Magtek Incorporated

TEST REPORT FOR

Handheld Secure Pin Entry Device
Model: DynaPro Go (300562XX)

Tested To The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.225
(13.110-14.010 MHz)

Report No.: 99423-19

Date of issue: November 1, 2017

ACCREDITED
Testing Certificates:
803.01, 803.02, 803.05, 803.06

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Magtek Incorporated
1710 Apollo Court
Seal Beach, CA 90740

REPRESENTATIVE: Robert Rodriguez
Customer Reference Number: 30004164

REPORT PREPARED BY:

Terri Rayle & Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 99423

DATE OF EQUIPMENT RECEIPT: September 14, 2017
DATE(S) OF TESTING: September 14-25 & October 23, 2017

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.02 & 5.03.11

Site Registration & Accreditation Information

Location	NIST CB #	TAIWAN	CANADA	FCC	JAPAN
Brea D, CA	US0060	SL2-IN-E-1146R	3082D-2	US1025	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.225

Test Procedure	Description	Modifications	Results
15.215(c)	Occupied Bandwidth	NA	Pass
15.225(a)-(c)	Field Strength of Fundamental	NA	Pass
15.225(e)	Frequency Stability	NA	Pass
15.225(d)	Field Strength of Spurious Emissions	NA	Pass
15.207	AC Conducted Emissions	NA	Pass

NA = Not Applicable

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

The following device/model has been tested by CKC Laboratories**: Point of Sale Device, Model: DynaPro Go**

Since the time of testing, the manufacturer has chosen to change the device and model name and states that it identical electrically to the one which was tested, or any differences between them do not affect their EMC characteristics, and therefore they meet the level of testing equivalent to the tested device/model**.**
Device: Handheld Secure Pin Entry Device
Model: DynaPro Go (300562XX)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 3

Equipment Tested:

Device	Manufacturer	Model #	S/N
Handheld Secure Pin Entry Device	Magtek Incorporated	DynaPro Go(300562XX)	NA

Support Equipment:

Device	Manufacturer	Model #	S/N
Laptop	Dell	E6630	1486

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Modulation Type(s):	OOK
Maximum Duty Cycle:	100%
Antenna Type(s) and Gain:	Loop / NA
Antenna Connection Type:	Integral
Nominal Input Voltage:	5V
Firmware / Software used for Test:	IPADsim 9.0.2.69

FCC Part 15 Subpart C

15.215(c) Occupied Bandwidth (20dB BW)

Test Setup/Conditions			
Test Location:	Brea Lab D	Test Engineer:	E. Wong
Test Method:	ANSI C63.10 (2013)	Test Date(s):	9/14/2017
Configuration:	3		
Test Setup:	The EUT containing a 13.56 MHz transmitter and single modular approved WiFi transmitter is placed on Styrofoam platform. WiFi Module FCCID: O7P-362 IC :10147A-362 Evaluation of 13.56MHz transmitter Frequency range: 13.56MHz The EUT is connected to a support laptop via a USB cable with ferrite on the EUT end. The device is operating at rated 5V DC from the USB port of the laptop, Transmit and receive simultaneously. Emission profile of the EUT rotated along three orthogonal axis was investigated. Recorded data represent worse case emission		

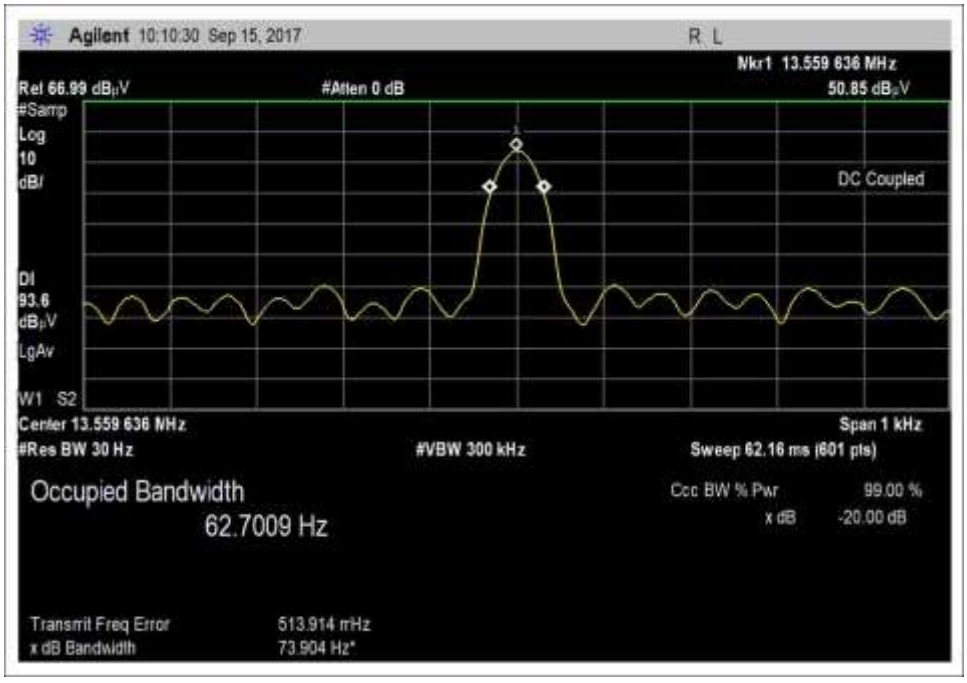
Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	45

