1809 10th St. # 400
Plano TX 75074

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TEST REPORT

Report Number: **100886221DAL-001**
Project Number: **G100886221**

Report Issue Date: **November 14th, 2012**

Product Name: **LCTQ 2.4GHz Radio System, Model: TQ**
FCCID: **XVE-SA12163**
ICID: **8668A-SA12163**
Standards: **FCC 47CFR.Part 15 Subpart C 15.247**
RSS 210*Issue 8 December 2010

Tested by:
Intertek Testing Services NA, Inc.
1809 10th ST #400
Plano, TX 75074

Client:
Traxxas
1100 Klein Road
Plano, TX 75074

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1 Introduction and Conclusion

The tests indicated in section 2 were performed on the product constructed as described in section 3. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test method, a list of the actual test equipment used, documentation photos, results and raw data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complied with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

The INTERTEK-Dallas is located at 1809 10th St. # 400, Plano TX 75074. The radiated emission test site is a 3-meter semi-anechoic chamber. The chamber meets the characteristics of CISPR 16-1 and ANSI C63.4. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters. The test site is listed with the FCC under registration number 485103. The test site is listed with Industry Canada under site number IC 6018A-1.

2 Test Summary

Page	Test full name	FCC Reference	IC Reference	Result
6	Peak Conducted Power	§ 15.247(b)(3)(4)	RSS-210 (A8.4)	Pass
8	Occupied Bandwidth	§ 15.247(a)(2)	RSS-210 (A8.2), RSS-GEN (4.6.1)	Pass
18	Power Spectral Density and Conducted Spurious Emissions	§ 15.247(e)	RSS-210 (A8.5)	Pass
20	Duty Cycle Determination	FCC 15A - 15.35(c)	RSS-210 (4.5)	Pass
26	Radiated Spurious Emissions (Transmitter) 15.205 in restricted bands, all others <-30dBc	§ 15.247(c)/15.209	RSS-210 (2.2)	Pass
36	Radiated Spurious Emissions (Receiver) see note 1	§ 15.109	RSS-Gen (6.1)	N/A (1)
33	AC Power Line Conducted Emissions	§ 15.107, § 15.207	RSS-Gen (7.2.4)	N/A (2)

Note 1: This device does not contain a receiver function. Therefore, the spurious emissions produced in transmit mode are the only spurious emissions produced in its operating mode.
Note 2: This device is powered by 4 AA Batteries.

Description of Equipment under Test

Equipment Under Test	
Manufacturer	Traxxas
Model Number	TQ (Referenced as LCTQ 2.4GHz Radio System)
Serial Number	1
FCC Identifier	XVE-SA12163
IC Identifier	8668A-SA12163
Receive Date	September 10th, 2012
Test Start Date	September 11th, 2011
Test End Date	September 21st, 2012
Device Received Condition	Pre-production Prototype
Test Sample Type	Spread-Spectrum Transmitter for Radio-Controlled Model Racing Cars
Frequency Band	2406-2453MHz
Mode(s) of Operation	Transmit
Modulation Type	GFSK
Maximum Output Power	+2.6dBm
Test Channels	2406 , 2429, 2453
Antenna Type (15.203)	E44057 0dBi +/- 0.5
Operating Voltage	DC Battery-powered

Description of Equipment Under Test
The Traxxas LCTQ 2.4GHz Radio System is a 2406 to 2453MHz Spread-Spectrum Transmitter for Radio-Controlled Model Racing Cars.

Operating modes of the EUT:

No.	**Descriptions of EUT Exercising**
1	For Peak Power and Radiated Emissions testing EUT was operating in a constant transmit, modulated mode.
2	For all other testing EUT was operated in modulated mode as dictated by the FCC 15.247/RSS210
3	The EUT continuously transmitted at maximum power.
4	The EUT was tuned to a low, middle, and high channel to perform power, occupied bandwidth, and spurious/harmonic tests.

Note: The **Traxxas** LCTQ 2.4GHz Radio System was tested to and found to be in compliance with FCC 15.247and IC RSS-210 issue 8.

System setup including cable interconnection details, support equipment and simplified block diagram

2.1 EUT Block Diagram:

The test sample was tested in stand alone mode and was not connected to any support equipment during the evaluation.

2.2 Cables:

Cables					
Description	Length	Shielding	Ferrites	Connection	
				From	To
Antenna Cable	6.0 inches	yes	no	TX port	Internal Antenna

2.3 Support Equipment:

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
None			

3 Peak Conducted Power

3.1 Test Limits

§ 15.247(b)(3): For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the *maximum conducted output power* is the highest total transmit power occurring in any mode.

§ 15.247(b)(4): The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2 Test Procedure

ANSI C63.10: 2009 and KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247). The peak output power was measured using the channel power function of the spectrum analyzer.

3.3 Test Equipment Used:

Description	Manufacturer	Model	Serial Number	Cal Date	Cal Due
EMI Receiver	Rhode & Schwarz	FSEK 30	825084/006	03/20/2012	03/20/2013
Cable	Taxxas	Production Cable	N/A	N/A	N/A

3.4 Results:

Project #	Date	Rule	Distance	Antenna	RBW	VBW	Detector
G100866211	09/10/2011	15.247	N/A	Direct	1MHz	3 MHz	Peak

Conducted-Transmitting

Frequency (MHz)	Recorded Level (dBm)	Cable Loss (dB)	Corrected Level (dBm)	Limit (dBm)	Margin (dB)
2406	2.40	0.20	2.60	30	27.40
2429	2.22	0.20	2.42	30	27.58
2453	2.12	0.20	2.32	30	27.68

Results: Pass

4 Occupied Bandwidth

4.1 Test Limits

§ 15.247(a)(2): Occupied bandwidth measurements were performed on the EUT to determine compliance with FCC 15.247(a)(2) and RSS-210.For digital modulation systems, the minimum 6dB bandwidth shall be at least 500kHz.

4.2 Test Procedure

ANSI C63.10: 2009 and KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247).
The occupied bandwidth was measured with a spectrum analyzer directly connected to the EUT while the EUT was operating in continuous transmit mode at the appropriate center frequency. The analyzer center frequency was set to the EUT carrier frequency. Display line and marker delta functions were used to measure the occupied bandwidth of the EUT. However, the 6 and 20dB bandwidth are referenced to a peak power measurement taken at the entire bandwidth or more for RBW, then using 1% RBW for the 6 and 20dB bandwidth. Measurements were made at three frequencies.

The 20dB bandwidth must be measured and reported for the FCC and for IC.

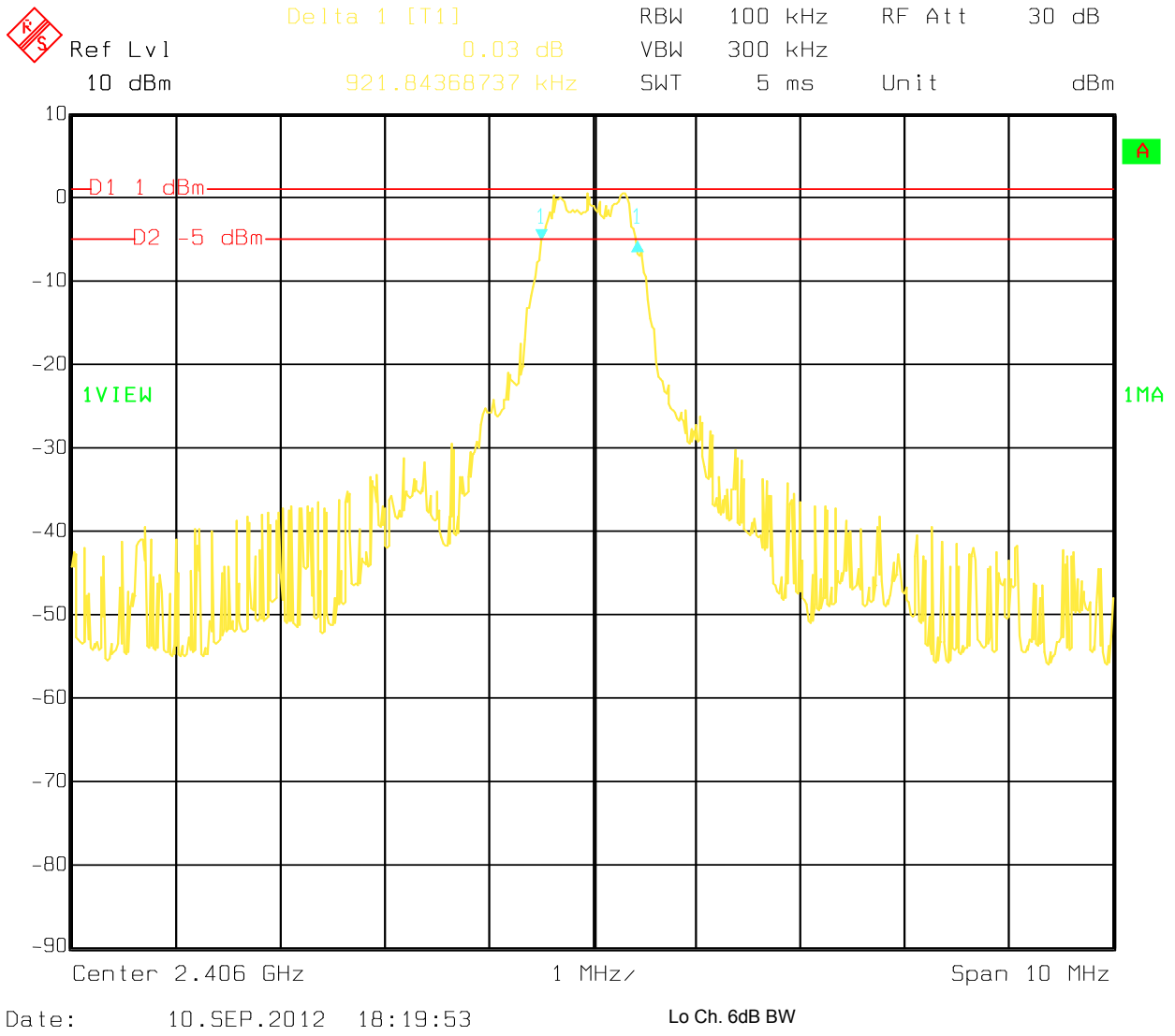
4.3 Test Equipment Used:

Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Receiver	Rhode & Schwarz	FSEK 30	825084/006	03/20/2012	03/20/2013
Cable	Taxxas	Production Cable	N/A	N/A	N/A

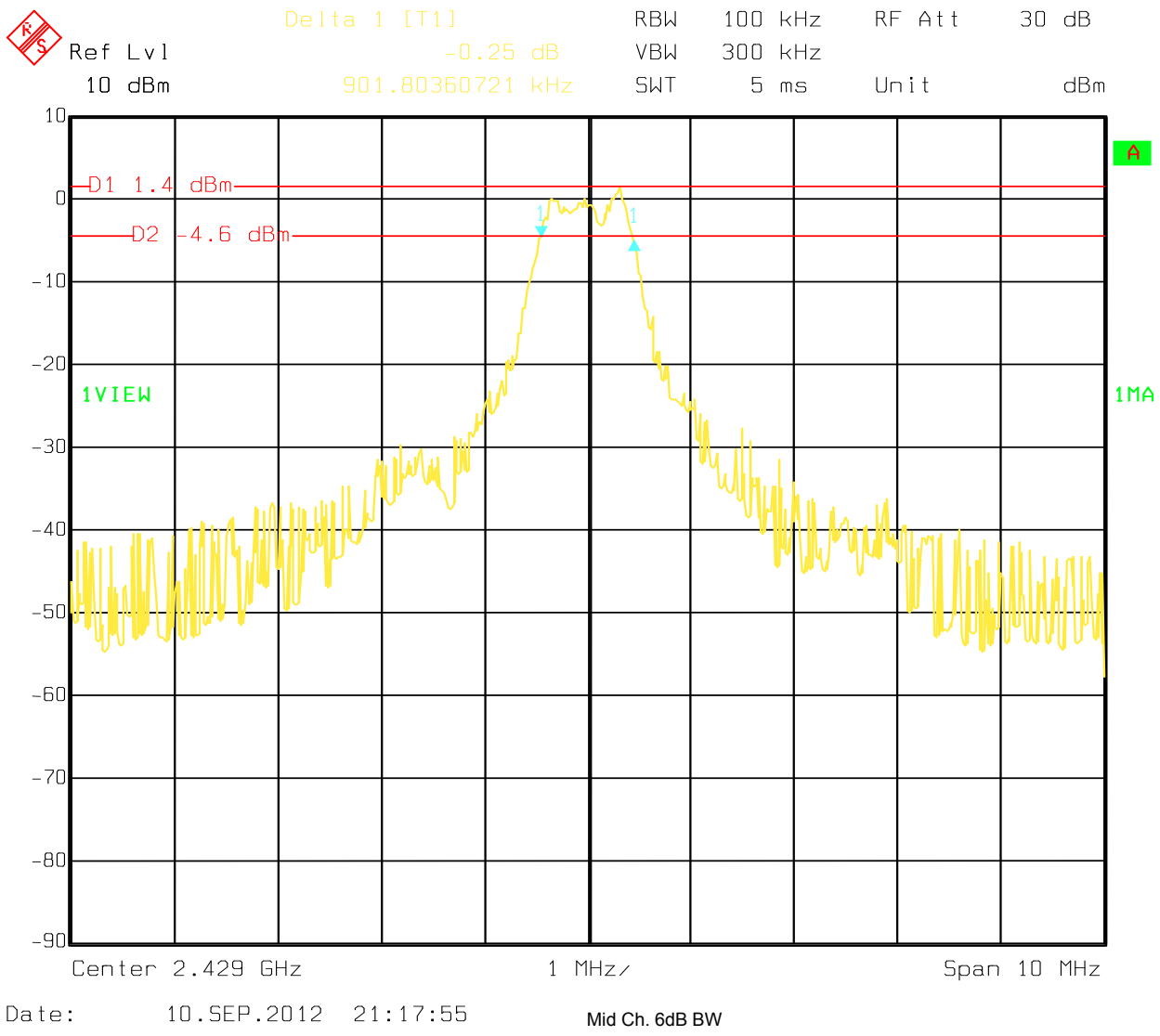
4.4 Results:

