TEST REPORT

FCC Part 15 Subpart C Section 15.231
IC RSS-210 Issue 8, Amendment 1
IC RSS-Gen Issue 4

MANUFACTURER'S NAME	Cinch Systems Inc 12075 43rd Street NE Suite 300 St Michael MN 55376 USA
PRODUCT NAME(S)	Hardwire Converter
MODEL NUMBER(S) TESTED	RF-CHW-DSC-16
SERIAL NUMBER(S) TESTED	123456
PRODUCT DESCRIPTION	Hardwire Converter with 433.92 MHz transmitter
TEST REPORT NUMBER	NC72106641.1 Rev A
TEST DATE(S)	27 May 2015

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Sections 15.231 “Periodic operation in the band 40.66–40.70 MHz and above 70 MHz.” and 15.207 “Conducted limits.”, Industry Canada RSS-210 Issue 8 Amendment 1 “Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment” and RSS-Gen Issue 4 “General Requirements and Information for the Certification of Radio Apparatus”.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

Issue Date: 23 July 2015

Joel T Schneider
Senior EMC Engineer

Greg Jakubowski
Senior EMC Technician

Not Transferable

EMC TEST REPORT

Test Report No.	**NC72106641.1 Rev A**	Date of issue:	23 July 2015
Product Names	Hardwire Converter		
Model(s) Tested	RF-CHW-DSC-16		
Serial No(s) Tested	123456		
Product Description	Hardwire Converter with 433.92 MHz transmitter		
Manufacturer	Cinch Systems Inc 12075 43rd Street NE Suite 300 St Michael MN 55376		
Issuing Laboratory	TÜV SÜD America Inc USA 1775 Old Highway 8 NW, Suite 104 New Brighton MN 55112 - 1891 Phone: 651-631-2487 / Fax: 651-638-0285		
Test Result	■ **Positive** ☐ **Negative**		

TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

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TÜV SÜD America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	25	07 July 2015	Initial Release
A	25	23 July 2015	Page 6: Added statement - Scan through 3 orthogonal axis for highest fundamental emission level.

DIRECTORY

Contents

EMC TEST REGULATIONS:
The tests were performed according to the following regulations:
FCC Part 15 Subpart C §15.231
IC RSS-210 Issue 8 Amendment 1
IC RSS-Gen Issue 4

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 18°C
Atmospheric pressure	: 98kPa
Relative Humidity	: 60%

POWER SUPPLY UTILIZED
Power supply system : 110VAC / 60Hz

TEST EQUIPMENT
All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

MEASUREMENT UNCERTAINTY
The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ±1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ±4.8 dB. All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

SIGN EXPLANATIONS
☐ - not applicable
■ - applicable

Radiated Emissions 30 - 3200 MHz
FCC 15.231(b), IC RSS-210 A1.1

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Testing was performed in accordance with the test procedure of ANSI C63.4 2009, clause 8.3.

Test location
Taylors Falls Lab, Large Test Site (Open Area Test Site)

Test distance
3 meters

Test Equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Date	Cal Due
OWLE03202	EM-6917B	Electro-Metrics	Biconicalog Periodic	101	16-Oct-14	16-Oct-15
WRLE10897	ZHL-1042J	Mini-Circuits	Amplifier Broadband AMP/ SMA QA1148002	NA	Code B 06-Feb-15	Code B 06-Feb-16
WRLE03895	NHP-600	Mini-Circuits	600 MHz HPF	3	Code B 8-May-15	Code B 8-May-16
WRLE10998	ESU 26	Rohde & Schwarz	EMI Receiver	100379	29-Aug-14	29-Aug-15
NBLE03196	8566B	Hewlett-Packard	Spectrum Analyzer	2240A01856	27-Feb-15	27-Feb-16
NBLE03195	85662A	Hewlett-Packard	Analyzer Display	2648A13518	27-Feb-15	27-Feb-16
WRLE02680	85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00343	08-Sep-14	08-Sep-15
WRLE10863	N/A	TÜV SÜD America Inc	Test Companion Software Version 3.4.71	N/A	Code Y	Code Y
WRLE02075	3115	EMCO	Ridge Guide Ant. 1-18 GHz	9001-3275	26-Feb-15	26-Feb-16
WRLE10536	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0002	Code B 07-Jan-15	Code B 07-Jan-16

Code B = Calibration verification performed internally. Code Y = Calibration not required when used with other calibrated equipment

Limit with 433.92 MHz fundamental and 3 meter distance

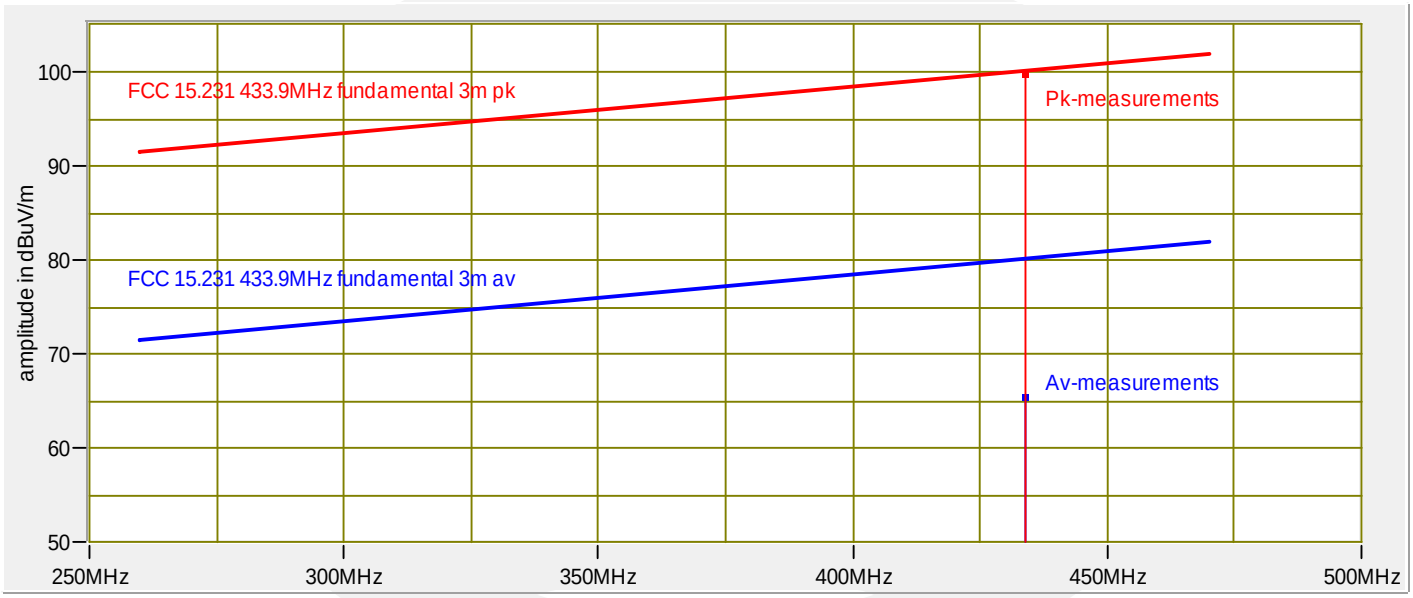
Detector	Field strength fundamental (μV/m)	Field strength Spurious (μV/m)
Average	10996.7	1099.67
Peak	109967	10996.7

Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in §15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section. Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer or receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with a 120 kHz / 6 dB bandwidth and average/peak/qp detection and measurements above 1000 MHz are made with a 1 MHz RBW/VBW / 6 dB bandwidth and peak detection, 1 MHz RBW / 10 Hz VBW for average detection. Table top equipment is placed on a non-conductive support 80 cm above the ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT is rotated 360 degrees. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB / decade (inverse linear-distance for field strength measurements).

Test data, fundamental
Scan through 3 orthogonal axis for highest fundamental emission level
Device is transmitting packets continuously and configured (for test purposes) to provide its maximum possible total on time.
Final pk & avg levels with a CISPR receiver (120kHz RBW)

Measurement summary: FCC 15.231 433.92MHz fundamental 3m pk							
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.231 433.92MHz fundamental 3m pk (dB)
433.915 MHz	75.4 Pk	2.29 / 22.08 / 0.0 / 0.0	99.77	97387	109967	V / 1.20 / 330	-1.05

Measurement summary: FCC 15.231 433.92MHz fundamental 3m avg							
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.231 433.92MHz fundamental 3m avg (dB)
433.915 MHz	41.0 Av	2.29 / 22.08 / 0.0 / 0.0	65.37	1855.7	10996.7	V / 1.20 / 330	-15.45

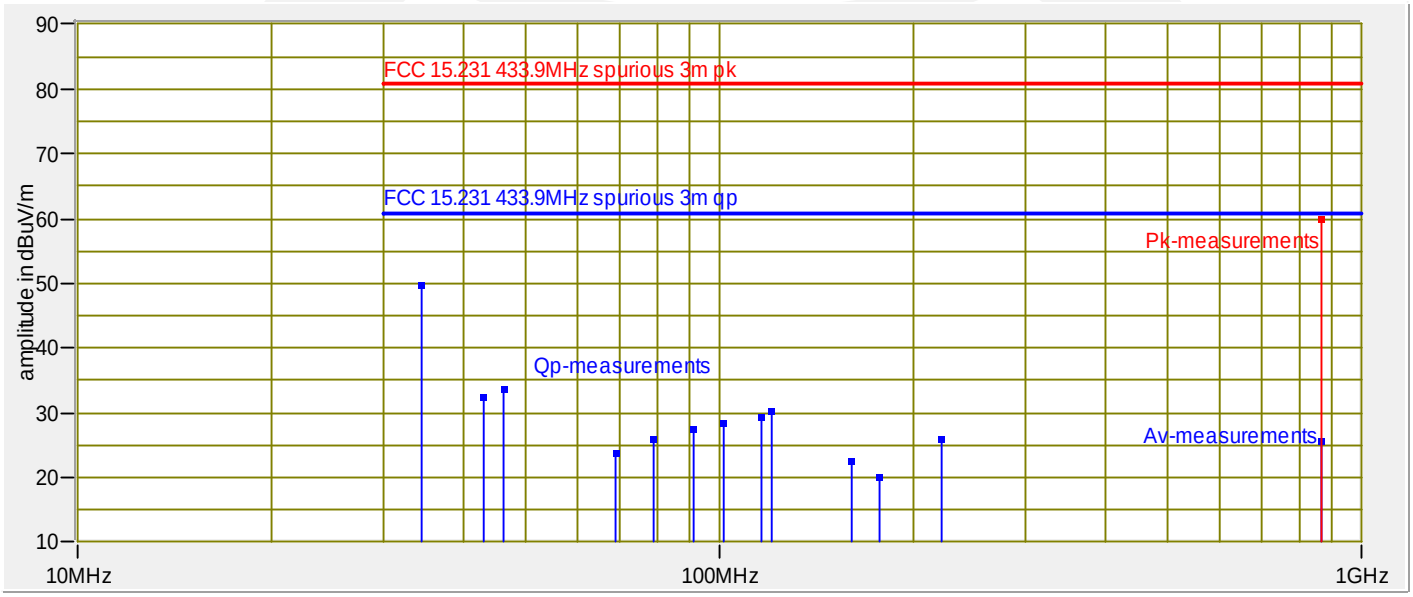


Test data, spurious
30MHz – 1000MHz

Measurement summary: FCC 15.231 433.92MHz spurious 3m pk							
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.231 433.92MHz spurious 3m pk (dB)
867.82 MHz	58.5 Pk	3.48 / 27.86 / 30.3 / 0.24	59.79	976.1	10996.7	V / 1.16 / 31	-21.03

Measurement summary: FCC 15.231 433.92MHz spurious 3m avg							
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.231 433.92MHz spurious 3m av (dB)
867.82 MHz	24.4 Av	3.48 / 27.86 / 30.3 / 0.24	25.69	19.3	1099.67	V / 1.16 / 31	-35.13

