Torsa Sistemas, S.L.

TEST REPORT FOR

Total Detector Tag
Models: Person Tag and Vehicle Tag

Tested To The Following Standards:

FCC Part 15 Subpart C Section(s)
15.207 and 15.247

Report No.: 96022-7

Date of issue: October 28, 2014

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

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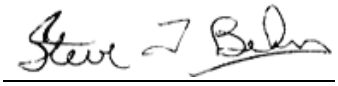
Project Number: 96022

DATE OF EQUIPMENT RECEIPT: October 13, 2014
DATE(S) OF TESTING: October 13-14, 2014

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	5.00.14
Immunity	5.00.07

Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Brea D	US0060	SL2-IN-E-1146R	3082D-2	100638	A-0147

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C

Test Procedure/Method	Description	Modifications*	Results
15.207 / ANSI C63.4	Conducted Emissions	NA	Pass
15.247(b)(3) / 558074 D01 DTS Meas Guidance v03r02	RF Power Output	NA	Pass
15.31(e)	Voltage Variation	NA	Pass
15.247(a)(2) / 558074 D01 DTS Meas Guidance v03r02	-6dBc Occupied Bandwidth	NA	Pass
15.247(d) / 558074 D01 DTS Meas Guidance v03r02 ITU-R 55/1 558074 D01 DTS Meas Guidance v03r02	Radiated Spurious Emissions and Band Edge	NA	Pass
15.247(e) / 558074 D01 DTS Meas Guidance v03r02	Power Spectral Density	NA	Pass

Modifications*/Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
The Person Tag was tested with a partial enclosure. Since the person tag has internal battery installed, an enclosure is needed to house it. The enclosure is plastic and the emission characteristic will not change whether it is fully closed, partial or opened. The Vehicle Tag was tested without an enclosure. The enclosure is plastic and the emission characteristics will not change whether it is fully closed, partial or opened.
No modifications were made during testing.

***Modifications listed above must be incorporated into all production units.**

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

Total Detector Tag
Manuf: Torsa Sistemas, S.L.
Model: Person Tag
Serial: NA

Total Detector Tag
Manuf: Torsa Sistemas, S.L.
Model: Vehicle Tag
Serial: NA

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Power Supply
Manuf: RS Power Technology CO., LTD
Model: RS-E2000
Serial: NA

Power Supply
Manuf: Xantrex
Model: XTS 30-2X
Serial: 58738

FCC PART 15 SUBPART C

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) CFR 47 Section 15 Subpart C requirements for Intentional Radiators.

15.207 AC Conducted Emissions

Test Setup / Conditions / Data

Person Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.207 AC Mains - Average**
Work Order #: **96022** Date: 10/13/2014
Test Type: **Conducted Emissions** Time: 10:33:51
Equipment: **Total Detector Tag** Sequence#: 4
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag 120V 60Hz
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	1/8/2014	1/8/2016
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T4	AN00969A	50uH LISN-Line 1 (L1) (dB)	3816/2NM	3/12/2013	3/12/2015
	AN00969A	50uH LISN-Line 2 (L2) (dB)	3816/2NM	3/12/2013	3/12/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	RS Power Technology CO., LTD	RS-E2000	NA

Test Conditions / Notes:

The equipment under test (EUT) and power supply are adjacent to each other on the table top. The EUT is on and continuously transmitting. A power supply is charging the battery and provides power to the EUT.
Input voltage from battery is 3.7V.
Input voltage from ACDC charger is 5VDC.

The device operates in the 902-928 MHz BAND
The device operates on a single channel with center frequency of 915.1 MHz

Frequency range of data sheet, 150kHz to 30MHz
RBW=9kHz, VBW=9kHz

Temperature: 20°C
Relative Humidity: 55%
Pressure: 100kPa

Site D

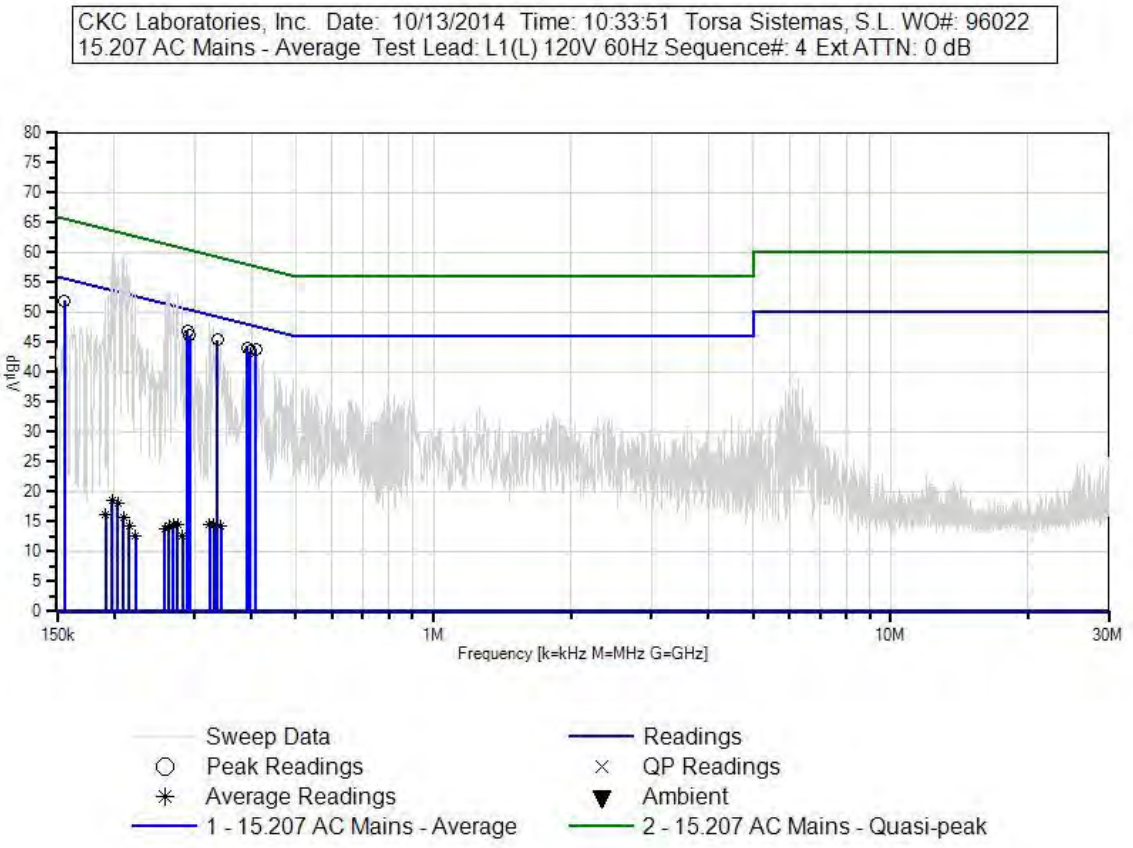
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L1(L)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	289.624k	41.0	+0.2	+0.0	+5.7	+0.1	+0.0	47.0	50.5	-3.5	L1(L)
2	155.818k	44.5	+1.7	+0.0	+5.7	+0.1	+0.0	52.0	55.7	-3.7	L1(L)
3	408.158k	37.9	+0.2	+0.0	+5.7	+0.1	+0.0	43.9	47.7	-3.8	L1(L)
4	336.165k	39.4	+0.2	+0.0	+5.7	+0.1	+0.0	45.4	49.3	-3.9	L1(L)
5	390.705k	38.1	+0.2	+0.0	+5.7	+0.1	+0.0	44.1	48.0	-3.9	L1(L)
6	292.532k	40.1	+0.2	+0.0	+5.7	+0.1	+0.0	46.1	50.5	-4.4	L1(L)
7	396.523k	37.5	+0.2	+0.0	+5.7	+0.1	+0.0	43.5	47.9	-4.4	L1(L)
8	330.347k Ave	8.6	+0.2	+0.0	+5.7	+0.1	+0.0	14.6	49.4	-34.8	L1(L)
^	330.347k	41.6	+0.2	+0.0	+5.7	+0.1	+0.0	47.6	49.4	-1.8	L1(L)
10	342.710k Ave	8.2	+0.2	+0.0	+5.7	+0.1	+0.0	14.2	49.1	-34.9	L1(L)
^	342.710k	41.2	+0.2	+0.0	+5.7	+0.1	+0.0	47.2	49.1	-1.9	L1(L)
12	323.802k Ave	8.5	+0.2	+0.0	+5.7	+0.1	+0.0	14.5	49.6	-35.1	L1(L)
^	323.802k	42.5	+0.2	+0.0	+5.7	+0.1	+0.0	48.5	49.6	-1.1	L1(L)
14	197.996k Ave	12.5	+0.2	+0.0	+5.7	+0.1	+0.0	18.5	53.7	-35.2	L1(L)
^	197.996k	53.8	+0.2	+0.0	+5.7	+0.1	+0.0	59.8	53.7	+6.1	L1(L)

16 Ave	203.813k	12.0	+0.2	+0.0	+5.7	+0.1	+0.0	18.0	53.5	-35.5	L1(L)
^	201.632k	52.2	+0.2	+0.0	+5.7	+0.1	+0.0	58.2	53.5	+4.7	L1(L)
^	203.813k	51.9	+0.2	+0.0	+5.7	+0.1	+0.0	57.9	53.5	+4.4	L1(L)
19 Ave	275.079k	8.5	+0.2	+0.0	+5.7	+0.1	+0.0	14.5	51.0	-36.5	L1(L)
^	275.079k	47.0	+0.2	+0.0	+5.7	+0.1	+0.0	53.0	51.0	+2.0	L1(L)
21 Ave	269.989k	8.5	+0.2	+0.0	+5.7	+0.1	+0.0	14.5	51.1	-36.6	L1(L)
^	269.989k	45.7	+0.2	+0.0	+5.7	+0.1	+0.0	51.7	51.1	+0.6	L1(L)
^	273.625k	41.5	+0.2	+0.0	+5.7	+0.1	+0.0	47.5	51.0	-3.5	L1(L)
24 Ave	263.444k	8.3	+0.2	+0.0	+5.7	+0.1	+0.0	14.3	51.3	-37.0	L1(L)
^	263.444k	47.2	+0.2	+0.0	+5.7	+0.1	+0.0	53.2	51.3	+1.9	L1(L)
^	267.080k	43.7	+0.2	+0.0	+5.7	+0.1	+0.0	49.7	51.2	-1.5	L1(L)
27 Ave	258.354k	7.9	+0.2	+0.0	+5.7	+0.1	+0.0	13.9	51.5	-37.6	L1(L)
^	261.263k	47.0	+0.2	+0.0	+5.7	+0.1	+0.0	53.0	51.4	+1.6	L1(L)
^	258.354k	45.2	+0.2	+0.0	+5.7	+0.1	+0.0	51.2	51.5	-0.3	L1(L)
30 Ave	209.631k	9.6	+0.2	+0.0	+5.7	+0.1	+0.0	15.6	53.2	-37.6	L1(L)
^	209.631k	53.5	+0.2	+0.0	+5.7	+0.1	+0.0	59.5	53.2	+6.3	L1(L)
^	206.722k	48.3	+0.2	+0.0	+5.7	+0.1	+0.0	54.3	53.3	+1.0	L1(L)
33 Ave	191.451k	10.3	+0.2	+0.0	+5.7	+0.1	+0.0	16.3	54.0	-37.7	L1(L)
^	194.360k	46.6	+0.2	+0.0	+5.7	+0.1	+0.0	52.6	53.8	-1.2	L1(L)
^	191.451k	45.9	+0.2	+0.0	+5.7	+0.1	+0.0	51.9	54.0	-2.1	L1(L)
36 Ave	282.351k	6.7	+0.2	+0.0	+5.7	+0.1	+0.0	12.7	50.7	-38.0	L1(L)
^	282.351k	45.9	+0.2	+0.0	+5.7	+0.1	+0.0	51.9	50.7	+1.2	L1(L)
^	285.260k	40.2	+0.2	+0.0	+5.7	+0.1	+0.0	46.2	50.7	-4.5	L1(L)

39 Ave	215.449k	8.3	+0.2	+0.0	+5.7	+0.1	+0.0	14.3	53.0	-38.7	L1(L)
^	212.540k	52.1	+0.2	+0.0	+5.7	+0.1	+0.0	58.1	53.1	+5.0	L1(L)
^	215.449k	50.1	+0.2	+0.0	+5.7	+0.1	+0.0	56.1	53.0	+3.1	L1(L)
42 Ave	222.721k	6.7	+0.2	+0.0	+5.7	+0.1	+0.0	12.7	52.7	-40.0	L1(L)
^	222.721k	47.3	+0.2	+0.0	+5.7	+0.1	+0.0	53.3	52.7	+0.6	L1(L)
^	219.085k	47.4	+0.2	+0.0	+5.7	+0.1	+0.0	53.4	52.9	+0.5	L1(L)



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.207 AC Mains - Average**
Work Order #: **96022** Date: 10/13/2014
Test Type: **Conducted Emissions** Time: 10:26:45
Equipment: **Total Detector Tag** Sequence#: 3
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag 120V 60Hz
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	1/8/2014	1/8/2016
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
	AN00969A	50uH LISN-Line 1 (L1) (dB)	3816/2NM	3/12/2013	3/12/2015
T4	AN00969A	50uH LISN-Line 2 (L2) (dB)	3816/2NM	3/12/2013	3/12/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	RS Power Technology CO., LTD	RS-E2000	NA

Test Conditions / Notes:

The equipment under test (EUT) and power supply are adjacent to each other on the table top. The EUT is on and continuously transmitting. A power supply is charging the battery and provides power to the EUT.
Input voltage from battery is 3.7V.
Input voltage from ACDC charger is 5VDC.

The device operates in the 902-928 MHz BAND
The device operates on a single channel with center frequency of 915.1 MHz

Frequency range of data sheet, 150kHz to 30MHz
RBW=9kHz, VBW=9kHz

Temperature: 20°C
Relative Humidity: 55%
Pressure: 100kPa
Site D

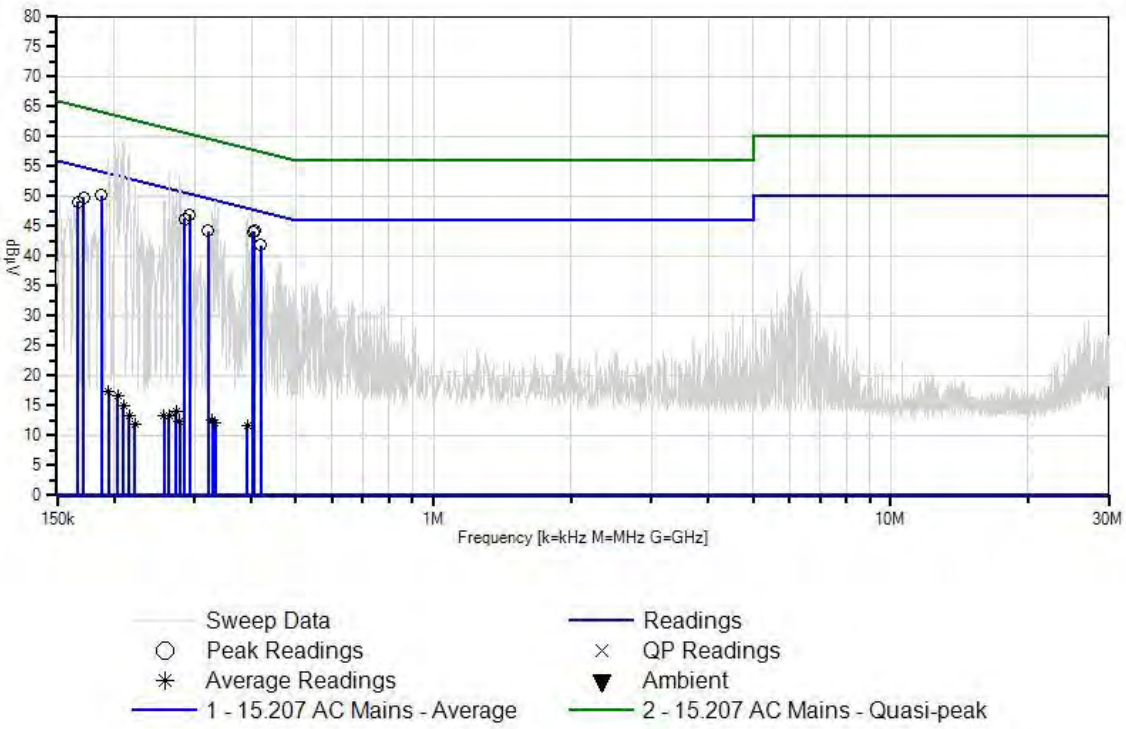
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L2(N)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	292.532k	41.1	+0.2	+0.0	+5.7	+0.0	+0.0	47.0	50.5	-3.5	L2(N)
2	405.249k	38.3	+0.2	+0.0	+5.7	+0.0	+0.0	44.2	47.7	-3.5	L2(N)
3	403.068k	38.2	+0.2	+0.0	+5.7	+0.0	+0.0	44.1	47.8	-3.7	L2(N)
4	187.815k	44.3	+0.2	+0.0	+5.7	+0.0	+0.0	50.2	54.1	-3.9	L2(N)
5	285.260k	40.3	+0.2	+0.0	+5.7	+0.0	+0.0	46.2	50.7	-4.5	L2(N)
6	171.816k	43.8	+0.3	+0.0	+5.7	+0.0	+0.0	49.8	54.9	-5.1	L2(N)
7	321.621k	38.3	+0.2	+0.0	+5.7	+0.0	+0.0	44.2	49.7	-5.5	L2(N)
8	419.066k	36.0	+0.2	+0.0	+5.7	+0.0	+0.0	41.9	47.5	-5.6	L2(N)
9	166.726k	43.0	+0.4	+0.0	+5.7	+0.0	+0.0	49.1	55.1	-6.0	L2(N)
10 Ave	194.360k	11.5	+0.2	+0.0	+5.7	+0.0	+0.0	17.4	53.8	-36.4	L2(N)
^	194.360k	50.3	+0.2	+0.0	+5.7	+0.0	+0.0	56.2	53.8	+2.4	L2(N)
12 Ave	391.432k	5.7	+0.2	+0.0	+5.7	+0.0	+0.0	11.6	48.0	-36.4	L2(N)
^	391.432k	40.3	+0.2	+0.0	+5.7	+0.0	+0.0	46.2	48.0	-1.8	L2(N)
14 Ave	328.165k	6.8	+0.2	+0.0	+5.7	+0.0	+0.0	12.7	49.5	-36.8	L2(N)
^	328.165k	41.6	+0.2	+0.0	+5.7	+0.0	+0.0	47.5	49.5	-2.0	L2(N)
16 Ave	273.625k	8.2	+0.2	+0.0	+5.7	+0.0	+0.0	14.1	51.0	-36.9	L2(N)
^	273.625k	44.9	+0.2	+0.0	+5.7	+0.0	+0.0	50.8	51.0	-0.2	L2(N)
^	269.989k	44.4	+0.2	+0.0	+5.7	+0.0	+0.0	50.3	51.1	-0.8	L2(N)
^	271.443k	40.6	+0.2	+0.0	+5.7	+0.0	+0.0	46.5	51.1	-4.6	L2(N)
20 Ave	203.813k	10.7	+0.2	+0.0	+5.7	+0.0	+0.0	16.6	53.5	-36.9	L2(N)
^	203.813k	53.1	+0.2	+0.0	+5.7	+0.0	+0.0	59.0	53.5	+5.5	L2(N)
^	200.904k	53.0	+0.2	+0.0	+5.7	+0.0	+0.0	58.9	53.6	+5.3	L2(N)
23 Ave	333.256k	6.2	+0.2	+0.0	+5.7	+0.0	+0.0	12.1	49.4	-37.3	L2(N)
^	333.256k	43.4	+0.2	+0.0	+5.7	+0.0	+0.0	49.3	49.4	-0.1	L2(N)

