Elliott

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March 30, 2004

Kevin Marquess
Hyper Corporation
3000 Danville Blvd., Suite F
Alamo, CA 94507-1572

Subject: FCC Emissions Report, Bar Code Scanner

Dear Mr. Marquess:

A report has been created detailing the results of the FCC and IC electromagnetic emissions testing performed on the Bar Code Scanner. This report can be submitted to the FCC for a Grant of Equipment Authorization pursuant to Subpart C of Part 15 of FCC Rules (CFR 47) regarding intentional radiators. Please find this report enclosed.

If you have any questions, please don't hesitate to call us at 408-245-7800.

Sincerely,

Juan Martinez
Senior EMC Engineer

JM/dmg
Enclosure: R55061

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Electromagnetic Emissions Test Report and Application for Grant of Equipment Authorization pursuant to FCC Part 15, Subpart C (15.247) FHSS Specifications for an Intentional Radiator on the Hyper Corporation Model: Bar Code Scanner

FCC ID:	OMG0008
GRANTEE:	Hyper Corporation 3000 Danville Blvd., Suite F Alamo, CA 94507-1572
TEST SITE:	Elliott Laboratories, Inc. 684 W. Maude Avenue Sunnyvale, CA 94086
REPORT DATE:	March 30, 2004
FINAL TEST DATE:	February 23, 2004
AUTHORIZED SIGNATORY:	Juan Martinez Senior EMC Engineer

ACCREDITED

TABLE OF CONTENTS

SCOPE

An electromagnetic emissions test has been performed on the Hyper Corporation model Bar Code Scanner pursuant to Subpart C of Part 15 of FCC Rules for intentional radiators. Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in ANSI C63.4-1992 as outlined in Elliott Laboratories test procedures.

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant FCC performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the Hyper Corporation model Bar Code Scanner and therefore apply only to the tested sample. The sample was selected and prepared by Kevin Marquess of Hyper Corporation

OBJECTIVE

The primary objective of the manufacturer is compliance with Subpart C of Part 15 of FCC Rules for the radiated and conducted emissions of intentional radiators. Certification of these devices is required as a prerequisite to marketing as defined in Part 2 the FCC Rules.

Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to the FCC. The FCC issues a grant of equipment authorization upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units that are subsequently manufactured.

SUMMARY OF RESULTS

Note – remove references in the table below that do not apply to the radio tested

FCC Part 15 Section	RSS 210 Section	Description	Measured Value	Comments	Result
	6.2.2(o)(a)	20dB Bandwidth	Refer to data provided by Client	The channel spacing shall be greater than the 20dB bandwidth	Complies
	6.2.2(o)(a)	Channel Separation	Refer to data provided by Client		Complies
	6.2.2(o)(a)	Number of Channels	Refer to data provided by Client	**2400- 2483.5 MHz**: 75 hopping frequencies: average time of occupancy <0.4 second within a 30 second period. *Less than 75 hopping frequencies: The total span of hopping channels shall be at least 75 MHz. The time of occupancy on any one channel shall be no greater than 0.4 seconds within the time period required to hop through all channels*	Complies
	6.2.2(o)(a)	Channel Dwell Time	Refer to data provided by Client		Complies
	6.2.2(o)(a)	Channel Utilization	All channels are used equally	Bluetooth® Devices: The system uses the Bluetooth® algorithm and, therefore, meets all requirements for channel utilization.	Complies
15.247 (b) (3)	6.2.2(o)(a)	Output Power, 2400 - 2483.5 MHz	2.9 dBm (0.00194 Watts) EIRP = 0.00194 W	Multi-point applications: **2400 – 2483.5 MHz** Maximum permitted is 1Watt, with EIRP limited to 4 Watts for a 50-	Complies

				channel system. Maximum permitted is *0.125 Watts for a system that uses less than 75 channels*	
15.247(c)	6.2.2(o)(e1)	Spurious Emissions – 30MHz – 25GHz	All spurious emissions < -20dBc	All spurious emissions < -20dBc.	Complies
15.247(c) / 15.209		Radiated Spurious Emissions 30MHz – 25GHz	47.5 dBuV/m @ 7323.558 MHz (-6.5 dB)	Emissions in restricted bands must meet the radiated emissions limits detailed in 15.207. All others must be < -20dBc	Complies
15.207		AC Conducted Emissions	45.4 dBuV @ 0.320 MHz (-14.3dB)		Complies
	6.6	AC Conducted Emissions	31dBuV @ 10 MHz (-17dB)		Complies
15.247 (b) (5)		RF Exposure Requirements	FCC /IC limits of power density not exceeded provided antenna is located a minimum of ?? cm from persons	Refer to MPE calculation for 17.5cm derivation. Refer to User's Guide for installation instructions requiring a 20cm separation	Complies
15.203		RF Connector	Integral to device	Integral antenna	Complies