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02869	Spectrum Analyzer	Agilent	E4440A	8/1/2017	8/1/2018
P05569	Cable	Pasternack	RG-214/U	12/7/2016	12/7/2018
00314	Loop Antenna	EMCO	6502	5/20/2016	5/20/2018
P04382	Cable	Andrew	LDF-50	6/6/2016	6/6/2018

Test Data Summary					
Frequency (MHz)	**Antenna Port**	**Modulation**	**Measured (kHz)**	**Limit (kHz)**	**Results**
13.56	1	OOK	0.0739	None	NA

NA = Not Applicable

Plot



Test Setup Photos

15.225(a)-(c) Field Strength of Fundamental

Test Setup/Conditions			
Test Location:	Brea Lab D	Test Engineer:	E. Wong
Test Method:	ANSI C63.10 (2013)	Test Date(s):	9/14/2017
Configuration:	3		
Test Setup:	The EUT containing a 13.56 MHz transmitter and single modular approved WiFi transmitter is placed on Styrofoam platform. WiFi Module FCCID: O7P-362 IC :10147A-362 Evaluation of 13.56MHz transmitter Frequency range: 13.56MHz The EUT is connected to a support laptop via a USB cable with ferrite on the EUT end. The device is operating at rated 5V DC from the USB port of the laptop, Transmit and receive simultaneously. Emission profile of the EUT rotated along three orthogonal axis was investigated. Recorded data represent worse case emission		

Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	45

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02869	Spectrum Analyzer	Agilent	E4440A	8/1/2017	8/1/2018
P05569	Cable	Pasternack	RG-214/U	12/7/2016	12/7/2018
00314	Loop Antenna	EMCO	6502	5/20/2016	5/20/2018
P04382	Cable	Andrew	LDF-50	6/6/2016	6/6/2018
01438	DC Power Supply	Topward	6306D	1/25/2017	1/25/2019
01878	Temperature Chamber	Thermotron Corp.	S 1.2 Mini-Max	5/15/2017	5/15/2019
P05947	Thermometer	Fluke	51	5/24/2016	5/24/2018

Test Data Summary - Voltage Variations					
Frequency (MHz)	Modulation / Ant Port	$V_{Minimum}$ (dBuV/m@30m)	$V_{Nominal}$ (dBuV/m@30m)	$V_{Maximum}$ (dBuV/m@30m)	Max Deviation from $V_{Nominal}$ (dB)
13.56	OOK/ Integral Loop	43.0	43.0	43.0	o

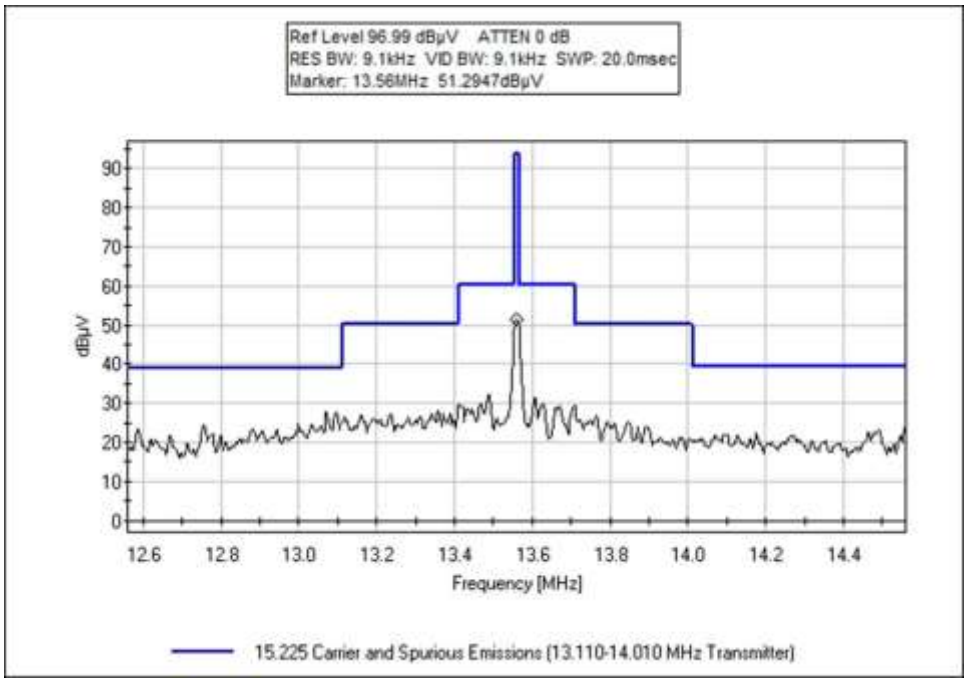
Test performed using operational mode with the highest output power, representing worst case.

Parameter Definitions:

Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	5V DC
$V_{Minimum}$:	4.25 Vdc
$V_{Maximum}$:	5.75 Vdc

Emissions Mask Data



Test Setup Photos

X Axis

Y Axis

Z Axis

Temperature Chamber

Temperature Chamber

15.225(e) Frequency Stability

Test Setup/Conditions			
Test Location:	Brea Lab D	Test Engineer:	E. Wong
Test Method:	ANSI C63.10 (2013)	Test Date(s):	9/22/2017
Configuration:	3		
Test Setup:	The EUT containing a 13.56 MHz transmitter and single modular approved WiFi transmitter is placed in temperature chamber. A near field probe was used for frequency deviation measurement. WiFi Module FCCID: O7P-362 IC :10147A-362 Evaluation of 13.56MHz transmitter Frequency range: 13.56MHz The EUT is connected to a support laptop via a USB cable with ferrite on the EUT end. The device is operating at rated 5V DC from the USB port of the laptop, Transmit and receive simultaneously.		

Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	45

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02869	Spectrum Analyzer	Agilent	E4440A	8/1/2017	8/1/2018
01878	Temperature Chamber	Thermotron Corp.	S 1.2 Mini-Max	5/15/2017	5/15/2019
P05947	Thermometer	Fluke	51	5/24/2016	5/24/2018
01438	DC Power Supply	Topward	6306D	1/25/2017	1/25/2019

Test Data Summary					
Temperature (ºC)	Voltage	Frequency (MHz)	Deviation (%)	Limit (%)	Results
					Pass
-10	5V dc	13.558850	0.000030000	±0.01	
0	5V dc	13.558888	0.000068000	±0.01	
10	5V dc	13.558780	0.000040000	±0.01	
20	5V dc	13.558820	0.000000000	±0.01	
30	5V dc	13.558850	0.000030000	±0.01	
40	5V dc	13.558780	0.000040000	±0.01	
50	5V dc	13.558780	0.000040000	±0.01	
Nominal Frequency:		13.560000			

Manufacture declared temperature range of operation -10 – 55DegC
Note: recorded frequency at -6dBc

Test Setup Photos

Temperature Chamber

Temperature Chamber

15.225(d) Radiated Emissions & Band Edge

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92821 • 714 993 6112		
Customer:	**Magtek Incorporated**		
Specification:	**15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**		
Work Order #:	**99423**	Date:	9/15/2017
Test Type:	**Radiated Scan**	Time:	15:57:14
Tested By:	E. Wong	Sequence#:	4
Software:	EMITest 5.03.02		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT containing a 13.56 MHz transmitter and single modular approved WiFi transmitter is placed on Styrofoam platform.
WiFi Module
FCCID: O7P-362
IC :10147A-362

Evaluation of 13.56MHz transmitter

Frequency range 13.56MHz

The manufacturer declares the highest EUT frequency generated or used, other than the fundamental frequency, is 12MHz

Frequency range of measurement = 9 kHz- 1 GHz.
9kHz -150kHz; RBW=200 Hz, VBW=200 Hz;150kHz-30 MHz; RBW=9kHz,VBW=9kHz;
30MHz-1000 MHz; RBW=120 kHz, VBW=120 kHz.

Test environment conditions:
Temperature: 23°C
Relative Humidity: 45%
Pressure: 100.8kPa

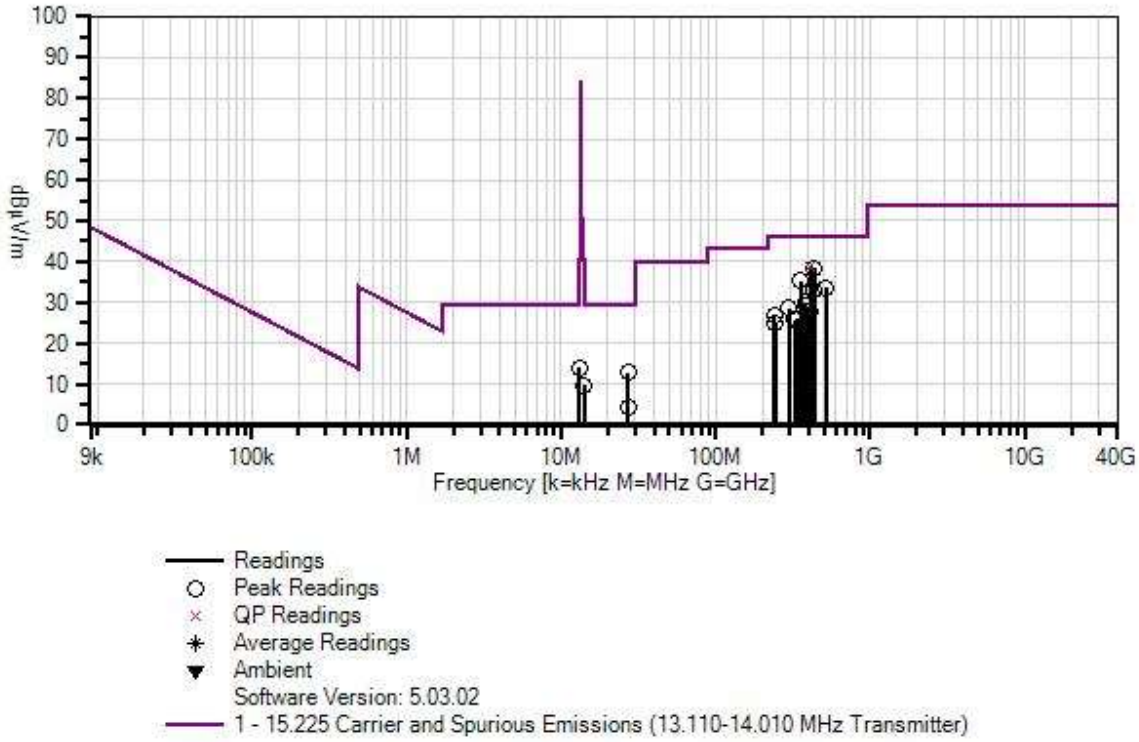
The EUT is connected to a support laptop via a USB cable with ferrite on the EUT end.