^	336.892k	42.3	+0.2	+0.0	+5.7	+0.0	+0.0	48.2	49.3	-1.1	L2(N)
^	330.347k	40.6	+0.2	+0.0	+5.7	+0.0	+0.0	46.5	49.4	-2.9	L2(N)
27 Ave	264.171k	7.5	+0.2	+0.0	+5.7	+0.0	+0.0	13.4	51.3	-37.9	L2(N)
^	264.171k	48.4	+0.2	+0.0	+5.7	+0.0	+0.0	54.3	51.3	+3.0	L2(N)
^	267.807k	43.3	+0.2	+0.0	+5.7	+0.0	+0.0	49.2	51.2	-2.0	L2(N)
30 Ave	257.626k	7.5	+0.2	+0.0	+5.7	+0.0	+0.0	13.4	51.5	-38.1	L2(N)
^	257.626k	43.4	+0.2	+0.0	+5.7	+0.0	+0.0	49.3	51.5	-2.2	L2(N)
32 Ave	209.631k	9.1	+0.2	+0.0	+5.7	+0.0	+0.0	15.0	53.2	-38.2	L2(N)
^	209.631k	53.5	+0.2	+0.0	+5.7	+0.0	+0.0	59.4	53.2	+6.2	L2(N)
^	206.722k	50.4	+0.2	+0.0	+5.7	+0.0	+0.0	56.3	53.3	+3.0	L2(N)
35 Ave	278.715k	6.4	+0.2	+0.0	+5.7	+0.0	+0.0	12.3	50.9	-38.6	L2(N)
^	278.715k	47.5	+0.2	+0.0	+5.7	+0.0	+0.0	53.4	50.9	+2.5	L2(N)
^	276.534k	39.2	+0.2	+0.0	+5.7	+0.0	+0.0	45.1	50.9	-5.8	L2(N)
38 Ave	215.449k	7.5	+0.2	+0.0	+5.7	+0.0	+0.0	13.4	53.0	-39.6	L2(N)
^	215.449k	51.1	+0.2	+0.0	+5.7	+0.0	+0.0	57.0	53.0	+4.0	L2(N)
40 Ave	221.993k	6.0	+0.2	+0.0	+5.7	+0.0	+0.0	11.9	52.7	-40.8	L2(N)
^	221.993k	45.9	+0.2	+0.0	+5.7	+0.0	+0.0	51.8	52.7	-0.9	L2(N)
^	225.629k	43.4	+0.2	+0.0	+5.7	+0.0	+0.0	49.3	52.6	-3.3	L2(N)

CKC Laboratories, Inc. Date: 10/13/2014 Time: 10:26:45 Torsa Sistemas, S.L. WO#: 96022
15.207 AC Mains - Average Test Lead: L2(N) 120V 60Hz Sequence#: 3 Ext ATTN: 0 dB



Sweep Data
Peak Readings
Average Readings
1 - 15.207 AC Mains - Average
Readings
QP Readings
Ambient
2 - 15.207 AC Mains - Quasi-peak

Vehicle Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.207 AC Mains - Average**
Work Order #: **96022** Date: 10/13/2014
Test Type: **Conducted Emissions** Time: 9:42:20 AM
Equipment: **Total Detector Tag** Sequence#: 0
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag 120V 60Hz
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	1/8/2014	1/8/2016
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
T4	AN00969A	50uH LISN-Line 1 (L1) (dB)	3816/2NM	3/12/2013	3/12/2015
	AN00969A	50uH LISN-Line 2 (L2) (dB)	3816/2NM	3/12/2013	3/12/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The equipment under test (EUT) and power supply are adjacent to each other on the table top.
The EUT is on and continuously transmitting.
Input voltage from power supply is 12VDC.

The device operates in the 902-928 MHz BAND
The device operates on a single channel with center frequency of 915.1 MHz

Frequency range of data sheet, 150kHz to 30MHz.
RBW=9kHz, VBW=9kHz

Temperature: 20°C
Relative Humidity: 55%
Pressure: 100kPa

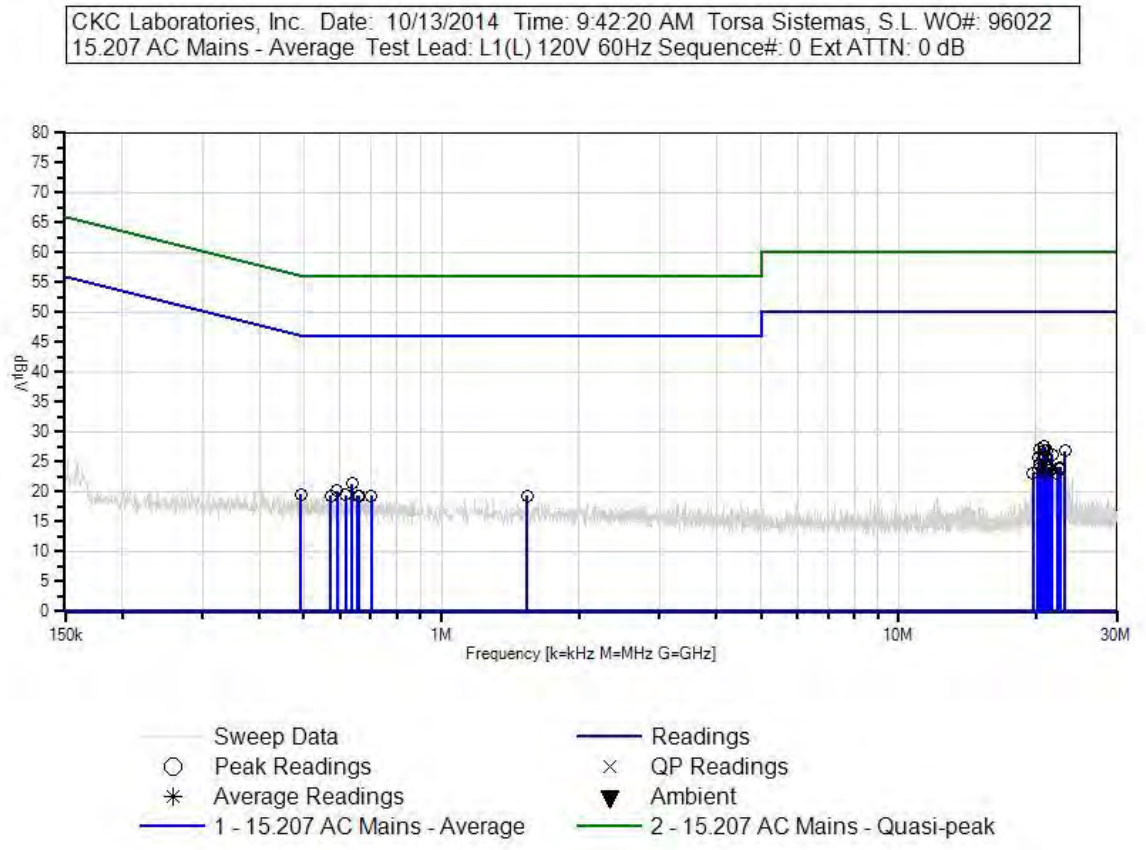
Site D

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: L1(L)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	20.806M	20.1	+0.2	+0.4	+5.8	+1.0	+0.0	27.5	50.0	-22.5	L1(L)
2	20.319M	19.9	+0.2	+0.4	+5.8	+0.9	+0.0	27.2	50.0	-22.8	L1(L)
3	20.869M	19.5	+0.2	+0.4	+5.8	+1.0	+0.0	26.9	50.0	-23.1	L1(L)
4	21.049M	19.5	+0.2	+0.4	+5.8	+1.0	+0.0	26.9	50.0	-23.1	L1(L)
5	23.130M	19.1	+0.2	+0.4	+5.8	+1.3	+0.0	26.8	50.0	-23.2	L1(L)
6	21.661M	18.8	+0.2	+0.4	+5.8	+1.1	+0.0	26.3	50.0	-23.7	L1(L)
7	20.256M	18.4	+0.2	+0.4	+5.8	+0.9	+0.0	25.7	50.0	-24.3	L1(L)
8	20.986M	18.2	+0.2	+0.4	+5.8	+1.0	+0.0	25.6	50.0	-24.4	L1(L)
9	20.688M	18.1	+0.2	+0.4	+5.8	+1.0	+0.0	25.5	50.0	-24.5	L1(L)
10	637.954k	15.4	+0.2	+0.0	+5.7	+0.1	+0.0	21.4	46.0	-24.6	L1(L)
11	20.373M	17.2	+0.2	+0.4	+5.8	+0.9	+0.0	24.5	50.0	-25.5	L1(L)
12	589.959k	14.2	+0.2	+0.0	+5.7	+0.1	+0.0	20.2	46.0	-25.8	L1(L)
13	21.112M	16.8	+0.2	+0.4	+5.8	+1.0	+0.0	24.2	50.0	-25.8	L1(L)
14	22.580M	16.5	+0.2	+0.4	+5.8	+1.2	+0.0	24.1	50.0	-25.9	L1(L)
15	21.175M	16.6	+0.2	+0.4	+5.8	+1.0	+0.0	24.0	50.0	-26.0	L1(L)
16	22.454M	16.3	+0.2	+0.4	+5.8	+1.2	+0.0	23.9	50.0	-26.1	L1(L)
17	20.193M	16.5	+0.2	+0.4	+5.8	+0.9	+0.0	23.8	50.0	-26.2	L1(L)
18	20.715M	16.4	+0.2	+0.4	+5.8	+1.0	+0.0	23.8	50.0	-26.2	L1(L)
19	21.598M	16.2	+0.2	+0.4	+5.8	+1.1	+0.0	23.7	50.0	-26.3	L1(L)
20	21.409M	16.2	+0.2	+0.4	+5.8	+1.0	+0.0	23.6	50.0	-26.4	L1(L)
21	491.786k	13.6	+0.2	+0.0	+5.7	+0.1	+0.0	19.6	46.1	-26.5	L1(L)
22	616.865k	13.5	+0.2	+0.0	+5.7	+0.1	+0.0	19.5	46.0	-26.5	L1(L)
23	701.948k	13.4	+0.2	+0.0	+5.7	+0.1	+0.0	19.4	46.0	-26.6	L1(L)
24	661.225k	13.4	+0.2	+0.0	+5.7	+0.1	+0.0	19.4	46.0	-26.6	L1(L)

25	20.923M	16.0	+0.2	+0.4	+5.8	+1.0	+0.0	23.4	50.0	-26.6	L1(L)
26	1.536M	13.3	+0.2	+0.1	+5.7	+0.1	+0.0	19.4	46.0	-26.6	L1(L)
27	573.233k	13.3	+0.2	+0.0	+5.7	+0.1	+0.0	19.3	46.0	-26.7	L1(L)
28	654.680k	13.3	+0.2	+0.0	+5.7	+0.1	+0.0	19.3	46.0	-26.7	L1(L)
29	19.706M	16.0	+0.2	+0.4	+5.8	+0.8	+0.0	23.2	50.0	-26.8	L1(L)
30	22.211M	15.6	+0.2	+0.4	+5.8	+1.2	+0.0	23.2	50.0	-26.8	L1(L)



Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.207 AC Mains - Average**
Work Order #: **96022** Date: 10/13/2014
Test Type: **Conducted Emissions** Time: 9:46:56 AM
Equipment: **Total Detector Tag** Sequence#: 1
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag 120V 60Hz
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T1	AN02343	High Pass Filter	HE9615-150K-50-720B	1/10/2013	1/10/2015
T2	ANP01910	Cable	RG-142	1/8/2014	1/8/2016
T3	ANP06085	Attenuator	SA18N10W-09	12/14/2012	12/14/2014
	AN00969A	50uH LISN-Line 1 (L1) (dB)	3816/2NM	3/12/2013	3/12/2015
T4	AN00969A	50uH LISN-Line 2 (L2) (dB)	3816/2NM	3/12/2013	3/12/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The equipment under test (EUT) and power supply are adjacent to each other on the table top.
The EUT is on and continuously transmitting.
Input voltage from power supply is 12VDC.