Measurement summary: FCC 15.231 433.9MHz spurious 3m qp							
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC 15.231 433.9MHz spurious 3m qp
34.35 MHz	54.68 Qp	0.53 / 24.16 / 29.71 / 0.0	49.66	304.09	1099.67	V / 1.00 / 220	-11.16
45.94 MHz	42.2 Qp	0.6 / 20.61 / 29.74 / 0.0	33.67	48.25	1099.67	V / 1.00 / 180	-27.15
42.99 MHz	40.1 Qp	0.58 / 21.3 / 29.74 / 0.0	32.25	40.97	1099.67	V / 1.00 / 180	-28.57
120.43 MHz	44.4 Qp	1.07 / 14.56 / 29.95 / 0.0	30.08	31.92	1099.67	V / 1.00 / 180	-30.74
116.05 MHz	43.3 Qp	1.04 / 14.81 / 29.94 / 0.0	29.21	28.87	1099.67	V / 1.00 / 0	-31.61
101.6 MHz	43.0 Qp	0.95 / 14.27 / 29.9 / 0.0	28.33	26.09	1099.67	V / 1.00 / 0	-32.49
91.0 MHz	43.25 Qp	0.89 / 13.3 / 29.87 / 0.0	27.57	23.91	1099.67	V / 1.00 / 180	-33.25
78.64 MHz	42.2 Qp	0.81 / 12.76 / 29.84 / 0.0	25.93	19.79	1099.67	V / 1.00 / 270	-34.89
221.212 MHz	38.01 Qp	1.48 / 16.34 / 30.04 / 0.0	25.79	19.48	1099.67	V / 1.00 / 0	-35.03
69.04 MHz	38.15 Qp	0.75 / 14.59 / 29.81 / 0.0	23.68	15.28	1099.67	V / 1.00 / 180	-37.14
160.018 MHz	36.9 Qp	1.24 / 14.27 / 30.06 / 0.0	22.35	13.11	1099.67	V / 1.00 / 90	-38.47
176.974 MHz	34.1 Qp	1.31 / 14.8 / 30.09 / 0.0	20.11	10.13	1099.67	V / 1.00 / 0	-40.71



Measurement summary: FCC 15.209 spurious in restricted bands 3m qp							
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV/m)	FINAL (uV/m)	LIMIT (uV/m)	POL / HGT / AZ (m)(DEG)	
120.43 MHz	44.4 Qp	1.07 / 14.56 / 29.95 / 0.0	30.08	31.92	150	V / 1.00 / 180	
116.05 MHz	43.3 Qp	1.04 / 14.81 / 29.94 / 0.0	29.21	28.87	150	V / 1.00 / 0	

Test data, spurious
1000MHz – 4340MHz

Measurement summary for limit1: FCC >1G 3m pk (Pk)						
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	FINAL (uV / m)	LIMIT (uV / m)
2.603 GHz	80.5 Pk	6.37 / 28.9 / 43.03 / 0.41	73.15	V / 1.00 / 202	4545	10996.7
4.339 GHz	60.75 Pk	8.96 / 32.01 / 43.09 / 0.57	59.2	H / 1.00 / 90	912	5000
3.905 GHz	57.35 Pk	8.42 / 32.08 / 43.01 / 0.58	55.43	V / 1.00 / 90	591	5000
3.037 GHz	56.3 Pk	7.32 / 29.95 / 42.91 / 0.35	51.02	V / 1.00 / 270	356	10996.7
1.302 GHz	57.7 Pk	5.13 / 25.59 / 40.66 / 0.59	48.36	V / 1.00 / 0	262	5000
3.471 GHz	50.95 Pk	7.61 / 31.14 / 42.79 / 0.32	47.25	V / 1.00 / 0	230	10996.7
2.17 GHz	54.9 Pk	6.21 / 27.51 / 42.99 / 0.47	46.1	V / 1.00 / 270	202	10996.7
1.736 GHz	53.95 Pk	6.04 / 26.35 / 42.66 / 0.13	43.82	V / 1.00 / 270	155	10996.7

Measurement summary for limit2: FCC >1GHz 3m av (Av)						
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	FINAL (uV / m)	LIMIT (uV / m)
2.603 GHz	57.7 Av	6.37 / 28.9 / 43.03 / 0.41	50.35	V / 1.00 / 202	329	1099.67
4.339 GHz	43.59 Av	8.96 / 32.01 / 43.09 / 0.57	42.04	H / 1.00 / 90	126	500
3.905 GHz	40.66 Av	8.42 / 32.08 / 43.01 / 0.58	38.74	V / 1.00 / 90	86.5	500
3.037 GHz	42.42 Av	7.32 / 29.95 / 42.91 / 0.35	37.14	V / 1.00 / 270	71.9	1099.67
3.471 GHz	40.58 Av	7.61 / 31.14 / 42.79 / 0.32	36.88	V / 1.00 / 0	69.8	1099.67
1.302 GHz	39.9 Av	5.13 / 25.59 / 40.66 / 0.59	30.56	V / 1.00 / 0	33.7	500
2.17 GHz	35.2 Av	6.21 / 27.51 / 42.99 / 0.47	26.4	V / 1.00 / 270	20.9	1099.67
1.736 GHz	34.55 Av	6.04 / 26.35 / 42.66 / 0.13	24.42	V / 1.00 / 0	16.6	1099.67

Occupied bandwidth
FCC 15.231(c), IC RSS-210 A1.1.3

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Testing was performed in accordance with the test procedure of ANSI C63.4 2009 clause 13.7

Test location
Taylors Falls Lab Large Test Site (Open Area Test Site)

