Report Number: C00108J1

FCC PART 15, SUBPART B and C

for

TEST REPORT

HES HYBRID ELECTRIC STRIKE iCLASS

Model: IC5020-EA

Prepared for

HANCHETT ENTRY SYSTEMS, INC. 22630 NORTH 17th AVENUE PHOENIX, CALIFORNIA 85027

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DATE: APRIL 30, 2010

	REPORT		APPENDICES			TOTAL	
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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 endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: HES Hybrid Electric Strike iCLASS

Model: IC5020-EA

S/N: N/A

Product Description: The product is a 13.56 MHz RFID System used for keyless doorway entry.

Modifications: The EUT was modified during the testing. Please see list of modifications in Appendix B.

Manufacturer: Hanchett Entry Systems, Inc.

22630 North 17th Avenue Phoenix, Arizona 85027

Test Dates: The tests were performed on January 5, 19, and February 26, 2010.

Test Specifications: EMI requirements

CFR Title 47, Part 15, Subpart B, sections 15.31(e), 15.107, and 15.109; and Subpart C,

sections 15.205, 15.207, 15.209, and 15.225

Test Procedure: ANSI C63.4: 2003 and ANSI C63.10: 2009

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



SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 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 15.207
2	Radiated RF Emissions, 10 kHz – 1 GHz	Complies with the Class B limits of CFR Title 47, Part 15 Subpart B, sections 15.31(e), 15.107 and 15.109; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209 and 15.225(a) through (d).
3	Frequency Tolerance, Temperature and Voltage Variation	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.225(e)



1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the HES Hybrid Electric Strike iCLASS, Model: IC5020-EA. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. 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; and Subpart C, sections 15.205, 15.207, 15.209, and 15.225.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.



ADMINISTRATIVE DATA

2.1 Location of Testing

2.

The EMI tests described herein were performed at the test facility of Compatible Electronics, 19121 El Toro Road, Silverado, CA 92676.

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

Hanchett Entry Systems, Inc.

Dominik Scheffler Mechanical Engineer

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer Scott McCutchan Lab Manager Josh Hansen Lab Manager

Jeff Klinger Director of Engineering

2.4 Date Test Sample was Received

The test sample was received on January 5, 2010.

2.5 Disposition of the Test Sample

The test sample has not yet been returned as of the date of this report.

2.6 Abbreviations and Acronyms

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

RF Radio Frequency

EMI Electromagnetic Interference EUT Equipment Under Test

P/N Part Number S/N Serial Number HP Hewlett Packard

ITE Information Technology Equipment

CML Corrected Meter Limit

LISN Line Impedance Stabilization Network

N/A Not Applicable



3.

APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2003	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 Unlicensed Wireless Devices



I. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The HES Hybrid Electric Strike iCLASS, Model: IC5020-EA (EUT) consists of a main PCB assembly and an antenna board, which were installed in a typical arrangement inside a metallic test fixture, simulating installation inside a metal door jam. The EUT was connected to a bench-top DC power supply via the red and black wires of its input cable. The yellow wire of its input cable was left unterminated. The white and green wires of its input cable were connected to the negative terminal on the power supply, each through an individual 470 k Ω resistor. The EUT was continuously transmitting and receiving throughout the testing.

The EUT was tested in two configurations, once with the PCB assembly mounted to the test fixture, and once with it hanging from a small chain inside the test fixture.

For conducted emissions testing, the bench-top power supply was replaced with an off-the-shelf AC to DC power adapter, typically of what could be used in an actual installation. The EUT is not marketed with a power source.

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 cable placements were maximized. Photographs of the test setup are in Appendix D of this report.



4.1.1 Cable Construction and Termination

- <u>Cables 1-2</u> These are 1 meter wires (red & black) connecting the EUT to the power source. They have a 5-pin connector at the EUT end, and are hard-wired to the power source.
- <u>Cable 3-4</u> These are 1 meter wires (white & green) connecting the EUT to the negative terminal on the power source, each through a separate 470 kΩ resistor. They have a 5-pin connector at the EUT end, and are hard-wired to the resistors, which were hard-wired to the power source.
- <u>Cables 5</u> This is a 1 meter, unterminated wire connected to the EUT. It has a 5-pin connector at the EUT end.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
HES Hybrid Electric Strike iCLASS (EUT)	HANCHETT ENTRY SYSTEMS, INC.	IC5020-EA	N/A	VC3-XX20
BENCH-TOP DC POWER SUPPLY (radiated emissions only)	BK PRECISION	1670	281-00414	N/A
AC to DC POWER ADAPTER (conducted emissions only)	I.T.E.	W012-2120-100-1A	N/A	N/A