The device operates in the 902-928 MHz BAND
The device operates on a single channel with center frequency of 915.1 MHz

Frequency range of data sheet, 150kHz to 30MHz.
RBW=9kHz, VBW=9kHz

Temperature: 20°C
Relative Humidity: 55%
Pressure: 100kPa

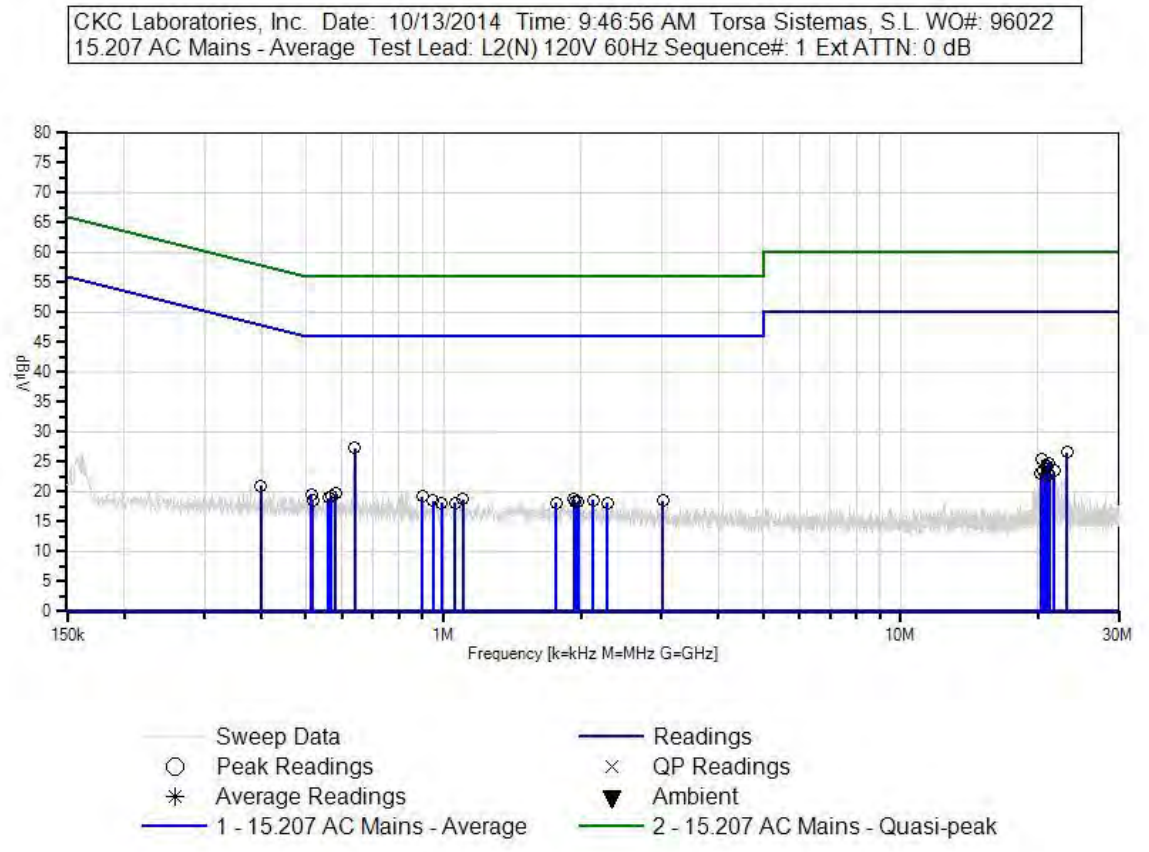
Site D

Ext Attn: 0 dB

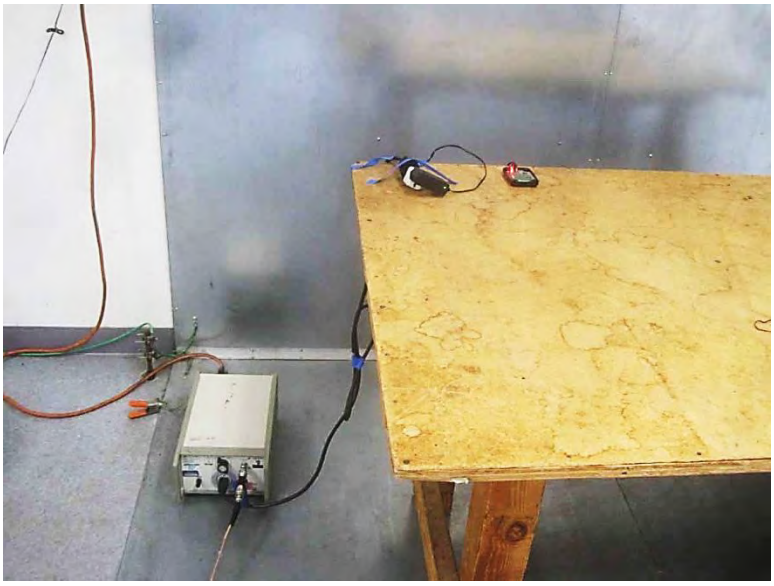
Measurement Data: Reading listed by margin. Test Lead: L2(N)

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	639.410k	21.4	+0.2	+0.0	+5.7	+0.0	+0.0	27.3	46.0	-18.7	L2(N)
2	23.130M	18.9	+0.2	+0.4	+5.8	+1.3	+0.0	26.6	50.0	-23.4	L2(N)
3	20.382M	18.0	+0.2	+0.4	+5.8	+1.0	+0.0	25.4	50.0	-24.6	L2(N)
4	21.049M	17.4	+0.2	+0.4	+5.8	+1.0	+0.0	24.8	50.0	-25.2	L2(N)
5	21.175M	17.2	+0.2	+0.4	+5.8	+1.1	+0.0	24.7	50.0	-25.3	L2(N)
6	20.806M	16.9	+0.2	+0.4	+5.8	+1.0	+0.0	24.3	50.0	-25.7	L2(N)
7	20.986M	16.9	+0.2	+0.4	+5.8	+1.0	+0.0	24.3	50.0	-25.7	L2(N)
8	581.233k	13.8	+0.2	+0.0	+5.7	+0.0	+0.0	19.7	46.0	-26.3	L2(N)
9	513.603k	13.7	+0.2	+0.0	+5.7	+0.0	+0.0	19.6	46.0	-26.4	L2(N)
10	20.499M	16.2	+0.2	+0.4	+5.8	+1.0	+0.0	23.6	50.0	-26.4	L2(N)
11	21.661M	16.0	+0.2	+0.4	+5.8	+1.1	+0.0	23.5	50.0	-26.5	L2(N)
12	567.416k	13.4	+0.2	+0.0	+5.7	+0.0	+0.0	19.3	46.0	-26.7	L2(N)
13	898.469k	13.4	+0.1	+0.0	+5.7	+0.0	+0.0	19.2	46.0	-26.8	L2(N)
14	20.256M	15.9	+0.2	+0.4	+5.8	+0.9	+0.0	23.2	50.0	-26.8	L2(N)
15	397.977k	15.1	+0.2	+0.0	+5.7	+0.0	+0.0	21.0	47.9	-26.9	L2(N)
16	559.417k	13.1	+0.2	+0.0	+5.7	+0.0	+0.0	19.0	46.0	-27.0	L2(N)
17	21.112M	15.5	+0.2	+0.4	+5.8	+1.0	+0.0	22.9	50.0	-27.1	L2(N)
18	1.103M	12.8	+0.1	+0.0	+5.7	+0.1	+0.0	18.7	46.0	-27.3	L2(N)
19	1.928M	12.6	+0.2	+0.1	+5.7	+0.1	+0.0	18.7	46.0	-27.3	L2(N)
20	20.869M	15.3	+0.2	+0.4	+5.8	+1.0	+0.0	22.7	50.0	-27.3	L2(N)
21	517.239k	12.7	+0.2	+0.0	+5.7	+0.0	+0.0	18.6	46.0	-27.4	L2(N)
22	2.123M	12.5	+0.2	+0.1	+5.7	+0.1	+0.0	18.6	46.0	-27.4	L2(N)
23	949.501k	12.6	+0.1	+0.0	+5.7	+0.1	+0.0	18.5	46.0	-27.5	L2(N)
24	3.025M	12.4	+0.2	+0.1	+5.7	+0.1	+0.0	18.5	46.0	-27.5	L2(N)

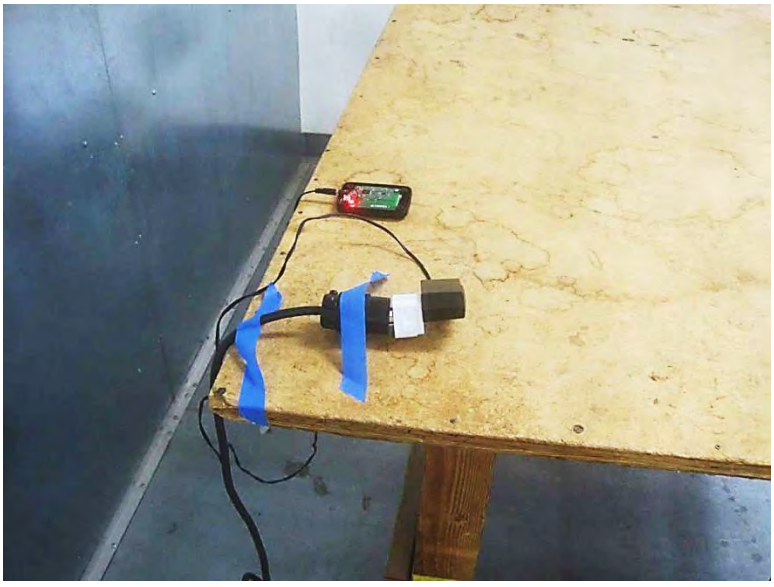
25	1.970M	12.3	+0.2	+0.1	+5.7	+0.1	+0.0	18.4	46.0	-27.6	L2(N)
26	1.945M	12.2	+0.2	+0.1	+5.7	+0.1	+0.0	18.3	46.0	-27.7	L2(N)
27	1.060M	12.3	+0.1	+0.0	+5.7	+0.1	+0.0	18.2	46.0	-27.8	L2(N)
28	992.029k	12.3	+0.1	+0.0	+5.7	+0.1	+0.0	18.2	46.0	-27.8	L2(N)
29	2.281M	12.1	+0.2	+0.1	+5.7	+0.1	+0.0	18.2	46.0	-27.8	L2(N)
30	1.766M	12.1	+0.2	+0.1	+5.7	+0.1	+0.0	18.2	46.0	-27.8	L2(N)



Test Setup Photos



Person Tag, View #1



Person Tag, View #2

Vehicle Tag, View #1

Vehicle Tag, View #2

15.247(b)(3) RF Power Output

Test Conditions / Setup

Person Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **RF Power**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag
S/N: NA

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
AN03431	Attenuator	89-20-21	9/5/2013	9/5/2015
AN06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	RS Power Technology CO., LTD	RS-E2000	NA

Test Conditions / Notes:

The EUT is placed on test bench. The EUT is on and continuously transmitting.
The EUT is evaluated at antenna port.
Input voltage from power supply: 5VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.
The equipment has an integral antenna and a temporary RF antenna port was provided only to facilitate conducted measurements.

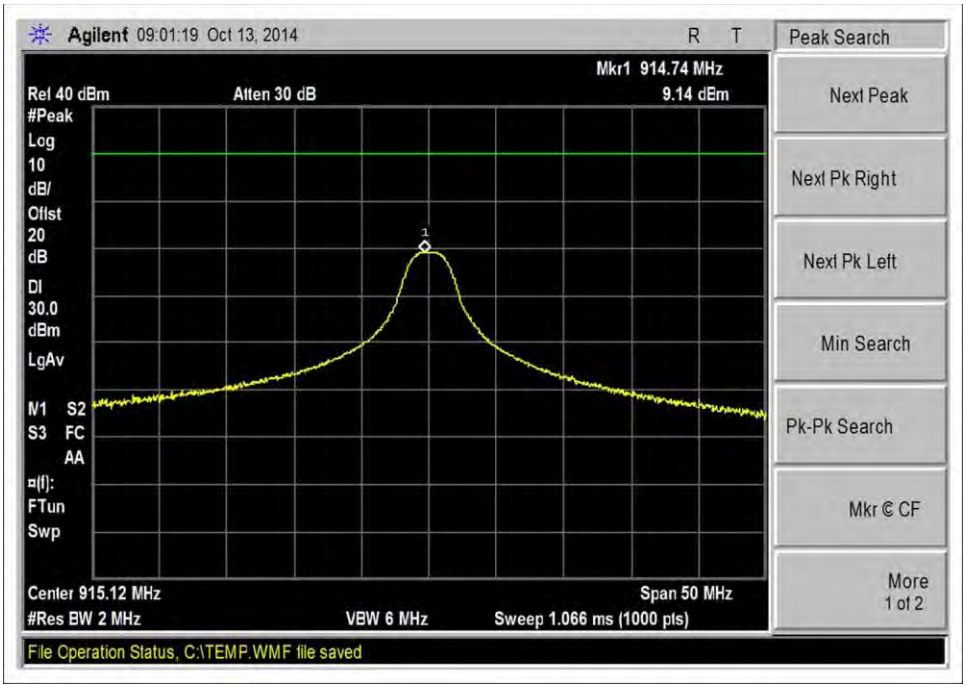
Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa.

Site D

Test procedure:
The test was performed under 558074 D01 DTS Meas Guidance, section 9.1.1, Dated June 05, 2014.

Test Data


Agilent 09:01:19 Oct 13, 2014
R T
Mkr1 914.74 MHz
9.14 dBm
Ref 40 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
20
dB
Dl
30.0
dBm
LgAv
N1 S2
S3 FC
AA
¤(f):
FTun
Swp
Center 915.12 MHz
#Res BW 2 MHz
VBW 6 MHz
Span 50 MHz
Sweep 1.066 ms (1000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr © CF
More
1 of 2
File Operation Status, C:\TEMP.WMF file saved

Vehicle Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **RF Power**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag
S/N: NA

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
AN03431	Attenuator	89-20-21	9/5/2013	9/5/2015
AN06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The EUT is placed on test bench. The EUT is on and continuously transmitting.
The EUT is evaluated at antenna port.
Input voltage from power supply: 12VDC

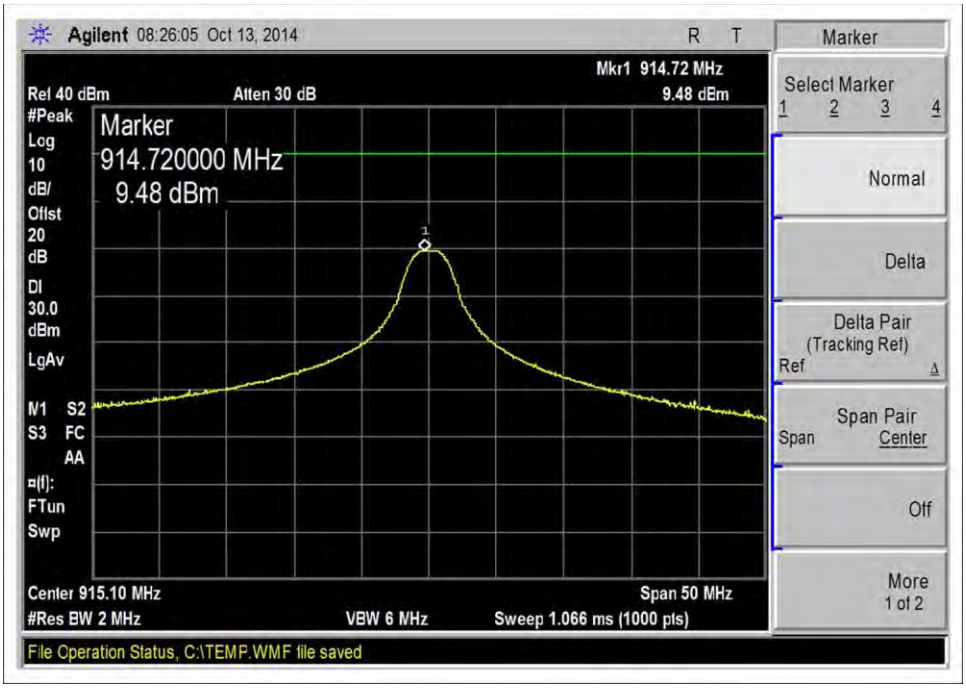
The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.
The equipment has an integral antenna and a temporary RF antenna port was provided only to facilitate conducted measurements.
Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa

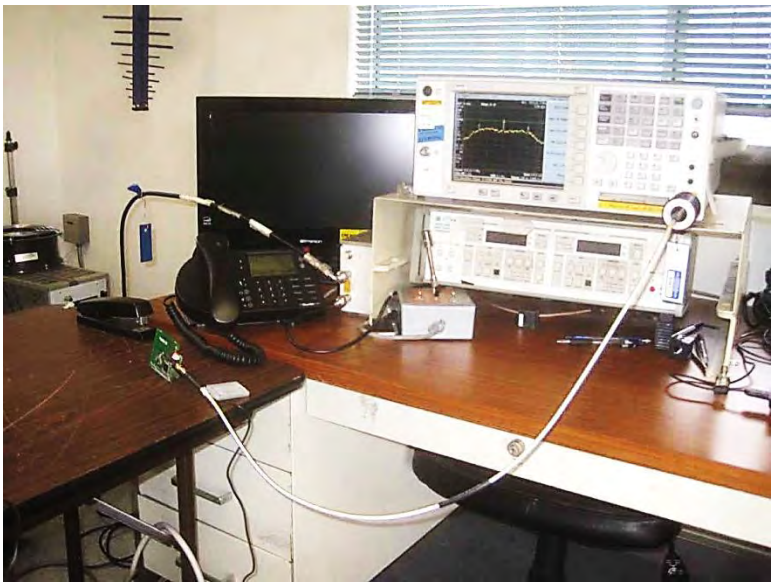
Site D

Test procedure:
The test was performed under 558074 D01 DTS Meas Guidance, section 9.1.1, Dated June 05, 2014.

Test Data


Agilent 08:26:05 Oct 13, 2014
R T
Mkr1 914.72 MHz
9.48 dBm
Ref 40 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
20
dB
Dl
30.0
dBm
LgAv
M1 S2
S3 FC
AA
¤(f):
FTun
Swp
Marker
914.720000 MHz
9.48 dBm
Center 915.10 MHz
#Res BW 2 MHz
VBW 6 MHz
Span 50 MHz
Sweep 1.066 ms (1000 pts)
File Operation Status, C:\TEMP.WMF file saved
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2

Test Setup Photos



Person Tag

Vehicle Tag

15.31(e) Voltage Variations

Test Conditions / Setup

Person Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.31e**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/12/2014	3/12/2016
T2	AN00851	Biconilog Antenna	CBL6111C	4/30/2014	4/30/2016
T3	ANP05555	Cable	RG223/U	5/7/2014	5/7/2016
T4	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T5	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is powered from support power supply which is located on the ground plane. The power supply provides 5V output voltage to the EUT and charging 3.7V internal battery. The EUT is on and continuously transmitting.
Input voltage from power supply: 5VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.

Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa

Site D

15.31(e) Compliance: The supply voltage was varied between 85% and 115% of the nominal rated voltage of 5VDC. No change in the fundamental signal level was observed.

Vehicle Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.31e**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/12/2014	3/12/2016
T2	AN00851	Biconilog Antenna	CBL6111C	4/30/2014	4/30/2016
T3	ANP05555	Cable	RG223/U	5/7/2014	5/7/2016
T4	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T5	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is powered from support power supply which is located on the ground plane. The EUT is on and continuously transmitting.
Input voltage from power supply: 12VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.