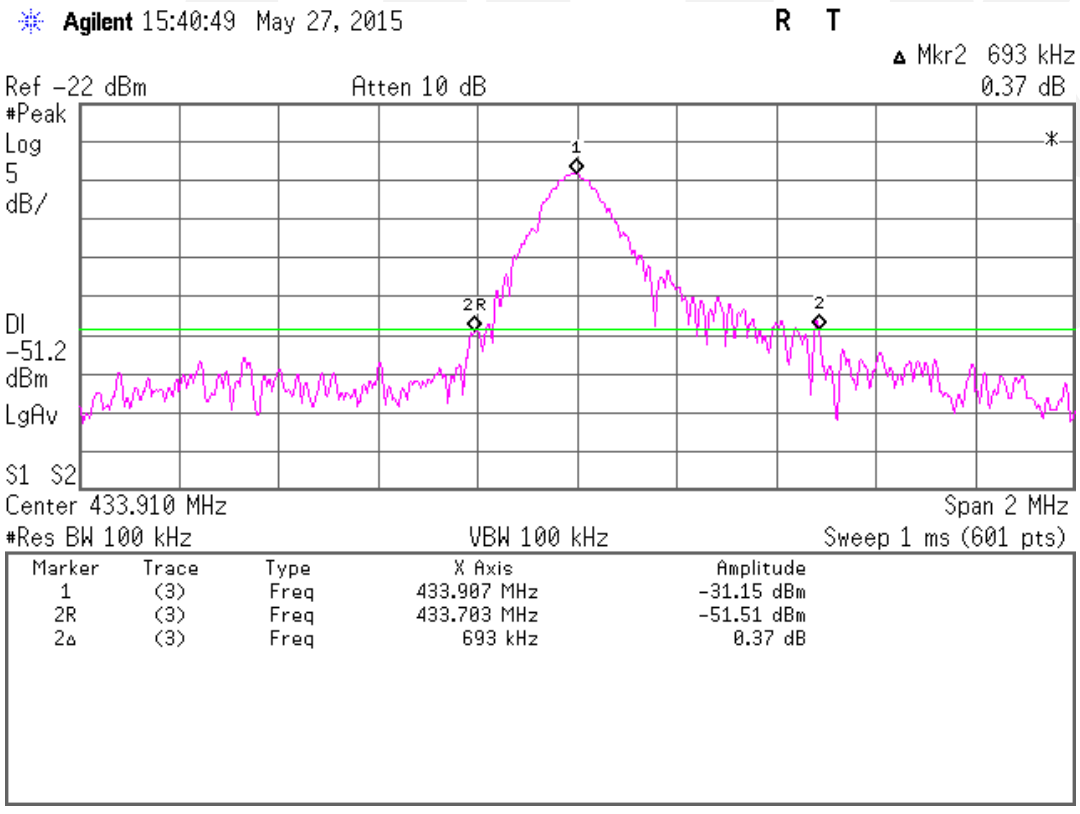
Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Date	Cal Due
OWLE03202	EM-6917B	Electro-Metrics	Biconicalog Periodic	101	16-Oct-14	16-Oct-15
WRLE10897	ZHL-1042J	Mini-Circuits	Amplifier Broadband AMP/ SMA QA1148002	NA	Code B 06-Feb-15	Code B 06-Feb-16
NBLE03367	E4440A	Agilent	Spectrum Analyzer	MY42510439	10-Sep-14	10-Sep-15

Code Y = Calibration not required when used with other calibrated equipment.

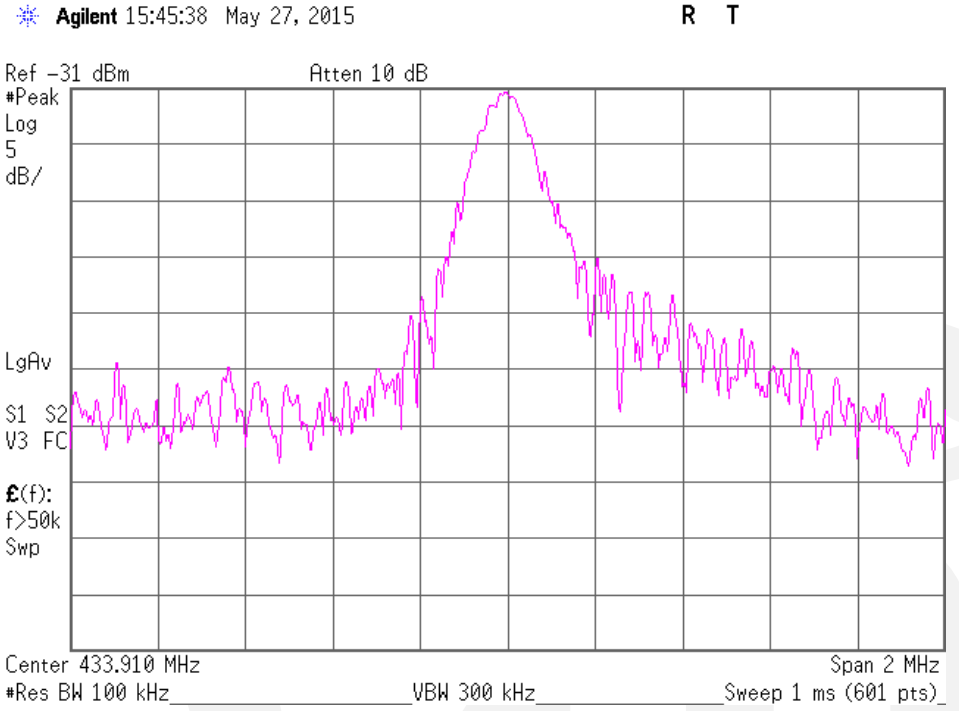
Test limit
No wider than 0.25% of the center frequency. 433.915 MHz x 0.25% = 1.084 MHz. Per FCC, measured at the -20 dBc points. Per IC RSS-210 A1.1.3, the 99% occupied bandwidth

