

FCC PART 15, SUBPART B and C
TEST REPORT
for
CORDLESS IMPACT WRENCH
Model: **EYFPA1JR**

Prepared for

C.E. ELETRONICS, INC.
2107 INDUSTRIAL DRIVE
BRYAN, OHIO 43506

Prepared by:  _

KENNETH LEE

Approved by:  _

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COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: FEBRUARY 20, 2015

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	15	2	2	2	13	29	63

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested: Cordless Impact Wrench
Model: EYFPA1JR
S/N: N/A

Product Description: The equipment under test is a Cordless Impact Wrench.

Modifications: The equipment under test was not modified in order to meet the specifications.

Manufacturer: C.E. Electronics, Inc.
2107 Industrial Drive
Bryan, Ohio 43506

Test Date: February 19, 2015

Test Specifications: Emissions requirements
CFR Title 47, Part 15, Subpart B and Subpart C, Sections 15.205, 15.209, and 15.249

Test Procedure: ANSI C63.4

Test Deviations: The test procedure was not deviated from during the testing.

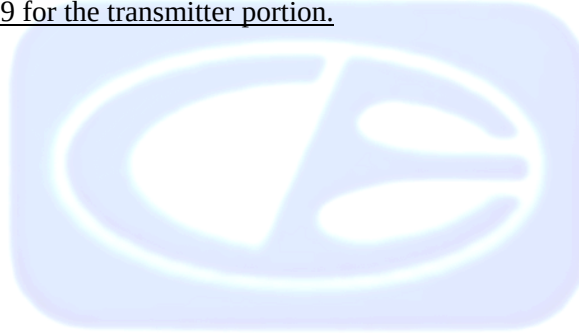
SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, AC Lines, 150 kHz – 30 MHz	This test is not applicable because the EUT is DC powered and does not connect to the public AC mains.
2	Radiated RF Emissions, 10 KHz – 25000 MHz	Complies with the Class B limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.249

*U = Expanded Uncertainty with a coverage factor of k=2

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Cordless Impact Wrench, Model: EYFPA1JR. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The Emissions tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

C.E. Electronics, Inc.

Tony Casterline System Design Engineer

Compatible Electronics, Inc.

Kenneth Lee Test Technician

James Ross Test Engineer

Michael Christensen Lab Manager, Brea Division

2.4 Date Test Sample was Received

The test sample was first received on February 19, 2015.

2.5 Disposition of the Test Sample

The test sample has not yet been returned to C.E. Electronics, Inc. as of the date of this report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

FCC	Federal Communications Commission
CISPR	Comité International Special Des Perturbations Radioelectriques
RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
S/N	Serial Number
P/N	Part Number
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations
N/A	Not Applicable
DoC	Declaration of Conformity
PC	Personal Computer
Inc.	Incorporated
PCB	Printed Circuit Board
LCD	Liquid Crystal Display
VDC	Voltage Direct Current
LED	Light Emitting Diode

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this Emissions Test Report.

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4: 2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10: 2009	American National Standard for Testing Unlicensed Wireless Devices
EN 50147-2: 1997	Anechoic chambers. Alternative test site suitability with respect to site attenuation
CISPR 22: 2008	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – Emissions

The Cordless Impact Wrench, Model: EYFPA1JR (EUT) is a stand-alone device powered by a 21.6 VDC battery pack. Prior to each test a receiver unit was used to set the channel of operation.

The EUT was tested for emissions at the low, middle, and high channels while in the X, Y and Z axis. The EUT was continuously transmitting.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the spectrum analyzer in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
CORDLESS IMPACT WRENCH (EUT)	C.E. ELECTRONICS, INC.	EYFPA1JR	N/A	O4O-EYFPA
BATTERY PACK	PANASONIC	EYFB60	N/A	N/A
RECIEVER	PANASONIC	EYFR02	N/A	OUR-XBEE

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB B					
Computer	Compaq	CQ5210F	CNX9360CF9	N/A	N/A
Monitor	Hewlett Packard	HPs2031a	3CQ046N3MD	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	December 4, 2014	1 Year
GENERAL TEST EQUIPMENT USED IN LAB D					
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Agilent Technologies	N9038A	MY51100115	March 6, 2014	2 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
CombiLog Antenna	Com-Power	AC-220	61060	May 20, 2014	1 Year
Preamplifier	Com-Power	PA-118	181656	January 15, 2015	1 Year
Preamplifier	Com-Power	PA-840	711013	May 13, 2014	2 Year
Loop Antenna	Com-Power	AL-130	17089	February 6, 2015	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2014	2 Year
Horn Antenna	Com-Power	AH-826	0071957	N/A	N/A
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A

6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

Please refer to section 2.1 and 7.1 of this report for emissions test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded during testing.

6.3 Facility Environmental Characteristics

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Radiated Emissions (Spurious and Harmonics) Test – Lab B

The EMI Receiver was used as a measuring meter. A preamplifier was used to increase the sensitivity of the instrument. The Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz and the PA 840 for frequencies above 18 GHz. The EMI Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

The measurement bandwidth and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
1 GHz to 18 GHz	1 MHz	Horn Antenna
18 GHz to 25 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2009. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test -- Lab B (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 1 GHz to 25 GHz to obtain the final test data.

The EUT was tested at a 3 meter test distance. The six highest emissions are listed in Table 1.0.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249 for radiated emissions. Please see Appendix E for the data sheets.

7.1.2 Radiated Emissions (Spurious and Harmonics) Test – Lab D

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets.

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is set up according to ANSI C63.4, EN 50147-2 and CISPR 22. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT.

The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.249 (d) for radiated emissions. Please see Appendix E for the data sheets.

7.1.3 RF Emissions Test ResultsTable 1.0 RADIATED EMISSION RESULTS
Cordless Impact Wrench
Model: EYFPA1JR

Frequency MHz	(QP) EMI Reading (dBuV)	Specification Limit (dBuV)	(QP) Margin Delta (dB)
7230 (H) (Z-Axis) (Low Channel)	50.82	54.00	-3.18
7230 (V) (Z-Axis) (Low Channel)	50.82	54.00	-3.18
7230 (H) (X-Axis) (Low Channel)	50.7	54.00	-3.3
7305 (V) (Z-Axis) (Middle Channel)	50.47	54.00	-3.53
7395 (V) (X-Axis) (High Channel)	50.15	54.00	-3.85
7230 (H) (Y-Axis) (Low Channel)	50.15	54.00	-3.85

Notes:

- * The complete emissions data is given in Appendix E of this report.
- (V) Vertical
- (H) Horizontal
- (QP) Quasi Peak

8. CONCLUSIONS

The Cordless Impact Wrench, Model: EYFPA1JR (EUT), as tested, meets all of the **Class B** specification limits defined in CFR Title 47, Part 15, Subpart B for the digital portion; and the limits defined in Subpart C, sections 15.205, 15.209, and 15.249 for the transmitter portion.



APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0,
200528-0, 200527-0

For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

NVLAP listing links[Agoura Division](#) / [Brea Division](#) / [Silverado/Lake Forest Division](#)

.Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

**ANSI listing** [CETCB](#)

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

US/EU MRA list [NIST MRA site](#)

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

APEC MRA list [NIST MRA site](#)

We are also listed for IT products by the following country/agency:

**VCCI Support member:** Please visit http://www.vcci.jp/vcci_e/**FCC Listing, from FCC OET site**[FCC test lab search](https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm) <https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm>

Compatible Electronics IC listing can be found at:

<http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home>

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass the FCC **Class B** specification.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

There were no modifications made to the EUT during testing.



APPENDIX C

ADDITIONAL MODELS

ADDITIONAL MODELS

USED FOR THE PRIMARY TEST

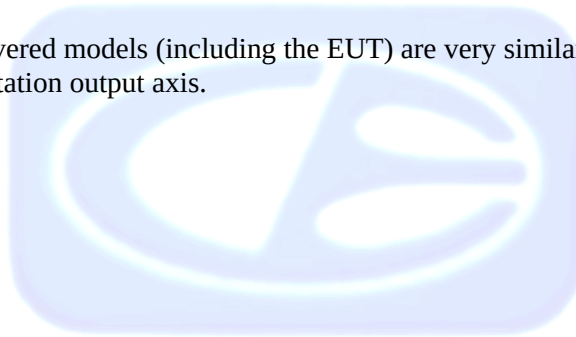
Cordless Impact Wrench
Model: EYFPA1JR
S/N: N/A

ADDITIONAL MODELS COVERED:

The following models are considered by the manufacturer to be similar to the sample tested, however the test results contained in this report relate only to the sample tested.

Models: EYFA1CR and EYFA1PR

Per the manufacturer, the three covered models (including the EUT) are very similar. The difference between the the three models is the shape of the rotation output axis.

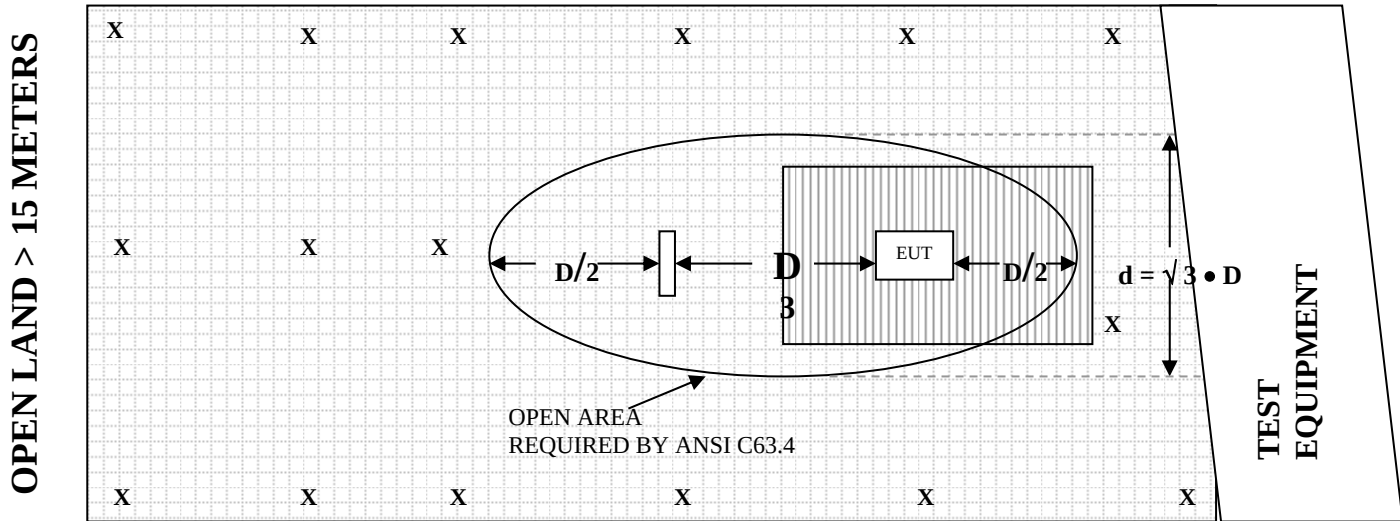


APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE

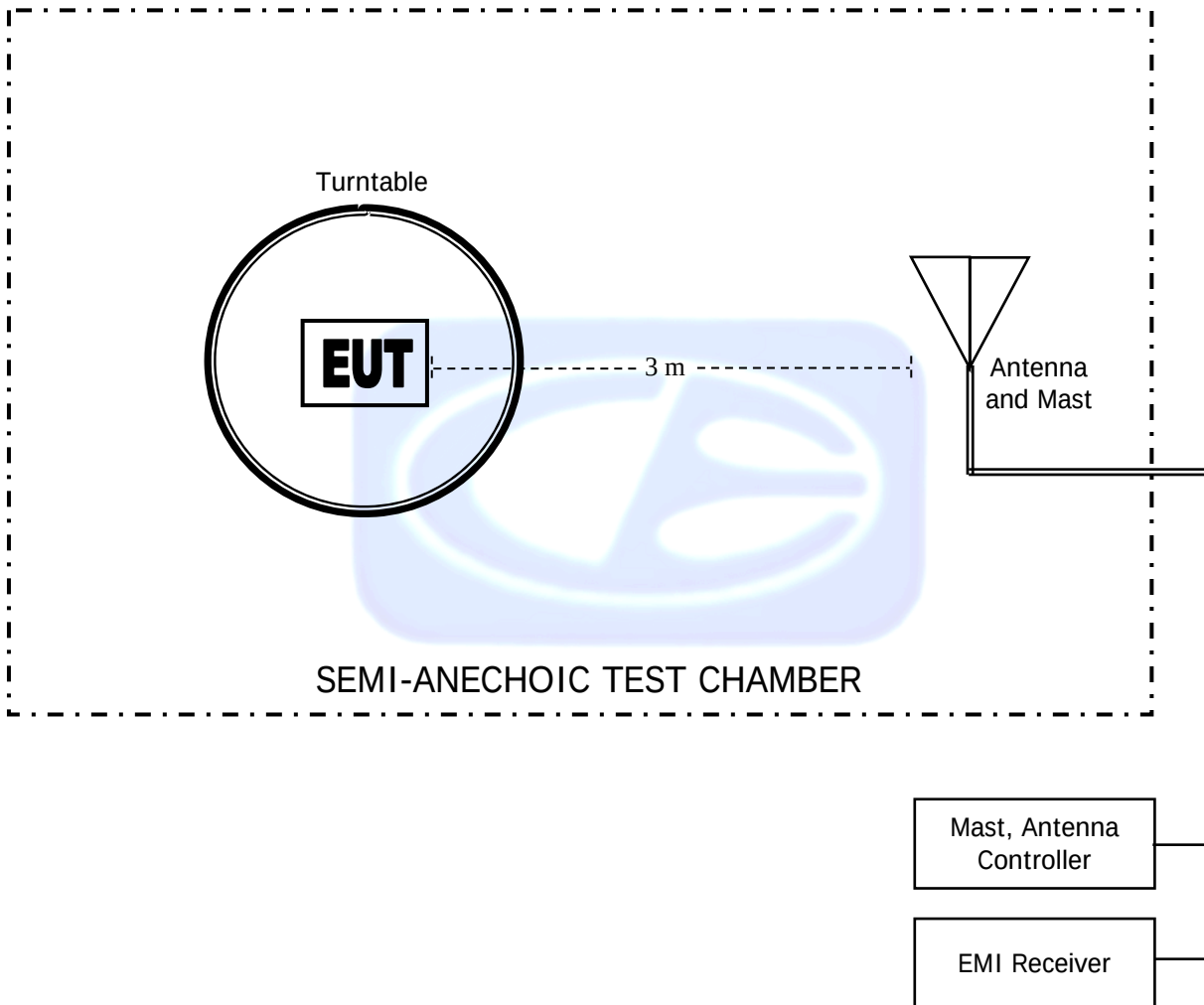
OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X	= GROUND RODS		= GROUND SCREEN
D	= TEST DISTANCE (meters)		= WOOD COVER

