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## TEST REPORT

**FCC Part 15**  
Radio Frequency Devices  
Subpart C – Intentional Radiators

**RSS 310**  
Low Power Licence-exempt Radio Apparatus:  
Category II Equipment

FCC ID ..... : M8YRAPT

**Report Reference No.** ..... : 10247674\_TRF\_Part 15

Compiled by (+ signature) ..... : Arturo Ruvalcaba

Approved by (+ signature) ..... : Tom Tidwell

Date of issue ..... : 10-Dec-13

Report Revision ..... : 0

Total number of pages ..... : 34

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**Applicant's name** ..... : DT Systems, Inc.

Address ..... : 2872 Walnut Hill Lane, Dallas, Texas 75229

**Model(s)** ..... : RAPT 1400

### Test specification:

Standard ..... : 47 CFR Part 15 Subpart C & RSS 310 Issue 2

Test procedure ..... : ANSI C63.4:2009

Non-standard test method ..... : N/A

TRF Revision ..... : 26-Apr-13

**Revision History**

#	Description	Date
0	Original Report Release	10-Dec-13

**Notices:**

1. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
2. The test results presented in this report relate only to the object tested.
3. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.
4. "(see Enclosure #)" refers to additional information appended to the report.
5. Throughout this report a point is used as the decimal separator.
6. Dimensions in English units for convenience only, metric units prevail.

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## Normative References

The following document(s) have been appropriately considered in the performance of the test results detailed in this report.

47 CFR, Part 15, Subpart C  
Radio Frequency Devices, Intentional Radiators

47 CFR, Part 2, Subpart J  
Equipment Authorization Procedures

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

RSS 310, Issue 2 (June-2007)  
License-Exempt Radio Apparatus (All Frequency Bands): Category I Equipment

RSS-Gen, Issue 3 (Dec-2010)  
General Requirements and Information for the Certification of Radio Apparatus

RSS-102, Issue 4 (Dec-2010)  
Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

OET Bulletin 65 (Aug-1997) Supplement C (29-Jun-2001)  
Evaluating Compliance With FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields

## Equipment Under Test (EUT)

### Details:

#### Test item description:

Model : R.A.P.T. 1400  
Serial Number : Nemko sample # 463  
Production Status : ☐ Production ☒ Pre-Production ☐ Prototype  
Other Status Info [Click here to enter text.](#)  
EUT Received Date : 2-Aug-13  
Ratings : 9.0VDC ☐ 1 $\phi$  ☐ 3 $\phi$  ☒ Battery

#### General product description:

The EUT is a remote control for a canine training collar.

#### Modifications to the EUT required for compliance:

There have been no modifications to the EUT as a result of this evaluation.

#### Deviations from Test Methodology:

There have been no deviations, additions to, or exclusions from the specified test standard.

#### Engineering Judgements:

No engineering judgments based on the results in this test report have been made.

Approved by (+ signature):

[Click here to enter text.](#)

*Table 1 – EUT Internal Operating Frequencies*

Frequency (MHz)	Description	Frequency (MHz)	Description
26.995	Transmit signal		

*Table 2 – EUT Operating Modes*

Mode #	Description
1	Transmit continuously
2	
3	

## EUT Configuration

A minimum representative configuration, as defined by the manufacturer, has been used for the testing performed herein. The selection of hardware (including interface ports), software, and cables were chosen by the manufacturer as being representative of the product's intended use. The interconnection of various articles of equipment and the types of cables used has also been defined by the manufacturer.

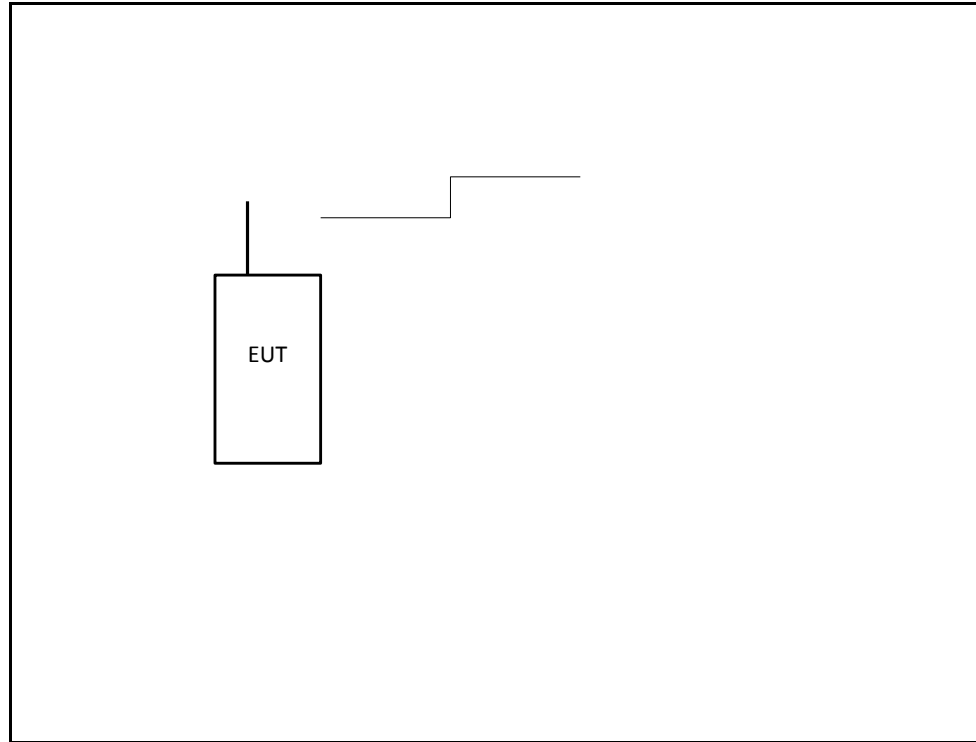
The placement of the equipment under test has been, to the extent practical, arranged to maximize emissions.