Test data per FCC 15.231(c)
20 dB occupied bandwidth = 693 kHz

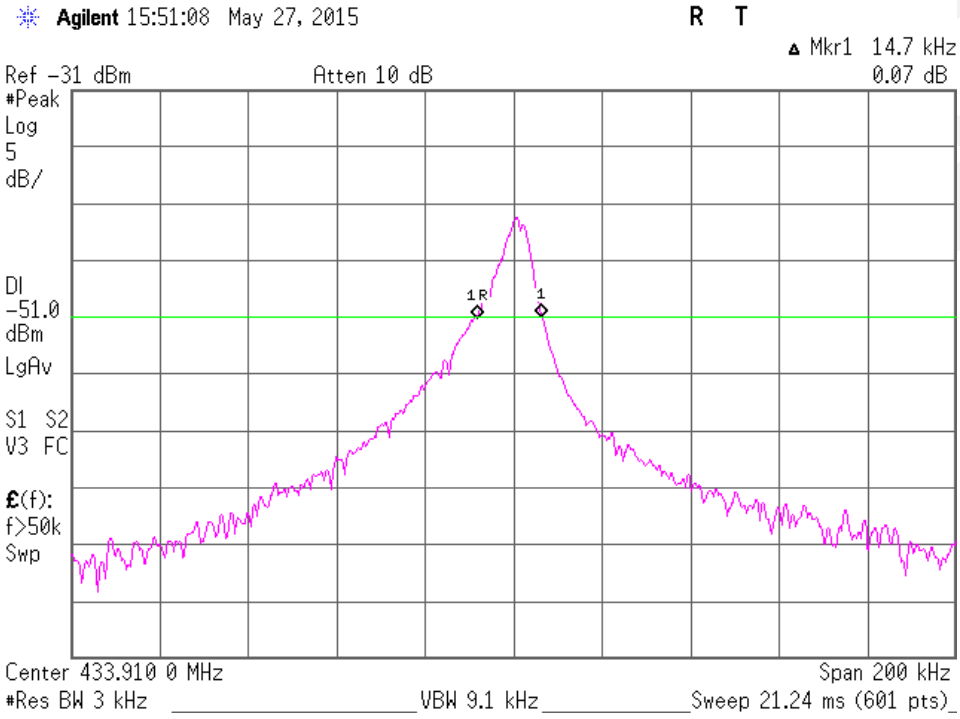


Test data per IC RSS-210
99% Occupied bandwidth = 14.7 kHz

1 of 2. RBW greater than OBW. Set ref lvl



2 of 2. RBW near 1% of OBW. Markers at -20dB from ref levl



Periodic operation
FCC 15.231(a), IC RSS-210 A1.1.1

Test summary
The requirements are: ■ - MET ☐ - NOT MET

Manufacturer declared operation mode.

Test Limit 15.231(a);
(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

"Whenever the transmitter is activated automatically it will transmit 4 packets of 26.452 msec in length spaced by 248 msec. Transmission cease after 849.808 msec."

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

"The supervisory periodic transmissions are the four automatic transmissions noted above. They occur once per hour, for a total hourly transmission time of 105.808 msec."

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition

"The transmitter is limited to reporting devices opening and closing. Other than the initial status change condition report there are no repeat transmissions other than the hourly supervisory transmissions."

(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

"Set up information cannot exceed 4 26.452 msec packets, spaced by 248 msec.

AC Power Line Conducted Emissions (RF-CHW-DSC-16)

FCC 15.207(a), IC RSS-Gen 7.2.4

Test summary

The requirements are: ■ - MET ☐ - NOT MET

Testing was performed in accordance with the test procedure of ANSI C63.4 2009, clause 13.3

Test location

Taylors Falls Lab Large Test Site

Test Equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Date	Cal Due
WRLE10942	FCC-LISN-50-25-2-10	Fischer Custom Comm	LISN	120306	16-Jun-14	16-Jun-15
WRLE02534	ESHS-20	Rohde & Schwarz	EMI Receiver 9kHz-30MHz	837055/003	11-Aug-14	11-Aug-15

Code B = Calibration verification performed internally. Code Y = Calibration not required when used with other calibrated equipment

Limit

Frequency (MHz)	Quasi-peak (dBuV)	Average (dBuV)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

*Decreases with the logarithm of the frequency

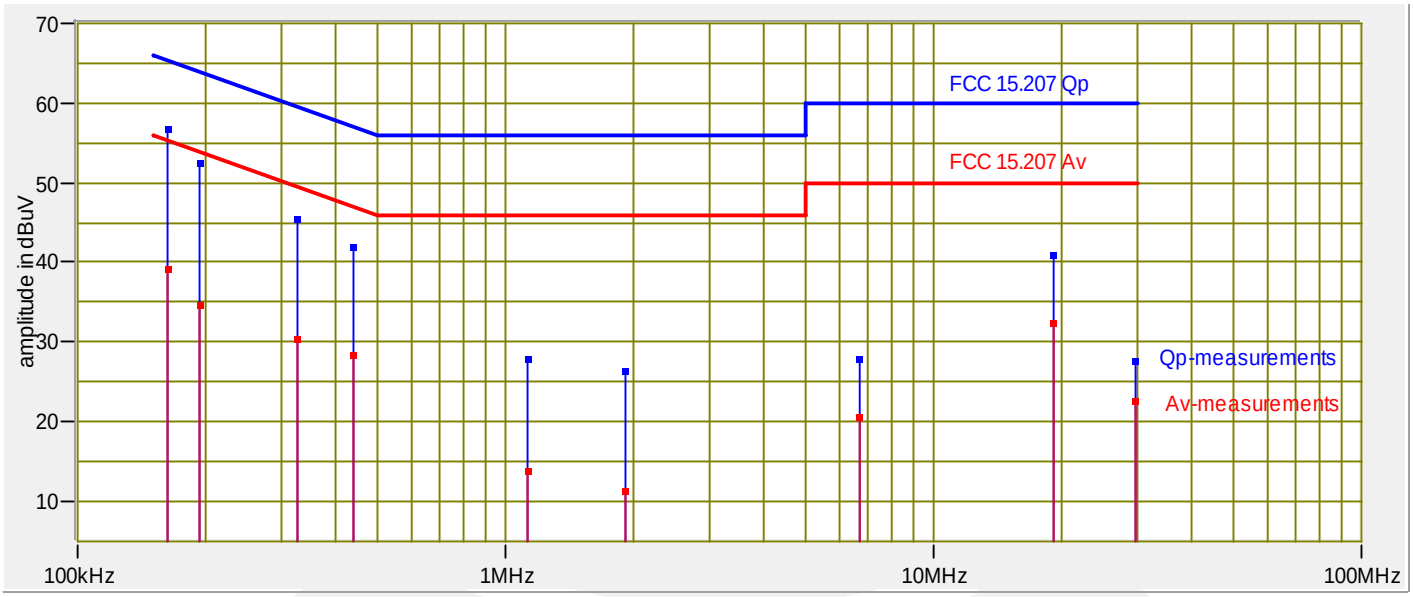
Test data

Measurement summary for limit1: FCC 15.207 Qp (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA1 FCC 15.207 Qp
162.0 kHz	56.81 Qp	0.0 / -0.25 / 0.0 / 0.0	56.56	L1	-8.8
192.0 kHz	52.63 Qp	0.0 / -0.25 / 0.0 / 0.0	52.38	N	-11.56
327.0 kHz	45.53 Qp	0.02 / -0.25 / 0.0 / 0.0	45.3	L1	-14.23
441.0 kHz	42.21 Qp	0.03 / -0.25 / 0.0 / 0.0	41.99	L1	-15.05
18.969 MHz	39.85 Qp	1.0 / 0.01 / 0.0 / 0.0	40.86	N	-19.14
1.122 MHz	27.91 Qp	0.1 / -0.24 / 0.0 / 0.0	27.77	L1	-28.23
1.911 MHz	26.25 Qp	0.18 / -0.23 / 0.0 / 0.0	26.21	L1	-29.79
6.741 MHz	27.35 Qp	0.59 / -0.16 / 0.0 / 0.0	27.78	L1	-32.22
29.793 MHz	26.31 Qp	1.28 / 0.1 / 0.0 / 0.0	27.69	N	-32.31