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with NAMAS document NIS 81.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	30 to 1000	± 3.6

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Hyper Corporation model Bar Code Scanner is a barcode reader with a Bluetooth transceiver which is designed to scan bar codes and transmit the data via the transceiver to a PC. Normally, the EUT would be placed on a tabletop during operation. The EUT was, therefore, treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3Vdc.

The sample was received on February 23, 2004 and tested on February 23, 2004. The EUT consisted of the following component(s):

Manufacturer/Model/Description	Serial Number	Proposed FCC ID #
Datalogic BT200-CS Bar Code Reader w/ Bluetooth	N/A	OMG0008

ENCLOSURE

The EUT enclosure is primarily constructed of molded plastic. It measures approximately 3.5 cm wide by 4 cm deep by 24 cm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with the emission specifications.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

		Cable(s)		
Port	Connected To	Description	Shielded or Unshielded	Length (m)
None				

EUT OPERATION DURING TESTING

Continuously transmitting at maximum power

ANTENNA REQUIREMENTS

The antenna port is a integral to the device and is part of the PCB board, which meets the requirements of 15.203.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on February 23, 2004 at the Elliott Laboratories Open Area Test Site #3 & 4 located at 684 West Maude Avenue, Sunnyvale, California. The test site contains separate areas for radiated and conducted emissions testing. Pursuant to section 2.948 of the Rules, construction, calibration, and equipment data has been filed with the Federal Communications Commission. In accordance with Industry Canada rules detailed in RSS 210 Issue 5 and RSS-212, construction, calibration, and equipment data for the test sites have been filed with the Federal Communications Commission.

The FCC recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent FCC requirements.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4-1992. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment. The test site is maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde and Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

POWER METER

A power meter and peak power sensor are used for all direct output power measurements from transmitters as they provide a broadband indication of the power output.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A biconical antenna is used to cover the range from 30 MHz to 300 MHz and a log periodic antenna is utilized from 300 MHz to 1000 MHz. Narrowband tuned dipole antennas are used over the entire 30 to 1000 MHz range for precision measurements of field strength. Above 1000 MHz, a horn antenna is used. The antenna calibration factors are included in site factors programmed into the test receivers.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height.

ANSI C63.4 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The FCC requires that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4, and the worst case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

RADIATED EMISSIONS

Radiated emissions measurements are performed in two phases as well. A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed from 30 MHz up to the frequency required by the regulation specified on page 1. One or more of these is with the antenna polarized vertically while the one or more of these is with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit.

A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth which results in the highest emission is then maintained while varying the antenna height from one to four meters. The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain. Emissions which have values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements are performed with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.

Measurement bandwidths (video and resolution) are set in accordance with FCC procedures for the type of radio being tested.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions from the AC power port are given in units of microvolts, the limits for radiated electric field emissions are given in units of microvolts per meter at a specified test distance and the output power limits are given in temrs of Watts, milliwatts or dBm. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp) the following formula is used to determine the field strength limit in terms of microvolts per meter at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

For reference, converting the voltage and electric field strength specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. Conversion of power specification limits from linear units (in milliwatts) to decibel form (in dBm) is accomplished by taking the base ten logarithm, then multiplying by 10.

FCC 15.247 (a)and RSS 210 (o) OUTPUT POWER LIMITS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Number Of Channels	Output Power
902 – 928	>=50	1 W (30 dBm)
902 – 928	< 50	0.25 W (24 dBm)
2400 – 2483.5	>= 75	1 W (30 dBm)
2400 – 2483.5	>= 75	0.125 W (21 dBm)
5725 – 5850	>=75	1 W (30 dBm)

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

RSS 210 (o) AND FCC 15.247 SPURIOUS RADIATED EMISSIONS LIMITS

T limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands detailed in Part 15.205 and for all spurious emissions from the receiver are:

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level.