FIGURE 2: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER



COM-POWER AC-220**COMBILOG ANTENNA****S/N: 61060****CALIBRATION DATE: MAY 20, 2014**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	23.40	200	14.40
35	23.70	250	16.40
40	24.20	300	17.90
45	22.60	350	15.60
50	22.10	400	19.90
60	17.90	450	20.40
70	12.70	500	21.60
80	11.60	550	21.50
90	12.20	600	22.30
100	13.20	650	23.50
120	15.70	700	23.70
125	15.80	750	25.90
140	13.60	800	25.90
150	16.90	850	26.40
160	14.20	900	27.00
175	14.90	950	27.70
180	15.00	1000	27.50

COM POWER AH-118**HORN ANTENNA**

S/N: 071175

CALIBRATION DATE: FEBRUARY 26, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.23	10.0	38.43
1.5	25.84	10.5	40.19
2.0	28.14	11.0	40.49
2.5	29.51	11.5	41.39
3.0	31.20	12.0	42.02
3.5	32.17	12.5	43.30
4.0	31.40	13.0	42.77
4.5	31.86	13.5	40.18
5.0	34.82	14.0	42.59
5.5	34.38	14.5	41.74
6.0	36.31	15.0	41.84
6.5	34.81	15.5	38.48
7.0	37.48	16.0	39.52
7.5	36.98	16.5	37.85
8.0	36.66	17.0	41.33
8.5	38.47	17.5	44.96
9.0	37.22	18.0	48.50
9.5	37.86		

COM-POWER PA-118**PREAMPLIFIER**

S/N: 181656

CALIBRATION DATE: JANUARY 15, 2015

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.59	6.0	26.64
1.1	24.17	6.5	25.03
1.2	26.36	7.0	24.15
1.3	24.14	7.5	25.65
1.4	26.08	8.0	23.53
1.5	26.71	8.5	26.54
1.6	24.73	9.0	23.55
1.7	27.34	9.5	22.57
1.8	26.09	10.0	25.89
1.9	27.11	11.0	24.05
2.0	27.43	12.0	28.19
2.5	27.43	13.0	23.62
3.0	27.92	14.0	24.85
3.5	27.86	15.0	25.94
4.0	27.59	16.0	24.68
4.5	27.41	17.0	23.67
5.0	26.18	18.0	27.48
5.5	26.30		

COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MAY 13, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	25.19	31.0	25.69
19.0	24.48	31.5	25.74
20.0	24.39	32.0	26.35
21.0	24.73	32.5	26.64
22.0	23.49	33.0	25.98
23.0	24.23	33.5	24.68
24.0	24.59	34.0	24.61
25.0	25.32	34.5	23.78
26.0	25.66	35.0	24.74
26.5	25.99	35.5	24.39
27.0	26.26	36.0	23.46
27.5	25.33	36.5	23.71
28.0	24.49	37.0	26.35
28.5	24.74	37.5	23.49
29.0	25.93	38.0	25.42
29.5	26.28	38.5	24.87
30.0	26.17	39.0	22.60
30.5	26.11	39.5	20.57
		40.0	19.15

COM-POWER AH-826**HORN ANTENNA****S/N: 71957**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

COM-POWER AL-130**LOOP ANTENNA****S/N: 17089****CALIBRATION DATE: FEBRUARY 6, 2015**

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-33.18	18.32
0.01	-34.10	17.40
0.02	-38.65	12.85
0.03	-39.28	12.22
0.04	-40.09	11.41
0.05	-40.85	10.65
0.06	-40.88	10.62
0.07	-41.07	10.43
0.08	-41.04	10.46
0.09	-41.19	10.31
0.1	-41.20	10.30
0.2	-41.52	9.98
0.3	-41.53	9.97
0.4	-41.42	10.08
0.5	-41.53	9.97
0.6	-41.53	9.97
0.7	-41.43	10.07
0.8	-41.23	10.27
0.9	-41.13	10.37
1	-41.14	10.36
2	-40.80	10.70
3	-40.66	10.84
4	-40.61	10.89
5	-40.33	11.17
6	-40.53	10.97
7	-40.47	11.03
8	-40.48	11.02
9	-39.93	11.57
10	-39.81	11.69
15	-43.35	8.15
20	-39.16	12.34
25	-40.24	11.26
30	-43.18	8.32



FRONT VIEW

BELOW 1 GHz

C.E. ELECTRONICS, INC.
CORDLESS IMPACT WRENCH
MODEL: EYFPA1JR
FCC CLASS B – RADIATED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

BELOW 1 GHz

C.E. ELECTRONICS, INC.
CORDLESS IMPACT WRENCH
MODEL: EYFPA1JR
FCC CLASS B – RADIATED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