Mode	Channel Number	Frequency (MHz)	Bandwidth (KHz)	Result
6 dB BW	High	2453	961.9	Pass
20 dB BW	Low	2406	1302.8	Pass
20 dB BW	Mid	2429	1342.6	Pass
20 dB BW	High	2453	1422.8	Pass

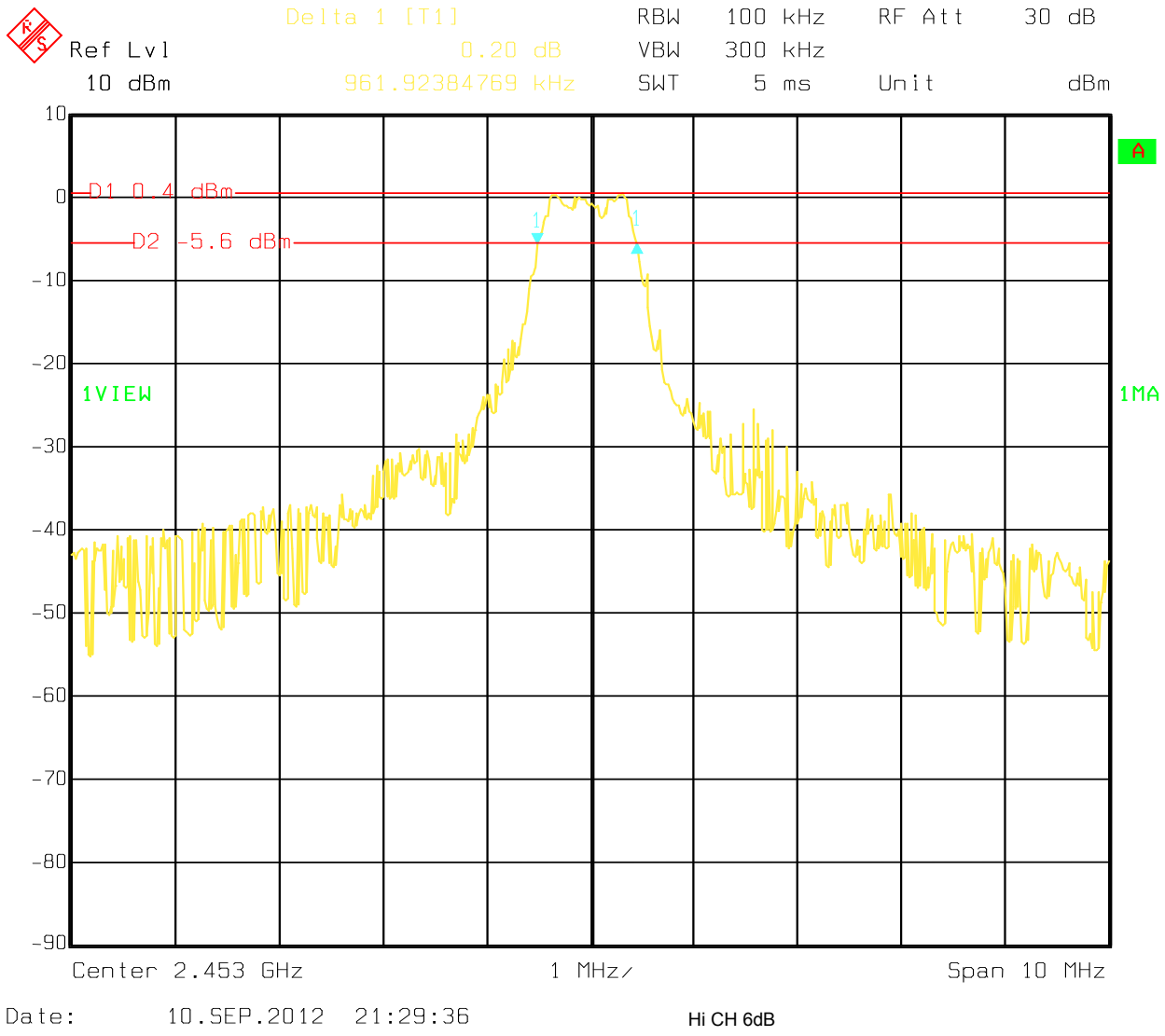
Results: Pass



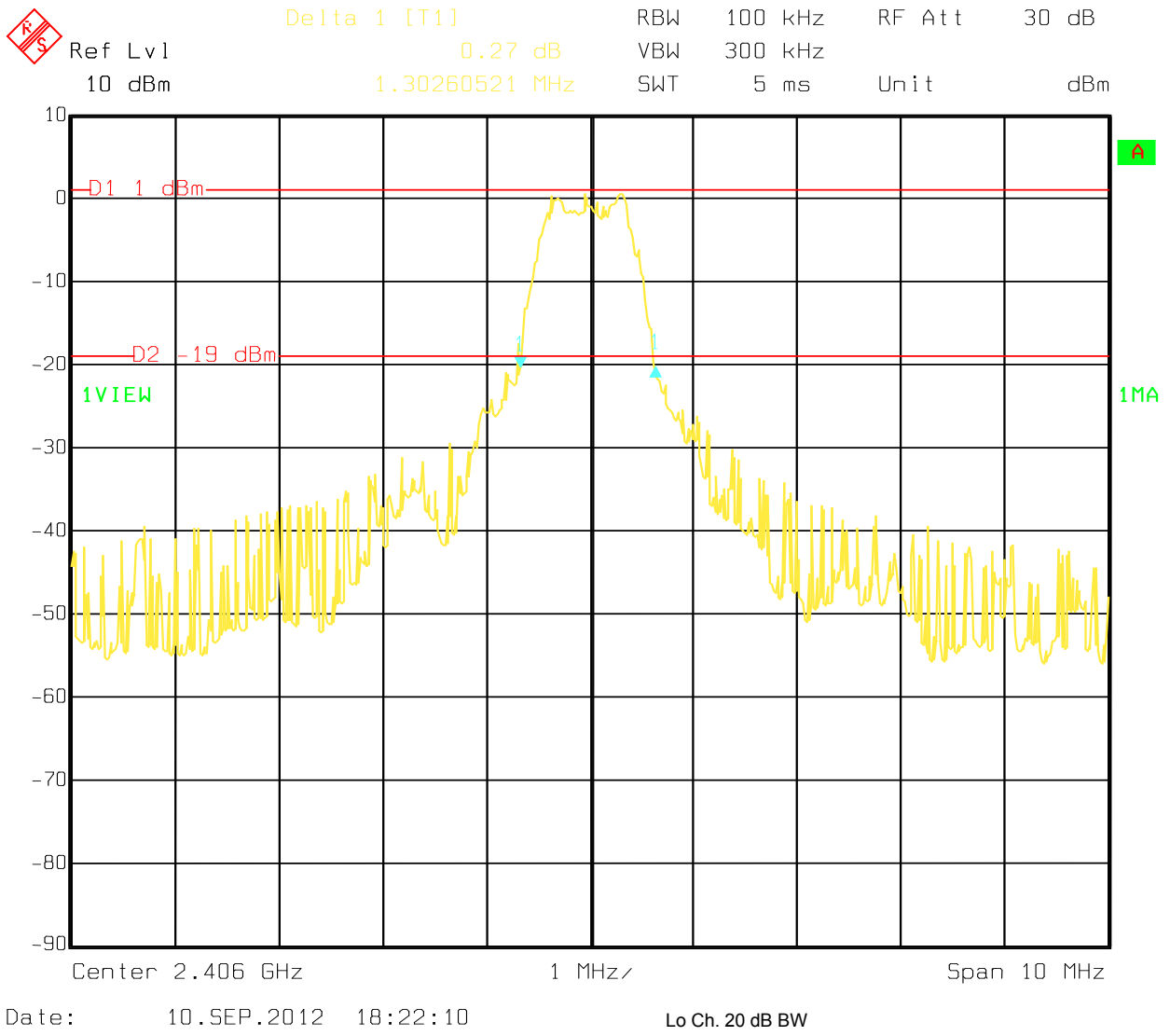
6dB Bandwidth Plot (Low Channel)



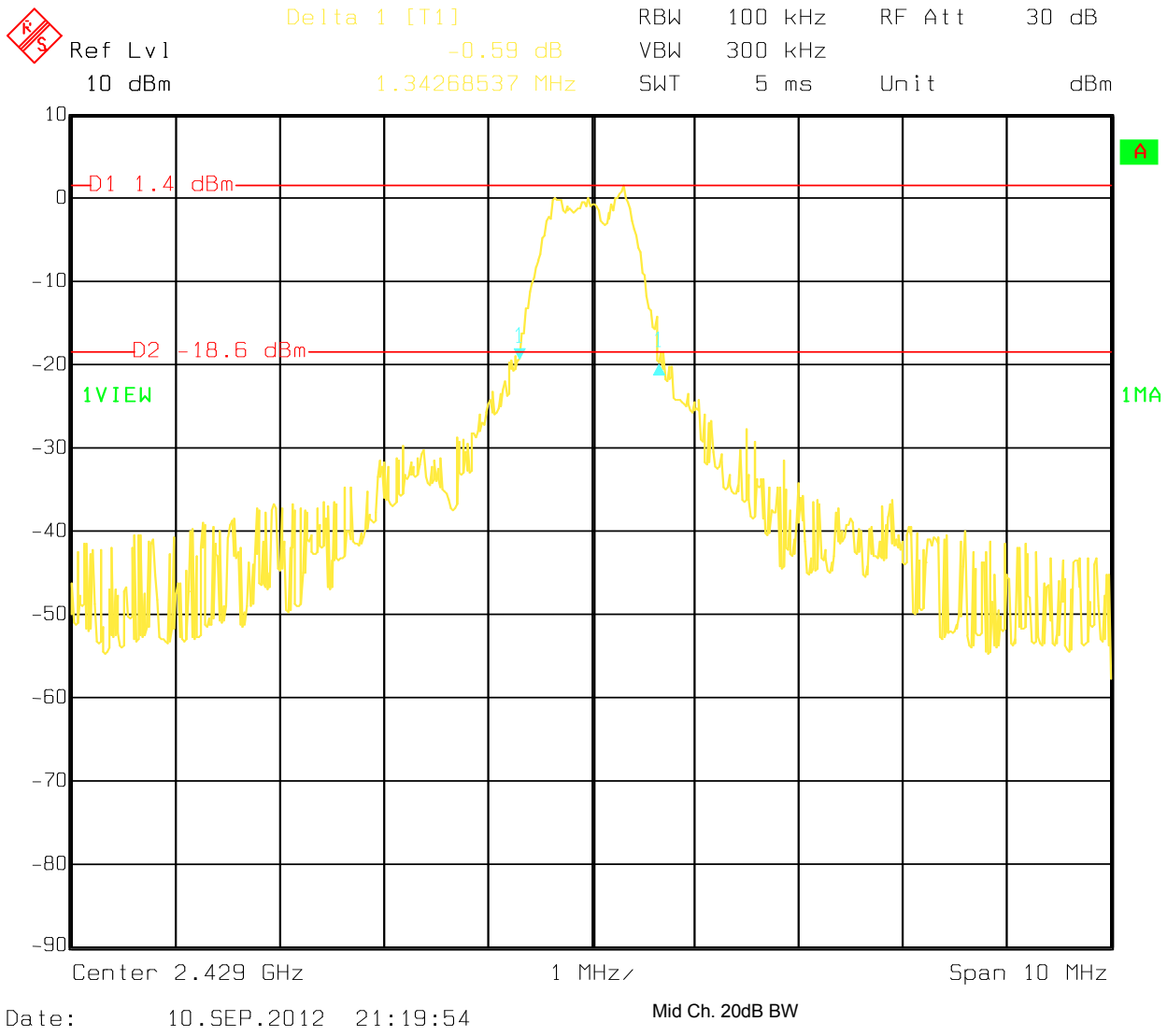
6dB Bandwidth Plot (Mid Channel)