5.2 EMI Test Equipment

2.2 Eith lest Equipment							
EQUIPMENT TYPE	MANU- FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATI ON DATE	CALIBRATION DUE DATE		
	GENERAL TEST I	EQUIPMENT U	SED FOR ALL RF	EMISSIONS TEST	S		
Computer	Hewlett Packard	4530	US91925900	N.C.R.	N/A		
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	2747A04875	5-8-2009	5-8-2010		
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2848A18214	5-8-2009	5-8-2010		
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01081	5-8-2009	5-8-2010		
Monitor	Envision	EFT720	I9CG48A767451	N.C.R.	N/A		
	RF RA	DIATED EMIS	SIONS TEST EQUI	PMENT			
Biconical Antenna	Com Power	AB-900	2819	10-16-2009	10-16-2010		
Log Periodic Antenna	Com Power	AL-100	1116	10-16-2009	10-16-2010		
Preamplifier	Com-Power	PA-103A	161206	12-7-2009	12-7-2010		
Loop Antenna	Com-Power	AL-130	17085	8-12-2008	8-12-2010		
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A		
	RF CON	DUCTED EMI	SSIONS TEST EQU	JIPMENT			
Emissions Program	Compatible Electronics	SR21	N/A	N/A	N/A		
LISN	Com Power	LI-215	12081	7-9-2009	7-9-2010		
LISN	Com Power	LI-215	12072	7-9-2009	7-9-2010		
TEMPERATURE TESTING TEST EQUIPMENT							
Multimeter	Fluke	87	956410240	5-28-2009	5-28-2010		
Temperature Chamber	Despatch Industries, Inc.	16212A	149857	6-13-2008	6-13-2010		
EMI Receiver	Rohde & Schwarz	ESIB40	100194	9-17-2008	9-17-2010		
Near Field Probe	Com-Power	PS-400	1152	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 EMI 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

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Operating Frequency

The EUT operates at 13.56141 MHz.

7.2 Channel Number and Frequencies

The EUT is a single-channel transmitter.

8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section. Data sheets and/or plots for all tests are located in Appendix E.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2003. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.

Test Results:

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 15.207.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz and the Com Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

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 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic 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: 2003. 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 (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.

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 15.225(a) through (d) for radiated emissions. The EUT also complies with the voltage variation requirements contained in section 15.31(e); the amplitude does not change when the voltage is varied.

8.2 Frequency Tolerance of Carrier Signal

The EUT was placed in temperature chamber and set to -20 degrees C. The EUT was exposed to this temperature for a period of 10 minutes. The temperature was subsequently increased at 10 degree increments up to +50 degrees with a 30 minute acclimation period between each temperature. At each temperature, the EUT was checked with an EMI Receiver to determine whether the carrier signal was within 0.01% of the fundamental frequency at startup, 2 minutes, 5 minutes and 10 minutes after removal from the temperature chamber. The frequency tolerance of the carrier signal was also checked at 85% and 115% of the rated supply voltage at 20 degrees C. A data sheet of the Frequency Tolerance testing is located in Appendix E.

Test Results:

The EUT complies with the frequency tolerance requirements of CFR Title 47, Part 15, Subpart C, Section 15.225(e).



9. CONCLUSIONS

With the EUT configured and operating as described in this report, the HES Hybrid Electric Strike iCLASS Model: IC5020-EA meets all of the specification limits defined in FCC Title 47, Part 15, sections 15.31(e), 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

APPENDIX A

LABORATORY RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

NVLAP listing links

Agoura Division - http://ts.nist.gov/Standards/scopes/2000630.htm
Brea Division - http://ts.nist.gov/Standards/scopes/2005280.htm
Silverado/Lake Forest Division - http://ts.nist.gov/Standards/scopes/2005270.htm



ANSI listing

CETCB



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



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).

