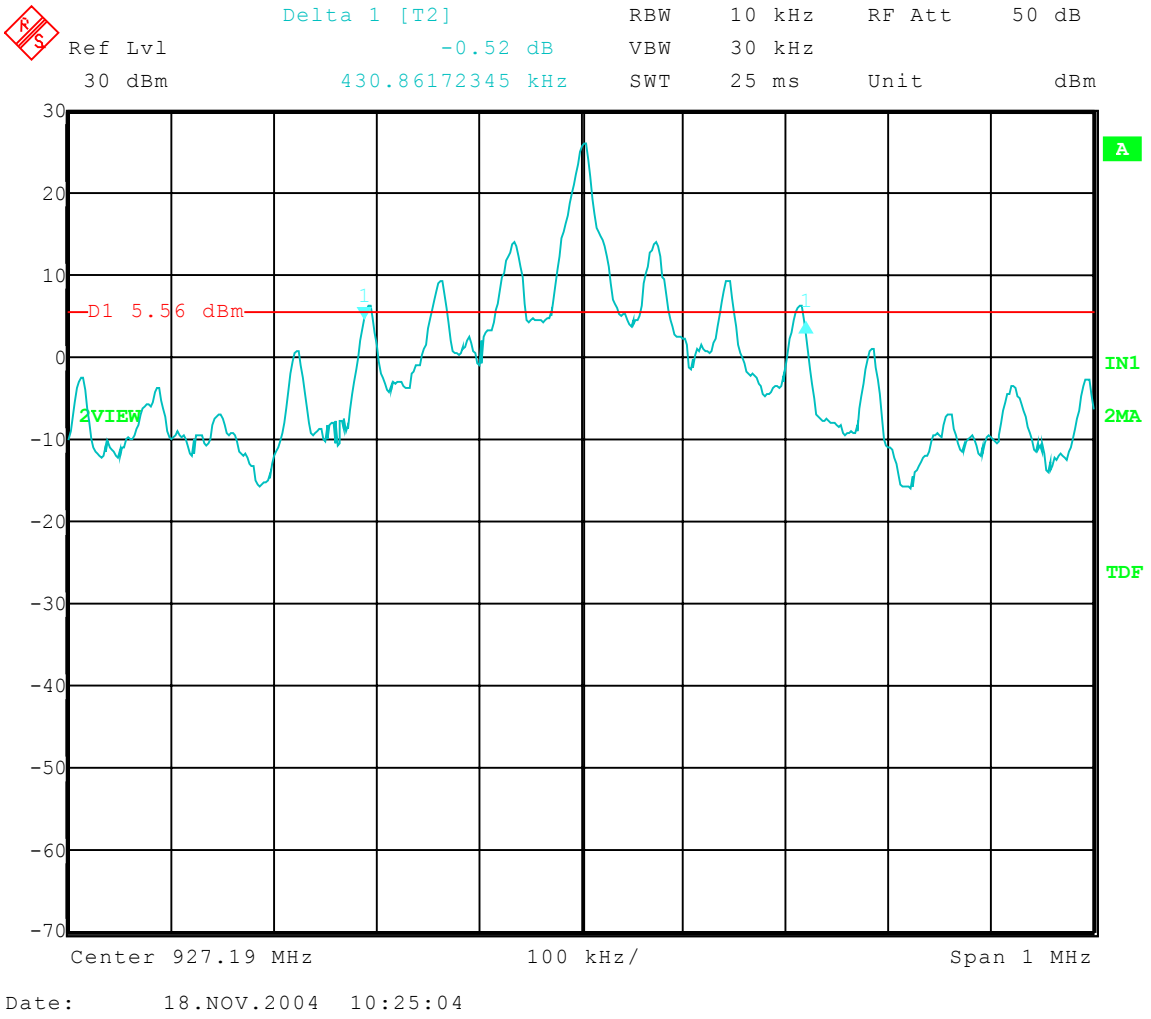


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: High Channel; Mid Power: Frequency – 927.233 MHz

20 dB Bandwidth = 430.86 kHz

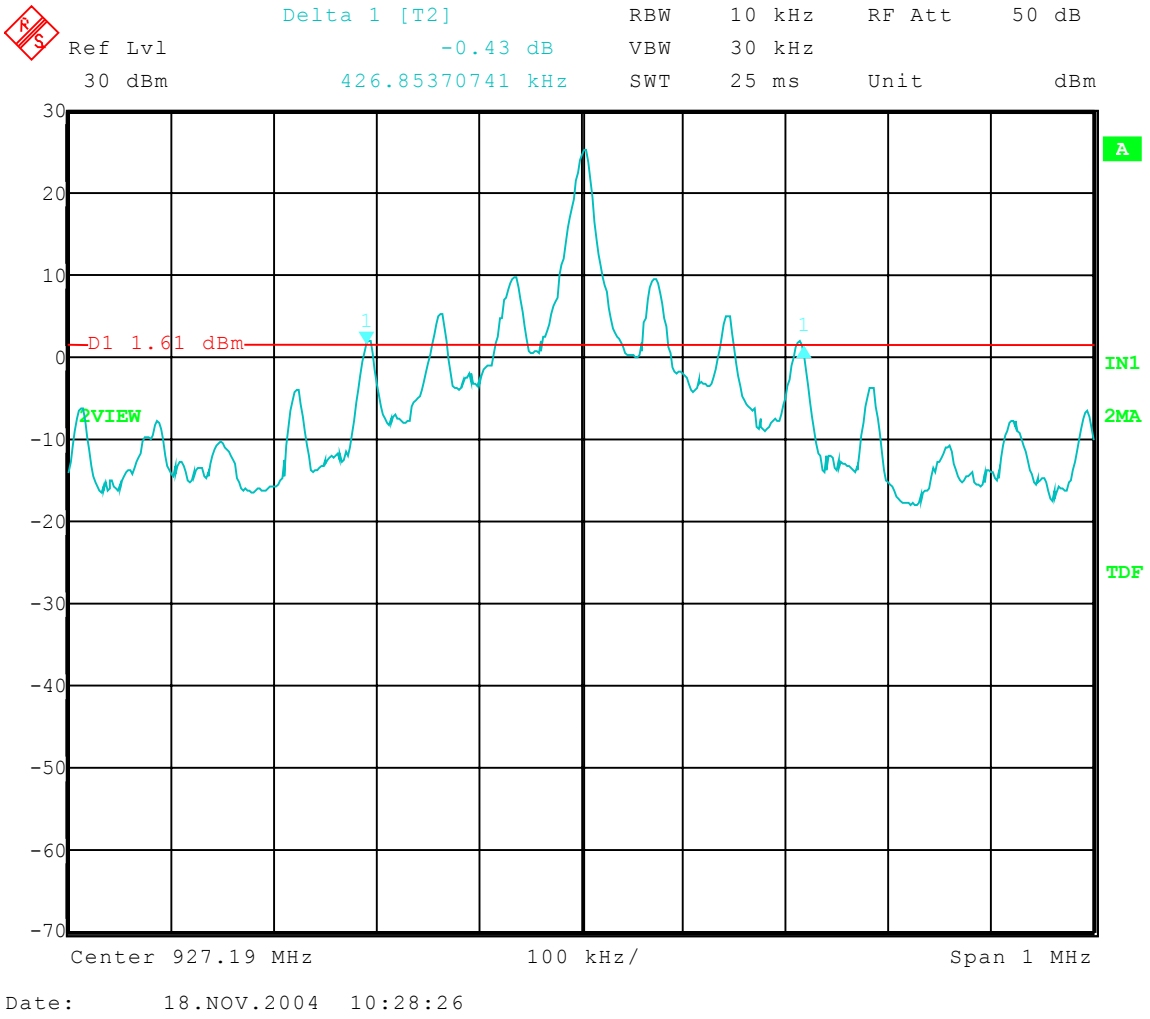


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: High Channel; Low Power: Frequency – 927.233 MHz

20 dB Bandwidth = 426.85 kHz

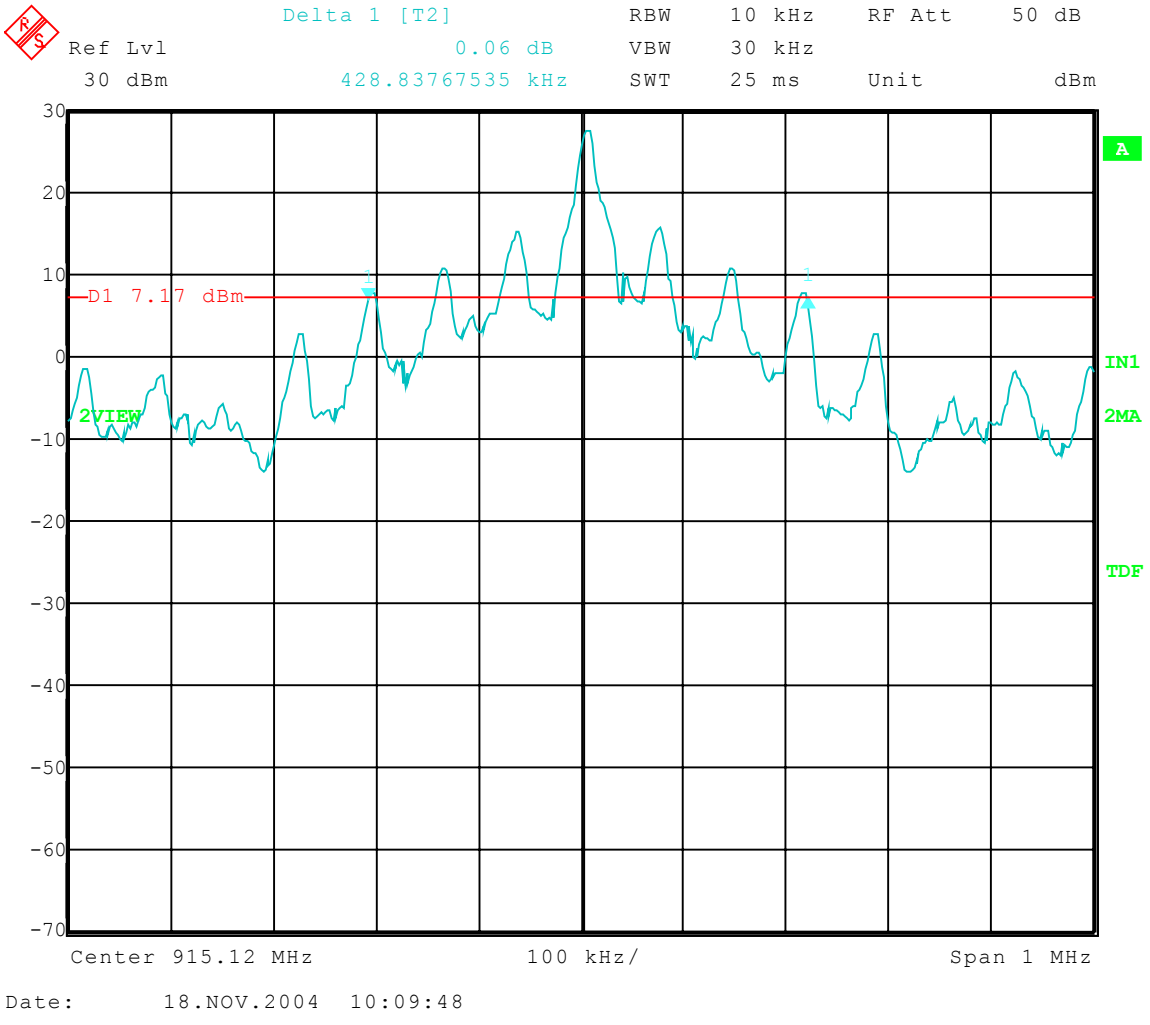


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: Middle Channel; High Power: Frequency – 915.101 MHz

20 dB Bandwidth = 428.84 kHz

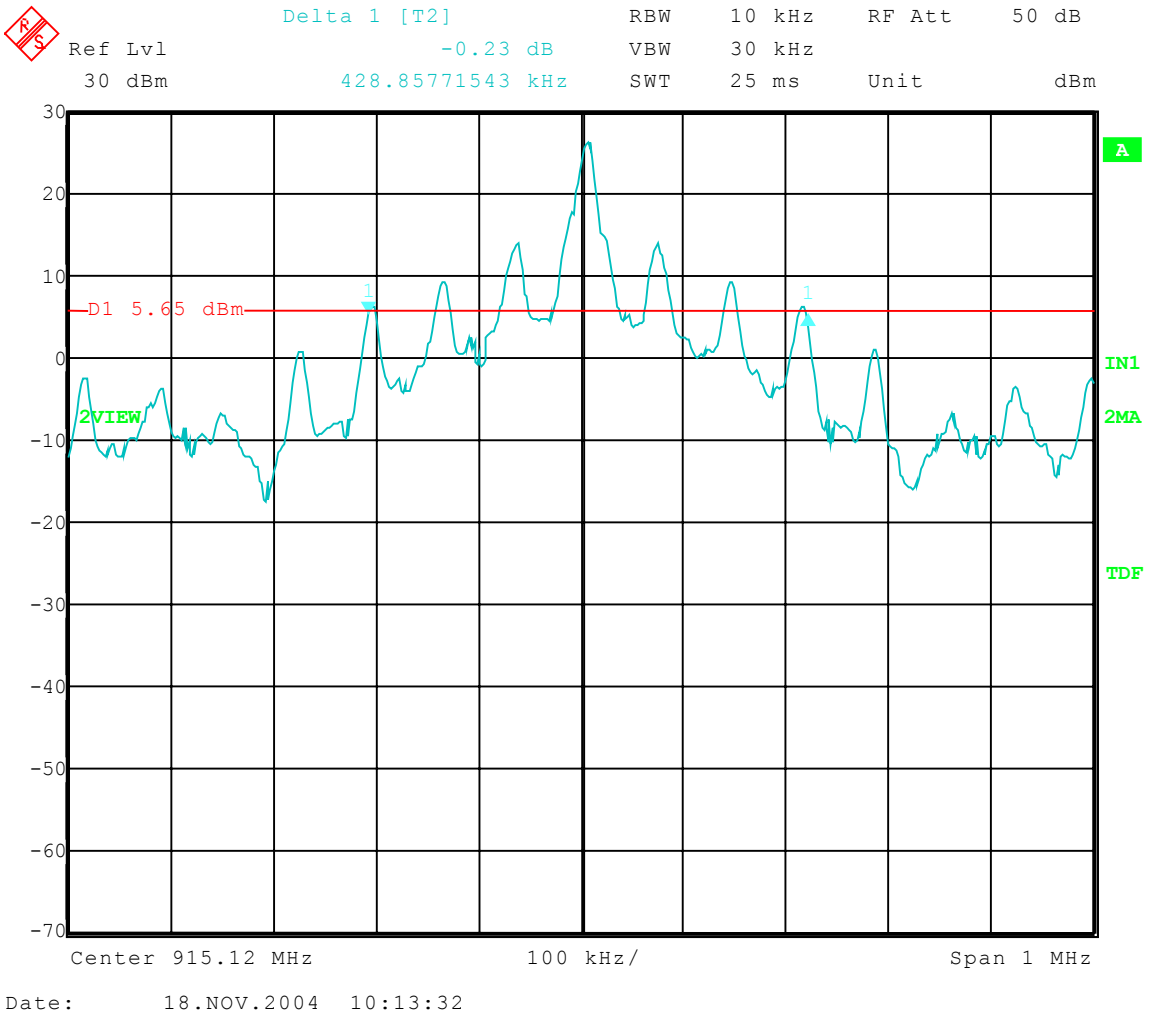


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: Middle Channel; Mid Power: Frequency – 915.101 MHz