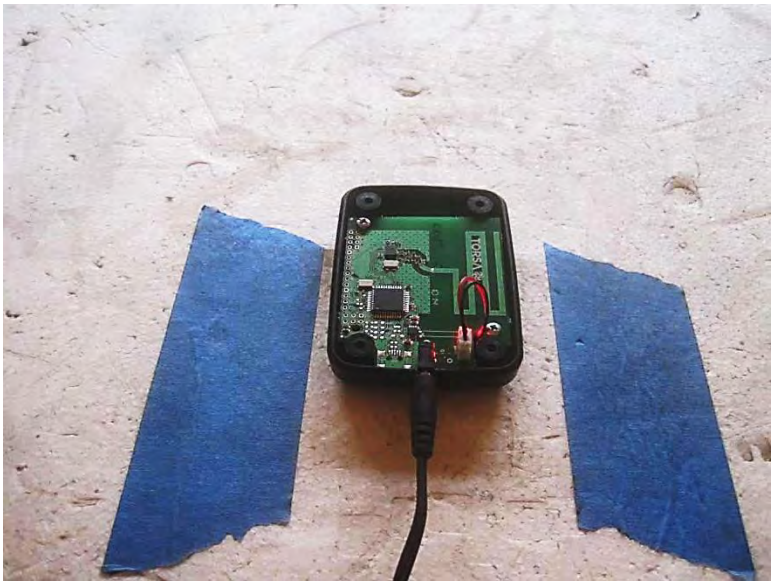
Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa

Site D

15.31(e) Compliance: The supply voltage was varied between 85% and 115% of the nominal rated voltage of 12VDC. No change in the fundamental signal level was observed.

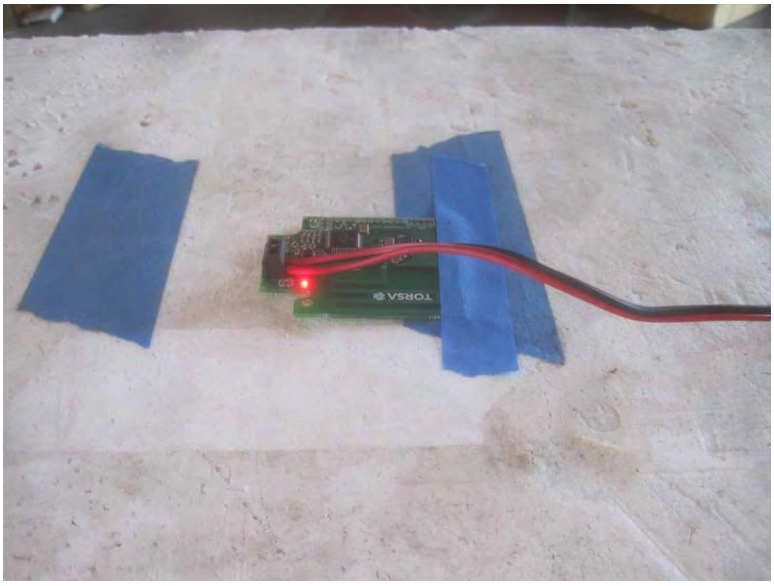
Test Setup Photos



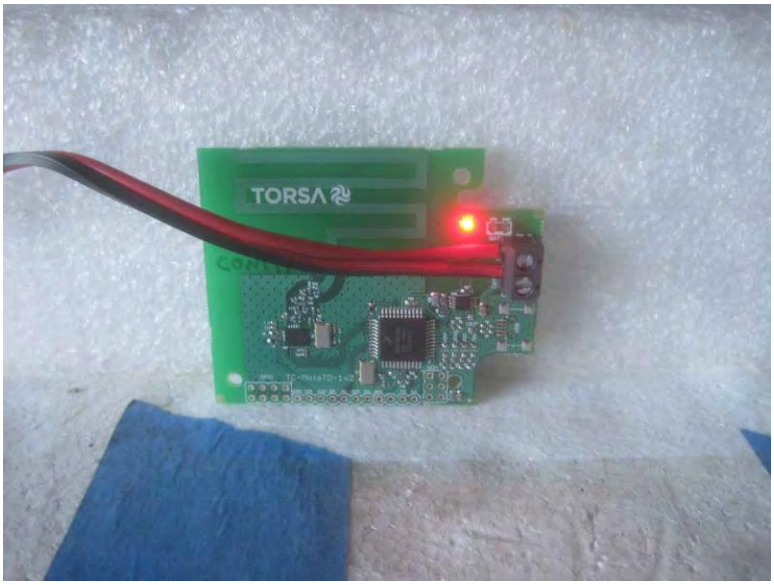
Person Tag, X Axis

Person Tag, Y Axis

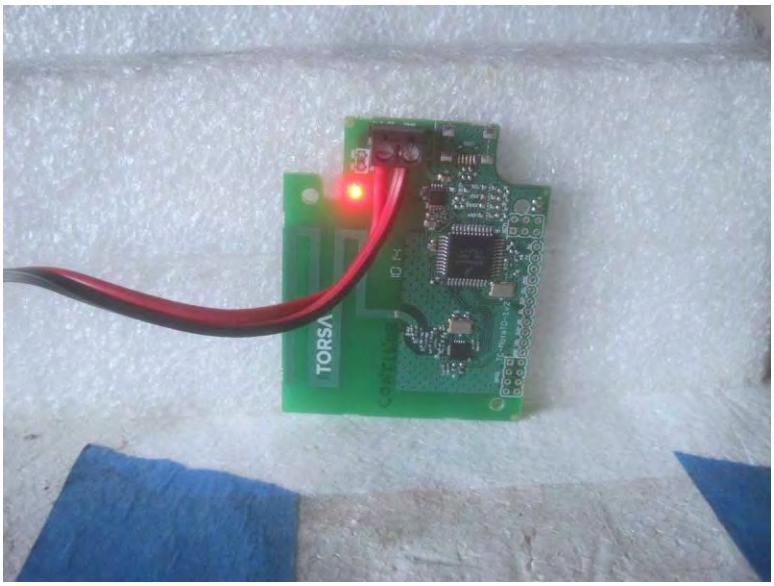
Person Tag, Z Axis



Vehicle Tag, X Axis



Vehicle Tag, Y Axis



Vehicle Tag, Z Axis

15.247(a)(2) -6dBc Occupied Bandwidth

Test Conditions / Setup

Person Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **-6dBc DTS Bandwidth**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag
S/N: NA

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
AN03431	Attenuator	89-20-21	9/5/2013	9/5/2015
AN06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	RS Power Technology CO., LTD	RS-E2000	NA

Test Conditions / Notes:

The EUT is placed on test bench. The EUT is on and continuously transmitting.
The EUT is evaluated at antenna port.
Input voltage from power supply: 5VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.
The equipment has an integral antenna and a temporary RF antenna port was provided only to facilitate conducted measurements.

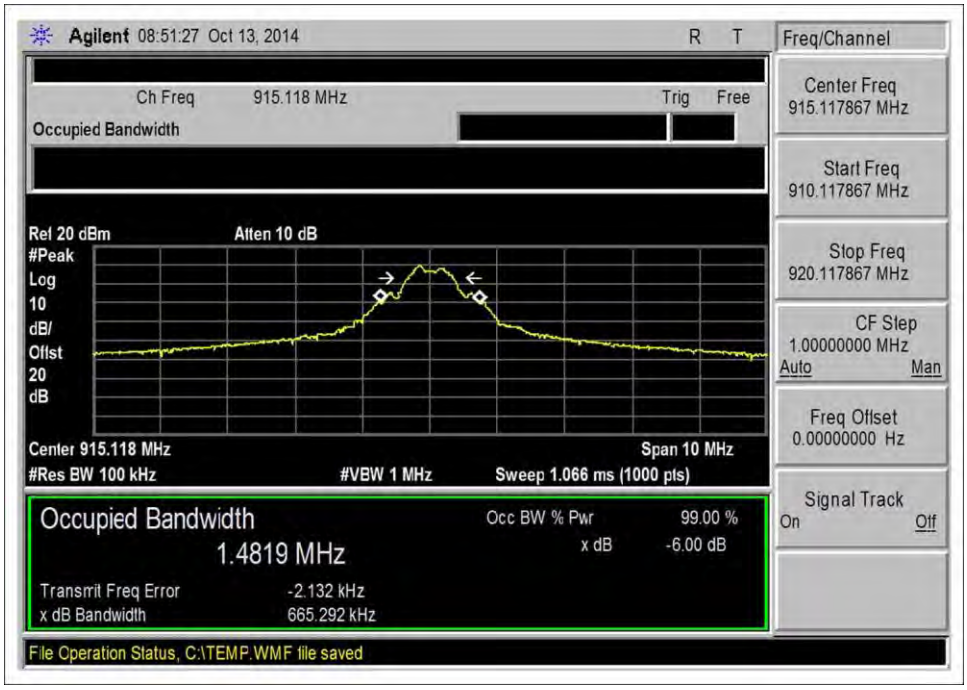
Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa

Site D

Test procedure:
The test was performed under 558074 D01 DTS Meas Guidance, section 8.2, Dated June 05, 2014.

Test Data


Agilent 08:51:27 Oct 13, 2014
R T
Freq/Channel
Ch Freq 915.118 MHz
Trig Free
Occupied Bandwidth
Center Freq
915.117867 MHz
Start Freq
910.117867 MHz
Stop Freq
920.117867 MHz
CF Step
1.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Ref 20 dBm
Atten 10 dB
#Peak
Log
10
dB/
Offst
20
dB
Center 915.118 MHz
Span 10 MHz
#Res BW 100 kHz
#VBW 1 MHz
Sweep 1.066 ms (1000 pts)
Occupied Bandwidth
1.4819 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -2.132 kHz
x dB Bandwidth 665.292 kHz
File Operation Status, C:\TEMP.WMF file saved

Vehicle Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **-6dBc DTS Bandwidth**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag
S/N: NA

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
AN03431	Attenuator	89-20-21	9/5/2013	9/5/2015
AN06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The EUT is placed on test bench. The EUT is on and continuously transmitting.
The EUT is evaluated at antenna port.
Input voltage from power supply: 12VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.
The equipment has an integral antenna and a temporary RF antenna port was provided only to facilitate conducted measurements.

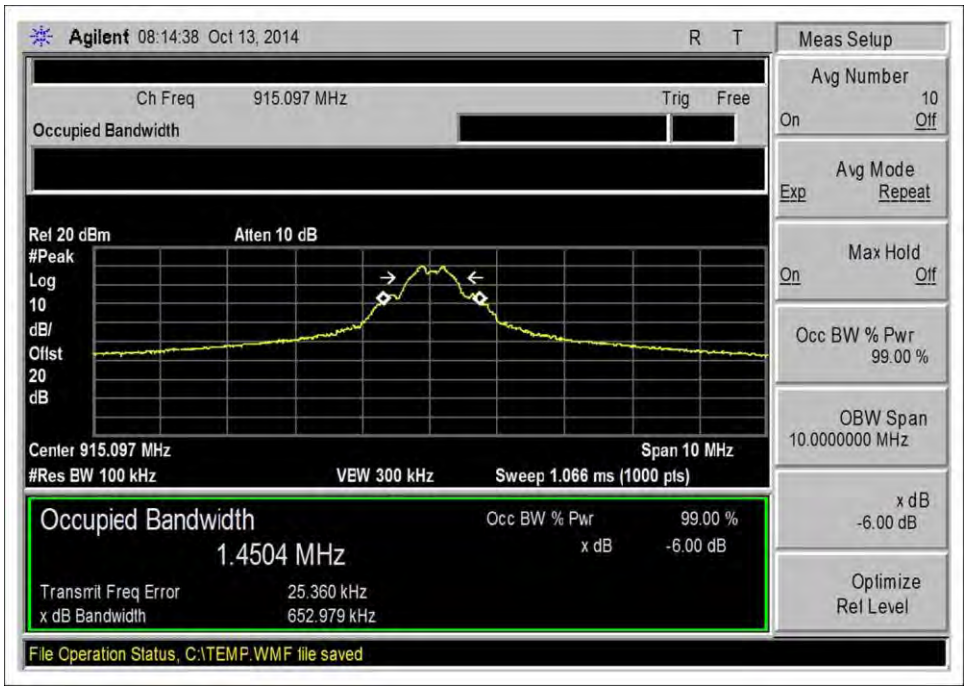
Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa

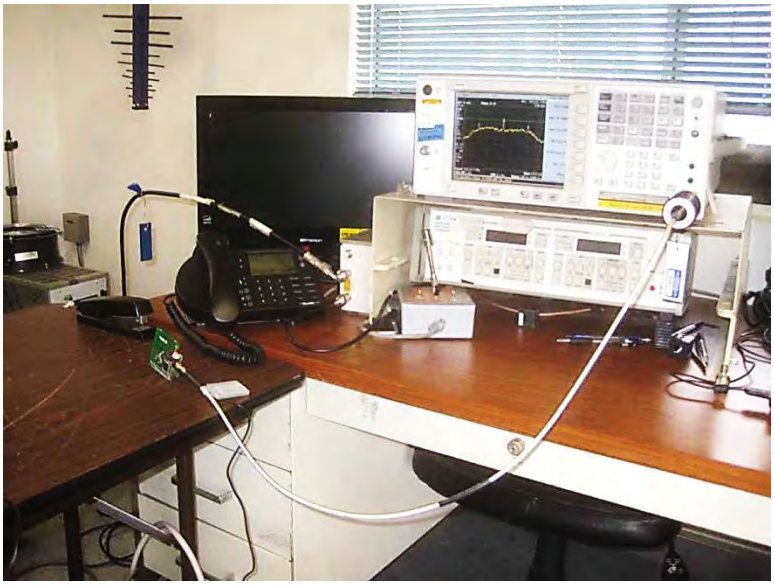
Site D

Test procedure:
The test was performed under 558074 D01 DTS Meas Guidance, section 8.2, Dated June 05, 2014

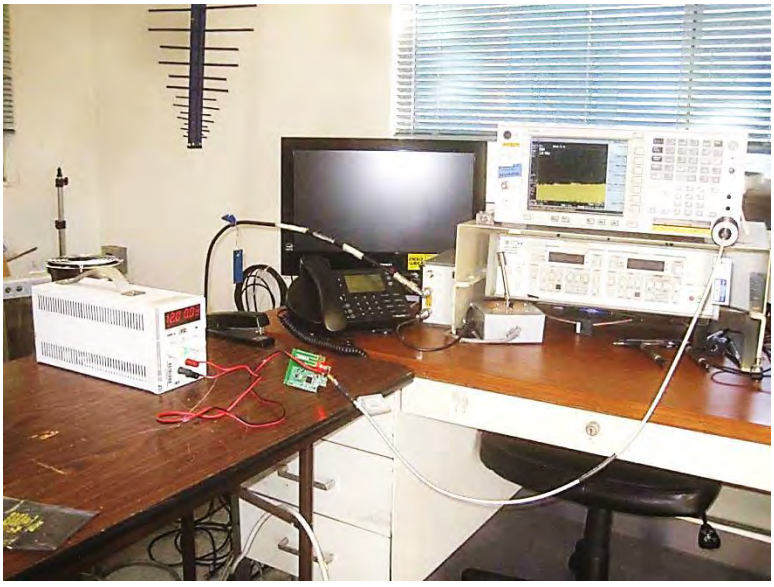
Test Data


Agilent 08:14:38 Oct 13, 2014
R T
Meas Setup
Ch Freq 915.097 MHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 10 dB
#Peak
Log
10
dB/
Offst
20
dB
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
10.0000000 MHz
Center 915.097 MHz
Span 10 MHz
#Res BW 100 kHz
VEW 300 kHz
Sweep 1.066 ms (1000 pts)
x dB
-6.00 dB
Occupied Bandwidth
1.4504 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error 25.360 kHz
x dB Bandwidth 652.979 kHz
Optimize
Ref Level
File Operation Status, C:\TEMP.WMF file saved

Test Setup Photos



Person Tag



Vehicle Tag

15.247(d) Radiated Spurious Emissions and Band Edge

Test Conditions / Setup / Data

Person Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	7/2/2014	7/2/2016
T1	AN00010	Preamp	8447D	3/12/2014	3/12/2016
T2	AN00851	Biconilog Antenna	CBL6111C	4/30/2014	4/30/2016
T3	ANP05555	Cable	RG223/U	5/7/2014	5/7/2016
T4	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T5	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T6	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T7	AN01646	Horn Antenna	3115	3/18/2014	3/18/2016
T8	ANP06360	Cable	L1-PNMNM-48	7/29/2014	7/29/2016
T9	ANP06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015
T10	AN03169	High Pass Filter	HM1155-11SS	7/30/2013	7/30/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	RS Power Technology CO., LTD	RS-E2000	NA

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is powered from support power supply which is located on the ground plane. The power supply provides 5V output voltage to the EUT and charging 3.7V internal battery. The EUT is on and continuously transmitting.
Input voltage from power supply: 5VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.

Frequency range of measurement = 9kHz-10GHz
9kHz -150kHz;RBW=200Hz,VBW=200Hz;
150kHz-30MHz;RBW=9kHz,VBW=9kHz;
30MHz-1000MHz;RBW=120kHz,VBW=120kHz,
1000MHz-10000MHz;RBW=1MHz,VBW=1MHz.