ABOVE 1 GHz

C.E. ELECTRONICS, INC.
CORDLESS IMPACT WRENCH
MODEL: EYFPA1JR
FCC CLASS B – RADIATED EMISSIONS

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

ABOVE 1 GHz

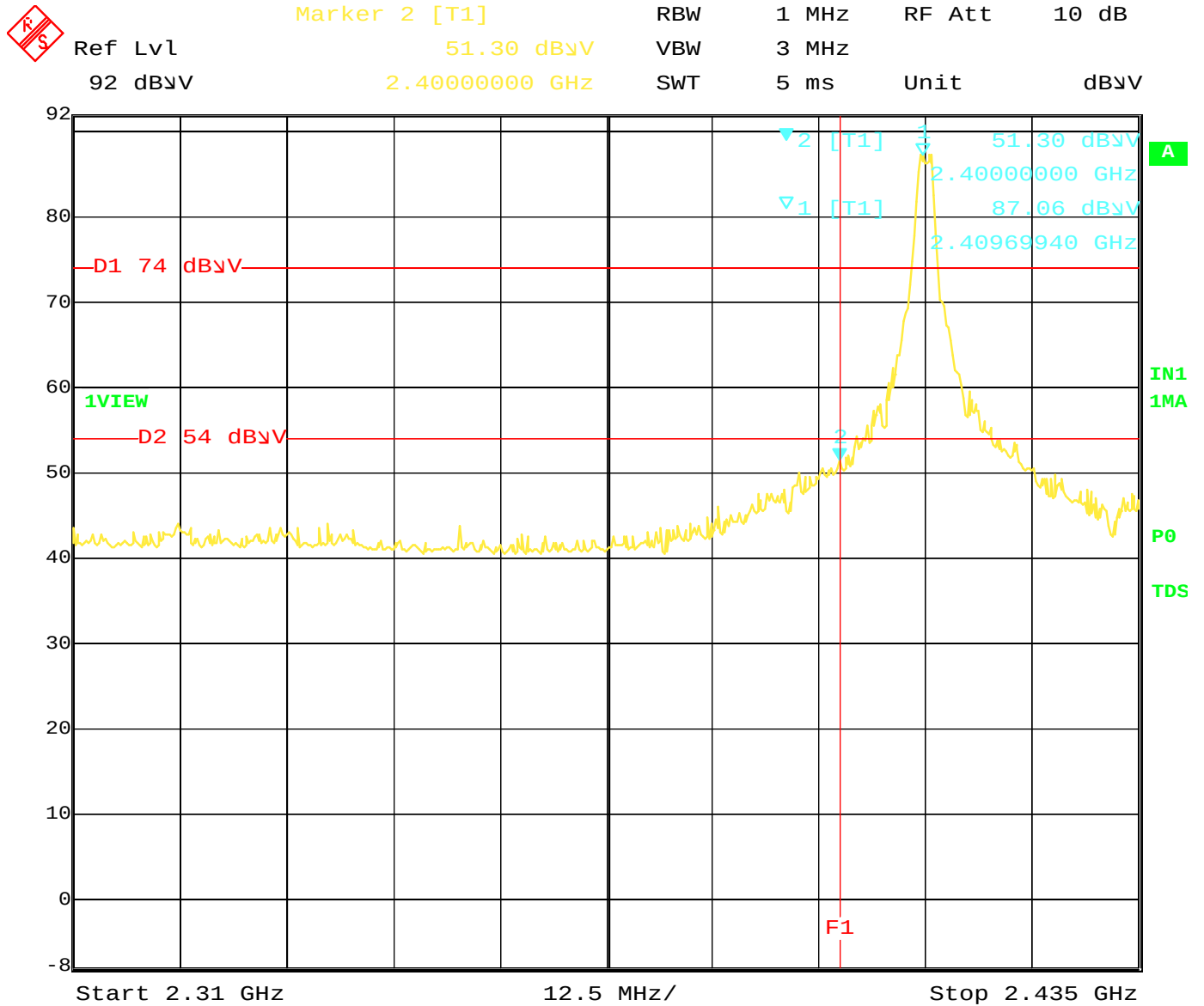
**C.E. ELECTRONICS, INC.
CORDLESS IMPACT WRENCH
MODEL: EYFPA1JR
FCC CLASS B – RADIATED EMISSIONS**