20 dB Bandwidth = 428.86 kHz

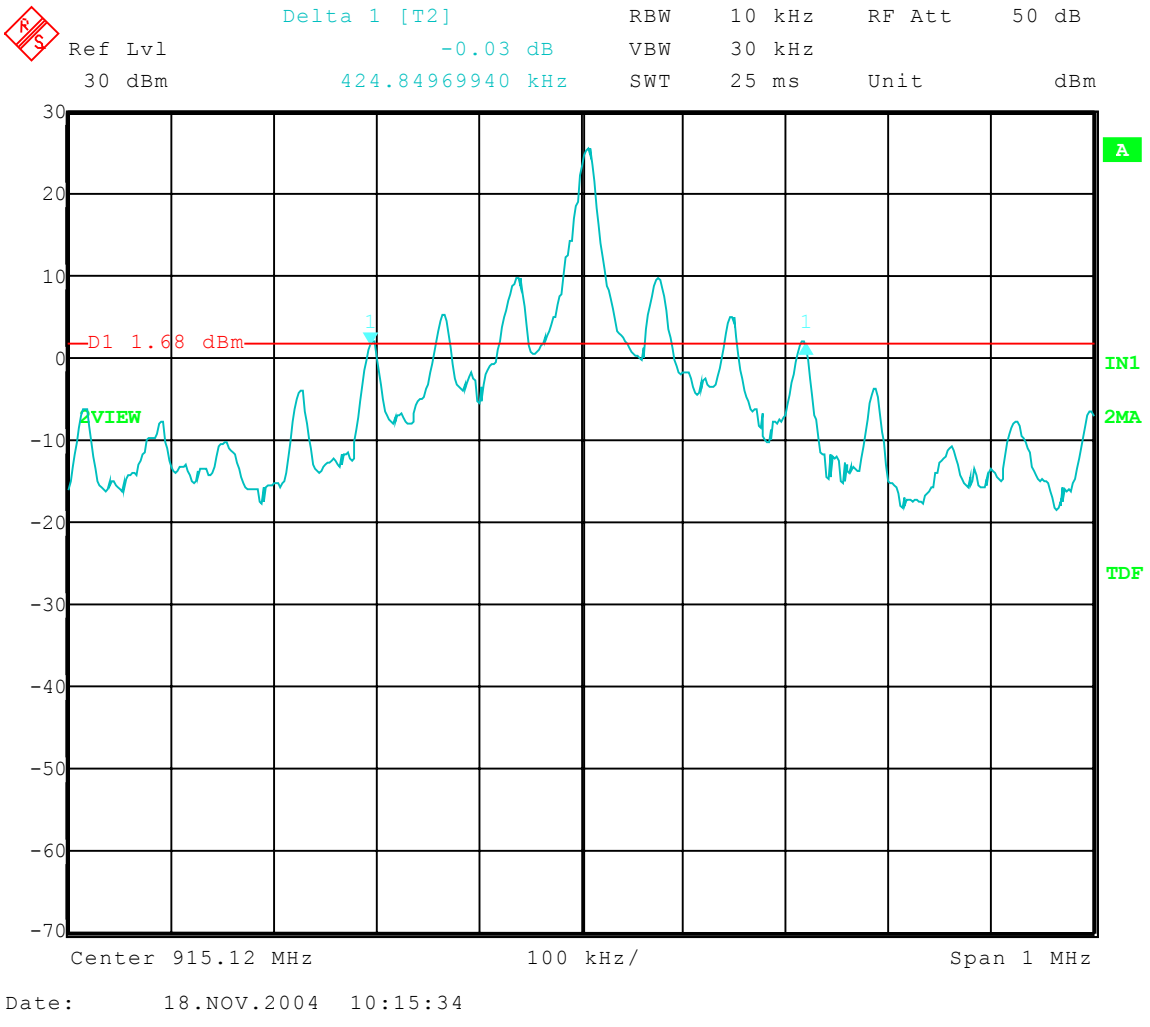


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: Middle Channel; Low Power: Frequency – 915.101 MHz

20 dB Bandwidth = 424.85 kHz

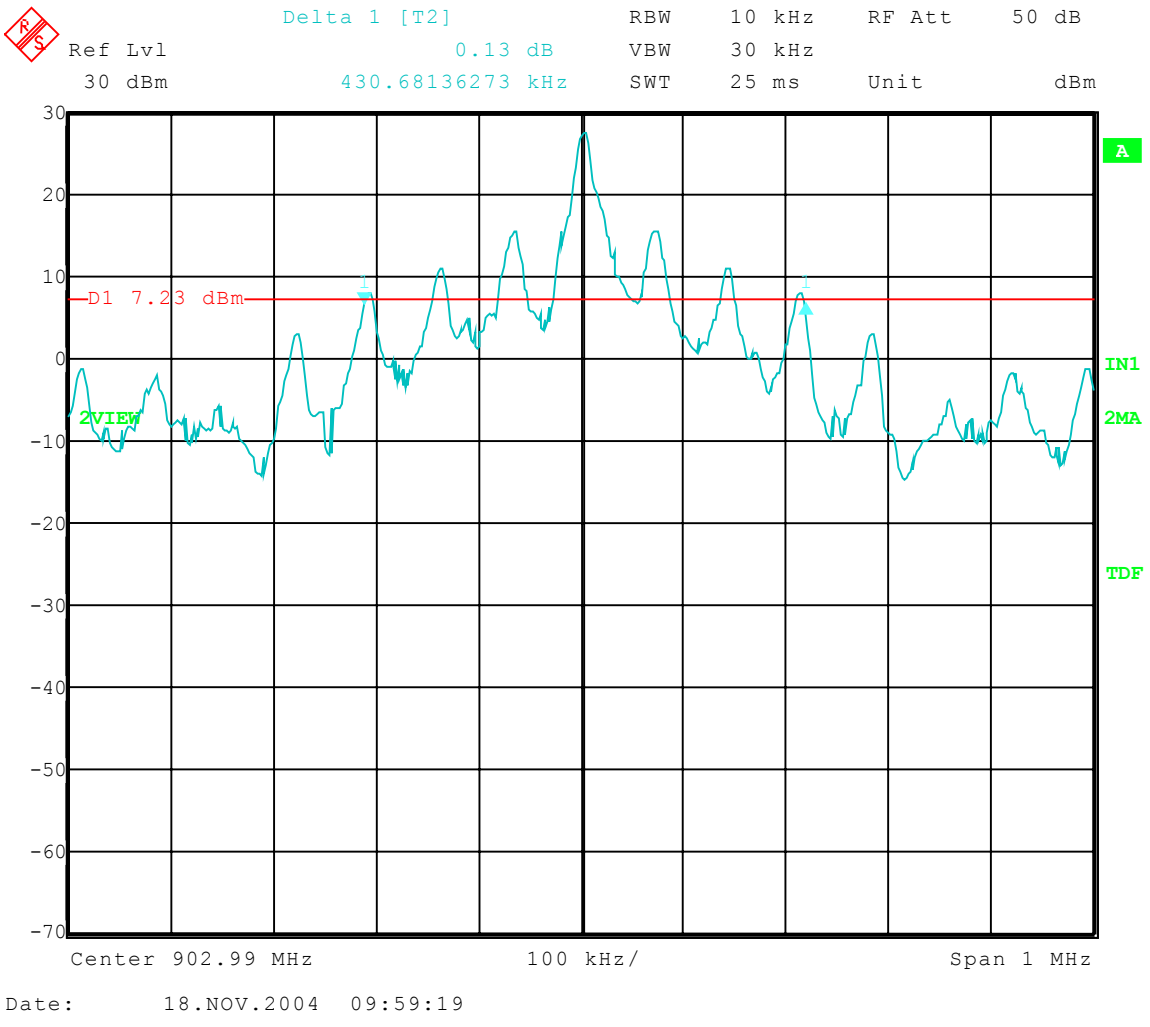


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: Low Channel; High Power: Frequency – 902.967 MHz

20 dB Bandwidth = 430.68 kHz

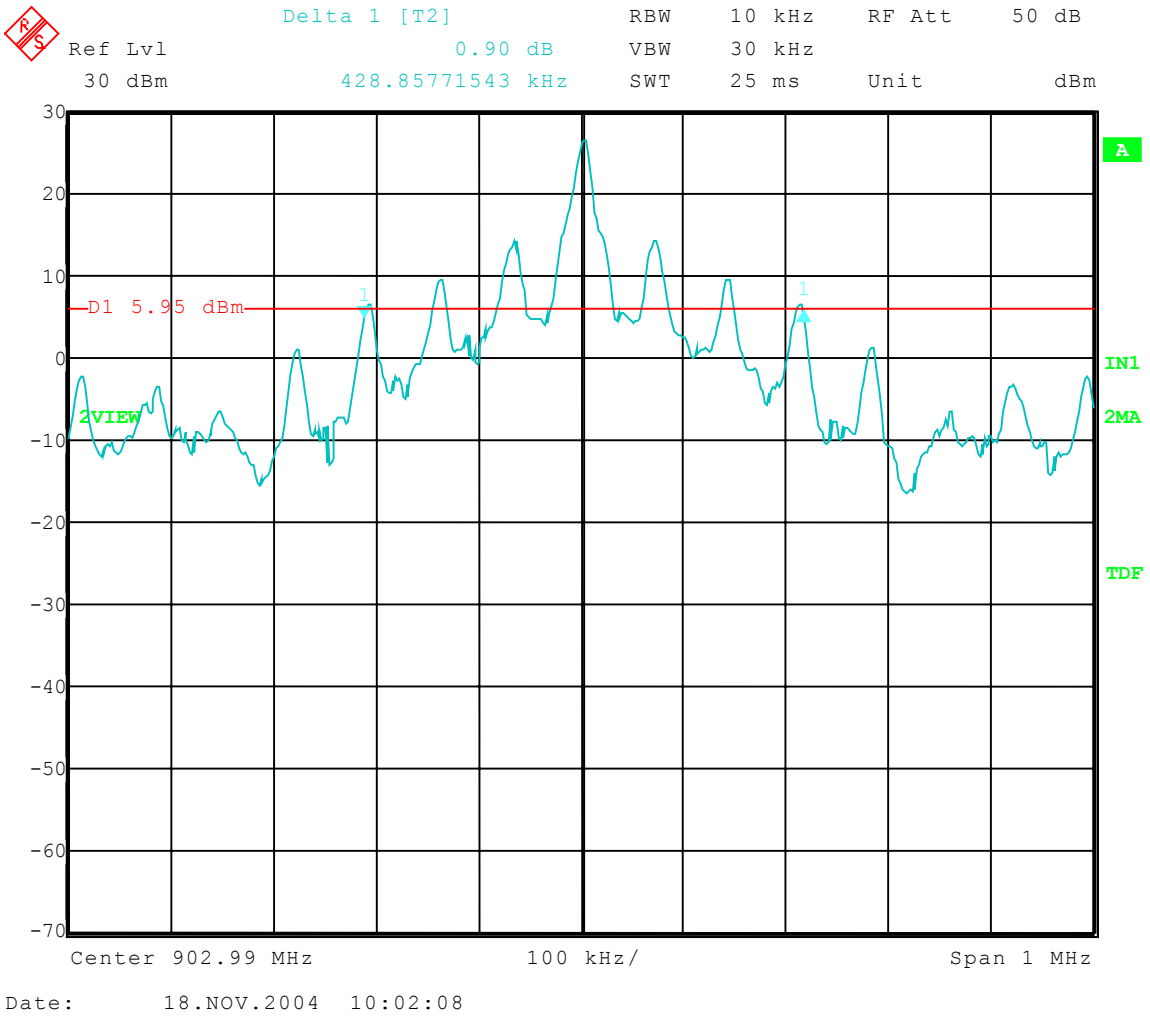


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: Low Channel; Mid Power: Frequency – 902.967 MHz

20 dB Bandwidth = 428.86 kHz

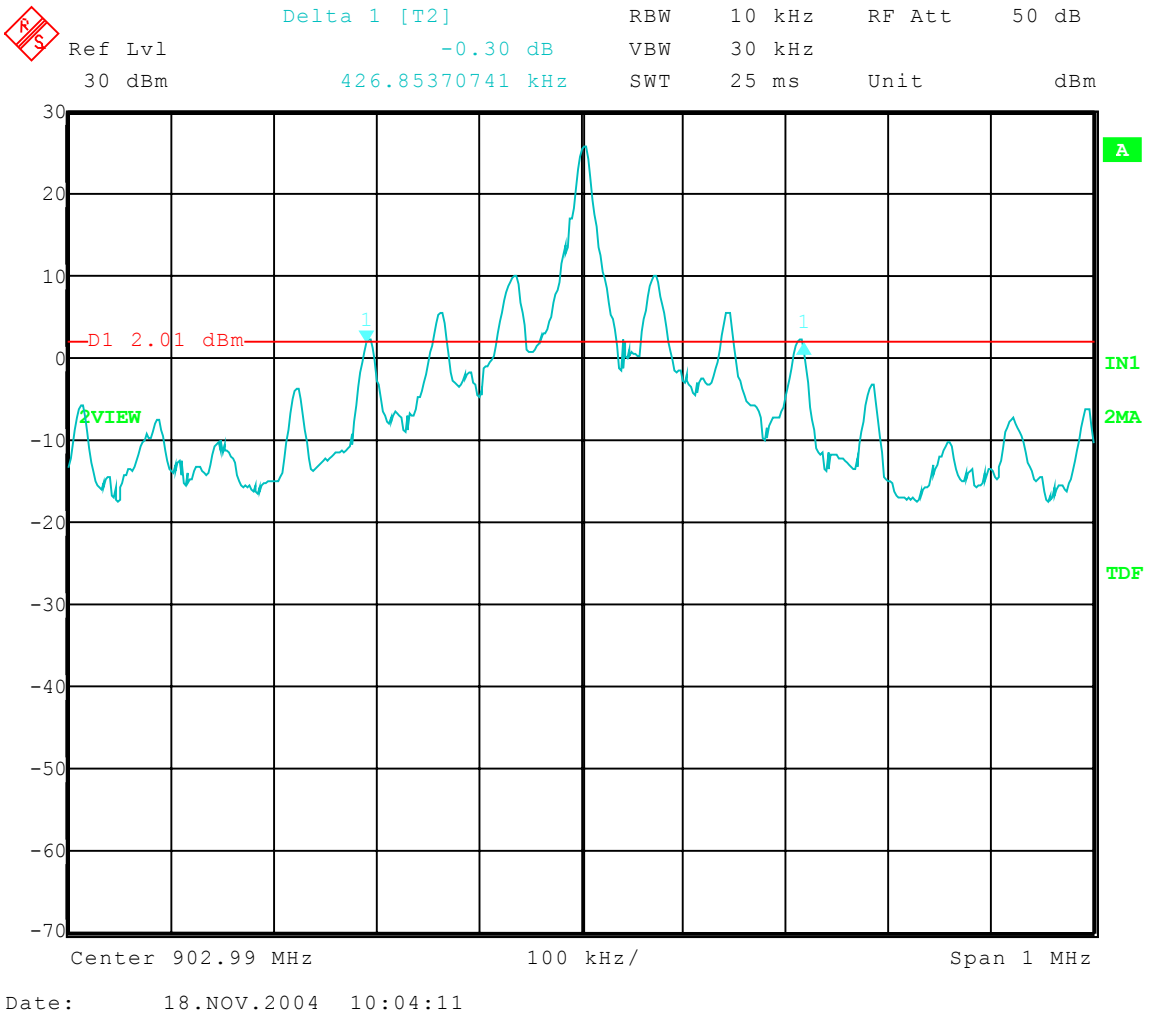


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: 20 dB Bandwidth - Conducted
Operator: Craig B
Comment: Low Channel; Low Power: Frequency – 902.967 MHz

20 dB Bandwidth = 426.85 kHz



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

SECTION 7.0

CARRIER FREQUENCY SEPARATION GRAPH(S)