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa
Site D

Data contained within this report is worst case emissions with the EUT in three different axis systems (X,Y,Z).

Ext Attn: 0 dB

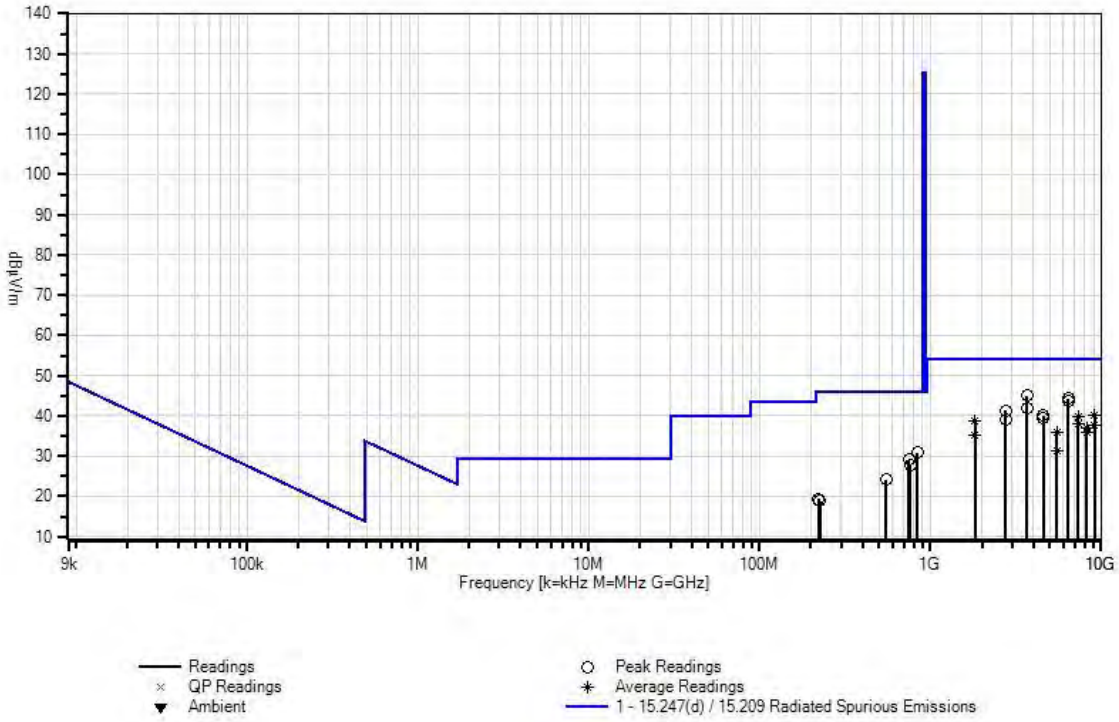
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	3661.460M	43.6	+0.0 +7.5 +0.8	+0.0 -39.9 +0.3	+0.0 +28.6	+0.0 +4.1	+0.0	45.0	54.0	-9.0	Vert
2	6406.483M	34.0	+0.0 +10.5 +1.1	+0.0 -38.8 +0.1	+0.0 +32.0	+0.0 +5.5	+0.0	44.4	54.0	-9.6	Horiz
3	6407.458M	33.3	+0.0 +10.5 +1.1	+0.0 -38.8 +0.1	+0.0 +32.0	+0.0 +5.5	+0.0	43.7	54.0	-10.3	Vert
4	3661.058M	40.5	+0.0 +7.5 +0.8	+0.0 -39.9 +0.3	+0.0 +28.6	+0.0 +4.1	+0.0	41.9	54.0	-12.1	Horiz
5	2745.960M	43.1	+0.0 +6.9 +0.7	+0.0 -39.7 +0.2	+0.0 +26.6	+0.0 +3.5	+0.0	41.3	54.0	-12.7	Vert
6	9153.208M Ave	21.8	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	40.2	54.0	-13.8	Vert
^	9153.208M	39.2	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	57.6	54.0	+3.6	Vert
8	4576.560M	35.4	+0.0 +9.1 +0.9	+0.0 -39.7 +0.2	+0.0 +29.6	+0.0 +4.6	+0.0	40.1	54.0	-13.9	Vert

9	7322.558M Ave	26.9	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.6	+0.0 +5.9	+0.0	39.8	54.0	-14.2	Vert
^	7322.558M	44.6	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.6	+0.0 +5.9	+0.0	57.5	54.0	+3.5	Vert
11	4576.158M	34.7	+0.0 +9.1 +0.9	+0.0 -39.7 +0.2	+0.0 +29.6	+0.0 +4.6	+0.0	39.4	54.0	-14.6	Horiz
12	2745.958M	40.9	+0.0 +6.9 +0.7	+0.0 -39.7 +0.2	+0.0 +26.6	+0.0 +3.5	+0.0	39.1	54.0	-14.9	Horiz
13	836.450M	29.1	-27.6 +3.3 +0.0	+22.4 +0.0 +0.0	+0.5 +0.0	+3.2 +0.0	+0.0	30.9	46.0	-15.1	Horiz
14	1830.858M Ave	45.2	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	38.6	54.0	-15.4	Horiz
^	1830.858M	61.1	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	54.5	54.0	+0.5	Horiz
16	7323.433M Ave	25.0	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.6	+0.0 +5.9	+0.0	37.9	54.0	-16.1	Horiz
^	7323.433M	43.4	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.6	+0.0 +5.9	+0.0	56.3	54.0	+2.3	Horiz
18	9153.633M Ave	19.3	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	37.7	54.0	-16.3	Horiz
^	9153.633M	35.2	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	53.6	54.0	-0.4	Horiz
20	746.050M	29.0	-27.8 +3.1 +0.0	+21.4 +0.0 +0.0	+0.4 +0.0	+3.0 +0.0	+0.0	29.1	46.0	-16.9	Vert
21	8238.108M Ave	21.3	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	37.0	54.0	-17.0	Vert
^	8238.108M	38.2	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	53.9	54.0	-0.1	Vert
23	5492.358M Ave	28.3	+0.0 +9.7 +1.0	+0.0 -39.4 +0.2	+0.0 +30.9	+0.0 +5.3	+0.0	36.0	54.0	-18.0	Vert
^	5492.358M	46.8	+0.0 +9.7 +1.0	+0.0 -39.4 +0.2	+0.0 +30.9	+0.0 +5.3	+0.0	54.5	54.0	+0.5	Vert
25	8238.533M Ave	20.1	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	35.8	54.0	-18.2	Horiz

^	8238.533M	35.6	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	51.3	54.0	-2.7	Horiz
27	759.100M	27.6	-27.8 +3.1 +0.0	+21.5 +0.0 +0.0	+0.4 +0.0	+3.0 +0.0	+0.0	27.8	46.0	-18.2	Vert
28	1830.858M Ave	41.8	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	35.2	54.0	-18.8	Vert
^	1830.858M	57.5	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	50.9	54.0	-3.1	Vert
30	548.000M	27.5	-27.9 +2.6 +0.0	+19.0 +0.0 +0.0	+0.4 +0.0	+2.5 +0.0	+0.0	24.1	46.0	-21.9	Vert
31	5491.333M Ave	23.5	+0.0 +9.7 +1.0	+0.0 -39.4 +0.2	+0.0 +30.9	+0.0 +5.3	+0.0	31.2	54.0	-22.8	Horiz
^	5491.333M	39.9	+0.0 +9.7 +1.0	+0.0 -39.4 +0.2	+0.0 +30.9	+0.0 +5.3	+0.0	47.6	54.0	-6.4	Horiz
33	221.650M	31.9	-26.6 +1.7 +0.0	+10.7 +0.0 +0.0	+0.2 +0.0	+1.5 +0.0	+0.0	19.4	46.0	-26.6	Horiz
34	225.920M	31.1	-26.6 +1.7 +0.0	+11.0 +0.0 +0.0	+0.2 +0.0	+1.5 +0.0	+0.0	18.9	46.0	-27.1	Vert

CKC Laboratories, Inc. Date: 10/14/2014 Time: 11:26:42 Torsa Sistemas, S.L. WO#: 96022
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Sequence#: 5 Ext ATTN: 0 dB



Person Tag Band Edge

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **Band Edge Compliance**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/12/2014	3/12/2016
T2	AN00851	Biconilog Antenna	CBL6111C	4/30/2014	4/30/2016
T3	ANP05555	Cable	RG223/U	5/7/2014	5/7/2016
T4	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T5	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	RS Power Technology CO., LTD	RS-E2000	NA

Test Conditions / Notes:

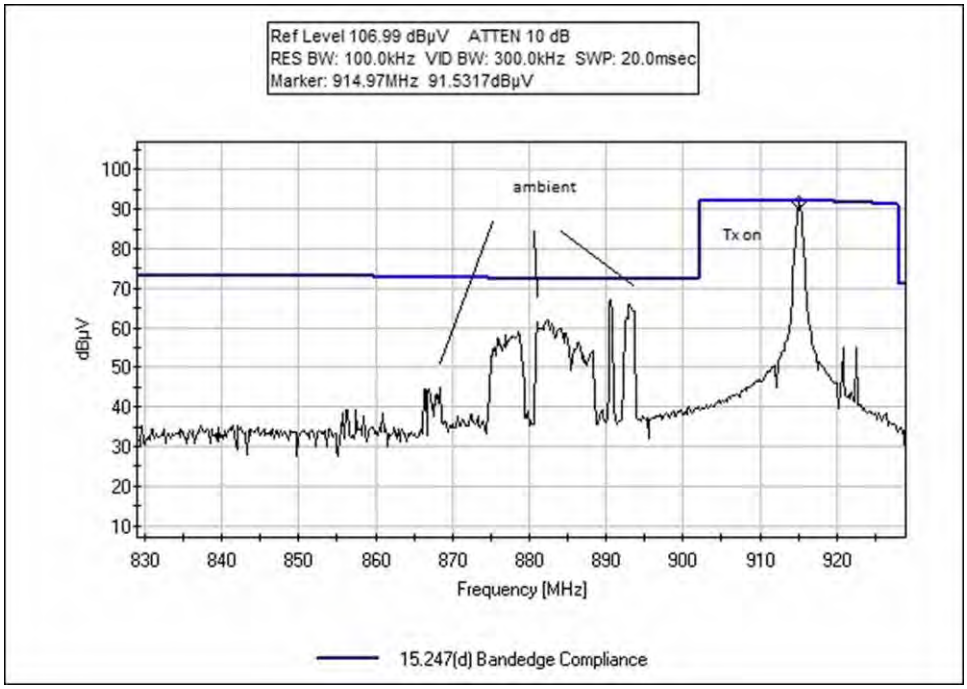
The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is powered from support power supply which is located on the ground plane. The power supply provides 5V output voltage to the EUT and charging 3.7V internal battery. The EUT is on and continuously transmitting.
Input voltage from power supply: 5VDC

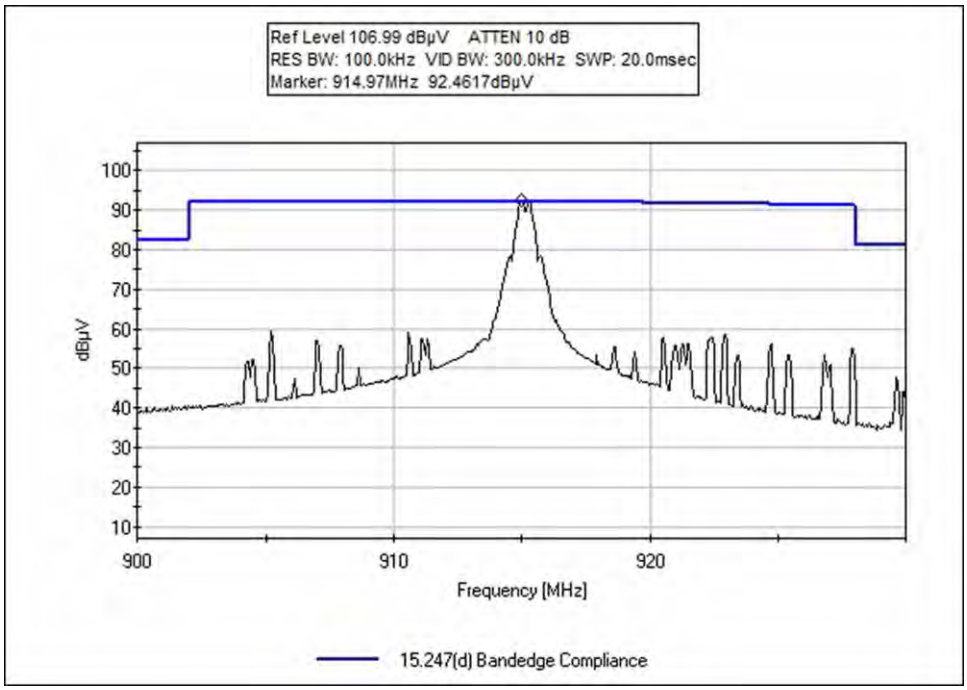
The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.

Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa
Site D

Data contained within this report is worst case emissions with the EUT in three different axis systems (X,Y,Z).


Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.0msec
Marker: 914.97MHz 91.5317dBµV
ambient
Tx on
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance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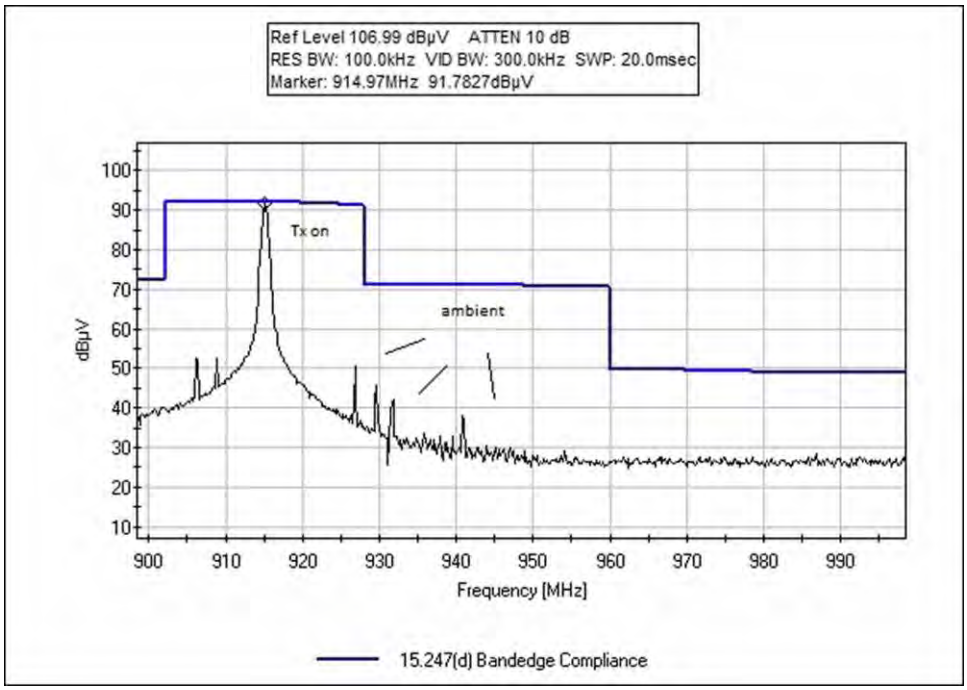
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance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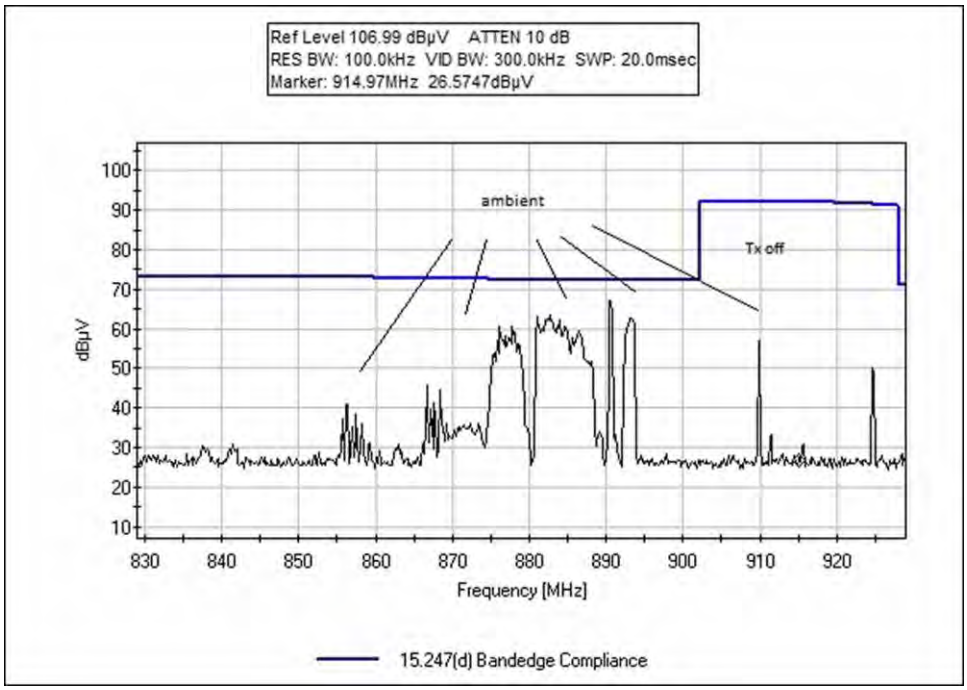
Tx on
ambient
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance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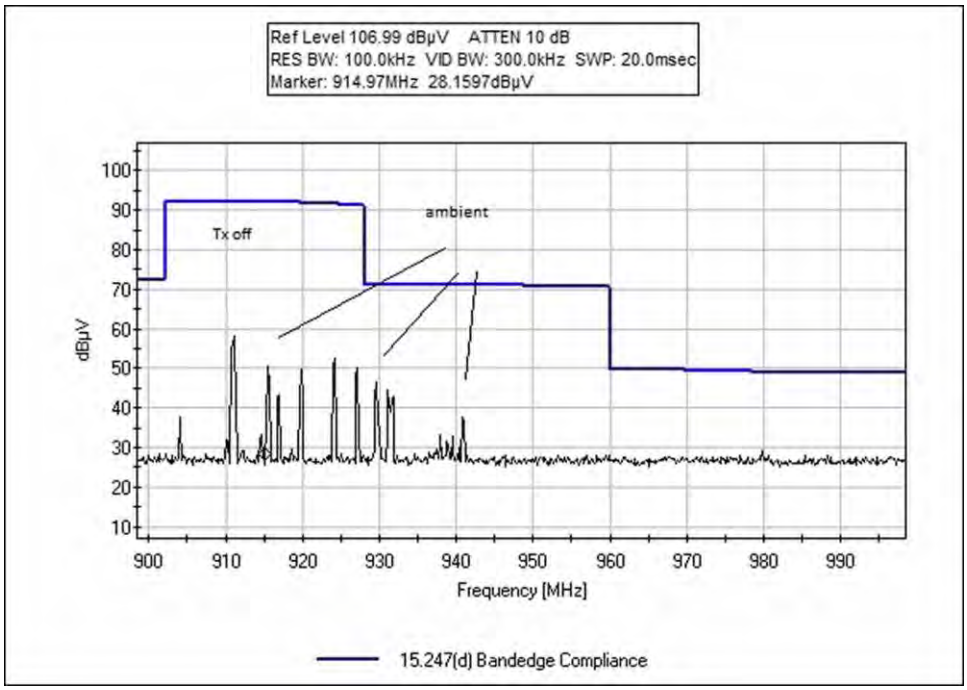
ambient
Tx off
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance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Marker: 914.97MHz 28.1597dBµV
Tx off
ambient
dBµV
100
90
80
70
60
50
40
30
20
10
900
910
920
930
940
950
960
970
980
990
Frequency [MHz]
15.247(d) Bandedge Compliance