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

APPENDIX E

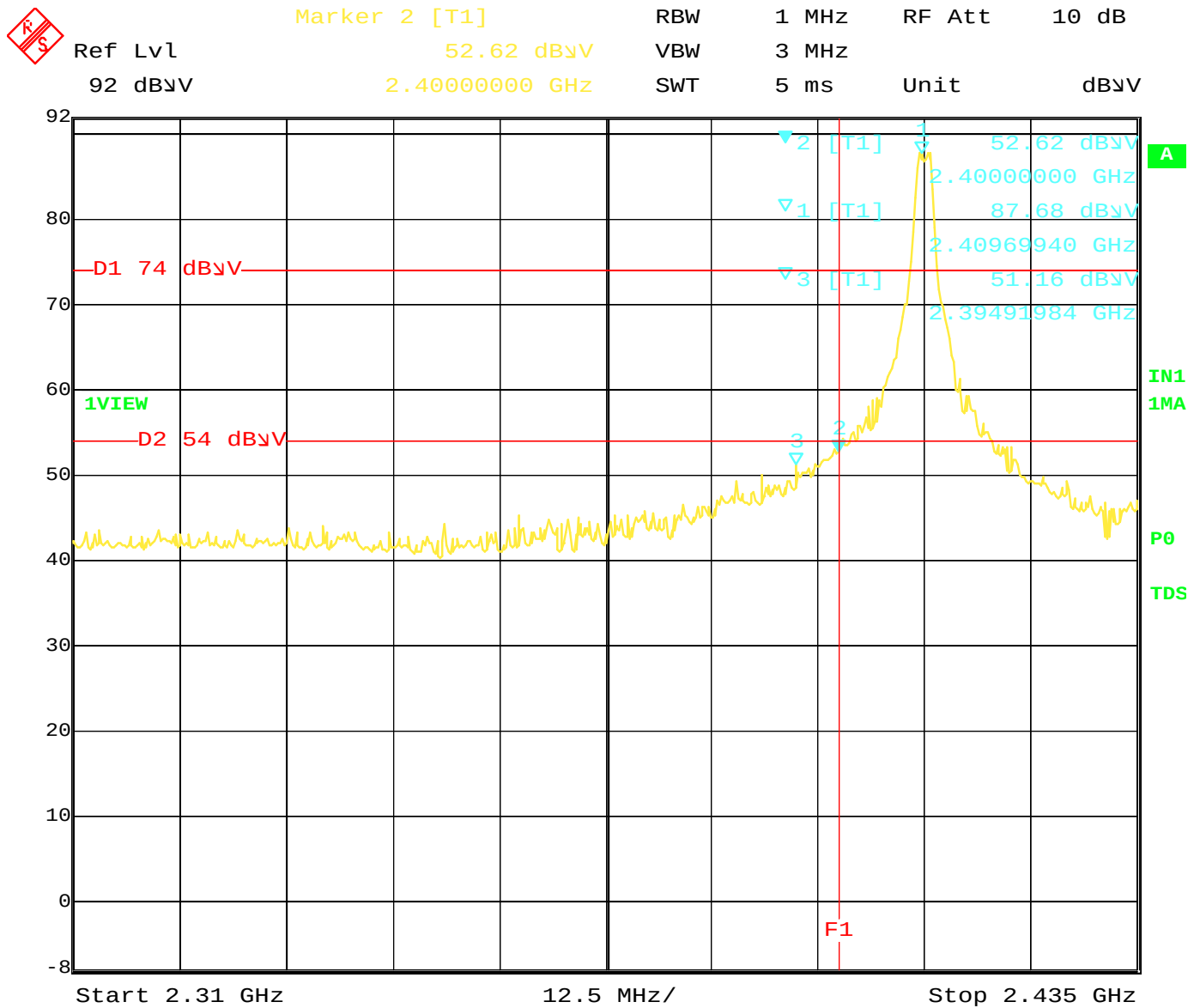
DATA SHEETS

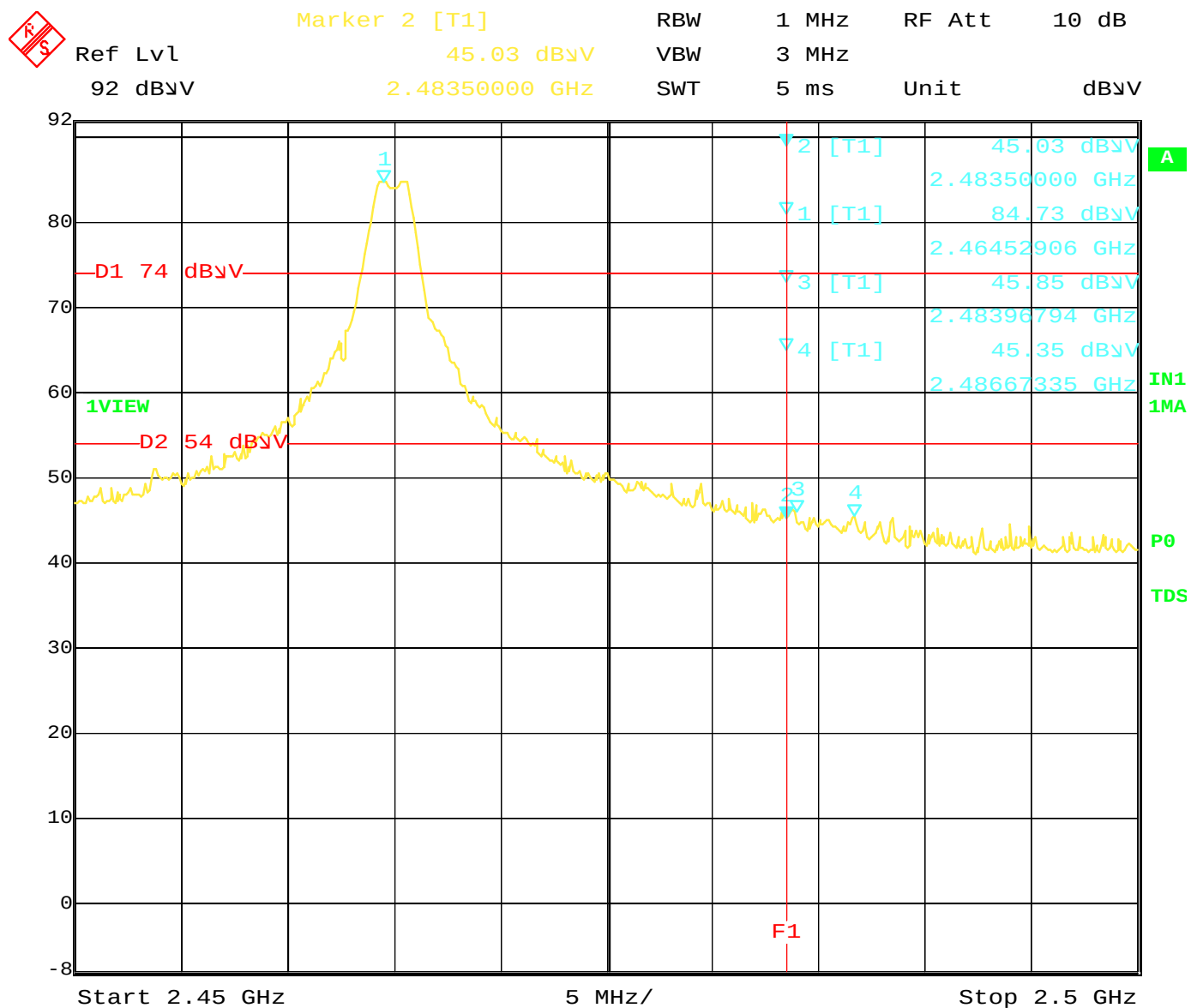




Date: 19.FEB.2015 11:09:37

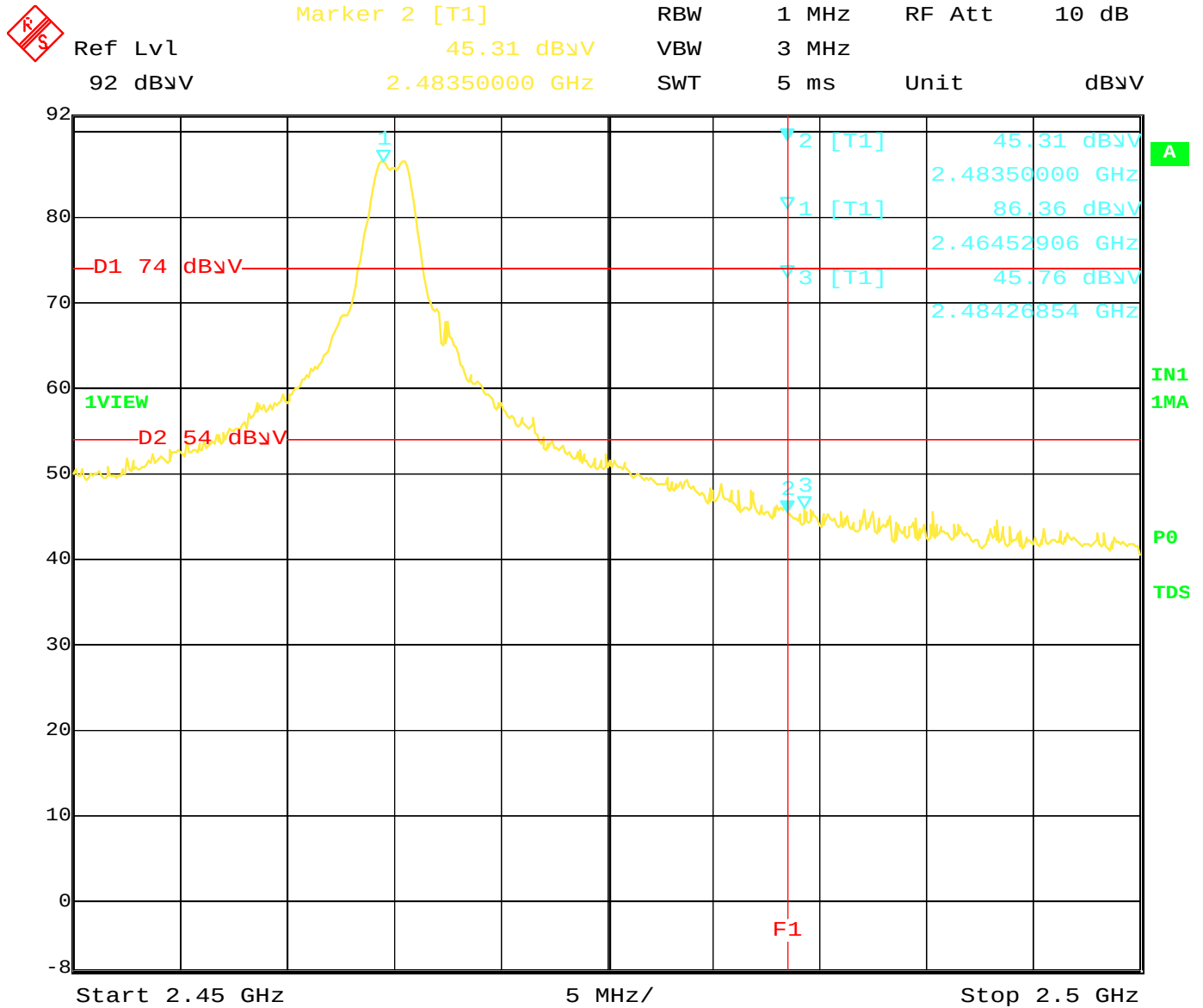
Band Edge – Horizontal – Low Channel – X-Axis – Worst Case





Date: 19.FEB.2015 12:59:30

Band Edge – Horizontal – High Channel – X-Axis – Worst Case



Date: 19.FEB.2015 12:38:43

Band Edge – Vertical – High Channel – Z-Axis – Worst Case

RADIATED EMISSIONS

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**Low Channel
X-Axis - Vertical**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2410	86.06	V	94	-7.94	Peak	1	335	
2410								
4820	43.71	V	54	-10.29	Peak	1.1	45	
4820								
7230	50.12	V	54	-3.88	Peak	1	110	
7230								
9640								No Emissions Detected
9640								
12050								No Emissions Detected
12050								
14460								No Emissions Detected
14460								
16870								No Emissions Detected
16870								
19280								No Emissions Detected
19280								
21690								No Emissions Detected
21690								
24100								No Emissions Detected
24100								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**Low Channel
X-Axis - Horizontal**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2410	87.06	H	94	-6.94	Peak	1	0	
2410								
4820	45.42	H	54	-8.58	Peak	1.75	100	
4820								
7230	50.7	H	54	-3.3	Peak	1	180	
7230								
9640								No Emissions Detected
9640								
12050								No Emissions Detected
12050								
14460								No Emissions Detected
14460								
16870								No Emissions Detected
16870								
19280								No Emissions Detected
19280								
21690								No Emissions Detected
21690								
24100								No Emissions Detected
24100								

FCC 15.249

C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JR

Date: 02/19/2015
Lab: B
Tested By: Kenneth Lee

Low Channel Y-Axis - Vertical

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2410	87.68	V	94	-6.32	Peak	1.5	335	
2410								
4820	44.32	V	54	-9.68	Peak	1	320	
4820								
7230	48.28	V	54	-5.72	Peak	1.75	270	
7230								
9640								No Emissions Detected
9640								
12050								No Emissions Detected
12050								