The device is operating at rated 5V DC from the USB port of the laptop, Transmit and receive simultaneously.

Emission profile of the EUT rotated along three orthogonal axis was investigated.
Recorded data represent worse case emission

Site D

Magtek Incorporated WO#: 99423 Sequence#: 4 Date: 9/15/2017
15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter) Test Distance: 3 Meters Horiz



Readings
Peak Readings
QP Readings
Average Readings
Ambient
Software Version: 5.03.02
1 - 15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/1/2017	8/1/2018
T2	ANP04382	Cable	LDF-50	6/6/2016	6/6/2018
T3	AN01994	Biconilog Antenna	CBL6111C	3/11/2016	3/11/2018
T4	ANP05283	Attenuator	ATT-0218-06-NNN-02	5/5/2016	5/5/2018
T5	ANP05569	Cable-Amplitude +15C to +45C (dB)	RG-214/U	12/7/2016	12/7/2018
T6	AN00010	Preamp	8447D	3/14/2016	3/14/2018
T7	ANP06978	Cable	Sucoflex 104A	4/5/2016	4/5/2018
T8	AN00314	Loop Antenna	6502	5/20/2016	5/20/2018

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

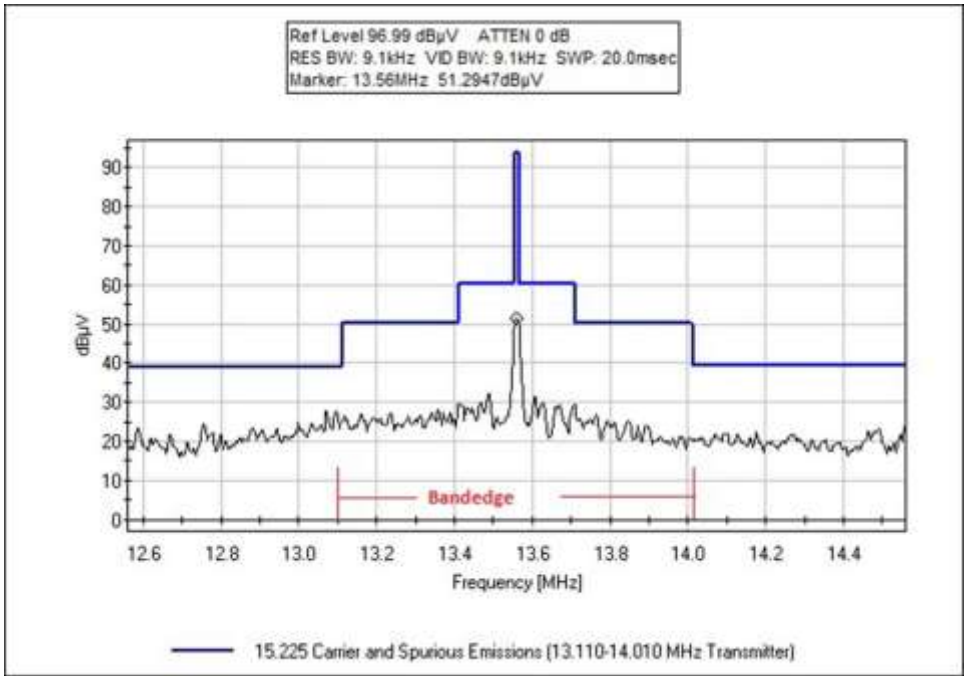
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8					
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	406.775M	38.9	+0.0	+2.1	+17.0	+5.8	+0.0	38.8	46.0	-7.2	Horiz
	QP		+2.1	-27.4	+0.3	+0.0					
^	406.775M	39.3	+0.0	+2.1	+17.0	+5.8	+0.0	39.2	46.0	-6.8	Horiz
			+2.1	-27.4	+0.3	+0.0					
^	406.803M	34.9	+0.0	+2.1	+17.0	+5.8	+0.0	34.8	46.0	-11.2	Horiz
			+2.1	-27.4	+0.3	+0.0					
^	406.850M	31.5	+0.0	+2.1	+17.0	+5.8	+0.0	31.4	46.0	-14.6	Horiz
			+2.1	-27.4	+0.3	+0.0					
5	433.880M	38.1	+0.0	+2.2	+17.5	+5.8	+0.0	38.5	46.0	-7.5	Horiz
			+2.2	-27.6	+0.3	+0.0					
6	352.558M	36.4	+0.0	+2.0	+15.7	+5.8	+0.0	35.3	46.0	-10.7	Vert
			+2.0	-26.9	+0.3	+0.0					
7	515.250M	31.7	+0.0	+2.4	+18.9	+5.8	+0.0	33.5	46.0	-12.5	Horiz
			+2.4	-28.0	+0.3	+0.0					
8	433.880M	32.4	+0.0	+2.2	+17.5	+5.8	+0.0	32.8	46.0	-13.2	Horiz
			+2.2	-27.6	+0.3	+0.0					
9	13.110M	23.5	+0.0	+0.3	+0.0	+0.0	-19.1	13.9	29.5	-15.6	Perpe
			+0.3	+0.0	+0.0	+8.9			Bandedge		
10	379.650M	30.5	+0.0	+2.1	+16.4	+5.8	+0.0	30.0	46.0	-16.0	Horiz
			+2.1	-27.2	+0.3	+0.0					
11	27.120M	25.2	+0.0	+0.5	+0.0	+0.0	-19.1	12.9	29.5	-16.6	Perpe
			+0.4	+0.0	+0.0	+5.9					
12	386.142M	29.5	+0.0	+2.1	+16.6	+5.8	+0.0	29.1	46.0	-16.9	Horiz
			+2.1	-27.3	+0.3	+0.0					
13	298.300M	31.5	+0.0	+1.8	+14.2	+5.8	+0.0	28.7	46.0	-17.3	Vert
			+1.8	-26.6	+0.2	+0.0					
14	400.025M	28.1	+0.0	+2.1	+16.9	+5.8	+0.0	27.9	46.0	-18.1	Horiz
			+2.1	-27.4	+0.3	+0.0					
15	393.275M	28.1	+0.0	+2.1	+16.7	+5.8	+0.0	27.8	46.0	-18.2	Horiz
			+2.1	-27.3	+0.3	+0.0					
16	411.892M	27.7	+0.0	+2.1	+17.1	+5.8	+0.0	27.6	46.0	-18.4	Vert
			+2.1	-27.5	+0.3	+0.0					
17	240.000M	31.2	+0.0	+1.6	+13.0	+5.8	+0.0	26.8	46.0	-19.2	Vert
			+1.6	-26.6	+0.2	+0.0					