FCC AC POWER PORT CONDUCTED EMISSIONS LIMITS

The table below shows the limits for emissions on the AC power line as detailed in FCC Part 15.207.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

RSS-210 SECTION 6.6 AC POWER PORT CONDUCTED EMISSIONS LIMITS

The table below shows the limits for emissions on the AC power line as detailed in Industry Canada RSS-210 section 6.6.

Frequency Range (MHz)	Limit (uV)	Limit (dBuV)
0.450 to 30.000	250	48

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - B = C$$

and

$$C - S = M$$

where:

R_r = Receiver Reading in dBuV

B = Broadband Correction Factor*

C = Corrected Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

* Broadband Level - Per ANSI C63.4, 13 dB may be subtracted from the quasi-peak level if it is determined that the emission is broadband in nature. If the signal level in the average mode is six dB or more below the signal level in the peak mode, the emission is classified as broadband.

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements. A distance factor, when used for electric field measurements, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

EXHIBIT 1: Test Equipment Calibration Data

1 Page

Conducted Emissions - AC Power Ports, 23-Feb-04
Engineer: Juan Martinez

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	FCC / CISPR LISN	LISN-4, OATS	362	01-Jul-04
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	372	17-Jul-04
Fischer Custom Comm.	LISN, Freq. 0.9 -30 MHz,16 Amp	FCC-LISN-50/250-16-2	1079	01-Jul-04
Rohde & Schwarz	Test Receiver, 0.009-30 MHz	ESH3	1316	15-Dec-04

EXHIBIT 2: Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS

TEST LOG SHEETS

AND

MEASUREMENT DATA

T54519 15 Pages

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EMC Test Data

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Emissions Spec:	FCC 15.209, 15.247, RSS-210	Class:	B / Radio
		Environment:	

EMC Test Data

For The

Hyper Corp on behalf of Datalogic

Model

BT200-CS

Date of Last Test: 2/23/2004

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Emissions Spec:	FCC 15.209, 15.247, RSS-210	Class:	B / Radio
		Environment:	

EUT INFORMATION

General Description

The EUT is a barcode reader with a Bluetooth transceiver which is designed to scan bar codes and transmit the data via the transceiver to a PC. Normally, the EUT would be placed on a table top during operation. The EUT was, therefore, treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3Vdc.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Datalogic	BT200-CS	Bar Code reader w/ Bluetooth	N/A	OMG0008

EUT Enclosure

The EUT enclosure is primarily constructed of molded plastic. It measures approximately 3.5 cm wide by 4 cm deep by 24 cm high.

Modification History

Mod. #	Test	Date	Modification
1	-	-	-

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Emissions Spec:	FCC 15.209, 15.247, RSS-210	Class:	B / Radio
		Environment:	

Test Configuration #1

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Dell	PPX	Laptop	62HMW	DoC
Alpha Electronics	BFL 25 412/115P	Power Supply	N/A	N/A
Hyper Corp	N/A	Charger	C03110400	N/A
HP	2225C	Printer	2714540166	N/A

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None				

Interface Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
EUT RS-232	Laptop	Multiwire	Shielded	1.2
Parrallel	Laptop	Multiwire	Shielded	2
DC input to EUT	AC mains	2 wire	Unshielded	1.5

EUT Operation During Emissions

Continously Transmitting at maximum power

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Emissions Spec:	FCC 15.209, 15.247, RSS-210	Class:	B / Radio
		Environment:	

Test Configuration #2

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None				

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None				

Interface Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
None				

EUT Operation During Emissions

Continously Transmitting at maximum power

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	B / Radio

Conducted Emissions - Power Ports

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 2/23/2004
Test Engineer: Juan Martinez
Test Location: SVOATS #3
Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment.

Ambient Conditions:

Temperature: 15 °C
Rel. Humidity: 59 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	FCC 15.207	Pass	-14.3dB @ 0.320MHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

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EMC Test Data

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	B / Radio

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

Frequency	Level	AC	FCC 15.207		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.320	45.4	Line 1	59.7	-14.3	QP	
0.378	44.0	Line 1	58.3	-14.3	QP	
0.218	48.1	Line 1	62.8	-14.7	QP	
0.156	50.0	Line 1	65.5	-15.5	QP	
0.161	45.2	Neutral	65.2	-20.0	QP	
0.190	43.7	Neutral	64.0	-20.3	QP	
0.220	42.3	Neutral	62.8	-20.5	QP	
0.252	41.0	Neutral	61.6	-20.6	QP	
0.307	38.5	Neutral	60.0	-21.5	QP	
0.378	14.3	Line 1	48.3	-34.0	AV	
0.320	15.4	Line 1	49.7	-34.3	AV	
0.307	14.7	Neutral	50.0	-35.3	AV	
0.161	18.8	Neutral	55.2	-36.4	AV	
0.218	15.9	Line 1	52.8	-36.9	AV	
0.252	13.9	Neutral	51.6	-37.7	AV	
0.156	17.3	Line 1	55.5	-38.2	AV	
0.220	14.6	Neutral	52.8	-38.2	AV	
0.190	14.8	Neutral	54.0	-39.2	AV	