14460								No Emissions Detected
14460								
16870								No Emissions Detected
16870								
19280								No Emissions Detected
19280								
21690								No Emissions Detected
21690								
24100								No Emissions Detected
24100								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**Low Channel**

Y-Axis - Horizontal

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2410	85.7	H	94	-8.3	Peak	1	190	
2410								
4820	46.16	H	54	-7.84	Peak	1.1	235	
4820								
7230	50.15	H	54	-3.85	Peak	1	90	
7230								
9640								No Emissions Detected
9640								
12050								No Emissions Detected
12050								
14460								No Emissions Detected
14460								
16870								No Emissions Detected
16870								
19280								No Emissions Detected
19280								
21690								No Emissions Detected
21690								
24100								No Emissions Detected
24100								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**Low Channel
Z-Axis - Vertical**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2410	87.49	V	94	-6.51	Peak	1	85	
2410								
4820	44.86	V	54	-9.14	Peak	1	15	
4820								
7230	50.82	V	54	-3.18	Peak	1.1	190	
7230								
9640								No Emissions Detected
9640								
12050								No Emissions Detected
12050								
14460								No Emissions Detected
14460								
16870								No Emissions Detected
16870								
19280								No Emissions Detected
19280								
21690								No Emissions Detected
21690								
24100								No Emissions Detected
24100								

FCC 15.249

C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JR

Date: 02/19/2015
Lab: B
Tested By: Kenneth Lee

Low Channel Z-Axis - Horizontal

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2410	83.99	H	94	-10.01	Peak	1	0	
2410								
4820	44.12	H	54	-9.88	Peak	1.15	160	
4820								
7230	50.82	H	54	-3.18	Peak	1.5	0	
7230								
9640								No Emissions Detected
9640								
12050								No Emissions Detected
12050								
14460								No Emissions Detected
14460								
16870								No Emissions Detected
16870								
19280								No Emissions Detected
19280								
21690								No Emissions Detected
21690								
24100								No Emissions Detected
24100								