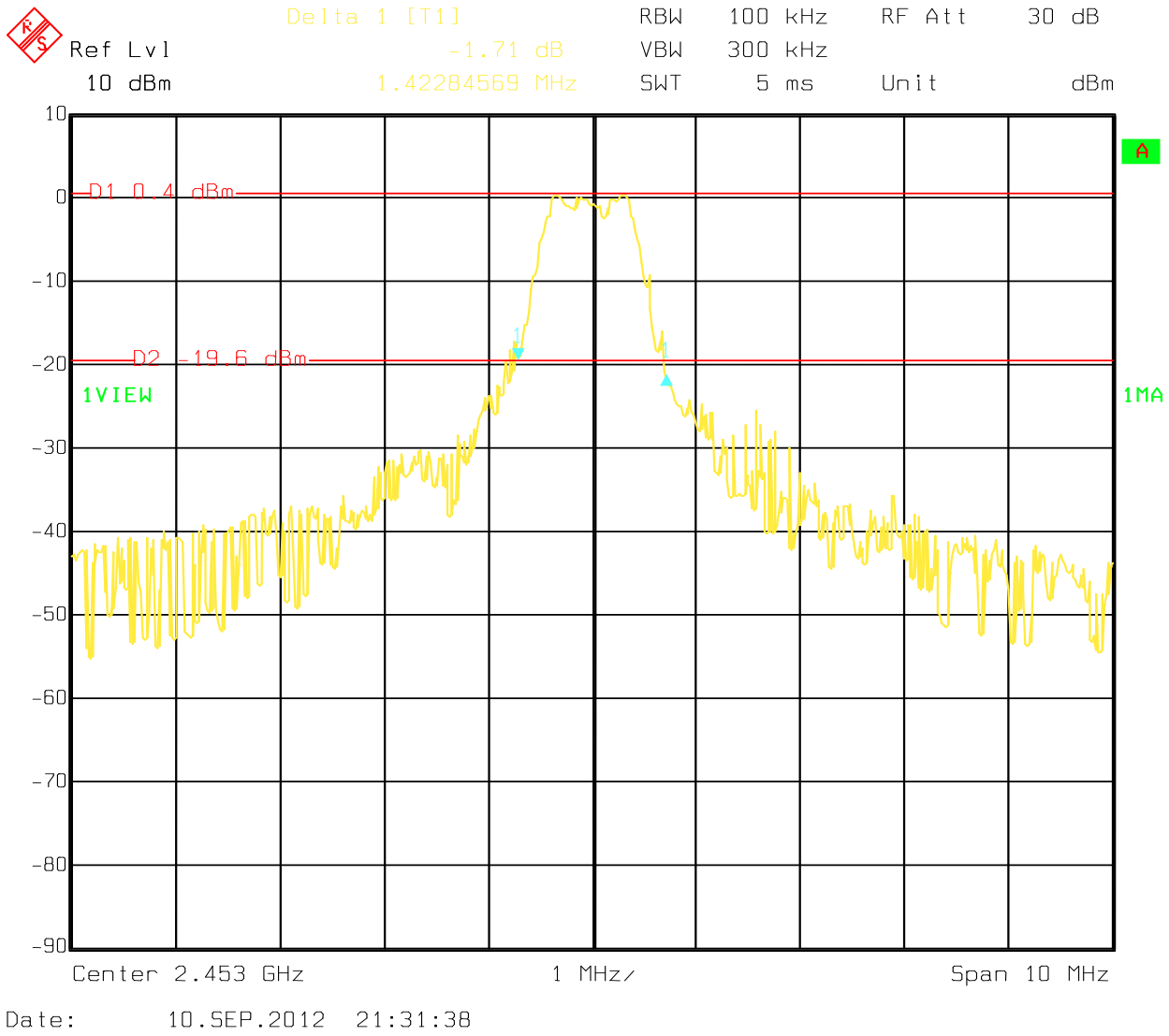
6dB Bandwidth Plot (High Channel)



20dB Bandwidth Plot (Low Channel)



20dB Bandwidth Plot (Mid Channel)



Hi Ch 20dB

20dB Bandwidth Plot (High Channel)

5 Power Spectral Density/Conducted Spurious Emissions

5.1 Test Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.2 Test Procedure Conducted Spurious Emissions

ANSI C63.10: 2009 and KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)
Peak spurious measurements were made in the frequency range of 30 MHz to a minimum of the 10th harmonic range while the EUT was tuned to the lowest and highest channels. The EUT was directly connected to a spectrum analyzer with a calibrated measurement cable.

From 30 MHz to 1000MHz the RBW/VBW of the Spectrum Analyzer was 120KHz/300Khz.
From 1GHz to 26GHz the RBW/VBW of the Spectrum analyzer was 1MHz/3MHz.
.

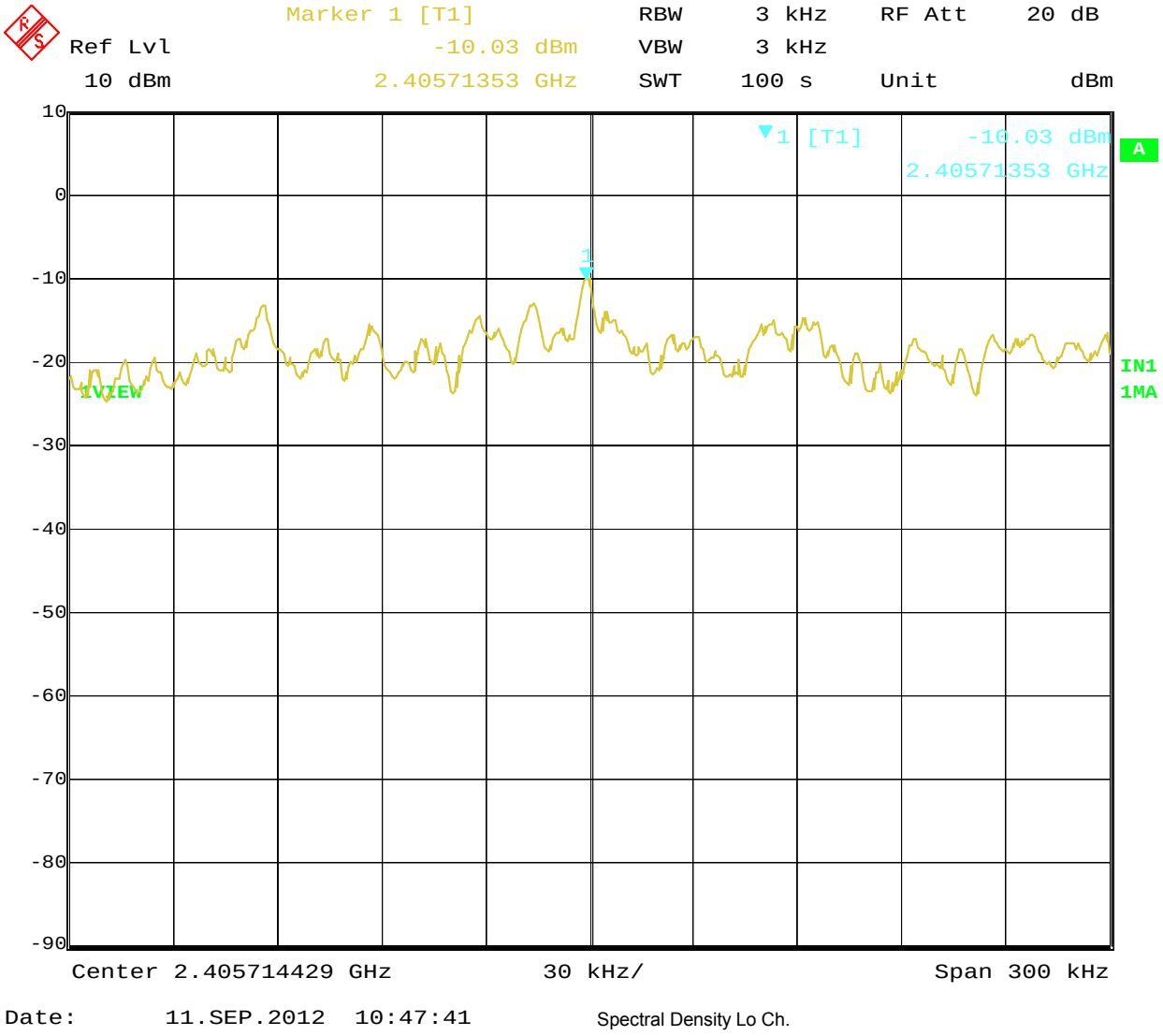
5.3 Test Equipment Used:

Description	Manufacturer	Model	Serial Number	Cal. Date	Cal. Due
EMI Receiver	Rhode & Schwarz	ESI	100044	04/05/2012	04/05/2013
EMI Receiver	Agilent	E7405A	US40240235	05/10/2012	05/10/2013
Conducted Spur TILE profile	Intertek	1130-008	Ver. 10	VBU	VBU

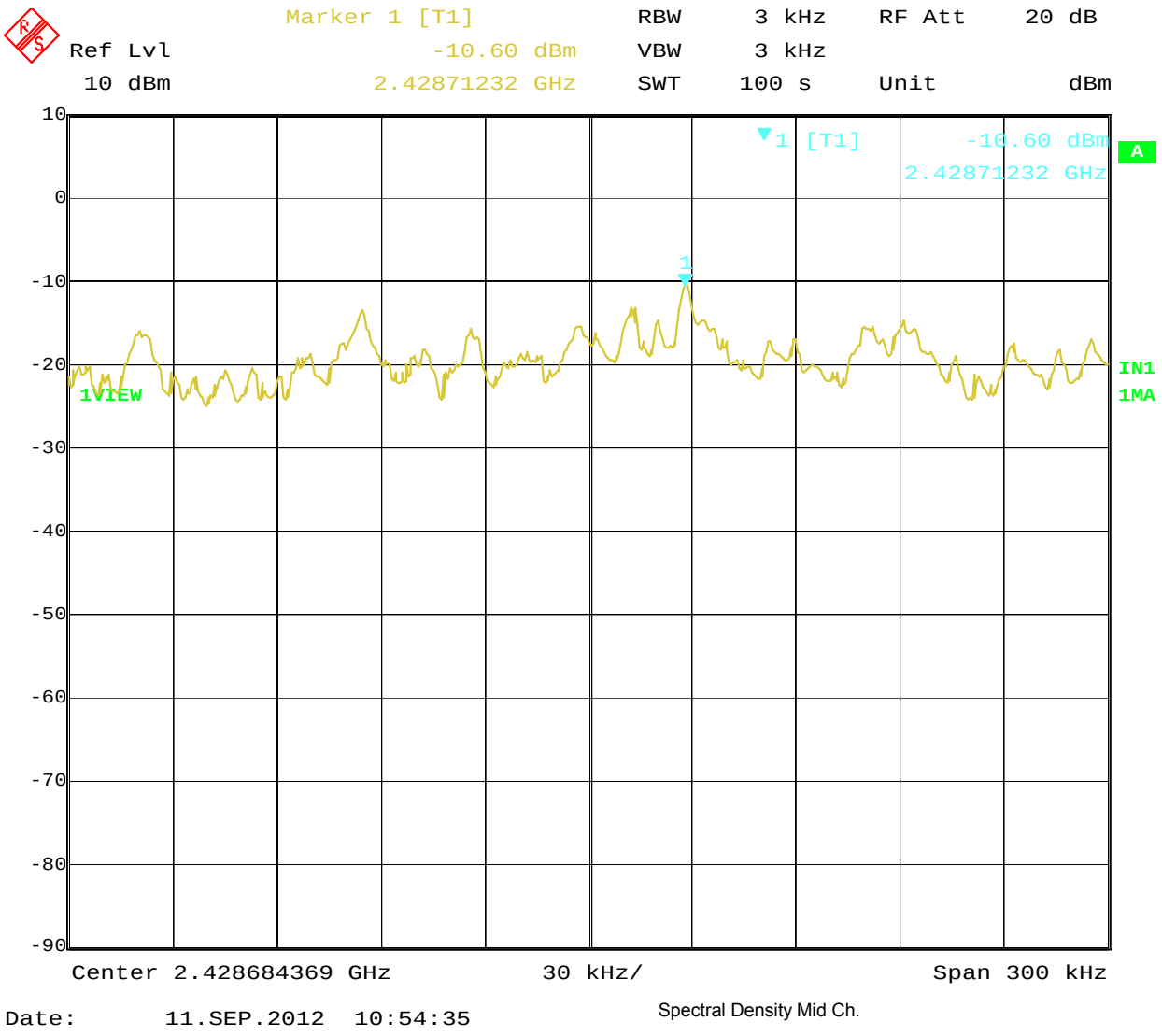
5.4 Results:

The following plots show that there are no conducted spurious emissions exceeding the 20dB down criteria.