Cables, of the type and length specified by the manufacturer, were connected to at least one of each type of interface port provided by the EUT and if practical, were terminated by a device typical of actual usage. For multiple ports of the same type, the addition of cables did not significantly affect the emission level (i.e. < 2B variation).

The arrangement of external power supply units was as follows:

- If the mains input cable of the external power supply unit is greater than 0,8 m, the external power supply unit shall be placed on the tabletop, with a nominal 0,1 m separation from the host unit.
- If the external power supply unit has a mains input cable that is less than 0,8 m, the external power supply unit shall be placed at a height above the ground plane such that its power cable is fully extended in the vertical direction.
- If the external power supply unit is incorporated into the mains power plug, it shall be placed on the tabletop. An extension cable shall be used between the external power supply unit and the source of power. The extension cable should be connected in a manner such that it takes the most direct path between the external power supply unit and the source of power.

*Figure 1 - EUT Configuration Diagram*



*Table 3 – EUT & Auxilliary Equipment List*

Item	Use*	Product Type	Manufacturer	Model	Serial No.
A	EUT	Remote control	D. T. Systems	R.A.P.T. 1400	Sample #463
Note: * Use = EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test)					

*Table 4 - Interconnecting Cables List*

Item	Use*	Cable Type
1		NO CABLES
2		
3		
4		
5		
6		
7		

## EUT Photo(s)

Photo 1	EUT Photo – Front/Top View	
		
<b>Supplemental Information:</b>		

Photo 2	EUT Photo – Rear/Side View	
		
<b>Supplemental Information:</b>		

Photo 4

EUT Photo – Antenna



**Supplemental Information:**

Summary of Testing			
<b>Possible test case verdicts:</b>			
- test case does not apply to the test object:	N/A		
- test object does meet the requirement:	P (Pass)		
- test object does not meet the requirement:	F (Fail)		
- not tested (not part of this evaluation):	NT		
<b>Date(s) of performance of tests:</b>		6-Aug-2013	
Clause	Test Description	Verdict	Comment
<b>47 CFR, Part 15, Subpart C</b>			
15.203	Antenna Requirement	P	
15.207	Conducted Emissions - Mains	P	
15.209	Radiated Emissions – Restricted Bands	P	
15.227(a)	Field Strength of Fundamental	P	
15.227(b)	Field Strength of Spurious Emissions	P	
<b>RSS GEN</b>			
7.2.4	Conducted Emissions - Mains	P	
7.2.2	Radiated Emissions – Restricted Bands	P	
5.6	RF Exposure	P	
<b>RSS 210</b>			
3.8	Field Strength of Fundamental	P	
3.8	Field Strength of Spurious Emissions	P	
<b>Additional Information</b>			
99% Occupied Bandwidth		P	
EUT tested on three (3) orthogonal axis		<input checked="" type="checkbox"/>	
Tested with new battery		NOTED	No RF power output variation noted

**Test Summary Notes:**

Testing was performed on a sample that was modified to transmit continuously.

**General remarks:****Summary of compliance with national requirements:**

Compliance with this standard provides a means of conformity with the United States Federal Communication Commission (FCC) certification authorization procedure and Industry Canada (IC) rules.

**Testing Location****Testing Laboratory:**

Nemko USA, Inc. (Dallas)

Testing location/ address:

802 N. Kealy Ave.  
Lewisville, TX 75057  
USA

Testing procedure: TMP

Tested by (name + signature):

Approved by (+ signature):

Testing location/ address:

**Supplemental Information:**

Testing results contained herein were performed at the location(s) listed above.

## Procedural Requirements

The following requirements are taken from the appropriate rules, other rules may apply and the manufacturer should consult the full text of the appropriate laws prior to marketing any device.

### **United States**

Mandated procedures for digital devices are defined in 47 CFR 15.201, *Equipment authorization requirement*. Details of the authorization certification procedures can be found in 47 CFR, Part 2, Subpart J, *Equipment Authorization Procedures*.

### **Canada**

Standard RSS-GEN contains the procedural requirements.

## Information to the User and Labeling Requirements

The following requirements are taken from the appropriate rules, other rules may apply and the manufacturer should consult the full text of the appropriate laws prior to marketing any device.

### **United States**

#### **Labeling**

##### **47 CFR 2.925**

(a) Each equipment covered in an application for equipment authorization shall bear a nameplate or label listing the following:

(1) FCC Identifier consisting of the two elements in the exact order specified in §2.926. The FCC Identifier shall be preceded by the term *FCC ID* in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification.