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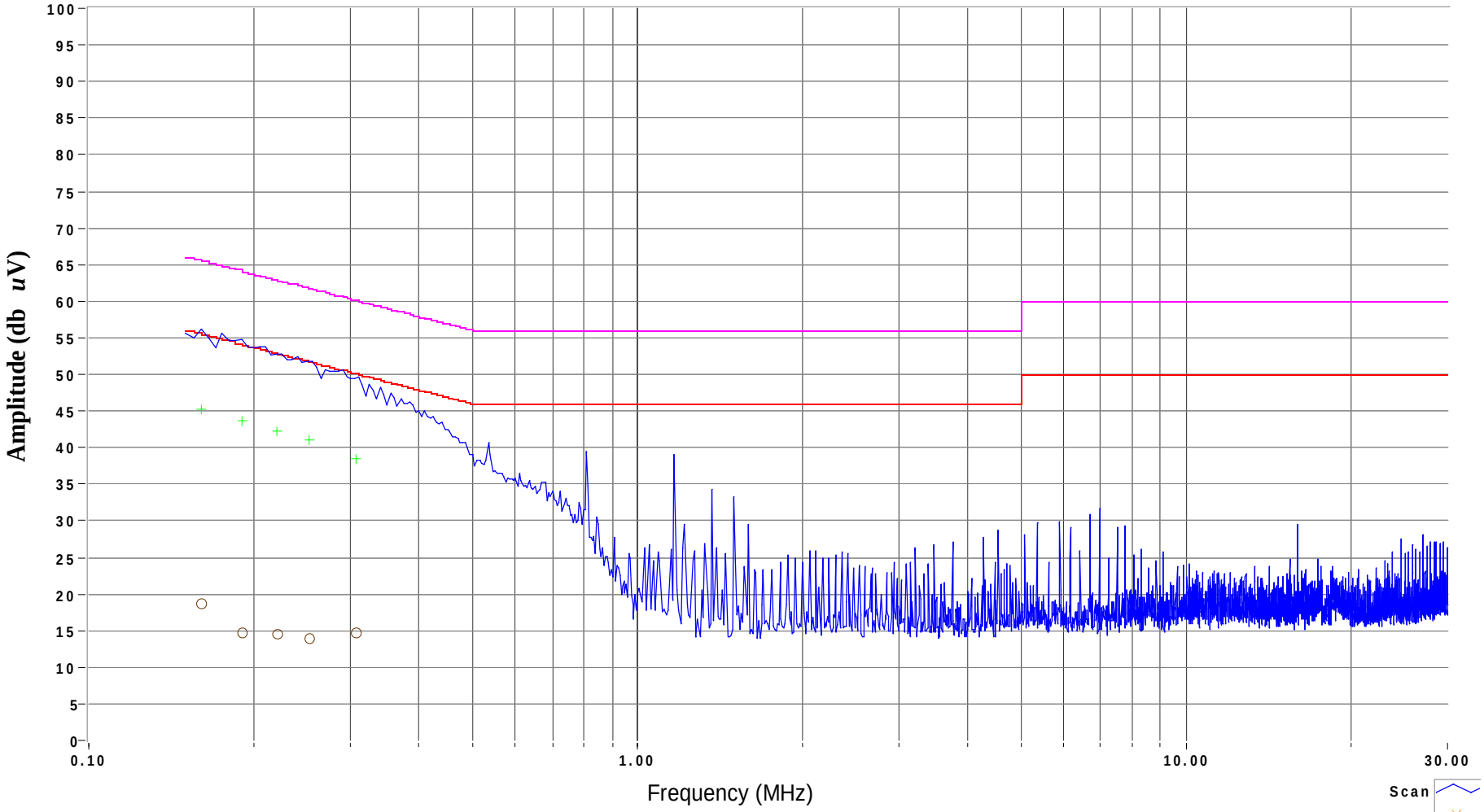
SVOATS# 3: DataLogic BT200-CS Run 2