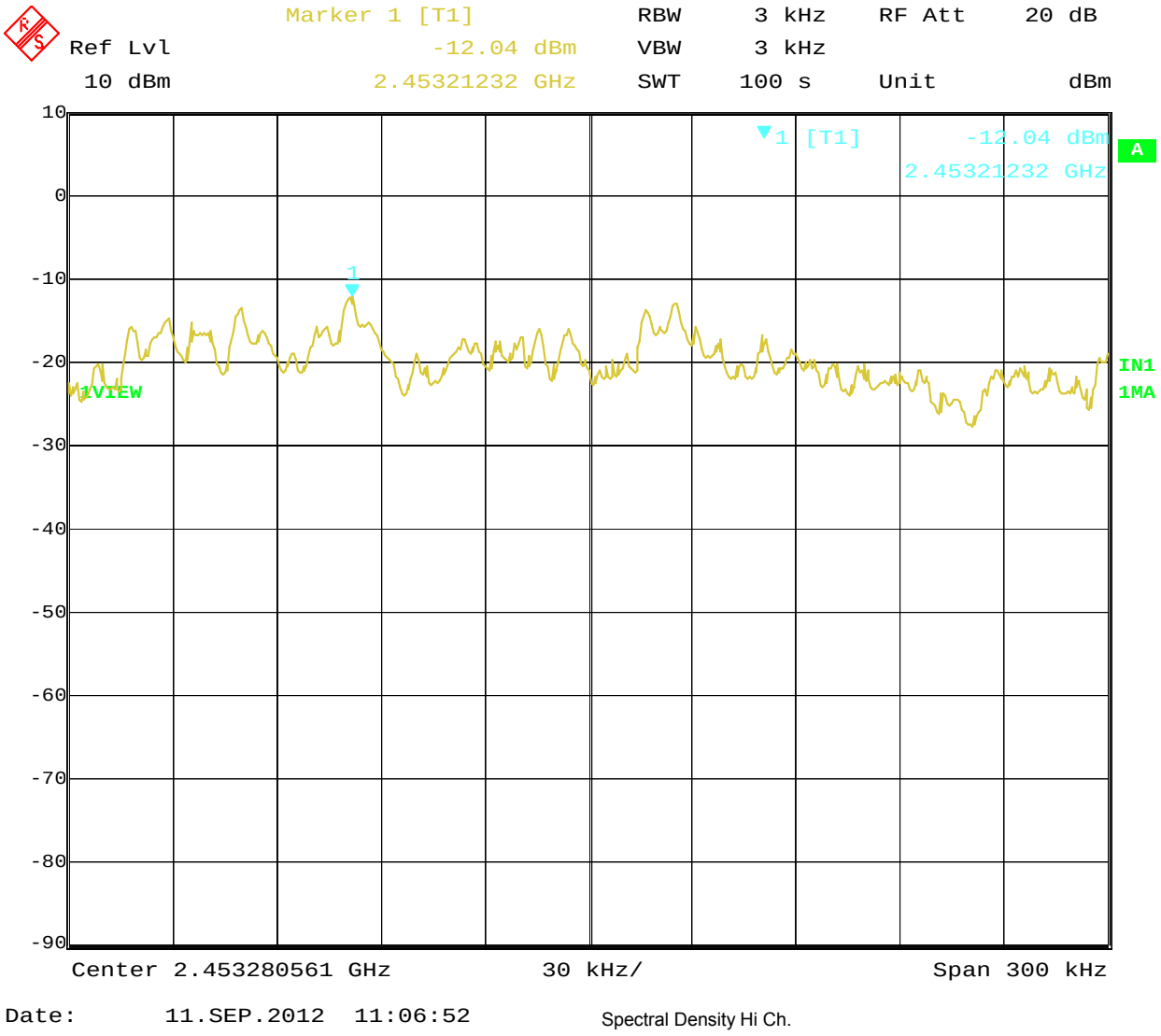
Results: Pass



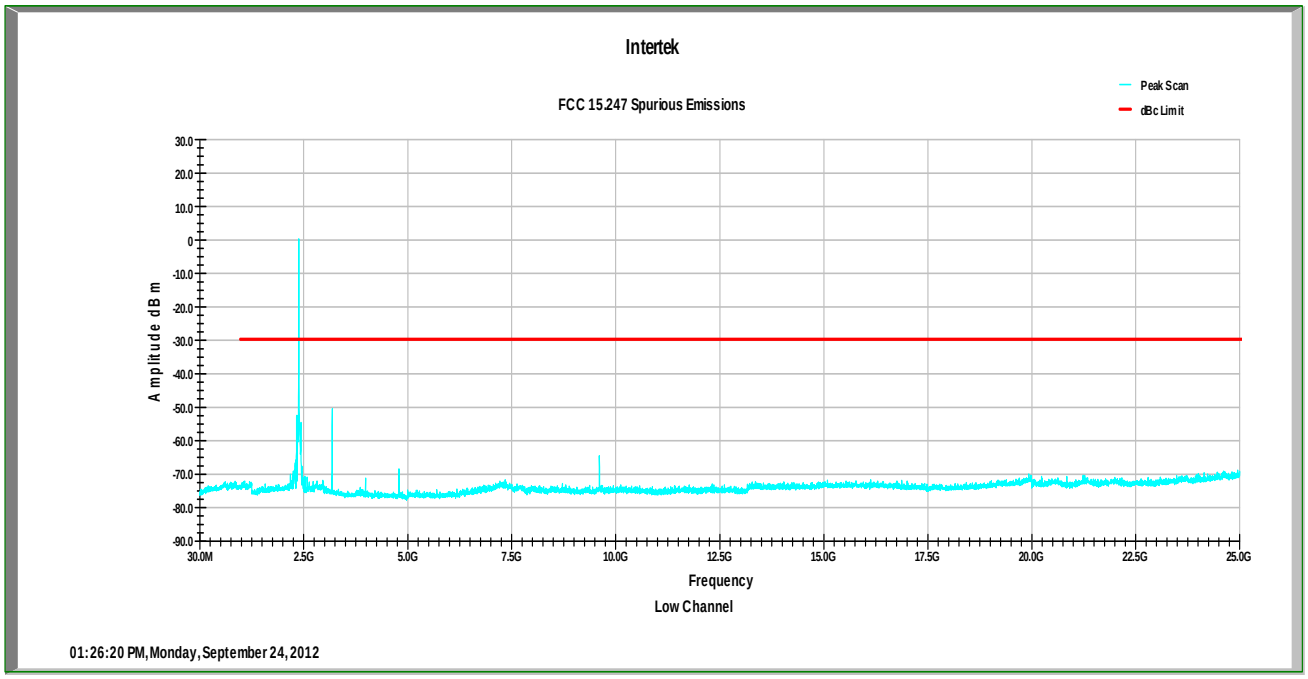
Spectral Density Lo Ch.



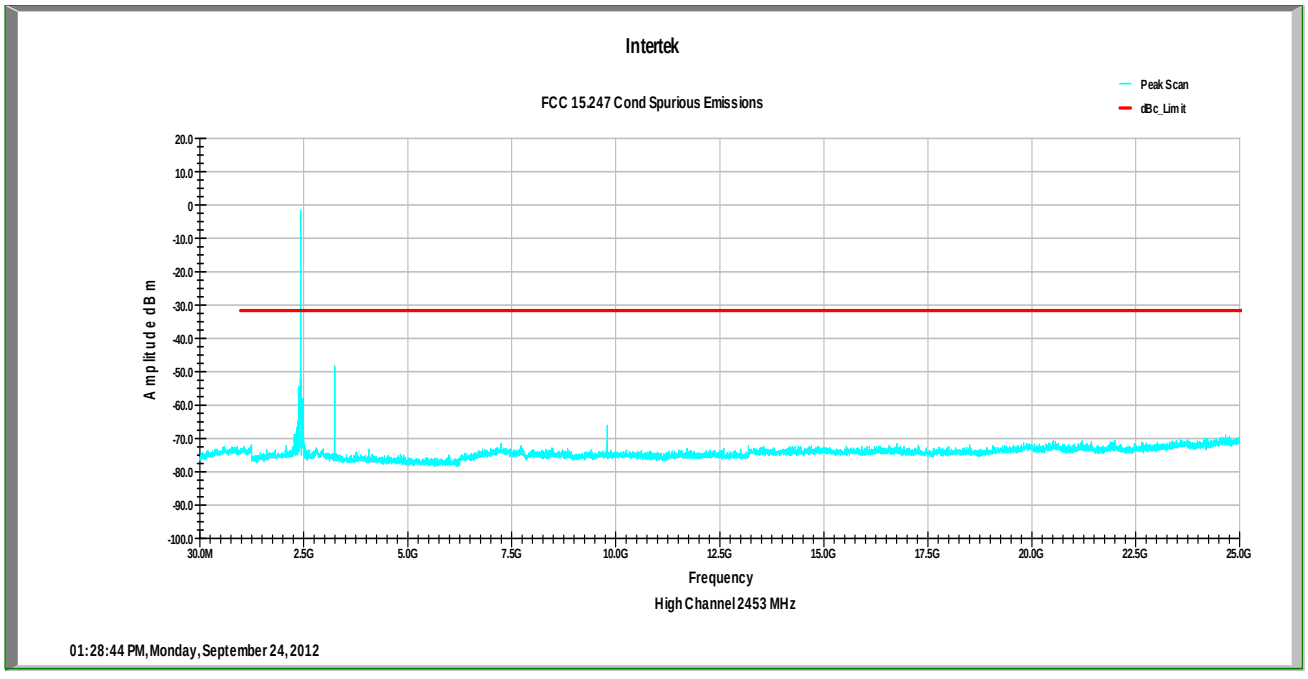
Spectral Density Mid Ch.



Spectral Density High Ch.



Conducted Spurious Emissions Low Channel



Conducted Spurious Emissions High Channel

6 Duty Cycle Determination (FCC 15A - 15.35(c))

6.1 Method:

From 47 CFR Part 15, Subpart A (15.35(c)) and RSS-GEN Section 4.5

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

Determine the period of the pulse train, T, in mSec and record the results. T is defined as the time from the beginning of one pulse train to the beginning of the next pulse train.

Count the number of different types of pulses, N and record the results.

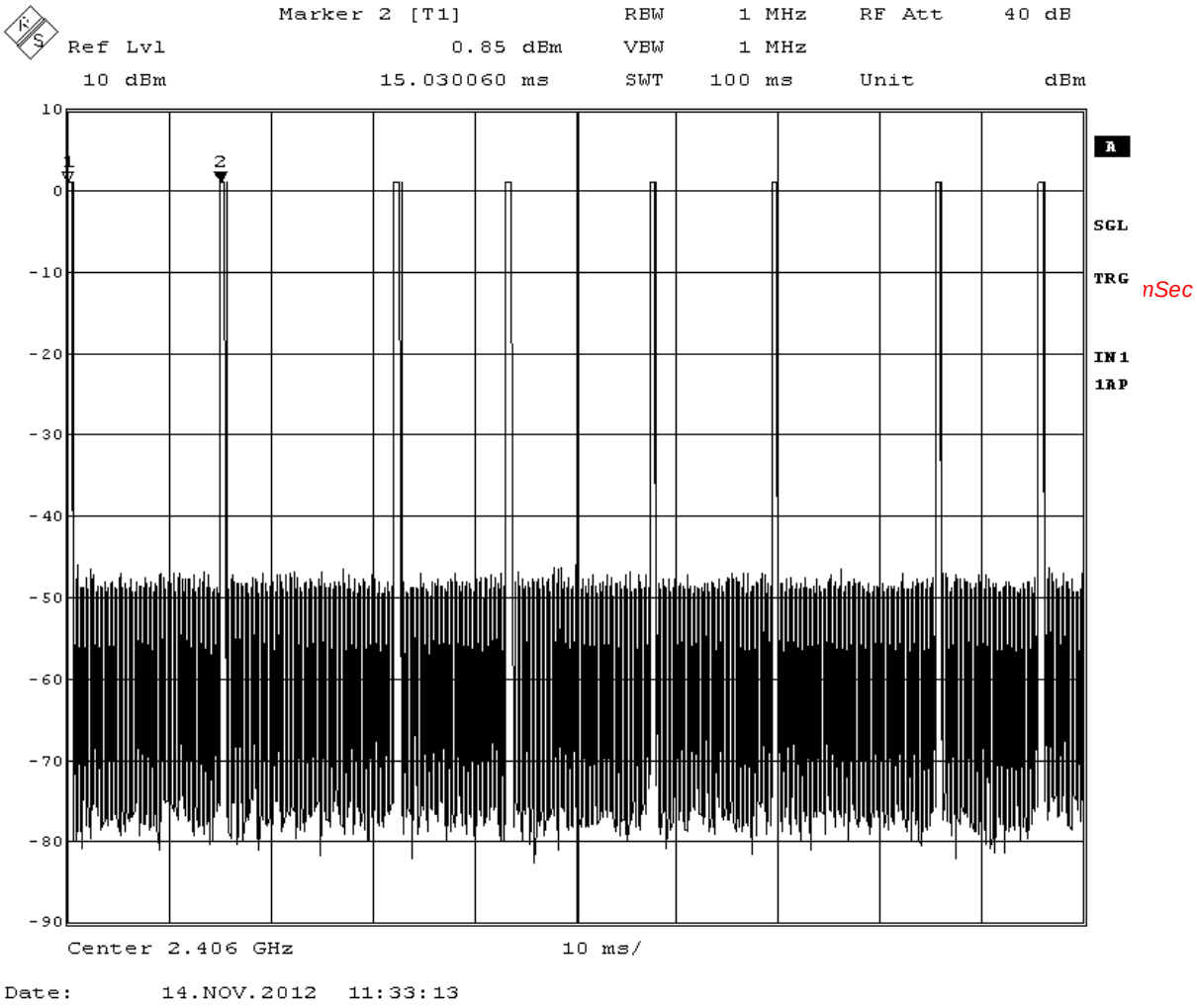
For each of the different types of pulses, count the number of occurrences within one pulse train.