18	14.010M	19.3	+0.0 +0.3	+0.3 +0.0	+0.0 +0.0	+0.0 +8.8	-19.1	9.6	29.5 Bandedge	-19.9	Perpe
19	335.983M	27.5	+0.0 +1.9	+1.9 -26.8	+15.3 +0.3	+5.8 +0.0	+0.0	25.9	46.0	-20.1	Vert
20	325.480M	27.5	+0.0 +1.9	+1.9 -26.8	+15.0 +0.3	+5.8 +0.0	+0.0	25.6	46.0	-20.4	Horiz
21	244.130M	28.9	+0.0 +1.6	+1.6 -26.6	+13.4 +0.2	+5.8 +0.0	+0.0	24.9	46.0	-21.1	Horiz
22	27.120M	16.5	+0.0 +0.4	+0.5 +0.0	+0.0 +0.0	+0.0 +5.9	-19.1	4.2	29.5	-25.3	Paral

Band Edge

Band Edge Summary					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @30m)**	**Limit (dBuV/m @30m)**	**Results**
13.110	OOK	Integral Loop	13.9	≤29.5	Pass
14.010	OOK	Integral Loop	9.6	≤29.5	Pass

Band Edge Plots



Test Setup Photos

X Axis

Y Axis

Z Axis

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA 92821 • 714 993 6112		
Customer:	**Magtek Incorporated**		
Specification:	**15.207 AC Mains - Quasi-peak**		
Work Order #:	**99423**	Date:	10/30/2017
Test Type:	**Conducted Emissions**	Time:	09:21:51
Tested By:	E. Wong	Sequence#:	10
Software:	EMITest 5.03.11		110V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT containing a 13.56 MHz transmitter and single modular approved WiFi transmitter is placed on the test bench.
WiFi Module
FCCID: O7P-362
IC :10147A-362

Evaluation of 13.56MHz transmitter

TX Frequency :13.56MHz

The manufacturer declares the highest EUT frequency generated or used, other than the fundamental frequency, is 12MHz

Frequency range of measurement = 150kHz- 30MHz.
150 kHz-30 MHz; RBW=9 kHz, VBW=9kHz