Spec: FCC 15.207

Mains Lead Neutral

Bar Code Reader w/ Bluetooth



120Vac. 60Hz

Scan
Peak
Quasi-peak
Average
Average Limit
QuasiPeak Limit

2/23/04

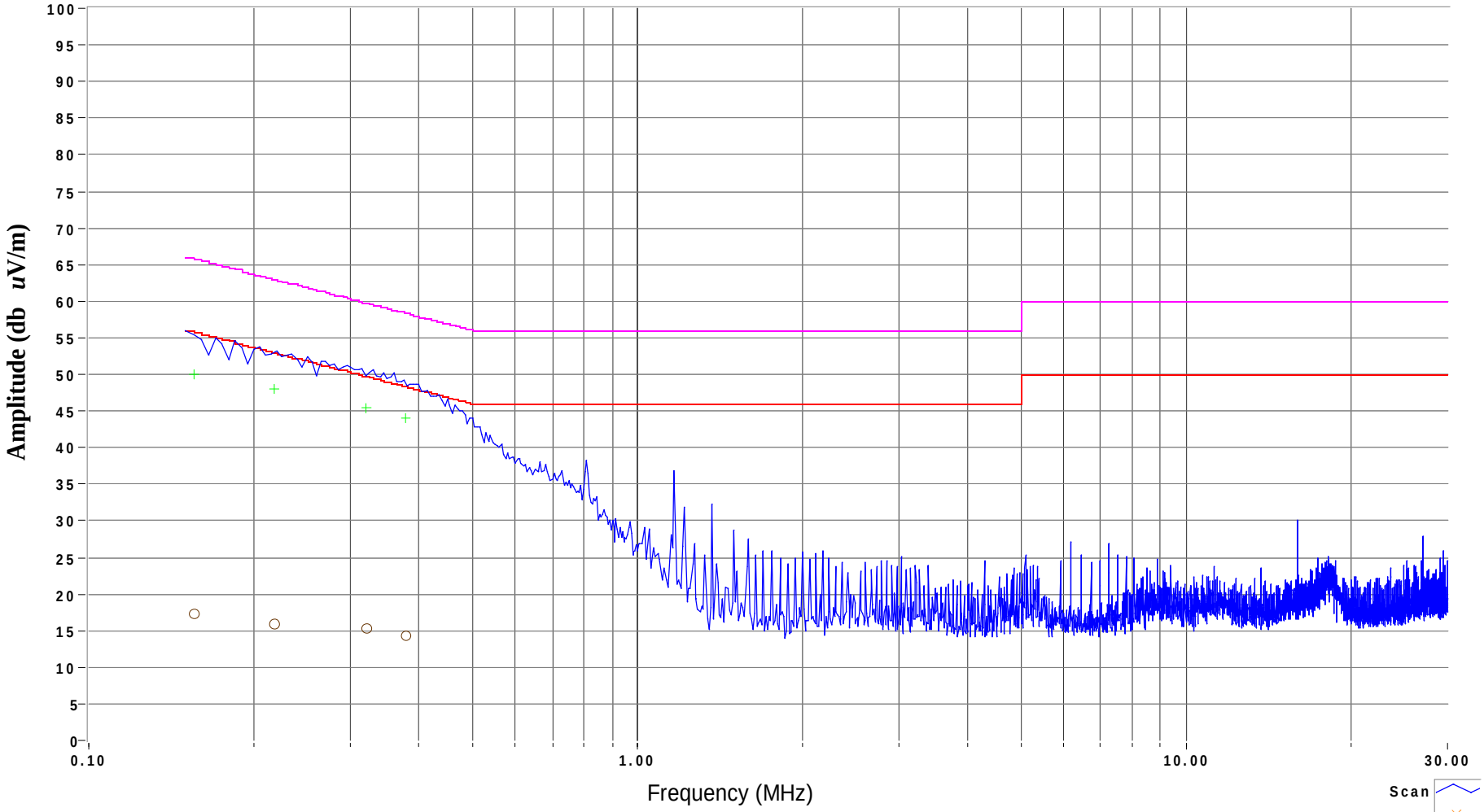
Juan Martinez

SVOATS# 3: Datalogic BT200-CS Run 1

Spec:
FCC 15.207

Mains Lead
Line 1

Bar Code Reader w/ Bluetooth



120Vac. 60Hz

Scan
Peak
Quasi-peak
Average
Average Limit
QuasiPeak Limit

2/23/04

Juan Martinez

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	N/A

Radiated Emissions

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 2/23/2004
Test Engineer: Juan Martinez
Test Location: SVOATS #4
Config. Used: 2
Config Change: None
EUT Voltage: 3 Vdc

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Unless stated otherwise the EUT was operating such that it constantly hopped on either the low, center or high channels.