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



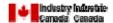
VCCI Listing, from VCCI site

Enter "Compatible" in search form http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html



FCC Listing, from FCC OET site

FCC test lab search 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



APPENDIX B

MODIFICATIONS TO THE EUT



MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247 specifications.

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

1) Added clip-on ferrite (TDK P/N: ZCAT2035-0930) on all wires with two turns on the main power cable.



APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT



ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

HES Hybrid Electric Strike iCLASS

Model: IC5020-EA

S/N: N/A

The following five models are covered under similarity. The only differences between the models are the Electric Strikes. They differ in application and accommodation of various locksets. The locksets vary in style (cylindrical lockset or mortise lockset) and length of the latch (1/2) to 3/4.

HES Hybrid Electric Strike iCLASS

Model: IC5220-EA

HES Hybrid Electric Strike iCLASS

Model: IC4520-EA

HES Hybrid Electric Strike iCLASS

Model: IC8020-EA

HES Hybrid Electric Strike iCLASS

Model: IC8320-EA

HES Hybrid Electric Strike iCLASS

Model: IC8520-EA

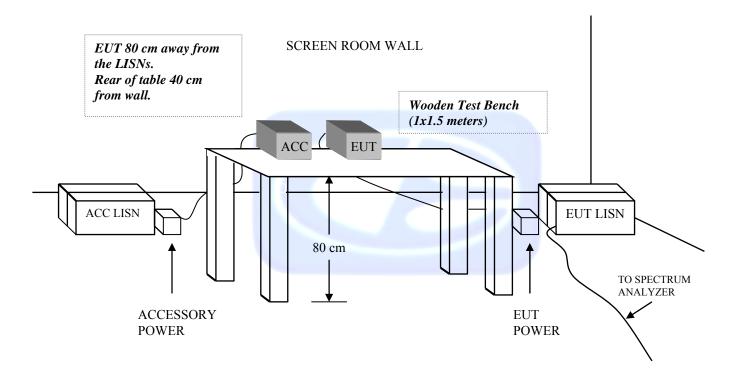


APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS



FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

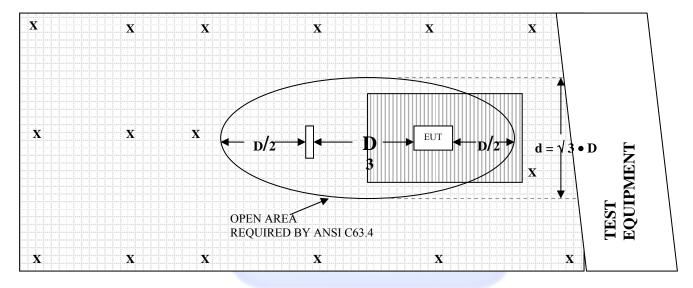


D



FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE -3 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

= TEST DISTANCE (meters)

X = GROUND RODS = GROUND SCREEN = WOOD COVER

(714) 579-0500

COM-POWER AL-130

ACTIVE LOOP ANTENNA (E-FIELD)

S/N: 17085

CALIBRATION DATE: AUGUST 12, 2008

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
0.009	8.5	0.8	9.97
0.01	9.57	0.9	10.04
0.02	10.21	1.0	10.21
0.03	10.77	2.0	10.53
0.4	10.47	3.0	10.4
0.05	9.13	4.0	10.14
0.06	9.9	5.0	10.57
0.07	9.54	6.0	10.83
0.08	9.4	7.0	10.43
0.09	9.67	8.0	10.6
0.1	9.67	9.0	11.4
0.2	7.04	10.0	10.34
0.3	9.77	15.0	3.53
0.4	9.7	20.0	10.73
0.5	9.7	25.0	7.13
0.6	10.17	30.0	8.4
0.7	10.14		

COM-POWER AB-900

LAB J - BICONICAL ANTENNA

S/N: 2819

CALIBRATION DATE: OCTOBER 16, 2009

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(MHz)	(dB)	(MHz)	(dB)
30.0	12.3	100.0	11.4
35.0	11.3	120.0	14.3
40.0	11.5	140.0	12.1
45.0	12.7	160.0	15
50.0	11.7	180.0	18.3
60.0	11	200.0	16.2
70.0	8.9	250.0	16.8
80.0	7.6	275.0	18.7
90.0	9.3	300.0	19.8