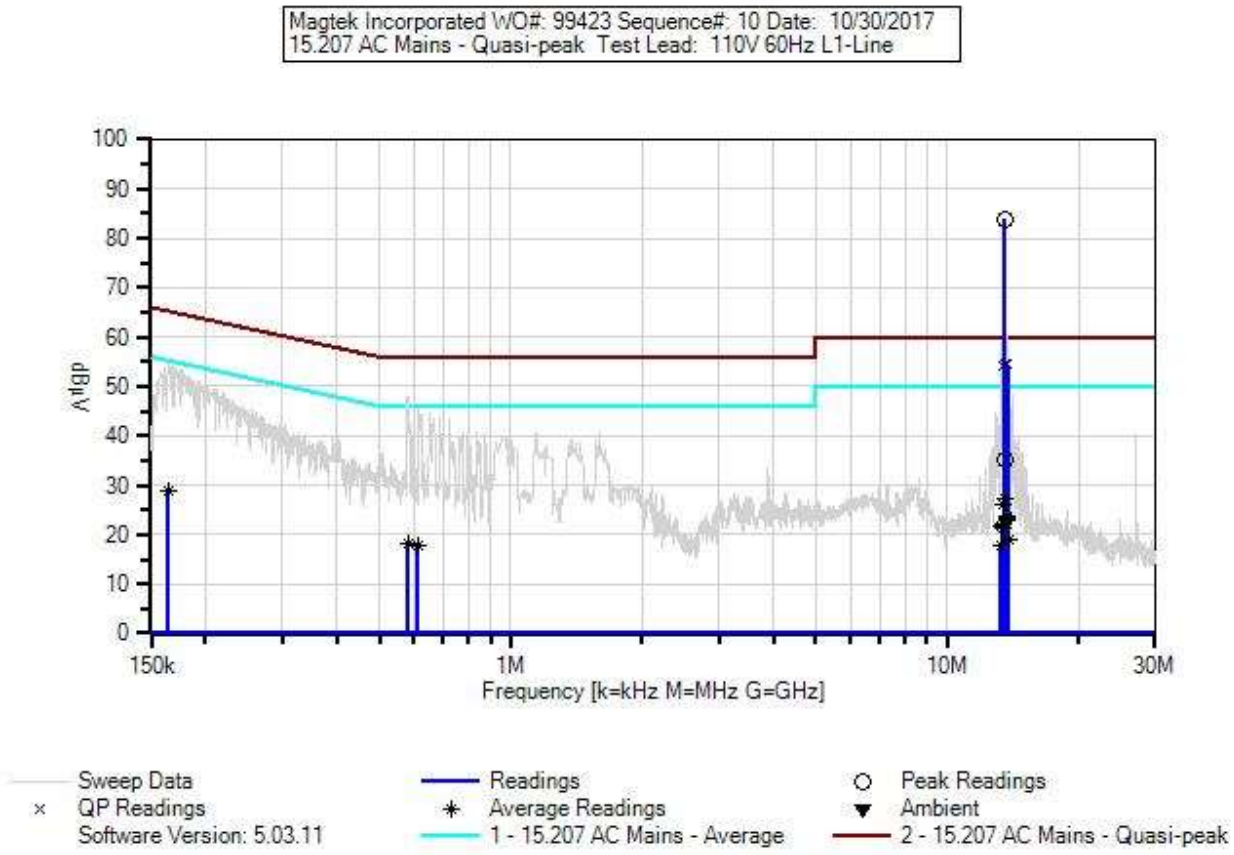
Test environment conditions: 23°C, 45% Relative Humidity, 100.8kPa

The EUT is connected to a support laptop via a USB cable with ferrite on the EUT end.

The device is operating at rated 5V DC from the USB port of the laptop, Transmit and receive simultaneously.

AC Conducted emission performed at AC main of the support Laptop Power supply

TX 0n, reading at fundamental measured with antenna, and with load attached.


Magtek Incorporated WO#: 99423 Sequence#: 10 Date: 10/30/2017
15.207 AC Mains - Quasi-peak Test Lead: 110V 60Hz L1-Line
100
90
80
70
60
50
40
30
20
10
0
dBµV
150k
1M
10M
30M
Frequency [k=kHz M=MHz G=GHz]
Sweep Data
QP Readings
Software Version: 5.03.11
Readings
Average Readings
1 - 15.207 AC Mains - Average
Peak Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/1/2017	8/1/2018
T2	ANP06085	Attenuator	SA18N10W-09	11/14/2016	11/14/2018
T3	AN02343	High Pass Filter	HE9615-150K-50-720B	1/25/2017	1/25/2019
T4	ANP01910	Cable	RG-142	11/30/2015	11/30/2017
T5	AN00969A	50uH LISN-Line 1 (L1)	3816/2NM	3/14/2017	3/14/2019
	AN00969A	50uH LISN-Line2 (L2)	3816/2NM	3/14/2017	3/14/2019

Measurement Data: Reading listed by margin. Test Lead: L1-Line

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	13.562M	77.7	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	83.9	50.0 fundamental data with antenna attached	+33.9	L1-Li
2	13.625M QP	48.3	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	54.5	60.0	-5.5	L1-Li
3	13.770M QP	48.2	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	54.4	60.0	-5.6	L1-Li
4	13.490M QP	48.0	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	54.2	60.0	-5.8	L1-Li
5	13.625M Ave	21.1	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	27.3	50.0	-22.7	L1-Li
^	13.625M	54.5	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	60.7	50.0	+10.7	L1-Li
7	13.490M Ave	20.0	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	26.2	50.0	-23.8	L1-Li
^	13.490M	54.3	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	60.5	50.0	+10.5	L1-Li
9	13.562M	29.1	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	35.3	60.0 fundamental data with load attached	-24.7	L1-Li
10	164.544k Ave	22.6	+0.0 +0.0	+5.7	+0.5	+0.0	+0.0	28.8	55.2	-26.4	L1-Li
^	164.544k	48.2	+0.0 +0.0	+5.7	+0.5	+0.0	+0.0	54.4	55.2	-0.8	L1-Li
^	167.452k	48.1	+0.0 +0.0	+5.7	+0.4	+0.0	+0.0	54.2	55.1	-0.9	L1-Li
13	13.661M Ave	17.4	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	23.6	50.0	-26.4	L1-Li
^	13.661M	51.1	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	57.3	50.0	+7.3	L1-Li
15	13.697M Ave	17.3	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	23.5	50.0	-26.5	L1-Li
^	13.697M	53.7	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	59.9	50.0	+9.9	L1-Li