*Example:* FCC ID XXX123. XXX—Grantee Code 123—Equipment Product Code

##### **47 CFR 15.19**

(a) In addition to the requirements in part 2 of this chapter, a device subject to certification, or verification shall be labeled as follows:

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

47 CFR 15.19(b)(2): Label text and information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. However, the type size for the text is not required to be larger than eight point.

47 CFR 15.19(b)(3): When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

47 CFR 15.19(b)(4): The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in §2.925(d) of this chapter. “Permanently affixed” means that the label is etched, engraved, stamped, silkscreened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

### ***Information to User***

47 CFR 15.21: The user’s manual or instruction manual for an intentional or unintentional radiator shall caution the user that:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

## **Canada**

### ***Labeling***

RSS –310, Section 2.2:

Category II equipment shall be labelled with the manufacturer’s name or brand name and model identification number and these words “**Canada 310**” to indicate compliance with RSS-310.

### ***User Manual Statements***

RSS-310, Section 2.3: In addition to the user manual requirements in RSS-Gen (Section 7.1.5), the carrier frequency and the RF output power (or field strength and measurement distance) shall also be stated in the user manual.

The user manual shall also contain the following text, in both English and French, declaring compliance to this Standard:

*This Category II radiocommunication device complies with Industry Canada Standard RSS-310.*

*Ce dispositif de radiocommunication de catégorie II respecte la norme CNR-310 d'Industrie Canada.*

RSS-GEN 7.1.3: User manuals for licence-exempt radio apparatus shall contain the following or equivalent notice in a conspicuous location in the user manual or alternatively on the device or both.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

## Technical Requirements

The testing requirements, as appropriate, were derived from ANSI C63.4; 47 CFR, Subpart A; RSS 310; and RSS GEN.

### Conducted Emissions

The mains cable of the EUT or EUT host unit was connected to the LISN defined in this standard and is bonded to the reference plane. Where applicable, remaining auxiliary equipment was powered through an additional LISN (also bonded to the reference plane), using a multi-socket outlet strip if necessary. The LISNs were at least 0.8m away from the EUT. A vertical ground plane was used while the table-top EUTs were placed on a wooden table 0.8m high. Floor-standing EUTs were insulated from the ground plane and grounded according to the manufacturer's instructions.

Signal cables were positioned for their entire lengths, as far as possible, at a nominal distance of 0.4 m from the ground reference plane. Where the mains cable supplied by the manufacturer was longer than 1 m, the excess was folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m. If the 1 m cable length cannot be achieved owing to physical limitations of the EUT arrangement, the cable length shall be as near to 1 m as possible.

All telecommunication and signal ports were correctly terminated using either appropriate associated equipment or a representative termination during the measurement of the conducted disturbances at the mains. If an ISN is connected to a telecommunications port during the measurement of conducted disturbances at the mains port, then the ISN receiver port was terminated in 50Ω. The ISNs were at least 0.8m away from the EUT.

### Mains

Any power cable(s) from the equipment under test that were directly connected to the AC Mains have been tested. In the event that the equipment under test had no direct connection to the Mains, that is, it was connected to a Host unit (example: USB powered); then conducted emissions was performed on the Mains of the Host unit. Battery powered equipment was not tested for conducted emissions; however, if the equipment makes provisions for connections to a battery charger that is connected to the Mains, then conducted emissions were performed on the battery charger.

*Table 5 – Class B Conducted Emissions Limits - Mains*

Frequency	Limits (dBμV)	
	Quasi-peak	Average
150 kHz – 500 kHz	66 - 56	5-46
500 kHz – 5 MHz	56	46
5 MHz – 30 MHz	60	50
NOTE 1: The lower limit shall apply at the transition frequency. NOTE 2: The limit decreases linearly with the logarithm of the frequency in the range 150 kHz to 500 kHz.		

## Radiated Emissions – Restricted Bands

The arrangement of the equipment is typical of a normal installation practice and as was practical, the arrangement was varied and emissions investigated for maximum amplitude. Final measurements were performed in a semi-anechoic chamber or on an open area test site (OATS). The equipment was rotated 360° and the antenna height has been varied between 1m and 4m. Measurements were taken at both horizontal and vertical antenna polarities. The receiver bandwidth was set to 120 kHz for measurements below 1 GHz, and 1 MHz for measurements above 1 GHz. A peak detector is used to detect an emission; a quasi-peak detector may be used to record a final measurement below 1 GHz and an average detector may be used above 1 GHz. An inverse proportionality factor of 20 dB/decade (10 dB) was used, as noted in 15.31(f)(1), to normalize the measured data to the specified test distance for determining compliance.