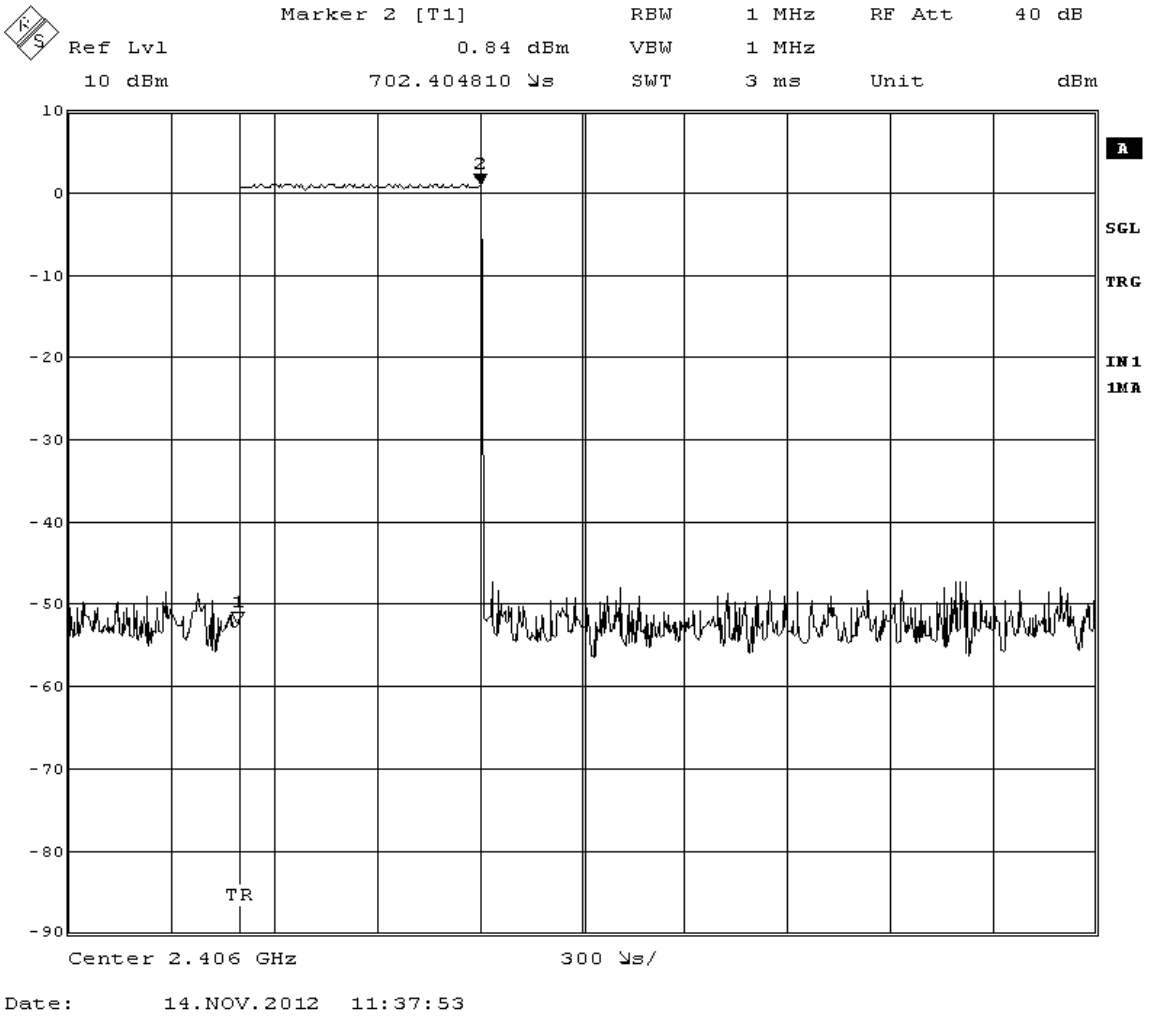
Use the Duty Cycle Correction Factor, DCCF, from the results table and use it to adjust the field strength measurements recorded for radiated emissions.

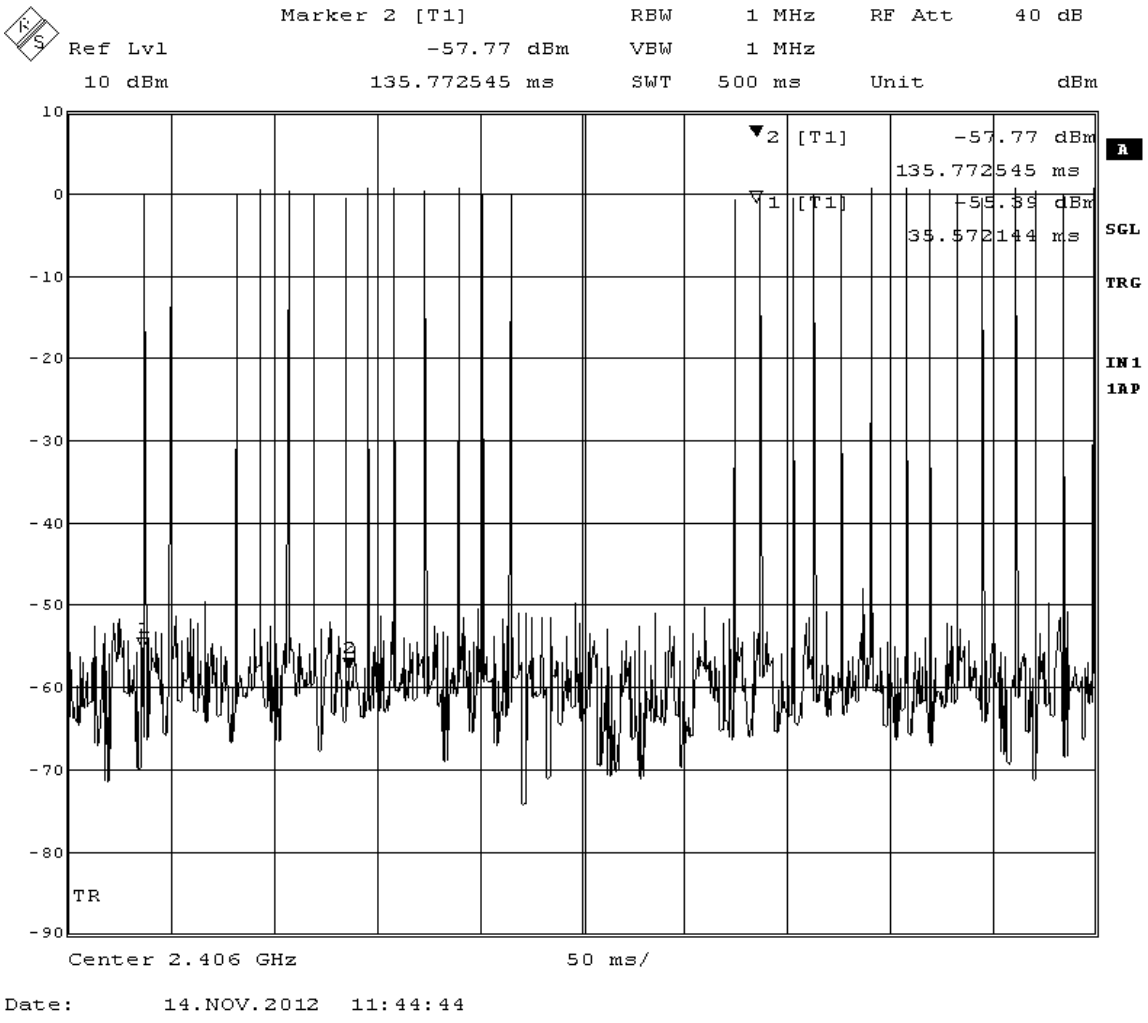
6.2 Test Equipment Used:

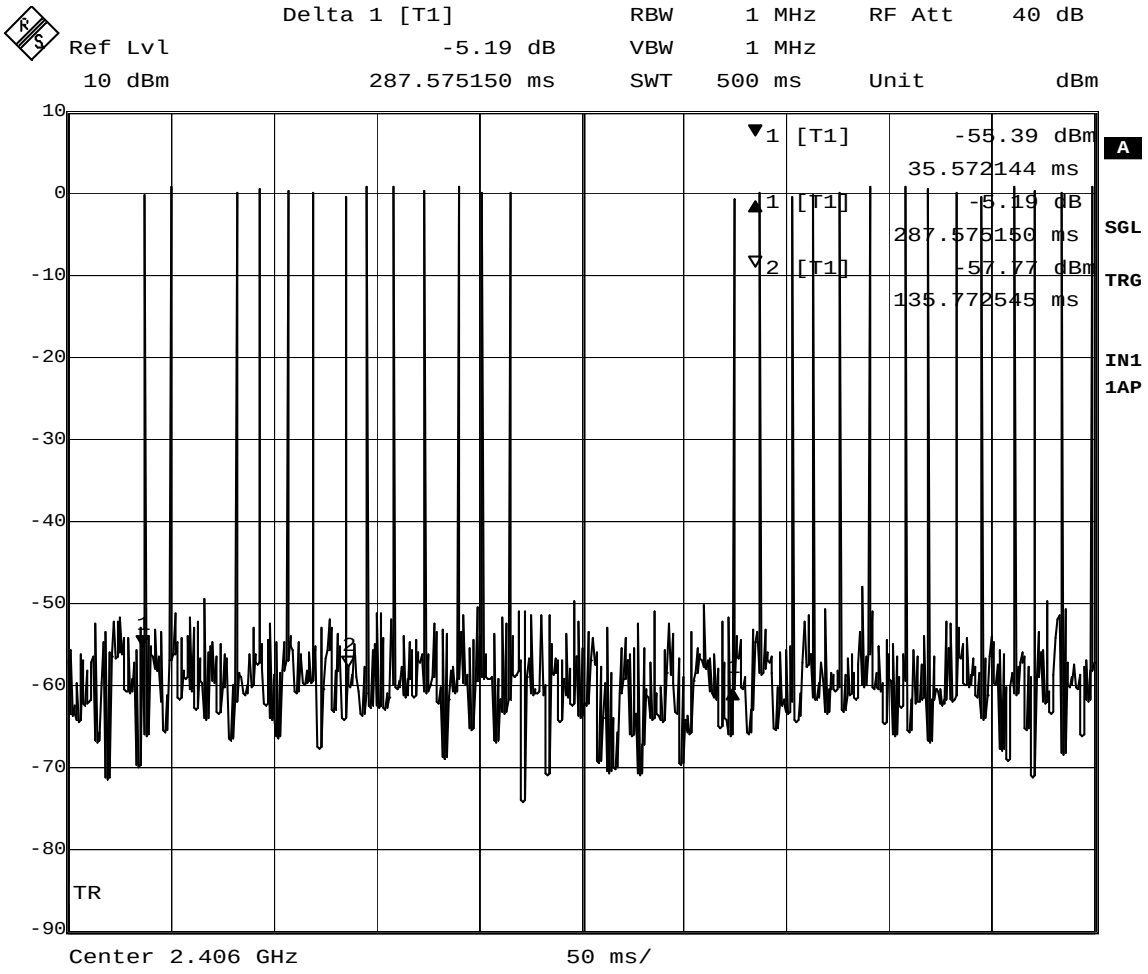
Description	Manufacturer	Model	Serial Number	Cal. Date	Cal. Due
EMI Receiver	Rhode & Schwarz	ESI	100044	04/05/2012	04/05/2013

6.3 Plots:


Marker 2 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
0.85 dBm
VBW 1 MHz
10 dBm
15.030060 ms
SWT 100 ms
Unit dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1
2
R
SGL
TRG
IN1
1AP
nSec
Center 2.406 GHz
10 ms/
Date: 14.NOV.2012 11:33:13


Marker 2 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
0.84 dBm
VBW 1 MHz
10 dBm
702.404810 µs
SWT 3 ms
Unit dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
A
SGL
TRG
IN1
1MA
TR
Center 2.406 GHz
300 µs/
Date: 14.NOV.2012 11:37:53


Marker 2 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-57.77 dBm
VBW 1 MHz
10 dBm
135.772545 ms
SWT 500 ms
Unit dBm
2 [T1]
-57.77 dBm
135.772545 ms
1 [T1]
-55.39 dBm
35.572144 ms
A
SGL
TRG
IN1
1AP
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
TR
Center 2.406 GHz
50 ms/
Date: 14.NOV.2012 11:44:44


Delta 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl -5.19 dB
VBW 1 MHz
10 dBm 287.575150 ms
SWT 500 ms
Unit dBm
1 [T1] -55.39 dBm
35.572144 ms
1 [T1] -5.19 dB
287.575150 ms
2 [T1] -57.77 dBm
135.772545 ms
A
SGL
TRG
IN1
1AP
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
TR
Center 2.406 GHz
50 ms/
Date: 14.NOV.2012 11:51:50

6.5 Data:

Duration of Pulse Train, T (mSec):	102
Averaging Interval, A_I (mSec):	100
Number of different Pulses, N:	1

Note: Count only the pulses within the first 100 mSec

	Number ($\#P_x$)	Pulse Width, mSec (PW_x)	Product ($\#P_x$)*(PW_x)
Pulse Width 1	8	0.702	5.616
Pulse Width 2			
Pulse Width 3			
Pulse Width 4			
Pulse Width 5			
Pulse Width 6			
Pulse Width 7			
Pulse Width 8			
Pulse Width 9			
Pulse Width 10			

Duty Cycle:	0.05616
Duty Cycle Correction Factor, dB:	-25.0

$$T_{on} = (PW_1 * \#P)_1 + (PW_2 * \#P_2) + \cdots + (PW_n * \#P_n)$$

$$DutyCycle = T_{on} \div A_I$$

$$DCCF = 20 * Log_{10}(DutyCycle)$$

7 Radiated Spurious Emissions (Transmitter)

7.1 Test Limits

§ 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Part 15.205(a): Restricted Bands of Operations

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1] 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	2655–2900	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	[2]
13.36–13.41.			