17 Ave	13.770M	16.9	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	23.1	50.0	-26.9	L1-Li
^	13.770M	54.3	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	60.5	50.0	+10.5	L1-Li
19 Ave	580.506k	12.4	+0.0 +0.0	+5.7	+0.2	+0.0	+0.0	18.3	46.0	-27.7	L1-Li
^	580.505k	42.1	+0.0 +0.0	+5.7	+0.2	+0.0	+0.0	48.0	46.0	+2.0	L1-Li
21 Ave	13.418M	16.0	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	22.2	50.0	-27.8	L1-Li
^	13.418M	52.4	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	58.6	50.0	+8.6	L1-Li
23 Ave	613.957k	11.9	+0.0 +0.0	+5.7	+0.2	+0.0	+0.0	17.8	46.0	-28.2	L1-Li
^	613.957k	39.4	+0.0 +0.0	+5.7	+0.2	+0.0	+0.0	45.3	46.0	-0.7	L1-Li
25 Ave	13.346M	15.6	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	21.8	50.0	-28.2	L1-Li
^	13.346M	52.8	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	59.0	50.0	+9.0	L1-Li
27 Ave	13.445M	15.3	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	21.5	50.0	-28.5	L1-Li
^	13.445M	50.0	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	56.2	50.0	+6.2	L1-Li
29 Ave	13.842M	12.8	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	19.0	50.0	-31.0	L1-Li
^	13.842M	46.3	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	52.5	50.0	+2.5	L1-Li
31 Ave	13.274M	11.5	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	17.7	50.0	-32.3	L1-Li
^	13.274M	43.2	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	49.4	50.0	-0.6	L1-Li

Test Location:	CKC Laboratories, Inc • 110 N. Olinda Place • Brea, CA 92821 • 714 993 6112		
Customer:	**Magtek Incorporated**		
Specification:	**15.207 AC Mains - Quasi-peak**		
Work Order #:	**99423**	Date:	9/25/2017
Test Type:	**Conducted Emissions**	Time:	10:49:40
Tested By:	E. Wong	Sequence#:	11
Software:	EMITest 5.03.11		110V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 3			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 3			

Test Conditions / Notes:

The EUT containing a 13.56 MHz transmitter and single modular approved WiFi transmitter is placed on the test bench.
WiFi Module
FCCID: O7P-362
IC:10147A-362

Evaluation of 13.56MHz transmitter

TX Frequency :13.56MHz

The manufacturer declares the highest EUT frequency generated or used, other than the fundamental frequency, is 12MHz

Frequency range of measurement = 150kHz- 30MHz.
150 kHz-30 MHz; RBW=9 kHz, VBW=9kHz

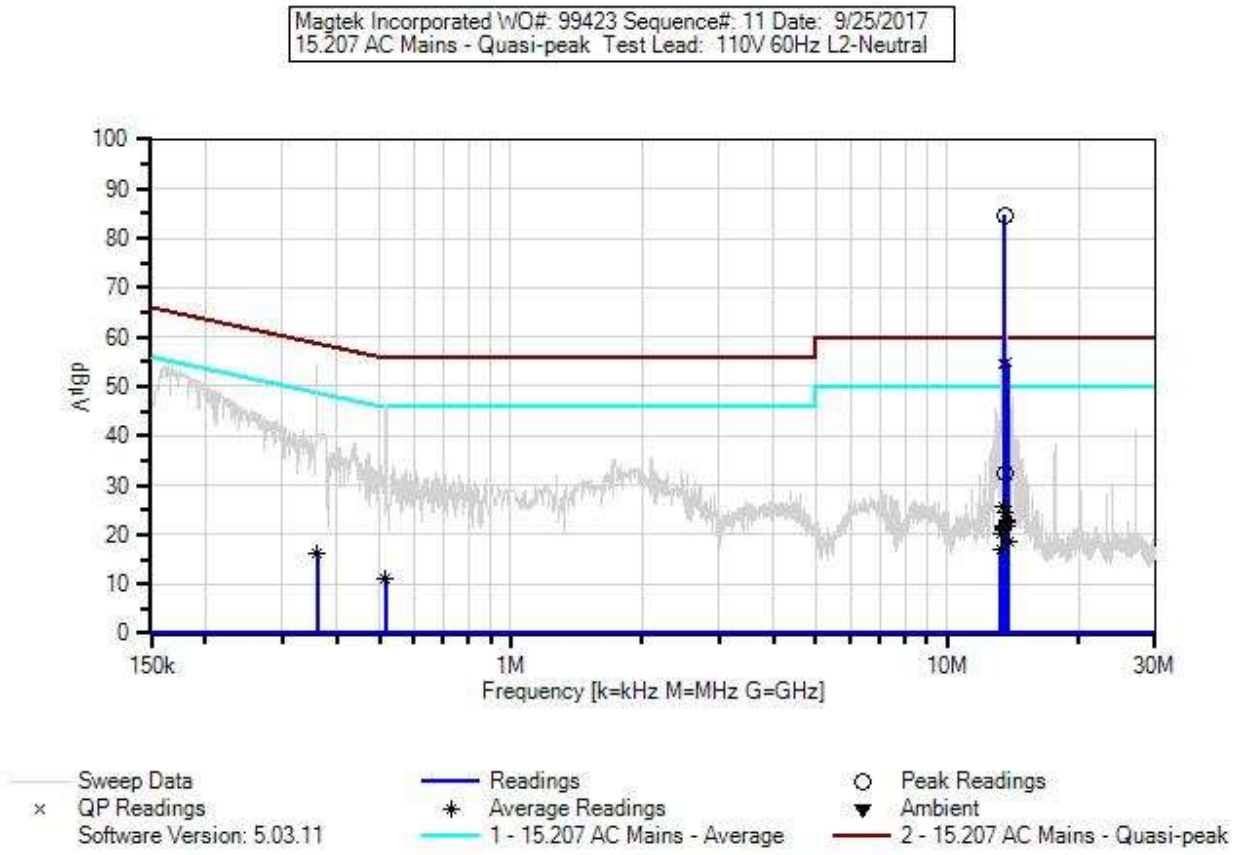
Test environment conditions: 23°C, 45% relative humidity, 100.8kPa

The EUT is connected to a support laptop via a USB cable with ferrite on the EUT end.