*Table 6 - Frequency range of radiated measurements per 15.33(a)*

Operating frequency of intentional radiator	Lowest frequency searched	Highest frequency searched
Below 10 GHz	9 kHz or lowest operating frequency generated in the device, whichever is highest	10th harmonic of highest fundamental frequency or 40 GHz, whichever is lower
10 – 30 GHz	9 kHz or lowest operating frequency generated in the device, whichever is highest	5th harmonic of highest fundamental frequency or 100 GHz, whichever is lower
At or above 30 GHz	9 kHz or lowest operating frequency generated in the device, whichever is highest	5th harmonic of highest fundamental frequency or 200 GHz, whichever is lower

*Table 7 - Restricted Bands 47 CFR 15.205*

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
13.36-13.41			

*Table 8 - Restricted Bands RSS-GEN*

MHz	MHz	MHz	GHz
0.090-0.110	12.57675-12.57725	960-1427	9.0-9.2
2.1735-2.1905	13.36-13.41	1435-1626.5	9.3-9.5
3.020-3.026	16.42-16.423	1645.5-1646.5	10.6-12.7
4.125-4.128	16.69475-16.69525	1660-1710	13.25-13.4
4.17725-4.17775	16.80425-16.80475	1718.8-1722.2	14.47-14.5
4.20725-4.20775	25.5-25.67	2200-2300	15.35-16.2
5.677-5.683	37.5-38.25	2310-2390	17.7-21.4
6.125-6.218	73-74.6	2655-2900	22.01-23.12
6.6775-6.26825	74.8-75.2	3260-3267	23.6-24.0
6.31175-6.31225	108-138	3332-3339	31.2-31.8
8.291-8.294	156.52475-156.52525	3345.8-3358	36.43-36.5
8.362-8.366	156.7-156.9	3500-4400	Above 38.6
8.37625-8.38675	240-285	4500-5150	
8.41425-8.41475	322-335.4	5350-5460	
12.29-12.293	399.9-410	7250-7750	
12.51975-12.52025	608-614	8025-8500	

**Radiated Emission Limit – Restricted Bands**

Reading on the measuring receiver showing fluctuations close to the limit, were observed for at least 15 s at each measurement frequency; the highest reading was recorded.

*Table 9 – Radiated Emissions Limits per 47 CFR 15.209(a)*

Frequency Range	Field Strength ( $\mu\text{V/m}$ )	Field Strength ( $\text{dB}\mu\text{V/m}$ )	Measurement Distance (m)
9 kHz – 490 kHz	2400/F(kHz)	48.5 – 13.8	300
490 kHz – 1.705 MHz	24000/F(kHz)	33.6 – 23.0	30
1.705 MHz – 30 MHz	30	29.5	30
30 MHz – 88 MHz	100	40.0	3
88 MHz – 216 MHz	150	43.5	3
216 MHz – 960 MHz	200	46.0	3
Above 960 MHz	500	54.0	3

**Field Strength of Fundamental**

15.227(a) and RSS 310, Section 3.8: The field strength of any emission within the 26.96 – 27.28 MHz band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

## Field Strength of Spurious Emissions

15.227(b) and RSS 310, Section 3.8 (Tables 2 and 3): The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter.

15.227(b) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in §15.209.

RSS 310, Tables 2 and 3

*Table 10 – General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz*

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, eirp)	
	Transmitter	Receiver
30 – 88	100 (3 nW)	100 (3 nW)
88 – 216	150 (6.8 nW)	150 (6.8 nW)
216 - 960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: Transmitting devices are not permitted in Table 1 bands or in TV bands (ie. 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 714-806 MHz).

*Table 11 – General Field Strength Limits for Transmitters at Frequencies Below 30 MHz*

Frequency (fundamental or spurious)	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9 – 490 kHz	2,400/F (F in kHz)	2,400/377/F (F in kHz)	300
490 – 1,705 kHz	24,000/F (F in kHz)	24,000/377/F (F in kHz)	30
1.705 – 30 MHz	30	N/A	30

Note: The emission limits for the 9-90 kHz and 110-490 kHz bands are based on measurements employing an average detector.

## Measurement Uncertainty

Determining compliance with the limits in these standards was based on the results of the measurement, and does not take into account the measurement instrumentation uncertainty.

Referencing the measurement instrumentation uncertainty considerations contained in CISPR 16-4-2, the expanded measurement uncertainty is  $\pm 4.90$  dB for radiated emissions,  $\pm 3.46$  dB for mains conducted emissions, and  $\pm 4.31$  dB for telecommunication ports conducted emissions.

## List of Test Equipment

The following test equipment was used in the performance of the testing herein.

*Table 12 – Test Equipment Used*

Asset Tag	Description	Manufacturer	Model	Serial Number	Cal. Date	Cal. Due
1025	Preamplifier, 25dB	Nemko USA, Inc.	LNA25	399	05-Mar-2013	05-Mar-2014
1733	Antenna, Active Loop	EMCO	6507	45939	18-Jun-2013	18-Jun-2014
1763	Antenna, Bilog	Schaffner	CBL 6111D	22926	07-Mar-2013	07-Mar-2014
1767	Receiver, EMI Test 20Hz - 26.5 GHz - 150 - +30 dBm LCD	Rohde & Schwartz	ESIB26	837491/0002	19-Dec-2012	19-Dec-2013
1783	Cable Assy, 3m Chamber	Nemko	Chamber		26-Sep-2012	26-Sep-2013
4057	PXI Digital RF measurement system 1MHz-6GHz	Aeroflex	PXI	302506/618	27-Jun-2013	27-Jun-2014

## **Test Results – Antenna Requirement**

Table No. 1	Antenna requirement	Verdict
<p>Type of antenna connection .....: <input type="checkbox"/> Integral antenna      <input type="checkbox"/> Permanently attached      <input checked="" type="checkbox"/> Unique connector</p> <p>Type of unique connector .....: Replaceable antenna. No rf connector</p> <p>Method of permanent connection .....: N/A</p>		P
		