COM-POWER AL-100

LAB J - LOG PERIODIC ANTENNA

S/N: 1116

CALIBRATION DATE: OCTOBER 16, 2009

FREQUENCY (MHz)	FACTOR (dB)
300	16.4
400	17.5
500	18.8
600	20.3
700	22.6
800	22.2
900	23.6
1000	25.2

COM-POWER PA-103

LAB J - PREAMPLIFIER

S/N: 161206

CALIBRATION DATE: DECEMBER 7, 2009

FREQUENCY	FACTOR	FREQUENCY	FACTOR
(MHz)	(dB)	(MHz)	(dB)
30	31.7	300	31.6
40	31.9	350	31.6
50	31.8	400	31.5
60	31.8	450	31.4
70	31.7	500	31.2
80	31.8	550	31.6
90	31.9	600	31.1
100	31.8	650	31.4
125	31.8	700	30.3
150	31.9	750	31.0
175	31.8	800	29.1
200	31.9	850	29.7
225	31.8	900	28.1
250	31.7	950	32.4
275	31.9	1000	32.3



HANCHETT ENTRY SYSTEMS, INC.
HES HYBRID ELECTRIC STRIKE iCLASS
MODEL: IC5020-EA
FCC SUBPART C – RADIATED EMISSIONS (9 kHz to 30 MHz)



FRONT VIEW

HANCHETT ENTRY SYSTEMS, INC.
HES HYBRID ELECTRIC STRIKE iCLASS
MODEL: IC5020-EA
FCC SUBPARTS B AND C – RADIATED EMISSIONS (30 MHz to 1 GHz)



REAR VIEW

HANCHETT ENTRY SYSTEMS, INC.
HES HYBRID ELECTRIC STRIKE iCLASS
MODEL: IC5020-EA
FCC SUBPART B AND C – RADIATED EMISSIONS (30 MHz to 1 GHz)



FRONT VIEW

HANCHETT ENTRY SYSTEMS, INC.
HES HYBRID ELECTRIC STRIKE iCLASS
MODEL: IC5020-EA
FCC SUBPART B AND C – CONDUCTED EMISSIONS



REAR VIEW

HANCHETT ENTRY SYSTEMS, INC.
HES HYBRID ELECTRIC STRIKE iCLASS
MODEL: IC5020-EA
FCC SUBPART B AND C – CONDUCTED EMISSIONS







HANCHETT ENTRY SYSTEMS, INC.
HES HYBRID ELECTRIC STRIKE iCLASS
MODEL: IC5020-EA
FCC SUBPART C – FREQUENCY STABILITY (TEMPERATURE & VOLTAGE)

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



APPENDIX E

RADIATED EMISISONS



RADIATED EMISSIONS TEST DATA

Test Location :Compatible ElectronicsPage : 1/1Customer :Dominik ShefflerDate : 1/8/2010Manufacturer :HES, Inc.Time : 12:50:43 PM

EUT name: HES Hybrid Electric Strike iCLASS Lab: J

Model: IC5020-EA Test Distance: 3 Meters

Serial #: N/A

Specification: FCC Part 15, Section 15.205, 15.209, 15.225

Qualification Data; Frequency Range: 9 kHz to 30 MHz

Tested by: Scott McCutchan

Tempurate: 17 degrees C, 47% Humidity, 102.0 kPA

Pol	Freq.	Reading	Meas. Type	Cable Loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit * = L	Delta R-L
	MHz	dBuV		dB	dB	dB	dBuV/m	dBuV/m	dB
	13.56	45.80	Peak	0.00	5.23	0.00	51.03	124.00	-72.97
	13.552	35.10	Peak	0.00	5.23	0.00	40.33	90.50	-50.17
	13.567	33.80	Peak	0.00	5.22	0.00	39.02	90.50	-51.48
	13.409	20.10	Peak	0.00	5.41	0.00	25.51	80.50	-54.99
	13.710	22.90	Peak	0.00	5.04	0.00	27.94	80.50	-52.56
	13.109	16.00	Peak	0.00	5.79	0.00	21.79	69.54	-47.75
	14.112	17.10	Peak	0.00	4.55	0.00	21.65	69.54	-47.89
	27.123	16.20	Peak	0.00	7.70	0.00	23.90	69.54	-45.64

NO HARMONICS OR OTHER SPURIOUS EMISSIONS FROM 9 kHz to 30 MHz

Sample Calculation for 13.56 MHz: Limit @ 30m = 15,848 uV/m = 84 dBuV/m

40 * log (Spec Limit Distance [30m] / Test Distance [3m]) = 40 dB distance factor

Limit @ 3 meters = 124 dBuV/m

^{*} Limits adjusted for 3 meter test distance using an extrapolation factor of 40 dB/decade.