The device is operating at rated 5V DC from the USB port of the laptop, Transmit and receive simultaneously.

AC Conducted emission performed at AC main of the support Laptop Power supply

TX 0n, reading at fundamental measured with antenna, and with load attached.


Magtek Incorporated \WO#: 99423 Sequence#: 11 Date: 9/25/2017
15.207 AC Mains - Quasi-peak Test Lead: 110V 60Hz L2-Neutral
100
90
80
70
60
50
40
30
20
10
0
dBµV
150k
1M
10M
30M
Frequency [k=kHz M=MHz G=GHz]
Sweep Data
QP Readings
Software Version: 5.03.11
Readings
Average Readings
1 - 15.207 AC Mains - Average
Peak Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02869	Spectrum Analyzer	E4440A	8/1/2017	8/1/2018
T2	ANP06085	Attenuator	SA18N10W-09	11/14/2016	11/14/2018
T3	AN02343	High Pass Filter	HE9615-150K-50-720B	1/25/2017	1/25/2019
T4	ANP01910	Cable	RG-142	11/30/2015	11/30/2017
	AN00969A	50uH LISN-Line 1 (L1)	3816/2NM	3/14/2017	3/14/2019
T5	AN00969A	50uH LISN-Line2 (L2)	3816/2NM	3/14/2017	3/14/2019

Measurement Data: Reading listed by margin. Test Lead: L2-Neutral

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	13.562M	78.3	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	84.6	50.0 fundamental data with antenna attached"	+34.6	L2-Ne
2	13.770M QP	48.6	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	54.9	60.0	-5.1	L2-Ne
3	13.490M QP	48.3	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	54.6	60.0	-5.4	L2-Ne
4	13.634M QP	48.1	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	54.4	60.0	-5.6	L2-Ne
5	13.490M Ave	19.4	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	25.7	50.0	-24.3	L2-Ne
^	13.490M	54.5	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	60.8	50.0	+10.8	L2-Ne
7	13.634M Ave	18.1	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	24.4	50.0	-25.6	L2-Ne
^	13.634M	54.6	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	60.9	50.0	+10.9	L2-Ne
9	13.661M Ave	16.6	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	22.9	50.0	-27.1	L2-Ne
^	13.661M	51.9	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	58.2	50.0	+8.2	L2-Ne
11	13.697M Ave	16.4	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	22.7	50.0	-27.3	L2-Ne
^	13.697M	53.4	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	59.7	50.0	+9.7	L2-Ne
13	13.562M	26.1	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	32.4	60.0 fundamental data with load attached	-27.6	L2-Ne
14	13.463M Ave	15.5	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	21.8	50.0	-28.2	L2-Ne
^	13.463M	51.1	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	57.4	50.0	+7.4	L2-Ne

16 Ave	13.770M	15.3	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	21.6	50.0	-28.4	L2-Ne
^	13.770M	54.8	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	61.1	50.0	+11.1	L2-Ne
18 Ave	13.418M	15.1	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	21.3	50.0	-28.7	L2-Ne
^	13.418M	52.7	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	58.9	50.0	+8.9	L2-Ne
20 Ave	13.445M	14.7	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	21.0	50.0	-29.0	L2-Ne
^	13.445M	50.3	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	56.6	50.0	+6.6	L2-Ne
22 Ave	13.346M	13.9	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	20.1	50.0	-29.9	L2-Ne
^	13.346M	53.1	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	59.3	50.0	+9.3	L2-Ne
24 Ave	13.833M	12.4	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	18.7	50.0	-31.3	L2-Ne
^	13.833M	45.8	+0.0 +0.3	+5.8	+0.1	+0.1	+0.0	52.1	50.0	+2.1	L2-Ne
26 Ave	360.162k	10.6	+0.0 +0.0	+5.7	+0.1	+0.0	+0.0	16.4	48.7	-32.3	L2-Ne
^	360.161k	49.0	+0.0 +0.0	+5.7	+0.1	+0.0	+0.0	54.8	48.7	+6.1	L2-Ne
28 Ave	13.283M	10.9	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	17.1	50.0	-32.9	L2-Ne
^	13.283M	43.8	+0.0 +0.2	+5.8	+0.1	+0.1	+0.0	50.0	50.0	+0.0	L2-Ne
30 Ave	517.238k	5.3	+0.0 +0.0	+5.7	+0.2	+0.0	+0.0	11.2	46.0	-34.8	L2-Ne
^	517.238k	40.5	+0.0 +0.0	+5.7	+0.2	+0.0	+0.0	46.4	46.0	+0.4	L2-Ne
^	518.692k	40.5	+0.0 +0.0	+5.7	+0.2	+0.0	+0.0	46.4	46.0	+0.4	L2-Ne

Test Setup Photos

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2.
Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret (“^”) was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.