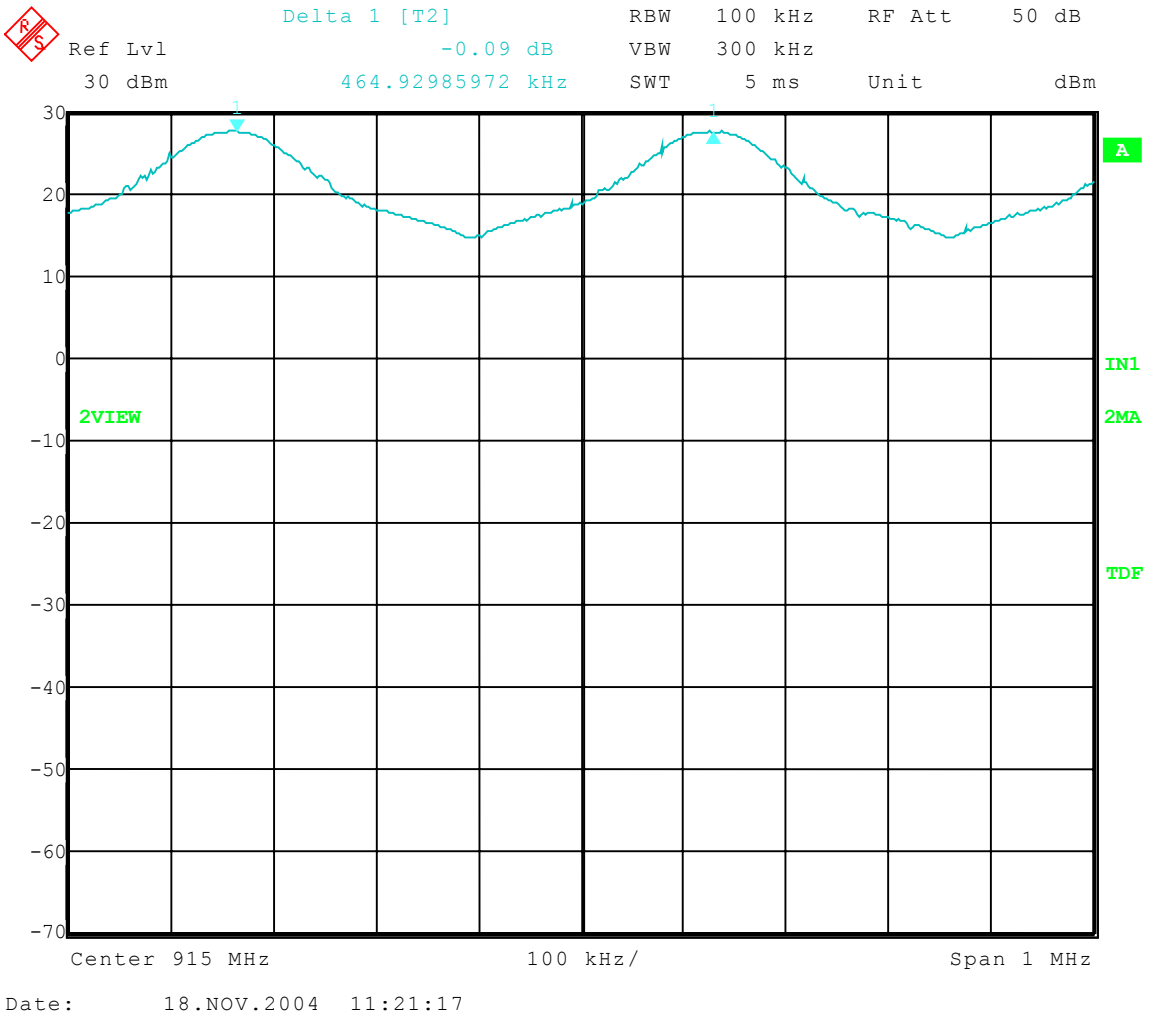
PART 15.247

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Carrier Frequency Separation - Conducted
Operator: Craig B
Comment: Frequency Hopping On

Carrier Freq Separation = 464.93 kHz



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

SECTION 8.0

NUMBER OF HOPPING FREQUENCIES GRAPH(S)

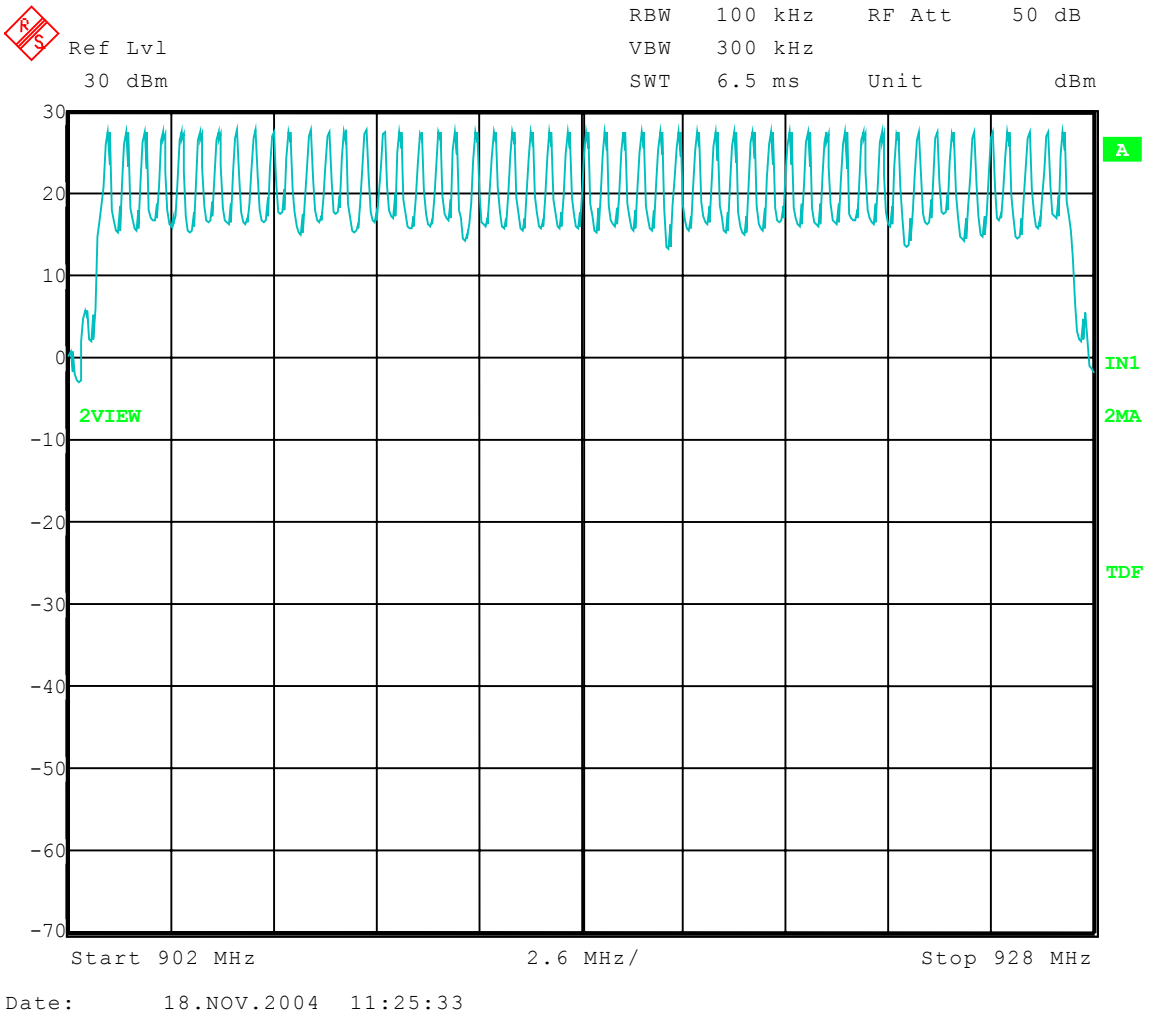
PART 15.247

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Number of Hopping Frequencies - Conducted
Operator: Craig B
Comment: Hopping Mode

Frequency Range = 902 MHz to 928 MHz
Number of Frequencies in Range = 53



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

SECTION 9.0

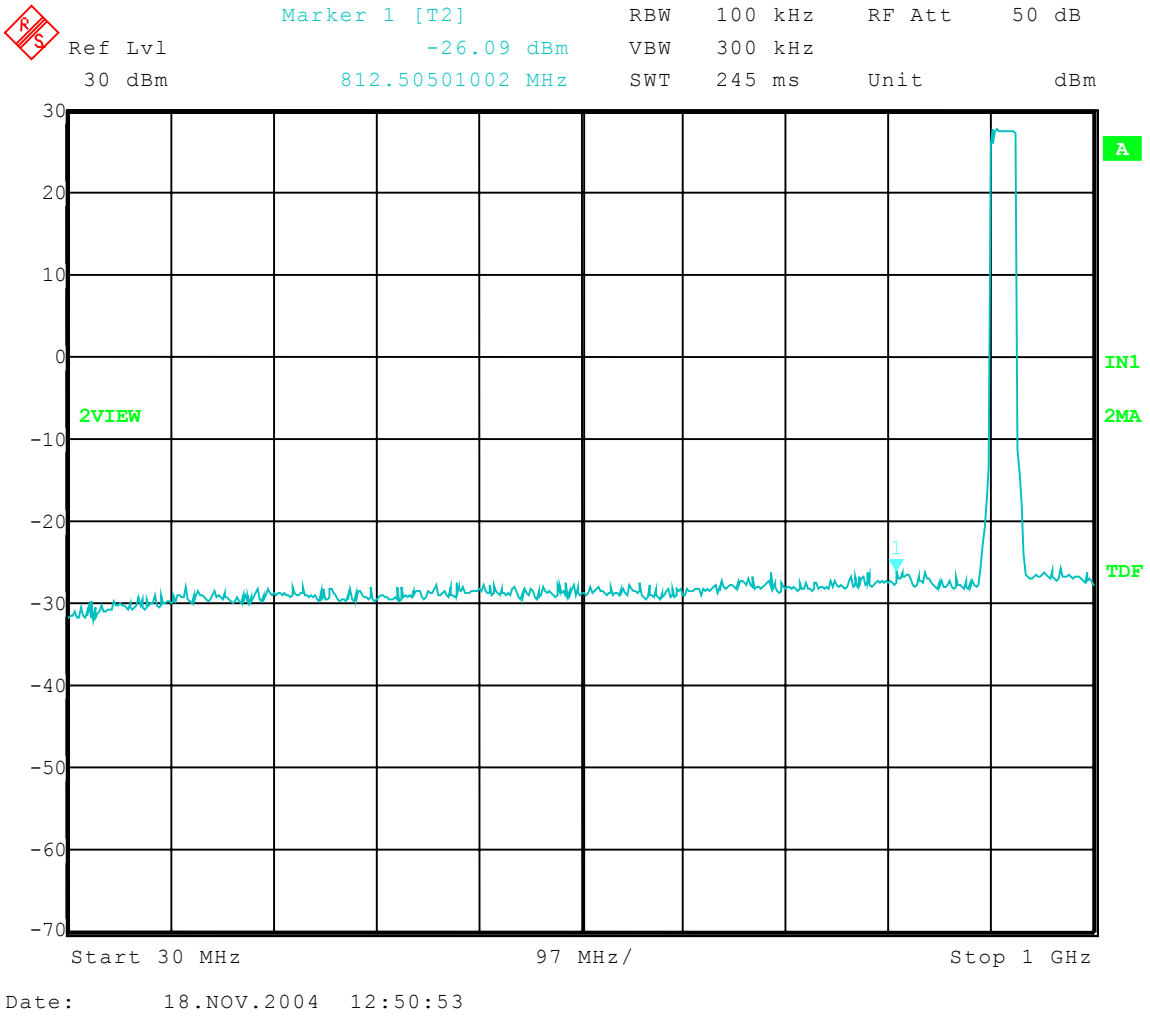
SPREAD SPECTRUM HOPPING ON GRAPH(S)

PART 15.247

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

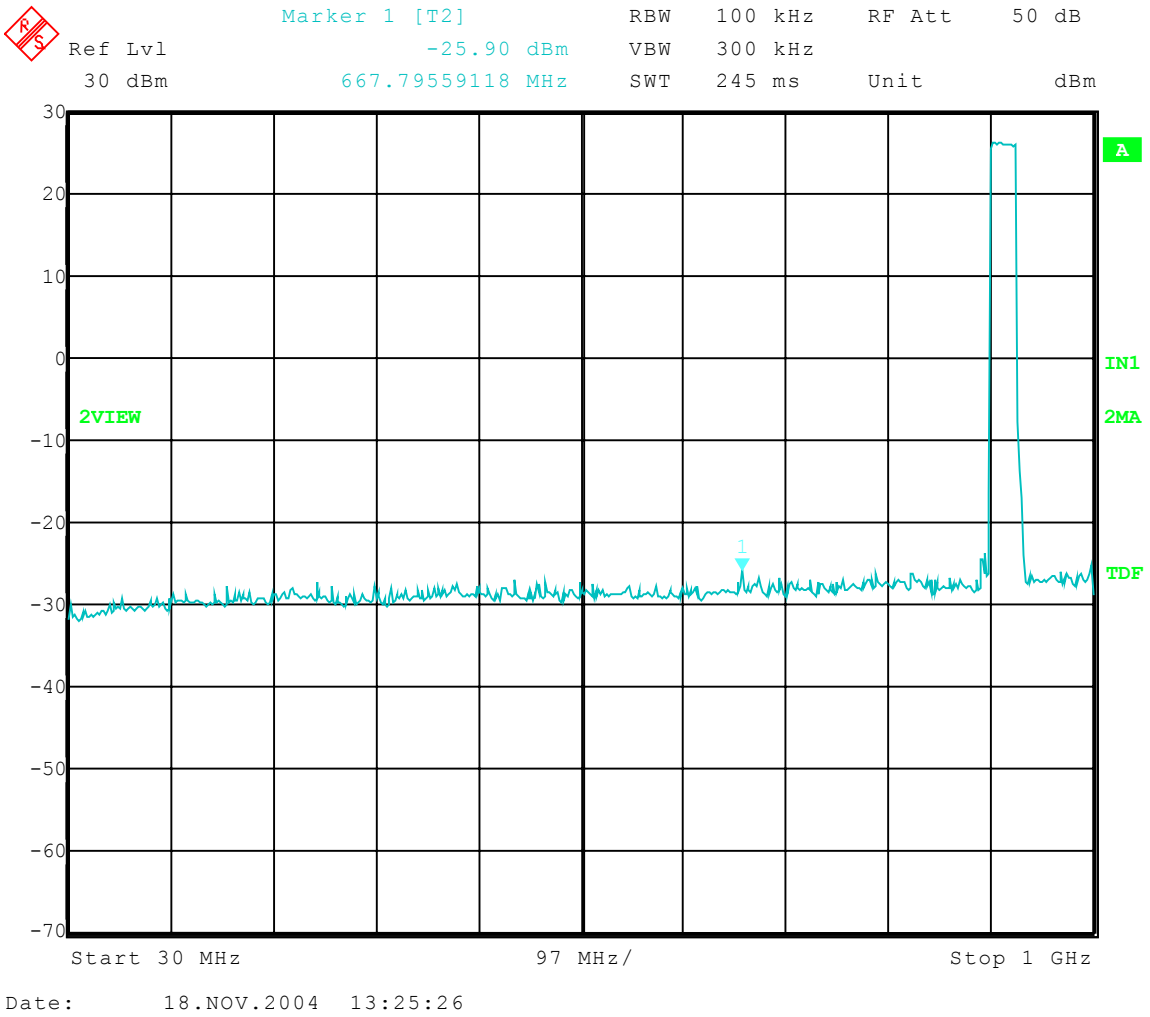
Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; High Power
Frequency Range: 30 to 1000 MHz
Limit = 7.50 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Mid Power
Frequency Range: 30 to 1000 MHz
Limit = 6.61 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