Measurement summary for limit2: FCC 15.207 Av (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV)	EUT Lead	DELTA2 FCC 15.207 Av
162.0 kHz	39.25 Av	0.0 / -0.25 / 0.0 / 0.0	39.0	L1	-16.36
18.969 MHz	31.45 Av	1.0 / 0.01 / 0.0 / 0.0	32.46	N	-17.54
441.0 kHz	28.61 Av	0.03 / -0.25 / 0.0 / 0.0	28.39	L1	-18.65
327.0 kHz	30.68 Av	0.02 / -0.25 / 0.0 / 0.0	30.45	L1	-19.08
192.0 kHz	34.82 Av	0.0 / -0.25 / 0.0 / 0.0	34.57	N	-19.37
29.793 MHz	21.07 Av	1.28 / 0.1 / 0.0 / 0.0	22.45	N	-27.55
6.741 MHz	20.04 Av	0.59 / -0.16 / 0.0 / 0.0	20.47	L1	-29.53
1.122 MHz	14.02 Av	0.1 / -0.24 / 0.0 / 0.0	13.88	L1	-32.12
1.911 MHz	11.35 Av	0.18 / -0.23 / 0.0 / 0.0	11.31	L1	-34.69

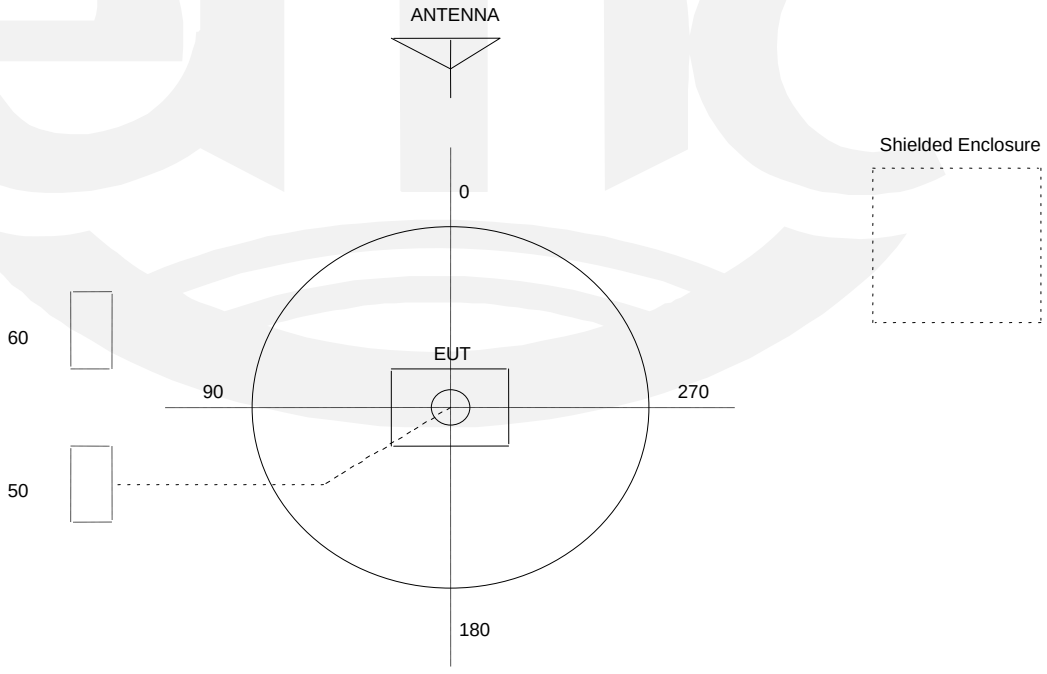

70
60
50
40
30
20
10
amplitude in dBuV
FCC 15.207 Qp
FCC 15.207 Av
Qp-measurements
Av-measurements
100kHz
1MHz
10MHz
100MHz

TEST SETUP FOR EMISSIONS TESTING

TAYLORS FALLS LAB
Large Test Site

Notes:

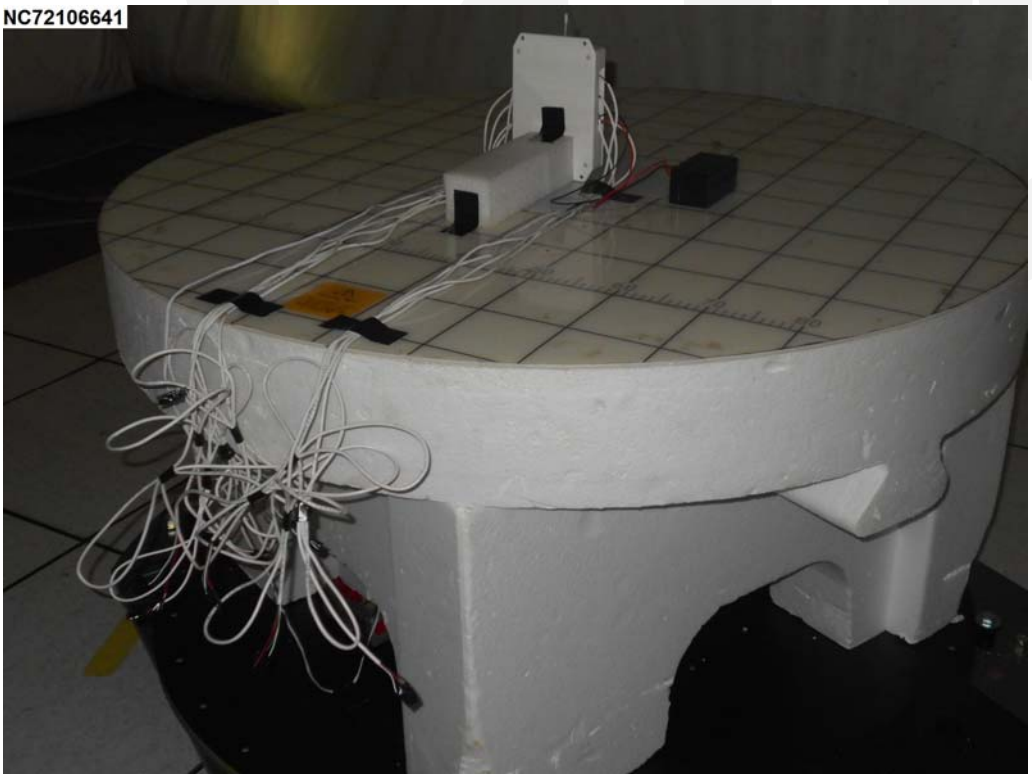
1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz and 60 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3 and 10 meters from the center of the turntable.
4. The circle is either a 6.7 meter or 1.2 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