[1] Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.
[2] Above 38.6

Part 15.209(a): Field Strength Limits for Restricted Bands of Operation

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2,400 / F (kHz)	300
0.490 - 1.705	24,000 / F (kHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

7.2 Test Procedure

ANSI C63.10: 2009 and KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.247)

7.3 Example of Field Strength Calculation Method:

The measured field strength was calculated by summing the readings taken from the spectrum analyzer with the appropriate correction factors associated with the antenna losses and cable losses. The calculation formula and sample calculations are listed below:

Formula:
FS = RA + AF + CF

FS = Field Strength in dBμV/m
RA = Receiver Amplitude in dBμV
AF = Antenna Factor in dB
CF = Cable Attenuation Factor in dB (Including preamplifier and filter attenuation)

Example Calculation:

RA = 19.48 dBμV
AF = 18.52 dB
CF = 0.78 dB

FS = 19.48 + 18.52 + 0.78 = 38.78 dBμV/m
Level in μV/m = Common Antilogarithm [(38.78 dBμV/m)/20] = 86.89 μV/m

7.4 Test Equipment Used:

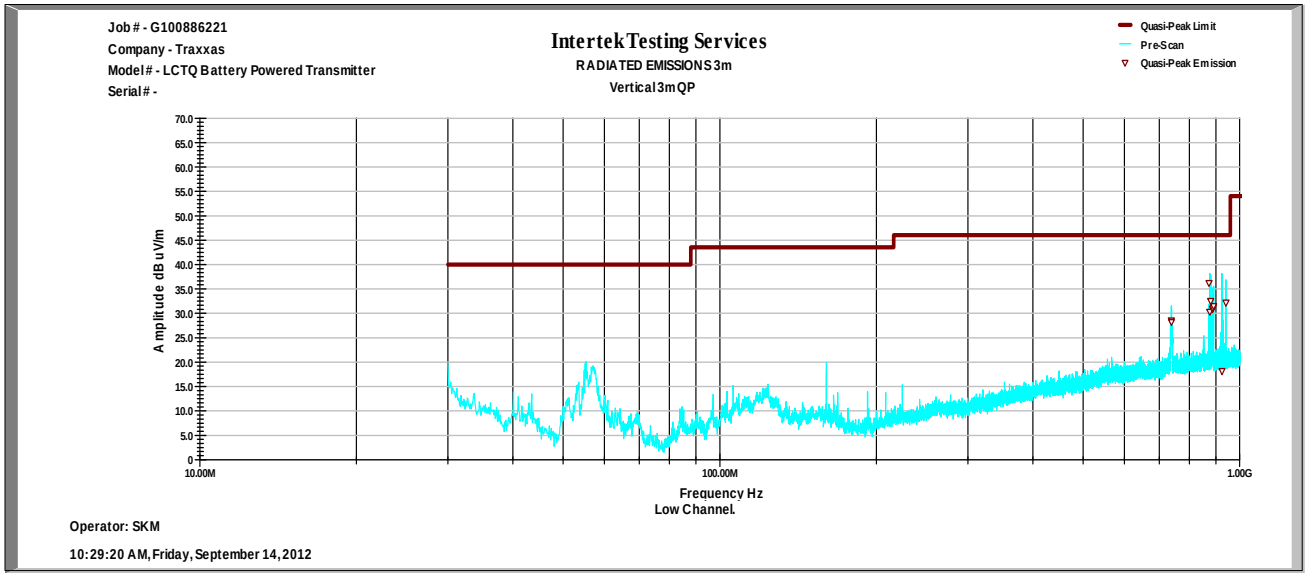
Description	Manufacturer	Model	Serial Number	Cal Date	Cal Due
Temp. Humidity & Pressure Recorder	Omega	OM-CP-PRHTemp2000	N10673	07/20/2012	07/20/2013
EMI Receiver	Rhode & Schwarz	ESI 7	100044	04/05/2012	04/05/2013
Bi-ConiLog Antenna	Chase	CBL6112B	2726	08/28/2012	08/28/2013
10KHz to 1GHz Preamp	Com-Power	PAM-103	441031	06/05/2012	06/05/2013
DC to 18GHz Coaxial RF Cable	MegaPhase	F520NKNK315	11111301001	09/14/2011	09/14/2012
DC to 18GHz Coaxial RF Cable	MegaPhase	F520NKNK315	11111301002	09/14/2011	09/14/2012
EMI Receiver	Agilent	E7405A	US40240235	05/10/2012	05/10/2013
Horn Antenna 700MHz-18GHz	A H Systems	SAS-571	787	04/12/2012	04/12/2013
RF Pre-amplifier 1 to 18GHz	Miteq	AMF-5D-00501800-28-1	1469795	06/05/2012	06/05/2013
Horn Antenna 18GHz to 40Ghz	A H Systems	SAS-574	570	07/17/2012	07/17/2013
RF Pre-amplifier 18 to 26GHz	Miteq	AMF-6F18002650-20-10	1467280	09/28/2011	09/28/2012
Radiated Emissions TILE profile	Intertek	1130-002	Ver 10	VBU	VBU

7.5 Results:

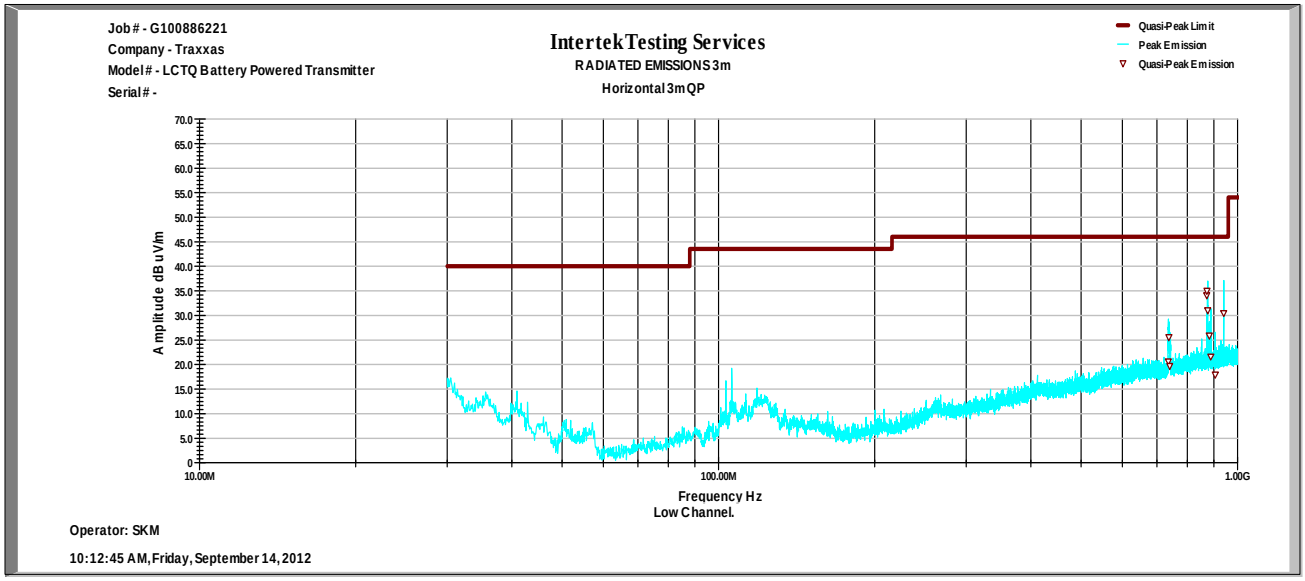
All spurious emissions were attenuated by at least 20dB below the level of the fundamental as required by Part 15.247(d). Additionally, all emissions falling within restricted bands of operation and at the band edges were found to be below the limit specified in Part 15.209(a). The spurious emissions listed in the following tables are the worst case emissions.

Worst Case Spurious Measurements

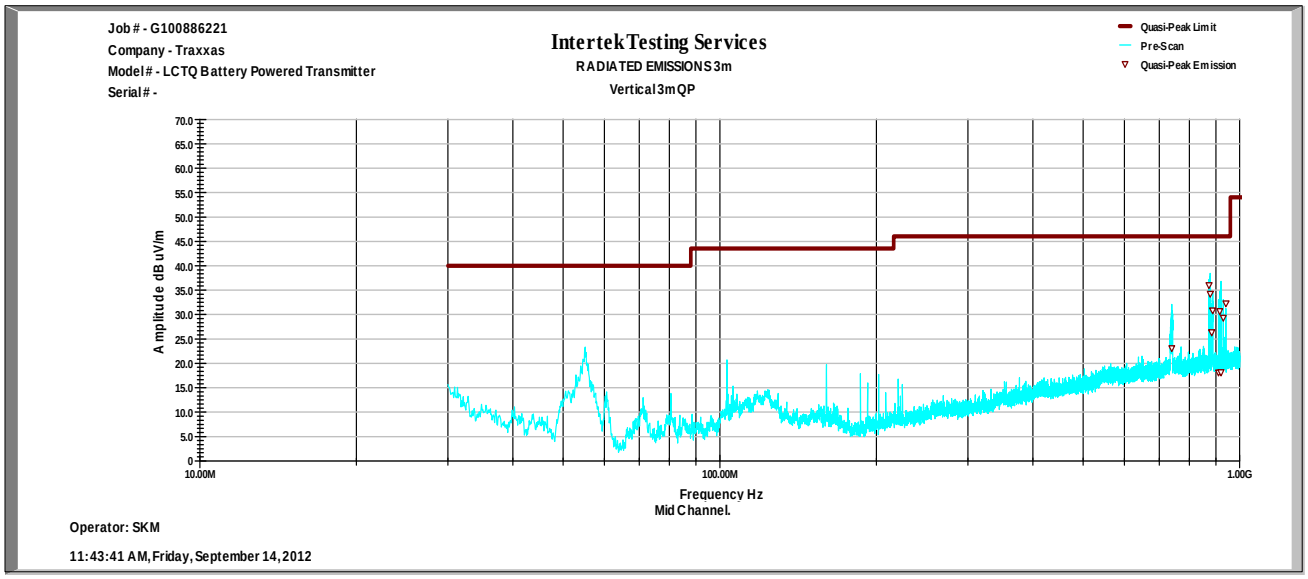
*Emissions were investigated through 3 orthogonal axis to determine the worst case.



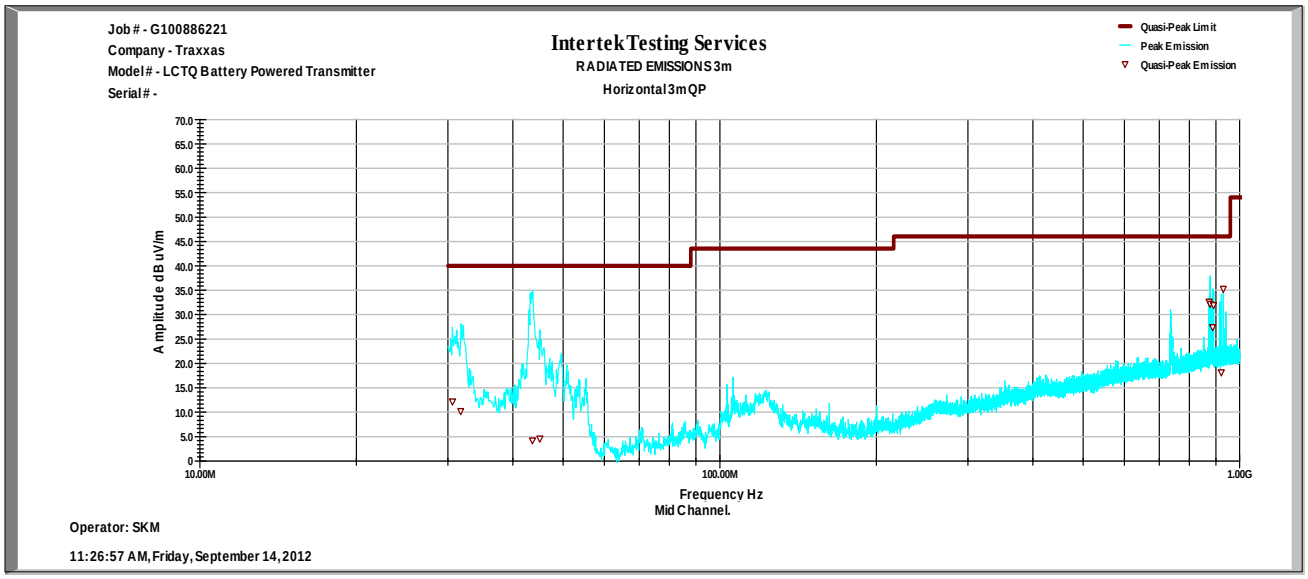
30 to 1000MHz Scan Vertical Antenna Position, Low Ch.