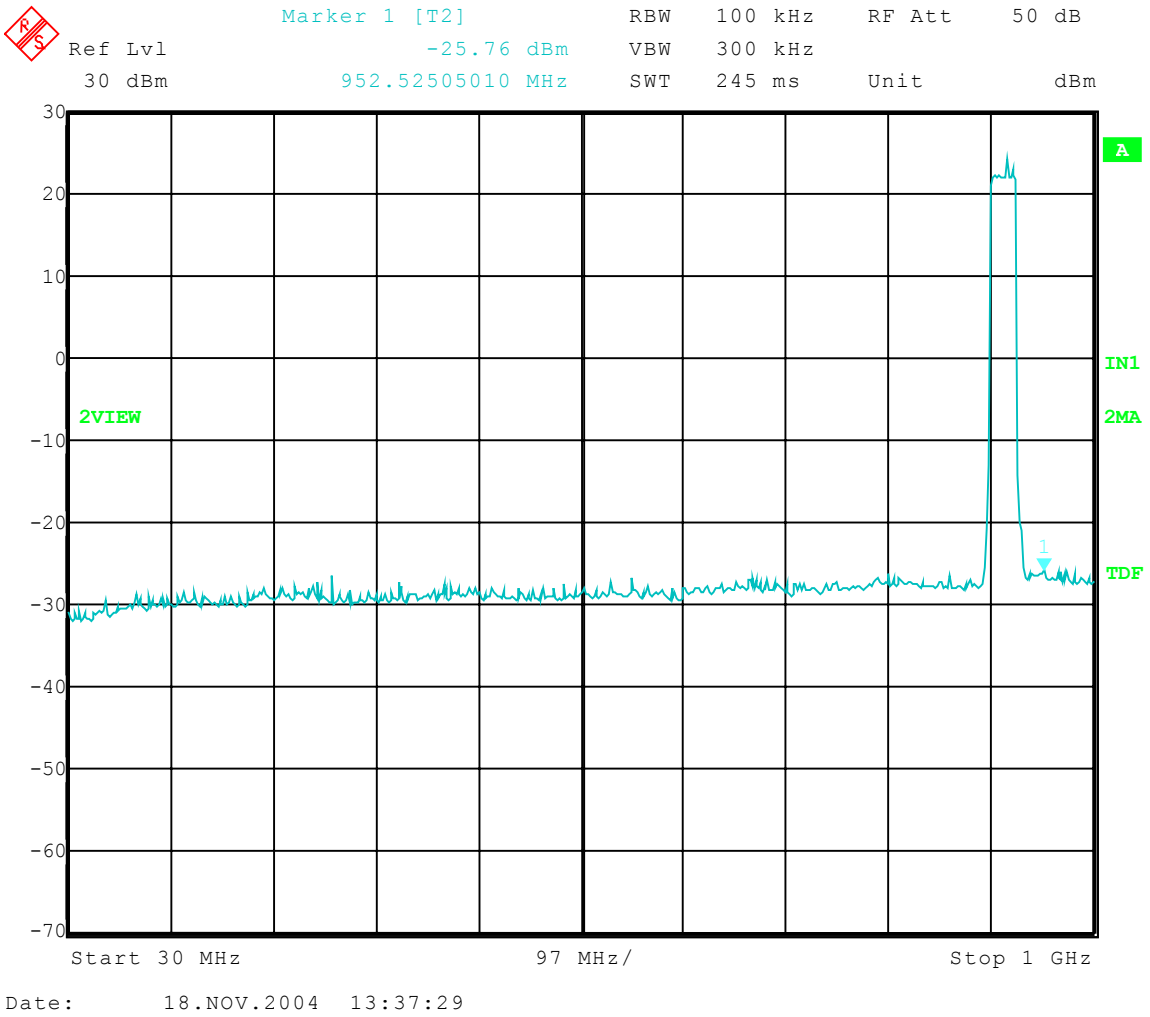


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Low Power
Frequency Range: 30 to 1000 MHz
Limit = 1.83 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

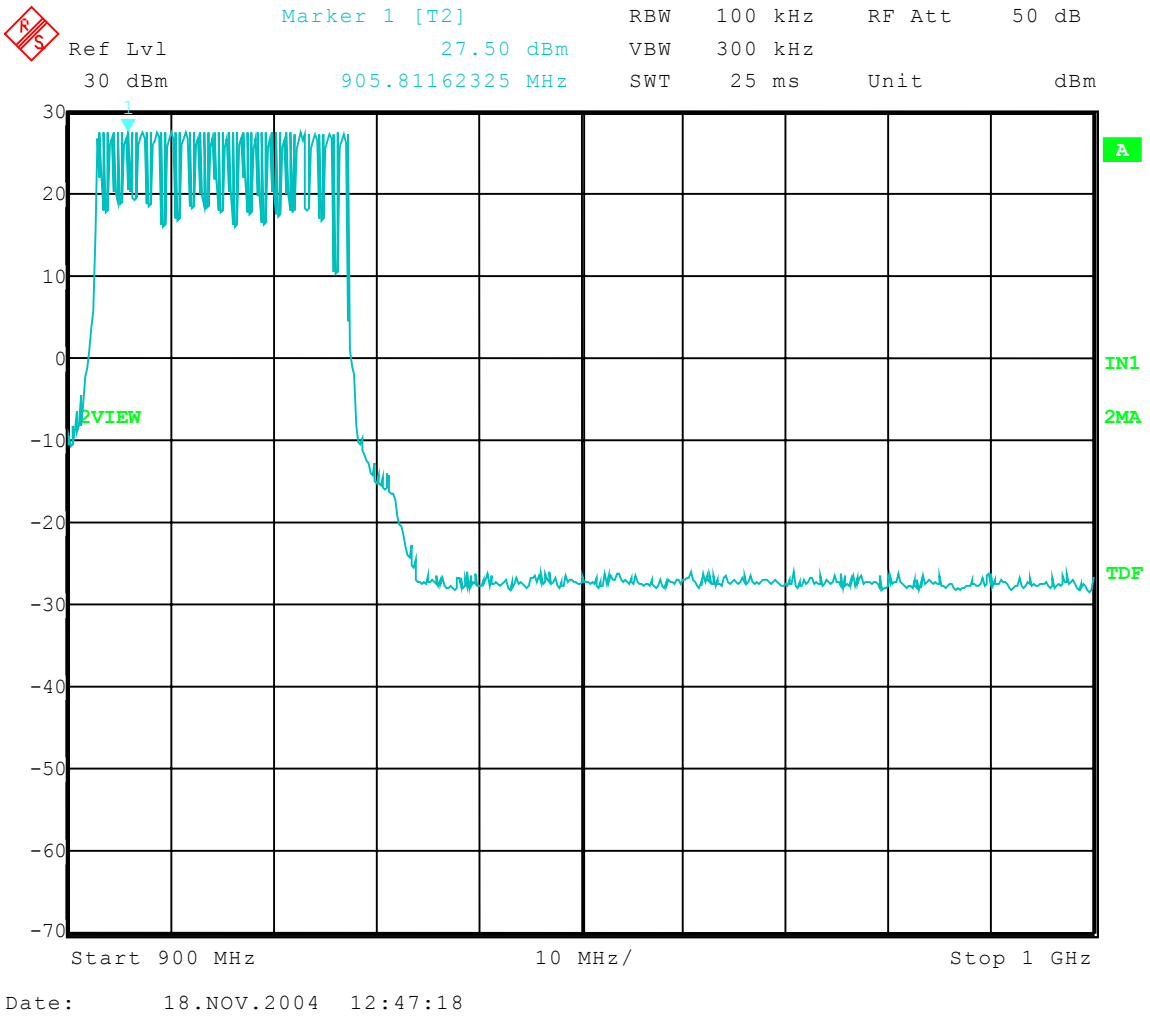


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; High Power
Frequency Range: 900 to 1000 MHz
Limit = 7.50 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

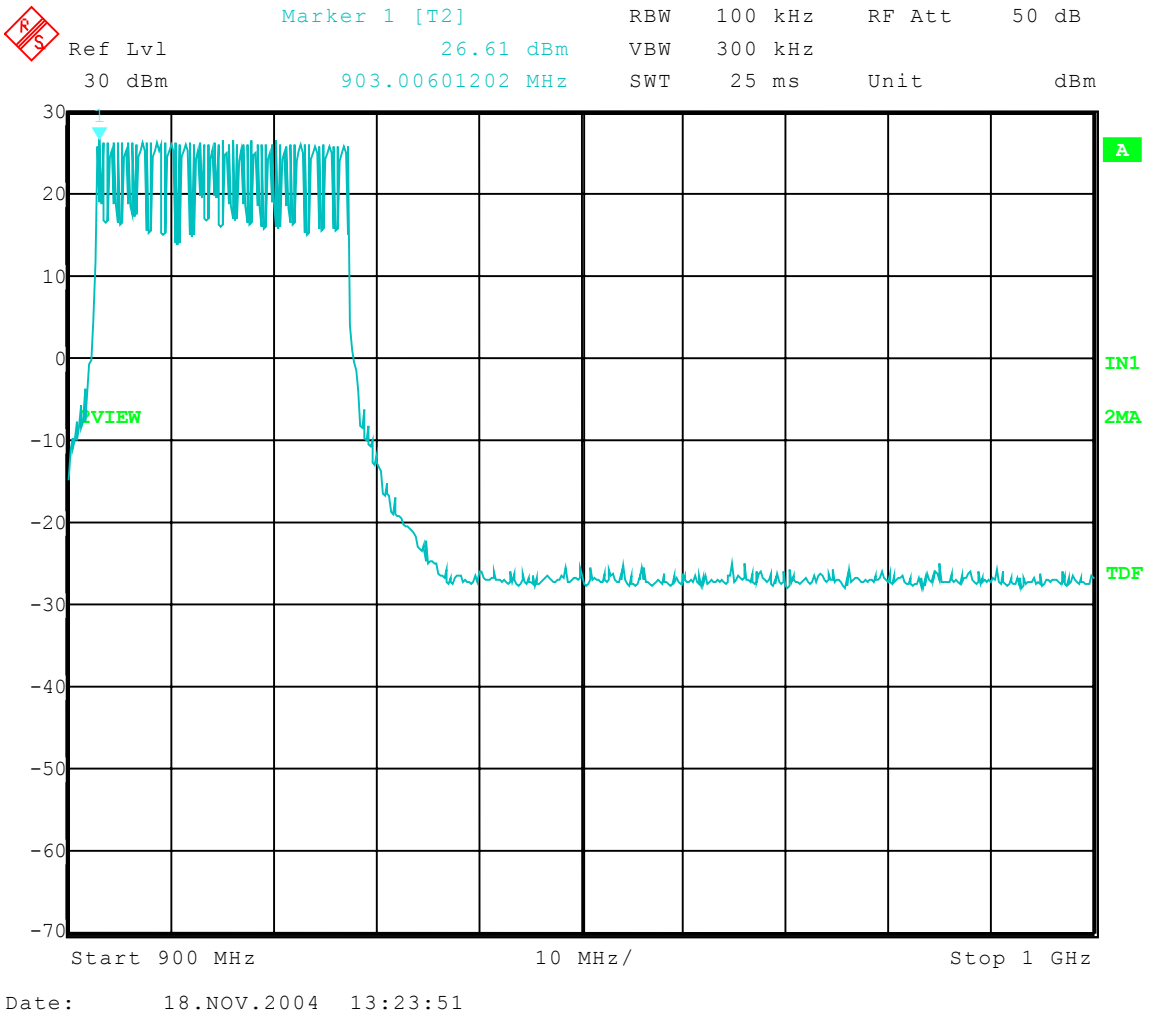


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Mid Power
Frequency Range: 900 to 1000 MHz
Limit = 6.61 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

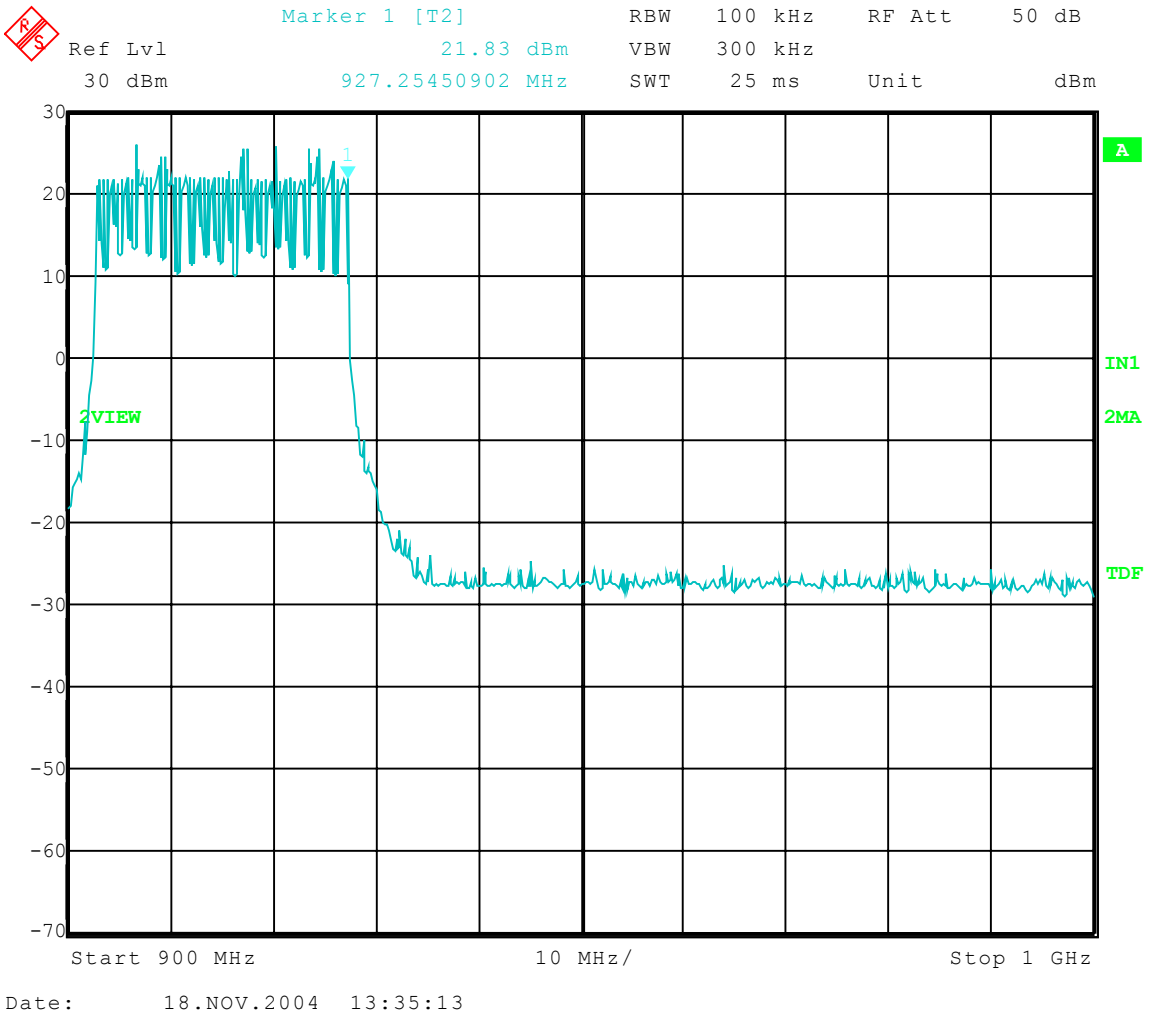


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Low Power
Frequency Range: 900 to 1000 MHz
Limit = 1.83 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

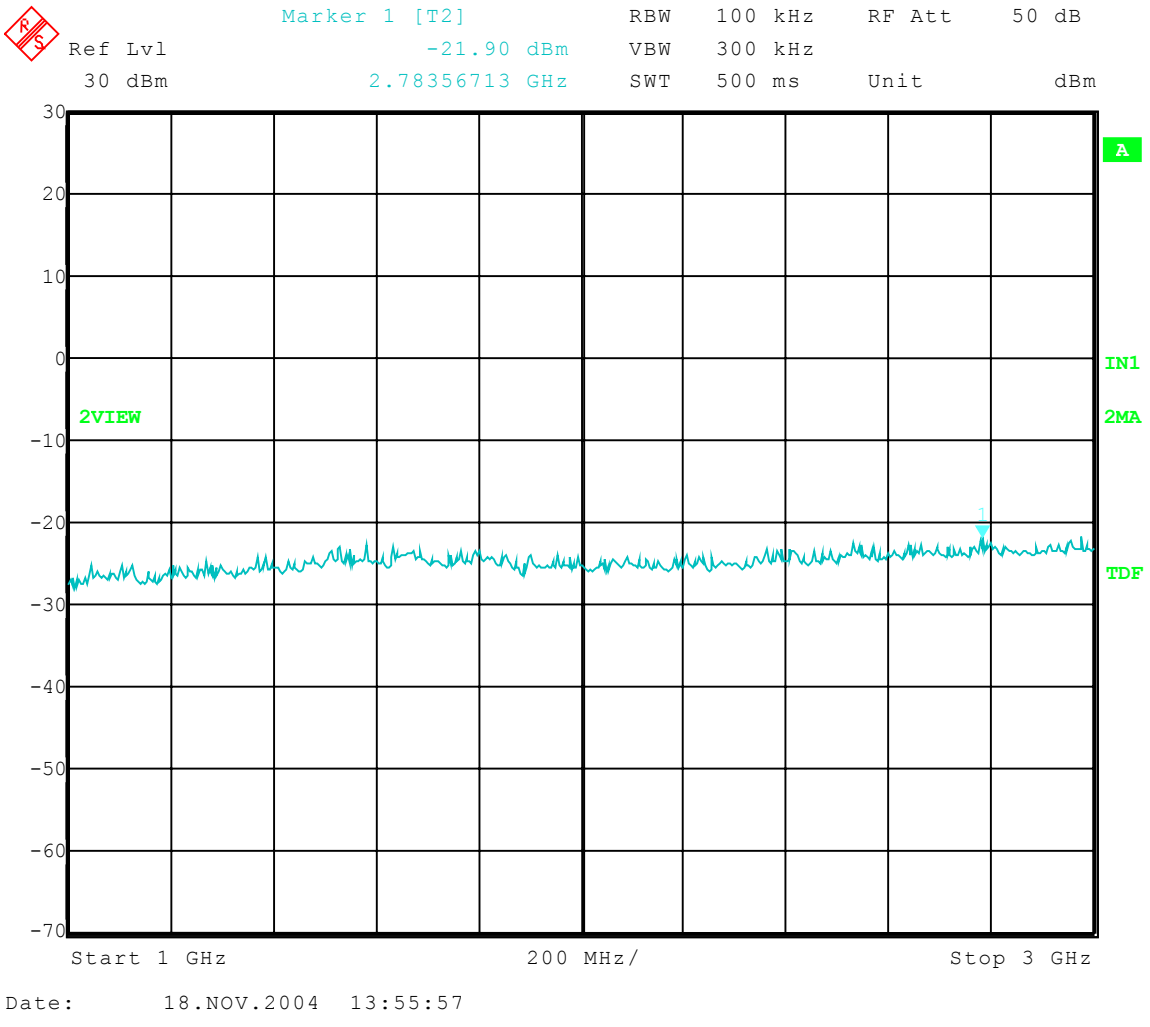


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; High Power
Frequency Range: 1 to 3 GHz
Limit = 7.50 dBm