Vehicle Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **15.247(d) / 15.209 Radiated Spurious Emissions**
Work Order #: **96022** Date: 10/13/2014
Test Type: **Maximized Emissions** Time: 16:04:47
Equipment: **Total Detector Tag** Sequence#: 4
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN00314	Loop Antenna	6502	7/2/2014	7/2/2016
T1	AN00010	Preamp	8447D	3/12/2014	3/12/2016
T2	AN00851	Biconilog Antenna	CBL6111C	4/30/2014	4/30/2016
T3	ANP05555	Cable	RG223/U	5/7/2014	5/7/2016
T4	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T5	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016
T6	AN00787	Preamp	83017A	5/31/2013	5/31/2015
T7	AN01646	Horn Antenna	3115	3/18/2014	3/18/2016
T8	ANP06360	Cable	L1-PNMNM-48	7/29/2014	7/29/2016
T9	ANP06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015
T10	AN03169	High Pass Filter	HM1155-11SS	7/30/2013	7/30/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is powered from support power supply which is located on the ground plane. The EUT is on and continuously transmitting.
Input voltage from power supply: 12VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.

Frequency range of measurement = 9kHz-10GHz
9kHz -150kHz;RBW=200 Hz,VBW=200Hz;
150kHz-30MHz;RBW=9kHz,VBW=9kHz;
30MHz-1000 MHz;RBW=120kHz,VBW=120kHz,
1000MHz-10000MHz;RBW=1MHz,VBW=1MHz.

Temperature: 22°C
Relative Humidity: 51%
Pressure: 100kPa
Site D

Data contained within this report is worst case emissions with the EUT in three different axis systems (X,Y,Z).

Ext Attn: 0 dB

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

#	Freq	Rdng	T1 T5 T9	T2 T6 T10	T3 T7	T4 T8	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	758.992M	43.7	-27.8	+21.5	+0.4	+3.0	+0.0	43.9	46.0	-2.1	Horiz
	QP		+3.1	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	758.992M	46.9	-27.8	+21.5	+0.4	+3.0	+0.0	47.1	46.0	+1.1	Horiz
			+3.1	+0.0	+0.0	+0.0					
			+0.0	+0.0							
3	849.310M	36.8	-27.6	+22.6	+0.5	+3.2	+0.0	38.8	46.0	-7.2	Horiz
			+3.3	+0.0	+0.0	+0.0					
			+0.0	+0.0							
4	5489.642M	38.0	+0.0	+0.0	+0.0	+0.0	+0.0	45.7	54.0	-8.3	Vert
			+9.7	-39.4	+30.9	+5.3					
			+1.0	+0.2							
5	746.167M	37.5	-27.8	+21.4	+0.4	+3.0	+0.0	37.6	46.0	-8.4	Horiz
	QP		+3.1	+0.0	+0.0	+0.0					
			+0.0	+0.0							
^	746.158M	40.4	-27.8	+21.4	+0.4	+3.0	+0.0	40.5	46.0	-5.5	Horiz
			+3.1	+0.0	+0.0	+0.0					
			+0.0	+0.0							
7	3659.592M	42.3	+0.0	+0.0	+0.0	+0.0	+0.0	43.7	54.0	-10.3	Vert
			+7.5	-39.9	+28.6	+4.1					
			+0.8	+0.3							
8	707.108M	36.3	-27.9	+20.8	+0.5	+2.9	+0.0	35.6	46.0	-10.4	Horiz
			+3.0	+0.0	+0.0	+0.0					
			+0.0	+0.0							

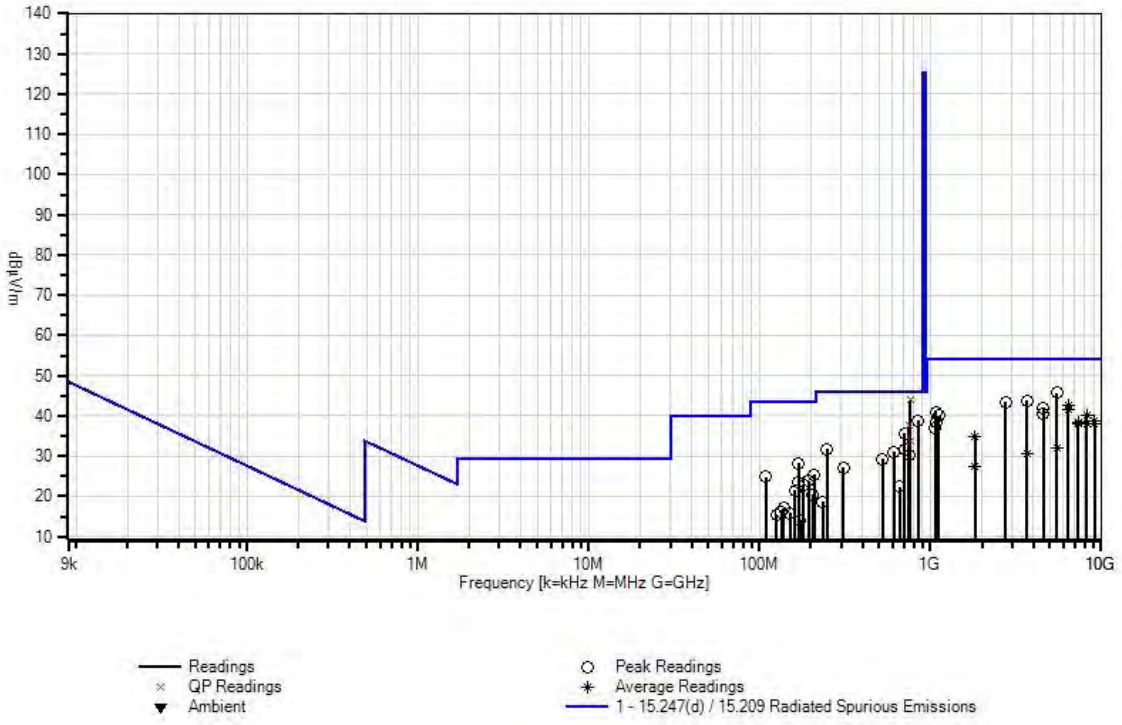
9	2746.050M	45.2	+0.0 +6.9 +0.7	+0.0 -39.7 +0.2	+0.0 +26.6	+0.0 +3.5	+0.0	43.4	54.0	-10.6	Horiz
10	2746.192M	45.0	+0.0 +6.9 +0.7	+0.0 -39.7 +0.2	+0.0 +26.6	+0.0 +3.5	+0.0	43.2	54.0	-10.8	Vert
11	6404.650M Ave	32.1	+0.0 +10.5 +1.1	+0.0 -38.8 +0.1	+0.0 +32.0	+0.0 +5.5	+0.0	42.5	54.0	-11.5	Horiz
^	6404.650M	50.9	+0.0 +10.5 +1.1	+0.0 -38.8 +0.1	+0.0 +32.0	+0.0 +5.5	+0.0	61.3	54.0	+7.3	Horiz
13	4574.692M	37.4	+0.0 +9.1 +0.9	+0.0 -39.7 +0.2	+0.0 +29.6	+0.0 +4.6	+0.0	42.1	54.0	-11.9	Vert
14	759.175M QP	33.6	-27.8 +3.1 +0.0	+21.6 +0.0 +0.0	+0.4 +0.0	+3.0 +0.0	+0.0	33.9	46.0	-12.1	Vert
^	759.175M	37.0	-27.8 +3.1 +0.0	+21.6 +0.0 +0.0	+0.4 +0.0	+3.0 +0.0	+0.0	37.3	46.0	-8.7	Vert
16	6404.250M Ave	31.1	+0.0 +10.5 +1.1	+0.0 -38.8 +0.1	+0.0 +32.0	+0.0 +5.5	+0.0	41.5	54.0	-12.5	Vert
^	6404.250M	49.9	+0.0 +10.5 +1.1	+0.0 -38.8 +0.1	+0.0 +32.0	+0.0 +5.5	+0.0	60.3	54.0	+6.3	Vert
18	1076.460M	53.8	+0.0 +3.8 +0.5	+0.0 -41.3 +0.0	+0.0 +22.0	+0.0 +2.1	+0.0	40.9	54.0	-13.1	Vert
19	4576.230M	35.7	+0.0 +9.1 +0.9	+0.0 -39.7 +0.2	+0.0 +29.6	+0.0 +4.6	+0.0	40.4	54.0	-13.6	Horiz
20	8234.850M Ave	24.6	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	40.3	54.0	-13.7	Horiz
^	8234.850M	42.4	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	58.1	54.0	+4.1	Horiz
22	1122.300M	52.6	+0.0 +3.8 +0.5	+0.0 -41.1 +0.0	+0.0 +22.1	+0.0 +2.1	+0.0	40.0	54.0	-14.0	Vert
23	706.980M	32.5	-27.9 +3.0 +0.0	+20.8 +0.0 +0.0	+0.5 +0.0	+2.9 +0.0	+0.0	31.8	46.0	-14.2	Vert
24	249.100M	42.1	-26.5 +1.8 +0.0	+12.5 +0.0 +0.0	+0.2 +0.0	+1.6 +0.0	+0.0	31.7	46.0	-14.3	Horiz
25	609.740M	32.9	-27.9 +2.8 +0.0	+20.2 +0.0 +0.0	+0.5 +0.0	+2.6 +0.0	+0.0	31.1	46.0	-14.9	Vert

26	169.010M	42.3	-26.8 +1.5 +0.0	+9.7 +0.0 +0.0	+0.2 +0.0	+1.3 +0.0	+0.0	28.2	43.5	-15.3	Vert
27	9153.550M Ave	20.3	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	38.7	54.0	-15.3	Vert
^	9153.550M	37.5	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	55.9	54.0	+1.9	Vert
29	1071.300M	51.6	+0.0 +3.7 +0.5	+0.0 -41.4 +0.0	+0.0 +22.0	+0.0 +2.1	+0.0	38.5	54.0	-15.5	Horiz
30	7322.850M Ave	25.4	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.6	+0.0 +5.9	+0.0	38.3	54.0	-15.7	Vert
^	7322.850M	43.1	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.6	+0.0 +5.9	+0.0	56.0	54.0	+2.0	Vert
32	7319.750M Ave	25.4	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.5	+0.0 +5.9	+0.0	38.2	54.0	-15.8	Horiz
^	7319.750M	42.8	+0.0 +11.3 +1.2	+0.0 -39.2 +0.1	+0.0 +33.5	+0.0 +5.9	+0.0	55.6	54.0	+1.6	Horiz
34	9149.950M Ave	19.8	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	38.2	54.0	-15.8	Horiz
^	9149.950M	35.6	+0.0 +13.3 +1.3	+0.0 -39.1 +0.1	+0.0 +35.8	+0.0 +7.0	+0.0	54.0	54.0	+0.0	Horiz
36	746.167M	30.0	-27.8 +3.1 +0.0	+21.4 +0.0 +0.0	+0.4 +0.0	+3.0 +0.0	+0.0	30.1	46.0	-15.9	Vert
37	8238.150M Ave	22.2	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	37.9	54.0	-16.1	Vert
^	8238.150M	40.0	+0.0 +12.4 +1.2	+0.0 -39.3 +0.0	+0.0 +35.0	+0.0 +6.4	+0.0	55.7	54.0	+1.7	Vert
39	522.740M	33.3	-27.8 +2.5 +0.0	+18.4 +0.0 +0.0	+0.4 +0.0	+2.4 +0.0	+0.0	29.2	46.0	-16.8	Vert
40	1070.960M	50.1	+0.0 +3.7 +0.5	+0.0 -41.4 +0.0	+0.0 +22.0	+0.0 +2.1	+0.0	37.0	54.0	-17.0	Vert
41	207.973M	39.2	-26.7 +1.6 +0.0	+9.6 +0.0 +0.0	+0.2 +0.0	+1.4 +0.0	+0.0	25.3	43.5	-18.2	Horiz
42	109.267M	38.7	-27.1 +1.1 +0.0	+11.0 +0.0 +0.0	+0.1 +0.0	+1.0 +0.0	+0.0	24.8	43.5	-18.7	Vert

43	310.700M	36.2	-26.6 +1.9 +0.0	+13.6 +0.0 +0.0	+0.3 +0.0	+1.8 +0.0	+0.0	27.2	46.0	-18.8	Vert
44	1830.800M Ave	41.4	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	34.8	54.0	-19.2	Horiz
^	1830.800M	60.9	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	54.3	54.0	+0.3	Horiz
46	193.410M	38.2	-26.7 +1.6 +0.0	+9.0 +0.0 +0.0	+0.2 +0.0	+1.4 +0.0	+0.0	23.7	43.5	-19.8	Vert
47	168.970M	37.5	-26.8 +1.5 +0.0	+9.7 +0.0 +0.0	+0.2 +0.0	+1.3 +0.0	+0.0	23.4	43.5	-20.1	Horiz
48	181.610M	37.7	-26.8 +1.5 +0.0	+9.0 +0.0 +0.0	+0.2 +0.0	+1.3 +0.0	+0.0	22.9	43.5	-20.6	Vert
49	161.110M	35.1	-26.9 +1.4 +0.0	+10.3 +0.0 +0.0	+0.2 +0.0	+1.3 +0.0	+0.0	21.4	43.5	-22.1	Vert
50	5489.550M Ave	24.2	+0.0 +9.7 +1.0	+0.0 -39.4 +0.2	+0.0 +30.9	+0.0 +5.3	+0.0	31.9	54.0	-22.1	Horiz
^	5489.550M	39.9	+0.0 +9.7 +1.0	+0.0 -39.4 +0.2	+0.0 +30.9	+0.0 +5.3	+0.0	47.6	54.0	-6.4	Horiz
52	205.401M	34.5	-26.7 +1.6 +0.0	+9.4 +0.0 +0.0	+0.2 +0.0	+1.4 +0.0	+0.0	20.4	43.5	-23.1	Horiz
53	3661.150M Ave	29.3	+0.0 +7.5 +0.8	+0.0 -39.9 +0.3	+0.0 +28.6	+0.0 +4.1	+0.0	30.7	54.0	-23.3	Horiz
^	3661.150M	43.8	+0.0 +7.5 +0.8	+0.0 -39.9 +0.3	+0.0 +28.6	+0.0 +4.1	+0.0	45.2	54.0	-8.8	Horiz
55	661.550M	23.6	-27.9 +2.9 +0.0	+20.5 +0.0 +0.0	+0.4 +0.0	+2.8 +0.0	+0.0	22.3	46.0	-23.7	Horiz
56	138.570M	29.7	-26.9 +1.3 +0.0	+11.6 +0.0 +0.0	+0.2 +0.0	+1.2 +0.0	+0.0	17.1	43.5	-26.4	Horiz
57	1830.400M Ave	34.0	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	27.4	54.0	-26.6	Vert
^	1830.400M	52.7	+0.0 +5.1 +0.6	+0.0 -39.7 +0.3	+0.0 +24.4	+0.0 +2.7	+0.0	46.1	54.0	-7.9	Vert
59	134.010M	28.9	-27.0 +1.3 +0.0	+11.6 +0.0 +0.0	+0.2 +0.0	+1.2 +0.0	+0.0	16.2	43.5	-27.3	Vert