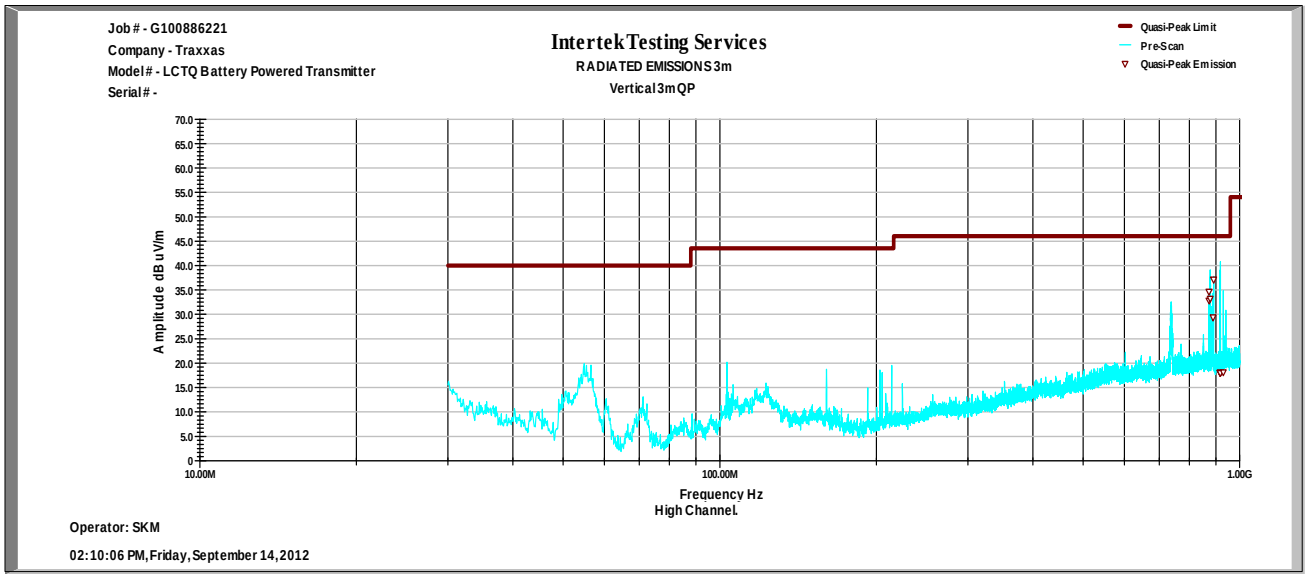
30 to 1000MHz Scan Horizontal Antenna Position, Low Ch.



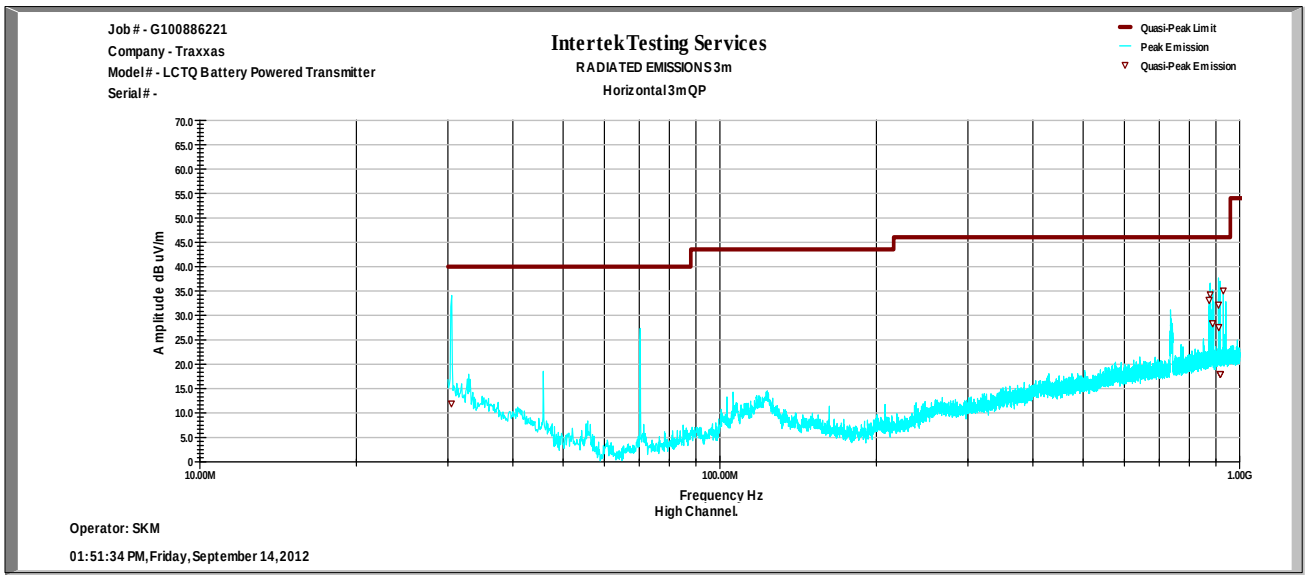
30 to 1000MHz Scan Vertical Antenna Position, Mid Ch.



30 to 1000MHz Scan Horizontal Antenna Position, High Ch.



30 to 1000MHz Scan Vertical Antenna Position, High Ch.



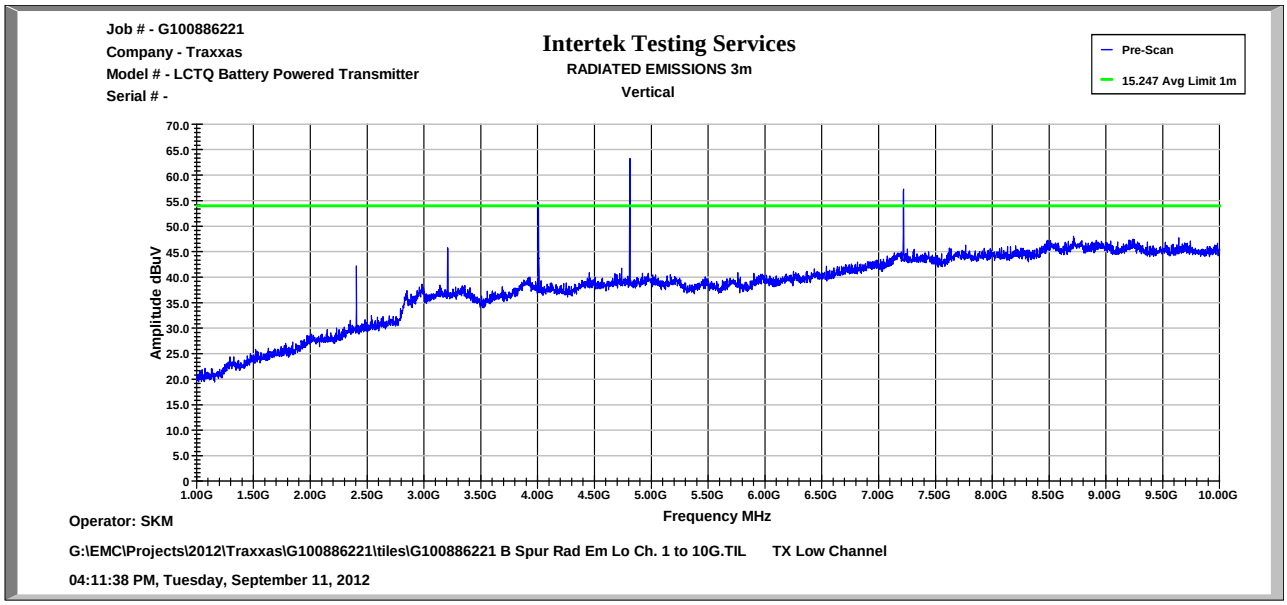
30 to 1000MHz Scan Horizontal Antenna Position, High Ch.

7.6 Data Sheet: 30 to 1000MHz Radiated Scans

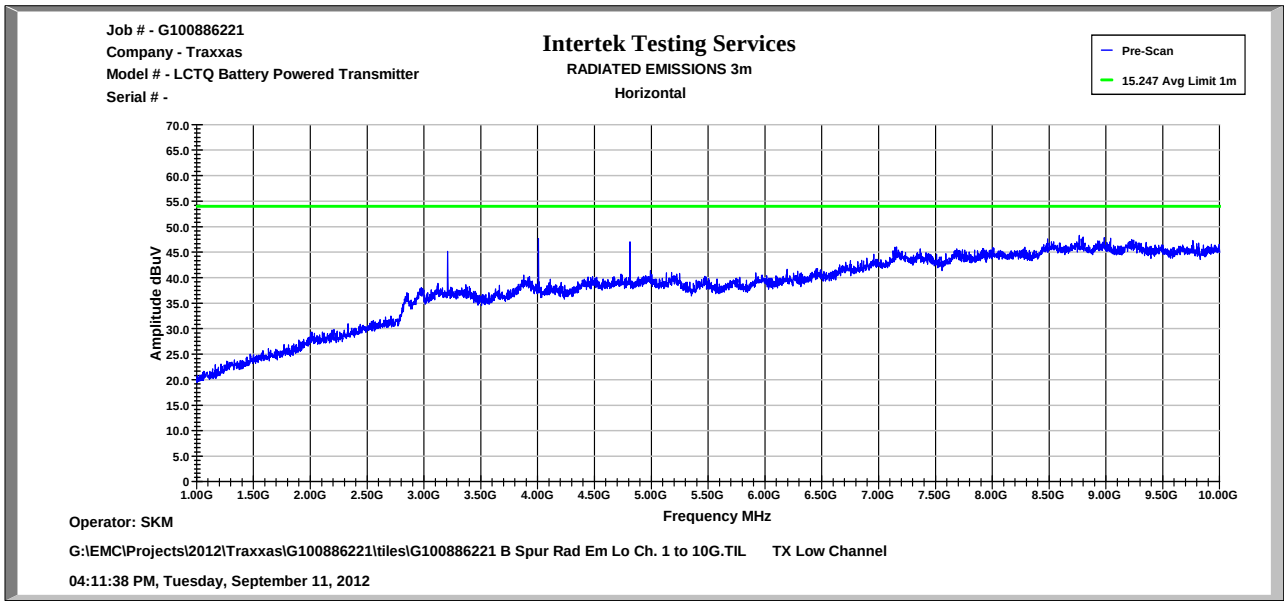
Polarity H/V	Frequency MHz	Height cm	Azimuth	QP Reading (dBuV/m)	Antenna Factor	Preamp Factor	Cable Factor	QP Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Low Channel										
V	738.85	189	140	37.345	20.677	34.405	5.035	28.53	46.021	-17.49
V	739.15	188	79	36.997	20.683	34.403	5.037	28.196	46.021	-17.825
V	872.8	189	91	43.043	20.9	34.039	5.501	36.205	46.021	-9.815
V	875.89	207	36	37.127	20.882	34.028	5.514	30.312	46.021	-15.708
V	879.41	269	193	39.314	20.812	34.021	5.528	32.521	46.021	-13.5
V	886.22	265	303	37.613	20.8	33.998	5.542	30.858	46.021	-15.163
V	888.61	279	171	37.809	20.8	33.993	5.547	31.064	46.021	-14.957
V	890.64	332	327	38.229	20.8	33.989	5.553	31.506	46.021	-14.515
V	940.85	203	305	37.976	21.2	33.827	5.713	32.163	46.021	-13.858
H	872.87	189	56	40.916	21.7	34.039	5.501	34.079	46.021	-11.941
H	873.46	118	10	41.81	21.7	34.036	5.504	34.977	46.021	-11.043
H	876.53	215	37	37.826	21.7	34.027	5.516	31.015	46.021	-15.006
H	940.85	338	174	36.296	22.3	33.827	5.713	30.483	46.021	-15.538
Mid Channel										
V	872.8	270	264	42.838	20.9	34.039	5.501	36.001	46.021	-10.02
V	877.65	160	99	41.028	20.847	34.025	5.521	34.224	46.021	-11.796
V	883.18	261	284	33.112	20.8	34.007	5.536	26.342	46.021	-19.679
V	887.22	251	65	37.572	20.8	33.996	5.544	30.821	46.021	-15.199
V	872.8	270	264	42.838	20.9	34.039	5.501	36.001	46.021	-10.02
V	915.25	206	167	36.958	21.005	33.919	5.63	30.669	46.021	-15.351
V	929.74	219	211	35.536	21.105	33.871	5.679	29.344	46.021	-16.677
V	940.85	166	144	38.086	21.2	33.827	5.713	32.273	46.021	-13.747
H	872.84	330	11	39.464	21.7	34.039	5.501	32.627	46.021	-13.394
H	877.31	139	308	39	21.7	34.025	5.519	32.193	46.021	-13.827
H	887.03	339	167	34.154	21.7	33.996	5.544	27.402	46.021	-18.619
H	890.68	149	235	38.673	21.714	33.989	5.553	31.95	46.021	-14.07
H	929.66	148	10	41.465	22	33.871	5.679	35.272	46.021	-10.749
High Channel										
V	872.85	267	46	41.481	20.9	34.039	5.501	34.644	46.021	-11.377
V	873.42	271	35	39.636	20.9	34.036	5.504	32.803	46.021	-13.218
V	877.52	151	106	40.011	20.85	34.025	5.52	33.206	46.021	-12.815
V	888.55	230	87	36.103	20.8	33.993	5.547	29.357	46.021	-16.664
V	890.61	152	34	43.836	20.8	33.989	5.552	37.111	46.021	-8.909
H	873.35	322	216	39.999	21.7	34.037	5.503	33.166	46.021	-12.855
H	877.42	233	10	41.135	21.7	34.025	5.52	34.329	46.021	-11.691
H	887.19	178	171	35.146	21.7	33.996	5.544	28.394	46.021	-17.626
H	910.21	291	121	38.513	22	33.93	5.611	32.195	46.021	-13.826
H	910.97	265	12	33.887	22	33.928	5.614	27.573	46.021	-18.448
H	929.66	284	222	41.265	22	33.871	5.679	35.073	46.021	-10.948