Ambient Conditions:

Temperature: 15 °C
Rel. Humidity: 59 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1a	RE, 30 - 26,500 MHz - Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	-9.8dB @ 7205.67 MHz
1b	RE, 30 - 26,500 MHz - Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	-6.5dB @ 7323.64 MHz
1c	RE, 30 - 26,500 MHz - Spurious Emissions	FCC Part 15.209 / 15.247(c)	Pass	-7.8dB @ 7442.54 MHz
2	Output Power	15.247(b)	Pass	2.9 dBm

Modifications Made During Testing:

No modifications were made to the EUT during testing

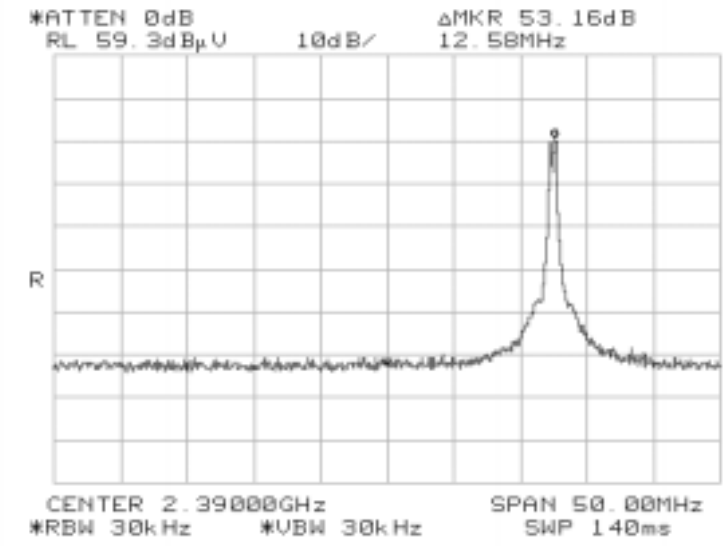
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	N/A

Run #1a: Radiated Spurious Emissions, 30 - 26,500 MHz. Low Channel @ 2402 MHz

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	92.6	97.36	Peak Measurement (RBW=VBW = 1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	76.72	82.07	Average Measurement (RBW=VBW = 10Hz)
Delta Marker - Peak	53.16 dB		
Delta Marker - Average	53.16 dB		
Calculated Band-Edge Measurement:	44.2 dBuV/m		Peak Measurement (RBW=VBW = 1MHz)
Calculated Band-Edge Measurement:	28.91 dBuV/m		Average Measurement (RBW=VBW = 10Hz)



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EMC Test Data

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Standing								
2401.915	92.6	H	-	-	PK	80	1.1	Low Channel
2401.875	97.4	V	-	-	PK	264	1.3	Low Channel
On side								
2401.865	88.7	V	-	-	PK	87	1.3	Low Channel
2402.225	94.1	H	-	-	PK	260	1.8	Low Channel
Laying flat								
2401.870	96.5	H	-	-	PK	31	2.0	Low Channel
2401.910	95.9	V	-	-	PK	275	1.3	Low Channel
Spurious Emissions:								
7206.519	66.3	V	76.5	-10.2	PK	303	1.0	Low Channel
7205.569	66.7	H	76.5	-9.8	PK	290	1.1	Low Channel
4808.010	32.6	H	54.0	-21.4	AVG	163	1.0	2nd harmonic, Noise Floor
4808.010	44.0	H	74.0	-30.0	PK	163	1.0	2nd harmonic, Noise Floor
4807.430	32.6	V	54.0	-21.4	AVG	14	1.0	2nd harmonic, Noise Floor
4807.430	43.5	V	74.0	-30.5	PK	14	1.0	2nd harmonic, Noise Floor

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental.
Note 2:	