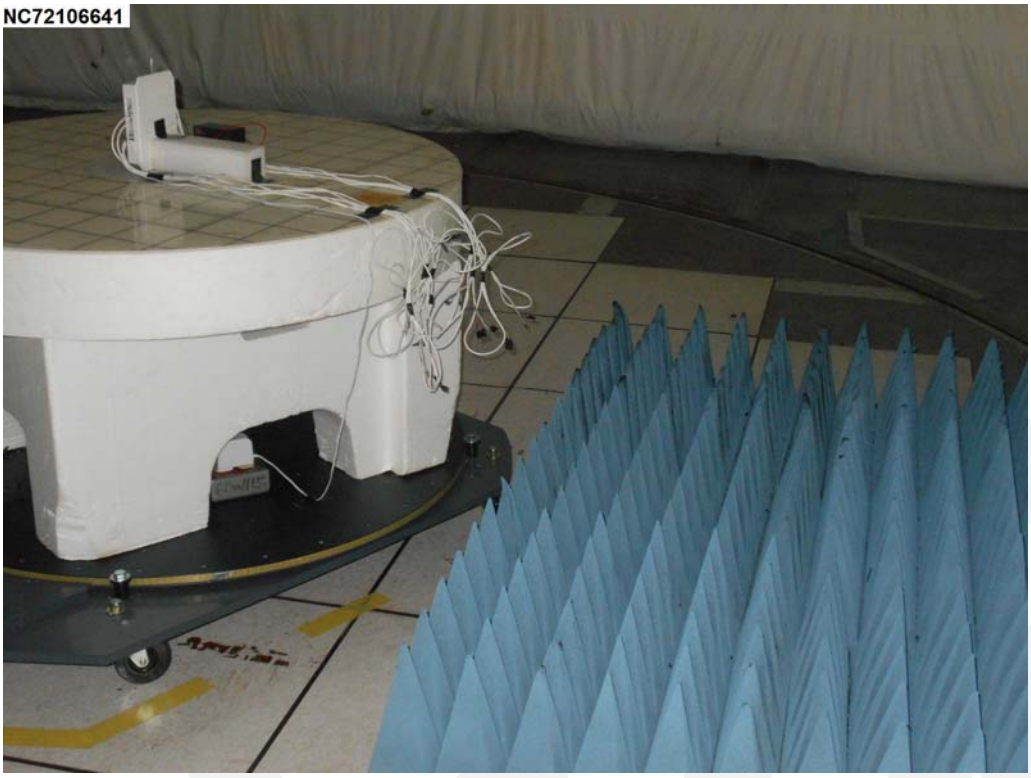
Test-setup photo(s): radiated emissions

NC72106641

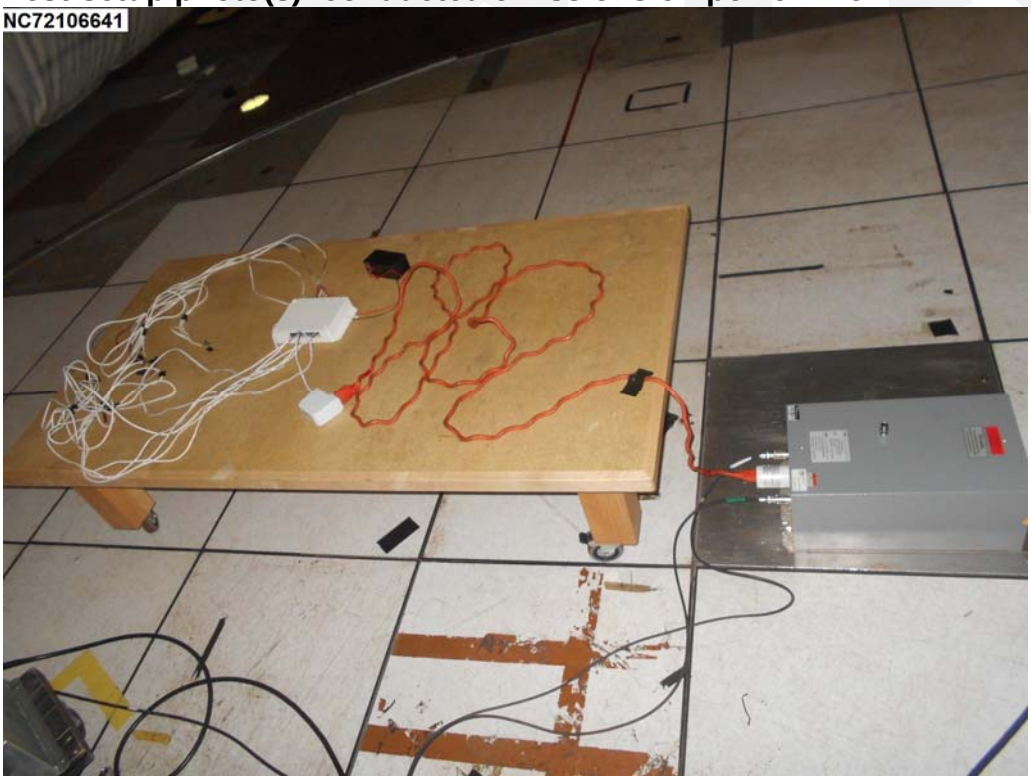
NC72106641



Test-setup photo(s): radiated emissions above 1 GHz



Test-setup photo(s): conducted emissions on power line



Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during immunity testing :

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

■ - Sends continuous packets- carrier with modulation

Configuration of the device under test:

■ - See Appendix A and test setup photos

☐ - See Product Information Form(s) in Appendix B

DEVIATIONS FROM STANDARD:
None.