<b>Supplemental Information:</b>		

## **Test Results – Conducted Emissions - Mains**



Table No. 2	<b>Conducted Emissions - Mains</b>	Verdict
		N/A

## Test Results – Duty Cycle

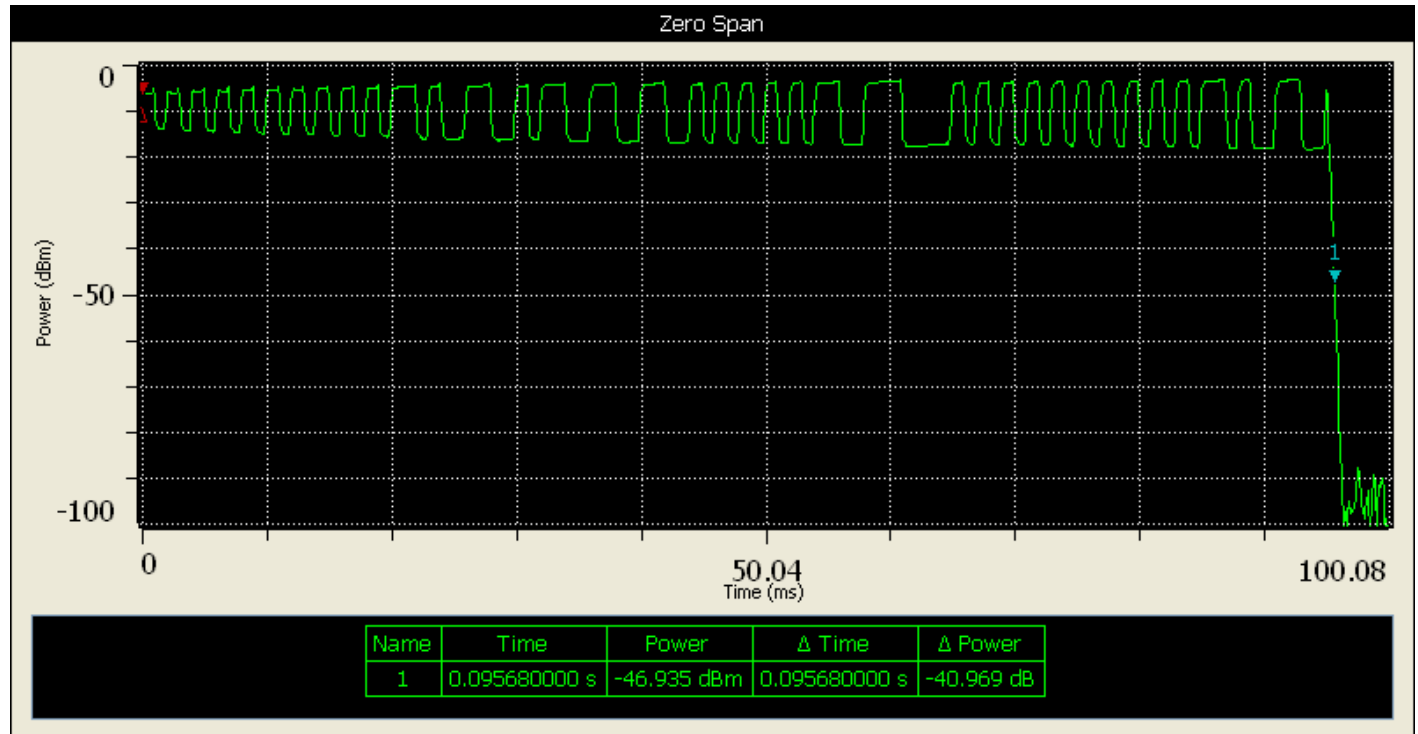
Table No. 3	Duty Cycle Correction	Verdict
		N/A

Test Date .....: Click here to enter a date.

Temperature .....: Click here to enter text. °C

Relative Humidity ...: Click here to enter text. %

Test Equipment Asset Tag List :

**Supplemental Information:**

Total rf on time = 95.7 msec.