Test Location : Compatible Electronics Page : 1/1 : Dominik Scheffler : HES, Inc. : HES Hybrid Electric Strike iCLASS Customer **Date :** 01/05/2010 Manufacturer Time : 01:07:04 PM

Eut name Lab : J

Test Distance : 3.00 Meters Model : IC5020-EA

Serial # : N/A Specification : FCC Pt. 15 B

Distance correction factor (20 * log(test/spec)) : 0.00

Test Mode

: 30 MHz to 1 GHz - Qualification Data Stationary mounting configuration Temp: 17 degrees C, Humidity: 47%, Pressure: 102.0 kPa Tested By: Scott McCutchan

Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	Limit = L dBuV/m	Delta R-L dB
V V	40.677 54.129 67.703	46.90 51.50 54.30	1.20 1.37 1.68	11.67 11.40 9.35	31.89 31.80 31.72	27.88 32.47 33.61	40.00 40.00 40.00	-12.12 -7.53 -6.39
V V	81.299 108.355	49.90 47.90	1.80	7.83 12.68	31.81 31.80	27.72 30.85	40.00	-12.28 -12.65
V V H H	122.039 149.245 54.237 67.835 81.246	43.10 39.10 39.90 42.20 46.10	2.18 2.30 1.38 1.68	14.06 13.49 11.39 9.33 7.82	31.80 31.90 31.80 31.72 31.81	27.54 22.99 20.87 21.49 23.91	43.50 43.50 40.00 40.00 40.00	-15.96 -20.51 -19.13 -18.51 -16.09





Page : 1/1 Test Location : Compatible Electronics Customer : Dominik Scheffler **Date :** 01/19/2010 Manufacturer : HES, Inc. Time : 10:42:14 PM

Eut name : HES Hybrid Electric Strike iCLASS Lab : J

Model Test Distance : 3.00 Meters : IC5020-EA

Serial # : N/A Specification : FCC Pt. 15 B

Distance correction factor (20 * log(test/spec)) : 0.00

Test Mode : 30 MHz to 1 GHz - Qualification Data

Free-hanging mounting configuration
Temp: 18 degrees C, Humidity: 32%, Pressure: 101.9 kPa
Tested By: Scott McCutchan

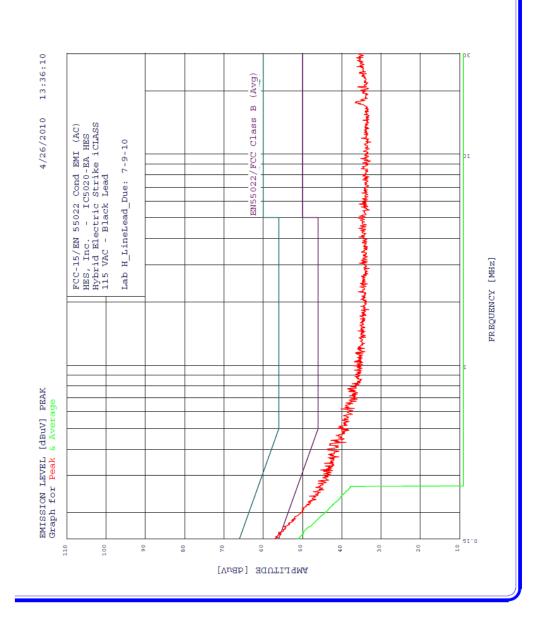
Pol	Freq MHz	Reading dBuV	Cable loss dB	Antenna factor dB	Amplifier gain dB	Corr'd rdg = R dBuV/m	= L	Delta R-L dB
V	40.670	44.20	1.20	11.67	31.89	25.18	40.00	-14.82
V	54.211	54.30	1.38	11.39	31.80	35.27	40.00	-4.73
V	67.813	52.50	1.68	9.33	31.72	31.79	40.00	-8.21
V	81.354	48.30	1.80	7.84	31.81	26.13	40.00	-13.87
V	149.157	51.80	2.30	13.48	31.90	35.68	43.50	-7.82
V	162.719	52.00	2.46	15.47	31.85	38.08	43.50	-5.42
H	40.667	43.80	1.20	11.67	31.89	24.78	40.00	-15.22
H	54.218	42.60	1.38	11.39	31.80	23.57	40.00	-16.43
H	67.808	44.60	1.68	9.33	31.72	23.89	40.00	-16.11
H	149.161	40.80	2.30	13.48	31.90	24.68	43.50	-18.82
н	162.723	41.40	2.46	15.47	31.85	27.48	43.50	-16.02