FCC 15.249

C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JR

Date: 02/19/2015
Lab: B
Tested By: Kenneth Lee

Middle Channel X-Axis - Vertical

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2435	82.45	V	94	-11.55	Peak	1	45	
2435								
4870	45.81	V	54	-8.19	Peak	1.15	185	
4870								
7305	49.69	V	54	-4.31	Peak	1	45	
7305								
9740								No Emissions Detected
9740								
12175								No Emissions Detected
12175								
14610								No Emissions Detected
14610								
17045								No Emissions Detected
17045								
19480								No Emissions Detected
19480								
21915								No Emissions Detected
21915								
24350								No Emissions Detected
24350								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**Middle Channel
X-Axis - Horizontal**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2435	85.95	H	94	-8.05	Peak	1.1	0	
2435								
4870	45.41	H	54	-8.59	Peak	1.75	170	
4870								
7305	49.75	H	54	-4.25	Peak	1.25	190	
7305								
9740								No Emissions Detected
9740								
12175								No Emissions Detected
12175								
14610								No Emissions Detected
14610								
17045								No Emissions Detected
17045								
19480								No Emissions Detected
19480								
21915								No Emissions Detected
21915								
24350								No Emissions Detected
24350								

FCC 15.249

C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JR

Date: 02/19/2015
Lab: B
Tested By: Kenneth Lee

**Middle Channel
Y-Axis - Vertical**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2435	84.61	V	94	-9.39	Peak	1.15	335	
2435								
4870	43.79	V	54	-10.21	Peak	1	95	
4870								
7305	50	V	54	-4	Peak	1	15	
7305								
9740								No Emissions Detected
9740								
12175								No Emissions Detected
12175								
14610								No Emissions Detected
14610								
17045								No Emissions Detected
17045								
19480								No Emissions Detected
19480								
21915								No Emissions Detected
21915								
24350								No Emissions Detected
24350								

FCC 15.249

C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JR

Date: 02/19/2015
Lab: B
Tested By: Kenneth Lee

Middle Channel Y-Axis - Horizontal

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2435	86	H	94	-8	Peak	2	235	
2435								
4870	44.43	H	54	-9.57	Peak	1.15	250	
4870								
7305	49.66	H	54	-4.34	Peak	1	270	
7305								
9740								No Emissions Detected
9740								
12175								No Emissions Detected
12175								
14610								No Emissions Detected
14610								
17045								No Emissions Detected
17045								
19480								No Emissions Detected
19480								
21915								No Emissions Detected
21915								
24350								No Emissions Detected
24350								

FCC 15.249

C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JR

Date: 02/19/2015
Lab: B
Tested By: Kenneth Lee

**Middle Channel
Z-Axis - Vertical**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2435	88.51	V	94	-5.49	Peak	1.75	45	
2435								
4870	45.77	V	54	-8.23	Peak	2	260	
4870								
7305	50.47	V	54	-3.53	Peak	1	90	
7305								
9740								No Emissions Detected
9740								
12175								No Emissions Detected
12175								
14610								No Emissions Detected
14610								
17045								No Emissions Detected
17045								
19480								No Emissions Detected
19480								
21915								No Emissions Detected
21915								
24350								No Emissions Detected
24350								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**Middle Channel
Z-Axis - Horizontal**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2435	82.11	H	94	-11.89	Peak	1.2	270	
2435								
4870	44.09	H	54	-9.91	Peak	1.15	190	
4870								
7305	49.67	H	54	-4.33	Peak	1	45	
7305								
9740								No Emissions Detected
9740								
12175								No Emissions Detected
12175								
14610								No Emissions Detected
14610								
17045								No Emissions Detected
17045								
19480								No Emissions Detected
19480								
21915								No Emissions Detected
21915								
24350								No Emissions Detected
24350								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**High Channel
X-Axis - Vertical**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2465	84.37	V	94	-9.63	Peak	1	335	
2465								
4930	45.13	V	54	-8.87	Peak	1.15	190	
4930								
7395	50.15	V	54	-3.85	Peak	1.2	350	
7395								
9860								No Emissions Detected
9860								
12325								No Emissions Detected
12325								
14790								No Emissions Detected
14790								
17255								No Emissions Detected
17255								
19720								No Emissions Detected
19720								
22185								No Emissions Detected
22185								
24650								No Emissions Detected
24650								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**High Channel**
X-Axis - Horizontal

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2465	84.73	H	94	-9.27	Peak	1	335	
2465								
4930	46.2	H	54	-7.8	Peak	1.1	115	
4930								
7395	49.74	H	54	-4.26	Peak	1	340	
7395								
9860								No Emissions Detected
9860								
12325								No Emissions Detected
12325								
14790								No Emissions Detected
14790								
17255								No Emissions Detected
17255								
19720								No Emissions Detected
19720								
22185								No Emissions Detected
22185								
24650								No Emissions Detected
24650								

FCC 15.249

C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JR

Date: 02/19/2015
Lab: B
Tested By: Kenneth Lee

High Channel Y-Axis - Vertical

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2465	85.76	V	94	-8.24	Peak	1.15	335	
2465								
4930	45.06	V	54	-8.94	Peak	1.75	270	
4930								
7395	49.83	V	54	-4.17	Peak	1.25	30	
7395								
9860								No Emissions
9860								Detected
12325								No Emissions
12325								Detected
14790								No Emissions
14790								Detected
17255								No Emissions
17255								Detected
19720								No Emissions
19720								Detected
22185								No Emissions
22185								Detected
24650								No Emissions
24650								Detected

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**High Channel**
Y-Axis - Horizontal

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2465	82.3	H	94	-11.7	Peak	1.75	235	
2465								
4930	44.92	H	54	-9.08	Peak	1	120	
4930								
7395	49.52	H	54	-4.48	Peak	1.25	180	
7395								
9860								No Emissions Detected
9860								
12325								No Emissions Detected
12325								
14790								No Emissions Detected
14790								
17255								No Emissions Detected
17255								
19720								No Emissions Detected
19720								
22185								No Emissions Detected
22185								
24650								No Emissions Detected
24650								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**High Channel
Z-Axis - Vertical**