Duty cycle correction =  $20 \log(95.7/100) = 0.4 \text{ dB}$ 

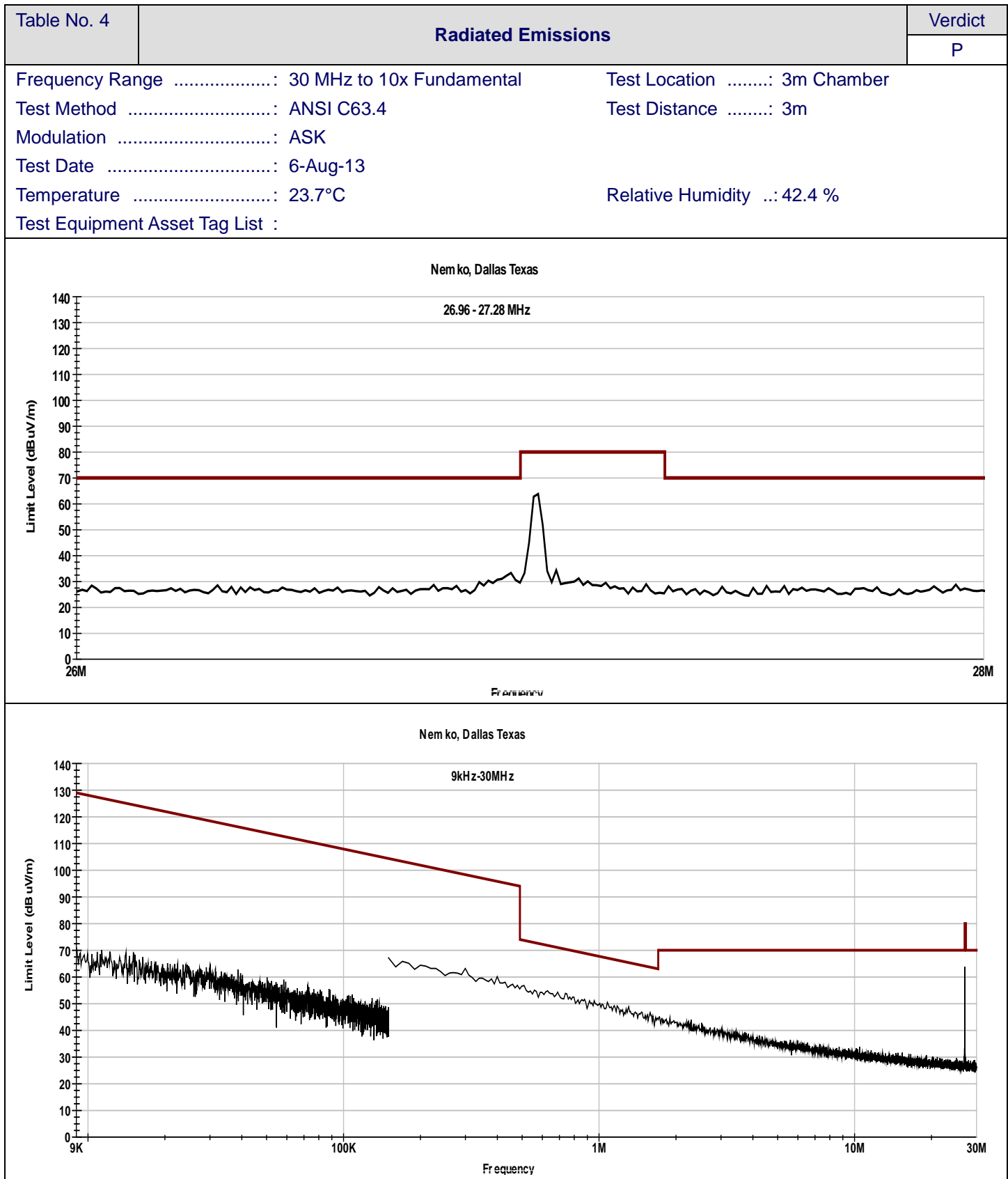
Note: This plot is provided for information only. Duty cycle correction was not used in measurements.