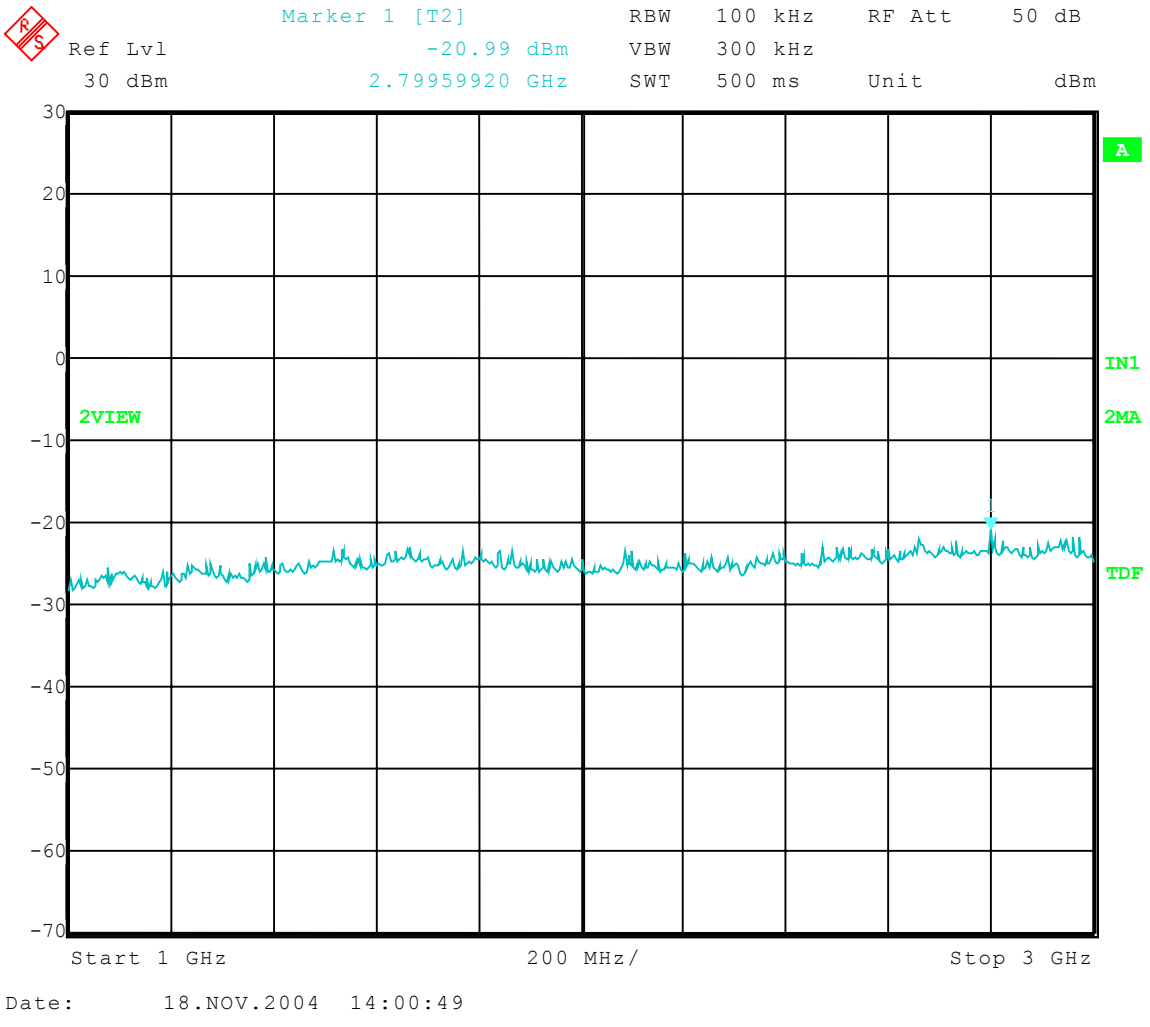
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Mid Power
Frequency Range: 1 to 3 GHz
Limit = 6.61 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

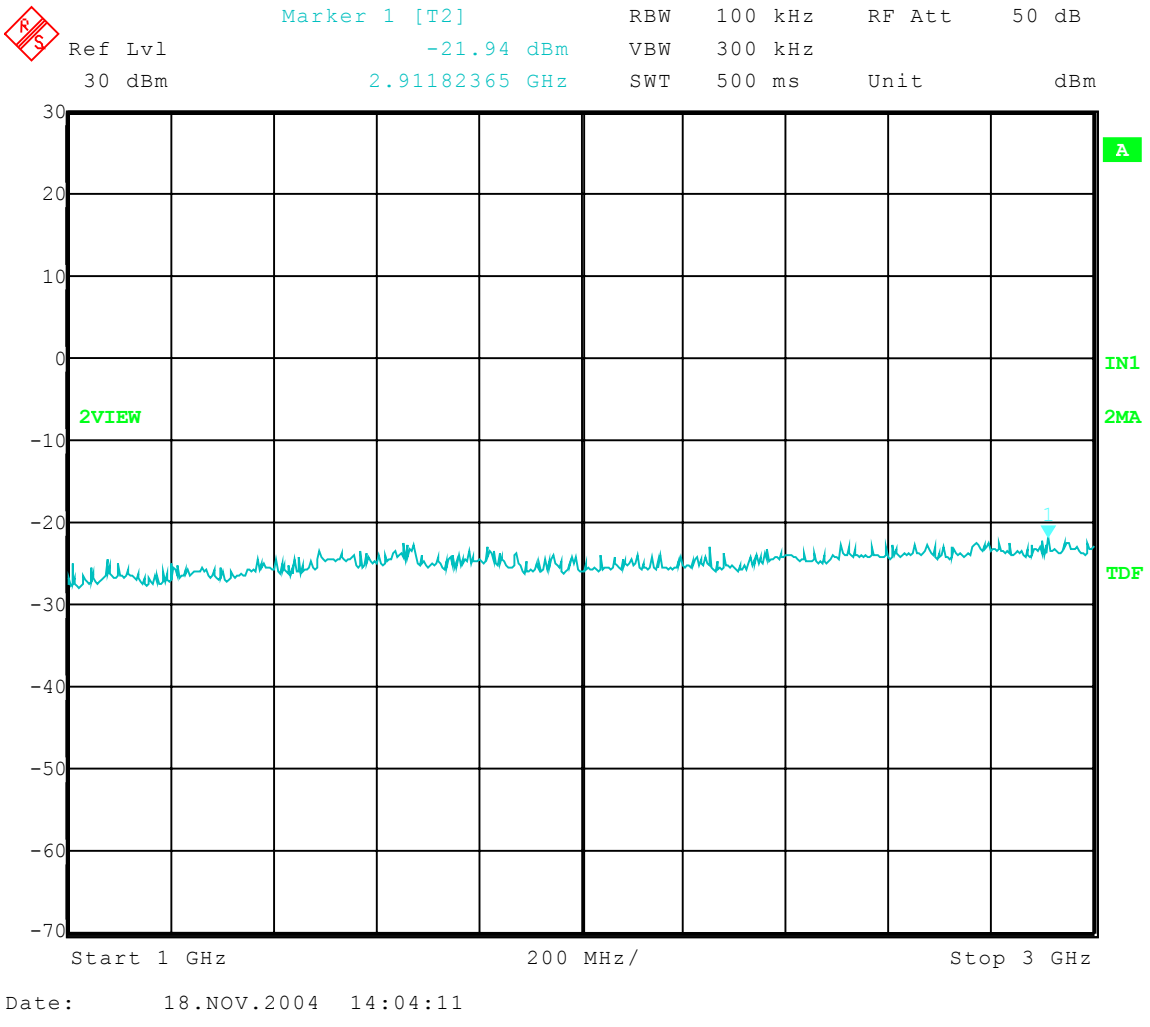


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Low Power
Frequency Range: 1 to 3 GHz
Limit = 1.83 dBm

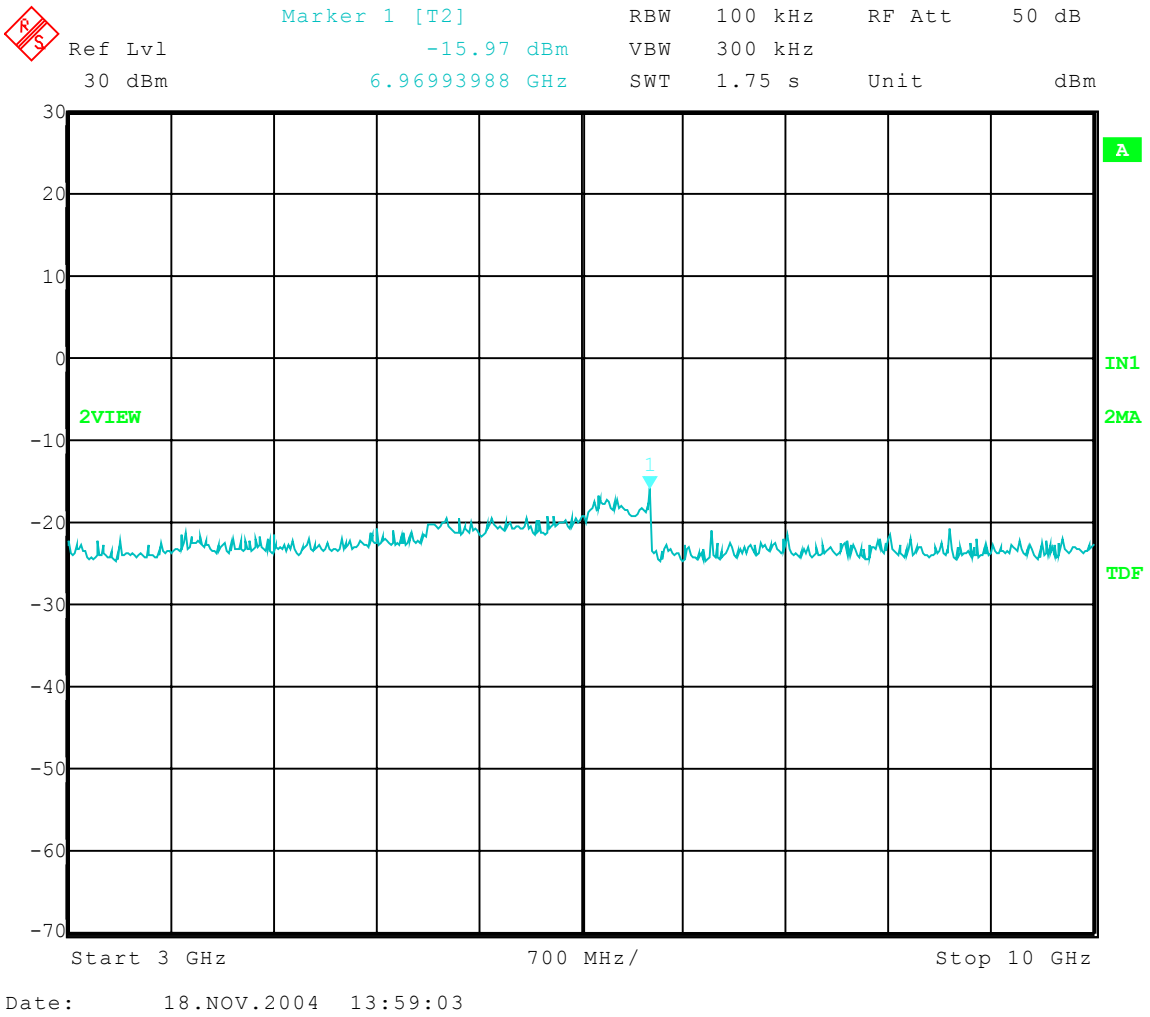
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; High Power
Frequency Range: 3 to 10 GHz
Limit = 7.50 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency

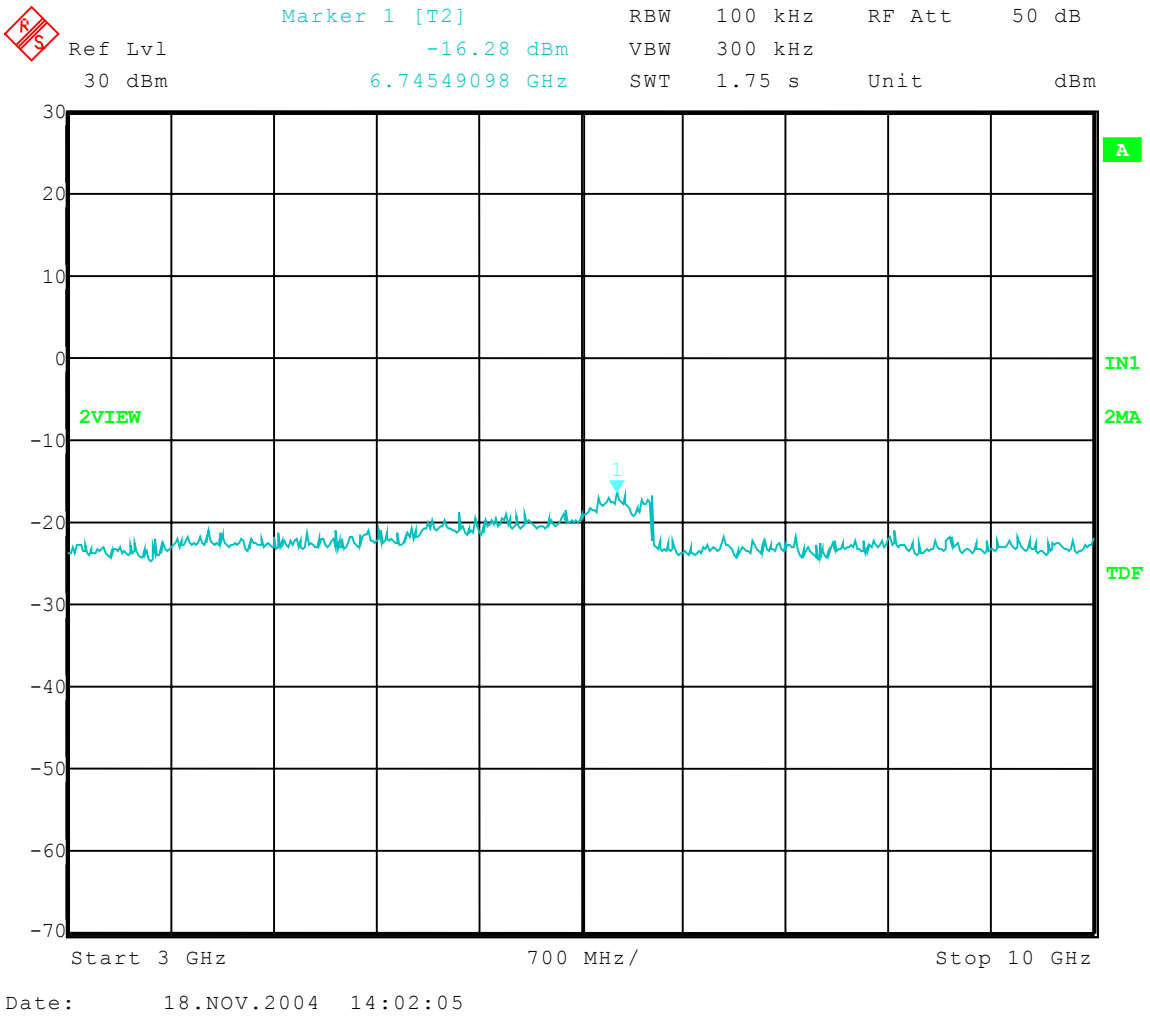


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Mid Power
Frequency Range: 3 to 10 GHz
Limit = 6.61 dBm