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EMC Test Data

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	N/A

Run #1b: Radiated Spurious Emissions, 30 - 26,500 MHz. Center Channel @ 2441 MHz

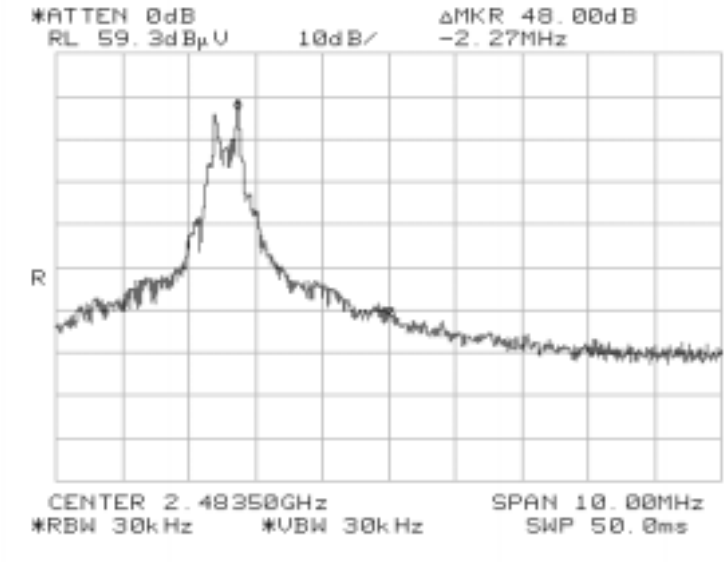
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Standing								
2440.855	96.3	V	-	-	PK	276	1.2	Middle Channel
2440.460	93.1	H	-	-	PK	84	1.6	Middle Channel
On side								
2441.215	94.0	H	-	-	PK	355	2.0	Middle Channel
2440.875	89.8	V	-	-	PK	276	1.2	Middle Channel
Laying flat								
2440.895	94.9	V	-	-	PK	97	1.0	Middle Channel
2440.865	98.2	H	-	-	PK	172	2.0	Middle Channel
Spurious Emission:								
4882.291	33.2	H	54.0	-20.8	AVG	361	1.0	2nd Harmonic
4882.291	44.5	H	74.0	-29.5	PK	361	1.0	2nd Harmonic
7323.558	47.5	H	54.0	-6.5	AVG	108	1.2	3rd Harmonic
7323.558	65.2	H	74.0	-8.8	PK	108	1.2	3rd Harmonic
4882.250	35.5	V	54.0	-18.5	AVG	170	1.0	2nd Harmonic
4882.250	48.5	V	74.0	-25.5	PK	170	1.0	2nd Harmonic
7322.538	46.4	V	54.0	-7.7	AVG	123	1.3	3rd Harmonic
7322.538	63.7	V	74.0	-10.3	PK	123	1.3	3rd Harmonic

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental.
Note 2:	

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	N/A

Run #1c: Radiated Spurious Emissions, 30 - 26,500 MHz. High Channel @ 2480 MHz

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	95.2	96.7	Peak Measurement (RBW=VBW = 1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	79.84	81.39	Average Measurement (RBW=VBW = 10Hz)
Delta Marker - Peak	48 dB		
Delta Marker - Average	48 dB		
Calculated Band-Edge Measurement:	48.7 dBuV/m		Peak Measurement (RBW=VBW = 1MHz)
Calculated Band-Edge Measurement:	33.39 dBuV/m		Average Measurement (RBW=VBW = 10Hz)



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EMC Test Data

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	N/A

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Standing								
2480.885	95.2	H	-	-	PK	249	1.4	High Channel
2481.170	96.7	V	-	-	PK	250	1.4	High Channel
On side								
2481.245	89.5	V	-	-	PK	260	1.0	High Channel
2481.200	91.5	H	-	-	PK	227	2.0	High Channel
Laying flat								
2481.245	93.2	V	-	-	PK	274	1.0	High Channel
2480.840	93.9	H	-	-	PK	98	1.2	High Channel
Spurious Emission (Tested at worst case orientation, Standing):								
4962.488	38.4	H	54.0	-15.6	AVG	285	1.0	
4962.488	51.6	H	74.0	-22.4	PK	285	1.0	
7442.523	46.2	H	54.0	-7.8	AVG	306	1.0	
7442.523	63.4	H	74.0	-10.6	PK	306	1.0	
4961.408	34.7	V	54.0	-19.3	AVG	0	1.0	
4961.408	45.9	V	74.0	-28.1	PK	0	1.0	
7443.454	46.0	V	54.0	-8.1	AVG	263	1.0	
7443.454	63.3	V	74.0	-10.7	PK	263	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental.
Note 2:	