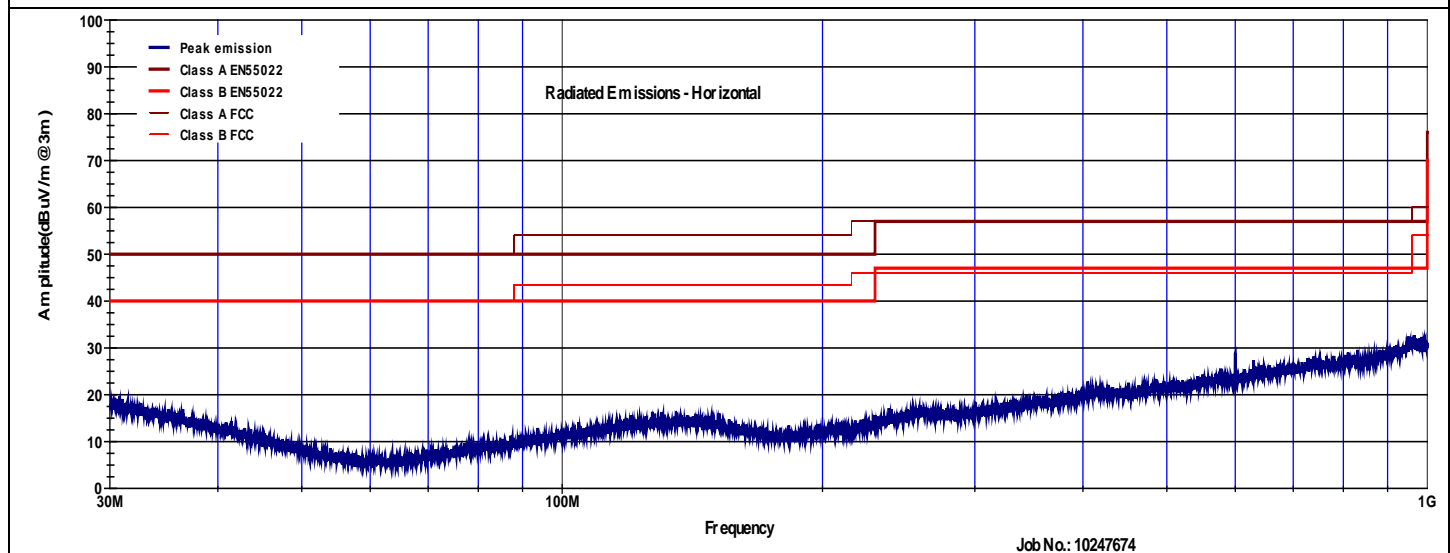
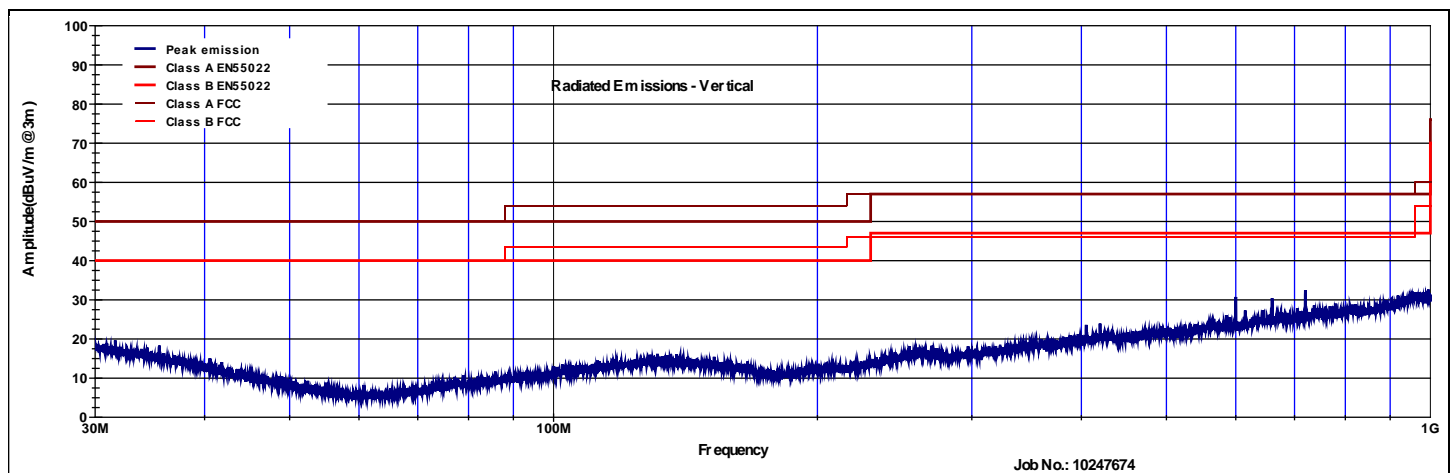
Tested by (+ signature) :

Arturo Ruvalcaba



## Test Results – Radiated Emissions





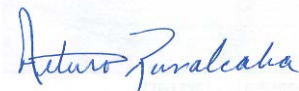
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Antenna Polarity (H/V)	Detector	Frequency (MHz)	Receiver Reading (dBuV/m)	Site Correction Factor (dB/m)	Duty Cycle Correction (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail	Comment
Loop	Pk	26.9991	47.7	16.1	-	63.8	80.0	16.2	Pass	

$$(6) = (4) + (5) - (6) \quad (9) = (8) - (7)$$

**Supplemental Information:**

Tested by (+ signature) :