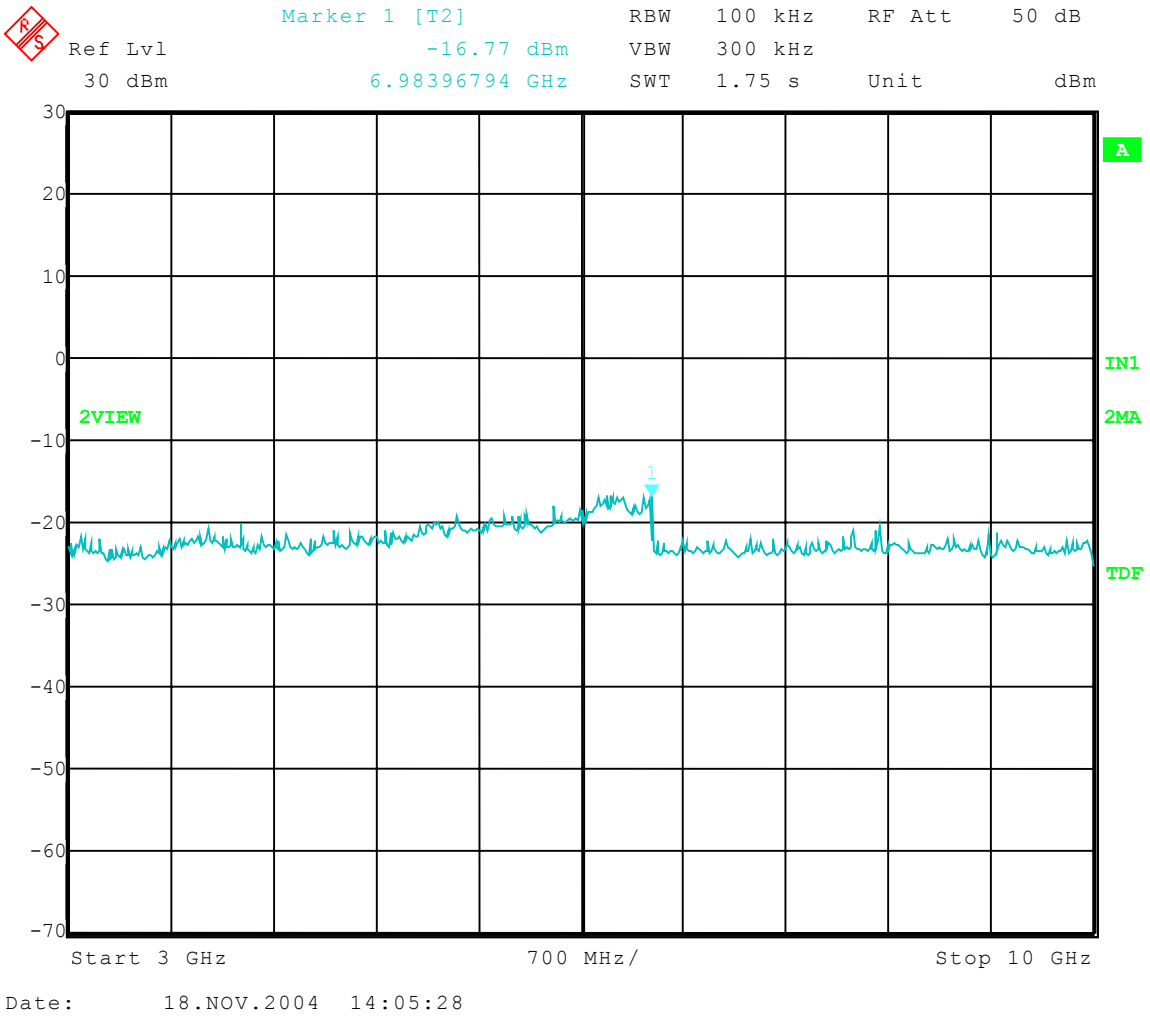
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Spurious Emissions - Conducted
Operator: Craig B
Comment: Spread Spectrum Hopping On; Low Power
Frequency Range: 3 to 10 GHz
Limit = 1.83 dBm
All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

SECTION 10.0

TIME OF OCCUPANCY GRAPHS

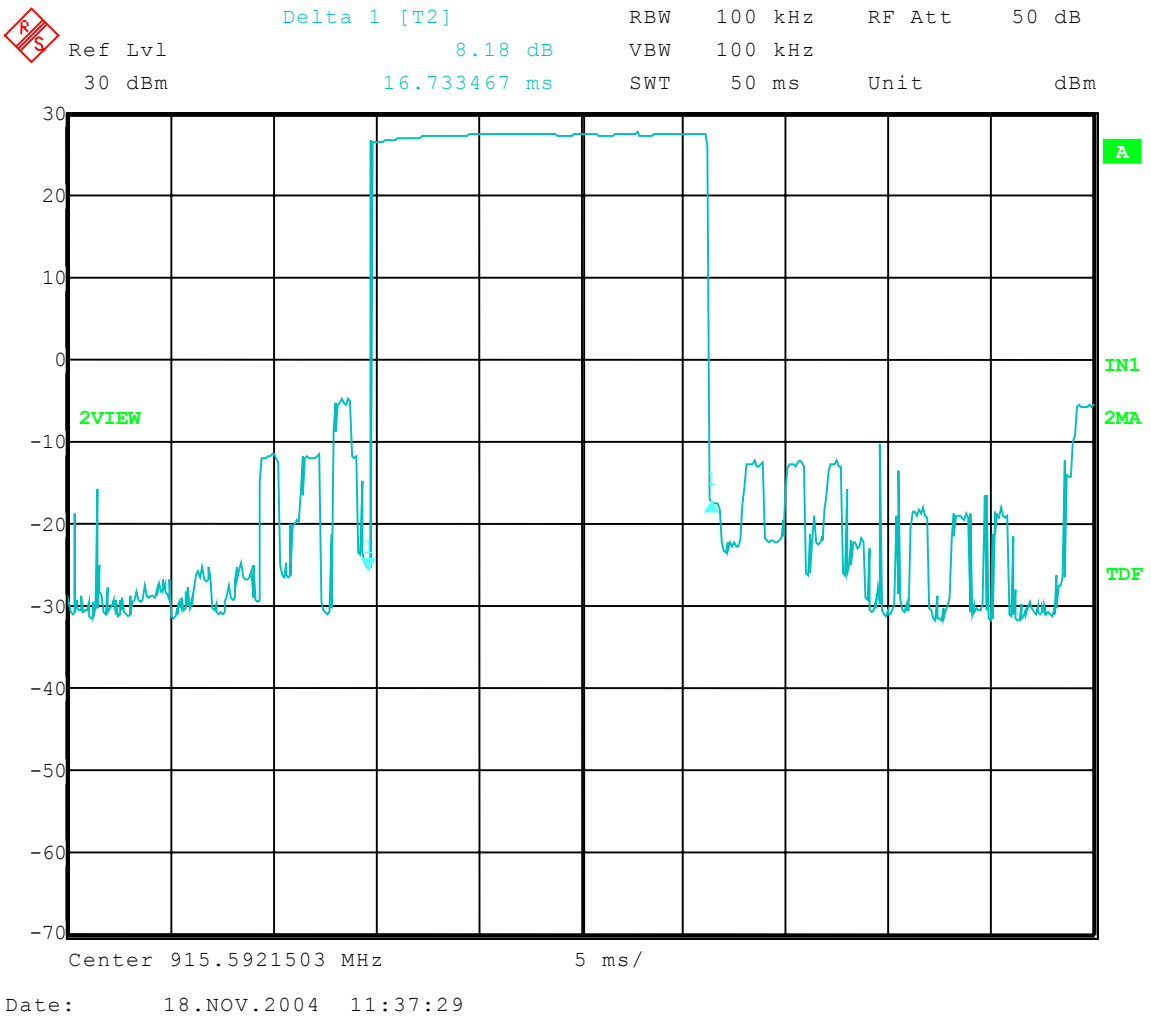
PART 15.247

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Dwell Time - Conducted
Operator: Craig B
Comment: Middle Channel - Hopping Mode On

Dwell Time = 16.73 mS

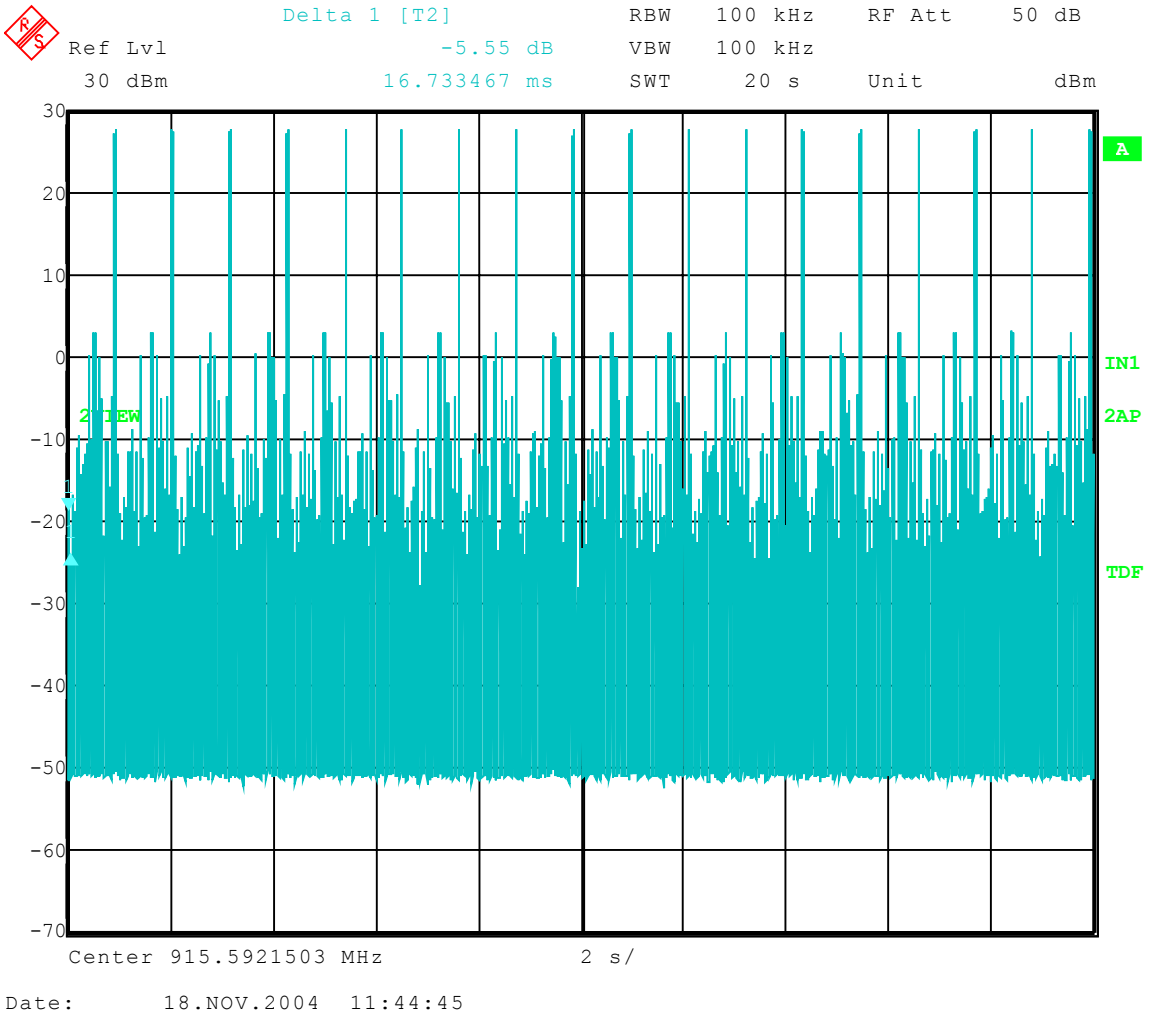


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Dwell Time in 20 Seconds - Conducted
Operator: Craig B
Comment: Middle Channel – Hopping Mode On

Dwell Time Limit = 0.4 Seconds in 20 Seconds
Times ON in 20 Sec = 18
Dwell Time in 20 Sec = Time Slot Length X Times On in 20 s
0.301 Seconds = 16.73 ms X 18



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

SECTION 11.0

CONDUCTED PEAK OUTPUT POWER GRAPHS

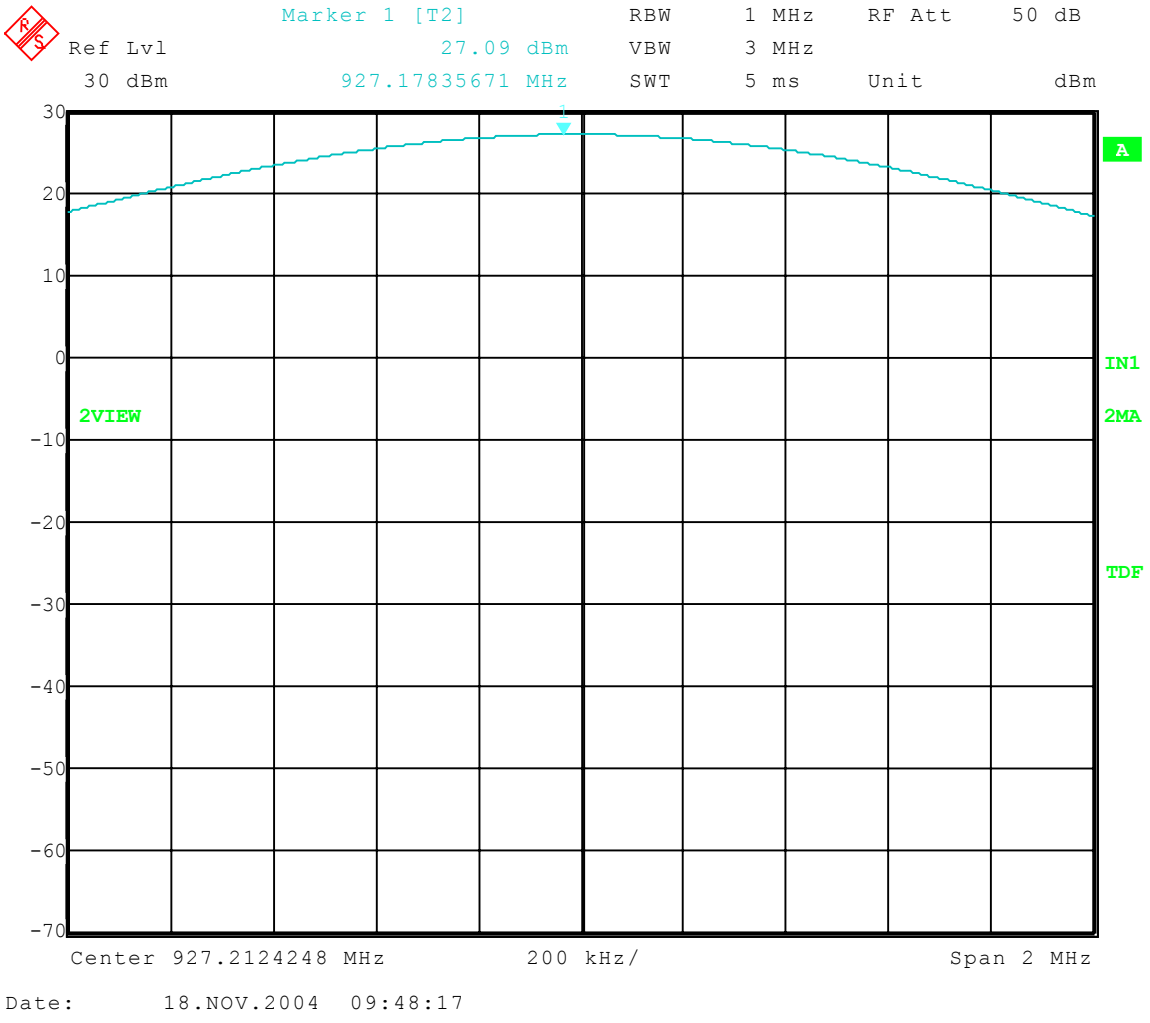
PART 15.247

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: High Channel; High Power: Frequency – 927.233 MHz