Client:	Hyper Corp on behalf of Datalogic	Job Number:	J54470
Model:	BT200-CS	T-Log Number:	T54519
		Account Manager:	Chrsitine Vu
Contact:	Kevin Marquess		
Spec:	FCC 15.209, 15.247, RSS-210	Class:	N/A

Run #2: Output Power

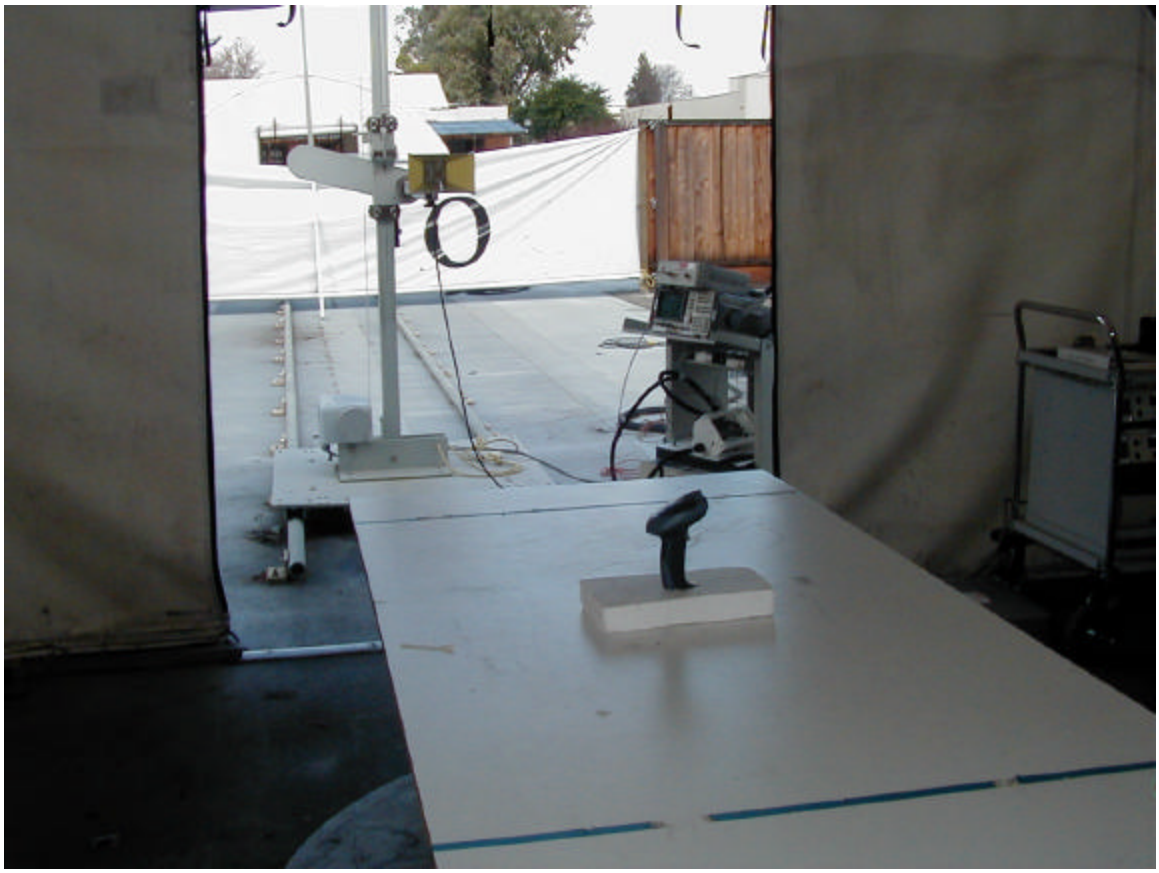
Channel	Frequency (MHz)	Field Strength at 3m	Antenna Pol. (H/V)	Res BW	Output Power
Low	2401.92	92.6	H	1MHz	-2.7
Mid	2440.46	98.2	H	1MHz	2.9
High	2481.17	95.2	H	1MHz	-0.1
Low	2401.92	97.4	V	1MHz	2.1
Mid	2440.46	94.5	V	1MHz	-0.8
High	2481.17	96.7	V	1MHz	1.4

Note 1:	Add note here
Note 2:	

EXHIBIT 3: Test Configuration Photographs

4 Pages

Radiated Emission (1 of 2)



Radiated Emission (2 of 2)

AC conducted Emission (1 of 2)

AC conducted Emission (2 of 2)