Arturo Ruvalcaba



## Test Results – 99% Occupied Bandwidth

Table No. 5	99% Occupied Bandwidth	Verdict
		P

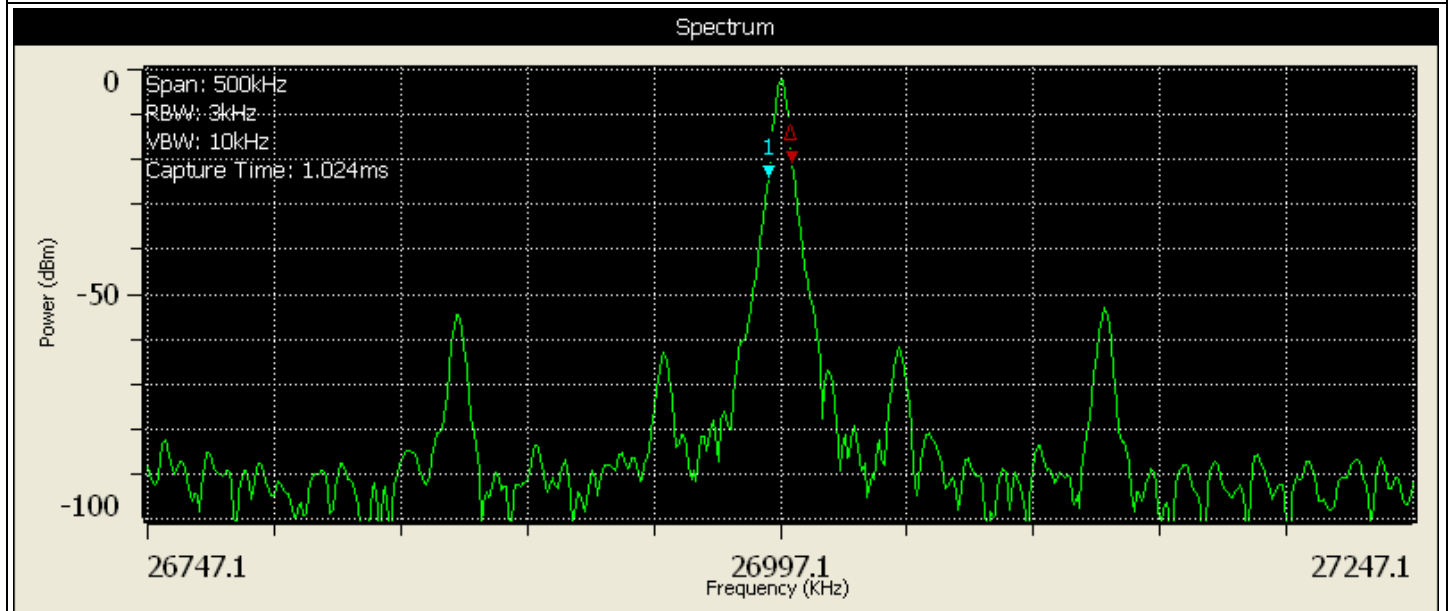
Test Method.....: ANSI C63.4

Modulation .....:

Test Date .....: Click here to enter a date.

Temperature .....: Click here to enter text. °C      Relative Humidity :      Click here to enter text. %

Test Equipment Asset Tag List :



Occupied B/W		
Upper	Lower	Occupied
26.993062 MHz	27.001584 MHz	8.522 kHz

**Spectrum Analyzer Settings:**

Spectrum analyzer settings:

Span = 500 kHz

RBW = 3 kHz

VBW = 3 x RBW

Detector function = peak

**Supplemental Information:**

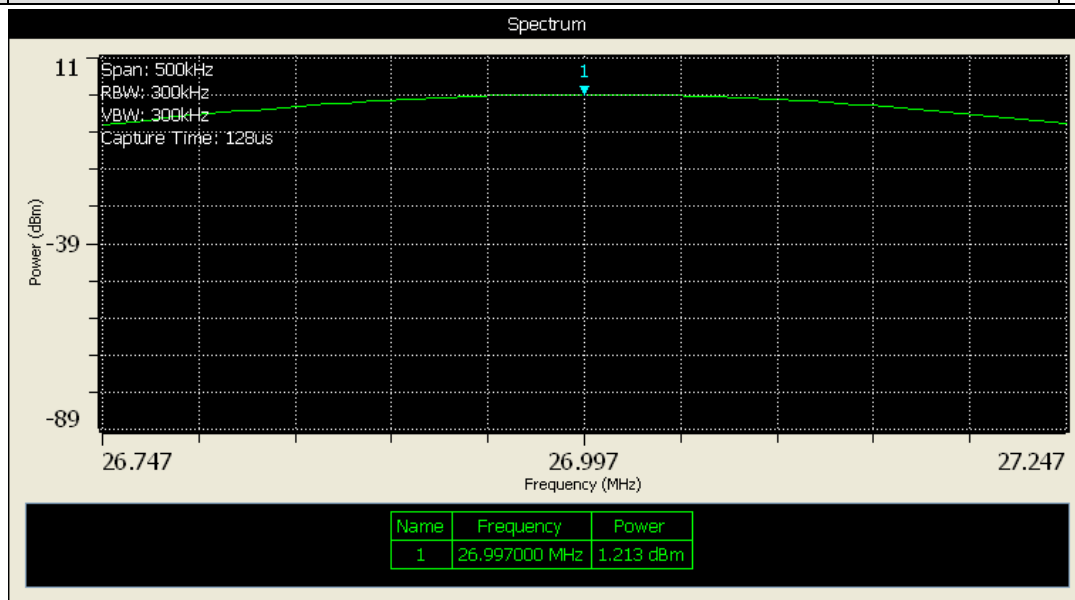
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## RF Exposure

Table No. 6	RF Exposure	Verdict
		P



### SAR Exclusion Justification

Test exclusion thresholds for <100 MHz at distances  $\leq 50$  mm

Guidance document reference: 447498 D01 General RF Exposure Guidance v05r01, page 11, paragraph 4.3.1(3)(b).

The power threshold is determined by:

**$[475 \text{ mW} * [1 + \log(1)] * 0.5] = 238 \text{ mW}$  for 1-g SAR exclusion and**

**$[1186 \text{ mW} * [1 + \log(1)] * 0.5] = 593 \text{ mW}$  for 3-g SAR exclusion**

- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are numeric thresholds

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies <100 MHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

### SAR test exclusion analysis:

Assumptions: Since the exact separation distance may vary from sensor to sensor, the minimum separation distance of 5 mm is assumed per the guidance document.

Measured power of rf carrier: 1.2 dBm which equates to 1.3 mW.

The result of the above SAR threshold calculation demonstrates that the rf carrier power is less than the SAR threshold levels calculated above for frequencies less than 100 MHz and distances  $\leq 50$  mm.

**Conclusion: The above analysis shows that the evaluated device qualifies for exemption from SAR testing.**

Tested by (+ signature) :

Arturo Ruvalcaba



## Setup Photos

Photo 3	Test Setup – 9 kHz – 30 MHz	
		
Supplemental Information:		

Photo 4	Test Setup – 30 MHz – 1 GHz	
		
Supplemental Information:		

Photo 5	Test Setup – EUT worst-case orientation	
		
Supplemental Information:		