CONDUCTED EMISISONS









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Report Number: C00108J1 FCC Part 15 Subpart B and FCC Section 15.225 Test Report HES Hybrid Electric Strike iCLASS Model: IC5020-EA

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4/26/2010

13:36:10

C-15/EN 55022 Cond EMI (AC) HES, Inc. Hybrid Electric Strike iCLASS 115 VAC - Black Lead

Lab H_LineLead_Due: 7-9-10 TEST ENGINEER : Scott McCutchan

30 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line 0.10 dB, Curve : Peak Amp(dBuV) Limit(dB) Peak criteria : Freq(MHz) Delta(dB) Peak# 0.153 56.81 55.82 0.99** 0.161 56.11 55.43 0.68** 0.55** 0.158 56.11 55.56 0.166 55.01 55.16 -0.15** 0.171 54.71 54.90 -0.19** -0.56** 6 7 0.168 54.51 53.51 55.07 54.59 -1.08** 0.178 0.176 53.51 54.68 -1.17** -1.52** -1.73** 52.81 52.51 54.33 54.24 0.183 0.185 10 11 0.187 52.21 54.15 -1.94** 50.01 12 0.210 53.23 -3.22** 13 0.205 53.40 -3.39** 0.202 50.11 53.53 -3.42** 15 0.212 49.61 49.11 53.14 -3.53** 0.216 52.96 -3.85** 16 0.239 52.12 48.81 43.76 52.87 47.86 18 0.219 -4.06** 0.400 -4.10 19 0.226 52.61 -4.20** 20 48.41 42.77 21 0.223 52.70 -4.28** 22 0.440 47.06 -4.29 23 0.417 43.16 47.50 -4.34 24 0.424 42.97 47.37 -4.41 49.75 51.73 25 0.318 45.34 47.22 -4.41 -4.51** 0.251 26 -4.51** -4.71** -4.73 27 0.228 48.01 52.52 0.263 46.62 46.03 51.33 50.76 28



Report Number: C00108J1 FCC Part 15 Subpart B and FCC Section 15.225 Test Report HES Hybrid Electric Strike iCLASS Model: IC5020-EA

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4/26/2010

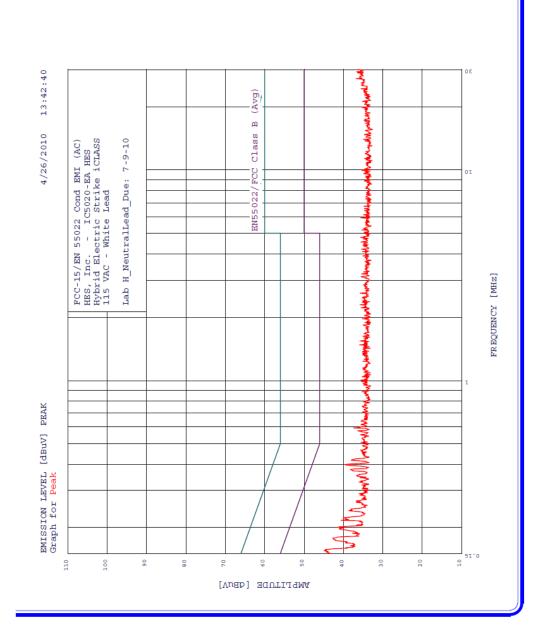
13:36:10

FCC-15/EN 55022 Cond EMI (AC) HES, Inc. - IC5020-EA HES Hybrid Electric Strike iCLASS 115 VAC - Black Lead