Results: Pass

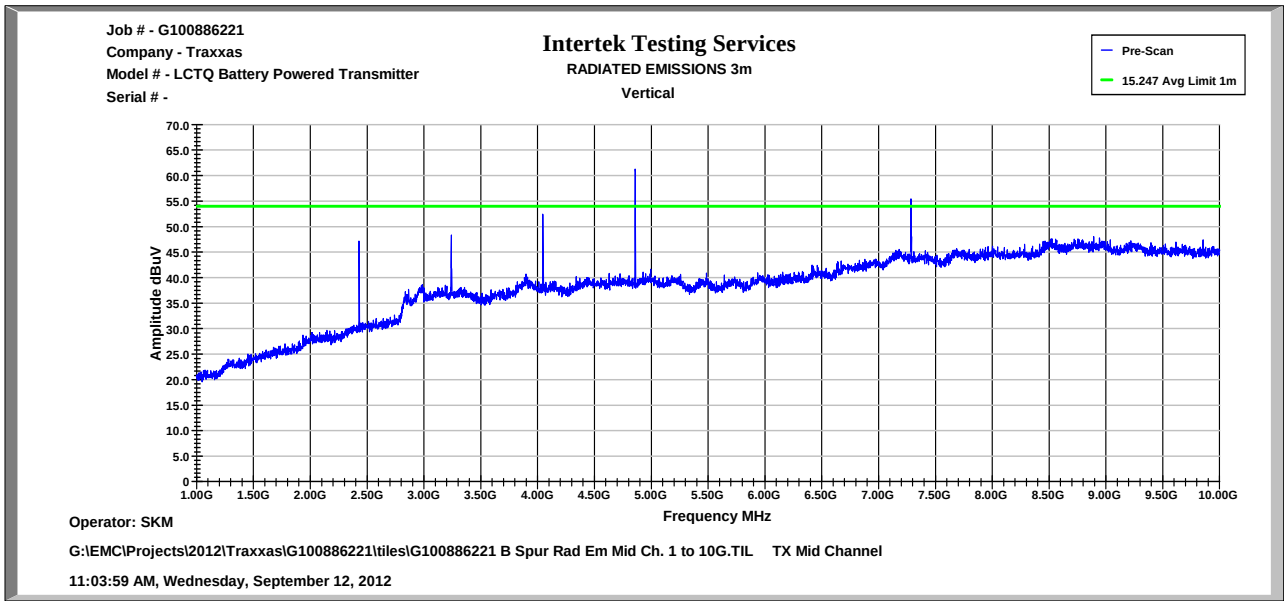
Note: Above 1 GHz testing was completed at 3 transmit frequencies to determine compliance.



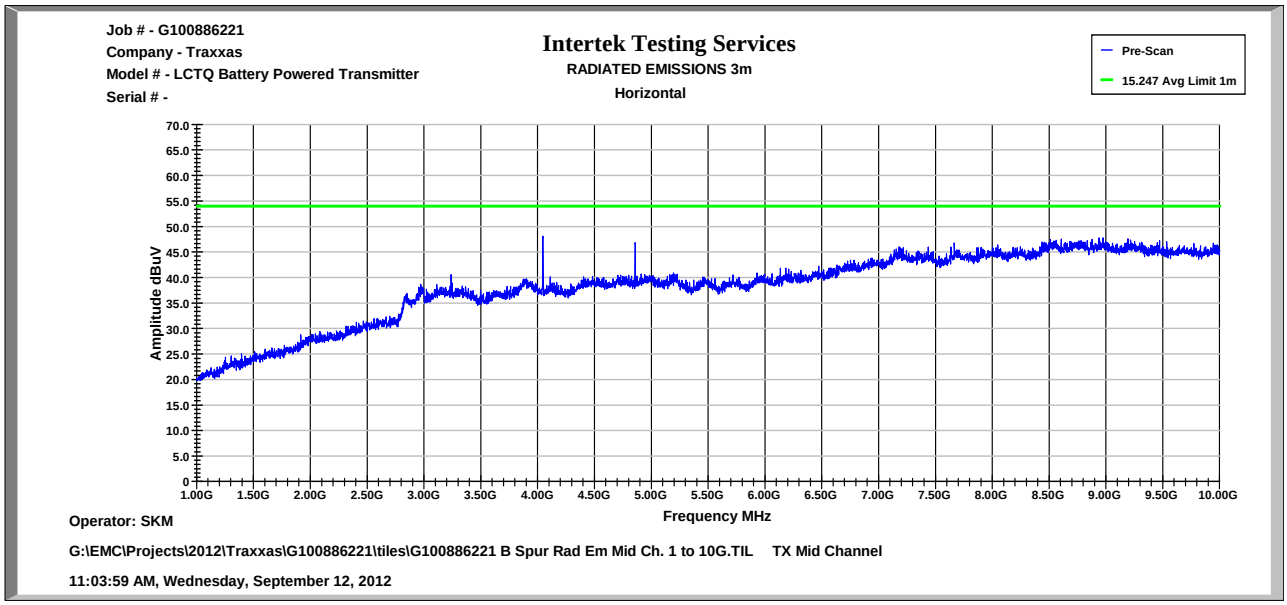
Low Channel, 1 to 10GHz Vertical Antenna Scan Plot



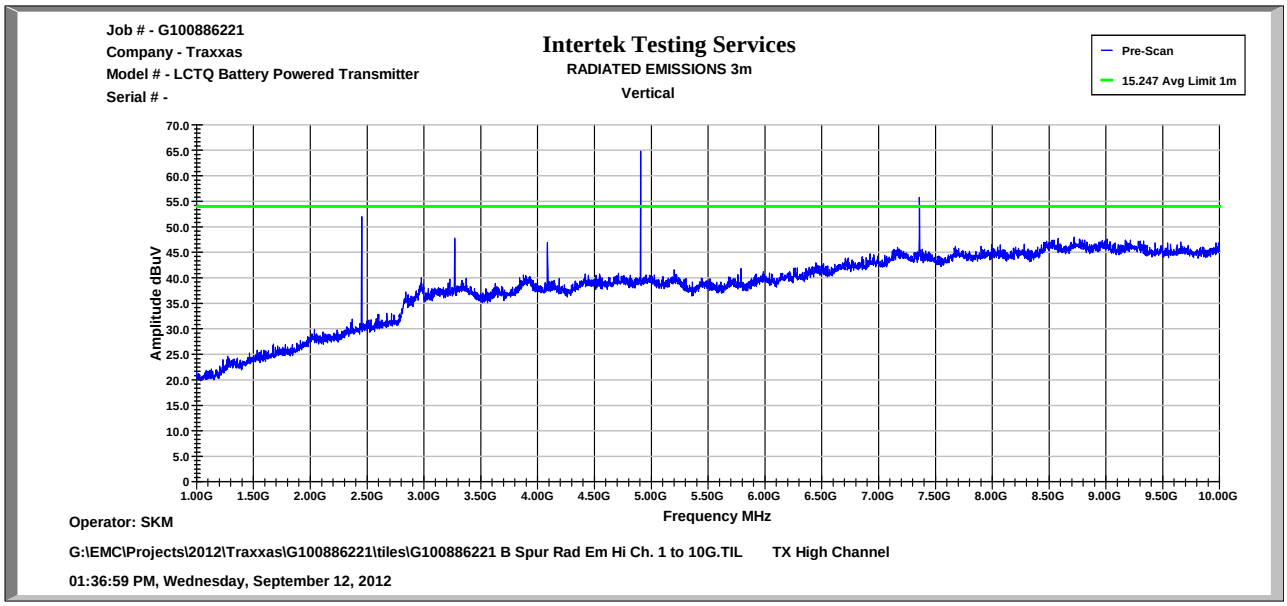
Low Channel, 1 to 10GHz Horizontal Antenna Scan Plot



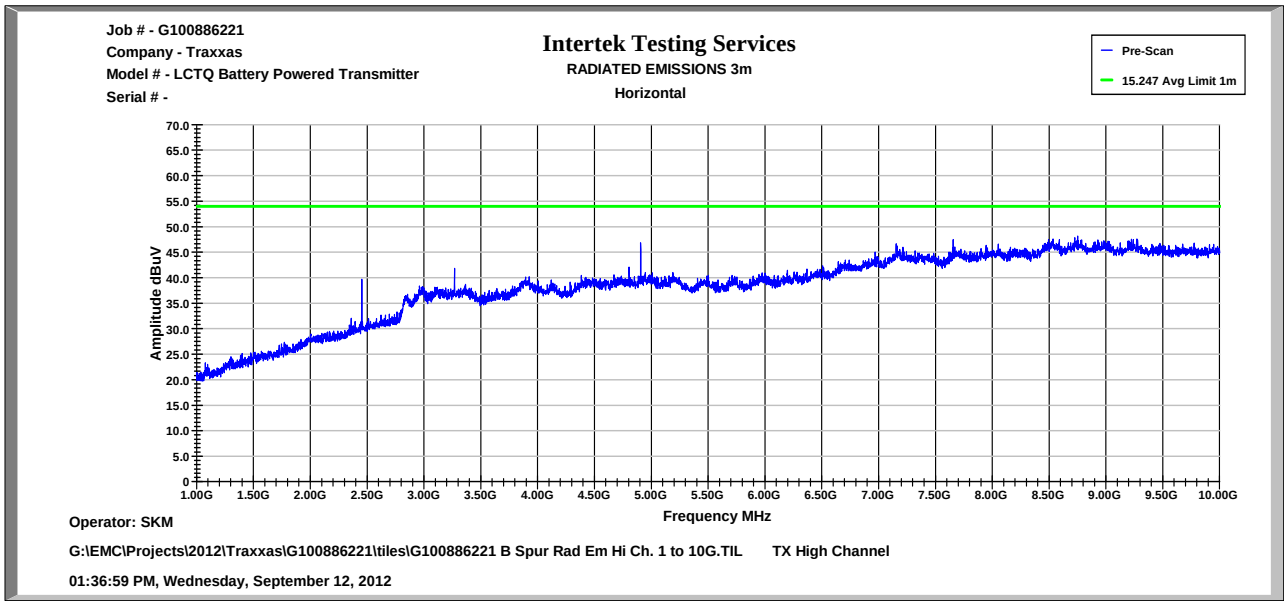
Mid Channel, 1 to 10GHz Vertical Antenna Scan Plot



Mid Channel, 1 to 10GHz Horizontal Antenna Scan Plot



High Channel, 1 to 10GHz Vertical Antenna Scan Plot



High Channel, 1 to 10GHz Horizontal Antenna Scan Plot

7.7 Data Sheet: 1 to 10GHz Radiated/Restricted Band Scans

Client: Traxxas
Model Number: LCTQ Battery Powered Transmitter
Project Number: G100886221
Tested By: SKM
Date: 11-14-12
Frequency Range (GHz): 1 to 10
Input power: Battery

Receiver: E7504E
Antenna: AH-271
Cables: AID 805
Preamp: AID 25596

Test Distance (m): 3
Limit: FCC Part 15.209
Modifications for compliance (y/n): N

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Net dB(uV/m)**	**Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
Low Channel									
V	4812.000	65.1	33.1	4.8	39.1	64.0	74.0	-10.0	Pk 1M/3M
V	4812.000	40.1	33.1	4.8	39.1	39.0	54.0	-15.0	Avg 1M/3M
V	7217.000	60.3	37.3	6.3	38.3	65.7	74.0	-8.3	Pk 1M/3M
V	7217.000	35.3	37.3	6.3	38.3	40.7	54.0	-13.3	Avg 1M/3M
Mid Channel									
V	4046.000	55.4	32.5	4.8	39.3	53.4	54.0	-0.5	Pk 1M/3M
V	4046.000	31.5	32.5	4.8	39.3	29.5	54.0	-24.4	Avg 1M/3M
V	4857.000	69.0	33.1	4.8	39.1	67.9	74.0	-6.1	Pk 1M/3M
V	4857.000	44.0	33.1	4.8	39.1	42.9	54.0	-11.1	Avg 1M/3M
V	7286.000	58.7	37.3	6.3	38.2	64.1	74.0	-9.9	Pk 1M/3M
V	7286.000	33.7	37.3	6.3	38.2	39.1	54.0	-14.9	Avg 1M/3M
High Channel									
V	4905.400	68.4	33.4	4.8	39.1	67.6	74.0	-6.4	Pk 1M/3M
V	4905.400	43.4	33.4	4.8	39.1	42.6	54.0	-11.4	Avg 1M/3M
V	7358.000	58.4	37.2	6.3	38.2	63.7	74.0	-10.3	Pk 1M/3M
V	7358.000	33.4	37.2	6.3	38.2	38.7	54.0	-15.3	Avg 1M/3M
Calculations		G=C+D+E-F		I=G-H					

NOTE: Above 10GHz no emissions were detected or measured above the noise floor. Averaging results were obtained using duty cycle correction factoring.

Results: Pass

8 Radiated Spurious Emissions (Receiver)

Not Applicable: This device does not contain a separate receive function. The nature of this device is that it will only receive while transmitting. Therefore, the spurious emissions produced in transmit mode are the spurious emissions produced in receive mode.

9 AC Power Line Conducted Emissions

Not Applicable: EUT is a battery-powered device.

10 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of k = 2, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

Parameter	Uncertainty	Notes
Radiated emissions, 30 to 1000 MHz	±3.9dB	
Radiated emissions, 1 to 18 GHz	±4.2dB	
Radiated emissions, 18 to 40 GHz	±4.3dB	
Power Port Conducted emissions, 150kHz to 30 MHz	±2.8dB	

11 Revision History

Revision Level	Date	Report Number	Notes
0	November 14, 2012	1008662211DAL-001	Original Issue