60	234.780M	30.2	-26.6 +1.7 +0.0	+11.6 +0.0 +0.0	+0.2 +0.0	+1.5 +0.0	+0.0	18.6	46.0	-27.4	Vert
61	151.110M	28.9	-26.9 +1.4 +0.0	+11.0 +0.0 +0.0	+0.2 +0.0	+1.3 +0.0	+0.0	15.9	43.5	-27.6	Vert
62	126.210M	28.4	-27.0 +1.2 +0.0	+11.7 +0.0 +0.0	+0.1 +0.0	+1.1 +0.0	+0.0	15.5	43.5	-28.0	Vert
63	173.070M	28.4	-26.8 +1.5 +0.0	+9.4 +0.0 +0.0	+0.2 +0.0	+1.3 +0.0	+0.0	14.0	43.5	-29.5	Horiz

CKC Laboratories, Inc. Date: 10/13/2014 Time: 16:04:47 Torsa Sistemas, S.L. WO#: 96022
15.247(d) / 15.209 Radiated Spurious Emissions Test Distance: 3 Meters Sequence#: 4 Ext ATTN: 0 dB



Vehicle Tag Band Edge

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **Band Edge Compliance**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag
S/N: NA

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00010	Preamp	8447D	3/12/2014	3/12/2016
T2	AN00851	Biconilog Antenna	CBL6111C	4/30/2014	4/30/2016
T3	ANP05555	Cable	RG223/U	5/7/2014	5/7/2016
T4	ANP05569	Cable	RG-214/U	5/7/2014	5/7/2016
	AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
T5	ANP04382	Cable	LDF-50	7/30/2014	7/30/2016

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The EUT is placed on the wooden table lined with Styrofoam of 10 cm thickness. EUT is powered from support power supply which is located on the ground plane. The power supply provides 5V output voltage to the EUT and charging 3.7V internal battery. The EUT is on and continuously transmitting.
Input voltage from power supply: 5VDC

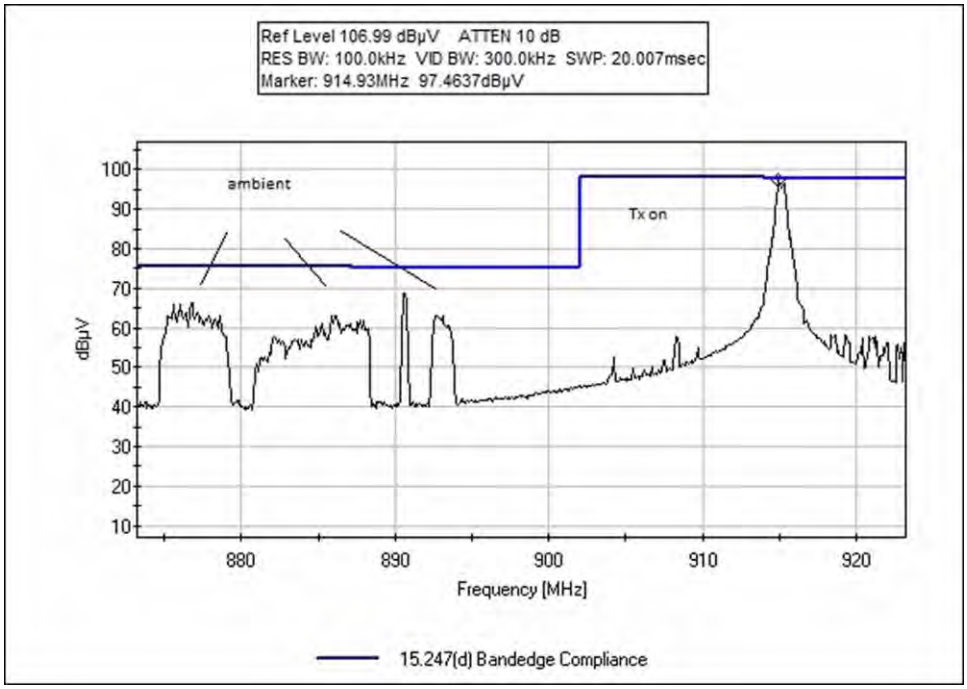
The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.

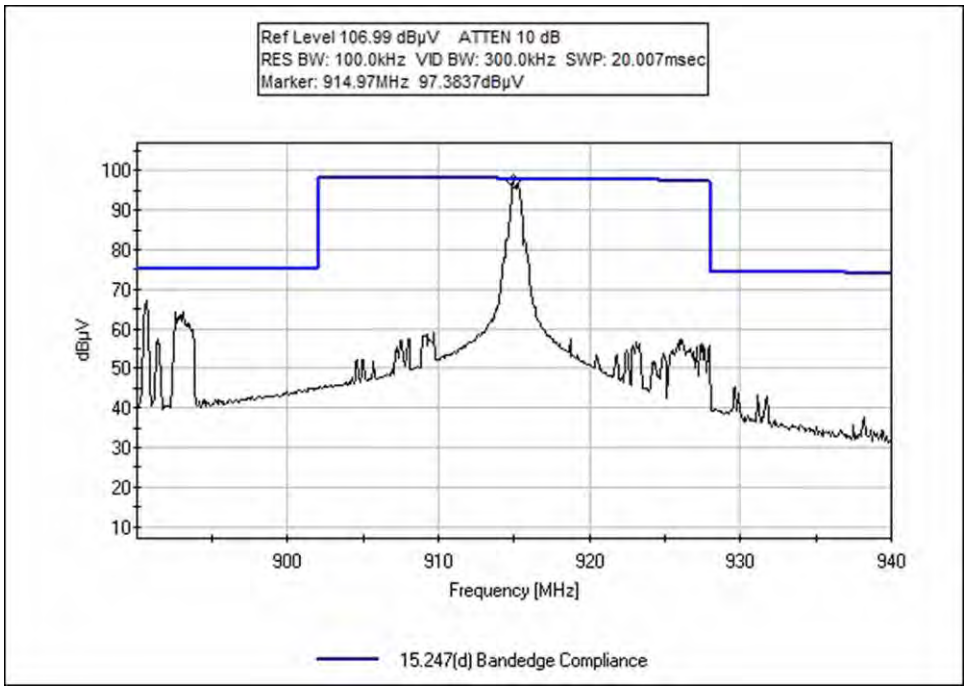
Frequency range of measurement = fundamental frequency

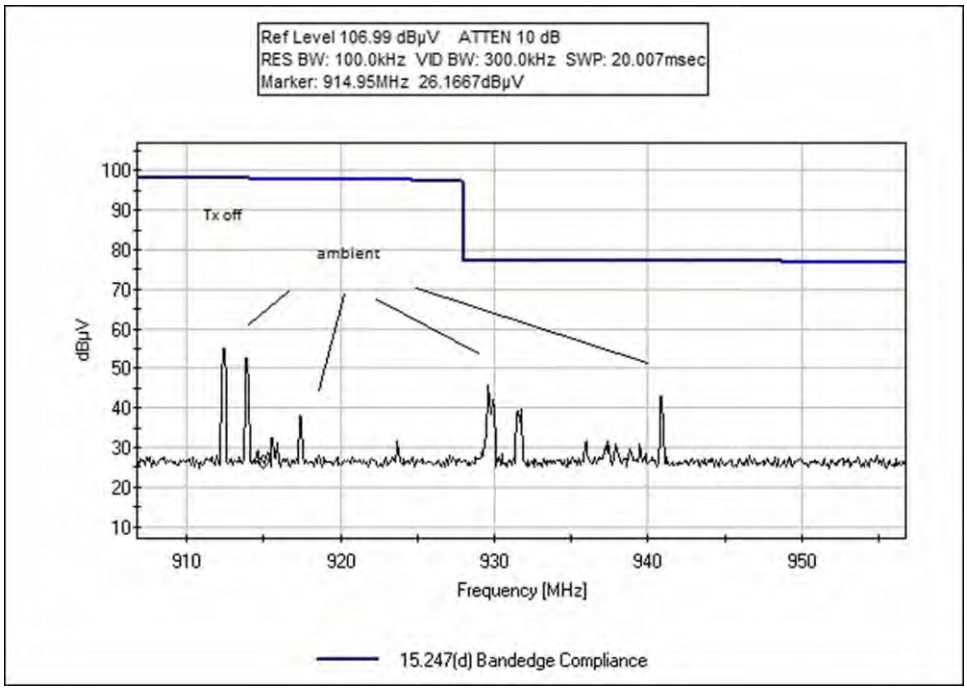
Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa

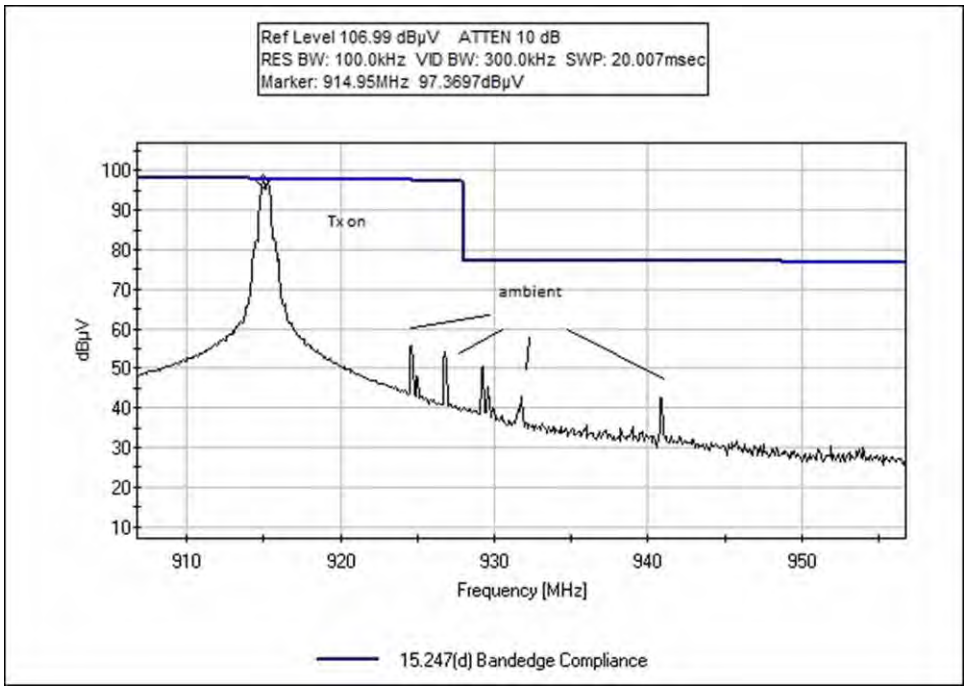
Site D

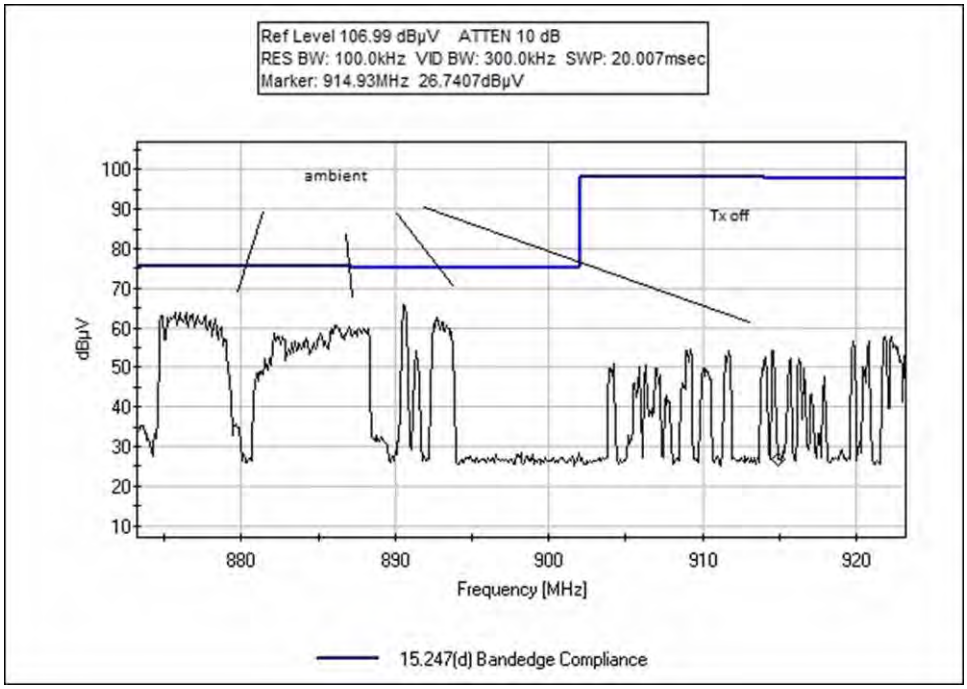
Data contained within this report is worst case emissions with the EUT in three different axis systems (X,Y,Z).


Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.007msec
Marker: 914.93MHz 97.4637dBµV
ambient
Tx on
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance

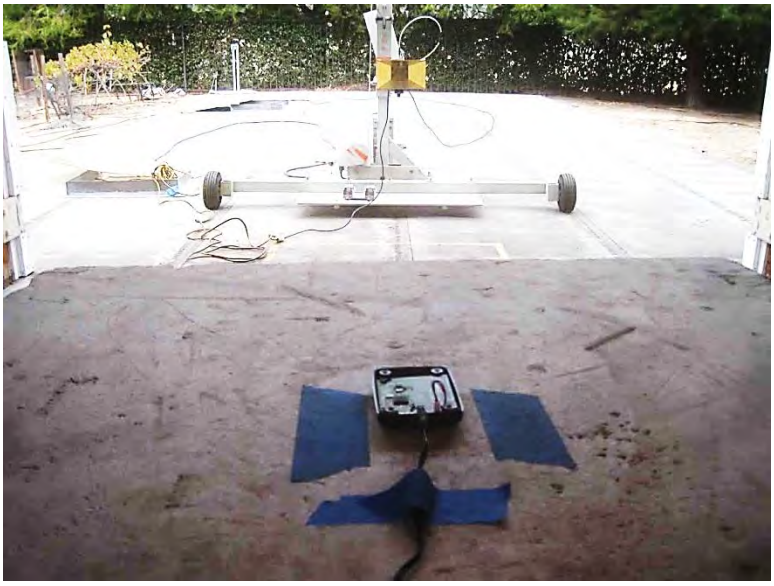

Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.007msec
Marker: 914.97MHz 97.3837dBµV
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance


Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.007msec
Marker: 914.95MHz 26.1667dBµV
Tx off
ambient
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance

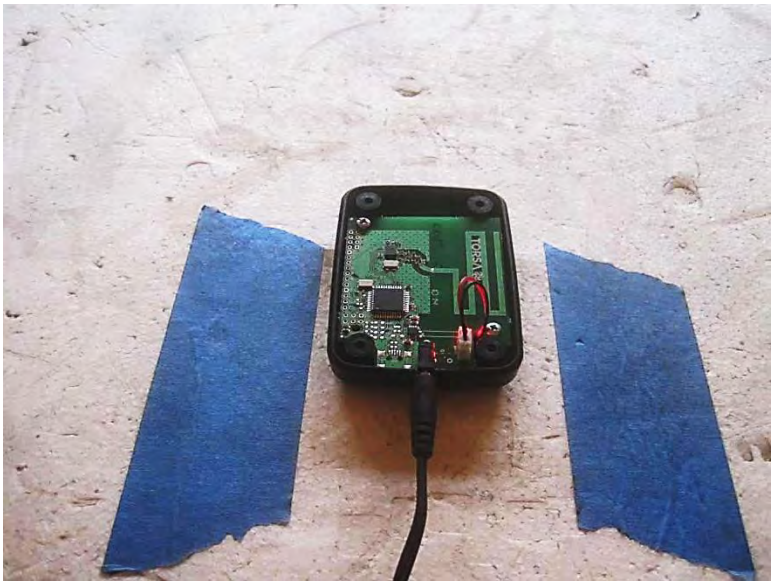

Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.007msec
Marker: 914.95MHz 97.3697dBµV
Tx on
ambient
dBµV
Frequency [MHz]
15.247(d) Bandedge Compliance


Ref Level 106.99 dBµV ATTEN 10 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 20.007msec
Marker: 914.93MHz 26.7407dBµV
ambient
Tx off
dBµV
100
90
80
70
60
50
40
30
20
10
880
890
900
910
920
Frequency [MHz]
15.247(d) Bandedge Compliance