Peak Output Power = 27.09 dBm = 511.7 mW

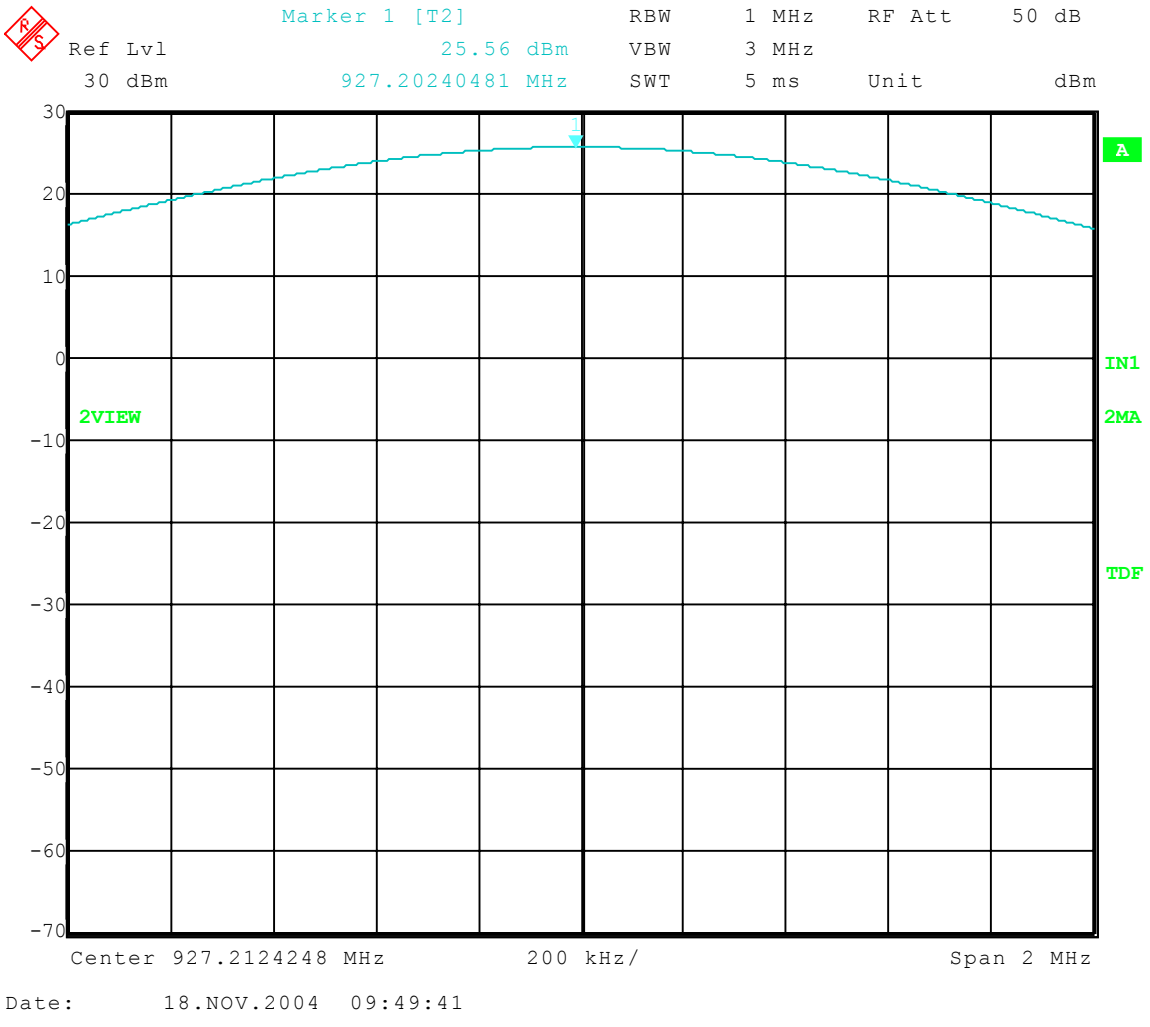


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: High Channel; Mid Power: Frequency – 927.233 MHz

Peak Output Power = 25.56 dBm = 359.7 mW

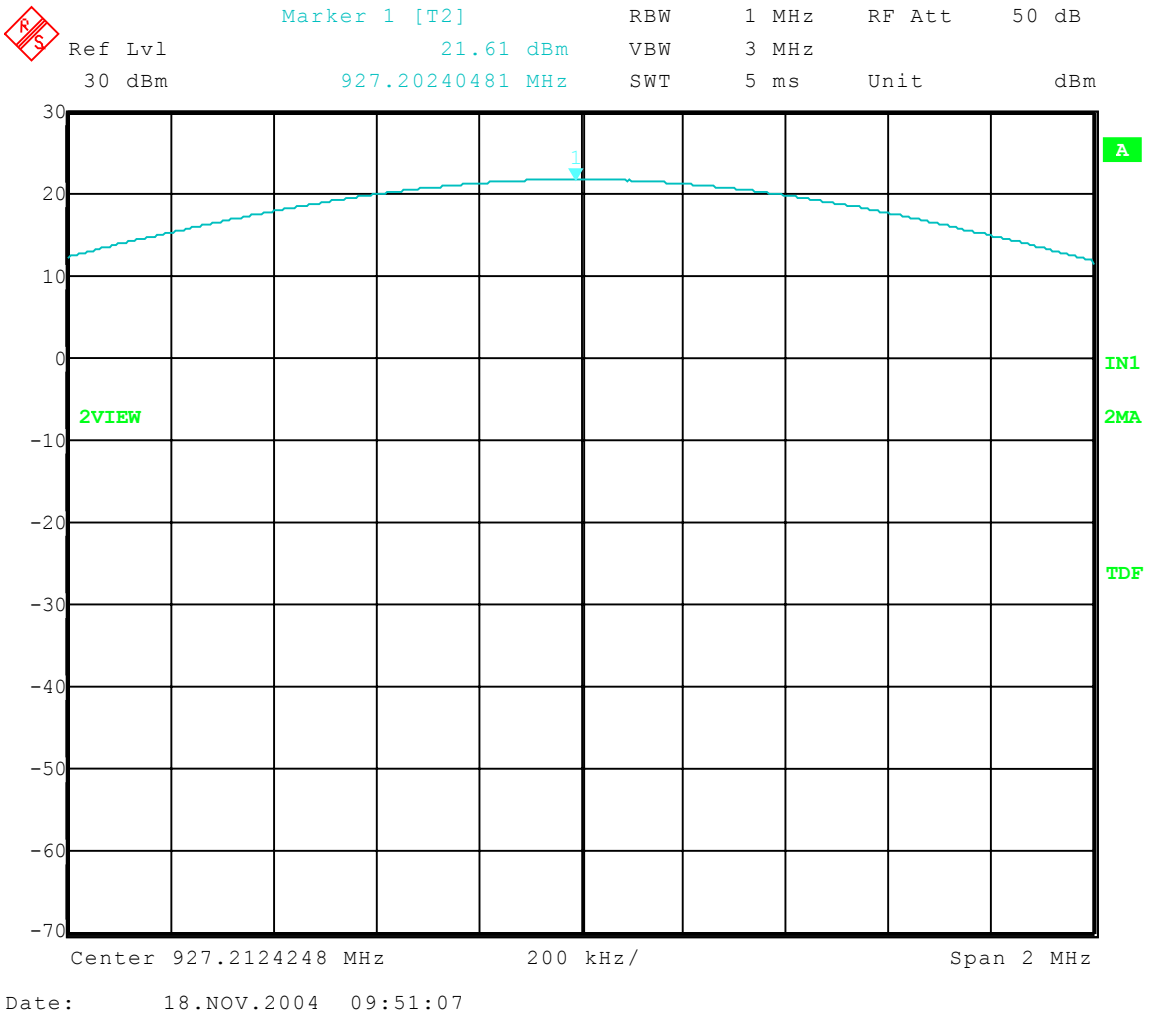


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: High Channel; Low Power: Frequency – 927.233 MHz

Peak Output Power = 21.61 dBm = 144.9 mW

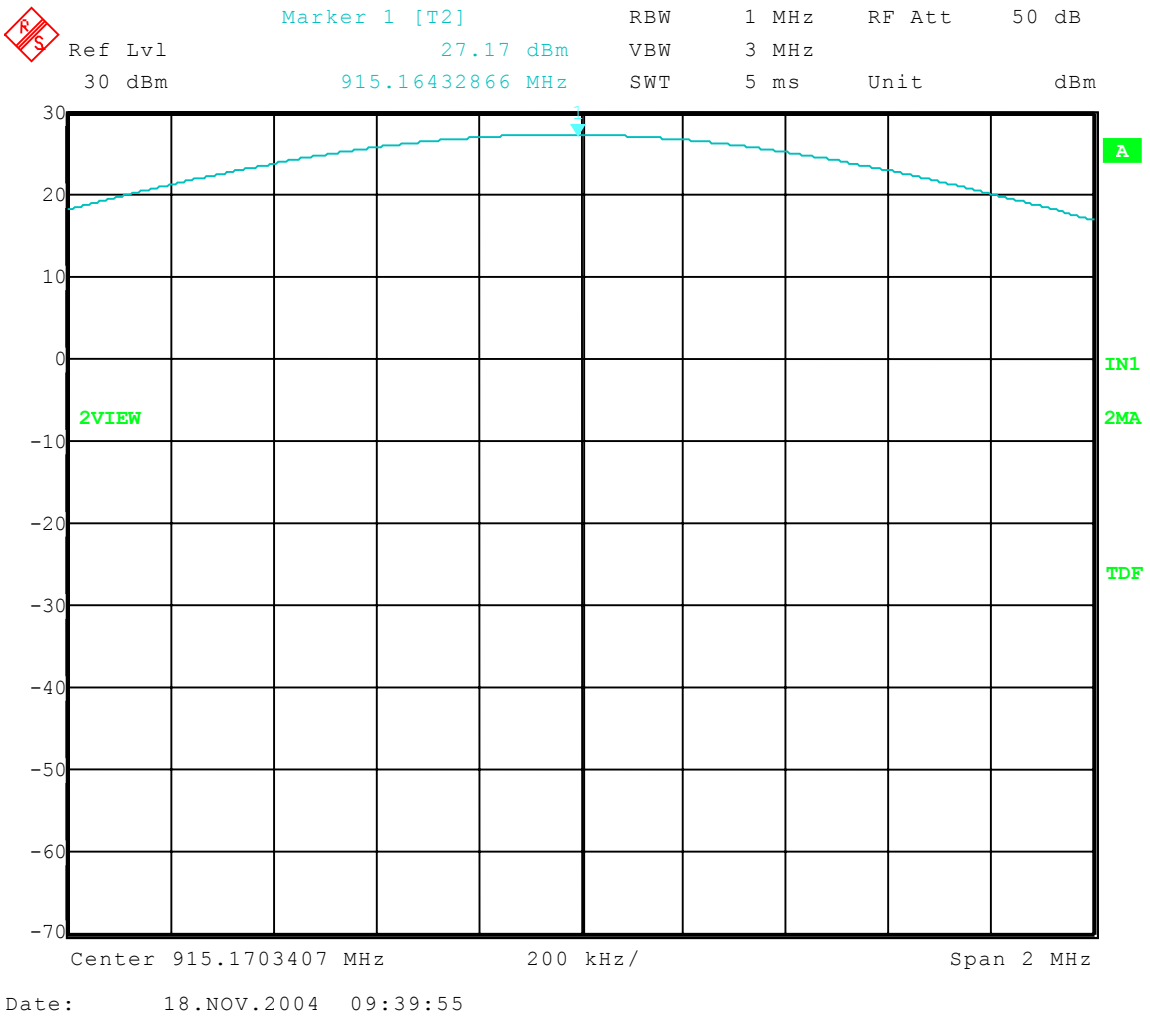


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: Middle Channel; High Power: Frequency – 915.101 MHz

Peak Output Power = 27.17 dBm = 521.2 mW

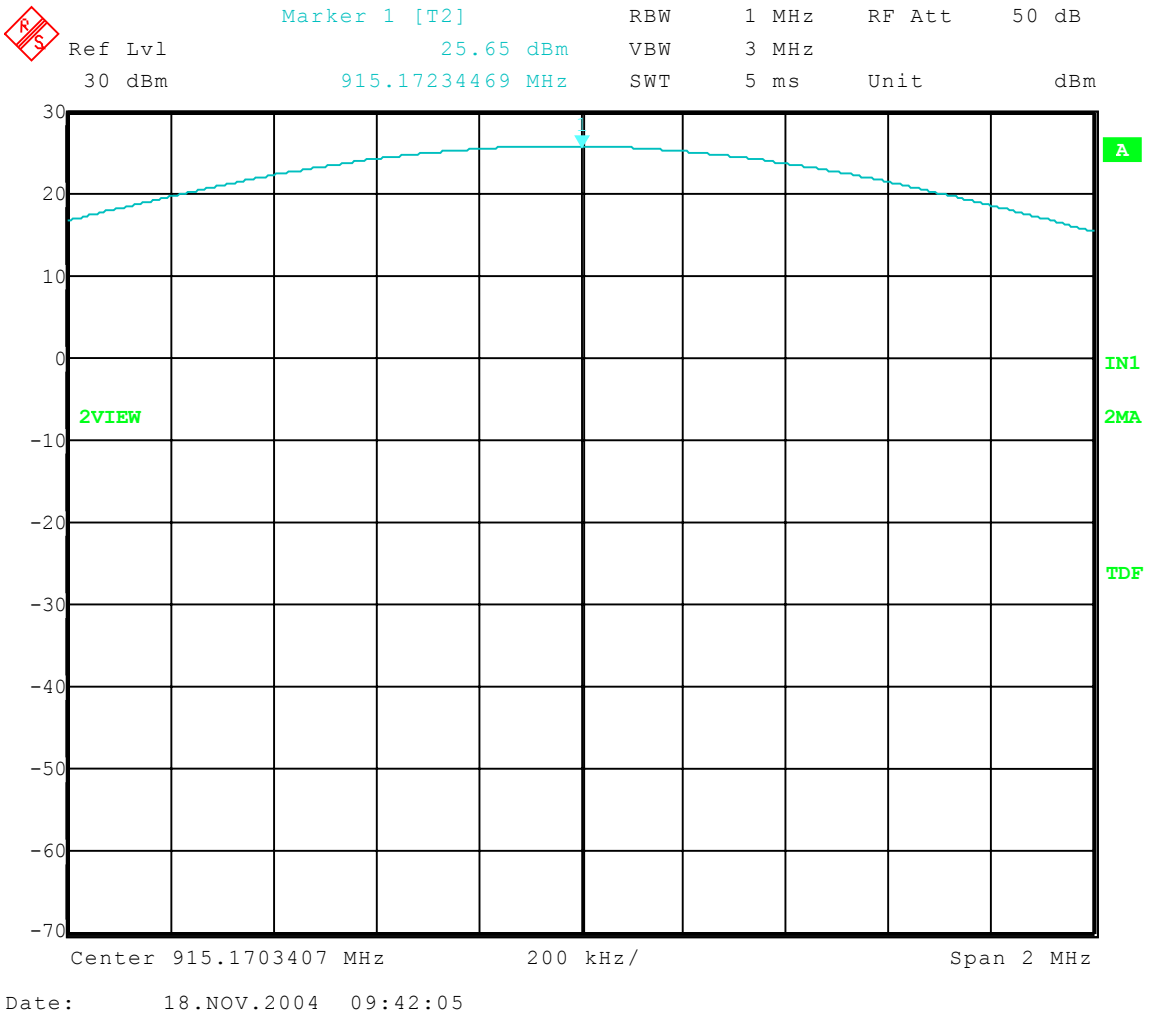


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: Middle Channel; Mid Power: Frequency – 915.101 MHz