GENERAL REMARKS:
None

Modifications required to pass:
■ None
☐ As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:
■ None
☐ As indicated in the Test Plan

SUMMARY:
The requirements according to the technical regulations are
■ - met and the device under test does fulfill the general approval requirements.
☐ - **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date: 27 May 2015
Condition of EUT: Normal
Testing Start Date: 27 May 2015
Testing End Date: 27 May 2015

TÜV SÜD AMERICA INC

Reviewed by:
Joel Schneider
Senior EMC Engineer

Tested by:
Greg Jakubowski
Senior EMC Technician

Appendix A

Constructional Data Form

Form

EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.

Company:	Cinch Systems Inc		
Address:	12075 43 ST NE		
	Suite 300		
	St Michael, MN 55376		
Contact:	Mark Cawley	Position:	Engineer
Phone:	763-497-1059	Fax:	763-497-0898
E-mail Address:	mark.cawley@cinchsystems.com		

General Equipment Description -- ***NOTE: This information will be input into your test report as shown below.***

EUT Description	Hardwire Conveter		
EUT Name	Hardwire Converter		
Model No.:	RF-CHW-DSC-16	Serial No.:	123456
Product Options:			
Configurations to be tested:			

Equipment Modification (*If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)*

Modifications since last test:	N/A
Modifications made during test:	N/A

Test Objective(s): ***Please indicate the tests to be performed, entering the applicable standard(s) where noted.***

☐	EMC Directive 2004/108/EC (EMC)	☒	FCC:	Class	☐ A	☒ B	Part	15	
	Std:	☐	VCCI:	Class	☐ A	☐ B			
☐	Machinery Directive 89/392/EEC (EMC)	☐	BSMI:	Class	☐ A	☐ B	(Separate Report)		
	Std:	☒	Canada:	Class	☐ A	☒ B			
☐	Medical Device Directive 93/42/EEC (EMC)	☐	Australia:	Class	☐ A	☐ B			
	Std:	☐	Other:						
☐	Vehicle Directive - 2004/104/EC (EMC)	☐	Ag Directive *2009/64/EC (EMC)						
	☐ Other Vehicle Std:								
☐	FDA Reviewers Guidance for Premarket Notification Submissions (EMC)								

Third Party Certification (contact TÜV for quote), if applicable (*Signature on last page required).

☐ Attestation of Compliance (AoC)*	☐ EMC Certification (used with Octagon Mark)*
☐ Statement of Compliance (SoC, previously CoC)* - All aspects of the essential requirements were assessed	
Protection Class (Req'd for AoC, SoC, EMC Cert. N/A for vehicles) ☐ Class I ☐ Class II ☐ Class III (Press **F1** when field is selected to show additional information on Protection Class.)	
☒ FCC / TCB Certification	☐ Taiwan Certification
☒ Industry Canada / FCB Certification	☐ Korean Certification
☐ e-Mark Certification	

Form

EMC Test Plan and Constructional Data Form

Attendance

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

Failure - *Complete this section if testing will not be attended by the customer.*

If a failure occurs, TÜV SÜD America should:

☒ Call contact listed above, if not available then stop testing. (After hrs phone): 651-269-4981
☐ Continue testing to complete test series.
☐ Continue testing to define corrective action.
☐ Stop testing.

EUT Specifications and Requirements

Length: 2.50" Width: 0.95" Height: 0.56" Weight: 2oz.

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 120VAC (RF-CHW) (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: DC/1P

Current (Amps/phase(max)): 100mA Current (Amps/phase(nominal)): 10mA

Other

Other Special Requirements

Need all testing/certs. required to obtain FCC ID and be ready to sell in US and Canada.

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
Residential preferrable, but commercial as a fall-back

EUT Power Cable

☐ Permanent OR ☐ Removable Length (in meters): 2
☐ Shielded OR ☒ Unshielded
☐ Not Applicable

Form

EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables

Type	Analog	Digital	During Test: Active	During Test: Passive	Qty	Shielding: Yes	Shielding: No	Shielding: Type	Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent
EXAMPLE: *RS232*	☐	☒	☒	☐	*2*	☒	☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	☒	☐
Zone	☐	☒	☒	☐	16	☐	☒	na	none	na	na	2	☒	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐

Form

EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: 1

Description: Production release candidate

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Sends continuous packets- carrier with modulation

2. Normal standby with 1 packet transmitted per hour

3. na

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #
Sensor	RF-CHW-DSC-16	123456	na

Form

EMC Test Plan and Constructional Data Form

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc) This information is required for FCC & Taiwan testing.

Description	*Model #*	*Serial #*	*FCC ID #*

Oscillator Frequencies

Manufacturer	*Frequency*	*Derived Frequency*	*Component # / Location*	*Description of Use*
SJK	13.56 Mhz	433.92 Mhz	Y1	x32 to derive transmit freq.

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
Eagle	GPU5W1601000WD00	na	☒ Switched-mode: (Frequency) 120 kHz ☐ Linear ☐ Other:
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*
na		

Form

EMC Test Plan and Constructional Data Form

Critical EMI Components (Capacitors, ferrites, etc.)				
Description	***Manufacturer***	***Part # or Value***	***Qty***	***Component # / Location***
na				

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

na

PLEASE ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

Authorization (Signature Required if a Third Party Certification is checked on pg 1)

5/26/2015

X Mark Cawley

Mark Cawley
Engineer

Customer authorization to perform tests according to this test plan. — Date

Test Plan/CDF Prepared By (please print) — Date