Test Setup Photos



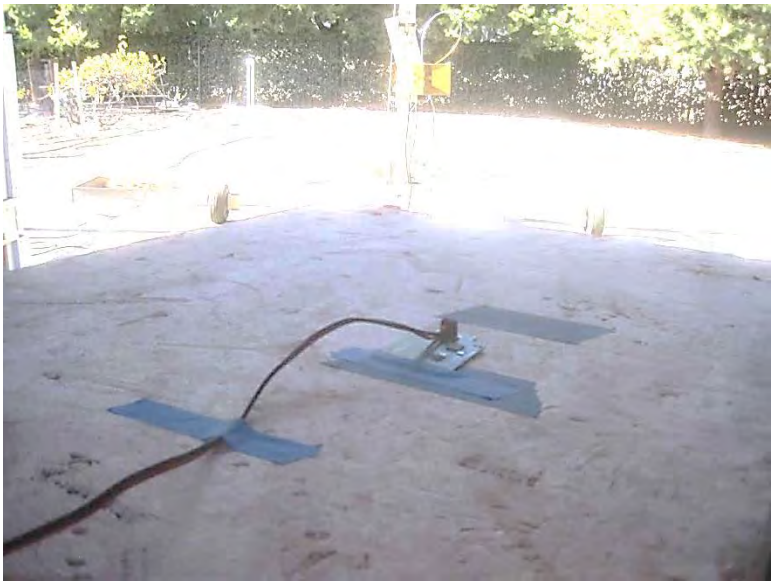
Radiated Spurious Emissions / Band Edge, Person Tag



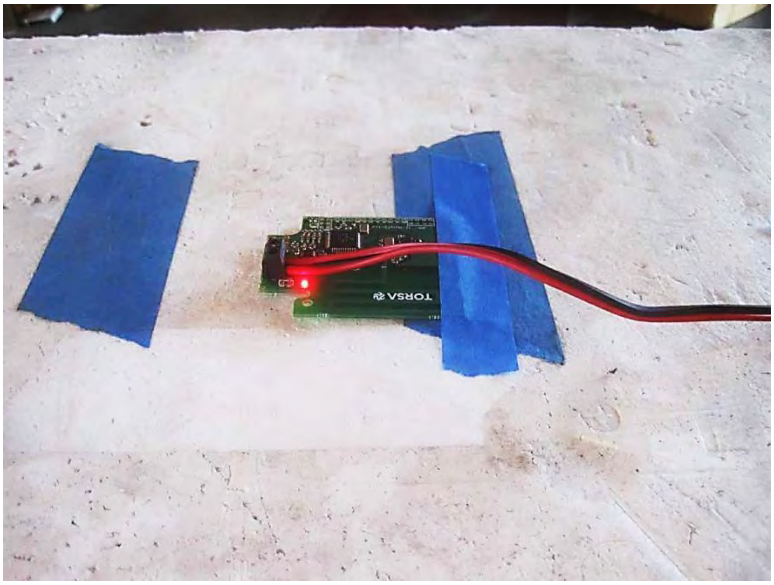
Radiated Spurious Emissions / Band Edge, Person Tag, X Axis

Radiated Spurious Emissions / Band Edge, Person Tag, Y Axis

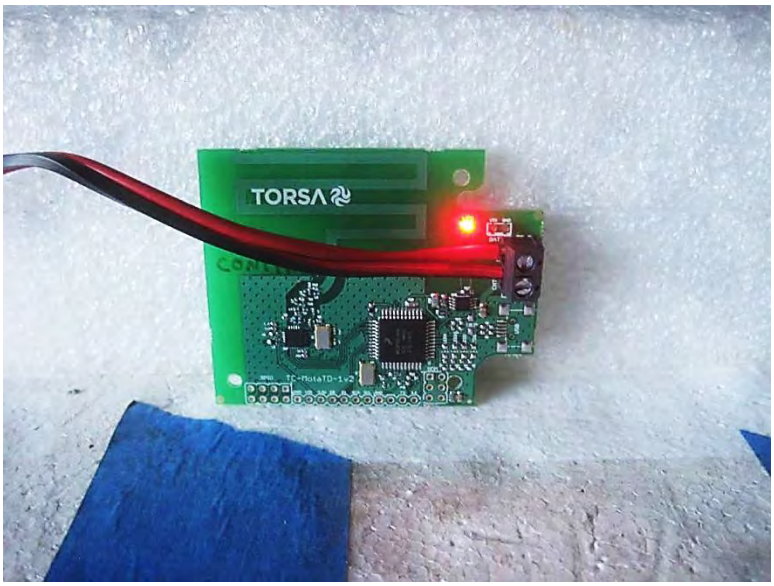
Radiated Spurious Emissions / Band Edge, Person Tag, Z Axis



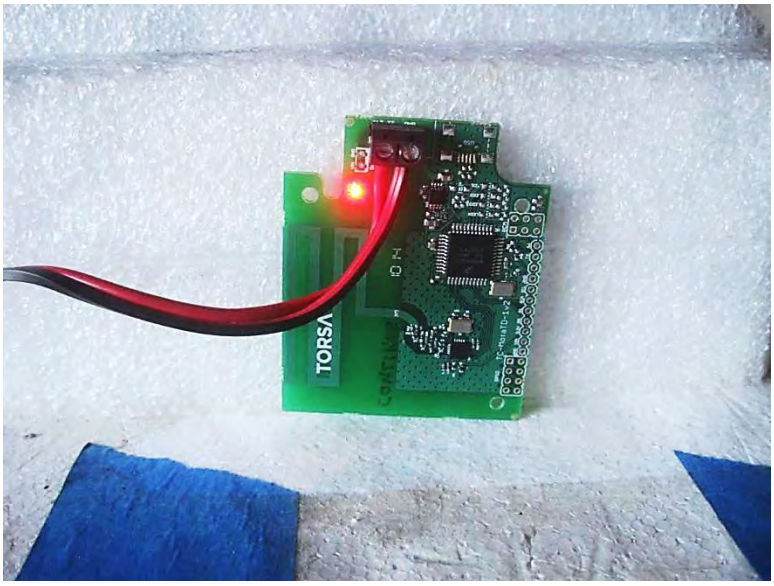
Radiated Spurious Emissions / Band Edge, Vehicle Tag



Radiated Spurious Emissions / Band Edge, Vehicle Tag, X Axis



Radiated Spurious Emissions / Band Edge, Vehicle Tag, Y Axis



Radiated Spurious Emissions / Band Edge, Vehicle Tag, Z Axis

15. 247(e) Power Spectral Density

Test Conditions / Setup

Person Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **Power Spectral Density**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Person Tag
S/N: NA

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
AN03431	Attenuator	89-20-21	9/5/2013	9/5/2015
AN06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Person Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	RS Power Technology CO., LTD	RS-E2000	NA

Test Conditions / Notes:

The EUT is placed on test bench. The EUT is on and continuously transmitting.
The EUT is evaluated at antenna port.
Input voltage from power supply: 5VDC

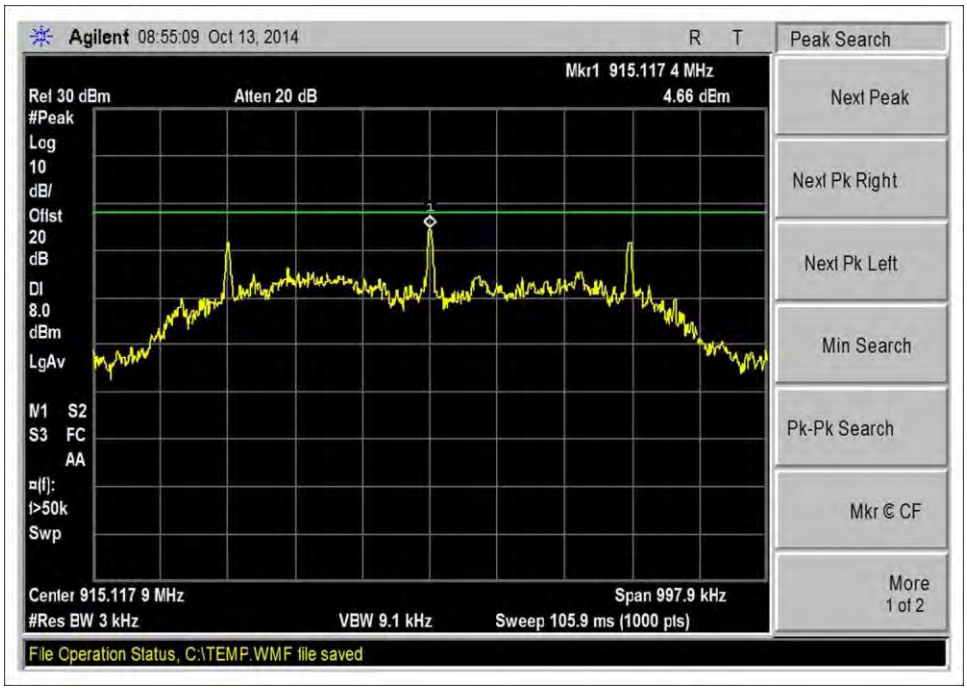
The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.
The equipment has an integral antenna and a temporary RF antenna port was provided only to facilitate conducted measurements.

Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa
Site D

Test procedure:
The test was performed under 558074 D01 DTS Meas Guidance, section 10.2, Dated June 05, 2014.

Test Data


Agilent 08:55:09 Oct 13, 2014
R T
Peak Search
Mkr1 915.117 4 MHz
Ref 30 dBm
Atten 20 dB
4.66 dBm
#Peak
Log
10
dB/
Offst
20
dB
Dl
8.0
dBm
LgAv
N1 S2
S3 FC
AA
¤(f):
f>50k
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr © CF
More
1 of 2
Center 915.117 9 MHz
Span 997.9 kHz
#Res BW 3 kHz
VBW 9.1 kHz
Sweep 105.9 ms (1000 pts)
File Operation Status, C:\TEMP.WMF file saved

Vehicle Tag

Test Location: CKC Laboratories, Inc. • 110 N. Olinda Place • Brea, CA 92823 • 714 993-6112

Customer: **Torsa Sistemas, S.L.**
Specification: **Power Spectral Density**
Work Order #: **96022** Date: 10/14/2014
Test Type: **Maximized Emissions** Time: 11:26:42
Equipment: **Total Detector Tag** Sequence#: 5
Manufacturer: Torsa Sistemas, S.L. Tested By: Don Nguyen
Model: Vehicle Tag
S/N: NA

***Test Equipment*:**

Asset #	Description	Model	Calibration Date	Cal Due Date
AN02869	Spectrum Analyzer	E4440A	7/10/2014	7/10/2015
AN03431	Attenuator	89-20-21	9/5/2013	9/5/2015
AN06544	Cable	32026-29094K-29094K-36TC	11/20/2013	11/20/2015

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Total Detector Tag*	Torsa Sistemas, S.L.	Vehicle Tag	NA

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Xantrex	XTS 30-2X	58738

Test Conditions / Notes:

The EUT is placed on test bench. The EUT is on and continuously transmitting.
The EUT is evaluated at antenna port.
Input voltage from power supply: 12VDC

The device operates in the 902-928 MHz BAND.
The device operates on a single channel with center frequency of 915.1 MHz.
The equipment has an integral antenna and a temporary RF antenna port was provided only to facilitate conducted measurements.

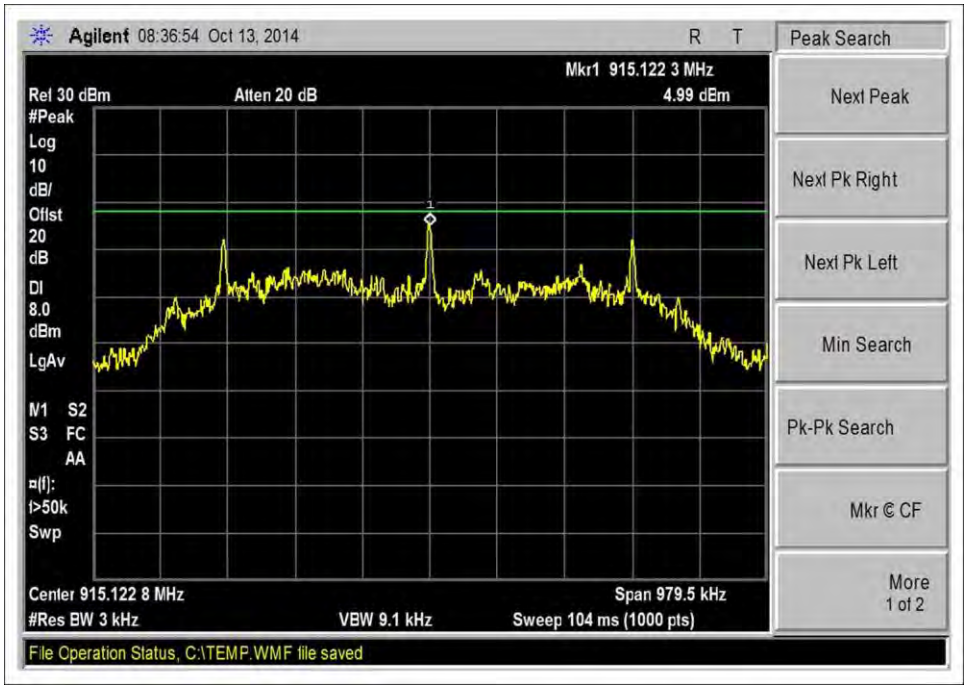
Frequency range of measurement = fundamental frequency

Temperature: 19°C
Relative Humidity: 58%
Pressure: 100kPa

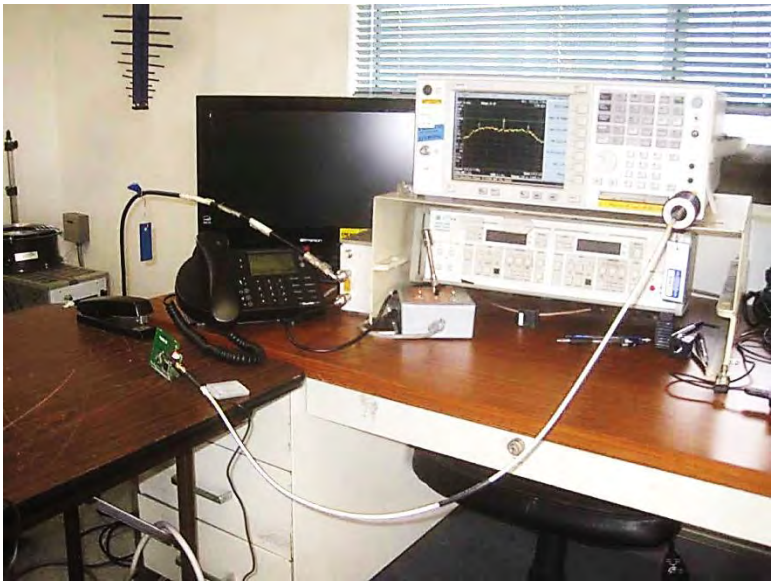
Site D

Test procedure:
The test was performed under 558074 D01 DTS Meas Guidance, section 10.2, Dated June 05, 2014.

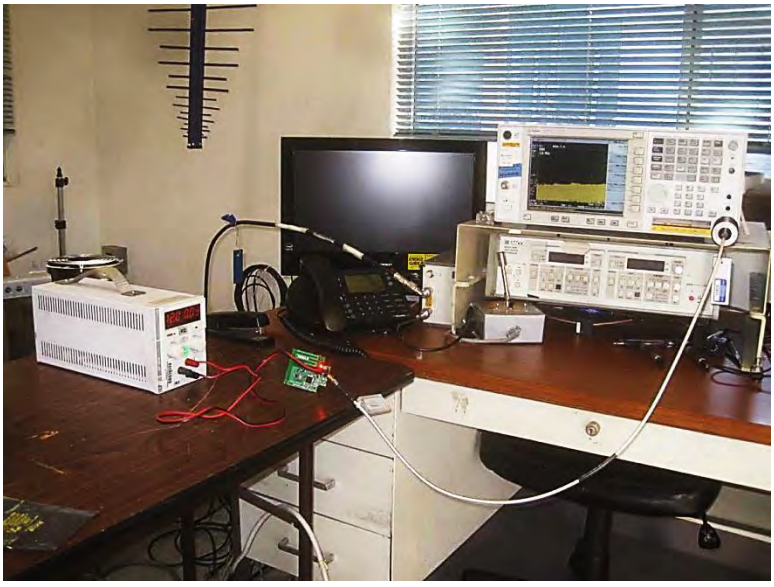
Test Data


Agilent 08:36:54 Oct 13, 2014
R T
Peak Search
Mkr1 915.122 3 MHz
Ref 30 dBm
Atten 20 dB
4.99 dBm
#Peak
Log
10
dB/
Offst
20
dB
Dl
8.0
dBm
LgAv
W1 S2
S3 FC
AA
¤(f):
f>50k
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr © CF
More
1 of 2
Center 915.122 8 MHz
Span 979.5 kHz
#Res BW 3 kHz
VBW 9.1 kHz
Sweep 104 ms (1000 pts)
File Operation Status, C:\TEMP.WMF file saved

Test Setup Photos



Person Tag



Vehicle Tag

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

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

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties 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.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	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 carrot ("^") 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.