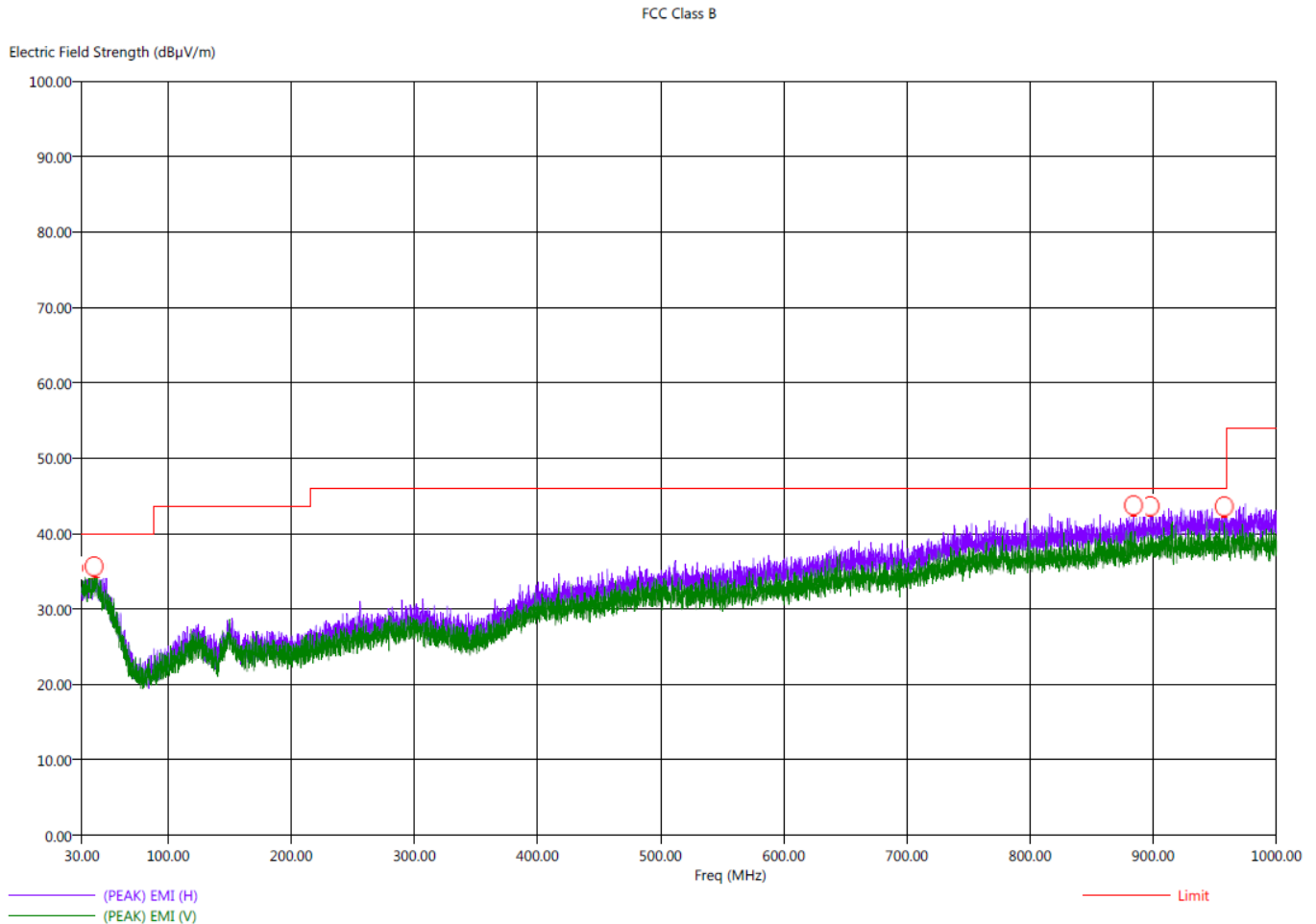
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2465	86.36	V	94	-7.64	Peak	1.5	45	
2465								
4930	45.42	V	54	-8.58	Peak	1.2	280	
4930								
7395	49.45	V	54	-4.55	Peak	1	310	
7395								
9860								No Emissions Detected
9860								
12325								No Emissions Detected
12325								
14790								No Emissions Detected
14790								
17255								No Emissions Detected
17255								
19720								No Emissions Detected
19720								
22185								No Emissions Detected
22185								
24650								No Emissions Detected
24650								

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**High Channel
Z-Axis - Horizontal**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2465	82.77	H	94	-11.23	Peak	1.15	335	
2465								
4930	43.59	H	54	-10.41	Peak	1.1	90	
4930								
7395	49.02	H	54	-4.98	Peak	1.75	55	
7395								
9860								No Emissions Detected
9860								
12325								No Emissions Detected
12325								
14790								No Emissions Detected
14790								
17255								No Emissions Detected
17255								
19720								No Emissions Detected
19720								
22185								No Emissions Detected
22185								
24650								No Emissions Detected
24650								

Title: Pre-Scan - FCC Class B
File: Agilent - Radiated Pre-Scan 30-1000Mhz - FCC Class B_Z-Axis_02-19-2015.set
Operator: Kenneth Lee
EUT Type: Cordless Impact Wrench
EUT Condition: Continuously Transmitting - Z-Axis - Middle Channel - Worst Case
Comments: Customer: C.E. Electronics, Inc.
M/N: EYFPA1JR

2/19/2015 3:07:25 PM
Sequence: Preliminary Scan



Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final-Scan 30-1000Mhz - FCC Class B_Z-Axis_02-19-2015.set
Operator: Kenneth Lee
EUT Type: Cordless Impact Wrench
EUT Condition: Continuously Transmitting - Middle Channel - Z-Axis - Worst Case
Comments: Customer: C.E. Electronics, Inc.
M/N: EYFPA1JR

2/19/2015 3:25:35 PM
Sequence: Final Measurements

Final Scan - FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Twr Ht (cm)	Ttbl Aql (deq)
37.90	H	36.92	31.80	-3.08	-8.20	40.00	23.96	0.41	111.13	245.00
40.00	V	36.72	32.11	-3.28	-7.89	40.00	24.19	0.43	205.04	250.50
41.90	V	36.62	31.73	-3.38	-8.27	40.00	23.62	0.44	189.52	129.25
884.00	H	43.87	38.67	-2.13	-7.33	46.00	26.81	2.60	189.76	148.00
897.50	H	43.44	39.01	-2.56	-6.99	46.00	26.97	2.63	399.91	136.00
957.70	H	44.96	39.87	-1.04	-6.13	46.00	27.67	2.74	347.43	321.75

FCC 15.249C.E. Electronics, Inc.
Cordless Impact Wrench
Model: EYFPA1JRDate: 02/19/2015
Lab: B
Tested By: Kenneth Lee**Digital Portion and Non-Harmonic Emissions from the Transmitter
10 kHz to 30 MHz and 1 GHz to 25 GHz**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Detected from 10 kHz to 30 MHz for the Digital Portion for both the Vertical and Horizontal Polarizations.
								No Emissions Detected from 10 kHz to 30 MHz for the Non-Harmonic Emissions from the Tx for the EUT for both the Vertical and Horizontal Polarizations.
								Investigated in the X, Y, and Z-Axis
								No Emissions Detected from 1 GHz to 25 GHz for the Digital Portion for both the Vertical and Horizontal Polarizations.
								No Emissions Detected from 1 GHz to 25 GHz for the Non-Harmonic Emissions from the Tx for the EUT for both the Vertical and Horizontal Polarizations.
								Investigated in the X, Y, and Z-Axis