Lab H_LineLead_Due: 7-9-10
TEST ENGINEER: Scott McCutchan

2 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line Peak criteria: 0.10 dB, Curve: Average Peak# Freq(MHz) Amp(dBuV) Limit(dB) Delta(dB)
1 0.150 51.00 56.00 -5.00**
2 0.161 49.90 55.43 -5.53







Report Number: C00108J1 FCC Part 15 Subpart B and FCC Section 15.225 Test Report HES Hybrid Electric Strike iCLASS Model: IC5020-EA

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4/26/2010

13:42:40

FCC-15/EN 55022 Cond EMI (AC) HES, Inc. - IC5020-EA HES Hybrid Electric Strike iCLASS 115 VAC - White Lead

Lab H_NeutralLead_Due: 7-9-10 TEST ENGINEER : Scott McCutchan

0.155 0.705 4.092

1.374

0.150

44.91

35.13 35.11

35.10

43.21

27

2.8 29

31

31 highest peaks above -50.00 dB of EN55022/FCC Class B (Avg) limit line Peak criteria : 0.10 dB, Curve : Peak Peak# Freq(MHz) Amp(dBuV) Limit(dB) Delta(dB) 39.56 37.36 37.96 -8.34 -8.64 0.398 47.90 46.00 47.50 0.595 0.417 0.577 36.36 46.00 -9.64 38.25 -10.09 48.34 1.480 35.81 46.00 -10.19 35.77 35.76 35.72 2.286 46.00 -10.24 8 46.00 1.544 46.00 -10.28 35.67 35.57 35.55 46.00 4.774 11 46.00 -10.43 46.00 -10.45 12 1.006 35.55 46.00 -10.45 3.107 35.54 46.00 -10.46 4.552 35.49 15 46.00 -10.510.508 35.48 46.00 -10.52 16 2.214 35.47 46.00 -10.53 0.641 35.45 18 46.00 -10.55 4.204 35.40 46.00 -10.60 0.990 35.35 46.00 -10.65 -10.66 -10.72 -10.72 21 3.209 35.34 46.00 0.885 35.28 46.00 22 0.532 35.28 46.00 2.462 35.26 46.00 -10.74 -10.74 1.043 35.26 35.22 46.00 25 46.00 -10.78 26

55.73 46.00

46.00

46.00

56.00

-10.82 -10.87 -10.89

-12.79



FREQUENCY STABILITY OF THE CARRIER FREQUENCY

Report Number: C00108J1
FCC Part 15 Subpart B and FCC Section 15.225 Test Report
HES Hybrid Electric Strike iCLASS
Model: IC5020-EA

SECTION 15.225[e] TESTING

COMPANY:	HES CORPORATION	DATE:	2-26-2010
EUT:	HES Hybrid Electric Strike iCLASS	ENGINEER:	KYLE FUJIMOTO
MODEL:	IC5020-EA	S/N:	N/A

TEMPERATURE	FREQUENCY	FREQUENCY	FREQUENCY	FREQUENCY	% OF SUPPLY
	(MHz) AT 0	(MHz) AT 2	(MHz) AT 5	(MHz) AT 10	VOLTAGE
	MINUTES	MINUTES	MINUTES	MINUTES	
-20°C	13.56148898	13.56148898	13.56138878	13.56138878	100
-10°C	13.56150902	13.56150902	13.56152906	13.56160922	100
+0°C	13.56148898	13.56148898	13.56158918	13.56152906	100
+10°C	13.56138878	13.56146894	13.56148898	13.56146894	100
+20°C	13.56144890	13.56136874	13.56144890	13.56140882	85
+20°C	13.56140882	13.56138878	13.56140882	13.56140882	100
+20°C	13.56140882	13.56142886	13.56142886	13.56142886	115
+30°C	13.56136874	13.56136874	13.56136874	13.56140882	100
+40°C	13.56150902	13.56142886	13.56140882	13.56140882	100
+50°C	13.56142886	13.56136874	13.56136874	13.56138878	100

The Frequency Tolerance allowed is 0.01% (± 0.00135614 MHz) of the frequency measured at $+20^{\circ}$ C at 100% Supply Voltage.

If the Frequency is between 13.56005268 MHz and 13.56276496 MHz, the EUT is considered within the specification limits of 15.225[e].

FCC Nominal Input Voltage = 12 Vdc