Peak Output Power = 25.65 dBm = 367.3 mW

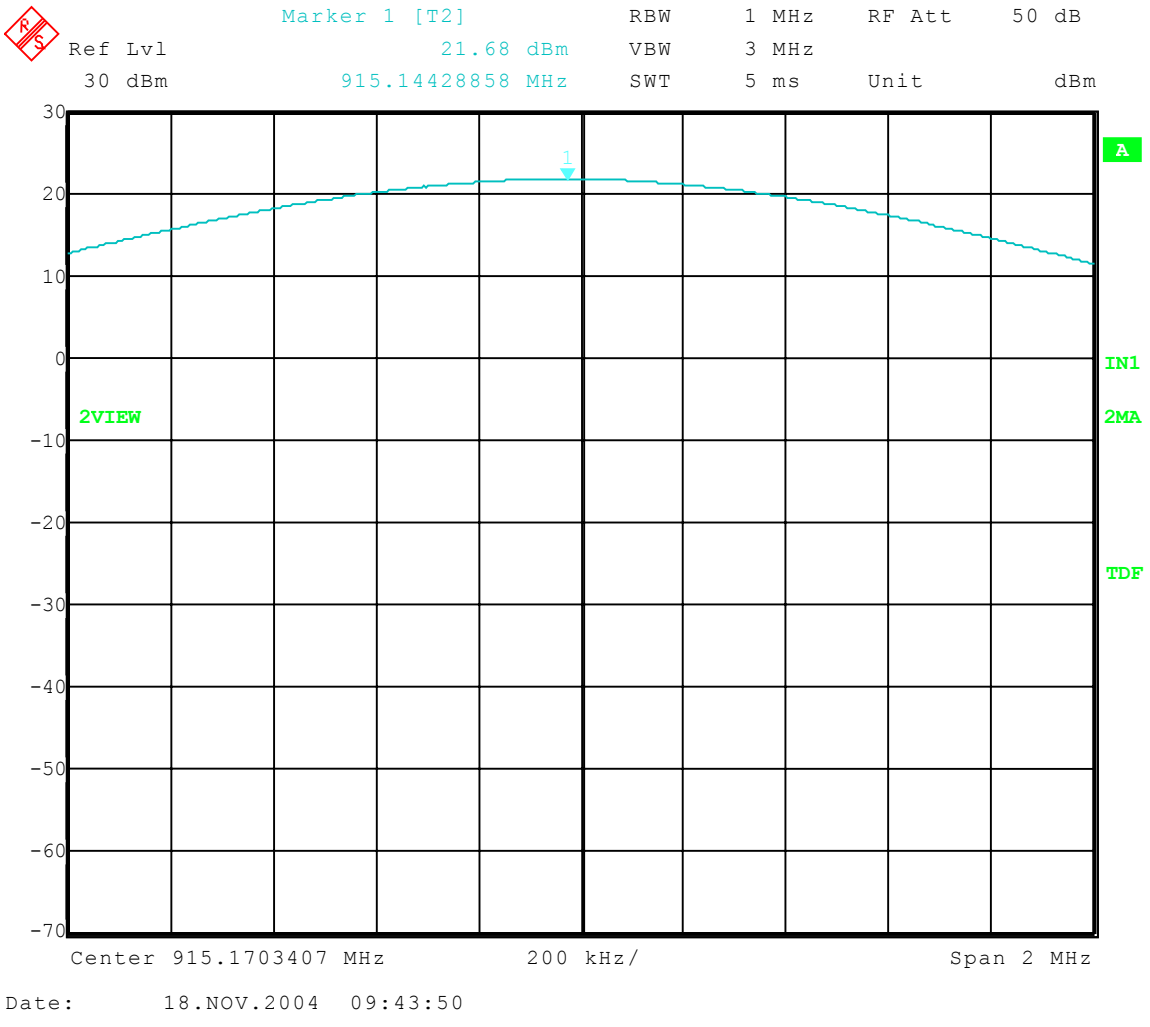


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: Middle Channel; Low Power: Frequency – 915.101 MHz

Peak Output Power = 21.68 dBm = 147.2 mW

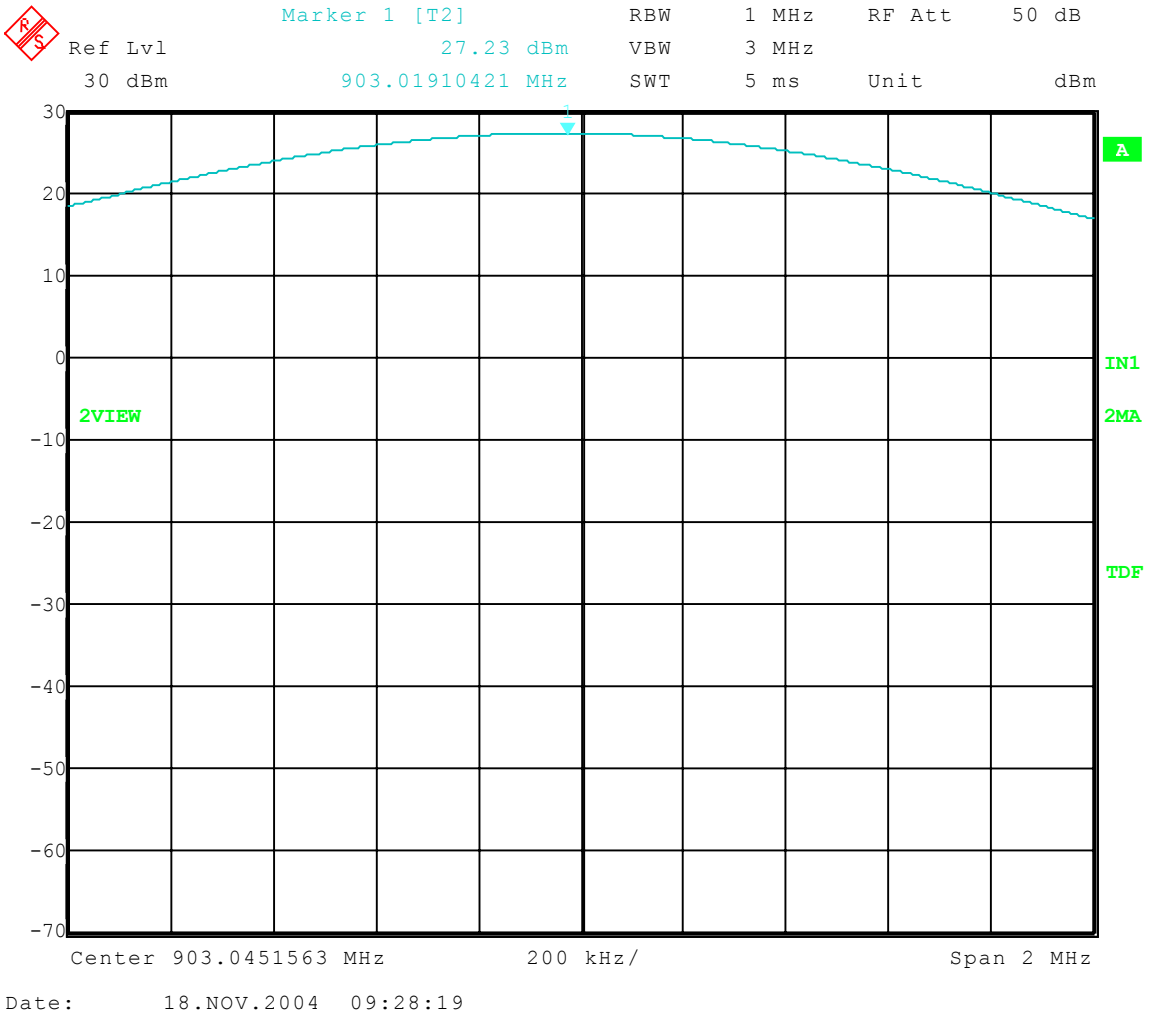


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: Low Channel; High Power: Frequency – 902.967 MHz

Peak Output Power = 27.23 dBm = 528.4 mW

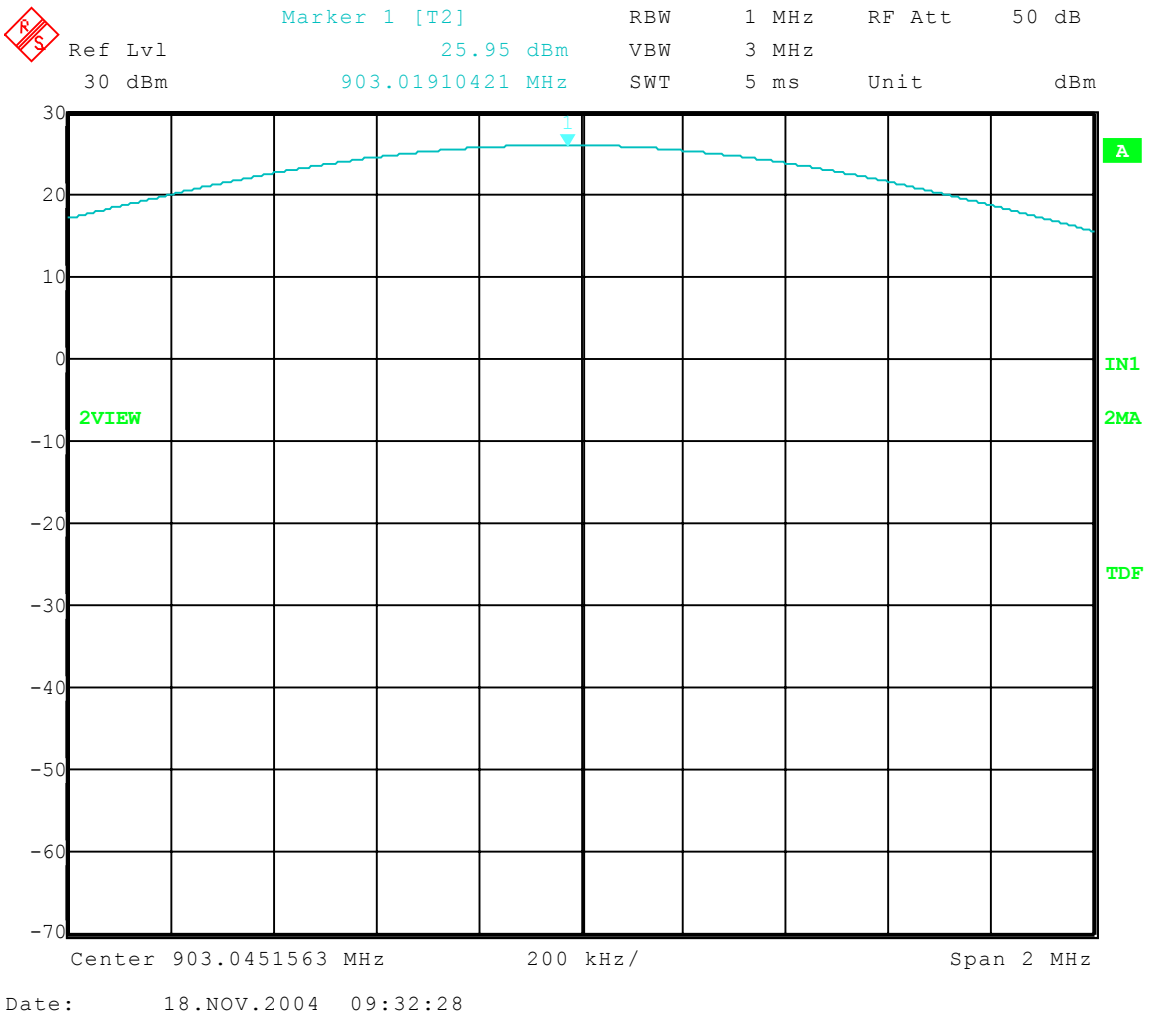


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: Low Channel; Mid Power: Frequency – 902.967 MHz

Peak Output Power = 25.95 dBm = 393.6 mW

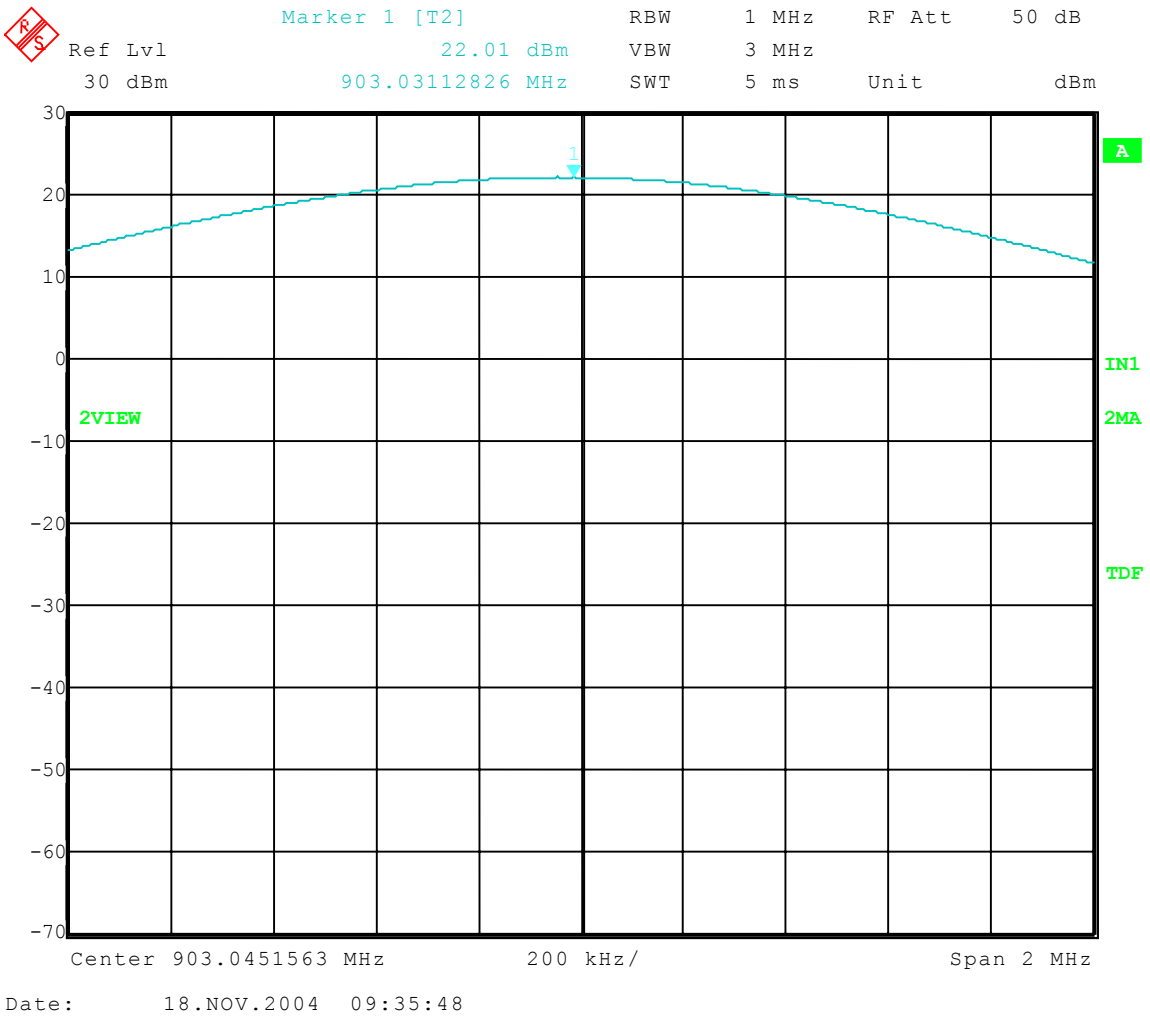


1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Test Date: 11-18-04
Company: Zebra Technologies
EUT: 170XiIII
Test: Peak Output Power - Conducted
Operator: Craig B
Comment: Low Channel; Low Power: Frequency – 902.967 MHz

Peak Output Power = 22.01 dBm = 158.8 mW



1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

SECTION 12.0

EFFECTIVE RADIATED POWER DATA

PART 15.247

1250 Peterson Dr., Wheeling, IL 60090

APPENDIX A

Company: Zebra Technologies
Model: R110PAX4
Operator: Craig Brandt
Date of test: 02-04-2005
Test: ERP

Frequency (MHz) & Polarization	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [ERP] (dBm)
902.994 vertical	102.57	13.21	6.97	2.15	6.24
902.994 horizontal	109.40	16.61	6.97	2.15	9.64
915.124 vertical	106.90	17.40	6.97	2.15	10.43
915.124 horizontal	107.25	14.70	6.97	2.15	7.73
927.189 vertical	102.50	11.91	6.97	2.15	4.94
927.189 horizontal	108.73	16.71	6.97	2.15	9.74

EIRP = Signal generator output - cable loss + antenna gain
$ERP_{(\text{ref. to } \frac{1}{2}\lambda \text{ dipole})}$ = Signal generator output - cable loss + antenna gain - 2.15
(Ref. ITU-R SM.329-8 Annex 1[1])